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Amateur Radio

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JULY 1987 \$2.50

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CQ

CQ Reviews:

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2 Meter Transceiver . . . p. 24**

**The MFJ-949C Versa
Tuner II . . . p. 44**



THE RADIO AMATEUR'S JOURNAL

KENWOOD

All New
Compact HF!

“DX-citing!”

TS-440S Compact high performance HF transceiver with general coverage receiver

Kenwood's advanced digital know-how brings Amateurs world-wide “big-rig” performance in a compact package. We call it “Digital DX-citement”—that special feeling you get every time you turn the power on!

• **Covers All Amateur bands**

General coverage receiver tunes from 100 kHz—30 MHz. Easily modified for HF MARS operation.

• **Direct keyboard entry of frequency**

• **All modes built-in**
USB, LSB, CW, AM, FM, and AFSK. Mode selection is verified in Morse Code.

• **Built-in automatic antenna tuner (optional)**

Covers 80-10 meters.

• **VS-1 voice synthesizer (optional)**

• **Superior receiver dynamic range**

Kenwood DynaMix™ high sensitivity direct mixing system ensures true 102 dB receiver dynamic range. (500 Hz bandwidth on 20 m)

• **100% duty cycle transmitter**

Super efficient cooling permits continuous key-down for periods exceeding one hour. RF input power is rated at 200 W PEP on SSB, 200 W DC on CW, AFSK, FM, and 110 W DC AM. (The PS-50 power supply is needed for continuous duty.)

• **Adjustable dial torque**

• **100 memory channels**

Frequency and mode may be stored in 10 groups of 10 channels each. Split frequencies may be stored in 10 channels for repeater operation.

• **TU-8 CTCSS unit (optional)**

Subtone is memorized when TU-8 is installed.

• **Superb interference reduction**

IF shift, tuneable notch filter, noise blanker, all-mode squelch, RF attenuator, RIT/XIT, and optional filters fight QRM.

• **MC-43S UP/DOWN mic. included**

• **Computer interface port**

• **5 IF filter functions**

• **Dual SSB IF filtering**

A built-in SSB filter is standard. When an optional SSB filter (YK-88S or YK-88SN) is installed, **dual** filtering is provided.

• **VOX, full or semi break-in CW**

• **AMTOR compatible**



Optional accessories:

- AT-440 internal auto. antenna tuner (80 m—10 m)
- AT-250 external auto. tuner (160 m—10 m)
- AT-130 compact mobile antenna tuner (160 m—10 m)
- IF-232C/IC-10 level translator and modem IC kit
- PS-50 heavy duty power supply
- PS-430/PS-30 DC power supply
- SP-430 external speaker
- MB-430 mobile mounting bracket
- YK-88C/88CN 500 Hz/270 Hz CW filters
- YK-88S/88SN 2.4 kHz/1.8 kHz SSB filters
- MC-60A/80/85 desk microphones
- MC-55 (8P) mobile microphone
- HS-5/6/7 headphones
- SP-40/50B mobile speakers
- MA-5/VP-1 HF 5 band mobile helical antenna and bumper mount
- TL-922A 2 kw PEP linear amplifier
- SM-220 station monitor
- VS-1 voice synthesizer
- SW-100A/200A/2000 SWR/power meters
- TU-8 CTCSS tone unit
- PG-2S extra DC cable.

Kenwood takes you from HF to OSCAR!



Complete service manuals are available for all Kenwood transceivers and most accessories. Specifications and prices are subject to change without notice or obligation.

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2201 E. Dominguez St., Long Beach, CA 90810
P.O. Box 22745, Long Beach, CA 90801-5745

KENWOOD

NEW!
45/35 Watt
Dual Bander

First Again!

TW-4100A

2 m/70 cm FM Dual Bander

A Kenwood original just got better! Kenwood was the first to develop a 2 m/70 cm mobile radio in a single, compact package. Since then, other companies have imitated the concept, but still have not done it the "Kenwood way." The all-new TW-4100A is more compact, more powerful, and packed with more features than ever before! With many new features and accessories, and backed by Kenwood's experience, the all-new Kenwood Dual Bander is light years ahead of the rest!

- **Selectable full duplex cross band ("telephone style") operation.**

Remote base or cross band repeater function possible (a control operator is needed for remote or repeater operation*).

- **45 watts on 2 m. 35 watts on 70 cm.** 5 watts (adjustable) low.

- **Frequency coverage: 142-149 MHz (allows operation on certain MARS and CAP frequencies) and 440-449.995 MHz.**



- **New compact size!** Only 5.9" W x 1.97" H x 7.87" D and weighs less than 4 pounds!

- **Proven high performance Kenwood GaAs FET front end receiver.**

- **Easy to operate!** Only 3 knobs and 8 keys on the front panel.

- **Separate antenna ports for VHF and UHF.** Minimizes loss and increases reliability and performance!

- **10 memory channels.** Lithium battery backs up memory. Store frequency, offset, subtone. Two channels store the transmit and receive frequencies independently **for odd split or cross band operation.**

- **Front panel-selectable CTCSS tone (when optional TU-7 is installed.)**

- **Non-volatile operating system.** Even after memory back up cell dies, all operating features remain intact! No re-programming or "board-swapping" necessary!
- **Programmable band scan and memory scan with memory channel lock-out.**
- **Large, illuminated LCD display and main knob.** For excellent visibility in direct sunlight or darkness.
- **Selectable frequency step for quick and easy QSY.**
- **Voice synthesizer VS-2 option.**

Optional accessories:

- **PS-50/PS-430** DC power supplies
- **MU-1** DCL modem unit
- **TU-7** CTCSS encoder
- **VS-2** Voice synthesizer
- **SW-100B** SWR/Power/Volt meter 140-450 MHz for mobile use
- **SW-200B** SWR/Power meter for base station use 140-450 MHz. 0-200 W in 2 ranges
- **SWT-1/SWT-2** 2 m and 70 cm antenna tuner
- **SP-40** Compact speaker
- **SP-50B** Mobile speaker
- **PG-2N** Extra DC cable
- **PG-3B** DC noise filter
- **MC-60A, MC-80, MC-85** Base station mics.
- **MC-55** (8-pin) Mobile microphone
- **MA-4000** Dual band mobile antenna with duplexer (shown)**
- **MB-11** Extra mobile mount



- **Digital Channel Link (DCL) option.**

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*Please check FCC regulations on repeater operation.

**Mag mount is not Kenwood supplied.

Minor modification necessary for repeater operation.

Specifications and prices subject to change without notice or obligation.

Complete service manuals are available for all Kenwood transceivers and most accessories.

KENWOOD

220 MHz
TH-315A
Coming Soon!

This HT Has it All!

TH-215A/315A/415A

Full-featured Hand-held Transceivers

Kenwood brings you the greatest hand-held transceiver ever! More than just "big rig performance," the new TH-215A for 2 m and TH-415A for 70 cm pack the most features and the best performance in a handy size. And our full line of accessories will let you go from ham-shack to portable to mobile with the greatest of ease!

- **Wide receiver frequency range.** Receives from 141-163 MHz. Includes the weather channels! Transmit from 144-148 MHz. Modifiable to cover 141-151 MHz (MARS or CAP permit required).
- **TH-415A covers 440-449.995 MHz.**
- **5, 2.5, or 1.5 W output, depending on the power source.** Supplied battery pack (PB-2) provides 2.5 W output. Optional NiCd packs for extended operation or higher RF output available.
- **CTCSS encoder built-in.** TSU-4 CTCSS decoder optional.
- **10 memory channels store any offset, in 100-kHz steps.** Each memory channel can store frequency, frequency step, offset, reverse switch position, and CTCSS frequency.
- **Nine types of scanning!** Including new "seek scan" and priority alert.
- **Intelligent 2-way battery saver circuit extends battery life.** Two battery-saver modes to choose, with power save ratio selection.
- **Easy memory recall.** Simply press the channel number!
- **12 VDC input terminal for direct mobile or base station supply operation.** When 12 volts is applied, RF output is 5 W!
- **New Twist-Lok Positive-Connect™ locking battery case.**
- **Frequency entry by keyboard or UP/DWN keys.**
- **Priority alert function.**
- **Monitor switch to defeat squelch.** Used to check the frequency when CTCSS encode/decode is used or when squelch is on.



- **Large, easy-to-read multi-function LCD display with night light.**
- **Audible beeper to confirm keypad operation.** The beeper has a unique tone for each key. DTMF monitor also included.
- **Supplied accessories:** Belt hook, rubber flex antenna, PB-2 standard NiCd battery pack (for 2.5 W operation), wall charger, dust caps.



Optional Accessories:

- PB-1: 12 V, 800 mAH NiCd pack for 5 W output
- PB-2: 8.4 V, 500 mAH NiCd pack (2.5 W output)
- PB-3: 7.2 V, 800 mAH NiCd pack (1.5 W output)
- PB-4: 7.2 V, 1600 mAH NiCd pack (1.5 W output)
- BT-5 AA cell manganese/alkaline battery case
- BC-7 rapid charger for PB-1, 2, 3, or 4
- BC-8 Compact battery charger
- SMC-30 speaker microphone
- SC-12, 13 soft cases
- RA-3, 5 telescoping antennas
- RA-8B StubbyDuk antenna
- TSU-4 CTCSS decode unit
- VB-2530: 2m, 25 W amplifier
- LH-4, 5 leather cases
- MB-4 mobile bracket
- BH-5 swivel mount
- PG-2V DC cable
- PG-3C cigarette lighter cord with filter



TH-215A shown

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MASTHEAD

EDITORIAL STAFF

Alan M. Dorhoffer, K2EEK
Editor
 Gail M. Schieber
Associate Editor
 Lew McCoy, W1ICP
Technical Representative

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Antennas & Accessories
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QRPP Editor
 Bernie Welch, W8IMZ
Contest Advisor
 Bill Welsh, W6DDB
Novice Editor
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CQ DX Awards Manager

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Phototypographers
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Illustrator
 Larry Mulvehill, WB2ZPI
Contributing Photographer

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The Radio Amateur's Journal



ON THE COVER: Here's Ron Moorefield, W8ILC, of Huber Heights, Ohio at the helm of his very impressive station. Ron also is one of the people who help make the Dayton Hamfest bigger and better each year. Photo by Larry Mulvehill, WB2ZPI.

JULY 1987

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Zero Bias

AN EDITORIAL

This month I think we'll open up the "Just Suppose'n" Department and toy with an idea that cropped up at the Dayton Hamfest. I'm not sure if the idea is brand-new or not, but it is curiously a captivating idea to muse about. Primarily it is in response to those people who still seek and are willing to labor for a no-code form of amateur license. By now I think most of us are sick of hearing about the subject, and I guess that's safe to say whichever side of the argument you're on, pro or con. The idea therefore has nothing to do with either fostering a code-free license or stomping on some damn fool idea of progress. CW forever.

First you have to start off with the presumption that there are various forms of amateur licenses with various questions and differing code speed requirements. The first part is easy, as they already exist, so we don't have to spend time developing tests, setting criteria, or making any change whatsoever to the current curriculum required for an amateur radio license. And, that most certainly includes all present code requirements. That part at least should satisfy each and every conservative traditionalist among us.

You will notice that for this hypothesis we are indeed coming out and saying that CW should be left a requirement and why not test for it as well. The second shoe falls, for those of you who are waiting, on the concept of CW. Sure, we've already said that CW is important and an applicant should be tested on it just as always. But consider the fact that at present you can pass the code test and the written test for an amateur license while at the same time failing the entire element on rules and regulations. Therefore, theoretically at least, it is possible to "earn" an amateur radio license while knowing absolutely nothing about amateur radio rules and regulations. You can play the same mind game about any other element of the exam, and you can see not how *much* you have to know, but in actuality how little besides CW you have to know. By extension, therefore, CW is currently more important than, say, rules and regulations.

If we've already agreed that CW is important and we should know it, then we can't suddenly get rid of it. I also think it's safe to say that we should really have a working knowledge of current rules and regulations, too. Which is more important? Well, consider the premise that if they're all important, they all should also be equal.

The CQ "Just Suppose'n" Department therefore cogitated, as they say, an amateur radio exam composed of the same exact questions and the same exact code requirements as before, with one bit of difference, however. Since everything seemed equally important, each of the questions, including the CW questions, were weighted the same. Nothing was added or taken away except the notion of two elements. At that exact moment a vocal representative of the CQ "Hackle Raising" Depart-



ment came in hackles bristling, ranting about all the changes this would require. We tried to see some of the possible objections. As far as we could see, this wouldn't really require any great change in FCC regulation. Primarily it would fall upon the VECs to adopt and adapt a few mechanical changes. Remember, nothing presently required or in the syllabus would be changed or dropped. All that would be changed is how the material is being looked at and weighed. "What about the fact that it seems to be watering down CW?" he asked, for which we countered that it was raising the importance of CW to the level of rules and regulations. That's the point, in a nutshell. It's all important, and most of all it's *equally* important.

It's an interesting idea if you think about it, and an idea that could work. The amount of legislation required would be just about nil, and the initial burden would be on the VECs in just changing the scoring system. What do you think about it? Is CW more important than the written exam, or is CW just another part of what we're supposed to know? Can you see the logic in awarding 2 points, for example, for a correct answer to a written exam question and 2 points for a correct answer to a CW comprehension question? Let me know what you think about it.

Travels With CQ

The big one in Dayton is history now, and if you missed another one, shame on you. As usual, Mother Nature gave us a slight bit of weather with which to contend. Friday it rained most of the day, and it seemed as though all of downtown Dayton—plus parts of Akron, Columbus, and a smidgen of greater Cincinnati—packed into the arena. It was wall-to-wall people in rainsoaked clothes. Saturday the sun shone brightly on a new day. However, the early morning temperature was so cold that only a

few hearty and foolish souls ventured out to the mind-boggling fleamarket. Of course I was one of those trudging about at the crack of dawn. Yes, as usual there were great bargains to be had by the fleet of foot and sharp-eyed shopper. The exhibit areas seemed packed all weekend, and typically every major product in amateur radio was on display. It was all there—all the good stuff you've always dreamed about, always wanted, and had to have. It literally just about called out to "take me home," and looking at the baggage area late Sunday afternoon at the Dayton Airport it seemed that a lot of people heard the call and were taking home all sorts of stuff. Even the overhead baggage compartment on our plane was jammed with enough merchandise to open up a dealership. You could tell by the smiles of ownership who aboard were amateurs (most of us), and you could hear the stories of who got what and for how much. It's good to know that we're finally mature enough to admit that we do get turned on by all of these wonderful toys and gadgets. For the very few of you who insist on being serious at one of these things and only think in terms of a qualitative communications advantage in the event of dire emergency, shame on you, too. It was fun, and you really had to go out of your way to remain serious and level-headed among all the goodies. That good and exhilarating feeling, in case you didn't know, is called fun, and that's the object of this whole thing.

In about two weeks Arnie and I will be heading up to Rochester, New York for their annual hamfest. For the last few years that's been a two-day affair, but unfortunately we can only make one day of it, Saturday. That Sunday is one of the big ones here on Long Island, the LIMARC fleamarket, and the turnout for that one rivals a few of the regular hamfests we attend. It's a double-header weekend of amateur radio. We've got a full season of hamfests still ahead of us, and we hope to see many of you in person as we tour the country. It really is okay to leave the shack alone for a day or two and get out among other amateurs and would-be amateurs. The shack needs a rest anyway, and the local electric company can shut down at last for some needed overhauling.

It's Not That Long Ago

If you really want some interesting reading and fascinating viewing, then pick up a copy of a new old book brought out by Vestal Press. It's a first-class reprint of *Radio-Craft* magazine for March 1938. This particular issue is the Jubilee Souvenir Number celebrating at that time 50 years of radio. There are articles and reminiscences by old timers of that day who are only historical figures of today. The ads alone are worth the price of \$14.95. If you want more information on the book and how to order one, write to Vestal Press at 320 N. Jensen Road, P.O. Box 97, Vestal, NY 13850.

73, Alan, K2EEK

NEW!

More Than TNC-2 Compatible



The PK-87 is not just another copy of the popular TNC-2, it's much more. With all the packet program features of the Multi-mode PK-232, the PK-87 is an economical new TNC designed to bring you enhanced, completely compatible packet software plus new hardware features for improved packet operation.

Software Enhancements

- * AEA's exclusive "MBX" Mailbox Monitor command lets you read and save received data without confusing headers, callsigns, or repeats.
- * New commands let you restrict the use of your station for connects and digipeater functions.
- * Host mode for improved terminal program operation and development of specialized programs and applications.
- * Compatible with existing WØRLI/WA7MBL PBBS/Mailbox/Gateway programs, with complete software command for remote selection of link rate, modem tone, etc.
- * Autobaud routines for terminal data rates from 300 to 9600 baud (programmable down to 45 baud), and software control to set on-air data rates from 45 to 9600 baud.

While the PK-87 can be used for HF operation, AEA recommends the PM-1 packet modem as a high performance front end for best results in HF packet service. Only the new AEA PK-87 has all these features. Contact your local AEA dealer and join the packet revolution today by ordering the new PK-87.

PK-87™ Packet Controller

Amateur Net Price
\$179.95

Hardware Enhancements

- * Eight front panel status indicators show Converse, Transparent, and Command modes; Multiple Connects, Data Carrier Detect, Push to Talk, Status, and Connect.
- * High sensitivity (5 millivolts RMS), and dynamic range from 5 to 770 millivolts RMS.
- * Rear panel AFSK output level adjustment from 5 to 100 millivolts RMS.
- * One minute hardware watchdog timer provides system security in unattended VHF/UHF PBBS/Mailbox and digipeater operation
- * Modem disconnect circuits guarantee compatibility with future high speed modem applications and developments.
- * Zilog 8530 SCC provides dependable hardware HDLC for higher speeds, and AMD 7910 for reliable modem performance without calibration.

Prices and specifications subject to change without notice or obligation



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	Height Extended	Height Retracted	Antenna Square Foot Windload Limit
HG-37SS	37 ft.	20.5 ft.	9.5 @ 50 mph
HG-52SS	52 ft.	21 ft.	9.5 @ 50 mph
HG-54HD	54 ft.	21.5 ft.	16 @ 60 mph
HG-70HD	70 ft.	21.5 ft.	16 @ 60 mph

Towers come complete with hinged base, installation steelwork, predrilled rotator plate and a manual winch.

Hy-Gain crank-up towers require no guying and conform to EIA, to the Uniform Building Code, and are approved by Los Angeles (license 1095). UBC documents for building permits are available on request (specify tower model) before you buy the tower.

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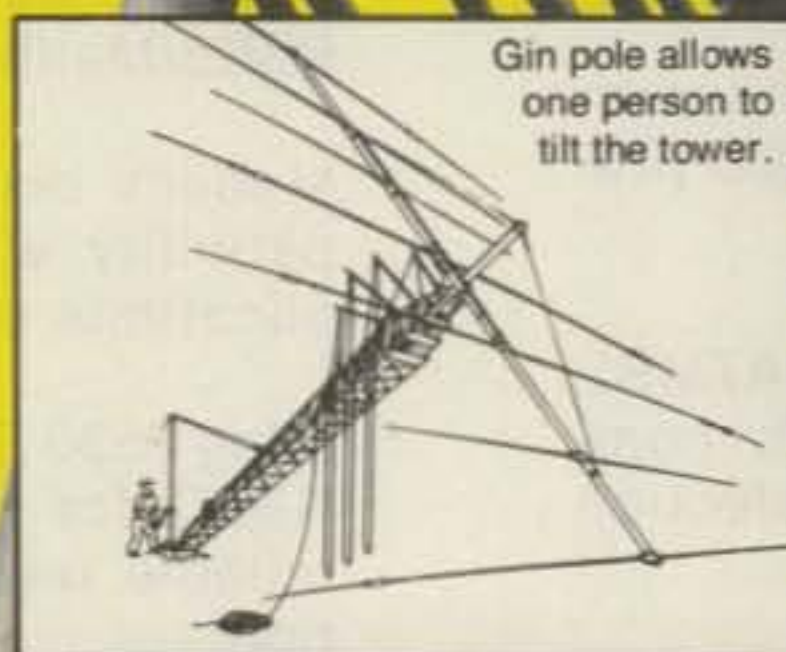
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Announcing:

• **NAS Open House**—The Naval Air Station (NAS) Moffett Field in cooperation with the NASA Ames Research Center ARC and the Navy Moffett Field ARC will be operating a Special Events station during the annual NAS Moffett Field Open House. The dates are July 3-5, and K6MF will be on the air from 16:00 UTC to 1:00 UTC all three days on 14.280 and 21.380 MHz, voice (A3) only. In addition to viewing the aircraft and operations of the NAS, the Navy Blue Angels will perform and it is expected that the Voyager will be in attendance. Special QSL cards will be mailed to those contacts that send an SASE to: AARC, P.O. Box 146; Moffett Field, CA 94035. For information contact David H. Bocker, WB6YGN, AARC President, 233 Barbara Dr., Los Gatos, CA 95030 (408-377-9345; 415-694-5536 days).

• **Thompson, Ohio**—KD8FJ will operate July 4 starting at 1400Z from Heritage Hill Camp. Operation will be in the lower edge of the 40 and 80 meter General phone band and if propagation warrants, in the Novice 10 meter band, 28.450. For a 8" x 10" certificate send QSL and SASE to George Bair, KD8FJ, 386 Cedarbrook Drive, Paibesville, OH 44077.

• **Chatham, Ontario, Canada**—The Chatham Kent ARC will operate VE3CRC from 1200-2200Z July 4th to celebrate Chatham's Festival of Nations. Phone and CW on 80-10 meters, packet and phone on 2 meters. Certificates for a QSL card to Cliff Russell, VE3NGG, R.R. #1, Chatham, Ontario, N7M 5J1.

• **Tom Sawyer Days Special Event**—The Hannibal, Missouri ARC will sponsor the National Tom Sawyer Days Special Events station on July 4-5. Frequencies will be 7.240, 14.255, 21.340 SSB. Also 28.400 SSB for Novice and Tech. Please QSL SASE with 44¢ 8½" x 11" envelope to P.O. Box 1522, Hannibal, MO 63401.

• **KT5I From Hobbs, New Mexico**—The State Line ARC will operate Special Events station KT5I July 5-12 to celebrate the 1987 National Soaring Championships (open class). Operation will be on all bands 10-80 meters. For large certificate send QSL and contact number to State Line ARC, KT5I, P.O. Box 1423, Hobbs, NM 88240.

• **Holmdel, New Jersey**—The Holmdel ARC will operate K2DR from 1500Z-2200Z July 11 and from 1500Z-2000Z July 12 to commemorate the 25th anniversary of the launching of the TELSTAR communications satellite. Operation will be in the lower 25 kHz of the General 20, 40, and 80 meter phone bands; in the lower 25 kHz of the Novice 10 meter phone band (check at 15 minutes after the hour); and on 146.55 and/or 145.64 MHz 2 meter FM. For certificate, send QSL and SASE to Holmdel ARC, P.O. Box 205, Holmdel, NJ 07733.

• **Oklahoma Field Day Event**—Oklahoma amateur radio ops will conduct their fourth annual "Field Day" exercises July 11-12 at Lake Canton, Oklahoma. Activities begin at 2 p.m. Saturday and continue until noon Sunday. Events take place in the "Big Bend" picnic shelter. The Lake Canton Field Day is held in conjunction with the annual IARU "Radiosport" DX Contest. Simulated emergency operations, QRP contacts, solar power, fellowship, and camping are among the attractions. The Lake Canton Field Committee will provide a certificate for contacts with event stations WD5HPU, WA5LTM, and other amateur stations which officially operate from Lake Canton during the event. Those who want the certificates should listen in the general phone portions of the 40-10 meter bands. Operations will also be conducted on 6 and 2 meter SSB. For a certificate, send QSL and large SASE to Lake Canton Field Day, P.O. Box 19097, Oklahoma City, OK 73144 (405-521-5048, WA5LTM, for more information).

• **W8DF Special Event Station**—The Southern Michigan ARS will operate W8DF from July 17 for the Battle Creek International Hot Air Balloon Championship on SSB 3890, 7240, 14250, and CW 7040 and 14040. For a 9" x 12" certificate, send a large SASE to S.M.A.R.S., P.O. Box 934, Battle Creek, MI 49016.

(continued on p. 56)

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Here's an exciting challenge for the amateur community. It involves state-of-the-art communications and public safety in an effort to learn about hurricanes and most importantly to provide an early warning of their paths.

HHAPP: The Hurricane Hunter Aircraft Packet Project

BY JOEL I. KANDEL*, KI4T

The National Oceanic and Atmospheric Administration (NOAA) recently gave the green light to a project proposal submitted by KI4T. The project encourages hurricane weather data collection by the amateur radio community, and transmission via packet radio for analysis to the National Hurricane Center. Nicknamed HHAPP (Hurricane Hunter Aircraft Packet Project), an airborne packet radio digipeater is to be installed on one of the Hurricane Hunter Aircraft to facilitate relaying weather data back to Miami via local Packet Radio Bulletin Board Stations (PBBSs).¹

HHAPP is being coordinated by members of the Dade Radio Club, with the cooperation of a number of meteorologists, engineers, and technicians at NOAA's Office of Aircraft Operations (OAO) in Miami and the National Hurricane Center (NHC) in Coral Gables, Florida.²

Why The Experiment?

There are three important aspects to the project: humanitarian aid to a population threatened by an approaching hurricane, furthering the science of meteorology by contributing raw data in a manner and quantity not previously available, and the testing and refinement of an amateur packet radio network in an emergency communications environment.

Metro-Dade County ARES has operated an amateur radio station at the National Hurricane Center for approximately eight years. During that time we have learned how valuable the marriage of amateur radio and hurricane tracking can be.

The National Weather Service (NWS) does not always have continuous reliable data input to it from an area affected by a hurricane. Downed phone lines, microwave links, and personnel evacuation hinder the collection and transmission of needed weather information. When evacuation of hundreds of thousands of civilians hinges on knowing where the hurricane is headed, it is a serious matter not to have all the available data. When Hurricane Elena threatened Pinellas County, Florida in 1985, an estimated 400,000 people were evac-



A NOAA Orion WP-30 aircraft, a hurricane hunter. (Photo courtesy of NOAA)



Here's a view of the dropsonde telemetry console with N4MEI, OAO Chief Systems Engineering Division, at the controls. (Photo courtesy of NOAA)

*5463 S.W. 92nd Ave., Miami, FL 33165



The dropsondes and the launching tube aboard the aircraft. (Photo courtesy of NOAA)

uated, the largest civilian evacuation in our country's history. And Elena was a medium-size hurricane.

When Hurricane Kate harassed the Gulf Coast in 1985, NHC lost its radar picture being sent from the Florida Panhandle. NHC originally thought it was due to downed phone lines, but they later found out (through amateur radio) that the Panhandle weather station had been forced to evacuate in the face of the approaching storm.

The Caribbean is even more vulnerable to loss of weather measuring capability. Airport control towers, often the site of the local meteorological station, are extremely vulnerable

to high winds. Backup information via amateur radio has in many instances been the only available weather information into NHC from the Caribbean.

Furthering the Science

Meteorologists at NHC would be the first to admit that forecasting "where" a hurricane will go is still less than an exact science. With all the technological advances in recent years—GOES Weather Satellites, hurricane hunter aircraft, radiosonde bouys—we have vastly improved our knowledge of where a hurricane is at any given time, but have only slightly im-

proved our knowledge of where it will go, and what total factors contribute to the direction and steering currents governing its path.

Eyes of hurricanes differ greatly in their makeup. Some are well formed, while others are more amorphous. Why this happens is still a mystery.

Noted meteorologist Dr. T. Theodore Fujita of the University of Chicago discovered that some storms and possibly hurricanes contain areas of extremely strong downbursts of wind which he calls microbursts and macrobursts, depending on their size. Reaching speeds of 168 mph, they are suspected of being responsible for windshears which have caused sudden airplane crashes.³

Fujita detected the presence of these from post-storm damage analysis to trees and buildings. Unlike tornado damage which leaves debris in a circular fallout pattern, macrobursts leave debris in a fan-shaped pattern all pointing in the same direction. Actual damage to known construction materials sometimes exceeded what the measured forces during the hurricane could have inflicted.

Downbursts cover a relatively small area and are of very brief duration, typically less than a minute. The only way to know they are present is by having multiple weather measuring sites within the storm or hurricane. The National Weather Service has never had the luxury of that degree of fine-scale coverage. Amateur radio operators now have an opportunity to supply it.

Packet Radio Networking

The amateur radio community is standing on the brink of the most exciting communications technology to come along in years. Pack-

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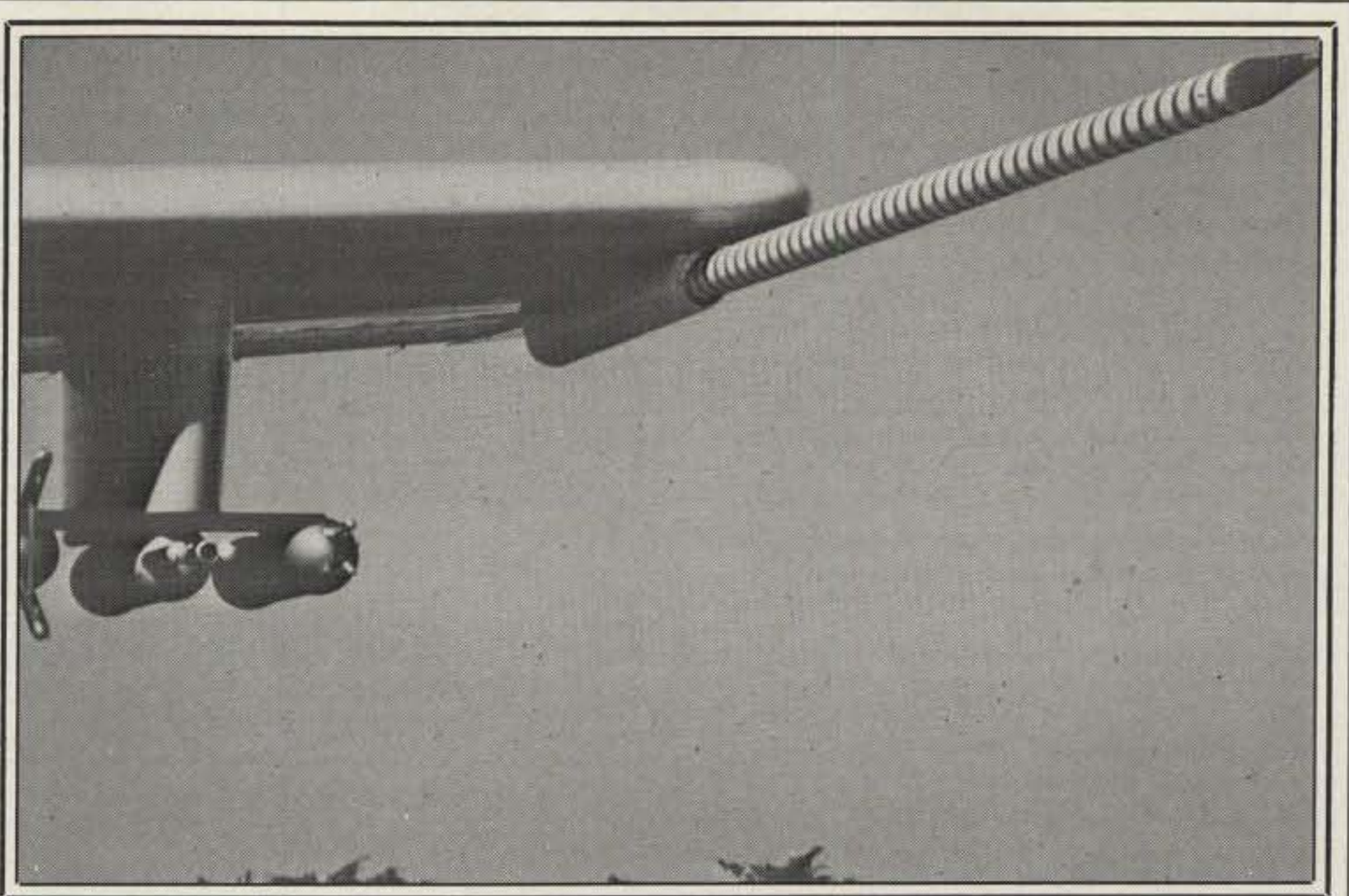
et radio linking promises a quantum leap ahead in the realm of emergency traffic handling in both accuracy and volume. What configuration these networks will ultimately take can only be arrived at through experimentation, trial and error.

We are beginning to recognize that there are some real differences between theory and practice. Patty Winter, N6BIS, discussed some of the experiences amateurs have had using packet radio in earthquake exercises in California.⁴ Packet length, connectivity format, digipeat paths, message format, and a host of other variables are being explored to provide maximum "thruput," or amount of information actually received in a given time period.

The Hurricane Hunter Aircraft Packet Project offers a real opportunity to continue to explore the variables. How will a moving digipeater (the hurricane hunter aircraft) perform? Will the severe weather affect its access range? How will the information most effectively be relayed back to NHC? How can we do it in the shortest period of time yet maintain a high thruput level? Can an amateur weather station supply effective data and accurately transmit those data via packet radio? Will we eventually be able to tie in the new JO-12 (formerly JAS-1) Satellite's packet store-and-forward capability to these operations? The answers to these questions and others will most certainly have a bearing on the configuration of future packet emergency networks.

The Hurricane Hunter Aircraft (HHA)

Space does not permit a full description of the highly specialized WP-3D Orion aircraft



Looking at the Orion's wingtip you can see some of the telemetry sensors. The long probe at the end is a wind-gust sensor. (Photo courtesy of NOAA)

and its sophisticated meteorological laboratory. Nine crew members and six or seven scientists accompany each flight into a hurricane, amassing enough data on each flight to analyze the remainder of the year.

The Orion aircraft spends on the average of ten hours on a mission. Given an average flying time of ten hours, with one hour to the hurri-

cane and another back, the eight hours in between is spent collecting large amounts of data as the four-engine turbo prop aircraft flies back and forth through the eye.

Whenever the storm is over open water, the aircraft releases "dropsondes," which parachute into the ocean and transmit data back to the aircraft. At \$600 each, these are expensive



AND THE BRAWN.

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expendables, but currently the only way to profile the atmosphere from flight level to the surface.

Some of the data are telemetered from the HHA to the GOES (Geological Orbiting Earth) Satellite, and others are radioed back by voice on HF direct or through NASA's ATS-3 (Application Technology) Satellite. All of the collected information is stored in on-board computers for later analysis.

While an aircraft can collect vast amounts of data in the air, what is happening on the ground can only be approximated. There is no substitute for masses of valid, accurate information from the ground within the storm. More about validity and accuracy later.

Operation

HHA will not only act initially as a digipeater and logging unit of stations heard, but its beacon range will help define the affected area for data gathering. Depending upon its "hunting" altitude, it will have a VHF radio horizon of 55-150 miles. The antenna height of your station will also determine range to the aircraft. The area of coverage closely approximates the area of significant weather data, so if a participating weather collection station can pick up the packet beacon from the aircraft, it is notification that the station's data are needed.

The airplane containing the digipeater will usually be flying through the storm at 20,000 feet, though it may sometimes drop to as low as 1500 feet. Attempts should be made to use HHA to digipeat into the closest PBBS. Part of our experiment is to test its viability.

In any case, assume that if the eye of a hurricane is anywhere within 200 miles, your weather data is useful.

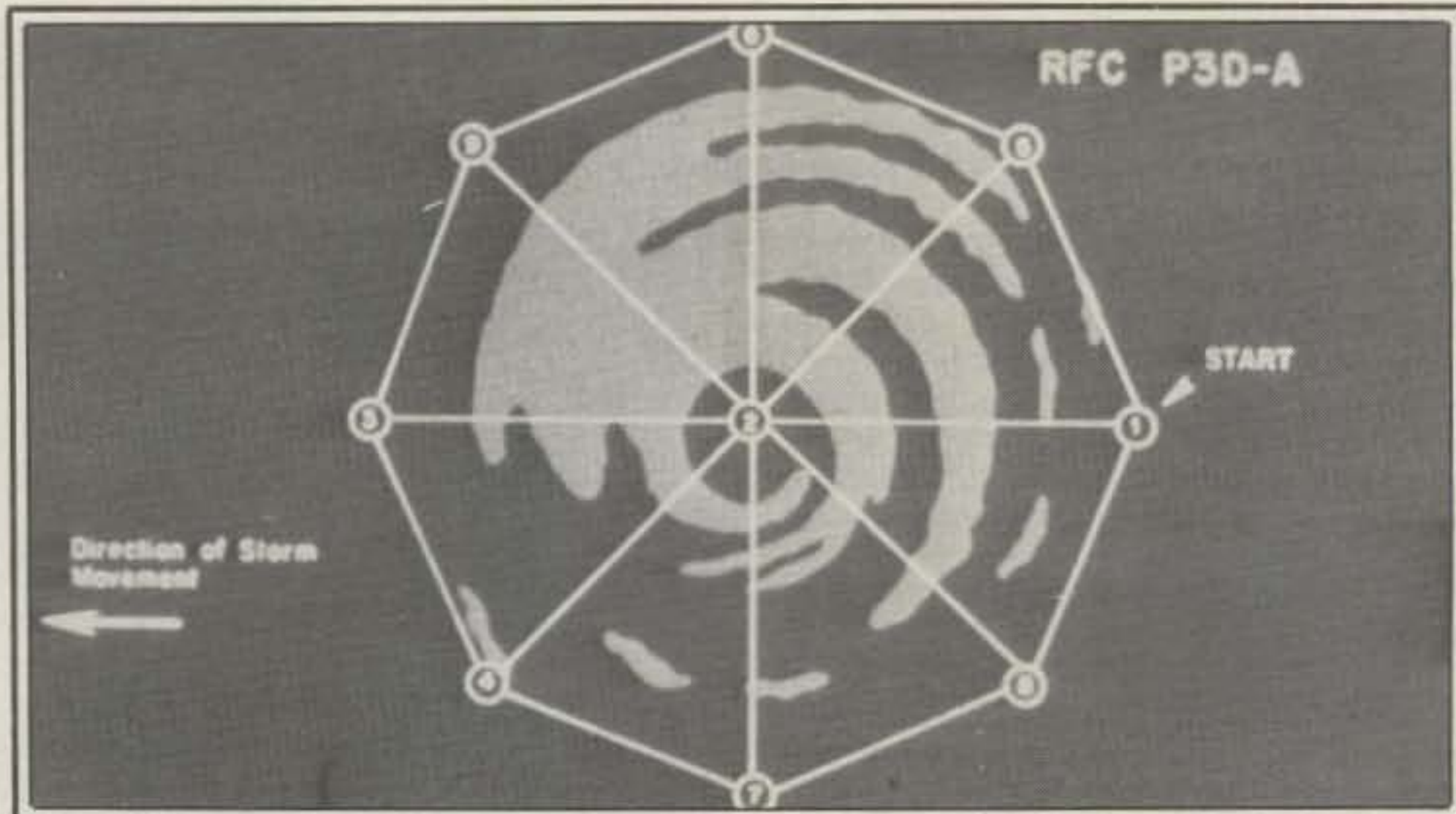
Packet on the Aircraft

The HHA amateur packet station is straightforward. It consists of a terminal node controller (TNC) of CMOS construction to lessen power requirements. It has been especially "hardened" by the manufacturer to withstand the vibrations of a turbo prop airplane hitting a wall of water packed with 180 mph winds. Most chips are soldered in, and major components are cushioned with silicone sealant. Plugs have either been eliminated by direct wiring, or connectors secured with wire fasteners.

Presently the TNC is in a standard software (AX.25L2V2) configuration, with 16 kilobytes of RAM data storage. In a future phase of the project special software may be used for data storage and forwarding by interrogation from the ground. But first we must study the benefits and shortcomings of mobile digipeating.

The 2 meter radio is presently set to digipeat on 145.01 MHz, the packet frequency used mostly as the PBBS and digipeater channel. It transmits at 10 watts powered by a 28/12 VDC aircraft power supply, which also powers the TNC. A NiCd 12 volt power pack will keep alive the 16K TNC RAM memory when the aircraft powers down its scientific instrumentation during takeoffs and landings. The NiCd power pack is trickle charged by the 28V/12V supply during flight time.

The 1/4-wave tail-mounted antenna is a special aircraft airfoil design, grounded and shunted to the radio to provide a measure of isolation from lightning and static charge buildup on the surface of the aircraft. It is not unknown for ball-lightning to float down the side of the



This is a graphic representation of a typical flight pattern through a hurricane involving eight hours of flying time. (Photo courtesy of NOAA)

plane in a hurricane, making it necessary to protect equipment as best as possible.

Since the aircraft hunting altitude is not sufficiently high to "single hop" digipeat a weather report directly to Miami from, say, the Texas Gulf Coast, the data will be digipeated to a local PBBS, which will in turn relay the information to K0KBY/K4TKU PBBS in Miami via 20 meters.⁵

In the Caribbean the aircraft digipeater will allow input from the islands which are normally out of VHF range of U.S. mainland. An excellent example is the link it can provide weather station and packet-equipped ZF1GC in Grand Cayman to the KA1ZT PBBS near Key West, Florida. Since hurricanes often cross through the Florida Straits or south of Cuba, the aircraft will provide a strategic 150-200 mile midpoint digipeat hop when at the 20,000 altitude.

W4EHW ("Emergency Hurricane Watch") at the National Hurricane Center will check the K4TKU PBBS every half hour on 2 meters to retrieve the information. Remember that part of the experiment is to exercise the existing packet network structure and test it.

The aircraft digipeater KI4T-1 will use the "alias" HHA for digipeat access, so in order to send a weather data message to PBBS W5XO in Texas, the data sender keys in:

C W5XO V HHA.

Once connected to W5XO, the message should be addressed as follows:

SP W4EHW @ K4TKU

SP (Private message) is being used rather than S (general message) not because we are interested in hiding the information, but to avoid time wasted in getting the message back to Miami. Current PBBS software protects SP messages from being read by other than the addressee. If PBBS in the affected weather area is connected to by a local station reading the input weather messages when it is called by a forwarding PBBS on 20 meters to pick up the messages, it will miss its connection and the message transfer will most likely be delayed an hour until the next regularly scheduled callup between those two PBBSs. A window should be left at the time the PBBS usually forwards its messages to avoid such delays.

If you want to record the weather data being sent to the PBBS by other stations, set your TNC monitor commands **M** and **MA** to "ON" and you'll see it all going by. Disciplined access by LAN (Local Area Network) members to the PBBS in the affected area will be of paramount importance. This cannot be stressed enough.

Most PBBSs are not set up to receive input from non-PBBSs on 20 meters, and will disconnect you if you try to access them directly on 20. Therefore, work through HHA if it is in range, or input the weather information directly into the 2 meter PBBS if you are in range.

HHA Beacon Text

When HHA is up, it will beacon every 9.5 minutes with the following text:

**KI4T > CQ [DATE TIME]:
HHA FLYING DIGI WX DATA FORMAT:
LATLONG/DYTIMZ/DIRASPMSP/BAROa >**

The Data Code

The Beacon Text contains a mnemonic for remembering the correct weather data format. The weather data code is a modified synoptic code used by the National Weather Service AFOS (Automation of Field Operations and Services) computer system. This particular version was devised with suggestions from NHC meteorologists and telecommunications specialists with the goal of (a) providing the necessary important weather information, (b) coding it so they were familiar with the format, (c) keeping it short to maximize packet throughput especially on 20 meters, and (d) reasonably logical so that it would not be too confusing to the amateur user.

LATLONG represents a 7-digit number indicating the latitude and longitude of the place the weather data were measured. It is written in tenths of a degree. For example, 2520806 is read as Latitude 25.2 degrees, Longitude 080.6 degrees. Decimal points are not sent, and we assume for the present that all readings will occur in the north latitude and west longitude.

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Other accessories include the HS-10 boom headset, HS-10SB PTT switchbox, HS-10SA VOX unit (for IC-02AT), and an assortment of battery pack chargers.

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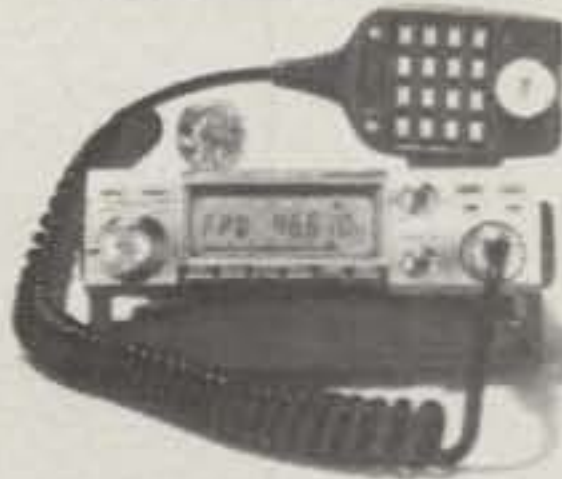
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equipment distributor to look it up for you. All use coordinates on a day-to-day basis and have Geodetic Survey maps.

DYTIMZ represents calendrical day (01-31) plus the time in UTC. 052030 represents the fifth day of the month, 2030 hours UTC. No need to send the month. Everyone will know what that is.

DIRASPMSP all pertains to wind. **DIR** is wind direction in compass degrees, 001-360. **ASP** is the **Average SP**eed as you read off the fluctuating wind speed indicator. **MSP** is the **Maximum SP**eed, or what is popularly referred to as "gusting." This is the reading that will catch severe microbursts or macrobursts previously mentioned.

Finally, **BAR0a** indicates **BARO**metric pressure in inches to two decimal places, and a single letter (**R, F, S**) designator for **R**ising, **F**alling, or **S**teady pressure. 2732F indicates pressure at 27.32 inches and Falling from the previous reading. The ">" indicates the end of the data string.

If for some reason parts of the data are missing, the missing information should be replaced with M's. The string size or position of the data within the string should never be altered.

As a complete example, the string 2520805/041930/270080MMM/2750S > is read as follows: Weather data collection location 25.2 degrees latitude, 080.5 degrees longitude; the readings taken on the fourth day of the month at 1930 hours UTC; the wind direction is 270 degrees (or out of the west) and averaging 80 miles per hour. Gusting speed is not known; barometric pressure is 27.50 inches of mercury and the same since the last reading.

Free Text

Additional description is not encouraged, unless important information or unusual damage has been witnessed. Tidal information, rainfall, and the presence of fog are important, but only if first-hand data. Limit the free text to no more than 49 characters, making the total string including the synoptic code no more than 80 characters long, including spaces. This is to maximize thruput on what promises to be static-ridden PBBS HF relay frequencies.

One could add the following type of abbreviated description: "Fog;tide 10' abv norm;20K evac;flooding 6' >". To ensure the optimum packet size, set your TNC "PACELN" parameter to 80 and do not exceed one packet.

Data Transmission Intervals

It is recommended that a weather station transmit no more often than every half hour. There is a tendency to automatically pick half hour on the hour intervals, but it is highly suggested that you choose random half-hour intervals, such as 12 past the hour and 18 minutes to the hour, thereby staggering access to the PBBS.

Instrumentation

Any reservations the National Hurricane Center may have had about the project stems from previous experience with inaccurate weather data radioed in from amateur observers. When an amateur observer sticks his head out the window and guesses wind speed, he causes a number of instant migraine headaches at NHC. Don't forget, the forecasters are taking these data very seriously in order to plot the course of the hurricane, and a sudden discrepancy or deviation from an otherwise consistent pattern can be serious cause for alarm. Therefore, accurate information is of paramount importance to the success of the project.

There are many types and manufacturers of weather instruments, some mechanical, some electronic. The type you use isn't as important as its calibration. Comparison with a known standard over a period of time—either at a local NWS bureau, an airport, or a military installation—will serve to calibrate your instruments.

Ideally it is best to leave them for a day or two at the standard site, though you might have difficulty setting up wind measuring sensors on a temporary basis. Certainly your barometer can be left for calibration. Accurate barometric pressure is the single most important piece of data you can supply.

Automated Telemetry

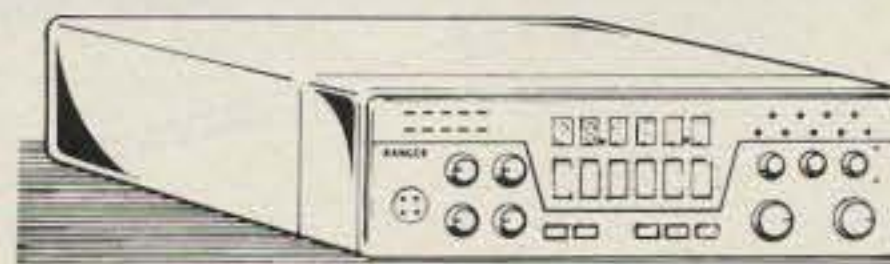
A number of companies currently manufacture meteorological units that are RS-232 com-



A satellite view of hurricane Allen. (Photo courtesy of NOAA)

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Selectivity: -6dB -60dB
SSB, CW 4.2 KHz 8.6 KHz
AM, FM 6.0 KHz 18 KHz

TRANSMITTER

Frequency Range: 28.0000-29.9999 MHz
Tuning Steps:

100 Hz, 1 KHz, 10 KHz, 100 KHz, 1 MHz

Emission Types:

LSB, USB, CW, AM, FM

Power Output: 30 watt Model

SSB—25 watts, AM FM—8 watts,
CW—30 watts

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CW—125 watts

Input 12.5 VDC 20A Max

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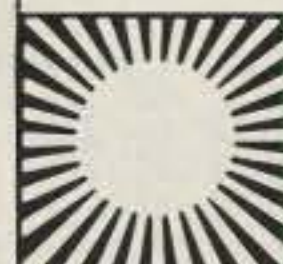
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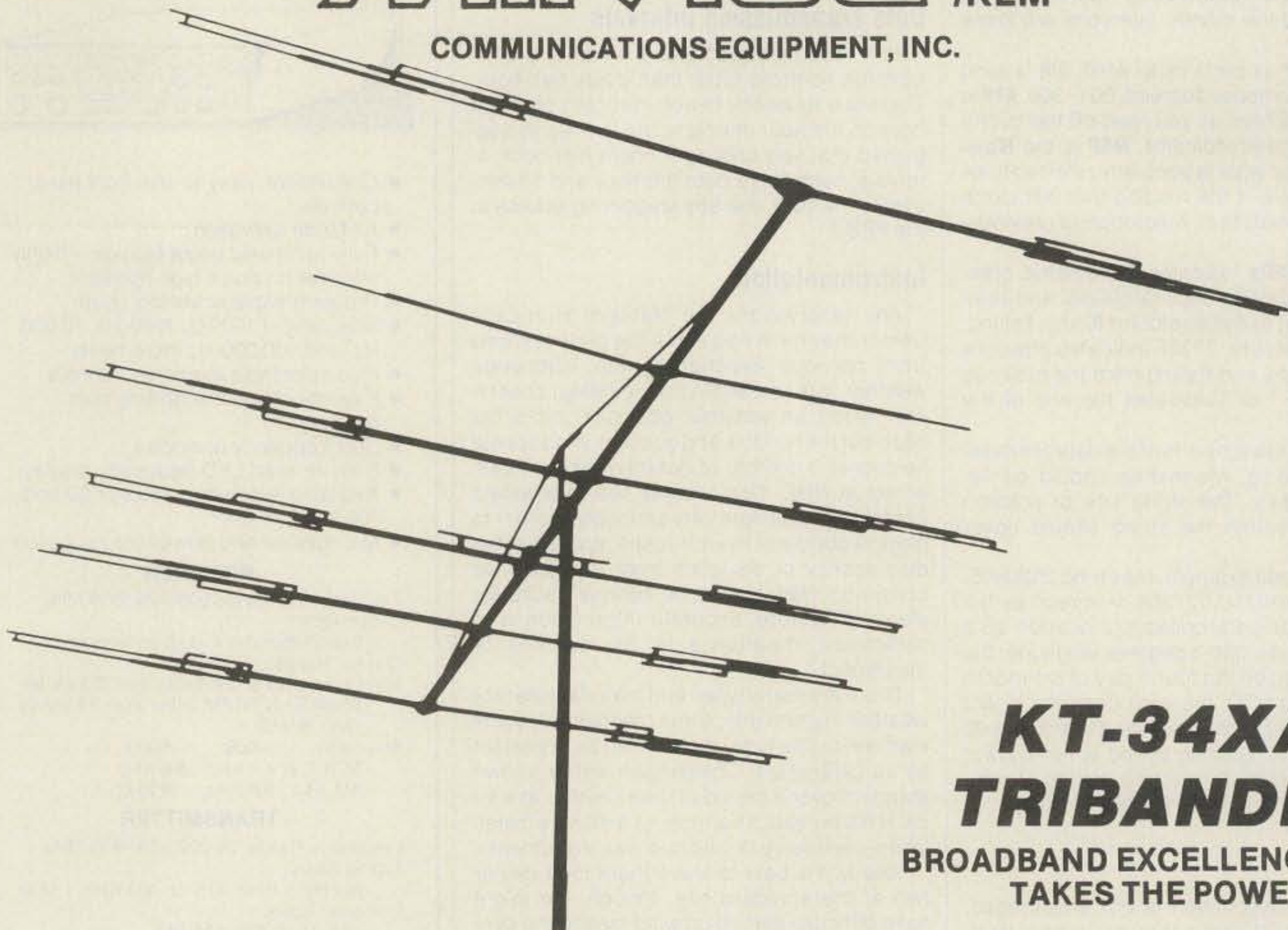
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KT-34XA TRIBANDER

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KLM's KT-34XA TRIBANDER is the 2nd generation of a unique new series of antennas designed to provide superior **broadband** coverage on 20, 15, and 10 meters. The combination of lossless linear loading and hi-Q air capacitors enables the KT-34XA to outperform **all** commercial available tribanders and meet or exceed the performance of a conventional stacked monoband system. The lower weight and windload of a single antenna mean reduced tower and rotator requirements. Thus, overall system costs can be kept to a minimum while enjoying the best of monobander-type performance.

KLM's field proven KT-34A is the heart of the "XA" model. The boom length of the "XA", however, has been doubled, and one tri-resonant and one full size 10 meter element have been added. These changes increase the gain to **11-11.3 dBd** on 10M, **9-9.5 dBd** on 15M, and **8.5-9 dBd** on 20M. Two driven elements are used to make the KT-34XA unusually broadbanded (a concept applied to many KLM antennas). Gain is virtually flat across each band except for 10 meters which has been optimized for the DX'er, 28-29 MHz. The chart shows the remarkable performance qualities of the KT-34XA.

The KT-34XA's design represents the first major advancement in tribander technology in over 20 years! The conventional traps, coils, and capacitors have been discarded in favor of integral linear loading and hi-Q air capacitors, all composed of aluminum tubing. These give the KT-34XA a conservative power handling capability of 4 KW PEP and an unusually high level of operating **efficiency**. Linear loading also makes full $\frac{1}{4}$ -wave elements possible on 15 and 10 meters, and brings 20 meters much closer to the desirable $\frac{1}{4}$ -wave than any conventional tribander.

BANDWIDTHS: ...	14.0-14.350 MHz	GAIN:	8.5-9dB
	21.0-21.50 MHz		9-9.5dB
	28-29 MHz		11-11.3dB
VSWR:	1.5:1	BOOM LENGTH:	32 ft. x 3" O.D.
FB/FS:	20dB/40dB	TURN RADIUS:	21.5 ft.
FEED IMP.:	50 ohms w/balun	WINDLOAD:	9 sq. ft.
BALUN:	3-60-4:1 5KW PEP	WT. (LBS.):	75 lbs.
ELEMENT LENGTH:	24 ft.	MAST:	2" O.D. (standard)

Mechanically, the KT-34XA has been built to survive the toughest weather conditions. All aluminum, including the boom, is strong 6063-T832 alloy. All electrical hardware is stainless steel. Virtually indestructible "Lexan" insulators, just like those on KLM's 40 meter "Big Sticker," are used for mounting the elements and insulating them from the boom. KLM's 3-60 MHz 4:1 balun is supplied for direct connection to any 50 ohm feedline.

