

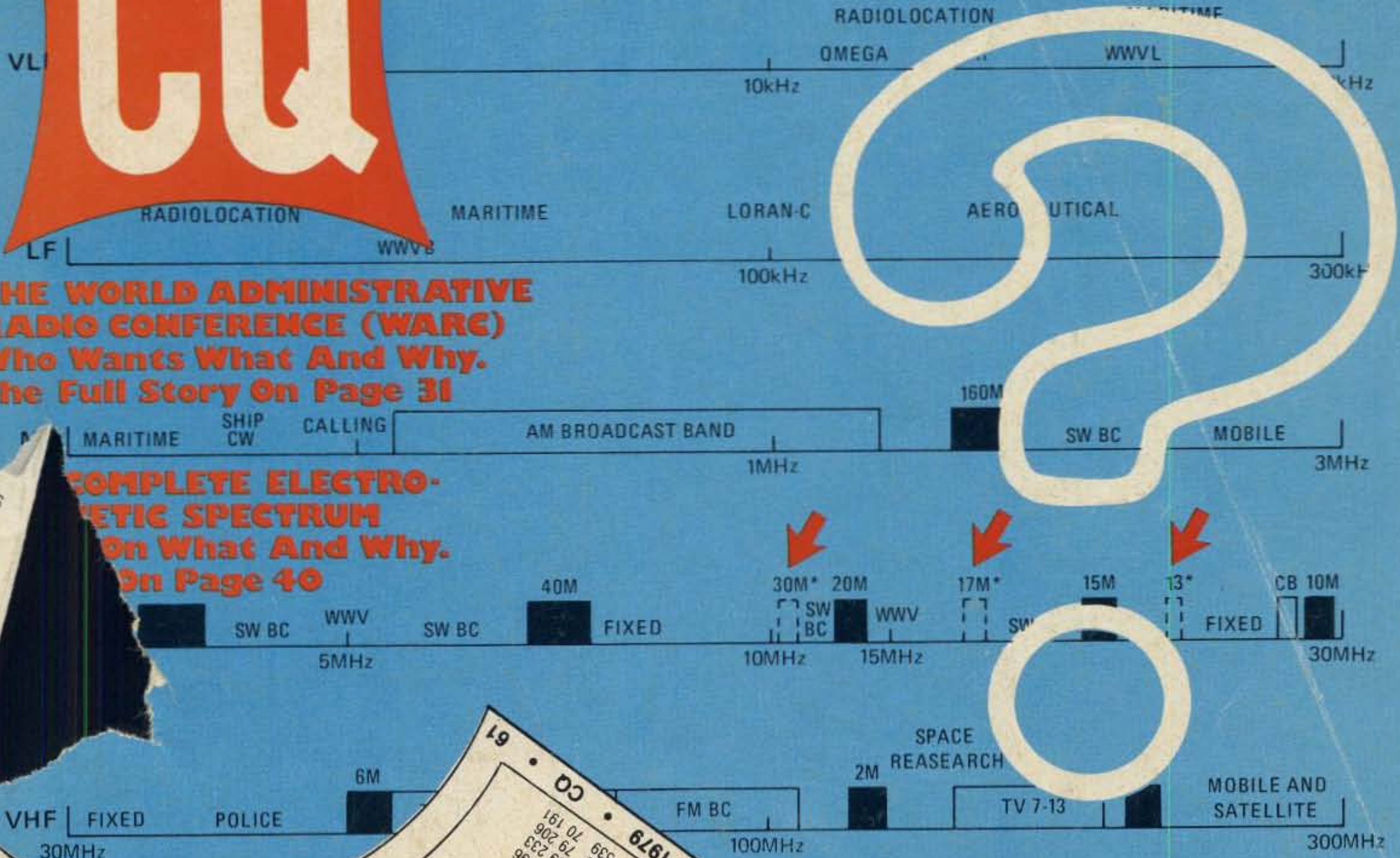
Amateur Radio

SERVING AMATEUR RADIO SINCE 1945

SEPTEMBER 1979 \$2.00

INCLUDING
modern
electronics

CQ



THE WORLD ADMINISTRATIVE RADIO CONFERENCE (WARC) Who Wants What And Why. The Full Story On Page 31

COMPLETE ELECTRO-MAGNETIC SPECTRUM On What And Why. On Page 40

CQ WWDX CONTEST PHONE RESULTS

See Page 48

THE RADIO AMATEUR'S JOURNAL



Spend less. Test more.

Integrated circuits are very private devices. When something goes wrong, they just don't work. Which is tough enough when part or all of *one* IC goes bad. But often worse, because a single bad IC usually means a large, complex system that won't function properly.

Until now, you could spend a lot of money and time—and still only be guessing what was happening at any point in a logic system.



Logic Probe LP-1. Captures pulses as fast as 50 nanoseconds, to 10MHz. Latching memory. Bargain-priced at only \$44.95*.

CSC puts troubleshooting at your fingertips. Now, there's a quicker, surer, less expensive way to get the information you need. CSC multi-family Logic Probes. Their LEDs light to show you at a glance the logic state at any point—and more. Catch fast pulses, even store them if you like. A flashing light signals pulse trains. And you can even approximate the duty cycle of asymmetrical waveforms.

Nothing could be simpler. No complex

settings, no sync, no wait. A switch selects the proper logic family. The probes derive their

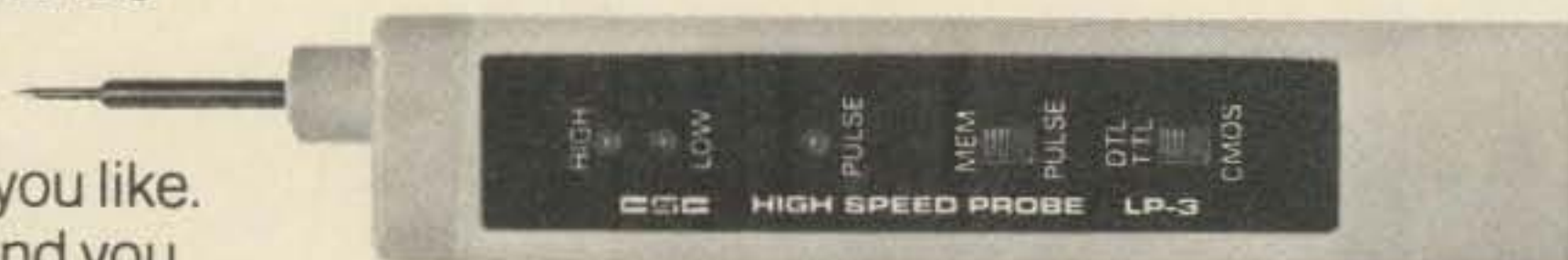


Logic Probe LP-2. All the basic features of LP-1, with pulse width as fast as 300 nanoseconds, to 1.5MHz. Doesn't have Latching memory feature... but features even lower price: \$29.95*.

power from the circuit under test. High impedance prevents circuit loading. And you do is touch the tip to any pin, pad or package. Instant picture of circuit conditions.

Laboratory quality. Economy price.

High speed. High precision. Even memory. CSC Logic Probes deliver all the performance you need for design, development, debugging and servicing. Making digital work less of a chore, more of a bargain. CSC for yourself!



Logic Probe LP-3. Five times the speed of LP-1 at less than twice the price. Captures pulses as narrow as 10 nanoseconds, to over 50MHz. Latching memory. The new value standard, at \$69.95*.

Call **1-800-243-6077** toll-free for details



70 Fulton Terr, New Haven, CT 06509 (203) 624-3103, TWX 710-465-1227
 OTHER OFFICES: San Francisco: (415) 421-8872, TWX 910-372-7992
 Europe: CSC UK LTD. Phone Saffron-Walden 0799-21682, TLX 817477
 Canada: Len Finkler Ltd, Ontario

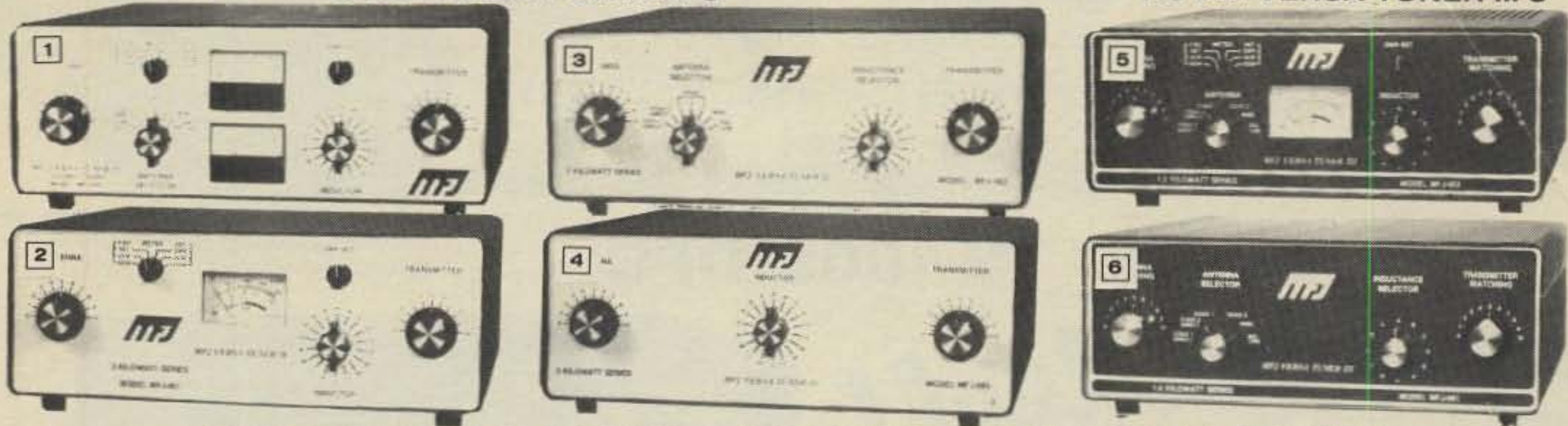
* Suggested U.S. resale. Available at selected local distributors. Prices, specifications subject to change without notice. © Copyright 1979 Continental Specialties Corporation

New MFJ 3 & 1.5 KW Versa Tuners

Run up to 3 KW or 1.5 KW PEP and match everything from 1.8 thru 30 MHz: coax, balanced line, random wire. Built-in balun.

3 KW VERSA TUNER IV's

1.5 KW VERSA TUNER III's



NEW MFJ KW VERSA TUNERS HAVE THESE FEATURES IN COMMON

These 6 new MFJ KW Versa Tuners let you run up to 3 KW or 1.5 KW PEP (depending on the model) and match any feedline continuously from 1.8 to 30 MHz: coax, balanced line or random wire. Gives maximum power transfer. Harmonic attenuation reduces TVI, out of band emissions.

All metal, low profile cabinet gives RFI protection, rigid construction, sleek styling. Black. Rich anodized aluminum front panel. 5x14x14 inches.

Flip down stand tilts tuner for easy viewing.

Efficient, encapsulated 4:1 ferrite balun. 250 pf, 6000 volt capacitors. 18 position dual inductor, 17 amp, 3000 V ceramic rotary switch (3 KW version). 12 position inductor, ceramic rotary switch (1.5 KW version). 2% meters. SO-239 coax connectors, ceramic feedthru for random wire and balanced line. One year limited warranty. Made in U.S.A.

3 KW VERSA TUNER IV's

1 MFJ-984 3 KW VERSA TUNER IV

\$299⁹⁵ *EXCLUSIVE RF AMMETER insures maximum power to antenna at minimum SWR. Built-in dummy load.*

This is MFJ's best 3 KW Versa Tuner IV. The MFJ-984 Deluxe 3 KW Versa Tuner IV gives you a combination of quality, performance, and features that others can't touch at this price.

An exclusive 10 amp RF ammeter insures maximum power to antenna at minimum SWR. A separate meter gives SWR, forward, reflected power in 2 ranges (2000 and 200 watts).

Versatile antenna switch lets you select 2 coax lines thru tuner and 1 thru or direct, or random wire, balanced line or dummy load.

A 200 watt 50 ohm dummy load lets you tune your exciter off air for peak performance. Efficient, encapsulated 4:1 ferrite balun.

2 MFJ-981 3 KW VERSA TUNER IV

\$199⁹⁵ *Accurate meter gives SWR, forward and reflected power in 2 ranges: 2000 and 200 watts. 4:1 ferrite balun.*

The MFJ-981 3 KW Versa Tuner IV is one of MFJ's most popular Versa Tuners. An accurate meter gives you SWR, forward and reflected power in 2 ranges: 2000 and 200 watts. Encapsulated 4:1 ferrite balun.

3 MFJ-982 3 KW VERSA TUNER IV

\$199⁹⁵ *Antenna switch lets you select 1 coax thru tuner and 2 coax thru tuner or direct, or random wire and balanced line.*

The MFJ-982 3 KW Versa Tuner IV gives you a versatile 7 position antenna switch that lets you select 1 coax thru tuner and 2 coax thru tuner or direct, or random wire and balanced line. Encapsulated 4:1 balun.

If you already have a SWR/wattmeter, the MFJ-982 is for you.

4 MFJ-980 3 KW VERSA TUNER IV

\$169⁹⁵ *Heavy duty encapsulated 4:1 ferrite balun for balanced lines.*

The MFJ-980 is MFJ's lowest priced 3 KW Versa Tuner IV but has the same matching capabilities as the other 3 KW Versa Tuner IV's.

Features an efficient, encapsulated 4:1 ferrite balun for balanced lines.

1.5 KW VERSA TUNER III's

5 MFJ-962 1.5 KW VERSA TUNER III

\$169⁹⁵ *SWR, dual range forward and reflected power meter, 6 position antenna switch, encapsulated 4:1 ferrite balun.*

The MFJ-962 1.5 KW Versa Tuner III is an exceptional value.

An accurate meter gives SWR, forward and reflected power in 2 ranges (2000 and 200 watts).

A versatile six position antenna switch lets you select 2 coax lines thru tuner or direct, or random wire and balanced line. Encapsulated 4:1 balun. Black front panel has reverse lettering.

6 MFJ-961 1.5 KW Versa Tuner III

\$149⁹⁵ *6 position antenna switch lets you select 2 coax lines thru tuner or direct, or random wire and balanced line.*

The MFJ-961 1.5 KW Versa Tuner III gives you a versatile six position antenna switch. It lets you select 2 coax lines thru tuner or direct, or random wire and balanced line. Encapsulated 4:1 ferrite balun.

If you already have a SWR/wattmeter, the MFJ-961 is for you.

Black front panel has reverse lettering.

FOR YOUR NEAREST DEALER OR FOR ORDERS

CALL TOLL-FREE **800-647-1800**

Why not visit your dealer today? Compare these 3 KW and 1.5 KW Versa Tuners to other tuners. You'll be convinced that its value, quality and features make it a truly outstanding value. If no dealer is available, order direct from MFJ and try it. If not delighted, return it within 30 days for a prompt refund (less shipping). Charge VISA, MC. Or mail check, money order plus \$10 shipping/handling.

For technical information, order/repair status, in Mississippi, outside continental USA, call 601-323-5869.

Order By Mail or Call TOLL FREE 800-647-1800 and Charge It On



MFJ ENTERPRISES, INC.

P. O. BOX 494

MISSISSIPPI STATE, MISSISSIPPI 39762

CIRCLE 37 ON READER SERVICE CARD

September, 1979 • CQ • 1

**FREE
PHONE!**

**800
854-6046**

CALIF. CUSTOMERS PLEASE CALL OR VISIT STORES LISTED BELOW
PLUS FREE SHIPMENT U.P.S. (Brown).
(Except where otherwise noted)

**SERVING
HAMS
BETTER!**

*North... south...
east... west*

All leading brands...
in-depth stocks...
new/used gear.



Bob Ferrero, W6RJ/K6AHV, Jim Rafferty, N6RJ
other well known hams give you courteous,
personalized service.

NEW KENWOOD TS-180S/DFC

Special deal!

- ① SEND US \$1149.95
- ② WE'LL SEND YOU A TS-180S/DFC PLUS YOUR CHOICE OF ANY ONE OF THE FOLLOWING:
 - Ⓐ PS-30,30A SUPPLY. \$139.00 value.
 - Ⓑ BIRD "43" WATTMETER. \$125.00 value.
 - Ⓒ YK-88SSB I-F FILTER plus 500Hz CW FILTER (2). \$119.90 value.

FREE SHIPMENT ALL ABOVE ITEMS (UPS Brown).



TS-180S/DFC, superlative new HF transceiver for DXers, contesters, discerning amateurs who want top performance, 160 through 10M (also ± 50 kHz above, below bands).

- Digital freq. control (DFC) • Four memories (usable in transmit and/or receive modes) and manual scan.
- All solid state including final • No dipping or loading, just dial up, peak the drive, operate.
- High power. 200W p.e.p./160W DC input, 160-15M, 160W p.e.p./140W DC input, 10 meters.
- Digital frequency readout • SSB, CW, FSK • Dual RIT (VFO or memory/fix) • Single conversion • Improved dynamic range • RF AGC prevents strong signal overload.
- Speech processor • 13.8VDC operation.

BIG VALUE "PACKAGE" ANTENNA, TOWER, ROTOR, ACCESSORIES

- ① TRI-EX W-51, 51' SELF SUPPORTING TOWER W/5 ft. MAST.
- ② TH6DXX, HY-GAIN'S BEST TRI-BANDER.
- ③ HY-GAIN BN-86 BALUN.
- ④ CDE HAM IV ROTOR.
- ⑤ 100' RG-8 SUPERFLEX COAX.
- ⑥ 100' ROTOR CABLE.

REGULAR
\$1600.00
VALUE
\$1199.00



PLUS FREE FREIGHT; CONTINENTAL U.S.A. (our choice).

TR-7625



CALL FOR
PRICES



TS-120S

HD-73

\$109.95



ALLIANCE ROTATORS



U-100
\$39.95

OVER THE COUNTER (Mon. thru Sat. 10 AM to 5:30 PM) MAIL ORDER, Phone, Write.

ANAHEIM, CA 92801

2620 W. La Palma
(714) 761-3033 (213) 860-2040
1 mile east Knotts Berry Farm

SAN DIEGO, CA 92123

5375 Kearny Villa Road (714) 560-4900
Highway 163 & Clairemont Mesa Blvd.

OAKLAND, CA 94609

2811 Telegraph Ave. (415) 451-5757
Hwy 24 Downtown. Left 27th off-ramp.

BURLINGAME, CA 94010

999 Howard Avenue (415) 342-5757
5 miles south on 101 from S.F. Airport

VAN NUYS, CA 91401

6265 Sepulveda Blvd. (213) 988-2212
San Diego Fwy at Victory Blvd.

**HAM
RADIO
OUTLET**



• ALDA • ALLIANCE • ALPHA • AMECO • ATLAS • BIRD • CDE • COLLINS • CUSHCRAFT • CURTIS •
• DENTRON • DRAKE • EIMAC • HUSTLER • HY-GAIN • ICOM • KENWOOD • KLM • MFJ • MOSLEY •
• PALOMAR • ROHN • ROBOT • SHURE • SWAN • TELEX • TEMPO • TEN-TEC •
• TRISTAO • TELREX • TRI-EX • WILSON • YAESU • more.

Prices/specs subject to change without notice. Calif. residents add sales tax.



EDITORIAL STAFF

Alan M. Dorhoffer, K2EEK
Editor
Irwin Schwartz, K2VG
Managing Editor
Kim Smith
Assistant Editor
Chris Kelly
Editorial Assistant

CONTRIBUTING STAFF

Frank Anzalone, W1WY
Contest Chairman
John Attaway, K4IIF
DX Editor
Larry Brockman, N6AR
Robert Cox, K3EST
W.W. Contest Directors
Theodore J. Cohen, N4XX
Washington Commentary
William DeWitt, W2DD
SSTV Editor
A. Edward Hopper, W2GT
USA-CA Director
Robert Huntington, K6XP
WPX Award Manager
George Jacobs, W3ASK
Propagation Editor
Donald McClenon, N4IN
160 M. Contest Director
Irwin Math, WA2NDM
Math's Notes
William Orr, W6SAI
Antennas
Hugh R. Paul, W6POK
Technical Evaluations
Adrian Weiss, K8EEG/W
QRPP Editor
Bernie Welch, W8IMZ
WPX Contest Director
Bill Welsh, W6DDB
Novice Editor

BUSINESS STAFF

Richard A. Cowan, WA2LRO
Publisher/Advertising Sales
Richard A. Ross, K2MGA
Assoc. Publisher
Jack M. Gutzeit, W2LZX
Advertising Sales Manager
Eileen Lucey
Advertising Assistant
Janet T. Kurtz
Circulation Manager

PRODUCTION STAFF

Kim Smith
Production Manager
Chris Kelly
Production Assistant
William H. Travis
Art Director
Liz Ryan
Assistant Art Director
Karen Jensen
Designer
Hal Keith
Illustrations

CORPORATE OFFICERS

Richard A. Cowan
Chairman of the Board & President
Cary L. Cowan
Vice President
Jack N. Schneider
Vice President of Marketing
Richard A. Ross
Vice President & General Manager
Marc L. Gilman
Credit Manager
Amy Gilman
Secretary/Treasurer
Sanford R. Cowan
Founder & President Emeritus

Offices: 14 Vanderventer Ave., Port Washington, L.I., N.Y. 11050. Telephone: 516-883-6200. CQ (ISSN 0007-893X) is published monthly by Cowan Publishing Corp. Second Class Postage paid at Port Washington, N.Y. and other points. Subscription prices: one year \$14.00, two years \$25.00. Entire contents copyrighted Cowan Publishing Corp. 1979. 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 form 3579 to CQ Magazine, 14 Vanderventer Ave., Port Washington, L.I., N.Y. 11050.

FEATURES

A COMPREHENSIVE REVIEW OF ALLOCATION PROPOSALS FOR THE AMATEUR-SATELLITE SERVICES SUBMITTED TO THE ITU FOR THE 1979 WORLD ADMINISTRATIVE RADIO CONFERENCE (WARC) Dr. Theodore J. Cohen, N4XX 31
THE COMPLETE ELECTROMAGNETIC SPECTRUM Vincent J. Luciani, K2VJ 40
ANNOUNCING: THE 1979 CQ WORLD WIDE DX CONTEST 46
RESULTS OF THE 1978 CQ WORLD WIDE DX PHONE CONTEST Larry Brockman, N6AR and Bob Cox, K3EST 48
QRP: OPERATING REPORTS AND NEWS Adrian Weiss, K8EEG/WORSP 68
MATH'S NOTES: AUDIO-RELATED INTEGRATED CIRCUITS Irwin Math, WA2NDM 72
ANTENNAS: DX ANTENNAS AND SLOPER DIRECTIVITY William I. Orr, W6SAI 78
DATELINE . . . WASHINGTON D.C.: THE INS AND OUTS OF THE WASHINGTON SCENE Theodore J. Cohen, N4XX 80
NOVICE: WORLDWIDE SOURCES OF CODE PRACTICE Bill Welsh, W6DDB 100
CQ SHOWCASE 102

DEPARTMENTS

DX: ON4UN CLOSES IN ON 5-BAND WAZ, N4UF - NEW COUNTRY AWARDS MANAGER John A. Attaway, K4IIF 85
AWARDS: STORY OF THE MONTH - WB9RCY & N9WA TRAVEL TO PORTUGAL A. Edward Hopper, W2GT 90
PROPAGATION: DX CHARTS FOR SEPT. 15 THROUGH OCT. 15 AND SHORT-SKIP CHARTS FOR SEPT. AND OCT. George Jacobs, W3ASK 96
CONTEST CALENDAR: CONTESTS FOR SEPT. AND EARLY OCT. Frank Anzalone, W1WY 99
ANNOUNCEMENTS22 OUR READERS SAY24
HAM SHOP108 ZERO BIAS5

New OMNI/SERIES B Filters The Crowd

The new OMNI/SERIES B makes today's bands seem less crowded. By offering a new i-f selection that provides up to 16 poles of filtering for superior selectivity. And a new Notch Filter to remove QRM. No other amateur transceiver we know of out-performs it.

NEW I-F RESPONSE SELECTION. OMNI comes equipped with an excellent 8-pole 2.4 kHz crystal ladder i-f filter which is highly satisfactory in normal conditions. But when the going gets rough, the new OMNI/SERIES B, with optional filters installed, provides two additional special purpose i-f responses.

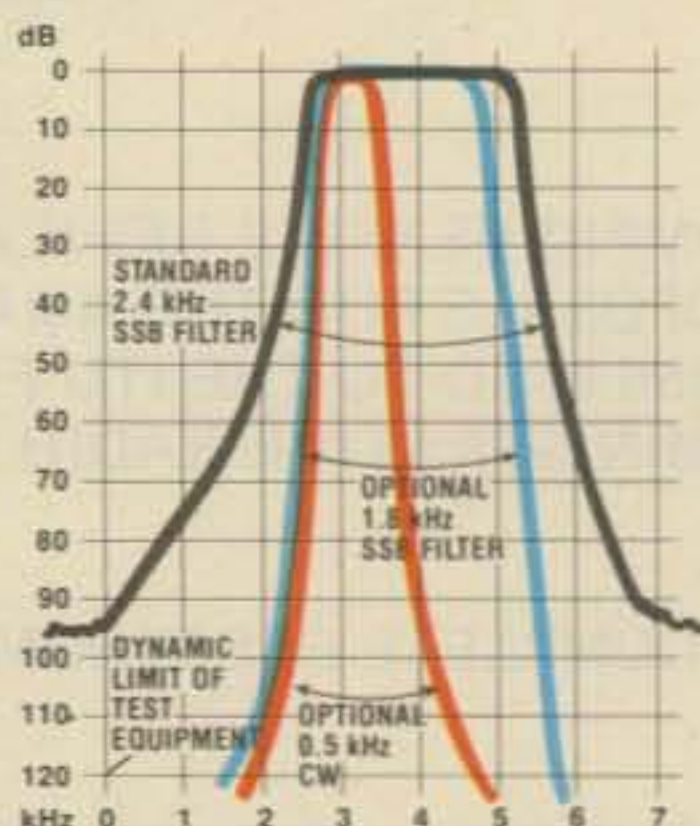
The 1.8 kHz crystal ladder filter transforms an unreadable SSB signal in heavy QRM into one that gets the message through. The 0.5 kHz 8-pole filter provides extremely steep and deep skirts to the CW passband window which effectively blocks out even the very strong adjacent signals.

Both of these filters can be front-panel switched in series with the standard filter to provide up to 16 poles of filtering for near-ultimate selectivity. In addition, the standard CW active audio filters have three bandwidths (450, 300, and 150 Hz) to give even further attenuation to adjacent signals. In effect, OMNI/SERIES B has six selectivity curves—three for SSB and three for CW. That's true state-of-the-art selectivity.

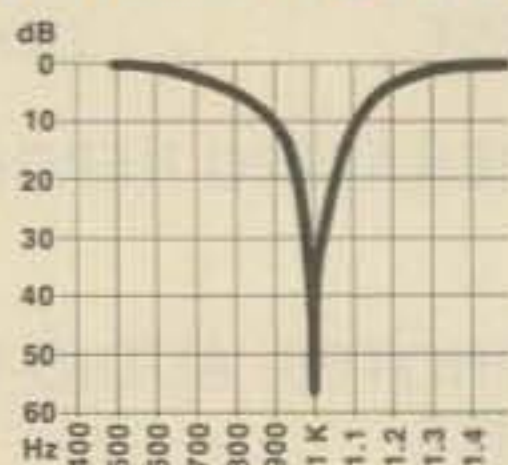
NEW NOTCH FILTER. A variable frequency notch filter in OMNI/SERIES B is placed inside the AGC loop to eliminate interfering carriers and CW signals without affecting received signals. Attenuation is more than 8 "S" units (over 50 db) for any frequency between 0.2 kHz and 3.5 kHz.

OMNI/SERIES B RETAINS ALL THE FEATURES THAT MADE IT FAMOUS.

All solid-state; 160-10 meters plus convertible 10 MHz and AUX band positions; **Broadband design** for band changing without tuneup, without danger;



OMNI/SERIES B I-F RESPONSES WITH STANDARD AND OPTIONAL FILTERS.



NOTCH FILTER PERFORMANCE ADJUSTED TO 1 kHz POINT.

Choice of readouts —OMNI-A for analog dial or OMNI-D for digital dial; **Built-in VOX and PTT** facilities; **Selectable Break-in**, instant or delayed receiver muting; **Dual-Range Receiver Offset Tuning**, ± 5 kHz or ± 0.5 kHz; **Wide Overload Capabilities**, dynamic range typically exceeds 90 dB and a PIN diode switched 18 dB attenuator is also included; **Phone Patch Interface Jacks**; **Adjustable ALC**; **Adjustable Sidetone**; **Exceptional Sensitivity**; **200 Watts** input to final with full warranty on final transistors for first year, pro-rata for 5 years; **100% Duty Cycle** for RTTY, SSTV or sustained hard usage; **12 VDC Circuitry** for mobile use, external supplies for 117/220 VAC operation; **Front Panel Microphone and Key Jacks**; **Built-in 25 kHz Calibrator** in analog dial model; **Zero-Beat Switch**; **"S"/SWR Meter**; **Dual Speakers**; **Plug-In Circuit Boards**; **Functional Styling**, black textured vinyl over aluminum "clamshell" case, complementary nonreflective warm dark metal front panel; **Complete Shielding**; **Easier-to-use size**: 5 $\frac{3}{4}$ "h x 14 $\frac{1}{4}$ "w x 14"d; **Full Options**: Model 645 Keyer \$85; Model 243 Remote VFO \$139; Model 252MO matching AC power supply \$139; Model 248 Noise Blanker \$49; Model 217 500 Hz 8-pole Crystal Ladder CW Filter \$55; Model 218 1.8 kHz 8-pole Crystal Ladder SSB Filter \$55;

OMNI owners note: Your OMNI can be converted to a SERIES B model at the factory for just \$50 (plus \$5 for packing and shipping). The notch filter replaces your present squelch control and provision is made for the two additional optional filters; a partial panel with new nomenclature is provided. Contact us for details.

Model 545 Series B OMNI-A \$949
Model 546 Series B OMNI-D \$1119

Experience the uncrowded world of OMNI/SERIES B. See your TEN-TEC dealer or write for full details.

TEN-TEC, INC.
SEVIERVILLE, TENNESSEE 37862
EXPORT: 5715 LINCOLN AVE., CHICAGO, ILL. 60646

Please send all reader inquiries directly



NOW YOU CAN HAVE BOTH

HIGH QUALITY & LOW COST!

The DS2000 KSR FROM HAL

HAL design experience now makes it possible to offer you an efficient, reliable, and cost effective terminal for your RTTY or CW station. Investigate the new DS2000 KSR from the people who KNOW HOW to build RTTY and CW equipment. See how you can get great performance and save money too!

- Integrated keyboard and video generator
- 72 character line
- 24 line display
- 2 programmable "Here Is" messages
- Automatic carriage return and line feed
- QBF and RY test messages
- Word mode operation, full screen buffering
- All 5 standard Baudot speeds
- 110 and 300 baud ASCII
- CW identification at the touch of a key
- Morse code transmit
- Morse code receive (optional)
self tracking speeds from 1-175 wpm on a separate plug-in circuit board (Available June, 1979)
- All in a convenient, small cabinet (14.1" x 9.25" x 4.35")

Price: \$449.00

Optional Morse Receive Board: \$149.00

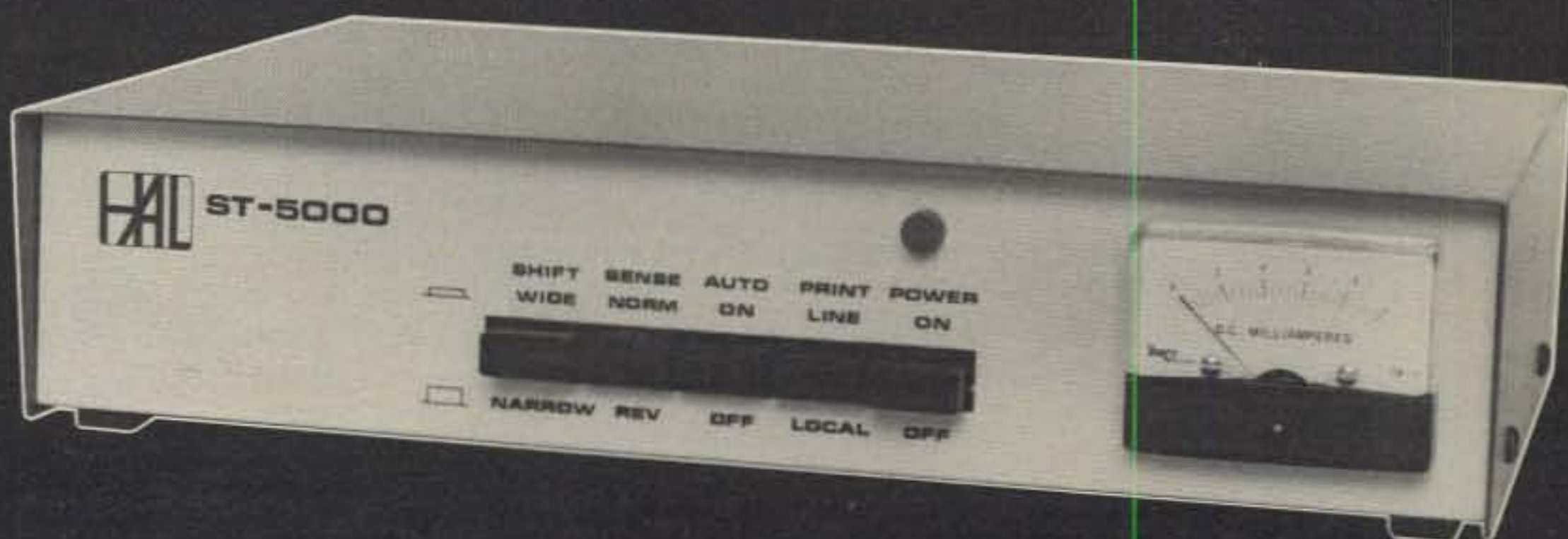
Optional 9" monitor: \$150.00

BIG PERFORMANCE SMALL SIZE. . . SMALL PRICE

If you're looking for an RTTY demodulator with great performance on both the HF and VHF bands, take a look at the ST-5000 from HAL. The use of active filters with no phase-lock loop or 'single-tone' short-cuts ensure the kind of performance you expect. Full features in an attractive and conveniently small package make this demodulator a value that's hard to beat!

- Hard limiting front end
- Active discriminator
- Active detector
- Wide and Narrow shift (850hz and 170hz)
- Normal and Reverse sense
- Autostart
- Self-contained high voltage loop supply
- RS-232C voltage output (direct FSK)
- Audio tone keyer (AFSK)
- Provision for external tuning scope
- Attractive, small cabinet (2.75" H x 8" D x 12" W)
- Fully assembled and tested

Price: \$225.00



For more information call or write us at:

HAL COMMUNICATIONS CORP.

P.O. Box 365

Urbana, IL 61801

Phone: 217-367-7373

In Europe contact:

Richter & Co.; Hannover

I.E.C. Interelco; Bissone

Please send all reader inquiries directly



DXpedition... The Ultimate Fantasy



Clipper ships sailing to foreign shores. Sixteen amateurs primed for adventure, coming together as the first group in 20 years to set foot on the remote French Island, Clipperton. Their goal: 30,000 QSO's in just 7 days.

If you're like most of us, a rare DXpedition is more a dream than a reality, but the Clipperton Linear Amplifier from DenTron brings the thrill of a DXpedition to you.

The Clipperton-L™ was inspired by the famous DXpedition on which 3 MLA-2500's were used. We built the Clipperton with 4 rugged, economical, 572 B's in the final to provide a full 2KW PEP on SSB and 1KW CW on 15 through 160 meters. With features like hi-lo power selector for equal efficiencies at 1 or 2 KW, a power transformer that is vacuum impregnated, wide spaced tuning and loading capacitors, built-in ALC and an improved whisper-quiet cooling system, the excitement of crashing a pile-up can be yours.

Clipperton-L suggested price \$599.50.
FCC type accepted.

CIRCLE 17 ON READER SERVICE CARD

Dentron
Radio Co., Inc.

2100 Enterprise Parkway
Twinsburg, Ohio 44087
(216)425-3173

Dedicated
to making amateur radio
more fun.

CONTEST
CONTEST
Contest
Contest

WINNERS

Now with booms of strong 6063-T832 alloy tubing!

KLM's
5 & 6 Element
"Big Stickers"



9.7-11 dBd

The Contesters choice for DX on 20, 15 or 10 meters. KLM's world famous "Big Stickers" offer unbeatable gain, F/B, bandwidth and pattern.



7.2 dBd

KLM's
7.0-7.3-4

DX punch on 40 meters. Constant gain and low VSWR across the band-phone and CW. Linear loaded to reduce size and weight.

KLM's
"4-Bangers"

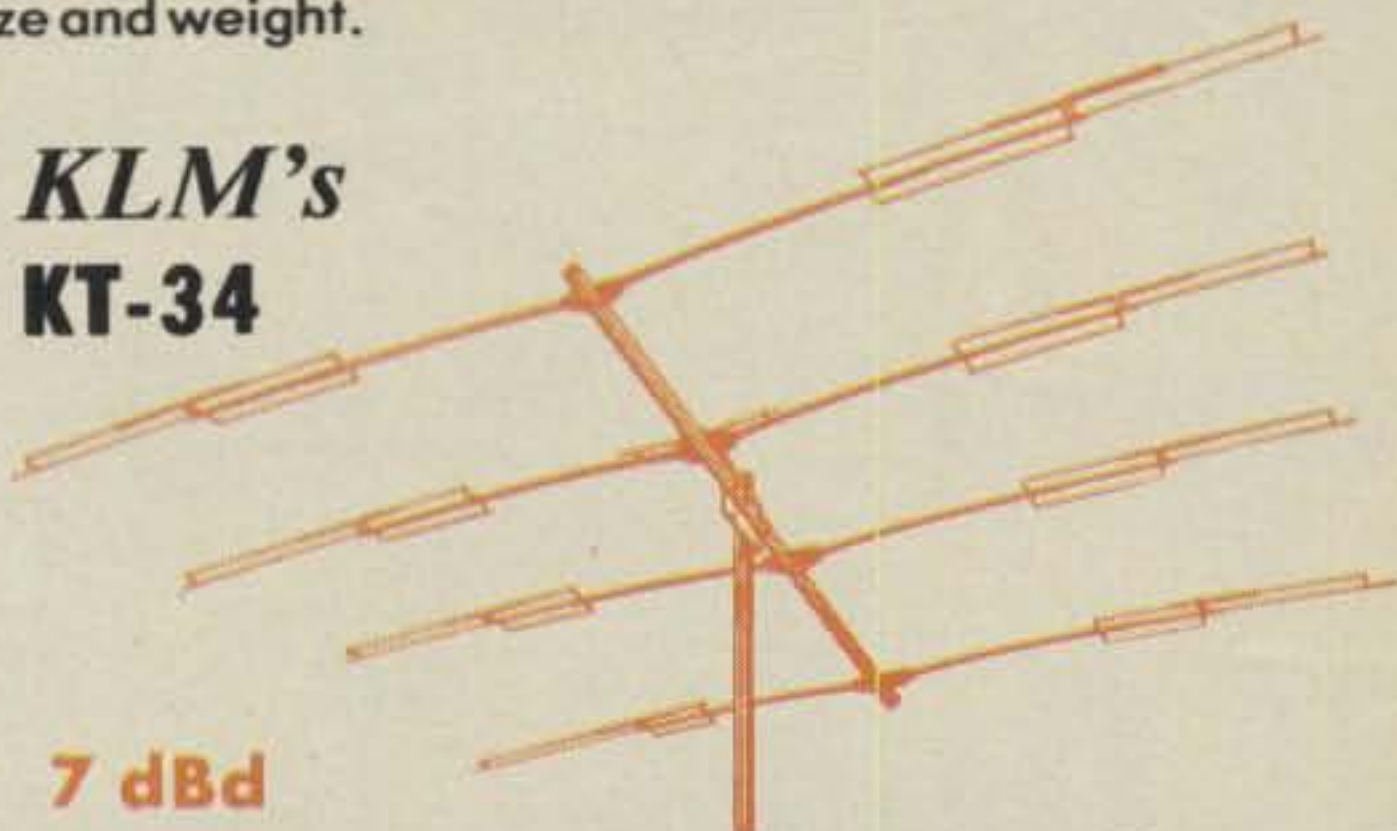


7.7 dBd

for 20, 15, or 10 Meters

4 Element monobander power at a reasonable price. Full performance across each band, no tuning or matching. One man installation, stackable, ideal for light duty towers and rotators.

KLM's
KT-34



7 dBd

The Tribander: true broadband coverage, phone and CW, on 20, 15 and 10 meters with no tuning or matching. Handles 4 KW with extraordinary efficiency.

And, for the "World Class" Amateur who insists on the ultimate:

KLM's **NEW**
7.0-7.3-5*

9.7 dBd

Brings the world famous gain and F/B of KLM's 20 meter, 5 element "Big Sticker" to 40 meters; delivers unchallenged performance all across the band.

7.2 dBd

The worlds one and only commercially available rotatable 80 meter beam. The 3.8-4 is simply unchallenged in it's class.

KLM's
3.8-4*

*BUILT ONLY TO YOUR ORDER. CALL KLM FOR DETAILS AND SPECIFICATIONS.

KLM 17025 LAUREL ROAD, MORGAN HILL, CALIFORNIA 95037 • (408) 779-7363

NEW FROM DSI!

50 Hz — 500 MHz 8 DIGITS
1 Meg INPUT — 1 Hz RESOLUTION — 1 PPM TCXO



- AC—DC Operation
- BNC Inputs 1 Meg Direct 50 Ohms Prescaled
- 8 Large .4" LED Readouts
- Auto Decimal Point & Zero Blanking
- 1 Year Limited Warranty Parts & Labor
- 100% Factory Assembled in U.S.A.

\$149⁹⁵

MODEL 500 HH
50 Hz — 500 MHz
Without Battery Capability

MODEL 100 HH
50 Hz — 100 MHz

\$99⁹⁵

Without Battery Capability

SAVE \$5⁰⁰

With Battery Capability

MODEL 500 HH . . \$169.95

MODEL 100 HH . . \$119.95

Includes AC-9 Battery Eliminator

The 100 HH and 500 HH hand held frequency counters represent a significant new advancement, utilizing the latest LSI design . . . and because it's a DSI innovation, you know it obsoletes any competitive makes, both in price and performance. No longer do you have to sacrifice accuracy, ultra small readouts and poor resolution to get a calculator size instrument. Both the 100 HH and 500 HH have eight .4 inch LED digits — 1 Hz resolution — direct in only 1 sec. or 10 Hz in .1 sec. — 1 PPM TCXO time base. These counters are perfect for all applications be it mobile, hilltop, marine or bench work. **CALL TODAY TOLL FREE: (800—854-2049) Cal. Res. CALL (800—542-6253) TO ORDER OR RECEIVE MORE INFORMATION ON DSI'S FULL PRODUCT LINE OF FREQUENCY COUNTERS RANGING FROM 10 Hz TO 1.3 GHz.**

FREQUENCY COUNTER CONSUMER DATA COMPARISON CHART

MANUFACTURER	MODEL	SUG'STD. LIST PRICE	FREQUENCY RANGE	TYPE OF TIME BASE	ACCURACY OVER TEMPERATURE		SENSITIVITY			DIGITS		PRE-SCALE INPUT RESOLUTION	
					17° - 40°C	0° - 40°C	100 Hz - 25 MHz	50 MHz - 250 MHz	250 MHz - 450 MHz	No.	SIZE IN INCHES	.1 SEC	1 SEC
DSI INSTRUMENTS	100 HH	\$ 99.95	50Hz-100MHz	TCXO	1 PPM	2 PPM	25 MV	NA	NA	8	.4	100 Hz	10 Hz
DSI INSTRUMENTS	500 HH	\$149.95	50Hz-550MHz	TCXO	1 PPM	2 PPM	25 MV	20 MV	30 MV	8	.4	100 Hz	10 Hz
CSC‡	MAX-550	\$149.95	1kHz-550MHz	Non-Compensated	3 PPM @ 25°C	8 PPM	500 MV*	250 MV	250 MV	6	.3	NA	1 kHz
OPTOELECTRONICS	OPT-7000	\$139.95	10Hz-600MHz	TCXO	1.8 PPM	3.2 PPM	NS	NS	NS	7	.4	1 kHz	100 Hz

* 1 KHz - 50 MHz ‡ Continental Specialties Corp.

The specifications and prices included in the above chart are as published in manufacturer's literature and advertisements appearing in early 1979. DSI INSTRUMENTS only assumes responsibility for their own specifications.

100 HH . . . \$ 99.95 W/Battery Pack . . . \$119.95
500 HH . . . \$149.95 W/Battery Pack . . . \$169.95

Prices and/or specifications subject to change without notice or obligation.

These prices include factory installed rechargeable NiCad battery packs.



DSI INSTRUMENTS, INC.
7924 Ronson Road, Dept. G
San Diego, California 92111

T-500 Ant. \$ 7.95
AC-9 Battery Eliminator \$ 7.95

TERMS: MC - VISA - AE - Check - M.O. - COD in U.S. Funds. Please add 10% to a maximum of \$10.00 for shipping, handling and insurance. Orders outside of USA & Canada, please add \$20.00 addition to cover air shipment. California residents add 6% Sales Tax. CIRCLE 20 ON READER SERVICE CARD

Full Features and Superior Performance ST-6000 RTTY DEMODULATOR

Select Rx & Tx Shifts
Accurately Tuned Rx Filters
Crystal Controlled Tx Tones
True Transceive Operation

Invert Both Rx Demod,
and Tx Tones

Data Status Indicators
Loop 1 Post-Autostart Pre-Autostart



Hard-Limiting [FM]
or
Non-Limiting [AM]
Reception

Correct for
Bias Distortion

Correct For
Multi-Path Distortion

Local Loop Operation

Autostart with:
◦ Motor Control
◦ Mark Hold
◦ Antispace

Tuning Oscilloscope
[Front Panel Controls]
Meter Indicator Option
Also Available

Automatic Tx/Rx Station
Control with Keyboard
Operated Switch [KOS]



Why not have the best?

The HAL ST-6000 Demodulator offers outstanding performance, versatility, and ease of operation. The Receive Demodulator features multiple-pole active filters available for "high" or "low" tones. These filters are frequency-matched to the transmit tone crystals for true transceive operation. Input bandpass filters, discriminator filters, and post-detection filters are carefully designed and tested for optimum weak-signal recovery. The ST-6000 has an internal loop power supply, 2 loop keyers, RS-232, MIL-188C, and CMOS data I/O, and rear panel connections to data and control circuits for connection to UART and computer devices. Use it with the HAL DS-3000 KSR for the best in RTTY performance.

\$595.00

Write today for HAL's latest RTTY catalog.

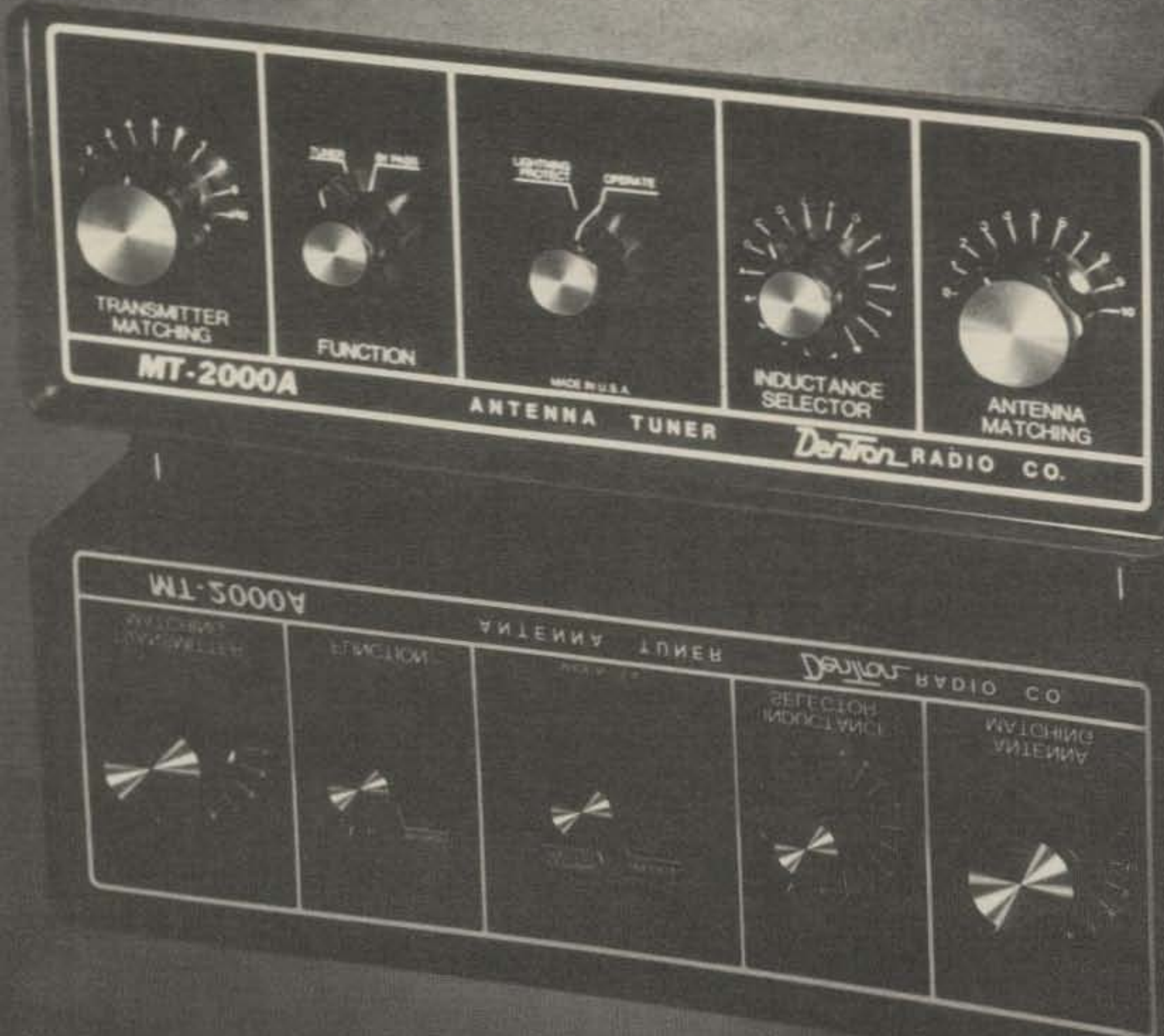


HAL COMMUNICATIONS CORP.
Box 365
Urbana, Illinois 61801
217-367-7373

Please send all reader inquiries directly

For our Overseas customers:
see HAL equipment at:
Richter & Co.; Hannover
I.E.C. Interrelco; Bissone

**If they copy the style,
they can't match the quality.**



**If they copy the quality,
they can't meet the price.**

The original DenTron Super Tuner. The original Super Super Tuner. The original MT-3000A. And now DenTron brings you the original MT-2000A, an economical, full-power tuner designed to handle virtually any type of antenna.

The sleek styling and low profile of the MT-2000A is beautiful, but be assured that is only a part of the excitement you'll derive from the MT-2000A. The MT-2000A is designed and engineered using heavy-duty all-metal cabinetry, and high quality American components throughout.

When you consider the MT-2000A's unique features: 5 1/4" H x 14" D x 14" W, front panel coax bypass switching, front panel lightning protection antenna grounding switch, 3KW PEP, and the ability to match

coax, random wire and balanced feedline, we're sure you'll decide to buy an American original and stay with DenTron.

MT-2000A \$199.50 at your favorite dealer.

DenTron

Radio Co., Inc.
2100 Enterprise Parkway
Twinsburg, Ohio 44087

216 425-3173



CIRCLE 34 ON READER SERVICE CARD

ANOTHER FIRST FROM DENTRON more power for less.



In January, 1978, our engineers developed a unique linear amplifier. The GLA-1000 was to be the smallest amateur linear to offer 1200 watts SSB PEP input, and 1000 watts CW input, with a built-in power supply, at the lowest possible price, \$379.50 sugg. retail.

How would it perform? Could a unit this small (5 $\frac{3}{8}$ "H x 11"W x 11"D) and economical measure up to high standards set by "professional" amateurs across the country? We decided to let a group of amateurs tell us.

The GLA-1000 was field tested for 1 month by the following amateurs: Robert Allen W8IO, Harold Unger WA2EQN, Robert Schiers N0AN, Jim Turle WA8RCN, Alan Applegate K0BG, Howard Townsend WA5MLT, Mickey LeBoeuf K5ML, Tom Lutman WB8ZWY, Ed Clegg W3LOY and Andy Calandria K5MVP. The group was instructed to "use the prototype under tough operating conditions, not to baby it in any way."

What was the response? Some on the air comments received by W8IO, "Fantastic signal, 12 db over barefoot exciter" (75SSB). "Excellent keying, no change in wave form, 5-9 +30 db in Kentucky" (40CW). From N0AN, "Overall quality excellent and up to the standards DenTron has come to stand for." From K5ML, "Finally a high quality amplifier that everyone can afford."

Response was unanimously positive. Build a powerful linear with special features like full metering of essential voltages and currents, a back-lit, black-out meter that even includes a relative, power output function. Keep it small and economical so that it is within the reach of all amateurs, and you've got a winner!

In inflationary times like these, it's important to find ways to do more for less.

We did, and we're proud of it.

Great Size, Great Power, Great Price. Great Little Amp

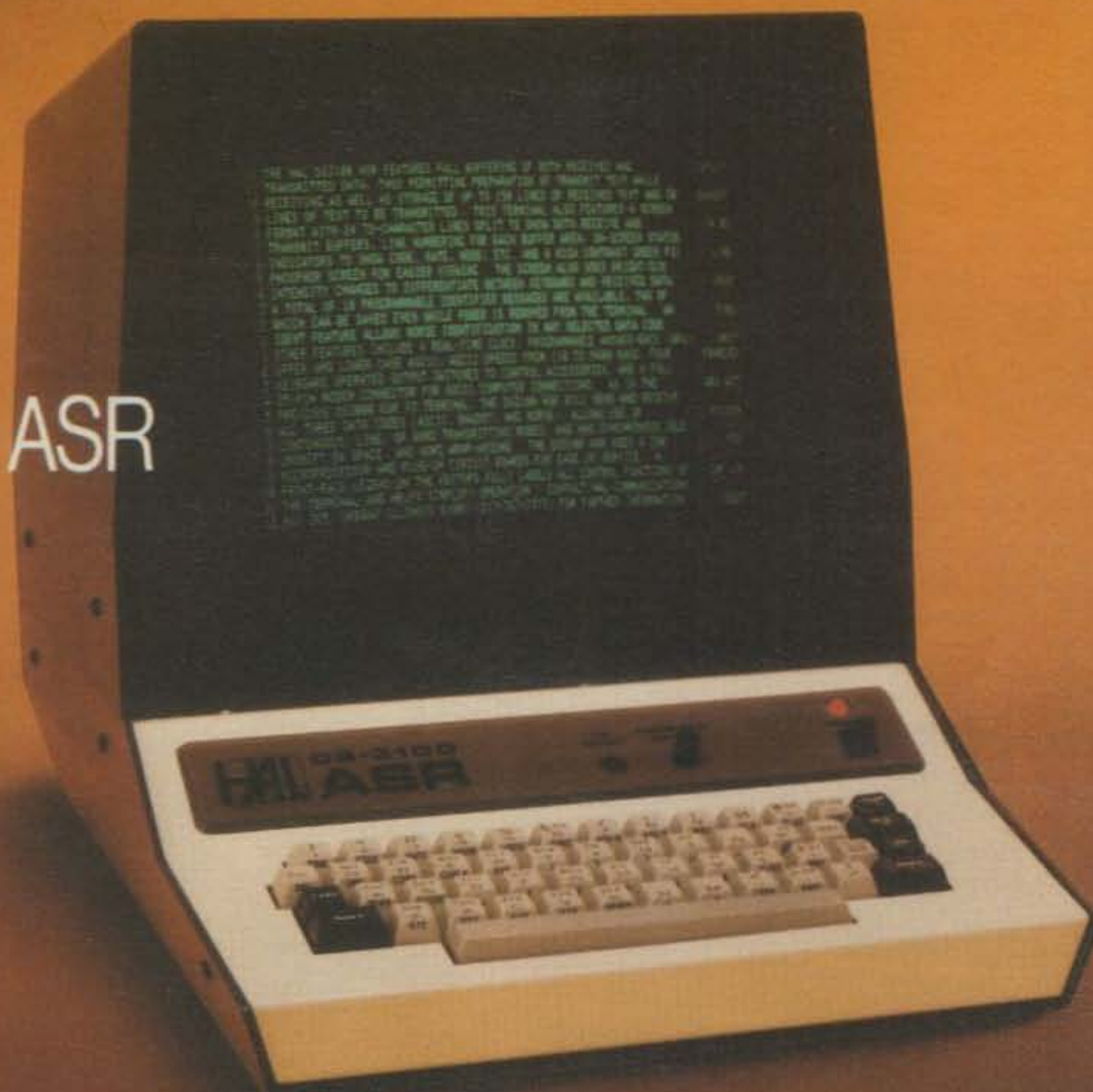
Dentron
Radio Co., Inc.

2100 Enterprise Parkway
Twinsburg, Ohio 44087
(216) 425-3173

\$379.50 Sugg. Retail
FCC Type Accepted

WHEN OUR CUSTOMERS TALK...WE LISTEN.

DS3100 ASR



We've Been Taking Notes.

Combining your ideas with some of our own, we've come up with what has to be the most advanced and convenient terminal available. These are some of the conveniences you can now enjoy by putting the DS3100 ASR in your RTTY and CW station:

ASR Operation (Compose your transmission *WHILE* receiving)

- 150-line Receiver Buffer
- 50-line Transmit Buffer
- Split Screen to Show Buffers
- Internal Real-Time Clock
- 10 Programmable Messages
- Automatic Answer-Back (WRU)
- Morse, Baudot, or ASCII Operation
- RTTY and CW Identification
- Full 128-Character ASCII
- 110-9600 baud ASCII
- 60-130 WPM Baudot
- 1-175 WPM Morse

Write or call for the DS3100 ASR specifications and see how *YOU* have helped design the new standard in amateur radio terminals.



HAL COMMUNICATIONS CORP.
Box 365
Urbana, Illinois 61801
217-367-7373

For our European Customers Contact:
Richter & Co., Hannover
I.E.C. Interelco, Bissone

Please send all reader inquiries directly

See the latest and finest quality electronics you can build yourself in this newest

FREE

HEATHKIT® CATALOG

SEE WHY HEATH® IS THE LEADER IN AMATEUR RADIO



NEARLY 400 PRODUCTS

96 BIG, COLORFUL PAGES



NEW! The HX-1681 QSK CW Transmitter features full break-in on 80 thru 10 meters.



POWER-PACKED FCC-APPROVED
The Heathkit SB-221 and SB-201 linear amps will get you through the QRM.



COMPLETE LINE of Amateur antennas and accessories.



WORLD'S BEST SELLER. Over 27,000 Hams have chosen the HW-101 80 thru 10 SSB/CW transceiver.



SEE THE WORLD'S LARGEST SELECTION OF INSTRUMENT KITS
NEW! The IO-4105 Scope offers pro features at a hobbyist price.



NEW! The IM-2212 fits your needs in a high-accuracy 3 1/2-Digit Auto-Ranging Multimeter.



NEW! The IR-5207 X-Y Chart Recorder gives you two-channel versatility.

NEW! The IM-5217 Solid-State Portable VOM is ideal for field use.



UNIQUE KITS FOR HOME, HOBBY OR BUSINESS

Discover now the fun and satisfaction you get from useful, easy-to-build Heathkit electronic kits. Computers, audio, color TV, auto, marine, radio control, test instruments, amateur radio kits and more are described in the latest FREE Heathkit Catalog.

MAIL COUPON OR CARD NOW ▶

For complete information on our entire line of amateur radio gear, plus nearly 400 other quality electronic kits, use the postcard to send for your FREE Heathkit Catalog, or write: Heath Company, Dept. 012-570, Benton Harbor, MI 49022. Heathkit products are also sold, displayed and serviced at Heathkit Electronic Centers* Coast to Coast.

*Units of Schlumberger Products Corporation.

SEE THE LATEST IN SELF-INSTRUCTION EDUCATION PROGRAMS



CHOOSE A SUBJECT! Heath offers a wide variety of self-instruction programs covering computers, test instruments, electronics and more.

NEW! General License Program
Earning your General Class Amateur Radio License was never easier.



HEATH
Schlumberger

Heath Company,
Dept. 012-570
Benton Harbor, MI 49022

YES Please send me my FREE Heathkit Catalog. I am not currently receiving your catalogs.

Name _____

Address _____

City _____ State _____

AM-391 _____ Zip _____

70-17-18-19-20

Announcing

- **Texas City, TX** — The Tidelands Amateur Radio Society, TARS, will host the only 1979 Hamfest in the Houston/Galveston, Texas area on September 1 and 2, 1979. From the registration and hospitality period on Saturday evening through the final prize drawing Sunday afternoon, Hamfest '79 is packed with activities and fun for the whole family. Hamfest '79 will be held at the Nestler Civic Center. In addition to many, many small prizes to be given away through the Sunday schedule, TARS will be giving away the winner's choice of a Kenwood TS-120-S, a Drake UV-3, a Wilson Mark II h.t., and a Wilson System III beam. For further info and pre-registration, write: Hamfest '79, P.O. Box 73, Texas City, TX 77590.
- **Horseheads, NY** — The Fourth Annual Elmira, New York International Hamfest will be presented from 8 a.m. to 5 p.m., on September 22, 1979. This year's Hamfest will be located at the Chemung County Fairgrounds and will feature dealer displays, a grand prize, even more door prizes than last year, a free flea market, tech talks, and more. Talk-in on 146.52, 10/70, and 96/36. For more info, contact: John Breese, WA2FJM, 340 West Ave., Horseheads, NY 14845.
- **Venice (Ross), OH** — The 1979 Cincinnati Hamfest will be held on Sunday, September 16, 1979, at Sticker's Grove. Exhibits, prizes, a flea market, hidden transmitter hunts, and much more will be featured. Admission and registration is \$4.00 (order your tickets in advance). For full info and complete details, request your copy of the "Hamfest Issue" of the club's magazine "The Mike and Key" from: W8ALW, 3965 Harmar Ct., Cincinnati, OH 45211, WA8STX, 10615 Thornview Dr., Cincinnati, OH 45241 or K8CKI, 1424 Main St., Cincinnati, OH 45210.
- **Whitestone, NY** — The Tu-Boro Radio Club Auction will be held on Thursday,

September 20, 1979, from 6 p.m. to 10 p.m., at the Tu-Boro Radio Club-Odd Fellows Hall. There will be a donation of \$1.00. Talk-in on 145.62 and 146.52 F.M. For further info, contact: the Tu-Boro Radio Club, 149-14 14th Ave., Whitestone, NY 11357.

- **Sutton, NH** — The Connecticut Valley F.M. Association would like to announce their 3rd Annual Hamfest to be held on September 23, 1979, from 9 a.m. to 5 p.m. Location: the King Ridge Ski Area. Festivities will include: a giant indoor/outdoor flea market, deal dealer exhibits, and much more. Admission is \$1.50 in advance, \$2.00 at the gate. Talk-in on Connecticut Valley F.M. Association Monitor 52/52 and 16/76. For advance tickets, write: C.A. Breuning, 54 Myrtle St., Newport, NH 03773.

- The Atlantic Region Repeater Legion would like to announce the formation of the East Coast Remote Base Association, organized primarily to promote and support current remote base technology and activity along the eastern seaboard. For more information, please contact: East Coast Remote Base Association, c/o Barry Siegfried, K2MF, 333 W. 57th St., Suite 306, New York, NY 10019.

- **Pecatonica, IL** — The Rockford Hamfest 1979 and the Illinois State ARRL Convention II will be held on Sunday, September 9, 1979, at the Winnebago County Fairgrounds. A large flea market, speakers and forums, and prizes (including a Kenwood TS-520 transceiver for first prize), will be some of the featured activities. Talk-in on 146.01/.61 Rockford Repeater or 146.52. Tickets cost \$2.00 in advance or \$2.50 at the gate. Tickets are available from any R.A.R.A. member or may be obtained by mail by writing to: R.A.R.A., P.O. Box 1744, Rockford, IL 61110. Please include a business size s.a.s.e. for tickets by mail.

- Anyone desiring to list stolen Amateur radio equipment, please send information to: the Colorado Council of Amateur Radio Clubs, c/o Charles E. Myers, WORNT, 1120 Yosemite Drive, Colorado Springs, CO 80910.

- **Pensacola, FL** — The Five Flags Amateur Radio Association, Inc., will hold its 1979 Ham-A-Rama on September 2, 1979, from 9 a.m. to 4 p.m., at the Pensacola Municipal Auditorium. A flea market, prizes, commercial exhibits, home brew contest, pile-up contest, forums, and more will be featured. There will be a \$1.00 donation at the door. For additional information, write: FFARA, P.O. Box 17343, Pensacola, FL 32522.

- **Bloomington, IN** — The Second Hoosier Backyard Hamfest will be held on September 8, 1979, at Hensonburg School. Sponsored by WR9AFY and Community Broadcasting Corp. Inc., highlights will include: ATV, ATV Rpt., SSTV demonstrations, home computer show, indoor swap and shop, plenty of free parking, and door prizes. Tickets: \$1.00 per head over 12. Talk-in on 147.78-18. For further info, inquire to: HBYH, 7391 W. Hwy 46, Ellettsville, IN 47429.

- **Erie, PA** — The RAE's Annual Hamfest will be held on September 23, 1979, between the hours of 8 a.m. to 4 p.m., at Rainbow Gardens, Waldameer Beach Park. Talk-in will be on 146.34/.94, 146.34 simplex and 7.250 MHz. The cost of admission will be \$3 at the gate which includes chances on the main prize, YL prizes, and half-hour drawings on door prizes. Flea market vendors will be charged \$1.00 per car. There will be a number of commercial exhibits on display. For further info, write: "Ham Jam '79", c/o the Radio Association of Erie, P.O. Box 844, Erie, PA 16512 or contact: Frank Grace, W3NR or Norma Vanderhoff, W3CG.

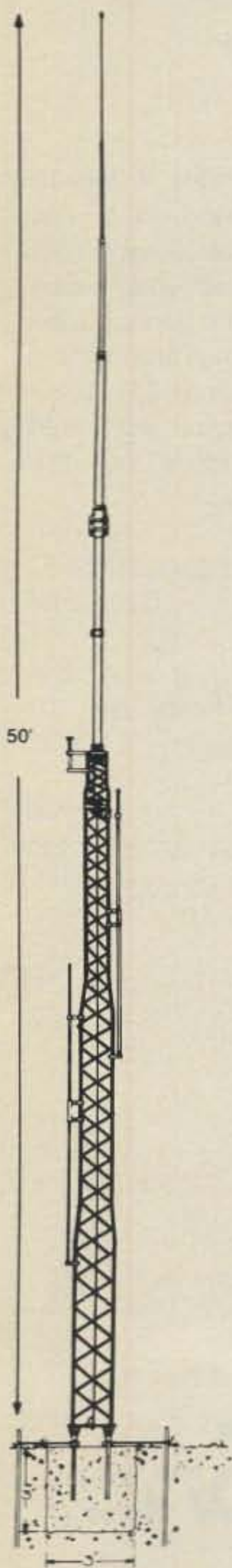
- **Warner Robins, GA** — The Central Georgia ARC would like to announce its First Annual Hamfest at the city recreation center. Scheduled for 8 a.m. to 5 p.m. on September 30, 1979, both dealers and flea market will be held indoors. Talk-in will be on 3.975 LSB, 146.25/85, and 146.52 simplex. The Georgia Single Side Band Assn. and the Georgia CW Assn. both plan their annual meetings at this hamfest. For more info, call or write: Bill Atkins, WD4ASB, 201 Avalon Dr., Warner Robins, GA 31093, (912) 923-3454, or check in on 3.975 MHz nightly at 2330 UTC.



When your looking for performance, remember this . . .

hy-gain®

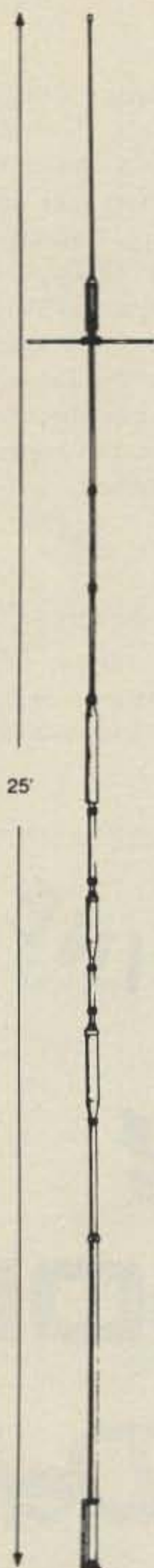
Verticals Stand Alone



18HT

- 80 thru 10 meters
- Automatic band selection
- Galvanized 24 ft. tower requires no guying
- Installs on 4 sq. ft. real estate
- Special hinged base assembly
- Weight: 96.7 lbs.

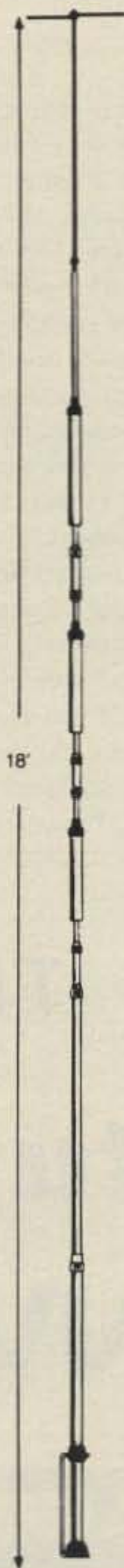
Order No. 182



18AVT/WB

- 80 thru 10 meters
- Automatic band selection
- Top loading coil on 80 meters
- True 1/4 wave resonance on all bands
- Weight: 10.7 lbs.

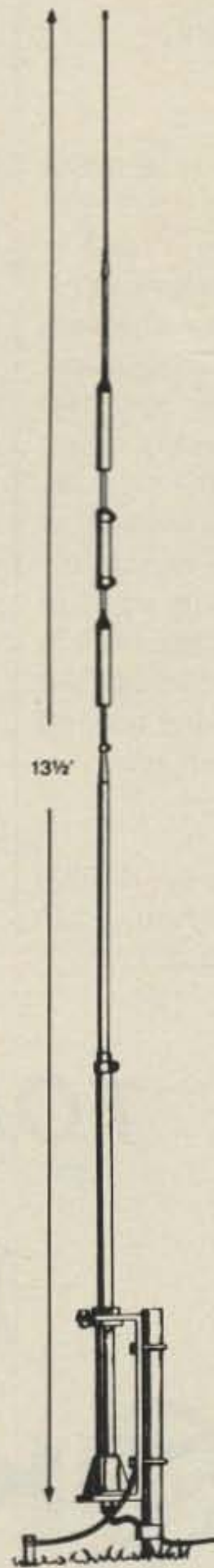
Order No. 386



14AVQ/WB

- 40 thru 10 meters
- 3 separate Hy-Q traps
- Wide band performance
- Especially low angle radiation pattern
- Weight: 8.2 lbs.

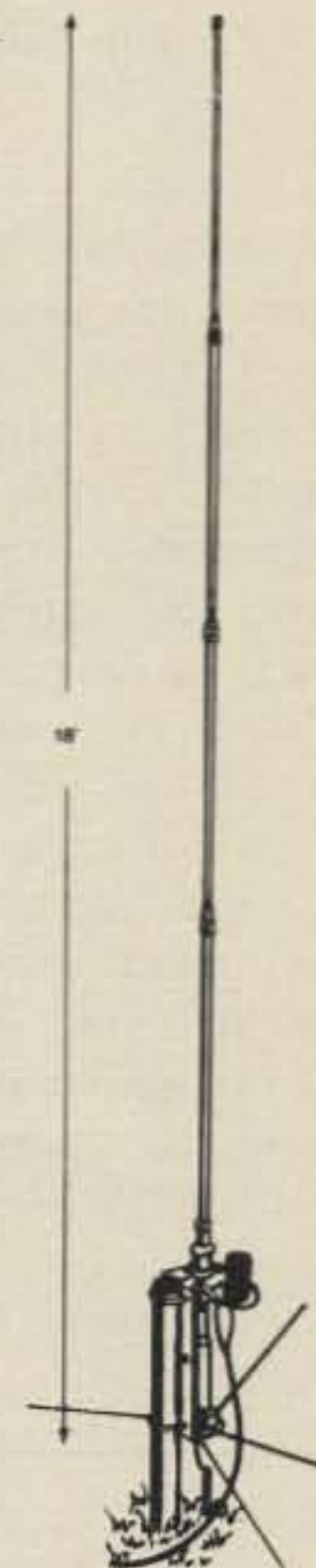
Order No. 385



12AVQ

- 20, 15 and 10 meters
- Wide band performance
- Especially low angle radiation
- Full circumference compression clamps at tubing joints
- Weight: 7.0 lbs.

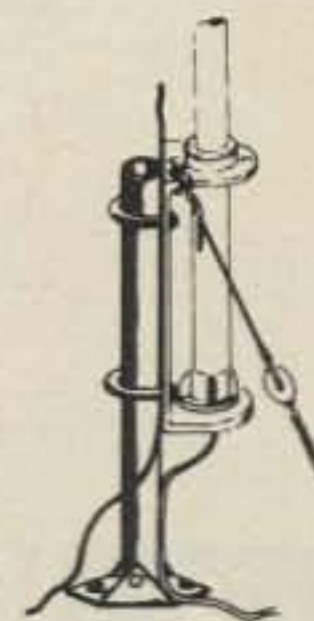
Order No. 384



18V

- 80 thru 10 meters
- Low cost highly efficient vertical antenna
- Easy band switching
- Highly portable
- Weight: 4.6 lbs.

Order No. 193



14RMQ

- Roof mounting kit
- Support for 18AVT/WB, 18V, 14AVQ/WB and 12 AVQ

Order No. 184



hy-gain electronics
DIVISION OF TELEX COMMUNICATIONS, INC.

8601 Northeast Highway 6
Lincoln, Nebraska 68505

Our Readers Say

Top Band's Top Two

Editor, CQ:

I am writing to thank you and CQ Magazine for sending me the 1977 160 Meter Contest Plaque for my efforts in that year's contest. It is an honor to receive it from you, and for me and others it represents the most distinguished award for contest activity on 160 Meters. I have participated in your contest for many years and watched it grow into one of real challenge, as well as one that does a great deal to sponsor and create World Wide activity on Top Band, unlike the ARRL contest, which does little more than sponsor QRM. All of us who work hard on and for 160 all over the world have a deep appreciation for CQ's contests.

James C. Hemingway, K1PBW
Shutesbury, MA

Editor, CQ:

I would like to thank you and CQ Magazine for the very handsome 1978 160 Meter World Plaque that I've just received. Quite some time ago, I had several letters from Frank, W1WY regarding the lack of a world plaque this year, and was very surprised and pleased to receive this on from CQ. You can be sure that it will occupy a prominent position in my new shack. I have operated in the CQ contests almost exclusively during my five year stay in Bermuda, and have thoroughly enjoyed them all. I hope that my station will be set up in time to participate in the upcoming contest season.

With the aid of several local hams, I dismantled my 60' tower and tri-bander in preparation for my return move to Connecticut. We departed Bermuda on the 22nd of June. I have moved to Gales

Ferry, CT, and have an acre on which to erect new antennas. Just behind our house are 33 acres that I hope to utilize as well.

Again, thank you for the plaque, very 73 to all.

