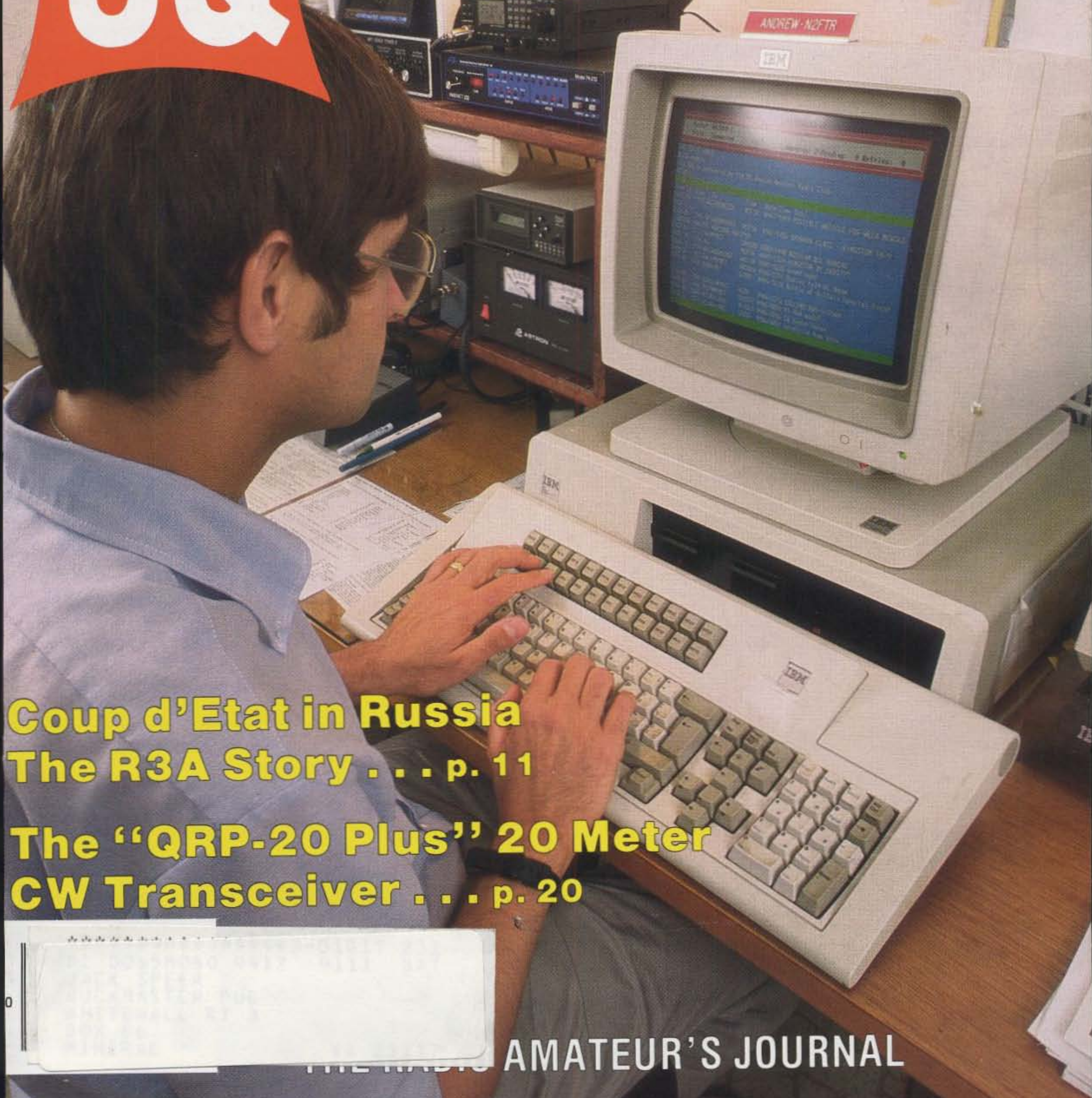


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Amateur Radio

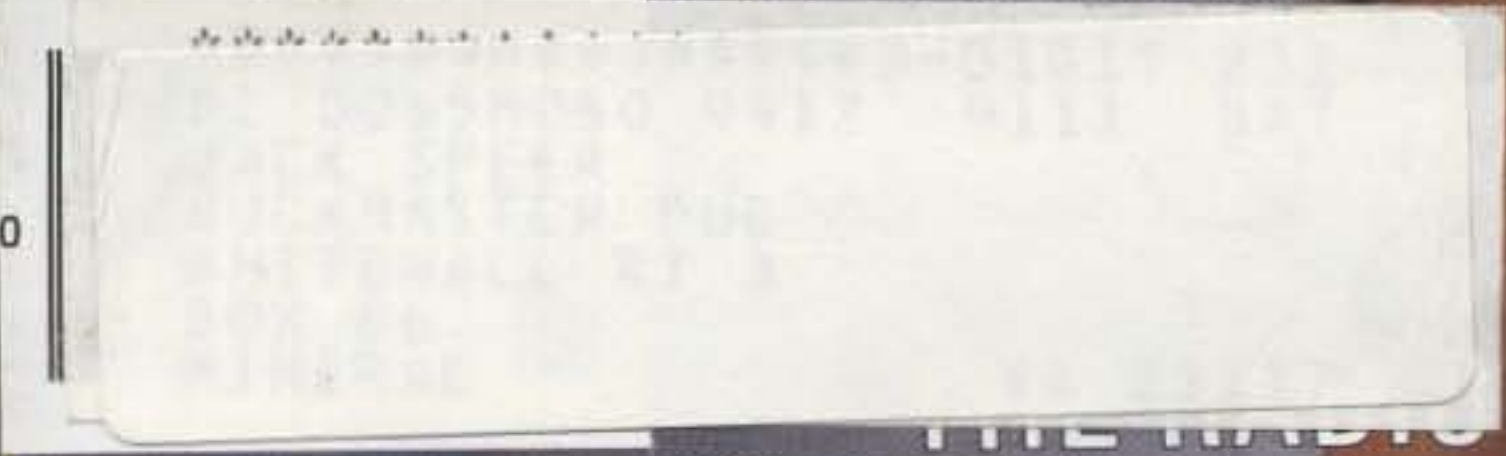
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**Coup d'Etat in Russia
The R3A Story . . . p. 11**

**The "QRP-20 Plus" 20 Meter
CW Transceiver . . . p. 20**



AMATEUR'S JOURNAL

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VS-2 Voice synthesizer. YG-455C-1 500 Hz CW filter for 455 kHz IF. YG-455CN-1 250 Hz CW filter for 455 kHz IF. YK-88C-1 500 Hz CW filter for 8.83 MHz IF. YK-88CN-1 270 Hz CW filter for 8.83 MHz IF. YK-88SN-1 1.8 kHz SSB filter for 8.83 MHz IF.

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The choice is yours. Kenwood's new FM Multibander allows you to start as a deluxe dual band radio – or add a third band. As a dual band, you'll have access to 144 and 450 MHz operation.

