

Amateur Radio

SERVING AMATEUR RADIO SINCE 1945
SEPTEMBER 1994

CQ

1945

Our
50th
Year

1994

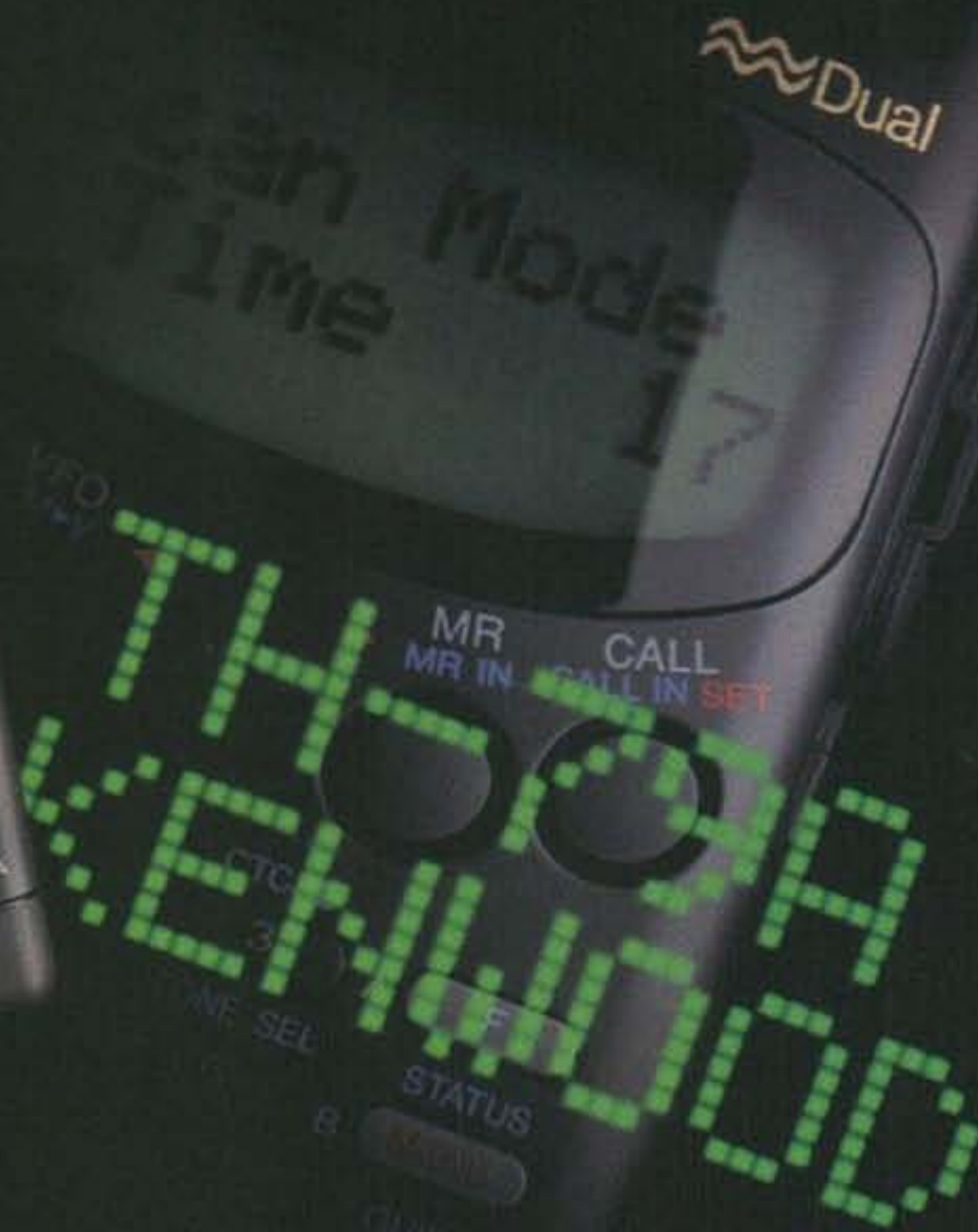
In This Issue

- **Three Antenna Projects You Can Build —**
 - A DX Antenna for 40 Meters
 - An Off-Center-Fed Dipole
 - A Simple 1/4-Wave 2-Meter HT Antenna
- Bill Orr Writes About Telephone Interference and the FCC . . . page 66
- K4ABT Tells How To Set Packet Audio Levels . . . page 88
- Results of the 1993 WWDX Phone Contest . . . page 13

on the cover: Tom Lee, K8AZ, Chesterland, OH

RADIO AMATEUR'S JOURNAL

On-Board Guidance System



New TH-79A FM DUAL BANDER

Information at your fingertips. Everything you need to know about operating the new TH-79A FM dual-bander (144MHz/440MHz) can be viewed in its unique dot-matrix LCD with alphanumeric display. No need for the manual. In addition to this innovative guide function, the TH-79A sports a user-friendly menu system, providing easy access to the many powerful features of this slim-line handheld transceiver. Such as 82 non-volatile memory channels with ID, DTSS and page functions, and a DTMF memory function for auto-dial operation. Full-crossband duplex operation is available, as is the ability to receive two frequencies on the same band (VHF+VHF or UHF+UHF) simultaneously. And thanks to the FET power module, long hours of operation are possible on one charge. With the TH-79A, transceiver technology enters the 21st century.

Features

- 2.7W approx. output (144MHz), 2W approx. output (440MHz) from MOS FET power module and supplied 6V battery; 5W approx. output using optional PB-34
- Dot-matrix LCD with menu/guide system
- 82 non-volatile memory channels with ID
- DTMF keypad with memory function
- DTSS (Dual-Tone Squelch System) with page
- Built-in CTCSS tone encoder/decoder
- Automatic band change ■ Power-on call sign display
- Auto repeater offset (VHF) ■ Input overvoltage warning
- 3-position output power control
- Auto power-off and battery save function ■ Time-out timer
- Multiple scan modes ■ Cross-band repeater function
- Page answer-back function ■ Channel display function
- Wideband receiver coverage, including AM receive on the aircraft band*
- Modifiable for MARS/CAP use**

*Specifications guaranteed for Amateur bands only.
**Permits required. Specifications guaranteed for Amateur bands only.

KENWOOD COMMUNICATIONS CORPORATION
AMATEUR RADIO PRODUCTS GROUP
P.O. BOX 22745, 2201 East Dominguez St., Long Beach, CA 90801-5745
•Customer Support/Brochures (310) 639-5300
•Repair Locations/Parts (800) KENWOOD •Bulletin Board Service (BBS) (310) 761-8284
KENWOOD ELECTRONICS CANADA INC.
6070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8

KENWOOD

BACK TO BASICS



TM-241A
FM MOBILE TRANSCEIVER

Pure and simple, the concept reads like this: "rock-solid performance with straightforward operation, at an affordable cost". And Kenwood's TM-241A (144MHz) FM mobile transceiver symbolizes this perfectly. Great looks and rugged construction are just the beginning. The TM-241A's user-friendly controls make mobile QSOs a snap, and a powerful 50-watt amplifier lets you work simplex with confidence or hit those distant repeaters. Reception specs are equally impressive: intermod characteristics have been improved* to reduce interference from strong adjacent band signals. Plus, there are 20 multi-function memory channels for programming combinations of frequency, sub-audible tone, and repeater offset.

So, if you're looking for true mobile performance, go back to the basics and reach for Kenwood's TM-241A.

Features

- 144-148 MHz TX, 118-174 MHz RX
- 50 watts RF output
- 20 multi-function memory channels
- Large LCD display with illuminated keys
- Full band scan, programmable band scan, memory scan with channel lock-out
- Time-operated & carrier-operated scan modes
- Built-in selectable CTCSS tone encoder
- Auto repeater offset
- Tone alert with elapsed time indicator
- DTSS for selective calling and paging (with optional DTU-2)
- Time-out timer
- Auto power-off with warning beeper
- Meets U.S. military standards for shock and vibration (MIL-STD 810C/D/E)*
- Modifiable for MARS/CAP use (permits required)

These specifications guaranteed for Amateur band only.
*Current K&K2 versions with serial number 5080000 or later.

KENWOOD COMMUNICATIONS CORPORATION
AMATEUR RADIO PRODUCTS GROUP

P.O. BOX 22745, 2201 East Dominguez St., Long Beach, CA 90801-5745

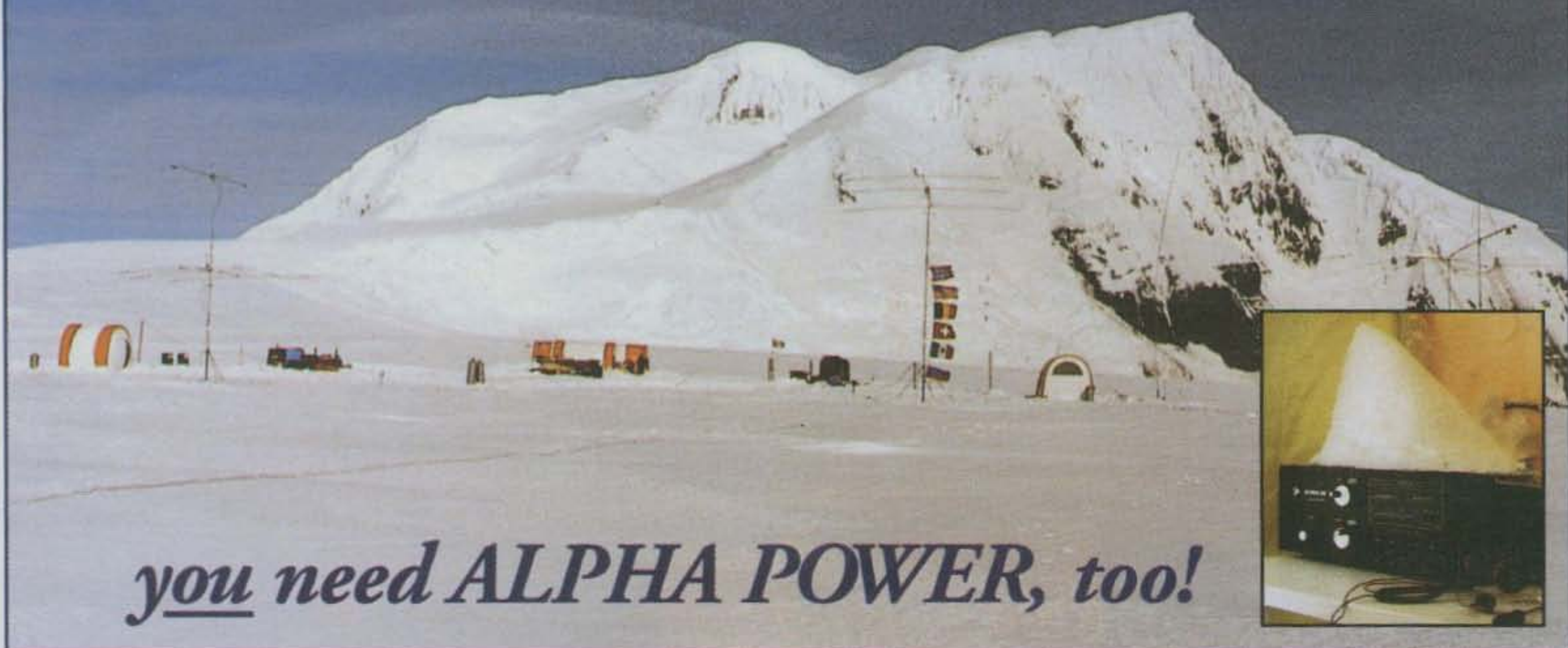
•Customer Support/Brochures (310) 639-5300

•Repair Locations/Parts (800) KENWOOD •Bulletin Board Service (BBS) (310) 761-8284

KENWOOD ELECTRONICS CANADA INC.
8070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8

KENWOOD

*When you absolutely, positively
have to get him logged tonight...*



you need ALPHA POWER, too!

Peter I Island, Antarctica – arguably “the most isolated spot on earth” – was #1 on the DX most-wanted list. So early in 1994 nine men landed there by helicopter from a Russian icebreaker. Physically isolated from the rest of the world, they battled howling blizzards and band-killing geomagnetic storms for three weeks to dish out 60,000+ 3YØPI QSOs. It was a severe test of men and equipment. Their choice of amplifiers? *ALPHA*, of course!

“The *ALPHA* amplifiers performed flawlessly....”

Expedition leader Ralph Fedor, KØIR

“Tip: *ALPHA*s will continue to run even when covered with 30 cm of snow.” Peter Casier, ON6TT (NCDXF Bulletin)

“All the *ALPHA*s worked the first time we powered them up and were still working 61,000 QSO’s later. I was amazed at the reports we received...under very difficult band and weather conditions!”

Tony Deprato, WA4JQS

ALPHA 89s powered 3YØPI. You may prefer one of these pileup-busters:



ALPHA 87A — Absolutely outperforms everything else!

“The ALPHA 87A effortlessly delivers legal-limit power from 160 through 10 meters... it automatically tunes itself for operation on a new band in about a second... delivers on all of its promises. While you’ve got the cover off, take a few minutes to admire the craftsmanship....”

QST Product Review, June 1992

ETO’S NEW 91ß — Positively the best value in amateur amplifiers.

The 91ß delivers traditional ETO power and durability. It is designed, sold, warranted and serviced by ETO. The price is amazingly low because we build the 91ß and most of its major components in Bulgaria. Result: the 91ß gives you typical ALPHA “1.5 kW brick-on-the-key” ruggedness, yet at only \$2298 it actually costs less than many “brand x” linears.



Shouldn’t your station be ALPHA powered?

Call Ray Heaton for descriptive literature and delivery information on all ALPHA products.

ETO

EHRHORN TECHNOLOGICAL OPERATIONS, INC.

4975 North 30th Street ■ Colorado Springs, CO 80919 ■ (719) 260-1191 ■ FAX (719) 260-0395

MASTHEAD

EDITORIAL STAFF

Alan M. Dorhoffer, K2EEK, Editor
 Gail M. Schieber, Managing Editor
 Nancy Barry, Editorial Assistant
 Lew McCoy, W1ICP, Technical Representative

CONTRIBUTING STAFF

Doug DeMaw, W1FB, Doug's Desk
 John Dorr, K1AR, Contest Calendar
 Chod Harris, VP2ML, DX
 Dave Ingram, K4TWJ, Special Interests
 George Jacobs, W3ASK, Propagation
 Joe Lynch, N6CL, VHF
 Frederick O. Maia, W5YI, FCC Correspondent
 Irwin Math, WA2NDM, Math's Notes
 Bill Orr, W6SAI, Radio Fundamentals
 Buck Rogers, K4ABT, Packet Radio Editor
 Karl T. Thurber, Jr., W8FX, Antennas & Software
 Norm Van Raay, WA3RTY, Awards & USA-CA
 Bill Welsh, W6DDB, Novice

AWARD MANAGEMENT

Jim Dionne, K1MEM, WAZ Award
 Norman Koch, K6ZDL, WPX Award
 Norm Van Raay, WA3RTY, USA-CA Award
 Billy Williams, N4UF, CQ DX Award

CONTEST MANAGEMENT

Steve Bolia, N8BJQ, WPX Contest Director
 Robert Cox, K3EST, WW DX Contest Director
 Roy Gould, KT1N, RTTY Contest Director
 David L. Thompson, K4JRB, 160M Contest Director

BUSINESS STAFF

Richard A. Ross, K2MGA, Publisher
 John Dorr, K1AR, General Manager
 Arnie Sposato, N2IQO, Advertising Manager
 Tracy A. Parbst, Sales Assistant
 Frank V. Fuzia, Controller
 John Dorr, K1AR, Director of Marketing

CIRCULATION STAFF

Catherine Ross, Circulation Director
 Melissa Nitschke, Operations Manager
 Carol Licata, Data Processing
 Denise Pyne, Customer Service

PRODUCTION STAFF

Elizabeth Ryan, Art Director
 Barbara Terzo, Assistant Art Director
 Susan Reale, Artist
 Edmond Pesonen, Electronic Composition Manager
 Dorothy Kehrweider, Production Manager
 Tracy A. Parbst, Production
 Emily Kreutz, Production
 Pat Le Blanc, Phototypographer
 Hal Keith, Illustrator
 Larry Mulvehill, WB2ZPI, Staff Photographer
 Joe Veras, N4QB, Special Projects Photographer

A publication of



CQ Communications, Inc.,
 76 North Broadway
 Hicksville, NY 11801-2953 USA.

Offices: 76 North Broadway, Hicksville, NY 11801.
 Telephone: (516) 681-2922. FAX (516) 681-2926. CQ (ISSN 007-893X) is published monthly by CQ Communications Inc. Second Class postage paid at Hicksville, NY and additional offices. Subscription prices (all in U.S. dollars): Domestic—one year \$24.50, two years \$47.00, three years \$69.00; Canada/Mexico—one year \$27.00, two years \$51.00, three years \$75.00; Foreign—one year \$29.00, two years \$55.00, three years \$81.00; Foreign Air Mail—one year \$82.00, two years \$161.00, three years \$240.00.

U.S. Government Agencies: Subscriptions to CQ are available to agencies of the United States government, including military services, only on a cash with order basis. Requests for quotations, bids, contracts, etc. will be refused and will not be returned or processed. Entire contents copyrighted CQ Communications Inc. 1994. CQ does not assume responsibility for unsolicited manuscripts. Allow six weeks for change of address. Printed in the United States of America.

Postmaster: Please send change of address to CQ Magazine, 76 North Broadway, Hicksville, NY 11801.



The Radio Amateur's Journal

ON THE COVER: Tom Lee, K8AZ, of Chesterland, OH packs an awesome amount of Amateur Radio into his shack, with "stuff" right up to the rafters. Tom enjoys great success as an All-Band entry in the CQ WWDX contest for Ohio on both SSB and CW. (Photo by Larry Mulvehill, WB2ZPI)



SEPTEMBER 1994

VOL. 50, NO. 9

FEATURES

RESULTS OF THE 1993 CQ WORLD-WIDE DX SSB CONTEST

	Bob Cox, K3EST/6	13
PHONE TROPHY WINNERS AND DONORS		14
TOP SCORES.....		18
BAND-BY-BAND BREAKDOWN—TOP ALL BAND SCORES.....		19
ZONE LEADERS, SINGLE OPERATORS.....		22
WORLD TOP 10 QRPp		23
TEAM CONTESTING.....		23
WORLD TOP 10 ASSISTED		23
AVERAGE % OF STATIONS WORKED ON EACH CONTINENT		23
CQ REVIEWS: THE NCG/COMET HA-4S HF MOBILE ANTENNA	Lew McCoy, W1ICP	38
A DX ANTENNA FOR 40 METERS	Paul Carr, N4PC	40
AN OFF-CENTER-FED DIPOLE ANTENNAR.F. Swartzendruber, AD5I		44
ANTENNAS & ACCESSORIES: ANTENNA NOTEBOOK, PART II	Karl T. Thurber, Jr., W8FX	50
CQ SHOWCASE: NEW AMATEUR PRODUCTS		56
VHF PLUS: TWO RECORD-SETTING STORIES.....	Joe Lynch, N6CL	58
RADIO FUNDAMENTALS: TELEPHONE INTERFERENCE AND THE FCC	Bill Orr, W6SAI	66
WORLD OF IDEAS: IN THE SPOTLIGHT—CLASSIC FM HANDHELDS	Dave Ingram, K4TWJ	74
PACKET USER'S NOTEBOOK: AUDIO LEVELS ARE NOT ALWAYS LEVEL	Buck Rogers, K4ABT	88
MATH'S NOTES: A SIMPLE 1/4-WAVE 2 METER HT ANTENNA	Irwin Math, WA2NDM	94
BILL'S BASICS: NOVICE-TECHNICIAN LICENSING COURSE, PART V	Bill Welsh, W6DDB	96
WASHINGTON READOUT: UNITED STATES CONSIDERING INTERNATIONAL AMATEUR RADIO LICENSING	Frederick O. Maia, W5YI	122
ANNOUNCING: THE 1994 CQ WORLD-WIDE DX CONTEST		140

DEPARTMENTS

AWARDS: STORY OF THE MONTH—PAUL W. LINDVALL, WD9EJK	Norm Van Raay, WA3RTY	46	
CONTEST CALENDAR: ANNOUNCING CQ'S 1994 CONTEST SURVEY, CONTESTS FOR SEPT. AND EARLY OCT.	John Dorr, K1AR	102	
DX: DXCC RULE 12—OPERATING ETHICS	Chod Harris, VP2ML	110	
PROPAGATION: RADIO STORMINESS ABATES, SHORT-SKIP CHARTS FOR SEPT. AND OCT., DX CHARTS FOR SEPT. 15 THROUGH OCT. 15	George Jacobs, W3ASK	130	
ZERO BIAS.....	4	HAM SHOP.....	146
ANNOUNCEMENTS	6		

ZERO BIAS

EDITORIAL

Let's face it. This summer, depending on where you live, has been too hot, too wet, too humid, and possibly too incinerating to do much in the way of antenna work. Well, the days are dwindling down to a precious few before "The Big One" comes up next month, so it may be time to put aside procrastination and get to work. There's no guesswork or wondering about the results of the 1993 CQ World-Wide DX SSB Contest. They're here in this issue for all to see.

In spite of dwindling sunspots—remember that they dwindle for everyone—contests have a way of generating their own propagation, and everyone faces the same exact conditions. Most contests (even the ones in which the exchange is your dog's name, your hat size, and the Latin name for rutabaga) are exciting. The CQ WW is beyond exciting and enters the world of exhilaration. It's just that it's all there, and all at the same time—one giant, level playing field. I don't mean level in the sense of me having a shot at winning, but level in the sense that absolutely everyone's call is unique and important and desirous of being worked. By the way, in case you didn't know, it's *Brassica napobrassica*.

I guess contests and QSO parties, and even Field Day, are atavisms to the days when there were practice sessions for handling traffic, both routine and emergency. Can you reliably exchange and record information at a rapid rate? After all, our national organization has the word *Relay* in its name, and that obviously is derived from what we used to do. Today our technology and hardware make that task more simplistic and certainly more reliable. Today the rationale for establishing links and nets for the exchange of information is a bit cloudy, unless you're talking about a specific affinity group interested in sharing information and having a mutual focus on a specific topic. Today contests, QSO parties, and even Field Day are our links, however tenuous, to our past. "We used to do it, and we still can do it" is the underlying statement, but for the moment we all are caught up in the activity itself, even for its own sake rather than for its antecedent roots. Most of us simply like the competition, the sense of achievement (whatever the goal) and being in the thick of things. Almost all of us never win, but then again, that comes as no great surprise either. If you are looking for a more traditional and altruistic way of using any burgeoning skills developed via the competitive method, I would suggest that you get involved with any of the MARS (Military Amateur Radio System) groups.

Speaking of MARS, I just received a great new book written by Paul Scipione, AA2AV, called *MARS: Calling Back To 'The World' From Vietnam*. It's the history of the MARS operation during the Vietnam War, where during the ten-year period of the war more than three-million messages were handled via amateur radio. It's quite an interesting book to read, and if you're old enough, it sure does bring back memories. I'd also like to mention that our own VHF Editor, Joe Lynch, N6CL, is mentioned as one of the operators of AD8AJ in Cu Chi, Vietnam. The book can be purchased from The Center for the Study of the Vietnam War, 6354 N. 12th St., Kalamazoo, MI 49009. It is priced at \$22.00 plus \$3.00 for shipping and handling. Checks should be made payable to Mr. Robb Adams, WA9ZMO.

Barring altruism and setting aside preparing for "The Big One" or even "The Little One," all of our amateur operating activities are basically fun first. They do tend to speed up your heart rate (I don't think that it qualifies as a replacement for aerobics, though.) and make you a faster and sometimes better operator. These activities tend to remind us to check out our station, antenna system, and sometimes even a reliable power source. So if you want to construe this as some sort of preparation, so be it, but I still call it fun. Even the folks who really hate these activities get to have their heart rates increased and get practice at eye-hand coordination through letter writing and communicating at a rapid speed via the landline. In a sense it's good for everyone.



Shirt and tie aside, sans hamfest booth, your Editor reviews the Dockyard area of Bermuda recently. It gets high marks and is certainly recommended.

Travels With CQ

Last month I told you about Dick and Arnie going to Germany for Europe's big one, Friedrichshafen. This is the German equivalent of Dayton and attracts about 20,000 amateurs from all over Europe. If you ever need any incentive to travel to Europe, make it a point to have the trip coincide with this hamfest. They do things on a bigger and grander scale than we do here, and they also have an outstanding fleamarket featuring gear and items never seen here. Dick said that it was really hot there, but that it didn't stop anything or slow things down. The area itself is beautiful, right on Lake Constance just a ferry ride away from Zurich. Arnie brought back a telegraph key for my collection that he picked up in the fleamarket, and it's a welcome addition. Well, maybe next year I'll go back.

I decided while they were away to take the time and get away on a real vacation, something I hadn't done for a long while. For years I have been receiving the bulletin from The Radio Society of Bermuda, and it always sounded like a great place to go. Without equivocating, it is! It's everything all the brochures, pictures, and stories say it is and more. I was told that the society had their own building, but I couldn't find any listing in the phone book, and although I had very good intentions of looking up some of the locals, the time went by too quickly. I was really getting into the idea of vacation, sightseeing, beach, and food. I have to admit that it felt odd checking into a hotel and not having an adjoining building for a hamfest, or a CQ booth, or even a fleamarket (not even a garage sale). Next time I'll try to include some amateur radio activity. The food was great, too.

We still have about six more hamfests to do before the year ends, with plenty of opportunity to bring home some more "Good Stuff." Our travel season ends the first weekend in October with the Boxboro Hamfest in Massachusetts. This is about the best time of the year to be in that area, as the trees are changing colors as fall takes over. It's about a four-hour drive from this area and scenic most of the way. If you want to keep in touch, bring your mobile rig along and describe what you see. I know I'd rather listen to that than some heuristic comparison of bran or even (if possible) a scintillating discussion of body parts and functions breaking down. Get out of the shack once in a while and go to a hamfest. You'll get some fresh air, enjoy some camaraderie, and experience all sorts of new and wonderful things. Just eat before you go or bring your own sandwich.

73, Alan, K2EEK



Award Tracking is Elementary

Remove the mystery from QSO logging with AEA Log Windows™. This fully integrated, easy-to-use Windows program combines the functions of logging, rig control, and DX Cluster monitoring with award tracking and reporting.

Switching to Log Windows is easy with complete import and export filters for most major logging programs. A powerful relational database tracks all your QSO information, letting you search records by call sign, prefix, date, zone, and more!

Discover an ingenious packet cluster interface that supports any data controller while in the dumb terminal mode; it also supports mouse-based spot grabbing and message reading.

Automatic award tracking makes tracking your status much less puzzling. Awards tracked include: DXCC mixed, phone, CW, FSK, and bands; CQ mixed, SSB, CW, FSK, and bands; WAS mixed, SSB, CW, FSK, and bands; and VUCC for VHF and UHF.

Let us clue you in on just how easy award tracking can be! Call AEA's Literature Request Line at (800) 432-8873 for more information, or call us direct at (206) 774-5554. Contact your favorite ham radio equipment dealer for best pricing.



Connect with us



ANNOUNCEMENTS

• **University of Aberdeen Quincentenary** – In 1995 the University of Aberdeen will celebrate its Quincentenary. They hope to have a station on the air during 1995 to mark this event. They would like to hear from graduates, students, and ex-students of the university, both home and overseas, who are licensed amateurs or SWLs. For more information, contact A.G. Anderson, GM3BCL, West Balfour House, Durris, Banchoory AB31 3BJ Scotland.

• **First Radio Research Company** – The United States Army Aviation Museum is looking for past members of the First Radio Research Company, an Army Aviation company of the Vietnam era, to gather information for its records to preserve the company's history. Members are asked to contact Regina Burns, United States Army Aviation Museum, P.O. Box 620610, Fort Rucker, AL 36362-0610; or Kenneth Supranowich, 1170 Keeven, Florissant, MO 63031 (314-839-2421).

• **QRP Afield 1994** – This CW-only event will take place from 1600–2200Z Sept. 17 on 1.810, 3.560, 14.060, 21.060, 28.060; Novice 3.710, 7.110, 21.110, 28.110. It is sponsored by the QRP Club of New England and is designed to encourage QRP enthusiasts to field-test their radio equipment using temporary antennas and non-commercial power sources. Certificates will be awarded to the ten stations with the highest point totals. For details contact Chet Bowles, AA1EX, RFD 2, Box 335L, Sharon, NH 03458.

• **Mail For Our Military Program** – This year's Mail for Our Military program is now underway. To find out more about the program, which sends cards and letters to service people around the world at the holidays, send a first-class postage stamp for return postage (a stamped SASE cannot be used—send just the stamp), along with your name and address, to: Mail For Our Military, P.O. Box 415, Fort Campbell, KY 42223-0415.

• **The following Special Events are scheduled for September:**

N1BBR and WX10, to celebrate the apple harvest in Vermont; from Addison County, Vermont; Addison County ARA; 1400–2100Z; Sept. 24; operation in the general portion of the 20 and 40 meter CW and phone bands as well as Novice 10 meter phone. Talk-in on local 2 meter repeaters. For certificate, send QSL info, \$1.00 and a 9 x 12 SASE to N1IJW, Elaine Eldridge, P.O. Box 10, New Haven, CT 05472-0010.

WF1N, from Appledore Island, one of the Isles of Shoals, NA-148; near the usual IOTA frequencies; Sept. 16–19. QSL to WF1N, direct or via the bureau. WF1N's new address is: Tony Spino, 15 Regency Hill, Waterbury, CT 06708-1845 (the '93 *Callbook* address is not correct).

K2BR, from the Miss America Pageant in Atlantic City, New Jersey (Absecon Island, IOTA NA111); Southern Counties ARA (SCARA); 10 AM EST Sept. 12; phone 25 kHz inside lower General class bands; CW 65 kHz inside lower General class; and Novice 28.100–28.500 kHz.

W3CWC, from Hagerstown, Maryland; to commemorate the 125th birthday of Hiram P. Maxim, W1AW, founder of the ARRL; Antietam Radio Association; 1500Z Fri., Sept. 2 to 0400Z Sat., Sept. 3, and 1200Z Sat., Sept. 3 to 2400Z Sun., Sept. 4; CW 3.640, 7.045, 14.040, 21.040, 28.040; SSB 3.920, 7.240, 14.240, 21.295, 28.350 MHz. For a commemorative certificate, send QSL and SASE to: Antietam Radio Association, Attn: Special Event Station W3CWC, P.O. Box 52, Hagerstown, MD 21741-0052. For more info contact Bob Long, KD3JK at 301-824-5132.

WA3MFT, from Reading, Pennsylvania; to commemorate the completion of renovation to the landmark Pagoda; 1600Z Sept. 17 to 2000Z Sept. 18; phone 3.880, 7.280, 14.280, 21.380, 28.480, and packet 145.09. For certificate, send QSL and 9 x 12 SASE to Berks Amateur Radio Society, P.O. Box 12632, Reading, PA 19604.

KD3XN, from Civil War Fort Delaware; Pea Patch Island, Delaware; Tri-County Amateur Group; 1400–2100 UTC; Sept. 23, 24, 25; General and Novice portions of 10, 12, 15, 17, 20, and 40 meters. For photo QSL, send SASE to operator worked.

WC3A, N3IRN, and N3LQS, from Liberty-Valley Elementary School; Danville, Pennsylvania; 1300–1900Z Sept. 19; all amateur bands. For certificate, send QSL to N3POB, D. Miguez, Liberty-Valley School, 175 Liberty-Valley Road, Danville, PA 17821.

K8SCH/4, from Assateague Island, Accomack County, Virginia; The OH-KY-IN ARS; Sept. 16–18; operation on 10, 15, and 20 with a beam, and dipoles on 40 and 80. All operation will be on SSB. Send QSL with SASE via *Callbook* or N8FU. Watch IOTA frequencies.

AC4QF, from 15th annual Erwin/Unicoi County Apple Festival; Erwin, Tennessee; Unicoi County Amateur Radio Service; 1300–2100Z Sept. 24; phone 14.265, 7.265. For QSL card, send QSL and #10 SASE to UCARS, P.O. Box 185, Erwin, TN 37650-0185.

WA4USN, to commemorate the BOC Challenge 1994–95; Charleston, South Carolina; The Charleston ARS; 1300–2300Z Sept. 16, 17, 18; 7.250, 14.045, 14.250, 21.045, 21.250, Novice CW portion of 40 meter band and 146.790. All frequencies ± 5 for QRM; 2 meters on Sept. 17 only. For QSL, send QSL and SASE to Sheila Frank, KC4UDD, 614 Longstreet Circle, Summerville, SC 29483.

K15MB, KB5RGJ, AB5GU, from Pearland, Texas Centennial Celebration; The Pearland ARC; Sept. 24; operation on 28.410, 21.310, 14.260, 7.230, and 7.125. Special certificates will be sent to stations working all three locations. For QSL or certificates, send SASE via Marty Haley, AB5GU, 803 Avenue I, South Houston, Texas 77587.

KN6CV, for 81st anniversary of the 1913 Corona Road Race, Corona, California; The Corona/Norco ARC; 1600–2400Z; Sept. 10; lower portion of General 80, 40, 20, and 15 meter subbands and 28.400. For QSL, send SASE to Corona Norco Amateur Radio Club, P.O. Box 1783, Corona, CA 91718.

7-land, from B.P.O. ELKS Lodge #287; Walla Walla, Washington; to commemorate the lodge's 100th anniversary; Sept. 23–25; operation in lower part of the General portion of as many bands as possible. For more information contact Robbie Gallo, KB7OBW, at 351 E. Rose, Walla Walla, WA 99362.

AB7BS, from the Pahrump Harvest Festival (Nye County Fair); Pahrump, Nevada; 1800–0400Z Sept. 16–18; on General 40, 20, and 15 meter phone and Novice 10 meter phone. For certificate, send 9 x 12 SASE to Phil Landmeier, AB7BS, P.O. Box 3000-304, Pahrump, NV 89041.

9-land, to commemorate Auburn Cord Duesenberg Days in Auburn, Indiana; Northeastern Indiana ARC (NEIARC); 1400–2200Z Sept. 4 & 5; lower 25 kHz of General bands on 40 and/or 80 meters. For a commemorative QSL, send confirmation and SASE to NEIARC, P.O. Box 745, Auburn, IN 46706.

N8CWP, from Anamosa, Iowa; The Jones

County ARC's annual Pumpkinfest; 1500Z–2000Z Saturday, Oct. 1; lower 50 kHz of the General subbands. For certificate send confirming QSL to Jim McClintok, N8CWP, Box 462, Morley, IA 52312.

WA8DDC, from Centennial Village; Greeley, Colorado; The Weld ARS; to celebrate Potato Day; 1600–2100Z Sept. 10; on 14.250 and 28.490 MHz. For a special certificate, QSL with a business-size SASE to WA8DDC, Rick Hubbard, P.O. Box 5116, Greeley, CO 80631.

CJ3IPM, from Renfrew County; Chalk River, Ontario, Canada; The Renfrew County ARC; to commemorate the International Plowing Match; September 20–24; all bands. QSL card available by sending SASE to RCARC, P.O. Box 39, Chalk River, Ontario, Canada K0J 1K0.

OS50USA, OO50USA, OQ50USA, and OR50USA, from Belgium; Bastogne Radio Amateurs Group, Mons Radio Amateurs Team, Tilleur Radio Amateurs Group, and Verviers Radio Amateurs Group; Sept. 24 and 25. For a special QSL, send your QSL via bureau to QSL manager or direct via P.O. Box address (with SASE for direct return) to: Post Office Box 11, B-4800 Verviers 1, Belgium.

• **The following hamfests, etc., are slated for Sept.:**

Sept. 2–3, **New Orleans International DX Convention**, Royal Sonesta Hotel, New Orleans, Louisiana. Contact Michael Mayer, W5ZPA, New Orleans International DX Convention, 5836 Marcia Avenue, New Orleans, LA 70124 (504-283-4143 days; FAX 504-524-2129).

Sept. 10, **Eighth Annual Ballston Spa Hamfest**, Ballston Spa, New York. Contact N2FEP, P.O. Box 41, Rock City Falls, NY 12863.

Sept. 10, **Erie Hamfest '94**, Franklin Twp. Firehall, Erie, Pennsylvania. Contact Tom Mc Clain, N3HPR, 3954 Solar Drive, Erie, PA 16506 (814-833-1640).

Sept. 10, **42nd Annual W9DXCC Convention**, Rolling Meadows, Illinois. Contact William S. McConnell, N9US, 708-397-9593.

Sept. 10, **UARC Hamfest**, UARC grounds, Old Pittsburgh Road, Uniontown, Pennsylvania. Contact Carl, WA3HQK, or Joyce, KA3CUT, Chuprinko, Route 6, Box 231-CC, Morgantown, WV 26505 (304-594-3779).

Sept. 10, **5th Annual 'FEST 1994**, Knights of Columbus, Grand Hall, Topeka, Kansas. Contact Rob Nall, WV0S, 5707 SW 28th Terrace, Topeka, KS 66614-2420 (913-271-8899).

Sept. 11, **Hamfest, Radiofest, Computer Expo**, Dubuque, Iowa. Contact Loren Heber, N0YHZ, 9479 Laudeville Rd., Dubuque, IA 52003; or Jerry Ehlers, N0NLU, 3115 Brunswick Street, Dubuque, IA 52001 (call 319-583-1016). (Exams, 1 PM.)

Sept. 11, **The Ozarks ARS Hamfest**, Monett City Park, Monett, Missouri. Call Stan, KFOKS at 417-452-3801.

Sept. 11, **Shawnee ARA Hamfest**, DuQuoin State Fairgrounds, DuQuoin, Illinois. Contact Joey Helleny, KB9HNO, 618-457-8114, or write to 600 So. 16th St., Herrin, IL 62947. (Exams.)

Sept. 11, **Butler County ARA Hamfest**, Butler, PA Farmshow grounds, Butler, Pennsylvania. Contact Joe Stahlman, WA3BVQ, 499 Keister Rd., Slippery Rock, PA 16057 (SASE) or phone 412-794-8383.

Sept. 11, **South Eastern Massachusetts ARA 7th Annual Hamfest & Flea Market**, at the club grounds, South Dartmouth, MA. Contact Michael Enos, P.O. Box 79064, North Dartmouth,

(Continued on page 121)

Data Controllers Put You In Control

- Dual simultaneous ports.
- Automatic signal identification.
- 9600 bps modem option available.
- 8-pole Chebyshev bandpass filter.
- Dual-port Gateway: Packet to AMTOR, Packet to PACTOR, and Packet to Packet.
- Twenty software selectable modems.
- 17K Packet, PACTOR, and AMTOR MailDrop.
- 16-level gray scale fax with opt. software.
- Same modes as the PK-232MBX.
- Full PACTOR Memory ARQ.

PK-900



DSP-2232

DSP-1232

- DSP-1232 has two switchable ports.
- DSP-2232 has two simultaneous ports.
- Same modes as the PK-232MBX.
- Includes modems for satellite use.
- Automatic signal identification.
- 17K Packet, PACTOR, and AMTOR MailDrop.
- DSP-2232 has dual-port Gateway: Packet to AMTOR, Packet to PACTOR, & Packet to Packet.
- DSP-2232 features front panel LCD.
- Up/Down Doppler shift for PSK modems.
- 9600 bps modem included.

- Designed for multi-mode operation.
- Internal 1200 bps VHF modem.
- Automatic signal identification.
- 18K Packet, PACTOR, and AMTOR MailDrop.
- 2400 bps modem option.
- 8-pole Chebyshev bandpass filter.
- Modes: Morse code, Baudot, RTTY, ASCII, AMTOR/SITOR, PACTOR, VHF & HF packet, B&W fax receive/transmit, NAVTEX/AMTEX, and ARRL Information Services.
- Gateway as a node.

PK-232MBX



PK-12

PK-96

- PK-96 is a 9600 bps packet-only controller with 9600 bps K9NG and G3RUH compatible direct frequency modulation and 1200 bps VHF packet.
- PK-12 offers 1200 bps VHF packet at less than 80 mA of power.
- PK-96 features true DCD state machine for open squelch operation.
- 32K RAM, easily expandable to 128K.
- KISS mode for TCP/IP compatibility.
- Control of third-party MailDrop traffic.

Call (800) 432-8873 for a complete catalog or information on a specific product. Contact your favorite amateur radio equipment dealer for best pricing.



Connect with us

Advanced Electronic Applications, Inc.
2006 196th Street Southwest
P. O. Box C2160
Lynnwood, WA 98036
(206) 774-5554

STELLAR PERFORMANCE

2M-22C

435-40CX

Enjoy the circular advantage of **KLM's** circular polarized VHF/UHF antennas. Satellite enthusiasts have long known the benefits of circular polarization for receiving terrestrial signals. The 3 dB line of sight loss is often recovered with the circular's superior ability to receive multipath or reflected signals. **KLM's** polarity switchers (included) allow instant switching between right and left hand twist/polarity. These **KLM** antennas can also be fed by separate feed lines for two antennas in one. Teflon baluns rated at 2 kW are supplied with each antenna. Also available are 2 and 4 port power dividers, fiberglass cross booms and stacking frames. Call or write for our 1994 catalog summarizing our line of high performance amateur antennas and accessories.

KLM
ANTENNAS, INC.

14792 - 172nd Dr. SE # 1
Monroe, WA 98272

(206) 794-2923
(206) 794-0294 FAX

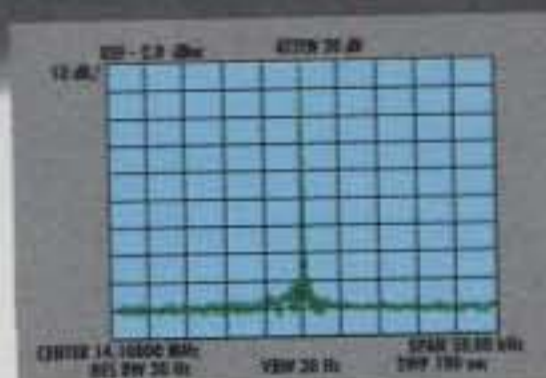
CIRCLE 156 ON READER SERVICE CARD

Expand Your Horizons to 6 Meters!



IC-736: 6 Meters and HF!

- HF and 6 Meters!
- 100 W Output for Both HF and 50 MHz
- Internal AC Power Supply
- Automatic Antenna Tuner (Covers 6 M to 160 M)
- Dual Antenna System
- 100% Full Duty Cycle
- Newly Developed DDS Circuit for 1 Hz Fine Tuning Resolution
- Quick Split Function (with pre-programmable offset)
- MOS-FET "Class A" Audio
- Multi-Function Meter (4-in-1)
- Double Cooling Fan
- Selectable Filters
- 10 dB Pre-amp, 20 dB Attenuator
- Built-in Electronic Keyer
- RIT, ΔTx, ΔRx
- 10 Key Pad
- VOX
- RF Gain
- 101 Memory Channels
- Passband Tuning
- AF-type Speech Compressor
- CW Full Break-In
- Notch Filter
- Noise Blanker
- Large Display



Transmitter C/N Ratio

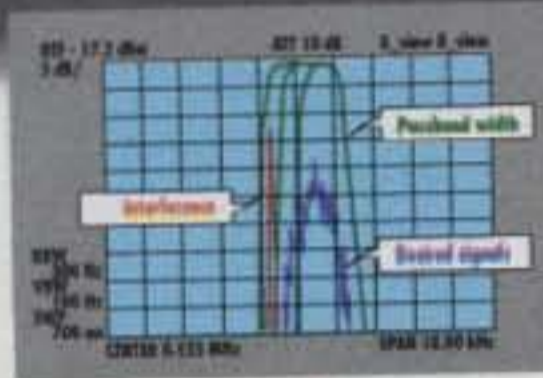
Now you can work all of the HF bands AND have access to one of the most exciting amateur bands – 6 M! The IC-736 is an all band, all mode transceiver with a general coverage receiver. Only an antenna, coaxial cable and AC outlet are necessary to get up-and-running with this rig. Cutting edge features and "plug 'n play" operation make the IC-736 a "complete station in a box!"

The IC-736's compact and cleverly designed **Automatic Antenna Tuner** has preset memories for each 100 kHz step, thereby providing very high speed tuning. Tunes all ham bands plus 6 M!

Equipped with **2 Antenna Connectors**, the IC-736 includes an **Automatic Antenna Selector**. In each band, the band memory memorizes the selected antenna so you don't need to change an antenna manually each time you change the operating band.

The IC-736 employs power **MOS-FET's** in the driver and final amplifier stages, providing a clean, 100 W of output power over all of the ham bands as well as the 50 MHz band.

An **Aluminum Die-Cast Frame** and **2 Large Cooling Fans** help stabilize the



PBT Characteristics

IC-736's PA circuit to obtain 100% full duty cycle operation. Performance you can count on under the most demanding of conditions.

CW fans will love the IC-736. The **Full Break-In Function** (QSK) allows you to receive signals between transmitted keying pulses (semi break-in is also available). **Separately Designed CW Key Jacks** allow you to connect both a memory keyer and a paddle – great for contest operation!

The **Double Band Stacking Register** memorizes 2 frequencies along with modes in each band so it can be used like 2 VFO's in one band.

Up to 10 **Electronic "Memo Pads"** are available. This is especially useful during contests or while DX hunting. When catching a station you would like to temporarily store, simply push the memo pad-write button. The frequency and mode is automatically stored in a memo pad so you can continue band searching.

For interference rejection, the IC-736 has **Passband Tuning** and a **Notch Filter**. During crowded band conditions, these two functions can be used in combination, providing an extremely effective method of reducing most types of interference.



Dynamic Range Characteristics

The **RIT** and **ΔTx** functions independently change the receive or transmit frequencies, respectively. Great for split frequency operation or for compensating for the frequency drift of another station.

The IC-736's offset frequency for **Quick Split** Function can be pre-programmed. A **Split Lock** function prevents you from mistakenly changing the receive frequency while changing the transmit frequency.

A newly designed **DDS** (Direct Digital Synthesizer) provides frequency resolution to an exacting 1 Hz. Rotate the main dial and experience the comfortable analog feeling of fine tuning. One complete dial rotation is equal to 200 Hz.

Call (206) 450-6088 for
FREE Product Literature!



ICOM America, Inc. Corporate Headquarters
2380-116th Ave. N.E., Bellevue, WA 98004

© 1994 ICOM America, Inc. The ICOM logo is a registered trademark of Icom, Inc. All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 736494Y

CIRCLE 144 ON READER SERVICE CARD

Experience the Quality

ICOM

Duals At Dawn

ARX-270

AR-270

NEW
AR-270B

Up To The Challenge

The challenge for Cushcraft engineers was to develop a line of 70cm/2m verticals with enough diversity in price and performance to suit any ham's needs. The task having been met, we now offer 3 models of dual band verticals: two aluminum and one fiberglass.

Choose Your Dual Band

If your space or budget is confined, then the AR-270 is the right choice. The "Dual Wonder" is less than 4 feet tall and mounts just about anywhere.

If, on the other hand, you're looking for top of the line performance, the ARX-270 is the way to go. It's a 16-1/2 foot, 3-piece fiberglass antenna that's factory tuned and assembled in minutes.

If the AR-270 isn't quite enough and the ARX-270 is more than what you had in mind, the all new AR-270B is the perfect middle ground. This antenna captures the best of both worlds with great performance in an 8 foot high package.

Cushcraft also offers the CS-270M dual band mobile antenna. This compact performer features the best components and the latest in 70cm/2m technology.

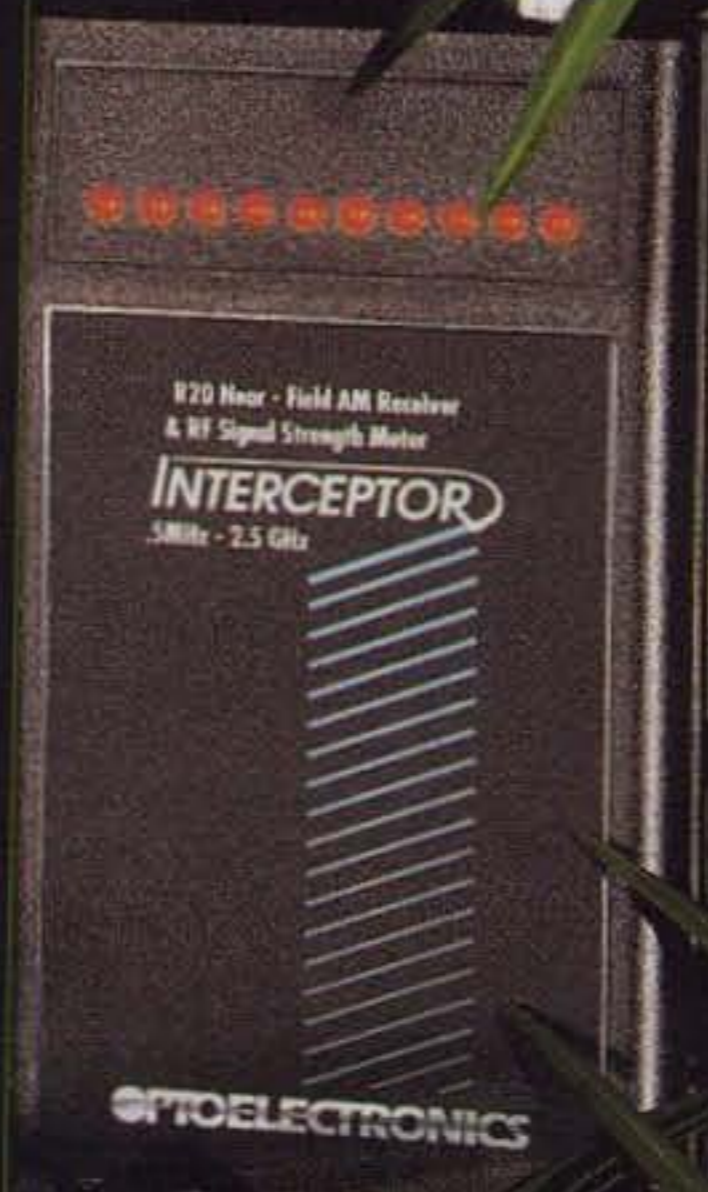
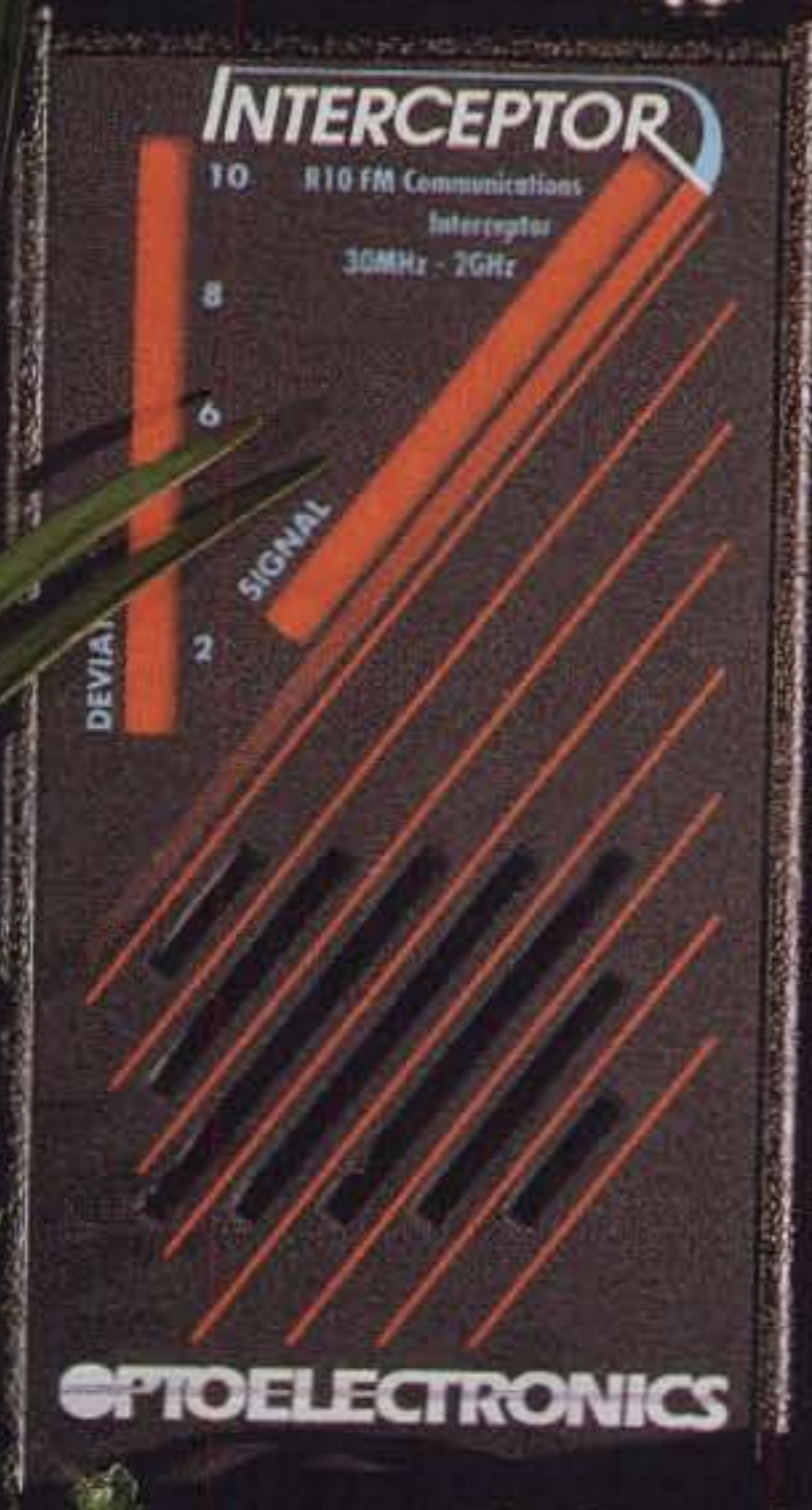
Whichever antenna is right for your situation, you can rest assured that performance and durability are built in. After all, it's a Cushcraft.

AVAILABLE THROUGH DEALERS WORLDWIDE



P.O. Box 4680, 48 Perimeter Road, Manchester, NH 03108 U.S.A. • 603-627-7877 • FAX: 603-627-1764

YOU CAN'T HIDE



FROM THE INTERCEPTORS

The New and Improved Model R10 FM Communications Interceptor®

If RF security is a concern then the R10 Interceptor® may be the answer. FM signals just can't hide from the R10. It provides a shield of protection that no FM signal can penetrate without being detected.

The proprietary circuitry was developed exclusively by Optoelectronics. Thousands of customers including security professionals, radio technicians, and monitoring enthusiasts appreciate the near field capabilities of the R10.

For the first time since its introduction two years ago the R10 has been upgraded with a new high intensity bargraph LED display, a

low battery indicator and a delayed squelch. The new squelch circuit provides continuous reception of a signal during most multi-path drop outs. Now when used with our DC440 Decoder, Digital Coded Squelch codes can be checked as well as CTCSS Tones and DTMF Characters.

- Check deviation with 10KHZ (1KHZ step) or 100KHZ (10KHZ step) range.
- Check relative signal strength.
- Skip button lets R10 scan to next signal.
- Continuous 30MHz to 2GHz coverage in less than one second.
- Completely automatic with no tuning required.
- 400 foot pick up range from hand held radios. (Distance will vary with RF background.)
- Use built in speaker or earphone/headphones.

Model R20 Interceptor/Bug Detector AM Communications Interceptor®

The R20 is a compact RF signal strength detector with a 10 segment bargraph display. There is also an audio output from the detector that is processed for constant volume for use with ear phone.

The audio output is useful for room sweeps where in close proximity to a transmitter a quieting effect can be heard due to detector saturation.

Transmitters can be easily checked for output and AM modulation.

- The 10 segment LED bargraph responds to all RF signals with nominal 3dB increments
- Pocket sized with built in telescoping antenna.
- 9 Volt battery operation.
- Monitor Aircraft, CB, AM broadcast transmissions when close.
- Check Microwave oven leakage.
- Wide .5MHz - 3GHz+ frequency range.

OPTOELECTRONICS

Order Line: **1-800-327-5912** Fax 305-771-2052

305-771-2050 • 5821 NE 14 Avenue, Fort Lauderdale, FL 33334
 Visa, Master Card, C.O.D., Cash or Money Order • Shipping Charges Additional.
 All specifications & prices are subject to change without notice or obligation.



R10 checks coded squelch codes with DC440 Decoder

R10 FM Communications Interceptor®	\$359.
R20 AM Communications Interceptor®	\$119.
DC440 Decoder	\$259.
CX12 RS-232C Interface Converter (Interface DC440 to PC)	\$ 89.

> 12 STORE BUYING POWER! <



HAM RADIO OUTLET

WORLDWIDE DISTRIBUTION

Phone Hours:

9:30 AM to 5:30 PM

Store Walk-In Hours:

10:00 AM - 5:30 PM • Closed Sundays

CALL TOLL FREE:

- West 1-800-854-6046
- Mountain 1-800-444-9476
- Southeast 1-800-444-7927
- Mid-Atlantic 1-800-444-4799
- Northeast 1-800-644-4476
- New England 1-800-444-0047

Toll free, incl. Hawaii, Alaska, Canada; call routed to nearest store; *all HRO 800-lines can assist you, if the first line you call is busy, you may call another.*

Call/Write for your HRO Catalog!

ANAHEIM, CA 92801
933 N. Euclid St.
(714) 533-7373
(800) 854-6046
Janet, WA7WMB, Mgr.
Near Disneyland

OAKLAND, CA 94606
2210 Livingston St.
(510) 534-5757
(800) 854-6046
Rich, WA9WYB, Mgr.
I-880 at 23rd Ave. ramp

SAN DIEGO, CA 92123
5375 Kearny Villa Rd.
(619) 560-4900
(800) 854-6046
Tom, KM6K, Mgr.
Hwy. 163 &
Claremont Mesa

SUNNYVALE, CA 94086
510 Lawrence Expwy. #102
(408) 736-9496
(800) 854-6046
Tom, KB6LUC, Mgr.
Lawrence Expwy.
So. from Hwy. 101

VAN NUYS, CA 91411
6265 Sepulveda Blvd.
(818) 988-2212
(800) 854-6046
Jon, KB5ZBI, Mgr.
San Diego Fwy.
at Victory Blvd.

NEW STORE!

NEW CASTLE, DE 19720
1509 N. Dupont Hwy.
(302) 322-7092
(800) 644-4476
Kent, KD1IJ, Mgr.
RT.13 1/4 mi., So. I-295

PORTLAND, OR 97223
11705 S.W. Pacific Hwy.
(503) 598-0555
(800) 854-6046
Earl, KE70A, Mgr.
Tigard-99W exit
from Hwy. 5 & 217

DENVER, CO 80231
8400 E. Iliff Ave., #9
(303) 745-7373
(800) 444-9476
Joe, KDØGA, Mgr.

PHOENIX, AZ 85015
1702 W. Camelback Rd.
(602) 242-3515
(800) 444-9476
Gary, WB7SLY, Mgr.
East of Highway 17

ATLANTA, GA 30340
6071 Buford Highway
(404) 263-0700
(800) 444-7927
Mark, KJ4VO, Mgr.
Doraville, 1 mi.
no. of I-285

WOODBIDGE, VA 22191
Washington D.C. area
14803 Build America Dr.
(703) 643-1063
(800) 444-4799
Curtis, WB4KZL, Mgr.
Exit 161, I-95, So. to US 1

SALEM, NH 03079
Boston, MA area
224 N. Broadway
(603) 898-3750
(800) 444-0047
Chuck, KM4NZ, Mgr.
Exit 1, I-93;
28 mi. No. of Boston

AZ, CA, CO, GA, VA residents add sales tax.
Prices, specifications, descriptions, subject
to change without notice.

YAESU

**CALL FOR THE
LATEST UPDATE
ON YAESU
FALL SPECIALS!**

**Watch for "NEW"
FT-900 HF Transceiver!**

FT-736R

The Ultimate Oscar Machine



VHF/UHF All Mode Transceiver
25W, Built-In Pwr Supply

FT-1000



200W, DUAL RX,
GEN COV RX, QSK, TCXO

CALL NOW FOR OUR LOW PRICING!

HANDHELDS



FT-416/FT-816

2 Mtr 440 Mhz
2W 2M/2W 440
5W optional
Direct DC input
Built-in VOX, 41 Mem.
DTMF paging, CTCSS built-in

FT-11R/41R

2M 440mHz
150 Mem. Channels
1.5W standard, 5W option
Alpha-numeric display
Compact & back lit keypad

NEW!

FT-890/FT-840



100w • Dual VFO's • QSK • DDS
IF notch filter, 12VDC
Optional built-in
auto antenna tuner



100W • 12V DC • DDS
Gen. Cov. Rx, 100 mem.
Optional Ext. Auto
Tuners Available

CALL NOW FOR OUR LOW PRICING!

FT-5100/FT-5200

2M/440 Mobile



Ultra compact 50W/35W
94 Memories • Non-remotable
Dual in-band receive
Built-in DTMF paging/Coded Sql.
CTCSS Encode built-in
Backlit DTMF mic included

2M/440 Mobile



Ultra Compact
50w/35w 2m/440
32 memories
Built-in duplexer
Backlit DTMF
MIC included

CALL NOW FOR OUR LOW PRICING!

FT-2200H/FT-2400H

2 Mtr.



2M 50W Mobile + Aircraft RX
50 Mem. CTCSS Encode +
Paging Built-In.
MW-2 Optional

Call For Special!

2 Mtr.



50W 31 memories
2 meter mobile
Large alpha-numeric LED
Backlit DTMF mi
Mil-spec design
(Limited Stock)

\$50.00 OFF

DUAL-BAND HANDHELDS



FT-530 2M/440mHz

2W standard, 5W opt.
82 Mem, Dual in-band Rx
DTMF paging + coded Sql. std.
Built-in VOX & CTCSS
Auto tone search
Built-in clock • Backlit keyboard

**CALL NOW FOR
SPECIAL PRICING!**

Results of the 1993 CQ World-Wide DX SSB Contest

BY BOB COX*, K3EST

When writing an article about the CQ WW DX Contest results, it's hard to know where to begin. There are so many stories that come flooding to mind that you, the entrants, have related to us over the last nine months. Each of you has a personal tale to tell about getting ready for the contest, some with months of preparation, others with a quick decision to enter the competition.

Just who enters the WW DX Contest? Well, for starters, about 30,000 different people from every part of the planet join in this competition. Of these 30,000 about 3000 sent in log entries. From these numbers it is apparent that most people just want to have a great time working their friends, trying out new antennas, and catching that new country on 80 meters.

But what about those who enter to win? There are thousands of these guys and gals all over the world. Each is confronted with the fact that the world is not propagationally fair. If you are on the west coast of the US, it is a Herculean task to compete against the stations from New England. If you are in New Zealand, you have to hope that the US operators turn their antennas SW. In Japan you are isolated enough to make a world high score seem impossible. But still, something drives each of us on to compete, to try to win, to improve our skill, to try to beat our next-door neighbor or friend in the next city. After all, this *is* what is important—beating your last year's score; beating your friend in northern Germany; creating a station, which if called upon, can respond to an emergency situation that might arise.

This brings us to the crux of the matter. Is there a way to equalize locations so that everyone has an equal chance to win the "big" one? The answer is not at all surprising. No. Everyone who has thought about this matter understands this fact. What the CQ WW write-up tries to do is, yes, emphasize the world winners, but also give credit to the entrant in Alaska or India who put in an incredible effort. The top-score boxes are important as an example of excellence, but hundreds of battles take place on the country level. There are trophies and certificates enough for all to have a chance to win one no matter where they are located. Now that the sunspots are reaching a low, the world winners are squeezed into more and more specific locations. For those of you who want to compete on a world level, you know where and what you have to do. But for the majority of us, it is enough to work that VS6 on 80, to beat Vlad in Moscow with his three-element Yagi.

The story could begin in Hong Kong, where the multi-multi station of VS6WO was being set up. Located on an apartment roof, the entire station antennas were a logistical challenge. As the operators started to arrive from around the world, they got together over dinner and



The island IS big enough! Back left: P40L (N5RZ, KRØY), P49T (AA4GA, WX4G, K4PI). Front left: P40C (AA2U) and P40W (W2GD).

beer to figure out how to have the high Asian score. A few days went by before they even thought about what other stations were doing. They had read that W2GD was going to fly down to Aruba and try to win, but they did not know that John was also trying to set up his station.

Located on the island of Aruba at the QTH of P43GR, John was busy pulling cactus out of his shoe. Aruba is a thorn-bush island, and great care must be taken to avoid several months of excruciating pain from an ambitious thorn. John had just received a set of new monobanders that he was anxious to try out in the test. When nighttime came it was time to get together with the other local hams, who turned out to be the crew of P40L—Jeff, KRØY, and Ralph, N5RZ. They had rented AI6V's QTH in the interior of the island. Carl had put up three towers on a small lot and the guys were busy testing to see if the rotators were okay and how it might be possible to put up a beverage antenna. Over dinner with P40W, P49T, and P40C, they had a great time talking about strategy and band openings. It turned out that P49T was also multi-single (WX4G and K4PI) and was in direct competition with P40L.

Eventually their thoughts turned to the island 100 miles to the SE—Bonaire. They knew that the operators of PJ1B were working very hard to have the best chance of winning the multi-

single category. With four towers and many years of experience, PJ1B was the team to beat. Not many know that Walt, WA3LRO, is the driving force behind PJ1B. At the same time as the Aruba operators were trying to figure out their plans, PJ1B was having a meeting. Over drinks they remembered hearing KP2A warning up that afternoon. Jose, CT1BOH, is a very dedicated contester, and had traveled to KP2A's QTH to try the impossible: win the CQ WW from North America.

Across the world in Europe, Jorma, OH2KI, was looking out over the straits of Gibraltar. In the distance was Africa, where Pekka, OH1RY, was setting up his station overlooking the Atlantic for 270 degrees.

The stories could go on and on: The multi-single of IQ4A located on a mountain overlooking Bologna. In the distance is the villa where Marconi transmitted his first wireless message.

So now let's first look at those operators who spent so much time and effort to try to win a particular category.

All Band

The all-band category always requires great skill, luck, and iron will. This year's iron man was John, W2GD, operating at P40W. Using a

*1816 Poplar Lane, Davis, CA 95616

TROPHY WINNERS AND DONORS

SINGLE OPERATOR, ALL BAND World

P4ØW (Opr. John Crovelli, W2GD)
Donor: Dave Rosen, K2GM
WA2RAU Memorial

World Low Power 7Q7XX

Donor: Slovenian Contest Club

World Assisted John Sluymer, CH3EJ

Donor: Snake River Contest Club

World QRP

7Z2AB (Opr. David Franks, K2XR)
Donor: Doc Sayre, N7AVK

U.S.A.

John Dorr, K1AR

Donor: Potomac Valley Radio Club
KC8C Memorial

Canada

David Goodwin, CH2ZP

Donor: Niagara Frontier Int'l DX Assn.
VE3WT Memorial

Caribbean/C.A.

KP2A

(Opr. Jose Carlos Cardoso Nunes, CT1BOH)
Donor: Alex M. Kasevich, VP2MM

Europe

Drago Turin, Jr., S59UN

Donor: Potomac Valley Radio Club
W4BVV Memorial

Africa

EA8AH

(Opr. Pekka Kolehmainen, OH1RY)
Donor: Gordon Marshall, W6RR

Asia

Satoshi Hara, JH5FXP

Donor: Japan CQ Publishing Company Ltd.

Japan

Kazuhiko Endou, JAØQNJ

Donor: Japan Crazy Contesters Club

Oceania

9M8R (Opr. Jim Sullivan, W7EJ)

Donor: Northern California DX Club

South America

9Y4H (Opr. Glenn Rattmann, K6NA)
Donor: Yankee Clipper Contest Club

SINGLE OPERATOR, SINGLE BAND

World—28 MHz

Arturo J. Gargarella, LU6ETB
Donor: Joel Chalmers, KG6DX

World—21 MHz

ZW5B (Opr. Jim Hoffman, N5FA)
Donor: French 21170 DX Net/LNDX
FY5AN Memorial

World—14 MHz

ZXØF (Opr. Atilano de Oms, PY5EG)
Donor: North Jersey DX Assn.
K2HLB Memorial

World—7 MHz

PJ9U (Opr. Seppo Sisatto, OH1VR)
Donor: Fred Laun, K3ZO
K7ZZ Memorial

World—3.8 MHz

Wolfgang Kraack, DL3LAB
Donor: Fred Capossela, K6SSS

USA—28 MHz

Howard Leake, W6AXX/3
Donor: Donald Thomas, N6DT

USA—21 MHz

Lawrence Emery, K1UO
Donor: Bill Gioia, K2EK

USA—14 MHz

John Bayne, KK9A

Donor: Southern California DX Club

USA—7 MHz

W7XR (Opr. Daniel Handa, W7WA)
Donor: Stanley Cohen, WD8QDQ

USA—3.8 MHz

John Rodgers, WE3C

Donor: Arnold Tamchin, W2HCW

USA—1.8 MHz

Jerry Rosalius, WB9Z

Donor: J. Bruce Siff, W2GBX

Carib./C.A.

V26N (Opr. Robert Hayes, KW8N)
Donor: Snake River Contest Club

Europe—28 MHz

IR8A (Opr. Pasquale Speranza, I8QLS)
Donor: Chod Harris, VP2ML

Europe—21 MHz

Marko Munih, S57EK
Donor: OH6JW Memorial

Europe—14 MHz

IT9A (Opr. Fabio Grisafi, IT9GSF)
Donor: A.G. Anderson, GM3BCL

Europe—7 MHz

Damijan Peternelj, S59AB
Donor: Roger Burt, N4ZC

Japan—28 MHz

Kazunori Kuroki, JR6EZE
Donor: Take Yokoyama, JL1BLW

Japan—21 MHz

Tadao Katsuta, JH7DNO
Donor: DX Family Foundation

MULTI-OPERATOR, SINGLE TRANSMITTER

World

PJ1B (Oprs.: WA3LRO, K3EST, N3ED,
W3UM)
Donor: Southern California DX Club
W6AM Memorial

U.S.A.

KC1XX (Oprs.: KC1XX, AD1C, K1EA,
KA1XN, KM3T)
Donor: Carolina DX Association

Europe

OT3T (Oprs.: DK1FW, DJ4AX, DL1SBR,
F6EXV, ON1ACV, ON1APM, ON1ARC,
ON1BEJ, ON2AAM, ON2ABE, ON2ALN,
ON4AAC, ON4AFZ, ON4AZL, ON4EJ,
ON4TJ, ON4UN, ON4WW, ON5EX, ON5NT,
ON5UK, ON6TT, ON6UL, ON6WU, Frida,
Sylvain.
Donor: Bob Cox, K3EST

Carib./C.A.

VP2VFP (Oprs.: AB4JI, K4ADK, KU4J,
N4BWS, WA2TMP, WA4DPU)
Donor: Eric Scafe, K3NA

Oceania

N6VI/KH6 (Oprs.: KA6SAR, N6DLU,
WA6OTU)
Donor: Junichi Tanaka, JH4RHF

MULTI-OPERATOR, MULTI-TRANSMITTER

World

EA9UK (Oprs.: WN4KKN, W6QHS, KK6QM,
N6KT, N6TJ, K5TSQ, W6MKB, KA1BQ,
OH2MM, EA9KF, EA9LZ, EA9UK)
Donor: W6QHS and KK6QM

U.S.A.

N2RM (Oprs.: N2RM & KZ2S, N2NT, K3UA,
N2AA, K2TW, KQ2M, KR2J, W2RQ, WM2H)
Donor: Paul Hellenberg, KS9K

Europe

GØKPW (Oprs.: G4BAH, G4PIQ, G4BWP,
G4BUO, G4VMM, G4FAM, G4FRE, G3VHB,
G7ABQ, NZ1W, G3XTT, G7BKO, G3ZAY,
GØAFH HG73DX)
Donor: Finnish Amateur Radio League

CONTEST EXPEDITIONS

World Single Operator

S21ZW (Opr. Craig Maxey, KH8AL)
Donor: Stuart Meyer, W2GHK

World Multi-Operator

VK9LI (Oprs.: K6MC, KC6KOO, N6AA,
N6CW, N6ZZ, W6KNC, W6XD, WB6OKK)
Donor: The German CDXG & SDXG
DJ3NG & DJ4EI Memorial

SPECIAL SINGLE OPERATOR AWARD

World—All Band Under 18 Years Old

Brian Woelz, N9OFD

Donor: Ham Radio Bookstore

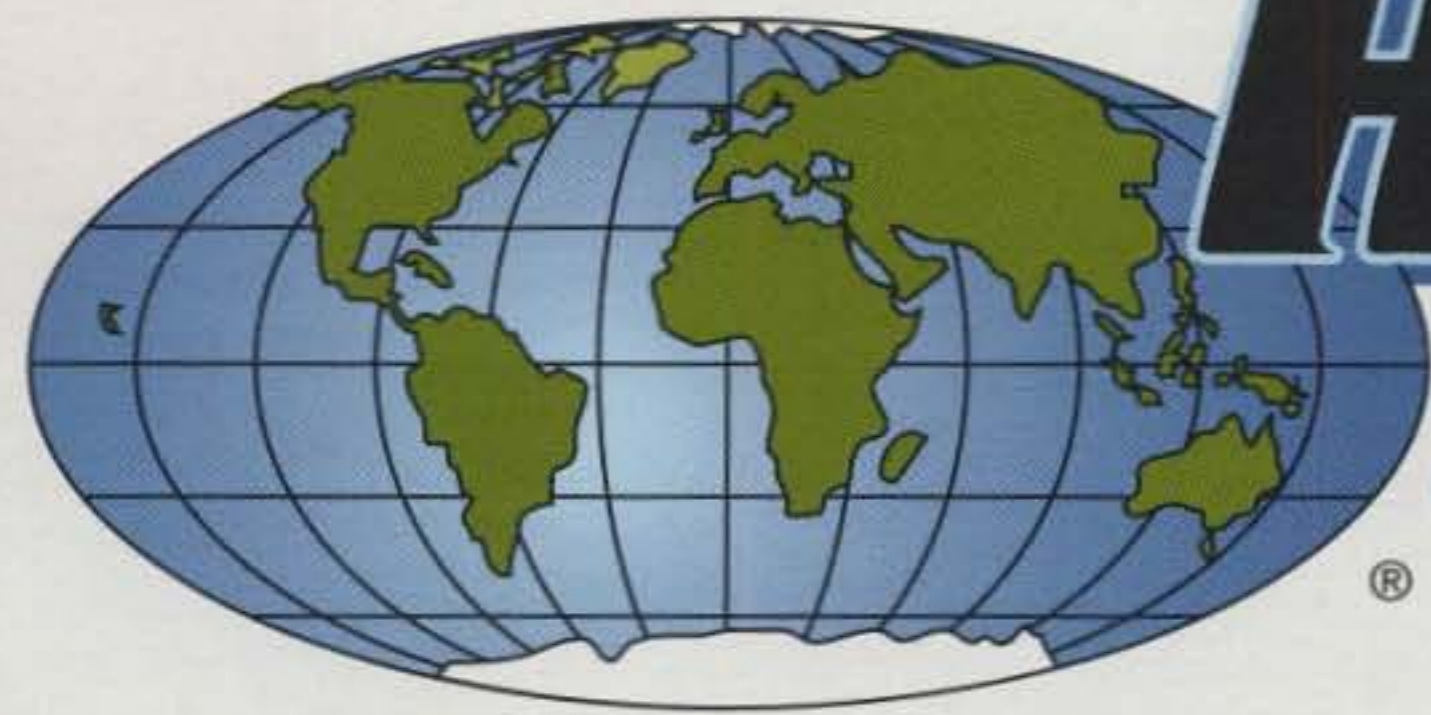
new set of antennas and a great location for the US and Europe, John put his location on the air for the last time before his host, P43GR, QSYs. Winning for the world, John operated about 43 hours.

Farther north was another fierce competitor, Jose, CT1BOH, operating from KP2A's great QTH. Jose finished second in the world, but set an all-time single operator QSO total! He must have meditated for weeks to stay up and

push so hard for 47 out of 48 hours.

It turns out that if the time on the air is averaged for the top 5 stations, it is about 43 hours. If you check out the rest of the top ten world all-band scores, you will see that only FR5DX

> 12 STORE BUYING POWER! <



HAM RADIO OUTLET

WORLDWIDE DISTRIBUTION

DR-1200T

1200 Baud

NEW!



2M Packet/FM Transceiver, 25W
REG. \$399.

SPECIAL \$279.95
(DR-1200T)

DR-1200TH2
9600 Baud
CALL FOR PRICE

ALINCO

USE THESE MANUFACTURER DISCOUNT COUPONS OFF OUR ALREADY LOW PRICE!

Now Good Through Sept. 30th

Call for Latest Update on Manufacturer Coupons!

DJ-G1T

2M/HT

NEW!



2M HT w/440 RX
Aircraft RX
80 Memories
Encode built in
Channel-scope built in

CALL FOR LOW INTRODUCTORY PRICE!

\$10 OFF

DJ-F1T/DJ-F1T-HP

NEW!



2w 2 meter compact HT
8 scan modes
40 memories
Now 5W Version Available, Too!

CALL NOW FOR SPECIAL PRICE!

\$10 OFF

DR-600T

2M/440 FM Transceiver

NEW!



45W/35W + Airband RX
Detachable/Removable Head
Keyboard freq. entry from microphone!

CALL NOW FOR SPECIAL PRICE!

\$10 OFF

DJ-180T/DJ-180T-HP

NEW!



2M 2W HT
10 Mem. Standard upgradable to 200 Mem.
PL Encode/Decode built in
DTMF Pad Included
no keyboard entry of frequency
Scanning

DJ-180T-HP 5W version now available
CALL NOW FOR SPECIAL PRICING!

\$10 OFF

DJ-580T

2M/440 Dual Band



40 Mem Channels
DSQ, Dual Display
CTCSS Enc/Dec Built-in
Cross Band Full Duplex

CALL FOR OUR SPECIAL LOW PRICE!

\$10 OFF

DR-130T

2M Mobile

NEW!



2M, 50W compact TCVR, Runs cool,
20 Memories, expandable to 100 Mem
with optional EJ-19U, CTCSS encode built in,
Tone SQL optional (EJ-20U)

Call Now For Special Low Price!

\$10 OFF

COAST TO COAST



FREE SHIPMENT UPS - Most items over \$100

RAPID DELIVERIES FROM THE STORE NEAREST TO YOU!

ANAHEIM, CA 92801
933 N. Euclid St.
(714) 533-7373
(800) 854-6046
Janet, WA7WMB, Mgr.
Near Disneyland

OAKLAND, CA 94606
2210 Livingston St.
(510) 534-5757
(800) 854-6046
Rich, WA9WYB, Mgr.
I-880 at 23rd Ave. ramp

SAN DIEGO, CA 92123
5375 Kearny Villa Rd.
(619) 560-4900
(800) 854-6046
Tom, KM6K, Mgr.
Hwy. 163 &
Claremont Mesa

SUNNYVALE, CA 94086
510 Lawrence Expwy. #102
(408) 736-9496
(800) 854-6046
Tom, KB6LUC, Mgr.
Lawrence Expwy.
So. from Hwy. 101

VAN NUYS, CA 91411
6265 Sepulveda Blvd.
(818) 988-2212
(800) 854-6046
Jon, KB6ZBI, Mgr.
San Diego Fwy.
at Victory Blvd.

PORTLAND, OR 97223
11705 S.W. Pacific Hwy.
(503) 598-0555
(800) 854-6046
Earl, KE7OA, Mgr.
Tigard-99W exit
from Hwy. 5 & 217

DENVER, CO 80231
8400 E. Iliff Ave., #9
(303) 745-7373
(800) 444-9476
Joe, KDØGA, Mgr.

PHOENIX, AZ 85015
1702 W. Camelback Rd.
(602) 242-3515
(800) 444-9476
Gary, WB7SLY, Mgr.
East of Highway 17

ATLANTA, GA 30340
6071 Buford Highway
(404) 263-0700
(800) 444-7927
Mark, KJ4VO, Mgr.
Doraville, 1 mi.
no. of I-285

WOODBRIIDGE, VA 22191
Washington D.C. area
14803 Build America Dr.
(703) 643-1063
(800) 444-4799
Curtis, WB4KZL, Mgr.
Exit 161, I-95, So. to US 1

SALEM, NH 03079
Boston, MA area
224 N. Broadway
(603) 898-3750
(800) 444-0047
Chuck, KM4NZ, Mgr.
Exit 1, I-93;
28 mi. No. of Boston

NEW STORE!

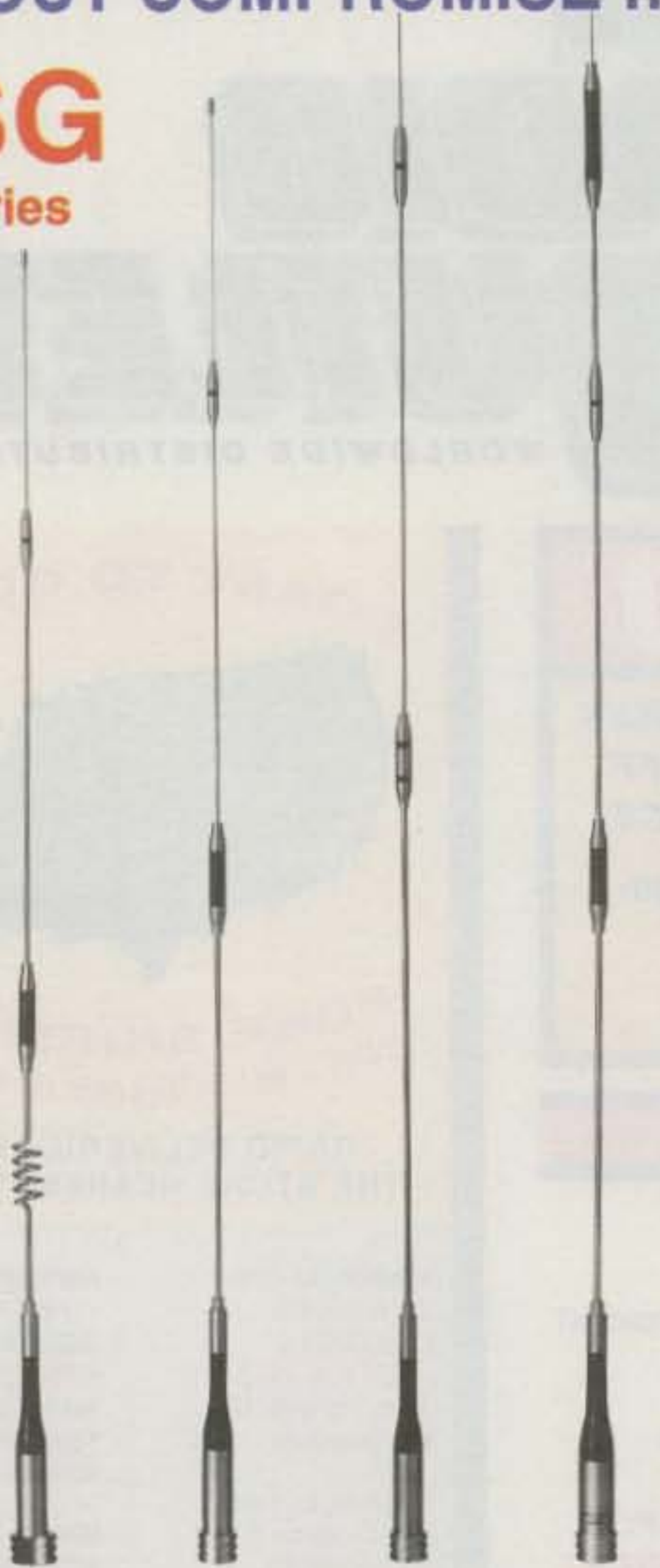
NEW CASTLE, DE 19720
1509 N. Dupont Hwy.
(302) 322-7092
(800) 644-4476
Kent, KD1IJ, Mgr.
RT.13 1/4 mi., So. I-295

AZ, CA, CO, GA, VA residents add sales tax.
Prices, specifications, descriptions, subject
to change without notice.

DIAMOND'S STATE OF THE ART VHF / UHF MOBILE ANTENNAS - MAXIMUM PERFORMANCE WITHOUT COMPROMISE !!

DIAMOND
ANTENNA

SG
series



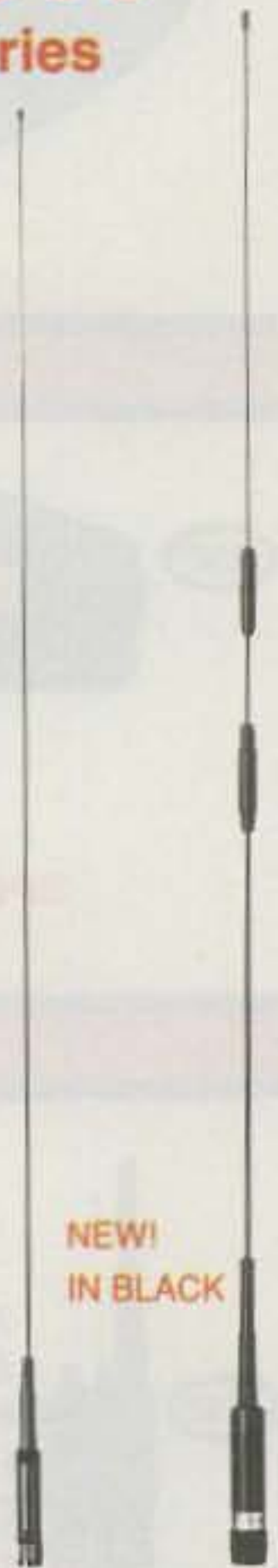
SG7200NMO SG7500 SG2000 SG7900

NR
series



NR72BNMO NR73BNMO NR770R NR770H

CR
series



CR214S CR320A

NEW!
IN BLACK

NEW!
IN BLACK

NEW!
IN BLACK

MODEL	BAND	GAIN(dBd)	POWER (w)	MOUNT	HT (IN)	ELEMENT PHASING
NR-72BNMO	2m/70cm	2.15	100	NMO	13.8	1/4 λ, 1/2 λ
NR-73BNMO	2m/70cm	2.15/5.3	100	NMO	33.5	1/2 λ, 2-5/8 λ
NR-770SA	2m/70cm	2.15/2.15	100	UHF	16.9	1/4 λ, 1/2 λ
NR-770HA	2m/70cm	3.0/5.5	200	UHF	40.2	1/2 λ, 2-5/8 λ
NR-770HNMO	2m/70cm	3.0/5.5	200	NMO	38.2	1/2 λ, 2-5/8 λ
NR-770RA	2m/70cm	3.0/5.5	200	UHF	38.6	1/2 λ, 2-5/8 λ
NR-790A	2m/70cm	4.5/7.2	120	UHF	57.5	6/8 λ, 3-5/8 λ
SG-7000	2m/70cm	2.15/3.8	100	UHF	18.5	1/4 λ, 6/8 λ
SG-7200NMO	2m/70cm	3.2/5.7	150	NMO	36.6	1/2 λ, 2-5/8 λ
SG-7500A	2m/70cm	3.5/6.0	150	UHF	40.6	1/2 λ, 2-5/8 λ

MODEL	BAND	GAIN(dBd)	POWER (w)	MOUNT	HT (IN)	ELEMENT PHASING
SG-7900	2m/70cm	5.0/7.6	150	UHF	62.2	7/8 λ, 3-5/8 λ
SG-2000	2m	5.2	150	UHF	62.6	7/8 λ
NR-140A	1-1/4m	3.8	100	UHF	36.2	5/8 λ
NR-124	23cm	8.4	100	N	25	4-5/8 λ
CR-214S	2m/1-1/4m	2.15/3.4	120	UHF	37	1/2 λ, 5/8 λ
CR-224A	2m/1-1/4m	5.0/6.0	150	UHF	68.5	7/8 λ, 2-5/8 λ
CR-320A	2m/1-1/4m/70cm	2.15/3.8/5.5	200/200/100	UHF	37.4	1/4 λ, 1/2 λ, 2-5/8 λ
NR-2000NA	2m/70cm/23cm	3.15/6.3/9.7	100	N	39	1/2 λ, 2-5/8 λ, 5-5/8 λ

SPECIAL FEATURES

- Factory pre-tuned /no adjustment
- Highest Performance antennas
- SG&NR series do not need grounding
- NMO and UHF (PO) base styles
- New black color models available
- Fold-over feature on most models



FOLD-OVER

PATENTED ONE-TOUCH FOLD-OVER FEATURE



RF PARTS
SAN MARCOS, CALIF.
(619) 744-0900



(Left) KK6BB/BV and (right) KC6CNV/BV operated from BV2FA's QTH. Shane gave the guys (both under 16) a chance to do well!

stayed at home. All the rest were guest operators looking for that special place to have fun.

In the US John, K1AR, destroyed the competition to continue his dominant role in US contesting. And even he traveled from Long Island to Massachusetts to activate K1EA's automated station. John dominated the high bands over fellow YCCC members Randy, K5ZD/1, and Dean, N6BV/1, who finished second and third, respectively.

The competition in the "rest" of the US was very tough, with Doc Sayer, N7AVK, out Oregon way coming out on top over the station from Tom Sawyer's home town, K4VX/Ø, and N7TT in western Washington.

In Europe Drago, S59UN, operating from NE Slovenia on top of a good location in the middle of a vineyard, took top honors. It was his opening to JA that made the difference over Jorma, OH2KI, who put ZB2X on the air. Both Drago and Jorma are no strangers to tough competition. They both worked very hard to construct good stations. It is interesting that the top scores in Europe are scattered from north to south in zone 15 and zone 14.

Before leaving the high-power single operator category a few other outstanding efforts must be mentioned. Al, WR6R/KH6, seems to love traveling to KH6 for the contest, and who can blame him. He broke into the top 20 from a difficult QTH. Jim, VK9NS, always livens up the contest, and this year he did a great job from zone 32. AH9B/VO2 made a tough zone easy by racking up big QSO numbers. I think he made a lot of Europeans and JA's happy to catch that rare zone.

This year the number of entrants in the low-power category exceeded all other categories. I guess guys were always running low power, but now have a chance to compete with others running equal power. Right up front let's say to please indicate on your cover sheet your power, not your rig type. We cannot make you low power unless you indicate your power and say LP on the sheet. Thanks in advance.

So who walked away with low-power honors

this year? 7Q7XX, putting in his last season before returning to JA. He was closely followed by first-time DXpeditioner N3ADL operating TO5MM. What a great job.

If you check out the rest of the top 10 scores you find S21ZW at #8. Craig, KH8AL, hopped on a plane in Seattle, traveled to Dacca, got licensed while there, put up some wires and a tribander, and gave a surprise to many people, especially on 40 long path to the USA. His license ran out before the contest was finished, so that was a serious handicap! 9J2FR and P29KH showed that you can be many places and still compete successfully.

In the US the top ten scores reflect a different make-up than the high-power scores. Barefooting his way to the top score was Jeff in West Virginia. Jeff is a pharmacist, so he must know the right combination of vitamins to keep going. Following closely in second place was K2SG. Just a few QSOs made the difference between these two scores. It was the traditional balancing of QSOs versus multipliers that made the difference. Over in Europe Slovenia made a big showing with four out of the top ten. After it all was checked out, S53EA ended up as the winner.

QRP

In the QRP category K2XR operating at 7Z2AB demolished all of the competition with an outstanding 2.56 million points to win for the world. Dave honed his HF skills back in the late 1970s while operating with KR2Q on 10 meters at super multi-multi station N2AA (at K2GL) and the results show: Dave had well over 1200 QSOs on 10 meters alone! Congratulations, Dave, and everyone thanks you for handing out a needed mult.

Assisted

This year somebody finally did an outstanding job in the Assisted category on the world level.

John, CH3EJ, managed to work the proper number of QSOs without glueing his eyes to the packet screen to come up with a winning score. Second place went to Roland, DK3GI, operating club station DLØWW. Closely behind Roland was Jeff, K1ZM/2, who finished first in the US. The Assisted category reflects the active packet systems of Europe and the US.

Multi-Single

In the most hotly contested battle of this year's SSB contest, three crews went to the ABC islands of what used to be the Netherlands Antilles (before Aruba went independent)—P49T, P40L, and PJ1B. When the dust settled, two of the stations broke the existing world record in the multi-single category with the third station just missing breaking it. After the closest scrutiny to which any logs have ever been subjected, PJ1B edged out P40L by less than 1%. It's a shame that there cannot be more than one winner when super human efforts of this magnitude have occurred.

Multi-Multi

Gathering operators from three continents is no easy task. That's exactly what EA9UK did to place first in the monster multi-multi category. Operating from a football field using the lights as antenna supports, they bested all comers by about 10 million points. Placing second was VP2EC (alias N5AU). Their score on the low bands was truly marvelous.

Special mention is made here of UW2F. A group of Bavarian Contest Club amateurs traveled to Kaliningrad by car to activate this famous station.

While in the far Pacific, the Southern California Contest Club decided that this was the year to put Lord Howe Island in everyone's log. It's difficult to make QSOs on 20 at noon in the middle of the Pacific.

For Your Information . . .

The SSB test yielded a total of 3119 logs. You might find it interesting to see what percentage of the these logs came from various continents: South America 3.5%; Asia 12.2%; Oceania 2.5%; Africa 1.6%; North America 38.2%; and Europe 41.9%.

As you can imagine, each year we receive letters of praise and of complaint. Last year we received several letters asking us to remind you that operating below 7040 on SSB is against several regional band plans. In many cases, when an amateur signs his license, he agrees to abide by the IARU regulations. So before you think that it is sure clear below 7040, there is a reason. Many countries cannot legally operate below that frequency. In addition, the country allocations of what frequencies can be used on SSB on 160 have changed recently. Now almost all Europeans operate above 1850 on SSB. If you have any doubts about what the frequencies are, ask someone before the contest.

Log submissions: The contest rules require that you submit a separate log for each band. Do not send a continuous log. If you use a computer to log your contest QSOs, we want your computer disk. The format we need is spelled out in the rules elsewhere in this issue,

TOP SCORES

WORLD

SINGLE OPERATOR HIGH POWER	*5Z4BI 1,250,088 S57EK 1,209,789	S57AV 40,365 4X4NJ 33,592 UT5DK 31,735 S51HB 28,224 *OZ3SK 23,313	21 MHz 5Z4BI 1,250,088 CN2JF 779,085 IK2DZN 644,872 EA8IY 601,156 EA3FQV 506,328 4X6ZK 453,476
All Band	14 MHz	LOW POWER	1.8 MHz
P40W 13,477,476 KP2A 13,202,298 EA8AH 12,052,110 9Y4H 10,574,676 6V6U 10,541,769 EA8BR 8,425,029 9M8R 6,947,766 8R1K 6,908,256 K1AR 6,596,688 FR5DX 6,212,808	ZX0F 2,111,420 PJ9M 1,864,584 CH7SV 1,302,863 IT9A 1,265,126 YW1A 1,240,000 S52AA 1,177,536	All Band	HA4XN 35,046 EA5GRC 34,681 CL3ZD 31,777
28 MHz	7 MHz	All Band	1.8 MHz
LU6ETB 1,551,260 PY3OC 1,121,672 LU5FEW 912,240 LU9MBY 762,508 CX5BW 746,181 L2Q 687,492	PJ9U 1,199,968 TI1C 1,052,057 CN2JR 630,126 S59AB 597,204 G3NLY 558,927 YV5MRR 507,276	7Q7XX 5,494,609 TO5MM 5,187,524 VP2EJ 4,499,874 HC1OT 4,194,840 EL2PP 3,491,256 HK0HEU 3,137,076 ED8CQ 2,144,004 S21ZW 2,007,372 9J2FR 1,902,810 P29KH 1,853,280	OZ3SK 23,313 LA6WEA 13,395 OH1KF 9,568 YL2GUO 8,200 SP2FOV 7,644 UB5TFB 7,290
21 MHz	3.7 MHz	28 MHz	QRP
ZW5B 2,834,228 9Y4VU 2,214,450 V26N 2,159,460 ZW0JR 1,438,668	DL3LAB 188,400 IV3TAN 184,080 GM0ECO 182,378 S51OJ 171,570 WE3C 169,020 ON9CJM 158,046	LU3HIP 556,750 EA6VQ 499,422 T93M 424,999 PY2PD 424,154 LU1VK 381,669 TI2KSR 322,920	All Band
	1.8 MHz		7Z2AB 2,590,945 F5BEG 525,770 N1AFC 349,752 EA3RQ 325,376 IK1GKE 309,276 UA9CUA 303,525 N4JF 297,920 JA2IVK 268,822 UB4FXX 268,488 LY1DR 260,832
			ASSISTED
			All Band
			CH3EJ 8,167,096

MULTI-OPERATOR SINGLE TRANSMITTER

PJ1B 22,596,570
P40L 22,442,112
P49T 17,684,346
OT3T 11,803,309
IQ4A 11,609,784
VP2VFP 10,357,209

MULTI-OPERATOR MULTI-TRANSMITTER

EA9UK 37,140,597
VP2EC 28,702,788
VP5L 20,720,222
G0KPW 18,718,332
HG73DX 18,653,271
UW2F 16,104,474

EUROPE

SINGLE OPERATOR HIGH POWER	OK1RI 1,136,610 S58AB 1,068,840 SP7GIQ 946,212 DJ7AA 932,752 YL1WW 781,064	IV3TAN 188,400 GM0ECO 183,162 S51OJ 175,560 ON9CJM 170,367 S52CD 141,700	S59DJK 834,309 DK1QH 769,472 EA3ELZ 760,806
All Band	14 MHz	1.8 MHz	28 MHz
S59UN 5,822,976 ZB2X 5,257,065 OH0DX 4,870,488 EA3NY 4,702,515 GW4BLE 4,366,124 DJ4PT 3,956,526 DL2NBU 3,411,670 G3NAS 3,196,200 GI0KOW 2,997,225 GJ0SLY 2,709,760	IT9A 1,265,126 S52AA 1,177,536 LZ5W 1,150,237 IB9S 1,106,756 CT1ESV 889,856 GM3WOJ 818,380	IV3PRK 44,676 S57AV 40,365 UT5DK 31,735 S51HB 28,224 *OZ3SK 23,769 OK1JDX 18,232	EA6VQ 499,422 T93M 424,999 OM3CFA 205,590 HA1FF 153,897 CT1ERK 153,232 IK4LZH 139,896
28 MHz	7 MHz	LOW POWER	7 MHz
IR8A 526,500 CT1AOZ 500,664 *EA6VQ 499,422 S51AY 447,408 *T93M 424,999 S51SO 300,510	S59AB 597,204 G3NLY 558,927 YT7AA 492,660 SP6YAO 463,813 DL8OH 398,660 UB4HO 329,175	All Band	RB5QRW 102,258 LZ1ZX 99,704 YO4FYQ 56,335 IK2EKY 47,940 UB5ZBF 34,278 YO3JF 18,522
21 MHz	3.5 MHz	All Band	3.7 MHz
S57EK 1,209,789	DL3LAB 191,760	S53EA 1,552,536 S59DX 1,539,520 TM6GG 1,518,594 LX1NW 1,210,971 LX1KC 1,049,152 EA3BKI 870,406 S51FA 834,558	S51AW 67,520 IT9HBT 62,178 S59CAB 57,749 HA4XN 35,046 EA5GRC 34,681 EA2ABM 31,108
			1.8 MHz
			OZ3SK 23,313

MULTI-OPERATOR SINGLE TRANSMITTER

OT3T 11,803,309
IQ4A 11,609,784
TM7C 8,564,011
LZ9A 7,780,144
OH2X 7,379,169
TM2Y 7,116,991

MULTI-OPERATOR MULTI-TRANSMITTER

G0KPW 18,718,332
HG73DX 18,653,271
UW2F 16,104,474
OT3A 14,932,489
UR8J 9,141,237
PI4COM 8,805,900

USA

SINGLE OPERATOR HIGH POWER	K1UO 865,623 K2SS/1 793,776 NG2X 666,246 KS1L 648,384 K3ZJ/8 599,589 WZ3Q/4 516,426	WF5E 125,020 KA5W 105,186 WE3C 169,020 W6RJ 153,700 AD1G 62,565 W9LT/8 33,441 K2RR/1 33,048 WB7EWC 22,464	WS1A 966,420 WA2UUK 822,126 AI6E/1 792,090 AA4EL 749,580 W2CRS/0 686,400 KE2ZU 617,760 K0RNZ 591,610 WA7BNM/6 557,190
All Band	14 MHz	1.8 MHz	1.8 MHz
K1AR 6,596,688 K5ZD/1 5,370,975 N6BV/1 4,785,781 K3ZO 3,857,259 W3BGN 3,481,832 K1RU 3,476,867 W2SC/1 3,439,248 N2LT 3,377,760 W1PH 2,981,356 K2DM 2,805,115	KK9A 733,698 K7RI 697,151 K9ES/4 503,982 W7IL 485,415 N8JEC 377,019 W1XE/0 307,008	WB9Z 12,264 K5UR 9,504 W2FCR 4,429 KK4SI 4,000 AA4MM 3,648 *K0CS 3,135	N1KWF 168,885 NY5B 159,880
28 MHz	7 MHz	LOW POWER	14 MHz
W6AXX/3 169,824 *KD4HXT 133,584 *KE5FI 127,124 *WB5CRG 125,857 W9XT/4 115,411 NZ8O 112,875	W7XR 358,345 KC7EM 328,530 KV0Q 246,048 W1RR 174,330	All Band	K1VUT 255,600 N4MO 196,482 K2QMF 157,290 KF8UM 138,112 AA4UF 73,800 KD5IA 47,712
			28 MHz
			KD4HXT 133,584 KE5FI 127,124 WB5CRG 125,857 KC3PZ 104,400 KA1YIY 92,476 WB2BZR/3 89,625
			7 MHz
			N9JF 18,018 N5AHS/3 7,738 WA6WPG 7,128 NI6G 5,735
			3.7 MHz
			WR3I/4 15,795 NV3V 4,366

MULTI-OPERATOR SINGLE TRANSMITTER

K0CS 3,135
WT3W 930

MULTI-OPERATOR MULTI-TRANSMITTER

KC1XX 7,630,228
N3RS 5,846,340
K1DG 5,724,795
K1NG 5,263,608
K1RX 5,053,572
KY3N 5,009,757

MULTI-OPERATOR MULTI-TRANSMITTER

N2RM 16,016,190
W3LPL 14,740,472
K2TR 11,868,171
K3LR 10,383,840
W7RM 6,708,236
KY1H 6,017,040

BAND-BY-BAND BREAKDOWN—TOP ALL BAND SCORES

Number groups indicate: QSOs/Zones/Countries on each band

WORLD TOP SINGLE OPERATOR, ALL BAND

Station	160	80	40	20	15	10
P40W	128/9/22	412/15/51	589/25/69	1599/31/115	1827/32/124	2613/31/113
KP2A	278/9/24	729/17/76	1160/30/101	1851/32/97	2092/33/107	2581/27/101
EA8AH	50/8/26	544/17/73	649/25/84	1551/34/103	1428/30/94	2447/25/94
9Y4H	179/8/18	432/18/54	582/23/70	1943/30/78	1515/29/88	2215/22/84
6V6U	7/4/6	61/10/29	407/20/70	2120/33/136	1570/30/131	1696/27/110
EA8BR	10/3/7	286/15/57	828/25/90	864/30/101	1133/29/94	1785/23/105
9M8R	10/6/10	225/23/45	746/35/103	888/35/101	1744/35/103	426/29/78
8R1K	51/8/18	225/11/43	610/22/71	1068/31/98	1068/31/95	1317/24/92
K1AR	28/9/20	265/18/70	261/24/81	994/36/132	1066/31/130	636/28/117
FR5DX	3/3/3	36/15/23	274/26/74	1308/34/126	942/36/117	1090/30/101

USA TOP SINGLE OPERATOR, ALL BAND

Station	160	80	40	20	15	10
K1AR	28/9/20	265/18/70	261/24/81	994/36/132	1066/31/130	636/28/117
K5ZD/1	34/10/20	232/19/73	250/26/79	762/37/125	924/32/119	557/27/108
N6BV/1	25/7/15	185/15/67	115/24/74	673/36/134	1174/29/128	463/23/85
K3ZO	14/8/13	149/18/58	197/24/74	751/33/115	903/30/108	334/24/76
W3BGN	38/9/21	190/15/56	166/23/68	617/32/113	535/28/103	517/27/101
K1RU	22/7/12	99/15/50	101/21/68	625/35/119	779/30/109	472/24/99
W2SC	13/5/7	114/13/54	167/25/79	533/30/107	940/27/99	463/25/77
N2LT	23/9/16	102/15/53	107/25/71	505/32/115	641/32/117	532/24/111
W1PH	18/7/14	116/15/54	129/24/68	539/36/119	728/29/105	294/20/81
K2DM	19/7/13	131/14/52	167/22/72	636/30/105	549/29/101	323/22/78

WORLD MULTI-OPERATOR SINGLE TRANSMITTER

Station	160	80	40	20	15	10
PJ1B	111/10/24	937/25/94	1055/29/114	2011/38/147	1829/32/139	3443/30/128
P40L	93/9/29	507/18/79	1267/30/109	2141/37/140	2134/33/142	3427/30/136
P49T	138/7/16	797/18/63	1054/27/91	1763/31/112	2001/32/130	3186/30/112
OT3T	132/11/65	563/23/97	1117/38/138	914/36/131	2003/38/145	497/29/136
IQ4A	65/7/54	186/23/97	1101/38/137	1032/37/147	1588/38/160	1108/32/142
VP2VFP	54/5/19	264/15/59	805/24/94	840/33/120	2249/34/123	1388/27/108

USA MULTI-OPERATOR SINGLE TRANSMITTER

Station	160	80	40	20	15	10
KC1XX	28/9/24	533/23/93	174/29/104	941/39/142	1076/34/141	613/28/136
N3RS	29/10/22	101/19/78	276/34/114	684/37/150	868/33/146	630/27/136
K1DG	31/11/27	239/21/86	175/29/99	768/38/140	1026/33/148	309/28/135
KY3N	22/7/13	230/21/83	182/25/92	629/34/134	1039/32/140	483/26/123
K1NG	37/12/29	124/18/77	172/28/97	875/38/141	928/32/148	297/28/128
K1RX	3/1/2	345/23/92	75/19/62	1087/38/138	579/31/126	524/25/131

WORLD MULTI-OPERATOR MULTI-TRANSMITTER

Station	160	80	40	20	15	10
EA9UK	319/9/55	1061/24/100	2584/35/137	2962/39/159	3860/40/165	2761/32/128
VP2EC	400/16/54	906/24/106	2351/34/144	2874/36/149	3916/36/151	2442/31/127
VP5L	386/8/26	1123/17/69	1880/32/114	3165/36/124	3524/31/109	2501/29/108
G0KPW	616/12/63	1126/21/101	1674/39/149	2579/39/159	2488/40/173	3881/26/152
HG73DX	517/8/60	1663/26/105	1806/34/124	2755/40/148	2611/39/153	923/34/132
UW2F	930/11/69	1530/26/106	1762/38/138	2595/40/150	2027/38/146	714/28/111

USA MULTI-OPERATOR MULTI-TRANSMITTER

Station	160	80	40	20	15	10
N2RM	143/13/38	711/23/102	602/34/119	1878/39/174	1890/37/163	1304/28/151
W3LPL	177/11/33	664/24/101	551/35/125	1972/39/175	1743/36/160	985/27/141
K2TR	131/12/37	616/20/91	427/30/108	2152/39/166	1102/34/146	747/27/139
K3LR	98/12/36	442/18/78	424/31/110	1475/38/166	1267/36/156	772/27/138
W7RM	36/9/12	431/21/46	500/32/91	1522/37/132	1445/33/108	289/19/47
KY1H	109/7/19	331/18/68	254/27/97	960/37/134	1124/30/136	598/27/112

but it doesn't hurt to emphasize this information here.

First of all, if you use CT, we want your .BIN file only. Please do not send only your .ALL file or .20 etc. files. Always remember to include your .BIN file. If you use N6TR's program, send your .DAT file. If you use another program (and there are many), send a separate file for each band. The file should be a vertical column of calls in the order you worked them on a particular band, with each call followed by a hard return.

It looks like our personalized report has been well received. If you want one, it is \$8. We must have a readable disk from you. FAX your request to 916-758-9062.

Thanks

A special thanks to the members of the CQ WW Contest Committee for their dedication to making the contest fun and a fairly judged event. Not only do they look at your logs, but they relay your ideas and suggestions to the whole committee. The hard-working log checkers are K1DG, K3EST, K6NA, KR2Q, KRØY, N3ED, N6AW, W2RQ, W3ZZ, W7EJ, and WA8YVR. A big thank you to N6TR, who created the ever-changing software used to check the logs, and to the keeper of the data bank and all around advisor, N6AA.

Special US gurus who we lean on more than once a contest season are K3ZO and N2AA. Special DX advisors who help us keep an international point of view are CT1BOH, DL6RAI, G3SXW, I2UIY, JE1CKA, OH2BH, OH2KI, OH2MM, OK2FD, PY5EG, SM3SGP, UA9BA, and S50A.

Congratulations to all the entrants and winners. CU in 1994!

73, Bob, K3EST

DX QRM

Best band turned out to be 10 meters. Too hard to



CU2T (left to right): CU2AA, CU2AE, CU2AF, CU2AP, CU2CE, CU2CR, and CU2DX.

crack the European QRM on the other bands . . . A61AD. My brother BV/KK6BB and I operated from the QTH of BV2FA. We took turns during about 9 hours of operating. Darrel is age 16 and I am 13. We can't wait for the CW contest! . . . BV/KC6CNV. Conditions, especially on 10 meters, were much better than I expected. CT told lots of people I was in Zone 2, which probably helped my rates at times. My wife, although suffering a mild case of pneumonia, insisted I enter the contest. What a pearl! . . . CH2ZP. I'm ARS since 1937. In November 28 I will AM 80 yrs old . . . CT1QF. Madeira has lost a dozen of people and 400 cars in heavy cloudbursts, thunderstorms, and hurricanes from Thursday till Sunday. We were lucky; we only

lost all our antennas at the 800 meter high contest location . . . CT3EE.

For 160 meters I used the duoband dipole and an antenna-turner (with 80 watts only) . . . DK5PD. Surprising good condx on 10 meters, but the QRM especially on the lower bands is stronger and stronger every year. Nevertheless it's always a pleasure to participate . . . DL8PC. Just a small log due to INTER-RADIO ham radio fair in Hanover, which unfortunately was held on CQ WW Contest weekend . . . DLØMCG. Many thanks again to all stations who were very patient with us QRPp stations and see you all next year! . . . DU1CHD/6. Congratulations for this very nice and fun contest. I see you in the next contest

1994 CALLBOOKS



THE QSL BOOK!

Continuing over a 70 year tradition, we bring you two new Callbooks for 1994 with more features than ever before.

The 1994 North American Callbook

lists the calls, names, and addresses for more than 500,000 licensed amateurs in all countries of North America, from Panama through Canada, including Greenland, Bermuda, and the Caribbean Islands, plus Hawaii and the U.S. possessions. 1,592 pages. Item # 087158 (paper) \$29.95

The 1994 International Callbook

lists more than 500,000 licensed amateurs in countries outside North America. Its coverage includes South America, Europe, Africa, Asia, and the Pacific area (exclusive of Hawaii and the U.S. possessions). 1,720 pages. Item # 087190 (paper) \$29.95

Every active amateur needs the Callbook! Fully updated and loaded with extra features, the 1994 Callbooks will be published in December 1993. Order now from your dealer or send in the coupon below.

Please send me _____ copy(ies) of
The 1994 North American Callbook
(Item # 087158, \$29.95) and _____
copy(ies) of **The 1994 International Callbook**
(Item # 087190, \$29.95).

I have enclosed my check/money order for \$_____. (Please add sales tax in CA, DC, IL, MA, NJ, NY, OH, PA, TN, VA & Canada, and \$3.00 per book for postage and handling for U.S. shipments and \$7.00 for all shipments outside the U.S.)

Or call and charge on your credit card. MasterCard, VISA and American Express cards accepted. Please be sure to include shipping instructions. Prepayment required and must be in U.S. funds.

DRAT 1093

RADIO AMATEUR callbook

P.O. Box 2013 Lakewood, NJ 08701
1-908-905-2961 (Phone) 1-908-363-0338 (Fax)

CIRCLE 94 ON READER SERVICE CARD

... EA2BP. This is my first CQ WW DX Contest, and I think this is the best. See you in the CQ WW DX Contest in 1994... EA3GHZ.

Our first CQ WW began at noon on Saturday. Too much problems with hard wind (quad spreaders made of PVC). We hope to get them of fiberglass next year. We had a good time! The best way to spend a weekend... EA4EJP. Poor propagation. 100 watts, a vertical, wind, rain, power line static, and Nebraska's most important football game of the year live on AFRTS right in the middle of it all, followed by trick-or-treaters the NEXT night! What more could a con-tester ask for? I hear Jorma (ZB2X) did well borrowing my REAL contest station on "the rock" (ZB2JL). Good for him! Thanks to all who struggled to hear my "little pistol" station through the muck, and to those who worked me thinking the call was TA7(HI). Any suggestions for a good alternative phonetic for "Echo"?... EA7HAL.

My first CQ WW Contest. I didn't know what I was doing. Calling, calling—and nobody answered! But next year, beware of me! (HI)... EC7DXZ. Amp home made broken, TS-930 broken, 40 meter antenna broken, but nobody is dead... ED4RCT. No propagation, but a lot of fun anyway, above all for the "new young ones." First time with CT, we enjoyed it a lot. Til next year... F6KAW. Again a very enjoyable contest. Conditions EW were poor and Stateside runs were difficult to sustain. Path to JA was very disappointing. However, this was more than compensated for by the availability of plenty of multipliers. I will be interested to see whether you accept T9, 404, and X5 all for Bosnia!... G3KMA.

Band sounding good. Went off for meal break on Sunday at 1840Z, and came back to find propagation almost gone. Only worked one more station!... G3YOG. DVK bought for the contest was useless due RF pick up. Tailwister Rotator kept jamming! But most of all, I had fun! Thanks to all who called a mere G station! Used Super-Duper for logging. It is really Super!... G4LJF. It was all going very well until the linear packed up on Saturday evening. Luckily it was not a fatal failure, but it left us without full power for a couple of hours... G8BRA. My first single op. entry—greatly enjoyed, conditions seemed good from Wales, manual logging hard work!... GW4BVJ/P. For the first time as single operator. TNX to CQ magazine!... HB9LCW.

The band was very noisy at sunset, best for me after midnight... HD3W. Congratulations to anyone who heard me with my modest equipment... HI8LC. One German operator asked me to turn beam. I explained carefully I couldn't move the palm tree the dipole was connected to... HP1/KB2DQE. Big surprise running search and pounce USA 60 QSOs/hour on 10 meters Sunday afternoon with 100 watts... IK2SAI. Great propagation and participation on 15 meters. Contest purpose was to test a new home-built rig. It works!... IK4AUY. This isn't a big score, but WOW!—40 zones in two days!... IN3QBR. Worked contest only on Sunday. Many rain's QRN but very nice see 10 meters still so populated!... IU1R.

I tried 40 meter QRP contest first time. Many difficult QSO but enjoyed this contest... JA2DLM. JA to east coast is very good condition, but negative condition was JA to Europe 10 MHz... JA2JSF. Poor openings to Europe and east coast of USA from Japan on 10 meters, but I enjoyed 10 meters pretty much... JA3LDH. I'm writing this on my way to Saipan for CQ WW CW from AH8K M/M station! Ten meters was poor from northern Japan, so missed lots of mults... JABRWU. This is my first entry for SSB part. Unfortunately, I'm planning to half entry for CW part due to attend for my colleague's wedding. Anyway, look forward to CW part... JK1AJX. I called, called, called! Please pick up my call!... JK6ISK. During the contest I've got a new country for my DXCC chasing—9L—among the QRM with no pile-up, as well as last year. Thrilling so much!... JM1APN.

Unfortunately due to the technical problems in helicopter, we were not able to activate Market Reef. Anyhow, super thanks to our marvelous host, OH8RJ!... OH8M. It was wonderful to experience the possibility of making DXCC in one weekend on a band that everyone considers "dead." Maybe it just needs activation! See you all next year!... OZ1ADL. Thank you once again for organizing the contest. I really enjoyed

it. The propagation conditions were a real challenge with the constant change in skip lengths. I was beginning to think that North America had boycotted the contest until a 1 hour period on Sunday gave me almost 40 contacts with USA... OZ2ZZZ. An attempt on the Oceania 14 MHz record which has now stood for 10 years was thwarted by the worst conditions to North America I have ever heard: just 78 Stateside QSOs in 48 hours—ugh!... P29DX (G4JVG).

During the first day my transmitter broke down; took me about 5 hours to repair it, but still enjoyed it very much. See you next year. This was my first contest... PA3FHB. A nice contest with a lot of fun. A contest without help from a DX cluster or an SWL. I am an old-fashioned contester. I do it self! But it's give me a lot of fun. Tell the next year, and thanks for your help as a manager in this contest... PA8IJM. Living (that is contesting, sleeping, and eating) for 48 hours sealed off from the outside at the 13th floor (200 feet high) of the building of the department of electrical engineering at the University of Technology Eindhoven can be characterized as GREAT FUN like ham-students have... PI4TUE.

Participating in the contest since 1956 (under various signs—RA1KBB, UW1BM, and now U1BA). This contest and March WPX are my favorites. Was some difficulties with that new callsigns in my former country and Balkans!... U1BA. It was quite a thrill to work PJ9U for a new country on 40meters. Even more of a thrill when he told me that with our QSO he had broken the world record... V85PB. This is our first contest for the club station but not the last, Hi!... VE2CLM. This was my first contest and I ran with a long wire ran around my loft under the roof, as I am not allowed to have external antennas where I live. By the way, I loved every short minute of it... VE3JKN. It's amazing the callsigns you see year after year, almost like a class reunion... VE3OTL.

Unable to work any JAs. What a difference from my last go at this contest from V63BD!... VE3SMA. First CQ WW had fun, but VE3HQW kept slave driving us to "run." I wanted to just work DX andd "multipliers"... VE3SMP. As always, a great contest with poor propagation. Operated this year from the Polar Amateur Radio Club at 82n x 62w at Canadian forces station alert, NWT. Temperature outside was a balmy minus 37degrees C, and with no heat in the shack, the temps were 3 degrees C. This was my last big contest from this QTH, as I am scheduled to depart the end of next week. Hope to see you again next year from more warmer climates... VE3UWC/VE8.

Having the contest on the Halloween weekend was certainly a "trick or treat" event; you were either "tricked" into thinking the band was completely dead or "treated" to the unexpected (and rare) multiplier plowing through the pileup from the "wrong direction"!... VE3ZD. First contest entered with a computerized logging program. WOW, what a difference! Now I can concentrate on entering even more contests!... VE8KM. Murphy struck early. Lost my beam to a wind storm on Thursday. Strung up some dipoles Saturday morning... VO1SF. It is very difficult to get multipliers from Paradise and as powerful US stations are getting on my frequency, it is impossible to hear any others... VP2VF. Where were NA stations hiding?... YB3OSE.

I lost 6 hours and 11 minutes due to troubles with generator, another 2 hours and 17 minutes due to troubles with my linear amp... YT9C (YU1IG). Was a nice contest, but for the first time in Venezuela at Friday 2300Z the electric power failed in all the YV territory and returned at 2345Z. Then my amplifier burned out, and my husband must travel 25 km to look for another amplifier. Was terrible, but I had fun... YV5NCJ. Glad to be able to confirm "ZL" as a new country for numerous new chums Stateside, but are any hams operating from "Rhode Island"... ZL1CDX. Our first effort but not the last... ZL2T. For the first time I sent in a log. Very windy, chilly conditions on a caravan in the Netherlands... ZS6IR/PA.

Due to a power cut off on Saturday, we had to take along a generator. Dismantling the antennas on Monday morning was not easy in the high winds, with the operators being really tired. Nevertheless, the contest was great fun as always. CU AGN from Vienna next year!... 4U1VIC. Am temporarily resident in Singapore (until the spring of 1994) and hold the call-

sign 9V1ZM (not guest operator). Operating the contest from here with a minimal station was certainly quite an experience—an experience in frustration! Most operators from Europe and North America don't listen for this part of the world and certainly don't appear to turn their antennas in this direction! But surprisingly, most people that I worked in NA and Europe thanked me for the new multiplier . . . 9V1ZM.

We did it the old-fashioned way—no packet! . . . VP2EC. Interesting contest. First time as DX and I have to agree that people turn their antennas to the Pacific. We heard many people with no QRM. Worst let down was hearing 9K2ZZ on 3791 calling CQ over and over and not being able to raise him. Biggest surprise was all the Middle East and Africa we did work and how few Europeans. There is always next year . . . WH8/WK6V.

USA QRM

This is the first contest I have ever participated in. The logging program I borrowed did not have the new eastern Europe countries. I also do not understand the scoring. The score I calculated did not approximate the program score. Despite this I really enjoyed the experience . . . AA3AZ. I ran 15 only until WB5UDX pulled ahead, then went to single all band. (I couldn't let him beat me.—Hi!) Had a GREAT time, DXCC and almost WAZ in 48 hrs . . . AA5ZX. This was my first contest! I went in to it to get new countries, and boy, did I! 31 new ones . . . AA7RW. Biggest thrill—burned up the TS-440 Saturday and the Alpha 374 amp. Had plenty of smoke in shack. First contest entered; great fun; lots of neat contacts . . . AA8GL.