Bill Birtcher, WA1RFM/VP9
Gales Ferry, CT

New Reader

Editor, CQ:

I am a Novice operator. I am 12 years old and am working on getting my General license. Then I will start on SSTV. I really enjoyed your article about W6VIO's SSTV pictures of Jupiter and its moons going around the world (June, 1979, CQ, pg. 60). I just subscribed to your magazine and would much enjoy reading more on this subject.

Richard Egües, KA5FEJ
Dallas, TX

Norm Chalfin is hard at work preparing more space articles for CQ Richard, so stand by one... —Ed.

☐

TOP OF THE LINE

Featuring

KENWOOD

 ICOM

 YAESU

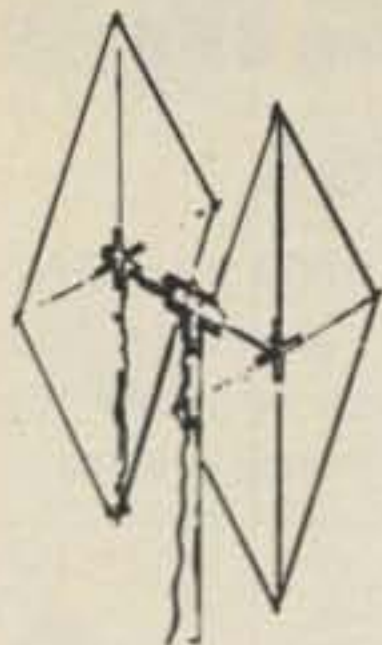
Dentron

ORDER TOLL FREE!
800-845-6183

 G.I.S.M.O.
2305 CHERRY ROAD
ROCK HILL, S.C. 29730

TEN-TEC,

73, THE GISMO GANG



SUPER-QUAD FIBERGLASS ANTENNAS

★
COMPLETE KITS INCLUDE
HARDWARE, WIRE, ALL
MOUNTS, BOOM.

★
STRONGER AND LIGHTER
THAN ALUMINUM

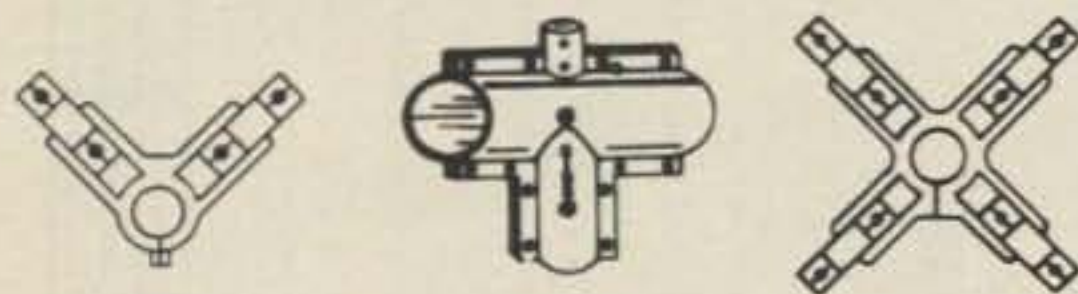
★
MAXIMUM GAIN

AVAILABLE IN A COMPLETE RANGE OF KITS

Special Instruction Manual on
Kirk's "Super Quads" \$2.75

- 2 3 4 ELEMENT TRI BAND
10 15 20 METER AMATEUR NET FROM \$213.90
- 2 3 4 ELEMENT DUAL BAND
10 15 OR 10 6 METER AMATEUR NET FROM \$125.35
- 2 ELEMENT 40 METER AMATEUR NET \$436.25
- UHF 4 ELEMENT 2 OR 6 METER
AMATEUR NET FROM \$60.45

ANTENNA MOUNT KITS



COMPLETE PACKAGED KITS INCLUDING

SPIDERS OR V-SUPPORTS • BOOM TO MAST MOUNT

• ALL NECESSARY ASSEMBLY HARDWARE

• INSTRUCTION MANUAL

HEAVY DUTY CAST ALUMINUM

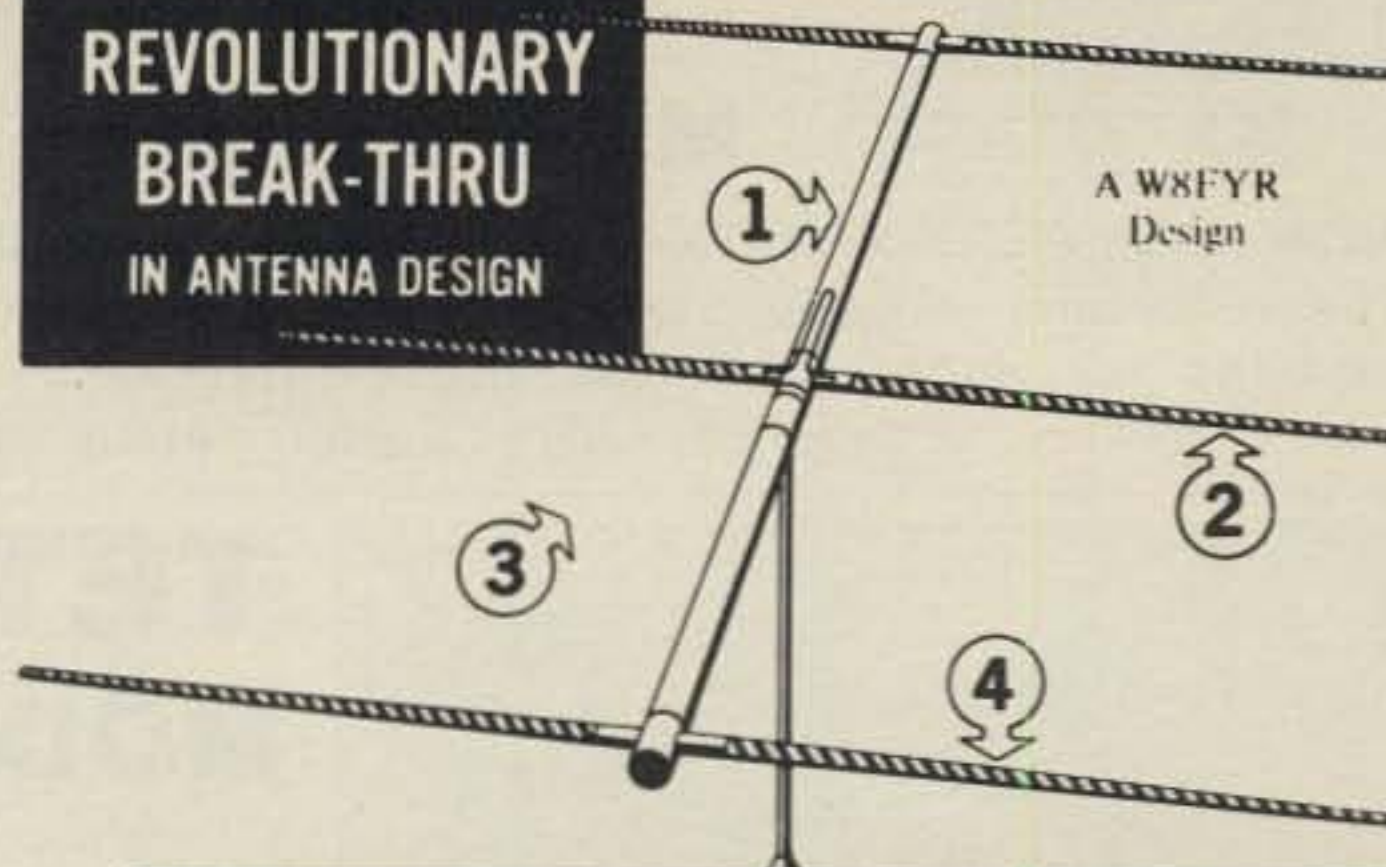
DELTA LOOP MOUNT KIT

- DL-1 (2) 1 1/2" Hub V-Supports
(1) 1 1/2" Boom to 1 1/2" Mast T-Mount \$16.10
- DL-2 (2) 2" Hub V-Supports
(1) 2" Boom to 1 1/2" Mast T-Mount \$24.69
- DL-3 (2) 3" Hub V-Supports
(1) 3" Boom to 2" Mast T-Mount \$40.64

QUAD MOUNT KIT

- QM-1 (2) 1 1/4" Hub Spiders (Small Spider for VHF)
(1) 1 1/4" Boom to 1 1/4" Mast T-Mount \$11.95
- QM-2 (2) 1 1/4" Hub Spiders
(Heavy Spider for 6M & 10M)
(1) 1 1/4" Boom to 1 1/4" Mast T-Mount \$15.12
- QM-3 (2) 1 1/2" Hub Spiders
(1) 1 1/2" Boom to 1 1/2" Mast T-Mount \$16.10
- QM-4 (2) 2" Hub Spiders
(1) 2" Boom to 1 1/2" Mast T-Mount \$24.69
- QM-5 (2) 3" Hub Spiders
(1) 3" Boom to 2" Mast T-Mount \$40.64

REVOLUTIONARY BREAK-THRU IN ANTENNA DESIGN



A W8FYR
Design

KIRK'S BRAND NEW ALL-FIBERGLASS HELICOIDAL BEAMS

AVAILABLE IN: | 2 & 3 ELEMENT - 40 METER
2, 3, 4 & 5 ELEMENT - 10-15-20 METER

CHECK THESE OUTSTANDING

- ① ALL FIBERGLASS ELEMENTS & BOOM
- ② ELEMENT LENGTHS 25% TO 35% SHORTER THAN METALLIC ARRAYS
- ③ PRECISION CONSTRUCTION, MINIMUM ASSEMBLY TIME.
NO TUNING
NO ADJUSTING

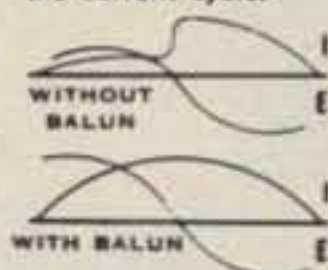
AND EXCLUSIVE FEATURES:

- ④ COPPER TAPE, SPIRALLY WOUND ELEMENTS COATED WITH DURATHANE
- ⑤ VSWR LESS THAN 1.5 AT UPPER & LOWER BAND LIMITS
- ⑥ GREAT STRENGTH AND VERY LIGHT
Example:
3 Element 40 M - 46 Lbs. \$589.50
3 Element 20 M - 17 Lbs. \$249.94
3 Element 15 M - 9 Lbs. \$192.45
3 Element 10 M - 8 Lbs. \$149.95

WORLD'S FINEST BROAD BAND BALUNS 1:1 Or 1:4 RATIO



Kirk Broad Band Baluns are designed for matching an unbalanced line, such as coaxial cable, to a balanced antenna to produce a symmetrical wave form of equal intensity from the current cycle.



MODELS 5075-D & 5075-LF For Dipole Antennas Net Wt. 7 Oz.

Kirk Baluns provide the greatest breakdown insurance by use of mylar insulation between the tough poly thermalize winding and the Ferrite Core and a final dip coating of low dielectric impregnation. Handle peak power of 2000 watts provided ratio error is low.

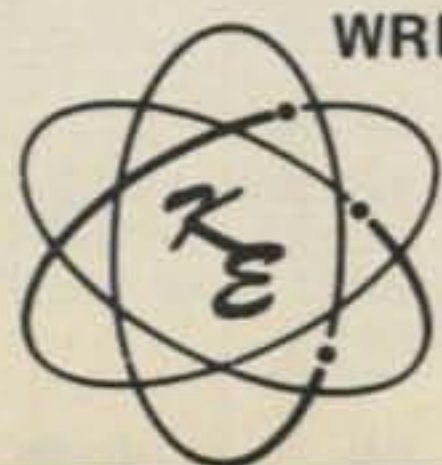
Unique in design, Kirk Baluns are produced in two distinctive models: One for Dipoles and one for Beam Antennas. NET PRICE \$14.25

Application Frequency Coverage & Power Ratings For The Various Models Shown Below

MODEL	APPLICATION	F/MC.	POWER
5075-D	Dipole	3.4-52 mcs	2K PEP
5075-B	Beam	3.4-52 mcs	2K PEP
5075-LF	Dipole	1.7-10 mcs	2K PEP



MODEL 5075-B For Beam Antennas Net Wt. 7 Oz.



WRITE FOR FULL INFORMATION. PRICES DO NOT INCLUDE POSTAGE.
PRICES ARE SUBJECT TO CHANGE

KIRK ELECTRONICS DIVISION

VIKING INSTRUMENTS, INC.

73 Ferry Rd., Chester, CT 06412

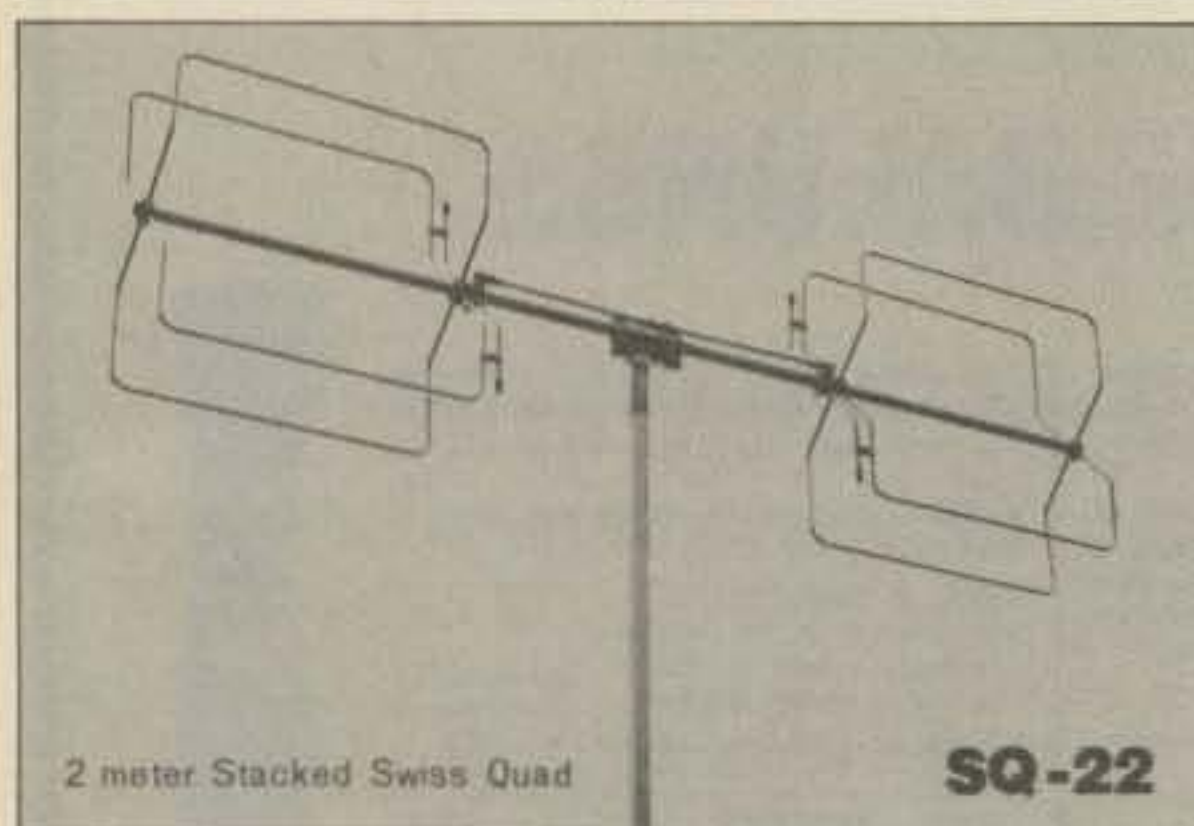
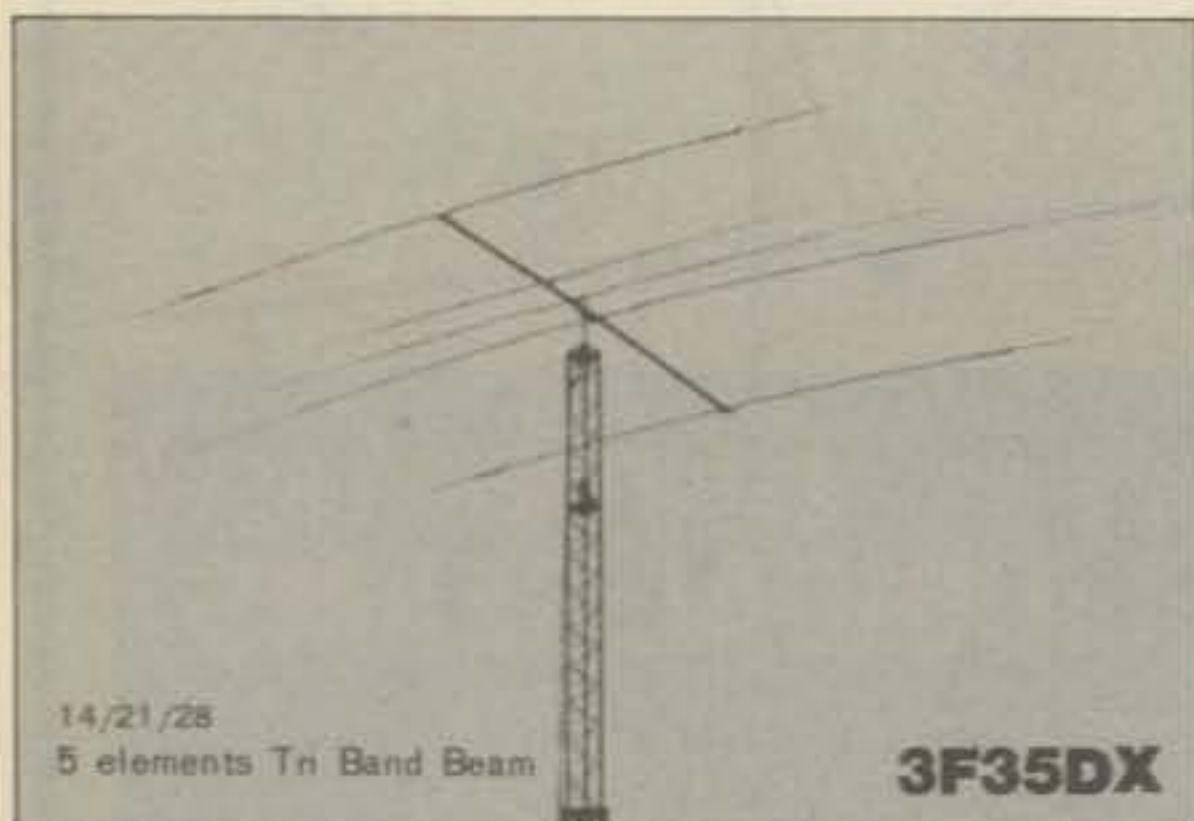
•Telephone: (203) 526-5324

TET[®]

ANTENNA SYSTEMS

Multi Band Beam Super DX Series

NEW HIGH PERFORMANCE TRI-BAND BEAMS AS GOOD AS FULL-SIZE MONO BAND ANTENNAS. These beams employ hybrid system which is a combination of separated full-size driven element for each band individually and Hi-Q trap parastic elements. These feature result high radiation efficiency, high power rating and excellent VSWR in entire band width.



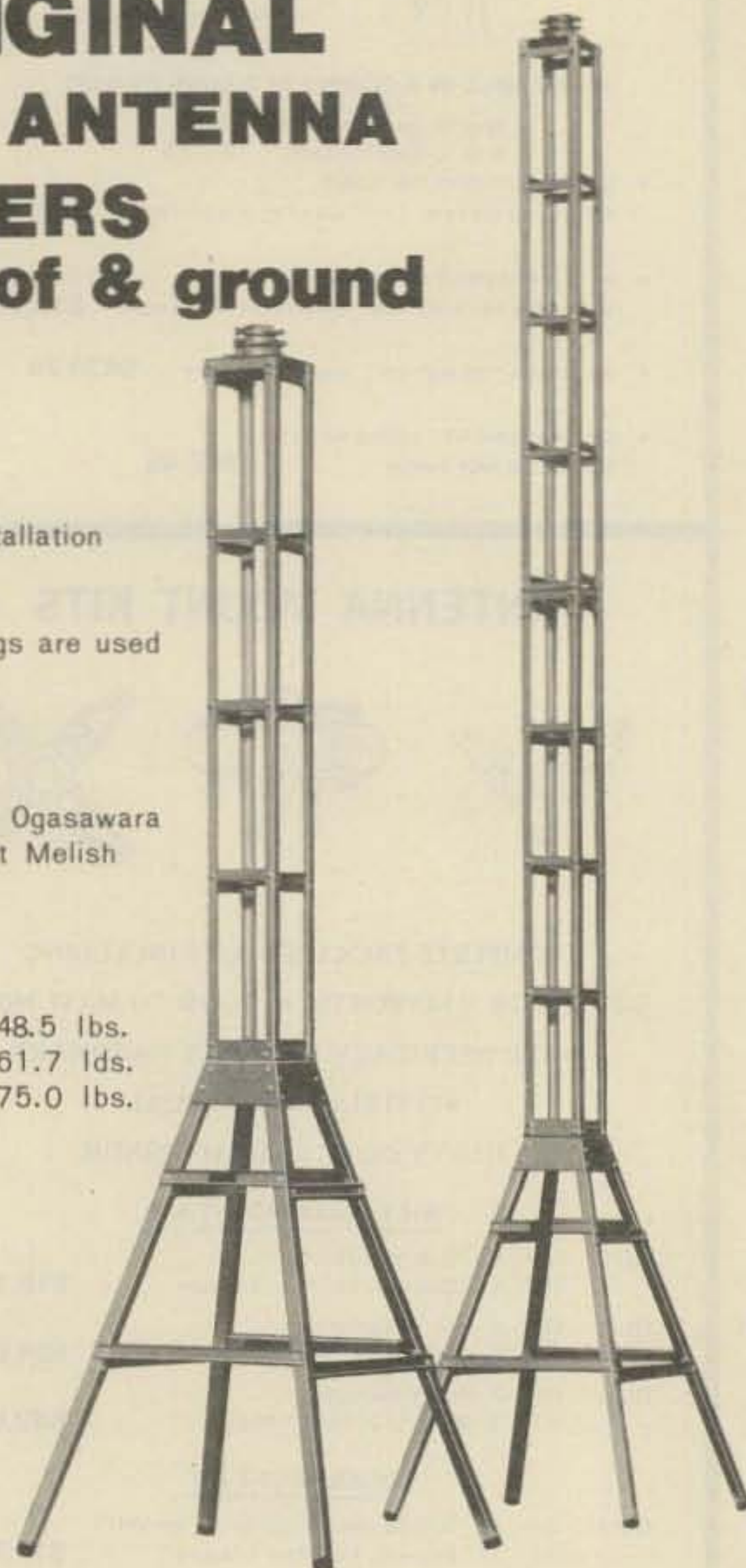
TET ORIGINAL MODULAR ANTENNA TOWERS

Ideal for roof & ground
mounts

- one man assembly and installation
- Light weight
- High quality aluminum alloy
- High stability (square tubings are used as base section)

Has been used by JD1YAH at Ogasawara island and DX peditionning at Melish Reef (VK9ZR)

Model TE-35A	11.6ft.	48.5 lbs.
Model TE-55B	18.0ft.	61.7 lds.
Model TE-75C	25.0ft.	75.0 lbs.



KR 2000—Designed for 360° rotation. Brake holds up to 10,000kg/cm (8680lbs/inch) torque.



KR 600—Designed for 360° rotation. Brake holds up to 4000 kg/cm (3470 lbs/inch) torque.



KR 400—Designed for 360° rotation. Rated to support up to 200 kg or 440 lbs. Read out tolerance ± 5 degree max



KR 500—Designed for 180° rotation. Brake holds up to 2000 kg/cm (1750 lbs/inch) torque.

425 Highland Parkway, Norman, Oklahoma 73069
Tel. (405) 360-6410

TET U.S.A., INC.

CIRCLE 51 ON READER SERVICE CARD

*We're convinced...we've built the world's
finest amplifier in its class!*



HENRY RADIO'S 1KD-5

THE NEWEST MEMBER OF THE FAMOUS HENRY RADIO FAMILY OF FINE AMPLIFIERS

The 2KD-5 and 2K-4A linear amplifiers completely fulfill the needs of discriminating amateurs who want the very best and are willing to pay the price. But we have long felt that many amateurs would be satisfied with less power if they could still have the same high quality and dependability. The 1KD-5 fulfills that need beautifully.

- Quality that is unmatched in any other linear in its class. The same high standards of engineering and construction as the 2KD-5 and 2K-4A. Heavy duty components guarantee years of trouble free, dependable performance.
- Smaller and lighter. Weighs about 27 pounds less... easier to take along on vacation trips and DXpeditions.
- Less expensive. If your budget is limited, but you still want a GOOD quality linear to kick your signal way up, with sharp, clear signals, the 1KD-5 will give you just about everything you want... and without sacrificing quality.

GENERAL INFORMATION

The 1KD-5 is a 1200 watt PEP input (700 watt PEP nominal output) RF linear amplifier, covering the 80, 40, 20 and 15 meter amateur bands. (10 meters on units shipped outside the U.S.)

Tube Complement: Eimac 3-500Z glass envelope triode operating in a grounded grid circuit.

ALC Circuit: ALC Circuit to prevent overdrive from high power exciters, also boosts average talk power.

Type of Emission: SSB, CW, RTTY or AM

Antenna Relay: DC relay system for hum-free operation, requires shorting contact to ground during transmit to key amplifier into transmit.

Power Output Indicator: Self-contained relative RF power meter.

Tank Circuit: Pi-L plate circuit with a rotary silver plated tank coil for greatest efficiency and maximum attenuation of unwanted harmonics.

Input Circuits: Cathode Pi input matching circuits for maximum drive and linearity.
Power Supply: Conservative power supply with solid state rectifiers for reliable, long term operation.

Dimensions: 8.75" high x 14" wide x 15" deep.

Weight: 48 pounds.

Price \$695.00

2K-4A floor console linear amplifier... still the "workhorse" of Amateur Radio. Engineering, construction and features second to none. Provides a long life of reliable service while its heavy duty components allow it to loaf along at full legal power. \$1195.00

2KD-5 desk model linear amplifier... lighter, more compact and less expensive, but still a heavy duty, high quality linear that will operate at full legal power month after month for years to come. \$945.00

Tempo 2002 amplifier for 2-meter operation. 2000 watts PEP input on SSB or 1000 watts input on FM or CW. \$795.00

Tempo VHF/UHF solid state power amplifiers for use in most land mobile applications. Call or write for list of models available.

Tempo 100AL10 VHF linear amplifier. Power output of 100 watts (nom.) with only 10 watts (nom.) in. \$209.00

3K-A linear amplifier (for export and military use only) Superior quality, extremely reliable. At least three kilowatt PEP input on SSB... 2000 watt PEP output. \$1595.00

4K-ULTRA linear amplifier (for export and military use only) For the most demanding operation... SSB, CW, FSK or AM. For general coverage operation from 3.0 to 30 MHz, but can be modified for operation on frequencies up to 100 MHz. 100 watts drive delivers 4000 watts PEP input. \$3450.00

All of the above except the 2002, 3K-A & 4K-ULTRA are available at Tempo dealers throughout the U.S.

11240 W. Olympic Blvd., Los Angeles, Calif. 90064 213/477-6701
931 N. Euclid, Anaheim, Calif. 92801 714/772-9200
Butler, Missouri 64730 816/679-3127

Prices subject to change without notice.

Henry Radio

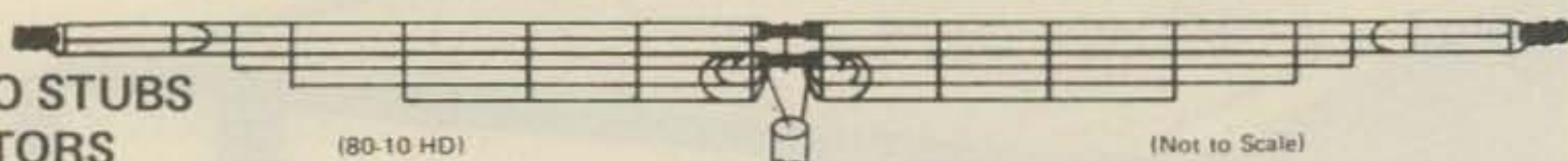
CIRCLE 29 ON READER SERVICE CARD

A VERY IMPORTANT ANNOUNCEMENT FROM



WORLD'S LARGEST SPECIALISTS IN THE DESIGNING, DEVELOPING AND MANUFACTURING OF "NO COIL, NO TRAP" ANTENNA SYSTEMS.

NO TRAPS,
NO COILS, NO STUBS
NO CAPACITORS



multi-band multi-frequency HF communications antennas
one half the length of conventional antennas
high performance and maximum efficiency
lowest cost/highest performance antenna available
fully assembled and pre-tuned ready for installation

★ ★ ★ NEW ★ ★ ★

Available Only from MOR-GAIN Two Models
Specifically Designed for the Novice/Technician Operator.
All of the Features and Performance of the Regular
MOR-GAIN HD Dipoles but Optimized for the
Operating Requirements of the Novice/Technician
Licensee. See Below for Specifications and Prices.

- There is no better antenna at any price . . . W9QIO • I had a Mor-Gain antenna and liked it extremely well . . . K4JMR
- The antenna has worked out well with very good reports . . . W2TVK • I can only give glowing reports about it . . . WA2IRN
- I have used these fine antennas before and see no reason to change now . . . W6BF • It has given me excellent service and results . . . W6CZS • I believe I have "sold" your antenna to almost every ham I have talked to . . . W4AHN • Its performance here far surpasses any other antenna that I have had . . . WA5GGS • For several years I have used the Mor-Gain and have been very satisfied . . . K2TSD • Am letting everybody know that it has been doing a good job for me . . . VE2VW • The antenna is performing just beautifully . . . W8WDZ/6 • My 75-40 has performed beautifully and I'm very happy with it . . . WB8DMB
- Another chap said he had also used it and that it was the greatest . . . W4NSP • I do not hesitate to recommend the antennas to others . . . K0SPR • I heard a ham extolling the virtues of your antenna . . . WB0PTM • I worked a station last night and the Mor-Gain was doing quite a job for him . . . WA3TCV

MOR-GAIN HD DIPOLES . . . • One half the length of conventional half-wave dipoles. • Multi-band, Multi-frequency. • Maximum efficiency - no traps, loading coils, or stubs. Fully assembled and pre-tuned - no measuring, no cutting. • All weather rated - 1 KW AM, 2.5 KW CW or PEP SSB. • Proven performance - more than 15,000 have been delivered. • Permits use of the full capabilities of today's 5-band xcvrs. • One feedline for operation on all bands. • Lowest cost/benefit antenna on the market today. • Fast QSY - no feedline switching. • Highest performance for the Novice as well as the extra-class op. • ST and HD models are furnished with crimp/solder lugs for transmission line connection. • HD/A models are furnished with female coax connector which mates with standard PL-259 male cable connector. • Designed for low height installation: 20-40 feet. • 50 ohm feed point impedance on all bands. • 75-(**) models are factory tuned for resonance at 3950 kHz; 75- (xx) HD (S/P) models - 3800 kHz., 80-(xx) models - 3650 kHz.

EXCLUSIVE 66 FOOT, 75-10 METER DIPOLES

• May be installed as inverted vee with negligible effect on performance. • Fabricated from high-strength 40% copperweld wire - over 500 pound breaking strength. • Stainless steel hardware. • Completely assembled and pre-tuned. No cutting or measuring necessary. • 1-year limited warranty. • Patented linear phase loading principle eliminates need for traps, loading coils or stubs. • Engineering design and manufacturing is backed by our more than 15 years experience. • Professional grade design - Amateur models are identical to those we produce for commercial/industrial systems • No antenna tuner required for operation within stated specifications. • Re-tuneable by the user to accommodate site proximity effects.

MODEL	BAND (Meters)	LENGTH (feet)	PRICE
40-20-HD	40/20	36	\$58.25
40-20 HD/A	40/20	36	\$63.50
75-10 HD	75/40/20/15/10	66	\$94.25
75-10 HD/A	75/40/20/15/10	66	\$99.50
75-10 HD(SP)	75/40/20/15/10	66	\$94.25
75-10 HD(SP)A	75/40/20/15/10	66	\$99.50
75-20 HD	75/40/20	66	\$80.25
75-20 HD/A	75/40/20	66	\$85.50
75-20 HD(SP)	75/40/20	66	\$80.25
75-20 HD(SP)A	75/40/20	66	\$85.50
75-40 HD	75/40	66	\$68.00
75-40 HD/A	75/40	66	\$73.25
75-40 HD(SP)	75/40	66	\$68.00
75-40 HD(SP)A	75/40	66	\$73.25
80-10 HD	80/40/20/15/10	69	\$98.50
80-10 HD/A	80/40/20/15/10	69	\$103.75
80-10 HD(NT)	80/40/20/15/10	69	\$98.50
80-10 HD(NT)A	80/40/20/15/10	69	\$103.75
80-40 HD	80/40/15	69	\$72.00
80-40 HD/A	80/40/15	69	\$77.25
80-40 HD(NT)	80/40/15	69	\$72.00
80-40 HD(NT)A	80/40/15	69	\$77.25

Please include \$2.75 for shipping and insurance.

NOVICE LICENSE OPERATION. The MOR-GAIN HD Dipole is the ideal antenna for the new or Novice operator. As the Novice progresses to higher license classes, he can easily re-tune the HD Dipole to the new frequencies of his higher frequency privileges. The HD Dipole is thus a one-time investment. HD Dipoles are available for all Novice frequencies.

LEAST COST. Dollar for dollar, the HD dipoles are the highest performance, least cost multi-band antennas on the market today. For example: the 5-band 75-10 HD dipole costs less than \$20.00 per band - an unbeatable low cost.

LIMITED REAL ESTATE. Where real estate for antenna installation is limited, the HD dipole is the ideal solution. Operation on 80/75/40 meters is now possible since the HD dipole is only half the length of a conventional half-wave dipole. For all around operation, the HD dipole will outperform any trap loaded horizontal or vertical dipole.

Mor-Gain
2200 C South 4th Street
Leavenworth, Kansas 66048
(913) 682-3142
Monday-Friday: 9AM-5PM CST



BankAmericard, Visa, and
Mastercharge are available.



Please write for fully descriptive 5 page brochure. Contact your favorite dealer or order direct from Mor-Gain.

A Comprehensive Review of Allocation Proposals For The Amateur-Satellite Services Submitted To The ITU For The 1979 World Administrative Radio Conference (WARC)

DR. THEODORE J. COHEN, N4XX*

On the 24th day of this month, the ITU will convene one of the most important international conferences to be held this century. On that day up to 154 countries will begin ten weeks of deliberations on the use of the entire radio frequency spectrum. The decisions made at this World Administrative Radio Conference (WARC) will be treaty-binding on the United States (once the decisions

have been reviewed and ratified by the Congress), and will determine the future course of telecommunications through the end of this century.

Allocations to the Amateur and Amateur-Satellite services, and to all other telecommunication services, will undergo changes as a result of the WARC. To see what some of these changes could be, we have asked one of our frequency management

specialists, Dr. Cohen (N4XX), to review the WARC proposals which are currently available to the public, and to summarize what he feels are the major areas of concern. His review, which is presented below, represents one of the most thorough analyses of WARC proposals to appear in the Amateur literature.

Alan, K2EEK

Introduction

On September 24, 1979, the International Telecommunication Union (ITU) will convene a World Administrative Radio Conference (WARC). Administrations attending the ten-week Conference—which could number as high as 154—are empowered to review and revise the entire body of the International Radio Regulations. Thus, the work of the 1979 WARC will have a significant impact on the international telecommunication community, for the decisions of the Conference will determine how the radio frequency spectrum will be used through the year 2000.

One major area of the Radio Regulations to be addressed at the WARC, and that which is of primary concern to the Amateur and Amateur-Satellite services,* is ARTICLE 5, the Table of Frequency Allocations. To this end, numerous administrations, including the United States, have, for the past few years, engaged in intensive reviews of ARTICLE 5. Further,

*8603 Conover Place, Alexandria, VA 22308

*The ITU recognizes two Amateur services: (1) The Amateur (Terrestrial) service; and (2) the Amateur-Satellite service.

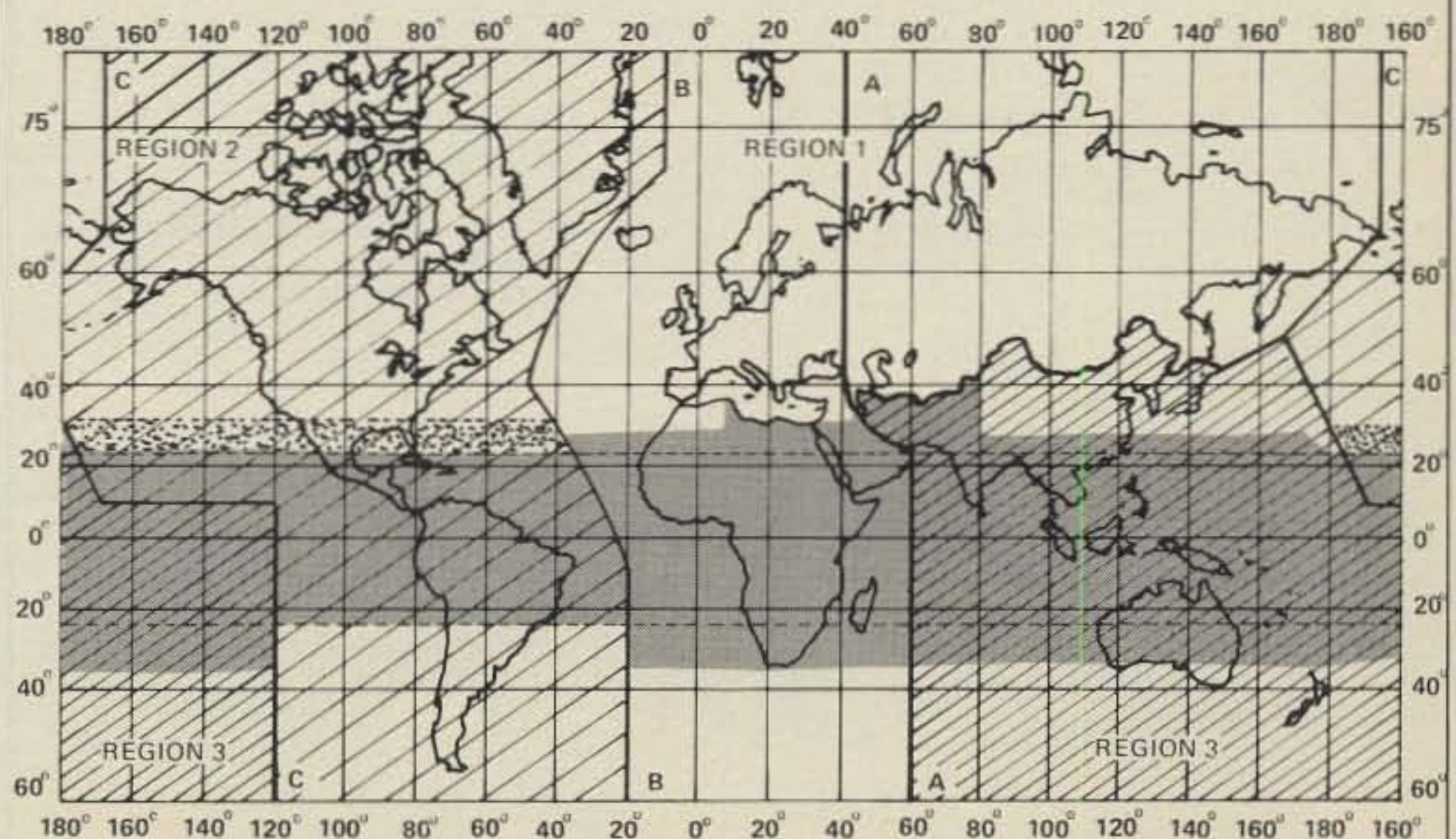
**160 kHz to 450 MHz only.

these administrations have set forth candidate allocation proposals to their various agencies and departments, and, in some cases, to their citizens, in an attempt to develop positions which are consistent with their telecommunication requirements through the end of this century. For many administrations, this review process resulted in the preparation of detailed position

papers and proposals on ARTICLE 5 which were forwarded to the ITU for distribution to member countries. At this writing, the contributions from 41 countries were available for analysis (see table 1 and fig. 1), and these contributions form the basis for this comprehensive review article.

Specifically, this article will summarize those administration proposals for ARTICLE 5 which impact

Chart of Regions as Defined in Table of Frequency Allocations



The shaded part represents the Tropical Zone

TABLE 2

REVIEW OF WARC PROPOSALS
1800-2000 kHz (160 meters)

BAND SEGMENT (kHz)	COUNTRY	DIFFERENCE FROM ITU (kHz)	REMARKS
1500-2000	ITU	---	No allocation to the Amateur service in Region 1. In Regions 2 and 3: AMATEUR FIXED MOBILE except Aeronautical Mobile RADIONAVIGATION
1800-2000	AFS	0	No change proposed
1800-1850	ARG	+50 in Region 1 0 in Regions 2 and 3	It is proposed to make AMATEUR (Exclusive), worldwide
1850-2000	ARG	-150	
1800-1809	ARS	-9 in Regions 2 and 3	In Region 1, AMATEUR (Exclusive) proposed In Regions 2 and 3 it is proposed to make AMATEUR exclusive.
1809-1859	ARS	+50 in Region 1	
1859-2000	ARS	-141 in Regions 2 and 3	
1800-2000	AUT	+200 in Region 1	Proposed to add AMATEUR in Region 1 (Shared with FIXED, MOBILE except aeronautical mobile, and RADIODETERMINATION)
1800-1809	BHR UAE IRQ KWT QAT	-9 in Region 2 and 3	Same as for ARS
1809-1859		+50 in Region 1	
		0 in Regions 2 and 3	
1859-2000		-141 in Regions 2 and 3	
1800-1900	CAN	0	In Region 2, it is proposed to make AMATEUR exclusive; no change proposed in Region 3
1900-2000	CAN	-100 in Region 2 0 in Region 3	
1800-2000	CHN	0	No changes proposed in Regions 2 and 3.
1800-2000	D	+200 in Region 1 0 in Regions 2 and 3	It is proposed to add AMATEUR in Region 1
1800-1809	G	-9 in Regions 2 and 3	It is proposed to add AMATEUR (Exclusive), worldwide
1809-1914		+105 in Region 1	
1914-2000	G	-86 in Regions 2 and 3	
1800-1820	HOL	-	NOP
1820-1840	HOL	+20 in Region 1	It is proposed to add AMATEUR (Exclusive) in Region 1
1840-2000	HOL	-	NOP
1800-2000	MLA	0	No changes proposed
1800-1875	NZL	0	AMATEUR downgraded to secondary status in Regions 2 and 3
1875-1900	NZL	0	AMATEUR (Exclusive) proposed in Regions 2 and 3
1900-2000	NZL	-100 in Regions 2 and 3	Note loss of 100 kHz in Regions 2 and 3
1800-1995	PNG	0	The proposed Primary (shared) allocation is in Regions 2 and 3, only.
1995-2000	PNG	-5 in Regions 2 and 3	
1800-1875	S	0	
1875-1900	S	+25 in Region 1	In Region 1, it is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal). No changes proposed in Regions 2 and 3.
1900-2000	S	0	
1800-1860	SLV	0	
1500-2000	SLV	-140 in Region 2 0 in Region 3	
1800-2000	SNG	0	
1800-1850	SUI	+50 in Region 1	In Region 1 it is proposed to add AMATEUR (Exclusive)
1850-2000	SUI	-	NOP
1800-2000	THA	0	

(Continued on next page)

TABLE 1

COUNTRY SYMBOLS AND REGIONS

SYMBOL	COUNTRY	ITU REGION
AFS	Republic of South Africa	1
ARG	Argentine Republic	2
ARS	Kingdom of Saudi Arabia	1
AUT	Austria	1
BEI	Belgium	1
BHR	State of Bahrain	1
BOT	Botswana	3
CAN	Canada	2
CHN	China (People's Republic of)	3
D	Germany (Federal Republic of)	1
DDR	German Democratic Republic	1
E	Spain	1
G	United Kingdom of Great Britain and Northern Ireland	1
HOL	Kingdom of the Netherlands	1
IND	Republic of Indonesia	3
IRQ	Republic of Iraq	1
KOR	Republic of Korea	3
KWT	State of Kuwait	1
MLA	Malaysia	3
MWI	Malawi	1
NZL	New Zealand	3
OMA	Sultanate of Oman	1
PAK	Pakistan	3
PNG	Papua New Guinea	3
POL	People's Republic of Poland	1
QAT	State of Qatar	1
ROU	Socialist Republic of Romania	1
S	Sweden	1
SLV	Republic of El Salvador	2
SNG	Republic of Singapore	3
SUI	Confederation of Switzerland	1
TCH	Czechoslovak Socialist Republic	1
THA	Thailand	1
TED	Trinidad and Tobago	2
TUR	Turkey	1
UAE	United Arab Emirates	1
URS	Union of Soviet Socialist Republics	1
USA	United States of America	2
YUG	Socialist Federal Republic Yugoslavia	1
ZAI	Zaire (Republic of)	1
ZMB	Republic of Zambia	1

on the Amateur and Amateur-Satellite services**. While the proposals reviewed here represent the views of about one-fourth of the countries which can participate in the WARC, it is hoped that by considering the proposals together, it will be possible to develop a preliminary "sense of the WARC" vis-a-vis the Amateur services. Indeed, it is only through a review such as this that the reader is able to identify significant trends in the collective positions of various administrations.

Analysis Details and Conventions

It must, above all, be remembered that the material reviewed here represents preliminary proposals to the ITU. Each administration, in the course of the WARC deliberations, can change its proposals on a given matter to better reflect its current technical and political positions. Accordingly, it is again emphasized that the review given here is meant only to identify areas wherein a consensus of administration proposals suggests that a specific action might be taken (e.g., to create a new Amateur service band at 10 MHz).

The analyses below will be presented by band, in order of increasing frequency. Where required, administration proposals will be tabulated; in such cases, only one table will be provided per band, with notes added to highlight proposals affecting specific ITU regions. Note

NO 29-30

1800-2000	TUR	+200 in Region 1	In Region 1 it is proposed to add AMATEUR (Exclusive)
1800-1860	USA	-60 in Region 2 0 in Region 3	
1860-1900	USA	+40 in Region 1	It is proposed to make AMATEUR (Exclusive), worldwide
1900-2000	USA	0	No allocation proposed for Region 1
1800-2000	YUG	0	
1800-2000	ZMB	0	

NOP: BEL, BOT, DDR, E, INS, KOR, MWI, PAK, POL, ROU, TCH, URS and ZAI

that in some cases, administrations have not submitted proposals on a given band in a given region. Whether this is to indicate support for the current allocations is not known; regardless in cases where no proposals affecting the Amateur services were tendered, the acronym NOP (i.e., no proposal) will be associated with the abbreviation for the appropriate administration.

Finally, note that the various administration proposals presented here are compared (with few exceptions) with current ITU, ARTICLE 5 allocations for the Amateur and Amateur-Satellite services. Using these comparisons, it is often possible to determine whether a consensus of opinion exists on, for example, the creation of, or the expansion of, a given band.

With the above as background, we now present the band-by-band summaries of administration proposals to the ITU in the matter of ARTICLE 5, the Table of Frequency Allocations.

160-200 kHz.

ARTICLE 5 currently shows the following allocations in this segment of the spectrum:

Region 1: BROADCASTING* (Exclusive; 160-225 kHz.)

Region 2: FIXED (Exclusive)

Region 3: FIXED and *Aeronautical Radiolocation***

Only two administrations (PNG and TRD) proposed allocations to the

* Primary allocations are identified by using all capital letters

**Secondary allocations are identified by using italics.

NB - The primary service shall have prior choice of frequencies.

Stations of a secondary service:

a. shall not cause harmful interference to stations of a primary service to which frequencies are already assigned or to which frequencies may be assigned at a later date;

b. cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date.

Amateur service in this band. These allocations were for 190-200 kHz. in Region 3 (PNG) and for 160-200 kHz. in Region 2 (TRD). While an allocation to Amateurs in the low-frequency (LF) band was considered in an early Notice of Inquiry (NOI) prepared by the Federal Communications (FCC; an exclusive worldwide allocation was proposed in the band 160-190 kHz. in the third NOI (November 24, 1976)), the United States did not include such an allocation in its proposals to the ITU.

Given that 39 of our 41 countries did not propose an LF allocation to the Amateur service, it appears unlikely that such an allocation will result from the WARC deliberation.

1800-2000 kHz. (160 meters)

The proposals submitted by various administrations are summarized in table 2. Of the 41 administrations surveyed, 28 submitted proposals on the 160 meter band. Among other things, these proposals appear to support the creation of an exclusive Amateur band in Region 1, with 16 administrations proposing such an allocation; the size of the band proposed ranges from 20 kHz. to 200 kHz. Many of these same administrations also proposed allocating the same band segment proposed for Region 1 to the Amateur service in Regions 2 and 3, on an exclusive basis.

The creation of a 160 meter allocation in Region 1, and the creation of an exclusive worldwide 160-meter allocation, are definite "pluses." On the negative side, however, 16 administrations proposed cuts in the current 160-meter allocations ranging in size from 5 to 150 kHz. Many of the administrations proposing such cuts are the same ones which are proposing to create a worldwide, exclusive Amateur allocation.

Summary: There appears to be a consensus of thought among some administrations which supports the creation of an exclusive, worldwide Amateur allocation in the 160-meter band; the "price" for such an allocation, however, would appear to be the loss of a portion of the band which is

now available to Amateurs in Regions 2 and 3.

3500-4000 kHz. (80/75 Meters)

Administration proposals for the 80 and 75 meter bands are summarized in table 3. Of the 41 administrations submitting proposals to the ITU, 25 made specific proposals on allocations in the band 3500 to 4000 kHz. Only 10 administrations favored the present allocations. On the other hand, 14 administrations proposed reductions in the size of the Amateur allocations. These reductions ranged in size from 50 to 300 kHz., and would generally affect the upper end of the band. More specifically, nine administrations proposed to allocate the top 50 to 100 kHz. of the 75 meter band to the Broadcasting services, on an exclusive basis.

Summary: The subject of allocations in the 80 and 75 meter bands may be contentious at the WARC, with some administrations favoring reallocation of a portion of the band to the Broadcasting service. Whether a portion of the band will be allocated to the Amateur service on an exclusive, worldwide basis (as is proposed by five administrations) remains a possibility.

7000-7300 kHz. (40 meters)

Twenty-three administrations submitted proposals affecting Amateur allocations in the 40-meter band (see table 4). Of these, 17 administrations (including the United States) proposed reductions of between 50 and 200 kHz. in the Region 2, Amateur allocation, with the frequencies to be vacated by the Amateurs then reallocated to the Broadcasting service on an exclusive basis. Only four administrations proposed new Amateur allocations between 6900 and 6950 kHz. and 7000 kHz.

Summary: The issue of Amateur allocations in the 7 MHz. band will be one of the most contentious issues, if not *the* most contentious issue, at the WARC which will involve the Amateur services. The proposals submitted to date suggest that a portion of the band may be reallocated to the Broadcasting service on an exclusive basis. Little support exists for expanding the worldwide exclusive AMATEUR and AMATEUR-SATELLITE allocation in the 7000-7100 kHz. band.

10000-10300 kHz. (30 meters)

Fifteen administrations submitted allocation proposals which directly or indirectly affect the Amateur and Amateur-Satellite services (see table 5). Of these, 11 proposed either a

TABLE 3

REVIEW OF WARC PROPOSALS		3500-4000 kHz (80/75 meters)	
BAND SEGMENT (kHz)	COUNTRY	DIFFERENCE FROM ITU (kHz)	REMARKS
3500-4000	ITU	-	In Region 1: 3500-3800 kHz AMATEUR FIXED MOBILE except aeronautical mobile In Region 2: 3500-4000 kHz AMATEUR FIXED MOBILE except aeronautical mobile (R) In Region 3: 3500-3900 kHz AMATEUR FIXED MOBILE
3500-4000	AFS	0	
3500-3750	ARG	0	
3750-3900	ARG	-150	
3900-4000	ARG	-100	
3500-3900	ARS	0	
3900-4000	ARS	-100 in Region 2	Note proposed loss of 100 kHz in Region 2 (to BROADCASTING)
3500-3520	AUT	20	In Region 1, the proposed allocation is to AMATEUR (Exclusive)
3520-3800	AUT	0	
3800-3900	AUT	-	NOP
3900-4000	AUT	-	NOP
3500-3900	BHR UAE IRQ KWT OMA QAT	-	NOP
3900-4000		-100 in Region 2	Note proposed loss of 100 kHz in Region 2 (to BROADCASTING)
3500-3800	CAN	0	It is proposed to allocate the band to AMATEUR (Exclusive), worldwide
3800-3900	CAN	0	In Region 2, it is proposed to make the allocation AMATEUR (Exclusive)
3900-4000	CAN	-100 in Region 2	Note the loss of 100 kHz in Region 2 (to BROADCASTING)
3500-4000	D	0	
3500-3615	G	-115 worldwide	
3615-3700	G	0	The proposed allocation is to AMATEUR (Exclusive) worldwide
3700-3800	G	0	The proposed allocation is to <i>Amateur</i> , worldwide
3800-3900	G	0	
3900-4000	G	0	
3500-3520	HOL	0	Upgrade AMATEUR to Exclusive in Region 1; no change in Regions 2 and 3
3520-3600	HOL	0	
3600-3800	HOL	0	
3800-3900	HOL		
3900-3950	HOL		NOP
3950-4000	HOL	-50 in Region 2	
3500-4000	MWI	0	
3500-3800	NZL	0	The proposed allocation is to AMATEUR (Exclusive), worldwide
3800-3900	NZL	0	
3900-4000	NZL	0	
3500-3700	PNG	0	<i>Amateur</i> proposed worldwide from 3500 to 3600 kHz AMATEUR (Exclusive) proposed worldwide from 3600 to 3700 kHz
3700-4000	PNG	-100 in Region 1 -300 in Region 2 -200 in Region 3	
3500-4000	S	0	It is proposed to add AMATEUR-SATELLITE in the band 3500-3525 kHz, in Region 1 only.
3500-3900	SLV	0	
3900-3950	SLV	0	
3950-4000	SLV	-50 in Region 2	Note proposed loss of 50 kHz in Region 2 (to BROADCASTING)
3500-3615	SNG	-115 worldwide	
3615-3800	SNG	0	
3800-3900	SNG	0	
3900-4000	SNG	0	
3500-4000	SUI	-	
3500-4000	TRD	0	In Region 2, it is proposed to make the allocation AMATEUR (Exclusive); no change proposed in Region 3 (3500-3900 kHz); NOP in Region 1
3500-3800	USA	0	
3800-3900	USA	0	It is proposed to make the allocation AMATEUR (Exclusive) in Region 2.
3900-4000	USA	0	
3500-4000	YUG	0	
3500-4000	ZMB	0	

NOP: BEL, BOK, CHN, DDR, E, INS, KOR, MLA, PAK, POL, ROU, TCH, THA, TUR, URS and ZAI

worldwide, exclusive allocation to the Amateur service or a worldwide allocation to the Amateur and Amateur-Satellite services (Primary, co-equal). The proposed bands are from 95 to 600 kHz. in size, with a lower band edge of 10100 kHz. favored.

Summary: Unified support for a worldwide Amateur allocation at 10 MHz. is evidenced by 11 administrators. Whether this support can be translated into an actual allocation at the WARC, however, remains uncertain at this time.

14000-14350 kHz. (20 meters)

Eleven administrations submitted allocation proposals which address the 20 meter band (see table 6). In all but one case (TRD), the proposed allocations are virtually identical to the present allocations. One problem which looms on the horizon, however, is the U.S.S.R.'s proposal to add FIXED (world-wide) in the band 14250-14350 kHz. Countering this proposal, however, is a proposal submitted by the Federal Republic of Germany which would delete a footnote in the Radio Regulations (Footnote 218) which now permits the U.S.S.R. to operate FIXED systems in this band segment.

Summary: Based on initial proposals to the ITU, there is reason to believe that current allocations to the Amateur and Amateur-Satellite services in the 20 meter band will be retained by the WARC.

18000-18500 kHz. (17 meters)

As seen in table 7, twelve administrations submitted allocation proposals which directly or indirectly affect the Amateur services. Only eight of these administrations, however, proposed that an allocation be made to the Amateur or Amateur-Satellite services in this band; the proposed allocation was between 100 and 500 kHz. in size.

Summary: A modicum of support exists for the creation of an allocation to the Amateur services at 18 MHz. Support, however, is not as great as that evidenced for an allocation at 10 MHz.

21000-21450 kHz. (15 meters)

The proposals submitted by various administrations are summarized in table 8. Of the 41 administrations surveyed, 17 submitted proposals which affect the Amateur and Amateur-Satellite services. In these 17 cases, the proposed allocations are virtually identical to the existing allocations. Some support is evidenced for an Amateur allocation in the band 20950-21000 kHz., though such

support is by no means strong (four administrations).

Summary: Based on initial proposals to the ITU, there is a reason to believe that current allocations to the Amateur and Amateur-Satellite services in the 15 meter band will be retained by the WARC. There is also a possibility that the lower band edge will be extended to 20950 kHz, though support for such an allocation is not strong.

25110-25600 kHz. (12 meters)

The proposals submitted by various administrations are given in table 9. As seen, 19 administrations addressed the question of allocations in the 12 meter band in the proposals, though only eight proposed that an allocation be made to the Amateur services. Further, there was little agreement between the five proposals as to the size of the band and to its location in the radio spectrum.

Summary: Little support exists at this time for the creation of a new Amateur band around 24 or 25 MHz.

28.00-29.70 MHz. (10 meters)

Of the 41 administrations submitting proposals to the ITU, only six addressed the question of 10 meter Amateur allocations (the remaining administrations stated no positions). In the case of the six, the proposals which were submitted supported the existing allocation to the Amateur and Amateur-Satellite services*.

Summary: There is no reason to believe, at this time, that the existing allocation to the Amateur services in the 10 meter band will be changed.

50.00-54.00 MHz. (6 meters)

This band, which is allocated to the Amateur (terrestrial) service on an exclusive basis in Regions 2 and 3**, was addressed in the WARC proposals of 17 administrations. In all but one of these proposals, no changes were proposed to the current allocations*.

Summary: It seems likely that the current allocation in Regions 2 and 3 will remain unchanged.

144.00-148.00 MHz. (2 meters)

Table 10 summarizes the proposals submitted by 15 administrations to the ITU. As is seen, nine administrations favor retention of the existing

*CHN proposed adding *Mobile*, worldwide, in the band 28.00-29.70 MHz.

**There is no 6 meter allocation to Amateurs in Region 1.

TABLE 4
REVIEW OF WARC PROPOSALS
7000-7300 kHz (40 meters)

BAND SEGMENT (kHz)	COUNTRY	DIFFERENCE FROM ITU (kHz)	REMARKS
7000-7300	ITU	-	Worldwide: 7000-7100 kHz AMATEUR } Primary, AMATEUR-SATELLITE } Co-Equal In Region 2, only: 7100-7300 kHz AMATEUR (Exclusive)
7000-7100	AFS	-	NOP
7100-7300	AFS	0	
7000-7100	ARG	-	NOP
7100-7250	ARG	+150 in Regions 1 and 3	It is proposed to make this allocation AMATEUR (Exclusive), worldwide
7250-7300	ARG	-50 in Region 2	Note proposed loss of 50 kHz in Region 2 (to BROADCASTING)
7000-7100	ARS	0	
7100-7300	ARS	-200 in Region 2	Note proposed loss of 200 kHz in Region 2 (to BROADCASTING)
7000-7100	AUT	-	NOP
7100-7300	AUT	-200 in Region 2	Note proposed loss of 200 kHz in Region 2 (to BROADCASTING)
7000-7100	[BHR, UAE, IRQ]	-	NOP
7100-7300	[KWT, OMA, QAT]	-200 in Region 2	Note proposed loss of 200 kHz in Region 2 (to BROADCASTING)
6900-7000	CAN	+100	It is proposed to allocate the band worldwide to AMATEUR and AMATEUR-SATELLITE (Primary, co-equal)
7000-7100	CAN	0	
7100-7300	CAN	-200 in Region 2	Note loss of 200 kHz in Region 2 (To BROADCASTING)
7000-7100	D	-	NOP
7100-7300	D	-200 in Region 2	Note proposed loss of 200 kHz in Region 2 (to BROADCASTING)
7000-7100	G	0	
7100-7300	G	-200 in Region 2	Note proposed loss of 200 kHz in Region 2 (to BROADCASTING)
6900-7000	HOL	+100	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal) worldwide
7000-7100	HOL	0	
7100-7300	HOL	-200 in Region 2	Note proposed loss of 200 kHz in Region 2 (to BROADCASTING)
7000-7100	NZL	0	
7100-7300	NZL	-200 in Region 2	Note proposed loss of 200 kHz in Region 2 (to BROADCASTING)
7000-7100	PNG	0	
7100-7250	PNG	+150 in Region 3	In Region 3 only, it is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal)
7250-7300	PNG	-50 in Region 2	Note proposed loss of 50 kHz in Region 2 (to BROADCASTING)
7000-7300	S	0	
6950-7000	SLV	+50 in Regions 2 and 3	No change in Region 1 is proposed
7000-7100	SLV	0	
7100-7300	SLV	-	NOP
7000-7100	SUI	0	
7100-7300	SUI	-	NOP
6800-7000	TRD	+200	It is proposed to allocate the band worldwide to AMATEUR and AMATEUR-SATELLITE (Primary, co-equal)
7000-7100	TRD	0	
7100-7300	TRD	0	
6950-7000	USA	+50	It is proposed worldwide to add: AMATEUR } Primary, AMATEUR-SATELLITE } Co-equal
7000-7100	USA	0	
7100-7250	USA	+150 in Regions 1 and 3	It is proposed that this allocation be made AMATEUR (Exclusive) worldwide
7250-7300	USA	-50 in Region 2	Note proposed loss of 50 kHz in Region 2 (to BROADCASTING)
7000-7300	YUG	0	
7000-7100	ZMB	0	
7100-7300	ZMB	-200 in Region 2	Note proposed loss of 200 kHz in Region 2 (to BROADCASTING)

NOP: BEL, BOT, CHN, DDR, E, INS, KOR, MLA, MWI, PAK, POL, ROU, SNG, TCH, THA, TUR, URS and ZAI

TABLE 5

REVIEW OF WARC PROPOSALS
10000-10300 kHz (30 meters)

BAND SEGMENT (kHz)	COUNTRY	DIFFERENCE FROM ITU (kHz)	REMARKS
10000-10300	ITU	-	Worldwide: 10100-11175 kHz FIXED (Exclusive)
-	ARG	0	
10100-10200	BOT	+100	It is proposed to add to AMATEUR (Exclusive), worldwide
10100-10300	CAN	+200	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal), worldwide
10100-10300	CHN	0	
10100-10200	G	+100	It is proposed to add AMATEUR (Exclusive) worldwide
10100-10200	HOL	+100	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal) worldwide
10100-10200	NZL	+100	It is proposed to add AMATEUR (Exclusive) worldwide
10100-10300	PNG	+200	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal) worldwide
10005-10100	S	+95	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal) worldwide
10100-10300	SLV	+200 in Region 2 only	Proposed allocation is to AMATEUR (Exclusive)
10100-10200	SNG	+100	It is proposed to add AMATEUR (Exclusive) worldwide
10100-10600	TRD	+600	It is proposed to add AMATEUR (Exclusive) worldwide
10100	USA	+100	It is proposed to add AMATEUR (Exclusive) worldwide
-	YUG	0	
-	ZMB	0	

NOP: AFS, ARS, AUT, BEL, BHR, D, DDR, E, INS, IRQ, KOR, KWT, MLA, MWI, OMA, PAK, POL, QAT, ROU, SUI, TCH, THA, TUR, UAE, URS and ZAI

allocations (with some variations, however; the Republic of Singapore, for example, proposes to downgrade the AMATEUR (Primary) allocation in the band 146-148 MHz. to Secondary

status). Two administrations, however, propose to reduce the size of the band by 2 MHz. (see table 10 for details).

Summary: From data available at

TABLE 6

REVIEW OF WARC PROPOSALS
14000-14350 kHz (20 meters)

BAND SEGMENT (kHz)	COUNTRY	DIFFERENCE FROM ITU (kHz)	REMARKS
14000-14300	ITU	-	Worldwide: 14000-14250 AMATEUR AMATEUR-SATELLITE } Primary, Co-Equal 14250-14350 AMATEUR (Exclusive)
14000-14350	ARG	0	
14000-14350	ARS	0	
14000-14250	D	-	NOP
14250-14350	D	0	The Federal Republic of Germany proposes to delete Footnote 218, which now permits the U.S.S.R. to operate FIXED systems in this band segment.
14000-14350	G	0	
14000-14350	HOL	0	
14000-14350	NZL	0	
14000-14350	S	0	It is proposed to add AMATEUR-SATELLITE, worldwide
14000-14250	SUI	0	NOP
14250-14350	SUI	-	
14000-14350	TRD	0	
14350-14500	TRD	+150	It is proposed to add AMATEUR (Exclusive), worldwide
14000-14250	URS	-	NOP
14250-14350	URS	0	It is proposed to add FIXED worldwide
14000-14350	USA	0	
14000-14350	YUG	0	

NOP: AFS, AUT, BEL, BHR, BOT, CAN, CHN, DDR, E, INS, IRQ, KOR, KWT, MLA, MWI, OMA, PAK, PNG, POL, QAT, ROU, SLV, SNG, TCH, THA, TUR, UAE, ZAI and ZMB

this time, it appears to be possible that Amateur allocations in this band will not be changed at the WARC.

220.00-225.00 MHz.

Twenty-four administrations addressed the question of allocations in the 200 MHz. band, though all of these administrations did not address allocations in all three ITU regions. Regardless, with few exceptions, the proposals submitted support retention of the current allocations**. There was no support given to the U.S. proposal to downgrade the AMATEUR allocation in Region 2 to Secondary status, with the Maritime Mobile service to be given Primary status (though Canada did propose a Maritime Mobile allocation in the band 216-220 MHz).

Summary: At this time, it appears unlikely that the Amateur allocation in the 220 MHz. band (Region 2, only) will be changed.

420.00-450.00 MHz.

Twenty-three countries addressed the question of Amateur allocations in the 420 MHz. band (see table 11). Of these, only twelve submitted proposals identical to the existing allocations while the remaining proposals, in one way or another, proposed changes to the band. In seven cases (Argentina, Austria, the Kingdom of the Netherlands, New Zealand, Papua, New Guinea, Sweden and the Republic of El Salvador), administrations proposed reductions in the current allocations ranging in size from 2 to 10 MHz.

Summary: Amateur allocations in the 420 MHz band will be a contentious issue at the WARC. The possibility exists that allocations to the Amateur services will be reduced.

Conclusions

With proposals available from only 41 to 154 administrations, it is too early to state with certainty what the outcome of the WARC will be vis-a-vis the Amateur (terrestrial) and Amateur-Satellite services. A preliminary analysis of the available proposals, however, does provide, in some cases, what may loosely be termed "a sense of the WARC". More specifically, the following tentative conclusions are drawn from the results presented above:

*One administration, Malaysia, proposes to add FIXED and MOBILE to the band 50.00-54.00 MHz in Region 3.
**Currently, the band 220-225 is allocated to the AMATEUR and RADIOLOCATION services. No. 220 MHz Amateur allocations exist in Region 1 and 3.

TABLE 7

REVIEW OF WARC PROPOSALS
18000-18500 kHz (17 meters)

BAND SEGMENT (kHz)	COUNTRY	DIFFERENCE FROM ITU (kHz)	REMARKS
18068-18990	ITU	-	Worldwide: FIXED (Exclusive)
18068-18168	ARG	+100	It is proposed to add AMATEUR (Exclusive) worldwide
18568-18768	BOT	+200 in Region 1	In Region 1, it is proposed to add AMATEUR (Exclusive); NOP in Regions 2 and 3
18568-18768	G	+200	It is proposed to add AMATEUR (Exclusive) worldwide
18068-18168	NZL	+100	Worldwide, it is proposed to add: AMATEUR } Primary, AMATEUR-SATELLITE } Co-Equal
18300-18500	PNG	+200	
18068-18168	S	+100	
-	SNG	0	
18100-18600	TRD	+500	It is proposed to add AMATEUR (Exclusive), worldwide
-	URS	0	
18068-18168	USA	+100	It is proposed to add AMATEUR (Exclusive) worldwide
-	YUG	0	
-	ZMB	0	

NOP: AFS, ARS, AUT, BEL, BHR, CAN, CHN, D, DDR, E, HOL, INS, IRQ, KOR, KWT, MLA, MWI, OMA, PAK, POL, QAT, ROU, SLV, SUI, TCH, THA, TUR, UAE and ZAI

1. There is virtually no support for an Amateur LF allocation;
2. Allocations to the Amateur services in the 1.6, 3.5, 7.0 and 420 MHz. bands will be contentious issues at the WARC. In particular, the possibility exists for a significant portion of the 7.0 MHz. band to be reallocated to the Broadcast service.

3. At this time it appears that the Amateur allocations in the 14, 21, 28, 50, 144 and 220 MHz. bands will remain about the same as they are today.

4. Some support exists for the creation of a new Amateur band at 10 MHz; support for new allocations at 18 and 24 or 25 MHz. is not as strong as that for a band at 10 MHz.

TABLE 8

REVIEW OF WARC PROPOSALS
21000-21450 kHz (15 meters)

BAND SEGMENT (kHz)	COUNTRY	DIFFERENT FROM ITU (kHz)	REMARKS
21000-21450	ITU	-	Worldwide: AMATEUR } Primary AMATEUR-SATELLITE } Co-Equal
20950-21000	ARG	+50	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, Co-equal) worldwide
21000-21450	ARG	0	
21000-21450	ARS	0	
21000-21450	BHR UAE IRQ KWT OMA QAT	0	
21000-21450	G	0	
21000-21450	HOL	0	
20950-21000	NZL	+50	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal) worldwide
21000-21450	S	0	
20950-21000	SLV	+50 in Region 2 only	The proposed allocation is to AMATEUR (Exclusive)
21000-21450	SLV	0	
21000-21450	TRD	0	It is proposed to allocate this band to AMATEUR and AMATEUR-SATELLITE (Primary, co-equal), worldwide
21450-21500	TRD	+50	
20950-21000	USA	+50	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal) worldwide
21000-21450	USA	0	
21000-21450	YUG	0	
21000-21450	ZMB	0	

NOP: AFS, AUT, BEL, BOT, CAN, CHN, D, DDR, E, INS, KOR, MLA, MWI, PAK, PNG, POL, ROU, SNG, SUI, TCH, THA, TUR, URS and ZAI

It's New.
It's for 2-meters.
It's the Best.
It's the Boomer.



A-3219 BOOMER
Cushcraft CORPORATION
THE ANTENNA COMPANY

And we have it.

C. Comm
6115-15th N.W.
Seattle, WA 98107
TOLL FREE
1-800-426-7741
in WASH. 206-784-7337

SST T-4 ULTRA TUNER DELUXE



ULTRA TUNER DELUXE Matches any antenna—coax fed or random wire on all bands (160-10 meters). Tune out the SWR on your antenna for more efficient operation of any rig. Home, mobile, portable—only 9" x 2 1/2" x 5" • 300 watt RF output capability • SWR meter with 2-color scale • Antenna Switch selects between two coax fed antennas, random wire, or tuner bypass • Efficient Airwound inductor • 208 pf. 1000V. Capacitors • Attractive bronze finished enclosure.

only \$64.95

SST T-2 ULTRA TUNER

Tunes out SWR on any antenna—coax fed or random wire (160-10 meters). Any rig—up to 200 watts RF output. Rugged, yet compact: 5 1/4" x 2 1/4" x 2 1/4".



only \$37.95

SST T-3 MOBILE IMPEDANCE TRANSFORMER

Matches 52 ohm coax to the lower impedance of a mobile whip. Taps between 3 and 50 ohms. 3-30 MHz. 300 watts output. 2 3/4" x 2" x 2 1/4".



only \$19.95

SST T-1 RANDOM WIRE ANTENNA TUNER

All bands (160-10 m.) with any wire • 200W output • Any transceiver • Home or portable • Neon tune-up indicator.



only \$29.95

SST DL-1 K3RLJ DUMMY LOAD. 1000W PEP 1.5:1 1-225 MHz. Sealed. 3-1/8" x 4-3/8".

only \$17.95

SST CL-1 24 HR. CLOCK. Giant red LED numerals. Month and day also at push of button. Beautiful for your desk. 110VAC.

only \$22.95

SST B-1 BALUN for balanced lines. 300W.

only \$5.00

Call (213) 376-5887 to order C.O.D., VISA, or Master Charge.

To Order:

Send a check or money order—or use your M.C. or VISA. Add \$8 shipping and handling. Calif. residents, add sales tax.

Guarantee: All SST products are unconditionally guaranteed for 1 year. In addition, they may be returned within 10 days for a full refund (less shipping) if you are not satisfied for any reason.