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- **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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**The Radio
 Amateur's Journal**



ON THE COVER: Andrew D. Schmidt, N2FTR, of Poughkeepsie,
 New York is shown operating the Mt. Beacon ARC bulletin board system from his
 home. (Photo by Larry Mulvehill, WB2ZPI)

NOVEMBER 1991

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ZERO BIAS

EDITORIAL

It's official at last: Albania is on the air. Albanian amateur radio license number one was issued to Martti Laine, OH2BH, as a guest license (Project IARU). The initial phase of this reintroduction of amateur radio will involve the training of a core group of Albanian nationals in operating the equipment and getting on-the-air experience. It is expected that a second station will become operational during the second week of activity.

Most of the amateur radio world still needs that ZA QSL card before they can have them all or at least think in terms of having them all. For some time to come a ZA contact will still be a highly prized accomplishment. There are eleven Albanians participating in this learning experience, tutored by some heavy-hitting world-class amateurs, but I suspect that all will be buzzed out before the initial clamor subsides. For the eleven neophyte ZA amateurs now and for the many to come, the excitement of the chase has just begun. For those out there whose chase ends with this contact, what happens now?

Once again the mailman will be the most popular person in amateur radio as thousands await their first ZA card. Intellectually we all know that sooner or later we'll work them, but somehow sooner is far better and more desirable. Obviously, this great boon to amateur radio did not simply occur because it was a good idea. A number of people worked diligently for a long time to make this happen, and through their efforts and the cooperation of the Albanian government your contact became possible.

Perhaps I was a bit prophetic in my September editorial with that picture of the FAXed ZA card, as the ZA operation began in September. FAX again allowed us to receive a quick copy of the ZA1A official license (courtesy of the folks at Yaesu USA), and a FAXed article leads off this issue. Although the reproduction quality of the ZA license is not great, I thought you might like to see what one looks like. With any luck, in the near future when you plan a vacation there might be one of these available for visitors. Bring along your portable FAX.

It's been reassuring to hear that our fellow radio amateurs have taken to welcoming the new ZA station with the typical jocularly generally reserved for exotic DX locations. I'm not too sure whether it's envy, a political statement, or just plain stupidity that can change a small percentage of us into manipulative, despotic arbiters of who can or cannot occupy the amateur spectrum. I am sure that it is probably poor toilet training as a child which leads the "peacocks" among us to tune up on the DX frequency first rather than listen and find out what is going on. These, too, are our fellow amateurs, and somehow when they obliterate the desired signal with "Who is the DX? Where is he listening? What is his QSL information?" or just the engendering dulcet tones made by an amplifier trying to find some point where it doesn't self-destruct, it produces in me a need to help sponsor the development of an RF-seeking missile. Perhaps their parents didn't pay enough attention to them or somebody ig-

nored them for too long, but they all have this overwhelming need to be noticed—no matter what.

Since the Bouvet incident we've introduced several basic articles on how to work DX, what is split operation, and how to maximize contest activity. Other publications have also tried to teach some basics. Perhaps we all started too high for some to grasp the point. Maybe it's time to start with the concept of the human ear, how it works and what it's good for. Listening can be a marvelous activity. It enables one to learn and find out things. It teaches patience and encourages the mystical power of thinking, and therefore reason. By listening, the human brain can be programmed to remember what it hears and by extension use the information in a constructive and productive manner. It really is miraculous how much one can take in both in real life and in amateur radio by keeping one's mouth closed and just listening. It certainly would cut down on the same questions being asked every few seconds and also might help retire a few policemen.

I'm afraid that there is very little hope for those who just enjoy the process of tuning up on someone else's signal (for whatever rea-

son). There apparently is also very little help for our good-natured fellow amateur who introduces his signal on top of all of this only to announce (to whom?) that the frequency is occupied or to give instructions on where this obtrusive signal should go. At some point it must become technically obvious that the offending signal can't hear him. Maybe that would be a good question to add to the examination pool: "Can the operators of stations producing two or more signals on the air at the same time and on the same frequency hear each other?" (Please, no wise-crack answers about duplex.)

Since it does seem unlikely that the course of amateur radio human nature will be radically altered, perhaps somewhere down the road in transceiver evolution it will become physically impossible to tune up a rig on the air, or to keep a non-substantive carrier on the air without some sort of automatic ID. If we are not blessed with the ability to purchase a fully automatic rig, then everything else will only tune into a dummy load (or self-destruct). This may help to eliminate part of the problem for future amateurs. Human nature is something else, and a fool doesn't always know he's a fool.

73, Alan, K2EEK

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THE ALBANIAN
AMATEUR RADIO ASSOCIATION

SHOQATA
E RADIOAMATOREVE SHQIPTARE

GUEST LICENSE LEJE PER TE FTUARIT

Radioamatorëve Shqiptarë

Martti Laine
vendndje Helsinki, Finlande
shirrjes së vendit të tij OH2BH
i kështu dhënë leja me
to ftuarit dhe shenja e
ZA1A në përputhje
me shoqatën.

kye është e vlefshme nga 16.09
1991 për rajonet PTT Tiranë
16.09 1991

License No. 1
The Albanian Amateur Radio Association
Certifies that
Mr. Martti Laine
Place of birth Helsinki, Finland
home call sign OH2BH class A
has been offered a guest license (Project IARU)
and call sign ZA1A
according to the rules of the
association.
This license is valid from 16.9.1991
on sites PTT Buzakë
Date 16.09

Kryesari i SH.R. SH

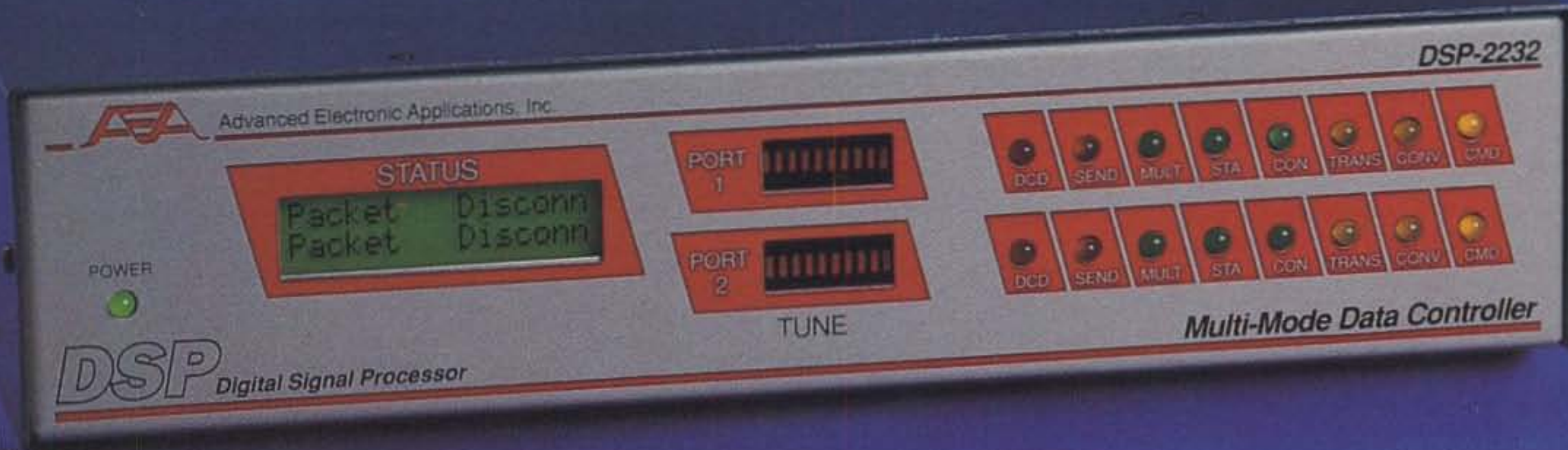
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DEPART 8.02
SHKUPËRIS 02

The license that made it all possible—ZA at last. Sorry for the poor quality, but this shot was made from a FAX just received.