Only worked 23 hrs this time due to equipment failure. Station #2 40 meter quad sits atop the 130 foot shunt-fed tower used on station #1 for 160 meters. This coupled 160 meter RF into the station #2 amp; lost a pin diode I think. Guess we can take the brick off now—huh . . . AA8U. The bug has bitten me; will see you in the next contest . . . AB5GU. First ham contest ever, on my birthday, and made 26 countries (new DXCC)—very fun . . . AB6SA. Quite frankly, I am disappointed to see what has become of this contest. It used to be my favorite, hands down. My comments are directed to what I observed during 80 meter operation though I have no reason to believe that it was really that much different on the other bands. This has become a contest between the few—i.e., the few stations that can afford to put up the biggest Yagis on the highest towers. Competition is a wonderful thing, though not when carried to the following ridiculous limit . . . K2RR.

Conditions quite good for this stage of the cycle, but quite a change from a couple of years ago. I always expect good conditions for the CQ WW. Don't know how you arrange it, hi! . . . W3VT/4. A big change in propagation from last year. Fewer QSOs and fewer multipliers—arrghhhh! . . . W6RCL. Working SU2MT for last zone needed (34). First time ever sending in contest log in 42+ yrs of hamming . . . W7DOZ. Ten meter propagation was really down compared to 1992 and hurt the score, but I almost equalled '92 score in spite of it. Time to get something on 160 for next year! . . . W8OSK.

Keeping up with packet spots can be quite a challenge! Great test . . . W8WP. We threw this effort together over the week just before the contest and the results reflect this fact! Do not have separate feed lines for the antennas except for the 80 vee that was put up Friday afternoon before the test. Mult station was not even used most of the time due to poor signal and its computer got trashed when the run station was on 20 meters. RFI was a serious problem (so I hear from the neighbors!). One guy called and said that we were coming through his door chime. We ran 100 watts much of the time on Sunday. Bottom line is we had lots of fun! . . . WA1G. Where were the South Americans? . . . WA2HF1/0.

Enjoyed some time I could put into CQ WW in between taking my two-year-old son out for Halloween and freak ice and snow storms on Sunday which completely coated my antennas . . . WA3FET. Certainly had a fine time again this year. Was never really able to run, but still what can you expect with an antenna on the chimney! Wait until next year with

AMIDON, INC. W2FMI BALUNS AND UNUNS TRANSFORMERS

HIGH POWER (2Kw - 10Kw) BALUN TO MATCH 50Ω COAXIAL TO:

			PART NO.	PRICE
12.5Ω	Balanced	Direct Connect Yagi Beam	4:1-HB50	\$39.95
50Ω	Balanced	1/2λ Dipole or Yagi Beam	1:1-HBH50	\$39.95
75Ω	Balanced	1/2λ Dipole at 0.22λ above Ground	1.5:1-HVB75	\$59.95
100Ω	Balanced	1/2λ Dipole at 0.22λ & Quad Loop	2:1-HB100	\$59.95
200Ω	Balanced	Folded Dipole, Log Periodic Beam	4:1-HBM200	\$39.95
200Ω	Balanced & Unbalanced	Off Center Fed Antennas	4:1-HB/U200	\$59.95
200Ω	Balanced	10Kw Antenna Tuners & G5RV Log Periodic Beam	4:1-HBHT200	\$59.95
300Ω	Balanced	300Ω Ribbon Folded Dipole	6:1-HB300	\$59.95
300Ω	Balanced & Unbalanced	Off Center Fed Antennas	6:1-HB/U300	\$89.95
450Ω	Balanced	Twin Lead/Ladder Line	9:1-HB450	\$89.95
600Ω	Balanced	Rhombic & V-Beam Antenna	12:1-HB600	\$199.95

UNUN: for ground fed antennas, verticals, slopers, inverted L

PART NO.	IMPEDANCE MATCH	PRICE
2:1-HDU50 (2 Ratios) <i>(connecting 50Ω coaxial to junction of two 50Ω parallel coaxial)</i>	50:22Ω 50:25Ω	\$49.95
2:1-HDU100 (2 Ratios)	112.5:50Ω 100:50Ω	\$49.95
1.5:1-HU75 <i>(connecting 50Ω coaxial to 75Ω coaxial)</i>	75:50Ω	\$49.95
4:1-HCU50	50:12.5Ω	\$49.95
9:1-HU50	50:5.56Ω	\$49.95
1.78:1-HDU50 (2 Ratios)	50:28Ω 50:12.5Ω	\$49.95
1.56:1-HDU50 (2 Ratios)	50:32Ω 50:18Ω	\$49.95
1.78:1-HMMU50 MULTIMATCH UNUN <i>(8 different ratios; can be used for Beverage Antenna)</i>		\$69.95

Unconditional money back guarantee for 1 year on completed unit.

All designs, when used according to instructions, are guaranteed to give outstanding performances. Comparisons with other matching transformers are invited.

NOTE: OTHER BALUN & UNUN TRANSFORMERS AVAILABLE. PLEASE CALL OR WRITE FOR ADDITIONAL DETAIL.

BOOKS: 1) "Transmission Line Transformers Design Handbooks", by Jerry Sevick, W2FMI, Amidon Associates, Inc., 1991. \$8.00 ea.
2) "Transmission Line Transformers", by Jerry Sevick, W2FMI, APRIL, 1990. \$20.00 ea.

UNUN SPECIAL KIT PRICE \$28.00! CALL TODAY!

Put MORE power into your ANTENNA and get better and higher signal strength. Use W2FMI Balun & Ununs by JERRY SEVICK.

- 98% (Avg) Efficient - (<0.2dB Loss)
- 1Mhz to 50Mhz
- Up to 10Kw
- Current & Voltage Type



ALSO AVAILABLE:

Iron Powder and Ferrite Products

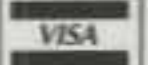
Millions of Parts in Stock for Immediate Delivery. Low Cost Experimental Kits.

Call for our FREE tech. flyer.

Toroidal Cores • Shielding Beads • Shielded Coil Forms • Ferrite Rods • Pot Cores • Baluns • Etc.

AMIDON, INC.

Committed to Excellence Since 1963.



2216 East Gladwick Street, Dominguez Hills, CA 90220
TEL: (310) 763-5770 • FAX: (310) 763-2250

CIRCLE 24 ON READER SERVICE CARD

RADIO WORKS

ANTENNA FEVER

CAROLINA WINDOM

Matching Transformer

Top Performer 6 Product Reviews Say so, DXpeditions prove it!

The Original "Controlled Feedline Radiation" Antenna
Its Secret is the GROUND INDEPENDENT
Low Angle, inverted, VERTICAL RADIATOR

One Antenna + Transmatch = All bands, 80-10 & WARC
Outperforms Dipoles, Trap Antennas, Verticals

Vertical Radiator

Dedicated Matching Transformer & Line Isolator

Model CW:	80-10, 132'	\$74.95	Feed With
Model CW/2:	40-10, 66'	\$74.95	50 Ohm Coax
Model CW160:	160-10, 266'	\$99.95	

RG-8X 95%, Premium 16¢
RG-213 95%, Mil Quality 34¢

Wire Antenna Parts

PL-259	Silver-Teflon, USA	\$1.29 or \$25/25
PL-259	Gold-Teflon, USA	\$1.49 or \$30/25
N/9913	'N' for 9913, 9086, Flexi, etc.	\$3.25
New N/9913	Silver-Teflon, Install like PL-259	\$3.25
CQ RG-8X	95%, Type IIA non-contaminating	23¢
CQ-8X MM	Solid Dielectric, 95%, Type IIA	27¢
SuperCable	International 9086, better than 9913	48¢
CQ FLEXI	Flexible 9913-type, very low loss	62¢
R1 Rotator	8 conductor (2x18, 6x24)	20¢
R2 Rotator	8 conductor (2x16, 6x18)	37¢
R4 Rotator	8 conductor (2x14, 6x16)	48¢
#16 Silky	19-strand, Cu-clad, strong, flexible	8¢
#14 Silky	19-strand, Cu-clad, strong, flexible	11¢
#14 HD	Stranded (7x22) hard-drawn copper	8¢
#14 CW	Stranded (7x22) copper-clad	9¢
#13 Insulated	19-strand, Cu-clad, tough jacket	15¢
450 Ladder	#18 solid Cu-clad, poly, windows	13¢
450 Ladder	#16, 19-strand, cu-clad, poly, windows	18¢
300 Ladder	New! #18 conductors	13¢
1/2" Braid	Tinned ground braid, any length	65¢

Coax and cable SALE prices are in 50 foot increments. All supplies are factory fresh - no surplus, no seconds.

Antenna Support Line Many types available
3/16" MilSpec Dacron®, sun resistant, 100' hank \$8

Current-Baluns

What's so different?

19 Models fit every application
Oversized, saturation resistant,
Ferrite Cores = High Power!
Excellent Output Balance
Maximum Load Isolation
Outstanding Load Mismatch Tolerance
L/C compensation = Max Bandwidth
Teflon® insulation in high power models
Laboratory Specifications Published
Internal wires brought outside case for
direct connection to your antenna

1:1, 50 ohm, 'Current-type' Baluns			
B1-2K	2 kW 80-10,	General Purpose	\$18.95
B1-4K	4 kW 160-10,	High Power, low cost	\$22.95
B1-5K	5 kW 160-10,	Precision, High Power	\$29.95
Y1-4K	4 kW 160-10,	Yagi-Balun, High-Spec	\$24.95
Y1-5K	5 kW 160-10,	Precision, Yagi-Balun	\$29.95

4:1 Baluns			
B4-1.5K	1.5 kW 80-10,	General Purpose	\$19.95
B4-2K	2 kW 80-10,	Precision Voltage-Balun	\$22.95
B4-2KX	2 kW 160-10,	Low loss, Current Balun	\$39.95
New RemoteBalun Hi-Power 160-10, Current-type			\$47.95

Line Isolators			
4K-LI	4 kW, 50 Ohms, SO-239 In, SO-239 Out		\$19.95
4KV-LI	4 kW, for Verticals, SO-239 In, PL-259 Out		\$26.95

REFERENCE CATALOG

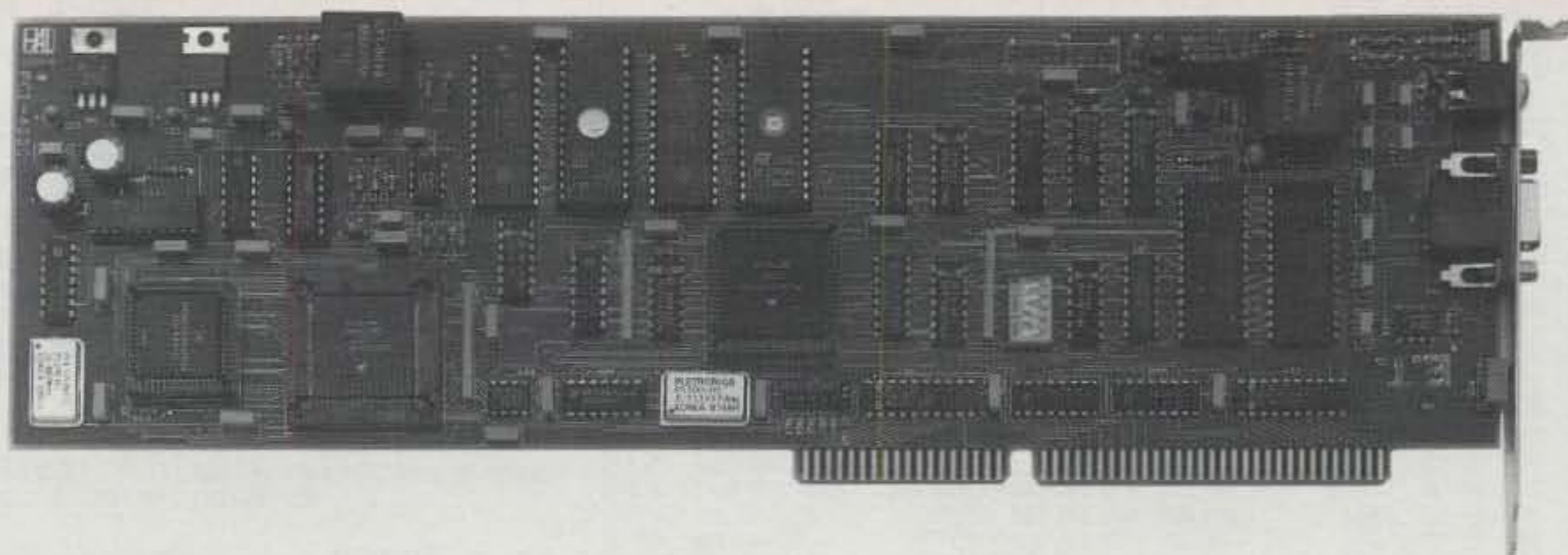
128 pages of hard-to-find parts and reference data on antennas, baluns, antenna support line wire, cable, and coax. It reads like a magazine. Articles on ground systems, "Budget DXing," "High Performance Wire Antennas," and much more. Order the Reference Catalog and receive our General Catalog, free. Send \$4, (\$8 foreign) cash or check for both catalogs, ppd.

Mention this ad for SALE prices. Prices are subject to change without notice. Add shipping, (10%, \$5 min) VISA & MC welcome. Give card #, exp. date signature.

THE RADIO WORKS
Free General Catalog. Allow 4 weeks for Bulk Mail Delivery or send \$2 for General Catalog by Priority Mail.
Call or write The Radio Works at
P.O. Box 6159, Portsmouth, NH 02873
FAX (603) 423-1973
(603) 494-0440

CIRCLE 112 ON READER SERVICE CARD

Tough Band Conditions Demand The Best HF Modem: The HAL PCI-4000/M



Regardless of the high's and low's of the sunspot cycle, the HAL PCI-4000/M HF Modem gives your digital communications the best chance to get through...reliably and efficiently.

Whether it's QRM you're fighting or a K-index at the vanishing point, it takes more than a low-cost "do-everything" gadget to work ALL the signals, not just the strong ones. If you've tried the budget modems and been disappointed, the HAL PCI-4000/M will show you how good HF digital communications can be...AMTOR, PACTOR, BAUDOT, ASCII, and CLOVER (the only modem *anywhere* for CLOVER).

WARNING! You'll never be satisfied with anything less once you've tried a HAL modem.

Check out these features:

- CLOVER, PACTOR, AMTOR, BAUDOT, & ASCII RTTY
- Plug-in card for PC-386 or PC-486 personal computer
- Programmable tones for AMTOR, PACTOR, and RTTY
- Highest data speed on HF (CLOVER)
- High-performance Digital Signal Processing (DSP)
- Friendly terminal software
- Wide variety of third-party software support
- HAL design and manufacturing - quality you can trust

Was \$995.
Order your PCI-4000/M today for
ONLY \$795.



The best doesn't always cost a lot more.



HAL Communications Corp.
P.O. Box 365
Urbana, IL 61801-0365
Phone (217) 367-7373/FAX (217) 367-1701



Table of exchange rates for various countries including OH1BV, OH1WZ/3, OH6VR, OH6NEV, OH7MQF, OH2LU, OH3NM, OH5TV, OH5PA, OH3LOK, OH1AA, OH6RM, OH8LD, OH6KT, OH2FM, OH2AQ, OH9LVH, OH3XA, OH3JR, OH7UE, OH1GI, OH4YR, OH6OS/2, OH6SU, OH7NW, OH2KWC, OH3AD, OH5TE, OH2BNX, OH3MMH28, OH8MZ, OH1KAG, OH2MPO, OH2LNH, OH3MYL, OH5LBR, OH2LXZ, OH6QP, OH1MCX14, OH6RC, OH3MC, OH1KF, OH2BVE.

FRANCE

Table of exchange rates for France including F6HLC, F6A0J, F5SAU, F6GIN, F50BK, F5HNQ, TM1K, F6FUN, F2EE, F6KBF, F5KEF, F5JOU, F5PRR, TM6GG, F8WE, F5PCX, F5RAB, F5NZD, F5SSA, F2RO, F5JBF, F5LBG, F6DLM, F6FTB, F5NFK, F5RMY, F5JSK, F5RFB, F6AXD, F6FIO, F5OHW, F6FNA, F5JOU, F6BVB.

GERMANY

Table of exchange rates for Germany including DJ4PT, DL2NB, DL8PC, DF3QG, DL1NCT, DJ1AZ, DJ8UV/P, DL2DXX, DL8UCC, DF5PK, DJ3HJ, DL9NCR, DL6NCY, DK1IT, DF9RD, DL1JPL, DL4YBP, DL3KZA.

Table of exchange rates for various countries including DJ2UU, DL4RDJ, DL6EH, DL4DCC, DL5CQ, DF5NF, DK5PD, DL2FDW, DL6DNU, DF8EG, DL8JTC, DL2JDS, DL6KVB/P, DK8EY, DJ6BN, DK5KJ, DF1EQ, DJ1ZU, DJ7AA, DK9UV, DL2SAX, DJ5LA, DL8OH, DF1JC, DL3LAB, DL2ARD/P, DL3OI, DJ4PI, DK1QH, DL6KY, DL1MGB, DL1JDK, DL9SOW, DL9NDS, DL3YJC, DJ8MW, DL5IO, DK5DS, DL8SDC, DL4JYT, DK4IO, DL7VBM, DF8IT, DL1FDV, DL4ZBC, DL3DBY, DL4GBA, DL8UVG, DL6RDE, DL3F8Y, DF9OZ, DF2IX, DL6NEA, DL6FBL/A, DL4DXF, DL1HSR, DL5IAB, DL3DRN, DL3HRA, DL3YDY, DL5AUJ, DL1SUA, DL8TO, DL2ECZ, DL3BRA, DL1DWT, DL2DBH, DL1IAO, DK8FS, DL5AYI, DL2AKF, DL3HWW, DL3AG, DL4MFM, DL1SBF/P, DJ8BX, DK5VO, DJ2YE.

GIBRALTAR

Table of exchange rates for Gibraltar including ZB2X.

GREECE

Table of exchange rates for Greece including SV1BLY, SV1IG.

HUNGARY

Table of exchange rates for Hungary including HA8HW, HA1FF, HG8FH, HG8QB, HAGNW, HA4FB, HABAT, HA4YV, HA4XN.

ICELAND

Table of exchange rates for Iceland including TF3T, TF3CW.

ITALY

Table of exchange rates for Italy including IV3UHL, IB8C, IU4G, HWTC, IK8NGI, IK4RVA, IZ1, IK2REA, IK3SCB, IR8A, IK5NTJ, I4A, IK2DZN, I4AFU, I4AFQ, IG8R, I2HVE, IU8A, IK2MLY, IS8DE, IK1DML, IV3YYK, IK4ALM, IQ5Q, ISJFG, IK2AEQ, IV3TAN, IK3ZNR, IV3PRK, IK2VUE, IQ8W, IK2SAI, IK8CHL, IK1JIM, IK2SDE, I4CSP, IK1POT, IO7G, IK8SMZ, IK6OIN, IK30GL, IK2UCK, IK8ROB, IK2RPE, IK8WEJ, IK1TTD, IK8IFW, IK8QBI, IK2FXA, IK8IOP, IN3IKF, IK7RVY, I4JEE, IK4LZH, IU1R, IK2OLJ, IK8QJO, IK4RSK, IR1T, IB4M, IR3S, IV3BUT, IK2IQR, IK2RGT, IK2EKY, IQ8HP.

JERSEY

Table of exchange rates for Jersey including GJ8SLY.

KARELIA

Table of exchange rates for Karelia including RN1NDX.

LATVIA

Table of exchange rates for Latvia including YL2KO, YL2IP, YL2EC, YL1WW, YL2SM, YL2GVV, YL2PP, YL2GN, YL2GUO, YL2GTD.

LIECHTENSTEIN

Table of exchange rates for Liechtenstein including H88, DF3GY/P.

LITHUANIA

Table of exchange rates for Lithuania including LY38X, LY2IJ, LY38H, LY2OM, LY2DX, LY2TZ, LY2BN, LY3KB, LY1DI, LY1VV, LY2PAQ.

LUXEMBOURG

Table of exchange rates for Luxembourg including LX1NW, LX1KC, LX1SG.

MACEDONIA

Table of exchange rates for Macedonia including Z328U, Z30M.

MOLDOVA

Table of exchange rates for Moldova including UO4OF, UO5OIS, ERDF, UO5OOC, ER1AA, UO5OED, UO5ODC.

NETHERLANDS

Table of exchange rates for Netherlands including PA8AGA, PA8KHS, PA8YN, PA8AFZ, PA8IJM, PA8GPMQ, PA8KDM, PA2SWL, ZS6IR/PA, PA3ECJ, PA3GCZ, PA8DJ, PA2JCG, PA8MIR, PA3ELD, PA3FHB, PA8DOM, PA3EMN, PA3GAB.

NORTHERN IRELAND

Table of exchange rates for Northern Ireland including GI8KOW, GI8OUM, GI8RDJ, GI4SNA, GI8SAP.

NORWAY

Table of exchange rates for Norway including LA1LIA, LA6MP, LA2WHA, LA7AFA, LA48N, LA2UJ, LA2DDA, LA6VDA, LA2IR, LA6WIA, LA6PB, LA8GV, LA2GCA, LA5RBA, LA2EIA, LA4MHA, LA3DHA, LA9CQ, LA8DY, LA2ZFA, LA6BBA, LA1BJA, LA3DV, LA5FBA, LA2AD, LA9JHA, LA8WGA, LA9FFA, LA3JT, LA8WG, LA1WJA, LA6WEA.

NORWAY

Table of exchange rates for Norway including LA1LIA, LA6MP, LA2WHA, LA7AFA, LA48N, LA2UJ, LA2DDA, LA6VDA, LA2IR, LA6WIA, LA6PB, LA8GV, LA2GCA, LA5RBA, LA2EIA, LA4MHA, LA3DHA, LA9CQ, LA8DY, LA2ZFA, LA6BBA, LA1BJA, LA3DV, LA5FBA, LA2AD, LA9JHA, LA8WGA, LA9FFA, LA3JT, LA8WG, LA1WJA, LA6WEA.

POLAND

Table of exchange rates for Poland including SP9KAO, SP2JMR, SP48PH/A, SP9HZF, SP5BY.

Table of exchange rates for various countries including SP5MXE, SP5XD, SP9LDI, SP2FWC, SP1JRF, SP5DDJ, SP9LAB, SP3EJ, SP6JZB, SP9FZU, SP7GIO, SP2PMO, SP9ATE, SP4DGN, SP1E0I, SP4CUF, SP8HXN, SP6YAO, SP5TZ, SP6NIC, SP3XBK, SP7SEW, SP7LZD, SP6DNZ, SP6SOX, SP7FOI, SP6TRO, SP9AGS, SP4GAP, SP8LZC, SP4EEZ, SP2AHD, SP9RQH/P, SP6MLX, SP9LDP, SP8OON, SP9MDY, SP3FLR, SP3KPN/3, SP8GEY, SP9VEJ, SP8HJ, SP5CBA, SP7LHX, SP7VCK, SP8BHH, SP9BPQ, SP9PEZ, SP9KZ, SP5IVC, SP3SLA, SP5BB, SP8EE, SP9DEMA, SP5XMM, SP8WJD, SP5LKM, SP6PAX, SP4SHD, SP5CPR, SP2GNB, SP6HXB, SP6FIB, SP9RXP, SP2FOV.

PORTUGAL

Table of exchange rates for Portugal including CT1EEN, CR6A, CT1EGE, CT1AOZ, CT18BJ, CT1ESV, CT1BNW, CT7D, CT1BWU, CT1ELP, CT1QF, CT1EDJ, CT1ERK, CT1ETE, CT1EAT, CT1AZS, CT1END.

ROMANIA

Table of exchange rates for Romania including YO6JN, YO3RU, YO7DAA, YO3APJ, YO2BEH, YO2DFA, YO8BNG, YO5BWI, YO4DUJ, YO9AGI, YO4NF, YO3AIL.



LET THE FUN BEGIN!

2 BIG DAYS

BOXBORO '94

The New England ARRL Convention at Boxboro, Massachusetts
 Take the Mass. Pike to Rte I-495. The convention is at exit 28.

OCTOBER 1 & 2



- Make DEALS at the Dealers! • See the Newest Gear! • Giant Flea Market
- FCC Exams - All Levels • WIN the Contests! • Wouff Hong Initiation
- YL Programs • DX Meetings & QSL Checking • ARRL & FCC Forums
- Big Banquet, Dance & Show Saturday Night • Free Sessions for Youngsters 6-16

Early Bird Registration \$7

For Tickets Write: Mel Cole WZ1Q, P. O. Box 8, Prides Crossing, MA 01965
 All-you-can-eat banquet, show & dance \$21 per person including tax and tip . Early Bird registration \$7 per person

CIRCLE 1 ON READER SERVICE CARD

MFJ TUNERS

MFJ's world famous 3 KW Antenna Tuner If you won't settle for less... here is the finest 3 KW tuner money can buy!

The MFJ-989C is not for everyone.

However, if you make the investment, you'll get the finest 3 KW antenna tuner money can buy.

Here's why...

Massive Transmitting Capacitors

You get two massive 250 pf transmitting variable capacitors with detailed logging scales. They can handle amps of RF current and withstand 6000 RF volts because the plates are smoothed and polished and have extra wide spacing.

Precision Roller Inductor

A precision roller inductor, 3 digit turns counter and spinner knob gives you exact inductance control for absolute minimum SWR.

Ball bearings on steel shafts give you a velvet smooth vernier feel and long term durability.

You won't have arcing problems



\$349⁹⁵

with this roller inductor.

Firm springs put high pressure on a plated contact wheel for excellent electrical contact.

Wide, low inductance straps are used for high currents and a new core minimizes RF loss.

Cross-Needle Meter

You get a lighted peak and average reading Cross-Needle SWR/Wattmeter with 200 and 2000 watt ranges. Its new directional coupler gives you accurate readings from 1.8 to 30 MHz.

Super Heavy Duty Balun

You get a super heavy duty current balun for balanced lines. It has two giant 2 1/2 inch powder iron toroid cores and is wound with Teflon® wire connected to high voltage ceramic feedthru insulators. It lets you operate high power into balanced feedlines without core saturation or voltage breakdown.

Ceramic Antenna Switch

A two wafer 6 position ceramic antenna switch with extra large contacts gives you trouble free switching.

Plus much, much more

You also get a 300 watt dummy load, full one year unconditional guarantee, flip stand, all aluminum cabinet, tough baked on paint, locking compound on all nuts and bolts. 3 KW PEP. 10 3/4x4 1/2x15 in. Don't settle for less, get yours today!

**More hams use MFJ tuners than all other tuners in the world!
Why settle for an imitation when you can have the real thing?**

MFJ's deluxe 300 Watt Tuner



MFJ-949E **\$139⁹⁵** More hams use the MFJ-949E than any other antenna tuner in the world!

Why? Because you get proven reliability, the ability to match just about anything and a one year unconditional guarantee.

You get a lighted peak and average reading Cross-Needle SWR/wattmeter, antenna switch, 4:1 balun for balanced lines, 1.8-30 MHz coverage and a full size dummy load that easily handles 300 watts of abusive tune-up power.

New 8 position antenna switch lets you pre-tune into dummy load to minimize QRM.

The inductor switch is designed for high RF voltages and currents--it's not a plastic switch made for small signals and wired with tiny gauge wire.

Each MFJ-949E cabinet is chemically treated and has a new tough scratch-proof vinyl cladding -- not paint that can scratch or chip off. You won't find a tougher, longer lasting finish anywhere.

MFJ's versatile 1.5 KW Tuner



MFJ-962C Use your barefoot rig now and have **\$229⁹⁵** the capacity to add a 1.5 KW PEP amplifier later! Lighted Cross-Needle SWR/Wattmeter. 6 position antenna switch, Teflon® wound balun, ceramic feedthru insulators for balanced lines. 1.8-30 MHz. 10 3/4x4 1/2x14 7/8 in.

MFJ's portable/QRP Tuner

Tunes coax, balanced lines, random wire 1.8-30 MHz. Cross-Needle Meter. SWR, 30/300 or 6 watt QRP ranges. 6x6 1/2x2 1/2 in. MFJ-971 **\$89⁹⁵**

MFJ's super value Tuner



MFJ-941E **\$109⁹⁵** The new MFJ-941E gives you a 300 watt PEP tuner with lighted Cross-Needle Meter that covers everything from 1.8-30 MHz for an incredible \$109.95.

Antenna switch selects 2 coax lines (direct or thru tuner), random wire, balanced line or external dummy load. 4:1 balun. 1000 volt capacitors.

2 Knob Differential-T™ Tuner



MFJ-986 **\$289⁹⁵** The MFJ-986 Differential-T™ 2 knob tuner uses a differential capacitor to make tuning foolproof and easier than ever. It ends constant re-tuning with broadband coverage and gives you minimum SWR at only one best setting. 3 KW PEP. 1.8-30 MHz.

Roller inductor makes tuning smooth and easy. Turns counter lets you quickly re-tune to frequency.

Lighted Cross-Needle Meter reads SWR/forward/reflected/peak/average power in 2 ranges. Current balun reduces feedline radiation and forces equal currents into unbalanced antennas.

MFJ's mobile Tuner



MFJ-945D **\$89⁹⁵** Don't leave home without this mobile tuner! Let the MFJ-945D extend your antenna bandwidth so you don't have to stop, go outside and adjust your mobile whip. Small 8x2x6 inches uses little room. Lighted Cross-Needle SWR/Wattmeter makes tuning easy while in motion. Has lamp switch. 1.8-30 MHz. 300 watts PEP. Mobile mount. MFJ-20, \$4.95.

MFJ's smallest Versa Tuner

The MFJ-901B is our smallest -- 5x2x6 inches -- (and most affordable) 200 watt PEP tuner -- when both your space and your budget is limited. Great for matching solid state rigs to linear amps. MFJ-901B **\$59⁹⁵**

MFJ's random wire Tuner

Operate all bands anywhere with any transceiver with the MFJ-16010. It lets you turn a random wire into a transmitting antenna. 1.8-30 MHz. 200 watts PEP. Ultra small 2x3x4 inches. MFJ-16010 **\$39⁹⁵**

MFJ's VHF or UHF Tuners

MFJ-921 or MFJ-924 **\$69⁹⁵** MFJ-921 covers 2 Meters/220 MHz. MFJ-924 covers 440 MHz. SWR/Wattmeter. 8x2 1/2x3 in. Simple 2-knob tuning for mobile or base.

MFJ's artificial RF Ground

Creates artificial RF ground. Eliminates or reduces RF hot spots, RF feedback, TVI/RFI, weak signals caused by poor RF grounding. Also electrically places a far away RF ground directly at your rig by tuning out reactance of connecting wire. MFJ-931 **\$79⁹⁵**

Free MFJ Catalog

Write or call toll-free... 800-647-1800

Nearest Dealer/Orders: 800-647-1800
24 Hour FAX: (601) 323-6551

Technical Help: 800-647-TECH (8324)

MFJ MFJ ENTERPRISES, INC.
P. O. Box 494, Miss. State, MS 39762
(601) 323-5869; 8-4:30 CST Mon.-Fri.
76206.1763@compuserve.com; Add \$h

Prices and specifications subject to change ©1994 MFJ Enterprises, Inc.

MFJ... making quality affordable

CIRCLE 172 ON READER SERVICE CARD



OWN THE WORLD'S BEST TURBO-DIESEL BASE STATION

Add a QMS Antenna Tuner System to your SSB.

\$895.00

The QMS is an SGC Smartuner® automatic antenna coupler, an SG-303 extended full-range antenna, and the special exterior—waterproof—mounting package, all in one.

Trucks are America's working rigs. And now, with a QMS strapped on the side, they're also one of the world's best base station configurations. It may look a little unusual, but the QMS gives any mobile HF-SSB an almost unbelievable jump in reception and transmitting range (3-20 db). Match it with a cutting edge SGC HF-SSB and it will blast holes through major mountain ranges and probably some laws of physics. Power and focus are everything in HF-SSB ham rigs. Buy this and own the best 3/4 ton base station on the road.

Mounting the tuner and antenna on the outside reduces engine noise and eliminates power-drawing antenna wire runs between the antenna and tuner.

QMS. It's the look of focused power.

LEARN TO LOVE THE LOOK



SGC
NO COMPROMISE
COMMUNICATIONS



1-800-259-7331

The SGC Building P.O. Box 3526 Bellevue, WA 98009 USA (206) 746-6310 Fax: (206) 746-6384

N6AW	3,846,085	2575	152	405
W7RM	6,708,236	4223	151	436
KG8CW	2,201,100	1437	135	445
W0AIH/9	3,568,878	2292	147	495
NE9O	3,296,664	2233	131	427
NX0I	2,117,605	1445	149	446

ALASKA
KL7Y 7,062,600 6048 144 330

ANGUILLA
VP2EC 28,702,788 12,889 177 731

ANTIGUA
V26B 11,846,252 8347 135 469

CANADA
CH9DH 14,649,546 9501 142 536
VE7ZZZ 5,699,840 5254 137 351

CAYMAN ISLANDS
ZF2JI 9,428,352 7370 136 435

ST. MARTIN
FJ5AB 4,458,012 4302 109 333

TURKS & CAICOS IS.
VP5L 20,720,222 12579 153 550

AFRICA
CEUTA & MELILLA
EA9UK 37,140,597 13547 179 744

ASIA
ASIATIC RUSSIA
UZ0SXF 947,920 1281 100 240

HONG KONG
VS6WO 10,793,254 8822 157 490

JAPAN
JA3ZOH 6,054,560 3474 164 468
JA1YXP 4,136,600 2672 163 396
JA1YDU 3,772,994 2554 158 380
JA7YRR 2,618,067 2111 132 305
JA0YAK 2,180,945 1803 140 305
JR1ZTT 1,623,240 1633 122 238
JA3YUA 1,342,800 1302 114 259

SRI LANKA
4S0DX 2,750,960 2438 124 378

EUROPE
BELGIUM
OT3A 14,932,489 8938 164 699

CROATIA
9A1A 17,565,936 10531 178 701

ENGLAND
G0KPW 18,718,332 9364 177 797

EUROPEAN RUSSIA
R6L 7,708,961 5209 167 642

FINLAND
OH3AT 78,668 280 40 102

GERMANY
DF0DX 8,387,560 5650 166 591
DL0XX 1,682,928 1872 108 414

HUNGARY
HG73DX 18,653,271 10285 181 722

ITALY
IQ3A 7,551,528 4473 158 568

KALININGRAD
UW2F 16,104,474 9558 181 720

LITHUANIA
LY7A 4,618,284 3983 153 555

NETHERLANDS
PI4COM 8,805,900 6023 150 595

NORWAY
LA3M 106,200 349 47 133

POLAND
SN6O 3,504,498 2926 132 474
SP9KAT 420,080 789 76 219

SPAIN
ED4RCT 1,513,200 1873 107 283
EA1WA 1,008,140 1298 91 289

SWITZERLAND
HB4FG 1,163,750 1337 107 383

UKRAINE
UR8J 9,141,237 5904 673 188
US7I 6,509,250 5491 161 589

YUGOSLAVIA
4N1Z 5,646,949 5055 146 503

OCEANIA
AMERICAN SAMOA
WH8 /WK6V 1,387,386 1824 101 185

INDONESIA
YE3Z 233,192 403 77 129

LORD HOWE ISLAND
VK9LI 10,881,894 7689 144 370

NEW ZEALAND
ZL2K 8,935,066 6257 142 355
ZL2T 3,270,672 2902 122 280

NORTHERN MARIANA IS.
WB2P 3,911,946 3936 124 229
/KH0

PHILIPPINES
DX1DBT 1,677,615 2019 94 197

SOUTH AMERICA
ARGENTINA
LU4FM 13,078,884 7057 150 487

BRAZIL
PR4B 5,124,540 3966 113 333

ECUADOR
HC0E 15,452,712 8014 147 507

PARAGUAY
ZP80A 6,176,040 4449 116 365

CHECK LOGS

Our thanks to the following stations who sent in check logs: 404D, 9A1CRJ, A71CW, AA4WX, CH9NH, DJ0SH, DK2XX, DL/PA0TV, DL1ASF, DL1JEI, DL1SWG, DL2DWA, DL5AMF, DL5DWW, DL5JRA, DL5YWM, DL6UKL, DL7UMF, DL7VUO, EA1AJS, EA1AW, EA1DKF, EA1FAE, EA1FBO, EA1IF, EA2BXJ, EA3EJW, EA3HB, EA4BJD, EA5AEN, EA5BZS, EA5DCL, EA5GMB, EA5GRM, EA5GRN, EA5SM, EA5ZW, EA6ACX, EA6MQ, EA7ABL, EA7EFE, EA7GW, EA7GYJ, EA9TQ, EC1DLE, EC3ABF, EC3CYT, EC5CQI, EC5CVQ, ER7Z, FG/KD6WW, JW7FD, K9EMG, KL7UR, KP2/KW8N, LA110, LA2IZ, LA2JX, LA2QM, LA4KF, LA4LN, LA5JX, LA8HGA, LA8KHA, LA9LD, LA9NM, LY2BAG, NU9Z, OE5BMO, OE6IMD, OH1XX, OH2FO, OH200, OH3GZ, OH3TY, OH5NCG, OK1AD, OZ1EUQ, OZ7BW, PA8UV, PA3BTH, PY1AJK, RA3GCC, RZ1NWT, RZ6LY, SM0BINK, SM0CSX, SM0MC, SM0UEV, SM2KAL, SM2LWU, SM3CBR, SM4AWC, SM5BBS, SM6BZE, SM6LJP, SM6PVB, SM7AYV, SM3MHD, SP-0189-GD, SP2CYK, SP2FAP, SP2GKQ, SP2IU, SP2WEP, SP3HD, SP3JIA, SP3MY, SP3NUY, SP3NYI, SP4AS, SP4ERB, SP4GDC, SP4HKN, SP4TBM, SP5GKN, SP5JTM, SP5MXY, SP6AGD, SP6AUI, SP6CDP, SP6CPF, SP6EY, SP6HFZ, SP6JZB, SP6RGB, SP6TGA, SP6TRH, SP6URF, SP7DRV, SP7EOE, SP7GAQ, SP7SEG, SP7VCA, SP8MCP, SP8NAD, SP9AVZ, SP9BBH, SP9CLO, SP9DAE, SP9MAN, SP9MQH, SP9PRO, SP9TCE, UA1CK, UA3WCN, UA4CAA, UA4PPR, UA4ZA, UA9JX, UB3IFD, UB4CWA, UB5RAF, UB5XAN, UJ8RA, UN7FW, UT7IY, UZ3JWA, VE2EM, VE3VD, VE6EDS, W8QZA/6, YL2GD, Y03AS, Y03FRI, Y03FVC/P, Y060BH, Y08CRU, Y08SAC.

MFJ-949E Deluxe 300 Watt Tuner

More hams use MFJ-949's than any other tuner in the world!
Why settle for an imitation when you can have the real thing?

In Stock at ham dealers everywhere!

Pick one up at your favorite dealer -- no shipping, no waiting, no hassles

MFJ-949E

\$139⁹⁵

Call your dealer for your best price
Includes FREE AC adapter for meter light



More hams use MFJ-949's than any other antenna tuner in the world!

Why? Because the world's leading tuner has earned a worldwide reputation for being able to match just about anything.

MFJ-949's have been highly refined and have years of proven reliability.

Every MFJ-949E comes with... MFJ's famous one year *No Matter What*™ unconditional guarantee... first-rate performance... unbeatable quality... the best tuner value in ham radio -- all from the world's most trusted name in antenna tuners.

Now the latest MFJ-949E gives you even more features and more value than ever at a new lower price.

Why take chances with an imitation when you can have the *real thing* from the world's most trusted name in antenna tuners.

More reasons why more hams use MFJ-949's than any other antenna tuner in the world...

Full 1.8-30 MHz Operation

1000 volt tuning capacitors, extra heavy duty inductor switch, Teflon® insulating washers and proper L/C ratio gives you arc-free no worries operation with up to 300 watts from 1.8 to 30 MHz.

Lighted Cross-Needle Meter

MFJ's lighted Cross-Needle Meter shows you SWR, forward and reflected power *simultaneously*. It reads both *peak* and average power on 300 or 30 watt ranges.

The meter is illuminated for easy reading in dim light and has an ON/OFF lamp switch. The meter lamp uses 12 VDC or 110 VAC. A *free* AC adapter is included at no extra cost.

Tunes any Antenna

The MFJ-949E tunes out SWR on dipoles, verticals, inverted vees, random wires, beams, mobile whips, shortwave receiving antennas... nearly anything!

Use coax feed, random wire or balanced lines. Has oversized *heavy duty* 4:1 balun.

Super Antenna Switch

MFJ's 8 position *super* antenna switch lets you select two coax fed antennas, random wire/balanced line or built-in

dummy load for use through your MFJ-949E or direct to your transceiver.

MFJ's Cross-Needle SWR/Wattmeter is always active for monitoring forward and reflected power and SWR.

QRM-Free PreTune™

MFJ's *QRM-Free PreTune*™ lets you pre-tune your MFJ-949E off-the-air into a built-in dummy load without causing QRM. Pre-tuning into a dummy load makes

tuning your actual antenna faster and easier.

Full Size Dummy Load

The MFJ-949E has a *full size* non-inductive 50 ohm dummy load measuring 3/4 inch diameter by 5 inches. It *easily* handles 300 watts of abusive tune-up power.

You'll find it handy for tuning, testing and repairing your rig, setting power level, adjusting your mic gain and more.

Watchout for cheap midget size dummy loads that changes resistance as it heats up -- marginal ones could burn up your transceiver.

Custom Inductor Switch

The inductor switch is the most likely component to burn up in *any* antenna tuner.

The inductor switch in the MFJ-949E was *custom* designed to withstand the extremely high RF voltages and currents that are developed in your tuner -- it's not a flimsy *plastic* switch made for small signals and wired with *tiny* gauge wire.

Superior Cabinet

Each MFJ-949E cabinet is chemically treated and has a new tough scratch-proof *vinyl* cladding -- not paint that can scratch or chip off. You won't find a tougher, longer lasting finish anywhere.

Detailed logging scales and legends are *permanently* silk screened on a *real* aluminum front panel and back panel -- it's not merely a plastic decal or glued-on paper strip that can peel off.

Superior Materials... Superior Construction

Every MFJ-949E use Teflon® insulating washers, countersunk screws for meter bracket, wing-nut for ground post, fire-retardant epoxy glass PC board (*not* canvas based), heavy .063 inch thick aluminum chassis (*not* flimsy .050 inch), heavy gauge wire used throughout (*not* small gauge), custom cabinet (*not* multi-purpose with unused holes and internal protruding screws).

No Matter What™ Guarantee

Every MFJ-949E is backed by MFJ's famous one year *No Matter What*™ unconditional guarantee. That means we will repair or replace your MFJ-949E (at our option) *no matter what* for a full year.

Others may give you a *limited* warranty on defects in material and workmanship.

But what do you do if it burns up and they say, "Sorry, your *limited* warranty does not cover that?"

Continuing Service

Only MFJ gives you a *direct* toll-free technical help line -- not merely a sales line. It's answered by *electronic technicians* who are experts in antenna tuners. We're here to help keep your MFJ product performing flawlessly -- no matter how long you own it -- just call toll-free 800-647-TECH(8324).

Call your dealer for your best price

In stock at ham dealers everywhere!

Order your MFJ-949E today or simply pick one up at your favorite dealer or hamfest -- no shipping, no waiting, no hassles.

Free MFJ Catalog

Write or call toll-free... 800-647-1800

Nearest Dealer/Orders: 800-647-1800

24 Hour FAX: (601) 323-6551

Technical Help: 800-647-TECH (8324)

MFJ ENTERPRISES, INC.
P. O. Box 494, Miss. State, MS 39762
(601) 323-5869; 8-4:30 CST Mon.-Fri.
76206.1763@compuserve.com

Prices and specifications subject to change. © 1994 MFJ Enterprises, Inc.

MFJ... making quality affordable CIRCLE 159 ON READER SERVICE CARD

CQ REVIEWS:

The NCG/COMET HA-4S HF Mobile Antenna

BY LEW McCOY*, W1ICP

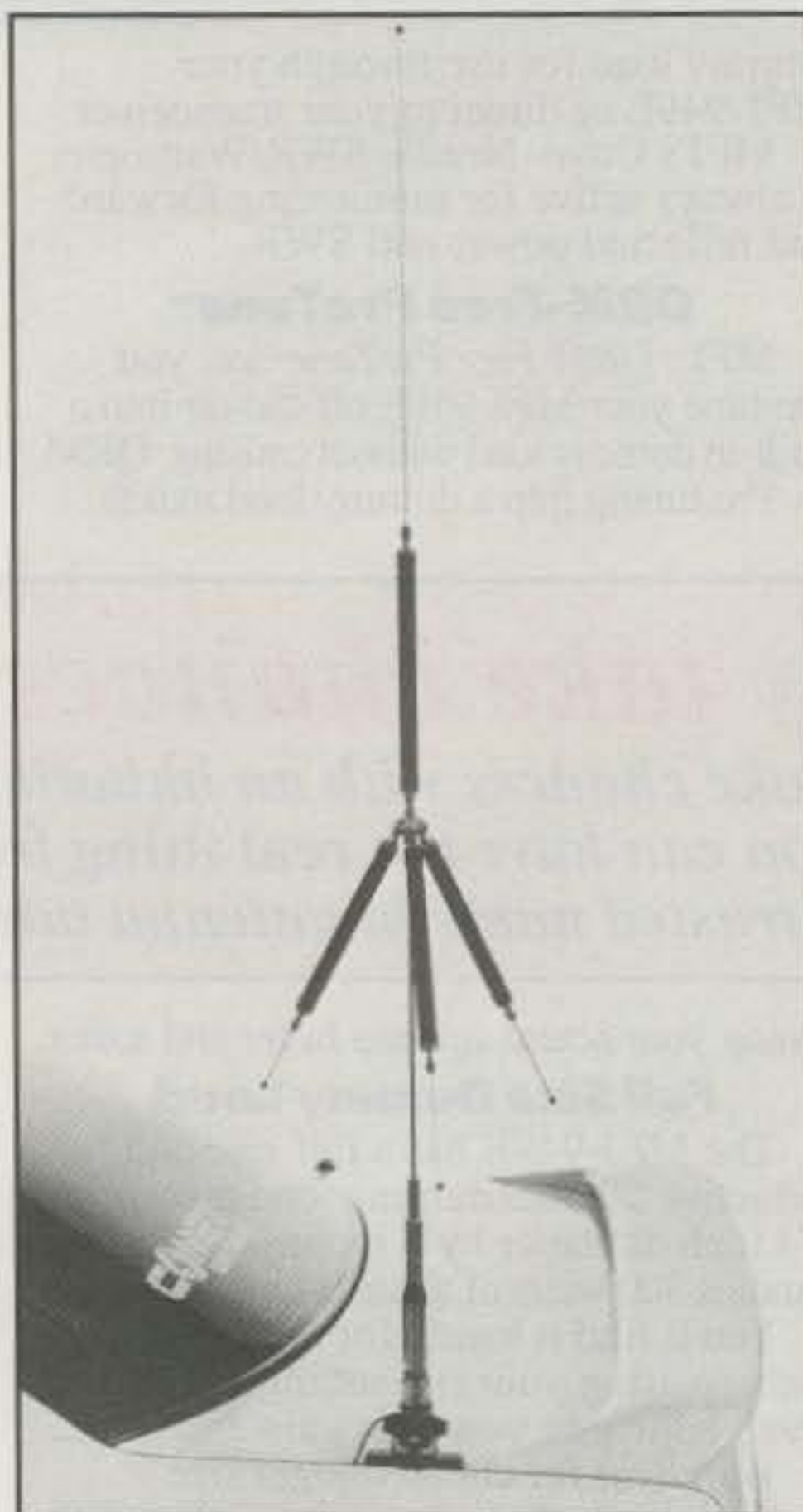
An importer of amateur products manufactured in Japan, NCG handles mostly antenna products—the COMET line—some of which I have reviewed previously. I have always been impressed by the COMET antennas, as they are well constructed and have unusual design features.

One of COMET's latest products is the HA-4S, which is basically a 40, 15, 12, and 10 meter mobile antenna. They also market an additional coil for the antenna which covers 20 meters (the L-14 HS). The mobile antenna has a heavy-duty trunk-lip/hatch mount. What impresses me is the very light weight of the mobile antenna. When set up for operation on the basic four bands (40, 15, 12, 10 meters), antenna weight is less than two pounds. Look at the mobile antenna photo, and I'll attempt to explain the construction.

At the base of the antenna is the hatch- or trunk-lip mount. It has a narrow lip with four mounting screws to tighten to the lip of the trunk. I mounted it on two different vehicles—a Cadillac and a Ford. I found that in both cases there was adequate trunk-lip clearance to provide mounting room and opening and closing of the trunk lid without problems.

The mount has three separate variable adjustments in order to orient the antenna properly. Therefore, getting the antenna to ride perfectly straight and upright is no problem. The first section of the antenna mounts to the base mount; this section is 23 inches long. Approximately 5 inches up from the bottom of this section is a knurled nut which can be loosened, permitting the antenna to be laid over if necessary. This bottom section is attached to the trunk mount via a heavy-duty nut. The feed assembly at this base is via a short length of RG-188A/U (this is very small coax, about 1/8 inch diameter). This short length, about 1 foot long, is permanently attached to a longer length of RG8X type coax (to go up to your rig). I might add that gold-plated fittings are used.

Back to the antenna. The short base



This photo shows the NCG/COMET HA-4S HF mobile antenna. Note the neat mounting trunk clamp.

section has a ring at the top with three mounting holes for various coils. In the case of 40, 15, 12 and 10 meters, I mean mounting for the 15, 12, and 10 meter coils. As you can see from the photo, these coils are mounted downward from the center ring.

Mounted above the ring is the 40 meter coil (or, if desired, the 20 meter coil). The 40 meter coil is 10 inches long, and the top whip is 19 inches. With the bottom section of 23 inches, this makes the overall antenna height just about 52 inches, or just over 4 feet.

I used an MFJ-249 SWR/frequency-counter bridge to check out each band. (While this is not a review of that instrument, it is certainly one of the most use-

ful tools an amateur can have and use.) I simply connected the MFJ-249 to the feed line and then adjusted each coil by varying the short tuning whip which is on each coil. I might add here that all bands had a match of less than 1.2 to 1. Again, it was a piece of cake using the MFJ unit. I merely tuned the unit for the lowest SWR reading, which was either directly in a band or close to it, and then adjusted the short tuning whip accordingly.

Without a doubt, this is one of the nicest "looking" low-band mobile antennas I have seen. It is really a "beautiful" antenna and is extremely well made. In performance, I compared it directly to a version of Don Johnson, W6AAQ's DK-3. I parked my car, with the COMET mounted on it, alongside my trailer, which had the DK-3 type on it. I operated the COMET on 40, 20, 15, 12, and 10. Keep in mind that both antennas were absolutely resonant. Also, I have to admit the DK-3 type, which uses a large center-loaded coil, had a better ground against which to operate than the COMET. In any case, switching back and forth between the two mobile antennas on both receive and transmit, in all cases the larger antenna was the better performer. Not much better, but better.

Would I buy and use a COMET for mobile? Absolutely. It is only slightly over 4 feet high, it is well matched, and what is important here, I made just as many contacts as with the other antenna.

Also, as I have pointed out in previous mobile antenna reviews, be certain to make good grounding connections at the base mount or trunk-lip mount. Reducing ground losses is extremely important.

The antenna pricing is broken down into three parts. First is the complete antenna for 40/15/12/10 meters; without the base it is \$179.95. The 20 meter section is \$29.95. The heavy-duty trunk mount is sold separately, because many amateurs already have a mobile mount. The trunk mount lists for \$34.95. A cable assembly with gold-plated fittings is available for \$38.95; it is 17 feet long.

The COMET antennas are marketed by NCG, 1275 North Grove St., Anaheim, CA 92806. ■

*Technical Editor, CQ, 1500 Idaho St., Silver City, NM 88061

MFJ *super* DSP filter

. . . Tunable "brick wall" bandpass, lowpass, highpass, notch filters . . . programmable pre-set filters . . . automatic multiple notch filter eliminates heterodynes . . . adaptive noise reduction reduces noise and QRN . . . for Voice, CW, Data . . .



MFJ-784

\$219⁹⁵



MFJ's *super* DSP filter automatically eliminates heterodynes, reduces noise and interference *simultaneously* on SSB, AM, CW, packet, AMTOR, PACTOR, RTTY, SSTV, WeFAX, FAX, weak signal VHF, EME, satellite -- nearly any mode you'll ever encounter.

You get MFJ's *tunable* FIR linear phase filters that minimize ringing, prevent data errors and have "brick wall" filter response with up to 60 dB attenuation just 75 Hz away.

Only MFJ gives you *tunable* DSP filters. You can tune each lowpass, highpass, notch and bandpass filters and vary bandwidth to pinpoint and eliminate interference. The last tunable filter setting is saved -- it's ready to use when you switch back to it again.

Only MFJ gives you 6 *factory pre-set* filters and 10 *programmable pre-set* filters that you can customize. Instantly remove QRM with a turn of a switch!

You get MFJ's *automatic notch filter* that searches for and eliminates *multiple* heterodynes.

You also get MFJ's advanced *adaptive noise reduction*. It silences background noise and QRN so much SSB signals sound like a local FM repeater.

The *automatic notch filter* and *adaptive noise reduction* can be used with *all* tunable and pre-set filters.

Automatic notch filter

MFJ's *automatic* notch filter searches for and eliminates *multiple* heterodynes in *all* filter modes -- it's so fast interfering CW and RTTY signals are also eliminated.

If you leave the *automatic* notch filter on during a phone contest, you'll never be worn down by the heterodynes of tuner-uppers.

Voice signals aren't degraded. The *narrow* automatic notch is silently working in the background destroying unwanted tones when they appear.

With up to 50 dB attenuation, you'll copy stations that would otherwise be masked by heterodynes. You'll miss fewer calls and be less exhausted when the contest is over.

When you need to *selectively* remove tones -- like when you're enjoying a CW ragchew and a couple of annoying CW stations appear nearby -- you can use the *two* MFJ *tunable* notch filters to completely knock them out.

Adaptive noise reduction

Pressing the "ON" button silences background noise. Some SSB signals sound like a local repeater! It makes noisy FM and AM signals readable and works with CW, Data and other signals.

It works in all filter modes and on all types of random noise including -- white noise, impulse noise, static, ignition noise, power line noise, hiss and atmospheric noise.

The LMS algorithm gives you up to 20 dB of noise reduction depending on the type of noise. You can adjust the amount of noise reduction to prevent distorting some signals.

Reducing random noise reduces fatigue and makes QSOs more fun -- especially, when the band is full of tiring noise.

Tunable highpass/lowpass filters

For Voice and Data nothing beats MFJ's exclusive *tunable* highpass/lowpass FIR linear phase "brick wall" filters.

You can *tune* the lower cutoff frequency 200 to 2200 Hz and the upper cutoff frequency 1600 to 3400 Hz.

Signals just 75 Hz away literally disappear -- they are reduced a *thousand* times, 60 dB!

Unlike other filters, speech clarity is not reduced by envelope distortion caused by unequal time delay.

By adjusting the highpass and lowpass filters you can create *custom* filters for Voice, Data and other modes.

When signals are weak, you can improve copy by removing high and low speech frequencies. They contain little information but are full of noise that reduce readability.

On crowded HF bands, overlapping SSB signals make copying difficult. You can improve copy by slicing off some overlap with razor sharp "brick wall" responses.

You can also highpass filter out hum, pulses, rasp and other irritating low frequency noise.

Tunable bandpass filters

Narrow band signals like CW and RTTY jump out of QRM when you switch in one of MFJ's three *tunable* FIR bandpass filters.

You can *tune* the center frequency from 300 to 3400 Hz. And vary the bandwidth from 50 Hz to 680 Hz -- from super tight CW filters to wide razor-sharp Data filters.

As you narrow the bandwidth, interfering signals just drop out because, just 60 Hz away, they're down by over 50 dB.

You can use *narrower* bandwidths to fight tough QRM because these linear phase filters

don't distort signals with unequal time delays.

Even with the narrowest 50 Hz bandwidth, you'll never have a problem with ringing.

One position gives you *two* tunable filters you can use together on one signal. For example, on RTTY, tune one filter to mark, the other to space and set each bandwidth tight for an incredibly sharp RTTY filter.

16 pre-set filters -- use factory set or program your own

With a turn of a switch you can select from *sixteen* convenient *pre-set* filters. You can use them for SSB, AM, CW, packet, AMTOR, PACTOR, RTTY, SSTV, WeFAX, FAX or any other mode you can think of.

If you don't like our *pre-set* filters, you can define your own filter by programming bandpass center frequency and bandwidth, lowpass and highpass cutoffs. *An MFJ exclusive!*

Only MFJ gives you the best of both worlds -- *tunable* filters to eliminate nearly any QRM and fast convenient *pre-set* filters customized for any mode.

Plus more . . .

A push-button quickly bypasses your filter so you can hear the *entire* unfiltered signal and see if anyone is calling you.

Built-in two watt amplifier. Has volume control, input level control, speaker jack, headphone jack, accessory jack, PTT line and PTT sense and line level output. 9x2 1/2x6 in.

It plugs between your transceiver or receiver and external speaker or headphones. Use 12 VDC or 110 VAC with MFJ-1315, \$14.95.

No Matter What™ guarantee

You get MFJ's famous one year No Matter What™ *unconditional* guarantee. That means we will repair or replace (at our option) your MFJ-784 *no matter what* for a full year.

Call your dealer for your best price

Automatically eliminate heterodynes, reduce noise and QRM on Voice, CW and Data. Call your favorite dealer for your *best* price and order your MFJ *super* DSP filter today!

Free MFJ Catalog

Write or call toll-free . . . 800-647-1800

Nearest Dealer/Orders: 800-647-1800
Technical Help: 800-647-TECH (8324)

• 1 year *unconditional* guarantee • 30 day money back guarantee (less s/h) on orders from MFJ • *Free* catalog

MFJ MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(601) 323-5869; 8-4:30 CST, Mon-Fri
FAX: (601) 323-6551; Add \$8 s/h

MFJ . . . making quality affordable

Prices and specifications subject to change © 1994 MFJ Enterprises, Inc.

About this time in the sunspot cycle 40 meters begins to look really good. N4PC describes the perfect antidote for the sunspot doldrums.

A DX Antenna For 40 Meters

BY PAUL CARR*, N4PC

Well, we've reached that time again. We're headed for the bottom of the eleven-year sunspot cycle, and it's becoming progressively more difficult to work DX on the higher bands. But don't give up. There's plenty of DX to work, but we need to look to the lower frequencies, and we need the right antenna for the job. Here's an antenna that requires no more room than a dipole and does not require a transmatch. It's inexpensive and produces a low-angle pattern even when mounted at or near ground level. Furthermore, it's easy to build and match. It's "The Half-Square Antenna." Believe me; it works!

A Brief History of The Half-Square Antenna

The half-square antenna was designed by Woody Smith, W6BCX, shortly after WW II. Woody had experimented with an inverted ground plane before the war, and he planned to extend the concept to two or more elements. After the war his plan became a reality. The two-element version consisted of a full-wavelength wire bent a 90-degree angle one-quarter wavelength from each end and mounted in an "upside down U" configuration. This is what we know as a half-square.

A problem arose. Before Woody could build the antenna, he had to move. He tried to interest some of his friends in building and testing the antenna. He met with rejection. The response was "nothing that simple could be any good or other people would be using it!" Well, Woody's friends were wrong.

Perhaps a more complicated design would attract attention. Thus entered a second design. This design consisted of a full-wave horizontal element with three quarter-wave vertical elements attached at half-wave intervals. This design was known as "The Bobtail Curtain," and Woody had an article on it published in the March 1948 issue of *CQ* ("Bet My Money on a Bobtail Beam"). The response was great. Reports began com-

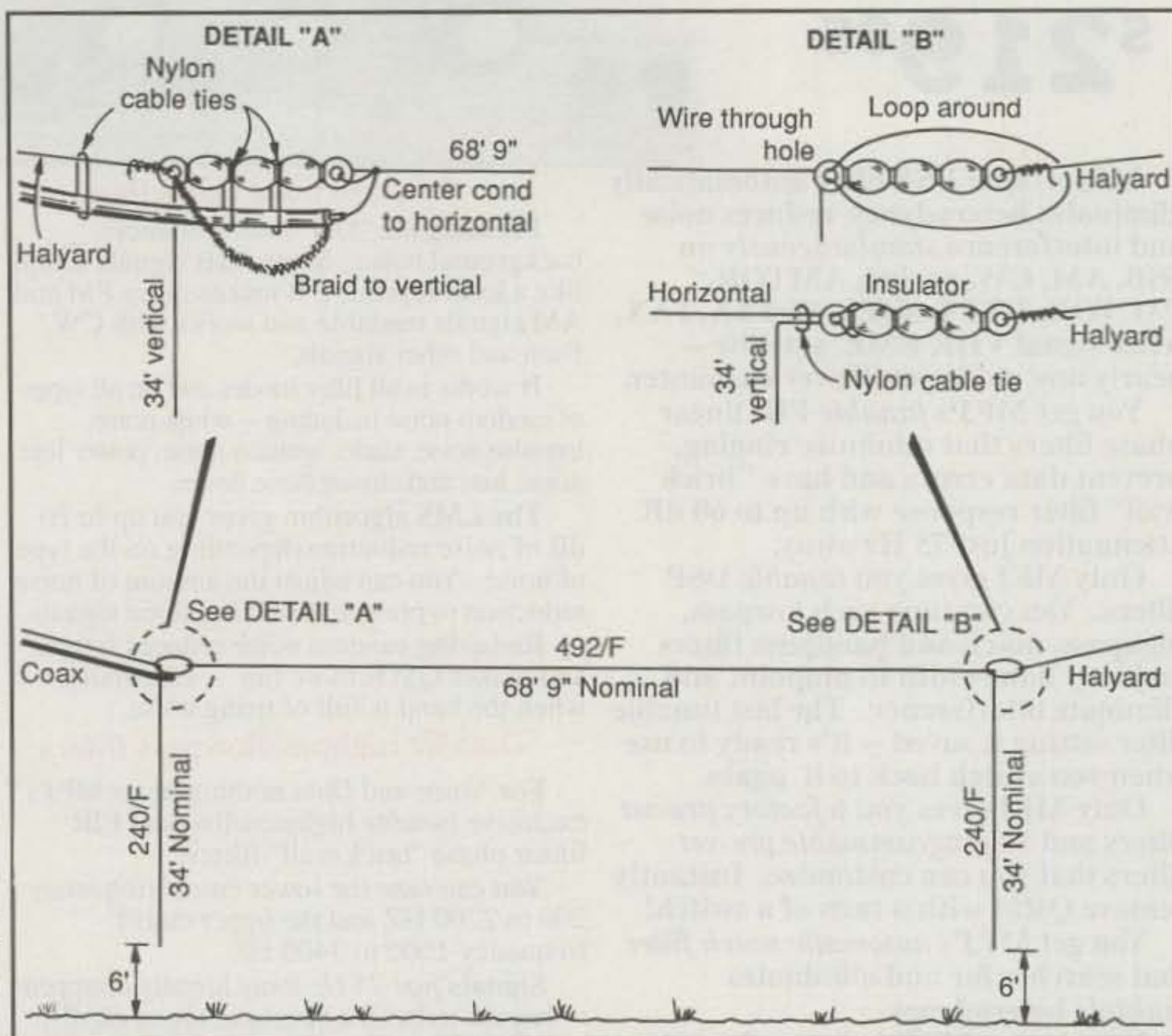


Fig. 1—Details on how to build the half-square antenna.

ing back that the antenna was a great DX performer, especially at distances of over 2500 miles. Some people reported that their antenna performed well, although they could build only two vertical elements. I'm sure Woody smiled.

I became aware of the antenna through a March 1974 article in *QST* written by Ben Vester, K3BC, and entitled "The Half-Square Antenna." Ben had been using an 80 meter Bobtail Curtain to maintain a DX schedule, and Mother Nature played a trick on him. During a storm the horizontal wire connecting one of the outside elements was broken, but he discovered that the antenna still performed very well. Ben performed extensive tests on the abbreviated antenna and reported his findings in the *QST* article.

My first Half-Square antenna was built as a comparison antenna for "The N4PC Loop" antenna (*CQ*, December 1990). I

fed the antenna at the junction of a vertical element and the horizontal phasing line with TV ribbon and matched the feed-line to the transceiver with a transmatch. I found the Half-Square to be an excellent performer, and this paved the way for a two-band version for the 12 and 17 meter bands. The article appeared in the September 1992 issue of *CQ*. Since the sunspot cycle is heading down, I think it's time for a design for 40 meters.

Design Philosophy

As I indicated before, the design is very simple. There is a half-wave horizontal section, and at each end of this section there is a quarter-wave vertical section attached. The formula to determine the length of the horizontal section is $l = 492/f$, where "f" is the frequency in MHz. If you do not have room for the full length, you

*97 West Point Road, Jacksonville, AL 36265

MFJ HF/VHF SWR Analyzer™ with RF Resistance Meter

Read your antenna SWR from 1.8-170 MHz... 10-digit LCD frequency counter... RF Resistance Meter™... smooth reduction-drive tuning... simple-to-use...



MFJ-259
\$219⁹⁵ If you work with antennas, MFJ's revolutionary new SWR Analyzer™ is the best investment you'll ever make! Now you can diagnose a wide range of antenna problems instantly with one easy-to-use instrument.

What the MFJ-259 Does
The MFJ-259 gives you a complete picture of your antenna's performance anywhere between 1.8 and 170 MHz -- you can even check SWR outside the ham bands without violating FCC rules. Set the bandswitch and tune the dial--just like your transceiver. SWR is displayed instantly!

RF Resistance Meter™
Does 2:1 SWR mean 25 ohms or 100 ohms? The new MFJ-259 tells you at a glance!

Now you can measure RF resistance up to 500 ohms at minimum SWR -- instantly -- on MFJ's exclusive side-by-side RF Resistance and SWR Meters!

Take the guesswork out of building matching networks and baluns for your antennas.

Watch the effects of spacing on radiation resistance as you adjust your antenna.

Here's What You Can Do...

Find your antenna's true resonant frequency from the shack.
Tune the antennas on your

tower and watch SWR change instantly as you make each adjustment. You'll know exactly what to do by simply watching the display.

Tune critical HF mobile antennas in seconds -- without subjecting your transceiver to high SWR.

Measure your antenna's 2:1 SWR bandwidth on a single band, or analyze multiband performance over the entire spectrum from 1.8 to 170 MHz!

Measure inductance, capacitance, resonant frequency of tuned circuits, transmission line velocity factor/impedance/loss. Test RF chokes, transformers, baluns.

Adjust your tuner for a perfect 1:1 match without creating QRM.

And this is only the beginning! The MFJ-259 is really four test instruments in one: an accurate RF signal generator, a high resolution 170 MHz frequency counter, RF Resistance Meter™ and an SWR Analyzer™.

Free Manual

MFJ comprehensive 18 page instruction manual is packed with useful applications -- all explained in simple language you can understand!

For free manual write or call MFJ.

Take It Anywhere

The MFJ-259 is fully portable, powered internally by 8 AA batteries or 110 VAC with MFJ-1312B, \$12.95. It's in a rugged all metal cabinet that's a compact 4x2½x6¾ inches. Take it to remote sites, up towers, on DX-peditions -- anywhere your antennas are located.

For rough service, pick up a convenient MFJ-29, \$19.95, padded carrying pouch to keep your MFJ-259 close at hand and looking like new.

How Good is the MFJ-259?

MFJ SWR Analyzers™ work so good, many antenna manufacturers use them in their lab and on the production line -- saving thousands of dollars in instrumentation costs! Professional installer and technicians use them worldwide.

Get More by Paying Less

With the MFJ-259, you get full 1.8 to 170 MHz coverage, simple operation, instantaneous readings, a high accuracy frequency counter and MFJ's exclusive RF Resistance Meter™ -- all for a low \$219.95.

1.8-170 MHz SWR Analyzers™



MFJ-249 MFJ-249 HF/VHF SWR Analyzer™ has all the features of MFJ-259 but less RF resistance meter. Includes 1.8-170 MHz continuous coverage, 10-digit LCD frequency counter and smooth vernier tuning.



MFJ-209 MFJ-209 HF/VHF SWR Analyzer™ is same as MFJ-259 without LCD frequency counter and RF resistance meter. Has jack for external frequency counter. MFJ-249/MFJ-209 are 4x2½x6¾ inches and uses 8 AA cells or 110 VAC with MFJ-1312B, \$12.95.

Carrying Pouch



MFJ-29 Tote your MFJ-249, MFJ-259 or MFJ-209 SWR Analyzer™ anywhere with the MFJ-29 custom Carrying Pouch.

Made with a special foam-filled fabric, the MFJ-29 cushions blows, deflects scrapes, and protects knobs, meters and displays from harm.

Wear it around your waist, over your shoulder, or clip it onto the tower while you work--the fully-adjustable webbed-fabric carrying strap has snap hooks on both ends.

Protect your investment and keep your analyzer safe and looking like new!

Dip Meter Adapter



MFJ-66 Plug a dip meter coupling coil into your MFJ SWR Analyzer™ and turn it into a sensitive and accurate bandswitched dip meter.

With a dip meter you'll save time and take the guesswork out of winding coils, measuring inductance and capacitance, measuring velocity factor and electrical lengths of coax. Determine resonant frequency of tuned circuits and measure Q of coils. Set of two coils cover 1.8-170 MHz depending on your MFJ SWR Analyzer™.

Free MFJ Catalog

Write or call... 800-647-1800

10-160M SWR Analyzer™



MFJ-207 If you're an HF man, this compact MFJ-207 HF SWR Analyzer™ will help you build 10-160 Meters antennas that'll make working DX almost routine.

Just plug in your coax to find the SWR of any HF antenna on any ham band 10-160 Meters. Has jack for external frequency counter. 7½x2½x2¼ inches.

Bandswitch Dip Meter™



MFJ-203 The MFJ-203 is a sensitive Bandswitched Dip Meter™ that covers all ham bands from 160-10 Meters. There are no plug-in tuning coils to keep up with or break.

Has detachable coupling coil, dual FET oscillator, op-amp meter amplifier and jack for external frequency counter. 7½x2½x2¼ in.

2 Meter SWR Analyzer™



MFJ-208 MFJ-208 2 Meter VHF SWR Analyzer™ finds the SWR of any antenna from 138-156 MHz. Jack for external frequency counter. 7½x2½x2¼ inches.

For Commercial VHF Radio
Same as MFJ-208 but for commercial VHF. MFJ-217, \$79.95, covers 30-50 MHz and MFJ-218, \$79.95, covers 150-170 MHz.

MFJ Antenna Bridge



MFJ-204B Great for determining feedpoint resistance of antennas and for designing impedance matching networks. Measure RF resistance up to 500 ohm. Covers all ham bands 160-10 Meters. Built-in resistance bridge, null meter, tunable oscillator-driver, frequency counter jack. 7½x2½x2¼ inches. Use 9 volt battery or 110 VAC with MFJ-1312, \$12.95

440 MHz SWR Analyzer™



MFJ-219 Read SWR of any antenna 420 to 450 MHz -- just plug coax of your antenna into SO-239 connector, set frequency and read SWR. Uses microwave integrated circuits and microstrip technology. Jack for external frequency counter. 7½x2½x2¼ in. MFJ-219N, \$99.95, same as MFJ-219 but with "N" connector.

MFJ-219/218/217/208/207/203 uses 9 volt battery or 110 VAC with MFJ-1312B, \$12.95.

Nearest Dealer/Orders: 800-647-1800

Technical Help: 800-647-TECH(8324)

• 1 year unconditional guarantee • 30 day money back guarantee (less s/h) on orders from MFJ • FREE catalog

MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(601) 323-5869; 8-4:30 CST, Mon.-Fri.
FAX: (601) 323-6551; Add s/h

MFJ... making quality affordable
Prices and specifications subject to change © 1994 MFJ Enterprises, Inc.

may shorten the horizontal section and increase the length of the vertical sections. The antenna does not seem to care if the horizontal section is exactly 180 degrees long; it works just fine if you're close to that length. The formula that I use to calculate the length of the vertical sections is $l = 240/f$, where "f" is the frequency in MHz. This length is too long for resonance in most cases, but it's easier to remove wire than to add wire to achieve resonance. Now for the specific construction details.

Construction Details

Start by cutting 103.5 feet of wire for the horizontal and one vertical section. The wire can be 16 gauge or heavier, and stranded wire is a bit easier to work with. Measure about 34 feet, 3 inches from the end of the wire and fold the wire back on itself. Push the folded wire through one eye of a standard insulator, form a loop, and then loop the wire around the insulator to form a cinch knot. This technique saves a solder joint, and the wire will hold very firmly when pressure is applied. Attach the other end of the horizontal section to another insulator with a cinch knot (see fig. 1).

Cut another wire to a length of 34 feet, 3 inches. This will form the other vertical element. Route this wire through the remaining eye of the insulator and secure the wire with a cinch knot. Next connect

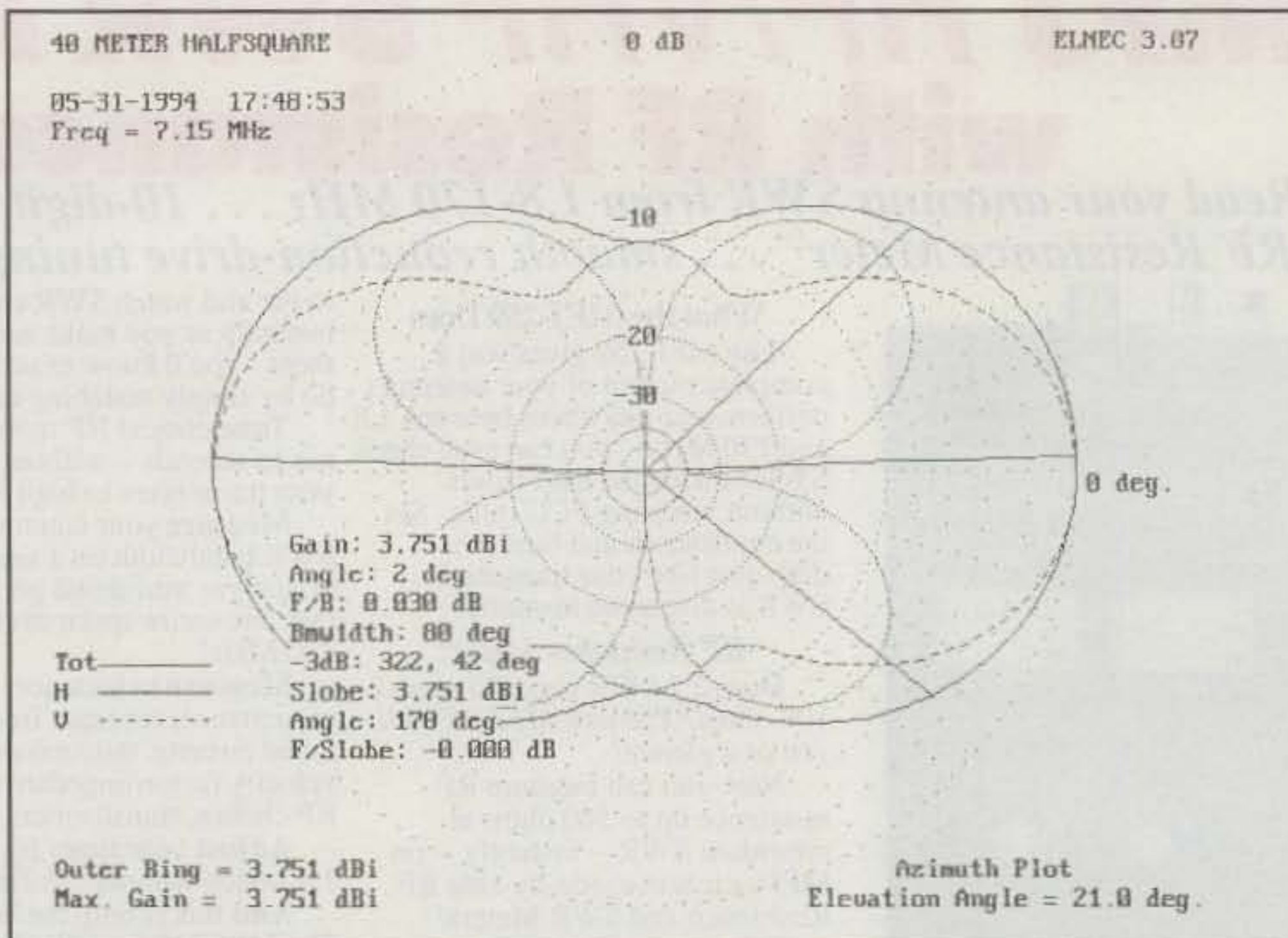


Fig. 2— The horizontal pattern for the antenna.

the coaxial feedline (I used 50 ohm) with the center conductor connected to the horizontal phasing line and the shield to the vertical element. Be sure to waterproof the end of the coax to prevent moisture from entering. Secure the coax to the insulator with nylon cable ties. Attach a

halyard to each insulator, and the antenna is ready to hoist into the air.

Place the antenna in the air by tossing the halyards over a convenient tree branch, and raise the antenna until the vertical elements are at a convenient height for trimming. Try to keep the coax

BATTERIES

BUY DIRECT FROM US, THE MANUFACTURER

MasterCharger® I & II



By simply changing adaptor cups, the MasterCharger will charge any Yaesu, Motorola, Icom, Kenwood, Alinco, etc. 2-Way Radio Battery

SPECIAL

FOR THE MONTH OF SEPTEMBER

10% OFF

REPLACEMENT BATTERIES

FOR **ICOM**

IC-W21AT, IC-W21ET

and

IC-2GXAT, IC-2GXA

NEW

7.2V @ 900mAh

7.2V @ 1500mAh

12V @ 600mAh

12V @ 850mAh

Available With And Without Microphone

Look for October's Special of the Month
Monthly Discounts Applicable to End-User's ONLY

MasterCharger® 1+1

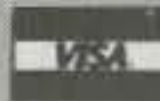
Electrically Identical to MasterCharger I



If you have two different radios you'll only need one charger to accommodate both radios. Now by simply switching the switch to the left or right, you can determine which charging cup to activate.



NYS residents add 8.5% sales tax. Add \$4.00 for postage and shipping.



Prices and specifications subject to change without notice

W & W ASSOCIATES

800 South Broadway, Hicksville, NY 11801

In U.S.A. & Canada Call Toll Free 800-221-0732

In NY State Call (516) 942-0011 • Fax (516) 942-1944

World Wide Distributorships Available, Please Inquire

MADE IN THE U.S.A.
SEND FOR FREE CATALOG AND PRICE LIST

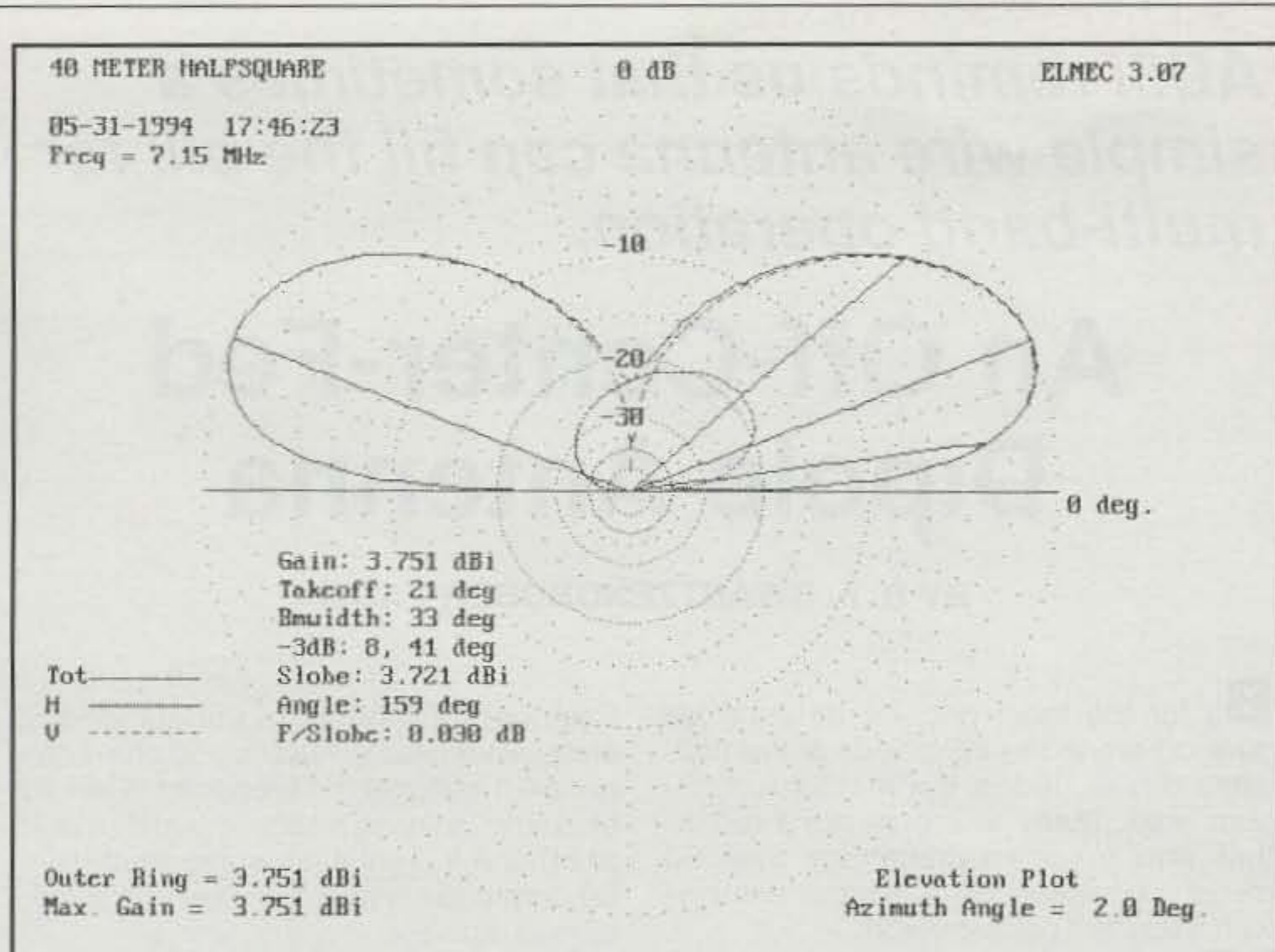


Fig. 3—The vertical pattern for the antenna.

away from the vertical element by about one-quarter wavelength. This will ensure that the coax does not adversely affect the SWR readings. (If you have room, route the coax along the halyard for the necessary distance.)

Next trim for best SWR. As I indicated earlier, the vertical elements are going to be too long in most cases, so the point of resonance will probably be slightly below the lower band limit. If you are a little shy about cutting the excess wire, just fold the wire back on itself and tape it in place with electrical tape. The amount folded back will be greater than the amount removed, and the wire on the end where the coax is attached will have more effect on changing the resonant frequency than the other vertical wire. When completed, the antenna should have an SWR of less than 1.4:1. I found a bandwidth of slightly more than 300 kHz for the 2:1 SWR points as measured with an MFJ 249 SWR analyzer. That's not bad for something that simple! So much for the construction. How about the predicted results?

Predicted Results

As can be seen in figs. 2 and 3, the vertical pattern is what you would expect from a vertically polarized antenna. The vertical angle of radiation is predicted to be 21 degrees even when the antenna is very close to the ground. (I used a height of 40 feet for the horizontal phasing line for this computer model.) The horizontal pattern is about the same as you would expect from a dipole—perpendicular to the horizontal phasing line. It's very close to the classic "bow-tie" pattern. Remember that

this will not be an omnidirectional pattern, since we have a pair of phased verticals.

On-The-Air Results

I have been very pleased with the performance. Even when using my QRP rig (the Forty Meter Fun Machine, 1.5 watts out), it is not uncommon to receive 559 to 589 reports. During one late-night operating session I heard a DU in the Philippines. With sweaty palms, I began to call him. I was not successful. I guess that was a bit too much for the antenna and a QRP rig. However, after 38 years of operating, I welcome any experience that makes my palms sweat.

Afterthoughts

I would be remiss if I did not include a bit about safety precautions. Never place an antenna over a power wire. Furthermore, try to place your antenna so that a power wire would not touch the antenna should the power wire fall. If you place the antenna close to the ground, be sure to take precautions so that animals or pedestrians cannot touch the end of the antenna. Remember, the end of the antenna is a high impedance, and very high voltages can be developed even when operating at low power levels.

If you would like to build the antenna but you are at a loss for a source of materials, Antennas West sells these antennas (see their ads in CQ.)

If you have questions that I have not answered in this article, give me a call. My phone number is 205-435-3642.

Put a little spice back in your life: try DX on 40 meters. You won't be sorry. ■

SWR/POWER METER



- Shows PEP instantly.
- Shows SWR while you talk!
- No "Cal" control. It's automatic.
- Remote sensor.

If you've been looking at slow moving panel meters or squinting at crossed needles, see when an improvement an instant display makes.

This new meter shows power and SWR on two light bars with 3% resolution. Three power ranges: 20, 200, 2000 watts. 1.7-30 MHz. Compact size, bright display makes tuning up a breeze.

Model M-840 SWR/Power Meter \$199.95
+ \$6 to ship U.S./Canada. For 12v DC.
Model PS-95 AC Adapter \$15.
Sales tax in Calif.

TOROID CORES



Palomar stocks a wide variety of cores and beads. Iron powder and ferrite. For winding coils and for RFI suppression.

Our RFI Tip Sheet is free on request. Tells how to use ferrites to suppress interference from computers, TNC's, transmitters.

Our RFI kit keeps RF out of your telephones, TVs, stereo, etc. **Model RFI-3 \$18** + \$6 to ship U.S./Canada. Tax in California.



Send for **FREE** catalog that shows our complete line: Toroids, Ferrite & Iron Powder Kits, SWR Meter, Digital Readouts, Baluns, Keys, Keyers and more.

PALOMAR ENGINEERS

Box 462222, ESCONDIDO, CA 92046
Phone: (619) 747-3343
FAX: (619) 747-3346

GORDON WEST RADIO SCHOOL

Prefix 0-823

08731X No Code Tech. \$49.95

Includes 2 novice theory tapes, 2 technical theory tapes, 1 textbook, the latest FCC Rulebook, and frequency and band charts.

087328 21-Day Novice \$39.95

Includes 2 code tapes, 2 theory tapes, 1 sample 5 wpm Novice code test, 1 textbook, and the latest FCC Rulebook.

087301 Novice Code \$39.95

Includes 6 tapes that make it easy to learn the code from scratch. Covers FCC Element 1A.

087336 2-Week Tech. \$34.95

Includes 2 theory tapes, 1 question-and-answer textbook, and the FCC Rulebook. Covers FCC Element 3A.

087360 Complete Gen. \$69.95

Includes 6 code tapes (5 to 13 wpm), 2 theory tapes, 1 textbook, and the FCC Rulebook. Ideal for upgrade from Technician to General.

087352 General Code \$39.95

Includes 6 tapes (5 to 13 wpm). Covers FCC Element 1B.

087344 General Theory \$34.95

Includes a fully illustrated textbook with 2 theory tapes to cover FCC element 3B. Also includes the FCC Rulebook.

087379 Adv. Theory \$44.95

Includes 4 theory tapes, 1 illustrated textbook, and the FCC Rulebook. Covers FCC Element 4A.

087409 Complete Extra \$69.95

Includes 4 theory tapes, 6 code tapes (13 to 22 wpm) 1 textbook, and the FCC Rulebook. Covers FCC Elements 1C and 4B.

087387 Extra Theory \$44.95

Includes 4 theory tapes, 1 illustrated textbook, and the FCC Rulebook. Covers FCC Element 4B.

087395 Extra Code \$44.95

Includes 6 tapes (13 to 22 wpm) for the Extra code exam. Covers FCC Element 1C.

Please send me the items that I have indicated above. I have enclosed my check/money order for \$
(Please add sales tax in CA, DC, IL, MA, NJ, NY, OH, PA, TN, VA & Canada, and \$3.00 for postage and handling for U.S. shipments and \$7.00 for all shipments outside the U.S.)

Or call and charge on your credit card. American Express, MasterCard and Visa accepted. Please be sure to include shipping instructions. Prepayment required and must be in U.S. funds.

DRAU 1093

RADIO AMATEUR callbook

P.O. Box 2013 Lakewood, NJ 08701
1-908-905-2961 (Phone) 1-908-363-0338 (Fax)

AD5I reminds us that sometimes a simple wire antenna can fill the bill for multi-band operation.

An Off-Center-Fed Dipole Antenna

BY R. F. SWARTZENDRUBER*, AD5I

By far the most popular antenna for newcomers to the HF bands is the half-wave dipole, fed in the middle with 50 ohm coax. Many amateurs don't realize that with minor modifications their 80 meter dipole can be a 4-band antenna with excellent performance.

My first Novice antenna, 30-some years ago, was an off-center-fed 80 meter half-wavelength dipole. Strung from the peak of the house to the tallest tree in the yard, it gave excellent performance on both 80 and 40 meters. After upgrading to General, it served me well on 20 and 10 meters also.

Everything has a price, and the price for four bands instead of one is a 300 ohm feedpoint. At the center of a half-wave dipole the feedpoint impedance is about 75 ohms. The impedance goes up as you move either way from the center and is around 4000 ohms at the ends. Since 300 is between 75 and 4000, it's logical to assume that a 300 ohm impedance point occurs somewhere each side of center in a half-wave dipole. It does, and that point is about a third of the way in from either end. Actually, it's about 0.3375, not one third, but measuring 136 feet of wire with that kind of accuracy is difficult.

How does it work on 40 meters? A half-wave on 80 is a full wave on 40, so it's now two half-waves long. Each half-wave has two 300 ohm points, one of which conveniently matches the 80 meter feedpoint. On 10 and 20 meters there are also multiple 300 ohm points, one of which matches the 80 meter feedpoint. On 15 meters the feedpoint falls on an impedance peak, and the antenna will not perform satisfactorily. Four out of five bands is still a lot better than just one.

What's to be done with this 300 ohm feedpoint? Use 300 ohm twinlead. The recent two-part series on balanced feedlines by Fred Bonavita, W5QJM (Jan. and Feb. 1994 CQ) does an excellent job of explaining how to use balanced feedlines and describes their advantages, not the least of which are lower cost and less loss. At the transmitter end of the feedline a simple antenna tuner can transform the

balanced 300 ohms to unbalanced 50 ohms. If you really must use 50 ohm coax, put a 6:1 balun at the feedpoint. A 4:1 will also work, leaving a slight mismatch of 75 to 50 ohms. That's no worse than using 50 ohm coax and a 1:1 balun on a center-fed dipole.

What does it take to build one of these antennas? About 140 feet of wire and three insulators. Remember the formula for the length of a half-wave? In free space it's 492/frequency in MHz. In the real world it's shortened about 5% to 468/frequency in MHz. Start with about 140 feet and plan to trim it to length. It is easier to shorten a dipole than it is to lengthen it, so start long. Cut the wire one third of the way from one end. If two people are available, it's probably easier to physically fold the wire into thirds than to measure it accurately. Install an insulator at the feedpoint, connect the 300 ohm feedline or a balun, and put an insulator at each end. At this point it's installed like any other dipole. Since the feedpoint is off-center, orient the antenna to minimize the length of feedline required.

Check the SWR on all four bands and trim as required. To shorten the antenna by a foot, take 4 inches off the short side and 8 inches off the long side. Keep the feedpoint at one-third the length of the antenna.

On 80 meters the pattern will be the same as a center-fed dipole, peaking 90 degrees off each side in a "figure 8" pattern. As the frequency increases, the pattern moves towards the ends, with the peaks on 10 meters about 30 degrees off each side at each end. As with any dipole, the peaks and nulls aren't all that pronounced.

If an 80 meter antenna isn't needed, or space won't allow one, the same design can be used for 40, 20, and 10 meters. It still won't work on 15. Start with about 68 feet of wire, feed it one-third of the way in from one end, and trim to length by checking the SWR on all three bands.

Although the off-center-fed dipole has been around for at least 40 years, it still offers a lot to the newcomer. It's an efficient, low-cost antenna with excellent performance on four bands. ■

* 1016 Kirnwood Dr., Plano, TX 75075

Striking News

From PolyPhaser
May 1994

(800) 325-7170

Volume 3, Number 2

New Earth Radiation Belt Has Interstellar Matter

NASA's Solar Anomalous and Magnetospheric Particle Explorer (SAMPEX) has confirmed the location of a new belt around the Earth that is composed of different particles from the Earth's Van Allen belts. Within the inner (lower) Van Allen belt which is mostly composed of protons, the SAMPEX shows a belt of cosmic

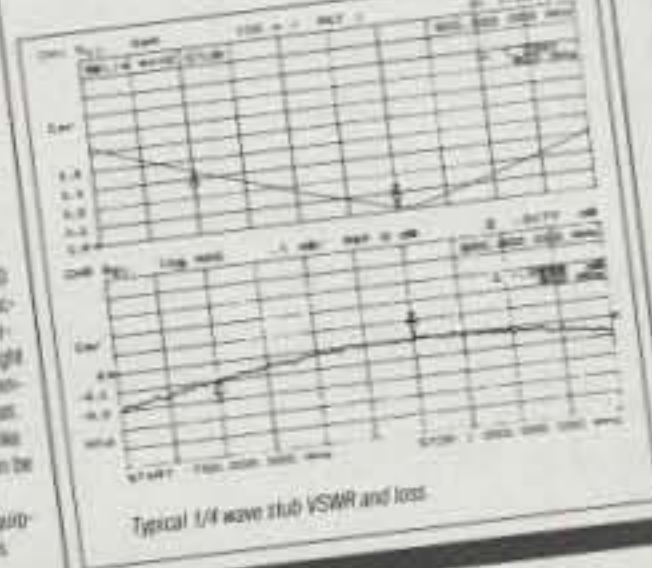
ray nuclei composed of so-called anomalous cosmic rays. These rays are the result of solar wind interacting with interstellar atomic nuclei. At roughly 6000 km elevation, at the equator, the start of the nuclei detection. The density increases with the falling of sunspot activity. The greatest density was above 6000 km over

the South Atlantic anomaly. This is where the Earth's tilted magnetic field brings the belts closest to the surface. This is also where there is a high incidence of lightning. This find may lead to a further understanding of the Earth's upper atmosphere which affects our lightning and weather patterns.

Why dc Continuity Protectors, Like Simple Gas Tubes and 1/4 Wave Stubs, Don't Work

The dc type gas tube protector covers a large bandwidth, from dc to 100 Hz (higher is possible). Few need this bandwidth, the military being the exception. Since lightning has most of its energy in the low frequency range below 1 MHz, the equipment connected to such a protector will have to endure the peak voltage prior to the gas tube's firing as well as the tube's arcing voltage for the duration of the strike. First, if the connected equipment has a dc path to ground, the gas tube will never fire. Typically receivers and cavities are a few of the kinds of equipment with dc paths across their inputs. In the case of receivers, the short to ground is a static drain inductor. The incoming surge will follow the dc path to ground. The equipment will have the strike energy delivered to its chassis or shell. The only way to get the gas tube to fire is to have a very fast (nanosecond) voltage waveform or a very large current (E=I, dV/dt). The (nanosecond) voltage waveform is an event which the coil will be unable to respond to. Once the coil opens, the current will become a very likely not survive. Once the coil opens, the current will become a very high voltage pulse through gaps and other components. Even if the gas tube could fire, the arcing voltage would be from 10 to as high as 30 kV. This would be present across the equipment input for 50 microseconds to 500 milliseconds or longer. This is like connecting some battery cells across the equipment's input. In the cavity case, the equipment cannot be able to handle the current. However, the fact that the surge current enters the equipment means could cause other equipment damage or upset. The goal of lightning protection is for you to be in control of the strike current. By spreading the strike's charge into the earth, the energy can be lowered to survivable levels. In order to do this, the charge must be spread away from the equipment and prevented from entering the equipment. This cannot be done with a protector which, by design, stands

strike energy with the equipment. By taking a conventional 1/4 wave section of coax line and shorting the center conductor to shield, a 1/4 wave stub can be made. Since the stub section has a high impedance at the cut frequency, it may be used with a fee connector as a short across the transmission line. The lower frequencies of lightning are attenuated. Like an antenna, the stub is a



Do You Know...



- ▶ 1/4λ stub protectors ring with lightning energy?
- ▶ which material shields lightning's H field?
- ▶ dc continuity RF protectors don't work?
- ▶ why single point grounding works best?
- ▶ about latent equipment damage?

FREE - join 25,000+ readers and learn from *The Leader in Lightning & Grounding Solutions*

PolyPhaser CORPORATION

(702) 782-2511 ■ FAX: (702) 782-4476 ■ 2225 Park Place ■ P.O. Box 9000 ■ Minden, NV 89423-9000

CIRCLE 62 ON READER SERVICE CARD

CAPMAN™

Computer Assisted Prediction Manager

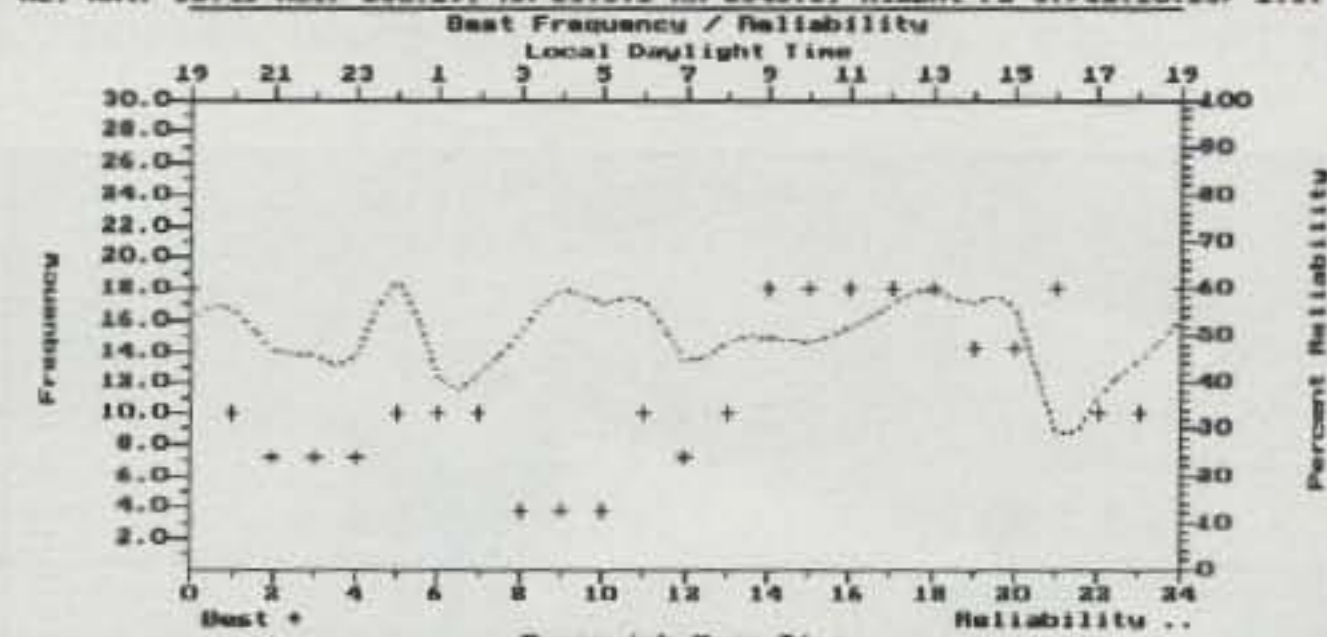
Optimize your HF operation!

Know the best times and bands for skeds or DX.
Evaluate station changes before making them.

Will a bigger amp do the job? What about changing the antenna?

CAPMAN provides answers in a user friendly menu driven skywave analysis package with context-sensitive help & color graphics

SEP 1994 - Averillo, TN Albany, USA NY - ISSN: 37 Flux: 92 K: 1
POWER = .100 MW, 3 MHz NOISE = -148.0 DBM, REQ. SWR = 43.0
Rx: Mstr 62.43 Rcur 240.25, MH 1375.1 KH 2546.5, Midnt F2 Ir/3a:10.13/ 1.37



Select Parameter by Number, Band by Letter or press (Q) to Quit
(1) SWR, (2) Reliability, (3) Mstr take-off angle, (4) Mstr Ant Gain
(5) Rcur Ant Gain, (6) S-Meter, (7) dB Microvolt, (8) dBu, (9) Best
(A) MUF, (B) 2.0 MHz, (C) 3.8 MHz, (D) 7.2 MHz, (E) 10.1 MHz, (F) 14.3 MHz
(G) 18.1 MHz (H) 21.2 MHz (I) 24.9 MHz (J) 28.5 MHz (K) 29.6 MHz
Select Output by Function key
(F1) SEP 27 (F2) OCT 25 (F3) NOV 24 (F4) DEC 23 (F5) JAN 21 (F6) FEB 20
(F7) MAR 27 (F8) APR 26 (F9) MAY 24 (F10) JUN 23 (F11) JUL 21 (F12) AUG 20

- ◆ Quick one-step forecast analysis.
- ◆ Customize ALL parameters.
- ◆ Display and print output graphically.
- ◆ Use Flux/SSN & optional K-index.
- ◆ Use MiniNec/EINec output for custom antennas.
- ◆ Calculate 22 Skywave parameters.
- ◆ MUF, FOT, SN, Reliability, angles of take-off & arrival, S-units, more using Es, E, F1, F2-layers.
- ◆ IONCAP[®] used by governments and broadcasters worldwide.
- ◆ Requires 80386 or above.
- ◆ Package \$89, outside USA +\$3.50

LUCAS Radio/Kangaroo Tabor Software
2900 Valmont Rd, Suite H, Boulder, CO 80301
303-494-4647 (494-0937 Fax) CIS 70511.2570

VISA MASTERCARD CHECK MONEY ORDER

C-3 Classic 3-band

20-15-10 (&17/12) Mtrs

Single Coax Feed

No Traps



Available at all 12 HAM RADIO OUTLET stores and TEXAS TOWERS. List is \$449. Call these fine dealers for your introductory price!

Force 12

Antennas and Systems

Call for Summer '94 brochure at (408) 988-2766 or (800) 248-1985, FAX (408) 988-2767. Custom also available. Contact Tom Schiller, N6BT.

Why imagine the ultimate when you can have it?

FORCE 12, part of BUY U.S.A., Inc.

3350 Scott Blvd, Bldg 6102, Santa Clara, CA 95054

CIRCLE 120 ON READER SERVICE CARD

NEWS OF CERTIFICATE AND AWARD COLLECTING

This month CQ salutes USA-CA County Hunter:

Paul W. Lindvall, WD9EJK
USA-CA All Counties #812
September 8, 1993

Paul is a member of the ARRL, MARAC (the Mobile Amateur Radio Awards Club), and the Stephenson County (Illinois) Repeater Association. He also has earned the ARRL's WAS 10 Meter SSB Award, MARAC's Cliff Corne, Jr. Award, the K9EAB Memorial Award, and N9DEH's "BIG RIG" Award. Paul tells his story.

"My interest in amateur radio began at age 30. After struggling with the code, I received my Novice Call, WD9EJK, in 1977. My amateur radio activities remained almost dormant until December 1985, when I took and passed my Technician test. I enjoyed 2 meters and especially SSB. With a modest station and a homebrew 2 meter beam, I even made a contact into Beaumont, Texas. CW continued to be a stumbling block. By February 1987 I had received my Advanced ticket after several failed attempts at 13 WPM.

"My wife, Susan, and my daughter, Jenna, are not hams. They tolerate my county hunting habits most of the time, but if invisible mobile antennas and no static speakers become available and are inexpensive, I'm sure I'll receive them in my Christmas stocking.

"On September 3, 1989 I heard Paula Batema, N8EMV, and Steve Batema, AK8A, were mobile on 40 meters in northern Missouri with Carl Durnavich, KF9FU, as net control. My addiction to county hunting started that day. With the purchase of a used TS-430S in May 1991, putting out counties became a big part of my amateur radio activities. Going mobile to give out contacts is still the most enjoyable part of county hunting for me.

"Most of my mobile trips have been uneventful, other than the turned heads and wide-eyed stares of those seeing multiple Hustler antennas for the first time, or the occasional comment such as, 'Do you have a TV in there?' or 'How far can you talk?' Even one of my non-ham friends kidded me, saying that my antennas make my car look like a 'back to the future' time machine. Jenna and her friends have nicknamed my car 'The Dork Mobile.'

"County hunters are always looking for that hard-to-get-into, seldom-run county

Box 76, Pleasant Mount, PA 18453-0076

SPECIAL HONOR ROLL

Tessy V. Nobre, PS8YL
 USA-CA All Counties #839
 June 12, 1994

HONOR ROLL

500		1000	
JH1AGU	2768	KB5UNX	2774
NU5V	2769	N2TPH	2775
SV3AGO	2770	9A2WV	2776
HA5DA	2771		
JA7DOT	2772	N2TPH	1321
W3DHN	2773		

The total number of counties for credit for the United States of America Counties Award is 3076. The basic award fee for subscribers is \$4.00. For nonsubscribers it is \$10.00. Initial application must be submitted in the USA-CA Record Book, which may be obtained from CQ Magazine, 76 North Broadway, Hicksville, NY 11801 USA for \$2.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 15, 1991. A complete copy of the rules may be obtained by sending an SASE to Norm Van Raay, WA3RTY, USA-CA Award Manager, Box 76, Pleasant Mount, PA 18453-0076 USA. DX stations must include extra postage for airmail reply.

line. While getting into position to put out the county line of Henderson/Warren, Illinois on a gravel road, I started to back onto the shoulder and suddenly dropped both right-side tires into a washed out rut hidden by tall grass. From an angle that seemed to be 45 degrees, I completed my county line contacts. After a quarter mile walk and a friendly tow from a farmer with tractor and log chain, my trip continued with only a 45-minute delay.

"My brother Jim, WD9EJN, surprised me for our mobile trip to Dayton, Ohio in 1993 by modifying his car for my county hunting habit. Jim removed the front bench seat, installed a bucket seat for driving, installed a tabletop in the front passenger seat, and mounted his mobile HF rig to operate from the driver's seat. He created a place for my HF rig to operate from the back seat, and mounted two separate Hustler 10-15-20-140 meter antenna systems. My mobile operating position was as good as or better than some fixed station setups I've had. Jim drove, monitored 40 meters while I was on 20 meters, and monitored 20 while I was on 40 meters. In many small towns on our way to Dayton through Illinois, Indiana, and Ohio, people shook their heads as I put out counties from my back-seat desk operating position.

"For all those working toward USA-CA, that long-awaited contact for 'the whole

ball of wax' came for me on June 26, 1993. L. T. Fortune, Jr., KF4FP, gave me a contact from Prince Edward County, Virginia for my 3076th county. Meeting and making on-the-air friends through county hunting keeps the hobby fun and entertaining. Wherever I travel, I can always count on people who hang out on 14.336.

"Family, work, softball, golf, church activities, and Gideons International occupy the rest of my time. For now county hunting gatherings have been limited to the Dayton Hamvention. See you on the radio.—73, Paul, WD9EJK"

Awards Issued

PS8YL Second Brazilian YL to achieve USA-CA. While attending the 25th annual meeting of the Mobile Amateur Radio Awards Club in Springfield, Missouri, I



Paul W. Lindvall, WD9EJK, USA-CA All Counties #812.

had the honor of personally presenting Tessy Nobre, PS8YL, with her plaque, signifying her completion of the requirements for USA-CA #839, June 12, 1994. Tessy, her husband, and her daughter were the guests of Bill Baxter, N7OTR. Tessy is a lovely and gracious lady, and it was certainly a pleasure meeting her. Tessy now holds USA-CA 3000 #863, and USA-CA #839, both dated 6-12-94.

W0DFK was also present and received his award USA-CA #837 (his award was acknowledged in last month's column).

The following USA-CA endorsements have been given:

Mitch Clemons, W4RKV, USA-CA #501 (11-08-85) brought his cards and documentation to Springfield, Missouri. I reviewed them and am happy to announce that he has completed the requirements for a CW endorsement for contacting all 3076 counties on CW. Congratulations, Mitch.

J. H. Kahrs, K2UVG, USA-CA #285 (6-13-80) also submitted his documentation for a Mobile to Mobile endorsement.

Ida Voss, N2TPH, submitted documentation for USA-CA 500 #2775 and USA-CA 1000 #1321. Ida is one of our newest county hunters. She is 77 years old and the mother of Bob Voss, N4CD.

Basic (USA-CA 500) certificates have been issued to the following amateurs. Congratulations to all.

Toshiki Aoki, JH1AGU, USA-CA 500 #2768.

Mike Hopkins, NU5V, USA-CA 500 #2769.

Evgnosia Tigaraki, SV3AGO, USA-CA 500 #2770.

Szucs Istvan, HA5DA, USA-CA 500 #2771.

Eietsu Nitani, JA7DOT, USA-CA 500 #2772.

William D. Shislet, Sr., W3DHN, USA-CA 500 #2773.

Morrie C. Pickler, KB5UNX, USA-CA 500 #2774.

Ida Voss, N2TPH, USA-CA 500 #1775.

Vladimir Pavlica, 9A2WV, USA-CA 500 #2776.

Award News

Ionian Islands Award. The amateurs of the Ionian Islands announce that the Ionian Islands Award will be available to operators of amateur radio stations and shortwave listeners who have worked or heard a total of three different amateur stations on any amateur frequency and mode, including satellites from the Ionian Islands region. The region consists of the islands of Kerkyra (Corfu), Paxi, Leucas, Ithaca, Kephallonia, Caringo, and Zakynthos (Zante) as they appear in the *International Callbook*.

Contacts must be from 1985 on. Submit a list of contacts or reports from the log



KENWOOD



TS-50



TS-450SAT

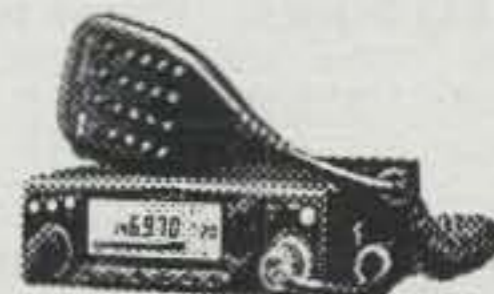


TM-742A

TH-79A
NEW!!!



TS-850SAT



TM-241A

**CALL OR WRITE FOR OUR FREE
KENWOOD PRODUCTS CATALOG.**

VISA • MASTERCARD • DISCOVER • AMEX

CIRCLE 51 ON READER SERVICE CARD

**Save Your Copies Of
CQ Magazine
Order Your Binders
Today! Call Jesse
Jones Industries.
Call Toll FREE 7
days, 24 hours
1-800-825-6690**



**DURABLE
ALUMINUM TOWER
KITS**

**Satin-Finish Anodized Aluminum
Tower Packages include:**

Concrete Footing Section	Hazer Kit
Convenient Hinged Base	10' x 2" Mast
Kevlar guy wire, Caps/Clips	Thrust Bearing
Turnbuckles & Earth Screws	Ground Rod Kit

All you add is concrete, a rotator, and your antennas!

M13-30 Foot \$1440	M18-30 Foot \$1660
M13-40 Foot \$1645	M18-40 Foot \$1915
M13-50 Foot \$1855	M18-50 Foot \$2160

Route 3, Box 322, Boonville, MO 65233
FAX 816-882-2734

Telephone 816-882-2734



**Now you can
do something
about
the weather**

Our ULTIMETER® II Weather Station protects your equipment, gives you up-to-the-second data to transmit on SKYWARN and A.R.E.S. networks.

Tells you when high winds threaten so you can crank down your tower and safeguard other equipment. You get over 20 weather functions:

- Wind Speed and Direction (40 ft. cable)
- Temperature (25 ft. cable)
- Chill Factor
- Alarms • Highs/ lows/ times/ dates • Metric/ English • Optional self-emptying rain gauge • 30-day money back guarantee • One-year warranty

HOME WEATHER STATION Only \$179.00

Add a Second Keyboard/Display Unit...Only \$69.00

NEW! Add our PC DATA LOGGER Only \$69.00

Del. in US, add \$8.25 shipping & insurance. NJ res. add 6% tax.

For information or to order with VISA/MC:
TOLL-FREE 1-800-USA-PEET (872-7338)
FAX orders: 908-517-0669

Or send check, m.o. or credit card no. and exp. date to:

PEET BROS. COMPANY 601-410C Woodland Rd.,
W. Allenhurst NJ 07711
Free Brochure Our 18th Year ©1993 Peet Bros. Co.

CIRCLE 87 ON READER SERVICE CARD

New Items Are Here!
COLLINS PARTS.....

Manual Sale: Brand New, Latest Edition!!

KWM-2/A - \$45 • 51S-1 - \$35 • 30S-1 - \$29 • 32S-3 or 32S-1 - \$24 • 30L-1 - \$24
75S-1, 75S-3/A or 75S-3B/C - \$29 • 516F-2 - \$19 • 312B-4/5 - \$25

Speaker: Replace original 5-ohm or KWM-2, 412, 5" x 7" with new, **BETTER SOUNDING** version. \$24ea.
Bristol Wrench Set: Complete set of 9 Bristol Spline wrenches for Collins. \$29.95
Crystals: Standard operating frequencies, 3-30 MHz, HC-6 holder \$ 9ea. \$/58
TR Relay for KWM-2/A, 32S- & 30L-1: Authentic relay for Collins Equipment \$54ea.
Extension Spacers: Tapered aluminum, black anodized, front extensions \$ 8ea.
Panel Meters: New Meters for most all Collins equipment. \$85ea.
Point: (12 oz. spray) Primer-Tie Chromite, Galvanizing Ring #128 Gray, Galvan #180, Front Panel #250, St. James Gray #270, KWM-280 Galvan Earth Brown. (1/2 pt. can) KWM-380 Front Panel or Cabinet. \$10ea. w/ 1/2 5/8
Power Cords: 51S-1 - \$21.95; 75S-1 - \$12.95; 3-wire GRAY cords, 4' long - 30K-14 \$5
516F-2 HV Interconnect Replacement Cables: 4' long (standard), 1 conn. - \$38; 10' long (for remaining pwr supply), 1 connector - \$95; 10' extension w/ male-female connectors - \$107
KWM-2A Plug-in Relay Mod Kit: Covers open frame to plug-in relays, incl. instructions, relays & etc. \$179
KWM-HF-380 Conversion Kit includes A3 Filter, Oscillator/Driver, 660 RDM, and HF-380 Emblem. \$525
KWM-380 Original **HEAVY KEYPAD** This authentic reproduction is a must for any 380 owner. Perfect! \$195
140 Hz CW Filter - \$130; 360 Hz CW Filter or 1.7 KHz RTTY/SSB/Data Filter - \$28;
6 KHz AM Filter - \$38; Front Panel Lenses - \$45; PS-068 200", new, brass, original!! - \$14.

FERRITE Split Beads

Suppresses: Radio Interference, EMI Surges & Protects Against: Lightning Surges On Communication coax, data & telephone cables.



Save Big Bucks. Prices cut up to 50%

#552882031= .23" L.D. \$2.50/set (6-24) \$2.25 (25-99) \$2 (100-249) \$1.70
#264-3164351= .375" L.D. \$2.95/set (6-24) \$2.50 (25-99) \$2 (100-249) \$2
#264-3164151= .5" L.D. \$4.50/set (6-24) \$4.25 (25-99) \$4 (100-249) \$3.75
* Includes plastic snap sleeve for easy installation. * Includes tie-wraps to join halves

High Voltage
OIL CAPACITOR
88µF • 1200vdc

- Modular Capacitor System
- No-PCBs
- 10" x 3-1/2" x 4-1/2"
- Parallel or Series (below)

1pc	88µF 1.2kv	\$35ea	\$ 35
2pc	44µF 2.4kv	\$32ea	\$ 64
3pc	29µF 3.6kv	\$29ea	\$ 87
4pc	22µF 4.8kv	\$27ea	\$108
5pc	18µF 6.0kv	\$26ea	\$130
6pc	15µF 7.2kv	\$25ea	\$150

Ferrite Toroid
FT240-43, 2.4" O.D., 1.4" I.D.
43 material absorbs interferences of all types. Wrap line cords, coaxes, speaker & telephone cords through core as many times as possible.

\$12ea (4/24) \$10 (25+) \$8

VACUUM CAPACITORS & RELAYS

K41B-Jennings	SPST (n.c.)	10kv	12 amps (14 wk call)	\$ 29
RB2A-Jennings	2PDT	20kv	20 amps (115dc call)	\$219
RB3-Jennings	SPDT	12kv	30 amps (14 wk call)	\$129
RD5A-Jennings	SPST (n.open)	12kv	15 amps (14 wk call)	\$ 65
RJ2C-Jennings	SPDT	12kv	50 amps (14 wk call)	\$185
RF4B-Jennings	SPST (latching)	8kv	30 amps (14 wk call)	\$ 65
TC-25 Jennings	4 - 25pF	20kv	Vacuum Variable Cap	\$ 95
CHV1-45-5 Jennings	1.5 - 45pF	5kv	miniature size	\$ 75
UCSL-1000 Jennings	Motorized (1330vdc)	7-1000pF	3kv	\$229
CVCC-2500 Jennings	20-2500pF	6kv	w/lead screw	\$249

We have over 4,000 vacuum caps, relays and interrupters in stock. Please call for prices!

Transformers



34 v.c.t @ 14 amps or 17 vac @ 28 amps
Collins p.n. 662-0650-020
Primary: 105, 115, 125, 210, 230, 240 & 250vac,
50/60Hz. 3-3/4"W x 5"D x 4-1/2"H, 14 lbs.
Copper EMI shield. \$45 each, 4+ now \$40 each!

21F194	12.6v.c.t. @ 6 amps (1500v test) / 117vac primary	\$15
H134-UTC	6.3v.c.t. @ 10 amps / 105, 115, 210, 220vac pri.	\$22
R12A	550 v.c.t. @ 110 ma & 5v @ 2a, 6.3vac @ 5a fil.	\$35
A6523	740 v.c.t. @ 210 ma & 5v @ 2a, 6.3vac @ 6a & 6a	\$50
402835-001	16vac @ 2 amps, shielded / 120 or 240v primary	\$ 9
M40-Triad	Auto Transformer, 200VA, 230v to 115v @ 1.74a	\$18

Feed-Thru Capacitors

CK-70	22 pF 1.5 kv	\$6.00 (10+)	\$5
CK-70	100 pF 1.5 kv	\$6.00 (10+)	\$5
CK-70	1000 pF 1kv	\$5.50 (10+)	\$5
CK-70	1500 pF 1kv	\$5.50 (10+)	\$5
CK-70	.01 µF 500v	\$8.00 (5+)	\$7
2432	1000 pF 2 kv	\$7.95 (10+)	\$7
2432	1500 pF 2 kv	\$7.95 (10+)	\$7
2498	1000 pF 4 kv	\$25 each	
99JX87	1000 pF 5 kv 5 amp	\$29 each	

Plate Chokes

R33-1	1 µH 850ma	\$6
240-0879	12 µH 1a 12kv	\$4
Z-14	44µH 600ma	\$6
240-2728	50 µH 1a 2kv	\$3
R50	0.5 mH 150ma	\$8
500-1	0.5 mH 250ma	\$11
4531	1 mH 200ma	\$9
4200	1 mH 400ma	\$15
4537	2.5 mH 200ma	\$9
R1005	10 mH 125ma	\$13

B&W Airdux Coil Sale

3022	1-3/4" OD	8 t.p.i.	14 ga	5 8	(10+)	\$7
3026	2" OD	8 t.p.i.	14 ga	5 10	(10+)	\$9
3027	2" OD	10 t.p.i.	16 ga	5 10	(10+)	\$9

CATALOG 711 included with your order. Please add adequate shipping. In U.S.-48 figure 30¢ per lb. to 70 lbs. (MINIMUM CHARGE: 1st - 3lbs add \$4). Others please call, fax or write for exact shipping total. We accept Visa, MC, Amexco, checks, Cash On Delivery (UPS only, add \$5) or wire transfer.

Stop by our 6,000 ft² Showroom

1502 Jones St. • Omaha, NE 68102
402-346-4750 • fax: 402-346-2939

Surplus Sales of Nebraska

Too Busy To Learn CW?

No time to "study" CW? CW Lite is the answer. Learn code quickly, easily, effortlessly as you take a "mental vacation" once each day. Sit back, relax, and LEARN CODE while you recharge your batteries in just a few minutes. This tape uses hypnosis conditioning and subliminals to rapidly teach you the code. Much faster and easier than mere copy practice tapes. You'll be copying code with the best of them in no time at all. For those who have NOT tried and failed with the old fashioned systems. CW Lite \$15.95 ppd (+3/ two-day delivery) in US

Within 60 days after starting with CW Lite, I was able to copy 15 WPM in my head. I took my CW test and passed on the first try—N3KRE

Hypnosis tapes are not copy-practice tapes.

Order today!

GA residents add 6% sales tax
Office hours after 4:30PM Eastern

Phone: 404-640-6295
FAX: 404-640-8780

MC/VISA mail/fax orders include signature

Spider Antenna

U.S. Patents 4349825, 4460898 Made in U.S.A.

Presenting the family of Spider™ Multi-Band Antennas

Four amateur bands (10, 15, 20, and 40 meters) at your command without having to change resonators or retune - just band switch your rig. Also available are the 75, 12, 17 and 30 meter bands. Needs no antenna tuner. Custom made with highest quality workmanship and materials.

Wherever you roam, on Land or Sea . . . or even at Home



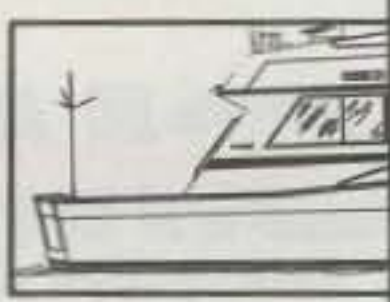
On Land

Suitable for use on any motor vehicle from a compact automobile to a motor home or trailer. Work four bands without stopping to change resonators.



