

# Amateur Radio

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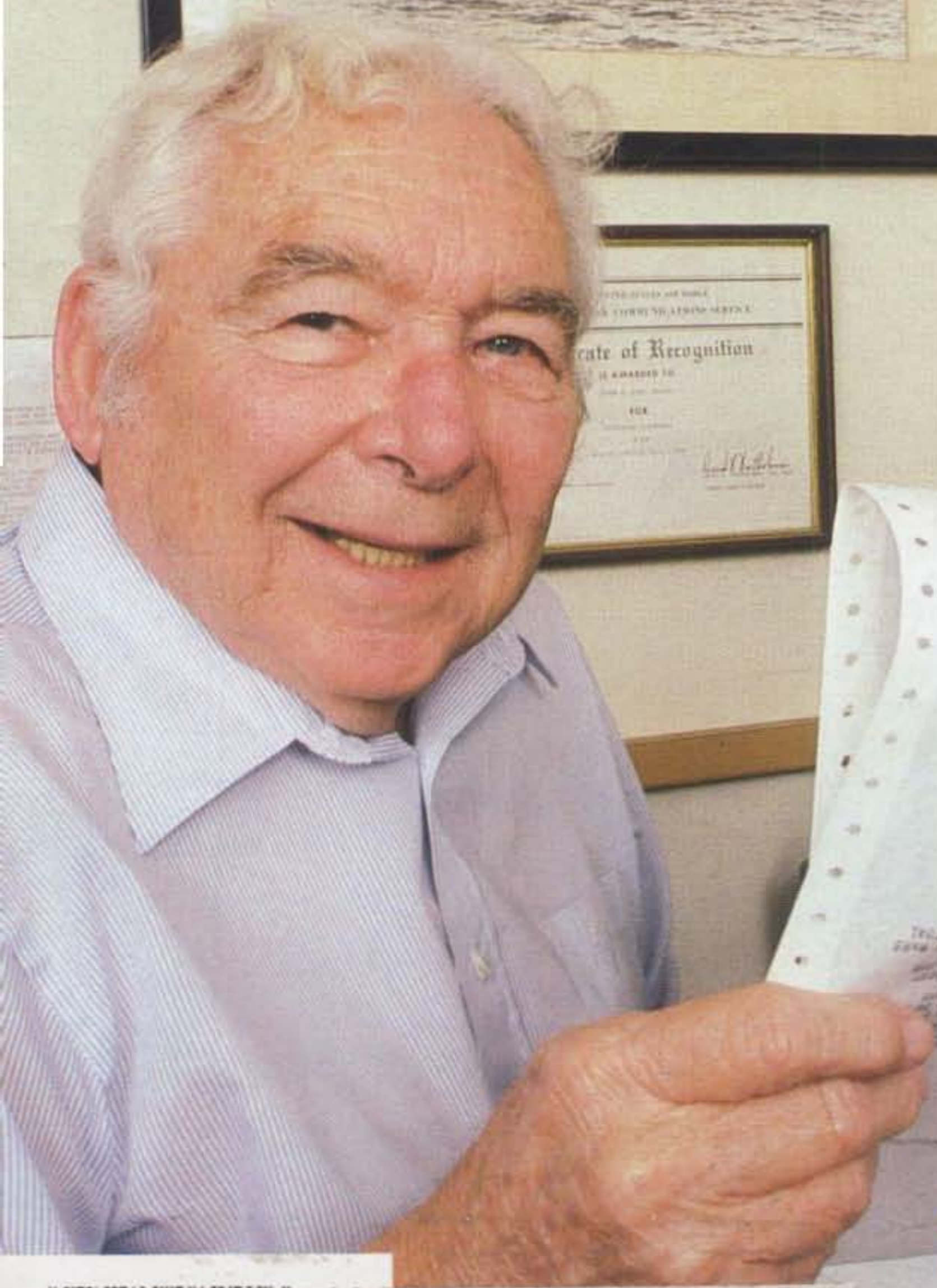
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# CQ

Including  
**HAM  
RADIO**

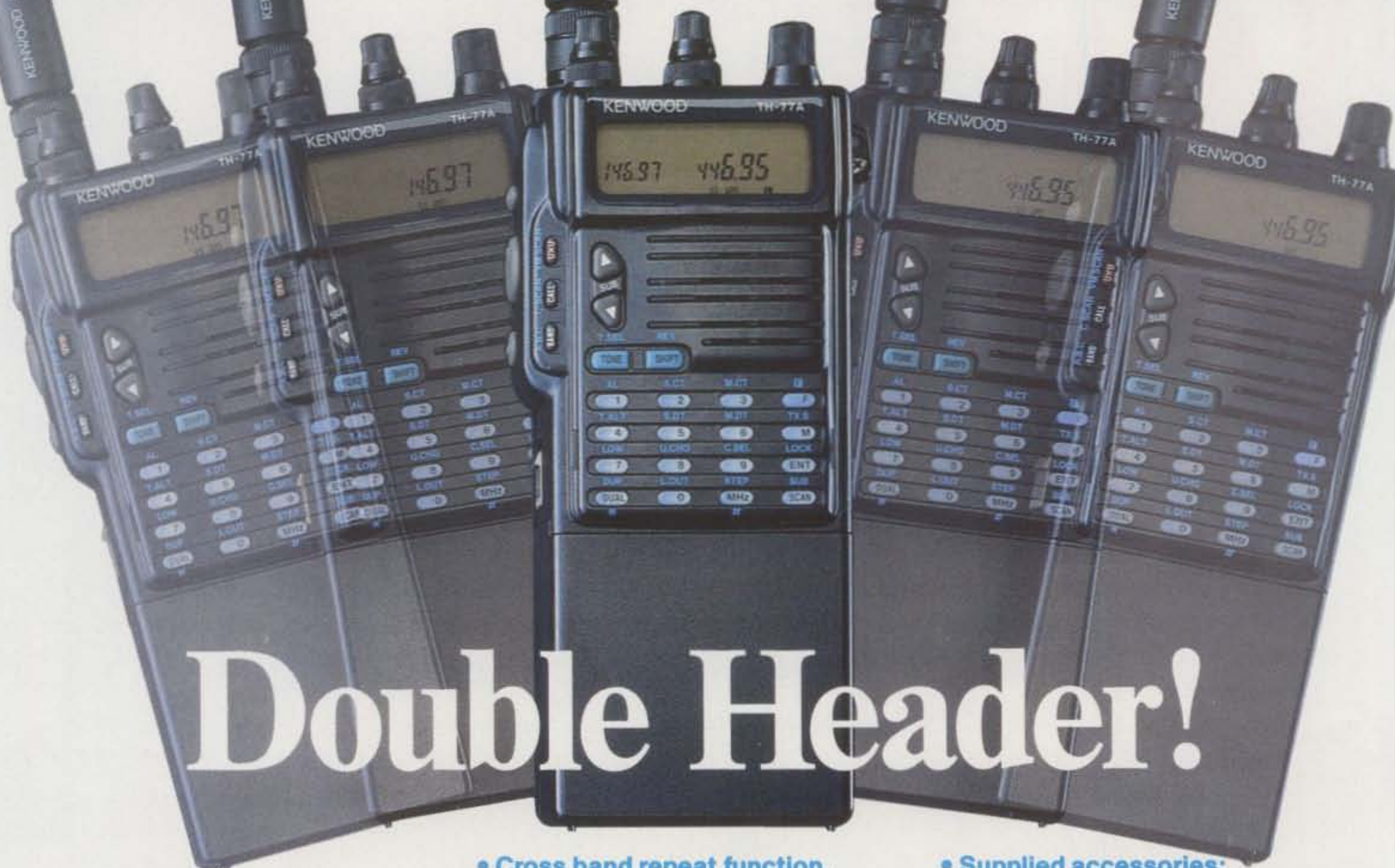
## Special Issue: Digital Communications



On the cover: W7FCQ enjoys some "old-fashioned" digital communications: RTTY.

AMATEUR'S JOURNAL

# KENWOOD



## Double Header!

### TH-77A

#### Compact 2m/70cm Dual Band HT

Here's a radio that deserves a double-take! The TH-77A is a feature-packed dual band radio compressed into an HT package. The accessories are compatible with our TH-75, TH-25, and TH-26 Series radios. Repeater and remote base users will appreciate the DTMF memory that can store *all* of the DTMF characters (\*, #, A, B, C, and D) that are usually required for repeater functions!

- **Wide band receiver coverage.** 136-165 (118-165 [AM mode 118-136] MHz after modification) and 438-449.995 MHz. TX on Amateur bands only. (Two meter section is modifiable for MARS/CAP. Permits required.)
- **Dual receive/dual LCD display.** Separate volume and squelch controls for each band. Audio output can be mixed or separated by using an external speaker.

- **Cross band repeat function.**
- **Dual Tone Squelch System (DTSS).** Uses standard DTMF to open squelch.
- **CTCSS encode/decode built-in.**
- **Forty-two memory channels.** All channels odd split capable.
- **DTMF memory/autodialer.** Ten 15-digit codes can be stored.
- **Direct keyboard frequency entry.** The rotary dial can also be used to select memory, frequency, frequency step, CTCSS, and scan direction.
- **Multi-function, dual scanning.** Time or carrier operated channel or band scanning.
- **Frequency step selectable for quick QSY.** Choose from 5, 10, 12.5, 15, 20, or 25 kHz steps.
- **Two watts (1.5 W on UHF) with supplied battery pack.** Five watts output with PB-8 battery pack or 13.8 volts. Low power is 500 mW.
- **DC direct-in operation** from 6.3-16 VDC with the PG-2W.
- **T-Alert with elapsed time indicator.**
- **Automatic repeater offset on 2 m.**
- **Battery-saving features.** Auto battery saver, auto power off function, and economy power mode.

- **Supplied accessories:** Flex antenna, PB-6 battery pack (7.2 V, 600 mA), wall charger, belt hook, wrist strap, keyboard cover.

- Optional accessories:**
- **BC-10:** Compact charger • **BC-11:** Rapid charger • **BH-6:** Swivel mount • **BT-6:** AAA battery case • **DC-1/PG-2V:** DC adapter
- **DC-4:** Mobile charger for PB-10 • **DC-5:** Mobile charger for PB-6, 7, 9 • **PB-5:** 7.2 V, 200 mAh NiCd pack for 2.5 W output
- **PB-6:** 7.2 V, 600 mAh NiCd pack • **PB-7:** 7.2 V, 1100 mAh NiCd pack • **PB-8:** 12 V, 600 mAh NiCd for 5 W output • **PB-9:** 7.2 V, 600 mAh NiCd with built-in charger
- **PB-11:** 12 V, 600 mAh OR 6 V, 1200 mAh, for 5 W OR 2 W • **HMC-2:** Headset with VOX and PTT • **PG-2W:** DC cable w/fuse
- **PG-3F:** DC cable with filter and cigarette lighter plug • **SC-28, 29:** Soft case
- **SMC-30/31:** Speaker mics. • **SMC-33:** Speaker mic. w/remote control • **WR-1:** Water resistant bag.

KENWOOD U.S.A. CORPORATION  
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# KENWOOD

...pacesetter in Amateur Radio

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

# KENWOOD



## TS-950SD

### "DX-clusive" HF Transceiver

The new TS-950SD is the first Amateur Radio transceiver to utilize Digital Signal Processing (DSP), a high voltage final amplifier, dual fluorescent tube digital display and digital meter with a peak-hold function.

#### • Dual Frequency Receive Function.

The TS-950SD can receive two frequencies simultaneously.

• **New! Digital AF filter.** Synchronized with SSB IF slope tuning, the digital AF filter provides sharp characteristics for optimum filter response.

#### • New high voltage final amplifier.

50 V power transistors in the 150-watt final section, resulting in minimum distortion and higher efficiency. Full-power key-down time exceeds one hour.

#### • New! Built-in microprocessor controlled automatic antenna tuner.

#### • Outstanding general coverage receiver performance and sensitivity.

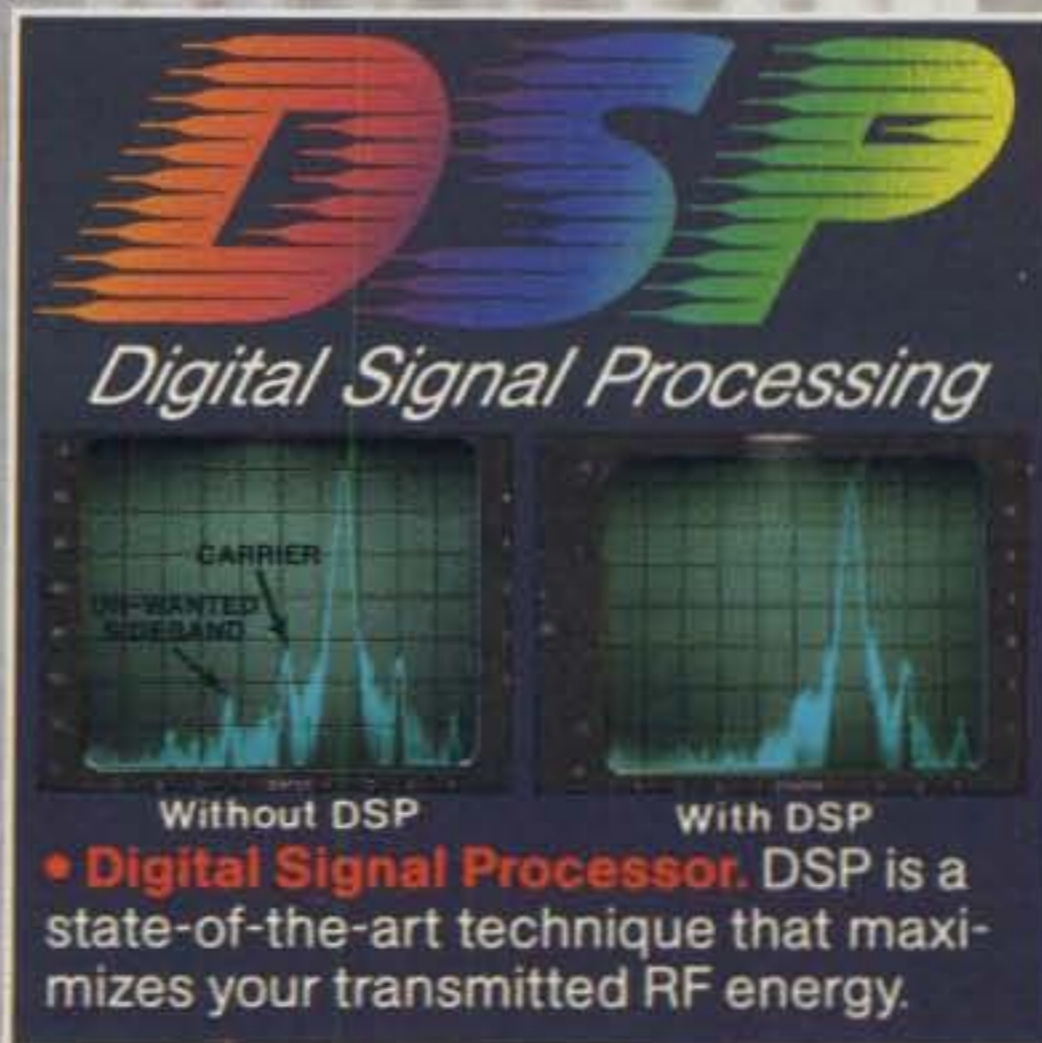
Kenwood's Dyna-Mix™ high sensitivity direct mixing system provides incredible performance from 100 kHz to 30 MHz. The Intermodulation dynamic range is 105 dB.

• **Famous Kenwood interference reduction circuits.** SSB Slope Tuning, CW VBT (Variable Bandwidth Tuning), CW AF tune, IF notch filter, dual-mode noise blanker with level control, 4-step RF attenuator (10, 20, or 30 dB), switchable AGC circuit, and all-mode squelch.

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

Specifications, features and prices subject to change without notice or obligation.

## The Ultimate Signal.



• **High performance IF filters built-in †** Select various filter combinations from the front panel. For CW, 250 and 500 Hz, 2.4 kHz for SSB, and 6 kHz for AM. Filter selections can be stored in memory!

• **Multi-Drive Band Pass Filter (BPF) circuitry.** Fifteen band pass filters are available in the front end to enhance performance.

#### • Built-in TCXO for the highest stability. †

#### • Built-in electronic keyer circuit.

• **100 memory channels.** Store independent transmit and receive frequencies, mode, filter data, auto-tuner data and CTCSS frequency.

#### • Digital bar meter.

**Additional Features:** • Built-in interface for computer control • Programmable tone encoder • Built-in heavy duty AC power supply and speaker • Adjustable VFO tuning torque • Multiple scanning functions • MC-43S hand microphone supplied

#### Optional Accessories

- DSP-10 Digital Signal Processor \*
- SO-2 TCXO \* • VS-2 Voice synthesizer
- YK-88C-1 500 Hz CW filter for 8.83 MHz IF \*
- YG-455C-1 500 Hz CW filter for 455 kHz IF \*
- YK-88CN-1 270 Hz CW filter for 8.83 MHz IF \*
- YG-455CN-1 250 Hz CW filter for 455 kHz IF \*
- YK-88SN-1 1.8 kHz SSB filter for 8.83 MHz IF \*
- YG-455S-1 2.4 kHz SSB filter for 455 kHz IF \*
- SP-950 External speaker w/AF filter
- SM-230 Station monitor w/pan display
- SW-2100 SWR/power meter
- TL-922A Linear amplifier (not for QSK)

\* Built-in for the TS-950SD

† Optional for the TS-950S

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## KENWOOD

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# KENWOOD

## Compact Champion!

### TH-27A/47A

#### 2 m and 70 cm Super Compact HTs

Here is a great new addition to Kenwood's HT family — the all new TH-27A for 2 meters and TH-47A for 70 cm! Super compact and beautifully designed, these pocket-sized twins give you full-size performance.

- **Large capacity NiCd battery pack supplied.** The standard battery pack is 7.2 volts, 700 mAh, providing extended transmit time with 2.5 watts. (TH-47A: 1.5 W.)
- **Extended receive coverage.** TH-27A: 118–165 MHz; TH-47A: 438–449,995 MHz. TX on Amateur bands only, (TH-27A modifiable for MARS/CAP. Permits required. Specifications guaranteed for Amateur bands only.)
- **Multi-function scanning.** Band and memory channels can be scanned, with time operated or carrier operated scan stop.
- **Frequency step selectable for quick QSY.** Choose from 5, 10, 12.5, 15, 20, or 25 kHz steps.
- **Built-in digital clock** with programmable timer.
- **Dual Tone Squelch System (DTSS).** Compatible with the TH-26AT Series and the TM-941A Triple bander, as well as other Kenwood series transceivers, this selective calling system uses standard DTMF to open squelch.
- **Five watts output** when operated with PB-14 battery pack or 13.8 volts.
- **T-Alert for quiet monitoring.** Tone Alert beeps when squelch is opened.
- **Auto battery saver, auto power off function, and economy power mode extends battery life.**
- **DTMF memory.** The DTMF memory function can be used as an auto-dialer. All characters from the 16-key pad can be stored, allowing repeater control codes to be stored!

- **41 memories.** All channels store receive and transmit separately for "odd split"
- **DC direct in operation.** Allows external DC to be used (7.2 – 16 volts). When external power is used, the batteries are being charged. (PB-13 only.)

#### Optional accessories:

- **BC-14:** Wall charger for PB-13, 14
- **BC-15:** Rapid charger for PB-13, 14
- **BH-6:** Swivel mount
- **BT-8:** Six cell AA Alkaline battery case
- **HMC-2:** Headset with VOX and PTT
- **PB-13:** 7.2 V, 700 mAh NiCd pack
- **PB-14:** 12 V, 300 mAh NiCd pack
- **PG-3F:** DC cable with filter and cigarette lighter plug
- **PG-2W:** DC cable
- **SC-30:** Soft case
- **SMC-31:** Standard speaker mic
- **SMC-32:** Compact speaker mic
- **SMC-33:** Compact speaker mic with controls
- **WR-2:** Water resistant bag.

- **Automatic offset selection (TH-27A).**
- **Direct keyboard frequency entry.** The rotary dial can also be used to select memory, frequency, frequency step, CTCSS, and scan direction.
- **CTCSS encode/decode built-in.**
- **Supplied accessories:** Rubber flex antenna, battery pack, wall charger, belt hook, wrist strap, dust caps.

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# MASTHEAD

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# The Radio Amateur's Journal

**ON THE COVER:** Truman O. Moore, W7FCQ of Scottsdale, Arizona reads RTTY copy from an old Teletype® machine ... the type that had that wonderful machine smell and occasionally dripped oil on the floor. (Photo by Larry Mulvehill, WB2ZPI)



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## VOL. 46, NO. 11

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# ZERO BIAS

## EDITORIAL

**T**he other day I listened in on a QSO during which two amateurs were bemoaning the fact that a rare DX station was collecting loads of IRCs and green stamps and as a result could afford to buy a first-rate station. Obviously, they thought something was wrong with this situation and that somehow it was unfair that the DX station had better equipment than they did, while they as average amateurs seemed to subsidize the DX station in return for a QSL.

First, we have to appreciate the notion that the rare (or not so rare) DX station's reason for being is not just to give us a signal report and send a free QSL card. I know it's a silly notion, and a number of amateurs still feel that everything connected with the hobby should be for free. However, the best things in life usually have a price tag attached if you look close enough, and amateur radio is no exception.

While there is a modicum of truth to the saying "money can't buy happiness," if you managed to send a few IRCs and/or a few green stamps, tell me you were unhappy when you opened the envelope and took out the 3Y5X QSL card. I'll even bet that the memories of the pile-ups, the rudeness, and the bad operating faded away. That QSL card, in hand, was suddenly worth a few bucks, and most of us would gladly do it again.

The two cynics I overheard are certainly not alone. Amateur radio has a number of them. However, I'm glad to say that we also have a goodly number of optimists. Without the optimists we wouldn't have any of the new and yet-to-come technologies that the rest of us enjoy and look forward to. As you look through this issue and read the articles and examine the advertising, keep in mind that optimism created it all.

People write articles generally because they have found a solution to a problem and they would like to share it, or they have come up with something new that perhaps might be of benefit and can be built upon.

The people who advertise with us all believe that they truly offer a beneficial product we can utilize and enjoy. All in all, a lot of work and effort goes into writing articles, manufacturing products, selling products and providing services, and yes, even producing monthly amateur radio magazines. All of it is optimistic, for we all feel that something good is coming from this effort. Part of that good is the ability to earn a living or to augment our

income out of what we do.

The above group of optimists share the common trait of being visible. We all know who they are either individually or by company name. Even the rare DX station who justifiably asks for return postage (to do with as he chooses) is known to us and the cynics. However, there is another group of optimists out there whom most of us never get to meet.

There are the optimists among us who dream and push the edges of technology out farther and farther. For the most part, we never know who they are or, even if we thought about it, how to thank them. These unrecognized creators of technology go unnoticed and unnamed by those of us who seize upon the new technology and use it as if it has always existed for our benefit. I don't know most of their names either, but I guess I can offer a collective thank you from all of us.

We look at the articles and ads in this issue and probably never stop to think of the individual or individuals who came up with the ideas for the technology. We accept the multi-featured modern transceiver or the multi-mode TNC as a given. Both use technology that probably wasn't around ten years ago, and in some cases five years ago. We find it hard enough to try to utilize and understand these features. Imagine having to devise and engineer them in the first place.

Perhaps somewhere down the line some manufacturer, for example, will put a page in the operating manual stating that the following people helped to create the product that you are about to use and enjoy. If necessary, it could even be amended to include a statement that the original work in this field was done by whomever. Somehow in our rush to consume technology we lose an appreciation of that technology and what it took to create it.

In amateur radio we zip through the overwhelming complexity of modern gear and really give no thought to how it was created. The cynics will examine the latest ultimate (for now) transceiver and slough it off, stating that *if* they were going to buy one, they would wait for the B Model. If and when there was a B Model, they would wait for a C Model.

Let's face it. The cynics of our hobby produce nothing but aggravation for themselves and occasionally for others. A lot of optimists helped to create this issue for you to enjoy. The technology that you are about to read and examine in our ads is exciting, but in the course of things

it will be a source of amusement in 20 years. However, the time is now, and there is a tremendous amount of amateur radio technology that is *here* right now, devised by fellow amateurs for us to enjoy, learn from, and, for a few, to be afraid of.

It's November, and Christmas is only a month away. If you haven't started your shopping or haven't left your "Wish List" around by now, shame on you. This month's issue might trigger some new items for your "Wish List" and give you a few new areas of amateur radio expression to think about.

We've worked Buck Rogers, K4ABT, pretty hard in this issue as you can tell by checking the table of contents. Buck has come up with some new twists to packet radio and some reports on where packet is heading. If you've been putting off trying AMTOR, check Bill Henry, K9GWT's article "AMTOR For Beginners" and get in on what's happening there.

Now we can't forget amateur radio's cynics this holiday season either. For those who think everything is too much money and people should build their own rigs exclusively, we are working on a special deal for them (or you). First, for a modest sum, a carton containing 3,894 discrete components plus 11 pounds of assorted hardware will be made available. For larger metal pieces or similar fabrication, a time-sharing allotment has been arranged with several mines and smelting and forging plants. For another slight fee a list of where to buy, lease, or rent test and programming equipment will be provided. Oh, this isn't a kit. A kit implies plans and how-to information. This package contains some blank paper and a few pencils so you can roll your own. After all, real hams can do these things.

For the rest of us who are trying to enjoy amateur radio and have some fun with it, there's still a sense of amazement and awe connected with some of these new "toys." No, I can't design or build most of it, but then again I can't build a car either. I can and do appreciate the people who can do those things, and I can spend some time trying to learn about what's new. Still, to me the most curious aspect of new technology is what went on in the mind of the first person to think of it. It's seeing or imagining something that didn't exist before and then figuring out a way to do it, all without a frame of reference.

73, Alan, K2EEK

# KEEP YOUR COOL

## with AEA's NEW LA-30 HF Linear Amplifier

### WHAT DO HAMS EXPECT WHEN THEY SEE THE AEA NAME ON A PRODUCT?

#### Quality and Value.

They expect mechanical and electrical integrity.

They expect the best possible physical construction. They expect a product that will look and perform as advertised for years to come.

They expect the support they need, before, during and after the sale.

They don't expect promises that can't or won't be delivered.

They don't expect the frustration that comes from products that don't perform as advertised, or technical support that's less than supportive.

They don't expect to spend their hard-earned money, just to lose their cool.

#### THE LA-30 DELIVERS!

The LA-30 HF Linear Amplifier delivers what hams expect from AEA.

Designed to provide reliable, stable, high RF output power, the LA-30 is equipped with a pressurized plenum and chimney cooling system to ensure extended periods of continuous use and longer tube life. We use a low-noise "squirrel-cage" blower that moves 30 cubic feet of air per minute past the tube and its base seal to help the LA-30 keep its cool. Others use computer type "muffin" blowers that don't cool the tube seals, and therefore shorten tube life.

Have you priced RF power tubes lately? They're not cheap. And when one goes out before you expect, you're bound to lose your cool.

#### QUALITY

We install parts that are designed to last, rather than cutting corners to reduce costs.



You won't find any shortcuts in our amplifiers. The LA-30 is the latest in a long line of high quality AEA products, going back over 12 years.

All aluminum parts are "alodized" to keep your LA-30 looking new. Alodizing is an expensive priming process that improves the metal's appearance and helps protect against scratching and corrosion. Make sure the amplifier you choose has alodized aluminum to keep it looking new for years to come.

We could cut manufacturing costs in other ways—such as using cheaper "self-tapping" screws and lower-quality aluminum—but then the unit just wouldn't meet our standards. Remember, only AEA amplifiers are built with AEA quality.

#### EASY TO USE.

With the LA-30's patent-pending cross-needle tuning bar meter system, we've eliminated the guesswork. You always know at a glance if the LA-30 is in tune. One dual-movement meter measures both plate and grid current simultaneously, which are both crucial to proper operation and extended tube life. The front panel controls are logically arranged and are marked with clear, easy-to-read markings and scales.

#### KEEP YOUR COOL!

Don't be fooled into buying an imitation when you can own an AEA. This compact self-contained tabletop unit will provide you with years of excellent performance. The LA-30 Linear Amplifier is the best HF

amplifier value on the market today, because of AEA.

### Engineering Makes the Difference!

#### SPECIFICATIONS:

<b>Freq. Range</b>	Amateur Bands 160-10 meters*
<b>RF Input Power</b>	SSB 1.2 KW P.E.P. CW/RTTY/AM/FM/ SSTV 1.0 KW
<b>Power Tube</b>	3-500Z zero-bias triode
<b>Supply Voltage</b>	110 VAC
<b>Dimensions</b>	14"W x 7½"H x 16½"D (36 x 19 x 42 cm)
<b>Weight</b>	35 lbs. (15.9 Kg.)

QSK modification available.

\* 10 meter mod. requires amateur license.



Advanced Electronic Applications, Inc.

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# ALINCO ELECTRONICS INC.



## DR-590T (NEW)

### VHF/UHF Twin Band Mobile

144-147. 995Mhz(RX137—173. 995Mhz)  
440-449. 995Mhz(RX410—469. 995Mhz)

45W Hi, 10W Mid., 5W Low on VHF

35W Hi, 8W Mid., 5W Low on UHF

Cross Band Repeater Function Simultaneous Receiving and Scanning on both Band

Front Control Panel is detachable. Remote Control will be available (Option)

MARS and CAP Modifiable (permit required)



## DR-570T

### Set your sights for dual!

The Alinco DR-570T "Twin Bander" has dual LCD readout, volume, squelch and tuning controls. Double barreled power with 45W on 2M and 35W on 70 cm, plus simultaneous receive on both bands or intermix with four modes of scan. The DR-570T will win the "battle" with its illuminated front function panel and LCD readout, readable in any lighting conditions. Don't let the "Tiny" DR-570T fool you! It's fast, and leaves the competition in the dust with many standard features you expect. Cross band-repeat with the flick of a switch. Full duplex, 20 memory channels, call channels, 16-key DTMF Microphone, and subtones are just a few. "Reach" for the DR-570T today!

## DR-110T & DR-410T

### Tiny 2M Power From Alinco!

DR-110T, this 2M Alinco, enters the nineties a proven winner with the "reputation" of best value. The DR-110T packs a powerful 45W on 2M and sports all the features you expect in today's transceivers. Tuning is a snap with the multi-functioned easy-to-see keyboard, 14 memory channels, subtones, scan, multi-colored LCD readout, reverse, are a few of the many features of the DR-110T. The mobile of the future-today! DR-410T available for 70 cm.



## DR-510T

### Best Dual Value on the Market!

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### Full Featured 2M Power Pack

The DR-112T is a "True FM" full-power (45 watts) transceiver. The backlit LCD display is ideal for bright or dim lit conditions. And, as with most Alinco products, the control panel is engineered to be "User friendly" and still offer a full range of features.







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## DJ-100T & DJ-120T & DJ-200T

Best 2M Micro Value

The Alinco DJ-100T/DJ-120T is "Magnificent" for its tiny size, but stands up to the competition with power and capability. 10 memory channels store offsets and subtones. Has LCD readout with call channels and reverse at your fingertips. 500 mah battery with direct DC to DC is standard. 3W on standard battery, 6W on optional battery leaves the competition in the dust! DJ-200T for 220 Mhz.

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2M H/T is here! And wow!

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# ANNOUNCEMENTS

• **N3EKX from Washington, DC** - HAM-VETS will operate N3EKX near the Vietnam Veterans Memorial in Washington, DC on Nov. 10 and 11 to commemorate Veterans Day. Operation will be on 20, 40, and 75 meters in the General portion of bands. For QSL send QSL and SASE to K9ICF, 13300 Wye Oak Drive, Darnestown, MD 20878.

• **WB3L from Pittsburgh, Pennsylvania** - WB3L will operate on Nov. 10-11 to commemorate "Light Up Night at the Point" from 1300-2400Z on 7.240, 14.240, 21.340, and 28.340. For QSL send your QSL and SASE to ARS WB3L, 3444 Bench Drive, Pittsburgh, PA 15236.

• **AB4TT from Clinton, North Carolina** - The Sampson County ARS will operate AB4TT on Nov. 8 from 1700-2400Z for the Sampson County Expo and Pork Festival. Operation in lower portion of General bands plus 10 meters, 28.100-28.500. QSL via SCARS, P.O. Box 64, Clinton, NC 28328.

• **K4AIF from Brevard, North Carolina** - The Transylvania County ARC will operate K4AIF to celebrate Halloween from the Devil's Courthouse in Transylvania County. Operation from 2100Z Oct. 31 to 0200Z Nov. 1 on 3.860, 14.295, 50.150, all SSB and 146.52 (FM simplex). For certificate send SASE (legal size or 9 x 12) to K4AIF, Dick Gustafson, 302 Wilson Drive, Brevard, NC 28712.

• **W4IAX from Dauphin Island, Alabama** - W4IAX will be "Live from the Island," Dauphin Island, from 1300Z Nov. 17 to 0000Z Nov. 18 on 3925, 7225, 14225, 21325, and 28325 MHz. QSL with business-size SASE and \$1.00 for certificate to W4IAX, Mobile ARC, P.O. Box 9315, Mobile, AL 36691.

• **W4MM from Calvary, Georgia** - The Albany ARC will operate W4MM from the 18th Mule Day Festival on Nov. 3 from 1300-2000Z on 28.383, 14.320, 7.260, and 3.975. For certificate send SASE to AARC, P.O. Box 70601, Albany, GA 31707-0011.

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

Nov. 3-4, **Ham Radio & Computer Expo 1990**, Gwinnett County Fairgrounds, Lawrenceville, GA. Contact Alford Memorial Radio Club, P.O. Box 3100, Lithonia, GA 30058.

Nov. 4, **Fox Cities ARC Hamfest**, Starlite Club, Kaukauna, WI. Contact Don Baker, 621 W. Seventh St., Ksukauna, WI 54130 (414-766-3886). (Testing at 9 AM)

Nov. 10, **New England DX Convention**, Sheraton Tara, Framingham, MA. Contact Joe Green, K2VUI, 8 Wedgewood Rd., Wellesley, MA 02181 (617-239-1370).

Nov. 10, **"6.91 Friendly Fest,"** Serb

Hall, Milwaukee, WI. Contact The Milwaukee Repeater Club, P.O. Box 2123, Milwaukee, WI 53201 (SASE). (Exams)

Nov. 10, **Twin Cities Hamfest**, West Monroe Convention Center, West Monroe, Louisiana. Contact Benson Scott, AE5V, 745 40 Oaks Farm Rd., West Monroe, LA 71291-9432 (318-323-3478). (Handicapped facilities; VE exams)

Nov. 11, **Shore Area Ham Radio & Computer Clubs Hamfest**, Allaire Expo Center, Allaire, NJ. Contact Al Jackson, NK2O, P.O. Box 635, Eatontown, NJ 07724 (201-922-8121). (VE exams)

Nov. 11, **SCARA Ham Radio & Computer Fleamarket**, North Haven Park and Recreation Center, North Haven, CT. Contact SCARA Fleamarket, P.O. Box 81, North Haven, CT 06473 (SASE), or call Brad at 203-265-6478 from 7 to 9 PM.

Nov. 11, **Massillon ARC Auctionfest '90**, Massillon K of C Hall, Massillon, OH. Contact MARC, P.O. Box 73, Massillon, OH 44648 (SASE).

Nov. 17-18, **18th Annual Ft. Wayne, Indiana Hamfest**, Allen County War Memorial Coliseum Exposition Center, Ft. Wayne, IN. Contact ACARTS, P.O. Box 10342, Ft. Wayne, IN 46851 (SASE), or call 219-693-3766 (evenings). (VE exams)

Nov. 17-18, **1990 ARRL Suncoast Convention**, Curtis Hixon Convention Center, Tampa, FL. Contact Jean Endicott, KC4KZU, 813-525-5178. (Exams)

Nov. 18, **Tri-State Hamfest & Computer Fair**, The Meadows Racetrack, south of Pittsburgh, PA. Contact Walt Piroth, N3BKW, PBBS N3BKW KA3MZS, (D) 412-258-5353; or WACOM, P.O. Box 1386, Washington, PA 15301. (VE exams)

Nov. 24, **Montgomery, Alabama Hamfest**, Garrett Coliseum, South Alabama State Fairgrounds, Montgomery, AL. Contact Hamfest Committee, c/o 2141 Edinburgh Drive, Montgomery, AL 36116, or call Phil at 205-272-7980 (after 5 PM CST). (Exams)

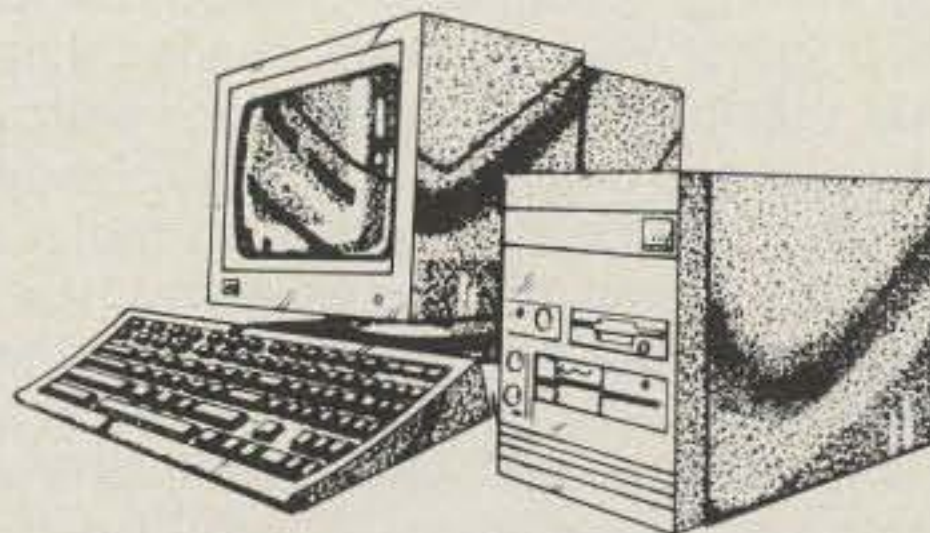
Dec. 3-9, **Africa Telecom 90**, Harare International Conference Centre, Harare, Zimbabwe. Organized by the ITU and Posts and Telecommunications Corp. of Zimbabwe, the event will be an exhibition and special session of the World Telecommunication Forum. For more information, contact Posts and Telecommunications Corp., P.O. Box 8061, Causeway, Harare, Zimbabwe (telephone + 263 4 728811; FAX + 263 4 731989).

**Corrections Department:** Please note that the author of "A Remote Base Controller for the ICOM 2AT" in the September issue has moved. Ron DeSilva, NU6F's new address is P.O. Box 9216, Auburn, CA 96504.

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CIRCLE 15 ON READER SERVICE CARD

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**"A rose is a rose is a rose," said Gertrude Stein many years ago. However, as K4ABT points out in this special "Packet User's Notebook" column, a rose can be so much more.**

# ROSEs are Red and Beautiful

BY BUCK ROGERS\*, K4ABT

The very thought of a rose brings thoughts of a silky, smooth cluster of petals that presents the observer with a bouquet and beauty that can only be described by one's own optical and fragrance-sensing palettes. In some distant past there was a meaningful cliché that went something like this: "Beauty is in the eyes of the beholder." Well, here in this month's special column we are going to discuss that very truism: The Beauty of the "ROSE."

## What is a "ROSE" Packet Switch?

The ROSE switch is the first amateur

\*506 Pheasant Ridge Drive, Warner Robins, GA 31088

packet networking program that uses the International Standard protocol for packet networks—CCITT X.25. The program is meant to be installed in place of the EPROM found in a TNC-2 (or clone) packet controller. It easily replaces TheNet and Net/Rom systems. It provides greater throughput with less overhead and less node updating garbage. Without deliberating, we'll use the list of features from the ROSE documentation:

ROSE X.25 packet switch offers the following features.

- Hop-by-Hop Acknowledgments between Switches—provides reliability and higher throughput.
- On-line Information—Information/Help SYSPO text supplied.
- FCC and foreign PTT acceptable AX.25 Level 2 SOURCE and DESTINATION Identification—the callsigns of both

the station of origination and termination appear at each end of the connection.

- Proper Transmitter Licensee Identification—switch always identifies its transmissions with its own callsign, not the callsign of any user. Callsigns traverse the network without adding any extra SSID or other changes.

- Backbone is Fully Transparent to Users—can add or remove switches in the backbone, change callsigns, bands/frequencies without having to inform users or modify BBS forwarding files.

- True Implicit Addressing—only need to know the address of the desired exit point of the network, not all the intermediate steps.

- Network Determined Routing—network manager determines best path, eliminating need for broadcasting of routing information to other switches.

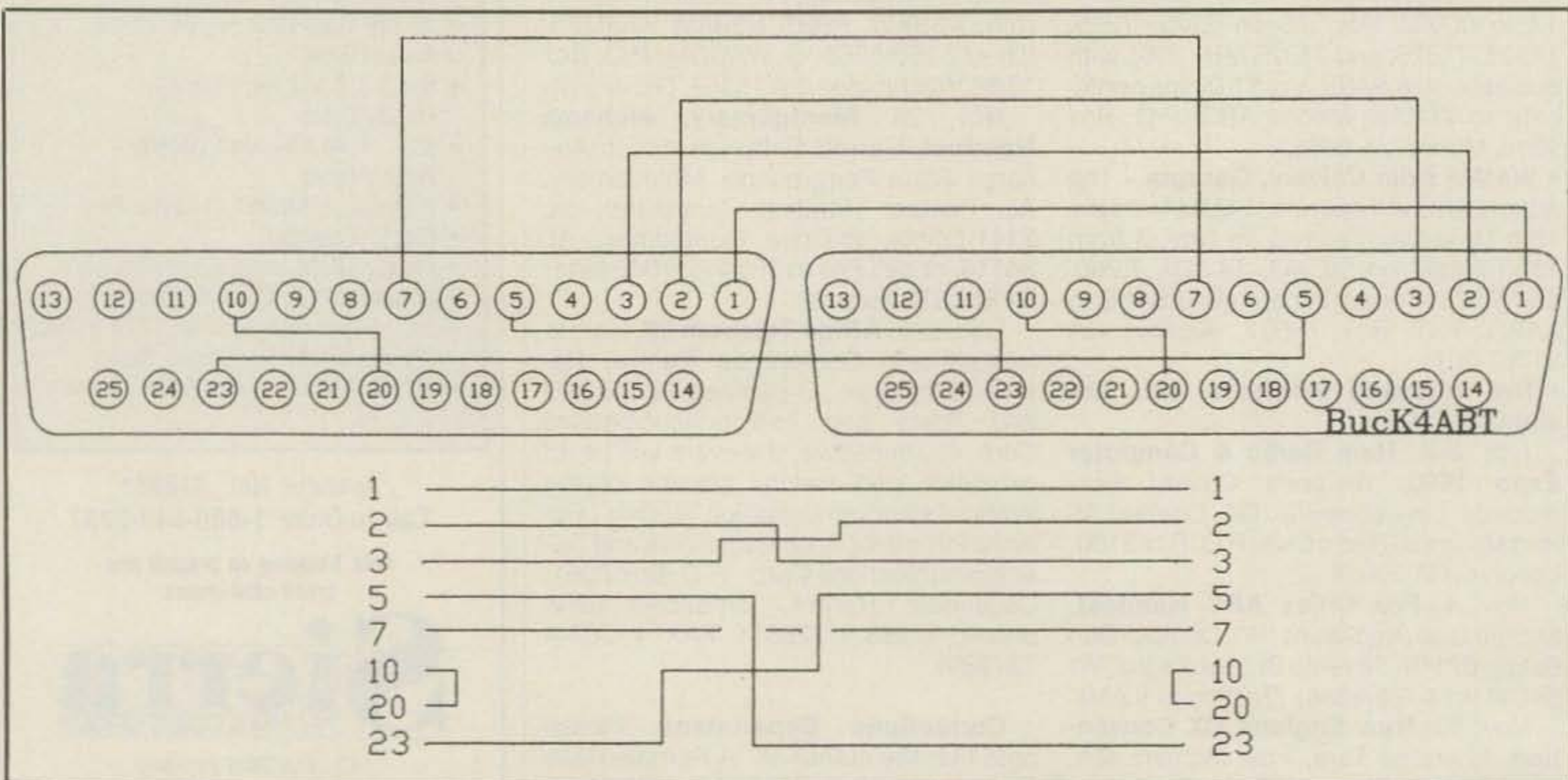


Fig. 1—RS232 interface cable/connectors used to interconnect two ROSE switches for the purpose of "gateway" between two different frequencies, or from 1200 to 2400 bps and vice versa. Note the transition of pins 2 to 3 and 3 to 2. Also notice that pins 5 and 23 are "transitioned."

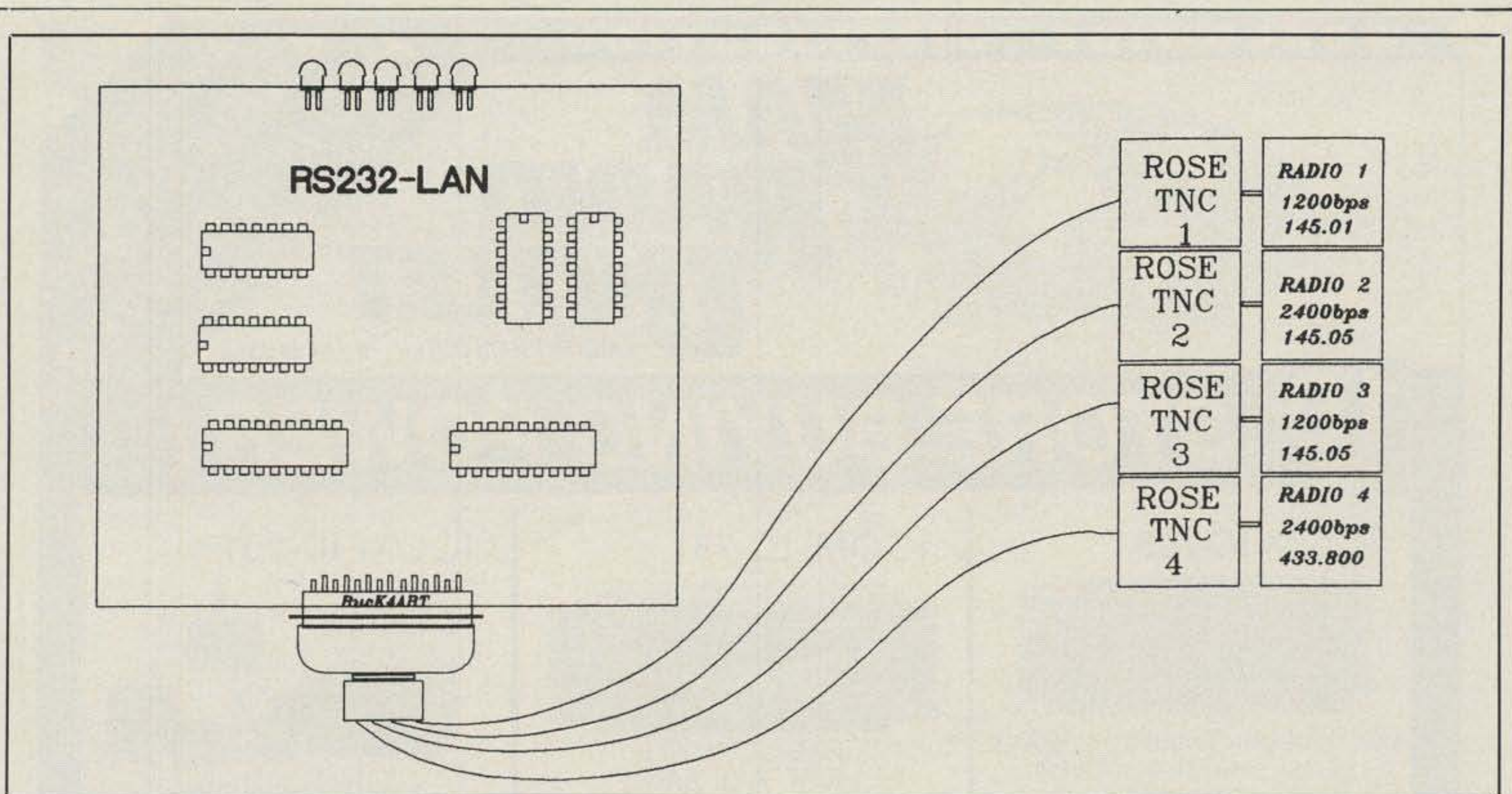


Fig. 2- If your "bouquet" of ROSES is in a cluster of more than two switches, then you will need to use the "RS232-LAN" (see text). The switches can "gateway" to each other in any manner you choose. Configuration is the option of the network manager.

- Dynamic Route Selection—network will automatically attempt alternative paths to remote switches, based on information the network manager provides.

- Predetermined Network Paths—network manager tells each switch which paths to use, will not attempt impossible links because another switch was heard during a band opening.

- Support for Emergency Operations—a switch can be added to the network to provide service from the afflicted area without modifications to the existing network.

- Security System for Remote Control—authentication of user who requests to view or modify configuration.

- The ROSE X.25 packet switch runs on any TNC-2 clone or compatible TNC. Some of the TNCs that are used in our system are the MFJ-1270B, MFJ-1274, MFJ-1270T (with turbo, 2400 bps), PacComm TNC200, PacComm Tiny-2, PacComm MicroPower, and Pac-Comm Dual Port DR-200.

- Full Radio Support on Asynchronous Port—the asynchronous port of a TNC can be attached to a 202, or any other modem with an RS-232 interface and radio, providing a dual port system. The second port is AX.25 using the Asynchronous Framing Technique (AFT) that was proposed by Toby Nixon of Hayes, which is pending CCITT adoption as the accepted method for sending X.25 over asynchronous links.

- Multi-Synchronous Ports using TNCs—since the asynchronous port has full radio support, it also can support one

or more switches via a special (commonly available) RS-232 cable.

- Complete Remote Configuration—all configuration is done over the air; many parameters can also be burned into the EPROM.

- Battery Backed-up Configuration—all routing information is retained when the power is removed. No need for manual intervention when power is restored.

## Background

A few years ago an organization called the Radio Amateur Telecommunications Society (RATS) was formed. Within this organization there is a young man who stands tall among the greatest software writers. In addition, he is well studied in the field of telephony and packet switching systems. His name is Tom Moulton, W2VY. Tom wrote and developed a networking matrix with a different twist and named it in a manner that commemorated "RATS." He called it "RATS Open Systems Environment." Thus, we have the foundation from which the ROSE began. From this point on I'll refer to the "RATS Open System Environment" as the ROSE.

I picked up some information about ROSE technology from some other packet enthusiasts at the Dayton Hamvention two years ago. Having read the documentation that I received at Dayton, my interest was more than just keen. It was razor-sharp. I could not rest until I had talked with the author of this system.

There was no doubt about it. W2VY had developed something good and it was time to let the rest of the packet radio and digital communications world experience it. I gave Tom a call.

## The True Meaning Of "Multi-Tasking"

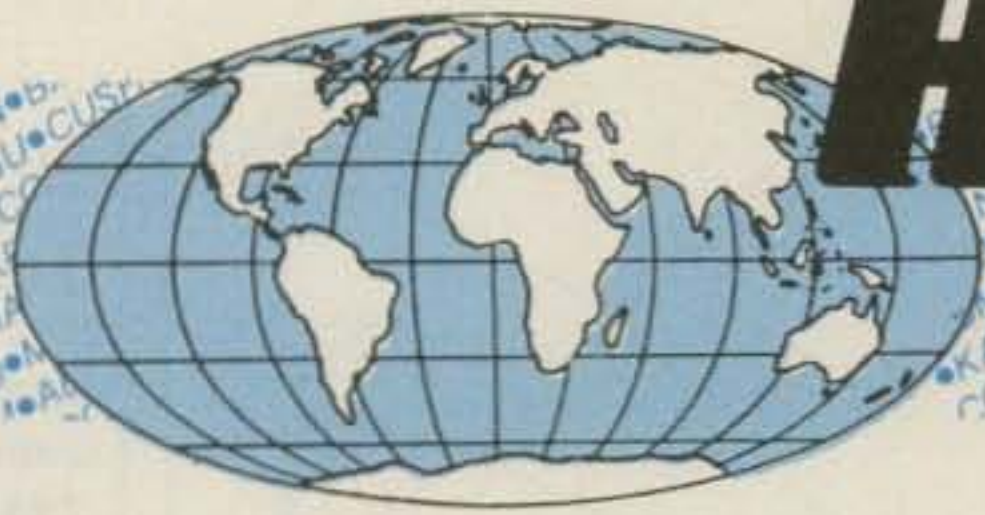
The task of installing a new topology into a packet network can be monumental. However, the end results can often be worth the effort many times over. I've spent many months studying this networking scheme developed by W2VY. I first wrote about the ROSE in the "Packet User's Notebook" a little over a year ago. At that writing I mentioned, "Here could be a far better network format, and a possible alternative to the nodes that a lot of folks have been bickering about."

Between the time I first introduced the readers of CQ to the ROSE and the present, the author has built more features into the ROSE code. A big improvement is also noted in some needed SYSOP functions.

In an open-minded effort to give this new version of ROSE my best shot, I set up two ROSE switches to make some tests. They worked, and they worked so well that I added a third switch to the system. This was some kind of evolution, for it was not long before there were 23 ROSE switches in use throughout the state of Georgia on 145.05 MHz. We are presently running version 900713.

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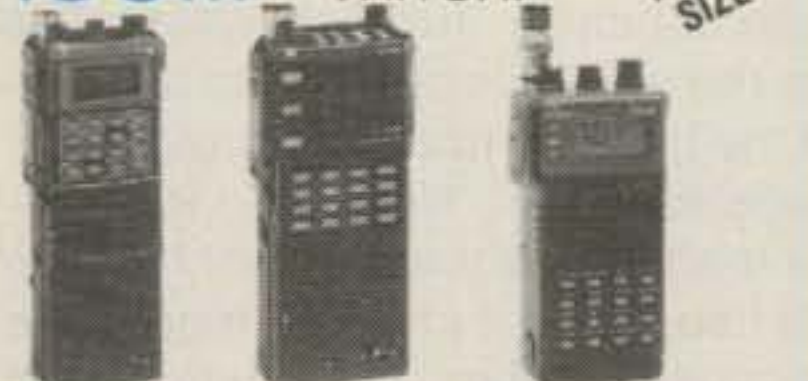
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## GARDS ROSE Network

Callsign	Address	Location	User Freq/Speed
W4MM-4	912888	Albany, GA	145.05 MHz 2400 bps
W4MM-5	912883	Albany, GA	145.05 MHz/1200 bps
KS4C-4	404834	Bowdon, GA	145.05 MHz/2400 bps
KS4C-5	404832	Bowdon, GA	145.05 MHz/1200 bps
K4ICT-5	912781	Macon, GA	145.05 MHz/1200 bps
K4ABT-4	912744	Macon, GA	145.05 MHz/2400 bps
N4IGI-5	912452	Milledgeville, GA	145.05 MHz/1200 bps
K4ABT-6	912987	Perry, GA	145.05 MHz/2400 bps
K4ABT-7	912929	Perry, GA	145.05 MHz/1200 bps
K4ABT-8	912868	China Hill/MacRae, GA	145.05 MHz/2400 bps
K4ICT-8	912833	Jacksonville, GA	145.05 MHz/1200 bps
K4ICT-7	912934	Cochran, GA	145.05 MHz/1200 bps
K4ABT-5	912836	Knoxville, GA	145.05 MHz/2400 bps
K4ICT-1	912745	Macon, GA	145.01 MHz/1200 bps
WA4PQK-4	404461	Fayetteville, GA	145.05 MHz/2400 bps
WA4PQK-5	404460	Fayetteville, GA	145.05 MHz/1200 bps
K4ABT-3	404892	ATLANTA link at	433.8 MHz/2400 bps
KF4ZB-5	912863	Sylvania, GA	145.05 MHz/1200 bps
KB4ACE-5	912272	Dublin, GA	145.05 MHz/1200 bps
N5BCH-4	912245	Valdosta, GA	145.05 MHz/2400 bps
N5BCH-5	912244	Valdosta, GA	145.05 MHz/1200 bps

Table 1— This is GARDS (Georgia Amateur Radio Digital System) ROSE switch KS4C-4,404834 145.05 MHz 400 bps co-located with KS4C-5,404832 at Carrollton, Georgia. SYSOP is Ray.

### Southnet Rekindles The Urge

Tom was the featured speaker at the Southnet Packet Conference in Albany, Georgia (see September 1990 "Packet User's Notebook"). There was a large gathering of SYSOPs and packeteers all ready to hear his address when he was finally introduced. For some reason he had chosen the ROSE as the topic for his forum. After his forum, I had an opportunity to chat with Tom and discuss some of his future plans for the ROSE.

### The Future is Now

By mid-August he had completed the implementation of the HEARD, INFO, USERS, and some other SYSOP-related functions into the ROSE. At the Jacksonville Hamfest Bob Grant, WD4BIW, told me there was a new version of ROSE for me that would be in my hands the following day. He said the new features were installed, and there was "security" now included. Thanks to Tom and Bob, the ROSE is now in full swing in many parts of the United States and the Caribbean. Many HF users are beginning to see ROSE addresses appearing from other countries.

ROSE is ready, and Tom has enhanced the features beyond the scope that anyone had expected. Without becoming overly excited when I speak about the ROSE, I can only say that this is by far the easiest and most exciting method of packet communicating I've experienced.

Following are explanations of two features of the ROSE.

**HEARD:** This provides the users with a tool to connect to a distant LAN ROSE switch and request a list of all the users of that area that have been active in the last few hours. This gives us a vehicle to discover who is operating packet beyond the horizon. Once you have connected to HEARD at the distant switch, the user presses <enter> a second time, and the HEARD list is initialized. A USER list will be sent to your station with information for the distant ROSE LAN. For a shortened version of the HEARD list, I recommend sending an asterisk (\*) instead of the second <enter>. The display which you receive will be from the most recent heard stations to the oldest heard. The list covers approximately three hours of time. The time may vary in accordance with the amount of switch use.

It would be to everyone's benefit if we refrain from downloading HEARD lists during "high-traffic" periods. Remember, there may be heavy traffic at the other end of the HEARD path. This can become a very useful feature if we don't abuse it.

Here is an example of how I would download a HEARD list of a 2400 bps ROSE at Albany, Georgia (about 100 miles) from the local Macon, Georgia ROSE switch:

(Using 2400 bps):

C HEARD V K4ABT-4,912888 <enter>

After I receive the message "CALL COMPLETED" I send an asterisk \*.

(Using 1200 bps):

C HEARD V K4ICT-5,912883 <enter>

After I receive the message "CALL COMPLETED" I send an asterisk \*.

**INFO:** The same scenario applies to the INFO command when connecting to a distant switch. As a convenience, I place a DIRECTORY into the INFO of each switch that will display all the ROSE switches that are available throughout Georgia. The list will be the same at all locations, since the network is state wide, so pulling an INFO list from a distant switch will render the same INFO as that of a local ROSE switch.

Table 1 is an INFO download from the Carrollton/Bowdon, Georgia switch. Here is an example of how we would download INFO from KS4C-4,404834:

(Using 2400 bps):

C INFO V K4ABT-5,404834

(Using 1200 bps):

C INFO V K4ICT-5,404834

### The ROSE Blooms To Perfection

The ROSE Version 900713 has given me an abundance of reasons for implementing the ROSE on the Georgia Amateur Radio Digital System's (GARDS) network of 23 switches. The ROSE switching system makes packet connecting as easy as making a telephone call!

Hold it! What was that last statement? As easy as making a telephone call! Well, alright, maybe a "long-distance" call. Once this LAN is linked to the Florida system at Tallahassee, a link will soon be added to link into Tampa. At this point and maybe as you read this column, I will simply call Tom's QTH with the following entry (no more, no less).

C W2VY V K4ABT-6,813989

That's it—no more, no less. In about one second the local switch returns "Call being set up," and in a very short time I'm greeted with "CALL COMPLETE TO W2VY."

We are ready to QSO, or as it sometime happens, I'll leave a message in his HandiPacket mailbox.

I'm not going to print the SYSOP or user's manual. That is something you will receive when you send the formatted 360K disk and a return SASE mailer to Tom Moulton, W2VY, 4812 East Busch Blvd. #7, Tampa, FL 33617-4066.

To make matters even easier, try downloading it from the "HAM" section of your favorite landline BBS. The manual is being revised to reflect many of the new features and instructions that make the configuration of the ROSE switch a breeze.



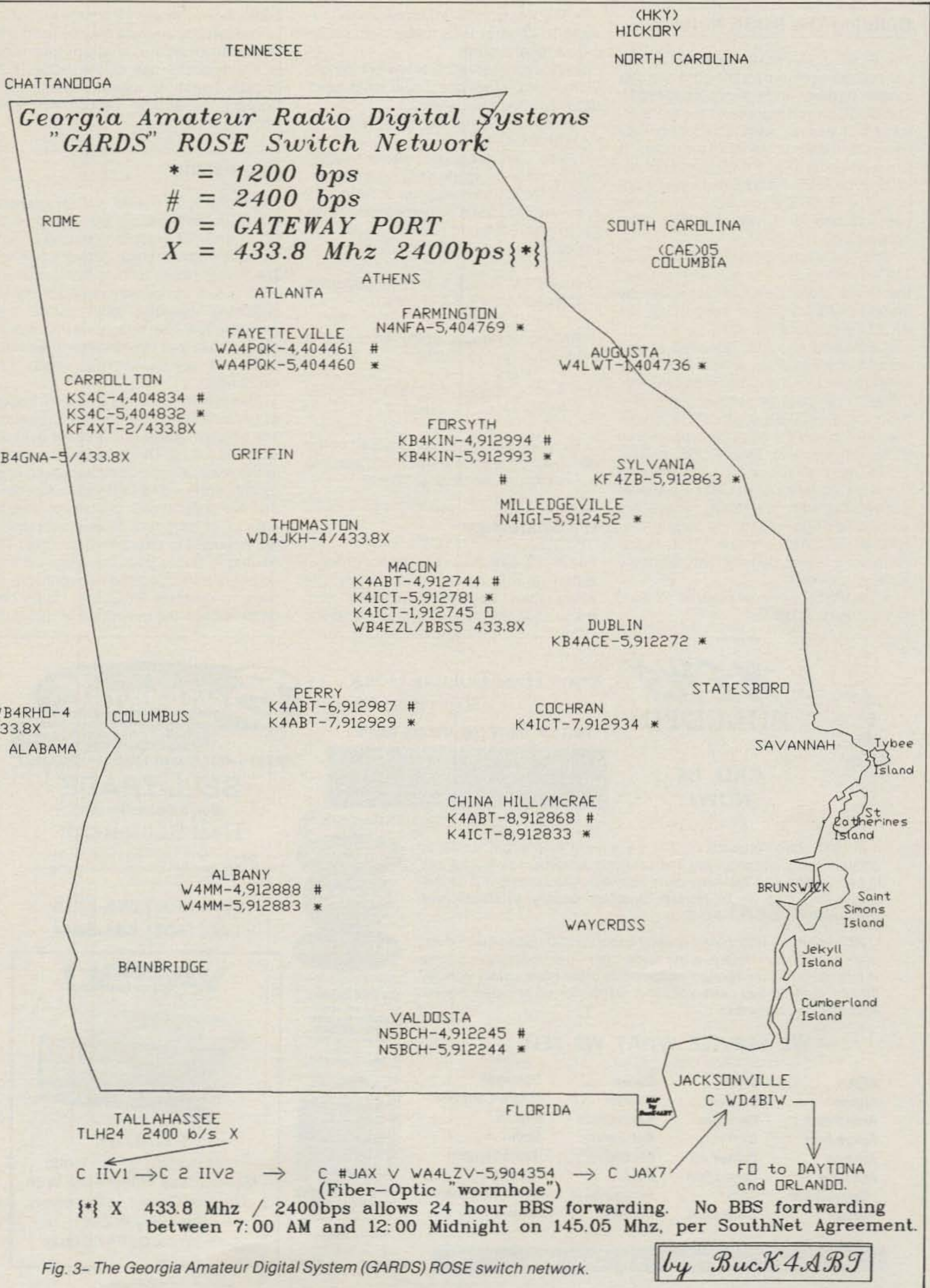


Fig. 3- The Georgia Amateur Digital System (GARDS) ROSE switch network.

## Building The ROSE Network

The ROSE X.25 packet switch is an advanced replacement for the common digipeater or other node switching EPROM. The ROSE switch represents the state-of-the-art in packet switching technology using international standard protocols. It is based on the CCITT X.25 Network Layer, and the ARRL AX.25 Link Layer Protocols. The ROSE X.25 packet switch is the best solution for amateur packet radio networking.

With the exception of the Kantronics TNCs running 2.85 or earlier firmware, the ROSE switch can be accessed by standard AX.25 TNCs supporting the AX.25 Link Layer Protocol.

Kantronics has just released a new version 3.0 firmware which has many new features for the Kantronics TNC line. While building a large number of new features into this new version 3.0 firmware, they also cured the bug which prevented a normal connect to a ROSE switch. Don't feel that you are buying the new firmware update just to clear a problem connecting with the ROSE. There are some meaningful reasons to update your KAM or KPC to the version 3.0 firmware. Here are a few of the new features of the Kantronics V 3.0:

- The PBBS will now reverse forward to the standard BBSes.

- The Kantronics 3.0 firmware will re-route to another BBS if you wish to bypass a local system.

- Beacon intervals are now in 1 minute increments. (*This one could have been dropped altogether.*—ed.)

- Software Carrier Detect added to the KAM and KPC-4.

If you wish to connect into the ROSE system while using the KAM or other Kantronics TNCs with the earlier version 2.85 firmware, you must remember to use an "i" in place of a one (1) and use the "o" instead of a zero (0). For example:

C K4ABT V K4ICT-5,912744 becomes  
C K4ABT V K4ICT-5,9i2744

Another example using an address field with a zero (0) in it is:

C KS4C V K4ABT-4,404834 becomes  
C KS4C V K4ABT-4,4o4834

By using the "i" or "o" instead of the one or zero the KAM will perform well and will not return the familiar "EH?"

## It's Shareware

The ROSE switch is a shareware product within the amateur radio community. The executable firmware is available from many sources, including many land-line

BBSs, as well directly from the author.

The switch firmware may be used free of charge for amateur radio purposes only. Commercial use of the ROSE X.25 packet switch is expressly forbidden. Contact the author for commercial licensing information.

## Addressing

The ROSE X.25 packet switch supports the global addressing plan adopted by CCITT and ISO. This plan includes a country code and a national network number. The ROSE switch follows the numbering plan in use in the national X.25 packet switching network; most packet networks follow the telephone numbering plan used in that country. North America uses the telephone area code and exchange.

This system will allow a user to request a connection with another station without any concern given to the exact path the data will follow. This is in sharp contrast to the explicitly specified approach used by digipeaters. The motivation for this is that the general user population doesn't care to, or have time to, keep abreast of the networking changes over time. The routing is under your complete control, so users can't clog the network with retries on obsolete RF paths. Users only need to know the network address of the



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destination, which is like a telephone number.

The ROSE switch may be configured with several paths to remote area codes or countries. Each of the specified links will be tried in the order it was specified to find an operational route.

### Improvements Over The Other Network Protocols

This is an improvement over several existing amateur systems which can only provide destination routing to switches known by the source switch.

These next few lines are for the SYSOP who builds the first ROSE system in his area. Please remember this old adage: "Humans are creatures of habit, and they resent change." I encountered nothing short of "the wrath" when I began implementing the ROSE network into the GARDS system. I hope your hide is as tough as mine. I was even called late at night with protests and names (other than Buck). In less than three weeks after the ROSE was in place, I was being praised as the guru of all packetdom (Tom Moulton, I bequeath that turban to you).

### The User Has The Ease of It All

Now that the users have discovered how easy it is to use and how much the throughput has improved, I really would have trouble if I tried to remove or take away the ROSE.

One of the first things you'll notice when using ROSE for the first time is how you stay connected over the long hauls. This is part of the "Virtual Circuit" aspect of the ROSE. You may find yourself momentarily disconnected, then suddenly you are reconnected. This is one feature of which I was not aware until I found that the ROSE would reestablish a "dropped" link via the alternate routes without any help from me. Many times the re-direct or automatic re-connect will go totally unnoticed by the users.

### True, RS232

Different from the other nodes that we are accustomed to, the ROSE switch uses "true" RS232 for communications between switches. If your system uses two switches for a gateway from 1200 to 2400 bps, or if it gateways from one frequency to another, then use the RS232 cable configuration shown in fig. 1. If your ROSEs are in a bouquet of more than two switches, such as a cluster of gateways and cross-links, then you will need the "RS232 LAN." The difference in building the gateways and bridges is in the manner in which we let them talk to each other. The nodes use a complex of di-

odes in a matrix that makes the builder "Kathode-Krazy" by the time he has tied four nodes together. In turn, the ROSE uses true RS232 through an electronic switching device called the "RS232 LAN."

This device can be fabricated by the switch SYSOP using the bare PC board from PacComm. Of course you can do as I've done, and call PacComm at 1-800-223-3511 and ask Linda to ship the "wired-and-tested" version via next day air. (We needed it fast.) The RS232 LAN can be ordered three ways: bare PC

board for \$25; complete kit (less case) for \$60; or wired and tested for \$75.

I opted for wired and tested for the three-way, gateway system shown in fig. 2, because we needed it fast. Lightning had destroyed our 145.01 MHz network "node" port, so what better time to add the ROSE. I'll go for the kit for future additions, since I now have a pattern to use as reference. LAN SYSOPs operate on a very limited budget—Hi!

Stop and smell the ROSEs!