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ON THE ROAD ...

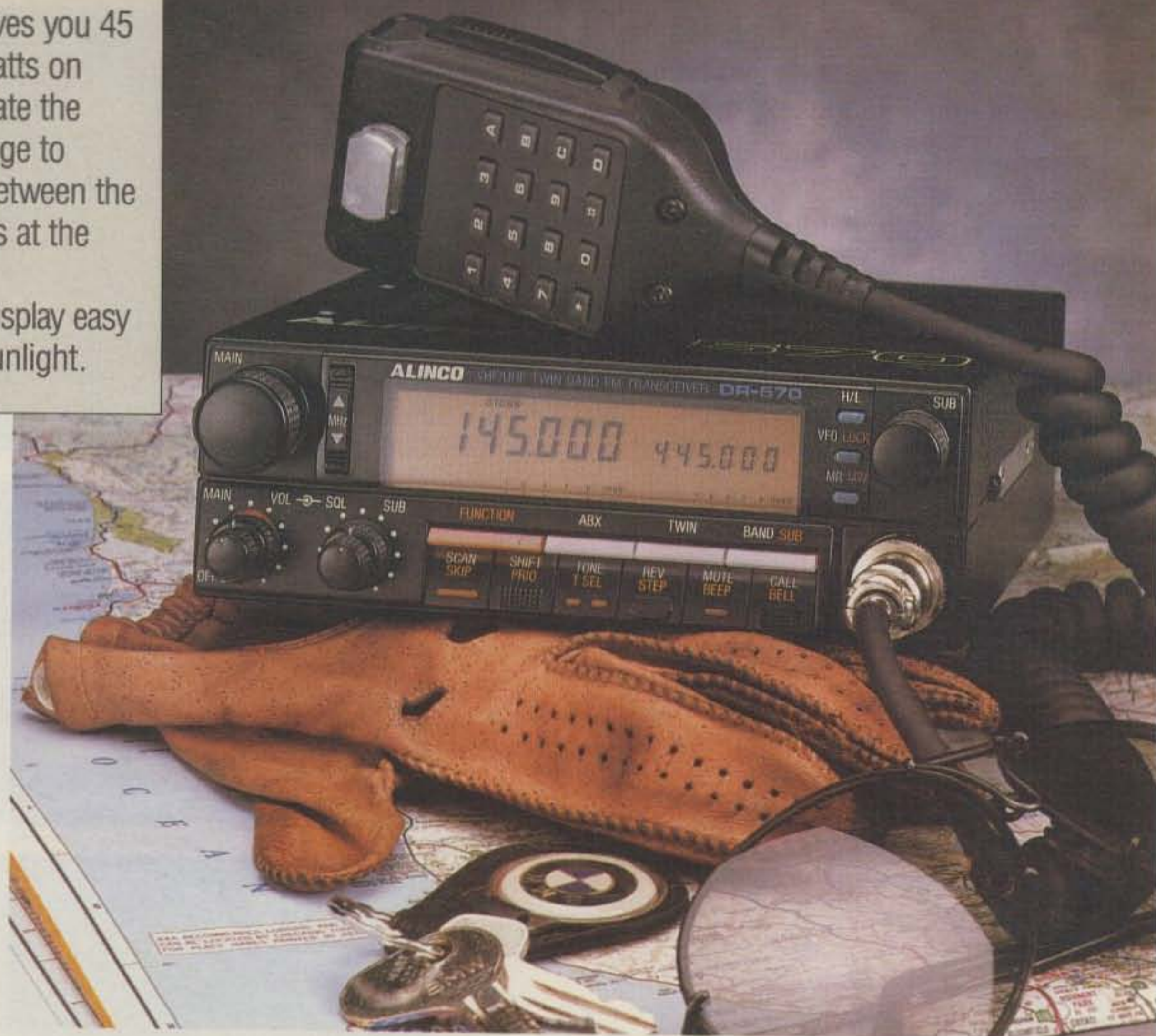
Model DR-570T

Cross Band Full Duplex, Twin Band Transceiver

The DR-570T allows full duplex operation and 20 memory channels with 4 scan modes. It also functions as a twin band receiver, with independently adjustable squelch and volume controls for each band.

A powerful output gives you 45 watts on VHF and 35 watts on UHF, plus you can activate the Automatic Band Exchange to switch back and forth between the "sub" and "main" bands at the touch of a button.

The LCD makes the display easy to read even in bright sunlight.



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Model DJ-162TD

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This 2M handy combines the best features from the most advanced handhelds available today. Built-in DTMF squelch is standard, as is a wildcard function to help you access any group code that you have programmed without recalling the exact numbers.

There are power saving features such as auto shut-off and timed LCD lighting, timed to turn itself off after 5 seconds of non-use. The display is conveniently located on top of the unit for reading when the transceiver is being carried in your pocket or in a bag. There is even a key lock mode to prevent accidental changing of frequencies, should the buttons be hit while the unit is being handled.

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ANNOUNCEMENTS

• **1991 Christmas Military "Mail Call!"** - Military "Mail Call!" serves as a clearing house for mail greetings to American troops in as many places as possible. For more information send a first-class stamp (*no return envelope*) along with your name and address to Military "Mail Call!", P.O. Box 817, Christmas, FL 32709-0817 (and mention where you read about this program).

• **PLA/NET, The Environmental Net** - Amateur radio operators and SWLs interested in a worldwide environmental awareness net can contact Robert N. Wilderman, K3SRO, 19 Glen Rd., Lansdale, PA 19446-1405—please send SASE (or call 1-215-822-7474, phone or FAX)—who is acting as net control for the KX2Z PLA/NET. The net meets the first and third Saturday of every month on 14.330 kHz (plus or minus QRM) at 1830Z to discuss environmental and ecological issues and to promote amateur radio. The European net starts at 1630Z with Peter, ON9CGV as net control (contact Peter Vekinis, Patrijzenlaan 2, 1560 Hoeilaart, Belgium; phone 32-2-657-3881, FAX 32-2-657-3975).

• **Midwest VHF/UHF Net** - This net meets on 3.836 MHz LSB (plus or minus QRM) at 0200Z Monday. Net control is Bryan, WA8MZQ, and Hal, KC4YO. Alternate nets are (same date and time) 144.265 MHz K8RZB and WA8NJR, 50.150 MHz WZ8D; in Minnesota 144.275 MHz KA0ZFU, in Michigan 144.250 MHz KB8ZW. The Midwest VHF/UHF newsletter is available for \$6.00 per year from N8ZM.

• **The following special events will take place during November:**

WA4UCE, from Tennessee Technological University 46th Homecoming, Cookeville, TN; ARS of Tennessee Tech. University; from 1400-2400Z Nov. 2 and 3; General portions of 80, 40, 20, 15, 10 meters, and Novice 10 meters. For certificate send QSL and 9 x 12 SASE to TTARS, Tennessee Technological University, Box 5262, Cookeville, TN 38505.