Or Sea

The Spider™ Maritimer is for use on or near the ocean. Highly polished stainless steel and nickel-chrome plated brass. Commercial marine frequencies (8, 12, 16 and 22 MHz) are also available.

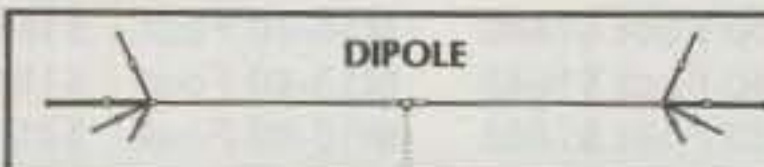


At Home

If you live in an apartment, condominium or restricted area, the Spider™ may well be the answer to your antenna problems.



DIPOLE



MULTI-BAND ANTENNAS
7131 OWENSMOUTH AVENUE, SUITE 263C
CANOGA PARK, CALIFORNIA 91303
TELEPHONE: (818) 341-5460



The Ionian Islands Award.

book. Enclose 5 IRCs or US\$ 3.00 or equivalent to cover expenses. Mail to the Award Manager, SV8ZS, Nikos Karavitis, Akrotiri Zakynthos, 291 00 Hellas.

The manager reserves the right to refuse the award to any station. In the event an award is refused, the fee will be refunded.

The Baden Diplom Award. The Baden Diplom is issued for contacts on or after July 1, 1976 with amateur radio stations in DARC district Baden. Licensed radio amateurs and SWLs are eligible for the award. The award is approved by the DARC. For complete information contact Michael Glaeser, DF3IS, Finkenweg 3, 75015 Bretten-Ruit, Germany.

Airports of the Czech Republic Award. The private training institute SOU Vodochody and Telegraphy Friends Club (TFC) sponsors this award for amateur radio contacts after January 1, 1994 with different cities where airports are located. All amateur bands including WARC count for the award, two-way CW, SSB, FM, or RTTY. European stations must contact 25 cities and DX 10 cities. VHF is available for OK/OM stations only. A special award for QRP stations will be issued.

Submit an application (GCR list) showing call, date, band, mode, and location sorted alphabetically by location to the Award Manager, Soukrome Sou Vodochody, Klubova Stanice OK1KOU, Jaroslav Formanek, 250 70 Odolena Voda, Czech Republic. For more information also contact the award manager.

On A Personal Note

May and June were traveling months for me. My trip to the Netherlands was a 20 on a scale of 1 to 10. I had a wonderful time with all the county hunters in Springfield, Missouri. The trip to Branson and the Osmond Brothers Show was very enjoyable. Barbara Mandrell was in the audience and brushed against my right arm as she left the show!

County Hunters sure can talk a lot when they get together. I think there may be some tall tales being told about the county line that got away. They are great folks to know.

73, Norm, WA3RTY

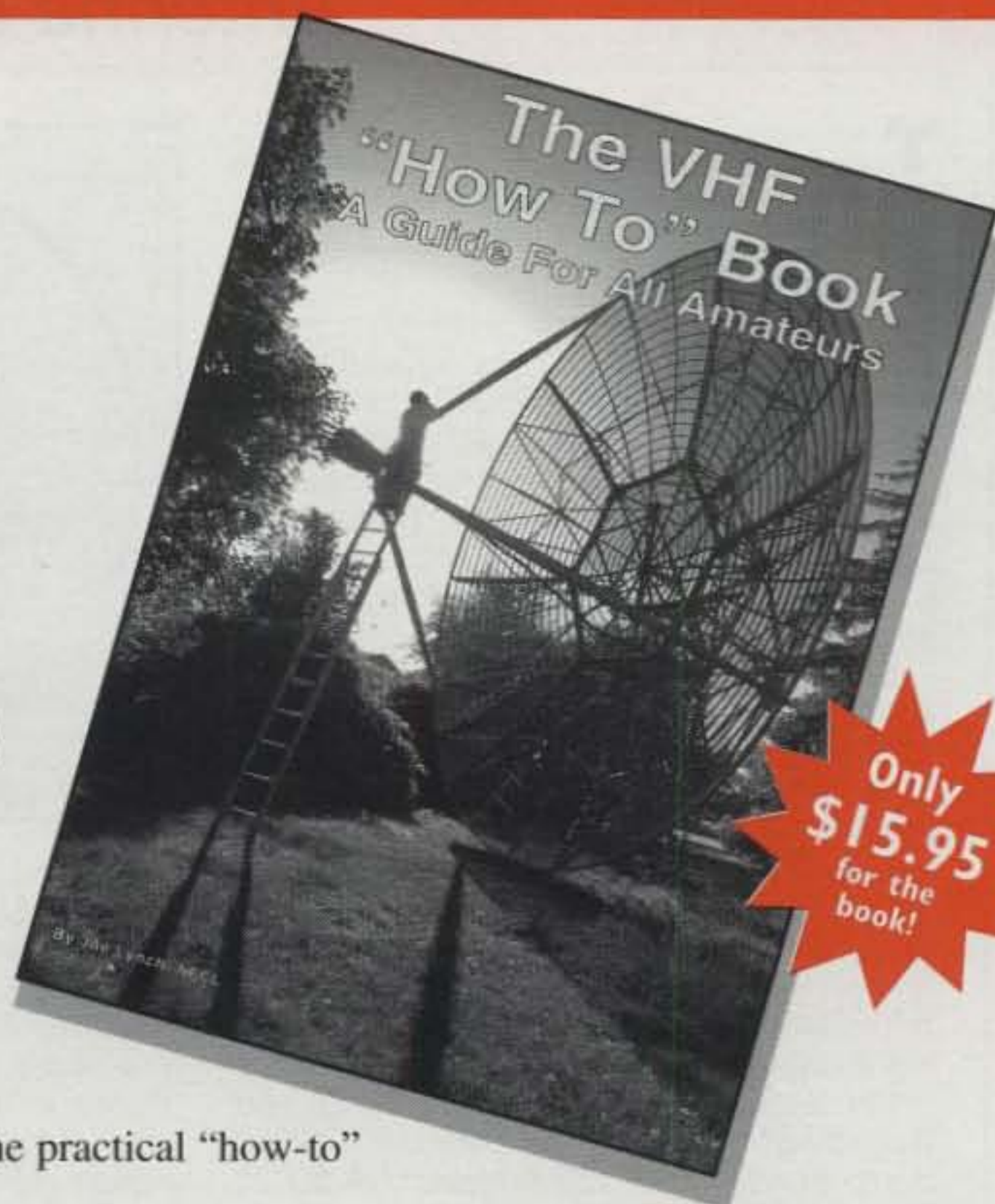
GET MORE OUT OF VHF RIGHT NOW! with CQ, of course.



Getting Started in VHF

AND

The VHF "How To" Book A Guide for All Amateurs



CQ's newest additions to our Video and Book Library bring the world of VHF to you . . .

Get in on the excitement that awaits you in the world of VHF — all with the practical "how-to" format that you've come to expect from CQ.

Send for your video
and book today —there's a whole
new world of amateur radio
awaiting you!

CQ's **Getting Started in VHF** tape offers the visual immediacy that you can only get from video. And, with **The VHF "How To" Book**, you'll have an expanded reference filled with practical advice, tables, pictures, and sources of additional information that you can't be without. Together, there's simply no better resource on VHF!

Whether you're a new Technician or have been an Extra for years, there's plenty of excitement in VHF operating. Our new VHF series can introduce you to a part of our hobby you've never experienced or show you how to have even more fun!

**FOR FASTEST SERVICE CALL OUR
ORDER DEPARTMENT AT
(800) 853-9797.**

CQ's VHF series is a fantastic addition to your club's library too!

HERE'S WHAT YOU'LL DISCOVER:

- Descriptions of VHF/UHF bands and operating activities
- How to find and use FM repeaters
- Exotic operating modes like ATV, Meteor Scatter, Aurora, Moonbounce, Satellites and more.
- Helpful operating hints
- Packet Radio basics
- Nets and emergency communications
- Propagation made easy
- VHF contesting

YES! I want to receive **Getting Started in VHF** and/or **The VHF "How To" Book**. I've filled in the information below.

- copies of **GETTING STARTED IN VHF** video at \$19.95, plus \$3.50 shipping and handling.
 copies of **THE VHF "HOW TO" BOOK** at \$15.95, plus \$4.00 shipping and handling.
 complete video and book set **ONLY \$33.95**, plus \$4.00 shipping and handling.

Name _____

Address _____

City _____

State _____

ZIP _____

Include \$7.00 for overseas shipments. Tapes also available in PAL format.

Payment: Mastercard Visa American Express
 Discover Money Order/Check
 Card # _____ Exp. Date _____

Mail orders to: CQ Communications, Inc., 76 North Broadway, Hicksville, NY 11801
 Fax (516) 681-2926. Club quantity discounts available.

ALSO AVAILABLE AT YOUR LOCAL DEALER.

ANTENNAS & ACCESSORIES

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

BY KARL T. THURBER, JR., W8FX

Antenna Notebook — Part II

This month we continue on in our notebook of antennas and related products.

Antenna Notes

Tohtsu Coaxial Relays. For several years Henry Radio has used various Tohtsu relays in its high-power VHF and UHF amplifiers. Recently Henry Radio also began to distribute the imported Tohtsu coaxial relays. These high-quality Japanese relays are available in an assortment of switching arrangements and connector types.

Several Single Pole, Double Throw (SPDT) and Double Pole, Double Throw (DPDT) 13.8 VDC relay configurations are available. These have various connectors (BNC, N, UHF, PC board mount, and coaxial leads) for frequencies as high as 1500 MHz and power levels to 1 KW PEP (600 watts DC). The relays have a switching time of less than 20 milliseconds and an insertion loss under 0.2 dB at 500 MHz. List prices range from about \$35 to \$185, depending on specific relay configuration.

For technical specifications, pricing, and availability, contact Henry Radio, Inc., 2050 South Bundy Drive, Los Angeles, CA 90025 (1-800-877-7979).

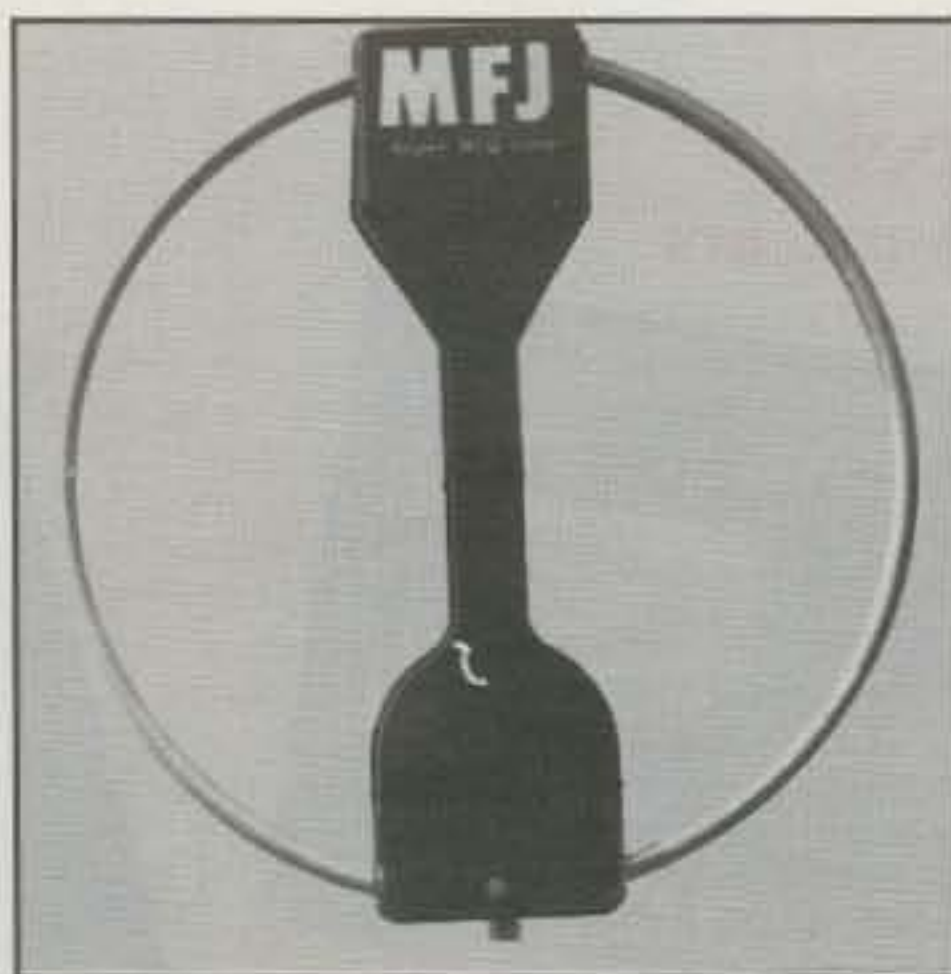
Direction Finder. Stephen A. Douglas, N6TLD, offers the Handy Finder Direction Finding (DF) Phase Detector which when connected to your receiver, operates effectively over the range 50 to 450 MHz. The unit has good potential for radio club transmitter hunting—both for fun and for jammer-catching.

The Handy Finder has two antennas. These are alternately switched online at a rate of about 1 kHz. The result is an audio tone on the received signal when there is a phase differential on the signal. The phase-modulated audio tone is the by-product of the switching action.

This phase differential occurs when one antenna receives the signal a few microseconds before the other. As the antenna is rotated to a point where both antennas are equally distant from the source, the phase differential, and thus the phase modulation, disappears. When there is no tone on the incoming signal, the DF unit is either pointed directly towards or directly away from the source.

Although assembled units are available (for \$33), the units are promoted primarily as kits at \$21; a ten-kit radio club package also is available for \$180. The kits come with comprehensive instructions and can be assembled in 30 minutes or less. All components are furnished, and the kits lack only batteries and handles.

For more information, contact Stephen A. Douglas III, N6TLD, P.O. Box 246925, Sacra-



The MFJ-1786 Super Hi-Q Loop™ Antenna is a 10–30 MHz continuous-coverage, small-space antenna. The small size and portability allow you to take the antenna with you and have it up and operating in a few minutes from practically anywhere. The antenna is only 36 inches in diameter and features an indoor, semi-automatic tuning unit with built-in cross-needle wattmeter. (Photo courtesy MFJ, Inc.)

mento, CA 95824-6925. Note that orders are sent COD only, with money order or cashiers check on delivery.

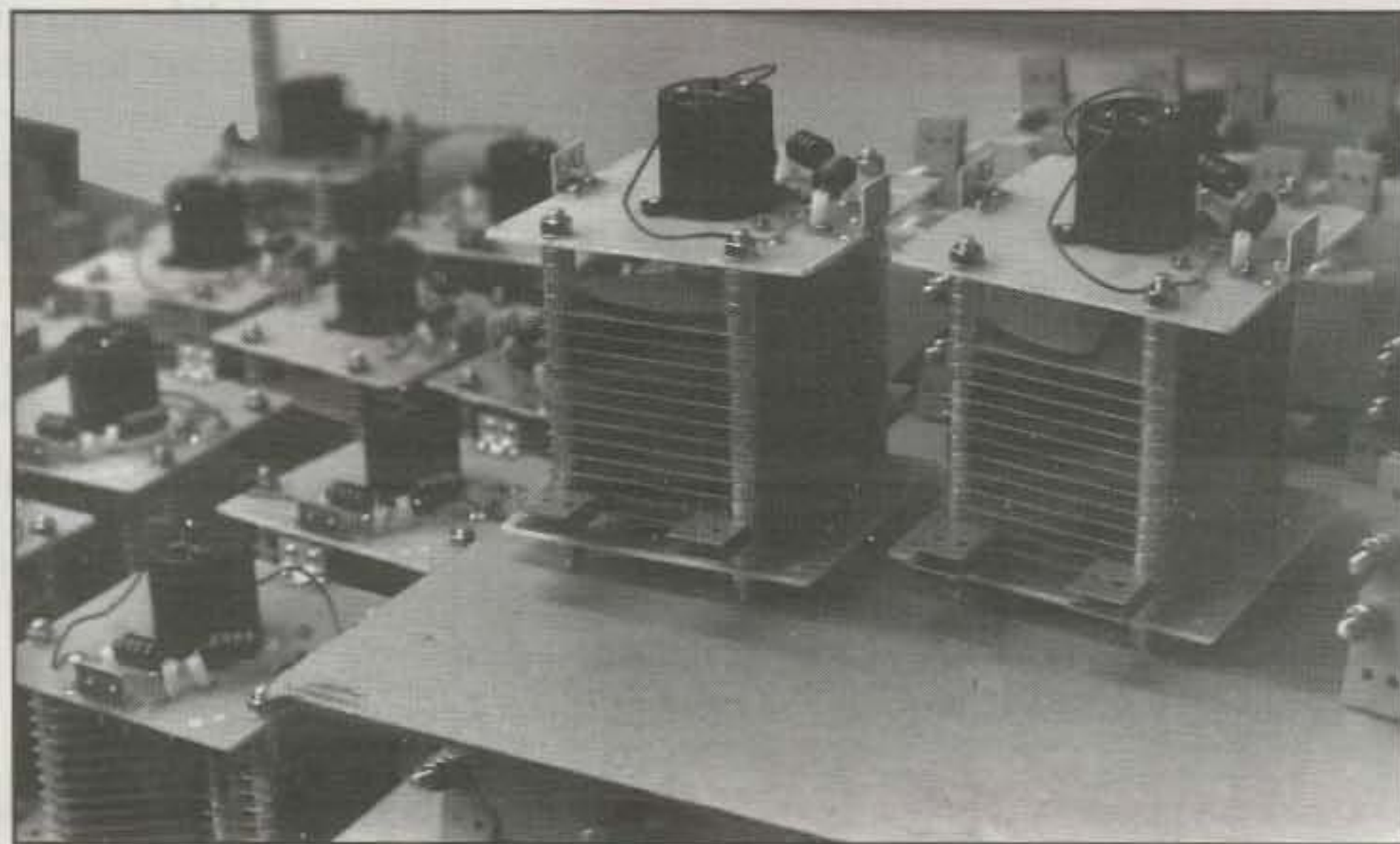
MFJ Super Hi-Q Loop Antenna. Over the past few years MFJ Enterprises has dramatically increased the range and scope of its

antenna and accessories products. The 1994 MFJ catalog confirms this expansion, with several new antenna-related products.

One of the most popular of the new antennas is the MFJ-1786 Super Hi-Q Loop™ Antenna. It is promoted as a remarkably small but high efficiency 10–30 MHz continuous-coverage, small-space HF radiator. The loop's small size and its portability allow you to take the antenna with you and have it up and operating in a few minutes from practically anywhere.

The antenna is only 36 inches in diameter and features an indoor, semiautomatic tuning unit with a built-in cross-needle wattmeter. All tuning and control voltages are coupled to the antenna through the coaxial feedline for a simple, neat, one-wire installation; a separate control cable is not required. The antenna features automatic band selection (including WARC bands), a round (rather than flat strip) radiating element, a custom butterfly capacitor, and all-welded construction. The antenna can be mounted to provide either vertical or horizontal polarization.

The loop element is the heart of the antenna. Since RF currents primarily flow near the thin, outer edges of flat conductor loops, the latter can have higher RF losses. To avoid this, the MFJ loop uses a thick-wall, large-diameter, round aluminum pipe for the radiating element. This construction results in better performance due to lower RF losses in the round pipe. Every current-carrying joint is welded to eliminate high-resistance pressure contacts that can reduce efficiency.



The MFJ-1786 Super Hi-Q Loop Antenna uses a specially designed, high-voltage, high-current butterfly capacitor featuring arc-welded construction. The low-resistance capacitor is designed to have much lower loss than conventional pressure-contact air-variable capacitors. (W8FX photo)

289 Poplar Drive, Millbrook, AL 36054

Ameritron *no tune* Solid State FET Amplifier

No tuning, no fuss, no worries -- just turn on and operate . . . Incredibly low \$1299 includes AC power supply, 600 Watts output, continuous 1.5-22 MHz coverage, instant bandswitching, no warm up, no tubes to baby, fully SWR protected, extremely quiet, very compact

- Ameritron's revolutionary ALS-600 is amateur radio's only linear amplifier that uses four rugged TMOS RF power FETs -- gives unequaled *no tune* solid state performance
- \$1299 includes Ameritron's *no tune* FET Amplifier and a 120/220 VAC, 50/60 Hz AC power supply for home operation
- Instant bandswitching, no tuning, no warm up -- just turn on and operate
- Output Power -- 600 Watts PEP, 500 Watts CW
- Continuous Coverage -- 1.5 to 22 MHz; 10/12 Meters with easy-to-install optional kit, \$29.95 plus s/h
- SWR Protection -- prevents amplifier damage if you switch to wrong band, use wrong antenna or have high SWR
- Over Power Protection -- if output forward power or reflected power exceeds safe level, output power is automatically reduced to prevent amplifier damage by controlling ALC to exciter
- Extremely quiet -- low speed, low volume fan is so quiet you'll hardly know it's there, unlike noisy blowers used in other amps
- Very Compact -- 6 x 9 1/2 x 12 inch amplifier takes up less desktop space than your transceiver and weighs about the same -- only 12 1/2 pounds
- Illuminated Cross-Needle SWR/Wattmeter -- lets you read SWR, forward and reflected *peak* power simultaneously
- Operate/Standby Switch -- lets you run "barefoot", but you can instantly switch to full power if you need it
- Front Panel ALC Control -- exclusive Ameritron feature -- convenient front panel control lets you adjust your output power
- Transmit, ALC, SWR LED indicators -- keeps you informed
- 12 VDC output jack -- lets you power low current accessories
- Separate ALS-600PS power supply (included) can be placed conveniently out of the way and plugged into your nearest 120 VAC outlet -- no special wiring needed
- Made in USA
- Enjoy 600 Watts of *no tune* solid state power. Call your favorite dealer for your best price and order your ALS-600 with power supply today

ALS-600
\$1299
 Suggested Retail
 (Includes AC
 Power Supply)



ALS-600PS Heavy Duty Power Supply

ALS-600PS power supply included with ALS-600 amplifier



- Massive choke input filter greatly improves voltage regulation and reduces peak AC line current
- Ameritron's exclusive Multi-Voltage Power Transformer lets you compensate for stressful high line voltage and performance robbing low line voltage
- Step-Start Inrush Protection™ stops damaging inrush currents and extends life of power supply components
- Illuminated Cross-Needle Meter monitors voltage and current of 50 VDC line
- Extremely quiet fan
- Very compact 6 x 9 1/2 x 12 inches -- can be placed conveniently out-of-way
- Wired for 120 VAC, supplies 50 VDC at 25 amps to ALS-600 amplifier
- Also use on 100-130 VAC and 220-250 VAC, 50/60 Hz
- Draws less than 12 amps at 100 VAC and less than 6 amps at 230 VAC
- Includes prewired cable to plug into ALS-600 amplifier
- Made in USA

Ameritron Mobile *no tune* Solid State Amplifier

Ideal mobile amplifier -- uses 13.8 VDC mobile electrical system, very compact 3 1/2 x 9 x 15 inches, extremely quiet, 500 Watts output, continuous 1.5-22 MHz coverage, instant bandswitching, no tuning, no warm up, SWR protected

ALS-500M
\$799
 Suggested Retail



- Mobile *no tune* Solid State Amplifier -- uses four rugged 2SC2879 high power linear RF power transistors
- Instant bandswitching, no tuning, no warm up -- just turn on and operate -- makes mobile QSOs safer
- Very Compact -- just 3 1/2 x 9 x 15 inches -- fits in nearly any mobile installation; weighs only 7 pounds, that's less than some mobile HF transceivers
- Extremely quiet -- quiet low speed, low volume fan stays off and silent until temperature rises
- Output Power -- 500 Watts PEP, 400 Watts CW
- Continuous Coverage -- 1.5 to 22 MHz; 10/12 Meters with easy-to-install optional kit, \$29.95 plus s/h
- Load Fault Protection -- disables and bypasses amplifier if antenna has excessively high reflected power or if bandswitch is set lower than exciter frequency -- virtually eliminates damage because of operating error; has Load Fault LED indicator
- Thermal Overload Protection -- disables and bypasses

Exact power output of amplifiers may vary on each band.

amplifier if temperature is excessively high; automatically resets when temperature drops to safe level; has Thermal Overload LED indicator

- Excellent harmonic suppression -- multiple section output network and push-pull output circuit gives excellent harmonic suppression
- DC current meter lets you monitor collector current
- ON/OFF Switch -- bypasses amplifier for "barefoot" operation without having to disconnect high current power supply cables
- Remote ON/OFF Control -- lets you remotely control ON/OFF function for out-of-the-way mounting of amplifier
- Exciter Drive -- less than 100 watts input gives full output
- Power Supply Requirements -- requires 13.8 VDC at 80 amperes peak current for PA transistors and separate line for 12-15 VDC at 4 amperes for control and bias circuits
- Made in USA
- Call your favorite dealer for your best price and order your ALS-500M today

Free Catalog!

AMERITRON®

... the high power specialist

116 Willow Road • Starkville, MS 39759

(601) 323-8211 FAX: (601) 323-6551

Free Catalog/Nearest Dealer: 800-647-1800

8 a.m. - 4:30 p.m. CST, Monday-Friday

Prices and specifications subject to change © 1994 Ameritron

CIRCLE 142 ON READER SERVICE CARD

The loop element is tuned with a low-resistance, high-current variable capacitor with no rotating contacts, and the outdoor electrical and mechanical components are protected by a weather-resistant molded cover. The loop handles a nominal 150 watts RF with low SWR. It's \$249.95, while a unit with a standard remote control with dual fast and slow tune buttons is \$219.95. A 17-page instruction manual accompanies the loop.

For a catalog, contact MFJ Enterprises, Inc., Box 494, Mississippi State, MS 39762 (1-800-647-1800). *A new wrinkle:* MFJ also offers to send free instruction manuals, where available, on products in which you're interested.

Vectronics Products. Vectronics' parent firm, Valor Enterprises, has been in the antenna manufacturing business since 1974, earlier focusing primarily on CB, commercial, and cellular antennas and accessories. Recently Valor's emphasis has broadened considerably to better encompass mobile communications antennas, mounts, and accessories for the amateur market through its Pro-am® product line.

Currently Valor offers not only amateur mobile and fixed-station antennas, but also antenna tuners, amplifiers, filters, dummy loads, and power supplies. These accessories are offered under the Vectronics name. The Ontario-based firm has since 1975 fielded a variety of products for the amateur market.

The latest Vectronics catalog shows a variety of antenna accessories. These include the 1.8-30 MHz VC-300 DLP analog, VC-300-D digital bargraph, and HFT1500 digital peak-reading antenna tuners; the Vector 500 and HF600-QSK linear amplifiers; several dummy loads, available in models handling up to 2500 watts and functional to 650 MHz; and several high- and low-pass filters.

For a catalog, contact Vectronics Division, Valor Enterprises, 1711 Commerce Drive, P.O. Box 601, Piqua, OH 45356-0601 (513-778-0074). A separate flyer depicting the complete line of Valor Pro-am amateur antennas and accessories and a list of local dealers also is available.

ASA Antenna and Accessories Update. In last September's column we noted the ASA catalog of HF/VHF/UHF antennas and accessories. As we said then, ASA offers a mixture of its own antenna products and those of others. Included are the slimline HF "Fiberwhips" and the WD4BUM HF "Ham Sticks"; VHF/UHF mobile and fixed-station antennas, including multiband units; scanner, CB, cellular, cordless telephone, marine, and business-band antennas; and a selection of mobile and fixed-station mounts, adapters, springs, connectors, and other accessories.

Recently ASA introduced a new HF mobile antenna package based on the popular Fiberwhips. It's the Model HFA-COM ("High Frequency Antenna—Combination"), which consists of five separate Fiberwhips for 10, 15, 20, 40, and 75 meters.

The Fiberwhips are unique in design, and are made of a fiberglass 3/8 inch staff with heavy-gauge helically wound copper wire, covered with industrial-grade, black heat shrink, using a tapered, tempered stainless-steel whip. The top, bottom, and whip sections are made of solid brass with nickel-chrome plating, and are designed mechanically so as to avoid the need for retuning after each breakdown and setup. The assembled length is approximately 8 feet. The five-band HFA-COM

LOGPlus! v2.5 - Copyright(c) 1988-94 by Robert A. Winters/KD7P

Registration Number: 25000361
Karl T. Thurber
289 Poplar Drive
Millbrook, Alabama 36054

Active log: W8FX

Statistics

Log QSOs: 4/ 0
Sat QSOs: 0/ 0
DXCC - CW: 0 SSB: 0
RTY: 0 MIX: 0

<F1-Help!>

- | | |
|-------------------------------|-------------------------------|
| A> Logbook Management | J> Generic Award Tracking |
| B> QSL Card and QSL Managers | K> Soviet Oblast Award |
| C> DX Alert Bulletins | L> County Hunters Award |
| D> DX Century Club Award | M> Dumb Terminal Program |
| E> Worked All Zones Award | N> Contest Conversions |
| F> Worked All Prefix Award | O> Program Default Parameters |
| G> Worked All States Award | P> HAMBase or SAM LookUp |
| H> UHF/UHF Century Club Award | Q> LOGPlus! (ZIP/ARC) BackUp |
| I> Islands On The Air (IOTA) | R> Global Indexing |

*** Designed for the CASUAL OPERATOR to the SERIOUS DX'ER! ***

Fig. 1—LOGPlus! by Bob Winters, KD7P, is an exceptionally fine and user-friendly all-in-one logging program. The program is well-suited for ragchewers, ardent DXers, and just about everyone in-between, including casual operators. The program is an upgraded descendant of an earlier KD7P program, the KD7P Amateur Radio Logbook Management System, examined in the March 1991 column. (See the text of this month's column for details.)

is \$69.50 plus shipping charges.

An expanded, 16-page catalog is available from ASA, P.O. Box 3461, Myrtle Beach, SC 29578-3461 (1-800-722-2681).

Soft Topix

Antenna Specialists Antenna Software. In the July 1993 column we drew attention to the new Antenna Specialists Bulletin Board System (BBS) that lets you access technical information and individuals in the company's technical services and engineering departments. The service is free to A/S customers, communications system operators, RF engineers, and radio amateurs. The BBS provides the latest A/S product specifications, digitized A/S antenna patterns, application notes, trade-show schedules, and seminars. The BBS, at 216-349-8698, also offers file/data downloading by users. Its SysOp is Al Dolgosh, K8EUR.

We should add that A/S also offers the A/S RF Tools Series, professional software for designing communications antenna patterns. Several programs are available. DXPLOT performs precise calculation of beam tilt coverage, PATPLOT displays and plots digitized base-antenna patterns, and ANTPLOT develops patterns for side-mounted base-station antennas. The programs are available on 5.25 inch IBM PC compatible diskettes, or they can be downloaded free from the A/S BBS.

Incidentally, A/S has long been known for its diversified line of base-station and mobile-communications antennas and accessories. An amateur products catalog is available from The Antenna Specialists Co., 30500 Bruce Industrial Parkway, Cleveland, OH 44139-3996 (216-349-8400).

LOGPlus! We highlighted the KD7P Ama-

teur Radio Logbook Management System in the March 1991 column. This was a comprehensive IBM-PC-based logging program by Bob Winters, KD7P/KH2, then stationed with the Coast Guard on Guam, "where America's day begins." I noted at the time that KD7P's software was even then a cut above most logging programs, having just about every capability from real-time contest entry to the tracking of five-band awards.

Now Bob has done himself one better with LOGPlus! It's an exceptionally fine, user-friendly, and superfast logging and contest program that's a much-improved direct descendant of the earlier program we highlighted in 1991. The highly flexible program is well-suited for ragchewers, ardent DXers, and just about everyone in between, including casual operators.

LOGPlus! offers a host of powerful features. It includes real-time logging with automatic date and time stamping; satellite logging; PacketCluster® monitoring with DXCC checking; Kenwood radio control (ICOM and Yaesu are on the way); selectable date formats; and automatic, detailed tracking of most major awards (DXCC, IOTA, WAS, WAZ, WPX, and many more).

Also featured are conversion routines for most popular logging and contest programs; QSL management (it prints labels, attaches QSL manager information, and prepares reports on QSLs outstanding); SWL card printing; and interfacing to popular call-sign-lookup programs, such as HamBase™ and SAM. The program is visually handsome, inviting users to maneuver easily through its many features.

LOGPlus! is \$40 in the U.S. and \$45 overseas. It's available in several different IBM-PC-compatible disk formats. For further information, contact Robert A. Winters, KD7P, at DMW

Systems, P.O. Box 1565, Snohomish, WA 98291-1565 (206-568-9630).

OH1AA Logging Program Update. In previous columns, most recently last April, we discussed the Finnish logger that's increasingly being favored by European DXers. Offered by Veikko "Vic" Nieminen, OH1MIE, the program was designed for the Finnish radio amateur club station OH1AA.

Recently Vic sent me a maintenance update, V6.35, with expanded documentation in English and several Scandinavian languages. The DOS-based program now even includes icons for operation under Windows. The club requests a donation of \$10 from those who use the program.

For more information, contact Radio Amateur Club OH1AA/Softline, P.O. Box 29, 20101 Turku, Finland.

From the Mailbag

Support Rope de CX4ACI. John Somerhausen, CX4ACI, sent us a missive regarding an interesting combination: sailors and support rope. Writes John:

"I'm rather surprised that, in the field of antenna tower staying, hams don't look more at sailors. After all, their problems are similar: trying to maintain a thin, tall structure upright against the pressure of the wind. Since I sailed before becoming a ham, when I had to stay my G4ZU beam antenna mast in Montevideo, 100 feet up on top of an apartment building, I took advantage of a trip to my native country, Belgium, to go to my traditional boat supplier and ask him what he had in store.

"Kevlar, which would have been ideal (low weight, low elasticity, high resistance) was out because of its poor resistance to UV radiation. So he suggested 'Spectra,' an acrylic fiber, slightly less strong than Kevlar, but with very good UV resistance. I used it for three years and it withstood the gales of Montevideo, including one where the antenna simply disassembled itself and even broke one element! According to SV1BTV/MM, who was in the yacht harbor about two miles from my QTH, the wind was blowing 60 knots at his mast height (about 30 feet), so it must have been close to 70 knots (almost 80 mph) at the level of the antenna."

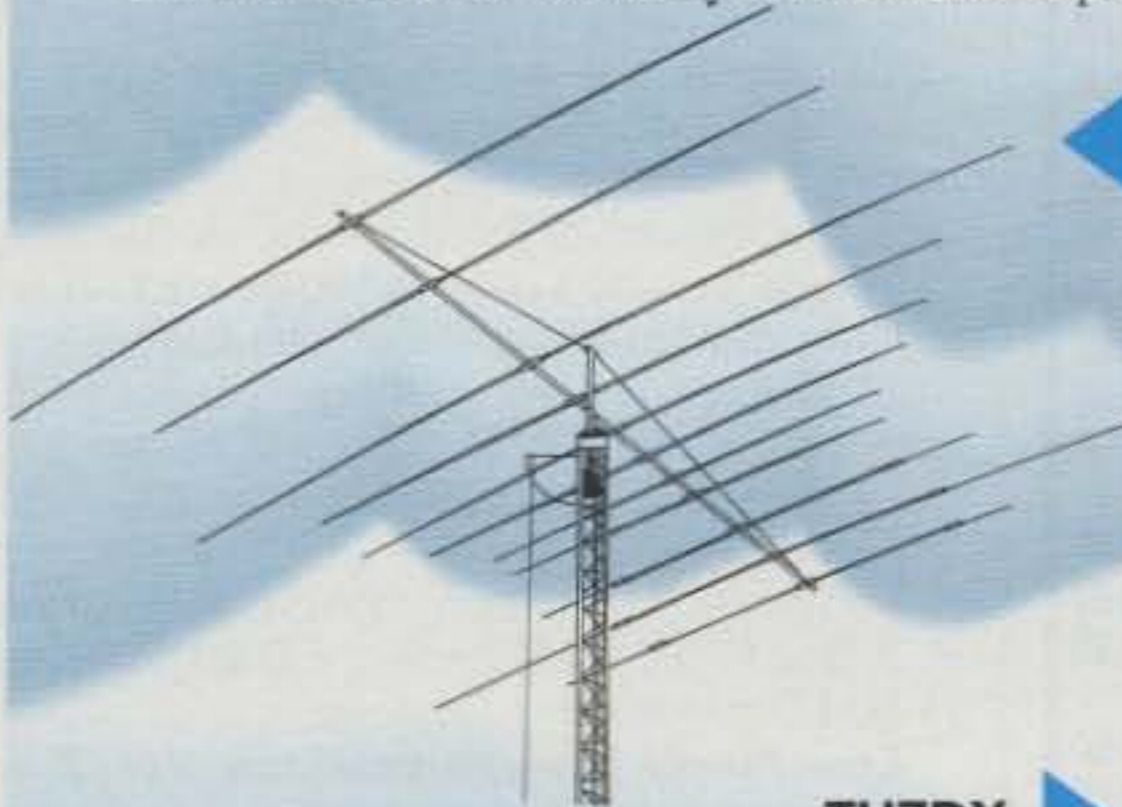
John enclosed a short length of Spectra rope, complete with two thimbles. He further describes the rope: "Like Kevlar, it doesn't like knots and one should use special terminals, but lacking these, I use 'inside hitches' which reduce its resistance only slightly. Not having the technical data, I can't vouch for its breaking strength, but it can't be far from the 700 lbs. of the $\frac{3}{16}$ inch Dacron." John had no knowledge of the Spectra rope's price or availability in the U.S., so we'll have to leave that up to readers to fill in.

Thanks de NX8R. In last November's column we highlighted a new supplier, 8Radio Products, operated by Dan Patterson, NX8R. We mentioned that in his catalog Dan offers an intriguing variety of custom towers and accessories.

These products included four-legged rooftop towers (not tripods), which offer excellent strength while providing an economical means of raising an antenna to a reasonable height when other methods aren't practical. We also noted his ground rod driver. Other accessories included a portable hinged tower base, tilt-over

Is your antenna under the weather?

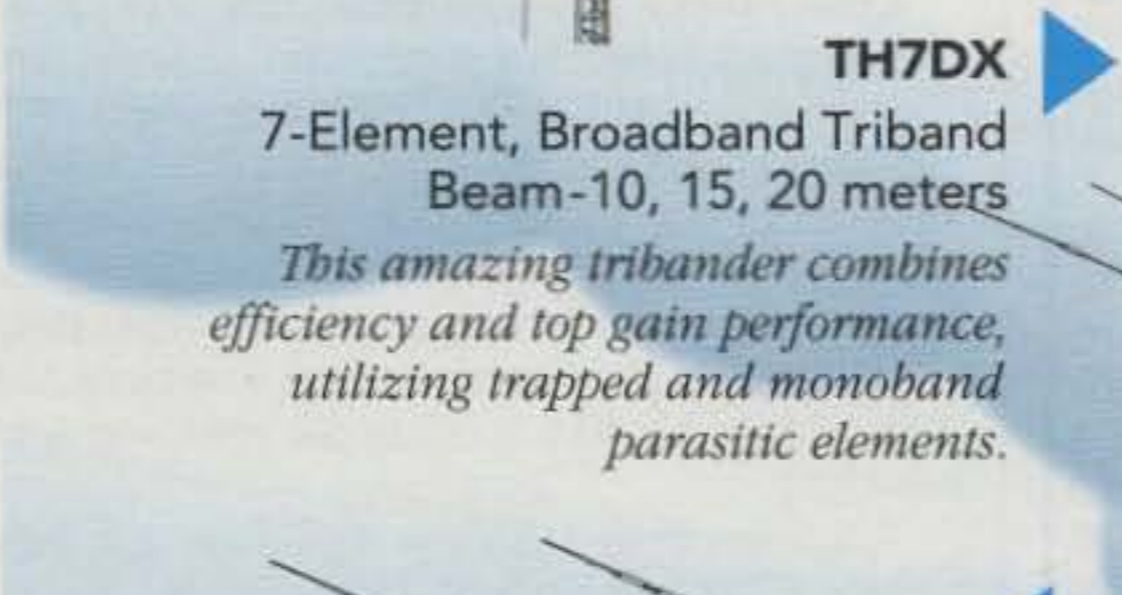
▶ Telex Hy-Gain® multiband beam antennas are built to stand up to any climate, so you can count on clear communications through wind, ice and rain. What makes Hy-Gain better? Thick wall swaged aluminum tubing and stainless steel hardware provide mechanical strength and resistance to corrosion. Machine parts, including tapered tubing, reduce wind surface for stability and reliable performance. Individually tuned traps offer outstanding tolerance, and die cast tiltable boom-to-mast brackets allow convenient maintenance. Finally, all designs undergo extensive testing under actual field conditions, and we back it all up with a two-year limited antenna warranty for additional peace of mind.



TH11DX

11-Element Broadband 5 Band Super Thunderbird Beam-10, 12, 15, 17, 20 meters

Designed for maximum DX performance with excellent directivity and efficiency on all five bands, the TH11DX also features the new Hy-Gain BN 4000 high power balun.



TH7DX

7-Element, Broadband Triband Beam-10, 15, 20 meters

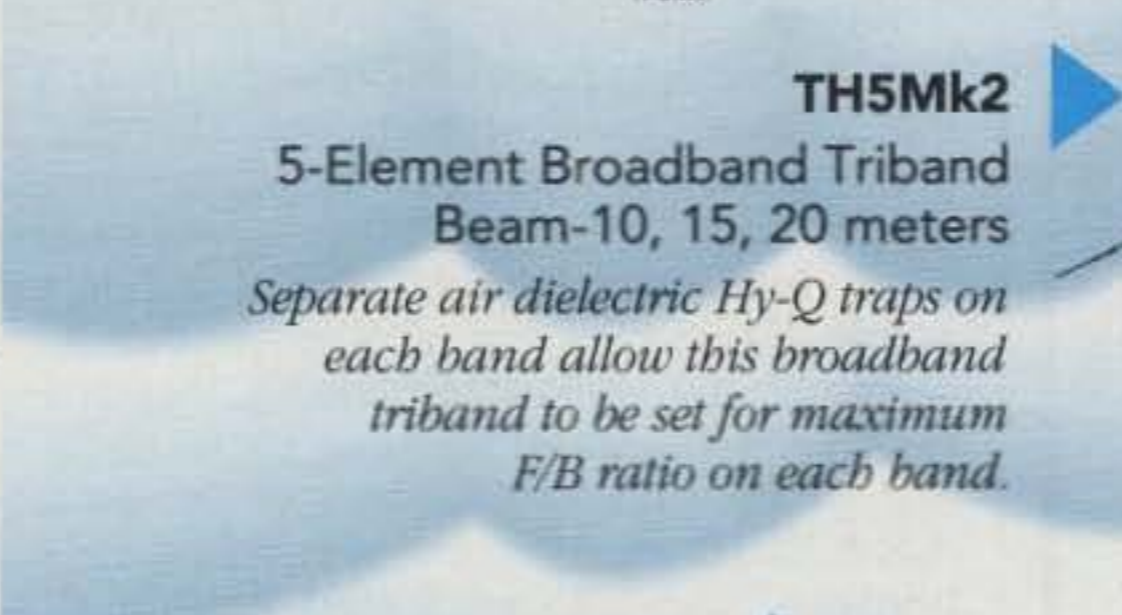
This amazing tribander combines efficiency and top gain performance, utilizing trapped and monoband parasitic elements.



Explorer 14

Broadband Triband Beam with Quad-Band Option-10, 15, 20 meters

Unique Para-Sleeve design optimizes edge-to-edge bandwidth without antenna tuner. Handles maximum continuous power within safety margins.



TH5Mk2

5-Element Broadband Triband Beam-10, 15, 20 meters

Separate air dielectric Hy-Q traps on each band allow this broadband triband to be set for maximum F/B ratio on each band.

Hy-Gain
by Telex

Telex Communications, Inc. • 8601 East Cornhusker Highway, Lincoln, NE 68505 USA
Telephone: 402-467-5321 • Facsimile: 402-467-3279

ICOM

IC-735 HF Xcvr./Gen. Cov. Rcvr.	\$1054.00
IC-736 HF/6-Meter Xcvr./Gen. Cov. Rcvr.	1884.00
IC-737A HF Xcvr./Gen. Cov. Rcvr.	1469.00
AT-150 HF Automatic Antenna Tuner	439.00
PS-55 AC Power Supply	226.00
SM-8 Desk Microphone	111.00
IC-R1 Communications Receiver	469.00
IC-R71A Communications Receiver	1044.00
IC-R7000A Communications Receiver	1249.00
IC-228H 2-Meter, FM, 45 Watt Xcvr.	349.00
IC-281H 2-Meter, FM, 50 Watt Xcvr.	374.00
IC-2340H 2-Mtr./440-MHz., FM, 45W/35W	599.00
IC-2GAT 2-Mtr., FM, Handheld With T-T	294.00
IC-2GXAT 2-Meter, FM, Mini Handheld W/T-T	294.00
IC-W2A 2-Mtr./440-MHz., FM, Mini H-H W/T-T	474.00
BP-4 Battery Case	20.00
BP-5 10.8 VDC, 425 mA.H., Ni-Cad Batt. Pack	73.00
BP-7 13.2 VDC, 425 mA.H., Ni-Cad Batt. Pack	87.00
BP-8 8.4 VDC, 800 mA.H., Ni-Cad Batt. Pack	87.00
CM-96 8.4 VDC, 1200 mA.H., Ni-Cad Batt. Pack	99.00
BP-83 7.2 VDC, 600 mA.H., Ni-Cad Batt. Pack	65.00
BP-84 7.2 VDC, 1000 mA.H., Ni-Cad Batt. Pack	87.00
BP-90 Battery Case	20.00
BP-130A Battery Case	21.00
BP-157A 7.2 VDC, 900 mA.H., Ni-Cad Batt. Pack	54.00
BP-160 7.2 VDC, 700 mA.H., Ni-Cad Batt. Pack	43.00
BC-35U Desktop Charger, BP-2, 5, 7, 8, 96	95.00
BC-72A Desktop Chg.; BP-81, 82, 83, 84, 85, Int.	104.00
BC-79A/AD-28 Dsktp. Chg.; BP-132A, 157A, 160	131.00
CP-11 Cigarette Lighter Cable W/Noise Filter	29.00
CP-12 Cigarette Lighter Cable W/Noise Filter	21.00
CP-13 Cigarette Lighter Cable W/Noise Filter	22.00
HM-46 Speaker/Microphone	40.00
HM-54 Speaker/Microphone	55.00
HM-65 Speaker/Microphone	42.00
HM-70 Speaker/Microphone	42.00

BENCHER

BY-1 Iambic Paddles, Black Base	\$64.95
BY-2 Iambic Paddles, Chrome Base	79.95
ZA-1A 1:1 Balun, 3.5 To 30-MHz	34.95

HUSTLER

G6-144B 2-Meter, Aluminum Vertical	\$90.00
G6-270R 2-Meter/440-MHz., Fiberglass Vertical ...	133.00
G6-440 440-MHz., Aluminum/Fiberglass Vertical ...	119.00
G7-144 2-Meter, Aluminum/Fiberglass Vertical	133.00

CUSHCRAFT

R5 14, 18, 21, 24, 28-MHz. Vertical	\$267.00
R7 7, 10, 14, 18, 21, 24, 28-MHz. Vertical	357.00
ARX-2B 2-Meter, Ringo Ranger II Vertical	49.00
ARX-220B 220-MHz., Ringo Ranger II Vertical	49.00
ARX-450B 450-MHz., Ringo Ranger II Vertical	49.00
AR-270 2-Meter/440-MHz., Ringo Vertical	61.00
AR-270B 2-Meter/440-MHz., Ringo Vertical	88.00
ARX-270U 2-Mtr./440-MHz., Fiber. Ringo Vert.	188.00
CS-270M 2-Mtr./440-MHz., Mag. Mt. Mobile	61.00
A270-10S 2-Meter/440-MHz., 5/5-Element Beam	70.00
A50-5S 50 To 54-MHz., 5-Element Beam	121.00
124WB 144 To 148-MHz., 4-Element Beam	49.00
A148-10S 144 To 148-MHz., 10-Element Beam	58.00
13B2 144 To 148-MHz., 13-Element Beam	97.00
224WB 222 To 225-MHz., 4-Element Beam	47.00
225WB 222 To 225-MHz., 15-Element Beam	100.00
A449-6S 440 To 450-MHz., 6-Element Beam	40.00
A449-11S 440 To 450-MHz., 11-Element Beam	58.00

ASTRON

RS-7A 13.8 VDC, 7 Amp Int., 5 Amp Cont.	\$49.50
RS-12A 13.8 VDC, 12 Amp Int., 9 Amp Cont.	71.50
RS-20A 13.8 VDC, 20 Amp Int., 16 Amp Cont.	88.50
RS-35A 13.8 VDC, 35 Amp Int., 25 Amp Cont.	141.50
RS-12M Same As RS-12A, With Meters	82.50
RS-20M Same As RS-20A, With Meters	108.50
RS-35M Same As RS-35A, With Meters	159.50
VS-35M Same As RS-35M, Adj. Volt./Curr.	171.50

UPS/Insurance Charges Are Additional
MC And VISA Orders Are Accepted
Prices Subject To Change Without Notice

LaRue Electronics

1112 GRANDVIEW STREET
SCRANTON, PENNSYLVANIA 18509
PHONE (717) 343-2124

concrete footer-mounted tower base, steel bar anchor bolts, custom tower footers, galvanized and plain steel tubing and pipe, and mast extensions for Ringo II™ type antennas.

Dan wrote to thank us for the coverage and the positive reader response to it. Says Dan: "For a little background, 8Radio Products is an offshoot of my main business, Patterson Welding & Mfg., a custom fabricator of steel, stainless, and aluminum products. Over the years I have been called upon to fabricate many accessories for my amateur radio friends; the items shown in my catalog represent just a few of these things. As time went on, I decided that since I was getting so much interest from the people in my radio club, maybe there is a market for some of this stuff. Hence, 8Radio Products was born."

We wish Dan luck. A catalog is free from 8Radio Products, 7785 Mentor Ave., Unit #8, Mentor, OH 44060 (216-946-6889).

Book Nook

Hambrew. This is a new quarterly magazine for amateur radio builders and designers. Its focus ranges from beginner-level kit-building projects to more advanced RF design. Some theory is offered, with kit reviews, etching patterns, cookbook-style projects, and more. Coverage includes diverse topics such as kit reviews, new products, transmitters, receivers, transceivers, antenna tuners, accessories, and test equipment. Domestic subs are \$20 per year (\$25 in Canada/Mexico and \$35 international).

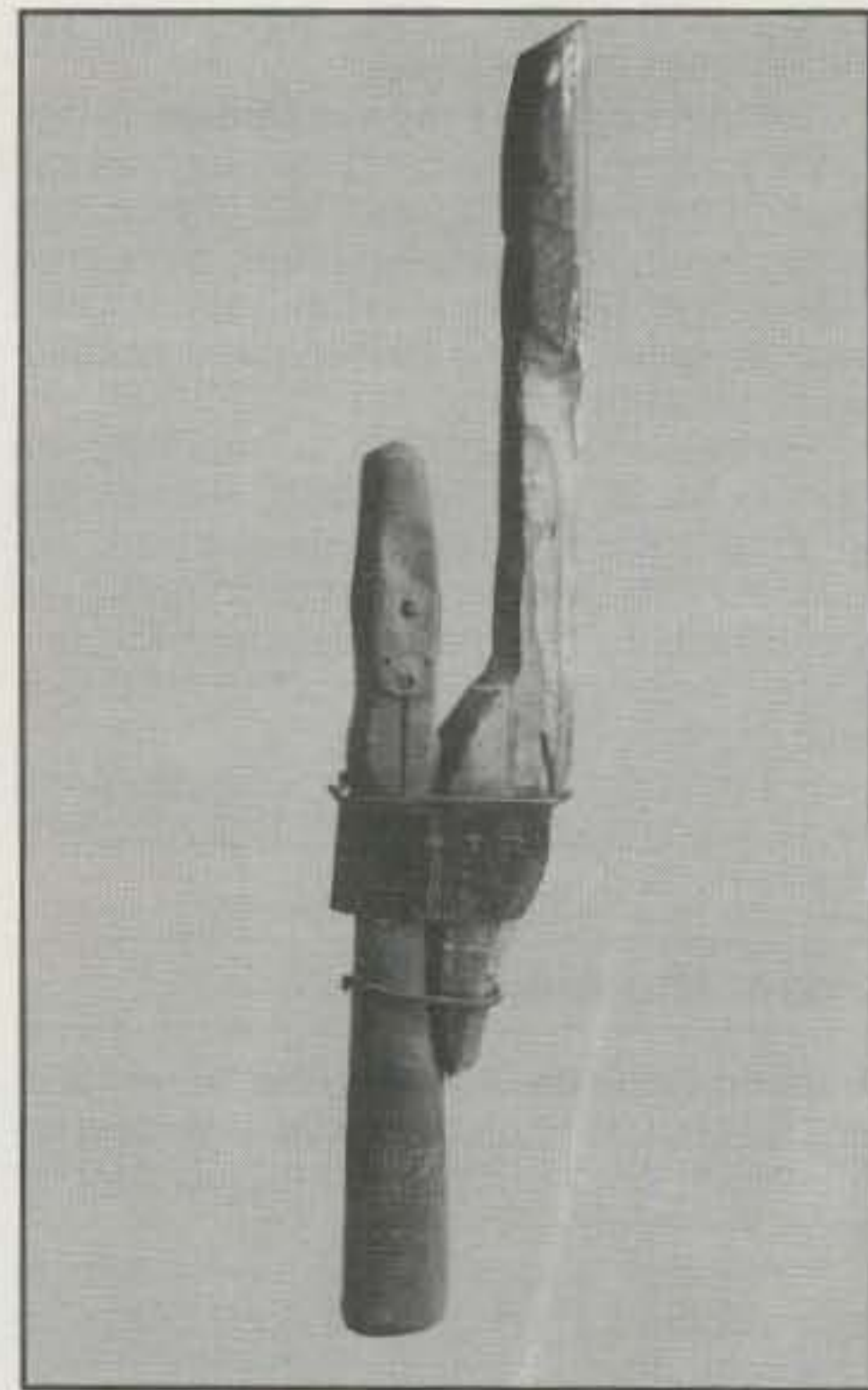
For more information, contact *Hambrew*, P.O. Box 260083, Lakewood, CO 80226-0083 (1-800-5-HAMRIG).

Low Power Communications, Vol. 2. In September 1992 we examined *Low Power Communications, Vol. 1—Basic QRP*. In it Richard H. Arland, K7YHA, came up with a promising "how to" QRP book. Topics covered included QRP history, getting started, antennas for QRP, propagation, basic operating practices, contesting, and more. The book still is available for \$14.95 plus \$2 shipping and handling.

A follow-on text is now available. It's *Low Power Communications, Vol. 2—Advanced QRP Operating*. Conceived, coordinated, and edited by K7YHA, author of Vol. 1, the book is eight chapters written by some of the biggest names in QRP. Chapter topics include low-power DXing, QRP contesting, QRP DXpeditioning, QRP satellite communications, milli/microwatting, Field Day operation, antennas, and solar power. Vol. 2 is \$19.95 plus \$2 s/h. It's available from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147 (1-800-420-0579).

Kanga US Catalog. Through Kanga US, Bill Kelsey, N8ET, imports QRP amateur radio kits manufactured by Kanga Products of England. Most of the Kanga kits are supplied semi-complete with all parts, including any PC boards and everything mounted on it. You supply the box, knobs, connectors, and some other components, the philosophy being that many homebrew constructors have these items in their junkbox, and to supply them would significantly increase the cost of the kits. QRP kits from Elktronics also are offered. For a catalog, contact Bill Kelsey, N8ET, at Kanga US, 3521 Spring Lake Drive, Findlay, OH 45840 (419-423-5643).

Radio Adventures Corp. Catalog. Lee



Originally just a spontaneous word invention by Hiram Percy Maxim, the Wouff Hong is a garrote-like strangulation device. It's one of a trio of mythical instruments of torture that might be used to attack poor operating practices and help ensure good operating techniques. It's still on display at ARRL headquarters. (Photo courtesy the ARRL)

Richey, WA3FIY, is offering crystal-controlled (fixed frequency) receiver kits used to copy amateur radio HF code practice sessions and news bulletins from the American Radio Relay League (ARRL) headquarters station, W1AW. The R1 series receivers are available in three different models for 80, 40, and 20 meters; both kits (\$29.95) and assembled models (\$49.95) are available.

Lee says that his objective is to provide useful, high-quality kits that will provide learning, adventure, and a sense of accomplishment. He now maintains a large inventory of parts, allowing him to ship most kit orders from stock.

Lee plans to expand his product line, initially to include a matching QRP (low power) transmitter for the R1 receiver. The transmitter should be available by the time this appears in print. A 100 watt SSB transmitter also should be offered.

For a newsletter and catalog, contact Radio Adventures Corp., RD 4, Box 240, Franklin, PA 16323 (814-437-5355).

Tejas Kits Catalog. According to proprietor Bill Hickox, K5BDZ, when in 1991 Heathkit announced it was discontinuing kits, he established Tejas RF Technology to offer reasonably priced, well-designed electronic kits to the hobby builder. Recently Bill shortened the firm's name to Tejas Kits and also has trademarked the name.

Still the flagship product is the Backpacker II, a low-power, single-band, portable CW transceiver kit. A growing line of other kit-related products is offered. These include a mini-keyer, gelled cell charger, CW audio filter, and several basic kit modules. Assembled and

tested units are also offered, such as a mini signal strength meter and a remote in-line RF sensor. A line of hard-to-find builder's parts is offered, too.

For a catalog of kits and accessory items, contact Tejas Kits, P.O. Box 720331, Houston, TX 77272-0331 (713-879-9300).

Packet Networking Catalog. Where do you get all the "small stuff" you need to meet your packet radio network needs? Amateur Networking Supply is a small, new company operated by packet networking enthusiasts and dedicated to providing the tools required to build better packet networks.

Products include TNC-to-radio cables; diode matrix boards, used to connect up to six packet TNCs together to form a network switching node; a WireModem Adaptor, to allow the high-speed linking of multiple network switching nodes and data servers over short distances using wire; power distribution boards; and various networking software, EPROMs, and documentation.

For a flyer, contact Amateur Networking Supply, Box 219, Montvale, NJ 07645-0219.

Pasternack Enterprises Catalog. Last noted in the January 1992 column, the Pasternack catalog has grown considerably since the firm was founded in 1972, and it now includes well over 2000 different coaxial products. The well-indexed, 61-page 1994 catalog shows a variety of adapters, amplifiers, attenuators, coax and coax assemblies, connectors, switches, patch cords, power dividers, terminations, tools, twinax, and other coax-related items. New products offered include several directional couplers and DC blocks.

Contact Pasternack Enterprises, Coaxial Products Division, P.O. Box 16759, Irvine, CA 92713 (714-261-1920).

Short Bursts

This month we're going to "lighten up" our normally straightforward (though hopefully not dull) presentation with visits to the worlds of radio nostalgia and electronic humor. First let's lighten the load with a nostalgia detour.

The Wouff Hong. The Wouff Hong is an integral part of amateur radio's traditions. Originally, however, it was merely a silly piece of improvised word invention, being the early-1900s creation of an anonymous writer using the pen name "The Old Man." This writer was found, after his death, to be ARRL co-founder, inventor, and radio pioneer Hiram Percy Maxim.

The Wouff Hong was mentioned in the humorous stories that ran in Maxim's "Rotten Radio" series in *QST*, the ARRL's journal. In the January 1917 issue T.O.M. (an affectionate reference to "The Old Man") mentioned the Wouff Hong for the first time, discussing it in his article "Rotten QRM." In this article Maxim referred to unnecessary interference by what he called "crummy operators," or what we would today call "lids."

The Wouff Hong didn't stand alone. It actually was one of three hypothetical instruments of strangulation and torture designed by T.O.M., along with his other nonsense-word creations, the Rettysnitch and the Uggerumph, all used to attack the poor operating practices of the day and help ensure good radio operating techniques. The Wouff Hong was not wholly ethereal: it soon appeared in *physical* form at ARRL headquarters and was pictured in June 1919 *QST*. Best of all, it's still on dis-

play for visitors to see at ARRL headquarters (see photo).

The Royal Order of the Wouff Hong emerged from this mystical symbol. It was, and still is, a sort of radio amateur semi-secret society that symbolized an honorary ARRL inner circle, and Wouff Hong initiations still are conducted during major ARRL conventions at midnight. Many amateurs today have Wouff Hong certificates gracing their hamshack walls alongside their operating awards and certificates.

The Ten Commandments of Electronics. Going way back to the November 1988 column, we ran one version of the so-called "Ten Commandments of Electronics," having seen them presented in the May 1988 issue of *Modern Electronics* (a former *CQ* sister publication). We referred mostly to that version of the commandments when we constructed our 1988 column, but since have seen different versions of the commandments on various bulletin board systems (BBSes), in overseas amateur publications, and most recently in the December 1993 issue of Dave Wolf, WO5H's new "Packet Power" newsletter.

To make a long story short, we've combined all these versions and present our own hybrid version here. Enjoy, and pardon our fractured mixture of olde and biblical English!

1. Beware the lightning that lurketh in the undischarged capacitor, lest it cause thee to bounce upon thy buttocks in a most undignified manner.

2. Cause thou the switch that supplieth large quantities of juice to be opened, yea, turned firmly off, that thy days may be long in this world.

3. Prove to thyself that all circuits that radiateth and upon which thou worketh are grounded, lest they lift thee to a higher-frequency potential and thus grant thee entry to radio heaven.

4. Tarry thou not amongst those fools who engage in intentional shocks, for they are surely nonbelievers and so are not longeth for this planet.

5. Take care that thou usest the proper method when thou takest the measure of a high-voltage circuit, lest thou incinerate both thee and thy valuable meter.

6. Take care thou tampereth not with interlocks and safety devices, for this incurreth the wrath of thy seniors and bringeth the fury of these seniors upon thy head and about thy shoulders.

7. Worketh thee not on energized equipment, for if thou so dost, thy fellow workers will surely buy beers without thee, and thy space at the bar will evermore be filled by another.

8. Service thy equipment not alone, for electrical cooking is a slothful process and thou mayest sizzle in thy own juices for hours upon a hot circuit before thy maker sees fit to end thy misery and drag thee into his fold.

9. Trifle thou not with radioactive tubes and substances lest ye commence to glow in the dark like a lightning bug and cause thy wife to see no further use for thee except for thy wages.

10. Committeth thee to memory the works of the prophets, which are written in the instruction manuals, for they surely giveth the straight dope.

While several of these entreaties don't really apply to the low-voltage, solid-state circuits of modern-day electronic equipment, there's wisdom in the words. These tongue-in-cheek commandments humorously but firmly remind



Next month we will highlight the Autek Research RF-1 RF Analyst. Promoted as the only instrument you need to adjust any antenna, it measures SWR, impedance (Z), inductance (L), and capacitance (C). (Photo courtesy Autek Research)

us of the deadliness of the circuits with which many of us work every day. So take heed, and consider this possible 11th commandment:

11. Be thou not afraid to ask stupid questions, for verily they are cheaper and safer than stupid mistakes.

Wrap-Up

That's all for this time, gang. Next time more "Antennas and Accessories" topics of current interest. See you then.

Overheard: Seems that without fail, all the "good ones" are taken.

73, Karl, W8FX

NEW TRIDENT

TRIDENT TR1200 Scanning Receiver

500KHz to 1300MHz with AM/FM/WFM

Coverage rivaling that of receivers that cost twice as much. Extremely compact and versatile. Features 1000 memory channels, 10 search banks, lockout on scan, & search. Backlighted LCD display, Attenuator, Delay, Hold, Bank lockout, Cellular locked out, 1 Year Warranty, & Earphone jack. Size: 5 7/8H x 1 1/2D x 2 1/3W. Wt 14oz. Ground shipping: \$6.95. 2 Day Air Freight: \$9.95. Call or Fax Toll Free, 24 hours



ACE
COMMUNICATIONS



Call
1-800-445-7717

10707 E. 106th Street Fishers, IN 46038
317-842-7115 Fax 1-800-448-1084

CIRCLE 19 ON READER SERVICE CARD

OUTbacker

Plug Into DX!

- 8 Bands On 1 Whip, 3.5-30MHz
- Quick & Easy QSY — No Coils To Change
- Polyurethane Coated Shaft
- Trunk Lip Mountable Perth®
- No Tuner Needed

★ Mobile ★ Portable ★ Condos
★ Marine ★ R.V.

In Stock
4', 6', 2 Piece, High Power Models
And The Ultimate Perth®
At Leading
Amateur Radio Stores

Tech Talk Time
5-10 EST
OUTBACKER
ANTENNA SALES
Don Arnold, WD4FSY/VK2IBB
330 Cedar Glen Circle
Chattanooga, TN 37412
Phone/FAX
(615) 899-3390
FAX (615) 899-6536

Worldwide Contact
TERLIN AERIALS
5 Yampi Way
Willetton, W.A. 6155
Australia
Tel 61 (9) 3545444
FAX 61 (9) 3545455

Dealer Inquiries Invited
For Outside North America

"...It takes a whammin' & keeps on hammin'..."
Gordon West
Gordon West, WB6NOA
"It's what we use at Radio School Classes..."

CQ Showcase

Curtis Keyer Kit From Jade Products, Inc.

Jade Products, Inc. has announced the newest member of its FUN-KIT line, the Curtis Keyer Kit. This kit is based on the Curtis Keyer, 8044ABM Integrated Circuit. The 8044ABM provides A and B iambic modes, sidetone oscillator, straight key input, weight control, speed control, speed meter output, and tone control. This circuit board supports all of these features plus positive and negative keying options, power-up transient protection, a 100 mw audio amplifier and audio transformer, and connections for a speed meter, if desired. The board measures 2" x 3" and can be powered from any voltage from 5 to 18 VDC.

The kit sells for \$39.95 (quantity pricing, for clubs for example, available). For more information, contact Jade Products, Inc., P.O. Box 368, E. Hampstead, NH 03826-0368 (603-329-6995; FAX 603-329-4499) or circle number 104 on the reader service card.

Milestone Technologies Ham Radio Software

Milestone Technologies has announced the availability of a package that combines its DOS software for amateur radio enthusiasts, the CODEMASTER Morse Code training program, and the Milestone LOGMASTER radio log-keeping system. CODEMASTER features a programmed learning environment and flexible practice to 40-plus wpm. LOGMASTER is a general-purpose log-keeping system featuring production of reports in varying formats, QSL card labels, and fast real-time contest mode.

The package is priced at \$40. For more information, contact Milestone Technologies, 3140 S. Peoria St., Unit K-156, Aurora, CO 80014-3155 (303-752-3382) or circle number 106 on the reader service card.

Larsen HyPer Connect System

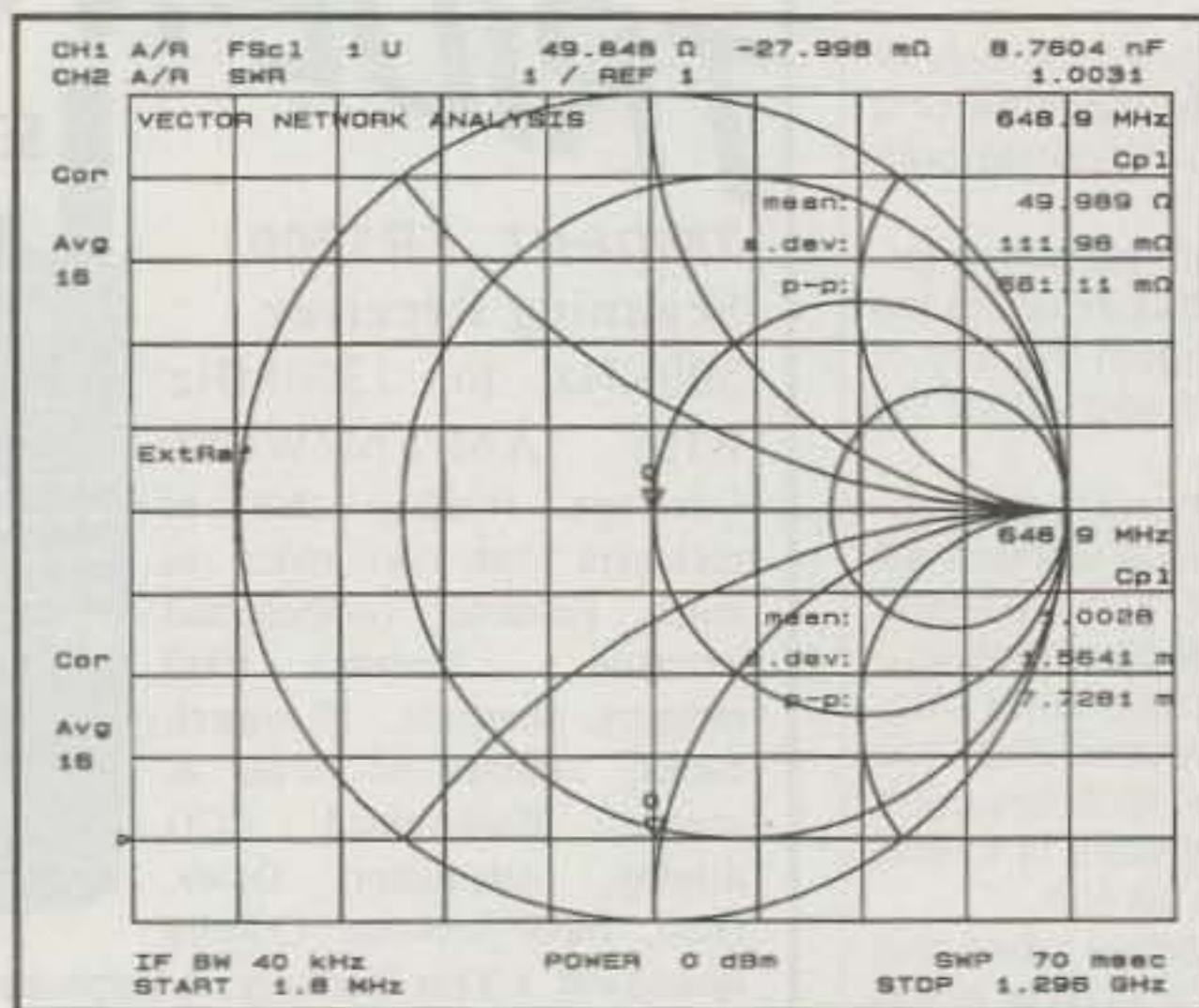
Larsen Electronics has introduced the HyPer Connect System, a universal master connector system for all major radio bands. The HyPer Connect System (high-performance universal connector) removes the burden of installing and stocking a wide variety of connector types by pre-installing a universal connector on the coax and providing a variety of adaptor connectors. Adaptor connectors are PL, N, TNC, BNC, Mini-UHF, and SMA. The HyPer Connect is factory pre-installed.



For more information, contact Larsen Electronics, 3611 NE 112th Avenue, Vancouver, WA 98682 (206-944-7551 or FAX 206-944-9556) or circle number 109 on the reader service card.

ETHERWORKS™

APL2 GUILD NAVIGATORS



Antenna Software Engineering • Custom Yagi Design and Analysis
Low VSWR Products 50 Ω & 75 Ω • Driven Element Impedance Matching

VHF/UHF Antenna Components

Custom Cut Aluminum (6061-T6 & 6063-T832) Rod and Tube
Radial Element Supports • End Caps / Plugs • Driven Elements
Premium Dielectrics • Customization & Alignment Tools

ADVANCED SYSTEMS ENGINEERING
P.O. Box 261 • Theodore, Alabama 36590
(205) 450-0806 • Fax (205) 450-0729

ICOM IC-2GXAT 2M Handheld

ICOM has introduced the IC-2GXAT (DTMF) 2 meter handheld. The unit offers 7 watts of output power with a 13.5 VDC power source or optional BP-132A battery pack. A power-saver function reduces current drain during standby. The 2GXAT is constructed to withstand the rigors of outdoor operation. The rear case is made of die-cast aluminum.

and the body is splash resistant. Repeater information can be stored in the call channel or 40 memory channels. Tone scan is available to detect the subaudible tone frequencies. Subaudible tone encoder, tone squelch, and pocket beep are included. A monitor function is included to receive a repeater input frequency. The IC-2GXAT includes five DTMF memory channels and a DTMF redial function for autopatching.



The IC-2GXAT also includes a memory transfer function for QSYing, programmable scan, and memory scan with a skip function. The display can be set to display the memory channel numbers only, and the number of available memory channels can be limited. A battery pack, charger, belt clip, and handstrap are included. For more information, contact ICOM America, Inc., 2380 116th Avenue NE, Bellevue, WA 98004 (206-454-8155); or circle number 108 on the reader service card.

G-TOR™ from Kantronics

Kantronics has introduced a new HF digital mode G-TOR for the KAM Plus and KAM Enhancement Board. This error-free mode can reliably transmit data more than twice the speed of PACTOR in most band conditions. G-TOR operates at 100, 200, or 300 baud, automatically adjusting the speed as necessary based on band conditions. Errors are corrected through the combination of Golay forward error correction and full-frame data interleaving.

G-TOR is now standard in the KAM Plus and KAM Enhancement Board at no extra cost and is available as an EPROM upgrade for the KAM Plus or KAM with Enhancement Board. For more information, contact Kantronics at 1202 E. 23rd Street, Lawrence, KS 66046 (913-842-7745; FAX 913-842-2021), or circle number 103 on the reader service card.

Varian High-Efficiency Shortwave Radio Tetrode

Varian Associates, Inc., has designed a cost-effective, multi-phase cooled, high-efficiency tetrode suitable for 100 kilowatt short-



wave transmitters. Designated the Eimac® 4CM100,000A, the new tetrode features 100 kilowatt anode dissipation and is capable of high-gain, high-efficiency operation in transportable shortwave transmitters.

For more information, contact Varian Power Grid Tube Products, 301 Industrial Way, San Carlos, CA 94070 (415-594-4000; FAX 415-592-9988), or circle number 110 on the reader service card.

LUCAS Radio CAPMAN 2.0

CAPMAN is a menu-driven skywave analysis package developed by Kangaroo Tabor Software. CAPMAN delivers IONCAP input file construction and management, two integrated execute functions, the ability to view and manipulate output files, and graphical display of output parameters for multiple target locations and time periods. The package allows you to customize it for your own station. Choices of output include MUF, FOT, S/N, Reliability, Service Probability, angles of take-off and arrival at receiver, S-meter units, field strength, and modes of propagation. Graphs of the predicted vertical ionogram, MUF, FOT, and LUF are available. The IONCAP+ program is provided with the purchase of CAPMAN. This CAPMAN package is a 32 bit version and requires an IBM compatible 80386 or above.

The CAPMAN package is \$89 shipped. For more information, contact LUCAS Radio/Kangaroo Tabor Software, 2900 Valmont Road, Suite H, Boulder, CO 80301 (303-494-4647; FAX 303-494-0937), or circle number 107 on the reader service card.

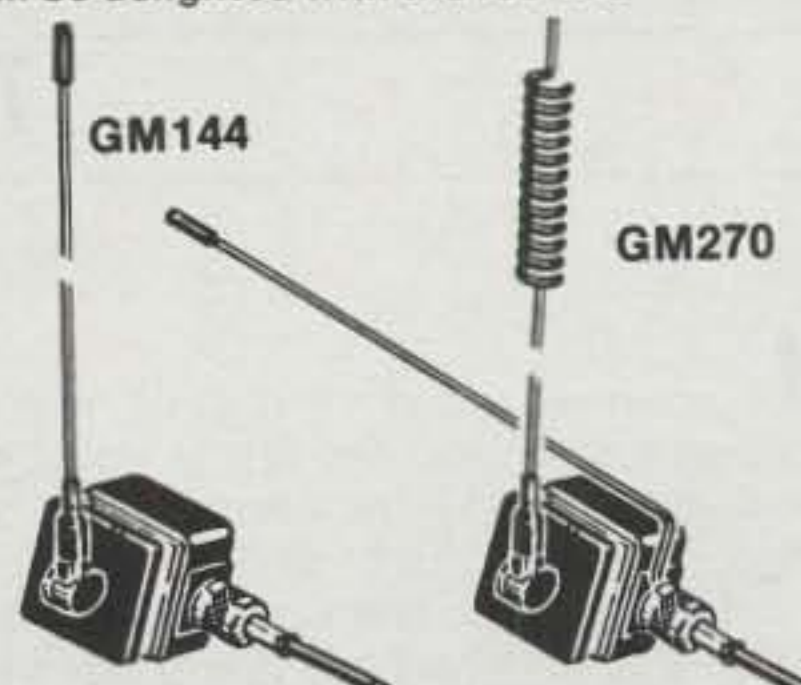
Index Laboratories' QRP PLUS

Index Laboratories now has a fully synthesized, processor-controlled, all-band CW/SSB transceiver. QRP PLUS incorporates SCAF variable bandwidth digital filters and is adjustable from 100 to 2400 Hz bandwidth to slice out QRM. The transceiver has 20 memories and can be interfaced with VHF/UHF transverters and external linear amplifiers.

QRP PLUS requires 12 VDC at 1.5 amp on transmit and 140 mA on receive. A well-regulated AC supply or gel cell rechargeable batteries are suitable. For more information, contact Index Laboratories, 9318 Randall Drive NW, Gig Harbor, WA 98332 (206-851-5725), or circle number 111 on the reader service card.

PRO•AM™'S NEW

PRO•AM's GM144 is 27.5 inches tall, handles up to 50 watts and covers 144-148 MHz with SWR below < 1.5:1 across entire band (tunable via interior coupling unit). Gain is 2.5 dB. Almost doubles your transmitted signal strength and extends receive range accordingly. You will be delighted with the results.



PRO•AM's GM270 is 26 inches tall, handles 50 watts, and covers 144-148 plus 440-450 MHz with SWR less than < 2:1 at band edges (tunable via interior coupling unit). Gain is 2.6 dB 2m and 6.3 dB 70cm. A real tiger!

"Stylish, trim, and petite" only begin to describe PRO•AM's exciting new 2 meter, 70 cm, and dualband mobile antennas. They feature a slender black chrome whip and small candy kiss-size base that looks terrific on any auto. Inside the little 1 1/4 inch diameter base is a newly-developed and ultra-strong titanium magnet that holds in place like a bulldog, even at high speeds. These new micro magnet antennas are supplied fully assembled and ready to use, with 9 feet of RG-174 mini coax and BNC connector.

- Covers 144-148 MHz & 430-470 MHz
- Pretuned
- Low SWR
- Wide bandwidth
- 25 watt rating
- Weighs only 4 oz!
- New micro magnet look
- Super trim whip
- Micro-size base
- Titanium magnet
- Ready to use
- Made in U.S.A.
- Built to last
- Single & Dualband models

Technical Data

- MM144B 2m: 19" tall
1/4 wave whip
- MM450B 70cm: 6.5" tall
1/4 wave whip
- MM270B 2m/70cm: 19" tall
1/4 wave 2m,
5/8 wave 70 cm



pro•am™

A Division of Valor® Enterprises

1711 Commerce Dr.
P.O. Box 601
Piqua, OH 45356-0601
513-778-0074

Available From Your Favorite Amateur Radio Dealer

pro•am™ The ultimate choice for the PROfessional AMateur!

CIRCLE 82 ON READER SERVICE CARD

September 1994 • CQ • 57

ALL ABOUT THE WORLD ABOVE HF

Two Record-Setting Stories

We open this month's column with two record-setting stories. The first is about what is believed to be the first-ever amateur radio contact on the 120 GHz amateur band. The second is about the first California to Hawaii QSO on 2.3 GHz and extending last year's California to Hawaii 902 MHz record. There were many other exciting events during late June and early July. Read on for the ones that tickle your fancy.

First Amateur Radio 120 GHz Contact Made

The following is principally based on a press release issued by Tom Williams, WA1MBA:

"On 11 July at 1214 UTC, Tom Williams, WA1MBA, and Jim Mead, WB2BYW, made contact on the 120 GHz amateur radio band. The distance of the QSO was 1.15 km (0.7 miles). Signal reports exchanged were 529. Both stations were in FN32rj, one station in Amherst, MA the other in Hadley, MA.

"This QSO is claimed to be the first contact on that band. The 120 GHz band is a US allocation, only 40 MHz wide.

"You may recall that Tom and Jim made the first contact on the 145 GHz band last year, setting the DX record for that band at 3.8 km. That contact and equipment was reported at the 1993 Microwave Update meeting and is written up in the *Proceedings*, and in July 1993 *QST*.

"The equipment used for the 120 GHz contact was much the same as for the 145 GHz, but with a few differences. The harmonic mixers were replaced with ones supplied by Pacific Millimeter Products of Golden, Colorado. The new ones are designed to run in the 110 to 170 GHz band. Also, because the 120 GHz band is only 40 MHz wide, the two radios were adjusted to be 29 MHz apart so that 10 meter radios could be used for receivers.

"Estimated power output is about 10 microwatts. The 12 inch dishes were over-illuminated at this frequency, resulting in an estimated 45 dB gain. Path loss is significant at 120 GHz due to the oxygen absorption line at 118 GHz. Tom and Jim waited for the lowest humidity day in a two week sultry heat wave in New England to make this contact.

"Signals were strong enough to extend the DX, but significant time was spent at 1.9 km, where signals were copied reliably in only one direction. Tom and Jim suspect that they could have extended to about 1.5 km, but there were no suitable sites at that distance, and as the morning went on the humidity was rising."

Tom's station was located on a highway on-

P.O. Box 73, Oklahoma City, OK 73101

VHF Plus Calendar

Sept. 1	Canada UHF Sprints, 1900-2300 local time.
Sept. 4	Poor EME conditions.
Sept. 5	New moon.
Sept. 7	Canada 432 MHz Sprint, 1900-2300 local time.
Sept. 8	Perigee.
Sept. 10-12	ARRL VHF QSO Party, 1800 UTC 10 September to 0300 UTC 12 September.
Sept. 11	Poor EME conditions.
Sept. 12	First quarter moon. Canada 220 MHz Sprint, 1900-2300 local time.
Sept. 17-18	Second weekend, ARRL 10 GHz Cumulative Contest, 0800-2000 local time, both days. Get-together of southern California VHF-UHF operators at KC6WLC's ranch QTH. (See text for more information.)
Sept. 18	Moderate EME conditions.
Sept. 19	Full moon.
Sept. 23-24	Tenth Microwave Update conference, Estes Park, Colorado. (See text for more information.)
Sept. 24	Apogee.
Sept. 25	Poor EME conditions.
Sept. 26	Canada 144 MHz Sprint, 1900-2300 local time.
Sept. 27	Last quarter moon.
Oct. 1	Canada 50 MHz Sprint, 1000-1400 UTC.
Oct. 2	Very good EME conditions.

ramp, and Jim's was located on the campus of the University of Massachusetts at Amherst.

New UHF World Distance Records Set

The first story is based principally on a press release from Chip Angle, N6CA, and Paul Lieb, KH6HME

"After 13 years of attempting and making contacts on most of the microwave bands, Paul Lieb, KH6HME, and Chip Angle, N6CA, finally made the shot from Hawaii to California on 2304 MHz. This leaves 10 GHz as the only band left to be worked. The latest two-way CW QSO took place on 11 July at 2321 UTC.

"The opening will be remembered as the great Hawaiian opening of 1994. As of this writing, the band is still open to everyone on 144 MHz. At times mobiles with omni antennas have been easily worked by Paul and Russ Sakai, KH6FOO, on 144 MHz. Additionally, Paul worked many stations on 144 through 1296 MHz. They both wore out their voices.

"The KH6HME station was located on the Mauna Loa volcano at 8200 feet elevation, at 19:35:19N and 155:27:10W (grid BK29go), and N6CA was at Palos Verdes City Hall at 33:44:45N and 118:24:16W (grid DM03tr) and an elevation of 340 feet. Distance for the contact was 2468.8 miles. Paul said he has never seen it so windy up on the volcano.

"The contact was made on CW with signal reports of 559 both ways with QSB. An SSB QSO was attempted for a few minutes but was not completed because of our rushing up to

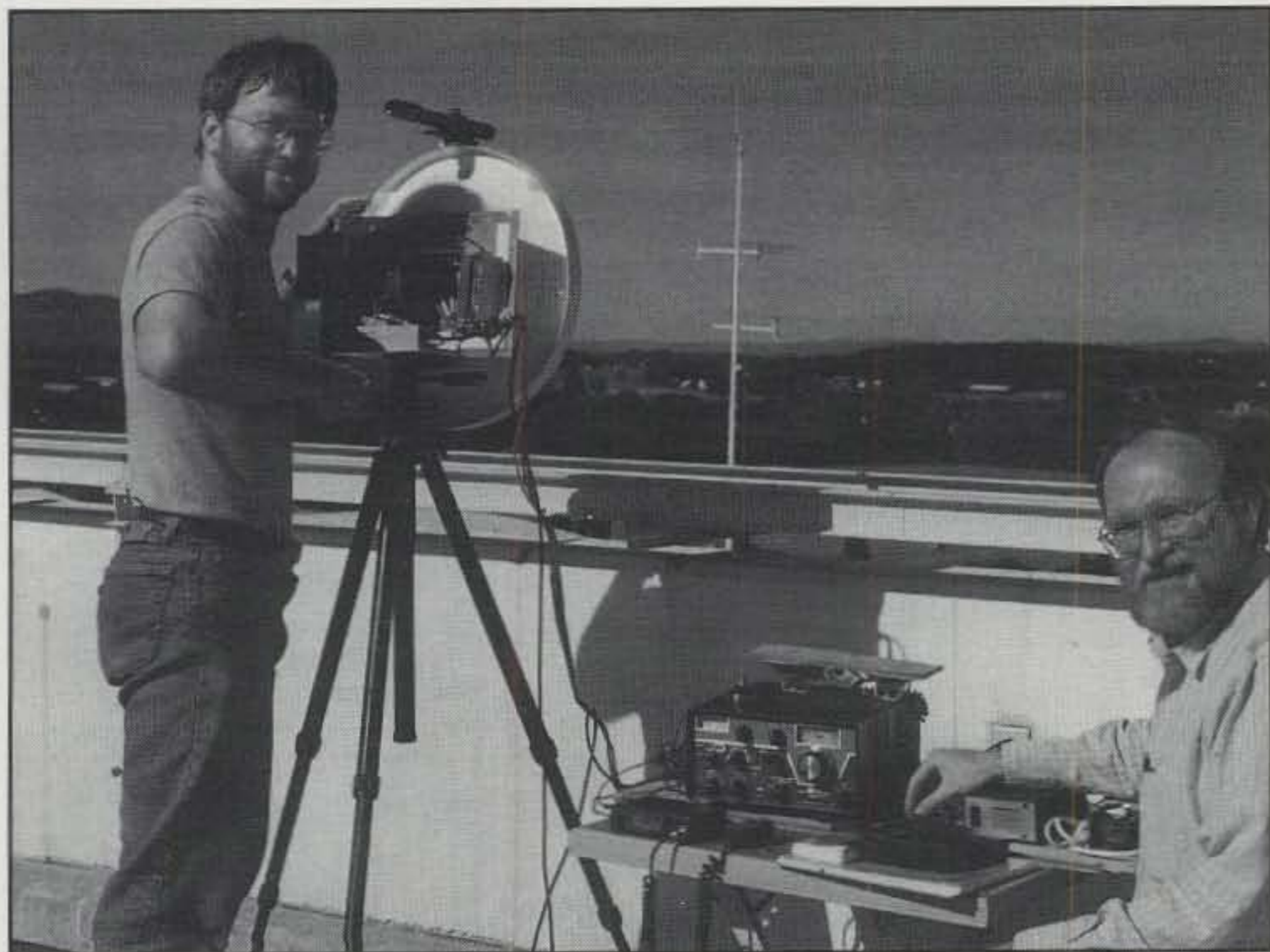
10 GHz. We ran for several hours on 10368 MHz but with no success. We finally ended up on 5760 MHz, also with no success. This was a not so common a type of opening with no elevation restriction on the California end along with good 1296 MHz propagation. It's been many years since this type opening occurred.

"Equipment consists of identical totally home-brew transverters built by N6CA running 12 watts output to 4 foot dishes and 1.5 dB noise figure receivers. They are direct conversion to 28 MHz. The 4 foot dishes have interchangeable feeds for 2.3 GHz to 10 GHz and require about 4 or 5 minutes to do so."

It was over a year ago, on 23 August, that Chip and Paul set records on 902 MHz and 5.7 GHz. At that time they tried, but could not complete, a contact on 2.3 GHz. This year was different. After most of the coast of California had been hearing the KH6HME beacon on 2 meters, and 70 and 23 cm, for more than a day, Paul was finally able to make it up the side of the volcano to activate his stations.

After arriving and working a number of stations in California on 2 meters and 70 cm, Paul and Chip completed the QSO on 2.3 GHz. Their new record retrieves the record back from the Australians. They mention that as of their writing the press release, on 12 July, the Weather Channel maps indicated that the bands had the potential for being open an additional two days! Perhaps they will complete their 10 GHz contact after we go to press with this column.

It wasn't more than a day after Chip and Paul set the 2.3 GHz record that Chip and Paul's 902 MHz record was extended by **Jack Henry**,



WB2BYW (left) aiming the 120 GHz radio while WA1MBA (right) adjusts equipment for the first contact on that band.

N6XQ. Running with Paul, at 2240 UTC, 12 July they completed a CW contact that extended the record distance to 2519 miles. Jack was using 12 watts into a 23-element F9FT Yagi and Paul was using 14 watts into a 6 foot loop Yagi.

During this fantastic opening contacts have been made between Hawaii and the west coast from Mexico to Oregon. Both Russ and Paul report more than 100 contacts were made in the first days of the opening. Additionally, operators on both sides report contacts being made with handhelds through repeaters on the other side. Further, Russ reported hearing a number of Oregon repeaters.

To add icing on the cake, on the evening of the beginning of this opening operators in southern California experienced a sporadic-E opening to Washington, Montana, and British Columbia. I received reports from Chip Margelli, K7JA, Jim Sharlow, WB2ODH/6, Wayne Hoffman, WB6WLR, Todd Evans, KB6IGC, and others, of contacts being made with the following stations: VE7XF (CN89), VE7CEU (CM87), VE7CA (CN89), N7MWV (CN87), NU7V (CN87), W7YOZ (CN87), K7ND (CN87), KD7TS (CN87), KG7FV (CN85), WA1JXN/7 (DN27), and N7KSI (CN86). All of these contacts were made between 0100 and 0200 UTC.

As I was closing this column, I got the following report from **Tim Marek, NC7K:** "Tonight (Tuesday) N6KBX, Don in CM98 calls me to say Paul, KH6HME was in to Sacramento (100 miles away) at times S9+! That does it! I loaded the truck and flew up Peavine Mountain just north of town. Good road to the top and 7500+ feet where I set up.

"Waiting for 1.5 hours and hearing nothing, I started to get discouraged, but . . . What's that? "CQ CQ this is Hawaii calling . . . KH6HME CQ CQ etc. . . ." I almost fell out of the truck. I had KBX tell him I was hearing him and to listen up for me. In the next ten minutes he went from audible to S3 to S5 and back to audible

before he QSY'd to 432. But, I called him on CW and got a 5x1 report and gave him a 5x5 which he rogered! I don't think I will sleep tonight! That's grid #128 and state #25! Wow! I always dreamed of that happening but never thought it would happen, or be so loud! Wow!"

Still More Records Set

New Asian 2 Meter Sporadic-E Record: On 13 June at 0325 UTC, VR2IH in Hong Kong worked JH7SCY/7 on 2 meters for a new Asian sporadic-E record on that band. The distance was 3020 km (1812 miles), which is considered a short double hop path.

USA to Jordan Via Sporadic-E: What may be the longest USA to anywhere QSO via sporadic-E was completed on the evening of 9 May. A group of operators from England had set up in Jordan. Using the call JY7SIX, they had given many in Europe a new country.

On 9 May, 6 meters had been open all day to Europe. Contacts in excess of 4000 km had been made throughout the day. Late in the evening the crew at JY7SIX went for a meal and left the keyer running on 50.110 MHz as a beacon. Upon their return they heard a weak CW signal replying. They reported that the signal was very clear and had no problem copying the call "WD4KPD." N. J. Waite, G3KOX, an excellent CW operator, was on the key and copied WD4KPD two to three times in and out of the QSB. After a five minute struggle the QSO with Dave Gaytko was complete, finishing at 2145 UTC. The distance is reported to be over 10000 km (6000 miles)!

First North America to Asia 13 cm EME QSO: The following is from Al Ward, WB5LUA: "After many months of running schedules, I was able to work JA4BLC on 13 cm EME on June 12. Yoshiro had already worked OE9ERC and OE9XXI on 2304/2424 crossband earlier

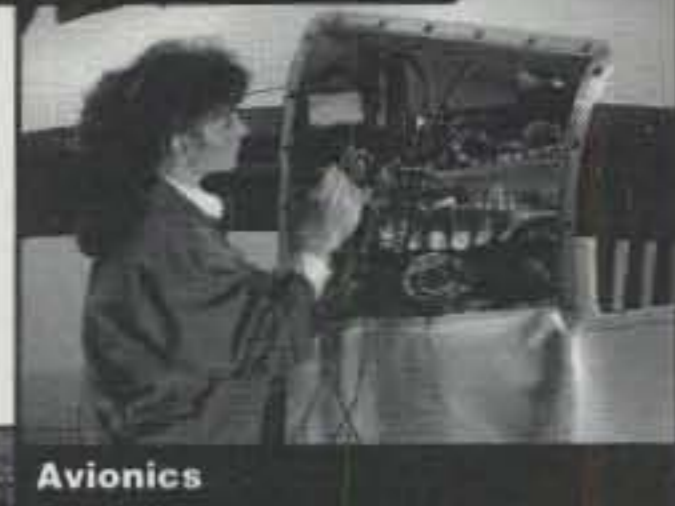
"The Best Prize Life has to Offer is the Chance to Work Hard, at Work Worth Doing"

Teddy Roosevelt

CIE, the world leader in home study electronics, provides the quality training and hands on experience you'll need to exceed in these exciting career opportunities in electronics.



Data Communications



Avionics



Computer Assisted Manufacturing

Research and Development Technician • Medical Technician • Junior Engineer • Instructor • Instrumentation Technician • Field Service Engineer • Engineering Technician • Design Technician • Computer Technician • Automated Equipment Technician • Digital Technician • Automotive Technician • Audio Technician • Customer Engineer • Robotics Engineer • Industrial Maintenance Technician • Mobile Radio Technician • Marine Technician • Communications Technician • Transmitter Engineer • Broadcast Engineer...

If you want a job worth doing you'll need the education CIE has been providing their graduates (over 150,000 of them) for over half a century.

Getting started is easy! Just fill out the coupon below and mail it today for your free catalog about the facts on a career in Electronics.

Name _____

Address _____

City _____ State _____ Zip _____

Age _____ Phone (_____) _____



CLEVELAND
INSTITUTE OF
ELECTRONICS
1776 East 17th Street
Cleveland, Ohio 44114
(216) 781-9400

ACQ21

in the year, but I believe our QSO is the first 13 cm EME QSO with both stations transmitting on 2424 MHz. It is the first North America to Asia 13 cm QSO. US has privileges in the 2300 to 2310 and 2390 to 2450 MHz frequency range at least for now. I have SWLed many microwave ovens at 2424 MHz! After many months of my transmitting on 2304 MHz and listening on 2424 MHz, I decided to move the VA-802 Klystron up to 2424 MHz to check echoes and also to establish frequency. I also decided to remove my combination 432/1296 feed, which forced me to use a feedhorn for 13 cm that was not optimum and install a new W2IMU feedhorn tuned for 2424 MHz. Sun noise was up 2 dB over the compromise feed that I had been using for months.

"With high declination and perigee not occurring at the same time, there were only two days a month when Yoshiro and I had a window. With the bad weather we have had in Dallas this spring, some schedules were missed. However, on June 12 we made an easy QSO in about 20 minutes. I was 'O' copy at JA4BLC and JA4BLC was 'M' copy at the start and peaked 'O' copy. Antenna elevation at WB5LUA was 35 degrees and about 25 degrees at JA4BLC. I was running about 300 watts on 2424.050 MHz and a W2IMU feedhorn made from a 4 inch coffee can, a conical transition section to a 6 inch coffee can. Even though I was able to achieve greater than 20 dB return loss at both ports and greater than 22 dB of port-to-port isolation at both 2424 MHz and 2304 MHz, my sun noise was 2 dB higher on 2424 MHz. I am now constructing a W2IMU feedhorn specifically designed for 2304 MHz with a larger diameter drift section. My preamplifier is a new design ATF-36077 device with a measured 0.4 dB noise figure. Yoshiro now has two VE4MA 7289 cavities paralleled for 120 watts output to a W2IMU feed on his 20 foot dish and an FH35LG LNA.

"Yoshiro was my initial number 25 on 13 cm EME and I was his number 4."

Sizzling Summer Sporadic-E Season

Where does one start with what has been one of the most successful summer sporadic-E seasons? There have been days when the FAX machine has run out of paper, the phone answering machine is showing multiple messages, and CompuServe's sign-on message indicates many e-mail messages are waiting.

Some of you, for example **Larry Jones, WB5KYK**, reported that you had sporadic-E propagation almost every day during June. Several of you sent reports of highlights of your activities on the special days of propagation.

A number of you reported completing goals. Among stations getting their 100th country on 6 meters are K1HTV, W3EP, and WB4WTC. Among stations completing WAS on 6 meters are W6YLZ and N6CL (thanks to W1AIM for my 50th).

Probably the most special day was 21-22 June, where operators throughout the southeast, midwest, and parts of the southwest enjoyed a 2 meter sporadic-E opening that lasted, for some, upwards of 3-plus hours.

Let's get to some of the reports. **Andy Blackburn, WD4AFY**, in EM92, writes the following:

"I can only describe it as the 'wildest' conditions that I have ever seen on VHF. In all, I

worked 84 two meter stations in at least 33 grid locators, 10 of them new, placing me in excess of 175 grids on 2 meters.

"During the fantastic opening it was all I could do to keep up logging and working what sounded like a 20 meter rare DX pile-up. While making contacts on 2 meters, I announced that I was listening on 222.100 MHz. At 0047 UTC on 22 June I heard Jim Roseman, W9UD, in EN41 calling. I immediately responded. We exchanged '59' signal reports and grid locator info. While the signal was perfectly readable, the audio did sound somewhat like aurora.

"About 50 minutes later I once again worked Jim and then a minute later worked Peter Beedlow, NN9K, also in EN41. I believe this is only the second time that two-way sporadic-E communications has been reported on this band.

"My equipment on 2 meters includes a Kenwood TS-790s, a 170 watt brick with pre-amp, and a Cushcraft 215 WB antenna up 45 feet. I just got on 222 MHz about a month ago, and am using a Sinclabs transverter, a Uniden HR 2600 as the IF, a 100 watt brick with pre-amp, and a Cushcraft 225 WB antenna up 20 feet."

Among Andy's longest 2 meter DX are Larry Lambert, N0LL, in EM09, Kansas; Dan Van Orden, N7AQX, in EM18, Kansas; Richard Gobel, K0US, Lyle Hurt, KC0OG, and Larry Trumble, AE0G, in EN10, Nebraska; and Ray Gustafson, WB0HHM, in EN13, South Dakota.

Roger Webb, WB4WTC, in EM95, reported the following: "On June 21/22 I worked (or heard) 33 stations via sporadic-E on 2 meters. Stations in W5 and W0 areas, including LA, AR, TX, OK, MO, KS, and NE. The opening started at 2256 UTC and included the following stations: KB5WMY (EM32), N5TQB (EM31), heard WA5JCI, NV5W (EL09), WB5OBS (EM20), W5SFW (DM95), KA5WRG (EM15), K5SW (EM25), K5YY (EM36), N5LPI (EM12), N7AXJ (EM18), W0KEZ (EM17), W0RT (EM27), N0IGZ (EM27), N0YUB (?), heard N0WVI (EM18), KF5IU (EM31), W5PIC (EM16), KC0EH (EM27), WA0X (EM37), W0PW (EM26), WD5EWD (EM22), N0EWO (EM26), WQ0P (EM19), WB0CLL (EM28), K0US (EN10, NE), KW0A (EM28), N0VKK (EM29), N5NIO/0 (?), N5FEQ (EM15), heard WA5PFF (EM25), and heard W5UN on FAI.

"My last entry is heard W4ZD on FAI at 0148 UTC at 298° azimuth and 25° elevation. During the opening I heard many aurora like stations that I was unable to copy their call. Some one-way skip was observed as some stations had difficulty getting my call letters and I had the same trouble with some others. I heard stations in the next grids east of me still in the opening for about 10 to 15 minutes after it closed for me. The opening lasted 8 minutes shy of 3 hours. It was definitely the best sporadic-E opening I have ever experienced on 2 meters."

Fred Laun, K3ZO, in FM18, reports that he made 24 QSOs in 14 grids over an hour. He missed the first part of the opening because of thunderstorms in his area.

Gene Zimmerman, W3ZZ, reported working 43 stations (and hearing others) in the following grids: EM10, EM12, EM13, EM20, EM21, EM22, EM24, EM30, EM31, EM32, EM33, EM40, EM50, EL29, EL39, EL49, and EL59. States worked included Texas, Louisiana, Mississippi, Alabama, Arkansas, and Oklahoma.

Steve Harrison, KO0U/4, also in FM18, reports the following: "Got home from work at

exactly 2345 UTC; my wife fixed my dinner plate, then as she was going to the store, I brought it into the shack and fired up the packet and radios. Bingo—144 MHz sporadic-E spots had already begun to appear! Looked at the TS 700 S-meter, and it was as high as I've ever seen it go, and it was set on 144.150 MHz! Turned up the volume, found a KB5 on frequency in QSO with a W2, and I began tuning up the band. *I could not find a clear frequency all the way to 144.250 MHz!*"

Once in the action, Steve worked a number of stations over the next 2½ hours. Steve observed that some of the W5 stations had "fast tropo fading" indicating that there may have been some tropo enhancement enabling these stations to get into the "skip zone." He reported that the band dropped out for a time between 0145 and 0200, finally to die at 0220 UTC.

EME enthusiast **Dave Blaschke, W5UN**, in EL29, reported that he worked 106 stations in call areas W1, 2, 3, 4, and 8. His longest haul was Carl Huether, KM1H, in New Hampshire. **John Godwin, KB5IUA**, also in EL29, reported that he made 96 QSOs in 26 grids, nearly half of them new. **Dave Teague, KF5IU**, in EM31, reported that he made 118 QSOs in 22 grids. On the extremes were QSOs in FN03, 13, 23, 32, and 42.

Carl Huether, KM1H, in FN42, reports the following: "I believe that I was at the extreme eastern end of the opening. Other FN42 stations I heard are 30 to 60 miles west of me. I'm almost in FN43 and almost in Maine! The stations south and west of me were having a feeding frenzy. It sounded as if FN20, 21, 30, and 31 had the best conditions. Those guys were exchanging 59+50 reports! I was running 1500 watts to stacked 4218 XLs and getting creamed by two guys in FN20 who were running 10 watts! I heard EL39, 59, EM20, 21, and 41 weakly and couldn't bust the pile-ups. Dave, W5UN, at EL29, at around 1600 miles, is my best 2 meter DX so far." A the extreme Carl reports that he worked KB5IUA and W5UN in EL29; and WA5WXD and K5AZU in EM40, W5THT in EM50, N5TQB and KF5IU in EM31.

Larry Maguire, WD4MBE, in EM96, reported working the following grids (numbers of stations in parentheses): in EM14 (3), EM15 (2), EM16 (2), EM20, EM21, EM22, EM24 (2), EM25, EM26 (2), EM31, EM32, EM36, EM37, EM44, and DM95. He reports that overall he got 12 new grids.

According to Len Parsons, W5AL, **Phil Patterson, W5SFW**, was the only one in DM95 to get in on the opening, and then for only 20 minutes. Beginning at 2340 UTC he worked WB4WTC (EM95), W2MGF (FM03), WD4MBE (EM96), KC4WKJ (EM94), and AA4H (EM86).

Ron Klimas, WZ1V, in FN31 in Connecticut, reports the following: "Worked 36 W4/W5's in 14 different grids between 2252-0220 UTC, 21-22 June, including W5VAS (EM40), N5TQB (EM31), W5THT (EM50), NV5W (EL09), KB5IUA (EL29), N5HVJ (EL59), WB5OBS (EM20), KA5ULI (EM30), KD4MXE (EM61), WA5JCI (EM21), N5QBJ (EM42), N7JJS/5 (EM32), KC5MZ (EM51), and N5VVB (EL49), plus numerous others from Florida to Texas.

"The opening here was continuous for 3½ hours, very stable, with most signals 59 plus! Many stations worked in the beginning of the opening were heard for the remainder of the evening time and time again.

"I tried CQs on 222.100 several times throughout the opening but found no takers.



Burghardt INC.

AMATEUR CENTER



182 North Maple
P.O. Box 73

Watertown, SD 57201

"The what you say is what you get state"

SINCE 1937...

"Your Most **RELIABLE** Dealer"

we'll treat

you

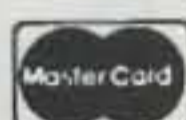
SELECTION

SERVICE

and

SATISFACTION!

HOURS: MON. - FRI. 9-5 p.m.;
SAT. 9-1 p.m.
CLOSED SUNDAYS/HOLIDAYS



Write for our
current bulletin
and used
equipment list.



SPECIAL

ICOM

Pricing
Ends Soon

Call Today

Offer Good Till 9-30-94

*Should Auld Acquaintance
Be Forgot...*

*... Just bring them all to
Sine Wave ...*

YOUR AULD AQUAINTANCES

L TO R: Jim Smith, President, with Stan Burghardt, founder.

reliable (rilai əb'l) *adj.* able to depend absolutely upon; able to place one's complete confidence in for all your ham radio needs, esp. relating to Burghardt Amateur Center.

CALL US TODAY!

reliable staff — most of our staff has been here at least 15 years. Stan's been here for 57 years.

reliable service — fully authorized Icom, Yaesu and Kenwood service center.



Burghardt INC.

AMATEUR CENTER

Sales Order Line
1-800-927-HAM 1(4261)

For Technical & Info.
(605) 886-7314

FAX (605) 886-3444

FAX PRODUCT INFO
(605) 886-6914

CLIP & SAVE

Call US TODAY!

reliable equipment — we have all the brands you want.

reliable used gear — fully reconditioned and guaranteed. We take trades. If we don't have what you want, get on our want list.



1994

1994

Wire & Coax

High Quality ... Low Price!

CABLE

- ☆ Flex-Weave™ 168 strand #14 wire: 12.8¢/ft for 1000ft
- ☆ 9913 type low-loss cable: less than 43¢/ft for 500ft
- ☆ 9914F Bury-Flex™, buriable, low loss cable: 64¢/ft for 500ft
- ☆ RG-213 Mil-Spec, direct burial replacement for RG-8/U as low as 39¢/ft for 500ft
- ☆ Ground Radial Wire solid #16 Cu: under 4¢/ft for 1000ft
- ☆ 450 ohm Ladder line as low as 14.5¢/ft for 500ft
- ☆ Call for other cable types, lengths, and S&H charges

1-800-950-WARE

Write for a FREE catalog (no calls please)

RADIOWARE  
PO Box 1478 Westford MA 01886
(508) 452-5555

CIRCLE 113 ON READER SERVICE CARD

Be an FCC LICENSED ELECTRONIC TECHNICIAN!



No costly school. No commuting to class. The Original Home-Study course prepares you for the "FCC Commercial Radiotelephone License." This valuable license is your professional "ticket" to thousands of exciting jobs in Communications, Radio-TV, Microwave, Maritime, Radar, Avionics and more...even start your own business! You don't need a college degree to qualify, but you do need an FCC License.

No Need to Quit Your Job or Go To School This proven course is easy, fast and low cost! **GUARANTEED PASS**—You get your FCC License or money refunded. **Send for FREE facts now. MAIL COUPON TODAY!**

COMMAND PRODUCTIONS

FCC LICENSE TRAINING, Dept. 96
P.O. Box 2824, San Francisco, CA 94126
Please rush FREE details immediately!

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____



Gary Dixon, K4MQG, Ted Goldthorpe, WA4VCC, and Bill Parris, AA4R, are lined up, to line up contacts for the ARRL June VHF QSO Party. Ted says this photo was not posed, that they really were all in QSO with someone at the moment of the shot. (Photo via WA4VCC.)

The FM simplex frequency of 146.52 MHz was just rolling with W5's though. I wonder if anyone made DX history on 222 MHz (or 432 MHz) last night? (See Andy, WD4AFY's report—ed.)

"This was by far the most intense long-lasting 2m Es opening I've ever heard!"

From **Herb Spoons, W3IWU**, the following: "A wild one running from before 2320 until 0220 UTC. Any so-called dropouts lasted no more than a minute a piece. From FN20FC logged EM31, 40, 50, 21, 22, 20, 12, 10, 61, 32, 42, 51, 33, 43 and EL29, 09, 59, 39, 49. There no doubt were more, but I neglected to write them down."

Pete Petri, WA5JCI, in EM21, reported the following: The band was open for him for 2½ hours. He worked 58 stations in the following grids: FM35, FM16 (2), EM96, EM91, FM19 (10), FM18 (5), FM27, FM20 (4), FM09, FM08, FM29 (7), EM79, FN30 (5), FN10, FN31 (2), FN20 (11), FM09, FM07, and FM17 (2). Eight of these grids were new ones for Pete.

Ray King, WB8YFE, in EN71, reported the following: Ray worked the first Florida station at 2324 UTC, with the band remaining open until 0225 UTC. He worked stations in EL95, EL96, EL97, EL98, EL99, EL87, EL88, EL89, EM70, and EM30. Ray states that for him it was one of the best quality sporadic-E openings that he had heard since getting on VHF in 1977.

Clint Walker, N1KTM/MM2, reports the following: From FM35 (off Cape Hatteras), EM32, EM12, EM22, EM21, EM15, EM24, EM14, EM45, EM13, EM43, EM36, EM26, EM33, EM35, and EM31, for a total of 41 stations. Incidentally, Clint has a new address. You can send for your QSLs to 21 Madison Drive, Sandwich, MA 02563. Clint will continue to be on-board the *S.S. Chemical Pioneer* until the middle of this month.

Your editor was alerted to the opening by a phone call from Roger Webb, WB4WTC. Roger told me that he thought we could work on 2

meters. I replied that I didn't think so because the 350 watt TE Systems brick was on the bed and the power supply was somewhere else in the bedroom, plus the 2 meter antenna was down, all as a result of my trip to Cuba.

Roger encouraged me to get on anyway. Thinking that the HF quad had been working on 6 meters, I reasoned that it might also work on 2 meters. I hastily put everything back together, connecting the HF quad to the linear. Not knowing anything about the SWR, I took a chance and turned on the TR 751. Immediately, I heard "K5YY, FM35." Not hearing anything else, I quickly announced "N6CL." Immediately I heard "N6CL, FM35." I responded by saying, "Wait a minute. Who is this?"

Clint came back and identified as "N1KTM/MM, off Cape Hatteras." "Hum," I said to myself, "I wonder what's going on." Two more contacts later—one with Larry, WD4MBE, and another with Howard Pullen, N4LFE, in FM06—I was convinced that we were having a barn-burning opening on 2 meters. Clint's signal remained in here for another half hour and then we lost all propagation. Locals **Larry Hazelwood, W5NZZ** (who had been hit by lightning only days before and had lost his 2 meter amplifier, and was running only 10 watts) and **Dwayne Angles, KA5WRG**, also got in on the action. Except for the contacts reported by Phil, W5SFW, in DM95, no other stations west of us reported any propagation.

In Florida **Bruce Sternstein, K2RTH**, in EL95, reported that he worked in excess of 100 stations. And **Lloyd Berg, N4UYO**, in EL88, reported that his best DX was VE4ZK in EN19.

Field Day Produces "Field Day" of Propagation

A number of you reported excellent propagation for Field Day. Some of you, however, were

surprised to find the band open to Europe. Just before Field Day started **Dave Batcho, N5JHV** called me to report that he was working Europeans. All told, Dave worked six stations in England, the Netherlands, and Belgium. After Field Day was under way a number of stations in Florida reported on an extended opening to Europe, some stations reporting in excess of 9 hours of propagation, with in excess of 130 contacts in 25+ countries being worked. A very partial list (supplied by Lloyd Berg, N4UYO) gives some idea of the enormity of the European stations on the band. Among the stations he worked were: IK2GSO, I3LLH, PA2VST, PA0LSB, DJ9KG, DL7QY, G6HCV, G4ASR, G4HBA, G4MKF, G0IMG, G1RMN, G1AWP, G0HNV, ON4PS, GW2HIY, SM7BAE, F1GXV, F5BYM, F5LNU, GW3MFY, EH7AH, EH1JV, EH1YV, EH1TA, CT4KQ, CT1VZ, and CU1EZ. Additionally, CU1EZ was worked as far west as EM25.

And from the British side, **Bob Mchenry, G3NSM**, reported the following North American stations: John O'Mara, WB4NFS/VP9 (FM72, John reportedly also got in on the opening, giving dozens of Europeans a new country), N4EJW (EL97, his son, N4EJV, was also active for over 9 hours during the opening), K4SC (EL98), N5JHV (DM62), KJ4E (EL98), NT4B (EL89), W4WHK (EM90), W5HUQ/4 (EM90), NU4Q (EL98), K3QKP (EL98), K2OU (EL87), WA4CHA (EL88), K8MFO (EM90), WC2G (EL88), KE4CXF (EL88), W4OO (EL96), K4FA (EL96), WD4MGB (EL87), and WB2QLP (EL96). Bob also reported almost making contact with **Leo, CM3ZD**. Leo did go on to make other European contacts. He is running 8 watts into a 3-element beam.

On Sunday many of the eastern US stations enjoyed an opening to the Caribbean. Stations worked included: VP5EE, V44KAI, TI2NA, TG9AJR, CO2KK, and a number of XE stations.

Bill Wiseman, KM1E, in FN53, in Maine, reported that he also got in on the Field Day action by working CU1EZ and CT1VZ on Saturday and V44KAI, VP9GE, KP4HX, TI2NA, KP4SQ, and VP2EHF on Sunday.

The action wasn't limited to 6 meters. I received the following report from **Jose Amador, CO2JA**: "This past Sunday, in the middle of Field Day, at noon I got engaged in my first sporadic-E QSOs on 2 meters. Scanning the band, I heard two unusual repeaters with 'W3' area calls. I spread the word in our local repeater and went to 144.2 MHz to see what I could do. My first impression was that some of the locals had noticed it first, because my S-meter was bouncing wildly with SSB. A quick CQ in FM gave no results.

"I looked for my cables and quickly I was tapping out the 455 kHz IF out from my FT230 via a minijack into a Sony ICF2001 portable receiver. It was not a local, but WM4D in FM16! He gave me a 599 +20 dB signal report! I made 10 QSOs, and 144.2 MHz looked like 50.125 before the band died. I managed to work also NG4C, K3GNC, NW3C, K2SMN, WA3HMK, W3HZW, K1HTV, KA1GD, and WN3A.

"My FT230 was modified several years ago and has three holes in its left side for the corresponding minijacks for PTT, keying, and 455 kHz IF out. I had previously modified it for 435 MHz Oscar 10 and 13 work using a varactor tripler, jumping 15 kHz in 70 cm and every 5 kHz in 2 meters.

"I managed to attract attention in spite of this limitation, but noticed that the band was pret-

Noise Killerst

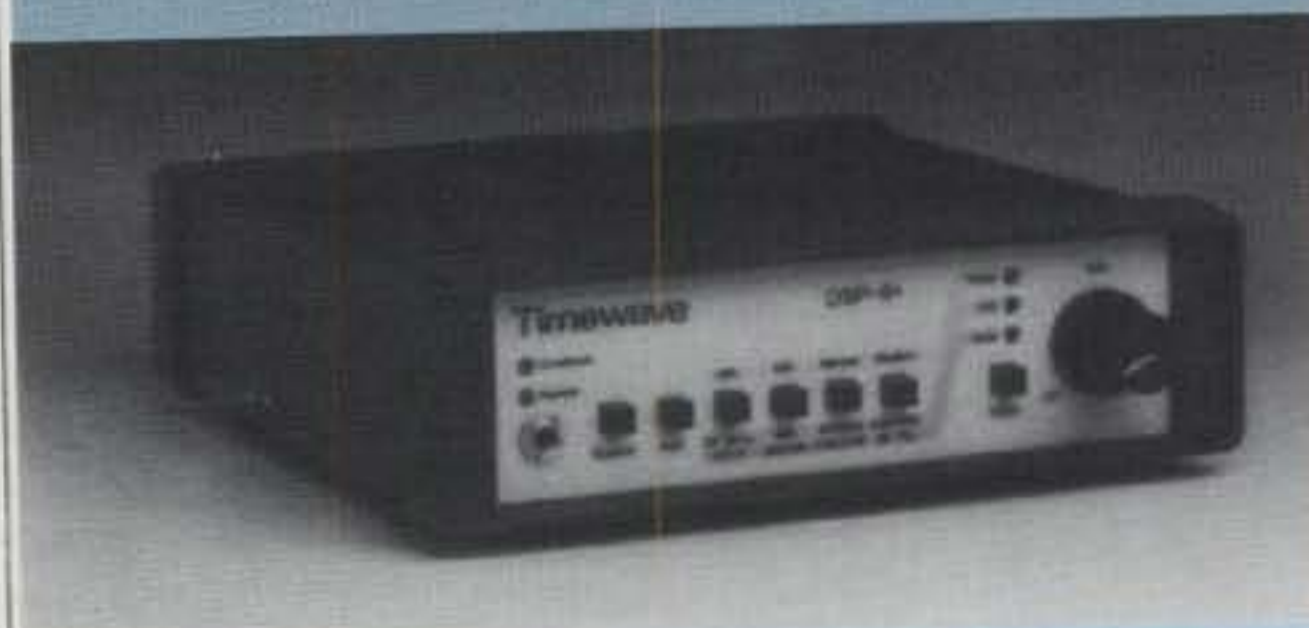
Advanced DSP Noise Filters For Voice, CW, and Data Modes

The TW DSP-9+ and DSP-59+ improve reception by simultaneously reducing random noise up to 20dB and heterodynes up to 50dB. TW DSP filters feature third generation 16 bit processing, providing razor sharp audio for SSB, CW and Data modes. Both have AGC for wider dynamic range and signal boosting/peaking, relay bypass and self test modes. A station requirement for weak signal, noisy band operation during the *LOW SUN SPOT CYCLE!*



NEW! DSP-59+ Multi-Mode Filter

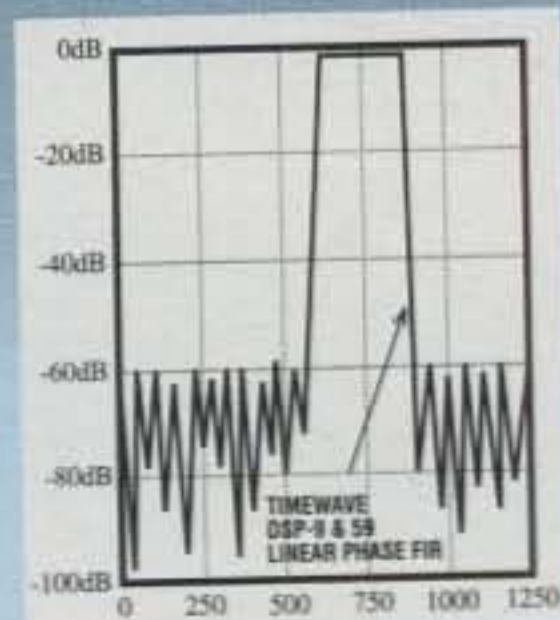
Now hundreds of CW and Bandpass filters allow the operator to select almost any filter combination. The easy turning filter knobs allow continuous coverage. Includes all data filters in the DSP-9+ plus G-TOR®, SSTV, EME and WEFAX. Voice filters cover 200Hz to 3.4kHz. 13 CW center frequencies, CW bandwidths from 25Hz to 600Hz and a CW marker to spot the center of narrow filters.



NEW! DSP-9+ Multi-Mode Filter

Push button selectable bandpass and automatic notch filters. SSB filters 1.6, 2.0, 2.4kHz, CW 100, 200 and 500 Hz. Programmable CW center frequencies 400/500/600/800Hz. HF data filters, HF Packet, PACTOR, G-TOR®, AMTOR, AM and RTTY with programmable center frequencies for North America and Europe.

G-TOR® is the registered Trademark of Kantronics.



DSP-59+ & DSP-9+ give steep-skirt filtering!

TIMEWAVE
TECHNOLOGY INC.

2401 Pilot Knob Road • St. Paul, MN 55120 USA
Phone: 612-452-5939 Fax: 612-452-4571

ty crowded, as I had to compete with Florida stations I did not hear, and I felt myself blanketed at times by others, in spite of my CQ attempts. Nevertheless, an unforgettable experience in the middle of Field Day!"

On The Air

The following is a collection of various reports I have received that just don't fit into the other topics:

Several of you sent copies of your summary sheets (and in a few cases, logs) of your activities during the ARRL June VHF QSO Party. Most of you reported that conditions were down from last year and a number attribute that to moving the contest to the earlier date. I have been advised by ARRL that this move was a "one time" occurrence to accommodate VHF-ers who also were participating in the ARRL National Convention. And I was one of those so accommodated.

A number of stations worked **5T5JC** during June for a new one. The farthest west report comes from **Larry Hazelwood, N5NZS**. A number of you worked Jimmy Treybig, W6JKV, as **VP5/W6JKV**. Jimmy reported making 1284 contacts, many with stations he had previously never worked on DXpeditions. As of this writing, Jimmy and **Mike Staal, K6MYC**, are operating from VP2V, making EME contacts on 6 and 2 meters. A rare double-hop opening enabled many on the west coast to work them. A number of west coast stations also worked **V31DE** for a new one on 6 meters.