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patible, where the data output is already digitized in either BCD or binary format, and can be interrogated by computer or dedicated microprocessor. Dedicated firmware is being developed by interested amateurs and will be disseminated to allow for automatic collection and packet transmission. Refinements in this area promise exciting equipment in the future.

Electronic instruments have both advantages and disadvantages. The obvious disadvantage is the need for electricity and an emergency source if normal power fails. But if you feel secure about your power sources, electronic instruments have quite a few advantages.

Detection of downbursts relies upon an instrument that can measure and retain peak wind-speed readings. Since the life of a downburst may be on the order of seconds, the instrument has to be able to store that event. It would be highly unlikely for an observer to be watching the instruments at the exact moment a downburst occurs. Many of the electronic digital instruments have peak reading storage.

File Upload

While the ideal is to automate the entire weather data collection and transmission process, manual entry of the synoptic code into a personal computer in the form of a text file, and later manually uploading to a PBBS will most likely be the norm for a while.

Uploading an existing file has the important advantage of keeping connect time to the PBBS to a minimum, and avoiding errors in the transmission of the data by eliminating the ty-

pographical mistakes of real-time keyboard entry. This is where LAN discipline comes into play. Keep connect time as short as possible.

Manual Entry

The least efficient method is real-time keyboard entry of the synoptic code during the PBBS connect period. While it is least desirable, it should be used if no alternative is present. Accurate weather information from the affected hurricane area is too valuable to ignore. If you have the weather measuring equipment, get the data in!

Summary

HHAPP is only the beginning of great possibilities. Only one Orion will have packet digitizing capabilities. If all works well, other hurricane hunter aircraft may be equipped to participate. This is a call to special service clubs and other amateur groups in areas prone to not only hurricanes but other meteorological and natural disasters to sponsor a packet telemetry unit to measure these phenomena and transmit the data via packet radio. During the upcoming hurricane season the Dade Radio Club will monitor this project and compile the results for later publication.

With the potential quantities of data collectable by the amateur radio community, we may well precipitate significant meteorological advancements, develop packet networking and telemetering techniques, and at the same time contribute to the safety and security of our communities.

Footnotes

1. The project was originally called "WETNET," but was changed to HHAPP in deference to another ongoing WETNET project. See Joel I. Kandel, "Packet Radio and the National Hurricane Center," Fourth ARRL Amateur Radio Computer Networking Conference, San Francisco, March 30, 1985.

2. Acknowledgements: The following have given unselfishly of their time, effort, and understanding to make HHAPP a reality: Rear Adm. F.D. Moran, OAO; Jan Zysko, N4MEI, Chief, Systems Engineering Div., OAO, who also critiqued this manuscript; Terry Schricker, N4NMX, OAO; Dr. Neil Frank, NHC; Dr. Robert Sheets, NHC; Bob Case, NHC; Terry Hemen, K9YMX, NHC; Jerry Drost, N4NAR, NHC, rtd.; K4CAG; W4VZ; N2WX; W1BEL; KC2FF; and all the PBBS "sysops" in the Gulf, Eastern Seaboard, and the Caribbean who have enthusiastically pledged their cooperation.

3. T. Theodore Fujita. *The Downburst: Microburst and Macroburst*, Chicago: The University of Chicago, 1985.

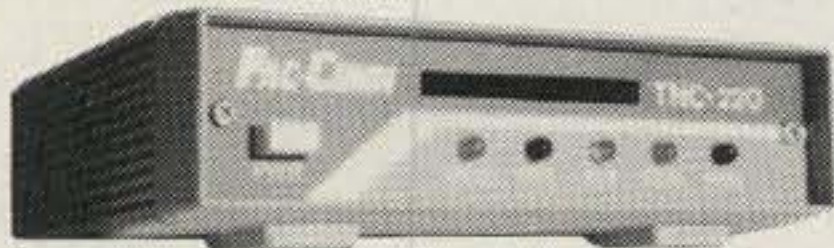
4. Patty Winter, N6BIS, "Packet Radio in Emergency Communications," *QST*, September 1986, pp. 53-57.

5. The Miami PBBS's functions are divided between two stations. K0KBY handles 20 meter message relaying only, while K4TKU interfaces with the Local Area Network on 2 meters for message input and retrieval. These functions are soon to be further divided among additional stations under the new "SKIPNET" plan, but all weather messages for the National Hurricane Center should be addressed to K4TKU.

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This simple project from NA7K will provide a three-day weekend of fully charged handheld operation in the field and supply continuous operating power in the shack as well. The author also discusses the practical aspects of charging nickel-cadmium batteries.

The Handy-Pack

Build Some Portable Power For Your Handheld

BY DAVID F. PLANT*, NA7K

One of the things that handie-talkie owners always seem to have in common is the factory-supplied battery pack going flat at the wrong time. We try to run on the lowest power setting, watch our transmit time, and recharge the pack whenever possible. None of these procedures approaches an ideal situation.

The other alternatives are backup battery packs for the field and a regulated supply (such as the VPS-912, CQ, November 1981) for fixed operation. These additional packs can mount in cost and a fixed supply isn't portable. The Handy-Pack evolved as a simple solution to these problems and has proven to be a useful supply for home, mobile, and field use.

The Circuit

Basically, the project consists of a NiCd battery pack built from 7 individual 1.2 volt cells providing 8.5 volts and a two-level charging circuit to allow normal charging and continuous trickle charging.

The two-level circuit is necessary, as NiCds can overheat or otherwise be damaged by overcharging. Specified charge time for most NiCds is approximately 12 to 14 hours. The trickle setting is to keep the pack "topped up," as NiCds do not hold a full charge for the period of time that conventional flashlight batteries do. This is the reason why amateurs in public or other communications work will often carry standard batteries as backup. The latter also have more life than NiCds for a given size, but are unsafe to attempt recharging.

The circuit, fig. 1, also includes red and green LEDs to indicate at a glance the



Almost the size of the handie-talkie it powers, the Handy-Pack provides several times the battery capacity of conventional battery packs.

charging status of Handy-Pack. An output cable is provided to access the handie-talkie. J1, the input jack, is chosen to accept the existing handie-talkie charger adapter plug or a jack of your choice if you build your own charger. The coaxial-type jack and plug used with commercial gear is, by the way, a good system in that it is relatively short-circuit proof.

R1 is used to current-limit charging in the regular charge switch setting, and R2 is used to decrease charge current in the trickle position. A 150 ohm resistor provides an 8 ma trickle and has shown no battery degradation in four years of continuous use.

D1 prevents the charged NiCd pack

from powering the LED indicators alone, as the 12 ma drain would eventually deplete the supply, and R3 limits LED current.

Construction

A Radio Shack #270-223 project box encased the battery pack and other components nicely. The trick is to assemble the batteries first and place the other electronics appropriately. The LEDs and switch S1 are mounted at one end of the enclosure and the output connections on the opposite end. As various manufacturers do not standardize their charger output plug polarity, check the polarity be-

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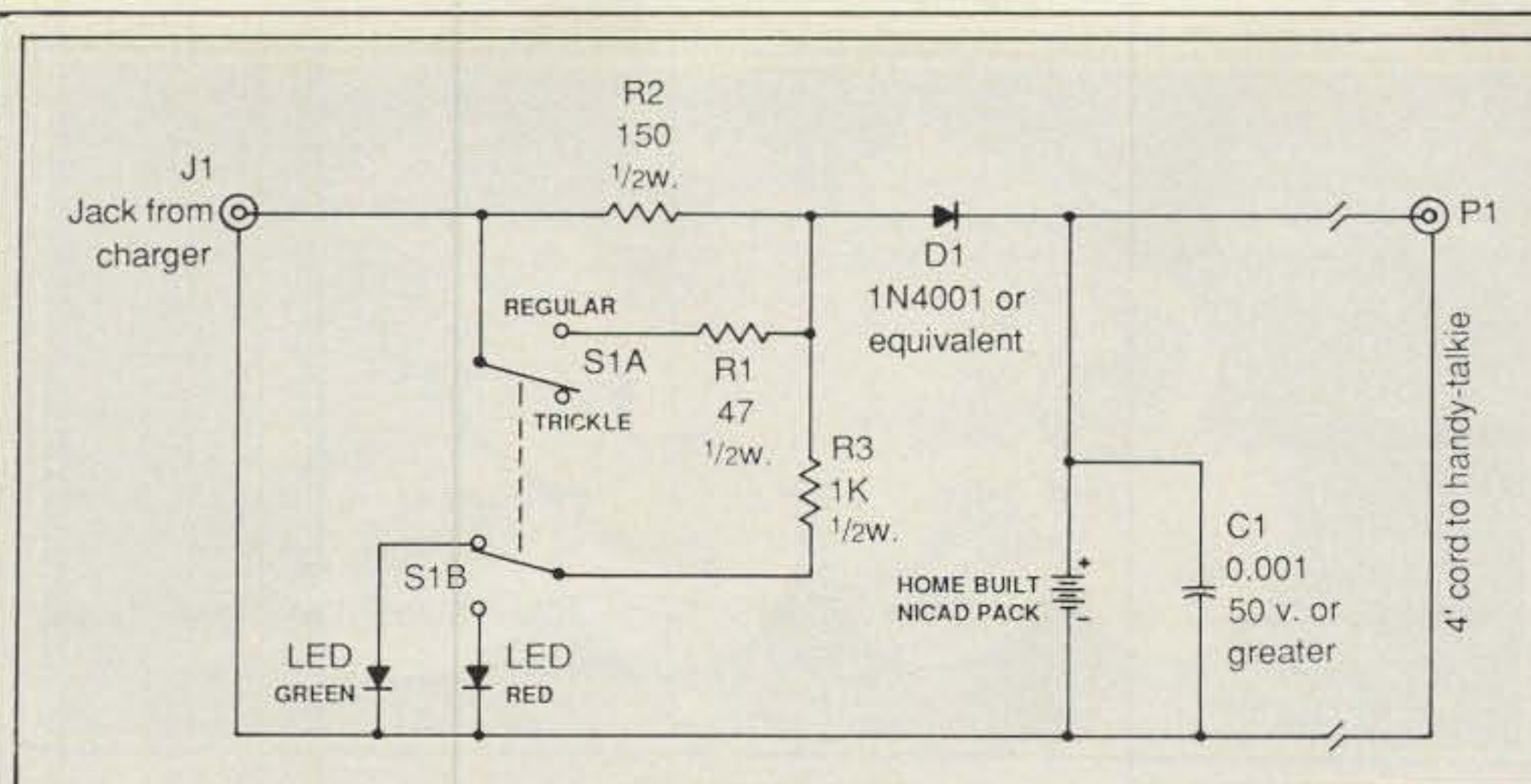


Fig. 1—Schematic diagram for the Handy-Pack.

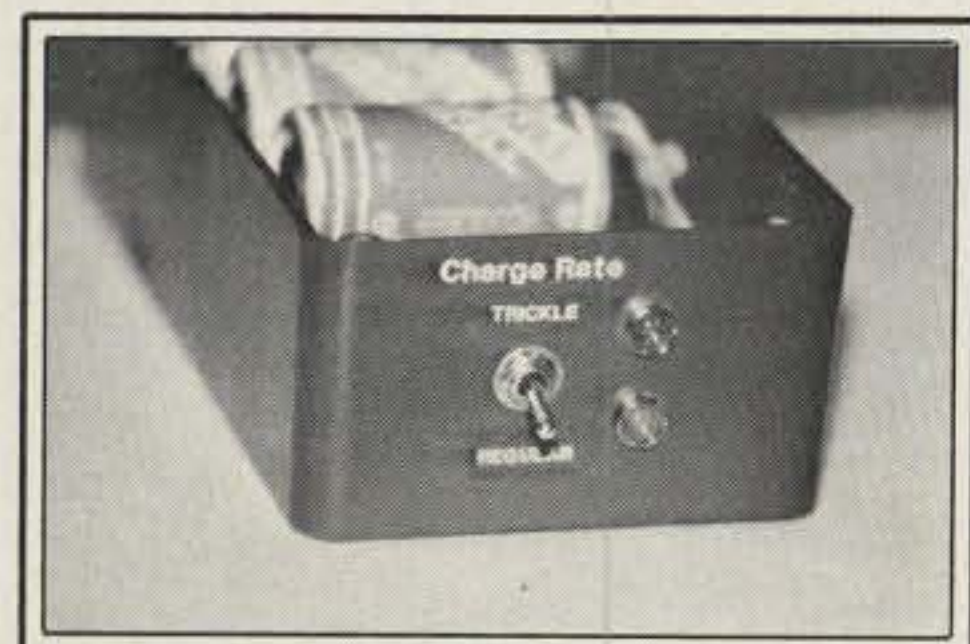


Top view of the completed project showing the relative placement of major components. The lead going from the left-hand side of the case is a 4 foot pair going to the handie-talkie.

fore wiring J1. The photos show the author's layout.

A 5-lug soldering-strip is used to mount the resistors and diode, and a piece of cardboard or other insulating material is placed between it and the batteries to prevent a possible short.

In order to fit the NiCds into the compact box, battery holders were not used. As shown in the photo, the batteries are



Closeup of the charge rate switch and LEDs mounted at one end of the Handy-Pack enclosure. The author used a green LED for trickle and red for regular charge to indicate status.

assembled in what is called a cordwood stack to conserve space, and they are wired together with short leads of tinned wire.

The author's technique to prevent heat damage to the batteries is to scuff their end caps with sandpaper and quickly apply a glob of solder to each with a hot iron. Confirming that the solder flowed properly—i.e., appears shiny—tinned wire is attached to complete the series connection. Taping the batteries together may help, or do two at a time until the pack is complete.

Allow enough lead-length from the box to the pack so it can be attached outside and placed in the enclosure after all other wiring is completed. (See photos.) The box cover will secure the batteries and make a mechanically stable unit.

NiCd Charging

The commercially supplied chargers come with both half- and full-wave unfiltered outputs. The internally mounted transformers have a limited output current provided by their high resistance secondary and rectified by a half- or full-



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CIRCLE 152 ON READER SERVICE CARD

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wave diode configuration. The output of these units provides the pulsating waveform that best charges NiCds. It is also this output which causes AC modulation on the transmitted signal when the charger is connected to a handie-talkie with a run-down battery.

The Handy-Pack gets around this problem by its large battery capacity. The NiCds are kept at full charge by the trickle feature, and in the regular charge setting can be recharged after hard use generally in 24 to 30 hours.

If your regular handie-talkie charger/adaptor is used, you will have approximately 40 ma of charge current available, which is standard for commercial NiCd packs using AA cells. This current output has two implications with the Handy-Pack.

First, the "C" cells used in this project have much greater capacity than standard handie-talkie packs, and as such will take longer to recharge with a conventional charger/adaptor. This situation can be overcome by building a simple charger as shown in fig. 2. Most will not find it worth the trouble unless the commercial charger is committed full time to the other packs.

Second, if your transceiver draws less than 40 ma on standby (those without extra features often do), you can monitor and deplete the Handy-Pack only slightly. Remember here that unswitched audio—i.e., receiving and hearing a signal—



View of the assembled "C" cell pack ready for connection to the project case. Note that the solder connections are shiny, indicating that the solder flowed well at the battery end caps.

can draw anywhere from 100 ma up, and of course, transmit will entirely change the equation.

Experimenting will yield the proper mix for your station. As a guideline, the Handy-Pack is given a regular charge once a week and trickle charged for the remainder of the time.

Two other comments are perhaps appropriate here. First, I've not plugged it into a car's cigarette lighter directly to ob-

tain charging and power in the field. Probably R1 and R2 are about right, but check the charging current and keep it between 40 and 80 ma on regular charge. Add to that the current drawn by the LEDs and use a fused lighter plug.

Second, this project is not intended to replace systematically maintained commercial battery packs, but I simply haven't had to buy any more over the last four years.



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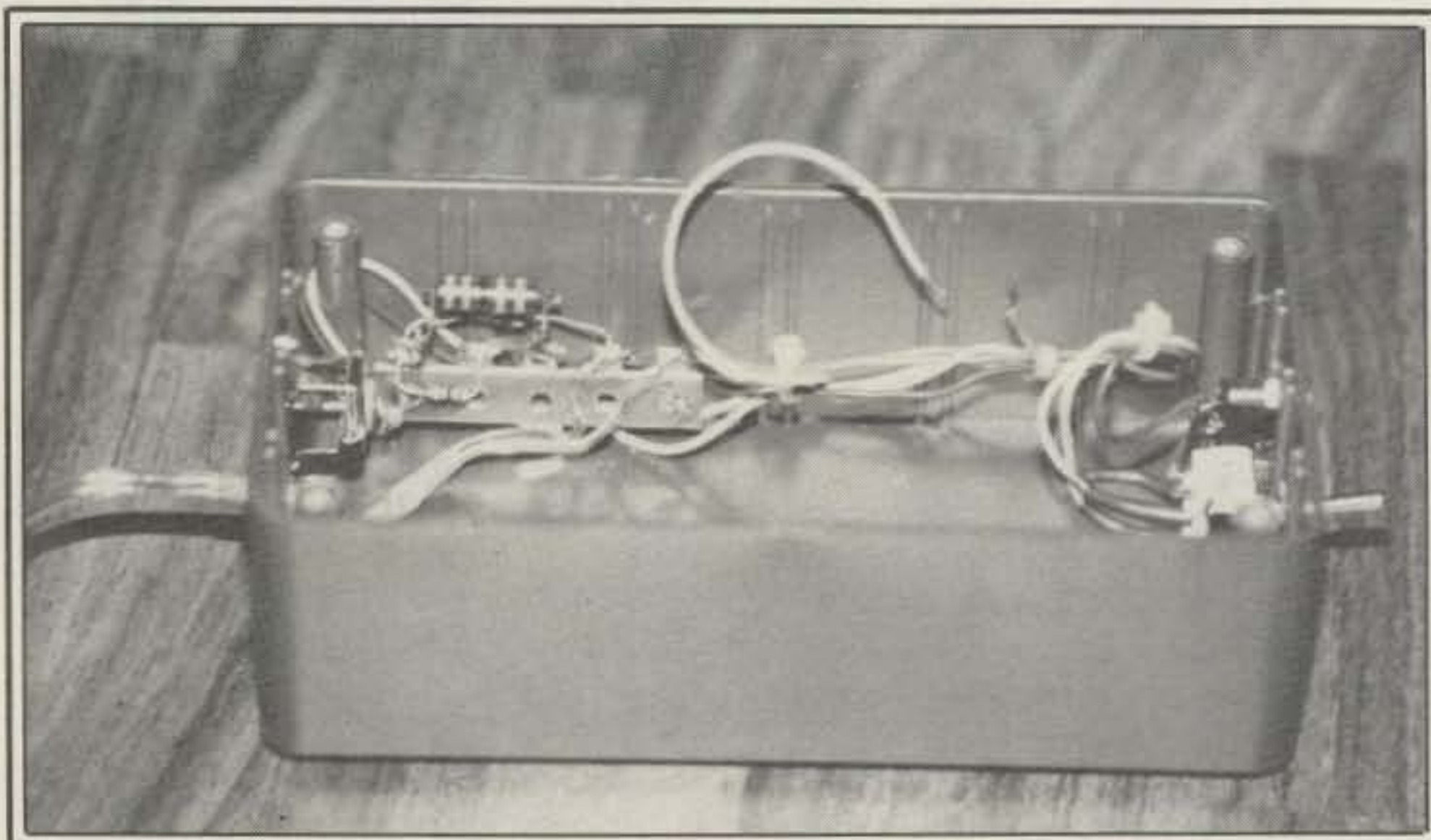


Photo of the completed project ready for the battery pack. The terminal strip at upper left mounts all the electronic components, and the two free leads connect to the battery pack when it is placed into the case.

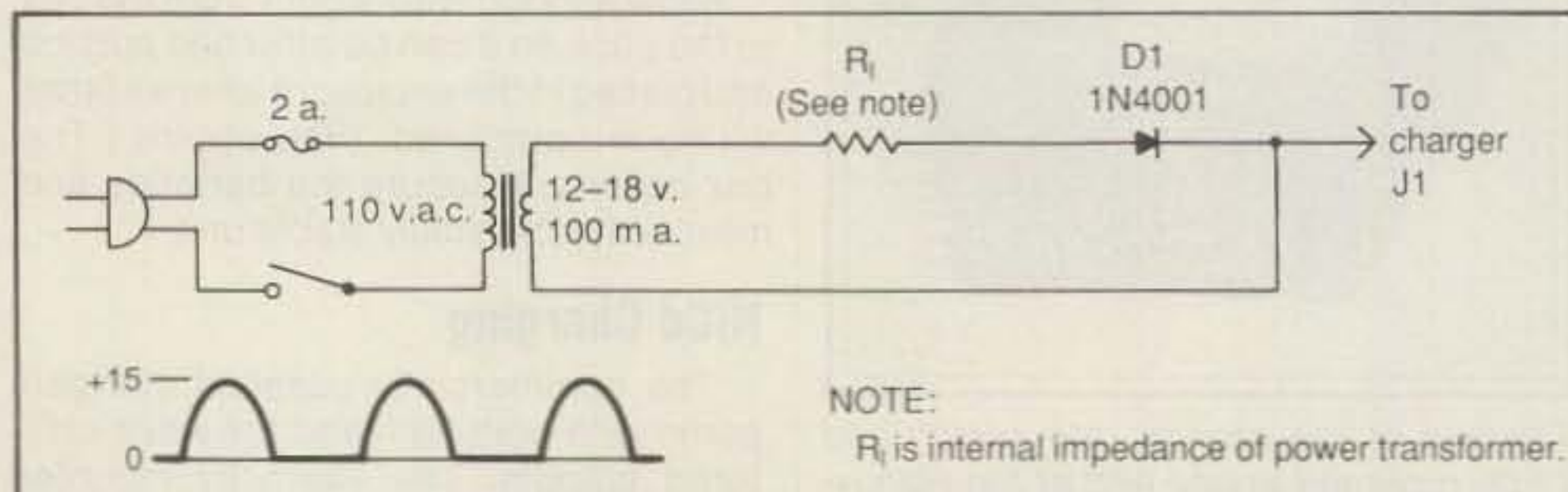


Fig. 2— Suggested circuit for a simple charger. The graph represents half-wave charger output without filtering. It is these peaks which give AC hum over the air when a battery pack is run down.

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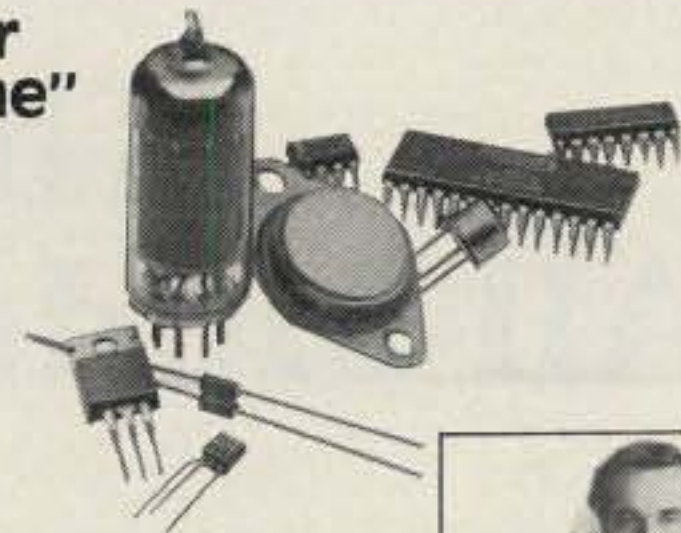


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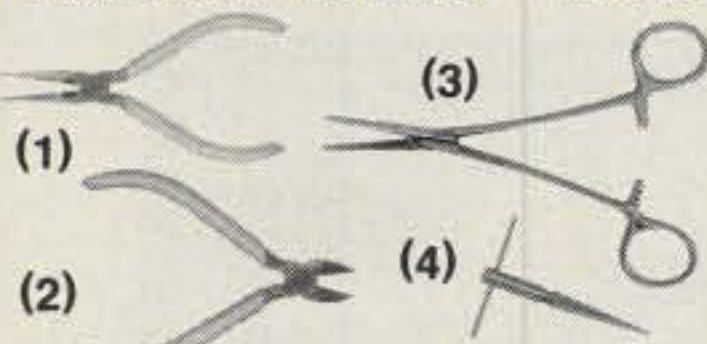
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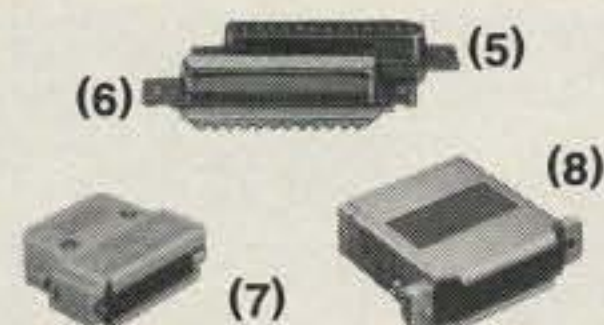


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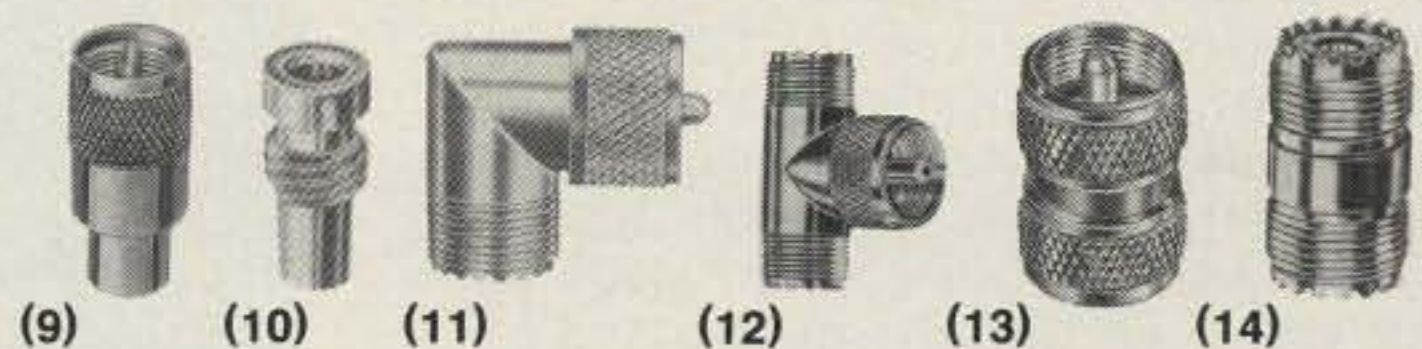
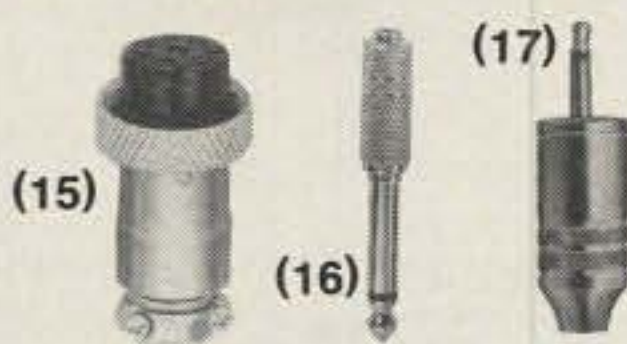


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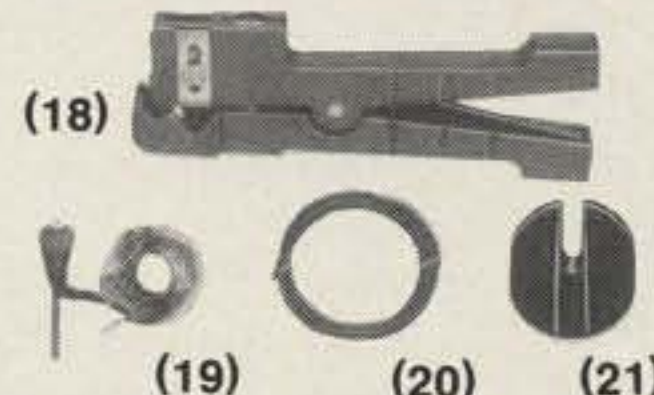
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The ICOM IC-275 All-Mode 2 Meter Transceiver

BY DAVE INGRAM*, K4TWJ

Evolutions and expansions are a natural part of our amateur radio world, and the unit featured in this CQ review is a prime example of that situation. Our migration toward upper spectrum bands continues to gain momentum, with 2 meters being the center hub of activity. FM and repeater operations "kicked off" this evolution, then the use of SSB, globe spanning/Phase III OSCAR satellites, and interlinked Packet operations set the band flourishing with action 24 hours a day. The more this trend continues, the more appealing our VHF bands become, and the greater significance all-mode transceivers such as ICOM's new IC-275 hold for today's amateurs.

Measuring 3½"H x 9½"W x 10"D, the IC-275 is size-identical to ICOM's popular IC-735 HF transceiver. Also, like the IC-735, there's a massive heat sink within the cabinet's rear area. The cabinet and front panel are flat black, with chrome switches and a brightness-adjustable amber display adding an air of sophistication. The main tuning knob is drag-adjustable, perfectly balanced, and fitted with a rubberized grip for a professional feel. The unit's bottom left row of front controls fit flush with the cabinet, but they spring out for easy adjustment when needed.

There are actually two variations of this transceiver. The IC-275A is a 25 watt output unit with a built-in AC supply. The IC-275H is a 100 watt output unit that requires an external 20 amp, 13 volt DC supply such as ICOM's PS55. Both IC-275 versions include a 6-pin rear connector like those on the IC-730, 735, 745, 751, 271, etc., for DC power. This "plug compatibility" is quite handy for "instant upgrading" or "switch hitting" in the mobile setup. One day you can operate HF, the next day VHF, etc. Nice!

It's difficult to pick the IC-275's most outstanding aspect, but its frequency coverage is a good starting point. The unit

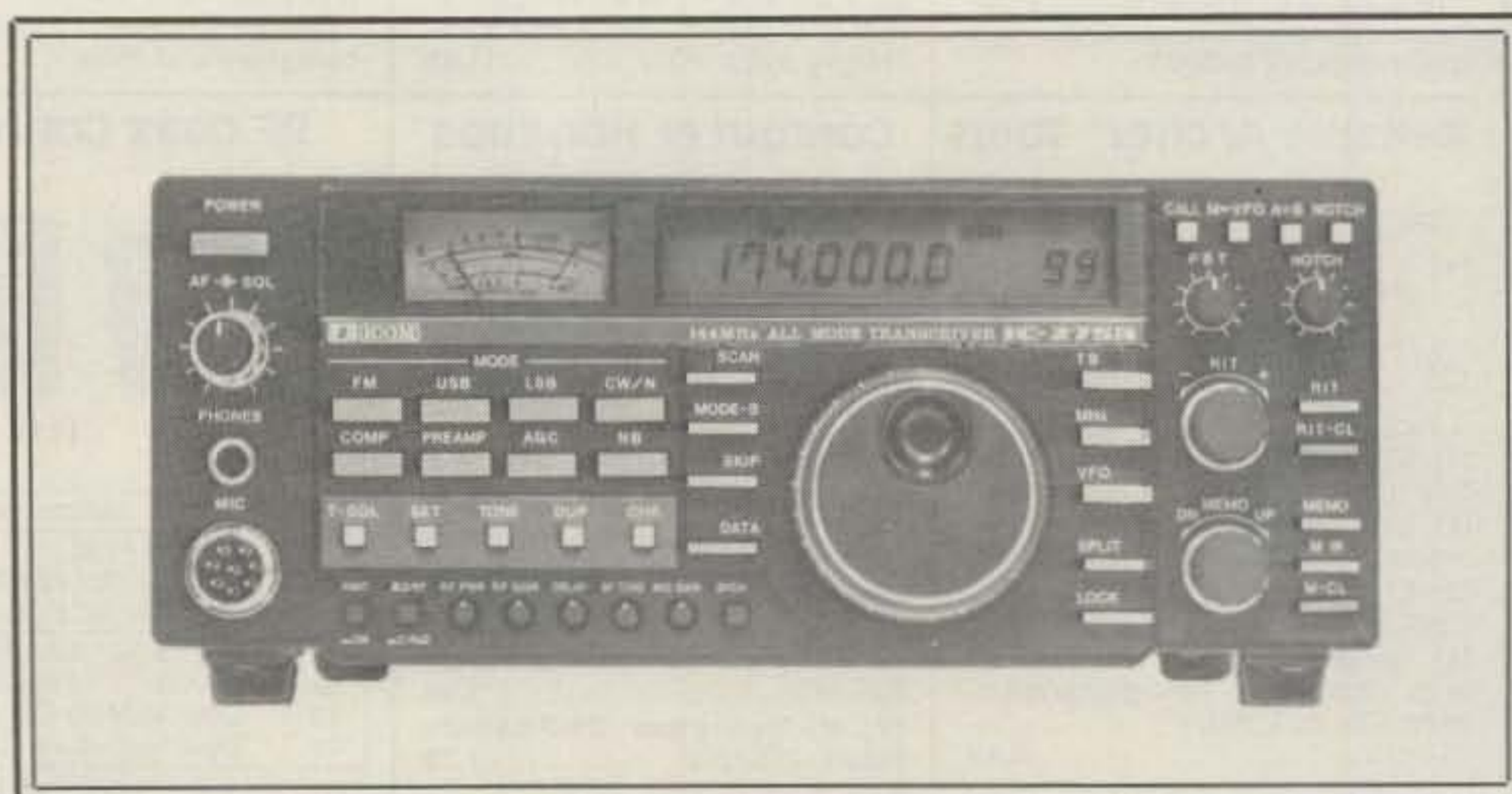


Fig. 1— The ICOM IC-275 all-mode 2 meter transceiver. Unit is quite compact and ultimately deluxe.

receives 138 to 174 MHz, which means you can tune all of 2 meters, the public-service frequencies, mobile phones, pagers, utilities, some weather satellites, plus nationwide NOAA weather stations in the 162 to 163 MHz range. Visualize using this rig in your car during an emergency or while traveling. You could call for help, shift frequencies, and monitor ambulance, police, fire, wrecker, etc. The IC-275's transmit range of 140.0 to 150.0 MHz should also appeal to MARS and CAP enthusiasts interested in deluxe performance. If you're considering computer control, there's a serial RS-232C connector on the IC-275's rear panel. It uses a 1200 baud data rate and allows control of frequency, mode, VFO (A or B) and memory selection via a home computer. Additional IC-275 specifications are included in Table I.

Special Features Galore!

The transceiver's dual VFOs are complemented by 99 tunable memories that store frequency, transmitter offset, and PL tones. Memories are selected by an indented action "Memo" knob. The main

tuning knob swings any memory or either VFO across the IC-275's full frequency range. Remote tuning is also provided with the unit's mike "UP/DOWN" buttons. The overall results are similar to 99 VFOs that remember favorite spots when initially selected, plus two "general-purpose" VFOs. Another attraction is the "call" channel. Program it with your favorite frequency, offset, and PL tone, press the button, and bingo, you're there. The unit also includes 32 PL tones, and their actual subaudible frequency (in Hz) can be displayed on the dial's readout. Standard repeater offsets of ±600 kHz are selected by pressing the "DUP" button. Any odd offset is available by pressing the "SET" button (offset then appears in display), rotating the main tuning knob, then pressing "DUP" again to store the preferred offset for that VFO or memory.

A fascinating variety of scanning methods are included in the IC-275. It will scan the full (138 to 174 MHz) spectrum, or you can program limits into special memories P1 and P2. It will also scan memories (non-programmed memories are skipped), or scan by a selected mode. Constantly busy memories can also be scan-locked

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out via a front switch. A newly designed high-speed Direct Digital Synthesizer and PLL unit operate as a double-PLL system to produce super-fast scanning and T/R operation. The latter aspect is also beneficial in Packet radio operations.

Pressing the front-panel "DATA" button disables the IC-275's front mike input while allowing rear DIN connector input for Packet operations and providing a 5 millisecond PLL lockup time—a clever and convenient idea.

The IC-275's performance "trump card" is in its SSB and CW department. Unique features here include Passband Tuning, IF Notch, speech processor, transmit and receive audio tone controls (they function on all modes), noise blanker, semi or full CW break-in, continuously variable RF output control that functions on all modes and independent of the mike gain, and a multifunction meter that includes FM "center tuning" and SWR bridge operation.

Circuitry Overview

As I explained in my September and October 1985 CQ "World of Ideas" columns, the most effective and unbiased way of evaluating any unit's "innards" is through a brief block-diagram study. The IC-275's block diagram is thus shown in fig. 3. The rig may initially appear complex, so let's simplify it. We'll first point out that the receiver's "front end" and transmitter's "final" stages have been broadbanded so exact frequency/memory selection, stability, T/R timing, etc., are determined by a single "local oscillator" signal from the PLL unit (bottom middle of diagram). After that process, other signal-handling stages in the IC-275 are fixed in frequency. Overall, the multi-stage PLL unit can be visualized as a VCO that's controlled by the CPU in its adjacent "logic/front unit" (bottom left of diagram).

Frequency-tuning the IC-275 involves rotating the main knob/main sensor, which chops an LED beam via its flywheel and sends beam interruption signals to a decoder and dial pulse counter. The counter's information is used along with the CPU's RAM/ROM-stored data to establish the PLL's output frequency. If that description was too complex, merely think of the logic/front unit as the "tuner" for the PLL unit, and the PLL unit as a local oscillator for the receiver and transmitter. Its output moves from the 127.25 BPF (middle bottom area) to Q8, the LO amp.

Now let's trace the IC-275's receive path (a pocket magnifier is helpful in circuit study). First notice that activating the front-panel "PREAMP" switch applies 13 volts to the antenna connector for powering the optional mast-mounted preamp. Now follow incoming signals from the antenna through the LPF, into the attenuator, through the BPF, and to the RF ampli-

• Frequency coverage	: U.S.A. version	138.000 ~ 174.000		
	: Europe version	144.0000 ~ 146.0000MHz		
	: Australia version	144.0000 ~ 148.0000MHz		
	*Specifications guaranteed from 143.8000 to 148.2000MHz.			
• Number of memory channels	: 99 channels plus P1, P2 and CALL CHANNEL			
• Antenna impedance	: 50Ω unbalanced			
• Frequency stability	: ±5ppm (0°C ~ +50°C)			
• Power supply requirement	: U.S.A. version	117V AC ±10%		
	: Europe, Australia versions	240V AC ±10%		
	: All versions	13.8V DC ±15%		
• Current drain (at 13.8V DC)	: Transmitting	At 25W output	Approx.	6A
		At 2.5W output	Approx.	3A
	: Receiving	At maximum audio output	Approx.	1A
		Squelched	Approx.	0.9A
• Dimensions	: 241(244)mm(W) x 95(108)mm(H) x 239(295)mm(D)			
	Bracketed values include projections.			
• Weight	: 6.2kg			
• Usable temperature range	: -10°C ~ +60°C			

14 - 2 TRANSMITTER

• Emission modes	: FM (F3E), SSB (J3E), CW (A1A)			
• RF output power	: 2.5 ~ 25W continuously adjustable			
• Modulation system	: FM	Variable reactance frequency modulation		
	: SSB	Balanced modulation		
• Maximum frequency deviation	: ±5kHz (FM mode)			
• Spurious output	: More than 60dB below peak power output			
• Carrier suppression	: More than 40dB below peak power output			
• Unwanted sideband	: More than 40dB down with 1000Hz AF input			
• Microphone impedance	: 600Ω			

14 - 3 RECEIVER

• Receive system	: Double-conversion superheterodyne			
• Receive modes	: FM (F3E), SSB (J3E), CW (A1A)			
• Intermediate frequencies	: 1st	10.75MHz (FM, SSB)	10.7491MHz (CW)	
	: 2nd	455kHz (All modes)		
• Sensitivity	: FM	Less than 0.18μV for 12dB SINAD		
		Less than 0.25μV for 20dB NQL		
	: SSB, CW	Less than 0.1μV for 10dB S/N		
• Squelch sensitivity	: FM	Less than 0.1μV		
	: SSB	Less than 0.56μV		
• Selectivity	: FM	15.0kHz/6dB	30.0kHz/60dB	
	: SSB, CW	2.2kHz/6dB	4.2kHz/60dB	
• Spurious response rejection	: More than 70dB			
• Audio output impedance	: 8Ω			
• Audio output power	: More than 2W at 10% distortion with an 8Ω load			
• RIT variable range	: ±9.99kHz			

Table 1—General specifications of ICOM's IC-275 transceivers.

fier, Q7. This 3SK121 is a GaAsFET, and its high gain and low noise figure really make the IC-275 a hot performer. After the next BPF there's a high dynamic-range balanced mixer consisting of two 2SK125's (Q1, Q2). These gems provide exceptionally low intermod in the IC-275. The resultant 10.75 MHz-converted signal is then passed to FL1, noise gated,

and moved through Q10 and on to FL2 or FL4, depending on the selected mode.

Take a second look at the noise gate's circuitry. Sampled noise pulses go through two amplifiers before detection (and deriving its own AGC), then they're detected, amplified, and used to "gate off" signal flow from FL1 to Q10 during the precise time of a noise pulse.



Fig. 2—Overview of the IC-275's main display indicates readout of frequency memory, VFO, mode, scan, etc.

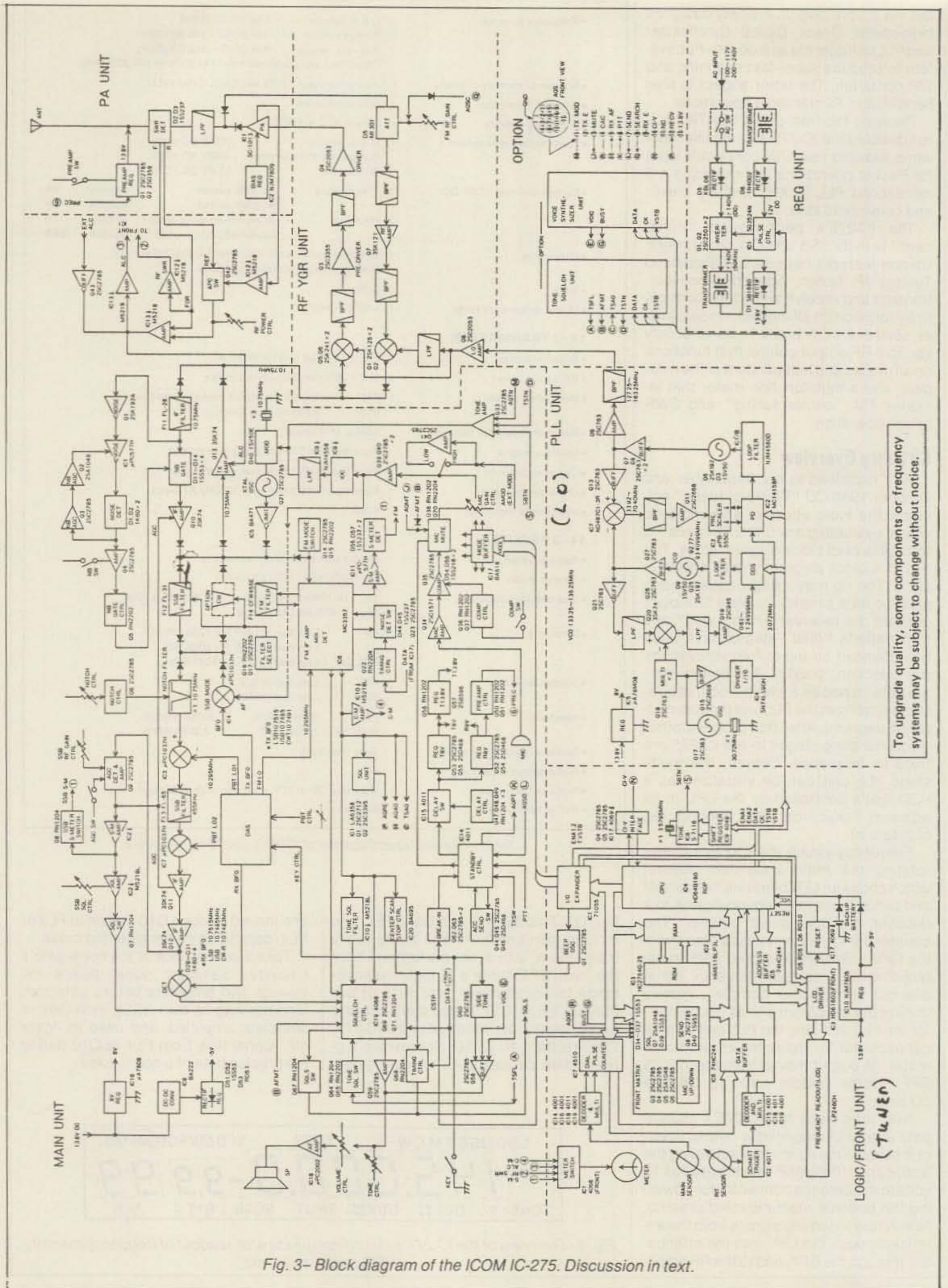


Fig. 3—Block diagram of the ICOM IC-275. Discussion in text.



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 CI-V Computer interface adapter ... TBA
 EX-310 Voice synthesizer..... 46.00



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 FL-63 250 Hz CW filter (1st IF) 54.50
 FL-52A 500 Hz CW filter (2nd IF) ... 108.00 99.95
 FL-53A 250 Hz CW filter (2nd IF) ... 108.00 99.95
 FL-33 AM filter..... 35.25
 FL-70 2.8 kHz wide SSB filter 52.00
 RC-10 External frequency controller 39.25

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 PS-35 Internal power supply 199.00 179.95
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 FL-54 270 Hz CW filter (1st IF) 53.00
 FL-52A 500 Hz CW filter (2nd IF) 108.00 99.95
 FL-53A 250 Hz CW filter (2nd IF) 108.00 99.95
 FL-44A SSB filter (2nd IF) 178.00 159.95



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 PS-55 External power supply..... 199.00 179.95
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SP-7 Small external speaker 49.00
CR-64 High stab. ref. xtal (745/751) 63.00
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SM-6 Desk microphone 44.95
SM-8 Desk mic - two cables, Scan..... 78.50
SM-10 Compressor/graph EQ, 8 pin mic 136.25 124.95
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 AG-25 Mast mounted preamplifier... 95.00
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IC-475A 25W 440 FM/SSB/CW w/ps 1399.00 1249
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 AG-1* Mast mounted preamplifier ... 99.50
IC-471H* 75W 430-450 ... CLOSEOUT 1399.00 999.95
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 UT-15 Encoder/decoder interface 14.00
 UT-15S UT-15S w/TS-32 installed.... 92.00

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IC-490A 10W 430-440... CLOSEOUT 699.00 499.95

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IC-37A Compact 25W 220 FM, TTP mic 499.00 439.95
IC-47A Compact 25W 440 FM, TTP mic 549.00 479.95
 PS-45 Compact 8A power supply ... 139.00 129.95
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 SP-10 Slim-line external speaker ... 35.99

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IC-28H 45W 2m FM, TTP mic 489.00 429.95
IC-38A 25W 220 FM, TTP mic..... 489.00 429.95
IC-48A 25W 440-450 FM, TTP mic ... 489.00 429.95
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Larsen PO-K Roof mount 20.00
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Signals from Q10 can take one of three paths according to mode. The SSB route continues through FL2, the IF notch, SSB filter with its twin mixers (that establishes passband tuning), Q11 and Q12, the detector, squelch, and on to the speaker. Going back to Q10, FM signals go down, through IC6, through FL4, the squelch, and on to the speaker.

Tracing the transmit path begins at the mike (look in diagram's center), continues through Q34, Q35, and on to Q39 and Q40. At that point the SSB path "makes a left turn" (follow dotted line) and moves into the "SSB Mode" mixer/balance modulator. The DSB signal then moves through FL2 (exit one sideband, to produce SSB), Q13, Q5/Q6 (it's then up-converted from a 10.75 MHz to a PLL-heterodyned 2 meter frequency), on through Q3, Q4, IC1, and to the antenna. Returning to Q39 and Q40, FM-mode audio con-

tinues "straight ahead" to D40, the crystal oscillator's FMing modulator. That resultant signal then "makes its way" up to Q13 and follows the previously outlined RF path to the antenna. I would like to cover several of the diagram's additional points, but this review might become too lengthy or boring. Drop me a letter with your opinion. Do you prefer or dislike our "technical rap"? Should it be longer or shorter?

On The Air

Although the IC-275 is quite elaborate, it's surprisingly easy to operate. The first time I used it was while mobiling home (why wait?), and I was chatting on local repeaters while listening to NOAA weather forecasts within two minutes of turn-on. Installation was a snap; my low band IC-735 was moved to the car's rear seat, the IC-275 was slipped into its front posi-


tion, and the 2 meter antenna was connected. After dialing a local repeater, I pressed the "DUP" button and bingo—600 kHz offset. I then clicked out the recessed mike gain, set it via off-air reports, and the fun began. Using the other VFO, I took a spin through the commercial bands to monitor a few mobile 'phones and suburban police (they still use VHF in this area, although metro police have moved to 460 MHz). If you haven't tried that monitoring during the day, you've missed some good chuckles. The IC-275's remote tuning via mike up/down buttons is great for mobiling.

The IC-275 quickly became a favorite little gem at the home QTH, especially for OSCAR satellite operations. The passband tuning works like a champ. Its center position gives full SSB bandwidth, while tuning it to either side shifts IF response and narrows the passband to reduce interference and noise. QRM isn't a big problem on 2 meters SSB (yet), but a bandwidth-optimized IF always improves signal-to-noise ratios and peaks receiver response. I also use the IF notch to further reduce noise, and the result is a great VHF DX or contest rig. If you're really serious in these areas, you'll want to add the rig's optional AG-25 mast-mounted preamp.

Considering the IC-275's fast T/R time also makes it attractive for 2 meter moonbounce activity. A stack of four Cushcraft "Boomer" antennas, some low-loss coax, and a healthy linear amplifier should swing that activity in fine style. Several moonbounce tests are conducted each year in which BIG setups with large antennas offer opportunities for basic-equipped amateurs to experience this unique mode. Their signals can usually be copied (and often worked) with a good multimode rig and 19-element Yagi.

Being active on Packet (and writing a book on Packet radio), I naturally connected the IC-275 to my computer setup. Its action was again smooth and fast. No hassles with TXDELAY or RETRY counts; just set the TNC's output level and enjoy.

Several other IC-275 operating features warrant mention. The built-in SWR bridge is great, and it beats "digging out" a separate unit for antenna checks. Ninety-nine memories are grand. You can use 15 for utilities, 15 for public services, 15 for SSB, 20 for OSCAR, 4 for weather, etc. The IC-275 and a mating 2 meter antenna are small and light enough to go anywhere you go—mobiling, vacationing, anything. It's a double handful of the "good life."

The IC-275 is supported by a full line of complementing accessories. They include the AG-25 preamp, UT-36 voice synthesizer, UT-34 tone squelch, CT-16 satellite interface/rig tracking unit, and FL-83 250 Hz CW filter. For more information, contact ICOM America, Inc., 2380 116th Street, S.W., Bellevue, WA 98004. 

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The clues are in, the plot has thickened, and now it's time to wrap up the mystery of sending and receiving those illusive QSLs.

The QSL Dragnet Part III – Conclusion

BY DON DASO*, WA8MAZ, AND ROGER BURT, N4ZC

The phone rang. My partner picked up. He said very little. He put the phone down. I kept typing.

"It's him," he said, "Again."

I looked over. I knew my partner was tired of helping the caller. A guy named Max.

"What is it now?" I stopped typing, waiting.

"Max is mad because somebody at the bureau sent back a bunch of his cards. 'Not in the log' was stamped across most of them." He sighed.

"Who's he mad at, the bureau?"

"I guess. I really didn't listen that closely. He kept saying it was impossible."

"That's our boy."

"Ha!"

I could remember the day Max first came to see us. He told us he wanted to be a DXer. He asked a lot of questions. We answered them. A week later he was back. He'd spent over \$3000. Why wasn't he working DX? My partner and I knew we had gotten ourselves in trouble. As if we didn't have enough to go around already. What did we know?

"Maybe after work?" I suggested.

"Yeah, after work. We can work after work."

I had to laugh. "At least we can play with his new radio. You always like that part."

My partner chuckled. "Some compensation." He shook his head.

"We all have to start somewhere," I said.

He looked up. "Maybe that's it. Max isn't at the starting line, although he should be. But he wants to be at the finish line. Immediate results. Big wins. Big DX." He moved some pencils around on his desk.

"Tell him to take up golf."

"Golf?"

"Sure. Then maybe he won't call us. Neither of us play the game."

He laughed. "Okay. Next time. Why do you think he got those cards?"

"Marked like that? Mistakes. Pure and simple. Mistakes on his part. The usual stuff."

"You're probably right. I remember getting a few."

"Have you ever thought about golf?" I said. "Seriously?"

We laughed.

Max's frustrations are real. It's pretty difficult to receive some (even one!) of your own QSLs back, from anywhere, with a notation or remark that you are "not in the log." Difficult, damaging to the ego, maybe a dilemma ("How'd *this* happen?" you may ask yourself.) but not the end of the world. Nor the end of your QSL efforts. Don't despair.

We can help you.

We can help because filling out the card is the area subject to the greatest number of problems with QSLs. (Just ask anyone who has ever worked as a manager or in the bureau system!) Illegible handwriting, incorrect information, smeared ink, a whole host of human errors can serve to get that dreaded "not in the log" remark or comment applied to one of your prized cards. (Just remember: your card got through and was examined seriously by someone. Someone who cared enough to let you know something was wrong. Your card was not simply thrown out. Learn from this mistake.

And don't think this doesn't happen to even the best operators.

Imagine this scenario: 160 meters in the early morning, static crashes are high, even on the beverage receiving antennas. The headphones are clamped tight on your ears; all you seem to hear is noise. But the JAs are in there calling. You get the signal report; you catch parts of a callsign. Then you get the complete JA call. But wait a minute. Was he calling you,

or someone else? You got only part of the callsign: "4S." (You think maybe it's easy to work JAs on 160 from the east coast? You think maybe you're the only one calling?) The opening ends on this uncertainty.

Obviously, the question is: Who did that JA work? The possibilities range into the dozens. If you are one of the callers, what should you do? You send your card, hoping for the best. Someone will be disappointed, of course. But it's not a vital mistake; rather, time and circumstance happen to us all.

But if you were the "4S" who got through and you had the wrong date on your card, then that's another story. The single largest error, without a doubt, is the use of an incorrect date and time on a QSL. The only time on a card should be in UTC, sometimes called Greenwich Mean Time (GMT) or Zulu time. Nothing else should ever be used. (In fact, the only clock visible to you as you operate should be in UTC to guarantee you do not fill out your log incorrectly. Keep a small calendar close by to ensure you get the date change necessitated by UTC accurate as well.) Put yourself in this position: Would you know what to do with a card you received with something like Central Mongolian Daylight Savings Time indicated on it? What time is that? Do you spend time looking through the log trying to figure it out, or does that card go into the roundfile? Use UTC and eliminate this type of trouble.

Another small point about time, but one that's vitally important: Be accurate! Check your clock before each operating session. Remember, if you're working someone, such as a DXpedition, who is running them contest-style at 200 (or more!) an hour, a few minutes of error may put you on another page in his logbook. That places your claim for a card in jeopardy. Your request must face the good graces of whoever is answering the logs. Again, will he spend time flipping back and forth looking for your callsign?