SST

ELECTRONICS

P.O. BOX 1 LAWDALE, CALIF.
90260 (213) 376-5887

CIRCLE 46 ON READER SERVICE CARD

TABLE 9
REVIEW OF WARC PROPOSALS
25110-25600 kHz (12 meters)

BAND SEGMENT (kHz)	COUNTRY	DIFFERENCE FROM ITU (kHz)	REMARKS
25110-25600	ITU	-	Worldwide: FIXED MOBILE except aeronautical mobile
-	ARS	0	
-	BHR UAE IRQ KWT OMA QAT	0	
24000-24300	BOT	+300	In Region 1, it is proposed to add AMATEUR (Exclusive); NOP in Regions 2 and 3
24000-24500	CAN	+500	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, Co-equal) worldwide
24000-24300	G	300	It is proposed to add AMATEUR (Exclusive) worldwide
-	HOL	0	
-	MLA	0	
24150-24350	NZL	+200	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal) worldwide
24500-24990	PNG	+490	It is proposed to add AMATEUR and AMATEUR-SATELLITE (Primary, co-equal) worldwide
-	SNG	0	
24000-24500	TRD	+500	It is proposed to add AMATEUR (Exclusive) worldwide
25100-25210	USA	+300	It is proposed to add AMATEUR (Exclusive) worldwide
-	YUG	0	
24000-24300	ZMB	+300	It is proposed to add AMATEUR (Exclusive), worldwide

NOP: AFS, ARG, AUT, BEL, CHN, D, DDR, E, INS, KOR, MWI, PAK, POL, ROU, S, SLV, SUI, TCH, THA, TUR, URS and ZAI

TABLE 10
REVIEW OF WARC PROPOSALS
144-148 MHz

BAND SEGMENT (MHz)	COUNTRY	DIFFERENCE FROM ITU (MHz)	REMARKS
144-148	ITU	-	Worldwide: 144-146 MHz AMATEUR AMATEUR-SATELLITE } Primary, 146-148 MHz } Co-Equal AMATEUR (Exclusive)
144-146	AUT	0	
146-148	AUT	-	NOP
144-146	CHN	0	
144-148	CHN	-	NOP
144-146	D	-	NOP
146-148	D	0	
144-148	G	0	
144-148	INS	0	In Region 3, it is proposed to add Fixed and Mobile in the band 146-148 MHz
144-146	KOR	-	NOP
146-148	KOR	-2	Note proposed loss of 2 MHz in Regions 2 and 3
144-148	MLA	0	
144-148	NZL	0	
144-146	PAK	-	NOP
146-148	PAK	0	
144-148	S	0	
144-148	SNG	0	It is proposed to downgrade AMATEUR to secondary status in the band 146-148 MHz in Regions 2 and 3.
144-146	THA	0	
146-148	THA	-2 in Region 3	In Region 3, it is proposed to delete AMATEUR
144-148	TRD	0	
144-148	USA	0	
144-148	YUG	0	

NOP: AFS, ARG, ARS, BEL, BHR, DDR, E, HOL, IRQ, KWT, MLA, OMA, PNG, POL, QAT, ROU, SLV, SUI, TCH, TUR, UAE, URS, ZAI and ZMB

TABLE 11
REVIEW OF WARC PROPOSALS
420-450 MHz

BAND SEGMENT (MHz)	COUNTRY	DIFFERENCE FROM ITU (MHz)	REMARKS
420-450	ITU	-	In Region 1, only: 430-440 MHz AMATEUR } Primary, AMATEUR-SATELLITE } Co-equal In Regions 2 and 3, only: 420-450 MHz RADIOLOCATION Amateur
420-430	ARG	-10 in Region 2 only	No change proposed in Region 3
430-440	ARG	0	In Regions 2 and 3 it is proposed to elevate Amateur to Primary (shared)
440-450	ARG	-10 in Region 2 only	No change proposed in Region 3
420-430	AUT	-	NOP
430-438	AUT	0	In Region 1, it is proposed to add AMATEUR-SATELLITE
438-440	AUT	-2 in Region 1	No changes proposed in Regions 2 and 3
440-450	AUT	0	
420-460	CAN	0 in Region 2	NOP in Regions 1 and 3
420-450	D	0	In Region 1, it is proposed to add AMATEUR-SATELLITE in the band 434-440 MHz
420-430	DDR	-	NOP
430-440	DDR	0	
440-450	DDR	-	NOP
420-450	G	0	
420-430	HOL	-	NOP
430-433	HOL	-3 in Region 1 only	No changes proposed in Regions 2 and 3
433-435	HOL	0	
435-438	HOL	0	In Region 1, it is proposed to add AMATEUR-SATELLITE
438-440	HOL	0	
440-450	HOL	-	NOP
420-450	INS	0	
420-450	KOR	0	
420-450	MLA	0	In Regions 2 and 3, it is proposed to elevate Amateur to Primary (shared)
420-430	NZL	-10 in Regions 2 and 3	In Regions 2 and 3 it is proposed to delete Amateur in the band 420-430 MHz
430-450	NZL	0	
420-430	PNG	-10 in Regions 2 and 3	In Regions 2 and 3, it is proposed to delete Amateur
430-440	PNG	0	In Regions 2 and 3, it is proposed to elevate Amateur to Primary, and to add AMATEUR-SATELLITE. Further, it is proposed to downgrade RADIOLOCATION to Secondary.
440-450	PNG	0	It is proposed to add FIXED and MOBILE in this band, and to delete RADIOLOCATION.
420-430	POL	-	NOP
430-440	POL	0	
440-450	POL	-	NOP
420-432	S	-2 in Region 1	In Region 1, it is proposed to add AMATEUR-SATELLITE
432-438	S	0	
438-450	S	-2 in Region 1	
420-430	SLV	-10 in Region 2	No change proposed in Region 3
430-440	SLV	0	
440-450	SLV	-10 in Region 2	No change proposed in Region 3
420-450	SNG	0	In Regions 2 and 3, it is proposed to add Fixed and Mobile except aeronautical mobile
420-430	SUI	-	NOP
430-440	SUI	0	
440-450	SUI	-	NOP
420-430	TCH	-	NOP
430-440	TCH	0	
445-450	TCH	-	NOP
420-450	THA	0	
420-450	TRD	0	In Regions 2 and 3, it is proposed to allocate this band to AMATEUR (Exclusive), NOP in Region 1
420-450	URS	0	
420-450	USA	0	
420-450	YUG	0	

NOP: AFS, ARS, BEL, BOT, CHN, BHR, E, IRQ, KWT, MWI, OMA, PAK, QAT, ROU, TUR, UAE, ZAI and ZMB

It's New. It's for 2-meters.

It's the Best.

It's the Boomer.



A-3219
BOOMER

Cushcraft
CORPORATION
THE ANTENNA COMPANY

And we have it.

**Communications
Center**
443 N. 48th
Lincoln, NE 68504
TOLL FREE 1-800-228-4097
in NE 402-466-8402

CIRCLE 9 ON READER SERVICE CARD

There's more out there than meets the eye (or ear). Join K2VJ on an excursion through the entire electromagnetic spectrum!

The Complete Electromagnetic Spectrum

BY VINCENT J. LUCIANI*, K2VJ

You've had your amateur radio ticket for a while now, and you've been having fun working skip on 10 meters, or DX on 20, rag chewing on 40, or traffic handling on 80. All this is fine; it's your reward for the hard work you put into getting your ticket. Eventually, though, you ought to round out your amateur radio horizons with a look at other parts of the spectrum, for an understanding of who else and what other services are out there. That's the purpose of this article, to give you a picture of the total spectrum; and we do mean, *total spectrum*.

I recall an incident from my early radio days that helped me to put it all together. It was a chart of the spectrum, laid out so that it gave me the picture I needed to firm up who and what was where. (There wasn't much going on then- 1944, compared to now.)

With that recollection in mind, I have prepared the chart shown, titled, *The Complete Electromagnetic Spectrum*.

Notice, I have taken the chart to a "frequency" difficult to define, infinity, as shown on the last band of the chart. More on that later.

There are eight bands in what is properly termed the radio spectrum, and then there is that last band that runs out to infinity to complete what is properly termed that "complete" electromagnetic spectrum. Accompanying photographs demonstrate the range of antenna structures in use at various parts of the radio spectrum.

*RD1, P.O. Box 111H, Egg Harbor City NJ 08215

Obviously, the chart is not intended to be a precise definition of frequency assignments, nor does it include all services. It is more a general picture of services and is designed to tie in the relative position of common services; the amateur bands, AM, FM, TV, and even CB.

If you want more specific information, however, I suggest you get the Government Printing Office color-coded, 3½ X 4½-foot wall chart that might make an interesting conversation piece on the shack wall. Write to: Supt. of Documents: US GPO; Washington, DC 20402. Ask for the United States Frequency Allocation Chart, Stock No. 003-000-00469-4.

It is priced at \$1.35.

My chart or their chart, or both; one picture is worth kilowords.

Very Low Frequencies (VLF), 3 kHz - 30 kHz

The first band, v.l.f., starts at 3 kHz. So far, FCC doesn't say too much about what goes on at the low end, up to about 10 kHz. This is a difficult part of the spectrum to define because, as you can appreciate, these are basically audio frequencies.

Where does an audio frequency end and an r.f. frequency begin? Let's look at the answer to that from an applications standpoint. If you were to connect a 3 kHz ten kilowatt tone to an immensely large loudspeaker and radiated that signal, you might violate a few local ordinances, acquire a swarm of stray dogs, and maybe dodge a barrage from irate neighbors. But, all in all, FCC doesn't feature in that kind of "radiation."

But if you took the same 3 kHz signal and hooked it up to a long wire antenna (a half-wave at this frequency would wrap around the world, and then some), then you have a signal of a different sort; that would be r.f.

There are signals- r.f. signals- down in that "audio" band. Signals of the r.f. type at these very low frequencies do strange things quite unlike our experiences on h.f. They get into everything and through anything. Submarines use them for underwater communications, radio navigational systems such as *Omega* use them for reliable world-wide signal coverage; and GBR sits on 16 kHz mightily pounding out solid c.w. copy to what was once the far-flung British Empire.

A receiver on this band would be a fascinating addition to any amateur shack. Converters are simple enough to build, although different antennas are used.

(Before moving on to the next band, one frequency that comes in below the v.l.f. band deserves mention; the most popular frequency in the world- 60 Hz, the power line frequency. Aircraft and other services power equipment with 400 Hz frequency, so it comes in a close second. And below 60 Hz exactly 21,600 degrees of phase lower (a pun; 21,600 degrees is 60 cycles)- is the lowest frequency of all, the battery frequency.)

Low Frequencies (LF), 30 kHz - 300 kHz

Even the l.f. band begins at what some hi-fi devotees consider within their domain of frequency response:

30 kHz. There is a collection of various services on this band, mostly those of radio location devices (direction finding), maritime services (ship), and aeronautical (beacons). An interesting band, although not as much as its neighboring bands.

Medium Frequencies (MF), 300 kHz - 3 MHz

The m.f. band contains the service we are probably most familiar with, AM broadcast. I say "probable" because our introduction of TV as a baby sitter gives many a greater exposure there than on AM.

Below the broadcast band is that batch of frequencies I cut my radio teeth on, those freqs in the range of 400 kHz to 500 kHz. If you don't know, 500 kHz is the international ship calling and distress frequency. Traffic handling is QSY'd to a frequency below 500 kHz.

And from there, good old 160 meters comes on the scene as the first full amateur band. Above 160 are shortwave braodcasters, land mobile services and a few others mixed in. Ship-shore phone used to be up there until it was phased out in favor of v.h.f.

High Frequencies (HF), 3 MHz - 30 MHz

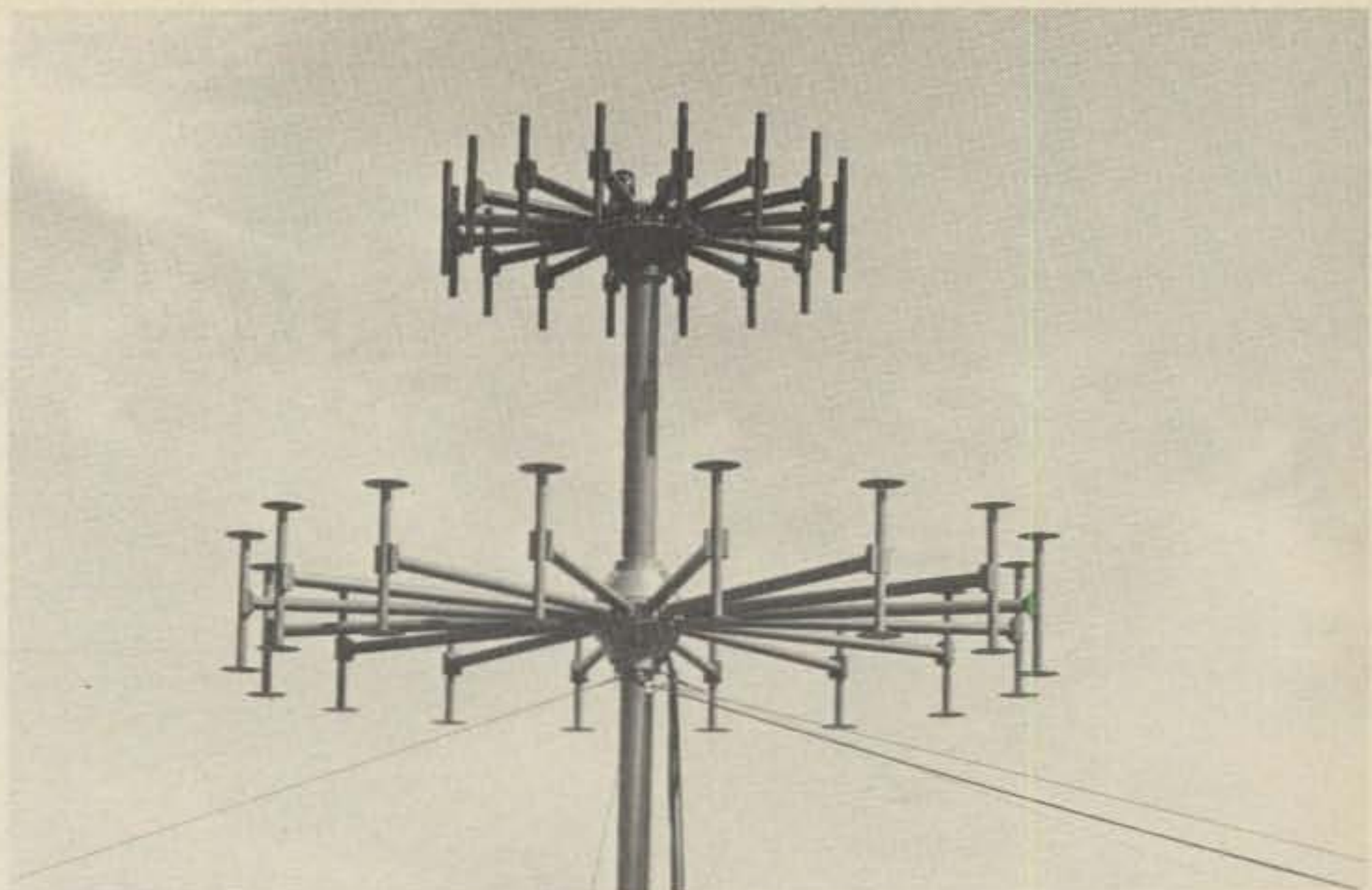
This is the workhorse band, the h.f. band. This is where all the action is; where everything and everyone gets into the act; the band that WARC 79 is really about.

Our chart shows not only the 80, 40, 20, 15, and 10-meter bands, it also includes the proposed 30, 17, and 13-meter bands. Of these three proposed bands, 30 meters has a lot to offer, should it ever become exclusively for amateur use. It would be a 24-hour band and it would provide solid DXing. The 17-meter band could also be a joy, but of a slightly different sort and not as good as 20 meters in general. The 13-meter band has less to offer.

Tucked away below 10 meters is that other band which, lately, has tended to serve as the minor league of amateur radio. I refer, of course, to the CB 11-meter band.

Very High Frequencies (VHF), 30 MHz - 300 MHz

On v.h.f. are the amateur bands that have offered entry to the technician who strains at copying code, the 6-meter band. Above that is the 2-meter band. Notice that the largest slice of the v.h.f. spectrum is cut out for the one-eyed monster, TV chan-



This u.h.f.-over-v.h.f. finding antenna array is used to automatically locate the direction of aircraft. The array elements are switched electronically to effectively rotate the directional pattern.

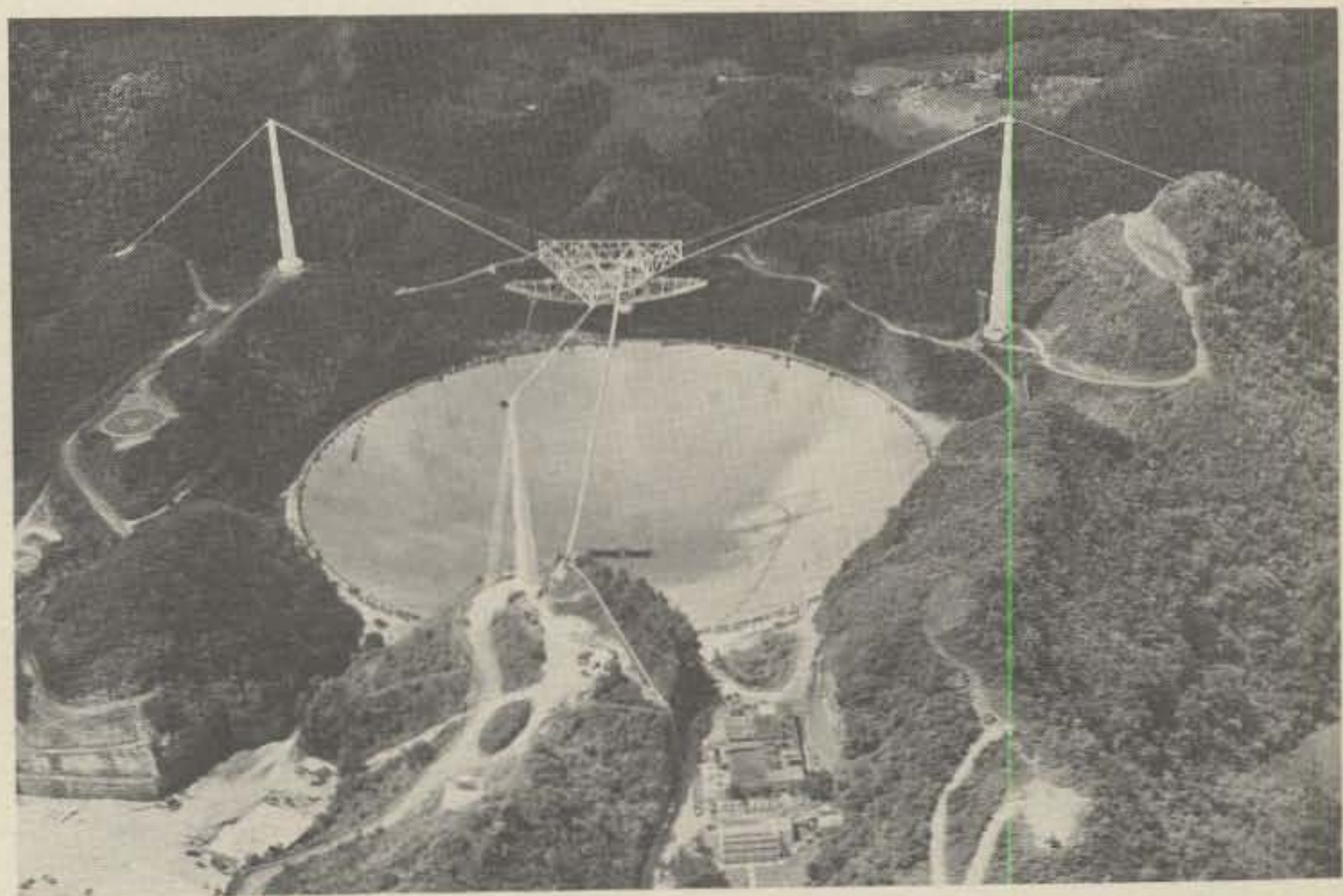
nels 2 through 13. And right in the middle of the TV band is the FM band.

(As an aside, let me point out how routinely you use a good cross-section of the spectrum every day.

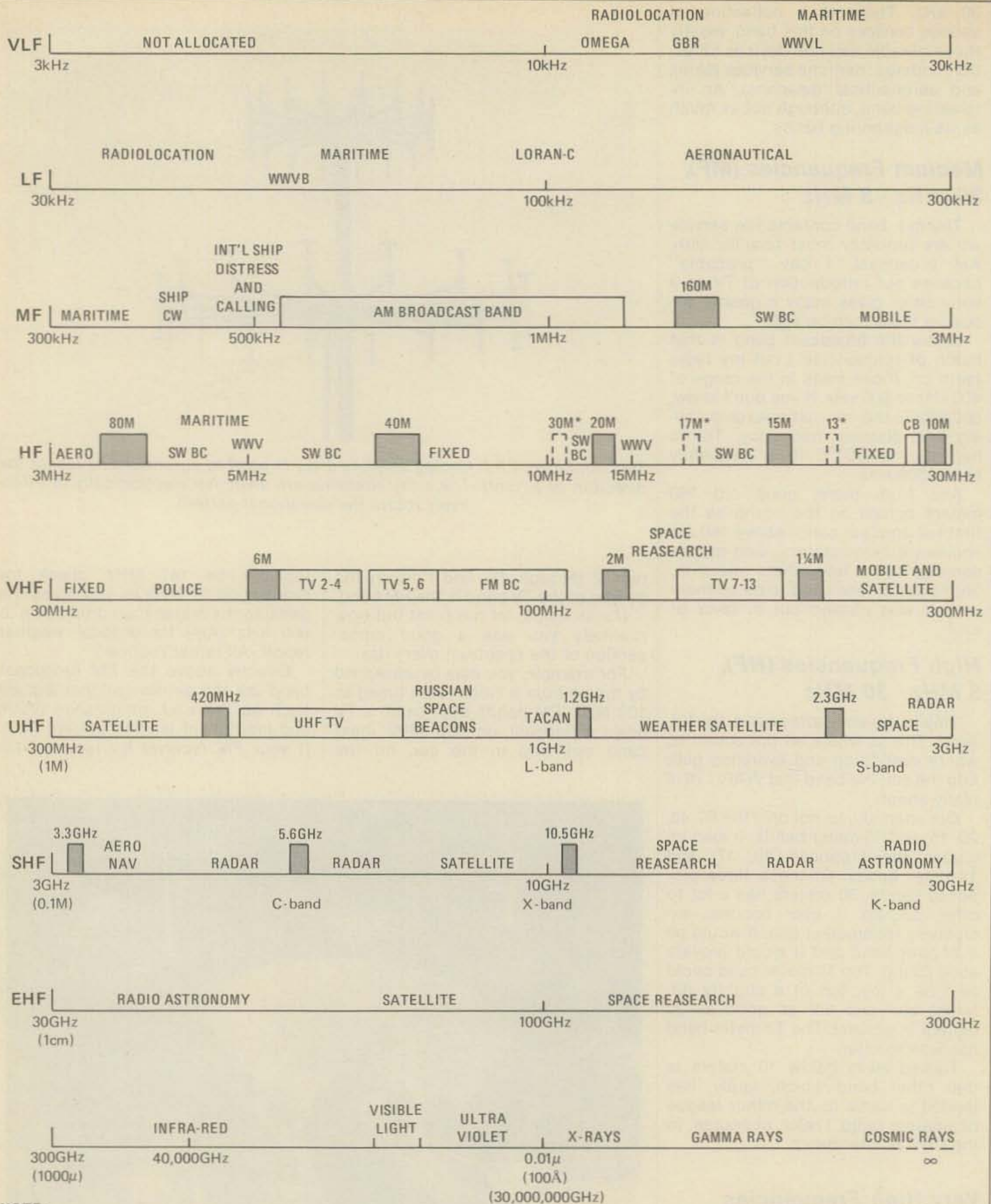
For example, you may be awakened by music from a clock radio tuned to 103 MHz (FM band); then catch a TV news broadcast on 490 MHz (next band up); hop in the car, hit the

repeater on 147 MHz; check for Smokey on 27 MHz as you press the pedal to the metal; then drop down to 960 kHz (AM) for a local weather report. All rather routine.)

Directly above the FM broadcast band are the air navigational signals such as the v.h.f. omni-range (VOR) and instrument landing system (ILS). If your FM receiver has some extra



Probably the most fascinating antenna system in the world, the radio telescope at Arecibo PR is used to explore the far reaches of the universe. Operated by Cornell University under contract with the National Science Foundation, the radio telescope is operated to receive only, or as a radar on frequencies from 5 MHz to 2.3 GHz. The spherical reflector is 1000 feet across, covers an area of 20 acres and results in a beamwidth of less than 0.04 degree in the S-band. Effective radiated power (e.r.p.) is 4,000,000 megawatts!



NOTE:

- Indicates amateur radio frequencies.
- * Proposed, WARC 79.

The complete electromagnetic spectrum. The range of frequencies varies from 3 kHz to those of cosmic waves. The bands of frequencies in the h.f. spectrum which are outlined with broken lines are those amateur bands proposed for WARC 79. See Theodore Cohen's article which begins on page 30 of this issue for a more detailed discussion of WARC 79 proposals.

range at the high end, tune for a birdie tone that will be regularly interrupted with a slow-speed cw identification. This will be a local VOR.

Ultra High Frequencies (UHF), 300 MHz - 3 GHz

Moving on up to the u.h.f. band, we convert 1,000 MHz to the symbol, G, for giga. Here, there are three more amateur bands alive, if you didn't know. There is also a swatch of frequencies for u.h.f. TV, and another band for air navigation.

Notice the space applications beginning to move in. Space research is probably one of the most prominent users of these frequencies, which is a mutually satisfactory arrangement because on earth we have DX problems due to inherent limitations in the u.h.f. band. But in space, the path is a straight line, point to point, to an earth receiving station, and very little power is needed to span tremendous distances. Look at what we got back from Jupiter. And you know that spacecraft's rig didn't sport any kW's.

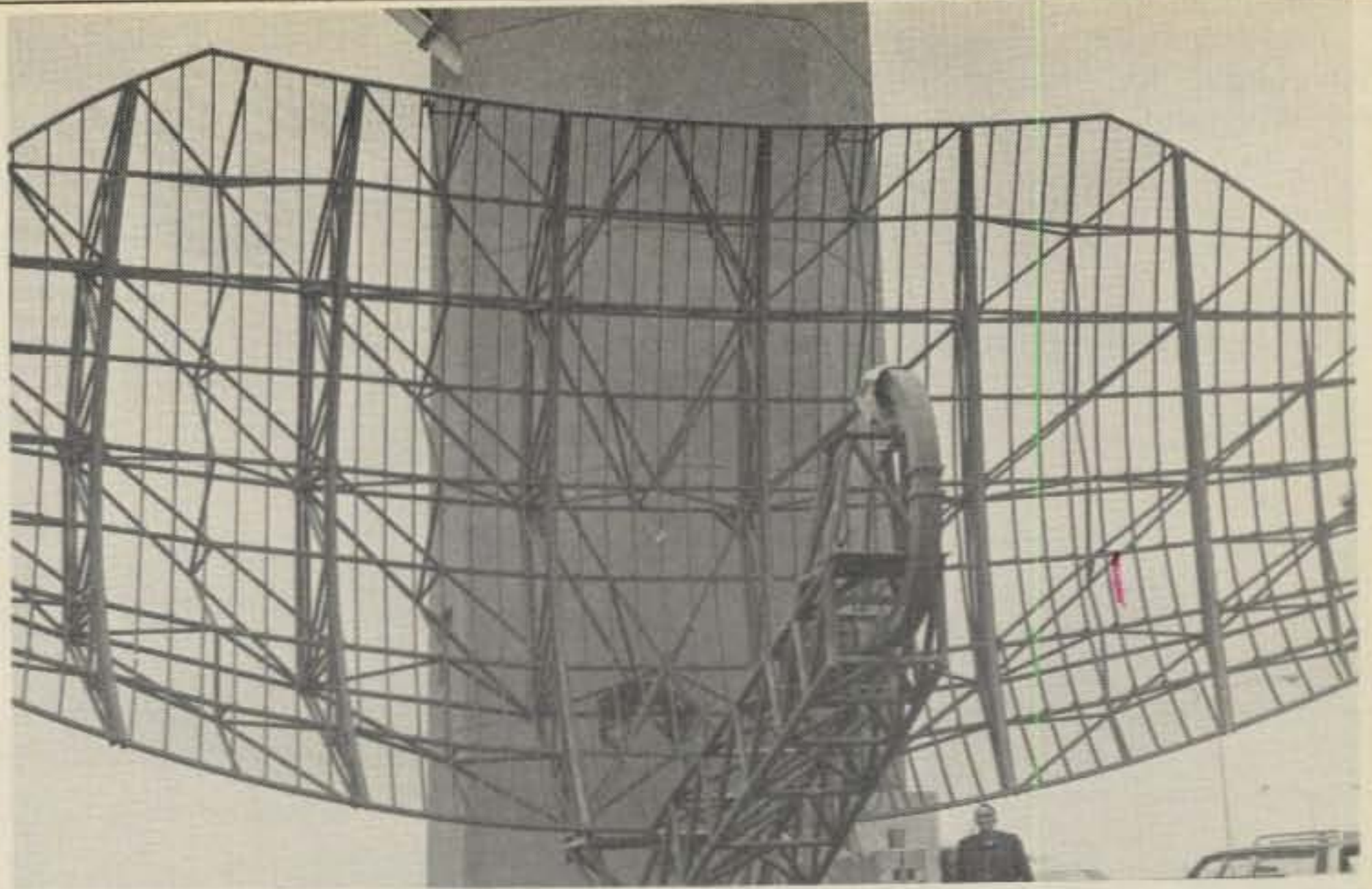
At u.h.f. and above, we are generally talking about enormous globs of frequencies. For example, the 420 MHz band, alone, is wider than the entire h.f. band. For this reason, we are in the habit of specifying spans of frequencies at u.h.f. and above as lettered bands. The more popular lettered bands are shown on the chart, starting with the L band at 1 GHz.

Super High Frequencies (SHF), 3 GHz - 30 GHz

In the s.h.f. band there are yet other allocations for the adventuresome amateur. Note these when next you think about frequency generation, for it's a different ballgame clear up here.

This is also the band where radar comes into its own; the C-, X-, and K-bands, although some long range radars use the lower L and S bands. Radar antennas are highly directional arrays, and they are practical only because of the small wavelengths involved- a half-wave at 30 GHz is about 1/4-inch in length. Each of these radar bands offers distinctive performance. Whereas on the h.f. band we don't worry about the effects of snow and rain on our signals, except for some leakage at the insulators, atmospheric conditions in K-band, for example, play a significant part because one snowflake gets to be an appreciable part of a wavelength. It is not at all unusual that a K-band radar with a normal range of 40 miles be limited to 10 miles during a rainstorm.

In addition to the varied space ser-



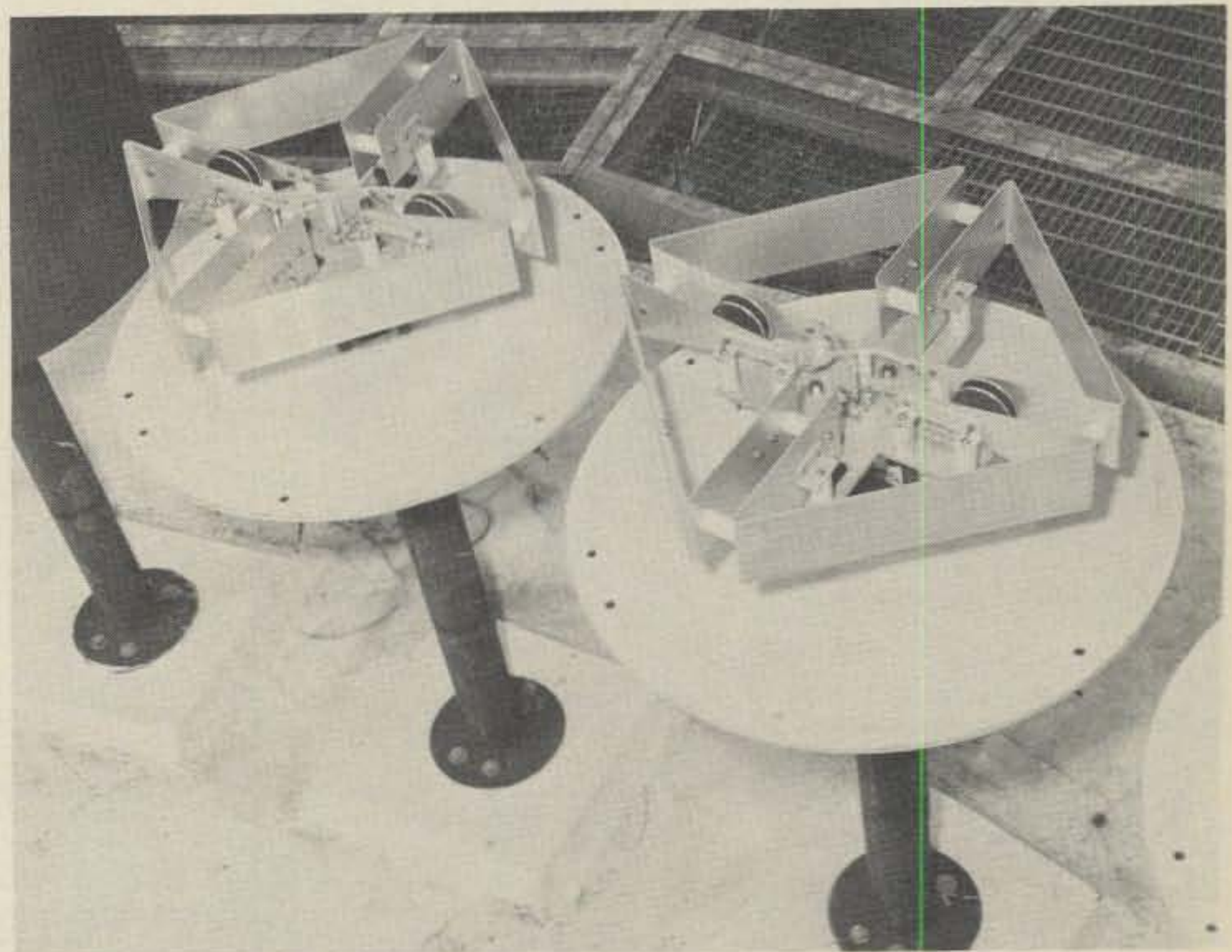
A u.h.f. L-band radar antenna for air surveillance prior to tower-top installation. This antenna reflector has a 50-foot spread which results in a beamwidth of 1.2 degrees and a gain of 34 dB.

vices it contains, s.h.f. is also used for radio astronomy.

Extremely High Frequencies (EHF), 30 GHz - 300 GHz

Finally, under the formally defined radio spectrum, comes the e.h.f. band. Ten times wider than the total

of all lower bands combined, one must wonder whether satellite techniques yet undeveloped might not one day make this band even more popular and more functional and more cluttered than the h.f. band. For the present, however, it is sparsely, mainly in space research and satellite applications.



These v.h.f. antennas are the Alford loops that are part of a Doppler VOR system. The Alford loop, second cousin to a quad, consists of a full-wave dipole which is crossed and folded back, end-to-end. The round capacitor plates shown are used to load the tapered transmission sections, improve impedance matching, and make it easier to reduce parasitic currents in the antennas from adjacent elements.

As the e.h.f. band ends at 300 GHz, we begin to acquire and require another unit to define wavelength.

Wavelength at 30 GHz is one centimeter; at 300 GHz it is 0.1 cm. If we are going to range out to the near-

infinite frequencies, a more appropriate unit of measure is needed; this unit is the micron (μ), which is one-millionth of a meter.

The micron is the unit shown on the bottom line in electromagnetic radiation. Even here, however, only part way through what we know of this last band, the micron becomes cumbersome and another unit, the Angstrom (\AA), is used. One Angstrom equals one ten-billionth of a meter.

Just in case you're interested, 100 Angstroms represents a frequency of 30,000,000 GHz. Now we're getting to where a speck of dust is a wavelength long.

Notice, on the chart, that visible light is listed. Light waves are electromagnetic radiations just as sure as is your 20-meter s.s.b. signal. And, like your s.s.b. signal, light has a collection of component frequencies. Let me divert here into a bit of physics to explain that.

As we apply increasing levels of heat to an object, we impart greater and greater energy to it; the object radiates energy at increasingly higher frequencies.

At the lower level of energy, it emits frequencies so low we cannot see them without a filter; these are the



Poised high above the terrain at Port Clarence AK, this 1350-foot top-loaded vertical is part of the North Pacific Loran-C chain operated by the U.S. Coast Guard. The 100 kHz transmitter puts out nearly a megawatt of power.

State of the art
TECHNICAL EXCELLENCE
in RTTY



The FSK-1000 Demodulator

If you operate a microcomputer, you can move into teleprinter communications to exchange software, pass message traffic and copy news wire services. The FSK-1000 no compromise circuit directly links your receiver and computer for landline copy over radio circuits.

Computer grade design and parts including 48 op. amps.

Continuously tunable shift from 100 to 1000 Hz.

Stops QRM with selectable 55 or 100 Hz. filters and two tone limiterless operation

Video operation available. We can install your Xitex SCT-100 board inside, too

Decision level correction circuits reduce selective fade

Write for details. Visa and Master Charge accepted

\$449.00

FOB Columbus, Ohio

IRL

700 Taylor Road
Columbus, Ohio 43230
(614) 864-2464

CIRCLE 32 ON READER SERVICE CARD

TELREX "Tri-Band" — \$415.00

ELECTRICAL

TB5EM

Gain in DB reference 1/2 wave dipole	8.5 dbd
Front to back ratio	28 db
V/S/W/R at resonant point	1.3/1
Maximum Power Input	4 KWP
Nominal Input Impedence	52 ohm
Beamwidth to 1/2 power input	60° 3 bands
Frequency range	10, 15, 20
Side Nulls	35 db

MECHANICAL

Number of Elements	Five
Alum. Boom: Dia. & Lgth. approx.	2.25"x18 ft.
Turning Radius approx.	20 ft.
Wind Load at 100 mph (approx.)	210 lbs.
Wind Area	7 sq. ft.
Longest Element	36 ft.
Net Weight (approx.)	49 lbs.
Shipping weight (domestic pack)	60 lbs.
Length of shipping carton	13 ft.

**MADISON
ELECTRONICS SUPPLY, INC.**

1508 McKINNEY • HOUSTON, TEXAS 77002
713/658-0268

W5GJ, W5MBB, K5AAD, N5JJ, AG5K, W5VVM, W5EGP,
WA5TGU, WB5AYF, K5BGB.

MASTERCHARGE • VISA

DLA!

CIRCLE 38 ON READER SERVICE CARD

infra-red rays.

Then, as the temperature of the object continues to rise, so does the radiated energy level and its emission frequency until soon we begin to see a flame in colors; first red, then, in order of ascending frequency (and energy), orange, yellow, green, blue, indigo, and violet. When we see a flame, obviously the object is radiating electromagnetic energy in the visible portion of the band.

As its temperature is further increased, it emits energy at the ultra-violet frequencies which, again, we cannot see without a filter. UV radiation is much more potent than visible or infra-red radiation, so watch out for that part of the flame you can't see.

Fortunately for we humans, the atmosphere does an excellent job of filtering out UV radiation from the sun, or we might long since have mutated into non-seeing creatures.

Continuing on the last band, we round out the upper limits of the spectrum with, in order, x-rays, gamma rays, and cosmic rays. The right end of the chart is shown in dashed lines because science has yet to define its upper limit. It may never do so.

These above rays are in the area where we get into what is called secondary emissions of exotic rays; emissions whose lifetimes are measured in micro-and nano-seconds. While the subject of primary and secondary rays is extremely fascinating, you are reminded they are still electromagnetic radiations bound, in large part, to the same basic set of laws that bind your 20-meter signal, or the transmissions from GBR, or those of a K-band radar.

That's it. If this description has succeeded in stirring your interest in the rest of the electromagnetic spectrum, then perhaps you could toy with a few far-out provocative notions dreamt up by an idle mind. For example... does the part of your signal that penetrates the ionosphere continue traveling, no matter how weakly, to the ends of the universe or, like cosmic rays, does it have a finite lifetime measureable in quantities beyond our earthly comprehension? Or... in the face of all theory, is wireless transmission here to stay or, however remove within our limited concepts, could it possible be a transient phenomenon?

Have fun tuning the spectrum. If you're limited to an amateur-band only transceiver, try tuning above and below band edges (without breaking the dial cord), or tuning the 500 kHz spread on your WWV crystal. This will give you a small sample of what else is on h.f., at least. [E]

ERC PROMISES UP TO THE MINUTE STATE-OF-THE-ART DESIGN AND PERFORMANCE WE'VE DONE IT FOR 1979

FOUR SIMULTANEOUS FILTERS IN ONE FOR UNPARALLELED QRM FREE RECEPTION (SSB & CW)
PLUS A SPECIAL PATENTED CW PROCESSOR

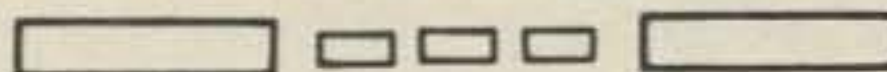


SL-56
AUDIO ACTIVE FILTER
(3.5 x 5.5 x 7.5 INCHES)

THE BRAND NEW SL-56 AUDIO ACTIVE FILTER SUPERCEDES OUR SL-55 IN BOTH CONCEPT AND PERFORMANCE. CONSOLIDATION OF MANY COMPONENTS HAS ALLOWED US TO MAKE 16 OPERATIONAL AMPLIFIERS (COMPARED TO 6 IN THE SL-55) INTO A FILTER GUARANTEED TO OUTPERFORM ANY OTHER AT A COST ONLY SLIGHTLY HIGHER THAN THE SL-55. THE FEATURES OF THE SL-56 ARE SO ADVANCED FROM ITS PREDECESSOR THAT CALLING IT THE SL-55A IS NOT JUSTIFIED. UNLIKE OTHER FILTERS THAT SIMPLY OFFER A CHOICE OF ONE OR TWO FILTER TYPES AT A TIME (NOTCH, BANDPASS, ETC.) SL-56 PROVIDES WHAT IS REALLY NEEDED --- THE SIMULTANEOUS ACTION OF A 6 POLE 200 Hz FIXED HIGH-PASS FILTER AND A 6 POLE 1600 Hz FIXED LOWPASS FILTER WITH A 60 dB NOTCH WHICH IS TUNABLE OVER THE 200-1600 Hz RANGE. THIS 3 FILTER COMBINATION IS UNBEATABLE FOR THE ULTIMATE IN QRM FREE SSB RECEPTION. ADJACENT CHANNEL QRM IS ELIMINATED ON THE HIGH AND LOW SIDES AT THE SAME TIME AND DOES NOT INTRODUCE ANY HOLLOWNESS TO THE DESIRED SIGNAL. ON CW THE SL-56 IS A DREAM. THE LOWPASS, HIGHPASS AND NOTCH FILTERS ARE ENGAGED ALONG WITH THE TUNABLE BANDPASS FILTER (400-1600 Hz) PROVIDING THE NEEDED ACTION OF 4 SIMULTANEOUS FILTER TYPES. THE BANDPASS MAY BE MADE AS NARROW AS 14 Hz (3dB). ADDITIONALLY, A SPECIAL PATENTED CIRCUIT FOLLOWS THE FILTER SECTIONS WHICH ALLOWS ONLY THE PEAKED SIGNAL TO "GATE ITSELF" THROUGH TO THE SPEAKER OR HEADPHONES (4-2000 OHMS). RECEIVER NOISE, RING AND OTHER SIGNALS ARE REJECTED. THIS IS NOT A REGENERATOR, BUT A MODERN NEW CONCEPT IN CW RECEPTION. THE SL-56 CONNECTS IN SERIES WITH THE RECEIVER SPEAKER OUTPUT AND DRIVES ANY SPEAKER OR HEADPHONES WITH ONE WATT OF AUDIO POWER. REQUIRES 115 VAC. EASILY CONVERTED TO 12 VDC OPERATION. COLLINS GRAY CABINET AND WRINKLE GRAY PANEL.

WARRANTED ONE YEAR FULLY RFI PROOF FULLY WIRED AND TESTED AVAILABLE NOW
\$75.00 POSTPAID IN THE USA AND CANADA. VIRGINIA RESIDENTS ADD 4% SALES TAX.

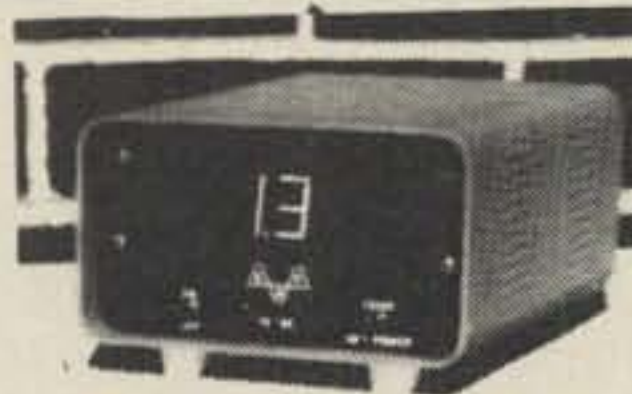
ATTN SL-55 OWNERS: THE CIRCUIT BOARD OF THE SL-56 IS COMPLETELY COMPATIBLE WITH THE SL-55 CHASSIS. OUR RETROFIT KIT IS AVAILABLE AT \$35.00 POSTPAID.



ERC INTRODUCES A BRAND NEW CONCEPT IN THE MEASUREMENT OF VSWR AND POWER ACCEPTED BY THE LOAD

REQUIRES 115 VAC AT LESS THAN 1/16 AMP.

COLLINS GRAY CABINET.
WRINKLE PANEL - BRIGHT
RED LED DIGITS (.33").
DECIMAL POINT IS THE
PILOT LIGHT.



TWO SO-239 COAX CONNECTORS ARE AT THE REAR PANEL.

DIMENSIONS 3.5 x 5.5 x 7.5 INCHES.

WEIGHT IS 2 POUNDS.

1.8-30 MHz

THE MODEL SL-65* (20-2000 WATTS) AND THE QRP MODEL SL-65A* (0.2-20 WATTS) DIGITALLY INDICATE ANTENNA VSWR UNDER ANY TRANSMISSION MODE -- SSB, CW, RTTY, AM Etc. THERE IS NO CALIBRATION REQUIRED AND NO CROSSED METER NEEDLES TO INTERPRET. SIMPLY LOOK AT THE READOUT AND THAT IS THE VSWR. SPEAKING NORMALLY INTO A SSB TRANSMITTER MIC, INSTANTLY CAUSES THE VSWR TO BE DISPLAYED THROUGHOUT YOUR ENTIRE TRANSMISSION. REVERSING THE POSITION OF A FRONT PANEL TOGGLE SWITCH AND THE DISPLAY INDICATES THE NET POWER (FORWARD LESS REFLECTED) THAT IS ACCEPTED BY THE ANTENNA. THE PEAK OF THE NET PEP IS DETECTED AND DISPLAYED WITHOUT FLICKER FOR ANY MODULATION TYPE. DISPLAY UPDATE IS CONSTANT YET FLICKER FREE AS YOU MAY CHANGE THE POWER ACCORDING TO YOUR VOICE. THERE IS NOTHING LIKE THIS QUALITY INSTRUMENT AVAILABLE ANYWHERE ELSE. IT IS THE ONLY VSWR-NET POWER INDICATOR THAT LETS YOU KNOW THE STATE OF YOUR ANTENNAS AND TRANSMITTED POWER AT ALL TIMES WHILE TRANSMITTING. EITHER MODEL IS A SOPHISTICATED DEVICE CONTAINING FOUR CIRCUIT BOARDS AND THIRTEEN INTEGRATED CIRCUITS.

SL-65 VSWR INDICATOR

- TWO DIGIT DISPLAY SHOWS VSWR TO AN ACCURACY OF .1 FOR VALUES FROM 1.0 AND 2.2. ACCURACY IS TO .2 FOR VALUES FROM 2.3 TO 3.4 AND TO .3 FROM 3.4 TO 4.0. FROM 4.1 TO 6.2 THE INDICATION MEANS THAT VSWR IS VERY HIGH.
- FOR VSWR VALUES NEAR 1.0, THE POWER RANGE FOR A VALID READING IS 20 - 2000 WATTS OUTPUT. FOR HIGHER VALUES THE UPPER POWER LIMIT FOR A FLICKER FREE VALID READING IS SOMEWHAT LESS (35 - 1000 WATTS FOR VSWR AT 2.0).
- DIVIDE THE ABOVE POWER LEVELS BY 100 TO OBTAIN THE PERFORMANCE OF THE SL-65A QRP MODEL.

WARRANTY ONE YEAR

SL-65 NET POWER INDICATOR

- THE POWER DISPLAYED IS THE DETECTED PEAK OF THE PEP FOR ANY MODULATION. THIS IS THE POWER THAT THE TRANSMITTER IS "TALKED" UP TO. DISPLAY DECAY TIME IS ABOUT ONE SECOND.
- THE POWER DISPLAYED IS THAT WHICH IS ACCEPTED BY THE ANTENNA - (FORWARD LESS REFLECTED).
- POWER IS DISPLAYED ON THE SAME TWO DIGITS AS VSWR IN TWO AUTORANGED SCALES. 20 TO 500 WATTS AND 500 TO 2000 WATTS. TRIPOVER AT THE 500 WATT LEVEL IS AUTOMATIC EX: A READING OF 1.2 COULD MEAN 120 OR 1200 WATTS. YOU MUST KNOW WHICH RANGE YOU ARE IN.
- ACCURACY IS TO 10 WATTS IN THE LOWER RANGE AND 100 WATTS IN THE UPPER RANGE. DIVIDE POWER SPECS BY 100 FOR SL-65A.

SPECIAL AUDIO VERSION AVAILABLE FOR THE SIGHTLESS
• WRITE FOR DETAILS •

PRICE: \$189.50 POSTPAID IN USA & CANADA. VA. RESIDENTS ADD 4% SALES TAX.

BOOKLET AVAILABLE AT \$2.00 REDEEMABLE TOWARD PURCHASE.
* PATENT PENDING.

ELECTRONIC RESEARCH CORP. OF VIRGINIA
P. O. BOX 2394
VIRGINIA BEACH, VIRGINIA 23452

TELEPHONE (804) 463-2669

Please send all reader inquiries directly.

Announcing:

The 1979 CQ World-Wide DX Contest

Phone: October 27-28 & C.W.: November 24-25
Starts 0000 GMT Sat. 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 thru 28 MHz.

III. TYPE OF COMPETITION:

1. *Single Operator (Single band, and all band). Single operator stations are those at which one person performs all of the operating, logging, and spotting functions. The use of DX spotting nets or any other form of DX alerting assistance places the station in the Multi-Operator category.*

2. Multi-Operator (all band operation only).

a. Single Transmitter, only one transmitter and one band permitted during the same time period (defined as 10 minutes). *Exception:* One—and only one—other band may be used during the same time period if—and only if—the station worked is a new multiplier.

b. Multi Transmitter (no limit to transmitters but only one signal per band permitted).

3. QRP_p (single operator only) Power must not exceed 5 watts output. Stations in this category will be competing only with other QRP_p stations for awards.

IV. NUMBER EXCHANGE: Phone: RS report plus zone (i.e. 5705). C.W.: RST report plus zone (i.e.: 57905).

A station in a call area different than that indicated by its call sign is required to sign portable.

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.

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, and Asiatic USSR.

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 will be issued to the licensee of the station used.

In the QRP_p category certificates will be awarded for single operator only.

IX. TROPHIES & PLAQUES. (Donors)

PHONE

Single Operator, All Band

World - Bill Leonard, W2SKE

World - QRP_p - Adrian Weiss, K8EEG/0

U.S.A. - Potomac Valley Radio Club

Canada - Jack Baldwin, VE3BS

Carib./C.A. - Jim Neiger, N6TJ

Europe - W4BVV Operators

Africa - Gordon Marshall, W6RR

Asia - Japan CQ Magazine

Japan - Palm Garden Contest Club

Oceania - No. California DX Club

Single Operator, Single Band

World - K2HLB Memorial, No. Jersey DX Assoc.

World - 21 MHz - Lee Wical, KH6BZF

World - 3.8 MHz - Fred Capossela, K6SSS

U.S.A. - 3.8 MHz - Arnold Tamchin, W2HCW

U.S.A. - So. California DX Club

Canada - Gene Krehbiel, VE7KB

Carib./C.A. - Pedro Piza, Jr., KP4RF

Oceania - 14 MHz - VK3JW Memorial, Pacific DX Net

Oceania - 21 MHz - Pacific R.A.T.S.

So. America - Rafael Ponce de Leon, CX3BR

Multi-Operator, Single Transmitter

World - Don Wallace, W6AM

Canada - Calgary Amateur Radio Assoc.

Multi-Operator, Multi Transmitter

World - Radio Club Venezolano

U.S.A. - Dale Hoppee, K6UA

Contest Expeditions

World - Single Opr. - Stuart Meyer, W2GHK

World - Multi - Op. - Bill Schneider, K2TT

Special - Single Operator, All Band

World - Phone/C.W. - John Knight, W6YY

C.W.

Single Operator, All Band

World - Larry LeKashman, W2AB Memorial

(Albert Kahn, K4FW)

World - QRPp - Gene Walsh, N2AA

U.S.A. - Frankford Radio Club

Canada - Canadian DX Association

Carib./C.A. - Jim Neiger, N6TJ

Europe - W3AU Operators

Africa - Gordon Marshall, W6RR

Asia - Japan CQ Magazine

Japan - Palm Garden Contest Club

Oceania - Maui Amateur Radio Club

Single Operator, Single Band

World - W2JT Memorial, No. Jersey DX Assoc.

World - 3.5 MHz - Fred Capossela, K6SSS

U.S.A. - No. Illinois DX Association

Canada - Canadian Amateur Radio Federation

Carib./C.A. - DX Club of Puerto Rico

Europe - 14 MHz - G2LB Memorial (From Friends)

Oceania - 21 MHz - Pacific R.A.T.S.

So. America - Rafael Ponce de Leon, CX3BR

Multi-Operator, Single Transmitter

World - Anthony Susen, W3AOH

Multi-Operator, Multi Transmitter

World - Hazard Reeves, K2GL

U.S.A. - Rush Drake, W7RM

Contest Expeditions

World - Single-Opr.

World - Multi-Opr. - Bill Schneider, K2TT

Clubs

World - Phone/C.W. - CQ Magazine

World - Phone/C.W. - Southeastern DX Club

Trophy winners may win the same trophy only once within a three year period. (This does not apply to any of the CQ special Special Awards.)

The Canadian, Carib./C.A. and the African awards are for residents *only*.

A resident is defined as one living in that country with an established Post Office address.

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, (except for DXpeditions especially organized for operation in the contest and manned by members.)

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 c.w.

XI. LOG INSTRUCTIONS:

1. All times must be in GMT.

2. Indicate zone and country multiplier only the FIRST TIME it is worked on each band.

3. Logs must be checked for duplicate contacts, correct QSO points and multipliers, and recopied logs must be in their original form with corrections clearly shown.

4. Use a separate sheet for each band.

5. 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.

6. Official 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 by following the samples shown, 40 contacts to the page on 8½"x11" paper.

7. All entrants are required to submit cross-check sheets for each band on which 200 or more QSO's were made. All other entrants are encouraged to submit cross-check sheets.

8. For each duplicate contact that is removed from a log by the committee, a penalty of three additional contacts will be exacted.

9. QRP_p 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 QSO's or unverifiable multipliers will be deemed sufficient cause for disqualification. (Incorrectly logged calls will be counted as unverifiable contacts.)

Disqualification can also result in the disqualified operator(s) being barred from competition in all CQ contests for a period of up to three years.

Actions and decisions of the CQ Contest Committee are official and final.

XIII. DEADLINE: All entries must be postmarked NO LATER than December 1, 1979 for the Phone section and January 15, 1980 for the C.W. section. Indicate phone or c.w. on envelope. Logs go to:

CQ WW Contest Committee
14 Vanderventer Avenue
Port Washington, L.I., N.Y. USA 11050

Note - It is very important that you indicate on the envelope whether your entry is Phone or C.W. This will speed up operations here at CQ.
-Ed.



1978 CQ World - Wide DX Contest Phone Results

BY LARRY BROCKMAN†, N6AR (ex-WA6EPQ), and BOB COX*, K3EST

If anyone had a doubt about the arrival of the new sunspot cycle, the 1978 WW DX Phone Contest allayed all fears. The conditions overall were outstanding. It seems that operators throughout the world had been for the curtain to go up, because the outstanding conditions were met with outstanding operating from all continents. 28 MHz. turned out to be *just* large enough to accommodate an incredible

†7164 Rock Ridge Terrace, Canoga Park, Calif. 91307

*5801 Huntland Road, Temple Mills, Maryland 20031.

onslaught of activity. You had to search way up to 28.800 or higher to find a clear frequency.

Contact totals and scores soared to heights no one thought possible only a few years ago. When the dust settled, there was 9Y4VT with 8.28M points. Operated by Richard Norton (N6AA), 9Y4VT set a new single operator all band record with 6,194 QSO's! EA0CR and CT3BZ (OH2BH op.) finished second and third respectively.

The gang at FY7BC set out to break the old multi-single record. They did so handily with 8.98M points. The

competition for second were fierce. RF6F, 9L1CA and IZ4VEQ all broke the old record.

The multi-multi class was led by the Potomac Valley Radio Club expedition to PJ9JR, with a score of 29.2M points. Peak hours if over 360 QSO's plus a total of 14,598 QSO's netted them the new world record. KH6XX, PJ8CO and EX9A finished second, third and fourth respectively.

Top USA all band score was WA8ZDT operating at W4DR. Kevin just edged out N7DD who was second again! (Maybe next year). Kevin broke the all time USA record.

K5GA from beautiful Houston walked away with the USA multi-single record. K1PR was second followed by K8NA. K5GA (K5RC on CW) lost several antennas due to high winds after the contest.

The USA multi-multi competition a close race with 4 stations beating the old record. N2AA edged out W3WJD, W7RM and W2PV. If you have not heard W7RM lost his antenna farm in a high wind storm during the winter. We all look forward to the day we hear W7RM handing out zones again.

In addition to the stations mentioned above, the following stations set new records: YU3ZV: World 21 MHz; KV4FZ: World 14 MHz; CW3BR: World 28 MHz; ZS6BNZ: Africa 28 MHz; VE3BWK/4U: Asia 14 MHz; DK5WL: Europe 28 MHz; I3MAU: Europe 7 MHz; VE3BMV: N. America 21 MHz; VR3AH: Oceania 28 MHz; W1CF: USA 3.8 MHz; WA6EKL: USA 21 MHz; K6OQ: USA 28 MHz.

31 entries were received in the new QRPP category, demonstrating the capabilities of flea powered equip-



FSII MULTI-OPERATORS
W.W. DX. C 1978

ment. Allan, VP9AD, is the top scorer with 1,147 QSO's, followed by Paul, OA8V. WA4IAR is the top USA entry with W6PQZ and his solar powered station taking second.

Several other entries are worthy of note. K1CGJ worked 72 countries and 25 zones on 28 MHz. I4DLS worked 65 countries on 14 MHz using 3.6 watts. An outstanding 3.8 MHz entry was received from AA1K, and JA0JCJ worked Europe and the USA on 3.8 with 8 watts PEP. We hope this exciting category will grow.

A Special Thanks

To the many expeditions that make the CQ contest so interesting. The expeditions of ZL3HI/C, PJ9JR, PJ8CO, VP2VER, HC8A, KH6XX, N1GL/VP9, VP2MBA, CT3/OH2FR, UK9OAD/U8W, RF6F, 9Y4VT, W4NT/CGA, VP1RX, FG0EID/FS, K2NJ/VP9, ZF2BC and



Crew at KH6XX. L to R (back) AE6E, G3VZT, WH6ABN, KH6XX, W7EJ, N6ZV; L to R (front) K7SS, AH6Z, N7ZZ.

HH2CQ made the weekend very enjoyable. The Oceania 14 MHz. VK3JW memorial trophy was not awarded due to a lack of a qualified entrant. (12 hrs. minimum operation)

The total logs received on SSB were 2,594 WHEW! What a lot of work checking and correlation of information. It wouldn't have been possible without the work of the Committee. The following people provided the expertise necessary to check each entrant in the category assigned to them: Frank Anzalone, W1WY; Terry Baxter, N6CW; Yuri Blarovicz, VE3BMV; Lenny Chertok, W3GRF; Dave Donnelly, K2SS; Lon Jenkins, N6VV; Fred Morris, AD6C; Glenn Rattmann, K6NA; Jim Sullivan, W7EJ; Reg Towne, N6SV; Gene Walsh, N2AA; Tom Taormina, K5RC and Gene Zimmerman, W3ZZ.

Congratulations to all the winners. 73, Bob K3EST and Larry, N6AR

THE BIG SIGNAL UNADILLA "W2AU" Baluns

DEMANDED BY
PROFESSIONALS
WORLD-WIDE
OVER 12 YEARS

- The Original Lightning Arrest
- 650# Strength
- Stainless Hardware
- Sealed
- GUARANTEED

ASSISTANCE?

Call: HUGH GUNNISON, WA2ZOT

Toll-Free 800-448-1666

[NYS Collect 315-437-3953]

Still
Only
\$14.95



FOR HIGHEST ANTENNA
EFFICIENCY

1:1 OR 4:1
2,000W
PEP

FULL-POWER, QUALITY HAM ANTENNA PARTS

AT YOUR DEALER

- BALUNS · TRAPS · INSULATORS
- QUAD PARTS · ANTENNA KITS
- BOOM/MAST MOUNTS · WIRE
- CABLE · CONNECTORS

WRITE FOR FULL CATALOG
[Enclose 30c Stamps]

MICROWAVE
FILTER
COMPANY, INC.

6743 KINNE STREET, EAST SYRACUSE, NEW YORK 13057

UNADILLA/REYCO DIVISION [Dept. CQ]

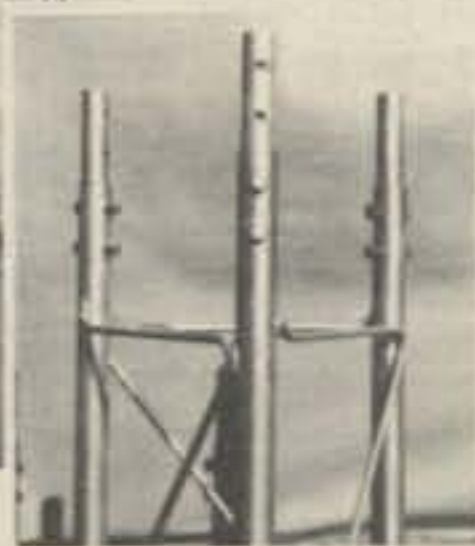
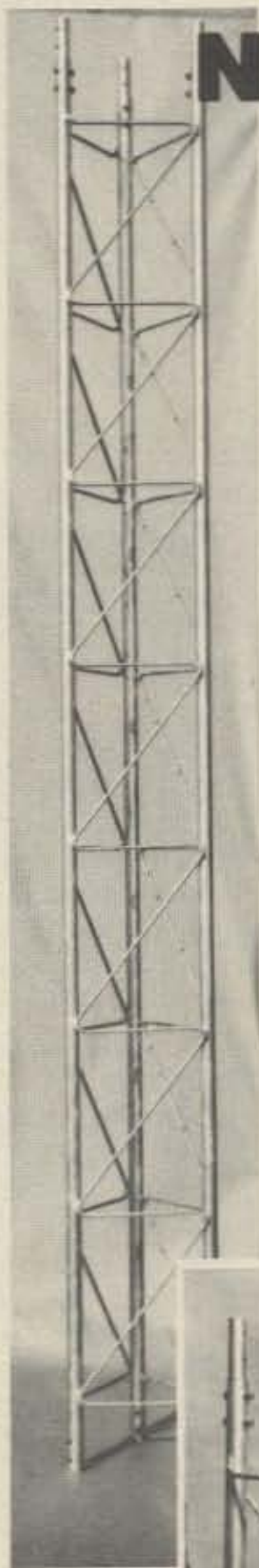
DEALERS WANTED - OVER 300 WORLD-WIDE

CIRCLE 43 ON READER SERVICE CARD

NEW TOWER DESIGN

TRI-EX'S "SUPER Z 25" TEN FOOT (3 METER) TOWER SECTION

- Tower sections may be joined to 200 feet (61 meters) high.
- Stronger — Full strength for the entire ten foot length. No swedged insertion joints. Meets Uniform Building Code.
- Full ten foot useful length — No three and one-half inch loss of length per section as occurs when joining tower sections which have swedged joints.
- Easy to erect — Joining sleeve fits easily into each lower section leg and holds tower sections together while sections are being bolted.
- Can be disassembled easily — The joining sleeve tends not to freeze into the next section like a swedged joint tends to do; thus a "Super Z 25" tower may be disassembled after long use and re-erected at another location.
- Steel tower section — Hot dipped galvanized (42 lbs. - 19 kg.)
- Lightweight, strong, non-corroding Triexium™ tower section (18.5 lbs. - 8.4 kg.) also available. Triexium™ is a special space-age, lightweight, high-strength alloy similar to those used in jet planes and space craft. It is non-corroding and cannot rust. It is care-free and maintenance-free. It meets Uniform Building Code and is actually stronger than steel sections. It never needs painting.



See your dealer or call or write Tri-Ex for more information today.

(209) 625-9400



Tri-Ex® TOWER CORPORATION

7182 Rasmussen Avenue, Visalia, California 93277

CIRCLE 52 ON READER SERVICE CARD



KL7HR, L to R sitting, KL7IWE, KL7FAP, KL7HR, Lou, Mike, Harold, KL7RA; L to R standing, KL7AZ, KL7IXZ, KL7IVX, AL7AF, KL7IUM, KL7UN.



I6NOA, Alex



The QTH of YU3EY, Multi-Single

USA QRM

Almost fell off the chair when I worked Chatham Islands. Spilled coffee on my lap... K1CGJ/QRPp. 1 new country-229th on QRPp... W6PQZ. To contact your local QRPper, consult the yellow pages under "Insane Asylum"... W5YZ. Finally worked zone 26 for WAZ... W4RW. Been wanting to work Russian Georgia never heard one till this contest-worked 2... AK4T. The score may not be a big deal but I had as much fun as the Megapoint gang... W4PLR. Even at 79, it is still fun... W4ZM. Had to get 5W1BR to help me work a "ZL"... N4KG. Really wanted DX-CC on 10M in test and just made it... N4CT (TJ1AW). Burned the Midnight oil-Lost a few pounds-Had a great time!!... W5ZPA. Worked KL7 & KH6 on 75 for 5BWAS #249 & 250... AE5H. It has been 15 yrs since last test-My how humble you feel being on the bottom!!... K6EXO. Didn't fully understand all this till after the logs were done, My God the paperwork!... KB6DJ. Worked 4U1UN for a new country #351... W6BS. Great to hear 10 like it was 20 years ago... W6PU. Openings on 15m are the best next to mom's apple pie... WA1PSI. Looks like I'll be all alone on 40m for the next 5 years... K1CV. Not too easy to operate with a BC348... WB2EOO. First time I tried 160-it was fun even with a bad antenna... K3KA. Amplifier blew up after 1 hr. 20 min. Best laid plans!... N3ED. The QRM on 28 MC was incredible. Good thing there was a lot of room... K3UA. My gripe is with the DX station who initially comes back with half my callsign, then after I correct it he continues on with "QSL-QRZ" and never repeats back my whole callsign. How do I know that he really got my call corrected?... W7JYW. Put up a beam the night before the contest, this was my first Test with a beam and boy, what a difference!... WB7SVQ. Seemed funny to get beaten in a pileup by K8LM, who was using my old equipment!... WB8LFO. This was easier from Cuba in the late 50's and early 60's when I multi-op'ed from CO8RA. Tough going from USA without a linear amp... KA8BAC. The biggest thrill was hearing Japan on ten-meter long path before sunrise—biggest disappointment was not working any!... WA8QIY. Love that Sunday afternoon horse-race into Africa on ten... K8YWG. My first one-weekend DXCC!... W8TWA. Lost voice six hours prior to end of Test, each QSO was painful near the end!... W9ZRX. My dog chewed the rotor cable, had to repair it during a rainstorm... WD9CUG. I was ready, the gear was ready, wife left for the weekend—and then the power line noise came to stay... K9SD. Single-band 75, where the fun is in the challenge... K9JF. 25 years since my last CQ WW and I'll never miss another... K9BLY.

DX QRM

Some problems on 40M; several European stations were probably using the same receiving frequency in the American phone band... DJ4PT. Worked about 2100 U.S. stations!... DK5WL. Glad to be contesting after 3 years absence... EA4LH. KL7JW came back on the first call!... G3FTQ/QRPp. This is the biggest CQ log I have ever written up!... G3FXB. Found 10 meters like I've never known it, and the QSLs that followed... GU4EON. First QRPp HF experience; in a word, Fantastic!... I4DLS. My first contest after 10 years from home QTH... DJ6QT. Thought I would give a few points away, but once started, could not tear myself from the rig... GW3UCB. I don't think some of the fellows believed that I was only running low power (5w PEP input)... VP9AD. "You are 5905", "OK, thanks-how does my signal compare with other G's?", "Fine, you are about 5 and 6"... G3HTA. 3 new countries for a total of 188 QRPp... OA8V. You really regret that you were out chasing girls on Friday... SM0GMZ. Biggest fun ever had, lots of new U.S. counties... PA2TMS. Good propagation to USA on 40m, but jamming and BC QRM very heavy... JA2BAY. I had a snow storm during the contest, if I didn't have it, I could have 500 more QSOs... JA8SCD. Worked WAC in one day... JA7JND. Many stations picked up my weak signal, thanks... JA0VHK. Our first experience in WW test, thank you JA2YDC. The conditions are very good on 10 Meters... JI1KUV. I'm in love with 10 Meters... KA6DX. Fine contest. I have new country HD0E... UR2FQ. Thanks for the nice contest... UQ2GDQ. New American callsigns are easy to work in pile-ups. Good to increase the speed... UB5WE. Pse 2 point from JA... UK9ABA. First time joined to the biggest contest in the world and sure enjoyed it... RA9AKO.

Soap Box QRM

Bands were crowded, openings very good on all bands... VU2TS. Very exciting to be in contest, age 70 years licensed in 1930... VK5MF. Worked zone 2 to complete my WAZ... VK6NE. The Europeans never did come through on ten... KH6WF. Worked 1.8 MHz for 24 hours but fierce QRN so had only 24 contacts... KH6ILA. Used dipole in attic!... VE3KIU. As I was letting wire out of the window from 260 feet some turkey a few floors down started coiling it up!... VE3FAC. Was surprised to have a



ZX2XB handed out a nice prefix.



4X4UH, David put Israel on the Map



WA8ZDT at controls of W4DR.



EA2IA, Inaki always a FB signal.



Some of the Ops. at JA3YKC; L to R JH3PKS, JF3KJJ, JR3FNZ and Top, JH4ETH.



OH2MM, Ville had the high Europe All Band Score



I24VEQ: L to R I4LCK, I4VEQ, I4ADS, I4RYC, I4USC, I4ZSQ not shown I4LEC and I5NSR.

YOU CAN'T BUY
ALPHA/VOMAX
PERFORMANCE IN ANY OTHER
SPEECH PROCESSOR



ALPHA/VOMAX can boost the "talk power" of your rig up to ten times (10 dB) or more under tough conditions.

VOMAX SBP-4's *split band processing* is the only technique more effective than rf clipping. Because harmonic and intermodulation distortion is uniquely low, intelligibility is superb and your voice sounds natural.

SET IT AND FORGET IT — Silky smooth AGC absorbs changes in mike output up to 40 dB, virtually insuring optimum clipping and a clean, crisp signal at all times. And VOMAX installs easily in the mike line to any rig.

You can pay more, but you can't match ALPHA/VOMAX performance or convenience. Contact your dealer or ETO for details on ALPHA linears and ALPHA/VOMAX.

ETO

EHRHORN TECHNOLOGICAL
OPERATIONS, INC.
P.O. BOX 708, CANON CITY, CO 81212
(303) 275-1613

CIRCLE 21 ON READER SERVICE CARD

DON'T KEEP A GOOD ANTENNA DOWN

...put it up instead. Install the World-Record Breaking antenna that won W6TYP the QRP ARC 1,000,000 miles/watt award.

THE JOYSTICK VFA

(Variable freq. ant) gives low angle, omnidirectional, harmonic free radiation on all bands 160 thru 10 (+ MARS and receive on all BC & SW).

1000's of glowing reports in our files of the VFA in use, often in poor QTH and/or under QRP, contests, etc.

SYSTEM 'A' \$84.00

250W P.E.P. &/or Receiving only

SYSTEM 'J' \$110.00

500W P.E.P. &/or Improved Q Factor Receive

Air mail cost included (Each system 3 sections easily assembled to make unit 7'6" long. Matching ATU). Not only will you save space but you get better value per \$ if buying direct UK manuf. Rush your Mastercharge, Visa, BankAmericard, or check, or ask for brochure:-

**PARTRIDGE (CQ)
ELECTRONICS LTD**

Broadstairs, Kent, England **G3CED** **G3VFA**
Tel: 0843 62535

CIRCLE 45 ON READER SERVICE CARD

BAND-BY-BAND BREAKDOWN—TOP ALL BAND SCORES

Number groups indicate: QSO's/Zones/Countries on each band.

WORLD TOP SINGLE OPERATOR—ALL BAND

Station	160	80	40	20	15	10
9Y4VT	31/5/6	247/12/25	436/18/60	1986/27/78	1363/27/76	2131/29/87
EAQ CR	29/4/12	317/13/49	481/20/69	1087/32/96	1236/28/85	1727/33/85
CT3BZ		375/13/46	423/16/53	1146/28/84	1790/29/85	1593/25/75
N1GL/VP9	56/6/8	271/15/42	226/16/44	1403/28/84	667/25/73	951/28/75
9Y4VU		107/9/16	178/11/37	657/24/68	815/26/64	1727/31/76
OH2MM	9/3/7	67/8/32	171/14/51	503/32/84	1154/25/67	1309/28/77
UB5WE		193/12/39	234/16/62	448/34/92	1258/28/78	751/28/84
G3FXB	7/2/5	175/12/45	53/11/35	349/28/78	669/25/70	1775/30/74
DK8FZ	6/2/6	270/10/50	154/13/48	494/27/79	958/23/74	990/28/68
OZ5KF		217/9/42	296/18/56	978/30/66	1019/25/59	664/27/50

WORLD TOP MULTI-OPERATOR SINGLE TRANSMITTER

Station	160	80	40	20	15	10
FY7BC	4/3/4	187/13/32	402/20/56	1922/30/97	1137/27/93	2473/31/89
RF6F		208/19/62	314/15/54	1727/37/122	1207/31/87	1400/29/86
9L1CA	1/1/1	61/11/19	137/16/30	1124/33/102	1856/30/96	2214/27/92
I24VEQ		156/10/47	300/18/61	713/36/105	2046/35/102	1725/32/86
YU3EY	53/4/15	217/13/59	175/16/64	933/35/106	511/33/101	2206/36/99
UK2BBB		254/8/44	431/24/78	702/33/105	1919/31/91	767/33/95

WORLD TOP MULTI-OPERATOR-MULTI-TRANSMITTER

Station	160	80	40	20	15	10
PJ9JR	37/5/14	758/17/62	1226/23/84	3918/35/135	4055/35/123	4616/32/111
KH6XX	41/7/9	475/20/33	793/24/53	2099/36/113	3295/39/117	3908/36/104
PJ8CO	78/5/13	518/12/47	516/16/54	4261/36/124	3949/34/111	3064/27/84
EX9A		642/22/67	871/32/83	2951/40/149	2457/37/106	2312/33/116
VE3KZ	388/8/15	826/18/52	803/23/61	1870/37/132	1707/33/111	1370/33/112
VP2VER	21/4/9	244/10/22	524/17/58	1888/31/93	2520/29/87	3504/25/82

USA TOP SINGLE OPERATOR-ALL BAND

Station	160	80	40	20	15	10
W4DR	6/5/4	67/15/39	96/18/58	509/33/103	490/29/85	674/27/97
N7DD	2/2/1	67/5/18	101/20/41	318/37/91	770/30/73	905/29/74
K1XX	15/5/9	99/13/42	77/16/40	308/31/89	501/31/86	591/27/97
W3BGN	10/4/6	60/13/33	65/16/37	367/33/94	340/24/77	58/28/96
W9ZRX	12/5/5	55/15/34	106/22/58	229/32/82	578/28/83	361/28/88
N2LT	10/4/5	47/13/29	65/18/39	281/32/91	296/28/78	661/27/95
N3DA		51/15/33	82/19/54	239/28/84	245/28/71	490/28/94
K6RR		30/10/10	117/13/16	190/27/73	743/27/54	511/24/51
N3RD		36/12/26	53/16/38	341/37/102	350/31/90	291/30/80
N6KT	3/2/1	58/11/16	48/15/22	76/23/47	589/26/64	806/25/61

USA TOP MULTI-OPERATOR SINGLE TRANSMITTER

Station	160	80	40	20	15	10
K5GA	7/5/5	39/15/37	173/21/64	549/39/125	619/35/103	1057/33/111
K1PR	3/2/3	94/17/54	164/20/63	425/28/101	486/31/95	683/28/99
K8NA	4/3/2	68/13/41	123/23/70	476/35/116	430/29/105	379/28/93
K7UK	8/6/5	98/16/32	159/29/45	218/38/89	937/32/79	323/27/72
W6BH		31/10/15	198/21/38	188/29/72	842/32/71	720/27/69
N6MG	4/2/2	53/11/14	171/17/34	166/31/68	582/27/63	736/27/62

USA TOP MULTI-OPERATOR MULTI TRANSMITTER

Station	160	80	40	20	15	10
N2AA	44/8/17	390/21/67	278/23/73	1160/39/140	1366/33/128	1292/33/121
W3WJD	33/7/16	428/19/64	225/23/73	1077/39/148	1533/35/134	1029/35/118
W7RM	32/7/7	247/18/34	468/23/59	997/39/129	2475/35/92	1075/30/93
W2PV	69/6/13	544/17/64	296/21/57	1200/37/133	1287/33/123	929/33/123
W3MM		328/18/59	200/22/66	877/37/127	944/34/122	967/33/118
W1ZM	33/7/16	280/16/51	239/21/68	615/35/113	1034/35/120	918/31/107

pileup of JA on 75 meters... VE7CMR. VE3BWK/4U was a long sought country and zone... VE7AJ. Love those pileups!... VE7CMK. First SSB contest, hope 10 meters is better next year. High cold winds knocked out all antennas except 10 and 2—too cold to repair... CF8CC. The new US prefixes played havoc with my check sheet. The main object of the contest was achieved. I had a ball... ZK6VU. I will return to JA in two weeks. Have enjoyed contest from Nairobi... 5Z4PV. Was surprised at amount of activity on ten. If I had known would do so well would have tried for world record!... VS6BNZ. Big thrill to be able to operate in India—now headed for HZ land... VU2ACD. Very difficult to get through QRM barefoot... VU2GO. Was giving my call as JA2HI when someone reminded me I was in VU!... VU2HI. Saturday and Sunday are working days here makes contesting a problem... 9K2EX. It seems to me that JA's are a very thick wall... JD1ALM. Murphy strikes again—During week before contest 10 meter condx. were great—during contest only so-so... KH6WF. A real thrill to have such cooperative guys. If this score doesn't win I can't do any better, conditions to USA were very good... VR3AH. Three power failures during first day! Wish US would identify DX call before working him—too many dupes... H44DX.