Bill LeBaron, W0MTK, who regularly sends me a report, indicated one particular anomaly. On 15 June, after working a few VE6 stations, he noticed a long-delay echo (3-4 seconds) on the signal of VE6DSH. Such an event is one of those mysteries of propagation.

Al Van Buren, K7CA, in DM26, reported six

different days of openings on 2 meters: On 17 June he worked CN97 and CN88; on 21 June he worked EM14, EM15, EM25, and EM32; on 28 June he worked EM14, EM21, EM24, and EM32; on 5 July he worked 25 stations in the following grids, EL29, EL09, EM00, EM20, EM31, EL17, EM10, EM30, EM40, EM12, EL59, EM13, EM14; on 10 July he completed a meteor-scatter contact with Ralph Bowen, N5RZ, in DM81; finally, on 11 July he worked stations in EM31, EM12, EM21, EL29. Thanks to Todd Evans, KB6IGC, for this report.

George Washburn, KB5IHD, reported that he and **John Hall, KA0KUY**, worked several Florida stations on 2 meters sporadic-E around 0200 UTC on 10 July. Among the stations worked: WA4CHA, WA4LOX, K2RTH, KQ4PI, and WB2HNC.

Tony Everhardt, N8WAC, Gary Flynn, KE8FD, Jeff Klein, WA2TEO, Ed Johnson, WD5EWD, and Frank Moorhus, AA2DR, all sent me reports of propagation on 6 and 2 meters for early June, with some reporting multiple days of sporadic-E propagation on 2 meters.

Bob Daniel, N9OZM, in EM49 reported a 1400 mile contact with Allen Duddles, WA7GSK, in DN13 on 2 meters at 0128 on 6 July.

Tim Marek, NC7K, operating from DM19, reported excellent propagation during the CQ WW VHF WPX contest. Having hours of double hop into the east coast area on 6 meters was one of his highlights. For those of you who entered the contest, remember your logs must be postmarked by 31 August in order to be tallied for the contest results.

Current Conferences

VHF Southern California Get-Together: Ron Hammel, KC6WLC, has opened his ranch in Ventura County, California for a weekend get-

together of the VHF-UHF operators of southern California (or anyone who wants to travel to southern California, for that matter). Beginning at 1 PM Saturday, 17 September and lasting through Sunday afternoon, Ron will host visitors to the ranch. Ron says that there are a number of beds available for those who wish to spend Saturday night. To get to his QTH, take the Frazier Park exit off Interstate 5. Go 15 miles west to the ranch. About halfway there you will enter the Lake of the Woods. At Lockwood Rd. turn left and follow it to the ranch. Talk-in for directions is 144.210 MHz USB, or 146.55 MHz FM. For more information, contact Ron at 805-949-8219 evenings or 805-245-1009 weekends.

1994 Microwave Update: The following is taken from an information flyer supplied by Bill McCaa, K0RZ: "The 1994 Microwave Update Conference is returning to Estes Park, Colorado, where Don Hilliard, W0PW, held the first four conferences. This year's conference will be at the Inn at Estes Park on September 22, 23, and 24, 1994.

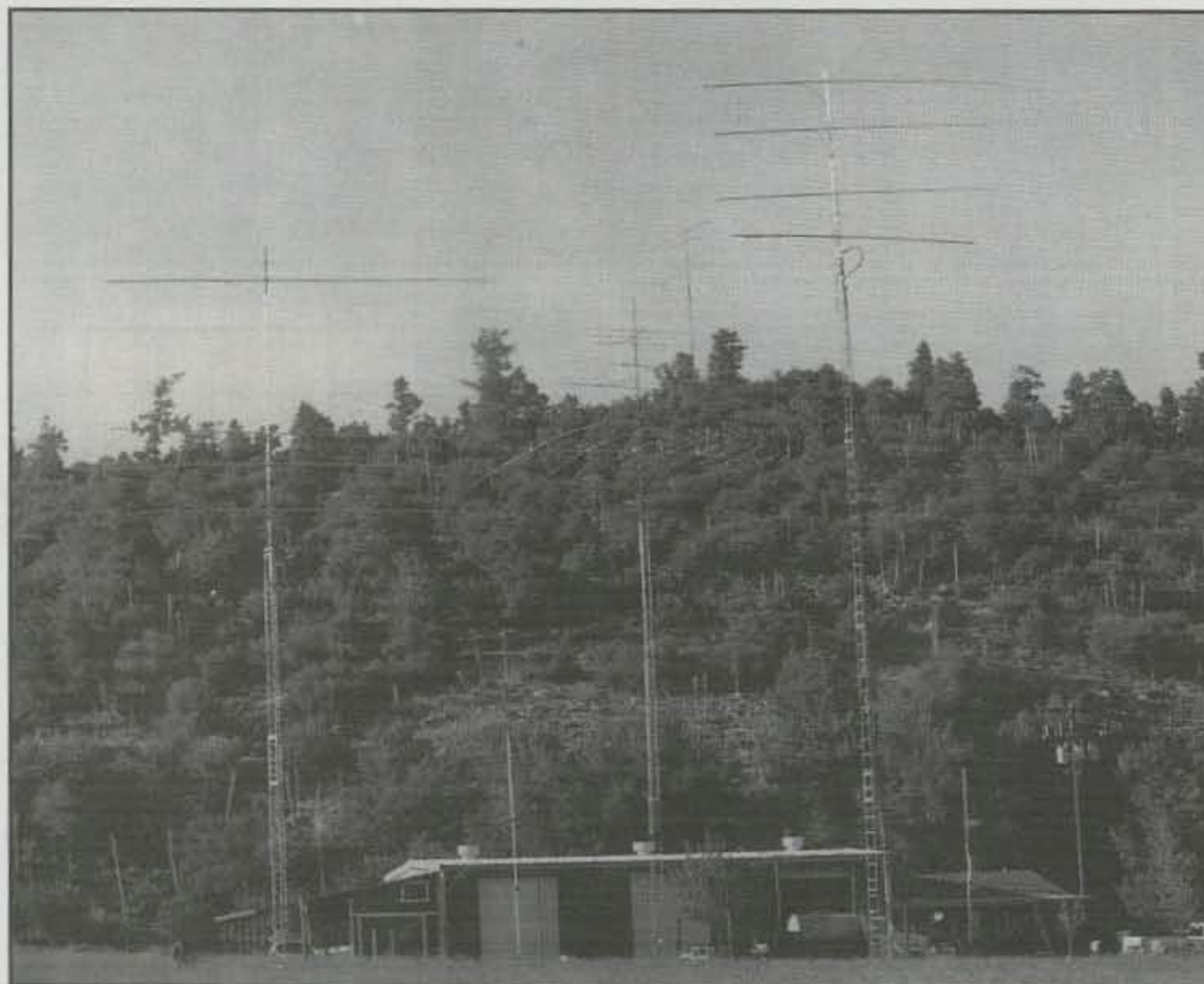
"The conference technical program is being developed by Al Ward, WB5LUA, and Jim Davey, WA8NLC. Some presenters scheduled are W3EP on Microwave Propagation; N6XQ on Microwave Operation California Style; K3SIW on Midwest Microwave Activities; W5IU on Future AMSAT Microwave Satellites; VE4MA on Feed Horn and Power Amplifier Design; WB5LUA on the Care and Feeding of PHEMT LNAs; W3HQT with a Video Tour of Down East Microwave; WA5TKU on YIG Oscillators/Sweepers; and WA6CGR on Phase Locked Sources. There will be a workshop panel discussion with KK7B, WA8NLC, W3HQT, and WB5LUA addressing the integration of commercially available amateur radio microwave kits into a working station. Discussions of microwave EME setup and operation lead by WB5VJB, and HeNe LASER DXing are also planned.

"As in the past, the ARRL will be publishing the *Proceedings*. All information on amateur microwave activity on 902 MHz and up is of interest. Additional speakers should contact Al Ward, WB5LUA, at (214) 699-4369.

"The conference will convene on Thursday evening September 22 and run through Saturday, September 24. On Thursday evening a meeting room will be available for visiting. Registration will take place between 7 PM and 9 PM in the lobby area outside the meeting room. Technical sessions will take place on Friday and Saturday morning. Friday evening there will be the swapfest and microwave band measurements of noise figure, scalar transmission and reflection, spectrum, and power. Everyone is encouraged to bring along microwave equipment for testing. The testing is provided to promote improved microwave station performance and not competition. Saturday afternoon is free time to enjoy the Colorado Mountains.

"Register for the conference as soon as possible so I can be sure that all needed facilities are available. Walk-in registrations are welcome, but at an increased fee. Conference pre-registrations were closed on August 15, 1994. The walk-in registration fee is \$45.

"The Inn at Estes, our conference host hotel, has a special room rate for the conference of \$62/night. The number of rooms is limited, and the closing date for room reservations is September 1, 1994. Contact the Inn at: Inn at



Ron Hammel, KC6WLC, will open his Ventura County, California ranch for a southern California get-together of VHF-UHF operators. (See text for more information. Photo via KC6WLC.)

Estes Park, 1701 Big Thompson Ave. (Hwy 34), P.O. Box 1408, Estes Park, CO 80517 (tel. 303-586-5363, 800-458-1182 outside Colorado). Be sure to mention you will be attending the Microwave Update 1994 Conference for the special room rate. Contact Charles' Tour and Travel at (303) 586-5151 for airline details and reservations."

For more information, contact Bill McCaa, KØRZ, P.O. Box 3214, Boulder, CO 80307-3214 (tel. 303-441-3069 work).

Current Contests

Canadian Sprints: The Radio Amateurs of Canada are sponsoring their annual Sprints beginning this month. All Sprints, except the 50 MHz Sprint, run from 1900 to 2300 local time. The 50 MHz Sprint runs from 1000 to 2400 UTC.

The first Sprint is the Microwave Sprint. It is set for 1 September and includes 902, 1296, and 2304 MHz. The second one is the 432 MHz Sprint and it is scheduled for 7 September. The third one is the 220 MHz Sprint. It is scheduled for 13 September. Canadians will monitor 222.100 in an effort to work south into the States. The fourth one is the 144 MHz Sprint. It is scheduled for 26 September. The last one, the 50 MHz Sprint is scheduled for 1 October. Exchange is your grid square and contacts are worth one point per QSO in each contest. Scoring for each Sprint is the grid squares multiplied by the total QSOs. Please note: No FM contacts are allowed on 146.52 simplex or via any repeaters. Mail your logs to RAC Vice President and VHF column editor, Dana Shtun, VE3DSS, 500 Willard Ave., Toronto, Ontario, M6S 3R6, Canada.

September ARRL VHF Contest: The September VHF contest is similar to the June VHF QSO Party. The contest starts Saturday, 10 September at 1800 UTC and ends Monday, 12 September at 0300 UTC. Full rules can be found in August QST.

ARRL 10 GHz Cumulative Contest: The second weekend of this contest is September 18-19, from 8 AM local to 8 PM local. A summary of the rules can be found in last month's column. Incidentally, the San Bernardino Microwave Society is sponsoring a plaque for the winner of this contest. This is the first time that the society (or anyone else, for that matter) is doing so.

Next month: The first weekend of the ARRL EME contest is set for 29-30 October. Conversations with the organizers of the Algonquin dish at Dayton lead your editor to believe that it will once again be on the air for the contest weekends. More information on that will hopefully be in next month's column.

Current Meteor Showers

Two minor showers, the α Aurigids (1-2 September) and the Piscids (two peaks, 8 and 21 September) can be seen this month. However, their activity has not been much above what is considered sporadic activity. Nevertheless, there is an increase of sporadic activity during this time of the year, especially in the morning hours. Because of this, meteor contacts can be completed almost every day on 6 meters and quite often on 2 meters. With regard to 6 meters, your editor can set his quad in the direction of the NØLL beacon (from here in Oklahoma City) and, at some time during every

morning, hear it for upwards of a minute, more than ample time to complete a meteor QSO.

And Finally

Cuban QSLs: I have the logs for COØFRC, COØBGG, COØEGZ, and CO2OJ/R. I will be handling the QSLing for these contest stations. Additionally, I have the logs for COØFRC's 1993 operation and can supply cards for them. Also, I have agreed to become Oscar Morales, CO2OJ's manager. I am not the manager for Arnie Coró, CO2KK. His cards go to W9JUV.

NN7K beacon back on: Jim Foster, NN7K, reports that his 6 meter beacon is back on the air from his backyard in DM09. He does shut it off when he is home and on the air. It runs 1 watt to a Ringo Ranger antenna.

My apologies go to an "N9" station who called me to report working PAØLSB. In my

haste I grabbed the first piece of paper I could find, which turned out to be a deposit receipt. I have since misplaced it and lost the record.

Once again this column is packed full with information supplied by you. In fact, I had to leave out some of the information this month. I will hopefully include it in next month's column. I thank all of you who have sent, FAXed, e-mailed, or called in materials to me.

Please continue to make this, your column, successful by continuing to contact me. You may call me at 405-528-6625, FAX me at 405-528-0746, e-mail me at 72124.2734@compuserve.com, or mail me your material at the address printed at the bottom of the first page of this column. Be sure, though, that you use the correct zip code—73101. Thanks.

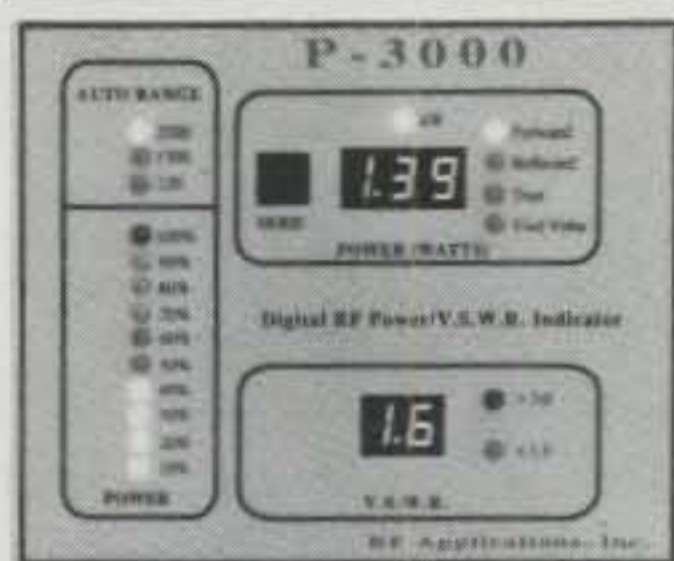
And thanks again for your support. Until next month ...

73, Joe, N6CL

RF Applications, Inc.

P-3000 Digital RF Power/V.S.W.R. Indicator

Peak Power Reading • Instant V.S.W.R. Readings • Bargraph



- 1.8 - 30 MHz
- 10 - 2950 Watts
- 1.0 - 19 V.S.W.R.
- Remote coupler
- NO RANGE SWITCHES
- Extensively tested
- Amplifier protection relay for high V.S.W.R.
- Includes cables & coupler
- Two year limited warranty

Price: \$299.00 + s/h

9310 Little Mountain Road
Kirtland Hills, OH 44060

ORDERS: 800.423.7252

Information: 216.974.1961

The RF Applications P-3000 is unlike any power/V.S.W.R. meter you have ever seen. It provides instantaneous readout of your station's most vital parameters. Using a remote coupler design, the P-3000 displays power from 10 to 2950 watts, V.S.W.R. from 1.0 to 19, and a unique, autoranging bargraph replicates the operation of your familiar meter movement. *Order yours today!*

Two Meter Deviation Monitor also available. *Please call for information.*

CIRCLE 92 ON READER SERVICE CARD

ASSOCIATED RADIO

If your operating needs have outgrown your current equipment call us about trading it in on a new or newer used rig to fit your needs. Our competitive prices and top trades will keep you coming back.

KENWOOD COMET
MFJ rfconcepts Cushcraft
YAESU ASA Kantronics
BUTTERNUT
ICOM ALINCO DAIWA



SERVICE FACILITIES AVAILABLE CALL FOR DETAILS
WE TRADE USED FOR USED, AND BUY USED EQUIPMENT

WE BUY AND SELL TOP QUALITY AMATEUR EQUIPMENT
FROM VINTAGE TO STATE OF THE ART

PRICING & ORDERS 1-800-497-1457

Send \$3.00 for catalog and used equipment list.

8012 Conser - Box 4327
Overland Park, KS 66204

USED AND TRADES
FAX

913-381-5900
913-648-3020

THINGS TO LEARN, PROJECTS TO BUILD, AND GEAR TO USE

Telephone Interference and The FCC

Earlier this year the FCC, cognizant of the over 25,000 complaints per year from persons experiencing telephone interference, decided to conduct an interference survey. Across the country 35 FCC field offices participated in the survey. Each office chose three recent complaints of telephone interference on a random basis and then investigated the complaints.

At the transmitting station causing the interference, the FCC investigators determined the type of station (amateur, CB, broadcast, etc.), measured the station power, and obtained data on antenna height, antenna gain, and the distance of the station to the complainant.

At the complainant's location, the investigators disconnected all the phones, took them to a chosen telephone jack, and plugged them in, one at a time, while the station was transmitting. The investigators then recorded which telephones received interference and which did not.

The FCC also tested the effectiveness of several commercially available filters, connecting the filters in-line while the station was transmitting.

The FCC summary states that this survey is based on a random sample, since it cannot be claimed that identical results would be derived under scientific surveying or testing, nor should the results be construed as FCC endorsement and criticism of any particular manufacturer's product. The FCC believes "these results to be a good 'first look' at the problem."

The investigators inspected 108 random cases of interference from stations ranging in power from 2 watts to an international shortwave broadcasting station of 500 KW. Of the stations, 47 were CB, 27 amateur, 23 AM broadcast, 10 FM broadcast, plus the international station.

In the complainant's homes 241 telephones were tested for interference. Of these, 68 percent received interference while 32 percent did not.

Various in-line filters were tested. The AT&T Z100B1 filter was tested on 138 phones; 62 percent of the phones continued to receive interference. Other filters were tested. As a group, these filters did not eliminate interference in 71 percent of the phones.

The FCC also tested two makes of RFI-filtered ("bullet-proof") phones. These

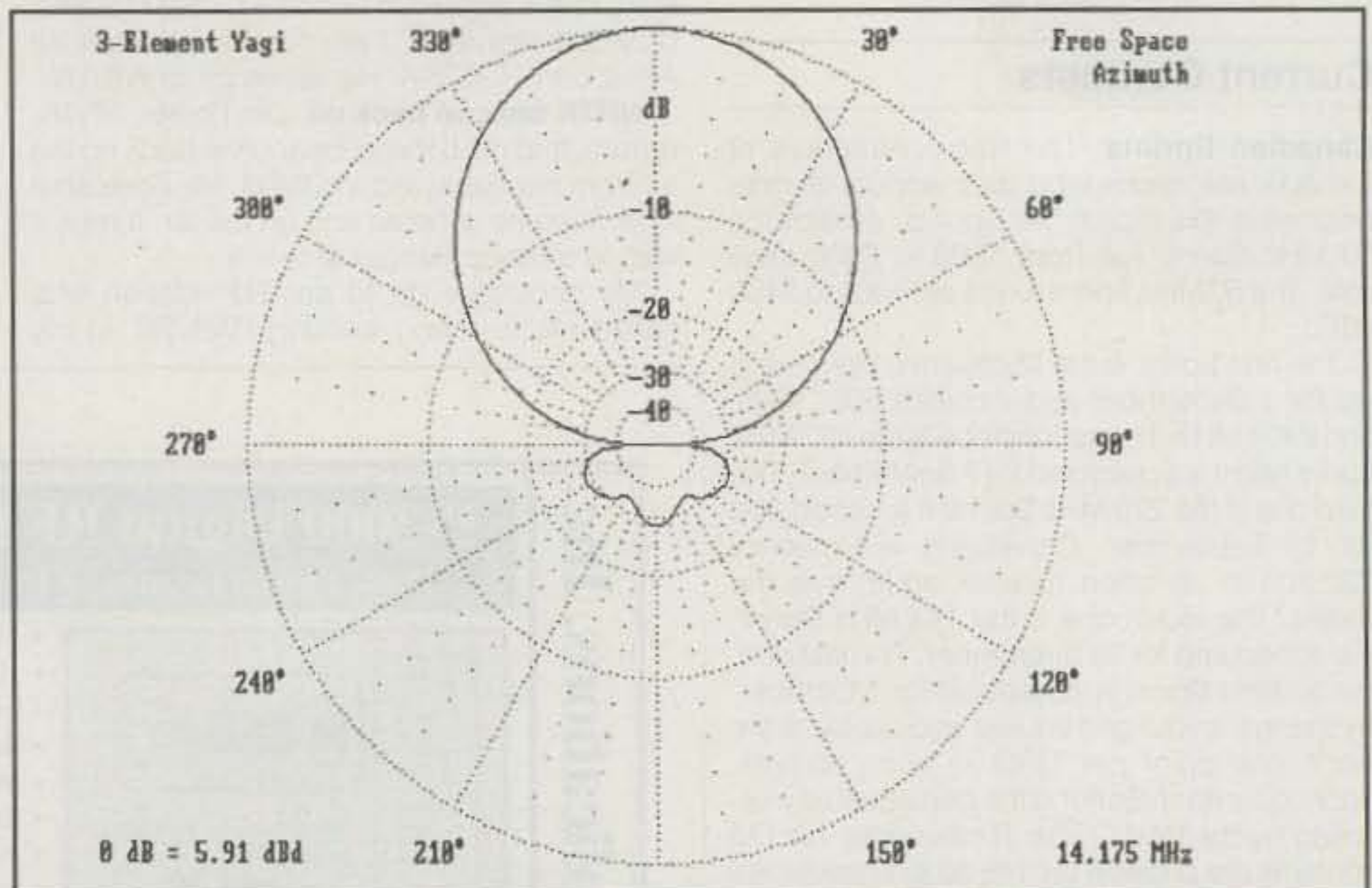


Fig. 1— Classic plot of Yagi in free space. Gain is 5.91 dBd.

phones eliminated interference at 96 percent of the locations!

The FCC Conclusions

1. The stations most likely to cause telephone interference are CB operators, who accounted for half the interference cases. Amateur and broadcast stations accounted for the other half.

2. The power levels used by the transmitting station did not appear to be a significant factor in causing telephone interference. Power levels of 10 watts or less caused telephone interference in a third of the cases.

3. A large proportion of residential telephones appear to be susceptible to radio interference. Although some phones did not receive interference, the limited nature of the testing performed in this survey would not support the conclusion that they would always reject interference.

4. Telephone interference filters cannot be relied upon to eliminate all telephone interference. In two out of three cases in the test sample they did not work. One of the reasons for the poor showing of the filters is that the filters are designed to be effective over a specific range of frequencies. An HF filter, for example, may be ineffective in curing an interference problem caused by a VHF transmitter.

5. Telephone interference can be cured. In some cases a combination of filters and

immune telephones is required for a complete solution. In other cases separate filters may be required for both telephone lines and handsets.

6. Manufacturers are able to design telephones to be interference-free.

Thoughts on The Survey

A good summary of the survey is given in the ARRL Letters¹ of March 24 and May 10, 1994.

It would have been helpful if the FCC survey listed the operating frequency of the radio stations surveyed. This would have clarified some obscure points and may have modified some of the conclusions, especially with regard to the filters.

A number of independent tests run by interested amateurs on telephone line filters using laboratory-grade test equipment have shown that a filter attenuation of at least 40 dB from 1.8 to 50 MHz is generally required to clean up HF interference coming into the telephone via the line. Various filters were tested and one, the TCE TPE 5302, met or exceeded this attenuation level across the passband. The FCC did not test this filter. On the other hand, the filters tested by the FCC, with the exception of the AT&T unit, were not tested by the amateurs. As the FCC survey says, "The filters . . . deserve further study."

One RFI-filtered ("bullet-proof") tele-

48 Campbell Lane, Menlo Park, CA 94025

Explore the Kenwood Dimension

The finest selection of communications equipment for the Amateur Radio enthusiast

H F T R A N S C E I V E R S



TS-950SDX •160m to 10m amateur band operation, 100kHz to 30MHz general coverage receiver •Built-in DSP (Digital Signal Processor) •MOS-type FET final section •Dual frequency receive •Menu system



TS-850S •160m to 10m amateur band operation, 100kHz to 30MHz general coverage receiver •DDS (Direct Digital Synthesizer) & digital PLL system •AIP (Advanced Intercept Point) system •IF slope tuning •Electronic message keyer circuit with weighting control



TS-450S/690S •160m to 10m amateur band operation, 500kHz to 30MHz general coverage receiver •6m amateur band and 50-54MHz general coverage receive (TS-690S) •DDS (Direct Digital Synthesizer) & digital PLL system •AIP system •IF shift function tuning •AF notch filter



TS-140S •160m to 10m amateur band operation, 500kHz to 30MHz general coverage receive •IF shift circuit •31 memory channels with multi-scan functions •Dual-mode noise blanker •Speech processor with audio compression amplifier

A L L - M O D E T R A N S C E I V E R S



TS-50S •Super-compact, 100-watt, 160m to 10m transceiver, 500kHz to 30MHz general coverage receiver •DDS (Direct Digital Synthesizer) with "fuzzy logic" control •AIP system •100-memory channels •CW reverse •Menu system



TS-790A •144/440MHz dual-band operation •1200MHz unit (option) •All-mode operation •Satellite communications with Doppler effect frequency correction •59 multi-function memory channels with lithium battery back-up



TS-60S •50MHz all-mode operation •Max. 90W RF output (SSB, CW & FM) •100 memory channels •DDS with "fuzzy logic" control •AIP, IF shift (SSB & CW) and optional 500Hz CW filter •Dual-menu system



TM-255A/455A •All-mode operation (TM-255A: 144MHz; TM-455A: 430MHz) •101 memory channels •DDS with "fuzzy logic" control •TF-SET (TX frequency set) function •DTSS selective calling with page •1200/9600bps packet terminal

F M M O B I L E T R A N S C E I V E R S



TM-742A/642A/942A •Multi-band operation (TM-742A: 144/440MHz; TM-642A: 144/220MHz; TM-942A: 144/440/1200MHz) •Optional FM band units for TM-742A/642A (TM-742A: 28/50/220/1200MHz; TM-642A: 28/50/440/1200MHz) •Dual/triple receive capability •101 memory channels per band •Detachable display & control panels (option)



TM-733A •144MHz/440MHz dual-band operation •Dual receive on same band (VHF+VHF or UHF+UHF) •"6-in-1" programmable memory •72 memory channels •DTSS selective calling with page •1200/9600bps packet terminal •AIP system •Cross-band repeater function



TM-241A/331A/441A/541A •Single-band operation (TM-241A: 144MHz; TM-331A: 220MHz; TM-441A: 440MHz; TM-541A: 1200MHz) •20 multi-function memory channels plus call channel •Multi-scan capability •Selectable CTCSS tone encoder •Multi-function microphone supplied



TM-251A/451A •Single-band operation (TM-251A: 144MHz; TM-451A: 440MHz) •41 memory channels (optionally expandable to 200) •Dual-band receive •Digital recording system •DTSS selective calling with page •1200/9600bps packet terminal

C O M M U N I C A T I O N R E C E I V E R



R-5000 •100kHz to 30MHz in 30 bands, with optional 108-174MHz coverage •SSB, CW, AM, FM & FSK modes •Dual IF crystal filters •IF shift circuit •100 memory channels with multi-scan functions

F M H A N D H E L D T R A N S C E I V E R S



TH-79A •144MHz/440MHz dual-band operation •Compact, light design •Mos FET power Module •Dot-matrix LCD, Guide function & menu system for easy operation •Dual receive on same band •82 non-volatile memory channels in EPROM •ID memory & DTMF memory •Built-in CTCSS encode/decode •Cross-band repeater function



TH-28A/48A •Single-band transmit and dual-band receive (TH-28A: TX 144MHz/RX 144/440MHz; TH-48A: TX 440MHz; RX 144/440MHz) •Alphanumeric memory •Alphanumeric message paging •40 multi-function memory channels (non-volatile) •Tone alert system with indicator



TH-22AT/42AT •Single-band operation (TH-22A: 144MHz; TH-42A: 440MHz) •MOS FET power module •Built-in DTMF keypad •40 memory channels in EPROM (plus 1 call channel) •Multiple scan functions •Dual scan stop modes (CO & TO) •Channel Display function

KENWOOD COMMUNICATIONS CORPORATION
AMATEUR RADIO PRODUCTS GROUP

P.O. BOX 22745, 2201 East Dominguez St., Long Beach, CA 90801-5745

•Customer Support/Brochures (310) 639-5300

•Repair Locations/Parts (800) KENWOOD •Bulletin Board Service (BBS) (310) 761-8284

KENWOOD ELECTRONICS CANADA INC.

6070 Keele Road, Mississauga, Ontario, Canada L5T 1S8

KENWOOD

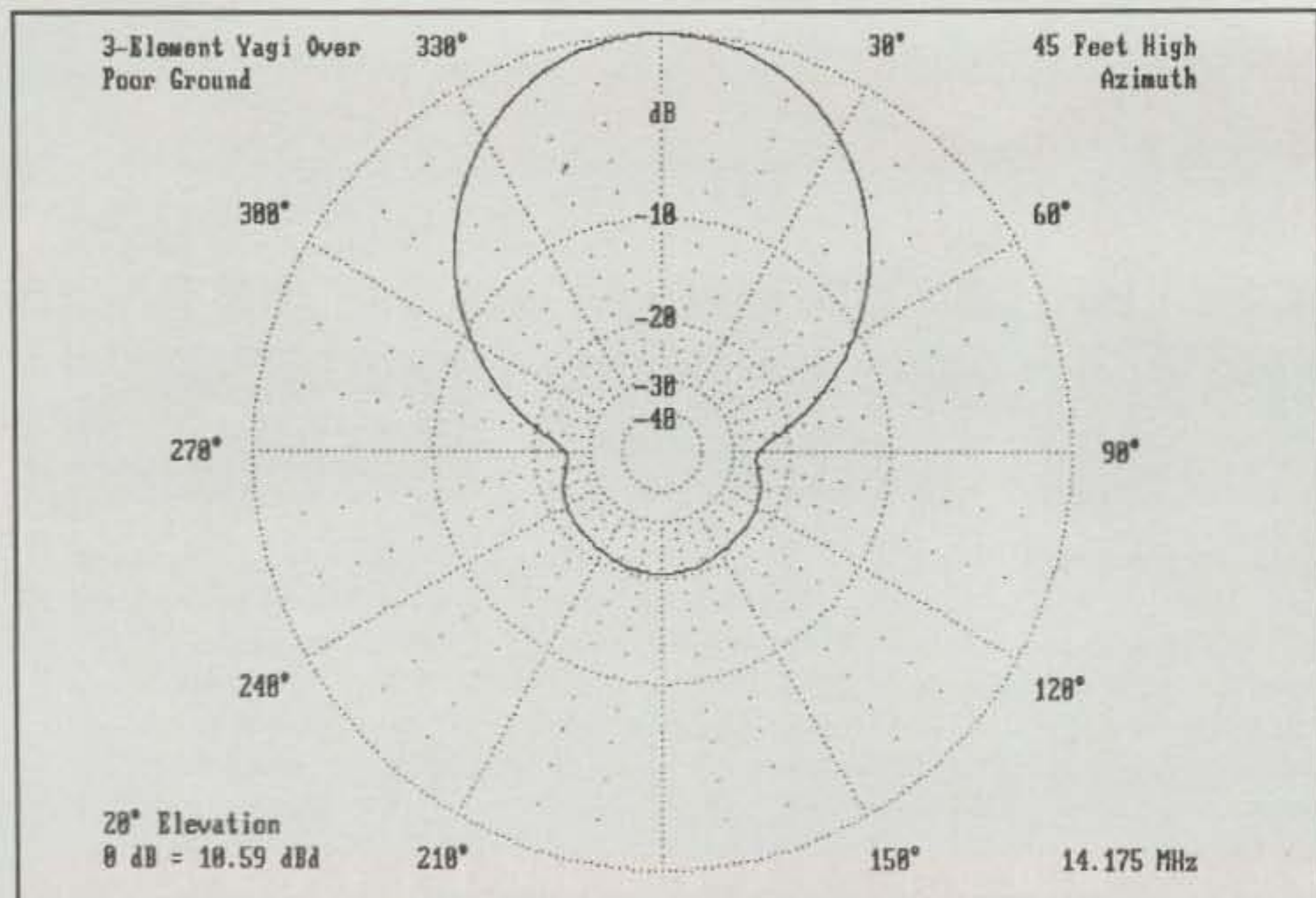


Fig. 2—Plot of same Yagi 45 feet above poor ground. Compare front-to-back and front-to-side ratio with fig. 1. Gain figure includes ground reflection gain.

phone successfully tested by the FCC is supplied by Pro Distributors, 2811 74th St., Lubbock, TX (1-800-658-2027). The phone is an internally-modified Western Electric desk-model touch-tone unit. Cost is \$79.95 plus shipping.

Another RFI-filtered phone successfully tested is supplied by TCE Labs, RR9, Box 243D, New Braunfels, TX 78133 (1-210-899-595). They provide either a wall- or desk-type internally modified phone at \$49.95, plus shipping.

After reading the survey results, my conclusion is that to make sure the household phone system is completely RFI-free, attention must be paid to both the phone and to the wiring in the home. In many instances an RFI-filtered phone is a necessity. Even then, it may be susceptible to interference in some cases if the telephone line in the residence is improperly installed, or if the transmitting antenna is close and parallel to the existing telephone line. A good line filter will clean up the line in the residence, but if the internal circuitry of the phone is RF-sensitive, interference will continue to be present.

My friend Tiff, W6GNX, found his residence a maze of RFI-prone telephone line looping up and down around the rooms. His solution was to ignore this mess and install a new, shielded telephone line, running close to ground level. This drastic approach may be needed in "unsolvable" cases.

Phone Manufacturers—Part of The Problem or Solution?

The ultimate solution to this universal problem lies with the telephone manufacturer! The FCC survey provides a long

list of telephone makes subject to interference which includes many well-known brands: AT&T, Bell, Conair, General Electric, GTE, Northern Telecom, Northwestern Bell, Panasonic, Radio Shack, Sears, Southwestern Bell, Unisonic, Western Electric . . . the list goes on and on.

The ironic fact is that the majority of these manufacturers also sell phones that seemingly are not susceptible to interference, even with no line filtering! What is the electrical difference between the telephones receiving interference and those which are not? The FCC is mute on this point.

The only way to get a handle on this problem is for some institution to devise a standardized laboratory testing procedure using controlled conditions and run a number of various makes and types of phones through the tests. The phone circuitry should be examined, phone by phone, to determine the RF-sensitive areas. Internal filtering or circuit changes can then be incorporated in the phone unit during the manufacturing process.

Next the home telephone wiring system should be studied. A haphazard, sloppy wiring job is a direct invitation to interference. Are shielded telephone lines worth the extra expense? What building codes, if any, apply to telephone installations?

Finally, telephone interference problems and solutions in other countries should be studied. This might be accomplished by the ARRL through the office of the International Amateur Radio Union (IARU). I have heard that Germany has strict control of spurious radiation from home appliances and also laws governing telephone installation and interference levels. Is this true? We might learn a lot by examining what others are doing



KENWOOD



	List	Juns
HF EQUIPMENT		
TS-950SDX Dlx xcvr w/keyer/DSP/filt	\$4799.95	Call \$
TS-850S 9-band transceiver w/mic	1949.95	Call \$
TS-850S/AT 9 band transceiver w/tuner	2149.95	Call \$
TS-450S 9-band xcvr/SW Rcvr/mic	1439.95	Call \$
TS-690S 9-band xcvr w/6m/mic	1899.95	Call \$
TS-450S/AT 9-band xcvr/tuner/mic	1639.95	Call \$
TS-50S Super compact HF xvr	1279.95	Call \$
AT-50 External automatic tuner	354.95	Call \$
TS-60S Super Compact 6M xvr	1209.95	Call \$
TS-140S 9-band HF transceiver w/mic	1079.95	Call \$

	List	Juns
ACCESSORIES		
TL-922A 2KW PEP HF linear (3-500Zs)	2099.95	Call \$
SM-230 Sta. monitor w/pan; 950/850	1099.95	Call \$
DSP-100 Digital signal proc. 450/850	669.95	Call \$
SW-2100 1.8-30MHz SWR/pwr meter	164.95	Call \$

	List	Juns
RECEIVERS		
R-5000 100 KHz-30 MHz receiver	1179.95	Call \$



	List	Juns
VHF/UHF		
TS-790A 45w 2m/40w 440 SSB/FM xcvr	2149.95	Call \$
TM-642 50w 2m/25w 220 FM xcvr/TTP	929.95	Call \$
TM-742A 50/35w/2m/440 FM xcvr w/TTP	929.95	Call \$
DTU-2 Digital paging unit	29.95	Call \$
DFK-4 13' remote cable kit	51.95	Call \$
DFK-7 23' remote cable kit	84.95	Call \$
TSU-7 CTCSS decoder unit	55.95	Call \$
UT-28S 50w 10 meter unit	339.95	Call \$
UT-50S 50w 6 meter unit	339.95	Call \$
UT-220S 25w 220 MHz unit	339.95	Call \$
UT-1200 10w 1.2 GHz unit	439.95	Call \$
TM-942A 2m/440/1.2 FM Xcvt/TTP	1279.95	Call \$
TM-733A 2M/70cm Mobile	749.95	Call \$
TM-255A FM,SSB,CW,2M, Detach Panel	1109.95	Call \$
TM-455A 440MHz Mobile, Detach Panel	1279.95	Call \$
TM-251A 50w 2m FM Xcvt w/TTP mic	529.95	Call \$
TM-331A 25w 220 FM Xcvt w/TTP mic	519.95	Call \$
TM-441A 35w 440 FM Xcvt w/TTP mic	529.95	Call \$
TM-541A 10w 1.2GHz FM Xcvt w/TTP mic	649.95	Call \$



	List	Juns
HANDHELDS		
TH-28A 2.5W 2m FM HT/batt/cgr/TTP	399.95	Call \$
TH-48A 2W 440 FM HT/batt/cgr/TTP	449.95	Call \$
TH-79A 2.7W 2m/440 FM HT easy to use	599.95	Call \$
TH-22AT 3W 2m FM HT	349.95	Call \$
TH-42AT 2.5W 440 FM HT	389.95	Call \$

1-800-882-1343

FAX 310-390-4393
5563 Sepulveda Blvd.
Culver City, CA 90230

About 2 1/2 miles from LAX-North on I-405

Out of State 1-800-882-1343

310-390-8003 FAX 310-390-4393

HOURS M-F 9:00 - 5:30 SAT 9:00 - 5:00 ESPANOL
5563 SEPULVEDA BLVD., CULVER CITY, CA 90230



SPECIAL DISCOUNTS EXP. 9/30/94

ICOM



HF Equipment	List	Jun's
IC-781 Super Deluxe HF Rig	\$6932.00	Call \$
IC-736 New HF Xcvr w/6 Meters	2310.00	Call \$
IC-707 New HF	1012.95	Call \$
IC-765 All-Mode HF	2913.00	Call \$
IC-737A Full Featured HF	1652.00	Call \$
IC-728 New, All-Band HF	1105.00	Call \$
IC-729 All-Band HF Plus 6 Meters	1492.00	Call \$
IC-2KL 500w, Amp	2260.00	Call \$
IC-4KL 1 kW Amp	7865.00	Call \$
Receiver		
IC-R1 100 kHz - 1300 MHz	567.00	Call \$
IC-R72 30 kHz - 30 MHz Rcvr	1145.00	Call \$
VHF		
IC-2GXAT Up To 7W Output, HT	359.95	Call \$
IC-T21A 2M HT, Rec 440MHz	395.95	Call \$
IC-P2AT HT	399.95	Call \$
IC-2GAT 7W HT	425.95	Call \$
IC-2SRA 2M HT, Scanner	599.95	Call \$
IC-281H 2M Mobile, Rec. 440MHz	462.95	Call \$
IC-901 Remote Mount Mobile	1119.95	Call \$
UHF		
IC-T41 New, 440MHz HT	472.95	Call \$
IC-P4AT HT	492.95	Call \$
IC-4SRA 70cm HT w/Scanner	612.95	Call \$
DUALBANDERS		
IC-V21AT 2M/220MHz HT	783.95	Call \$
IC-2330 2M/220MHz Mobile	865.95	Call \$
IC-W21AT 2M/440MHz HT	625.95	Call \$
IC-2340H 2M/440MHz Mobile	799.95	Call \$
IC-2700H 2M/440MHz Mobile Detch Panel	959.95	Call \$
IC-820H 2M/440MHz All-Mode	1999.95	Call \$
IC-Δ1A 2M/440/1.2GHz, HT	TBA	Call \$
IC-X2A 440MHz/1.2GHz HT	772.95	Call \$
IC-Δ100H 2M/440MHz/1.2GHz Mobile	1689.95	Call \$
220 MHz		
IC-P3AT, Mini FM HT	452.00	Call \$
IC-3SAT, 2.5W, 220 HT	399.00	Call \$

YAESU



HF Equipment	List	Jun's
FT-1000D Top Performer	\$4919.00	Call \$
FT-990 All Mode	2579.00	Call \$
FT-747GX Econo Performer	909.00	Call \$
FT-890 HF Base w/ Gen. Cov.	1439.00	Call \$
FT-840 New Compact HF	999.00	Call \$
FL-7000 15m-160m Solid State Amp	2459.00	Call \$
Receivers		
FRG-100B Mini Receiver	669.95	Call \$
VHF		
FT-11R, New Worlds Smallest 2M HT	369.00	Call \$
FT-11RH 5 Watt Version of FT-11R	389.00	Call \$
FT-23 R/17 Mini HT	299/329	Call \$
FT-2200 50w, 2m Mobile	449.95	Call \$
FT-2400 50 Watt, Mobile	439.00	Call \$
FT-2500M New, Rugged 2 Meter Mobile	439.00	Call \$
FT-290R/690R-6M, All Mode Portable	699/839	Call \$
UHF		
FT-41R, Worlds Smallest 440MHz HT	429.00	Call \$
FT-7200 35w, 440MHz Mobile	579.95	Call \$
FT-7400H New, Rugged 440MHz Mobile	569.00	Call \$
FT-790 R/II 70cm/25w Mobile	819.00	Call \$
VHF/UHF Full Duplex		
FT-736R, All Mode, 2m/70cm	2149.00	Call \$
Dual Bander		
FT-530 2m/70cm HT	569.00	Call \$
FT-5100 Compact 2m/440 Mob.	749.00	Call \$
FT-5200 Compact 2m/440 Mob.	789.00	Call \$
FT-6200 Cpt 440/1.2 GHz Mob.	879.00	Call \$
1.2 GHz		
FT-911 Compact HT	529.00	Call \$
FT-912 10w Mobile	709.00	Call \$
Repeaters		
FTR-2410 2m Repeaters	1247.00	Call \$
FTR-5410 70cm Repeaters	1247.00	Call \$
Rotators		
G-800SDX med./hvy. Duty	439.00	Call \$
G-1000SDX Heavy Duty.	539.00	Call \$
G400RC Light/Med. Duty II sq ft	449.95	Call \$

SR STANDARD

HandHelds	List	Jun's
C168A Mini 2 Meter	\$469	Call \$
C188A Mini 2 Meter Deluxe	489	Call \$
C228A 220MHz	695	Call \$
C468A Mini 440 MHz	480	Call \$
C158A Affordable 2 Meter	339	Call \$
C178 Mini 2 Meter	459	Call \$
C228A 2M/220MHz	695	Call \$
C558A 2M/440MHz	689	Call \$
C628A 440MHz/1.2 GHz	727	Call \$
C528A 2M/440MHz Twinbander	495	Call \$
Mobile		
CCR-708A Communications Test Receiver With Spectral Display Scope	List \$750	Call \$
C5608DA 2M/440	List \$890	Call \$
C5718DA 2M/440	List \$849	Call \$

ALINCO ELECTRONICS INC. CALL TODAY

DJ-G1T New, 2m, HT List \$409	DJ-180T 2m, HT List \$279	DJ-580T 2m, 70cm HT List \$519	DJ-F1T 2M Handheld List \$339
DR-130T 2 Meter Mobile List \$399			
DR-430T 440MHz Mobile List \$479			
DR-600T 2M/440MHz Mobile, List \$759			
DR-1200T 2M Data Radio, List \$339			

New Items from COMET

Dual-Band 2M/70cm Mobile

- SB-5/SB-5NMO SB-7/SB-7NMO
- Gold Plated Connector
 - Fold-Over Element
 - Superior Quality
 - Choose PL-259 or NMO type

Miracle Baby HT Antenna



- CH-32
- Dual-Band 2M/70cm
 - Surprising Performance
 - Only 1.75 Inches Tall
 - BNC Connector

JUN'S BARGAIN BOX

ICOM

IC-X2A 440MHz 1.2GHz HT List \$772.95	\$459.95
IC-2330A 2M/220MHz Mobile List \$911.95	\$549.95
IC-901A Detachable Front Dual Band Mobile List \$1119.00	\$799.00

LIMITED QUANTITIES ONLY WHILE THEY LAST

CIRCLE 57 ON READER SERVICE CARD

THE SOTRON COMPACT ANTENNAS FROM 160-10 METERS

NO TUNERS
NO RADIALS
NO RESISTORS
NO COMPROMISE

FIVE EXCELLENT REVIEWS JUST DON'T HAPPEN BY CHANCE
CALL US FOR A FREE CATALOG.

*See review in Oct. 73, 1984 CQ, Dec. 1988
*Sept. 73, 1985 Mar. W.R. 91
March 73, 1986

BILAL COMPANY
137 Manchester Drive
Florissant, Colorado 80816
(719) 687-0650

CIRCLE 32 ON READER SERVICE CARD

Say You Saw It In CQ

K2AW'S FAMOUS HI-VOLTAGE MODULES

20,000 IN USE IN OVER 50 COUNTRIES		SAME DAY SHIPPING MADE IN U.S.A.
HV14-1	14KV-1A	250A.SURGE \$15.00
HV10-1	10KV-1A	250A.SURGE 12.00
HV 8-1	8KV-1A	250A.SURGE 10.00
HV 6-1	6KV-1A	150A.SURGE 5.00

Plus \$3.00 SHIPPING—NY RESIDENTS ADD 8% SALES TAX

K2AW's "SILICON ALLEY"
175 FRIENDS LANE WESTBURY, NY 11590
516-334-7024

"Specialist in RF Connectors and Coax"

Part No.	Description	Price
PL-259/USA	UHF Male Phenolic, USA made	\$.70
PL-259/ST	UHF Male Silver Teflon USA	1.25 10/\$10.00
UG-21D/U	N Male RG-8, 213, 214 Delta	3.25
UG-21B/U	N Male RG-8, 213, 214 Kings	5.00
9913/PIN	N Male Pin for 9913, 9086, 8214 Fits UG-21 D/U & UG-21 B/UN's	1.50
UG-21D/9913	N Male for RG-8 with 9913 Pin	4.00
UG-21B/9913	N Male for RG-8 with 9913 Pin	5.75
UG-146A/U	N Male to SO-239, Teflon USA	6.00
UG-83B/U	N Female to PL-259, Teflon USA	6.50

The R.F. Connection
213 North Frederick Ave., #11 CQ
Gaithersburg, MD 20877 • (301) 840-5477
800-783-2666 FAX 301-869-3680
Complete Selection Of MIL-SPEC Coax,
RF Connectors And Relays

THE ADVANTAGES OF BUYING AZDEN

When you buy an FM mono-bander, factory-direct from Azden (2, 6, 10, 220, 440), or a headset, you'll enjoy these great advantages:

FACTORY-DIRECT SUPPORT: Engineers and technicians from our factory perform all service, and our "all ham" sales staff has years of experience.

RELIABILITY: Designed to MIL-STD-810, Azden radios are commercial grade and virtually "maintenance free".

COMPATABILITY: For Packet, CAP and MARS.

TWO YEAR WARRANTY: Everything is covered the first year, and we only charge for labor in the second year.



MOBILES	
PCS-7000H	2 Meters
PCS-7200	220 MHz
PCS-7300H	440 MHz
PCS-7500HD	440 MHz
PCS-7500H	6 Meters
PCS-7800H	10 Meters
HANDHELDS	
AZ-11	10 Meters
AZ-61	6 Meters
AZ-21A	2 Meters
HEADPHONES	
HS-05	With Boom Mic
DM-10	Without Mic



**TO PLACE ORDERS
(ONLY) CALL: 1-800-643-7655**

For literature, prices, and service call (516) 328-7501, Fax: (516) 328-7506, or write to: AZDEN CORPORATION, 147 New Hyde Park Road, Franklin Square, New York 11010.

CIRCLE 28 ON READER SERVICE CARD

about this vexing problem.

The overseas study might well take place, but unless an FCC-imposed standard is set specifying the RFI rejection criteria that all new telephones have to meet, as is done with type-approved transmitting equipment with regard to spurious emission, it is naive to think that the manufacturers will do anything about it in the public interest! It is also naive to hope that (in the words of the FCC) "this survey, notwithstanding its informality, will serve as a catalyst for affected parties to productively address and resolve this problem."

Want to bet on this? I predict that until the manufacturers are forced by government decree to clean up their act, nothing along these lines will happen. I will be happy to be proven wrong. Meanwhile, as in the case of the valuable studies of TVI and possible cures for it done in the early 1950s by the ARRL and independent amateurs, little will happen unless amateurs spear-head the effort. The ball, unfortunately, is in our court!

The Yagi Over Ground

A while ago I spoke to a fellow on 20 meters who had a 3-element Yagi on a 45 foot tower. Nothing startling about that, but I found out during the QSO that he had laid out an elaborate copper ground screen, about 90 feet square, on the ground under the tower. The screen really improved his signal, he said.

After the QSO I began to think about that screen. Did it really improve his signal? He is located in the midwest, where ground conductivity is pretty good. Has he wasted time and money in installing his elaborate ground?

*The ARRL Antenna Book*² shows elevation patterns of horizontal half-wave antennas at various antenna heights above average earth ($K = 13$, $G = .005$ S/m) at 14 MHz. Taken as a whole, it looks as if there is a loss of about 2 dB in the plane of the main lobe as compared to the same pattern over perfectly conducting earth. Perhaps my friend does achieve something with his elaborate ground system.

The K6STI MN Antenna Analysis Program³ provides the means to check horizontal antenna azimuth and elevation pattern in free space as well as over various grades of earth. I first configured the program to show the comparison in the azimuth pattern of a 3-element Yagi in free space, above good ground and above poor ground. The classic free-space pattern is shown in fig. 1. The patterns of the same Yagi over good and poor ground are nearly identical (fig. 2). The gain figure of the array over good ground is about 0.54 dB better than the figure for poor ground.

Note that the front-to-side and front-to-back ratios of the array are degraded for



5 WAREHOUSE LOCATIONS

Our own unique CREDIT CARD!

- ★ Toll Free Lines ★ Low Prices ★ Large Stocks
- ★ Top Trades ★ Service Department ★ Knowledgeable Staff
- ★ Fast Shipping ★ Flat Rate to 48 States

MORE Buying Power with the ...

HEADQUARTERS - MILWAUKEE, WI

(414) 358-0333 • (800)-558-0411 • Fax (414) 358-3337

24-hour BBS (414) 358-3472 (8-N-1, up to 14.3k baud)

WICKLIFFE, OH (216) 585-7388 • (800) 321-3594 • Fax (216) 585-1024

ORLANDO, FL (407) 894-3238 • (800) 327-1917 • Fax (407) 894-7553

CLEARWATER, FL (813) 461-4267 • (813) 443-7893 • No Toll Free Line

LAS VEGAS, NV (702) 647-3114 • (800) 634-6227 • Fax (702) 647-3412



AES® Credit Card

18.9% APR

NO PAYMENT FOR 90 DAYS

No Minimum Purchase

No Down Payment

No Annual Fees

Call for Application Today!

HOURS • Mon - Fri 9-5:30; Sat 9-3:00

Complete YAESU line in Stock and ... we Service what we Sell!



FT-1000 HF Transceiver

Tx: 160 to 10m Amateur Bands
Rx: 100kHz to 30MHz • 100

memory channels • cross-band dual receive • 200W • built-in antenna tuner with memories • built-in AC supply • 6"h x 16"w x 15"d, 58 lbs..... **SPECIAL** ☎

FT-1000D • Deluxe version • dual bandpass filter for crossband receive • temperature compensated crystal oscillator • 2.4kHz/2KHz SSB filters and 500Hz CW crystal filter..... **SPECIAL** ☎



FT-990 HF Transceiver

Tx: 160 to 10m Amateur Bands
Rx: 100kHz to 30MHz • 90

memory channels • SCAF • FSP • DDS • high speed antenna tuner with memories • AC power supply. 12½"w x 4½"h x 11½"d, 30 lbs..... **SPECIAL** ☎

FT-990DC • DC version w/o AC supply... **SPECIAL** ☎

FT-890/AT Compact HF Transceiver

Tx: 160 to 10m Amateur Bands
Rx: 100kHz to 30MHz • 32 mem-

ories plus two VFOs per band • 100W • automatic antenna tuner • IPO • DDS • FSP • auto 10M repeater offset • selectable CTCSS encode • requires 13.5VDC @ 20A • 9½"w x 3½" x 9½"d, 12.3 lbs.. ☎

FT-890 • HF transceiver w/o antenna tuner ☎



FT-840 Compact HF Transceiver

Tx: 160 to 10m Amateur Bands
Rx: 100kHz to 30MHz • 100

memories (independent Tx/Rx per memory) • Twin band stacking VFOs • optional FM • automatic 10M repeater offset w/selectable CTCSS encode • 100W • 13.5VDC @ 20A • 9½"w x 3½" x 9½"d, 18 lbs.. ☎



FL-7000 HF automatic 1KW Linear amplifier

70w input produces 600W out ☎



FT-736R Multi-Mode U/V Full Duplex Base

2 meters: 144-148MHz; 70cm: 430-450MHz • optional

modules for 50, 220MHz and 1.2GHz • 100 memories • full duplex crossband with inverted tracking (AO-13) • data in/out jack • 25W (144, 220, 440MHz) 10W (50, 1.2GHz) • 13.5 VDC or built-in AC supply • 5½"h x 14½"w x 11½"d, 19.8 lbs..... ☎



FT-850 24.5, 28 & 50MHz Multi-mode

Continuous 24.5-56.0 MHz receive • 105

memories: 99 for channels, 4 programmable scan, 2 priority • 10-100W (25W AM) • 12VDC @ 18A or built-in AC power supply • 5½"h x 11½"w x 11½"d, 18 lbs..... ☎



FT-5200/6200 Dual Band Mobiles (left)

FT-5200: 2m/440MHz (50/35W) • **FT-6200:** 440MHz/1.2GHz (35/10W) • 32 memories • CTCSS encode • dual receive • built-in duplexer • cross band rpt • remotable • 5½"w x 1½"h x 6"d, 2 lbs.. ☎

FT-5100 like FT-5200 w/o remote capability..... ☎

FT-2200/7200 Mobiles (right)

2200: 2m w/110-180MHz rx (50W). **7200:** 440MHz (35W) • 50 memories • DTMF page & coded squelch • backlit DTMF mic • 5½"w x 1½" h x 6½"d, 2.8 lbs. ☎



FT-2400/7400H Mobiles (left)

FT-2400H: 2m (50W) • **FT-7400H:** 440MHz (35W) • 31 memories • alphanumeric display • track tuning • CTCSS encode • backlit DTMF microphone • 6½"w x 1½" h x 7"d, 3.3 lbs..... ☎

FT-912RH (right) • 1.2GHz Mobile..... ☎

FT-2500M 2m Mobile (not pix) • 50w • 31 memories • CTCSS encode • scan • backlit DTMF microphone • 6"w x 1½" h x 7"d, 1½ lbs..... ☎



FT-290/690/790R MkII

VHF/UHF Multi-Purpose Mobiles/Portables

290R: 2m (25W) **690R** 6m (10W) **790R:** 430-450MHz (25W) • FM/SSB/CW • 2W portable operation using 12V DC @ 1.1A, or opt. battery case (9 C-size alkaline or nicads) • DTMF mic with up/down tune • dual VFOs • 10 memories • scan • LCD display • shoulder strap • 2½"h 6½"w x 7½"d, 2.6 lbs. ☎



FT-416/816



FT-411E/911



FT-26/25



FT-11/41R

FT-411E • 2.5w 2 meter FM HT ☎

FT-911 • 1w, 1.2GHz HT..... ☎

FT-416 • 2m HT/batt/chgr, black **SPECIAL** ☎

FT-816 • 440 MHz HT/batt/chgr, black HT ☎

FT-26/25 • 2w 2 meter FM HT ☎

FT-26/27 • 5w 2meter FM HT ☎

FT-76/25 • 2w 440 MHz FM HT ☎

FT-23R-17 • 2.5w 2 meter FM HT ☎

FT-23R-12 • as above but 2 meters, 5w ☎

FT-33R • 5w 220 MHz FM HT ☎

FT-530 • 2m/440 FM HT w/TTP **SPECIAL** ☎

FT-11R • 1.5w 2 meter FM HT ☎

FT-11R/HP • 5w 2 meter FM HT ☎

FT-41R • 440MHz FM HT ☎

COMPLETE YAESU ROTOR LINE IN STOCK

YAESU CLOSEOUTS

FT-811 • 2W, 430-450 MHz HTw/Coupon \$234⁹⁵

FT-815 • 440MHz FM handheld 299⁹⁵

FT-712RHT/C8 • 35W, 440MHz mobile 309⁹⁵

FT-747GX • 100W, 160-10M transceiver 739⁹⁵

5 WAREHOUSES

1-2 Day Delivery to most locations.

Orders over \$1500⁰⁰ PREPAID...

Flat Rate up to \$1499⁹⁹

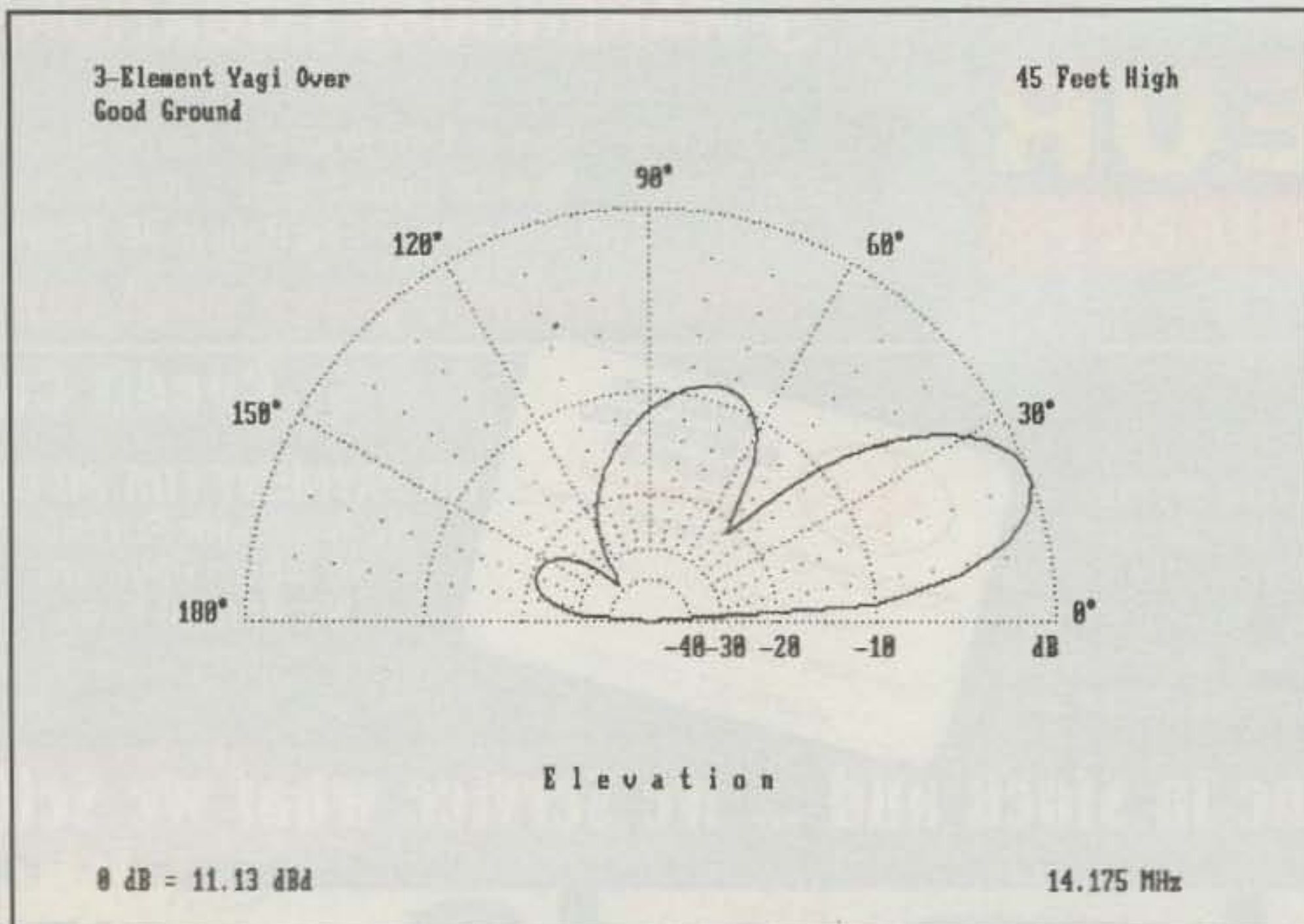


Fig. 3— Elevation plot of Yagi 45 feet over good ground.

both cases of ground reflection, as compared to the free-space azimuth plots. Also note that ground reflection has added nearly 6 dB to lobe maxima in the elevation plane. This gain occurs be-

cause the ground-reflected wave adds in-phase to the direct wave at this angle. But what of the elevation plot? Fig. 3 shows the plot over good ground. The plot over poor ground is almost identical, the

main difference being that the deep nulls apparent in the good ground pattern are not as prominent in the poor ground pattern.

So there you are. As far as a horizontally polarized HF antenna is concerned, there's no need to worry about ground conductivity, as the horizontally polarized antenna is relatively immune to ground loss underneath it, provided it is reasonably high in the air.

There's not much you can do about it, in any event!

The Mail Bag

Many thanks to the following readers who took time to write to me about this column. I appreciate your input: K1MMI, W7DHD, W2YYI, DL6AB, AA5TR, W0EDS, W7IV, KG5PP/YV5, W9NZF, and K2VX.

Footnotes

1. "The ARRL Letter," a biweekly publication of the American Radio Relay League, 225 Main St., Newington, CT 06111.

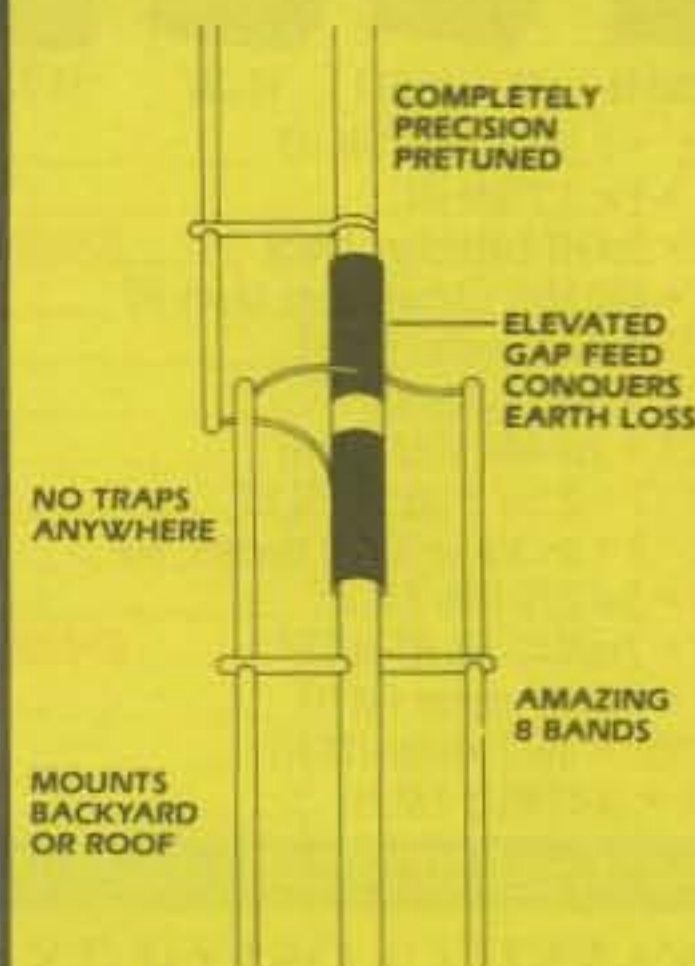
2. *The ARRL Antenna Book*, published by American Radio Relay League, 225 Main St., Newington, CT 06111.

3. The MN Antenna Analysis Program may be obtained from Brian Beezley, K6STI, 507 1/2 Taylor St., Vista, CA 92084. 73, Bill, W6SAI

THE ANSWER IS GAP TECHNOLOGY • THE ANSWER IS GAP TECHNOLOGY

Q An Antenna with No Earth Loss?

A Yes...the answer is GAP'S revolutionary technology.



If you're looking for an antenna that can outperform the others and give you the edge, you're looking for a GAP. The Challenger DX-VIII is the revolutionary design that answers your demands for multi-band operation and unequalled efficiency with low noise. This is the technology that eliminates Earth Loss. GAP delivers from an elevated feed; your power doesn't disappear into the ground. Put it up. Turn it on. No tuning. No frustration. GAP delivers everything but the hassles. And — GAP delivers at a fraction of the cost of the "so-called" competition.

The Challenger DX-VIII

80m 40m 20m 15m 12m 10m 6m 2m

\$259
plus shipping

All out efficiency.
All out performance.
GAP gets it all out.



6010 Bldg. B
N. Old Dixie Hwy.
Vero Beach, FL 32967
(407) 778-3728
Commercial Frequencies Available

THE ANSWER IS GAP TECHNOLOGY • THE ANSWER IS GAP TECHNOLOGY

ATTENTION !!!



GREAT ALUMINUM TOWERS

- Lightweight
- Rugged strength
- Easy assembly
- Rust free

FREESTANDING
20ft to 100ft ...

Universal Manufacturing Co.
43900 Groesbeck Hwy
Clinton Township, MI 48036

810-463-2560
FAX 810-463-2964

The All-American Pro Receiver Goes Amateur!



HF-1000

Since 1957, Watkins-Johnson Company has been the leading supplier of high quality, high performance receivers for governments and military worldwide. Now, through the magic of digital signal processing and state-of-the-art manufacturing technology, W-J offers the HF-1000 Digital Receiver to short-wave listeners and HAM stations.

Trade publications worldwide have given the HF-1000 high rankings. To give the HF-1000 a tryout, contact your area distributor or dealer today.

Features:

- Frequency Range of 5 to 30,000 kHz in 1-Hz Steps
- High Dynamic Range (+30 dBm IP3)
- 58 Standard IF Bandwidths with exceptional shape factors

- AM, FM, CW, USB, LSB, ISB & Synchronous AM
- 3 Fast, Flexible Scanning Modes
- Tunable Notch Filter
- Bandpass Tuning
- User-friendly, Uncluttered Front Panel with Large, Readable LED
- RS-232 or CSMA Remote Control
- World Power: 97 to 253 Vac, 47 to 440 Hz, 35 W



Watkins-Johnson Company
Electronic Equipment Division
700 Quince Orchard Road
Gaithersburg, Maryland 20878-1794
For information, call 1-800-W-J HELPS

Dealers

CANADA
Norham Radio, Inc.
4373 Steeles Avenue, West
North York, Ontario M3N 1V7
Tel: 416-667-1000
Fax: 416-667-9995

DENMARK
NORAD A/S
Specialelektronik
Frederikshavnsvej 74
DK 9800 Hjørring
Tel: 45-98-909-999
Fax: 45-98-909-988

FINLAND
Aventel OY
Kuopatie 4
00730 Helsinki
Tel: 358-0-346-3415
Fax: 358-0-346-3540

FRANCE
Generale Electronique Services
BP 46 77542 Savigny-Le Temple
Cedex, France
Tel: 33-1-64-41-7888
Fax: 33-1-60-63-2485

ISRAEL
STG International Ltd.
7, Derech Hashalom
Tel-Aviv 67892
Tel: 972-3-696-5231
Fax: 972-3-696-5141

NETHERLANDS/BENELUX
DELTRON Comms. Int'l.
P. O. Box 474
NL-7900 AL Hooerveen
The Netherlands
Tel: 31 (0) 5280-68816
Fax: 31 (0) 5280-72221

Distributors

CANADA
Support Measures, Inc.
P. O. Box 1279
20 Main Street, #8
Manotick, Ontario K4M 1B1
Tel: 613-692-2915
Fax: 613-692-2878

GERMANY, AUSTRIA & HUNGARY
Stabo Ricofunk
Muenchewiese 14-16
31137 Hildesheim, Germany
Tel: 49-5121-7620-0
Fax: 49-5121-516846

UNITED KINGDOM
Lowe Electronics, Ltd.
Chesterfield Road
Matlock, Derbyshire DE4 5LE
Tel: 44-629-580800
Fax: 44-629-580020

UNITED STATES
Universal Radio, Inc.
6830 Americana Parkway
Reynoldsburg, OH 43068
Tel: 800-431-3939
614-866-4267
Fax: 614-866-2339

Ross Distributing Co.
78 South State Street
Preston, ID 83263
Tel: 208-852-0830
Fax: 208-852-0833

Electronic Equipment Bank
323 Mill Street, NE
Vienna, VA 22180
Tel: 800-368-3270
703-938-3350
Fax: 703-938-6911

Grove Enterprises, Inc.
P. O. Box 98
300 S. Highway 64, West
Brasstown, NC 28902
Tel: 800-438-8155
704-837-9200
Fax: 704-837-2216

Tucker Electronics, Co.
1717 Reserve Street
Garland, TX 75042-7621
Tel: 800-527-4642
214-348-8800
Fax: 214-348-0367

ITALY
Watkins-Johnson Italiana
S.p.A.
Piazza G. Marconi, 25
00144 Roma - EUR - Italy
Tel: 39-6-591-2515
Fax: 39-6-591-7342

A LOOK AT THE WORLD AROUND US

In The Spotlight: Classic FM Handhelds

Okay, friends and radio fanatics, here's the column you've been hearing about and looking forward to seeing. The subject is classic handheld FM transceivers. It's hot-hot-hot, and all amateurs from Code-Free Tech to Extra class can join the fun right now. A technical electronics background is not mandatory. Your enthusiasm for and fondness of radio (and maybe a vacant hall shelf or shack corner showcase for displaying the gems) are your tickets to the game. Sound interesting? Read on!

What is the special glamour and attraction associated with old-style FM handhelds and what makes one a classic? Much like telegraph keys that I spotlight in this column two or three times a year, handhelds are compact items from eras past. They are presently low in cost, easy to reactivate, and just plain fun to use on the air. Some models are also now well on their way to becoming genuine collectibles. Amateurs unable to find 20-year-old "bricks" (so nicknamed because of their size) need not feel disheartened. A unique new handheld destined to become a true classic occasionally surfaces today, and one such ready-to-buy delight is featured herein (a habitual carry-over idea from my keys columns!).

What? Own more than one FM handheld? Sure! Handheld transceivers are like good friends and faithful companions—the more the merrier! Some old units are a mite challenging to find, but they are real attention grabbers when restored to new. Live a little! Start building your own collection of beautiful and classic FM handhelds today while availability is good and prices are low!

Somewhere out there I sense lights flashing and amateurs thinking an old crystal-controlled talkie sounds like the perfect answer for cheap packeting. Slap that wrist! The idea will work, true, but it reminds me of using a classic Jaguar XKE or Corvette Sting Ray to haul sod. The introductory part of this subject could easily continue several more paragraphs, but let's shift those "fix 'em up" details toward the end and jump right into views of the goodies.

4941 Scenic View Drive, Birmingham, AL 35210



Photo 1— The rig that kicked off the craze—Standard's SRC-146. This first-of-the-imports favorably introduced amateurs across the land to the joys of handheld 2 meter operating. Unit is trim, well built, and a true classic.

Photo 1

Our views begin with the first amateur radio dedicated talkie imported to the US, Standard's SRC-146. This delight immediately became known as the true mark of a serious FMer, and it also established Standard as a big name in amateur radio. I first saw an SRC-146 at the FM Bash at Dayton (half the crowd had one on 146.52 and the emcee was using 2 meters as a PA system). I sold my 2 meter mobile rig, scrounged some extra cash, and bought their subsequent all dark-cased model (SRC-146A) soon thereafter. It was the best move I ever made.

The SRC-146 measures 8.5"H x 3"W x 1.5"D, runs 1 watt output, has 5 crystallized channels, and features a pull-up antenna that retracts into the rig's case (a now-forgotten treat). A stubby antenna was optional. Twelve volt operating power is supplied by 10 rechargeable (or 9 alkaline) "AA" cells. The SRC-146 is perfectly balanced and a joy to use.

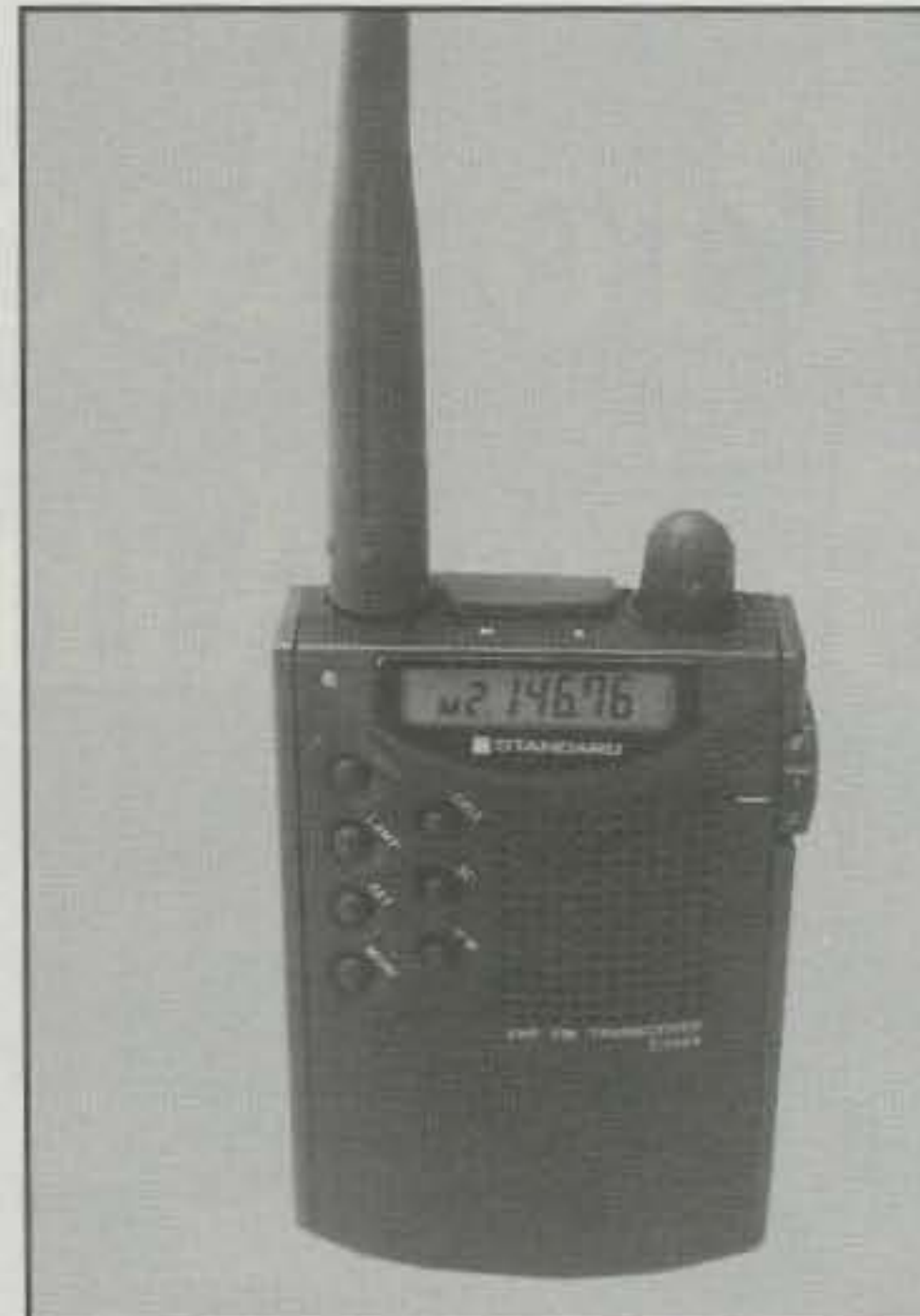


Photo 2— Unbelievable but true is the best way to describe Standard's brand-new C-108A micro FM handheld. Unit is smaller than Captain Kirk's Star Trek communicator, is loaded with features, and is available in 2 meter or 70 cm versions.

Photos 2 and 3

Next in the spotlight is an incredible new item available right now, and it has already been acclaimed the smallest and most amazing FM handheld produced in two decades—Standard's C-108A. This must-have gem truly qualifies as a modern-day classic, and it is priced low enough so that you can buy one even if you presently have a fairly new FM talkie and mobile rig. The C-108A measures only 3" x 2" x 1" (place five "AA" cells side-by-side for size analogy), and can be carried in a dress-shirt pocket all day without a tell-tale bulge or even realizing it is there! This is the radio we have all been waiting for!

The C-108A receives 100 to 170 MHz, transmits from 144 to 148 MHz, has 20 memories, scans, priority watches two frequencies, has battery save and auto shut-off modes, PL encoder, and much more. Receiver sensitivity and audio quality are outstanding (naturally, as Standard is the



Now The Company That Takes You Around The World Lets You Take The World Around With You.

The Drake SW8 – Finally, Professional Desktop Performance In An Affordable, Portable World Band Shortwave.

The company that has been setting the standards in premium-quality world band shortwave performance now puts top-of-the-line features and technology at your fingertips with the SW8... wherever you want to take it. Designed for both desktop use and easy portability, the

Drake SW8 includes many of the same features that have made Drake a perennial favorite of experts – superb audio, versatility, and the unique combination of professional quality and functional simplicity. So tune in the world and get the best of all worlds – quality and affordability, desktop

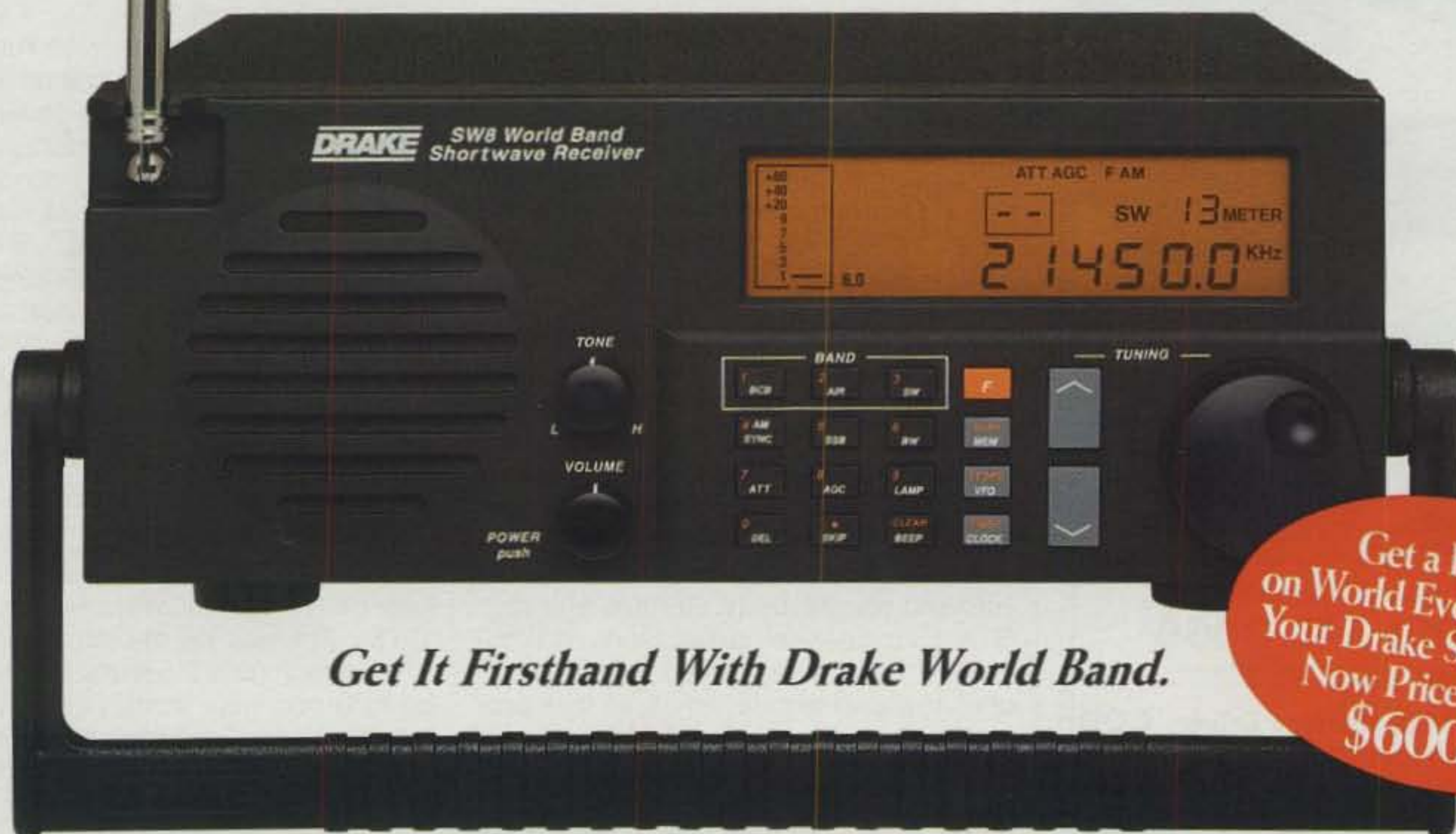
technology and portability.

The Drake SW8.

To order your SW8 direct, for more information, or for the dealer nearest you call:

1-800-937-2531

DRAKE



Get It Firsthand With Drake World Band.

Get a Handle
on World Events... Order
Your Drake SW8 Today.
Now Priced under
\$600.00



Orders & Price Quotes
1-800-7OKHAMS
1-800-765-4267



FREE SHIPPING

UPS SURFACE On Purchases of \$50 or More (except Power Supplies and Antennas)

Local & Information

(405) 748-3066

FAX (405) 748-3077

13424 Railway Drive **COD**
 Oklahoma City, OK 73114

Oklahoma owned and operated.
 Not affiliated with any other store

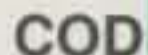
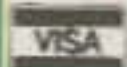
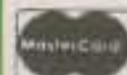


Photo 3— Size comparison of Standard's 1973 model SRC-146 and new C-108A with regular cigarette pack for reference. What a difference a day—two decades, actually—makes!

amateur radio division of Marantz!). This micro-talkie uses two regular "AA" alkaline or nickel cadmium cells for power, output is 200 milliwatts, and battery life is very good. Is 200 mw enough power for FM fun? Ten years ago, no; today, yes indeed! Modern repeaters are much more sensitive and plentiful than during past times. Thus, being "in range" of at least one is now the rule rather than the exception. Oh, yes: a matching miniature speaker/mike with DTMF keypad will soon be available for the C-108A. If you cannot find a C-108A (or C-408A for 70 cm) at a radio dealer, telephone Standard at 312-763-0081 for assistance. Like the song goes, however, "you better hurry because they are going fast!"

Photo 4

We return to the golden age of VHF FM with views of another unit that is still envied and sought today: Genave's famous GTX-1 six-channel talkie. Genave Electronics' main interest was commercial aircraft and land mobile radios, so their professional quality was easily carried over to the GTX-1's design. It is built like a bat-

tleship, survives shameful abuse, and its large front speaker pumps out great-sounding audio. The Genave talkie was available in two versions—one with a front touchtone pad for autopatching and one without a tone pad.

This American-made unit measures 8"H x 2.6"W x 1.3"D and has an all-metal case with a leather-texture cover similar to that used on 35 mm cameras. Eyelets on the case top even permit using a camera neck strap for easy across-the-shoulder carrying "Rambo-style." The radio uses a handful of "AA" alkaline or rechargeable batteries for power, and runs 3.5 watts output. Its slim-line styling and solid feel make it an all-time favorite. In other words, it's a genuine classic!

Photo 5

Next up are two impressive delights made by Wilson, a Las Vegas based manufacturer of 2 meter FM talkies during the mid 1970s. The unit on the left is the model 1402, which runs 2.5 watts output, holds up to 6 channels worth of crystals, and sports a bottom-mounted microphone for "hold like a telephone" use. The radio

OPTOSCAN456

50 Channels Per Second!!!

OptoScan 456 costs less than any other computer aided scanning system and is supported by all the best software packages including Scan Star™ and Scan Cat™. OptoScan 456 uses the highly regarded Radio Shack Pro 2005 and Pro 2006 VHF/UHF scanners. These popular receivers with the OS456 package installed becomes:

The New Standard—The OptoScan 456.

- CTCSS & DCS Controlled Scanning and Logging
- DTMF Decode & Log with Channel and Time
- PC Software for computer Log, Scan & Search
- RS-232C & CI-V Interface
- No Drill or Solder Installation
- Output for signal level and spectrum display

Why Computer Controlled Scanning? The computer makes the scanner perform, simply and effortlessly. Even when you are not around, the computer can continue to search out frequencies you want and record them—virtually unlimited numbers.

Why Decode CTCSS tones and DCS codes? The OS456 decodes tones, codes and touch-tone characters to provide the Radio Monitoring Enthusiast with a powerful new tool in sorting out who is talking, and accessing a repeater. Optoelectronics has produced the OptoScan 456 to make the PRO-2006 family radios perform to a new standard that no one else can match for any price!

Complete Installation Kit, Model OS456, includes the assembled and tested controller board, mounting hardware (no soldering or drilling required), cables, OptoScan 456 basic software for the PC and the installation video.....\$299.

Complete Optoscan 456 and modified Pro-2006 are available from our distributors:
Grove Ent., 1-800-438-8155, NC; Marymac Ent., Inc., 1-800-231-3680, TX; E.E.B., 1-800-368-3270, VA.



OPTOELECTRONICS



ALL NEW
ALL NEW
ALL NEW
ALL NEW
ALL NEW

Model 25 Scout Electronic Equivalent of Forward Reconnaissance

The Remarkable New Frequency Scout automatically finds and records frequencies for later use and will tune a receiver.

The Scout is pocket size—ready to go anywhere, and, unlike a frequency counter, the Scout can differentiate between random noise and coherent RF transmissions.

It is ideal for surveillance walk-by situations with a built-in vibrator to alert you a frequency was recorded.

For drive-by applications, a beeper lets you know when a new frequency is found or an already recorded frequency is hit. Up to 250 hits can be counted on each of the 50 frequency memories.



Reaction tunes VHF/UHF receivers equipped with CI-V serial communications interface.

- Exclusive Optoelectronics Digital Filter/Capture Technology (pat. pend.)
- 50 Memory Locations for unique frequencies
- 250 Hit Counter for each frequency in memory
- Reaction tunes OptoScan 456 CI-V Communications receivers
- Selectable annunciators include vibrator, beeper and EL back lit display
- Can be interfaced to a PC for data logging using OptoLog Software
- 16 Segment RF signal level bargraph for relative signal level detection
- 10MHz to 2.8GHz single frequency range.
- Six+ hour battery life—one hour rapid charge
- Pocket Sized: 3.7" H x 2.75" W x 1.2" D

The Scout Model 25 with rapid Charge and high capacity NiCad batteries.....\$399.

Scout is pictured with optional DB32, dual band, VHF/UHF miniature antenna.....\$ 29.

DC440 Decoder (pictured above) with New CI-V Interface

If you are into UHF/VHF communications monitoring then you will want to add a DC440 to your system. This popular decoder has been upgraded with a new communications interface port that is CI-V compatible. Now you can take advantage of the new scanning software that supports tones and codes. If you are using an R7100 or R7000 receiver then the DC440 will connect to either the CT17 or CX12 RS-232C Converter for single serial port use.

- Simultaneous off the air detection of 50 CTCSS tones, 106 DCS codes and 16 DTMF characters
- Six measurement modes for maximum flexibility
- Scrollable ten character display of up to 127 stored DTMF characters
- Convenient front panel controls for Power, Mode and Recall

The DC440 with CI-V Interface.....\$259.

NiCad 44 (Optional Internal NiCad battery pack).....\$ 39.

CX12 CI-V to RS-232C Interface Converter



Low cost converter for CI-V logic level data to RS-232C for connection to a Personal

Computer serial port. The CX12 is fully equivalent to the Icom CT-17 converter.

The CX12 is an accessory for the Optoelectronics DC440 and Model 25 Scout. Price: \$89.

1-800-327-5912

Fax 305-771-2052

Optoelectronics, Inc.

305-771-2050 • 5821 NE 14 Avenue, Ft Lauderdale, FL 33334
Visa, Master Card, C.O.D., Cash or Money Order. Shipping Charges Additional.

All specifications & prices are subject to change without notice or obligation.

ICOM

Novex

ALINCO

Bearcat

COMET

EMOTO

AOR

pro-am

SIGMA

JIM PROFESSIONAL SERIES

ANLI Antenna

JPT

Count On More

*See "5 Great

NEW



Tucker TF-144

2m Intermod Filter
Regularly \$79⁹⁵
Introductory Special

\$59

Don't Let Intermod Ruin Your Hamming...

If you are like most us, your 2m radio becomes filled with the squawks and beeps of intermodulation distortion or "intermod" whenever you get close to an urban area. This is caused by the thousands of high-power pagers, FM broadcast stations, cellular sites and other nearby VHF transmissions that overload your 2m receiver's sensitive front end. Most modern transceivers don't have the helical filtering to stop intermod from getting in.

Our Filter Stops Intermod...

Our team of RF engineers have designed a 3 pole filter that will end your intermod problems forever. Our goal was to design the finest, tightest intermod filter available and, after exhaustive testing, we have done so. The TF-144 automatically switches on during receive and attenuates out-of-band signals by as much as 50 dB or more.

Easy To Use...

Simply install the TF-144 in-line between your antenna and the antenna input of your mobile rig or handheld and hook up the attached wire to +12 VDC (it draws only minimum current). We even supply a wire connector for attaching it to your existing 12 V transceiver hookup. The TF-144 takes care of the rest. It automatically switches on during receive and off during transmit. Nothing could be easier!

1 Year Warranty And Our Exclusive Tucker SatisfactionPlus Guarantee...

The TF-144, like all of our other Tucker Brand Products is built to last. It is designed and manufactured to industrial standards, not the typical "amateur grade" quality found in most amateur radio accessories. Our exclusive SatisfactionPlus Guarantee means you will be more than satisfied with the TF-144's performance- if not, simply send it back within 30 days- NO QUESTIONS ASKED!

Specifications...

Passband: 144-148 MHz (2m Amateur)
Connectors: SO-239
Power Requirement: 10-15 VDC less than 100 mA
Dimensions: 2.5" x 1.75" x 1.75"
MADE IN USA.



Tucker T-1000

The Best 300 W Tuner

Regularly \$149
Introductory Special **\$139**

FREE FedEx Economy Two-Day Service



The Tucker T-1000 has been designed to give you more than any other tuner currently available for 300 W and its construction will let you appreciate its many features for years to come. Covers the frequency range from 1.8 to 30 MHz; 3.5 to 30 MHz, continuous 300 watts; 150 W on 1.8 MHz. Utilizes continuous rotation capacitors to provide superior transmitter/antenna tuning. Inductance is setup using a 12-position switched inductor. Antenna Selector: six positions: COAX 1 tuned and DIRECT, COAX 2 tuned and DIRECT, bypass and balanced antenna. Power Switch: high and low (300 W/30 W). Comes complete with a 1 year warranty and our risk-free Tucker SatisfactionPlus guarantee. Dimensions: 10.2" (259 mm) W x 9.4" (239 MM) D x 3.5 (89 mm) H. Weight: 3.4 lbs (1.5 kg). Made in USA. Get the best, order your T-1000 today!

Tucker T-100

1500 Watt Low-Pass Filter **\$49⁹⁵**



Every shack should have a low-pass filter to insure against TVI from harmonic interference. The new Tucker T-100 Low-Pass Filter is the finest 1500 W filter available. It utilizes a nine-pole Chebyshev design with a cutoff frequency of 35 MHz. Includes additional attenuation to TV IF frequencies above 40 MHz. 1500 Watts continuous. Comes with a 1 year warranty and our exclusive SatisfactionPlus warranty. Made in USA to last for years.

Icom IC-2iA
2m H.T. Regularly \$309
Now **\$199**



This shirt-pocket sized radio eliminates the myriad of buttons found on most other HTs and allows the simplest operation of any handheld. Sophisticated features such as 10 memories, scan modes, 24 hour clock, advanced power saving functions, tone squelch, and much more are included. Up to 5 W output is available in this unit that measures only 2.3" x 3.6" x 1.2". Leave all those complicated buttons behind- step up to the simple-to-use but powerful IC-2iA!



Tucker T-275
2500 Watt Fan-Cooled Dry Dummy Load
\$169

The new T-275 is the highest-power rated dummy load on the market today! It will handle 2500 watts average for a full minute! Its quiet fan keeps the load cool for longer life. The resistors used in our T-275 is of a special ceramic construction which has stronger composition and offers better performance than the carbonum resistors used in most dummy loads. Operates from DC-150 MHz with and SWR of 1.3:1 or less. SO-239 Connectors. Compact and lightweight. Attractive blue and gray finish. One year warranty and our Tucker SatisfactionPlus guarantee. Built to last in the USA.

5 GREAT REASONS TO BUY FROM TUCKER ELECTRONICS & COMPUTERS...

- The Best Customer Service Available...**
From giving helpful advice and technical support to shipping your order as fast as possible, our more than 100 friendly employees are here to help you. Plus, we have the best return privilege in the business-30 days to decide if the product is for you- **NO ONE CAN MATCH THIS!**
 - Toll-Free Technical Support...**
We don't solicit your business on our **TOLL-FREE** lines and then force you to pay for long-distance charges if you have a question or problem. Tucker customers call one **TOLL-FREE** line whether ordering, asking advice or needing technical support.
 - More Trade-Ins...**
Not only do we take Amateur Radio Equipment in on trade, but also Test Equipment, Computers, Shortwave Radios and Scanners- we'll trade for any item in our inventory- **CALL TODAY FOR A QUOTE!**
 - More Selection...**
In addition to major brands of Amateur Radios, we also carry Shortwave Radios, Scanners, Computers, Test Equipment, our Exclusive Tucker Brand Products and more books, parts and accessories than any other dealer!
 - Our Free 100+ Page Catalog...**
Our **FREE** catalogs not only give you insightful information and specs. on everything we sell, you'll shown for all items for your convenience in ordering- **CALL TOLL-FREE FOR YOURS TODAY!**
- Discover What More And More Hams Are Discovering...
The Tucker Difference!**

CALL NOW FOR YOUR **FREE CATALOG!**

Tucker Is Your Complete Source For Shortwave/Amateur Radio, Scanners and Accessories
Call, Write, or Fax for a **FREE** copy of our latest catalog!



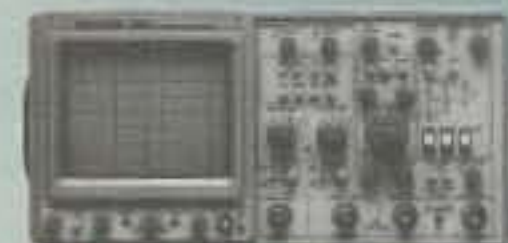
ALL NEW HAM EQUIPMENT



AVAILABLE FOR TRADE

YOUR USED EQUIPMENT IS VALUABLE. CALL FOR AN INSTANT TRADE QUOTE.

TEST EQUIPMENT



WANTED

From Tucker* Reasons" Below

C-COR 4329E

Universal Amplifier \$149

The 4329E Universal Amplifier has Pass band characteristics of -3 dB (5 Hz to 130 MHz); ± 0.5 dB (10 Hz to 70 MHz). Output (before 1 dB compression): 10 V p-p, 250 mW (10 Hz to 70 MHz). Gain of this amplifier is rated at 20 dB and linearity (at 1 kHz) is 0.25 dB max. variation from linear from 0.1 to 10 V p-p output. VSWR is 1.7:1 max. (input); 2:1 nominal (output). 50 Ω input and output impedance, BNC connectors. Comes with case, internal power supply, and manual. Input power is from 104 to 125 VAC, 50 to 400 Hz.



FREE FedEx
Economy Two-Day
Service

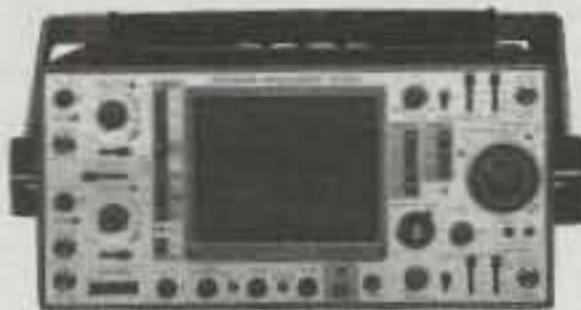


HP 5300A/5301A Measurement System

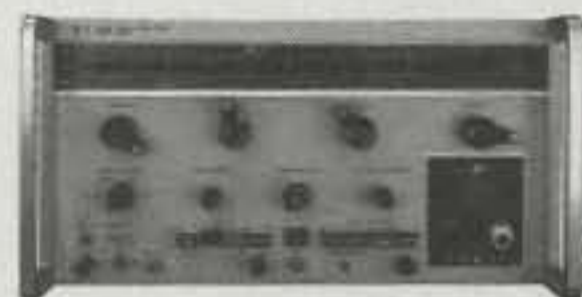
\$195

The HP 5300A Mainframe with the 5301A Frequency Module make up this versatile Measurement System. Covers the frequency range from 10 Hz to 10 MHz. Sensitivity: 25 mV rms (50 Hz to 1 MHz), 50 mV rms (10 Hz to 10 MHz); 150 mV p-p pulse at minimum pulse width (50 nS). Input Impedance: 1 M Ω . Gate times: manually selected 0.1, 1, or 10 S; auto position selects gate time to 1 S for max. resolution. Accuracy of ± 1 count + time base accuracy. Features include: 6-digit dot matrix display, overload protection/indicator, selectable trigger level (positive, negative, or 0 V), external timebase input and BCD output as a standard rear panel output. 10 MHz crystal frequency with typical stability of ± 2 parts in 10⁶. For added versatility, call for other available plug-ins.

Kikusui COS6100M Oscilloscope \$795



Ready for a 5 channel portable oscilloscope? One with up to 12 traces? We have it in the Kikusui COS6100M. This 100 MHz oscilloscope has a 20 KV accelerating voltage for a very bright, clear display. The COS6100M's front-panel is laid out logically and has some features not normally found on similar scopes. It will trigger off of channels 1, 2, 3, or "ALT." A patented "trigger lock" allows for stable, automatic triggering even on complex signals such as TV waveforms. Another unusual feature is the ability to display several lissajous patterns at once. For example, X-Y displays of channel 3 vs. channel 1, 2, 4, and 5 can be displayed simultaneously. This is an outstanding value on an oscilloscope!



HP 8690B/8699B Sweep Oscillator System

\$995

Versatile solid-state sweeper with the ability to accept BWO and solid-state plug-ins. Frequency range from 100 MHz to 4 GHz. Sweep functions include Start/Stop, Marker, ΔF , and CW operation. Provisions for internal and external AM modulation.

HP 608F/8708A Signal Generator With Synchronizer \$449



The last model of the great HP 608 Series Signal Generators which were widely used in the best labs. The 608F is great for checking-out receivers since it is a cavity tuned power oscillator. As a result, single side-band phase noise is extremely low, allowing you to test narrow-band radios for sensitivity and selectivity. Frequency coverage from 10 to 455 MHz in 5 bands ($\pm 1\%$). AM Modulation from 0 to 95%. Output Level from 0.1 μ V to 0.5 V, calibrated in volts and dB. The HP 8708A provides frequency stability to 430 MHz. This phase-lock stabilizer eliminates microphonics and drift resulting in an extremely stable frequency level.



HP 651B Test Oscillator

\$395

The 651B Test Oscillator is a wide range capacitance-tuned oscillator covering a frequency range from 10 Hz to 10 MHz with distortion (10 Hz to 5 MHz) $< 1\%$, (10 MHz) $< 2\%$. The oscillator has a stable sine-wave output signal that is adjustable from 10 μ V to 3.16 V into 50 or 600 Ω . Two output impedances are provided at front-panel output connectors. The 600 Ω connector provides an output with an impedance that is compatible with transmission lines and many distribution systems. The 50 Ω connector provides an output where a low-source impedance is desired.

Protek 123/223 Handheld 7-Function Digital Multimeter \$79

FACTORY
NEW



It's easy to see the physical difference between this 7 function meter and others you've seen...the difference doesn't stop there! It's distinct design was conceived to function as an integral part of its test and measuring capability. Once the rotary knob is positioned to the desired function and the probes connected to the test point, the bold LCD indicates the test circuits value quickly and accurately. Measures DCV to 1000 V, ACV to 750 V, DC & AC Current to 10 A, Resistance to 40 M Ω , Frequency from 100 Hz to 500 kHz, and Capacitance from 4 nF to 40 μ F full scale. This handheld is loaded with features including Auto Ranging, Bar Graph, Data Hold, Ampere Warning Beep, Relative Set, 4,000 Count Display, Auto Power Off, Continuity, and Diode Test. A fantastic meter at an unheard of price! Model 123 has standard function select switch and model 223 has "Thumb-Wheel type" rotary knob, please specify when ordering.

HP 3476B Digital Multimeter \$129



The 3476B differs from the popular 3476A by its ability to operate from AC or rechargeable batteries. Under battery operation you can break ground loops resulting in quieter readings or make measurements in remote locations. This is a 3 1/2-digit, five function, autoranging instrument which measures AC and DC voltage in five ranges, AC and DC Current in two ranges, and Ω in five ranges. The 3476B features a hold function, auto-zero, auto-polarity, and a sampling rate of three readings/sec.

DRSI

HEIL
SOUND

HUSTLER

SONY
RECEIVE

D
DATONG
ELECTRONICS
LIMITED

GRUNDIG
made for you

EDCO

AEA

DAIWA

SANGEAN

ASTRON

MP

TOLL FREE:
800-527-4642

FEDERAL
EXPRESS

We Take
Trades!

TUCKER

ELECTRONICS & COMPUTERS

30 Day
Return Policy
SATISFACTION
GUARANTEED!
90 Day
Warranty

We
Accept These



Major
Credit Cards

CIRCLE 167 ON READER SERVICE CARD

en Francais, und auf Deutsch • 214-348-0367 • All Test Instruments Include Manuals and are Completely Operational Unless Otherwise Stated.

Alpha Delta Model DELTA-2 and DELTA-4 Coax Switches

Setting "first in the industry" standards for lightning surge protection, precision low-loss switching and master antenna ground functions—all in a single, cost effective product.



- Arc-Plug® cartridge surge protection system—replaceable element provides continuous protection of the active antenna circuit. Unused circuits are automatically grounded. Easy access through front panel.
- Master antenna ground function—internally disconnects and grounds all circuits when in center "off" position.
- Efficient low-loss cavity design—uses constant impedance micro-strip construction for outstanding low-loss performance and state-of-the-art co-channel isolation. No lossy wafer switches are used.
- All connectors are across rear for best "out of the way" cable installation. Other brands use front-mounted "common" connectors which cause unsightly cable loops.
- Positive detent roller bearing drive for "no question" switch positioning.
- The Delta Series handles full legal power.

- Cheaper switches typically don't have N-type connectors because poor, non-constant impedance designs become obvious when using precision N connectors. One look inside cheaper switches will tell you they are still overpriced.
- Designed and produced in the U.S.A. by Alpha Delta.

Model Delta-2 (2-position, UHF connectors, 500 MHz)	\$49.95
Model Delta-2/N (2-position, N connectors, 1.3 GHz)	\$64.95
Model Delta-4 (4-position, UHF connectors, 500 MHz)	\$74.95
Model Delta-4/N (4-position, N connectors, 1.3 GHz)	\$89.85

At your Alpha Delta Dealer or add \$5.00 for direct U.S. orders. Exports quoted.

See Data Sheet for surge limitations.

ALPHA DELTA COMMUNICATIONS, INC.

P.O. Box 620, Manchester, KY 40962 • 606 598-2029 • FAX 606-598-4413



current solutions to current problems

ANTENNA OPTIMIZERS

AO 6.0 automatically optimizes antenna designs for best gain, pattern, impedance, SWR, and resonance. AO optimizes cubical quads, phased arrays, interlaced Yagis, or any other arrangement of wire or tubing. AO uses an enhanced, corrected MININEC algorithm for improved accuracy and assembly language for high speed. AO features 3-D radiation patterns, 3-D geometry and wire-current displays, 2-D polar and rectangular plots with overlays, automatic wire segmentation, automatic frequency sweep, symbolic dimensions, symbolic expressions, skin-effect modeling, current sources, polarization analysis, near-field analysis, and pop-up menus. NEC/Wires 1.5 accurately models true earth losses and complex arrays with the sophisticated Numerical Electromagnetics Code. Analyze elevated radials, Beverages, delta loops, wire beams, giant quads, LPDAs, or entire antenna farms. 3-D geometry display, 2-D polar and rectangular plots with overlays. Modeling capacity: AO, 225 pulses; NEC/Wires, 1000 segments (450/2000 for symmetrical, free-space designs). AO or NEC/Wires, \$100; both, \$130.

YO 5.0 automatically optimizes monoband Yagi designs for maximum forward gain, best pattern, and minimum SWR. YO models stacked Yagis, dual driven elements, tapered elements, mounting brackets, matching networks, skin effect, ground reflection, and construction tolerances. YO optimizes Yagis with up to 50 elements from HF to microwave. YO uses assembly language and runs hundreds of times faster than NEC or MININEC. YO is calibrated to NEC for high accuracy and has been extensively validated against real antennas. YO is highly graphical and easy to use. NEC/Yagis 2.0 provides reference-accuracy Yagi analysis and easy modeling of large arrays of Yagis. A special feature instantly changes array patterns and gain as you adjust array spacing. 1000 segments (2000 in free space). YO with NEC/Yagis, \$100.

AO and NEC require a 386+387 or better and VGA; YO runs on any PC. Visa, MasterCard, U.S. check, cash, or money order. Add \$5 overseas.

Brian Beezley, K6STI

507 1/2 Taylor, Vista, CA 92084 • (619) 945-9824

MICROWAVE New Products For 1994 TRANSVERTER KITS

50 thru 432 MHz
10 GHz Soon!!

903 thru 5760 MHz still available

COMPONENTS!

Coax relays, GaAsFETS, chip caps & resistors, MMIC's, modules, PCB's, boxes, trimmers, feedthru's, diodes, cable, connectors, more!

Write For Free Catalog

Down East Microwave

RR 1, Box 2310

Troy, ME 04987

Phone 207-948-3741 Fax 207-948-5157



CIRCLE 38 ON READER SERVICE CARD

Log ALL your QSO's

in

1 Main Database

FEATURES, FEATURES, FEATURES too

numerous to mention!

WRITE OR CALL FOR FREE
INFORMATION PACKET

1-800-944-WJ20

WJ20

For PCs
MC/VISA
Outside N.A. add \$10.00

MASTER QSO LOGGING PROGRAM

USA: P.O. Box 16C, McConnellsville, NY 13401

EUROPE: Jonit, Dept. C, Box 2063, S-831 02 Östersund, Sweden

JAPAN: JLDKX, 1933-26 Hirata, Takanezawa, Shiota, Tochigi 329-12

CIRCLE 138 ON READER SERVICE CARD



Photo 4—The Genave GTX-1 and GTX-1T two meter talkies. These units were made in 1975 and are still envied by FM enthusiasts today.

measures 9"H x 2 7/8"W x 1 7/8"D and weighs 1 pound 6 ounces. The 1402 was available with or without a front-mounted tone pad, and a similar-size 12 watt amplifier complete with talkie-holding bracket plus external speaker mic was available as an option. When combined, the setup became a respectable mobile rig. Assuming that full lashup could be found today, it might be combined with a 12 volt, 3 or 4 amp gel cell battery to make a whopper of a portable rig for campouts or carrying to the beach.

The unit on the right in photo 5 is a Wilson 1405, which was also made for 2 meter FM during the mid 1970s. The number of 1405s produced never equalled that of the 1402. Consequently, this is a somewhat rare bird (and a good find!) today. The 1405 runs 5 watts or 1 watt output (power selected by top-mounted toggle switch), also holds up to 6 channels worth of crystals, and has the feel of a well-engineered radio. It was sold less tone pad, but companies such as PIPO offered them as easy add-ons. I added one such tone pad to my own 1405. It looked and worked great, but a neat glow-in-the-dark version came out the next



JST-245

160-10 Meters PLUS 6 Meter Transceiver



Fifteen reasons why your next HF transceiver should be a JST-245...

- 1** All-Mode Operation (SSB,CW,AM,AFSK,FM) on all HF amateur bands and 6 meters. JST-145, same as JST-245 but without 6 meters and built-in antenna tuner.
★ JST-145 COMING SOON ★
- 2** MOSFET POWER AMPLIFIER • Final PA utilizes RF MOSFETs to achieve low distortion and high durability. Rated output is 10 to 150 watts on all bands including 6 meters.
- 3** AUTOMATIC ANTENNA TUNER • Auto tuner included as standard equipment. Tuner settings are automatically stored in memory for fast QSY.
- 4** MULTIPLE ANTENNA SELECTION • Three antenna connections are user selectable from front panel. Antenna selection can be stored in memory.
- 5** GENERAL COVERAGE RECEIVER • 100 kHz-30 MHz, plus 48-54 MHz receiver. Electronically tuned front-end filtering, quad-FET mixer and quadruple conversion system (triple conversion for FM) results in excellent dynamic range (>100dB) and 3rd order ICP of +20dBm.
- 6** IF BANDWIDTH FLEXIBILITY • Standard 2.4 kHz filter can be narrowed continuously to 800 Hz with variable Bandwidth Control (BWC). Narrow SSB and CW filters for 2nd and 3rd IF optional.
- 7** QRM SUPPRESSION • Other interference rejection features include Passband Shift (PBS), dual noise blanker, 3-step RF attenuation, IF notch filter, selectable AGC and all-mode squelch.
- 8** NOTCH TRACKING • Once tuned, the IF notch filter will track the offending heterodyne (± 10 KHz) if the VFO frequency is changed.
- 9** DDS PHASE LOCK LOOP SYSTEM • A single-crystal Direct Digital Synthesis system is utilized for very low phase noise.
- 10** CW FEATURES • Full break-in operation, variable CW pitch, built in electronic keyer up to 60 wpm.
- 11** DUAL VFOs • Two separate VFOs for split-frequency operation. Memory registers store most recent VFO frequency, mode, bandwidth and other important parameters for each band.
- 12** 200 MEMORIES • Memory capacity of 200 channels, each of which store frequency, mode, AGC and bandwidth.
- 13** COMPUTER INTERFACE • Built-in RS-232C interface for advanced computer applications.
- 14** ERGONOMIC LAYOUT • Front panel features easy to read color LCD display and thoughtful placement of controls for ease of operation.
- 15** HEAVY-DUTY POWER SUPPLY • Built-in switching power supply with Power Factor Correction (PFC) and "silent" cooling system designed for continuous transmission at maximum output.

"This device has not been approved by the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained."



Japan Radio Co., Ltd.

430 Park Ave., 2nd Floor New York, NY 10022

Phone: (212) 355-1180 Fax: (212) 319-5227

CIRCLE 177 ON READER SERVICE CARD

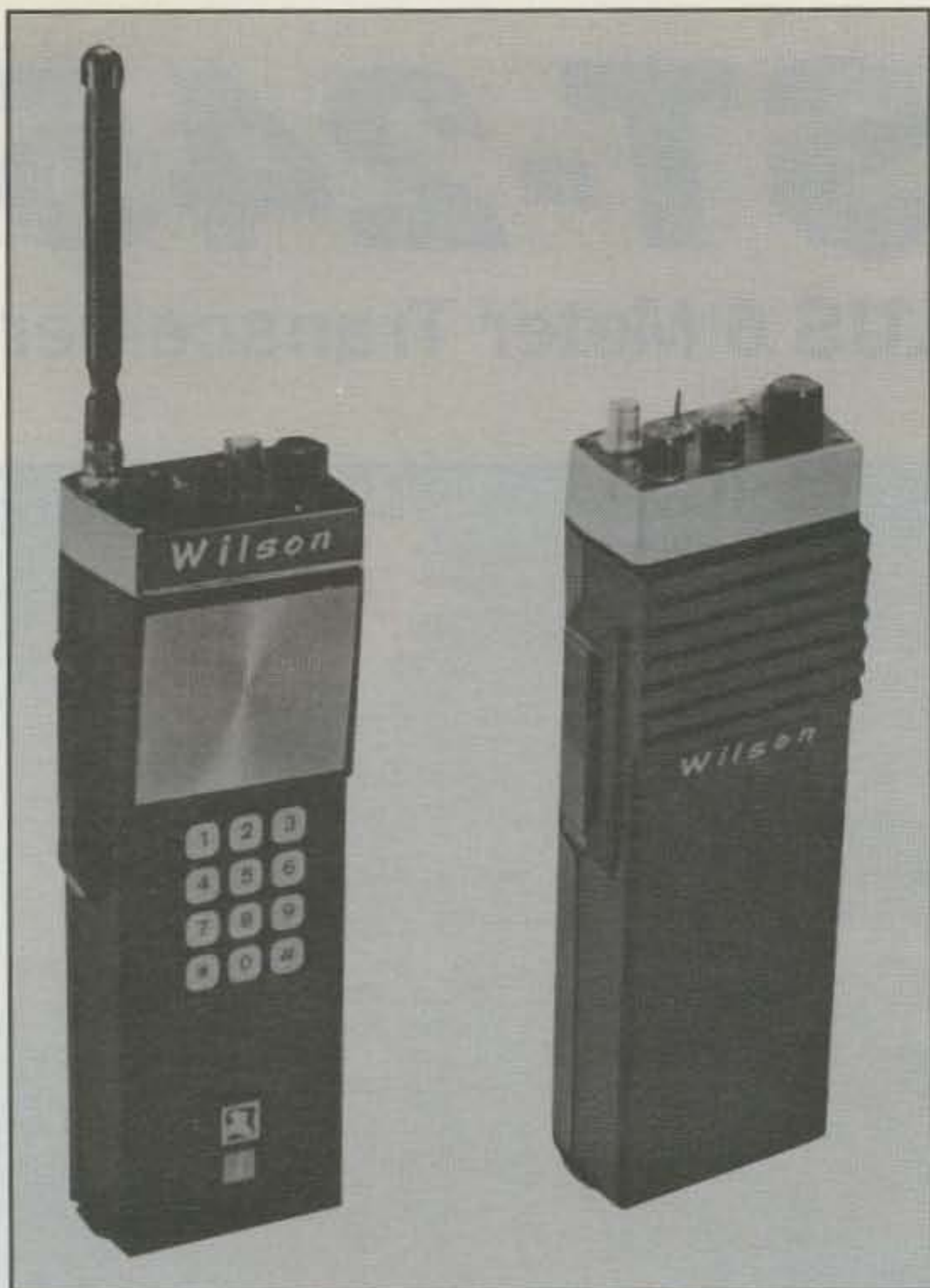


Photo 5— Two well-known models of early Wilson FM talkies. Unit on the left is the 1402, and on the right is the 5 watt 1405. When refurbished, crystallized up for a local repeater, and combined with a tall pull-up antenna, they make unique 2 meter rigs today.



Photo 6— Two mid-sized talkies that bridged the size gap between early model "bricks" and modern miniature handhelds. Unit on the left is a Wilson Mark II, and on the right is the FDK Palm II. Both radios are crystal-controlled delights.

month (alas, if I had only known to wait!). Say hallelujah if you remember glow-in-the-dark keypads!

The 1405 is approximately the same size as the 1402 (only 1/8 inch thinner), and both units are powered by a handful of "AA" cells. High-current cells in good condition (new!) are very important when the 1405 is switched to 5 watts output (the radio draws 900 ma of current during high-power transmissions). Wimp cells cause low-frequency "motorboating" that catches everyone's scorn. Ah, but the 1405 was (and still is!) quite enjoyable and easy to use. That is the beauty of crystallized radios: there are no programming steps or keypunch sequences to remember. You just switch them on, click-select a frequency/channel, and listen/transmit to your heart's content!

Photo 6

Early-model FM talkies were rather large in size, so reduced dimensions were a natural evolution in design (and one that continues to capture our fancy today!). Two of the original "pocket talkies" that

enjoyed high popularity are Wilson's Mark II and FDK's Palm II shown in photo 6. Both of these gems measure a trim 6"H x 2 1/2"W x 1 1/2"D, sport attractive blue cases with front tone pads, cover six "you crystal 'em" channels, and deliver 2.5 watts output. Styling is totally classic, with the speaker and mic in the rigs' upper section and full-size tone pad on the rigs' lower section.

Sharp-eyed readers will notice XYL Sandy, WB4OEE's call letters label-strip added in place of the Palm II's nameplate. She carried the FDK everywhere in her purse for several years. I added a homebrew replacement battery to it a few years ago, and both of us still use it occasionally during stormy weather (microprocessor-controlled rigs are delicate when lightning bolts are nearby).

Photo 7

This description will be brief, as space is running out. Only one crystallized talkie was produced in kit form during past times: VHF Engineering's HT-144 shown in photo 7. The kit was supplied with all

parts, prewound coils, case, and pull-up antenna. Estimated assembly time was 10 hours. This unit is quite scarce today.

Search and Rescue

So where do you begin the hunt for a classic crystal-controlled talkie today? Ah, there is the challenge! Fortunately, many of the guidelines for collecting keys also apply to FM handhelds. Finding one (or more!) means checking out early-bird swapmeets, hamfest fleamarkets, old dealer "junkstock" (ouch!), and running ads in magazines such as *CQ*. Also be ready to make a quick "yea" or "nay" decision when a treasure is discovered, as second chances are not frequent occurrences. Get the manual, too! You will definitely need it for calculating new crystal frequencies, tweaking coils, etc.

What is the difference between a jewel and a junker? There are no set rules here, but if a particular unit looks clean, is crystallized up for at least one neighborhood repeater, and you can quick-check proper operation, it is probably a gem. Value and pricing? Again as with keys, this can

Pactor is fast. G-TOR is more along these lines.



Kantronics KAM Plus with lightning fast G-TOR

The KAM Plus strikes again. It's now available with lightning fast G-TOR, a Kantronics innovation. More than twice the speed of Pactor in most band conditions, this error-correcting mode is the fastest HF mode available in a stand-alone TNC.

In addition to G-TOR, the KAM Plus operates the other popular modes and is capable of operating an

HF mode and VHF packet at the same time. The KAM Plus also features more than 100K of personal mailbox space. And like most Kantronics products, the KAM Plus is small, portable and equipped with a NEWUSER command set and on-line helps.

KAM Plus with G-TOR. Together, the two are taking HF digital communications by storm.

Kantronics

only be a generalization according to what the buyer will pay and what the seller will accept. (No scalping, please! Offenders are subject to nationwide packet bulletin board exposure!)

Let's now assume you have found a cream-puff talkie. We will briefly review its resurrection. First, use the talkie's manual to guide you through calculating crys-

tal frequencies for your favorite repeater. You will probably be anxious to get going at this time, so I suggest using JAN's express 48-hour crystals-to-go service at 1-800-JAN XTAL. After the little critters arrive, carefully slip them into the rig's awaiting sockets and tweak them exactly on frequency with the aid of a high-resolution counter. Alternately, remove the

**A
T
T
E
N
T
I
O
N**

If your looking for an antenna to cover all of:
10m, 12m, 15m, 17m, 20m, 30m, 40m, & 100 KHz of 80m

Then contact:
GAP
ANTENNA PRODUCTS
Tel # (407) 778-3728

Ask them about their new **TITAN**. A compact vertical that requires **NO** radials. This antenna is so new they haven't had time to develop an ad yet.

**Sold out at
 Dayton and Dallas!**



Handheld 2-mtr/220 MHz phase sense direction finder. Used with any FM xcvr. Oil compass. Type VF-142, \$139.95, \$3.50 S&H. Call/write for info. CA add tax.