*Rt. 1 Box 246, Mt. Holly, NC 28120

Or will he give up, and resign your card to the trash? Accuracy on your part will pay off!

QSLs should be filled out in ink, preferably a kind that does not smear. Take a few minutes and try several samples of pens on your cardstock. Find something that's permanent, doesn't smear, and use it all the time. Darker colors, black or blue, work best.

Once you've found the right ink, please *write legibly*. Two very simple words, and an obvious point, but one which is forgotten or ignored a large percentage of the time. (Again, ask a manager, or anyone who works for the bureau, how many cards are simply unreadable. You'll be surprised.) So take a cool, critical look at the handwriting on one of your outgoing QSLs. Get a second opinion. Practice, if you must, but be legible. A simple block printing style is probably best, using all capital letters. Make certain each letter is distinctive—that a "U" cannot be mistaken for a "V," for instance. (We mean that each letter should be readily apparent, explicit, and not distinctively "unique.") If you don't know or remember how this style of printing is supposed to look, do some research. Don't rely on your own personal "flair" to create distinctive letters. For instance, many times a "U" can look like a "W." Again, multiply this problem 40 to 50 times and it becomes more than just an annoyance.

Cards that cannot be read are often thrown away; they're not answered. Highlighting certain words is not a good idea. Over time the highlight ink can combine with the underprinting, rendering the whole word illegible.

Another small point, but again one which is often overlooked, is this: When you make a mistake in filling out some information or data on a card (sooner or later we all do it) such as the call, band, or date, that card *must* be thrown away and another one sent. Don't just scratch out the error, repeatedly write over it, or try erasing it and think you have corrected your mistake. Such a card will not be accepted for an award or a certificate (Who can guarantee who made that change?) and is therefore useless. Neatness should prevail!

Signing your card is important. Just your first name will suffice, and many awards require it. It's also a nice personal touch—something that will be unique to your card no matter how standardized it may be.

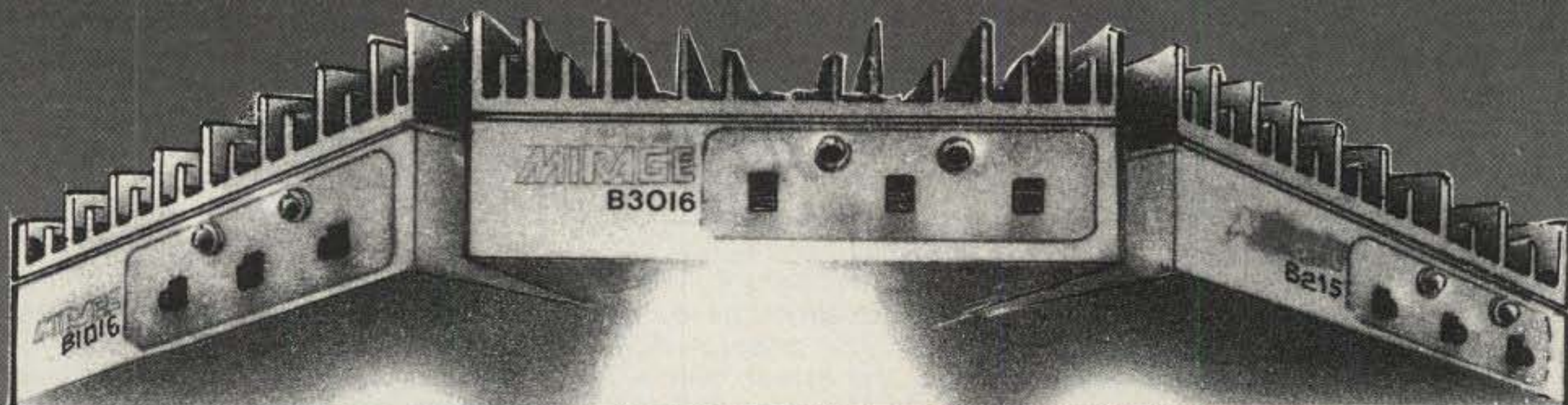
Earlier in this series we made a plea about SWL cards. When filling out your reply QSL, there is basically only one correct way to do it. Many overseas short-wave listeners have government-assigned numbers. If one is evident on the SWL card, use it. If not, use the person's name and country or call area (for instance, John Doe SWL-W4). Do *not* use

the callsign of the station with which you were in QSO, and which the SWL card will show. You are confirming that SWL's reception, and your card should be made out to the individual listener. Also, the RST or report box should indicate "SWL" and not the report you gave the station with which you were in QSO, or anything else. The idea is to show that you are confirming a reception report.

If you have followed this series of articles on QSLs, perhaps your personal perspective on the process has changed. Perhaps your rate of returns on cards has gone up or is about to. Or perhaps you have designed a special, personal card using some of the guidelines we have presented. Or you've sent off an envelope to the bureau, or you now better understand the workings of the bureau service you've been using for years. Perhaps you've found some interesting mail in your box instead of just bills, ads for magazine clearing houses, or flimsy four-color fliers addressed "occupant" or resident." Perhaps you've learned that good penmanship (especially with the relaxation of rules on the keeping of a logbook) is vitally important. Perhaps you have acquired a new appreciation for QSLs, one of the most graphic representations of our hobby. Perhaps you remain as fascinated with them as we do, after a combined total of 75 years of hamming.

Good luck, and good QSLing!

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CIRCLE 129 ON READER SERVICE CARD

This month in Part II we follow the OH0MD/OJ0 crew through storms and back home again to safety.

DXpedition To Market Reef, OH0MD/OJ0 – Part II

BY DAVE HEIL*, K8MN/OJ0

When the last antenna came down and the final piece of gear had been loaded onto the boat, the 150 hours of operating had netted us 18,257 QSOs, a new record for a Market Reef operation. If you needed Market and didn't work us, you either weren't on the air that week or spent your time working 80 meters at noon local time.

Some of the East Coast U.S. top-band ops got a bonus. Don and I managed to work over 30 of them—the first ever U.S.A./Market Reef 160 meter QSOs. The first five statesiders contacted were K1ZM, K2EK, W3BGN, AA1K, and K1IU. We would have worked many more had some not spoiled things for the many. We copied many more calls than were worked and even tried to have the stateside ops clear our transmitting frequency and call us 1 or 2 kilo-Hertz higher. Our request apparently wasn't heard because of the Ws still calling. Interestingly, we've already received almost twice as many QSLs as we had QSOs on 160. Creativity is not dead. We were tickled to work VK6HD, some Canadians, several South Americans, and a South African on top band along with hordes of Europeans.

Operating technique by W/K ops seems to be improving for the most part. One disturbing practice by a few of the new ops is that of giving your call and a signal report even though you haven't been acknowledged by the DX station. It's risky and not very wise. Having a station ask for QSL information every two or three minutes is quite annoying. During operation from market we gave QSL information about every 10 minutes. Still there were those who persisted in asking for QSL information repeatedly every few seconds. One other pet peeve we developed is the operator who jumps into the pileup, gets and gives a signal report, and proceeds to ask for our call. Gad, if you don't listen long enough to find out who you're calling, what kind of operator are you?

Part of our operation took place over the IARU contest weekend. We had a lot of fun passing out the contest QSOs, though we weren't in a rare zone. We made no real effort to go for score, but figured that there would be those happy to pick up a couple of points in the test and maybe pick up a new DXCC counter in the process.

On July 10 the winds picked up a bit and the



Running beams this close to each other and operating two kw rigs on the same band was proof of technical excellence. Don't get it wrong—it wasn't this calm very often. The balloon in the background supported the 160 meter vertical.

sea was showing a pronounced chop. Kee predicted a storm and told us it might be a big one. He mentioned that if it came to pass we might have to remain on the island for longer than planned. The prospect didn't exactly thrill Wayne and myself. Wayne had a plane to catch and I had to be back in Helsinki for work at the embassy on the 17th.

The morning of the 11th brought high seas and stiff winds. An aluminum ladder which we'd used to gain access to the roof of the generator building clattered to the lower level. Vilho lowered the balloon supporting the 160 meter vertical and tied it off. We watched a number of diving ducks head toward open water to ride out the storm, and the few seals which had been sunning themselves on the rocks some distance off shore for several days were nowhere to be seen.

By 4:30 p.m. local time the waves were washing over most of the island and our rocky

piece of real estate became smaller and smaller. A large freighter passing through the channel was tossed about by the Baltic's churning gray-green waters. Kee, Don, and I began moving everything not fastened down into the lower level of one of the buildings.

The wind howled through the CW station and occasional gusts shook the entire building. Gusts of cold, damp air made it necessary for Don and I to wear sweatshirts. The heat from the TR7 and L7 amp did little to warm us. A Finnish Coast Guard ME8 helicopter made several low passes to check our situation. Those of us not operating dashed outside to have a look at the chopper.

Kee shouted above the wind that the really high waves would begin after the wind died down somewhat. He mentioned that he had once been stranded on the island for five weeks and that his father had been stuck there for six weeks during a similar storm. I left the shelter of the lighthouse and began moving about the surface of the island snapping photos of the storm. Lars shouted and waved me back to the light and cautioned me of the danger of being swept away by the surging water. Anytime we moved out of shelter of the buildings to cross the narrow catwalk, the wind buffeting was tremendous and we were thankful for the sturdy railings. The elements of the 203 were molded into a seemingly permanent arc by the pressure of the wind. The smaller TH3 rode the storm much better, and the little Yagi did little more than shudder during the gusts. A problem developed with the rotor control and Vilho clambered up the tower to check the situation.

That evening after our dinner in the shabby but warm kitchen of the lighthouse, the bands were in poor condition and we gathered for some coffee and cigarettes around the table. We discussed our strategy for the remainder of the expedition and pondered whether or not we'd make it off the reef on schedule. We had communications with the mainland through the courtesy of the Mobira Company which had provided us with a reliable portable radio-telephone with direct-dial capabilities. Martti suggested that in the event we weren't able to land the boat, we consider arranging for a helicopter to return Wayne and I to Helsinki.

I produced a bottle of Finlandia vodka and Martti poured some into schnapps glasses and began his comedy routine.

"As they say in Finland," he began, "I don't think we came here to talk," and he downed his first glass. Kee turned on the TV (television

*c/o CQ Magazine



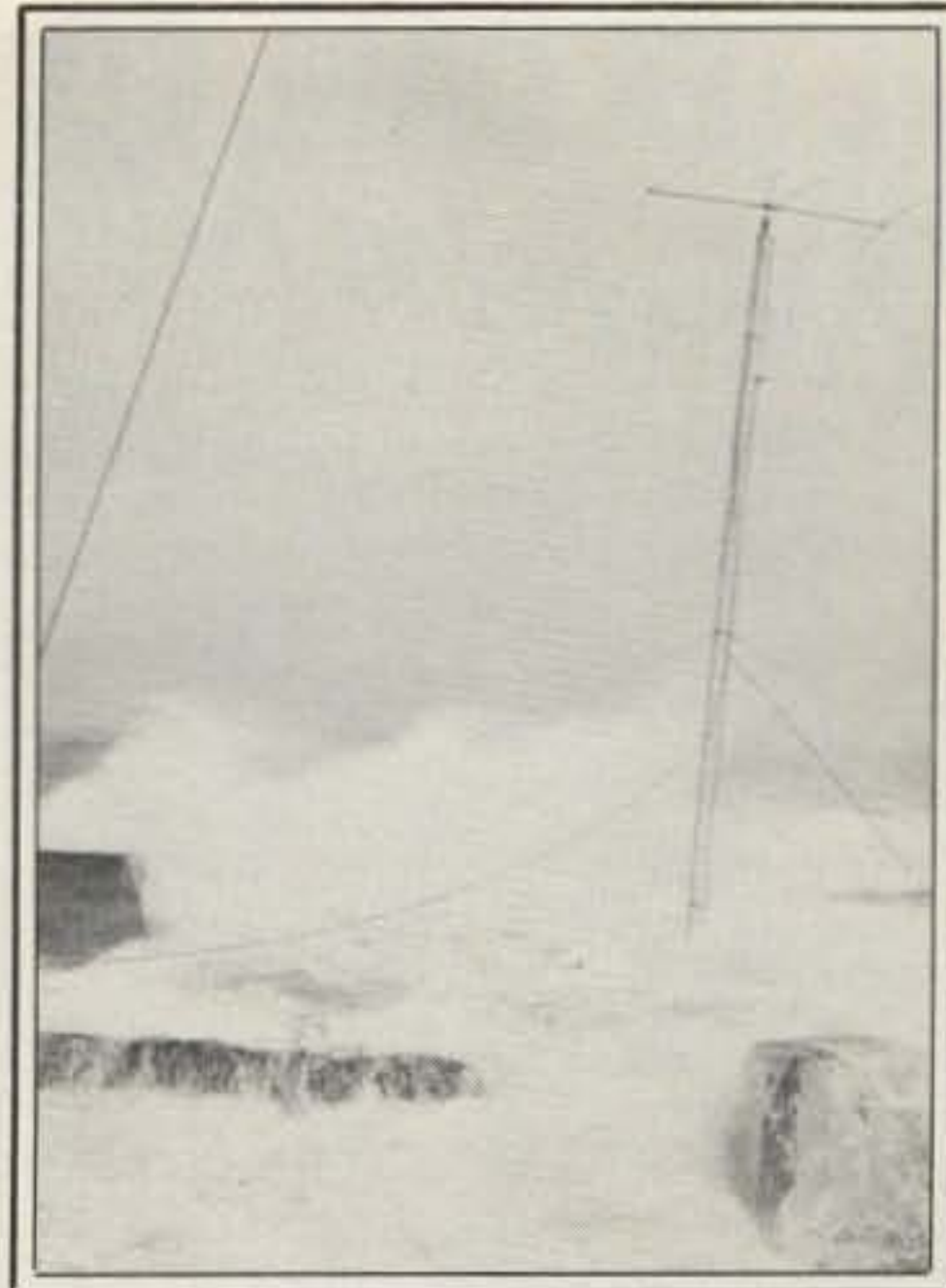
DXpeditioning is not always sweet and lovely. The waves came up to 30 feet at times, representing enormous power, which eventually knocked down the tower and carried it out to sea.

on an expedition?) and tuned to the "Twilight Zone" (appropriately enough) with Finnish and Swedish subtitles. The lighthearted mood continued as we downed the rest of the bottle and began to consume a bottle of cognac which Don had brought along. Martii promoted the idea that if the storm continued, we could all become band specialists, Vilho becoming friends with all the 40 meter JAs, Don and I getting to know the WVE ops on top band, and he learning about the family lives of the UB5s rolling in on 20 meter short skip. He even claimed to have worked all the UB5s from WAA to WZZ. After he had us in stitches he continued.

"You know that Don chose all the operating

frequencies in advance, and all I can hear on 7090 is sort of symphony from Radio Peking." The last of the cognac disappeared, and we began downing Johnny Walker and Pepsi. Martti launched into a tale of how he and a friend had been out in the woods with an old man, a veteran of the war. They'd had a bottle of vodka along, and as they shared it, they'd gotten the old gent talking about the battles he'd been in. Before long the fellow was running through the woods chasing an invisible enemy and shouting "RAUTAA RAJALLE"—Finnish for "More iron to the border." Somehow it sounded good in Finnish with the heavily rolled "Rs," even to American ears. It caught on and became our motto for the expedition. Later in the evening Kee, Martti, Don, and I climbed the narrow winding stairs to the light and received a spectacular view of the waves pounding Market Reef. The wind gusts were so fearsome that it felt at times as if the heavy plate glass would come crashing in on us. Sometime during the night, the balloon supporting the top-band vertical dashed itself to pieces on the rocks.

July 12, despite the worsening storm, our operation continued. Rates were still high and the bands were in good shape. The seas were now running between 7 to 9 meters and the winds in the 90 to 100 km per hour range. The waves crashed over the seawall and flowed to the base of the lighthouse. Water flowed over the entire island. Martti reported that as he sat in the "white house" a huge wave had surged over it. Market Reef now boasted its first flush toilet. The sea was now pounding the base of the tower. Vilho calmly pronounced that the tower would soon come down. He was right. About 30 minutes later while Martti, Vilho, and I watched from the catwalk, the first of the large guys gave way, and before any of us could raise a camera to catch the action, the tower swung toward the rocks in a graceful arc. The 203 was smashed and for some minutes the tower lay there. Wayne had been working 4Z4EU on SSB at the time and wondered what happened to the band. I rushed to the CW shack to notify Don. He simply nodded and kept operating. A barefoot Kee lashed a rope to his waist and took another line in an ef-



fort to get to the tower, but the winds drove him back to the shelter of the lighthouse. Eventually the tower was washed from the reef into the shallow harbor and large chunks of what had been the 203BA headed towards Sweden. Don remarked that Vilho would probably salvage the tower and try using it as a replacement for our top-band vertical.

The next day Martti and I decided that we couldn't stand to smell ourselves any longer.



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CIRCLE 76 ON READER SERVICE CARD

We grabbed soap and towels and braved the remnants of the storm to have a quick bath in one of the shallow pools of icy water on the rocks. The cold winds mercifully numbed us as we squatted and splashed ourselves like two oversized baby birds. Vilho was on hand to capture the moment on film for posterity. It wasn't the *most* unpleasant thing I've ever done, but it ranks near the top. We agreed that it had been worth the discomfort. That night we had another of our kitchen sessions. Most of us had run out of cigarettes, and Lars kindly re-supplied us from his stock. After we finished the last of the scotch whiskey, someone remembered the big bottle of Finlandia which we'd presented to the now-sleeping Lars as a gift. Martti told us that he would handle the situation and headed for the darkened bedroom. We heard Lars mutter something in Finnish and Martti returned with the vodka. I asked him what Lars had said.

"He asked if we would leave him his shirt," replied Laine. Don agreed to replace the gift.

The weather began to improve over the weekend, though as Kee had predicted, the waves were high even on Monday. Things didn't look good for a Tuesday departure. The QSOs continued to pile up, and Flink experimented with a number of top-band antennas. Don, Wayne, and I were ready to leave and were getting worried about the prospect of being forced to remain on the island despite assurances that a boat was standing by at Mariehamn ready to pick us up should the weather improve. Tuesday morning, as if pre-arranged, the seas were almost glassy-smooth and the sun was shining brightly. The boat arrived and the three of us waved our goodbyes to Martti, Vilho, Kee, and Lars, who would re-

main on the island until the following morning. We made our way back to Aland *almost* without incident. A steering cable broke and we drifted helplessly for about an hour until repairs were effected. By late afternoon the boathouse at Eckero came into view. We hurriedly loaded the car and drove to Mariehamn, where Don and I parted company with Wayne, who elected to spend the night in a hotel. We helped Wayne get settled in and enjoyed the use of his shower before we ventured to the Archipelag Hotel's disco to kill some time before driving to meet the government ferry for the mainland.

On Thursday, July 17th Jorma, OH2KI, and Ville, OH2MM, Martti, Vilho, Wayne, Don, and I were joined by wives and girlfriends and by Don's father, Kusti, K8HHZ, who had spent the week with relatives near Oulu. We met at Sasilik, a quaint Russian restaurant in Helsinki. After several toasts we enjoyed a fine dinner while being entertained by a Russian troubador. As I was enjoying the sound of a tender ballad, I was nudged in the ribs by Laine.

"Heil, I don't think this is the love song," he said. "I think this is about the next five year plan. Up with the production. Down with the drinking."

Kusti and Don were presented with what have to be some of the world's largest vodka glasses. Wayne received a liquid-filled plastic pillow to be placed in a refrigerator and used as an aid for a hangover. Martti then showed the slides which he'd developed the previous day. The women giggled as the shots of our bathing episode flashed on the screen. We enjoyed coffee laced with cognac as we relived the details of our operation. It was good to be back. [M]

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Here are the full details on how you can easily and quickly join these exciting activities.

Six Meters A Band of Many Faces

BY DAVE INGRAM*, K4TWJ

If you haven't investigated 6 meter's many areas of pursuit lately, you may be overlooking some exciting activities. While top of the sunspot cycle DX openings are no longer daily occurrences at this particular time, surprise propagation often allows amateurs using a couple of watts and a good antenna to work nearly every station on the band. When sunspot counts rise, 6 meters comes alive; almost every state in the union, plus South America, Australia, Europe, and a creditable number of exotic DX areas can frequently be found in the range of 50.00 to 50.25 MHz.

Today's surge in 6 meter interest is a result of several "alternate" propagation means and unbelievably versatile multi-mode rigs. Excluding 6 meter FM operations, most of the activity is between 50.050 and 50.150 MHz, with 50.110 MHz used as an internationally established band monitoring/opening watch/monitor frequency. There's more than enough excitement in this range to pique anyone's enthusiasm, and the usual 6 meter rig doesn't cost an arm and a leg to purchase.

The Predictable Side of 6 Meters

There are two types of relatively predictable activities on 6 meters: f.m. and associated repeater operations which encompass the range of 51.000 to 53.990 MHz and ground-wave SSB/CW operations which encompass the range of 50.000 to 50.999 MHz.

FM activity on 6 meters affords a substantially greater range than equivalent 2 meter systems. However, the true excitement of 6 meters lies in its SSB/CW activities. Disregarding band openings, evening SSB QSOs over distances of 70 to 150 miles are commonplace for most 10 watt rig and gain vertical setups. The relatively uncongested and wide-open air of 6



A prime example of mountain-topping or camping fun is exemplified in this TV tray setup situated in front of a camper. The top unit (FT-690R) and SWR bridge are used for 6 meters, while the bottom unit (FT-480R) is used for 2 meters. We'll let you guess which worked the most DX!

meters is a refreshing change from the sometimes hectic pace of HF activity, and this band is available for use by all amateurs holding a Technician or higher class license. Another appealing aspect of 6 meters is the new type of equipment and relatively small antennas available for this band. Their use almost resembles carrying long-distance communications capabilities in a hip pocket.

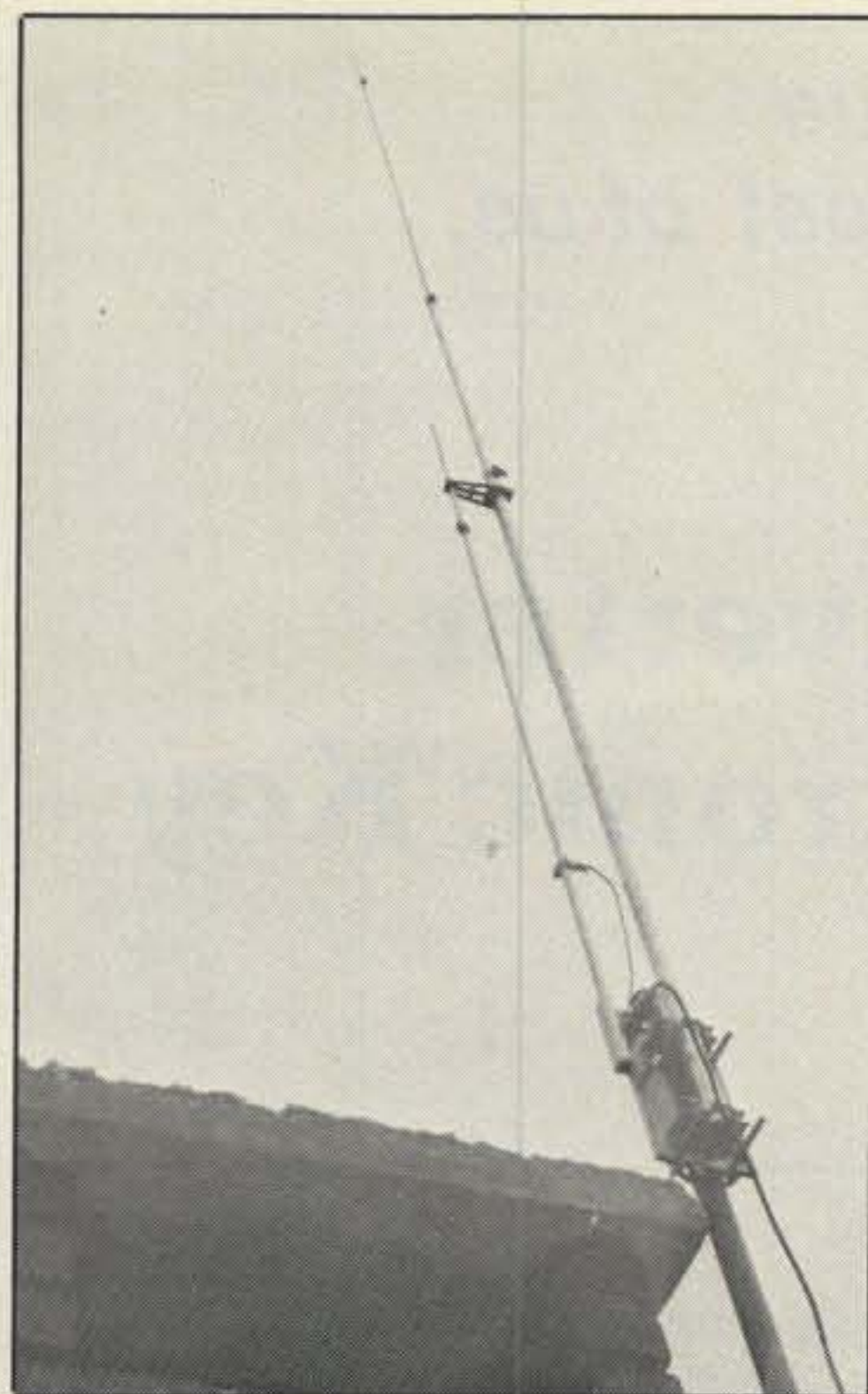
Skip Activity on 6 Meters

The true excitement and fun of 6 meters happens during long-distance band openings. An opening begins with only band hiss or "regular noise" being audible. Variations in this noise often indicate changes in propagation: a form of fading/increasing of hiss combined with a barely perceptible "roar" can be noticed as propagation begins to change. (This phenomenon is difficult to describe, but easy to recognize). The band soon comes alive with signals, and operations occasionally

resemble a holiday celebration. Low activity or rare states often create pileup conditions on 6 meters as numerous operators keenly realize this present state of VHF activity will not last very long. Stations begin stacking upward and downward from the centralized SSB frequency of 50.110 MHz, while CW operations begin flourishing between 50.060 and 50.090 MHz. Band openings of this type typically exist for a few minutes to a couple of hours. Then almost as abruptly as the surprise propagation began, the band closes. Fortunately, however, additional openings usually happen before one's interest dwindles or before the excitement wears thin. (These conditions have also been noted coinciding with ionospheric storm conditions on HF. Checking 6 meters and television's channel 2 when 20 meter conditions are poor can be quite rewarding.)

While the previously described DX operations on 6 meters are due to sporad-

*Eastwood Village No. 1201 So., Rt. 11, Box 499, Birmingham, AL 35210



This KLM JV6 six meter vertical radiator is approximately 15 feet extended and 65 inches collapsed for transportation. That collapsed size fits perfectly in most cars.

ic-E openings, several exotic forms of propagation are also experienced on this band. Auroras (or Northern Lights), meteor showers, and tropospheric ducting or scatter challenge abilities of devoted amateurs during both high and low sunspot-activity years. A full discussion of these aspects, however, is beyond the introductory scope of this article. We'll thus summarize by stating that 6 meters is truly a propagation pioneer's haven!

Equipment for 6 Meters

The days of 6 meter AM rigs such as the classic "Gooney Box," Gonset's rather large portable of the early 1960s, are definitely past. A new wave of outstanding yet comparatively inexpensive equipment is available to the budding VHF enthusiast, and SSB is the mode in vogue. Most modern 6 meter transceivers operate in the 10 to 20 watt range, while QRP units in the 2 or 3 watt category are quite popular for portable and mountain-topping activities (camping and 6 meters are an ideal combination).

Although three-element Yagi antennas are popular for 6 meter operations, we personally prefer gain verticals. Omni-directional antennas are very beneficial for spotting band openings and contacting stations before beams swing and activities boom.

Joining the Action

If you've never operated 6 meters, you're set for a treat, and you're not alone. Numerous amateurs are also

learning about this band's special attractions each day. Few getting-started problems are experienced by isolated amateurs, reducing the need for a helping Elmer. Any inexpensive s.w.r. bridge can be used for checking/tuning 6 meter antennas, and a small army isn't required for their erection. Likewise, operating in the 10 watt range shouldn't cause excessive TVI (check this closely, however; 6 meters is frequency-adjacent to TV's channel 2).

Set your rig on 50.110 MHz, and continue previous activities until signals begin to appear. If the rig operates FM, setting its squelch precisely at threshold is suggested. The unit will sit quietly until signals appear anywhere within ± 5 kHz, and then squawk like heck to announce freshly heard activity (*don't transmit FM in this portion of 6, however!*).

If you would like to really experience some operating excitement on 6 meters (and realize the aspect of being DX rather than the DXer), try traveling to a high-altitude location in a nearby or rare state. If

such mini-expeditions are planned for bordering several states during a VHF contest period, one surely will conclude that VHF RF energy seems to have an ionizing effect for creating band openings. Somehow that situation will happen almost every time!

We've occasionally heard older amateurs state that their communications interests have dwindled, and such remarks simply don't make sense. Operating new bands and modes definitely has a way of rekindling any waning interest or keeping one very fascinated with our exciting amateur radio world. If you're in a rut and thinking there's nothing new under the sunspot cycle, try a new band such as 6 meters. We're quite confident that you'll realize a renewed enjoyment—and possibly realize reflections of your early days in amateur radio—when each QSO was exciting and something you wanted to share with others. Our world of amateur radio is filled with fascinating pursuits, and they're awaiting your investigation. Enjoy!

CQ

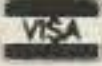

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RS-20A, RS-20M, RS-20S, VS-20M	16	20	5 x 9 x 10 1/2	18
RS-12A, RS-12M, RS-12S	9	12	4 1/2 x 8 x 9	13
RS-10A	7.5	11	4 x 7 1/2 x 10 1/4	11
RS-7A, RS-7B	5	7	3 1/4 x 6 1/2 x 9 4 x 7 1/2 x 10 3/4	9
RS-4A	3	4	3 1/4 x 6 1/2 x 9	5

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VE3QQ comes through with another unique project to satisfy the craftsman urge in most of us.

How To Build An Instant In-Line Inverter For Your Negative Electronic Key

BY ALBERT H. JACKSON*, VE3QQ

This plug-in adapter is designed to give safe and convenient positive output to the normally negative Vibroplex EK-1 and should work equally well with other comparable keyers. The deceptively simple alternative of "turning over the key leads" can be risky: with cathode keyed transmitters this could place unsafe voltages on the brass base of the keyer, and grounding the base, accidentally or otherwise, would short the keyer supply through the output transistor in the key-closed condition.

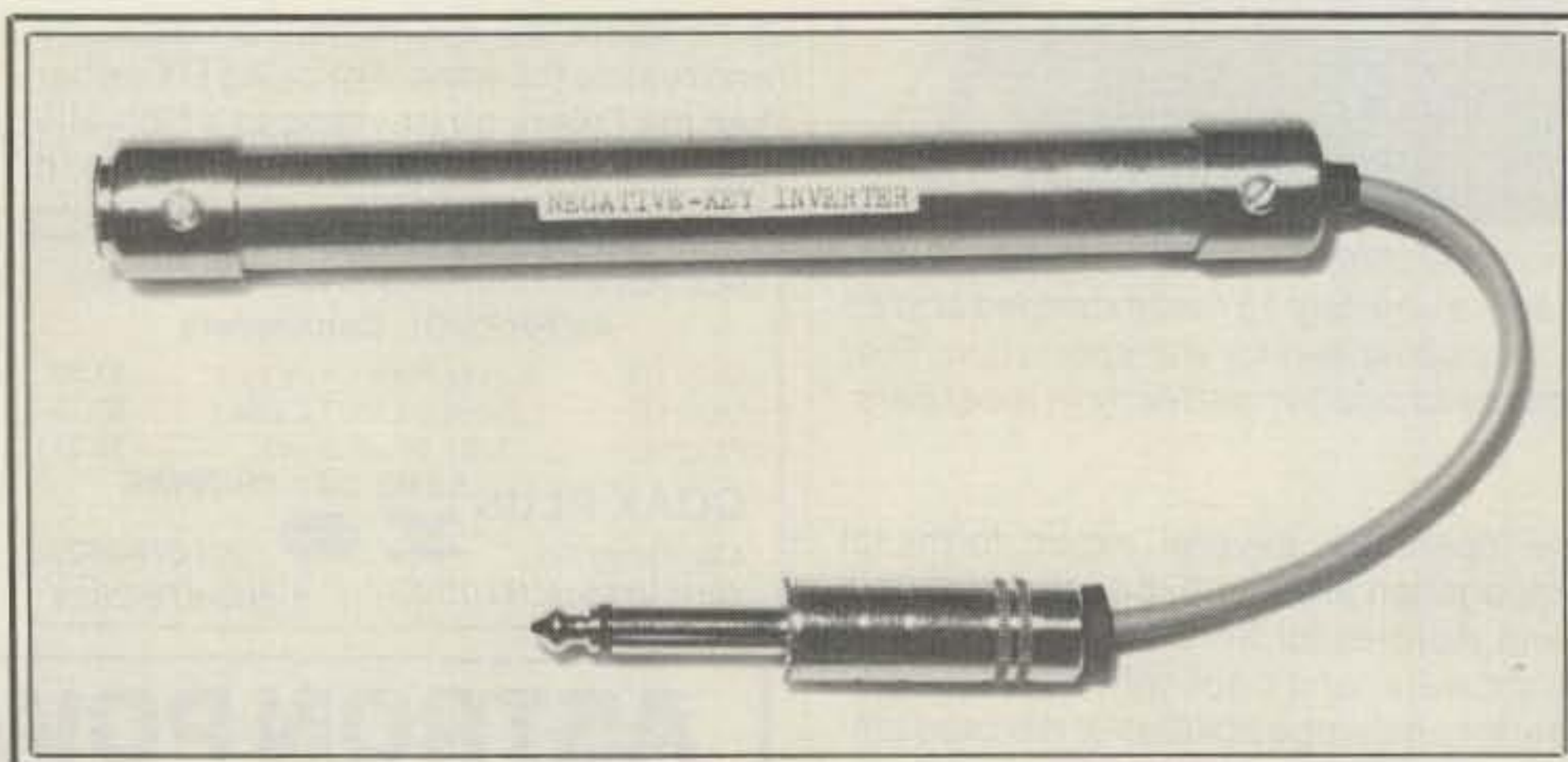
A better, hazard-free approach is to modify the keyer for frame grounding as described in a previous article,¹ and then to connect it through an output inverter like the one presented here. Even with a different keyer having its own means of polarity change, you could find this self-contained accessory faster and easier to use.

Circuit

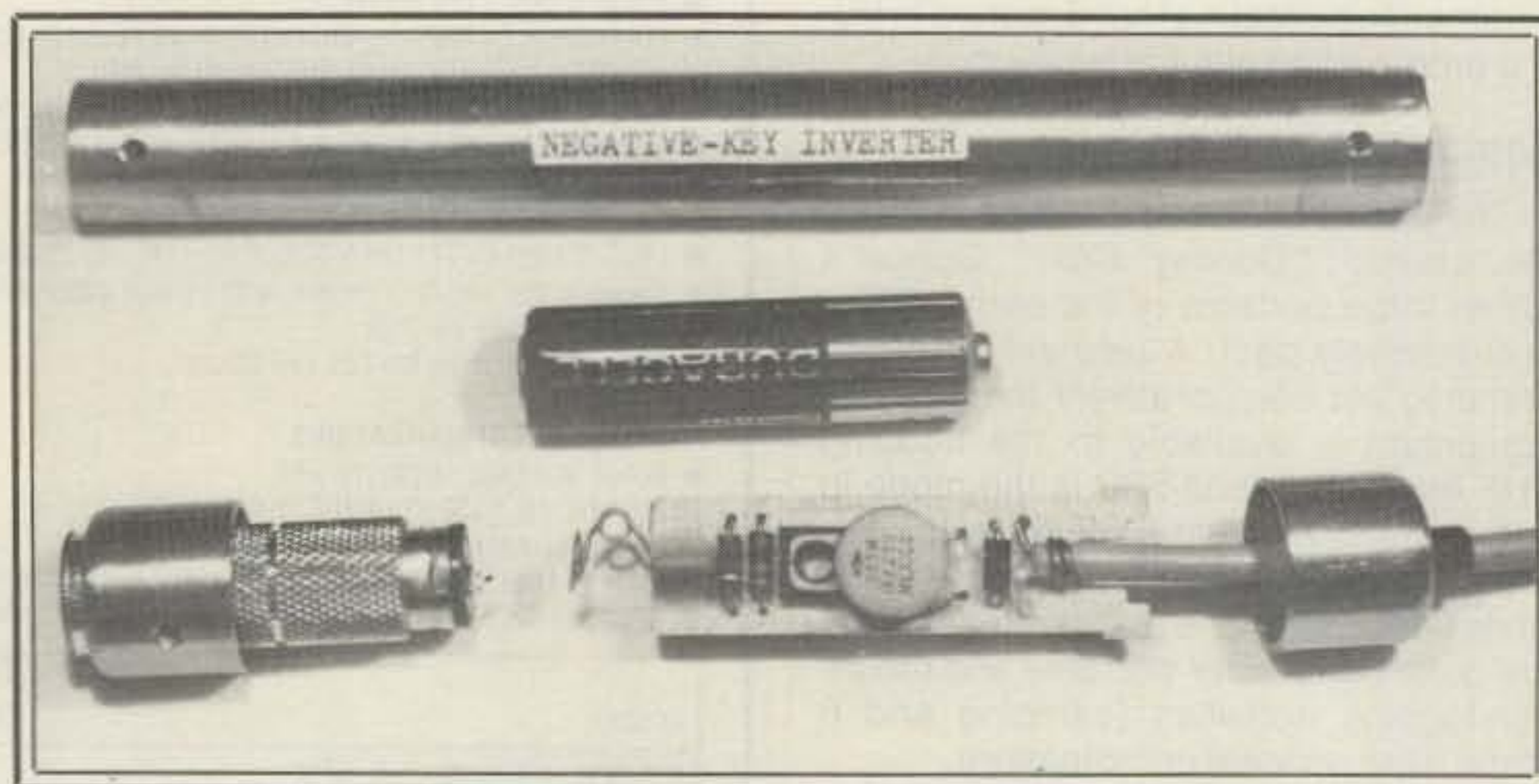
The schematic, fig. 3, is similar to the "Band-Aid" circuit given in an earlier article by K2SE,² but represents a 1 1/2 volt input version of the Curtis 8044 IC positive control system with the same keying capabilities: up to +300 volts at 200 ma. Depending on the resistance chosen for R1, the internal AA battery should provide shelf-life service for low and medium output currents, and somewhat shorter terms for increased loading and heavier transmitter requirements. Be sure your rig's key-line open circuit voltage is safely below the above-mentioned limit, measure its key-closed current, and select an appropriate 1/4 watt value for R1 using Table I as a guide.

For a given R1 figure, the small and usually unimportant transistor residual collector/emitter voltage drops with lower key-line current and vice versa, while

*215 Brock St., Box 994, Stayner, Ontario, Canada L0M 1S0



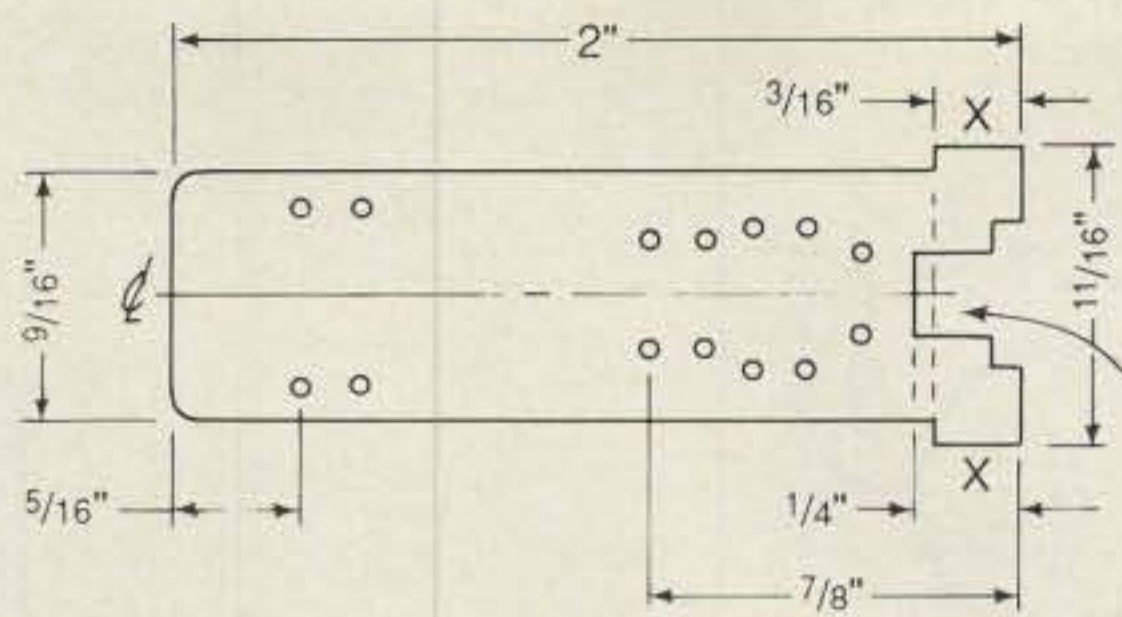
Though the photo has darkened the lacquered copper case, this is the completed in-line inverter.



With the case removed, the inner components look like this.

Approximate Circuit Characteristics (key closed)				
With R1	I Battery	At I Collector	E Collector/Emitter	R Output
470 ohms	1.7 ma	30 ma	.16 volts	5.3 ohms
150	4.8	70	.16	2.3
75	8	100	.18	1.8
33	22	200	.26	1.3

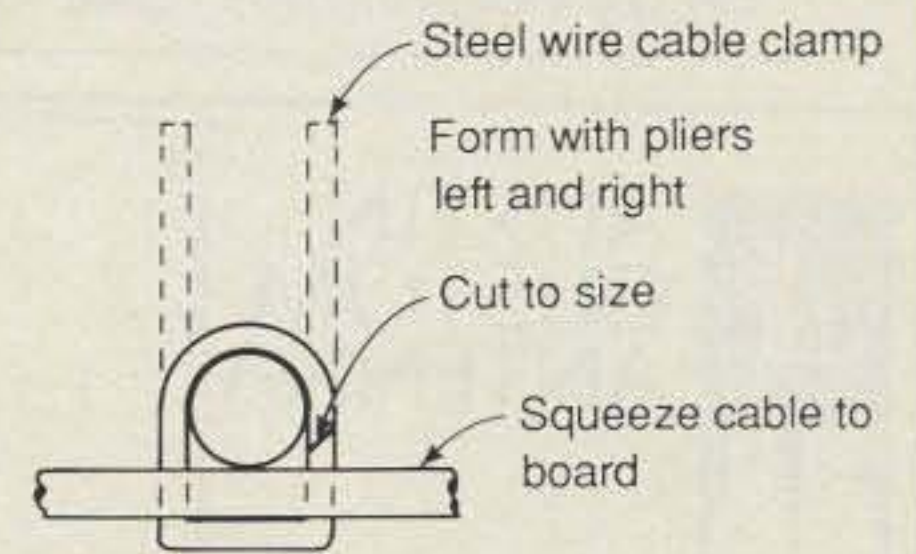
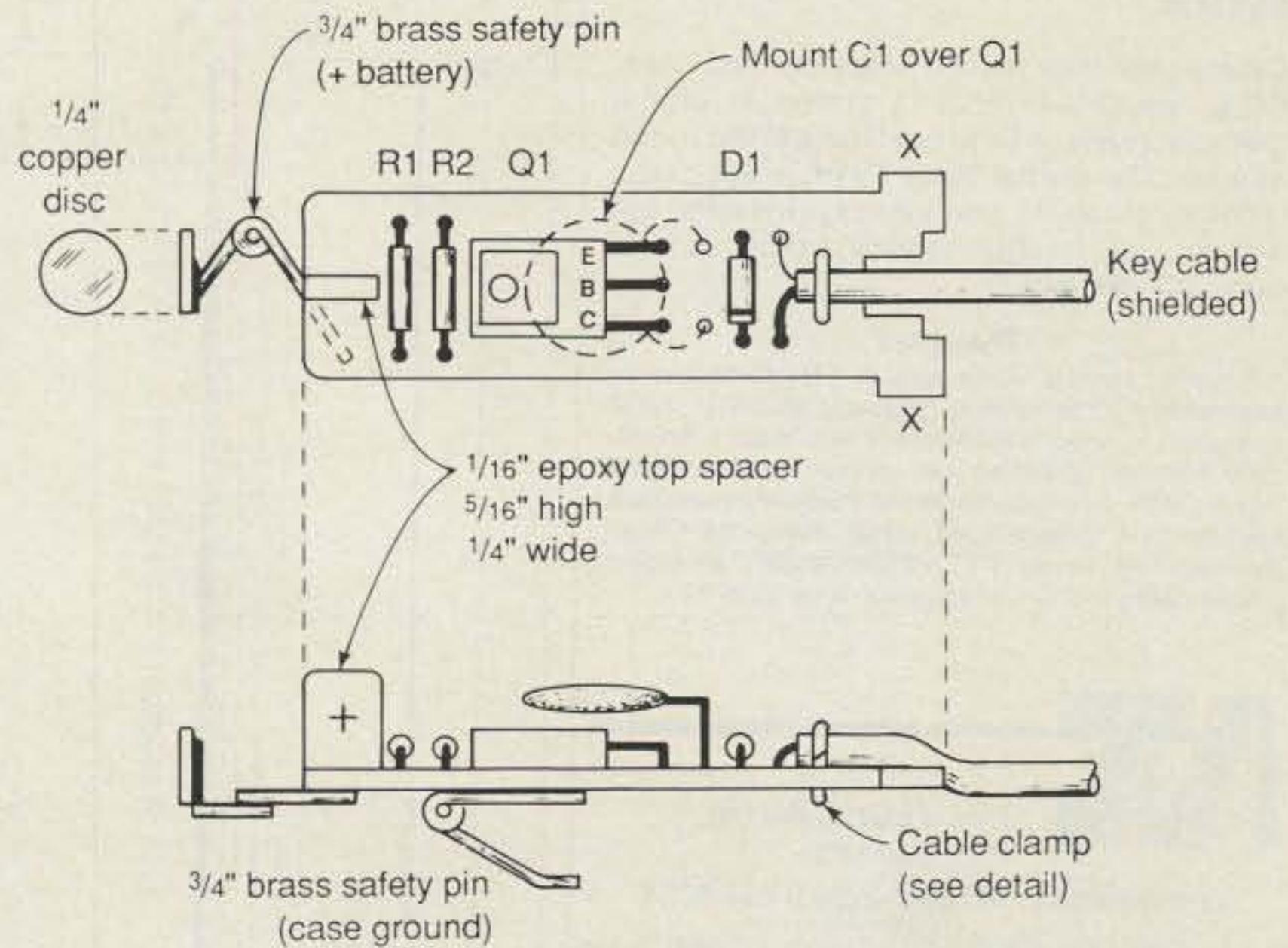
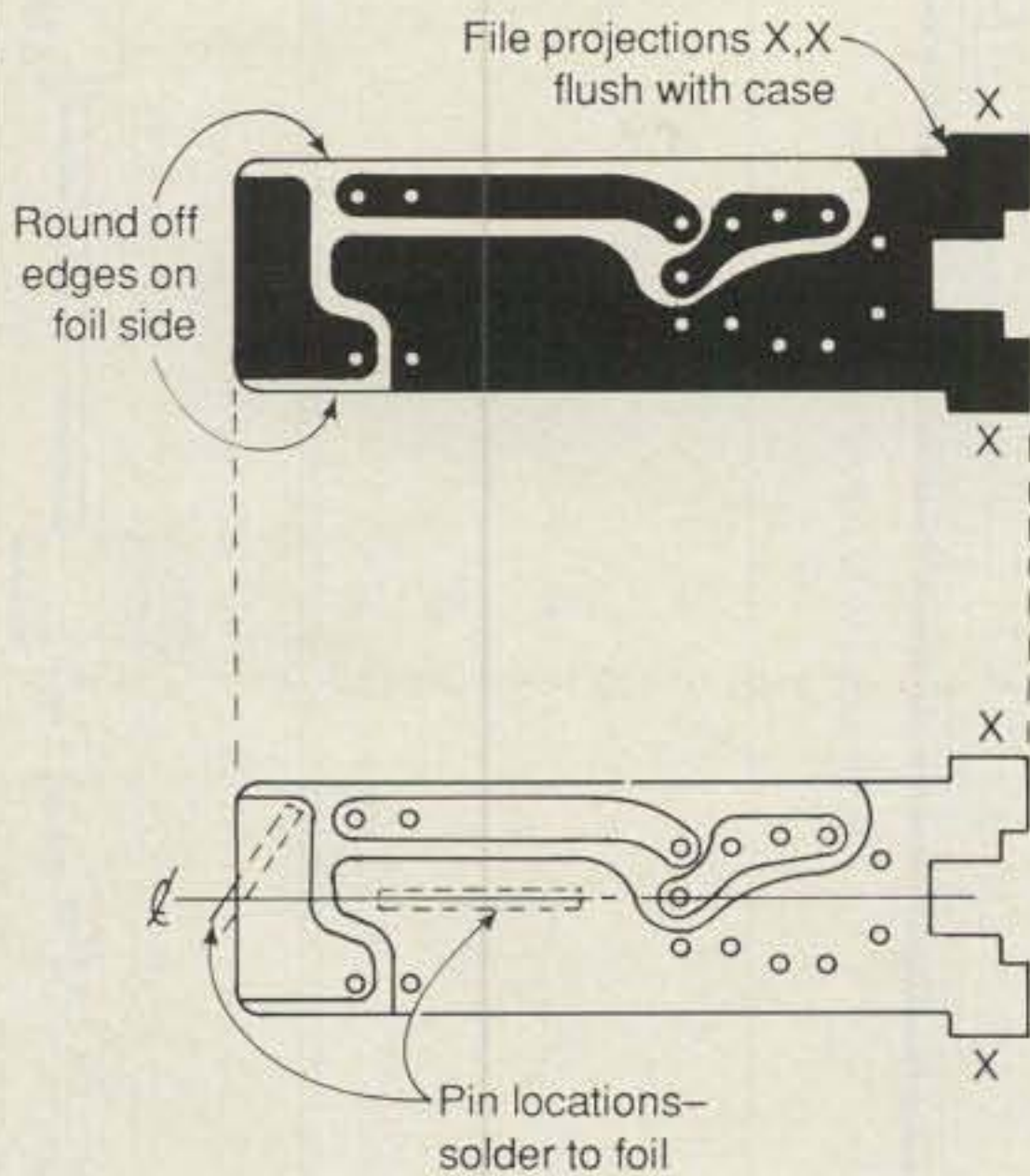
Table I—Approximate circuit characteristics with key closed.



Holes: #58 drill
 Horizontal spacing: 1/8"
 Vertical spacing: 3/8"
 Transistors: 1/8"
 Capacitor: 1/4"
 Diode: 5/16"

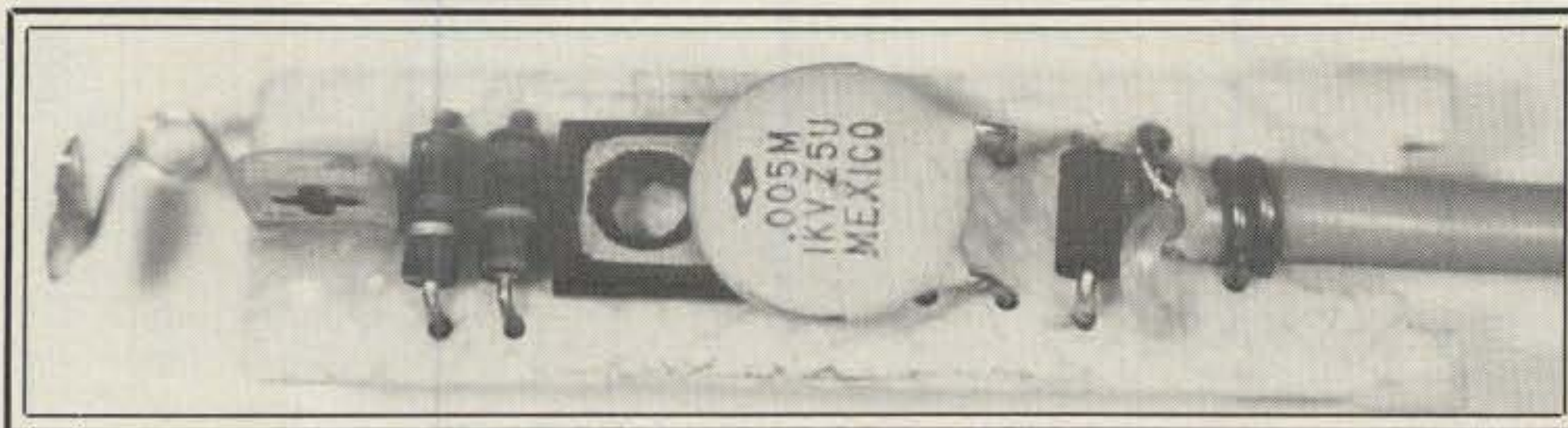
Clearance for cable grommet

1/16" EPOXY BOARD (COPPER CLAD 1 SIDE)

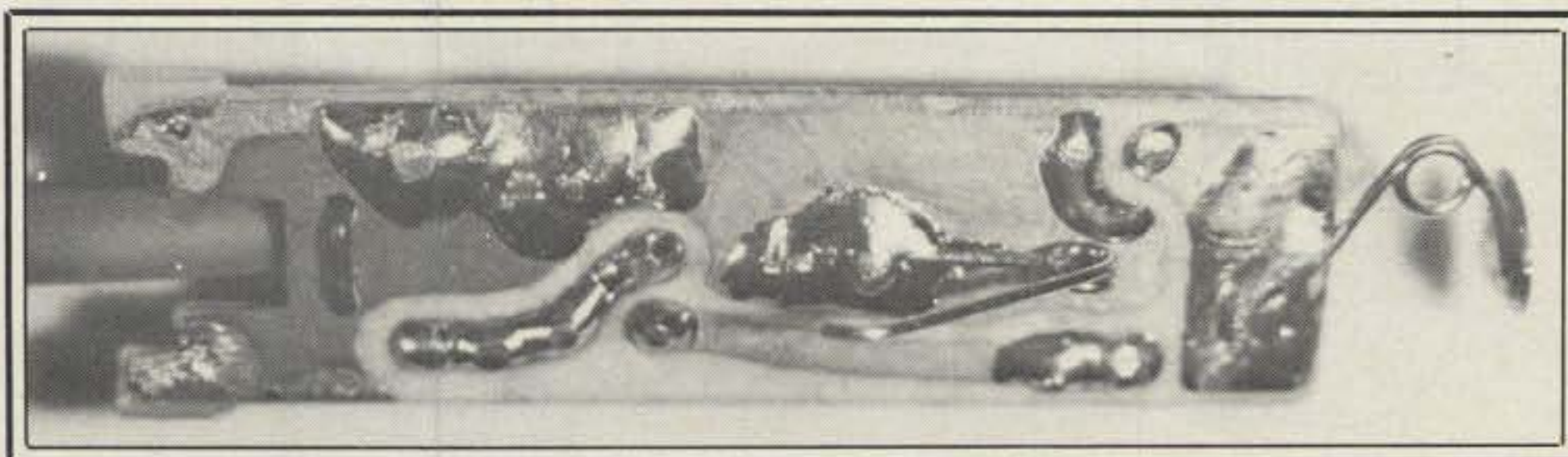


DETAIL (2X ACTUAL SIZE)

Fig. 1—Circuit board details including parts layout.