W4BS, from grand opening of the Pyramid on the Mississippi, Memphis, TN; Delta ARC; 1400-0000Z Nov. 9; on 14.305, 21.320, 28.455. For QSL send SASE to Delta ARC, P.O. Box 16343, Memphis, TN 38186-0343.

4-land, from decommissioning of the *USS Lexington AVT-16*, Pensacola, FL; Serious Hams ARC; Nov. 4-10; lower portion of General 80-15 meter subbands and 28.350. For certificate send QSL and 9 x 12 SASE to Mike Brown, N4MAD, 519 S. Edgewood Circle, Pensacola, FL 32506.

AB4TT, from Sampson County Expo, Clinton, NC; Sampson County ARS; from 1700-2400Z Nov. 7; lower portion of the General bands. For certificate send QSL and SASE to SCARS, P.O. Box 64, Clinton, NC 28328.

W5MS, from AbbeyFest I, near the shore of Lake Corpus Christi, Live Oak County, TX; Corpus Christi ARC; 0000-2359Z Nov. 3; lower 25 kHz phone subbands of 80, 40, 20, 15, 10 meters; RTTY on 20 and 15 meters; 146.96-, 147.08+, 444.70+. For certificate send QSL and large SASE to Br. Dominic Mazoch, OSB, N5TCB, HCR 2 Box 6300, Sandia, TX 78383.

VG3W, from Remembrance Day, Guelph, Ontario,

Canada; Guelph ARC; 1500-2200Z Nov. 9-11; on 10, 15, 20, and 40 meters SSB and CW. For QSL send QSL and SASE or IRC to Guelph ARC, P.O. Box 1305, Guelph, Ontario, Canada N1H 6H9.

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

Nov. 2, **Enid, Oklahoma ARC Hamfest**, Hoover Building, Garfield County Fairgrounds, Enid, Oklahoma. Contact Tom, N5LWT, 405-233-8473 evenings. (VE exams 10 AM, walk-ins welcome)

Nov. 2-3, **Ham Radio & Computer Expo**, Gwinnett County Fairgrounds, Lawrenceville, Georgia. Contact Alford Memorial Radio Club, Hamfest Information, P.O. Box 3100, Lithonia, GA 30058.

Nov. 3, **Fox Cities Hamfest '91**, The Starlite Club, corner of State Highway 55 and Cty JJ. Contact Larry Siebers, KD9IA, 414-788-3823 or at N2781 Weyers Rd., Kaukauna, WI 54130. (Exams check-in at 8:15-8:50)

Nov. 8-10, **Houston Ham Convention**, Houston, Texas. Musa Manarov, U2MIR/UV3AM, and Boris Stapanov, UW3AX, will be guests of The Texas DX Society for the event. Contact N5DC at 713-358-0051.

Nov. 8-10, **AMSAT-NA Annual Meeting and Symposium**, Los Angeles Airport Holiday Inn, Los Angeles, California. Contact the Symposium Committee at 213-937-7942 (11-6 PST).

Nov. 9, **Cookeville, Tennessee Indoor Hamfest**, location given on talk-in on 145.43 repeater. Contact

(continued on p. 130)



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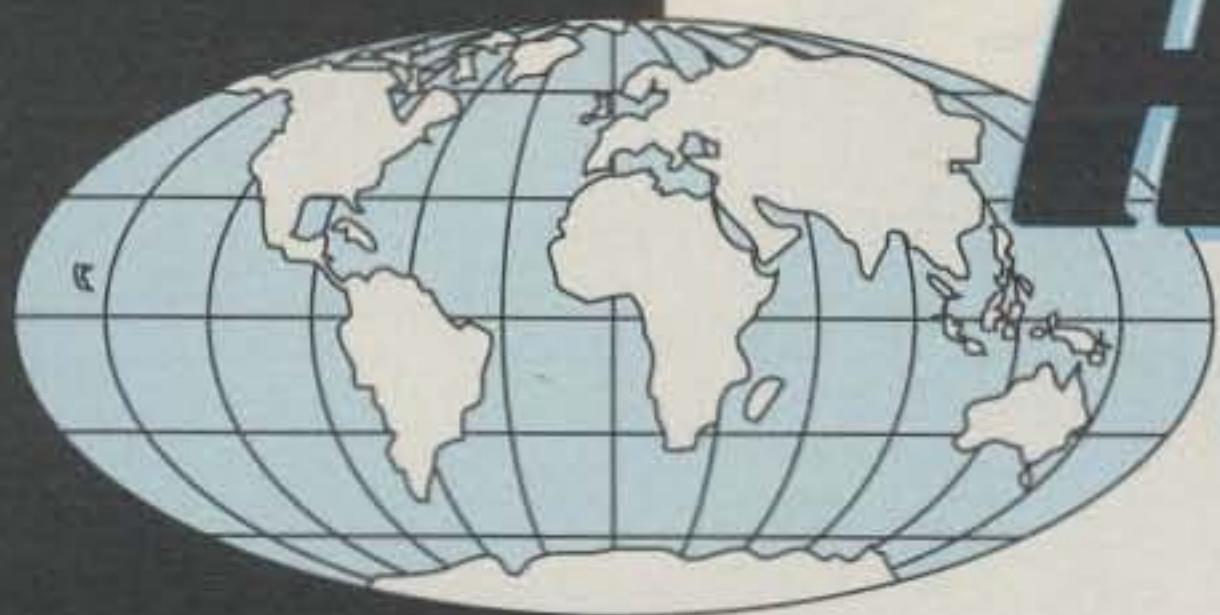
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Mast Size Range, in	1.25-2.0	1.25-2.0	1.25-2.0
Wind Load, ft ² (m ²)	4.4 (0.47)	5.5 (0.51)	4.1 (0.38)
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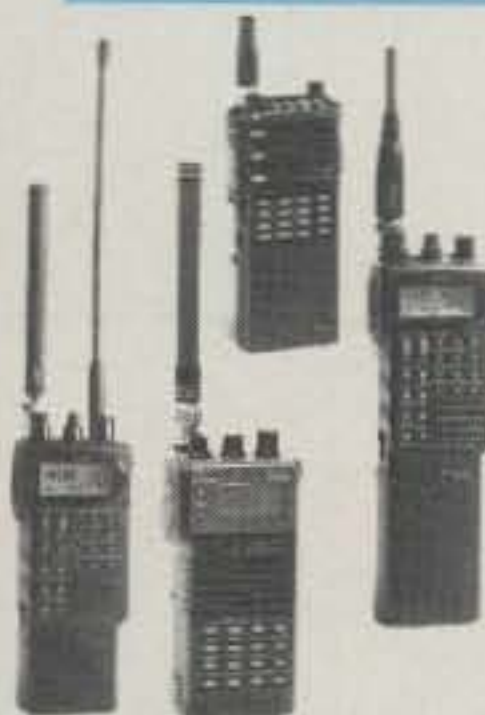
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Coup d'Etat in Russia

BY PETER M. STREZEV*, UA3AOC

The following article was made possible through the cooperation of Dick Ehrhorn, President of ETO. Dick rushed the material to us via FAX, and we began preparing it immediately for this issue. Both Dick and I waited anxiously for the photos showing the R3A operation to arrive. The photos literally arrived on the last day of production for this issue, for which Dick and I are grateful. Most of the pictures were sent without notes as to who is in the picture. One of the photos seems to stand out in my mind because it apparently shows a famous guest operator of R3A. We thank Dick and Peter (plus the folks at ETO whom I drove crazy with phone calls) for allowing us to publish the material.