**RADIO ENGINEERS, 7969 Engineer Rd. #102
 San Diego, CA 92111 619-565-1319**

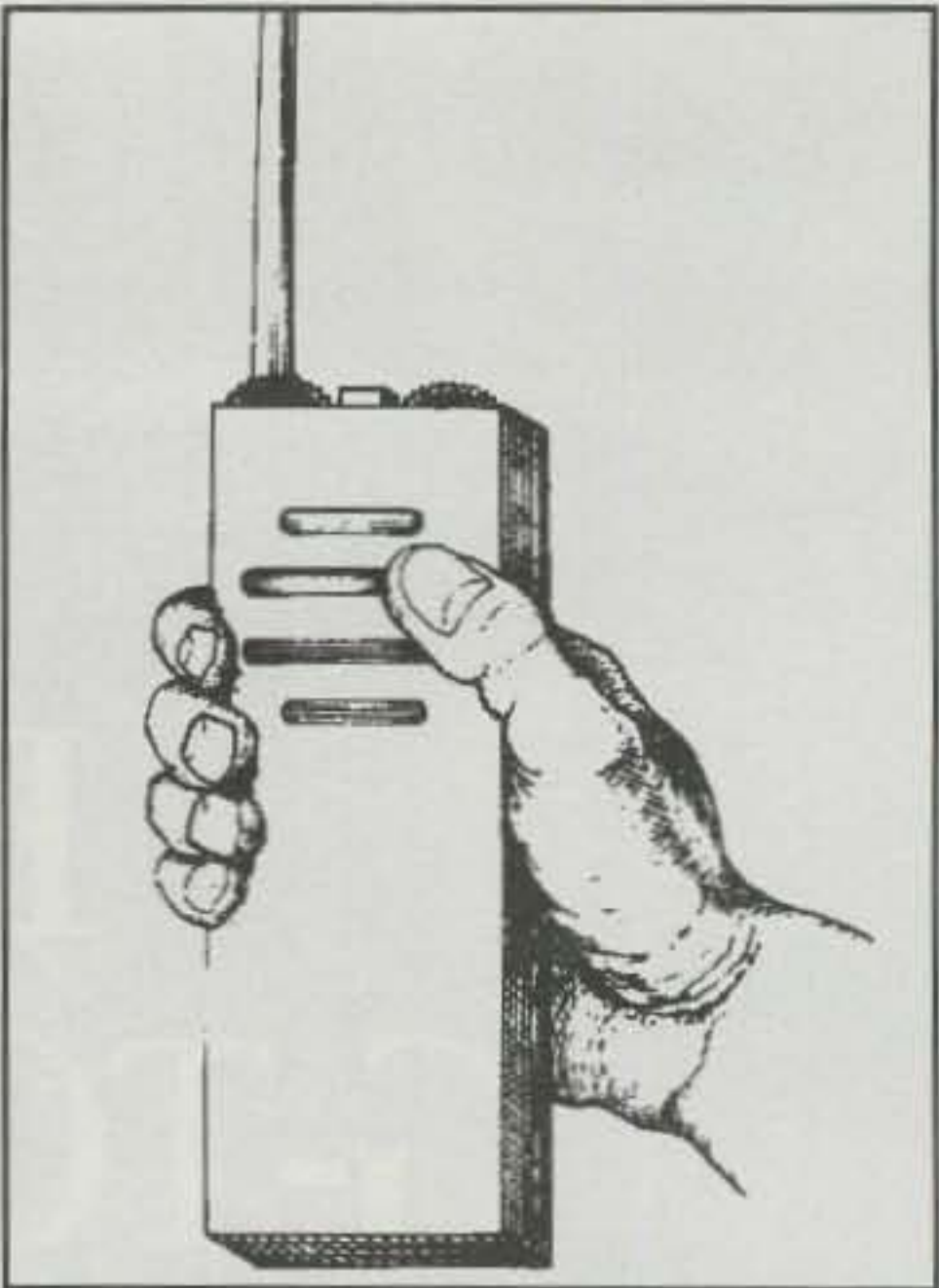


Photo 7- VHF Engineering's HT-144 kit talkie. Detailed photos of this unit were as scarce as the radios. Note top-mounted thumbwheels for volume and squelch.

QUALITY QSLs by WX9X

1000 QSLs from \$28⁹⁵

Write or Call for **FREE SAMPLES!** Stamps Appreciated

**354 West Street
 Valparaiso, IN 46383
 (219)465-7128 Fax (219)464-7333**

CABLE TV CONVERTERS
Save \$100'S


- All makes and models
- Quality Equipment
- Shipped within 24 hrs
- Years of customers complete satisfaction
- Free catalog

L & L ELECTRONICS, INC.
 1430 Miner St. Suite 522
 Des Plaines, IL 60016

VISA 1-800-542-9425 MASTER CARD

Purchaser Must agree to comply with all State and Federal laws.

FREE SAMPLE COPY!



ANTIQUE RADIO CLASSIFIED
Antique Radio's Largest-Circulation Monthly Magazine

Articles - Classifieds - Ads for Parts & Services
 Also: Early TV, Ham Equip., Books, Telegraph, 40's & 50's Radios & more...
 Free 20-word ad each month. Don't miss out!

1-Year: \$29.95 (\$47.95 by 1st Class)
 6-Month Trial - \$16.95. Foreign - Write.

A.R.C., P.O. Box 802-C14, Carlisle, MA 01741
Or Call: (508) 371-0512

antenna from a fancy multimode 2 meter rig and use its deviation meter for "zero beat" guidance.

Since the handheld's case is open (yes, it is normal to open old talkies), this is the ideal time to connect a wattmeter to its antenna socket and check output power. Again, refer to your unit's manual for tune-up guidance. Additional steps (such as full realignment, troubleshooting minor problems, etc.) depend on your technical expertise, patience, and eyesight. Need help? Professional technicians specializing in amateur radio gear usually advertise their services in magazine display ads and classifieds. Most of them are sharp as tacks and quite congenial.

Column space is now super-short! Let's close with some quick notes on battery packs.

Good news! Many old-style talkies accept a handful of AA batteries for power. If you use alkalines rather than nickel cadiums, be sure to include a dummy/filler cell in one slot (to compensate for the difference in 1.2 and 1.5 volt cells). If necessary, homebrew a filler with springs on a wood dowel and a metal jumper between springs.

If your handheld uses a special battery pack, check hamfest suppliers for mini (type "N") cells and make a home replacement. Use masking tape to secure the cells together.

Good luck, good FMing, and may those dear old talkies live forever without fearing junkbox extinction!

73, Dave, K4TWJ

**the Original
 ULTIMATE PADDLE**
We Didn't invent CW. We Perfected It.



- Non-Skid Feet
- Stainless Steel Adjustable Spring for Different Fists
- Nylon & Stainless Self Adjusting Needle Bearings
- Gold Plated Solid Silver Contact Points
- Large Clear Plastic Handles
- Unmatched Responsiveness

Write or Call for Brochure

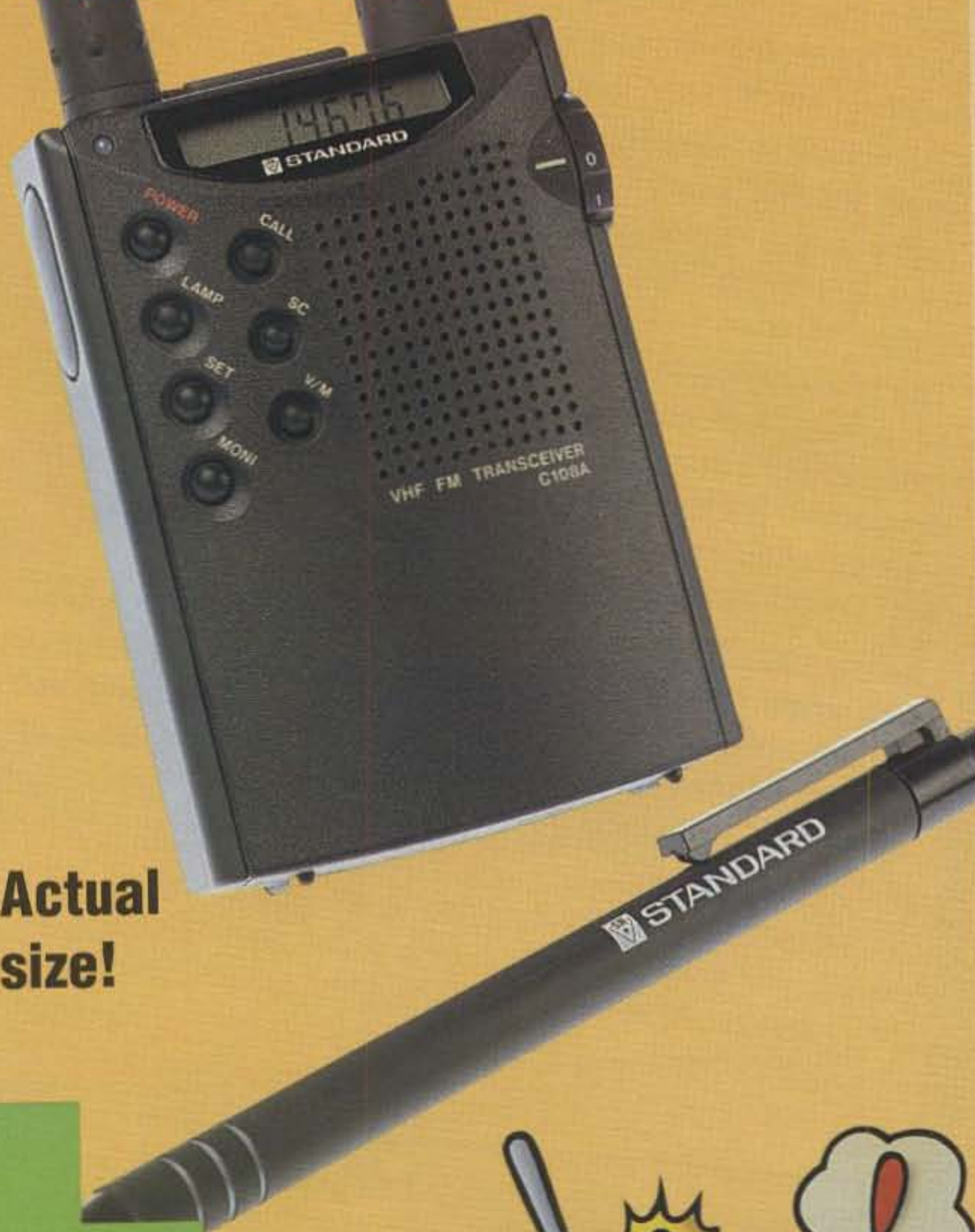
BENCHER, INC.
 831 N. Central Ave., Wood Dale, IL 60191
 708/238-1183 FAX 708/238-1186

Made in U.S.A.

CIRCLE 31 ON READER SERVICE CARD



2 METERS IN YOUR SHIRT POCKET!



**Actual
size!**



For more information on the C108A and other STANDARD products, please contact your nearest STANDARD dealer. Specifications, features and price are subject to change without obligation or notice.

Standard Amateur Radio Products, Inc.
P.O. Box 48480
Niles, Illinois 60714
Tel. (312) 763-0081 Fax (312) 763-3377

Here's the tiniest hand-held Amateur transceiver ever offered! Standard's C108A is truly the rig you'll want to carry with you all the time. Its 200 mW output is ample for hamfests, picnics, conventions — or even for working nearby repeaters. With its 100-175 MHz receiver, you can also monitor the public service, marine and aircraft (AM detector) bands along with your favorite 2-meter frequencies.

JUST LOOK AT WHAT YOU GET WITH THE C108A:

- 100-174.995 MHz receive, FM or AM detector
- 200 mW Transmit Power
- 20 memories; stores frequency, offset and CTCSS tone
- CTCSS built-in; 23 tones available
- Scan modes: 1 MHz, Full Range, Memory, and Memory-Scan-Memory; programmable for Pause and Busy
- DC Power: 2 alkaline AA penlight cells

PLUS Battery Save and Auto Power Off, Keyboard Lock. The C108A measures only 2.3"x3.2"x1", weighs less than 5 oz.—get one for your shirt pocket today!

ACCESSORIES:

- | | |
|---------|-------------------------|
| CHP111 | Headset microphone |
| CHP150 | VOX microphone |
| CLC401 | Standard soft case |
| CLC402 | Deluxe soft case |
| CMP111 | Speaker microphone |
| CMP113 | Tie pin microphone |
| CMP115 | Mini speaker microphone |
| CNB401 | NiCad battery pack |
| CSA401A | NiCad battery charger |



STANDARD

The right tools make all the difference!

Thinking about your next antenna project—or maybe your first antenna project? Looking for new designs and ideas? Before you reach for your tool kit, reach for the tool you don't have yet—the brand-new edition of *The ARRL Antenna Book*.

Extensively revised, this 17th edition features a new chapter on HF Yagi Arrays. You'll find a suite of 72 optimized Yagi designs for the HF amateur bands, from a tiny 8-foot-long, 3-element, 10-meter beam to an 80-foot-long, 20-meter monster.

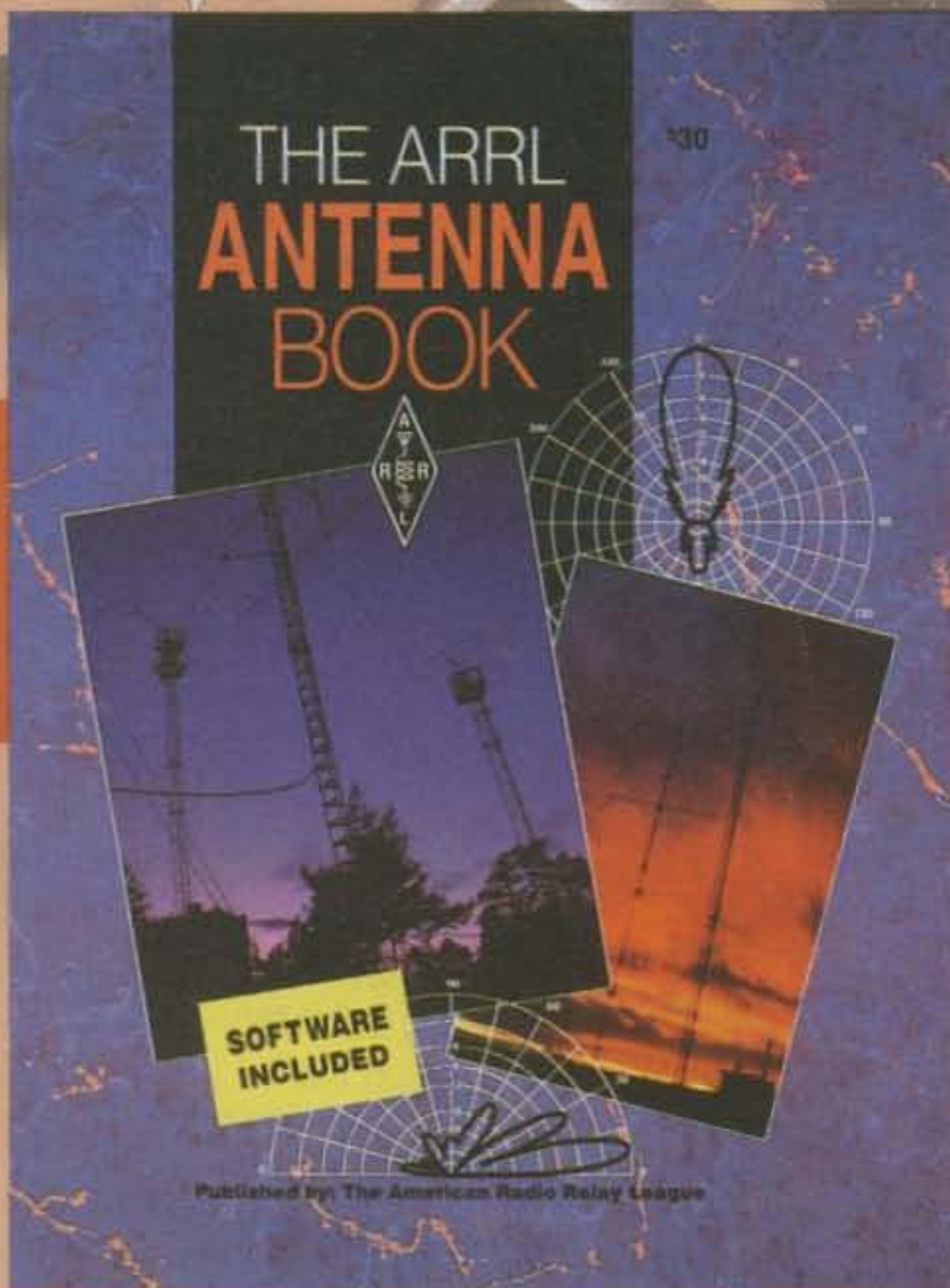
The Radio Wave Propagation chapter now includes comprehensive statistical data on the range of elevation angles needed for communication from all areas of the US to important DX locations around the world. You'll also find an upgraded VHF and UHF Antenna Systems chapter with K1FO optimized Yagi designs.

Nearly 1000 drawings make it easy to follow the text, which was written by ARRL HQ staffers and an impressive list of outside antenna experts. Photos, tables and bibliographies for further reading make the 28 chapters in this book an invaluable tool for you.

This new 736-page edition of *The ARRL Antenna Book* comes bundled with another handy brand new tool—a 3 1/2-inch IBM-format disk with programs to help you design and analyze Yagi antennas, forecast propagation, evaluate transmission lines and more.

The success of your project depends on the quality of your tools. Since its first publishing in 1939, *The ARRL Antenna Book* has helped thousands of hams get the job done right. Order your copy today.

ARRL Order No. 4734 Retail: \$30



The American Radio Relay League

225 Main Street • Newington CT 06111-1494

CIRCLE 170 ON READER SERVICE CARD

NEW



NEW DUAL BAND 2 METER/440 MHz. G6-270R

The high performance of our well known G6-144 and G6-440 are combined in our new 2 meter/440 dual band vertical, model G6-270R.

A sleek, one piece tapered fiberglass radome eliminates the intermodulation and mechanical problems associated with two and three piece UHF radome designs.

Made in the U.S.A. of high quality American materials, the G6-270R offers 6 dBd gain (8.1 dBi) on both bands for outstanding fringe area performance.

The antenna is shunt-fed and D.C. grounded for lightning protection and will survive winds to 100 mph.

The G6-270R is factory tuned for quick and easy installation.

Model G6-270

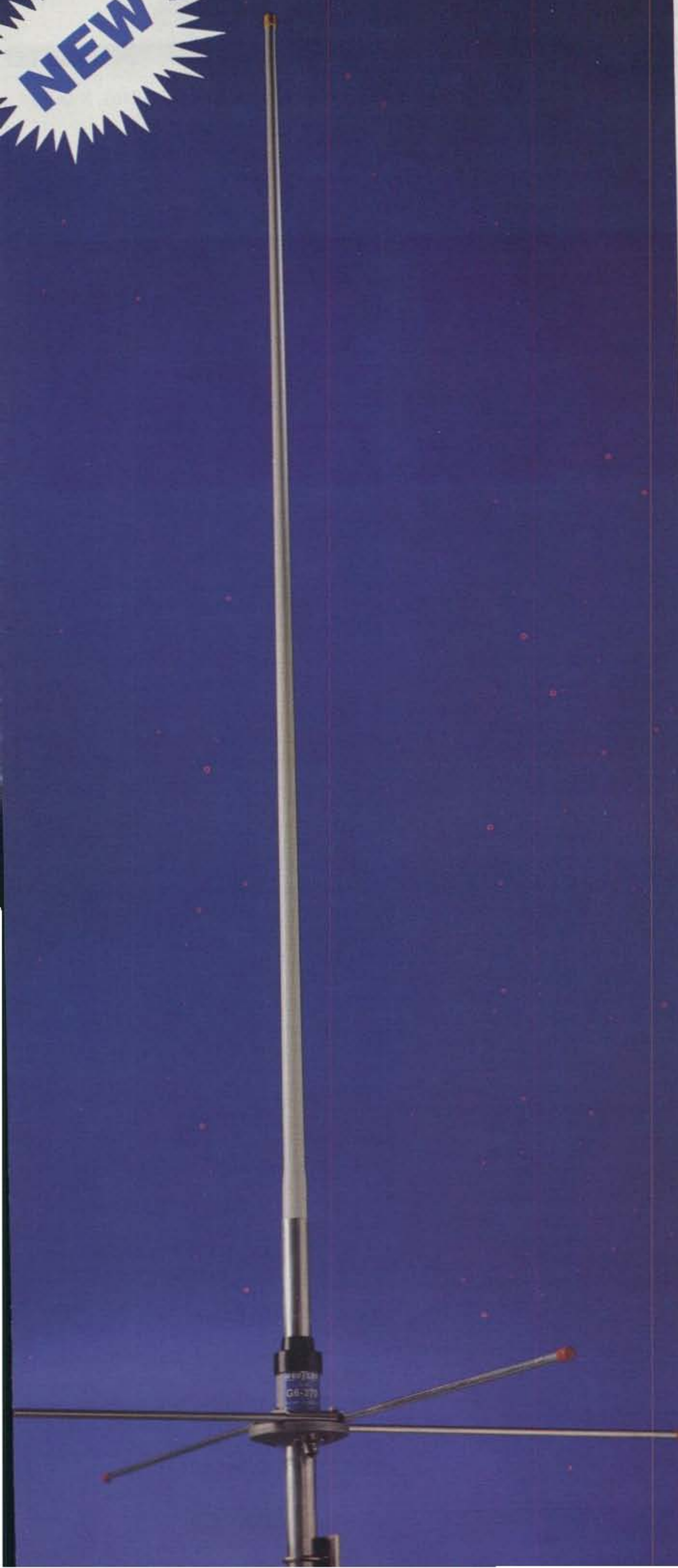
Specifications:

Gain:	6 db VHF 6 db UHF
Bandwidth:	10 MHz UHF 3MHz VHF
Design:	4x5/8 wave collinear 440 5/8 over 5/8 collinear 2 meters Shunt fed-DC ground
Length:	100 inches
Weight:	6 lbs
Wind Survival:	100 mph
Mounting:	Includes hardware for 1-1/2" dia. mounting mast Mounting plate will accept 2" U-bolts, not included.
Termination:	Type N female

NEWTRONICS ANTENNA CORP.

One Newtronics Place
Mineral Wells, Texas 76067
817-325-1386

CIRCLE 6 ON READER SERVICE CARD



PACKET USER'S NOTEBOOK

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

BY BUCK ROGERS, K4ABT

Audio Levels Are Not Always Level

At the SouthNet Packet Conference in June I witnessed many changes that are taking place in packet radio. Amateur radio is witnessing a new era in packet radio as it begins the leap into the next generation of user level controllers and network level nodes.

The most significant area is at the 9600 baud user level. PacComm has provided both the user and the node SYSOP with a tool that will allow direct conversion of their high-speed TNCs for use in node service applications using the more popular networking nodewares—e.g., X-1J, etc. This new generation of TNC from PacComm is called SPRINT, not to be confused with another highly efficient communications network.

The New Breed

Many new amateurs are more computer oriented than those who joined our ranks a few years ago, and they are entering the digital ranks of amateur radio in greater numbers. As a direct result of this new entry-level amateur, those of us who are longtime users of the digital modes are becoming the tutors of this new breed of amateur. And if the OEMs take note of the many new packet users, the packet equipment manufacturers will surely be compensated for their efforts if they direct more attention (products) to the needs of the digital user and community.

The last time we saw an upsurge in our ranks was when FM repeaters became popular. Before that it was the advent of single-sideband technology that created renewed interest in amateur radio. The first time I can recall a sudden increase in the ranks of amateur radio was in the early 1950s, when the Novice license was born.

There are many newcomers to packet radio who are attempting to "roll their own" packet stations. Through no fault of theirs, the new packeteer will wire the new terminal node controllers (TNCs) to the computer, and by following the connecting scheme in the TNC manual, he or she will next make the connections to the transceiver input connector.

211 Luenburg Drive, Evington, VA 24550



The Watkinsville, Georgia (WKV) site owned by Oconee Well Diggers, who allows the use of their tower and facilities for this SEDAN emergency communications X-1J2 node. Other amateur radio repeaters are in use at the same site. The WKV node consists of an Alinco Data-Radio, an MFJ-1270B, and a 9 dB vertical antenna fed with hardline to the 165 foot level of the tower. WKV node is located 10 miles south of Athens, Georgia (home of the University of Georgia). Pictured are (left) Jeff, KD4AOZ, and (right) Usher, KN4WK.

In a rush to put the new packet station on the air, the new packeteer often fails to check the amount of transmit audio (AFSK) from the TNC to the transceiver. With some TNCs this level may be too low, but with others it may be too high.

Since the majority of packet operations begin on VHF, the controller is interfaced to an FM transceiver. Here is where we discover the biggest problem in packet radio: "More is not always best."

More Is Not Always Best

The reason this problem exists in the first place is because many transceiver manufacturers have not considered the fact that many of their new models are being used for data communications.

The next generation of test equipment needed in the ham shack is an item called a deviation meter. There are lots of manufacturers of deviation meters. However, the cost of the product is restrictive, and too it is often manufactured as an integral part of a larger piece of test equipment that supports a combined deviation meter (such as the IFR 1200S), tone generator, spectrum analyzer, frequency meter/



Two SEDAN node SYSOPs at the Wilmington, North Carolina node site. On the left is ED, WA4KUS, and on the right is SEDAN president and SYSOP of several SEDAN nodes, Rick, KD4JKX. (Photo via Bill, AD4DN, SYSOP of the "ILM" node.)

counter, and power meter, all rolled into an expensive master station test monitor.

So often I hear the following remark, but in the form of a complaint: "I can print the other station, but I can't connect to it."

Here's The Scenario

The new packeteer has everything connected as specified in the manual, and is now printing packets from other packet stations. As the streams of data flow across the screen, this same packeteer wishes to connect to a station or BBS that has been spotted on the frequency. The incoming signal is good, and the print is perfect.

Now here is the moment of truth. The new packeteer has the manual handy and the connect routine down to perfection. And why shouldn't it be perfect? He/she has read the book and has watched friend Steve down the street do it a hundred or more times.

The connect request is typed in, and the <Enter> key is pressed:

```
cmd:C K4ABT <Enter>
```

After about 40 seconds and 10 tries (default RETry) the screen deposits the following statement to the new packeteer:

```
Retry Exceeded  
cmd: *** DISCONNECTED >
```




AMATEUR ELECTRONIC SUPPLY®

HEADQUARTERS - MILWAUKEE, WI

(414) 358-0333 • (800)-558-0411 • Fax (414) 358-3337
24-hour BBS (414) 358-3472 (8-N-1, up to 14.3k baud)

WICKLIFFE, OH (216) 585-7388 • (800) 321-3594 • Fax (216) 585-1024
ORLANDO, FL (407) 894-3238 • (800) 327-1917 • Fax (407) 894-7553
CLEARWATER, FL (813) 461-4267 • (813) 443-7893 • No Toll Free Line
LAS VEGAS, NV (702) 647-3114 • (800) 634-6227 • Fax (702) 647-3412

5 WAREHOUSE LOCATIONS Our own unique CREDIT CARD!

- ★ Toll Free Lines ★ Low Prices ★ Large Stocks ★ Top Trades
- ★ Service Department ★ Knowledgeable Staff
- ★ Fast Shipping ★ Flat Rate to 48 States

MORE Buying Power with the ...



AES® Credit Card

NO PAYMENT FOR 90 DAYS

No Minimum Purchase
18.9% APR No Down Payment
No Annual Fees

Call for Application Today!
HOURS • Mon - Fri 9-5:30; Sat 9-3:00

ALINCO

Call AES®
for Prices!
1-800-558-0411

YOUR COMBINATION FOR QUALITY,
LOW PRICES AND SUPER SERVICE

VHF & UHF MOBILE UNITS

DR-130T 2-Meter Mobile

50/5W output • 140-174MHz receive • 20 memories (100 optional) • CTCSS encode built-in • 5 1/2" w x 1 1/2" h x 6" d, 2 1/2 lbs. • Model DR-430T is 440MHz.



DR-570T 2m/440MHz Twin Band Mobile

45/35W • 130-170, 340-470+ MHz receive • Full duplex cross band • 20 memory channels, 4 scanning modes • CTCSS encode/decode • internal duplexer • Separate controls - each band • 5 1/2" w x 2" h x 6 1/2" d, 3 1/2 lbs.



DR-600T 2m/440MHz Twin Band Mobile

45W (2m)/35W 440 MHz • receives 118-174 (including AM and 410-470 MHz) • 40 memories • scan • full duplex cross band operation • remotes from any DTMF capable 2m or 70cm unit • separate VHF/UHF outputs • separate controls for each band • CTCSS and DTMF encode • 5 1/2" w x 2" h x 7" d, 3 1/2 lbs.



DR-1200T 2m Data Radio

Optimum Packet • 25W • 1200/2400 baud • 14 programmable memories • 4 scan modes • programmable CTCSS encode/decode • voice transmission with optional microphone • 5 1/2" w x 2" h x 6 1/2" d, 2.2 lbs.



DR-1200TH2 is 9600 baud version.

HAND HELD UNITS



DJ-180T DJ-580T DJ-F1T DJ-G1T

DJ-180T 2m HT - Intuitive, EZ to operate! • receives 130-174 MHz • 2.0W, 5W with optional battery, illuminated LCD display • 16 digit DTMF • 10 memories • 5 1/2" h x 2 3/4" w x 1 3/8" d.

DJ-180TH - Same as DJ-180T but 5W standard
DJ-580T 2m/440MHz Twin Band HT - 2.5W • receives 130-174 & 410-470MHz. Modifies for MARS/CAP tx, + 118-136MHz+ • 40 memories • CTCSS encode/decode • DTMF encode • DSQ. • full duplex cross band repeat • scan • autodialer • back-lit keypad • simult. rx on both bands-separate controls • 6 1/2" h x 2 1/4" w x 1 1/4" d, 0.97 lbs.

DJ-F1T 2m Mini HT - 2.5W • receives 130-174MHz and 118-136MHz • scanning • autodialer • back lit keypad, 40 memories • call channel • CTCSS • DTMF encode • DSQ paging • 4 1/2" h x 2 1/2" w x 1 1/2" d, 14 oz.

DJ-F1T/HP - Same as DJ-F1T but 5W • 12V 600mah nicad battery standard.

DJ-G1T 2m HT - 2m tx/rx + 440MHz and AM aircraft receive • Channel Scope spectrum analyzer • 80 memories -5 for autodialer • Crossband semi-duplex operation • DSQ paging • Scan • 4 1/2" h x 1 1/2" w x 1 1/2" d, 12.6 oz.

ALINCO COUPONS & REBATES... Up To \$50 Savings!

COUPONS Good on the radios listed until Aug. 31st, 1994. The coupon amount shown is applied at the time of sale ... there is nothing for you to send in!

REBATES If you purchase one of the radios listed and the indicated accessory you can receive a Rebate Check direct from Alinco for the amount shown. To qualify, the radio and accessory must be purchased on or before August 31st, 1994.

CLOSEOUTS

DJ-162TD 2.5w 2m HT/nicad + alkal. case ... \$199⁹⁵

DR-119T 50W 2m Mobile ... \$344⁹⁵

DR-592T 45w/35W 2m/440 FM mobile ... \$469⁹⁵

COUPONS

- \$10 OFF DJ-180T • DJ-180TH
- \$20 OFF DJ-F1T • DJ-F1T/HP • DJ-580T
- DR-130T • DR-600T
- \$30 OFF DJ-G1T

Always ask about latest Coupons

REBATES

Purchase Radio	Purchase Accessory	SAVE!
DJ-G1T	EDC-52	\$20
DJ-580T	EMS-8Z	\$5
DJ-F1T & HP	EBP-14N	\$20
DR-600T	EJ-7U	\$5
	EDC-19	\$15
DR-130T	EJ-20U	\$5
	EJ-19U	\$5
DJ-180T/TH	EJ-15U	\$5
	EMS-9	\$5

AES® Warehouse locations allow 1 to 2 day UPS Delivery to most locations without expensive Air Charges.

Orders over \$1500⁰⁰ shipped via UPS Ground in the 48 States are PREPAID.

An economical Flat Rate applies on orders up to \$1499⁹⁹.

WE'VE GOT IT ALL!

YAESU HF



FT-1000 / FT-1000DCall!
 FT-990 / FT-990DCCall!
 FT-890ATCall!
 FT-840Call!

VHF/UHF



FT-5200 / FT-5100Call!
 FT-2500 / FT-2200Call!
 FT-2400CLOSEOUT!
 FT-530 / FT-416 / FT-11Call!

KENWOOD HF



TS-950SDXCall!
 TS-850S / TS-850SATCall!
 TS-450S / TS-450SATCall!
 TS-50SCall!

VHF/UHF



TM-742A / TM-733ACall!
 TM-241 / TM-251Call!
 TH-78 / TH-28 / TH-22Call!

AEA

PK-900449
 PK-232MBX299
 PK-96/14K195

ASTRON

RS-12A (12A peak)73
 RS-20A (20A peak)90
 RS-20M (20A, w/ meters)112
 RS-35A (35A peak)144
 RS-35M (35A, w/ meters)162

HYGAIN

TH-11DXS849
 TH-7DXS639
 218S369
 Hygain crankups- Please call.

KANTRONICS

KAM+299
 KPC-3110
 KPC-9612 (32k/128k)219/239

M2

2M7 / 2M12Call
 2MCP14 / 2M5WLCall
 2MCP22 / 2M18XXXCall
 432-13WLA / 432-9WLCall
 440-18 / 436CP30Call

TIMEWAVE



DSP-59+ DSP filter299
 DSP-9+ DSP filter219
 DSP-9 DSP filter169
 Timewave products in stock!

ROTATORS

Telex HAM IV (15 sq.)355
 Telex Tailtwister (20 sq.)420
 Yaesu G500 (elevation)259
 Yaesu G800S (21 sq.)309
 Yaesu G800SDX (21 sq.)379
 Yaesu G1000SDX (23 sq.)459
 Yaesu G2700SDX (34 sq.)879
 Yaesu G5400B (az. / el.)479
 Please call for other rotators.

US TOWERS

- The best heavy duty galvanized steel design available.
- All tower models are totally self-supporting, no guys!
- Shipped factory direct to reduce shipping cost to you.
- Please call for shipping quote. In CA, add 6% state tax.

MODEL	MIN.	MAX.	WINDLOAD	PRICE
MA-40	22'6"	40 FT.	10 SQ. FT.	679.00
MA-550	22'1"	55 FT.	10 SQ. FT.	1069.00
MA-770	23'10"	71 FT.	10 SQ. FT.	3129.00
MA-850	24'6"	85 FT.	10 SQ. FT.	3389.00
TX-438	22'6"	38 FT.	18 SQ. FT.	989.00
TX-455	21'0"	55 FT.	18 SQ. FT.	1489.00
TX-472	23'8"	72 FT.	18 SQ. FT.	2449.00
TX-489	24'4"	89 FT.	18 SQ. FT.	4269.00
HDX-538	22'6"	38 FT.	30 SQ. FT.	1279.00
HDX-555	22'0"	55 FT.	30 SQ. FT.	2239.00
HDX-572	23'8"	72 FT.	30 SQ. FT.	3859.00
HDX-589M	24'8"	89 FT.	30 SQ. FT.	7689.00

COAX & CABLE

ANDREW HELIAX®
 1/2"2.49/ft. 7/8"5.99/ft.
 connectors: 1/2".....32 7/8"78

COAX
 CQ4XL IIA49/ft.
 CQ4XL Flexi65/ft.
 RG-213/U (8267 equiv.)39/ft.
 CQ8X (mini RG-8/U)25/ft.

ROTOR CABLE
 5 conductor (5-#20)22/ft.
 8 conductor (2-#18, 6-#22)25/ft.

ALUMINUM

6063-T832 DRAWN TUBING

O.D.	WALL	I.D.	COST
.375"	.058"	.259"	.35/ft.
.500"	.049"	.402"	.45/ft.
.500"	.058"	.384"	.50/ft.
.625"	.058"	.509"	.55/ft.
.750"	.058"	.634"	.65/ft.
.875"	.058"	.759"	.75/ft.
1.000"	.058"	.884"	.80/ft.
1.125"	.058"	1.009"	.90/ft.
1.250"	.058"	1.134"	1.10/ft.
1.375"	.058"	1.259"	1.20/ft.
1.500"	.058"	1.384"	1.40/ft.
1.625"	.058"	1.509"	1.60/ft.
1.750"	.058"	1.634"	1.80/ft.
1.875"	.058"	1.759"	1.90/ft.
2.000"	.058"	1.884"	1.95/ft.
2.125"	.058"	2.009"	2.05/ft.

In 6' and 12' lengths; 6' via UPS,
 12' via truck or air freight collect.

6061-T6 EXTRUDED TUBING

O.D.	WALL	I.D.	COST
.188"	Solid	---	.15/ft.
1.125"	.058"	1.009"	.70/ft.
1.250"	.058"	1.134"	.85/ft.
2.000"	.120"	1.760"	2.60/ft.
2.000"	.250"	1.500"	4.10/ft.
2.500"	.120"	2.260"	3.25/ft.
3.000"	.065"	2.870"	2.20/ft.
3.000"	.120"	2.760"	3.85/ft.

6', 12', & 24' lengths; 6' via UPS,
 12' & 24' via truck freight collect.

ROHN

25G/45G/55G65/149/197
 FK2548/58/68'1350/1450/1485
 FK4544/54/64'1775/1950/2075
 HBX40 40' tower (10 sq.)325
 HBX48 48' tower (18 sq.)450
 HBX56 56' tower (10 sq.)589
 HDBX40 40' tower (18 sq.)429
 HDBX48 48' tower (18 sq.)579
 Please call for other Rohn items.

GUY HARDWARE

3/16EHS guywire18/ft.
 1/4 EHS guywire23/ft.
 3/16 preformed big grips2.29
 1/4 preformed big grips3.49
 500D guy insulator2.29
 502 guy insulator4.49
 3/8EE turnbuckle8.95
 3/8EJ turnbuckle9.95
 1/2X9EE turnbuckle11.95
 1/2X9EJ turnbuckle12.95
 1/2X12EE turnbuckle13.95

PHILLYSTRAN

NONCONDUCTING GUY CABLE
 HPTG1200I (1200#)42/ft.
 HPTG2100I (2100#)52/ft.
 HPTG4000I (4000#)75/ft.
 HPTG6700I (6700#)95/ft.
 PLP2738 (2100 big grip)6.50
 PLP2739 (4000 big grip)9.00
 PLP2755 (6700 big grip)13.00

CARBON STEEL MASTS

WALL	5'	10'	15'	20'
.12	29	55	82	99
.18	49	95	139	179
.25	--	129	--	249

Don't be fooled by claims of aluminum masts as strong as steel! Our 2" O.D. galvanized steel masts have a typical yield strength of 87,000psi.

TOLL FREE ORDERS

Ordering is easy! Just grab your phone and call us at:

(800) 272-3467

FAST SHIPPING!

You'll get it fast! Most items are shipped the same day.

IF YOU DON'T SEE IT... ASK!

Or, send for your free copy of our latest catalog of over 2,600 amateur radio products!



WE'VE GOT EVERYTHING!

In addition to the manufacturers represented in this ad, we also carry a full line of amateur products from: Alinco, Alpha-Delta, Ameritron, Amphenol, Anli, AOR, Artsci, ARRL, B&W, Bencher, Bird, Callbook, Comet, Create, Daiwa, Datong, Diamond, Emoto, Force 12, Genesys, GLA, Heil, Hustler, JIM, KLM, Larsen, M², Maldol, Martin, Mirage, Novex, Nye Viking, Outbacker, Palomar, Pro-Am, Radio Publications, rf Concepts, SAM, SAT Tracker, Sigma, Smiley, Standard, TE Systems, Universal Tower, Van Gorden, Vibroplex, and More.

If you don't see it listed here, please be sure to call us!

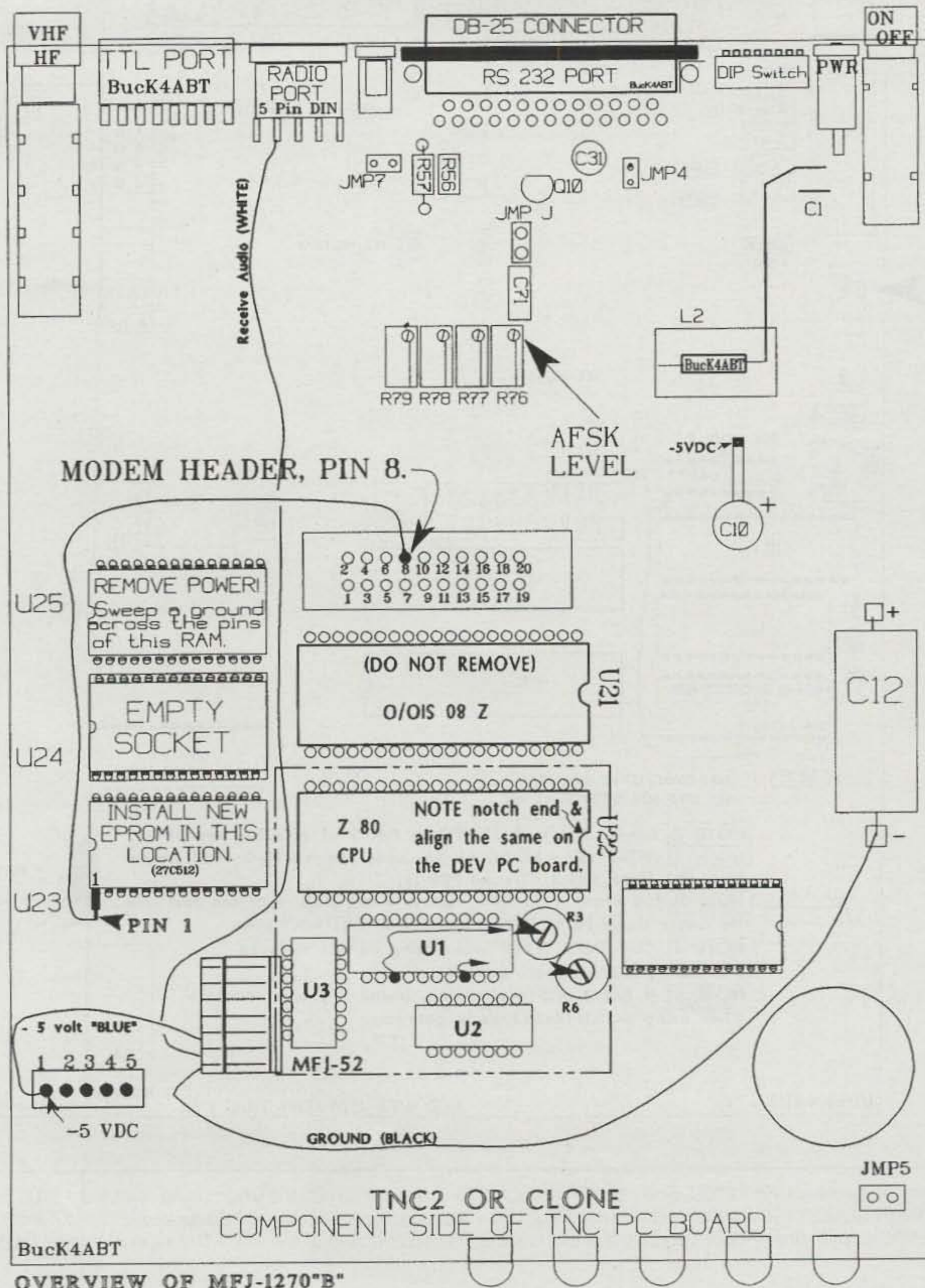
Prices and specifications were current at press time, but are subject to change without notice or obligation. Please call to verify prices prior to ordering.

TEXAS TOWERS (800) 272-3467

TECH:(214) 422-7306 FAX:(214) 881-0776

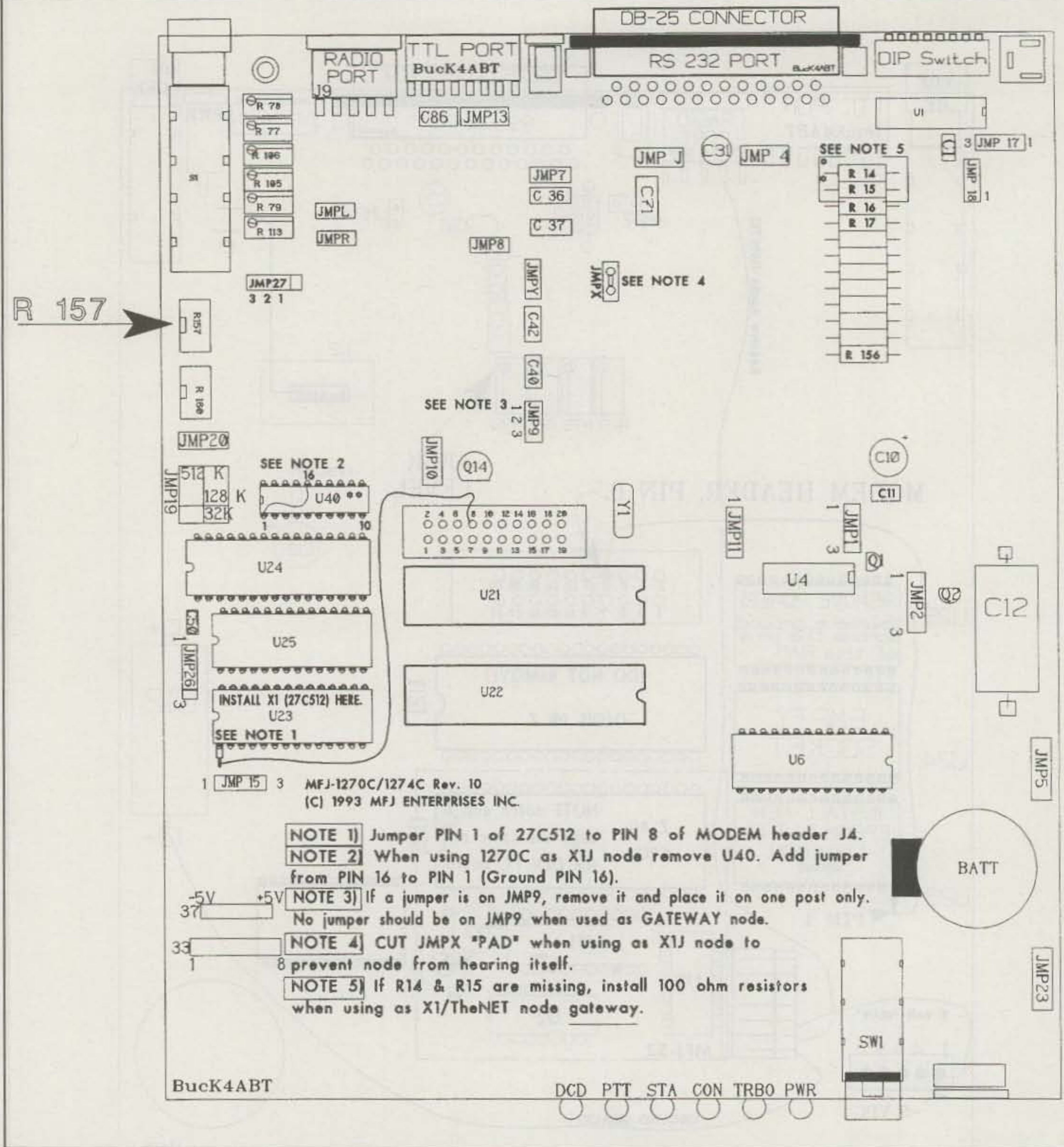
A Division of Texas RF Distributors, Inc. • 1108 Summit Avenue, Suite #4 • Plano, TX 75074 • USA

HOURS: MON-FRI: 9 AM-5 PM, SAT: 9 AM-1 PM. M/C & VISA GLADLY ACCEPTED.



OVERVIEW OF MFJ-1270"B"

Fig. 1- This drawing illustrates the EPROM and MFJ-52A placement. Note the wire attached from pin 1 of the EPROM (outside the socket) to pin 8 of the modem header disconnect. In the earlier version of the MFJ-1270B the AFSK level control is located inside the TNC. Note the arrow pointing to R76. See fig. 2 for the location of the AFSK level control on the MFJ-1270C.



1 JMP 15 3 MFJ-1270C/1274C Rev. 10
(C) 1993 MFJ ENTERPRISES INC.

- NOTE 1) Jumper PIN 1 of 27C512 to PIN 8 of MODEM header J4.
- NOTE 2) When using 1270C as X1J node remove U40. Add jumper from PIN 16 to PIN 1 (Ground PIN 16).
- NOTE 3) If a jumper is on JMP9, remove it and place it on one post only. No jumper should be on JMP9 when used as GATEWAY node.
- NOTE 4) CUT JMPX "PAD" when using as X1J node to prevent node from hearing itself.
- NOTE 5) If R14 & R15 are missing, install 100 ohm resistors when using as X1/TheNET node gateway.

Fig. 2- Overview of the new MFJ-1270C. See notes 1 through 5 for special instructions when using the MFJ-1270C in node service. When setting the AFSK transmit level inside the TNC, know the location of the transmit audio level control before you begin. In the MFJ-1270C above, the AFSK level control is accessible from the outside of the TNC. The level control is labeled R157.

The important TNC parameters are checked again to be sure they are correct. **TXDelay** is 35, **DWait** is 16, **FRack** is 4, and since the computer-to-TNC connection is using hardware hand-shaking (RTS & CTS), **XFLow** and **FLOW** are set to **OFF**. Everything seems to be set properly.

A quick telephone call to a nearby packeteer and we are on the way to the

solution. The nearby packeteer listens on the same frequency while the new packeteer tries the connect again.

This time the neighbor packeteer notices the audio is louder than other stations in the area. There is also some "hash" or maybe distortion (or possibly a little of both) present in the transmitted audio from the new station.

The problem has been identified, but the cure is not a simple one! The problem: too much deviation, and possibly too much speech amplification is taking place inside the transceiver. Yes, the two are different, yet they both can cause a common problem. Too much "speech amplification" or "deviation" can cause the problem we have just described.

When All Else Fails . . .

If you are unable to locate the proud owner of a deviation meter (similar to the IFR 1200S), then check with local two-way radio service shops.

An easy or quick means to check the deviation is when there is an X-1J node in your area which has the MFJ or PacComm deviation meter PCB installed (see MFJ-52A insert in fig. 1). If this is the case, all you have to do is establish a connect to the node outfitted with the PacComm AD-3 or the MFJ-52A and download an Mheard list. Your call and current transmitted deviation level will be the first line displayed in the Mheard list.

Know Where The "Steering Wheel" Is Located

It is advisable to know which component inside the TNC controls the audio output. In addition, locate where both the mic gain and deviation controls are within the FM transceiver. This is to reduce the time spent looking for them when you are ready to set the levels.

Examples of the AFSK level control locations are shown in figs. 1 and 2. At fig. 1 the AFSK level control is located inside the TNC, and in fig. 2 the control is accessible from outside the TNC.

Some TNC manufacturers use strapping options (jumpers) and staking pins which enable two or three level settings. The TNCs with variable resistors as the AFSK level control allow the more precise setting of the transmit levels.

In any case, you would like to have a clean transmit audio signal with the deviation running between 3 and 3½ kHz. Do not exceed 3.5 kHz or you will have defeated the purpose of all your efforts.

The reference modulating tone can be taken from the (most) TNC (in the CAL mode) or by using a 2200 Hz tone. If the latter is used, the audio should be rechecked when the TNC is connected to the input of the transceiver.

If an external 2200 Hz tone is used to set the transceiver deviation, it may be necessary to set the internal TNC AFSK (transmit audio) level control when the TNC is connected to the transceiver. This is because of any level differences between the level of the 2.2 kHz reference tone and the output level of the TNC. Do not readjust the internal controls of the transceiver!

Finally, if the transceiver you are using for packet operation doubles as the voice transceiver, then it would be wise to have the microphone handy when you are setting the deviation.

The voice level can be optimized with

the level settings of the TNC. In my case, the radios I use are dedicated to packet and operate exclusively in a data environment. If I must choose, I make sure the level control is set to favor data. Voice operation is secondary. If the audio is tailored for data, then voice operation, in most cases, will improve also.

Shelby, NC Hamfest And Packet Forum

The Shelby Amateur Radio Club will sponsor the Shelby, North Carolina Hamfest on September 3-4 at the Cleveland County Fairgrounds in Shelby. In addition to the fleamarket, prize drawings, and VEC exams, at 10 AM on Saturday there will be an entry-level packet forum presented by Buck Rogers, K4ABT, which will start with the basics and proceed to an introduction to the more advanced levels of packet radio. A free packet booklet will be given to those who attend the forum. For additional information on the hamfest contact John Ledford, N4GOQ, 3410 Oakcrest Drive, Shelby, NC 28150 (704-482-4507).

Thanks For The Help

To the many readers who wrote to me with information about the many sources for the 8-pin (RJ-45) connector, I wish to say thanks. Norman, N4AGN, notes that Radio Shack does carry the connector as part number 279-440. To those who notified me that other transceivers are beginning to use the same type of microphone connector, yes, I am seeing the trend, but no one as yet has included a spare RJ-45 (6 cents each from MEI).

Chip, K7JA, of Yaesu, wrote to let me know that Yaesu does indeed have available a packet radio interface cable for their FT-2400. It is their part designation Yaesu Packet Interface Cable, Part # "2400 MIC CABLE," and it sells for \$8.00. The rationale behind this extra cable is that the microphone provided with the FT-2400 is not a speaker/microphone, and therefore doesn't have a receive audio line on the cable. The cable also comes with a simple one-page interface procedure.

And Frank, KF9NZ, you are absolutely correct. Tinsel wire is a beast to work with. As you may have seen in the article, I used one of your old "telecommunications tricks" and wrapped the two ends of tinsel wire with tiny tinned wire and did a quick solder weep to the joint. No, it did not do the "brittle-break" as we sometimes see when the splice is over-heated. And thanks, Frank, for saying I'm good!

Have Fun Packeting!

de Buck4ABT @ KQ4OK.VA.U.S.A.NA

FREE

24 page Catalog

Books for your radio library.



Antennas, equipment, operating guides, contests, CQ Videos, packet radio, satellites plus much, much more are all in this one handy catalog. Call or write today and get your very own copy.

(800) 457 7373



Radio Bookstore

PO Box 209

Rindge, NH 03461

CIRCLE 95 ON READER SERVICE CARD



Alienated by your cable company?

We have the Best in

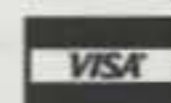
CABLE CONVERTERS & DESCRAMBLERS!

Everquest • Panasonic • Jerrold
Zenith • Pioneer • Scientific Atlanta
Oak • Eagle • Hamlin • Tocom

Call For Your FREE Catalog Today!

1 800 624-1150

And say NO to un-earthly equipment rental fees.



MD Electronics

875 S. 72nd Street Omaha, NE 68114



Member of National Consumer Cable Association

CIRCLE 71 ON READER SERVICE CARD

September 1994 • CQ • 93

WHAT'S NEW AND HOW TO USE IT

A Simple 1/4-Wave 2 Meter HT Antenna

I recently had the opportunity to use one of the new 2 meter HTs on the market with the factory supplied "rubber duck" antenna. While I was impressed with the many features of the rig and the overall quality of construction, I was not necessarily impressed with the antenna. True, it was a neat, rugged device, but being only 4 inches long, it greatly reduced the 3 watts of output power the manufacturer had struggled to obtain from such a tiny unit.

As is usually the case, I decided to try to improve matters. What obviously was needed was a larger antenna. A 5/8 wave with its low radiation angle and gain (over a dipole) would have been a good choice, but a 3 foot plus "whip" attached to the small BNC connector on the HT would probably snap the connector. What I finally settled on is a simple 1/4-wave whip. Cost is minimal (under \$5.00) and assembly time is about 15 minutes.

Fig. 1 is an exploded view of the antenna. It is made of readily available parts and is well within the means of the most novice of novices. The connector is a low-cost BNC male to female adapter from Radio Shack, and the whip is a discard from an old transistor radio or cordless telephone of the proper length. Alternately, a replacement whip from Radio Shack or the local telephone replacement component aisle in the supermarket will do. The insulator was made from a short length of plexi-glass rod I happened to have, although any insulating material of the approximate size will do. You even can use a small piece of a wooden broomstick in a pinch. (If you do use wood, it's a good idea to give it a coat of clear varnish or polyurethane for moisture resistance.

Fig. 2 shows the details of the various antenna components. To start, first cut the insulator rod to a length of 1 inch. Next extend the whip antenna fully, and using a hacksaw or plumber's tubing cutter, cut the length of the large section to exactly 19 inches. Keeping the antenna fully extended, drill a 1/16 inch hole (#60 drill) about 1/8 inch from one end through both sides of the tubing. This hole will act as a stop for the antenna sections, when collapsed, and a point to attach a wire. Discard any internal brass shim-stock pieces that may fall out of the end of the antenna rod after cutting. Now carefully measure the diameter of the cut antenna rod

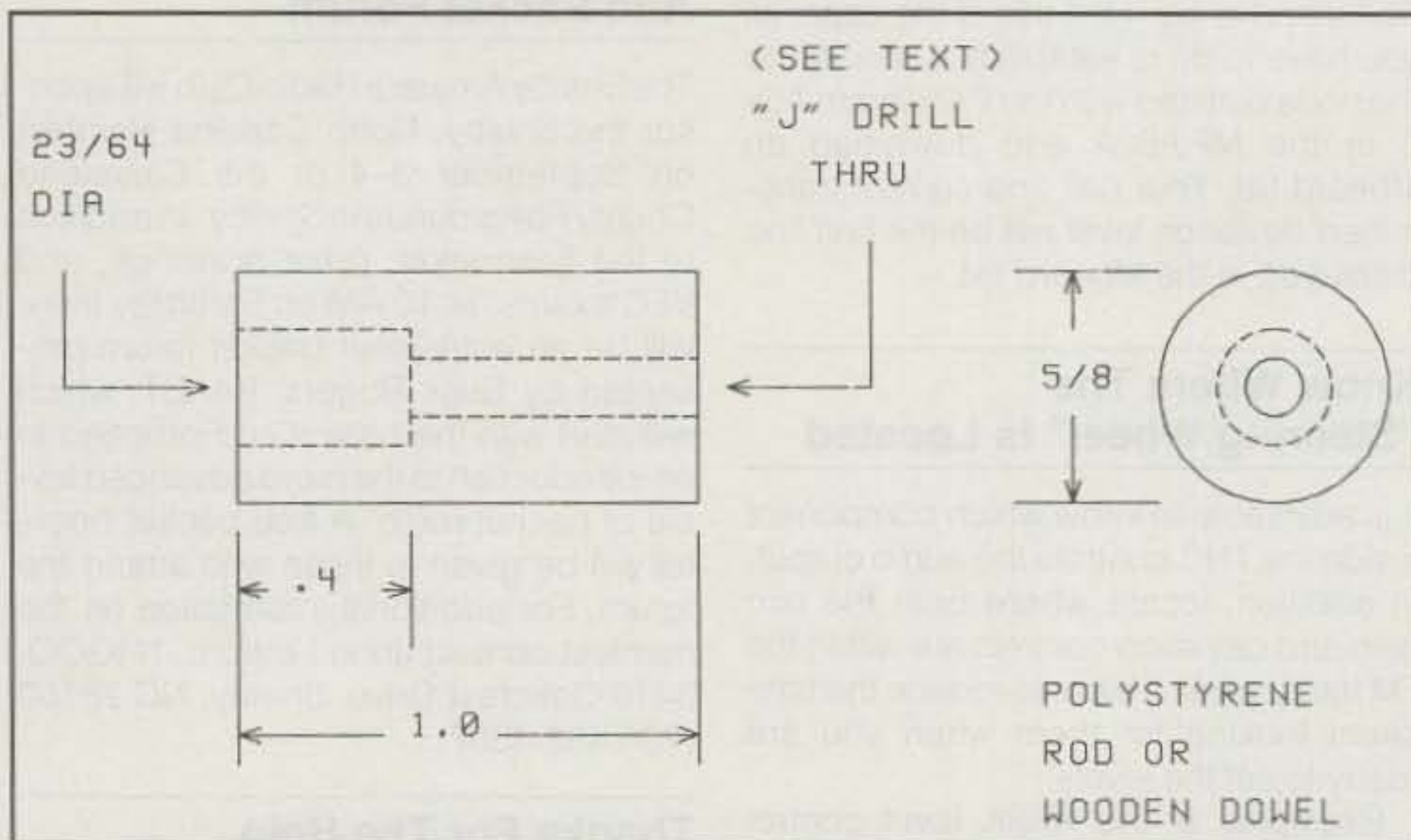


Fig. 1- Antenna insulator details.

and drill a hole all the way through the insulator to form a tight, but sliding fit. The diameter shown in fig. 2 was the right size for my antenna, but it probably will be different for the one you use.

Next drill a hole about 0.4 inch deep for the F connector as shown. This depth is not critical, but should be about the length of the threaded section of the F connector on the BNC/F adapter. The hole size shown is slightly smaller than the F threads and will allow you to "force-thread" the F connector onto the insula-

tor. Alternately, you can drill the hole for a line fit if you wish. If you choose the force-thread approach, thread the insulator before assembly.

Slide the insulator halfway onto the extended antenna. Using a small file or piece of sandpaper, file the plating from the end of the antenna rod until you have exposed the brass surface. Now pass a short length of bare, stranded #20 hook-up wire through both holes and solder at each hole. Cut the wire coming out of one hole flush with the antenna rod. Cut, twist,

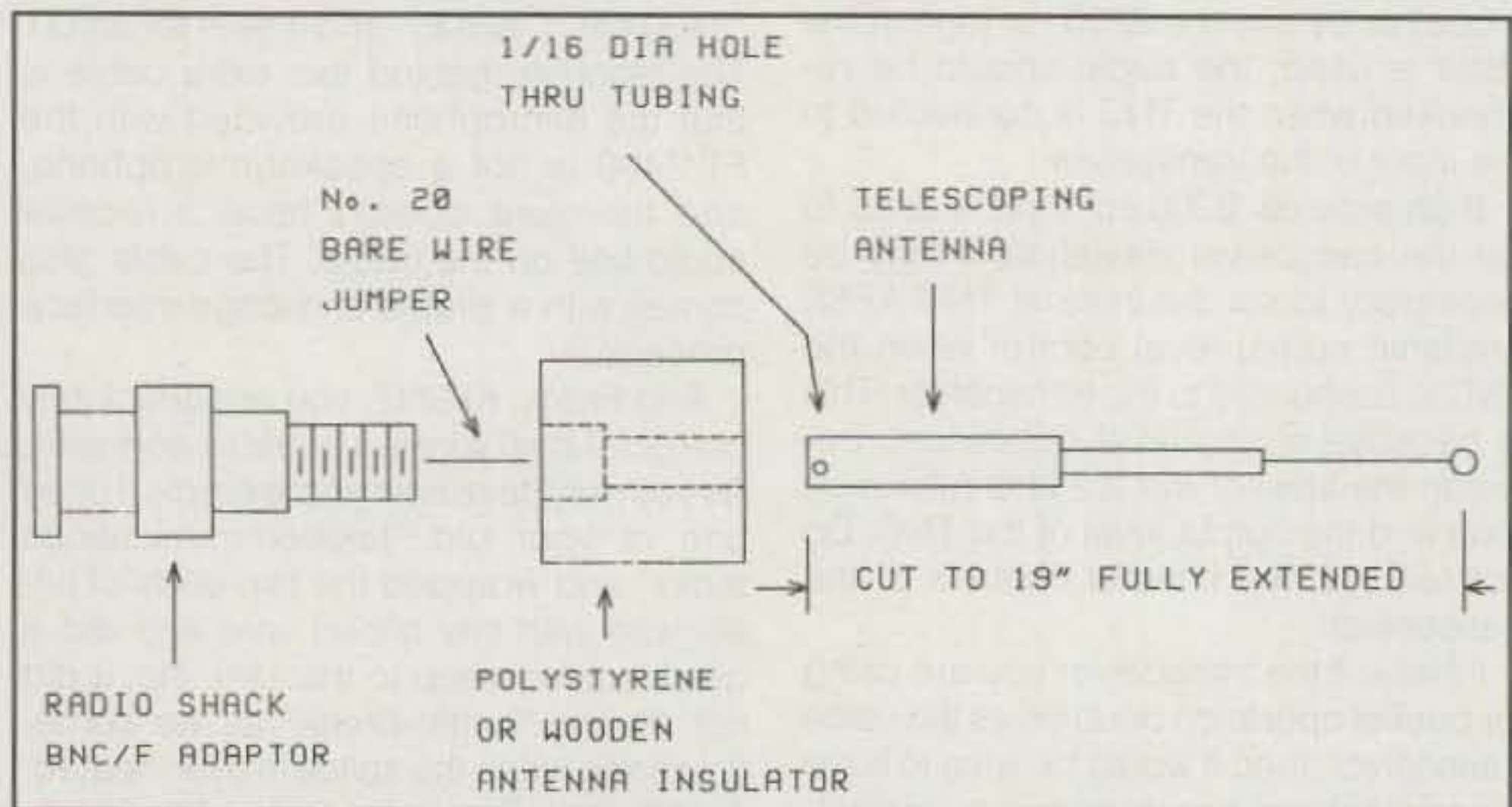


Fig. 2- Exploded view of 1/4-wave antenna.

* c/o CQ magazine

tin, and form the other wire so that it can be plugged into the F connector leaving a 1/16 inch gap between the end of the antenna rod and the surface of the F connector shell. Mix some 5-minute epoxy and coat the end of the antenna rod and threads of the F connector. Now assemble all components, making sure that the wire does not contact the shell of the F connector and that the epoxy coats all contacting surfaces. Before the epoxy has a chance to cure, check that there is continuity between the antenna rod and center pin of the BNC and that there is no connection to the BNC shell. When the epoxy cures, the antenna is ready for use.

In operation, extend the sections to maximum. For storage, collapse the sections. The result is a unit that is as large as the rubber duck.

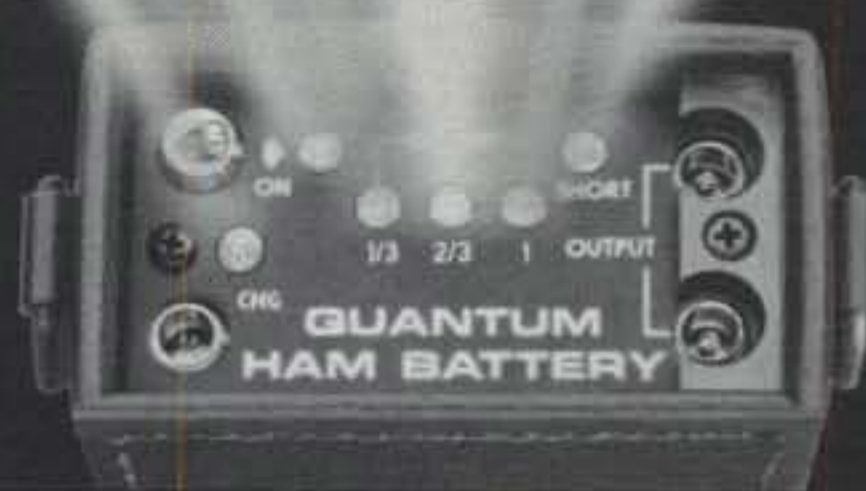
Performance of two such antennas was excellent and very repeatable. The radiated RF, measured on a field strength meter three feet from the antenna, was at least three to four times that of the rubber duck. SWR at 146.52 MHz was also well under 1.5:1, and mechanically the HT tolerated the antenna with no problems at all. While such an antenna usually operates best with a ground plane, no undesirable results were noticed.

I hope the antenna described will be of use to you, and I welcome any comments.
73, Irwin, WA2NDM

QUANTUM[®] CONFIDENCE

EXPERIENCE IT!

Thousands of hams have experienced "QUANTUM CONFIDENCE" by using the Quantum Ham Battery. Get the confidence of dependable power...



ready when you need it for emergencies, events, field day, boating, cellular phones and more.

MADE IN THE USA

Dealer Inquiries Invited

Compare Quantum's unique features to your present battery packs.

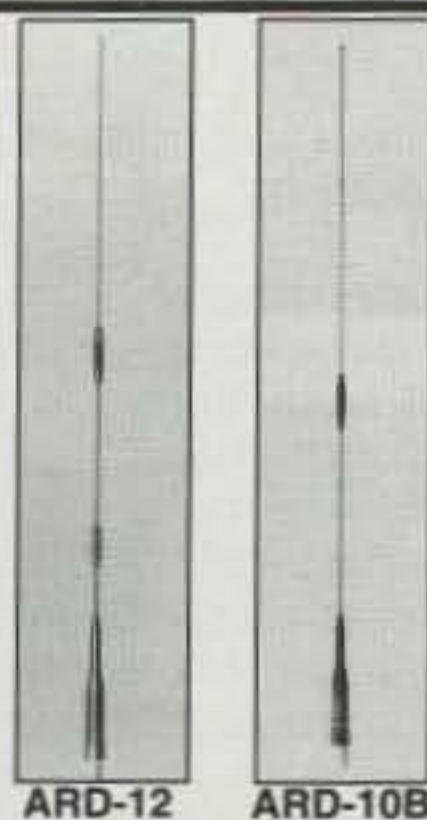
- 12 VOLT, 2.1 AH CAPACITY — Up to 6 times the capacity of standard battery packs and maximum output from your HT.
- STATUS LIGHTS — To monitor battery capacity.
- SEALED LEAD CELLS — Maintain charge for months and can be recharged to 100% capacity without the memory effect of nicads.
- ADAPTERS — To fit most HT's, cellular phones & other types of electronic equipment.
- DUAL OUTPUTS — To power two units simultaneously.
- FACTORY REPLACEABLE BATTERY CELLS AND COMPONENTS.

Call 1-800-989-0505 for information or your nearest dealer (9-5 EST) or Fax 516-222-0569 • **QUANTUM INSTRUMENTS INC.**
1075 Stewart Avenue, Garden City, NY 11530 • 516-222-0611



CIRCLE 86 ON READER SERVICE CARD

YOUR COMMUNICATIONS EDGE!



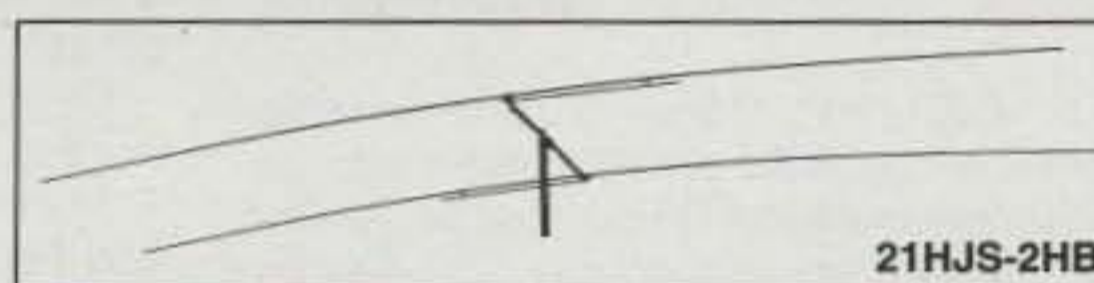
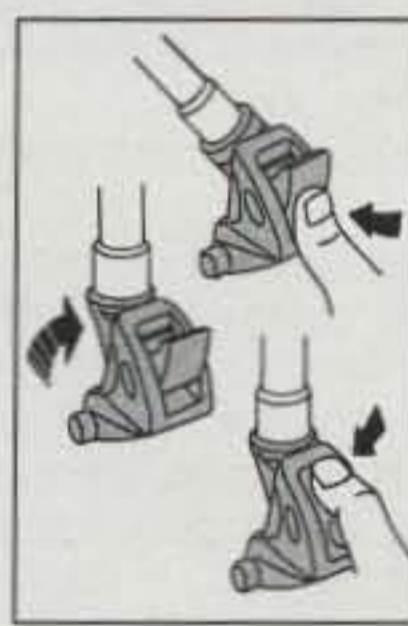
ARD-12 ARD-10B



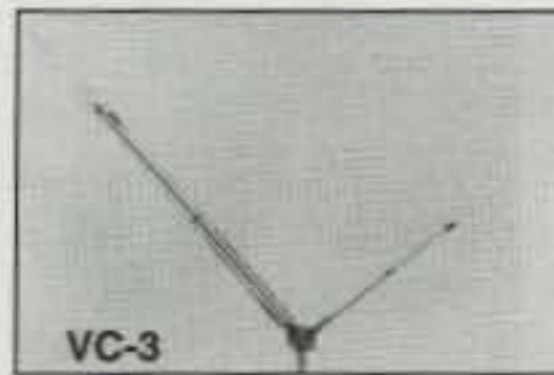
TM-SRA



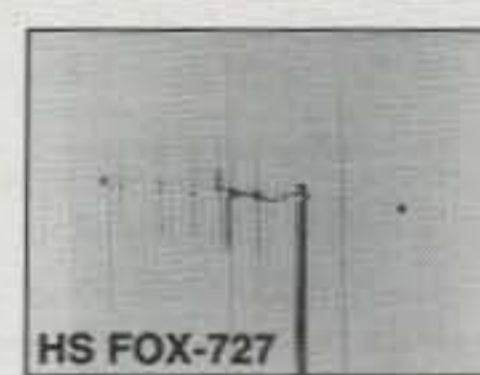
AM-01B



21HJS-2HB



VC-3



HS FOX-727

2m/70cm Mobile Antennas

A sleek, stylish and super-efficient model to fit every need! Stainless steel or black chrome whips with unique triple coated finish. Amazing performance!

Trunk Lip Mounts

Clean, fully adjustable design. Ensures a quick and professional installation in only minutes. Tilt-over models, too! Rubber-backed no-mar clamps. Outstanding quality.

Cable Sets, Too!

The finishing touch! Produces a complete ready-to-install package. One stop shopping! Maldol has it all!



6,10,12 & 15 Meter Beams

Lightweight and high gain. Easy one-person installation and wow: they really beat a dipole or vertical in performance! Nulls QRM and improves reception too!

Portable Vee Antenna

Maldol's VC-3 is the neatest condo or vacation antenna yet! Covers 40,15,10 meters. Only 16.5 ft. wide. Handles 150 watts.

2m/70cm Beams

Great for home or portable use, single or stacked. Easy-to-handle. 3,5, or 12 element versions. Interlaced 2m/70cm model HSFOX727 is a gem for OSCAR.

Maldol USA Sales Office
4711 N.E. 50th Street
Seattle, WA 98105

AnswerFax: 206-525-1896
Fax: 206-524-7826
E-Mail: MALDOLUS@Connected.com

Available from
Dealers Nationwide
Prodigy: VJSH80A

"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

Novice-Technician Licensing Course—Part V

This month we continue on in our amateur radio licensing course. This time we will cover rules and regulations.

Rules and Regulations

Basis and Purpose

Part 97 of the FCC Rules and Regulations governs the Amateur Radio Service.

- Part 97 includes station operating standards, technical standards, and emergency communications.

- Part 97 does not include standards of station construction.

The Amateur Radio Service is defined as a personal radio service featuring self-training, intercommunication, and technical investigation.

Reasons amateur radio service exists:

1. Proven ability to handle emergency communications.
2. Advancement of the radio art.
3. Improvement of communication and technical skills.
4. Increase in numbers of trained operators and electronics experts.
5. Enhancement of international goodwill.

An amateur radio operator has written authorization (an FCC license) to be the control operator of an amateur radio station. The control operator is responsible for station transmissions.

An amateur radio station is used for radio-communications in the amateur radio service.

A volunteer examiner (VE) is an amateur who is part of a team which conducts FCC element examinations for people who want to obtain/upgrade amateur operator licenses.

Station/Operator Licenses

The control operator of an amateur radio station is required to have a valid FCC-issued amateur radio operator's license.

An operator license authorizes a specific person to operate an amateur radio station in the amateur bands in accordance with specified privileges.

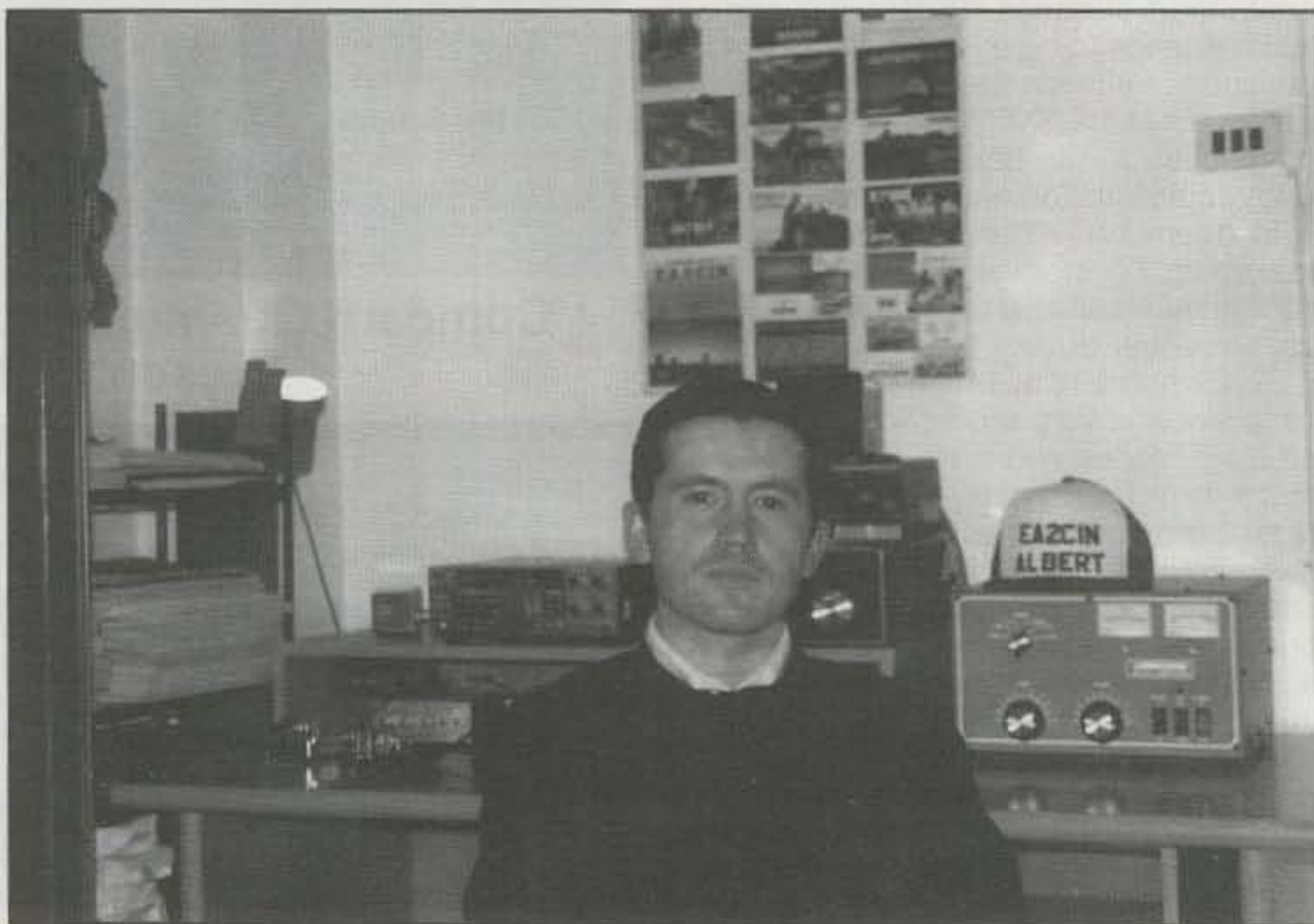
An operator license allows you to operate an amateur station wherever such operation is controlled by the FCC.

The FCC-issued amateur radio operator/primary station license allows you to operate an amateur radio station anywhere in the United States.

A license is required to transmit and a control operator must be present at the station's control point.

From the least to the most operating privileges, the license classes are Novice, Technician, General, Advanced, and Extra class.

A licensee is allowed to control any number of transmitters at the same time.



Alberto de Andres Mata, EA2CIN, of Zaragoza, Spain contacts many American amateurs, as is evidenced by the 3076 counties he has worked so far.

A copy of your license (or the original license) is required at your station to transmit.

Only FCC-issued licenses authorize amateurs to operate in this country.

The most common initial licenses are Novice and Technician.

There is no Morse Code examination requirement involved in obtaining a Code-Free Technician license.

When you want to renew and/or change an operator/primary station license, a copy of the license is submitted with a completed Form 610 that is mailed to the FCC in Gettysburg, Pennsylvania.

The current ten-year amateur radio license has a two-year grace period, within which re-examination is not required.

Frequency Privileges

Novice and Technician-Plus

80 meters 3675–3725 kHz

40 meters 7100–7125 kHz

15 meters 21,100–21,200 kHz

10 meters 28,100–28,500 kHz

1.25 meters 222–225 MHz

23 centimeters 1270–1295 MHz

In addition, Technician-Plus frequency privileges include:

6 meters 50–54 MHz (50.1–54.0 MHz voice segment)

2 meters 144–148 MHz (144.1–148.0 MHz voice segment)

70 centimeters 420–450 MHz

33 centimeters 902–928 MHz

Plus, all amateur bands 2300 MHz and above in frequency.

The Code-Free Technician shares use of this latter group of frequencies.

Examples:

3700 kHz is in the 80 meter band

7125 kHz is in the 40 meter band

21.15 MHz is in the 15 meter band

28.15 MHz is in the 10 meter band

223 MHz is in the 1.25 meter band

If interference occurs on a band which amateur radio shares on a secondary basis with some other (primary) user, the amateur must shift to a non-interfering frequency.

All amateurs share equal rights to the use of all frequencies in every amateur radio band. Use common sense and be courteous on the air.

Examination Elements, Licenses, and Callsigns

To upgrade from a Code-Free Technician license to a Technician-Plus license, you only have to pass the FCC Element 1-A 5 WPM code test.

When a Code-Free Technician licensee has upgraded to a Technician-Plus license, the Certificate of Successful Completion of Examination (CSCE) serves as authorization for her/him to use the "Novice" high-frequency (3–30 MHz) bands.

Only representatives of foreign governments are not eligible to hold American amateur radio licenses.

There is no age limit with regard to holding a license.

FCC examination element requirements are: Novice 1A (5 WPM) and 2 (written)

45527 Third Street East, Lancaster, CA 93535-1802

STORE HOURS
MON-FRI
10AM-6PM
SAT 10AM-3PM

R & L ELECTRONICS HAMILTON, OHIO

CALL OR WRITE
FOR FREE
CATALOG
(FREE IN
US ONLY)

1315 MAPLE AVE
HAMILTON, OH 45011

8524 E WASHINGTON ST
INDIANAPOLIS, IN 46219

(800)221-7735

(800)524-4889

[(513)868-6399 TECH/LOCAL] [(513)868-6574 FAX]

[(317)897-7362 TECH/LOCAL] [(317)898-3027 FAX]

WE STOCK MOST ALL AMATEUR RADIO PRODUCTS. CALL US FOR ANY OF YOUR AMATEUR NEEDS.

KENWOOD



TS-950SDX



TS-850S



TS-450S



TS-50S



TH-79A



TH-28A



TM-742A



TM-733A



TM-241A



TM-255A

Code-Free Technician 2 (Novice written) and 3A (Tech written)

Technician-Plus 1A, 2, and 3A

Station authorizations (callsigns) are only issued to licensed amateur radio operators.

If a license is lost, mutilated, or destroyed, write to the FCC telling them what happened, and enclose an FCC Form 610 requesting a new license.

Use an FCC Form 610 to notify the FCC of a mailing address change. State the new address and attach a copy of the existing license to the Form 610 before mailing it to the FCC at Gettysburg, Pennsylvania.

The FCC must be able to correspond with an amateur without delay. Consequently, each amateur must keep his/her address up to date at all times.

The expiration date is stated on the license. It is normally ten years from the date of issue.

A license renewal application should be made 60 to 90 days prior to the license expiration date.

American callsigns start with the letter A, K, N, or W.

Single digits one through zero are included in American callsigns, with zero representing the tenth district.

A typical American amateur radio callsign is KB6SOH, where **SOH** is the suffix (one, two, or three letters), **6** is the single digit (zero represents ten), and **KB** is the prefix (one or two letters starting with A, K, N, or W, except AM through AZ and A2 through A9). The prefix of an American amateur radio callsign can be A, AA-AL, K, KA-KZ, N, NA-NZ, W, or WA-WZ.

Bands and Emissions

An emission is a radio frequency transmis-

sion from a radio station.

Only A1A code (CW) transmissions are allowed in the "Novice" 15 meter (21,100-21,200 kHz), 40 meter (7100-7150 kHz), and 80 meter (3675-3725 kHz) bands.

A1A code (CW) and J3E/SSB voice are allowed in the 28.3-28.5 MHz segment.

A1A code (CW), RTTY (radioteletype), and data are allowed on 28.1-28.3 MHz.

FM voice is allowed on 222-225 MHz.

All emissions are permitted in the 1.25 meter (222-228 MHz) and 23 centimeter (1270-1295 MHz) bands.

The maximum RTTY shift below 50 MHz is one kHz. There is no maximum RTTY shift above 50 MHz.

Maximum RTTY/Data Symbol Rates:

28-50 MHz = 1200 bauds

50-222 MHz = 19.6 kilobauds

above 222 MHz = 56 kilobauds

(The baud rate is the number of elements transmitted per second.)

Maximum RTTY/data emission bandwidths:

50-222 MHz = 20 kHz

222-450 MHz = 100 kHz

70 cm and up = 100 kHz

Packet radio maximum symbol rates:

10 meters = 1200 bauds

2 meters = 19.6 kilobauds

Data transmissions include telecommand, telemetry, and computer communications.

- Telecommand includes remote radio control adjustment of satellites; also, model control by radio.

- Telemetry includes radio transmissions of quantitative information, such as from a satellite to Earth.

- Computer communication includes packet radio.

Frequencies available to all licensees except Novice; examples: 52.525 MHz, 146.52 MHz, 446.00 MHz.

Transmitter Output Power

The maximum output power any class of amateur radio licensee may use is 1500 watts peak envelope power.

Output power is measured most accurately at the antenna connector of the transmitter/amplifier.

When operating radio control (telecommand) of a model craft, the transmitter's maximum allowable output power is 1 watt.

- Station identification is not required on the air.

- The operator's callsign, name, and address must be attached to the radio-controlled model.

One should use the minimum amount of power that is needed to communicate satisfactorily.

The maximum output power all classes of amateur licensees (Novice through Extra) may use in the "Novice" high-frequency (3-30 MHz) bands is 200 watts PEP (Peak Envelope Power).

Novice maximum output power on the 1.25 meter band (222-225 MHz) is 25 watts PEP.

Novice maximum output power on the 23 centimeter band (1270-1295 MHz) is 5 watts PEP.

Peak envelope power (PEP) is the average power supplied to the radio frequency transmission line from the transmitter (or amplifier) during one complete cycle of RF at the crest of the modulation envelope.

Operating Responsibilities

A control operator is licensed by the FCC and is authorized to operate an amateur radio station.

A control operator must be present at the station's control point whenever transmissions are being made from her/his station.

The station licensee is always responsible for proper operation of her/his station, in accordance with the FCC rules and regulations.

The station licensee can authorize other FCC-licensed amateurs to operate her/his station. In such cases the station licensee and the guest control operator share responsibility for proper operation of the station. The callsign of a guest control operator is not required in station records, nor does the content of her/his transmission data have to be recorded.

Unlicensed people are not allowed to transmit from an amateur radio station unless a control operator gives her/his permission to do so and is present at the station's control point.

If a Novice or Technician operates a station that is licensed to a higher class licensee (General, Advanced, or Extra), she/he may not operate above her/his Novice or Technician privileges.

If a General, Advanced, or Extra class licensee is operating a station that is licensed to a Novice or Technician, she/he is allowed to use her/his higher privileges, using a dual station and operator identification such as KB6SOH/W6JEP (Tech/Extra).

Each operator must have her/his license in her/his possession whenever and wherever she/he operates an amateur radio station. A photocopy of the license suffices. Either the original license or a copy of it can be in the operator's possession or can be posted promi-

QUICK AND SIMPLE !!!

Flash cards NOVICE thru EXTRA theory. Key-words underlined. COMPACT-EASY Over 2000+ sets in use. Ideal for beginners, XYLs & children (& OMs too!)

NOVICE	\$11.95	Order Today! from VIS STUDY GUIDES P.O. BOX 17377 HATTIESBURG, MS 39404
TECHNICIAN	\$10.95	
GENERAL	\$9.95	
ADVANCED	\$15.95	
EXTRA	\$14.45	

Shipping 1 - \$3.00
2 or more - \$4.00
CLUB DISCOUNTS

HI-PERFORMANCE DIPOLES

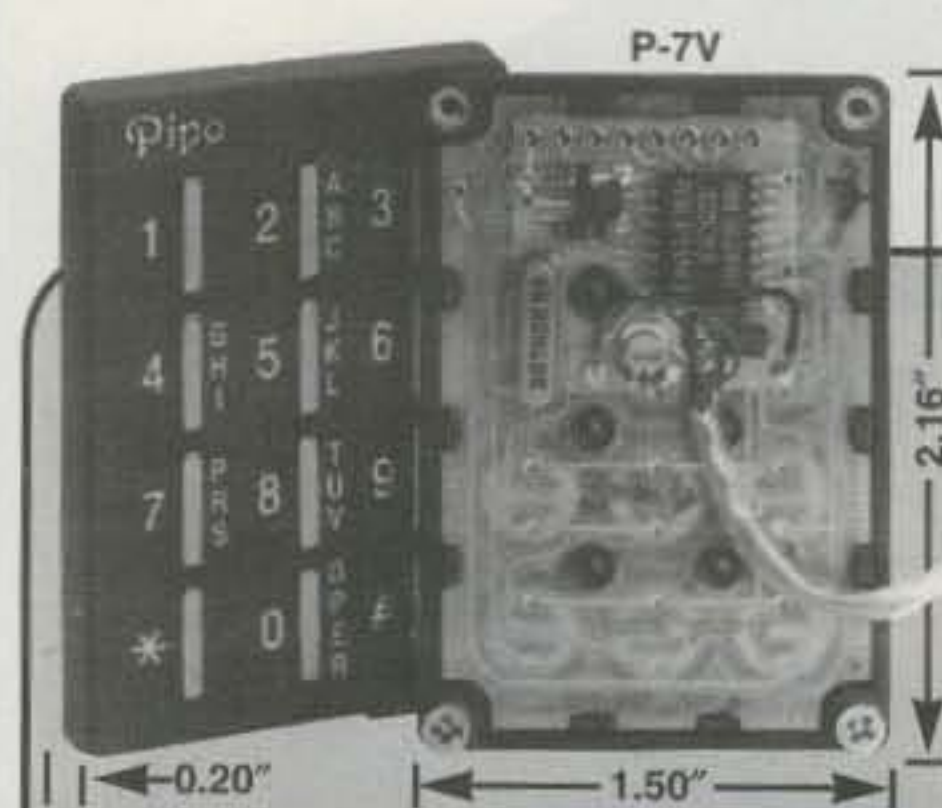
Antennas that work! Custom assembled to your center freq. ea. band - advise ht. of center and each end - hang as inverted "V" - horizontal, vert dipole, sloping dipole - commercial quality - stainless hardware - legal power - no-trap, high-efficiency design. Personal check, MO or C.O.D. (\$3)

MPD-5*	80-40-20-15-10M Max-Performance Dipole, 87' or 78' long	= \$110
MPD-2*	80-40M Max-Performance Dipole, 85' long = \$65, 105' long = \$72	
MPD-3712	30-17-12M Max-Performance Dipole, 31 ft. long	= \$73
HPD-3*	160-80-40M Hi-Performance Dipole, select 113 ft. or 125 ft.	= \$ 83
SSD-6	160-80-40-20-15-10M Space-Saver Dipole, 71 ft. long	= \$146
SSD-5*	80-40-20-15-10M...42' long = \$110, 60 ft. long = \$114	

*Tunes 9-Bands with Wide-Matching-Range-Tuner. S&H PER ANTENNA = \$6.00
\$.52 S&H for catalogue of 30 dipoles, slopers, & unique antennas
708-384-3414 **WINN ANTENNAS** BOX 393 MIL PROSPECT, IL 60056

CIRCLE 131 ON READER SERVICE CARD

CIRCLE 136 ON READER SERVICE CARD



DTMF/steel keys! sealed gold contacts!

- COLOR: All keyboards come in BLACK...
- OPTIONAL: Specify DARK BROWN
- Contacts are: WATER PROOF/DUST PROOF
- Completely self contained - NO RFI
- Simple 3-wire connection
- Output level adj.
- Wide operating range 4 to 16VDC
- Wide temperature range -22° to +160° F
- Supplied with instructions, schematic, template & hardware.

P-7V 12 KEY VERT \$58*
P-7H 12 KEY HORIZ. \$58*
P-8V 16 KEY VERT. \$63*

CALL OR WRITE
FOR FREE CATALOG
*Request quantity pricing

Mail
Order
To:

Pipo Communications®
Emphasis is on Quality & Reliability

P.O. Box 2020
Pollock Pines, California 95726
916-644-5444
FAX-916-644-PIPO

CIRCLE 89 ON READER SERVICE CARD

nently at the control point.

The control point of an amateur radio station is the place where station operating functions are performed.

Identification

It is okay to use languages other than English during amateur radio contacts, but station identification must be stated in English. Such other languages must be known internationally.

The FCC recommends using a phonetic alphabet to minimize callsign errors when identifying stations.

Amateurs are allowed to use A1A code (CW) to identify their stations on any (all) frequencies they are licensed to use. This applies to frequency segments normally used for packet radio, teletype, voice, and all other emission types. When a Novice has upgraded to Technician, and she/he is operating on a non-Novice Technician frequency (such as 146.52 MHz), as authorized by a Certificate of Successful Completion of Examination (CSCE), she/he uses her/his Novice callsign followed by /KT (KB6RXU/KT, for example).

•Other upgrade indicators are AG (Advanced to General), AA (Advanced to Advanced), and AE (Advanced to Extra).

•AT is not used because it is a callsign prefix that is assigned to India (KT is used).

The FCC assigned callsign must be used to identify one's amateur radio station.

Station identification is not required at the start of a transmission, but it is required at least one time during each transmission, plus at the end of each transmission.

•Each station must identify itself at the end of each transmission, and within each ten minutes of a transmission.

•As an example, a station must be identified no less than three times during a 25 minute continuous transmission.

When handling third-party international traffic, both stations (USA and foreign) must be identified at the end of each transmission.

You are allowed to operate an amateur radio station anywhere in the USA; operation is not restricted to the geographic location shown on your license.

The FCC can authorize amateurs to communicate with non-amateur stations such as Military Affiliate Radio System (MARS) and Radio Amateur Civil Emergency Service (RACES) stations, such as in times of emergencies. In addition, the FCC allows amateurs to contact military stations during Armed Forces Day.

Amateurs are allowed to operate mobile from any type of vehicle (airplane, automobile, balloon, bicycle, motorcycle, RV, truck, etc.) or from any temporary location without restriction.

Prohibitions

The FCC does not allow amateurs to transmit false signals, unidentified signals, broadcasts, music, or indecent/obscene/profane words or unknown codes/ciphers.

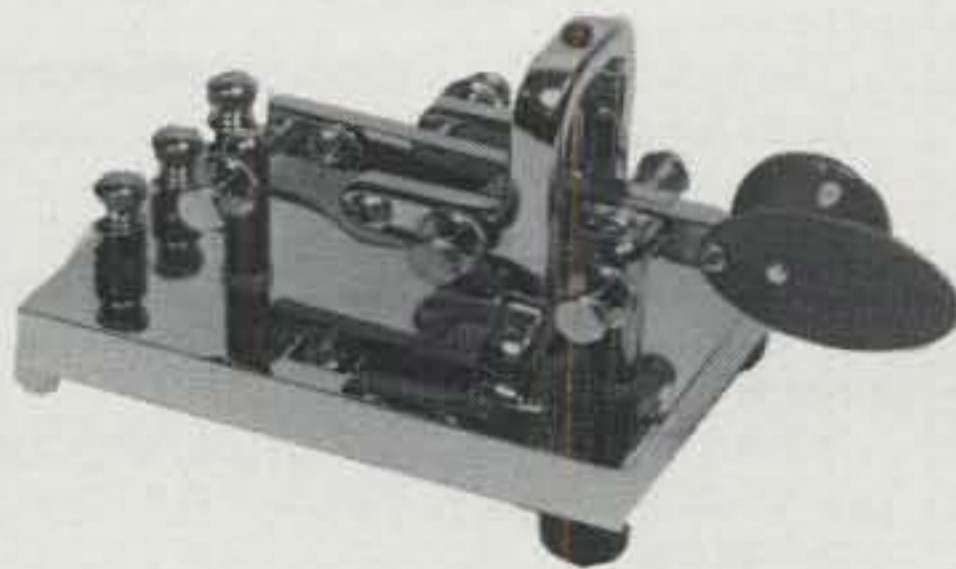
A broadcast is the transmission of programs that are of interest to the general public, either direct or by relay.

•Amateurs are not allowed to transmit broadcasts.

A one-way transmission involves information that is primarily of interest to amateurs and to other people who are interested in the amateur radio service.

VIBROPLEX

"the oldest name in amateur radio"



Deluxe \$115.00
Standard 89.00

the "Vibrokeyer"

The Vibroplex Vibrokeyer is designed for "Bug" operators who want to move to electronic keyers without relearning keying. The single lever paddle initiates the automatic dots and dashes of the electronic keyer with the same motion used to operate the "Bug." The Vibrokeyer uses the same main frame and chrome finished parts as the "Original" for the same smooth and easy operating Vibroplex feel. For those who want to combine traditional skill with modern electronics.

Also available is our "100th Anniversary Book," many key gift items and Parts Lists for all current models. Write or see your local Dealer.

**The Vibroplex Company, Inc./98 Elm St./Portland, Maine 04101
NOW CALL TOLL FREE! 1-800-AMATEUR**

CIRCLE 129 ON READER SERVICE CARD

YAESU SPECIALISTS



FT-11R
World's smallest
2M/440MHz
Handheld

- VHF/UHF HTS.
- 2 Meter Mobiles
- Dual Band Mobiles
- Dual Band Handhelds
- Deluxe HF Radios
- Mobile HF Radios



**FT-11R
NEW, MINI
2M HANDHELD
FT-41R/440MHz**

Full Yaesu Line with all your favorite accessories

The Radio Place

5675A Power Inn RD. Sacramento CA. 95824

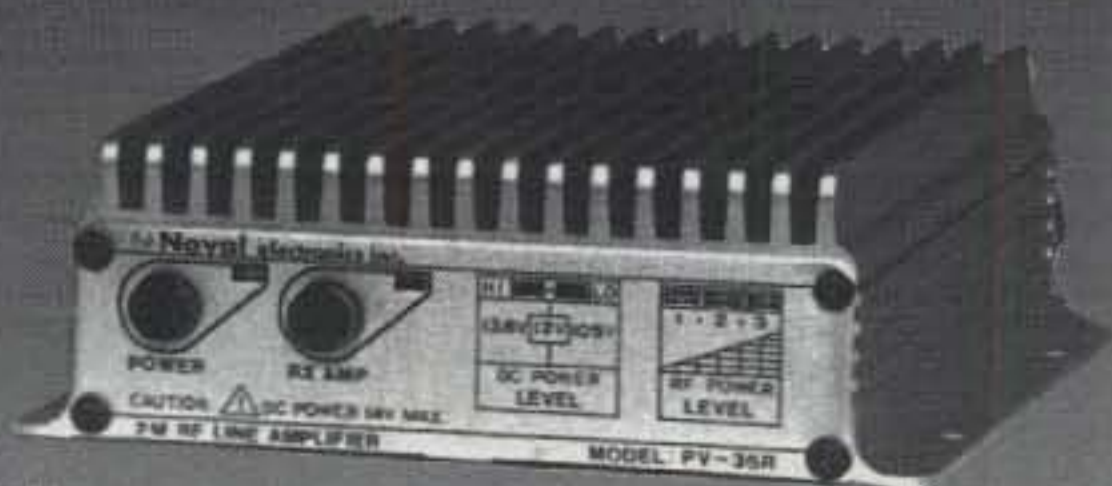
916-387-0730 Mon.-Fri. 9-5:30PT Sat. 10-5:30PT Fax 916-387-0744



CIRCLE 97 ON READER SERVICE CARD

All Mode VHF Power Amplifier

**Naval
PV-35R
3 Watts In
35 Watts Out**



- Power level indicator
- Supply Voltage Indicator
- GaAsFET pre amp

\$149

Plus \$7.50 s/h

Naval electronics inc. Phone: (813) 885-6091
5417 Jet View Circle, Tampa, Florida 33634

CIRCLE 79 ON READER SERVICE CARD

Pocket Morse Code Trainer

Learn Code Faster & Easier
Better than code tapes
Take it anywhere to practice
Ideal for beginners to advance
Lite Weight & Compact



Features:

- Selectable code rates from 3 wps to 31 wpm
- Plays standard or Farnsworth.
- Dimensions 1" x 3.8" x 2.4"
- Runs 40 hr on one 9v battery
- Weights only 2.3 ounces

Only **\$29.00**

3 Modes of Operation

1. Continuous fresh random code.
(with selectable letter groups, ie A-Z, 0-9, and more)
2. Random code practice test.
(Check your accuracy against the answer key)
3. Interactive training mode
(Excellent for beginners to help memorize the code)

Deluxe Pocket Morse Code Trainer

6 Modes of Operation

In addition to the 3 standard modes of operation, the deluxe has 3 more additional modes. Only **\$49.00**

4. Continuous newly generated QSO.
(New QSO are generated with different names, radios, cities and more)
5. Practice code exams just like the real code test. (includes answer key to check accuracy)
6. Continuous random words
(randomly plays different words)

The deluxe pocket morse code trainer has more power than most PC morse code software programs, yet can still fit in your shirt pocket.

Call 214-350-088 to Order

Computer Aided Technology Inc., Visa & MC accepted
10132 Monore Dr., Dallas, TX 75229 Add \$5 shipping

CIRCLE 37 ON READER SERVICE CARD

DON'T TAKE CHANCES
WITH INFERIOR MAST MATERIAL!

- 4130 Chrome-moly aircraft grade steel
- American made, tested to ASTM Stds
- 2" and larger. Min. 110,000 PSI Yield

Productivity Resources

P.O. BOX 813 BELLVILLE TX 77418-0813
409-865-2727 FAX 409-865-9800

CALL TOM, K5RC, FOR A QUOTE VISA - MC - AMEX

Be a Ham Operator without learning Morse Code!

NO CODE TECHNICIAN Updated Questions! Home study course contains 200-pg. textbook, FCC Rules & IBM compatible software. VISA or MasterCard Accepted.

Toll Free 1-800-669-9594
The W5Y1 Group, Box 565101, Dallas, TX 75356

\$29.95

Postpaid Money Back Guarantee! Plus \$3 Shipping



•Amateurs are allowed to transmit one-way transmissions.

A transmission which disturbs other communications is harmful interference, which is never allowed.

Interfering with police, fire, or ambulance communications could endanger people and/or property.

The lack of proper station identification constitutes an unidentified transmission, which is prohibited.

An amateur is allowed to transmit an SOS (A1A code/CW) or MAYDAY (voice) distress call if life and/or property is known to be threatened.

•Such transmissions can be any mode, power, or frequency; they are not limited to amateur bands.

•The transmission of a false distress call is the transmission of a false/deceptive signal, which is prohibited.

Beacon, Emergency, International, Repeater, Space, and Third-Party

Beacon stations make one-way transmissions to enable observations of propagation and reception conditions to be made by other people.

•The maximum output power allowed is 100 watts PEP.

•A beacon operator must hold a Technician or higher class license.

If normal communication channels become overloaded or disrupted, the FCC can declare a temporary state of communications emergency, which includes any special conditions or rules that amateurs must observe during the emergency.

•In this situation, the FCC allows amateurs to handle any traffic that is essential to facilitate relief actions.

Unless it is prohibited by either government, there is no restriction against American amateurs communicating with amateurs in other countries. No such prohibition exists at this time.

If repeater-to-repeater interference occurs, and the frequency coordinator recommends continued use by one repeater, the unrecommended repeater must resolve the problem. If both are recommended or if neither is recommended, both must resolve the problem.

Any class of amateur can be the licensee of an American space station, which is any station that is more than 50 km (about 31 miles) above Earth's surface.

The 6 meter band may not be used for Earth-satellite communications because it is part of TV channel one in some parts of the world.

If you want to retransmit communications between a space shuttle and associated Earth stations, prior approval is required from the National Aeronautics and Space Administration (NASA).

Third-party traffic involves two amateurs handling a message for at least one person other than themselves; it usually involves two people in addition to the two amateurs.

•It can be in any emission (A1A code/CW, voice, RTTY, etc.).

•Amateurs are not allowed to accept payment in any form (money, goods, or services) for handling third-party traffic.

Amateurs are allowed to exchange third-party traffic only with amateurs in other countries with which our country has third-party traffic agreements.

•An exception exists: If the third party is acting as the control operator, she/he is allowed to communicate.

If a non-amateur guest is using an American amateur radio station, the control operator must make sure this country has a third-party traffic agreement with the country of any foreign (DX) amateur who may want to communicate with the unlicensed guest.

When an unlicensed third party (non-amateur guest) uses an amateur's station, the station licensee must be present at all times, and she/he must continuously supervise communications.

The control operator of a club station can be paid for transmitting one-way transmissions such as code practice and information bulletins.

•This exception only applies in special situations such as at W1AW, the ARRL Headquarters Station.

South Pacific Map

I recently obtained an excellent map of the South Pacific. It shows the location, capital, and political status of American Samoa, Cook Islands, Fiji, French Polynesia, Guam, Hawaii, Kiribati, Nauru, New Caledonia, Niue, Papua New Guinea, Pitcairn Islands, Solomon Islands, Tokelau, Tonga, Tuvalu, Trust Territories of the Pacific Islands (Belau/Palau, Federated States of Micronesia, Marshall Islands, and Northern Mariana Islands), Vanuatu, Wallis and Futuna, and Western Samoa. Small island groups are shown within the previous larger groups. These include the following island groups: Austral, Chesterfield, Gambier, Gilbert, Marquesas, New Georgia, Phoenix, and Society Islands.

The name of this map is "Pacific Island Nations and Their Exclusive Economic Zones." It is published jointly by the State of Hawaii's Department of Business and Economic Development and the Pacific Basin Development Council. The overall dimensions of the map are 31 inches wide by 23 inches high, with an image area of 27.75 inches by 19.75 inches. If you want a good presentation regarding the Pacific Islands, this map does the job. A free copy can be requested from the State of Hawaii, Department of Business, Economic Development, and Tourism, P.O. Box 2359, Honolulu, Hawaii 96804.

Printed Aids

My previous columns contain information that is useful to new and aspiring amateurs. Many of these items have been reprinted for distribution to students of licensing courses I instruct. For ease of use, these printed aids have been separated into six categories. These categories are introduction, code, theory, station, operating, and miscellaneous. Outdated items are continually replaced with newer material. Fifteen dollars brings a complete set of current printed aids, including shipping costs. A list of these printed aids will be sent to anyone who requests it and sends a business-size (#10) self-addressed and stamped envelope to my California address. Licensing-course instructors are welcome to revise and/or duplicate these items to suit their requirements.

73, Bill, W6DDB

ASTRON POWER SUPPLIES

• HEAVY DUTY • HIGH QUALITY • RUGGED • RELIABLE •



MODEL VS-50M

SPECIAL FEATURES

- SOLID STATE ELECTRONICALLY REGULATED
- FOLD-BACK CURRENT LIMITING Protects Power Supply from excessive current & continuous shorted output
- CROWBAR OVER VOLTAGE PROTECTION on all Models except RS-3A, RS-4A, RS-5A, RS-4L, RS-5L
- MAINTAIN REGULATION & LOW RIPPLE at low line input Voltage
- HEAVY DUTY HEAT SINK • CHASSIS MOUNT FUSE
- THREE CONDUCTOR POWER CORD except for RS-3A
- ONE YEAR WARRANTY • MADE IN U.S.A.

PERFORMANCE SPECIFICATIONS

- INPUT VOLTAGE: 105-125 VAC
- OUTPUT VOLTAGE: 13.8 VDC ± 0.05 volts (Internally Adjustable: 11-15 VDC)
- RIPPLE Less than 5mv peak to peak (full load & low line)
- All units available in 220 VAC input voltage (except for SL-11A)

SL SERIES



• LOW PROFILE POWER SUPPLY

MODEL	Colors		Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
	Gray	Black				
SL-11A	•	•	7	11	2 5/8 x 7 1/2 x 9 3/4	12
SL-11R	•	•	7	11	2 5/8 x 7 x 9 3/4	12
SL-11S	•	•	7	11	2 5/8 x 7 1/2 x 9 3/4	12
SL-11R-RA		•	7	11	4 1/4 x 7 x 9 3/4	13

RS-L SERIES



• POWER SUPPLIES WITH BUILT IN CIGARETTE LIGHTER RECEPTACLE

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
RS-4L	3	4	3 1/2 x 6 1/2 x 7 1/4	6
RS-5L	4	5	3 1/2 x 6 1/2 x 7 1/4	7

RM SERIES



MODEL RM-35M

• 19" RACK MOUNT POWER SUPPLIES

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
RM-12A	9	12	5 1/4 x 19 x 8 1/4	16
RM-35A	25	35	5 1/4 x 19 x 12 1/2	38
RM-50A	37	50	5 1/4 x 19 x 12 1/2	50
RM-60A	50	55	7 x 19 x 12 1/2	60
• Separate Volt and Amp Meters				
RM-12M	9	12	5 1/4 x 19 x 8 1/4	16
RM-35M	25	35	5 1/4 x 19 x 12 1/2	38
RM-50M	37	50	5 1/4 x 19 x 12 1/2	50
RM-60M	50	55	7 x 19 x 12 1/2	60

RS-A SERIES



MODEL RS-7A

MODEL	Colors		Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
	Gray	Black				
RS-3A		•	2.5	3	3 x 4 1/4 x 5 3/4	4
RS-4A	•	•	3	4	3 3/4 x 6 1/2 x 9	5
RS-5A		•	4	5	3 1/2 x 6 1/2 x 7 1/4	7
RS-7A	•	•	5	7	3 3/4 x 6 1/2 x 9	9
RS-7B	•	•	5	7	4 x 7 1/2 x 10 3/4	10
RS-10A	•	•	7.5	10	4 x 7 1/2 x 10 3/4	11
RS-12A	•	•	9	12	4 1/2 x 8 x 9	13
RS-12B	•	•	9	12	4 x 7 1/2 x 10 3/4	13
RS-20A	•	•	16	20	5 x 9 x 10 1/2	18
RS-35A	•	•	25	35	5 x 11 x 11	27
RS-50A	•	•	37	50	6 x 13 3/4 x 11	46
RS-70A	•	•	57	70	6 x 13 3/4 x 12 1/2	48

RS-M SERIES



MODEL RS-35M

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
• Switchable volt and Amp meter				
RS-12M	9	12	4 1/2 x 8 x 9	13
• Separate volt and Amp meters				
RS-20M	16	20	5 x 9 x 10 1/2	18
RS-35M	25	35	5 x 11 x 11	27
RS-50M	37	50	6 x 13 3/4 x 11	46
RS-70M	57	70	6 x 13 3/4 x 12 1/2	48

VS-M AND VRM-M SERIES



MODEL VS-35M

• Separate Volt and Amp Meters • Output Voltage adjustable from 2-15 volts • Current limit adjustable from 1.5 amps to Full Load

MODEL	Continuous Duty (Amps)			ICS* (Amps) @13.8V	Size (IN) H x W x D	Shipping Wt. (lbs.)
	@13.8VDC	@10VDC	@5VDC			
VS-12M	9	5	2	12	4 1/2 x 8 x 9	13
VS-20M	16	9	4	20	5 x 9 x 10 1/2	20
VS-35M	25	15	7	35	5 x 11 x 11	29
VS-50M	37	22	10	50	6 x 13 3/4 x 11	46
• Variable rack mount power supplies						
VRM-35M	25	15	7	35	5 1/4 x 19 x 12 1/2	38
VRM-50M	37	22	10	50	5 1/4 x 19 x 12 1/2	50

RS-S SERIES



MODEL RS-12S

• Built in speaker

MODEL	Colors		Continuous Duty (Amps)	ICS* Amps	Size (IN) H x W x D	Shipping Wt. (lbs.)
	Gray	Black				
RS-7S	•	•	5	7	4 x 7 1/2 x 10 3/4	10
RS-10S	•	•	7.5	10	4 x 7 1/2 x 10 3/4	12
RS-12S	•	•	9	12	4 1/2 x 8 x 9	13
RS-20S	•	•	16	20	5 x 9 x 10 1/2	18
SL-11S	•	•	7	11	2 5/8 x 7 1/2 x 9 3/4	12

NEWS/VIEWS OF ON-THE-AIR COMPETITION

Announcing CQ's 1994 Contest Survey

This month marks my fifth annual contest survey. Each time I launch this project, my intent is to respond to current issues within the contest community. One of the most significant measures of the survey's success is in the broadness of the respondents' contesting experience. In other words, we don't want to publish results that reflect opinions of just the big guns. For this reason, all of your input (and comments) is invaluable.

There have been a number of "hot" topics in the on- and off-air scuttlebutt of contest conversation this year. In addition, as we enter into the doldrums of the current solar cycle, it seems appropriate to reflect on our contesting roots. Within the contest community there remains cautious anticipation of many good things to come in the years ahead. Likewise, there are many events from our own early days in contesting that could be usable in recruiting and teaching the contesters of the future.

Please take a few moments to make your thoughts known. Many of the questions are intended to be thought-provoking. Others are simply there for fun. Don't forget that this year's results are to be mailed directly to CQ! And, for the first time feel free to send your replies electronically to my Compuserve or Internet E-mail addresses found in this column.

New Feature: This Month's Quotable Quote

A phrase I've heard many times in the past is something along the lines of "now that was a quotable quote!" Very few months go by in which I fail to either read or hear someone say something profound about the sport of contesting. Starting this month, I'm going to begin sharing them with you. If you have one that you'd like me to pass along to our readers, feel free to send it to my attention.

The Final Word On WRTC '90 Awards

Many of you may remember the 1990 World Radio Team Championship held in conjunction with the Goodwill Games in Seattle, Washington. I have recently been informed that a limited quantity of certificates and WRTC T-shirts are still available. Although all of the prizes were mailed some time ago, many of them were returned due to bad addresses and other errors. If you were eligible to receive either of these items, please drop a note to: Steve Morris, K7LXC, 16521 73rd Ave. SE, Snohomish, WA 98290. Your requests (including overseas locations) will be honored on a first-come, first-serve basis. Finally, take note

c/o CQ magazine
Internet: p00259@psilink.com
Compuserve ID: 71301,424

Calendar of Events

Aug.	27-28	TOEC Field Contest
Sept.	3-4	All Asian SSB DX Contest
Sept.	4	Bulgarian DX Contest
Sept.	4	Radio Club Panama XXIII Contest
Sept.	5	Michigan QRP Club Sprint
Sept.	7-9	YLRL Howdy Days
Sept.	10-11	Worked All Europe SSB Contest
Sept.	10-12	ARRL VHF QSO Party
Sept.	11	North American CW Sprint
Sept.	17	1994 QRP Afield Contest
Sept.	17-18	Scandinavian CW Activity Contest
Sept.	18	North American SSB Sprint
Sept.	24-25	CQ WW RTTY Contest
Sept.	24-25	Scandinavian SSB Activity
Sept.	24-25	Washington State Salmon Run
Sept.	25-26	Fall Classic Radio Exchange
Oct.	1-2	VK-ZL SSB Contest
Oct.	8-9	VK-ZL CW Contest
Oct.	8-9	Pennsylvania QSO Party
Oct.	8-9	Homebrew Fall Festival
Oct.	9-10	Illinois QSO Party
Oct.	12-14	YLRL CW Anniversary Party
Oct.	15-16	JARTS WW RTTY Contest
Oct.	15-16	QRP ARCI CW QSO Party
Oct.	26-28	YLRL SSB Anniversary Party
Oct.	29-30	CQ WW DX SSB Contest
Nov.	5-7	ARRL CW Sweepstakes
Nov.	19-21	ARRL SSB Sweepstakes
Nov.	26-27	CQ WW DX CW Contest
Dec.	31	RAC Canada Winter Contest

that additional shirts can be sent to members of multi-operator teams as long as supplies last.

Final Comments

I look forward to seeing the results from this year's contest survey. Please feel free to add your own comments at the end of the survey. Not only do I read each and every one of your submissions from start to finish, but they provide invaluable input for future columns.

As always, please remember that the deadline for the December issue is October 1st.

73, John, K1AR

Panama Anniversary Contest

0001Z to 2359Z Sunday, Sept. 4

The Panama Radio Club invites all radio amateurs of the world to participate in the XXIII Anniversary Contest.

Class: Single Operator, All Band, SSB only.

Exchange: RS and serial number (e.g., 59001).

Scoring: HP club members are 2 points; all other stations are 1 point. The multiplier is the total number of DXCC countries worked on all bands. Final score is total QSO points times multiplier.

Awards: Certificate of participation will be

September's Contest Tip

Timing in big (or small) pileups is everything. By its very nature, the denser a pileup becomes, the harder it is to pull out call signs, regardless of how good the operator is at the other end. A successful calling technique I use quite often is to wait a few seconds before calling with everyone else (SSB and CW). That slight delay and attentiveness to "sneaking in" your call when others are catching their breath works time and time again! If only I had 25 cents for every time a DX station said to me in a pileup, "The Alpha Radio go ahead..." Using low power in smaller contests to practice this technique will hone your calling skills even more for the big ones.

sent to all amateurs who work 10 or more HP stations. Please enclose 3 IRCs and a separate log of these contacts. A plaque will be awarded to the station with the high score from each continent.

Logs must be postmarked by November 30th and sent to: Radio Club Panama, Anniversary Contest, P.O. Box 10745, Panama 4, Panama.

Bulgarian DX Contest

0000Z to 2400Z Sunday, Sept. 4

The Bulgarian Federation of Radio Amateur holds this activity the first Sunday in September each year. It's on CW only, all five bands, 10-80 meters, using the IARU Region 1 band plan.

Classes: "A"—Single operator, all band; "B"—Single operator, single band; "C"—Multi-operator, all band, single transmitter; "D"—SWL.

Exchange: RST and ITU Zone.

Points: QSOs with LZ stations, 6 points. With other stations in the same continent, 1 point. In other continents, 3 points. SWLs must show calls of both stations heard. Score 3 points if both exchange numbers are copied; 1 point if only one is copied.

Multiplier: Total ITU Zones worked on each band.

Final Score: Total QSO points from all bands times the sum of the multiplier from each band.

Awards: Classes "A" and "C"—Cups and medals to the three top world scorers and medals to the three continental leaders in each continent. Class "B"—Medals to the top three scorers on each band in the world. Class "D"—Medals to top three.

Logs: Use a separate sheet for each band, a summary sheet showing the scoring, and the usual signed declaration.

Mailing deadline is 30 days after the end of the contest: Central Radio Club, P.O. Box 830,

AES® & STANDARD... the right Combo for Quality, Price and Superior Service



C-108A (2M)
The Smallest!



C-158A (2M)
Affordable!



C-168A (2M)
C-468A (440MHz)
Deluxe/Small!



C-178A (2M)
+ low power
440MHz



C-188A (2M)
C-288A (220MHz)
Slim-Line



Twin-Banders
C-528A (2M & 440MHz)
C-228A (2M & 220MHz)
C-628A (440MHz & 1.2GHz)



C-558A
2M & 440MHz
Twin-Band Deluxe



VHF/UHF Handhelds and Mobiles

Full Line Stocked at all locations for Same Day Shipping...



C-1208DA
2M FM Mobile



CCR-708A
50-905MHz
Spectral Display
Receiver



C-5718DA
Twin-Band
2M & 440MHz
Mobile

CALL TODAY FOR OUR LOW PRICES!

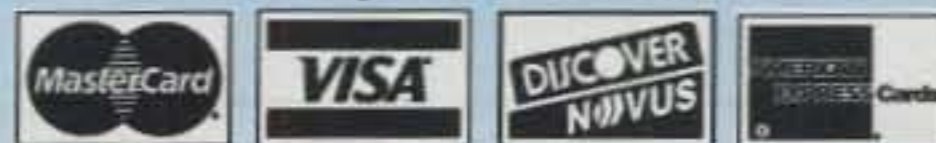
New!... Flat Rate Shipping & Orders over \$1500⁰⁰ Prepaid! **Plus**
(via UPS Ground in the 48 States)



the AES® Credit Card!

- ★ No Annual Fee
- ★ No Minimum Purchase
- ★ 90 Days - No Payments

Also, for your Convenience...



AMATEUR ELECTRONIC SUPPLY®
MILWAUKEE, WI 1-800-558-0411

WICKLIFFE, OH 1-800-321-3594 • ORLANDO, FL 1-800-327-1917
CLEARWATER, FL (813) 461-4267 • LAS VEGAS, NV 1-800-634-6227
HOURS: Mon-Fri 9-5:30; Sat 9-3

Now from CQ, the Leader in Innovative Amateur Radio Products . . .

THE CQ 1994 AMATEUR RADIO ALMANAC

Get in on the action! With over 500 pages of facts, figures, tables and information on Amateur Radio, the 1994 Amateur Radio Almanac is the authority.

GET YOUR COPY OF CQ'S 1994 AMATEUR RADIO ALMANAC AND FIND OUT . . .

- * Who has the world's largest QSL card collection.
- * What propagation was like in the month and year you were born.
- * Why 1919 was the most important year in the history of ham radio.
- * How many hams live in your town.
- * Where the world's largest amateur antenna systems are located.
- * The location of the world's HF/VHF radio beacons.
- * The names and callsigns of famous amateur radio personalities from around the world.

OVER 500 PAGES!!