A close-up of the mini-size layout.



The foil side, with its contact-making pin-springs soldered in place.

the output resistance remains relatively constant. Interpolate a resistor value consistent with minimum battery drain and satisfactory keying in your transmitter. The very high key-open resistance of the EK-1 will have negligible effect on battery life during periods of non-use, and the usual CW duty cycle eases the load while operating.

Construction

Cut and file the circuit board to size as diagrammed in fig. 1, round off its lengthwise edges on the foil side, and proceed to the "plumber's delight" case. This consists of a short length of 1/2 inch trade size (37/64 inch ID) rigid copper pipe and two end caps, sawed, smoothed, and assembled as indicated in fig. 2. (Don't try to use a rotary pipe cutter, which might reduce the end diameters by rolling the edges inward.)

Insert the circuit board into the pipe.

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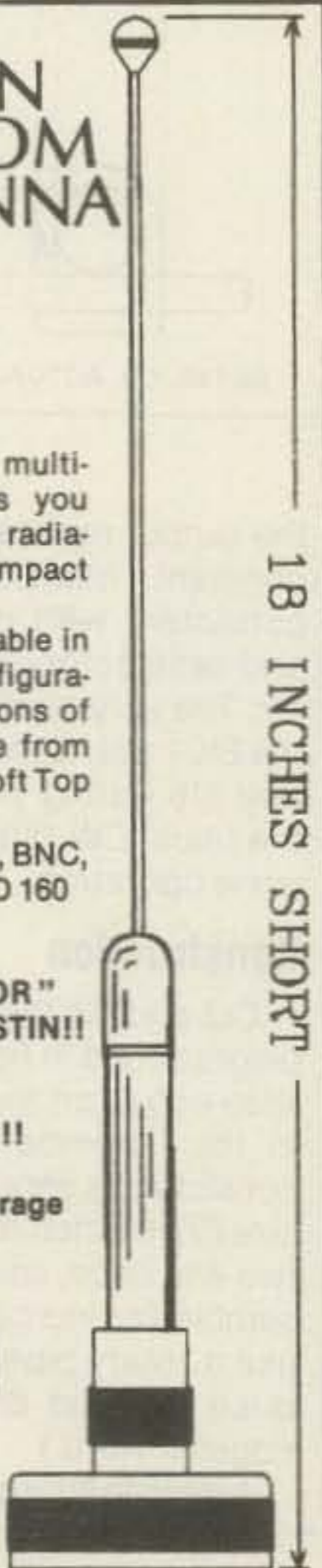
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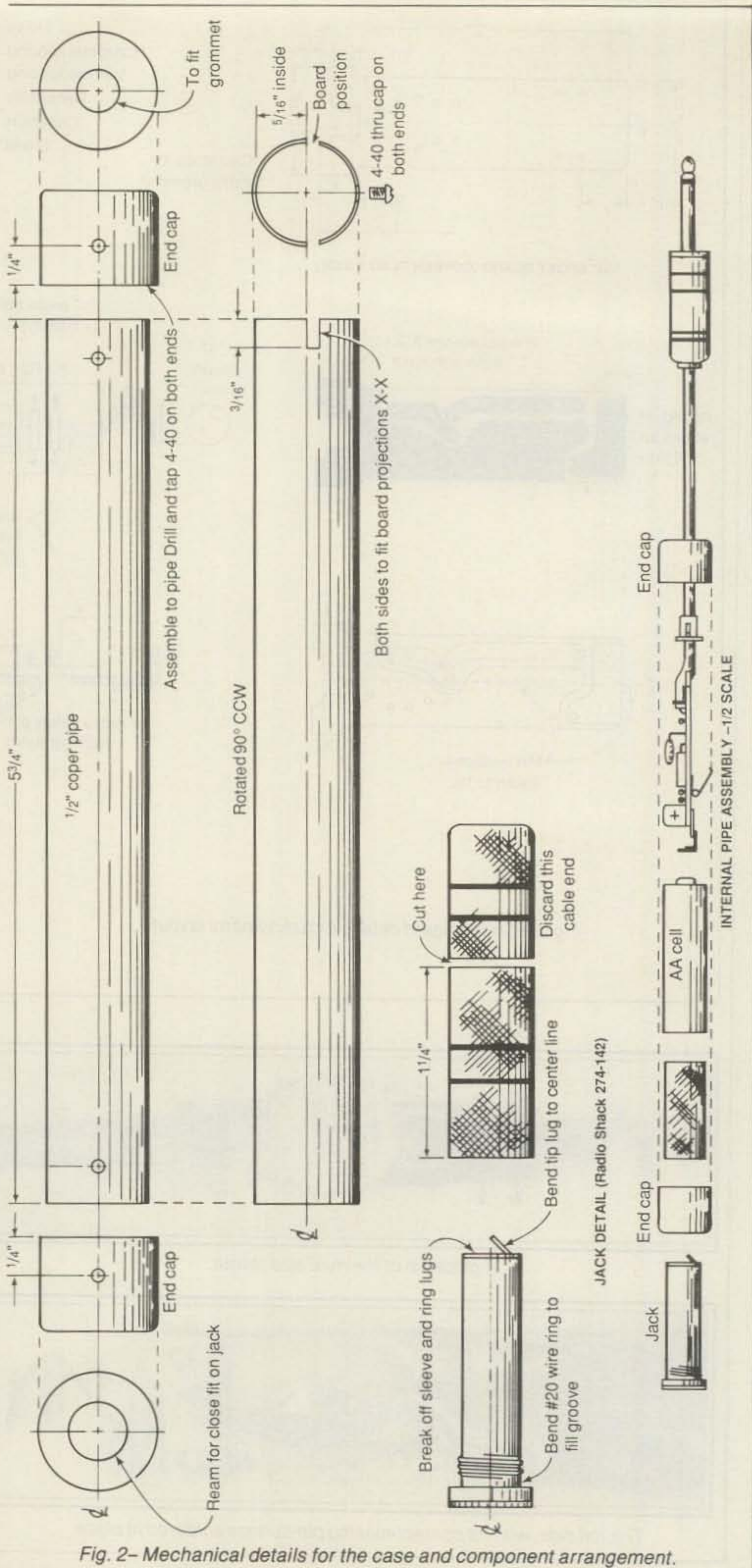


Fig. 2- Mechanical details for the case and component arrangement.

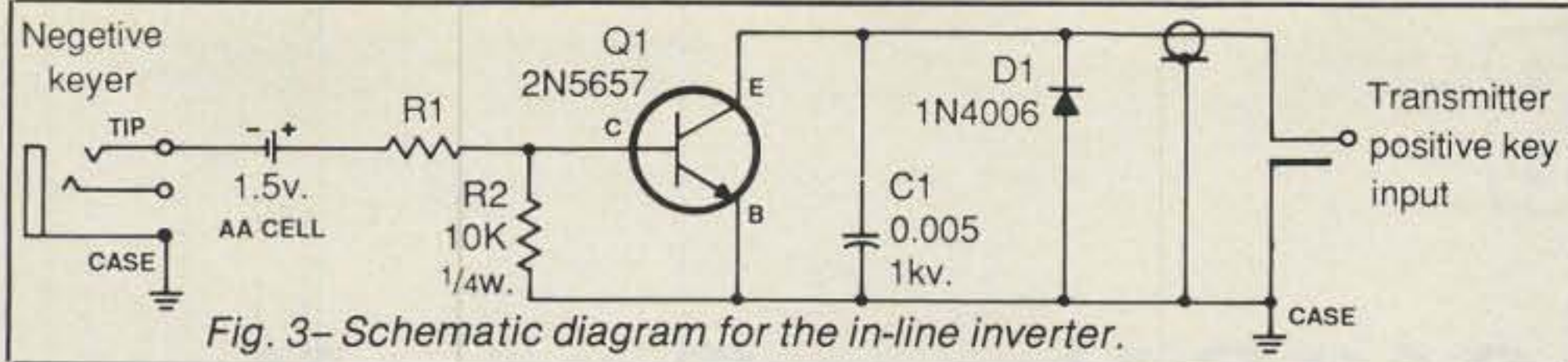


Fig. 3—Schematic diagram for the in-line inverter.

Mark, cut, and fit the notches shown at the right of the lower drawing to accommodate the side alignment projections "X." When the board is fully seated, file these projections even with the outer surface. On completion, the copper case was burnished with a strip of fine emery paper and given a few coats of clear spray lacquer (end caps in place, holes blocked on the inside). It could, of course, be plated for greater finish durability if you prefer.

Prepare the input jack by cutting its outer shell at the given line to produce a shortened mounting collar. Because the collar walls are thin, the end cap hole should be just large enough to pass the threads on the jack, and final reaming (or filing) is recommended. Treat the terminal lugs as noted on the sketch.

Circuit Board and Final Assembly

Draw, etch, drill, and finish the board details, making sure all parts will clear the confining outer pipe. Attach the top spacer with 5-minute epoxy cement. Two


small brass safety-pins act as partly formed springs for the positive battery and case ground connections. Cut off the clasps, bend and trim as shown, and solder in place. Center the battery contacting disc inside the case.

Apply a little liquid thread sealant (*Loctite*® or equivalent) to the screw portion of the jack to prevent loosening of this safety ground connection. String the components together in the order indicated in fig. 2 and the photo. Be certain both pin springs remain in compression, insert the end-cap retaining screws, and check operation with your positive rig and keyer. That should complete your quick-change keying inverter.

My thanks to Miss E. Sheffer for the photographs.

References

¹Jackson, A.H., "How To Improve The Vibroplex EK-1 Brass Racer Keyer," *CQ*, October 1984, p. 13.

²Solov, E., "A Band-Aid For Keyer Polarity," *CQ*, February 1983, p. 89. 

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The MFJ-949C Versa Tuner II

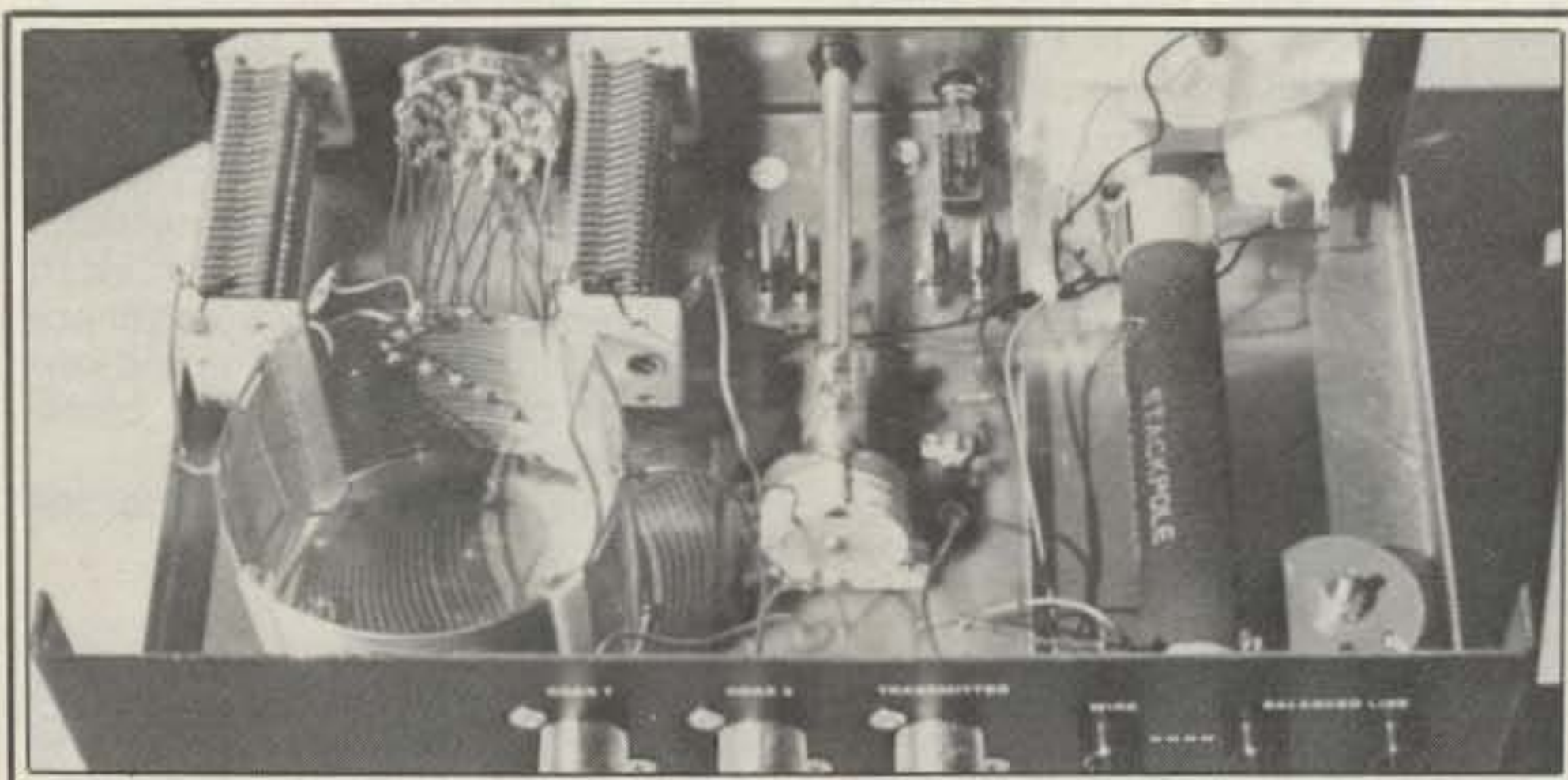
BY LEW MCCOY*, W1ICP

MFJ Enterprises manufactures a rather extensive line of Transmatches, and I recently had the opportunity to test their model 949C, which is also designated the "Versa-Tuner II." I have probably designed, built, and wrote up more antenna tuners (Transmatches) than anyone around today, so I had a real interest in the MFJ unit.

The circuit of the antenna system matching portion, fig. 1, shows us that the 949 is what is now considered standard for those Transmatch circuits using a tapped inductor. Both input and output capacitors are 208 pF variables used with a tapped/switched inductor L1. However, the 949 is much more than just the matching portion of the circuit. Also included is a POWER/SWR bridge for tuning up. Additionally, there is a complete switching circuit whereby two different coaxial-fed systems can be switched or a bypass position is available for removing the Transmatch from the antenna system. Or, if desired, a single-wire or balanced-line feed can be used and matched. A bonus is a 300 watt, 50 ohm dummy load that can be switched in to provide a perfect tune-up or testing load for the transmitter.

The meter used for POWER/SWR is the dual needle type. One needle indicates reflected power and the other, forward power. I had used such an indicator some years ago and liked the system then, just as I do now with the Versa Tuner. Essentially two meters in one, the indications are easy to follow, and tune-up and adjustment of the 949 becomes routine. The meter is calibrated with three scales—forward power (up to 300 watts), reflected power (50 watts), and SWR. There are two power ranges, 30 watts or 300 watts, available by means of a panel switch.

As MFJ points out, the 949, using a tapped inductor, will match most antenna systems to a perfect match. There are some antenna loads that fall outside of the range of the system, but it is usually



At the upper left in this rear view are the two variable capacitors and the tapped inductor. At the right-hand side is the noninductive dummy load resistor.

easy to tailor such antennas to come into the "perfect" matching range. I use a double-extended, 80 meter Zepp for my wire antenna, with open-wire feeders. This antenna system, when used on all bands, will present some rather extreme matching situations on some bands. I found that with the 949 I could obtain 1.5 to 1 or better on all frequencies. One

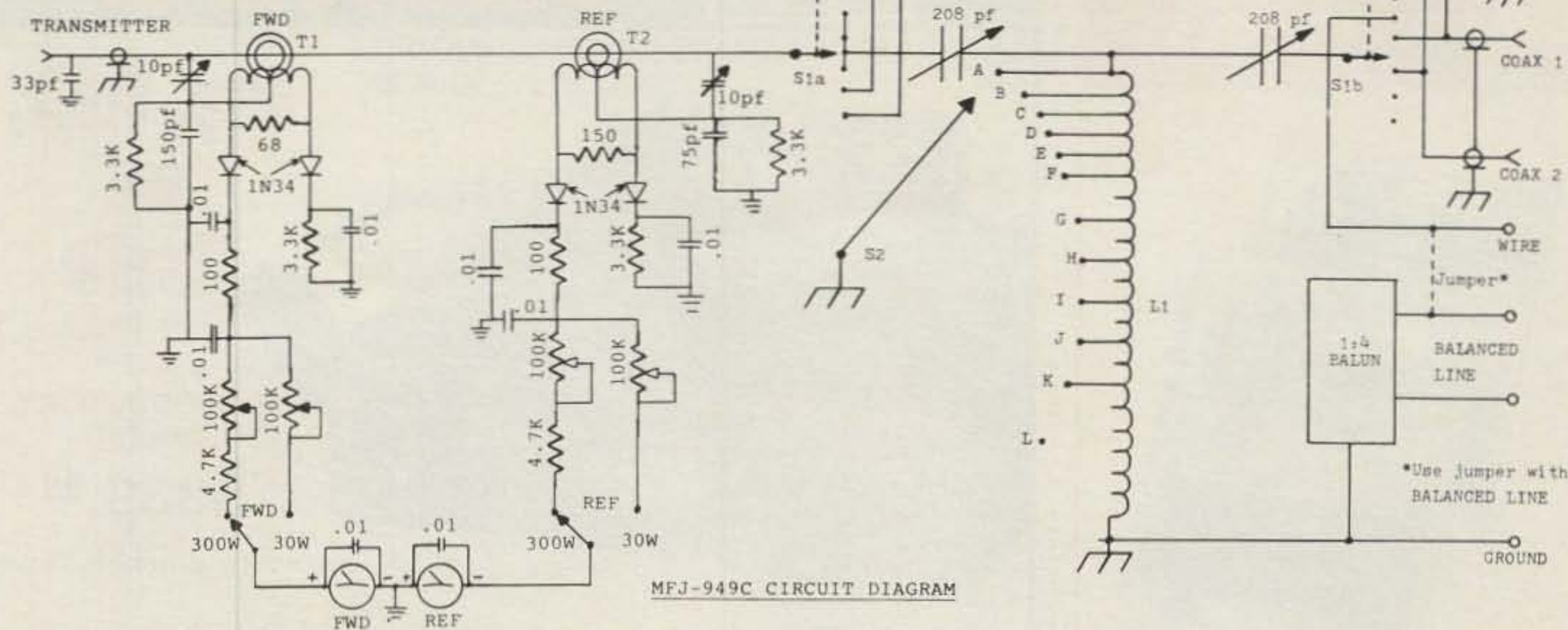
thing about such a system—the load will always be "relatively" high impedance, so it isn't always the best test for a tuner. Physically short verticals for 160, 80, and 40 can present very low reactive impedance. Sometimes, assuming the vertical is very short, radiation resistance becomes a fraction of an ohm. Such loads can be the real test for a fixed (tapped) in-



This photo shows the front-panel controls. The SWR/Power meter uses a dual needle type meter, at the left.

*Technical Editor, CQ, 200 Idaho St., Silver City, NM 88061

Fig. 1— This is the circuit of the MFJ 949C. The left-hand portion of the circuit makes up the power bridge and SWR detectors. At the right-hand side is the actual tuning network.



MFJ-949C CIRCUIT DIAGRAM

ductor tuner. (Roller inductors make such matching relatively easy.) In most cases, the 949 handled these short antennas very well.

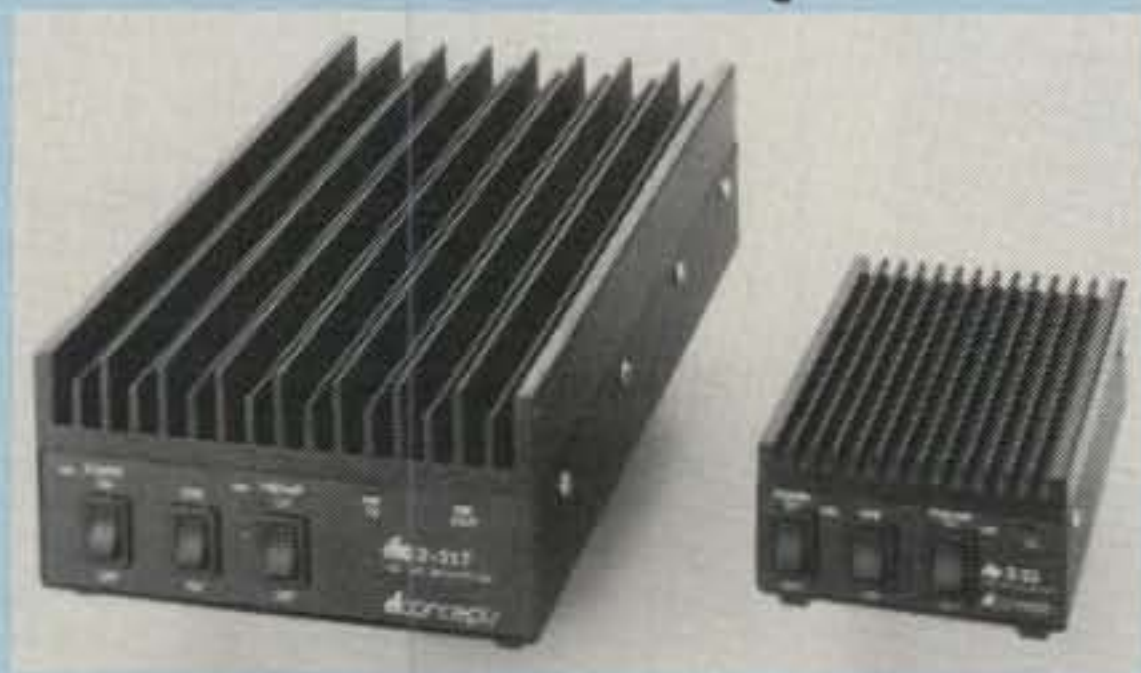
The maximum power rating the tuner will handle is 300 watts. MFJ's instruction manual, which by the way is excellent, carefully points out that the 300 watt level should not be used for more than two min-

utes, key down. In other words, the 300 watt rating is for CW or single-sideband, not RTTY. I tested the unit on RTTY at 150 watts and had no problems. Also, as pointed out in the manual, this unit, or for that matter any Transmatch, must be adjusted for a match using the lowest possible power. After a match is achieved, then, and only then, should power be

brought up to normal operating levels. Under unmatched conditions some very, very high RF voltages can be developed, causing arcing of components.

The 949C measures 10 1/4 inches wide, 3 1/4 inches high, and 7 inches deep. It lists for \$149.95 and is available from MFJ Enterprises, Inc., Box 494, Mississippi State, MS 39762.

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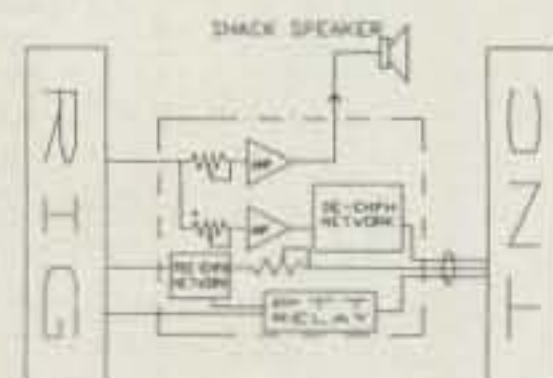
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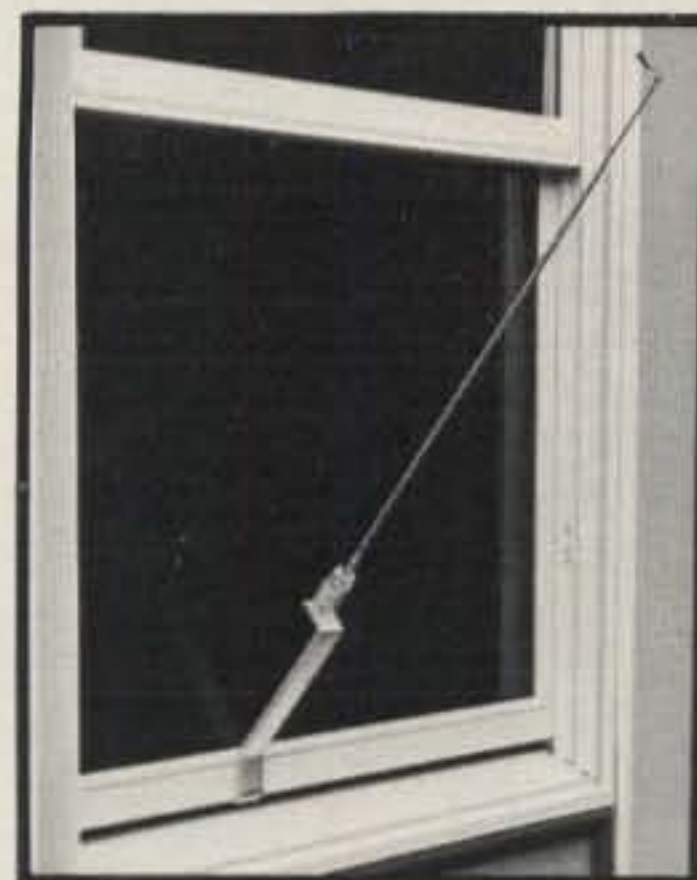


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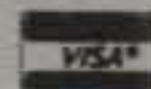
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Editor, *CQ*:

I am writing to you as both an amateur radio operator and as Director of Handicapped Affairs for Revere, Massachusetts. Amateur radio has always had a strong tradition of brotherhood and sisterhood regardless of physical ability. In keeping with this tradition, I would respectfully request that clubs when advertising classes, exams, meetings, flea markets, and hamfests let it be known if the event is wheelchair accessible. I would be remiss if I didn't urge all such events be held in accessible locations, but being a realist I understand this is not always possible for many reasons. It would, however, save time and inconvenience if the information would be included in writeups and flyers.

Steven J. Rich, WA1DFL
Revere, MA

SK Old Friend

Editor, *CQ*:

How many times have we used that final international signal SK to indicate the end of our QSO, and that we were going to QRT the big switch? How many times indeed. How many times have we read the monthly published listings of Silent Keys with casual disinterest and finding no personal implication of interest, quickly proceeded to the more interesting technical articles?

I was recently shocked, saddened, and

diminished when informed that William R. Stocking, W0VM, had signed his final SK to life's greatest QSO. Bill was more than just a friend or fellow ham radio buddy. Bill's own personal brand of patience, kindness, and consideration extended to all who came in contact with him and can never be forgotten. His love of ham radio was genuine and sincere, and he did not hesitate to share his knowledge of and love for our hobby with everyone he came in contact with. The Bill Stocking mold was and remains a rare limited edition... a collector's item.

We shared our mutual interests in antenna design and experimentation. Our theoretical disagreements seldom exceeded ten percent of our discussions. As a former teacher, Bill's mathematical expertise was always available to me in solving a complex math quotation beyond my comprehension. Bill was never "too busy." His soft spoken "hello" when answering the telephone was indicative of the man himself. Bill's cheerful and happy reception of my phone calls always led to lengthy conversations of and about ham radio.

I shall miss Bill Stocking. I can only extend my humble, feeble, and obviously inadequate condolences to Bill's family in their hour of sorrow. I shall always cherish the memory and friendship of Bill. SK, old friend. I shall miss you.

Jack Sobel, W0SVM
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CIRCLE 53 ON READER SERVICE CARD

Will the new Novice privileges lead to fewer Novices upgrading? KB1N addresses that issue this month in an open letter to his daughter, KA1PMU.

Dear Anita

BY PETER R. O'DELL*, KB1N

Dear Anita,

You've passed a few milestones already in your short life as an amateur. When you asked last fall to attend a Novice class, your mom and I had our doubts. You are only nine years old, and we didn't want to push you into something that you weren't ready for. You stuck with the class and passed the test with flying colors.

We ordered the Heathkit keyboard for you. You took to kit building like a duck takes to water. But getting you to use it was something else. You just didn't seem to care for CW all that much.

Now with Novice Enhancement in place, you've made contacts on 10 meters and 220. I'm not sure which you prefer the most, but both are ahead of CW in your book; that's obvious.

I see a question that is forming in the back of your mind now. Very simply, it is this: "Now that I've found out that I like 10 meter phone and 220 FM better than CW on any band, do I have to go ahead and upgrade? What would be the benefit to me to upgrade?"

These are simple questions, yet the answers lie at the heart of this hobby of ours. How you answer these questions for yourself may indicate how you will do in life. No, ham radio is not the "SAT" for "Real World U." This hobby does present challenges and opportunities that mirror things you will encounter in life. Most people fall into a habit of responding to challenges in the same way, regardless of the context. Learn your lessons well here, for they will be of service to you in the years to come.

Weigh the Benefits

On a very simplistic level, all you need to do is look at the other bands and frequencies that are available to you as you upgrade. When you pass the Technician test, you will immediately have all of the bands and privileges above 50 MHz. If you lived in an area where 220 MHz FM

activity was not so extensive, you would be anxious to have access to 2 meter FM.

With a little more theory and some work on Morse code, you will be able to pass the General exam. That will give you voice privileges on all the HF bands as well as CW on 20 meters. Additionally, you'll be able to use the digital modes on the HF bands. Like the Technician, the General offers major additional privileges. More study and work will net you the Advanced and Extra, should you desire to go for these. Both offer additional frequencies for phone operation, and the Extra gives you access to the DX portion of the HF CW bands.

Being a ham is like attending a smorgasbord. Before Enhancement, Novices could only eat the baked beans of CW. Now you are allowed to have some corn bread, iced tea, and a little desert to go along with your beans. Look around you, though, and you will see that the other license classes are treated to all the delicacies of the world. If you are satisfied with a limited diet, then so be it. There is more; all you have to do is ask for it.

Weigh the Investment

Nothing in life is free. You'll learn more about that as you grow older and wiser. Outside of some insignificant fees for taking the tests, upgrading doesn't cost you any money. But you must invest your time and effort into preparing for the exams.

The merits and drawbacks of CW have been debated ad nauseum in the last few years. Even though the FCC has granted voice privileges to Novices, it will probably be years before CW is de-emphasized in the amateur exams. What I am telling you is that whether you like it or not, you are going to have to come to terms with it.

Unless you have a learning disability (and you don't), CW is just a skill that improves with practice. The best practice is getting on the air and making contacts, even though you prefer voice contacts. If you set a goal of making one CW contact each day, you will be amazed at how quickly your speed improves. After you've gotten your Extra, if you want to

throw away the key and never use the mode again, that's fine. Of course, somewhere along the line you might discover you like CW. Anything is possible.

How about the time that you must invest in learning the theory? Probably the biggest difficulty here (particularly where the rules and regulations are concerned) is the convoluted language in which the test questions are written. You are going to have to do some reading and ask a lot of questions. When you encounter something you don't understand, ask us about it. If there was a class for Technician being given locally, we'd take you to it. But there isn't, so most of the effort is falling on your shoulders.

There is nothing wrong with memorizing the questions and answers, either. One of the things that seemed to help you with the Novice exam was to make up flash cards with photocopies of the questions. You can do that for the other license exams, too.

Another thing to remember is that you can keep taking the tests until you pass them. I took the General code test several times before I passed it. Your mom always found the code to be a breeze, but she had to take some of the theory tests several times before passing. The only people who ever fail these tests are the ones who stop taking them before they pass.

So, it is going to take you some finite amount of time and effort to upgrade. That's the cost or investment. If you want to keep things at a simplistic level, just balance out the benefits against the cost. Which weighs heavier for you? Ben Franklin recommended this procedure for decision-making about 200 years ago.

Look Beneath the Surface

If you look a little deeper at things, you will probably find that there is more going on here than simply weighing new privileges against how long it will take you to earn them. Go ahead and dig a little deeper.

Since kindergarten you have been on an educational treadmill. Your teachers

*7 Brian Road, South Windsor, CT 06074

guide you and direct you, and sometimes they prod you a little. You don't go too far to the left; you don't go too far to the right. Just keep moving along. Some people follow that treadmill all the way through high school and college, and even on through graduate degrees. They've never really done anything on their own.

You've already learned something that was above and beyond the treadmill. Remember how ecstatic you were when you passed your Novice license? You were bouncing around the car so much I had trouble driving. There is a joy to be had when you accomplish something because you want to, not because some authority figure says that you have to pass school. You'll feel that joy again when you upgrade. Chances are it will become a habit with you.

Upgrading is among the first accomplishments in amateur radio that produce this joy. There are plenty of other things that you can do. Some people devote time and effort to chasing DX. Others are only on the air during contests. Traffic handling attracts many amateurs. Building and testing equipment provides a deep sense of satisfaction to some. All these people you meet on the air started where you are at one time or another. That's what accomplishment is all about. It is not where you are at any given time, but the path that you take that counts.

Novice Enhancement has made your Novice license more desirable because you can do more with it and have more fun with it than before. This doesn't mean that you should stop thinking about upgrading; it just means that you should have fun with this license as you prepare to move up. The FCC just made it a little easier to stop and smell the roses on your journey as an amateur. Enjoy your Novice license!

You are the one who will have to decide how far you are going to go. You are the one who will have to do the work. But you are the one who will have earned the sense of accomplishment as you move ahead.

There is the story of the wise old man who lived high on the hill overlooking the town below. It was said by the people that the old man knew everything. His insight into the human condition was second to none. They believed that he could answer any question they presented to him.

One day some children were playing at the base of the hill. A mean little boy found a baby bird that had fallen from its nest. He picked up the bird as it thrashed about on the ground.

"Come with me," he said to the other children. "We are going to ask the old man a question that he cannot answer. We will prove that he is just an old man and nothing more. I will ask him what I have. He couldn't possibly see the bird. Even if he guesses correctly, we will still get him. I'll ask him if the bird is alive or

dead. If he says it is alive, I will crush the bird and show him the body. If he says it is dead, I will release the bird to thrash about on the ground."

Slowly the group made its way to the top of the hill. Defiantly, the mean little boy demanded that the old man come out of his hut and face them. With a gentle smile on his face, the old man did come out and greet the group.

"Tell me, old man," demanded the mean little boy, "what do I have behind my back?"

The old man's eyesight was as keen as his insight. He had observed the boy picking up the baby bird far down below at the bottom of the hill. "You have a baby bird that has fallen from its nest," he gently responded.

Shocked, the mean little boy quickly regained his composure and demanded, "Tell me this then, old man. Is the bird alive or dead?"

The old man smiled and looked deeply into the mean little boy's eyes. "I can't answer that question, son. If I tell you the bird is alive, you will crush it and show me the limp body. If I tell you it is dead, you will release it to thrash about on the ground. So you see, the answer to that question is in your hands."

Anita, you must answer the question of whether it is worthwhile to upgrade. Whatever you decide, I love you.

Dad

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CIRCLE 159 ON READER SERVICE CARD

Announcing: (from p. 6)

• **Special Event Station NF0Q/8-NF0Q** and KA8JNN will operate NF0Q/8 at Mt. Clemens, MI on July 12 from 1200Z-2100Z to commemorate the 200th anniversary of the Northwest Ordinance of 1787. This Special Event station will transmit on 7250 and 14325 as propagation and QRM permit. Secondary frequencies will be 21350, 28410, and Detroit area 2 meter repeaters. For certificates, send a large SASE to Eric Koch, NF0Q, 2805 Westminister, St. Charles, MO 63301.

• **Petersburg, Nebraska Centennial**-On July 12 from 1500-0000 UTC, using the callsign KC0DA, the Buzard's Roost Repeater Club will have a Special Event station on the air from downtown Petersburg, Nebraska to help this community celebrate their centennial. Frequencies 3.950, 7.250, 14.295, 28.375 (possible CW operation also). QSL with SASE to KC0DA, Larry L. Lehmann, 706 West Fairview Ave., Albion, NE 68620.

• **Spiceland, Indiana**-The Henry County ARC will operate N9WB to celebrate Spiceland Freedom Days on July 17 & 18 from 1500Z to 2400Z each day. Frequencies phone 3.870, 7.235, 14.235, and CW 3.735 and 7.135. For certificate send SASE to Henry County ARC, c/o Civil Defense, 1131 Broad St., New Castle, IN 47362.

• **Little Brown Church, Nashua, Iowa**-Great Plains ARC will operate station KC0CP from 1400Z July 18 to 1700Z July 19, from the site of The Little Brown Church In The Vale. Frequencies will be 25 kHz above lower edges of General phone bands; FM 146.52 and SSB 144.220. For certificate send QSL and large SASE to D. Muchow, Box 203, Oelwein, IA 50662.

• **Seneca Falls, NY**-The Auburn ARA and the Seneca Co. ARES will operate W2CDS July 18 and 19 from 1400 to 2000 UTC during Convention Days from the site of the first meeting place for women's suffrage. Visiting licensed YLs are invited to operate the station. Suggested frequencies as time and conditions allow are phone 7.250, 14.250, 21.350, 28.350; CW 7.050, 7.125, 14.050, 21.050, 21.150, 28.150. For certificate send QSL and large SASE to W2CDS, 2485 Lower Lake Rd., Seneca Falls, NY 13148.

• **Chattanooga ARC Special Event**-The Chattanooga ARC will sponsor a Special Events Day on July 18-19. The club station, W4AM, will be in operation from 9 AM to 5 PM EDT on July 18 and 19 on 40 meters from 9 until 12, and 20 meters from 12 noon until 5 PM. A certificate is available to all amateurs working W4AM on these days. Send an SASE to K4TNE, P.O. Box 12, Wildwood, GA 30757.

• **Inland Empire ARC Special Event**-The Inland Empire ARC will operate on July 23, 24, and 25th, from 1700-0800 UTC celebrating the Muscular Dystrophy Association's Trap Shoot and Chili Cookoff in Chino, California. A certificate will be issued via WA6ZEF when accompanied by a QSL card and #10 SASE. Operating frequencies will be in the General class portions of the 75, 40, 20, and 15 meter phone bands. The station will also operate in the new Novice and Technician portion of the 10 meter phone band.

• **Smith Island, Maryland**-The Nanticoke Amateur Radio Club in cooperation with the Somerset County Amateur Radio Emergency Services will operate a Special Event station from Smith Island, Maryland, in the Chesapeake Bay from approximately 1700Z July 24 to 0500 July 26. Operation will be both CW and SSB in the lower portion of the General and Advanced bands. Station call will be KW3Z and this operation will count for the Islands On The Air Award, zone NA-83. QSL via KC3RY, Carl M. Dennis, 510 Arbutus Ave., Seaford, DE 19973.

• **Special-Event Station K8EPV**-The Eastern Michigan ARC (K8EPV) will commemorate the 62nd Port Huron to Mackinac Island Yacht Race, July 25 and 26. The station will operate from 1400-0200Z each day. Frequencies will be 3.910, 7.235, 14.235 or 28.335 phone, and 3.710, 7.110, and 21.110 CW. A certificate will be issued upon receipt of a large (#10) SASE with your QSL to K8EPV (Callbook) or 654 Georgia, Marysville, MI 48040.

• **W2QFC Special Event**-The Pioneer Radio Operators Society will operate W2QFC on July 26 from the village park in East Aurora, NY joining celebration of the 14th annual "Racing Day." Frequencies 3935, 7235, 14235 from 10 AM to 5 PM EDST. For a special QSL SASE to W2QFC, 308 Parkdale Ave., East Aurora, NY 14052.

• **Brazil's Fire Prevention Week**-To commemorate Brazil's Annual Fire Prevention Week, ZZ8ADV (SSB) and ZZ8VMC (CW) will be active on bands 10-80 meters from June 29 to July 5. QSL Manager: PW8DP, P.O. Box 84, Porto Velho, RO 78900, Brazil.

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

July 4, **Harrisburg Hamfest**, Bressler Fire Co. Picnic Grounds, Harrisburg, PA. Contact KC3MG, 131 Livingston St., Swatara, PA 17113 (717-939-4957).

July 5, **Murgas ARC Hamfest and Computerfest**, Ice-O-Rama Sports Complex, Wilkes-Barre, PA. Contact K3SAE, RD 1 Box 214, Pittston, PA 18643 (717-388-6863).

July 11, **Eau Claire ARC Hamfest**, 4-H Fairgrounds, Eau Claire, WI. Contact KA9DWH, 2840 Saturn Ave., Eau Claire, WI 54703.

July 11, **Mt. Beacon Hamfest**, Arlington Senior High School, Poughkeepsie/LaGrange, NY. Contact Julius Jones, W2IHY, RR2, Vanessa Lane, Staatsburg, NY 12580 (914-889-4933).

July 11, **Straits Area ARC Swap and Shop**, Fairgrounds, Petoskey, MI. Call 616-347-8693 or 616-582-7322.

July 11-12, **Maple Ridge Hamfest**, St. Patrick's Center, Maple Ridge, BC, Canada. Contact Floyd Beardsell, VE7HI, Box 292, Maple Ridge, BC, V2X 7G2.

July 11-12, **Indiana State ARRL Convention and Hamfest**, Marion County Fairgrounds, Indianapolis, IN. Call 317-356-4451.

July 11-12, **International Peace Garden Hamfest and Computerfest**, Peace Garden, between Dunsenith, North Dakota, and Boissevain, Manitoba. Contact NTARC, Box 2002, Minot, ND 58702.

July 12, **DuPage ARC Hamfest/Computer Show**, American Legion Post 80, Downers Grove, IL. Contact W9DUP, P.O. Box 71, Clarendon Hills, IL 60514 (312-985-0527 evenings and weekends).

July 12, **North Hills ARC Hamfest**, Northland Library, North Hills, PA. Contact Bob, N3DOK, 367-2393.

July 12, **Wood County ARC Ham-A-Rama**, Wood County Fairgrounds, Bowling Green, OH. Contact Ross Mergenthaler, NS8C, 2682 Joseph Road, Pemberville, OH 43450 (419-837-5270).

July 17-19, **Glacier-Waterton International Hamfest**, Three Forks Campground, Glacier National Park. Contact Shirley Smith, KC7OA, 1822 14th Ave. So, Great Falls, MT 59405 (406-452-5958).

July 18, **South Milwaukee ARC Swapfest**, American Legion Post #434, Oak Creek, WI. Contact South Milwaukee ARC, P.O. Box 102, South Milwaukee, WI 53172-0102.

July 19, **SCARC '87**, Sussex County Fairgrounds, NJ. Contact Don Stickle, K2OX, Weldon Rd., RD#4, Lake Hopatcong, NJ 07849 (201-663-0677).

July 19, **TSRAC Wheeling Hamfest/Computer Fair**, Wheeling Park, WV. Contact TSRAC, Box 240, RD1, Adena, OH 43901 (614-546-3930).

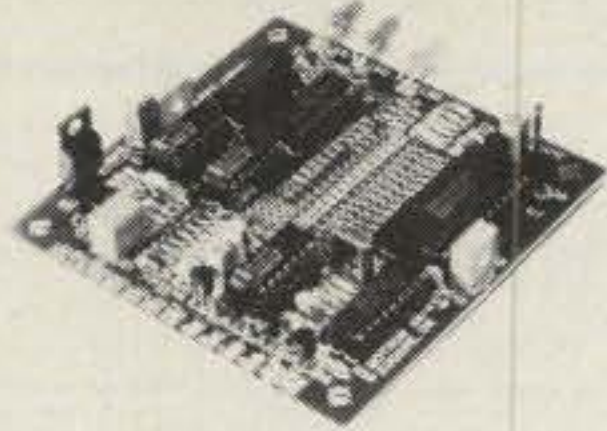
July 24-26, **ARRL "Heavy Hitters Hamfest"**, Topsfield Fairgrounds, Topsfield, MA. Contact Russ Corkum, WA1TTV, 21 Thorndike St., Arlington, MA 02174.

July 25-26, **Northwest DX Convention**, Greenwood Inn, Beaverton, OR. Contact Willamette Valley, DX Club, 58731 Columbia River Hwy, St. Helens, OR 97051.

July 26, **BRATS Maryland Hamfest and Computerfest**, Howard County Fairgrounds, West Friendship, MD. Contact W3GXK, BRATS, P.O. Box 5915, Baltimore, MD 21208.

July 31, Aug. 1-2, **CORA's Ham Holiday and Oklahoma State ARRL Convention**, Lincoln Plaza, Oklahoma City, OK. Contact CORA Ham Holiday, P.O. Box 850142, Yukon, OK 73085-0142.

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CIRCLE 140 ON READER SERVICE CARD

PRINCIPLES, PRACTICES, AND PROJECTS FOR THE VHFER

CQ Contest

This issue should be distributed about mid-way in time between the ARRL June VHF QSO Party and Field Day. Perfect time for you contesters out there to plan for the CQ World-Wide VHF WPX Contest, July 18-19 this year. And for you non-contesters, why not give the VHF WPX a try? It's about the simplest contest in the world, and there are dozens of opportunities to win something.

All you need to do to enter the VHF WPX is:

1. Get on the VHF/UHF bands between 0001 UTC July 18 and 2400 UTC July 19;
2. Make some contacts—preferably, lots of them;
3. Record all those contacts in your log;
4. Determine which competitive category you'd like to enter (this can be established after the contest is all over; you needn't think about this in advance if you don't want to);
5. Check your log for duplicates and complete information, referring to the contest rules printed in the February issue of CQ (reprints available upon request);
6. Calculate your score based on the same rules;
7. Copy your log (photostats work fine) and mail it in! (You can send the original, but we'd recommend you keep one copy for your files.)

If you'd like rules reprints, log and entry forms, or any kind of additional information regarding the CQ World-Wide VHF WPX Contest, don't hesitate to ask for them! Write to S.C.O.R.E., P.O. Box 1161, Denville, NJ 07834 or to CQ magazine at 76 North Broadway, Hicksville, NY 11801. SASE is appreciated.

For those who would like to pursue the contest seriously—and hundreds have chosen to do so in the past two contests—begin planning now for the event. Choose your contest site, operators, equipment, and antennas. For portable operations, make sure permission to use the selected site has been secured. Plan to take Friday, July 17 off from work if at all possible to allow proper station setup and testing. Remember, the contest begins at one second past midnight UTC on Friday; this is 8 o'clock PM Friday evening on the east coast of the U.S. and only 5 o'clock PM on the west coast. True contesters should be used to this timing, for all the DX contests have similar periods.

If you miss the beginning of the contest, you could possibly miss the best conditions of the entire weekend. But not necessarily. The last hour on Sunday evening could produce the best propagation. It's impossible to tell in advance, so my advice is to be near the station as much as possible during the entire contest period.

In this month's column you'll find two photographs of some happy-faced VHF contesters who were among the leading scorers in last year's VHF WPX. Don't these fellows look happy? They should be: 14EAT/3 took the world's top honors and a trophy for the highest multi-



Three of the operators at 14EAT/3, the world's highest scoring multi-multi station in the 1986 CQ WW VHF WPX Contest. This shot shows the group all packed up and ready to head home after the contest.

op/multi-band score, while NN8H had the highest score in the 8th U.S. call area and the third highest multi-multi U.S. score, securing themselves a beautiful parchment certificate. Both these groups, and dozens of others, operated from field-portable sites. July is probably the best month for this type operation in the northern hemisphere.

Get with it and join the fun in the 1987 VHF WPX Contest. It's our third such annual operating event and is certain to be a ball.

Too Late Department

A lot of mail is received each month, much of it announcing someone's plans to operate from a rare grid (or whatever) in the next month or two. This is great, and I love to hear about such things, but two months' notice isn't quite enough time to get this kind of information published.

A few such reports were received in April. One was from Dennis Martin, N0GPD, who announced a "Six Meter Birthday Party" scheduled for June 5-7 and involving an operation from grid EN20. This makes an interesting story, but it was received too late to get into the May or June issue. By now the dates have passed. How did it go, Dennis?

Another report was received from Frank Brooks, W4UMC, along with an excellent letter to the FCC in reply to General Docket #87-14 (regarding the proposed reallocation of 220-222 MHz for commercial land mobile services). The letter from Frank was very

good, and I'd have printed excerpts here for others to use as arguments in their letters to the FCC, but the reply date has long since passed. By now we should know how this matter was decided.

Still another announcement was received from Dan Fegley, W1QK. Dan's multi-op contest group planned to work the June VHF QSO Party from grid FN51 on 5 bands. FN51 is rather rare, encompassing mostly water. This would have made a great announcement for publication in the May or June column, but the information wasn't received until mid-April, when the June issue was long "put to bed." Dan, can you get your group together to work the VHF WPX Contest this month? We'd love to hear you on.

I guess my message is, get these announcements out as early as possible, even if accuracy suffers in the rush. A mostly correct announcement published on time is better than a completely accurate one received too late for publication. Our deadline for this column at CQ is three months before the published issue; e.g., information received from April 1 through April 30 could make the July issue. Materials received beginning May 1 would have to wait until the August issue.

Novice Enhancement

The February issue of "220 Notes" (which I received March 20!) contained some good information on Novice operation on 220 MHz. For example, will Novices be allowed to use re-



Three of the operators at NN8H, multi-multi portable station (MI) in the 1986 CQ WW VHF WPX Contest. Their smiling faces tell the whole story.

peaters the outputs of which fall outside the Novice subband? The answer appears to be "no" according to information received as of this writing. Some good news: It seems that amateurs all over the country are spreading out the welcome mat for Novices (and Techs) with new privileges. I've already worked a number of Novices on 135 cm FM and 10 me-

ter SSB, but none yet on 23 cm, where I have no FM equipment.

To help celebrate Novice Enhancement, the effective date of which was the same as the Charlotte, North Carolina hamfest, the folks at CQ hung a large banner across the booth proclaiming "Happy Novice Enhancement." A photograph of this banner was in Alan Dorhof-

fer's editorial in the May issue. What the photo doesn't show is how the first banner ordered by CQ was printed: "Happy Novel Enchantment." And you thought everything at CQ always runs smoothly. And yes, I attended the Charlotte hamfest.

Anyway, let's continue to open doors and invite Novices into the wonderful world of VHF. The more comfortable we make the newcomers, the longer they're destined to remain active amateurs who will contribute to the hobby.

Received In Time

The 1987 SWOT QSO Party, sponsored by the Side Winders On Two, is scheduled for the weekend of August 1-2 beginning 1900 UTC Saturday and ending 0400 UTC Monday (August 3). Only SSB and CW contacts, exchanged in the normal weak-signal subband from 144.0 to 144.3 MHz, count for contest credit. Exchange call signs, SWOT numbers, and grid squares. Contacts with SWOT members count two points; contacts with non-members count one point each. The score is the number of points times the total grid squares worked.

SWOT will issue certificates for the highest score in each ARRL section. Logs must be mailed by August 15. For further information, comments, or suggestions, contact SWOT by writing to Jerome Doerrie, K5IS, Rt. 2, Box 72, Booker, TX 79005.

"Microwave Update 1987" will be held September 10-13 at The Inn at Estes in Estes Park, Colorado. Because of a slight mixup in the dates at The Inn, this is the weekend after Labor Day. Scheduled speakers at the convention as of this writing are: Hans Peters, VE3CRU; Al Ward, WB5LUA; Jim Davey,

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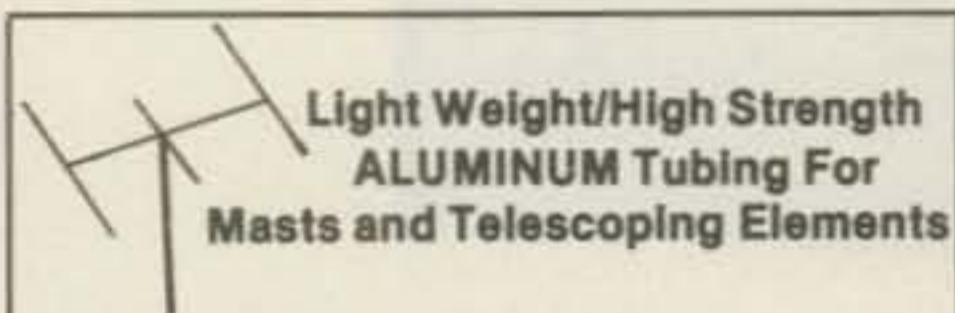
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CIRCLE 111 ON READER SERVICE CARD



K6ARE's method of dealing with the "where to put the rig?" problem was to mount it to a plastic tray which straddles the transmission hump and can be moved quickly.

W8LNC; Bob Dryden, W4QJK; Rick Campbell, KK7B; and Don Hilliard, W0PW. The program will include noise-figure and antenna-gain measurements for 1.3, 2.3, 3.4, 5.7, and 10 GHz. There will be swap sessions and equipment displays on both Thursday and Friday evenings.

The registration fee for this annual microwave conference is \$38, with a registration cut-off date of August 1. Checks should be payable to Microwave Update 1987 and mailed to Donald L. Hilliard, W0PW, P.O. Box 563, Boulder, CO 80306. I assume Don will answer any questions as well.

At the other end of the VHF spectrum, 6 meters should be very exciting about now. To help us check band conditions, a couple of new 50 MHz full-time beacons have emerged, according to reports received in April. Mick Lindley, KB4UPI, advises he's operating what he believes to be the only 6 meter beacon in Alabama. His beacon, which runs 1 watt to a dipole antenna, is operational 24 hours a day on 50.070 MHz and identifies as AL KB4UPI. For further information, write to Mick at Route 15, Box 1098, Birmingham, AL 35224.

To Mick's north, a new 6 meter beacon is reported to be in operation by Pat Bunn, N4LTA. Pat intended his new beacon to run three power levels: 1 watt, and + and - 10 dB from that level, which will be programmed to change about every 15 seconds with a 5-second CW note to indicate the new power level. The N4LTA beacon was intended to operate on 50.065 MHz from a Spartanburg, SC location using a "halo" antenna at 30 feet above

ground. For further information and reception reports, write to Pat at 171 Spring Lake Drive, Spartanburg, SC 29302.

Joe Gerardin, KB6OQW, wrote in to ask about connecting a transverter to his IC735 HF transceiver. His inquiry was a bit confusing to me, in that he compared this setup with the IC-28, an FM-only rig. Joe, to determine what will deliver the most performance for the smallest investment (which is, after all, what most of us are trying to do), we must first settle on the desired mode(s) of operation and whether fixed, portable, or mobile operation is intended.

The IC-28 is a fine FM mobile rig, but it won't work SSB/CW and it requires an external 13.8 Vdc power source. The IC735 with a transverter—for example, a Microwave Modules MMT144/28—makes an excellent SSB/CW base station but is not a very attractive mobile setup, nor will it offer much in the way of FM capability. Most of our discussion in this column deals with weak-signal work—i.e., SSB and CW used for long-distance communications. In my opinion, every licensed amateur who is a driver should have some sort of mobile setup, and the most effective and easily implemented mobile installations are FM-only. Mobile SSB work can be great fun and will often net considerable DX, but FM is far more practical.

Home station work, on the other hand, can be a bit more serious; this is where the weak-signal modes come in. VHF/UHF SSB/CW work often entails copying signals which are just above the noise and require great concen-

tration for meaningful copy. Well-situated, horizontally-polarized antenna systems are a must, and medium to high power, while not an absolute must, is very desirable. Very "low-noise" (minimum possible noise figure) receivers are the rule, as are low-loss feedlines. These things are difficult to accomplish, or take advantage of, in a mobile installation.

My recommendation is, if you want to have fun chatting with locals about auto traffic, the weather, and so forth, invest in the FM mobile rig. If you desire to explore new horizons in weak-signal DXing from your home station, go for the transverter. Better still, invest in both. I think you'll be glad you did.