STATION OPERATORS

Multi-Operator Single Transmitter

AA4DR & WA4MDS. 2 M. NET. AB4H & AA4AA, AA4KT, AA4H, AA4TP, AA4TN, N4IR, K4VZZ, WB4RRJ, WB4QLT, N4TN, K4LSP, K4LN, W4JD, AD9Y & AD9Z, CE6A/W4NT & W4GTS, W4PPT, K4NYK, N4RJ, N4ZS, WB4AXN, WB4ZNH, CE2AA, CE2MH, CE2CC, CE2HN, CE2GK, CE2AH, CE2BJ, CF1RY & VE1CCC, CF3VM & VE3CKF, VE3CPU, VE3FZW, VE3ICR, CG6WQ & VE6KW, VE6N, VE6OY, CT2ARA, CT2AQ, CT2AX, CT2BT, CT2CC, CT2CE, CT2CI, CT2CJ, CT2CM, CT2QN, CT2SH, DF8SAR, DL8CH, DL8CM, DL8FR, DL8HA, DK5VD, DL8DC, DJ8RI & DJ6KH, DF3BV, DF3BU, DK8BE, DK0KU: CLUB, DL7PD & DJ0UP, DL0JK: DK2XX, DK8ZL, DK6FT, DL0UE: DL3LU, DK2SS, DL8RL, DF2OU, DF3AV, DJ7MG, DL7BI, DL0WU: DJ4AX, DJ8SW, DK4EM, DK4TP, DK6JZ, DL9DY, DL9GSA, DM2AYC, DM2AIC, DM2BHC, DM3SIC, DM2CBB & DM4VEB, DM3CK: DM4OXH, DM5VVH, DM3GM: DM3BGM, DM3SGM, DM2FJM, DM2AGM, DM3PL: Ponetka, Hahn, DM4CN: CLUB, EA6ET & Ju. Sintes Pujol, EA8JU & EA8AT, EA8BX, EA8MO, EA8ND, EA8RT, EA8RU, F2LY & F6BDN, F6DQX, F6DQG, F6DYK, F6EDM, F6FIO, F5II & F6ARC, F6BFH, F9IE, F8DUS, F6DLM, F6KAW: F6AUO, F6FBQ, F6BPX, F6ASS, F6AOJ, F6ALX, FG0EID/FS: K7GEX, WB7BNP, FY7BC & FY7BG, F5QQ, F2QQ, G3KMI: G4GUO, G8GSO, G4ESC, G8KAV, G4AEQ, G3ZYW, G8OQV, G8GKQ, G8PXI, G4BIX, G4DZC, G4BRA/P: G3YMC, G3XVR, G4DDL, G3WTM, G4AVC, G6CW: G3YUT, G4ANS, G4HNS, G4AFJ, G3TVY, G4EKW, G4CKG, G8PSP, G8OUA, G8OSK, G8FRB, G4EAN, G8KHJ, G6UW: G3YZO, G3ZAY, G4BAH, G4FAM, BR3-32525, Joan, G8JC: G3UDR, G3TQD, G3TQZ, G4BYB, G4DXD, G8ASO, G8NSL, HA3KHB: HA3GO, Szarka, Geliencser, HA3KHC: Borsfoldi, Kardos, Kormendi, HA5KBM: Lukacs, Schneidhoffer, Vago, HA5KFL: Olah, Pekarik, Szollos, Szalanczye, Osztas, Marton, HA5KJC: Szabo, Matyus, Holman, HA5KCC/2: HA5MA, HA5MO, HA5MD, HA5LV, HA5KP, Magony, HA5KKO: HA7UX, Fulop, Kormendi, HA6KNI: HA6NF, Vegert, Habony, Denes, HA6KVB/p: Suszter, Simon, Kuksar, Vas, HA7KSV: HA7UF, HA7SH, Adamecz, HA9KOB: HA9RU, HA9PV, HA9RB, Laki, HA9SB, HA0KLE:

HA0MJ, Venczel, Devenyi, Tomasovsky, Fabian, Szalontai, HB9AUS & HB9NH, HE9ASD, HE9HWS, HE9EEX, HB9PGL, HD0E: HC5AT, HC5EA, HC5DP, HC5EE, HC5GL, HC5JN, HC5NW, HC5PC, HG5A: HA5GF, HA5FN, HA3NU, HA5FM, HA5OM, Voros, HK3AXT & HK3TF, HK3AFD, HK3CFM, HK4RCA: HK4CKT, HK4DBX, I1KN & W3US, I1LBH, I1JUZ, I1FNX, I1ANP, I1SBU, I1W1PP, Lorenzelli, I1UW & I1ANF, I1DIE, I1DSG, I1GJC, I1GUB, I1PCT, I1RBP, I1RIN, I1VVZ, I1XXM & I1ZEU, I1HAG, I1PHX, I1SAHO & I1N3QBR, I1N3ANE, I1N3RWH, I1S0BYR & I1S0DTK, I24VEQ & I4ADS, I4CLK, I4LEC, I4RYC, I4USC, I4ZSQ, I5NSR, JA2YDC: Ryu, Atsu, Yasu, Ree, Jun, Kazu, Mitsui, Syo, Ken, Yuki, Yoko, Toshi, Paul, Harry, Uto, Ben, Steve, Mumo, JA2YKA: JH2QXG, JH2PZX, JH3URO, JA4UDP, JH4TCM, JA5JSR, JA4YFH: JH3XCU, JA4XKL, JH4DIT, JH4SQU, JA4YPE: JH3BJN/4, JH6AZL/4, JH4WYR, JF3EGT/4, JA6YCU: JH6OCF, JH6OKK, JH6ECP, JE2ICU/6, JA7YCO: JA7ROK, JH7CUU, JH7IMX, JI1OFF, JI1FLB, JG1SLY, JA0SLY, JH7QMG, JI1CSE, JH7UJI, JH7XZX, JH8GTG, JH8BZR, JA7YFB: JH7PVM, JH7LJT, JH7VWF, JA0YAK: Shibayama, Asai, Tahaka, Kanazawa, Imaizumi, Kawamukai, Tanie, JF1YID: JA1DNZ, JA4EIQ, JA7AKQ, K1PR & K1TO, K1XM, WA1MAO, WB3BSV, K1RU & K1YR, K1GSK & K1KJG, N1AU, WB1AEL, K2CC: AB2L, K2IA, N2AKT, WA2MYU, K2FL & KA2BAO, K3PA & K3YL, K3RA & K3KP, WB3AVN, WA3VUQ, K3SME & WA3FZQ, K3WX & WB3JRU, K4HEX & WA4DLY, WD4EXG, WD4GCE, WA4RTS, WA4WVQ, WB4YVD, K4KJO: WA2WYM, N4AFB, N4BS, N4E1Y, WD4HPL, W4IGI, WA4IVW, WD4KOG, WD4LWH, WA4DEB, WA4PAB, WD4SIH, KC4T, WA4UQA, WA4UOI, W4WYX, WB4ZKC, K4PI & 2M Net, K4VX & K4IOH, K4YEP, K0CMF, K4ZGB & WA4ENJ, WB4LIB, WA4LTG, WB4NZU, WB4ITB, WA4AUX, WB4UDE, N4AZJ, KA4C & 2M Net, KD4M & KD4S, K4WSB, WD4CNO, W4GKF, KA4EKA, KG4KG: W6QL, W6KG, K5GA & K5LZO, K5RC, K5TM, K5ZD, K5KG & AD5W, W5SJS, K6MEP: N6ADI, N6VR, WB6GNS, WA6IJZ, K6VMN, WA6DJS, K6QX & WR6ACZ, K6YK & WR6ACZ, K6ZM & K6CLV, K7TM & K7FR, K8AZ & K8ND, W8HSK, W8KIC, K8JLB & AC8W, K8IEK, K8DD, K8NA & K8IA, K8SY, N8JW, W8SYR, W8TA, K8XR & K8OO, K9JS & WB9UJ, WB9UY, WB9YBI, K9KU & WA9BOW, WA9ZPR, K89BR & N9LE, K0BJW & K0PKK, WD0FHY, K0CS & AB0W, AB0X, W8TN, WB0UXI, W0JU, K0VBU, K0XR, K0SVX & AD0F, K0AT, K0LUZ, W0WP, K0UK & K0CL, K9MWM, WB0FOR, K0FX, W0KEA, KA0APC & N0AIL, K20DX: K25ED, K25FR, K25JA, K25UH, K25JM, LA1K: LA1BU, LA3BO, LA3GW, LA4RT, LA5EV, LA5KO, LA6ES, LA6MU, LA8BU, LA8KV, LA6HL & LA0CA, LA9K: LA5JS, LA2SQ, LA4MV, LU7MAY & LU4MDR, LU3MDO, LU3MCO, LU5MDD, LX1CC: LX1RR, LX1CR, LZ1KWZ: Kzassimir, Plamen, LZ7A: LZ1AD, LZ1AM, LZ1AQ, LZ1CQ, LZ2JE, LZ1UO, Stoyanov, Ilchew, Iliew, Gamszow, N1NA & WA1VEC, WB1CPZ, AB1D, W1YNE, WA1VTZ, K1BL, K1DA, WA1QJF, WB1DGD, N1ZE & W1KM, N2MM & N2ME, N2SB, WA2HGM, N3AW & K83AG, WB2YOF, N3EC & AE3C, N3KS, W3DF, N6DT, N3LR & WB3HEO, N4HB & N4ZJ, WB4BVY, WA4KNP, N4NX & 2M NET, N4TX & 2M NET, N5AN & W5WMU, N6MG & WA6PGB, WR6ACZ, N7CY & WA7RVA, N7RO & W7DQM, WB7DYB, W7EKM, WA7ZWG, N8RA & N8AID, WB8LIU, K8WW, WB8ZWR, OG4AB: OH4QN, OH4TO, OH4TP, OH4TS, OH4TH, OH4SL, OH4UI, OH1VR & OH1LX, OH3XZ, OH2AA: OH2BRW, OH2BQZ, OH2BOS, OH2BNI, OH2BNJ, OH2BRY, OH2BNP, OH2DS, OH2B-OB, OH3AA: OH3TO, OH3WS, OH4RH & OH4OO, OH7SX & OH7UE, OH7UG, OH7VR, OH1KCF: CLUB, OH1KHH/p: OH1VB, OH1ABB, OH1FIM, OH1MDK, OH1KOK: CLUB, OH1KQJ: CLUB, OH1KSO: OH1AEZ, OH1WT, OH1JWA, OH1JCW, OH1AMF, OH1ADH, OH1KTW: CLUB, OH1KUR: OH1AET, OH3CLD, OH3CLF, OH1AYE, OH2KAT: OH1STU, OH2KNP: OH2BEF, OH2BSA, OH2SGW, OH2KPS: CLUB, OH3KAG: OH3ZWA, OH3CMS, OH3-26743, OH3CIR, OH3KAP: CLUB, OH3RMW: OH3YCM, OH3ZTW, OH3VSZ: OH3ZAF, OH3AS, OH6MP & PA0MFM, ON6NL, MP/YXL, OY5J & OY8I, OY8KH, PI1ARS: Kanon, Wittebol, PA0HTR, PI1KMA: Timmerman, PE1AVT, Slager, RF6F: UB5EC, UB5MCI, UB5MDC, UB5-059-22, UF6HV, SK2GJ: CLUB, SK3AH: SM3AFT, SM3AJL, SM3COL, SM3EAP, SK3HK: SM3AFR, SM3CER, SM3DXC, SK4EA: SM4BMX, SM0EAI, SK6AG: CLUB, SK6AW: SM6FMC, SM6HCX, SM6CVE, SM5AOE & SM6BJI, SM5AZU & SM0MC, SM0ATN, SP1PBW: SP1AHL, SP1AMU, SP1JPQ, SP5PWK: SP5AWV, SP5BSV, SP5BT, SP5CJT, SP5CLK, SP5DZI, SP5DZJ, SP5DER, SP6KSF: SP6ABX, SP6AXW, SP6BFD, SP6PZB: SP6FAF, SP6FIH, SP7KAN: SP7FRD, SP7CBN, SP7JWA, SP9KCB: CLUB, SP9PDF: CLUB, SP9PDG: SP9-2291, SP9CSW, SP9IFQ, TF3JB & TF3CW, UK1ABR: UW1CX, UW1BG, UK1ADR: Suharev, Podovalnikov, Sorokin, UK1TAR: UA1TQ, UA9-090-117, UK2AAB: Kosarev, Pilosyan, Zinkevich, UK2AAP: Bilchenko, Shudakow, Tracevski, UK2BAG: UP2BAA, UP2BAE, UP2BGC, UP2BZ, UK2BAS: UP2PAJ, UP2-38-609, UK2BBB: UP2BAS, UP2BAW, UP2BBB, UP2PX, UP2-38-517, UP2-38-727, UK2BCG: UP2PCB, UP2BFI, UK2PAO: UP2-38-574, UP2-38-624, UP2-38-440, UP2BEJ, UP2BFU, UP2PAQ, UK2PAP: UP2OX, UP2PAX, UP2BCI, UP2-38-1553, UK2PCR: UP2BCR, UP2BCT, UP2BDF, UP2BEG, UP2BFL, UP2-38-1541, UP2-38-728, UK2GBL: Stobias, Abois, Abol, UK2GKW: UQ2ON, UQ2-37-134, UQ2-37-1035, UK2RAQ: Lepp, Liivrand, Soone, Varjo, UK3AAH: Kuheshov, Solncev, Zhukov, Dobroljubov, Kazarnovsky, Kustovsky, UK3ABB: UW3FI, UA3XAC, UA3-170-885, UA3-170-888, UV3CC, UA3AKE, UA3ABZ, UK3ABO: UV3GM, UA3-170-189,

Drake R-7 Synthesized Receiver

Spans the Spectrum



from VLF thru HF!

Full general coverage reception, 0-30 MHz, with no gaps or range crystals required. Continuous tuning all the way from vlf thru hf. Superb state-of-the-art performance on a-m, ssb, RTTY, and cw—and it transceives with the Drake TR-7.

Features of Drake R-7 Model 1240 Digital Readout Receiver

100% solid state broadband design, fully synthesized with a permeability tuned oscillator (PTO) for smooth, continuous tuning. • **Covers the complete range 0 to 30 MHz** with no gaps in frequency coverage. Both digital and analog frequency readout. • **Special front-end circuitry** employing a high level double balanced mixer and 48 MHz "up-converted" 1st i-f for superior general coverage, image rejection and strong signal handling performance. • **Complete front-end bandpass filters** are included that operate from hf thru vlf. External vlf preselectors are not required. • **10 dB pushbutton-controlled broadband preamp** can be activated on all ranges above 1.5 MHz. Low noise design. • **Various optional selectivity filters** for cw, RTTY and a-m are switch-selected from the front panel. Ssb filter standard. • **Special new low distortion "synchro-phase" a-m detector** provides superior international shortwave broadcast reception. This new technique permits 3 kHz a-m sideband response with the use of a 4 kHz filter for better interference rejection. • **Tunable i-f notch filter** effectively reduces heterodyne interference from nearby stations. • **The famous Drake full electronic passband tuning system** is employed, permitting the passband position to be adjusted for any selectivity filter. This is a great aid in interference rejection. • **Three agc time**

constants plus "Off" are switch-selected from the front panel. • **Complete transceive/separate functions** when used with the Drake TR-7 transceiver are included, along with separate R-7 R.I.T. control. • **Special multi-function antenna selector/50 ohm splitter** is switch-selected from the front panel, and provides simultaneous dual receive with the TR-7. This makes possible the reception of two different frequencies at the same time. Main and alternate antennas and vhf/uhf converters may also be selected with this switching network. • **The digital readout** of the R-7 may be used as a 150 MHz counter, and is switched from the front panel. Access thru rear panel connector. • **The built-in power supply** operates from 100, 120, 200, 240 V-ac, 50/60 Hz, or nominal 13.8 V-dc. • **The R-7 includes a built-in speaker**, or an external Drake MS-7 speaker may be used. • **Built-in 25 kHz calibrator** for calibration of analog dial. • **Low level audio output** for tape recorder. • **Up to eight crystal controlled fixed channels** can be selected. (With Drake Aux-7 installed.) • **Optional Drake NB-7A Noise Blanker** available. Provides true impulse type noise blanking performance. • **Size:** (excluding feet, knobs and connectors) 13.6"W x 4.6"H x 13.0"D (34.6 x 11.6 x 33.0 cm). • **Weight:** 18.4 lbs (8.34 kg)

Drake R-7 Model 1240—0-30 MHz General Coverage, Digital Readout \$1295.00
 Drake R-7 Model 1241—Amateur Bands (160-10 meters), Analog Dial \$1100.00

Specifications and prices subject to change without notice or obligation.

R. L. DRAKE COMPANY



540 Richard St., Miamisburg, Ohio 45342
 Phone: (513) 866-2421 • Telex: 288-017

For a FREE Drake Full Line Catalog contact your favorite Drake Dealer.

CIRCLE 15 ON READER SERVICE CARD

September, 1979 • CQ • 53

**It's New.
It's for
2-meters.
It's the
Best.
It's the
Boomer.**



**A-3219
BOOMER**

cushcraft
CORPORATION
THE ANTENNA COMPANY

**And we
have it.**

**Barry
Electronics**
512 BROADWAY
NEW YORK, NY 10012
212-WA5-7000

CIRCLE 10 ON READER SERVICE CARD

PASS FCC EXAMS



The Original FCC Tests-Answers Exam manual that prepares you at home for FCC First & Second class Radiotelephone licenses. You get the complete set of 15 newly revised multiple-choice examinations - covering all areas tested on the actual FCC exam. Also included - helpful study tips, short cuts, and "Self-Study Ability Test." These updated FCC Tests-Answers take the mystery out of preparing for current FCC exams. Practical proven Material. \$9.95 postpaid. Unconditional Moneyback Guarantee.

COMMAND PRODUCTIONS
RADIO ENGINEERING DIVISION
P.O. BOX 26348-C SAN FRANCISCO, CA 94126
Please rush me Tests-Answers for FCC First and Second Class Commercial License. My \$9.95 is enclosed.

Name _____
Address _____
City _____ State _____ Zip _____

Please send all reader inquiries directly

SUBSCRIBER SERVICE

CHANGE OF ADDRESS

Planning to move? Please let us know six weeks in advance so you won't miss a single issue. Attach old label and print new address in the space provided. Also include your mailing label whenever you write concerning your subscription to insure prompt service on your inquiry.

Date / /
City _____
Address _____
Name _____
State _____
Zip _____

Attach Label Here

Please print

CQ Magazine
14 Vanderventer Ave., Pt. Washington, NY 11050

PHONE TROPHY WINNERS AND DONORS

Single-Operator All Band

World

9Y4VT, (Opr. Richard Norton, N6AA)
Donor: Bill Leonard, W2SKE

U.S.A.

W4DR, (Opr. Kevin Drost, WA8ZDT)
Donor: Potomac Valley Radio Club

Canada

VC7WJ, (Opr. Stuart Santelmann, WA1LKX)
Donor: Jack Baldwin, VE3BS

Carib./C.A.

Charles L. Clayton, VP2MBA
Donor: Jim Neiger, N6TJ

Europe

Ville Hiilesmaa, OH2MM
Donor: W4BVV Operators

Africa

Fernando-Juan Fernandez, EA8CR
Donor: Gordon Marshall, W6RR

Asia

Alfred Laun, HS1ABD
Donor: Japan CQ Magazine

Oceania

Katashi Nose, KH6IJ
Donor: No. Calif. DX Club

Single-Operator Single Band

World, 28 MHz

Rafael Ponce de Leon, CX3BR
Donor: K2HLB Memorial, N. Jersey DX Assoc.

World, 21 MHz

Drago Turin Jr., YU3ZV
Donor: Lee Wical, KH6BZF

World, 3.8 MHz

W1CF, (Opr. Dennis Mitchell, K8UR)
Donor: Fred Capossela, K6XX

U.S.A., 21 MHz

K1VTM, (Opr. Clarke V. Greene, K1JX)
Donor: So. California DX Club

U.S.A., 3.8 MHz

David Schoen, N2KK/G
Donor: Arnold Tamchin, W2HCW

Canada, 21 MHz

Yuri Blarovich, VE3BMV
Donor: Gene Krehbiel, VE7KB

Carib./S.A., 14 MHz

Herbert L. Schoenbohm, KV4FZ
Donor: Pedro Piza, Jr., KP4RF

Oceania, 21 MHz

Gary Belcher, KH6GMP
Donor: Pacific R.A.T.S.

South America, 21 MHz

Sergio Pontoni, YV2AMM
Donor: Rafael Ponce de Leon, CX3BR

QRPP Trophy

VP9AD, Allan J.B. Davidson
Donor: Adrian Weiss, K8EEG/O

Multi-Operator Single Transmitter

World

FY7BC (Oprs. FY7BC, FY7BG, F2OQ, F5OQ)
Donor: Don Wallace, W6AM

Canada

WB2RLK/VE1 (Oprs. VE1AIH, VE1MX, WB2RLK/VE1)
Donor: Calgary, A.R.A.

Multi-Operator Multi-Transmitter

World

PJ9JR (Oprs. K3EST, K3NA, K3RT, W3AZD,
WA3ZAS, K4VX, N4MM, N4RV, PJ2AAX,
PJ2ARI, PJ2FR)
Donor: Radio Club Venezolano

U.S.A.

N2AA (Oprs. K1KL, K2GL, K2BQ, K2NG, K2SS,
N2AA, N1XX, W1PM, K2TT, K2UR, N2WT,
WB2VYA, WA2SFB)
Donor: Dale Hoppe, K6UA

Contest Expedition Trophy

World Single Operator

CT3BZ, (Opr. Martti Laine, OH2BH)
Donor: Stuart Meyer, W2GHK

World Multi-Operator

ZL3H/C (Oprs. ZL1ADI, ZL1AJL, ZL1BKL,
ZL1AMO, ZL1ABS, ZL2AH, ZL3NR/c, ZL4NF)
Donor: Bill Schneider, K2TT

UA3-170-796. **UK3ACO:** UA3GC, UA3AGC. **UK3ACW:** UA3AEZ, UA3ABD, UA3ADY, UA3-170-566. **UK3DAU:** Nickolaevich, Nickolaevich. **UK3QBM:** UA3ODW, UA3ODR, UA3QBX, UA3OCU, UA3QES. **UK3TBF:** Kuznetsov, Letkov, Sidorov. **UK4ABW:** UW4AK, UA4-156-590, UA4-156-589, UA4-156-591. **UK4FAD:** UA4-148-32, UA4-148-200, UA4-148-286. **UK4SAM:** UA4-91-127, UA4-91-55, UA4SAM. **UK4UAC:** UA4UA, UA4UAC, UA4-92-47. **UK4WAA:** Markov, Kuznetsov, Mohov, Morgunov. **UK4WAB:** Baranov, Krylov, Sakerin. **UK5IBB:** UB5-73-1615, UB51JK, UB5-73-209, UB51HD, UB5-73-1615, UB5-73-2887. **UK5JAD:** Grene, Vlasov, Volkov. **UK5LAS:** Kapustina, Gordiehko, Linjova. **UK5MAG:** UB5MBP, UB5MDL, UB5MDP, UB5-59-11, UB5-59-610. **UK5MBE:** UB5MEG, UB5MEH, UB5MGP, UB5MKS, UY5WE, RB5MHE, RB5MNJ. **UK5MBF:** UB5MAB, UB5MDU, UB5MDG. **UK5MBV:** UB5MFR, UB5-59-010, UB5-59-7. **UK5MBQ:** CLUB. **UK5MCJ:** CLUB. **UK5MCO:** Maidanov, Shinkarenko. **UK5MDI:** UB5MBM, UB5MJS, UB5-59-57. **UK5QAV:** Zlenko, Dedich, Tarasenko, Nikitin. **UK5QBE:** UB5QBG, UB5QAV, UB5-64-900, UB5-64-37. **UK5UBB:** UB5-65-271, UB5-65-512. **UK5UBF:** Pilysh, Treus, Evtushenko, Zdolnik. **UK5WAG:** UY5XB, Alexeyev, Nozdryn. **UK6LEZ:** Gamzelev, Kiblitky, Indienko. **UK6LKP:** UA6LLT, UA6-150-331, UA6-150-330, UA6-150-420. **UK6QAA:** Siniansky, Pavlushenko. **UK6QAD:** Glushan, Kulish, Vorotnikov. **UK6WAA:** UA6WBV, UA6-86-104, UA6-86-147. **UK7LAF:** UL7-26-304. **UK7NAG:** UL7NAC, UL7NAL, UL7NAT. **UK9ABA:** UA9ACN, UV9AK, UV9AX, UV9AF, UV9BC. **UK9CCC:** UA9-154-1057, RA9CMV, UA9-154-1043, UV9CI. **UK9OBI:** UA900, UA9-145-217, UA9-145-426. **UK9UAO:** UA9UGS, UA9UOB, UA9-130-177, UA9UKM. **UK9XAA:** Chegesov, Schvets, Izmalkov. **UK9AAB:** UA9ADR, UA9AFO, UA9-103-114, UA9-103-290, UA9-103-373, UA9-103-90. **UK9LAK:** Shchelkunov, Mizoshinichenko, Shchelkunov. **UK9SAA:** Smirnov, Sysoer, Kalmykov, Mamontov. **VE1/WB2RLK:** VE1AIH, VE1MX, VE1UNB, VE1BCZ, VE1BEC, VE1BHA, VE1QT, VE1BJC, Al. Ralph. **VE3JDO & VE3JGT, VE2DZE, VE3KPA & VE3KQS, VE4AA:** VE4AH, VE4SN, VE4EW, VE4AE, VE4SW, VE4AT, VE4MP, VE4XJ, VE4RP, VE4SA, VE4SL. **VE7VCC:** VE7BQF, VE7DCQ, VE7DFO, VE7DGU. **VP1RX:** W4SME, W4BSO. **VP9DX:** VP9HP, VP9IV, VP9IW, VP9HK, VP9JA, VP9JC. **W1BK & W1VAR, W1VMU:** CLUB. **W1XX & W1JKS, W1OD, W2AEE & W2ARF, AE2B, W2KVE, W2ZKY, W2SVF, W2JD & W2PGC, W2TXH, W2KI & K2PO, W2UI & N3KR, W2XL & W2KTR, W2MBB, W2OOL & W2ONW, W2VEE & W2OXX, W3GL & W3HB, W3GRF & W3GCG, W3HRD & W3FHO, W3FSB, W3NAN & K3ON, W3ANV, W3NNA & W3VJN, 2M, NET, W3KFI & W3KFI, W3KFI, W3KHH, W4EI & W4BZR, W4DBK, W4LVM & 2M, NET, W4MGX & 2M, Net. **W4MAV & W4PKF, W4PUJ & W4MBP, W4WYN & W4WPO, W4FOT & W4PAB, W4LSD, W4LSG, W4YNV, W4YOF, W4SUE & K5OAZ, W5VCE, W6BH & W6IQM, W6BIP & W6DJI, W6PYN, W6CFK & K6TXR, W6VLD:** WA6DPO, N6KN, WA6HJK, WA6EUM, K6TXA, W6YMV, W6ZSU, W6ICK, W3CEO. **W6YRA:** A16K, WD6BAY, KB6AA, W6TKO, W6LHO. **W7NIN & K7OX, W7ZLC & K7WA, K7LXC, K7VV, W7UQV, W8PNF & AC8N, W8VVLV & W8BFC, W8ZBK, AA9N, KA9BBO, W8BHB, W8MTC, W8ZDN & W8WGM, W8WIP, W8DEE & W8QCY, W8SD & W8PJB, K8SD, W8SMV, W8GKE, W8MZB, AC8M, W8YMR, N8OAZ, N8AIT, W8UFS, W8QWY & KA8CRO, W8SNG & W8SNH, XE1OW & XE1ADS, XE1ADU, YO4KBJ: YO4CT, YO4YG, YO6KBM: YO6OO, YO6DB, YO6KEJ: YO6BJO, YO6MD, YO8KAN: YO8ME, YO8MI, YO8GV, YO8KGZ, YO8AEU, YO8AXN, YU1AJD: Dick, Zuki, Nick, Jordan. **YU1BCD:** YU1ODO, YU1ODS, YU1OQI, YU1OQZ, YU1QBC, YU1NZV, YU4VPA. **YU2CAL:** Ben, Bob. **YU3EY & YU3DM, YU3FK, YU3TBW, YU3TCB, YU3TU, YU4JLM:** YU4RS-2105, YU4RS-2150, YU4RS-2121. **YV5GRD & YV5AGS, YV5HCS, YV5HBV, YV4VS, Adolfo, ZL1AZV & ZL1AXB, ZS6TJ:** ZS6BQU, ZS6WV, ZS6BRQ, ZS6BQC, ZS6J, ZS6BPE, ZS6BPE, ZS6BOJ, ZS6IW, ZS6RC, ZR6LR, ZR6J, ZS6ZA, ZS6BRZ, ZS6AQU, ZR6N, ZS6ARE, ZR6LO, ZS6CL, ZR6MM, ZR6ND, 4M5UCV: #22015, 24978, 22411, 24974, 18560. **4U1UN:** W2PK, W2QM, K2YJ, N2UN, N2KW, W2YY, YO3JW, K2FC, HB9RS/W2. **4Z4SG:** 4Z4KX, 4X4IA, 4Z4WQ, 4Z4NXI, 4Z4WS, Ron, Dudi, Sam, Yaron. **9L1CA & EL2EU, W2CHO, 9L1KB, 9L1WS.******

STATION OPERATORS

Multi-Operator Multi-Transmitter

AD3V & W3NX, CF2YM2: VE2AUF, VE2HG, VE2JQ, VE2YM. **DL0II:** DJ2YE, DF1EA, DL3MV, DJ6EX, DJ4TJ, DK7JC. **DL0PG:** DF1QQ, DJ1FC, DJ6TK, DJ1QV, DK2QL, DK3BJ, DK5JI, DK8QA, DK9JL. **K0AX/DU2 & WB4ZNV, K5FSS, K3SWH, WD4KMD, WBY4SN, WB3III, Debellas, EA1NR & EA1FK, EA1HG, EA1LM, EA1LO, EA1MI, EA1MQ, EA1NQ, EA1VG, EA0CU:** EA8CU, EA8CY, EA8HJ. **EX9A:** UL7LEZ, UA9ACZ, UA9AEN, UA9AIS, UA9AN, UW9BY. **HH2CQ:** HH2MC, HH2T, K4UTE, N4UF, N4KE. **HP1DX:** HP1CY, HP1GV, HP1KC, HP1TS, HP1PM, HP1YV. **JH1ZLA:** JA1KSO, JE1GUP, JE1OMO, JF1BUI, JH1DTC, JH1OCC, JI1HXR, JR1JFO, JH2IRH, K7JA. **JA2YEF:** JF2DUS, JF2GNY, JH2XMM, JR2JUE, JR2PVI, JA0UEX. **JA2YXV:** JA2MQJ, JH2AIX, JH2BUS, JH2KTY. **JA3YBF:** JE3MCC, JE3OPD, JE3PED, JF3ELY, JF3JCT, JF3MTT, JF3NAL, JH3KIL, JH3NFZ, JH3PTH, JR3AJZ, JR3IOT, JR3UPO, JR3VSW, JH4CES, JH4DHX, JH6UBZ, JH0FQP. **JA3VKC:** JR2SQU, JA3ODC, JA3REU, JE3KCC, JE3MXQ, JF3KJJ, JF3SFP, JF3XHP, JH3AIU, JH3FIQ, JH3JRB, JH3KWO, JH3PKS, JH3PRR, JH3VOT, JR3BKH, JR3RIU, JR3XGK, JH4ETH, JA5GZB, JA5TDH, JA6VXM, JA9UDU. **JA4UBU:** CLUB. **JA4YVL:** JA4BKL, JA4CZM, JA4FUQ. **JA6YBR:** CLUB. **JA7YAA:** JA7KPK, JA7UQA, JA7WTC, JH7AEF, JH7DMV, JH7DVK, JH7DQN, JA7JRV, JH7SFC, JH7SFX, JG1UJD, JE1SRK, JA7LMK, JA7WBW, JH7WHM. **JA7YRR:** JA7CFB, JA7CLN, JA7CLX, JA7XUV, JA7JUD, JA7WSC, JH7MEV, JH7MEX. **JA9YAA:** JA5NQT, JH7UMC, JA8SHT, JA8ULV, JA9GAD, JA9KTR, JA9LPT, JA90FJ. **JH1YDT:** JH1GNU, JH1SBE, JR1AQQ, JR1FNR, JE1BME, JE1QMV, JF1ASB, JF1DMQ, JF1EAL, JF1EPK, JF1ODO, JI1SHX, JK1RJU, JA0VSH. **K1IK & K1RQ, W1IUU, K1RX & AB1Y, K1DG, W1PH, K2NJ/VP9:** K2NJ, K4LDR. **K3II & W3VA, W3EFH, W3FVJ, K3WW & K3WJV, N3ED, W3EX, WA3YO, W3FIY, W3FIZ, K4CG:** K3WUW, WA3ZJT, N4MO, WB4BQX, K5JA: AG5N, K5FUV, K5MR, K5RX, KA5COH, N5MP, N5RZ, N5TR, W5PBZ, W5PIP, W5EWP, W5GJN. **K8LX & K8GM, K8MD, N8EA, N8UM, W8W, W8TBQ, W8YVR, W8BALP, W8BAYC, KH6XX & AE6E, AH6Z, G3VZT, KH6LW, K7SS, N6ZV, N7ZZ, WH6ABM, W7EJ, KL7HR & AL7AF, KL7AZ, KL7FAP, KL7IUM, KL7IVX, KL7IWE, KL7IXZ, KL7RA, KL7UN, KL7IRT & WA4LJJ, AL7AK, KL7ENY, KL7KPL, KL7JEH, KL7JHK, KL7JHN, WL7ACY, WD0FIR. **N2AA & K1KI, N1XX, W1PM, K2GL, K2BQ, K2NG, K2SS, K2TT, K2UR, N2WT, WA2SFB, WB2VYA, OH1AA:** OH1IG, OH1JP, OH1LW, OH1NH, OH1NM, OH1NQ, OH1TV, OH3ZE, OH5UX, PI1VKL: CLUB. **PJ8CO:** K1CO, W1XK, K2MM, K2TR, K2WR. **PJ9JR:** K3EST, K3NA, K3RT, W3AZD, W3ZAS, K4VX, N4MM, N4RV, PJ2AAX, PJ2ARI, PJ2FR. **SK2KW:** SM2CPF, SM2DCF, SM2DMB, SM2DMU, SM5EKM, SM2HAK, SM2HGL, SM2HTT, SM2HZO, SM2IXM, SM0DGU, SM0MG, SM0GNU. **SP2ZFJ:** SP2AGM, SP2JUU, SP0078/EL, SP015/EL. **SP6PAZ:** SP6DVP, SP6FJG, SP6HAY, SP6HEK, SP6IGQ, SP6JYQ. **UK4WAR:** Fomin, Fomin, Islamor, Lapin, Ohotnikov, Shevtsov, Vasiliev, Yarmilov, Zapolski, Zagumennov. **UK5IAZ:** UB5-73-1151, UB5-73-342, UB5-73-1619, RB51XF, UB5-73-1474. **UK5IAZ:** UB5-73-837, UB5-73-470, UB5-74-113, UA6-101-152, UA6LO. **VE3KZ & VE3AKG, VE3BVD, VE3EDC, VE3ENM, VE3FFA, VE3FRA, VE3IXE, VE3KNX, G3YBH, VP2VER:** N6CW, N6RA, N6ZZ. **W1ZM & K1VR, K1ZM, WA1QGT, K2DM, K2ZM, K3ZM, K9ES, W2PV & K1AR, K1EA, K1FWE, K1SF, N1TZ, K2QF, K2VW, K2XA, N2HR, WB2QDP, W2YV & K1TA, K2NN, K2OY, N2NT, W2YX. **W3AA & AA3B, K3OA, K3RL, W3BI, W3GM, WA3VPO, K0VCK, W3AU:** & CX1EK/W4, DK5AD/W3, WA3TAI, WA3UPH, WB3DNL, W3FA & K3ZZ, N3GB, W3XY, WA3KCY, K8II. **W3KWH & K3MD, K3RYA, K3TP, W3IOH, W3SVJ, W3TVB, W3UIR, W3WHY, WA3BOH, WA3FWA, WA3FYJ, WB3BRY, WB3CXD, WB3EHO, WB3FWC, WB3HDI, K0BUDI3. **W3LPL & K3AO, W3MR, WA4CAD, W6AXX, W3MA & W3DHM, W3MM & K1PT, K3GM, K3OO, N3BB, N3VV, WA3VYD, W3WJD & K2BU, K3VW, W3RJ, W3XU, WA3LRO, W4BVV & K3KU, K3NPV, W3ZZ, WA3AMH, K4GD, K7ZZ, W6RDF:** K6XT, N6KA, N6ND, N6ZI, WA6EJL, W6EQI, W7KHN. **W7KW & AA7A, K7GM, N7CJ, N7MW, N7NR, N7RP, N7RT, W8BAP & AA8C, K8BST, KA8BUF, W8B8BP, W8B8ZL, W8BJOJ, W8BGF, W8BGL, W8BGM, W8BKVX, W8NTB, W9YH:** AD9O, K9GL, K9MK, K9VW, WD4CTG & WA4ADP, WA4LWL, WD4RIM, ZF2BC: K4VYN, W4YKH, WD4AXM. **ZL3HI/C:** ZL1ABS, ZL1ADI, ZL1AJL, ZL1AMO, ZL1BKL, ZL2AH, ZL3NR/c, ZL4F. **5K3SH:** HK3DEV. **4U1ITU:** K1ZZ, W2QD, W3JPT, OH2KH, SM0CKV.******

MORE FEATURES FROM ALLIANCE!



HD-73 HEAVY-DUTY ROTATOR

with exclusive Dual-Speed Control!

For antennas up to 10.7 sq. ft. of wind load area. Mast support bracket design permits easy centering and offers a positive drive no-slip option. Automatic brake action cushions stops to reduce inertia stresses. Unique control unit features DUAL-SPEED rotation with one five-position switch. SPECIFICATIONS: Max. wind load bending moment—10,000 in.-lbs. (side-thrust overturning); Starting torque — 400 in.-lbs.; Hardened steel drive gears; Bearings — 100- $\frac{3}{8}$ " diameter (hardened); Meter — D'Arsonval, taut band (back-lighted). There's much, much more — so get the whole story!

Mail this coupon for complete details!

YES! Send me complete details on the HD-73!
 Give me the name of my nearest dealer!

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____



The **ALLIANCE** Manufacturing Co., Inc., Alliance, Ohio 44601
A NORTH AMERICAN PHILIPS COMPANY

Maker of the famous Antenna Rotator... Alliance Tenna-Rotor®... "TV's Better Color Getter!"

© 1978 The Alliance Mfg. Co., Inc.

Please send all reader inquiries directly

TR-7600

TR-7625



RM-76



TS-700SP

**Compact in size...
big on performance!**

TR-7625

Featuring 25 watts RF output (switchable to 5 watts low power), the TR-7625 is a high-performance 2-meter FM transceiver with memory, and is designed to permit multi-channel (800-channel) operation. Compact and perfect for mobile or ham shack use. When used with optional RM-76 Microprocessor Control Unit, the TR-7625 offers a whole new dimension in channel memory and scanning capability.

TR-7600

Looks the same as the TR-7625, but offers 10 watts RF output (switchable to 1 watt low power). Also uses RM-76 Microprocessor Control Unit. For the Amateur Operator who's looking for optimum versatility in a 2-meter FM transceiver!

RM-76

Combined with either the TR-7600 or TR-7625, this optional Microprocessor Control Unit allows the operator to store frequencies in six memories (simplex/repeater); scan all memory channels; automatically scan up the band in 5-kHz steps; manually scan up or down in 5-kHz single or fast continuous steps; set lower and upper scan limits; clear scan (for transmitting); stop scan (with HOLD button); scan for busy or open channel; select repeater mode (simplex, transmit frequency offset (± 600 kHz or ± 1 MHz), or one memory transmit frequency. Operates on 143.95 MHz simplex (MARS). Display indicates frequency (even while scanning) and functions (such as autoscans, lower scan frequency limit, upper scan limit, and error, i.e., transmitting out of band).

TS-700SP

Here's an outstanding 2-meter all-mode transceiver that provides an extra dimension of versatility over the entire 2-meter band. Feature-packed and equipped for SSB, FM, CW and AM. Complete with built-in digital frequency readout, receiver preamplifier, VOX, sidetone, and microphone.

SPECIFICATIONS	Models TR-7600/TR-7625*	Model TS-700SP	Model TR-8300
Frequency Range:	144.00 to 147.995 MHz	144.0 to 148.0 MHz	TX: 445.0 to 450.0 MHz RX: 442.0 to 447.0 MHz
Mode:	FM	SSB (USB, LSB), CW, AM, FM	FM
Dimensions:	161mm (6-5/16") wide 81mm (2-3/8") high 230mm (9-1/16") deep	278mm (10-7/8") wide 124mm (4-7/8") high 320mm (12-5/8") deep	180mm (7-1/16") wide 60mm (2-3/8") high 240mm (9-7/16") deep
Weight:	1.75kg (3.85 lbs) Approx	11.0kg (24.2 lbs)	2.3kg (5.1 lbs)
RF Output Power:	High: 10(25) watts (min.) Low: 1(5) watt approx. (adjustable to 10 watts)	SSB, FM, CW—10 watts AM—3 watts FM (Low)—Approx. 1 watt	High: 10 watts Low: 1 watt Approx.
Modulation:	Variable reactance direct shift	SSB: Balanced modulation FM: Variable reactance frequency shift AM: Low power modulation	Variable reactance phase shift
Microphone:	Dynamic microphone with PTT switch, 500 Ω	Low-impedance microphone (500 Ω)	Low-impedance microphone (500 Ω) with PTT switch
Sensitivity:	Less than 0.4 μ V for 20 dB quieting	Less than 0.4 μ V for 20 dB quieting SSB & CW: 0.25 μ V for 10 dB (S+N)/N AM: 1.0 μ V for 10 dB (S+N)/N	1 μ V for 30 dB (S+N)/N 0.5 μ V for 20 dB noise quieting
Squelch Sensitivity:	Less than 0.25 μ V	0.25 μ V	0.3 μ V
Selectivity:	More than 75 dB at 30 kHz of adjacent channel	SSB, CW & AM: 2.4 kHz/-6 dB, 4.8 kHz/-60 dB FM: 12 kHz/-6 dB, 24 kHz/-60 dB	20 kHz/-6 dB 40 kHz/-70 dB
Image Rejection:	More than 70 dB	Better than 70 dB	

ACCESSORIES - VFO-700 remote VFO; SP-70 external speaker; KPS-7 power supply; MC-50 base microphone; MC-30S mobile noise-cancelling microphone; and MC-45 Touch-Tone microphone.

See your Authorized Kenwood Dealer for more details.



TR-8300

Designed for use in the 70-cm amateur band. Unique design of the TR-8300 makes it a great choice for mobile or fixed-station use. This FM transceiver is capable of F3 emission on 23 crystal-controlled channels (three supplied). Transmitter output is 10 watts.



KENWOOD
...pioneer in amateur radio

TRIO-KENWOOD COMMUNICATIONS INC.
1111 WEST WALNUT COMPTON CA 90220

TS-520SE



"Cents-ability" in a quality HF Rig!

The TS-520SE is an economical new version of the TS-520S...the world's most popular 160-10 meter Amateur transceiver. Now anyone can easily afford a high quality HF transceiver, providing 200 watts PEP input on SSB and 160 watts DC on CW!

The TS-520SE is a high-quality 160-10 meter SSB/CW transceiver intended for ham-shack use. The following changes were made to produce the new "SE" model:

- Replaced the heater switch with a CW WIDE/NARROW bandwidth switch, for use with the optional CW-520 500-Hz CW filter. A big improvement for the CW operator!
- Removed DC converter terminals. Now it operates strictly on 120 VAC and is not intended for mobile use.
- Removed transverter terminals. Now it is strictly a 160-10 meter SSB/CW transceiver.

All other proven features and high quality of the TS-520S have been retained in the TS-520SE, including:

- Effective noise blanker.
- Three-position (OFF, FAST, SLOW) amplified-type AGC circuit.
- RIT control.

- Eight-pole crystal filter.
- Built-in 25 kHz calibrator.
- Front-panel carrier level control.
- Semi-break-in CW with sidetone.
- VOX/PTT/MANUAL operation.
- TUNE position for low-power tune up.
- Built-in speaker.
- Built-in cooling fan.
- 20-dB RF attenuator.
- Provisions for four fixed channels.
- Speech processor consisting of a very effective audio compression amplifier.

The TS-520SE functions with many popular accessories, including:

- DG-5 digital frequency display/counter.
- VFO-520S remote VFO.
- SP-520 external speaker.
- CW-520 500-Hz CW filter.
- AT-200 antenna tuner/SWR and RF power meter/antenna switch.
- TL-922A linear amplifier.
- MC-50 dynamic microphone.
- SM-220 Station Monitor with BS-5 pan display module.

SPECIFICATIONS FOR THE TS-520SE

GENERAL:	
Frequency Range:	1.8- 2.0 MHz (160 m) 3.5- 4.0 MHz (80/75 m) 7.0- 7.3 MHz (40 m) 14.0-14.35 MHz (20 m) 21.0-21.45 MHz (15 m) 28.0-28.5 MHz } (10 m) 29.5-29.7 MHz } 29.1-29.7 MHz } 15.0 MHz, receive only (WWV)
Modes:	SSB (USB, LSB), CW
Antenna Impedance:	50-75 ohms
Frequency Stability:	Within ± 1 kHz during one hour after one minute of warm-up, and within 100 Hz during any 30-minute period thereafter.
Power Requirements:	120 VAC, 50/60 Hz; 200 W (transmit)
Dimensions:	13-1/8 inches wide, 6 inches high, 13-3/16 inches deep
Weight:	35.2 pounds
TRANSMITTER:	
Input Power:	200 W PEP (SSB), 160 W DC (CW)
Carrier Suppression:	Better than 40 dB
Unwanted Sideband Suppression:	Better than 50 dB
Spurious Radiation:	Better than -40 dB
Microphone Impedance:	50 k ohms
AF Response:	400-2,600 Hz
RECEIVER:	
Sensitivity:	0.25 μ V for 10 dB (S + N)/N
Selectivity:	SSB: 2.4 kHz/-6 dB; 4.4 kHz/-60 dB CW: 0.5 kHz/-6 dB; 1.5 kHz/-60 dB (with optional CW filter)
Image Ratio:	Better than 50 dB
IF Rejection:	Better than 50 dB
Audio Output:	1.0 W (8-ohm load with less than 1% distortion)
AF Output Impedance:	4-16 ohms

Ask your Authorized Kenwood Dealer about the amazing TS-520SE...and its surprisingly affordable price!

 **KENWOOD**
...pacesetter in amateur radio

TRIO-KENWOOD COMMUNICATIONS INC.
1111 WEST WALNUT/COMPTON, CA 90220

**WORLD TOP
10 QRP
(5w input)**

1. VP9AD	582,255
2. OA8V	367,872
3. WA4IAR	182,400
4. W6PQZ	143,100
5. DL8PC	109,736
6. K4JRB	103,572
7. PA0HLM/P	61,560
8. G3FTQ	59,796
9. W5YZ	57,640
10. F9YZ	46,080

Number groups after call letters denotes following: Band, (A=all), Final Score, Number of QSO's, Zones and Countries. Certificate winners are listed in Bold Face.

**PHONE RESULTS
SINGLE OPERATOR
NORTH AMERICA**

UNITED STATES	
K1XX	A 2,197,692 1595 123 363
WA1TFF	1,152,900 1211 107 271
W1UR	896,510 855 99 271
W100	864,635 890 89 246
W1YN	701,505 708 96 261
K1WB	614,420 704 87 223
W1XS	391,465 485 81 214
K1WJ	312,634 421 79 195
K1HMO	273,780 365 78 192

K1LS	259,008 430 64 149
K1GD	246,543 368 66 175
W1BIH	224,076 293 85 189
N1JW	214,722 331 74 163
K1EM	180,420 358 52 134
K1YHM	177,390 313 68 151
W1HX	153,670 229 80 174
W1WY	152,428 273 62 150
W1RQ	145,464 299 48 126
K1MEM	124,875 246 55 130
N1AU	118,917 241 54 127
W1ETV	96,744 243 38 101
N1AS	88,722 205 46 113
W1FJ	84,494 192 48 118
W1GD	77,880 182 46 119
K1AD	61,087 174 35 92
K1KTB	59,784 162 41 100
W1VV	59,184 152 46 98
WA1RDH	35,308 130 33 64
AD1S	26,924 105 38 68
W1ICU	21,406 100 26 51
K1LXJ	18,841 87 27 56
W1PLJ	15,844 84 22 46

K1RB	3,984 33 13 31
K1KNQ	2,590 27 12 23
N1MM	429,704 984 34 118
WA1UZH	271,545 729 29 100
K1TN	261,625 723 28 97
WB1DGG	259,080 699 28 99
WA1HFN	242,555 601 32 107
WB1ANT	175,972 556 29 87
K1LWI	173,271 540 27 84
K1SA	89,000 313 26 74
WA1OUB	80,391 221 30 78
WB1EUB	72,280 252 26 78
K1OT	71,208 294 24 62
WA1FCN	31,878 146 22 55
W1CNU	24,895 133 21 44
N1AN	23,800 123 23 47
WB1CPW	14,148 95 16 38
AD1Y	6,720 75 6 24
W1CTR	3,596 46 10 19
N1RI/1	2,610 33 11 18
K1VTM	616,572 1332 36 126
K1RM	543,063 1174 35 122
K1MM	403,004 981 33 115
WA1PSI	44,280 188 23 67
WB1GDY	7,280 65 14 26
W1YG	168,468 430 36 103
W1GG	135,847 373 33 98
W1GSH	111,720 351 30 84
WA1AER	101,455 350 30 73
WB1EMN	14,877 96 16 41
W1ESN	12,240 69 17 43
K1CV	34,030 155 20 62
W1CF	114,227 435 23 80
K1PBW	2,664 46 7 17
W1BB	624 17 5 11
N2LT	A 1,763,478 1360 122 337
N2SS	1,152,668 1036 104 287
K2BMI	1,097,547 919 112 309
K2UA	1,010,740 937 109 279
W2GD	991,561 915 105 284
W2IB	990,856 849 117 305
N2RM	764,314 772 99 247
N7TT/2	690,063 699 98 265
K2LE	664,680 692 91 257
W3HKK/2	514,292 685 72 196
WA2AUB	498,586 531 93 253
N2MR	487,830 546 89 233
AB2E	413,535 522 79 206
WB2SST	376,623 539 70 191
W2LU	368,988 466 99 218
K2TD	352,716 466 72 201
AA2Z	314,335 452 69 176

N9RR/2	279,910 432 61 169
N2KT	275,196 423 67 161
W2LEJ	227,824 356 63 169
W2REH	218,943 315 70 173
WA2AUB	211,029 296 86 187
N2GC	209,530 338 66 164
N2VW	191,970 303 75 162
W2QY	137,058 293 45 114
K2PA	119,081 239 56 137
N2CQ	117,950 238 53 122
AE2A	107,184 246 43 111
K2YGM	106,400 219 50 125
W2FGY	99,925 212 52 123
KB2DE	76,664 195 46 102
K2BK	73,059 186 42 105
W2HAZ	51,612 136 46 92
W2AYJ	47,520 142 45 87
W2NS	43,660 135 41 77
K2JF	37,851 121 39 72
N2KA	36,421 116 42 79
W2SDO	34,680 122 35 67
W2PFO	30,349 122 28 61
K2MN	14,878 63 31 55
K2MQ	12,084 60 27 49
W2FDE	8,640 68 11 34
WB2RWW	5,628 49 16 26
WA2WSD	3,735 34 17 28
WB2PXA	1,479 26 12 17
WA2PFC	1,118 20 11 15
WA2ZWH	73,324 276 26 66
WA2IFS	67,600 228 25 79
WA2PHA	43,260 183 24 60
WB2TKY	40,313 157 26 65
W2HG	38,098 157 24 62
WA2GUM	18,810 124 15 40
W2OKJ	8,910 91 8 25
WB2MJQ	6,532 56 16 30
W2FTY	6,480 48 18 36
KB2FA	136,612 392 30 89
WB2ZGI	127,211 374 26 93
WA2YLY	13,984 106 16 30
WB2ITR	197,664 480 34 108
WA2PLR	984 25 11 13
WB2VFT	13,054 92 17 44
WB2E00	8,820 118 11 25
K2SX	6,216 71 11 26
W3BGN	A 1,867,404 1409 118 344
N3DA	1,442,805 1107 118 337
N3RD	1,394,778 1071 126 336
N3AD	1,338,218 1126 110 317
K3ZJ	1,307,573 1175 112 297
W3GG	1,295,580 1024 113 316

N3UN	1,019,565 874 107 310
WA3SXH	863,580 856 86 274
N3RL	789,144 720 106 287
K3NZ	737,417 741 98 255
N3II	726,293 711 104 263
WA3DSD	672,324 661 95 263
N3DA	671,127 683 92 257
W3FV	580,606 649 93 233
K3MWW	553,668 576 99 249
KA3BKR	540,540 735 72 188
K3KA	525,742 589 93 236
W3GU	502,216 624 83 203
W3UJ	494,865 566 85 230
K3ND	477,855 551 89 244
W3GNO	468,072 581 91 206
WA3RSK	450,017 533 99 212
K3SA	441,712 508 81 223
K3WOK	362,026 472 78 188
K3IU	356,983 498 69 184
W3KT	318,662 427 83 191
W3GK	302,080 419 71 185
N3BE	281,231 424 70 163
W3HAD	248,103 265 63 180
K3MA	243,542 388 62 159
W3AZ	237,282 403 56 157
W3YFZ	225,570 369 66 153
W3KHB	214,914 319 68 170
WA3EKL	212,625 342 65 160
WB31XG	211,641 314 67 170
W3BB	207,870 355 58 147
W3EVW	206,901 317 75 162
K2SCU/3	200,997 353 60 147
W3KV	189,280 307 69 155
K3VA	168,315 273 66 163
WB3EAG	158,925 309 56 139
K3NL	134,757 242 65 142
W3GRS	131,340 215 68 152
W3OV	130,910 253 59 131
AD3Z	127,197 242 58 131
W3KFD	111,520 246 51 109
W3ZJ	78,204 202 47 100
WA3WNU	76,650 184 43 107
K3CY	71,071 178 46 97
W3HVM	66,740 173 43 99
K3GQJ	65,190 191 39 84
W3BE	60,534 144 53 124
N3HW	54,450 189 37 73
W3HB	53,060 148 51 89
WB3CIW	47,880 145 50 90
N4HX/3	43,130 165 28 67
K3TM	36,270 105 31 59
W3PN	33,075 119 41 64
W3DPH	30,330 120 32 58

The Personal Antenna

...Custom created with Hustler components.

Make your choice of Hustler components. Aluminum and chrome plated brass mast with bumper mounting or stainless steel 180° adjustable ball fender/deck mount. Standard 500 watt PEP resonators or Super 2 KW PEP resonators with large "Hi-Q" computer designed inductor and stainless steel tip rod. Optional quick disconnect stainless steel resonator spring. Quality manufactured 50 ohm coax. You want top performance. That's why you should customize with the MO/RM series antennas and components from Hustler, the name recognized for personal quality in antennas!

C-32 \$7.95
QD-1 \$16.95
RSS-2 \$5.95
RM-20S \$13.95
RM-40S \$16.95
RM-75S \$31.95
MO-1 \$22.95
MO-2 \$22.95



3275 North B. Ave. • Kissimmee, Florida 32741

Clearly the choice of those who know quality.



DEALERS

Adirondack Radio Supply
185-191 West Main St.
Amsterdam, NY 12010
518-842-8350

The Base Station, Inc.
2101 Pacheco St.
Concord, CA 94520
415-685-7388

"Ham" Buerger, Inc.
68 North York Rd.
Willow Grove, PA 19090
215-659-5900

Hatry Electronics
500 Ledyard St.
Hartford, CT 06101
203-527-1881

Spectronics, Inc.
1009 Garfield St.
Oak Park, IL 60304
312-848-6777

ZZZ Electronics, Inc.
422 Armour Circle, NE
Atlanta, GA 30324
404-876-0631

CALL TOLL FREE
1-800-228-4097

Hy-Gain 3806

2-Meter Hand-Held Amateur Transceiver

SPECIALLY PRICED ONLY \$119.⁹⁵



- Low cost, 6-channel hand-held provides superb voice transmission over short to medium distances
- Sharply tuned on-frequency selectivity in the RF amplifier stages plus FET's in the 1st and 2nd mixers for virtual immunity to out-of-band signals intermodulation distortion and cross-modulation
- Separate microphone and speaker elements for enhanced audio
- Internally adjustable mic preamp—a Hy-Gain exclusive
- Specially gasketed case seals out water, dirt and corrosive salt air
- Watertight, high-impact ABS plastic case—ribbed for non-slip grip
- Top-mounted controls for instant access

Accessories:

Model No.	Description	Price
3807	Nicad Battery Pack	\$31.95
1104	Touch Tone Pad	\$44.95
1106	AC Battery Charger	\$ 9.95
1107	Cigarette Lighter Adaptor Cord	\$ 9.95
1108	Antenna Adaptor Cord	\$ 9.95
1110	Carrying Case (Leather)	\$17.85
1111	Carrying Case (Vinyl)	\$ 9.95
269	Rubber Duck Antenna	\$ 5.95
	Crystal Certificates	\$ 3.95

PLEASE ENCLOSE \$2.50 FOR SHIPPING AND HANDLING PER UNIT

CALL TOLL FREE
1-800-228-4097

for Quality Ham Radio Products at Discount Prices

YAESU
 KENWOOD
 DRAKE
 ICOM
 STANDARD
 EDGECOM
 KDK
 PANASONIC

DENTRON
 HY-GAIN
 MOSLEY
 CUSHCRAFT
 WILSON
 HUSTLER
 LARSEN
 BENCHER
 ROBOT

TAYLOR
 SWAN
 TEMPO
 TEN-TEC
 MIDLAND
 CDE
 AUTEK
 MIRAGE
 AEA

E.T.O. ALPHA
 VHF ENGINEERING
 BERK-TEK CABLE
 CONSOLIDATED TOWER
 SAY
 SHURE
 TELEX
 ROBOT-SSTV
 BENCHER

Our Mail Order Hours (CST)

M-F 8 am to 12 Midnight
 Saturday 8 am to 6 pm
 Sunday 12 Noon to 8 am

Call and Talk to

Don	WBØYEZ	Ken	WDØEMR
Denny	WØQR	Eli	KAØCEJ
Bill	WBØYHJ	John	WBØMTS
Joe	WAØWRI	Blaine	WBØQLH
Jim	KAØCRK	Bob	WBØRQZ



Communications Center


443 N. 48th, Lincoln, Nebraska 68504

In Nebraska Call (402)466-8402

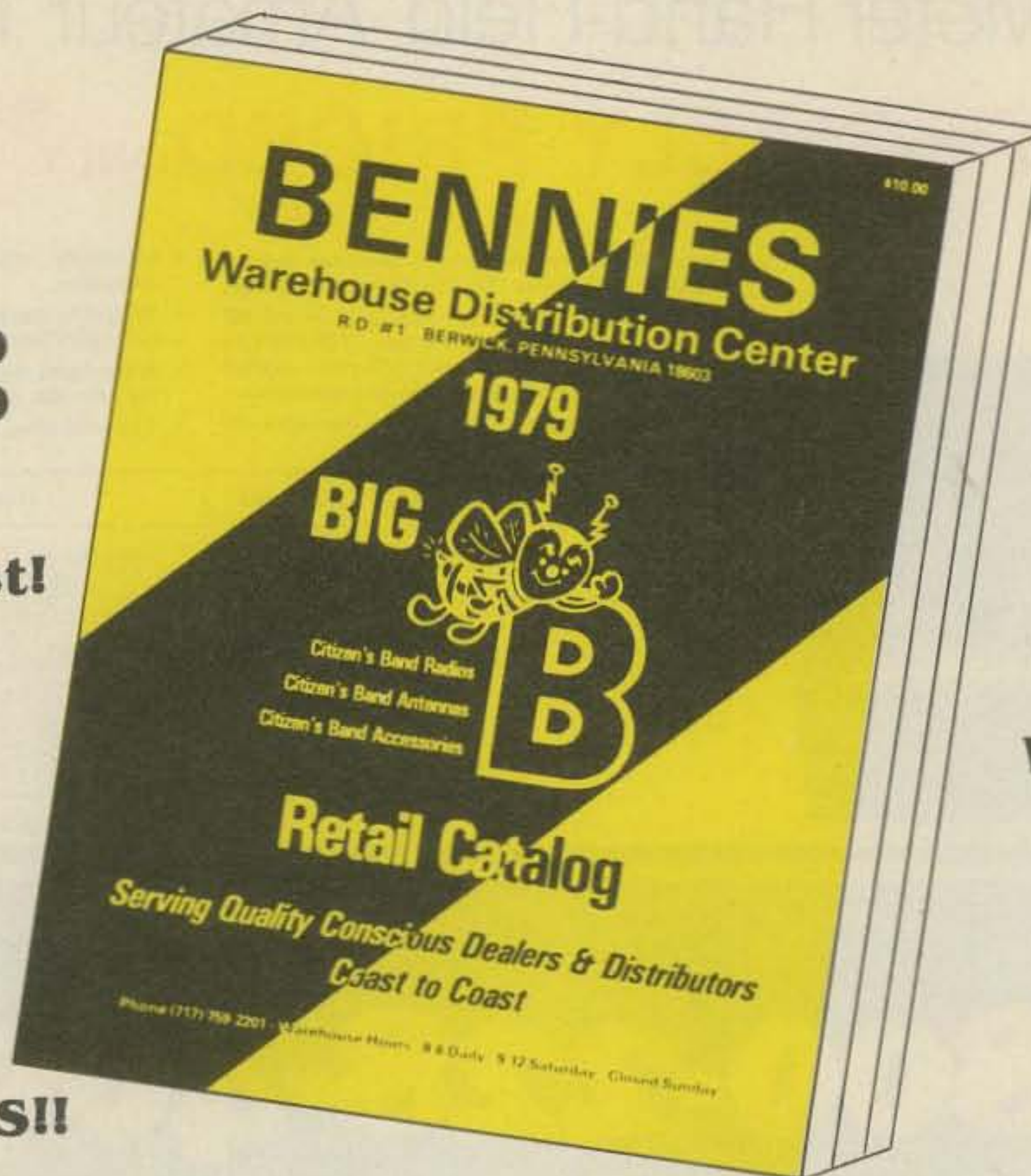


\$AVE GA\$\$ WITH CB!

ARE YOU IN  BUSINESS?

LET US  BEE YOUR SUPPLIER!

**SEND \$10.00
For Our 1979
ELECTRONIC
CATALOG
And Price List!**



**You Will Also
Be Put On Our
Weekly Mailing
List When You
Apply For
Catalog.**

**Over 300
Pages Of
ELECTRONICS!!**

**Please send letterhead or tax number! If you
are just starting business talk to our Sales
Personnel for any assistance you may need.**



BENNIES

**WAREHOUSE DISTRIBUTION CENTER
R.D.1 BERWICK, PA. 18603 717-759-2201**

CIRCLE 72 ON READER SERVICE CARD

K0KE	21	237,390	659	33	90
K0ZX	21	227,290	694	31	88
N0AT	21	107,734	317	29	89
K0CO	21	76,095	325	27	62
W0SML	21	73,295	240	28	79
K0VGB	21	31,652	143	23	59
K0AQ	21	24,360	129	22	48
W0AYT	21	6,370	47	12	37
W0KSL	21	2,442	27	12	52
K0VBU	21	798	16	9	12
K0KX	14	205,572	500	36	112
W0ZV	21	62,829	195	37	80
W0BGY	21	61,566	238	24	69
K0XD	21	11,375	63	22	43
K0RF	7	85,170	354	23	62
K0VUW	21	26,364	176	20	58
W0UD	21	14,628	82	21	48
W0TKJ	21	7,738	62	18	35

ALASKA					
KL7GRP	A	376,838	929	55	99
KL7AF	21	60,043	269	42	52
KL7ED	14	127,425	688	21	54

BERMUDA					
N1GLVP9	A	3,815,736	3540	118	326

CANADA					
VE1AI	A	1,234,863	1341	100	257
VE3IQ/1	21	192,910	350	53	147
VO1KO	21	43,860	244	21	30
VE1ALJ	21	3,854	45	22	39
VE1BNN	28	276,873	950	27	96
VO1FB	21	120,175	536	23	72
VE1BBS	21	35,469	229	17	46
VE2AYU	A	628,976	829	84	220
VO2AG	21	92,400	491	28	56
CH3GCO	A	1,791,108	1828	110	286
VE3CEF	21	466,764	635	79	212
VE3HD	21	401,351	528	79	192
VE3DLR	21	357,870	648	66	171
VE3DUS	21	342,528	506	73	183
VE3VC	21	123,221	216	62	142
VE2EZU	21	19,000	82	34	61
VE3UX	21	14,823	67	25	56
VE3ECH	21	2,262	39	13	16
VE3IKN	28	121,392	434	26	82
VE3IPS	21	92,552	416	23	69
VE3JAR	21	83,748	372	23	63
VE3KIU	21	7,310	72	14	29
VE3BMV	21	913,556	2273	35	123
VE3BBH	21	377,910	840	30	100
VE3WD	14	261,380	722	34	106
VE3IPR	21	33,264	201	22	55
VE3ACB	21	5,336	48	19	27
VE3ECP	3.8	53,200	475	15	41
VE3FAC	1.8	2,072	148	3	4
VE3BBN	21	900	91	2	3
VE4SW	21	260,585	1101	23	72
VE5DX	A	2,247,471	2962	109	218
CF5RA	21	919,248	1492	88	176
VE5AAO	21	143,524	1354	28	78
VE6AG	A	467,103	971	70	107
VE6AGV	21	444,690	1097	74	109
VE6MP	21	200,096	416	49	120
CG6LB	7	24,026	289	15	26
VC7WJ	A	2,739,140	3716	99	203
<i>(OPR. WA1LKK/K1UA)</i>					
VE7CC	21	2,461,184	2851	113	255
VE7CMK	21	1,870,372	2779	97	171
VE7AJ	21	62,356	182	56	75
VE7CRW	28	49,880	423	21	37
CF7IQ	21	8,626	97	16	22
VE7CML	21	713,950	2593	30	79
VE7AQF	21	369,360	1532	27	63
VE7AV	14	145,152	471	28	84
VE7AQR	21	141,660	573	22	69
VY1BF	28	80,647	994	19	22
CF8CC	21	47,628	1151	10	11

CUBA					
CO2JA	A	374,773	626	80	179
CM2HB	7	50,830	400	18	46

DOMINICA					
VP2DD	1.8	25	3	2	3

DOMINICAN REPUBLIC					
H18LC	A	204,672	691	40	83
H18MOG	28	582,894	2029	28	89
H18XDJ	21	555,498	2100	31	96
H18JAG	1.8	2,080	66	5	11

GREENLAND					
OX3ZM	A	56,826	316	35	47
OX3AK	21	23,746	156	21	41
OX3BX	21	9,028	52	20	41

MEXICO					
6D1MEX	A	684,472	2102	52	82
XE2MX	21	612,438	1108	72	134
4C1VOZ	21	292,434	1023	46	76
XE1VV	21	228,312	556	55	112
6F8J	28	509,886	1719	30	87
XE1LCH	21	365,376	1960	26	62
XE1LLS	14	158,166	725	28	73

MONSERRAT					
VP2MBA	A	974,142	2032	62	145

PANAMA					
HP1XYA	14	137,640	650	27	66

PUERTO RICO					
KP4AM	A	399,360	1188	57	103
KP4DS	28	650,650	2738	28	82
KP4D	21	796,053	2600	33	106
KP4RF	14	1,390,785	3529	38	127

ST. LUCIA					
VP2LBH	A	175,914	981	36	51

VIRGIN ISLANDS					
KV4FZ	14	1,520,904	3890	36	132

AFRICA					
CANARY ISLANDS					
EA0CR	A	7,639,624	4876	130	396
EABURE	21	645,540	1031	59	151
EABJJ	28	783,364	1771	34	114

EGYPT					
SM2ALH	A	798,390	1173	59	270

GABON					
TR8RG	A	364,641	631	59	138
TR8DC	21	70,108	349	21	47
TR8AC	14	112,032	523	22	50

KENYA					
5Z4PV	A	97,625	309	40	66

LIBERIA					
EL2AE	21	116,920	539	22	57

MADERIA ISLANDS					
CT3BZ	A	7,211,790	5316	11	343
CT3BD	21	1,283,366	2450	67	151
CT3/	28	75,670	379	20	50
OH2FR	21	75,670	379	20	50

REPUBLIC OF SOUTH AFRICA					
ZS6BNZ	28	855,260	2049	35	105
ZS6WW	21	80,172	395	19	49

INDIA					
VU2ACD	A	545,566	791	82	184
VU2TS	21	334,400	819	62	147
VU2GQ	21	19,240	101	22	52
VU2HI	14	285,328	810	33	103

IRAN					
EP2RL	A	1,050,090	1177	77	178
EP2JC	21	38,537	165	27	62
EP2SL	3.8	7828	84	9	29

ISRAEL					
4Z4HF	28	448,250	1377	30	80
4Z4UX	21	222,420	694	33	77
4Z4WQ	21	55,309	300	22	49
4X4UH	21	738,315	1907	33	102

JAPAN					
JH1JGX	A	1,623,739	1496	122	255
JR1AIB	21	1,322,989	1180	131	258
JA1ELY	21	1,113,222	1157	111	223
JA1PCY	21	891,048	1125	98	173
JR1MTQ	21	800,028	980	98	186
JA7JWF	21	433,600	739	73	127
KA6DX	21	399,384	563	96	162
JF1SEK	21	315,328	535	73	135
JA8SW	21	221,721	412	70	117
JA3EQC	21	121,968	338	51	75
JJ1DNE	21	111,426	269	57	90
JA9SQO	21	101,864	301	46	73
JR1LEV	21	92,520	276	50	70
JA6OKK	21	71,775	179	52	93
JH6SQI	21	70,455	236	45	60
JA2YAC	21	52,173	208	46	47
JA9SOT	21	46,870	191	33	53
JA5SIX	21	46,866	159	43	64
JA0FMB	21	46,170	143	46	68
JA1PUK	21	45,496	129	48	73
JA7ARW	21	35,441	154	37	46
JA4GXS	21	34,122	129	42	52
JA1JCA	21	30,104	148	34	37
JH4RKD	21	25,545	135	24	41
JJ1KUV	21	20,435	120	24	37
JJ1SOE	21	20,398	115	30	32
JA1BDI	21	18,316	92	35	41
JA5AUC	21	18,128	67	37	51
JA4ZD	21	17,080	102	25	36
JH5EYD	21	13,330	109	15	28
JA1RDP	21	11,475	79	24	27
JF3CEC	21	11,295	87	23	22
JA2FSM	21	10,395	65	27	28
JA7BIJ	21	9,222	162	29	29
JA3MFE	21	9,116	71	27	26
JK1ONH	21	7,824	50	20	28
JA5ARW	21	6,191	53	16	25
JA0TVA	21	4,960	59	15	16
JA4XKL	21	4,896	37	18	30
JA7FMZ	21	3,276	41	14	14
JA1LB	21	2,952	31	18	18
JA7AQZ	21	1,140	18	9	11
JF1NCT	21	520	10	10	10
JH1AJT	28	540,123	1439	32	97
JH1ARJ	21	426,041	1268	31	90
JA6OKB	21	420,352	1146	34	94
JA2DYI	21	404,246	1294	32	75
JH7DNO	21	382,941	1122	34	83
JR1IJV	21	324,760	970	32	83
KA6JC	21	280,908	899	33	75
JA7BSK	21	233,992	908	25	83
JH18BT	21	220,542	640	32	86
JF1EEK	21	219,199	696	32	77
JA1DQT	21	181,896	603	30	76
JF1XAM	21	126,144	451	30	66
JA1MYW	21	106,227	376	31	68
JH1BNC	21	105,555	394	28	65
JH7UJU	21	80,184	360	24	54

INDIA					
VU2ACD	A	545,566	791	82	184
VU2TS	21	334,400	819	62	147
VU2GQ	21	19,240	101	22	52
VU2HI	14	285,328	810	33	103

IRAN					
EP2RL	A	1,050,090	1177	77	178
EP2JC	21	38,537	165	27	62
EP2SL	3.8	7828	84	9	29

ISRAEL					
4Z4HF	28	448,250	1377	30	80
4Z4UX	21	222,420	694	33	77
4Z4WQ	21	55,309	300	22	49
4X4UH	21	738,315	1907	33	102

JAPAN					
JH1JGX	A	1,623,739	1496	122	255
JR1AIB	21	1,322,989	1180	131	258
JA1ELY	21	1,113,222	1157	111	223
JA1PCY	21				

TOP SCORES

WORLD		USA	
Single Op		Single Op	
All Band		All Band	
9Y4VT	8,281,800	W4DR	2,727,108
EA0CR	7,639,624	N7DD	2,680,820
CT3BZ	7,211,790	K1XX	2,197,692
N1GL/VP9	3,815,736	W3BGN	1,867,404
9Y4VU	3,732,944	W9ZRZ	1,797,120
OH2MM	3,649,556	N2LT	1,763,478
UB5WE	3,551,757	N3DA	1,442,805
G3FXB	3,520,445	K6RR	1,411,540
DK8FZ	3,189,028	N3RD	1,394,778
OZ5KF	3,186,303	N6KT	1,393,789
Single Op		Single Op	
Single Band		Single Band	
28 MHz		28 MHz	
CW3BR	1,662,718	K6OQ	527,560
VR3AH	1,442,244	W4QQN	440,580
KG6JIH	1,233,960	N1MM	429,704
DK5WL	1,000,368	K3UA	401,938
OA4JR	872,931	W5MYA	385,710
ZS6BNZ	855,260	K9RA	374,374
21 MHz		21 MHz	
YU3ZV	1,212,530	WA6EKL	635,830
YV2AMM	1,187,280	K1VTM	616,572
GU5CAA	1,123,380	K1RM	543,063
CX7AL	961,758	AE6U	520,336
VE3BMV	913,556	N6SV	489,839
CW3A	861,720	AI6V	430,815
14 MHz		14 MHz	
KV4FZ	1,520,904	K9DX	311,064
KP4RF	1,390,785	N6RJ	266,114
VE3BWK/ 4U	1,061,634	W9OBF	241,890
HC1BU	749,126	K9RF	226,500
FC9UC	722,598	W5NA	225,440
OH8OS	665,802	K0KX	205,572
7 MHz		7 MHz	
I3MAU	240,108	K0RF	85,170
SP3DOI	198,198	K9HMB	55,242
JA2BAY	149,500	WB9NKH	38,402
OH8SR	136,952	K1CV	34,030
JA1AEA	125,680	W9CH	28,980
OH1IJ	107,535	K0VUW	26,364
3.8 MHz		3.8 MHz	
W1CF	114,227	W1CF	114,227
N2KK/6	71,520	N2KK/6	71,520
YU1EXY	63,833	W8WW	57,216
HC1EE	60,912	K8XX	38,052
DW8WW	57,216	W9L5	31,200
DT2AUJ	56,700	WA3FET	30,160
1.8 MHz		1.8 MHz	
GM3ZSP	4,179	K1PBW	2,664
DJ8WL	3,887	W8LRL	1,608
YU3EF	3,066	K6SE	1,280
K1PBW	2,664	K5YY	688
JA1UPO	2,646	W1BB	624
G3XWZ/A	2,180	K8CFU	616
Multi-Op		Multi-Op	
Single Transmitter		Single Transmitter	
FY7BC	8,989,695	K5GA	4,150,306
RF6F	7,445,996	K1PR	2,871,628
9L1CA	7,367,846	K8NA	2,289,474
IZ4VEQ	7,087,304	K0UK	2,223,864
YU3EY	6,432,251	W6BH	2,204,160
UK2BBB	5,539,240	N6MG	1,729,856
Multi-Op		Multi-Op	
Multi-Transmitter		Multi-Transmitter	
PJ9JR	29,211,300	N2AA	8,940,909
KH6XX	18,134,798	W3WJD	8,460,605
PJ8CO	15,998,080	W7RM	8,269,368
EX9A	15,364,085	W2PV	7,701,540
VE3KZ	10,612,755	W3MM	5,905,896
VP2VER	9,188,191	W1ZM	5,400,200

G4CVZ	**	240,130	730	45	140
G5COP	**	189,156	541	43	89
G3DYY	**	318,000	588	83	192
G3TKR	**	96,096	322	45	123
G5CMX	**	51,150	285	23	70
G2AJB	**	44,821	209	34	99
G3MWZ	**	37,948	210	28	78
G3MXJ	28	829,584	2035	36	108
G3ZQW	**	771,498	2197	34	92
G4CNY	**	769,350	1980	36	102
G4DRT	**	160,680	624	27	77
G3XFW	**	6216	73	12	25
G3TXF	21	345,344	1028	32	96
G3RRS	14	472,099	1305	40	117
G3ZHL	**	75,440	567	18	64
G4HLN	**	27,714	296	14	48
G3RAM	**	16,254	173	13	50
G4DBL	7	4,059	87	7	26
G3XWZ/A	1.8	2,180	66	4	16

FAEROES ISLANDS

OY1A	A	10,875	120	18	57
------	---	--------	-----	----	----

FINLAND

OH2MM	A	3,649,556	3213	110	318
OH6DX	**	2,695,632	2872	98	258
OH1XX	**	2,307,823	2111	112	327

OH6JW	**	2,254,980	2026	117	338
OH2YY	**	1,297,560	1803	80	250
OH2PM	**	1,155,339	1372	97	272
OH1AD	**	505,749	836	79	184
OH7NW	**	94,600	330	44	144
OH2KP	**	89,628	297	50	144
OH5PA	**	60,420	176	47	112
OH2VO	**	44,472	217	45	91
OH3HY	**	34,524	138	35	49
OH2PD	**	31,956	160	29	46
OH2BSS	**	16,354	105	28	46
OH2JG	**	14,507	71	34	55
OH1EH	**	6,450	49	21	38
OH2VZ	**	5,723	49	21	38
OH1EB	**	2652	36	15	24
OH3TY	**	1650	27	16	22
OH6TA	**	875	16	11	14
OH5NW	28	617,984	1726	34	102
OH1MA	**	507,492	1518	33	94
OH3PB	**	99,654	429	28	74
OH2XA	**	18,502	138	16	42
OH500	**	3515	56	11	26
OH2BCP	21	672,278	2039	35	99
OH5TS	**	493,038	1591	30	87
OH1HB	**	99,360	409	30	78
OH2FS	**	91,876	390	26	77
OH5LP	**	54,600	512	19	59

OH4SD	**	53,900	303	20	57
OH3MF	**	36,774	255	20	61
OH1VA	**	32,760	202	20	64
OH8VC	**	18,827	191	19	48
OH1LU	**	10,584	84	16	47
OH80S	14	665,802	1868	38	103
OH2JD	**	18,900	200	14	56
OH8VU	**	25	3	2	3
OH8SR	7	136,952	697	28	78
OH1IJ	**	107,535	736	24	83
OH1ZK	**	9,898	166	9	40
OH6UC	3.8	666	38	3	15
OH2BO	1.8	1496	91	3	14

FRANCE

F8WE	A	232,650	696	53	172
F6DFQ	**	178,664	427	61	123
F6DDP	**	109,855	349	47	126
F2R0	**	92,157	276	45	94
F6DLM	**	38,400	125	48	102
F6DE0	**	38,115	196	30	69
F6BJA	**	14,820	95	24	36
F6DRP	**	12,920	116	19	49
F6EPO	**	10,290	108	23	47
F6BVB	28	73,720	389	22	54
F6EEM	**	57,072	303	21	61
F2V0	**	3,892	59	11	17

BEWARE!!