Specially Priced at Only **\$19.95**

The Source

- Year in Review
- Rules & Regs • Repeaters
- The Biggest, Fastest, Furthest • Geographic Stats • Propagation • Awards • Contests • Space • Postal Regs • Useful Tables • Silent Keys • Thousands of Facts & Figures

ORDER TOLL FREE (800) 853-9797
Also available from your local dealer

QTY	TITLE	UNIT PRICE	TOTAL PRICE
_____	1994 Amateur Radio Almanac	\$19.95	\$ _____
		Shipping/Handling _____	Total _____
Check/Money Order Enclosed _____ (make checks payable to CQ Communications)			
Charge to my: <input type="checkbox"/> MC <input type="checkbox"/> VISA <input type="checkbox"/> AMEX <input type="checkbox"/> Discover			
Account # _____		Exp. Date _____	
Name _____		Callsign _____	
Address _____			
City _____		State _____	Zip _____

Please mail your orders to: CQ Communications, Inc.
76 North Broadway, Hicksville, New York 11801-9962 FAX: (516) 681-2926

THE Handy Holder

Only **\$8** 99 Plus \$2.00 S&H

Complete Mounting Hardware Included



CONCEPTS ALPHA
P.O. Box 1316
MUNFORD, TN 38058
(901) 837-3518

1-800-650-9863

CIRCLE 26 ON READER SERVICE CARD

NEW BOOK

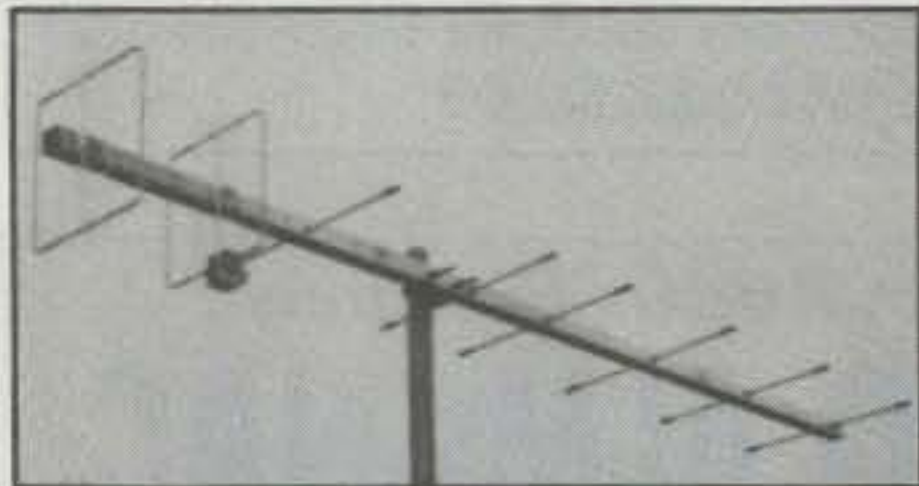
Behind the Front Panel by D. Rutland, MSEE

Learn how 1920's radios worked

Easy to read explanations. A must for all amateurs!
53 schematics, 25 photos, 192 pages.

Send check or money order for \$18.95 plus \$2.00 S & H to:
Wren Publishers, PO Box 1084C, Philomath, OR 97370.
(503) 929-4498.

VHF QUAGIS



Q144-8 \$99.95
Q222-8 \$74.95
Q432-8 \$59.95

SENTECH, INC.
P.O. BOX 2136
RIVERVIEW, FL 33569

PHONE 813-677-4410 FAX 813-671-4122

CIRCLE 123 ON READER SERVICE CARD

COAX-SEAL

The Only Material That Will Adhere to Polyvinyl or Vinyl Outer Coax Jackets!

- Forms around and seals odd-shaped fittings.
- Non-contaminating and non-conductive.
- Wide ambient temperature range (-30° F to +180° F).
- Stays flexible for years insuring moisture-proof connections.
- Reusable—quick disconnection and resealing with same material.
- A must for satellite TV—microwave work.
- Hundreds of uses.
- Moistureproofs all connections.



COAX-SEAL... This space-age material is simple to apply. Remove 6" of plastic. Wrap to cover toward fitting. After wrapping, mold to form a smooth surface and force out air.

EFFECTIVE MOISTUREPROOF INEXPENSIVE

EVERY LNB AND COAXIAL CONNECTOR NEEDS COAX-SEAL

Trial packet for 4 connectors - \$1.00 ppd.

UNIVERSAL ELECTRONICS, INC.
4555 Groves Road, Suite 12 Columbus, OH 43232
Phone (614) 866-4605 • FAX (614) 866-1201

G4ZPY PADDLE KEYS INTERNATIONAL

WORLD'S LARGEST SELECTION OF 51 HAND CRAFTED MORSE KEYS
FINEST QUALITY BRITISH CRAFTSMANSHIP

For details

Send SASE to Dave Ingram, K4TWJ
4941 Scenic View Drive, Birmingham, AL 35210
or 2 IRC's or \$2.00 Direct to G4ZPY
41 Mill Dam Lane, Burscough Ormskirk L40 7TG England
Tel: 44 704 894299

5 BAND QUAD

\$289 2 Element Complete


Complete Kits, Parts and Custom Building For Quads From 40m to 440MHz. Remember Your Ideas Can Become Reality. UPS Shippable

Lightning Bolt Antennas
RD#2, RT 19, Volant, PA 16156
412-530-7396

Use Your Free Reader Service Card For More Information On Companies Advertising In This Issue.

Multi-Band Remote Switched
TRANSCEIVER BANDPASS FILTERS
NEW! 6-Band (160-10), 200+ Watts
MODEL 600

Positive or Negative Keying

★ **\$229** plus S&H 
Dunestar 503/397-2918

Write, FAX or Call for more information
P.O. Box 37, St. Helens, OR 97051

"ONLINE" U.S. & INTERNATIONAL CALL DIRECTORY

OVER A MILLION CALL SIGNS

Hamcall online service gives you ALL hams via your computer & modem. Updated each month! **Only \$29.95** per year. Unlimited use - 24 hours a day - you pay for the phone call.
800:282-5628 * 703:894-5777 * FAX 703:894-9141



BUCKMASTER
Route 4, Box 1630
Mineral, Virginia 23117
Internet: info@buck.com



THIS MONTH'S GOODIE FROM THE CANDY STORE

YAESU FT-416/25B

Under **\$256.00** less applicable coupon

Similar Savings on AEA, Icom, Astron, Yaesu, Cruscraft, Alinco, Etc. All L.T.O.

Yaesu FT-73RTT \$240.00

Over 9039 Ham Items in Stock, all Prices, Cash FOB Preston.

More Specials in HAM-ADS. Looking For Something Not Listed??

Call or Write. To save time and money, have the model number ready.

Call Today (208) 852-0830

ROSS DISTRIBUTING COMPANY

78 S. State Street, Preston, Id. 83263

Hours Tue.-Fri. 9-6 - 9-2 Mondsays. Closed Sat. & Sun.

Quality Microwave TV Antennas

WIRELESS CABLE - IFTS - MMDS - Amateur TV

Ultra High Gain 50db(+) • Tuneable 1.9 to 2.7 Ghz.

• 55-Channel Dish System \$199.95

• 36-Channel Dish System \$149.95

• 20-Channel Dish System \$124.95

• Optional Commercial Grid Antenna (not shown) Add \$50.00

• Yagi Antennas, Components, Custom Tuning Available

• Call or write (SASE) for "FREE" Catalog

PHILLIPS-TECH ELECTRONICS

P.O. Box 8533 • Scottsdale, AZ 85252

(602) 947-7700 (\$3.00 Credit all phone orders)

MasterCard • Visa • American Express • COD's • Quantity Pricing

September's Quotable Quote

To kick off this month's new feature, here are two quotes for you to consider:

"Serious contesting is fun, even though you know you ain't gonna be the winner!"—Willy Umanets, UA9BA (ex-UW9AR)

"As for contesting, kick back, have fun, and play it like it is, not as you wish it was."—Gene Walsh, N2AA

1000 Sofia, Bulgaria. Logs may also include applications for the many BFRA awards: NRB, W-100-LZ, 5 Bands LZ, W-28-Z, Black Sea, and Sofia awards.

Labor Day QRP CW Sprint

0000Z to 0400Z, Mon., Sept. 5

Sponsored by the Michigan QRP Club, this is a fun event to add to your Labor Day weekend's activities.

Classes: A—250 milliwatts or less output. B—250 milliwatts to 1 watt. C—1 watt to 5 watts. D—Over 5 watts output.

Exchange: RST, QTH (state/province/country) and MI-QRP membership number (non-members send power output).

Frequencies: 1810, 3560, 7040, 14060, 21060, 28060, 50060 kHz. Novice: 3710, 7110, 21110, 28110 kHz.

Scoring: Stations may be worked once per band for QSO points. All member QSOs are 5 points. Non-member contacts in W/VE are 1 point. Non-member QSOs outside of W/VE are 4 points. Multiply total QSO points on all bands by the number of states/provinces/countries worked on all bands. USA and Canada do not count as countries. Total points may be multiplied by 1.25 for homebrew/commercial RX/TX combinations. Completely homebrew stations multiply their score by 1.5.

Awards: Certificates will be awarded by class for each QTH multiplier.

Logs must be received by October 5th and should be sent (including equipment description and power output) to: L. T. Switzer, N8CQA, 654 Georgia Ave., Marysville, MI 48040-1243. Logs and entry sheets are available by sending an SASE to N8CQA.

YLRL Howdy Days Contest

1400Z Wed., Sept. 7 to 0200Z Fri., Sept. 9

This annual event is sponsored by the Young Ladies Radio League (YLRL) and is open to all licensed women operators around the world. All amateur bands may be used. Any type of emission may be used (SSB, CW, etc.). A station may be worked only once on each band for contact points. No crossband, net, or repeater contacts allowed.

Exchange: YLRL member or NON-YLRL member. Be sure to show time breaks in your log.

Frequencies: CW—80 meters 3.540–3.725 MHz; 40 meters 7.040–7.070 MHz; 20 meters 14.040–14.070 MHz; 15 meters 21.120–21.150 MHz; 10 meters 28.150–28.200 MHz. SSB: 80 meters 3.940–3.970 MHz; 40 meters 7.240–7.270 MHz; 20 meters 14.250–14.280 MHz; 15 meters 21.380–21.410 MHz; 10 meters 28.300–28.610 MHz.

Scoring: Score two points for each YLRL

CIRCLE 84 ON READER SERVICE CARD

member contacted. Score one point for each non-YLRL member contacted. For each duplicate contact that is removed by the YLRL vice-president, a penalty of three additional and equal contacts will be exacted. There are no multipliers.

Awards: Top-scoring YLRL member will receive her choice of YLRL pin, charm, or stationery. In addition, the top-scoring non-YLRL member will receive a one-year YLRL membership certificate.

All log entries should be sent to: Carla Watson, WO6X, 473 Palo Verde Dr., Sunnyvale, CA 94086. Logs must be postmarked no later than October 10, 1994.

ARRL VHF QSO Party

1800Z Sat., to 0300Z Mon., Sept. 10-12

All bands 50 MHz and up can be used for this one. The August issue of *QST* should have all the details. It is recommended that you send for official summary and log sheets. A large SASE will get you a supply. Address your request to the ARRL VHF Party, 225 Main St., Newington, CT 06111.

North American "Sprint"

CW: Sept. 11 SSB: Sept. 18
Sunday, 0000Z to 0359Z (Sat. night)

This is the fall edition of the "Sprint" run by the *National Contest Journal*. As the name implies, it's a shorty, only four hours long.

North Americans will be contacting other North American stations as well as stations in other countries, single operator only. North American boundaries are as defined by the rules used in the CQ WW DX Contest. As a reminder about recent rule changes: (1) Simultaneous transmission on more than one band is no longer permitted, (2) automatic reception methods may not be used, (3) you can no longer standby on a frequency and work the station who answers the CQ of the station you just worked (e.g., round-robin QSOs).

Exchange: Call, QSO no., name, and QTH (state, Canadian area, or country).

Scoring: Multiply total QSOs by the sum of states, Canadian areas, and other North American countries worked for your final score. (U.S. and VE are not countries; KH6 is not considered a state.) There are eight Canadian multipliers: VE1/NO1/NO2, VE2-VE7, VY1/NE8. Non-North America countries do not count as a multiplier.

Frequencies: Three bands only—80, 40, and 20 meters. CW—3540, 7040, 14040. SSB—3850, 7225, 14250. (Plus or minus QRM.)

Awards: A trophy to the highest scoring entrant. Certificates to the top scorer in each U.S. call area, Canada, and other North American country. Also to the ten top scores, each member of the winning team, and the highest scoring entrant on each team.

Team competition is limited to a maximum of ten operators as a single unit. Pre-contest registration is required for each team before the start of the contest with N6TR for CW and K7GM for SSB.

There are other detailed rules, a special QSY rule, disqualifying penalties, etc. I suggest you write to N6TR or K7GM if you do not have a copy of the *NCJ*.

Entries must be received no later than 30 days after the end of each "Sprint." CW logs



EAST COAST AMATEUR RADIO, INC.

1:00 PM - 5:00 PM
weekdays

10:00 AM - 3:00 PM
Saturdays

Full Line of Amateur
Radio Accessories in Stock
Call for Best Price

KENWOOD

Authorized Sales & Service Center








496 McConkey Drive
Tonawanda, NY 14150

716-835-8530

CIRCLE 93 ON READER SERVICE CARD

LUKE

GET THE POWER

OUR CONTINUOUS DUTY POWER SUPPLIES BEAT THE COMPETITION HANDS DOWN. 40 TO 100 AMPERES, 13.8, 24, 28 AND 50 VDC. CONTACT... LUKE POWER SUPPLIES, 7113 NORTH 9 MILE, LAKE CITY, MICHIGAN 49651 OR CALL (616) 229-4593

THE FAMED 2 METER

ALSO THE ULTIMATE FOR SCANNERS BCB to 1300 MHZ

A. S. A. 9209

+9 db Co-Linear "MultiWave" Base Station Double 5/8 over 1/4 wave delivers up to +9 db gain. All fiberglass & solid aluminum construction. Fits masts up to 1-1/2". 2 Meter Base Station 10' length.

\$36.73

+ 6.00 S&H

(SC RES. 5% SALES TAX
CHECK IN ADVANCE OR C.O.D.
ALSO AVAILABLE IN 220 & 440



Model 9209
+9db

ASA

"Service is the Reason For Our Success"

Tel: (803)293-7888 P.O. Box 3461
Watts: 1-800-722-2681 Myrtle Beach, SC 29578

CIRCLE 18 ON READER SERVICE CARD

Introducing CT Version 9 by K1EA

The Competitive Edge is now sharper than ever!

Since its introduction in 1985, CT has been the *recognized* leader in contest logging software. Version 9 continues the tradition of cutting-edge, innovative leadership. A host of exciting new features makes contesting (and winning) easier than ever!

- 50-line display mode
- Color-coded band map
- Keyer paddle support
- Window position/color control
- Sunrise/sunset tables
- Increased CW speed range
- Built-in mouse support
- Band switch support
- Variable CW weighting
- Automatic "installer" program
- Beam headings & rotor control
- Single op/Multi TX support

CT 9 supports 15 major contests, controls most transceivers, sends call signs and reports, includes MM/MS networking, duping, scoring, QSO rates, PacketCluster® interface, QSL labels, and more!

CT 9 requires a 386- or 486-based PC with at least 2MB of RAM.

Pencil and paper are obsolete. To be a winner, you must play the game with the right tools!

CT Version 9 for 386/486 only	\$ 79.95	Upgrade from CT 8 to CT 9	\$ 44.95
CT Version 8 for XT/AT/386/486	69.95	Group discount for 5 or more in same order	

Shipping/Handling: \$4 US/Canada - \$8 Foreign
Payment by U.S. check, MasterCard, or Visa (Mass. residents add 5%)

K1EA Software

a division of Harvard Radio, Inc.
5 Mount Royal Avenue, Marlborough, MA 01752
24-hour order line: (508) 779-5054 • Fax: (508) 460-6211
Support: (508) 460-8873 • BBS: (508) 460-8877

CIRCLE 59 ON READER SERVICE CARD

1994 CQ Magazine Contest Survey

Your Callsign (optional): _____

Contesting Experience (years): _____

1. Do you favor the concept of limiting contest operation to portions of bands, thus creating "contest-free" operating zones?

YES NO

2. Who would you recommend as the next inductee into the CQ Contest Hall of Fame?

3. What do you predict the winning CQ WW scores will be in the year 2000 for the following categories:

Single Operator/USA SSB _____
Single Operator/World SSB _____
Single Operator/USA CW _____
Single Operator/World CW _____

4. Do you support the elimination of the traditional 59/599 portion of contest exchanges in favor of more meaningful information?

YES NO

5. Should the single operator category:

a. Be limited to using only one radio? YES NO
b. Be allowed to use packet spotting? YES NO

6. What was your first contest operation?

7. How did you become interested in contest operating? (Circle all that apply.)

a. Contest Elmer
b. Discovered contest operating while operating radio
c. Local radio club
d. Magazine
e. Other _____

8. At what age did you start operating contests?

9. Do contests still have the same appeal for you that they did when you began?

YES NO

10. As a contest operator, what feature(s) would you like to see in the next generation transceiver?

a. _____
b. _____
c. _____
d. _____

11. Are you in favor of limiting transmitter output power to 100 watts for domestic contests?

YES NO

12. If you had the power to change one and only one aspect of contesting, what would you recommend?

13. In a few words, how does your spouse **really** feel about your interest in contest operating? (Spouses, feel free to answer this question personally!)

Additional comments:

(use extra sheets if necessary)

Return your survey responses to:

John Dorr, K1AR
1994 Contest Survey
c/o CQ Communications, 76 N. Broadway, Hicksville, NY 11801

Deadline: November 30, 1994

Scanners/CB/Ham/Shortwave

COMMUNICATIONS ELECTRONICS INC.
Emergency Operations Center

25th Anniversary Special
Save \$30.00
on Bearcat® 8500XLT or 2500XLT radio scanners.

Celebrate our 25th anniversary with special savings on your choice of a new Bearcat 8500XLT or Bearcat 2500XLT radio scanner. This coupon must be included with your prepaid order. Offer valid only on orders mailed directly to Communications Electronics Inc., P.O. Box 1045 - Dept. CQ0994, Ann Arbor, Michigan 48106-1045 U.S.A. Coupon expires November 30, 1994. Limit one coupon per item. Coupon may be photocopied. Coupon may not be used in conjunction with any other offer. Credit cards are excluded from this offer. Void where prohibited.

Bearcat Scanners

Bearcat 2500XLT-K Radio Scanner

List price \$649.95/CE price \$338.95/SPECIAL
400 Channels • 20 Banks • Turbo Scan
Rotary tuner feature • Auto Store • Auto Sort
Size: 2-3/4" Wide x 1-1/2" Deep x 7-1/2" High
Frequency Coverage: 25.0000 - 549.9950, 760.0000 - 823.9950, 849.0125 - 868.9950, 894.0125 - 1,300.0000 MHz.

Signal intelligence experts, public safety agencies and people with inquiring minds that want to know, have asked us for a world class handheld scanner that can intercept just about any radio transmission. The new Bearcat 2500XLT has what you want. You can program frequencies such as police, fire, emergency, race cars, marine, military aircraft, weather, and other broadcasts into 20 banks of 20 channels each. The new rotary tuner feature enables rapid and easy selection of channels and frequencies. With the AUTO STORE feature, you can automatically program any channel. You can also scan all 400 channels at 100 channels-per-second speed because the Bearcat 2500XLT has TURBO SCAN built-in. To make this scanner even better, the BC2500XLT has AUTO SORT - an automatic frequency sorting feature for faster scanning within each bank. Order your scanner today from CEI.

A modification sheet with instructions to restore full 800 MHz. coverage for our Bearcat 2500XLT or Bearcat 200XLT may be ordered for \$8.00. To order any Bearcat radio product call 1-800-USA-SCAN.

Other Bearcat Scanners

Bearcat 8500XLT-K base/mobile \$368.95
Bearcat 890XLT-K base/mobile \$228.95
Bearcat 855XLT-K base \$148.95
Bearcat 2500XLT-K handheld ... \$338.95
Sportcat 150-K handheld \$178.95
Bearcat 760XLT-K base/mobile \$198.95
Bearcat 700A-K info mobile \$148.95
Bearcat 560XLA-K base/mobile \$83.95
Bearcat 220XLT-K handheld \$228.95
Bearcat 200XLT-K handheld \$198.95
Bearcat 148XLT-K base/WX alert \$88.95
Bearcat 120XLT-K handheld \$148.95
Bearcat BCT2-K info mobile \$138.95



Bearcat 8500XLT-K Radio Scanner

List price \$689.95/CE price \$368.95/SPECIAL
500 Channels • 20 banks • Alphanumeric display
Turbo Scan • VFO Control • Priority channels
Auto Store • Auto Recording • Reception counter
Frequency step resolution 5, 12.5, 25 & 50 KHz.
Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High

Frequency Coverage:
25.000 - 28.995 MHz. (AM), 29.000 - 54.000 MHz. (NFM),
54.000 - 71.995 MHz. (WFM), 72.000 - 75.995 MHz. (NFM),
76.000 - 107.995 MHz. (WFM), 108.000 - 136.995 MHz. (AM)
137.000 - 173.995 MHz. (NFM), 174.000 - 215.995 MHz. (WFM),
216.000 - 224.995 MHz. (NFM), 225.000 - 399.995 MHz. (AM)
400.000 - 511.995 MHz. (NFM), 512.000 - 549.995 MHz. (WFM)
760.000 - 823.9875 MHz. (NFM), 849.0125 - 868.9875 MHz. (NFM)
894.0125 - 1,300.000 MHz. (NFM).

The new Bearcat 8500XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology featuring a triple conversion RF system, enables Uniden's best scanner to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. Other features include **VFO Control** - (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. **Counter Display** - Lets you count and record each channel while scanning. **Auto Store** - Automatically stores all active frequencies within the specified bank(s). **Auto Recording** - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional **CTCSS Tone Board** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. **20 banks** - Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; **MB001** Mobile mounting bracket \$14.95; **BC005** CTCSS Tone Board \$54.95; **EX711** External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from Communications Electronics Inc. today.

CB/GMRS Radios



A National Weather Service (NWS) receiver with automatic emergency broadcast activation has been added to the legendary Cobra 29 CB radio. The integrated NWS receiver in the Cobra 29LTDWX will automatically activate to receive emergency announcements about severe weather and travel conditions. A special tone-alert signal broadcast by the NWS activates the weather receiver and overrides any CB radio reception for monitoring the warning message. **Cobra 29LTDWX-K CB/Weather Alert..** \$129.95
Cobra 2000GTL-K SSB Deluxe CB Base \$389.95
Cobra HH40-K CB 40 ch. Handheld \$99.95
Uniden GMR100-K GMRS Handheld \$159.95
Uniden WASHINGTON-K SSB CB Base \$189.95
Uniden GRANTXL-K SSB CB Mobile \$139.95
Uniden PRO538W-K CB & Weather \$59.95



Weather Stations

Now you can be your own weather reporter with the Davis Weather Monitor II. Our top-of-the-line weather station combines the most advanced weather monitoring technologies available into one incredible package. Glance at the display, and see wind direction and wind speed on the compass rose. Check the barometric trend arrow to see if the pressure is rising or falling. Push a button, and read indoor and outdoor temperature, wind chill, humidity and barometric pressure. Our package deal includes the new ultra high resolution 1/100 inch rain collector part #7852-K, and the external temperature/humidity sensor, part #7859-K. The package deal is order #DAVI-K for \$479.95 plus \$15.00 shipping. If you have a personal computer, when you order the optional Weatherlink computer software for \$139.95, you'll have a powerful computerized weather station at an incredible price. For the IBM PC or equivalent order part #7862-K. Apple Mac Plus or higher including PowerBook, order part number 7866-K.

The Weather Monitor II (7440-K) comes complete with anemometer with 40 feet of cable, external temperature sensor with 25 feet of cable, junction box with 8 feet of cable, AC power adapter, detailed instruction booklet and one year limited factory warranty.



Davis Weather Monitor II 7440-K \$334.95
Davis Weather Wizard III 7425-K \$154.95
Davis Remote Display Unit 7815-K \$84.95
Davis Rain Collector II 0.01" 7852-K \$59.95
Davis Rain Collector II 0.2 mm 7852M-K \$59.95
External Temperature/Humidity Sensor 7859-K \$99.95
Davis Anemometer Mast Mount 7890-K \$15.95
Weatherlink Software for IBM PC-Version 3.0 7862-K \$139.95
Weatherlink Software for Apple-Version 3.0 7866-K \$139.95
4-Conductor 40' (12.2 m) extension cable 7876-K \$17.95
6-Conductor 40' (12.2 m) extension cable 7878-K \$21.95
8-Conductor 25' (7.6 m) junction box cable 7880-K \$14.95
8-Conductor 50' (15.2 m) junction box cable 7881-K \$24.95
8-Conductor 100' (30.5 m) junction box cable 7882-K \$44.95
Modem Adaptor 25-pin for communications port 7870-K \$9.95
Car/Boat/RV Lighter Cord 7873-K \$9.95
2400 baud modem for Weatherlink MEXT-K \$39.95
Weatherlink language disks: Française, Deutsche, Italiana, Española 7863-K \$24.95

Other neat stuff

Grundig Satellit 700-K portable shortwave receiver with 512 memory & AC adapter \$389.95
Grundig Yacht Boy 400-K digital portable shortwave receiver - 40 memory presets \$199.95
Grundig Yacht Boy 250-K portable shortwave receiver \$139.95
Sangean AT5800-K portable 20 memory shortwave receiver \$69.95
Sangean AT5805A-K portable shortwave receiver w/AC adapter - 9 memory presets \$148.95
Sangean AT5806-K portable 45 memory shortwave receiver \$159.95
Sangean AT5818CS-K portable shortwave receiver with cassette recorder \$209.95
Uniden EXP200-K 900 MHz. 2 line cordless telephone \$289.95
Uniden EXP9100-K 900 MHz. 1 line cordless telephone \$269.95
Cobra CP910-K 900 MHz. spread spectrum cordless phone \$249.95
FANS P161P-K 60 name/number caller ID, unwanted call blocker, automatic paging \$149.95
SNI ID200-K Bouncer name/number caller ID, call reject, forward to machine \$89.95
ICOM GP22-K handheld global positioning system (GPS) \$399.95
WR200-K weather radio with National Weather Service storm alert \$39.95
RELM WHS150-K VHF handheld 5 watt, 16 channel transceiver \$339.95
RELM RH250NB-K VHF 25 watt, 16 channel synthesized transceiver \$289.95
Ranger RC12950-K 25 watt 10 meter ham radio transceiver \$239.95
Ranger RC12970-K 100 watt 10 meter ham radio transceiver \$369.95
Uniden LR09100SW-K Super Wideband Laser/Radar Detector \$139.95
ME2-K Map Expert CD Rom for IBM PC by DeLorme Mapping \$299.95
MCPGX HamCall CD Rom for IBM PC by Buckmaster Publishing \$39.95
ANTX-K VHF scanner/VHF transmitting antenna PL259 connector \$29.95
ANTM800-K magnet mount scanner antenna w/ BNC connector \$29.95
ANTM800T-K magnet mount scan antenna w/Motorola plug \$29.95
ANTMPL-K magnet mount scan antenna with PL259 connector \$29.95
ANTSGNCK glass mount scanner antenna with BNC connector \$29.95
ANTSGMOT-K glass mount scanner antenna with Motorola jack \$29.95
B10-K AA Ni-Cad rechargeable batteries - Pack of 10 batteries \$29.95
AD1400-K Uniden AC adaptor for PRO340XL CB & scanners \$14.95

Buy with confidence

It's easy to order from CEI. Mail orders to: Communications Electronics Inc., Emergency Operations Center, P.O. Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add \$15.00 per radio for U.P.S. ground shipping and handling in the continental U.S.A. unless otherwise stated. Add \$8.00 shipping for all accessories and publications. Add \$8.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, P.O. Box, or APO/FPO delivery, shipping charges are two times continental U.S. rates. Michigan residents add state sales tax. No COD's. No returns or exchanges after 31 days. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Call 1-800-USA-SCAN to order toll-free. Call 313-996-8888 if outside the U.S.A. FAX anytime, dial 313-663-8888. For technical assistance to solve your communications problem, call the Communications Electronics technical support hotline for \$2.00 per minute at 1-900-555-SCAN. Order your new electronic equipment from Communications Electronics Inc. today.

Scanner Distribution Center and CEI logos are trademarks of Communications Electronics Inc. Sale dates 9/1/94 - 11/30/94. AD #091394Q. Copyright © 1994 Communications Electronics Inc.

For credit card orders call
1-800-USA-SCAN
Communications Electronics Inc.
P.O. Box 1045, Ann Arbor, Michigan 48106-1045 U.S.A.
For information call 313-996-8888 or FAX 313-663-8888

THE CAGE DIPOLE RING KIT

PVC Spreader Rings,
12" Dia. 1/2 TO 1"
Wall. Predrilled For
6 or 8 Wires...

ALPHA ONLY \$9.99 each
P.O. Box 1316
MUNFORD, TN 38058
(901) 837-3518

(10 rings \$89.00) All Prices Plus Shipping

1-800-650-9863

CIRCLE 21 ON READER SERVICE CARD

RF HUNTER TESTER! DIGI-FIELD DIGITAL FIELD STRENGTH METER

- Measure your antenna strength
- Check your property for EMF
- Hunt for radio interference
- Pattern your antennas
- Test your house (microwave, 60 cycle noise)
- DC to 12 GHz!

\$139.95
Plus \$6.50 s/h



MODEL "A" NORMAL USE at
100MHz -38 dBm (150 nanowatts)
MODEL "B" ULTRA SENSITIVE at
100MHz -57 dBm (2 nanowatts)
NEW! MODEL "C" "A-B" switch
Combines both Models!
TELESCOPIC ANTENNA INCLUDED
EXT. ANT. OPT. LOW BAT. IND.
CALIBRATION CURVES IN dBm,
VOLTS and POWER.



To order call - (800) FIELD 58 (343-5358)
I.C. Engineering 16350 Ventura Blvd.
Suite 125, Encino, CA 91436 PH.(818) 345-1692 • 818-345-0517 Fax

CIRCLE 53 ON READER SERVICE CARD

go to: Larry Tyree, N6TR, 15125 S.E. Bartell Road, Boring, OR 97009. SSB goes to: Rick Niswander, K7GM, Box 3778, Greenville, NC 27386-1778.

Scandinavian Activity Contest

CW: Sept. 17-18 Phone: Sept. 24-25
1500Z Saturday to 1800Z Sunday

It's the world working the world in this 35th Scandinavian Activity Contest (SAC). The same station may be worked on each band for QSO and multiplier credit. The prefixes used in Scandinavia are LA, LB, LG, LJ (Norway); JW (Svalbard & Bear Is); JX (Jan Mayen); OF, OG, OH, OI (Finland), OHØ (Åland Is.); OHØM (Market Reef); OX (Greenland); OY (Faroe Is.); OZ (Denmark); SJ, SK, SL, SM (Sweden); and TF (Iceland).

Bands: 3.5, 7, 14, 21, 28 MHz according to IARU band plans; 3560-3600, 3650-3700, 14060-14125, and 14300-14350 kHz should be kept free of contest activity.

Classes: Single operator and multi-operator single transmitter, all band only. Multi-operator must remain on the same band for at least 10 minutes. Also QRP single operator (maximum of 10 watts output) and SWL (only SAC stations may be logged).

Exchange: RS(T) plus a QSO number starting with 001.

Scoring: European stations score 1 point for each SAC contact. Non-Europeans score 1 point on 14, 21, and 28 MHz, and 3 points on 3.5 and 7 MHz.

Multiplier: Each call area in the above list of SAC countries worked on each band (call areas, not prefixes).

Final Score: The sum of QSO points from all bands times the sum of the multiplier from each band. Scoring for SWLs same as above.

Awards: Certificates to the winning station in each class, both CW and phone, in each country and each U.S.A. call area. QRP stations will be listed in one common list. The non-SAC SWL winner will be awarded. Plaques to the top-scoring station in each continent.

The usual disqualification criteria will be observed. Include a summary sheet and a dupe sheet for logs with more than 200 QSOs, and a signed declaration. Logs may also be submitted on MS-DOS formatted diskettes. Mailing deadline is October 31st. At press time an address was not available to use for mailing contest entries. However, last year's rules indicate that the OZ boys will manage this year's logs.

Washington State Salmon Run

1600Z Sat., Sept. 24 to 2400Z Sun., Sept. 25

This popular state QSO party is sponsored by the Western Washington DX Club and is open to amateurs worldwide on SSB and CW.

Classes: Single or Multi Operator, Single Transmitter. Also, entrants may operate QRP, low power (200 watts or less) or in the open category on SSB, CW, or mixed modes.

Exchange: RS(T) and QTH (state/province/DXCC country or Washington state).

Scoring: Count 2 points for SSB and 3 points for CW. QSOs with CW Novice/Tech-nicians are worth 6 points. The multipliers are Washington counties (maximum 39) or state/

24 HOUR SHIPPING ELENCO • HITACHI • B&K PRODUCTS GUARANTEED LOWEST PRICES TO ORDER - CALL TOLL FREE 1-800-292-7711 1-800-445-3201 (Can.)

AFFORDABLE - HIGH QUALITY
2 YEAR WARRANTY



STANDARD SERIES
S-1325 25MHz \$349
S-1340 40MHz \$495
S-1365 60MHz \$849

- Features:
- High Luminance 6" CRT
 - 1mV Sensitivity
 - X-Y Operation
 - Voltage, Time, + Frequency differences displayed on CRT thru the use of cursors (S-1365 only)
 - Plus much, much more

ELENCO OSCILLOSCOPES



DELUXE SERIES
S-1330 25MHz \$449
S-1345 40MHz \$575
S-1360 60MHz \$775

- Features:
- Delayed Sweep
 - Automatic Beam Finder
 - Z Axis Modulation
 - Built-in Component Test
 - Plus all the features of the "affordable" series

Hitachi Compact Series Scopes

V-212 - 20MHz Dual Trace	\$425
V-525 - 50MHz, Cursors	\$1,069
V-523 - 50MHz, Delayed Sweep	\$995
V-522 - 50MHz, DC Offset	\$975
V-422 - 40MHz, DC Offset	\$849
V-222 - 20MHz, DC Offset	\$695
V-660 - 60MHz, Dual Trace	\$1,375
V-665A - 60MHz, DT, w/cursor	\$1,449
V-1060 - 100MHz, Dual Trace	\$1,549
V-1065A - 100MHz, DT, w/cursor	\$1,695
V-1085 - 100MHz, QT, w/cursor	\$2,125

B&K OSCILLOSCOPES

2120 - 20MHz Dual Trace	\$389
2125 - 20MHz Delayed Sweep	\$539
1541B - 40MHz Dual Trace	\$749
2160 - 50MHz Dual Trace, Delayed Sweep, Dual Time Base	\$949
2190 - 100MHz Three Trace Dual Time Base, Delayed Sweep	\$1,379
2522A - 20MHz / 20MS/s Storage	\$869

Digital Multimeter EDM-83B \$175.00 Almost every feature available. Bargain of the decade.	Digital Multimeter CM-1500B \$59.95 DC, AC volts DC, AC amps Large 1" LCD display	Digital Capacitance Meter CM-1555 \$49.95 • Measures capacitors from 1pf to 20,000µf • 3-1/2 Digit LCD readout with unit indicator	Digital LCR Meter LCR-680 \$79.95 • 3-1/2 Digit LCD Display • Inductance 1µH to 200H Resistance 1Ω to 20MΩ • Capacitance 1pf to 200µF	Function Generator FG-801 \$149.95 Square, triangle sine wave. Freq range 0.2Hz to 2MHz
---	--	--	--	---

3-3/4 Digit Multimeter BK-390 \$139.00 • 0.1% DCV acy • Analog bar graph • Auto/manual ranging • 4,000 count LCD display • Capacitance meas. • Temperature probe	Digital Multimeter Kit with Training Course By Elenco M-2665K \$49.95 • Full function 34 Ranges • Extra large display • Ideal school project M-2661 (Assembled) \$55.00	Frequency Counter F-1225 \$225.00 • 8 Digit LED display • Wide measuring range • High sensitivity • Data hold function • Input impedance 1MΩ or 50Ω • 10:1 Input attenuation function	FLUKE MULTIMETERS (All Models Available Call)
--	--	---	--

Triple Power Supply XP-620 By Elenco \$75.00 3 fully regulated supplies; 1.5-15V @ 1A, -1.5 to -15V @ 1A or (3-30V @ 1A) and 5V @ 3A Kit XP-620K \$49.95	Quad Power Supply XP-581 By Elenco \$79.95 Four supplies in one unit; 2-20V @ 2.5A, 5V @ 3A, -5V @ .5A and 12V @ 1A. All regulated and short protected	High Current DC Power Supply BK-1686 \$169.95 • 3 to 14 VDC Output • 12A @ 13.8V (less current at lower voltages) • For servicing high power car stereos, camcorders, ham radios, etc. • Connect 2 or more in parallel or series	Wide Band Signal Generators SG-9000 \$124.95 RF Frequency 100K-450MHz AM modulation of 1KHz Variable RF output SG-9500 150MHz built-in counter \$239
---	---	---	--

FM Receiver Kit & Training Course \$44.95 AR2N6 Built Ideal training aid for beginners. Makes it fun and easy to learn about amateur radio. • Covers both 2 meter (144-148MHz) and 6 meter (50-54MHz) FM. • Dual conversion superheterodyne	60 Hertz EMF Probe MP-1 \$89.95 Works with any DMM
--	---

Telephone Kit PT-223K \$14.95 Available Assembled PT-223 \$15.95	Function Generator Blox #9600 By Elenco \$29.95 Kit \$26.95 Sine, Triangle, Square wave	Learn to Build and Program Computers with this Kit MM-8000 By Elenco \$129.00 From scratch you build a complete system. Our Micro-Master trainer teaches you to write into RAMs, ROMs and run a 8085 microprocessor, which uses similar machine language as IBM PC.	Electronic Tool Kit TK-1000 \$39.95 A professional organizer tool kit at affordable prices. Includes 25 high quality tools in a high impact carrying case which includes a pocket for meter.	Digital/Analog Trainer Complete Mini-Lab For Building, Testing, Prototyping Analog and Digital Circuits XK-525 \$159.95 Kit XK-525K \$129.95 Elenco's trainer is designed for school projects, with 5 built-in power supplies. Includes a function generator with continuously variable, sine, triangular, square wave forms. All power supplies are regulated and protected against shorts. The case can include a full line of tools and meter of your choice.
---	---	--	---	---

WE WILL NOT BE UNDERSOLD UPS SHIPPING: 49 STATES 9%, OTHERS CALL IL RES add 7.75% TAX PROBES INCL ALL SCOPES & METERS

C&S SALES INC.
1245 ROSEWOOD, DEERFIELD, IL 60015
FAX: 708-530-6095 • (708) 541-0710

15 DAY MONEY BACK GUARANTEE FULL FACTORY WARRANTY WRITE FOR FREE CATALOG

CIRCLE 108 ON READER SERVICE CARD

provinces/DXCC countries for Washington state stations. Credit multipliers only once per mode on multiple bands. Final score is total QSO points times multiplier. Low-power stations multiply score by 2 and QRP by 3.

Frequencies: CW—1805, 3560, 7045, 14060, 21060, 28060. SSB—1815, 3925, 7260, 14280, 21380, 28380. Novices—3700, 7125, 21150, 28160.

Awards: The highest scores in each DX country and US call area will receive a package of Pacific Northwest smoked salmon. Certificates will be available for other category winners. A participation certificate will be awarded to each log submitted (50 QSOs [US], 25 QSOs [DX], 100 QSOs [Washington State] minimum).

The mailing deadline for logs is October 31st. Logs should be sent to: Western Washington DX Club, W7FR, Box 224, Mercer Island, WA 98040.

CQ WW RTTY Contest

0000Z Sat. to 2400Z Sun., Sept. 24-25

This is the 9th running of the CQ WW RTTY Contest organized by CQ magazine, and from the response to last year's contest, it has become one of the major RTTY competitions.

Bands: All five bands, 10 through 80 meters.

Classes: Single operator, single and all band, and single-op assisted all band only. Multi-operator, single transmitter, all band only. Keep in mind that single operators are lim-

ited to 30 hours out of the 48-hour contest period. Off times may not be less than 3 hours in length. Multi-operator stations may operate the full 48 hours.

Exchange: RST, state or VE area, and CQ Zone for stations within the 48 continental U.S. states and 13 Canadian areas. All others send RST and CQ Zone.

Points: One for contacts within own country. Two for contacts outside own country but same continent. Three for contacts outside own continent.

Multiplier: One for each state (48) and VE area (13). One for each DX country (ARRL and WAE list). One for each CQ Zone (40). All of the above on each band.

Final Score: Total QSO points from all bands times the sum of the multiplier from each band.

Awards: Plaques to the first-place winners in each operator class. Certificates to the second and third place. And certificates to the first-place finisher in each DX country.

Complete and detailed rules were published in the July issue of CQ and should be reviewed for more detailed information. The standard CQ log and summary sheets are recommended. Sample forms are available from CQ. Include an SASE (or IRC) with your request. All entries must be postmarked no later than December 1st. An extension may be given upon a written request. Logs go to: CQ RTTY Contest, Roy Gould, KT1N, P.O. Box DX, Stow, MA 01775 USA. Requests for log forms go to: CQ Magazine, 76 N. Broadway, Hicksville, NY 11801.

Fall Classic Radio Exchange

1900Z Sun., Sept. 25 to 0400Z Mon., Sept. 26

The 1994 Classic Exchange, "CX," is a celebration of the older commercial and homebrew equipment that was the pride of our shacks just a few short decades ago. The object is to restore, operate, and enjoy older equipment with like-minded amateurs. A classic radio is anything that is older than 10 years (although not a requirement for participation).

Exchange: Name, RST, QTH, receiver/transmitter type. Each station may be worked with different equipment combinations on each band and mode.

Scoring: Multiply total QSOs by the following: total number of different receivers and transmitters worked on each band and mode plus the total number of states/provinces/countries worked on each band and mode. Multiply that total by your personal Classic Multiplier (the total age of all receivers and transmitters used in your station; three QSOs minimum to qualify and 2 QSOs if equipment is a transceiver). Homebrew units count as 25 years unless they are older.

Frequencies: CW—60 kHz from the low band edge; SSB—3880, 7290, 14280, 21380. Novice/Technician use 20 kHz up from low band edge. Note that 7060 and 3560 tend to be the most popular operating frequencies.

Send logs, photos, comments, and anecdotes to Jim Hanlon, W8KGI, Box 581, Sandia Park, NM 87047. Include an SASE for the next CX newsletter.

NRF-7 PRICE REDUCTION!!!

~~WAS \$249.95~~ NOW Only \$219.95



NRF-7 General Purpose Noise Remover Unit
Now Only \$219.95

"First and Finest in DSP Noise Reduction"



JPS Communications, Inc.

P.O. Box 97757, Raleigh, NC 27624
(919)790-1011 FAX:(919)790-1456 TECH:(919)790-1048

JPS Communications is pleased to announce a price reduction in the NRF-7 from \$249.95 to \$219.95, effective 1 August 1994. Decreased parts costs and increased production efficiency have allowed us to continue our policy of passing on cost savings to our customers. We provide you, the user, with the latest high-quality, state-of-the-art products at the lowest prices. All of our Amateur Radio products are fully upgradable as improvements and additional features are developed, so your unit should never become obsolete!

The NRF-7 provides Dynamic Peaking noise reduction, which is extremely effective at reducing white/pink atmospheric noise and similar noise types. A DSP Spectral Multi-Tone Notch Filter eliminates any number of received tones. Super sharp filters for CW (200 Hz and 500 Hz BW), data (500 Hz BW) and voice (1700 Hz and 2300 Hz BW) are also provided to eliminate adjacent channel interference and provide optimum reception of CW and data signals. Try one at your local Amateur Radio Dealer. Write or call us for a dealer near you.

TOLL FREE ORDER LINE: 800-533-3819

We accept Mastercard, VISA, checks, money orders in US\$.
Free shipping within the continental U.S.

NEWS OF COMMUNICATION AROUND THE WORLD

DXCC Rule 12: Operating Ethics

A major controversy broke out on the Internet DX reflector in June. In a midwest newspaper appeared an article stating that a person who had pleaded guilty to two felonies concerning the theft of some checks had used that money to pay for a DXpedition. Some of the Internet correspondents demanded that the DXpedition be disqualified from DXCC credit. Others thought that only those contacts made by the DXpeditioner in question should be denied DXCC credit.

As it turned out, the news report was false. None of the stolen funds were used to pay for the DXpedition, so the question of possible disqualification of a major DXpedition is moot.

The depth of the concern on the Internet, and on the air, however, demonstrated a wide gulf between the DXCC rules about ethics and DXers' understanding of those rules and their application. Hence this controversy, although based on erroneous information, gives us an excuse to examine DXCC Rule 12: Operating Ethics.

Rule 12 states: "(a) Fair play and good sportsmanship in operating are required of all DXCC members. In the event of specific objections relative to continued poor operating ethics, an individual may be disqualified from DXCC by action on the ARRL Awards Committee. (b) Credit for contacts with individuals who have displayed continued poor operating ethics may be disallowed by action of the ARRL Awards Committee. (c) For (a) and (b) above, 'operating' includes confirmation procedures and/or documentation submitted for DXCC accreditation."

Note the use of the word "operating." Rule 12 is specifically about *operating* ethics. It makes no mention of any other sort of ethical or moral questions. In fact, it specifically adds QSLs and accreditation documentation to "operating" ethics, further demonstrating that the rule refers only to operating and not to any other questions.

DXers with a thorough knowledge and understanding of this rule would realize that the source of funds for a DXpedition has nothing to do with "operating." This seldom-applied rule refers instead to on-the-air shenanigans, such as Don Miller's "selective" hearing. (On some of his DXpeditions Don Miller would fail to hear certain callsigns. When the same stations

called using other callsigns, they got through on the first call. This does not meet the requirement of fair play and good sportsmanship.)

Much of the above-mentioned controversy centered on whether the DXpedition organizers were aware that some of the funds used on the trip may have been obtained illegally. The gist of the argument was that if the organizers of the DXpedition had known that some of the DXpedition funds were "tainted," then the DXpedition should be disqualified from DXCC.

This attitude suggests a lack of understanding about major DXpeditions and their funding. It is difficult enough for a DXpedition organizer to pull together all the diverse elements necessary for a successful DXpedition without monitoring sources of funds. (See the 3YØPI DXpedition book described later in this column for a better appreciation of what is involved in such an operation.) In many cases the DXpedition organizers are not directly involved in fund raising. A third party such as the Northern California DX Foundation (NCDXF) may be the collection point for donations and operators' shares, for example. The NCDXF doesn't ask its donors to certify that none of the donations was obtained by illicit means.



In 12 months 665 countries worked! Dave Hammond, WC4B (left); Ken Miller, K6IR; and John Kanode, N4MM (right), worked 201, 227, and 237 of the 250 DXCC field-check eligible countries in a year.



Alex, SVØAN, in Athens, Greece, likes to chat with North American stations when band conditions permit. (Thanks to KDØJL for the photo.)

P.O. Box 50, Fulton, CA 95439

WE SHIP WORLDWIDE

Barry Electronics Corp.

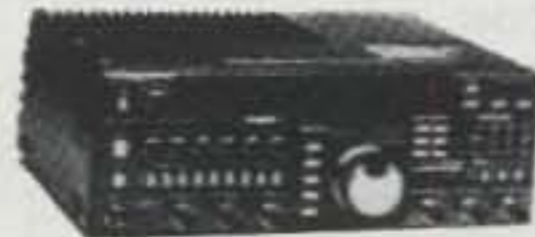
WORLD WIDE AMATEUR RADIO SINCE 1950

Your one source for all Radio Equipment!



Wherever I go, I take my radio.
Specialist in RADIOS;
Business marine aviation,
ham radios and scanners.

KITTY SAYS: WE ARE OPEN 7 DAYS A WEEK
Saturday 10-5pm/Sunday 11-4 pm
Monday-Friday 9 to 6:00 PM
Come to Barry's for the best buys in town



CONTACT US FOR THE LATEST IN
BUSINESS AND HAM RADIOS,
SHORTWAVE RECEIVERS &
SCANNERS. MOTOROLA, YAESU,
ICOM, KENWOOD, ALINCO,
STANDARD, MAXON, RELM, BENDIX,
KING, SONY, SANGEAN.

For the best buys in town call:
212-925-7000

Los Precios Mas Bajos en Nueva York
WE SHIP WORLDWIDE!

Export orders expedited.

IC-R71A, R72A, R100, R7000A, R7100A, R9000A,
IC-725, 728, 729, 735, 737, 765, 781. IC229H,
IC3230A, IC901A, GPS Receiver: GP-22



ICOM

"YAESU Ham and Business Radios"

FT-767GX, FT-890, FT-747GX, FT-990, FRG-8800,
FRG-100B FT-736R, FT-1000D, FT-416/816, FT-530,
FT-5200, FT-2400, FT-470, FT-530- FT-411E

KENWOOD



ANTENNAS
A-S, AES, Cushcraft, Hy-Gain,
Hustler, KLM, METZ, Urban,
MODUBLOX, TONNA, Butternut,
Multi-Band

"TS-50S", TS450S/AT, R-5000, TS-850S,
TM 241/A/441A, TR-751A, Kenwood Service
Repair, TS140S, TS690S, RZ-1, TS-790A,
TS950SD, TH-78A, TH28/48A, TM-941A,
TM-741A, TM-732A, TM-641A, TM-742A.

MARINE RADIOS
ICOM M7, M11, M56, M700TY, M800
AVIATION PORTABLE ICOM A-21
MOTOROLA MARINE KING KX 99

SCANNERS

AOR:
900, 1000,
1500, 2500,
2800, 3000A
ICOM:
R-1, R100,
R71A, R72A,
R7000,
R7100,
R9000
Bearcat



ICW2A W2IAT P2AT/4AT
IC-H16/U16 IC2IA
MOTOROLA RADIUS COMMERCIAL RADIOS
TH-78A FT-530

Telephone Autopatch

Patches telephone calls from your radio to phone line. Great for making and receiving phone calls where there are no phone lines. Simple to use. Write or fax for inquires. Simplex, semi-duplex, full duplex, CES & CSI Models stocked: SDI-50, PPV, CS700/800/900 etc. Our service Lab will wire in systems for you if requested.

Save money on batteries.
Ask for Special Prices.



MFJ-989C
8L8H, AT300, etc.

Covercraft/Coaxseal Stocked

SHORTWAVE RECEIVERS STOCKED

Shortwave Receivers

- SONY • GRUNDIG
- SANGEAN • ICOM

Call 212-925-7000

Satellite telephone in suitcase for worldwide use. WRITE.



MOTOROLA

Antenna Tuners:
MFJ, AEA AT-300,
ICOM, KENWOOD,
YAESU.

COMMERCIAL & HAM REPEATERS STOCKED. WRITE FOR QUOTES

Kantronics
KAM PLUS, KPC 2/3/4,
KPC2400, SUPER FAX II,
KPC IV, Data Engine, D4-10, etc.

Computer Interfaces
Stocked: MFJ-1270B,
MFJ-1274, MFJ-1224, AEA
PK-88, MFJ-1278T, PK-900, PK-232
MBX W/FAX, DRSI PRODUCTS
DSP 2232

MOTOROLA AUTHORIZED DEALER
KACHINA COMMUNICATIONS DEALER
AUTHORIZED DEALER

SONY

Shortwave Radios Stocked
DIGITAL FREQUENCY COUNTERS
OPTOELECTRONICS model 1300 H/A, 0-1300MHz
2300, 2210 H, 0-2200 MHz, 2600H, UTC-3000, 2810

Long-range Wireless Telephone for export in stock

BENCHER PADDLES, BALUNS, LOW PASS FILTERS IN STOCK

MIRAGE/RFC Amplifiers
ASTRON POWER SUPPLIES
Belden Wire & Cable, Int'l Wire
OPTO KEYERS STOCKED

Radios for Business, Gov't, 2-way, etc. Stocked & Serviced, Call for Great Prices!

COMET ANTENNAS STOCKED

HEIL EQUIPMENT IN STOCK

ALINCO DJ580T, 120T, 162T, 460T, 180T, F1TH, DR570T, etc.

Wide selection of SW & Amateur Publications

Telephone scramblers for cellular and regular phones. \$299.00 each

CAR Stereo with Shortwave
Phillips DC-777 @ \$499.95 in stock

BIRD Wattmeters & Elements In Stock

ANTENNAS:
AEA, AlphaDelta, ANLL, Antenna Specialist, Barker & Williamson, Comet, Cushcraft, Diamond, GAP, Hy-Gain, Hustler, Larsen, Etc.



EIMAC
3-500Z
572B, 6JS6C
12BY7A &
6146B

(144, 220, 440 MHz), IsoLoop.

BIRD Wattmeters & Elements In Stock



STANDARD



JRC Short-wave radios
JST135, NRD-535D

Hy-Gain Towers will be shipped direct to you FREE of shipping cost.

Ameritron Amplifiers
AMERITRON

MAIL ALL ORDERS TO: BARRY ELECTRONICS CORP., 540 BROADWAY, NEW YORK, NY 10012 (FIVE BLOCKS NORTH OF CANAL ST., BETWEEN SPRING & PRINCE ST.)

New York City's LARGEST STOCKING HAM DEALER
COMPLETE REPAIR LAB ON PREMISES

"Aquí Se Habla Español"

BARRY INTERNATIONAL
FAX 212-925-7001 Phone 212-925-7000

Monday-Friday 9 A.M. to 6:00 P.M.
Saturday 10- 5pm /Sunday 11- 2pm

IRT/LEX-"Spring St. Station". Subways: BMT-"Prince St. Station". IND-"F" Train-Bwy Station"
Bus: Broadway #6 to Spring St. Path-9th St./6th Ave. Station.

COMMERCIAL RADIOS STOCKED: ICOM, Motorola, MAXON, Standard, Yaesu. We serve municipalities, businesses, Civil Defense, etc. Portables, mobiles, bases, repeaters...

ALL SALES FINAL

Technical help offered upon purchase

FAX: 212-925-7001

We stock: AEA, Alinco, Ameco, Ameritron, Antenna Specialist, ARRL, Astatic, Astron, B&K, Belden, Bencher, Bird, Butternut, CES, Cushcraft, Daiwa, Eimac, Henry, Heil, Hustler, Hy-Gain, Icom, KLM, Kantronics, Kenwood, Larsen, Maxon, MFJ, Mirage, Motorola, Nye, Palomar, RF Products, Shure, Standard, TUBES, Uniden, Yaesu, Vibroflex, Duplexers, Repeaters, Scanners, Radio Publications

WE NOW STOCK COMMERCIAL COMMUNICATIONS SYSTEMS
HAM DEALER INQUIRES INVITED PHONE IN YOUR ORDER & BE REIMBURSED
COMMERCIAL RADIOS stocked & serviced on premises.
Amateur Radio Courses Given On Our Premises, Call Export Orders Shipped Immediately.

EVERY ISSUE OF CQ on microfiche!

The entire run of CQ from January, 1945 thru last year is available.

You can have access to the treasures of CQ without several hundred pounds of bulky back issues. Our 24x microfiche have 98 pages each and will fit in a card file on your desk.

We offer a battery operated hand held viewer for \$75, and a desk model for \$220. Libraries have these readers.

The collection of over 800 microfiche, is available as an entire set, (no partial sets) for \$360.00 plus \$5 for shipping (USA). Annual updates available for \$10.

Your full satisfaction is guaranteed or your money back. VISA/MC accepted. Ham Radio magazine available for \$205.00.

SUCKMASTER PUBLISHING

"Whitehall"

Route 4, Box 1630
Mineral, Virginia 23117

703: 894-5777

800: 282-5628



RACK BOXES NEW DEEPER SIZES



MODEL	DESCRIPTION W x D x H (IN)	PRICE \$	MODEL	DESCRIPTION W x D x H (IN)	PRICE \$
1RU5	19 x 5 x 1.75	34.00	2RU12	19 x 12 x 3.5	45.25
1RU7	19 x 7 x 1.75	36.50	2RU15	19 x 15 x 3.5	48.25
1RU10	19 x 10 x 1.75	38.75	2RU17	19 x 17 x 3.5	51.25
1RU12	19 x 12 x 1.75	42.75	3RU5	19 x 5 x 5.25	46.00
1RU15	19 x 15 x 1.75	45.75	3RU7	19 x 7 x 5.25	48.50
1RU17	19 x 17 x 1.75	48.75	3RU10	19 x 10 x 5.25	51.00
2RU5	19 x 5 x 3.5	38.50	3RU12	19 x 12 x 5.25	54.00
2RU7	19 x 7 x 3.5	38.75	3RU15	19 x 15 x 5.25	57.00
2RU10	19 x 10 x 3.5	41.25	3RU17	19 x 17 x 5.25	60.00

PREPAID ORDERS SHIP GROUND FREE (48 STATES)
SESCOM, INC.
2100 WARD DR., HENDERSON, NV 89015 USA
USA/CANADA (800) 634-3457 FAX (800) 551-2749
OFFICE (702) 565-3400 FAX (702) 565-4828
TECH LINE* (702) 565-3993 M-Th 9 am to 4 pm (PST)

CIRCLE 124 ON READER SERVICE CARD

**NEW!!! COLOR
SLOW SCAN TV
for the Sound Blaster!**

Now send and receive Slow Scan TV with your Sound Blaster compatible sound card in FULL COLOR!
ONLY \$99.95

SLOW SCAN II
View Slow Scan TV in Black and White. Re-send pictures.
ONLY \$40.00

Audio Analyzer
New! Analyze those audio signals that you hear, such as SSTV, RTTY, AmTOR, and Packet radio.
ONLY \$39.95

Requires PC, VGA 640x480 - 256 colors, and Sound Blaster compatible sound card.
Shipping \$5 - Overseas \$10
Illinois residents add 6.25% tax

Harlan Technologies 815-398-2683
5931 Alma Dr. - Rockford, Illinois 61108

CIRCLE 52 ON READER SERVICE CARD

ICOM BATTERY INSERTS

BP-3	8.4v	270mah	\$14.00
BP-3	8.4v	400mah	\$21.00
BP-5	10.8v	600mah	\$20.00
BP-7	13.2v	600mah	\$23.00
BP-8	8.4v	800mah	\$19.00
BP-8	8.4v	1400mah	\$24.00
BP-22	8.4v	270mah	\$21.00
BP-23	8.4v	600mah	\$17.00
BP-24	10.8v	600mah	\$19.00

KENWOOD BATTERY INSERTS

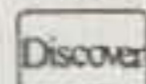
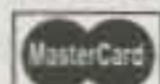
PB-21	7.2v	200mah	\$11.00
PB-2400	9.6v	800mah	\$19.00
PB-25/26	8.4v	600mah	\$21.50

YAESU BATTERY INSERTS

FNB-2	10.8v	600mah	\$19.95
FNB-4/4A	12v	600mah	\$26.00
FNB-10	7.2v	600mah	\$15.00
FNB-12	12v	600mah	\$25.00

MORE BATTERY INSERTS

Tempo S1 Early	270mah	\$19.00
Tempo S2/4/5 Late	600mah	\$21.00
Standard BP-1	270mah	\$21.00
Ten-Tec BP-1	600mah	\$21.00
San-Tec #142#144 Tabs	600mah	\$15.00
Uniden Bearcat	600mah	\$15.00
Uniden Bearcat	800mah	\$19.00
Regency MT1000 Tabs	600mah	\$15.00



* Add \$4.00 Shipping

* FL residents add 7% Sales Tax

TNR The Battery Store
279 Douglas Ave., Suite 1112
Altamonte Springs, FL 32714

1-800-346-0601 FAX (407) 682-4469

NO ENTERTAINMENT FEE

That's right. There's never an entertainment charge at the **Solder-It Booth (GRAYSLAKE, IL)**. Come and see for yourself why the reviewers agree that the Solder-It Kit makes soldering PL-259s, miniature connectors, aluminum, and so many other nasty soldering jobs so easy. Last year we had a lineup of folks who needed emergency soldering jobs... Monel eyeglass frames for a fellow from Kenwood, a clasp on a gold bracelet for a YL ham from NJ, a few PL-259s, din plugs and other connectors for new rig owners, a cracked HT case, a pot metal toy gun for a budding cowpoke. One woman fixed a hole in her truck radiator so she could get home.

THIS IS EASY!
The Solder-It Kit is still \$59.00 + \$4.00 S&H (Ohio add 7%)
Send Check to Solder-It Box 20100 Cleveland, OH 44120
(216) 721-3700 We ship within 48 hrs.

CIRCLE 125 ON READER SERVICE CARD

The World of Ham Radio Callsign Sep 94 Database

The World of Ham Radio CD-ROM includes the FCC amateur call sign database. Scan over 750,000 US ham calls in just seconds with CALLSIGN. A D-Base data file is also included for all your special callsign application needs. You will receive the latest releases in ham radio software programs covering all the amateur categories from programmers all over the world. Let CDVIEW guide you while viewing over 7,000 IBM program files, over 1,000 radio mods, and thousands of SWL frequencies. Available by subscription three times a year in May, September, & January for \$99 US, \$109 Foreign. May 94 issue \$40 plus shipping: USA \$3, Overnight USA \$10, Foreign airmail \$5. AmSoft, PO Box 666, New Cumberland, PA 17070-0666 USA FAX: 717-938-6767

AmSoft 717-938-8249



**\$40
CD-ROM**



Nor do DXpedition organizers police the source of the operators' shares.

Let's take this a step further. What if a DXpeditioner *did* obtain some funds illegally and then use those funds for a DXpedition? Is this a violation of Rule 12? While The ARRL Awards Committee would consider each case individually, a single instance of this (highly unlikely) scenario does not appear to be a case of "continued poor operating ethics." First, the source of travel funds is only very remotely related to operating, and second, it is not a "continuing" problem. It would take an enormous stretching of Rule 12 to cover such an event.

To look at another hypothetical example, what if a DXpeditioner offered an illegal bribe to an official in order to obtain operating permission? This is much more closely related to "operating," in that an illegal act was directly connected to the operating permission. While this might fall under the jurisdiction of Rule 12, a single such act is not "continuing poor operating ethics." Note that the rule also requires there to be specific objections relative to the continuing poor operating ethics. This means that DXers would have to voice their disapproval of the action. The offense would have to be very blatant for more than a handful of DXers to object strongly.

Let's take this highly hypothetical case yet another step. What if a DXpeditioner did have a continuing pattern of illegal activity so egregious that many DXers found it offensive enough to object? Rule 12 provides only two sanctions against the offending DXpeditioner: (a) disqualification from DXCC and (b) disallowance of credit for contacts made by *that individual*. I am not aware of any case in which a DXer has been thrown out of the DXCC program for continued poor operating ethics. To my best recollection, not even Don Miller was bounced from DXCC. Credit for some of Don's operations was disallowed, but most of his DXpeditions were accepted for DXCC credit.

In the case of a multi-operator DXpedition, only those contacts made by the specific operator could be disallowed DXCC credit, under the wording of Rule 12.

Thus, the suggestion that DXCC credit for an entire major DXpedition be disallowed because of the actions of one DXpeditioner is not within the DXCC rules. At the very worst, and it would have to be at least as blatant as Don Miller's actions, DXCC credit for contacts made by a single operator might be disallowed. However, this is extremely unlikely.

Fortunately for DXers and DX, we never had to consider such action, since the initial reports of impropriety were baseless. Perhaps in the future DXers will take the time to review the DXCC rules before sug-

The WPX Program

SSB

2463.....BV2CD/7 2464.....LU5EWO

CW

2822.....W6VEM 2825.....KB5OHT
2823.....KØIFL 2826.....JA7JI
2824.....— 2827.....JT1BH

MIXED

1667.....IK2MMF 1670.....KB5OHT
1668.....VE6ACY 1671.....GM3EDZ
1669.....EA5YJ 1672.....AA6WJ

Mixed: 450 IK2MMF, KF4BU, EA5YJ, KB5OHT, GM3EDZ, AA6WJ, VE4ACY, 500 IK2MMF, KF4BU, EA5YJ, GM3EDZ, AA6WJ, VE4ACY, 550 IK2MMF, KF4BU, EA5YJ, GM3EDZ, AA6WJ, VE4ACY, 600 IK2MMF, KF4BU, EA5YJ, GM3EDZ, AA6WJ, VE4ACY, 650 IK2MMF, KF4BU, EA5YJ, AA6WJ, VE4ACY, 700 KF4BU, EA5YJ, JA3BKP, AA6WJ, VE4ACY, 750 KF4BU, EA5YJ, JA3BKP, AA6WJ, VE4ACY, 800 KF4BU, EA5YJ, AA6WJ, VE4ACY, 850 KF4BU, EA5YJ, AA6WJ, 900 KF4BU, EA5YJ, AA6WJ, 950 KF4BU, EA5YJ, AA6WJ, 1000 KF4BU, EA5YJ, AA6WJ, 1050 KF4BU, EA5YJ, WA3GNW, 1100 KF4BU, 1150 KF4BU, 1200 KF4BU, 1250 KF4BU, 1300 KF4BU, 1350 KF4BU, 1400 KF4BU, W9IAL, 1450 KF4BU, W9IAL, 1500 KF4BU, 1650 K4RDU, 1700 K4RDU, 1900 SM6CST, 2000 KS4S, 2050 KS4S, 2500 HAØHW, 3100 W1BWS, 3200 W1BWS, 3250 W1BWS, SM3EVR, 3350 W2FXA.

SSB: 350 BV2CD/7, LU5EWO, 400 BV2CD/7, LU5EWO, 450 BV2CD/7, LU5EWO, 500 BV2CD/7, LU5EWO, 550 LU5EWO, 650 KD7CX, 700 KD7CX, 2500 W5AWT, 2550 I6ZJC, W5AWT, 2600 I6ZJC, W5AWT, 2650 I6ZJC, NØC, W5AWT, 2700 I6ZJC, W5AWT, 2750 W5AWT, 2800 W5AWT, 2850 W5AWT, 2900 W5AWT, 2950 W5AWT.

CW: 350 KØIFL, KB5OHT, JA7JI, I1FHA, JT1BH, 400 KØIFL, KB5OHT, JA7JI, I1FHA, JT1BH, 450 KØIFL, JA7JI, I1FHA, JT1BH, 500 KØIFL, JA7JI, I1FHA, JT1BH, 550 KØIFL, JA7JI, I1FHA, JT1BH, 600 KØIFL, JA7JI, I1FHA, JT1BH, 650 JA7JI, I1FHA, JT1BH, 700 JA7JI, I1FHA, JT1BH, 750 JA7JI, JT1BH, 800 JA7JI, JT1BH, 850 JA7JI, JT1BH, 900 JA7JI, JT1BH, 950 JA7JI, F5JUD, JT1BH, 1000 JA7JI, F5JUD, JT1BH, 1050 JA7JI, F5JUD, 1100 JA7JI, JG2LGM, 1150 JA7JI, 1200 JA7JI, 1250 KS4S, 1300 KS4S, 1350 KS4S, 1400 KS4S, 1450 KS4S, 1650 OZ5UR, 1700 OZ5UR, 1750 SM6CST, 1950 G3VQO, 3650 WA2HZR.

10 Meters: KF4BU.
15 Meters: BV2CD/7, KF4BU.
20 Meters: KF4BU.
40 Meters: —
80 Meters: AA6WJ.
160 Meters: ZS6EZ.

Asia: IK2MMF, JA7JI.
Africa: G3VQO, JA7JI, KS4S.
No. Amer: KF4BU, JA7JI.
So. Amer: NH6T, JA7JI, N7JB.
Europe: IK2MMP, KF4BU, NH6T, JA7JI.
Oceania: KF4BU, JA7JI.

Award of Excellence with 160 Meter Bar: ZS6EZ, KØJN.

Award of Excellence Plaque Holders: I8YRK, W4CRW, SMØAJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GQ, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, W4BQY, IØJX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, HI8LC, KA5W, KØJN, W4VQ, KF2O, K3UA, HA8XX, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QMQ, EA7OH, K2POF, DJ4XA, IT9TQH, W8ILC, K2POA, N6JV, W2HG, ONL-4003, VE7DP, K9BG, W5AWT, KØØG, HB9CSA, F6BVB, W1BWS, YU7SF, G4BUE, N3ED, DF1SD, K7CU, I1POR, LU3YLW4, NN4Q, KA3A, YBØTK, VE7WJ, VE7IG, K9QRF, YU2NA, N2AC, W4UW, NXØI, W9NUF, N4NX, SMØDJZ, DK5AD, WB4RUA, DK5AD, WD9IIC, W3ARK, I6DQE, LA7JO, VK4SS, K6JG, I1EEW, I8RFD, I3CRW, VEFXR, N4MM, KC7EM, ZS6BCR, CT1YH, IV3PVD, KA5RNH, ZP5JCY, F1HWB, KC8PG, NE4F, VE3MS, K9LJN, ZS6EZ, YU2AA, I1WXY, IK2ILH, DEØDAQ, LU1DOW, N1IR, IK4GME, WX3N, KC6X, N6IBP, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, S51NU.

Award of Excellence Plaque Holders with 160 Meter Endorsement: CT1YH, IV3PVE, KA5RNH, ZP5JCY, AB9O, FM5WD, SMØDJZ, DK5AD, SM6CST, I1JQJ, PY2DBU, W3ARK, HI8LC, KA5W, UR2QD, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SMØAJU, KF2O, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, IT9TQH, DL9RK, N6JV, ONL-4003, W1JR, W6OUL, W5AWT, KØØG, F6BVB, W4BQY, YU7SF, W5UR, N4NO, DF1SD, K7CU, I1POR, W8RSW, N4KE, I2UIY, YBØTK, W8ILC, W1BWS, VE7WJ, K9QRF, NN4Q, W4UW, NXØI, G4BUE, LU3YLW4, I4EAT, WB4RUA, VE7WJ, N4NX, DEØDXM, VE7IG, K9BG, I1EEW, AB9O, CT1YH, IV3PVD, KA5RNH, ZP5JCV, I2MQP, IØRIZ, W5ODD, WX3N, IK4GME, HA8XX, YU1AB, F6HMJ, HB9DDZ, K9XR, KØJN, ZS6EZ.

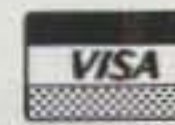
Complete rules and application forms may be obtained by sending a business-size self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to: "CQ WPX Awards," P.O. Box 593, Clovis, NM 88101-9511 USA.

M² 2 Meter SQLOOP



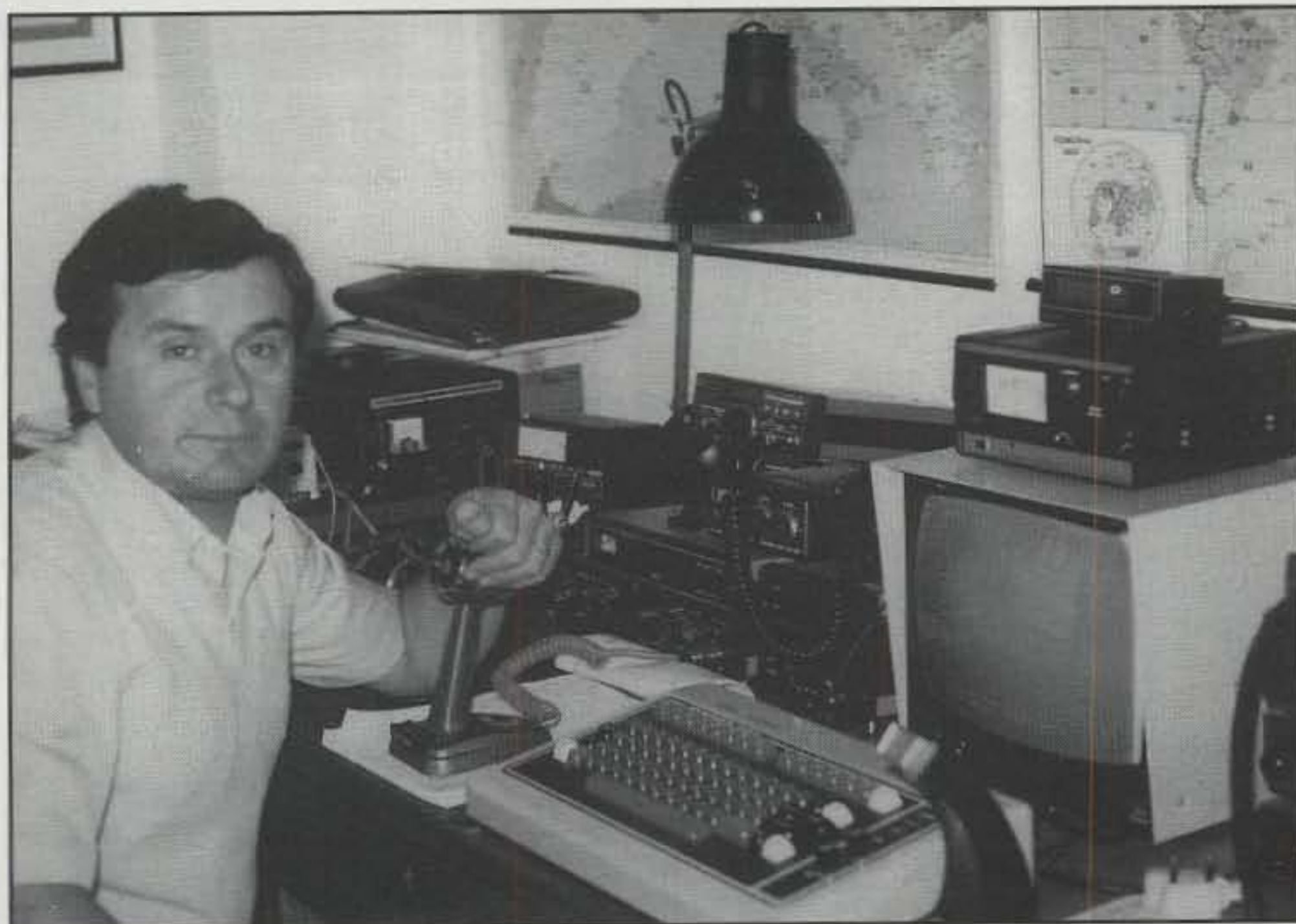
(shown with optional Mag-mount & mast)

Enjoy 200 mile range (or more) with the 2 meter SQLOOP, an omnidirectional, horizontally polarized, 9" square loop antenna for SSB & CW. A variety of base and mobile mount options. Ideal for hams with limited space or antenna restrictions. Picks up nearly 5 dB of ground gain (over avg. gnd.) that verticals can't. Or, try a SQLOOP-STACK for over 8 dB ground gain at 28'. 432 MHz and 6 meter models, too. Call for new illustrated catalog.



M² 7560 N. Del Mar Ave.
Fresno, CA 93711
(209) 432-8873 FAX: 432-3059

CIRCLE 74 ON READER SERVICE CARD



Julian, T77J, in San Marino likes 15 meter SSB. (KDØJL photo.)

Save on ALL
Radio Shack
Scanners & Radios

WITH
MANUFACTURERS
WARRANTY
IN U.S.
(copy available on req.)

3 WAYS TO SAVE

1 **FREE**
SHIPPING & HANDLING
48 STATES

2 **BIG**
PRICE REDUCTION

3 **NO TAX**
COLLECTED
49 STATES



PRO-43 \$298 WITH BATT'S

CALL FREE: 1-800-433-SAVE 9-5
Since 1981 Central Mon.-Fri.

The Difference is The Price

USRADIO

USRADIO 377 Plaza, Granbury, TX. 76048

RADIO ELECTRONICS

MADE EASY—NO SHORTCUTS!!

BOOKS FOR THE SERIOUS STUDENT OF ELECTRONICS

EXCELLENT FOR SELF AND CLASSROOM STUDIES

MATERIAL USED TO TRAIN THOUSANDS OF ELECTRONIC TECHNICIANS

NINE BOOKS—TOO MUCH MATERIAL FOR ONE BOOK!!

DETAILED AND PACKED WITH ILLUSTRATIONS

1. Matter, energy, and direct current
2. Alternating current and transformers
3. Electronic tubes and power supplies
4. Solid state devices and power supplies
5. Amplifiers
6. Wave-generation circuits
7. Propagation, transmission lines and antennas
8. Amplitude and phase modulation
9. Microwave

\$11.75 each Plus S&H

30-day money-back guarantee

Call Today :

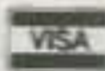
1-800-300-3294 ext/sec 6137

(Please indicate book title or number)

MC/VISA accepted or send



Check/M.O. (No C.O.D.) To:



LATHROP PUBLICATIONS

P.O. Box 207

Upper Marlboro, MD 20773

CIRCLE 68 ON READER SERVICE CARD

Is CW A Problem?

Held back because you *can't* do code? Why? Mental blocks about CW are easy to overcome with **CW Mental Block Buster**. This tape and booklet program uses hypnosis, affirmations and mental movies (visualization) to **EXPLODE your mental blocks**. You've never heard a code tape like this before. Why waste time banging your head against the wall with a *mere practice tape*—**You can explode the wall with CW Mental Block Buster!** Requires 30 minutes per day for 30 consecutive days to begin to see improvement. You can learn code! **You can move up!** \$25.95 ppd (+\$3/two-day delivery) in US

Thank you for your CW Mental Block Buster tape. It really works. I have tried to learn CW for a period of 31 years. The best I could do was 3 wpm...I passed my Novice and then the 13 wpm General—KB29HPB

Hypnosis tapes are not copy-practice tapes.

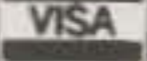
Order today!

GA residents add 6% sales tax
Office hours after 4:30PM Eastern



Phone: 404-640-6295

FAX: 404-640-8780



MC/VISA mail/fax orders include signature

PASS Publishing, P.O. Box 768821, Roswell, GA 30076

The WAZ Program

Single Band WAZ

10 Meter SSB

476.....SM3TLG 478.....HB9AOF
477.....N9KAE

15 Meter SSB

470.....JM2FOH

20 Meter SSB

950.....KA6RLX 951.....WB2KSK

10 Meter CW

144.....DK3QM

17 Meter CW

14.....G4BWP

30 Meter CW

5.....K4CIA 6.....N4VZ

17 Meter Mixed

26.....WB4DBB

All CW

50.....SM3TLG 53.....JK1BSM
51.....VE9RJ 54.....WO3Z
52.....NI6T 55.....F6GCP

All Band WAZ SSB

4183.....IK4MSV 4187.....ZS4Y
4184.....KF2DT 4188.....NI6T
4185.....AA7UN 4189.....WB4MRH
4186.....KJ6HI 4190.....IK4SWX

CW/Phone

7466.....F6IIA (CW) 7473.....JA8GSN (CW)
7467.....DL5KUR (CW) 7474.....NM1P
7468.....NL7VJ 7475.....PA3EIH (CW)
7469.....I2UPG (CW) 7476.....NI6T
7470.....WY0V 7477.....I0FSP (CW)
7471.....JR1EYB 7478.....I0FSP
7472.....JH2VYZ 7479.....WW1V

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all CQ awards is \$4.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

gesting such draconian measures as disqualifying an entire DXpedition for the alleged actions of one member of the DXpedition team.

DX Reading Material

What's a DXer to do when the sunspots disappear? With the rapid decline in sunspot Cycle 22, DXers have suddenly found considerable time on their hands. Fortunately, there are a couple of new

5 Band WAZ

As of May 31, 1994, 390 stations have attained the 200 Zone level.

New recipients of 5 Band WAZ Award with all 200 Zones confirmed:

K5OVC
RB5GW
W6TC
G3MXJ
JW5NM

The top contenders for 5 Band WAZ (zones needed, 80 meters):

N4WW, 199 (26)	KM5W, 199 (26)
K6YRA, 199 (34)	K1ST, 199 (26)
AA4KT, 199 (26)	YZ1MB, 199 (23, 40m)
K7UR, 199 (34)	4X6DK, 199 (4)
NA8Y, 199 (26)	I1POR, 199 (1)
VE7DX, 199 (34)	AB0P, 199 (23)
W0PGI, 199 (26)	SM6AHS, 198 (12, 31)
W2YY, 199 (26)	UA3AGW, 198 (1, 12)
W9WAQ, 199 (26)	KL7Y, 198 (34, 36)
K6EID, 199 (34)	VO1FB, 198 (19, 27)
W1JR, 199 (23)	EA5BCK, 198 (27, 39)
VE7AHA, 199 (34)	KZ4V, 198 (22, 26)
W1FZ, 199 (26)	K4PI, 198 (23, 26)
IK2GNW, 199 (1)	G3KDB, 198 (1, 12)
W9CH, 199 (26)	EA2KL, 198 (22, 26)
AC0M, 199 (34)	DK2GZ, 198 (1, 24)
IK8BQE, 199 (31)	W4YV, 198 (18, 18 on 40)
JA2IVK, 199 (34, 40m)	UY5XE, 198 (24, 27)

The following have qualified for the basic 5 Band WAZ Award:

K5OVC, 200 Zones	RA3AUU, 197 Zones
RB5GW, 200 Zones	DL1SDN, 172 Zones
OE1ZL, 195 Zones	JW5NM, 200 Zones
WB9CIF, 164 Zones	

Endorsements:

AB0P, 199 Zones	G3MXJ, 200 Zones
W6TC, 200 Zones	UY5XE, 198 Zones

902 Stations have attained the 150 Zone level as of May 31, 1994.

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all CQ awards is \$4.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

books that will help to pass the time until Cycle 23 starts up in a couple of years.

The first is *3Y0PI Peter 1 Island*, by 3Y0PI DXpeditioner Robert Schmieler, KK6EK. This is unquestionably the best DXpedition book ever written, probably the best DX book ever, and according to IOTA expert Dewitt Jones, W4BAA, the best amateur radio book ever.

3Y0PI is certainly the most complete and readable account of a major DXpedition ever published. Readers feel as though they are actually on Peter 1 Island. You struggle alongside the actual DXpeditioners, fighting the blizzards, anxiously awaiting the pick-up helicopter, worrying about band conditions.

3Y0PI is far more than just a log of the actual DXpedition. It includes much of the

planning and preparation that go into such a major DXpedition, including the heart-wrenching news that their pick-up ship had canceled out. The actual trip is chronicled in detail, with many wonderful stories of how the team members surmounted one unforeseen problem after another. I found it so enthralling that I stayed up past 3 AM reading it!

Following the detailed log, the book provides a comprehensive look into propagation from the DXpedition end, natural science results, stories about the DXers who worked Peter 1 Island, insights into DXpedition operating hints, and much more. The 240-page, softbound book includes 64 photographs and 78 illustrations. Cost is only \$20, plus \$2 shipping in the US (US\$15 elsewhere), and the book is available from Robert Schmieder, 4295 Walnut Blvd., Walnut Creek, CA 94596. All proceeds from the book go toward defraying the cost of the 3YØPI DXpedition. I can't recommend this book too highly.

Another comprehensive new DX book is the long-awaited 2nd ed. of *Low-Band DXing*, by John Devoldere, ON4UN. This edition is not simply an updated version of the highly regarded first edition, but essentially is an entirely new book, with extensive additions in the areas of computers and 160 meters. The 400-page, softbound book covers all aspects of low-band DXing, including propagation, operating techniques, equipment, and more than 300 pages on low-band antennas! With sunspot Cycle 22 fading rapidly, and Cycle 23 not due to raise maximum usable frequencies for several years, low-band DXing will become even more popular. This book will be the bible for those both new to the low bands, and the more experienced low-band DXer who wants to improve his or her low-band country totals. (A warning: *There are more than the usual number of minor errors and typos in this edition; use extra care and common sense before attempting to duplicate some of the antennas and circuitry in the book.*—ed.) *Low-Band DXing* is available from the ARRL and elsewhere for \$20.

Up-Coming DX Activities

The **St. Paul Island CY9** DXpedition by NØTG, AA4VK, WA4DAN, and KW2P is still set for Sept. 19-25. See the July DX column for more information on St. Paul.

Roger Kuchera, K1TG, will operate from Martha's Vineyard (NA-046 for Islands On The Air) Sept. 3-11. He'll be on CW only, 80-10 meters. QSL to his home address: 270 Tawny Thrush Rd., Naugatuck, CT 06770-4814 with SASE, please, or via the W1 bureau.

Ontario, Canada, amateurs may use special prefixes Sept. 18-25 commemo-

W9GR DSP II



What is DSP? DSP allows the "construction" of various filters of great complexity by using computer code. This allows us to have easy access to a variety of filters, each perfectly optimized for whatever mode we are operating. The DSP II has been designed to operate in 10 different modes. Four filters are optimized for reducing interference to SSB phone signals from CW, heterodynes and random noise interference. Four more filters operate as "brick-wall" CW bandpass filters. The remaining two filters are designed for reliable recovery of RTTY and HF packet radio information signals. A single front panel switch selects any of these filters.

Easy hookup to rigs speaker jack.

* The W9GR DSP II is the most popular DSP on the market — Thousands in use worldwide!

W9GR DSP Filter\$299.95 12V DC Power Supply\$11.95

SDP-600

Make and receive phone calls from your mobile rig or handie-talkie with your own personal autopatch. Connection is easy — just hook-up to the mike and speaker jacks on your base station rig and plug into the phone line! Complete control is assured through touch-tone access codes that you set and change at will. Long distance toll access is controlled by special code that you set, preventing fraudulent usage. All programmable codes and set-ups are stored in special non-volatile memory immune to power failures. Repeater owners use the SDP-600 as well for reliable and solid repeater autopatches. Power required is 12 volts DC at 100 MA. Experience the freedom of owning your own autopatch, on your own frequency, to use when and as you wish. The SDP-600 is made in the USA and carries a one year warranty.



SDP-600 Personal Autopatch, fully wired.....\$249.95 SDPA 12 volt power supply unit.....\$11.95

j•Com Transceiver Control Computer Interface



The j•Com Transceiver Control Computer Interface is functionally identical to the Kenwood IF-232C, Icom CT-17, Yaesu FIF-232C, Ten-Tec 305 and Heath computer interfaces. It will work with all radios and rig control software which use these interfaces.

- No external power supply is necessary. The j•Com TC interfaces require very little power for operation. This power is obtained directly from the computer COMM port.
- All electronics are enclosed in the shielded DB-25 connector hood. RFI susceptibility and radiation is reduced.
- Fully assembled and tested.
- Fully Hardware and Software Compatible. Works with all rig controlled software — Free shareware disk included!

\$54.95

ORDERS CALL 1-800-446-2295 ORDERS ONLY

TECH/ORDER/INFO (716) 924-4560 FAX (716) 924-4555



TERMS: Satisfaction guaranteed. Examine for 10 days. If not pleased return in original form for refund. Add \$4.95 for shipping, handling and insurance. For foreign orders add 20% for surface mail. COD (U.S. only) add \$5.00. Orders under \$20 add \$3.00 NY residents add 7% sales tax. 90-day parts warranty on kit parts. 1-year parts & labor warranty on wired units.

RAMSEY ELECTRONICS, INC. 793 CANNING PARKWAY, VICTOR, NY 14564

j•Com • 793 CANNING PKWAY • VICTOR, NY 14564

CIRCLE 54 ON READER SERVICE CARD



Dealers for Kenwood, Yaesu, Icom, Cushcraft, AEA, Kantronics, Bencher, Diamond, Astron, MFJ, Hustler, Ameritron, Larsen, ARRL, and more...

Service is also available.

Get your best price then call us LAST!!

(801) 567-9494 - (800) 942-8873
7946 South State Street
Midvale, UT 84047

CIRCLE 35 ON READER SERVICE CARD

WORLD'S BEST SELLING

AMATEUR RADIO LICENSE
COMPUTER-AIDED
INSTRUCTION SOFTWARE

\$39.95 PLUS \$3 SHIPPING



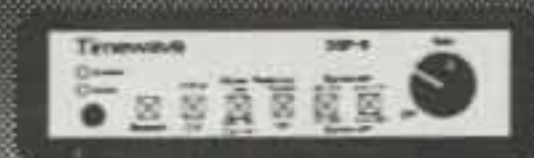
- Learn at your IBM/compatible PC! Eight 3 1/2" and 5 1/4" disks cover all written and Morse code exams — Novice through Extra. Review all 2,000 questions, take sample exams, learn Morse code, build telegraphy speed ...and more!
- Free bonus! Complete Part 97 FCC Rule Book!

TOLL FREE 1-800-669-9594

W5YI Group, Inc.
Box 565101, Dallas, TX 75356

CIRCLE 134 ON READER SERVICE CARD

DSP FILTERS By: TIMEWAVE TECHNOLOGY, INC.



DSP-9

\$169.00



DSP-9+

\$219.00



DSP-59+

\$299.00

FREE UPS Within the Continental U.S. on DSP Filters. Ohio Residents Please Add 5.75% Tax.

ALSO A&A Engineering
STOCK: RF Applications, Inc.

ARWSM
Amateur Radio Wise
P.O. Box 8029 Youngstown, Ohio 44505



Orders Only 1-800-807-1220
Information 1-216-759-1220
NO COD ORDERS

CIRCLE 23 ON READER SERVICE CARD

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries for the mode indicated. The ARRL DXCC Countries List is used as the country standard. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. Deleted countries do not count and are dropped from listing as they occur. Currently there are 327 countries. To remain on the CQ DX Honor Roll, annual updates are required. Honor Roll updates may be made at any time, in any number. Updates indicating "no change" will be accepted to meet the annual requirement. All updates must be accompanied by an SASE for confirmation. The fee for endorsement involving the issuance of a sticker is \$1.00.

CW

K2TQC.....327	KD8V.....327	WA4IUM.....326	W0JLC.....324	N2KW.....319	N6CW.....316	K4CXY.....309	HA5NK.....301	N4OT.....284
K1MEM.....327	9A2AA.....327	KZ4V.....326	I2QMU.....324	VE3HO.....319	KA5TQF.....316	VE7DX.....309	KA2DIV.....300	WB4UBD.....284
W9DWQ.....327	N4KG.....327	K9IW.....326	W0SR.....323	IT9TQH.....319	K9TI.....315	K4JLD.....309	YU1TR.....300	F6HMJ.....284
N4MM.....327	OK1MP.....327	I5XIM.....326	WA4JTI.....323	W8XD.....319	K1HDO.....315	KA7T.....308	N5FG.....300	KP4P.....283
K2FL.....327	W0IZ.....327	K8LJG.....325	AG9S.....323	WB4RUA.....319	W3BBL.....315	KB4HU.....307	WA8YTM.....299	K7JYE.....283
DL1PM.....327	PA0XPQ.....327	EA2IA.....325	N7RO.....323	K4IQJ.....318	N4AH.....315	G3KMQ.....307	YU2TW.....299	WB4DBB.....283
K3UA.....327	W2FXA.....327	KB8DB.....325	W7CNL.....323	F3TH.....318	K2JF.....314	N3DQN.....306	W6YQ.....299	KF5PE.....282
K9BWQ.....327	SM6CST.....327	WA8DXA.....325	NC9T.....322	AA5NK.....318	Y33VL.....314	K1VHS.....305	WB6OKK.....297	HB9DDZ.....282
K9MM.....327	N4JF.....327	IT9QDS.....325	W4OEL.....322	WB5MTV.....318	AA2X.....314	N1HN.....305	OZ5UR.....295	W2LZX.....279
K2ENT.....327	W2UE.....327	W6DN.....325	ON4QX.....321	W1WAI.....318	W5OG.....313	W8URM.....304	YV5ANT.....294	HB9AFI.....278
K2OWE.....327	W9WAQ.....327	G4BWP.....325	K9QVB.....321	N6AV.....318	K2JLA.....312	N5HB.....304	KB3X.....289	KA3R.....277
K4CEB.....327	AA4KT.....327	W8HZ.....325	DJ2PJ.....321	AA6AA.....317	WA2HZR.....311	G2FFO.....303	WG5G/QRp.....288	W3HQU.....276
I4EAT.....327	N6AR.....326	IT9TGO.....324	K9AB.....320	KU0S.....317	OH3NM.....310	VE9RJ.....303	W7IIT.....287	WF9K.....276
K6JG.....327	YU1HA.....326	W7ULC.....324	IT9ZGY.....320	W4OEL.....317	VE7CNE.....310	WB6OKK.....303	K0HOW.....287	YU7FW.....275
K6LEB.....327	K8NA.....326	N7MC.....324	K4XO.....319	N5FW.....316	IK2ILH.....310	WA4DAN.....301	CT1YH.....284	

SSB

K4MZU.....327	DL9OH.....327	SV1ADG.....326	N4KEL/M.....323	K4JLD.....320	K8YVI.....318	F1OZF.....311	AB4PY.....302	YB1RED.....289
K2TQC.....327	KS0Z.....327	N4KG.....326	W5LLU.....323	N5FG.....320	W4UNP.....318	K1VHS.....311	N6RJY.....302	T15RLI.....287
K2FL.....327	W6EUF.....327	WA4WTG.....326	W0GML.....323	KQ9W.....317	EI6FR.....317	EI6FR.....311	WA9BDX.....302	OK1AWZ.....287
W9DWQ.....327	OE3WWB.....327	WD8PUG.....326	WN5IJZ.....323	KD5ZM.....320	WB6PSY.....317	N1ALR.....310	KD5ZD.....302	4X8DK.....287
W9SS.....327	W2FXA.....327	W2CC.....326	KE5PO.....323	WS9V.....319	WB3CON.....317	KF8VW.....310	WA9MEM.....302	IK8BMW.....286
WA4IUM.....327	SM6CST.....327	K2JLA.....326	W7FP.....323	A18S.....319	9H4G.....317	I2MQP.....310	KD4YT.....302	N8BJQ.....284
DJ9ZB.....327	K6YRA.....327	W6BCQ.....326	WW1N.....323	VE4AT.....319	ZL1BIL.....317	I4CSP.....310	RA2YA.....301	KB5RF.....284
WB1DQC.....327	N4KG.....327	VE2PJ.....326	YV5IVB.....323	ON5KL.....319	WA6DTG.....317	KB7IVU.....310	W2LZX.....301	KJ5LJ.....284
XE1AE.....327	K3UA.....327	VE2WY.....326	KB7VD.....323	WA4DAN.....319	IBIGS.....317	W8AXI.....310	XE2DU.....301	NU4Y.....283
EA2IA.....327	OK1MP.....327	W7OM.....325	XE1CI.....322	AA6AA.....319	W3GG.....316	KA5RNH.....310	VE6PW.....301	VE3IMO.....283
K2ENT.....327	W6DN.....327	W0SFU.....325	W5XQ.....322	KB3X.....319	XE1XM.....316	TI2JP.....309	NO4J.....301	XE1ILJ.....283
OZ5EV.....327	I2QMU.....327	IT9ZGY.....325	K2ARO.....322	KE4HX.....319	KB3OQ.....316	ZL1BOQ.....309	WP4AFA.....300	KE6CF.....283
KA3HXO.....327	PA0XPQ.....327	AA4KT.....325	VE7DX.....322	KI3L.....319	LU7HJM.....316	W3SOH.....309	WA5SUE.....300	YC3OSE.....282
CX4HS.....327	N4JF.....327	KC8EU.....325	KA5TQF.....322	KR9O.....319	KV2S.....315	N6AHV.....308	YU2TW.....300	YV1JV.....282
F9RM.....327	CX1TE.....326	KM2P.....325	WB4PUD.....322	VE3HO.....319	WA9RCQ.....315	KP4P.....308	WT4T.....300	WB2NQT.....282
I4EAT.....327	K5OVC.....326	LA7JO.....325	LE1HA.....322	XE1MD.....319	KB9OC.....315	XE1MD.....308	W7KSK.....300	VE4MT.....282
KB8DB.....327	AA6BB.....326	K7LAY.....325	K6WR.....322	KB2MY.....319	KB8O.....315	WA8YTM.....308	VE3FJE.....300	WA8QII.....281
VE3XN.....327	KA6V.....326	WB3DNA.....325	WA3HUP.....321	KB1JU.....319	EA3EQT.....315	KP4EQF.....308	AB4UF.....300	VU2DVP.....281
YU1AB.....327	K5TVC.....326	K6LEB.....325	K9HDZ.....321	CE7ZK.....319	N3ARK.....315	I0SGF.....308	WB4UHN.....300	W8/DL2SCA.....281
VE1YX.....327	I8ACB.....326	K8CSG.....325	K0GT.....321	WB4DBB.....319	N1SD.....315	N5HSF.....308	IBIGS.....299	LU6FAZ.....281
N4MM.....327	N6AR.....326	IK8BOE.....325	K4MOG.....321	WB2JZK.....319	IK7DBB.....314	KA4RAW.....308	K5DUT.....299	KB5MRT.....281
N7RO.....327	YU1HA.....326	K7EHI.....325	TI2HP.....321	K9QVB.....318	KC2FC.....314	W8URM.....307	I2ZGC.....299	WN6J.....281
YS1GMV.....327	WD8MGQ.....326	W3GG.....325	VE7WJ.....321	KB5FU.....318	WA5HWB.....314	N6AV.....306	NW5K.....299	NX0I.....280
K9MM.....327	XE1L.....326	K2JF.....324	IBXTX.....321	AA4AH.....318	HR1KAS.....313	WD5P.....306	WB6GFJ.....299	YU1TR.....280
4Z4DX.....327	K8LJG.....326	WB5TED.....324	IBYRK.....321	G4GED.....318	OH5KL.....313	TI2TEB.....306	Y33VL.....299	WN5K.....279
ZL1AGO.....327	KB4HU.....326	W6BCQ.....324	N5FW.....321	NJ0C.....318	WD0DMN.....313	VE3DLR.....306	AB4NS.....299	KK4TR.....279
KF7SH.....327	K8NA.....326	WB4UBD.....324	TI2CC.....321	W6NLG.....318	ZS6A00.....313	KX5V.....306	KJ9N.....298	KA0ZFX.....279
ZS6LW.....327	VE3MR.....326	PY4OY.....324	K4POV.....321	IK8GCS.....318	F6BFI.....313	XE1MDX.....305	VE3CKP.....297	HA5NK.....279
VK4LC.....327	VE3MRS.....326	WZ4I.....324	I4LCK.....321	W6MFC.....318	W5GVP.....313	VK3JF.....305	EA5RJ.....296	VU2CVP.....278
YV5AIP.....327	OE2EGL.....326	W2FGY.....324	N2KW.....321	K4SBH.....318	N6PTI.....313	EA2AOM.....305	HP1JC.....296	VE7HAM.....278
ZL3NS.....327	W4NKI.....326	I2EOW.....324	K0HOW.....321	WE2L.....318	PY2DBU.....313	W6SHY.....305	HP6AYV.....295	K4BYK.....277
K9IW.....327	KZ4V.....326	W0SR.....324	KS2I.....321	N5ORT.....318	K7TCL.....313	4X4JO.....305	VE3XO.....294	WN5MBS.....277
K6JG.....327	K3UA.....326	IK1GPG.....324	KA9I.....321	N2VW.....318	KD9CN.....313	WA2FKF.....305	KJ6GC.....294	CT1AHU.....277
WA6OET.....327	VE3GMT.....326	AA5NK.....324	W7ULC.....321	XE1ZLW.....318	K4LR.....312	CT1EEB.....305	IT9VDQ.....293	KG6LF.....277
WA4JTI.....327	K9BWQ.....326	K8YVI.....324	W3AZD.....321	OE7SEL.....318	IBINW.....312	N4KE.....304	OA4QV.....293	VE2DRN.....277
YV1AJ.....327	IK8CNT.....326	NC9T.....324	IBKCI.....320	EA8TE.....318	K8CMO.....311	K3LUE.....304	AA2FN.....293	W0IKD.....277
YV1KZ.....327	W8YDB.....326	YV1CLM.....324	IBAMU.....320	CX1TE.....318	K8NWD.....311	WF9K.....304	TI2LTA.....292	KQ4GC.....277
N6AHU.....327	OZ3SK.....326	YV5CWO.....324	K4CXY.....320	K9TI.....318	ZS6BBY.....311	G4NXG/M.....304	K9EC.....292	G0LRX.....277
EA4DO.....327	W4EEE.....326	IK0IOL.....323	K9AB.....320	K1UO.....318	WA9IVU.....311	KJ6HO.....304	K2EEK.....292	KC6AWX.....276
W9OKL.....327	A18M.....326	IT9TQH.....323	G4ADD.....320	KF5AR.....318	K3NEE.....311	WA1DHM.....303	N6ITW.....291	EA5GKE.....276
9A2AA.....327	W4UW.....326	WA4ECA.....323	OA4ED.....320	IBIYW.....318	WB0BNC.....311	W3YEY.....302	CP5NU.....290	NX4Y.....275
KD8V.....327	KE4VU.....326	K9HQM.....323	I4WZK.....320	I1POR.....318	IN3ANE.....311	AC8A.....302	WA3KKO.....290	DK5WQ.....275
DL6KG.....327	WB6OKK.....326	KC5P.....323	I4SAT.....320	VE2GHZ.....318	4N7ZZ.....311	KB9LN.....302	I4UFH.....289	
KZ2P.....327	AG9S.....326	K1HDO.....323	IBLEL.....320	KU9I.....318				

RTTY

K2ENT.....307
WB4UBD.....275
K3UA.....266
N14H.....252
KE5PO.....228

rating the International Plowing Match in Renfrew, ON. VE3s may use **CJ3** and VA3s may use **CH3**. **CJ3IPM** will be aired by club stations.

DX, DXCC, and DXAC News

DXAC votes: The ARRL DXAC (DX Advisory Committee) voted 15 to 1 against reinstatement of (deleted) **Aldabra** to the DXCC Countries List. The DXAC decided

that **Aldabra** does not meet the criteria of the present rules. In another ballot the DXAC voted to approve **call area calling guidelines**. (There were 11 yes votes and 2 no votes with 3 abstains.) The DXAC guidelines call on DX stations to operate in a manner perceived to be fair and balanced to all areas, and to work portable stations in the specific call area they are listening for. (*This means WB2CHO/6 calls with the 6s—ed.*)

New BV Bands. The Chinese Taipei Ministry of Posts and telecommunications has granted BV amateurs permission to use the following new frequencies: 3500–3512.5 kHz, 3550–3562.5 kHz, 18068–18080.5 kHz, 18110–18122.5 kHz, 24890–24902.5 kHz, 24930–24942.5 kHz, 50000–50012.5 kHz, and 50110–50122.5 kHz.

The **DXCC Desk** has received documentation, and accredited, the following operations (with start dates): 3D2MD



**the
HAM STATION**

P.O. Box 6522
220 N. Fulton Avenue
Evansville, IN 47719-0522

Store Hours
MON-FRI: 8AM - 5PM
SAT: 9AM - 3PM
CENTRAL TIME

SEND \$1.00 FOR NEW AND USED
EQUIPMENT SHEETS

WARRANTY SERVICE CENTER FOR:
ICOM, KENWOOD, YAESU

FOR SERVICE INFORMATION CALL
(812) 422-0252
MONDAY - FRIDAY

TERMS:

Prices Do Not Include Shipping.
Price and Availability Subject to
Change Without Notice
Most Orders Shipped The Same Day
COD's Welcome



IC-737A
100W, HF Transceiver,
Built-In Tuner
Special Low Price-Call!

ICOM

TEAM ICOM '94
An "All-Star Line Up"



IC-735
Ultra Compact,
Full Featured
HF Transceiver

IC-2GXAT
2 Meter
Handheld
Up To
7 Watt
Output



IC-2iA
Ultra-Slim, Easy To
Operate, Pocket Sized,
2 Meter FM Handheld
\$199.95
All Coupons Included,
Limited Quantities



IC-T21A
2 Meter
Handheld
With
440MHz
Receive



IC-281H
2 Meter Mobile With
440MHz Receive



IC-2340H
2M/440MHz FM Mobile, 100 Memories,
Independent Controls

USED EQUIPMENT BBS 812-424-3614 COMPUSERVE 72072,712

ORDERS & PRICE CHECKS

800-729-4373

NATIONWIDE & CANADA

LOCAL INFORMATION

812-422-0231

FAX 812-422-4253

CIRCLE 63 ON READER SERVICE CARD

**19th Annual
Va. Beach HamFest
& Computer Fair -
ARRL Roanoke Division Convention
Sept. 17 & 18, 1994**

- * Major Commercial Exhibitors,
Dealers & Organizations
- * Amateur Exams & Upgrades
- * DX & Technical Forums
- * Computer Hardware, Software
and Accessories
- * Plenty of Free Parking
- * Held at the Va. Beach Pavilion
- * Talk In on 146.970



General Admission Tickets
\$5 In Advance - \$6 At the Door
Tickets Good Both Days!

**HamFest Information Line
1-804-HAMFEST**

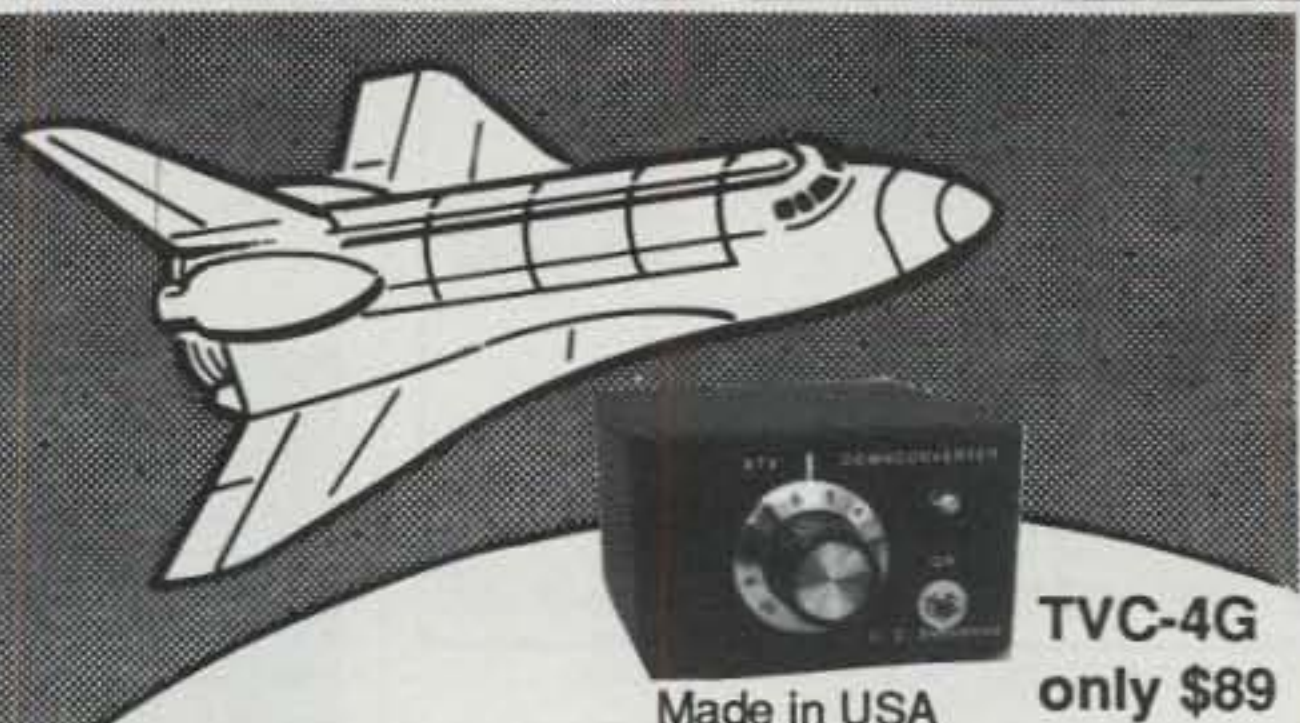
Tickets
Manny Steiner K4DOR
3512 Olympia Lane
Va. Beach, VA 23452

Exhibitor Information
Lewis Steingold W4BLO
1008 Crabbers Cove Lane
Va. Beach, VA 23452

Send SASE - Checks Payable To TRCI, Inc.

CIRCLE 119 ON READER SERVICE CARD

AMATEUR TELEVISION



SEE THE SPACE SHUTTLE VIDEO

Many ATV repeaters and individuals are retransmitting Space Shuttle Video & Audio from their TVRO's tuned to Spacenet 2 transponder 9 or weather radar during significant storms, as well as home camcorder video. If it's being done in your area on 420 - check page 501 in the 94-95 ARRL Repeater Directory or call us, ATV repeaters are springing up all over - all you need is one of the TVC-4G ATV 420-450 MHz downconverters, add any TV set to ch 2, 3 or 4 and a 70 CM antenna (you can use your 435 Oscar antenna). We also have ATV downconverters, antennas, transmitters and amplifiers for the 400, 900 and 1200 MHz bands. In fact we are your one stop for all your ATV needs and info. We ship most items within 24 hours after you call. **Hams, call for our complete 10 page ATV catalogue.**

(818) 447-4565 m-f 8am-5:30pm pst.

Visa, MC, COD

P.C. ELECTRONICS

Tom (W6ORG)

2522 Paxson Ln Arcadia CA 91007

Maryann (WB6YSS)

CIRCLE 64 ON READER SERVICE CARD

Presenting
**THE K1FO 12 ELEMENT
 144 MHz YAGI**



ELECTRICAL SPECIFICATIONS:

Measured gain	12.6 dBd
E-Plane beamwidth	34 deg
H-Plane beamwidth	37 deg
Sidelobe attenuation	
1st E-Plane	-18 dB
1st H-Plane	-15 dB
SWR	1.13:1 typical
F/B ratio	22 dB
Maximum power	2000 Watts
Impedance	50 ohm

MECHANICAL SPECIFICATIONS:

Length	178.4in.
Boom	1.375" 6061 T-6 Aluminum
Elements	1/4" Aluminum rod
Wind survival	120+ MPH
Mast	up to 2" diameter
Element insulators	Black Dairin
All Stainless Steel Hardware	
Coax connector	N-type
Weight	11 lb

ALSO AVAILABLE HIGH PERFORMANCE YAGI ANTENNAS FOR
 6 METERS, 2 METERS, 222 MHz, 432 MHz
 POWER DIVIDERS STACKING FRAMES
 Tropo, Weak Signal, ATV, EME, OSCAR, FM, Packet, Contest

Add \$6 UPS S/H for each antenna, \$8 west of Mississippi
 PA residents add 6% state sales tax.
 CALL OR WRITE FOR OUR NEW CATALOG

RUTLAND ARRAYS

1703 Warren St. • New Cumberland, PA 17070
 Information (717) 774-3570 6pm-10pm EST
 Orders Phone/FAX 1-800-536-3268
 DEALER INQUIRIES ARE INVITED

CIRCLE 115 ON READER SERVICE CARD

Authorized
**KENWOOD
 Amateur Radio
 Service Center**

Convenient
 East Coast Location
 Factory Trained Technicians

Service Info Hot Line
215-357-1486

Repair Status Ext 33
 Tech. Info Ext 66



Use Our Convenient
B.B.S. 215-355-8830

Hours 9-5 M-F

4033 Brownsville Rd.

Treose, PA 19053

CIRCLE 50 ON READER SERVICE CARD

*Use Your Free
 Reader Service
 Card
 For More
 Information On
 Companies
 Advertising In
 This Issue.*

QSL Information

1B1AB to G0ITX
 3G1X to CE1IDM
 3X0YU to YU1FW
 3XY8A to YU1FW
 4J3M to UD6DJ
 4K49V to UD6DC
 4K8DX to DL7ABL
 4K8F to UA9AB
 4L8G to RF6FM
 4L1AA to CT1CJJ
 4L8A to OZ1HPS
 4N78DX to YU1DX
 4X1VF to K1FJ
 5N0MVE to ON7LX
 5R8AL to WA4VDE
 5R8DG to F6FNU
 7X4AN to W8CNL
 8P9DX to VE3ICR
 8P9GU to DL7VOG
 8Q7AB to DK1RP
 9A8AA to 9A2VC
 9G1SD to N0NLP
 9G1WJ to K1SE
 9K2MU to 9K2AR
 9K2ZZ to W8CNL
 9L38M to VE3VON
 9Q5PL to OE7SHJ
 9X50M to DF9TA
 9Y4SF to WA4JTK
 A22DX to N1FBW
 A22EX to N4CID
 A35MW to VK2BEX
 A35RK to KK6H
 AA9GZ/CY9 to K0SN
 BZ1QL to BY1QH
 C53HG to W3HCW
 C56/DK2OC to DK2OC
 CE9PUA to EA8BGY
 CP4BT to DL9OT
 D3X to CT1EGH
 ED5DX to EA5BYP
 EG1ITU to EA1KK
 EG2ITU to EA2BFM
 EG7ITU to EA7GFG
 EG8ITU to EA8BGE
 EG9ITU to EA9TQ
 EP2ASZ to IK6GZM
 ER5AL to YO4BII
 EW1WZ to DL1OY
 EX0M to DF8WS
 EX8DX to F5OJO
 F5LGF/TT8 to F5LGF
 FK8FU to NA5U
 FOBAKI to NX1L
 FO8MIZ to JA1HGY
 FR/F5PXQ to F5KDZ

GB8DH to G0LRE
 H44/JA10EM to JA10EM
 H44KA to K2PF
 HB0/DA1WA to DJ0LC
 HI/DL5PV to DL5PV
 HR3/KD5M to KD5M
 HT1T to SM0KCR
 HV4NAC to IK0FVC
 IC8SDA to IK8CQH
 IO8CIO to IO8NZZ
 J52AG to SM0AGD
 J6/AH8G to DK7PE
 J8/AH8G to DK7PE
 JW0H to LA5NM
 K0SN/CY9 to K0SN
 KC6SD to K7ZSD
 KP2AD to OK1AJY
 N9JCL/CY9 to K0SN
 OA4CWR to K3JXO
 OD5LP to HB9CRV
 OD5MM to HB9CYH
 OM9SNP to OM3LA
 OQ50USA to ON4RAT
 OX3GX to WA3KSN
 P49T to W3BTX
 PJ5/K3UOC to W1AF
 PY0FF to W9VA
 PY0TUP to PY1UP
 R1FJL to RA1OA
 R3F/9 to RW9C
 RABA/K4EWG to K4EWG
 RZ3AZO to I1HYW
 S79CK/C to I4LCK
 SN0PR to SP6FER
 SV9/HA6ZV/P to HA6ZV
 T91EL to 9A2AA
 T91ENS to DJ0JV
 T92X to KA9WON
 T97M to DL8OBC
 T99W to DL1QQ
 TA2II to TA2DV
 TL8MS to DL6NW
 TM5FFI to F6KDF
 TM5OLF to F5MXH
 TM5RMT to F5KGZ
 TN1AT to F6FNU
 TO5ORC to FM5CW
 TP6CE to F6FQK
 TT9PS to F1OIJ
 TU2ZR to SM3DMP
 TU4EI to W3HCW
 TY1IJ to DJ5IO
 UE4NAB to RW4NW
 UN6T to UL7TJ
 V31RM to DL7UJO
 V31UO to DL7UJO

VK4YI to VK4NGH
 VO1XA/VE8 to WB2YQH
 VP2MR to N5DXD
 VP2VE to WA2NHA
 VP5JM to W3HNK
 VP9MZ to WB2YQH
 VQ9GB to KF7TA
 VQ9KC to AA7AN
 VQ9MZ to K8XF
 XK2EE to VA2EE/VE2NAM
 XU0HW to HA0HW
 XU7VK to HA0HW
 Y11DZ to WA4JTK
 YJ0AVH to VK4CRR
 YP700BV to YO6EZ
 YS1DRF to W2PD
 YS1XS to WD4PDZ
 Z31ET to YU5ET
 ZA1AJ to OK2PSZ
 ZA1B to HB9BGN
 ZA1J to I2MQP
 ZD8AF to N2AU
 ZF2SP to KB0JBX
 ZF2SQ to WA0JTB
 ZF2WQ to WB6SFA
 ZK1MUE to W7QMU
 ZK1OEM to K6WC
 ZK1OFM to W7QMU
 ZS0X to DJ6SI
 ZS9Z to ZS6EZ
 ZY0SK to PS7KM
 ZY0SP to PT7AA
 5B4ADA to Ivo, P.O. Box 1642, Nicosia, Cyprus
 A71AC to Hassan, P.O. Box 11799, Doha, Qatar
 BV2FR to Maxwu, P.O. Box 53-09, Taipei, Taiwan
 CO8CH to P.O. Box 28, Puerto Padre, Tunas, 77210 Cuba
 ET3SID to Sid, P.O. Box 60229, Addis Ababa, Ethiopia
 GMBKCY to Built of Lewis Lighthouse, Lewis Is. PA86 0XH, Scotland
 SV1CIV to P.O. Box 31802, Athens 10035, Greece
 TA2IJ to P.O. Box 810, Istanbul 81307, Turkey
 TG9AKC to P.O. Box 2700, Guatemala
 XQ0YAF to P.O. Box 4, Easter Island, via Chile
 ZA/OK2ZW to P.O. Box 66, Blansko 67811, Czech Republic



Frank Smith, OH2LVG, operates PJ7/ from the new La Chatelaine rental QTH on St. Maarten.

CQ DX Awards Program SSB

2087.....KF2DT	2092.....LU5EWO
2088.....BV2CD/7	2093.....KA5VFU
2089.....K4ZTL	2094.....KB5CSQ
2090.....VK4WLX	2095.....AB5RG
2091.....T3BJH	

CW

900.....VE5RD

SSB Endorsements

320.....VE2WY/326	310.....K4LR/312
320.....K2JLA/326	310.....CT1EEB/306
320.....W2CC/326	275.....HP6AYV/295
320.....AA4KT/325	200.....LU5EWO/222
320.....NC9T/324	200.....T3BJH/204
320.....KB7VD/323	150.....K4ZTL/181
320.....W7ULC/321	28 MHz.....KF2DT
320.....W3AZD/321	28 MHz.....LU5EWO

CW Endorsements

320.....I5XIM/326	310.....K2JLA/312
320.....AA4KT/327	300.....HA5NK/301
320.....WBHZ/325	275.....HB9DDZ/282
320.....W7CNL/323	150.....VE5RD/152
320.....W4OEL/322	1.8 MHz.....HB9DDZ
320.....NC9T/322	3.5/7 MHz.....HB9DDZ
310.....AA2X/314	28 MHz.....HB9DDZ

Total number of active countries is 327. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an SASE is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business-size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for airmail reply. Please make all checks payable to the awards manager.

(25/6/1991); 3D2/ON4QM (24/9/1990); 5W1JW (9/9/1991); A35DM (8/8/1990); C56/ON4QM (30/10/1989); DPØRIM (13/2/1993 special agreement callsign, counts for 5T5); H44QM (30/10/1991); S92QM (16/3/1992); T20CB (9/9/1992); T30MD (24/9/1992); V63SB (24/3/1994); VS6/WA6TJM (2/6/1992); XT2TX (19/11/1993); YJØAMD (1/10/1990); ZK1DM (25/9/1991); ZK2XX (29/10/1993); and ZK3DM (9/8/1993).

New rental QTH available: In May of this year Frank Smith, OH2LVG, and I went to St. Maarten for the purpose of establishing a permanent rental QTH there. With the assistance of manager Walton Westlake of the Hotel La Chatelaine, we put up three-element multiband beams for 20-10 meters, and a vertical for the lower bands.

Visiting amateurs can now fly to St. Maarten with their rig (there are no customs in St. Maarten, so there are no hassles with bringing your own radio gear), take the short taxi ride to La Chatelaine, plug into the antennas, and be on the air!

La Chatelaine is a luxury hotel with all the amenities, right on Simpson Bay Beach. Room 1 is steps away from the fresh-water pool and features two bedrooms, ceiling fans, and a complete kitchen.

Check out our **NEW \$40 Special** To Charge You Up...

Periphex Power Packs for Longer QSO Time

Buy your radio from the manufacturer. Buy the battery pack from Periphex—where batteries are our only business!

replacements for regular price

FNB-26 YAESU 1000ma	\$ 60.00
BP-84S ICOM 1400ma	\$ 63.00
PB-7S KENWOOD 1400ma	\$ 59.00
EBP-24S ALINCO 1500ma	\$ 62.00

Now Only \$40 Each

- One Year Warranty
- Matched cell construction
- Case re-build service
- Long life, extended operating time
- Made for HAMS, by HAMS

Add \$4.00 Shipping & Handling for first battery, \$1.00 for each add'l battery - U.S. only
Connecticut residents add 6% tax.

Available from your dealer...

PERIPHEX inc.
the only thing low about our charge is the cost...
1-800-634-8132

115-1B Hurley Road • Oxford, CT 06478 • (203) 264-3985 • FAX (203) 262-6943

CIRCLE 83 ON READER SERVICE CARD

CABLE X-PERTS, INC.

COAX	100FT/UP	500FT
FLEXIBLE 9913 UV RES DIRECT BURIAL JACKET.....	.62/FT	.59/FT
9913 EQUAL UV RESISTANT JACKET.....	.47/FT	.43/FT
RG 213/U MIL-SPEC DIRECT BURIAL JACKET.....	.34/FT	.32/FT
RG 8/U FOAM 95% BRD UV RESISTANT JACKET.....	.32/FT	.30/FT
RG MINI 8X BLK, CLR or SILVER JKT (UV RES).....	.16/FT	.15/FT
RG 58/U SOLID CENTER CONDUCTOR.....	.15/FT	.13/FT
RG 58A/U STRANDED CENTER CONDUCTOR.....	.17/FT	.15/FT
RG 142/U DBL SILVER BRD TEFLON.....	1.30/FT	1.10/FT
RG 214/U DBL SILVER BRD IIA JACKET.....	1.50/FT	1.30/FT
RG 11/U FOAM PE SOLID CENTER 95% BRD.....	.42/FT	.40/FT
450 OHM LADDER LINE 18GA SOLID CW COND.....	.12/FT	.11/FT
72 OHM HEAVY DUTY TWIN LEAD 12GA STRD.....	.27/FT	.25/FT
300 OHM HEAVY DUTY TWIN LEAD 18GA STRD.....	.15/FT	.13/FT
LMR 600 LOW LOSS (LIKE 1/2" HARDLINE).....	1.47/FT	1.45/FT
LMR 400 LOW LOSS (SIMILAR TO 9913).....	.62/FT	.60/FT
LMR 240 LOW LOSS (MINI 8 SIZE).....	.37/FT	.35/FT

ROTOR CABLE	20FT	18FT
STANDARD DUTY (8 COND) 2/18 6/22 UV RES.....	.20/FT	.18/FT
HEAVY DUTY (8 COND) 2/16 6/20 UV RES JKT.....	.35/FT	.33/FT
18GA 4/C GRAY PVC JACKET.....	.15/FT	.13/FT
18GA 7/C GRAY PVC JACKET.....	.19/FT	.17/FT

ANTENNA WIRE	14FT	12FT
14GA 168 STR SUPERFLEX UNINSULATED.....	.14/FT	.12/FT
14GA 7/22 HARD DRAWN BC UNINSULATED.....	.08/FT	.07/FT
14GA SOLID "COPPERWELD" UNINSULATED.....	.07/FT	.06/FT
DACRON ROPE DBL BRD 3/16" 770# TEST.....	.12/FT	.10/FT

BALUNS	PRICE
W2AU 1:1 or 4:1 1.8-40MHz TRANSFORMER TYPE.....	\$21.00/EA
W2DU 1:1 1.8-30MHz CURRT TYPE DIPOLE OR BEAM.....	\$23.00/EA
ORIGINAL G5RV KIT.....	\$28.00/EA

WIRE	PRICE
10GA 2/C RED/BLK 25FT \$10.00 50FT \$20.00 100FT \$38.00	
12GA 2/C RED/BLK 25FT \$7.50 50FT \$15.00 100FT \$28.00	
1" TINNED COPPER BRAID 10FT \$10.00 25FT \$20.00 100FT \$75.00	
1/2" TINNED COPPER BRD 25FT \$12.00 50FT \$24.00 100FT \$40.00	

CONNECTORS	PRICE
PL 259 SILVER/TEFLON/GOLD TIP 10PKS.....	\$11.00
25PKS.....	\$25.00
"N" CONNECTOR SILVER/GOLD TIP 10PKS.....	\$32.50
25PKS.....	\$75.00

MORE ITEMS STOCKED...
CABLE & WIRE CUT TO YOUR SPECIFIC LENGTH!