73, de Buck4ABT

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# CQ REVIEWS:

## The GenWest Engineering Voicebox

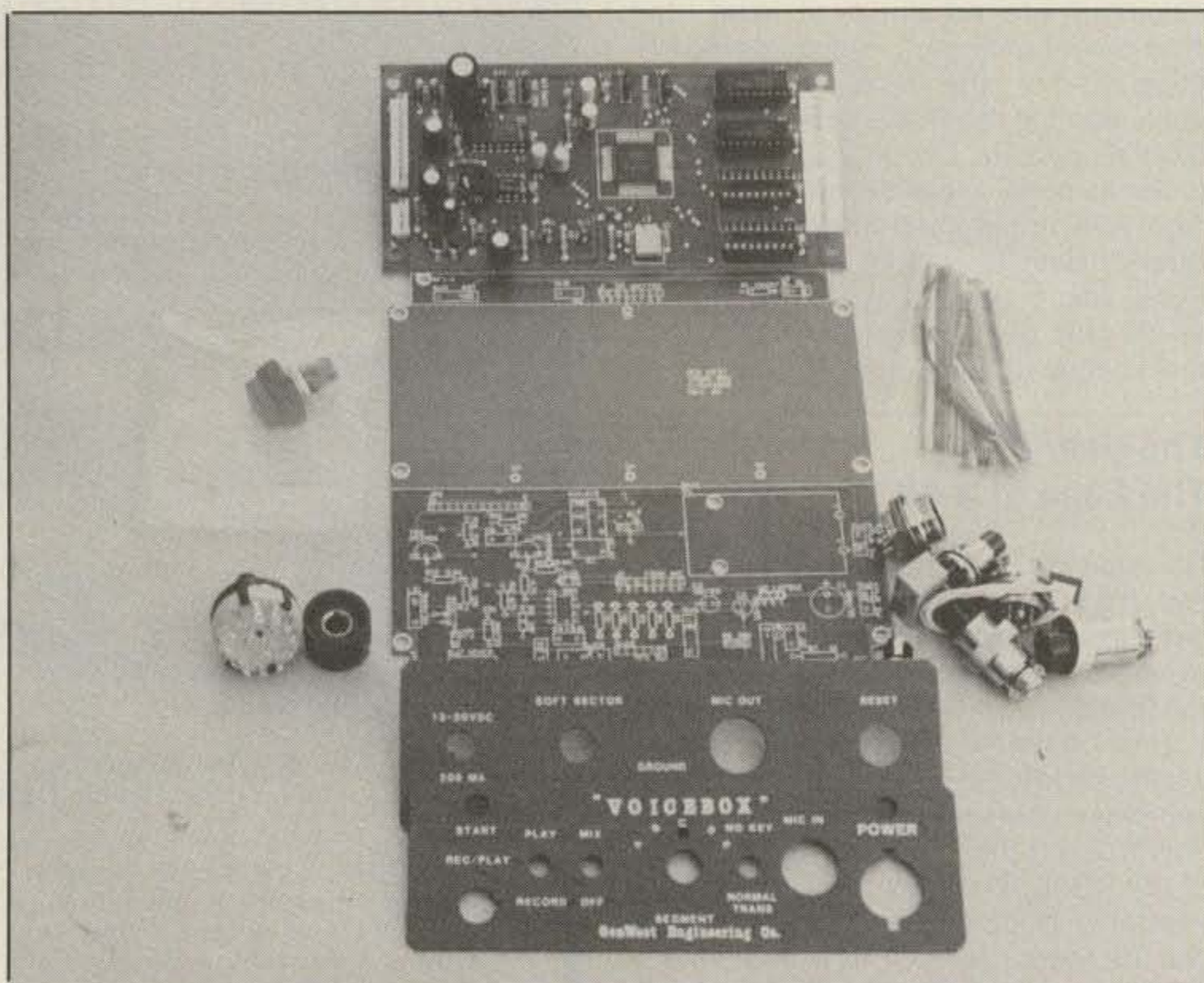
BY LEW McCOY\*, W1ICP

**T**he Voicebox manufactured by GenWest Engineering is truly an amazing device which incorporates many new computer techniques. It is a piece of equipment that eliminates much of the stress in ordinary operating, plus prevents or alleviates vocal-cord over-use. I know that contesters and DX chasers will welcome the Voicebox into their station. What is it? Read on.

In the past many contest and DX operators who did a lot of voice or phone operation have tried tape recorders and other devices to do the actual calling such as "CQ,CQ,CQ SS," or "CQ Contest, CQ Contest, this is W1!" and so on until their collective throats got very sore. It doesn't take many hours of operating before the vocal chords take a beating. Wouldn't it be better to have a device that would do all this work for you—sound *exactly* like yourself and be simple to operate? Well, that's what the Voicebox does.

The Voicebox is similar to a tape-loop cassette in what it puts out, but it is much more efficient in operation. The heart of the recording mode is an Adaptive Delta Modulation Algorithm that duplicates your recording to a point where the listener cannot distinguish between your actual voice or the recorded voice. One advantage over a loop recorder is that you don't have to wait for your recorded message to come around. You begin by recording whatever message you want. For example, I could record "Hello CQ—CQ—CQ. This is W1ICP calling CQ and listening for any calls." I merely need to push the **Play/Record** switch on the front of the Voicebox and the message is transmitted. Of course, you can record other types of calls and fit them into their operating procedure. More on operating in a moment.

The Voicebox is available as a kit or a fully wired and tested unit. I chose the kit route to see what was involved. (I enjoy wiring kits!) The completed Voicebox



*Here is the kit as it comes from the manufacturer.*

measures 6¼ inches wide, 2¼ inches high, and 7½ inches deep. I found it took me about three hours to wire the kit. A very excellent step-by-step instruction manual is provided, so the construction is easy. I don't think I would recommend the kit as a first-time project because you do need experience in soldering. However, if you have that experience, no problem.

One thing I liked very much about the kit is that much of the wiring, cables, etc., is pre-cut to length, saving a lot of tedious work. All materials are first rate. There are two circuit boards. One requires wiring, but the voice board with its memory is factory wired and tested, saving the builder considerable work.

I found when I turned on the unit the first time it didn't play. Upon careful examination I found I had goofed in wiring the jack for the external power supply.

Once I corrected my wiring error the Voicebox worked FB.

There are several switches across the front panel, but their operation is simple to learn and clearly explained in the manual. There are two **Play/Record** switches, the first a pushbutton switch for operation and the second a toggle for setting the **Play** or **Record** mode. Next are the **Mix/Off**, **Segment**, **No Key/Normal**, and **Power** switches. Let's discuss the **Segment** switch operation first.

The unit is provided with two DRAMs that have 1 meg × 1 memory each. This provides a total recording time of 64 seconds. (This may not sound like much, but believe me it is adequate.) If you were going to transmit a bulletin, then there is space for two additional DRAMs to provide a total of two minutes-plus recording time. There are five **Segments** available

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



The completed Voicebox is a well-engineered unit.

—A, B, C, D, and E—with a total recording time of 64 seconds (two DRAMs), or 128 seconds with the added DRAMs. In the circuit there are five timing resistors that are used to determine the length of time for each segment—A = 4 to 5 seconds, B = 9 to 10 seconds, C = 9 to 10 seconds, D = 14 to 15 seconds, and E = 19 to 20 seconds. These recording lengths can be altered by changing the timing resistors.

The **Play/Record** switches are just what the name implies. You place the toggle switch in the **Record** position and record your message. A red LED comes on whenever you push the **Play/Record** pushbutton switch, during the record segment or when the recorded segment is transmitted. To repeat, when you move the toggle to **Play** and you push the first switch, your transmitter is turned on.

Next the red LED comes on, and the message is transmitted. Your transceiver mike is plugged into the Voicebox and the unit is connected via a cable to your transceiver mike input. More about this in a moment.

There is one real "cute" feature about the Voicebox that bears special mention. Suppose you are working a rare DX station in a pile-up but his QTH and QSL information goes by too quickly for you. All you need to do is switch to the record mode and record him into one of the segments, and go back and get the information when you need it!

The **Mix** switch, when it is turned on, makes your microphone live. Suppose you are working a 10-10 contest. You would record your QSL, QTH, etc., information. In using this information on the air, you would send the message and



An inside view of the unit from the back.


then add "your 10-10 number is" after which the Voicebox recording would drop out.

The **No Key** switch is just what the name implies. It permits you to record or play messages without going on the air. I didn't mention it before, but the unit has its own speaker and monitoring system. Checkout procedure is simple and easy to accomplish. No exotic equipment is needed.

Your regular transceiver microphone is plugged into the front microphone jack. You are provided with two appropriate microphone jacks and cable to interconnect the Voicebox from the microphone jack on the back panel to the normal mike input on your rig.

### Final Observations

To be honest, I think the Voicebox is one of neatest pieces of gear to come along in amateur radio. There are countless ways it can be used in voice transmissions, saving the operator much wear and tear. I know the unit I have will get plenty of use, particularly in contest work. Also, prospective DXpeditioners would be wise to look at the opportunities the Voicebox will afford them.

The price of the kit is \$189.95 and the completed unit is \$259.95. The Voicebox is manufactured by GenWest Engineering, 1217 W. Hatcher Rd., Suite 11C, Phoenix, AZ 85021 (602-943-5255). 



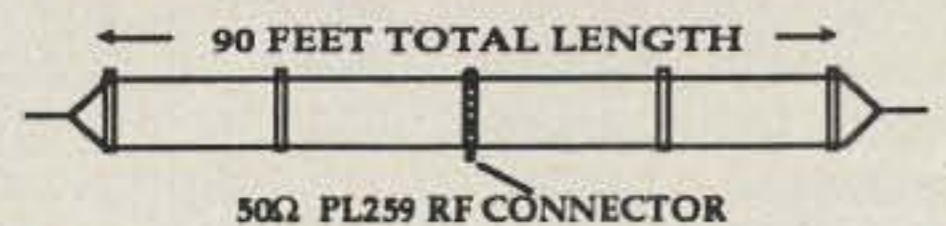
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## How To Add 2400 BPS To The AEA PK-232

BY BUCK ROGERS\*, K4ABT

**N**ot long ago I wrote an article in the "Packet User's Notebook" explaining how to add the 2400 bps QPSK feature to several different manufacturers TNCs. The article was written to complement the modem and TNC of each of the manufacturers mentioned in the article. Each company told me that the modem could be installed by the user, and the modem was available to the end user. At that writing I reported that the 2400 bps modems were available from these manufacturers, and they could be added by the end users. That was true at the time I researched and wrote that column (see May 1990 CQ).

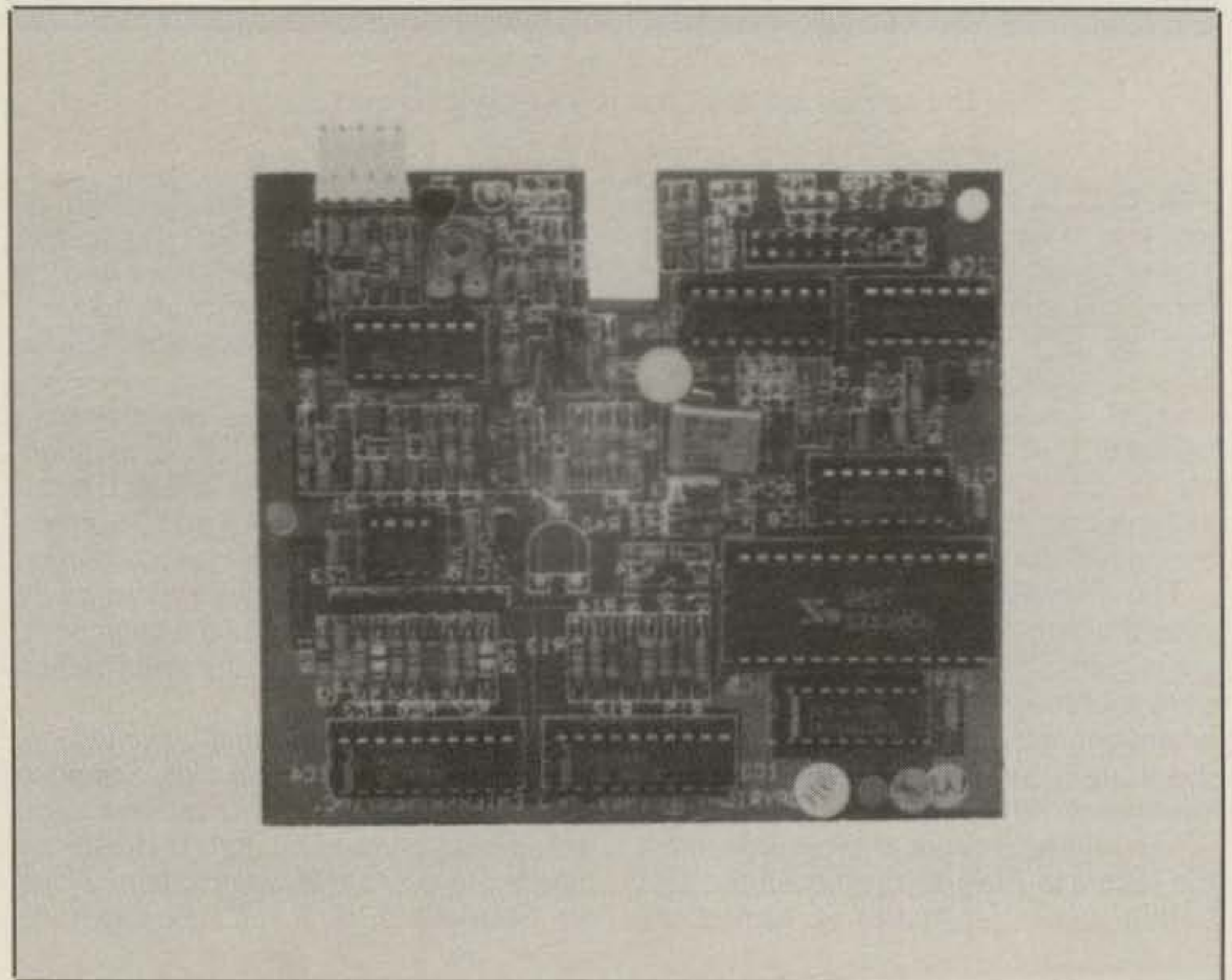
After I had written the column, and after it was in print, one of the manufacturers felt that an installation of this kind might be too difficult for the packeteer. Therefore, they decided to make the 2400 bps update a factory modification.

With a lot of folks calling and writing to me about their plight, I went to my files and dug out some old data on the PK-232 and an earlier 2400 bps modification that Glynn, WB4RHO, had made to a friend's PK-232 about two months ago.

Several packeteers and I spent long hours building the modification that we are about to discuss in this article. Special thanks to Glynn, WB4RHO, and to Dick Mills, W4MTP. There's not enough room to send kudos to all those packeteers who participated in this project to develop an economical means to put 2400 bps PSK into the PK-232.

We've developed a 2400 bps modem installation for the PK-232 for under \$80. To do so we had to make a trade-off in the method of switching used to go between 1200 and 2400 bps. The reason was to eliminate the cost of new firmware and a new EPROM.

\*506 Pheasant Ridge Drive, Warner Robins, GA 31088



*The MFJ-2400X add-on can make your AEA PK-232 operate on 2400 BPS.*

The trade-off amounted to using "hardware" switching instead of "software" switching. The move towards economy included making use of a modem from another supplier.

MFJ packages 2400 bps Add-On Modem Kits for other makes of TNCs, including the turbo additions to their own line of packet controllers. We purchased some of these kits and made the necessary changes to them so they would easily adapt to this PK-232 modification.

After we modified the modems and had the PK-232 operating at 2400 bps, we asked MFJ if they would add these changes to one of their kits and give it an "X" rating (PUN). Thus, the 2400 bps PSK Modem Add-On Kit that may be added to

a PK-232 is called the **MFJ-2400/X**. The cost is \$79.95, and it is available from MFJ or one of the MFJ distributors.

The MFJ-2400/X Kit contains a completely wired and tested modem and the following items necessary for the addition of 2400 bps to a PK-232:

1. Modem with seven wires already soldered to the "HEADER" location of the MFJ-2400/X.
2. Five-pin Molex connector (plug) pre-wired.
3. One  $\frac{7}{8}$  inch aluminum spacer.
4. One  $\frac{7}{8}$  inch plastic spacer.
5. Two #6 flat fiber washers.
6. One 6-32  $\frac{1}{4}$  inch screw.
7. One switch.

The results of this mod are pleasing, to

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2600	1MHz 2.4GHz		•	•	•	± .2ppm add \$ 80.
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JP5 and JP6 later. **JP4** (jumper) will *not* be replaced, but it is wise to store one of these jumpers in a safe place, should you need it at a later time.

The seven (modem) wires discussed in the next steps are already attached to the MFJ-2400/X Modem PCB. They are 9 inches in length and should be trimmed to the length that is required in each step. *Carefully* solder the indicated color to the location specified. Refer to the point-to-point wiring guide in fig. 1.

1. "**Modem**" **VIOLET WIRE** from modem to GROUND near J1.
2. "**MODEM**" **WHITE WIRE** from modem to PIN 17 of U7.
3. "**MODEM**" **BLUE WIRE** from modem to CENTER PIN of JP4.
4. "**MODEM**" **GRAY WIRE** from modem to CENTER PIN of JP5.
5. "**MODEM**" **PINK WIRE** from modem to PIN 3 of U8.
6. "**MODEM**" **WHITE w/RED TRACER** from modem to PIN 14 of U7.
7. "**MODEM**" **RED WIRE** from modem to the inside PIN of JP4 (pin towards the front of the PK-232).
8. The balance of the modem header pin locations, 2 through 4, 6 through 11, 13, 15, 16, and 20 *have no connections*.

### Wiring The Molex 5-Pin Plug (Audio/Control)

The connecting points described here can be located by using the PK-232 "Parts Pictorial Diagram" in the PK-232 manual. You may wish to use the illustration in fig. 1 in conjunction with the PK-232 parts pictorial.

"**A**"—Solder the **GREEN** wire from the 5-pin plug to the ANODE end of D9 (-10 volt, end toward the back panel of the PK-232).

"**B**"—Solder the **YELLOW** wire to the CATHODE end of D12 (+5 volt, end towards the front of the PK-232).

"**C**"—Solder the **ORANGE** wire to the (Ground) solder pad near the right rear corner (near J1, same point as MODEM VIOLET wire).

"**D**"—Solder the **RED** wire to *outside pin*, second row from rear of **SW2**. Designated "**D**" **RED** in fig. 1 (RxAudio).

"**E**"—Solder the **BROWN** wire to *inside pin*, second row from rear of **SW2**. Designated "**E**" **BROWN** in fig. 1 (TxAudio).

Next we attach the MFJ-2400/X modem to the PK-232 main PC board. Install the nylon stand-off (just plugs in) at the hole near modem IC U5. If the RAM/EPROM MBX PCB was attached to your PK-232, replace and secure it with the original screws. **CAUTION:** When replacing the MBX PCB, *do not* bend any of the pins. Attach the BLACK wire that was removed earlier to its original location (Pin 1 of JP1).

Remove the front, center screw from

the underside of the PK-232 case, and replace it with the one supplied with the MFJ-2400/X Kit.

Install the 7/8 inch aluminum spacer (also supplied) on the screw that was just installed at the bottom of the case. Tighten snugly; *do not over-tighten*.

Attach the MFJ-2400/X modem to the top of the aluminum spacer using two fiber washers (supplied), *one above* and *one below* the modem PC board. Secure with the 1/4 inch screw (supplied).

### Adding 1200/2400 "Speed-Shifter" (Switch)

The switch included with the kit is to be installed in an easy-to-reach location. The location for the switch is at the discretion of the user. Install the switch in a convenient location and within reach of the 9 inch **BLACK** and **ORANGE** wires at "F" and "G".

I mounted the switch on the rear apron of the PK-232 using a couple of drops of the "quick set" syanacate, type super glues. Being careful not to crimp or pinch the wires, I partially replaced the top cover of the PK-232. Next I routed the BLACK and ORANGE wires out an opening near one of the radio ports of the PK-232. The switch supplied with the MFJ-2400/X bps Kit contains a single-pole double-throw switch. The connection is easy if you remember to connect the ORANGE "F" wire to the center, or *common* post of the switch. The BLACK "G" wire then goes to either of the outside switch posts. The Make/Break function of the switch is all that is required for the transition from 1200 to 2400 bps.

### Replacing The Jumpers (Strapping Options)

Using only two of the three jumpers that were removed earlier from **JP4**, **JP5**, and **JP6**, replace one of the jumpers on the two inside pins (center pin, and pin to-

wards the front of the PK-232) of **JP5**. Follow the same procedure with the jumper installation at **JP6** by placing the second jumper on the center pin and the inside pin of **JP6** (see fig. 1). JP4 jumper will *not* be used.

Make a note of the **jumper** on the MFJ-2400/X Add-On modem at location **CN6**. This is the jumper that is used to set the transmit audio level to your transceiver. The level settings correspond to the position of the jumpers indicated below:

Jumper Position of Modem Jumper CN6	Level
Jumper Removed (attached to only one pin)	Low
Jumper Pins 1 & 2	Medium
Jumper Pins 2 & 3	High

Begin operation with the **CN6** Jumper set to the **MEDIUM** position, and after you run some tests with the 2400 bps mode you may discover that no changes are needed.


### 1200 BPS Operation

After you double-check all the wiring and "smoke" test the PK-232, you are ready to make the on-air test. At the cmd: prompt type: **HB 1200** and press the <enter> key.

Set the switch that you installed earlier to wires "F" and "G", to the open or such that +5 volts is present at the COMMON post of the switch. You are now ready to operate at 1200 bauds.

### 2400 BPS Operation

To operate 2400 bps PSK set the switch to the position that grounds the COMMON (orange wire) post and sets it to 0 (zero) volts. At the command (cmd:) prompt type: **HB 2400** and press the <enter> key. You are ready to operate at 2400 bps.

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***This year certainly has been a great year for DXpeditions. AH3C tells us what it was like to be part of the Jarvis Island group.***

## **DXpedition To Jarvis Island, AH3C/KH5J**

BY PETER H. GRILLO\*, AH3C

**A**s Danny Weil and the YASME spirit demonstrated so well, braving the open sea alone is probably the highest risk DXpedition. On a larger scale, is there mystique or luck involved in putting together a major group sailing-type DXpedition? Dreamers are best left alone in their naivete. The fact is, such an event requires hard work, commitment, incredible stamina, total belief that it can be done, a team of dedicated operators and supporters, strong financial support, and a little bit of help from above! Yet we want to do it because there is enough adventure to make it exciting. The burning desire must come from within.

The reward? A completely fulfilling sense of accomplishment. "Where are you going next?" they all ask. Totally drained, we only respond with a shrug, a smile, and a trip to our own shacks to chase that elusive one that also went to fulfill the next DXpedition dream.

### **Identifying With The Dream**

Having been a DXer for most of a generation and then off the air for a 10 year lapse, I found great fortune when employment on Johnston Island (KH3) was offered to me. Occasional chats with old friends brought back the ache for doing an even rarer island. However, something is different with DX. Large quantities of new prefixes abound. Countries are still being added and deleted. The DXCC rules have changed. At least we know that habitation of a piece of land is still not required to be declared a country. The mileages have changed, but the concept has not. Government and geography are better defined. There still seems to be a problem in defining an island nation. Where is the baseline? What is the shape of an island nation? Drawing straight lines over open water between islands of island countries could falsely disqualify a potential new one. The Pacific continues to look enticing.

A host of "problem children" remain on the DXCC list—for example, Midway Island and Kure Island, US possessions smack in the middle of Hawaii. These were grandfathered into the current list as a result of previous operations when "separate administration" was a part of the rules. Why are there two KH5s and



*Our vessel, Makanalani, en route with Pete, AH3C, and Judy, XYL, on regular watch, 4 hours/day for 8 days.*



*It's high noon, Friday the 13th, and the work has just begun. That water looks so inviting. Look out for that shark, Eric!*

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CIRCLE 136 ON READER SERVICE CARD

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*Jarvis Island is a National Wildlife Refuge, and a bird-watcher's paradise.*



*"Let's use both landings. That way we can mobilize quickly while still keeping at least 1000 foot separation between the two sites," we argue (N7NG, K3NA, OH2BH, AH3C, and Mark Rauzon).*

not just one, or maybe even three? Kingman Reef is only 50 miles away from Palmyra. Jarvis is over 450 miles away from Palmyra but it is still tied to Palmyra on the current list! Each has its parent as the USA. The geography has changed also. In 1983 the Republic of Kiribati entered into an agreement with other nations to honor their respective 200 mile economic zones. This created an intervening country between Palmyra and Jarvis and would qualify Jarvis as separate from Palmyra, if the baseline were defined based on the area of influence around Washington Island. Also, we can show that there were amateur radio operations on Jarvis during a period when the DXCC desk would have quickly added Jarvis, but it was merely overlooked because those amateurs then operating simply did not follow DXCC and didn't make a case for it.

Why not make a run for it, make a presentation that clears the air? When the smoke clears, a new DXCC country just may surface.

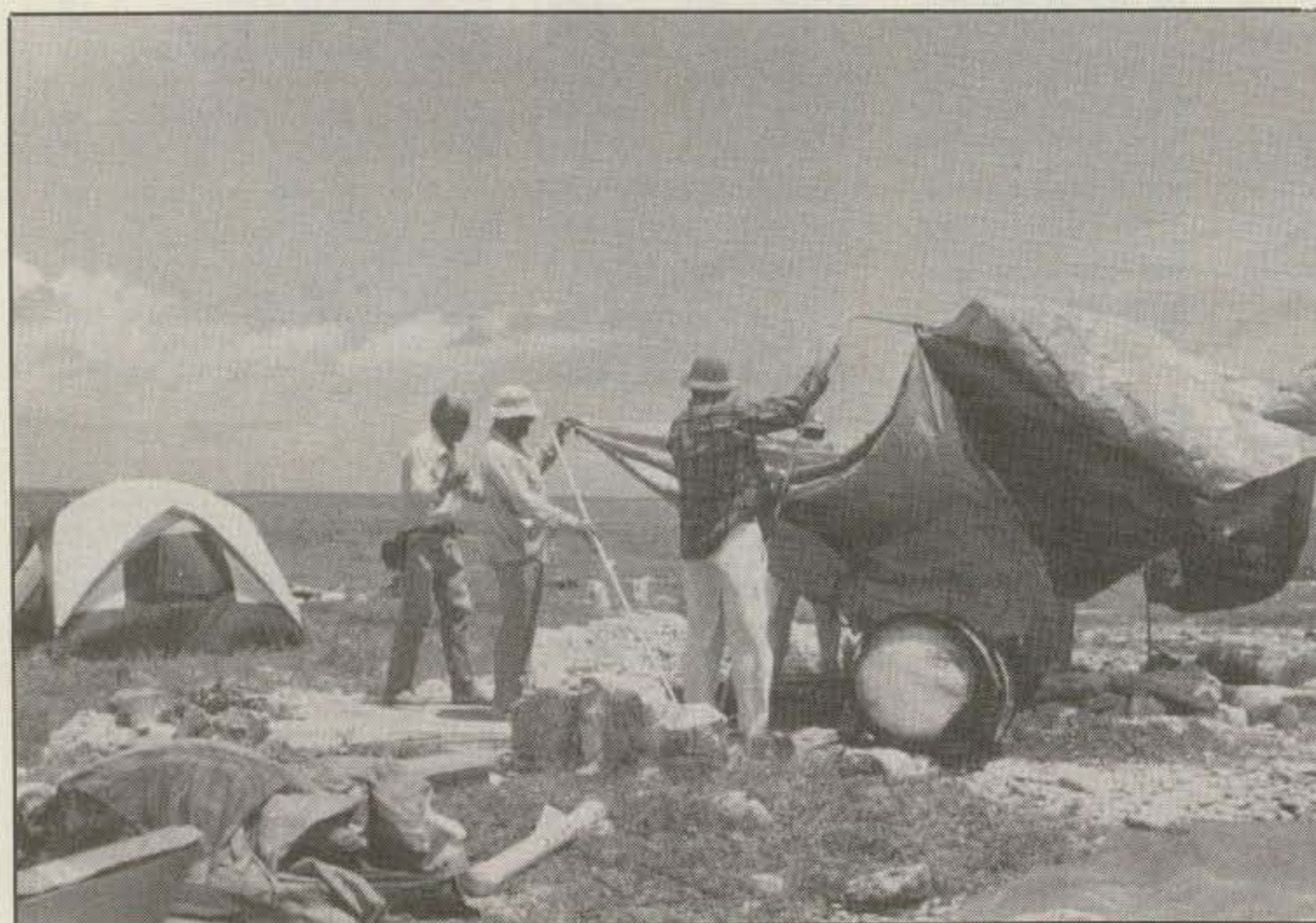
### Gathering the Muscle

Who could be more knowledgeable about this sort of thing than Martti Laine, OH2BH, who successfully launched four new DXCC countries? It is December 1989 and Martti is in California poring over the maps with Wayne, N7NG, looking for a new one. Together we research Jim, W6CF's files for historical DXCC information. Eric, K3NA, is brought in to review our initiative. He wants to help and makes his and Toni, KN3T's commitment to join the group to operate on Jarvis Island.

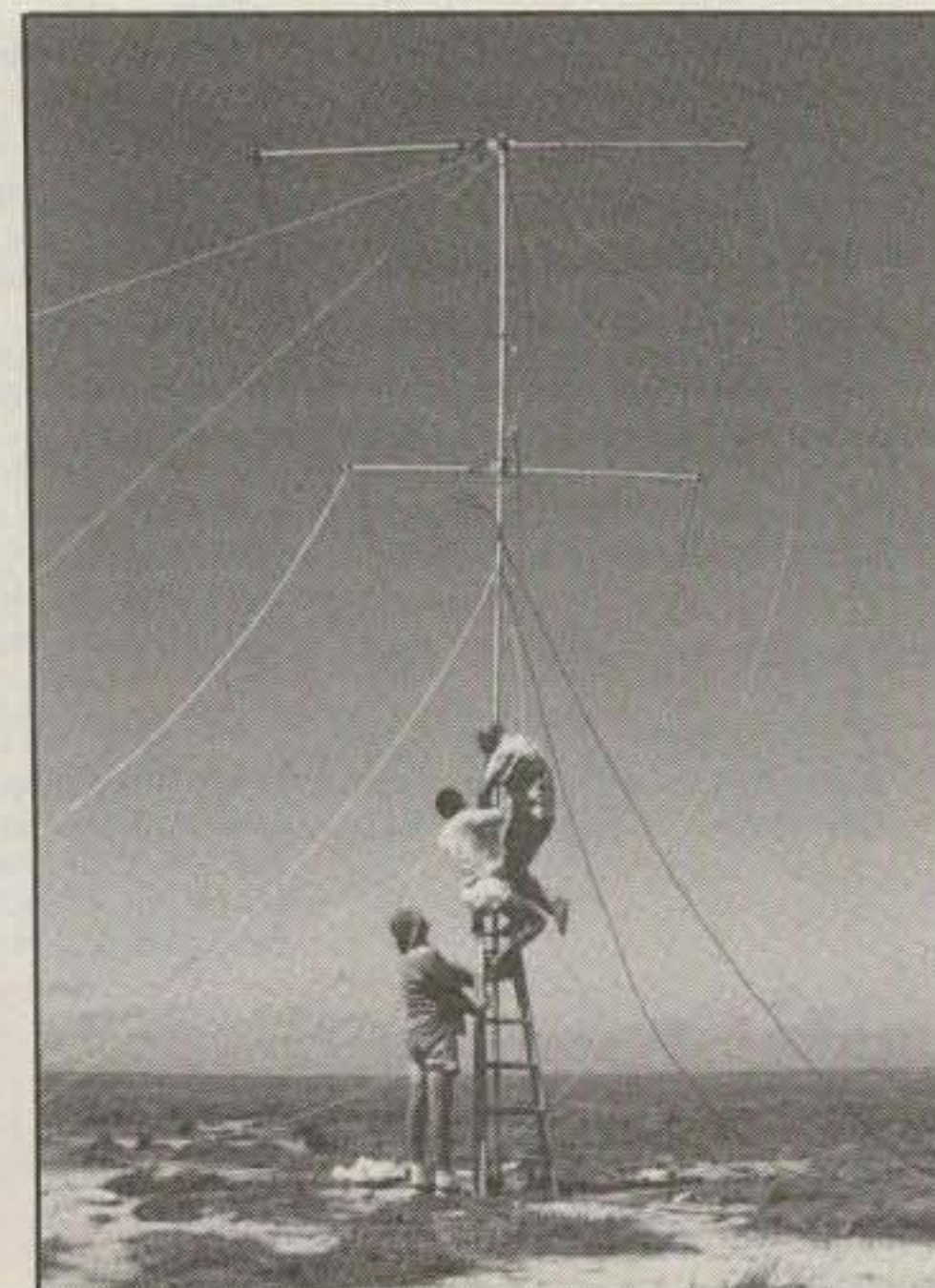
"Sleep on it," says Martti. "Then call me or



*A true multi-national flag-raising ceremony.*



*Let's see . . . how does this thing go together, anyway? It's beginning to look like a kite.*



*Stacking antennas calls for real team effort. Now we know what the ladder was for.*

BAND	JAPAN	USA	EUROPE	OTHER	TOTAL	TOTAL
28 CW	1243	4377	178	358	6156	
28 SSB	1299	8068	74	956	10397	
28 RTTY	25	23		21	69	
					TOTAL 28	16622
					MHz	
21 CW	1371	3454	1936	504	7265	
21 SSB	2621	3239	2638	701	9199	
21 RTTY	36	272		14	322	
					TOTAL 21	16786
					MHz	
14 CW	1257	2886	2526	544	7213	
14 SSB	1213	3288	2038	735	7274	
14 RTTY	5	8	27	2	42	
					TOTAL 14	14529
					MHz	
7 CW	657	1338	182	136	2313	
7 SSB	747	1598	184	214	2743	
					TOTAL 7	5056
					MHz	
3.5 CW	73	387		31	491	
3.5 SSB	48	253		33	334	
					TOTAL 3.5	825
					MHz	
					TOTAL 1.8	35
					MHz	
					TOTAL 10	65
					MHz	
					TOTAL 18	100
					MHz	
					TOTAL 24	147
					MHz	
					TOTAL 50	450
					MHz	
<b>TOTALS</b>	<b>10595</b>	<b>29191</b>	<b>9783</b>	<b>4249</b>		<b>54615</b>

fax me the information. We Finns always find fresh, clearer thinking after a good rest."

The team is growing. Our friend Kan, JA1BK, not only offers to be our spokesman for securing Japanese support, but also selects Japanese operator Masahiro "Misa," JG2BRI, to manage 6 meters and to represent JA ranks for this operation. Now we are six. Still, we need more help. NCDXF offers solid financial and logistics support. ICOM recognizes the value of this major gathering of forces and offers to help with loaning seven modern IC-735

transceivers which are aimed at portable operations like ours.

Our transportation must have just the right combination. Navigation must be impeccable, weather must be hospitable, customs must be understanding, and everyone must be on time. We commit personal funds to get us there and back. The boat charter alone is approaching \$20,000—up front!

While meeting on the air we decide to go for four HF stations. Jim, WA6AUE, is brought in to beef up our CW operation. Pertti, OH2RF, with



Site 1—The Cushcraft A3 tribander is about 60 feet above the water. Most of our phone contacts were made from here.

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- 112-page textbook
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- sample 5 wpm Novice code test
- over \$50 in radio manufacturers' discount coupons.

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2 theory tapes, 2 textbooks, FCC Rule Book, 4 code tapes, code oscillator set, examiner test packet, and over \$50 in radio discount coupons.

### #02 NOVICE CODE COURSE \$32.95

6 cassette tapes make it easy to learn the code from scratch.

### #07A 2-WEEK TECH . . . . . \$22.95

This Technician course includes 2 theory tapes and 1 illustrated textbook.

### #05 COMPLETE GENERAL. . \$62.95

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### #06 GEN. CODE COURSE . . \$32.95

This General course includes 6 tapes for speed building from 5 to 13 wpm.

### #08B COMPLETE ADVANCED \$62.95

This Advanced course includes 4 theory tapes, 1 textbook, and 6 code tapes (13 to 22 wpm).

### #09 ADV. THEORY COURSE \$32.95

4 tapes and 1 illustrated textbook

### #10 COMPLETE EXTRA. . . \$62.95

4 theory tapes, 1 textbook, and 6 code tapes (13 to 22 wpm).

### #12 EXTRA THEORY COURSE \$32.95

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### #11 EXTRA CODE COURSE \$32.95

6 tapes for speed building from 13 to 22 wpm for the Extra code exam.

### #13 BRASS KEY & OSC. . . . \$25.95

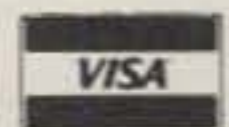
### #15 PLASTIC KEY & OSC. . . \$21.95

#### SINGLE CODE TAPES

\$10.95 each including shipping

- #19 5 wpm Novice QSO tests
- #20 5 wpm Random Code
- #21 5-7 wpm Speed Builder
- #22 7-10 wpm Speed Builder
- #23 10 wpm Plateau Breaker
- #24 10-12 wpm Speed Builder
- #25 12-15 wpm Calls & Numbers
- #26 13 wpm Random Code
- #27 13 wpm Test Preparation
- #28 13 wpm Car Code
- #29 13-15 wpm Speed Builder
- #30 15-17 wpm Speed Builder
- #31 17-19 wpm Speed Builder
- #32 20 wpm Random Code
- #33 20 wpm Test Preparation
- #34 20 wpm Car Code
- #43 3-15 wpm Code Review
- #40 12-21 wpm Code Review

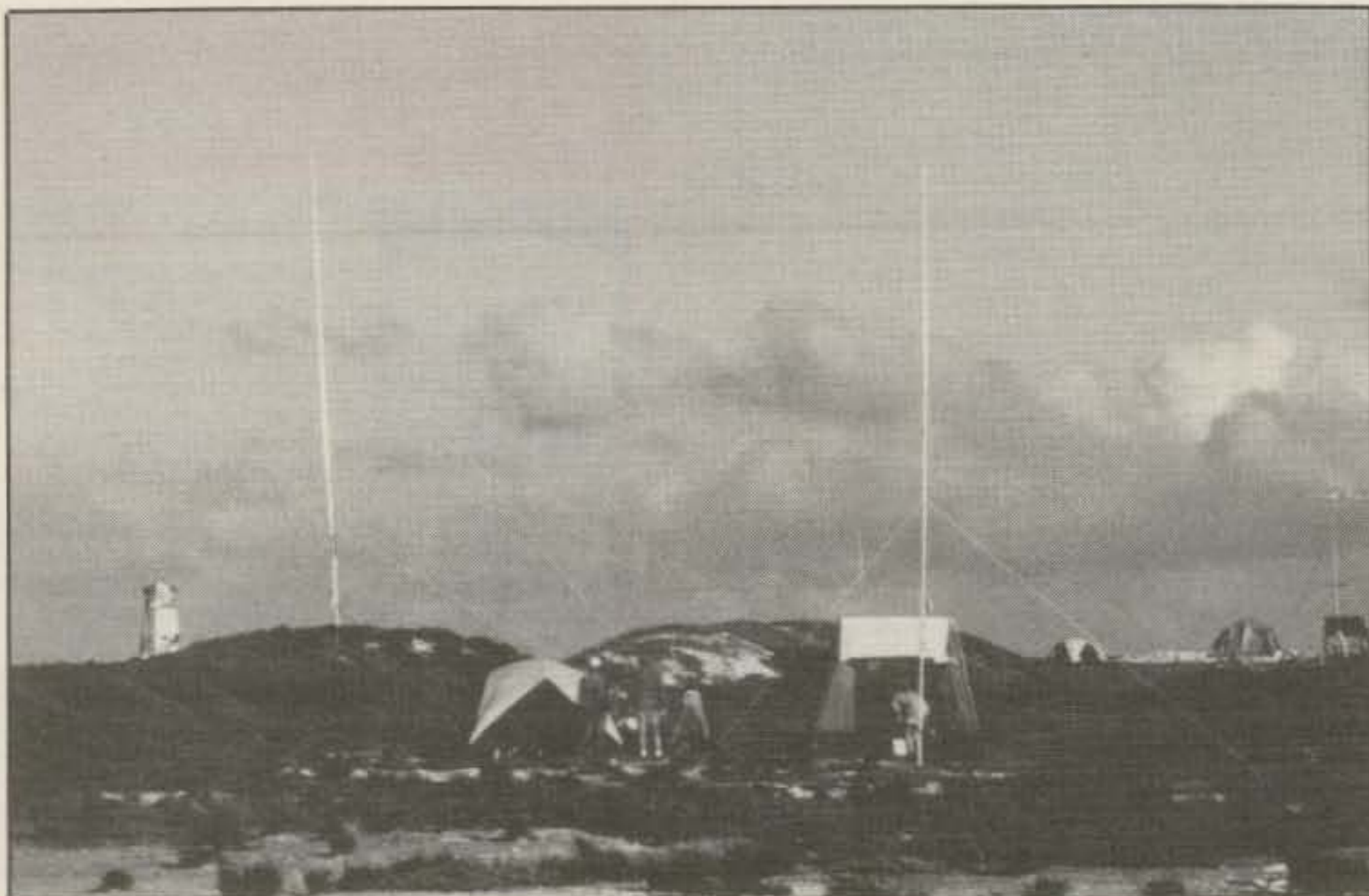
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IL residents add 6½%



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CIRCLE 151 ON READER SERVICE CARD



A view of both sites. It is now time to erect the stacked array at site 2. Do we have any volunteers?



AH3C/MM—the main cabin below is no place for landlubbers on the high seas.

his knowledge of European operators and propagation adds a refinement to smooth our total team effort.

"Don't forget the ladder," says Wayne.

"Six foot? Ten foot? Wood? Aluminum?" asks Pete.

"Make it a standard 6 foot, sturdy, wooden, self-supporting ladder."

"OK. That will be item 127. Do we need amplifiers for this operation?"

Martti immediately announces, "Regardless of power requirements, we should be using a minimum of 1 KW at each radio to keep full command of the pile-ups. We definitely want to reach our small audience by building up the balance with our power and having our beams high enough."

The U.S. Fish & Wildlife Service grants permission for our visit. However, we must not disturb any of the wildlife on the island, and we will

have Mark Rauzon, wildlife biologist, with us. He will survey the wildlife population.

Equipment and supplies must be staged in Honolulu, identified, checked out, and loaded on the boat. I commit to an extra week off from work. Our supportive KH6 group—KH6VP, AH6IO, KH6JEB, KH6IJ, and Mrs. Nose—help tie the ribbon. In the meantime, Eric, K3NA, is busy researching the history of Jarvis Island and preparing the first-draft DXCC initiative. The fax machines are smoking from all the action. Three weeks before departure we make the announcement of our intentions to go to Jarvis and to introduce our proposal to ARRL.

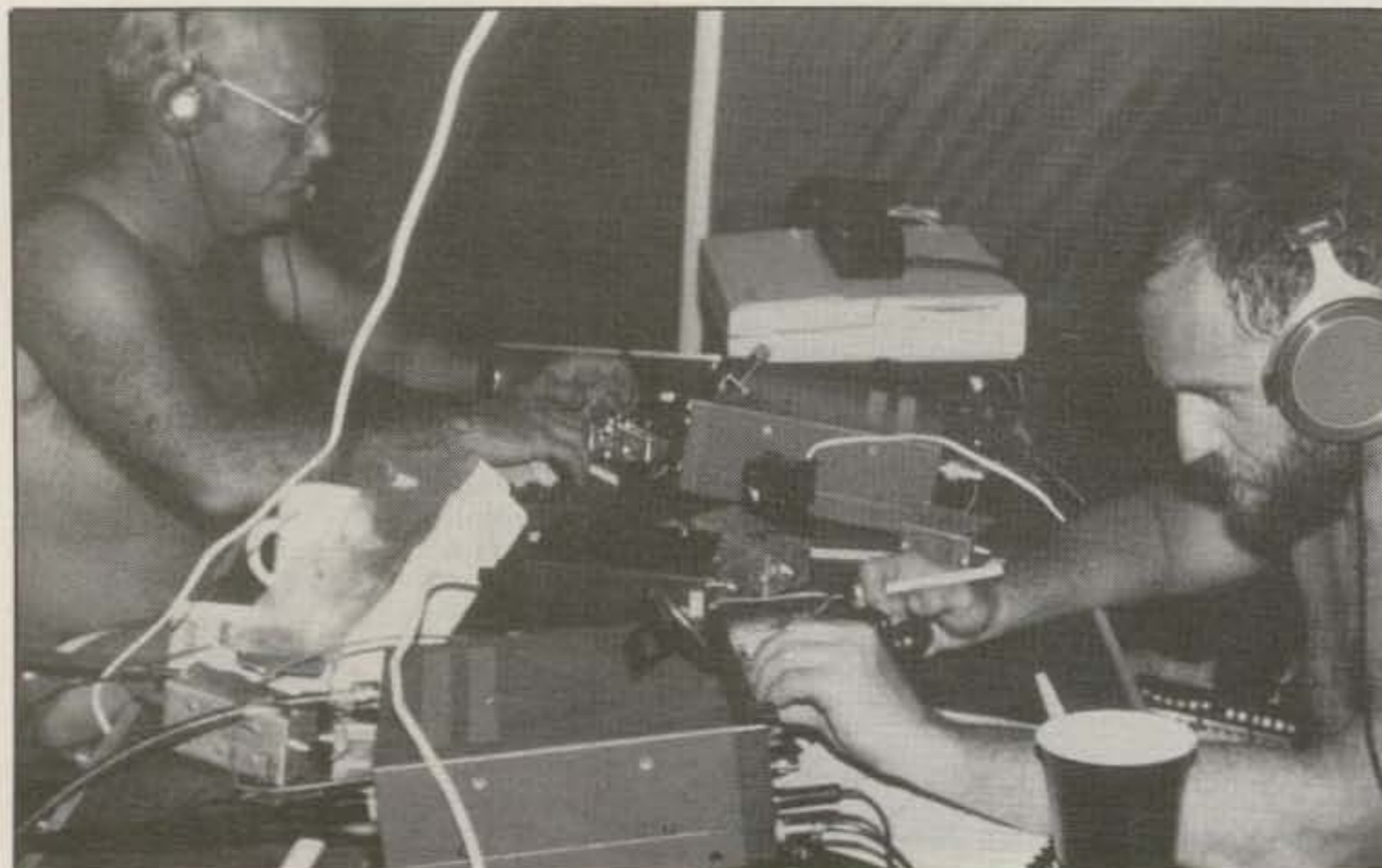
Our sailing vessel, the 71 foot ketch *Makanalani*, is properly outfitted with satellite navigation equipment, sextant, radar, depth finder, powerful engine, two rafts, berths for ten, a deck crew of two, galley complete with first mate as chef, and expert captain. The bright

red diesel fuel containers stand like soldiers in the sparkling Pacific sun.

## Bon Voyage

It is Sunday, April 1, five days before the Visalia International DX Convention as Judy, my XYL, and I wave good-bye from the *Makanalani* to Manny Pires, KH6AY, and his XYL, standing at the dock. Manny was one of the first amateur radio operators on Jarvis Island in 1938.

A 20 meter dipole is strung between the two masts and AH3C/MM maintains daily contact with the rest of the team. After three days of trying to operate below deck, setup of the IC-735 is moved to the cockpit. The main cabin is no place for a greenhorn landlubber. After six days of rough, choppy sailing the seas get much bigger as a storm passes directly over



Now are having some real "fun"! The Jarvis work-em-all contest has begun! Wayne, N7NG, and Eric, K3NA, banging it out on CW.



If you heard that fast-talking YL signing "QRZ?" you nabbed a new one for YLDXCC—Toni, KN3T.

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**\$279<sup>95</sup>**



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Tests in *Packet Radio Magazine* prove the modem used in the MFJ-1278 copies HF packet more accurately than all other modems tested.

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### Exclusive Built in Printer Port

Only the MFJ-1278 has a dedicated printer port that lets you plug in your Epson or IBM compatible printer.

You don't need to buy a silly \$40 cable just to plug in your printer.

### 20 LED Precision Tuning Indicator

MFJ's unequalled tuning indicator makes it really easy to work HF packet. Unlike others, you use it the same for all modes -- not different for each mode. Just tune your radio to center a single LED and *you're precisely tuned in to within 10 Hz* -- and it shows you which way to tune!

### New Easy Mail™ Personal Mailbox

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MFJ-1274

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MFJ-1270B

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MFJ-1270B super clone of TAPR's TNC-2 gives you more features than *any* other packet controller -- for \$139.95

You can double your fun by operating VHF and HF because you get *high performance* switchable VHF/HF modems.

You get the Easy Mail™ Personal Mailbox with soft-partitioned memory so you and your buddies can leave messages 24 hours a day.

In MFJ's new WeFAX mode you can print full-fledged weather maps to screen or printer and save to disk using most computers.

A new KISS interface lets you run TCP/IP and MSYS. NET ROM compatible.

You also get 32K RAM and a free 110 VAC power supply (or use 12 VDC).

For dependable HF packet tuning, the MFJ-1274 gives you a high resolution tuning indicator -- and it's only \$20 more.

New 2400 baud Turbo models available: MFJ-1270BT, \$209.95; MFJ-1274T, \$229.95.

Mailbox with soft-partitioned memory so you and your ham buddies can leave messages for each other 24 hours a day.

### Multi-Gray Level FAX/SSTV Modem

You'll see tomorrow's news today when you copy outstanding FAX news photos with crisp clear details. MFJ-1278 is the *only* multi-mode with a built-in multi-gray level modem. It lets you transmit and/or receive multi-gray level pictures with an appropriate terminal program.

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**NEW!** gives you *exclusive* HF packet identification!

MFJ's new ASA automatically identifies HF packet, RTTY, ASCII and AMTOR signals. A

kiss interface or dumb modem, fast throughput anti-collision technology, independent transmit level for each radio port, random code generator, lithium battery backup, RS-232 and TTL serial ports, socketed ICs, tune up command, peripheral I/O port, automatic serial numbering, programmable message memories, dual radio ports (*each* HF or VHF), CW paddle jack, audio amplifier and speaker jack so you can monitor CW sidetone, transmit and receive audio and packet connect bell, *new* fully integrated instruction manual with *Fast Start™* booklet and more. 9½ x 9½ x 1½ inches.

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quick "OK" command selects the mode!

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### New MFJ MultiCom™ . . . exciting new 1278 software

*High resolution AP news photo received on 20.738 MHz using MFJ MultiCom and MFJ-1278 with multi-gray modem.*



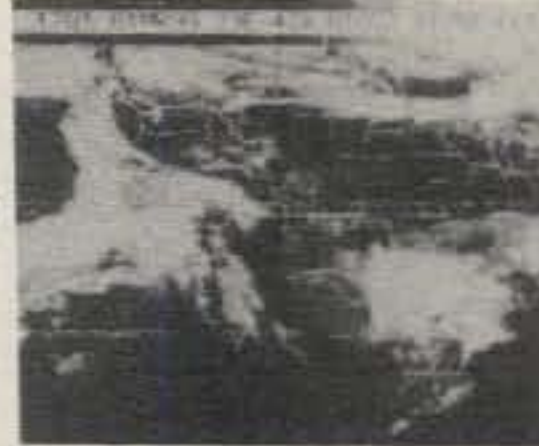
MFJ-1289 New menu-driven MultiCom™ brings out the full power of your MFJ-1278 with multi-gray modem. **\$59<sup>95</sup>**

No set-up required -- just load and use. You get incredible high resolution WeFAX maps and AP news photos right off HF. You also get color packet pictures and multi-gray SSTV.

**Bursting** with features . . . One-Key Macros™ combine multiple keystrokes into a single touch, Call-Alert™ sounds an alarm when any characters you tell it to watch for come in, Auto-Set™ instantly switches entire stored sets of parameters, Auto-Router™ stores digipeater node routes for instant use, Packet Multi-Plex™ lets you transmit or receive a binary file and continue your QSO, Multi-Word™ gives a powerful word processor that is tailor-made for multi-mode communications.

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*Multi-Gray WeFAX weather map received on 16.410 MHz using MFJ MultiCom and MFJ-1278 with multi-gray modem.*



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CIRCLE 32 ON READER SERVICE CARD

*Makanalani*. Ten foot seas combined with blinding rain and 40 knot winds make us all aware of our vulnerable position. Ten hours later the storm subsides and we take inventory. No damage to equipment, but the boat bites are numerous.

We inch our way toward Christmas Island late at night on April 8th. Phil, T32AN, guides *Makanalani* by VHF radio to a suitable harbor at midnight. On the next day, as soon as the sun clears the palm trees, we don the scuba gear and jump overboard for a refreshing dive. The customs officials arrive at 10 AM and we are cleared to land.

The Captain Cook Hotel has hosted many T32 hams. It is set up with a special bungalow with two radio operating positions. We gather up the ICOM gear to check it over. The station and antenna are put together with help from the hotel staff and T32BS is on the air by 7 PM. Conditions are terrible! Boulder A-index is 48 and K-index is over 7. A major proton event is in progress. Absolutely no luck over the pole. Only 300 QSOs during the one and only night of operating. Oh well, at least the equipment is functional.

The weekly 737 from Honolulu is on time. Phil, T32AN, greets us in his well-rigged truck. His support is like manna from heaven. It is 20 miles from the airport to the dock. We cannot leave without our passports being stamped by customs. All the officials are still at the airport. We "cool our heels" and get acquainted. The waiting in the searing sun is an omen of things to come. Humidity is 95% and it is 95 degrees F outside. Four hours later the officials return from the airport and we are finally free to go on to Jarvis Island.

Once on board, the detailed plotting of each site comes together. Two teams are created. Site 1 has OH2BH as team captain with OH2RF, AH3C, and JG2BRI. Site 2 has N7NG as team captain, with WA6AUE, K3NA, and KN3T. Layout is visualized and landing party selected.

Two hours before dawn early in the morning of the third day at sea our skipper, Tony Clarke, points about 30 degrees to port (the left) and announces he has sighted land. We stare in disbelief. After all, it is Friday the 13th. We can expect everything to go wrong this day. Moments later the first blip of radar appears on the screen about 6 miles away. Who can be sleeping at a time like this? We all gather in the cockpit as the glow of first light begins to silhouette Jarvis Island. Volunteering for watch, two Brown Boobies sweep in and plant themselves on top of the masts. A dozen Frigate Birds hover overhead like sentinels. A school of porpoises dashes across our bow, and a lone Manta Ray lazily cuts the surface with his dorsal fin. If all goes well, today will be our first day of operation.

## Staging, Construction, and Startup

We are able to drop anchor just outside the break in the reef. Wayne, N7NG, is first of our group to land. Our 2 meter HTs provide the first two-way radio contact with Jarvis Island since 1983 when George, AD1S's team was there. Each trip to shore we bring at least one passenger in the first zodiac and a full load of gear on the second zodiac. There is no movement of air. The work must be accomplished at the hottest time of day. We are consuming water at an



"There are 24 hours in a day, Misa. Don't you dare miss a single 6 meter opening!" JG2BRI remembers his instructions from JA1BK.

alarming rate. Six trips and 4 hours of hauling up the 25 foot hill to the SSB site, plus 2 more hours of dragging over to the CW site wilts the entire team.

The tents are identified and the teams go to work. Two non-campers (myself and Martti) wrestle the flimsy floorless wall tent in the 15 knot breeze. Jim and Wayne (our experienced campers, we later find out) are too weak from their struggle with the generators to find the tent erection project humorous. Yet once the corners of the airy tent are secured, they are ready for a new assignment. Site 2 is selected approximately 1000 feet due west of the shoreline SSB site so as to be separated just far enough to permit CW and SSB operating on the same band at any time to optimize propagation conditions. Broadside to the north is required so we can be absolutely assured that we have maximum attenuation of transmitted signals



"Get off my frequency! Can't you tell we are busy here?" Pertti, OH2RF, commands!



# BEST OF MFJ

MFJ, Bencher and Curtis team up to bring you America's most popular keyer in a compact package for smooth easy CW



MFJ-422B

\$134<sup>95</sup>

The best of all CW world's -- a deluxe MFJ Keyer using a Curtis 8044ABM chip in a compact package that fits right on the Bencher iambic paddle!

This MFJ Keyer is small in size but big in features. you get iambic keying, adjustable weight and tone and front panel volume and speed controls (8-50 WPM), dot-dash memories, speaker, sidetone and push button selection of automatic or semi-automatic/ tune modes. It's also totally RF proof and has ultra-reliable solid state outputs that key both tube and solid state rigs. Use 9 volt battery or 110 VAC with MFJ-1305, \$12.95.

The keyer mounts on a Bencher paddle to form a small (4-1/8 x 2-5/8 x 5/2 inches) attractive combination that is a pleasure to look at and use.

The Bencher paddle has adjustable gold plated silver contacts, lucite paddles, chrome plated brass and a heavy steel base with non-skid feet.

You can buy just the keyer assembly, MFJ-422BX, for only \$79.95 to mount on your Bencher paddle.

## Deluxe 300 W Tuner



MFJ-949D

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MFJ-949D is the world's most popular 300 watt PEP tuner. It covers 1.8-30 MHz, gives you a new peak and average reading Cross-Needle SWR/Wattmeter, built-in dummy load, 6 position antenna switch and 4:1 balun -- in a compact 10 x 3 x 7 inch cabinet. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312, \$12.95.

## Antenna Bridge

MFJ-204B

\$79<sup>95</sup>

Now you can quickly optimize your antenna for peak performance with this portable, totally self-contained antenna bridge.

No other equipment needed -- take it to your antenna site. Determine if your antenna is too long or too short, measure its resonate frequency and antenna resistance to 500 ohms. It's the easiest, most convenient way to determine antenna performance. Built in resistance bridge, null meter, tunable oscillator-driver (1.8-30 MHz). Use 9 V battery or 110 VAC with AC adapter, \$12.95.



## SuperActive Antenna

"World Radio TV Handbook" says MFJ-1024 is a "first rate easy-to-operate active antenna ... quiet ... excellent dynamic range ... good gain ... very low noise ... broad frequency coverage ... excellent choice."

Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz to 30 MHz.

Receives strong, clear signals from all over the world. 20 dB attenuator, gain control, ON LED. Switch two receivers and aux. or active antenna. 6x3x5 in. Remote unit has 54 inch whip, 50 ft. coax and connector. 3x2x4 in. Use 12 VDC or 110 VAC with MFJ-1312, \$12.95.



MFJ-1024 \$129<sup>95</sup>

## VHF SWR/Wattmeter

MFJ-812B

\$29<sup>95</sup>

Covers 2 Meters and 220 MHz. 30 or 300 Watt scales. Also reads relative field strength 1-170 MHz and SWR above 14 MHz. 4 1/2 x 2 1/4 x 3 in.



## MFJ Coax Antenna Switches



\$34<sup>95</sup> MFJ-1701



\$21<sup>95</sup> MFJ-1702B



\$59<sup>95</sup> MFJ-1704

Select any of several antennas from your operating desk with these MFJ Coax Switches. They feature mounting holes and automatic grounding of unused terminals. They come with MFJ's one year unconditional guarantee.

MFJ-1701, \$34.95. Six position antenna switch. SO-239 connectors. 50-75 ohm loads. 2 KW PEP, 1 KW CW. Black alum. cabinet. 10x3x1 1/2 inches. MFJ-1702B, \$21.95. 2 positions plus new Center Ground. 2.5 KW PEP, 1 KW CW. Insertion loss below .2 dB. 50 dB isolation at 450 MHz. 50 ohm. 3x2x2 in. MFJ-1704, \$59.95. 4 position cavity switch with lightning/surge protection device. Center ground. 2.5 KW PEP, 1 KW CW. Low SWR. Isolation better than 50 dB at 500 MHz. Negligible loss. 50 ohm. 6 1/4 x 4 1/4 x 1 1/4 in.

## "Dry" Dummy Loads for HF/VHF/UHF



MFJ-260B \$28<sup>95</sup>

MFJ-262 \$69<sup>95</sup>

MFJ-264 \$109<sup>95</sup>

MFJ has a full line of dummy loads to suit your needs. Use a dummy load for tuning to reduce needless (and illegal) QRM and save your finals.

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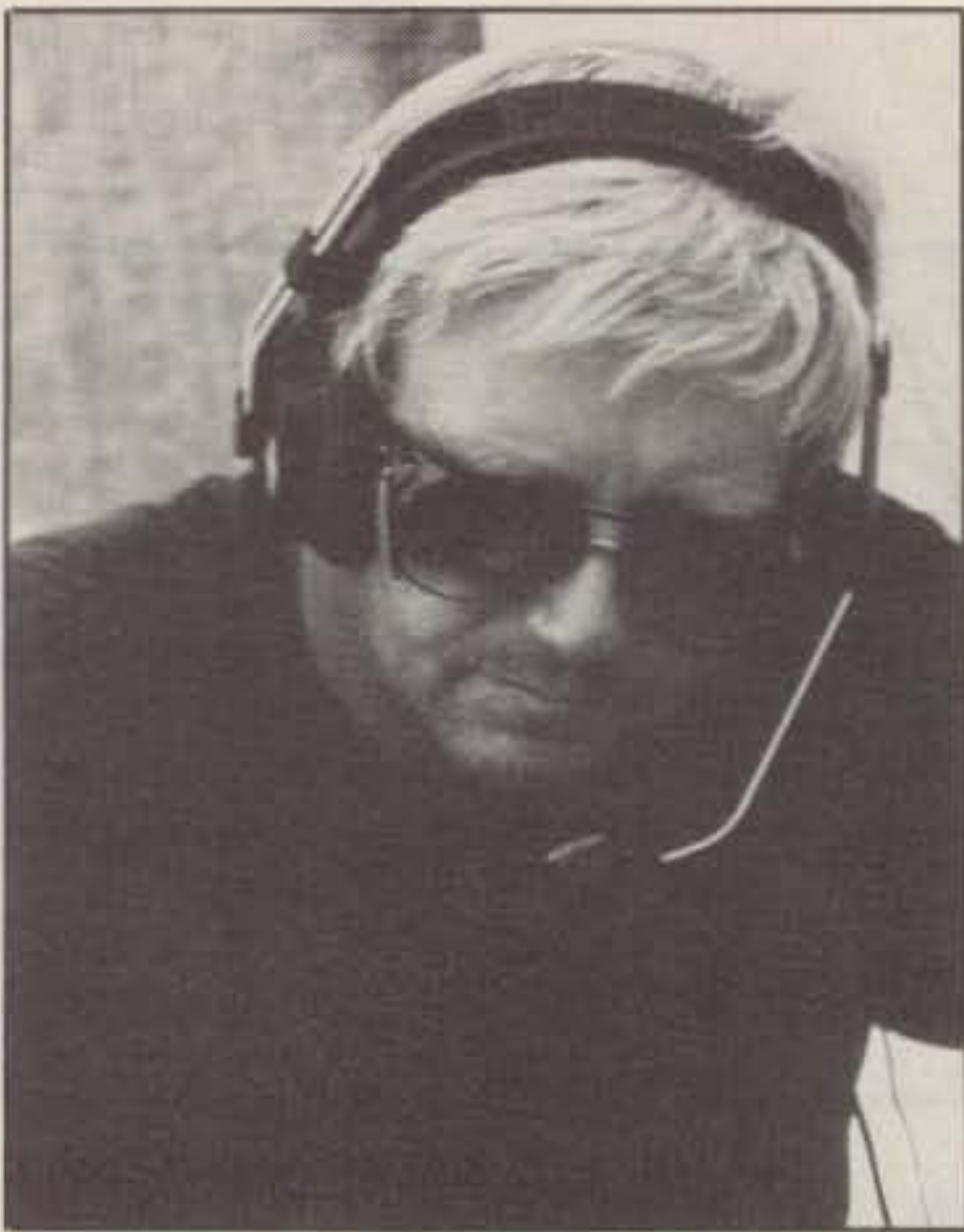
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*That beard started two weeks ago when we left KH6 land.*



*"Victory at sea! Now we know how to keep Martti quiet. So Pertti, you're next," says Jim.*

from each site when clawing for European contacts. We get the nod from Mark, our U.S. Fish & Wildlife representative, to proceed with the operation.

The startup blood is boiling. Everyone digs deep inside their soul to find energy to continue. It is late Friday night before we have our first station plugged in as we listen to the 20 meter band on the trap vertical. Our first QSOs are quite historic. We sign our call one time on 14,285. The band explodes. Somehow JA1BK surfaces out of the commotion. Manny, KH6AY, is next, followed by the first mainland U.S. contact, W6KTE, and first European, DJ6OV. Each operator is given a couple of hours operating time so as to provide rest for the others. Our first CW QSO was W6RGG on 7,023 at 0700 UTC followed by KL7H/6, W6GO, and K5UR.

The island is desert-like. Recent rains give

the vegetation a soft light-green hue. We all feel the presence of the millions of birds. Their sounds change as the day progresses. The searing sun beats down quickly. During daylight we are the only creatures still moving about. We must put up the beams at the worst time of the day. By evening we have all five stations running. The campsite comes alive with thousands of visitors. First we stumble on the persistent hermit crabs. These creatures will eat anything laying about. In the morning the trash bags resemble a mini-landfill area after the dumpster has emptied its load. Next we see a gradual buildup of small Miller moths. Within 2 hours of evening, the minor distraction becomes an invasion of thousands of these winged pests. We have to be careful about inhaling while attempting to make contacts. These moths are everywhere and concentrate around the lights. "POW, ZAP! We

have heard that sound before! It's the amplifier. One more moth has met his fate at the hands of the powerful DX machine. We wonder if the station at the other end of our QSO heard the arc over.

Waiting his turn at the radio, Pertti sees a little white mouse. It braves its way into the tent, first peeking its nose in and then making a quick run across the floor. Minutes later, reconnoitering for the rest of his clan, it jumps up on the operating table, snaps up a piece of cracker, and skitters back out of sight. All night long this search and pounce mission gets more and more daring. We take a certain delight in the antics, but are more protective of the supplies.

The first 24 hours result in 6000 QSOs. Our captain comes ashore with more water and advises us we are consuming entirely too much. Our original estimate of 1 gallon per person per day is thrown out the window. He posts the sign: "½ gallon per person per day. Use this marking pen to label your jug."

### Working the Multitude

The team goal is 50,000 QSOs, and individual goals are 1000 QSOs per day. We want to make 10,000 European contacts within the 50K. Communication between the two sites is useless. If the other site is not using a given frequency, then it is available. In this way we focus the primary station of each site on its primary mode, while the secondary station is the swinger. We also find it impossible to make firm operating schedules.

Propagation starts from a low and improves continuously throughout the 8½ days of operating. We experience a mild solar flare on the third day. This impacts the polar path, but JAs and Ws abound, keeping a normal rate. Fifteen meters becomes the primary European band with outstanding conditions from 10 PM local time (0800 UTC) to 7 AM (1700 UTC). Even 10 meters opens up at midnight to Europe.

Pile-up management is made easy with our big signal from four stations. The frustration level is reduced tremendously as the "worthy DXer" has a choice of frequencies to go to for



*"Is that you, Paulo? ... I2UIY, 59 ... thanks!" Martti, OH2BH, logs QSO number 15,972.*

his first QSO. This also cuts the pile-up in segments allowing for 10-15 kHz spread maximum. The Yanmar diesel generators hum beautifully. No spark plugs leads to no man-made noise. We are able to hear the weakest watery-sounding signal while maintaining domination of our frequency, just as Martti and Wayne had predicted. US signals on 10 meters are booming from 1800 to 0400 UTC. JAs show up in the log on almost every page. The operating tables are arranged so that we face each other with rigs side by side. When two bands are hot, it is almost like what happens when two sailboats meet at sea, going in the same direction. Instant contest! At last we are having some real "fun."

On the fourth day we notice the *Makanalani* has gone. The wind has come up to 15 knots and has shifted from northeast to southeast. Huge waves break across the opening in the reef. They are about 4 miles out, fishing for skipjack tuna. The water is so clear the crew is able to see numerous sharks. Swimming and scuba diving are ruled out. The boat slowly paces the shoreline. Each afternoon some of the operators had been taking dips in the water near the landing. However, the crew now unloads a 6 foot reef shark that they caught while patrolling offshore. We are told these sharks are everywhere. It is not advisable to do any swimming.

By the end of the sixth day the big-signal stations have worked us on virtually every available band. However, the pile-ups continue. There is no end to the numbers of stations out there. We work the South Sudan, Bangladesh, and Spratly operations. It appears that "DX-plosion 1990" was a reality. April was the month for DX widows!

## Closing Down, Departure, And Tying Up The Loose Ends

We must weigh anchor no later than noon on Sunday, or we will most certainly be stuck on T32 another week. Site 2 is first to be dismantled. One station is left operational most of the day with a vertical, while beams are broken down for staging on shore. During the night, site 1 slowly gets torn down. Dawn of the 22nd, Pertti, OH2RF, is calling CQ on 20 meter phone. No takers. Have we worked them all? Finally WB6RFI gives us our last contact as Wayne pulls the plug. We clean up each site and depart Jarvis Island in jubilation. Our celebration fades rapidly as the boat is fully loaded with bodies collapsed about the deck. We arrive at T32 just in time. We wave to the crew of *Makanalani* as we depart for Honolulu.

After living together for two weeks in a most uncommon fashion, we hold a delicate bond that must suddenly be broken as we reach Honolulu. The empty feeling is somewhat eased by sharing a few hours together before our various flights spread us around. The glow persists as we each head home to recover from our adventure.

Editing involves identifying each operator's pages, numbering, and sorting. WB2DND sends each of us a disk for data entry. We send it back. He compiles the data, checks it for accuracy, and forwards a complete set of labels to OH2BN. A fresh new team of dedicated DX-ers in Finland is gathered together to assist in the gargantuan task of sorting and assembling the QSLs for mass distribution and direct mail. Final statistics are shown in Table I.

## Post Log

For some, "Let's do it" can mean "Sounds like a good idea. What do you want me to do?" To hear it from Martti, it was, "How many passengers allowed? How much fuel must we carry? How much water?" There was a constant sense of urgency as target dates were hammered out. Each step was clearly worked out as individual roles were adopted. We tried to leave nothing to chance.