By the way, the IC735, like practically all HF transceivers, will work with transverters; however, this may not be a simple "plug-in" process. The IC730 pretty much required an optional transverter accessory called the "TRV unit" to interface with transverters; possibly the IC735 requires something similar. At this writing I'm not certain. Surely a call to ICOM will determine what's involved. Thanks for writing, Joe.

Bert Voth, WA0PWE, wrote to say, "VHF SSB is much more interesting than HF!" Bert says he'd rather work a band opening on 6 meters than most anything else, and he's only running 8 watts PEP on 6 meters. WA0PWE also advises that several amateurs in the Salina/Wichita, KS area are using old 144 MHz AM transceivers or converted aircraft rigs for "private" point-to-point work. "They work quite well with a small beam," says Bert, who owns both an old Gonset Communicator II and Hallcrafters SR42.

God, how well I remember those old rigs! The "Gooney Box II" was my first 2 meter rig back in 1965, and I bought a shiny new Hallcrafters SR-42A in '66 when I was just entering high school. Saved up for about 6 months to buy the Hallcrafters rig, which I think cost about \$189 at the time. That was a lot of money for a kid whose only source of income was a part-time job at the local electronic parts store. I loved the SR-42A, with its glistening knobs and built-in AC/DC power supply. Yes, this tube-type rig could be used mobile and had an internal vibrator-type power supply for DC operation, just like the old automotive broadcast radios.

Bert's letter brought on a nostalgia attack. Having been active on 2 meters for about 22 years, I've seen the band through a lot of changes. Mostly for the better.

The Six Meter DX Society recently honored Pat Dyer, WA5IYX, with a plaque as their Outstanding DXer for 1986 for his outstanding contributions to the study of VHF propagation. The society's first plaque recipient was Jim Treybig, W6JKV, in 1985. Mario Karcich, WB2CZB, the Society's spokesman, says "the society will continue to award plaques to individuals who they feel contribute to the 6 meter DX community each year."

The Society currently has only eight members: WB2CZB, WB2MAI, WB4OSN, W3JO, K2MUB, N3AHI, W2CAP/1, and W3IWU. Each of these folks is a respected member of the 6 meter DX community.

Dick Randall, K6ARE, of Livermore, CA wrote to tell of his solution to the problem of mounting a rig in a car lacking the appropriate underdash space for conventional methods. He purchased a plastic tray which would normally be used to straddle the "transmission hump" and hold drinking cups and assorted paraphernalia and mounted his IC-28A two

meter FM rig's mobile bracket to this tray. Dick says, "The bracket that came with the rig was used to mount the unit towards the rear of the tray with additional metal strips on the underside of the tray for reinforcement. Part of the rear of the tray had to be cut out so the rear of the rig could extend through and provide a better angle when tilted for viewing the dial."

Since so many of us have newer cars with very little underdash space, Dick's suggestion might help someone in a predicament. I don't know whether or not these molded plastic trays can be placed in front-wheel drive cars having no "transmission hump." Problems, problems.

I mounted my 2 meter FM rig, an Alinco ALR-206T, with its mating bracket to the side of the center console in my Toyota Cressida. There simply wasn't any other place to put the little rig, but it fit to the side of the console, with its heatsink towards the floor and front panel tilted up towards me. The whole installation took maybe 5 minutes, but is very strong and has lasted more than a year now with no ill effects.

New Stuff

Encomm, Inc. introduced three new products from Tokyo Hy-Power Labs. The model HL-37V, HL-160V25A, and HL-250V25 are power amplifiers for use in the 2 meter band, each featuring a low-noise GaAsFET receiver preamp and internal T/R switching.

The HL-37V is intended for use with hand-

held transceivers and requires only 2-3 watts RF input for 30 watts power output. This is a multi-mode (linear) amplifier whose internal GaAsFET preamp has adjustable gain from -20 to +14 dB, according to Encomm. Suggested list price is \$99.95.

The HL-160V25A "Ace Model" is a compact version of THL's popular HL-160V25 and produces 160 watts RF output from 25 watts drive. The new unit, which has a simplified control panel and is smaller than the original HL-160V25 design, is multi-mode (linear) and has a built-in GaAsFET preamp. Suggested retail price is \$269.95.

The "granddaddy" 2 meter amplifier from THL is their new model HL-250V25, which is said to produce 250 watts RF output from 25 watts drive. It incorporates two separate 125 watt output modules which are combined to produce the quarter-kilowatt output level—no small feat at this frequency. Requiring 38 amperes at 13.6 Vdc supply voltage, the HL-250V25 is recommended for base station work and also contains a GaAsFET preamp. I'd like to see one of these! It would be interesting to find what THL does to avoid destruction of the GaAsFET while switching such a high power level. The HL-250V25 suggested retail price is \$459.95. All these amplifiers, and other Tokyo Hy-Power Labs products, are available from Encomm, Inc., 1506 Capital, Plano, TX 75054.

That's about it for this month. Hope to hear you in the VHF WPX Contest. Get on and have fun! And tell a friend.

73, Steve, WB2WIK

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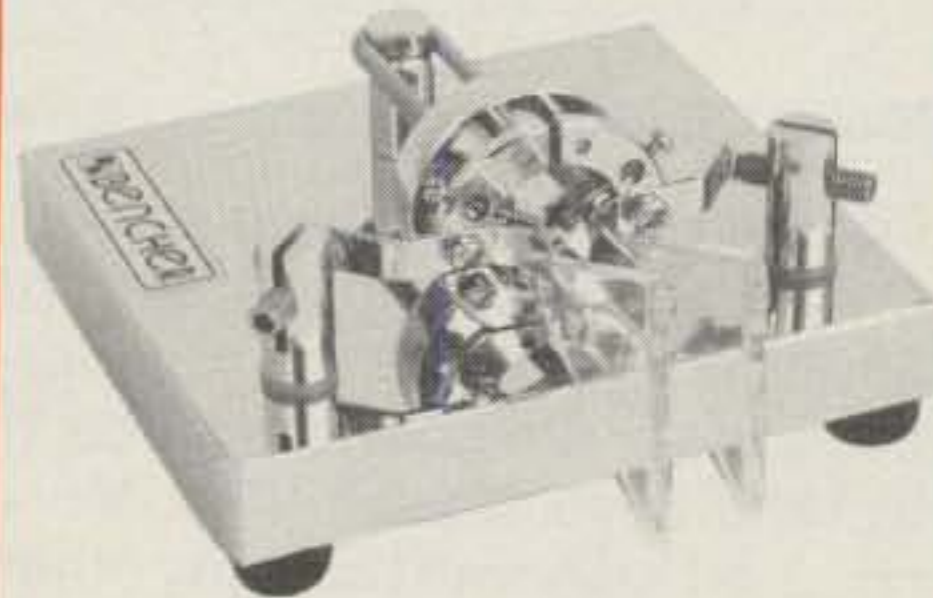
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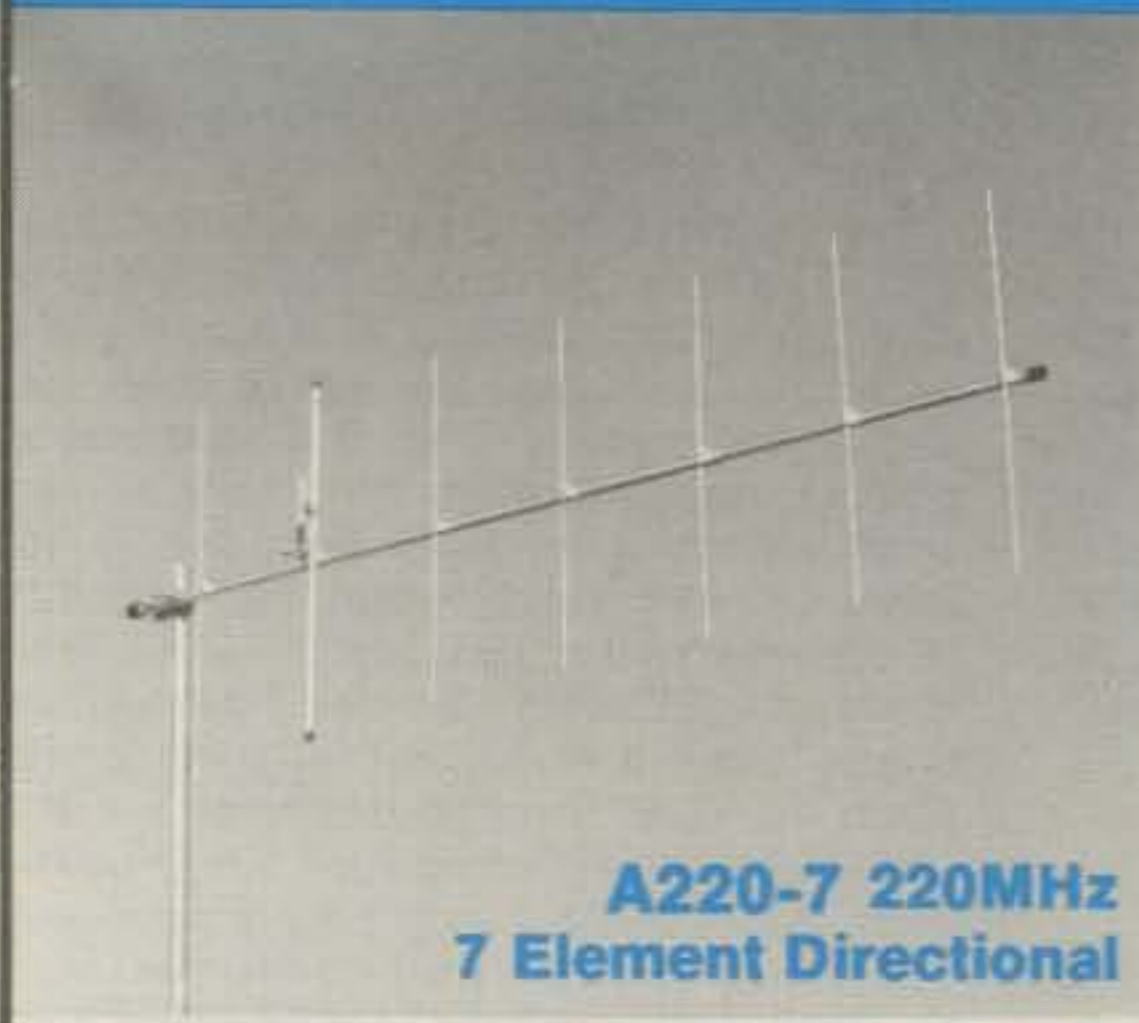
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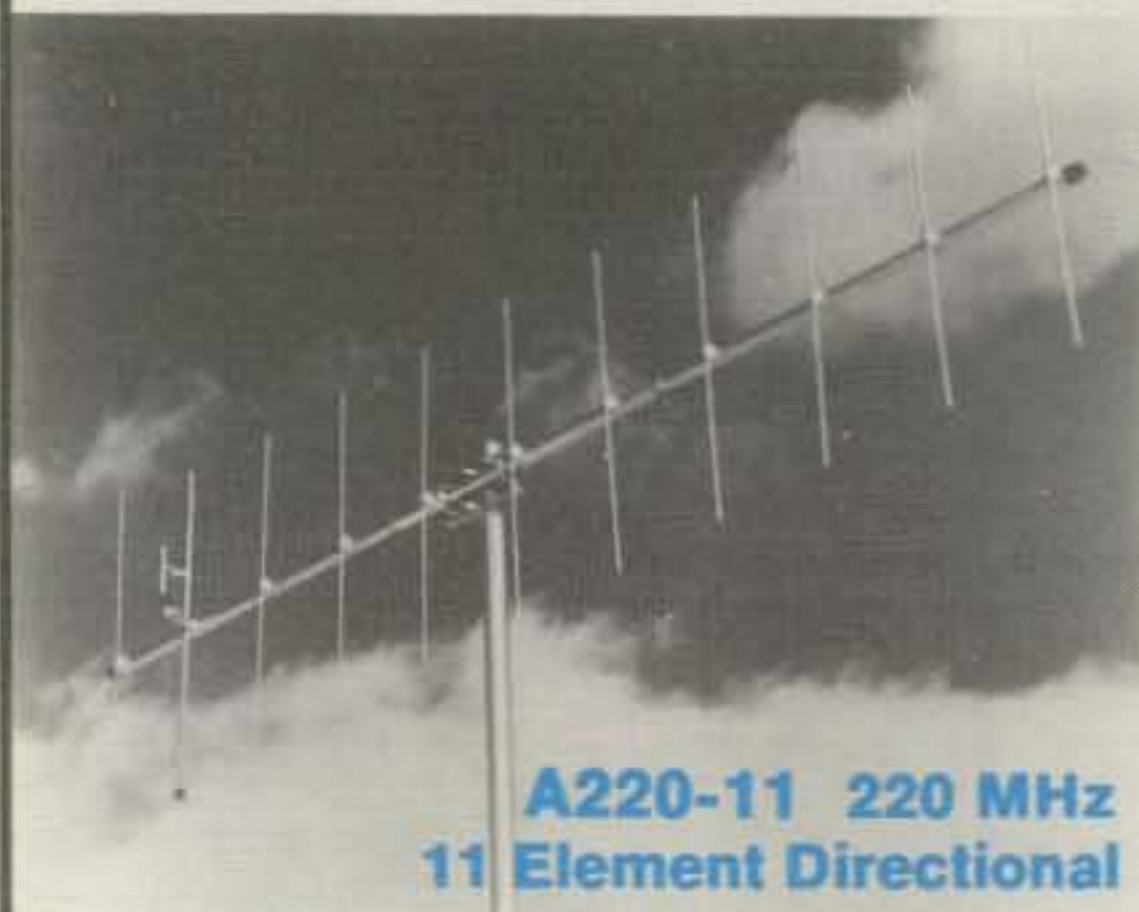


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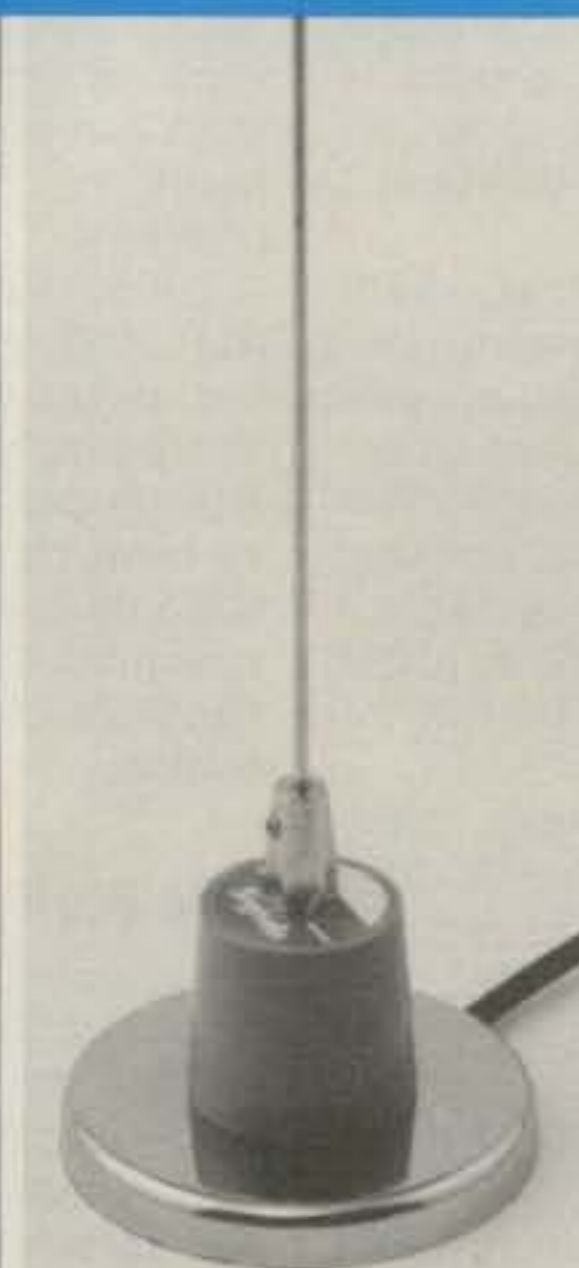
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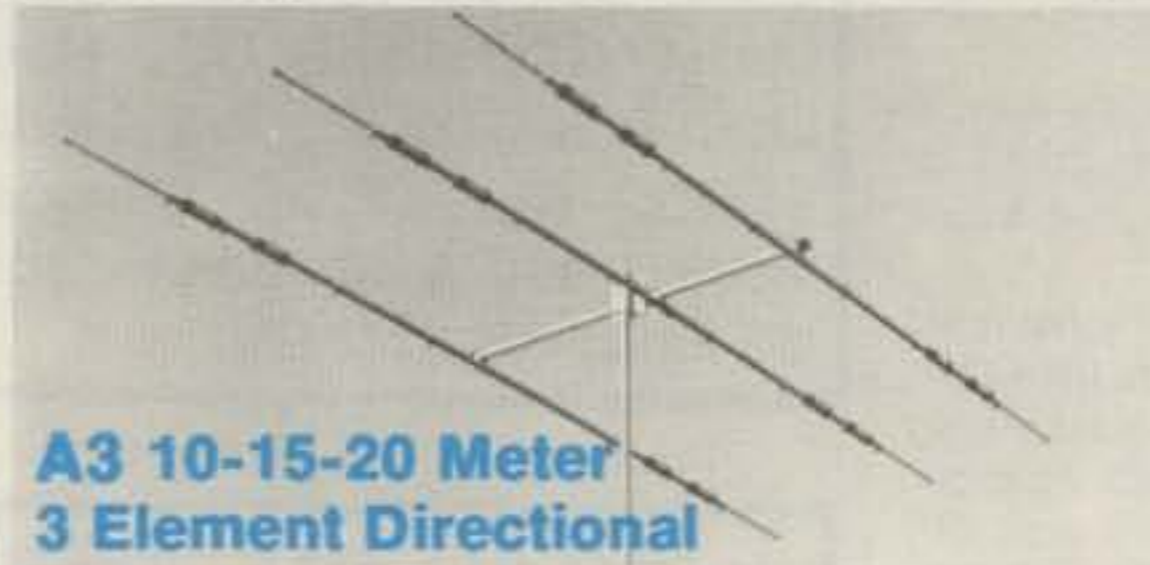
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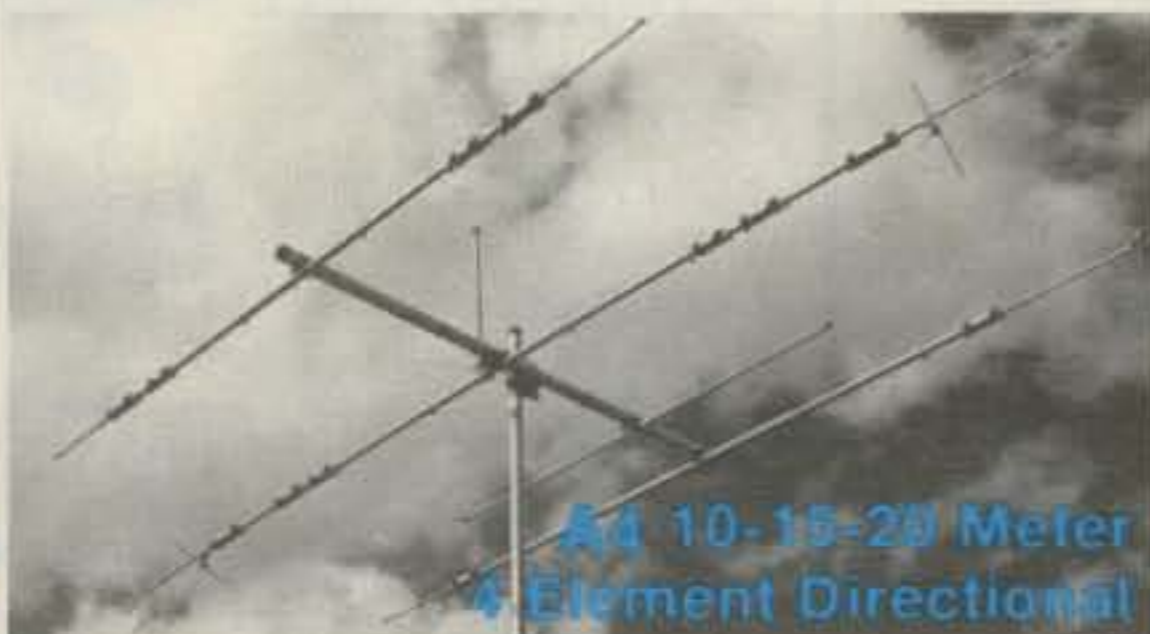
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"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

Getting Started—Part VI

This is the sixth part of an eight-part article that has been written to help new amateurs get on the air. Each new part of this article is useful by itself; however, maximum benefit can be derived from reading the entire article. Previous issues of *CQ* can usually be purchased for \$2.50 each by writing to *CQ*, 76 N. Broadway, Hicksville, NY 11801.

Balun

This coined name comes from one function of this RF transforming device. There are fixed and adjustable baluns which can be typically used to match 300 to 300, 75 to 75, 300 to 75, and 75 to 300 ohm circuits in any combination of balanced or unbalanced inputs and outputs. The balance to unbalance operation gives the device its name, with BAL from balanced and UN from unbalanced. Baluns are marketed in several configurations, and they enable your antenna system to perform more efficiently. However, satisfactory operation can be realized without a balun. Some baluns are constructed to also serve as an excellent center connector for a dipole antenna. Whenever you are feeding a balanced antenna (dipole, folded dipole, Yagi-Uda, quad, etc.) from an unbalanced line (such as RG-213/U), it is stated to be advisable to use a balun between your transceiver and antenna.

Tuners For Balanced Antennas

There is a wide variety of antenna tuners available for use with balanced (two-conductor transmission line) antennas such as beams, quads, and dipoles. Some of these devices can also function as a longwire (or random wire) antenna tuner, and many of them can be used to read output power. These devices are nice to have, but they are seldom essential to proper operation of antennas. However, balanced wire antenna tuners cancel out feedline inductive/capacitive effects that could otherwise prevent the transmitter from providing its maximum RF output power.

Transmission Lines

It is not sensible to go to the trouble and expense of installing a good antenna and excellent equipment, and then inter-



Here are Gloria, KB6ORO, and Rick, KB6ORL, Robinson. Rick is a Technical Sergeant in the U.S. Air Force. He is stationed at Clark Air Base in the Republic of the Philippines. He works at the MARS (Military Affiliate Radio System) station (AGA8CL), where he handles a lot of phone-patch traffic through AFC6RI in Anaheim, CA. Don Chandler, N4KCL, helped them get started as amateurs.

connecting the antenna and rig with an inefficient transmission line. Most amateurs use coaxial cable (coax) for their transmission lines because it is convenient to use and easy to install. Coax can do the job well, but you should avoid the use of lossy coax. I often find RG-58C/U (50 \pm 2 ohms) or RG-59B/U (75 \pm 3 ohms) coax used as the antenna transmission line. These types of coax are popular because they are thin (less than 0.35 inch diameter), less expensive, and easier to install than their more efficient counterparts.

Unfortunately, RG-58C/U has twice as much loss as RG-213/U coax and less than one fifth as much power-handling capability. Similarly, RG-59B/U has almost twice as much loss as RG-216/U coax and less than half as much power-handling capability. What makes the coax situation even worse is that amateurs often use earlier and less efficient versions of these coax types, such as RG-58/U, RG-58A/U, RG-59/U, and RG-8/U (RG-213/U predecessor). These older types of coax are rated about as well as their newer counterparts, but their losses increase about ten times faster. The losses in these older coax types start to increase from the day they are made, and

it is normal for loss to be doubled within two years after they are made, even if they are still in a good environment, such as in a store or warehouse. RG-213/U (50 \pm 2 ohms, 0.405 inch diameter) and RG-216/U (75 \pm 3 ohms, 0.425 inch diameter) are preferred antenna transmission lines; they are well worth the extra trouble and expense.

To put this matter in proper perspective, assume that you are operating on 10 meters and that your transmitter is feeding 100 watts to the radio-shack end of a 100 foot long RG-58/U transmission line connected to the antenna. Under these conditions the most power to reach the antenna would be less than 50 watts. This unnecessary loss of useful output power is hard to accept, but it is not the real culprit which will cost you many long-distance (DX) contacts. The worst thing about using a lossy coax is that the received signals are also greatly attenuated (reduced) as they travel from your antenna to your receiver. Since DX signals are often 10 microvolts (10 millionths of 1 volt) or less, it is obvious that we cannot afford to reduce signal levels by using lossy coax. If you want a thorough explanation of coax cables, send a large (at least 9 1/2" x 12") self-addressed envelope with double first-class postage to me and I will send you a free copy of a class aid I wrote on this subject. Also, the August 1983 Novice column provides thorough coverage of military RF transmission lines.

It is sometimes difficult to find a good way to bring antenna transmission and rotator control wiring into the radio shack. If your station is located on the ground floor, it is usually best to run these cables under the house (or through the cellar) and to bring them up into the radio shack through a hole (or holes) drilled in the floor. If it is necessary to bring these leads in through a window, it is preferable to construct a window panel replacement containing the required connectors and holes mounted on a good RF insulation material. If an antenna lead-in panel is to be made, it is usually better to install a double-female coax connector in this panel for each line into your shack. Barrel connectors are readily available at good suppliers, and they provide a watertight connection through a panel with low RF loss.

If you have an excess length of coax, do not coil it or leave it in your shack for possible future use. Just leave enough

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slack in each coax line to reach your gear with no strain and cut off the rest of the coax. Every inch of transmission line causes loss, and it is sensible to cut off unnecessary extra coax. When an extra-long coax transmission line is coiled, it has an inductive characteristic which can contribute to interference and antenna loading problems.

Station Accessories

The major parts of a station have already been covered. However, there are several other major items which are important to the establishment of a good station, and these things are discussed in subsequent paragraphs.

Desk or Table. Once you have selected the best location for your station, obtain a large sturdy table (or desk) to hold your equipment. The table can be metal or wood. If it is metal, ground it to the station ground point at the transmitter's ground stud. The top surface must be large enough to leave plenty of operating room after the equipment is positioned for use. The only way you can send correct code with a handkey is to have your elbow resting comfortably on the surface of the operating table. It sometimes helps to move a table a few inches away from a wall and to let the major equipment overhang the back end of the table.

Lighting. Fluorescent lights can produce enough noise to drown out weak received signals. If you experience fluorescent lighting noise, it is advisable to conduct a light-by-light check to determine which ones create the most noise. If it is possible to do so, have the most troublesome lights turned off while you operate. Most fluorescent lighting noise can be eliminated by using shielded (better grade) transformers. The newer RF energized fluorescent tubes can be a worse source of interference than the standard ones.

Clock. It is handy to have a large four-digit clock within easy view of the operating position or on the operating table. Clocks are built into some equipment. It is good to set the clock to Coordinated Universal Time (UTC), which is common to amateur radio operators throughout the world. Amateurs who work a lot of long-distance (DX) contacts commonly use only UTC on the air and in their records.

Code

Handkeys. It has been my experience that nothing develops confirmed voice-only amateurs faster than bad sending practices. The best way to develop a good fist is to learn how to use a handkey (manual telegraph key) and to stick with it until your code receiving proficiency has reached about 13 wpm. Proper spacing between letters and words helps make code pleasant to copy at any speed. Do not use a junk handkey because it makes it more difficult to develop proper sending



Both Clif Smith, KA1NWB, and his 11-year-old son Drew, KA1OIO, of Pittsford, Vermont, were licensed last year. Drew has made more than 500 contacts and he was worked amateurs in 46 states. His dad has done almost as well. Their station includes a Kenwood TS-430S transceiver, Kenwood AT-130 antenna tuner, Bencher keying paddle, MFJ electronic keyer, Hy-Gain antenna rotator, tri-band Yagi-Uda antenna, and a 40/80 meter trap dipole. Drew is president of his sixth grade class; he is also active in baseball, soccer, basketball, and skiing.

technique. Select a good handkey with adjustable keying contacts gap, adjustable return spring (keying) pressure, well-machined (smooth) and adjustable arm pivot points and matching pivot point receptacles, good alignment between the entire upper and lower keying contact surfaces, and good plating on the keying contacts.

Many handkeys are not acceptable, so take care to select a good one. Unfortunately, it is not safe to assume that all handkeys are good, because even some expensive ones are not acceptable. Avoid the use of a skirt on the knob of a handkey because it tends to encourage improper grasp of the knob, resulting in poorly sent code characters. A skirt is a flat piece of insulating material about the size of a half dollar, and it is located immediately below the handkey knob. A new operator would most likely let his/her fingers rest against the top of a skirt. This failure to properly hold the knob impairs normal transfer of force as the wrist is raised and lowered while sending. The resulting degradation of the sending action ruins the consistency in the lengths of dit and dahs and causes uneven spacing between the individual parts of code characters.

Some handkeys are mounted on large base plates that raise the knob uncomfortably high above the operating surface of the table. Some handkeys have such poor alignment between the upper and lower keying contacts that very little of the total contact surface functions when the key is closed.

It helps to mount a handkey so it will not move as you send. The handkey can be

mounted directly on the operating table, but it is usually mounted on a thin but heavy piece of plastic or wood to avoid marring the table surface. If the handkey is to be attached to a base, the base should not be more than 1/2 inch thick, and it should be at least 3 inches wide by 8 inches long. The handkey is mounted near one end of the base with the key knob towards the center of the base. Modern adhesives make it easy to mount handkeys on a wide variety of base materials. Whether it is mounted on a base or directly on the operating table, the handkey is positioned where it is comfortable to reach when the operator is seated close to the table with his/her elbow on the table. The June through August 1979 Novice columns provide a useful article about code, which includes keying instruments coverage.

Rhythm is easily developed while using a good manual (hand) telegraph key. Accuracy is the most important initial objective. Develop good spacing and accuracy. Speed will increase easily and naturally as you work contacts on the air.

Recorded Checks. It is advisable to practice sending off the air before you receive your license. Cut an article out of a newspaper or magazine and record it in code on a tape. Use text that contains an assortment of numerals and punctuation marks. Add a few work signs to make your practice text more useful. Set aside the tape and printed article for at least a week; then copy what you recorded. Check it a second time to make sure you copied exactly what you recorded. Then check your copy against the original printed article. It is beneficial to make several such recordings over about one month's time to improve your sending. This system will quickly make you aware of any mistakes you make in sending code.

On-The-Air Practice. Nothing increases code proficiency faster than on-the-air operation. When you must copy what the other fellow is saying, you try a lot harder to make perfect copy. It's this natural extra effort that makes actual operation more effective code practice than listening to tapes, records, or code practice transmissions. There's nothing more frustrating to me than to encounter a Novice who does not operate regularly after we've helped him earn his license and set up his station.

Contests. Participate in as many on-the-air contests as possible. If nothing else, operate in the annual February ARRL Novice Roundup; this contest provides a wonderful opportunity to work many new stations and countries in a short time. Keep track of local, national, and international contests advertised in major amateur radio publications. You'll win every time you enter a contest because your objective is to increase your code speed, and you'll be doing it!

Goal. When your code receiving speed reaches the point where you're consistently making passing plain-language runs at 15-16 wpm, you are ready to pass the code part of your General/Advanced exam. If your theory is good, take the exam right away.

Handkey Use. Don't tap out code with your fingertips; this is extremely tiring and it sounds terrible to others. Use your wrist from the beginning and you'll quickly develop a smooth and effortless sending style. When you're first learning to send with your wrist, you can minimize any tendency to finger tap by opening up the key contacts to at least one-sixteenth of an inch and adjusting the spring tension to where quite a bit of pressure is needed to close the key contacts. Your wrist can easily provide the force needed to close the key contacts, but your fingers will tire when finger tapping; consequently, you'll get in the habit of sending correctly. You can set a large coin on the back of your sending wrist hand and it should stay there, if you are sending correctly. Correct sending is smooth and easy. Wrist sending seems difficult to master because we are all accustomed to doing things with our fingers. Nevertheless, you'll learn that it is easier and better to send by wrist motion instead of finger tapping.

A good initial practice is to time dits

and dahs using the sweep hand of a clock. A dit should be sent exactly at each second point, during each 1 minute practice run. Similarly, send a dah starting at each exact 5 second point and hold it for 2 seconds. Wait 3 seconds and send another 2 second dah. Repeat this procedure during each 1 minute practice run. Clock exercises can quickly get you into the habit of sending correctly using your wrist.

Sending Speed. Send slowly and carefully. Accuracy is far more important than speed. No one enjoys a contact with an amateur operator who makes a lot of errors, but errorless code sounds good even at the slowest speeds. Sending speed comes naturally, and there's no advantage to sending faster than the speed at which you can send well. Your sending speed is normally faster than your code receiving speed, so make yourself slow down by sending very carefully. If you send code as fast as you can transmit it, you'll be in trouble if the other amateur answers at the same speed; it will be too fast for you to copy. Don't speed up to work Generals and other higher-class (and DX) amateurs you hear in the Novice bands. These experienced amateurs are usually in the Novice bands to give you some code practice and to send you a card. Sometimes they are there because they are very rusty and need the code

practice. An experienced operator is much more likely to be tolerant of slow code and errors than your fellow Novice. Don't hesitate to ask anyone to slow down (QRS) or to repeat information; one-way contacts are not satisfactory to anyone.

Sending Accuracy. Accuracy and rhythm should be the goals for any beginner learning to send code. Make clear corrections of sending errors to avoid confusing the other amateurs. If you goof on the first letter of a word (or a single-letter word such as A), send an error/repeat sign and go back to the start of the last word you sent without error. If you make an error after the first letter in a word, send the error/repeat sign and go back to the start of the word you were sending when you made the error. It is acceptable to use a series of seven (or more) dits to indicate that you've made an error and that you're going to repeat. It is better to send the question mark, though, as this always means that you are going to repeat information, whether or not you made an error, whenever it is sent out of context.

Bugs and Keyers. It is much easier to develop good sending rhythm (spacing) with a handkey than with a semi-automatic key (bug) or an electronic keyer. Many amateurs fail to develop good sending

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techniques before they start using a bug or keyer, and this results in poor sending that causes unsatisfactory results when they try to complete on-the-air code contacts. Speed should not be the primary objective of new amateurs because it is far more important to develop good code sending rhythm, which makes one a pleasure to contact at any speed.

When your code receiving proficiency reaches about 15 wpm, it is advisable to develop alternate sending capability with a bug or keyer, since either permits one to transmit fast code with very little effort. It is not good to use both a bug and a keyer with the same hand because their differences in keying actions tend to harm an operator's timing and spacing of code characters. When using a semi-automatic key, the operator sends each dah manually and just makes a single motion to send a series of dits. When using an electronic keyer, dits and dahs are automatically sent as long as the operator holds the paddle to the right or left respectively.

When you are ready to get a high-speed code sending instrument, select a very good one. Junk bugs and keyers are no bargain at any price. I use a bug for high-speed code operation because that is the device I am accustomed to using. However, if I were starting out now, I would use an electronic keyer with a paddle, which is what I advise my students to switch to when they reach a code reception capability of about 15 wpm. I also advise my students to develop reasonable capability before using any high-speed telegraph keying device on the air.

Writing Instruments. Before leaving the subject of code, I want to advise you to get a good writing instrument to use when copying code. If you use a pencil, use a sharpened one with a number two (or softer) lead. I have had special code-practice pencils made for my students and these pencils have grade 1 1/2 lead. If you use a mechanical pencil, computer lead should be used for copying ease. Computer lead is called electrographic mark sensing lead and it is available from major computer outfits. When copying code with a pencil or pen, it is called copying by stick. If you use a ballpoint pen when copying code, it should not be retractable, because they have some tip movement each time they are applied to (or removed from) the paper. This motion will slow you down and it can reduce your code receiving speed. I believe the best code-practice writing instrument is the series of fine-line felt-tip marking pens. Regardless of which kind of writing instrument you use, it should provide a dark (readable) mark with very little pressure required.

If you are serious about becoming an extremely proficient code operator, you should shift to using a typewriter at about the same point (15 wpm) you change to a bug or keyer. There are special typewrit-

ers intended for use by code operators; these machines are called telegraph mills. It has been my experience that used typewriter shops sometimes have mills for sale, and their price is usually quite low since few people want them. One way to spot a mill is to look for a typewriter that is all upper-case letters and has no markings on the keys. If you are not able to obtain a mill, there is nothing wrong with simply learning to copy code with a regular typewriter. If you do not know how to type, pick up a textbook on this subject at your local public library. It is easy to teach yourself how to type correctly, and you will often benefit from this capability. Naturally, you will have to practice code at a much slower rate when you first switch to a typewriter or mill. However, as your typing proficiency improves, you will be pleasantly surprised by how rapidly your code receiving capability rises. If you want a copy of a class aid listing worldwide sources of code practice, send your request to me in writing and supply a large (9 1/2" x 12" minimum) self-addressed envelope with quadruple first-class postage attached. The October and November 1980 Novice columns provide worldwide sources of code practice. Additional code-practice information appears in the June 1981 and September 1983 Novice columns. Worldwide codes are shown in the December

1980 issue, and code operating tips are detailed in the January 1981 column.

This concludes the sixth part of this eight-part article. The seventh part covers headphones and speakers, QSL cards, instruction manuals, and logbooks and legal considerations.

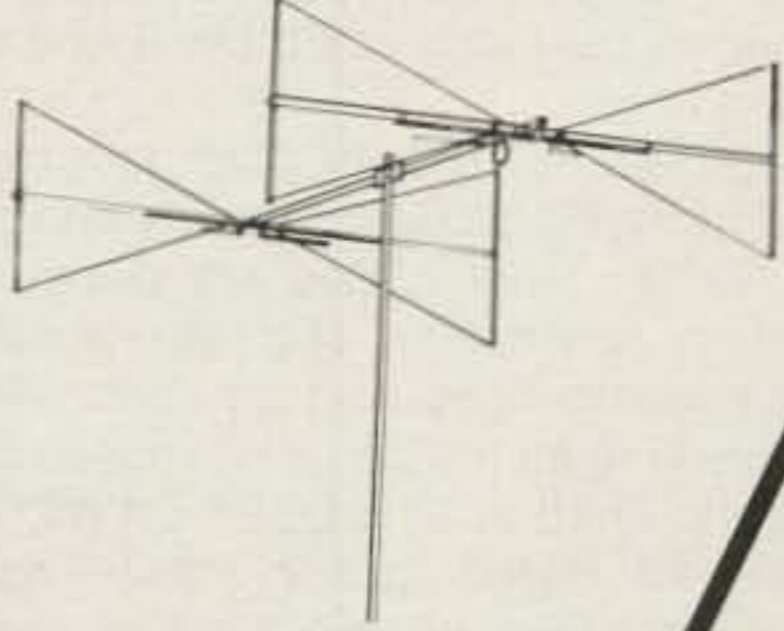
Photographs Wanted

Photographs of Novices in their shacks provide introductions to a few of the newer amateurs. Photograph size is unimportant, but good definition, contrast, and subject matter are important. Color pictures can be used, but black-and-white photographs are preferred. Operating activities and achievements, plus a self-introduction, are needed with each picture. Send an SASE if a picture must be returned. A free one-year CQ subscription (or renewal) is awarded to the one amateur whose picture I select as the winner for the month. If you are a subscriber, please enclose the mailing label (or copy) from your latest CQ issue. One award is made each month, no matter how many photographs are printed. DX amateurs, who frequently work the American Novice bands, are also urged to submit photographs. I have not received a picture from a Novice in Hawaii or Vermont.

73, Bill, W6DDB

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NEWS OF CERTIFICATE AND AWARD COLLECTING

The Story of the Month for July is:

Kenneth Wosika, KB7QO
Polk County, Iowa, #3077

"I dedicate this article to my wife, Norma. She is my childhood sweetheart. We met when she was 13 and I was 14 and married four years later. We have three children. George, KC0MB, lives in Bena, Minnesota and has three daughters. Karen has three sons and lives in Yankton, South Dakota. Frank has one daughter and lives in Hesperia, California.

"I began amateur operating with the call KA7GWH and made my first CW contact with KA9CTM on March 17, 1980. On June 1, KA7HFP gave me Montana to complete WAS on CW. I studied full time and on September 17, 1980 passed the General and Advanced class examinations and was given my present call, KB7QO. There was lots of action on 10 meters at that time, and I collected scores of certificates from around the world. On April 22, 1981 I completed the 3905 Century Club #625 on 40 meters and #920 on 75 meters. I was looking for something else when our son George, KC0MB, suggested county hunting.

"On April 30, 1981 I made my first county contact with KD9Q while Doug was running the Clinton/DeKalb, Missouri county line. I could not believe the pile-up! Next, WA7NNH ran Umatilla County, Oregon, followed by N7AKG running Spokane County, Washington. Then it was Doug again, this time in Clay County, Missouri. In 30 minutes I had my first 5 counties from mobiles, but what to do with them? The next QSO with George brought the necessary information. I had to admit to him, though, that it took a little more time for me to get hopelessly involved and develop into an avid county hunter. The further I ventured, the greater the challenge became. On November 23, 1981 I reached the USA-CA Class 2000 level and received certificate #1699 with three gold seals, the spaces for two more seals looking very empty.

"I acted as net control, the fastest way to gather counties, and the list of needs became smaller. I was net control the evening of January 10, 1982 when several mobiles were making their way home from a county hunters convention in Minneapolis. Wind-chill factors were as low as minus 100 degrees Fahrenheit. A distress call came from N9CHU, who had stopped to help a stranded motorist and



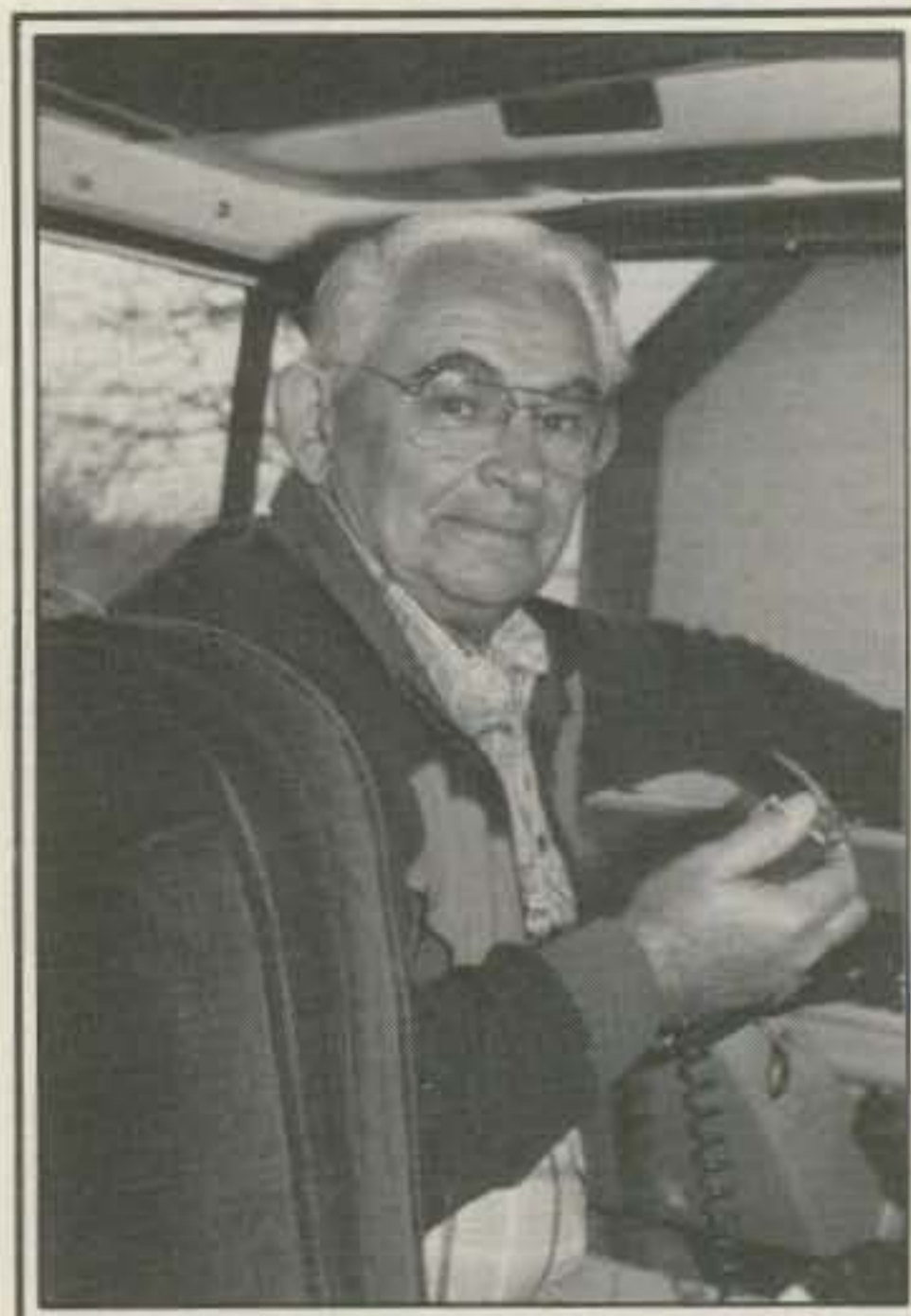
Ken Wosika, USA-CA #384, at home in Las Vegas, Nevada.

became stranded himself. He received help very soon, and the net settled down to routine operating. Then at 2340 hours another distress call came from N0CKN and N0COL, Gwen and Jerry, who had come upon three stranded autos with the occupants near freezing. The net went on immediate standby, and all efforts were made to get help. Soon Gwen and Jerry's vehicle also stalled and, at 0229, with their battery near dead, Jerry reported a blue light approaching. This is a long story, and if you ever get a chance, let Gwen and Jerry tell you the rest of it. Suffice it to say here that this was a case in which two county hunters were in the right place at the right time, and those stranded motorists were saved. I have been involved in other incidents where mobile radio amateurs performed similar services, but I will remember that one for a long time.

"On May 19, 1982 KC0MB gave me Eddy County, North Dakota as my last county, #3076. I completed my paperwork, filed my application, and received those two missing seals and an endorsement for working all the counties mobile on 20 meters. I had attained USA-CA All Counties #384, dated June 7, 1982. I had no doubt that I would work them all again to earn the MARAC second-time award.

"I was in the process of installing a mobile rig when Jerry and Gwen stopped by on their way to the National County Hunters Convention in San Diego, California. On July 6 I gave Jerry my first contact operating mobile and gave Gwen the second. We headed out behind them to attend our first county hunters convention. It didn't take long to realize that I enjoyed giving out counties even more than collecting them. From then on I was planning mobile trips at every opportunity.

"On November 7, 1982 I went to Inyo, California to give George his last county



Ken, KB7QO, at the driver/operator position, Everywhere, USA.

to complete USA-CA. He suggested that I give a plaque to anyone working me in all 16 Nevada counties plus Carson City. Seventeen county hunters have received that plaque so far.

"In July, 1983 N7AKT and I traveled together to the national convention in Charleston, West Virginia and by the time I arrived back home from that trip I had operated mobile in 33 states and the urge to do all 50 had set in.

"Norma and I had decided to visit Hawaii for our 41st anniversary, so with my radio under my arm and a suitcase full of antennas, mast sections, magnetic mounts, and assorted parts, we were on our way. We had rental cars on each of the islands so we were able to operate mobile from all five counties. Looking down on Kalawao from the top of Molokai provides a most beautiful and impressive experience. It is also difficult terrain to negotiate. Heavy rains forced our retreat four different times while we were operating mobile from that location. The road, really a pack-mule trail, left a few things to be desired. However, we really enjoyed Hawaii and hope to return. I had given out 104 last counties, and my second, to WD0CFZ, to fill out an All Counties score.

"I was net control when KL7RO ran mobile from the Second to the Fourth district in Alaska and I said, 'I don't think you can do that, Fred.' He replied, 'You come up here and I will show you how.' We ex-

333 South Lincoln Ave., Mundelein, IL 60060.

changed several letters and he sponsored me with a letter to the governor's office for a permit so I could drive the Dalton highway to Prudhoe Bay.

"I received my plaque from MARAC for All Counties, Second Time, #34 on May 3, 1984, and by that time I had decided that just maybe I could run all counties rather than collect them all again, for the third time. A trip to the National Convention in Kansas City brought that goal a bit closer. Then came Norma's retirement on March 29, 1985, and we were on the road the 30th, working toward a total of 201 days of travel that year.

"Our confirmations arrived for our cruise to Alaska, leaving from Vancouver, B.C. on June 21. On the way to Vancouver we got a sample of what was coming as we operated from Island and San Juan Counties, Washington. We boarded the ship with 396 other RVs, cars, etc., on the fourth of ten decks, so you have some idea of the size of the ship. It was super!

"We spent 21 days in Alaska and drove 5216 miles. KL7RO and KL7VY, Fred and Marge, gave us the use of their home in North Pole for our headquarters, and we became special friends. Our permit to drive the Dalton highway was good for 30 days, allowed only one entry, and was void upon our leaving the Second District checkpoint. The 24 hours of daylight north of the Arctic Circle really added to our enjoyment. I could write a book on our Alaskan experience, but I will limit my comments here to a few happenings. Cold Foot Services, northern-most truck stop in the world, provided our last chance to fill up with diesel fuel, but Fred could have brought more if needed. People at the truck stop told us of seeing a large grizzly bear in the area, and as we drove north we saw it. It was big enough to give us both a start as it came lumbering toward us on the road. Luckily a heavy truck approaching from the north frightened him enough so that he headed off into the woods. It all happened so fast that we did not get a picture, but he was BIG!

"We spent four days transmitting from the Second District, most of that time on the tundra north of the Brooks Range. Norma said it was just God and us. We did make friends with some sea gulls that were looking for handouts, but there was little else at that spot. On the way out we stopped on the Arctic Circle. However, the county hunters were more interested in the fourth district than the special location. I went off net frequency later and had a big DX pileup of operators interested in the special location rather than the county.

"Reluctantly we kept our date to meet the ship for the return trip to Vancouver, this time via the outer passage, and then on to the national convention at Coeur d'Alene, Idaho. This was the first of four trips that took us into 49 states during the year. Florida was my 50th state, and I re-

USA-CA Honor Roll

3000		1500	
W4WXJ	565	W4WXJ	782
YV5AGD	566	KE7PB	783
W0MHK	567	YV5AGD	784
G4KHG	568	WPE6YL	785
		WA1YZV	786
		G4KHG	787
2500		1000	
W4WXJ	634	W4WXJ	956
YV5AGD	635	KE7PB	957
WPE6YL	636	YV5AGD	958
W0WYX	637	WPE6YL	959
G4KHG	638	PT2TF	960
		N1EDL	961
		AK2H	962
2000		500	
W4WXJ	696	YV5AGD	2163
KE7PB	697	KA5PVB	2164
YV5AGD	698	PT2TF	2165
JH6GWW	699	KA4OVZ	2166
WPE6YL	700	JA1FGB	2167
W0WYX	701		
G4KHG	702		

The total number of counties for credit for the United States of America County Award is 3076. The basic award fee for subscribers to CQ is \$4.00. For non-subscribers, it is \$10.00. Initial application must be submitted in the USA-CA record book which may be obtained from CQ Publishing Company, 76 North Broadway, Hicksville, NY 11801, U.S.A. for \$1.25. To qualify for the special subscriber rate please send a recent CQ mailing label with your application. To be eligible for the USA-CA, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated April 2, 1985. A complete copy of the rules may be obtained by sending a SASE to the USA-CA Custodian, 333 South Lincoln Avenue, Mundelein, IL 60060, U.S.A. DX stations must include extra postage for air mail reply.

ceived MARAC's plaque #1 for operating from all 50 states on CW.

"Norma injured her back on the way to the convention in Manchester, Tennessee that year and attended the banquet in a wheelchair. We rushed home where she had back surgery and experienced a successful and quick recovery. Our son Frank and I also suffered injuries shortly thereafter. After Frank's surgery in February we traveled on to finish running all of the counties in Texas, including the temporary County of Armadillo, which was created in celebration of the Texas sesquicentennial. Now we could shoot for a grand total of 3077 counties run.

"We attended the national convention in Asheville, North Carolina and on the way home enjoyed a double celebration—our 44th anniversary and our granddaughter's marriage. This year we also attended the convention in Marshall, Minnesota as well as enjoying the annual Manchester, Tennessee convention again. I received another pleasant surprise at

USA-CA Special Honor Roll

- John D. Hill, W4WXJ
All Counties #533, All SSB, 3-2-87
- Tony Gomez, YV5AGD
All Counties #534, All 20M SSB, 3-6-87
- Fred Van Aalst, WD4RAF
All Counties #535, Mixed, 3-19-87
- Eddie Scholes, G4KHG
All Counties #536, Mixed, 3-28-87

Manchester when N4IWY presented me with a Kentucky Colonel's commission from Governor Martha Lane Collins. Thanks again, Dick.

"Norma and I decided that this should be the year (1986) for us to reach our goal of having operated from all the counties in the United States. We arranged that Polk, Iowa, the home county of Gwen and Jerry, would be the final one. The appointed day finally arrived, and on November 25 at 1930 hours it was "Polk County, Iowa—#3077." Gwen and Jerry had arranged a media event with TV coverage and many hams in attendance. It was truly a moving and exciting experience which I shall remember always. Thank you, Gwen and Jerry.

"For those with an interest in statistics or numbers, we gathered a few. We operated from 3077 counties; made a total of 106,113 contacts, including CW; traveled approximately 150,000 miles by car and van, plus air travel to Hawaii and ship travel to Alaska; and gave 699 last counties, 8 of which were to complete USA-CA All Counties. Six amateurs worked KB7QO in all 50 states, 17 worked me in 1,000 or more different counties, 6 worked me in 1,500 or more, and our son George worked me in more than 2,200. One station, W5QLD, worked me in every county in 13 different states.

"We plan to be making many more trips, but at a slower pace, taking time to smell the flowers. Thanks again to all the net controls and all the others who helped us enjoy our travels and realize our goal. I wish I could name you all, but it is just not possible.—73, Ken."

Awards Issued:

John D. Hill, W4WXJ, filed his application and received All Counties #533, All SSB, along with USA-CA 3000 #565, USA-CA 2500 #634, USA-CA 2000 #696, USA-CA 1500 #782, and USA-CA 1000 #956, All SSB Mobiles, and all dated 3-2-87.

Tony Gomez, YV5AGD, completed all his paperwork and qualified for All Counties #534, USA-CA 3000 #566, USA-CA 2500 #635, USA-CA 2000 #698, USA-CA 1500 #784, USA-CA 1000 #958, and USA-CA 500 #2163, All 20 Meter SSB, dated 3-6-87.

Fred Van Aalst, WD4RAF, collected that last one and qualified for All Counties #535, Mixed, dated 3-19-87.

Eddie Scholes, G4KHG, qualified for and received All Counties #536, USA-CA 3000 #568, USA-CA 2500 #638, USA-CA 2000 #702, and USA-CA 1500 #787, Mixed, dated 3-28-87.

Bill Grim, W0MHK, sent his application and received USA-CA 3000 #567, Mixed, dated 3-16-87.

Betty Pearl Cruz, WPE6YL, listened closely and qualified for USA-CA 2500 #636, USA-CA 2000 #700, USA-CA 1500 #785, and USA-CA 1000 #959, Mixed, dated 3-10-87.

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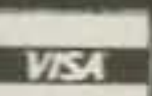
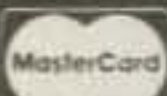
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Frank A. "Bob" Swanlund, W0WYX, added to two gold seals to his certificate by claiming USA-CA 2500 #637, and USA-CA 2000 #701, Mixed, dated 3-23-87.