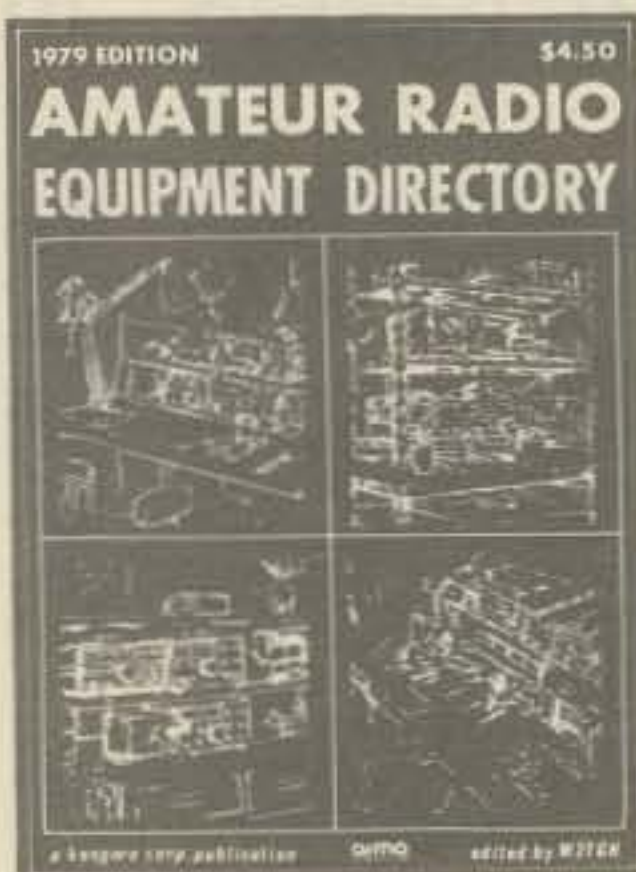
Aluminum towers are not usually as strong as steel towers — ask for engineering facts before purchasing any tower. Aluminum towers, in most cases, are one-half as strong as steel towers within the same price range.

Notice Paid For By Unarco-Rohn

(Advertisement)

F6CMO	2,132	34	11	15	DJQXT	64,330	331	23	47	DM2CPD	1,056	26	8	8	HA5HM	1,410	32	8	22			
F9GL	14	218,253	759	37	96	DK5VO	47,196	214	29	63	DM4SDA	126	6	3	4	ICELAND						
F6FHA	4,641	89	9	30	DL9HN	47,034	240	22	56	DM2DSG	21	12,349	123	15	38	TF3US	A	63,706	450	31	75	
F6EMP	2,652	42	11	32	DK8JB	41,544	246	24	48	DM2AOL	11,640	79	19	41	K4IIF/TF	52,264	379	27	67			
GERMANY (FRG)					DJ6XG	41,339	211	25	42	DM2FBN	6,996	68	16	28	TF3YH	15,200	101	23	53			
DK8FZ	A	3,189,028	2672	103	325	DK1NF	26,896	158	23	45	DT4YUL	6,232	88	12	29	TF3AC	28	9,589	140	12	31	
DJ4PT	3,173,184	2880	124	324	DK4IO	20,820	165	20	40	DM2FMO	5,280	85	12	28	IRELAND							
DL8UI	2,474,155	2322	114	329	DL3ZI	18,368	101	28	54	DM2EHA	2,075	39	8	17	EI9CB	A	708,292	1367	66	191		
DJ6QT	1,720,612	1584	109	334	DJ4EJ	12,870	91	18	37	DM3UGO	918	32	6	11	EJ2CA	28	73,032	433	19	49		
DJ3HJ	1,477,440	1986	82	222	DL2RM	7,272	86	14	22	DT3UE	720	24	7	9	EJ7CC	21	83,750	579	16	51		
DK1QC	1,356,089	1637	95	232	DF3OE	1,638	38	9	29	DT3FZN	14	16,434	211	15	43	E12BB	14	242,190	801	36	102	
DK8NG	1,044,528	1213	95	281	DL9SNA	21	92,340	377	23	72	DM4MSM	16,046	145	22	49	ITALY						
DJ4ZR	994,740	1303	82	199	DJ9ZB	46,920	277	20	65	DM4YJM	15,309	196	12	51	IV3PRK	A	2,438,052	2295	106	305		
DL7RT	977,760	1188	90	270	DK3JU	22,287	152	17	40	DM2EHL	13,104	200	10	46	I2MOP	413,172	869	62	145			
DJ5JH	935,136	960	101	281	DL3AH	14	85,680	303	33	93	DM5WVL	8,944	143	11	41	I3VJW	149,066	456	44	102		
DK3SN	728,460	961	79	206	DK5WN	7	61,938	550	16	58	DM2FLN	6,900	122	9	37	I12YR	63,888	313	36	96		
DF7FH	696,656	1100	75	202	DK3FB	16,856	200	14	42	DM2BTB	6,298	116	10	37	I8INW	9,525	76	31	44			
DJ9MH	615,288	813	97	275	DJ2XU	7,972	53	6	28	DM2CJH	4,982	48	16	37	I6PLN	28	650,012	1918	35	86		
DJ2TI	524,238	779	76	210	DA100	3.8	24,704	339	11	53	DM3XZH	4,972	69	13	31	I1POR	632,730	1714	33	98		
DJ4PI	408,672	536	97	255	DJ8WL	1.8	3,887	153	5	18	DM2CRO	3,325	105	6	29	I4AVG	520,752	1635	35	79		
DL8OS	333,095	620	65	152	GERMANY (GDR)					DT2BLE	1,767	53	6	25	I5VXG	508,926	1487	33	88			
DJ8JY	257,712	559	62	106	DT2DUK	A	2,646,000	2714	99	293	DM2BWA	1,222	4	4	22	I1YBM	336,636	1457	33	75		
DJ3ST	218,027	407	67	196	DM2CDL	1,026,672	1347	83	210	DM2BH	648	25	5	13	I5MPP	248,008	766	31	85			
DJ8UV	200,244	566	57	189	DM2BJJ	517,321	931	73	208	DM5JBN	528	22	8	16	I1FQH	218,218	886	26	65			
DK8AX	199,584	495	58	158	DT2CUO	432,365	992	56	159	DM2FHO	7	2,187	86	4	23	I4GZV	194,679	758	27	70		
DF2HL	188,596	405	63	166	DM3XPE	201,576	615	61	166	DT2BOO	1,650	69	4	25	I0GFP	174,339	672	27	72			
DJ7XB	153,260	350	63	131	DM4WFF	172,660	566	53	141	DT2AUJ	3.8	56,700	596	19	51	I2LPA	170,128	561	31	81		
DJ3GI	143,682	286	70	161	DT3VAA	168,796	454	56	142	DM4WPF	36,992	496	12	52	I8KPV	132,466	561	78	79			
DK8OP	138,634	630	29	49	DM4YK	133,496	483	52	112	DM2CRB	15,141	288	8	41	I4CSP	82,656	401	22	60			
DL3PN	136,390	439	44	71	DM4RDA	132,212	269	71	133	DM2EVA	7,257	176	6	35	I8ZLW	81,130	465	17	53			
DJ2UJ	134,420	327	61	159	DM3HF	123,640	230	71	149	DM2CMA	220	21	2	9	I2ARC	56,210	333	21	49			
DF3ZV	123,324	439	44	128	DT28TO	104,718	345	51	135	DM2FKL	156	11	4	9	IV3HL	39,960	210	24	48			
DJ9GW	106,085	205	68	177	DT4BK	96,264	405	42	126	SV0WA	28	73,120	480	24	56	IV3TQE	33,748	205	22	37		
DK8KC	105,612	373	42	114	DT3NKF	66,150	363	32	94	GREECE					I6NOA	21	609,588	1867	32	91		
DF2RQ	105,040	306	47	83	DM2DKK	63,648	319	36	100	GUERNSEY					I1BAF	352,110	1186	28	82			
DJ5MC	101,355	319	48	97	DT2YLD	49,200	172	52	98	GU3YIZ	A	511,290	1186	45	126	IN3FJT	332,406	1041	30	88		
DL1MD	93,312	269	44	100	DT3BE	47,124	153	44	75	GU4EON	28	721,995	2284	33	89	I3ILH	17,544	152	19	49		
DL2JO	59,492	254	40	99	DM3VFF	42,020	233	28	81	GU5CAA	21	1,123,380	2729	35	123	I0ZXB	14	448,248	1708	36	103	
DF4BO	51,480	276	30	87	DM2GGL/A	39,420	208	38	108	GU5CIA	1,300	21	10	15	I1VDF	274,680	860	37	103			
DL7OG	50,052	165	41	88	DM2BRK	39,096	347	24	84	GU3HFN	1.8	1,764	100	3	14	I4AFQ	244,215	822	34	101		
DF8XP	47,872	188	36	92	DM5ZLG	25,896	176	31	73	HUNGARY					I4EVO	12,960	147	15	45			
DK5KJ	33,960	177	36	84	DM3UH	25,484	117	36	56	HA8ZS	A	1,319,760	1594	103	257	I3MAU	7	240,108	1060	24	78	
DA1EG	28,704	144	36	68	DM3EA	22,470	79	44	61	HA0DU/9	713,106	1029	94	252	I3BBZ	38,285	352	16	49			
DF2RG	8,845	78	23	38	DM4YEL	21,390	80	39	54	HA0KLU	657,748	1129	94	244	MALTA							
DK5CI	2,842	35	15	14	DM5RNH	7,503	97	17	44	GUERNSEY					9H1EV	14	390,610	1257	34	100		
DF6YC	1,160	38	9	14	DM3BF	5,044	93	9	43	GU3YIZ	A	511,290	1186	45	126	NETHERLANDS						
DK5WL	28	1,000,368	2480	36	108	DM5WGL	1,012	31	9	14	GU4EON	28	721,995	2284	33	89	PA2TMS	A	3,011,940	2883	108	327
DJ0UJ	658,420	1810	37	103	DM4UVL	837	33	7	20	GU5CAA	21	1,123,380	2729	35	123	PA0AGA	1,030,887	1364	85	266		
DL3ZA/P	401,866	1088	37	97	DM3WMJ	28	70,470	328	26	61	GU5CIA	1,300	21	10	15	PA0TAU	548,166	814	83	226		
DK8QU	384,429	1175	35	92	DM3SBM	30,225	177	22	43	GU5YK	1,300	21	10	15	PA0HWM	190,309	388	65	152			
DJ4XA	275,717	808	33	94	DM40LG	20,064	140	20	37	HA6ZV/P	91,104	363	45	111	PA0LJM	177,177	585	51	126			
DJ1ZU	247,936	845	28	76	DM4WZA	12,540	133	13	25	HA50C	42,658	412	18	59	PA0TO	48,960	230	37	83			
DK4ST	195,804	831	26	58	DM4LGG/	9,912	92	15	27	HA4XG	6,120	75	12	33	PA0YN	20,025	123	27	40			
DJ7IK	179,250	509	35	115	30G	9,912	92	15	27	HA7PQ	840	26	10	20	PA0CYW	384	8	8	8			
DK9RM	74,784	377	24	52	DM3XM/	5,236	64	11	17	HG4KYH	28	294,910	971	32	77							
DF2KD	74,460	400	23	45	3WYJ	4,050	57	10	17	HUNGARY												
DJ4SD	71,118	333	26	55	DT3LE	3,264	51	13	19	HA8ZS	A	1,319,760	1594	103	257							
DF8XC	69,445	285	28	67	DM3ZJL	3,264	51	13	19	HA0DU/9	713,106	1029	94	252								

ALL NEW 1979 EDITION



THIRD BIG EDITION! The most complete directory of Amateur Radio Equipment — over 1600 products — over 100 manufacturers/distributors. Includes prices, specifications and pictures of transceivers, transmitters, receivers, amplifiers, power supplies, transverters, antennas, tuners, towers, meters, microphones, keys, VFO's, pre-amps, test gear, etc. etc.

BONUS — Included with each directory is a free newsletter containing the latest price and product information. No ham library is complete without a copy of the 1979 Edition!

Order your copy today! Only \$4.50 postpaid (U.S.), \$6.00 First Class Mail (U.S.) — Canada \$5.50 — Foreign (air) \$8.00.

KENGORE CORP. Dept. Q
9 James Ave. Kendall Pk., NJ 08824

Special offer — a complete set of 77, 78 and 79 Directories is available for \$9.00 (U.S. only).

CIRCLE 36 ON READER SERVICE CARD

STEP UP TO TELREX

WITH A
TELREX "BALUN" FED—"INVERTED-VEE" KIT

THE IDEAL HI-PERFORMANCE
INEXPENSIVE AND PRACTICAL TO INSTALL LOW-FREQUENCY
MONO OR MULTIPLE BAND, 52 OHM ANTENNA SYSTEM



Telrex "Monarch" (Trapped) I.V. Kit
Duo-Band / 4 KWP I.V. Kit \$62.50
Post Paid Continental U.S.

Optimum, full-size doublet performance, independent of ground conditions!
"Balanced-Pattern", low radiation angle, high signal to noise, and signal to interference ratio!

Minimal support costs, (existing tower, house, tree).

A technician can resonate a Telrex "Inverted-Vee" to frequency within the hour!

Minimal S/W/R is possible if installed and resonated to frequency as directed!

Pattern primarily low-angle, Omni-directional, approx. 6 DB null at ends!

Costly, lossy, antenna tuners not required!

Complete simplified installation and resonating to frequency instructions supplied with each kit.

For technical data and prices on complete
Telrex line, write for Catalog PL 7



ASBURY PARK, NEW JERSEY 07712 U.S.A.

CIRCLE 50 ON READER SERVICE CARD

UK2PCR	1,409,732	1778	103	291
UK2BAG	771,512	1166	88	234
UK2PAO	458,460	931	67	216
UK2BCG	99,774	589	33	105

UKRAINE				
UK5MAG	1,565,016	1926	90	276
UK5IBB	1,205,604	1780	83	241
UK5QBE	947,894	1480	87	231
UK5QAV	581,702	1119	72	202
UK5MBF	236,098	724	50	144
UK5WAG	230,472	602	51	165
UK5JAO	153,176	516	50	114
UK5MBE	143,276	579	43	129
UK5MCO	80,447	428	33	90
UK5UBB	71,878	191	56	110
UK5LAS	69,518	400	27	83
UK5MBV	67,518	345	33	88
UK5MCJ	32,829	229	28	65
UK5MBO	30,260	224	22	67
UK5MDI	19,092	180	21	53
UK5UBF	132	6	5	6

OCEANIA				
NEW ZEALAND				
ZL1AZV	1,317,222	2786	38	124

SOUTH AMERICA

ARGENTINA				
LU7MAY	2,208,440	2915	83	177

CHILE				
CE2AA	741,258	1228	69	153

COLUMBIA				
HK3AXT	1,482,936	1643	90	222
HK4RCA	970,752	1476	83	173

ECUADOR				
HDWE	2,988,216	2558	105	291

FRENCH GUIANA				
FY78C	8,989,695	6125	124	371

VENEZUELA				
YV5GRD	2,172,240	2342	82	198
4M5UCV	505,968	877	75	179

**MULTI-OPERATOR
MULTI-TRANSMITTER
NORTH AMERICA
U.S.A.**

N2AA	8,940,909	4530	156	543
W3WJD	8,460,605	4292	158	545

W7RM	8,269,368	5266	151	413
W2PV	7,701,540	4325	147	513
W3MM	5,905,896	3316	144	492
W1ZM	5,400,200	3119	145	475
W4BVV	4,763,987	2628	143	500
K5JA	4,611,420	2981	143	418
K8LX	4,486,281	2854	146	445
W7KW	4,191,138	2946	143	375
K3WW	3,798,904	2288	142	454
W2YV	3,792,278	2595	123	395
W3AA	3,502,830	2201	134	456
W3FA	3,452,837	2159	138	433
W6RDF	2,863,597	2308	130	309
W1RR	2,700,556	1910	125	389
W3LPL	2,657,340	1707	136	434
W3AU	2,192,631	1956	98	299
K1RX	2,121,390	1563	120	365
K4CG	1,698,228	1274	122	361
W3KWH	1,186,650	1037	113	292
W9YH	1,148,532	946	121	331
W3MA	971,852	811	112	315
K3II	607,059	645	90	243
WD4CTG	411,718	550	80	198
K1IK	382,659	597	62	167
AD3V	144,824	310	48	124
W8BAP	70,128	222	54	90

ALASKA				
KL7HR	5,352,144	6556	102	234
KL7IRT	3,524,766	4592	92	202

BERMUDA				
K2NJ/VP9	2,568,438	3928	87	206

BRITISH VIRGIN ISLANDS				
VP2VER	9,188,191	8700	113	348

CANADA				
VE3KZ	10,612,755	6960	152	483
CF2YM/2	457,920	1361	60	100

CAYMAN IS.				
ZF28C	1,830,486	3523	70	176

HAITI				
HH2CQ	8,301,354	5606	142	445

PANAMA				
HP10X	2,948,552	3695	92	242

ST. MAARTEN				
PJ8CO	15,998,080	12383	130	430

AFRICA				
CANARY ISLANDS				
EA0CU	988,560	1380	68	172

ASIA				
JAPAN				
JH1ZLA	4,837,860	3613	140	319
JA3YKC	4,399,076	3152	140	344
JA7YRR	3,304,473	3154	125	268
JA3YBF	2,772,225	2375	131	274
JA2YXV	989,800	1332	100	180
JA7YAA	984,458	1248	100	177
JA2YEF	983,178	1155	111	195
JH1YDT	544,453	891	76	141
JA6YBR	360,387	620	74	133
JA4YVL	293,760	559	74	118
JA9YAA	218,155	471	65	96
JA4YBU	217,170	491	69	102

ASIATIC RUSSIA				
EX9A	15,364,085	9233	164	519

EUROPE

GERMANY (FRG)				
DLWPG	4,739,226	4456	143	336

FINLAND				
OH1AA	7,889,105	5513	140	455

ITU GENEVA				
4U1ITU	1,920,995	2371	91	274

NETHERLANDS				
PI1VKL	119,765	604	25	60

SPAIN				
EA1NR	328,080	781	62	178

SWEDEN				
SK2KW	9,180,600	6957	149	451

POLAND				
SP6PAZ	490,581	1150	72	201
SP2ZFJ	5,106	96	13	33

EUROPEAN S.S.R.				
UK6LAZ	4,318,050	3286	139	411
UK4WAR	2,859,136	2577	113	335
UK5IAZ	1,676,178	2038	94	371

OCEANIA

CHATAM IS.				
ZL3HI/C	6,803,074	6711	112	246

HAWAII				
KH6XX	18,134,798	10602	161	422

PHILLIPPINES				
K0AX/DUZ	2,238,624	2700	103	185

SOUTH AMERICA				
COLUMBIA				
5K3SB	2,607,255	3277	78	189
NETHERLAND ANTILLES				
PJ9JR	29,211,300	14598	147	528
WORLD				
QRP SECTION				
5 watts of Less Input				

VP9AD	A	582,255	1147	64	163
0A8V	"	367,872	666	62	130
WA4IAR	"	182,400	332	64	136
W6POZ	"	143,100	328	60	99
DL8PC	"	109,736	339	53	119
K4JRB	"	103,572	195	62	127
PA0HLM/P	"	61,560	220	39	113
G3FTQ	"	59,796	336	36	115
W5YZ	"	57,640	237	36	52
F9YZ	"	46,080	204	31	65
W6VYK	"	40,132	191	37	42
GM3RFR	"	28,325	143	29	74
WB5PYL	"	26,416	113	34	70
AD5F	"	24,990	113	44	58
PA3AEG	"	16,644	129	25	51
JL1BDI	"	13,536	98	19	29
PA3AEX	"	5,940	76	14	19
K9LGR	"	3,082	43	23	23
G4BUE	"	1,980	21	17	19
OZ1AYY	"	1,836	42	11	23
WA7NSM	"	1,365	13	7	7
K1CGJ	28	63,147	233	25	72
OK3IAG	"	47,168	219	31	57
OK1ASQ	21	21,231	119	18	45
WB2ULI	"	21,231	119	18	45
JK1AKX	"	104	5	4	4
K8EEG/Q	"	6	1	1	1
I4DLS	14	41,905	300	20	65
OK1KSH	"	2,652	100	6	20
AA1K	3,8	3,430	44	11	24
JA0JCJ	"	36	3	3	3

CHECK LOGS

Our deep thanks to the following stations who sent in check logs: CT1BY, CT1VY, DL-237/12237, DM2BDG, DM2CBA/A, DM2CLG, DM2CMF, DM2CTB, DM2CTF, DM2DDN, DM2DEO, DM2DGE, DM2DTD, DM2ERH, DM2FGH, DM3JQG, DM3MMO, DM3OAA, DM3TNA, DM3WB, DM3WMO, DM3ZJH, DM3ZVA, DM4REE, DM4WPF, DM4WZA, DM4XCE, DM4XUJ, DM4ZKF, DM5IG, DM5XIG, DM5YQG, DM6AH/DM3ZZH, DT2AIC, DT2AUF, DT2BGC, DT2BPF, DT2DOD, DT3BS/p, DT3CF, DT3FZN, DT4DE, DT4ZFM, DM-EA-9278/G, DM7684/E, EP2NC, EP2RL, JA3FZI, JH3BJN/4, JR6ERO, K3DR, K6FM, KA2BXH, KC4USV, LA4HW, LA7V, LABCJ, LA9MN, LZ2KBA, LZ2KIM, LZ2KRR, N3CC/MM, OH2BAC, OH2XD, OH5YX, OH8OR, OK2BNK, OZ1LO, OZ3SK, OZ7KU, OZ9PP, PA3AFF, PA0COR, PA0LEG, PA0TV, PI1PT, PY1BDU, PY1E-J/PT2, RA3AGE, REF 22725, SM3CBR, SM3CJA, SM5BDV, SM5CZY, SM5FBL, SM5FTH, SM5IMO, SM6DSS, SM6ID, SM7ASN, SM7IDF, SM7IUN, SP1DWZ, SP3ADZ, SP3GEM, SP3JZ, SP5ALG/S, SP5BAK, SP5IFU, SP5ITZ, SP5JB, SP5PGN, SP6ANY, SP7CDG, SP9ALU, SP9AUV, SP9BLF, SP9EVP, SP9KJT, SP9PT, UA3ABP, UA3AGF, UA3AGG, UA3AGL, UA3AHM, UA3DDF, UA3DJS, UA3EAL, UA3NG, UA3PAZ, UA3TAM, UA3VCP, UA3VFI, UA3ZBZ, UA4CK, UA6AIB, UA6HCH, UA6HGK, UA6YBH, UA9CBO, UA9FDN, UA9OS, UA9QAQ, UA9TS, UA9YE, UA0ACN, UA0CBW, UA0JU, UA0NH, UA0SFN, UB5MHF, UB5UAL, UB5UCH, UB5VAA, UC2ABT, UC2LBE, UD6DKZ, UF6CX, UF6OAC, UG6GAF, UJ8-JCL, UK10AO, UK2RAX, UK3AAO, UK3DBV, UK3DBW, UK3MAX, UK3TAY, UK3XAA, UK3XAG, UK3YAV, UK4FAV, UK5BBB, UK5VBB, UK5WAZ, UK6LWA, UK6YAB, UK7PBE, UK9CAA, UK9FAA, UK9JAB, UK9OAU, UK9QAA, UK9WAK, UL7PBI, UL7QF, UO5PK, UR2RBR, UV3CE, UV3DN, UV3MM, UW3FW, UW4NH, UW6CV, UW0MF, UY5YB, VK3KS, VO2BF, W7LDJ, W9KXW, WA2TJF, WA4QCY, WA6NHB, WA9GFR, WB3HGE, YO3BEJ/9, YO4BZC, 3A2HB, D. STROM.

Disqualification: N3DG, Duplicate.

MORE MEMORY



THE MIMIC IAMBIC MEMORY KEYSER GIVES YOU:

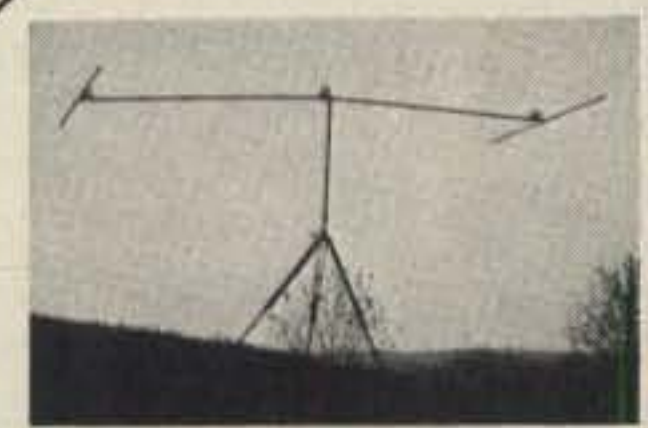
- 2 to 2½ times the memory of the others - 40 to 65 letters in each of four memories.
- Dual Tone sidetone monitor tells you when the memory is half full.
- Fully Iambic. Dit & Dah paddle memories. Self completing characters, automatic spacing and weighting.
- Memory section doesn't take off by itself when recording thanks to the fully triggered clock.
- Speed adjustable from below 5 to well over 40 WPM.
- Messages can be recorded at one speed and played back at another.
- Works on 115 VAC, 8-16 V AC or DC. All three supplies are built in.
- About one third the size of the others—2.5 H, 4 W, 5½ D.
- Highest quality G-10 PC board with all new high quality reliable components.
- All plugs for the paddles and the transmitter supplied.
- Fully RFI protected. Solid state output keys Grid Block, Cathode keyed and the new transistorized rigs.
- Comes with a 90 Day repair guarantee. Unit can be returned within 30 days for full refund (less shipping).
- KIT VERSION Only \$79.95 Please add \$1.50 shipping.
- WIRED & TESTED UNIT Only \$99.95—NYS residents add 7% sales tax. Dealer Inquiries Welcome.



DAYTRONICS COMPANY
12 Oakdale Ave., Box 426
Selden, New York, 11784

SMITHE PRODUCTS

Distributed by
the Comm Center



HF Bantam
80 through 10 meter portable dipole complete with carrying case



55" Portable Monobanders
Same size as the 2 meter broomstick
20 meter version BR-20
15 meter version BR-15
10 meter version BR-10



2 Meter Broomstick
55" fully self-contained 5/8 wave
Hang it up....
No ground plane required



Boom-to-Mast Clamps

Send S.A.E. for Detailed Specs!

* ALUMINUM * ALUMINUM * ALUMINUM *
Home brewing? Better check our aluminum prices!

SMITHE PRODUCTS AVAILABLE FROM:



CALL 800-638-4486
Laurel Plaza — Route 198
Laurel, Maryland 20810

QRP

The art of very low power operating

QRPP Operating Reports & News

Well gang, I asked for letters in a recent "news" column and the response has been great! From what I can tell, a lot of you guys have been sitting out there just waiting for an invitation to add your comments to our monthly QRPP outpourings. So, let's dig right in and let the fraternity share its views and experiences this month.

de. . . WA9FPP/1, Ron Subka, Box 52, Frankestown, NH 03043: "I sure hope you like to read mail—I imagine your P.O. box is stuffed regularly! I've been off the air for a few years, but after happening onto a copy of the August '77 CQ I read your article on the HW-8 and started to gear-up again. I've wired up a 7 MHz. MPF102/buffer v.f.o. and a direct conversion receiver—I copy 40-20-15 meters FB with it. I must say that I am amazed at the DX rolling in. Most of my past operations have been during sunspot minima, and I'm not used to copying all those fancy DX calls yet! I mostly like to build stuff, but your article convinced me that I *needed* an HW-8, so one is now on order (I hold you responsible for my implusiveness!) I'll use it as my "QRP Lab Reference Rig" for all my experiments. I've got no other gear anyway—just a 120 lb. junkbox. It will be interesting to work out a rx/tx converter for it for 160 and 10 meters. I've never operated 10m, but I'm an old 160 man. I used to put out a potent cw/am signal from a 6AQ5 in the early '60's from Chicago. Also, to "show up" a friend back then, after telling him that I could work anything he could with a cigar box, I wired up an 80/40 meter rig in one. Not too much shielding! But with about 6.5 watts I worked everything he could and more. The best QRPP comment I received was from Texas'WOW, 599, you sound like a million watts down here! Anyway, I became a confirmed QRPP'r. I've had good results with as low as 50mw, although 100mw is a bit more reliable. My first direct conversion receiver was used back in

*83 Suburban Estates, Vermillion, SD 57069

1962. I had it gutted and was rebuilding the main receiver and was just "listening" on an old decrepid Knight-kit regenerative "Spanmaster." I turned on my v.f.o. in an attempt to calibrate it for 40m and signals started to roll in! With the REGEN control turned back just a little bit, the detector operated as a high-gain product detector, and signals were turned in with the v.f.o. After fooling around with the v.f.o./detector coupling, I found that I had a really high performance receiver. I plugged the v.f.o. in the cigar box xmtr. and had a ball operating QRPP transceive for months after that. It worked so well that I lost interest in the initial receiver rebuilding project and didn't get back to it for about six months. So anyway—now to the point of this letter. I came across a few copies of *The Milliwatt* about five years ago and liked it. Do you still publish it? (ED: No, *The Milliwatt* ceased publication in June, 1975, after a run of 33 issues. We still have about 26 issues in stock at \$4.00 per six issues, plus postage. The money garnered from the sale of back issues goes toward the expenses of awarding the DXCC QRPP and DXCC Milliwatt trophies which were initiated by *The Milliwatt*. With the sunspot cycle on its upswing, seems like we're facing a spate of applications for trophies, so we can use some sales!)

de. . . KH6JHS, Mike Hebert, 47-351C Waihee Rd, Kaneohe, HI 96744: "Been meaning to write for quite some time now. Must say that I enjoy your column in CQ, but I do rather miss *The Milliwatt*. Put me on your subscription list if you ever start up again. I've been hamming for about 20 years now. Started out as KN7EQY and was a QRPP'r back then. Best DX was W6USA on 40m using a homebrew 50L6/35Z5 AC-DC rig and a 30 ft. verticle wire. I went through various permutations since coming to Hawaii. Was active on 2m with a Benton Harbor lunchbox—the call was KH6FLF. Then I was off radio for a while, and came back as a Novice re-tread, WH6HIB, and ran a HT-40 and a homebrew 30w c.w. rig on 40 and 15. I

then built a 5763 Colpits rig for 40 (3.5w output) and worked K7TAK in Idaho the night that I finished the rig and while using only 33 ft. of #22 wire strung around my bedroom about 10 ft. off the ground! Sure was a pleasant surprise! After the Novice expired, I went QRT again until last year. I bought an HW-8 and got on again as KH6JHS. I got my Advanced ticket this year and bought myself an Argonaut. I was sure pleased with the results in the DX Contest. Didn't rack up a big score, but made more QSO's than I thought possible. It sure was fun hearing that 'power???' query being repeated! Thus far, in the past nine months I have worked 45 states, 28 countries, all JA districts, and 41 of the 47 JA prefectures. This was all done with a 40m inverted Vee up 35 ft. and fed through 33 ft. of homebrew open wire line with a homebrew balanced tuner. Simple antennas do work if you keep the losses down! I've had 599 reports on 40m from CT and TX. Also a nice roundtable with W6 and ZL3 on 40 one night! I now have a beam. Got a Mosley TA-33 up two weeks ago in place of the inverted Vee. So far results have been good, but not spectacular. Worked into CE3-land on 20 s.s.b. with a 54 report. Have also worked ZL, VK, 3D2, 5W1, JA, and UA0, as well as the U.S. on s.s.b since putting up the beam. I was hoping for somewhat better results, but it does work better than the Vee so I can't really complain. Maybe when I get it up higher than the present 22 ft. it will work better! The only drawback is that I had to take down the inverted Vee to put the beam up, so I am presently without an antenna for 40m. Had some pleasant QSO's this afternoon. Broke into an a.m. QSO on 10m between two W4's in ALA to let them know they were being heard out here. Boy were they surprised—especially when I let them know I was running a converted CB rig (Messenger 123B) barefoot. We had a nice roundtable for about 20 minutes and my signal was running S9 at times. After that, I QSY'd and called CQ—raised a WB5 in TX. He's an ex-CB'r and maybe our QSO has inspired him to re-crystal his

CB rig and give QRPP a try on 10m (ED: We are interested in receiving details on CB to 10m conversions of CB rigs from those of you who have gone this route. So, if anyone can provide this type of information, we'll pass it along to the rest of our readers!) Well, I've rambled long enough! You might mention that I am open to skeds on 15m c.w. between 1730-1830Z, and that I monitor 28.8 MHz. from 1900-0300Z daily. I need ME, VT, DEL, WYO, and South Dakota for WAS! I'm enclosing a QRPP QSL card that I use in case you find it worth publishing. 73's (ED: see the QSL elsewhere in this issue.)

de. . . **WB1DKX**, Michael Geschwinder, RFD-1 Box 236A, Newport, NH 03773: "I just wanted to let you know that there is another QRPP'r on the air. I first heard about QRPP in your articles and the great story about OA8V. My station is an Argonaut 509, 405 linear, and the 251 power supply. I only have an 80 meter dipole up at the present, but I hope to have a beam for 10m soon. With this equipment I have worked a total of 4 countries, 3 states, and 3 zones. Not great, but with an 80 meter dipole and 5 watts, that's not too bad! One problem I have found is that DX stations rarely listen for QRP signals. I have only heard two DX stations call "QRP only." I hope more of them will listen for us in the future. 73 and I hope to hear you on the air."

de. . . **Woodrow Terry**, 432 E. Spruce St., Cherokee, IA 51012: "I am about to receive my Novice license. I will want to work QRP. I am among those people who, for various reasons for handicaps, cannot assemble electronic gear. I wondered if perhaps you could refer me to a good technician who, for regular wages, would assemble an HW-8 and power supply for me now, and perhaps more gear later. Thank you." (ED: I was unable to provide Mr. Terry with the reference to someone who would build gear for handicapped individuals. So, I will appreciate receiving a card or letter from anyone who will do this type of service. I will publish any such responses so that other hams can have the benefit of kit-assembly services.)

de. . . **VE5JQ**, John Dudley MD, 217 Albert Ave., Saskatoon, Sask, Canada S7N 1E8: "I was surprised to see my letter to you from August '78 printed in the QRPP column in CQ. Thanks for your help. For an update. I did get my Argonaut and QRPP operations have been going full blast!! I am repeatedly being surprised by the nice contacts I can make with QRPP. I have worked all states, all continents, and 61 countries using a vertical or homebrew

15m quad loop at 25 ft. I shall be erecting a 2 el. quad in the spring and shooting for DXCC. I'll send a picture of my station shortly. Thanks for pushing my interest in QRPP. It has turned out to be beyond my wildest dreams!" (ED: VE5JQ managed to work, after he sent this letter, the rather rare WØRSP in SD during the QRP Contest this spring. It was a pleasure to QSO one of our faithful readers who has corresponded via the mails. It gives me a real thrill whenever I hear a call that I know through the QRP column coming back to one of my CQ's! Hope to contact a lot more of the fellas in the future.)

de. . . **WB0GRN**, Art Labahn, 7224 Outlook, Overland Park, KS 66204: "Just a note to let you know of my achievement. I am sending in my record book and application for USA-CA Class 1000. All contacts were made mobile to mobile using an Argonaut 509, 5 watts input. As of this date (2/10/79), I have 1549 counties confirmed. I've only been serious about this county hunting for about 10 months."

de. . . **WB2VEN**, Chris Del Plato, 15 Kathryn Drive, Whippany, NJ 07981: "I enjoyed reading your column with the letters from other QRPP operators and hope to see more. I got my ticket about a year ago, but didn't get on the air until July, 1978. In a few nights I had my HW-8 built, despite a few solder bridges, and got on the air. It was rough in the beginning, until I learned the key to operating QRPP—listening. My antenna is a CB vertical, which limits me to 15 meters. Nevertheless, I have 35 states and 19 DX QSO's. My DX includes two EA8's, VE7's, three DJ's, two PA's, UA2, ON4, SM6, HB9, 6Y5, KP4, OH5, VE2, I2, and a G3. Well, that's it from here in Jersey. 73 and keep up the good work with QRPP!!"

de. . . **WA1OVW**, Jeff A. Messier, Box 159-B RFD #1, Enosburg Falls, VT 05450: "Just a note to let you know that QRPP operation is alive in the Green Mountain state of Vermont. After I ordered my HW-8, I horse traded for an Argonaut 509. Both little rigs are FB. Best DX with the HW-8 is DK8—a 549 with my vertical antenna. The Argo has landed F6, F9, DJ9, HA5, F5, and OE1 on 10 meters. Thanks for the articles on the HW-8 modes, especially on the receiver section. How about some articles on QRP DX antennas and tuners? 73."

de. . . **WD4KJF**, George R. Bard, 689 Roxburo Ct., Lawrenceville, GA 30245: "I have a few spare moments here at work and just wanted to write a bit about QRPP. I have been operating QRPP for about 5 weeks

It's New.

It's for 2-meters.

It's the Best.

It's the Boomer.



 **cushcraft**
CORPORATION
THE ANTENNA COMPANY

And we have it.

G.I.S.M.O.

2305 Cherry Road
Rock Hill, SC 29730

TOLL FREE

1-800-845-6183

in S.C. 1-366-7157

CIRCLE 11 ON READER SERVICE CARD

with 30 states and 5 countries worked. The rig is an HW-8 with a 4BTV on the ground with radials. I formerly operated a Hallicrafters HT-40/HG-10 with a SX101 receiver and assorted dipoles. The old rigs are for sale and the dipoles down. I use a semi-auto bug and MFJ c.w. filter with the HW-8. Power supply is homebrew. I have found that operating with QRPp is almost as easy as when running 75 watts. The most surprising thing is the reaction from other operators. Most have gone out of their way to complete or even extend a QSO when I mention that I am running QRP. I recently answered a CQ from WB0CLX, Gary, operating QRO from near Denver. He quickly fired up his Argonaut and we completed the QSO two-way QRPp until the QSB killed us. On another occasion, a QRO station AF2C—Jay—in New York tried to assist me in a QSO with an Italian station. No success, but it was a nice try. My "Elmer," Chet, W4WDR, gave me some back issues of CQ when I was preparing for my FCC exams. I have read your articles over and over and now subscribe to the magazine. I plan to try the RIT modification to the HW-8 when I find time. I don't have the issue with Part I of the mods though. If you have time to jot down the issues of *The Milliwatt* or CQ with

HW-8 mods and info, I'd appreciate it. (ED: We've only run three articles on the HW-8: "The heath HW-8 QRPp Transceiver Test Report," CQ (May, 1977); "Super-Modified HW-8 Contest Machine: Part I—15 m Rcvr. Sensitivity Improvement, Audio Filter, S.W.R./ Wattmeter," CQ (August, 1977); "Super-Modified HW-8: Part II—Rcvr. Incremental Tuning, Loudspeaker, Pilot Light," CQ (October, 1977.) In addition, an RIT circuit appeared in QST which is inferior to the above circuit.) Well, Ade, if your success as a writer can be measured by renewed QRP interest among hams and HW-8 sales, you can be well satisfied! Heath should pay you a commission! (ED: Now that is what I call constructive thinking! HI!) I may try mobile within the next 4-6 weeks. I have a business trip coming up. Antenna will be a 108" whip and DenTron Jr. Monitor. If I have any luck, I'll let you know. 73." de . . . WB5VDL, Clem "Larry" Harris, 6110 Pecan Trail Dr., San Antonio, TX 78249: "Just a note to let you know that I think your QRPp articles in CQ are great. Really enjoy them as well as QRP and also just 'regular hamming.' Anyway, since you left the door ajar a while to let poetry creep into your column, I figured I would send you a limerick I wrote last week while I was hiding from my books and Extra

Class c.w. tape. As you can see, I would be better off to learn a SKILL!! Here goes:

There was a young QRP'er
Who went QRT
And stepped out for a beer.
Drunk he did git,
Lost his daw and his dit,
So now he sends with a keyer!

Clem "Larry" Harris WB5VDL

You are welcome to use it if you can. Please put my name next to it to protect your professional reputation as a responsible writer who would not stop to limerick writing. Hope to work you on 10m sometime. Maybe even get to meet you sometime socially or at least on phone. Yeah, you guessed it—I drink beer and use a straight-key! 73's and God Bless."

Circuit Correction—3.5/7 MHz. Vackar Viking-5 V.F.O.

Several errors found their way into print in the "A Solid State 3.5/7MHz V.F.O. For the Viking-5 Transmitter" article, (CQ, April, 1977, pp.32-36). In the schematic, p. 34, R1 is shown as 4.7K ohm. R1 should be 47K ohm. R3 is shown as 1K. R1 should be 470 ohm. In fig. 1, the parts list for the Viking-5 circuit incorrectly lists the toroid for L4 as a "T-40-2" type. It should be T-50-2 type.

The G-QRP-Club CW QRPp Activity Weekend—August 4/5, 1979

The G-QRP-Club sponsors periodic QRPp activities. One upcoming event (unless this is published after August) will take place during the weekend of August 4/5, 1979. Two periods are established for Europe-U.S. QRPp contacts. 1.) 1600-1900Z, 21060 and 28060 Khz; 2.) 1900-2200Z on 1406 KHz. During these periods, club members in Europe will be calling the U.S. and listening for QRPp replies. U.S. stations may also call "CQ QRP DX EU" and the European stations will be listening. Let's see if we can get some QSO's out of this effort!

The next activity weekend is scheduled for October 6/7, 1979. The same periods as listed above apply during the October effort.

Letters/Photos

Well gang, that's it for this month. I'm gratified by the response to our call for letters and operating reports. I know from your letters that you enjoy reading this type of column and I'll certainly keep them coming as long as your response makes it possible. We would appreciate receiving photos also! So, let's get out the old Brownie and have the XYL take a shot of you at the rig! For now, 73 and good QRPp'ing! Ade, K8EEG/W0RSP

Kantronics' Field Day™

Morse/radioteletype reader & speed display



only
\$449.95

Kantronics' Field Day morse code/teletype reader reads code signals right off the air. Its powerful microcomputer system picks out signals, computes their speed and even reads sloppy copy up to 80 words per minute.

The **Field Day** is simple to use. You plug it into your station receiver just as you would a set of headphones. Code and teletype conversations are converted from dots and dashes to standard alphanumeric text. The text advances from right to left across ten big 1/2 inch displays.

The **Field Day** displays incoming or outgoing code speed for you at the touch of a button, right on the front panel. The **Field Day** is enclosed in a compact, lightweight package including speaker. HWD 3.44" by 8.50" by 9.25". The **Field Day** has the features that make it a truly great code reader. Write us for a complete **Kantronics** authorized dealer list.

KANTRONICS

The Lightweight Champs.

1202 East 23rd Street
Lawrence, Kansas 66044

We accept Visa, Master Charge, check and money orders.

Phone: 913-842-7745

Fig. 4 — Simple phono amplifier. The cartridge could be replaced by a crystal microphone for use as a simple P.A. system.

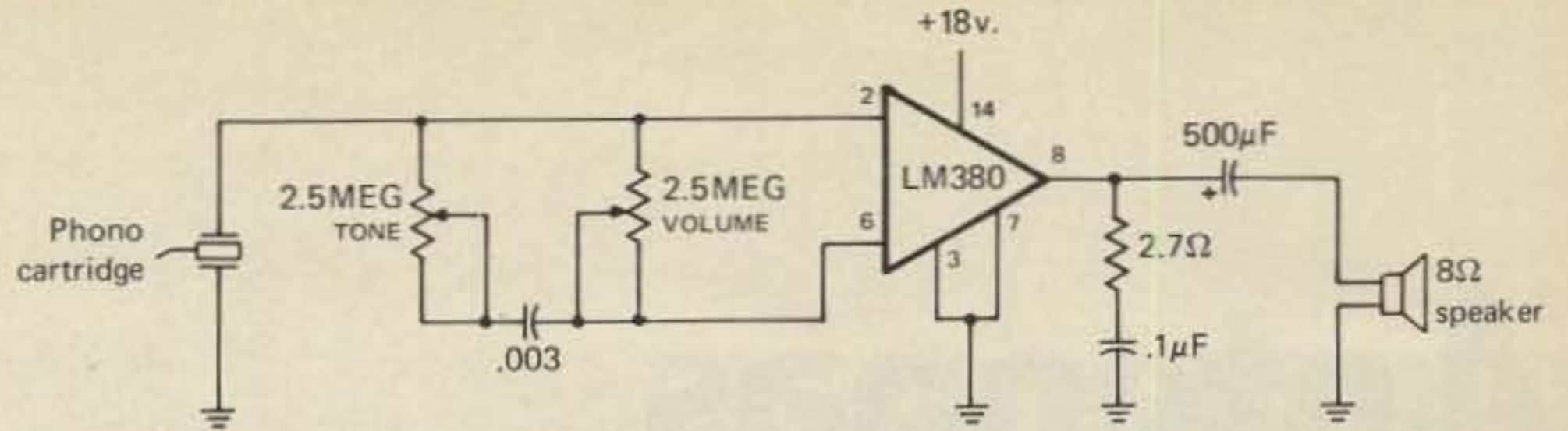


Fig. 4 is the circuit of the LM380 as a simple phono amplifier which could be used to update a child's toy phonograph. The extra 2.5 megohm pot is a tone control which actually cuts the highs as it is adjusted and

should have an audio-tape for proper operation.

Gain is totally adequate for use with most common crystal cartridges in use today.

A final application of the LM380 is

as a very simple intercom amplifier. Here, in fig. 5, a minimum number of parts and a DPDT toggle switch allow operation over surprisingly long distances. Note that the amplifier may be mounted at either end of the line or by itself. Only the switches need be located next to the speakers.

Both the LM380 and LM170 are manufactured by National Semiconductor Corp. 2900 Semiconductor Drive, Santa Clara, CA. 95051. It would be advisable to obtain data sheets from them for these devices if you plan to use them as there are many additional applications that are indicated on these sheets as well as specific application notes for each device.

In any event, both chips should be useful additions to any experimenters collection.

73, Irwin, WA2NDM

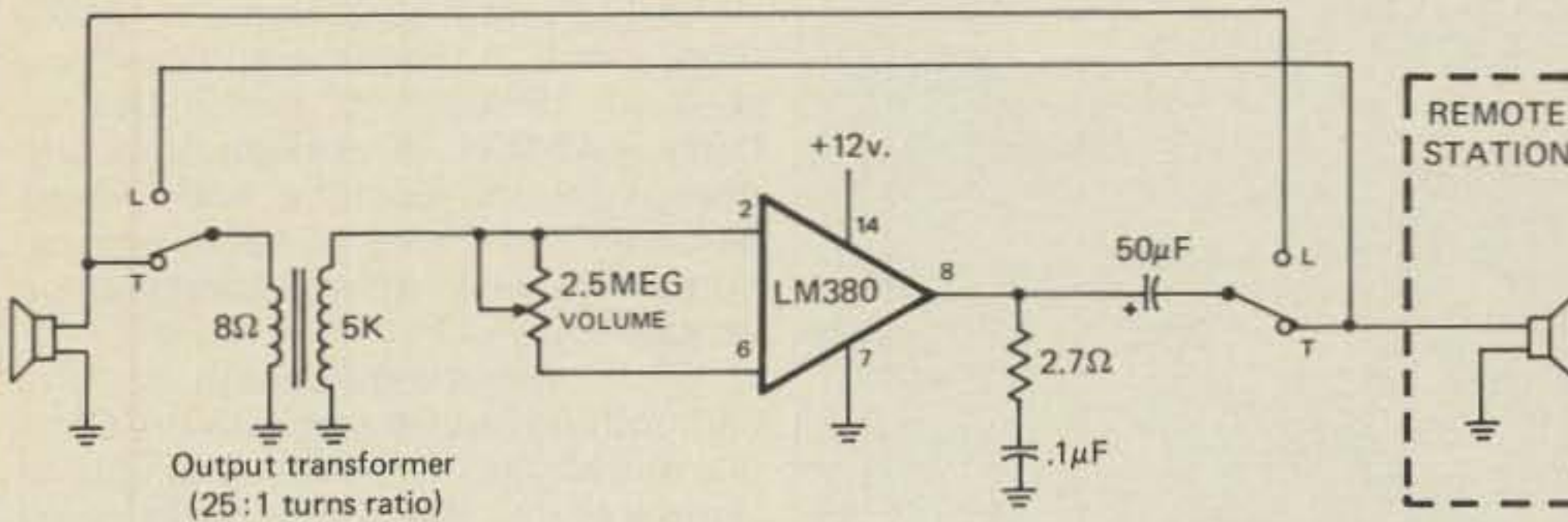


Fig. 5 — Simple intercom using the LM380. Both speakers should be 8 ohm units.

LUMITIME

CC-24 Digital Alarm Clock

U.L. APPROVED



\$27.95

24 hour numerals and 24 hour alarm. The illuminated orange bar numerals are 1 5/8" high. Also featured are new slim line styling, catnap control and an illuminated constantly changing kaleidoscopic pattern to indicate continuous operation. Available in Beige or Charcoal-Brown case colors.

Size: 2 1/4" x 4 1/8" x 8 3/4"

MADISON ELECTRONICS SUPPLY, INC.

1508 MCKINNEY • HOUSTON, TEXAS 77002
713/658-0268

MASTERCARD • VISA

W5GJ, W5MBB, K5AAD, N5JJ, AG5K, W5VVM, W5EGP, WA5TGU, WB5AYF, K5BGB.

DLA1

CIRCLE 39 ON READER SERVICE CARD

CUSTOM-MADE 8-POLE CRYSTAL FILTERS GET THE BEST FOR LESS. IMPROVE YOUR RIG — OLD OR NEW. NO SET IS BETTER THAN ITS FILTER!

CW FILTERS — \$55 EACH

250 and 500 Hz for YAESU
*FT-101 (through F); *FR-101; FT-7/B;
*FT-301; *FT-101Z/D; FT-901 (all);
FTdx560/570/401/B; FT-200 (Tempo I).

250 and 400 Hz for KENWOOD
*TS-520/S; *R-599; *TS-820/S;
*R-820/S

250 Hz for COLLINS
75S-3B/C
\$150 each

*Diode Switching Boards Available.

SSB FILTERS — \$55 EACH

1.8 and 2.4 kHz for YAESU
*FT-101 (through F); *FR-101; *FT-301;
FT-7/B

1.8 kHz (only) for YAESU
FTdx560/570/401/B; *FT-101Z/D;
FT-901; FT-200 (Tempo I)

1.8 kHz (only) for KENWOOD
*TS-520/S; *R-599; *TS-820/S; *R-820/S
1.8 and 2.1 kHz for HEATH
All types except SB-104

AM FILTERS — \$55 EACH

6.0 kHz for YAESU (only)
*FT-101 (through F), *FR-101
(Others available shortly)

*DIODE SWITCHING BOARDS

These permit the addition of one or two filters more than those for which room is normally provided. With complete instructions — no drilling.

For YAESU and KENWOOD Only
Single type (one filter). \$12
Dual type (two filters). \$21

SPECIAL FOR DRAKE R-4B/C

GUF-1. Broad First IF Filter. Far Superior to original unit for CW/SSB. Choice of 6 or 8 kHz Bandwidth. \$65

GUF-2. Narrow First IF Filter for Superior CW. PCB assembly with Filter, Relays, etc. Permits automatic selection of broad or narrow filter. Choice of 600 or 800 Bandwidth. Easy installation. \$90

YF56H125. Extremely sharp (125 Hz B.W.) CW Second IF Filter for DX and Contesters. Plugs into back apron of set. \$90.

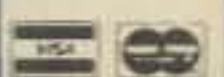
GUD. Product Detector mini-board converts existing detector to superior double-balanced type. Fully wired, easy installation. \$30

Reduce QRM with FOX-TANGO'S superb quality crystal filters. Custom-made for each rig, installation is a breeze — just drop the filter into existing holes. When ordering, state make of rig, model, filter type, and bandwidth desired. Prices include airmail post-paid to U.S., Canada, and Mexico. For overseas insured airmail add \$5 for crystal filters, \$2 for diode switching boards. Satisfaction guaranteed or money back. Dealer inquiries invited.



FOX-TANGO CORP.

Box 15944P, W. Palm Beach, FL 33406



CIRCLE 24 ON READER SERVICE CARD

70-71-72

Antennas

Design, construction, fact, and even some fiction

"Who's your friend?", I asked as Pendergast swept into the ham shack with a large bumpkin in tow.

Pendergast sat down in my favorite operating chair and motioned towards his companion. "I want you to meet Johnathan Cadaver. He's a Country-Western song writer and studying for his Novice ticket".

Johnathan engulfed my outstretched hand in a bear-like grasp and said that he was pleased to meet me. He didn't sound like a song writer at all.

"Well, what songs have you written?", I asked in a cheery tone.

Johnathan sighed and said, "Have you ever heard *I'd Rather Have A Bottle In Front Of Me Than A Frontal Lobotomy?*"

"No, I don't think I have", I replied.

"How about *Take Back Your Golden Garter, Mother, My Calf Is Turning Green?*"

*48 Campbell Lane, Menlo Park, CA 94025



Fig. 1-The antenna farm at DXer W3GRF. A four element 40 meter beam with eight interlaced 10 meter elements on a 70-foot boom (photo by K4VX).

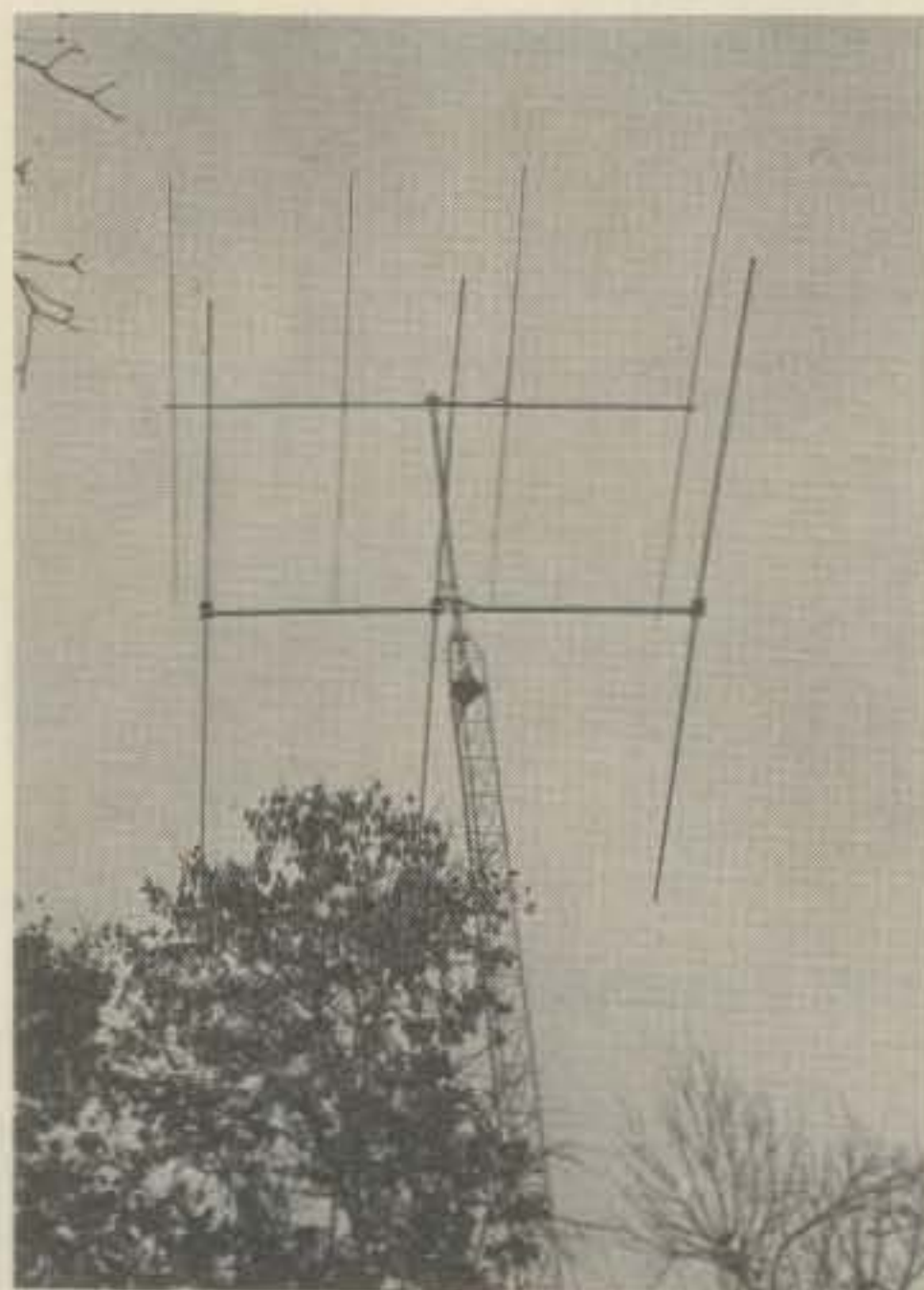


Fig. 2-The stacked beams at WD9GMA for 10 and 15 meter operation feature the new Gamma match design of KA9ACN.

I shook my head.

Pendergast sighed deeply and said, "Johnathan, I think you had better concentrate on your Novice license for a while and forget about Country-Western music".

"I guess you're right", replied Johnathan. "I should be able to take the exam in a few weeks".

"One of the fun things about ham radio is the hobby of antennas", said Pendergast. "You'll have a lot of fun, Johnathan, working on antennas. Sometimes that's more fun than talking on the air".

"Pendergast is right, as usual", I remarked. "As an example of what's happening these days, here's a picture of the antenna farm at W3GRF (fig. 1). Lenny has a four element 40 meter beam with eight interlaced 10 meter elements on a 70-foot boom. This picture was taken by K4VX. Isn't that a beautiful antenna?"

Johnathan studied the photograph.

"I'd have to write a lot of songs to pay for that", he announced.

"A lot of fellows have less expensive installations than that One", I said. "Look at the antennas at WD9GMA and KA9ACN and KA9ACO (figs. 2 and 3). These are homemade stacked 15 and 10 meter beams. Larry, KA9ACN, is working on a new design for the Gamma and Omega matches and hopes to have information available on an improved version very soon".

"Fine", remarked Pendergast. "I've had nothing but trouble with the Gamma match on my beam. Changes in temperature, humidity and barometric pressure play havoc as far as keeping the container that houses the capacitor sealed. And it's harder and more expensive each year to find a suitable transmitting capacitor for the matching system".

"Larry hopes to have these problems solved soon. As soon as I receive word from him, I'll let you know", I said.

"Anything else in the old mail bag?", asked my friend.

"Well, I received a letter from Matt, WB6HSG, with a beautiful photograph of his antenna (fig. 4). Matt wanted me to know that all of the Monster Quads are not located in Fort Worth or Dallas.

"Matt's antenna is mounted on a 48 foot boom and consists of six elements on 20 meters, 7 elements on 15 meters and 9 elements on 10 meters.

The Monster Quad is mounted on a Tri-Ex "Sky Needle" TM-37OHDC at a height of 96 feet. The Quad loops are constructed of No. 14, nineteen strand, teflon covered wire (white). The spreader arms and spiders are by Cubex. And Matt uses separate coaxial lines to each driven element.

"The antenna was tuned and dipped to frequency at a height of 52 feet with the aid of a crane and a 70 foot ladder boom. Matt says he can't measure the gain, but it appears very good, and the front-to-back ratio is better than 35 dB on all bands".

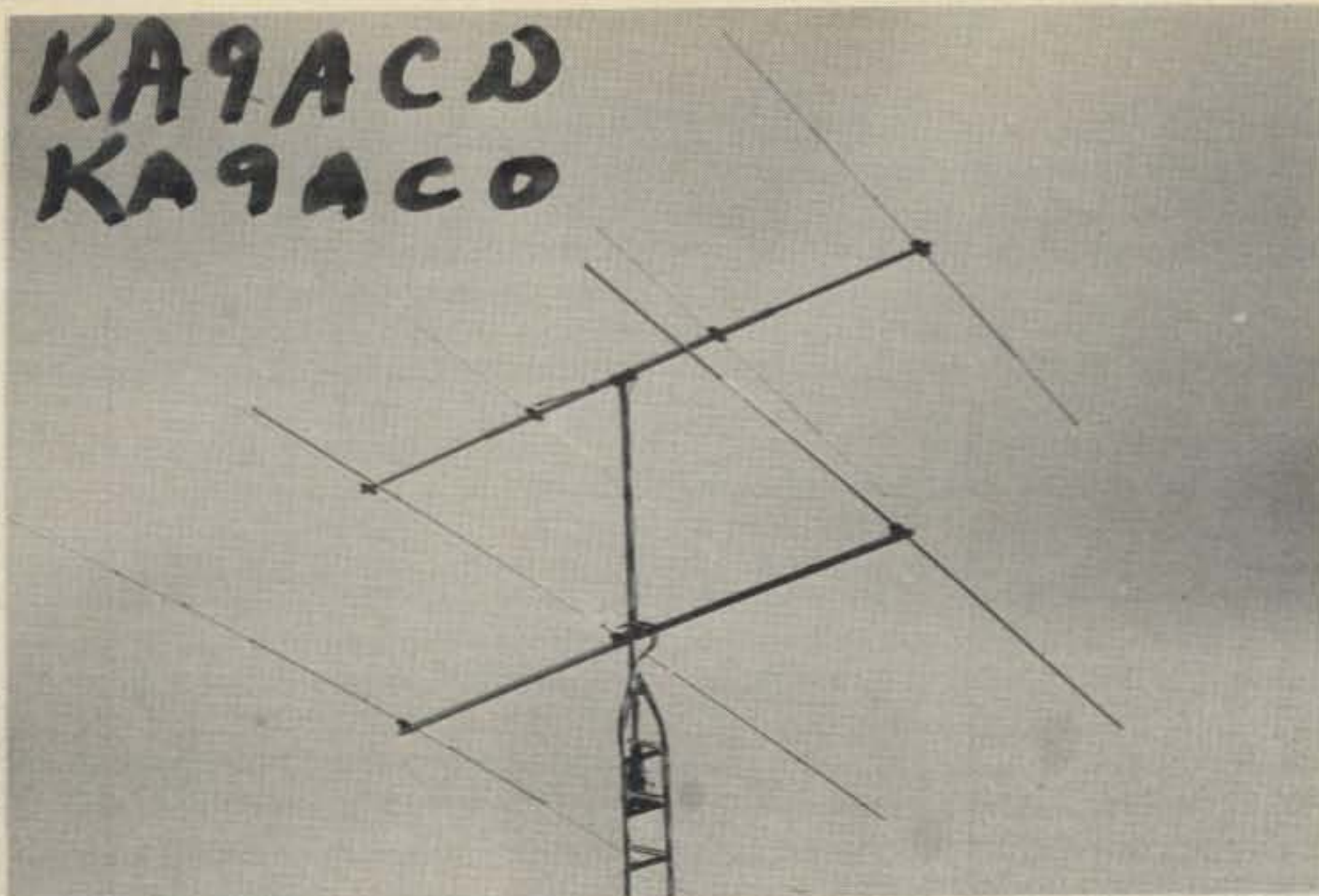


Fig. 3-Another stacked 10 and 15 meter combo at KA9ACD and KA9ACO. Three elements on 15 and 4 elements on 10 meters. A neat installation.

"Those are pretty impressive figures", intoned Pendergast as he and Johnathan studied the illustrations.

"Matt goes on to say that he's going to make some on-the-air com-

parisons soon. He's installing another tower about 150 feet away from this one and will make comparison tests using the Quad against a long-boom Yagi and a six element KLM array. He's also going to check

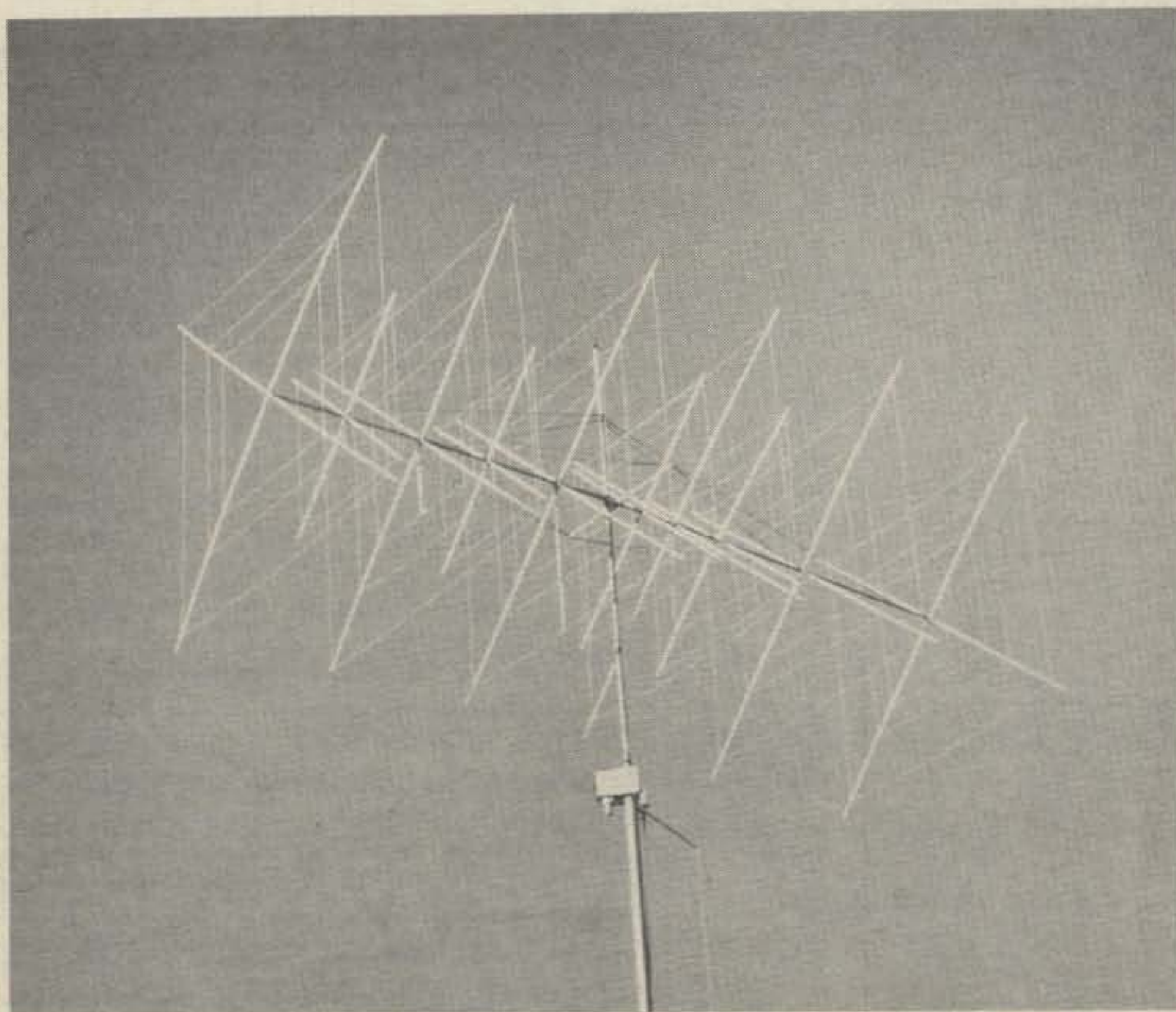
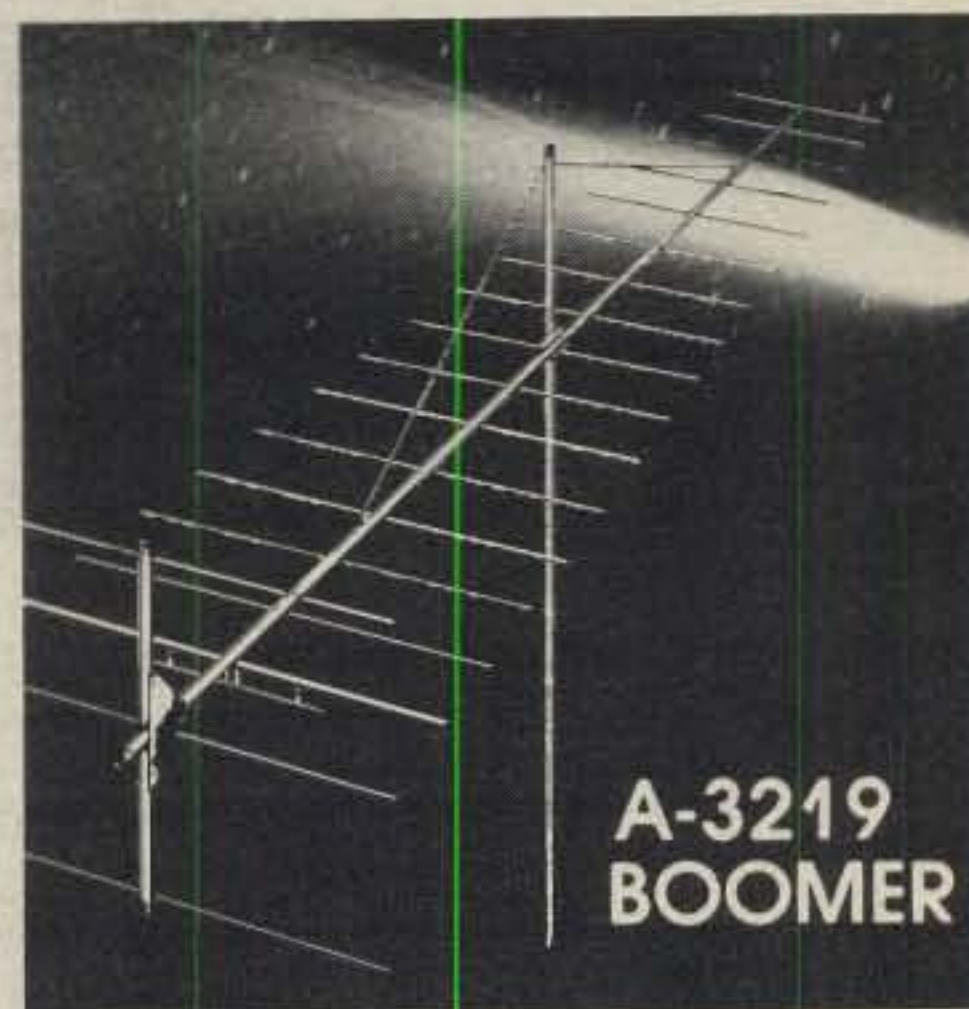


Fig. 4-How's this for a first-class Monster Quad? The impressive multiband job at WB6HSG. Matt has six elements on 20 meters, seven elements on 15 meters and 9 elements on 10 meters, all on a 48 foot boom. Array is at 96 feet on a Tri-Ex "Sky Needle".

It's New.
It's for
2-meters.
It's the
Best.
It's the
Boomer.



 **cushcraft**
CORPORATION
 THE ANTENNA COMPANY

And we
have it.