Often during slack times Martti and Pertti would banter back and forth in their native tongue, testing each other on what they were hearing from their most familiar European audience, never giving up on the learning aspect of this event. Our dinner gatherings would bring forth all kinds of interesting discoveries on propagation. Through our own experiences and from each other we learned a bit more on how to plan ahead, execute effectively, and analyze the result. A quote from OK3JW sums up our objective: "The 10 meter band was absolutely closed. I heard only noise and AH3C/KH5J."

Granted, Jarvis Island is not as rare a DX location as it was before April. There are many who wished we had operated other modes, such as satellite, or spent more time on other band modes. We believe that sometime in the next decade, a follow-up trip to Jarvis will be warranted.

## Acknowledgements

Special thank you and acknowledgment goes to the following:

Kan, JA1BK, and *Japan CQ Magazine* for financial support and a complete 6 meter station.

The Northern California DX Foundation for financial and technical assistance. In particu-

lar, Rusty, W6OAT, who was always there when things got especially tight.

ICOM, who loaned us seven model IC-735 transceivers which performed flawlessly.

Jarmo Jaakola, OH2BN, and the host of OH friends who are our QSL management team.

Vic, K9UIY, my Johnston Island QSL manager, who patiently fielded question after question from the DX community regarding Jarvis.

Katashi, KH6IJ, and Matsuyo Nose, our Hawaiian logistics friends, without whose help we would not have ever left KH6 land!

Tom, KH6VP, and Richard, AH6IO, who kindly offered their help, warehouse, equipment, antennas, and experience.

Rick, KH7JEB, who ran around Honolulu to find materials for us in between his own DXpeditions to Kure Island.

Rod, NZ7E, who was always available on frequency while we were on Jarvis Island in the event of an emergency.

TG9VT and gang, who loaned us RTTY gear.

Burt, W0RLX, and George, AD1S, Jarvis experts who volunteered vital detailed information about Christmas and Jarvis Islands.

Chod, VP2ML, editor of *The DX Bulletin* and *DX Magazine*, and Bob Winn, W5KNE, editor of *QRZ DX*. Both offered free press to help the DX community, our precious audience, find us on the bands.

Don, WB2DND, who supplied us with software and helped us compile the computer data.

Phil, T32AN, who guided us to Christmas Island and gave us warm support with logistics while on the island.

Larry, NF6S, and Ken, N6SYP. Both were most helpful in kicking off our adventure with logistics support.

Manny, KH6AY, who shared his experiences and documentation about his Jarvis Island stay and his emergency evacuation in 1938.

CQ

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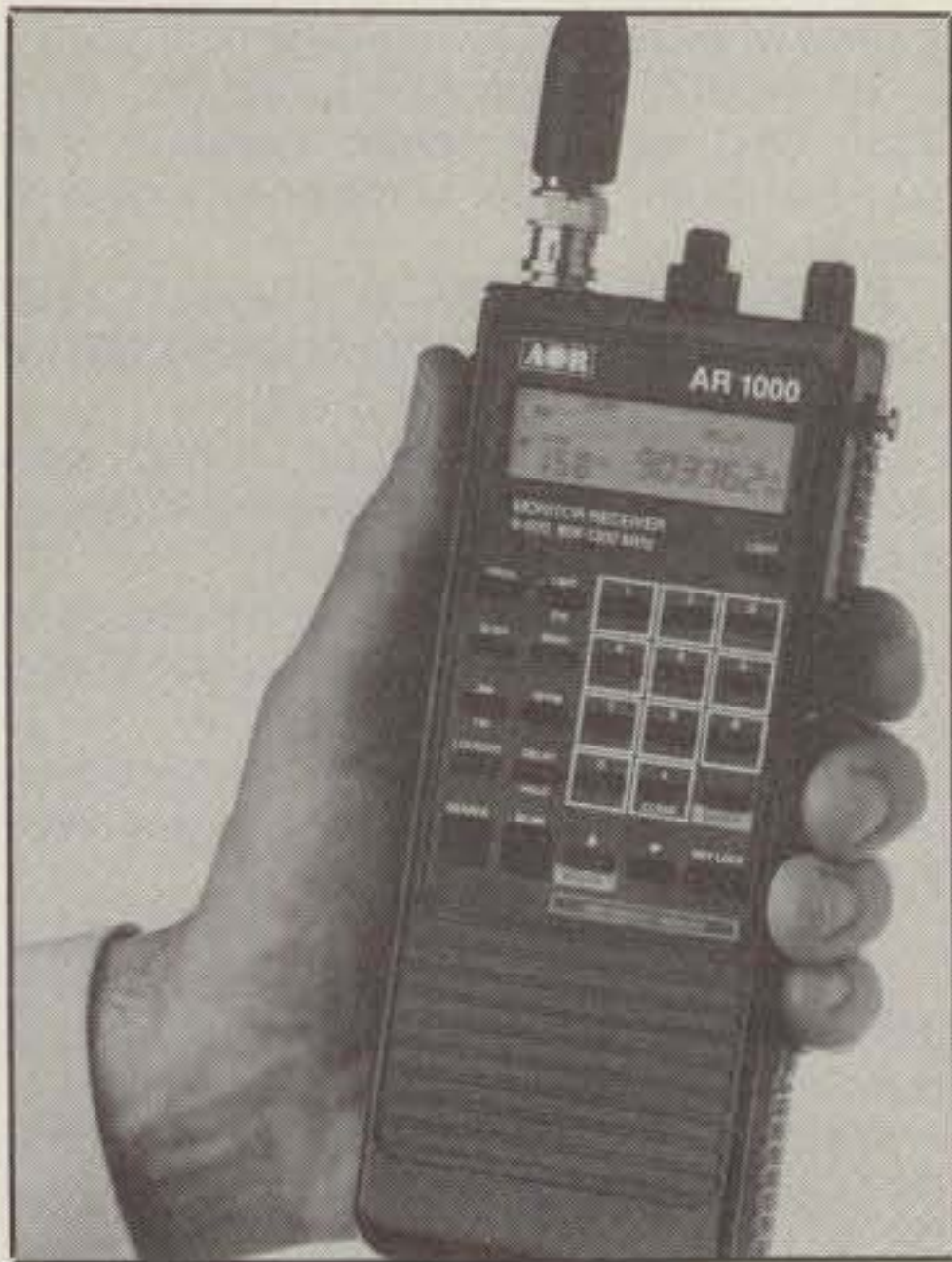
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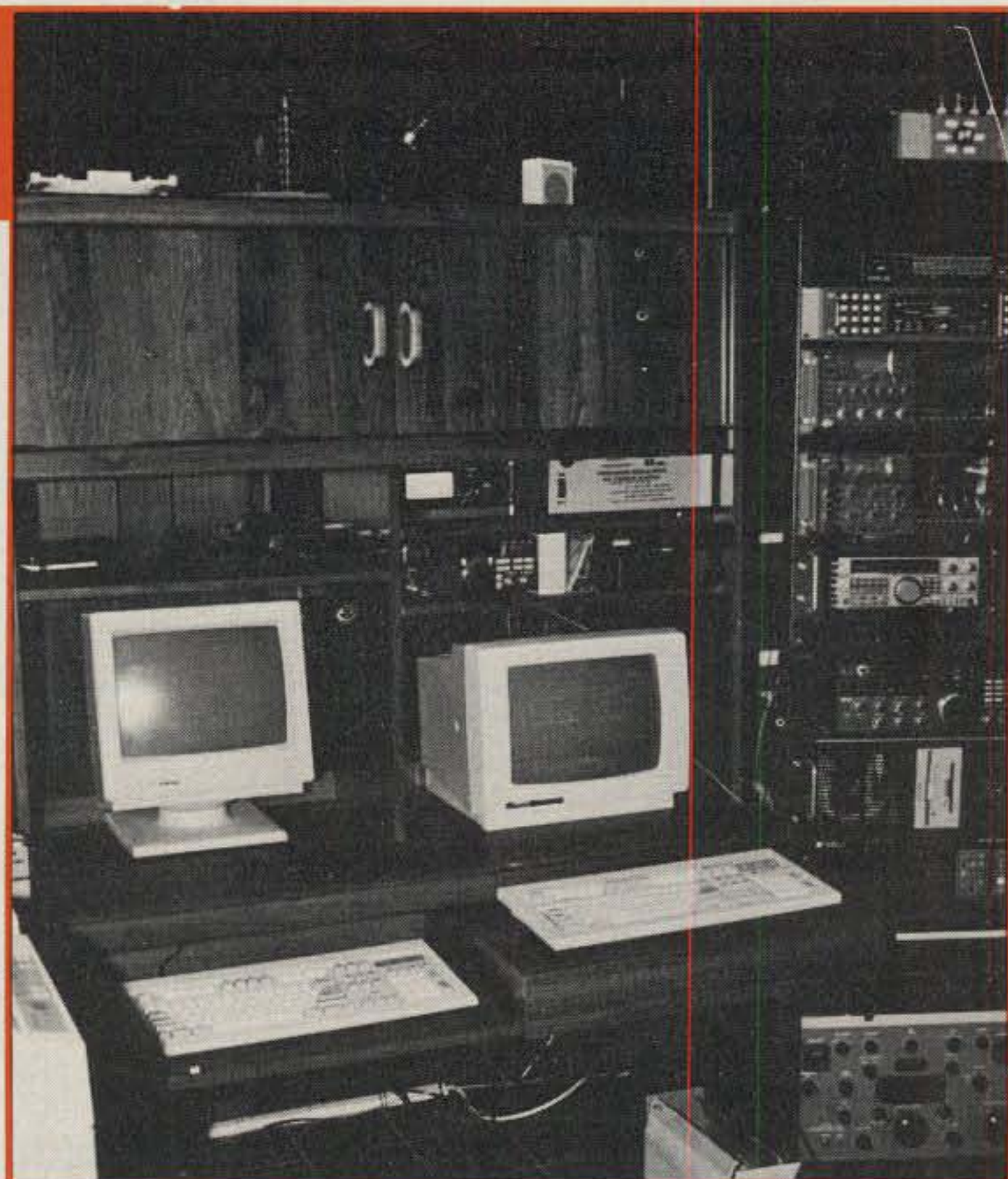
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2. INPUT DESIRED FREQUENCY		8. WRITE MEMORY TO VFO	VFO A		
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6. SWEEP BETWEEN 2 LIMITS		ALT-Q. END			
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COMPACT HF PERFORMANCE  
• General Coverage Receiver  
• Covers All Amateur Bands  
• USB, LSB, CW, AM, FM, AFSK

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**HF ALL BAND TRANSCEIVER**  
• Compact and Lightweight  
• Receive .03 to 30 MHz  
• Transmit 180-10 Meters  
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• Built-in PL Encode/Decode  
• Up To 5 Watt Output



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• 30 Memory Channels  
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• TM-631A, 2 Meter/220 MHz

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series: 18 general-purpose memories, one-touch call channel memory, two scanning range memories, and more. Price: \$581. For additional information, contact Yaesu USA, 17210 Edwards Rd. Cerritos, CA 90701, or circle number 105 on the reader service card.

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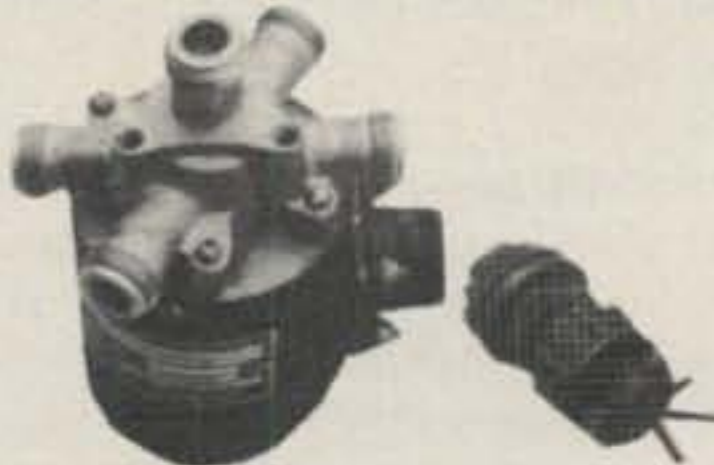
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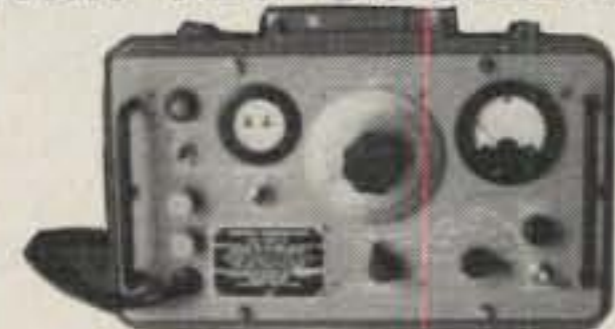
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# CQ REVIEWS:

## The Astron RS-50M and RM-50M Power Supplies

BY PETER J. BERTINI\*, K1ZJH

Our club's repeater sites are often inaccessible for months, thanks to our New England winters! We chose Astron power supplies to fill the need for reliable power sources for our repeaters. Three Astron RS-50M supplies and one RM-50M supply have been in continuous service for several years at different mountain-top locations.

This review centers on Astron's higher current supplies, those with a 20 amp or greater rating. A 100 watt mobile HF transceiver in your shack needs upwards of 20 amps during transmit, and if you also have a VHF packet station, VHF transceivers, VHF power amplifiers, etc., the advantage of having a hefty 12 VDC power source in the shack is obvious!

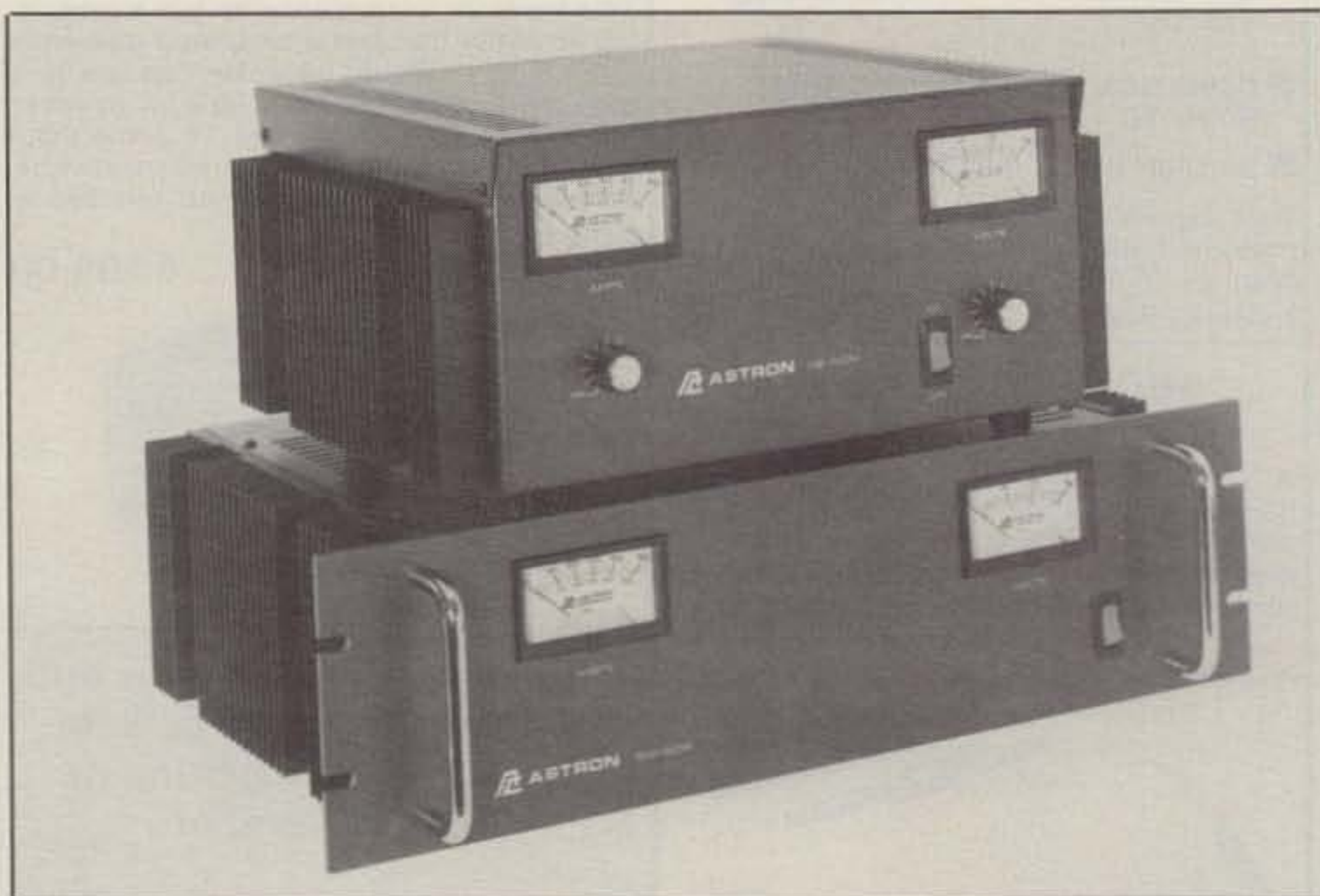
### The Product Line

Astron offers many different models and styles of supplies, from 3 amps to 50 amps. The prefix number designates the style—RS models are tabletop units, RM models are rack mounts, and the VS and VRM prefixes indicate tabletop or rack supplies with adjustable current-limiting and voltage controls. The number gives the ICS rating. For example, the RS-50M supply will deliver 50 amps with a 50% duty cycle, 5 minutes full load, 5 minutes idle. Supplies with current and voltage metering have an "M" suffix.

Options such as rack mounting, metering, and adjustable voltage and current limiting are available only in the 12 amp and higher models. At the specified 13.8 VDC output the 50 amp models can deliver 37 amps continuously. You may set the output voltage lower, but this increases the voltage drop across the pass regulators and reduces the current rating accordingly. Setting a 50 amp supply to 10 VDC output reduces the continuous rating to 22 amps; at 5 VDC only 10 amps is available.

The supplies will hold output regulation to plus or minus 0.05 volts deviation, with less than 5 mV ripple, from no load to full load.

\*20 Patsun Rd., Somers, CT 06071



One of Astron's tabletop power supplies sitting on a rack-mountable power supply.

### Construction

The power supplies are housed in rugged steel cases. They are heavy; both 50 amp models weigh close to 50 pounds. It took two of us to install the rack-mount model! Most of the weight is the power transformer. The transformers run cool with no load; Astron didn't skimp on core material quality. The heatsinks are also hefty and do their job well. The rack-mounted supplies are electrically identical to their tabletop cousins, except a different style case is used.

These are linear supplies. Switching-type supplies offer better efficiency, lighter construction, and smaller size—but few amateurs are willing to try repairing one. The heart of the power supply is the LM723 voltage regulator IC, and provides the voltage regulation and current sensing functions. 2N3771 pass regulators are used; eight of them handle the 50 amp models. Almost all of the parts are generic and available from larger supply houses. Over-voltage protection is provided by an SCR crowbar circuit. If crow-

barred or presented with a short-circuit load, the current folds back to a very low value. We ran two supplies for several days with shorted outputs with no ill effects. Available are 220 VAC models. The standard models are rated for 105 to 125 line voltages.

Besides my experiences with the 50 amp models, several of my friends are using 20 and 35 amp Astron supplies and have had no problems. Our RM-50M arrived with a meter damaged in shipment. Astron quickly responded with a replacement meter. One of the RS-50M supplies had the annoying tendency to crowbar from line glitches during lightning storms. The factory was called and a capacitor value change was suggested that cured the problem. The supplies are fairly immune to RF, but strong RF fields, especially VHF, can cause erratic operation. Don't put your mag-mount antenna on the power supply!

The Astron RS-50M is priced at \$314.95 and the RM-50M is \$354.95 amateur net. They are manufactured by Astron Corp., 9 Autry Lane, Irvine, CA 92718.







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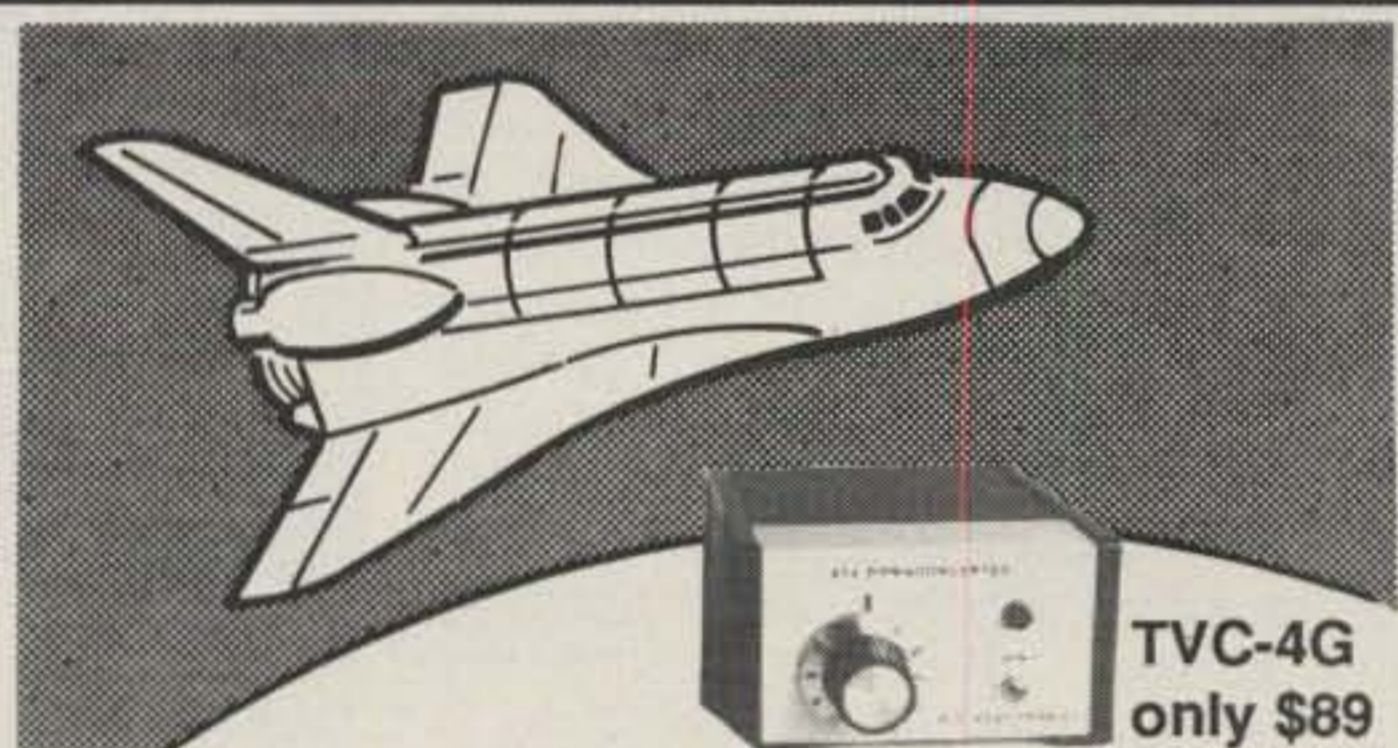
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# CQ REVIEWS:

## The Sierra Technologies 80386SX Computer System

### Computer Considerations For The Cost Comparison Shopper!

BY BUCK ROGERS\*, K4ABT

**C**omputers have become the wave of the present and future. No longer is the computer reserved just for the work place. It has taken its place in our everyday living environment in many ways, and the number of uses are increasing in quantum leaps.

The increase in the number of households that support at least one PC is accelerating faster than did the growth of the "one TV per household" statistic some years back. The use of computers in schools and classrooms has also increased dramatically. The decade of the eighties inspired educators to give computers a second look, as many teachers were less computer literate than some of their students. In many parts of the country this statement continues to hold true.

There are classrooms which provide computerized audio/visual teaching aids. The educator who has teaching skills built around computer literacy is here for the long-haul. This kind of teaching and learning supports the reasons why our children often use the computer in the home.

From their early years our youngsters become involved in an interactive participation with the computer. It is no wonder then that our educational process is moving toward this means of gaining the attention of the student. The groundwork for this kind of teaching and learning aid began when the student was playing "Pak-Games."

The student discovers all too soon how the computer can be used to perform homework at a faster pace and with greater precision. The student may compose text or develop a database for future homework assignments.

\*506 Pheasant Ridge Drive, Warner Robins, GA 31088



*Note the sleek design of the compact column cabinet. It has all ON/OFF, RESET, and TURBO controls within easy reach of the user. Drive indicators and drive access doors are also up front. No more looking and searching for the correct button to push. Additional security is provided in the form of a "key-lock" adjacent to the POWER switch.*

The presence of the computer in the home also allows the parent to explore its many uses. In addition, the parent may soon discover how the computer can be used as a tool to keep track of the family income. The parent quickly learns how easy it is to use the computer, because the software that is being developed now uses a "common sense" approach. We can take a few minutes each week to sit at the home PC and balance the budget, update our bank books, and record tax information. These are just a few of the uses of the personal computer.

Because of this onslaught of data processing, computer-based working, and

living environments, educators have discovered a totally new curriculum. Schools and colleges are teaching the use of the PC in the classroom.

No sooner had schools of higher learning discovered the need for computer instruction courses, then they learned they had an added requirement. Software programs for the personal computer had risen to a seemingly complex level. This brought on a new application for both business and industry. Schools had to add specialized courses to teach database, spread-sheet, Computer Aided Design (CAD), and Computer Aided Manufacturer (CAM) courses.



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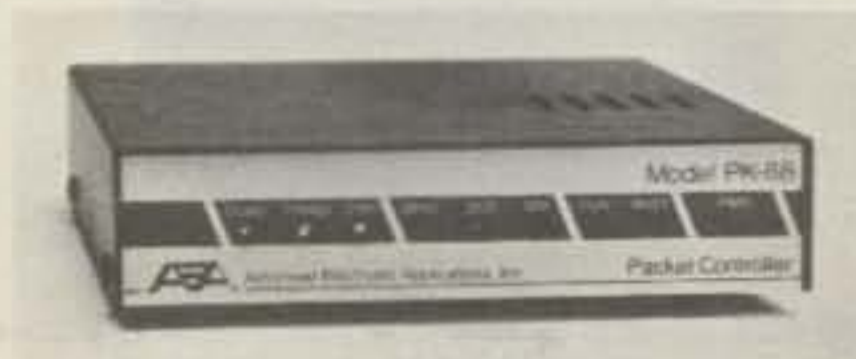
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The MM-3 also features automatic serial number insertion and incrementing in any memory message. Use the front panel knob to adjust your sending speed or enter a precise speed with the keypad, toggling between the two at any time. Exchanges can be expedited by having parts of your message sent at a higher speed. You can even add remote switches for four of the memories to send your response or call CQ. The MM-3 can also be programmed for automatic beacon use. The RS-232 compatible serial I/O port provides computer control of the MM-3 and monitoring of the Morse training features.

## Packet



### PK-88 Packet Radio TNC

Unique operating features with a proven hardware and software design make AEA's PK-88 your best choice in packet radio--now with MailDrop, an 8KByte efficient personal Mailbox. The PK-88 also allows multiple single frequency QSO's, digipeating and networking. It's a superb value, packed with all the most needed packet radio features such as direct interface capability with NET/ROM and TCP/IP. In addition to all the features of a "standard" TNC, the PK-88 offers features not found in any other TNC:

- **WHYNOT** command - Shows reasons why some received packets are not displayed.
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- **Enhanced MPROTO** command - Suppresses display of non-ASCII packets from Level Three switches and network nodes.

## Multi-Mode



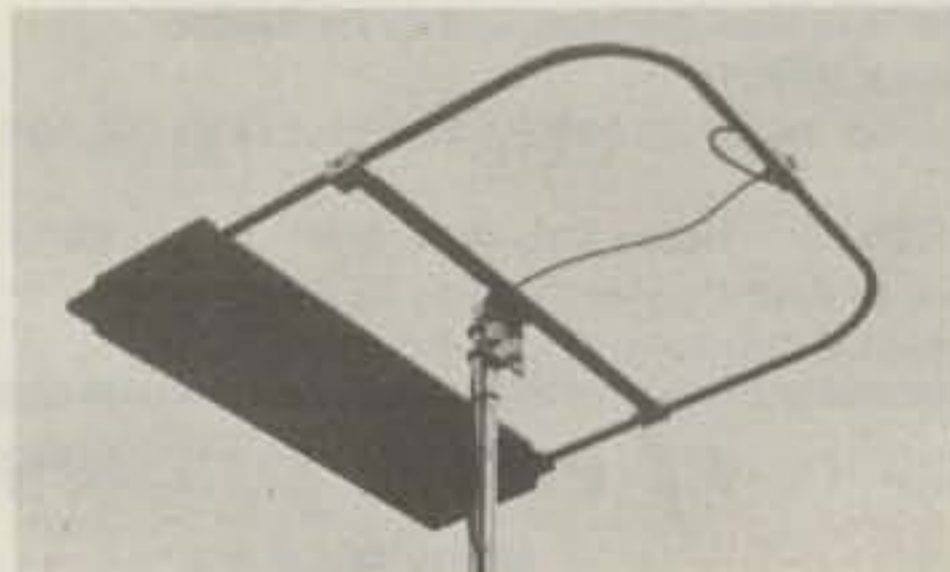
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## Antennas



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AEA brings you the breakthrough in compact HF antenna design with its high-performance, low-profile IsoLoop HF antenna. Designed specifically for hams with limited space or antenna restrictions, the 32"-square IsoLoop covers all frequencies from 14 to 30 MHz, at up to 150 watts continuous.

No ground radials are needed and its balanced, shielded feed-loop isolates the antenna from the feedline. This ensures that your signal is radiated by

the antenna, not the feedline, which helps eliminate TVI and stray RF in the shack.

The inherent hi-Q of the IsoLoop makes it like a very sharp tunable filter that radiates. The narrow bandwidth suppresses harmonics from your transmitter, and also attenuates out-of-band signals that could overload your receiver.

The omni-directional IsoLoop makes an excellent attic or balcony antenna, and because it weighs only 12 pounds is also perfect for portable use.

# Better Experience

## Dummy Load

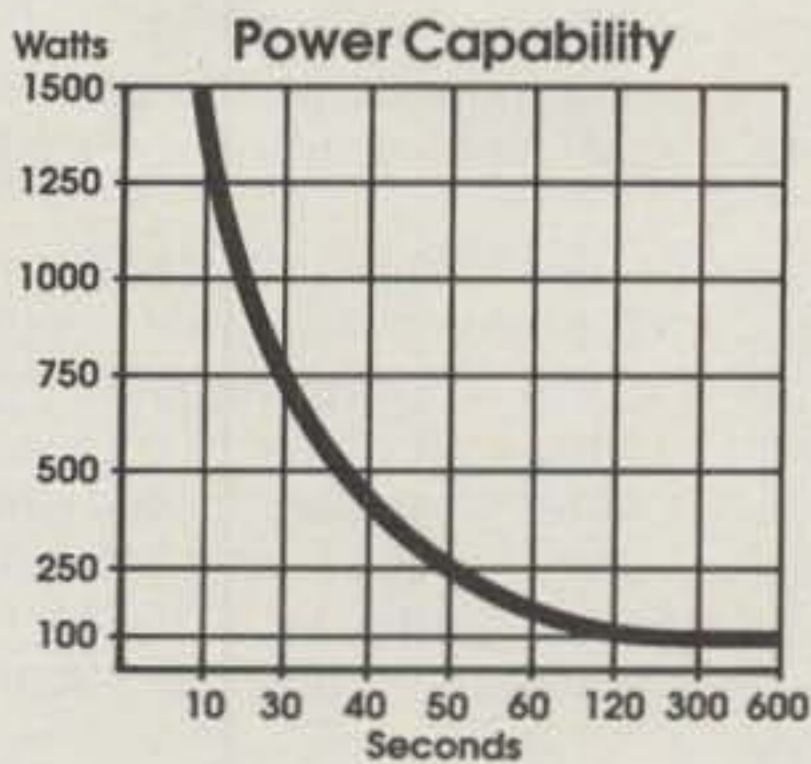


### DL-1500

#### DC-650 MHz Up to 1500 Watts

AEA's dry dummy load simulates a perfect 50 ohm antenna up to 650 MHz so you can test your transmitter without radiating a signal on the air.

- DC-650 MHz
- Simulates matched 50 ohm transmission line to test your transmitter
- Handles short-term RF power up to 1500 watts
- VSWR of less than 1.3:1 at 650 MHz
- Compact and lightweight
- Air cooled dry load



## EconoTuner



### ET-1 Antenna Tuner

#### 300 Watts of All-Band Tuning

Meet your match with AEA's new ET-1 Econo-Tuner™. A quality, economical antenna tuner for under \$150, the ET-1 Econo-Tuner is designed to match virtually any receiver, transmitter or transceiver from 1.8 to 30 MHz with up to 300 watts of RF power.

Compatible with almost ANY antenna including verticals, dipoles, inverted vees, beams and mobile whips that are fed by coax cable, balanced lines or a single wire. For easy connection to balanced lines, a 4:1 balun is built-in.

A front panel switch control allows you to switch between two coax-fed antennas (direct or through the tuner). You can also switch to a balanced line or wire antenna. The BYPASS position allows you to switch to a dummy load (such as AEA's DL-1500 dry dummy load) or a direct connected coax antenna. In the BYPASS position, COAX 1 OUT or COAX 2 OUT can be selected so that the tuner is bypassed, but not the meter circuit.

The ET-1 features a precision dual-movement meter to simultaneously monitor power and SWR.

Unique engineering designs have made AEA one of the leading innovators in the amateur radio industry. That same quality and superior technical support make the ET-1 your best deal for an antenna tuner.

## Antennas

### IsoPole™ Omni-Directional VHF and UHF Base Station Antennas

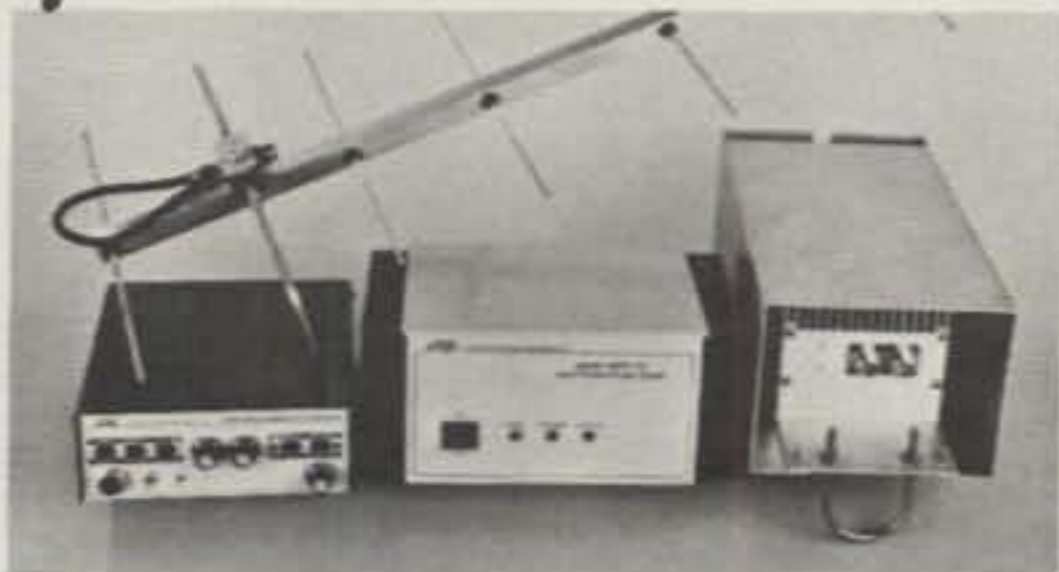


An outstanding mechanical and electrical design make the IsoPole the best choice for an economical omni-directional VHF or UHF base station antenna. All IsoPole antennas yield the maximum gain attainable for their respective lengths and a zero degree angle of radiation which puts the most signal on the horizon. Exceptional decoupling results in simple tuning and a significant reduction in TVI potential. Decoupling cones offer great efficiency over obsolete radials which radiate in the horizontal plane. The IsoPoles also have a broader frequency coverage than any comparable antennas. Typical SWR is 1.4 to 1 or better across the entire band!

All mounting hardware is stainless steel. The decoupling cones and radiating elements are made of corrosion-resistant aluminum alloys. Aerodynamic cones are the only appreciable wind load and are attached directly to the support (a standard TV mast, not supplied).

IsoPoles are ideal for packet radio. The decoupling cones stop computer hash picked up by the outer shield of the coaxial cable from being passed to the receiver.

## Amateur TV

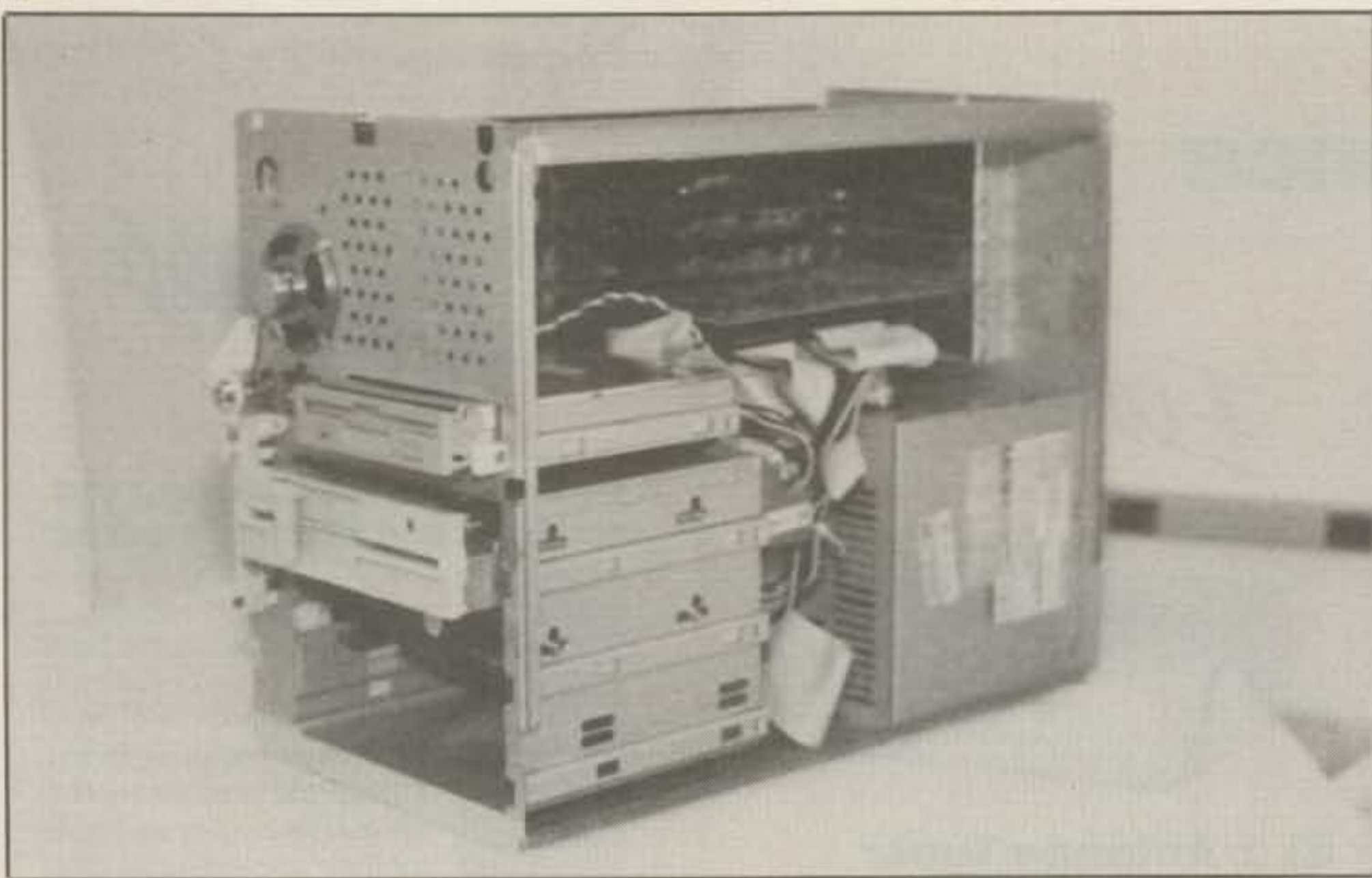


### AEA's New ATV System

Add a new dimension to your amateur radio communications with AEA's Amateur Television (ATV) system. If you hold at least a technician-class license, you can transmit and receive live or taped audio and video Fast-Scan TV (FSTV) information that rivals broadcast quality. Now you can share more than conversation over the air with this new mode of "personal communications."

**It's Easy and Inexpensive.** If you have a video camera or camcorder and a standard TV set, you may already own the most expensive components of an ATV system. AEA's ATV system includes a transceiver and antenna. Simply connect the camera, TV and the antenna to the transceiver, and you're on the air LIVE with one watt P.E.P.! If you want to broadcast with more power, AEA also offers a 50 watt mast-mounted linear amplifier and GaAsFET preamp with power supply. Your TV set will monitor your transmitted and received pictures.

Amplifier Now Available.



With the sturdy steel cabinet removed, the Sierra Technologies 80386SX continues to display a strong and rugged personality.

## Just Another Member Of The Family

Soon each family in America will find the need to "adopt" a computer. There are already small single- and dual-task computers in the household, but these support specific chores or actions such as timing, make/break, ON/OFF or start/stop functions in the automatic washers, climate control, energy control, etc. Even the small smoke detectors that are required in all new homes are microprocessor based.

When we think of the differences the computer has made in our lives, we begin to understand how great the impact of the PC really is. Our society has accepted the personal computer as a quiescent member of the household who stands ready to dash into action at the simplest command.

In many ways our home computer has a "personality" all its own. It has become a probing force behind our day-to-day decision making and productivity. The computer has given us more leisure time, and with the same offering, we've included it as a participant in much of our leisure.

## Tools or Toys?

I use the PC as a tool, but when I'm not "tooling" around, I'm at one PC building another article for the "The Packet User's Notebook" column. Another PC is being used in a packet QSO with a DX station on 20 meters. Still another is passing binary files with a station on 2 meters, and a fourth computer is transferring a 256-color, high-resolution picture to a friend via packet video. I can use the PC just as easily on AMTOR, RTTY, CW, ASCII, or any other digital mode that

comes to mind. The PC when associated with amateur radio can be summed up in the following sentence: The computer is one of the most useful components in today's ham shack simply because of its versatility, dependability, and durability.

## A Search for Tomorrow

I used to look through the "swapper" magazines and shopping guides for a bargain-basement price on a PC. The problem I ran into with this "shopping-blind" method was all too often I came up short on the parts I had ordered by means of "back orders," or I was disappointed with what I had received.

The element of surprise was very often just that. When the merchandise I thought I had purchased arrived, we were surprised! In some instances items that were "supposed" to be included weren't, and other times such items were included but were defective. I was on the phone long distance on my nickel calling the vendor to discuss how we were going to resolve my dilemma.

I've spent too much time and expense recently searching for the next generation of PC for my writing, drawing, and packeting. This is why I'm writing this article and review. I truly feel that I might save a prospective computer purchaser some time and money by pointing out the possible pitfalls that can be encountered.

## Look Before You Leap

My next PC purchase had to be thought out carefully, because I wanted this PC to be around for awhile. In the writing business there is no longer time to spend

shopping for "just the right" mouse trap. I didn't care to go through the "shopping rags" to find all the bits and pieces that I needed to build an 80386 machine. I have the 8088s, the 8086s, and 80286 XTs and ATs.

This time it had to be short, sweet, and ready to run. I had decided that I wanted the 80386SX system. I went first for quality, with best price second. My plans were to purchase the system from a dealer who had a good reputation as a supplier and the best technical support record after the sale.

This 80386SX would be completely outfitted with all the elements that are needed to support DesignCAD for my drawings in the "Packet User's Notebook" column, as they are drawn using the DesignCAD and AutoSketch.

In addition to a serial port for the Trak-Ball, I needed a second serial port to attach another data transfer switch that fans out to five TNCs.

My "search for tomorrow's" PC is over. I had a reason to look for the best bang for my buck, and I found it.

While in a packet QSO with my son Glynn, WB4RHO, I mentioned that I was searching for a good deal in a 386 system. He quickly suggested "Randy's Discount Disks." He told me that he and a friend, Jimmy, KC4HFK, had each purchased new systems from Randy, and had found the PCs to be perfect in every option they had ordered.

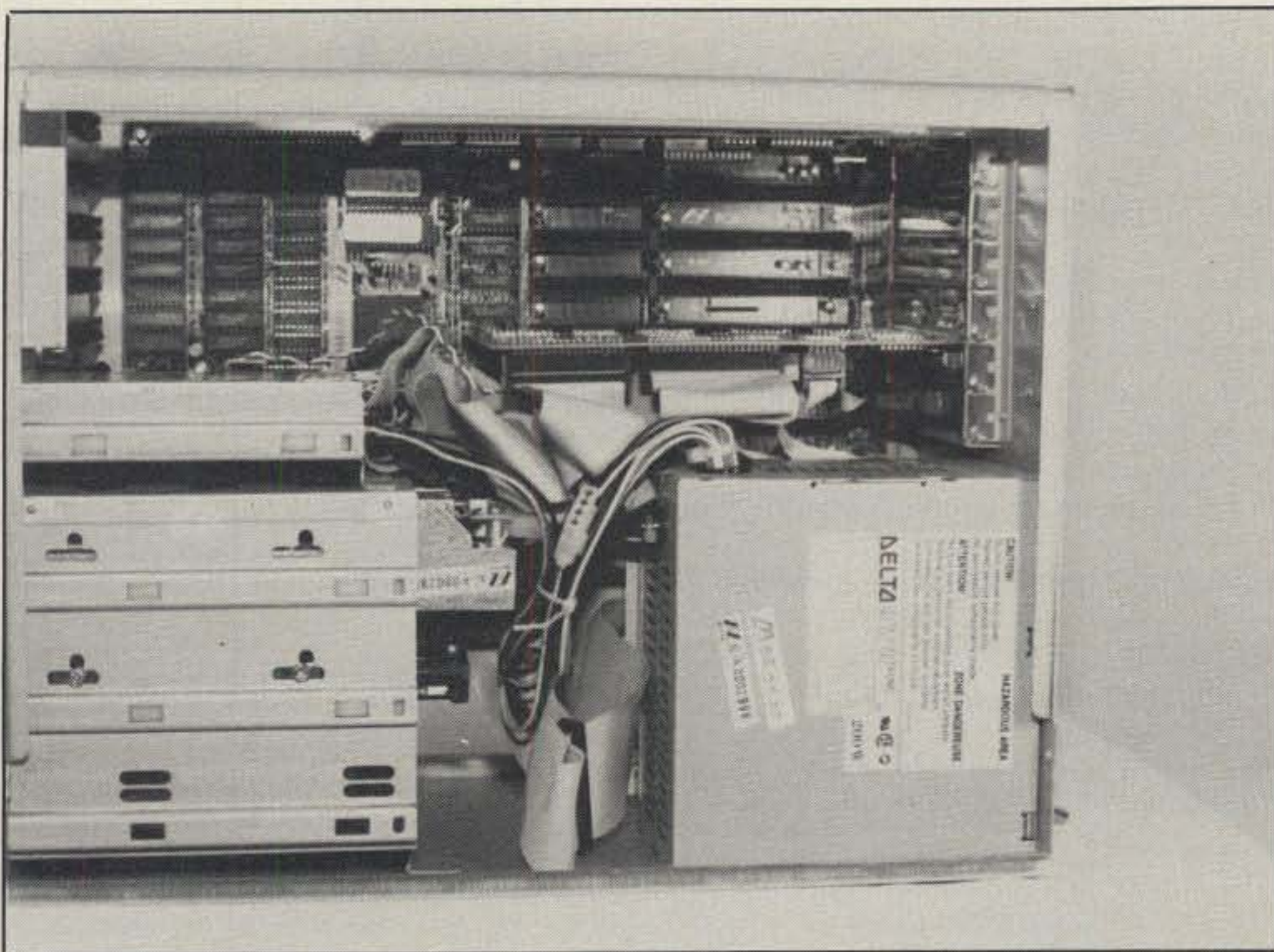
Coming from my son, that had to be an endorsement if I ever heard one. Glynn is aware of how meticulous I am with my equipment purchases, and he seemed so positive that I had to at least give Randy's a try.

I asked Glynn to give me the telephone number. The next packet that appeared contained the toll-free number. I "hot-keyed" to the text editor feature of the MULTICOM terminal program and sent the toll-free number to the printer. While I was in the editor feature of MULTICOM, I sent the phone number to disk as "RANDYS.NUM."

Glynn and I completed our packet QSO, so I decided to give Randy a call. I dialed order-line number 1-800-543-2237. When the operator answered "Sierra Technologies," I thought for a moment that I may have dialed an incorrect number. As it turns out, Sierra Technologies is the parent company of Randy's Discount Disks.

Randy was outside, so I left my telephone number, and in about ten minutes he returned my call. We discussed my wants, needs, likes, and dislikes. In a very short time I had the bottom line figure for the system I wanted and needed. As a matter of fact, Randy had the exact system I needed already put together in a "package," so to speak.

I didn't make my decision at that moment, because we were a few days away



Even after the standard features are added, there are empty expansion ports that can allow adding future features and peripherals.

from the 1990 Dayton Hamvention and I wanted to do more shopping around.

As usual, I enjoyed the Dayton Hamvention, and I did more shopping around for the system I needed. With every price quotation the arithmetic kept me shopping. I finally got around to visiting Randy's booth at Dayton. There was no denying that Randy Bridges was present at Dayton. That was not a booth, but rather that was wall to wall computers. From the looks of it, I thought I would have to take a number or make an appointment to see Randy. We amateurs have a sixth sense when it comes to finding a bargain, and it was apparent that Randy was making some available. We discussed the previous quote, and he continued to be as good as his word. His "deal" was the best yet, and what's more, Randy had the system in stock and ready to ship. I asked him to ship it to me as soon as he got back from Dayton.

A few days later UPS made the delivery, and I was in PC heaven. I methodically put together the system in a calm and reserved manner.

Now if you believe that last sentence, then I have a "deal" for you. What really happened is this: I had that system unpacked, connected together, and humming in no time flat. The best part of all is that "Randy 2" (that's the way I keep the two Randys separate—Randy 1 is Randy Bridges, and Randy 2 is Randy Zipper) had already installed my Disk Operating System (DOS) formatted and partitioned on the hard disk for me. My job was simple because all I had to do was connect the keyboard, short-stack, and monitor

together, apply power, and the system booted to the "C>" prompt.

I had briefly mentioned to Randy that I wanted the disk partitioned into two segments as drive(s) "C" and "D." I could just as easily have had the full 40 megabytes as one "C" drive if I wanted to run it in that configuration. MS/DOS 4.01 and above will easily support the full 40 megabyte hard disk.

### A Lot of Computer For The Money

There it was, 1 megabyte of memory (RAM), 40 megabyte hard disk, one 1.2 mb 5.25 inch floppy, one 1.44 mb 3.5 inch drive, two serial (COM) ports, a parallel printer port, column cabinet (short-stack), the TTX VGA monitor, PVGA 1024 VGA color card with 512K of graphics memory (RAM) installed on the color card, and the 80386SX CPU. It was up and running in very short order. I connected my printer to the parallel port and ran a printer test to confirm communications between the computer and the printer.

Next I installed my PCTOOLS.EXE 4.3 (older version—someday I'll buy version 6.0) and prepare to transfer some of my favorite word-processor and other often-used programs and files from the old 8088 machines.

### Several Days Later

What did I do before the 80386SX? This computer is *fast*, and it didn't cost an arm



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  - 83-168 UHF, RG-59/U Reducer . . . . . .41
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  - 82-101 Type-N, Barrel Adapter . . . . . 5.47
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- 124WB 144 to 148-MHz, 4-Element Beam . . . 44.00
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- RS-35A 13.8 VDC, 35 Amp Int., 25 Amp Cont. . . . 138.94
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and a leg. With DesignCAD my drawings seem to "pop" to the screen. With my old version of Professional Write word processor, I used to be able to type faster than the screen could update. Not so anymore. This is "speed" in the greatest sense of the word.

## Resolution

Perhaps now is a good time to describe the viewing capabilities. With the PVGA 1024 card stuffed with 512K (standard with the Sierra) of RAM, the color rendition that it exhibits is certainly a treat for the palette of the eye.

The PVGA 1024 color graphics card can deliver 1024 x 768 resolution modes that provide 16 colors with the accompanying software that is supplied with the Sierra 80386SX system. It has all the capabilities of the IBM Personal System/2™ VGA Display Adapter including full VGA compatibility at the hardware level.

With support for a 16-bit bus and high-

speed memory access, the Data Bus allows the PVGA 1024 to present a data path between the system processor and the video display memory that is two times the width of the 8-bit video display systems. This also includes the 16-bit video BIOS implementation of the AutoSense™ feature.

The graphics card also supports 640 by 400 dot enhanced graphics with 256 simultaneous colors from a palette of over 262,000 possible colors, with the 512K of display memory.

As most readers already know, I'm obsessed with computer pictures and graphics. I collect pictures of airplanes, cars, women, and flowers, especially roses. Many of the "GIF" format picture disks that readers send to me are in my collection. Most of my graphics collection are in VGA, and many are converted to the packet VGA picture format. With this new TTX VGA monitor and PVGA 1024 color display combination, I've begun admiring and "showing-off" my picture collection more often.

As I view these brilliant and extreme regions of the visible light spectrum on this Sierra system, I cannot help but be thankful for the blessing of good eyesight. This kind of resolution and color-imagery is where we discover a strange form of solace and gratification that has mystified the artist and art lovers for eons.

## In Retrospect

As I look back over the last several months, I'm proud and happy with the purchase of the 80386SX system from Sierra Technologies. If you find yourself at an impasse about which system to purchase, then you owe it to yourself and your checkbook to give Randy a toll-free call at 1-800-543-2237. You may discover they have the exact system for which you are shopping. If you need other information, try the info line, 904-729-3444. For technical assistance, you may call the tech hot-line at 904-729-3447. The mailing address is Sierra Technologies Group, 143 John Simms Parkway, Valparaiso, FL 32580.

The Sierra Technologies System that I purchased and described here is 100% IBM compatible and runs at 16 (or 8) MHz speed, with a zero wait state. It is supplied with the VGA color monitor and the PVGA color card described above.

One 3.5 inch 1.44 megabyte and one 5.25 inch 1.2 megabyte floppy disk drive are included. The workhorse of the drives is the 40 megabyte hard drive that has an access time of better than 20 milliseconds.

One megabyte of RAM is installed, and the system can be expanded to eight megabytes of on-board RAM. There are two serial ports and a parallel printer port. A battery-backed real-time clock/calendar board is also included. A 101 key, IBM-style keyboard is standard with the Sierra system.

It is a complete PC with all the trimmings, and the mother board is socketed for the addition of a math co-processor if so desired. There are extra, vacant expansion slots in the upright "short-stack" for future additions such as digitizers and other hardware peripherals.

The Sierra system retails for \$2495, and the amateur net price is \$1895.


## Trademarks

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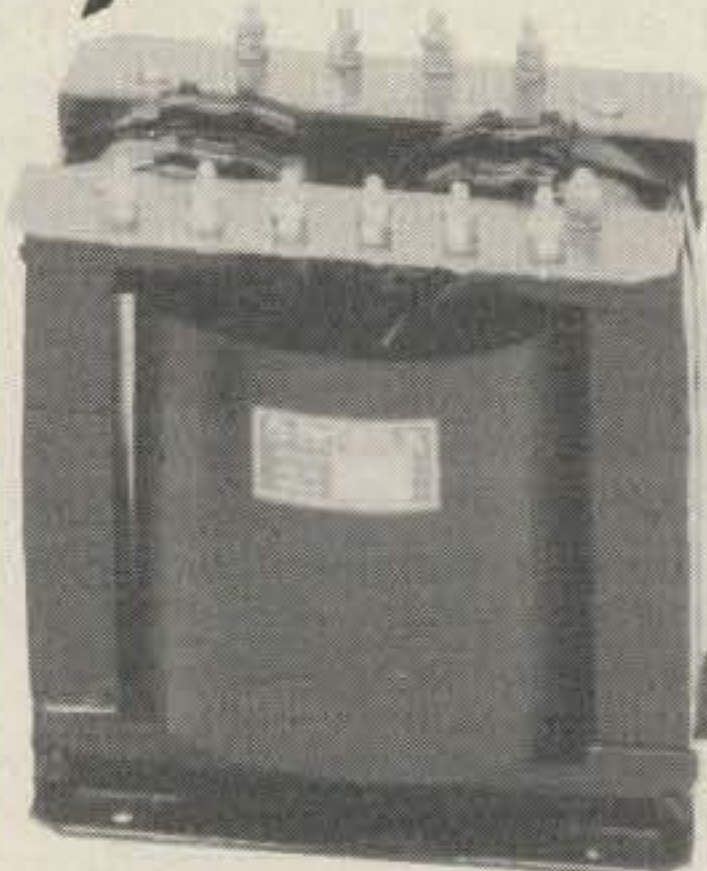
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The HTX-100 operates USB or semi break-in CW with sidetone. Packet compatible? Yes, with 40 ms rx/tx turnaround. Eight-pin mike connector. Requires 12VDC at 7 amps. Only \$259.95

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HTX-100 is backed by a 1-Year Limited Warranty and Realistic's outstanding quality control. The optional Tandy® Service Plan extends warranty to five years for just pennies a month!

See this high-performance transceiver now at one of the 7000 Radio Shack locations, along with our big selection of accessories for improving your home or mobile station. Your nearby Radio Shack store offers excellent values in coax cable, antenna wire and hardware, RF connectors and adapters, fuses, power strips and more.

NOTE: You must have a current FCC Amateur Radio License to transmit with this transceiver. Prices apply at participating Radio Shack stores and dealers. Radio Shack is a division of Tandy Corporation

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# Rules For The CQ WAZ Awards Program



**T**he CQ Worked All Zones (WAZ) Award and its variations are issued to any licensed amateur station presenting proof of contact with the appropriate number of CQ zones of the world. This proof consists of proper QSL cards which in many cases may be checked by any of the authorized check points or sent directly to the WAZ Award Manager. Many of the major DX clubs in the USA and Canada and most national amateur radio societies are authorized CQ check points. If in doubt, consult the WAZ Award Manager. Any legal type of emission may be used, providing communication was established after November 14, 1945 for the basic award.

1. The Official CQ WAZ Zone Map and the printed zone list which follows these rules are used to determine the zone in which a station is located.

2. Confirmations must be accompanied by a list of claimed zones, using CQ form 1479 or a facsimile, showing the callsign of the station contacted within each zone, with the date, time, band, and mode of each contact. The list must also clearly show the applicant's name, callsign, and complete mailing address. The applicant must show the type of award for which he or she is applying, such as Mixed Mode, All SSB, or All CW (see #7 below). A hand-written list may be submitted and will be accepted for processing, provided that the above information is shown.

3. All contacts must be made with licensed, land-based, amateur service stations operating in authorized (on the date of contact) amateur bands. Contacts with non-land-based stations, such as ships at sea, aeronautical mobile, or polar ice stations are not acceptable.

Awards obtained by any mobile station will be endorsed as such, as will awards obtained by QRP stations, providing that the QSL cards submitted specify these modifiers.

4. All contacts submitted by the applicant must be made from within the same DXCC country. It is recommended that each submitted QSL clearly show the contacted station's zone number, if possible. When the applicant submits cards made out to different callsigns, evidence should be provided to show that he or she also holds or has held those callsigns at the time of the contact.

5. Any altered or forged confirmations submitted by an applicant for WAZ credit may result in permanent disqualification. The WAZ Manager may request the resubmission of certain confirmations as required. While a QSL card is normally accepted as proof of a contact, the final proof is an entry in the DX station's logbook for the listed QSO. Failure to resubmit QSLs in a timely manner when requested by the WAZ Manager may result in the recall of the award in question. Submission of an application for any WAZ award acknowledges consent to abide by the decisions of the CQ WAZ Manager and the CQ Awards Committee.

6. An application must be accompanied by the processing fee (subscribers must include a recent CQ mailing label with the application fee of \$4.00; nonsubscribers \$10.00) and a self-addressed envelope with sufficient postage or International Reply Coupons (IRCs) to return the QSL cards by the class of mail desired and indicated. International Reply Coupons equal in redemption value to the processing fee are acceptable. The 1990 redemption value of IRCs is \$.50 each. Checks should be made out to the name of the WAZ Award Manager.

7. In addition to the basic certificate for which any and all HF bands may be used, specially endorsed and numbered certificates are available for Phone (including AM), Single Sideband, and CW operation. The Phone certificate requires that all contacts be Two-Way Phone, the SSB certificate requires that all contacts be Two-Way SSB, and the CW certificate requires that all contacts be Two-Way CW.<sup>1</sup>

8. If at the time of the original application a note is made stating the possibility of a subsequent application for an endorsement or special certificate, only the missing confirmations required for that endorsement need be submitted with the later application, providing a copy of the original authorization signed by the WAZ Manager is enclosed.

9. Decisions of the CQ Awards Committee on any matter pertaining to the administration of this award are final.

10. All applications should be sent to the WAZ Award Manager after the QSL cards have

been checked by an authorized CQ check point. If the application is for 160 meters or 5 Band WAZ, all QSL cards must be checked by the WAZ Award Manager.

11. Zone maps, printed rules, and application forms are available from the WAZ Award Manager. Send a 6 x 9 inch self-addressed envelope with \$.65 postage, or \$1.00 and your address label. For DX stations, send an address label and 3 IRCs.

The following list of zones is presented as a guide. Any questions will be decided by the CQ Zone Map. For rulings on borderline areas, consult the WAZ Award Manager.

**Zone 1.** Northwestern Zone of North America: KL7, VY1/VE8 Yukon, the Northwest Territories west of 102 degrees. (Includes the islands of Victoria, Banks, Melville, and Prince Patrick.)

**Zone 2.** Northeastern Zone of North America: VO2 Labrador, the portion of VE2 Quebec north of the 50th parallel, the VE8 Northwest Territories east of 102 degrees. (Includes the islands of King Christian, King William, Prince of Wales, Somerset, Bathurst, Devon, Ellesmere, Baffin, and the Melville and Boothia Peninsulas.)

**Zone 3.** Western Zone of North America: VE7, W6, and the W7 states of Arizona, Idaho, Nevada, Oregon, Utah, and Washington.

**Zone 4.** Central Zone of North America: VE3, VE4, VE5, VE6, and W7 states of Montana and Wyoming, W0, W9, W8 (except West Virginia), W5, and the W4 states of Alabama, Tennessee, and Kentucky.

**Zone 5.** Eastern Zone of North America: 4U1UN, CY9, CY0, FP, VE1/VY2, VO1, the portion VE2 Quebec south of the 50th parallel, VP9, W1, W2, W3, and the W4 states of Florida, Georgia, South Carolina, North Carolina, Virginia, and the W8 state of West Virginia.

**Zone 6.** Southern Zone of North America: XE/XF, XF4 (Revilla Gigedo).

**Zone 7.** Central American Zone: FO (Cliperton), HK0 (San Andres), HP, HR, TG, TI, TI9, V3, YN, and YS.

**Zone 8.** West Indies Zone: C6, CO, FG, FJ, FM, FS, HH, HI, J3, J6, J7, J8, KG4 (Guantanamo), KP1, KP2, KP4, KP5, PJ (Saba, St. Maarten, St. Eustatius), V2, V4, VP2, VP5, YV0 (Aves Is.), ZF, 6Y, and 8P.

**Zone 9.** Northern Zone of South America: FY, HK, HK0 (Malpelo), P4, PJ (Bonaire, Curacao), PZ, YV, 8R, and 9Y.

**Zone 10.** Western Zone of South America: CP, HC, HC8, and OA.

**Zone 11.** Central Zone of South America: PY, PY0, and ZP.

**Zone 12.** Southwest Zone of South America: 3Y (Peter I), CE, CE0 (Easter Is., Juan Fernandez Is., San Felix Is.), and some Antarctic stations.<sup>2</sup>

**Zone 13.** Southeast Zone of South America:

<sup>1</sup>The Two-Way CW Award is a new addition to the WAZ Program. Previously all Mixed WAZ Awards were numbered consecutively, with All CW noted. This practice will continue for mixed mode applications. In addition, a new WAZ Award is being announced. Beginning January 1, 1991, the All CW WAZ Award will be issued. This is a new award, and certificate numbers will start with number 1. To qualify, the QSL card from each zone must indicate a contact on two-way CW and must be dated after January 1, 1991.

<sup>2</sup>Antarctic notes. The boundaries of CQ zones 12, 13, 29, 30, 32, 38, and 39 converge at the South Pole. Stations KC4AAA and KC4USN are at the South Pole, and will count for any one of the listed zones. Most Antarctic stations indicate their zone on the QSL card. A few stations and their zones are: 4K1A 39, 4K1B 29, 4K1C 29, 4K1D 38, 4K1E 29, 4K1F 13, 4K1G 30, 4K1H 12, 4K1J 13, 8J1RL 39, CE9 13, DP0 38, FT-Y 30, HF0POL 13, HL5BDS 13, KC4AAC 13, KC4AAD 13, KC4AAE 29, KC4USB 32, KC4USV 30, LU-Z 13, VK0GM 29, VP8ME 38, Y38ANT 38, and ZL5AA 30. This list changes frequently. Questions regarding the zone location of a particular Antarctic station should be directed to the WAZ Award Manager.

CX, LU, VP8 Islands, and some Antarctic stations.<sup>2</sup>

**Zone 14.** Western Zone of Europe: C3, CT, CU, DL, EA, EA6, EI, F, G, GD, GI, GJ, GM, GU, GW, HB, HB0, LA, LX, ON, OY, OZ, PA, SM, Y2, ZB, 3A, and 4U1ITU.

**Zone 15.** Central European Zone: ES (UR), HA, HV, I, IS0, LY (UP), OE, OH, OH0, OJ0, OK, SP, T7, TK, UA2, YL (UQ), YU, ZA, 1A0, 9H.

**Zone 16.** Eastern Zone of Europe: UA1, UA3, UA4, UA6, UA9(S,W), UB, UC, UO, and 4J1 (M.V. Island).

**Zone 17.** Western Zone of Siberia: UA9 (A,C,F,G,J,K,L,Q,X) and UH, UI, UJ, UL, and UM.

**Zone 18.** Central Siberian Zone: UA9 (H,O,U,V,Y,Z) and UA0 (A,B,H,O,S,T,U,V,W).

**Zone 19.** Eastern Siberian Zone: UA0 (C,F,I,J,K,L,Q,Z).

**Zone 20.** Balkan Zone: JY, LZ, OD, SV, TA, YK, YO, ZC4, 4X and 5B.

**Zone 21.** Southwestern Zone of Asia: A4, A6, A7, A9, AP, EP, HZ, UD, UF, UG, YA, YI, 4W, 7O, 9K, and J2/A (Abu Ail).

**Zone 22.** Southern Zone of Asia: A5, S2, VU, VU (Laccadive Is.), 4S, 8Q, and 9N.

**Zone 23.** Central Zone of Asia: JT, UA0Y, BY3G-L, BY9A-L, BY9T-Z, and BY0.

**Zone 24.** Eastern Zone of Asia: BV, BY1, BY2, BY3A-F, BY3M-S, BY3T-Z, BY4, BY5, BY6, BY7, BY8, BY9M-S, VS6, and XX.

**Zone 25.** Japanese Zone: HL and JA.

**Zone 26.** Southeastern Zone of Asia: HS, VU (Andaman and Nicobar Islands), XV, XU, XW, XZ, and 1S (Spratly Islands).

**Zone 27.** Philippine Zone: DU (Philippines), JD1 (Minami Torishima), JD1 (Ogasawara), KC6 (Republic of Belau), KH2 (Guam), KH0 (Marianas Is.), V6 (Fed. States of Micronesia).

**Zone 28.** Indonesian Zone: H4, P2, V8, YB, 9M, and 9V.

**Zone 29.** Western Zone of Australia: VK6, VK8, VK9X (Christmas Is.), VK9Y (Cocos-Keeling Is.), and some Antarctic stations.<sup>2</sup>

**Zone 30.** Eastern Zone of Australia: VK1-VK5, VK7, VK9L (Lord Howe Is.), VK9 (Willis Is.), VK9 (Mellish Reef), VK0 (Macquarie Is.), and some Antarctic stations.<sup>2</sup>

**Zone 31.** Central Pacific Zone: C2, FO (Marqueses), KH1, KH3, KH4, KH5, KH6, KH7, KH9, T2, T3, V7, and ZK3.

**Zone 32.** New Zealand Zone: A3, FK, FO (except Marqueses and Clipperton), FW, KH8, VK9 (Norfolk Is.), VR6, YJ, ZK1, ZK2, ZL, 3D2, 5W, and some Antarctic stations.<sup>2</sup>

**Zone 33.** Northwestern Zone of Africa: CN, CT3, EA8, EA9, IG9, S0, 3V, and 7X.

**Zone 34.** Northeastern Zone of Africa: ST, ST0, SU, and 5A.

**Zone 35.** Central Zone of Africa: C5, D4, EL, J5, TU, TY, TZ, XT, 3X, 5N, 5T, 5U, 5V, 6W, 9G, and 9L.

**Zone 36.** Equatorial Zone of Africa: D2, TJ, TL, TN, S9, TR, TT, ZD7, ZD8, 3C, 9J, 9Q, 9U, and 9X.

**Zone 37.** Eastern Zone of Africa: C9, ET, J2, T5, 5H, 5X, 5Z, and 7Q.

**Zone 38.** South African Zone: A2, ZD9, Z2, ZS1-9, 3DA0, 3Y (Bouvet Is.), 7P, and some Antarctic stations.<sup>2</sup>

**Zone 39.** Madagascar Zone: D6, FT-W, FT-X, FT-Z, FH, FR, S7, VQ9, 3B6/7, 3B8, 3B9, 5R8, and some Antarctic stations.<sup>2</sup>

**Zone 40.** North Atlantic Zone: JW, JX, OX, TF, and 4K2 (Franz Josef Land).

### Single Band WAZ

Special WAZ Awards will be issued to amateur radio stations presenting proof of contact

with the 40 zones of the world on *one* of the bands: 80, 40, 20, 15, 10. Contacts for a single band WAZ must have been made after January 1, 1973. Single band certificates will be awarded for ALL SSB or for ALL CW only.