Herb Rode, KE7PB, submitted his application for USA-CA 2000 #697, USA-1500 #783, and USA-CA 1000 #957, Mixed, dated 3-5-87.

Yasu-Tada Ninomiya, JH8GWW, added USA-CA 2000 #699, All SSB, dated 3-9-87, to his fine record.

Joyce B. LaGasse, WA1YZV, qualified for USA-CA 1500 #786, All SSB Mobiles, dated 3-21-87.

Therezinha Cardozo, PT2TF, got off to a good start by claiming USA-CA 1000 #960, and USA-CA 500 #2165, All SSB, dated 3-14-87.

Clarence E. Allen, N1EDL, filed his application and received USA-CA 1000 #961, Mixed, dated 3-23-87.

Warren H. Ash, AK2H, qualified for USA-CA 1000 #962, All CW, dated 3-27-87.

USA-CA 500 certificates went to:

Tony Gomez, YV5AGD, USA-CA 500 #2163, All 20 Meter SSB, 3-6-87.

Charles A. Dobbins, KA5PVB, USA-CA 500 #2164, Mixed, 3-9-87.

Therezinha Cardozo, PT2TF, USA-CA 500 #2165, All SSB, 3-14-87.

Tom Clark, KA4OVZ, USA-CA 500 #2166, All CW, 3-16-87.

Masaru Usami, JA1FGB, USA-CA 500 #2167, Mixed, 3-31-87.

CW County Hunting

Table I is a tabulation of confirmed contacts by CW county hunters as of Jan-

uary 1, 1987. An asterisk (*) denotes a holder of the USA-CA All Counties Award. A number sign (#) denotes second time. Information is by courtesy of Buster Boatman, N0CKC.

Awards Available

Grupo Praiano De CW Awards. Grupo Praiano de CW (GPCW) offers the following four awards under rules and requirements as indicated. Send all applications and inquiries to the Awards Manager, GPCW, Caixa Postal 556-11100, Santos-SP, Brasil.



GPCW Award offered for working member stations of the Praiano CW Group.

1. The GPCW Award is available to all amateurs for having worked 3 different GPCW members. Contacts in any HF band on or after November 5, 1973 are valid. Mode: CW only, with a minimum re-

Honor Roll

	Jan. 87	Jan. 86		Jan. 87	Jan. 86
#1 W8RSW*			#3 KA5A		
#5 W3HQU			#7 N0T*		
#9 N2RT*			#11 N5QQ*		
			#4 W1JTD*		
			#8 W00DS*		
			#12 WA6VJP*		
W0FBB*	3071	3051	KD6PP*	2388	—
W9VEN	—	3064	N9DR	2385	2374
K3LK*	—	3063	K7GJZ	2355	—
W7IEU	3049	2899	N7TT*	—	2301
KA4IFF	3045	2988	VE3IR*	2287	—
N6QA	3043	3021	WA2EYA	2268	—
K7EQ	3037	2947	W3EYF	2130	960
K8KIR	3021	2955	WB1EIL	—	2020
N0CKC*	3004	2822	VE3KZE	1962	—
W2EMW	2995	2903	WA4KER	1938	1262
W7GHT*	2980	—	NF0X*	1930	868
W4POA	2925	2850	W3XE*	1920	—
W2EZ	2921	—	VE1ASJ	—	1702
W6NNV	2920	2671	KA1CLV	1617	1512
K9WA	2894	—	K4MF	1480	—
N2CWG	2861	2722	N5QQ*	—	1250#
W1TEE	2833	2741	K2PF	1230	—
K8MW*	2824	2567	VE1WF	1209	—
W3HQU*	2770#	—	W6CF	1187	385
W8WVU	—	2758	AD5F	1080	—
W8YL	—	2757	KK0V*	916	—
W5VGF/6	—	2753	W9CRN*	716	—
KN4Y	2686	2591	KA1CV(QRP)	—	707
W7HZL	2683	2400	WB1AOD	—	597
N0CYB	2650	2350	KA8MSU	—	449
W9MY	2521	2205	W6ISQ	356	—
WD9BCG*	2495	—			

port (RST) of 338. A certified list is required. The fee is 5 IRCs. A QRP endorsement is available. Applicants who want the QRP endorsement must submit a



SWL GPCW Award offered by the Praiano CW Group.

signed statement that all contacts were made with no more than 10 watts input.

2. The SWL GPCW Award is available only to licensed SWLs who submit proof of having listened to QSOs of three different GPCW members. Contacts in any HF band, starting on or after July 1, 1976, on

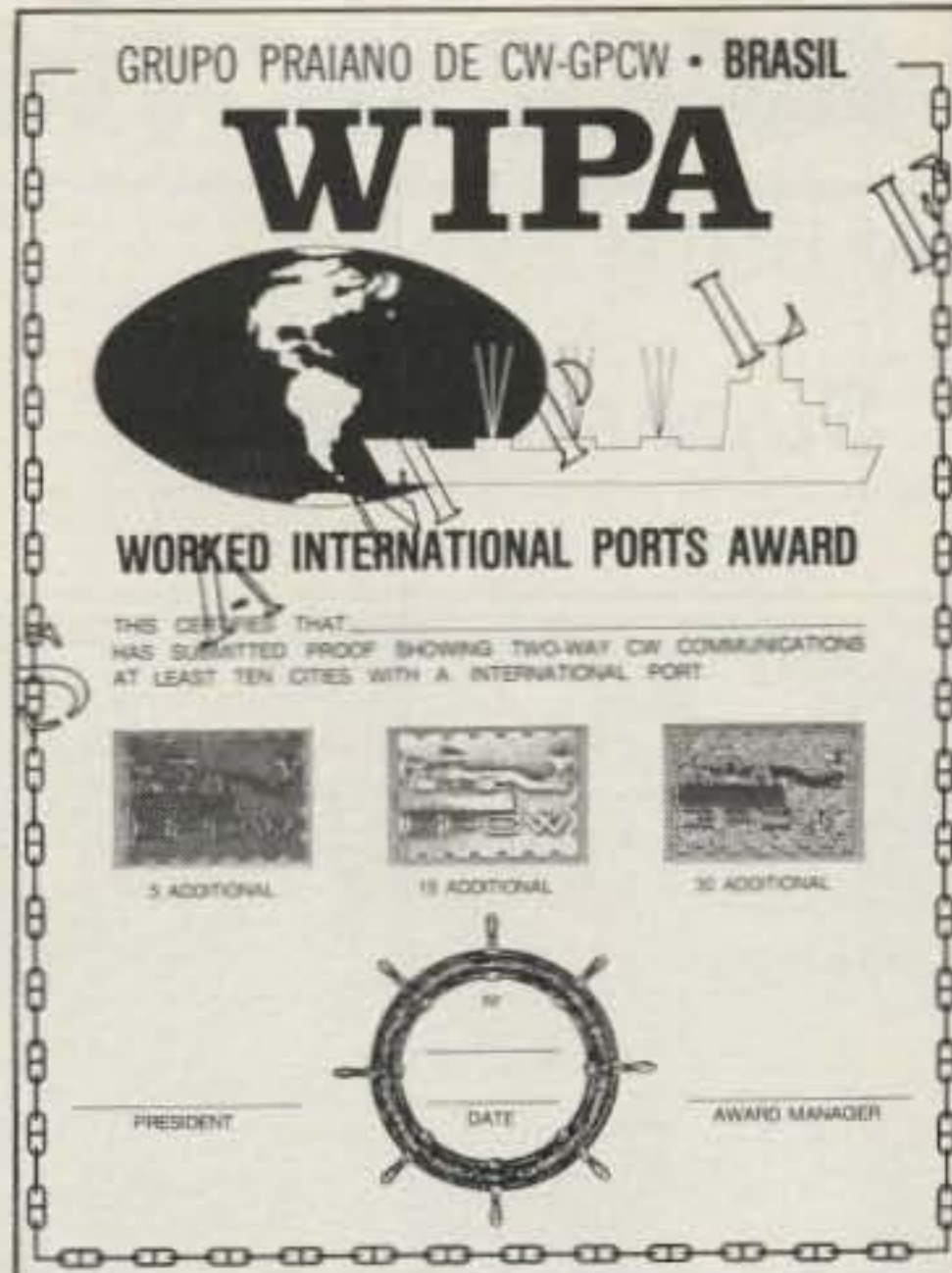


Brazilian Coast Award available from the Praiano CW Group.

CW only, are acceptable. Submit a certified list and 5 IRCs to the awards manager.

3. The Brazilian Coast Award is issued to all licensed amateurs and SWLs who can submit proof of CW contacts with 8 different call areas of the Brazilian coast. Contacts since September 30, 1978 on any band and with a minimum report (RST) of 338 are valid. Applicants shall submit a certified list and fee of 10 IRCs. Coastal call areas are PP1, PP5, PP6, PP7, PR7, PR8, PT7, PY1, PY2, PY3, PY5, PY6, PY7, PY8, PY0F, S, T. The prefix PU is also valid if it is identified with a coastal call area.

4. The WIPA Award may be requested by all licensed amateurs and SWLs who prove contacts in different cities considered as international ports. Contacts with 10 cities representing three continents are required. No more than two contacts



Worked International Ports Award by the Praiano CW Group.

may be with cities in the applicant's own country. Only contacts made on or after January 1, 1983, exclusively CW with a minimum report (RST) of 338, are valid. Applications are to be authenticated by a recognized Radio Association. The fee is 10 IRCs. Special credits are available in the form of seals (medallions) for 5, 15, and 30 additional contacts ("copper," "silver," and "gold"). Submit authenticated application and 5 IRCs for each seal requested.

Michigan Sesquicentennial Certificate. To celebrate Michigan's 150th birthday the Monroe County Radio Communication Association is offering a Michigan Sesquicentennial Certificate. The certificate is printed on heavy parchment and is suitable for framing. Every confirmed contact with a station located in the state of Michigan is worth three points. A minimum of 150 points is necessary to earn the certificate. Contacts may be made on any band and any mode. However, no station may be worked more than once, and "store and forward" BBS systems may not be used. (This does not eliminate repeater or digipeater contacts.) A special endorsement is available for working all 83 Michigan counties. Contacts must be made between January 23, 1987 and January 23, 1988.

To apply for the certificate, send a list of stations worked, including call, name, band, mode, and time/date, and a letter from a local club officer verifying your QSL cards to MCRCA, P.O. Box 384, Monroe, MI 48161, USA. Please include \$1.00 to cover return postage and handling (no IRCs). Applications for the certificate must be postmarked no later than June 30, 1988.

73, Dorothy, WB9RCY

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Antennas & Accessories

a monthly feature by
KARL T. THURBER, JR., W8FX

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

Super Software

This month author Thurber surveys some very outstanding software that he has encountered which may find a real place in your hamshack. Read on for a most interesting discussion, one you should find quite informative and useful!

—K2EEK

Last time we got together we again opened up the mailbag, devoting the bulk of the column to a review of some of the interesting letters received. We highlighted two very topical letters on the ever-popular G5RV multiband antenna, including lengthy comments by the antenna's inventor, Louis Varney. Following our mailbag review, we examined several software products of interest and took a look at some good sources of hamshack reading material.

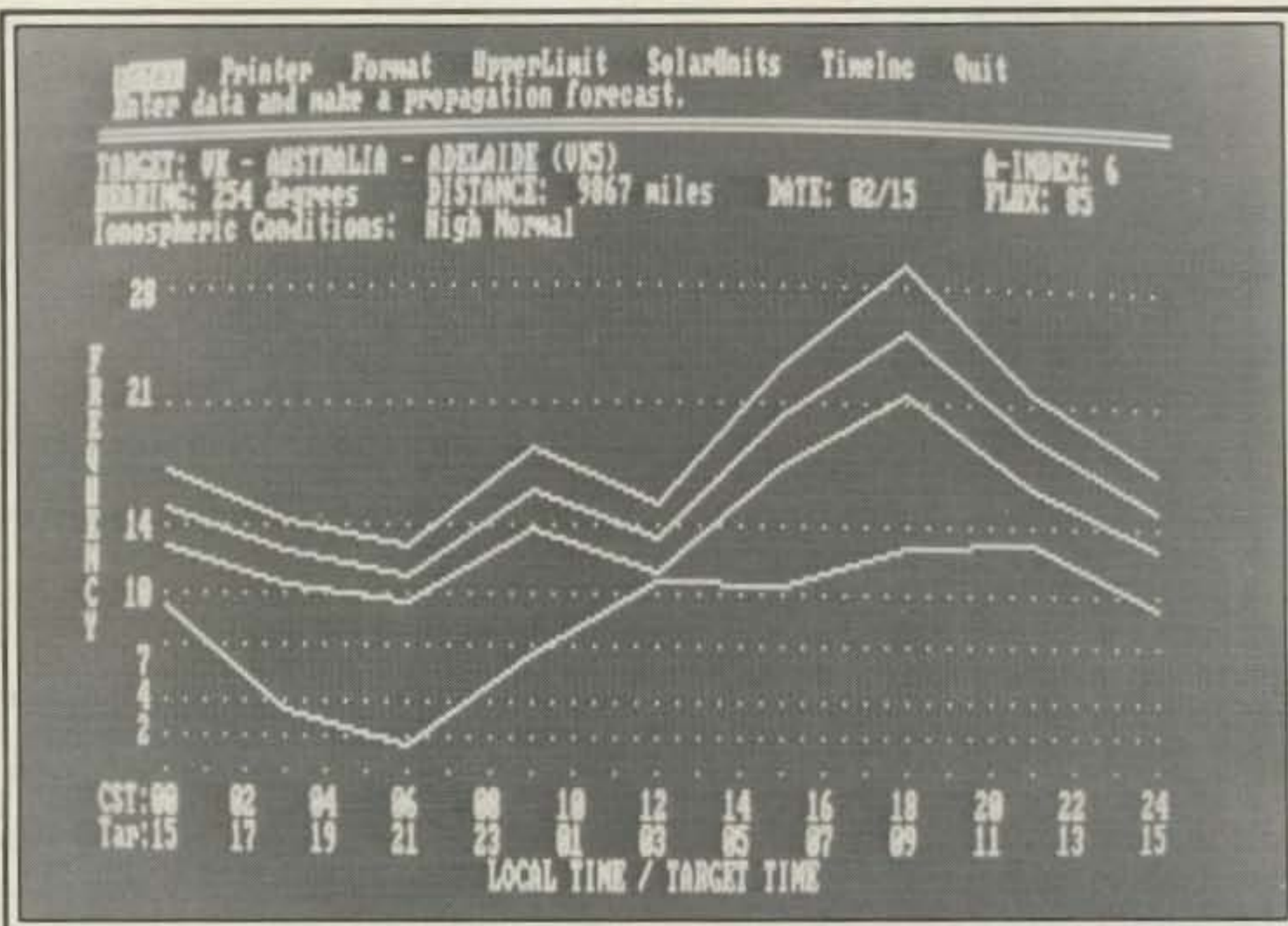
This time we're going to examine some new and exciting software that dramatically increases the power of the hamshack PC. We plan to look at an excellent propagation prediction tool, BandAid™, and a comprehensive Sweepstakes logging program, SCORE™. After looking at these two products, both of which are designed for the IBM-PC and compatibles, we'll take note of some new additions to the hamshack library, examine some new antenna products, and reserve just enough room for some "short bursts" before closing out the column. Let's look at the software first.

Super Software for Your PC

BandAid. Without a doubt, one of the most useful classes of hamshack software is that of propagation prediction tools. The traditional way of trying to get a handle on current and future propagation conditions is by using propagation charts. You've seen and used them before. *CQ* and the other amateur publications print them each month. They're highly useful, as they can tell you the best frequencies and times to use when trying to contact other (usually DX) stations. These charts have been in use for many years, and their usefulness has been established.

Computer-based propagation programs, with their reliance on tried and proven propagation algorithms and access to close to real time data, have a great deal to offer the aggressive DXer and contest operator. In the past we have described several commercial propagation aid programs, including Base (2) Systems' MUFLOT for the Commodore 64 and the Super DX EDGE™.

The latter program, by Xantek, is a particularly useful one, in that it incorporates a gray-line capability. This program, which we discussed in the column two months ago, calculates maximum usable frequency (MUF) and computes great circle bearings (antenna di-



Typical screen display of Base (2) Systems' BandAid propagation forecasting program for the IBM-PC. Shown are HPF, MUF, FOT, and LUF over a path from the author's Alabama location to Australia; beam heading is also depicted. (W8FX photo)

rections) and distance between any two locations. In addition, the program is able to display and automatically update the position of the gray line, and to calculate and display sunrise and sunset times for any location at any time of

the year. (Xantek, Inc., P.O. Box 834, Madison Square Station, New York, NY 10159.)

Growing out of the successful Commodore 64-based program MUFLOT, Bill Dolson, K8DDV, and Jim Dolson, WB8ZBD, have gone

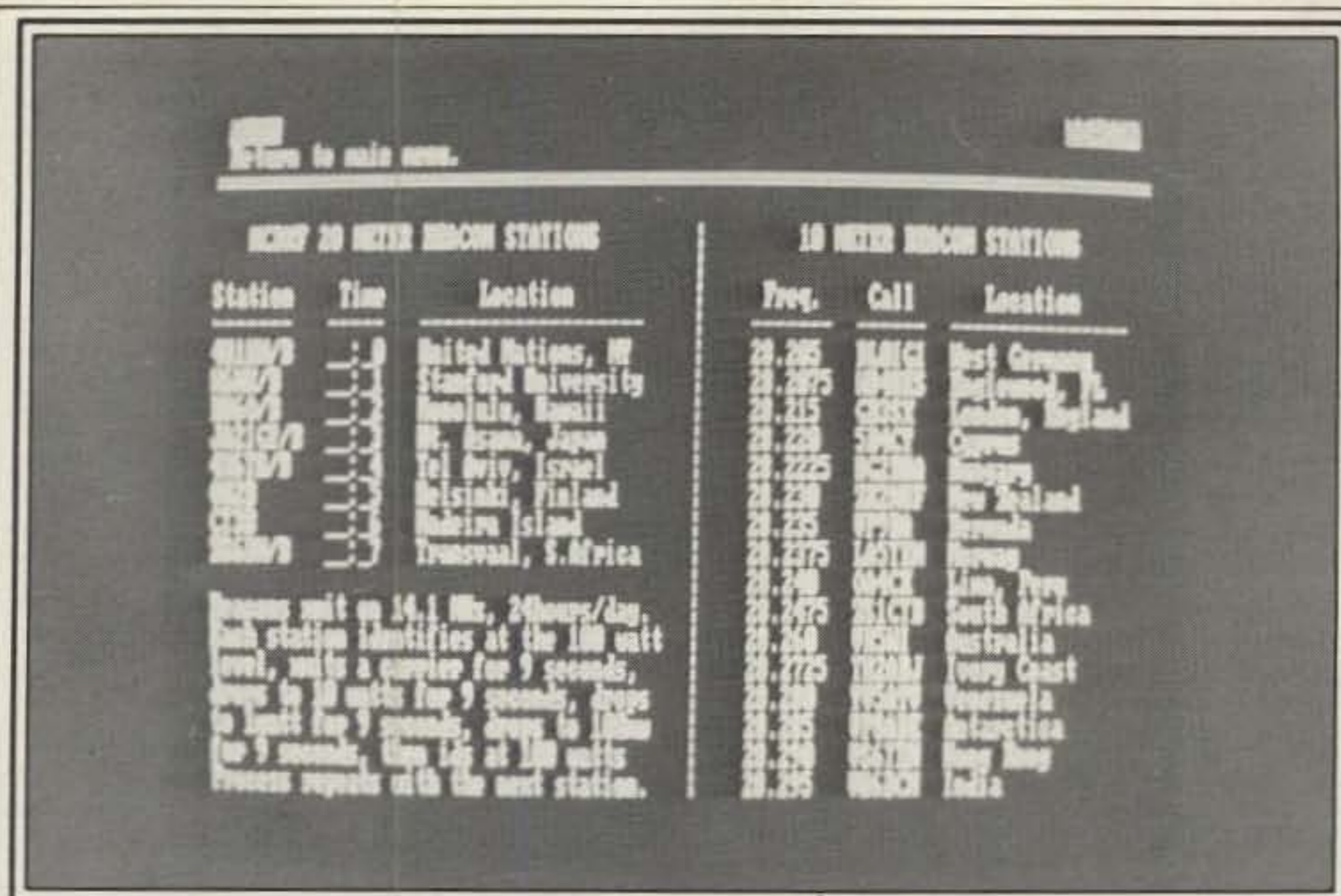
List Mutual Sunrise & Sunset Times to All Targets in the Target Database

Target	Description	Bearing	Sunrise	Sunset
AL	ALABAMA	100 deg	1119utc	2410utc
CH	CHILE (SANTIAGO)	166 deg	1114utc	
CS	SOUTH SHETLAND ISLAND	167 deg	1115utc	
CU	CUBA (HAVANA)	159 deg	1116utc	
CU	CUBA (HAVANA)	159 deg	1116utc	
CR	COSTA RICA	50 deg	1115utc	2407utc
EC	ECUADOR (QUITO)	165 deg	1116utc	
VE	VENEZUELA (CARACAS)	190 deg		2400utc
IS	ISLANDIA	169 deg	1120utc	
JP	JAPAN (TOKYO)	165 deg	1117utc	
US	UNITED STATES (NEW YORK)	167 deg	1118utc	
EP	EUROPE (PARIS)	164 deg	1115utc	
IR	IRELAND	182 deg		2404utc
IN	INDIA	1 deg	1115utc	2414utc
US	UNITED STATES (INDIANA)	14 deg	1113utc	2410utc
LA	LOUISIANA	232 deg		2417utc

Press any key to continue
Hit [ESC] to cancel

The BandAid Sunrise/Sunset option allows the calculation of several SR/SS conditions. Shown here is a screen display of a portion of the mutual sunrise and sunset times between the author's station and other locations during a given month. (W8FX photo)

317 Poplar Drive, Millbrook, AL 36054



A nice "plus" in the BandAid program is the inclusion of 20 and 10 meter beacon lists. You may find these lists useful for telling if the band is "really" open. You can get into the beacon list and change it, adding or subtracting entries as necessary. (W8FX photo)

on to produce another winner in BandAid. This program is aptly described by Bill and Jim as "a complete propagation aid for the amateur radio enthusiast," and indeed it is. Designed for the IBM-PC or compatible with at least 256K RAM and an IBM color/graphics card or equivalent, the program offers a complete menu of features.

At the heart of the program is the propagation forecasting module, which allows you to predict ionospheric propagation conditions to another station. In addition to the more common MUF measure, you can also predict the HPF (highest possible frequency), FOT (Frequency of Optimum Traffic), and LUF (Lowest Usable Frequency) between yourself and the other station; these predictions can be presented in either table or graph form. Either solar flux or sunspot number can be used as an input parameter. The distance and bearing to the target station is shown, in addition to the actual propagation prediction. Due to the extensive database of very specific target areas, you should never have to work with actual coordinates (latitude and longitude) after setting up the program to reflect your own QTH.

BandAid offers a number of additional features, in addition to the basic forecasting capability. The most important of these is the ability to make grayline and sunrise/sunset predictions. The program allows these to be made in four different ways: (1) sunrise/sunset times for your location during any month; (2) sunrise/sunset times at any other location; (3) a list of mutual sunrise/sunset times between yourself and any other station of your choosing; and (4) a list of countries throughout the world with which you share a mutual sunrise/sunset.

Another useful feature is the built-in UTC time conversion table to enable you to easily convert local time to UTC and back (especially useful during spring and fall after the time change between standard and daylight savings times). The program also includes a list of 20 and 10 meter beacon stations currently in operation, useful for helping to tell if the band is really open. You can edit the list, adding or deleting beacon stations for currency.

BandAid also allows you to maintain a database containing QSL information for DX or other stations worked, and you can maintain the target database or calls and countries as needed (the database comes with about 460 entries to start with). Another useful feature is a memory jogger, called the "AuthFreq option"; this shows at a glance the authorized HF frequencies for your class license. The program also has a "gee whiz" feature, the World option, which allows you to display the location of any station on a map of the world. You tell BandAid what station or country you want to locate, and it displays a map of the world on the screen with the target on a blinking crosshair.



The World Map option of BandAid displays the location of any station in the target database on a world map, marked by a flashing crosshair. In the example selected here, LU (Buenos Aires) has been chosen. (W8FX photo)

The program is quite easy to use; it doesn't make use of any cryptic commands. Rather, it has a menu-driven command structure similar to that on products such as Lotus 1-2-3™ or Symphony™. At every point in the program all of the commands are always visible, keeping required reference to the manual at a minimum. A handy convenience feature is the ability to customize the program for your location and license class, and to preset the program for various preferred options.

Fig. 1 is a screen dump of the BandAid MUF option screen, as it displays a propagation prediction from the author's QTH to VK7-land. Fig. 2 is a printout derived from the program's World option, showing in this example the approximate location of Paraguay (ZP).

BandAid is priced at \$69. For more details, contact Base (2) Systems, 2534 Nebraska St., Saginaw, MI 48601.

As an interesting aside, it appears that the lows of the current sunspot cycle are fast approaching, and the next cycle will be somewhat below average in magnitude. According to information put out by the government's Space Environment Services Center in Boulder, Colorado, it's important to note that the predicted time of the next solar minimum is based on the lengths of previous sunspot cycles.

These cycle lengths over the last 136 years appear to fall into a "bimodal distribution" of about 123 months and 140 months. Since there aren't any truly objective methods for determining the length of the current cycle, number 21, the forecasters conservatively choose an average cycle length of 133 months (minimum to minimum). Using this value, the minimum smoothed mean sunspot number for Cycle 21 should occur in July of this year. However, using a cycle length of 140 months would result in a minimum sunspot number in February 1988.

The predicted time of the next solar maximum is based on the average time between minimum and maximum—about four years. Even-numbered sunspot cycles appear to be

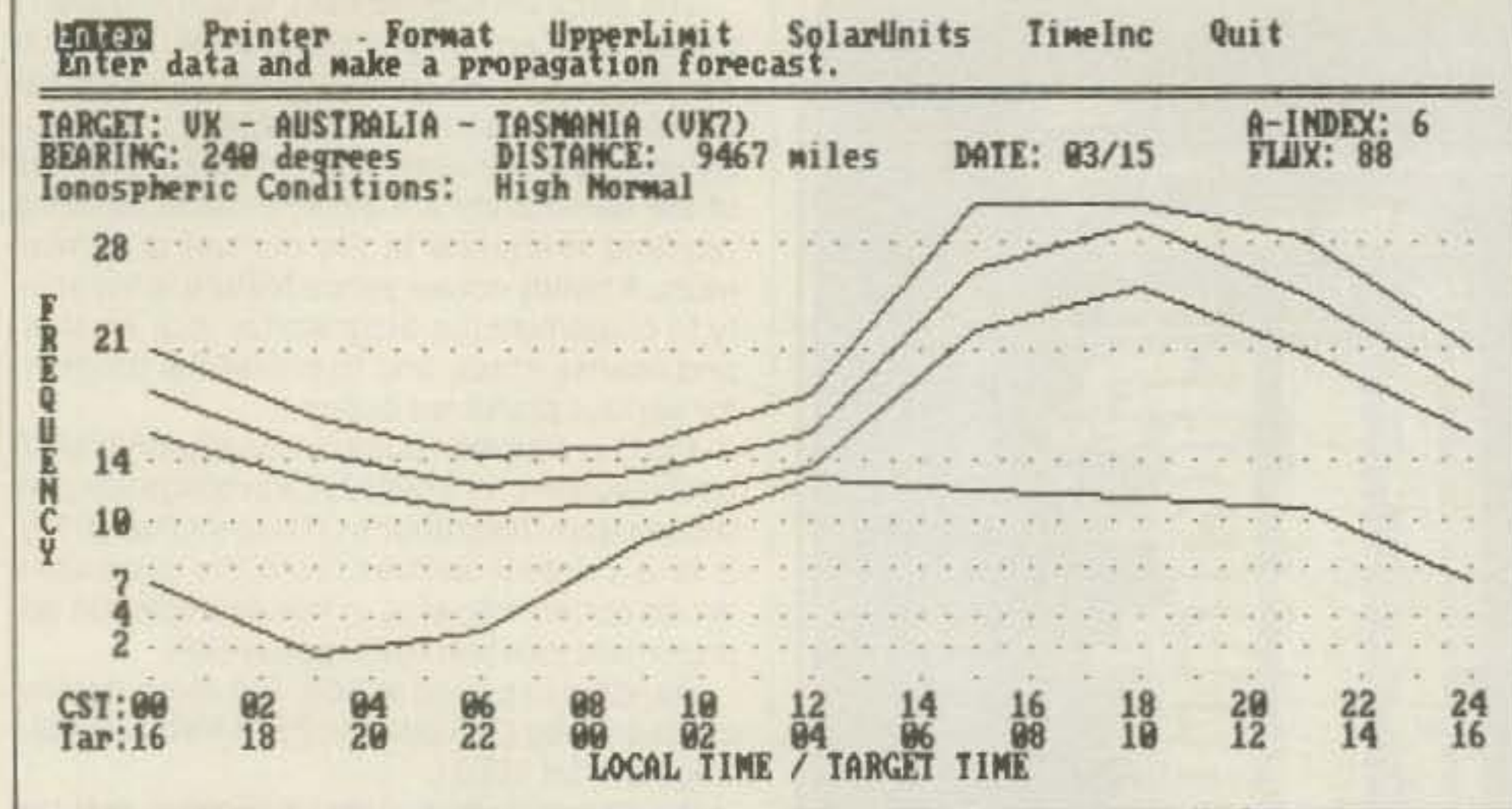


Fig. 1—BandAid MUF option screen. Displayed here is a path between the author's Alabama QTH and Tasmania (VK7). The four lines on the graph are actually in color (which doesn't reproduce here) and depict LUF, HPF, MUF, and FOT. See text for discussion.

"flat-topped," meaning that the precise time of the maximum smoothed mean monthly number of the next sunspot cycle (22) will be reached in mid-1991 (though sunspot numbers may be close to the maximum values for two years or more).

The predicted maximum smoothed monthly mean values for Cycle 22 therefore are based on forecaster opinion. The forecasters predict a maximum sunspot number of about 100, plus or minus 10. This suggests that the next cycle will be somewhat below average in magnitude, but will not be an unusually "small" cycle. How 'bout them apples?

SCORE. A really powerful product for the contest-oriented operator is SCORE, the Sweepstakes Contest Operating Results Enhancer, also for the IBM-PC and compatible systems. The product is intended to provide a "competitive edge" to the user, relieving the casual operator from the tedious manual process of maintaining logs and monitoring status. This is not your average Sweepstakes contest log, but one which includes a number of window-oriented status and edit displays, along with full support for control of certain transceivers and antenna rotors.

The program boasts nearly instantaneous dupe checking (generally less than one sec-

ond), automatic UTC time conversion, provision for handling off-the-air intervals, comprehensive edit checking of input data, and the production of a number of reports which can be displayed on the screen, printed out, or saved to disk. The program allows a wide range of user-preference options to customize the manner in which SCORE operates; these may be stored as startup defaults if desired. Log information may be imported or exported so that you can use the logs in conjunction with other software, such as wordprocessing and database programs. Comprehensive, context-sensitive online help information is available at all times.

At the heart of the program is the "Contest Control Panel." This consists of seven windows, several of which are displayed at any given time. Windows are activated using the appropriate function keys. The Log Entry window is used to enter new contacts, which provides the information to be entered into the log. The Contest Status window provides a continuous display of current scoring information, including both contact and time information.

The Transceiver Control and Rotor Control windows are used to display and change the control settings of the transceiver and rotor, when these functions are enabled. The LIFO

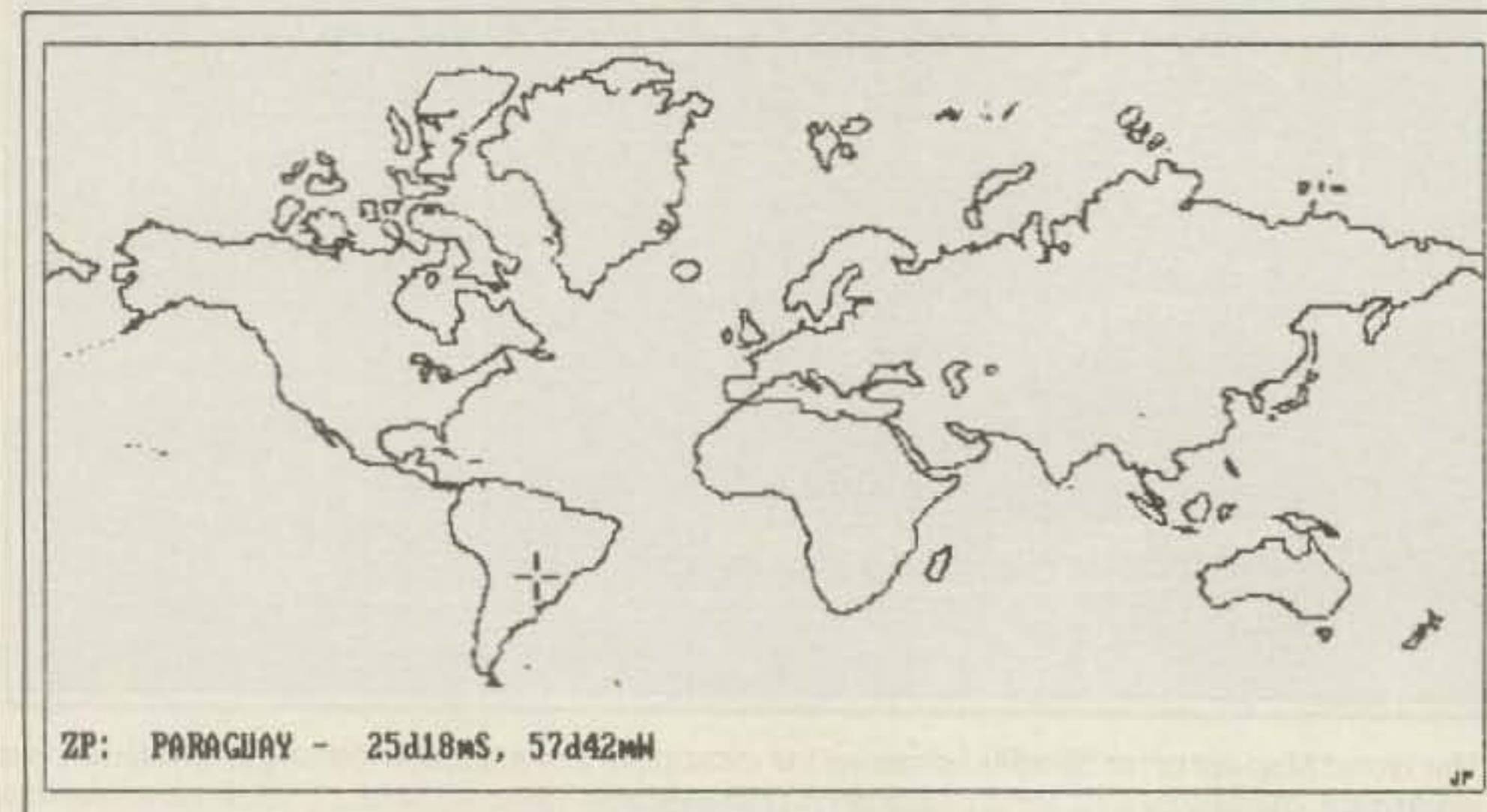


Fig. 2—Shown here is the BandAid "World" option showing the location of Paraguay (ZP).

Log Display window shows the last five entries in the Contest Log, updated automatically as new entries are entered. The Sections Status window shows each of the ARRL section identifiers, highlighting sections yet to be worked. Finally, the Contest Log/Edit Browse window allows the contest log to be browsed, and for the display to be ordered by either contact number or callsign.

A particularly useful feature is the availability of ten memory registers for saving contact exchange and transceiver information for later recall. This function can be helpful, as an example, when efforts to get through a pileup are not at first successful. Not only can all available contest exchange information be saved, but the transceiver settings can also be saved, allowing the operator the freedom to continue to work other stations, while providing the ability to return immediately to the pileup frequency and recall the exchange information later. The program offers full support of the Heath SS-9000T, Kenwood TS-940S, and Kenwood TS-440S transceivers. The Pro-Search rotor is also supported, though either the transceiver or rotor functions, or both, can be disabled through user configuration settings if you don't want these features.

Fig. 3 shows the SCORE Main Menu, while fig. 4 shows a typical contest report produced by the program.

According to Mike Cassidy, WA6LOW, MJC Technologies' president, MJC is a professional personal software development and marketing firm specializing in products for amateur radio. Formally established in 1985, MJC plans a full line of software products for contest support and operating aids in the near future. SCORE is available now and is priced at \$95.50. For more information, contact MJC Technologies, 3704½ Foothill Blvd., Suite 524, La Crescenta, CA 91214.

New Products of Note

Unadilla Products. The 20-year-old line of Unadilla amateur radio products has a new home. Formerly a part of the Microwave Filter Company, the line of baluns, antenna insulators, coaxial relays, antenna coils, and other accessories is now offered by Unadilla as a division of Antenna's Etc., P.O. Box 215 BV, Andover, MA 01810-0814.

The reorganized operation specializes in accessories "to make your antenna more effective," and believes that the simple dipole is the best all-around, affordable antenna for most amateurs. Thus, the majority of Unadilla's products relate to the dipole. All of the firm's major products have at least two things in common: (1) each one was designed by an accomplished amateur; and (2) each has been widely accepted for years by commercial, military, and amateur communicators alike.

At the heart of Unadilla's product line are the W2AU and W2DU baluns, which offer a variety of configurations for operation on 160 meters through VHF (300 MHz). Both series of baluns claim a minimum efficiency of 95 percent, have stainless steel hardware and hang-up hooks, and handle high power levels. The W2AU baluns are of conventional broadband ferrite-core design, while the W2DU baluns are non-ferrite types and handle very high power levels (up to 9 kw).

For more details and information on new products, contact the firm for a catalog.

News From Radiokit. A recent mailing from Radiokit revealed the firm's new address: Box

M A I N M E N U

1. SCORE Contest Control Panel
2. Change Contest Time Information
3. Produce Reports
4. Utility Functions
5. Change User Preferences
6. Change Configuration Parameters
7. Execute DOS Commands

Select menu item above, or Q to Quit:

Help information is available by using the <F1> key at any time

Fig. 3— Shown here is a screen dump of the on-screen SCORE main menu.

973, Pelham, NH 03076. Radiokit offers a wide-ranging product line of kits, "project packs," components, dials, chassis, chokes, toroidal inductors, printed circuit boards, insulators, and the like. Many of these components are of the kind that have long since become scarce as hens' teeth, so to speak, on the shelves of your local amateur dealer or electronic parts store. Practically everything in the catalog has a direct use in amateur radio construction projects, so obtaining a copy of their

catalog for the reference value alone is highly worthwhile.

Amidon Flyer. Speaking of references, the Amidon Associates catalog of iron-powder and ferrite coil forms is among the best. The firm's large foldout flyer is chock full of iron-powder and ferrite cores, shielded coil forms, ferrite pot cores, and ferrite beads. What makes the flyer so useful, in addition to the extensive listings, is the mini-tutorial on each class of product which describes what each

1986 ARRL SWEEPSTAKES -- Phone
Contest Score Summary

Call Used: W1AW

ARRL Section: Connecticut

Power Class: 150 watts or less

SCORING: 850 QSO points x 69 sections = 58,650 claimed score.

! 58,650 Claimed Score ! 425 QSOs ! 69 Sections ! 22:02 Op. Hours !

Total Off-Period Time: 03:28
Total Elapsed Time: 25:30

No. of Off-Period Intervals: 6

Multiplier Check-Off List

1	2	3	4	5	6	7	8	9	VE
*Conn	*ENY	*EPa	*Ala	*Ark	*EBay	*Ariz	*Mich	*Colo	*MarN
*EMass	*NLI	*Del	*Ga	*La	*LA	*Ida	*Ohio	*Iowa	*Que
*Me	*NNJ	*MDC	*Ky	*Miss	*Org	*Mont	*WVa	*Kans	*Ont
*NH	*SNJ	*WPa	*NC	*NMex	*SBar	*Nev		*Minn	*Man
*RI	*WNY		*NFla	*NTex	*SCV	*Oreg	9	*Mo	*Sask
*Vt			*SC	*Okla	*SDgo	*Utah	-----	*Nebr	*Alta
*WMass			*SFla	*STex	*SF	*Wash	*Ill	*NDak	*BC
			*Tenn		*SJV	*Wyo	*Ind	*SDak	VEB
			*Va		*SV	KL7	*Wisc		
			*WI		Pac				

* Indicates Sections Worked

Remaining Sections: 5

Fig. 4— SCORE program "Contest Score Summary." Depicted here is a typical report printout produced by the SCORE program. This one, using demo data, is for the 1986 ARRL Sweepstakes, and shows the contest score summary.

product is, what typical applications are, and how to help ensure that you're ordering the right item for the intended job. Several graphs and formulas are provided.

For a catalog, write to Amidon Associates, 12033 Otsego St., North Hollywood, CA 91607.

Good Reading

Radio Handbook. The 23rd edition of the *Radio Handbook* by Bill Orr, W6SAI, has been out for some time now, and it's a good one. The new edition has technical information on everything from interference reduction for VCRs to the latest in HF and VHF linear amplifier design, all covered in 895 pages.

Antenna-related topics are covered in some depth. There are chapters on electromagnetic propagation, transmission lines and matching systems, HF general-purpose antennas, HF fixed directive antennas, HF rotary beam antennas, and VHF/UHF antenna systems.

The new edition contains more than 35 construction projects, including about a dozen new projects such as a 1500 watt 3CX800A7 HF amplifier, a VHF high-power amplifier using the 8877, and a "slot" beam antenna for 2 meter work. Included are schematics, exploded views, photographs, component lists, assembly instructions, and operating characteristics.

Incidentally, the *Handbook's* author, Bill Orr, comes with some excellent credentials. First licensed in 1934, a year before the first edition was published, he received his electrical engineering education from Columbia University and the University of California. In 1948 Bill designed and built one of the first all-metal Yagi beam antennas for 20 meter amateur communications, and he has also designed high-gain beams for both military and commercial service. Editor of the *Handbook* since 1955, he is the author or co-author of numerous books and has written over 100 technical articles. I should also mention that Bill preceded us as editor of this column in *CQ*, writing the Antennas column through early 1980.

The *Handbook* is available from *CQ's* Book Shop for \$24.95 plus shipping and handling. It is published by Howard W. Sams & Co., 4300 West 62nd St., Indianapolis, IN 46268.

Propagation Publishing Update. A call from proprietor NG9E told us of the firm's move to a new headquarters. Their new address is 707 E. Franklin, Owensville, MO 65066. You might also want to send for their extensive catalog of operating aids, callbooks, and other materials.

Interference Technical Paper. A letter from John W. "Wes" Spence, AC5K, offered for sale at a nominal cost a technical paper on power-line and electrical radio interference.

John's three-page, illustrated paper is full of very useful information on power-line and other electrical interference to radio and television receivers. This is based on John's first-hand experience in his former job with Gulf States Utilities Company, where part of his job was tracking down electrical noises when customers complained of interference. The paper is organized into sections, including one defining "line noise," determining the source of the noise, and noise caused by power company equipment. Captioned photographs of typical power pole hardware are included.

The paper is available to *CQ* readers for \$2.00 postpaid from John W. Spence, AC5K, 465 Creekwood Dr., Silsbee, TX 77656.


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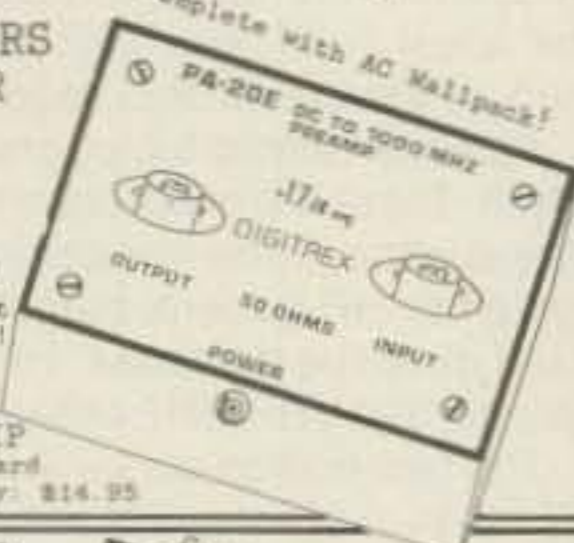


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holder households conducted last year by the United Services Automobile Association (USAA), a major insurance company catering to military officers, revealed some interesting things about computer usage in the "upscale" American home.

USAA found that nearly 35 percent of the households surveyed have a computer, compared with only about 14 percent for the general population. Almost all of the households with a computer had one that has or could use a modem, and more than three-quarters use the computer for wordprocessing, many for office work done at home. Eighty percent use their computer for some financial function, such as balancing checkbooks, tracking a budget, maintaining tax records, and getting investment information. Four out of five have printers and/or disk drives in use with their computer.

Tying in with these figures, 80 percent of the households use their computer for something beyond games and entertainment: 78 percent of children under 19 use their machines for educational and school-related purposes, in addition to playing games.

These figures, which show a definite affinity for computers, may be skewed a bit, since the company's policy holders (mostly military officers) are well educated and have the money to purchase the equipment and software to run on it. Then, too, some just like to play with gadgets! Hmmm... how do we hams fit into this profile?

Computer Protectors. To most people UPS means United Parcel Service. But a UPS is also an electronic device known as an "uninterruptible power source," a product that helps keep your computer up and running for at least

a little while when the hamshack, home, or office lights go out.

These handy devices used to be priced out of the range of home users, but they're becoming more reasonable now. Essentially, they are devices that plug in between the computer (or other equipment) and the AC outlet. Current from the outlet keeps a battery charged up, and should the power fail, the battery takes over, with the device generating what looks to the computer like normal AC power.

Such devices are generally ignored with an "I don't need that" by most of us, until the day comes when we lose a Sweepstakes log or other important computer-based data that's difficult or impossible to replace. Interestingly, research has shown that more than 90 percent of power outages last less than two seconds, while over 98 percent last less than a minute. Although many of the lower priced UPS devices can only keep the computer up and running for a few minutes, this is enough in most cases, as the stats show.

The surge protector is a related device we should remind you about using if you've got a computer in your hamshack. This simple device can help "clean up" spikes, surges, and transients that may cause data loss while you're using your machine or possibly even cause damage to it. Many name-brand computers include internal surge protection, but many do not. Some sound advice is to buy a power strip or a somewhat fancier "power convenience center" (with switches, power outlets, and pilot lights) having built-in surge protection. Connect your computer, your rig, and other sensitive equipment to it for some added peace of mind.

Of course, surge protectors can't save your equipment from a direct lightning strike, but they can do wonders protecting your gear from lesser electrical perils than a direct hit. Voltage surges of varying frequency and intensity can affect your gear; the number one cause of a spike (an overvoltage condition) is the switching on and off of an electrical motor, particularly when the motor is driving equipment. Also, the energizing or de-energizing of electrical relays, transformers, or solenoids can cause troublesome spikes, as can electric utility switching of lines and generators. And, when undervoltage conditions (brownouts and blackouts) are corrected, there is usually a high voltage surge immediately following restoration of full power.

Bear in mind that a direct hit by lightning is, of course, catastrophic, but of low probability. The most frequent danger is that a distant lightning strike may be transmitted through utility power lines and show up as a large voltage spike all along the line. Actually, in time of a direct hit in close proximity to your hamshack, a little prayer would probably be more effective than would a surge protector!

Wrapping It Up

This time around we've covered a variety of topics. We've looked at two impressive hamshack software products, BandAid and SCORE, and we've also examined several antenna-related products of interest. We went on to pull a few books from the bookshelf and concluded with some "short bursts" tidbits of hopefully useful information.

Next month we'll continue in the Antennas & Accessories tradition with several more topics of current interest. See you then.

73, Karl, W8FX

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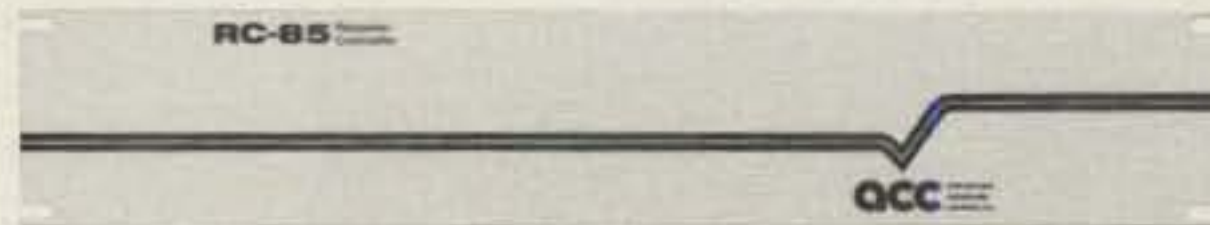
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INFO ON AMATEUR RADIO LICENSING

Commonly Asked Questions Concerning Amateur Testing!

Being a national VEC, we got bombarded with all sorts of questions from applicants concerning amateur testing, upgrading, and licensing. Here are some of the ones we get asked the most!

I have a Technician license now. Will I have to take the new General written Element 3(B) in addition to the 13 wpm (Element 1B) to upgrade to General Class? Prior to March 21, 1987, passing a single written examination (Element 3) qualified Novice level operators to upgrade to Technician. To upgrade still further to the General class only required the 13 wpm code test. The FCC split Element 3 into two sections—Element 3(A) and 3(B)—as part of the Novice Enhancement proceeding.

They did this because the Element 3 question pool had questions in it about General class operation. The Commission felt (and many commenters agreed) that the various amateur radio examination questions should closely parallel any operating privileges obtained. Most also thought that 574 questions were simply too many to learn at any one time.

The VHF/UHF questions were then assigned to the Technician (Element 3A) pool and the HF/General questions to a 3B pool. This was done by agreement among the various VECs, since the FCC no longer gets involved in the amateur testing business, except in an oversight capacity.

As of March 21, 1981 the Element 3 fifty-question examination was split into a 25-question Element 3(A) and 25-question Element 3(B). Applicants for the Technician class now need only to answer 19 of 25 Element 3A questions to upgrade. The old Element contained 574 questions. The new Element 3A contains 286 questions, and 3B contains 288 questions. None of the questions have been changed, only reassigned to separate Technician and General question pools. The study material that you have for the old Element 3 is still good. We recommend, however, you find out which questions went to 3A and which to 3B. Every license preparation publisher has made this information widely available.

Applicants that have passed the previous Element 3 have taken a 50 question

exam covering *both* Technician and General class theory. The FCC has "grandfathered" these applicants into the 3(B) requirement, and these applicants need only take the 13 wpm code to upgrade.

To prove that you have passed the old Element 3 test only takes a Technician license (or a Certificate of Successful Completion dated March 20, 1987 or before). All Volunteer examiners are aware that some Technician class amateurs have to be administered Element 3(B) and some do not. If you have taken Element 3(A) and not Element 3, the test team will administer you Element 3B when you apply to upgrade to the general class.

It doesn't seem to create a burden to VE testing teams since applicants can easily prove which exam elements they have passed and when. There have been a few instances, however, where applicants have lost their Upgrade Certificate and we have had to research our records to confirm their status. We have also had instances where applicants have given VE teams their certificate without keeping a copy which could be needed later. *Never* give anyone your last copy of an upgrade certificate. Every VEC maintains a record of every examination administered to every applicant.

Must I take my amateur examinations with VEs representing only one VEC organization? No, you can be administered amateur radio examinations by VE teams of *any* VEC group. There are currently about 20 different groups, although only about four of them account for over 90% of all testing. The ARRL, W5YI (our VEC operation), Central Alabama, and DeVry VECs are the principal volunteer examiner coordinators. (There has been a recent reduction in the number of active VECs.) Every VE team (and VEC) is required to accept the Upgrade/Credit certificates of every other VEC.

That is not to say that there are not some advantages in sticking with one VE team—and a single VEC operation. The biggest advantage is that the VEs and VECs can easily verify previous examination records if the need arises (and it frequently does!).

It can be very confusing to all concerned when applicants upgrade faster than the VE/VEC can process the applications or the FCC can issue the licenses. Most VECs allow applicants to upgrade

further before their previous license has arrived from the Commission. The VEC will write and ask the applicant to forward them their new license when it is received. Some applicants have applications at more than one VEC organization and it gets *very confusing* for the candidate to know where to send which license copy! A VEC holding two or more upgrade applications can combine them into one submission to the FCC. This can't be done if the applications are at different VECs.

Since there is no waiting time to retake failed tests, why can't an applicant immediately retake the exam at the same session? Technically according to the rules, you can. I don't know of a single VEC that *routinely* allows it, however. You reach a point where you have to say to yourself, what is the purpose of testing an applicant, and at what point does the testing process become an exercise in the ridiculous. To repeatedly administer examinations until the applicant finally passes certainly doesn't indicate any degree of proficiency, skill, or knowledge.

Most VECs prefer that the applicant go home and study the license preparation material a little more and then try again, even if it is the following day. The testing process has certainly gotten easy enough over the years. There is nothing to prevent applicants from appearing at two different testing sessions in the same day, however. There is another consideration, too. VE teams can collect only one test fee per sitting regardless of the number of examinations an applicant is administered.

There have been cases where a VE/VEC has immediately retested an applicant where extenuating circumstances exist, such as when an applicant is leaving the country and the exam was missed by one or two questions. They are the extreme exception, however.

At the Novice level it may be a different story. We have reason to believe that volunteer examiners frequently *immediately* retest applicants, particularly if they come close the first time. Remember that it takes two General class (or higher) level VEs to administer the 5 word-per-minute and Element 2 theory requirement now.

How is the VE program above the Novice level doing? It is doing very well and seems to have pretty much settled down. It is now in its third full year. About 3,500 amateurs

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are currently tested monthly for upgrades, and more during the peak hamfest months of March, April, and May. The FCC keeps strict records on its progress and issues monthly and year-to-date status reports. From this report we learn that there are about 300 test sessions a month, each with typically 11 applicants taking an average of 1½ examinations. The average pass (upgrade) rate for 1985 was 58.17%, and in 1986 it was 59.65%. So far this year it is around 61.5%. It is interesting to note that the VE/VEC system pass rate isn't much different from that of the FCC when they ran the testing program.

Under the VEC program in 1985 there were 41,439 applicants tested for upgrades, there were 42,422 in 1986, and so far this year we are running about 5% ahead of last year. The American Radio Relay League's testing program coordinates about 50% of all testing, and the W5YI (our) program about half that. No other VEC has as much as 10% of the testing "market." The FCC is very pleased with the progress of the program.

That is not to say that there have not been some isolated problems. There have, and they are being dealt with. Not only have there been irregularities on the part of applicants, but some VEs (and VECs) are no longer part of the program.

Why is it taking so long for me to get my new Novice (or upgraded) license from the FCC? We could write a book on that one! We handle that question on almost a daily basis. The FCC in Gettysburg reports that Novice applications are up more than double. Whether that will hold up is a matter of speculation. Time will tell. The deluge of new Form 610 applications has caused somewhat of a backlog at the FCC. The time it takes to turn an application around to a license is lengthening. Gettysburg tries to handle Novice applications first, since these applicants can't get on the air until that first license arrives. Applicants who upgrade can operate with their new privileges for up to a year. Still they want their new upgrade license *now*.

The net result is Novice applications are being issued about six weeks after receipt. Routine renewals get handled quicker. Upgraded licenses, however, are taking up to 12 weeks—*frequently longer!* Sometimes it takes a month for your upgrade application just to get to the FCC. Darlene Reeder (Amateur Section at Gettysburg) told us last week that they are about a month behind just in getting to new upgrades! On May 4th they were just *beginning* to process applications received April 1st. That means it could be up to eight weeks before they even *start* on your Form 610! She also told us that she had requested (and has received) additional clerical help to process the application backlog.