TUFTS RADIO
ELECTRONICS

206 Mystic Avenue
 Medford, MA 02155

TOLL FREE:

1-800-225-4428

in Mass. 617-395-8280

CIRCLE 12 ON READER SERVICE CARD

out some smaller three and four element Yagi beams as time permits".

"Sounds great", said Pendergast. "I'm looking forward to hearing all about his experiments".

"Here's some more information that may be of interest to you". I handed Pendergast a letter. "This is from John, VE2CV. He has the great advantage of being able to run tests on an antenna range at the Canadian Department of Communications Research Center at Ottawa, Ontario. John modeled an 80 meter sloper antenna at 200 MHz. and ran tests to determine the radiation pattern of this interesting antenna. A sloper, as you know, is merely a quarter-wave

antenna, coaxial fed, the uses the supporting tower as a ground plane.

"John says that the sloper radiated essentially like a vertical ground plane antenna with an essentially omnidirectional pattern (fig. 5). A slight directivity exists in the direction of the wire".

"That sounds reasonable", said Pendergast. "It is too much to expect any great degree of directivity out of such a simple antenna".

"In closing, John says that the best antenna he has run on the range is a full-wave Delta loop, apex up, and fed at one corner. This provides a vertically polarized signal with a surprising gain of about 6 dB over a dipole!

He measured the input impedance at about 150 ohms and used to 4-to-1 balun to match a 50 ohm coaxial transmission line. He says that one basic problem is that ground cannot be properly modelled as a finitely conducting earth".

Pendergast smiled. "Just tell John that earth can be approximated at S-band (2-4 Gc) by coating the ground plane with peanut butter!"

"That's a handy thing to know", I replied.

Johnathan, who had been listening intently to the discussion finally spoke up. "Well, I'm not a ham yet. And I don't understand a lot of this conversation. Aren't there some simple rules about dipoles and ground plane antennas that I can understand and that will help me when I get on the air?"

"Yes", I replied. *Radio Communication*, the monthly magazine of the *Radio Society of Great Britain*, reprinted an article by ZL2AKW of New Zealand, published originally in "Break-In". These rules summarize the state of things very nicely and dispel a lot of "antenna lore" that is floating around. Here they are:

- 1- A dipole cut for the middle of the 80 meter band and fed with a 50 ohm line via an antenna tuner will work over the whole 80 meter band.
- 2- The same antenna, fed with 300 ohm ribbon line, or open-wire line, will work on any band from 160 meters through 10 meters.
- 3- Unless higher than 150 feet, it hardly matters on 80 meters in which direction the dipole points: more significant will be the obstructions, trees, etc. which absorb some of the power.
- 4- A long antenna provides more microvolts to the receiver than a short one but a transmitting antenna radiates all the power fed to it (minus IR loss).
- 5- Antennas, and the equipment connected to them, can confidently be expected to provide better and better results on the high frequency bands as the sunspot cycle goes up and up.
- 6- The result of doubling your r.f. output will be virtually unnoticeable, but halving input power may well be noticeable since output efficiency may be affected.
- 7- A poor antenna is always a poor antenna; but when conditions are good it will work.
- 8- There are no magic formulas or magic boxes that are able to improve the performance of a poor antenna, but it is easy to reduce dramatically the efficiency of a good antenna.
- 9- A bought antenna is not a better antenna than a home-made one, but merely a more expensive antenna; a better investment is a good book on antennas.

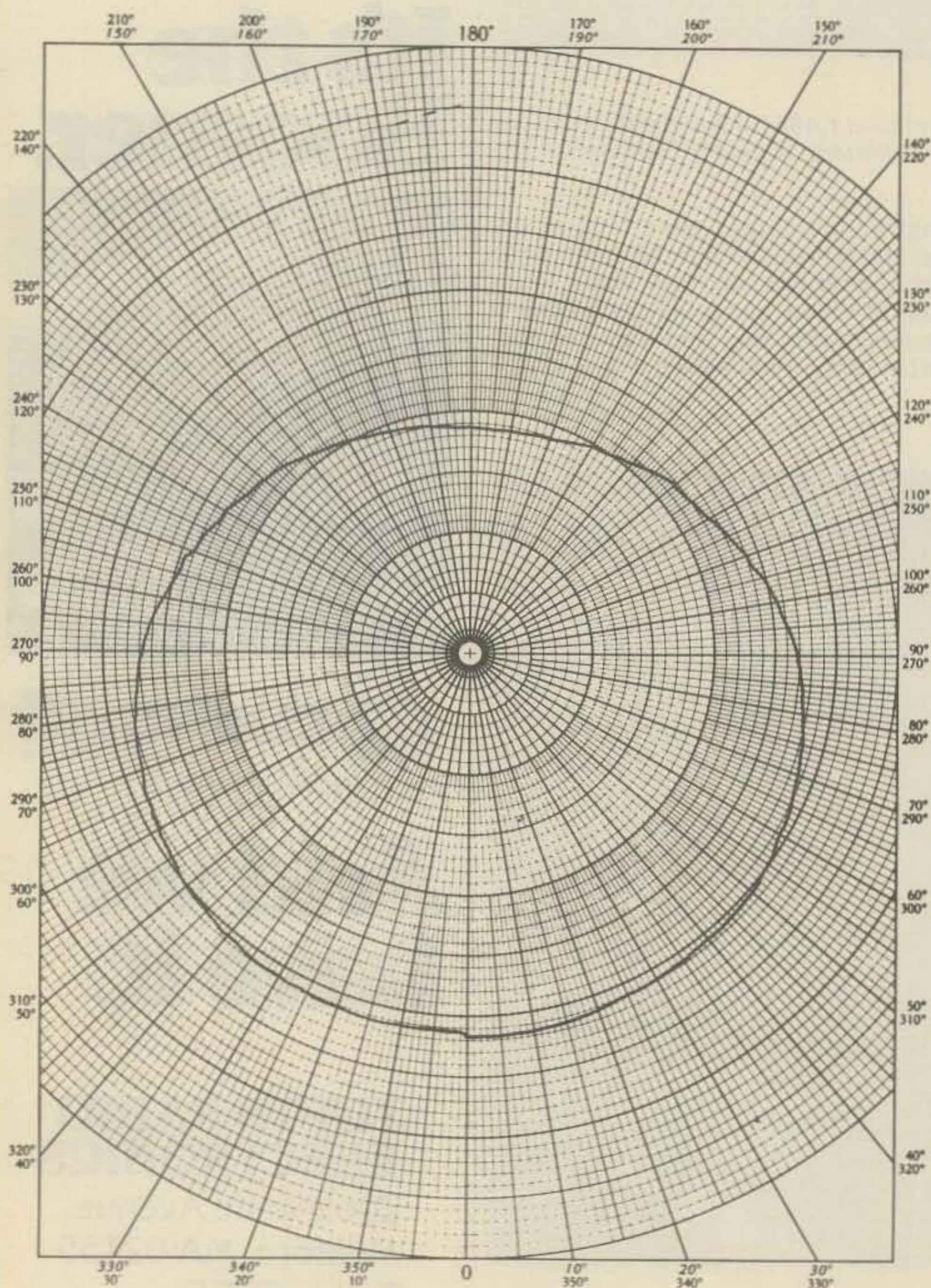


Fig. 5-Directivity pattern of sloper antenna modelled at 200 MHz by VE2CV. Sloper pattern is essentially the same as a vertical antenna, with a slight directivity exhibited away from the tower.

Johnathan smiled. "It sounds as if there is no easy road to a loud signal".

"That's right", I admitted. "But you can still work wonders with an inexpensive dipole antenna or a ground plane. The whole situation is relative. A good operator with a simple antenna can work plenty of DX until he is outclassed by a good operator with a big antenna. One of the toughest times for a QRP station with a simple antenna to work DX is in a DX contest. Too much competition from the big signals. On the other hand, an excellent contest operator can overcome the handicap of a simple antenna and still compete DX-wise. Unfortunately, there aren't many of us that fall in this exalted class".

I tossed Pendergast a clipping from the "Financial Times of London". "Read this", I said. "Allan, VP9AD, sent it to me. It concerns experiments run at the Royal Military College in England. It was found that a large reduction in antenna length could be achieved by placing a ferrite coating on the wire. In the tests, small ferrite beads were strung on the wire. The experiments covered the frequency range of 5 MHz. to 100 MHz. The lower frequency limit was limited only by the bulk and weight of the beads".

"You mean I can string ferrite beads on a wire—a dipole—and reduce the physical length?", demanded my friend.

"That's what it looks like to me", I replied. "This may be the way to make a physically small Yagi beam antenna".

"Maybe that'll be the next breakthrough in mini-antennas", said Pendergast hopefully. "I hope to hear more about ferrite loaded wires. And I also hope you can tell me what this is all about". He handed me a small drawing torn from a magazine.

"This is from a recent issue of *CQ-Ham Radio*, published in Japan. It looks like the driven element of a Quad antenna (fig. 6). Too bad I can't read Japanese! But look at that interesting feed system! Is it an attempt to broadband a Quad loop? The dimensions are in meters, so this looks like it is a 20 meter loop."

I studied the drawing. "This seems like a first cousin to the so-called 80 meter coaxial dipole which was supposed to provide broadband coverage of the entire 80 meter band".

"But it didn't, did it?", interrupted Pendergast. "I remember that Walt Maxwell, W2DU, pretty well shot that antenna down in flames in one of his articles".

"I remember that", I said. "Perhaps this loop feed system doesn't work any better. But hope springs eternal. I

would like to try it out".

It looked as if Pendergast and Johnathan were getting ready to depart, so as a final remark, I said, "Before you go, you might be interested in the simple 80 meter vertical antenna at WD9AXF. Jack wanted a quick vertical for DX work. He hung 50 feet of RG-58/U coax in a pine tree and used the outer shield as the radiator. At the bottom of the antenna he inserted a surplus coil (2-1/2 inches in diameter and 11 turns per inch, about 8 inches long) in series with the coaxial line to the station. He laid out 32 radials from the base of the tree, each radial about 66 feet long. Then he adjusted the num-

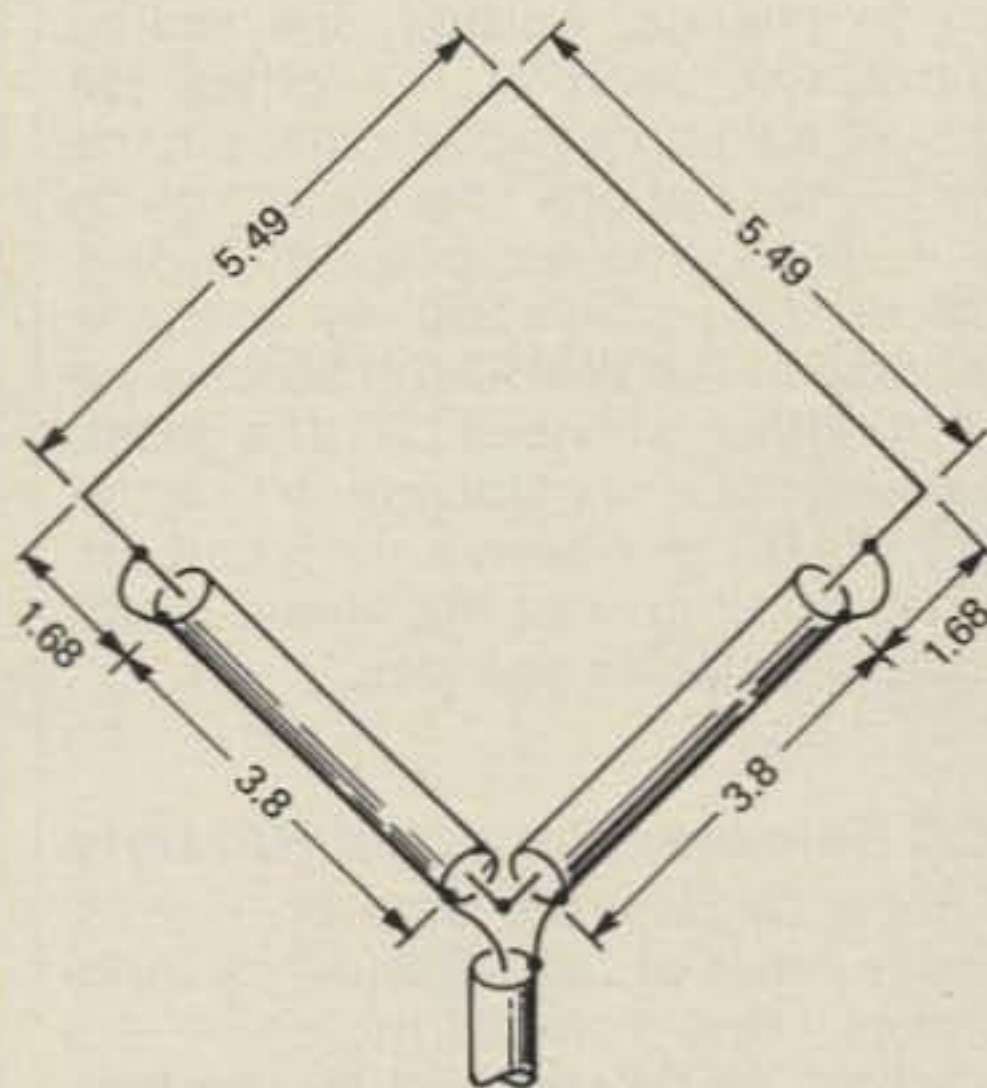


Fig. 6 — The interesting Quad loop feed system featured in the Japanese magazine *CQ-ham radio*. It looks like a version of the 80 meter coaxial dipole design. Dimensions are in meters.

ber of turns in the series-connected inductor and could drop the SWR to less than 1.3-to-1 at any point in the 80 meter band.

"The RG-58/U coax he used for the vertical antenna was wrapped around the trunk of the tree as a support. And the whole thing only took a few hours to build up. Jack says that compared to his inverted-V the vertical antenna is usually weaker out to about 1200 miles but beyond that it is the better of the two.

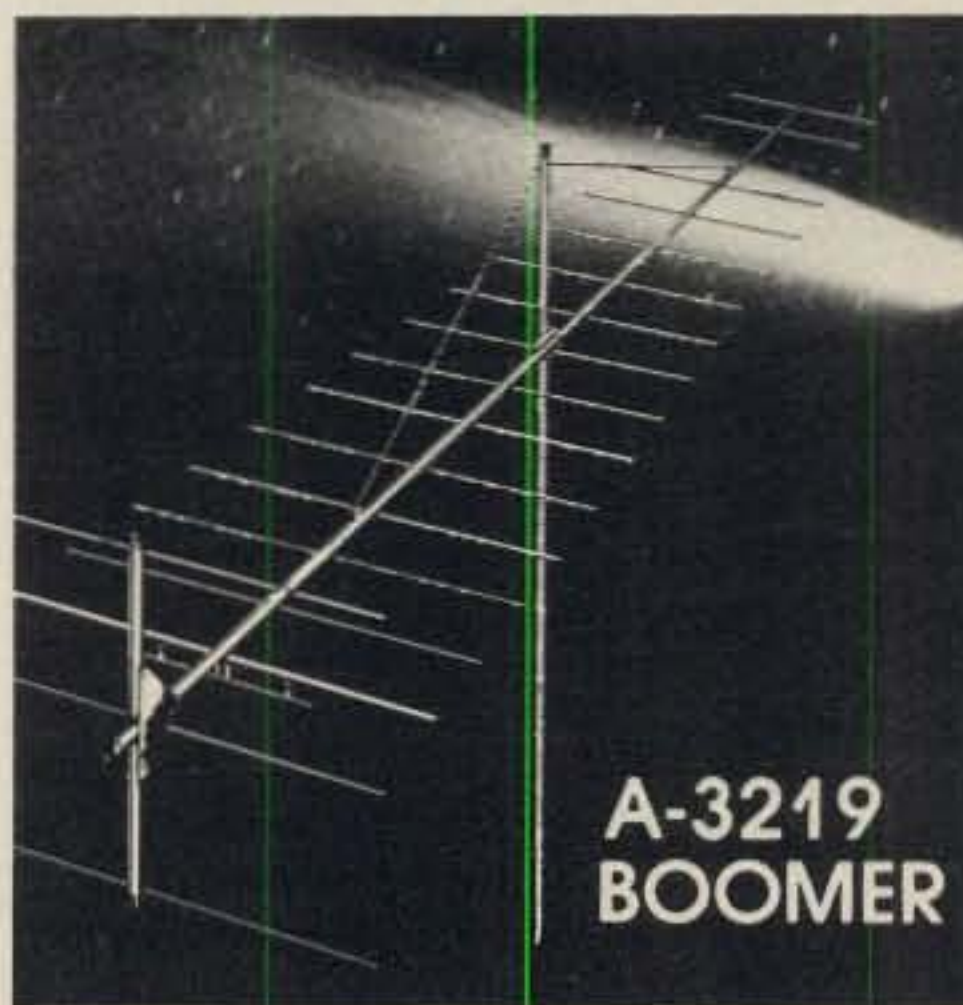
"So there you are. A simple vertical antenna that uses a tree for support". Note - More antenna information? Read Bill Orr's antenna handbooks: "Simple, Low-cost Wire Antennas" (\$4.95) and "All About Cubical Quad Antennas" (\$4.75). Available from Radio Publications, Inc., Box 149, Wilton, CT 06897. Add 50¢ per book for postage and handling.

It's New.

It's for 2-meters.

It's the Best.

It's the Boomer.



 **cushcraft**
CORPORATION
THE ANTENNA COMPANY

And we have it.

Jun's Electronics

11656 West Pico Building
Los Angeles, CA 90064
213-477-1824

dateline...

Washington, D.C.

The ins and outs of the Washington scene

ITU Convenes WARC

On September 24, 1979, the International Telecommunications Union (ITU) will convene a World Administrative Radio Conference (WARC). This Conference, the first WARC to be held in 20 years, is empowered to review and revise almost all of the international Radio Regulations. As such, the decisions made at the WARC will have a significant impact on the direction telecommunications will take through the remainder of the 20th Century.

Of major concern to the Amateur (terrestrial) and Amateur-Satellite services (the ITU defines two Amateur services) are proposed changes to Article 5 of the Radio Regulations: The Table of Frequency Allocations. A comprehensive review of allocation proposals to the WARC from 41 countries, to be found elsewhere in this issue, suggests that allocations in the 160, 80/75 and 40 meter bands will be contentious; in particular, there is a possibility that Amateurs will lose 50 to 200 kHz. in Region 2, in the band 7100-7300 kHz., to the Broadcasting service.

Other areas of concern include the 220 MHz. band (where the Federal Communications Commission is arguing for an allocation to the Maritime Mobile service) and the 420 MHz. band (where a number of countries are proposing allocations to other services such as the Fixed service).

There is support for a new Amateur band at 10 MHz., though it remains to be seen whether this support can be translated into an allocation. Little support exists for new allocations at 18 and 24 MHz.

It must be remembered that the proposals examined to date are sub-

ject to change. Further, the United States, like each of the other 154 countries eligible to participate in the WARC, has but one vote on any given issue. Thus, it is not possible at this time to state with certainty what the outcome of the WARC will be vis-a-vis the Amateur services. At the least, however, there is no question that the 1979 WARC will have a profound impact on the future of the Amateur and Amateur-Satellite services.

FCC Releases Projected RFI Data

Recently released data on the annual number of radio frequency interference (RFI) complaints which are expected to be received by the Federal Communications Commission (FCC) suggest that the number will exceed 90,000 per year by the second quarter of fiscal year 80 (FY 80). At that same time, the Commission expects the number of complaints to Congress to exceed 800 per year. In both cases, the numbers of complaints are rising at a rate of about 12% per year, indicating again that RFI is, and will continue to be, one of the greatest problems facing the Amateur operator today.

Anne P. Jones Sworn in as FCC Commissioner

In April 1979, Anne P. Jones, former General Counsel of the Federal Home Loan Bank Board, was sworn in as a member of the Federal Communications Commission. Ms. Jones, who was nominated by President Carter, was confirmed by the Senate in March 1979. Her term will run until June 30, 1985.

A native of Arlington, Mass., Ms. Jones received her B.S. degree from Boston College, and her LL.B. from Boston College Law School.

Ms. Jones is a member of the

Federal Bar Association Securities Law Committee and Savings Institutions Law Committee. She is also a member of the Massachusetts Bar Association and a member of the Board of Trustees of Boston College.

The Cowan Publishing Corporation and the staff of CQ join your Washington editor in wishing Ms. Jones well in her new position as an FCC Commissioner.

CB Expansion

As noted by the American Radio Relay League (ARRL) in its comments on RM-3299 and RM-3317 (to establish an SSB-only Radio Service in the 27.41-28.00 MHz. range), the illegal use of high-powered equipment on frequencies in, and around, the Citizens Band has grown significantly in recent years. Attention was also drawn to so-called "HF" operations between 27.41 and 28.00 MHz. In both cases, the illegal operations were attributed to the easy availability of Amateur-type equipment to the public, regardless of whether the purchasers displayed a valid license for use of the equipment. Based on information we have uncovered, illegal operations such as those noted above are expected to increase, with an ever growing number of these operations shifting to the 10 meter Amateur band.

Specifically, a company known as Communication Modifications, Inc., recently introduced a digital phase-lock-loop "channel expander" which will permit most 40-channel CB transceivers to operate on frequencies between 26.405 and 27.995 MHz., and between 28.405 and 29.995 MHz. Note that one of these frequency ranges covers almost all of the 28.00 to 29.70 MHz. Amateur band. The use of this device by CBers, of course, is illegal. Yet, the availability of this device... the sale of which is perfectly legal

*8603 Conover Place, Alexandria, VA 22308.

variety of code transmissions from all parts of the world and over a frequency range of about 22 kHz. to 24 MHz. You can use some really junk-type receivers and still hear good code practice stations in this list.

The November 1977 through March 1978 Novice columns provide information to help one select and install the best possible station. If you are not familiar with amateur radio equipment, I advise you obtain these issues and read them very carefully.

There are several stations regularly transmitting code practice in the ham bands and you can request free details from the American Radio Relay League, 225 Main Street, Newington, Connecticut 06111. The ARRL operates W1AW, which provides regular code practice. With the exception of national holidays and infrequent special occasions, W1AW sends code practice transmissions on 1.835, 3.58, 7.08, 14.08, 21.08, 28.08, 50.08 and 147.555 MHz. Each code practice run is 8 minutes long. Slow speed code practice transmissions begin at the lowest speed and progress to the highest speed. High speed code practice transmissions begin at the highest speed and drop down to the lowest speed.

Slow speed code practice runs are made at 5, 5, 7.5, 7.5, 10, 13, and 15 words per minute (w.p.m.). On Monday, Wednesday, and Friday, slow practice starts at 0000 and 1400 UTC. On Tuesday, Thursday, Saturday, and Sunday, slow code practice starts at 0300 and 2100 UTC.

Fast speed code practice runs are made at 35, 30, 25, 20, 15, 13, and 10 w.p.m. On Monday, Wednesday and Friday, fast practice starts at 0300 and 2100 UTC. On Tuesday, Thursday, Saturday, and Sunday, fast code practice starts at 0000 and 1400 UTC. UTC is Universal Time Coordinated. It is simple to convert UTC to your local time. UTC is the same basic time that was previously called Greenwich

Mean Time (GMT) or Zulu (Z) Time. UTC is 5, 6, 7, and 8 hours ahead of EST, CST, MST, and PST (Standard time), respectively. Consequently, just deduct the proper number of hours from the indicated UTC to determine your local time. UTC is 4, 5, 6, and 7 hours ahead of EDST, CDST, MDST, and PDST (Daylight Savings Time), respectively.

Note: Remember that the first two numbers of four-digit time represent the hours and the second pair of numbers are the minutes. Consequently, 0930 is 9:30 AM and 2130 is 9:30 PM.

Once you've learned the code and attained a receiving proficiency of at least 7 w.p.m. the best way to increase your code speed further is to get your Novice license and to operate as much as possible. If you are preparing yourself to pass a code exam, make sure to copy everything down because you must practice to perfect your ability to transcribe what you hear. Just listening is not enough.

The following list of commercial and military code transmissions is of prime usefulness to anyone who wants to increase code receiving proficiency anywhere between 10 and 50 w.p.m. Remember that these transmissions are protected by the Secrecy of Communications Act which prohibits you from either making use of the received information or from passing it along to someone else. This on-the-air receiving practice is particularly beneficial to beginners because it gives them the opportunity to become familiar with receivers under various on-the-air conditions.

Code students normally progress from listening to time ticks (for receiver familiarization) thru copying traffic lists, weather reports, broadcasts to merchant ships, hydrographic reports, and (finally) press reports. This list contains code prac-

tice sources which are useful to code enthusiasts of all capabilities and it indicates the content of each broadcast by one or more of the following: HK is a hydrographic report. This is good practice for students who are not yet able to copy fast press reports.

MCST is a broadcast to merchant ships. This is most useful to the student who has progressed past the need to copy weather reports.

PX is a press report. This provides the best code practice for advanced students because broadcasts range between fixed speeds of 15 to 50 wpm. You'll copy news which you'd otherwise not always see or hear. This is truly enjoyable practice!

TFC is a traffic list. This is the best practice for a beginning code student. The shore station repeats the four-letter ship call sign twice for each ship for which he has traffic.

TX is a time tick. This has very little code practice value but some stations do identify in code and this is useful to a beginner. Time ticks are listed to help newcomers get accustomed to receiver calibrations. WWV provides continuous time and frequency checks on 2.5, 5, 10, 15, and 20 MHz.

WX is a weather report. This is most useful to a student who has progressed past the need to copy traffic lists. Weather reports, hydrographic reports, and broadcasts to merchant ships frequently overlap each other in their degrees of copying difficulty.

Please bring all corrections and additions to the attention of the author. Your letter or card will be greatly appreciated. I look forward to talking to you on the air. Please understand that I'm just another worker in the Amateur Radio Service trying to make it easier for people who want to learn the code.

WORLDWIDE CODE TRANSMISSIONS

UTC*	Station	BCST**	Kilohertz
0000	JCS Choshi, Japan	TFC	4340 6467 8654 12826 17112 22419
00	JMC Tokyo, Japan	WX	91 4298 6397 12840
00	NSS Washington	TFC	122 4390 5870 9425 12804 17050 22491
00	VPS Hong Kong	TFC	527 6404 8566 13020
00	WNU New Orleans	PX	4695 6495 8570 12827 17178
00	YUS Split, Yugoslavia	TFC	484 8734
00	YUZ Rijeka, Yugoslavia	TFC	6421 12777
05	EAC Cadiz, Spain	TFC	6505 7150 8720 12500 17600
05	WOE Lake Worth, Florida	TFC	472 6411 8486 12971 17161
10	WNY New York	TFC	147 482 2051 4367 6520 13061
18	KSE Los Angeles	WX	416 2042 4322 6436 8550 12840
18	WPA Port Arthur, Texas	TFC	416 4322 6435 8550 12839 17257 22569
20	DZG Manila, P.I.	TFC	483 6441 8588 12882 17176
20	ICB Genoa, Italy	TFC	487 6425 8650 12979
20	KTK Mussel Rock, Calif.	TFC/WX	436 4358 6516 8714 13115 17185 22515
20	NMR San Juan, P.R.	WX/HX	127 4795
30	DUM Manila, P.I.	WX	5880 8920 15832
30	JOC Otschi, Japan	TFC	6439 8686 13105 17165
30	KHK Honolulu	TFC	484 8542 13029 16978
30	KLB Seattle	TFC	488 4349 6411 8546 8582 8658 12908 12917 17007 22539
30	KLC Galveston	TFC	484 2063 4256 6369 8666 13038 17209
30	YUZ see 0000 listing		
35	NSS Washington	WX	122 4390 5870 9425 12804 17050 22491
35	WNU New Orleans	TFC	478 4695 8570 12827 17178 22450
35	WSV Savannah	TFC/WX	138 434 2044 4250 6408 8686 12952 17257
48	NIK Argentina	HX	155 5320 8502 (Only During Ice Season)
50	IQH Naples, Italy	TFC	435 8350 13011 17161
50	KOK Los Angeles	TFC	464 4283 6463 8590 12993 17065 22413
50	NMF Boston	WX	466
50	WCC Chatham, Mass	TFC/WX	436 2036 4367 6376 8586 8630 12926 13033 16973 17271 22599
0100	DZR Manila P.I.	TFC	474 6446 8568 12852 17136
00	KPH Bolinas, California	TFC	426 2045 4247 6477 8618 12808 13002 17017 22479 22557
00	TAR Istanbul, Turkey	TFC	8662
00	VPB Colombo, Ceylon	TFC	482 8742
00	XYR Rangoon, Burma	WX	500 8640
00	YUZ see 0000 listing		
05	EAC see 0005 listing		
05	WOE Lake Worth, Florida	WX	472 6411 8486 12971 17161
05	ZEN -6 Hong Kong	PX	17905 (Associated Press)
10	SUH Alexandria, Egypt	TFC	8575 12970
10	VPW Singapore	WX	9075 13425
18	VWM Madras, India	WX	158 3201 8674

No - 79 - 80

18	WSC Tuckerton, N.J.	TFC	460 4331 6502 8610 12948 17242 22521
20	DZR Manila, P.I.	WX	474 6446 8568 12852 17136
20	JJC Japan	HX	39 4316 8702 13051 17069
30	DSP Manila, P.I.	PX	18565 (Associated Press)
30	DUM Manila, P.I.	WX	5880 8920 15832
30	JOS Nagasaki, Japan	TFC	4328 6491 8706 13069 17271 22647
30	KFS San Francisco	TFC	476 4274 6366 12885 17026 22425
30	KLC Galveston	TFC	484 4256 6369 8660 13038 17208 22467
30	SVA Athens, Greece	TFC	8096 13029
30	VWC Calcutta, India	TFC	12745
0130	WMH Baltimore	TFC/WX	428 4346 8502 8686 12953
30	YUZ see 0000 listing		
35	WAX Hialeah, Florida	TFC	488 6467 8526 11250 13011 22431
40	FFL St. Lyse, France	TFC	4328 8342 8460 12912 16125 17040
50	IQX Trieste, Italy	TFC	5265 6418 8502 12975 17084
50	WSL Amagansett, N.Y.	TFC	418 8658 12997 13078 16998 22485
55	JJC Japan	TX	39 4316 8702 13051
55	NSS Washington	TX	122 4390 5870 9425 12804 17050 22491
55	VPS Hong Kong	TX	435 8566
0200	DYR Phillipines	WX	474 8430
00	See 0000 listings for JCS, NSS, VPS, and YUZ		
00	KCBR	PX	15095
00	NBA Balboa, Canal Zone	MCST	148 5006 11080 17127
00	XSV	WX	445 6486 8630 12822
00	XSX Keelung	WX	405 8714
05	See 0005 listings for EAC and WOE		
10	WNY see 0010 listing		
18	See 0018 listings for KSE and WPA		
20	See 0020 listings for DZG, ICB and KTK		
30	See 0030 listings for JOC, KHK, KLB and KLC		
30	NPG San Francisco	MCST	115 6429 9278 12966 17055
30	XSW Kao-Hsiung	WX	460 8582
30	YUZ see 0000 listing		
35	See 0035 listings for WNU and WSV		
48	XSQ	WX	445 6390 8514 17021
50	See 0050 listings for IQH and KOK		
55	DUM Manila, P.I.	TX	5880 8920 15832
57	XSG	TX	458 6414 8052 12671
0300	See 0100 listings for DZR, KPH and VPB		
00	WSC Tuckerton, N.J.	PX	4331 6340 8430
00	WSL Amagansett, N.Y.	PX	4343 6418 8514 12997
00	YUZ See 0000 listing		
05	EAC See 0005 listing		
05	NPO San Miguel, P.I.	WX	159 3377 6460 10966 15930
05	XSG	WX	458 6414 8052 12871
10	SUH see 0110 listing		
18	WMM	PX	11037 15607 (Monday Only)
18	WSC see 0118 listing		
20	DZG Manila, P.I.	WX	483 6441 8588 12882 17176
20	JMC see 0000 listing		
25	JMB Tokyo	WX	3218 7515 14605 18190
30	See 0130 listings for JOS, KFS, KLC, and SVA		
30	WMH Baltimore	TFC	428 4346 8502 8686 12953
30	YUZ see 0000 listing		
35	WAX see 0135 listing		
40	FFL see 0140 listing		
48	WAX Hialeah, Florida	WX	488 6390 8526 13011 17199
50	ADD-2 Naha, Okinawa	WX	428 8554
50	IQX see 0150 listing		
55	NSS see 0155 listing		
0400	GFV Habbaniyah, Iraq	WX	4240 7470 13240
00	IAR Rome, Italy	TFC	519 8670 13015 17232
00	JAO-3 Tokyo, Japan	PX	15945
00	JCS Choshi, Japan	TFC	4340 6467 8654 12826 17112 22419
00	KLC Galveston, Texas	WX	484 2063 4256 6369 8666 13038 17209
00	See 0000 listings for NSS, VPS and YUZ		
040	TXZ Djibouti, French Som.	TFC	464 8682 17165
0400	VPN Bahamas	WX	426 8710
05	See 0005 listings for EAC and WOE		
10	WNY see 0010 listing		
18	See 0018 listings for KSE and WPA		
18	WSC see 0300 listing		
18	WSL Amagansett, N.Y.	PX	476 4343 6414 8514 12997
20	See 0020 listings for DZG, ICB and KTK		
20	KFS San Francisco	WX	436 6348 8714 12696 22515
20	NPG San Francisco	WX	115 6429 9278 12966 17055
20	NPN Guam	WX	484 4955 8150 13530 17530
30	DZG	WX	483 6418 8646 12930 17242
30	See 0030 listings for JOC, KHK, KLB and KLC		
30	NBA Balboa, Canal Zone	TFC/WX	148 5448 11080 17127
30	NPM Honolulu	WX	131 4525 9050 13655 17122 22593
30	NPO San Miguel, P.I.	HX	159 3377 6460 10966 15930
30	YUZ see 0000 listing		
35	See 0035 listings for WNU and WSV		
50	WCC Chatham, Mass.	TFC	436 2036 4367 6376 8586 8630 12926 13033 16973 17271 22599
50	IQH Naples, Italy	TFC	435 8350 13011 17161
50	KOK Los Angeles	TFC/WX	464 4283 6463 8590 12993 17065 22413
50	WHD New York	PX	6512 8052 13020 16968
55	NBA Balboa, Canal Zone	TX	148 5448 11080 17127
0500	See 0100 listings for DZR, TAR, VPB and XYR		
00	GYS Singapore	WX	112 8630 12781 17266 21870
00	JAO-3 see 0400 listing		
00	KPH Bolinas, California	TFC/WX	426 2045 4247 6477 8618 12808 13002 17017 22479 22557
00	NHB Kodiak, Alaska	WX	4825 8622 12817
00	NHY Port Lyautoy, F.M.	HX	4623 7535 12145 17021
00	NPG San Francisco	HX	115 6429 9278 12966 17055
00	NPM Honolulu	HX	131 4525 9050 13655 17122 22593
00	NPN Guam	HX	484 4955 8150 13530 17530
00	NSS Washington	HX	122 4390 5870 9425 12804 17050 22491
00	WSL Amagansett, N.Y.	WX	6421 8734 12777
00	YUZ see 0000 listing		
05	EAC see 0005 listing		
10	SUH see 0110 listing		
15	VWM Madras, India	TFC	446 12718
18	WSC see 0118 listing		
20	KTK Mussel Rock, Calif.	PX	436 6516 8714 13114 17184
30	See 0130 listings for JOS, KFS, KLC, VWC and SVA		
30	CFH Halifax, Nova Scotia	WX	115 4271 6425 8542 12813 17084
30	CKN Vancouver, Canada	WX	133 4307 6446 12921 17288
30	GZH Colombo, Ceylon	WX	123 6519 8726 12983 16978
30	KHK Honolulu	WX	484 8542 13029 16978 (Not Weekends)
30	KUP Truk	WX	442 8544
30	NBA see 0430 listing		
30	NHY Port Lyautey, F.M.	WX	4632 7535 12145 17395
30	VPB Colombo, Ceylon	TFC	12926
30	WMH see 0330 listing		
30	YUZ see 0000 listing		
30	ZNR Aden	TFC/WX	8710 12060
35	NSS see 0035 listing		
35	WAX see 0135 listing		
0540	FFL St. Lyse, France	TFC	4328 8342 8460 12912 16125 17040
50	See 0150 listings for IQX and WSL		
55	NSS see 0155 listing		
55	NPG San Francisco	TX	115 6428 9277 12966
55	NPM Honolulu	TX	131 4525 9050 13655 17122 22593
57	VRB Colombo, Ceylon	TX	500 8742
0600	See 0000 listing for JCS, JMC, VPS and YUZ		
00	GYR Malta	WX	121 4319 8594 13105 16988
00	GYZ Malta	WX	116 4331 6418 8494 12750 16968
00	KUP see 0530 listing		
00	NSS Washington	TFC/WX	122 4390 5870 9425 12804 17050 22491
00	VPB Colombo, Ceylon	WX	486 8742 12988
05	See listings for EAC and WOE		
10	WNY see 0010 listing		
18	See 0018 listings for KSE and WPA		
20	See 0020 listings for DZG, ICB and KTK		
30	See 0030 listings for JOC, KHK, KLB and KLC		
30	NPG see 0230 listing		
30	ODR Lebanon	TFC	8702
30	VWC Calcutta, India	WX	153 12745
30	YUZ see 0000 listing		
35	See 0035 listings for WNU and WSV		
50	See 0050 listings for IQH and KOK		
50	ADD-2 see 0350 listing		
0700	See 0100 listings for DZR, KPH and VPB		
00	YUZ see 0000 listing		
05	EAC see 0005 listing		
10	SUH see 0110 listing		
18	WSC see 0118 listing		
30	See 0130 listings for JOS, KFS, KLC and SVA		
30	See 0530 listings for NHY and ZNR		
30	ODR see 0630 listing		
30	WMH see 0330 listing		
30	YUZ see 0000 listing		
30	ZNR Aden	PX	8710
35	WAX see 0135 listing		
40	FFL see 0140 listing		
50	See 0150 listings for IQX and WSL		
55	NSS see 0155 listing		
55	VIX	TX	8478
0800	See 0000 listings for JCS, NSS, VPS and YUZ		
00	See 0200 listings for NBA and XSX		
00	CTV Monsanto	WX	418 5015 7353 8674
00	TXZ see 0400 listing		
00	VWB Bombay, India	TFC	476 12966
00	4XO Haifa, Israel	WX	484 8484 17060
05	See 0005 listings for EAC and WOE		
10	KPH Bolinas, California	PX	4247 6488 8618 17016 22557
10	WNY see 0010 listing		
18	See 0018 listings for KSE and WPA		
18	VWC see 0630 listing		
20	See 0020 listings for DZG, ICB and KTK		
30	See 0030 listings for JOC, KHK, and KLC		
30	ASK Karachi, Pakistan	WX	195 484 500 8694 13056
30	BAV-24 Taipeh, China	PX	14475 (Associated Press)
0830	BBC-30 Taipeh, China	PX	7600 (Associated Press)
30	NPO see 0305 listing		
30	ODR see 0630 listing		
30	VPT Malta	TFC	416 8710 13128
30	XSW see 0230 listing		
30	YUZ see 0000 listing		
35	See 0035 listings for WNU and WSV		
48	VWB Bombay, India	WX	159 12966
50	See 0050 listings for IQH and KOK		
50	WCC see 0450 listing		
55	DUM see 0255 listing		
0900	See 0100 listings for DZR, KPH, VPB and XYR		
00	See 0530 listings for CFH and ZNR		
00	IAR Rome, Italy	TFC	519 8670 13015 17232
00	NSS Washington	PX	9425
00	TXZ Djibouti, F.S.	WX	464 8682
00	VPT see 0830 listing		
00	YUZ see 0000 listing		
05	EAC see 0005 listing		
10	SUH see 0110 listing		
15	VWM see 0515 listing		
18	See 0118 listings for VWM and WSC		
18	KFS San Francisco	PX	4247 6366 8558 12845
20	JMC see 0000 listing		

25	JMB	see	0325 listing		
30	See	0130 listings for	JOS, KFS, KLC, SVA and VWC		
30	See	0530 listings for	CKN and GZH		
30	DUM	see	0030 listing		
30	GKU	Portishead, England	WX	102 6428 8606 12853 17151	
30	NBA	see	0430 listing		
30	ODR	see	0630 listing		
30	WMH	see	0330 listing		
30	YUZ	see	0000 listing		
35	WAX	see	0135 listing		
40	See	0420 listings for	NPG and NPN		
40	FFL	see	0140 listing		
40	NPM	see	0430 listing		
45	JAO-3	see	0400 listing		
50	IQX	see	0150 listing		
55	See	0155 listings for	NSS and VPS		
55	GBR	Gibraltar	TX	16 4025 6985 7397 12455 18680	
55	NBA	see	0455 listing		
1000	See	0000 listings for	JCS, NSS, VPS, YUS and YUZ		
00	See	0400 listings for	GFV, KLC, and TXZ		
00	DYC-2	Philippines	WX	8702	
00	JAO-3	Tokyo, Japan	PX	12275 (Associated Press)	
05	See	0005 listings for	EAC and WOE		
10	WNY	see	0010 listing		
18	See	0018 listings for	KSE and WPA		
20	See	0020 listings for	DZG, ICB and KTK		
20	DZR	see	0120 listing		
30	See	0030 listings for	JOC, KHK, KLB and KLC		
30	See	0430 listings for	DZG and NBA		
30	NPG	see	0230 listing		
30	ODR	see	0630 listing		
1030	VPB	see	0530 listing		
30	YUZ	see	0000 listing		
35	See	0035 listings for	WNU and WSV		
50	See	0050 listings for	IQH and KOK		
1100	See	0100 listings for	DZR, KPH and VPB		
00	See	0500 listings for	NHB and WSL		
00	VWM	see	0515 listing		
00	YUZ	see	0000 listing		
05	EAC	see	0005 listing		
05	VPW	Singapore	TFC	6559 8718 13128	
10	SUH	see	0110 listing		
18	WSC	see	0118 listing		
30	See	0130 listings for	JOS, KFS, KLC and SVA		
30	See	0530 listings for	NHY and ZNR		
30	ODR	see	0630 listing		
30	WMH	see	0330 listing		
30	YUZ	see	0000 listing		
35	WAX	see	0135 listing		
40	FFL	see	0140 listing		
50	See	0150 listings for	IQX and WSL		
55	See	0155 listings for	JJC and NSS		
55	See	0555 listings for	NPG and NPM		
1200	See	0000 listings for	JCS, JMC, NSS, VPS and YUZ		
00	TXZ	see	0900 listing		
00	VPT	see	0830 listing		
00	WLO	Mobile, Alabama	TFC	438 6446 8714 13124 17170	
05	See	0005 listings for	EAC and WOE		
10	WNY	see	0010 listing		
18	See	0018 listings for	KSE and WPA		
20	See	0020 listings for	DZG, ICB and KTK		
20	JJC	see	0120 listing		
20	ZGV	Nairobi, Kenya	WX	9043 12000 17365	
30	See	0030 listings for	JOC, KHK, KLB and KLC		
30	ASK	see	0830 listing		
30	GKL	Portishead, England	TFC	13000	
30	ODR	see	0630 listing		
30	VPX-3	Penang, Malaya	TFC	13100	
30	YUZ	see	0000 listing		
35	See	0035 listings for	NSS, WNU and WSV		
35	CTH	Azores	WX	429 1094 7351 9724	
48	NIK	see	0048 listing		
50	See	0050 listings for	IQH, KOK and WCC		
1300	See	0100 listings for	DZR, KPH, and XYR		
00	VPT	see	0830 listing		
00	VRT	Bermuda	WX	484	
00	WSE	Jacksonville	WX	464 8722 12079 17170 23079	
00	YUZ	see	0000 listing		
05	EAC	see	0005 listing		
10	See	0110 listings for	SUH and VPW		
15	VWM	see	0515 listing		
18	WSC	see	0118 listing		
18	ZEL	22 Hong Kong	WX	7658	
20	WPD	Tampa, Florida	TFC	420 4274 6446 8742 13051 17170	
27	VRB	see	0557 listing		
1330	See	0130 listings for	JOS, KFS, KLC, SVA and VWC		
30	See	0530 listings for	GZH and ZNR		
30	DUM	see	0030 listing		
30	GYS	see	0500 listing		
30	ODR	see	0630 listing		
30	VPB	see	0600 listing		
30	WMH	see	0330 listing		
30	YUZ	see	0000 listing		
35	WAX	see	0135 listing		
40	FFL	see	0140 listing		
50	See	0150 listings for	IQX and WSL		
55	NSS	see	0155 listing		
1400	See	listings for	JCS, NSS, VPS and YUZ		
00	See	0200 listings for	KCBR and NBA		
00	WLO	see	1200 listing		
05	See	0005 listings for	EAC and WOE		
05	WSF	New York	TFC/WX	442	
10	WNY	see	0010 listing		
18	See	0018 listings for	KSE and WPA		
18	WCO	New York	PX	3378 6460 10966	
18	WCO	New York	PX	13020 16968 22407 (Sunday)	
18	See	0018 listings for	KSE and WPA		
18	WCO	New York	PX	3378 6460 10966	
18	WCO	New York	PX	13020 16968 22407 (Sunday)	
20	See	0020 listings for	DZG, ICB and KTK		
30	See	0030 listings for	JOC, KHK, KLB and KLC		
30	See	0230 listings for	NPG and XSW		
30	NSS	Washington	MCST	122 4390 9425 12804	
30	ODR	see	0630 listing		
30	YUZ	see	0000 listing		
35	See	0035 listings for	WNU and WSV		
50	See	0050 listings for	IQH and KOK		
55	DUM	see	0255 listing		
1500	See	0100 listings for	DZR, KPH and VPB		
00	JAO-3	Tokyo, Japan	PX	8175 (Associated Press)	
00	VPT	see	0830 listing		
00	VWM	see	0515 listing		
00	WSE	Jacksonville, Florida	TFC	464	
00	YUZ	see	0000 listing		
05	EAC	see	0005 listing		
05	NPO	see	0305 listing		
10	SUH	see	0110 listing		
18	WNU	see	0000 listing		
18	WSC	see	0118 listing		
20	DZG	see	0320 listing		
20	JMC	see	0000 listing		
20	VWC	see	0630 listing		
20	WPD	see	1320 listing		
25	JMB	see	0325 listing		
30	See	0130 listings for	JOS, KFS, KLC and SVA		
30	DUM	see	0030 listing		
30	ODR	see	0630 listing		
30	VPT	see	0830 listing		
30	WMH	see	0330 listing		
30	YUZ	see	0000 listing		
35	WAX	see	0135 listing		
40	FFL	see	0140 listing		
48	WAX	see	0348 listing		
50	See	0150 listings for	IQX and WSL		
55	NSS	see	0155 listing		
1600	See	0000 listings for	JCS, NSS, VPS and YUZ		
00	See	0400 listings for	GFV, IAR, KLC, TXZ and VPB		
00	NBA	Balboa, Canal Zone	HX	148 5449 11080 17127	
00	WLO	see	1200 listing		
05	See	0005 listings for	EAC and WOE		
05	WOE	see	0105 listing		
10	WNY	see	0010 listing		
18	See	0018 listings for	KSE and WPA		
20	See	0020 listings for	DZG, ICB, KTK and NMR		
20	See	0420 listings for	KFS, NPG and NPN		
30	See	0030 listings for	JOC, KHK, KLB and KLC		
30	See	0430 listings for	NPM and NPO		
30	ASK	see	0830 listing		
30	CNP	Casablanca	TFC	441 8686	
30	ODR	see	0630 listing		
30	VPW	see	1105 listing		
30	YUZ	see	0000 listing		
30	ZNR	see	0530 listing		
35	See	0035 listings for	WNU and WSV		
48	VWB	see	0848 listing		
50	See	0050 listings for	IQH, NMF and WCC		
50	KOK	see	0450 listing		
55	NBA	see	0455 listing		
1700	See	0100 listings for	DZR, VPB and XYR		
00	See	0500 listings for	KPH, NHB, NPM, NPN, NSS and WSL		
00	See	0600 listings for	GYR and GYZ		
00	DZM	Philippines	PX	8670	
00	NBA	see	0430 listing		
00	YUZ	see	0000 listing		
05	EAC	see	0005 listing		
10	SUH	see	0110 listing		
15	VWM	see	0515 listing		
18	See	0118 listings for	VWM and WSC		
20	WPD	see	1320 listing		
30	See	0130 listings for	JOS, KFS, KLC, SVA and VWC		
30	See	0530 listings for	CKN, GZH and NHY		
30	ODR	see	0630 listing		
30	WER-	21 New York	PX	11525 (European Bulletin, Mon-Fri)	
30	WER-	25 New York	PX	15983 (European Bulletin, Mon-Fri)	
30	WER-	37 New York	PX	17648 (Middle East Bulletin, Mon-Fri)	
30	WMH	see	0330 listing		
30	YUZ	see	0000 listing		
35	WAX	see	0135 listing		
40	FFL	see	0140 listing		
48	WPA	Port Arthur, Texas	WX	416 4322 6435 8550 12840 17256 22569	
50	See	0150 listings for	IQX and WSL		
55	See	0555 listings for	NPG and NPM		
55	See	0155 listing			
1800	See	0000 listings for	JCS, JMC, NSS, VPS and YUZ		
00	NSS	see	0600 listing		
00	WES-	25 New York	PX	15983 (Europe and Middle East Bulletin Sunday)	
00	WLO	see	1200 listing		
00	WPD	Tampa, Florida	WX	420 4270 6446 8742 13051 17170	
00	WWRN		PX	18525 (Latin American Bulletin, Mon-Fri)	
00	WWRP		PX	12023 (Latin American Bulletin, Mon-Fri)	
1805	See	0005 listings for	EAC and WOE		
10	WNY	see	0010 listing		
18	See	0018 listings for	KSE and WPA		
18	NPO	San Miguel, P.I.	PX	3378 6460 10966	
18	WCO	New York	PX	13020 16968 22407 (Sunday)	

- 20 See 0020 listings for DZG, ICB and KTK
 20 JJC see 0120 listing
 30 See 0030 listings for JOC, KHK, KLB and KLC
 30 CNP see 1630 listing
 30 NPG see 0230 listing
 30 NSS see 1430 listing
 30 ODR see 0630 listing
 30 YUZ see 0000 listing
 30 ZNR see 0530 listing
 35 See 0035 listings for WNU and WSV
 50 See 0050 listings for IQH and KOK
 1900 See 0100 listings for DZR, KPH and VPB
 00 WHD see 0450 listing
 00 VWM see 0515 listing
 00 YUZ see 0000 listing
 05 EAC see 0005 listing
 10 SUH see 0110 listing
 18 WSC see 0118 listing
 20 WPD see 1320 listing
 30 See 0130 listings for JOS, KFS, KLC, SVA and WMH
 30 KLC Galveston, Texas PX 13038
 30 ODR see 0630 listing
 30 YUZ see 0000 listing
 35 WAX see 0135 listing
 40 FFL see 0140 listing
 50 See 0150 listings for IQX and WSL
 55 NSS see 0155 listing
 2000 See 0000 listings for JCS, NSS, VPS and YUZ
 00 CTV see 0800 listing
 00 NBA see 0200 listing
 05 See 0005 listings for EAC and WOE
 10 WNY see 0010 listing
 18 See 0018 listings for KSE and WPA
 20 See 0020 listings for DZG, ICB and KTK
 30 See 0030 listings for JOC, KHK, KLB and KLC
 30 See 1730 listings for WER-21, WES-25 and WES-37
 30 CNP see 1630 listing
 30 ODR see 0630 listing
 30 YUZ see 0000 listing
 35 See 0035 listings for WNU and WSV
 35 NPO see 0305 listing
 50 See 0050 listings for IQH and KOK
 50 WCC see 0450 listing
 55 DUM see 0255 listing
 2100 See 0100 listings for DZR, KPH, VPB and XYR
 00 CFH see 0530 listing
 00 CKN Vancouver, Canada PX 131 6446 12921 17288
 00 IAR see 0400 listing
 00 YUZ see 0000 listing
 2105 EAC see 0005 listing
 10 SUH see 0110 listing
 15 VWM see 0515 listing
 18 WSC see 0118 listing
 20 JMC see 0000 listing
 20 WPD see 1320 listing
 25 JMB see 0325 listing
 30 See 0130 listings for JOS, KFS, KLC, SVA and WVC
 30 See 0530 listings for CKN, GZH and ZNR
 30 DUM see 0030 listing
 30 NPG see 0420 listing
 30 ODR see 0630 listing
 30 WMH see 0330 listing
 30 YUZ see 0000 listing
 35 CTH see 1235 listing
 35 WAX see 0135 listing
 40 FFL see 0140 listing
 40 NPM see 0430 listing
 40 NPN see 0420 listing
 50 See 0150 listings for IQX and WSL
 55 NSS see 0155 listing
 2200 See 0000 listings for JCS, NSS, VPS and YUZ
 00 See 0400 listings for GFV, JAO-3 and KLC
 00 DZP Manila, P.I. PX 9390 15440 17910 19885 22185 (Far East Bulletin, Mon-Fri) 436 6348 8714 12696 22515
 00 KFS San Francisco WX 436 6348 8714 12696 22515
 00 NBA see 0430 listing
 05 See 0005 listings for EAC and WOE
 05 WSF see 1405 listing
 10 WNY see 0010 listing
 18 See 0018 listings for KSE and WPA
 20 See 0020 listings for DZG, ICB and KTK
 30 See 0030 listings for JOC, KHK, KLB and KLC
 30 CNP see 1630 listing
 30 NBA see 0430 listing
 30 NPG see 0230 listing
 30 NSS see 1430 listing
 30 ODR see 0630 listing
 30 YUZ see 0000 listing
 35 See 0035 listings for WNU and WSV
 50 See 0050 listings for IQH and KOK
 55 NBA see 0455 listing
 2300 See 0100 listings for DZR, KPH and VPB
 00 See 0500 listings for NHB and WSL
 00 KTK see 0520 listing
 00 KUP see 0530 listing
 00 VWM see 0515 listing
 00 YUZ see 0000 listing
 05 EAC see 0005 listing
 10 SUH see 0110 listing
 18 WSC see 1418 listing
 30 See 0130 listing for JOS, KFS, KLC and SVA
 30 NHY see 0530 listing
 30 ODR see 0630 listing
 2330 WMH see 0330 listing
 30 YUZ see 0000 listing
 35 WAX see 0135 listing
 40 FFL see 0140 listing
 50 See 0150 listings for IQH and WSL
 55 See 0555 listings for NPG and NPM
 55 NSS see 0155 listing

Summary. I hope this discussion about code practice has helped you. This type of information is subject to rapid change and it is assumed that some listings will be incorrect by the time you read this article. However, most of the station activities included in this list have held constant for many years and you can expect to hear them if you listen for them. I will, of course, be glad to receive written comments about changes. I will check out received information and make appropriate modifications to the master list that my students have used for several years.

The January through March 1979 Novice columns contain an article about QSL cards. That article includes explanations of how QSL bureaus function. The information essentially remains correct. However, some changes have been made in the way one uses the ARRL Outgoing DX QSL Bureau, which is a service to ARRL members. These changes

became effective June 1, 1979. The SASE (self-addressed, stamped envelope) is no longer required with each shipment of outgoing DX cards sent to the ARRL. The League previously returned a confirmation slip in the SASE to let you know that your cards had been received. Confirmation slips have been discontinued to reduce the workload and the cancelled check provides an adequate indication that one's cards have been received. ARRL members previously sent one dollar with each shipment of cards, regardless of how many cards were sent at one time. For most amateurs, the one dollar fee will still suffice. However, if you send more than one pound of cards (about 155 cards) in a shipment, you now have to send more than one dollar. One dollar must be sent with each pound of cards, or a fraction thereof. As an example, if you send 2 pounds and 3 ounces of cards to ARRL, you must also send three dollars. The rest of the rules remain the same as they

are detailed in the QSL article.

Novices are urged to submit good black-and-white pictures of themselves at their operating position. If your photograph is printed in a future Novice column, you will receive a one year subscription (or renewal) to CQ. A brief description of operating activities and some personal background information are needed with your picture.

Some of the stations I've recently worked on the novice bands are: KA1CCG Alma @ Old Lyme, Conn., KA2BKG Jeff @ Sparta, N.J., KA3AAO Rich @ Evans City, Penn., KA4FNB George @ Atlanta, Georgia, KA5DUP Gene @ Alexander, Arkansas, KA6FCK John @ Riverside, California, KA7DVR Geoff @ Lathrop Wells, Nevada, KA8ETT Jim @ Morgantown, W. Va., KA9APK Layton @ Crawfordsville, Ind., WD0DEP Andy @ Minot, N. Dakota

73, Bill, W6DDB

DX

News of communications around the world

ON4UN Closes in on Full 5-Band WAZ

John A. Devoldere, ON4UN, author of *80 Meter DXing*, has obviously put the lessons he taught on low frequency DXing to good use in soaring to a commanding lead in the 5-Band WAZ chase. With 195 zones worked and confirmed on 80 - 10 meters, John is only 5 away from the magic 200 and the world's first complete 5-Band WAZ.

When CQ introduced this new award on Jan. 1, 1979 we had expected it to take a year or more to complete the contacts and secure the cards. However, ON4UN succeeded in confirming difficult zones such as 18 and 19 in a matter of weeks.

As of May 24, 1979, the 5-Band WAZ Honor Roll reads as follows:

Callsign	Zones Submitted For Credit	Certificate Number (for 100 zones)
ON4UN	195	4
D4CBS	152	1
W1NG	150	3
W8GT	150	9
N4RR	120	10
SM0AJU	113	17
K4XO	104	13
DL3RK	103	16
K4MQG	102	6
WA4JTI	102	7
K7UR	102	11
CT2SH	102	18
AA6AA	100	2
N6DX	100	5
WD8EOJ	100	8
VE3GCO	100	12
N4MM	100	14
WA0TKJ	100	15

While Devoldere is far out in front in cards *submitted*, it is by no means certain that he will be the first to reach 200 zones. Others may be holding their cards until they can qualify for the full 5-Band WAZ. D4CBS, AA6AA, W1NG or one of the other outstanding DXers in the race could be standing in front of the registered mail window of the post of-

*P.O. Box 205 Winter Haven, FL 33880



Doug, VE3MV (right), representing the Canadian CX Club, presenting a special award to the radio club "MIHAJLO PUPIN" YI1BGD on the air. Vladin, YU1OQI (left) and Zoran, YU1OQZ (center) shown accepting the award. (Photo via Doug, VE3MV).

office at this very moment.

DXers interested in 5-Band WAZ should contact CQ's WAZ Award Manager, Leo Haijsman, W4KA, for complete rules and application forms. Leo's QTH is 1044 Southeast 43rd. St., Cape Coral, FL 33904. Leo was in the middle east from May 28 - June 16 so if he is running a little behind in returning your cards please bear with him.

N4UF - New Country Award Winner

The DX Department has had a shift in duties since the August DX column was written, and Billy F. Williams, N4UF, is now Manager for the CQ CW DX Award and the CQ SSB DX Award. Job responsibilities forced Rod Linkous, W7OM, to give up this part of the program, but Rod will continue to serve as Assistant DX Editor and prepare every third column. Effective May 15 Billy began checking cards for award applicants and maintaining the c.w. and s.s.b. honor rolls.

Since he was first licensed in 1964, Billy Williams has held the calls WN4UFW, WA4UFW, N4UF and VP5BW. In addition he participated in the HH5/Haiti operation by the North

Florida DX Association in October 1977 and operated from Haiti again as HH2CQ in October 1978. Club offices he has held include President of the North Florida Amateur Radio Society, President of the Jacksonville RANGE Association, President of the North Florida DX Association, Chairman of the Jacksonville Hamfest Association, Editor of the *North Florida DX Association News* and Editor of the North Florida Amateur Radio Society publication *Balanced Modulator*.

Billy is Professor of Vocational Electronics at Florida Junior College in Jacksonville.

De Extra

The *De Extra* section provides both readers and staff the opportunity to editorialize on matters of DX interest. This month's comment is by Art Candell, HH2A, who is much less than enthusiastic over the QSL Bureau system:

"One of the problems of a radio amateur sending his cards to a QSL Bureau rather than a QSL Manager is the invariable "looting" of any stamps, IRC's or even sase's. The bare cards, after long, long delays eventually find



Reinaldo R. (Ray) Alea, KA8BAC, of Dayton, Ohio. Ray has now worked his way up to an Advanced Class license. As a novice he earned WPNX certificate #138 and now has earned the CQ DX Award and DXCC. He is QSL Manager for his father, CO8RA.

The WPX Program

Mixed

744...K9BQL	748...DK5AN
745...VE1MX	749...WA3ZMY
746...K9EVB	750...IBNLC
747...W1XK	751...WA7ILC

S.S.B.

1156...WD4DJC	1161...I6ONE
1157...ZP5VO	1162...N4ANV
1158...DM2BTO	1163...WD8MGQ
1159...DM2YLO	1164...WD4EYD
1160...DK6WF	

C.W.

1825...N4SX	1829...I6AYS
1826...IX1LDX	1830...IT9VDO
1827...LA1SV	1831...WB9UIA
1828...DJ2CT	

WPNX

155...WD8KAC	157...WD5IUV
156...KA3BLP	158...WB9UIA

Endorsements:

Mixed: 400 K9BQL, K9EVB, W1XK, DK5AN, WA3ZMY, 450 IBNLC, 500 JA7FFN/1, VE1MX, 550 KL7AF, GM4DKO, 600 JH3XCU, 650 N5RR, 700 N4WX, 750 OK1DVK, VE7IG, 950 XE1J, 1000 YU2CBM, 1350 K5UR, 1450 K2VV.

SSB: 300 WD4DJC, I6ONE, N4ANV, WD8MGQ, WD4EYD, 350 K9BQL, ZP5VO, WA2YUH, 400 KL7AF, DK6WF, I6POO, 450 N5RR, JH3XCU, WA7ILC, 500 I2OMF, I6AYS, 600 DM2BTO, 650 VE7IG, 700 I8YZP, 800 JH1VRQ, 1000 N2SS, 1100 W6RKP, 1150 ZL3NS.

C.W.: 300 N4SX, W2XQ, LA1SV, DM4ZFM, DJ2CT, IT9VDO, 350 WB2FFY, 400 JA7FFN/1, I6AYS, 450 N5RR, N6FX, 500 WB9UIA, 550 DJ1YH, 650 SP6BBA, JH1VRQ, VE7CNE, I0ZQ, 750 OK1KYS, 800 KH6HC, 850 VE1MF, 950 W3TVB, 1150 G2GM, 1350 W2NC, 1500 W4BQY.

10 meters: PA2TMS, YU1NFR, EP2TY.

15 meters: W2CC, OK1KYS, PA2TMS.

20 meters: W2CC, OK1KYS, W6YMH, KL7AF, DM2BTO, I2OMF.

40 meters: OK1KYS, PA2TMS, XE1J.

80 meters: OE1KJW, W2CC, W4BQY.

160 meters: WA7ILC.

Africa: XE1J.

Asia: OK1DVK, KL7AF, PA2TMS, JA7FFN/1, WA4QMQ, W6YMH, XE1J.

Europe: W2HAZ, KL7AF, PA2TMS, DM2BTO, DM2YLO, DK6WF, WA4QMQ, WA2UDT, XE1J.

No. America: N5RR, PA2TMS, YU1NFR, I8YZP, W1XK, K1RB, WB2FFY, WA4QMQ.

So. America: JH1VRQ.

Oceania: JA7FFN/1, WA4QMQ.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if air-mail desired) to "CQ WPX Awards", 5014 Mindora Dr., Torrance, CA 90505, U.S.A.



Chris Page, G4BUE, has worked 20 meter single band WAZ and is now into the QRPP race. He hopes to have all 40 zones very shortly using less than 5 watts and is experimenting with even lower power inputs. He has worked a W2 while using an input of only 150 milliwatts and 3 continents using only 250 milliwatts. Chris was also awarded QRPP DXCC #8 by Ade Weiss, endorsed first European.

themselves in the hands of the overseas ham who finds he must shell out considerable postage if the cards are to be acknowledged

"I Invariably give the call of my QSL Manager, WA6RPF, following a QSO. I am also listed clearly in the callbook. To send your cards to a QSL Bureau in spite of this almost precludes your receiving a reply as it is sometimes over a year between the QSO and receipt of the card, and the reply postage is excessive.

"To you who have sent HH2A a QSL card over the past year and a

half via a Bureau, and have not received a reply, send me an sase with your call. Do not send another card. If you are DX please send an addressed envelope and enough IRC's to cover airmail postage, even if you previously send postage via the Bureau.

"Most cards were forwarded to me less IRC's and postage by CARF National QSL Bureau, ARRL, ISWL and others.

"In conclusion, if you need that rare DX card, the most unlikely way to receive it is to go through a Bureau. The best way is via the DX station's QSL Manager. He is invariably a hard-working guy who endeavors to respond quickly and correctly to all cards received. And don't forget, either an sase of sufficient IRC's."

De DX Editor K4IIF: We agree strongly that the quickest and surest way to a QSL is via the DX station's QSL Manager. However, in fairness to CARF, ARRL and others we should add that most DXers who use the Bureau's do so for reasons of economy and do not send stamps and IRC's. Cards which arrive bare were probably sent bare. Therefore, DX stations who receive cards via the Bureau should save their own postage by replying through the Bureau.

Super DXpedition Planned

Alex Kasevich, W1CDC, of the Caribe DX Association, is attempting

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more countries for the mode indicated. The top SSTV DXers are also listed. The ARRL DXCC Country List, LESS DELETED COUNTRIES, is used as the country standard. Total number of countries currently on the DXCC list as of this listing is 319. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. To remain on the CQ DX Honor Roll, annual updates are required. Honor Roll updates may be submitted any time, in any number. Updates indicating "no change" will be accepted to meet the annual requirement.

C.W.

W6PT.....319	N4PN.....313	N6AV.....305	N6FX.....299	WA8DXA.....290
ON4QX.....317	W9DWO.....310	W2GT.....305	DL3RK.....295	DJ7CX.....288
K6EC.....316	W8KPL.....309	W4BOY.....304	K4CEB.....293	JA1GTF.....287
W6ID.....314	K5JG.....307	K9MM.....300	N6CW.....292	W4OEL.....275

S.S.B.

WA2RAU.....319	I8KDB.....315	DJ9ZB.....310	N6AV.....300	JH1VRQ.....288
DL9OH.....318	K6WR.....315	I4ZSO.....310	W8ILC.....300	OE3WWB.....288
I0AMU.....318	SM6CKS.....315	W4UG.....310	W9SS.....300	I6PLN.....287
W2TP.....318	VE3MJ.....315	ZS6LW.....310	HP1JC.....299	JA1GTF.....287
W9DWO.....318	G3FKM.....314	EA4LH.....309	DJ7CX.....296	N6AW.....287
K2FL.....317	VE3MR.....314	YV1KZ.....309	F9MS.....295	OK1MP.....286
K8DYZ.....317	W9KRU.....314	F2MO.....308	K8LJG.....295	W7OM.....286
W3CWG.....317	ZL3NS.....314	K5OVC.....307	W9DO.....295	YS1O.....286
W4EEE.....317	I8YRK.....313	XE1KS.....307	K8PYD.....294	VE3FJE.....285
W4UG.....317	K6JG.....313	ZL1AGO.....306	N2SS.....294	I3LLD.....283
W6EUF.....317	K6EC.....312	N4MM.....305	W6FET.....294	K1UO.....283
XE1AE.....317	N4WF.....312	W3GG.....305	DK6KG.....293	K5DUT.....279
K4MQG.....316	W4DPS.....312	W0SD.....305	LU1BAR/W3.....293	JA6GDG.....277
K6YRA.....316	W6RKP.....312	VE7WJ.....304	K4LSP.....292	AA4A.....276
W3AZD.....316	I0ZV.....311	DK2BL.....303	K9RF.....291	DJ2AA.....276
W3NKM.....316	K9MM.....311	K6XP.....302	9H4G.....291	K9PPY.....276
W4SSU.....316	OE2EGL.....311	W0SFU.....302	VE7CE.....290	WA4JTI.....276
W9JT.....316	VE2WY.....311	WB6DXU.....302	WA4WTG.....290	W2CC.....275
F9RM.....315	VE3GMT.....311	I5WT.....300	VE7HP.....289	W0SR.....275
I8AA.....315	W9QLD.....311			

SSTV

W8YEK.....108	G3IAD.....101
---------------	---------------



Siggi, TF3CW, at the operating position of TF6M during the July, 1978 DXpedition. The total QSO's were 10,800 in 85 hours of operation on both phone and c.w. QSLs go to Siggi's QTH: Sigurdur Jakobsson, TF3CW, Hraunbair 100, 110 Reykjavik, Iceland.

to assemble a major DXpedition to one of the very rare spots. He is interested in hearing from DXers who would like to have a part in the effort. The time window is late summer or early fall next year, 1980, with exact dates to be announced when legal for-

The WAZ Program

10 Meter Phone

7 ... JH7DNO
8 ... K5OVC
9 ... JA2DYI
10 ... JA2UYS
11 ... I5WRI
12 ... JE2QWC

15 Meter Phone

15 ... G3TOE

20 Meter Phone

227 ... W0UYL
228 ... K4NJS
229 ... CX7BF
230 ... KP4AM
231 ... VE7IX

80 Meter Phone

4 ... ON4UN

10 Meter C.W.

3 ... YU2RTW
4 ... JR1IJV

15 Meter C.W.

12 ... W0SF
13 ... ITLA

20 Meter C.W.

78 ... OH2BN
79 ... IX1LXD
80 ... I5IRM
81 ... AF5M

40 Meter C.W.

13 ... YU2RTW

All Band WAZ S.S.B.

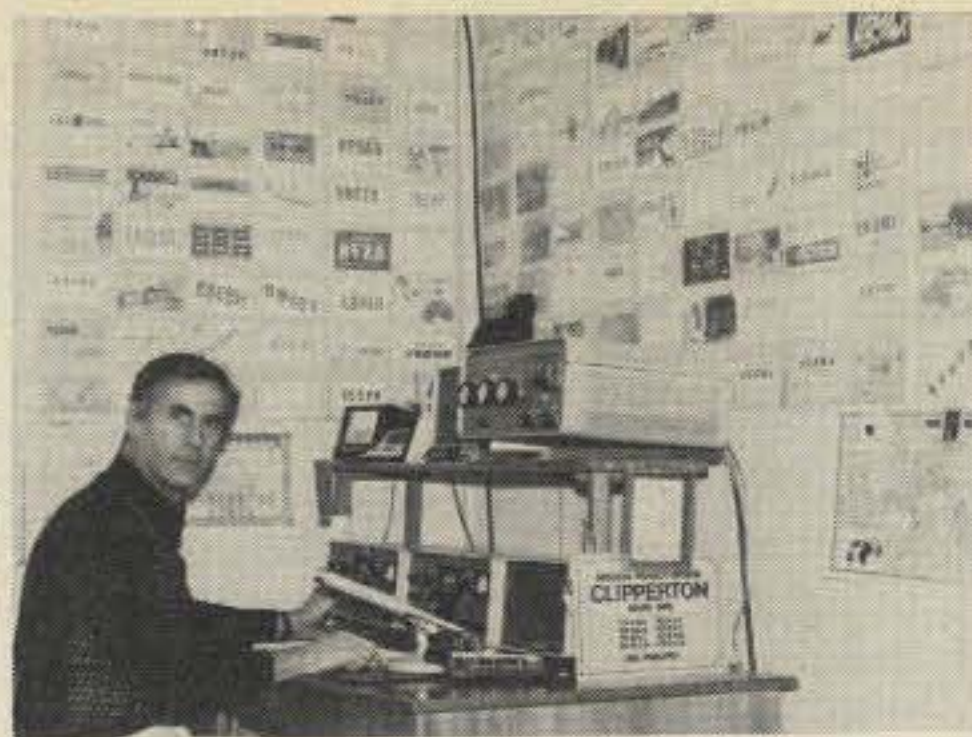
1652 ... PT2TF
1653 ... EP2TY
1654 ... W3IQS
1655 ... W8SDV
1656 ... XE1GBM
1657 ... I6NOA
1658 ... I6ZJC
1659 ... I5LZJ
1660 ... I0RKF

C.W./Phone Mixed

4545 ... W2KI	4555 ... HA3GT
4546 ... OZ7XG	4556 ... WA5IGD
4547 ... WD8IXV	4557 ... I0UCM
4548 ... WB4MAR	4558 ... W0VIP
4549 ... EABNU	4559 ... W2NJV
4550 ... JH2CJW	4560 ... N4SX
4551 ... DK2XX	4561 ... WA7ILC
4552 ... DL7WT	4562 ... WA7LAG
4553 ... DL9YG	4563 ... SM6AYM
4554 ... DJ2XO	

All Phone

553 ... K4LNO



If you worked the big Clipperton DX-pedition in March, 1978 you received your QSL via Kurt Bindschedler, HB9MX. His QTH is Strahleggweg 28, 8400 Winterthur/ZH, Switzerland. Kurt still has some cards in case you haven't gotten around to sending yours.

malities have been completed. He indicates that a large seaplane with a pilot and co-pilot will be at the groups disposal, and that a major manufacturer of amateur equipment will provide top-of-the-line ham gear.

All persons who apply *must* hold a current amateur radio license, general class of higher, and *must* provide a doctor's statement indicating no physical problems which would be aggravated by extreme heat, sun, humidity, sea sickness, air sickness, possible physical exhaustion and insect bites. All members of the expedition should be proficient contest style operators, both s.s.b. and c.w., and must be able to contribute to the expedition in at least one of the following categories:

- 2 Persons with some para-medical training
- 1 Medical Doctor
- 2 Cooks
- 1 Navigator
- 1 Antenna Specialist
- 1 Electronics Technician (Solid State)
- 1 Mechanic with gasoline generator experience

All applicants must be able to swim and should have some climbing ability.

Alex states that these stringent requirements are not intended to discourage anyone from applying. He is simply trying to insure the safety of all members and increase the chances of success under difficult circumstances. There are always hidden or unexpected dangers in a trip of this magnitude.

DXers interested in applying should write Alex at P.O. Box 93, East Glastonbury, CT 06025. Include your questions and remarks, your telephone number and the best time to contact you.

New Certificate Charges

Just a reminder that the fee for WAZ, WPX and CQ DX Award certificates was increased to \$5.00 effective June 1, 1979. The fee for WPX and CQ DX Award endorsement stickers has now been set at \$1.00.