### 5 Band WAZ

Applicants who succeed in presenting proof of contact with the 40 zones of the world on the 80, 40, 20, 15, and 10 meter bands (for a total of 200) receive a special certificate in recognition of this achievement. A prerequisite for 5 Band WAZ is that the applicant must already be a holder of any 40-zone WAZ.

The 5 Band WAZ Award is offered for any combination of CW, SSB, RTTY, or other mode contact, mixed mode only. Separate awards will not be offered for the different modes. Contacts must have been made after 0000Z January 1, 1979. Initial proof of contact shall consist only of QSL cards checked by the WAZ Manager, and all provisions of Rule 5 of the WAZ rules are strictly enforced. The first plateau is a total of 150 zones on a combination of 5 bands. Applicants should use a separate sheet for each band, using CQ form 1479 or a facsimile.

After the 150 zone point, each 10 zones requires the submission of the QSL cards and a \$1.00 fee. At the 200 zone point the applicant will be awarded a gold sticker for the certificate and the opportunity to purchase an engraved plaque to commemorate the achievement.

All applications should be sent to the WAZ Award Manager. The 5 Band Award is governed by the same rules as the regular WAZ Award and uses the same boundaries.

### WARC Bands WAZ

Effective January 1, 1991 single band WAZ Awards will be issued to amateur radio stations presenting proof of contact with the 40 zones of the world on any *one* of the WARC bands: 30, 17, or 12 meters. (Each band constitutes a separate award, and each may be applied for separately.) This award is available for Mixed Mode, All SSB, All CW, or All RTTY. Contacts for each one of these WARC WAZ Awards must have been made after each station involved in the contact had permission from its licensing authority to operate on the band and mode.

### RTTY WAZ

Special WAZ Awards are issued to amateur radio stations presenting proof of contact with the 40 zones of the world using RTTY. For the mixed band award QSL cards must show a date of November 15, 1945 or later. The RTTY WAZ is also available with a single band endorsement. For a single band endorsement for 80, 40, 20, 15, or 10 meters the QSL cards must show a date of January 1, 1973 or later.

### WNZ

WNZ stands for "Worked Novice Zones" and is available *only* to holders of a U.S. Novice or Technician class license. Proof of contact with at least 25 of the 40 CQ zones as defined by the WAZ rules is required. All contacts must be made using the 80, 40, 15, and 10 meter Novice bands. All contacts must be made while holding a Novice or Technician class license, although the application may be submitted at a later date. Contacts must be made prior to receiving authorization to operate with

higher class privileges. The WNZ is available as a Mixed Mode, CW Only, or SSB Only award. It may also be endorsed for a single band. The WNZ Award may be used to fulfill part of the application requirement for the WAZ Award when all 40 zones are confirmed.

1. The basic award may be secured by submitting QSL cards for 25 zones. The processing fee is \$5.00 for all applicants.

2. All QSL cards must show a date of January 1, 1952 or later.

3. Use CQ form 1479 or a facsimile to make application for this award.

### 160 Meter WAZ

The WAZ Award for 160 Meters requires that the applicant submit directly to the WAZ Manager QSL cards from at least 30 zones. All QSL cards must be dated January 1, 1975 or later, and a \$5.00 application fee must accompany all applications. The 160 WAZ is a mixed mode award only. The basic 160 WAZ Award may be secured by submitting QSL cards from 30 zones. Stickers for 35, 36, 37, 38, 39, and 40 zones may be secured from the WAZ Manager upon the submission of the QSL cards and \$2.00 for each sticker.

### Satellite WAZ

The Satellite WAZ Award is issued to amateur radio stations submitting proof of contact with all 40 CQ zones through any amateur radio satellite. The award is available for Mixed Mode only. All QSL cards must show a date of January 1, 1989 or later.

The WAZ Award Manager is Jim Dionne, K1MEM, 31 De Marco Rd., Sudbury, MA 01776.

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**For many of us AMTOR is an abstraction, a simple click away on a mode switch. What is it? How does it work? How do I use it? These and many more questions are answered by K9GWT in simple, everyday terms.**

# AMTOR For Beginners

BY BILL HENRY\*, K9GWT

**A**MTOR is a relatively new and exciting "RTTY-type" mode. However, I find that many would-be "AMTORites" suffer from "chirp-fright." At first, the alphabet-soup of acronyms, strange modes, and transmitter pulsing can be very intimidating. Not to worry. It's all quite simple once you get your feet wet.

This is not the first—nor the last—beginner's article on AMTOR. The references list a number of other authors and articles on the same topic. You may find that their words are even more informative than mine. Multiple opinions always help. Take heart in the knowledge that AMTOR is actively used by many amateurs and is growing. You do *not* have to be a Ph.D. or computer-whiz to have fun on AMTOR!

## What Is AMTOR?

Very simply, AMTOR is "modern RTTY." It is very similar in many ways to the plain old "teletype" we have used since the 1950s. AMTOR is also similar to packet. Some would say that AMTOR is the "technical bridge" between RTTY and packet. However you want to think of it, AMTOR is a mode which we use to send text back and forth between radio stations. Like RTTY (and packet), AMTOR uses an FSK (Frequency Shift Keyed) modulation mode. Unlike RTTY, but similar to packet, AMTOR includes *error correction*. On poor signals, receiving RTTY can become tedious as the errors and misprints pile up. A good RTTY modem can help, but there will still be some errors when the other fellow's signal fades to "zip." Not generally so on AMTOR. It just keeps repeating until it "gets it right"!

## AMTOR Modes

AMTOR is not just one mode to send text; it includes *several* related, but different modes. The major modes of AMTOR are:

**ARQ:** In ARQ mode the sending station sends three characters at a time. He then turns his transmitter OFF and the receiving station sends a one-character control signal to signify "OK, go ahead" or "Please Repeat Last Group." In ARQ mode both stations alternate between transmit and receive. The station sending text is called the ISS for "Information Sending Station," and the station receiving text is called the IRS for "Information Re-

ceiving Station." ARQ mode is the normal mode used by amateurs when in QSO. ARQ may also be called "Mode A" on some controllers. This is the "chirp-chirp" stuff you hear between 14070 and 14080! ARQ mode is similar to packet in this respect.

**FEC:** FEC (Forward Error Correction) mode is a lot like RTTY. One station turns on his transmitter, sends an entire message, and then stands-by for the other station to transmit his response. FEC does not have the "Acknowledge/Repeat" pulse exchange of ARQ mode for error correction. However, FEC corrects errors by the simple expedient of transmitting each character twice. The receiving controller has the "smarts" to know when an error has occurred and to then look at the repeated character. FEC mode is primarily used for calling CQ to set up a QSO in ARQ mode, but it may also be used for RTTY-like QSOs and is especially useful when "broadcasting" bulletins to many stations. The W1AW bulletins are sent via FEC; commercial shore stations often transmit weather information using FEC mode. On some controllers FEC mode may be called "Mode B" or "Mode F."

**SFEC:** SFEC (Selective FEC) mode is almost identical to FEC mode, but it includes a special call-up code so that it may be directed to selective stations; your controller won't lock onto SFEC unless you have coded the same Selective Call sign as that sent by the transmitting station. SFEC has to date seen little use in amateur radio. Its major use is for messages to a group of ships in the maritime service. SFEC may or may not be included in your AMTOR controller. SFEC is sometimes called "Mode S."

**STBY:** STBY (Standby) Mode is just what it sounds like. This is the normal "rest" condition of your AMTOR controller when you are monitoring and waiting for someone to call you. AMTOR controllers are intelligent and can distinguish between ARQ, FEC, and SFEC signals. When a valid AMTOR signal is received (and you have a "SELCAL match" in ARQ or SFEC mode—more on this in a bit), the controller automatically switches to the correct mode and starts printing. The AMTOR controller should not respond or produce receive print when a RTTY, CW, or packet signal is received.

**MON:** MON (Monitor) mode allows you to listen to ARQ, FEC, or SFEC signals. MONitor is also called "LISTEN" mode on many AMTOR controllers. This is a receive-only mode and therefore you do *not* get the error-correction feature when listening to ARQ signals. The controller does the best it can, but you will probably get some "hits" that would not be noticed if you were "connected" in ARQ mode. In

some AMTOR controllers, MONitor mode automatically accepts and prints ARQ, FEC, and SFEC signals; in others, MON or LISTEN will *only* receive ARQ mode signals and you must go back to STBY mode to listen to FEC or SFEC signals. Read your manuals on this one! Monitor is an amateur invention for AMTOR (credit G3PLX<sup>1,2,3</sup>); it is not specified by CCIR-476 or CCIR-625, and is generally not available in commercial "SITOR" equipment.

## What Is This "SELCAL" Business?

In ARQ mode (and SFEC mode) a special "station identifier" is sent at the start of the "link." This "identifier" specifies which station you wish to establish communications with. Without it, all AMTOR stations on your frequency might start "chirping-back" to you and your controller could not sort out the mess. The acronym "SELCAL" stands for **SE**lective **CAL**I. The SELCAL letters can actually be any letters we choose, but amateur convention is to use a contraction of your callsign to make up your own SELCAL. Eddie Schneider, (G0AZT<sup>4</sup>) has the best table for figuring out your own SELCAL:

- 1 × 2 Callsign—Drop the # and duplicate the first letter (example: K9CW SELCAL = KKCW).
- 1 × 3 Callsign—Drop the # and use all four letters (example: K9GWT SELCAL = KGWT).
- 2 × 1 Callsign—Drop the # and duplicate the first letter (example: KS9I SELCAL = KCSI).
- 2 × 2 Callsign—Drop the # and use all four letters (example: AB1CD SELCAL = ABCD).
- 2 × 3 Callsign—Drop the # and second letter (example: WA9YLB SELCAL = WYLB).

This is a very convenient system first proposed and used by Peter Martinez, G3PLX. It is logical, easy to figure out, and in use by practically all amateurs. However, it is *not* infallible! Consider the SELCAL for W9CD, "WWCD." The above formulas also say that "WWCD" would be used by W9WCD, W1CD, W6WCD, and even "WW9CD" (if we ever get to that callsign). Fortunately, this happens rarely, but will occur more often as AMTOR grows in popularity. The "solution" is simply to pick another four-letter combination.

*Common Misconception:* The FCC (or any other regulatory body) does *not* require that your AMTOR SELCAL be related to your callsign! The practice is simply a convenient way to construct a SELCAL. It is *not* required and a SELCAL does *not* relieve us from sending our *full* callsign for identification!

\*616 W. Church Street, Champaign, IL 61820

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Recently, the FCC added a new version of AMTOR to Part 97 of our Rules and Regulations, the "CCIR-625" version. The major difference between CCIR-625 and the original CCIR-476 version is that the new version has a seven-letter rather than a four-letter SELCAL. At this writing, CCIR-625 is brand new and only a few amateurs have made use of it. The seven-letter SELCAL does, however, solve the confusion caused by the four-letter algorithm discussed above. To date, there is no one strong recommendation for just how these seven letters are chosen. I suggested one idea in November 1989 *CQ* (K9GWT<sup>3</sup>), but there are many other schemes that will also work. CCIR-625 includes "downward compatibility", so don't fear, it will also recognize your "older format" signal and communicate. CCIR-625 includes several other nice features and some much-needed clarifications of "gray-areas" of CCIR-476. Use of CCIR-625 will increase as our older AMTOR equipment is upgraded or replaced.

I should also mention that this whole business of "making-up" letter-style SELCALs is strictly an amateur radio invention. The commercial SITOR systems are *required* to use number SELCAL codes that relate to a permanently assigned ship or land-based station identifier. In theory, each marine ship or shore station has a unique SELCAL that can be used to identify the station in an emergency. In practice, that wasn't the case for CCIR-476, since the available number pool has long since been exhausted. This was, in fact, the major reason for commercial adoption of CCIR-625. CCIR 491-1 defines how these SELCAL numbers are converted to letters that are actually sent on the radio link. CCIR-476 will support 4- and 5-digit numbers; CCIR-625, 9-digit numbers. Amateurs are not required to use CCIR-491 procedures to define a SELCAL. Be glad, as it's *not* a simple translation! G3PLX's scheme makes a *lot* more sense.

## How Do I Use This SELCAL Thing?

Simple! You "mash" the magic SELCAL button on your terminal, type in four letters, and away you go—hi! Actually, it's a little more involved than that, but not by much.

In ARQ mode there are two SELCAL codes to worry about—yours and the other guy's. Your SELCAL identifies your station so that other stations may call you and "link-up." Assuming that you do not change callsigns often, this is something you have to do when the controller is new and may never have to mess with again. This SELCAL may be called "LOCAL SELCAL," "MYSELCAL," "MYS," or "MYA." Whatever it's called, read your manual, enter four letters, and store it ("perm" on some controllers; save "CONFIG" on the PCI-3000).

The second ARQ SELCAL is the one of the other station. This SELCAL will need to be changed *each time* you call a different station. This SELCAL may be called "REMOTE CALL," "HISSELCAL," or just be a prompt when you start to send in ARQ mode. Enter the four letters corresponding to the other station's SELCAL.

There are actually two more SELCAL codes, both associated with SFEC (Selective FEC) mode. These are often called the "GROUP CALLS"—"local" and "remote." They will only be required when you are receiving or sending

in SFEC mode. The "local" GROUP CALL corresponds to the SFEC SELCAL that your station will recognize when receiving SFEC messages. The "remote" GROUP CALL is the SFEC SELCAL you will send when transmitting in SFEC. Other stations must have this same SELCAL loaded as their "local GROUP CALL" to receive your SFEC transmission.

## How Do I Call CQ?

We use FEC mode when calling CQ in AMTOR. This is a whole lot like RTTY, but with some special recommendations:

**1. Keep your CQ short—2 or 3 lines.** A short CQ is just common sense—and courteous. Two or three short CQs on a frequency will probably be a *lot* more productive than a long wordy call. I may have gone to sleep by the time you get done calling!

**2. Include your SELCAL as part of the CQ text.** What you want is for the other guy to call you in ARQ mode. He can't do this if he doesn't know your SELCAL!

**3. Start each CQ with a blank line.** The "official" requirements of CCIR-476 and CCIR-625 say that FEC printing does not start until *after* receipt of a CR/LF. Not all AMTOR controllers require this, but it's best to be safe!

**4. Do NOT include a string of "RYRYRYRYRY . . ." letters.** AMTOR uses a special 7-bit data code. The combination "RYRYRY . . ." is the worst bit combination you can imagine for FEC synchronization. In fact, few (if any) AMTOR controllers will ever synchronize to a string of "RYRYRY . . ." and some will lose sync! "RYRYRYRYRY . . ." is a poor idea on RTTY and a disaster for FEC!

I suggest the following AMTOR FEC CQ message:

```
Transmitter ON, AMTOR controller in FEC
mode
(blank line)
CQ CQ CQ DE K9GWT K9GWT K9GWT SEL-
CAL: KGWT KGWT KGWT
CQ CQ CQ DE K9GWT K9GWT K9GWT SEL-
CAL: KGWT KGWT KGWT
CQ CQ CQ DE K9GWT K9GWT K9GWT SEL-
CAL: KGWT KGWT KGWT
CQ DE K9GWT (KGWT), BILL IN URBANA, IL
ZZZZ (HAL PCI-3000)—or—END command
Transmitter OFF, AMTOR controller returns to
STBY mode
```

Paul Newland (AD7I<sup>6,7</sup>) also suggests that we delay between transmitter ON and the start of the CQ text, sending 5 to 30 seconds of "FEC idles" at this start. This is a good idea, since "idles" are required for FEC receive synchronization. However, many AMTOR controllers do not include a way to delay text transmission. The CCIR "rules" require that synchronizing "idles" be sent at the end/start of each line, so the first CR/LF (blank line) gives you a headstart, and there are "idles" sent at the end of each line. Some AMTOR controllers also insert extra idle characters within each line. As G0AZT and AD7I both point out, this is a *very* good idea and one we all hope all manufacturers will soon adopt.

## How Do I Answer A CQ?

First we have to assume that you have successfully received an FEC CQ call and that it is formatted like the example. You must know the

other guy's SELCAL to answer his CQ! Assuming that you did get his SELCAL, enter it as required and start sending in ARQ mode. (The procedure is different for every AMTOR controller. *Read your manual!*) If your answer is successful, the other station will soon start chirping back to you, and "away we go."

## I'm Linked—Now What?

Ha! Wasn't that easy? Now all you have to do is start typing text. Assuming that you have all the weird and wonderful computer buffer controls set correctly (read your manual), text will now be sent to the other station—three characters per "chirp."

Even though our FCC regulations are now considerably relaxed concerning ID, I still like to start each major transmission with the standard "CW style" ID line—"K9CW DE K9GWT," for example. Old habits die hard for me! I also must admit that I send the ID line again at the end of each of my transmissions. It's not necessary, but few have complained!

## Over

ARQ mode has a special command to use when you have typed all you want and it's time for the other guy to beat on the keys. We call this the "OVER" command. The OVER command is actually the transmission of "plus" and "question mark" characters in sequence (+ ?). Once you send (+ ?), the AMTOR controllers take over and "turn the channel around"—you become the "IRS" and the other guy becomes the "ISS." On some controllers there is a special key to press or command to enter for OVER; on others you just type +?. *Note:* If you are still using an old Model 15 or 28 TTY machine as your AMTOR terminal, you must type "quote" and "question mark"; the U.S. Baudot keyboard has a "quote" where the CCIR terminal has a "plus." It's the same bit pattern, but different key-top labels!

## Master/Slave

Note that I referred to an exchange of "ISS" and "IRS." This has *nothing* to do with "MASTER" or "SLAVE." Since you were the original calling station in ARQ mode, we call you the MASTER station. In ARQ mode the MASTER station is simply the station that first started the link. The SLAVE station is the called station in ARQ mode. The terms "MASTER" and "SLAVE" have nothing to do with who is sending text and who is receiving text. The only real distinction between "MASTER" and "SLAVE" is that the "MASTER" sets the timing standards for the link and will be the station initiating a re-call if conditions get so bad that the link fails. In an ARQ QSO the ISS and IRS designations change with each OVER operation; the MASTER/SLAVE designation does not change during an ARQ mode QSO.

## Forced Over

The above describes how a "normal" OVER is done. However, what do you do if the other guy is long-winded ("long-fingered"?) and you want to interject a comment? Ha! We have a solution called "FORCED OVER." In this case the receiving station (IRS) can push another

special button and take command—instantly (at least within three characters). Once you do this, you are again the ISS and what you type is sent to the other station. Here you had better hope that the "flow-control" between your terminal and AMTOR controller works right (and that of the other station as well).

Properly configured, what should happen is that transmit text from the original ISS will be held at the FORCED OVER. When you again return control to the other station (by typing +?), his transmit text should resume *exactly* where it was interrupted. Most computer systems can do this; most mechanical machines *cannot* do this! A FORCED OVER can be rude and may result in loss of some text if flow-control is not working properly at both stations. Most of us now use "computer-controlled terminals," so it is rarely a problem. However, beware if the other guy says he is using an old TTY machine as a terminal!

## End Command

An ARQ link will go forever if you don't end it. ARQ has a special "END" command that is used to shut-down the chirping link. How you send the END command varies a lot between AMTOR controllers. On some it's a special CTRL key; on others you type "ZZZZ" to end. Read your manual! You may observe some of us saying quaint things like "I'LL LET YOU DOWN THE LINK" or simply "LINK DOWN." Obviously, we about to end the link! By the way, don't forget to send an ID line before dropping the link.

The above has been just one example of how to use AMTOR. Eddie Schneider, (G0AZT<sup>4</sup>) Paul Newland, (AD7I<sup>6,7</sup>), and CQ's Buck Rogers (K4ABT<sup>8</sup>) have also written excellent step-by-step beginner's operating instructions. You will learn other techniques and tips with a close reading of their articles.

## Won't All That Chirping Destroy My Radio?

Baloney and poppy-cock! This is by far the *greatest* concern of every AMTOR beginner I have met. It was my biggest concern when I started. In spite of what you hear, AMTOR does *not* destroy rigs; at least it shouldn't. Modern transceivers will take all the click-click operation of the TX/RX relays I have been able to give them. I have never worn out a relay or lost a rig to ARQ chirping. In fact, since the duty cycle of ARQ mode is only 47% at worst, ARQ is a lot easier on the transmitter than RTTY or FEC mode (100% duty cycle).

I do know of two cases where we thought we had wiped-out a TX/RX relay—both on a TS-830s. What actually happened is that multiple relay operations vibrated the relay out of its socket! The TS-830s TX/RX relay is mounted upside down; judicious placement of a 1/4 inch piece of foam rubber fixed both cases!

## Can I Use My Linear?

Now I am going to "hedge my bet"! First of all, you do *not* need a linear for AMTOR. The error correction feature means that while you may get more repeats on weak signals, you can almost always get through with 100 watts or less. Second, with very few exceptions, linears

have large and slow relays. These relays are *not* suited for fast ON/OFF switching required in ARQ mode. The relays often switch high voltages and/or currents. Yes, you can get some pretty spectacular arcs and sparks in the linear, and they will cost *big bucks* to fix!

So unless your linear manufacturer makes a big deal out of "QSK" operation of his linear, forget high power on AMTOR. You don't need it! Actually, we could all probably drop our output power to 10 watts or less and never notice the difference. If you have TVI, AMTOR with low power may be your solution!

## How About Switching Times?

This is another supposed "problem" that has been blown out of proportion. Switching times used to be a concern. It really is *not* a major concern with the current and previous generation of transceiver models. They can *all* be used on AMTOR. However, switching time can be a *big* problem on older equipment. Some models are in fact unusable on AMTOR or may require substantial modifications to use ARQ mode. Many radio manufacturers now have data sheets that give switching times and suggested modifications. Active AMTOR operators are also a good source for modification information—"Caveat Emptor"! By the way, if your rig has a "QSK" mode, use it!

There is also a lot of on-the-air discussion about what values to use when setting the programmable delays in your AMTOR controller. Some amateurs say "set them as low as they will go." Good luck if you do! Here again, *read your manual* and start with the manufacturer's recommended settings. Messing with delays is a two-edged sword. Shorter delays extend your longest distance in ARQ mode, *but* may also increase your minimum distance. The number and purpose of programmable delays varies with each AMTOR controller—*read your manual!* A "delay" time of 20 to 50 ms will work with practically all radios—and cover the world. You do *not* need to set delays to "5" or "10" to work DX! Chances are your radio is not that fast and you may actually be trashing some of your own data while the poor radio is trying to switch! Each controller/radio combination is slightly different. Do some experimenting and determine your own parameters.

## What About The Shift For AMTOR?

In my opinion, there is only one shift that AMTOR stations should use, and that is **170 HZ SHIFT**. This has been the amateur radio RTTY shift for years, is the shift used in all commercial SITOR stations, and is usually the *only* shift supported in the FSK mode of modern transceivers. 170 Hz shift *is* the standard, and you are only doing yourself a disfavor if you attempt to run AMTOR using another shift.

A second shift, 200 Hz, has recently appeared on the amateur bands. 200 Hz shift originated with the Bell 103 telephone-line modem and was adopted for inclusion in packet controllers. When packet moved from VHF to HF, the 200 Hz shift PLL modems came "for free." I think all who run HF packet would have to admit that 200 Hz shift really does not work well for packet. There is an active and much needed drive for improvement in HF packet

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modem standards. Changing the shift (and modulation type) is a recognized requirement for improved HF packet operation. If 200 Hz shift doesn't work for HF packet, why use it on AMTOR?

If your controller has 200 Hz shift, you face a double disadvantage when talking to the rest of us. First of all, your 200 Hz shift transmit signal does not match our 170 Hz spaced receive filters. This makes our receiver tuning much more critical and increases the odds that we will get "hits," many repeats, and eventual link failure. Second, your receive filters do not match our 170 Hz transmitted signal. You also have to "straddle-tune," face tuning errors, and accept less than optimum demodulator performance. A 30 Hz difference does not sound like a lot, but it can make a *big* difference on marginal links.

If you have an AMTOR controller with a 200 Hz shift modem, I suggest that you consider re-

tuning the receive filters and transmit tones for 170 Hz shift. Your AMTOR will be much better for the effort! By the way, retune for 2125 Hz MARK and 2295 Hz SPACE. That's the standard and what your transceiver FSK circuit is set up for! You will not be "true transceiver" with any other tone frequencies.

### What Is APLink?

APLink is a very nice message-forwarding computer program written by Vic Poor, W5SMM. APLink serves as a link between HF AMTOR and VHF packet networks. APLink is run in an "IBM-Compatible" Personal Computer (PC) and provides two data ports—one for the AMTOR controller and one for the packet controller (TNC). The two ports share a common message storage; each can access the other's message files (with some guidance


from the control operator). Vic has written APLink drivers for the AEA PK-232, AMT-1, and HAL PCI-3000 AMTOR controllers. Only a "Gateway" or message relay station needs to run APLink software, so it's a program that many of us will never need. However, we may all want to use the long-haul message relay feature of an APLink Gateway station.

Many Gateway stations also include frequency scanning to monitor 8 to 16 different bands and/or frequencies. These stations therefore avoid many of the problems associated with skip distance and changing band conditions with time. It's also an efficient use of radio spectrum, since the control circuitry automatically skips frequencies which are already in use. The best way to find out more about APLink is to tune around 20 meters, find an APLink station, and watch the fun in MONITOR or LISTEN mode. You will get the idea after a couple of listening sessions and then be able to call and request HELP files for more data. APLink is an exciting new use of RTTY, one that makes full use of the error correcting and robust nature of AMTOR.

### Conclusions

AMTOR is great mode. It is really not hard to run. AMTOR has fewer cryptic commands and is actually simpler to use than packet. HF AMTOR is a whole lot more reliable than HF packet or "straight RTTY." AMTOR does not require high transmitter power. Practically all modern transceivers can run all AMTOR modes. There are now a lot of amateurs all over the world running AMTOR. Whether you like to rag-chew or run traffic, AMTOR is an ideal mode. I must admit that running ARQ mode in a RTTY contest is a lot of work, but it can also be very rewarding! All around, AMTOR is *the* HF data mode for many of us long-time RTTY fanatics.

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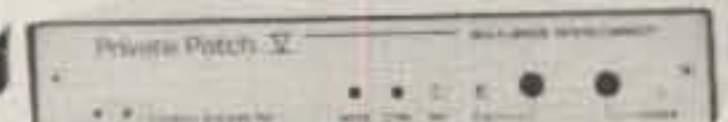
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# CQ REVIEWS:

## The MFJ-1274/T 2400 BPS Packet Radio Controller

BY BUCK ROGERS\*, K4ABT

I went to bed last Thursday with a problem on my mind, and when I awoke at 6 AM Friday morning I had the solution to the problem.

How many times has this scenario been repeated? There is some kind of mechanism in the human brain that produces a memory management enhancement and problem-solving techniques that we have not yet fully understood. Needless to say, though, while we sleep the facts and figures seem to sort out themselves, and we come up with a solution to the problem in the morning.

Not so long ago I had a similar problem, and the topic of this discussion is the outgrowth of that "solution."

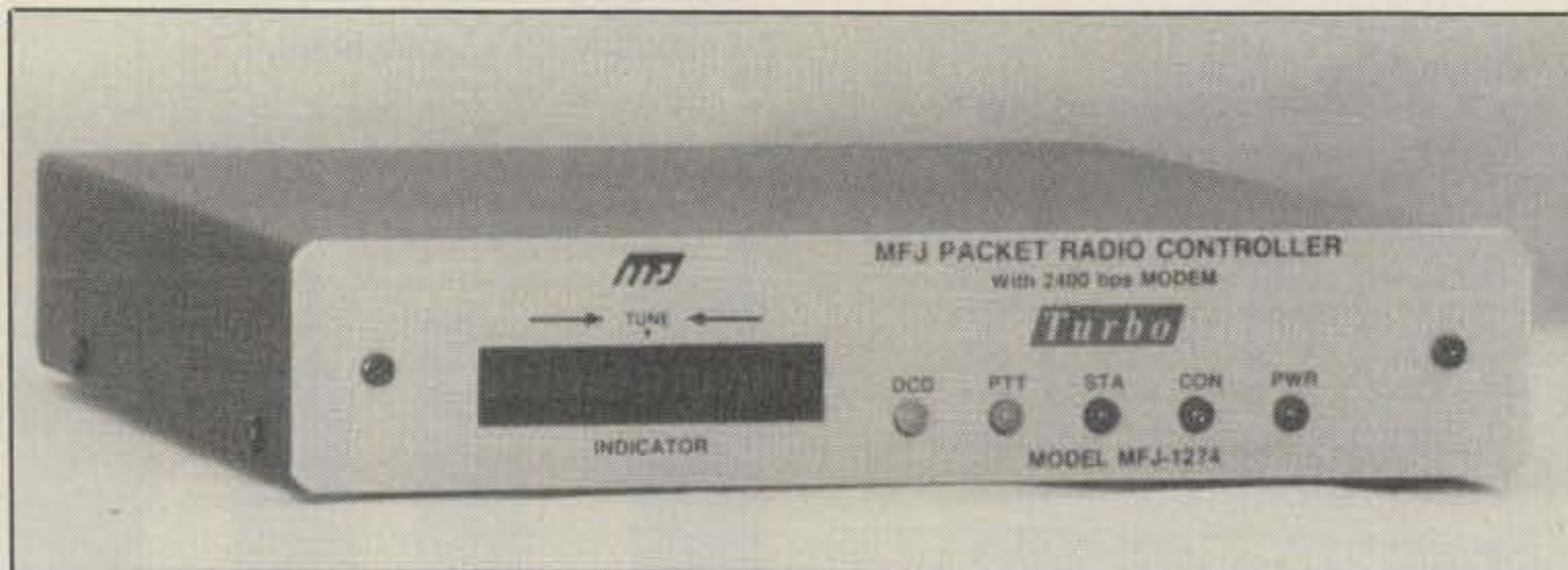
### The End Justifies The Means

To affirm that statement in a more comprehensible manner, we will simply say, "A method will be found to satisfy the necessity." I was groping for a way to build a gateway, node, and conference switch into the GARDS (Georgia Amateur Radio Digital System), and at the same time I wanted to accommodate an HF gateway within the complex.

Now placing an HF gateway into a node cluster is not a great feat provided there is someone to oversee the activities of the HF port. There are still some restrictions that relate to the use of HF digipeating. Maybe someday the League and the FCC will determine that we are not trying to circumvent the system by calling China, via the North Pole, by digipeating via "MOORE" node in Oklahoma (when you figure that out, you will be eligible for a seat on the committee).

My need for a TNC with HF tuning capability, and the addition of a ROSE switch EPROM had become somewhat of a problem. There was another requirement that went along with this dilemma. I also had to add a similar TNC with HF tuning cap-

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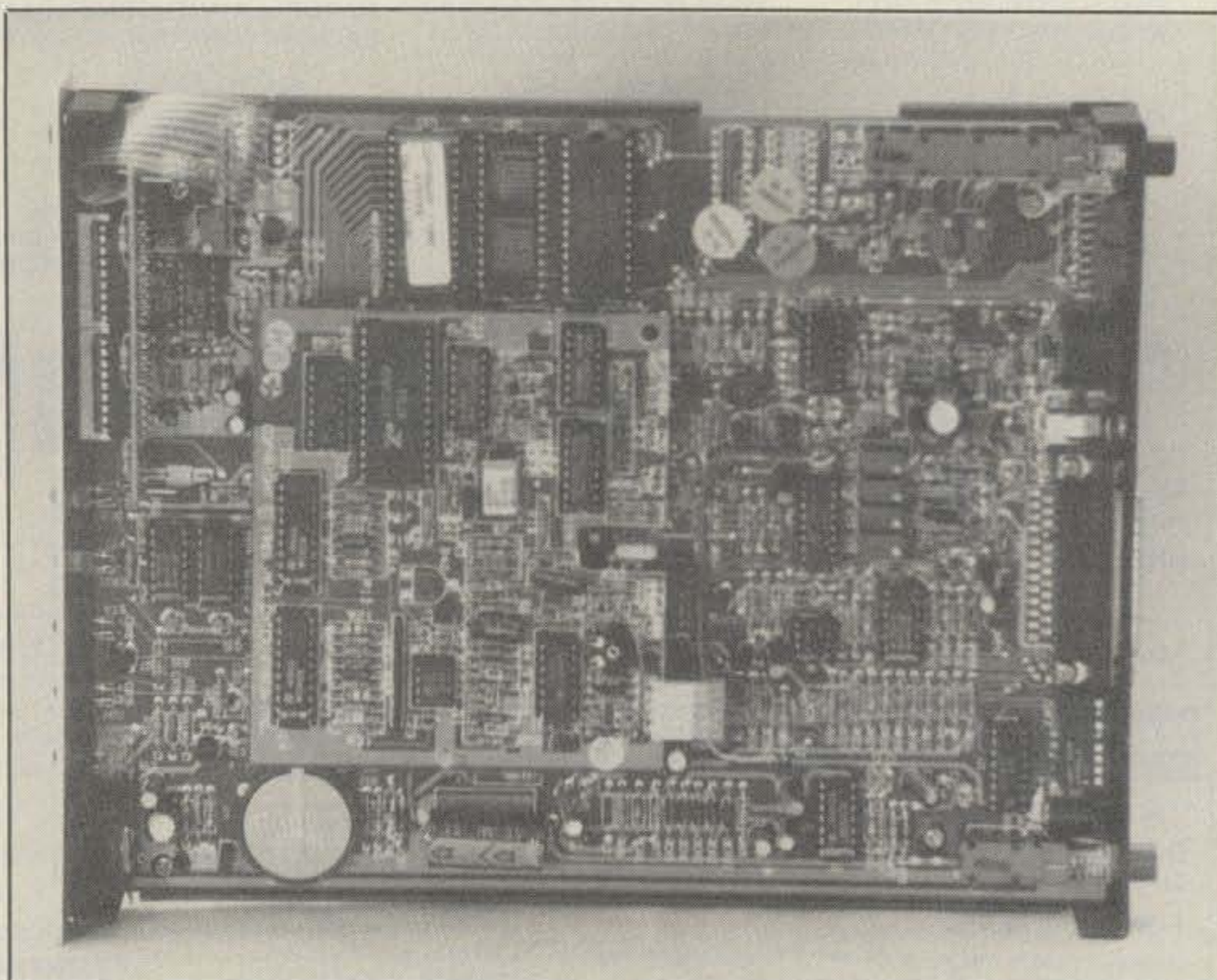
Front view of the MFJ-1274/T TNC.

abilities to this same cluster as a conference node.

### The Solution

I awoke with the solution: The MFJ-1274

was the answer. Here is a TAPR II, TNC 2 clone which has the best of all worlds already built in. Not only is it Net/Rom, ROSE, and TheNet ready, but it has the HF tuning indicator built-in. The MFJ-1274/T is available with the 2400 bps (turbo) modem installed.



Interior view of the packet radio controller.

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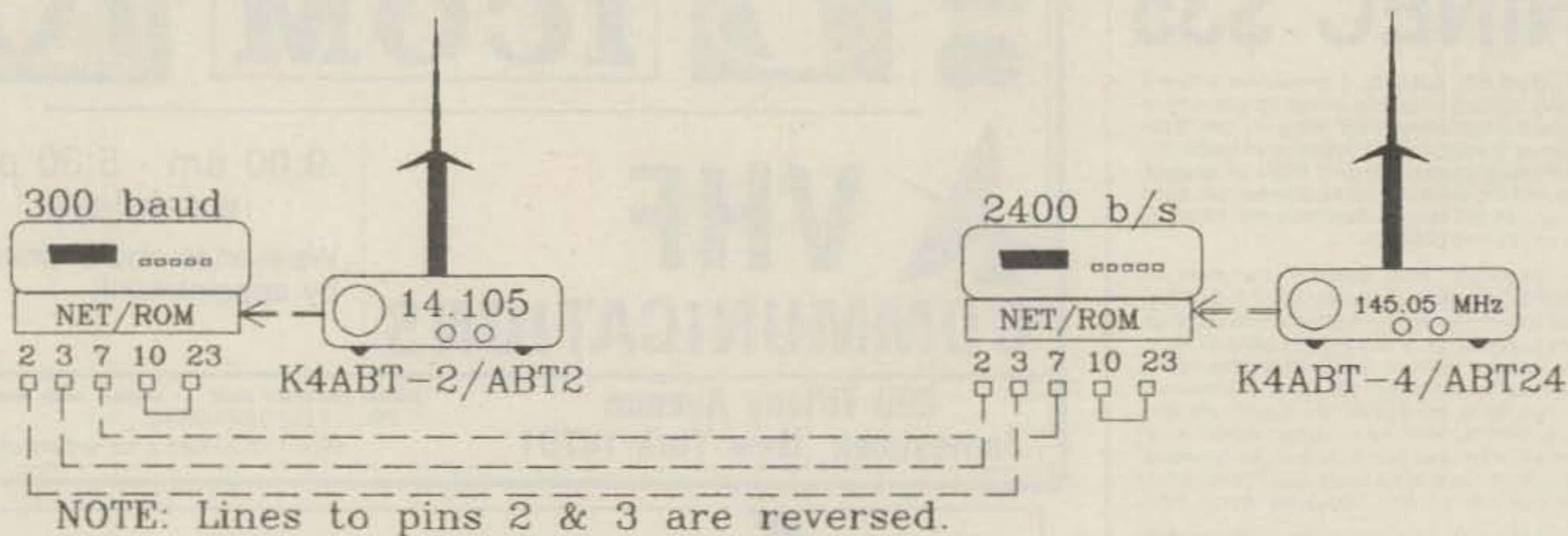


Fig. 1- Two meter to 20 meter gateway. The "jumper" mod in fig. 4 must also be included in these nodes.

In the turbo configuration this TNC offers everything the serious packeteer might need to operate the popular packet modes. The MFJ-1274/T is equipped with a built-in tuning indicator for HF (300

bauds) packet operation. The "mailbox" is a standard feature, and it is ready to operate 300, 1200, or 2400 bits-per-second (bps).

Phase Shift Keying (PSK) is the latest

trend-setter to come along. It lets us improve the speed and throughput of data without making any modifications to the transceivers. With the MFJ-1274/Turbo, we are able to connect it to the transceiv-

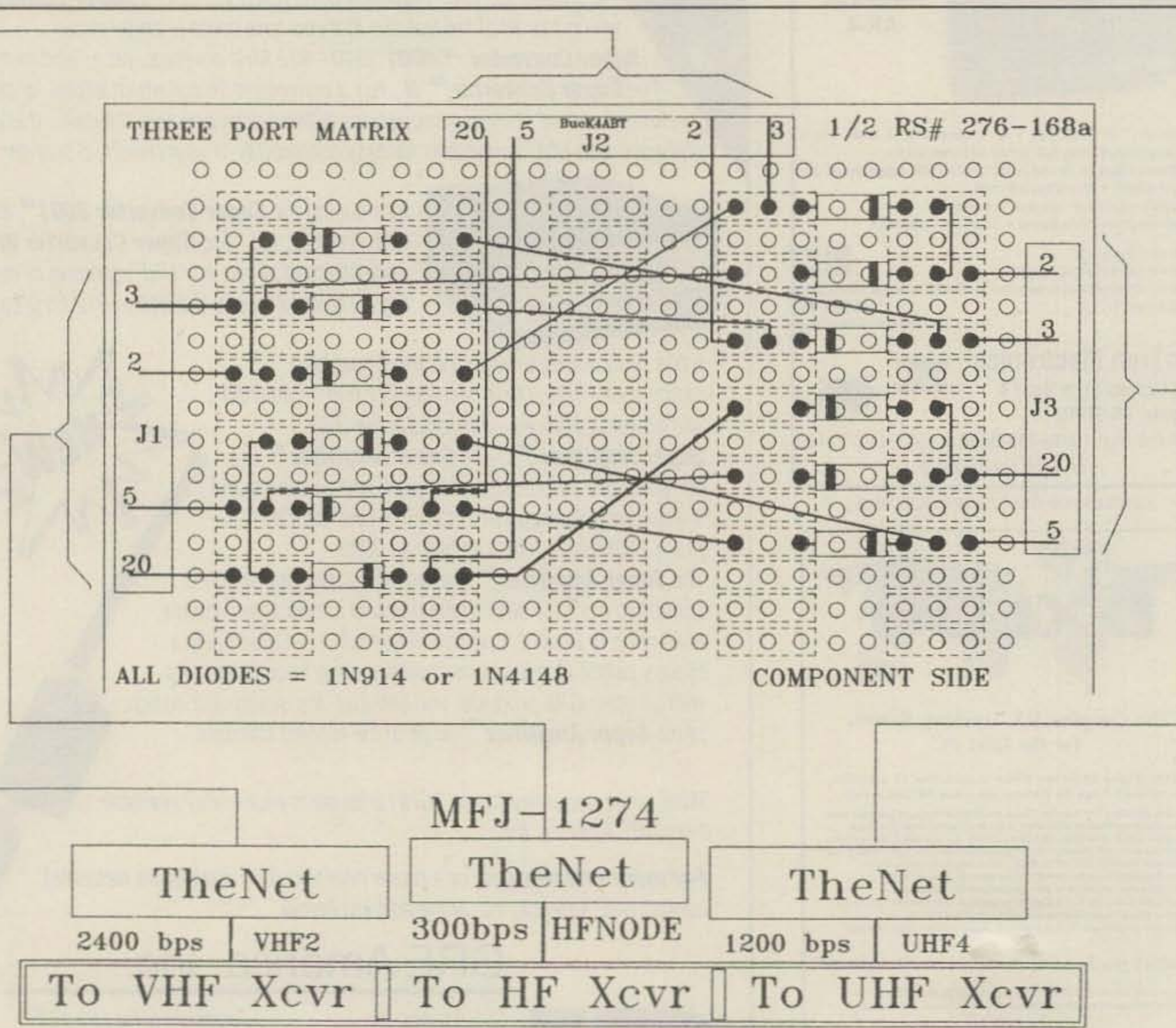


Fig. 2- Note the similarity between this VHF, UHF, and HF "cluster" gateway and the multi-frequency conference node in fig. 3. The same modifications apply to each cluster.

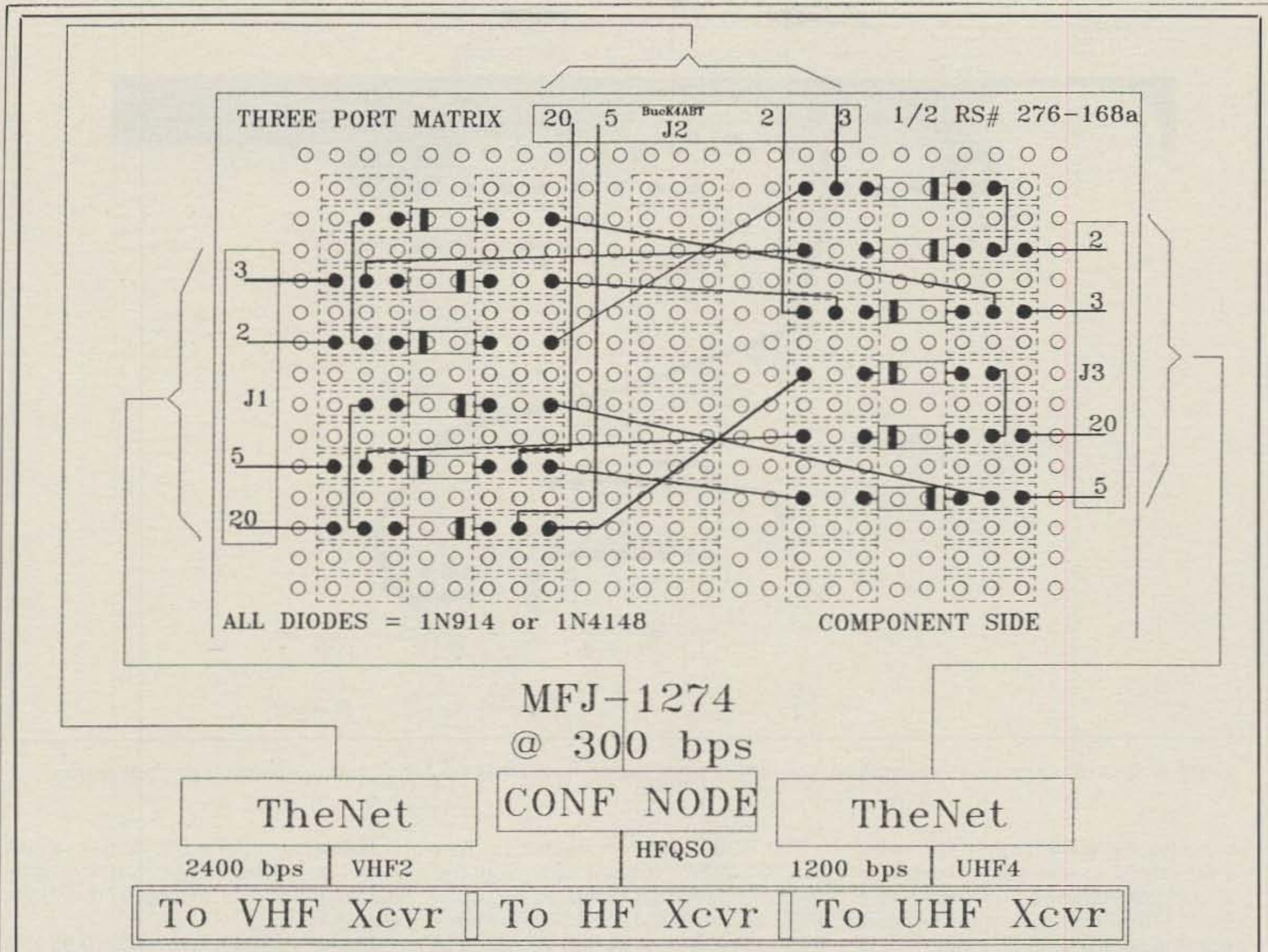


Fig. 3- This diode matrix enables access to the conference node direct and through VHF2 or UHF4. The "jumper" mode shown in fig. 4 must be installed in each of the TNCs. It is also necessary to add the jumpers between pins 10 and 23 of the individual DB25 connectors.

er mic input as we would any other TNC and operate an even higher speed of 2400 bps.

The MFJ-1274, or MFJ-1274/Turbo, is ideal as a node, switch, gateway port, conference node, or KISS mode controller. The latter is useful when used with some Bulletin Board Systems (BBS) software.

When operating the MFJ-1274 as a port to HF, it can be configured with any one of the three types of networking standards. At present, the ROSE switch seems to be the system that is gathering more support all across the US and in some countries outside the US. (See the article on the ROSE switch in this issue.)

In the illustrations that accompany this article I've included the gateway, node, conference switch, and ROSE switch configurations (both HF/VHF/UHF and 300/1200/2400 types). There are other ways to configure the MFJ-1274/T, but that would limit space for other articles about digital and data communications in this month's issue.

Fig. 1 is an illustration of the gateway

application for use with the VHF and UHF switches. Fig. 2 provides us with a means to communicate from VHF or UHF into the HF bands. Fig. 3 shows us how to make use of the MFJ-1274 in a conference node that is accessible from HF, VHF, or UHF. Here we are able to use one

conference node from two or even three bands. It is advisable to keep the access to the conference node away from busy or "through-put" frequencies.

When using the MFJ-1274 or MFJ-1274/Turbo in a cluster or complex that contains two or more MFJ-1274s that are

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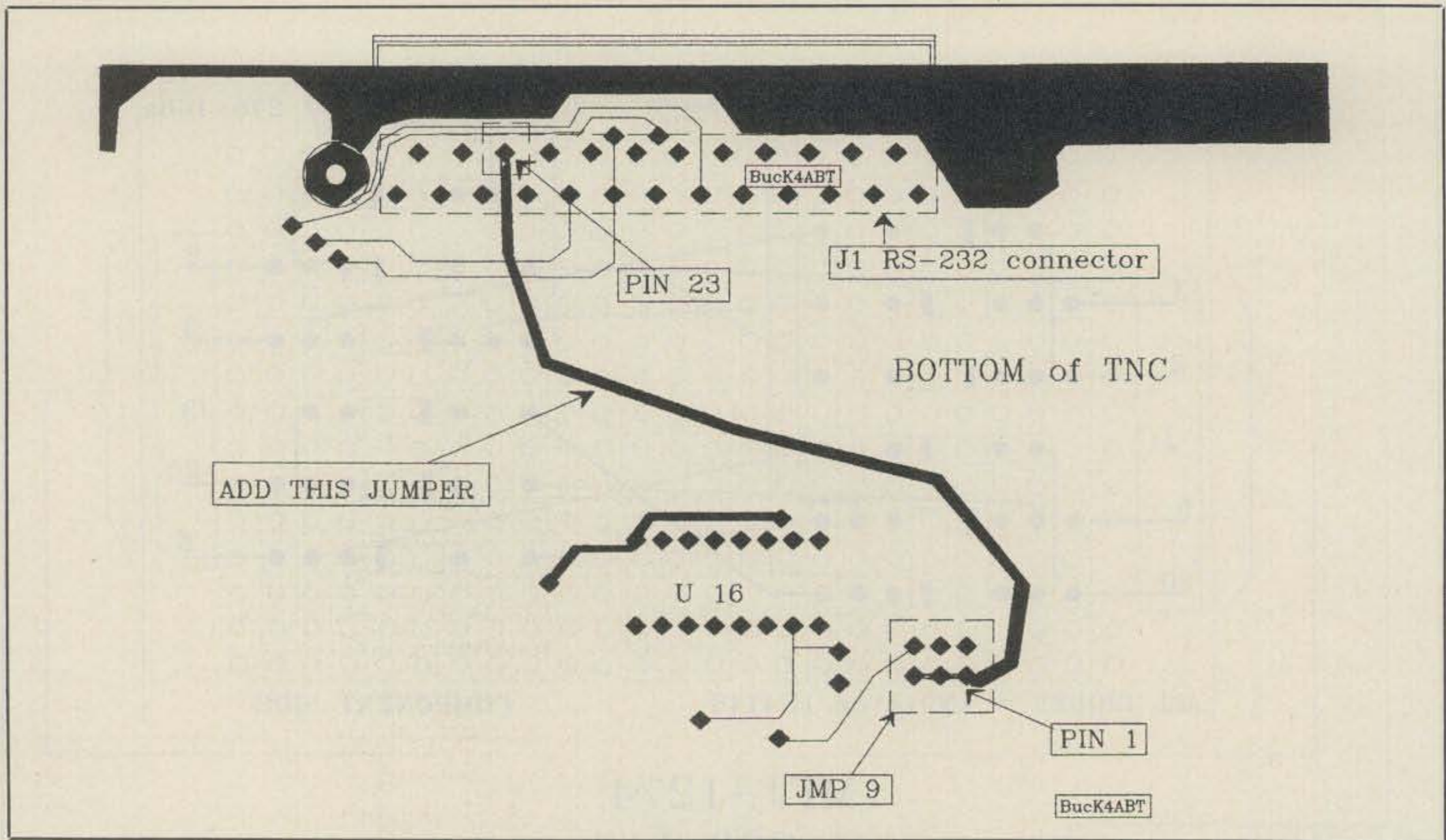


Fig. 4- This minor modification enables flow control when two or more TNCs are configured in a gateway or node cluster.

connected via the RS232 port, it is necessary to add the jumper shown in fig. 4.

Fig. 5 describes how we implement the MFJ-1274/Turbo as a part of a two-speed, single-frequency node and gateway. In this case, the gateway is from 1200 to 2400 bps, instead of the usual band-to-band gateway.

The ROSE switch is written by Tom Moulton, W2VY. It is available from the author by sending a formatted 360K 5 1/4 inch floppy disk and an SASE disk mailer with sufficient postage for the return to you. Send to Tom Moulton, W2VY, 4812 East Busch Blvd. #7, Tampa, FL 33617-4066.

TheNet is in the public domain, available from many BBSes. Net/Rom is a trademark of and available from Software 2000.

The MFJ 1274/T sells for \$229.95 and is available from MFJ Enterprises, Inc., Box 494, Mississippi State, MS 39762 (601-323-5869).

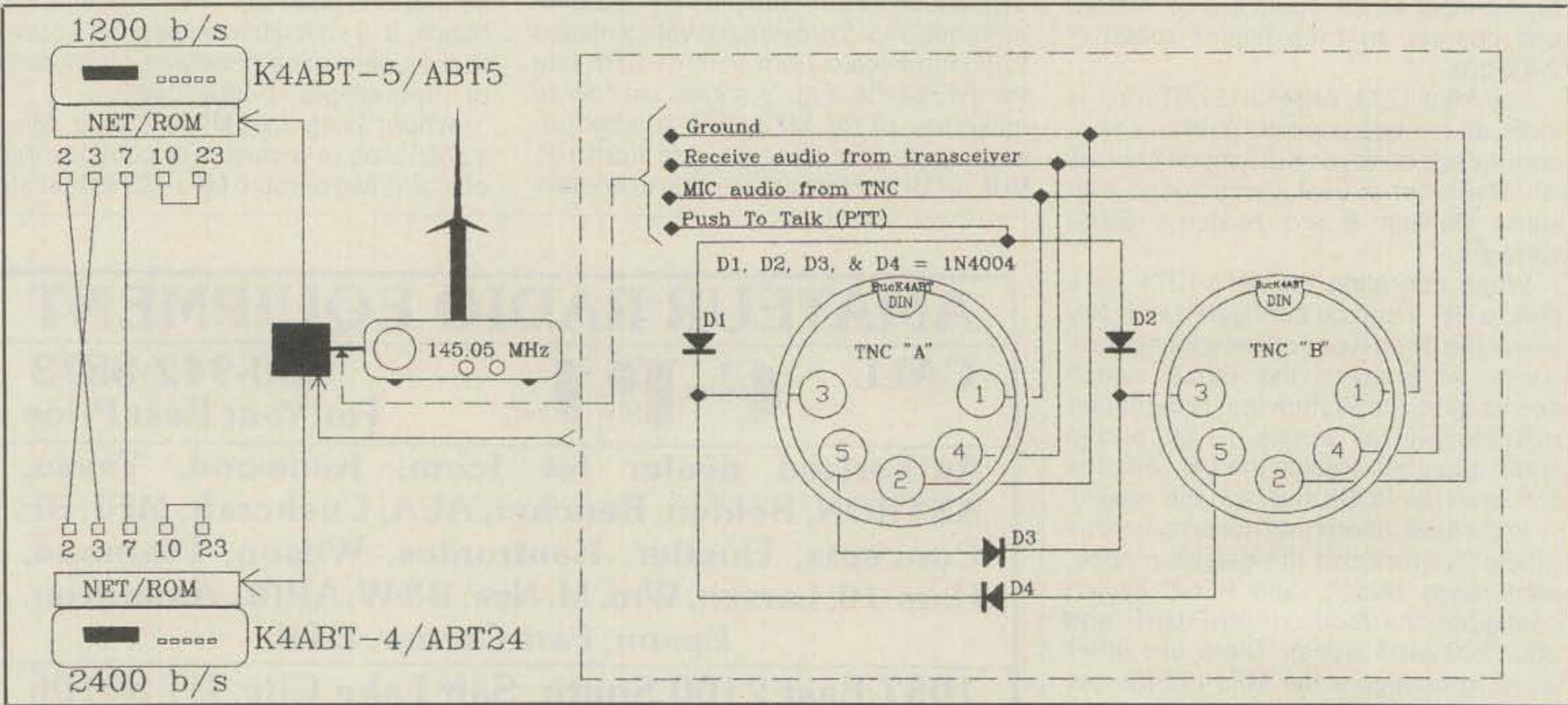


Fig. 5- This drawing describes the manner used to implement a dual-baud gateway. In this application either the MFJ-1270B/T or the MFJ-1274/T TNC may be used. Note: The diodes can be 1N4004 or 1N4005, silicon. If the ROSE code is used instead of NET/ROM, use the cable shown in the ROSE DOC file.



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**Harmonics:** -50 dB typical.

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The Hercules II is attractively styled to match our HF base station transceivers and will interface nicely with virtually all transceivers. The front panel includes an analog multi-meter for collector current, voltage, forward power and SWR. A ten element LED bargraph instantaneously displays peak power output. Band selection is either with the front panel switch or remotely via a rear panel connector. A front panel speaker is built in.

The internal heat sinks are air cooled by a temperature controlled tube axial fan. Whisper quiet in ssb operation, yet enough air capacity for cool operation in the key-down modes. The Hercules II is compact, good looking and generates a signal that is within one S-unit of the mighty Titan.

## MODEL 9420 115/230 VAC POWER SUPPLY



Housed in a separate utility enclosure and remotely controlled through the 6 foot power cable. 100 amperes at 13.7 Vdc is provided. 80 amperes for the amplifier and 20 amps for the exciter. An alternate power supply can be a heavy duty, deep cycle, lead acid battery and an automatic 10 amp charger. This low cost alternative power source will support the Hercules II during sustained amateur service.

**The Mighty  
Titan ... Simply  
Unbeatable!**



The Titan has it all! Maximum legal power with ease, all full power bands 160 through 15 meters (10 and 12 meters after authorized modification), lightning fast QSK for break-in cw and the digital modes and a two speed blower for quiet operation. This awesome performance from a desk top amplifier is made possible by the remote power supply and a pair of Eimac® 3CX800A7 ceramic triodes. The heart of the power supply is our own four core, tape wound Hypersil® transformer. This 41 lb behemoth is conservatively rated at 2.5 kVa CCS (9.2 kVa IVS) and is nearly noiseless, even at 1500 watts output!

Other features include a front panel, peak reading wattmeter using an instantaneous ten element LED bargraph display. PTT/VOX or QSK control line select switch, built-in SWR meter and an "over-drive" warning LED. 3:1 vernier TUNE and LOAD controls in combination with an outstanding RF deck design, make the Titan a real "pussy cat" to load and operate.

The Titan is styled to match our transceivers but it interfaces beautifully, no matter what exciter you are using. If you are ready to choose your dream amplifier, the Titan has it all! Check it out.

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# The 1991 CQ World-Wide 160 Meter DX Contest

**CW: January 25-27  
Starts: 2200 GMT Fri.**

**SSB: February 22-24  
Ends: 1600 GMT Sun.**

**H**ere is your chance to run up your state and country totals in a very short time. We can expect activity from all 50 states and over 100 countries on both CW and Phone. Pacific DX is encouraged to transmit 1907-1912 kHz and specify a listening frequency. WVE transmission there usually gets no answer and makes lots of enemies.

**Classes:** Single and multi-operator. Use of packet, a spotting net, or a logging assistant makes you multi-op. Use of a computer does not. Multi-ops show who was operating for each QSO.

**Exchange:** RS(T) and state for USA, area for Canada. DX stations send the prefix, or a country abbreviation. It's good insurance for those prefixes often confused by bad handwriting, such as OK/DK, OL/DL, etc. Stations omitting this information for non-multiplier QSOs will not receive credit for them.

**Scoring:** Contacts with stations in own country, 2 points. Contacts with stations in other countries in same continent, 5 points. Contacts with stations in other continents, 10 points. Maritime mobile points determined by location. All Canadian QSOs count 5 points for USA and vice versa.

If you persuade someone not usually on 160 to get on and work you, be sure to mention it in your log so you get credit for the "rare" call, if he doesn't work several others. Some public-spirited ops such as W2GD have considerably increased participation this way.

**Multiplier:** Each U.S. state (48), Canadian area (13), DX country, and maritime mobile. KH6 and KL7 are considered countries, but not also states. *No one may count USA or Canada as a country multiplier.* Canadian areas: VO1, VO2, NB, NS, PEI, VE2, VE3, VE4, VE5, VE6, VE7, NWT, Yukon. ARRL and WAE country lists and WAC boundaries are the standards.

**Final Score:** Total QSO points times the sum of all multipliers (States + VE areas + DX countries + Maritime mobiles).

**Penalties:** Three additional contacts may be deleted for each unacknowledged duplicate or unverifiable contact removed from the log. A second multiplier may be removed for each one lost by the above action.

**Disqualification:** You may be disqualified for violation of your country amateur radio regulations, unsportsmanlike conduct, or claiming excessive duplicate or false multiplier contacts. If the corrected score without penalties shrinks more than 3% from that claimed, disqualification will be considered.

**Awards:** Certificates to the top scorers in each class for each state, Canadian area, and DX country. In close races, also to runners-up. Also the following plaques with donating sponsors indicated.

	Single Operator	
	CW	SSB
World (N5JJ Memorial)	K5AAD	K5AAD
USA	K4TEA	K4JRB
Zone 3	KM4MG	N4ONI
Zone 4	K5NA	KC4MJ & KM4IH
Zone 5	WA4CUG	K4ODL
Europe	K4UEE	N4NX
Africa	K4SB	WB4ZNH
Oceania	K4TKM/6	K4DLI & KB4SSS
Asia	NE4S	W4LVM
South America	K4JAG	KL7JAR/4

	Multi-Operator	
World	N4RJ	Southeastern DX Club

Sample log and summary sheets may be obtained from CQ by sending a large SASE with sufficient postage to cover your request. You can make up your own, 40 contacts per page, columns for GMT, exchanges, multiplier, and points. Show the multiplier and its sequential number only the first time it is worked. Please don't write on the back of the pages. Dupe sheets are requested for logs over 200 QSOs. They should check the total QSO claim. Computer alphabetized sheets are especially welcome.

Include a summary sheet with your entry showing the scoring and other essential information. Include a printed name and mailing address, and a signed declaration that all rules have been observed. Mailing deadline for CW entries is February 28, and March 31 for the SSB section.

Send logs to 160 Meter Contest Director Donald McClenon, N4IN, 3075 Florida Avenue, Melbourne, FL 32904 USA. They may also be sent to CQ 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801. Please indicate CW or SSB on the envelope.



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**DX MAGAZINE'S** August issue presented WX7K's (paraphrased) "casual survey . . . of 35 big gun . . . truly outstanding . . . 40M signals . . . that commanded the frequency . . . especially in pileups . . ." Results: "About 50% of amplifiers were an ALPHA model."

And the new ALPHA 87A is the best ALPHA yet!

73,



*Dick Ehrhorn*

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W4ETO



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# ANTENNAS & ACCESSORIES

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

BY KARL T. THURBER, JR., W8FX

## Antennas and Attics—Do They Mix?

**T**his month we'll discuss HF attic antennas, drawing on the extensive resources of Bill Fanckboner, W9INN, the man behind W9INN Antennas. We'll also briefly run through some new antennas and antenna products. We'll round out the column with some software notes on HAM-TIME, DXdB, and Quorum, as well as some update information on Logger, Morseman Plus, and one of our very favorite utilities, PC Tools Deluxe™ Version 6. Let's begin by dusting off some of the cobwebs in the attic.

### Antennas and Attics

Very frequently we're asked questions about using indoor HF antennas when it's difficult or impossible to erect an outdoor flattop for some reason. First, to make one thing "perfectly clear," it's always better to install an antenna outdoors, regardless of what claims may have been advanced for an antenna's performance indoors.

You can often get away with an indoor antenna for receiving. However, you may never know the *real* differences between antenna performance indoors and outdoors, differences and complications that turn up when the antenna is used to transmit. Still, many operators must consider using an attic antenna for transmitting due to partial or complete restrictions against outside antennas, if they are to get on the air with any kind of a creditable signal.

Bill Fanckboner, W9INN, is a longtime wire-antenna experimenter and designer, and he's corresponded with us several times about antenna design and philosophy. Bill is especially mindful of the problems many amateurs have in working with attic-mounted antennas. He tells me that his best-selling antenna is his MPD-5C, an 87 foot long 80-10 meter "no traps" coax-fed dipole. Some of these skyhooks have gone into the attics of multiple-unit condominiums, which often are 100 feet long. Another popular antenna is his five-band (80-10 meter) SSD-5-42' 42 foot dipole, many of which have gone into smaller attics.

Any comparison of an equivalent attic antenna with a similar one installed outdoors is highly subjective. But Bill's experience (and that of many of his customers) tells him that a shortened HF attic antenna tends to be "down" about 1½ to 2 S-units, or 9 to 12 dB, when compared to a full-size outdoor antenna at the same height. Many factors account for this difference, such as the presence of nearby conduit, ducts, and plumbing, as well as the type of roofing shingles used. Bill notes that common asphalt shingles are slightly conductive. Thus, they can affect both antenna reso-

nant frequency and the overall performance of an antenna installed in an attic.

As Bill notes in one of the "fact sheets" he sends out along with his antenna catalog, locating an antenna—especially a multiband antenna—in an attic can be tricky. This is because it's difficult to compensate for the antenna's exact surroundings, its environment. All of the building's conductors are coupled to the antenna to a greater or lesser extent. This coupling causes a change in the resonant frequency, which is usually lower than the same antenna hung in the clear. However, it isn't necessary that the antenna be exactly resonant on all of the desired frequencies, as a wide-range tuner can be used to provide a match that the transmitter will accept.

When hanging the attic antenna, keep it as clear of "things" as possible. Run it a couple of feet below the roof, because of the effects of the slightly conductive asphalt shingles. Also, keep the end sections at least a foot or two from walls, the ceiling, and the floor. If you need to bend the antenna slightly to keep it clear of obstructions, you can use Dacron line to do so, as it is an excellent insulator. Tie it directly to small loops in the antenna element: make small loops ½ inch in diameter, twisting the wire a turn or two.

After you've hung the antenna, determine the antenna's resonant frequency on each band. This normally will be the frequency at which the minimum SWR occurs. Check the SWR every 10-20 kHz across the entire band. Write down the frequency at which minimum SWR occurs on each band. If it's a multiband antenna, repeat the process for each band you'll be using.

It's possible that the antenna's resonant frequency will be out of the band. You can use an antenna noise bridge or similar accessory to find the resonant frequency. Once you've determined where the antenna is resonant, you can adjust each band's point of resonance using whatever technique is appropriate to the particular antenna: adjusting impedance matching stubs, end stubs, traps, wire element length, etc.

Bill suggests starting adjustments with the highest band first: if that's 10 meters, start with it. He notes that there is a great deal of coupling between bands. He's found the greatest coupling effects to occur on the bands adjacent to (on either side of) the band being changed. For example, a change in the 40 meter resonant frequency will mostly affect 20 and 80 meters.

As a practical matter, with most coax-fed HF wire antennas you can often use a tuner to avoid making any adjustments to the antenna itself, as long as resonance is somewhere in the band. However, since the 80 meter band is so broad, and the antenna bandwidth typically is very narrow, you should adjust resonance on this band to within 50 kHz of the desired fre-

quency before resorting to using the tuner.

If you feed the attic dipole with ladderline or other parallel conductor feedline, you must use a tuner. However, in most cases you probably can just hang the antenna and operate. If you want to make resonant frequency adjustments, one way to do so is to **temporarily** attach a 50-75 ohm transmission line to the antenna and make adjustments with the tuner out of the circuit. Then attach the ladder line after you've completed adjustments using the temporary coax feedline.

Bottom line: If you have a little patience, you'll likely find that an attic antenna can "work out" surprisingly well. And a tip of the hat to W9INN for sharing his thoughts on HF attic antenna installation with us!

### Antenna Shorts

**Tice Flagpole Vertical.** Sometimes an outdoor wire antenna or a tower-mounted beam is out of the question. Either there isn't sufficient room, or the antenna would be an eyesore if installed in the only place there is room for it. And as most of us know, many cities, developments, condominiums, and apartments restrict antenna placement. One solution to the operating problem is the attic antenna, but there are others.

On more than one occasion a reader has sent us a snapshot and description of his personal solution to the "no antennas allowed" rule. Many amateurs find they can get on HF by patriotically disguising their vertical antenna as a flagpole. The idea is to make the antenna look as much like a flagpole as possible.

The first commercial HF flagpole antenna I've seen is the Tice Electronics FP3V Flagpole Vertical, a small, three-band (10, 15, and 20 meter), 10 foot trap antenna designed to fit almost anywhere. The active part of the 8 lb. antenna is copper wire, while the supporting structure is sunlight-resistant electrical-grade PVC plastic that folds in half for portability. The helical loading circuits are enclosed to be weatherproof. Installation consists of digging the included mounting post in the yard, unfolding and securing the two portions of the antenna, and placing it on the mounting post. The antenna requires a ground rod and/or radials.

The Tice antenna is fed with 50 ohm coax and can handle 200 watts. SWR is claimed to be less than 1.4:1 at resonance, and is typically 1.2:1 or less. All of 15 and 20 meters are covered, while bandwidth on 10 meters is 600 kHz. The FP3V triband model is priced at \$59.95. There's also the similar FP4V; it covers 40 meters as well and is 15 feet tall with a capacity hat. Its price is \$98. The instruction manuals, accessories, and even a US flag are available separately.