The lengthening application backlog is also causing those of us with the VE/

VEC program some grief! We get ten calls a day wanting to know if we have received and processed an applicant's application for upgrade. An applicant who calls Gettysburg is routinely told that they "have no record" of their application, so the applicant starts calling the VE team or the VEC. It really is a problem and everyone is getting frustrated. We have had to disconnect our telephone recorder. We simply can't return long-distance calls like this. We would get nothing done!

We questioned the FCC as to why they tell applicants they "have no record" of their application when in reality they (just about) always have it. We were told that inputting the data into their computers is nearly the last thing they do and until that time there is "no record" of receiving an application. As I write, the FCC has over 10,000 Form 610s in various stages of processing, and the pile is growing. Hang in there. And please *don't call the VE, VEC, or the FCC* until at least three months (and preferably four months) have elapsed since you passed your upgrade. All it does is prevent us from processing the ones we have.

Amateurs seem to be "timing" their applications to receive certain call sign prefixes or suffixes and the processing delay is apparently fouling up their "system." The continual changing of amateur call signs is really getting to be a burden to everyone connected with license issuance! We have had hundreds of applications where an applicant almost immediately upgrades two (or even three times) and requests a new upgraded call sign every time. Many (maybe most) never get used since another call sign gets issued right behind it. An applicant frequently calls the VEC and asks them not to change a call sign on a pending application they are holding when they get a call sign they like. We then have to find an application being held and cross off the new call sign request, another time-consuming delay. Believe me, we can emphathize with the FCC! They have to be getting far more time-wasting calls than we do.

Even the amateur radio industry is concerned about the length of time it takes to turn applications around. It was a subject at the recent industry meeting held at the Dayton HamVention in April. I predict that eventually a system will be developed that will respond to the mounting deluge of applications at the Commission. And as with any new system, the public will generally oppose it. Novice Enhancement is sure to cause an expansion of new amateurs, and with it more upgrades, and correspondingly more delays. The FCC really is working long, hard, and efficiently on the problem, but there is just so much a minimum amount of people can do.

Another problem causing unbelievable delays is illegible writing or wrong information on Form 610s. The FCC electronically compares data on upgrade applica-

tions to their data base in Washington. This is done primarily for enforcement reasons so new or upgrade licenses will not be issued to applicants who have sanctions against them. VE teams and VECs have no way of checking this. The VE/VEC system is responsible for submitting properly completed Form 610s to the Commission, but wrong dates of birth, illegible writing, and other errors cause an application to hit the FCC's "error list" and further delay. An applicant who changes a name or address—or other data—without indicating this or submitting an amended Form 610 is simply asking for a delay.

We recently got back an application with wrong applicant information that had been in process over two months. We now have to return the application for correction and then reforward it to the FCC with our regular daily VEC mail which might not be processed for another 30 days! Moral: Be *extremely careful* when completing Form 610s. If you "scratch" them up, don't be surprised if it takes six months before you get your upgrade. We deal with this almost on a daily basis! More delays are caused by applicants, VEs, and, yes, VECs (in that order) than by the FCC, yet they are the one that everyone blames.

I know what a VE does. What is the purpose of a VEC? In a single sentence, a VEC (Volunteer Examiner Coordinator) is the administrative link between the FCC and the volunteer examining team who administers upgrade examinations to amateur radio operators. A VEC . . .

- Recruits and accredits Volunteer Examiners and issues accreditation documents.
- Coordinates examination sessions with VEs by . . .
 - a. Keeping them abreast of rule changes affecting testing;
 - b. Providing or making provision for amateur radio testing materials and needed test-session forms;
 - c. Acting as the repository for successful candidates' applications (Form 610s) and other needed documents;
 - d. Screening, approving, and forwarding successful applications for amateur radio operator upgrade licenses to the FCC, Gettysburg, PA;
 - e. Resolving defects in Form 610 applications.

A VEC also assists in the development and/or revision of amateur radio operator test pool questions and has the authority to invalidate any test where testing confidence is lacking. There are many different VEC organizations, and while each operates under the same FCC guidelines, each has a slightly different administrative approach, depending upon how these guidelines are interpreted. Volunteer examiners follow the testing program as defined by the VEC and the FCC in their Part 97 rules.

Why does it take two VEs to administer Nov-

ice examinations and three for Technician and higher level? Novice examinations used to require a single VE. As of March 21 two are needed. The VE/VEC System administering tests above the Novice level requires three examiners. It was the FCC that determined back in 1983 that three VEs were the proper number to certify higher class amateur examinations.

The enabling legislation signed by President Reagan on September 13, 1982 did not specify the number of volunteer examiners necessary, only that VEs must have passed higher class examinations themselves if they exist. It was the ARRL, the national amateur organization, that requested two examiners certify new Novices to ensure testing credibility and integrity.

How many questions must an applicant get correct to pass the new Novice, Technician, and General class examinations? A very good question, and one that was pondered at a recent VEC meeting held at the Dayton HamVention. It now takes 22 questions answered correctly out of 30 to pass a Novice exam. We originally thought it to be 23, since a passing score of "at least 74%" is explicitly required by §Part 97.29(b) to pass any written amateur radio theory examination. Twenty-two right is actually 73.3%. It was finally agreed among the VECs and the FCC that 22 right would pass the Novice examination. It takes 19 correct answers to pass the new Element 3A (Technician) and 3B (General), however. (Eighteen right is 72%, while 19 correct is 76%.) Seventy-four percent of 25 questions is 18½ questions, so 19 correct was agreed upon.

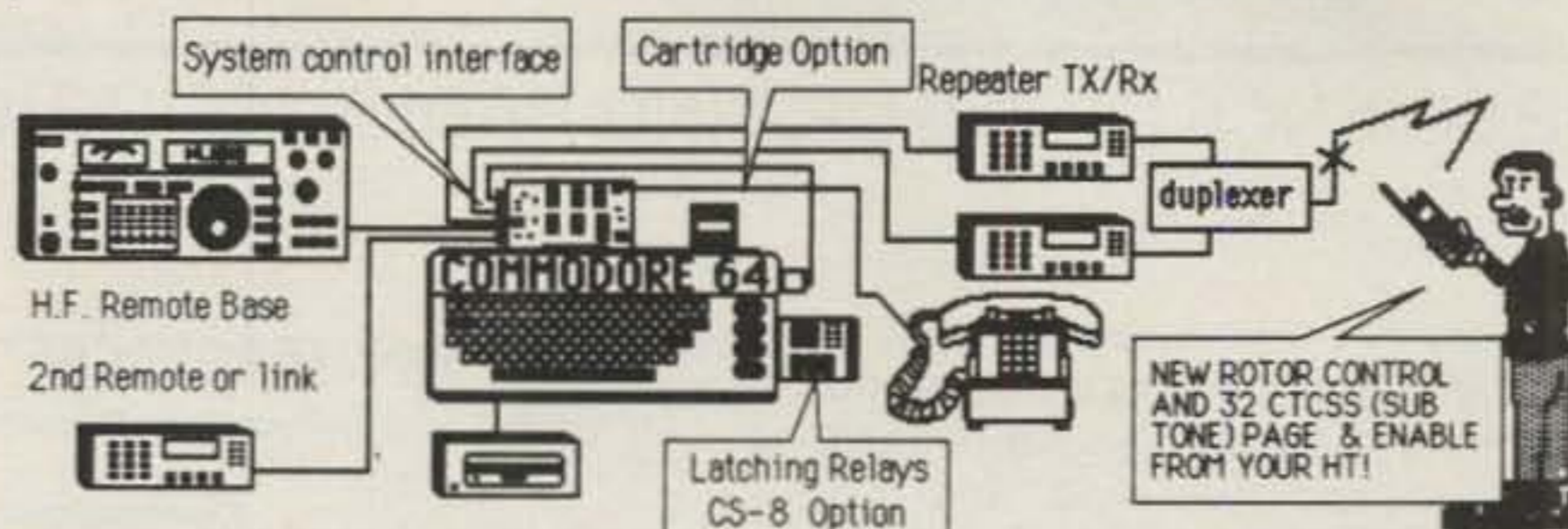
Where do I get a new application Form 610? My local FCC office only has the old ones. The government does not yet have the new FCC Form 610 available suitable for the new rules caused by Novice Enhancement. The FCC has a very large supply of previous version applications on hand (nearly a two-year supply) and wants to use them up before printing new ones. While the June 1984 and July 1985 Form 610 versions can be used, they do not provide for the separation of Element 3 into 3A and 3B, or the necessity of having two Novice volunteer examiners. They work just fine for routine license renewals and upgrades above the General class level.

The FCC did, however, provide rough "draft" copies to the various VECs. The ARRL had one professionally typeset and has made copies available to all other VECs. So if you need *new* copies of the new Form 610, you must get these from the ARRL or us, the W5YI-VEC program. Possibly other VECs have them available, too. One or two are free by forwarding W5YI (or the League) an SASE.

Photocopies of Form 610s may be used *providing that they are of the same paper color and weight as issued by the government.*

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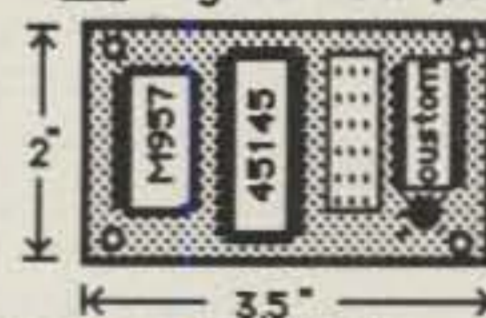
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Please send all reader inquiries directly.

Propagation

a monthly feature by
GEORGE JACOBS, W3ASK

THE SCIENCE OF PREDICTING RADIO CONDITIONS

The monthly mean sunspot count for March 1987 was 14.8. This is based upon observations made at 40 solar observatories throughout the world, and compiled and coordinated by Dr. Andre Koeckelenbergh of the Royal Observatory of Belgium.

The monthly number for March results in a smoothed running number of 12.4 centered on September 1986. This smoothed number averages the monthly mean values between March 1986 and March 1987.

The smoothed number for September is the lowest so far observed during Cycle 21, and may well mark the end of that cycle and the beginning of Cycle 22. It will require several more months of data to fine-tune this date.

The 10.7 cm solar flux level observed at the Algonquin Radio Observatory in Ottawa, Canada was 74 for March 1987.

On the basis that Cycle 22 began during October 1986 and is now on the rise, a smoothed sunspot number of approximately 30 is forecast for July 1987. This level may vary, however, by as much as plus or minus 25%.

As a result of the expected increase in solar activity, HF propagation conditions this July should be somewhat improved over last year's conditions.

July Propagation

With longer hours of daylight and the sun high in the northern sky, HF propagation should be considerably more stable during July than they were during the radio-storm ridden spring months.

Twenty meters should continue to be the best band for DX propagation during the month. When conditions are at least Low Normal the band is expected to remain open to one area of the world or another from sunrise through the early evening. Peak conditions are expected for a few hours after local sunrise, and again during the late afternoon and early evening, when the band should open in almost all directions. When conditions are at least Low Normal, expect 20 meter openings towards South America, the South Pacific, and Oceania until as late as midnight. When conditions are High Normal or better, the band should also remain open to most other areas of the world until as late as midnight.

11307 Clara Street, Silver Spring, MD 20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for February 1987

Propagation Index	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 3, 7, 19, 29	A	A	B	C
High Normal: 2, 6, 8, 14, 16, 21, 28	A	B	C	C-D
Low Normal: 1, 4-5, 9-10, 13, 15, 17-18, 20, 22, 25-27, 30-31	A-B	B-C	C-D	D-E
Below Normal: 11-12, 23-24	B-C	C-D	D-E	E
Disturbed: None	C-E	D-E	E	E

Where expected signal quality is: A—Excellent opening, exceptionally strong, steady signals greater than S9.

B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S3, and with considerable fading and noise.

E—No opening expected.

HOW TO USE THIS FORECAST

1. Find *propagation index* associated with particular band opening from Propagation Charts appearing on the following pages.
2. With the *propagation index*, use the above table to find the expected signal quality associated with the band opening for any day of the month. For example, an opening shown in the charts with a *propagation index* of 3 will be good-to-fair (B-C) on July 1st, good (B) on the 2nd, excellent (A) on the 3rd, good-to-fair again (B-C) on the 4th and 5th, etc.

Considerably fewer DX openings are expected on 15 meters and very few on 10 meters during July. This decline results from a combination of changing seasonal conditions and the present period of very low sunspot activity. When conditions are at least Low Normal, 15 should occasionally open towards the south. Look for some short-skip openings into the Caribbean area and Central America as early as 10 a.m., with a peak expected to all areas of Latin America between 3 and 5 p.m. local daylight time. When conditions are High Normal or better, the band may also open to Africa during the late afternoon from the eastern half of the country, and to Australasia and the South Pacific area during the late afternoon and early evening from the western half of the country.

Don't expect much DX on 10 meters during July, but some short-skip openings should be possible from time to time towards the Caribbean and possibly Central America as a result of sporadic-E ionization. When conditions are High Normal or better, an occasional opening deeper into South America may be possible, especially during the afternoon hours.

HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular Meter band (10 through 160 Meters), as shown in the left hand column of the Chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate Meter band column (10 through 40 Meters) for a particular geographical region of the continental USA, as shown in the left hand column of the Charts. An * indicates the best time to listen for 80 meter openings.

2. The *propagation index* is the number that appears in () after the time of each predicted opening. 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 in HST. To convert to daylight time in other USA time zones, add 3 hours in the PDT zone; 4 hours in the MDT zone; 5 hours in the CDT zone, and 6 hours in the EDT zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 15 or 3 P.M. in Los Angeles; 18 or 6 P.M. in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to daylight time in other areas of the USA, subtract 7 hours in the PDT zone; 6 hours in the MDT zone; 5 hours in the CDT zone and 4 hours in the EDT zone. For example, at 20 GMT it is 16 or 4 P.M. in N.Y.C.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts 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 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 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. Dept. of Commerce, Boulder, Colorado, 80302.

During the hours of darkness 40 meters should open to many areas of the world, but seasonally high static levels may at times make DX reception difficult. Higher static levels are also expected to hinder DX on 80 meters, but the band should open to some areas of the world during the hours of darkness. Not many DX openings are expected on 160 meters during July because of higher static levels and the increased hours of daylight. Best bet for 40, 80, and 160 meter DX openings is an hour or two before midnight for openings towards the north and east, and just before local sunrise for openings towards the south and west.

CQ Short-Skip Propagation Chart July & August, 1987 Local Daylight Savings Time AT Path Mid-Point

Band (Meters)	Distance Between Stations (miles)			
	50-250	250-750	750-1300	1300-2300
10	Nil	08-10(0-1) 10-14(0-3) 14-18(0-1) 18-22(0-2) 22-08(0-1)	08-10(1) 10-14(3) 14-18(1-2) 18-22(2-3) 22-08(1)	08-10(1-0) 10-14(3-0) 14-18(2-0) 18-22(3-0) 22-08(1-0)
15	Nil	08-10(0-2) 10-14(0-3) 14-18(0-2) 18-20(0-3) 20-22(0-2) 22-08(0-1)	08-10(2) 10-14(3) 14-18(2) 18-20(3) 20-22(2) 22-00(1-2) 00-08(1)	08-10(2-0) 10-14(3-0) 14-16(2-0) 16-18(2-1) 18-20(3-1) 20-21(2-1) 21-00(2-0) 00-08(1-0)
20	10-00(0-1)	07-10(0-2) 10-16(1-4) 21-00(1-2) 00-07(0-1)	07-10(2) 10-16(4) 19-21(3-4) 21-00(2-3) 00-07(1-2)	07-10(2) 10-16(4-2) 19-21(4) 21-23(3-2) 23-00(3-1) 00-05(2-0) 05-07(2-1)
40	08-12(1-2) 12-16(1-4) 16-20(2-4) 20-23(1-2) 23-08(0-1)	08-10(2-3) 10-12(2) 12-16(4-2) 16-18(4-3) 18-20(4) 20-23(2-4) 23-08(1-3)	08-10(3-1) 10-16(2-0) 16-18(3-1) 18-21(4-3) 21-23(4) 23-06(3-4) 06-08(3)	08-10(1-0) 10-16(0) 16-18(1-0) 18-21(3-2) 21-06(4) 06-08(3-1)
80	07-12(3-4) 12-17(4-3) 17-22(4) 22-05(3-4) 05-07(3)	08-10(4-1) 10-12(4-0) 12-17(3-0) 17-19(4-1) 19-21(4-2) 21-23(4-3) 23-05(4) 05-07(3) 07-08(4-2)	08-10(1-0) 10-17(0) 17-19(0-1) 19-21(2-1) 21-23(3-2) 23-05(4) 05-07(3) 07-08(2-1)	08-19(0) 19-21(1-0) 21-23(2-1) 23-04(4-3) 04-05(4-2) 05-06(3-1) 06-07(3-0) 07-08(1-0)
160	18-19(1-0) 19-20(1) 20-22(3-2) 22-00(4-3) 00-06(4) 06-08(3-2) 08-09(1) 09-10(1-0)	19-20(1-0) 20-21(2-0) 21-22(2-1) 22-00(3-2) 00-04(4-2) 04-06(4-3) 06-08(2-1) 08-09(0-1)	21-22(1) 22-01(2-1) 01-04(2) 04-06(3-2) 06-07(1) 07-08(1-0)	21-23(1-0) 23-01(1) 01-06(2-1) 06-07(1-0)

Central USA	09-13(1) 13-17(2) 17-19(1)	04-05(1) 05-07(3) 07-09(2) 09-13(1) 13-16(2) 16-18(4) 18-19(3) 19-20(2) 20-22(1)	18-21(1) 21-22(2) 22-01(3) 01-02(2) 02-03(1)	20-22(1) 22-01(2) 01-02(1) 21-02(1)*
Western USA	08-09(1) 09-11(2) 11-13(1) 13-15(2) 15-17(3) 17-18(2) 18-19(1) 14-16(1)**	04-06(1) 06-08(2) 08-11(3) 11-15(2) 15-16(3) 16-18(4) 18-19(3) 19-21(2) 21-23(1)	18-19(1) 19-20(2) 20-22(3) 22-02(4) 02-04(3) 04-05(2) 05-06(1)	19-20(1) 20-22(2) 22-02(3) 02-03(2) 03-04(1) 23-03(1)*

*See explanation in "How To Use Short-Skip Charts" which appears in the box at the beginning of this column.
* Indicates best time for 160 meter openings.
**Indicates best time for 10 meter openings.
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.

DX Propagation Charts for July appeared in last month's column. For an assessment of day-to-day conditions expected during the month, see the Last Minute Forecast which appears at the beginning of this column. This month's column contains Short-Skip Propagation Charts for July and August, as well as charts centered on Hawaii and Alaska. The Short-Skip Chart contains band predictions for one-hop openings between distances of approximately 50 and 2300 miles from your transmitting location.

Peak Sporadic-E Propagation

Optimum short-skip propagation conditions are expected during July as a re-

sult of a seasonal peak in sporadic-E ionization. During the daylight hours, considerable short-skip openings are forecast for 10 and 15 meters over distances ranging between approximately 400 and 1300 miles, with openings occasionally extending out to beyond 2000 miles. Around-the-clock short-skip openings should be possible on most days on 20 meters, with the skip often as short as 300 miles and as long as 2300 miles. Short-skip conditions on 20 should peak during the late afternoon and the early evening.

Good daytime short-skip conditions are expected on 40 meters, with openings between distances of approximately 100 and 750 miles. During the hours of darkness the skip should lengthen, with openings possible between 250 and 2300 miles. Conditions on 80 meters are also expected to be good during the daylight hours, with openings up to approximately 300 miles. During the hours of darkness good openings should be possible on this band up to the one-hop limit of 2300 miles, but the band could be quite noisy. While no short-skip openings are likely on 160 meters during the daylight hours, some should be possible up to about 1300 miles during the hours of darkness. When static levels are low, longer distant openings may also be possible.

VHF Ionospheric Openings

Intense sporadic-E ionization expected during July should result in numerous 6 meter openings and an occasional 2 meter opening. Fairly frequent 6 meter

ALASKA Openings Given in GMT#

To:	15 Meters	20 Meters	40 Meters	80 Meters
Eastern USA	Nil	12-15(1) 22-01(1) 01-03(2) 03-05(1)	07-10(1)	Nil
Central USA	00-03(1)	13-16(1) 23-01(1) 01-04(2) 03-05(1)	08-12(1)	Nil
Western USA	02-05(1)	14-16(1) 16-18(2) 18-00(1) 00-02(2) 02-05(3) 05-06(2) 06-08(1)	07-09(1) 09-13(2) 13-15(1)	10-13(1)

HAWAII Openings Given In Hawaiian Standard Time

To:	15 Meters	20 Meters	40 Meters	80 Meters
Eastern USA	12-14(1) 14-15(2) 15-16(1)	02-05(1) 05-07(2) 07-14(1) 14-16(2) 16-18(3) 18-19(2) 19-20(1)	18-20(1) 20-00(2) 00-02(1)	20-21(1) 21-23(2) 23-01(1)

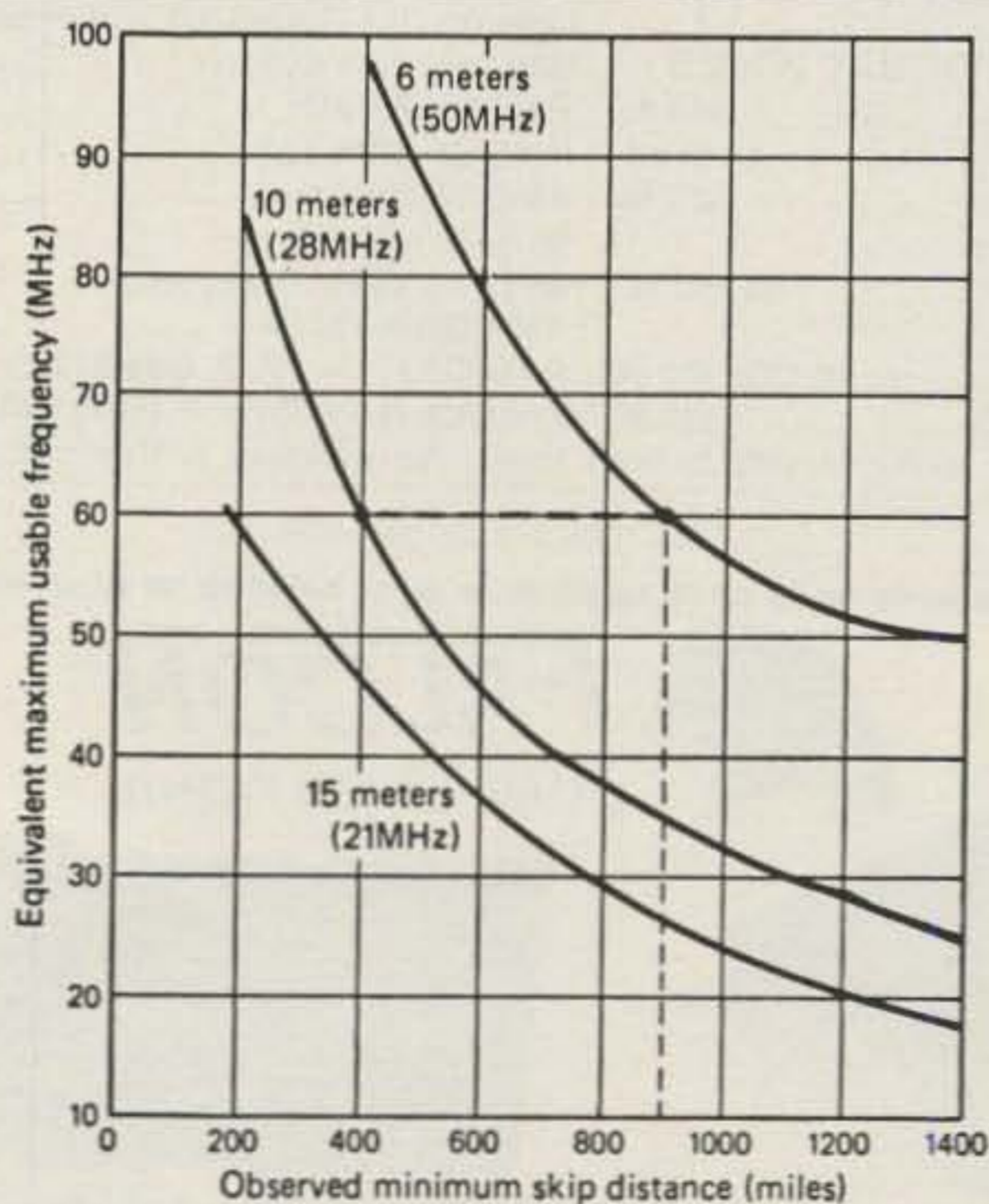


Fig. 1—Chart describing correlation between sporadic-E openings on the 10 and 15 meter amateur bands and possible 6-meter openings at the same time. The example shows a minimum skip distance of 400 miles observed on 10 meters; from the chart, 6 meters should be open with skip distance of greater than 900 miles.

openings should be possible over distances ranging between approximately 600 and 1300 miles, with some openings extending out to 2000 miles, and possibly beyond. When 2 meters opens, it may be possible to work stations between 1000 and 1300 miles away. While sporadic-E short-skip openings can take place at just about any time of the day or night, statistics indicate that conditions should peak

for a few hours before noon and again during the late afternoon and early evening. During July you can expect 6 meter sporadic-E openings on at least 3 out of every 4 days. Openings may last from a few minutes up to hours.

The *Delta Aquarids* meteor shower is expected to peak at about 2 a.m. EDT on July 29, with an hourly meteor count of about 20. This should make possible me-

teor-scatter-type openings on the VHF bands from late on July 28 through the early hours of July 30.

While little, if any, auroral activity is expected during July, it may pay to check the VHF bands during those days that are expected to be Below Normal or Disturbed.

Self-Forecasting Short-Skip Openings

Here is a useful tip for forecasting 6 meter short-skip sporadic-E openings. The geometry of propagation is such that as the skip distance *decreases* on 15 and 10 meters, the highest frequency that will be reflected by the sporadic-E cloud *increases*. By observing the *minimum* ionospheric skip heard on 15 or 10 meters during an E_s opening, and using the chart shown in fig. 1, it should be possible to tell whether 6 meters will open, and what the skip distance will be.

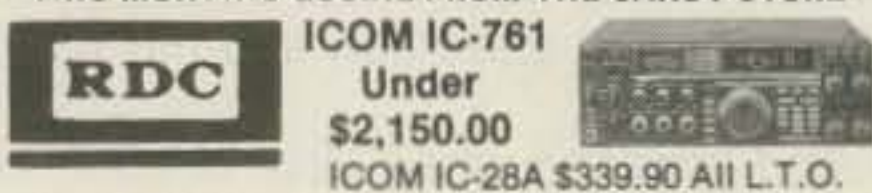
To demonstrate this, consider the following example. Suppose the minimum skip distance observed on 10 meters in a southwesterly direction is 400 miles (it is the distance to the *nearest* skip station heard that is important). From fig. 1, the intersection between 400 miles and the 10 meter curve corresponds to an MUF of 60 MHz. This means that 6 meter short-skip openings in a southwesterly direction are very likely to occur. The minimum skip distance expected on 6 meters can be found from fig. 1 by locating the intersection between 60 MHz on the ordinate (vertical scale) and the 6 meter curve. The resulting distance is found to be 900 miles. A useful rule of thumb to remember is that when skip stations are heard at less than 500 miles away on 10 meters, or less than 250 miles on 15 meters, the chances are very good that 6 meters will open in the same general direction.

From most locations in the continental United States, 1300 miles E_s openings should extend into both Canada and Mexico. From the southern third of the country it should be possible to work a rather large number of countries in Central America and the Caribbean area during 15, 10, and 6 meter sporadic-E openings. As mentioned previously, during intense periods of sporadic-E ionization, short-skip openings up to approximately 1300 miles may also be possible on 2 meters, and multi-hop openings up to 2000 miles may be possible on 15, 10, and 6 meters.

Long-distance (DX) television reception may also be possible during periods of intense sporadic-E ionization. Signals from low-band VHF TV stations, mainly channels 2 and 3, which cannot normally be received more than 75 to 100 miles away, suddenly are propagated up to 1300 miles or beyond, often with strong signal levels. The signals can be seen if the channel is unassigned in your area. Otherwise it will appear as interferences to the local channel.

73, George, W3ASK

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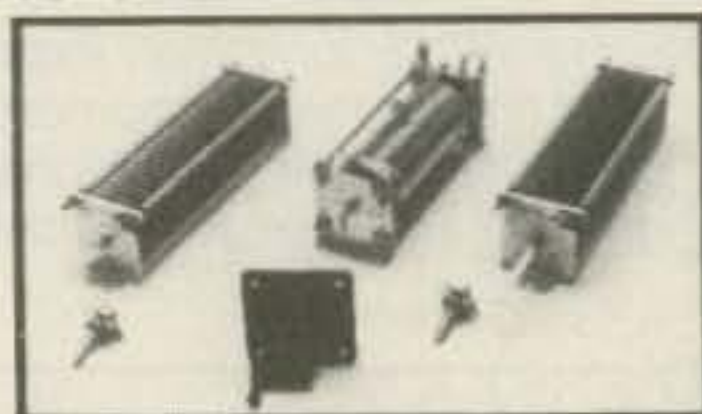
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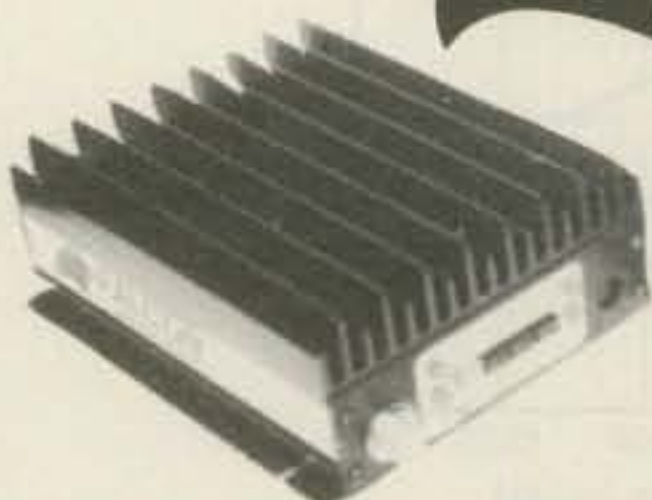
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NEWS OF COMMUNICATION AROUND THE WORLD

*O woe is me, my sad refrain,
So many countries still remain,
Unheard, unworked and unconfirmed,
And yet the world seems unconcerned.*
—WB4FOT

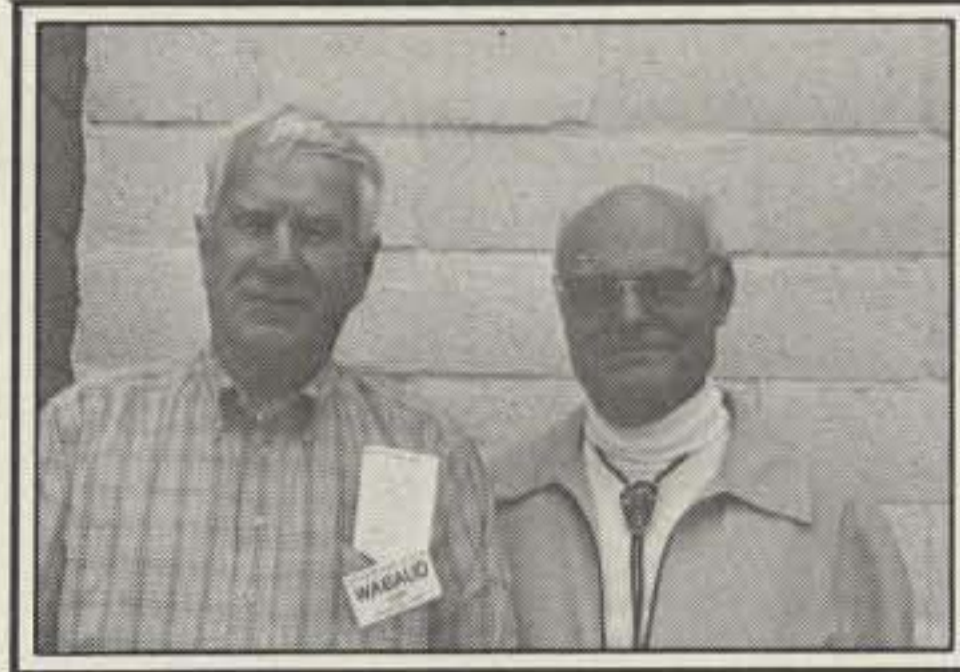
There are some who will say that one can find strange wonders in DXing, that if you hang around long enough you will find your share of unusual things, and that one never knows when they might come. Recently one of the Locals came trudging up the hill with a question. Ordinarily we expect these to come with questions about the great mysteries of DXing. This one came with something else.

"Do you ever stop to think that DXers live in another world?" he asked. "One different from the one in which other amateurs live?" We heard the words and went to immediate full alert, watching this one out of the corner of an eye. What sort of a question was this?

It was that time of summer when the solstice is near, a time when young DXers have been known to caper and gambol in the meadows of the night. It was also the period of the full moon, a time when experience can teach one to be wary. Strange phenomena have been known to occur during the full moon, and even stranger behavior by DXers has been reported on those summer evenings when the sun is setting out in the Pacific while a new moon is looming over the eastern hills. It is always a time to be cautious and we dodged just a bit, nodding to the question but being careful with our words. "Yes, we have," we said, and that was enough.

The Local smiled. "I thought you might know something about it," he said, "but tell me something. Is this other DX world something that one can know and define, or is it an extension of the innate sense of immortality that DXers have? And is this belief in their own immortality often reinforced by things such as the DXCC Honor Roll, new countries, big towers, and booming signals? What do you think?"

What did we think? We were thinking just why did this have to happen to us! Here we had been dozing in the warm summer afternoon, listening to the bees rush in and out of their hives, the world only a distant murmur on the freeway down in the valley. Then this one had to show up with his questions. One may hear the ancient warning about the Ides



How do you tell a DXer? Very easily. They always come with a genial disposition, the small smile, and the evidence of living the good life of DXing. On the right is Father Edmund J. Benedetti, HV2VO, operator of the amateur station in the Vatican City. On the left is one of the California Locals down off his hill for the convention—Hugh Cassidy, WA6AUD.

of March, but how about a warning about the Perigee in June? We were trapped, trapped with no possible escape. But guess what? The Old Timer came ambling down the hill, he often saying these days that he finds it easier walking down the hill than up.

It was later when we wondered if there was something to what this Local was asking. Then maybe there was something else, as yet undefined, that brought the Old Timer strolling in when all our hope for peace and quiet and contemplation had gone out the window. Immediately we were able to relax. "Let the Old Timer answer these questions," we told ourselves. "After all, doesn't he like the challenge?"

So the Local tried his question on the Old Timer. We wondered, as we listened to the words, just what it was that we might be missing. We had a firm belief in our own ability to understand most anything with a bit of logic therein. In this instance we had to wonder if our understanding was a bit out of sync.

"Perhaps you might be able to help me understand something," the Local started in, "and that is whether DXers as a group tend to be in a world apart, a world that they know and enjoy, but with those experiences known only to them and not known or even comprehended by other amateurs. Does your DX experience tend to reinforce the undeniable existence of the natural dignity, and acknowledged worth, and the general excellence of DXers when compared to most anything else? Do you believe that this comes because DXers live on a different plane and are endowed with a different understanding? That they are in a world where they

have found and grasped the dignity and the merit of DXing and thus have expanded their capacity for self-realization? What do you think?"

What did the Old Timer think? We had heard the words and waited for understanding. It was a conversation heard but not understood. We thought that if it were run by a second time we would get understanding. If not understanding, perhaps just a bit of an idea what the words of the Local were all about. But though we were slightly confused, it did seem that the Old Timer was not. We waited to learn if he was in agreement.

"It has been said," the Old Timer started off, "that there is no darkness, but ignorance. Few DXers live in darkness. Most have moved toward the light of understanding otherwise known as the DXCC Honor Roll. DXers are eternal optimists. Thus, they live their lives on a positive philosophy which in itself is but another and higher form of DXing. Always a DXer will be known for putting positive meanings into his life. DXers are always positive. The older they are, the more countries they have, and the more true-blue they become, the more positive they are. But that is the way DXing has always been. The more they have, the more they are, the more positive they become. Understand?"

Understand? Understand what! We were leaning forward, elbows on knees and fingers idly scratching our foreheads. We were afraid to look up. We were not sure about just what the Old Timer was saying. We were even afraid to learn that the Local might have understood. The Local, being a low country-total DXer, properly should be one not able to understand. We worried that he might. It had to be the time of the year, the Perigee in June. There was no other logical explanation. Then the Local spoke and our worst fears were confirmed. He did understand!

"Why that's just the way I look at it," the Local said. "And being positive optimists, DXers can be said to live in different worlds than others. And there are many worlds, and a DXer may inhabit one or many as is his fate. Right?"

Possibly we let out a small and hopeless groan. Possibly we might even have spoken aloud without knowing it. We soon realized that both the Old Timer and the Local were looking at us with an air of expectation, so we had to say something. "Such as..." we attempted desperately. It was enough. The Local immediately stepped forward.

"Such as the International DX Conven-

tion," the Local said briskly. "Certainly that is a different world and a world in which only DXers are found, a world where only DXing is spoken. That definitely is a different world and a world with positive thinking. Right?" The Old Timer was nodding his head as he listened to the words.

We were back in the ball game. This was something we could understand. "Of course," we said, "but give some examples. Whom did you meet, what did you see? Things like that." It was a good move and the Local hardly needed any encouragement. He had come to talk and all he needed was an audience. Enlightenment had come to us by then, and we were all audience and nothing else.

"It was the first time I had made the DX Convention," the Local said. We had to wonder about these younger DXers who in these days have seen so little, worked so few, but always seem to know so much. It did not seem right, but we said nothing. "It was the first time," the Local continued, "and I really did not know what to expect. But I had hardly arrived at the hotel when I ran into Wayne Mills, N7NG, whom I worked on Clipperton a

few years back. I think Wayne was my first big-gun DXer I ever talked to face-to-face. Then when I looked around I came across editors for the DX bulletins, just about all of them. I met Harvey McCoy of the *Long Island DX Bulletin*, Bob Winn of *QRZ DX*, and John Minke of *Worldradio*. At the evening cocktail party I had a chance to talk with Chod Harris of *The DX Bulletin*, and someone pointed out Bob and Ellen White. They told me that those two know about everything that has happened in amateur radio since World War II. What do you think?"

"That's right," we said briskly, happy to find an opening where we were sure of ourselves. "They gave you the right slant. Anyone else?" With things going right finally, we were not going to let things run into areas where we might again be lost. Positively! The Local was helpful.

"Oh, there was a lot more," he said, and we were beginning to think that if we worked it right we might escape from this pit of confusion. "There were some big awards given out. Kan Mizoguchi, JA1BK, was given a plaque naming him as the newest member of the DX Hall of Fame. It really got a big response, even

though the award was not made until midnight at the Saturday night banquet. At my table they told me that JA1BK is an outstanding DXer as well as one who has helped DXing greatly, not only in Japan but around the world. They also told me that it takes an exceptional DXer to be named to the Hall of Fame. I saw Katashi Nose, KH6LJ, whom I have worked in contests, and when he got an award, it was good because he was one I knew. He got a plaque naming him to the Contest Hall of Fame. How about that?"

If we had ever thought that this Local might again return to his theme of positive DXing in other worlds, the fear was fading. A little priming and this one would run all day. "Yeah, how about that!" we said. "Katashi has been the epitome of contesting for longer than we can remember. He goes way back." We were thinking that we had better not say too much, but keep the Local going. "Anyone else?" we said again, and the Local was off again.

"It is hard to remember them all," he said, but it was evident he was willing. "I talked with Lloyd Colvin to thank him for all the countries he has brought on the air for me. He sure is easy to talk to and a real DXer. Iris, too. They are remarkable. And I talked with a ZL named Ron. His call was ZL1AMO, and I was told he also is in the Hall of Fame. Later I realized I had worked him from some South Pacific area. I saw Einar, LA1EE, who was just back from Peter I Island. How about that! And there was Reinhard Geissler, DL1UF, as well as Baldur Drobnica, DJ6SI, and his XYL. I saw Father Benedetti, HV2VO, from the Vatican amateur station, and some TI2s who spoke about operating from Cocos Island. There was a whole raft of VEs and probably a lot I missed. But I saw plenty. There was even

The WPX Program Mixed

1271	YU4EYC	1276	JR3RVO
1272	KS4S	1277	K8MNG
1273	W5AWT	1278	JH8WJY
1274	VE7DYX	1279	YT3T
1275	G3YBH		

SSB

1879	YB0PR	1884	JR3RVO
1880	NE4F	1885	YC7DF
1881	HK6BER	1886	F6EWK
1882	YC0EMJ	1887	KA9MOM
1883	VK4ATO		

CW

2431	I0AMU	2436	EA5AR
2432	OK1DGN	2437	JH2RMU
2433	OK3ZWX	2438	EA4AXT
2434	VE3EFX	2439	F6IGF
2435	PA3CWL	2440	VK4DA

VPX

251 DE1EWH

Endorsements

VPX: 350 DE1EWH, WDX9IJK. 400 DE1EWH, WDX9IJK. 450 DE1EWH. 500 DE1EWH.

Mixed: 450 DK4ZZ, KS4S, W5AWT, VE7DYX, G3YBH, JR3RVO, K8MNG, YT3T. 500 DK4ZZ, G3YBH, JR3RVO, K8MNG, YT3T. 550 DK4ZZ, G3YBH, JR3RVO, K8MNG, YT3T. 600 KS3F, DK4ZZ, W5EW, G3YBH, JR3RVO, K8MNG, YT3T. 650 DK4ZZ, G3YBH, JR3RVO, K8MNG, YT3T. 700 G3YBH, YT3T. 750 G3YBH, YT3T. 800 G3YBH, AB1U, YT3T. 850 G3YBH, AB1U, YT3T. 900 NE4F, G3YBH, AB1U, YT3T. 950 G3YBH, AB1U, YT3T. 1000 KI3L, YT3T. 1050 YU1GR. 1100 AI6Z, JA4ESR. 1150 AC2J. 1200 AC2J. 1700 KF20.

S.S.B.: 350 VE3AFX, YB0PR, NE4F, YC0EMJ, JR3RVO, F6EWK, KA9MOM, JR3LGB, IT9CUE. 400 VE3EFX, YC0EMJ, JR3RVO, F6EWK, JR3LGB, IT9CUE. 450 HC2IX, VE3EFX, YC0EMJ, JR3RVO, F6EWK, JR3LGB, IT9CUE. 500 CP8IH, YC0EMJ, JR3RVO, F6EWK, JR3LGB, I8ZTE, IT9CUE, FD1HWB. 550 CP8IH, AB1U, YC0EMJ, JR3RVO, F6EWK, JR3LGB, I8ZTE, IT9CUE, FD1HWB. 600 NM5Y, JR3RVO, AB1U, F6EWK, JR3LGB, IT9CUE, FD1HWB. 650 AB1U, F6EWK. 700 AI6Z, AB1U,

F6EWK. 750 F6EWK. 800 F6EWK. 850 I2TZK, F6EWK. 900 I2EOW, I2TZK, F6EWK. 950 F6EWK, AG2K. 1000 AG2K. 1100 CX9CO. 1400 KF20. 1450 NJ0C

C.W.: 350 OK1DGN, PA3CWL, EA5AR, JG2LGM, DF2PI, EA5LZ, EA4AXT. 400 OK2DGN, PA3CWL, EA5AR, DF2PI, HA5LZ. 450 OK1DGN, PA3CWL, EA5AR, DF2PI, HA5LZ. 500 PA3CWL, EA5AR, DF2PI, AB1U, HA3LZ. 550 EA5AR, DF2PI, AB1U, HA5LZ. 600 PY2DBU, EA5AR, DF2PI, AB1U, HA5LZ. 650 DL2HBT, EA5AR, JH2TPI, HA5LZ. 700 DL2HBT, EA5AR, JH2TPI, HA5LZ. 750 EA5AR, HA5LZ. 800 NE4F, HA5LZ. 850 WA2CNF, AI6Z, HA5LZ. 900 HA5LZ. 950 HA5LZ, AK2H. 1000 HA5LZ, AK2H. 1050 W9VEN, KF20, KL7AF, HA5LZ. 1100 W9VEN, KF20. 1500 W3TVB. 1550 W3TVB.

10 Meters: G3YBH, JR3RVO
15 Meters: YC0EMJ, G3YBH
20 Meters: G3YBH, IT9CUE
40 Meters: NE4F, G3YBH
80 Meters: NE4F, JA4ESR, KS3F, W9IAL
160 Meters: OK3MB, PA3CWL, JA4ESR

Asia: NE4F, YC0EMJ, JR3RVO, IT9CUE
Africa: OK3MB, G3YBH
No. America: I2TZK, YU2QS, JR3RVO, EA3AA
So. America: NJ0C, AI6Z, W4UW
Europe: PA3CWL, YC0EMJ, YU2QS, AA4LB, JR3RVO, IT9CUE
Oceania: OK3MB, I2EOW, YC0EMJ

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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, P.O. Box 1351, Torrance, CA 90505-0351 U.S.A.



While the LA1EE callsign might draw only moderate attention, the 3Y1EE drew a lot of attention. This is Einar Enderud, one of the operators at Peter I Island. An electrical engineer back home in Norway, Einar was at the International DX Convention to tell how it all was done—a new DXCC country!

The WAZ Program

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243 WA4CTA

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40 Meter Phone

40 YB0WR 41 JA7EAI

15 Meter CW

119 K4KUZ

20 Meter CW

259 WB0TTL

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3090	DL6NT	3095	JA7NVF
3091	KA6KUK	3096	W9TWM
3092	WB3BGI	3097	JE7BEX
3093	CX2CB	3098	F6EWK

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6070	G4BWP	6078	WD9BBI
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6072	IT9IYZ	6080	W6UZ
6073	IT9AXZ	6081	DL7WJ
6074	DL4KBU	6082	W6IHA
6075	JE1BDC	6083	YU4EZC
6076	K7EQM		

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (39 cents) size 4½ x 9½ to the WAZ Manager, Leo Haijsman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants forwarding QSL cards either direct to the WAZ manager or to a check point should include sufficient postage for safe return of their QSL cards. The processing fee for all C.Q. awards is \$4.00 for subscribers and \$10 for non-subscribers. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application.

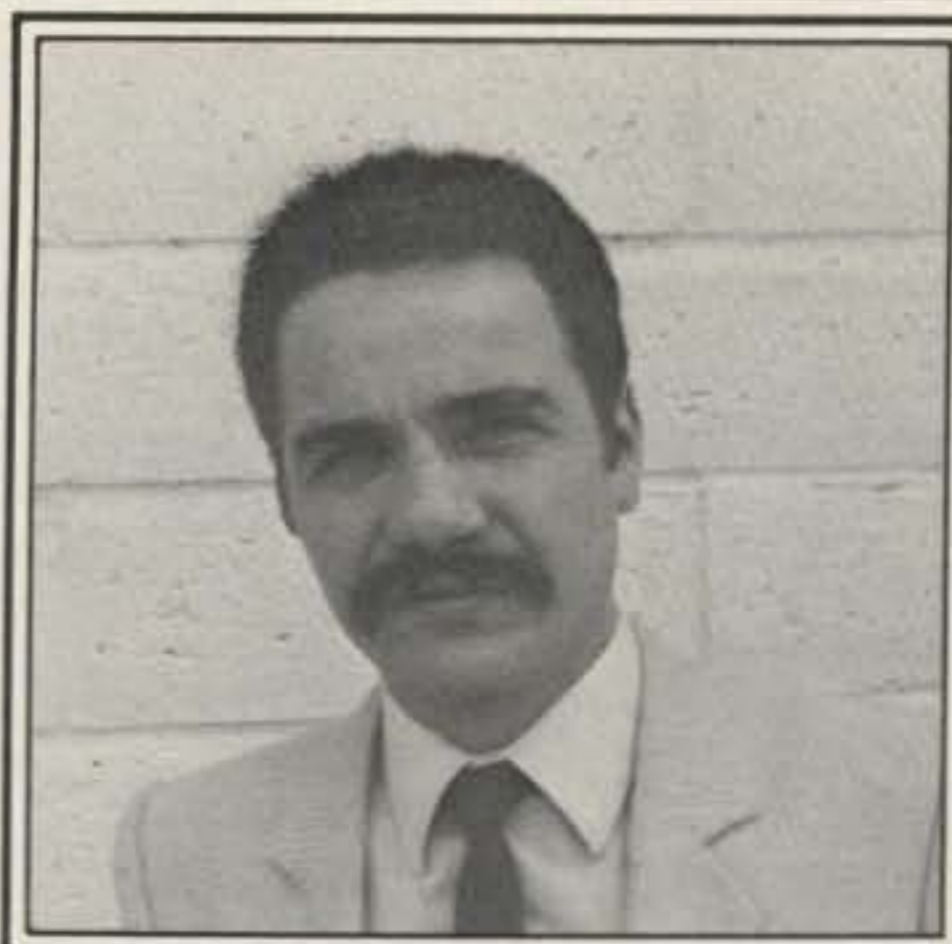
a fellow whose call is W0MLY. Someone told me that he is always the first!"

That was a call we recognized. "The first?" we had to question. We had to know more about this. "The first what?" we demanded. The Local smiled.

"Seems that they say George is always the first into the banquet room," the Local said. "George, they say, knows strange and mysterious ways and more doors to work DX than there are guards to watch them."

Things were moving right and we were feeling good again. In a bit the Local was off, trotting down the hill and looking hopefully for new worlds to conquer or old DXers to confuse. He had come wishing to talk and he had. And we could understand his enthusiasm about the International DX Convention. It is a unique event and nothing but DXing. But we were glad that the Local had gone, and it was good just to sit in the summer sunshine. Maybe we would survive the Perigee in June. "What do you think?" we finally asked the Old Timer. He took a while to respond.

"I think that some of these Locals are going to be heard from in the future," he said slowly. "They think but they also act. They are really DXers. I think we need them."



Here is Jacques Calvo, F6GXB, who is on the staff of the Japanese CQ magazine. Jacques was at the Visalia International DX Convention in April. (CQ staff photo)

No one would disagree with such a premise. True-blue DXers will always be needed. One need not argue the obvious. And if we held on just a bit more we might survive the Perigee. If you can endure, things will always improve. Sometimes being able to turn off a hearing aid also helps, like the time one of the Locals tried to explain the difference between the synodic and sidereal lunar month. But when the Perigee in June is at hand, be wary.

After awhile we asked, "Whatever happened to the good old days of DXing? Where did they go?" The Old Timer had to laugh.

"You know the answer to that," he said. "The so-called good old days of DXing were the days when you were young. The good days always are. Remember?"

We tried, but we still wonder where they went, the good days when we knew all the answers. Or was it just that we had not yet realized that there was so much to know and learn, such as what the Locals are talking about these days. Packet DXing?

DXCC and DXAC

Some months back the DXAC was directed by the ARRL Board of Directors to study the restructuring of the DXCC program. A questionnaire prepared by the DXAC is intended to get input from DXers especially on some recurring points of the DXCC. Perhaps you have already seen the questions and have replied. If you have not, prepare! We are going to run all the questions by you, and while not in the form the DXAC made the distribution, you get every word in every question asked. The DXAC form provided for a yes or no answer to the questions. You can use the short form and answer tersely. Or you can take the long form and answer at length—verbosely.

1. Are you basically satisfied with the present DXCC Awards Program?

2. Would you work towards a single-band DXCC and single-band Honor Roll Award if they were available?

3. Should Honor Roll be recognized at the time you meet criteria rather than when your call sign appears in QST?

4. Are you in favor of expanding the DXCC Awards Program to include 5BDXCC-CW, 5BDXCC-Phone, and endorsable 5BDXCC for new bands?

5. Should list operations be disqualified for DXCC credit?

6. Should DX stations or DXpeditions that solicit donations over the air be disqualified for DXCC credit?

7. Would you like the DXCC country criteria relaxed to allow for more new countries?

8. Do you believe that the QSL count for the basic DXCC Award can be made at points other than the headquarters DXCC desk without jeopardizing the integrity of the DXCC Awards program?

9. Do you feel that accreditation decisions on DX operations have been consistent and/or handled realistically?

10. In your opinion are there some entities on the DXCC countries list that should be deleted?

11. Should the DXAC be involved in the decision process of accrediting DX operations?

12. Are you in favor of a "fresh start" of the DXCC program as happened in 1945?

13. Since 1945 Honor Roll has been achievable in about 8 years. Do you think this is too long a period to achieve Honor Roll?

14. Should we consider deleting countries that prohibit amateur radio operation or that have been inactive for long periods of time?

15. Do you feel that your DXCC matters are being handled efficiently at ARRL headquarters?

16. Do you favor replacing the DXCC program with a new program based upon a worldwide grid system?

17. Should the start date for DXCC-CW be rolled back to 1945?

18. Top of the Honor Roll is the significant plateau of the DXCC. Does the listing of the de-

5 Band WAZ

Standings as of April 1, 1987

New recipients of 5 Band WAZ with all 200 zones worked:

134. G3GIQ
135. LA9GV
136. OZ7YY
137. ON7EM
138. SM7FIG
139. YB0WR

The top 13 contenders for 5 Band WAZ are:

1. JA1BWA, 199	8. K9CEB, 199
2. JA3EWU, 199	9. DJ9ZB, 199
3. N4WW, 199	10. SP6JCY, 199
4. K6YRA, 199	11. W2YY, 198
5. W8UVZ, 199	12. K7UR, 198
6. JA0CWZ, 199	13. K9GX, 198
7. JA3CWZ, 199	

409 Stations have met the 150 Zone level.

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CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries for the mode indicated. The ARRL DXCC Countries List is used as the country standard. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. Deleted countries do not count and are dropped from listing as they occur. Total countries are now 317. To remain on the CQ DX Honor Roll, annual updates are required. Honor Roll updates may be made at any time, in any number. Updates indicating "no change" will be accepted to meet the annual requirement. All updates must be accompanied by an SASE for confirmation. The fee for endorsement involving the issuance of a sticker is \$1.00.