—K2EEK

It happened suddenly. I had worked late the previous evening and permitted myself to sleep longer than usual. Being alone at home (my wife and daughter were on vacation in the Ukraine), I went to a nearby shop to buy some food. It was 9 AM on Monday, August 19, 1991, and I was still unaware of what had happened in my country just a few hours earlier.

In spite of the dramatic changes that had happened in the USSR since Gorbachev came to power in 1985, nobody could be sure—some people with fear, others with hope—that these changes were really irreversible. The nucleus of power, the KGB and the Army, were still under the total control of the Communist Party. The government structures were overfilled with Party functionaries who held key posts everywhere. Furthermore, President Gorbachev himself was General Secretary of the Communist Party at the same time, and this often meant that

he was a hostage in the hands of Party reactionaries.

With every reform implemented, the resistance of the old guard grew stronger and stronger. Some time ago rumors of trouble and even open threats of using force to return our society back to Communism became almost something ordinary. But most people did not believe the threat to be real.

So there I was, standing in the shop, when I heard an old woman in the queue say, "More goods in the shop today. Apparently because of that . . ." "Which that?" I wondered. "Didn't you hear? Gorbachev has fallen ill and is not President any more. Yanaev took power and promises to put everything back in order. Perestroika is over."

Amazed, I froze for a while, trying to gather my thoughts, then hurried home to find out exactly what had happened. Upon reaching my apartment I immediately turned on my transceiver which has "Radio Liberty" and the "Voice of America" frequencies memorized. The news was just being reported, and with growing despair I realized all the potential horror of the event. Communist hardliners had finally performed an act that had been only rumored about, but had never been taken seriously by most people—a *military revolt*.

It was a strange coincidence. Just the day before I had sent a letter to Barry Garratt, VE3CDX, who has been a friend of mine since the Soviet-Canadian Transpolar Expedition (the Ski-Trek project). We spent a couple of months together in the center of the Arctic Ocean, at the North Pole-28 drifting ice station. Some readers may remember the 4K0DX and 4K0DC operation. In the letter there was a phrase ". . . we are optimistic to some degree, as the Communists are being slowly pushed from the scene. If nothing critical happens, and the Bolsheviks do not come back by some means, we may have a chance to recover . . ." How could I suspect that the *critical* moment was only several hours away?



Although his whole face isn't shown, the "guest operator" of R3A seems to be Boris Yeltsin. The man standing behind him is the author, UA3AOC.

I turned on the TV-set. The effect was like turning on a time machine and jumping back in time 10 years or so. There was only one channel broadcasting. A mixture of gloomy classical music, ballet, and chuckle-headed official reports keenly reminded me of Brezhnev's era.

The information seemed preposterous, but was nevertheless put out very seriously. It was explained that Gorbachev was no longer able to perform his duties due to his serious illness. Yanaev (the Vice-President) and seven other high officials (their names made me feel fear and nausea at the same time, as the key figures were KGB and Army high officials!) had formed a State Committee of Emergency State (abbreviation unpronounceable even in Russian). They made an announcement of a state of emergen-

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- Increments: 10,12.5,25,30
- Audio: 1W
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| Sensitivity: | .35uV NFM, 1.0uV WFM,
1.0AM/SSB/CW |
| Speed: | 20 ch/sec. scan. 20ch/sec. search |
| IF: | 736.23, (352.23) (198.63) 45.0275, 455KHz |
| Increments: | 50Hz and greater |
| Selectivity: | 2.4KHz/-6db (SSB) 12KHz/-6db
(NFM/AM) |
| Audio: | 1.2 Watts at 4 ohms |
| Power: | Input 13.8 V. DC 500mA |
| Antenna: | BNC |
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| Dimensions: | 3 1/7H x 5 2/5W x 7 7/8D Wt. 2lb 10oz. |

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| Mobile Mounting Bracket. | MM1 | \$14.90 |
| RS232 Control Package | SCS2 | \$295.00 |
- (software & cable) offers spectrum display and database.

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|--------------|---------------------------------------|
| Coverage: | 1 MHz - 1500MHz |
| Sensitivity: | .35uV NFM, 1.0uV WFM,
1.0AM/SSB/CW |
| Speed: | 38 ch/sec. scan. 38 ch/sec. search |
| IF: | 750.00, 45.0275, 5.5MHz 455KHz |
| Increments: | 5,12,5,25 KHz |
| Audio: | 1.2 Watts at 4 ohms |
| Power: | Input 13.8 V. DC 300mA |
| Antenna: | BNC |
| Display: | LCD, backlighted. |
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Here is Gene, RA3AA, at the heart of the action, R3A. The station was located on the sixth floor of the Soviet Parliament Building, often called the "Russian White House." The sign pinned to the drapes has R3A written on it over the words "Parlament Rossee" (Russia).

cy in some regions without specifying them (later it became clear what they had in mind—Moscow, Leningrad, and other large cities where the Democratic movement has been more or less noticeable), which was followed by an awkward mixture of threats and promises, such as establishing a strict order and discipline everywhere, raising salaries and lowering prices, and so on.

Political analysts of "Radio Liberty" were adding fuel to the fire by their mirth-

less predictions and estimations. Some of them considered this relapse back to Communism would last 10 or 15 years, while others insisted it was forever.

I pondered feverishly. If the junta succeeded (I was almost sure they would), there would be no way of living here. After these last years of relative democracy, I would not be able to bear even a day in such an environment. My first thought was, of course, to run abroad. But this seemed highly unrealistic. First, the

putschists would undoubtedly close the borders. Second, I couldn't undertake anything like that with my family being away and uninformed.

At last I realized that I would not be able to find any solution by myself, and I decided to go downtown and see what other people's reactions were. On my way my despair only grew when I saw people behaving as if nothing had happened. Some were standing dolefully in long lines in the shops, while others were hurrying somewhere minding their own business or standing discussing the event in low voices.

Red Square seemed to be blocked by the troops and militia, and Manezhnaya square (next to Red Square) was almost deserted. In a corner there was a small crowd with a Russian white-blue-red flag overhead. I went closer and heard a megaphoned voice describing the latest developments. The news was that Russian President Boris Yeltsin was still at his post. He had issued an edict which characterized the event as an anti-constitutional revolt and called on the people to disobey the conspirators' decrees and orders. This inspired a slight hope in me.

The orator addressed people with an appeal to go to the "White House" (a building on the Moscow River embankment where the parliament of Russia resides) to "defend Yeltsin." I started along Tverskaya street toward the White House. Almost all of the small cross streets were packed with tanks, troop-carriers, and other military machinery. People were looking anxious, and some women were crying.