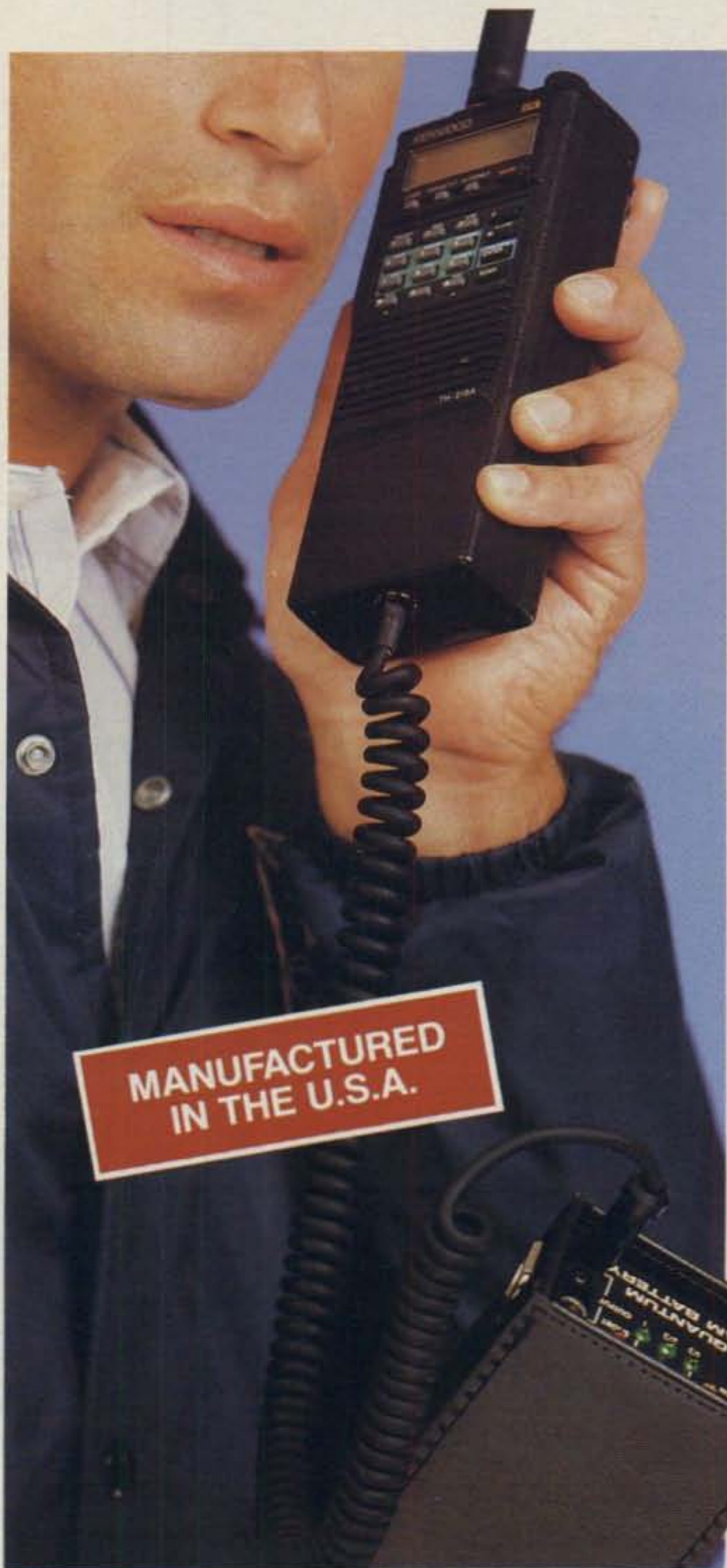
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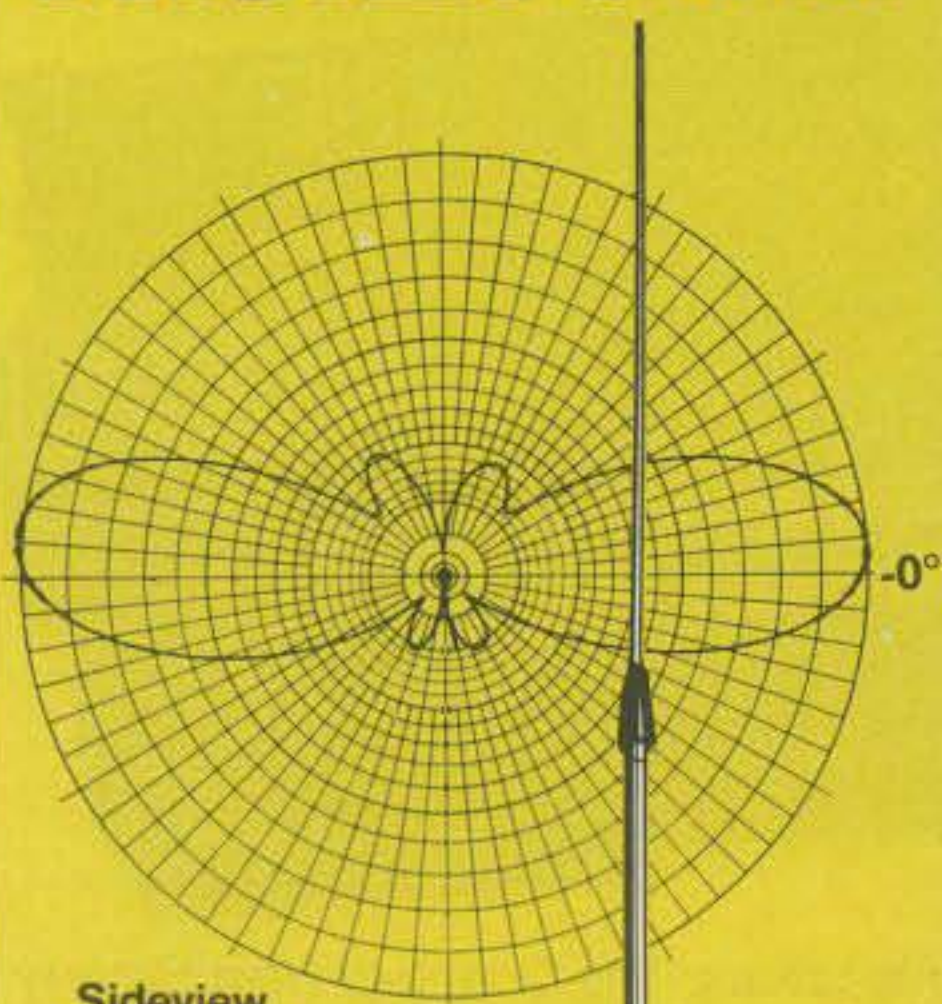
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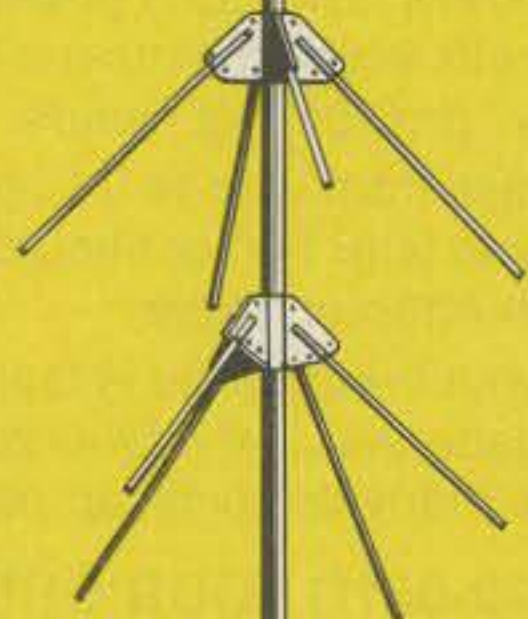
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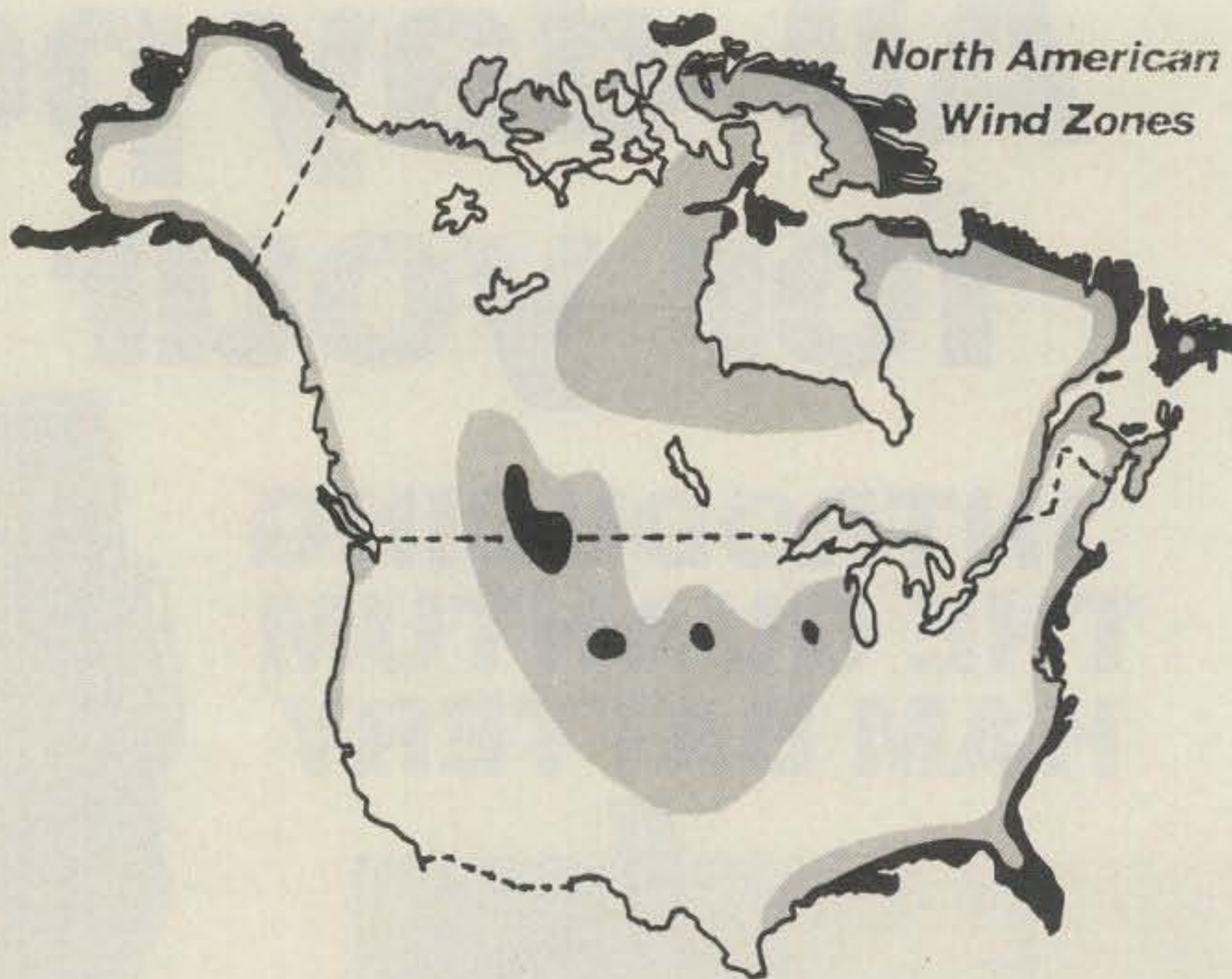


Fig. 1- Here's a synoptic sketch of North American wind zones. It shows the normal maximum wind velocities you should consider in tower selection. The solid areas are 100 MPH, the shaded areas 85 MPH, and the clear areas 70 MPH. Like other tower manufacturers, Trylon provides a chart using this information and the surface area of your load to help you determine the wind thrust value at the top of the proposed tower. This enables you to select the most appropriate tower for your area. (From Trylon tower literature)

WAØTDA, Tice Electronics Company, 933 W. St. Croix Ave., Stillwater, MN 55082.

**Rutland Arrays Yagis.** This Pennsylvania manufacturer specializes in K1FO-style Yagis covering 144 through 440 MHz. They offer eight models designed for 144, 220, 222, 432, and 440 MHz operation in their latest spec

sheets. The company also offers 2-, 4-, 6-, and 8-port power dividers covering 144-148, 220-230, and 430-450 MHz, as well as stacking frames to stack 4, 6, or 8 K1FO-type Yagis.

A particularly interesting addition to the product lineup is the RA8-2UWB, an 8-element 2 meter "ultra wideband array" that is espe-



Fig. 2- Shown here is the HAM-TIME Main Clock Menu. It displays the local and GMT time, along with the correct date for each. The major function keys are shown at the bottom of the screen. You also can access three additional menus from this menu: the Event Timer, Lap Timer, and Time Zones Menus. (Screen display courtesy ECode Systems, Inc.)

cially intended for use with 2 meter all-mode transceivers. The array's length is 11 feet 9 inches, and it sports a claimed gain of 13.3 dBi. The operating bandwidth is greater than 4 MHz. Front-to-back (F/B) ratio is 22 dB and maximum power-handling capability is 400 watts.

For spec sheets and pricing contact Rutland Arrays, 1703 Warren St., New Cumberland, PA 17070.

**Trylon Titan Towers.** Information received from Bert Martin, Sales Manager, Trylon Towers, says the company has introduced what they call their "second generation tower system," the Titan™ line. The Titans replace the Trylon ABC towers and are designed for very heavy-duty operation. They may be self-supported or guyed. The towers boast a newly designed base and lower section for improved stability.

The Titan towers are available in kit form or factory assembled 8 foot sections that allow you to match your height and load requirements to the prevailing weather conditions. The towers are engineered to handle top-mount loads of up to 300 lbs. Seven different models are available to handle various load surface areas and maximum wind strengths, which combine to form an overall "wind thrust value." In its tower literature Trylon provides an easy-to-use chart for determining the proper tower model to take into account these factors. Towers are available to handle wind thrust values from 200 to 1300 lbs. The towers are priced according to height and strength, ranging from a 16 foot T200 that runs \$380 list, up to a 96 foot bruiser that goes for \$2425.

The kits are shipped FOB Buffalo, New York and are complete with splice bolts, top mount plates, clamping brackets, and stub legs. You can erect the towers using a crane or boom truck (the most efficient method) or by using a Gin Pole. Trylon also offers anti-climb shields, mast bearings, ground kits, base foot "weldments" (for attaching the tower to flat roofs or concrete), grounding and lighting kits, antenna mounting pipes, light-fixture supports, and antenna side-mount kits.

For more information, contact Trylon Manufacturing Co., Ltd., P.O. Box 186, Elmira, Ontario N3B 2Z6, Canada.

Fig. 1 shows a North American Wind Zone Chart, as included in Trylon's literature.

**Cushcraft WARC Band Dipole.** The WARC bands are relatively new, and there seems to be a real lack of commercial antennas that recognize the bands' existence. Cushcraft has taken a step in filling this void with its D3W rotatable dipole which covers the 12, 17, and 30 meter bands.

The new antenna is a trapped tubular aluminum dipole. It physically resembles the driven element of a tri-band beam, though of course it lacks the directivity of the beam. The antenna is designed to cover all three bands with an SWR of 2:1 or less, with SWR at resonance 1.5:1. The antenna has a mast diameter of 2 inches and a length of 34 feet. It weighs in at 11 lbs., so you can turn it with a TV-type rotator. It features all stainless-steel hardware and rugged construction. Price class is about \$200.

For specs contact Cushcraft Corp., 48 Perimeter Rd., Box 4680, Manchester, NH 03108.

**TCE Labs Filters.** TCE Labs offers three types of filters for amateur use: cable TV, telephone, and AC line. The Type BX Cable TV Filter is intended to eliminate interference from TV set overload as a result of close proximity of



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CIRCLE 72 ON READER SERVICE CARD

HF transmitting equipment. A high-pass filter, it attaches directly to the coax input connector of the VCR or TV set and uses industry standard F-type connectors. It's priced at \$24.95.

TCE Labs also offers two other filters. One is the TP-12 Telephone Filter, said to offer highly effective suppression of RFI from SSB transmitters in standard telephones. The filter has a standard telephone jack and plug so it can be installed either at the wall outlet or (preferably) at the telephone instrument's base plug. It's \$18.95.

A third filter is the KW-1 AC Line Filter, a commercial-quality filter said to provide an attenuation ratio of 8000:1 of RF in AC lines. The 2 lb. filter has two three-wire standard AC line sockets for plugging in amateur equipment, a TV, VCR, or other AC line sensitive equipment drawing up to 1000 watts. The filter also eliminates most types of noise and hash generated by electrical machinery. Its price is \$42.95.

For more information contact TCE Labs, 5818 Sun Ridge, San Antonio, TX 78247.

## Software Topix

**HAM-TIME.** The June issue of *Popular Electronics* featured an interesting hands-on review of the ECode Systems' HAM-TIME software, and I was intrigued by it. A letter to ECode Systems' Robert W. Ellis, WB9JBI, brought me an evaluation copy.

HAM-TIME is a digital clock simulator or "large format clock program" for the IBM PC. The program is especially for those who use GMT. It provides a convenient way to keep track of time without constantly making conversions between local time and GMT. While of greatest interest to amateurs and SWLs, outside of the hamshack the program's counters and timers are also useful for lab or hobby-room use.

Some of the program's main features include a local/GMT time dual display, as shown in fig. 2; a digital alarm clock; a snooze alarm; 12 or 24 hour mode; a time-remaining event count-down timer; an audible time indicator; and a handy sports lap timer. The large, near-screen-filling display makes it easy to read the time even from across a room.

There are two special displays. One of these is the Time Zone Display, which provides a quick way to check the time across the country. A second is the Cities Around the World display. This display gives you a way to keep track of time in any area of interest. You can customize this display by preparing a text file to replace the preset city names with other city names or even callsign prefixes from that area.

I found the program to be very well done, with the combination function key and menu format easy to use. The fact that you can install HAM-TIME on a laptop computer opens up many portable and on-the-road possibilities, too. The program is intuitive in its operation, and the accompanying manual is concise and brief. However, I would like to see a resident pop-up version of the program that one could hot-key into from another program, such as a logging or contesting program, if possible.

HAM-TIME is available for the IBM PC and compatibles having at least 128K memory. You need a CGA- or EGA-compatible display screen. A speaker and a real-time clock in your PC are desirable. The program is \$24.95 and is available from ECode Systems, Inc., 335 West Virginia, Phoenix, AZ 85003.

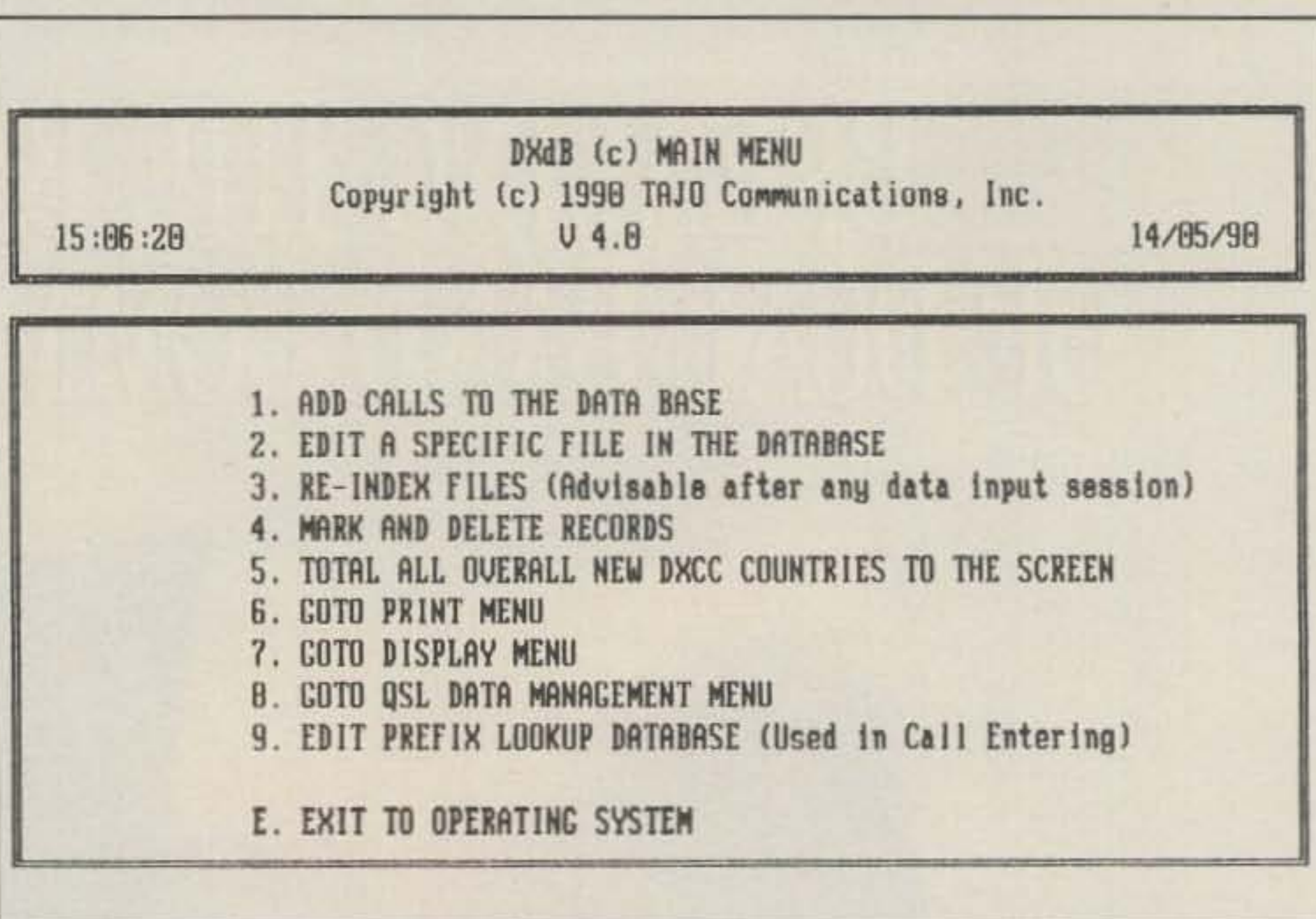


Fig. 3- The DXdB Main Menu allows you to access a variety of features of this DX data tracking program that boasts very fast sorting and data-management capabilities. Though sophisticated, the program is completely menu driven and easy to use.

**DXdB DX Database Program.** TAJD Communications has come up with DXdB©, a special-purpose DX data tracking program for the IBM PC and compatibles. Not a logger in the conventional sense, DXdB is a fast, menu-operated data management program for those who need to keep track of information and accomplishments such as DXCC, WAZ, new country "want lists," and Russian oblast to-

tals. DXdB, claims the manufacturer, should allow you to access and analyze your DX records faster and more accurately than by any other means.

In data entry, which is very sophisticated and includes error checking, you enter the call of the station worked, date, time, mode, and signal report. There's a field for you to enter the "standard" prefix for the country. After

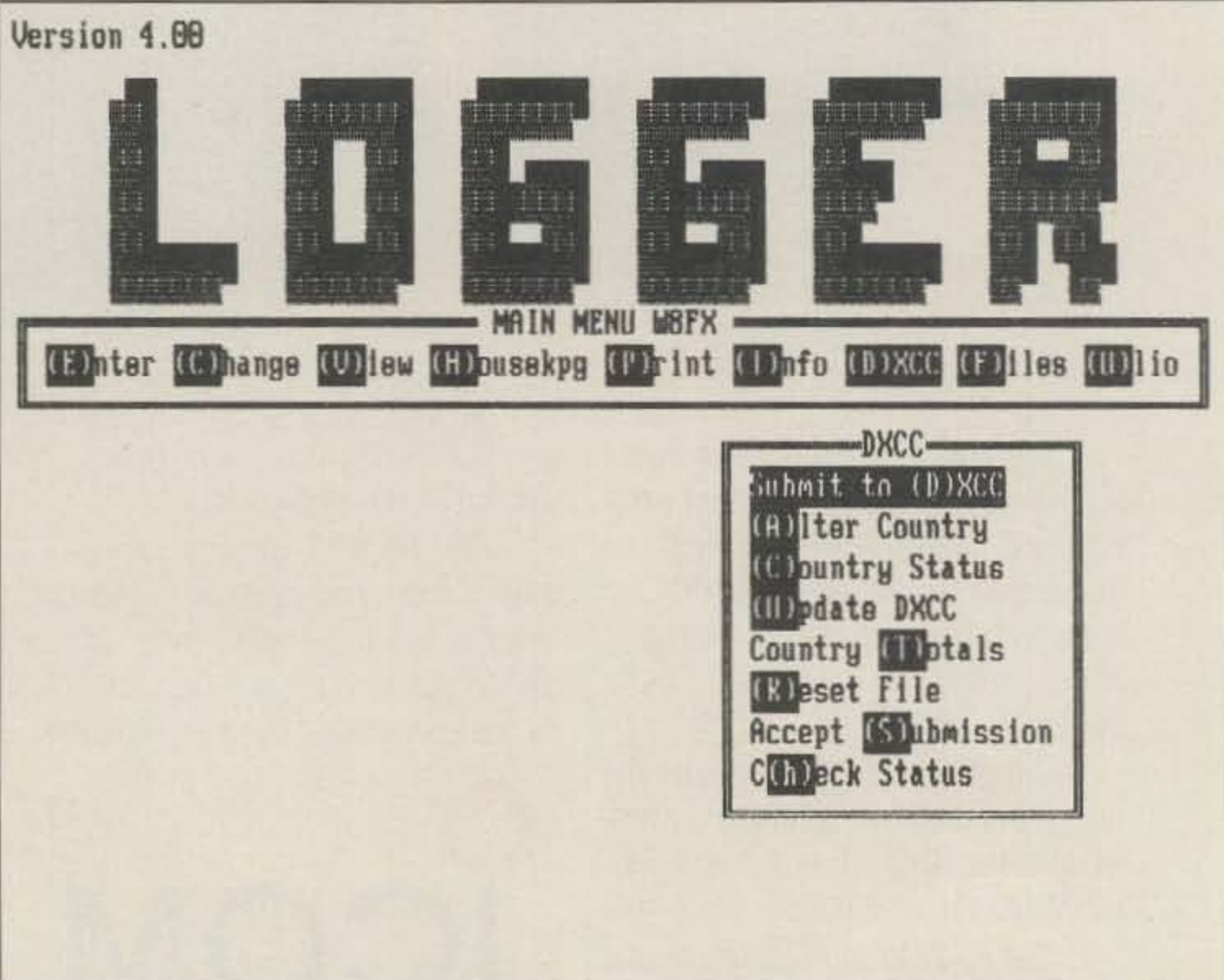


Fig. 4- A screen dump of the LOGGER Version 4 Main Menu shows a variety of features in a logging program that focuses on tracking DXCC and other DX awards. Our first look at LOGGER in the January 1989 column revealed an outstanding program, and it appears that the new version is even better. See the text of this month's column for more details.



you do this, the program supplies the country name and the CQ Zone (if there's only one for the country). There also is an "oblast" field, but you can use the field for other tracking purposes.

Once you've entered the data, it can be edited, listed, browsed, printed, searched, and sorted by various criteria such as band, mode, zone, or oblast, or by a combination of criteria. The program also includes a complete QSL data management facility that lets you keep track of outstanding QSLs and print labels for outgoing QSLs.

I found the program to be an excellent one for its stated purpose of tracking DX data, and it comes with a short but well-written manual. However, the program disk is copy protected, and you should be aware of this. The "key program protection scheme" used is fairly simple but means that you have to follow carefully certain procedures should you de-install and then re-install DXdB, to prevent being locked out of the program and your valuable DX records.

DXdB is priced at \$35 and is sold by TAJO Communications, Inc., P.O. Box 050372, Roseville, MI 48066-0372.

Fig. 3 shows the DXdB Main Menu.

**Quorum WEFAX Card.** The Quorum Communications WEFAX PC Adapter is an "intelligent" scan converter for HF FAX, NOAA APT, GOES WEFAX, and Russian Meteor images on your IBM PC or compatible EGA or VGA display. It contains a built-in 8-bit analog to digital converter that, in connection with software running on the PC, provides a very easy to use and integrated weather FAX reception system. The program allows display of up to 640 x 480 pixels in up to 16 levels of gray or colors. The card's built-in microcomputer provides all of the timing and synchronization needed to receive the images without being concerned with timing loops or the PC processor or clock speed. The PC acts as a display, control, and file system for the adapter.

Some of the main features include a menu-driven interface; automatic synchronization, file save, aspect ratio correction, and level control; tape recorder inputs and outputs; built-in audio amplifier; software-selectable video bandwidth; keyboard selection of major system functions; and a user-configurable timer that allows unattended operation. The system can even be configured for satellite path direction so that, for example, a south-to-north pass builds from the bottom of the screen.

The WEFAX PC Adapter is priced at \$399; a companion 135-139 MHz weather satellite receiver, the SL-137, is \$375. More information, along with a demo disk that allows you to view and manipulate stored images, is available from Quorum Communications, Inc., P.O. Box 277, Grapevine, TX 76051.

**801A Scanning System.** Using this system in conjunction with the ICOM R7000 communications receiver's interface lets your IBM PC or compatible computer control your receiver. This allows faster scanning, more useful scan-delay modes, and several other capabilities. Some of these include storage of up to 1800 channels in as many as 200 banks in a database, storage of a text description of each channel for display during scanning, setup of as many as 100 search ranges, function key access to scan-timer values and three scan-continue modes, and channel lockout by function key. Other system features include the ability to program R7000 memories from the 801A database, search multiple ranges for ac-

tivities to build a list of up to 500 active frequencies, and more.

The complete system includes the program (available on 5.25 inch or 3.5 inch diskette), a half-slot serial interface card, a serial interconnection cable for the R-7000, and a detailed instruction manual. The system is priced at \$98. A demo program disk is available for \$6; it's the same as the real program, except it doesn't "talk to" the R7000.

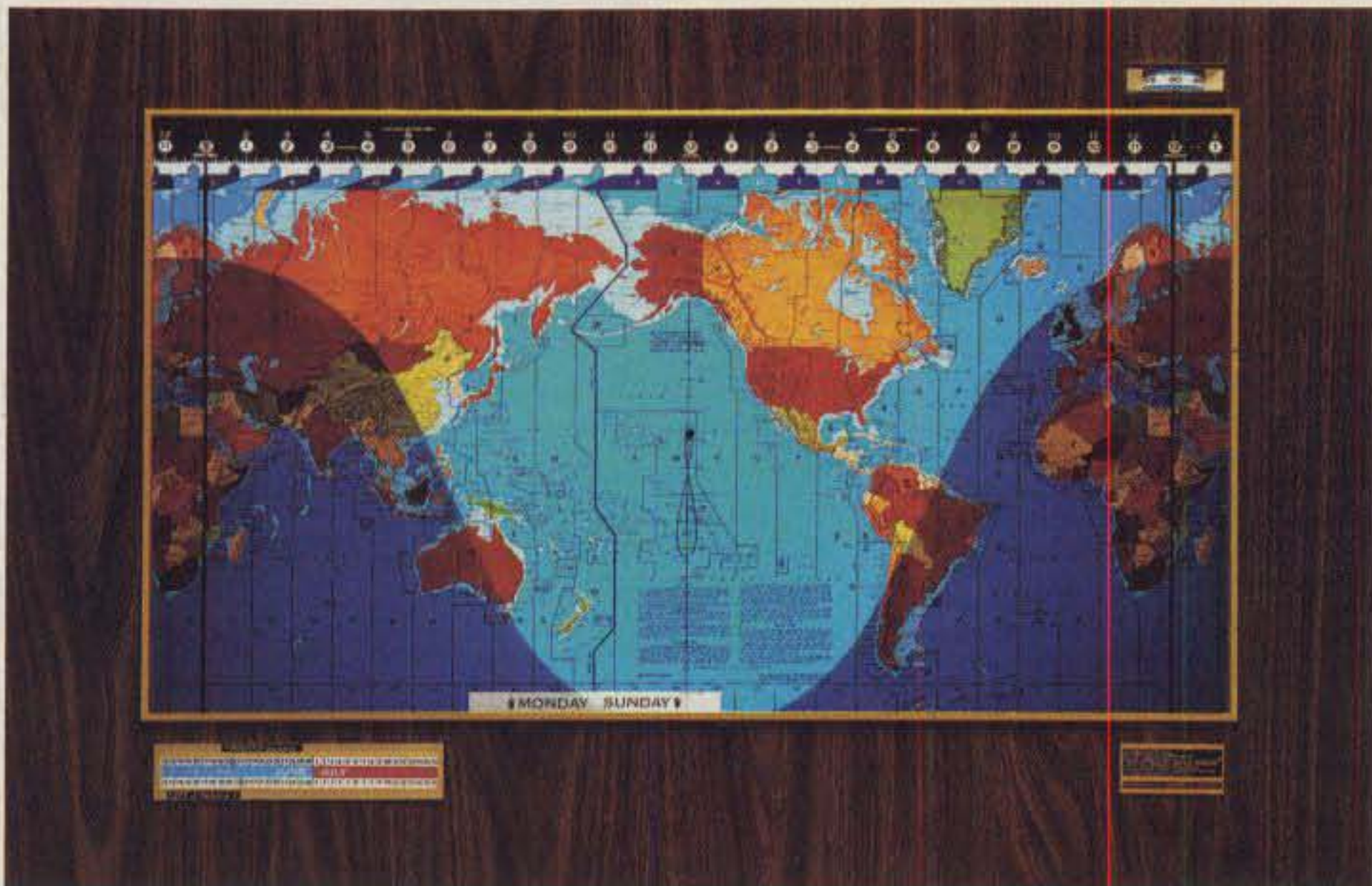
For more information contact 801-SCAN, 397 Dal-Rich Village, Suite 12, Richardson, TX 75080.

**Morseman Plus Update.** In the March column we surveyed Morseman Plus Version 2.52, a very competent Morse Code trainer for the IBM PC. Upon reading our comments in the column, the program's developer, Robin Gist, NE4L, of Renaissance Development, sent us the latest Version 3 update.

The new version includes some nifty new features. One is a new "effective speed" parameter. This allows a straightforward Farnsworth implementation so that you can keep a certain character speed, but have more spacing between characters. Use of this feature is desirable so that you can learn the characters by their respective sounds and not by counting the dits and dahs.

There's also a new "practice only" mode. With it you can practice only the characters that are giving you trouble. To use it you simply enter the characters that you need to practice, and the program sends only those characters. There's also an expanded word dictionary for the random-word generator. This gives you access to 50,000 words (as opposed to 1500 in Version 2.52), with the option to add another 50,000 words. Other enhancements include improvements to the FCC/VEC Test feature as

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well as scripts that allow you to embed commands in text files to control the program. The package is priced at \$24.95 plus \$2.00 shipping and handling.

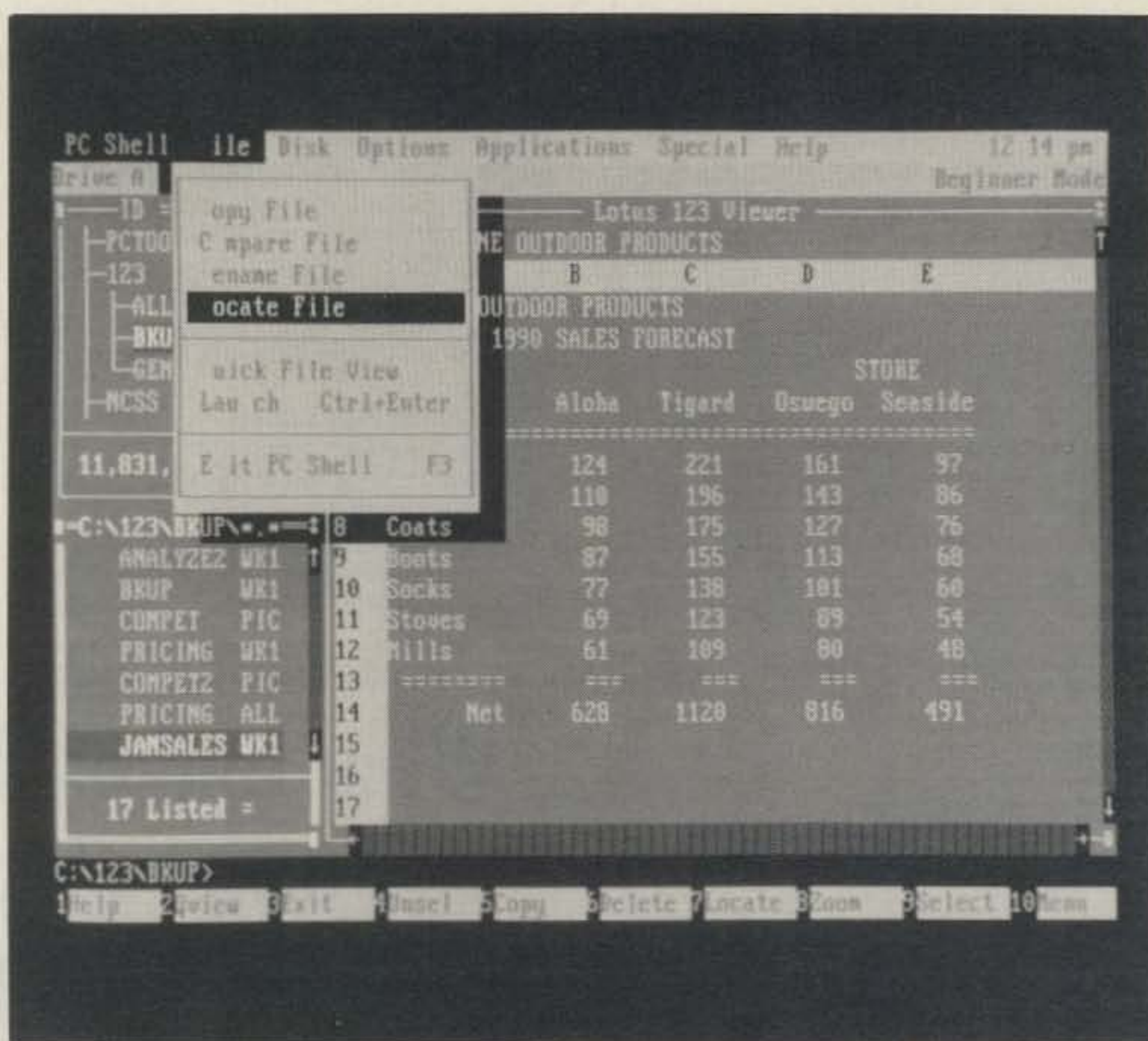
Robin notes that some users have had problems using Version 3 on "near compatibles" running versions of DOS earlier than V3.2, such as older Tandy and AT&T 6300s. He should have these minor problems worked out by the time this appears in print.

Incidentally, Robin also operates the Renaissance Software Library, which offers a good selection of top-rated shareware and public-domain software for the IBM PC and compatibles. Included in the library are a large number of amateur radio programs, including several I have not seen elsewhere. The 5.25 inch disks are \$3 each; 3.5 inch disks are \$4.

For details contact Renaissance Development, Box 640, Killen, AL 35645.

**LOGGER Update.** You may recall our first visit to LOGGER, the IBM PC logging program that specially focuses on tracking DXCC and other awards, in the January 1989 column. The early version was an outstanding program, and it appears that the new Version 4 that Jim Bobo, W5ODD, sent me is even better, with several new features.

To review, LOGGER is far from generic. It is a system of six related programs used to keep a log of contacts and to work contests easily. You can use the log it produces to print out lists of contacts, DXCC lists, and WAZ lists, or to display contacts on the monitor screen. As we noted in the earlier column, LOGGER offers a wide range of features, including the generation of monthly calendars; country, zone, state, and province count; display of contact records; bearing and distance as well as sun-



Here's a typical pull-down screen from PC Shell, the superb DOS shell included in the PC Tools Deluxe V6 utility package. You can configure the shell to different levels of user expertise. Here it's shown in beginner mode. You also can use the shell to access other programs in the package. (Photo courtesy Central Point Software, Inc.)

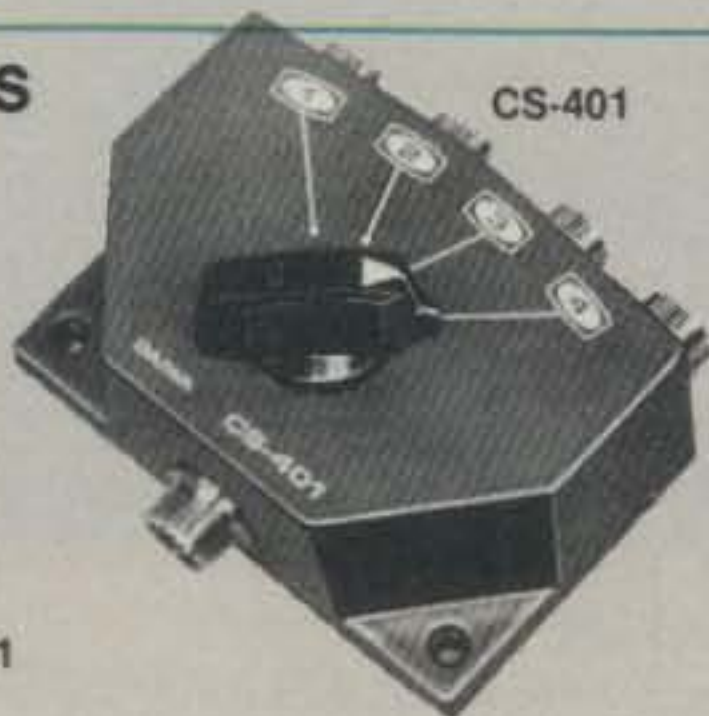
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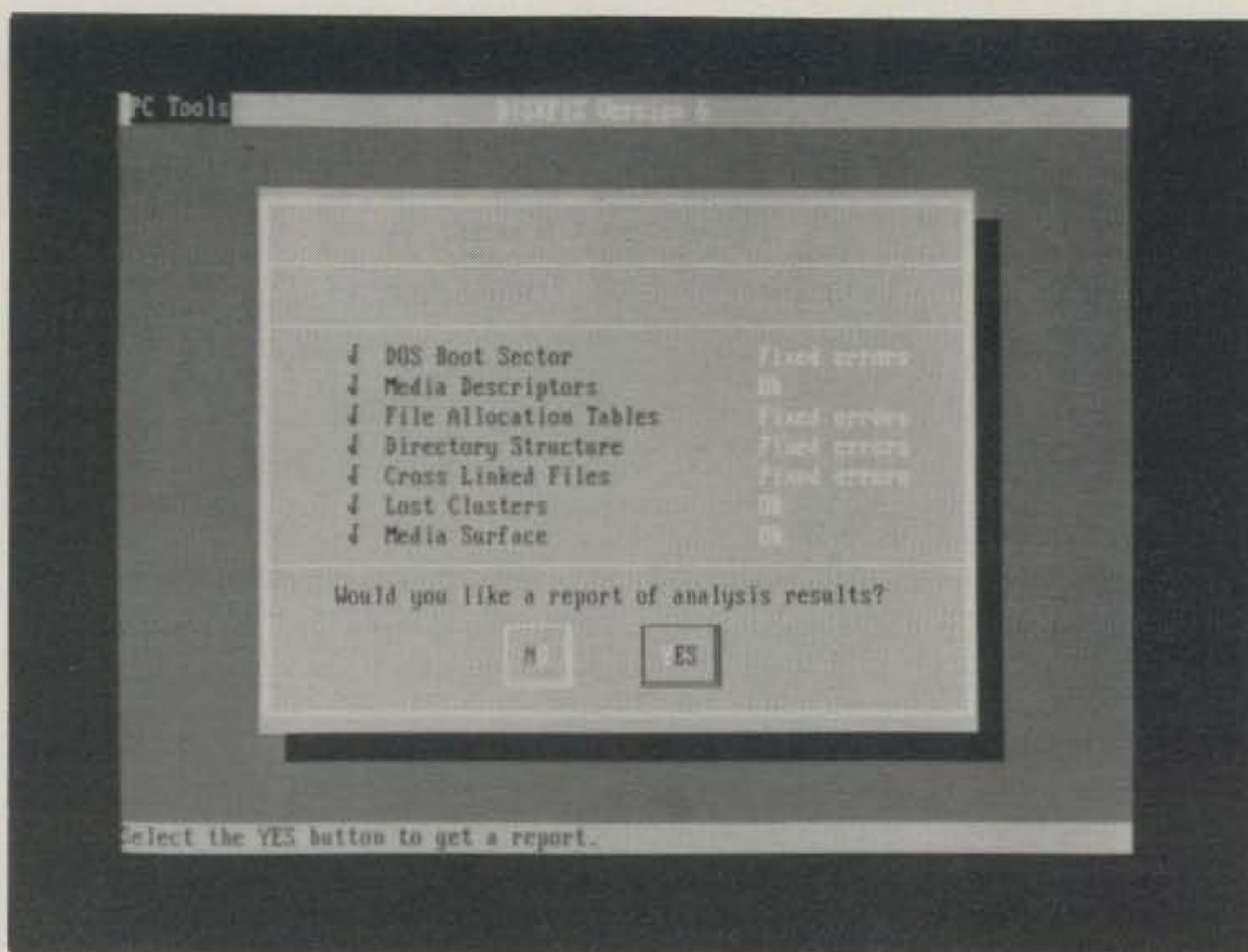
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CIRCLE 2 ON READER SERVICE CARD



Shown here is a new addition to the extensive array of PC Tools utilities. It's DiskFix™, a comprehensive disk repair program. The new program handles disk corruption nicely; it can rebuild hard-disk partition tables and logical boot sectors, repair File Allocation Table (FAT) and directory information, recover lost files and subdirectories, lock out bad disk sectors, and much more. (Photo courtesy Central Point Software, Inc.)

rise/sunset time calculation; a grid locator function; various print options, including QSL labels; and much more that we don't have space to detail here. Suffice it to say that the new version has the look and feel of a polished commercial software package, including a shell-to-DOS feature, a complex calculator, and a number base conversion routine.

The LOGGER program isn't public domain, although it is freely distributed and nonregistered users can use the program for a short while to see if it meets their needs. The registration fee is \$35. This fee entitles you to re-

ceive the latest version of all of the programs in the package, except for a special contesting program known as CONTEST; you can get it for \$15 extra. Registration entitles you to receive future upgrades for 2 years for a \$5 nominal fee.

For information contact Jim Bobo, W5ODD, at Alamo DX Amigos, 196 Tomahawk Trail, San Antonio, TX 78232. Fig. 4 depicts the LOGGER Main Menu.

**PC Tools Deluxe V6.** Again, the best gets even better. Once more, the software wizards at Central Point Software have improved their

award-winning utility package with the release of Version 6. (We reviewed earlier versions on four separate occasions—in the March and October 1988, October 1989, and March 1990 columns—the last review that of PC Tools V5.5 in March.)

With each new version Central Point adds to the utility's collection of programs and strengthens the existing ones. The new version is more than a comprehensive set of disk utilities; it's actually evolved into something that is more of a complete operating environment for your PC. This makes it suitable as one of the first program packages you might purchase.

Just in case you're not familiar with PC Tools, some of its major features include a multipurpose DOS shell; disk backup and maintenance utilities; a desktop program that includes a database, outline, notepad, appointment scheduler, modem communications, and four different calculators for algebraic, scientific, business, and programming tasks.

Version 6 includes communications capabilities to very easily send and receive E-Mail from MCI Mail, Easylink, and CompuServe®. There's also a facility to quickly write up a memo and send it via FAX, if you have a FAX card on your PC. Also included is an integrated version of Traveling Software's LapLink® program, to connect a laptop or other PC to your PC via the serial ports, enabling quick and easy PC-to-PC file transfer. And the new database function generates dBASE-compatible database files, with indexing, mail merge, append/transfer, and field editing; it handles up to 10,000 records per file.

Another completely new feature is Disk-Fix™, an automatic and powerful disk repair program. Still another is the many new file viewers to allow you to see directly files produced by more than 30 different applications in their native format, without having to load the software that created the files. The PC Backup program now includes appended backups and comparison of backups with the original files as well as support of several different tape backup drives.

There's also a new PC-Cache program that speeds hard-disk operations using expanded memory (EMS), extended memory, or conventional memory. A nice touch, too, is the selectable user levels in both the PC Backup and PC Shell programs.

The new version is big in two ways. It requires about 3 megabytes (MB) of hard-disk space, and the three fat manuals contain nearly 1000 pages of documentation for you to digest. The price now stands at \$149. This may seem high, but upgrades for registered users of earlier versions are bargain-priced at only \$35. Overall, PC Tools V6 does everything well. When taken as a whole, the collection is priceless—especially should you need to repair a crashed disk and recover highly valuable data.

For detailed information, contact Central Point Software, Inc., 15220 NW Greenbrier Pkwy., #200, Beaverton, OR 97006.

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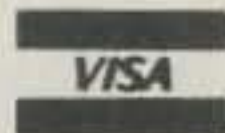
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## Wrapping It Up

That's all for this month, guys and gals. Next time more Antennas & Accessories topics of current interest. See you then.

*Overheard:* The Fourth Law of Computing is "On a clear day you can wait forever."

73, Karl, W8FJ



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KANTRONICS KAM

## A LOOK AT THE WORLD AROUND US

### A Keys Bonanza!

Thanks to your continuing interest and support, this month's column features yet another blowout celebration of amateur radio's favorite accessory—the telegraph key. This time we have a fascinating collection of views and information that spans the most prized bugs to the latest handmade paddles. Some special treats and ever-popular items are also included to balance our photographic tour and inspire your own interest in key collecting. This whirlwind review is once again overflowing available space, so hold onto your magnifying glass and pay close attention as we move at our usual fast pace. I will postpone soapboxing until later and jump right to the details.

The star contributors of this month's views are Jim Aguirre, WB7DHC, of Preston, Washington; Evelyn Garrison, WS7A, of ICOM America fame; Charles Tryor, N4LMY, U.S. liaison for G4ZPY's keys; MFJ Enterprises; and Kent keys. CQ Editor Alan Dorhoffer, K2EEK, and yours truly, K4TWJ, also added some of our own keys. Additional details are included as we continue. Let's begin with WB7DHC.

Jim Aguirre (P. O. Box 527, Preston, WA 98050) has an impressive collection of over 100 bugs, and he specializes in Vibroplexes. His knowledge of keys is equalled only by the accuracy of his documentation of bugs. Let's look at his key delights.

#### Photo 1

Surely the rarest and most unusual Vibroplex ever made is the "Midget," or pocket bug. A very limited number of this little marvel were produced between 1917 and 1925. They are so scarce, in fact, that Jim has only a single photograph shot from W7GAQ's collection to share with us (and we promised its safe return to WB7DHC after use!). Advertisements of the Midget appeared mainly in trade magazines (such as the *Railroad Telegrapher* ad shown in fig. 1), so many amateurs were not aware of its existence.

Close ad and photo inspection reveals the Midget's design. Its base is apparently 2 inches wide by 5½ inches long, with a

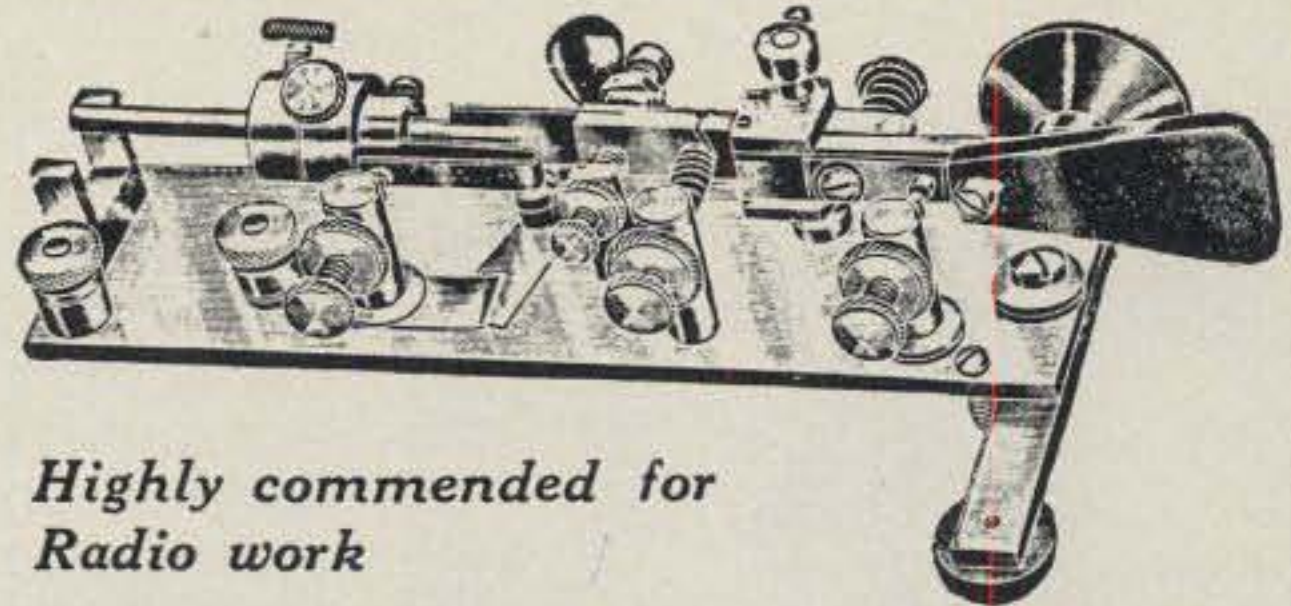
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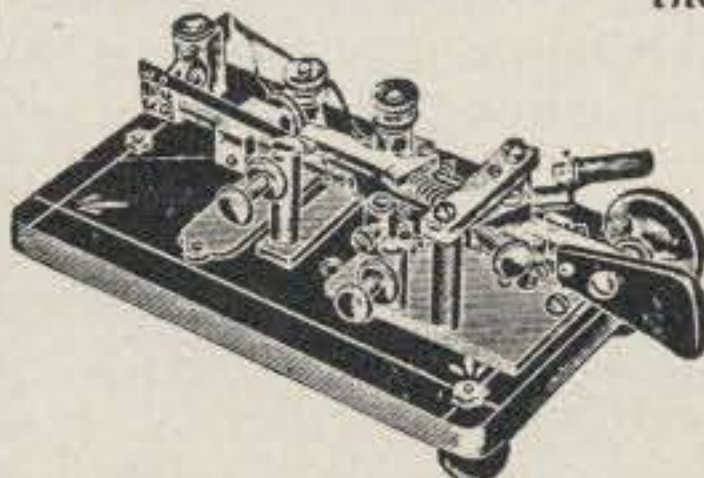
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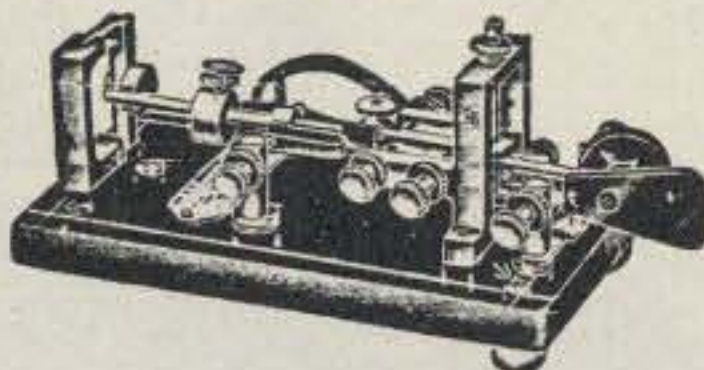
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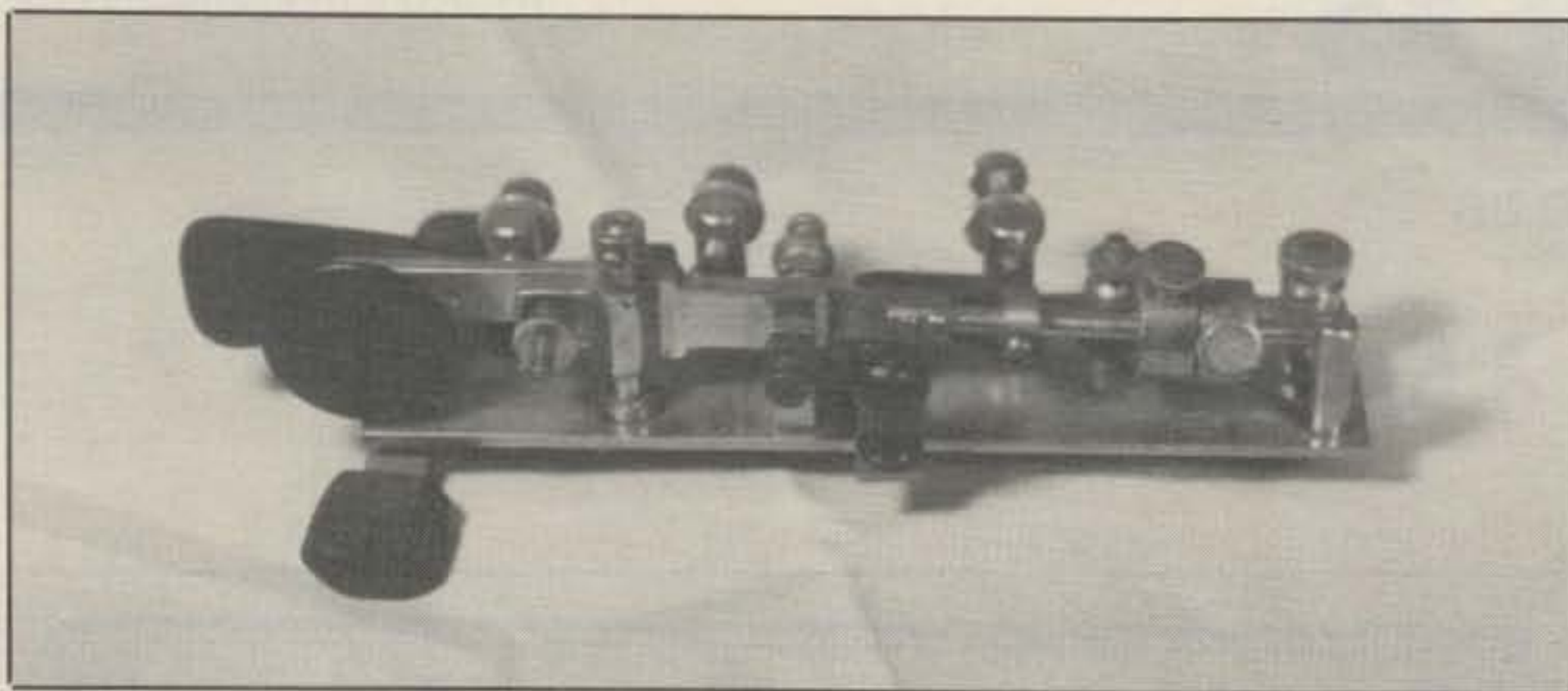
J. E. ALBRIGHT, General Mgr., Member N. Y. O. R. T., N. Y. Div. 26. Cert. 68

Fig. 1—This advertisement featuring the Vibroplex Midget appeared in a 1924 edition of *The Railroad Telegrapher* magazine. (Tnx to WB7DHC)

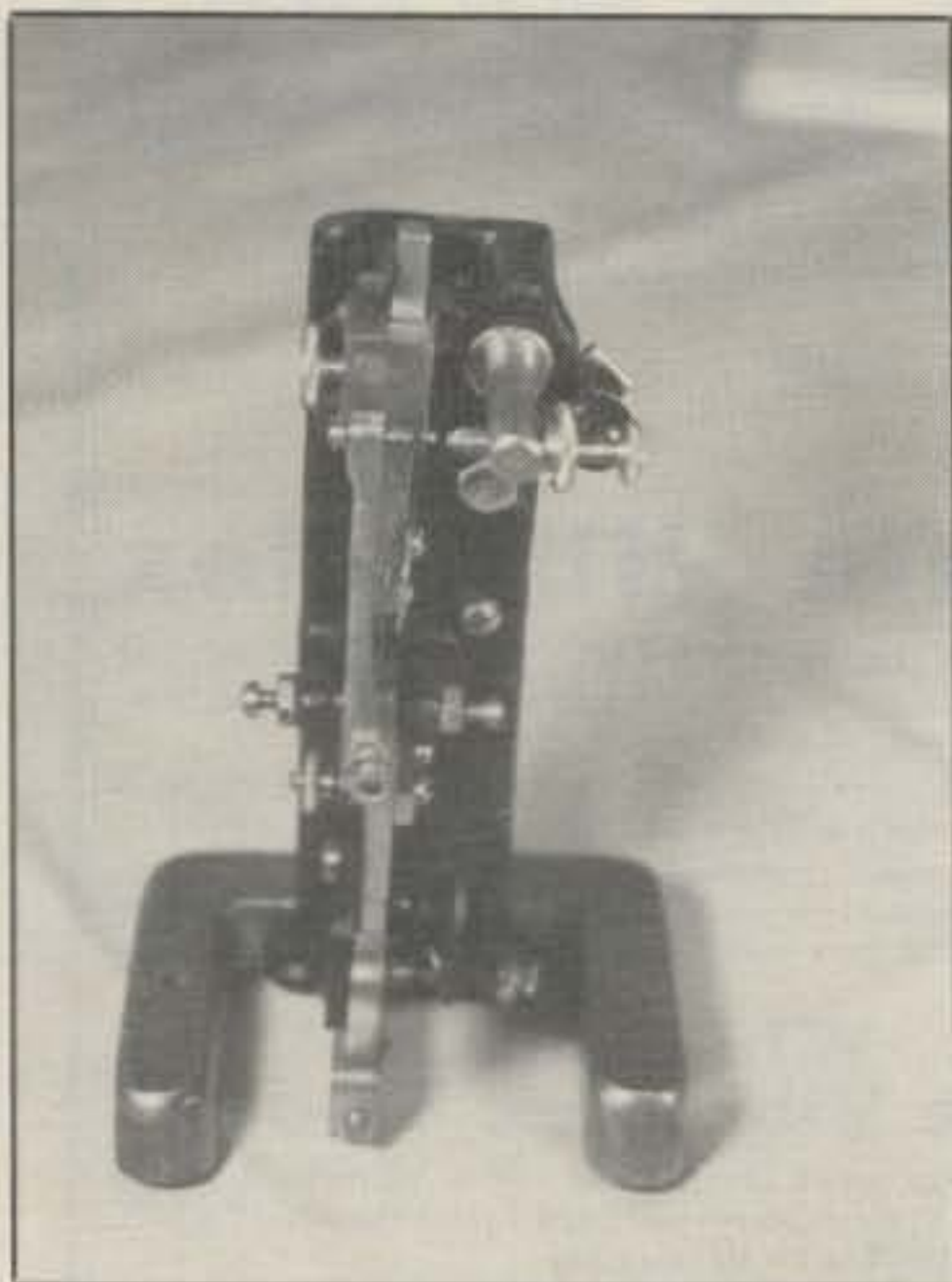
swivel foot bracket for pocket carrying. There is no conventional yoke; a single ball-bearing-equipped post holds the main arm (obviously to reduce height). That post was evidently "borrowed" from

the classic vertical bug shown in photo 2. The Midget's rear damper is a miniature version of that used on Model 4/Blue Racers. We do not have details on the Midget's "feel" during use, but judging by that

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*Photo 1— The extremely rare and highly prized Vibroplex Midget. A very limited number of these pocket-size bugs were made between 1917 and 1925. As you can see, its "yokeless" construction is unique. (Photo from W7GAQ's collection and courtesy of WB7DHC.)*



*Photo 2— A serious collector's delight—the famous and rare vertical Vibroplex. Visualize this marvelous item standing by your favorite rig today. Ham heaven indeed! (Key owned by W7GAQ; photo via WB7DHC.)*

short mainspring and pendulum, it would surely be a real high-speed thrill!

### Photo 2

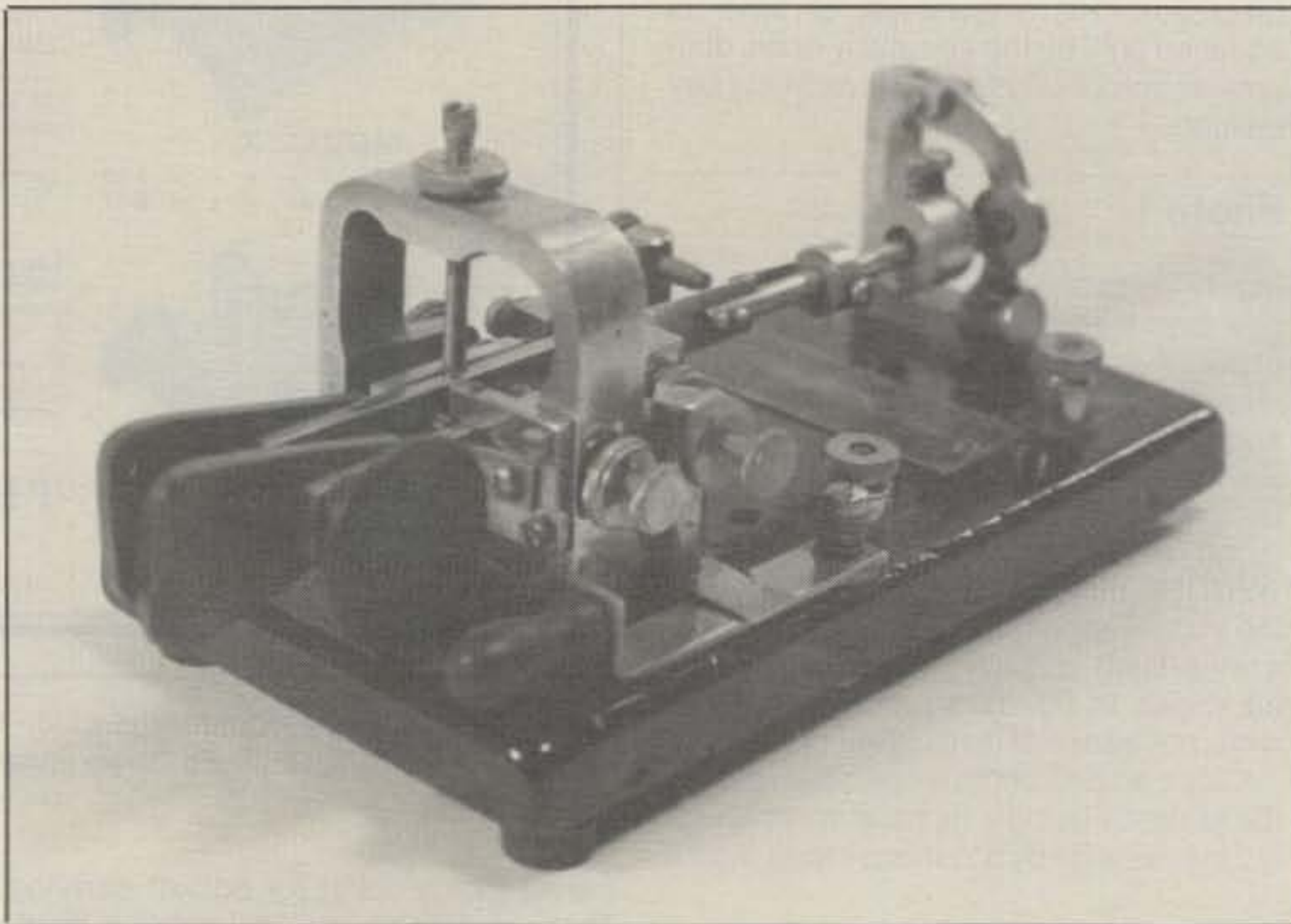
This quite rare and classic vertical Vibroplex was designated the "Upright" model and affectionately dubbed the "Wire Chief's key" because it occupied minimum space on a busy operator's desk. Like the Midget, the Upright was also produced in very limited quantity. Look closely and you will see it uses a single contact for making both dots and dashes. Its horse-shoe-shaped base is necessarily heavy to maintain stability during use. Although barely visible in this WB7DHC photo from W7BAQ's collection, the Up-

right's fingerpieces are mounted horizontally and face directly at the camera.

Visualize setting one of these glamorous bugs by your main rig and using it on the air today. Absolutely breathtaking! And imagine pulling out one for a DX pile-up contest at your local club meeting. The other operators would simply topple over and give up!

### Photo 3

The Double Lever model Vibroplex shown in this photo belongs to WB7DHC, and it is especially appealing to dedicated collectors. Look closely inside its round yoke and notice the unusual "cloverleaf" pattern. Although strictly a personal opinion, I visualize that as a carrying aid and fore-



*Photo 3— The Double Lever model Vibroplex with its standard square yoke is a true collector's item, but this later (and more rare) version is even more special. Notice the unusual "cloverleaf" pattern inside its rounded yoke. (Key and photo via WB7DHC.)*

runner to the famed Tee Bar used on Mac Keys and Speed-X bugs. An owner could hook two fingers inside the cloverleaf yoke, lift the key, and tromp off to his post of duty. The Double Lever was manufactured from 1911 to 1914 with a regular square yoke, and in limited quantity from 1914 to 1917 with a cloverleaf yoke. The common design in both models was their dual fingerpieces—a semi-automatic squeeze key without iambic action!

### Photo 4

This photo is loaded with juicy information, some apparent, some not. First, the middle bug is WB7DHC's Martin Junior. On its right is his Model 4, which preceded the Blue Racer (note U-shaped damper), and on its left is his late-model (1950s era) deluxe/chrome Blue Racer (note small Original-style damper).

The Junior is identical to an Original model Vibroplex, except it has a 3 inch base rather than the standard 3½ inch base. This size seems ideal to me; it is not as massive as a regular bug, but it does not tend to "walk" during heavy use like a 2½ inch based Blue Racer. Only one other Vibroplex was manufactured on a 3 inch base—the Zephyr. Except for its smaller base and the addition of a circuit closing lever, the Zephyr was identical to the popular Champion that I featured in a previous "Keys Revisited" column (also see photo 5). One additional note: the little Blue Racer could also be special ordered on a standard 3½ inch base if desired (although that reminds me of having a gold medal bronzed!).