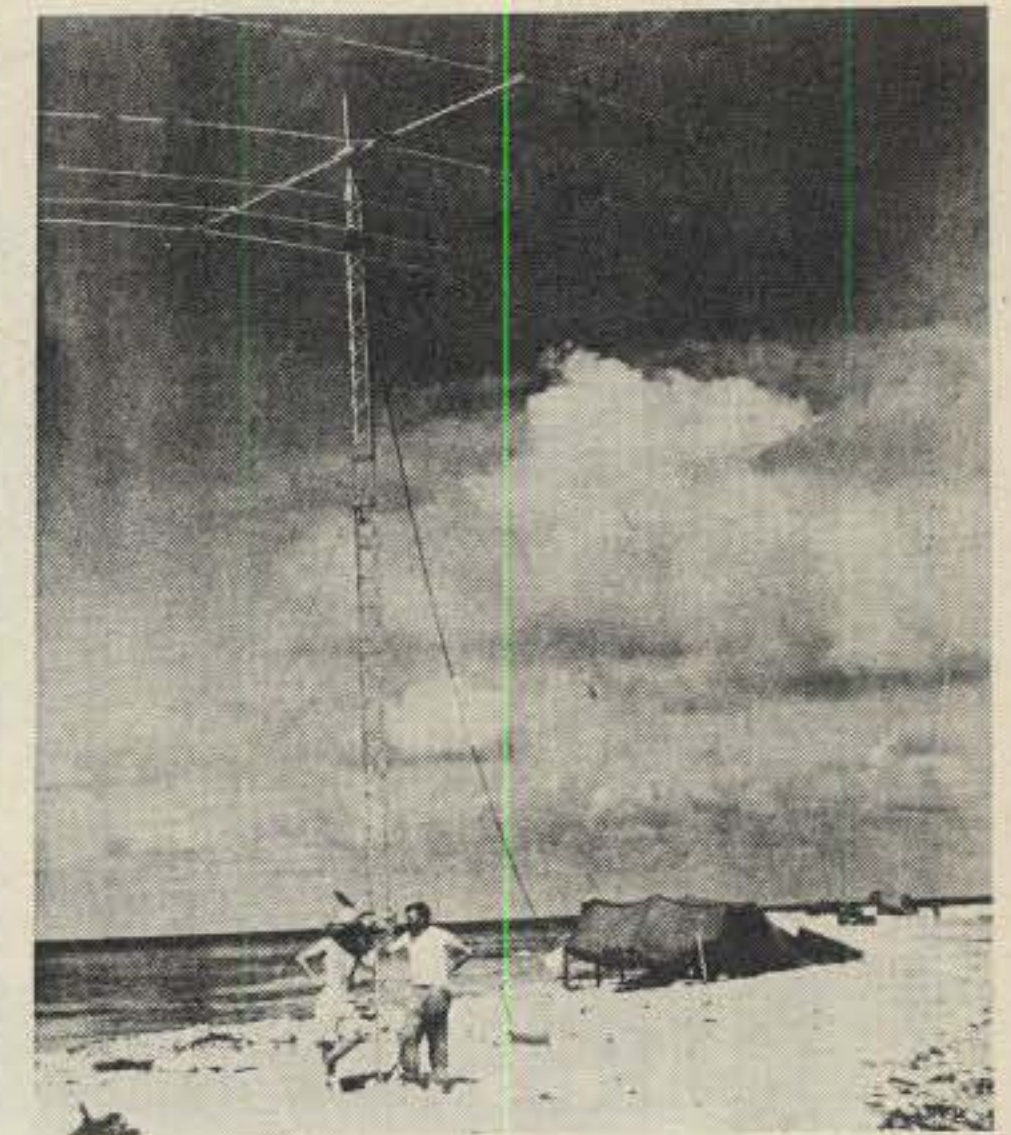
Here and There

Pacific DXpedition - An operation from the Northern Cook Group (Manihiki) is planned for Aug. 10 - Sept. 3, 1979 by K0EVE, ZK1DR, W0WP and K0SVW. They will operate on 80 - 10 meters, s.s.b. and c.w. Operation from ZK1, YJ8, FK8, KS6, 3D2, A35, ZK2 and 5W1 is also under consideration. QSL to W0WP/WA0WCR.

Papua/New Guinea - Paul, VK2NDL, will be in P29-land for 3 years using the call P29NDX on c.w. He hopes to fill the void for anyone needing P29 on c.w. Listen for Paul on 3525-3530, 21125-21130 and 28100-28220 KHz. (Tks N5US)

Laos - Erik Sjolund, SM0AGD, was scheduled to be in Laos this past summer and hoped to be able to operate. Erik has the expertise to bring off an operation under adverse circumstances. If you work him, QSL to SM3CXS.

KH6IJ - At presstime we are happy to report that Katashi Nose is recovering from his stroke and that the well



Here is another photo from Nostalgiasville, W4DQS and W8FGX relax beneath the tower and beam on the eastern tip of Bajo Nuevo during the great KH0AB operation 15 years ago. The c.w. station was in the tent in the foreground and the phone station in the tent on the west end of the island with the generator in between. Bajo Nuevo is about 850 ft. long and 35 ft. wide depending on tides. (Photos by Nereo)

The complete rules for WAZ are found in the May 1976 issue of CQ Magazine Application blanks and reprints of the rules may be obtained by sending a self addressed stamped envelope, size 4-1/4 x 9-1/2 to the WAZ manager, Leo Haijsman 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants forwarding QSL cards direct to the WAZ manager should include sufficient postage for the safe return of their QSL cards. Please note that effective June 1, 1979, the processing fee for all CQ certificates was raised to \$5.00, this fee must accompany all applications.

wishes of his amateur radio friends have made an important contribution. **1S1DX/Spratly** - The original attempt to land at Spratly was repelled by gunfire and the group was forced to return to Brunei. A second effort to land on a different island was carried out successfully by K4SMX, K1MM and VK2BJL who completed 13,300 QSO's in 60 hours of operation. Those of you who worked 1S1 for the first time owe this group a debt of gratitude. This was a very hazardous operation. Donations (not QSLs) may be sent to K2TJ.



Alf Almedal, LA5QK, maintains the CQ awards checkpoint for Norway. Alf is 47 years old and a retired Norwegian Air Force captain. His chief amateur interests are DX and Contests. The Almedal family is very amateur radio oriented. Eldest son Roy is LA5KO and next son Jan is LA9HW, ex-LB1G.

KP4AM/D, Desecheo - Effective Sept. 1, 1979, cards may be submitted for DXCC credit and for CQ DX Award credit. For the latter award cards go to our new CQ DX Award Manager, Billy Williams, N4UF, at 911 Rio St. Johns Drive, Jacksonville, FL 32211. **Northern California DX Foundation** - The NCDXF has been very effective in promoting and supporting operations from rare DX countries. The best way to express your appreciation is by a donation to the Foundation at P.O. Box 717, Oakland, CA 94604.

The Foundation recently reported that Stan Kiesel, K6UD, has been appointed to the Board of Directors replacing Ed Peck, K6AN, who has retired. Mr. Peck was a member of the original CQ DX Awards Advisory Committee 12 years ago.

Haiti - Butch, HH2PW, is very active on 10 meters. He can also be found on 40 meters, 7292 kHz at 1000 GMT, with his brother, WD4FGH, and his QSL Manager, WD9GSO. (Tks WD9GSO)

J7 - This is the new prefix for Dominica, formerly VP2D-

CZ6 - This is a special prefix used to commemorate the 75th anniversary of Edmonton, Alberta, Canada.

Cuba: Ray Alea, KA8BAC, writes that he schedules his father, CO8RA, every Saturday and Sunday near 2136

kHz. from 1900 GMT, and that any ham needing to confirm Cuba is welcome to break in. CO8RA is one of only a few stations active from Cuba and KA8BAC is his QSL Manager so there should be no trouble getting a card.

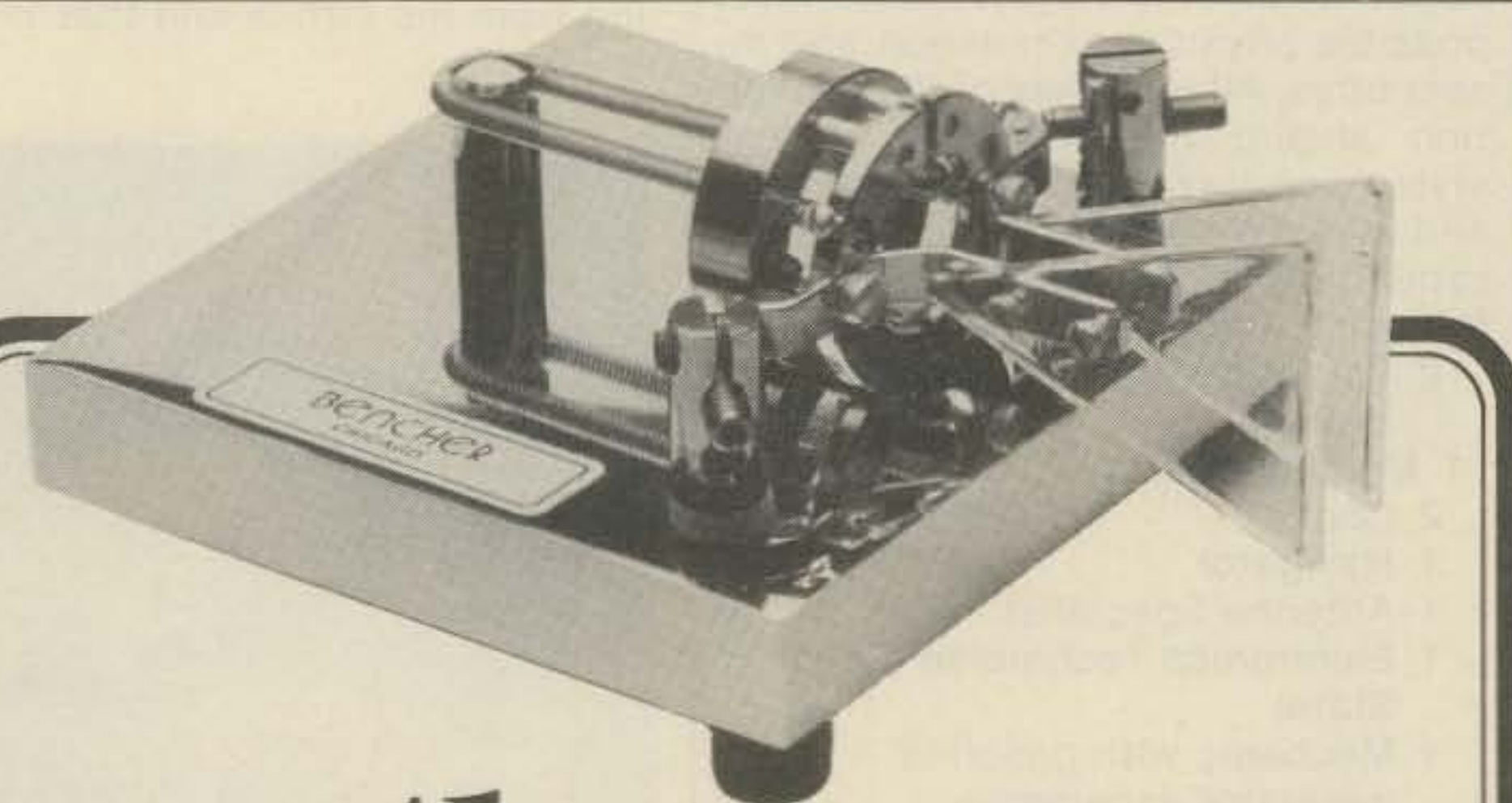
QSL Information

QSLs for the following DX stations should be routed through Don Brickey, W7OK, P.O. Box 95, Las Vegas, NV 89101. Don is a CQ DX Committee Member.: FK8BG, FK8CR, FW8AD, P29DP, VP2KA, VP2KN, VP2SF, VR1AF, VR1AG, and VR3AR.

QSLs for the following should be routed through Bob Schenck, N2OO,



Roland Colin, FC2CH, has confirmed Corsica for many happy DXers. If his call is in your log, the QTH is 20210 Porto-Vecchio, Corsica.



the Ultimate LAMBIC PADDLE

WRITE FOR LITERATURE

BENCHNER, INC.

333 W. Lake Street, Dept. D
Chicago, Illinois 60606 • (312) 263-1808

- Full range of adjustment in tension and contact spacing.
- Self-adjusting nylon and steel needle bearings.
- Solid silver contact points.
- Polished lucite paddles.
- Precision-machined, chrome plated brass frames.
- Standard model has black, textured finish base; deluxe model is chrome plated.
- Heavy steel base; non-skid feet.

Available at selected dealers or send \$39.95 (\$49.95 for chrome model) plus \$2.00 shipping and handling. Overseas amateurs invited to request quotation for air parcel post shipment.

YOUR HAM TUBE HEADQUARTERS!

TUBES BOUGHT, SOLD AND TRADED
SAVE \$\$\$ - HIGH \$\$\$ FOR YOUR TUBES

MONTHLY SPECIALS

3CX1000A7/8283	\$285.00	572B	\$27.50
3CX1500A7/8877	280.00	811A	10.80
3-500Z	79.95	813	18.00
3-1000Z	205.00	6146B	4.95
3WP1	24.00	6360	4.75
4-125A	42.00	6883B	5.25
4-400A	52.00	8122	51.00
4-1000A	275.00	8236	22.00
4CX250B	29.50	8908	5.25
5DEP1	18.00	8950	4.75

BRAND NEW****FACTORY GUARANTEED

TOP BRAND Popular Receiving Tube Types. BRAND NEW 72% Off List* Factory Boxed. FREE LIST Available—Includes full line of RF Power Transistors. Minimum Order \$25.

The intelligent Ham alternative to CB Two meter mobile 40 watt rf power transistor 2N6084—\$16.00. Linear rf transistors in stock.

Eimac Tubes & Accessories In Stock
Write or phone for types not listed

TUBES—BOUGHT-SOLD AND TRADED
Premium Prices Paid For EIMAC TUBES

CeCo

Use toll free no.
800-221-0860

COMMUNICATIONS, Inc.

2115 Avenue X
Brooklyn, NY 11235
Phone (212) 646-6300

SERVING THE INDUSTRY SINCE 1922

2-12 Oak Leaf Drive, Tuckerton, NJ 08087: FO0AKV, KV4KV, KV4KV/D, VP2DAY, VP2DXF, VP2EET, VS5OO, VS5MS, VS5KV, and VS6AK starting 03/21/79.

73, John, K4IIF

C5ABZ - Via K6MEP
 CN8CY - To WB0MSZ
 CT3AF - c/o W3HMK
 EA9GJ - Via WD6BIF
 ET3ZU/A - To I0IJ
 FB8XV - c/o F5VU
 FG9DYM/FS7 - Via W3HMK
 FK8CR - To W7OK
 FR7BU - To F6EQN
 FR7ZLT - c/o N4NX
 GU5CIA - Via N6MA
 HL9UW - To WA5LGR
 HM0OO - c/o DK5ML
 HS1ABD - Via K3EST
 HV2VO - To I0GPY
 J28AZ - c/o I8JN
 J6LGG - Via WB4SXX
 JA7JT/JD1 - To JH7BRG
 JG1IWI/JD1 - c/o JF1COE
 JJ1GUL/JD1 - Via Japan Amateur Radio League, Box 377, Tokyo Cental, Tokyo, Japan
 K1CC/PJ7 - To K3RYA
 K4YT/6W8 - c/o W2TK
 KG6RT - Via W6IAE
 KX6PP - To WD4NVH
 KZ5NW - c/o WB6PTI
 LU3ZY - Via LU2CN
 M1C - To K2FV
 N4ADJ/KHz (Guam) - Via WB4CCT
 N6PO/TG7 - c/o W6SZN
 OD5HQ - Via DJ9ZB

OE6XG/A - To WA3HUP
 OY2LP - c/o W1OD
 PJ4CR - Via W9ZDK
 S2BTF - Box 108, Dacca, Bangladesh
 S79MC - K4NW
 SV9JI - c/o P.O. Box 502, Iraklion, Crete
 TL8JM - Via W5RU
 TN8BL - To VE3EUP
 TR8GDC - c/o W5RU
 UG6GAF - Via UB5UAL
 VK2DCA/VK9N - To HB9AAA
 VK0JC - c/o OZ8AE
 VP2DXH - Via WD9GIG
 VP2MM - To W1CDC
 VP2MAB - c/o W1YNT
 VP2MBK - To K1IJV
 VP2MCH - c/o KA0CHK
 VP8QE - To K8FU
 VP8SB - Via G3ZMF
 VQ9JJ - W5RU
 VQ9KK - c/o WA3HUP
 VQ9MR - To NSGU
 VQ9TC - Via W3HMK
 VR1BE - c/o N6ADI
 VR3AH - WB4PRU
 VR6HI - c/o ZL1ADI
 WA4EDT/KX6 - Via WA4EDT
 XE2FU - To K5RC
 XT2AW - c/o Box 2332, Ouagadougou, Voltaic Republic
 YK1AA - Via DJ9ZB

The CQ DX Awards Program

S.S.B.

683 K5DUT	690 XE1OW
684 WA7YBN	691 XE1OX
685 WB3KAM	692 XE1YO
686 A18S	693 KA8BAC
687 WB0BMB	694 LU1BAR/W3
688 WA6PJR	695 I8ZTE
689 XE1GBM	

C.W.

369 K3IE	370 WA2IKO
----------------	------------------

S.S.B. Endorsements

310 W3AZD/316	275 VE3FJE/285
310 W4SSU/316	275 K5DUT/279
310 F9RM/315	275 W2CC/275
310 ZL3NS/314	250 K7RI/271
310 N4WF/312	200 XE1YO/209
310 W6RKP/312	200 WA4TLI/200
300 XE1KS/307	200 WD8AHS/200
300 W8ILC/300	150 WA7LAG/196
275 DJ7CX/296	150 4Z4DX/187
275 W6FET/294	150 XE1GBM/182
275 LU1BAR/W3/293	150 WA6PJR/161
275 WA4WTG/290	28MHz LU1BAR/W3
28MHz WA4QM0	3.5/7 MHZ LU1BAR/W3

C.W. Endorsements

310 ON4QX/317	275 WA8DXA/290
275 N6FX/299	275 DJ7CX/288

Complete rules and application forms for the CQ DX Awards Program can be obtained by sending a business size, No. 10, envelope, self-addressed and stamped to: "CQ DX Awards", 911 Rio St. Johns Drive, Jacksonville, Florida 32211 U.S.A.

YS1GMV - To W3HMK
 YV0AA - Radio Club de Venezuela, Box 2285, Caracas, Venezuela
 YX1AA - Via YV1TO
 ZB2CG - c/o G3ATU
 ZB2DV - Via G4EMR

ZB2G - To K2FJ
 ZF2CL - c/o DK7PZ
 ZS2MI - ZS6APO
 1S1DX - Via VK2BJL
 3V8AA - To IS0LYN
 3V8BZ - c/o DL1HH
 3Y1VC - Via LA1VC

3Y5DQ - To LA5DQ
 4S7JD - c/o K4MOG
 5B4EP - Via K2JL
 5N2AKY - To W4BUW
 5W1BZ - c/o JA3CZY
 6D1LCH - Via XE1LCH
 7X2BK - To WA3HUP
 8P6GN - c/o WB4RRK
 8Q7AG - Via WB4ZNH
 8Q7AH - To HB9TL
 9A1VU - c/o DL1VU
 9G1LK and 9G1LL - Via WA4ZRS, Box 248, Waxhaw, NC 28173
 9N1BMK - c/o JA8BMK
 9U5AN - To OZ9DX

The following would like to become QSL Managers for any interested DX stations:

Billy G. Suit, K4BUF, Route 8, Box 276, Asheboro, NC 27203

Mike Cameron, KA8CWR, 817 Garfield St., Port Huron, MI 48060

Bob Cregar, WD8NKT, 1103 S. Jefferson, Bay City, WI 48706



Al Friedman, K6YRA, was the first U.S. amateur to win a single band WAZ certificate for 15 meter phone. Al was first licensed in 1957 and earned many awards as W9YRA before moving to the west coast. He is a member of the Southern California DX Club.

New 2 Meter Avanti Mobile Antenna

Mounts on glass — no holes!

- Receives and transmits through glass.
- Superior performance equivalent to 5/8 wave.
- Superior radiation full Omni-Directional.

It's easy to install — No holes to drill, no magnet to scratch the paint, no clamps. Uses an especially developed epoxy adhesive that secures antenna to window like a 1/4" bolt. The capacity coupling box is simply attached with a special adhesive tape to inside of window. Worried about crimping or corroding coaxial cables? It's all inside and out of sight.

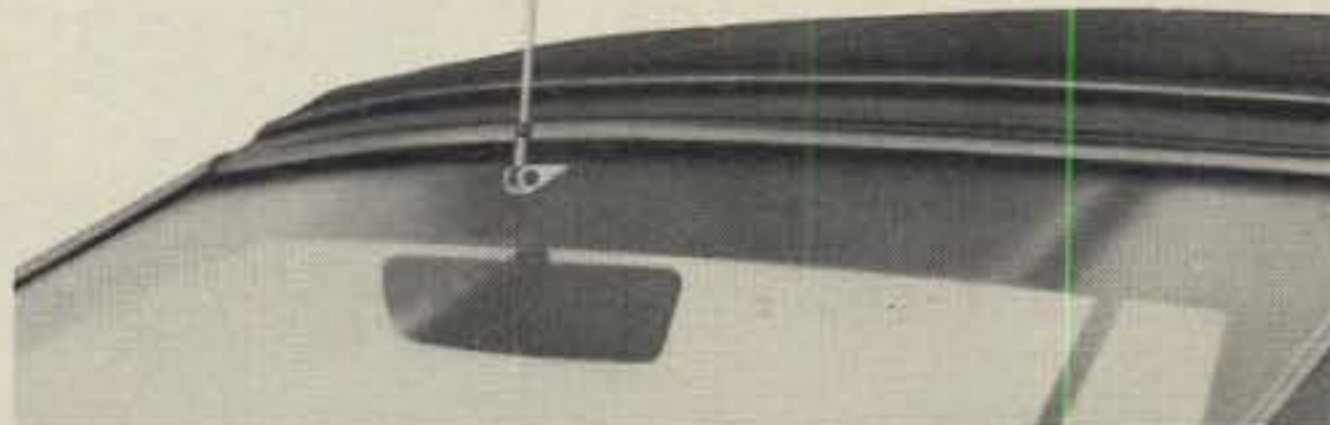
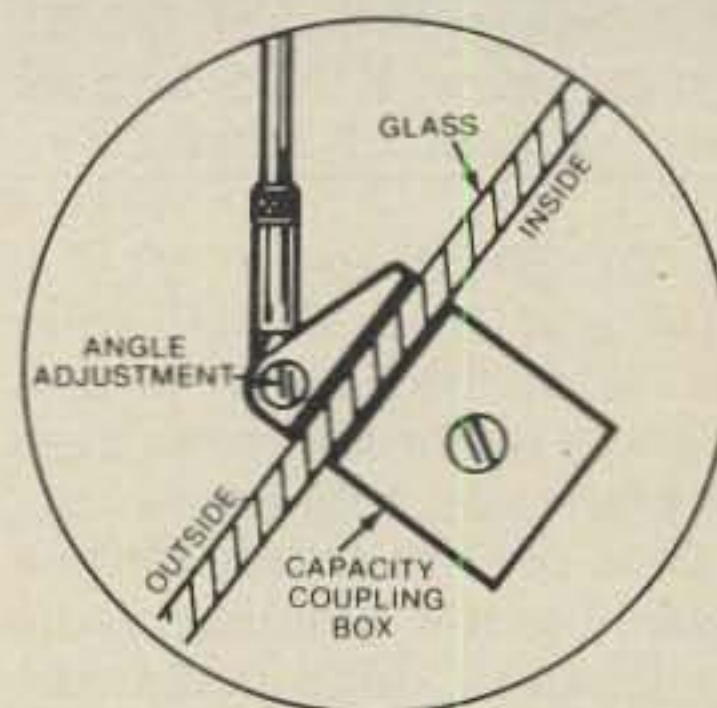
Models also available for 220 MHz and 432 MHz.

AH 151.3G SPECIFICATIONS

Gain	Equivalent to 5/8 wave
2 meter V.S.W.R. Band Width	Better than 1.5:1
Maximum power	150 watts
Nominal Impedance	50 Ohms
Chrome plated casting. Stainless Steel hardware. Swivel whip holder	
Height	33"
Performance and Mechanical Patents Pending	

Buy one from your nearest AVANTI dealer. If your dealer does not have one in stock, have him call the following toll free number and we will ship him one within 24 hours:

(800) 323-9429



See Avanti's other new amateur mobile and base antennas. Write for new catalog today.

Send 50¢ for handling and postage.

avanti antennas

Avanti Research and Development, Inc.,
 340 Stewart Ave., Addison, IL 60101
 © 1979 In Canada: Lenbrook Ind., Scarborough, Ontario M1H 1H5

Awards

News of certificate and award collecting

The September, "Story of The Month", as told by Dorothy, WB9RCY and Wayne, N9WA, is:

Our Trip to Portugal

"This is a condensed version of the journal we kept during our trip to Portugal. Our decision to go to Portugal was made last summer ('78) and was based on our desire to visit the places where the great navigators lived and studied.

"We were very fortunate because we were able to visit the places we went to see in the company of county hunters and other members of the amateur radio community in Portugal. Our visit was enriched many times over because of the company of our friends.

Special Honor Roll All Counties

- #225 Earl C. Kirkeby, W0HNV 5-7-79
- #226 John Johnson, WD9AXF 5-8-79
- #227 Ernest H. Taves, K1KPS 5-25-79
- #228 Lester W. Krute, K3LK 6-2-79

"Charlie, CT1BY; Mateiro, CT1TZ; Miro, CT1UA and Jose, CT4UZ were waiting for us at the Lisbon airport with roses and a warm welcome, even though our plane was four hours late. They took us to our hotel, then to their FCC to pick up my amateur radio license for Portugal. Miro had taken care of the application for me and the license was ready when we got there. We went to Estoril and stopped to see the Mother and sister of Miro and Mateiro. Maria Teresa, their sister, has been hospitalized since 1977 as the result of an auto accident.

"The following morning we picked up our rented auto, a Ford Cortina, and started north. The auto was equipped with a 2 meter rig, courtesy of CT1BY.

"Alberto, CT1QZ spent two days with us while we went to Nazare, the lovely fishing village on the Atlantic coast, and to Coimbra where many of our friends attended the university.

We saw Luso where natural spring water is bottled for distribution all over Portugal. We saw the national forest where huge eucalyptus trees perfume the air. Victor, CT1GG lives in the Coimbra area. We did not see him because he was ill, but we did talk to him many times during our visit. He told us that his fever had one benefit, he had worked 57 new counties while he was home.

"The next three days were spent with Mateiro. We went with him to Aveiro, where we saw the Ria for the first time, and the beautifully painted moliceiros - small sailing craft. We visited John, CT1RF, and with his gracious help I was able to work four Aveiro stations for the Aveiro award. We went with Mateiro to Porto where we met Allen, CT1DF who guided us around his city and took us to visit the port wine caves. That evening we were honored with a dinner at the home of Allen and his XYL, Esaura, CT4YG. Among the dinner guests were CT1TZ, CT1BH, CT1EE, CT1XY and CT1YP.

"Mateiro took us to his lovely home overlooking Oliveira de Azemeis where we met his wife Maria and his little daughter Joanna. He took us to

visit the glass factory of his uncle where they had made a vase to commemorate our visit and some glasses with our calls and the MARAC Portuguese County Hunters logo on them. We were honored again in Oliveira de Azemeis at dinner with Maria, Mateiro, Justino, CT1RT, Cesar, CT1UE and Rogerio, CT1UD. Justino is the father of Miro and Mateiro.

"We went to Viseu, Charlie and Miro were waiting by the road to show us the way to our hotel. During our two days in Viseu we visited the homes of Charlie and his wife Adilia, CT4YL, Miro and his wife Lena, where we also became acquainted with Miro's son Nunu and daughter Patricia, and Serafim, CT4KQ.

USA-CA Honor Roll

3000		2000		1000	
W0HNV	255	W0HNV	364	W0HNV	539
K1KPS	256	K1KPS	365	GM3BCL	540
K5GC	257	WA9WGJ	366	WD4HVZ	541
WB9OOE	258	K3LK	367	K1KPS	542
K3LK	259		1500	K3LK	543
	2500	W0HNV	420		500
W0HNV	320	WB5NFS	421	W0HNV	1351
K1KPS	321	GM3BCL	422	GM3BCL	1352
K3LK	322	K1KPS	423	SM6CSB	1353
K2UVG/6	323	K3LK	424	I3YCV	1354
				SM5BFJ	1355
				WB7SKL	1356
				SM6BZE	1357
				K3LK	1358



Joanna, harmonic of CT1TZ; Wayne, N9WA; Rogerio, CT1UD, Cesar, CT1UE; Mateiro, CT1TZ; Dorothy, WB9RCY; Maria XYL of CT1TZ at CT1TZ QTH. Foto by Justino, CT1RT.

P.O. Box 73, Rochelle Park, N.J. 07662

Serafim had been spending much time working on OSCAR. He has decided to become a county hunter and has been on the net often recently. Another dinner was hosted for us in Viseu. Those present included CT1BY, CT4KG, CT4IC, CT4EW, CT4YL, CT4YV and CT1UA. During the dinner it was my pleasure to present the MARAC plaque to CT1BY. Charlie had the highest score for a DX station in the 1978 Mobile QSO Party.

"The day we left Viseu, Charlie and Adilia traveled with us most of the day to show us the old town of Ameida near the Spanish border. We left them and went south to Castelo Branco. The next day we went to Estremoz, where we were met by Vieira, CT4PXA and Fiel, CT4SHA who were kind enough to spend the day with us visiting museums and cathedrals in their lovely city.

"Our next two-day stop was near the QTH of Adilio, CT1RM. Adilio took us to his home where we were received by Maria Jose, his wife and her father. We were happy that their three month old Felipe was awake. His birth was announced on the county hunters net, so he is a famous baby. One evening we were all in Adilio's shack talking and listening to the county hunters in the background when we heard our son Dennis, N0WA call for a county. We moved off the net and were able to have a nice QSO. Adilio and his father-in-law spent two days in Evora with us. They took us to see the little mountain village of Monte da Oliveirinha, and the craftsmen who are fighting a losing battle against mechanization. Adilio's father-in-law is a professor of agronomy, so he has the knowledge to explain many things to us about the country.

"We left Evora to go to Sagres, on the very southwest corner of Portugal. The ancient school of navigation is at Sagres. From there we went north to Santiago do Cacem, Sebutal and Lisbon.

"Charlie and Adilia spent the last two days of our visit in Lisbon with us. Saturday evening Adilio and Maria Jose joined us and we went to a night club for dinner and to listen to the "fado" - the sad, nostalgic songs of Portugal.

"Sunday we went to see the Royal Coach museum, and the Tower of Belem which has stood in Lisbon Harbor for centuries. We went to the most western part of Portugal and received a certificate as proof of our visit there. Mateiro and Adilio joined us for dinner the last evening of our visit and Charlie and Adilia appeared at the hotel at four o'clock the next morning to see us to the airport.

"There are no words to fully



Wayne, N9WA near Lisbon, motor of rented car overheated!

describe the beauty of the cathedrals and the art treasures in the museums. Their restaurants, some of which are among the finest in the world, are also difficult to fully describe. We sure enjoyed them very much.

One of the primary purposes of amateur radio is to promote international good will. The Portuguese are



Aruba ARC Certificate to have been issued during 1976 Bicentennial Year.

masters in the arts of courtesy and good will. We learned much from them.

To our friends in Portugal we say, "Muito obrigado pela sua hospitalidade, Ate logo".

73, Dorothy, WB9RCY and Wayne, N9WA.



Miro, CT1UA in QSO with mobile in Washington.

Awards Issued

Earl Kirkeby, W0HNV waited until he had them all and picked up USA-CA-500 through All Counties endorsed, Mixed.

Jack Johnson, WD9AXF added All Counties to his fine collection.

Ernie Taves, K1KPS who had received his USA-CA-500 in July 1962, finally found time to catch them all and do his paper work to acquire USA-CA-500 through 2000 endorsed all SSB, all 20, all mobiles: USA-CA-2500 endorsed all SSB, all 20; and USA-CA-3000 and All Counties endorsed, Mixed.

Les Krute, K3LK (ex W3OFU) also waited until he had them all and obtained USA-CA-500 through 1500 endorsed all mobiles, all CW; USA-CA-2000 and 2500 endorsed all mobiles; and 3000 & All Counties endorsed Mixed.

George Challenger, K5GC (ex W5HTM, W5HTM/KP6, VR3P) collected USA-CA-3000.

Jim Latimer, WB9OOE keeps plugging away and claimed USA-CA-3000 endorsed all A-3.

Hank Kahrs, K2UCG/6 was issued USA-CA-2500.

David Christensen, WA9WGJ applied for USA-CA-2000 endorsed all SSB.

Lynn White, WB5NFS with the help of Harold, WA2GLU qualified for USA-CA-1500.

Sandy Anderson, GM3BCL collected USA-CA-500, 1000 and 1500, first award to Scotland.

Al Armitage, WD4HVZ gained USA-CA-1000.

USA-CA-500 certificates endorsed mixed went to:

Harald Lofhede, SM6CSB.

Leif Hammarstrom, SM5BFJ.

USA-CA-500 certificates endorsed all A-1 were issued to:

Artie Cerviatti, I3YCV.

Stan Robinson, WB7SKL.

Kurt Adhammar, SM6BZE.

Awards.

CQ DX Award: New Custodian, Billy F, Williams, Jr., N4UF, CQ DX Awards manager, 911 Rio St. Johns Drive, Jacksonville, Florida 32211. Regretfully, Rod, W7OM must relinquish this job.

Birmingham Postal Zone Award (BPZA): This worked all Birmingham Postal Zones is sponsored by the South Birmingham Radio Society, whose call signs are G3OHM and G8HOM.

1. All license rules, regulations, terms, exceptions and conditions must be observed - award available to all amateurs/SWL worldwide.

2. Certificates will be awarded as follows:

a. 25 points - Bronze Certificate.

b. 50 points - Silver Certificate.

c. 75 points - Gold Certificate.

3. Points will be awarded as follows:

a. Worked/Heard G3OHM or G8OHM (Only one of these call signs will count, but one must be worked/heard to qualify. = 5 points.

b. Worked/Heard members of South Birmingham Radio Society in different postal zones. = 2 points.

c. Worked/Heard non-members of S.D.R.C. in different zones. = 1 point.

Note: There are 98 Postal Zones in the City of Birmingham and area.

4. All QSOs must be direct. However, the OSCARS may be used, provided that they are used exclusively, and the Certificate will be suitably endorsed.

5. All points must be obtained while operating from the same location, i.e. home QTH, /A /P, /M, but not a mixture.

6. A call sign is only acceptable once from one location. A call sign will be acceptable in its basic form, or /A, /M, or /P. It may not be recorded again in any other form.

7. Check logs to be sent to the Award Manager. QSLs may be required.

8. The cost of each entry will be 1.00 Sterling, or 6 IRCs, or \$3.00 dollars (US). The correct amount must

accompany the application.

9. A stamped addressed envelope (or SAE & IRC) must be sent with any enquiries to the Award Manager.

10. The decision of the Committee/Award Manager on matters concerning this Award is final.

11. Award Manager, John K. Harvey, G8KLO, 38 Bodenham Road, Birmingham B31 5DS, West Midlands, Great Britain.

VIII Mediterranean Games Award:

During the occasion of the VIII Mediterranean Games taking place in Split from 15-9-79 to 29-9-79, radio clubs "MARJAN" and "ANTE JONIC" sponsor this award.

1. The award is available to any licensed or SWL radio amateur.

2. Only contacts with amateur radio stations from the country's participants are valid. They include: CN, EA, EA6, EA9 Ceuta & Melilla, F, FC, I, IS0, OD, TA, SU, SV Crete, SV Dodocanese, YK, YU, 3A, 3V8, 5A, 7X and 9H.

3. Needed contacts:

HF. Europe	9 contacts.
Rest of world	5 contacts.
VHF (satellite, MS, EME, Es, Aurora, tropo, etc.)	2 contacts.

4. A substitution *once* for any of the afore mentioned countries may be a QSO with any of the following: YT9MI, YU9CBR, YU9CDL, YU9DX,

YU9FH, YU9FW, YU9RCZ, YU9RDB, YU9RJG, YU9RJT, YU9RKY, YU9RMG, YU9RTW, YU9RXK and YZ9MG.

5. All contacts must be made during the period 15-6-78 to 30-9-79.

6. Contacts may be made on any amateur band and any mode.

7. Send GCR list, 4 IRCs or 1 USA dollar (do not send QSL cards) to: Radio Club "MARJAN", P.O. Box 155, 58001 Split, Yugoslavia.

Fort Kaministiquia Tercentenary

Scroll: During 1979, the members of the Lakehead Amateur Radio Club will be using the prefix VX3 to commemorate the 300th Anniversary of the founding of the first fur trading post at the mouth of the Kaministiquia River in 1679, near where the City of Thunder Bay now stands.

To help celebrate/observe this event, a special scroll will be available to any amateur in the U.S. or Canada who works five (5) stations in Thunder Bay with the VX3 prefix. There will be no charge for these applicants.

Stations outside the U.S. and Canada must work three (3) VX3 calls in Thunder Bay, and 2 IRCS will be required from these applicants to cover extra mailing costs. Send your log information to: Lakehead Amateur Radio Club, P.O. Box 2571, Thunder Bay, Ontario, P7B 5G1, Canada

Monmouth County Certificate: No longer available! This Award used to be issued by The Board of Chosen Freeholders of Monmouth County N.J. Thanks to Art, W2HAE for this information.

Notes

I apologize for the delays in the All Counties Plaques.

Information arrived too late to publicize the 10th Anniversary Apollo II, Man's First landing and walk on the moon. This was July 21, 6 PM to July 22 9 PM local time and logs were to be mailed by August 17 to VHF Space Center, K4AWS, Box 15, Sumterville, Florida 33585.

The Aruba Amateur Radio Club, P.O. Box 273, San Nicolas, Aruba, Netherlands Antillies, wish to apologize for their problems in issuing the Certificates for commemorating the 1976 Bicentennial Year. These were to be issued to any American station who made contacts with three PJ3 stations during the "Aruba Salutes America" QSO Party from October 1976 to December 1976. They have the impression that there are still some stations who did *not* receive their certificate - so please apply again.

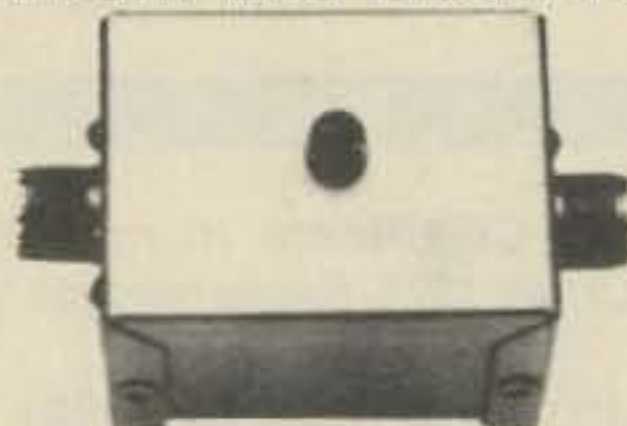
Remember, write and tell me, How was your month? 73, Ed., W2GT.

CoaxProbe*

Coaxial RF Probe for Frequency Counters and Oscilloscopes That Lets You Monitor Your Transmitted Signal Directly From the Coax Line.

Only **\$9.95**

plus 1.00 postage



FINALLY! A RF PROBE that lets you connect into your coax cable for frequency measurements and modulation waveform checks directly from the transmitter.

JUST CONNECT THE CoaxProbe* into your transmission line and plug the output into the frequency counter or oscilloscope. Insertion loss is less than .2db so you can leave it in while you operate.

A NECESSITY IN ANY WELL-ORGANIZED HAM SHACK, the CoaxProbe* eliminates "jerry-rigging" and hassles when tapping into the coax line is desired.

A SPECIAL METHOD OF SAMPLING keeps output relatively constant with a wide variation of power. Power output of 8 watts gives .31v out, while 800 watts will give 1.8v out. (rms 3-30 mhz.) 2000 watts PEP rating too!

*Trademark of Eagle Electronics.

USE IT ON 2 METER RIGS TO ADJUST FREQUENCY. The CoaxProbe* has a range of 1.8 to 150 mhz.

MONITOR YOUR MODULATION WAVEFORM. With an oscilloscope of proper bandwidth, you can check your modulation for flat-topping, etc. Ideal for adjusting the speech processor.

NOW YOU CAN MONITOR SIGNALS when connected to the dummy load, eliminating unnecessary on-the-air radiation.

AVAILABLE FOR THE FIRST TIME TO AMATEURS. Try it for 10 days. If not satisfied, send it back for refund (minus shipping charges).

Order today from:

Eagle Electronics

Box 426 A, Portage, MI 49081
Michigan Res. Add 4% Sales Tax

SAVE \$10.00 ON A GREAT DEAL!






When you subscribe to CQ you save \$10.00 over the newsstand price. But you also save time. Because your copy will be at your home weeks before it's in the stores. And that means a big head start on all those great items advertised in CQ's classified ad section.

CQ is far more than just a fun-reading ham radio magazine. It's loaded with in-depth product evaluations, up-to-date dx and contest info, and the most authoritative propagation charts published anywhere.

CQ's also loaded with great building ideas, new product announcements, and everything the new amateur needs to upgrade his license. We've got the only regular ham tv column, the best novice column, and the most information on QRP to be found anywhere.

In a nutshell, CQ is the all-around winner in the ham radio field. It's your best reading magazine, and the very best buy in the market. So mail in your money-saving subscription today. We'll get CQ coming your way in a short order*

*Please allow 6 weeks for our computer to digest the information to handle your subscription. We could do it faster, but we know that you'll want the magazines sent to the right address.

	<h2>The Radio Amateur's Journal</h2> <p>14 Vanderventer Avenue, Port Washington, L.I., N.Y. 11050</p>	<input type="checkbox"/> NEW	Domestic One year..... <input type="checkbox"/> \$14.00 Two years..... <input type="checkbox"/> \$25.00
		<input type="checkbox"/> RENEWAL	Foreign One year..... <input type="checkbox"/> 17.00 Two years..... <input type="checkbox"/> 31.00
Dear OM: Enclosed please find \$_____ for _____ Year(s) Subscription to CQ, The Radio Amateur's Journal.		 	
Name _____ Call _____		_____	
Address _____		_____	
City _____ State _____ Zip _____		<input type="checkbox"/> VISA <input type="checkbox"/> Mastercharge	
Signature _____		_____	

No - 93 - 94

Propagation

The science of predicting radio conditions

The Swiss Federal Solar Observatory at Zurich reports a monthly mean sunspot number of 135 for May. Daily values ranged from a low of 96 to a high of 207. This results in a 12-month running smoothed sunspot number of 112, centered on November, 1979. The sunspot cycle is measured by the level of smoothed sunspot activity, and the latest reading is an increase of but one point over the previous month's level. It looks almost certain now that the peak of the present cycle is near at hand, or may already have occurred. A smoothed sunspot level in the high 140's is forecast for September, 1979.

September is a month of change for propagation conditions on the h.f. amateur bands. On some days conditions will seem to be much the same as during the summer months, on other days the first signs of winter-time conditions will be noticeable. For this reason, this month's column contains both Short-Skip and DX Propagation Charts. The DX Charts are valid for the period from mid-September through mid-October, the Short-Skip Charts are valid for the entire months of September and October.

September Conditions

During September a greater number of DX openings are expected on 10, 15 and 20 meters during the hours of daylight. Improved nighttime DX propagation conditions are also forecast for the 40, 80 and 160 meter bands, with considerably lower static levels. A seasonal decline in conditions is expected on 20 meters during the hours of darkness, but this is expected to remain a good band for DX almost around-the-clock.

The fall, or *autumnal equinox* will occur on September 22 as the sun crosses the plane of the equator on its apparent travel from northern to southern skies. On this day the hours of daylight and darkness are equal in

*11307 Clara St., Silver Spring, MD
20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for September 1979

Propagation Index	(4)	(3)	(2)	(1)
Above Normal: 16, 27	A	A	B	C
High Normal: 1, 15, 17-18, 20-21, 26, 28-29	A	B	C	C-D
Low Normal: 2-3, 7-8, 11-12, 14, 19, 22, 25, 30	A-B	B-C	C-D	D-E
Below Normal: 4, 6, 9-10, 13, 23	B-C	C-D	D-E	E
Disturbed: 5, 24	C-E	D-E	E	E

Where expected signal quality is: A—Excellent opening, exceptionally strong, steady signals greater than S9+30 dB.

B—Good opening, moderately strong signals varying between S9 and S9+30 dB, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S9, 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 day of the month. For example, an opening shown in the charts with a *propagation index* of (3) will be good (B) on Sept. 1st, good-to-fair (B-C) on the 2nd and 3rd, fair-to-poor (D-E) on the 4th, etc.

For updated information dial Area Code 516-883-6223 for DIAL-A-PROP, subscribe to bi-weekly MAIL-A-PROP, P.O. Box 1714, Silver Spring, MD 20902.

length throughout the world. The affects of the equinox are felt on h.f. propagation conditions 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 season for DX openings between the temperate regions of both the northern and southern hemispheres. A similar period occurs during the spring equinox, which is centered on March 21. Look for an improvement in conditions between the USA and South America, to the South Pacific area and Australasia, to southern Asia, and to southern Africa and Antarctica. This improvement should be noticeable on all bands 10 through 160 meters, and the best time for

equinoctial-type openings should be the twilight periods around local sunrise and sunset, but they will occur at other times as well. Many of these inter-hemispheric openings may follow either the *long* or the *short* great circle path, so be sure to check both directions.

V.h.f. Ionospheric Openings

Solar activity is now high enough to support F-2 layer DX openings from the U.S. to many areas of the world on the 6 meter band. During September and early October it may be possible to take advantage of equinoctial-type openings on this band between the U.S. and the temperate areas of the southern hemisphere. The best times for such openings are the afternoon hours.

Later in the evening there is increasing possibilities for trans-equatorial (TE) type openings on 6 meters between southern locations in the USA and South America. TE conditions usually peak during late September and early October, and the best time to look for such openings is between 8 and 11 p.m., local standard time. While F-2 layer openings on 6 meters are generally steady and quite strong, TE openings are usually weak, and often accompanied by flutter fading.

Although summertime sporadic-E ionization should fall off considerably during September, an occasional 6 meter short-skip opening may still be possible over distances ranging between approximately 1000 and 1300 miles. Best time to check is before noon and again during the early evening.

No major meteor showers are expected during September, but some minor ones may permit meteor-scatter type openings on the v.h.f. bands on September 20th and for a few days after.

There is usually a seasonal increase in auroral activity during equinoctial periods, so expect some 6 and 2 meter auroral-type short skip openings during the month. The best

possibilities for such openings should coincide with periods of expected radio storminess. Check the "Last Minute Forecast" at the beginning of this column for those days during September that are expected to be BELOW NORMAL or DISTURBED.

CQ DX Contest Special-1979

This year's CQ Worldwide DX Contest will be held on the following dates:

October 27-28 Phone Section
November 24-25 C.W. Section

As during the past 28 years, next month's Propagation column will be devoted to a special, comprehensive forecast which will focus on both sections of the Contest.

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, 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 c.w., or 1 kw, p.e.p. 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.

Eastern Mediterranean & Middle East	09-10 (1) 10-12 (2) 12-14 (1)	08-09 (1) 09-12 (2) 12-14 (3) 14-16 (2) 16-18 (1)	07-09 (2) 09-15 (1) 15-17 (2) 17-21 (3) 21-23 (2) 23-01 (3) 01-03 (2) 03-07 (1)	19-21 (1) 21-00 (2) 00-01 (1) 22-00 (1)*	Eastern Mediterranean & Middle East	10-13 (1)	08-09 (1) 09-11 (2) 11-13 (3) 13-14 (2) 14-16 (1)	06-07 (1) 07-09 (2) 09-14 (1) 14-16 (2) 16-20 (3) 20-22 (2) 22-00 (3) 00-01 (2) 01-02 (1)	20-23 (1) 21-23 (1)*
Western Africa	09-12 (1) 12-14 (2) 14-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	07-09 (1) 09-13 (2) 13-15 (3) 15-17 (4) 17-19 (3) 19-20 (2) 20-22 (1)	05-08 (2) 08-15 (1) 15-17 (2) 17-21 (4) 21-00 (3) 00-03 (2) 03-05 (1)	20-23 (1) 23-02 (2) 02-04 (1) 00-03 (1)*	Western Africa	10-12 (1) 12-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	07-10 (1) 10-13 (2) 13-15 (3) 15-17 (4) 17-18 (3) 18-20 (2) 20-21 (1)	05-08 (2) 08-15 (1) 15-17 (2) 17-19 (3) 21-23 (3) 23-02 (2) 02-05 (1)	20-23 (1) 23-01 (2) 01-02 (1) 23-01 (1)*
Eastern & Central Africa	10-12 (1) 12-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	08-10 (1) 10-13 (2) 13-14 (3) 14-16 (4) 16-18 (3) 18-19 (2) 19-20 (1)	12-14 (1) 14-17 (2) 17-22 (3) 22-02 (2) 02-03 (1)	20-02 (1) 00-01 (1)*	Eastern & Central Africa	11-13 (1) 13-16 (2) 16-17 (1)	09-10 (1) 10-13 (2) 13-17 (3) 17-18 (2) 18-19 (1)	13-15 (1) 15-17 (2) 17-20 (3) 20-23 (2) 23-00 (1) 07-09 (1)	21-00 (1)
Southern Africa	09-11 (1) 11-12 (2) 12-13 (3) 13-14 (2) 14-15 (1)	08-11 (1) 11-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-08 (2) 08-15 (1) 15-16 (2) 16-19 (3) 19-00 (2) 00-03 (3) 03-04 (2) 04-06 (1)	19-22 (1) 22-00 (2) 00-02 (1) 23-01 (1)*	Southern Africa	09-11 (1) 11-12 (2) 12-13 (3) 13-14 (2) 13-15 (1)	07-09 (1) 09-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-08 (2) 08-14 (1) 14-16 (2) 16-19 (3) 19-22 (2) 22-01 (3) 01-05 (1)	20-21 (1) 21-23 (2) 23-01 (1) 21-23 (1)*
Central & South Asia	09-11 (1) 19-22 (1)	08-09 (1) 09-12 (2) 12-13 (1) 20-22 (1)	07-08 (1) 08-10 (2) 10-12 (1) 17-19 (1) 19-22 (2) 22-01 (1)	05-07 (1) 20-23 (1)	Central & South Asia	09-11 (1) 19-21 (1)	09-11 (1) 18-19 (1) 19-21 (2) 21-22 (1)	07-08 (1) 08-10 (2) 10-12 (1) 17-19 (1) 19-22 (2) 22-01 (1)	06-08 (1) 19-21 (1)
Southeast Asia	11-14 (1) 18-21 (1)	08-09 (1) 09-11 (2) 11-13 (1) 13-15 (2) 15-19 (1) 19-21 (2) 21-22 (1)	06-07 (1) 07-10 (2) 10-12 (1) 15-18 (1) 20-21 (1) 21-00 (2) 00-02 (1)	06-08 (1)	Southeast Asia	10-12 (1) 12-13 (2) 13-15 (1) 17-18 (1) 18-19 (2) 19-20 (1)	09-11 (1) 11-13 (2) 13-15 (1) 18-19 (1) 19-20 (2) 20-22 (1)	07-08 (1) 08-09 (2) 09-10 (3) 10-11 (2) 11-13 (1) 16-20 (1) 20-23 (2) 23-02 (1) 07-08 (1)	05-09 (1)
Far East	09-11 (1) 18-20 (1)	08-09 (1) 09-11 (2) 11-13 (1) 16-18 (1) 18-20 (2) 20-22 (1)	07-08 (1) 08-10 (3) 10-12 (2) 12-14 (1) 18-20 (1) 20-22 (2) 22-00 (1) 00-03 (2) 03-04 (1)	05-08 (1) 18-19 (1) 05-07 (1)*	Far East	15-17 (1) 17-19 (2) 19-20 (1)	10-16 (1) 16-18 (2) 18-21 (3) 21-22 (2) 22-23 (1)	07-08 (1) 08-10 (3) 10-12 (2) 16-19 (1) 19-21 (1) 21-23 (2) 23-00 (3) 00-01 (2) 01-03 (1)	03-05 (1) 05-08 (2) 08-09 (1) 06-08 (1)
South Pacific & New Zealand	09-14 (1) 14-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	08-09 (1) 09-11 (2) 11-14 (1) 14-17 (2) 17-18 (3) 18-20 (4) 20-21 (3) 21-22 (2) 22-00 (1)	12-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-04 (3) 04-08 (2) 08-10 (3) 10-12 (2)	01-02 (1) 02-03 (2) 03-06 (3) 06-08 (2) 08-09 (1) 03-05 (1)* 05-07 (2)* 07-08 (1)*	South Pacific & New Zealand	11-13 (1) 13-14 (2) 14-15 (3) 15-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	08-09 (1) 09-15 (2) 15-17 (3) 17-20 (4) 20-21 (3) 21-22 (2) 22-00 (1)	04-08 (2) 08-11 (3) 11-13 (2) 13-18 (1) 18-20 (2) 20-22 (3) 22-02 (4) 02-04 (3) 04-07 (2)* 07-08 (1)*	00-01 (1) 01-06 (3) 06-08 (4) 08-09 (2) 09-10 (1) 02-04 (1)* 04-07 (2)* 07-08 (1)*
Australasia	10-12 (1) 14-16 (2) 17-18 (3) 18-19 (2) 19-21 (1)	08-09 (1) 09-10 (2) 10-12 (3) 12-14 (2) 14-17 (1) 17-18 (2) 18-20 (4) 20-21 (2) 21-23 (1)	07-09 (2) 09-11 (3) 11-13 (2) 13-16 (1) 16-18 (2) 18-21 (1) 21-23 (2) 23-02 (3) 02-04 (2) 04-07 (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)*	Australasia	09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	08-09 (1) 09-11 (2) 11-15 (1) 15-16 (2) 16-18 (3) 18-20 (4) 20-21 (3) 21-22 (2) 22-23 (1)	06-08 (2) 08-11 (3) 11-13 (2) 13-16 (1) 16-18 (2) 18-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-04 (3)	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	08-09 (1) 09-10 (2) 10-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	06-07 (1) 07-08 (2) 08-11 (4) 11-13 (3) 13-18 (4) 18-20 (3) 20-21 (2) 21-22 (1)	03-05 (2) 05-07 (3) 07-10 (4) 10-14 (2) 14-16 (3) 16-23 (4) 23-03 (3)	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)*	Caribbean, Central America & Northern Countries of South America	08-09 (1) 09-10 (2) 10-12 (3) 12-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	07-08 (1) 08-09 (2) 09-11 (4) 11-14 (3) 14-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	07-10 (4) 10-12 (3) 12-14 (2) 14-16 (3) 16-23 (4) 23-03 (3) 03-05 (2) 05-07 (3)	19-20 (1) 20-21 (2) 21-22 (3) 22-05 (4) 05-06 (3) 06-07 (2) 07-08 (1) 20-23 (1)* 23-05 (2)* 05-07 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	08-09 (1) 09-13 (2) 13-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	06-07 (1) 07-08 (2) 08-11 (3) 11-15 (2) 15-16 (3) 16-19 (4) 19-21 (3) 21-22 (2) 22-23 (1)	10-16 (1) 16-17 (2) 17-18 (3) 18-00 (4) 00-03 (3) 03-05 (3) 05-07 (2) 07-10 (2)	21-00 (1) 00-04 (2) 04-06 (1) 01-05 (1)*	Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	08-09 (1) 09-12 (2) 12-14 (1) 14-15 (2) 15-16 (3) 16-18 (4) 18-19 (2) 19-20 (1)	07-08 (1) 08-09 (2) 09-11 (3) 11-15 (2) 15-16 (3) 16-20 (4) 20-22 (3) 22-23 (2) 23-00 (1)	11-16 (1) 16-17 (2) 17-20 (3) 20-01 (4) 01-04 (3) 04-06 (2) 06-08 (3) 08-11 (2)	21-00 (1) 00-05 (2) 05-07 (1) 01-06 (1)*
McMurdo Sound, Antarctica	15-19 (1)	11-15 (1) 15-17 (2) 17-21 (3) 21-22 (2) 22-23 (1)	16-17 (1) 17-20 (2) 20-03 (3) 03-05 (2) 05-07 (1) 07-09 (2) 09-10 (1)	23-01 (1) 01-05 (2) 05-07 (1) 04-06 (1)*	McMurdo Sound, Antarctica	16-19 (1)	12-15 (1) 15-18 (2) 18-21 (3) 21-22 (2) 22-23 (1)	16-18 (1) 18-22 (2) 22-01 (3) 01-04 (2) 04-08 (1) 08-10 (2) 10-11 (1)	23-01 (1) 01-05 (2) 05-07 (1) 05-07 (1)*

September 15- October 15, 1979

Time Zone: EDT (24-Hour Time)

EASTERN USA TO:

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Central	08-10 (1) 10-11 (2)	08-09 (1) 09-11 (2)	02-04 (1) 04-06 (2)	18-19 (1) 19-21 (2)
Europe & North Africa	11-13 (3) 13-15 (2) 15-16 (1)	11-14 (4) 14-15 (3) 15-17 (2) 17-19 (1)	06-10 (3) 10-12 (2) 12-15 (3) 15-17 (4) 17-21 (3) 20-22 (1)* 22-01 (2)* 01-04 (1)*	21-23 (3) 23-02 (4) 02-03 (3) 03-04 (2) 04-05 (1) 20-22 (1)* 22-01 (2)* 01-04 (1)*
Northern Europe & European USSR	09-10 (1) 10-13 (2) 13-14 (1)	08-09 (1) 09-10 (2) 10-13 (3) 13-14 (2) 14-16 (1)	03-06 (1) 06-08 (2) 08-11 (3) 11-13 (2) 13-17 (3) 17-19 (2) 19-21 (1)	18-20 (1) 20-04 (2) 04-06 (1) 21-04 (1)*

Time Zones: CDT & MDT (24-Hour Time)

CENTRAL USA TO:

Western & Southern Europe & North Africa	09-11 (1) 11-13 (2) 13-14 (1)	08-10 (1) 10-12 (2) 12-14 (3) 14-16 (2) 16-17 (1)	06-07 (1) 07-10 (2) 10-13 (1) 13-14 (2) 14-16 (4) 16-18 (3) 18-23 (2) 23-03 (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 USSR	09-13 (1)	08-09 (1) 09-11 (2) 11-12 (3) 12-13 (2) 13-15 (1)	06-07 (1) 07-10 (2) 10-12 (1) 12-13 (2) 13-17 (3) 17-19 (2) 19-21 (1) 23-04 (1)	20-23 (1) 23-01 (2) 01-02 (1) 22-01 (1)

Time Zone PDT (24-Hour Time)

WESTERN USA TO:

Western & Southern Europe & North Africa	09-12 (1)	08-09 (1) 09-10 (2) 10-12 (3) 12-13 (2) 13-15 (1) 22-00 (1)	06-07 (1) 07-10 (2) 10-12 (1) 12-14 (2) 14-17 (3) 17-19 (2) 19-21 (1) 23-01 (1)	20-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Central & Northern Europe & European USSR	09-11 (1)	08-09 (1) 09-11 (2) 11-13 (1)	06-07 (1) 07-09 (2) 09-12 (1) 12-17 (2) 17-18 (1) 21-23 (1)	20-21 (1) 21-22 (2) 22-23 (2) 21-22 (1)*

Eastern Mediterranean & Middle East	09-11 (1) 11-12 (2) 12-13 (1) 20-22 (1)	08-09 (1) 09-10 (2) 10-11 (3) 11-12 (2) 12-13 (1) 20-22 (1)	06-07 (1) 07-09 (2) 09-14 (1) 14-16 (3) 16-20 (1) 20-23 (2) 23-01 (1)	20-23 (1)
Western & Central Africa	09-11 (1) 11-12 (2) 12-14 (3) 14-15 (2) 15-17 (1)	08-10 (1) 10-13 (2) 13-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	01-07 (1) 07-09 (2) 09-14 (1) 14-15 (2) 15-16 (3) 16-20 (4) 20-23 (3) 23-01 (2)	21-00 (1)
Eastern Africa	11-13 (1) 13-15 (2) 15-16 (1)	09-13 (1) 13-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	07-09 (1) 12-15 (1) 15-17 (2) 17-19 (3) 19-21 (2) 21-23 (1)	20-23 (1)
Southern Africa	09-10 (1) 10-12 (2) 12-14 (1)	07-09 (1) 09-11 (2) 11-14 (3) 14-16 (2) 16-17 (1)	01-07 (1) 07-09 (2) 09-10 (1) 12-16 (2) 16-20 (3) 20-01 (2)	19-22 (1)
Central & South Asia	09-11 (1) 17-19 (1)	08-11 (1) 16-17 (1) 17-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	02-08 (2) 08-10 (3) 10-12 (2) 12-17 (1) 17-21 (2) 21-02 (1)	06-08 (1) 19-21 (1)
Southeast Asia	09-10 (1) 10-11 (2) 11-12 (1) 16-17 (1) 17-18 (2) 18-19 (1)	07-10 (1) 10-13 (2) 13-16 (1) 16-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	03-07 (2) 07-09 (3) 09-12 (2) 12-13 (1) 21-22 (1) 22-01 (2) 01-03 (3)	01-03 (1) 03-06 (2) 06-08 (1)
Far East	15-16 (1) 16-17 (2) 17-18 (3) 18-19 (2) 19-20 (1)	09-11 (1) 14-15 (1) 15-18 (2) 18-19 (3) 19-20 (4) 20-21 (2) 21-22 (1)	04-07 (2) 07-10 (4) 10-13 (3) 13-15 (2) 15-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-04 (3)	01-03 (1) 03-07 (2) 07-08 (3) 08-09 (1) 03-05 (1)* 05-07 (2)* 07-08 (1)*
South Pacific & New Zealand	10-12 (1) 12-13 (2) 13-14 (3) 14-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	07-09 (1) 09-10 (2) 10-12 (3) 12-14 (2) 14-16 (3) 16-21 (4) 21-23 (3) 23-01 (2) 01-02 (1)	14-17 (1) 17-19 (2) 19-21 (3) 21-02 (4) 02-04 (3) 04-08 (2) 08-09 (1) 09-11 (4) 11-12 (3) 12-14 (2)	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	09-12 (1) 12-14 (2) 14-15 (3) 15-18 (4) 18-19 (3) 19-21 (2) 21-22 (1)	07-08 (1) 08-11 (2) 11-14 (1) 14-15 (2) 15-17 (3) 17-21 (4) 21-22 (3) 22-23 (2) 23-00 (1)	08-10 (4) 10-12 (3) 12-13 (2) 13-15 (1) 15-18 (2) 18-20 (1) 20-22 (2) 22-23 (3) 23-02 (4) 02-04 (3) 04-08 (2)	01-02 (1) 02-03 (2) 03-06 (3) 06-08 (2) 08-09 (1) 02-04 (1)* 20-22 (2)* 04-06 (2)* 06-07 (1)*
Caribbean, Central America & Northern Countries of South America	08-09 (1) 09-10 (2) 10-12 (3) 12-15 (4) 15-17 (3) 17-18 (2) 18-19 (1)	07-08 (1) 08-09 (3) 09-11 (4) 11-13 (3) 13-17 (4) 17-19 (3) 19-20 (2) 20-21 (1)	06-07 (3) 07-09 (4) 09-11 (3) 11-14 (2) 14-16 (3) 16-23 (4) 23-02 (3) 02-06 (2)	19-20 (1) 20-21 (2) 21-22 (3) 22-04 (4) 04-05 (3) 05-06 (2) 06-08 (1) 20-23 (1)* 23-04 (2)* 04-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	07-08 (1) 08-09 (2) 09-12 (3) 12-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-15 (2) 15-16 (3) 16-19 (4) 19-20 (3) 20-21 (2) 21-23 (1)	09-15 (1) 15-17 (2) 17-18 (3) 18-23 (4) 23-03 (3) 03-05 (2) 05-07 (3) 07-09 (1)	21-23 (1) 23-03 (2) 03-05 (1) 00-03 (1)*
McCurdo Sound, Antarctica	14-16 (1) 16-18 (2) 18-19 (1)	10-14 (1) 14-16 (2) 16-20 (3) 20-21 (2) 21-23 (1)	08-10 (1) 15-17 (1) 17-19 (2) 19-22 (3) 22-00 (4) 00-03 (3) 03-08 (2)	22-00 (1) 00-05 (2) 05-06 (1) 03-05 (1)*

* Indicates best time for eighty 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.

CQ Short-Skip Propagation Chart September & October, 1979 Local Daylight Time At Path Mid-Point (24-Hour Time)

Band Meters	Distance Between Stations (Miles)			
	50-250	250-750	750-1300	1300-2300
10	NIL	10-19 (0-1)	08-10 (1) 10-12 (1-2) 12-14 (1-3) 14-15 (1-4) 15-17 (1-3) 17-19 (1-2) 19-22 (0-1)	08-09 (1-2) 09-10 (1-3) 10-12 (2-4) 12-14 (3-4) 14-15 (4) 15-17 (3) 17-19 (2) 19-20 (1-2) 20-22 (1)
15	NIL	08-10 (0-1) 10-14 (0-2) 14-15 (0-3) 15-17 (0-2) 17-21 (0-1)	08-10 (1-2) 10-14 (2-4) 14-15 (3-4) 15-17 (2-4) 17-20 (1-3) 20-22 (1-2) 22-08 (0-1)	08-09 (2) 09-10 (2-3) 10-17 (4) 17-20 (3) 20-22 (2-3) 22-23 (1-2) 23-01 (1) 01-08 (1-0)
20	12-14 (0-1) 14-17 (0-2) 17-22 (0-1)	08-10 (0-3) 10-12 (0-4) 12-14 (1-4) 14-17 (2-4) 17-18 (1-4) 18-22 (1-3) 22-03 (0-2) 03-08 (0-1)	06-08 (1-2) 08-10 (3-4) 10-18 (4) 18-22 (3-4) 22-01 (2-3) 01-03 (2) 03-06 (1)	06-08 (2) 08-10 (4) 10-14 (4-2) 14-16 (4-3) 16-22 (4) 22-00 (3-4) 00-01 (3) 01-03 (2) 03-06 (1-2)

HOW TO USE THE SHORT-SKIP CHARTS

- 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.
- The *propagation index* is the number that appears in () after the time of each predicted opening. On the Short-Skip Chart, where two numerals are shown within a single set of parenthesis, 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) " " " between 14 and 22 days
 - (2) " " " between 7 and 13 days
 - (1) " " " 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 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 c.w. or 300 watts p.e.p. on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts c.w. or 1 kw p.e.p. on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave length above ground on 40 and 20 meters, and a wave-length 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 10db 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. Department of Commerce, Boulder, Colorado, 80302.

40	08-10 (2-3) 10-12 (3-4) 12-18 (4) 18-20 (3-4) 20-23 (1-2) 23-06 (0-1) 06-08 (1-2)	08-10 (3-4) 10-12 (4-3) 12-16 (4-2) 16-18 (4-3) 18-20 (4) 20-23 (2-4) 23-01 (1-4) 01-06 (1-3) 06-08 (2-3)	08-10 (4-2) 10-12 (3-1) 12-16 (2-1) 16-18 (3-2) 18-20 (4-3) 20-01 (4) 01-04 (3-4) 04-06 (3) 06-08 (3-4)	08-10 (2-1) 10-16 (1-0) 16-18 (2-1) 18-20 (3-2) 20-04 (4) 04-06 (3-4) 06-08 (4-3)
80	07-09 (3-4) 09-11 (4) 11-19 (4-3) 19-00 (4) 00-05 (3-4) 05-07 (2-4)	07-09 (4-2) 09-11 (4-1) 11-17 (3-1) 17-19 (3-2) 19-21 (4-3) 21-07 (4)	07-09 (2-1) 09-17 (1-0) 17-19 (2-1) 19-21 (3-2) 21-22 (4-3) 22-06 (4) 06-07 (4-3)	07-09 (1-0) 09-17 (0) 17-19 (1) 19-21 (2) 21-22 (3-2) 22-04 (4-3) 04-06 (4-2) 06-07 (3-1)
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)

HAWAII September & October 1979 Openings Given In Hawaiian Standard Time

To:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	06-08 (1) 08-12 (2) 12-14 (3) 14-16 (2) 16-17 (1)	05-06 (1) 06-08 (2) 08-12 (1) 12-16 (2) 16-18 (3) 20-22 (1)	11-14 (1) 14-16 (2) 16-18 (3) 18-21 (4) 21-00 (3) 00-04 (2) 04-06 (3) 06-07 (2) 07-08 (1)	18-20 (1) 20-23 (2) 23-00 (3) 00-01 (2) 01-02 (1) 20-22 (1)* 22-00 (2)* 00-01 (1)*
Central USA	06-08 (1) 08-11 (2) 11-14 (4) 14-16 (2) 16-17 (1)	05-06 (1) 06-08 (2) 08-10 (1) 10-12 (2) 12-14 (3) 14-16 (4) 16-18 (3) 18-20 (2) 20-22 (1)	09-14 (1) 14-16 (2) 16-18 (3) 18-22 (4) 22-00 (3) 00-04 (2) 04-06 (3) 06-09 (2)	18-20 (1) 20-22 (2) 22-01 (3) 01-03 (2) 03-04 (1) 21-22 (1)* 22-00 (2)* 00-02 (1)*
Western USA	07-09 (1) 09-11 (2) 11-14 (4) 14-16 (3) 16-18 (2) 18-19 (1)	06-07 (1) 07-09 (2) 09-14 (3) 14-17 (4) 17-19 (3) 19-22 (2) 22-00 (1)	10-15 (2) 15-17 (3) 17-19 (4) 19-00 (3) 00-02 (2) 02-04 (1) 04-06 (2) 06-08 (4) 08-10 (3)	18-19 (1) 19-20 (2) 20-02 (4) 02-04 (3) 04-05 (2) 05-06 (1) 21-22 (1)* 22-23 (2)* 23-02 (3)* 02-03 (2)* 03-04 (1)*

ALASKA September & October, 1979 Openings Given In GMT

To:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	18-20 (1) 20-23 (2) 23-00 (1)	16-18 (1) 18-22 (2) 22-01 (3) 01-02 (2) 02-03 (1)	14-16 (1) 21-23 (1) 23-00 (2) 00-02 (3) 02-03 (2) 03-04 (1)	08-12 (1)
Central USA	19-21 (1) 21-00 (2) 00-02 (1)	17-19 (1) 19-22 (2) 22-00 (3) 00-02 (4) 02-03 (2) 03-04 (1)	15-17 (1) 21-23 (1) 23-00 (2) 00-04 (3) 04-05 (2) 05-07 (1)	08-11 (1) 11-13 (2) 13-14 (1) 11-13 (1)*
Western USA	20-22 (1) 22-00 (2) 00-02 (3) 02-03 (2) 03-04 (1)	18-21 (1) 21-23 (2) 23-02 (4) 02-03 (3) 03-05 (2) 05-06 (1)	16-18 (1) 18-20 (3) 20-00 (2) 00-02 (3) 02-04 (4) 04-05 (3) 05-06 (2) 06-10 (1)	08-11 (1) 11-14 (2) 14-16 (1) 11-14 (1)*

See explanation in "How To Use Short-Skip Charts" in box at the beginning of this column.
Note: The 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 time 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 forecast rating of (2), or higher.

Contest Calendar

News/views of on-the-air competition

There are no changes in the dates and rules of this year's World Wide DX Contest. The rules are on page 46 of this issue.

This cannot be said, however, about some of the activities for the month of September. A change in the dates made by a couple of activities has made the weekend of September 15th - 16th a rather crowded mess. Hardly fair to those organizations that have established that weekend for the past years.

We broke the 5000 entry mark in our 1978 contest, and I attribute this success in no small way to the fact that we have used the same weekends (last full weekends of October and November), almost since the inception of the contest. There have also been very few changes or modifications to the rules.

73 for now, Frank, W1WY

Ohio Interstate QSO Party

Saturday, Aug. 25 and Sunday Aug. 26
2:00 PM to 12:00 PM EDT each day.

The Mad River Radio Club has taken over the administration of this activity.

The same station may be worked on each band and mode and Ohio stations may also work other instate stations.

Exchange: RS(T), QSO no. and QTH. County for Ohio, ARRL section or country for others.

Scoring: Ohio stations multiply total QSOs by number of ARRL sections, Ohio counties and DX countries worked. Others multiply their QSO total by number of Ohio counties worked. (max. of 88)

Portable and mobile Ohio stations may multiply their final score by 1.5. (Except those in Butler, Clark, Cuyahoga, Franklin, Hamilton, Lake, Lorain, Lucas, Mahoning, Montgomery, Portage, Richland, Stark, Summit or Trumbull counties.) QRPp stations using 5 watts or less output multiply final score by 1.25.

Frequencies: 5 kHz. up from low edge of each General class band,

14 Sherwood Road, Stamford, CT
06905

Calendar of Events

Aug. 25-26	Ohio QSO Party
Sep-Nov 1-30	RTTY Art Contest
*Sept. 1-2	Skokie Aviation Party
*Sept. 8-9	European Phone Contest
Sept. 8-9	Pennsylvania QSO Party
Sept. 8-9	CLARA AC/DC Contest
Sept. 14-15	Kentucky QSO Party
Sept. 15-16	CAN-AM Phone Contest
Sept. 15-16	Maryland/DC QSO Party
Sept. 15-17	Wash. State QSO Party
Sept. 15-16	Scandinavian CW Contest
Sept. 22-23	Scandinavian Phone
Sept. 29-30	CAN-AM C.W. Contest
Sept. 29-30	Delta QSO Party
Sep-Oct 30-1	Classic Radio Exchange

both s.s.b. and c.w. Try 15 meters on the hour and 10 meters on the half hour.

Awards: Certificates to top single operator in each ARRL section, Ohio county and each DX country. Plaques for high Ohio and out-of-state single operator and multi-single operator winners. (multi-multi not eligible) Participation certificates for each entry with 50 or more contacts.

A summary sheet showing the scoring, and the usual signed declaration is also requested. Include a large s.a.s.e. for copy of results.

Mailing deadline is Sept. 8 to Jeff Maass, K8ND, 4410 Norwell Drive, Columbus, Ohio 43220.

World Wide RTTY Art Contest

September 1 thru November 30

Space does not permit going into detail on this contest organized by the Southern Counties Amateur Teleprinter Society of California.

Essentially the contest is related to the transmission of subject matter by means of manual input to a teleprinter using a standard communication keyboard.

Since you have until November 30th to participate and submit your entry I would suggest you write to the address below for more details and information.

RTTY Art Contest, c/o Norm Koch, K6ZDL, P.O. Box 1351, Torrance Calif. 90505

C.L.A.R.A. AC/DC Contest

Starts: 1800 GMT Sat., September 8
Ends: 1800 GMT Sun., September 9

Sponsored by the Canadian Ladies Amateur Radio Assoc. this contest is open to both YL's and OM's. Each station may be worked twice, once on c.w. and once on phone, or on two different bands, c.w. or phone.

Exchange: RS(T), QTH, name and call.

Scoring: For CLARA members, 1 point per contact. For non-members, 1 point for each CLARA member worked, and 3 points if it's a Bonus station. (YL's will identify if they are a bonus station.)

Multiply total QSO points by number of Canadian call areas worked.

Frequencies: Phone - 21300, 14160, 14280, 7200, 3900, 3775. CW - 21035, 14035, 7035, 3690.

Awards: CLARA winner, Certificate and Club Pin. Trophy and certificate to non-member winner, and to 2nd and 3rd place. All entries eligible for a drawing.

Mailing deadline November 30th to: Diana VanderZande, VE7DTO, Jensen Rd. SS #3, Prince George B.C., Canada V2N 2S7.

Pennsylvania QSO Party

Starts: 1700 GMT Sat. September 8

Ends: 2359 GMT Sun. September 9

This is the 22nd annual party sponsored by the Nittany A.R.C. The same station may be worked on each band and mode for QSO points. Penn. stations may also make in-state contacts for QSO and multiplier credit.

Exchange: QSO no., RS(T) and QTH. County for Penn., ARRL section for others.

Scoring: For Penn. - 3 points for out-of-state contacts, 1 point for in-state. Multiply total by ARRL sections worked. (inc EPa. & WPa.) Also a multiplier of 1 may be taken for DX, but 1 only regardless of DX worked.

For Others - 1 point for each Penn. contact, multiply total by Penn. counties worked. (max. of 67)

Frequencies: C.W. - 1810, 3550, 7050, 14050, 21050, 28050, Phone - 1815, 3980, 7280, 14315, 21380, 28560. Novice - 3715, 7160, 21115, 28115.

Awards: Certificates to section winners, and to outstanding Penn. entries. (min of 10 QSOs)

Look for "super-activity" on Saturday evening at 8 PM local time and again at 1 PM on Sunday.

Include a summary sheet with your entry showing the scoring, equipment description and other interesting information. A check list of counties worked is also required. Include a s.a.s.e. if copy of results is desired.