ORDERS ONLY: 800-828-3340

TECH INFO: 708-506-1886
FAX: 708-506-1970

113 McHenry Rd., Suite 240
Buffalo Grove, IL 60089-1797

For Complete Literature Mail SASE

Motron

ELECTRONICS

310 Garfield St Suite 4
PO Box 2748
Eugene, Oregon 97402

TxD-1

Transmitter
FingerPrinting
System

This is an actual FingerPrint captured by the TxD-1

Now Shipping!

FM/AM radio transmitters have a unique frequency versus time start-up characteristic—even radios of the same make and model. This "FingerPrint" can be captured, stored and analyzed. Our exclusive TxD Software and the patented technology of the TxD-1 IBM/Compatible circuit board can help you identify the abusers on your repeater! Or help you keep track of the number of radios per account on commercial repeaters. CTCSS, DCS and DTMF decoding, as well as Deviation measurements and Spectrum Occupancy features further enhance the system.

Call or write for a full brochure with full details, additional examples, and technical specifications

TxD-1 with Software \$699.00

Shipping/Handling UPS Ground USA: \$8.00
Visa/MC and AMEX and Government Purchase Orders accepted.
COD on Cash or Money Order basis only.

Orders: (800) 338-9058

Info: (503) 687-2118 fax (503) 687-2492

CIRCLE 76 ON READER SERVICE CARD

How To Earn Your NO-CODE License

How To Earn Your NO-CODE Ham License

Don Stoner, W6TNS, has done it again with the only guaranteed study material. If you fail your test, NARA will refund your money—no questions asked! The first edition was critically acclaimed—now Don has updated it for the July, 1993/June, 1997 period. **YOU CAN DO IT!**



We Guarantee it!!!

How To Earn Your No-Code Ham License is not a memorization book and isn't loaded with material you won't be asked on your test. Stoner explains the theory behind the questions in a simple, easy-to-understand style. The actual questions that will be asked are included at the end of each chapter so you can *test yourself immediately*. Numerous photos and drawings make the information easy to absorb. Great for Novice testing too! **How To Earn Your No-Code Ham License** is an ideal classroom textbook. Testing software for the IBM and Macintosh is also available. In stock at all major Amateur Radio dealers or call NARA toll-free for same day shipping. Only \$9.95 (\$2.00 S&H). Don't forget to ask about joining NARA and receiving the *Communicator* magazine.



Box 201407, Arlington, TX 76006

1-800-GOT-2-HAM

CIRCLE 77 ON READER SERVICE CARD

PORTABLE SATELLITE ANTENNA



Complete 3' KU Band System

For FREE Information Package and Pricing

• Call 219-236-5776 •



R.C. Distributing
PO Box 552 • South Bend, IN 46624

CIRCLE 91 ON READER SERVICE CARD

120 • CQ • September 1994

en. The setup is ideal for a small family or two couples.

Mr. Westlake plans to run 220 volt lines to both operating positions and have 12 volt power supplies on hand. For more information about this luxury rental shack, contact him at 5995-54269, FAX 5995-53195, or write to him at P. O. Box 2056, St. Maarten NA, Dutch West Indies.

This will be a popular DXpedition spot, thanks to the ease of bringing in gear and the built-in antenna farm. The off-season rates are very reasonable, for Worked All Europe contests, for example. Enjoy!

NCDXA Contest: The National Capitol DX Association held a 12 month contest to demonstrate that DXers really can work a lot of different countries, even at the current low level of the sunspot cycle. The contest was to work as many of the 250 "field-check eligible" DXCC countries as possible in a year. The top three DXers in this competition were ARRL Director John Kanode, N4MM, with 237 of the 250 possible countries; Ken Miller, K6IR, with 227; and N3II with 222. Eight other club members contacted more than 200 of the eligible countries, and a number of others worked more than 100 such countries. Those contacting 200 or more countries received a handsome plaque for their efforts.

QSL Notes

The QSL bureau of the Chinese Taipei Amateur Radio League is P.O. Box 73, Taipei 100, Taiwan ROC.

QSL **A35VI** to Ed Hartz, K8VIR, P.O. Box 177, Holly, MI 48442.

QSL **FY/F5PHW**, **FM/F5PHW**, and **J28BS** to Philippe Berger, F5PHW, 24 Lot Labracat, 30800 St. Gilles, France.

Bill, K1SE, has the **7Z2AB** logs up to Jan. 16, 1994. He is working on getting the more recent logs, but please don't duplicate QSL requests in the meantime. His address is P.O. Box 685, Manassas Park, VA 22111-0685.

QSLs for **ZL3KG** go to Wayne Mears, WB6EQX, 20496 Highway 26, West Point, CA 95255.

QSL **8P9EA**, **8R1RPN**, and **8R1K** for CQ WW CW and SSB in 1992, and CQ WW SSB in 1993, via Olli Rissanen, OH0XX, Suite 599, 1313 South Military Trail, Deerfield Beach, FL 33442.

QSL **UA0AP** direct to Harchenko N. Gennady, P.O. Box 13179, Krasnoyarsk-42, CP-660042, Russia.

EZ Turkmenistan (ex-UH8/RH8) QSL cards should be sent via the new QSL bureau in that country: P.O. Box 555, Ashgabat 20, Turkmenistan 744020. Do not send cards via Box 88, Moscow. EZ8BO (ex-UH8BO) is president of the Turkmenistan Radio Amateur League.

4L1AA: CT1CJJ is **not** the QSL manager for 4L1AA; he is a QSL-collecting

point to avoid stolen mail in Georgia. CT1CJJ forwards QSO data from cards received direct once a month, and Omari answers them from Georgia. Omari does **not** answer cards received via the bureau, so don't send cards to CT1CJJ via that route. His direct address is: Jose Manuel Farto Lopes, CT1CJJ, Lugar da Igreja, Sao Martinho da Gandara, 3720 Olivera de Azemeis, Portugal.

QSL **9G1KB** (1976-82) via W6FXL.

QSL **BV0SAT** from May 15-22 via Bolon Lin, BV5AF, P.O. Box 39, Changhua 500, Taiwan.

QSL **BV0RI** from June 12-15 via the Chinese Taipei Amateur Radio League's QSL bureau: P.O. Box 73, Taipei 100, Taiwan.

QSL Silent Keys **ZP5YV** and **ZP5CF** via ZP5YW. ZP5YW can also confirm contacts made with **ZP1-9AA** stations.

Wesley Hjalmar Linquist, PY5FB, is closing his logs for his operations as **PP9WHL**, **ZX2CW**, **ZZ8CW**, **PQ2CW**, **PQ8WHL**, **ZZ8WHL**, **PY5FB/PQ8**, and **PY5FB/PPB**. He QSLed via the bureau in 1992, but anyone still needing a card should request same via his new address: Rua Jordo Schiavetto 520, 13184-080 Hortolandia (SP) Brazil.

QSL Orin Snook, **YC0ARO**, via his new address: c/o Fluor Daniel Jakarta/37NM, 3333 Michelson Dr., Irvine, CA 92730.

Bob "Kappy" Kaplan, WA4WTG, handles cards for: **FY7AE**, **K7NJ/4X**, **TJ1BF**, **S52DD**, **ZF2GE**, **ZP5KS**, **VK6RQ**, **YU4AX**, **YZ4Z**, **4Z4HF**, **4Z4LF**, **4X4NJ**, **4X4UF**, **4X2BYB**, **4X6BYB**, **4X4FF/5N4**, **5Z4RH**, **6Y5MC**, **8P6AH/KP4**, **8P0A**, **9M8MG**, **9M8PV**, **4N4AX**, **4N4CX**, **4N4MX**, **8P6IB**, **V21AK**, **KH6M/C6A**, **5N0SVL**, and **C6AHY**. SASE, please; no bureau cards from stateside DXers. Kappy also collects used foreign stamps. His address is 718 SE 3rd Lane, Dania, FL 33004.

QSL "Bad Guys"

3B8FT has not replied to two direct requests, nor has his purported QSL manager, IK8DYD, responded to three requests, including US\$1. Anyone ever get a 3B8FT card?

WA2NHA, listed as QSL manager for **RH8BKA**, says he hasn't received any logs from Turkmenistan "for a long time. Try direct." When he returned unanswered QSL requests, he kept the US\$1.

QSL "Good Guy"

Larry, **KE2VB**, returns IRCs and US\$1 received with requests for cards from his **KE2VB/KP2** ARRL DX contest operation, saying, "It's my pleasure to QSL." He'll be back in the Virgin Islands for the 1995 test.

73, Chod, VP2ML

Say You Saw It In CQ

Announcements (from page 6)

MA 02747.

September 11, **Shawnee ARA Hamfest and Computer Swap Meet**, Du Quoin State Fairgrounds, Du Quoin, Illinois. For more information, contact Joey Helleny, KB9HNO at 618-457-8114; or write to 600 South 16th Street, Herrin, IL 62948.

Sept. 11, **ARRL Hudson Division Convention**, Rockland Community College Field House, Suffern, New York. Contact Tom Raffaelli, WB2NHC, at 914-769-1486 (evenings).

Sept. 11, **F.A.R. FEST '94**, Montgomery County Agricultural Center, Gaithersburg, Maryland. Call Mary Morris, 703-971-3905; or Al Brown, 301-490-3118.

Sept. 17, **Columbia Montour ARC Hamfest**, Nescopeck Township Firehall grounds, Pennsylvania. Contact Dave, WC3A, 717-752-6851. (Exams 10 AM.)

Sept. 17, **1994 Northern New Mexico Hamfest**, Glorieta Baptist Conference Center, 16 miles southeast of Santa Fe, New Mexico. Contact Helenrose Burke, W5IXS, P.O. Box 73, Ojo Sarco, NM 87550 (505-689-2367). (Exams, contact Bonnie Griffiths, KD0JQ 505-662-9155.)

Sept. 17, **F.A.R.E., The Family Amateur Radio Event**, Rawhide Western Town, Scottsdale, Arizona. Contact Len Winkler, KB7LPW at 602-861-0303, or P.O. Box 9219, Phoenix, AZ 85068.

Sept. 17, **Sonoma County Radio Amateurs, Inc. 12th Annual Ham Radio Flea Market**, Holy Ghost Hall, north of Sebastopol, California. Contact SCRA, Box 116, Santa Rosa, CA 95402.

Sept. 17, **The Ascension ARC Annual "Gonzales Hamfest,"** Gonzales Recreation Center, Prairieville, Louisiana. Contact George Turner, KB4EOC at 504-622-3598; 16179 Galvez

Ave., Prairieville, LA 70769.

Sept. 17, **Super Swap III**, Unity Christian High School, Hudsonville, Michigan. Contact Jeff Belknap, N8RWS, P.O. Box 1248, Grand Rapids, MI 49501, or call 616-531-7899.

Sept. 17, **Phoenix Family Amateur Radio Event**, Rawhide Pavilion, Rawhide, Arizona. Contact FARE, P.O. Box 9219, Phoenix, AZ 85068.

Sept. 17-18, **The Virginia Beach Hamfest and Computer Fair**, the Virginia Beach Pavilion, Virginia Beach, Virginia. Call 1-804-HAMFEST. (Exams Sunday morning.)

Sept. 18, **South Jersey RA Hamfest**, Pennsauken High School parking lot, Pennsauken, New Jersey. Contact Diane Nafis, N2LCQ, 17 Roosevelt Drive, Laurel Springs, NJ 08021 (609-227-6281). (Exams, 9:30 AM registration.)

Sept. 18, **L'Anse Creuse ARC Swap and Shop**, at L'Anse Creuse High School, Mt. Clemens, Michigan. Contact Dave Herrington, N8NLK, 165 Crocker Blvd., Mt. Clemens, MI 48043-2546 (SASE), or call 810-465-2797. (Exams 11 AM, contact Don Olszewski, WA8IZV, 810-294-1567.)

Sept. 18, **AARC Hamfest Computer Show**, Lenawee County Fairground, Adrian, Michigan. For more information, contact Greg, KZ8X, 4281 Mohawk Trail, Adrian, MI 49221 (517-263-1153).

Sept. 18, **Western Connecticut Hamfest**, Edmond Town Hall, Newtown, Connecticut. Contact Ken Weith, KD1DD, Box 3441, Danbury, CT 06813 (call 203-743-9181). (Handicapped accessible.)

Sept. 24, **Lincoln, Maine Area Hamfest**, E. Burr Elementary School, Lincoln, Maine. Contact Darrell, N1LGX, 794-6445. (Exams, call Dave Baker, N1GOI, 794-3398.)

Sept. 24, **Titusville ARC Hamfest**, Fox Lake Park, Titusville, Florida. Contact Les Griner,

K4SJC, 4555 Rosehill Ave., Titusville, FL 32780 (407-267-1565).

Sept. 24, **Elmira, NY International Hamfest**, Chemung County Fairgrounds, Elmira, New York. Contact Dave Lewis, Road 1, Box 191, Van Etten, NY 14889 (607-589-4523). (Exams contact Bill, 607-962-1134.)

Sept. 24-25, **Radio Expo**, Lake County Fairgrounds, Evanston, Illinois. Contact Mike Brost, WA9FTS, Box 1532, Evanston, IL 60204 (312-262-6773).

Sept. 25, **Metro 70cm Network Electronic Flea Market**, Lincoln High School, Yonkers, New York. Contact Metro 70 cm Network, 53 Hayward St., Yonkers, NY 10704 (914-969-1053). (Exams.)

Sept. 25, **St. Peters ARC Swapfest**, St. Charles County Community College, St. Peters, Missouri. For more information, contact Jay Underdown, W8OGS, 58 Judy Drive, St. Charles, MO 63301 (314-723-4200). (Exams.)

Sept. 25, **Falls Lake ARC 3rd Annual Swapfest**, NC National Guard Armory, Butner, North Carolina. Call Fred, KC4VSO, at 919-575-4262. (Exams, 10 AM.)

Sept. 25, **Boulder, Colorado ARC Hamfest**, Boulder County Fairgrounds Exhibition Bldg., Boulder (Longmont), Colorado. Contact BARC, P.O. Box 2033, Boulder, CO 80306-2033 (303-441-3883). (Exams.)

Oct. 1-2, **The Greater Louisville Hamfest/ARRL Kentucky State Convention**, Commonwealth Convention Center, Louisville, Kentucky. Write to P.O. Box 3444-Q, Louisville, KY 40232-4444.

Oct. 2, **Ashland Area ARC Hamfest/Flea-market**, Ashland County Fairgrounds, Ashland, Ohio. Contact Wallis Green, W3YXS, 3 E. Liberty Street, Ashland, OH 44805 (419-281-3903).

TERRAMAR SYSTEMS COMPANY

The Fully Automatic Amateur Antenna Matcher



ONLY
\$179.

Move Over Maxcom®!

MATCH ALL has finally captured Maxcom® technology. Not only captured it, but specifically adapted it for amateur radio operation.

MATCH ALL instantly matches your high frequency amateur transceiver to your antenna (long wire, vertical, whip, or dipole) with less than 1.5:1 V.S.W.R. on all H.F. amateur bands.

In addition, **MATCH ALL** goes Maxcom® one better—it handles S.S.B. voice and C.W. operation.

Constructed of marine aluminum (6061-T6), stainless steel, and epoxy. For

Dealer inquiries welcome

your security and comfort **MATCH ALL** includes a fifteen day Money Back Guarantee and a full year "No Questions Asked" free replacement should your matcher ever fail.

All Bands. All Modes. All for \$179

To place your protected C.O.D. order call 305-523-3123 or mail check/M.O. to: **Terramar Systems Co.** 3299 S.W. 11th Avenue Ft. Lauderdale, FL 33315

Please add \$4.00 shipping charge and 6% Florida sales tax if applicable.

ALL MAJOR LINES NEW & USED

Your factory authorized dealer since 1942:



HUGE FREE HAM-SWL CATALOG

The new Universal Radio 100 page communications catalog covers everything that is new for the amateur, shortwave listener and scanner enthusiast. Equipment, antennas, books and accessories are all shown with prices. This informative publication is available **FREE** by fourth class mail or for \$1 by first class mail.

universal
radio inc.

Universal Radio, Inc.
6830 Americana Pkwy.
Reynoldsburg, OH 43068
800 431-3939 Orders/Prices
614 866-4267 Information
614 866-2339 FAX

United States Considering International Amateur Radio Licensing

An inter-governmental meeting was held this past summer between the U.S. State Department, the FCC, and representatives of the Conference of European Postal and Telecommunications Administrations. This group is known primarily by its acronym—CEPT.

The CEPT team (out of Copenhagen, Denmark) had a very broad agenda dealing with spectrum and policy issues. CEPT is comprised of telecommunications regulators across eastern Europe. The United States consults with them on major international telecommunications issues. Amateur licensing was but one very small item.

CEPT is very interested in concluding an agreement whereby about 40 European nations would recognize the amateur radio license of the United States and vice versa. The State Department has been working on negotiating an agreement with CEPT for mutual recognition of amateur radio licenses between different countries. Once negotiated, it will be up to the FCC's Private Radio Bureau to provide the details and implement the agreement.

In the case of CEPT, it's like working with a lot of different countries. It is really not the kind of body with which the U.S. State Department usually deals. It has taken the State Department more than 6 months of legal analysis to figure out how they could actually conclude an agreement with the CEPT countries. The State Department interest lies in a provision they have among themselves which allows non-CEPT administrations to participate in the CEPT amateur licensing system. The U.S. State Department is now at the stage where they have solved all of their legal questions. The FCC and the American Radio Relay League are also very interested in concluding the CEPT international licensing agreement, as is the amateur community in general.

How Does The CEPT System Work?

The CEPT member countries have come to an arrangement among themselves to recognize each other's amateur radio license. CEPT Recommendation T/R 61-

National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101 (817-461-6443)

01 permits amateurs of certain European countries to operate in other member countries for short periods of time. You can drive from country to country and just operate under your own national license, provided it has been marked in a way that is recognized as an international license under the CEPT agreement. CEPT recognizes only two different amateur license classes.

The agreement was originally adopted in 1985. In 1992 CEPT amended the agreement so that other non-European countries could become part of this recommendation. It allows international visitors to participate in amateur radio operations on a reciprocal basis. This is the provision that the United States is pursuing. Basically, the agreement will allow an American with a properly endorsed FCC license to go to Europe and operate his amateur radio equipment in all CEPT countries without further licensing. It would say on the license in several languages that this is a CEPT international amateur radio license.

And amateurs of any of the CEPT European countries would be able to come to the U.S. and the FCC would also recognize their properly endorsed amateur radio license. CEPT basically breaks all amateur radio licenses down into the following two classes of stations: code with all privileges (CEPT Class 1), and no-code operations above 30 MHz (CEPT Class 2).

The licenses are required to be printed in three languages—English, French, and German. The FCC will have to decide how they are going to print U.S. amateur licenses so that they can be recognized as CEPT licenses. Would they have to re-issue all amateur radio licenses? Can they re-issue licenses on an "as needed" basis, or issue newly-worded licenses when they come up for renewal? The first thing they would have to do is print new licenses in English, French, and German.

The approach is called a reciprocal recognition approach. The FCC would have to determine how our present amateur radio structure would convert to these two CEPT license classes. We might have two or three categories of U.S. amateur radio licenses that would compare to a single CEPT license. For example, in a CEPT country our General, Advanced, and Amateur Extra classes would probably convert to the all-band

all-privilege license; and the Technician class would convert to a no-code VHF and higher frequency ticket. The Recommendation also talks about being valid for temporary stays, which would have to be defined.

The FCC is also working on an international amateur radio operating permit for the Americas—for certain countries in North, Central, and South America. The idea is the same, but the approach is slightly different, somewhat on the order of an international automobile driving permit. This is being handled in another forum called CITEL, the Inter-America Telecommunication Commission.

Temporary Licensing of Visiting Foreign Amateurs

CEPT is a reciprocal arrangement that applies to only certain foreign countries. The FCC is also considering a novel procedure that would allow any visiting foreign amateurs to operate for up to 60 days while visiting the United States.

There are currently two ways that foreign amateurs may be licensed to operate their equipment in the United States. One is to obtain a regular ten-year term license by passing the required FCC examinations. Second, amateurs of the 76 countries the governments of which have signed reciprocal operating agreements with the United States may, on the basis of the amateur service licenses issued by their own countries, be granted one-year permits to operate amateur stations while in this country.

The FCC has proposed a third way—a temporary visiting amateur operator's license. Foreign amateurs would complete the whole process during one quick visit to a VEC-coordinated exam session, either before or during the visit.

Teams of Extra Class volunteer examiners would (1) review identification, (2) inspect the foreign amateur's license, and (3) determine the extent of the operating privileges. The VEs would accept the foreign license as proof of qualification in eight of the nine subelements contained in the various question pools. The topic that is not covered by a foreign license is the FCC (Part 97) rules.

The VE team would then administer a 20 question written examination, Element 5. The question pool would consist of the FCC rules questions from each of the five

existing question pools, about 400 questions. If the foreign amateur scores 18 or higher, the VEs would make a record of the examination and issue a Certificate of Successful Completion of Examination.

The CSCE would authorize amateur operating privileges in the United States for up to 60 days, which could begin immediately. The beginning and ending date of the single 60 day period would be indicated on the CSCE. Operating privileges would be those authorized by the foreign amateur's own license and which do not exceed those of a U.S. amateur Extra Class operator. The visiting amateur would identify his/her station by prefixing his/her callsign with the letter "W" followed by the station's U.S. numerical area location.

Excerpts From CEPT Recommendation T/R 61-01

Here are excerpts from CEPT Recommendation T/R 61-01, which spells out the provisions of the CEPT Radio Amateur License and the appendix that discusses "Participation of Non-CEPT Administrations in the CEPT Radio Amateur License."

Recommendation T/R 61-01 (Nice 1985, revised in Paris 1992 and by correspondence August 1992)
"CEPT RADIO AMATEUR LICENSE"
 Adopted by European Radiocommunications Committee

INTRODUCTION:

The Recommendation as approved in 1985 makes it possible for radio amateurs from CEPT countries to operate during short visits in other CEPT countries without obtaining an individual temporary license from the visited CEPT country . . .

The recommendation as revised in 1992 has the aim to make it possible for non-CEPT countries to participate in this licensing system.

THE EUROPEAN CONFERENCE OF POSTAL AND TELECOMMUNICATIONS ADMINISTRATIONS,

considering:

a) that the Amateur Service and Amateur Satellite Service are Radiocommunications Services according to Article 1 of the ITU Radio Regulations and governed by other provisions of the ITU Radio Regulations as well as national regulations.

b) that it is necessary to harmonize licensing procedures for temporary installation and use of portable and mobile radio amateur stations in CEPT countries and non-CEPT countries.

c) that Administrations are responsible, in accordance with Article 32 of the ITU Radio Regulations, for taking such measures as they judge necessary to verify the operational and technical qualifications of a person seeking a radio amateur license. Additionally, the radio amateurs shall not be allowed to transmit on frequencies below 30 MHz unless they have

ATV CONVERTERS • HF LINEAR AMPLIFIERS

DISCOVER THE WORLD OF FAST SCAN TELEVISION

70 CM



33 CM

AMATEUR TELEVISION CONVERTERS

ATV3 420-450 (GaAs-FET) \$ 49.95 Kit
 ATV4 902-928 (GaAs-FET) \$ 59.95 Kit

2 METER VHF AMPLIFIERS

35 Watt Model 335A \$ 79.95 Kit
 75 Watt Model 875A \$119.95 Kit
 Available in kit or wired/tested

HF AMPLIFIERS per MOTOROLA BULLETINS

Complete Parts List for HF Amplifiers Described in the MOTOROLA Bulletins
 AN758 300W \$154.15 AR313 300W \$366.00
 AN762 140W \$95.15 AR305 300W \$346.82
 AN779L 20W \$83.79 EB63 140W \$ 89.65
 AN779H 20W \$93.20 EB27A 300W \$136.80
 EB104 600W \$371.65

New!! 1K WATT 2-50 MHz Amplifier

POWER SPLITTERS and COMBINERS 2.39MHz
 600 Watt PEP 2-Port \$ 69.95
 1000 Watt PEP 2-Port \$ 79.95
 1200 Watt PEP 4-Port \$ 89.95

100 WATT 420-450 MHz PUSH-PULL LINEAR AMPLIFIER - SSB - FM ATV

KEB67-PK (Kit) \$159.95
 KEB67-PCB (PC Board) \$ 18.00
 KEB67-I (Manual) \$ 5.00

UNIVERSAL DIGITAL FREQUENCY READOUT

TK-1 (Wired/tested) \$149.95

HEAT SINK MATERIAL

Model 99 Heat Sink (6.5 x 12 x 1.6) \$ 24.00
 CHS-8 Copper Spreader (8 x 6 x 3/8) \$ 22.00

We stock Hard-to-Find parts

CHIP CAPS-Kemet/ATC
 METALCLAD MICA CAPS-Unelco/Semco
 RF POWER TRANSISTORS
 ARCO TRIMMER CAPACITORS
 BROADBAND HF TRANSFORMERS

MINI-CIRCUIT MIXERS

SBL-1 (1-500Mz) \$ 6.50
 SBL-1X (10-1000Mz) \$ 7.95



Low Pass Filters for Harmonics (Up to 300W)
 10m, 15m, 20m, 40m, 80m & 160m

For detailed information and prices, call or write for our free catalog.



Add \$4.00 for shipping & handling

CCI Communication Concepts Inc.

508 Millstone Drive • Beaver Creek, Ohio 45434-5840
 (513) 426-8600 • FAX (513) 429-2811



CIRCLE 36 ON READER SERVICE CARD

U.S. AMATEUR RADIO MAIL LISTS
 Labels, floppy disks, CD-ROM, mag tape.

- Newly licensed hams
- All upgrades
- Updated each week

BUCKMASTER Publishing

Route 4, Box 1630
 Mineral, Virginia 23117
 703:894-5777
 800:282-5628
 Fax 703:894-9141
 Internet: info@buck.com



TNT Today's No-Tune Multiband Antenna

No pruning. No tuning. No knots to twist.
 TNT is No-Tune on 80 cw, 40, 20, 17, 12, 10. TNT/2 is No-tune on 40, 20, 10. Work other bands w/ tuner. DX & Gain rise w/ frequency.
 Ready to Use. Includes isolation balun & 99 ft RG8x. Kink-Proof Wx-Sealed Low Noise. No Traps or Resistors. Insulated to 3000 V. Rated 500 Watts.

The modern coax-fed version of the classic off-center fed window.
 Technote 126--\$7 ppd
AntennasWest
 Box 50062C, Provo, UT 84605 ☐ Hotline

TNT Window 135 ft. long P&H \$89.95 +\$8
TNT/2 Window 67 ft. long P&H \$79.95 +\$7
 Order 801 373 8425

CIRCLE 11 ON READER SERVICE CARD

BUFFALO HAMFEST

and COMPUTER SHOW

Saturday,
 Sept. 17, 1994

Erie County Fairgrounds
 Route 62 - South Park Avenue
 Hamburg, New York

Tickets \$5. Flea Market \$5.

Operated by: Rochester Hamfest
 300 White Spruce Blvd, Rochester, NY 14623
 Exhibitor info: 716-424-7184

CIRCLE 33 ON READER SERVICE CARD

Advanced Antenna Analysis Program

ELNEC -- the smart antenna analysis program

Advanced doesn't mean "complicated". It means smart. Powerful. And above all, easy to use. ELNEC combines the power and versatility of MININEC with a friendly, easy-to-use menu structure, detailed plots, and advanced analysis features in a program unsurpassed for fast, easy, and accurate antenna analysis. With ELNEC you can analyze the performance of nearly any type of antenna in its actual operating environment. Want to change a wire length? Just tell ELNEC the new length and it does the rest. Interested in phased arrays? ELNEC has true current sources. The MaxP option extends ELNEC's capability to even more complex antennas (up to 260 "pulses"). Of course there's a very detailed manual. And no copy protection hassle.

ELNEC runs on any PC-compatible computer with 512k RAM, CGA/EGA/VGA/Hercules graphics, and 8/9 or 24 pin Epson-compatible dot matrix or HP LaserJet/DeskJet printer. Two versions are available, optimized for use with and without a coprocessor. (The MaxP option requires a coprocessor, hard disk, and 640k RAM.)

ELNEC is just \$49.00, postpaid to USA/Canada. MaxP is \$25.00. (Add \$3.00 per order for air mail to other countries.) VISA AND MASTERCARD ORDERS welcome - include card number and expiration date. Specify coprocessor or noncoprocessor version and disk type preference. Order or write for information from

Roy Lewallen, W7EL
 P.O. Box 6658 Beaverton, OR 97007

CIRCLE 70 ON READER SERVICE CARD

BAMCOM COMMUNICATIONS YAESU

Performance without compromise.SM

800-283-8696 504-277-6815
 P.O. BOX 557 ARABI, LOUISIANA 70032
 MON.-THUR. 9-6 CTZ



FT-530



FT-11R

CIRCLE 30 ON READER SERVICE CARD

proved their ability to send correctly by hand, and to receive correctly by ear, texts in Morse code signals.

d) that the issue and administration of temporary licenses to foreign visitors based on bilateral agreements involves a considerable increase in work for Administrations.

e) that certain Administrations have concluded or are drawing up agreements intended to simplify the current procedure for the issue of such temporary licenses.

f) that the International Amateur Radio Union (IARU) supports the simplification of procedures to obtain temporary operational privileges for foreign visitors in CEPT countries and in other countries,

noting that

this Recommendation bears no relation to the import and export of amateur radio equipment, which is subject only to relevant customs regulations,

noting further that

despite the procedures of this recommendation, Administrations always have the right to require separate bilateral agreements when recognizing the radio amateur licenses issued by foreign Administrations,

recommends

1. that CEPT member administrations recognize the principle of CEPT radio amateur licenses issued under the conditions specified

in Appendices I and II, on which the Administrations of the countries visited will levy neither duties nor taxes, only the Administration issuing the license being entitled to do so.

2. that Administrations, not being members of CEPT, accepting the provisions of this Recommendation, may apply for participation in accordance with the conditions laid down in Appendices III and IV.

Appendix I – GENERAL CONDITIONS FOR THE ISSUE OF “CEPT RADIO AMATEUR LICENSES.”

1. GENERAL PROVISIONS RELATING TO THE CEPT RADIO AMATEUR LICENSE

The “CEPT radio amateur license” will take a form similar to a national license or a special document issued by the same authority, and will be drafted in the national language and in German, English, and French: it will be valid for non-residents only, for the duration of their temporary stays in countries having adopted the Recommendation, and within the limit of validity of the national license. Radio amateurs holding a temporary license issued in a foreign country may not benefit from the provisions of the Recommendation.

The minimum requirements for a “CEPT radio amateur license” will be:

i) a declaration according to which the holder is authorized to utilize his amateur radio station in accordance with this Recommendation in countries where the latter applies;

- ii) the name and address of the holder;
- iii) the call sign;
- iv) the CEPT license class;
- v) the validity;
- vi) the issuing authority.

A list may be added or provided indicating the Administrations applying the Recommendation.

2. LICENSE CLASSES

Each of the CEPT classes described below will only be considered as equivalent to a national class in cases where conditions of utilization in another country are not considerably broader than those in the country where the license was issued. The equivalence of national license classes from CEPT countries to the CEPT license classes is given in columns 4 and 5 of Appendix II. CEPT license class holders are authorized to utilize amateur radio in visited CEPT countries according to the national license class conditions of those visited CEPT countries as shown in columns 6 and 7 of Appendix II.

Class 1: This class permits utilization of all frequency bands allocated to the Amateur Service and Amateur Satellite Service and authorized in the country where the amateur station is to be operated. It will open only to those amateurs who have proved their competence with Morse code to their own Administration.

Class 2: This class permits utilization of all

CQ Back Issues SPECIAL!

Complete your CQ magazine collection today by ordering missing back issues direct from CQ. Single copies are only \$3.50 (postage included) or . . .

Order Combination Packs and Save!

- #1 CQ Worldwide Contest Results (Sep/Oct 1989-1993).....\$30
- #2 CQ WPX Contest Results (Mar/May 1989-1993)\$30
- #3 CQ Antenna Issues (Apr/Aug 1989-93)\$30
- #4 CQ Digital (RTTY/Packet) Issues (Nov 1987-90/92)\$15
- #5 Complete set, Lew McCoy, W1ICP, Antenna Issues.....\$50
(Feb/Aug/Dec 89, Jun/Aug 90, Apr/May/Sep-Nov 91, Jun 92, Jan/Feb/Jun/Nov/Dec 93)
- #6 Complete set, Jerry Sevick, W2FMI Unun/Balun\$35 Issues
(Aug/Nov 92, Jan/Mar/Apr/Jun/Aug/Nov/Dec 93, Feb/Apr 94)
- #7 Any complete year (1989 through 1993).....\$35/yr

Supplies of Certain Issues Are Limited

For Fastest Service Call Toll-Free (800) 853-9797

Name _____ Call _____
 Address _____ City _____ State _____ Zip _____
 Credit Card # _____ Expires _____ Check/Money Order Enclosed

Description	Price
Shipping & Handling	FREE
Total	

Mail orders to: CQ Communications, 76 North Broadway, Hicksville, New York 11801 FAX 516-681-2926

frequency bands allocated to the Amateur Service and Amateur Satellite Service above 30 MHz and authorized in the country where the amateur station is to be operated.

3. CONDITIONS OF UTILIZATION

3.1. On request the license holder shall present his CEPT radio amateur license to the appropriate authorities in the country visited.

3.2. Authorization is granted for utilization of a portable or mobile station only. A portable station shall, for the purposes of this recommendation, include any station using mains electricity at a temporary location, e.g. a hotel or a camping site.

3.3. Authorization is also granted for utilization of the station of a radio amateur holding a permanent license in the host country.

3.4. The license holder shall observe the provisions of the ITU Radio Regulations, this Recommendation and the regulations in force in the country visited. Furthermore, any restrictions concerning national and local conditions of a technical nature or regarding the public authorities must be respected. Special attention should be paid to the difference in frequency allocations to the radio amateur services in the three ITU Regions.

3.5. The use of the amateur radio station aboard an aircraft is prohibited.

3.6. When transmitting in the visited country the license holder must use his national call sign preceded by the CEPT call sign prefix as indicated in column 3 of Appendices II and IV. The CEPT call sign prefix and the national call

sign must be separated by the character "/" (telegraphy) or the word "stroke" (telephony). For a mobile amateur radio station the national call sign must be followed by the characters "/M" (telegraphy) or the word "mobile" (telephony). For a portable amateur radio station the national call sign must be followed by the characters "/P" (telegraphy) or the word "portable" (telephony).

3.7. The license holder cannot request protection against harmful interference.

4. EQUIVALENCE BETWEEN CEPT LICENSE CLASSES AND NATIONAL LICENSE CLASSES

4.1. The equivalence between CEPT license classes and national license classes in CEPT countries is given in columns 6 and 7 of Appendix II.

4.2. The equivalence between CEPT license classes and national license classes in non-CEPT countries is given in columns 6 and 7 of Appendix IV.

Appendix II – TABLE OF EQUIVALENCE

This Appendix lists each of the CEPT countries (as of August 1, 1992), the CEPT call sign prefix to be used on the air and how national licenses convert to CEPT Class 1 and CEPT Class 2 license classes and how CEPT licenses parallel national licenses.

The CEPT countries are: Albania, Austria, Belgium, Bulgaria, Cyprus, Czech/Slovak, Denmark (including Faroe Islands and Green-

land), Finland, France (and possessions), Germany, Greece, Hungary, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Monaco, Netherlands, Norway, Portugal (including the Azores), Romania, San Marino, Spain, Sweden Switzerland, Turkey, the United Kingdom (including Isle of Man, N. Ireland, Jersey, Scotland, Guernsey and Wales), Vatican City, and Yugoslavia.

Appendix III – PARTICIPATION OF NON-CEPT ADMINISTRATIONS IN THE "CEPT RADIO AMATEUR LICENSE" ACCORDING TO THIS RECOMMENDATION

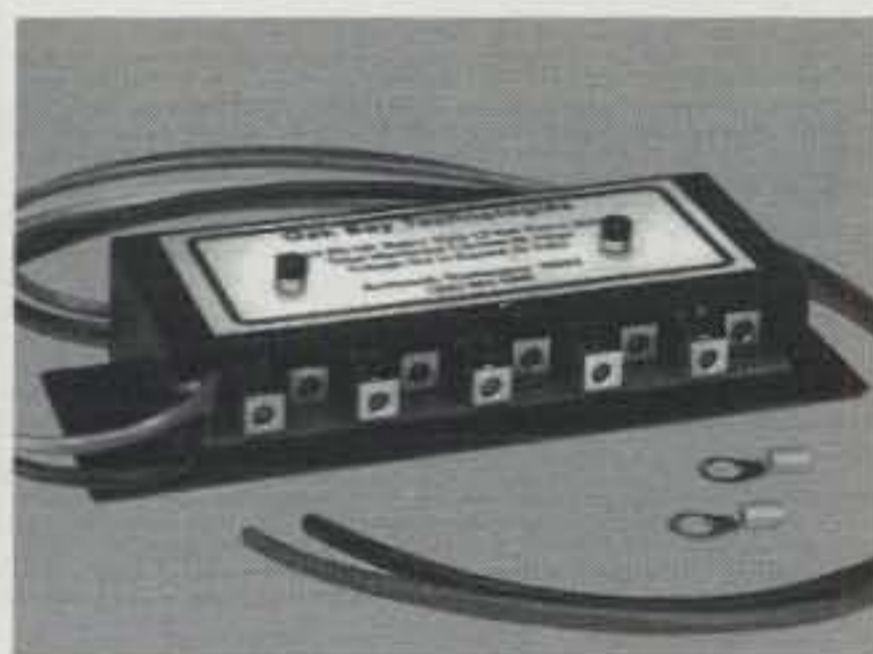
1. APPLICATION

1.1. Administrations, not being members of CEPT, may apply to the CEPT for participation in the CEPT radio amateur licensing systems regulated by this Recommendation. Applications should be addressed to CEPT European Radiocommunications Committee (ERC), through the European Radiocommunications Office (ERO is located in Copenhagen, Denmark). A non-CEPT administration in joining this Recommendation enters into an agreement with all CEPT countries having implemented this Recommendation or will do so in the future. It should be noted that non-CEPT countries wishing to implement this Recommendation between them should do so by separate agreement.

1.2. The application shall include a list of license classes in the country concerned, their privileges, and the proposed CEPT license

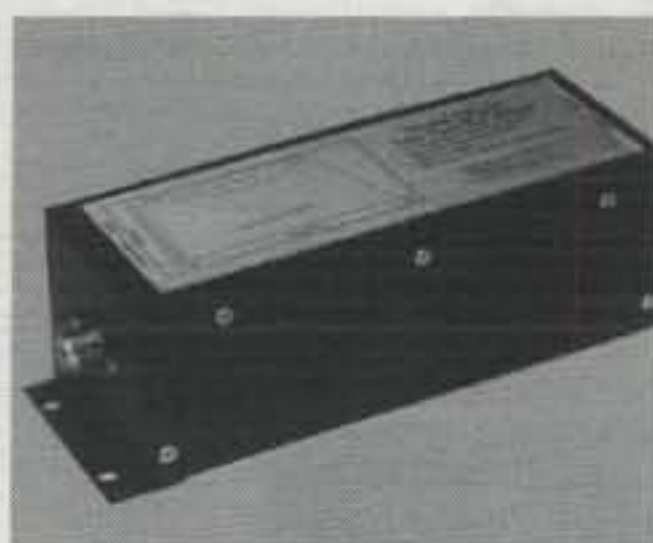
Heavy Duty 50 Amp 12 Volt Power Strip & Low Pass Filter

Model PS-101



- Commercial Design
- Low Insertion Loss
- Upper Cutoff 30 MHz
- > 85 db Attenuation
- Operating Frequency 1.8 - 29.7 MHz
- 1000 Watts
- Helps eliminate TVI

- Perfect for HF Radios
- 5 Fused Outputs
- 50 Amps total Current
- Heavy Duty Steel Enclosure
- Wire and Fuses Included



Model LP-11P

Available now from your favorite Radio Dealer!

Oak Bay Technologies, Inc.
Port Ludlow, WA 98365

Are You In A Rotator Rut?

Most Rotators Share The Same Features:

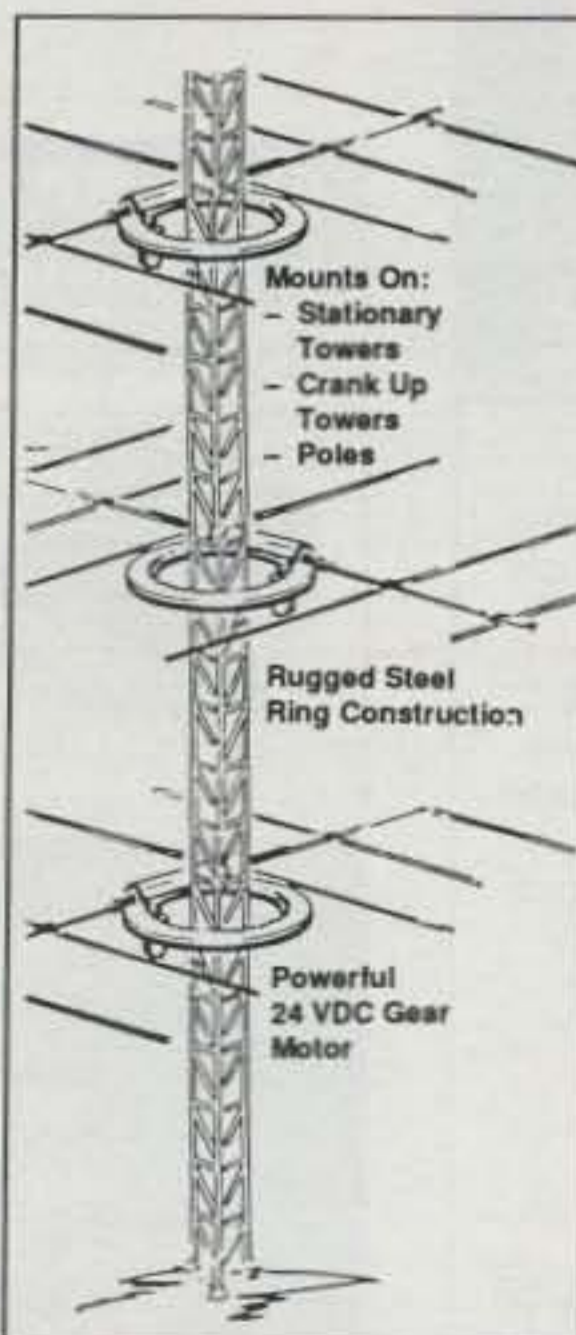
- They Aren't Rugged (built of cast aluminum & pot metal)
- They Cost Too Much and They Wear Out Too Soon
- They Have No Standard Mounting Schemes (Rotor Plates, Custom Drilling, Thrust Bearings are extra cost)
- They Freeze Up, Slow Down And Stop When They Shouldn't
- They Were Designed For "Intermittent Amateur Service"

DID YOU EVER WONDER WHY THERE IS A NEED FOR COMPANIES THAT SPECIALIZE IN RE-BUILDING ROTATORS ???

There is an Alternative To Rotator Rut!



TIE-RING



- Mounts OUTSIDE The Tower, At The Top or On The Side
- Full 360° Rotation
- Designed For HEAVY DUTY Use In Adverse Weather
- All Parts On The Outside; No Maintenance Nightmare
- No need for rotor plates, thrust bearings or side mounts
- High Accuracy Control Box With Pre-Set (Point-and-Shoot)
- American Made, Galvanized after fabrication, BUILT TO LAST

THE POSSIBILITIES ARE UNLIMITED!
LET YOUR IMAGINATION RUN WILD!

CALL TODD TODAY!
1-800-TIC-RING

TIC General, Inc.
P.O. Box 1, 302 Third St. East
Thief River Falls, MN 56701
218-681-1119 FAX 218-681-8509

Serving the LORD
Since 1987



\$49.95!

THE POWER STATION

THE POWER STATION is a 12v x 7.0 AmpHr gel-cell battery complete with voltmeter, wall charger and a cord for charging via automobiles. It will power most HT's at 5 watts for 2-4 weeks (depending upon how long-winded you are) Also VHF, UHF, QRP, or HF mobiles such as the KENWOOD TS-50 (at 100W). There are no hidden costs, all you need is your mobile, HT power cord or cigarette lighter adapter.

The POWER STATION provides 12V from a cigarette plug and has two recessed terminals for hardwiring. A mini-phone jack with regulated 3V, 6V, or 9V output can be used separately for CD players, Walkmans, etc. The POWER STATION can be charged in an automobile in only 3 hours, or in the home in 8 hours. The charger will automatically shut off when the battery is completely charged, so you can charge it even when it has only been slightly discharged, (unlike Ni-Cads that have memory). Our charging circuit uses voltage sensing circuitry, other brands are timed chargers which always charge the battery a full cycle, this damages their battery and shortens it's life if it only needs a partial charge. The POWER STATION has a voltmeter that shows the exact state of charge of the battery, not worthless idiot lights that tell you "YOUR BATTERY IS NOW DEAD." The voltmeter can even be used to measure voltages of other sources.

Dealer Inquiries Invited

Send Check or M/O for \$49.50 + \$8.50 s/h. Include shipping address and telephone number to:

Joe Brancato

**THE HAM CONTACT, P.O. Box 3624, Dept. CQ
Long Beach, CA 90803**

CA residents Add 8 1/4% Sales Tax. Canadian Residents Please Send U.S. Money Order & \$17.10 Shipping. If you wish more information please send a SASE to the above address. For COD orders, call (310) 433-5860, outside of CA call **ORDERS ONLY (800) 933-HAM4** and leave a message.

SEE
MAY 94
73 REVIEW



CIRCLE 48 ON READER SERVICE CARD



ELECTRON TUBES OVER 3000 TYPES IN STOCK!

Also hard-to-find transformers, capacitors and parts for tube equipment.
Send \$2.00 for our 32 page catalog.

ANTIQUE ELECTRONIC SUPPLY
6221 S. Maple Ave. • Tempe, AZ 85283 • 602-820-5411

Fast & Fun G5RV QuickKits™

created by Antenna Test Box 50062-S, Provo, UT 84605

Fast & Easy to Build

- Fail-Safe visual instructions
- No measuring or cutting
- Everything included
- Finish antennas in minutes

Quality Components

- Presoldered Silver Fittings
- Kink-free QuietFlex wire
- Fully insulated, wax sealed, no-corrode, low noise design

Tune All Bands Incl WARC

• Double Size G5RV 204 ft 160-10 Dipole	\$59.95
• Full Size G5RV 102 ft 80-10 Dipole	\$39.95
• Half Size G5RV 51 ft 40-10 Dipole	\$29.95
• Quarter Size G5RV 26 ft 20-10 Dipole	\$25.95
• ReadyMade 102 ft G5RV	\$50.00
• ReadyMade 51 ft G5RV/2	\$40.00
• 200' Dacron 250# line	\$11.95

Want Plans, Patterns, Data? Order TechNote #124-D \$6.95 ppd USA

Order Hot-Line: Add \$3 P&H **801 373 8425**

CIRCLE 11 ON READER SERVICE CARD

ONV SAFETY BELT CO.

ONV Safety Belt With Seat Harness
\$89.95



ONV Belt W/O Seat
Harness \$74.95

ONV Tool Pouch \$15.95

OSHA

We Ship Worldwide
Order Desk Open
7 Day/Week

Add \$5.00 For Handling VISA M/C CHECK

"Tower Climbing Lanyards"

3 feet long with large Gorilla Hook

To clip on ONV Safety Belts.

For use on towers, ladders, etc.

\$39.95 + \$5.00 UPS

Feel Safe CLIMBING Towers!

P.O. Box 404 • Ramsey, NJ 07446

800-345-5634

Phone/FAX 201-327-2462

CIRCLE 80 ON READER SERVICE CARD

NEW! ALL 900 QUESTIONS! FCC Commercial General Radiotelephone Operator License

Only **\$19.95** plus \$2.00 shipping
Complete FCC Element 1 and 3 Question Pools

Become an FCC licensed
Electronic Technician

- 336-page fully-illustrated textbook covers everything you need to know to get your FCC commercial radiotelephone operator license.
- Contains every possible word-for-word examination question (including new 1994 updates), multiple choices, answers and explanation of the answer.
- Complete information on every commercial radio license, examination and how to qualify.
- FCC regulations you need to know!



National Radio Examiners
Div., The W5YI Group, Inc.
P.O. Box 565206, Dallas, TX 75356
VISA, MasterCard call toll free:
1-800-669-9594

CIRCLE 135 ON READER SERVICE CARD

class equivalents. Details of national examination syllabuses or documents describing the requirements of the national license classes and their privileges shall be enclosed with the application. All the details mentioned above must be submitted in one of the official languages of the CEPT (English, French, or German).

1.3. The applying Administration shall provide the call sign (prefixes) to be used by visiting radio amateurs, and details of any special conditions relating to the implementation of this Recommendation in the country concerned. Special conditions or restrictions should be confined to a minimum, and should not be imposed unless absolutely necessary.

1.4. A non-CEPT Administration having been granted special conditions as per 1.3, shall include these in a footnote in Appendix IV.

2. PROCEDURES OF APPLICATIONS

2.1. The CEPT ERC shall check, based mainly on Recommendation T/R 61-02E, each application to determine the equivalence of the national license classes to those specified in this Recommendation and to assess the acceptability of any deviations from the respective Recommendations which have been requested by the applying Administration.

2.2. When the ERC has agreed to accept the participation of a non-CEPT country it notifies the applying Administration and arranges for the CEPT Liaison Office to include relevant details in Appendix IV.

2.3. A CEPT Administration requiring a separate bilateral agreement to apply this Recommendation with a CEPT Administration, shall indicate this in a footnote in Appendix IV.

3. CONDITIONS OF UTILIZATION

The technical and operational privileges which apply for CEPT license holders from a non-CEPT countries are in conformity with the privileges of the appropriate national license classes indicated in Appendix II, columns 6 and 7.

Appendix IV - TABLE OF EQUIVALENCE BETWEEN NATIONAL CLASSES OF NON-CEPT COUNTRIES AND CEPT LICENSE CLASSES

This is a blank form for non-CEPT countries to indicate the call sign prefix, and how their national license structure related to CEPT Class 1 and 2 - and what privileges are available to CEPT license holders when operating in their country.

The International Trend To A Two-Class System

At the June VEC Conference held at the FCC in Gettysburg, Pennsylvania, John B. Johnston, W3BE (Chief of the Personal Radio Branch) discussed the possible adoption of CEPT and CITEL international licensing. He also made the statement that this "... could lead to a possible simplification of our own license structure."

It is a fact that the United States is the only country in the world the amateur licensing system of which is structured to force—or at least, foster—what is believed to be increased communications knowledge. That may have been proper

25 years ago, but is the current system appropriate for the future?

The incentive system of amateur radio licensing goes back to the late 1960s when it was thought that amateur radio needed "... remodeling and revitalization." (Those are actual words from the Report and Order adopted August 24, 1967.)

It was thought by the FCC and the amateur community as represented by the American Radio Relay League that some 100,000 General Class ticket holders needed to be motivated to increase their level of expertise. To stimulate that occurrence, the FCC introduced "reserved frequencies"—spectrum blocks available only to Advanced and Extra Class licensees. It was these additional frequency segments that would provide the incentive. Element 4 was split into 4A and 4B, and the Advanced Class license, which had not been available since 1951, was re-established. Novice licensees had their license terms extended to a two-year non-renewable term. Everything was geared to pushing the amateur "up the ladder."

Effective November 22, 1967, the five-class Amateur Radio University was off and running. The new incentive segments were phased in over a period of a couple of years. I never thought it was that big a

deal, but General Class amateurs who had to pass more examinations to re-obtain spectrum to which they already had access were, as a group, infuriated.

It must be remembered that amateur radio back in the 1960s was basically HF. VHF and the higher frequencies were considered "experimental." Twenty-five years later things are exactly the opposite. VHF and higher class operation is more widespread and microwave equipment and technology are more complex.

Today the beginning "day one" operator has unlimited access to the most complicated "futuristic" communications systems imaginable. The "knowledgeable" HF operator obtains what is fast becoming "old-fashioned" spectrum and techniques.

I don't want to make this "background" a rehash of the pro and cons of incentive licensing. However, I feel it is important that you know how the multi-class "motivation system" came about. A quarter century ago, the greater majority of amateurs held a General Class ticket which basically yielded all privileges. Today the state-of-the-art (and inclination of the leisure communications operator) is at the VHF and higher class level. The big question is, of course, "Is a two-class system appropriate, and what are its ramifications?"

73, Fred, W5YI

M²

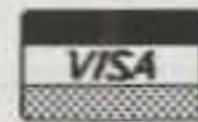
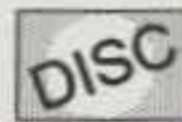
**2M9FM &
2M9SSB**



Two *hot* new computer designs for your favorite 2 meter mode. The **2M9FM** (145-148 MHz) and **2M9SSB** (144-146 MHz) are optimized for gain with no compromises for unneeded bandwidth; the most gain for boom length of *any* antenna on the market. Where do you want to make yourself heard?

Featuring classic M² construction: CNC machined components, O-ring sealed connectors, stainless steel hardware, 100 MPH wind survival, 1.5 kW power handling. M² offers over 60 unique antennas, from S band to 80 meters, to help make you heard.

WRITE, CALL OR FAX FOR OUR NEW ILLUSTRATED CATALOG.



**M² 7560 N. Del Mar Ave.
Fresno, CA 93711
(209) 432-8873 FAX: 432-3059**

CIRCLE 73 ON READER SERVICE CARD

A KEYNOTE SPEAKER from Grove!

NEW!



**Order
SPK13**

Introductory price.

\$ 199^{95*}

Price goes up on September 1, 1994.

* Plus \$7.50 UPS Ground Shipping

The Grove engineering team has created the most revolutionary audio accessory on the communication market: the SP200 Sound Enhancer.

Housed in a stylish, solid oak cabinet hand crafted in the mountains of North Carolina, the SP200 is sure to enhance any radio room. The control panel, constructed of sturdy, black aluminum, has been designed for optimum ease and convenience when tuning and refining signals.

The SP200 combines a powerful audio amplifier, top-of-the-line speaker, and an adjustable filter system to create the most versatile listening environment ever available to radio enthusiasts. The keen peak/notch filter system and advanced noise limiter allow the listener to pull clear and distinct signals out of the haze of interference and background noise, while the adjustable bass and treble controls provide the flexibility to create just the sound you want. FSK, RTTY, packet, FAX, CW and all other data systems are enhanced while interference and electrical noise are reduced or even eliminated by the analog audio processor.

The SP200 also comes equipped with a stereo/mono headphone jack for private listening, and an automatic tape activator so that you never have to miss anything.

Try the new Grove SP200 Sound Enhancer with your receiver, scanner, or transceiver and enjoy the latest in speaker sophistication; you'll agree this is truly a keynote speaker!

SPECIFICATIONS:

Power Required: 12 to 14 VDC @500 mA; 120 VAC adaptor Incl.
Audio Power Output: 2 W @ 10% THD (8 ohms)
Audio Selectivity: Peak/notch 30 dB or greater, 0.3-6 kHz
Squelch Hold: 0-10 seconds
Noise Limiter: Adjustable-threshold pulse noise clamp
Tape Activator: Audio activated (VOX), 3 second hold
Tape Output: 500 mV P-P @ 600 ohms (nom.)
Headphone Jack: Universal mono-wired stereo jack
Dimensions: 10-7/8"W x 6-7/8"H x 7-1/4"D

Why pay over \$400 for these separate accessories:

- Speaker
- Adjustable Filter
- Recorder Activator
- Audio Amplifier
- Audio Activated Squelch
- Noise Limiter

When you can have it all in the new Grove

**SP-200
SOUND ENHANCER**

CALL NOW!

(800) 438-8155

(704) 837-9200

PO Box 98

Brasstown, NC 28902



**GROVE
ENTERPRISES**

*Changing the way you
hear the world*

CIRCLE 46 ON READER SERVICE CARD

THE SCIENCE OF PREDICTING RADIO CONDITIONS

Radio Storminess Abates

The unusually large number of radio storms that occurred between February and May of this year finally abated. During June there were no reports of serious radio storms. Geomagnetic and ionospheric conditions appear to have returned to what is generally considered to be typical for the low phase of solar activity that we are now experiencing.

Solar Cycle Progress A Spotless Sun!

The Royal Observatory of Belgium reports an absolutely spotless sun between May 26 and June 5. This has been the longest period of a spotless sun since 1986. The mean sunspot number for May, as reported by the observatory, was 18. This results in a 12-month running smoothed sunspot number, upon which the sunspot cycle is based, of 41, centered on November 1993. This is a drop of four points from the previous month's level. Cycle 22 is expected to continue its decline, with a smoothed sunspot number in the mid-20s expected for September 1994.

As expected, there was a corresponding decrease in 10.7 solar flux levels during May. According to daily observations made at Penticton, BC by the Dominion Radio Astrophysical Observatory, the mean monthly level of 10.7 cm solar flux was 80. This results in a smoothed level of 98 centered on November 1993. A smoothed solar flux level in the mid-80s is forecast for this month. During the May 26 to June 5 period of a spotless sun, the daily solar flux levels varied between 68 and 70.

September Propagation

Mid-September to mid-October is generally a period of changing propagation conditions on the HF amateur bands. On some days conditions should continue to be much the same as they were earlier in the summer, but on other days the first signs of winter-time conditions should be noticeable. This month's DX Propagation Charts cover the period of variable conditions between September 15 and October 15, rather than the usual two-month span. A Short-Skip Propagation

11307 Clara St., Silver Spring, MD 20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for September 1994

Propagation Index.....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 5, 12, 25	A	A	B	C
High Normal: 4, 6, 11, 13, 24	A	B	C	C-D
Low Normal: 2-3, 7, 9-10, 17-19, 22-23, 26-27, 29-30	B	C	D	D-E
Below Normal: 1, 8, 14, 16, 20, 28	C	C-D	D-E	E
Disturbed: 15, 21	C-D	D	E	E

Where expected signal quality is: A—Excellent opening, exceptionally strong, steady signals greater than S9.

B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S9 and S6, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S3, and with considerable fading and noise.

E—No opening expected.

HOW TO USE THIS FORECAST

1. Find propagation index associated with particular band opening from Propagation Charts appearing on the following pages.
2. With the propagation index, use the above table to find the expected signal quality associated with the band opening for any date of the month. For example, an opening shown in the charts with a propagation index of 3 will be fair to poor (C-D) on Sept. 1st, fair (C) on the 2nd and 3rd, good (B) on the 4th, excellent (A) on the 5th, etc.

Chart for September and October is also included in this month's column.

Twenty meters should continue to be the best band for DX propagation from mid-September until mid-October. The band should open in almost all directions for a few hours after sunrise, and remain open to several different areas of the world throughout most of the day and into the early evening. Signals might be a bit stronger than they were during July and August, but the band will close an hour or two earlier because of the shorter period of daylight.

A seasonal improvement is expected for DX conditions on 15 and 17 meters, but solar activity is so low now that considerably fewer openings are expected compared to the past several years. The best time to check the bands is from a few hours before noon through the afternoon hours. The best bet for fairly good openings is towards South America, but openings to Africa and the South Pacific should also be possible.

Solar activity is too low for any really

solid 10 or 12 meter DX openings, although some may be possible towards South America and other southern localities during the afternoon hours, as well as occasionally to Europe and Africa earlier in the day.

Improved nighttime DX propagation conditions are expected on 30, 40, 80, and 160 meters as a result of seasonally lower static levels and increasing hours of darkness. Thirty and 40 meters should provide the best chances for DX from sunset through the sunrise period. Be sure to also check 80 and 160 meters during the hours of darkness and during the sunrise period.

HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters), as shown in the left hand column of the chart. For the Alaska and Hawaii charts the predicted times of openings are found under the appropriate meter band column (10 through 40 meters) for a particular geographical region of the continental USA, as shown in the left hand column of the charts. An * indicates the best time to listen for 80 meter openings.

2. The propagation index is the number that appears in () after the time of each predicted opening. In the Short-Skip Chart, where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of days during the month on which the opening is expected to take place, as follows:

- (4) Opening should occur on more than 22 days
- (3) Opening should occur between 14 and 22 days
- (2) Opening should occur between 7 and 13 days
- (1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

3. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. On the Short-Skip Chart appropriate daylight time is used at the path midpoint. For example, on a circuit between Maine and Florida, the time shown would be EDT; on a circuit between N.Y. and Texas, the time at the midpoint would be CDT, etc. Times shown in the Hawaii chart are in HST. To convert to daylight time in other USA time zones, add 3 hours in the PDT zone; 4 hours in the MDT zone; 5 hours in the CDT zone, and 6 hours in the EDT zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 15 or 3 P.M. in Los Angeles; 18 or 6 P.M. in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to daylight time in other areas of the USA, subtract 7 hours in the PDT zone; 6 hours in the MDT zone; 5 hours in the CDT zone and 4 hours in the EDT zone. For example, at 20 GMT it is 16 or 4 P.M. in N.Y.C.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts CW or 300 watts PEP on sideband; the Alaska and Hawaii charts are based upon a transmitter power of 250 watts CW or 1 KW PEP on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the propagation index will increase by one level; for each 10 dB loss, it will lower by one level.

5. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado, 80302.



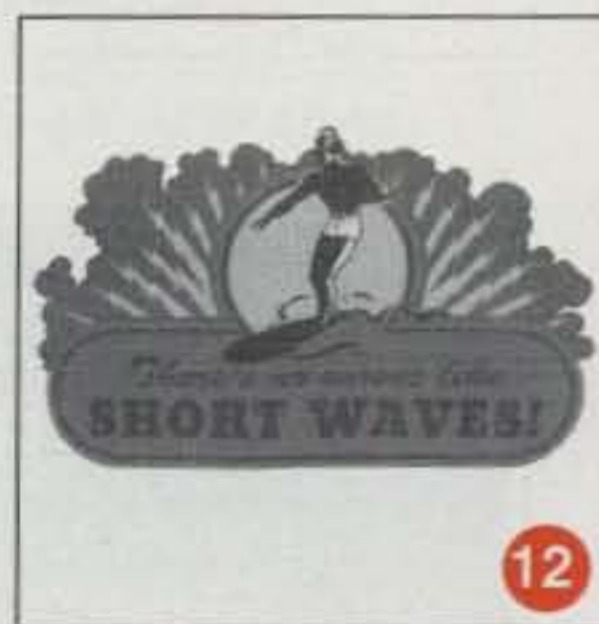
Radio T-Shirts



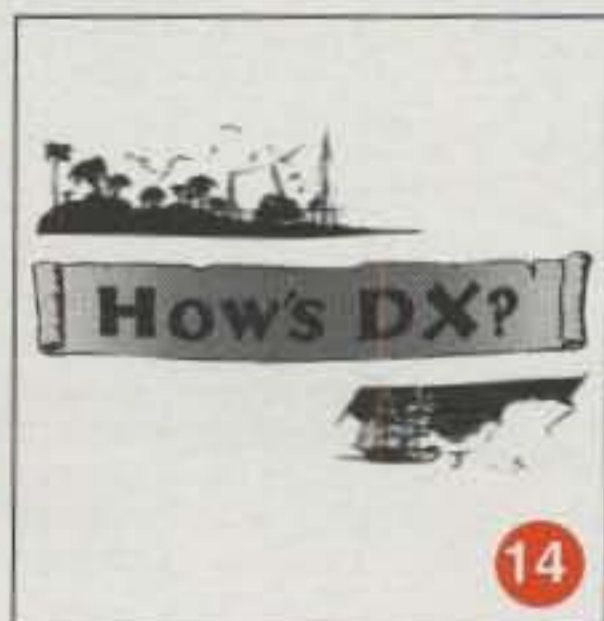
High-Quality T-Shirts, made in U.S.A., pre-shrunk 100% cotton.



\$17.95
per shirt
plus shipping
& handling



Here are some new additions to our T-Shirt Library! →



Yes! Rush my CQ T-Shirt(s) to me right away! Here's my order below

Name _____ Callsign _____

Address _____

City _____ State _____ Zip _____

Please allow 4-8 weeks delivery

Qty	Item #	Size	Price	S & H	Total
				Grand Total	

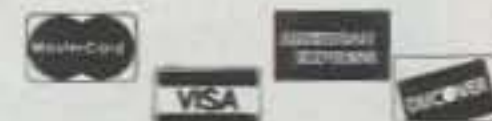
Available sizes: L, XL, XXL (add \$2) Please add \$2 shipping and handling per item ordered. Order 4 or more and receive free shipping. Make your check or money order payable to: CQ Communications, Inc., 76 North Broadway, Hicksville, New York 11801

Please charge my:

MC/VISA/AMEX/Discover # _____

Expires _____

Signature _____



To Order Toll Free Call (800) 853-9797 or FAX (516) 681-2926

Ham License Preparation

Written Test Study Manuals

By Gordon West, WB6NOA

No-Code Technician.....	\$9.95
General Study Manual.....	\$9.95
Advanced Study Manual.....	\$9.95
Extra Study Manual.....	\$9.95

No-Code Technician Theory.....\$19.95

By Gordon West, WB6NOA

On four 2-hr. audio cassette tapes

No-Code Technician Video Package.....\$29.95

Contains 240 page manual by Gordon West, Part 97 Rules and 90-minute VHS video. Ideal for Instructors!

Morse Code Test Preparation

by Gordon West, WB6NOA

Each set contains two 2-hr. audio cassette tapes.

Code Teacher.....0-5 WPM.....	\$9.95
General Code.....3-15 WPM.....	\$9.95
Extra Code.....12-21 WPM.....	\$9.95

Morse Academy Software.....\$9.95

Learn code at IBM PC!

IBM Compatible Software

Each with 200 page Study Manual

No-Code Technician.....	\$29.95
General Upgrade.....	\$29.95
Advanced Software.....	\$29.95
Extra Software.....	\$29.95

Add \$1.50 Shipping Charge
VISA or MasterCard Accepted.

The W5YI Group, Inc.

P.O. Box 565101 • Dallas, TX 75356

Toll Free 1-800-669-9594

CIRCLE 133 ON READER SERVICE CARD

SEND YOUR RADIO TO SCHOOL

Donate Your Radio

516-674-4072

516-674-9600 FAX



Radio Club of

Junior HS 22

POB 1052

New York, NY 10002

Donate your radio or related gear to an IRS approved charity. Get the tax credit and help a worthy cause. Equipment picked up or shipping arranged. We have been bringing Communication to Education since 1980.

CQ Short-Skip Propagation Chart September & October 1994 Local Daylight Savings Time At Path Mid-Point

Meter Band	Distance Between Stations (Miles)			
	50-250	250-750	750-1300	1300-2300
10	Nil	10-21 (0-1)	08-10 (1) 10-15 (1-2) 15-22 (1)	08-10 (1-0) 10-14 (2-0) 14-18 (1) 18-22 (1-0)
15	Nil	08-10 (0-1) 10-14 (0-2) 14-22 (0-1)	08-10 (1) 10-14 (2) 14-17 (1-3) 17-18 (1-2) 18-22 (1) 22-00 (0-1)	08-10 (1) 10-14 (2) 14-17 (3) 17-18 (2-1) 18-20 (1) 20-00 (1-0)
20	12-20 (0-1)	08-10 (0-1) 10-12 (0-2) 12-15 (1-4) 15-17 (1-3) 17-20 (1-2) 20-07 (0-1)	08-10 (1-2) 10-12 (2-4) 12-15 (4) 15-17 (3-4) 17-19 (2-4) 19-20 (2-3) 20-21 (1-3) 21-23 (1-2) 23-08 (1)	08-09 (2-1) 09-10 (2) 10-14 (4-2) 14-16 (4-3) 16-19 (4) 19-21 (3) 21-23 (2) 23-01 (1) 01-06 (1-0) 06-08 (1)
40	08-10 (0-2) 10-12 (2-4) 12-16 (3-4) 16-18 (2-3) 18-20 (1-2) 20-22 (0-1)	08-10 (2-3) 10-12 (4-3) 12-16 (4-2) 16-18 (3) 18-20 (2-4) 20-22 (1-4) 22-00 (0-3) 00-03 (0-2) 03-06 (0-1) 06-08 (0-2)	08-10 (3-2) 10-12 (3-1) 12-16 (2-1) 16-18 (3-2) 18-20 (4-3) 20-22 (4) 22-00 (3-4) 00-03 (2-3) 03-06 (1-2) 06-08 (2-4)	08-10 (2-1) 10-16 (1-0) 16-18 (2-1) 18-20 (3-2) 20-21 (4-3) 21-00 (4) 00-03 (3-4) 03-06 (2-3) 06-08 (4-2)
80	07-09 (3-4) 09-12 (4) 12-19 (4-3) 19-22 (4) 22-04 (3-4) 04-07 (2-3)	07-09 (4-2) 09-12 (4-1) 12-17 (3-1) 17-19 (3-2) 19-21 (4-3) 21-04 (4) 04-06 (3-4) 06-07 (3)	07-09 (2-1) 09-17 (1-0) 17-19 (2-1) 19-21 (3-2) 21-22 (4-3) 22-04 (4) 04-06 (4-2) 06-07 (3-2) 06-07 (2-1)	07-09 (1) 09-17 (0) 17-19 (1) 19-21 (2) 21-22 (3-2) 22-04 (4-3) 04-06 (2) 06-07 (2-1)
160	17-19 (1-0) 19-21 (2-1) 21-06 (4) 06-08 (3-2) 08-10 (2-1) 10-12 (1-0)	18-20 (1-0) 20-21 (1) 21-03 (4-3) 03-06 (3-2) 06-08 (2-1) 08-10 (1-0)	20-21 (1-0) 21-23 (3-1) 23-03 (3) 03-06 (2-1) 06-08 (1)	21-23 (1-0) 23-03 (3-2) 03-06 (1) 06-08 (1-0)

ALASKA

September & October, 1994
Openings Given in GMT #

Reception Area	10 Meters	15 Meters	20 Meters	40/80* Meters
Eastern States	Nil	21-23 (1)	12-14 (1) 18-21 (1) 21-00 (2) 00-02 (1)	08-12 (1)
Central States	Nil	21-01 (1)	13-15 (1) 19-22 (1) 22-01 (2) 01-03 (1)	08-13 (1)
Western States	Nil	20-21 (1) 21-23 (2) 23-01 (1)	17-18 (1) 18-22 (2) 22-01 (3) 01-03 (2) 03-05 (1)	08-11 (1) 11-14 (2) 14-16 (1) 11-14 (1)*

From mid-September through mid-October, for short-skip openings less than 250 miles use 80 meters during the day and either 80 or 160 meters at night. For distances between 250 and 750 miles try 30 and 40 meters during the day and 80 meters at night. For openings between 750 and 1300 miles the best bet should be 20 meters during the day, 30 and 40 meters from sundown to midnight, and 80 meters from midnight to sunrise. For openings beyond 1300 miles, try 17 and 20 meters during most of the daylight

HAWAII September & October 1994 Openings Given In Hawaiian Standard Time

Reception Area	10 Meters	15 Meters	20 Meters	40/80* Meters
Eastern States	Nil	07-12 (1) 12-15 (2) 15-16 (1)	11-13 (1) 13-14 (2) 14-16 (3) 16-17 (2) 17-19 (1) 03-05 (1) 05-07 (2) 07-08 (1)	17-19 (1) 19-21 (2) 21-00 (3) 00-02 (2) 02-03 (1) 19-20 (1)* 20-23 (2)* 23-01 (1)*
Central States	09-13 (1)	07-11 (1) 11-12 (2) 12-14 (3) 14-15 (2) 15-17 (1)	05-06 (1) 06-09 (2) 09-13 (1) 13-15 (2) 15-17 (4) 17-18 (2) 18-20 (1)	17-19 (1) 19-21 (2) 21-02 (3) 02-04 (2) 04-05 (1) 19-20 (1)* 20-00 (2)* 00-02 (1)*
Western States	10-15 (1)	07-10 (1) 10-12 (2) 12-15 (3) 15-16 (2) 16-18 (1)	06-07 (1) 07-10 (3) 10-12 (2) 12-14 (3) 14-16 (4) 16-18 (3) 18-19 (2) 19-21 (1)	17-18 (1) 18-19 (2) 19-01 (4) 01-03 (3) 03-06 (2) 06-07 (1) 19-20 (1)* 20-22 (2)* 22-03 (3)* 03-04 (2)* 04-06 (1)*

period, with 30 and 40 meters optimum during the hours of darkness. Check 12 and 15 meters for some good openings beyond 1300 miles during the afternoon hours.

Equinoctial Propagation

The fall, or autumnal, equinox will occur on September 22. This is the day on which the sun will cross the plane of the earth's equator as it appears to travel from northern to southern skies. On this day the hours of daylight and darkness are equal in length throughout the world. Sunrise should take place at approximately 6 AM local time and sunset at about 6 PM local time, no matter where you are in the world.

The effects of the equinox on HF propagation are felt from about mid-September through early October. During this period the characteristics of the ionosphere are similar over large areas of the world, and this is usually the best time of the year for DX openings between the temperate regions of the northern and southern hemispheres. A similar period occurs during the spring equinox, which is centered on March 21.

Expect considerably more frequent openings from mid-September through early October between the USA and South America, to the South Pacific area and Australasia, to southern Asia, and to southern Africa and Antarctica. Openings to these areas should improve on all bands, but they probably will be most noticeable on 20, 17, and 15 meters during the day and on 30 and 40 meters at night. These equinoctial-type openings may follow either the long or the short great-circle path. The best time for these openings should be the twilight periods

A NEW DIMENSION HAS OPENED...

Satellite Times

With your **CURRENT** equipment, **YOU** can begin listening to signals from orbiting satellites! You don't need a satellite dish to hear satellite signals! The signals are there, you just need to learn **HOW** to hear them. Satellite Times will be there for you all year long to lead you into this ever-growing and **FASCINATING** realm of monitoring. Don't miss another signal; **CALL TODAY!**

Each issue dedicated to:

- ▷ Worldwide TVRO
- ▷ NASA and Weather
- ▷ GPS and Scientific
- ▷ Radio Astronomy
- ▷ Amateur
- ▷ Business
- ▷ Computers and Satellites
- ▷ Military and Government
- ▷ How-To's and MUCH MORE!

ORDER NOW!

Charter Subscription Rates:

- 1 year US: \$16.95 (6 issues)
- 1 year foreign: \$23.95 (6 issues)

Subscription after 12/31/94:

- 1 year US: \$19.95 (6 issues)
- 1 year foreign: \$26.00 (6 issues)

**Satellite
Times**

(800) 438-8155

PO Box 98
Brasstown, NC 28902
Toll line: (704) 837-9200
Fax Line: (704) 837-2216

CIRCLE 47 ON READER SERVICE CARD

CQ Has Done It Again!

Announcing the 1994 CQ Beginner's Guide to Amateur Radio



Only
\$4.95
+ \$2.50 s/h

Whether you're a Novice, Technician or just beginning to think about getting your license, CQ's Buyer's Guides are your best information source for amateur radio equipment. But that's not all—veteran hams find our guides to be invaluable too! Our **1994 CQ Beginner's Guide to Amateur Radio** is no exception!

Chock-full of practical information that can't be found anywhere else, you'll find this edition is our best yet. Here's just a sample of the articles you'll find:

- ★ Shopping to Avoid Obsolescence, Joe Lynch, N6CL
- ★ All About Antennas, Paul Carr, N4PC
- ★ Computers in the Shack, Ed Juge, W5T00
- ★ HF Operating for Success, John Dorr, K1AR
- ★ Beginner's Guide to DXing, Chod Harris, VP2ML
- ★ The Fine Art of QSLing, Lew McCoy, W1ICP
- ★ Award Hunting and Contesting, Doug Grant, K1DG
- ★ Hardware for Your First Station, Doug DeMaw, W1FB

But There's Much More!!

In addition to these first-rate articles by some of the hobby's leading authors, you'll find dozens of pages of equipment listings. They provide product specs, prices, and other essential information.

And, who can't use our world-renowned Dealer and Manufacturer listings? They'll tell you exactly where to reach the companies and distributors that serve the amateur marketplace.

You'll want to keep this book handy for your day-to-day operation. Don't delay, be sure to order your copy of the 1994 CQ Beginner's Guide to Amateur Radio today!

For Fastest Service, Order Toll Free (800) 853-9797

Or Fax 516-681-2926, CQ Communications, 76 North Broadway, Hicksville, New York 11801 Also available through your local dealer!

NEMAL ELECTRONICS

Factory authorized distributor for Alpha, Amphenol, Belden, Kings, Times, Cablewave

COAXIAL CABLES

(per ft - 100ft prices)

1180 BELDEN 9913 very low loss (real Belden)	.52
1102 RG8/U 95% shield low loss foam 11ga	.34
1110 RG8X 95% shield (mini 8)	.15
1130 RG213/U 95% shield mil spec NCV jkt	.36
1140 RG214/U dbl silver shield mil spec	1.85
1705 RG142B/U dbl silver shield, teflon ins	1.50
1450 RG174/U 50 ohm, 100" od mil spec	.14
1410 RG58/U mil type 50 ohm 95% shield	.12

HARDLINE 50 OHM

FLC12 1/2" Cablewave corr. copper blk jkt	1.79/ft
FLC78 7/8" Cablewave corr. copper blk jkt	4.55/ft
NM12CC N conn 1/2" corr. copper m/f	28.15
NM78CC N conn 7/8" corr. copper m/f	67.50
UM12CC PL259 for 1/2" corr. copper	24.75
FLX14 1/4" super flexible	1.65/ft
FLX12 1/2" super flexible	3.15/ft

CONNECTORS MADE IN USA

NE720 Type N plug for Belden 9913	\$3.95
NE723 Type N jack for Belden 9913	4.95
PL259AM Amphenol PL259	.89
PL259TS PL259 teflon ins/silver plated	1.59
PL258AM Amphenol female-female (barrel)	1.65
UG175/UG176 reducer for RG58/59 (specify)	.22
UG21D N plug for RG8,213,214	3.35
UG83B N jack to PL259 adapter, teflon	6.50
UG146A SO239 to N plug adapter, teflon	6.50
UG255 SO239 to BNC plug adapter	4.75
SO239AM UHF chassis mt receptacle, Amphenol	1.10
UG88C BNC plug RG58,223,142	1.55

GROUND STRAP GROUND WIRE

GS38 3/8" tinned copper braid	.35/ft
GS12 1/2" tinned copper braid	.50/ft
HW06 6ga insulated stranded wire	.35/ft
AW14 14ga stranded Antenna wire	.07/ft

ROTOR CABLE 8 CONDUCTOR

8C1822 2-18ga and 6-22ga	.22/ft
8C1620 2-16ga and 6-20ga	.32/ft
8C1618 2-16GA and 18GA	.42/ft

* Prices do not include shipping. Visa/Mastercard \$30 min. COD add \$5.

Call or write for complete price list. Nemal's new 44 page CABLE AND CONNECTOR SELECTION GUIDE is available at no charge with orders.

12240 NE 14th Ave., N. Miami, FL 33161

(305) 893-3924 24hr. FAX (305) 895-8178 (800) 522-2253

ROTORS



ROTORS

Rotors, Parts and Repair Service
Reconditioning Large or Small
American Made Rotors
Repairs-\$25.00*
Rebuilds-\$50.00*

All parts in stock for immediate delivery.
New units for sale.
Trade-ins welcome.




ROTORS

C.A.T.S., 7368 S.R. 105 Pemberville, OH 43450
Call N8DJB at (419) 352-4465 10:00-5:00
*LABOR ONLY-PARTS & SHIPPING ADDITIONAL

PARTS

UHF REPEATER

Make high quality UHF repeaters from
GE Masters II mobiles!

- 40 Watt Mobile-Radio only **\$199**
- Duplexing and tuning information **\$12**

(information without radio purchase \$40)

Versatel Communications

Orders 1-800-456-5548 For info. 307-266-1700
P.O. Box 4012 • Casper, Wyoming 82604

HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA chart in the 5, 9 and 0 areas; the Western USA chart in the 6 and 7 areas, and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (15 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An * indicates the best time to listen for 160 meter openings.

3. The propagation Index is the number that appears in () after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

- (4) Opening should occur on more than 22 days
- (3) Opening should occur between 14 and 22 days
- (2) Opening should occur between 7 and 13 days
- (1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this Propagation column for the actual dates on which an opening with specific propagation index is likely to occur, and the signal quality that can be expected.

4. Time shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M., 13 is 1 P.M., etc. Appropriate daylight time is used *not* GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitter power of 250 watts CW, or 1 KW PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the propagation index will increase by one level; for each 10 dB loss, it will lower by one level.

6. Propagation data, contained in the charts has been prepared from basic data published by the Institute For Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado, 80302.

September 15-October 15, 1994
Time Zone: EDT
(24-Hour Time System)
EASTERN USA TO:

Reception Area	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Central	11-14 (1)	10-11 (1)	07-08 (1)	18-19 (1)
Europe		11-15 (2)	08-10 (3)	19-21 (2)
& North Africa		15-16 (1)	10-12 (2)	21-23 (3)
			12-14 (3)	23-02 (4)
			14-16 (4)	02-03 (3)
			16-17 (3)	03-04 (2)
			17-18 (2)	04-05 (1)
			18-19 (1)	20-22 (1)*
				22-01 (2)*
				01-04 (1)*
Northern Europe & European CIS	10-12 (1)	10-13 (1)	07-08 (1)	18-20 (1)
			08-10 (3)	20-04 (2)
			10-12 (2)	04-05 (1)
			12-14 (1)	21-04 (1)*
			14-16 (2)	
			16-18 (1)	
Eastern Mediterranean & Middle East	11-13 (1)	10-11 (1)	07-08 (1)	19-21 (1)
		11-13 (2)	08-09 (2)	21-00 (2)
		13-15 (1)	09-14 (1)	00-01 (1)
			14-16 (2)	22-00 (1)*
			16-17 (3)	
			17-18 (2)	
			18-19 (1)	
			22-00 (1)	
Western Africa	14-16 (1)	09-11 (1)	08-10 (1)	20-23 (1)
		11-13 (2)	13-15 (1)	23-02 (2)
		13-16 (3)	15-16 (2)	02-04 (1)
		16-17 (2)	16-17 (3)	01-03 (1)*
		17-18 (1)	17-18 (4)	
			18-20 (3)	
			20-21 (2)	
			21-23 (1)	
Eastern & Central Africa	13-15 (1)	11-13 (1)	13-15 (1)	21-02 (1)
		13-15 (2)	15-17 (2)	
		15-16 (1)	17-18 (3)	
			18-19 (2)	
			19-21 (1)	



JOIN ARRL

BENEFITS FOR YOU

QST, QSL Bureau Awards, Low Cost Insurance Operating Aids, Government Liaison and More—Much More!

MEMBERSHIP APPLICATION

Name _____ Call _____

Street _____

City _____ Prov./State _____ PC/ZIP _____

\$30 in U.S. \$42 elsewhere (U.S. funds) Persons age 65 or over, upon submitting proof of age, may request the special dues rate of \$24 in the U.S., \$36 elsewhere in U.S. funds. Licensed amateurs age 21 and younger may qualify for special rate, write for application. For postal purposes, fifty percent of dues is allocated to QST, the balance for membership.

VISA, MC, AMEX, Discover # _____

Signature _____ Expires _____

The American Radio Relay League

225 Main St. Newington, CT. 06111 USA

CQ

TOLL FREE

1-800-666-0908

PRICING AND ORDERS ONLY

KENWOOD



SAVE! Manufacturers Coupons

CALL FOR ALL KENWOOD

YAESU

FT-890AT
FT-890
FT-1000

NEW!



SAVE! Manufacturers Coupons

CALL FOR ALL YAESU RADIOS & ACCESSORIES

ICOM



SAVE! Manufacturers Coupons

NEW!

CALL FOR ALL ICOM

AZDEN



STANDARD



ALINCO



SAVE!

AEA • ASTRON • AZDEN • COMET
 • CUSHCRAFT • DIAMOND
 • KANTRONICS • MFJ • SANGEAN
 • SONY SHORTWAVE • DRAKE
 GRUNDIG • MANY MORE...

NEW EQUIPMENT PRICING AND ORDERS 1-800-666-0908 OUT OF STATE
 TECHNICAL, USED GEAR, INFO 203-666-6227 24HR FAX 203-667-3561

Hours:

LENTINI COMMUNICATIONS INC.

M-F 10-6,
 SAT. 10-4

21 GARFIELD STREET, NEWINGTON, CT 06111



C.O.D.s
OK

Same Day
Shipping

CIRCLE 65 ON READER SERVICE CARD

Looking to challenge your building skills?
 Want to explore beyond Amateur communications?

Well here's the publication for YOU!

COMMUNICATIONS QUARTERLY, the journal of communications technology. You are invited to become part of an elite group of Radio Amateurs and technical professionals as a subscriber. Circulation will be strictly limited.

Each quarterly has approximately 100 pages of technical material; advertising is limited. Articles flow from page to page, without the interruption of ads placed in the middle. The open layout accentuates each author's work and lets you make notes, calculations, or comments for later reference. Graphs, photos, computer program listings, and charts are presented in an easy-to-use format.

COMMUNICATIONS QUARTERLY is printed on a high-quality stock and "perfect bound" (square backed). It is such a valuable resource, you'll want to file each copy away in your technical archives for future reference. In fact, over time you'll find much of what is presented in COMMUNICATIONS QUARTERLY will become the standard in the Amateur and professional communications field.

Act now. Subscribe today!

1 year - \$29.95 Foreign 1 year - \$39.95
 2 years - 56.95 Foreign 2 years - 76.95
 Foreign Air Mail 1 year- \$ 60.00
 Foreign Air Mail 2 years - 118.95
 MasterCard/VISA/American Express accepted

CQ Communications, Inc., 76 North Broadway,
 Hicksville, NY 11801
 Phone: 516-681-2922

The XP-706 Multiband Antenna

In the final analysis quality is less expensive

The unique design of the XP-706 antenna system gives you MONO-BAND PERFORMANCE in a Multiband beam. The antenna USES NO TRAPS or loading coils that rob power and limit bandwidth. Sommer Antennas use the FULL surface area of the elements on ALL bands.

The result: "REGARDLESS OF DISTANCE, SINGLE HOP OR LONG PATH, MY SIGNAL WAS ONE TO THREE S-UNITS BETTER WITH 100 WATTS THAN STATIONS RUNNING LINEARS INTO CONVENTIONAL ANTENNAS."

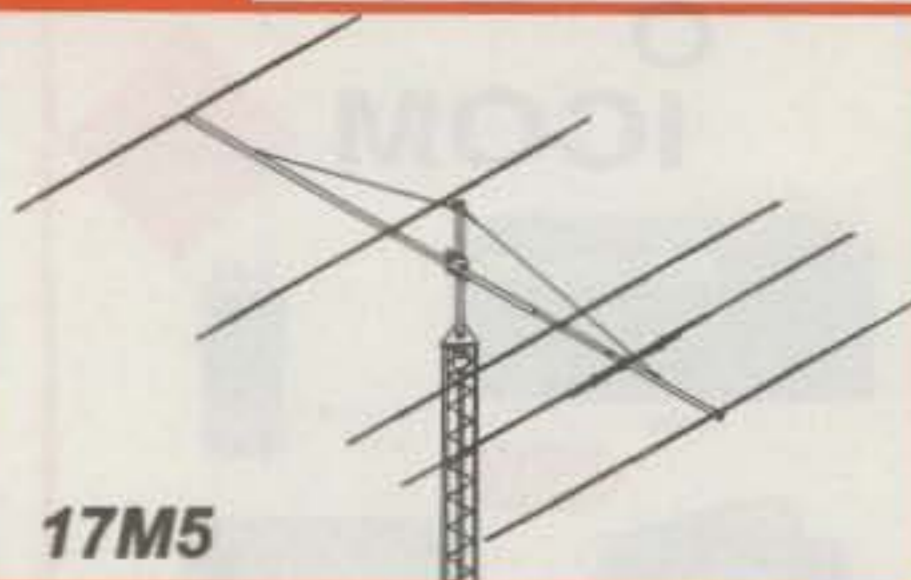
NIEJF in a review about our XP 706 in 73 magazine, 4/1987

The German Antenna only from



395 W. Osceola Road
 P.O. Box 710
 Geneva, FL 32732
 Phone: 407-349-9114
 FAX 407-349-2485

M² 17 METERS ???????



17M5

The word is getting around: 17 meters is the hot spot for HF DX. If you haven't explored this easygoing, uncrowded band, you're in for a big surprise...and, surprise, M2 has **two** high performance beams designed specifically for 17 Meters: the three element 17M3 and the five element 17M5. Both feature computer optimized gain, CNC machined components, stainless steel hardware and 100 MPH wind survival ratings. From S-band to 80 meters, M2 offers over 60 distinctive antennas for adventure and exploration. **WRITE, CALL OR FAX FOR OUR NEW ILLUSTRATED CATALOG!**



M² 7560 N. Del Mar Ave.
Fresno, CA 93711
(209) 432-8873 FAX: 432-3059

CIRCLE 72 ON READER SERVICE CARD

1691 MHz Weather Satellite System

1691 MHz HEMT Pre-amp.
model TS-1691-PAMP.....\$250

1691 MHz Receiver
model TS-1691-RECVR.....\$450

Decoder Board & Software
model TS-VGA-SAT4.....\$349

Low Loss Coaxial Cable
(65 ft) with connectors.....\$65
other lengths available

Track II IBM Satellite Orbital
Program Tracks All Satellites,
World Map, Print Out.....\$99

1691 MHz Loop-Yagi Antenna
model 1691-LY(N).....\$99

Demonstration Disc (IBM-PC VGA
compatible) of signals recorded from
WX-SAT system.....\$3

Shipping: FOB Concord, Mass.
Prices subject to change without notice.
Write for details.



SPECTRUM INTERNATIONAL, INC.



Post Office Box 1084-Dept.-Q
Concord, Mass. 01742, U.S.A.
Phone: (508) 263-2145
Fax: (508) 263-7008

CIRCLE 126 ON READER SERVICE CARD

Southern Africa	11-14 (1)	09-11 (1) 11-13 (2) 13-15 (3) 15-16 (2) 16-17 (1)	08-10 (1) 13-15 (1) 15-18 (2) 18-19 (3) 19-20 (2) 20-21 (1) 23-01 (1)	19-22 (1) 22-00 (2) 00-02 (1) 23-01 (1)*
Central & South Asia	Nil	09-11 (1) 18-20 (1)	07-08 (1) 08-10 (2) 10-12 (1) 19-22 (1)	05-07 (1) 20-23 (1)
Southeast Asia	Nil	10-12 (1) 14-16 (1) 18-20 (1)	07-08 (1) 08-10 (2) 10-12 (1) 16-18 (1) 20-22 (1)	06-08 (1)
Far East	Nil	09-11 (1) 18-20 (1)	08-09 (1) 09-10 (2) 10-12 (1) 17-19 (1) 19-21 (2) 21-23 (1)	06-08 (1)
South Pacific & New Zealand	15-18 (1)	11-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-20 (1)	07-08 (1) 08-11 (2) 11-14 (1) 16-20 (1) 20-00 (2) 00-04 (1)	01-02 (1) 02-03 (2) 03-06 (3) 06-09 (2) 03-04 (1)* 04-06 (2)* 06-07 (1)*
Australasia	17-19 (1)	14-17 (1) 17-19 (2) 19-20 (1)	07-08 (1) 08-10 (2) 10-12 (1) 14-16 (1) 16-18 (2) 18-21 (1) 21-00 (2) 00-02 (1)	02-04 (1) 04-06 (2) 06-07 (3) 07-08 (2) 08-09 (1) 04-05 (1)* 05-06 (2)* 06-07 (1)*
Caribbean, Central America & Northern Countries of South America	11-14 (1) 14-17 (2) 17-18 (1)	09-10 (1) 10-13 (2) 13-15 (3) 15-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	07-08 (1) 08-09 (3) 09-10 (4) 10-15 (2) 15-17 (3) 17-19 (4) 19-21 (3) 21-22 (2) 22-00 (1)	19-20 (1) 20-21 (2) 21-04 (4) 04-06 (3) 06-07 (2) 07-08 (1) 21-23 (1)* 23-04 (2)* 04-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina and Uruguay	14-15 (1) 15-17 (2) 17-18 (1)	09-10 (1) 10-11 (2) 11-14 (1) 14-16 (2) 16-18 (3) 18-19 (1)	07-08 (1) 08-10 (2) 10-11 (1) 14-16 (1) 16-18 (2) 18-19 (3) 19-20 (4) 20-21 (3) 21-23 (2) 23-00 (1)	21-00 (1) 00-05 (2) 05-07 (1) 01-06 (1)*
McMurdo Sound, Antarctica	Nil	16-18 (1)	18-20 (1) 20-23 (2) 23-01 (1) 08-09 (1)	00-03 (1) 03-05 (2) 05-07 (1) 04-06 (1)*

Time Zones: CDT and MDT (24-Hour Time System) CENTRAL USA TO:

Reception Area	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Central Europe & North Africa	10-14 (1)	10-14 (1)	07-08 (1) 08-10 (2) 10-13 (1) 13-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	18-20 (1) 20-23 (2) 23-01 (3) 01-02 (2) 02-03 (1) 21-23 (1)* 23-01 (2)* 01-02 (1)*
Northern Europe & European CIS	Nil	10-13 (1)	07-08 (1) 08-10 (2) 10-12 (1) 12-15 (2) 15-17 (1) 21-23 (1)	20-23 (1) 23-01 (2) 01-02 (1) 22-01 (1)*
Eastern Mediterranean & Middle East	10-13 (1)	10-13 (1)	07-08 (1) 08-09 (2) 09-15 (1) 15-17 (2) 17-18 (1) 21-23 (1)	20-23 (1) 21-23 (1)*
Western Africa	12-14 (1)	09-11 (1) 11-13 (2) 13-15 (3) 15-16 (2) 16-17 (1)	07-09 (1) 13-15 (1) 15-16 (2) 16-19 (3) 19-20 (2) 20-22 (1)	20-23 (1) 23-01 (2) 01-02 (1) 23-01 (1)*

Eastern & Central Africa	Nil	12-16 (1)	07-09 (1) 13-16 (1) 16-19 (2) 19-20 (1)	21-00 (1)
Southern Africa	11-13 (1)	09-10 (1) 10-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	07-09 (1) 12-14 (1) 14-16 (2) 16-18 (3) 18-19 (2) 19-20 (1) 22-00 (1)	20-21 (1) 21-23 (2) 23-01 (1) 21-23 (1)*
Central & South Asia	Nil	18-21 (1)	07-08 (1) 08-10 (2) 10-12 (1) 18-21 (1)	06-08 (1) 19-21 (1)
Southeast Asia	Nil	17-19 (1)	07-08 (1) 08-10 (2) 10-13 (1) 18-22 (1)	05-08 (1)
Far East	Nil	15-17 (1) 17-19 (2) 19-20 (1)	07-08 (1) 08-10 (3) 10-11 (2) 11-13 (1) 17-19 (1) 19-22 (2) 22-00 (1)	03-05 (1) 05-07 (2) 07-09 (1) 06-08 (1)*
South Pacific & New Zealand	14-18 (1)	10-13 (1) 13-16 (2) 16-18 (3) 18-19 (2) 19-20 (1)	06-08 (1) 08-10 (3) 10-12 (2) 12-18 (1) 18-20 (2) 20-22 (3) 22-00 (2) 00-02 (1)	00-01 (1) 01-07 (3) 07-08 (2) 08-09 (1) 02-04 (1)* 04-07 (2)* 07-08 (1)*
Australasia	16-18 (1)	13-16 (1) 16-19 (2) 19-21 (1)	05-07 (1) 07-08 (2) 08-10 (3) 10-13 (2) 13-17 (1) 17-18 (2) 18-20 (1) 20-23 (2) 23-01 (1)	02-03 (1) 03-05 (2) 05-07 (3) 07-08 (2) 08-09 (1) 05-06 (1)* 06-07 (2)* 07-08 (1)*
Caribbean, Central America & Northern Countries of South America	11-13 (1) 13-16 (2) 16-18 (1)	09-10 (1) 10-11 (2) 11-13 (3) 13-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-08 (3) 08-10 (4) 10-12 (3) 12-15 (2) 15-17 (3) 17-19 (4) 19-21 (3) 21-22 (2) 22-00 (1)	19-20 (1) 20-21 (2) 21-01 (3) 01-05 (4) 05-06 (3) 06-07 (2) 07-08 (1) 20-23 (1)* 23-05 (2)* 05-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	14-15 (1) 15-17 (2) 17-18 (1)	09-10 (1) 10-11 (2) 11-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	07-08 (1) 08-09 (2) 09-11 (1) 13-16 (1) 16-18 (2) 18-19 (3) 19-20 (4) 20-22 (3) 22-00 (1)	21-00 (1) 00-04 (2) 04-06 (1) 01-05 (1)*
McMurdo Sound, Antarctica	Nil	16-18 (1)	17-20 (1) 20-23 (2) 23-01 (1) 08-10 (1)	00-03 (1) 03-05 (2) 05-07 (1) 04-06 (1)*

Time Zone: PDT (24-Hour Time System) WESTERN USA TO:

Reception Area	10 Meters	15 Meters	20 Meters	40/80* Meters
Western Europe & North Africa	Nil	10-12 (1)	07-08 (1) 08-10 (2) 10-13 (1) 13-15 (2) 15-16 (1) 22-00 (1)	20-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Central & Northern Europe & European CIS	Nil	10-12 (1)	08-09 (1) 09-10 (2) 10-12 (1) 12-14 (2) 14-16 (1) 22-00 (1)	20-00 (1)
Eastern Mediterranean & Middle East	Nil	10-12 (1)	08-12 (1) 12-14 (2) 14-16 (1) 20-22 (1)	20-23 (1)

Western & Central Africa	12-14 (1) 13-15 (2) 15-16 (1)	10-13 (1) 13-15 (2) 15-16 (1)	07-08 (1) 08-09 (2) 09-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	21-00 (1)
Eastern Africa	Nil	13-15 (1)	07-09 (1) 13-15 (1) 15-17 (2) 17-19 (1) 21-23 (1)	20-22 (1)
Southern Africa	11-15 (1)	11-15 (1)	07-09 (1) 12-14 (1) 14-18 (2) 18-19 (1) 22-00 (1)	19-22 (1)
Central & South Asia	Nil	17-19 (1)	08-09 (1) 09-11 (2) 11-13 (1) 17-19 (1) 19-21 (2) 21-22 (1)	06-08 (1) 19-21 (1)
Southeast Asia	Nil	16-19 (1)	07-08 (1) 08-10 (3) 10-11 (2) 11-12 (1) 21-22 (1) 22-00 (2) 00-01 (1)	01-03 (1) 03-06 (2) 06-08 (1) 03-06 (1)*
Far East	16-19 (1)	14-16 (1) 16-19 (2) 19-20 (1)	07-08 (1) 08-10 (3) 10-13 (2) 13-20 (1) 20-21 (2) 21-22 (3) 22-23 (2) 23-01 (1)	01-03 (1) 03-08 (2) 08-09 (1) 03-07 (1)*
South Pacific & New Zealand	13-15 (1) 15-17 (2) 17-18 (1)	11-15 (1) 15-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	14-18 (2) 18-20 (3) 20-22 (4) 22-23 (3) 23-01 (2) 01-07 (1) 07-08 (2) 08-10 (3) 10-11 (2) 11-14 (1)	21-22 (1) 22-23 (2) 23-00 (3) 00-05 (4) 05-07 (3) 07-08 (2) 08-09 (1) 23-02 (1)* 02-06 (2)* 06-07 (1)*
Australasia	15-17 (1)	13-16 (1) 16-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	17-19 (1) 19-20 (2) 20-00 (3) 00-03 (2) 03-07 (1) 07-08 (2) 08-10 (3) 10-12 (2) 12-13 (1)	01-02 (1) 02-03 (2) 03-06 (3) 06-08 (2) 08-09 (1) 02-04 (1)* 04-06 (2)* 06-07 (1)*
Caribbean, Central America & Northern Countries of South America	11-13 (1) 13-15 (2) 15-17 (1)	08-09 (1) 09-12 (2) 12-14 (3) 14-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	07-08 (1) 08-09 (2) 09-10 (3) 10-15 (2) 15-17 (3) 17-19 (4) 19-21 (3) 21-23 (2) 23-00 (1)	19-21 (1) 21-02 (3) 02-04 (2) 04-07 (1) 20-22 (1)* 22-03 (2)* 03-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina, & Uruguay	13-14 (1) 14-16 (2) 16-17 (1)	09-10 (1) 10-11 (2) 11-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	08-10 (1) 13-15 (1) 15-17 (2) 17-20 (4) 20-21 (3) 21-22 (2) 22-00 (1)	21-23 (1) 23-02 (2) 02-04 (1) 00-03 (1)*
McMurdo Sound, Antarctica	Nil	16-19 (1)	07-10 (1) 17-19 (1) 19-20 (2) 20-22 (3) 22-00 (2) 00-01 (1)	01-03 (1) 03-05 (2) 03-05 (2) 03-06 (1)*

#See explanation in "How To Use Short-Skip Charts" in box at the beginning of these charts.
 Note: Alaska and Hawaii Propagation Charts are intended for distances greater than 1300 miles. For shorter distances, use the preceding Short-Skip Propagation Chart.
 *Indicates best times to listen for 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher.
 **Indicates best times to listen for F-2 layer openings on 6 meters.
 For 12 meter openings interpolate between 10 and 15 meter openings.
 For 17 meter openings interpolate between 15 and 20 meter openings.
 For 30 meter openings interpolate between 40 and 20 meter openings.

POWER POCKET

12V/2.0 Amp Hours of dependable power, in a convenient soft case. Simply insert the cigarette adapter plug normally used in your car's lighter to instead plug into the POWER POCKET. The POWER POCKET provides hours of extended talk time, up to 6 times longer than standard battery packs!

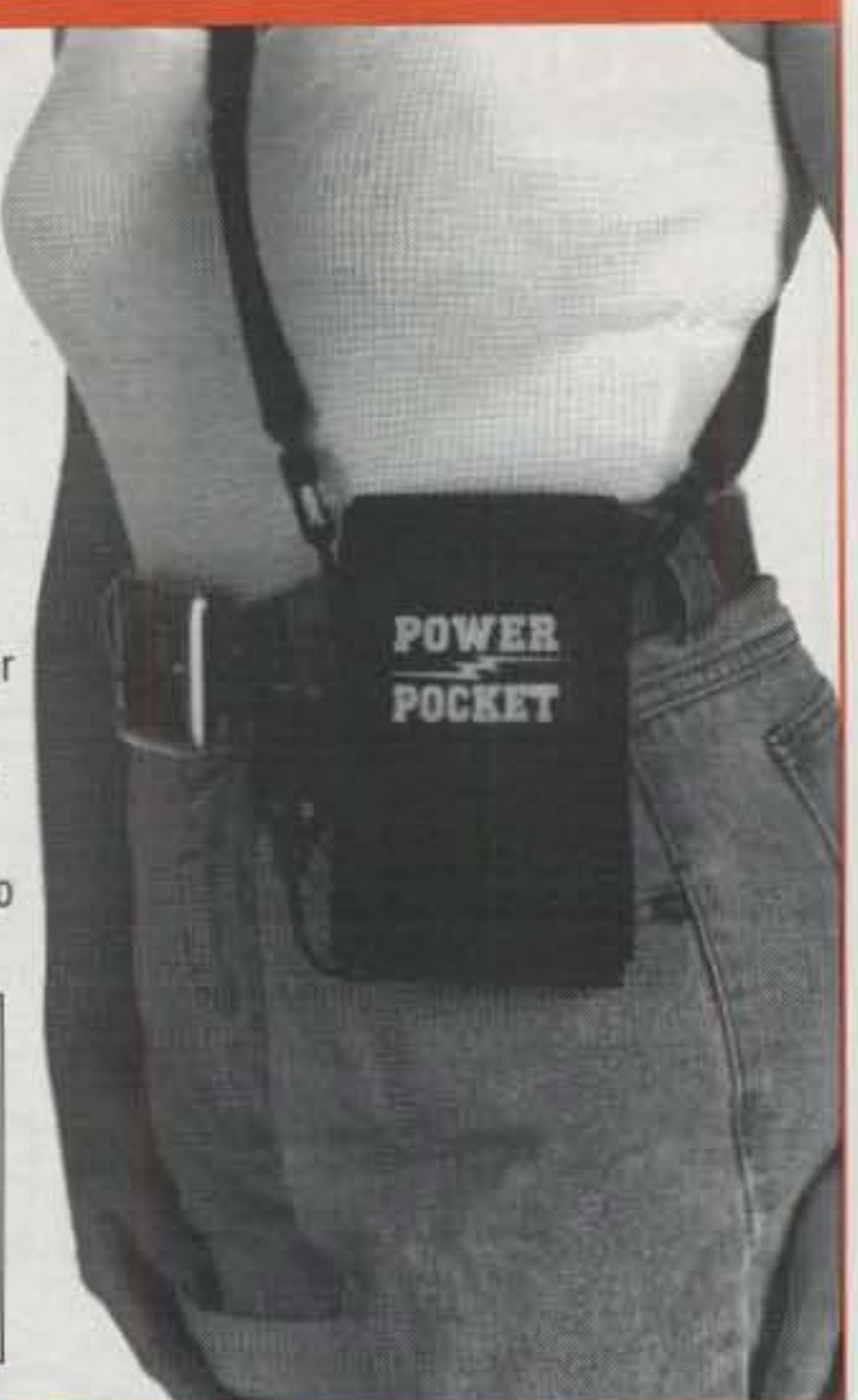
- Emergencies - Special Events - Search & Rescue - Hiking - Cycling - Hamfests - Field Day - Etc.

Without power, your HT is useless! Don't be caught without a POWER POCKET when you need it most.

- Compact slim design that is light weight, only 30 ozs., with a belt loop and shoulder strap included.
- 110V Wall Charger included. Charge rate: 6-8 hours from complete discharge.
- Sealed lead acid case, can be recharged to 100% without memory effect of NiCads.

The POWER POCKET is available from most major Amateur Radio Dealers, or contact:

NCG COMPANY
 1275 N. Grove Street
 Anaheim, CA 92805
 (800) 962-2611
 (714) 630-4541
 Fax (714) 630-7024



CIRCLE 78 ON READER SERVICE CARD

KENT MORSE KEYS

Available In Assembled Or Self Assembly Form



Call Or Write For Details On Our Full Range Of Keys.



R.A. Kent [Engineers]
 P.O. Box 809
 Mount Ida
 AR 71957-0809
 Tel: (501) 867-4550



SAM Amateur Radio Callsign Database

Find Hams quickly and easily by Callsign or by Name. Search for a specified City, State, or Zip Code. Print with standard or customized output. Ideal for mailing lists, QSL's etc. **NEW FOR '94**, search filters that allow you to specify FIRST NAME, LICENSE CLASS, AGE, ADDRESS, or CALL SUFFIX, AREA, OR PREFIX.

SAM Option files include County Cross Reference, License Expiration Date, Full Date of Birth, Previous Calls and Date First Licensed

Requires IBM Compatible PC, 17.5 MB of hard drive space, and high-density floppy drive.

NOW AVAILABLE ON CD-ROM

Disk Version \$39.95 CD-ROM \$39.95
 SAM OPTIONS \$7.50 each
 Shipping and Handling \$5.00

RT SYSTEMS, INC
 8207 STEPHANIE DRIVE, HUNTSVILLE, AL 35802
 1-800-723-6922 or 1-205-882-9292
 Visa, MasterCard or Discover

BATTERIES

Nickel-Cadmium, Alkaline, Lithium, Sealed Lead Acid For Radios, Computers, Etc. And All Portable Equipment

YOU NEED BATTERIES? WE'VE GOT BATTERIES!
 CALL US FOR FREE CATALOG



E.H.YOST & CO.
 7344 TETIVA RD.
 SAUK CITY, WI 53583
 (608) 643-3194
 FAX 608-643-4439

CIRCLE 139 ON READER SERVICE CARD

HAM VIEW PRODUCTS MULTI MEDIA WINDOWS SOFTWARE

It Speaks!!
 DX From Tango India Two Kilo on Fifteen Meters CW



- Log View V5 \$70 Contest Support, HYPER TEXT HELP, Powerful Report Formats, Morse Keyer, Award Tracking, Labels, Cards, Bearing, Distance, Talks to Pack View & Rig View
- V5 Upgrade \$40
- Pack View V2 \$30 Now with Voice & Morse Announce, Upload and Download Text, Autospot, Advanced Prefix/Band/Mode Filters, 48 programmable macro keys.....
- New V2 Upgrade \$20
- Rig View (TS,IC,FT) \$30 Mouse Tuner Encoder, Command Keys.....
- Package Deal \$110 Log View, Pack View & one Rig View

PDK INC, Paul Keezer, NX1P, TEL (508)649-4360 (BBS Support)
 46 Oak St., Dunstable MA. 01827 US shipping included, \$8 elsewhere

CIRCLE 82 ON READER SERVICE CARD

ICOM • ICOM • ICOM • ICOM • ICOM

ICOM



IC-737A
All Band All Mode
HF Transceiver

HF BASE
HANDHELDS
V/UHF MOBILES
RECEIVERS
ALL YOUR FAVORITE
ACCESSORIES



IC-281H
2M Mobile



IC-W21AT
New
2M/440MHz
Handheld

The Radio Place

5675A Power Inn RD. Sacramento CA. 95824

916-387-0730 Mon.-Fri. 9-5:30PT Sat. 10-5:30PT Fax 916-387-0744



CIRCLE 98 ON READER SERVICE CARD

QSLs by
FREE SAMPLES - STAMPS APPRECIATED
NOW \$24.95
1000 QSLs from
682 MT. PLEASANT RD., MONETTA, SC 29105
W4MPY

PAY TV AND SATELLITE DESCRAMBLING
all new info VOLUME 6 all new info
* Volume 6 — our best yet — details all known fixes for all cable, wireless and satellite systems. Many do-it-yourself. Schematics included. Only \$15.95
• Pay TV Volumes 1-5 (all different) • Hacker Video (VHS)
• Wireless Cable Hacking • Build Satellite Systems (includes DBS)
• Compleat Wizzard (VC2+) All these titles \$15.95 each 3/\$34.95 5/\$52.95
• Monthly Newsletter \$29.95/yr. • New Catalog \$1
• All our info \$129.95
SCRAMBLING NEWS
1552 HERTEL AVE., #123 BUFFALO, NY 14216
Voice/FAX/BBS (716) 874-2088 C.O.D.'s are OK. Add \$6

1 ANTENNA - 9 BANDS
NO TRAPS - LOW SWR
CHOOSE BETWEEN 500W OR 2KW VERSIONS. INSTALL HORIZONTALLY OR AS AN INVERTED VEE. SWR USUALLY BETTER THAN 1.5:1 ON MOST BANDS. OUR SPECIAL BALUN MATCHES YOUR 50 OHM FEED LINE TO OUR HIGH IMPEDANCE OFF CENTER FED WINDOM ANTENNA. ALL ANTENNAS COME WITH A 3 YEAR LIMITED WARRANTY AND A 10 DAY MONEY BACK GUARANTEE. WRITE FOR YOUR FREE DATA REPORT TODAY. SHOWS TECHNICAL DATA, ACTUAL SWR CURVES, CUSTOMER COMMENTS AND OUR LOW LOW FACTORY DIRECT CANADIAN PRICES.
GARANTENNAS
RR #14 MAPLEWARD ROAD
THUNDER BAY, ONTARIO
P7B 5E5
PHONE (807) 768-8164

CIRCLE 41 ON READER SERVICE CARD

TOWER-MATETM
Accessory Pouch
Only \$15.95
Never Enough Pockets when working on a Tower Project?
Use the all new "BIG POCKET!"
• Great time saver!
• Easy to Use.
• Easily attaches inside tower with Velcro fasteners.
• Creates the perfect place for those bolts, tools, and other parts.
TM 25 fits "Rohn 25" or similar \$15.95 ea.
TM 45 fits "Rohn 45/55" or similar \$19.95 ea.
S&H \$3.00 (DX \$5.00)
Order Today Call (916) 482-4018
Fax Orders Welcome
FAX (916) 481-5381
P.O. Box 601616, Sacramento, CA 95860-1616

CIRCLE 127 ON READER SERVICE CARD

around sunrise and sunset, but they will occur at other times as well.

VHF Ionospheric Openings

Although summertime sporadic-E ionization is expected to fall off considerably during September and early October, an occasional 6 meter short-skip opening may still be possible over distances ranging between approximately 1000 and 1300 miles. The best time to check is before noon and during the early evening.

There is usually an increase in auroral activity during an equinoctial period, so look for some fairly frequent 6 and 2 meter auroral-type openings. The best times for such openings are when conditions on the HF bands are Below Normal or Disturbed. Check the Last Minute Forecast at the beginning of this column for those days that are likely to be in these categories during September.

No major meteor showers are expected during September, so few, if any, meteor-scatter-type openings are likely on the VHF bands this month.

Conditions for trans-equatorial (or TE) scatter propagation also usually peak during equinoctial periods. However, in the present period of low solar activity, TE openings are likely to be considerably less numerous than in previous years. Some 10, 12, and perhaps a rare 6 meter opening may be possible by this propagation mode between the southern tier states and deep South America. The best time to check for TE openings is between 8 and 11 PM local time. Openings are usually of fairly short duration, and signals can vary between very weak and watery to fairly strong, with some degree of flutter fading almost always present.

CQ DX Contest Special 1994

The 1994 contest weekends will mark the 44th consecutive CQ WW DX Contest for which this column has contained special propagation forecasts. This year's contest weekends are:

October 29-30—SSB Section
November 26-27—CW Section

In the tradition of the past 43 years, there will appear in next month's "Propagation" column a special, comprehensive forecast that will focus on both sections of the contest. Besides the latest updated propagation predictions to all areas of the world, the column will also contain pointers for scoring as many points as possible.

73, George, W3ASK

Copy W1AW at the Flick of a Switch

You or your club will enjoy building this crystal controlled receiver for code practice and news bulletins from W1AW. Choose the 80, 40 or 20 meter R1 kit as appropriate for your location. See details in the February 1993 QST.

(Wired and tested receivers, Club quantity discount and individual components are available.)



RADIO ADVENTURES CORP

Main Street, Seneca, PA 16346
(814) 677-7221



\$29.95
Kit

\$49.95
Wired & Tested

+3.25 Ship PA residents add 6% sales tax.

CIRCLE 42 ON READER SERVICE CARD

ALL AMPS ARE NOT CREATED EQUAL!



Competitors may settle for someone else's off-the-shelf components - not TEN-TEC. We hand build our own variable capacitors and all coils in plate tuning network.

No compromises. We even wind our own Hypersil[®] transformers and individually match every rectifier for recovery time.

QSK is not an option. It's built-in! CW and AMTOR is a dream. SSB operators will love the lightning fast, smooth operation.

Extensive metering monitors average and peak power simultaneously. Includes 160 and WARC.

TITAN

- 1500 watts, all modes from pair 3CX800
- Unique Pi-L Network provides the easiest, broadest tuning you'll ever use.
- Vacuum Relay
- Compact RF deck conserves space. Separate power supply with 41 lb behemoth transformer.
- Grid current limiting protects your tubes.
- 3 year limited warranty • Factory Direct \$3195.00*

CENTURION

- 1300 watts PEP, 1000 watts CW. pair 3-500Z
- Best value in its price class.
- Instant ON, no warmup
- Built-in "hot" switching protection
- Factory Direct \$1795.00*
- W/O tubes \$1495.00*

HERCULES II

- 550 watts, all modes. Solid State. No Tuning Required
- General Coverage, ideal for CAP, MARS
- Mobile or Base, uses 13.5 VDC directly from battery or optional power supply
- Use remote with a TEN-TEC rig or optional Remote Head
- Factory Direct \$1395.00*

America's Best

TEN-TEC

1185 Dolly Parton Parkway
 Sevierville, TN 37862 U.S.A.
 Office: (615) 453-7172
 Fax: (615) 428-4483
 Repair Dept.: (615) 428-0364

**ORDER FACTORY DIRECT HOTLINE
 CALL 1-800-833-7373**

Telephone Hours: 9:00 AM -5:30 PM Eastern

**Now taking trades on used TEN-TEC gear.
 Reconditioned used gear for sale.**

VISA, MASTERCARD, DISCOVER
 UNDER GSA CONTRACT Government / Commerical Inquiries Invited

- Buy Direct and Get the Factory Price
- No-Risk 30 Day Money-Back Guarantee**
- Expert Advice
- Legendary Service

*Plus shipping and handling
 **Customer pays shipping both ways

**MADE IN
 USA**

Announcing:

The 1994 CQ WW DX Contest

**Phone: October 29–30
Starts 0000 GMT Saturday**

**CW: November 26–27
Ends 2400 GMT Sunday**

I. OBJECTIVE: For amateurs around the world to contact other amateurs in as many zones and countries as possible.

II. BANDS: All bands, 1.8 through 28 MHz, except for WARC bands.

III. TYPE OF COMPETITION (choose only one):

For all categories, all transmitters must be located within a 500 meter diameter or within the property limits of the station licensee's address, whichever is greater. All antennas used by the entrant must be physically connected by wires to the transmitters and receivers used by the entrant.

1. **Single Operator Categories:** Single band or all band; only one signal allowed at any one time; the operator can change bands at any time.

a. **Single Operator High:** Those stations at which one person performs all of the operating, logging, and spotting functions. The use of DX alerting assistance of any kind places the station in the Single Operator Assisted category.

b. **Single Operator Low:** Same as 1(a) except that the output power shall not exceed 100 watts (see rule XI. 11).

c. **QRPp:** Same as 1(a) except that the power output must not exceed 5 watts (see rule XI.11).

2. **Single Operator Assisted:** Single operator stations are those at which one person performs all of the operating and logging functions. The use of DX spotting nets or any other form of DX alerting assistance is allowed.

3. **Multi-Operator** (all band operation only):

a. **Single Transmitter:** Only one transmitter and one band permitted during any 10-minute period. Exception: One—and only one—other band may be used during any 10-minute period if—and only if—the station worked is a new multiplier. Logs found in violation of the 10-minute rule will be automatically reclassified as multi-multi.

b. **Multi-Transmitter:** No limit to transmitters, but only one signal and running station allowed per band.

4. **Team Contesting:** A team consists of any five radio amateurs operating in the single operator category. A person can be on only one team per mode. Competing on a team will not prevent any team member from submitting his personal score for a radio club. A team score will be the sum of all the team member scores. SSB and CW teams are totally separate. That is, a member of an SSB team can be on a totally different CW team. A list of a team's members must be received at CQ Headquarters by the time the contest begins. Mail or FAX the list to CQ, Att: Team Contest, 76 North Broadway, Hicksville, NY 11801 U.S.A.; FAX 516-681-2926. Awards will be given to the top teams on each mode.

IV. NUMBER EXCHANGE: Phone: RS report plus zone (i.e., 5705). CW: RST report plus zone (i.e., 57905).

V. MULTIPLIER: Two types of multiplier will be used.

1. A multiplier of one (1) for each different zone contacted on each band.

2. A multiplier of one (1) for each different country contacted on each band.

Stations are permitted to contact their own country and zone for multiplier credit. The CQ Zone Map, DXCC country list, WAE country list, and WAC boundaries are standards. Maritime mobile stations count only for zone multiplier.

VI. POINTS: 1. Contacts between stations on different continents are worth three (3) points.

2. Contacts between stations on the same continent but different countries, one (1) point. *Exception:* For North American stations only, contacts between stations within the North American boundaries count two (2) points.

3. Contacts between stations in the same country are permitted for zone or country multiplier credit but have zero (0) point value.

VII. SCORING: All stations: the final score is the result of the total

QSO points multiplied by the sum of your zone and country multiplier.

Example: 1000 QSO points × 100 multiplier (30 Zones + 70 Countries) = 100,000 (final score).

VIII. AWARDS: First-place certificates will be awarded in each category listed under Sec. III in every participating country and in each call area of the United States, Canada, European Russia, and Japan.

All scores will be published. To be eligible for an award, a Single Operator station must show a minimum of 12 hours of operation. Multi-operator stations must operate a minimum of 24 hours. A single-band log is eligible for a single-band award *only*. If a log contains more than one band it will be judged as an all-band entry, unless specified otherwise.