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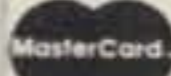
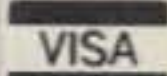
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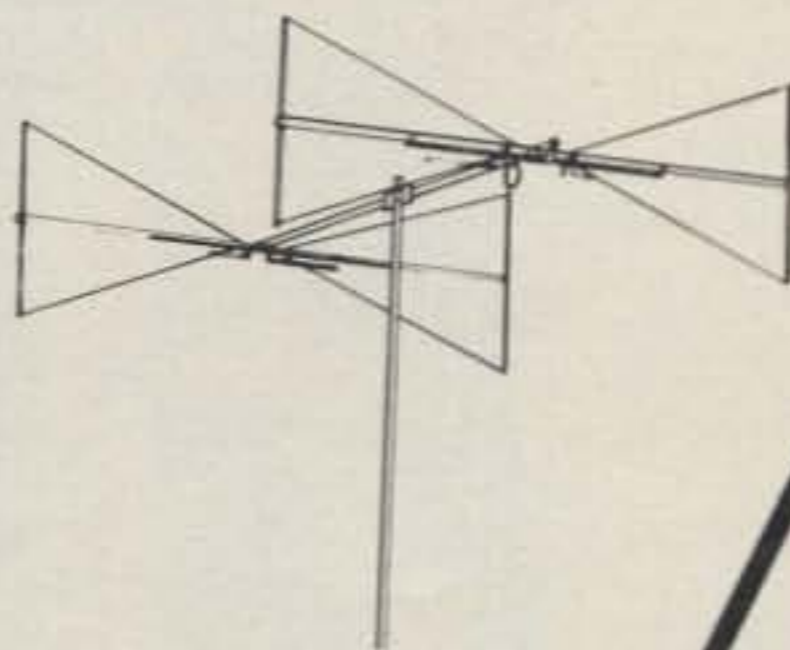


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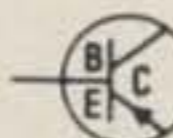
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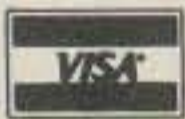
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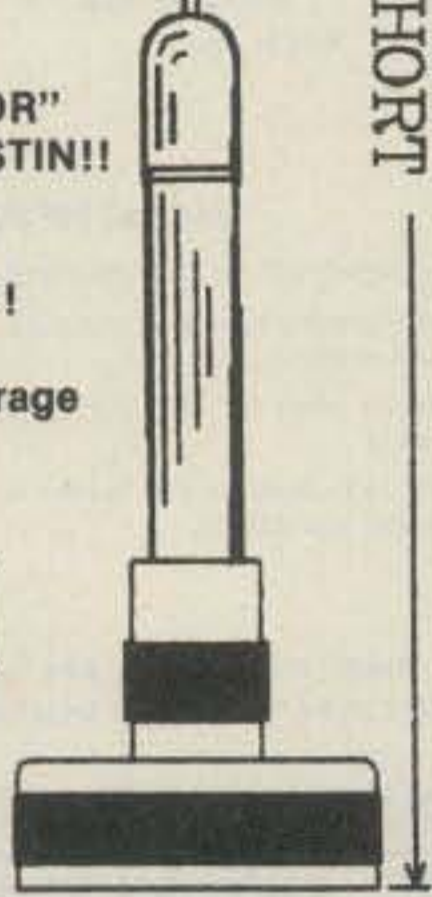
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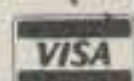
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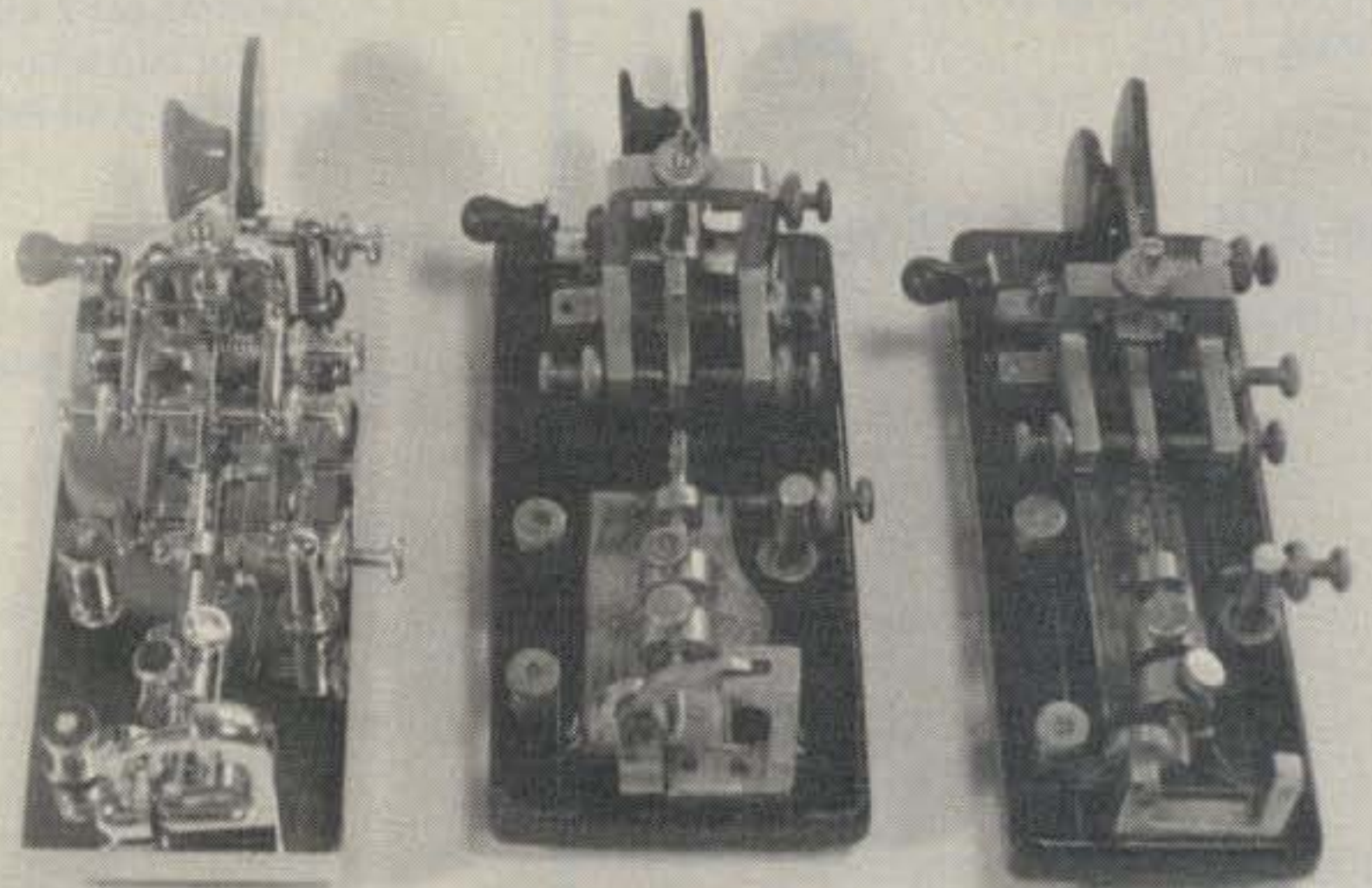


Photo 4- A triple treat! The key on the left is a late-model deluxe Blue Racer. The middle key is a Martin Junior, and the key on the right is an old Model 4. Full details are in the text. (Keys and photo via WB7DHC.)

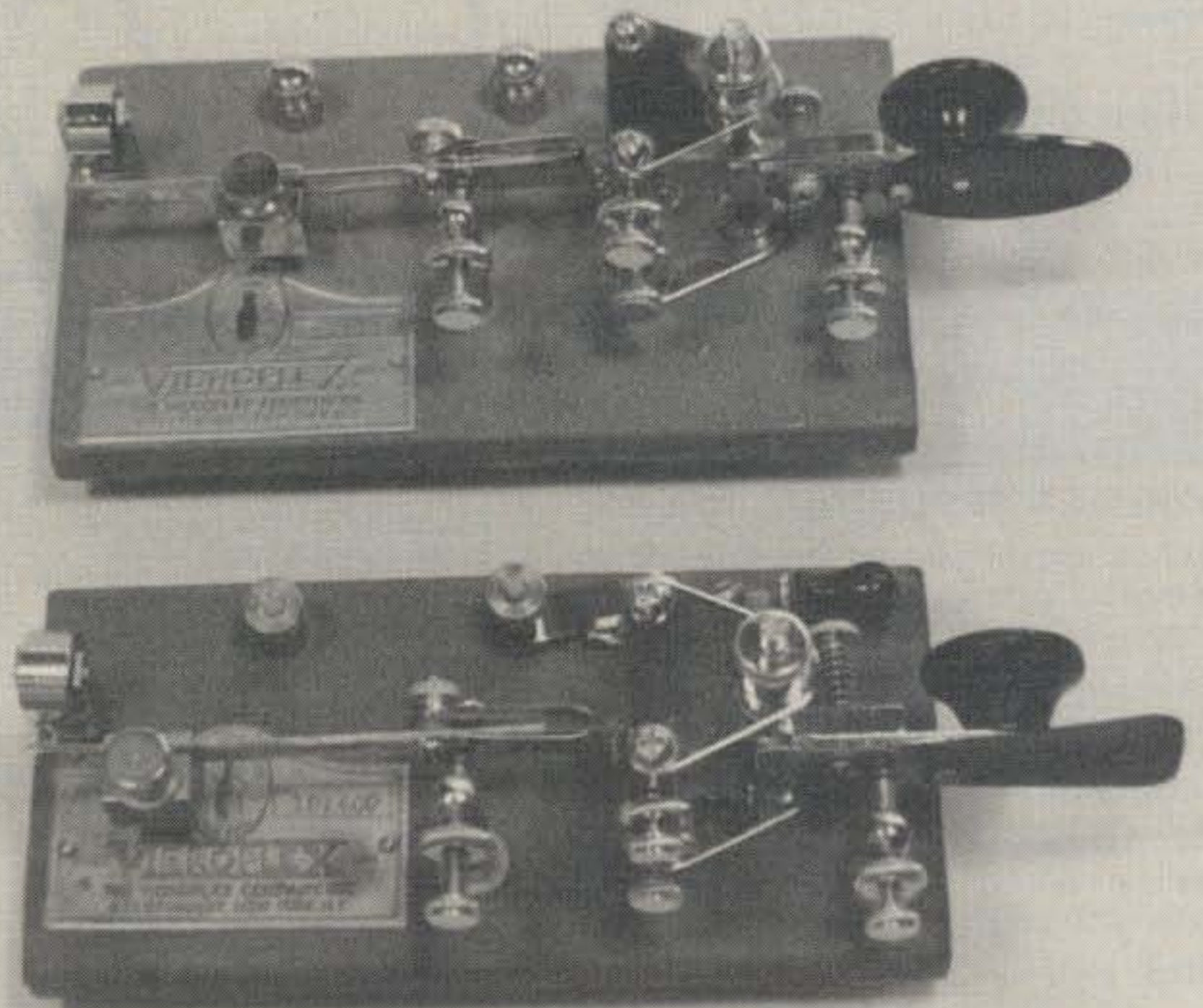


Photo 5- Comparison of Champion model Vibroplex with its 3 1/2 inch wide base (top) and Zephyr with its 3 inch base (bottom). (Keys and photo via WB7DHC.)

The Junior, Blue Racer, and Zephyr are fabulous bugs to use on the air today with a modern transceiver. They add a special air and personality to your fist that simply cannot be achieved with an electronic keyer. Just remember my previous columns' notes on adjustment. Add plenty of lever travel and tension during setup, include an extra weight to calm high-speed dits, and get some real wrist action going for a beautiful sound. Vibroplex, incidentally,

has plenty of extra weights, and you can order them (please!) by telephoning 1-800-AMATEUR. When you call, ask about their new book on the history of Vibroplex. Didn't I tell you this month's column was loaded with good information?

### Photo 6

This trio of Speed-X bugs comes from my own (K4TWJ) hands-on and used-daily

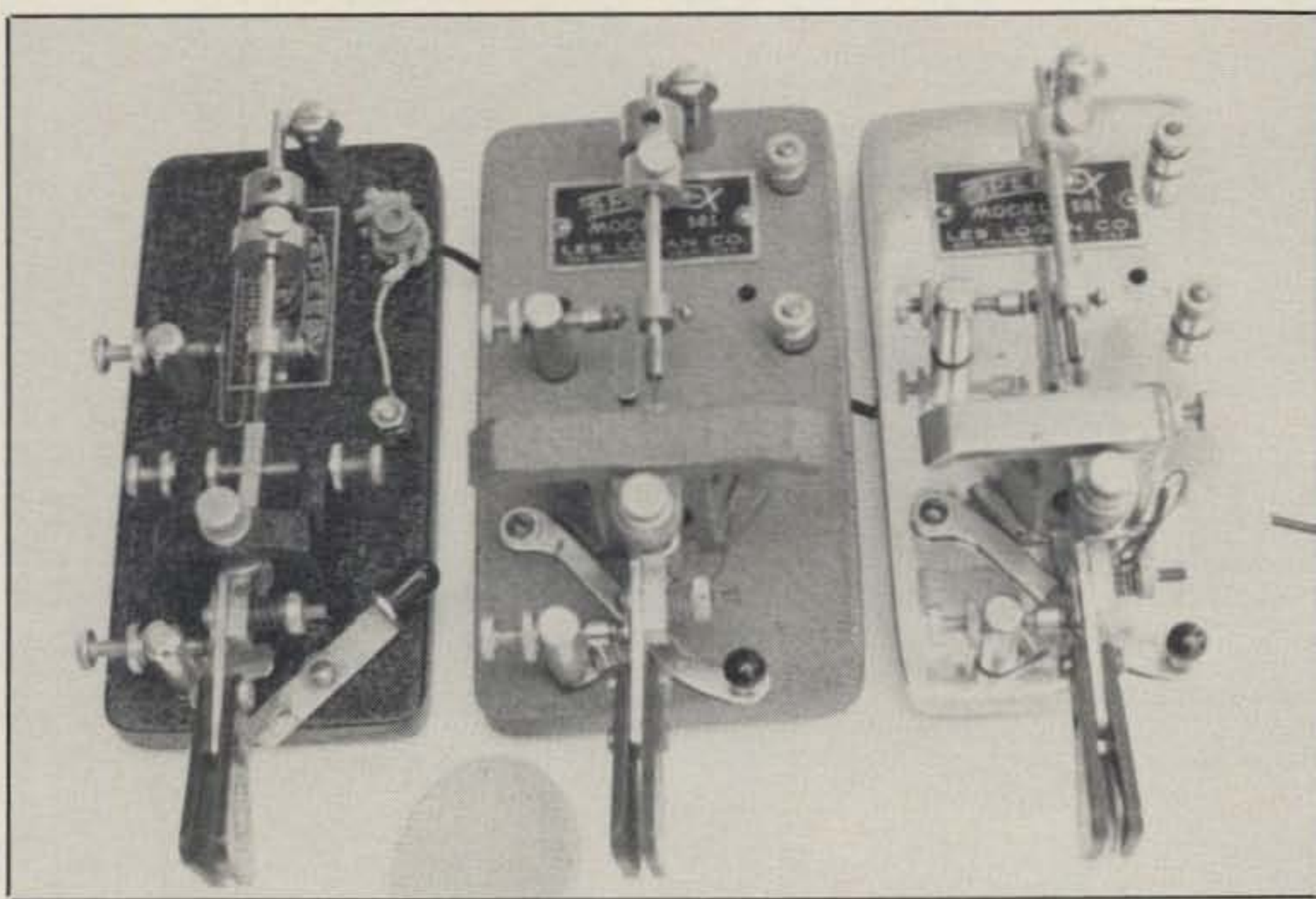


Photo 6- The Speed-X team used daily by K4TWJ. The bug on the left has the E.F. Johnson name and a 3 inch base like Junior in photo 4. The two bugs on the right are Les Logans and have 3½ inch bases like Vibroplex Originals. The round foam item between bugs one and two is a windscreen for mobile use. (See text for details.)

collection. The left item carries an E.F. Johnson label and has a 3 inch base like the previously discussed Vibroplex Zephyr or Junior. Jerry, K9UT, passed this delightful bug over to me, and I love it (note tell-tale cable to rig)! The bug is a docile little critter with a great feel and a wee tad of paddle "feedback," and it can be slowed to 10 wpm with only two weights.

The middle Speed-X sports a Les Logan nameplate, and it has the same congenial personality as the little Johnson Speed-X. I acquired this gem from CQ contributor Ted Cohen, N4XX. It has a

3½ inch base like a Vibroplex Original, except this model 501 is battleship gray. It also has replaceable dot/dash contacts and a Tee Bar for carrying.

The Speed-X on the right is an all-chrome/deluxe 501, but it has only half a Tee Bar. Surprisingly, this bug's feel is more like that of a regular Vibroplex. My only explanation is every mainspring is different, and that is the main factor in each bug's personality. That's true, and you heard it right from the voice of prophecy!

The small and barely visible item in lower part of photo 5, incidentally, is a

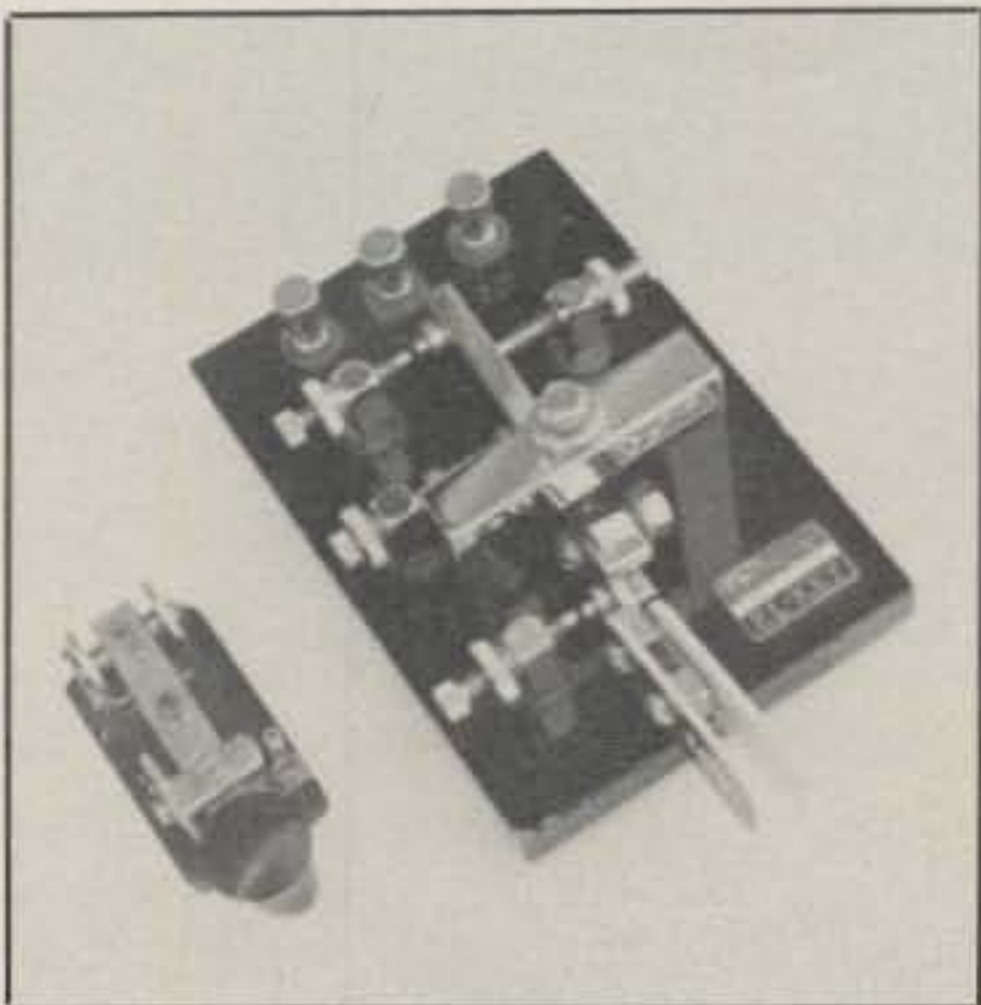


Photo 7- The item on the left in this picture is a miniature lineman's hand key from India. On the right is an EI Key paddle from France. (K4TWJ collection.)

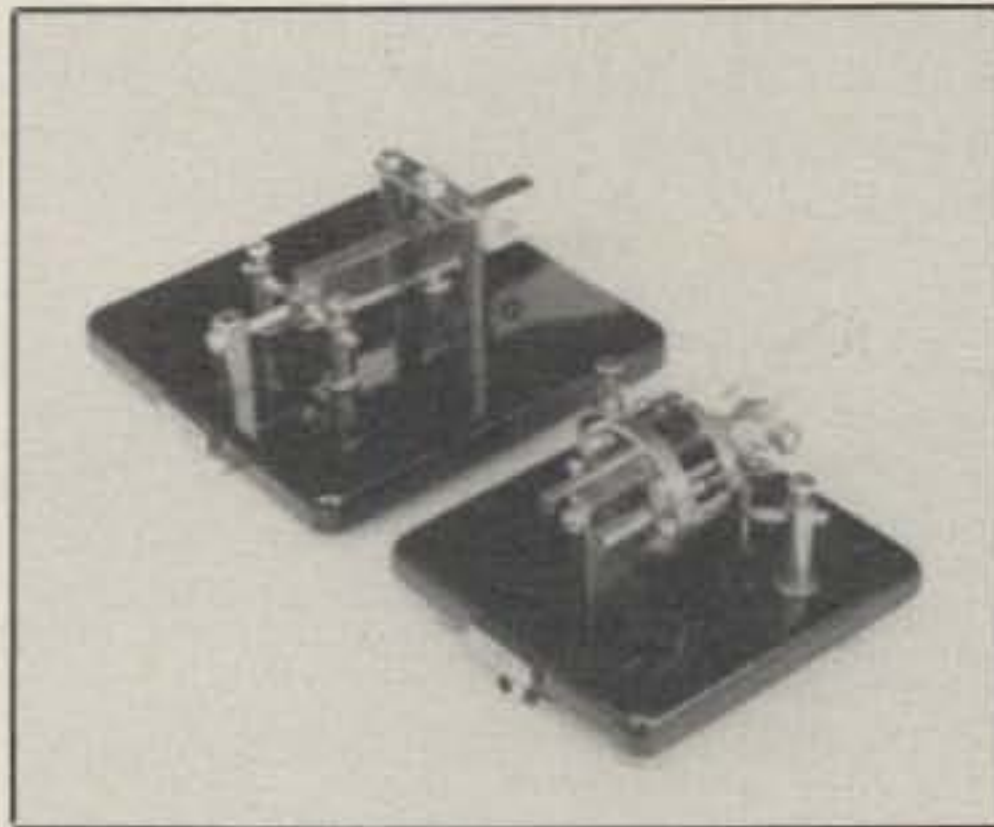


Photo 8- These beautiful hand-crafted paddles are being made right now by Gordon, G4ZPY, in England. They look like fine jewelry and handle like silk. Single Paddle model has a white fingerpiece. Dual Lever has clear plastic fingerpieces. (N4LMY keys.)

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Photo 9- Unique cut-in-crystal version of a hand key sitting atop a dome. This conversation piece was presented to Evelyn Garrison, WS7A, by Soviet competitors at WRTC '90. (WS7A photo.)

wind screen I use on my bug's finger-piece for mobile work. It reduces road rumble and wind noise, you know.

### Photo 7

Let's now shift to more recent items of interest. If you were hamming during the late '50s, you probably remember a US-made electronic keyer paddle called the EI-Key. The EI-Key in this picture, however, was made by Poucel Electronics of France. It has a blue, white, and red nameplate and heavy black base. Construction is quite rugged, yet it has a very smooth feel. My EI-Key's fingerpieces were broken, so I replaced them with handmade ones sporting my call.

The small item in this photo is an Indian "spy key." Actually, it is a telegraph line-man's test key. The "spy" term evolved from its small size. The key's parts are nickel-plated brass. They are mounted on a plastic base. The knob's design reflects British influence. I acquired this key from Charles, N4LMY, who purchased two from a chap listed in CQ's classified ads. Read our magazine's rear pages closely, gang. There's gold hidden in those hills!

### Photo 8

Okay, modern-day key buffs, here are two destined to become classic beauties you can purchase right now and enjoy using with the electronic keyer built into your deluxe home transceiver. These paddles are meticulously handcrafted like fine jewelry by Gordon Crowhurst, G4ZPY (41 Mill Dam Lane, Burscough, Ormskirk, Lancs, L407TG England). The Single Lever model (left) has highly polished and glazed brass parts mounted on a glossy black steel base. Particularly unique is its single front spring adjustment and its tiny ball bearing race assembly at the main arm's pivot point.



Photo 10- A commemorative version of this WRTC-awarded keyer is being made in limited quantities by MFJ Enterprises. The word "winners" is replaced by "WRTC '90." (Details in text.)

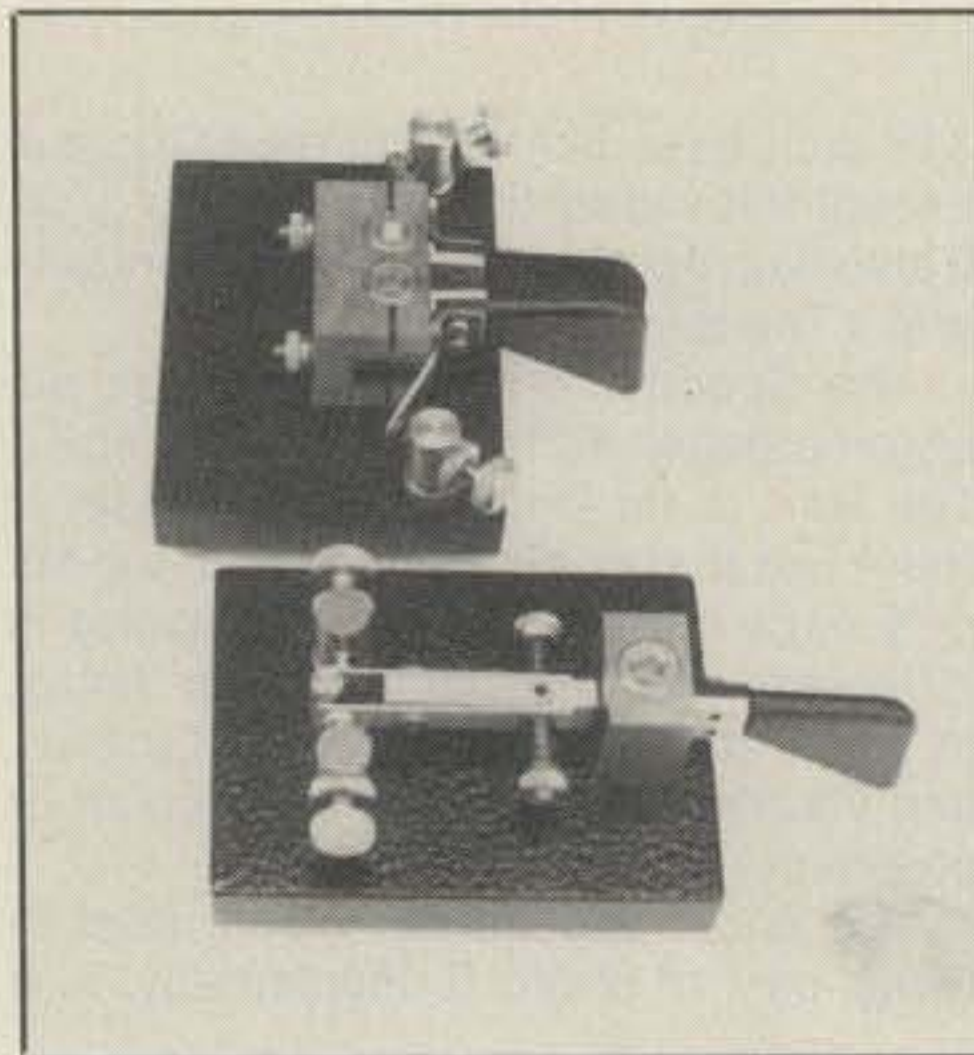


Photo 11- These two presently available Kent paddles look good, handle great, and are built like a battleship. (K2EEK collection.)

The Twin Paddle also has highly polished brass parts mounted on a similar glossy base. Its pivot points also have mating concave and convex surfaces that wear in rather than out with use. Both G4ZPY keys are very precision instruments. Their contacts are typically set for 1 to 3 thousandths of an inch clearance, for example, with an automotive feeler gauge. These paddles are perfect for effort-free CW, and they add elegance to any setup.

I learned of G4ZPY's keys from his CQ ad and through Charles Tryor, N4LMY. Charles bought a pump key and the paddles shown here. He and Gordon became

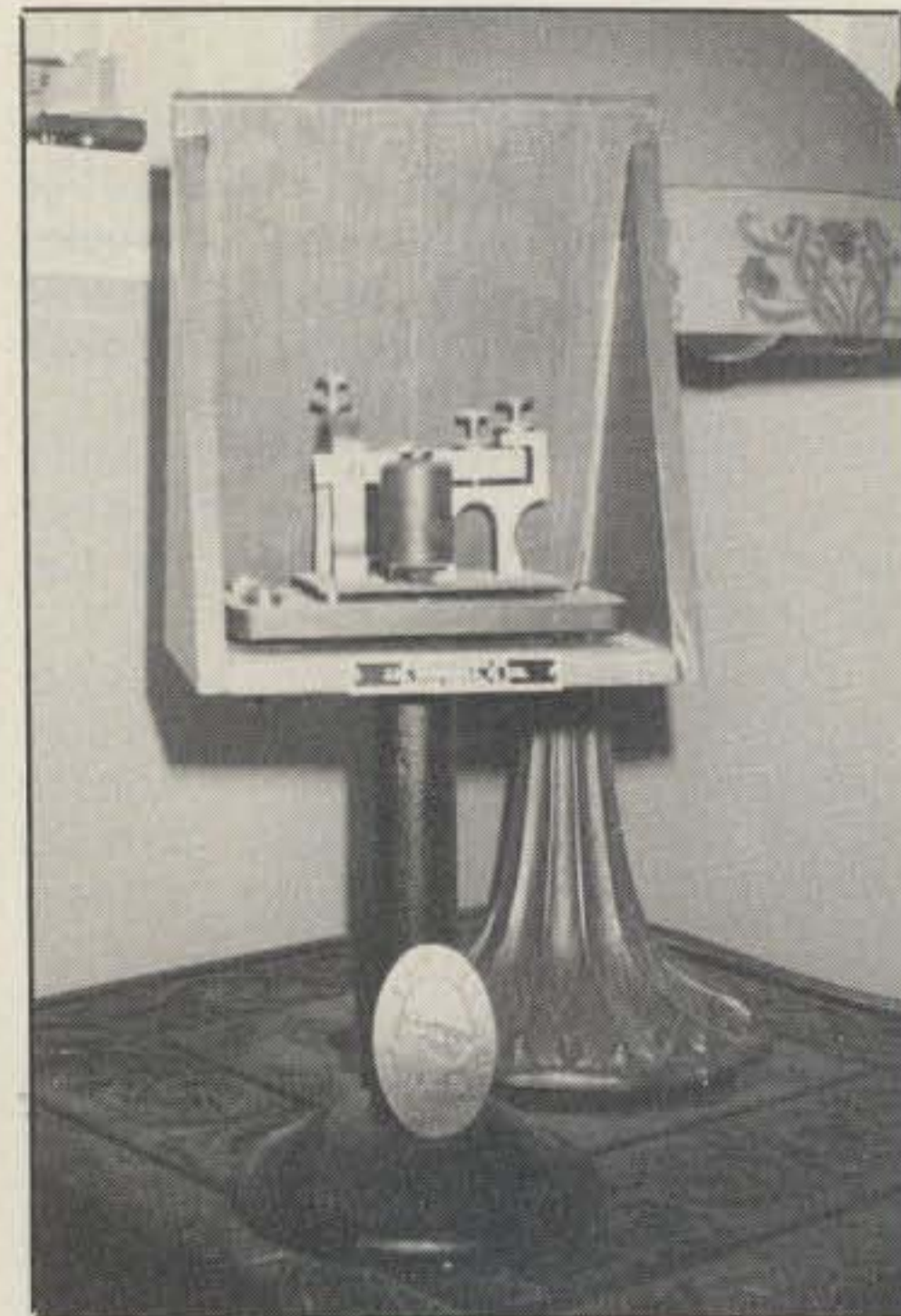


Photo 12- This is a mint-condition J.J. Bunnell & Co. sounder and sounder box. The brass object resting on the base is an employee's badge from the Postal Telegraph Union.

pen pals, so Charles offered to mail info and price lists of G4ZPY keys to US inquiries. Key orders, however, should go directly to G4ZPY in England. A helpful hint: To avoid the additional and high cost of exchanging dollars and pounds, order via your MasterCard or Visa. A computer automatically makes the conversion, and

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ST144-28 model shown

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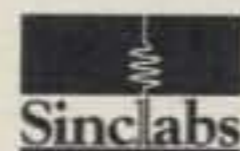
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**Features:**

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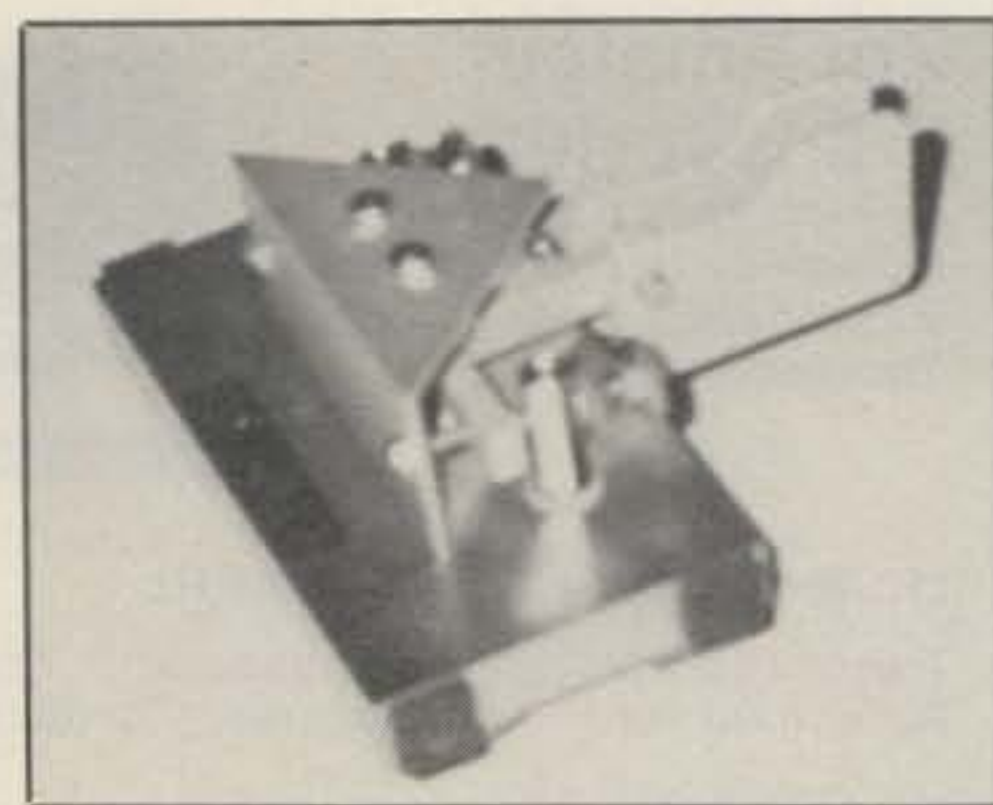


Photo 15- A modern-day key imported from West Germany is this one made from aluminum and manufactured by Samson.

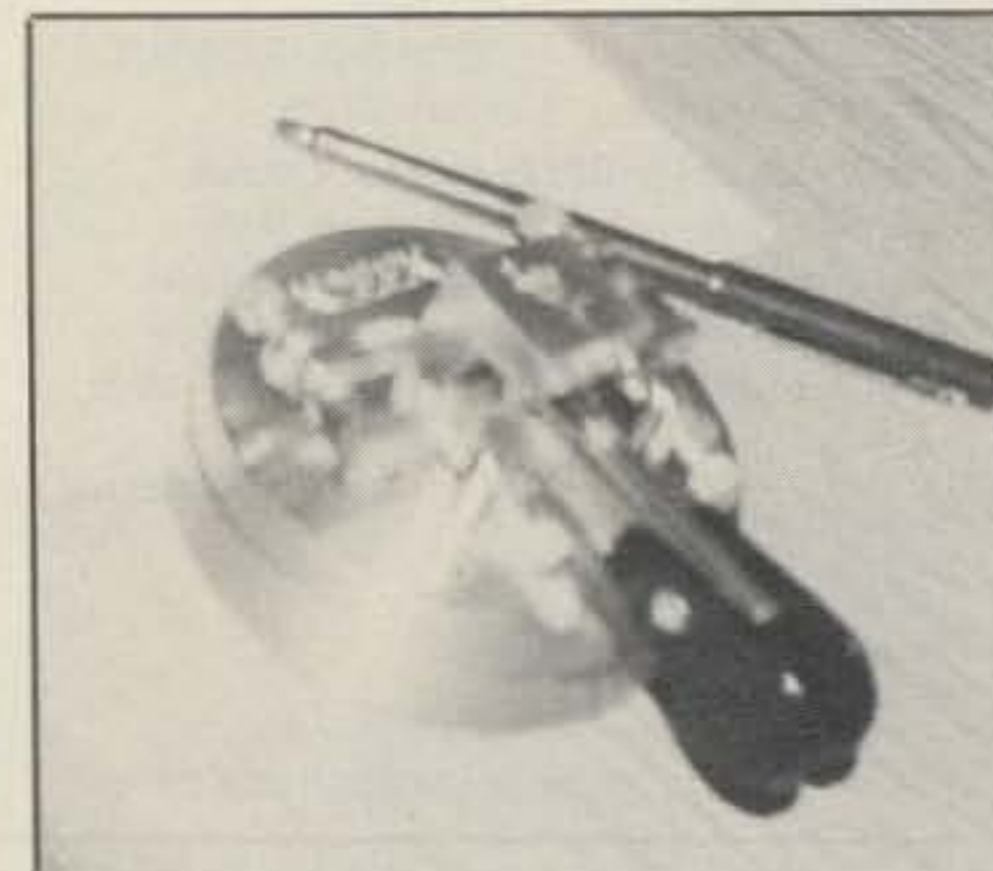


Photo 16- This key is bound to become a collector's item. Featuring magnetic contacts and made from machined brass, these keys are hand-made by Steve Nurkiewicz, N2DAN/4, who lives in Florida.

you save \$15 or \$20. I learned of that technique from the English magazine *Radio Bygones*, which recently expanded to include the outstanding *Morse Magnificat* magazine that highlights old-time keys. *Radio Bygones* is a terrific magazine if you like classic rigs and keys. It is loaded with good info. Charge-card subscriptions go to: Radio Bygones, 8 Corfe View Rd., Corfe Mullen, Wimborne, Dorset, BH21 3LZ England.

**Photo 9**

This unbelievably unique conversation piece is a cut-in-crystal version of a hand-key sitting atop a similar clear dome. It was made in Russia and presented to Evelyn Garrison, WS7A, by the Soviet competitors in WRTC '90 (last month's feature story). It may well be the only one of its kind in the world. Inscribed inside the dome is "AREL," their equivalent to our own ARRL. Truly a fascinating item!

**Photo 10**

This WRTC-related item also has an interesting story to share. First, the unit is a combination Curtis keyer and Bencher paddle MFJ Enterprises sells as a self-contained electronic keyer (Model 422-B). The keyer shown here was customized with a silk-screened logo of WRTC '90 and six models were presented to the six WRTC winners. MFJ is now replacing the word "winners" with "WRTC '90" (and retaining the logo) and making it available to interested amateurs. This is a limited-edition key, so contact MFJ directly to order (telephone 1-800-647-1800).

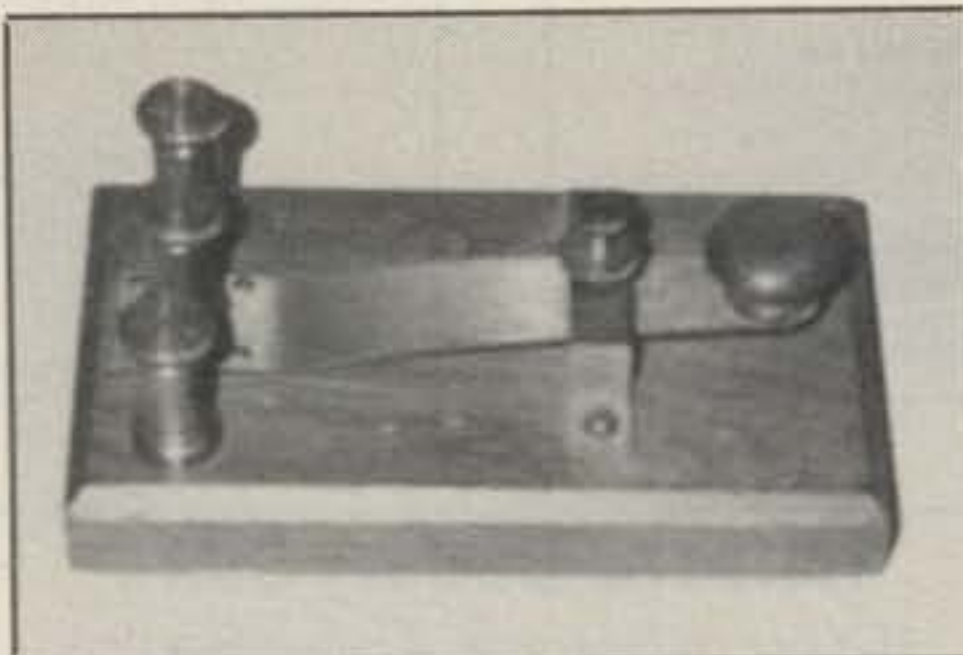


Photo 13- Also from J.J. Bunnell & Co. is this example of their strap key.

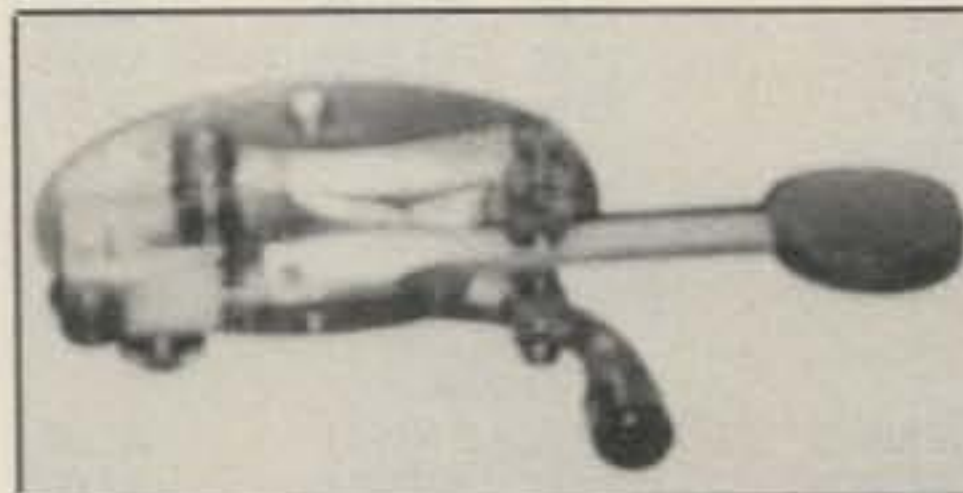


Photo 14- One other J.J. Bunnell & Co. item is their famous "sideswiper" key.

**Photo 11**

Here we have two very impressive paddles available right now in kit form from R.A. Kent (Engineers), 243 Carr Lane, Tarleton, Preston, Lancs, PR46YB England. Assembly is fairly easy and takes roughly an hour. The Single Lever model (lower area of picture) has a solid-brass arm that manipulates brass strips on each side for making dots and dashes. Springs fitted against knurled nuts on

fine-pitch screws adjust tension on each side. A permanently lubricated ball bearing assembly is set into the brass yoke at the pivot point.

The Dual Lever paddle (upper area of picture) has dual ball-bearing assemblies and neat rear adjustments for each arm's tension. Arm travel is set by a fine-thread screw on each contact's post. Both paddles have a very comfortable feel, and construction of these paddles is superb. These Kent keys, incidentally, are part of CQ Editor Alan Dorhoffer's collection. Photos 12 through 16 are also from K2EEK's collection.

That winds down another "Keys Special," and we trust you enjoyed the views. Shall we do it again next year? You tell me. Let's see more pictures of your unusual key items and hear more tales of their use. Meanwhile, I will look forward to chatting with all of you on 30 CW week-nights or on 14.180 to 14.225 Sundays 2200-2300 GMT.

73, Dave, K4TWJ

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112-7	1.125"	40	35	30	144-4	.440"	41	70	60	1200-2	2.80"	170	4.00	3.60
112-6	1.125"	37	35	30	150-2	.500"	49	80	68	1200-6	2.80"	100	4.75	4.25
112-17	1.125"	7.5	40	35	150-4	.500"	40	80	68	1200-12	2.80"	900	3.00	2.40
116-52	1.60"	150	35	30	150-17	.500"	18	90	78	1225-28	2.25"	215	6.00	5.40
125-2	2.55	34	40	35	150-26A	.500"	420	90	78	1225-4	2.25"	190	6.00	5.40
125-4	2.55"	37	40	35	150-28	.500"	330	80	68	1300-2	3.04"	114	6.00	5.40
125-17	2.55"	12	40	35	168-2	.695"	57	80	68	1300-30	3.04"	228	13.00	12
130-2	3.00"	43	40	35	168-6	.695"	67	80	68	1300-52	3.04"	850	8.00	7.20
130-4	3.00"	38	40	35	168-12	.695"	490	80	68	1400-2	4.00"	180	13.00	12
130-17	3.00"	18	40	35	180-2	.795"	55	95	82	1400-30	4.00"	240	22.00	20
130-52	3.00"	73	40	35	180-6	.795"	45	95	82	1400-52	4.00"	1400	12.00	11
130-2	3.75"	40	40	35	180-12	.795"	500	85	72	1520-2	5.20"	300	22.00	20
130-4	3.75"	35	40	35	1130-4	1.30"	15	100	140					
130-17	3.75"	15	40	35	1130-2	1.57"	140	3.25	2.75					

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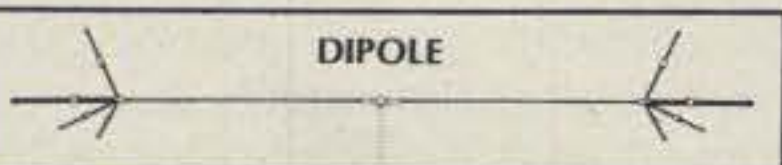
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## THE SCIENCE OF PREDICTING RADIO CONDITIONS

The CQ World-Wide DX CW Contest will be held on the weekend of November 24 and 25. Last month's column contained comprehensive HF band-opening predictions to all areas of the world from North America for use during both the Phone and CW weekends. Special DX Propagation Charts for use during the CW weekend appeared in last month's column, along with several valuable tips and suggestions for piling up contest points. Be sure to refer to last month's column if you are planning to participate in the CW Contest weekend. Some additional tips are contained in this month's column, along with a sample multi-band contest operating schedule centered on the western half of North America.

### Sunspot Cycle Progress

Although there may still be some disagreement among the experts, it looks almost certain now that Cycle 22 has passed its peak and is slowly declining. The Royal Observatory of Belgium reports a monthly mean sunspot number of 147 for July. This results in a 12-month running smoothed sunspot number of 151 centered on January 1990. This is a drop of three points from the previous month's level, and a drop of almost eight points from the peak value recorded for Cycle 22 to date—a level of 159 centered on July 1989. A smoothed sunspot number in the low 130 range is expected during November 1990.

Corresponding to the drop in sunspot number, the 10.7 cm solar flux level also declined during July 1990. The Algonquin Radio Observatory at Ottawa, Ontario reported a mean level of 178 for the month. This results in a smoothed level of 200 centered on January 1990. A smoothed level in the low-to-mid 180 range is expected during November.

Be sure to check the Last Minute Forecast appearing at the beginning of this column for a day-to-day forecast of general conditions expected on the HF bands during November.

In addition to tips for the CW Contest weekend, this month's column contains Short-Skip Propagation Charts for use between distances of approximately 50 and 2300 miles, and between Hawaii and Alaska and the continental areas of North America.

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### LAST MINUTE FORECAST

Day-to-Day Conditions Expected for November 1990

Propagation Index .....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 2-3, 22, 27, 30	A	A	B	C
High Normal: 1, 4, 6-7, 13, 19, 24-25, 28-29	A	B	C	C-D
Low Normal: 5, 8, 11-12, 17-18, 21, 23, 26	A-B	B-C	C-D	D-E
Below Normal: 9-10, 14, 16, 20	B-C	C-D	D-E	E
Disturbed: 15	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 S0 and S3, and with considerable fading and noise.

E—No opening expected.  
3dB per S-Unit.

### HOW TO USE THIS FORECAST

1. Find propagation index associated with particular band opening from Propagation Charts appearing on the following pages.
2. With the propagation index, use the above table to find the expected signal quality associated with the band opening for any day of the month. For example, an opening shown in the charts with a propagation index of 3 will be good (B) on November 1, excellent (A) on the 2nd and 3rd, good (B) on the 4th, good-to-fair (B-C) on the 5th, etc. Good conditions (B) should occur during the CQ World-Wide CW Contest Weekend of November 24-25.

### CW Contest Tips

Look for excellent DX conditions on 10, 15, and 20 meters during the daylight hours from shortly after sunrise through sunset.

From sundown to midnight it should be a toss-up between 20 and 40 meters for DX honors. Openings on 20 meters should mainly be towards the quadrant extending from southeast through west to northwest, while 40 meters should open towards the north, east, and south.

Some good openings can also be expected during this period on 15 meters, particularly towards southern and western areas, and on 80 and 160 meters where propagation patterns should be similar to those on 40 meters, but with somewhat weaker signals and higher noise levels.

The best bands for DX propagation between midnight and sunrise should be 40 and 80 meters, with openings possible to most areas of the world, but peaking to-

### WW Contest Bulletin

Since this issue of CQ should reach most subscribers prior to the start of the CQ World-Wide DX Phone Contest weekend of October 27 and 28, here is an up-to-the-minute forecast made at press time for general HF propagation conditions expected during the Phone Contest weekend. The CQ crystal ball is now calling for considerably better than the Low Normal rating given in last month's column. It looks almost certain that at least High Normal conditions should exist on October 27th, as the contest begins. Openings to several areas of the world may approach Above Normal at times. Conditions may drop off somewhat on Sunday, October 28th, but they are expected to remain between Low Normal and High Normal to almost all areas of the world. The relatively quiet geomagnetic conditions expected, along with an expected sunspot number in the low 130s, should result in a great weekend propagationally for the 1990 WW Phone Contest.

The initial forecast for the CW Contest weekend of November 24 and 25 is very similar to the above forecast for the Phone Contest weekend. Great propagation conditions are also expected for the CW Contest. Generally High Normal conditions should prevail on Saturday, November 24th, and they are very likely to continue into Sunday the 25th. There will be a fine-tuned update for the CW Contest weekend as a bulletin in next month's column.

Although solar activity was in the high 150s during the 1989 contest weekends, it is possible that conditions during the 1990 contest will be as good as they were during the 1989 contest, and possibly somewhat better! This is all based on the hope that a Sudden Ionospheric Disturbance (SID) will not occur. While it is not possible to predict an SID, the chances of one occurring during the contest weekends are considered to be less than 15%.

wards the south, southwest, and west. Good openings should also be possible on 20 meters, but mainly towards the south and west. Also check for 160 meter DX openings during this period. Again, propagation patterns will be similar to



## 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 80 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 standard time is used at the path midpoint. For example on a circuit between Maine and Florida, the time shown would be EST, on a circuit between N.Y. and Texas, the time at the midpoint would be CST, etc. Times shown in the Hawaii Chart are in HST. To convert to standard time in other USA time zones add 2 hours in the PST zone; 4 hours in the MST zone; 3 hours in the CST zone, and 5 hours in the EST zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 14 or 2 P.M. in Los Angeles; 17 or 5 P.M. in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to standard time in other areas of the USA subtract 8 hours in the PST zone; 7 hours in the MST zone; 6 hours in the CST zone and 5 hours in the EST zone. For example, at 20 GMT it is 15 or 3 P.M. in N.Y.C.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts c.w. or 300 wattsp.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.

## CQ Short-Skip Propagation Charts November & December, 1990 Local Standard Time at Path Mid-Point (24-Hour Time System)

Band (Meters)	Distance From Transmitter (Miles)			
	50-250	250-750	750-1300	1300-2300
10	Nil	Nil	07-09 (0-1) 09-11 (0-2) 11-15 (0-3) 15-16 (0-2) 16-18 (0-1)	07-08 (1) 08-09 (1-2) 09-11 (2-3) 11-15 (3-4) 15-16 (2-4) 16-18 (1-4) 18-19 (0-3) 19-20 (0-2) 20-21 (0-1)
15	Nil	08-10 (0-1) 10-16 (0-3) 16-17 (0-2) 17-18 (0-1)	07-08 (0-1) 08-09 (1-3) 09-10 (1-4) 10-16 (3-4) 16-17 (2-4) 17-19 (1-4) 19-20 (0-3) 20-21 (0-1)	07-08 (1) 08-09 (3-2) 09-19 (4) 19-20 (3) 20-21 (1-2) 21-00 (0-1)
20	09-11 (0-1) 11-15 (1-2) 15-17 (0-1)	09-11 (1-4) 11-15 (2-4) 15-17 (1-4) 17-18 (0-4) 18-19 (0-3) 19-20 (0-2) 20-07 (0-1)	07-09 (2-3) 09-18 (4) 18-19 (3-4) 19-20 (2-4) 20-21 (1-4) 21-23 (1-3) 23-02 (1-2) 02-07 (1)	07-09 (3) 09-12 (4) 12-15 (4-3) 15-21 (4) 21-23 (3-4) 23-02 (2-3) 02-06 (1-2) 06-07 (1)
40	07-08 (0-2) 08-09 (1-3) 09-19 (4) 19-21 (2-3) 21-00 (1-2) 00-07 (0-1)	07-08 (2-4) 08-09 (3) 09-15 (4-3) 15-19 (4) 19-21 (3-4) 21-00 (2-4) 00-02 (1-3) 02-06 (1-2) 06-07 (1-3)	07-08 (4) 08-09 (3-2) 09-15 (3-1) 15-17 (4-2) 17-00 (4) 00-02 (3-4) 02-06 (2-4) 06-07 (3-4)	06-07 (4-3) 07-08 (4-2) 08-09 (2-1) 09-15 (1-0) 15-17 (2-0) 17-19 (4-3) 19-06 (4)

80	08-15 (4-3) 15-02 (4) 02-04 (3-4) 04-07 (2-3) 07-08 (3-4)	08-09 (3-2) 09-15 (3-1) 15-18 (4-3) 18-04 (4) 04-07 (3-4) 07-08 (4-3)	08-09 (2-1) 09-15 (1-0) 15-18 (3-1) 18-06 (4) 06-07 (4-3) 07-08 (3-1)	08-09 (1-0) 09-15 (0) 15-18 (1-0) 18-20 (4-1) 20-05 (4) 05-06 (4-3) 06-07 (3-1) 07-08 (1)
160	07-09 (3-2) 09-11 (2-0) 11-17 (1-0) 17-19 (3-2) 19-07 (4)	07-09 (2-1) 09-17 (0) 17-19 (2-1) 19-04 (4) 04-07 (3-2)	07-09 (1-0) 09-17 (0) 17-19 (1-0) 19-21 (4-2) 21-04 (4) 04-06 (2) 06-07 (2-1)	07-19 (0) 19-21 (2-1) 21-04 (4-3) 04-06 (2-1) 06-07 (1-0)

## ALASKA November & December, 1990 Openings Given in GMT#

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	17-18 (1) 18-20 (2) 20-22 (3) 22-00 (2) 00-01 (1)	15-16 (1) 16-17 (2) 17-21 (3) 21-23 (4) 23-00 (3) 00-01 (2)	12-16 (1) 16-18 (2) 18-21 (1) 21-23 (2) 23-02 (3) 02-03 (2) 03-05 (1)	06-12 (1) 07-11 (1)*
Central USA	17-18 (1) 18-20 (2) 2-00 (3) 00-01 (2) 01-02 (1)	15-16 (1) 16-17 (2) 17-20 (3) 20-23 (4) 23-01 (3) 01-02 (2) 02-03 (1)	12-16 (1) 16-18 (2) 18-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-03 (3) 03-04 (2) 04-06 (1)	06-08 (1) 08-13 (2) 13-14 (1) 07-12 (1)*
Western USA	18-19 (1) 19-20 (2) 20-21 (3) 21-23 (4) 23-00 (3) 00-01 (2) 01-02 (1)	16-17 (1) 17-18 (2) 18-20 (3) 20-01 (4) 01-02 (3) 02-03 (2) 03-04 (1)	12-16 (1) 16-18 (2) 18-22 (3) 22-02 (4) 02-04 (3) 04-05 (2) 05-07 (1)	02-03 (1) 03-05 (2) 05-14 (3) 14-15 (2) 15-16 (1) 04-06 (1)* 06-14 (2)* 14-16 (1)*

## HAWAII November & December 1990 Openings Given In Hawaiian Standard Time #

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	06-07 (1) 07-08 (2) 08-13 (4) 13-14 (3) 14-15 (2) 15-16 (1)	06-07 (1) 07-09 (4) 09-12 (3) 12-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	12-14 (2) 14-17 (4) 17-21 (3) 21-00 (2) 00-06 (1) 06-08 (3) 08-09 (2) 09-12 (1)	17-18 (1) 18-20 (2) 20-02 (3) 02-03 (2) 03-04 (1) 19-20 (1)* 20-01 (2)* 01-03 (1)*
Central USA	06-07 (1) 07-08 (3) 08-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-07 (1) 07-09 (4) 09-13 (3) 13-17 (4) 17-19 (3) 19-20 (2) 20-21 (1)	08-13 (2) 13-14 (3) 14-20 (4) 20-00 (3) 00-02 (2) 02-05 (1) 05-06 (2) 06-08 (3)	17-18 (1) 18-20 (2) 20-21 (3) 21-01 (4) 01-03 (3) 03-04 (2) 04-05 (1) 19-20 (1)* 20-22 (2)* 22-01 (3)* 01-03 (2)* 03-04 (1)*
Western USA	07-08 (1) 08-09 (2) 09-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-08 (2) 08-12 (3) 12-18 (4) 18-20 (3) 20-21 (2) 21-22 (1)	08-10 (4) 10-15 (3) 15-22 (4) 22-01 (3) 01-04 (2) 04-06 (1) 06-08 (3)	17-18 (1) 18-19 (2) 19-20 (3) 20-03 (4) 03-05 (3) 05-06 (2) 06-07 (1) 19-20 (1)* 20-21 (2)* 21-04 (3)* 04-05 (2)* 05-06 (1)*

#See explanation in "How To Use Short-Skip Charts" at the beginning of this column.

Note: The Alaska and Hawaii Propagation Charts are intended for distances greater than 1300 miles. For shorter distances use the preceding Short-Skip Propagation Chart.

\*Indicates best time for 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher. For 12 meter openings interpolate between 10 and 15 meter openings. For 17 meter openings interpolate between 15 and 20 meter openings. For 30 meter openings interpolate between 40 and 20 meter openings.

those on 80 meters, but signals will be weaker and noise levels higher.

Table I is a sample work chart for the CW Contest section, devised from the DX Propagation Charts which appeared in last month's column. This particular example is for multi-band operation and for a PST zone QTH. Similar work charts can be devised for other bands, for other operating conditions, and for other time zones. The work chart shows when propagation conditions are expected to be optimum to various areas of the world (propagation index 3 or more, unless otherwise shown) for each three hour time period throughout the day.

## VHF Openings

Lots of 6 meter F-2 layer DX openings are expected this month. Solar activity continues at a high enough level to permit openings to most areas of the world. Conditions should peak towards Europe and in a generally easterly direction before noon. Openings should pick up towards Africa shortly after noon, and continue to swing towards a southerly direction during the early afternoon hours. By late afternoon start looking for openings more towards the southwest and west. It's possible that signal levels may at times be quite strong during many of these 6 meter openings.

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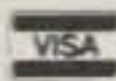
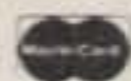
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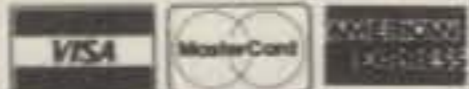
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Time PST	Band Meters	Areas To Which DX Conditions Expected To Be Optimum
00-03	20	Southeast Asia, Far East, South Pacific & New Zealand, Australasia, Caribbean, Central America, Antarctica, Africa*, South America*
03-06	20	South Pacific & New Zealand, Australasia, Caribbean, Central America, Southeast Asia*, Far East*, South America*, Antarctica*
06-09	20	Caribbean, Central America, South America, Southeast Asia, Far East, South Pacific & New Zealand, Australasia, Central and South Asia, Europe*, Eastern Mediterranean*, Middle East*, Antarctica*
09-12	15	Europe, Southeast Asia, Far East, South Pacific & New Zealand, Australasia, Caribbean, Central America, Western Africa, Eastern Mediterranean*, Middle East*, Eastern, Central & Southern Africa*, South America*
12-15	10	Africa, South Pacific & New Zealand, Australasia, Caribbean & Central America, South America
15-18	10	Central & South Asia, Southeast Asia, Far East, South Pacific & New Zealand, Australasia, Caribbean & Central America, South America
18-21	15	Southeast Asia, Far East, South Pacific & New Zealand, Caribbean & Central America, South America, Central & South Asia*, Australasia*, Antarctica*
21-00	20	Far East, South Pacific & New Zealand, Australasia, Caribbean & Central America, South America, Antarctica, Europe*, Africa*, Southeast Asia*

\* Propagation index (2), all others (3) or (4)

Table I—Sample multi-band contest operating schedule, western USA.

Some trans-equatorial (TE) type 6 meter propagation may also be possible during November. The best time to check for such conditions is between approximately 8 and 11 PM local standard time. TE openings favor locations in the southern tier states, and generally take place to South American countries south of the equator. Signals at best are expected to be weak, erratic, and with considerable flutter fading.

Some meteor shower activity is expected during November which could make possible meteor-scatter-type openings on the VHF bands. The *Taurids* shower, which should last for a day or two, is expected to peak on November 3 with a meteor count of approximately 15 an hour. A second shower of about the

same duration and intensity, called *Leonids*, should reach peak intensity during the early evening hours of November 16 (EST).

November is generally a month in which some fairly intense auroral activity can occur, bringing with it conditions for auroral-type short-skip openings on the VHF bands. Auroral activity is usually associated with periods of radio storminess and is most likely to occur on those days shown as Below Normal or Disturbed in the Last-Minute Forecast, which appears at the beginning of this column.

Good luck in the CW section of the 1990 CQ Word-Wide DX Contest, and be sure to let me know how these special contest propagation forecasts work out.

73, George, W3ASK

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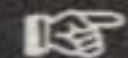
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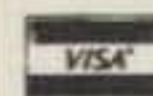
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MODEL VS-50M

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MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
RM12A	9	12	5 1/4 x 19 x 8 1/4	16
RM-35A	25	35	5 1/4 x 19 x 12 1/2	38
RM-50A	37	50	5 1/4 x 19 x 12 1/2	50
• Separate Volt and Amp Meters				
RM-35 M	25	35	5 1/4 x 19 x 12 1/2	38
RM-50 M	37	50	5 1/4 x 19 x 12 1/2	50
RS-4A	3	4	3 3/4 x 6 1/2 x 9	5
RS-5A	4	5	3 1/2 x 6 1/8 x 7 1/4	7
RS-7A	5	7	3 3/4 x 6 1/2 x 9	9
RS-10A	7.5	10	4 x 7 1/2 x 10 3/4	11
RS-12A	9	12	4 1/2 x 8 x 9	13
RS-20A	16	20	5 x 9 x 10 1/2	18
RS-35A	25	35	5 x 11 x 11	27
RS-50A	37	50	6 x 13 3/4 x 11	46

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### RS-M SERIES



MODEL RS-35M

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MODEL RS-12S

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MODEL VS-35M

- Separate Volt and Amp Meters • Output Voltage adjustable from 2-15 volts
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- |                                      | @ 13.8VDC @ 10VDC @ 5VDC | @ 13.8V |    |    |
|--------------------------------------|--------------------------|---------|----|----|
| VS-20M                               | 16                       | 9       | 4  | 20 |
| VS-35M                               | 25                       | 15      | 7  | 35 |
| VS-50M                               | 37                       | 22      | 10 | 50 |
| • Variable rack mount power supplies |                          |         |    |    |
| VRM-35M                              | 25                       | 15      | 7  | 35 |
| VRM-50M                              | 37                       | 22      | 10 | 50 |

\*ICS—Intermittent Communication Service (50% Duty Cycle 5 min. on 5 min. off)

## NEWS OF CERTIFICATE AND AWARD COLLECTING

**T**he Story of the Month for November is:

**Harold C. Griffin, N4OA  
USA-CA All Counties #611,  
Mixed 3-6-89**

"I am 44 years old and teach school. I work with children who are severely/profoundly mentally retarded, blind, and have cerebral palsy. They are a wonderful group of children whose needs are a real challenge to meet. I am married to Linda and have five children: Andrew, age 20; Sarah, 18; James, 16; Laura 6; and Genie, 5.

"I started county hunting in earnest in December 1979 when my brother, James Griffin, N4JG, told me about the county hunting operation on 14.336 MHz. He had heard of it from one of his associates at work, Ed Daigre, W5ILR. At that time I had worked about 500 counties on code.

"It took me ten years to complete USA-CA All Counties #611. The time might have been shorter, but I have a dipole antenna and low power, which limits the strength of the signal. During these ten years I have talked with many good friends. At the MARAC convention in Manchester, Tennessee a few years ago I had a chance to actually meet some of them in person. They are a wonderful group of people.

"I would like to thank a number of individuals who have really helped me along the way. I thank my brother, James, N4JG, for getting me started in county hunting. I also would like to personally thank Dave, N0GYN, for going to get my last county—Sherman, Nebraska—in 20-degree below zero temperatures. Also I would like to thank Galen, KB5FU, for the many counties he went out of his way to give me. His mobile trips have added a new dimension to working counties on multiple bands in a very time-efficient and professional manner. Third, I would like to say thank you to Arnie, K9DCJ. Arnie has done so very much for county hunting. He has a tremendous ability to remember names and make newcomers and old timers feel welcome. Others who come to mind and who have been good friends are Karl, WA6MAR; Carl, WA9PQY; Ed, W5ILR; Gene, N4ANV; Pete, K4QFK; Bill, KM4W; Orv, VE3BFJ; Dorothy, WB9RCY; and the many other amateurs who went out of their way for a



*Harold Griffin, N4OA (left), USA-CA All Counties #611, with his brother, James, N4JG.*

needed county or who relayed me in as they served as net control.

"As someone once said, the nice thing about this award is that it requires each one to help the other. Again, I thank all of you for your assistance in making USA-CA All Counties #611 a reality.—Sincerely, Harold, N4OA."

### Awards Issued

Lloyd B. Glasscock, K0GEN, collected a full complement of confirmed county contacts and received USA-CA All Counties #668, USA-CA 3000 #696, USA-CA 2500 #773, USA-CA 2000 #838, USA-CA 1500 #922, USA-CA 1000 #1121, and USA-CA 500 #2425, All SSB Mobiles, dated 7-2-90.

Leonard A. Postage, N4UMR, filled out his good record and claimed USA-CA All Counties #669, and USA-CA 3000 #697, All SSB, dated 7-3-90.

Ed Dranchak, NT9V, filed his completely filled record book claiming USA-CA All Counties #670, USA-CA 3000 #698, USA-CA 2500 #774, USA-CA 2000 #839, USA-CA 1500 #923, USA-CA 1000 #1122, and USA-CA 500 #2427, All SSB, dated 7-5-90.

Edgar E. Newman, W2RPZ, put together his final group of confirmed contacts

### USA-CA Honor Roll

	3000	NV6L	926
K0GEN	696	NW10	927
N4UMR	697		
NT9V	698		
NW10	699		
		1000	
	2500	K0GEN	1121
K0GEN	773	NT9V	1122
NT9V	774	K6PQA	1123
N7FQQ	775	NV6L	1124
NW10	776	NW10	1125
		500	
	2000	K0GEN	2425
K0GEN	838	TF5BW	2426
NT9V	839	NT9V	2427
N7FQQ	840	JA3MNY	2428
NV6L	841	JR8AY1	2429
NW10	842	KF7RU	2430
		K6PQA	2431
		KB4HBH	2432
	1500	EA6MQ	2433
K0GEN	922	OH3OJ	2434
NT9V	923	NV6L	2435
KB9YY	924	VE4ROY	2436
N7FQQ	925	NW10	2437

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 nonsubscribers it is \$10.00. Initial application must be submitted in the USA-CA Record Book, which may be obtained from CQ Communications, 76 North Broadway, Hicksville, NY 11801 USA 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 an SASE to Dorothy Johnson, WB9RCY, USA-CA Custodian, 333 South Lincoln Avenue, Mundelein, IL 60060 USA. DX stations must include extra postage for airmail reply.

and claimed USA-CA All Counties #671, All CW, dated 7-20-90.

Louis R. Bligh, NW10, filed his good application and received USA-CA 3000 #699, USA-CA 2500 #776, USA-CA 2000 #842, USA-CA 1500 #927, USA-CA 1000 #1125, and USA-CA 500 #2437, All CW, dated 7-28-90.

Beatrice I. Wilson, N7FQQ, received USA-CA 2500 #775, and USA-CA 2000 #840, Mixed, dated 7-21-90.

Ada (Jan) J. McLernon, NV6L, claimed USA-CA 2000 #841, USA-CA 1500 #926, USA-CA 1000 #1124, and USA-CA 500 #2435, Mixed, dated 7-26-90.

John L. Biester, KB9YY, received USA-CA 1500 #924, All SSB, dated 7-13-90.

Robert P. Banner, K6PQA, claimed USA-CA 1000 #1123, and USA-CA 500 #2431, Mixed, dated 7-23-90.

USA-CA 500 certificates went to:

Lloyd B. Glasscock, K0GEN, USA-CA 500 #2425, All SSB Mobiles, 7-2-90.

Brynjolfur Jonsson, TF5BW, USA-CA 500 #2426, Mixed, 7-2-90.

Ed Dranchak, NT9V, USA-CA 500 #2427, All SSB, 7-5-90.