Mailing deadline is October 15th to: Douglas R. Maddox, W3HDH, 1187 S. Garner St., State College, PA 16801.

Kentucky QSO Party

0001 Z Sept. 14 thru 2359 Z Sept. 15

The Bluegrass A.R.C. is again sponsoring this one. The rules are somewhat different from last year's version.

Exchange: QSO no., RS(T) and QTH. County for Kentucky stations; state, province or country for others.

Scoring: One point per contact. Kentucky use states, provinces and countries worked for their multiplier. Others use Kentucky counties worked. (max. of 120)

There are also the following additional multipliers (a) 1.5 for all 10 meter QSOs between 0200 Z and 1000 Z. (b) 2.0 for input of 15 watts or less. (c) 1.5 for input of 200 watts or less. (d) 2.0 for all VHF QSOs, simplex only. (e) 2.0 for Novice or Techs, c.w. only.

Only one contact per band or mode permitted with the same station.

Frequencies: Lower edge of General bands, both phone and c.w. Novice bands, 2 meter simplex and also 6 meters.

Awards not specified but it is assumed the usual certificates will be awarded.

Mailing deadline is Oct. 5th to Donald Page WD4HPL, 309 Pocahontas Tr., Georgetown, Ky. 40324.

Canadian - American Contest

Phone: Saturday, September 15

C.W.: Saturday, September 29

0000 to 2400 GMT each day

This is the third time around for this contest which was created to increase communication and friendship between amateurs of the two countries.

Contacts may be made on all bands, 1.8 thru 28 MHz. It is recommended however that operation be confined to the General portions of each U.S. band. QSO exchange will be between the two countries as well as contacts within each country.

Categories: Single operator, multi-operator single transmitter and club competition.

Exchange: RS(T), QSO no., and multiplier area. Postal abbreviations for the 50 U.S. states. "CN" for U.S. possessions in the Caribbean. "PC" for Pacific possessions. And provinces for Canada. (59001 CT, 599001

PQ and etc.)

Points: W/K to W/K and VE to VE QSOs, 2 points. W/K to VE QSOs, 3 points.

Multiplier: 50 U.S. states, 2 U.S. possessions, (Carib. and Pacific areas) 10 Canadian provinces, 2 Canadian territories, (NWT and Yukon) 1 Canadian Island. (Sable, St. Paul) Total of 65 per band, max. of 390 from all bands.

Final Score: Total QSO points from all bands multiplied by the sum of multipliers from each band.

The same station may be worked on each band for QSO and multiplier credit. Stations operating outside their own area must identify their location.

Multi-operator stations must stay on the same band at least 10 minutes before switching to another band.

Phone and c.w. are separate contests. However combined phone and c.w. scores will be used for overall competition.

Awards: Certificates to single operator station winners in each multiplier area, and the top five combined phone and c.w. scores for multi-operator stations.

There are 8 Trophies and Plaques.

Phone: Canadian and American Champion.

C.W.: Canadian and American Champion.

Phone & CW: Canadian and American Champion.

Multi-Operator Champion. (Combined)

Highest aggregate Club score.

And a one year subscription to *Long Skip* the CANADX monthly bulletin to the top 5 U.S. scorers.

A disqualification clause will be strictly observed. Violation of amateur regulations, rules of the contest, unsportsmanly conduct, taking credit for excessive duplicate contacts or multipliers will be deemed cause for disqualification. So check your log carefully before submitting it.

Do not use separate log sheets for each band. Indicate the multiplier only the first time it is worked on each band. A summary sheet must accompany each entry, showing the scoring and other pertinent information. And entries with over 200 contacts must also include a check sheet for each band.

Sample log forms, summary and check sheets are available from the contest chairman. A large s.a.s.e. will bring you samples. (Do not glue U.S. stamps to the envelope.)

Mailing deadline for all entries is 30 days after end of contest to: CAN-AM Contest, VE3BMV, P.O. Box 292, Don Mills, Ont., Canada M3C 2S2

Maryland/D.C. QSO Party

Starts: 2000 GMT Sat., September 15
Ends: 2400 GMT Sun., September 16

This is the 14th annual party sponsored by the Maydale A.R.S. The same station may be worked on each band and mode for QSO points as well as band multipliers.

Exchange: QSO no., RS(T) and QTH. County for Md./D.C., (Baltimore and Wash. are independent cities) and ARRL section or country for others.

Scoring: Two points for each QSO, 4 points if it's on 10 and 15 c.w.

Md./D.C. use ARRL sections and countries worked for their multiplier. Others use Maryland counties and independent cities worked. (max. of 26)

Frequencies: Use all bands including Oscar. On c.w. 75 KHz. up from low end of each band on even hours. On s.s.b. 25 KHz. in from low end of each phone section on odd hours. Try 10 and 15 on the half hour.

Awards: Certificates to the top scorers in each ARRL section, Md. county, independent cities, and each country, both on phone and c.w. A minimum of 1000 points required for Md./D.C., and 250 points for all others.

Plaques for top combined phone/c.w. score in Md./D.C., and outside the Md./D.C. area. And to the top Mobile providing he has a minimum of 10 contacts from each county and independent city.

Use a separate log for each band and mode, include a summary sheet showing the scoring, name and address in Block Letters, and a signed declaration that all rules and regulations have been observed.

Mailing deadline is October 15th to: Maydale A.R.S., c/o C.E. Andersen, W3XE, 14601 Claude Lane, Silver Spring, MD 20904.

Washington State QSO Party

Three Periods GMT

0100 to 0700 Saturday, September 15

1300 to 0700 Sat./Sun. Sept. 15/16

1300 to 0100 Sun./Mon. Sept. 16/17

This is the 14th annual party sponsored by the Boeing Employees A.R.S. (BEARS) The same station may be worked on each band and mode for QSO and multiplier credit. Wash. stations may work other Wash. stations for QSO points.

Exchange: QSO no., RS(T) and QTH. County for Wash., state, province or country for others.

Scoring: Phone contacts are worth 2 points, c.w. 3 points. Wash. stations multiply total QSO points by number of states, VE provinces and DX countries worked. Others use Wash. counties for their multiplier. (max. of 39)

There is an additional multiplier of 1 for each group of 8 contacts with the same Wash. county for non-Wash. stations.

Frequencies: CW - 1805, 3560, 7060, 14060, 21060, 28160. Phone - 1815, 3925, 7260, 14305, 21380, 28580, Novice - 3725, 7125, 21150, 28160.

Awards: Certificates to the top scorers, both single and multi-operator, in each state, VE Province, DX country and Wash. county. Additional awards where warranted.

The Worked Five Bears Award is available to anyone working 5 club members, before, during or after the party. The Worked Three Cubs Award is available for working 3 Novice members.

Include a check sheet with your entry if you have 100 or more contacts. Results will be mailed to all entries, no s.a.s.e. required.

Mailing deadline is October 18th to: Boeing Employees A.R.S., Contest Committee, Att: Willis D. Propst, K7RS, 18415 38th Ave., S., Seattle, Wash. 98188.

Scandinavian Activity Contest

CW - Sept. 15-16 SSB - Sept. 22-23

Starts: 1500 GMT Saturday

Ends: 1800 GMT Sunday

It's the world working the Scandinavians in this the 21st running of the S.A.C. Phone and c.w. are separate contests. The same station may be worked once on each band, 3.5 thru 28 MHz., for QSO and multiplier credit.

It is suggested that the following sections of the bands be used. CW: 3505 - 3575, 7005 - 7040, 14010 - 14075, 21010 - 21125, 28010 - 28125. SSB: 3600 - 3650, 3700 - 3790, 7050 - 7100, 14150 - 14300, 21200 - 21350, 28400 - 28700.

The prefixes used in Scandinavia are: LA/LB/LG/LJ Norway, JW Svalbard & Bear Is., JX Jan Mayen, OF/OG/OH/OI Finland, OH0Aaland Is., OJ0Market Reef, OX Greenland, OY Faroe Is., OZ Denmark, SJ/SK/SL/SM Sweden.

Classes: Single operator, and multi-operator both single and multi transmitter. Multi transmitter stations must use a separate series of serial numbers for each band. Club stations are considered as multi-operator.

Exchange: RS(T) plus a QSO number starting with 001.

Points: European QSOs count 1 point on any band. DX contacts are 1 point on 14, 21 and 28 MHz, 3 points if on 7 or 3.5 MHz.

Multiplier: Each call area in the above list of Scandinavian countries worked on each band. (LA1, LB1, LJ1 are in same call area, as are SM3, SK3, SL3) Portable stations in Denmark or Norway count as the 10th area. OH0 is the 10th area for Finland, OJ0 is also separate, and SJ9 is the 9th area for Sweden.

Final Score: The sum of QSO

points from all bands times the sum of the multiplier from each band.

Awards: Certificates to the highest scoring station in each class, both s.s.b. and c.w., in each country and each U.S. call area. Additional awards depending on the returns. Plaques will be awarded to the top scoring stations in each continent, both on s.s.b. and c.w.

Use a separate log sheet for each band. Include a summary sheet showing the scoring, your name and address in Block Letters, and a signed declaration that all rules and regulations have been observed.

The usual disqualification criteria will be observed and strictly enforced.

Mailing deadline for all entries is October 15th. This year logs go to: SRAL Contest Manager, OH2QV, P.O. Box 306, SF-00101, Helsinki 10, Finland.

Delta QSO Party

Starts: 1800 GMT Sat. September 29

Ends: 2400 GMT Sun. September 30

This is the 10th annual QSO Party sponsored by the Delta Division of the ARRL. Delta stations (Ark., La., Miss., Tenn.) may work stations both in and outside their boundaries, others only Delta stations. The same station may be worked on each band and mode, and portable and mobiles in each county change.

Exchange: QSO no., RS(T) and QTH. County and state for Delta stations, ARRL section for all others.

Scoring: For Delta - Total number of QSOs multiplied by ARRL sections worked. (max. of 75)

Outside Delta - Total QSOs multiplied by the Delta counties worked. (max. of 316) DX stations may be worked but for QSO points only. They have no multiplier value.

Frequencies: CW- 3550, 7050, 14050, 21050, 28050. SSB - 3990, 7290, 14290, 21390, 28590. Novice - 3775, 7175, 21125, 28125.

Certificate Awards:

A. Achievement: To all stations contacting 5 or more stations in each of the 4 Delta states.

B. Delta: To the 3 highest scoring stations in each of the 4 Delta states, 4th and 5th place awards if warranted.

C. Others: To the highest scoring station in each ARRL section, and in each country, 2nd and 3rd place awards if warranted.

D. Plaques: To the Top scorers in and outside the Delta division. Top portable and mobile Delta stations. Highest scoring Delta Club station.

Mailing deadline for logs is October 21st to: Malcolm P. Keown, W5XX, 213 Moonmist, Vicksburg, Miss. 39180.

It's New.

It's for 2-meters.

It's the Best.

It's the Boomer.



 **cushcraft**
CORPORATION
THE ANTENNA COMPANY

And we have it.

BRITTS

Two-Way Radio

2508 Atlanta Street

Smyrna, GA 30080

404-432-8006

CIRCLE 99 ON READER SERVICE CARD



Showcase

Michael Anthony & Co.'s One-Hand Soldering System

The *Hot Rod* soldering system from Michael Anthony & Co. combines soldering iron and solder into a self-contained "one hand" tool.

Unlike conventional soldering irons, the *Hot Rod* features an exclusive solder feeding mechanism which gives the operator a free hand while soldering. It also provides greater precision and control for intricate work.

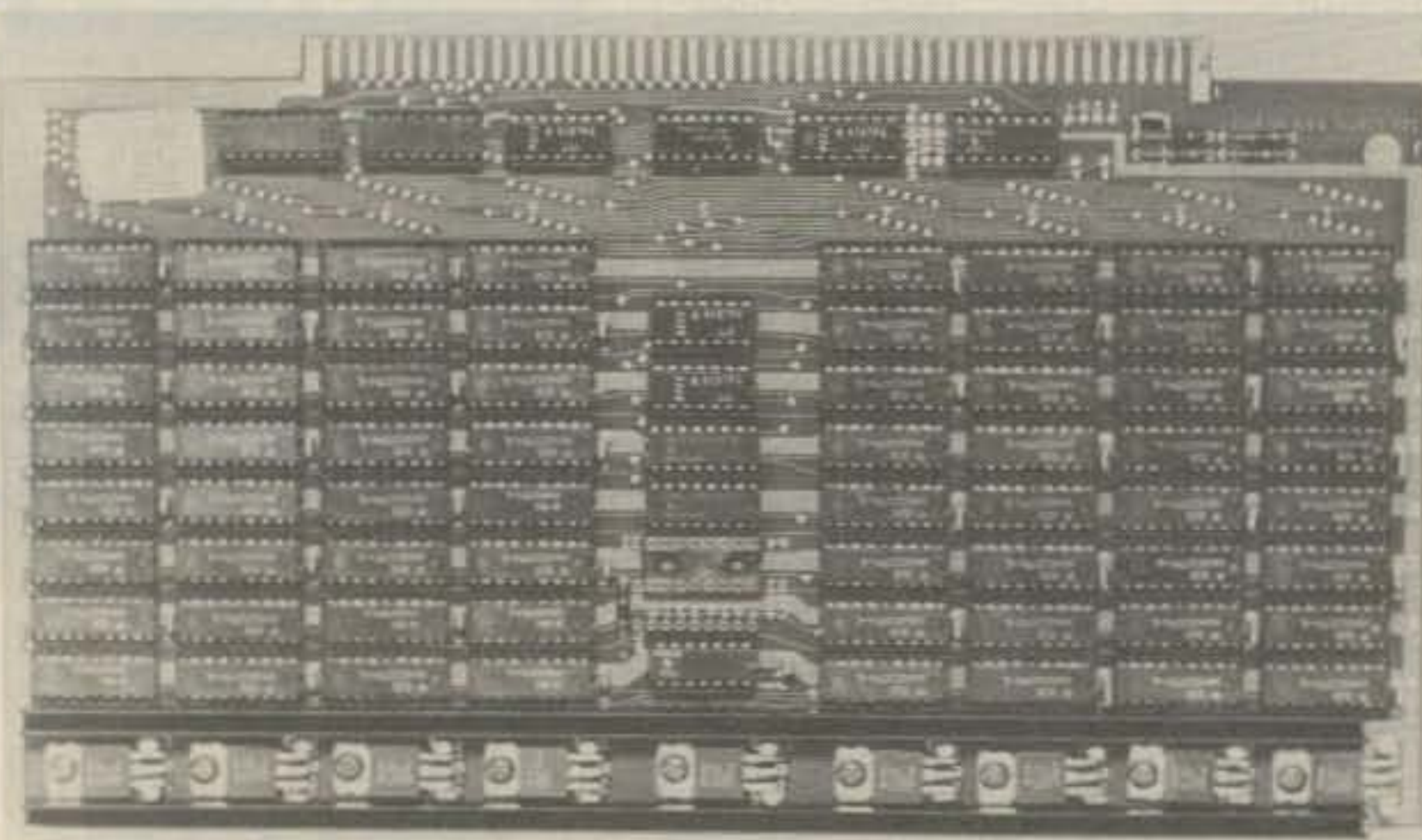
A refillable solder magazine is located in the handle of the gun. Solder is fed from the magazine directly onto the gun tip by means of a thumb dial located on top of the handle. The solder magazine comes equipped with a



full supply of 60/40 resin core solder, but can be refilled with any type of solder, up to 18 gauge.

The unit sells for \$19.95 and is

available from Michael Anthony & Co., 10407 Western Ave., Downey CA 90241. For more information, circle number 68 on the reader service card.



Tarbell Electronics 32k RAM Memory Board

Tarbell Electronics has announced immediate availability of

their 32k static RAM board. The new memory board is S-100 bus compatible and runs at 300 ns. It features extensive addressing, or bank switching, and contains nine

regulators which greatly enhance its heat distribution.

Included is a phantom line for disabling memory—very useful for such functions as bootstrapping. The board is fully factory assembled and tested prior to shipping.

The same board is available with 16k, leaving half the board open for future addition of chips.

The Tarbell Memory Board is supplied with a 20-page operating manual which includes a complete parts inventory, schematics, and several test routines. The 32k version is priced at \$625; the 16k version is \$390.

For more information contact Tarbell Electronics at 950 Dovlen Place, Suite B, Carson CA 90746, or circle number 67 on the reader service card.

Programma International Inc.'s Apple II Light Pen

A new low-cost light pen is now available for simple installation and immediate operation in applications such as bar graphs, charts, and games. The Apple II Light Pen is supplied with three demonstration programs on cassette.

The first demo program instructs on the use of the Light Pen as a menu selecting tool, providing a fine example of useful pen applications.

The second is a program of graphics demonstrations which permit the user to select from a menu of graphic shapes and colors. Selection from either the shape or color menu is accomplished by merely depressing the RETURN key.

The third program is a graphics color bit-pad demonstration. A color may be selected from the color menu by depressing any key.

The pointer software driver performs seven functions which include selection of graphics mode and page two display, search for X and Y ordinates, a test for odd/even Y ordinate, set page one display, and return to calling program.



The entire package, including light pen, software on cassette, and operating manual, are priced at \$34.95. The pen is backed by a full 90-day warranty. For more in-

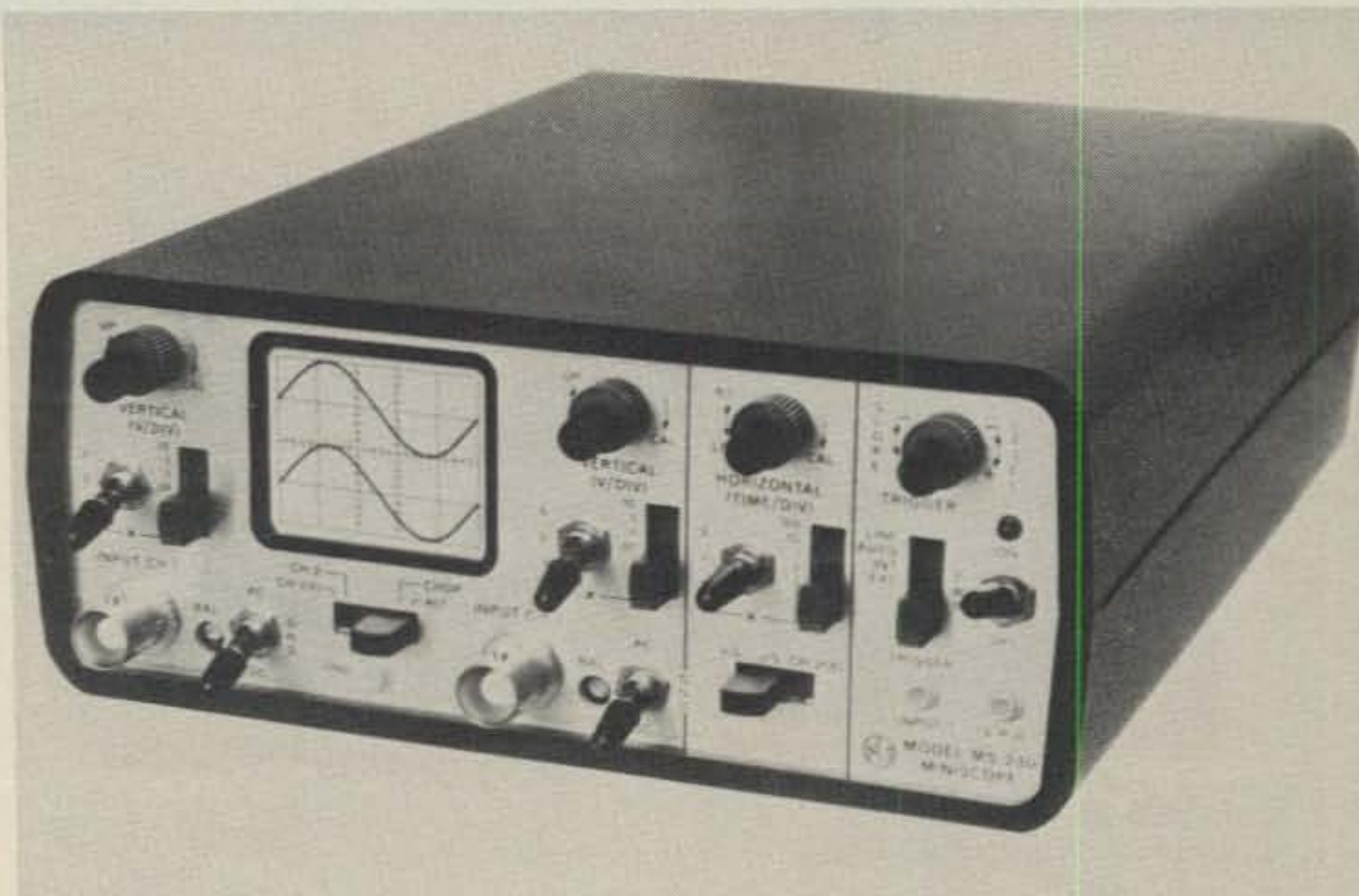
formation, contact Programma International, Inc., 3400 Wilshire Blvd., Los Angeles CA 90010, or circle number 66 on the reader service card.

Non-Linear Systems, Inc.'s Model MS-230 30 Megahertz, Dual-Trace, Portable Oscilloscope

The Non-Linear System, Inc.'s new Model MS-230 is quite small, measuring 2.9 inches high by 6.4 inches wide and 8.5 inches deep. It weighs 3.5 pounds, including batteries.

The MS-230 features alternate, chopped and separate sweep modes. Internal and external trigger modes are included. There are 12 vertical gain settings for each channel's range from 0.01 to 50 volts per division. Time base settings number 21 from 0.05 microseconds to 0.2 seconds per division. Verniers are provided for time base and vertical amplifier adjustment.

The MS-230 Miniscope includes a horizontal input channel and an internal calibrator. The graticule

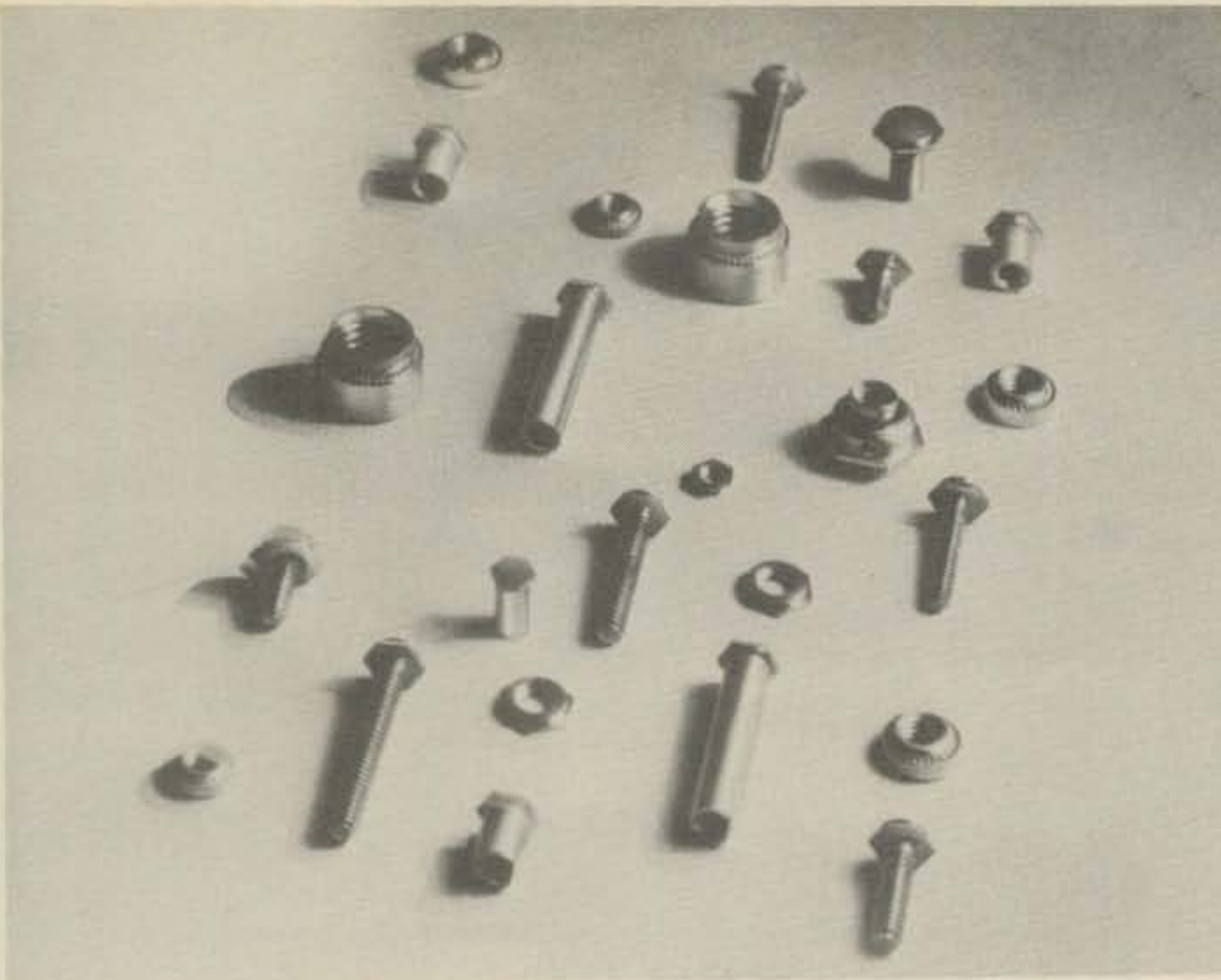


consists of 0.25 inch divisions arranged 5 across and 4 high.

The unit sells for \$599 and is available from Non-Linear

Systems, Inc., P.O. Box N, Del Mar CA 92014, or circle number 74 on the reader service card.

710 - 103 - 109



Precision Metal Products Co.'s Presserts

Presserts captive hardware provides strong, permanent wear-resistant threads in soft brass, mild steel, aluminum and thermoplastic material, and are offered in a wide variety of styles and types to meet almost every application requirement.

Installation is simply accomplished by pressing the *Pressert* into place with an arbor or hydraulic press. Cold flow of panel material into the channel grooves and knurls provides permanent installation and the unit will not push, pull or torque out.

For more information about *Presserts* write to Precision Metal Products Co., 41 Elm St., Stoneham MA 02180, or circle number 73 on the reader service card.

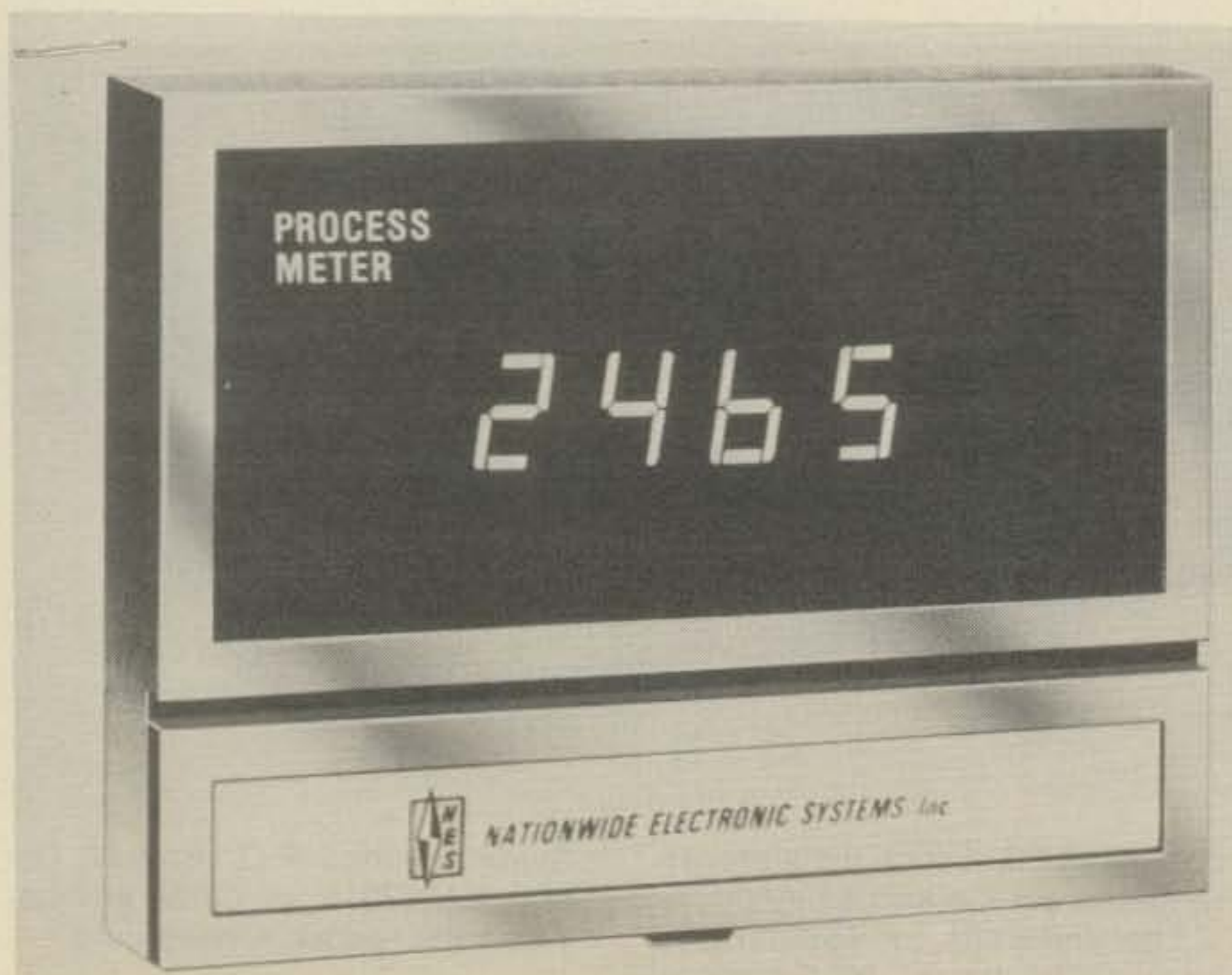
Unusual Contests

V.J. Luciani, K2VJ, a regularly contributing author to *CQ* has just had a book published. Not one to put all his eggs in one basket, author/publisher Luciani has anthologized many in-

teresting tests of skill along with how you can enter any of hundreds of competitions listed in his new book titled, "Unusual Contests." So if you are interested in becoming the next world champion cow chip thrower, get a copy of K2VJ's book by writing

him P.O. Box 682, Cologne NJ 08213. The book costs \$4.95, plus 50¢ shipping (New Jersey residents add 25¢ sales tax).

For more information contact the author or circle number 85 on the reader service card.



Nationwide Electronic Systems, Inc.'s Microprocessor

The Nationwide Electronics Systems' *Slimline I* Process Meter is designed to take any input signal and read out in any unit the operator wishes.

The meter accepts commonly used process signals such as 4-20 mA, 0-10 v.d.c., etc., and outputs BCD signals and a display in any desired engineering units. The process meter is entirely programmed for input voltage/current range and display reading by selectors located under the hidden front flip-up door.

The meter is priced at \$249.

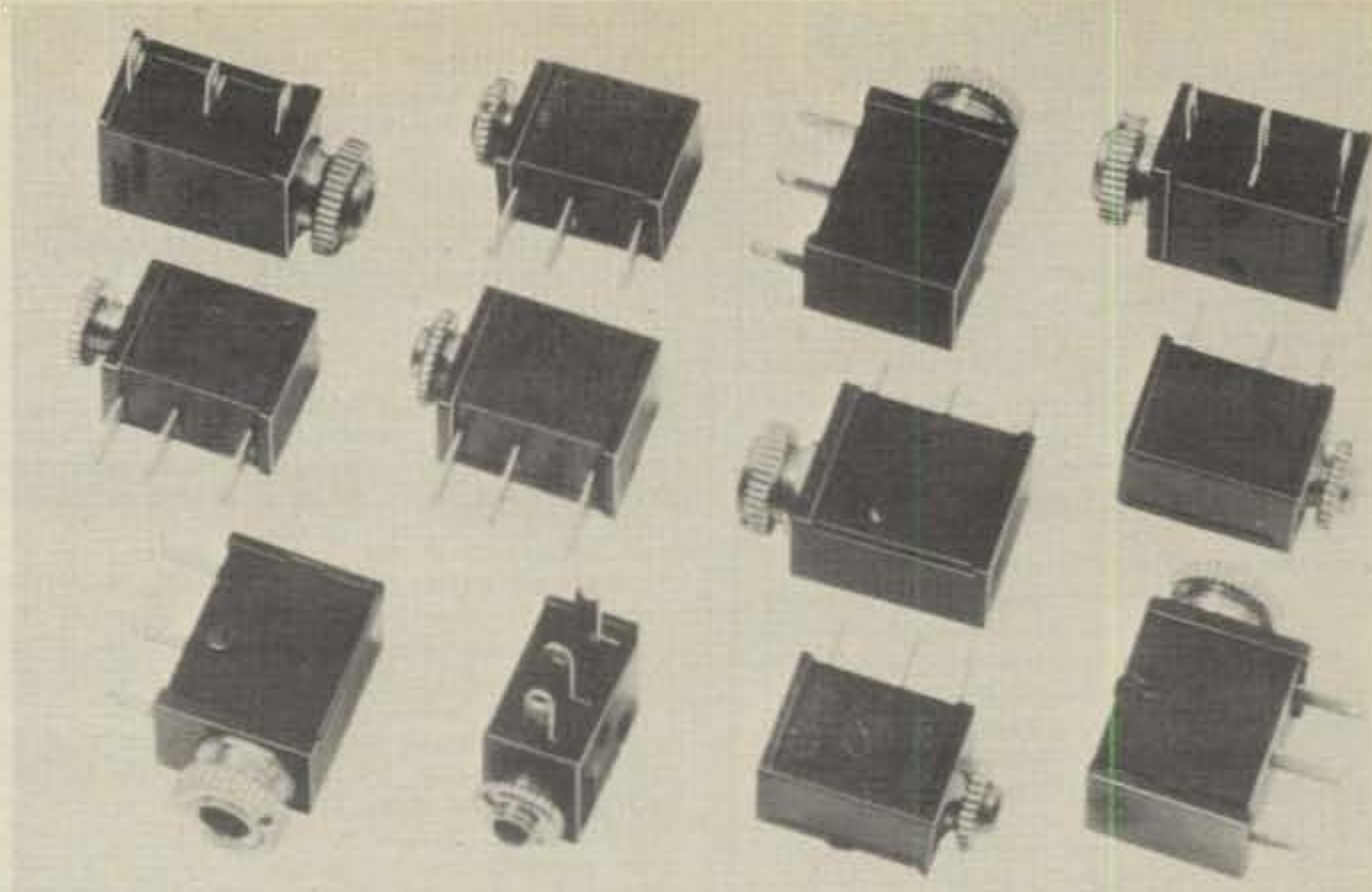
For further information, contact Nationwide Electronics Systems, Inc. at 1536 Brandy Parkway, Streamwood IL 60103, or circle number 70 on the reader service card.

AVA Electronics Corp.'s New Catalog

AVA Electronics Corp. has announced the publication of their new twelve-page catalog.

The catalog contains information and ordering instructions for AVA's R.F. Adaptor line - 180 different units in all. Also included is their full array of terminators, attenuators, dust covers and patch cords.

The catalog is designated #379 and is available free of charge from AVA Electronics Corp., 4000 Bridge St., Drexel Hill PA, or circle number 82 on the reader service card.



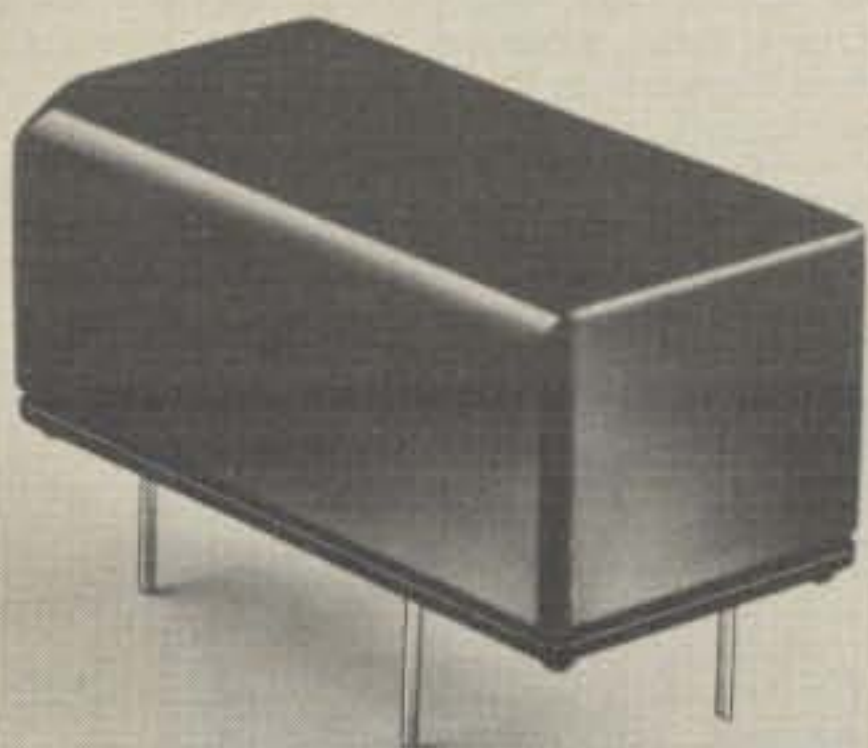
Imtronics Industries' Miniature And Subminiature Jacks

A complete line of fully enclosed miniature and subminiature jacks has been introduced by Imtronics Industries. The jacks feature quick connect solder terminals and dustproof construction that allows perfect contact with each insertion.

Contact surfaces are designed and oriented in the plastic body

to generate maximum contact pressure. The jacks have an extremely high reliability and, according to Imtronics, have shown no breakdown after 100,000 heavy duty test insertions. Insulation resistance is 100 megohms at 250 v.d.c., and contact resistance is less than 15 megohms.

For more information, contact Imtronics Industries at 200 13th Avenue, Ronkonkoma NY 11779, or circle number 81 on the reader service card.



Panasonic's DIP Nickel-Cadmium Batteries

Panasonic has announced two models of DIP nicad batteries for printed circuit board mounting. Designated as MEMORY MOUNT™, the new batteries are available in voltages of 2.4 and 3.6 v.d.c., with capacities of 110 mAh.

The batteries are available in the discharged state. Once they have been soldered into a p.c. board, they can be charged to the desired capacity.

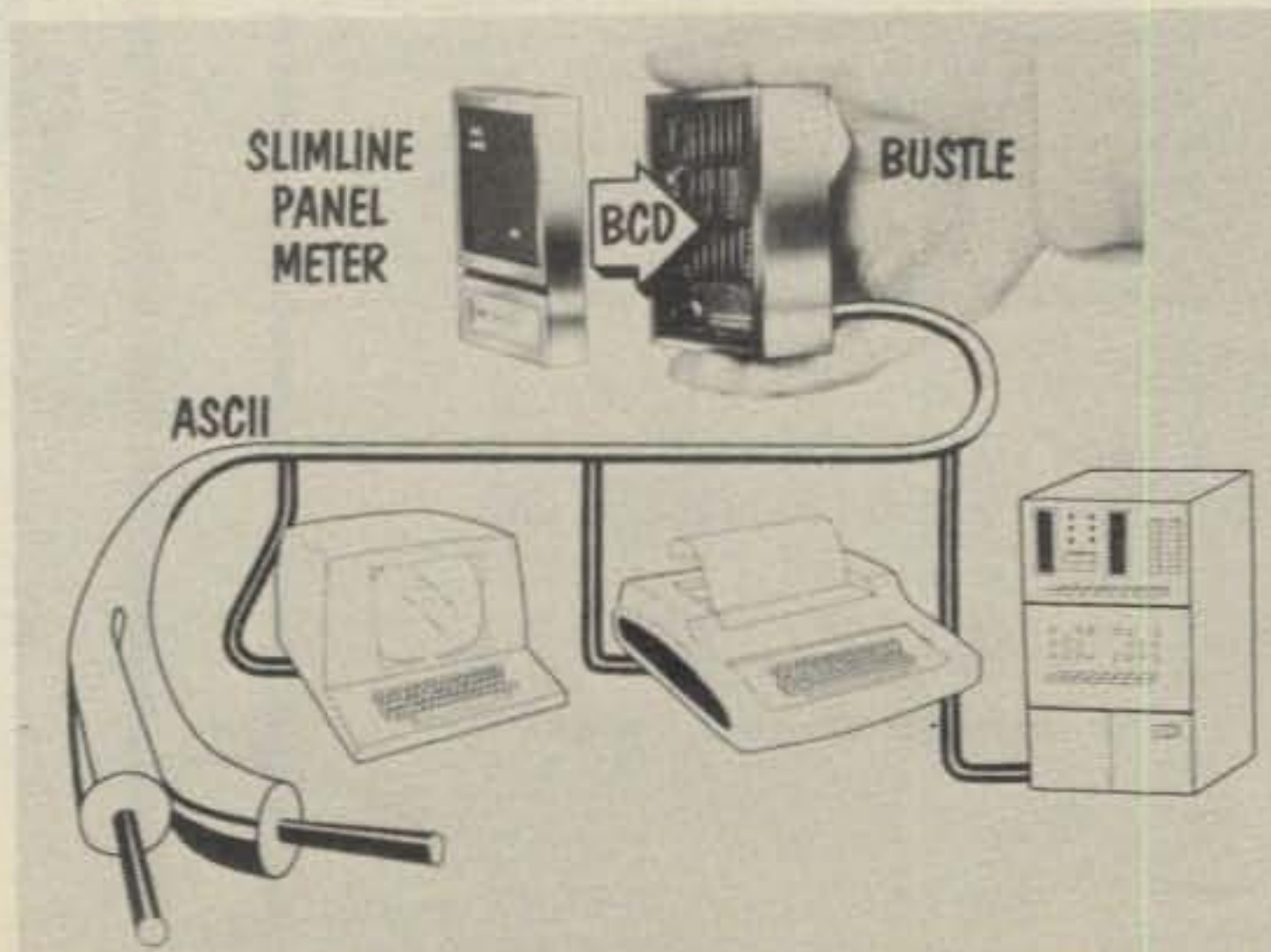
For more information, contact Panasonic at One Panasonic Way, Secaucus NJ 07094, or circle number 80 on the reader service card.

Nationwide Electronic System, Inc.'s BCD-To-Serial ASCII Converter

The ASCII *Bustle* has several new features which include: (1) switch selectable baud rate from 110 to 9600 baud; (2) a 2-digit switch selectable identification number; (3) 32-character special

message (or optionally, a two-special message unit) in non-volatile memory; (4) parity switch for selection of even, odd, spacing, marking, or no parity; (5) jumper selector for the number of stop bits.

For further information, contact Nationwide Electronic Systems, 1536 Brandy Parkway, Streamwood Il 60103, or circle number 83 on the reader service card.



HAM SHOP

FREE TO CQ SUBSCRIBERS

Advertising Rates: Non-commercial ads are 10 cents per word including abbreviations and addresses. Commercial and organization ads are 35 cents per word. Minimum charge \$1.00. No ad (non-subscriber) will be printed unless accompanied by full remittance. Free to CQ subscribers (maximum 3 lines per month). Recent CQ mailing label must accompany ad.

Closing Date: The 10th day in the third month preceding date of publication. Because the advertisers and equipment contained in Ham Shop have not been investigated, the Publisher of CQ cannot vouch for the merchandise listed therein. Direct all correspondence and ad copy to: CQ Ham Shop, 14 Vanderventer Ave., Port Washington, New York 11050.

WANTED: Pre-1925 wireless gear, books, magazines, spark transmitters and tubes. Jim Kreuzer, 1428 Main Rd., Corfu, NY 14036.

VP5 PROVIDENCIALES. Your family won't mind your DXing. They will also have the time of their lives with swimming, snorkeling, fishing, beachcombing, etc. Our new home is completely furnished, including transceiver and antenna. Refer to June '77 issue of CQ. Info-Rene Weber, 2600 Douglas Road, Suite 1100, Coral Gables, FL 33134.

QSLs with Class! Unbeatable quality, reasonable price. Samples: 50 cents refundable. QSLs Unlimited, 1472 SW 13th Street, Boca Raton, FL 33432.

CALL TOLL FREE for an EZ deal. 800-247-2476/1793. Iowa call 800-362-2371. See ad elsewhere. W0EZ, Bob Smith Electronics, RFD 3, Fort Dodge, Iowa 50501.

TRS-80 HAM PROGRAMS Dup search and log contests. . . DXCC, WAS tracking, Antenna Math, much more. \$1.00 brings list, refundable. WA4PYF; Box 145-C, Lithonia, GA 30058.

MUSEUM for radio historians and collectors now open. Free admission. Old time amateur (W2AN) and commercial station exhibits, 1925 store and telegraph displays, 15,000 items. Write for details. Antique Wireless Assn., Holcomb, N.Y. 14469.

ARRL ROANOKE DIVISION CONVENTION & HAMFEST. Fourth Annual Tidewater Hamfest-Computer Show-Flea Market will be held in the Norfolk, Va. Cultural and Convention Center SCOPE October 20 and 21, 1979. 60,000 square feet of air-conditioned exhibit and Flea Market tailgating space are available. Doors open at 9:00AM. ARRL meetings, DX, Traffic forums, plus a CW contest are scheduled. FCC Exams are planned for amateur upgrading Saturday 9-12AM. A special feature will be a dinner cruise and banquet on the Spirit of Norfolk Cruiseship Saturday night. Advance registrations \$2.50 (SASE), \$3.50 at the door. Flea Market tailgate spaces \$3 day. Cruise and banquet \$16 person, \$30 couple. Tickets and information-TRC, Box 7101, Portsmouth, Va. 23707.

HAM KEY CHAIN. Handle, Call, QTH on lifetime plastic. \$2.00. K4TIV, Box 1551, Johnson City, TN 37601.

BUY/SELL your used amateur gear. We match buyers with sellers nationwide. Send make, model number, price, name, address, telephone. Fee \$1.00. S.A.S.E. Write or phone Ham Buy & Sell Exchange, 3550 Lochinvar Ave., Santa Clara, Calif. 95051. 408-247-4220.

WANTED: Hallicrafters S-1 through S-7, H8PA, 5-T, SX-10, SX-12 and other early Hallicrafter gear, parts, and manuals-any condition-for private collection. Price and condition first letter. C. Dachis, WD5EOG, 4500 Russell Drive, Austin, Texas 78745.

MOBILE IGNITION SHIELDING provides more range with no noise. Available most USA engines, some imports. Free literature. Bonding straps on sale now. Estes Engineering, 930 Marine Drive, Port Angeles, WA 98362.

QSL CARDS: 500/\$10. 400 illustrations. Free Catalogue. Bowman Printing, Dept. CQ, 743 Harvard, St. Louis, MO 63130.

WANTED: Old radio transcription discs; any size, speed. Larry, W7FIZ, Box 724, Redmond, WA. 98052.

EZ DEALS are hard to beat. Try me and see for new or used ICOM, Cushcraft, KLM, Yaesu, Drake, Wilson, VHF Eng., Ten-Tec, Swan, DenTron, CDE, Hustler, Larsen, and more. 800-247-2476/1793. Iowa call 800-362-2371. W0EZ, Bob Smith Electronics, RFD 3, Fort Dodge, Iowa 50501. 515-576-3886.

TRAVEL-PAK QSL KIT — Converts Post Cards, Photos to QSLs. Stamp brings circular. Samco, Box 203, Wynantskill, N.Y. 12198.

6BDXCC RECORD BOOK \$5.00. WB5HVY, 4706 Washington Avenue, Gulfport, MS 39501.

ENGRAVED PINS. 1" x 3", 2 lines, \$1.00. 3 lines \$1.50. Any wording. 16 letters per line. Black, red, blue, green, yellow, walnut, white. Fast! Postage 25 cents per order. Holly Engraving, Box 3926-F, Hollywood, FL 33023.

BROWNING Golden Eagle Mark III D104, \$500. Beach Haven, N.J. (609) 492-1104.

The only REALLY NEW 80-10 meter vertical design in 20 years!

Completely automatic bandswitching 80 through 10m [160-10m with optional TBR-160 add-on unit.]

Low V.S.W.R. over entire 40, 20, 15, & 10m bands plus ANY 60-100 KHZ segment of 80/75m. NO ANTENNA TUNER NEEDED! ENTIRE 26 ft. length active on 80, 40, 20, & 10m with full 1/4 wave resonance on 15 m for greater bandwidth & superior DX performance. Ground, roof, or tower mount—no guys needed.

HIGHEST QUALITY CONSTRUCTION & WORKMANSHIP THROUGHOUT. HIGH STRENGTH ALUMINUM ALLOY AND FIBERGLASS DESIGN. Complete with 1-1/8 in. O.D. tubular mounting post, RG-11/U matching line, and connector for PL-259. Use any length of 50-52Ω coax.

V.S.W.R. at resonance: 1.5:1 or less; all bands. Power rating: Legal limit SSB/CW 40-10m; 1200 W P.E.P./500W CW on 80/75m.

AT YOUR DEALER OR DIRECTLY FROM

 **BUTTERNUT ELECTRONICS CO.**

ROUTE ONE
LAKE CRYSTAL, MN. 56055
PHONE 507-947-3126

OTHER MODELS, TOO! FREE INFORMATION.

Model HF5V-II \$98.00 PPD. IN CONT. USA (BY UPS). MN. RESIDENTS ADD TAX.

Call or Write for Delivery or Quote

KENWOOD TS-120S



MADISON ELECTRONICS SUPPLY, INC.

1508 MCKINNEY • HOUSTON, TEXAS 77002
713/658-0268

LEAVE A MESSAGE & WE'LL CALL YOU BACK!

LUXURY home located in Durango, Colo., 5000 sq. ft., 5 BR, 5 Bath, 3 fireplaces, fantastic view of mountains and a perfect location for a Ham. In place now, 5 Ton Big Bertha Mast, 125', 360 degree, at 7500 elevation. Call Newton Real Estate, (303) 247-4292.

FOR SALE: Motorola HT 220 Slim Line. Single channel 14784/24 rpt., plug in charger, 2 battery packs, manual available. Post-paid. Excellent \$850. Canadian. VE7AZO, 2429 14th Ave., Port Alberni, B.C., Canada V94 2Y1.

FIBERGLASS VAULTING POLES. Perfect Quad spreaders or VHF/UHF booms. S.a.s.e. for info. K5WSE, Box 1032C, Cedar Park, TX 78613 (512) 259-2164.

99 ELECTRONIC TERMS DICTIONARIES, \$2.00 (money orders only) Darrell Hohensee, 217 N. Hamilton, Pratt, KS 67124.

SCANNER/MONITOR Accessories, kits and factory assembled. Free catalog. Capri Electronics, Route 1A, Canon, GA 30520.

ANTENNA ACCESSORIES catalog for Hams, CBers and Home TV innovators has application data. Send 15 cent stamp to Dept. CQ2, Unadilla/Reyco, Box 280, East Syracuse, N.Y. 13057.

WANTED: Crystal Impedance Meters. TS-330, TS-683, TSM-15 or RFL Models 531, 459 or 1207. Glenn, K3SWZ, 403 Center-view Ave., New Cumberland, PA 17070. (717) 938-3655.

FREE: Fundamentals of Light Propagation, masses with C - plus relative velocities, superior, trajectory relativity & unified field theory, Einstein's eclipse scandal, obsolete, elastic solid, aether - based, relativity scandals exposed, reformed! Write W.T. Thomas Jr., 408 Vermont, Daytona, FL 32018.

WANTED: Collins 51-R receiver (VHF). Bill Orr, W6SAI, Eimac, 301 Industrial Way, San Carlos, CA 94070.

WANTED: Antique Glass-looking for old milkglass-purple, slag, carmel, and green-town. Tell me what you have. I pay the highest prices. Write: Jack Schneider, c/o Cowan Publishing Corp., 14 Vanderventer Ave., Port Washington, NY 11050.

SALE: Heath IM-28 VTVM kit. New, perfect. Ordered by mistake. \$40. Schultz, Box "L", FPO NY 09544.

MEDICAL: Any licensed amateur radio operator in the medical or paramedical field should join MARCO (Medical Radio Council). Contact: Stan Carp, M.D., K1EEG, 44 Main St., Saugus, MA 01906. (617) 233-1234.

LOOKING FOR old Lionel trains. Interested only in "O" Gauge, excellent to like-new condition. Primary interest is locomotives prior to 1952, but will consider complete sets or more recent models. Am willing to buy outright for cash or swap radio gear to meet your needs. Write: Dick Cowan, c/o CQ Magazine, or call (516) 883-6200.

FOR SALE: Old issues of Ham Radio, 73, CQ, QST. Some complete runs. Send s.a.s.e. for lists and prices. A. Dorhoffer, K2EEK, CQ Magazine, 14 Vanderventer Ave., Port Washington, NY 11050.

WANTED: Extra coils for SW-3 receiver. I have odd-ball coils and need your single extras to make up complete set. Buy or trade. Bill Orr, W6SAI, Eimac, 301 Industrial Way, San Carlos, CA 94070.

SALE: Sony ICF-5900W multi-band receiver designed for SWLs. Like new condition w/ manuals, \$100. Schultz, W4FA, Box "L", FPO, NY 09544.

FOR SALE: Tektronix 535 oscilloscope with dual trace and fast rise-time plug-ins. Very good condition, \$425. Prefer local pick-up. Irwin Schwartz, K2VG, c/o CQ Magazine, 14 Vanderventer Ave., Port Washington, NY 11050.

Antenna Baluns

All Palomar Engineers products are made in U.S.A. Since 1965, manufacturers of Amateur Radio equipment only.



1 Kw CW, 3 Kw PEP input. For dipoles, inverted Vees, beams, quads. Dependable. Takes temporary overloads in stride.

Specify 1:1 or 4:1 ratio.

Model 1K \$22.50



2 Kw CW, 6 Kw PEP input. Far more rugged than any other balun made for amateur use.

Specify 1:1 or 4:1 ratio.

Model 2K \$42.50



2 Kw CW, 6 Kw PEP input. Our heavy duty balun with mounting bracket for 2" mast or boom.

Specify 1:1 or 4:1 ratio.

Beam Balun \$47.50

Only Palomar Baluns Have All These Features

- RF toroidal core for highest efficiency.
- Teflon insulated wire.
- Stainless steel hardware. Won't rust.
- Epoxy filled case. Waterproof.
- Wideband 1.7 to 30 MHz.
- White case to reflect the sun.
- Lightning protection built in.

Free brochure sent on request

How many lightweight baluns have you burned out already? Install the balun that will stay up there working year after year.

To order, add \$2 shipping/handling. California residents add sales tax.

Palomar Engineers

Box 455, Escondido, CA. 92025 • Phone: [714] 747-3343

NORTH GEORGIA'S ONLY
AUTHORIZED YAESU DEALER



Wright's 2-Day Radio
Sales & Service

ADVANCED AMATEUR RADIO EQUIPMENT

2508 Atlanta St.
DAN C. BRITT Belmont Hills Shopping Center
432-8006 Smyrna, GA. 30080

CIRCLE 49 ON READER SERVICE CARD



Instant

Identity

The time has come for all amateurs to unite on sight. We must know each other as do other fraternal organizations. The ability to recognize each other on any occasion is a true mark of fraternal brotherhood. Group III, (WB2LCK, KB2DX and KB2DZ) designed this 10 karat gold ring to portray our great and proud fraternity. This exquisite ring is made exclusively for you by Josten's (world famous for their quality achievement rings) with your call letters prominently displayed. For detailed information and reusable ring sizer... Write:



Group III Sales Co.
Dept. 3519 P.O. Box 259
Little Neck, N.Y. 11362

No Obligation

CIRCLE 26 ON READER SERVICE CARD

MILITARY SURPLUS WANTED

Space buys more and pays more. Highest prices ever on U.S. Military surplus, especially on Collins equipment or parts. We pay freight. Call collect now for our high offer. 201 440-8787.

SPACE ELECTRONICS CO.

div. of Military Electronics Corp.
35 Ruta Court, S. Hackensack, N.J. 07606

CIRCLE 48 ON READER SERVICE CARD

ALL BAND TRAP ANTENNAS!



PRE-TUNED - COMPLETELY ASSEMBLED - ONLY ONE NEAT SMALL ANTENNA FOR UP TO 6 BANDS! EXCELLENT FOR CONGESTED HOUSING AREAS - APARTMENTS LIGHT - STRONG - ALMOST INVISIBLE!

FOR ALL MAKES & MODELS OF AMATEUR TRANSCEIVERS - TRANSMITTERS - GUARANTEED FOR 2000 WATTS SSB 1000 WATTS CW. FOR NOVICE AND ALL CLASS AMATEURS!

COMPLETE AS SHOWN with 90 ft. RG58U-52 ohm feedline, and PL259 connector, insulators, 30 ft. 300 lb. test dacron end supports, center connector with built in lightning arrester and static discharge - molded, sealed, weatherproof, resonant traps 1"X6"-you just switch to band desired for excellent worldwide operation - transmitting and receiving! WT. LESS THAN 5 LBS.

160-80-40-20-15-10 bands 2 trap-- with 90 ft. RG58U - connector - Model 777BU ... \$59.95
80-40-20-15-10 bands 2 trap --- 102 ft. with 90 ft. RG58U - connector - Model 998BU ... \$54.95
40-20-15-10 bands 2 trap --- 54 ft. with 90 ft. RG58U coax - connector - Model 1001BU ... \$53.95
20-15-10 bands 2 trap --- 26 ft. with 90 ft. RG58U coax - connector - Model 1007BU ... \$52.95

SEND FULL PRICE FOR POST PAID INSURED DEL. IN USA. (Canada is \$5.00 extra for postage - clerical - customs - etc.) or order using VISA Bank Americard - MASTER CHARGE - AMER. EXPRESS. Give number and ex. date. Ph 1-308-236-5333 9AM - 6PM week days. We ship in 2-3 days. PRICES MAY INCREASE SO - ORDER NOW AND SAVE! All antennas guaranteed for 1 year. Money back trial! Made in USA. FREE INFO. AVAILABLE ONLY FROM.

WESTERN ELECTRONICS

Dept. AC-9

Kearney, Nebraska, 68847

CIRCLE 53 ON READER SERVICE CARD

Two Great New Circuit Values From:

DIGITREX ELECTRONICS COMPANY

PA-19 Wideband Preamplifier

- 2 to 200 MHZ Bandwidth(-3dB Points)
- 19 dB Gain!
- 50 Ohms Input & Output Impedance
- Tiny PC Board Size(7/8" x 1-5/8")
- Absolutely No Tuning Required
- Extremely Stable
- Draws only 20MA@12VDC
- Great Way to Increase Sensitivity of Receivers, Counters, etc.
- Fully Assembled and Tested
- Instructions Provided, Full Warranty



only \$6.95

+.50 Shipping/Handling

PS-600 600 MHZ Prescaler

- Provides ÷10 and ÷100 TTL Level Output
- 75 MV RMS Input Sensitivity
- Built in 5 Volt Regulator allows use at 8-12 VDC@90-110 MA.
- Tiny PC Board Size (1-1/4" x 1-3/8")
- Fully Assembled and Tested
- Instructions Provided, Full Warranty
- Uses 11C90 DC and 74196 IC's.



only \$18.95

+.50 Shipping/Handling

4412 Fernlee Royal Oak, Michigan 48073

COD Orders Accepted 7am-10pm Phone 313-651-9247

CIRCLE 14 ON READER SERVICE CARD

FACSIMILE

COPY SATELLITE PHOTOS,
WEATHER MAPS, PRESS!

The Faxes Are Clear — on our full size (18-1/2" wide) recorders. Free Fax Guide.

TELETYPE

RTTY MACHINES, PARTS, SUPPLIES

ATLANTIC SURPLUS SALES (212) 372-0349
3730 NAUTILUS AVE BROOKLYN, N.Y. 11224

Please send all reader inquiries directly

GET ORGANIZED!

Here's a set of 4 sturdy files that holds over 4 years of your favorite 8 1/2" x 11" magazines.

4 MAG FILES \$4.95

Send \$4.95 plus \$1.00 for postage and handling to:

DGM INDUSTRIES
P.O. BOX 388-H
DOVER, N.H. 03820



Please send all reader inquiries directly.

FOR SALE: Complete set of Time-Life camera books, 17 volumes plus master index and Photographers Handbook, \$125. A. Dorhoffer, K2EEK, CQ Magazine, 14 Vanderventer Ave., Port Washington, NY 11050.

QSL — QSL — QSL: Please send QSL Cards to: Philip Steven Kurland, P.O. Box 1686, New Haven, CT 06507.

The book "CQ YL" has been updated again with a new supplement bringing the YLRL Officers section up to date through 1977, plus a report on the 7th International YLRL Convention held in Houston in June 1976. If you have a copy of "CQ YL" and would like to add the new supplement (the pages are "slotted" so they can be inserted directly into the book's spiral backbone), drop a note with your request to author/publisher W5RZJ, Louisa Sando, 9412 Rio Grande Blvd., NW, Albuquerque, NM 87114. Please enclose \$1 to cover cost of printing and mailing. The one and only book about YLs in ham radio, "CQ YL" contains 23 chapters, over 500 photographs. Order your autographed copy, or a gift copy from W5RZJ, \$3.50, postpaid.

FOR SALE: Cushcraft A147-22, stacked, 11 element, 2 meter beam. New in carton, 70.00. A. Dorhoffer, K2EEK, CQ Magazine, 14 Vanderventer Ave., Port Washington, NY 11050.

SSTV AND PHOTOGRAPHERS - Make offer, 1 each, like new, Fujitar lenses, 135 mm, f4.5, telephoto, 35 mm, f 3.5, wide angle. Cary Cowan, c/o CQ Magazine, or call (516) 883-6200.

SELL: 2 mtr FM Sonar transceiver, AC P/S, mobile bracket \$150. George Pataki, WB2AQC, 34-24 76th St., Jackson Hgts., NY 11372.

WANTED: Pre-war issues or Short Wave Craft magazine. Bill Orr, W6SAI, Eimac, 301 Industrial Way, San Carlos, CA 94070.

FOR SALE: Round Emblem Collins Equipment. KWM-2, never used, still in original seals, new, 516F-2 a.c. supply (used, very good condition), 312B-4 (used, very good condition), mobile supply and mounting bracket with cables, Collins Dummy Load (winged emblem), Noise Blanking, Spectronics digital readout for KWM-2, DX Engineering Speech Processor for KWM-2, Collins SM-3 microphone. \$2,000 for all. A. Dorhoffer, K2EEK, CQ Magazine, 14 Vanderventer Ave., Port Washington, NY 11050.

CQ AND QST 1950-1975 ISSUES FOR SALE. Send SASE if ordering 73, Ham Radio, or other CQ and QST issues. One dollar minimum order and all issues cost 25 cents each, including USA shipping. Send chronological list and full payment to W6LS, 2814 Empire Ave., Burbank, CA 91504. Available issues and refund sent within one month.

CERTIFICATE FOR Proven Two-Way Radio Contacts with Amateurs in all ten (10) USA call areas. Award suitable to frame and proven achievements added on request. SASE brings TAD data sheet from W6LS, 2814 Empire Ave., Burbank, CA 91504.

BE FIRST TO KNOW precisely when and where to work all the choice DX. Bi-weekly LI DX Bulletin has: Hot DX News-Time and Frequency of each goodie-QSL Info-Propagation Forecast and more... Send business size SASE for free sample or \$10 for 1-year domestic subscription to: Long Island DX Bulletin, PO Box 173, Huntington, NY 11743.

SCANNER OWNERS! It's here! The "Top Secret" Registry of U.S. Government radio frequencies 25 to 470 MHz, by K2AES. First and only book of its kind ever published! Lists 2,250+ freqs. of Military, FBI, Treasury, FCC, Border Patrol, Customs, Secret Service, NASA, FAA, CIA, Federal Prisons, U.S. Marshals, Satellites, National Park Service, Fish/Wildlife, and much more! Only \$4.95 postpaid (USA, APO, FPO orders only, please); from CRB Research, P.O. Box 56-CQ, Commack, NY 11725.

MOTOROLA HT-220 Type CC3540, \$150. Solid-State-Electronic-12VDC refrigerators. Holds 40 cans pop, \$150. each NEW! W6 VRO, 8900 Manzanita Dr., Alta Loma, CA 91701.

COLLECTORS: Highest offer gets rare 1925 callbook, exc. condx. Samkofsky, 1420 Mount Vernon Drive, Holiday, Fla. 35590.

VILLA FOR SALE: \$59,900.00... or... long term lease \$480.00 per month. This property is on Spanish point, Monserrat, W.I., considered the Emerald Isle, in the Caribbean... consisting of... Spacious 3 Bedrooms, 3 Bathrooms, Dining Room, Large Living Room, Ultra Modern Kitchen, 550 Square Foot Veranda, Swimming Pool, and beautifully landscaped grounds, complete with furniture, appliances and contents. Can be used as a revenue producing property. Contact: Fred Cooper, 115 Torbay Rd., Unit B 7, Markham, Ontario or Phone (416) 495-9140.

FOR SALE: New Heathkit HW-8 transceiver and power supply. Assembled and tested. Best offer. Frank Varano, 37 South Market St., Shamokin, PA 17872.

I would like to get in touch with former members of the Civilian Conservation Corp. (C.C.C.). Joseph Schwartz, K2VGV, 43-34 Unio St., Flushing, NY 11355.

SELL: Realistic DX-160 receiver, \$100, MFJ CPO 555, \$10. Dave, KA2CYN, (914) 638-1176.

WANTED: CV-89/URA-8A, AFSAV-133C demods and C-404A/ARC-3 control boxes. C.T. Huth, 146 Schonhardt St., Tiffin, OH 44883.

CANADA: Selling QST 1952-1978, \$10 per year postpaid. VE3HU, Box 2747, Thunder Bay, Ontario, P7B 5G2.

WANTED: Wiring diagram and manual on Sanborn Model 151-100A recorder. C.J. Reed, Box 2057, Florence, SC 29503.

WANTED: Any National receiver, working or not. Sell: HW-8, power supply, \$130. HR2A with 5 sets of rock, \$160. Also kw Amp for parts 4-400A, 6M, 2M, 220MHz cavity filters, \$35 ea. T.N. Colbert, WA8 MLV, 1800 Rhodes, no. 612, Kent, OH 44240.

SEND SASE for list of 4-7000A amplifier components. L. Basham, 735 Caves Hwy., Cave Junction, OR 97523.

WANTED: Tempo VF/One Externl VFO for HF rig. Write/Phone, KB2DE, (315) 697-2562, after 220Z. 209 James St., Canastota, NY 13032.


CANADIANS: Measurements 82 & Hickok 295X sig-gens w/manuals. VE6RF, Bob Fransen, 227 Cottonwood, Sherwood Park, Alta T8A1Y3.

SELL: Drake Transceiver TR4C, AC-4, power supply, MS-4 speaker and cabinet, mint, \$495. Paillard Bolex H-16, 3 lenses, mint, \$200. You ship UPS. Write DS, Box 48, Ballardvale, MA 01810.

ADVERTISER'S INDEX

To speed information to you on products shown in CQ advertising, a new computerized Reader Service System has been designed. For additional information on a particular ad in this issue, tear out the Reader Service postcard bound in this issue and circle the numbers on the card which correspond with the Reader Service numbers listed on the INDIVIDUAL ADS. DON'T CIRCLE THE PAGE NUMBERS! Fill in your name and address, and mail. We'll have your information on the way in short order.

Alliance Mfg. Co.	55
Atlantic Surplus Sales	110
Avanti Research & Development, Inc.	89
Barker & Williamson	65
Barry Electronics	79
Bencher	88
Bennie's Warehouse Distribution Center	60
Britt's 2-Way Radio Sales & Service	110
Butternut Electronics	108
CeCo Communications Inc.	88
Command Productions	54
The Comm Center	67
Communications Center	59
Continental Specialties	Cov. II
Cornell-Dublier	111
Cushcraft Corp.	37, 39, 54, 69, 75, 77, 101
DGMI Industries	110
DSI Instruments	14
Daytronics	67
DenTron Radio	12, 16, 17
Digitrex	110
R.L. Drake Co.	53
ETO	51
Eagle Electronics	92
Eimac, Div. of Varian	Cov. IV
Electronic Research	45
Flesher Corp.	65
Fox Tango Corp.	73
G.I.S.M.O.	24
Gregory Electronics	71
Group III	110
HAL Communications	11, 15, 18
Hal-tronix	71
Ham Radio Outlet	2
Heath Co.	21
Henry Radio	27
Hustler, Inc.	58
Hy-Gain Electronics, Div. of Telex	23
ICOM	7
IRL Co.	44
International Crystal Mfg. Co.	6
KLM	13
Kantronics	70
Kengore Corp.	64
Kenwood	56, 57
Kirk Electronics, Div. of Viking	25
MFJ Enterprises	1, 30
Madison Electronics	44, 71, 73, 108
Micro-Filter Co.	49
Mor-Gain	28
NRI	29
Palomar Engineers	109
Partridge Electronics Ltd.	51
SST Electronics	38
Space Electronics	110
Swan Electronics	8
Telrex Laboratories	64
Ten-Tec, Inc.	4
TET-U.S.A.	26
Tri-Ex	49
Unarco-Rohn	63
Western Electronics	110
Yaesu Electronics Corp.	112, Cov. III

 target
your signal
with a
Ham IVtm
rotor

*the Engineered
Choice for
Antennas Up
to 15.0
Sq. Ft.*



The New HAM IV — just one of six rotors from CDE to professionally target your signal for better communications... exclusive features like all-steel gear systems and positive power brake make the HAM IV the newest standard by which all other rotors are judged.

ON TARGET KIT

Send for your EMBROIDERED PATCH, WALL CERTIFICATE, TIME ZONE GUIDE. Plus details on the CDE Rotor to match your antenna. Enclose \$1 for handling and mailing costs. Send to:



CDE **CORNELL-DUBILIER**

CORNELL-DUBILIER ELECTRIC CORPORATION
Box 162, Essex Fells, New Jersey 07021

358R

I'm On Target—Send Kit To:

H4

Name _____

Address _____

City _____

State _____ Zip _____

Enclosed \$1. for kit handling & mailing.
or
 Send free details on all CDE rotors.

Please send all reader inquiries directly

ALL NEW

FT-101ZD

HIGH-PERFORMANCE HF TRANSCEIVER

Today's technology, backed by a proud tradition, is yours to enjoy in the all-new FT-101ZD transceiver from YAESU. A host of new features are teamed with the FT-101 heritage to bring you a top-dollar value. See your dealer today for a "hands on" demonstration of the performance-packed FT-101ZD.

Diecast front panel, plus heavy duty case

Built-in, fully adjustable, VOX circuitry

Built-in RF speech processor for more "talk power" when you need it

Built-in, threshold adjustable, noise blanker

Equipped for SSB and CW operation. Choice of wide or narrow bandwidth for CW (with optional CW filter installed)

Continuously variable IF bandwidth: 300 Hz to 2.4 KHz



Digital plus analog frequency readout. Digital display resolution to 100 Hz

Rugged 6146B final amplifier tubes with RF negative feedback

RF and AF gain controls located on concentric shafts for operator convenience

Full band coverage: 160 through 10 meters, plus WWV/JJY (receive only)

TX, RX, or transceive frequency offset from main dial frequency

For WARAC Flexibility

Select switches for use with FV-901DM synthesized scanning VFO (option). FV-901DM provides scanners plus 40 frequency memory bank.

SPECIFICATIONS

TRANSMITTER

PA Input Power:

180 watts DC

Carrier Suppression:

Better than 40 dB

Unwanted Sideband Suppression:

Better than 40 dB @ 1000 Hz, 14 MHz

Spurious Radiation:

Better than 40 dB below rated output

Third Order Distortion Products:

Better than -31 dB

Transmitter Frequency Response:

300-2700 Hz (-6 dB)

Stability:

Less than 300 Hz in first 30 minutes after 10 min. warmup; less than 100 Hz after 30 minutes over any 30 min. period

Negative Feedback: 6 dB @ 14 MHz

Antenna Output Impedance:

50-75 ohms, unbalanced

GENERAL

Frequency Coverage:

Amateur bands from 1.8-29.9 MHz, plus WWV/JJY (receive only)

Operating Modes:

LSB, USB, CW

Power Requirements:

100/110/117/200/220/234 volts AC, 50/60 Hz; 13.5 volts DC (with optional DC-DC converter)

Power Consumption:

AC 117V: 75 VA receive (65 VA HEATER OFF) 285 VA transmit; DC 13.5V: 5.5 amps receive (1.1 amps HEATER OFF), 21 amps transmit

Size:

345 (W) x 157 (H) x 326 (D) mm

Weight:

Approximately 15 kg.

COMPATIBLE WITH FT-901DM ACCESSORIES

RECEIVER

Sensitivity:

0.25 uV for S/N 10 dB

Selectivity:

2.4 KHz at 6 dB down, 4.0 KHz at 60 dB down (1.66 shape factor); Continuously variable between 300 and 2400 Hz (-6 dB); CW (with optional CW filter installed): 600 Hz at 6 dB down, 1.2 KHz at 60 dB down (2:1 shape factor)

Image Rejection:

Better than 60 dB (160-15 meters); Better than 50 dB (10 meters)

IF Rejection:

Better than 70 dB (160, 80, 20-10 m); Better than 60 dB (40 m)

Audio Output Impedance:

4-16 ohms

Audio Output Power:

3 watts @10% THD (into 4 ohms)

CIRCLE 54 ON READER SERVICE CARD



Price And Specifications Subject To Change Without Notice Or Obligation

YAESU
The radio.



379X

YAESU ELECTRONICS CORP., 15954 Downey Ave., Paramount, CA 90723 • (213) 633-4007
YAESU ELECTRONICS Eastern Service Ctr., 9812 Princeton-Glendale Rd., Cincinnati, OH 45246



THE 901DM "SMART RADIO" FAMILY

HERE NOW
left to right

- YD-844A High/Low Impedance Microphone (50K/600 Ohms)
- FC-901 Antenna Tuner
- FV-901DM Synthesized Scanning VFO
- FT-901DM HF All Mode Transceiver
- FTV-901 Multi Band Transverter—2 meter/6 meter/ $\frac{3}{4}$ meter
- SP-901P Speaker Phone Patch

THERE'S MORE TO COME . . .

Price And Specifications Subject To
Change Without Notice Or Obligation



YAESU
The radio.

YAESU ELECTRONICS CORP., 15954 Downey Ave., Paramount, CA 90723 • (213) 633-4007
YAESU ELECTRONICS Eastern Service Ctr., 9812 Princeton-Glendale Rd., Cincinnati, OH 45246

CIRCLE 40 ON READER SERVICE CARD

From transistor to 25kW is one easy step with EIMAC.

EIMAC high-gain tetrode and cavity combination for FM and TV.

The new EIMAC 8990 and companion CV-2200 cavity amplifier are expressly intended for single-tube 25 kW FM and TV service. This tough tetrode exhibits a power gain over 20 dB and has a rated anode dissipation of 20 kW. It's also ideally suited to VHF-TV linear service, thanks to the new low-loss internal structure.

EIMAC's 8989 is a similar tetrode, rated for 10 or 15 kW FM service in the CV 2210 cavity. The 8989 is suitable for VHF-TV service as well.



For complete information:

Get a copy of EIMAC's Quick Reference Catalog and Data Sheets on the 8989 and 8990 from Varian, EIMAC Division, 301 Industrial Way, San Carlos, California 94070. Telephone (415) 592-1221. Or contact any of the more than 30 Varian Electron Device Group Sales Offices throughout the world.

For more information on Varian's CTC Transistors operating in the 88 to 108 MHz range, contact Varian, CTC Division, Telephone (415) 592-9390.

Tomorrow's new generation today.

EIMAC's 8989 and 8990 new-generation tubes augment the 4CX5000A, 4CX10000A, and 4CX15000A in today's new equipments. High power gain, improved electrical stability and low internal inductance combine to provide tomorrow's power tube today.