CW

ON4QX	316	W6ID	311	K8PYD	305	N5FW	294	I8WY	281
W9DWO	316	K4XO	311	N4KG	305	K8LJG	292	K2OWE	281
W6PT	316	N6AR	311	AB4H	304	N5DX	291	K7ZR	280
K4CEB	316	DL3RK	310	W0IZ	303	W0HZ	291	I5XIM	280
N4JF	316	SM6CST	310	WA8DXA	302	WA4JTI	290	W2LZX	280
K9MM	315	AA6AA	309	YU2TW	301	W1WLW	289	W9NUF	280
N4PN	315	DL8CM	309	I3OBO	301	W4BV	289	HB9AFI	279
DL7AA	315	W9BW	309	W6SN	300	N8MC	288	IT9QDS	279
N6AV	315	N4MM	308	WB4RUA	300	WD9IIC	288	WA4DAN	278
W3GRS	314	DL1PM	308	W0SR	300	WA2HZR	286	DL1QT	277
W8KPL	314	K1MEM	308	W7CNL	299	NN4Q	286	W9SC	277
K6LEB	314	OK1MP	308	K3FN	298	YU1HA	286	KA3R	276
K6JG	314	W9RY	308	K3UA	298	K4CXY	283	W1WAI	276
N6CW	313	W4OEL	307	K9IW	298	W6YQ	282	K4SE	275
K9AB	313	SM3EVR	307	EA2IA	298	G2GM	282	N4AH	275
K6EC	312	W1NG	306	DJ7CX	297	JH1VRQ	282	K09W	275
W4BQY	312	K9QVB	306	WD9IIX	296	K1VHS	281	K9BWQ	275
W2FXA	312								

SSB

K2FL	316	K5OVC	313	VE3MRS	306	JH1VRQ	300	W9TA	289
W4EEE	316	YU1AB	313	KB5FU	306	KC8EU	300	K8ZZU	289
K6WR	316	VE7WJ	313	K8CMO	306	WA0TKJ	299	KE4HX	288
W4UG	316	N4MM	313	XE1OX	306	I6PLN	299	OK1AWZ	288
W6EUF	316	K4XO	313	EA1QF	305	KA8T	299	I8KCI	288
VE3MR	316	F2MO	312	NA5W	305	DJ7CX	298	KI3L	287
DL9OH	316	K8PYD	312	KZ8Y	305	K9SM	298	EA3KW	287
N4JF	316	W0SD	312	NS7Z	305	I8LEL	298	AB9E	287
I0ZV	316	K9RF	312	K3UA	305	JH4PRU	298	W5LLU	287
KD8VM	316	K4MOG	312	I8KCI	305	K8ZZU	298	G3XTT	287
I0AMU	316	I8ACB	312	K8VAV	305	EA9IE	298	XE1MDX	287
F9RM	316	W9SS	312	W6SN	305	XE1NI	298	N8BJQ	286
Ti2HP	316	N2SS	312	W8IMZ	304	I1POR	298	N3ARK	286
KS2I	316	LA7JO	312	XE1J	304	KB3OO	298	K9MNT	285
YV1KZ	316	OE2EGL	312	VE7HP	304	K5DUT	297	KB5RF	285
I8AA	316	LU3YL	312	W4UNP	304	HP1JC	297	KD8V	284
DJ9ZB	316	K6EC	311	W6NLG	304	YU7KV	297	WB3HAZ	283
W3GRS	315	W4SSU	311	NY5L	304	K3LUE	297	VE3MV	283
VE3MJ	315	I4LCK	311	CT1UA	304	XE1OW	297	IN3ANE	283
4Z4DX	315	W0SR	311	I4EAT	304	WB3GPR	296	K4JLD	283
W9DWO	315	K9BWQ	311	VE7DX	304	KQ9W	296	PY2DBU	283
W9JT	315	K6XP	311	XE1KS	303	KB3KV	296	AE5B	282
ZL1AGO	315	K9AB	311	W2LZX	303	W4BQY	296	G4GED	282
W4NKI	315	W1LQQ	311	WB3DNA	303	W9OKL	296	KC8YM	282
VE2WY	315	W7FP	311	KB0U	303	I0SGF	296	AI9R	282
K6YRA	315	N6OC	311	K0GT	303	K7LAY	295	TG9EP	282
W3AZD	315	DL6KG	311	K1MEM	302	W0IYR	295	N1ALR	282
XE1AE	315	IV3YRN	310	N5FG	302	KK0C	295	K9TI	280
VE3GMT	315	DK2BL	310	W6FET	302	W6MFC	295	ZL1BOO	280
ZL3NS	315	AA6AA	310	W2FGY	302	KA9ABC	295	G4FAM	280
I8YRK	315	W8JXM	310	K9HQM	302	VE3XO	295	KU9Z	280
N6AR	315	WA4JTI	310	WA4DAN	302	I8ZTE	294	VE6PW	280
VE1YX	315	9H4G	310	I3OBO	302	WD0BNC	294	KS0Z	280
W4DPS	315	N4PN	309	K9UAA	302	I5BDE	294	KB5DN	279
I4ZSQ	315	K1UO	309	NJ2C	302	WD8PUG	294	EA6DE	279
OK1MP	315	W6DN	309	KP4EQF	302	WB3CQN	294	JH8NYK	279
ZS6LW	315	W7OM	309	A18M	302	K4SE	293	KX5V	279
I8KDB	315	ZL1BIL	309	WB4UBD	302	KC8JH	293	K4BYK	278
W9BW	315	WD9IIX	309	N5FW	302	A15I	293	I5EFO	278
K9LKA	315	SM4CTT	309	I5EFO	302	K4LR	293	VE3IUE	278
N4WF	314	VK4VC	308	W6BCQ	302	W9NUF	293	KB8O	278
OZ3SK	314	YV5AIP	308	WB4NDX	301	AG9S	293	KG9N	278
K9MM	314	N6AV	308	WA3HUP	301	KD5ZM	293	G4ADD	278
YV5DFI	314	W2CC	308	VE3FJE	301	WA4LOF	292	WB6OKK	278
K6JG	314	A18S	308	W8ILC/QRPP	301	AC0A	292	WB0UFL	277
CT1FL	314	N4KG	308	YU2TW	301	I2MOP	292	W4PTT	277
OZ5EV	314	K8NA	308	N4CRU	301	VE3FEA	292	KB0SY	277
W2SUA	314	WA4WTG	308	KZ0C	301	VP9CP	292	I8XTX	277
W0SFU	314	W1NG	308	N8BKF	301	W8LKG	292	N0AMI	276
W9YDB	314	G4CHP	308	KZ2P	301	K1VHS	292	N7ASL	276
OE3WWB	314	W9RY	308	KE3A	301	W0ULU	292	WA6DTG	276
VE3XN	314	KU9I	308	WT4T	301	W4UW	292	WA4OPW	276
YS1RRD	314	K9HDZ	308	NN4Q	301	SV1JG	292	AI9U	276
N7RO	314	VE4SK	307	YV1AJ	301	WA2FKF	292	KC2RS	276
K8LJG	314	WB1DQC	307	WA0HZ	300	VE3IPR	291	WA9IVU	276
W3GG	314	I0MBX	307	I5EFO	300	N5AWS	291	K0HQW	276
I2LLD	314	KV2S	307	K9QVB	300	K2JF	291	AB9O	276
K9AB	314	WD8MGQ	307	KB9KD	300	W4JFE	291	I8INW	275
ON5KL	313	KB9OC	307	VE4AT	300	K2JLA	291	WB1EAZ	275
EA2IA	313	KB8DB	307	WZ4I	300	DU9RG	291	VE7BSM	275
W8ILC	313	VK3JF	307	I2ZGC	300	VE3CKP	290	K8NWD	275
EA4LH	313	K9IW	306	K2JLA	300	KB2HK	290	VE5FX	275
OZ8BW	313	KR9O	306	WA2MID	300	VE3DLR	290	KC2FC	275
N6AW	313	N4KE	306	NW5K	300	JA5PUL	289	N2CIC	275
W8PCA	313	WA0DCQ	306	WB6GFJ	300				

leted countries confirmed, in QST, serve any useful purpose in the DXCC Awards program?

19. In your opinion what single change could be made which would result in the greatest improvement to the DXCC program?

You can make a comment to the DXAC by answering, where proper, these questions on a yes or no basis. Question #19 does call for more comment, and there seems to be no reason why you cannot reply to any of the numbered questions at length should you desire to do so.

Previously there has been mention here of a program based on a world-wide grid system. There is also a proposal being offered which would revise DXCC Rules 2 and 3. The feeling expressed in this proposal is that Rules 2 and 3 are ambiguous and the proposals are to remove the ambiguity and inconsistent treatment of islands. The proposal specifically says that it is not intended to handle instances such as 4U1VIC or 1A0KM; it is not intended to determine proper amateur operation in a country; it is not intended to suggest whether or not to start DXCC over.

This proposal to revise DXCC Rules 2 and 3 has been prepared by Eric L. Scace, K3NA. Much of the suggestions are based on the United Nations Convention on the Law of the Sea. In studying the proposals it might be remembered that while there were some 159 signatories to the study, it was never ratified. The time limit for ratification was December 1984 and at that time 14 countries had ratified the proposed treaty; 60 countries would have had to ratify it for it to become effective. The United States, Britain, and West Germany were opposed to the proposed treaty. Much of the opposition came over a proposal to control and govern the mining of resources from beneath the sea. In the proposal made by K3NA the definitions of "baselines," the line around land from which sea territories are measured, and the "exclusive economic zones," these in some cases extending up to 200 miles offshore, are taken from the words in the United Nations Sea Conference proposal.

K3NA has prepared explanatory papers on the proposal. They run to a number of pages, and if interested you might drop a prepaid envelope to Eric Scace, 10701 Five Forks Road,



Here is Reinhold Geissler, DL1UF, who came all the way from Hamburg, Germany to meet the DXers gathered at the International DX Convention. DL1UF was a callsign recognized by many attending. The convention has always been the gathering to match a familiar call with a face-to-face visit and QSO.

CQ DX Awards Program

SSB

1525	K9HDZ	1531	G4RBD
1526	JR3RVO	1532	WB6UAN
1527	N6CGB	1533	NI9C
1528	KC7EM	1534	WA2GMC
1529	YC0SY	1535	W9SC
1530	YV1AJ	1536	KD9BG

CW

692	YU2CKL	694	NI9C
693	NM9H	695	KD9BG

SSB Endorsements

310	N6AR/315	275	PY2DBU/283
310	K4XO/313	275	G4GED/282
300	W9RY/308	250	KC7EM/271
300	K9HDZ/308	250	W9SC/259
300	K9IW/307	250	I2EOW/250
300	XE1OX/306	200	KD9BG/231
300	W6BCQ/302	200	N6CGB/200
300	YV1AJ/301	200	I3ZSX/200
275	XE1OW/297	150	JR3RVO/179
275	XE1MDX/287	3.5/7 MHz	I2EOW
275	K4JLD/283	Mobile	WB6UAN

CW Endorsements

310	N6AR/311	275	W9SC/277
275	W9RY/293	250	K4JLD/260
275	W0HZ/291		

Total number of active countries is 317. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an s.a.s.e. is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

Frederick, Maryland 21701. That prepaid envelope should be a large business size at the minimum with three rates of first-class postage (56¢) affixed.

Frederick, Maryland. Wasn't that where Robert E. Lee was supposedly greeted with the cry "Shoot, if you must, this old gray head, but spare my DXCC, he said..." or was that another campaign? Anyhow, if you are interested in all of this, get all the available information and answer all the questionnaires. There may be changes coming, and you can be a part of the process.

If you answer the DXAC questions, they would like a bit of background information including your callsign, your class license, age, and whether you are an ARRL member, a DXCC member, or an Honor Roll member. If you are not sure where to send your comment for the DX survey, send it directly to downtown Newington.

Barbados

A full-bore effort is planned for the October CQ WW DX Phone test with a crew from tide-water Potomac country aiming to blanket the action from 160 through 10. Prior to the contest there will be action in the CW mode plus 30 meters.

This contest crew hones their skills in the CQ WW CW DX Tests each year, operating K3KG in the multi-single category. Going to 8P6-Barbados will be K3KG, W4NL, K3ZR, K4FJ, and N4TX, Steve Thompson. QSLing will be handled by K4BAI with an SASE or SAE/IRC requested.

The CQ WW DX Tests the last full weekend



This is Cho, HL5AP, long a marine operator with the Sanko Steamship Company but now retired in Busan. A holder of many DX awards, Cho has also signed HM1AP, HM9AP, HM5AP, PA9SR, EL0Pmm, 5L0Pmm, and EL0APmm. You will find Cho in the DX Tests. His QTH is in the QSL Information section of the column.

in October and November always mark the start of the great DX season. You have a couple of months to get ready, and with the Cycle 22 headed up, the Great Days of DXing are at hand.

Market Reef

There will be sustained activity from Market Reef starting late in July, the action running from July 25th to August 2nd. One Finnish operator, one Swedish operator, and three UK types will be operating. OH0MA/OJ0 will be the call used to indicate that this is a station on Market Reef and not in the Aaland Islands.

The Finnish authorities have not issued the OJ0 prefix for some years now. Stations on Market Reef use the OH0 prefix. Some tend to believe that an OH0 station is in the Aaland Islands, and often it is. But it might also be a station on Market Reef. This may be a bit difficult to understand, but all is not lost. The operation starting the end of July will sign OH0MA/OJ0. One will then have to try hard to be confused.

Now that we have your attention, it is also possible that some of the operators will sign their own call /OH0. If you hear G4JVG/OH0, GM3YOR/OH0, G4EDG/OH0, or SM5AQD/OH0, maybe even OH0NA/OH0, what do you think it will be? Market Reef, of course! However, if you hear OH0NA all by itself, you will readily know that this is Kee back home in the Aaland Islands. After all this explanation there should be no possibility of misunderstanding. On the other hand, if you hear a station signing OH0 as a prefix or a suffix or anything at all, work it. As the Hero of Mafeking would often say, "Work 'em now, worry later!" It might also save a lot of thinking.

QSLing for the Market Reef effort may need some guidance. OH0MA will go to Kee Eriksen, SF-22430, Saltvik, Finland. OH0/G4JVG will go to S. Telenius-Lowe, "Penworth," Tokers Green Lane, Reading, RG4 9EB, England. This is the correct address; the one in the CB is incorrect. However, the CB is correct for the address for G4EDG, GM3YOR, and SM5AQD.

G4JVG is currently in Sweden, and Steve tells the wondering DXer that Market Reef is between Sweden and the Finnish-administrated Aaland Islands, about a half-acre in size and running 310 meters long and 85 meters wide. The island is uninhabited. The lighthouse is automated, and is only occasionally visited by yachtsmen and daring DXers. There are two support buildings on the island in addition to the lighthouse, and landing often depends on

the weather and sea conditions. There are times when a landing is impossible, and thus operating dates can never be exact.

Should you need Market Reef for a new one or to fill out a band for a single-band DXCC, prepare! They plan to operate 24 hours a day, CW and SSB and possibly even some RTTY.

The Caribbean Desk

Should you be planning to visit VP2V-British Virgin Islands it might be helpful to remember that visiting amateurs are limited to 150 watts DC input and 400 watts SSB PEP output. Arthur Swain, the Telecommunications (Radio) Office in the BVI, passes along the information so that anyone headed that way will be aware of the power limits. If you need more information, drop him a query at the Ministry's office at Tortola, BVI.

Bill Fikis, K2IBW, passes along the information that there has been a prefix change down at St. Barthelemy Island in the French West Indies. Instead of the locals signing FG/FS it is now just a simple FJ prefix.

The prefix FS had been shared with French St. Martin, but effective in mid-March St. Barthelemy Island became FJ. Stations previously signing TK5BL and FBs AU, CB, BU, EB, EK, BW, and BQ are now signing FJ5BL, FJ5AU, etc. Those callsigns listed in the foregoing were all the valid licenses on the island at the time of the prefix change. All this came directly via K2IBW from the PTT on Rue de Bercy in downtown Paris.

Montserrat

Alex Kasevich, VP2MM, will be out with some DXpedition-style operation for a week starting July 4th. Along with Alex will be Rick Casey, who will be signing VP2MIU. To ensure that there is no interruption in the important task of handing out VP2M-Montserrat contacts, Dave Heinrich will provide support for the effort by attending to the antennas, engineering, and photography. You might also suspect culinary engineering and generator fuel monitoring.

Modes will be mostly CW and SSB on all HF bands plus 6 and 2 meters. Some VHF experimentation will be attempted on request, including satellite possibilities. QSLs go to AB1U with SASE or SAE/IRC.

A note from last year's activity in the Caribbean area, DL1JW, Hubert Esser, was a Turks & Caicos last October for uninterrupted CW action for two weeks. He was booked into the new Pillory Beach Hotel on the west side and found the hotel cooperative in helping him get up some dipoles and longwires. Hubert also found that the temporary reciprocal U.S. license, DL1JW/W4, carried more weight than his longstanding German amateur license. Over 2000 QSOs, mostly CW, were made during the stay.

Robin Laing, VP5GT, is the president of the Turks & Caicos radio club, and might have caught him as control on the Caribbean MM net at 21400 kHz. VP5GT might be a good source for local conditions such as transportation. Hubert, DL1JW, stopped in North Carolina enroute home to Bad Kreuznach after being bumped off a flight out of the islands and arriving in Ft. Lauderdale on a chartered twin-engine private plane. QSLs for the operation go to the CB address. The callsign used—DL1JW/VP5, naturally.

Worried? Check This!

Back in March 1986 P.B. Buckley, ZS2RM,

in downtown Port Elizabeth happily went to the local post office to send off QSL cards for two-way CW DXCC 200, the bundle containing cards all the way back to 1975. The address was checked for correctness, the package was bounced off the floor to check security, and the whole thing was sealed with sealing wax. Everything was on rails, and obviously all Buck had to do was wait for the certificate to show in the mail. Right? Wrong!

After a couple of months ZS2RM began to worry and contacted the ARRL. Your QSLs? What QSLs? Never saw them! A check through the postal channels indicated that the records showed that the package arrived in the states, but beyond that nothing.

The South African postal authorities advised Buck to file a claim against the U.S. Postal Service. But included in the bundle were 71 QSLs which were the only ones Buck had for those countries. On top of everything, he lost his vocal cords some years back and lives off a pension.

What would you do? Buck did worry and wonder how he could ever replace those QSL cards. But good things do come to the Deserving, and on February 17, 1987 the package of QSL cards arrived in downtown Newington. Now his credits stand at 315 mixed and his CW total should be 238 and climbing.

What happened? It seems that a shipping container was off-loaded when the ship arrived in the U.S. and then was not delivered to the Postal Service. It just sat in the yard at the dock. Apparently after a good many months had passed it was noticed and finally delivered to the New Jersey International and Bulk Mail Center in Jersey City. The Postal Service says

that they are upset with the delay and pursuing the matter with the steamship company.

Years back there was an amateur/scientist down at the Stanford Research Center doing research on "long-delayed" echoes, these being a signal heard and then in a second or so, sometimes more, the signal heard again—a delayed echo. ZS2RM is an unwilling expert in long-delayed QSLs. But should you need a QSL for ZD9BR from November 1970 to November 1971, or for ZD9GA from November 71 to January 1972, Buck has the logs and was the QSL Manager. He can still supply QSLs; SAE/2 IRCs or simply \$1.00 U.S., will cover the shipping. These stations were on Gough Island.

RASD

There is a possibility of activity from this country in early August, probably within the first two weeks in the month. Now that you are wondering possibly what RASD stands for, it is Republica Arabe Saharai Democratica, sometimes known as the Saharan Arab Democratic Republic. It used to be called Rio de Oro (EA9) if that helps you any.

The Spanish Lynx DX Club indicates that they have permission to operate in the southern portion of what was once Rio de Oro. They plan to have two operators and will operate CW and SSB. The call might, speculatively, be S0RASD, or it might be something else. When Spain relinquished Rio de Oro, neighboring countries moved in and things have not been quiet since January 1976 when the Spanish government withdrew. Morocco occupies the northern portion of the former colony. Should you wonder about country status, RASD belongs to the Organization of African Unity, has

observer status at the United Nations and Council of Europe, and has had a government in existence for some years. It does look good.

Some Wind-Up DX Pitches

The deadline on the FCC proposal on the private sector issuing certain amateur call signs has been extended to July 31st. This will also give the ARRL board meeting in early July a chance to review the ARRL position.

Shiant Island off the Island of Harris in the Outer Hebrides will be activated July 13th, running to July 18th, operating on 160 to 2 meters with 10 meter FM and 2 meter SSB/FM. Look for GB8SI/P each day from 1000Z. QSL to GM3MTH.

SV1VF writes to update the SX1MBA operation on the battleship *Averof*. The correct route for the *Averof* Award or the SX1MBA QSL is to: RAAG Award Manager, P.O. Box 3564, 10210, Athens, Greece.

Sheldon C. Shallon, W6EL, has a newly released version 2.0 of the MINIPROP propagation prediction program. The program is compatible with the IBM PC and clones, or compatible with computers using the CP/M operating system. If interested, drop a line to W6EL at 11058 Queensland Street, Los Angeles, CA 90034.

Some months ago we mentioned Jim Henderson and his trips some years back to Niue and similar spots in the Pacific. We immediately got queries asking where Jim might be, the writers thirsting for one of his QSLs. What could we say? We had lost track of Jim, but found him anew deep in the throngs at the International DX Convention. He is signing KF7E out of Las Cruces, New Mexico and still has the

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CIRCLE 69 ON READER SERVICE CARD

logs for ZM7AH/5W1AL/ZK2DX/A35JH—Box 6153, Las Cruces, NM 88006.

New officers of the Southeastern DX Club are: Ken Byers, K4TEA, President; Mike Greenway, K4PI, Vice-President; John Harden, K4JAG, Secretary and Bulletin Editor; Bill Blaine, W4UYC, Treasurer, and Dave Thompson, K4JRB, and Bill Barr, N4NX, handling the activities and special programs. What is the message the SEDXC has for its members? "Pay your dues!" They know what their priorities are.

WESTLINK notes that Glenn Baxter, K1MAN, has been advised by the FCC that his assistance to CBS during the early hours of the Salvadorean earthquake may be a violation of the prohibition of the use of amateur radio for business purposes. K1MAN has replied that while acknowledging that he was aware of the prohibition, they were also concerned with providing a public service, the U.S. Embassy had been destroyed, for nine hours the link with HC2DZ/YS1 was the only source of information about conditions in El Salvador, and BBC joined with CBS in seeking information. At the time of writing no further information is known, and the expectation is that nothing more than a warning will be issued.

QSL Information

Often there is a query on how to become a QSL Manager for a DX station. There are a number of ways, any one of which might work. You might note a DX station on the air handling his own QSLing, wait for a break, and put the question to him. Need help? If timid, when QSLing a station you could slip in a note asking if he needed a manager. Or you can do as Michael McGuire, KA8NAO, does. Mike says that he is ready. Good fist, good voice, good work habits. He lives at 212 No. Columbus, Fremont, OH 43420. In any situation, it is always best to spell out the obligations on either side in advance.

All of the following was compiled with a lot of help from the Truhlers at the W9LNQ QTH.

AA4GA/VP2M to AA4GA
C21NI to JE3LWB
C30BBE to OH3TY
FG/WA6PKN to WA6PKN
FJ5AB to FG7CB
F00OK to W6TM
FS5IPA to F5SX
FY8DP to F3NT
HV2VO to I0AOF
IK8AFL to I2UIY
J37ZY N28G
J6CQ to K4LTA
J70A to NF5Z
KC6MX to K1XM
OH3AA/OH0 to OH3RF
PJ1JP to WA6PKN
PJ7A to W3HNK
P29FG to WA0GUD
PJ7/WA6PKN to WA6PKN
TU4A to K1MM
T06JUN to F5AM
VP2MW (Mar 7-8) to N4IZE
VP2ET to K5RX
V31CV to NA5S
V31DX (*87) to N5DD
VU2IAM to UY5XE
W2KN/FS/FG to W2KN
WL7E to KL7GNP
WB6SHD/VP2M to WB4QBB
YV6BXN to KA3GEA
ZC4HA to RSGB Bureau
4C2A to XE2AFL
4MBARV to YV5ARV
4MBARV (160m) to YV10B
8P6HG to VE5RA
AH6GJ & AH6GQ to Bill Early,
WA9AEA, 501 No. Hill Rd.,
McHenry, IL 60050

EA8RCT to Radio Club Gran
Canaria, Box 123, Las Palmas
de Gran Canarias
E18EK to Bill Early, WA9AEA,
501 No. Hill Rd., McHenry, IL
60050
FE9IL to Edward DuBois, 33
Les Tamaris, 34340 Marseil-
lan, France
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Motherwell, Scotland
GB8SI/p to GM3MTH, Box 20,
Motherwell, Scotland
HG7B to Istvan Bogyo,
HA0DU, Box 16, Debrechen,
H-4003, Hungary
HL5AP to Byong-joo Cho, P.O.
Box 14, Haeundae, Busan,
Korea
K5LBU/ST0, K5LBU/TJ, and
K5LBY/9Y5 to Charles Frost,
3618 Macon Place Court,
Houston, TX 77082
SM1MBA to RAAG Award
Mgr., Box 3564, 10210 Athens,
Greece
VE8YQ to Bill Early, WA9AEA,
501 No. Hill Rd., McHenry, IL
60050
WA6PKN to Jerry Plemmons,
35 Falcon Circle, East Green-
wich, RI 02818
ZM7AH to P.O. Box 6153, Las
Cruces, NM 88006
387PAX to P.O. Box 72, Valpa-
raiso, Chile
8P6AY to K1COW, Oakland
Shores, Spencer, ME 01562

DXing all the way. Leif Ottosen, OZ1LO, was headed for the Madeira Islands, and Mike Metzger, ZM7MM, and Marty Maessen, ZM7AT, were winding down a Tokelaus effort that ran for some weeks. K1DRN was on Prince Edward Island signing VE1 after being on Grand Bahama Island earlier in the month signing /C6A. The dispute over cross-mode contacts in the DXCC-CW certificate was boiling over; you call the station on SSB, ask them to listen for your CW signal, and even though at times the DX station might not be able to read CW, when the QSL came through it counted. There were all sorts of reasons given to defend the practice. The ARRL finally moved to disal-

low this ploy for those seeking the DXCC-CW certificate. VR1X was getting ready to depart the Gilberts. Some northern California DX types were still noting the passing of W6WX, Dave Baker. A true-blue DXer always. The ARRL was lifting the restrictions in Rule 9 of the criteria so credit would be given for contacts made from within the same DXCC country rather than from within the same call area as previously. KA1S was due from Marcus Island, VQ9D/S79D was home visiting in Virginia, and WA6KWQ was on from Wake Island. Cycle 21 was on the boards and picking up tempo. The Great Days of DXing were at hand!
73, Cass, WA6AUD

First Annual CQ WW RTTY DX Contest 0000 UTC September 26 to 2400 UTC September 27

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CIRCLE 163 ON READER SERVICE CARD

DX Ten Years Back

In July 1977 Ted Henry, W6UOU, was off on a trip across the Pacific and around the world,

Contest Calendar

a monthly feature by
FRANK ANZALONE, W1WY

NEWS/VIEWS OF ON-THE-AIR COMPETITION

I realize I am sticking out my neck when I include the Colombian and SEANET contests in this month's calendar. I have not heard from either organization as of this writing, but I am using last year's established dates and rules which have been current the past few years. I hope they are correct and will be of interest to those who have participated in the past. I may not be as concerned about these delinquent announcements next time.

A correction in the mailing deadline for logs in the All Asian Contest: logs must be postmarked no later than July 30th for the phone section, and September 30th for the CW section (not the arrival dates published in last month's issue).

Now is the time to send us information concerning contest expeditions that are being planned for the coming World-Wide DX Contest this fall. We have already received notice from OH3TY that a group of OHs will make a big effort from Andorra/C3 this October in the phone section of the CQ World-Wide.

We had a good number of plaques presented at both the Visalia and Dayton Conventions this past April. There are still a few we are holding for lack of shipping information. If you are still waiting for your award for the 1985 World-Wide, drop me a note and we will get to work on it. (That's plaques, not certificates.)

Deadline for announcements for the October issue is July 15th, and August 15th for the November issue. Send information to my home address, please.

73 for this time, Frank, W1WY

Kansas VHF/UHF Sprint

2300Z Fri. to 0500 Sat., July 10-11

This shorty is being sponsored by the Wichita Amateur Radio Club. Activity will be on all amateur bands between 29 MHz and 2304 MHz, CW, SSB, Packet, and FM. Contacts must be made via repeaters only. Oscar satellites, digi-repeaters, and FM repeaters. Only contacts with Kansas stations are valid.

Exchange: Name, QSO no., and station call.

Scoring: One point per QSO. Same station may be worked on different repeaters and bands.

Multiplier: One per repeater worked through and number of different bands contacts were made on.

Example: 4 QSOs through 3 repeaters,

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Calendar of Events

* July 1	Canada Day Contest
* July 4	Clinton Riverboat Day
July 4-5	Venezuelan SSB Contest
July 10-11	Kansas VHF/UHF Sprint
July 11-12	IARU World Championship
† July 11-12	Colombian DX Contest
July 18-19	CQ WPX VHF Contest
† July 18-19	SEANET CW Contest
July 18-19	AGCW-DL QRP CW Contest
July 25-26	Venezuelan CW Contest
July 25-27	MARAC County Hunters CW
Aug. 1	YLRL YL-OM SSB Sprint
Aug. 1-2	New York State QSO Party
Aug. 1-3	Two Meter QSO Party
Aug. 8-9	European CW Contest
† Aug. 15-16	SEANET SSB Contest
Aug. 15-17	New Jersey QSO Party
Aug. 22-23	All Asian CW Contest
Sept. 5-6	Nat'l CW & SSB Champion
Sept. 9-11	YLRL "Howdy" Days
Sept. 12-13	European SSB Contest
Sept. 19-20	Fernand Raoult F9AA Cup
Sept. 19-20	Scandinavian CW Contest
Sept. 26-27	Scandinavian SSB Contest
Sept. 26-27	CQ WW RTTY DX Contest
Sept. 27-28	Homebrew Radio Exchange
Oct. 10-11	Pennsylvania QSO Party
Oct. 24-25	CQ WW DX Phone Contest
Nov. 14-15	European RTTY Contest
Nov. 28-29	CQ WW DX CW Contest

* Covered last month.

† Unofficial.

on 2 different bands, score is $4 \times 3 \times 2 = 24$ points.

Add 50 points to final score if noncommercial is used.

Add 100 points to final score for club call signs that are used.

(Better write to the Wichita ARC for their copy of the rules.—ed.)

Awards: Will be made to each participant sending in a log. The top 5 scorers will receive the 1987 ARRL Repeater Directory.

Send logs to: Wichita ARC, Att.: Randy Berger, NØFUJ, 707 North Main Street, Wichita, KS 67203.

IARU HF Championship

1200Z Sat. to 1200Z Sun., July 11-12

This is the old IARU Radiosport Contest with a new name. The operating time has been cut down to 24 hours and a few other minor modifications have been made, but basically the format is still the same.

It's a worldwide competition open to all amateurs on all six bands, 10 through 160 meters (no WARC bands).

Categories: Single operator, CW only, phone only and mixed mode. Multi-operator, single transmitter, mixed-mode only.



Bob Ferraro, W6RJ, the 80 meter phone champ in the 1985 World-Wide DX Contest, was all smiles when Bob, K3EST, presented him with a special CQ plaque. (Photo via "The DX Bulletin," VP2ML)

Must remain on a band for at least 10 minutes at a time. (Exception: Only IARU member-society HQ stations may operate simultaneously on more than one band with one transmitter on each band/mode.)

Exchange: RS(T) and ITU zone. IARU HQ stations, RS(T), and official member-society abbreviation.

Points: Contacts within own zone or with an HQ station, 1 point. Contacts within own continent but different zone, 3 points. Contacts with different continents, 5 points.

Multiplier: Total number of ITU zones and IARU HQ stations worked on each band. (Note: HQ stations do not also count as a zone multiplier.)

Final Score: Total QSO points from all bands times the sum of the multiplier from each band.

Awards: Certificates to the top scorers in each category, in each state, ITU zone, and each DXCC country. In addition, achievement awards will be issued to stations making at least 250 QSOs or a multiplier total of 50 or more.

Entries with more than 500 QSOs are required to include a dupe sheet with their log. A three QSO reduction will be assessed for each duplicate QSO for which credit has been taken. Disqualification may occur if the overall score is reduced by 2% or more.

It is recommended that you check QST for more detailed information. A large SASE will get you official forms.

Mailing deadline for entries is August 13th to: IARU Headquarters, Box AAA, Newington, CT 06111.

Colombian Contest

0000Z Sat. to 2359Z Sun., July 11-12

There have been a few changes in the format of this year's contest. A close check of the rules is suggested.

It's still a worldwide type contest on all six bands, 1.8 through 28 MHz, CW only and SSB only.

Classes: Single operator, single and all band, multi-operator, single and multi-transmitter. (There is only one single band class, that used on 14 MHz.)

Exchange: RS(T) plus a three-figure QSO number starting with 001.

Scoring: For non-HK's—QSOs with HK's 10 points, with other countries 5 points, with own country 1 point.

For HK's—QSOs with other countries 10 points, with other HK's 5 points.

Multiplier: Number of different countries and HK call districts worked on each band.

Final Score: Total QSO points times the sum of the multiplier from each band.

Awards: Certificates to each station showing a minimum of 50 contacts, at least 10 of which are HK's on SSB or 5 if on CW, will receive a certificate. Plaques to the overall winning HK and non-HK in each class and each mode. Also for HK's in each call area.

Use a separate log sheet for each band. Indicate the multiplier in a separate column only the first time it is worked on each band. A summary sheet showing the scoring and other essential information and the usual signed declaration are also required.

Disqualification rules regarding taking credit for duplicate contacts, violation of rules and regulations, etc., will be strictly enforced.

Mailing deadline is August 30th to: L.C.R.A. Contest Committee, Apartado Aereo 584, Bogota, Colombia.

SEANET DX Contest

C.W.: July 18-19 SSB: Aug. 15-16

The object of the contest is to contact stations within the SEANET area. The same station may be worked once on each band. Cross-band or cross-mode contacts are not allowed. Multi-operator stations are limited to one signal during the same time period.

Classes: Single operator, single and all band, and multi-operator all band only.

Exchange: RS(T) plus a three-figure QSO number starting with 001.

Scoring: Stations outside SEANET area—(a) Contacts with stations within the NET area with the following prefixes: 20 points on 160; 10 points on 80 and 40; 4 points on 20, 15, and 10 (DU, HS, YB, 9M2, 9M6, 9M8, 9V1, V85).

(b) With stations in other NET areas: 10 points on 160; 5 points on 80 and 40; and 2 points on 20, 15, and 10.



Over 500 DXers and contesters attended the International DX Convention at Visalia this past April. Bob Cox, K3EST, one of our CQ World-Wide Contest Directors, presented a number of WW and WPX Contest awards to winners, including those in the above group. Left to right are N6VI, W6MKB, W6RJ, K6AA, W6OUL, N6KT, and WR6R. (Photo via "The DX Bulletin," VP2ML)

(c) Contacts between stations outside the NET area have no value.

(d) Multiplier of 3 for each NET country worked.

Stations within SEANET area: (a) Contacts with stations outside NET area—10 points on 160; 5 points on 80 and 40; 2 points on 20, 15, and 10.

(b) Between stations within the NET area: 6 points on 160; 3 points on 80 and 40; 1 point on 20, 15, and 10.

(c) Contacts with stations in own country have no value.

(d) Multiplier of 2 for each NET country worked, 3 with country outside NET area.

Final Score: Total QSO points times the sum of the multiplier.

Awards: The three highest scoring stations on CW and on SSB will receive plaques. There are other awards for each class.

Entries must be received no later than October 20th by the CEBU Amateur Radio League, P.O. Box 304, Cebu City, Philippines 6401 (Att: SEANET Contest).

SEANET Area Prefixes: A35, A51, AP, BV, BY, C21, DU, FK8, FR, FW8, HL, HS, H44, JA (etc.), JD1, KA, KC6, KH2-3-4-5-6-7-8-9-0, KX6, P29, S2, S79, T2, T3's, VK (all), VQ9, V85, VS6, VU2, VU7, XU, XV5, XW8, XX9, XZ2, YB, YJ8, ZK, ZL (all), 3B6-7-8-9, 3D2, 4S7, 5W1, 8Q7, 9M2-6-8, 9N1, and 9V1, 1Z9.

AGCW-DL QRP Contest

1500Z Sat. to 1500Z Sun., July 18-19

This is the summer edition of this QRP CW-only contest. The same station may

be worked on each band, 1.8 through 28 MHz. There are five classes:

Class A—3.5 watts or less input. **Class B**—10 watts or less, for single operators. **Class C**—10 watts or less for multi-operators. **Class D**—QRO stations, over 10 watts input (may work only QRP stations). **Class E**—SWL's.

Class C may operate the full 24 hours; others must take a 9-hour break.

Exchange: RST, QSO no., and power input, i.e., (559001/5) (579001/QRO). Add "X" if using crystal control.

Scoring: QSO within own country, 1 point. With other stations in own continent, 2 points. With DX outside own continent, 3 points. (Double points if using crystal control.)

Multiplier: One for each DXCC country, and one for each DX station worked. Call areas in JA, PY, VE, W, and ZS count as separate multipliers.

Final Score: Total QSO points from all bands times the multiplier as indicated.

Awards: Certificates for the first three places in each class and band.

Use a separate log sheet for each band, and a summary sheet showing the scoring, name and address, and other essential information. Mail logs within six weeks of the end of the contest to: Siegfried Hari, DK9FN, Spessartstrasse 80, D-6453 Seligenstadt, West Germany (include 1 IRC for a copy of the results).

CQ WW VHF WPX Contest

0000Z Sat. to 2400Z Sun., July 18-19

This is the third Annual CQ World-Wide

VHF Contest. Complete and detailed rules can be found in the February issue, but will be reviewed here briefly for those who do not have that issue. However, I strongly recommend that you get a copy of the February issue for a more detailed copy of the rules.

Bands: All bands from 6 meters through 23 cm may be used (50, 70, 144, 220, 432, 902, and 1296 MHz).

Classes: 1. Single Operator—(a) all band; (b) single band; (c) all band low power; (d) single band low power (30 watts PEP). 2. Multi-operator—(a) all band; (b) single band. 3. Portable (temporary power source only). 4. FM only.

Exchange: Call sign and grid square (4 digits, e.g. FN20).

Scoring: One point per QSO on 50, 70, and 144 MHz; 2 points on 220 and 432 MHz. Four points on 902 and 1296 MHz. Stations may be worked once per band regardless of mode.

Final Score: Multiply total QSO points times the sum of different prefixes worked on each band.

A prefix is considered to be the three letter/number combination which forms the first part of the callsign. (A station in a call area different from that indicated in the call is required to sign portable. The location of the portable call determines the prefix.)

Awards: A large selection of certificates and plaques will be awarded to the

top scorers in each class in all major geographic areas, North America, Europe, and Japan. And in each US state, Canadian province, European countries, and Japan call areas. Additional areas will be considered if returns justify.

Mailing deadline for logs is August 31st. They should be sent to: CQ VHF WPX Contest, c/o S.C.O.R.E., P.O. Box 1161, Denville, NJ 07834. They can also be sent to: CQ VHF WPX Contest, 76 N. Broadway, Hicksville, NY 11801.

County Hunters CW Contest

0000Z Sat. to 0200Z Mon., July 25-27

The MARAC County Hunters Net is sponsoring this year's contest. Mobile and portable operation from less active countries is welcome and encouraged.

The same station may be worked on each band, and mobile and portables from each county change for QSO credit. Mobiles operating on a county line give and receive one QSO number, but each county is valid as a multiplier. (Mobile and portables must identify by signing M or P after their call.)

Exchange: QSO no., category (M or P), RST, county and state for US stations, province or country for others.

Scoring: QSO's with fixed stations are worth 1 point, with mobile and portables 3 points.

Multiply total QSO points by sum of US

counties worked for final score.

Frequencies: 3575, 7055, 14065, 21065, 28065. On 20 and 40 mobile and portables should call CQ below the suggested frequency. Fixed stations use above the suggested frequencies.

Awards: Certificates to winners as follows:

F—Fixed or fixed portables in each state, province, and country with 1000 or more total score.

P—Portable in each state operating from a county other than its normal location with 1000 or more score.

M—Mobile in each state operating from 3 or more counties with a minimum of 10 QSOs from each county.

Plaques to the top-scoring mobile, portable, and fixed station in the US meeting the above requirements.

Mobile and portables who change states calculate their score for a state certificate, and total score for plaque.

A summary sheet showing the scoring is requested and a check sheet of counties worked is a must for entries with 100 or more counties.

Mailing deadline for logs is August 31st to: Jerry Burkhead, N6QA, 7525 Baltic St., San Diego, CA 92111.

YL/OM Summer SSB Sprint

1800Z to 2200Z Sat., August 1

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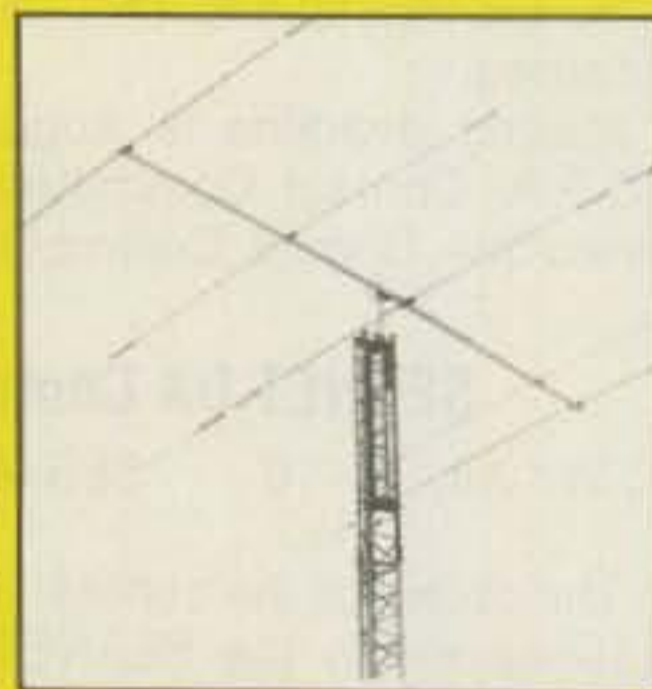
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ty organized by the YLRL. Only contacts between YLs and OMs count, on all HF bands, no nets or repeaters, and a power limit of 1500 watts PEP.

Exchange: Call, RS, name, and state, province, or country.

Scoring: (A) One point per QSO. Same station may be worked once on each band.

(B) Alphanumeric multiplier. Using the last number and the first letter following that number of the call—i.e., W1XZ is 1X, W2GLB/7 is 2G, 9Y4A is 4A, etc. (An unusu-

al multiplier; don't recall having seen it before.—ed.)

(C) Low power bonus of 1.5 for stations using 200 watts PEP or less at all times.

(D) Final Score—total QSO points (A), times the multiplier (B), times low power bonus (C), if applicable.

Frequencies: 3955, 7255, 14265, 21395, 28595 MHz, plus or minus 15 kHz.

Awards: Certificates to the three highest scoring YLs and OMs. And to the top scoring YL and OM in each U.S. district, VE

province, and DX country (minimum of 10 valid contacts).

Print or type logs and show the scoring. Operator's signature is requested.

All entries must be received by September 1st and go to: Mary Lou Brown, NM7N, 504 Channel View Drive, Anacortes, WA 98221.

New York State QSO Party

1600Z Sat. to 1600Z Sun., Aug. 1-2

These are new dates and modified rules for this fourth annual QSO Party sponsored by the Salt City DX Association. They specifically encourage portable and mobile operation from rare New York State counties during the peak camping and vacation season.

The same station may be worked on each band and each mode, and NY stations can make in-state contacts for QSO and multiplier credit. Mobiles in each county change.

Exchange: RS(T) and QTH. County for NY stations; state, VE province, or country for DX.

Scoring: One point for SSB contacts, 2 points for CW.

New York stations multiply total QSO points by (NY counties + states + VE provinces + DX countries) worked for their final score.

Others multiply total NY QSO points by the number of NY counties worked (maximum of 63).

Frequencies: 1815 and 40 kHz up from bottom of all other bands on CW. And 1880, 3880, 7280, 14280, 21380, and 28580 on SSB. (No WARC bands.)

Awards: Certificates to the top scoring stations in NY State, U.S., Canada, and DX entrants. Special awards for the highest scoring single operator, NY State club group operating from a rare NY county and NYS mobile.

Mailing deadline is September 21st to: George Hippisley, K2KIR, RD #1 Box 27A, Verona, NY 13478.

Two Meter QSO Party

1900Z Sat. to 0400Z Mon., Aug. 1-3

The Side Winders On Two is sponsoring this one. You can use SSB or CW, 144.0 to 144.3 MHz, but no repeaters or relayed contacts.

Exchange: Call, SWOT number if you are a member, and grid square locators.

Scoring: Two points for contacts with SWOT members; one point if with a non-member. Your score is the total QSO points times the number of grid squares worked.

Awards: Certificates to the top scores in each ARRL section.

Mailing deadline for logs is August 15th to: Jerome Doerrie, K5IS, Rt. 2 Box 72, Booker, TX 79005.

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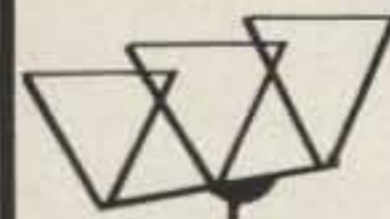
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Mounted in a brushed aluminum frame, these clocks feature 5/8 inch LCD numerals and a sloped face for easy across the room reading. Both also feature easy set month, day, hour, minute and second functions that can be operated in an alternating time-date display mode. MFJ-108, 4 1/2 x 1 x 2 inches; MFJ-107, 2 1/4 x 1 x 2 inches. Battery included.

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Run up to 1.5KW PEP and match any feedline continuously from 1.8 to 30 MHz: coax, balanced line or random wire.

Lighted Cross-needle Meter reads SWR, forward and reflected power in one glance. Has 200 and 2000 watt ranges. 6 position antenna switch handles 2 coax lines, random wire and balanced lines. 4:1 balun. 250 pf, 6 kv variable capacitors. 12 position ceramic inductor switch. Smaller size matches new rigs: 10 3/4 x 4 1/2 x 14 7/8 inches. Flip stand for easy viewing. Requires 12V for light.

MFJ RANDOM WIRE TUNER

MFJ-16010 \$39.95

MFJ's ultra compact 200 watt random wire tuner lets you operate all bands anywhere with any transceiver using a random wire. Great for apartment, motel, camping. Tunes 1.8-30 MHz. 2x3x4 inches.



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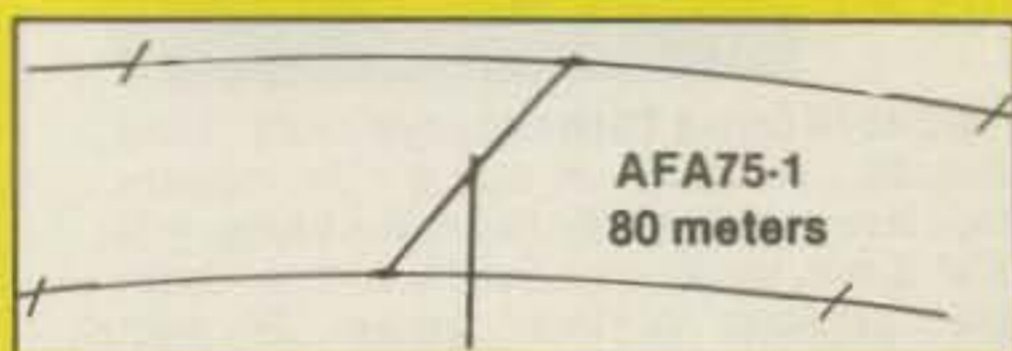
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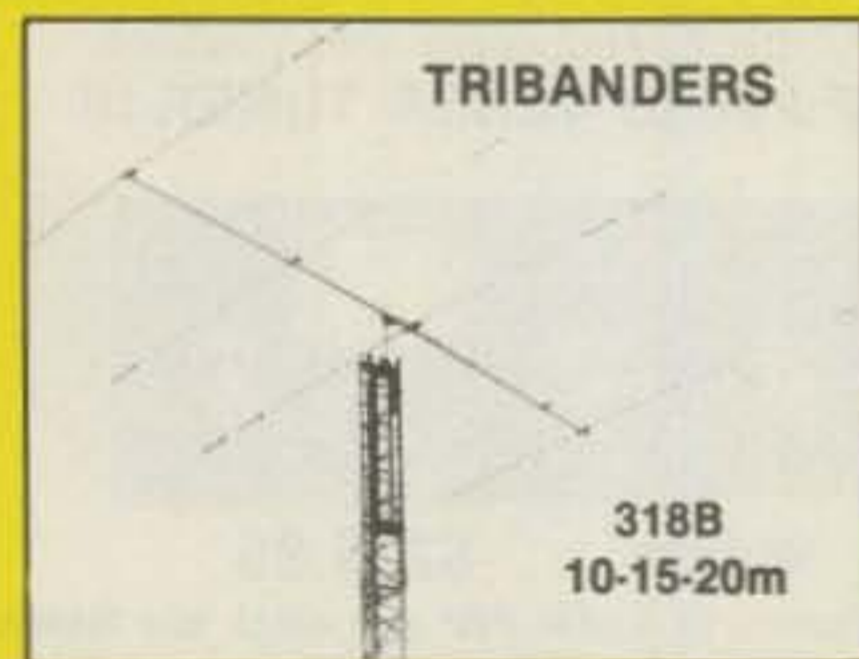
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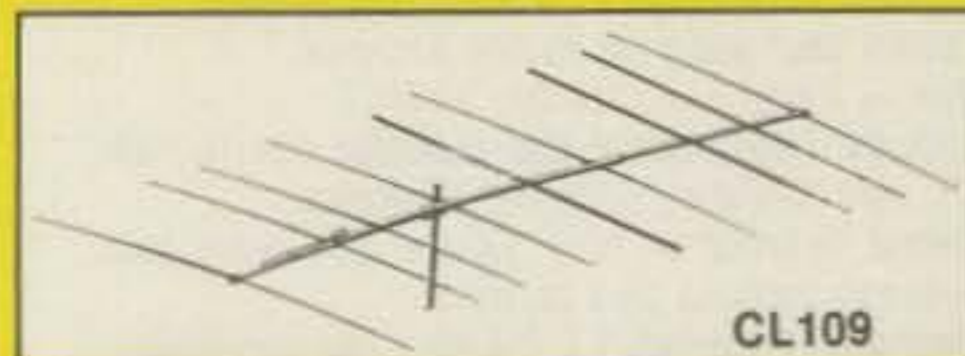


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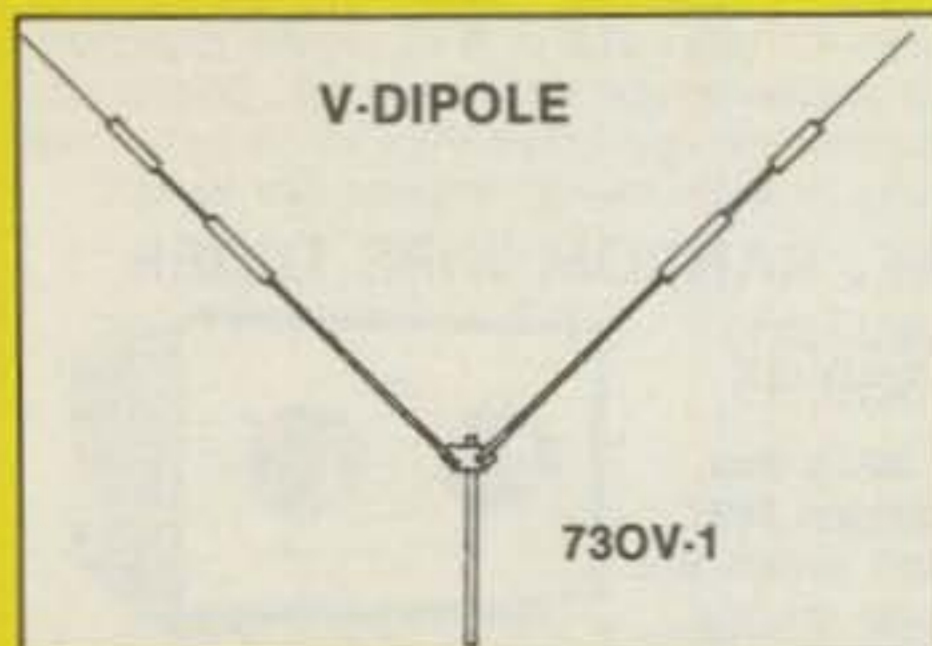
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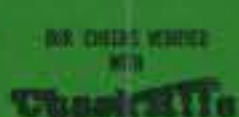
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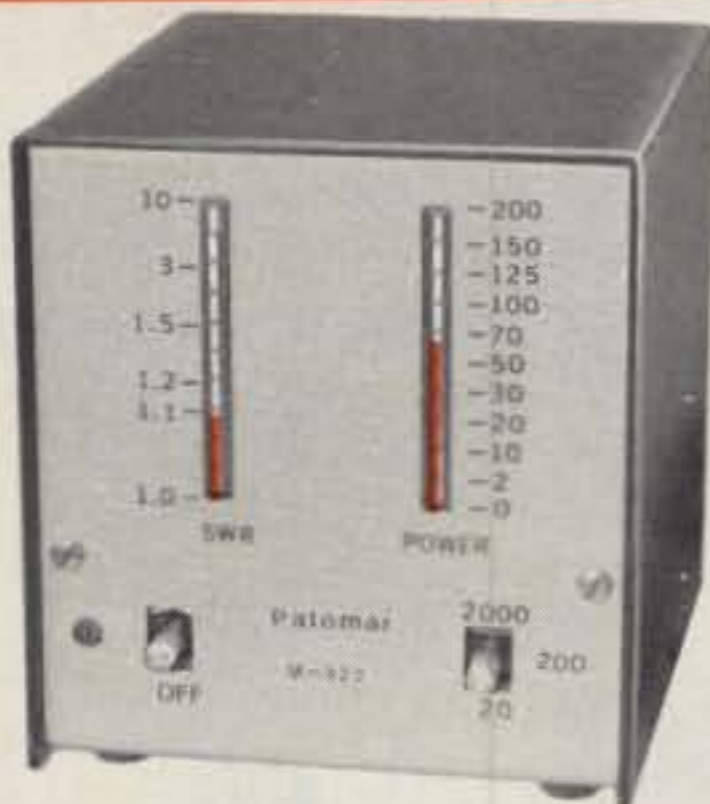


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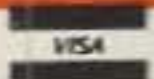
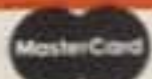
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Superb Design, Uncompromised Quality. A 105dB dynamic range receiver features high RF sensitivity and steep skirted IF selectivity that cuts QRM like a knife. A 100% duty cycle transmitter includes a large heatsink and internal blower. The IC-761 transceiver is backed with a full one-year warranty and ICOM's dedicated customer service with four regional factory service centers. Your operating enjoyment is guaranteed!

All Bands, All Modes Included. Operates all HF bands, plus it includes general coverage reception from 100kHz to 30MHz. A top SSB, CW, FM, AM, and RTTY performer!

Passband Tuning and IF Shift plus tunable IF notch provide maximum operating flexibility on SSB, CW, and RTTY modes. Additional features include multiple front panel filter selection, RF speech processor, dual width and adjustable-level noise blanker, panel selectable low-noise RF preamp, programmable scanning, and all-mode squelch. The IC-761 is today's most advanced and elaborate transceiver!

Direct Frequency Entry Via Front Keyboard or enjoy the velvet-smooth tuning knob with its professional feel and rubberized grip.

Special CW Attractions include a built-in electronic keyer, semi or full break-in operation rated up to 60 WPM, CW narrow filters and adjustable sidetone.

Automatic Antenna Tuner covers 160-10 meters, matches 16-150 ohms and uses high speed circuits to follow rapid band shifts.

Complementing Accessories include the CI-V computer interface adapter, SM-10 graphic equalized mic, and an EX-310 voice synthesizer.

You're The Winner with the new era IC-761. See the biggest and best HF at your local ICOM dealer.

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ICOM America, Inc., 2380-116th Ave. N.E., Bellevue, WA 98004 Customer Service Hotline (206) 454-7619
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ICOM CANADA, A Division of ICOM America, Inc., 3071 - #5 Road, Unit 9, Richmond, B.C. V6X 2T4 Canada

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