333 South Lincoln Ave., Mundelein, IL 60060

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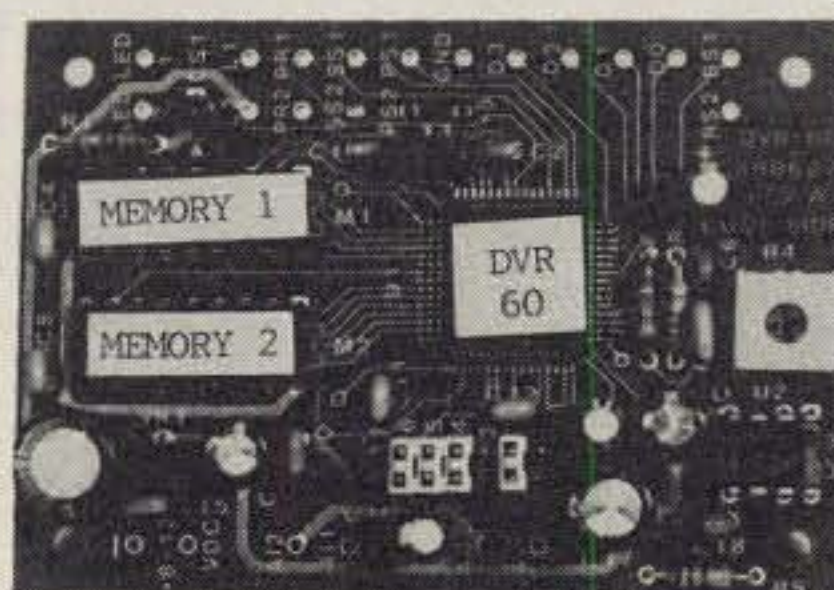
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MPD-2	80-40M max-performance dipole, 85' long	\$62
HPD-3*	180-80-40M hi-performance dipole 113' long	\$79 ppd
SSD-6*	180-80-40-20-15-10M space saver dipole 71' long	\$125 ppd
SSD-5*	80-40-20-15-10M space-saver dipole-specify L. 42' \$105	\$2' \$108 ppd
SSD-4*	80-40-20-15M space-saver dipole-specify L. 46' \$93	\$0' \$ 96 ppd

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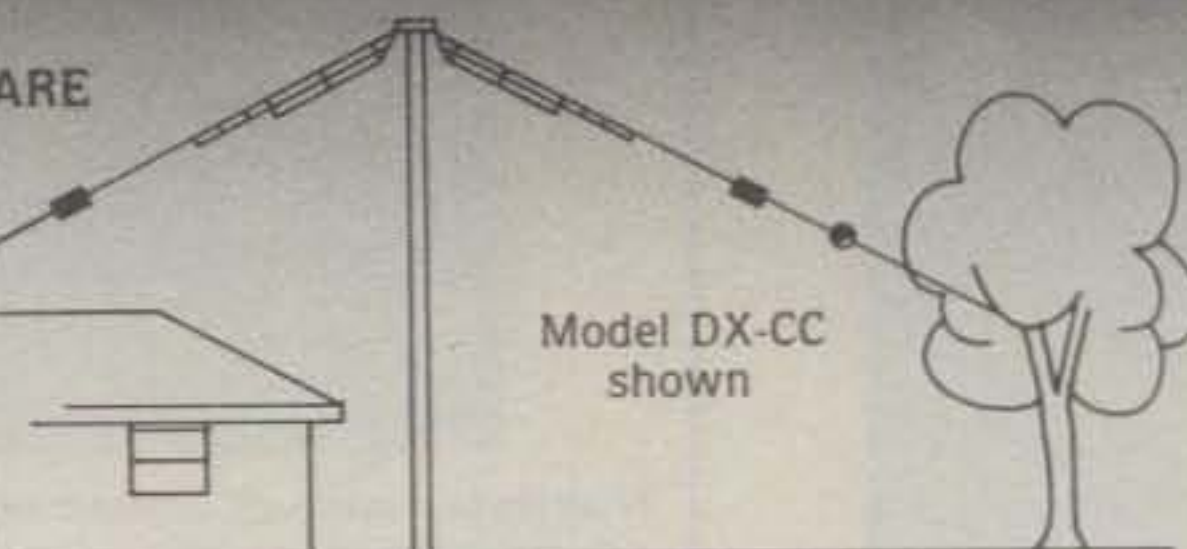
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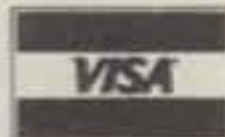
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- Only 82' overall length . . . . . **\$79.95 each**

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## USA-CA Special Honor Roll

Lloyd B. Glasscock, K0GEN  
USA-CA All Counties #668  
All SSB Mobiles, 7-2-90

Leonard A. Postage, N4UMR  
USA-CA All Counties #669  
All SSB, 7-3-90

Ed Dranchak, NT9V  
USA-CA All Counties #670  
All SSB, 7-5-90

Edgar E. Newman, W2RPZ  
USA-CA All Counties #671  
All CW, 7-20-90

Hiroyuki Kimura, JA3MNY, USA-CA 500 #2428, Mixed, 7-5-90.

Akira Sato, JR8AYI, USA-CA 500 #2429, All SSB, 7-11-90.

Jerold (Jerry) A. Goetsch, KF7RU, USA-CA 500 #2430, All SSB, 7-14-90.

Robert P. Banner, K6PQA, USA-CA 500 #2431, Mixed, 7-23-90.

Oliver S. Johnson, KB4HBH, USA-CA 500 #2432, Mixed, 7-23-90.

Jose Quintana Sintes, EA6MQ, USA-CA 500 #2433, Mixed, 7-23-90.

Jukka Tamminen, OH3OJ, USA-CA 500 #2434, Mixed, 7-24-90.

Ada (Jan) J. McLernon, NV6L, USA-CA 500 #2435, Mixed, 7-26-90.

Roy Coldwell, VE4ROY, USA-CA 500 #2436, Mixed, 7-28-90.

Louis R. Bligh, NW10, USA-CA 500 #2437, All CW, 7-28-90.

## Awards Available

**Golden City Award.** The Golden City Award is offered by the Johannesburg Branch of the South African Radio League. Gold was discovered in Johannesburg in 1886, and today Johannesburg produces almost 30% of the world's gold annually. It is only fitting that the Golden City Award should be so named.

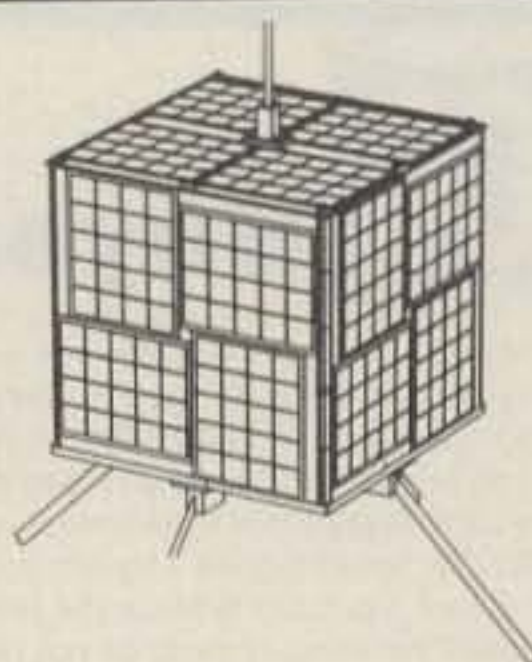
The award is available to any station that can submit a GCR list of confirmed contacts with 15 stations in the Johannesburg area. (Zone 38 stations need 30 confirmed contacts.) Reports must be no less than RST 33(9). The cost of the award is 5 IRCs, except for stations in the USSR, who may obtain the award at no charge. All contacts must be dated after 30 May 1960. Any band and any mode are acceptable.

The address for the award is Johannesburg Amateur Radio Club, P.O. Box 807, Houghton, 2041, Rep. of South Africa.

Note that the Golden City DX Net, which provides an opportunity to work

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CIRCLE 94 ON READER SERVICE CARD

most of the required stations, meets every Sunday from 1900 to 2000 UTC on 14.240 MHz, plus or minus QRM. The net control is Marc, ZS6HZ.

**Promethius Amateur Association Awards.** The Promethius Amateur Association has an awards program for contacts with its members. QSOs with members from their home or DX QTHs are valid for awards. Since SWLs are members, their QSL cards count as working a club member. There are no band, mode, or date limits for awards. Shortwave listeners may apply. There are no fees for invalids.

The different awards and requirements are as follows:

Promethius Award—3 QSOs required, fee \$3.00 US.

Promethius Pennant—4 QSOs required, fee \$5.00 US.

Promethius Plaque—5 QSOs required, fee \$10 US.

Promethius Statuette—10 QSOs required, fee \$20 US.

Promethius T-shirt—3 QSOs from DX list, fee \$15 US.

As a supplement to this program, there are awards for contacts with 4J5FV. A handsome pennant is available for one QSO during the CQ WW WPX CW Contest in 1990. The cost of this award is \$5.00.

The Upper Eshers Award is available for two QSOs with 4J5FV. Repeat contacts on different bands, different modes, or different contests—e.g., CQ WW DX CW and SSB contests in 1989, and CQ WPX DX Contest in 1990—are valid for this award. The award costs \$5.00. A special prize worth \$10.00 is available for three QSOs with 4J5FV.

Promethius members as of May 1, 1990 are as follows: RB5IJ, RB5IUL, UB5IRZ, UB4IYU, UB3IWA, UK507331, UB50733775, UB50733745, RB4ICP, RB4IBQ, RB5FH, RD6DM, UB5JRR, UB4JDM, UB70672, W6HJK, UG7GWH, 3W8AA, K8DHK, UB50733942, XE1EX, IN3BGM, DK5KD, UG6GE, UG6GCC, and NA3O.

Promethius DX stations are: RB5IJ/RI5L, RB5IJ/UB7J, RB5IJ/UF9V, RB5IJ/UG3G, RB5IJ/UG9G, UB3IWA/RF2V, UB4IYU/RB6J, UB4IYU/UB6J, UB4IYU/UG0G, UB4IYU/UG1G, UB4JDM/RG, UB5IRZ/UG8G, 3W3RR, 3W5IJ, and 4J5FV.

QSLs, applications, and fees should go to PAA Inc., Box 195, Donetsk, 340000, USSR. No name or callsign should appear on the envelope.

**Six Counties Award—Northern Ireland.** The operators of Special UK Station GB4SPD offer the Six Counties Award. It is available to radio amateurs and SWLs



The Six Counties Award offered by Northern Ireland, special UK station GB4SPD.



## HPF-1 High Pass Filter

Suppress television interference with AEA's new HPF-1 high pass filter, intended for 75 or 300 ohm TV input impedance.

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- Use between transmitter and antenna or tuner
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Some of the many awards offered by the Irish Radio Transmitters Society for meritorious service to amateur radio and the IRTS.



President Con Hunter, EI9V, presenting the IRTS DX Trophy to Joe Duffin, EI8GT/W2ORA.



The IRTS DX Trophy and Collins Cup awarded to deserving amateurs by the Irish Radio Transmitters Society.

who work/log GI stations. It is on a points system, 12 points being required. Station GB4SPD is worth three points. GI stations are worth one point each. At least one GI station per county is required. Contacts via repeaters do not count.

The cost of the award is 2.00 Pounds Sterling or 8 IRCs. Send log extract and fee to Awards Manager GI4WRI, 175

Staffordstown Road, Randalstown, Co. Antrim - BT41 3LT, Northern Ireland.

**IRTS Awards.** The following information about the Irish Radio Transmitters Society awards is courtesy of Joe Duffin, EI8GT/W2ORA. Joe is very active in IRTS functions. Anyone interested in joining the IRTS and receiving their newsletter, etc., may get in touch with Joe at 4 West

Central Avenue, Moorestown, NJ 08057-2415, USA. He has IRTS applications and information.

The IRTS has many awards, some for contests and some for meritorious service to amateur radio and to the IRTS. Two of the most prestigious are the IRTS DX Trophy and the Collins Cup, both of which have been awarded to EI8GT/W2ORA.

**IRTS DX Trophy.** This cup was purchased by special subscription of the members soon after the founding of the Society in 1932. It is the oldest of the IRTS awards, and is presented to the highest scoring station in either the phone or CW section of the annual ARRL DX contest. At first the winners received replicas, and the cup itself was first presented in 1934.

At present it is awarded to the highest scoring single-operator station. The awards committee members are attempting to devise a system whereby a comparison can be drawn between the relative merits of the scores of multi-operator and single-operator stations.

This trophy is a sterling silver cup, 7 inches in diameter, with the calls and names of all previous winners engraved on the side. The recipient gets to keep the cup for one year.

**Collins Cup.** The solid-silver Collins Cup was donated to the Society by Harry Wilson, EI2W. It commemorates his friend, Michael Collins, EI3N, who was electrocuted while carrying out adjustments to his rig at his home in Rathgar, Dublin in June 1951. The Collins Cup is awarded for exceptional service to the society or to amateur radio.

**Zone 12 Award.** We are informed that the fee for the Zone 12 Award is now \$4.00 US or 8 IRCs. Information about the award appeared in this column in July 1990.

Good Hunting!

73, Dorothy, WB9RCY

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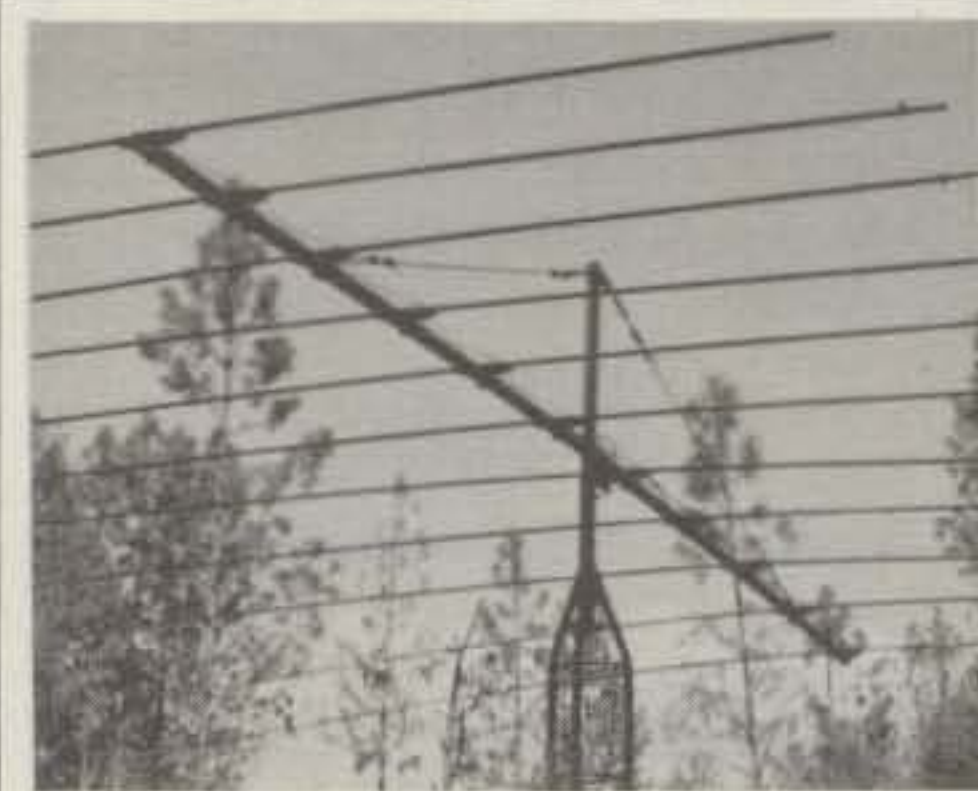
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## REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

### *From 15 BPS To 50 Million—Processing Digital Data*

**R**ule No. 1 in the United States is you must be proficient in the international Morse code if you want to be an amateur radio operator. It's a long story as to exactly why! In a sentence, the reason has always been that's the way the amateur community wants it. It looks like this is about to change.

You can trace binary signaling almost to the beginning of civilization! Smoke signals, jungle drums, and reflected sunlight are all forms of binary code. Simply stated, binary numbering is a two-bit code system. The two bits can be anything—presence/absence, start/stop, on/off, yes/no, voltage/no voltage, etc. In CW (continuous wave Morse Code signaling) it is a series of spaced short and long tones.

The ones and zeros that are so basic to modern computers are actually clusters of binary signals of equal duration. Each series of binary bits processed together is called a byte. A CW character is a series, or byte, of one to five dots and dashes averaging 10 bits. A series of bytes becomes a word.

When you come right down to it, the only difference between Morse code and today's 32-bit bytes is speed. Human brain "computers" simply don't have the capacity to process 5-bit Baudot codes very fast, much less today's 32-bit. It takes a machine, a teletypewriter, to interpret Baudot signals being sent at 60 words per minute. Remember that back in the 1950s radioteletype was state-of-the-art. We knew about computers, but they were beyond the expertise and pocketbook of the average ham.

Actually the first electronic computer, the ENIAC (for Electronic Numerical Integrator and Computer), was developed only in the mid-1940s. It was a giant and contained 18,000 vacuum tubes, weighed 30 tons, and occupied a room 30 by 50 feet. The term "debugging" originated when ENIAC's operators had to sweep out the moths that accumulated from its heat.

Developed at the University of Pennsylvania, in 1946 ENIAC was shipped to the Aberdeen Proving Ground in Maryland. It was primarily used to compute the

trajectory of shells during WW II. During 1952 approximately 19,000 tubes had to be replaced—more than 100% of the tube complement! ENIAC was operational until 1955, and today you can see portions of it at the Smithsonian Institution's new Information Age exhibit. It's worth the trip!

Thanks to the invention of transistors (1948) and integrated logic circuits (1965), microprocessors that have blinding speed have been developed. You might think 20 words per minute (about 15 bits/second) Morse code human processing is fast, but microchips today operate in the millions of instructions (baud) a second. Clock rates of 500 times faster than ENIAC's 100 kilobits/second are now possible at a very tiny fraction of its cost and size.

Computer processing that cost tens of thousands of dollars and took up an entire room now is available as a low-cost desktop consumer appliance. The majority of this progress has taken place in just the last decade! Unfortunately, amateur radio has not kept up, and we still require antiquated technology as a prerequisite. I say "we" because it is the amateur community and not the FCC that has always emphasized the need for telegraphy proficiency. The average age of our amateur operators has now increased to about 50, as relatively few newcomers appear interested in Morse communication. They would rather play with their computers.

#### History of International Radio Regulations

Why then is Morse code a requirement? Is it the international law? Well, yes and no! Article 32 of the International Radio

Regulations states, "Any person seeking a license to operate the apparatus of an amateur station shall prove that he is able to send correctly by hand and to receive correctly by ear texts in Morse code signals. The administrations may, however, waive this requirement in the case of stations making use exclusively of frequencies above 30 MHz." In actual practice, however, applicants are no longer required to be tested on hand sending code since our FCC has taken the position that receiving Morse code is evidence that an applicant also can send it.

An equivalent international regulation has existed from at least 1938. Article 8, Section 197 (Cairo WARC 1938) required "... any person operating amateur and private experimental station apparatus, either on his own account or for another, must have proved his ability to transmit passages in the Morse Code and to read in telegraphy reception by ear, passages thus transmitted. He may be replaced only by authorized persons possessing the same qualifications."

In 1947 (Atlantic City WARC) the regulation (Article 42, Section 1003.3) included for the first time a frequency limit above which a test in Morse code may be waived and set this limit at 1000 mc/s. In 1959 (Geneva WARC) this frequency limit was lowered to 144 MHz, and in 1979 (another Geneva WARC) it was lowered to its current 30 MHz.

The text of this international regulation has been amended at each general WARC since 1947, and it is wondered what will happen at the next general WARC. The next WARC will be held in 1992, but appears to be limited in scope to reviewing frequency allocations in certain parts of the spectrum. The next

	Fiscal Year 1988	Fiscal Year 1989	1989
<b>Novice System Subtotal</b>	<b>18,550</b>	<b>20,047</b>	<b>40.5%</b>
Technician	15,157	16,047	33.4%
General	5,404	5,479	11.1%
Advanced	4,902	4,397	8.9%
Amateur Extra	3,399	3,013	6.1%
<b>VEC System Subtotal</b>	<b>28,872</b>	<b>29,411</b>	
<b>New and Upgraded</b>	<b>47,422</b>	<b>49,458</b>	<b>100%</b>

Table 1—Amateur service processing demand. Note that 73.9% of all amateur licenses issued by the FCC are for the Novice and Technician class. (Source: FCC, Gettysburg, Pennsylvania.)

National Volunteer Examiner Coordinator,  
P.O. Box 565101, Dallas, TX 75356-5101

VEC	Test Elements Administered	Rank	Share	Cumulative
ARRL-VEC	25,525	1	45.35%	45.35%
W5YI-VEC	18,719	2	33.26%	78.61%
C. Alabama	3,528	3	6.27%	84.88%
Sunnyvale	1,751	4	3.11%	87.99%
DeVry	1,628	5	2.89%	90.88%
13 Others	5,130		9.12%	100.00%
<b>Totals</b>	<b>56,281</b>		<b>100.00%</b>	<b>100.00%</b>

Table II- Amateur service testing by VEC, January to June 1990. A record 56,000 amateur radio operator test elements were coordinated by Volunteer Examiner Coordinators at 3046 test sessions between January and June 1990. This is an 8.4% increase over the prior year. Although there are 18 VECs, the ARRL and W5YI-VEC testing programs account for nearly 80% of all amateur radio operator testing above the Novice level. (Source: FCC, Private Radio Bureau, Washington, DC.)

WARC that could review Article 32 is not known at this time.

### Modern Amateur Radio

Amateur radio is a great many things in the 1990s. There are so many technical and operational challenges that it is totally impossible to participate in all of them. Solid-state technology, the widespread availability of commercial equipment, and associated applications with computers have greatly expanded the potential of amateur radio operations.

Is it really essential for Morse code to be a compulsory component laid down by

international regulation? There are several efforts underway right now in other countries looking toward eventually eliminating the Morse proficiency requirement from the international law. This would allow the various ITU nations to decide for themselves how the telegraphy requirement should be handled in their countries.

Does passing a test in Morse code necessarily make an amateur a better operator on any frequency? Some amateurs feel the effort it takes one to learn the code is an indication of motivation and quality. Others point out there are no international regulations that specify li-

censing requirements for speaking into a microphone for SSB voice transmission or for feeding computer-derived data into a packet radio link.

### Why Morse Code Above 30 MHz?

Our system of government is one of public participation—government of the people, for the people, by the people. We elect our legislators to represent us and procedures exist allowing the public to advise our government's administrative agencies.

In the past there has been widespread public outcry every time our Federal Communications Commission has attempted to relax the U.S. amateur licensing requirements as provided by international law. Amateurs, represented by the American Radio Relay League, relentlessly have gone to great pains during past campaigns to express their reservation about reducing any Morse code requirement.

They point out Morse code is the common bond that ties all amateur operators together, an internationally understood language requiring less spectrum. They say code-only transmitters are easier and cheaper to build and get through when other modes fail. Amateurs have always been concerned about congestion



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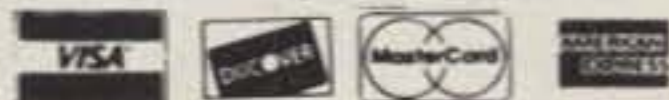
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on the amateur bands and quality of operation. They saw what happened when the 11 meter amateur band was reallocated to CB. While most other nations have successful code-free amateur classes, the United States does not.

Today's newcomer, especially youngsters, does not seem to be interested in learning the code when he or she can tinker with newer technology. Computers do not require a license when data is exchanged over the telephone. They could, however, be linked by free radio waves instead of tying up an expensive phone line. And there are all sorts of other new electronic gadgets that those so inclined can operate without being licensed. Sadly, at a time when interest in home computers

and satellites is mushrooming, growth in the amateur radio service is stagnating. To make matters worse, the commercial need for our incredibly valuable spectrum is sky-rocketing.

Amateurs began rethinking their position when the FCC began reallocating amateur spectrum to commercial interests a couple of years ago. The reallocation of 220-222 MHz really should not have come as a surprise. The Commission made it crystal clear in 1983 that since the amateur community didn't wish to expand use of its frequencies, amateur spectrum would necessarily become a prime candidate for reallocation. Amateur radio frequencies are, by far, our most valuable resource and will even be

more precious as technology in the microwave area continues to develop.

The FCC agreed to look once more into the issue of relaxing the Morse code requirement when a dozen petitioners, surprisingly including the reserved American Radio Relay League, requested provision for the code-free amateur operation allowed by international law.

On February 8, 1990 the FCC formally proposed a Communicator amateur license which would not require any test of Morse code proficiency. They pretty much followed the suggestions of the ARRL; that is, privileges would include all amateur frequencies 222 MHz and above. There was a major difference, however. The Commission's version of code-free amateur operation was designed so as not to exceed their present application processing capacity. The FCC proposed to eliminate the Novice and Technician classes and replace them with a code-free Communicator class.

The Commission presently processes about 50,000 amateur licenses a year. Notice that 75% are at the Novice and Technician class level (see Table I). Note too that there are two distinctly separate testing programs: the Novice and the VEC Systems.

Novices are tested by two volunteer examiners who need not be accredited by a VEC. Applicants for the Technician through the Extra class level are administered examinations by three VEs in a more structured atmosphere (see Table II). There are currently 18 Volunteer Examiner Coordinator organizations. A VEC acts as the liaison between the volunteer examiner team and the FCC.

There is a growing feeling in amateur circles that there should only be one examination program administered through the VEC system since all test questions (including those of the Novice program) are developed by the VEC's Question Pool Committee (QPC). The VEC testing system is also perceived to be a more trustworthy program.

In this day of Gramm-Rudman and controlled budget deficits, the FCC knew they had no hope of obtaining additional resources to process amateur applications. They did the only thing they could and still not increase costs. They merely traded the Novice/Technician processing costs for the code-free Communicator class processing. This would allow 40,000 new code-free Communicator class licenses to be issued by their Gettysburg, Pennsylvania facility. This assumed, of course, there would be no increased amateur license demand caused by a code-free class. We believe this to be an incorrect assumption, since there seem to be many individuals who would be amateurs if it were not for the code requirement. The public comment period ended August 6th, replies September 7th.



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This time the comments from the amateur community are vastly different. As a general rule, amateurs are in favor of a codeless amateur class. While the ARRL still insisted that code-free operation should only be above 222 MHz, most other large amateur groups felt that any codeless class adopted should extend down to the 30 MHz level authorized by the ITU and adopted by most countries that have a code-free amateur class. Among others, these groups include the Quarter Century Wireless Association (QCWA), the Radio Amateur Satellite Corp. (AMSAT), Tucson Amateur Packet Radio (TAPR), the Volunteer Examiner Coordinators (VECs), the Amateur Industry Group (AIG), and the National Amateur Radio Association (NARA).

They also argued that it was important for newcomers to be exposed to routine amateur operation which is lacking in most areas of the nation at the 220 MHz and higher frequency level. They believe a 5 words-per-minute code test is not a fair prerequisite for obtaining 6 and 2 meter operating privileges when telegraphy is basically non-existent at the VHF and higher amateur band level.

It will probably be year end or early spring 1991 before we find out how the Federal Communications Commission will rule on no-code. But the handwriting is on the wall. We predict you will see code-free amateur radio operating in the United States in view of the overwhelming change of heart on the part of the amateur community. Best guess is that it will be implemented in mid-1991. It appears the question is not "if" but "how" it will be achieved. We'll keep you posted.

## Amateur Radio Exams

We keep getting questions about the mechanics of amateur radio license testing. Here are the basics!

All of the multiple-choice questions that make up the "Question Pools" are developed by a group of VECs (Volunteer Examiner Coordinators) called the Question Pool Committee, or QPC for short. Approximately ten times as many questions as will be asked on any one examination make up each of the five question sets.

There are five different sets of questions—one each for the Novice, Technician, General, Advanced, and Amateur Extra classes. Novice applicants study the questions, and then a team of two VEs administers 30 questions chosen from the pool according to a formula.

Novice-level VEs must hold at least a General class license, have clean radio enforcement records, be 18 years old or more, and not be related to examinees to administer the Novice 5 words-per-minute code (Element 1A) and 30-question written "theory" (Element 2) examina-

tions. Applicants failing any examination may, at the option of the testing team, be retested immediately.

We have Novice testing kits available (\$4.95 postpaid) containing everything needed to conduct a Novice testing session. Included are pre-made written and telegraphy examinations, FCC Form 610 applications, and an instruction booklet. We even have software available (another \$4.95) which will permit a VE team to (1) examine a Novice applicant directly at a computer keyboard or (2) generate a properly constructed printed Novice examination and answer sheet. The computer automatically produces a scored answer sheet if the test is taken at the keyboard. (Examiners ordering Novice testing material must include a copy of their General or higher class operator license.)

All question pools are available and widely published along with the multiple choices and correct answer identified. These question-and-answer sets are available to anyone and may be obtained from many amateur radio publishers or by mail from The W5YI Group (P.O. Box 565101, Dallas, TX 75356). *The Licensing Handbook* (\$11.95 postpaid) contains all 1931 questions appearing in the Novice, Technician, General, Advanced, and Extra class examinations.

As mentioned above, three Advanced or higher class volunteer examiners are required to administer the higher license classes (Technician through Extra class) VE/VEC System examinations. In addition, the VEs must be approved (or "accredited") by Volunteer Examiner Coordinators (VECs). Your author heads up the second largest VEC organization in existence. More than 7000 Extra class VEs are accredited worldwide under the W5YI-VEC testing program. The W5YI-VEC does not accredit Advanced class VEs.

Send a self-addressed stamped envelope for a VE application if you are an Extra class level amateur and wish to be accredited under the W5YI-VEC banner. Request a copy of our VE Manual if you are serious about starting a testing team or give us a call at 817-461-6443. There is no charge to become accredited. Volunteer examiners in the VE/VEC System follow the testing instructions supplied by the Volunteer Examiner Coordinator. VECs in turn follow the testing guidelines issued by the FCC in §Part 97 of the Commission's rules.

Every VEC organization uses exactly the same word-for-word test questions, multiple choices and answers, for every license class, Novice through Extra class. Thus, all license preparation material available from any publisher applies to all upcoming examinations.

One word of caution, however. The VEC Question Pool Committee periodically revises each of the various question

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The new 1991 International Callbook lists 500,000 licensed radio amateurs in the countries outside North America. It covers South America, Europe, Africa, Asia, and the Pacific area (exclusive of Hawaii and the U.S. possessions).

The 1991 Callbook Supplement will be published June 1, 1991, with thousands of new licenses, address changes, and call sign changes received over the preceding six months. This single Supplement will update both the North American and International Callbooks.

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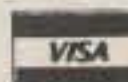
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sets to make certain that the questions properly reflect the changes in amateur radio rules, operation, and technology. Be certain you obtain the current versions. All General, Advanced, and Extra class examinations will change on November 1, 1990. (The Novice and Technician written tests were last revised on July 1, 1990.)

Novice examinations usually take place at the homes of the amateur examiners, while VE/VEC System test sessions are more formal. They are usually held at public places such as schools or other meeting rooms. There is never a charge to take a Novice examination. The test fee for VE/VEC System examinations, however, is currently a maximum of \$4.95. This fee is adjusted every January by the FCC based on changes in inflation.

Completed Form 610 applications for the Novice license are sent by the VE team directly to the FCC in Gettysburg, Pennsylvania. VE/VEC System applications, however, must be sent to the VEC by the VE team for initial processing. The VEC checks the paperwork for proper handling, approves the application, and then forwards to Gettysburg for license issuance. Novice-level examinees can also take their examinations at regularly scheduled VE/VEC sessions at no charge. It usually takes about a month to receive a Novice license from the FCC after testing, and a little longer for Technician and

higher upgrades since the application must go through the VEC System.

The Novice, General, and Extra class levels require testing in Morse code proficiency at 5, 13, and 20 words per minute. The 5 words-per-minute code test is usually made up by the VE, while the 13 and 20 words-per-minute code test is most often supplied by the VEC to the volunteer examiner. The 5 words-per-minute code test is frequently sent by hand, while the faster speed code exams are almost always transmitted on a cassette tape.

The actual code test may be designed by either the volunteer examiner and/or the VEC and usually consists of a transmission typically heard on the amateur airwaves. Each examination must contain all alphabet letters, numerals one to zero, and certain punctuation and operating procedure signs.

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We've just developed an exciting new product which helps applicants prepare for their written amateur radio exams! It's software written for an IBM-PC compatible computer which lets you take any number of instantly-scored practice exams at the keyboard or print out any number of unique practice exams (complete with an answer key) for yourself, your friends, your students, etc. All exams are made up of the proper mixture of questions from the question pool and each is different! It can also be set up to let you practice all the questions in one sub-element if you feel the need for heavy-duty study of a difficult section.

You won't believe how easy it is to use! Just enter the name of the license class you want to study, press the ENTER key two more times, and presto! You're studying! You can review and/or change your answers at any time, skip over questions and come back to them later, and keep constant track of your progress. You can also customize a variety of features to your personal taste. We've needed this kind of study method for a long time in amateur radio.

The best part is the price! We'll send you four 360-K, 5¼ inch floppy disks which cover all 1931 questions appearing in all license classes, Novice through Extra, postage paid for \$19.95. These disks can be copied to a hard disk for extra speed or can be used directly by any 256K (or greater) IBM compatible computer. Practicing at the keyboard does not require a printer, but if one is connected to LPT1: it can be used to make serial-numbered, printed practice exams for personal or classroom use.

Want to order? Money-back guarantee from: The W5YI Group, P.O. Box 565101, Dallas, TX 75356. VISA/MasterCard call (toll-free) 1-800-669-W5YI (9594).

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73 de W5YI

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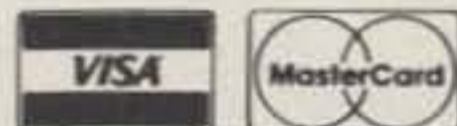
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"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

## Printed Material—Part I of IV

This article is intended to provide new amateurs with information about a few of the current sources of useful printed data. No attempt has been made to list all such sources. I have simply written a brief introduction to each item I have on hand. Obviously, each amateur radio publication contains data about many more sources of printed material. This article is just an introduction to such items. Excellent material is available to anyone who requests it.

Catalogs and other printed material of the major equipment manufacturers are not detailed in this article. Such items can be requested directly from AEA, Azden, ICOM, Kenwood, Ten-Tec, Yaesu, etc., using information printed in the major amateur radio magazines.

Prices may change by the time this article is printed and distributed. Prices are only shown to indicate approximate costs. If one resides in the same state as the seller of a desired item, a state sales tax probably exists, in addition to the stated price. If one is not a resident of the USA, additional cost is associated with all items.

**Amateur Electronic Supply Catalog.** Amateur Electronic Supply publishes an 80-page catalog which is particularly useful to newer amateurs. AES has outlets in Florida, Illinois, Nevada, Ohio, and Wisconsin. If you want one of their catalogs, you can request it by writing to AES at 5710 West Good Hope Road, Milwaukee, WI 53223. The toll-free telephone number at their Milwaukee outlet is 1-800-558-0411.

**Amateur Radio DX Blue Book.** An updated and improved version of Jim Creevey, W4UYZ's DX operation guide is available at \$6.95 prepaid, shipped to USA addresses. It contains 28 pages of information that is vitally important to new amateurs who want to contact DX (foreign) amateur radio stations. It includes a B-size (17 by 11 inches) foldout world grid map that is keyed to the associated DX data lists printed in the book. It is bound in a plastic comb binder, which allows you to leave it open without having to hold it open. It is shipped in a protective cardboard carton. It includes amateur ra-



*Nine-year-old Andy Robinson, KA3WDW, of Downingtown, Pennsylvania is a third-grade student who also enjoys playing baseball. Andy shares this radio shack with his father (George, WA3LVR).*

dio frequency allocations, callsign sequence list of DX data, central Pacific islands data, commonly used Q-signals, a country name-to-common callsign prefix conversion list, DX bearings, Fahrenheit/Celsius temperature conversions, miles/kilometers conversions, Pacific islands economic zones, Pacific islands grid map, QSL receiving and sending tips, and other data. The address is J/C Enterprises, 4920 Mayflower Street, Cocoa, FL 32927.

Jim offers a list of 330 beam headings, relative to your specific location, at \$2.50. Naturally, you must supply your exact geographic location.

**Amateur Television Quarterly Magazine.** If you are interested in amateur TV, or if you think you might get interested in this facet of our hobby, *ATVQ* is a good investment. The annual subscription rate is \$15 (domestic) and a sample issue cost \$4. The address is *ATVQ Magazine*, 1545 Lee Street, Suite 73, Des Plaines, IL 60018.

**The AM Press/Exchange.** Donald Chester, K4KYV, is the editor of this monthly newsletter, which is dedicated to advancing amplitude-modulation usage in our amateur radio service. The annual subscription rate is \$10 and the address is 2116 Old Dover Road, Woodlawn, TN 37191.

**Antenna and Tower Mount Catalog.** This catalog lists dual mounts, ginpole kits, ladder masts, mast adapters, pulleys, quadpods, rotator mounts, standoff brackets, and other related items. The address is IIX Equipment, Ltd., P.O. Box 9, Oak Lawn, IL 60454.

**Antennas West Data Packet.** Jim Stevens, KK7C, offers a bunch of specification sheets which cover the assortment of good (HF (3-30 MHz) antennas being sold by Antennas West. His indoor antennas are popular. His QRV (I am ready) Quick Launch system is excellent for use in erecting wire antennas. I use one and I recommend it highly. Jim's full-size HF antenna are excellent. An assortment of data sheets can be obtained at no charge by writing to Antennas West, Box 50062, Provo, UT 84605. Their toll-free order line is 800-926-7373 and the number to use to get technical support is 801-373-8425. Their FAX number is 801-375-4664.

**Antique Radio Classified.** This monthly magazine is written for people who buy, sell, recondition, collect, and display old radios. A six-month subscription costs \$11. A one-year subscription costs \$20, or \$30 for first-class mailing. Their address is P.O. Box 802, Carlisle, MA 01741. A free sample copy is available.

**ARRL Letter.** "The ARRL Letter" is published every two weeks to keep League members up to date on what is happening in amateur radio. A one-year subscription costs \$19.50, and subscription rates are restricted to ARRL members. The address to use is "The ARRL Letter," 225 Main Street, Newington, CT 06111.

**Apartment Operating.** Paul Gerhardt, KB3HH, offers a set of tips to help people who want to achieve good results while operating from restricted space locations such as apartments and townhouses. The address is 1255 Stonewood Court, Annapolis, MD 21401.

**ARRL Publications.** The American Radio Relay League has a superb assortment of printed materials. A free copy of their current list of publications can be requested by writing to ARRL, 225 Main Street, Newington, CT 06111. You do not have to be a League member to purchase ARRL publications.

**Auto-Call Magazine.** The Foundation for Amateur Radio is a federation of more than 50 clubs in the area of our nation's capital. I have found their publication to be an excellent source of up-to-the-minute amateur radio news. If you would like to receive a sample copy of *Auto-Call Magazine*, send your request (with an

\*45527 Third Street East, Lancaster, CA 93535-1802



SASE) to the Foundation for Amateur Radio, P.O. Box 7612, Falls Church, VA 22046-1452.

**Awards Directory.** There are several sources of information about available operating awards, including the monthly awards column that appears in this magazine. One of the best sources of such information is the "K1BV Directory of DX Awards." The 1990 edition of this directory features 1380 awards from 113 countries that have DXCC credit. Copies can be ordered from Ted Melinosky, K1BV, 525 Foster Street, South Windsor, CT 06074-2936. Each directory sells for \$16 (priority mail) to Canadian and USA addresses; \$15 DX surface mail; \$20 airmail to Central America, Europe, or South America; and \$23 airmail to all other DX addresses. Connecticut purchasers must also include the 8% sales tax. International Reply Coupons (IRCs) are accepted at 50 cents each.

The format is 8.5 by 11 inch 3-hole punched (looseleaf) for maximum flexibility. Awards available to shortwave listeners (SWLs) are identified. Lists of club/group members are included where they are known. The 210 pages of awards details are supplemented by hints that can help amateurs collect operating awards. A few of the subjects Ted covers are effective QSL techniques, QSL bureau usage, sample applications form, term definitions (GCR is General Certification Rule, etc.), and using contests to earn awards.

**BCD Electro Catalog.** Electronic parts and computer accessories are advertised in the 40-page catalog of BCD Electro. A one-year subscription to this catalog, plus supplements, costs \$1.00. The address is P.O. Box 45207, Garland, TX 75045. Their telephone number is 214-343-1770.

**Bird Power Measurement Instruments Catalog.** The current Bird catalog is 60 pages long. It describes Bird's extensive line of attenuators, calorimeters, coax filters, coax switches, directional couplers, load resistors, and RF wattmeters, plus many related accessories and products. It includes good descriptions of the manner in which many of these instruments function. If you have a sincere interest in RF power measurement, you should get a copy of the Bird catalog. I am one of the thousands of amateurs who have used Bird products successfully for several decades. Their address is Bird Electronic Corporation, 30303 Aurora Road, Cleveland, OH 44139.

**Buckmaster Publishing.** 1990 United States callsign directory data is available in three formats from Buckmaster Publishing, Route 3, Box 56, Mineral, VA 23117. These versions are (1) by call-sign, (2) by last name, and (3) by state/city. Each version sells separately for \$10, and all three cost \$25. Include a \$3 shipping fee with each order.

**Burghardt.** Burghardt Amateur Center sells and trades new and reconditioned amateur radio equipment. They service what they sell. Their telephone number is 605-886-7314. You can request a copy of their latest used-equipment list. Their address is 182 North Maple, P.O. Box 73, Watertown, SD 57201.

**Canadian International DX Club.** The May through October 1982 issues of CQ contain my introduction to shortwave listening. A class handout reprint of the same article is available at no cost to anyone who requests one and sends a large (9 by 12 inches, minimum) self-addressed envelope with triple first-class postage (65 cents) attached.

Rob Gerardi is the Ham DX Editor of the "Messenger," which is a good newsletter that is published by the Canadian International DX Club. Each issue of the "Messenger" is about 50 pages long. In addition to detailed listings of listening opportunities, it includes information about radio stamps, computers, and technical topics. Arctic DX is covered very completely. A sample copy of the "Messenger" costs \$2 airmailed to the U.S.A. or Canada, and \$3 airmailed elsewhere. International Reply Coupons may be used to make payments, at the rate of 50 cents each. The address of the Canadian International DX Club is #61-52152 Range Road 210, Sherwood Park, Alberta, Canada T8G 1A5. Remember that mail to Canada now costs a little more than domestic postage.

The November and December 1988 issues of CQ contain my article about amateur radio stamps. A free copy of that article is available to anyone who requests it and furnishes the usual SASE (#10 business envelope).

The February 1986 issue of CQ contains my article about International Reply Coupons, which amateurs often use to prepay postage of DX cards they want to receive. As usual, a free copy of that article is available to anyone who requests it and furnishes an SASE (#10).

**Catalog of Catalogs.** "The World's Best Catalogs" is 30 pages long and it describes the contents of 202 catalogs advertising an extremely wide range of products. A few of these catalogs cover electronic devices, tools, and specialty items which could be of interest to amateurs. The cover price is \$6, but I received one at no charge. The address to use to request this catalog is "The World's Best Catalogs," 144 South First Street, P.O. Box 4035, Burbank, CA 91503.

**Clandestine Confidential Newsletter.** This is a list of secret transmissions data. A six-issue subscription costs \$10 (U.S.A.) or \$13 (DX). The address is RR-4, Box 110, Lake Geneva, WI 53147.

**CQ Buyer's Guides.** The CQ Amateur Radio 1990 Equipment Buyer's Guide is available at \$4.95 each prepaid. The



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price is the same for the *CQ Amateur Radio 1990 Antenna Buyer's Guide*. Each sells at \$6 prepaid to DX/foreign addresses. The address is CQ Communications, Inc., 76 North Broadway, Hicksville, NY 11801 (FAX 516-681-2926).

The CQ Book Shop, included in each issue of *CQ*, includes several useful publications about amateur radio.

**CRB Research Books.** CRB offers a 26-page catalog describing a variety of publications about stations and frequencies other than those of our amateur radio service. The cover price is \$1 and the address is P.O. Box 56, Commack, NY 11725. This information is not limited to the 3-30 MHz range, and it includes several "confidential" lists.

**Crystals.** International Crystal Manufacturing Company, Inc. offers a comprehensive assortment of crystals and holders. Their address is P.O. Box 26330, Oklahoma City, OK 73126-0330. They met all my requirements during the past 40 years.

**Disaster Preparedness Brochure.** The Federal Emergency Management Agency (FEMA) is offering a free 18-page guide to proper emergency prepared-

ness. Its title is "Millions of Americans Have Experienced Disaster—Are You Prepared?" You can send your request for a copy to FEMA, P.O. Box 70274, Washington, DC 20024.

**Doyle Communications.** Doyle Communications offers a free catalog that shows their wide range of amateur radio books, many of which they sell at discount prices. Their address is Route 8, Box 18, Lake Pleasant, NY 12108 (telephone 518-548-5515).

**The DX Bulletin and The DX Magazine.** "The DX Bulletin" is issued every week to keep amateurs informed about current DX news. A free sample issue can be requested from "The DX Bulletin," Box 50, Fulton, CA 95439. Send an SASE with your request. The annual subscription costs to domestic (USA) addresses are \$29 for second-class mailing and \$38 for first-class mailing. Foreign airmail subscription cost is \$50 (U.S.A.) annually.

*The DX Magazine* is issued every week to provide in-depth coverage of DX material. The annual subscription rate is \$15. The address is the same for both publications. The telephone number is

707-523-1001.

**DX Around The World.** The ninth edition of Dieter Konrad, OE2DYL's *DX Nets Around the World* is available. The price is \$3, or 9 International Reply Coupons. IRCs can be purchased at post offices. Do not use checks. Include a business size (#10) self-addressed envelope with your request. The mailing address is Dieter Konrad, Rosengasse 1, 5020 Salzburg, Austria.

**DX Operator's World Atlas.** If your atlas is as large as mine, this item should be of interest to you. Walt Stinson, W0CP, sells a world atlas which is small enough to be used as an aid at an operating position. It is 185 hardbound 5 by 7 inch pages printed in color on high-quality paper. Cultural profiles of 173 countries are included. Map details exceed those of most atlases. A callsign allocation table and a world time zone map further increase the usefulness of this DX operating aid. The worldwide postpaid price is \$17.95, and the foreign airmail ppd price is \$25 each. The address is 4150 East Quincy Avenue, Englewood, CO 80110.

A 60-page index makes it easy to quickly locate places on the Atlas maps. Each location's grid coordinates are stated, plus the number of the page on which the required map is printed.

## Summary

This completes the first segment of this four-part article. The subsequent segments will provide additional useful information.

## Printed Aids

My previous columns contain information that is useful to new and aspiring amateurs. Many of these items have been reprinted for distribution to students of licensing courses I instruct. For ease of use, these printed aids have been separated into six categories. These categories are introduction, code, theory, station, operating, and miscellaneous. Outdated items are continually replaced with newer material. Fifteen dollars brings a complete set of current printed aids, including shipping costs. A list of these printed aids will be sent to anyone who requests it and sends a business-size (#10) SASE to my California address. Any single item is available at no charge to anyone who supplies a self-addressed and stamped envelope. When a single item is being requested, it is advisable to supply a large (at least 9 by 12 inch) envelope and to include a couple of extra stamps (loose in your envelope) in case extra postage is required. Some items are long. Licensing-course instructors are welcome to revise and/or duplicate these items to suit their requirements.

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CA-2X4SR	146 MHz 446 MHz	3.8dB 6.2dB	150W	3' 4"	MOBILE
CX-901	146 MHz 446 MHz 1.2 GHz	3.0dB 6.0dB 8.4dB	150W	3' 6"	BASE/REPEATER
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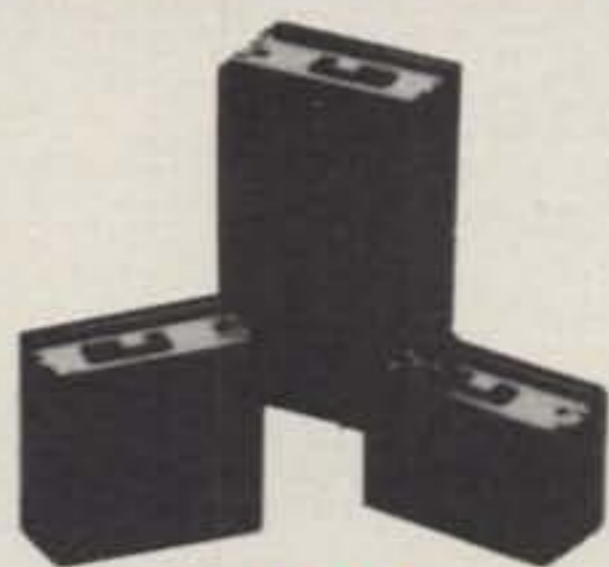
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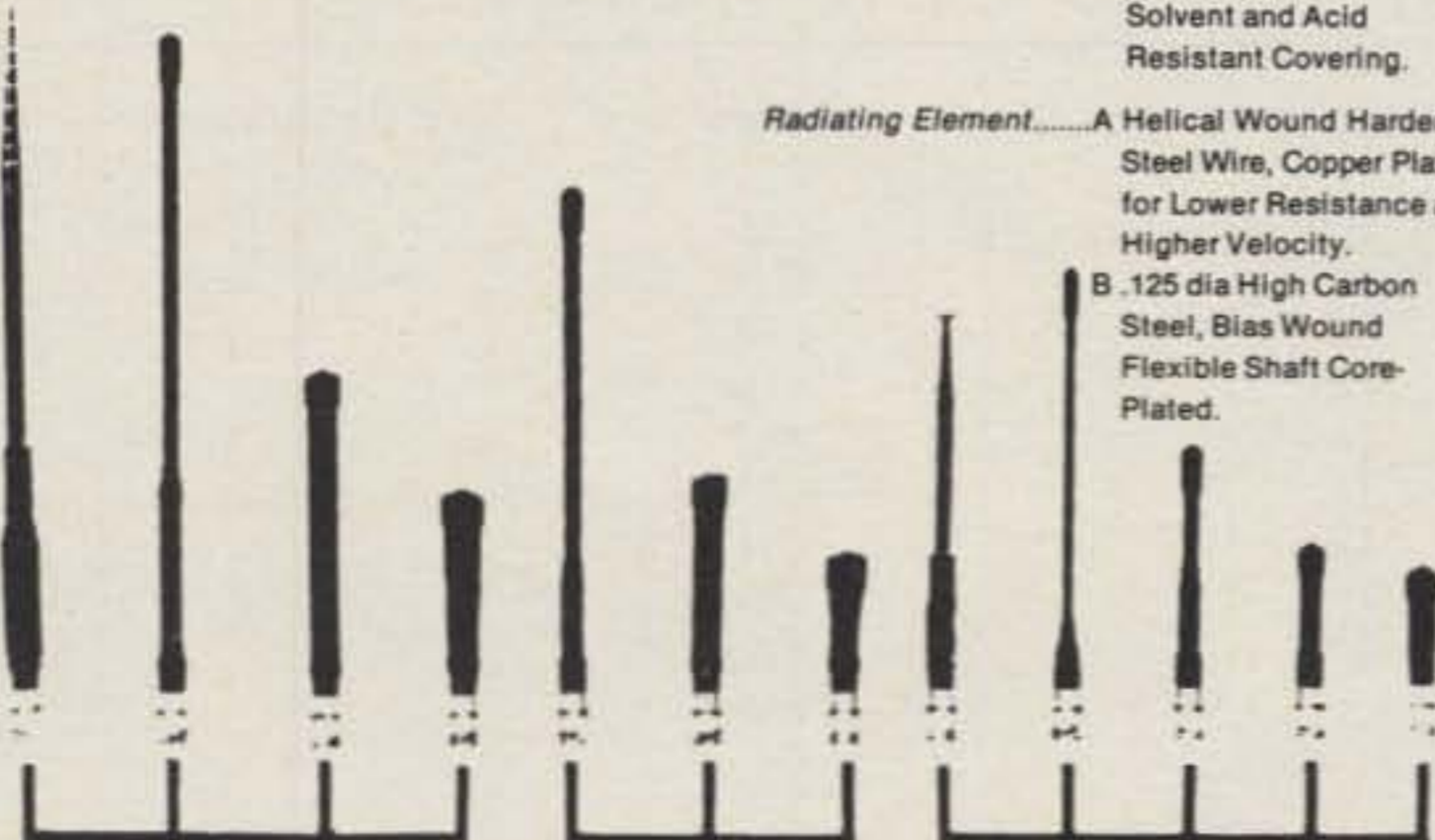
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## NEWS/VIEWS OF ON-THE-AIR COMPETITION

### Are Contesters Real Hams—The Final Results

One of my biggest fears when conducting a survey is the chance that no one will respond. In light of the topic this month, I've added another question to my thinking that asks, "Do contesters answer surveys?" Fortunately, the answer is a resounding YES! Obviously, the theme of this survey is based on several subjective assumptions. After all, what exactly is a real ham? For that matter, what does one have to do to qualify as a "true tester"? As Randy Thompson, K5ZD, concluded in his response, "am I a real ham or really a tester?"

There is no lack of opinions among active amateurs about contest operators. To some non-testers, we contribute more than our share of bad influence in amateur radio. For example, many feel we are nothing more than a group of ego-centric operators who obliterate the amateur bands weekend after weekend. We are a crowd that only takes from the hobby and rarely gives anything back. Subscribers to this line of thinking feel that if weren't for contests, the majority of these operators probably wouldn't even be in the hobby!

The goal of the survey was to straightforwardly measure the level of commitment contest operators have to non-contest amateur activities. Are testers involved in many of the projects that have so dramatically improved the public's impression of our hobby? Do we contribute toward technical advancement and facilitating our peers' growth in the hobby? Maybe we're just QSO machines that sit on the edge of 20 meters shouting numbers and symbols at each other. If you are a tester (or even a casual operator), I think you'll be as pleased as I was to learn the survey's results. If you are a cynical non-tester, you just may be a little surprised.

Before I begin the analysis, let me give you some background about the responses. The intent of the survey was to identify areas where testers are most often criticized (e.g., QSL policies, contributions to the hobby, etc.). Second, I attempted to identify testing participation in the more general-purpose aspects of the hobby (e.g., being an Elmer to a new amateur, awards, etc.). In total I re-

#### Calendar of Events

Oct. 20-21	Worked All Germany Contest
Oct. 27-28	<b>CQ WW SSB DX Contest</b>
Oct. 31 - Nov. 1	YLRL SSB Anniversary Party
Nov. 3-4	Int'l Police Assn. Contest
Nov. 3-5	ARRL CW Sweepstakes
Nov. 9-11	Japan Int'l SSB DX Contest
Nov. 10	ALARA YL/OM Contest
Nov. 10-11	OK-DX Contest
Nov. 10-11	WAEDC RTTY DX Contest
Nov. 10-11	North Carolina QSO Party
Nov. 17-19	ARRL SSB Sweepstakes
Nov. 24-25	<b>CQ WW CW DX Contest</b>
Nov. 30 - Dec. 2	ARRL 160M Contest
Dec. 1-2	Telephone Pioneers QSO Pty
Dec. 8-9	ARRL 10M Contest
Dec. 9	ARCI QRP CW Sprint
Jan. 25-27	<b>CQ WW 160M CW Contest</b>
Feb. 16-17	ARRL DX CW Contest
Feb. 22-24	<b>CQ WW 160M SSB Contest</b>
Mar. 2-3	ARRL DX SSB Contest

ceived 228 replies. From this pool, 195 were from the U.S. and the remaining 33 came from 16 DXCC countries. The testing experience levels varied from 6 months to 53 years (W3BY claims this prize!) with an average of 16.9 years. As you might expect, the responses also varied from W5FO's 11-page handwritten masterpiece (including play-by-play action from Wimbledon) to several giving the appearance of being completed while commuting to work on the New Jersey Turnpike with a coffee in one hand and

the 2 meter rig in the other. In each case, I appreciate your participation and the supplementary comments you included.

#### Survey Results

**Question 1.** Do you regularly answer your bureau/direct QSL cards?

YES—206 (90.7%)  
NO—21 (9.3%)

This is a real sore point for many amateurs working contest stations. The perception is that "those testers NEVER QSL!" Based on this survey, it seems that this perception is a myth. While testers perhaps process QSLs slower than some would like, the fact remains that the vast majority of us eventually get to the task. Many respondents commented that computers are substantially helping with QSL chores. I know that my call sign receives 5 to 8K QSL requests per year, and I can't even begin to imagine the requests for the large multi-multi stations. Nevertheless, 9% is still a high number and reflects the need for some concern in fulfilling what some consider to be the final obligation to a QSO.

**Question 2.** How many unsolicited outgoing QSLs have you sent in the past 12 months?

a) zero—22 (10.0%)

Area	# of Responses	Area	# of Responses
W1	21	DL	2
W2	26	DU	1
W3	21	G	6
W4	29	HB9	1
W5	22	KH6	3
W6	21	KL7	6
W7	13	LA	1
W8	12	OH	1
W9	19	OE	1
W0	11	PY	1
		SM	1
		SV	1
		TI	1
		VE	5
		ZS	1
		9M2	1

Table 1—Geographical breakdown for survey responses.

2 Baldwin Street, Windham, NH 03087

- b) 1-5—22 (10.0%)
- c) 5-25—21 (9.7%)
- d) greater than 25—154 (70.3%)

This question was intended to measure a good old-fashioned aspect of our hobby—exchanging QSLs. Given the sometimes overwhelming burden of answering incoming cards, I was surprised to discover that 70% of us also send a substantial number on an unsolicited basis.

**Question 3.** Do you actively track your DXCC country totals?

- YES—185 (81.1%)
- NO—43 (18.9%)

I certainly wasn't shocked by this response. Anyone who devotes the time to working as many stations as the active contester probably will dedicate some time to keeping track of basic information such as DXCC totals.

**Question 4.** Are you currently involved in a local radio club (non-contest)?

- YES—163 (71.8%)
- NO—64 (28.2%)

This question really hits home on the subject of a contester's involvement in non-contesting circles. The question's purpose was to specifically identify our interest in supporting local amateur organizations beyond the traditional contest club (e.g., YCCC, FRC, NCCC, etc.). Many respondents indicated they are active club officers responsible for a myriad of public-service activities and other contributions.

**Question 5.** Have you administered an amateur radio exam in the last 12 months?

- YES—84 (37.2%)
- NO—142 (62.8%)

The numbers associated with this question are somewhat skewed by the fact that many countries have not established self-administration for amateur licensing. In any case, only one third of the responses indicated their active involvement in the upgrading/introduction of amateurs through the established US Volunteer Examiner process. In my opinion, this is an area where experienced amateurs such as contesters can offer more support and expertise.

**Question 6.** How many QSOs with a non-contester have you made in the past 12 months that were longer than 10 minutes in duration?

- a) zero—8 (3.6%)
- b) 1-5—29 (12.9%)
- c) 5-25—60 (26.8%)
- d) greater than 25—127 (56.7%)

For years contesters have been accused

of participating in a clique that is only penetrated when your contest scores achieve a certain level. The clique has been described in terms of our attitudes on and off the air. I'm sure you have already pictured that "typical" amateur QSO in your mind. It begins by firing up your rig on 20 meters SSB and calling CQ with the beam pointing west (from an East Coast perspective). WD1XXX calls you and you think to yourself, "Do I really want to talk to this guy about his rig and weather?" Fortunately for amateur radio, there is much more to a QSO than that, and I was pleased to see others feel the same way as over one half of us conduct

QSOs with amateurs outside of our contesting circle. Some of the respondents indicating choice (a) mentioned that they do not single out non-contesters as much as they don't work anyone in between contests (e.g., no available station).

**Question 7.** Do you operate special modes from your station (e.g., RTTY, SSTV, AMTOR)?

- YES—99 (44.2%)
- NO—125 (55.8%)

While special modes of operation don't necessarily qualify you to be a "real ham," they are one small measure of

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your interest in some of our hobby's leading technologies and advancements. At the risk of being accused of soliciting QSOs in the next RTTY contest, even my station has made the plunge into RTTY and AMTOR!

**Question 8.** Have you ever been an "Elmer" for another amateur?

YES—180 (80.7%)  
NO—43 (19.3%)

The response to this question should be extremely encouraging to any contester. I personally had the luxury of being taught by two "Elmers" in my formative amateur years who provided infectious enthusiasm and advice that remains with me to this day. And for the contesters answering this survey, 80% have given that gift to many others in the hobby. One respondent indicated that he had personally "Elmered" over 25 new amateurs over the years and has remained a close friend with many of them to this day.

**Question 9.** How many hamfests did you attend in the past 12 months?

a) zero—39 (17.0%)  
b) 1—46 (20.0%)  
c) 2—59 (25.7%)  
d) 3 or greater—86 (37.3%)

The responses to this question were partially influenced by the fact that not every-

one has easy access to regularly held hamfest events. The boys in KL7 and KH6 were quick to point that one out! Nevertheless, contesters seem to like to participate in hamfest activities with the majority attending three or more in the past 12 months. My interpretation of this is that the contester is basically a social animal who uses hamfest gatherings to meet his peers and search out bargains for his construction projects (see Question 12).

**Question 10.** Have you participated in a public-service activity (e.g., 2 meter communications in parades, road races, concerts) in the past 12 months?

YES—91 (42.3%)  
NO—124 (57.7%)

I was pleased to see the large number of positive answers to this question. In addition to the examples I raised in the query, many pointed out their involvement in disaster communications, emergency communication drills, Boy Scout events, etc. Although the majority of responses indicated no participation in public-service events, I'd be willing to bet that the numbers reflect a higher percentage of "contester" participation when compared against the overall amateur population. In other words, would four out of ten hands show active public-service participation at your local ham club meeting? If you have some hard data on this subject, please send it along.

**Question 11.** Circle the following awards you have obtained:

a) 5BDXCC—58 (25.2%)  
b) 5BWAZ—19 (8.3%)  
c) 5BWAS—28 (12.2%)  
d) DXCC Honor Roll—42 (18.3%)  
e) Worked All Counties—13 (5.7%)

Not surprisingly, contesters have achieved many prestigious awards. While working DXCC is a significant accomplishment for many, contest operators have the advantage of working large numbers of stations over short periods of time, resulting in impressive award tallies. I must say I was as surprised as you probably are to see the noticeable number of stations claiming Worked All Counties.

**Question 12.** Have you "homebrewed" a piece of amateur equipment in the past 12 months?

YES—125 (55.6%)  
NO—100 (44.4%)

There was one response that stood out accusing contesters of being appliance operators who lack the technical expertise of the general amateur population. While it's fair to admit that contesters rarely build their own transceivers in today's modern age of technology, over half of the respondents have made a serious attempt to improve their stations while operating at the workbench.

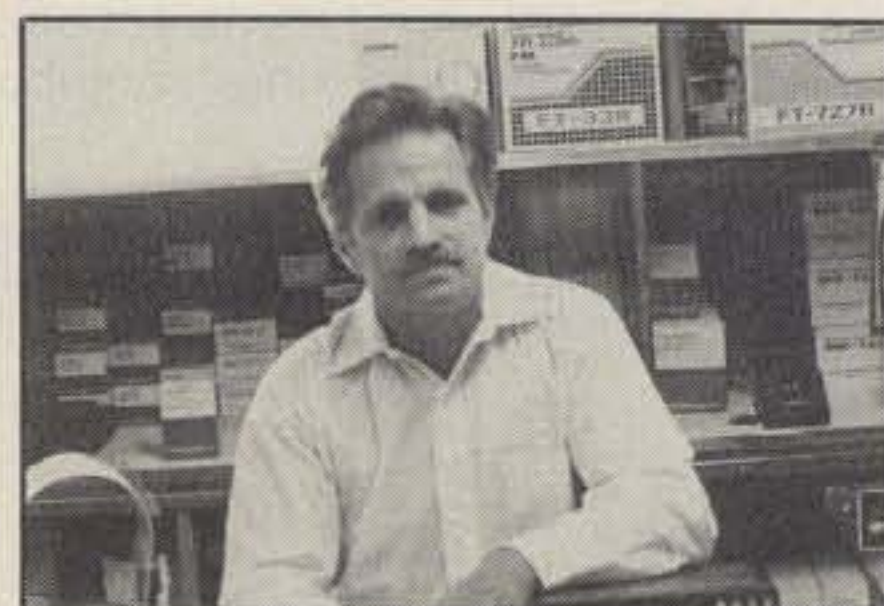
**Question 13.** Have you ever held an



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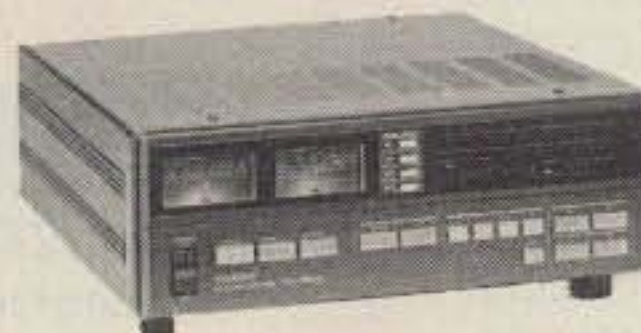


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amateur service position (e.g., Section Manager, VEC, OO, etc.)?

YES—115 (51.1%)

NO—110 (48.9%)

This question was attempting to measure the average contester's contribution to the hobby from another broad-based perspective. Positions such as Section Manager, Volunteer Examiner, Official Observer, and other amateur service opportunities offer an extraordinary opportunity to transfer the tremendous knowledge contesters have gained about amateur radio. They can also require significant time demands that truly separate the committed amateur from a casual visitor. Based on the survey's response, over 50% of the respondents have made that commitment in one form or another during their amateur career.

### Final Comments

Depending on your perspective, contest operators have had the adulation and disdain of our fellow amateurs over the years. Based on the results of this survey, I'm proud to say that the contesting community as a whole offers much more to our hobby than is perceived by those complaining about the QRM on 15 meter CW during late November. Our contributions to youth recruitment, technical advancement, improved operating standards, and public service have been substantial and should be viewed with pride.

Next month's column should prove to be exciting as I reminisce (based on the input from over 25 contesters) on some of contesting's Great Moments in Sport. I've gathered some impressive statistics as well as a few good old-fashioned war stories that may remind you of one or two personal experiences.

The "contester's roster" I have proposed is coming along but still needs your help. In order to provide the best coverage, I would like to include club rosters along with the individual input you submit-

ted on the survey. Please submit your contest club's roster to me (on a 5 1/4 inch MS-DOS formatted disk if possible) as soon as possible.

Finally, the ARRL is announcing a new incentive program for the Sweepstakes Contest. Any entry exceeding 100 QSOs will be eligible to receive a commemorative SS Pin that is specially engraved with the year and mode of operation. To receive your pin, include \$2.00 with your entry. As always, the deadline for the February issue is December 1, 1990.

73, John, K1AR

### ARRL Sweepstakes

CW: Nov. 3-5 Phone: Nov. 17-19  
Starts: 2100Z Sat. Ends: 0300Z Mon.

This is the 57th running of the Sweepstakes, making it the oldest domestic competition going, and it really stirs up a lot of activity.

Operation is limited to stations in ARRL sections. Operating periods are restricted to a maximum of 24 out of the 30 hour contest period. Times off may not be less than 30 minutes and must be clearly indicated in your log.

In order to minimize QRM to non-contesters it is recommended that operation be confined to certain portions of the bands. It is recommended that you check QST for details.

There are several other regulations, including a cross-check sheet if you make 200 or more contacts. A large SASE (45¢ in postage) will get you the "SS Package" and Operating Aid #6 with enough log and summary sheets for an average outing.

**Exchange:** QSO no., power class, call, last two digits of year first licensed, and your ARRL section.

Stations using 150 watts or less are classed "A," over 150 watts "B," and QRP "Q." The same station may be worked only once regardless of the band.

**Scoring:** Each completed QSO is worth 2 points. The multiplier is derived from the number of ARRL sections.

**Awards:** The usual certificates in each

class and mode for single operator stations in each section and multi-operator stations in each division.

Logs must be received no later than December 31st and go to: ARRL Communications Dept., 225 Main Street, Newington, CT 06111.

### Japan International DX Contest

2300Z Fri. to 2300Z Sun., Nov. 9-11

This is the third year for the Japan International DX Contest organized by the Japanese *Five Nine Magazine*. It's the JAs working the world on SSB only, all five bands, 10-80 meters (no WARC bands).

**Classes:** Single operator, single and all band, multi-operator all band only. Single operators are limited to 30 hours out of the 48-hour contest period. Off periods of at least 60 minutes must be clearly indicated in the log. Multi-operators can operate the full 48 hours. Stations must remain on the same band for at least 10 minutes before changing bands.