It was about noon when I reached the destination. There were several thousand people around the White House listening to the news and reading leaflets which were attached everywhere. I heard noise and rumbling from all directions and saw people, most of them young men, carrying various heavy objects from everywhere. Some were dragging some huge metal tubing and other pieces of iron. A bulldozer which came from heaven knows where lugged weighty concrete blocks from a nearby building site. Barricades were growing with every minute, while a column of tanks and troop-carriers showed in the vicinity of the first barricade and stopped, their guns aimed at the White House.

I quickly found my place with a group of men who were dismantling the fence around the White House and carrying it to the growing barricade nearby. Meanwhile the older people and women surrounded every tank in the column and were speaking to the soldiers, trying to explain to them what was going on. It turned out that the soldiers had no idea of what was happening, who sent them, or whom they were to fight. The "counter-propaganda" seemed to work well, as after a while all the tank guns were decor-



This is a view of part of the crowd that gathered in front of the Russian White House.

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10 MHz under 1.5:1 UHF

Termination _____ Shunt fed - D.C. Ground
Type N female

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ated with flowers. People even brought some food for the soldiers, and finally, shortly before dark, the column turned around and headed back.

Nevertheless, the situation remained very disturbing. The city was packed with troops, and nobody could tell if all of them could be "re-convicted," especially the ones who belonged to the KGB. It was getting dark when it was announced that a ten tank detachment commanded by Major Evdokimov had declared their loyalty to the Constitution and President Yeltsin and would come to block the key approaches to the White House.

I will never forget what their arrival was like. The exultation was indescribable when tanks, one after another, with the Russian tricolors on top and "Liberty" written on one of them, passed through the barricade, which was partly disassembled to let them in. Later more troops joined us, but still we knew that the putschists could squash us in an hour, if they wanted to, due to their overwhelming superiority.

I was sitting at a bonfire next to one of the barricades when I heard somebody saying with indignation: "What the hell; they don't even have a tiny radio station in the building! If the junta cuts off the telephones they will become blind and deaf . . ." This startled me and made me think. I quickly gathered my wits and remembered that after all, I am a ham.

Breaking through the crowd, I rushed to one of the White House entrances. Making the armed guards understand who I was and what I wanted was not an easy task, but finally I was let in and led to the Press-Center. It took quite a while to explain the idea of using amateur radio in the situation. The first part of the project was to set up a VHF link between the White House and a Moscow 2 meter network. Later, I thought, with more amateurs involved, an HF station could be installed. Shortly after that I left the White House and headed home to pick up the VHF equipment and change my clothes for more suitable ones.

Early morning of Tuesday, August 20th, I was on my way back to the White House with an ICOM IC-2AT handheld, a battery charger, a piece of cable, and a couple of connectors in my bag. This was risky. If I was arrested because of the curfew violation, it would not be easy to find some innocent explanation for the contents of the bag. Anyway, there was no alternative and I only had my luck to rely on.

I reached the White House without trouble and got into the building by the same way as before. There was something new, though. One of the Deputies told me he had heard something about a group of radio amateurs already establishing a radio station somewhere in the building. It took me half an hour of roaming in the maze of White House corridors before I found the necessary room, one



An historic moment takes place on the steps of the Russian White House. The R3A crew poses with the flag of Independent Russia. Gene, RA3AA, is kneeling in front, and Peter, UA3AOC, is at the extreme right holding the HT. Printed on the white stripe of the flag are the call letters of the operators of R3A during the uncertain period.

floor higher than Yeltsin's office.

I was very glad to see a familiar face there—Sasha Panormov, RW3DP. He and I happened to be together in Leninakan, Armenia after the destructive earthquake of 1988, and the two difficult weeks spent there made us good friends. I did not recognize anyone else, but this was of no significance then (only when everything was over did I have a chance to get to know their calls: UA6XGL, UV3DCX, UA1ZCU, UA3ANL, UV3ACQ, UA6YHP, and UA3AMC). The operators seemed to have done a good job. The HF station (an ICOM IC-726) with R3A call-sign (which was invented by the operators themselves) was already on the air. Later Gene, RA3AA, managed to break through the barricades with an ETO Alpha 76 amplifier, and this made R3A powerful enough to punch through the deliberate QRM. The guys had nothing for VHF, so my appearance was right on time.

The HF operation had nothing in common with ordinary QSOing. When we received official documents they were quickly broadcast, and just as quickly, reports from everyone on the frequency were received. A direct temporary telephone line was installed between the R3A shack and the White House Defence Headquarters so we could "pour out" the information immediately. From time to time other people such as well-known

Deputies, popular artists, and journalists were given the microphone. Their speeches and appeals were being tape-recorded by the amateurs on frequency and were spread later in all regions.

The personal callsigns and names were obviously not used, even if someone on the frequency insisted. This was not superfluous: I was told later that as soon as R3A was launched, the KGB started pressing hard at the Central Radio Club to figure out who we were, our names and addresses. Needless to say, the officials could not help even if they had wanted to.

At some time in the morning we were told by other amateurs that R3A was being jammed by a strong noise-like signal. We changed our tactics, and using amateur radio terminology to notify our correspondents, we started jumping from one frequency to another. Every jump provided us with 10 to 15 minutes of clear air before the KGB jammers could find us and resume.

I tried VHF, but the "rubber duck" did not perform well from the R3A shack. I had to try several other rooms before I found a window that provided me with a more or less reliable VHF link. The obvious idea was to erect a simple quarter-wave vertical on top of the roof, but we were persuasively told by the guards to wait until darkness, as unknown snipers

were detected on the roofs of surrounding buildings.

Tension rose as evening neared. We were constantly told of new tank columns entering Moscow from all directions. Headquarters, by its own means, received information about possible assault by the KGB *spetsnaz* to neutralize with a gas attack thousands of people who surrounded our building. Women were asked to leave the White House, but only a few of them obeyed. Everybody in the building was given a gas mask.

However, night came and we were still anxiously awaiting further developments while doing our business. With the darkness hundreds of bonfires were lit and surrounded the White House under the low and damp clouds. It was raining almost all the time now, and being inside the warm and dry building, I felt somewhat guilty about the people outside who were ready to defend the White House (with me inside) with their bodies. They were not feeling doomed, though. Some were busy breaking bricks into smaller pieces, while others bottled gasoline from the tanks of nearby cars.

Shortly before midnight we got another job. Headquarters managed to find a 1 KW commercial HF radio station somewhere, and we had to put it into operation. The equipment arrived and we were busy cabling and powering when the first

shooting started. Instantly, lights in the White House were put out and only dim emergency lights remained. The people outside were asked by the Defense Commander to free a 50 meter gap between them and the building walls. The guards on the ground floor were ordered to open fire immediately if anyone attempted to break into the building.

Hearts pounding and gas masks banging, Sasha and I ran up the dark stairs to the top of the building (with no power, the elevators were out) with a heavy roll of wire on our backs in order to make a random-wire vertical antenna. Shooting repeated again and again, and once we heard the crash of a tank gun. The crowd outside the building started howling "Shame! Shame!" and then "Russia! Russia!" Psychologically our position was worse than that of the people outside. Somehow it is better to see a danger than to only hear it.