In countries or sections where the returns justify, 2nd and 3rd place awards will be made.

All certificates and plaques will be issued to the licensee of the station used.

IX. TROPHIES & PLAQUES (Donors) PHONE

Single Operator, All Band

World—Dave Rosen, K2GM (WA2RAU Memorial)

World—Single Operator Assisted—Snake River Contest Club

World—Low Power—Slovenia Contest Club

World—QRPp—Doc Sayre, N7AVK

U.S.A.—Potomac Valley R.C. (KC8C Memorial)

U.S.A.—Low Power—North Coast Contesters

Canada—Niagara Frontier Int'l DX Association
(VE3WT Memorial)

Carib./C.A.—Alex M. Kasevich, VP2MM/W4

Europe—Potomac Valley R.C.—W4BVV Memorial

Europe—Low Power—Scott Jones, WR3G & Tim Duffy, K3LR

Africa—Gordon Marshall, W6RR

Asia—Japan CQ Publishing Company Ltd.

Japan—Japan Crazy Contesters Club

Oceania—Northern California DX Club

South America—Yankee Clipper Contest Club

Single Operator, Single Band

World—28 MHz—Joel Chalmers, KG6DX

World—21 MHz—French 21170 DX Net/LNDX
(FY5AN Memorial)

World—14 MHz—North Jersey DX Assn. (K2HLB Memorial)

World—7 MHz—Fred Laun, K3ZO (K7ZZ Memorial)

World—3.8 MHz—Fred Capossela, K6SSS

U.S.A.—28 MHz—Donald Thomas, N6DT

U.S.A.—21 MHz—Bill Gioia, K2EK

U.S.A.—14 MHz—Southern California DX Club

U.S.A.—7 MHz—Stanley Cohen, WD8QDQ

U.S.A.—3.8 MHz—Arnold Tamchin, W2HCW

U.S.A.—1.8 MHz—J. Bruce Siff, W2GBX

Carib./C.A.—Snake River Contest Club

Europe—28 MHz—Chod Harris, VP2ML

Europe—21 MHz—OH6JW Memorial

Europe—14 MHz—A.G. Anderson, GM3BCL

Europe—7 MHz—Roger Burt, N4ZC

Japan—28 MHz—Take Yokoyama, JL1BLW

Japan—21 MHz—DX Family Foundation

Multi-Operator, Single Transmitter

World—Southern California DX Club (W6AM Memorial)

U.S.A.—Carolina DX Association

Europe—Bob Cox, K3EST

Carib./C.A.—K3NA

Oceania—Junichi Tanaka, JH4RHF

THE OMNI-VI FEEDS ON WEAKLINGS
 THE OMNI-VI FEEDS ON WEAKLINGS
 THE OMNI-VI FEEDS ON WEAKLINGS
 THE OMNI-VI FEEDS ON WEAKLINGS



Even under the most crowded band conditions, the TEN-TEC Omni-VI receives the weakest signals loud and clear. Signals the competition can barely hear. In fact, the "weaklings" are the Omni-VI's meat and potatoes. That's because our advanced crystal mixing virtually eliminates phase noise. And the meticulous design provides much more *usable* dynamic range than the competition. But that's not all the remarkable Omni-VI has going for it.

- Superior receive selectivity eliminates the strongest interference from even the closest signals. And you can select the optimum amount of filtering for different band conditions.
- At the touch of a button, our proprietary DSP Automatic Notch Filter instantly and automatically eliminates interfering carriers in the passband. Not just one carrier, but *all* carriers.
- The fastest, most comprehensive PC Interface in the industry minimizes frustrating time between commands. And our renowned SPORT interface offers selectable 1,200 - 19,200 baud rates.
- The Omni-VI also has 100 memories and scratch pad, oven-stabilized time base, dual VFOs, +/-10 KHz offset receive and transmit, full or adjustable Semi QSK, iambic keyer and much more.
- Every TEN-TEC product comes with our legendary support. New owners speak directly to experienced hams, not to a machine.

Ask anyone who uses a TEN-TEC unit, and you'll begin to understand our customers' nearly fanatical loyalty. There are many reasons for it. And the superior performance of the Omni-VI is just one of them. At \$3,000, it would be a bargain. At just \$2,385, it's a steal. Order yours today, factory direct with our no-risk 30 day money-back guarantee. And start feeding on the weaklings.

FACTORY DIRECT \$2385*

- Buy Direct and Get the Factory Price
- No-Risk 30 Day Money-Back Guarantee**
- Expert Advice
- Legendary Service
- Now taking trade on used TEN-TEC gear.

ORDER FACTORY DIRECT HOTLINE
 CALL 1-800-833-7373

Telephone Hours: 9:00 AM - 5:30 PM Eastern

VISA, MASTERCARD, DISCOVER

UNDER GSA CONTRACT

Government/Commercial Inquires Invited



1185 Dolly Parton Parkway
 Sevierville, TN 37862 USA
 Office: (615) 453-7172
 Fax: (615) 428-4483
 Repair Dept.: (615) 428-0364

*Plus shipping and handling
 **Customer pays shipping both ways

Tour the factory and learn more about the
 OMNI-VI. TEN-TEC Video only \$10.00.
 Refundable with purchase of any
 transceiver or amplifier.

"America's Best"

Multi-Operator, Multi-Transmitter

World—W6QHS & KK6QM
 U.S.A.—Paul Hellenberg, KS9K
 Europe—Finnish Amateur Radio League

Contest Expeditions

World—Single Opr.—National Capitol DX Association
 (Stuart Meyer, W2GHK Memorial)
 World—Multi-Opr.—The German CDXG & SDXG
 (DJ3NG & DJ4EI Memorial)

Special—Single Operator Award

World—All Band Under 21 years old—Radio Bookstore

CW**Single Operator, All Band**

World—Albert Kahn, K4FW (W9IOP Memorial)
 World—Single Operator Assisted—Snake River Contest Club
 World—Low Power—Slovenia Contest Club
 World—QRPP—Gene Walsh, N2AA
 U.S.A.—Frankford Radio Club
 U.S.A.—Low Power—North Coast Contesters
 Canada—Canadian DX Association
 Carib./C.A.—Larry Brockman, N6AR
 Europe—Edward Bissell, W3AU
 Europe—Low Power—Scott Jones, WR3G & Tim Duffy, K3LR
 Africa—Gordon Marshall, W6RR
 Asia—Japan CQ Publishing Company Ltd.
 Japan—Japan Crazy Contesters Club
 Oceania—Maui Amateur Radio Club
 So. Amer.—Venezuela DX Club

Single Operator, Single Band

World—28 MHz—Joel Chalmers, KG6DX
 World—21 MHz—Don Busick, K5AAD (N5JJ Memorial)
 World—14 MHz—North Jersey DX Assn. (W2JT Memorial)
 World—7 MHz—Alex M. Kasevich, VP2MM/W4
 World—3.5 MHz—Fred Capossela, K6SSS
 World—1.8 MHz—Kenneth Byers, Jr., K4TEA
 U.S.A.—28 MHz—Michael Conatore, AA7NX
 U.S.A.—21 MHz—Wayne Carroll, W4MPY
 U.S.A.—14 MHz—Northern Illinois DX Association
 U.S.A.—7 MHz—Jan Perkins, N6AW (W6AM Memorial)
 U.S.A.—3.5 MHz—CQ Magazine
 U.S.A.—1.8 MHz—Peter Hutter, WW2Y
 Canada—Radio Amateurs of Canada
 Carib./C.A.—Snake River Contest Club
 Europe—28 MHz—Southern New England DX Club
 Europe—21 MHz—Robert Naumann, KR2J
 Europe—14 MHz—Maud Slater (G3FXB Memorial)
 Europe—7 MHz—Ivo Pezer, 5B4ADA/T93A
 Europe—3.5 MHz—Frankford Radio Club (K3VW Memorial)
 Europe—1.8 MHz—WA8YVR & N4TZ
 Japan—21 MHz—DX Family Foundation

Multi-Operator, Single Transmitter

World—Anthony Susen, W3AOH
 U.S.A.—Douglas Zwiebel, KR2Q
 Canada—Eastern Canadian DX Assn.
 Carib./C.A.—North Nevada DX Contest Club
 Europe—Friends of K3AO (K3AO Memorial)
 Africa—Ralph Bellas, Jr., K9ZO
 Oceania—Junichi Tanaka, JH4RHF

Multi-Operator, Multi-Transmitter

World—Hazard Reeves, K2GL Memorial
 World—SSB/CW Combined—Ehrhorn Technological Operations
 U.S.A.—Bob Ferrero, W6RJ (N6RJ Memorial)
 Europe—Finnish Amateur Radio League

Contest Expeditions

World—Single-Opr.—Yankee Clipper Contest Club
 World—Multi-Opr.—Bill Schneider, K2TT

Special—Single Operator Award

World—All Band—Under 21 years old—Radio Bookstore

Club

World—SSB/CW—CQ Magazine, W1WY Memorial
 Non-USA—SSB/CW—No. Calif. Contest Club—N6AUV Memorial
 A station winning a World Trophy will not be considered for a sub-area award. That trophy will be awarded to the runner-up of that area.

X. CLUB COMPETITION:

1. The club must be a local group and not a national organization.

2. Participation is limited to members operating within a local geographic area defined as within a 275 km radius from center of club area (except for DXpeditions especially organized for operation in the contest; club contributions of DXpedition scores are percentaged to the number of club members on the DXpedition).

3. To be listed, a minimum of 3 logs must be received from a club and an officer of the club must submit a list of participating members and their scores, both on phone and CW.

XI. LOG INSTRUCTIONS:

1. All times must be in GMT.
 2. All sent and received exchanges are to be logged.
 3. Indicate zone and country multiplier only the FIRST TIME it is worked on each band.
 4. Logs must be checked for duplicate contacts, correct QSO points and multipliers. Submitted logs must have duplicate contacts clearly shown.
 5. DISKS: Please send us your computer disk. IBM, MS-DOS compatible disks are required: The format we prefer is your CT.Bin file, for example HSØAC.BIN or your N6TR.DAT file or your .DBF files. If you use a different program than mentioned above, the generic format we want is a separate file, for each band, containing a vertical single column of calls in chronological order. The committee will require a disk for any possible high score on request. The outside of the disk should be labeled clearly with the Call of the entrant, the files included, the mode (SSB or CW), and the category. Disks **must** be accompanied by a paper log satisfying all logging instructions.

6. Use a separate sheet for each band.

7. Each entry must be accompanied by a summary sheet showing all scoring information, category of competition, contestant's name and address in BLOCK LETTERS, and a signed declaration that all contest rules and regulations for amateur radio in the country of operation have been observed.

8. Sample log and summary sheets and zone maps are available from CQ. A large self-addressed envelope with sufficient postage or IRC's must accompany your request.

If official forms are not available, make up your own 80 contacts to the page on 8½" x 11" paper.

9. All entrants are required to submit cross-check sheets (an alphabetical list of calls worked) for each band on which 200 or more QSOs were made. All other entrants are encouraged to submit cross-check sheets.

10. Duplicate contacts and broken calls penalty: up to 3%, three (3) additional contacts removed; over 3% is grounds for possible disqualification.

11. QRPP and low power stations must indicate same on their summary sheets and state the actual maximum power output used, with a signed declaration.

XII. DISQUALIFICATION: Violation of amateur radio regulations in the country of the contestant, or the rules of the contest; unsportsmanlike conduct; taking credit for excessive duplicate contacts; unverifiable QSOs; or unverifiable multipliers will be deemed sufficient cause for disqualification. Incorrectly logged calls will be counted as unverifiable contacts.

An entrant whose log is deemed by the Committee to contain a large number of discrepancies may be disqualified from eligibility for an award, both as a participant operator or station, for one year. If an operator is disqualified a second time within 5 years, he will be ineligible for any CQ contest awards for 3 years.

The use of non-amateur means such as telephones, telegrams, etc., to elicit contacts or multipliers **during** a contest is unsportsmanlike and the entry is subject to disqualification. Action and decisions of the CQ Contest Committee are official and final.

XIII. DEADLINE:

1. All entries must be postmarked NO LATER than December 1, 1994 for the Phone section and January 15, 1995 for the CW section. **Indicate phone or CW on the envelope.**

2. An extension of up to one month may be given if requested by letter or other means. The granted extension must be confirmed by letter sent to the contest director, must state a legitimate reason, and the request must be received before the log mailing deadline. Logs postmarked after the extension deadline may be listed in the results but will be declared ineligible for an award.

Both Phone and CW logs should be sent to CQ Magazine, 76 North Broadway, Hicksville, NY 11801.

DEMAND THE BEST



DR-600T (144 MHz/440 MHz)

The outstanding abilities of the DR-600T set it apart from every other radio. Features like Wide Frequency Coverage, Excellent Intermod Rejection, Direct Frequency Entry from the microphone, Three Output Power Selections, Autopatch Memories, and 6 Scanning Modes make the DR-600T the radio of choice for demanding users. The Remote Mount Head allows for custom installation in most any vehicle, and also helps to deter theft.

This road-ready rig can also be remote controlled by any radio that transmits DTMF tones. This remarkable feature allows the DR-600T to act as a full-featured Cross-Band Repeater. For added control, a security code can be programmed that will allow control only by the control operator (you).

DJ-G1T

The DJ-G1T 2m HT from ALINCO scores another "First" for Amateur Radio technology. Our new "Channel Scope" feature opens new doors for Ham operators. Now it is possible to visually monitor up to 7 memory channels at once with just a glance at the display.

Also, the Channel Scope feature can be used to show band activity in the frequency domain, much like a Digital Spectrum Analyzer. Hunting for band activity just got easier.

Other outstanding features include 440 Receive, 80 Memory channels, AM Aircraft receive, 5 Autodialer channels, DSQ for private paging, Cross-Band Semi-Duplex, 6 Scan Modes, and Odd Splits on all Memory Channels.

Better Products, Better Service.
See for yourself why people are
coming to ALINCO.

ALINCO
ALINCO ELECTRONICS INC.

438 Amapola Ave., #130,
Torrance, CA 90501
Phone: (310) 618-8616
Fax: (310) 618-8758

CIRCLE 165 ON READER SERVICE CARD

BRAND NEW FROM ALINCO

The brand new ALINCO DR-M06T 6-meter VHF FM mobile transceiver lets you broaden your scope of communication and enjoy sporadic E propagation. Easy programming and compact size are only a few of the outstanding features that bring the excitement of the 6-meter band directly to you. (FCC approval pending)

Super compact size!

5-3/5" (W) x 1-3/5" (H) x 4-3/5" (D)
Operational at 50 MHz - 54 MHz
with 10 Watts output.





CQ BOOK &



CQ 1994 Amateur Radio Almanac

If you're like most hams, you'll be fascinated by the thousands of facts, tables, graphs, maps, and other information to be uncovered in the CQ 1994 Amateur Radio Almanac. Compiled by Doug Grant, K1DG, CQ's Almanac puts it all right at your fingertips, providing a resource that you'll refer to over and over again. If you're looking for it, it's in the Almanac! **Order No. BALM\$19.95**

The VHF "How To" Book

This book is the perfect operating guide for both the new and experienced VHF enthusiast. Developed by CQ VHF Columnist, Joe Lynch, N6CL, this book is the ideal reference tool for all phases of VHF operating. Learn more about packet, EME, satellite, ATV, and repeater operation. You'll also find a complete tutorial on exotic propagation modes as well as pages of data and sources for additional information. **Order No. BVHF\$15.95**

The Quad Antenna

Hams love antenna books and this book is no exception. Written by world renowned author Bob Haviland, W4MB, The Quad Antenna is the authoritative technical book on the design, construction, characteristics and applications of Quad Antennas. Discover how to easily build a quad antenna for your station that will help you fill your logbook with rare DX that you have only dreamed about before. **Order No. QUAD..... \$15.95**

The Packet Radio Operator's Manual

This book is written by CQ columnist and Amateur Radio Packet authority Buck Rogers, K4ABT. An all new introduction and guide to packet operation, it is the perfect single source, whether you're an advanced user or just starting out. Learn about packet radio without all the technical jargon. Also included are detailed hookups for dozens of radio/packet controller/ computer combinations, making this book the definitive resource for the active packet user. **Order No. PROM..... \$15.95**

Ham Radio Horizons: The Book

Written by Peter O'Dell, WB2D, this is a book about ham radio that every beginner can enjoy! If you want to get in on the fun and excitement of Amateur Radio, Ham Radio Horizons is the perfect way to get started. HRH is full of tips from expert hams in: DXing, Contesting, Serving the Public, Ham Radio in Space, Experimenting, Digital Communications — you name it! This exciting book is an excellent gift to a prospective ham or for use in your club's licensing classes and library. **Order No. BHOR..... \$12.95**

The Vertical Antenna Handbook

Take advantage of the 20 years of research and practical experience of naval communications engineer Capt. Paul H. Lee, USN(ret), N6PL. Learn the basic theory, design, and practice of the vertical antenna. Discover easy construction projects such as a four-band DX vertical or a broadband array for 80 meters. Ever wonder how to build a functional directive vertical system? Paul Lee can get you started today! **Order No. VAH..... \$9.95**

Keys, Keys, Keys

Enjoy, nostalgia with this visual celebration of amateur radio's favorite accessory. Written by the well-known author and CQ columnist Dave Ingram, this book is full of pictures and historical insight that only K4TWJ can provide. If you've ever wondered about the old days of Morse, this book's for you. **Order No. KEYS.....\$9.95**

Also available at your local dealer

Now Available Direct From CQ!

Title	Order No.	Price	Title	Order No.	Price
1994 NA Callbook	NACB.....	\$29	ON4UN Antennas and Techniques for Low Band DXing	LOWDX.....	\$20
1994 Int'l Callbook	INTCB.....	\$29	Gordon West No-Code Technician Plus License Manual.....	GWTM.....	\$10
1994 Callbook Pair.....	NAICB.....	\$54	Gordon West General License Manual.....	GWGM.....	\$10
ARRL Handbook	ARRLHB.....	\$25	Gordon West Advanced License Manual...	GWAM.....	\$10
ARRL Antenna Book.....	ARRLAB.....	\$20	Gordon West Extra License Manual.....	GWEM.....	\$10
ARRL Operating Manual.....	ARRLOM.....	\$18			
ARRL Repeater Directory.....	ARRLRD.....	\$6			
Now You're Talking	ARNYT.....	\$19			

VIDEO LIBRARY



All Videos Available In PAL format

Getting Started in Ham Radio

This is a fast-paced video introduction to the fascinating world of ham radio. CQ's experts show how to select equipment and antennas; which bands to use; how to use repeater stations for improved VHF coverage; the importance of grounding and the basics of soldering. How to get the most out of your station, whether it's home-based, mobile or hand-held.

Order No. VHR\$19.95

Getting Started in Packet Radio

This video will help de-mystify the exciting but sometimes confusing world of packet radio. Learn how to get started using your computer on the radio. Included are step-by-step instructions on making packet contacts and using packet bulletin boards, networks and satellites.

Order No. VPAC.. \$19.95

Getting Started in Contesting

For the newcomer to contesting or an experienced veteran, this video is for you! You'll get advice and operating tips from some of contesting's most successful competitors, including Ken Wolff, K1EA, Dick Newell, AK1A, and CQ's own contest columnist, John Dorr, K1AR. Here's just a sample of what you'll see: what contesting's all about, explaining contest jargon, tips for beginners, how to compete from a small station, operating secrets from the "pros", live QSOs from world class stations, VHF/UHF contesting.

Order No. VCON\$19.95

Getting Started in Amateur Satellites

Learn with this video how veteran operators set up their satellite stations. Find out how to locate and track ham satellites with ease. Watch as operators access current satellites and contact far ranging countries around the world. This video is filled with easy to understand advice and tips that can't be found anywhere else .

Order No. VSAT..... \$19.95

Getting Started in DXing

Top DXers share their experience with equipment, antennas, operating skills, and QSLing. You'll see hams work rare DX around the world. If you're new to DXing, this video is for you! All this valuable information may well give you the competitive edge you need to master the exciting world of DXing.

Order No. VDX..... \$19.95

Getting Started in VHF

This is the ideal introduction to the world of VHF. See demonstrations of the latest radios. Also, learn about repeater usage as well as the more exotic VHF operating modes. Whether you are interested in packet radio, satellite operation, or simply using your local repeater, this is your video!

Order No. VVHF....\$19.95

Ham Radio Horizons: The Video

This introduction to Amateur Radio is an excellent complement to the Ham Radio Horizons book. Enjoy seeing all aspects of ham radio ranging from what it takes (and costs) to get started to how you can get your ham license. Designed for the general public, HRH is ideal for public events, presentations to community groups and as an opening to your club's licensing courses! There's no better way to introduce someone to ham radio.

Order No. VHOR.....\$19.95

Order Toll-Free 1-800-853-9797

YES! I want to learn from the experts. Rush me my book(s)/video(s) right away!

Please add \$4 shipping & handling. **FREE** shipping & handling for orders \$50 and over.

Please make your check or money order payable to: CQ Communications, Inc.

Qty	Item #	Description	Price	Total Price
			Shipping/Handling	
			Total	

Name _____ Callsign _____

Address _____

City _____ State _____ Zip _____

MC/VISA/AMEX/Discover # _____ Expires _____

Form of payment: MC VISA AMEX Discover Check Money Order

Please mail your orders to:  **CQ Communications, Inc., 76 North Broadway, Hicksville, New York 11801-9962** FAX 516-681-2926

The Handie-Holder

Need a convenient way to hold your HT while mobile? Screw mount to the floor, or mount to the windshield with our optional suction kit. This kit gives you a very strong mount that requires no holes and can be moved in a snap. Both models have a strong, ten inch, flexible swivel mount, allowing easy adjustment. They are made of high quality aluminum and steel parts with an attractive, black finish.



HH-A comes with a sturdy poly webbing harness that is fully adjustable to fit any size HT \$26.95

HH-B comes with an adjustable cradle that uses a "SQUEEZE-N-LOCK" system and thick foam padding to grip any size HT \$36.95

Optional suction kit add: \$3.50
Shipping/Handling add: \$3.75
KS residents add 6.5% sales tax

*For orders or questions, call (913) 364-7979, 24 hrs/day.
*We accept MC/VISA, check or money order.
*Most orders shipped within 24 hours.

HANDIE RADIO PRODUCTS
10206 W. 89th Terrace
Overland Park, KS 66212

*Send SASE for Free info on other available mobile mounts!

CIRCLE 61 ON READER SERVICE CARD

INSURANCE

Computer & Radio Equipment

HAMSURE coverage follows your equipment wherever you take it. Theft from vehicles, earthquake, water damage and all other hazards including surges. Insure all your equipment and accessories (except towers and antennas but including rotors), media and purchased software.

Low Premium Low Deductible

HAMSURE
7901 Laguna Lane
Orland Park, IL 60462
800-443-6242 800-988-7702
Weekdays Evenings & Weekends

Great Circle Bearings Included

The 1994 Amateur Radio Mail Order Catalog and Resource Directory

A must for every Active Ham

Only \$16 Plus \$3 S/H USA (\$6 DX)

Resource Solutions, 6050 Peachtree Pky
Suite 340-228, Norcross, GA 30092 USA
Orders Only (800) 825-8684
Order Direct or from Your dealer

CIRCLE 114 ON READER SERVICE CARD

HAM TOWERS by ALUMA

Easy to install. Low Prices. Crank-ups to 100 feet.

• Telescoping Crank-ups • Tilt overs • Guyed Crank-ups • Fixed

Over 36 types aluminum towers made
Specials designed and manufactured—write for details

FOR ALL TYPES OF COMMUNICATIONS



ALUMA TOWER COMPANY
BOX 2806 CQ
VERO BEACH, FL 32961-2806
(407) 567-3423 FAX 407-567-3432

HAM SHOP

FREE TO CQ SUBSCRIBERS

Advertising Rates: Non-commercial ads are 20 cents per word including abbreviations and addresses. Commercial and organization ads are \$1.00 per word. Boldface words are \$1.50 each (specify which words). Minimum charge \$2.00. No ad (non-subscriber) will be printed unless accompanied by full remittance. Non-commercial free to CQ subscribers, as space permits, maximum 3 lines each. All ads must be typewritten double-spaced. Recent CQ mailing label must accompany ad.

Closing Date: The 10th day in the third month preceding date of publication (example: Jan. 10th for the March issue). Because the advertisers and equipment contained in Ham Shop have not been investigated, the Publisher of CQ cannot vouch for the merchandise listed therein. The publisher reserves the right to reject any paid or nonpaid advertisement. Direct all correspondence and ad copy to: CQ Ham Shop, 76 N. Broadway, Hicksville, NY 11801.

WANTED: Collins antiques, anything old from speakers, receivers, transmitters, and all accessories, any condition. Top \$\$\$ paid. Rick, 1-800-462-2972 anytime.

ELECTRON TUBES: All types buy and sell. Daily Electronics, 10914 NE 35th St., #B-6, Vancouver, WA 98682. Call 800-346-6667 or 206-896-8856, or FAX 206-896-5476.

CB-TO-10M CONVERSIONS: FM kits, frequency modification hardware, books, plans, high-performance CB accessories. Catalog \$3. CBCI, Box 31500CQ, Phoenix, AZ 85046.

Low Power Communications: All about QRP operating—contesting, field day, digital, computers, DX, solar, milliwatt. Volume 1—Basic QRP, \$14.95. Volume 2—Advanced QRP, with chapters by some of the world's best QRP operators, \$19.95 from Tiare Publications, P.O. Box 493, Lake Geneva WI 53147 \$2 s/h first book (\$3 foreign), \$1 for second book. Visa/Mastercard welcome.

The Outer Space Frequency Directory, by A.R. "Tony" Curtis. The radio monitor's guide to eavesdropping on satellites, space shuttles, space stations, interplanetary space probes, and non-human signals arriving from deep space. \$17.95 + \$2 s/h (\$3 foreign) from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. Visa/Mastercard welcome. US \$ only.

KAUAI B&B VACATION FOR HAMS. Super rig. Pool and spa. Send \$2 for brochure and photos to your host. Jim Reid, AH6NB. Lawailoa Retreat, 3465 Lawailoa Lane, Koloa, Kauai, HI 96756, or please phone 808-332-7984.

IMRA-International Mission Radio Assn. helps missionaries—equipment loaned; weekday net, 14.280 MHz, 1:00-3:00 PM Eastern. Sr. Noreen Perelli, KE2LT, 2755 Woodhull Ave., Bronx, NY 10469.

THERMOGRAPHED CARDS! Raised-print QSLs at flat printing prices. Samples: Phone 817-461-6443 or write: W5YI Group, Box 565101, Dallas, TX 75356.

KNOW FIRST! Ham radio fanatics—you need THE W5YI REPORT, a twice-monthly award-winning Hot Insider Newsletter Acclaimed best! Confidential facts, ideas, insights, nationwide news, technology, predictions, alerts. Quoted coast-to-coast! We print what you don't get elsewhere! \$19.50 annually to new subscribers! Money-back guarantee! FREE sample for S.A.S.E. (two stamps). W5YI, P.O. Box 565101, Dallas, Texas 75356.

CERTIFICATE for proven contacts with all ten American districts. SASE to W6DDB, 45527 Third Street East, Lancaster, CA 93535-1802.

HALLICRAFTERS Service Manuals. Amateur and SWL. Write for prices. Specify Model Numbers desired. Ardco Electronics, P.O. Box 95, Dept. C, Berwyn, IL 60402.

WANTED: Older model bugs, unusual bugs, and miniature hand keys. State price, condition. Dave Ingram, K4TJW, 4941 Scenic View Drive, Birmingham, AL 35210.

CHASSIS, CABINET KITS: SASE K3IWK, 5120 Harmony Grove Road, Dover, PA 17315.

PSE QSL! An Expert's Guide to Amateur Radio QSL'ing. By CQ's Bill Welsh, W6DDB. Every imaginable facet from designing to ordering to filling them out to filing them. Card sources, postage usage, bureaus, much much more. \$9.95 + \$2 s/h (\$3 foreign) from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. Visa/Mastercard welcome. US \$ only.

FREE Ham Gospel Tracts, SASE. N3FTT, 5133 Gramercy, Clifton Heights, PA 19018.

FOREIGN AIRMAIL POSTAGE for successful QSLing! Many countries, monthly bargains, plus **EUROPEAN AIRMAIL ENVELOPES!** Samples, prices: William Plum, 12 Glenn Road, Flemington, NJ 08822. FAX 908-782-2612.

HAVE AM CAPABILITY? Join SPAM (Society for the Promotion of AM). For information and membership, send \$1 and SASE to SPAM, WB6TRQ, Box 62, Potrero, CA 92063.

RCI-2950 OWNERS: New modification manual including Power increase, Clarifier modification, Modulation increase, Operating hints, and more. Parts Included. Only \$20.00 ppd in U.S. (Missouri residents add \$1.15 tax). Scott, P.O. Box 510408, St. Louis, MO 63151-0408 (314-846-0252). Money Orders or C.O.D.

WEATHER RADIO—The Complete Guide to Receiving NOAA, Volmet, Weatherfax, Weather Satellite and Other Weather Information Sources, by A.R. "Tony" Curtis, K3RXX. Everything from TIS stations to Russian fishing fleet and ham emergency weather nets. \$14.95 plus \$2 s/h (\$3 foreign) from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147 US \$ only. Visa/Mastercard.

INEXPENSIVE HAM EQUIPMENT: Send stamp for list. WA4DSO, 3037 Audrey Dr., Gastonia, NC 28054.

RTTY JOURNAL published ten times per year for those interested in the Digital modes. Timely information on RTTY, AMTOR, PACKET, PACTOR, CLOVER, MSOs, Contesting, Hardware/Software for the digital modes, plus technical articles. This is a Digital operators magazine. \$16 per year (foreign higher). RTTY JOURNAL, 1904 Carolton Ln., Fallbrook, CA 92028-4614.

The Code Book—Amateur Radio CW Operating, by Robert J. Halprin. A practical guide for those who want to make CW a bigger part of their amateur radio hobby. Mastering the code, operating techniques, tools of the trade, files and audio tape, contests, DXing, traffic, QRP, and more. \$17.95 + \$2 s/h (\$3 foreign) from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. Visa/Mastercard welcome.

The HamSat Handbook, by A.R. "Tony" Curtis. A complete history, frequency guide and specs for every amateur satellite, current and past, how they work and much more. \$19.95 plus \$2 s/h (\$3 foreign) from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. Visa/Mastercard welcome.

FOR SALE: CQ/Ham Radio/QST/73 magazines and binders. SASE brings data sheet. W6DDB, 45527 Third Street East, Lancaster, CA 93535-1802.

ROSS'S\$\$\$ NEW September (ONLY) SPECIALS: Save time and money. Have model number and manufacturer ready when you call or write. KENWOOD MB-4000 \$18.00; KNB-7A \$65.00; TH-22AT \$245.00; PB-10 \$40.00. MFJ Call. ALINCO Call. YAESU SM FT-227R \$14.00; SM FT-902 \$15.00. ICOM 4SAT \$365.00; 4KL \$6175.00; AG-1 \$80.00; 47A \$350.00; MICRO 4AT \$280.00; 3230A \$550.00; 575A \$1200.00. CUSHCRAFT 4218XL \$150.00; A148-3S \$30.00; A147-11 \$50.00; R7 \$340.00. BENCHER Call. BUTTERNUT Call. AEA PK64A/HFM \$145.00. TELEX HY-GAIN Call. RFCONCEPTS Call. MIRAGE Call. LARSEN Call. ROHN HDBX48 \$550.00. LIMITED TIME OFFERS: Looking for something not listed or hard to find? Call or write. Over 9000 ham-related items in stock for immediate shipment. Mention ad. Prices cash, F.O.B. Preston. Hours Tuesday-Friday 9:00 to 6:00, 9:00 to 2:00 P.M. Mondays. Closed Saturday & Sunday. ROSS DISTRIBUTING COMPANY, 78 South State, Preston, Idaho 83263 (208-852-0830).

VIDEO SYNC GENERATOR. Restores Horizontal & Vertical sync lines from distorted analogue video formats. For information on completed units & pricing write: R.C. Distributing, Box 552, South Bend, IN 46624. Phone: (219) 236-5776.



Orders & Price Quotes
1-800-7OKHAMS
1-800-765-4267

YAESU



FT-840
Compact HF
Transceiver



FT-990
HF Base
Transceiver



FT-890
Compact HF
Transceiver



FT-416
2 Meter
Handheld



FT-11R
World's
Smallest 2MHT



FT-530
2M/440MHz
Handheld



FT-2200
2 Meter
Mobile

**FREE
SHIPPING**

UPS SURFACE On Purchases of \$50 or More
(except Power Supplies and Antennas)

Local & Information
(405) 748-3066
FAX (405) 748-3077

13424 Railway Drive COD
Oklahoma City, OK 73114



Oklahoma owned and operated.
Not affiliated with any other store



WANTED: HAM EQUIPMENT AND OTHER PROPERTY. The Radio Club of Junior High School 22 NYC, Inc. is not only the Big Apple's largest Ham club, but it is also the nation's only full-time non-profit organization working to get Ham Radio into schools around the country as a theme for teaching using our EDUCOM—Education Thru Communications—program. Send your radio to school. Your donated amateur or other property, which will be picked up or shipping arranged, means a tax deduction to the full extent of the law for you as we are an IRS 501(c)3 charity in our fourteenth year of service. Your help will also mean a whole new world of educational opportunity for children around the country. Radios you can write off; kids you can't. Enjoy the coming fall by helping someone else and yourself. Please write, phone, or FAX the "22 Crew" today: The RC of JHS 22, POB 1052, New York, NY 10002. Telephone (516) 674-4072 or FAX (516) 674-9600. Young people, nationwide, can get high on Ham Radio with your help. Meet us on the WB2JKJ Classroom Net: 7: 238 MHz, 1100-1230 UTC and 21.395 MHz 1300-1900 daily. A new school term is just beginning. Your help now could change the course of many a young person's future.

COMMODORE 64 HAM PROGRAMS: 8 disk sides, over 200 Ham programs, \$16.95. 29¢ stamp gets unusual software catalog of Utilities, Games, Adult and British Disks. Home-Spun Software, Box 1064-AR, Estero, FL 33928.

FOR SALE: New, Unused, in original cartons: Radio Shack DMP 130A dot matrix printer, PTC-64, C-64 printer controller, \$160.00. K2EEK, CQ Magazine, 76 N. Broadway, Hicksville, NY 11801.

DX QSL's. THE "GO LIST." We make getting the QSL cards as much fun as the QSO itself. Over 20,000 QSL routes. Updated and published monthly on 3.5 inch diskette (5.25 inch available). One copy \$12/USA, Quarterly \$32/USA, Monthly \$62/USA. The **W6GO/K6HHD** QSL Manager List, POB 700C, Rio Linda, CA 95673.

RECEIVING TUBES, Used, Guaranteed: Under \$2.85. Sams; 6 for \$10. CQ, QST, HR, Ham Gear, Books, Parts. LSASE to Don Merz, 47 Hazel Drive, Pittsburgh, PA 15228.

PacketCluster for DXers and Contesters! Multi-user, multi-node networking software features real-time messaging, announcements, DX alerts, e/mail, linking, and much more. Up to 64 users can connect to your node using a radio, TNC, and PC or terminal. Hardware also available. Pavilion Software, 5 Mt. Royal Ave., Marlborough, MA 01752 (508-779-5054, or FAX 508-460-6211).

ELECTRON TUBES! Buy & Sell. Daily Electronics, 10914 NE 39th St. #B-6, Vancouver, WA 98682 (206-896-8856, 800-346-6667; FAX 206-896-5476).

6-10 GHz Newsletter. SASE. Box 685, Holbrook, AZ 86025.

DXers say **THE DX BULLETIN** is the most accurate, timely, and complete source of DX news available. \$42 for 50 weekly issues. MasterCard/Visa or check to Box 50C, Fulton, CA 95439-0050 (707-523-1001). Samples free.

THE DX MAGAZINE is your bi-monthly ticket to the exciting world of DX: DXpeditions, Reviews, Awards, QSL Information, News, and Opinions. 64 well-illustrated glossy pages. Only \$15/year. Sample \$2. Box 50C, Fulton, CA 95439-0050 (707-523-1001).

AMP REPAIR CENTER: ALPHA, AMERITRON, AMP SUPPLY, DRAKE, HEATHKIT, ETC. 40 Years Experience. Former Service Manager With Amplifier Manufacturer. **OMEGA** Electronics, 101-D Railroad Street, Knightdale, NC 27545 (919-266-7373). Bill, K4BWC.

WANTED: Nostalgic ham would like to restore and operate your vintage receivers, transmitters, or transceivers from the 1950 to 1975 era. All makes and models considered. Please write WB4JUN, 601 Black Oak Blvd., Summerville, SC 29485. All inquiries will be answered.

DACRON ROPE; WHY RISK FAILURES with aerial supports? Strong, high UV resistant, non-stretch Military type black DOUBLE (unlike our competitors' single) braided Dacron, 3/32 inch (\$.06/ft.), 3/16 inch 770 lb. test (\$.11/ft.), 5/16 inch (\$.16/ft.). DAVIS RF CO., 24-HOUR ORDERS 1-800-328-4773.

AMATEUR RADIO REPAIR!!! Most makes, reasonable. Dan Rupe, W7HBF, 1302 South Uplands Dr., Camano, WA 98292 (206-387-3558).

THE COMPETITIVE EDGE FROM K1EA SOFTWARE. CT—the ultimate contest software. Runs 13 contests, interfaces to most transceivers, PacketCluster, logging and QSL programs. \$69.95 plus \$3 S/H. For voiceless contesting add the DVP digital voice processor board. \$299.95 plus \$5 S/H. Interface cable (specify radio) \$44.95. Order line 508-779-5054, or FAX 508-460-6211. MC/VISA accepted. K1EA Software, 5 Mt. Royal Ave., Marlborough, MA 01752.

1994 CALLBOOKS. North American, \$21.95; International, \$21.95. Both, \$39.95. **ARRL HANDBOOK**, \$23.95; Antennas & Techniques for **Low-Band DXing**, \$18.95. POSTPAID USA. AA6EE—Callbook Distributor, 16832 Whirlwind/C9, Ramona, CA 92065 (619-789-3674).

LAMBDA AMATEUR RADIO CLUB international for gay and lesbian hams. Box 24810, Philadelphia, PA 19130 (215-978-LARC).

PORTABLE SATELLITE ANTENNA: Complete 3 foot KU band system. For free information package and pricing write: R.C. Distributing, Box 552, South Bend, IN 46624; phone 219-236-5776.

WANTED: McIntosh and Marantz tube Hi-Fi gear, any conditions. Also, older FENDER and GIBSON electric guitars/amps. Frank Czaja, AI9T, 8968 W. Forest Home #4, Greenfield, WI 53228 (414-529-9395).

Join TAPR—Tucson Amateur Packet Radio (non-profit developers of the TNC). Membership benefits include: supporting the development of new communications technology, quarterly newsletter, low-priced software/shareware, 10% discount on kits and publications: \$15/year (foreign higher). Visa/MC accepted. When joining, mention CQ, receive TAPR Packet Radio General Info booklet (\$7 value)! Call (817) 383-0000. Mail: 8987-309 E. Tanque Verde Rd. #337, Tucson, AZ 85749-9399.

AFRAID OF FCC TESTS? Let your C64/128 drill you. All questions on 5-1/4 inch disk. With instructions. Full screen diagrams if used. Your call on screen and optional printed summary. PFD. Novice, Tech, or General \$19.95. Advanced or Extra \$24.95. New NOCODE (2 disks) \$34.95. Ralph Parlette, WB6JOY, 27 Morning Sun, Mill Valley, CA 94941 (415-383-0507).

AMATEUR RADIO REPAIR: FCC licensed, 18 years experience, lab quality NBS traceable test equipment, reasonable rates. G.B. COMMUNICATIONS, INC., 963 Birch Bay Lynden Road, Lynden, WA 98264 (206-354-5884).

WANTED: COLLINS KW-1. Joel Thurtell, 11803 Priscilla, Plymouth, MI 48170 (1-313-453-8303).

MORSE CODE COMPUTER INTERFACES for IBM \$49.95. Free IBM Shareware and Ham Catalog. Dynamic Electronics, Box 896, Hartselle, AL 35640 (205-773-2758, FAX 773-7295).

SSB TOO EXPENSIVE? Go ADVANCED MODULATION. 1500 watts POSITIVE PEAKS possible. Enjoy AM QUALITY. \$2.00 brings circuits. W4CJL, 202 Baker Drive, Florence, AL 35630.

DISCOUNT PRICES AT RT ELECTRONICS: 10/11 meter radios, antennas, scanners, power supplies, and more. Free flyer. P.O. Box 2123, Warren, Ohio 44484 (phone 216-369-1789).

ANGUILLA—VP2EI Ham apartment for 1 or 2 persons. Multi-band Yagi, 40M Yagi, R7 Vertical, tuner, power supply. Call Dave, VP2EHF, or Dorothea, VP2EE, 809-497-2150.

BROWNIES QSL Cards since 1939. Catalog and samples \$1 (refundable with order). 3035 Lehigh St., Allentown, PA 18103.

QSL CARDBOXES™ & INDEX DIVIDERS, send SASE. 7-Mike Hamstuff, P.O. Box 14455, Scottsdale, AZ 85267-4455.

POST CARD QSO KIT. Converts Post Cards, Photos, to QSLs! Stamp brings circular. K-K Labels, P.O. Box 412, Troy, NY 12181-0412.

OLD GUITARS WANTED: Fender, Gibson, VOX, and Martin. Also, old guitar amplifiers. Immediate cash paid. Frank Czaja, AI9T, 414-529-9395.

BEGINNING COLLECTOR needs anything **Vibroplex®!** Send me your list. Mitch, WA4OSR, 11-C Midtown Park, E., Mobile, AL 36606 (205-476-4100; 205-342-7259)

"G5RV" "SIGNAL ENHANCER" LEGAL LIMIT +. \$49.95 assembled and ready to install. Free shipping 48 contiguous states. **OMEGA** Electronics, 101-D Railroad Street, Knightdale, NC 27545 (orders only 1-800-900-7388). Bill, K4BWC. Dealer Inquiries Invited.

KEYS, BUGS, SOUNDERS, Relays, Paper, Parts, Meters, Testers, Spark Coils, etc. 15 pages, refundable, \$2.00 plus 2 stamps. Dr. Jacobs, 60 Seaview Terrace, Northport, NY 11768.

FREE Ham Radio Gospel Tracts: DX Contact and Christian Helps. SASE: N1GDP, RAR-OFC, P.O. Box 8, Harmony, ME 04942.

CALL SIGN DECAL: 1-1/4 inch white vinyl characters, applies to inside of auto window. \$5.00. DCALL, 2102 Waterbury Dr., Uniontown, OH 44685-9770.

TWO POWERFUL



HAM RADIO VIDEO COURSES FROM ARRL

Everything you need to pass your Novice, Codeless Technician and General Class Amateur Radio license tests — plus Morse code. Guaranteed!

These breakthrough courses are fast, easy and fun!

Get the Best, When You Need the Best!

- Only the American Radio Relay League (ARRL), the national organization of Amateur Radio Operators, has more than 75 years experience in helping people—just like you—become hams. With our expert help, you'll be on the air in no time!
- ARRL Video Courses demonstrate every important concept on video. You succeed because you completely understand the material, not because of rote memorization.
- Only the ARRL has the resources to make sure you have the latest, most accurate information on video. With the ARRL, you know your course is fully updated for the current FCC exams.
- Your course is produced in association with King Schools, whose award-winning "Monster Graphics" let you see your instructor and "the action" at the same time.
- With the ARRL, expert help is only a phone call away. Call us any business day, toll-free, to have your questions about ARRL Video Courses or your FCC exam answered personally.



COLORED BANDS SHOW

RESISTOR VALUES



Here's What You Get—

Expert Information That's Easy to Understand!

TECHNICIAN CLASS COURSE (No Morse Code Required)

Your complete ARRL Technician Class Home Study Video Course includes:

- Three exciting video tapes—five hours of invaluable instruction—covering everything you need to pass your Novice and Technician Class written exams.
- A 164-page Course Book with detailed notes.
- Every exam question—with correct answers and detailed explanations.
- Six practice exams to "tune you up" for the real thing. On the big day, you'll be more than ready!

GENERAL CLASS COURSE

Your complete ARRL General Class Home Study Video Course includes:

- Three exciting video tapes—four hours of invaluable instruction—covering everything you need to pass your General Class written and Morse code exams.
- A 96-page Course Book with detailed notes.
- Every exam question—with correct answers and detailed explanations.
- Three practice exams to "tune you up" for the real thing. On the big day, you'll be more than ready!
- Morse Academy software—so you'll learn Morse code the right way, the Farnsworth way.

With our ironclad guarantee, you risk nothing!

We're so sure you're going to pass your Amateur Radio license tests with the ARRL Technician and General Class Video Courses that we make this exceptional guarantee:

1. Examine either course for 20 days. If it's not what you expected, simply return it for a full refund—no questions asked.
2. You will pass your FCC codeless Technician-class written exam within one year, or you can return your course for a full refund—every penny. Or, you will pass your FCC General-class written and Morse code exams within one year, or you can return your course materials for a full refund. You pass, or you don't pay! (Include a dated proof of purchase and the date and location of your VEC-administered exam session when you return your course.) And...
3. In addition, the veteran hams at ARRL Headquarters are available to answer your questions and provide expert advice and information. We're only a phone call away—and we won't let you fail!



Choose from 4 Great Deals:

1. Your ARRL Technician Class Video Course, only **\$99**
2. Your ARRL Technician Class Video Course, Plus The Technician Class Computerized Exam Review Software (a \$49 value), all only **\$119**
3. Your ARRL General Class Video Course, including Morse Academy Morse code training software, only **\$99**
4. Your ARRL General Class Video Course, Morse Academy software Plus The General Class Computerized, Exam Review Software (a \$49 value) all only **\$119**

To Order, Call 1-800-32-NEW HAM or Tear Out And Mail Today

OK! I want to start enjoying the World of Amateur Radio. Rush me:

- Complete Technician Class Video Course \$99
- Complete General Class Video Course \$99
- Extra Course Book Tech. Gen. (with course purchase only) \$19
- Complete Course And Computerized Exam Review Software Tech. Gen. All only \$119

Exam Review Software

- Macintosh IBM Compatible (Tech only) (512k, hard drive)
- Specify 3 1/2" 5 1/4" Disks

Order now and get in on the fun of Amateur Radio!

Ship To:
Name _____
Address _____
City _____
State, ZIP _____
Tel (_____) _____

Charge To:
 MC VISA AMEX Discover
Card No. _____
EXP _____

Check or Money Order Enclosed

TOTAL PURCHASE \$ _____

Shipping and Handling _____

UPS Surface, \$5
 FEDEX 2-Day Delivery, \$15

In CT add 6% Tax _____

In CA add 7.5% Tax _____

TOTAL AMOUNT \$ _____

The American Radio Relay League
Helping Hams Get Started Since 1914

225 Main St, Newington, CT 06111
203-666-1541 • Fax 203-665-7531

CQ ALSO AVAILABLE FROM YOUR LOCAL AMATEUR RADIO DEALER

ROOF TOWERS

Light & durable
ALUMINUM
8-Foot \$189.95
9-Foot \$328.75
18-Foot \$467.50
Shipped UPS!



Route 3, Box 322, Boonville, MO 65233
FAX 816-882-7200

Telephone 816-882-2734

CIRCLE 88 ON READER SERVICE CARD



PUTTING THE AMATEUR BACK IN RADIO

FUN-KIT LINE

KITS: BATTERY CONTROLLERS
"SMART" SOLAR CONTROLLERS
CURTIS KEYSER KIT

ANTENNAS: SPECIALIZING IN LADDER-LINE:
80 OR 160 M MARCONI; "JADE" POLE;
MULTIBAND DIPOLE; "WINDOM" ANTENNA

COMPONENTS: UC3906 BATTERY CHARGER CHIP
8044ABM CURTIS KEYSER CHIP, LM338K,
LM350K, MC3423P1, NE804AN, AND MORE

P.O. Box 368 E. HAMPSTEAD, NH 03826-0368
PHONE: 603-329-6995 FAX: 603-329-4499

CIRCLE 56 ON READER SERVICE CARD

CB-TO-10 METERS

We specialize in CB radio modification plans and hardware. Frequency and FM conversion kits, repair books, plans, high-performance accessories. Thousands of satisfied customers since 1976! Catalog \$3.

CBC INTERNATIONAL

LOU FRANKLIN/K6NH - Owner
P.O. BOX 31500CQ, PHOENIX, AZ 85046



HANDIE-BASE

Desktop Radio Stands
Models For Most Handheld Radios
"Please Specify Your Radio Model". Send \$14.95 plus \$3.50 shipping to:

Handie-Base and More Inc.
P.O. Box 2504 (Dept. B)
Broken Arrow, OK 74013-2504
Contact your Local Dealer -
Dealer Inquiries Welcome.

Satisfaction Guarantee

Super HF Performance In A Compact Quad Design

2 element 5-band (10m-20m) quad on a 7' boom
Strong, no extras, only small rotor needed,
each driven element is independently fed

Only \$299 + shipping

Quads, Kits, Parts, RF Switches, Gin Poles

ANTENNA MART

P.O. Box 699 • 8 Shiloh Drive • Loganville, GA 30249
(404) 466-4353 FAX (404) 466-3095

ROBERT HALL ELECTRONICS

AMATEUR RADIO REPAIR

1660 MCKEE ROAD

SUITE A

SAN JOSE, CA 95116

(408) 729-8200

ATTENTION SB-220 OWNERS: Restore your SB-220 to better than new condition with these upgrade and repair parts and assemblies. Parasitic Suppression, Filter Cap Block, Fan & Motor, Multi-Meter, Plate Meter, Rectifier-Metering Board, Inrush Current Limiter, New Feet. Remember, a replacement for your SB-220 costs at least \$2,000. Write for details to HARBACH ELECTRONICS - WA4DRU, 2318 South Country Club Road, Melbourne, FL 32901-5809.

R.F. TRANSISTORS For Dealers, Repair Shops, Manufacturers, MRF455, MRF454, 2SC2879, 2SC2290, etc. WESTGATE 800-213-4563.

BOOK SALE! Call for large list of electronics and computer books, 1-800-887-1284.

RADIO DOCTOR VIDEOS for Repair and Alignment of HF Transceivers. Reviewed by Gordon West, Jan. (73 Mag.). Videos for popular KENWOOD, YAESU, and ICOM. ORDERS: 1-800-788-1416 MC/VISA. Catalog: SASE (2 stamps), RADIO DOCTOR, 710 Teague Dr., Kennesaw, GA 30144.

HAM TRADER YELLOW SHEETS. Buy, sell, trade ham radio equipment/electronics gear. Published twice a month. Ad deadline is one week before publication, which assures quick results. Mailed First Class. One-year subscription (24 issues) \$16.50. P.O.B. 2057, Glen Ellyn, IL 60138-2057, or P.O.B. 15142, Seattle, WA 98115. For sample copy send #10 SASE (2 stamps).

QSLs—ELEGANT, AFFORDABLE. Samples \$1 (refundable with order). AACO, Dept. C49, 1639 Fordham Way, Mountain View, CA 94040.

Handy Talky cases: Black or camouflage \$8.95, personalized \$14.95, desk stands \$8.95. Specify make & model. Add \$8 for s/h. Send SASE for catalog. R. Thomson, 165 Wellington Street, Suite 28010, Barrie, Ontario, Canada, L4N 7W1.

RADIO TRANSCRIPTION DISCS WANTED: W7FIZ, Box 724, Redmond, WA 98073-0724.

DXers/CONTESTERS: ELIMINATE ATMOSPHERIC WHITE NOISE, static, heterodynes or enhance AMTOR/RTTY. JPS Communications NRF-7 DSP audio filter. NEW LOW PRICE: \$199.95 delivered continental USA. For impulse noise elimination, ignition, power line, plus all NRF-7 noise cures, order NIR-10: \$309.95. Immediate shipment. **Davis RF Co.**, 1-800-328-4773.

WANTED: **NC400** National receiver. Jim, W6OU, 714-528-5652.

WANTED: X-band radar/microwave equip. Complete/incomplete, civilian, military, parts test equip., TM's, etc. SHF, Box 10215, Pittsburgh, PA 15232-0215.

R-390A SALES - SERVICE - PARTS: Info SASE to Miltronix, P.O. Box 3541, Toledo, OH 43608.

QSL SALE! 100/\$8, 300/\$14, 500/\$20, 1000/\$28, 1500/\$38, 2000/\$48. Many designs! 1994 Callbooks \$25.95, includes 100 free Eyeball QSO cards. Free shipping! Phone or write for free samples or ordering. Shell Printing, KD9KW, Box 50, Rockton, IL 61072. Call 815-629-2193, anytime.

TOWERS: HEIGHTS TOWER SYSTEMS, LTD. sells a Complete line of ALUMINUM self-supporting, stacked and telescoping towers ** High wind-load capability ** Screw-operated and Winch-operated Fold-over kits, manual or motorized for total convenience. ** For FREE brochure, call (313) 692-6711, fax (313) 692-6727, or write: 9505 Groh Rd. Bldg. 70E, Grosse Ile, MI 48138.

PICTURE QSL CARDS of your shack, etc., from your photo or black ink artwork. 500 \$28.00, 1000 \$44.50. Also non-picture cards. Custom-printed cards, send specifications for estimate. Send 2 stamps for illustrated literature. Generous sample kit \$2.00, half pound of samples \$3.00. **RAUM'S**, 8617 Orchard Road, Coopersburg, PA 18036. FAX or phone 215-679-7238.

MAXIMUM PERFORMANCE, TOTAL SIMPLICITY, build in a few hours. Beam antenna designed for 10 meter and/or Citizen Band operation. Only 9-1/2 foot turning radius. Work skip like the big guys without spending big bucks. Send \$9.95 plus \$2.00 shipping/handling for construction booklet to Watson Publications, 15A Dibble Road, Old Saybrook, CT 06475.

WANTED: Good condition, working HX50 (or similar) Hammarlund Transmitter. Thanks, Marc, 708-438-0940.

ALL HF BANDS with a 47 foot antenna. Outstanding results, completely built, not a kit. Satisfaction guaranteed. Order MB-2A. SASE for catalog. The Ant Farm, P.O. Box 3196, Wescosville, PA 18106.

WANTED: IC-2GAT in good condition for volunteer rescue group. Call 817-561-5587.

FALL SALE: DSP AUDIO FILTERS, FINALLY HEAR WEAK signals. NIR-10 \$309.95; NRF-7 \$199.95; NTR-1 \$149.95; NF-60 \$135.00; SSTV-1 \$134.00. FREE SHIPPING 48 states. TWO WEEK FULL SATISFACTION OR FULL REFUND. Do not accept JPS clones. 24 HOUR ORDERS. Authorized JPS dealer: **DAVIS RF Co.**, ORDERS ONLY 1-800-328-4773; Tech Info. 508-369-1738; or FAX 508-369-3484 for return call!

COMPLETE STATION, matching units, Kenwood 430 transceiver, power supply, outboard speaker, only \$730, plus shipping. WA3FSL, 610-372-0782.

KIT BUILDERS: NEW, SYNTHESIZED QRP Transmitter/Transceiver, the ARK4. Full Transceiver Kit w/case, only \$199.95. One board, no wiring, top-quality components & PCB. GUARANTEED TO WORK. For info send SASE. Call/write to order: S & S Engineering, 14102 Brown Road, Smithsburg, MD 21783 (301-416-0661).

P49V's ARUBA COTTAGE FOR RENT with 2 bedrooms, rig, and mono-band ants. For info write Carl Cook, 1724 Via del Verdes, Concord, CA 94521.

TRANSCIVERS: Kenwood TS520S \$375, TS530S \$500, Yaesu FT101E \$375. K1BW, 508-537-7195.

SUBSCRIBE TO 6-50 WORLDWIDE for Six Meter Enthusiasts, DX Digest for DX Chasers, or The NOVICE/TECH Report. Call 817-694-4047, FAX 817-694-2522, or write Rt. 1 Box 187-A, Whitney, TX 76692.

IBM SHAREWARE! Huge Selection! \$1.00 disk! 35¢ Specials! Catalog \$1.00. PMA-HS, Box 2424, Scottsdale, AZ 85252.

PROGRAMMABLE COUNTER: Works with ANY VFO Rig! Get a digital display for your rig, 100 Hz resolution. You can read the tuned frequency directly; no need to calculate offsets. Counts to 40 MHz, up OR down. Counter Kit \$69.95. Kit w/case \$99.95. Assembled w/case \$139.95. GUARANTEED TO WORK. For info send SASE. Call/write to order: S & S Engineering, 14102 Brown Road, Smithsburg, MD 21783 (301-416-0661).

ENGRAVED: SMALL OR TINY CUSTOM PLASTIC PLATES. Colors, Black w/white, red w/white, etc. Reasonable. Quotes free. RUBBER STAMP SHOP, 3824 Herbertsville Road, Point Pleasant, NJ 08742. Write or phone 908-892-6330. FAX 1-908-295-1391. Attention: "Old Soldier."

WANTED: Send us your QSL card and we'll enlarge and transfer it in original color to a quality white T-shirt (TS-2), only \$12.95; or to a Cap (CA-2), only \$7.95. T-shirts—S, M, L, XL, XXL (\$2 extra). Caps, white front, mesh back in Navy, Red, Green, Black, White. Also Name & Call Sign Caps (CA-3), only \$6.95, lettering in black, mesh in above colors. Add \$3.00 minimum S&H or 5% of total order. PERSONALIZED PHOTO, Dept. B, P.O. Box 370244, W. Hartford, CT 06137 (203-233-7277; FAX 203-236-3719).

FOR SALE: CUSHCRAFT R7 Antenna (vertical) mint condition w/handbook, US\$250. COMAX Communications Decoder, type CD-670, Telereader, brand new, w/op. instructions US\$485. You pay shipping. Offer to VE7EHD, 604-265-3175.

QSLs/RUBBER STAMPS—Top Quality! Send 52¢ stamp to: Free Ebbert QSLPAK, D-2, P.O. Box 24280, Columbus, Ohio 43224.

WANTED: Unassembled Heathkit HW-9 Kit. Ken Gilcrest, KB7ZTU, 3300 N. Tenaya #2079, Las Vegas, NV 89129 (702-656-1332).

RUBIDIUM OSCILLATORS: Bail/Efratom M-100, excellent 10 MHz frequency standard, \$700. Call 219-749-9530 or 219-482-8690.

WIN VALUABLE FCC RADIO LICENSES WORTH MILLIONS! Step by Step Approach. By Industry Expert. Send \$15.00 to TruckComm, 9380 SW 72nd St., #B165C, Miami, FL 33173.

DX-SCUBA EXPEDITION "ZF": Grand Cayman Island home for rental. Enjoy the beautiful waters of the Caribbean by day, and work the big pile-ups at night! For information please contact: Kirk Fabrizio (ZF2RH, AH6ML), 1601 Loma St., Santa Barbara, CA 93103 (phone 805-965-5379).

1994 DX BLUE BOOK. Newest Prefix, Country, and 300 Pacific Islands listings. 10 fold-out Prefix Maps. 10-page easy-to-use Russian/English QSO dialogue. CQ/ITU zones, ITU times, DXCC status, QTH, QSL, third party & reciprocal operation info each Prefix. Much more! Large SASE info. \$9.45 ppd. U.S. Optional 11" x 17" desk-top antenna headings. Amateur Radio DX Blue Book, 4920 Mayflower St., Cocoa, FL 32927 (407-632-6809).

RESTRICTED Top Secret Hacker Information. Cellular, Cable, Surveillance, Satellite, VideoCipher, Books, Videos, more. Catalog \$3.00. TELECODE, P.O. Box 6426-CQ, Yuma, AZ 85366-6426.



WORLD CLASS

SENSITIVITY • SPEED • DISTANCE • POWER

Model 3300 \$129.
1MHz-2.8GHz MiniCounter

- True pocket size
- 10 digit LCD display for best outdoors visibility and longer battery life
- Select six gate times
- Direct & pre-scaled ranges
- Hold switch locks display
- Low battery indicator

Model M1 \$229.
10Hz-2.8GHz HandiCounter®

- High speed OE10
- Digital Filter greatly reduces random noise & oscillation
- Digital Auto Capture locks counter display on first reading to pass filter
- 5 Hour NiCad
- 10 Digit Backlit LCD display
- 16 segment RF bargraph
- Arm/Store button stores & recalls frequencies
- 250MHz direct count
- Digital Communications Port permits data logging with optional converter & software

Model 3000A \$329.
10Hz-3GHz HandiCounter®

- High speed OE10
- Digital Filter greatly reduces random noise & oscillation
- Digital Auto Capture locks counter display on first reading to pass filter
- 6 Hour NiCad
- 10 Digit Backlit LCD display
- 16 segment RF bargraph
- Arm/Store button stores & recalls frequencies
- 250MHz direct count
- Digital Communications Port permits data logging with optional converter & software
- Multi-function: Frequency, Period, Ratio & Time Interval Measurement
- Dual High Impedance Inputs & Amplifiers
- Built In High Pass Filter

Model 8040 \$679.
Bench Portable Counter

- With all the features of the 3000A plus:*
- Dual 500hm and 1Meg Ohm input amplifiers with AC/DC coupling, ± Polarity, Trigger Level adjust, Low Pass Filter & Attenuator
 - Internal clock output/ external clock input
 - RS-232 Serial computer interface
 - Optional ± 0.1ppm TCXO or ± 0.05ppm KVG ovenized timebase

Products above shown with optional antennas.

When you order ask about our full line of Antennas and Filters to give you maximum pick-up distances & our Probes and Product Accessories.

Order Toll Free

1-800-327-5912

In FL: 305-771-2050 FAX: 305-771-2052

5821 NE 14th Ave, Ft. Lauderdale, FL 33334

OPTOELECTRONICS

5% Ship/Handling (Max \$10) U.S. Canada. • 15% outside continental U.S. • Visa, Master Card, C.O.D., Cash or Money Order only.

HamCall CD-ROM

US & International Callsign Lookup
Over 1,000,000 listings and 100 Countries
Includes U.S. Clubs & Military Stations.
ICALL program looks up: name, address,
expiration date, birth year, license class,
county, lat/long, area code, time zone, &
elevation. Retrieve by any data element
on PC, call, name and zip on the MAC.
Hundreds of new programs are on this
disc- see the Electronics Software Compendium
CD-ROM for a larger collection of software.
•No hard disk required • Print Labels • Export to hard/disk
or floppy • TSR runs from text window • Updated every
April & Oct • Standing orders accepted • Dealer discounts
for 6 or more • Latest public domain PC & MAC software.
Same low price of \$50.00 plus \$5.00 shipping.



New CD-Rom Electronics Software Compendium

The Electronics Software Compendium
is a collection of programs and data files
that pertain to electronics, broadcasting,
amateur radio and SWL activity.

Over 15,000 files in total. The disc is updated and issued
semi annually in April & Oct. Over 200 megabytes of
material is resident on this CD-ROM, for MAC & PC. Send
your order to Buckmaster Publishing, \$25.00 plus \$5.00
shipping.

BUCKMASTER

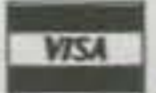
Route 4, Box 1630 • Mineral, VA 23117

703:894-5777

800:282-5628

703:894-9141(Fax)

Internet: info@buck.com



2-Meter & 222MHz HEAVY DUTY...Small... OPTIMIZED GAIN

Antennas

by 'Nil-Jon'TM

Superior mathematics/
concepts beats computer.
3 & 4 elem. (vert/horiz) single &
stacked arrays available...stacking
harnesses included
From \$77!...



Order Today! Call N.O.A.R.D. at: 1-800-277-9460

FOR SALE: HEATHKITS, HD-1416 Code Osc., PK-3 RF probe,
IM-5238 AC Voltmeter, also Hickok 209 C VTVM. You pay ship-
ping. Maker offer to VE7EHD, 604-265-3175.

FOR SALE: QST/HR/73 and misc. publications. SASE. KA1VY,
Ernie Guimares, P.O. Box 1262, Lakeville, MA 02347-7262.

WANTED: Henry 2K2 or 2K3 linear amplifier in good condi-
tion. Call Wilson 408-241-9090, or FAX me a note with info FAX
408-241-6291.

WANTED: Ten-Tec Model 290 attenuator for Argonaut. Con-
tact: George Osier, N2JNZ, 814 Morris Street, Ogdensburg,
NY 13669.

5-1/4, 360K, XT Floppy Drive, \$5.00. Walt Grosch, KZ9F, 1735
Stoneway Ct., Richfield, WI 53076 (414-628-1558).

IC-730 (80-10, dual VFO, memory), FL-30, FL-45, HM-7, \$450.
SM-5 (w/rig), \$25. VS300A Tuner, \$75. AEA PCB-88 w/P.S.,
\$119. K1LEC 303-356-7399.

WANTED: SWAN SPHERICAL TVRO ANTENNA CON-
STRUCTION PLANS for 16 feet. I will gladly pay copy and
postage charges. DU7LA, P.O. Box 901, Cebu 6000, Philip-
pines.

WANTED: Schematics for Knight Kit R55A rcvr, Heathkit TS-
3, IG-42, Precision E200C, RCA WR49B sig. gen., Ballantine
300H VTVM, Jack, WA4CSM, 8109 N.W. 58 Ct., Tamarac, FL
33321.

VACUUM CAPACITORS USCL. 5-500pF, 5000V, \$150 each.
Write to J. Wroblewski, Nelspruit 1200, P.O. Box 898, South
Africa. Please include telephone number.

TRADE 8877 Tube for 6 meter rig, as old as SB610 or 2 meter
amp. WB7DEJ, 504-641-2779.

WANTED by ex-St. Louisan: Walter Ashe Radio Catalogs. Nate
Williams, W9GXR, 6915 Prairie Drive, Middleton, WI 53562.

WANTED: Functioning Dentron plate voltage/current meter for
Clipperton-L amplifier. Doug Renwick, P.O. Box 50, Clavet,
SK, Canada S0K 0Y0.

WANTED: IC-SM5 Mic. K2JFE, Paul Wiegert, 625 Van Duzer
St., Staten Island, NY 10304.

WANTED: Freight Service Official Guide 1990-1993. T.N.
Colbert, WA8MLV, General Delivery, Burton, OH 44021.

WANTED: Vibroplex Presentation Model Bug. Bill, W6PRI, 408-
996-7624, or Callbook address.

MAXON 49-F5 FM Communicator, \$25.00. Walt Grosch, KZ9F,
1735 Stoneway Court, Richfield, WI 53076 (414-628-1558).

PALOMAR Solid-State Linear 3-30 MHz, 5W in 100W out, auto
TR, RCVR amp, \$195. Waters 3002 Phone Patch, \$60. All
excellent. List \$1.00 and SASE. Joe Bedlovies, P.O. Box 139,
Stratford, CT 06497.

FOR SALE: CQ/HR/73/QST magazines. SASE for list. KA1VY,
Ernie Guimares, 401 Bedford St., Lakeville, MA 02347.

WANTED: RYCOM R-2174A/URR Voltmeter and C-1180/
GRC-27 Control Unit. Charles T. Huth, 229 Melmore St., Tiffin,
OH 44883 (1-419-448-0007).

WANTED: Kenwood DSP-100. Pse write with price including
UPS to Ohio OTH. DU7LA, P.O. Box 901, Cebu 6000, Phil-
ippines.

WANTED: SWT II Kenwood Matchbox for 440 MHz (or equiv.),
Richard, WA0KKC, 7139 Hardy, Overland Park, Kansas
66204.

SEEKING 2 MTR SSB TRANSCEIVER such as ICOM 202 or
SANTEC LS 202A or similar. Need not be working. Mike Kulyk,
10 Pine St., Central Islip, NY 11722.

WANTED: Kenwood TS-940, TS-711A; Yaesu FT-767GX, FT-
5200, FL-2100B, FTV-250, YP-150. Gyongyosi, 1044 Riverton
St., No. Brunswick, NJ 08902. Please include your phone num-
ber.

WANT TO CONTACT: Ex-U.S. Navy radiomen who went to
radio school during WW II. State where school attended. Bill,
419-435-4127. K8TBW@WB8LYF.#NWOH.OH.USA.NOAM.

HW-101 WANTED, working or not. KC8HF, 5354 Fox Ridge
Dr., W. Bloomfield, MI 48322.

WANTED: Heath Model HP-24 AC Power Supply for Model
HA-14 Amplifier. Will consider both units if necessary. N5DIJ,
P.O. Box 195, Sargent, GA 30275.



Daiwa, Rugged Reliability for Today's Amateur

DAIWA POWER SUPPLIES

More power, features & quality - for less in rugged, compact packages!
Excellent regulation with less than 2.5mV ripple. Fully protected with both
"crowbar" overvoltage & current and fold-back overcurrent protection cir-
cuits. Front panel, fully adjustable voltage is standard on most models & more!
Other models available.

MODEL	VOLTAGE	CURRENT (ICS)	CURRENT (CONT)	SIZE (INCHES)	WEIGHT (LBS.)
RS40X	1-15	40A	32	11x5.5x9	22
RS300	1-15	30A	24A	7x6x9	18
PS120M	3-15	12A	9.2A	5x4x9	11
PS50TM	8-15	5.2A	4.2A	6x3x8	6

* ICS: 50% Duty Cycle

PS50TM

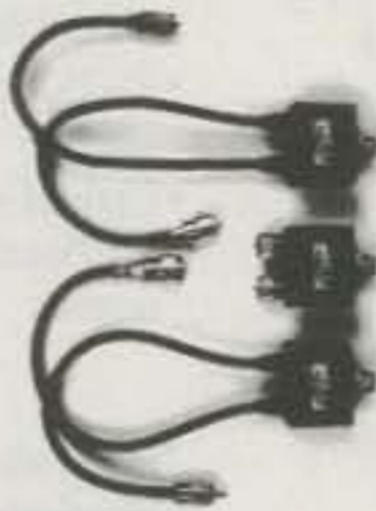


RS300



HIGH POWER DUPLEXERS

- DX 10M
- DX 10D
- DX 10N



- DX10M - PL259's With cables on both bands
- DX10N - PL259/N With cables 440MHz/ Type N
- DX10D - PL259 Without cable on both bands

Duplexer Specs:

PASS BAND	1.6 - 30MHz	140 - 150 MHz	400 - 460MHz
PASS POWER	400 W CW 1 KW PEP	250W CW 500W PEP	200W CW 400W PEP
INSERT. LOSS	less 0.1 dB	less 0.1 dB	less 0.2 dB
ISOLATION	over 60 dB	over 60 dB	over 60 dB

DAIWA'S wide range of accessory products offers more
features and quality - for less! Call your favorite dealer for
complete details and pricing.

DAIWA DIGITAL & CROSS-NEEDLE METERS

DP800 series-for computerized, fully auto. digital PEP or Avg.
pwr reading in three models for 1.8 - 525MHz. • NS660 models
covering 1.8MHz - 2.5GHz, all pwr levels, PEP or Avg w/
remote sensor capability. • CN101 series-for PEP & Avg pwr reading, base
station use for HF and VHF/UHF. • CN410 series-compact mobile HF &
VHF/UHF models (2 power levels) w/ custom backlit meter for night viewing.

MODEL	TYPE	FREQ. RANGE	POWER RANGE	CONN. TYPE	MIN SWR DETECT
DP830	Auto Digital	1.8-150MHz 140-525MHz	0-1.5kW 0-150kW	UHF & N	< 1W
NS660A	Cross Needle	1.8-150MHz	30/300/ 3kW	UHF	< 8W
CN101	Cross Needle	1.8-150MHz	15/150/ 1.5kW	UHF	< 4W
CN103M/N	X Needle	140-525MHz	20/200W	UHF or N	< 4W
CN460M	X Needle	140-450MHz	15/150W	UHF	< 3W

PROFESSIONAL CAVITY TYPE COAXIAL SWITCHES From Daiwa-The originator of the cavity type coaxial switch!

MODEL	CS201	CS201GII
Frequency Range	600MHz/1 GHz	2 GHz
Power Rating	2.5 kW PEP 1 kW CW	1.5W CW up to 30MHz 250 W CW up to 1 GHz 150 W CW up to 2 GHz
VSWR	below 0.12	below 1:1.3 at 1.3GHz
Insertion Loss	less than 0.2 dB	< 1.2 dB at 1-2 GHz
Isolation	60 dB 600Mhz	50dB 1 Ghz
Connector	SO239	N
Output Port	2	2



Electronic Distributors Vienna, VA, 22180
325 Mill St. NE PH 703 938 8105 FAX 703 938 4525

**Austin
Amateur
Radio
Supply**



5325 North I-35 • Austin, Texas 78723

1-800-423-2604

**YAESU
FT416GRY**



Two Meter Handheld
Two Watts
Rx 130-174 MHz
Tx 144-148 MHz
41 Memory Ch
10 DTMF Auto-dials
Tone Enc & Dec

**Free Under
Freight In The 48 \$**

FNB-25G
7.2V 600 mAh Batt Pk
Reg 49.95 Now \$25
With Radio Purchase

**FT416BLK
Special Pricing!**

ALINCO



**Final
Close
Out!
Under
\$**

DR592T

Dualband Mobile 2M/70CM
Tone Encode • 28 Mem Ch
Rx 130-174 • 400-520 MHz
Cross Band Repeat
Dual Antenna Ports

**Free Remote Control w/Opt EJ-8U
Freight Remote Head w/Opt EDC-20
In The 48 Limited Supply!**

**Call Now!
1-800-423-2604**



**On
Sale!**

ARX-2B	54.95
A148-10S	65.95
13B2	104.95
AR-270	66.95
AR-270B	96.95
A3S	319.95
R-7	345.00

**Free Freight
In The 48**

**Call For
Special Prices
On Other Models**

Advertiser's Index

AEA/Adv. Elec. Applications.....	5,7
AMSOF.....	112
ARRL.....	86,134,149
ASA.....	105
Ace Communications.....	55
Advanced Systems Engineering.....	56
Alinco Electronics.....	143
Alpha Concepts.....	104,108
Alpha Delta Communications Inc.....	80
Aluma Towers.....	146
Amateur Elec. Supply.....	71,89,103
Amateur Radio Wise.....	115
Ameritron.....	51
Amidon.....	21
Antenna Mart.....	150
Antennas West.....	125,128
Antique Electronic Supply.....	128
Antique Radio Classified.....	84
Associated Radio.....	65
Astron Corp.....	101
Austin Amateur Radio Supply.....	153
Azden.....	70
Bamcom Communications.....	125
Barry Electronics.....	111
Beezley, Brian, K6STI.....	80
Bencher, Inc.....	84
Bilal Co./Isotron Ants.....	69
Boxboro Hamfest.....	29
Buckmaster Publishing.....	104,112,125,152
Buffalo Hamfest.....	125
Burghardt Amateur Center.....	61
C & S Sales.....	108
C.A.T.S.....	134
CB City International.....	150
CQ Almanac.....	103
CQ Back Issues.....	126
CQ Beginner's Guide to Amateur Radio.....	133
CQ Books & Videos.....	144,145
CQ T-Shirts.....	131
CQ VHF Products.....	49
CABLE X-PERTS.....	119
Cleveland Institute of Electronics.....	59
Comet Antennas/NCG Inc.....	154
Command Productions.....	62
CommPute, Inc.....	115
Communications Concepts Inc.....	125
Communication Electronics.....	107
Communications Quarterly.....	135
Computer Aided Technology.....	100
Cushcraft Antennas.....	11
Diamond Antennas.....	16
Down East Microwave.....	80
Drake, R.L.....	75
Dunestar Systems.....	104
ETO.....	2
East Coast Amateur Radio.....	105
EDCO/Daiwa.....	152
Force 12 Antennas.....	45
G4ZPY Paddle Keys.....	104
GAP Antennas.....	72,84
Garantennas.....	138
Grove Enterprises.....	129,133
HAL Communications.....	25
Ham Contact, The.....	128
Ham Radio Outlet.....	12,15
Ham Station.....	117
Hamsure.....	146
Hamtronics.....	118
Handi-Base & More.....	150
Handi Radio Products.....	146
Hardin Electronics.....	47
Harlan Technologies.....	112
Hustler Antennas.....	87
IC Engineering.....	108
ICOM America, Inc.....	Cov. IV,9
J Com.....	115
JPS Communications.....	109
Jade Products.....	150
Japan Radio (JRC).....	81
Jun's Electronics.....	68,69
K1EA Software.....	105
K2AW's "Silicon Alley".....	69
KLM Antennas.....	8
Kantronics.....	83
Kent Morse Keys.....	137
Kenwood, USA.....	Cov. II,1,67
L & L Engineering.....	84
LaRue Electronics.....	54
Lathrop Publications Inc.....	114
Lentini Communications.....	135
Lewallen, Roy, W7EL.....	125
Lightning Bolt Antennas.....	104

(continued on page 155)

**Austin
Amateur
Radio
Supply**

**KENWOOD
Radios
&
Accessories**

5325 North I-35 • Austin, Texas 78723

1-800-423-2604

KENWOOD

**Sizzling
Summer
Sale**



**TS50S • TS450SAT
TS850SAT**

**Call Now
For Latest
Special Pricing!**



**TM742A
Dual Band
Tri Band
Mobiles**



TM733A

**Two Meter
Mobiles**



TM241A • TM251A

Great Handhelds!



TH22AT • TH28A • TH78A

COMET

MODERN, MULTI-BAND ANTENNA SYSTEMS

MOBILE ANTENNA PRODUCTS



Modern, high-performance stations use COMET Antennas, Duplexers, Triplexers and Accessories! COMET products are designed to provide an exceptional level of signal quality and coverage area. Whether operating mobile or from your base station, COMET products make you sound good. No other product line has the selection, convenience, quality and performance!

DUAL-BAND MOBILE ANTENNAS

FL-67S Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required
Gain & Wave: 146MHz 4.5dBi 1/2 wave
VSWR: 1.5:1 or less
Max Power: 150 watts
Length: 4' 11"
Connector: Gold Plated PL-259
 446MHz 7.2dBi 5/8 wave x 3

FL-62S Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required
Gain & Wave: 146MHz 3.5dBi 1/2 wave
VSWR: 1.5:1 or less
Max Power: 150 watts
Length: 3' 5"
Connector: Gold Plated PL-259
 446MHz 6.0dBi 5/8 wave x 2

NEW! **SB-7/SB-7NMO** Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required
Gain & Wave: 146MHz 4.5dBi 5/8 wave center-loaded
VSWR: 1.5:1 or less
Max Power: 70W FM
Length: 4' 7"
Connector: PL-259 or NMO style
 446MHz 7.2dBi 5/8 wave x 3

NEW! **SB-5/SB-5NMO** Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required
Gain & Wave: 146MHz 3.0dBi 1/2 wave
VSWR: 1.5:1 or less
Max Power: 120W FM
Length: 38"
Connector: PL-259 or NMO style
 446MHz 5.5dBi 5/8 wave x 2

NEW! **SB-2/SB-2NMO** Dual-Band 146/446MHz
Gain & Wave: 146MHz 2.15dBi 1/4 wave
VSWR: 1.5:1 or less
Max Power: 60W FM
Length: 18"
Connector: PL-259 or NMO style
 446MHz 3.8dBi 5/8 wave

NEW! **B-10/B-10NMO** Dual-Band 146/446MHz, Cellular Look-a-like
Gain & Wave: 146MHz 0dBi 1/4 wave
VSWR: 1.5:1 or less
Max Power: 50W FM
Length: 12"
Connector: PL-259 or NMO style
 446MHz 2.15dBi 1/2 wave

B-20/B-20NMO Dual-Band 146/446MHz, Cellular Appearance, No Ground Plane Required
Gain & Wave: 146MHz 2.15dBi 1/2 wave
VSWR: 1.5:1 or less
Max Power: 50 watts
Length: 30"
Connector: PL-259 or NMO style
 446MHz 5.0dBi 5/8 wave x 2

NEW! **SB-25/SB-25NMO** Mono-Band 146MHz w/Fold-Over, No Ground Plane Required
Gain & Wave: 146MHz 4.1dBi 5/8 wave center loaded
VSWR: 1.5:1 or less
Max Power: 100W FM
Length: 4' 9"
Connector: PL-259 or NMO style

COMET products are available from most major dealers. For customer service, or a complete catalog, please call us at 800/962-2611. We're confident COMET products and accessories will enable you to enjoy Amateur Radio to its fullest!



NCG COMPANIES
 1275 North Grove Street
 Anaheim, CA 92806
 (714) 630-4541
 FAX (714) 630-7024

NEW!

MINI SPEAKER/MIC



HM-P2K/F
 Mini spkr/mic featuring full TX/RX quality!
 Light weight, extremely small. 1"x2" with collar pocket clip.
 HM-P2K: Kenwood Version
 HM-P2F: Icom/Yaesu Standard/Alinco/etc.

TRI-BAND MOBILE ANTENNAS

CX-224/224NMO Tri-Band 146/220/446MHz, w/Fold-Over, No Ground Plane Required
Gain & Wave: 146MHz 2.15dBi 1/2 wave
VSWR: 1.5:1 or less
Max Power: 100 watts
Length: 3'
Connector: PL-259 or NMO style
 220MHz 3.6dBi 5/8 wave
 446MHz 6.0dBi 5/8 wave x 2

FJ-15S Tri-Band 52/146/446MHz w/Fold-Over
Gain & Wave: 52MHz 2.15dBi 1/4 wave
VSWR: 1.5:1 or less
Max Power: 120 W FM
Length: 4' 10"
Connector: PL-259
 146MHz 4.5dBi 5/8 wave
 446MHz 7.2dBi 5/8 wave x 3

HF MOBILE AND HT ANTENNAS

HA-4S Quad-Band HF 40/* (20)/15/12/10 Meters w/Fold-Over
Wave: 1/4 wave
VSWR: 2:1 or less
Weight: 1 lb. 14 oz.
Length: 4' 4"
Max Power: 120W SSB (200W SSB 28MHz)
Connector: PL-259

SH-55 Super Flexible 146/446MHz HT Antenna
Gain & Wave: 146MHz 1.5dBi 1/4 wave
Max Power: 10 watts
Length: 15.5"
Connector: BNC
 446MHz 3.2dBi 5/8 wave x 2

NEW! **CH-722SA** High Gain HT Antenna
Gain & Wave: 146MHz 3.0dBi 1/2 wave
Max Power: 50 watts
Length: 35", 2 sections, 18" each
Connector: BNC
 446MHz 5.5dBi 5/8 wave x 2

CH-32 Miracle Baby 146/446MHz HT Antenna
Gain & Wave: 0dB 1/4 wave
Max Power: 10 watts
Length: 1.75"
Connector: BNC

DUPLEXERS AND MOBILE MOUNTS



CF-4106K, I, J,
 146/446MHz
 Band Pass, Ins Loss, Max Pwr.
 1.3-150MHz, 0.1dB, 800w PEP
 400-540MHz, 0.2dB, 500w PEP
 Isolation: 60dB
CONNECTORS:
 4160K 4160I 4160J
 Output: SO-239 SO-239 SO-239
 Low In: PL-259 PL-259 SO-239
 High In: PL-259 N-Male SO-239



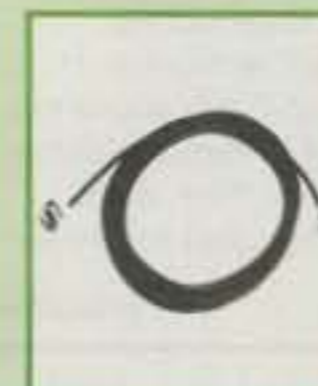
RS-21
 Trunk, hatchback, rear door (van, blazer, etc.) mount. Adjustable to virtually ANY angle. Rubber-coated base protects vehicle paint.



NEW! **RS-820**
 Heavy-Duty, Low Profile Trunk Lip or Hatch Back Mount. Rubber-coated base protects vehicle paint.



WS-1M
 Multi-Adjustable Window Clip Mount. 11.5 feet of high quality coax. Gold-plated UHF Conns. for Antennas up to 40" in height.



3D4M Standard Cable Assembly. 13.5 feet of low loss coax. Gold plated UHF (PL-259/SO-239) connectors.
3D5M Standard Cable Assembly. Same as 3D4M, but 17 feet of coax



CK-5M Deluxe Cable Assembly. 13 feet double shielded very low loss coax + 12" RG-188 teflon coax. Gold plated UHF (PL-259/SO-239) connectors.
CK-5M5 Deluxe Cable Assembly. Same as CK-5M, but 17 feet of coax

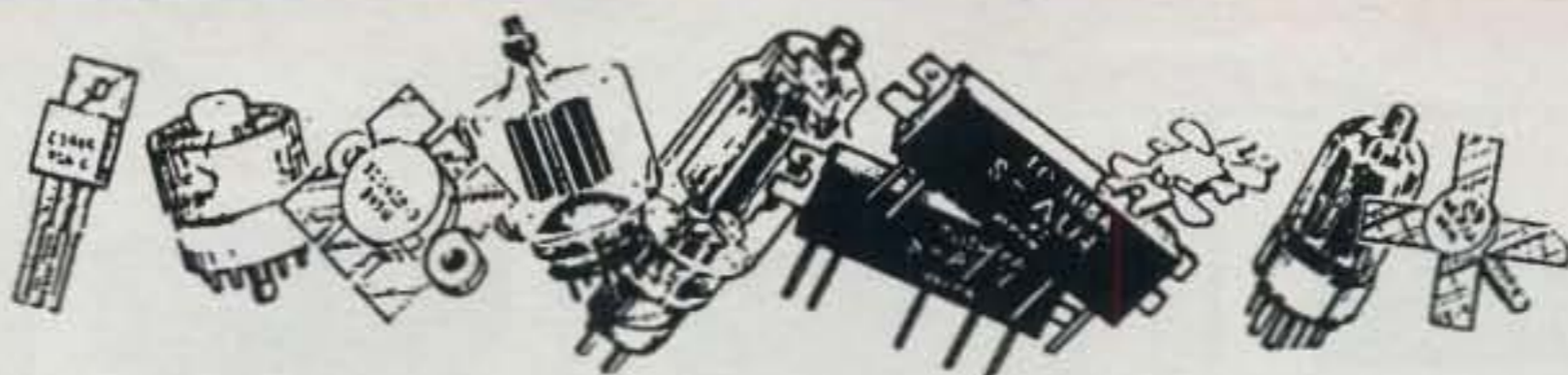
NEW!

Advertiser's Index (cont'd)

Lucas Radio/Kangaroo Tabor Software	45
Luke Co	105
M2 Antennas	113,129,136
MD Electronics	93
MFJ Enterprises	35,37,39,41
Maldol, USA	95
Martin Engineering, Glen	47,150
Match All	121
Motron Electronics	119
NCG Inc.	137
National Amateur Radio Association	120
Naval Electronics	99
Nemal Electronics	134
Nil-Jon Antennas	152
ONV Safety Belt Co.	128
Oak Bay Technology	127
Oklahoma Comm. Center	76,148
OPTOelectronics	10,77,150
Outbacker Antennas	56
PC Electronics	117
PASS Publishing	48,114
PDK Inc.	137
Palomar Engineers	43
Peet Bros. Company	47
Periphex Inc	119
Phillips-Tech Electronics	104
Pipo Communications	98
Polyphaser	45
Pro-Am/Valor	57
Productivity Resources	100
QSLs by W4MPY	138
QSLs by WX9X	84
Quantum Instruments	95
R & L Electronics	97
RC Distributing	120
RF Applications	65
RF Connection	69
RF Parts	155
RT Systems	137
Radio Adventures Corp	138
Radio Amateur Callbook	20
Radio Bookstore	93
Radio Center USA	156
Radio Club of JHS 22	132
Radio Engineers	84
Radio Place, The	99,138
Radio Works	21
Radioware	62
Resource Solutions	146
Robert Hall Electronics	150
Ross Distributing	104
Rutland Arrays	118
SGC Inc	36
Scrambling News	138
Sentech Inc	104
Sescom Inc	112
Solder-It	112
Sommer Antennas	135
Spectrum International	136
Spider Antennas	48
Standard Amateur Radio	85
Surplus Sales Of Nebraska	48
TIC General	127
TNR Batteries	112
Telex	53
Ten Tec	139,141
Texas Towers	90
Timewave Technology	63
Towermate	138
Tucker Electronics & Computers	78,79
US Radio	113
Universal Electronics	104
Universal Manufacturing	72
Universal Radio	121
VIS Study Cards	98
Vallarta Hamfest	147
Versatel Communications	134
Vibroplex	99
Virginia Beach Hamfest	117
W & W Associates	42
W5YI Marketing	100,115,128,132
W9INN Antennas	98
WJ2O Master QSO Logging Program	80
Watkins-Johnson	73
West Radio School, Gordon	44
Wren Publications	104
Yaesu Electronics	Cov.III-III-A-III-B
Yost & Co.	137

Only the best companies advertise in CQ. Learn how easy it is to enjoy the benefits the great CQ audience has to offer. Call Arnie Sposato, N2IQO, at (516)681-2922 or FAX (516)681-2926.

RF POWER TRANSISTORS AND TUBES



RF PARTS BRAND PREMIUM GRADE POWER TUBES

100% POWER TESTED • 2 YEAR LIMITED WARRANTY • BEST VALUE

572B	3-500Z	3-500ZG/GRAPHITE
MATCHED SET/2 \$104.95	SPECIAL PRICE \$94.95	SPECIAL PRICE \$109.95
MATCHED SET/4 \$209.90	MATCHED SET/2 \$199.95	MATCHED SET/2 \$229.95

ADDITIONAL TRANSMITTER TUBE VALUES

811A RFP	3-500Z EIMAC	3-500Z AMPEREX	6146B GE
MATCHED SET/2 \$38.90	SPECIAL PRICE \$148.80	SPECIAL PRICE \$148.80	SPECIAL PRICE \$26.95
MATCHED SET/3 \$58.35	MATCHED SET/2 \$318.80	(List Price...\$183.00)	MATCHED SET/2 \$59.95

PARTIAL LISTING OF POPULAR TUBES AND TRANSISTORS IN STOCK

MGF1302 \$7.95	MRF497 \$16.95	2N6082 \$14.35	MB8719 \$6.35	POPULAR TUBES	
MRF134 18.00	MRF515 2.90	2N6083 14.35	NE602 5.50	12BY7 \$13.95	
MRF136 22.00	MRF555 3.50	2N6084 14.35	PLL02A 11.93	572B PL/Pride 45.00	
MRF137 27.00	MRF559 2.25	2SA1012 1.30	TA7205AP 1.85	572B RFP 49.95	
MRF140 75.00	MRF586 2.65	2SB754 2.50	TA7222AP 2.05	572B Cetron CALL	
MRF141 84.50	MRF629 7.95	2SC730 7.95	MP=Tested Matched Pr	807 10.95	
MRF141G 179.70	MRF630 6.50	2SC741 5.90	OUTPUT MODULES	810 89.50	
MRF150 66.00	MRF641 21.95	2SC1307 CALL	SAU4 \$49.90	811A 15.95	
MRF151 82.00	MRF644 25.00	2SC1419 3.95	SAV6 39.95	811A RUSS. 17.95	
MRF151G 164.00	MRF646 27.00	2SC1729 17.95	SAV7 39.95	811A RCA CALL	
MRF174 83.00	MRF648 33.70	2SC1945 6.65	SAV17 69.70	813 RFP 37.95	
MRF207 2.95	MRF650 33.70	2SC1946A 19.95	SAV24 78.80	833A, 833C 89.95	
MRF224 17.75	MRF652 14.85	2SC1947 6.75	M57710A 39.95	6146B 15.95	
MRF237 5.40	MRF653 19.95	2SC1955 9.00	M57714 54.50	6146B-MP 36.95	
MRF238 16.00	MRF846 45.00	2SC1969 2.65	M57719N 54.95	7199 23.95	
MRF239 17.00	MRF847 41.70	2SC1970 2.45	M57726 67.95	8560A MOTO 124.95	
MRF240, A 18.50	MRF901 1.50	2SC1971 5.55	M57727 69.95	8560AS CALL	
MRF245 34.00	MRF966 4.75	2SC2029 3.50	M57729 79.95	8873 EI 379.95	
MRF247 29.95	MRF1946 17.00	2SC2075 2.43	M57732L 32.95	8875 EI CALL	
MRF262 14.50	MRF1946A 17.00	2SC2094 15.95	M57735 69.95	3-400Z EI CALL	
MRF264 15.45	MRF2628 10.00	2SC2097-MP com 61.90	M57737 49.95	3-500Z PL/Pride 90.00	
MRF309 46.75	SRF2072 13.75	2SC2166C 1.75	M57739C 53.25	3-500Z PL/Pride 105.00	
MRF317 64.00	SRF3749 CALL	2SC2221 8.25	M57741 L,M,H 57.70	4-400C EI 159.95	
MRF327 62.00	SRF7000 CALL	2SC2237 9.30	M57762 79.95	4-400G/CG 120.00	
MRF329 69.90	TIP in stock CALL	2SC2289 11.95	M57785M 62.95	4-1000A EI CALL	
MRF340 14.85	2N3055 1.45	2SC2290 14.95	M57787 59.95	4PR1000A EI CALL	
MRF421 24.95	2N3553 2.85	2SC2290-MP 35.95	M57791 84.95	3CX400A7 EI CALL	
MRF422 38.00	2N3771 3.35	2SC2312C 4.95	M57792 88.80	3CX400U7 EI CALL	
MRF422-MP 85.00	2N3866 1.25	2SC2509-MP KEN 37.70	M57796MA 34.95	3CX800A7 EI CALL	
MRF427-MP 46.00	2N4427 1.70	2SC2630 24.95	M67705M 47.90	3CX1200A7/D7 CALL	
MRF429 44.95	2N5109 1.75	2SC2640 21.90	M67715 59.95	3CX1500A7 EI 598.80	
MRF433-MP 32.00	2N5179 1.25	2SC2782 34.75	M67728 128.80	3CX3000A7 EI CALL	
MRF450 13.50	2N5589 19.95	2SC2783 54.85	M67742 109.85	4CX250B SPECIAL 89.95	
MRF454 13.95	2N5590 16.95	2SC2879 16.95	M67748H, L 39.90	4CX350A, F EI/SVT CALL	
MRF455 10.95	2N5591 19.00	2SC2879-MP 42.95	M67749M 44.40	4CX1500B EI CALL	
MRF455A 11.95	2N5643 19.00	2SC2904 34.95	PF0011 CALL	4CX5000A EI # 1095.00	
MRF458 17.95	2N5944 14.00	2SC2905 41.40	MHW SERIES CALL	4CX15000A7 1395.00	
MRF475 9.25	2N5945 14.00	2SC3101 8.95	ICOM SC SERIES CALL	5CX1500B EI CALL	
MRF477 11.95	2N5946 15.00	3SK121Y 3.95	OVER 15,000 RF	We have large inventories	
MRF485 KEN CALL	2N6080 14.35	3SK174 4.23	MODULES IN STOCK.	of new EIMAC tubes. Call	
MRF492 14.95	2N6081 14.35	3N211 5.95	Call if P/N not shown.	for numbers not shown.	

\$3 HAND. CHARGE ON ORDERS UNDER \$25

Mfg: EI = Eimac, PL = Penta Labs • RFP = RF PARTS CO. • Note: (#) = Industrial Boxed Eimac/Amperex
Price & availability subject to change without notice • Quantity Pricing Available

• SAME DAY UPS SHIPPING OF ORDERS RECEIVED BY 4 PM PST (7 PM EST) •

UPS GROUND: \$5.00 minimum + \$.50/lb. over 2 lbs.
UPS 3-DAY: \$6.00 minimum + \$1.00/lb. over 2 lbs.
UPS 2-DAY: \$7.50 minimum + \$1.00/lb. over 2 lbs.
UPS NEXT DAY: \$16.50 minimum. For Saturday delivery add \$10.00.
C.O.D.: Add \$4.50. Cash, Money Order, or Pre-approved Company
Check. No C.O.D. to Alaska, Hawaii, Puerto Rico, or Canada.
CANADA: \$5.50 minimum up to 1 lb. postal. UPS available.
CALIFORNIA: Residents add appropriate sales tax.
PREPAID Bank Check or Money Order. Personal checks \$40.00 limit.

VISA and MASTERCARD accepted. \$25.00 minimum parts order.
OPEN ACCOUNT: Net 30 to firms whose credit has been pre-approved.
FOREIGN: Insurance/Registration is often available. Advise if desired.
Small Packet Air shipment for small parts.
\$10.00 shipping/handling up to 8 oz., 4 lb. & 8"x8"x8" box max.
AIR PARCEL POST/FED EX/DHL/UPS is also available.

PLEASE FAX YOUR RF PARTS NEEDS FOR OUR QUOTATION.
FOR CATALOG - Call 619-744-0750

• INDUSTRIAL • O.E.M. • SERVICE • R&D • AMATEUR • MARINE
Monday - Friday 7:00 a.m. - 5 p.m. PST / 10:00 a.m. - 8 p.m. EST

VISA	ORDERS ONLY	1-800-RF-PARTS 1-800-737-2787	NO TECHNICAL	MasterCard
	MAIN ORDER LINE	619-744-0700	DELIVERY INFORMATION	
WE EXPORT	CUSTOMER SERV. OR WARRANTY	619-744-0750 (10 a.m. - 4 p.m. only)	TECHNICAL & APPLICATIONS	WE EXPORT
	FAX	619-744-1943	FAX	



RF PARTS
435 SOUTH PACIFIC STREET
SAN MARCOS, CA 92069

RADIO CENTER USA

All Factory
Coupons Apply. Call
For Latest Specials!

1-800-821-7323
East/Midwest

1-800-345-5686
West

KENWOOD



TS-50S/60S
Compact 100W HF Xcvr.
TS-60S, 90W, 6M
Compact XCvr

ICOM



IC-737A
High Performance HF Trans.
With Auto Antenna Tuner

YAESU



FT-990
100 Watt HF Transceiver
w/General Cov. Receiver

YAESU



FT-1000D
Premium HF Transceiver
In A Class By Itself

ALINCO



DR-600T
2M/440MHz Mobile With
Detachable Front Panel
Direct Freq. Entry Thru Mic.



TM-733A
2 Meter/70cm Mobile
50W/35W output.
Detachable Front Panel



IC-2700H
2 M/440MHz Mobile
w/Detachable Panel
v/v, u/u, or v/u



FT-2200
2 Meter Mobile. Compact
Size With 3 Power Levels



FT-530
2M/440MHz
Handheld With
Multiple Power
Levels, 82 Mem.
And Aircraft
Receive



DR-130T
2 Meter Mobile With
50 Watts Output, 20 Mem.
Easy-To-Use Controls



TM-241A
Easy To Use 2 Meter FM
Mobile With Models For
440MHz and 1200MHz



IC-281H
2 Meter Mobile



FT-5100
Compact 2M/70cm Mobile.
Built-In Antenna Duplexer



FT-11R
2 Meter, FM
Handheld. World's
Smallest Size HT
With Full Sized
Keyboard



DJ-580T
2 Meter HT
w/Extended
Receive, Great
Sound, CTCSS
En/Decode, 8 Scan.
Modes



TH-22AT
Compact,
2M HT,
3 Watts

TH-79A
2M/440 HT
Easy To Use
New Dot-Matrix
LCD Display



IC-2GXAT
2 Meter
Handheld With
Up To 7 Watts
Output



FT-690MKII
Portable 6 Meter, U/LSB,
CW, FM.

*6 Meters Is Hot!
Buy The Best!*



ROTATORS
Medium,
Medium Heavy,
Heavy Duty And
Azimuth-Elev.



MFJ-784 DSP Filter
New, Reduces Noise And
QRN For Voice, CW, DATA
Available August
Wait And Get The Best!

rconcepts

VHF/UHF Amplifiers
• 2M, 220MHz, 440MHz,
Dual Band Models
• GaAs FET Preamps
• High SWR Shutdown
• 1 Year Warranty
CALL TODAY!

OUTBACKER

8 HF Bands On 1
Whip No Coils To
Change, No Tuner
HF Mobilizing Fun,
Plug And Play
NEW LOW PRICES

ASTRON CORPORATION



We Beat The Print Ads
New Low Prices!
Call Now

Cushcraft

A3S.....	\$329.95
A4S.....	\$389.95
R5.....	\$259.95
R7.....	\$343.95
13B2.....	\$ 94.95
17B2.....	\$159.95
124WB.....	\$ 49.95
ARX2B.....	\$ 49.95
AR270.....	\$ 59.95
AR270B.....	\$ 84.95
ARX270.....	\$184.95
A148-3.....	\$ 34.95
A148-10.....	\$ 57.95
A449-11.....	\$ 59.95
A50-5.....	\$124.95

MFJ

1270C.....	\$110
1276.....	\$139
1278B.....	\$259
1704.....	\$ 54
1786.....	\$214
1796.....	\$169
1798.....	\$229
411.....	\$ 66
284, 5, 6, 7.....	\$ 22
249.....	\$169
259.....	\$189
949E.....	\$109
986.....	\$239
989C.....	\$288

**Large Stock,
Call For Other Items**

COMET

High Performance
Base/Repeater And
Mobile Antennas

**Guaranteed
Lowest Prices**

Kantronics



KAM Plus
TNC Features PACTOR,
CW, RTTY, ASCII, AMTOR,
Packet And Now With
Super Fast G-TORI!

MIDLAND SALE

2 Meter/440MHz
Dual Band
Antenna
NMO Mag Mount
Super Priced
For Mobile Fun

\$33.95

AEA
PK-232MBX Controller
\$279

**Camcorder
Battery Sale**

**Midland
Antenna Sale**

Cushcraft
R7 10-40M Vertical
Only \$338

MFJ
949E ANTENNA TUNER
SPECIAL NOW ONLY
\$109

ALINCO
ASTRON
BENCHER
COMET
CUSHCRAFT
HUSTLER
ICOM
KANTRONICS/RFC

**BEST
PRICES ON
BIG NAME
BRANDS**

KENWOOD
MFJ
MIDLAND
MIRAGE
M²
OUTBACKER
VAN GORDEN
YAESU

HOW TO ORDER

- Credit card customers: Call our 800 numbers Monday thru Friday 9:00 A.M. to 5:00 P.M., Saturday 9:00 A.M. to 2:00 P.M. CST and PST.
- No surcharge for credit cards.
- Cash paying customers: Please mail your checks to either address below.

630 NW Englewood Road
Kansas City, MO 64118
(816) 459-8832

525 E. 70th Avenue, 1W
Denver, CO 80229
(303) 288-7373



FT-2500M/FT-7400H 2m/70cm Mobiles

NEW

Specifications

- **Frequency Coverage:**
FT-2500M
RX: 140-174 MHz
TX: 144-148 MHz
FT-7400H
RX/TX: 430-450 MHz
- Rugged Military Spec Design
- Advanced Track Tuning (ATT)
- Selectable Alpha-Numeric Display
- Largest Display Available
- Power Output:
FT-2500M 50/25/5 Watts
FT-7400H 35/20/5 Watts
- Flip Up Front Control Panel
Hides Seldom Used Buttons
- Backlit DTMF Mic
- 31 Memory Channels
- CTCSS Encode Built-in
- Automatic Power Off (APO)*
- Time-Out Timer (TOT)*
- Manual* or Automatic
Backlighting Adjustment
- **Accessories:**
FTS-17A CTCSS Decode Unit
FRC-6 DTMF Paging Unit
SP-4 External Speaker
FP-800 Power Supply

*FT-2500M

"No other mobile has a Military spec rating. This radio can really take it!"

"New Omni-Glow display and backlit DTMF Mic, too. Both Yaesu 'firsts'!"

"3-stage advanced track tuning really reduces intermod. Its great!"

"Yaesu did it again."



Performance beyond the call of duty.

Just when you thought you had the most formidable mobile built, we made the FT-2500M – the next evolution of powerful, rugged mobile radios.

The FT-2500M takes the durable quality, features, and performance of the popular FT-2400H and goes one better! A new easy-to-operate front panel design with rubber coated knobs, new, large state of the art Omni-Glow display to provide enhanced viewing at all angles and light levels, and Yaesu's exclusive 3-Stage Advance Track Tuning feature that reduces intermodulation and front-end overload puts the FT-2500M as close as you can get to commercial grade performance in amateur frequencies.

The FT-2500M is the only mobile with a Military spec rating and the most often used controls on the front and

those you "set and forget" neatly hidden. It's the first mobile radio with a backlit DTMF mic, too. With its extra large heat sink and one-piece die-cast chassis, the tough FT-2500M is unlike any other mobile in its class.

Test the mettle of your mobile. If it doesn't measure up to the endurance standards of the U.S. Military, get the FT-2500M. For flawless performance in rough and rugged situations, the FT-2500M is really formidable – just what you'd expect from Yaesu. See it at your dealer today!

YAESU
Performance without compromise.SM

FT-2200/7200

Just 5.5"W x 1.6"H x 6.5"D, the FT-2200/7200 radios are designed to fit into today's more compact cars with ease.

SPECIFICATIONS • Frequency Coverage: FT-2200 RX: 110-180 MHz, TX: 144-148 MHz. FT-7200 RX/TX: 430-450 MHz. • Wide Receiver Coverage: 110-180 MHz • AM "Aircraft" Receive: 110-139 MHz • Built-in DTMF Paging/Coded Squelch • Selectable Channel Only Display • 10 Memory DTMF Auto Dialer • Backlit DTMF Mic • Power Output 50/25/5 Watts (FT-7200 35 Watts) • 50 Memory Channels • Remote Operation w/ Optional MW-2 • CTCSS Encode Built-in • Optional Digital Voice Storage System. Accessories: See your authorized Yaesu dealer.



© 1994 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90701 (310) 404-2700

Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

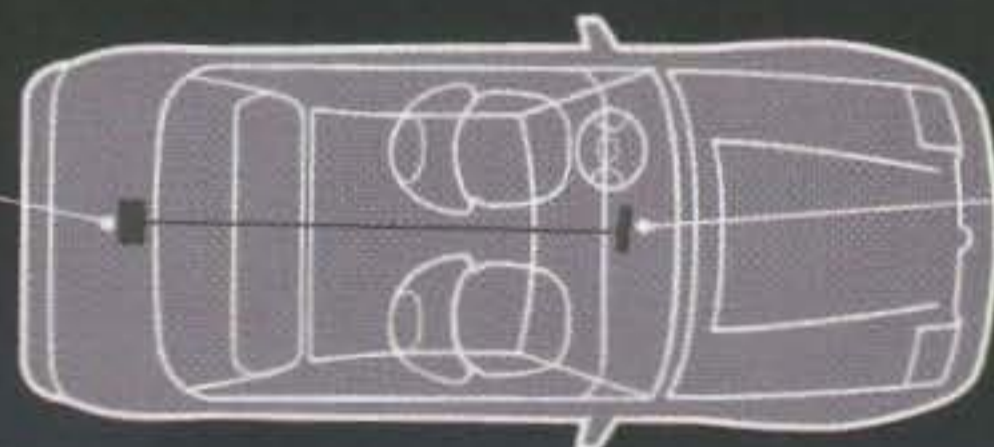
Compact HF Transceiver FT-900AT

that's going places.

For ease of use, Yaesu's exclusive Omni-Glow display enhances viewing in any light condition.

Trust Yaesu to know what you want. True HF you can take with you or leave at home!

100 Watt RF deck can mount in trunk, or under seat.



Detachable front panel mounts up front.

And, since the high speed antenna tuner is built-in, it means less clutter in your shack.

For sheer high-performance, anywhere, the incomparable FT-900AT ranks with the FT-1000 to further establish Yaesu as the choice of the world's top DX'ers.

Available now at your Yaesu dealer.

YAESU

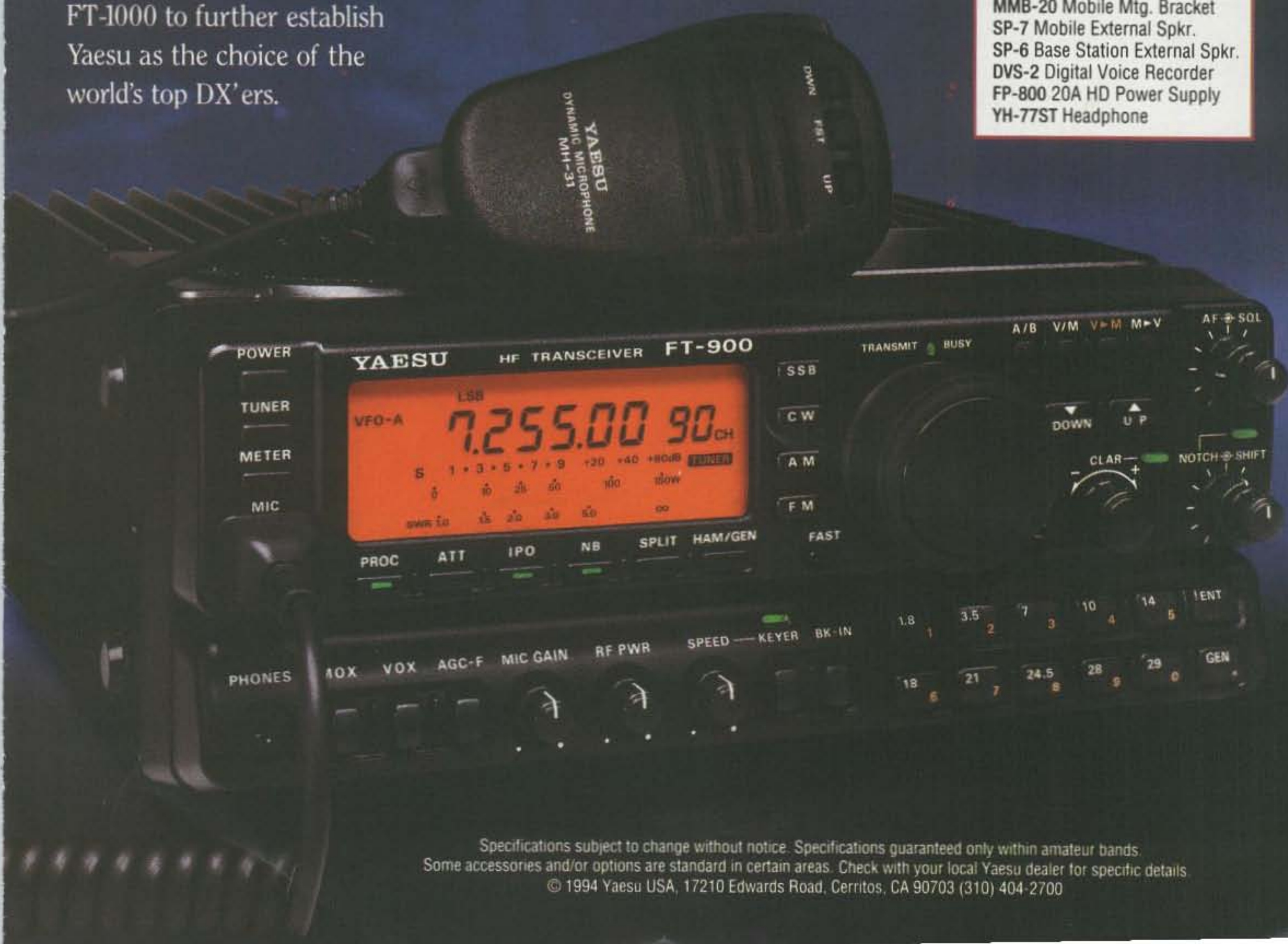
Choice of the World's top DX'ers

Specifications

- Remote Front Panel Design
- Built-In Auto Antenna Tuner
- Direct Keypad Entry when used as a Base Station
- Large, Bright Omni-Glow™ LCD Display
- 100W on SSB, CW, FM modes; 25W on AM
- IF Shift and 30db Notch Filter
- Digital S/R, SWR & ALC Meters
- Programmable CTCSS Encode w/Repeater Offset
- Direct Digital Synthesis (DDS)
- 100 Memory Channels
- Frequency Range
RX: 100 kHz-30 MHz
TX: 160-10 meters
- CW Full Break-in Keying w/Adjustable Speed
- Fast/Slow AGC Circuit
- Intercept Point Optimization
- Duct Flow Cooling System
- Twin Band Stacking VFOs
- Built-in Noise Blanker
- Built-in Adjustable Speech Processor

ACCESSORIES:

- YSK-900 Remote Mount Kit
- MMB-62 Controller Bracket
- MMB-20 Mobile Mtg. Bracket
- SP-7 Mobile External Spkr.
- SP-6 Base Station External Spkr.
- DVS-2 Digital Voice Recorder
- FP-800 20A HD Power Supply
- YH-77ST Headphone



Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.
© 1994 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90703 (310) 404-2700

NEW HF

Introducing an HF

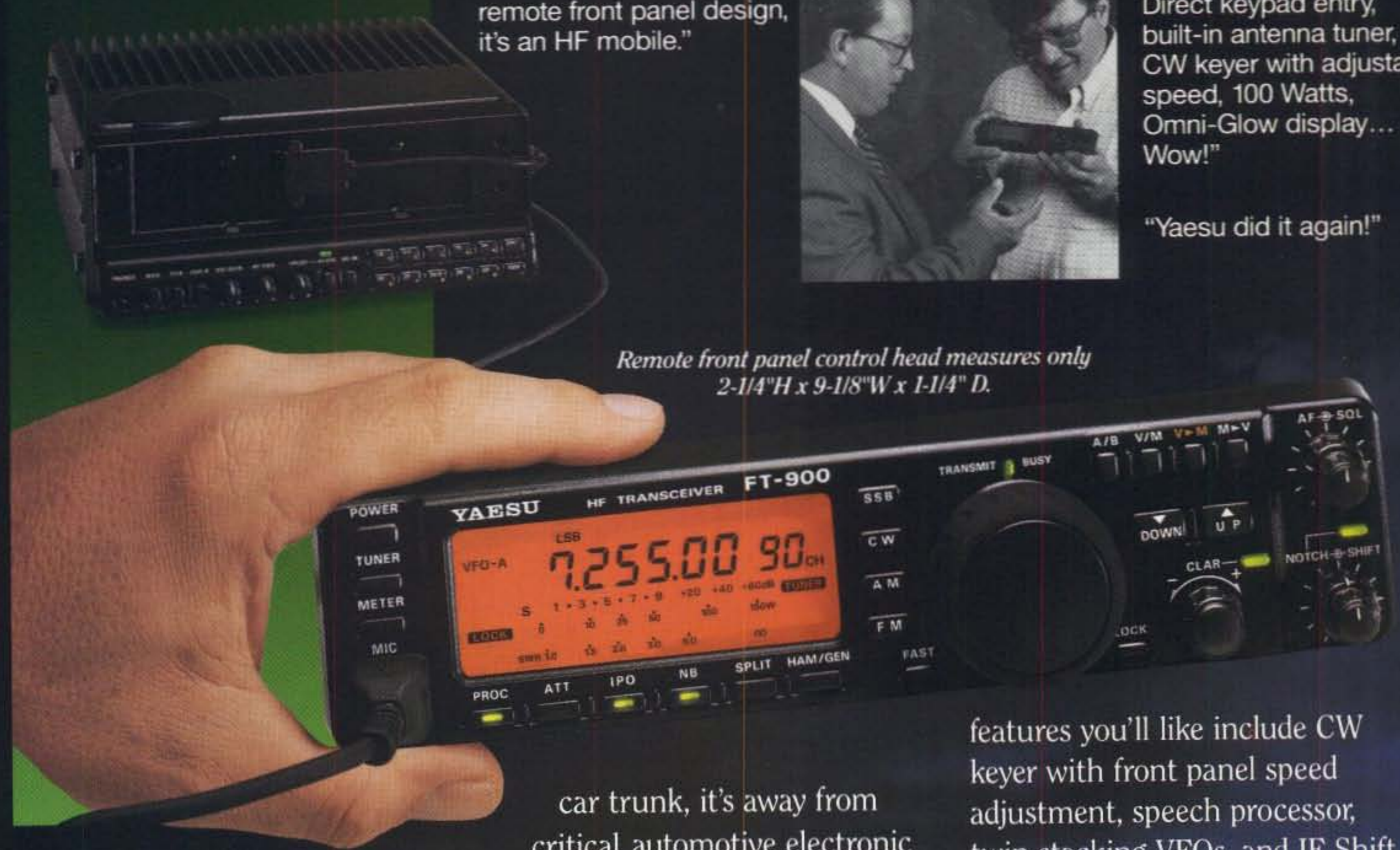
"With the small snap-off remote front panel design, it's an HF mobile."



"It's a great base, too. Direct keypad entry, built-in antenna tuner, CW keyer with adjustable speed, 100 Watts, Omni-Glow display... Wow!"

"Yaesu did it again!"

Remote front panel control head measures only 2-1/4"H x 9-1/8"W x 1-1/4" D.



Uncompromising HF quality that will change your lifestyle. It's the first transceiver with true HF technology to go mobile in any vehicle or stay at home as a compact base station.

With its revolutionary, small, snap-off remote panel, the controls of the FT-900AT can install almost anywhere in your car, truck or camper. Since the 100 Watt RF deck can be installed under a seat or in your

car trunk, it's away from critical automotive electronic wizardry. And, for ultimate convenience, the built-in antenna tuner simplifies in-car operation.

As a base station, the compact full function FT-900AT includes direct keypad entry for pinpoint accuracy during quick band/frequency changes. Other

features you'll like include CW keyer with front panel speed adjustment, speech processor, twin stacking VFOs, and IF Shift and Notch. No competitor offers this! Bonuses, such as signal strength, power output, SWR and ALC digital meters, add value to the FT-900AT, and the proven duct-flow cooling system provides excellent long-term transmit power output reliability and frequency stability.



The FT-900AT controls mount almost anywhere in your car, truck or camper.

The Choice is Yours...

The new IC-2700H or IC-2340H give you a choice of features and budget. Choose the one that best fits your needs. Either way you win ... it's an ICOM!



IC-2700H with supplied HM-92 DTMF Microphone.

IC-2700H

- Covers 2 M (144-148 MHz) and UHF (440-450 MHz)
- 50 W VHF, 35 W UHF (selectable)
- Detachable Front Panel
- 3 Channel Scratch Pad Memory
- Separate Tuning Dial, Volume and Squelch Control for Each Band
- FULL Remote Control Microphone
- INFRARED Wireless Microphone (opt.)
- 3 Repeater Quick Memories
- 118 Total Memory Locations
- Remoteable DTMF Control
- Auto Repeater Duplex Direction
- V/V or U/U - Simultaneous Receive of 2 Signals on the Same Band
- Built-in Pager and Code Squelch
- 24 Squelch Levels
- One-touch PTT with Time-out Timer
- Tone Scan (w/optional UT-84)



Wireless IC-2700H HM-90 infrared mic (optional).

IC-2700H

The IC-2700H features a **Detachable Front Panel**. With the optional mounting kit you can mount the faceplate in an easy-to-see location while keeping the main body in a secure place, such as the trunk of your car. With its **Easy to Read Display**, all indications are visible and separate for each band providing safe operation while driving.

The IC-2700H has **Independent Controls and Switches** for each band. Often-used

dials and switches for each band are duplicated, providing true dual band operation in V/V, U/U or V/U modes.

The supplied **DTMF Microphone** provides **full remote control of all transceiver functions**. The optional **Wireless Infrared Microphone** also provides full control. The IC-2700H *can even be controlled by a passenger in the back seat of a vehicle! Talk about back seat driving!*

Transmitted frequencies are *automatically* entered into **Scratch Pad Memories** for easy recall. Each band has 6 scratch pads, 3 for duplex settings (repeater

use) and 3 for simplex settings. The **Memory Allocation Function** allows you to divide the memory channels between bands to suit your preferences - 20 to 80 memories can be allocated to a band for a 2 band total of 100.

The **Auto Repeater Function** automatically selects the proper duplex offset direction, allowing you to work repeaters with ease.

The optional **Tone Scan Function** scans for and sets the subaudible tone frequency being transmitted by another station for you. This is especially helpful when travelling in unfamiliar territory.

IC-2340H

- Covers 2 M (144-148 MHz) and UHF (440-450 MHz)
- 45 W VHF, 35 W UHF (selectable)
- Independent Controls
- 110 Total Memory Locations
- Auto Repeater Offset Function
- Remote DTMF Mic (opt. UT-55)
- 14 Autodialing Memories
- Direct Frequency Input
- One-push Action Buttons
- Built-in Duplexer
- 2.4 W Audio
- Large, Easy to Read Display
- Tone Scan (opt. UT-89)
- Voice Synthesizer (opt. UT-66)
- Optional Pager and Code Squelch
- Optional Tone Squelch and Pocket Beep



IC-2340H

The IC-2340H offers **Independent Controls and Switches** for each band (VFO/MHz, Memory/Call, Volume/Squelch and main tuning dial) for **True Dual Band Operation**. Both frequencies are "stated" for quick visual reference and greater driving safety.

Easy to read in ambient light or direct sunlight, the IC-2340H's **Large**

display is easy to view and operate, even while driving.

The IC-2340H features **110 Memory Channels** (each band has 50 regular memories, 2 scratch pad memories, 1 call channel and 2 scan edges).

One Push Button Controls allow you to adjust functions on your IC-2340H with a single push of a button. This offers increased operating convenience and safety while driving.

OR... Basic Dual-Band Operation

IC-2340H with supplied HM-77 DTMF Microphone.

Scan Function. Just as with the IC-2700H, the IC-2340H will automatically select the proper duplex and offset direction for repeater operations. It will also scan for and set the subaudible tone frequency being transmitted by other stations.

Call (206) 450-6088 for FREE Product Literature!



ICOM America, Inc. Corporate Headquarters
2380-116th Ave. N.E., Bellevue, WA 98004

© 1994 ICOM America, Inc. The ICOM logo is a registered trademark of ICOM, Inc. All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 2700/2340494Y

CIRCLE 169 ON READER SERVICE CARD

Experience the Quality

ICOM