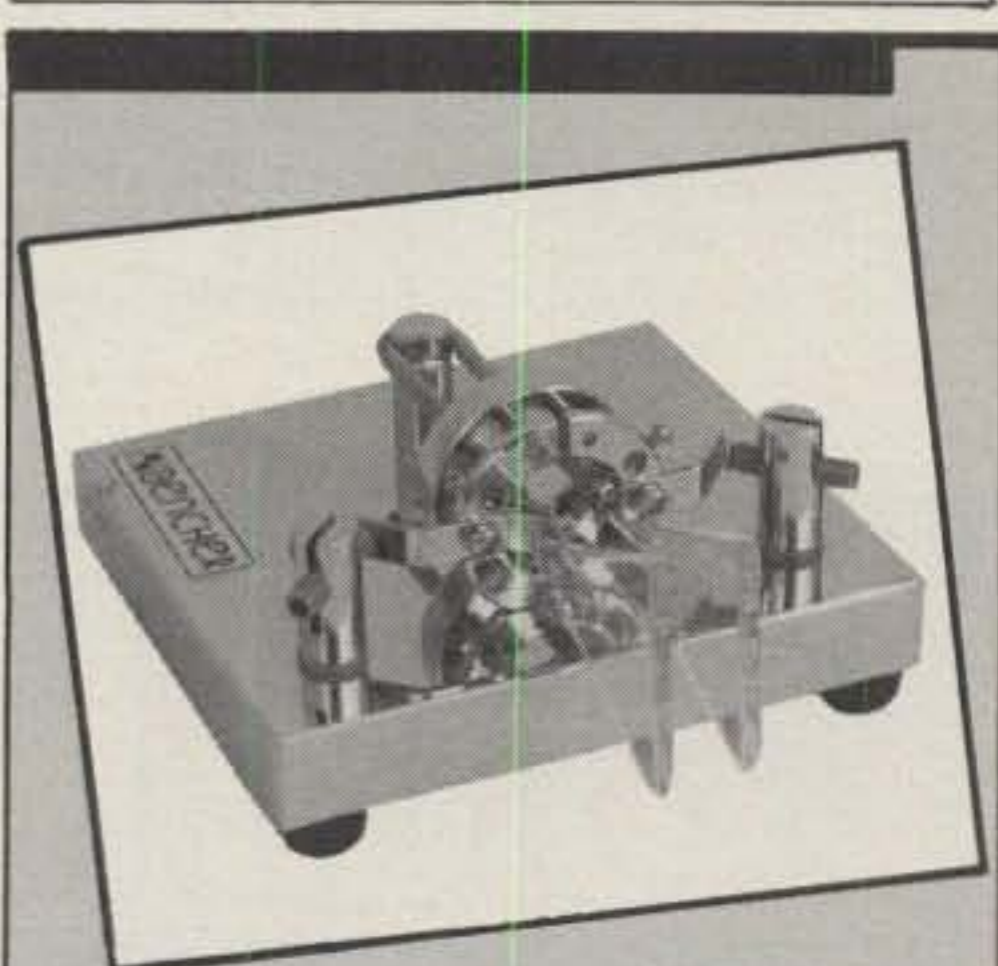
**Exchange:** RS plus a Prefecture number (1-50) for JAs, RS plus a progressive 3-digit QSO number for non-JAs.

**Points:** Two points for 80 meter QSOs, 1 point for 40-15 meters, 2 points for 10 meters.

**Multiplier:** Total number of JA Prefectures, plus #48 JD1 Ogasawara Is., #49

### Quotable Contest Survey Quotes

- "I currently don't QSL, but plan to soon . . . REALLY!"
- "I've coordinated five VE sessions and only been licensed two years."
- "Contesters are the cream . . . they rise to the top."
- "What IS the definition of a real ham?"
- "If it weren't for guys like me working the big guns, there would be no contests."
- "I contest for the fun of it."
- "During contests I hold up until 11 PM, then I hit the sack."
- "I've only been licensed for six months, but I love contesting."
- "I have none of the awards listed above, but did get my RCC (Rag Chewer's Club) in 1939!"
- "I have over 100 contest certificates and cherish them all."
- "Recently I started physical conditioning to endure contest operating longer."
- "I have never used a linear in 32 years of contesting."
- "Contesters tend to push the state-of-the-art."



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### 1989 CQ WW SSB Errata

W0ZV should be listed as a Single Operator, All Band entry, #1 in W0, #11 United States.

VE7NKI was incorrectly listed as VE7KNI in the Operator's List for the Multi-Single World Trophy.

JD1 Okino-Torishima Is., and #50 JD1 Minami-Torishima Is. (maximum of 50 per band).

**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 class in proportion to the number of entries from each country and each call area in the U.S. and Japan. Plaques to the continental winners in each class, single and multi-operators, and to the three U.S. CQ zones. And a special award to the U.S. single operator, all band winner of a round-trip ticket to Japan (LA or SF to Tokyo). Stations working all JA Prefectures (1-47) during the contest can request a special award with their entry.

**Logs:** Use a separate sheet for each band. Indicate the multiplier in a separate column only the first time it is worked on each band. Entries with more than 500 contacts must include a cross-check dupe sheet. There are the usual penalties for taking credit for duplicate contacts; more than 2% means disqualification.

Mailing deadline is December 31st to *Five Nine Magazine*, Japan International DX Contest, P.O. Box 8, Kamata, Tokyo

144, Japan. Entrants may receive the final results by enclosing one IRC and an SAE.

### ALARA YL/OM Contest

0001Z to 2359Z Sat., Nov. 10

Organized by the Australian Ladies Amateur Assn., this activity is open to all YLs, OMs, and SWLs worldwide. YLs work everyone, OMs work YLs only, and SWLs log YLs only.

Use all five bands, 3.5 through 28 MHz (no WARC bands). Each station may be worked once on each band and each mode for point credit.

**Exchange:** RS(T), QSO number starting with 001, and name. ALARA members will identify.

**Scoring:** Phone—Contacts with ALARA members 5 points, with non-member YLs 4 points, with OMs 3 points. Double above points for CW contacts. SWL—5 points for ALARA YLs logged, 4 points for non-member YLs logged. Total QSO points from all bands for final score. There is no multiplier. QSOs with Novice operators count for double points.

**Frequencies:** Use the following frequencies: 3560-3590, 7070-7100, 14250-14280, 21190-21200, 21380-21410, and 28380-28410.

**Awards:** A wide selection of certificates to YL, OM, and SWL winners, both CW and phone, in each VK call area, each country, and each continent. And the Florence McKenzie CW Trophy to the top-scoring VK YL Novice operator.

Only original signed logs are accept-

able, and they must be received by December 31st. They go to: Mrs. Marilyn Syme, VK3DMS, P.O. Box 91, Irymple, 3498 Vic. Australia.

### European RTTY Contest

1200Z Sat. to 2400Z Sun., Nov. 10-11

Rules for the WAEDC RTTY contest are the same as for the CW and Phone sections held in August and September.

There is one main difference, however. To generate more activity in Europe and increase the QSO points, contacts between European stations are also permitted. QTC traffic, however, is not permitted within your own continent.

Check the August Calendar for all the detailed rules and regulations.

**Exchange:** RST plus a progressive QSO number.

**Points:** Each QSO and each QTC exchanged are worth one point. QTCs may be sent/received worldwide between continents (limit of 10).

**Multiplier:** Multipliers are determined from the DXCC list.

**Bonus Multiplier:** Multiply your multiplier on 80 meters by 4, on 40 meters by 3, and on 10/15/20 meters by 2.

**Awards:** Certificates will be awarded to the highest scorers in each class in each country with a reasonable score. Continental leaders will receive a plaque. Certificates will also be awarded to stations with at least half the score of the continental leader.

It is suggested that you use the official DARC log forms. A large SASE (IRCs) to the address below will get you a supply.

Mailing deadline for all entries is December 15th to: WAEDC Contest Committee, Postbox 1328, D-8950 Kaufbeuren, West Germany.

### Czechoslovakian Contest

1200Z Sat. to 1200Z Sun., Nov. 10-11

The Czechoslovakian Radio Club invites amateurs worldwide to participate in the annual OK-DX contest.

Use all six bands, 1.8 to 28 MHz. The same station may be worked once per band, either phone or CW, for QSO and multiplier credit.

**Classes:** Single operator, both single and all band, multi-single, multi-multi, and SWL.

Only one transmitter and one band permitted during the same 10-minute period for multi-single entries.

**Exchange:** RS(T) and your ITU zone.

**Scoring:** One point per QSO; 4 points if it's with a Czech, 2 points for different continent, and 1 point within same continent. Own country may be worked, but for multiplier credit only.

**Multiplier:** Sum of different ITU zones worked on each band.



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A penalty of three additional contacts of the same point value will be deducted for each duplicate QSO or multiplier removed by the committee. Taking credit for excessive duplicates and other violations (regulations, unsportsmanlike conduct, etc.) will be deemed cause for disqualification.

**Awards:** Certificates in each class to the top-scoring station in each country. Additional awards will be made if returns justify. The "100 OK," "OK SSB," "Slovensko," and other Czech awards will be issued for contacts in the contest if a written application is submitted with your log.

Use a separate log for each band, indicate the zone multiplier only the first time it is worked on each band, and include a cross-check list for each band with 200 or more QSOs.

A summary sheet showing the scoring and the usual signed declaration that all rules have been observed is also requested.

All entries must be postmarked no later than December 15th and go to: Czechoslovakian Radio Club, P.O. Box 69, 11327 Praha 1, Czechoslovakia, or directly to the Contest Manager, Karel Karmasin, OK2FD, Gen. Svobody 636, 67401, Trebic, Czechoslovakia.

### North Carolina QSO Party

0000Z Sat. to 2400Z Sun., Nov. 10-11

This year the Alamance Amateur Radio Club (K4EG) is the official sponsor of the North Carolina QSO Party. Non-North Carolina stations work other NC operators. North Carolina stations may work anyone. Stations may be worked once per band/mode and mobiles/portables that change counties may be worked again for QSO credit.

**Exchange:** RS(T) and QTH (county for NC stations, state/province/DXCC country for others).

**Frequencies:** SSB—3860, 7260, 14260, 21360, 28360 kHz. CW—3540, 3740, 7040, 7140, 14040, 21140, 28040, 28140 kHz.

**Scoring:** Each NC county is a multiplier (100 total). In addition, North Carolina stations count NC counties, states, VE provinces, and DXCC countries for multiplier credit. Score 2 points for a CW QSO, 1 point for SSB, and 5 points for any Novice/Technician contact regardless of mode (Novices/Technicians should sign /N or /T after their callsigns). Final score is total QSO points times multiplier.

**Awards:** Certificates will be awarded to the high scorers. Logs must be kept in chronological order, numbering each new multiplier and including a separate multiplier check list. The mailing deadline for entries is December 15th, 1990, and they should be sent to: NC QSO Party, c/o K4EG, Box 3064, Burlington, NC 27215. If

you want the final results, include an SASE with your entry.

### CQ WW DX CW Contest

0000Z Sat. to 2400Z Sun., Nov. 24-25

Just a reminder, as if you needed one, that the CW section of our WW DX Contest is coming up the last weekend of this month. The phone section of course is past history. Complete rules were published in the September issue. Be sure to take special note of the new Single Operator Assisted Category. The contest trophies list has been updated and well covered in the rules.

All logs, both Phone and CW, must be sent to the CQ office: CQ World-Wide DX Contest, 76 North Broadway, Hicksville, NY 11801 USA.

Deadline for logs for the Phone section is December 1st, and January 15th for the CW section coming up. Be sure to indicate Phone or CW on your envelope. This will avoid your log from being entered in the wrong section.

### ARRL 160 Meter CW Contest

2200Z Fri. to 1600Z Sun., Nov. 30-Dec. 2

This is the 21st year for this "Top Band" activity. Exchange is between US stateside, VE, and DX stations. DX to DX not permitted for contest credit.

**Classes:** Single operator, and multi-operator single transmitter.

**Exchange:** RST and ARRL section for W/VE. RST only for DX stations; ITU Region for maritime and aeronautical mobiles.

**Scoring:** Contacts between stations in ARRL sections count 2 points, with DX stations 5 points.

**Multiplier:** Determined by number of ARRL sections and DX countries worked (for W/VE). (DX use ARRL sections only.)

**Final Score:** Total QSO points times the ARRL section and DX country multiplier.

**Awards:** Certificates to the top-scoring single operator station in each ARRL section and DXCC country. And to the top-scoring multi-operator station in each ARRL Division and continent.

Indicate the multiplier in a separate column only the first time it is worked. Entries with 200 or more QSOs are required to include a dupe sheet. Official log forms are recommended and are available from the ARRL. A large SASE and 45¢ postage or 2 IRCs will get you a supply for more than 300 contacts.

The usual grounds for disqualification (violation of established rules, excessive duplicate contacts, etc.) will prevail.

Mailing deadline for logs is January 6th to: ARRL Communications Dept., 160 Contest, 225 Main Street, Newington, CT 06111.

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CIRCLE 93 ON READER SERVICE CARD 113

## NEWS OF COMMUNICATION AROUND THE WORLD

*Is Packet Ruining DX?*

**"B**ong, bong." The distinctive double tone of an incoming DX announcement cuts through the bustle of *The DX Bulletin's* office. A glance at the computer screen of the PacketCluster node tucked in one corner of the office shows the line "28494.0 FR5DX 28-Aug-1990 1950Z Erick [N6EE]." Hum, I need Reunion Island on 10 meters. I punch in the frequency on the keypad input of the ICOM IC-765 with my right hand while turning the knobs of the Ameritron AL-1200 amplifier to the premarked 10 meter positions with my left hand. I reach for the Heil BM-10 boomset while typing "SH/HFR" on the keyboard of the PacketCluster computer. "FR—Reunion: 6 degs." The Cushcraft A-4 swings to the north as I punch on the VOX and fine-tune the Reunion station on the 765.

FR5DX says, "QSL. QRZ?"

"WB2CHO/6," I reply.

"The Hotel Oscar portable Six, you're five nine." Bingo, another band-country in the log. Total elapsed time from bong to log—about 90 seconds. Total time lost from work to snag FR5DX—less than two minutes. PacketCluster has changed the face of DX. Has it ruined it?

My secretary thinks so. Donica has been known to shout "that's cheating" when I work a packet spot without moving from my position in front of the main computer. Gone are the hours of carefully tuning the bands, aiming the beam in various directions to seek out openings, and listening to a pile-up for 20 minutes or more to determine the callsign of the DX station. Now someone else is doing all the work, and I need only push a few buttons and turn a few knobs in this well-equipped station to snag a new one.

Gone is the thrill of the chase. It has been replaced with a sense of frustration if the DX station doesn't come back to the first call. Am I on the wrong split? Is the antenna aimed in the right direction? Should I try the long path? Depending on PacketCluster for DXing is a far cry from what was required to DX even a few short years ago. Is this good or bad for DX?

First, there is no question that PacketCluster is a boon for individual DXers, especially those DXers whose other activities severely limit the amount of listening



*UB5JRR (left) and RB5IJ at their CQ WW SSB contest operation in 1989. Romeo, UB5JRR, was active as 3W3RR from Vietnam earlier this year, and was part of the 1S1RR Spratly DXpedition.*

time. Instead of spending a half hour a day listening to the bands, and maybe working a handful of stations, the DXer can simply sit in the shack working on non-DX business and wait for the DX announcements to scroll across the screen. Or, just home for work, the DXer no longer needs to spend time determining what band is open to what part of the world, and which DX stations are under which pile-ups. A quick "SH/DX" provides that information in seconds.

The benefits of PacketCluster to the individual DXer have been described in many other places. With the addition of specialized databases and programs that sort and organize PacketCluster data, the packet setup has become one of the single most useful DX tools. PacketCluster is great for the DXer, but is it good for DX?

Over-dependence on PacketCluster is a potential problem. One of the benefits of DX is that it hones operating skills. Only the most experienced amateurs can pull the weak DX signal out from under local QRM, determine the DX station's operating style, locate the correct split frequency, and time the call correctly. These valuable skills can disappear if the DXer comes to depend on PacketCluster to find the DX and the split. But this problem is not unique to PacketCluster. It has been a part of DX for many years, as DXers would call fellow hams on the phone to alert them to rare DX. Two-meter DX spotting nets can create a similar dependency. When the Peter I DXpedition was active, the NCDXC VHF spotting network was filled with exact listening fre-

quencies, which made contact possible by even unskilled DXers. PacketCluster simply makes this sharing of information more efficient. Also, because packet networks are not instantaneous, the practice of calling out exact listening frequencies doesn't work as well with PacketCluster as it does with voice networks. PacketCluster has returned the skill of spotting listening frequencies to DX.

Another obvious problem with the widespread use of PacketCluster is an increase in the size of the pile-ups. When more than 100 DXers receive the same DX spot at about the same time, the pile-up on that DX station will explode. DX stations can easily tell when they have been "spotted" on the network; the number of stations calling for a given area increases dramatically. The increase in the number of stations calling makes DXing more difficult for the less well-equipped station. Unless the average DXer can make a contact before the horde descends on the frequency, he or she may have to wait until all the Big Guns have worked the station before getting another chance.

PacketCluster also provides additional opportunities for the DX freeloader. You have all met this character: the one who never buys a *Callbook*, subscribes to a DX newsletter, or holds office in the local DX club. Instead, this character continuously asks for someone to share news from the DX bulletins, asks for addresses from the *Callbook*, and is first to criticize club officers. With the advent of PacketCluster, the freeloader can work DX as it is spotted, never take the time to tune the bands, and share spots with other DXers.

While PacketCluster provides a new outlet for the freeloader, it also reduces the burden on fellow DXers. The freeloader no longer needs to tie up the voice repeater asking for DX news or repeats of the last spot, or what station is under what pile-up, or if the 5H has been on today. A couple of keystrokes, and the freeloader has all that information and more without interrupting anyone else. While PacketCluster has not eliminated the freeloader, it has made the freeloader less obnoxious to fellow DXers.

PacketCluster has led to some improvements in DXing. Gone are the "What's your call?" and "Has the 70 been on today?" questions that plagued the airways. Most routine DX information is now available 24 hours a day, without

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result is a clean signal without flat-topping.

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The guts of the AL-80A is its heavy heavy duty power supply. A 22 pound transformer using a high silicone steel core, computer grade capacitors, heavy duty bleeders and ten 3 amp, 1000 V power rectifiers give you a stiff 2700 volts fully loaded. Some amplifiers using two 3-500Zs use a light power supply so they can't give much more power output than the AL-80A.

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Suggested Retail



Ameritron -- the high power specialist -- brings you the ATR-15 antenna tuner that's designed for legal limit amplifiers. Heavy duty silver plated bandswitch virtually eliminates switch failure. High power transmitting capacitors. 1.8-30 MHz. Peak reading SWR/wattmeter. 6 position antenna switch. Selectable 1:1 or 4:1 balun. 5 1/4 x 13 1/4 x 13 1/2 inches. Meter lamps uses 12 VDC.

**Ameritron Dummy Load** ADL-1500  
ADL-1500 Legal Limit Dummy Load, \$59.95. Oil included. Run 1500 watts for 5 minutes. 0-400 MHz. **\$59.95** Suggested Retail



Remote Coax Switches

RCS-8V  
**\$149**  
Suggested Retail

RCS-8V, DC-UHF 5 KW Coax Switch.

Replace 5 coax feedlines with one with this Ameritron Coax switch. Weatherproof box mounts outdoors on your tower or mast. Attractive control unit sits on your operating desk. Low SWR to 450 MHz. Low loss. Rated at 5 KW to 30 MHz, 1 KW at 150 MHz.

RCS-4, \$134.50. 4 position HF switch. Similar to RCS-8V. Requires no control cable. Handles 2500 watts PEP.



Compact Portable Linear

AL-84  
**\$549**  
Suggested Retail



Ham radio's most compact and most inexpensive self contained amplifier. 5x10x11 inch "tote it under your arm" powerhouse gives you 600 watts PEP, 400 watts CW. Four 6MJ6/ 6LQ6. Low SWR input. Great portable amplifier.

**AMERITRON**

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921 Louisville Rd. • Starkville, MS 39759  
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Call for a catalog or your nearest dealer!

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## The WPX Program

### Mixed

1466 WB2YQH 1468 W1FYI  
1467 KD3QP

### SSB

2168 JF1TEU 2175 WB5TED  
2169 WB4OMM 2176 KD3QP  
2170 VE3BTQ 2177 JA6BMR  
2171 G0FWG 2178 HL9HP  
2172 EA6MQ 2179 KM4FC  
2173 EA7DXR 2180 WE2T  
2174 I6XGZ 2181 IK8HVH

### CW

2640 WB3LOP 2643 FD1MNV  
2641 EA6AAK 2644 W4TYU  
2642 KA3KWH 2645 KP4R

### WPX

260 KC4ODE

### VPX

264 I1-21171 265 HA5-303

### Endorsements

Mixed: 450 WB2YQH, W19Z, 500 WB2YQH, W19Z, 550 WB2YQH, 600 WB2YQH, VE1HA, G3DCC, 650 WB2YQH, G3DCC, 700 WB2YQH, 750 WB2YQH, JA4BAP, N6CW, 800 WB2YQH, DE0DAQ, W4USW, N6CW, 850 WB2YQH, K70A, PA0ASD, N6CW, 900 WB2YQH, KU0A, W3FDU, PA0ASD, 950 WB2YQH, I6DQK, PA0ASD, 1000 WB2YQH, I6DQE, W9IAL, K9BQL, PA0ASD, 1050 WB2YQH, I6DQE, 1100 WB2YQH, I6DQE, 1150 WB2YQH, I6DQE, KA3DBN, 1200 WB2YQH, KA3DBN, 1250 WB2YQH, KA3DBN, 1300 KA3DBN, 1550 KS3F, W5AWT, 1600 W5AWT, 1700 W5AWT, 1750 W4UW, W5AWT, 1800 N6JM, 2000 I8RFD, 2050 I8RFD, 2150 I1EEW, 2900 W4BQY, 2950 W4BQY.

SSB: 350 VE3BTQ, G0FWG, EA6MQ, WB5TED, W1FYI, WE2T, OE6CLD, IK8HVH, 400 VE3BTQ, G0FWG, EA6MQ, WB5TED, IE6CLD, IK8HVH, 450 VE3BTQ, G0FWG, EA6MQ, WB5TED, IK8HVH, 500 VE3KQS, VE3BTQ, N4HID, G0FWG, EA6MQ, WB5TED, IK8HVH, 550 VE3BTQ, G0FWG, EA6MQ, IK8HVH, 600 VE3BTQ, G0FWG, EA6MQ, K2EEK, IK8HVH, 650 G0FWG, EA6MQ, IK8HVH, 700 KF7RU, EA6MQ, IK8HVH, 750 EA6MQ, IK2AEQ, IK8HVH, 800 KU0A, EA6MQ, W3FDU, IK8HVH, 850 KU0A, EA6MQ, LU8DY, K8ZZU, IK8HVH, 900 EA6MQ, LU8DY, K9BQL, K8ZZU, IK8HVH, 1050 WK4F, 1100 WK4F, W0ULU, 1900 W4UW, I1EEW, 2100 W4BQY, 2150 W4BQY, 3100 ZL3NS.

CW: 350 EA6AAK, FD1MNV, W4TYU, 400 EA6AAK, FD1MNV, 450 EA6AAK, OK3TAY, 500 DE0DAQ, 550 DE0DAQ, G3DCC, 600 DE0DAQ, G3DCC, 650 W4UW, KL7UR, 700 KL7UR, 750 JG2LGM, 850 VS6UW, 900 PA3DBG, I1EEW, 950 PA3DBG, 1000 JA7FFN, PA3DBG, 1250 G4SSH, W8IQ, 1300 W8IQ, 2300 W4BQY.

10 Meters: WB4OMM, IK8CNT, I6XGZ, JA6BMR

15 Meters: KF7RU, IK8CNT

20 Meters: KF7RU, W1FYI

40 Meters: DE0DAQ

Asia: W9GCH, W3FDU, W8IQ

Africa: I6DQE, W3FDU

No. Amer.: DE0DAQ, IK2ILH, W3FDU, W4TYU, PA3DBG

So. Amer.: I6DQE

Europe: W3FDU, W1FYI, OE6CLD

Oceania: I6DQE, W3FDU, W8IQ

Award of Excellence: WB4RUA with 160M Bar Endorsement

Award of Excellence Plaque Holders: DK5AD, WDIIC, W3ARK, LA7JO, VK4SS, K6JG, N4MM, I8YRK, W4CRW, SM0AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GQ, VK9NS, DE0DXM, DK4SY, UR2\*\*, AB9O, FM5WD, I2DMK, W4BQY, I0JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, H18LC, KA5W, K0JN, W4VQ, KF2O, K3UA, HA8XX, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QMO, EA7OH, K2POF, DJ4XA, I79TQH, W8ILC, K2POA, N6JV, W2HG, ONL-4003, VE7DP, K9BG, W5AWT, KB00G, HB9CSA, F6BVB, W1BWS, YU7SF, G4BUE, N3ED, DF1SD, K7CU, I1POR, LU3YLW4, NN4Q, KA3A, VED7WJ, YB0TK, VE7WJ, VE7IG, K9QFR, YU2NA, N2AC, W4UW, NX0I, W9NUF, N4NX, SM0DJZ, DK5AD, WB4RUA.

Award of Excellence Plaque Holders with 160 Meter Endorsement: W9NUF, N4NX, VK9NS, DE0DXM, VE7IG, K9BG, AB9O, FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, PY2DBU, W3ARK, H18LC, KA5W, UR2\*\*, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM0AJU, KF2O, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, I79TQH, DL9RK, N6JV, ONL-4003, W1JR, W6OUL, W5AWT, KB00G, F6BVB, W4BQY, YU7SF, W5UR, N4NO, DF1SD, K7CU, I1POR, W8RSW, N4KE, I2UIY, YB0TK, W8ILC, W1BWS, VE7WJ, K9QFR, NN4Q, W4UW, K9QFR, NN4Q, W4UW, NX0I, G4BUE, LU3YLW4, I4EAT, WB4RUA, VE7WJ.

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.



Joe Hypnarowski, WA6VNR, was part of the PJ2U multi-multi CQ WW SSB contest DXpedition in 1989. He operated with his own callsign outside the test, concentrating on the new bands.

Fulton, California office) simply don't know enough about IRCs to handle them. They not only don't sell them, but they won't exchange them for stamps. In fact, very few post office employees know how to correctly handle IRCs. Fortunately, this can work to the advantage of the DXer, as well as causing problems. If you do succeed in finding a post office willing to sell you IRCs, make sure that the postal worker stamps the IRCs with the round cancellation stamp on the left-hand side of the IRC. To be acceptable, an IRC must be stamped on the left by the issuing post office, and *not* be stamped on the right until cashed in.

Again theoretically, a valid IRC can be exchanged for one unit of *surface* postage from one country to another. In the US the cost of sending one ounce to another country by surface mail is \$0.40. Thus, the post office should give you \$0.40 worth of stamps in exchange for a valid IRC. Don't be surprised if your local post office gives you more or less than this amount; again, few USPS employees know as much about IRCs as the average DXer. If the post office offers you *less* than \$0.40, take your business elsewhere. (An even less known regulation is that IRCs issued in the US should be exchanged for the face value on the IRC, minus a one cent service fee. Only a handful of USPS employees know this rule.)

Actually, relatively few individual IRCs are actually cashed in by US DXers. Most DXers need IRCs to send for DX QSLs, and US amateurs (other than some QSL managers) usually receive few IRCs. Those relatively few US amateurs who receive more IRCs than they use themselves can often get a better price on them from fellow DXers than the \$0.40 the USPS offers.

This secondary market in IRCs is technically against international postal regulations, but these regulations are not enforced. The secondary market price for IRCs varies with supply and demand. With the increased interest in DX in the past couple of years, combined with the

bothering other DXers. PacketCluster has improved accuracy in logging, as the DXer can determine the correct call off the computer screen. The "missing dot" problem that turns H73T into S73T and 5H3TW into HH3TW disappears with PacketCluster. The system has even reduced QRM by telling DXers which stations are operating split.

In short, PacketCluster is a useful DX tool similar to many others: the amplifier, and rotatable beam, "dual VFO" radios, VHF repeaters. As with many other DX tools, PacketCluster can be abused, and over-dependence on this multi-faceted DX tool can be harmful. But overall, PacketCluster is an important and valuable DX tool, one that has changed the face of DX, but for the better.

(PacketCluster is a registered trademark of Pavillion Software, P.O. Box 803, Hudson, MA 01749.)

## Beginner's Corner: The IRC

"4 QSL SAE ES IRCS PSE." One of the first DX tools the newcomer to DX meets is the International Reply Coupon (IRC). For almost any contact with stations outside the US, the DXer should supply the DX stations with both a self-addressed envelope (SAE) and some means of paying for the direct postage back to the US. There are three ways of paying for this postage: US \$1.00 bills (often called "green stamps"), actual postage stamps for the DX country (available from a handful of dealers), or IRCs. Of these options, the easiest and safest alternative is the IRC.

IRC's are theoretically available at any full-service post office. The cost is presently \$0.95, and will increase to \$1.05 early next year. However, many of the smaller post offices (including my own

## The WAZ Program

### Single Band WAZ

#### 10 Meter SSB

362 JE1GWO 363 K0HQW

#### 15 Meter SSB

353 TI2HP 356 JI3FYI  
354 JA9AVP 357 WL7E  
355 JH9PUW

#### 20 Meter SSB

810 TI2HP 814 OE7KWT  
811 K0HQW 815 K5AOL  
812 KP4P 816 AA4ZK  
813 IK6GZM 817 K16GI

#### 40 Meter SSB

63 TI2HP

#### 10 Meter CW

89 JA8KSD 91 WB4TDH  
90 JH1LBR 92 NF5Z

#### 15 Meter CW

188 AA4DO

#### 20 Meter CW

378 KG1V

#### WNZ Award

32 10 M SSB KA1TNK

#### RTTY Awards

48 RTTY W1EW 50 RTTY WD5DBV  
49 RTTY W5VT

#### 160 Meters

67 Y33VL

#### All Band WAZ SSB

3600	WD0HPW	3610	UB5JOO
3601	KE8MK	3611	KE0RR
3602	JH9PUW	3612	UH8EA
3603	JA9AVP	3613	G0FOX
3604	IK7FFX	3614	HK3BED
3605	EA1MO	3615	K2QIL
3606	EA7CWA	3616	PA0BYL
3607	K2VIV	3617	HP6AYV
3608	JE1OUF	3618	N6PYN
3609	W8KZM		

#### CW/Phone

6841	NK4Q	6848	WB3LQP (CW)
6842	EA6NB	6849	KE8MK
6843	KK4YA	6850	N4JHP (CW)
6844	RA9YD	6851	WB4FLB (CW)
6845	KQ2K (CW)	6852	IK1JTQ
6846	DK7PE	6853	JA9CXA
6847	VE4ACY	6854	VK2CWS (CW)

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (65 cents) size 4 1/2 x 9 1/2 to the WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Rd., Sudbury, MA 01776. 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 CQ awards is \$4.00 for subscribers and \$10 for non-subscribers. Please make all checks payable to the Awards Manager. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application. Send any questions to K1MEM by mail and include an SASE (please do not telephone).

large number of major DXpeditions to rare countries, the price has risen from \$0.45-50 to \$0.55-65. Look for this price to rise to about \$0.75 next year. Even at this price, these "used" IRCs are a better deal than new ones from the post office. If you do purchase "used" IRCs, be sure to insist on valid IRCs only. Typically about 10% or more of all IRCs in circulation are not properly stamped on the left.

Another thing to watch for in the secondary IRC market is forged IRCs. While it is



*WB2P recently finished 5-Band Worked All Zones from this well-equipped shack. Zones 23 and 26 on 40 and 80 meters were the hold-outs, but RV0YF, 3W8CW, and XU8CW provided the necessary QSOs. Note the PacketCluster screen in the corner.*

hard to imagine anyone going to the trouble of forging something worth only a few pennies, there are a small number of fake IRCs floating around the DX community. (In the more than 10,000 IRCs that have passed through my office in the past two years, I have seen exactly one.) The forged IRCs are readily distinguishable from real ones. The paper is thicker and not as translucent, the printing job is poor, almost smudged, and there is no UPU watermark when the IRC is held up to the light. (Should you come across a forged IRC, hang on to it. It will probably be a collector's item. Don't try to cash it in at your local post office. There are US federal laws prohibiting such activity.)

There is a lot more to the story of IRCs, but this should keep the new DXer on the right track, and avoid wasting money on invalid IRCs.

## November DX Activity

**Steve Muster, G4UOL**, will be active from the Isle of Man as GD4UOL the last two weeks of the month on CW only. This is Steve's third trip to island, and he hopes to better his total of 5400 contacts that he logged in 1989. Steve will accept schedules. Contact him at his new address: Flat 4, 60 Genesta Road, Westcliff on Sea, Essex, UK SS0 8DB. QSL his GD4UOL to this address or via the RSGB bureau. Steve will also be active in the CQ WW CW test November 24-25.

Other single-operator CQ WW CW operations will include John Crovelli, W2GD, returning to Aruba as **P40GD**. John will be in Aruba November 20-27 and will concentrate on 17 and 12 meters outside the contest. He is usually on 160 meters on the hour at night. QSL to N2MM. Jacky, F2CW, expects to return to Morocco and operate with the contest call of **CN5A**. QSL to Jacky's home call. K4BAI also plans a return to Barbados as **8P9HT**. John plans to be there November

22-27 and favors 25 kHz up from the bottom of the band on CW and 21375 and 28490 kHz on SSB. On the new bands look for John on 10,118, 18,070, and 24,898 kHz. QSL his home call.

In the multi-single category K1XM, KQ1F, K1KP, and KN3T will operate from the Cayman Islands ZF. And another Finnish team returns to the Canary islands as **EA8AGD** for a multi-single operation. QSL via OH6DK. Finally, the RadioTeam Finland will be on as **PJ9A** in the multi-multi category, as mentioned last month. The Finns should be active outside the test on SSB and CW as well.

The CQ WW contests provide an excellent opportunity for the DXer to work new band-countries and even pick up a new country. But before you call a station in the test, read the rules in the September issue of CQ, and know your correct contest exchange so that the DX operator doesn't have to ask for it.

## QSL Notes

**OD5EH** can't receive QSLs in war-torn Lebanon, so his contacts should be confirmed via Vasil M. Kasyanenko, P.O. Box 20, Geprgievsk, 357800 USSR.

Serge Sadakov, RA1OA, is QSL manager for: **4K3ODX**, **UZ1PWE**, **UA1PAZ**, **UA1POL**, and **UA1POL/1**. Serge's address is P.O. Box 48, Arkhangelsk, 163040 USSR.

## 5 Band WAZ

**As of July 31, 1990, 285 stations have attained the 200 zone level.**

**New recipients of 5 Band WAZ Award with all 200 zones confirmed:**

HA0MM	EA1OD
I4EWH	DJ7RD

**The top contenders for 5 Band WAZ are:**

- |                 |                  |
|-----------------|------------------|
| 1. N4WW, 199    | 13. HA8XX, 199   |
| 2. UQ1GXX, 199  | 14. SV1JA, 199   |
| 3. W7OM, 199    | 15. K7UR, 198    |
| 4. SP9PT, 199   | 16. I8IGS, 198   |
| 5. K6YRA, 199   | 17. VE7DX, 198   |
| 6. K5UC, 199    | 18. W0PGI, 198   |
| 7. LA4HW, 199   | 19. VE7AHA, 198  |
| 8. PY7ZZ, 199   | 20. SM6AHS, 198  |
| 9. DL9WW, 199   | 21. K1ST, 198    |
| 10. K0CS, 199   | 22. KB8DB, 198   |
| 11. KB0G, 199   | 23. ZS6BCR, 198  |
| 12. ZS6BCR, 199 | 24. VE6OU/6, 198 |

**670 Stations have attained the 150 zone level as of July 31, 1990.**

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (65 cents) size 4 1/2 x 9 1/2 to the WAZ Manager, Jim Dionne, K1MEM, 31 De Marco Rd., Sudbury, MA 01776. Applicants should include sufficient postage for safe return of their QSL cards. The processing fee for all CQ awards is \$4.00 for subscribers and \$10 for non-subscribers. Please make all checks payable to the Awards Manager. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application. Send any questions to K1MEM by mail and include an SASE (please do not telephone).

## 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 324. 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

W9DWQ	324	OK1MP	317	W0SR	311	W1WAI	302	N5FW	294	DJ2PJ	286
K2FL	324	W6PT	316	IT9ZGY	311	YU2TW	301	IT9TOH	294	JH1VRQ	282
K2TQC	324	K4XO	316	K8PYD	310	I3OBO	301	W6YQ	294	W3BBL	282
N4JF	324	K3UA	316	W7CNL	310	W0JLC	301	IT9VDQ	294	I2QMU	281
K4CEB	324	N4PN	315	AA6AA	309	WB4RUA	300	K4CXY	292	K7ZR	280
DL1PM	323	DL7AA	315	K9IW	309	DL6QW	300	N5DX	291	I5XIM	280
K9MM	323	W1NG	315	K9BWO	309	NN4Q	300	KB0G	291	W2LZX	280
K6JG	323	N4KG	315	W9RY	308	I8WY	300	IT9QDS	290	KB9XG	280
ON4QX	322	N2KW	315	W0HZ	308	KZ4V	300	N4AH	290	W9NUF	280
YU1HA	322	W8KPL	314	K2OWE	308	F3TH	300	WA4IUM	290	K9TI	280
SM6CST	321	DL8CM	314	W4OEL	307	W6DN	299	W1WLW	289	KB8DB	280
N6AV	321	EA4IA	314	W6SN	307	K3FN	298	W4BV	289	HB9AFI	279
SM3EVR	320	N6CW	313	K09W	307	DJ7CX	297	K1VHS	289	KA2DIV	279
K6LEB	319	WA2HZR	313	SM6CTQ	306	K8LJG	297	G2GM	289	KA3R	278
K1MEM	319	W2DXA	312	W9WAQ	305	N8MC	297	K2JF	289	DL1QT	277
N4MM	319	K6EC	312	W2UE	305	WA4DAN	297	K8NA	288	K4JLD	277
DL3RK	319	W0IZ	312	WA4JTI	305	WA8YTM	297	G2FFO	287	K9DDO	277
W4BQY	318	DJ1XP	311	AB4H	304	WD9HX	296	W9SC	287	KU0S	277
K9AB	318	W6ID	311	WD9IC	303	KD8V	296	VE7DX	287	NS7Z	276
N6AR	317	K9QVB	311	WA8DXA	302	NY5L	295	G3KMQ	287	K4SE	275

### SSB

K2FL	324	W8ILC	318	I8KCI	313	CX4HS	306	I6PLN	299	PA0XPO	287
W6EUF	324	N6AR	318	F2MO	312	KE4HX	306	KA8T	299	I2EOW	287
VE1YX	324	KM2P	318	W0SD	312	KA3HXO	306	KB2FC	299	N8BJO	286
F9RM	324	K9AB	318	K9RF	312	WA6DTG	306	DJ7CX	299	N3ARK	286
N4JF	324	KB8DB	318	K9HDZ	312	W5LLU	306	K9SM	298	N9CPW	286
VE3MR	324	VE7WJ	318	LA7JO	312	WA6DTG	306	JH4PRU	298	K9MNT	286
DJ9ZB	324	WA4DAN	318	LU3YL	312	KZ8Y	305	EA9IE	298	IK7DBB	286
4Z4DX	324	YV5GWO	318	N6OC	312	K8VFX	305	XE1HI	298	KB5RF	285
W4EEE	324	N2KW	318	NA5W	312	EA1QF	305	KF5DX	298	KF5AR	285
W9DWQ	324	DJ1XP	317	W8ILC/QRPP	312	K4RIG	305	K5DUT	298	IK8BMW	285
W4DPS	324	KD8VM	317	I2MQP	312	K8ZZU	305	HP1JC	297	G4SZD	285
W0YDB	324	N4WF	317	NN4Q	312	I4WZK	305	YU7KV	297	VE2GHZ	285
EA4DO	324	K4POV	317	KS0Z	312	SM6CST	305	XE1OW	297	KC7EM	284
DL9OH	324	WD8MGO	317	IK2GNW	312	WA4IUM	305	WD9GQV	297	KR9F	284
VE3XN	324	SV1ADG	317	KA6V	312	KD8V	304	F6BFI	297	WB3HAZ	283
K6WR	323	W9OKL	317	AA6BB	312	KC8YM	304	WB3GPR	296	VE3MV	283
ZL1AGO	323	NY5L	317	W4SSU	311	W6MFC	304	KB3KV	296	ZP5JCY	283
YU1HA	323	KR9O	317	K6EC	311	K4LR	304	I0SGF	296	I8DVJ	283
I0ZV	323	I8LEL	317	K8NA	311	KB0SY	304	K8NWD	296	YB3CEV	283
VE3GMT	323	KC8EU	317	NJ0C	311	WE2L	304	KB0G	296	K3NEE	283
EA2IA	323	WA4JTI	317	I8XTX	311	KA9TNZ	304	EA4KK	296	W3SOH	283
I8YRK	323	I8ACB	316	AG9S	311	WA2FKF	304	W0IYR	295	WA9BXB	283
VE2WY	323	K8PYD	316	KB4HU	311	WA8YTM	303	KK0C	295	AE2B	282
ZL3NS	323	K4XO	316	G4ADD	311	XE1KS	303	G3XTT	295	A19R	282
W9OKL	323	N4KG	316	WD8PUG	311	W2LZX	303	VE3XO	295	TG9EP	282
K6JG	323	A18S	316	XE1OX	311	KB0U	303	KI3L	295	VE3NUP	282
K6YRA	323	W0SR	316	IK8BQE	311	W0ULU	303	I7UNX	295	N1ALR	282
K8LJG	322	WB1DQC	316	DK2BL	310	W4BOY	303	K4JLD	295	EA8TE	282
N4MM	322	VK4LC	316	AA6AA	310	XE1XM	303	WD0BNC	294	PY2DBU	281
W2SUA	322	T12CC	316	AB90	310	K7EH	303	I5BDE	294	NP4CC	281
OA4OS	322	W2CC	316	KU9I	310	K1MEM	302	WB3CON	294	NX0I	281
I0AMU	322	9H4G	316	N6AHV	310	N5FG	302	KB80	294	G4FAM	280
K9MM	322	W7FP	316	KB9OC	310	I3OBO	302	VE5FX	294	KU9Z	280
I8ALB	322	K2JLA	316	K1MIZ	310	K9UAA	302	IT9VDQ	294	W9VA	280
W9SS	322	WA4WTG	319	I2QMU	310	KP4EQF	302	K4SE	293	WB8TLI	280
N7RO	322	XE1AE	315	IV3YRN	310	N5FW	302	KC8JH	293	W5XO	280
T12HP	322	I8KDB	315	I5EFO	310	VE2PJ	302	AI5I	293	KB5DN	279
I8AA	321	K9LKA	315	I1POR	310	IK8GCS	302	W9NUF	293	EA6DE	279
OZ3SK	321	OH5KL	315	W6BCO	310	K0HOW	302	KD5ZM	293	JH8NYK	279
VE3MRS	321	OZ8BZ	315	G4GED	310	KZ4V	302	VE6PW	293	KX5V	279
K5OVC	321	YV5DFI	315	KB3OQ	310	KB1JU	302	T12LA	293	WN5K	279
DL6KG	321	W9RY	315	IK8CNT	310	VE3DLR	302	WA4LOF	292	K4BYK	278
I4LCK	320	I4EAT	315	KP4P	310	N6CGB	302	AC0A	292	VE3IUE	278
OK1MP	320	NJ2C	315	N4PN	309	WA3HUP	301	VE3FEA	292	DF6EX	278
KS2I	320	W4UNP	315	WD9HX	309	VE3FJE	301	VP9CP	292	KG9N	278
YU1AB	320	YS1RRD	314	K9QVB	309	WB4NDX	301	WB4LKG	292	I8WYD	278
PY1APS	320	K3UA	314	K4CXY	309	YU2TW	301	SV1JG	292	WB0UFL	277
W3GG	320	I2LLD	314	WB6PSY	309	N4CRU	301	T12JP	292	W4PTT	277
I4ZSQ	320	W1NG	314	VK4VC	308	KZ0C	301	KE7UL	292	WD0DMN	277
YV1KZ	320	W1LQQ	314	YV5AIP	308	N8BKF	301	N4KELM	292	K8YVI	277
W2FXA	320	SM4CTT	314	N6AV	308	WT4T	301	VE3IPR	291	HK6BER	277
W4NKI	320	W6SN	314	A18M	308	KB2HK	301	W4JFE	291	NC9T	277
YS1GMV	320	WB4UBD	314	NS7Z	308	K7LAY	301	DU9RG	291	I8IYW	277
K9BWO	320	K9IW	314	YV1AJ	308	KB9KD	301	XE1CI	291	N0AMI	276
N6AHU	320	K2JF	314	K8CMO	308	KC2FC	301	KB7VD	291	N7ASL	276
W7OM	320	KE4VU	314	K4MQG	308	KB2MY	301	K9TI	291	WA4OPW	276
IT9ZGY	320	K9HQM	314	I0MBX	307	IN3ANE	301	K1HDO	291	KC2RS	276
K1UO	320	W6NLG	314	KV2S	307	KF7SH	301	VE3CKP	290	WA9IVU	276
K2TQC	320	EA4LH	313	VK3JF	307	VE4AT	300	I4UFH	290	I2WZX	276
KZ2P	320	W8PCA	313	VE4SK	307	SV8CS	300	W9TA	289	NO4J	276
VE7DX	320	N2SS	313	KA9ABC	307	I2ZGC	300	JA5PUL	289	KC4MJ	276
ZS6LW	319	OE2EGL	313	WA2MID	307	NW5K	300	A19U	289	KA5YCM	276
W3AZD	319	ZL1BIL	313	WA4ECA	307	WB6GFJ	300	WD9IC	289	KI4FW	276
W0SFU	319	WZ4I	313	WB4PUD	307	JH1VRQ	300	YV2EJU	289	WB1EAZ	275
OZ5EV	319	IT9TGO	313	WB6OKK	307	IT9TQH	300	I4CSP	289	NX4Y	275
IT9XGY	319	K0GT	313	XE1MDX	307	K1VHS	300	OK1AWZ	288	VE7BSM	275
CT1FL	319	W2FGY	313	WB5TED	307	WA9RCO	300	EA3KW	287	W0FF	275
W6DN	319	G3VOF	313	N4KE	306	I8IGS	300	AB9E	287	I8INW	275
G4CHP	319	WB3DNA	313	KB5FU	306	PY4OY	300	W9SC	287	WA5SUE	275
W9JT	318	K09W	313	KE3A	306	ZL1BOQ	300				
OE3WVB	318	W4UW	313	K3LUE	306	WA0TKJ	299				

The Soviet amateurs who operated from Spratly Island in April made contacts from Vietnam after their DXpedition. QSL **3W6PY**, **3W1PZ**, and **3W9CZ** with SAE and postage to P.O. Box 43, Temirtau, Kazakh Republic 472310 USSR.

Carlos Bufanio, LU8DY (ex-LU8DWN), says to QSL his special contest call **LR8DY** to his home address: Lavallo 280, 1876 Bernal, Buenos Aires, Argentina.

Stu Honeysett, **H44SH/H44R**, has left the Solomons for the Ivory Coast, West Africa. QSL his Solomon contacts via his new address: c/o Serebou Seed Project, Commonwealth Development Corp., 04 B.P. 161, Abidjan 04, Cote D'Ivoire, West Africa.

**V85BJ** is Robert Reyes, now at 30 Mohawk Road West, Apt. 214, Hamilton Ontario Canada L9C 1V8.

QSL the Latvian station **YL1WW**, and their contest call **RQ9W**, as well as previous call **UQ1GWW** to Igor Kuzhelev, P.O. Box 418, Riga 226001, Latvia.

Izmir, Turkey amateurs **TA3B**, **TA3C**, **TA3D**, and **TA3F** say not all their mail is being delivered. They suggest using registered mail, or sending cards via DL5YCC if you don't get a timely response.

Peter Casier, ON4AAQ, will confirm his August **C30EMA** Andorra operation and the **OQ7AR** WPX operation via the ON bureau, or direct to P.O. Box 1, B-9230 Melle, Belgium.

Barry Stewart, ZL2RR, is the new manager of the New Zealand Association of

### CQ DX Awards Program

#### SSB

1790	AA6BB	1795	EC3CPT
1791	KA6V	1796	GW0GDI
1792	WE2T	1797	KP4P
1793	KF7SH	1798	WA9BXB
1794	W1FYI		

#### CW

802	ZL1BSG		
799	IT9VDQ	801	JH2TPI

#### SSB Endorsements

320	W4DPS/324	310	W6NLG/314
320	EA4DO/324	310	KE4VU/314
320	W9DWQ/324	310	K2JF/314
320	W4EEE/324	310	KA6V/312
320	W0YDB/324	310	AA6BB/312
320	W9OKL/323	310	WD8PUG/311
320	K6JG/323	310	KP4P/310
320	VE2WY/323	300	WA6DTG/306
320	I8ACB/322	300	KF7SH/303
320	W9SS/322	300	KB2MY/301
320	T12HP/322	275	IT9VDQ/294
320	DL6KG/321	200	T12SAH/218
310	WA4WTG/316	200	N4HID/200

#### CW Endorsements

320	K6JG/323	275	K2JF/289
320	ON4QX/322	150	ZL1BSG/150

Total number of active countries is 323. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an SASE is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

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ADDRESS: SEE BELOW

TELEPHONE: \_\_\_\_\_

MODEL: SG-230 SERIAL NBR: QA90484 VOLTAGE: 12V

DATE PURCHASED: 1 MAY 89 DATE INSTALLED: 1 DEC 89

INSTALLED BY: J. MARTINO (OPERATOR)

CAPE TOWN DEPT OF STATE WASH DC 20521

20521

(provide full name, address & telephone of installer)

\*refer to owners manual for full warranty terms

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 TUNING:  Simple  Difficult  
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Henry Radio, CA - 213-820-1234  
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Rudy, DK7PE (standing), recently operated as 7Q7CW from Malawi, a country that has seen a burst of activity this year. Rudy frequently operates from rare countries. Here he visits with Ahmed, SU1AH, in Cairo.

Radio Transmitters (NZART) QSL bureau. Send your ZL cards to P.O. Box 857, Wanganui, New Zealand.

Anita Keighley, KN2N, has the 3B8FP logs for only the period September 6, 1987 to May 31, 1989. She has not been

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able to obtain the more recent logs. While she'll continue to answer QSL requests for this period, direct or via the bureau, more recent contacts should be confirmed direct: Rachid Karroo, Box 164, Curepipe, Mauritius Island, Indian Ocean.

**7Q7RM** is J. Bill Musoke, P.O. Box 30135, Lilongwe-3, Malawi.

**A41KY** is Yaqoob al Jarby, Box 981, Muscat, Oman.

For **YI1BGD**, QSL via the individual operators:

Majid, Box 5864, Baghdad  
Diya, Box 7361, Baghdad  
Saad, Box 6100, Baghdad  
Emad, Box 7488, Baghdad  
Raed and Faris, Box 7147, Baghdad.  
QSL Operator Samy via ON7LX.

**KA1NCN** reports that **GB8SI** will QSL all contacts via the bureau. For a direct response, try Box 599, Glasgol G1, Scotland.

And **1S5IJ** and **JX3AG** are both reported as pirate stations.

## QSL Managers

- |                      |  |
|----------------------|--|
| 1Z9B to KA6V         | TK5EL to F6FNU   |
| 3B8DB to NA5U        | TR8BY to FF6KGU  |
| 3G6MBQ to CE60S      | TR8CJ to G3ORC   |
| 4K1A to RA3ST        | TR8GL to F6IXI   |
| 4S7CF to BV1JY       | U9Z/UA9YDF to UA9YAB   |
| 5H3TW to K3ZO        | UA9YDF/U9Z to UA9YAB   |
| 5T5SA to IK2GES      | UB6P/UB5UT to UB5UT  |
| 5V7RC to OZ1LLC      | UC5A/UA6EO to UC2AHZ   |
| 5W1KY to WA3HUP      | UD6DKW to W3HMK  |
| 5Z4BI to W4FRU       | V31TU to IQ1A  |
| 708AA to F6EXV       | V44KJ to WB2TSL  |
| 7Q7JA to JH8BKL      | VE2DWU/C10GI to VE2DWU   |
| 7Q7RM to K6KII       | VE2EDK/C10GI to VE2EDK   |
| 7X2CR to IS0LYN      | VP2EY to HB9SL   |
| 8P6AL to KU9C        | VP5GH to WN5K  |
| 9L1US to WA8JOC      | VP5P to WN5A   |
| 9M2ZZ to N4RMF       | VP5VPX to W4NPX  |
| A61AD to WB2DND      | VP8CEA to G4JOV  |
| AA6LF/KH5 to AA6LF   | VU2ZAP to W3HMK  |
| AH9AC to I8YCP       | WZ6C/ST4 to W4FRU  |
| C30CAG to F6BKP      | XU8DX to JA1NUT  |
| C53GB to FD1MXH      | Y90ANT to Y21RO  |
| C10GI to VE2EDK      | Y90SOP to Y42DA  |
| C160R to VE6KC       | YC8OAT to YB0HZL   |
| CT3BX to CT3EE       | YI2LVB to I8YCP  |
| DL8CM/ZS1 to DL8CM   | YJ2BKS to SP5DYO   |
| EAB/G8KPW to G4BAH   | YJ8MB to SP5DYO  |
| EA8BF to EA8UR       | YL75ID to UQ1GWW   |
| EA9TL to EA9IB       | ZC4CZ to G4SSH   |
| EK1NWB to UA1NEJ     | ZD8CUE to G4ZVJ  |
| FK8FI/M to F6GZA     | ZD9CN to W4FRU   |
| FK8GJ to F6CXJ       | ZK1XP to AA6LF   |
| FP/W5WU to W5WU      | ZK3EY to WA3HUP  |
| FT4XG to F1AAS       | ZS9AAA/ZS1 to DK9KX  |
| FT5XH to F6GYV       | 9J2AL to P.O. Box 32481, Lu-saka, Zambia                       |
| FY/KD3FK to KD3FK    | BY5RY to Box 5816, Fuqing                                      |
| H44RW to ZL1AMO      | BZ4RDF to Box 1827, Nanjing                                    |
| HB9IQB/58A to HB9IQB | HP1XBH to Box 912, APO Mi-ami 34002                            |
| HSBAC to WA4BCQ      | 0D5OX to Box 597, Tripoli                                      |
| HZ1AB to K8PYD       | RA1QCA/RA1N to Box 19, Sor-tavaia                              |
| J20X to F2VX         | RZ10A/A to RA1OA, Box 48, Archangelsk 163040                   |
| J28NU to F6FNU       | TF3EJ to Jakob Helgason, Haedarbyggd 25, 210 Gardabae, Iceland |
| J5CVF to CT1DI2      | UA9JXX to Box 34, Surgut 026400 USSR                           |
| JD1/JA9IAX to JJ1TBB | UC2WJ to Box 24, Vitebsk 210038 USSR                           |
| KA2IJ to WB3EXR      | UD70GF to Box 169, Baku 370000                                 |
| KE9A/DU3 to WB9YXY   | UI4L/UA4AD to Miro, Volco-grad 400066                          |
| KH3/KA3HMS to KA3HMS | ZD8LIJ to Steve Hodgson, Box 2, Ascension                      |
| OH8BDA to OH2BDA     | ZK1BY to P.O. Box 3, Tokai-mura 31911 Japan                    |
| OJ8/N78G to KF7PO    |  |
| OM2BTI to OK2BTI     |  |
| P29PL to VK9NS       |  |
| PP5IW/PP8 to PP5AS   |  |
| RB6P/RT4UF to RT4UF  |  |
| RC90/RB5MP to RB5MP  |  |
| RY1B/UW9SG to UW9SG  |  |
| S79MX to HB9MX       |  |
| SV9/KN6M to K8CW     |  |
| TA3F to DL5YCC       |  |
| T19CF to T12CF       |  |
| T19US to T12US       |  |
| TK/DL7HZ to DL7HZ    |  |

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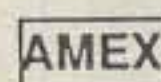
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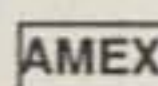
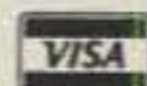
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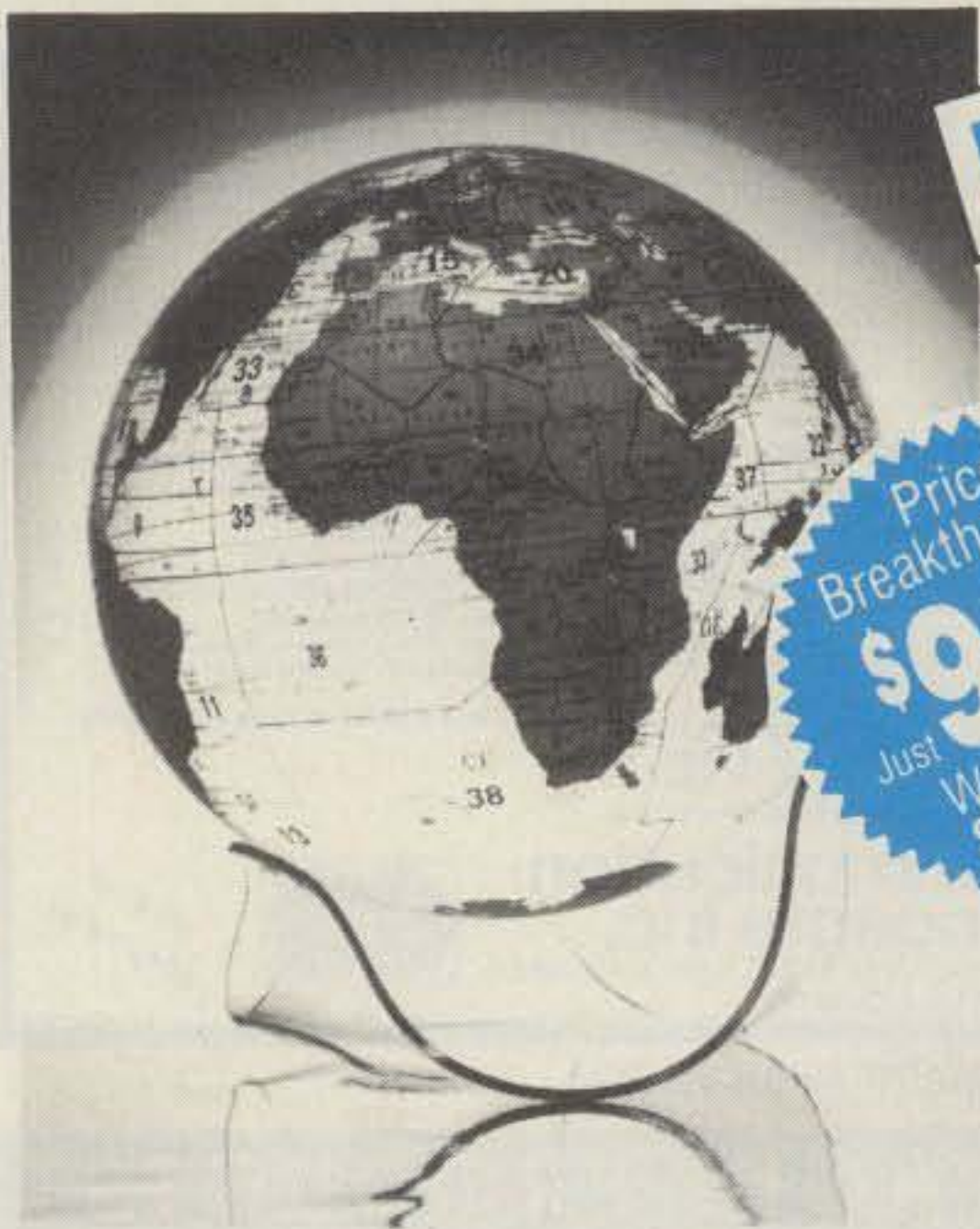
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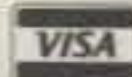
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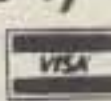
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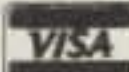
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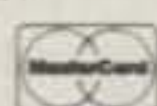
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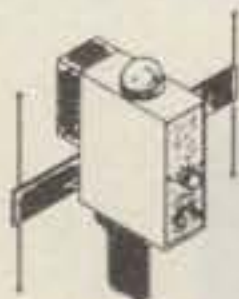


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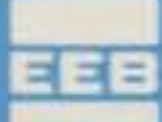
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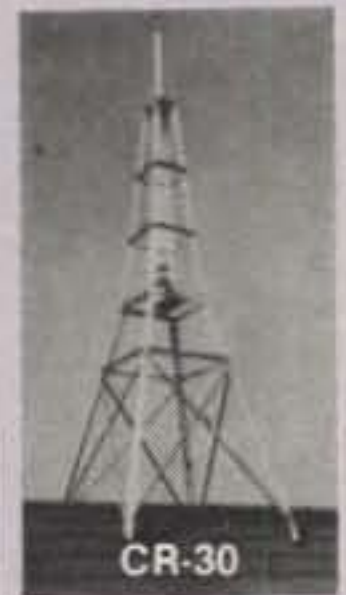
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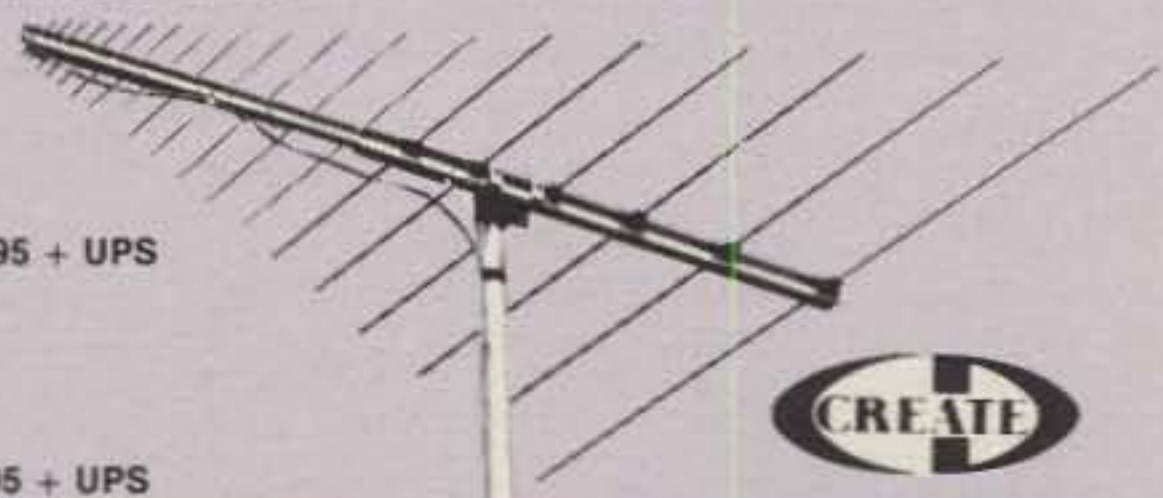


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FOR SALE: Vibroplex Lightning Bug semi-automatic key with original box, \$125. Gerry Skloot, KE2N, 2923 Mandalay Beach Rd., Wantagh, NY 11793.

WANTED: Manual, power cord, microphone for KDK model #FM-2015R. Kevin, P.O. Box 5032, Springfield, VA 22150.

ATTENTION HEATHKIT COLLECTORS: SB-401, SB-303, SB-610 all cables and manuals included. Exel. cond., \$375 for all. George, WA3LVR, 215-873-0979, FAX 215-269-9098.

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WANTED: (1) Yaesu Digital Display Model YC601, (2) Yaesu Monitor Scope Model YO100, (3) Yaesu External VFO Model FV101B. WB6VOW, Bob Tibbits, 11023 Marcia St., Weldon, CA 93283.

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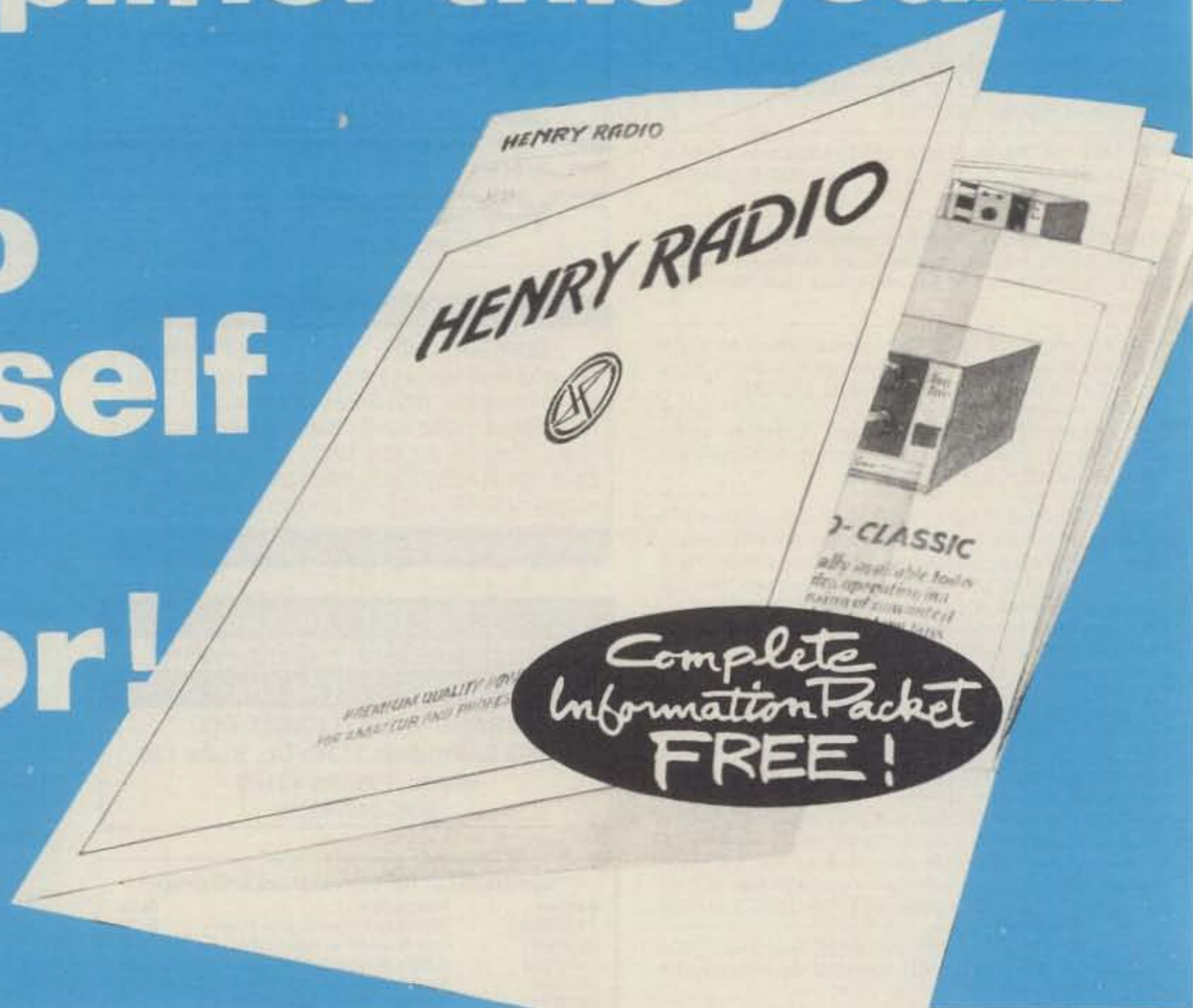
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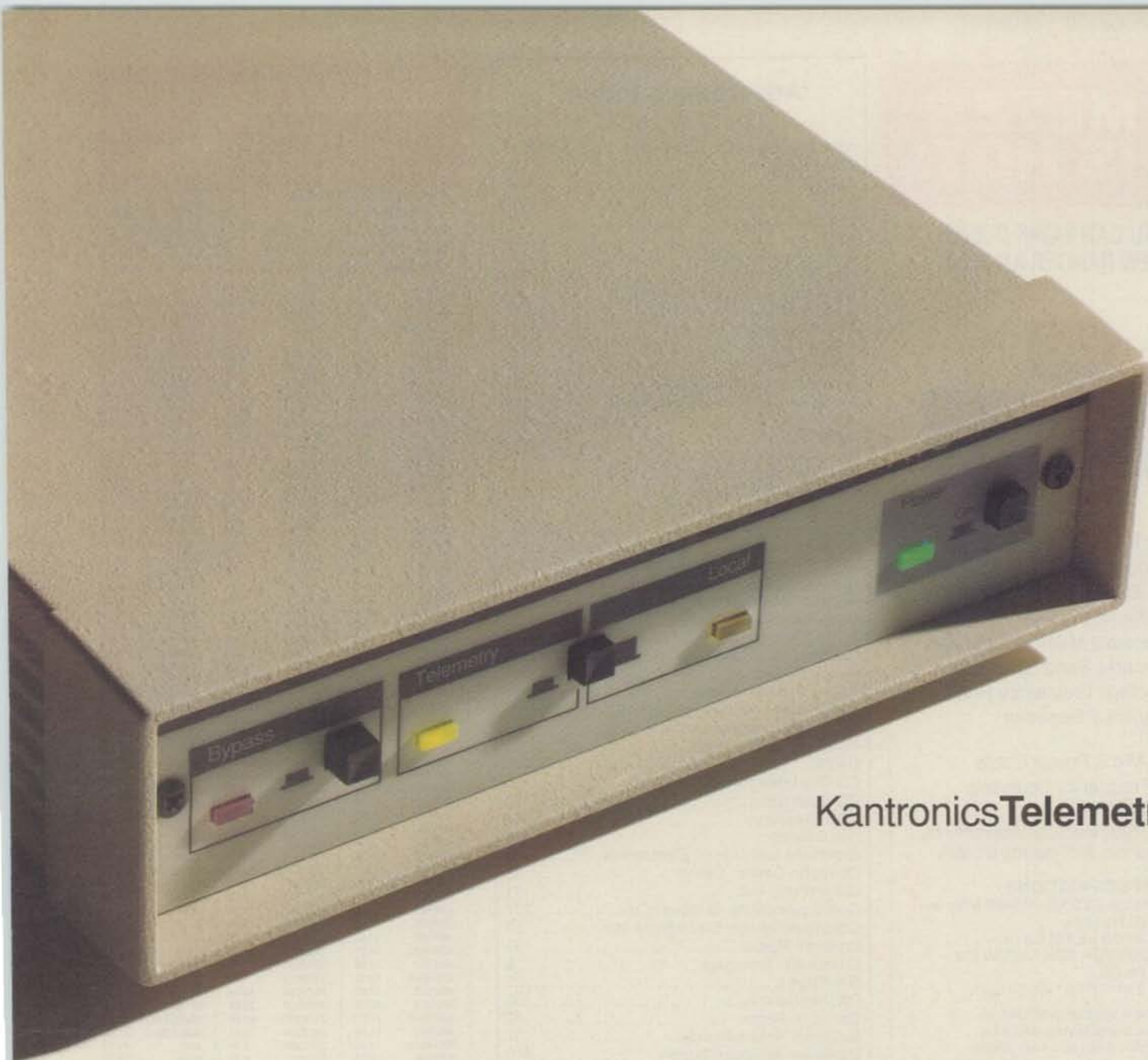
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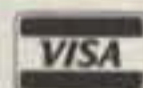
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