We reached the eleventh floor and decided this had to be enough. We found a suitable room, opened the window, and started letting down the wire using a hammer tied to the end for weight. While we did that, an announcement came over the inner broadcasting system for all Deputies to quickly gather in a certain room on the ground floor. We promptly finished our job, tied the wire to something in the room, and hurried downstairs.

Descending the staircase two steps at a time, I tried to rethink the situation. If the attackers succeeded and broke into the building, we would be in a trap. Even if we were not shot at once, we were apparently on the KGB's "top" list (remember deliberate jamming!), and after reading Solzhenitsin's *GULAG Archipelago* one can never be sure which choice is better. The conclusion I came to was to fight. Otherwise I would be taken like a helpless puppy. If fighting started in the building, I thought, I would run downstairs to the ground floor, find a weapon, and join the guards. For some strange reason this thought calmed me somewhat and I even started cheering up Sasha by putting out some nonsense like "... in any case there'll be no way of living under the Bolsheviks, so what's the difference."

Nonetheless, we continued working, and soon the new radio station was ready to be put on the air. Gradually the shooting and howling outside stopped and first news came from there. The first victims were a dreadful reality. Other news made me feel more confident and proud of the Russian people. Information was contradictory, but nevertheless stunning. One or two light tanks had been set on fire and their crews captured. A column of six or seven tanks was blocked in a tunnel with a Colonel or possibly a General inside.

It was probably this moment when the conspirators realized their position was a hopeless one. But those people in the White House and around it did not know

when the next attack would start and from where to expect it. There was a strong fear of a possible air attack with high chances of success.

While continuing our operation on the air, we counted the hours—2 AM, 3 AM, 4 AM From the experience of Tbilisi and Vilnius we knew that the hours preceding dawn are the most dangerous ones.

I returned to my VHF position and started receiving reports from Moscow amateurs who were on the air. UA3AMB, RW3DR, RA3AA, and others were constantly in touch, reporting what they saw and heard in their neighborhoods. I gave up the idea of putting up an external antenna. For a sniper with a modern rifle there is no big difference between day and night, so I had to rely upon my "rubber duck" a little longer.

With dawn the tension started to ease off. Laughter and jokes broke out here and there among the exhausted people. The rain was still heavy, but nobody outside seemed to pay attention to it. After two sleepless nights some people curled up and slept right in the rain puddles.

The following day seemed sort of unrealistic. Even when the news came about the putschists hurriedly leaving Moscow and flying to an unknown destination, the reaction was more or less indifferent. For some time we only discussed where they might be flying and came to a conclusion that only Saddam Hussain or Muamar Kaddafee would be ready to welcome them.

I finally managed to get on top of the building and erected a VHF antenna made from a piece of coaxial cable. Now more amateurs were able to inform us about troop movements. Unlike the previous days, the majority of the reports indicated that the troops were being withdrawn from Moscow.

The third day passed, and somewhere around midnight I fell asleep in a chair in some room in which I happened to be. I woke up a few hours later feeling cold. Dawn was just beginning. Emerging from a dream, I heard the crowd around the White House chanting "Victory! Russia! Yeltsin!" The feeling was unforgettable.

I returned to the R3A shack to learn the good news. It was more than encouraging. Gorbachev had returned to Moscow some time ago and returned to his duties. Several conspirators had already been arrested.

Later people from all parts of the city gathered around the White House and a "winners' meeting" was held. The view was quite spectacular—a boundless sea of rejoicing people, with a lot of the Russian white-blue-red flags fluttering in the sky overhead.

After the meeting we spent some time in the shack, happy and excited. Then I went home and fell sound asleep until the next morning.

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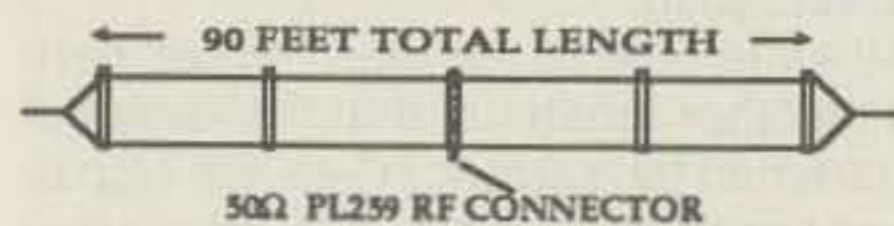
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Is there any limit on the amount of stuff you can pack into a little equipment enclosure? Apparently not, as W6ZH proves with his handiwork reconfiguring the QRP-20 kit.

The "QRP-20 Plus" 20 Meter CW Transceiver How To Build and Enjoy Using An Expanded Version of A Popular Kit

BY PETE HOOVER*, W6ZH

This is *not* going to be a step-by-step article on how to build a QRP rig. Rather, it is a chronicle of what went into building a kit, some pitfalls to look out for if you want to do the same thing, and a word or two on QRP operating away from the home location. The kit can be built with hand tools and aligned with a receiver and a digital VOM.

Having built and used a rig designed by Rick Littlefield ("An NE602-based QRP Transceiver for 20 Meter CW," *Ham Radio*, January 1989, p. 9), I was fairly sure that another of his efforts, the QRP-20 rig, would be another well-thought-out unit. What was the attraction? A complete 20 meter CW-only transceiver that measured 4" x 4" x 2". That included a superhet receiver, VFO control of both transmit and receive, sufficient on-paper selectivity to handle crowded band conditions, and adequate power (4 watts output) to make QSOs certain, even with modest antennas.

With this in mind, in November 1989 I ordered the QRP-20 kit from RadioKit, the supplier of the previous K1QBT designed kit. The cost was \$124.95 (plus \$4.00 shipping and handling), the same as it is now. The kit arrived some three weeks later. The original January 1989 article in *Ham Radio* showed a rig built on three separate circuit boards, but the kit had been redesigned to fit on one board. In addition to the components was a 16-page instruction manual that was very well done.

Quick Note #1: As will be pointed out in a moment, Rick Littlefield's article in



A fine example of home-brewing—a palm-sized QRP rig.

the September 1990 issue of *CQ* on the QRP-15 version of this rig ("The QRP-15 CW Transceiver," p. 43) should be read *prior* to ordering the QRP-20 kit. Reason: The 15 meter version, while basically the same 20 meter circuit adapted to 15 meters, includes a number of improvements and refinements that have not yet found their way into the QRP-20 kit, but *may* in the near future, so check with RadioKit before ordering.

The QRP-20 kit contains everything you need to build the rig—the case, all hardware, active and passive components, and even the wire. However, this is *not* a Heathkit (may *they* rest in peace). The instructions, while very thorough, are not the "... fasten blue wire to test-point

2 (TP2) and solder (S 4)." A bit of advice (worth what you pay for it): If you haven't built a kit before, think long and hard (and consult your wallet) before starting with this one! However, you don't need to be an expert to have expert results, providing you take your time and think at least twice before drilling, soldering, etc.

As soon as I received the kit, I made a copy of the instructions (put the original one away) and made an additional copy of the parts list, the circuit diagram, and the parts layout diagram. I put the "reference" copy of the instructions in a three-ring binder along with any drawings that I made while I was working on the kit. That way I had (and still have) a complete reference of what I did.

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So in spite of my warning you ordered the kit anyway. After setting up your binder, the next step (I know. I said it wasn't going to be step-by-step, but bear with me.) is to make sure you have all the components. On page 15 of the instructions is a very complete parts list. Using the copy of the list that you made, check what you received against the list. If there *is* anything missing (a possibility), a phone call or note to RadioKit will get you the needed stuff at no cost by return mail. This is important, because the kit uses a number of miniature and/or subminiature components that may not be locally available. The circuit board is small, the component count is pretty high, and the usual 1/4 watt resistors, etc., just won't fit! (See the QRP-15 article for board size, etc.)

Before you decide that RadioKit has done you dirt by sending all the wrong components, think about this: If you haven't dealt with modern, small components recently, you will find that the new nomenclature will give you fits. For example, a 0.01 uFd capacitor is now marked "103M"! Help is at hand. Check the "Component Data" chapter of the *ARRL Handbook* or similar sources for this type of information. You may also find that component style or type in your kit differs from what is shown in the parts list. Check the circuit carefully before sending a rocket to RadioKit because you may find that all is okay. As an example, a PC-type vertical trim resistor may be replaced by a horizontal or flat unit. **Quick Note #2:** To save you from having to look up this information every time while building, sort similar parts into muffin tins or egg cartons, and using 1/4" x 1/2" Avery labels, mark the pockets with the components' value(s).

Also check to make sure that the hardware on the parts list is really what's needed. For example, I found that the VFO capacitor required 4-40 mounting hardware and not 6-32 as referenced in the instructions. Also, make sure that you are equipped with a #60 drill (a real small one; get a couple while you're at it, as these little dudes break easily). As I was building the kit I found several instances where a circuit board pad was not drilled to take a component lead. This can easily be taken care of with a hand drill when the need arises.

If you are considering some modifications or additions to the QRP-20 circuit, now is the time to start planning on what, and where, it will go. Read the QRP-15 article and compare its circuit with the QRP-20. It is not likely that you will want to change the receiver mixer output circuit, or eliminate one of the crystal filter stages, but you may have some other ideas. If so, will your additions/mods result in something that needs to be adjusted while operating? Keyer speed, for example. If so, it probably should be on the



Photo A- The starting point. This is how the kit looked as received by the author.

front panel. If not, like a key jack, it can go on the back panel. You may even wish to remove something! I did not include a built-in speaker. I never use one on CW, as it takes up space, and if it *is* used it tends to vibrate the rig unnecessarily.

Since I had to locate both an audio volume control and a keyer speed control on the left side of the front panel, I couldn't use the regular-size audio pot that came with the kit—one which had a power off/on switch attached. I used some small pots I had found some time ago at a swap meet, but if you need such items, you could check RadioKit or other parts and/or kit suppliers that advertise in this magazine.

The new volume control did not have an on/off switch, so I found a "micro-miniature" DPDT toggle unit at Radio Shack (#275-626) that would do the job. Don't forget that we are dealing with a front

panel that measures 4" x 2" and "small is in." These little switches are not expensive and are useful, so get a bunch of them. I used four—power off/on, audio filter wide/narrow, and two in the RIT/XIT circuit. For indicator lights I got some miniature LEDs (#276-026) from the same source. I used one for power off/on and one in the RIT/XIT circuit.

Do you think that you might want a RIT circuit? It is recommended for QRP operation. It is not included in the QRP-20 circuit, but it is included in the QRP-15 design. Here's the QRP-15 design. If your junk box doesn't include the necessary components, order them from RadioKit (see fig. 1).

I added not only a RIT but also XIT (transmit incremental tuning; how would you abbreviate/label it?). This required another switch and a Radio Shack "micro" SPDT relay (#275-241). The RIT/XIT

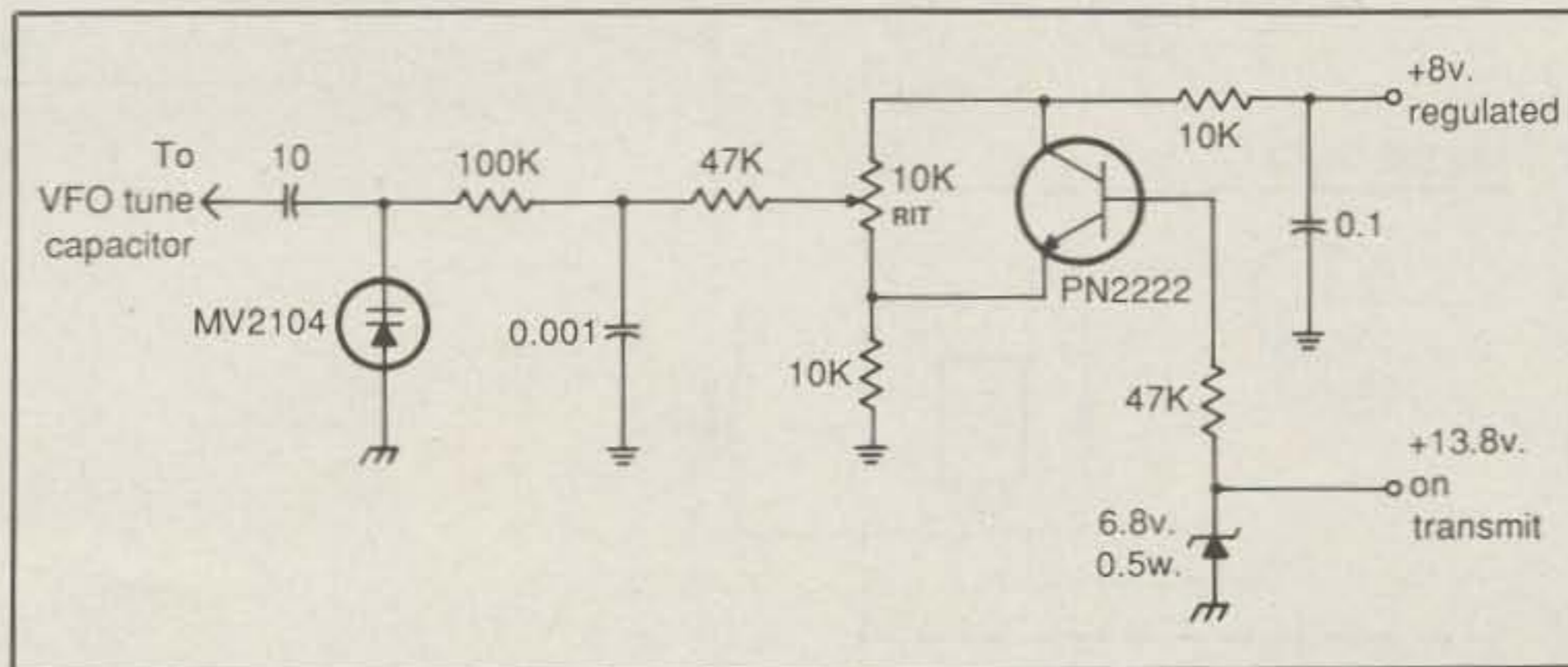


Fig. 1- The original QRP-15 RIT circuit (see CQ, September 1990).

relay is attached to the back side of the front panel with "super glue." The voltage divider network is "mounted" on the back of the control pot, and the varactor and miniature trimmer capacitor (obtained from Oak Hills Research—see info at end) are attached to the VFO variable capacitor. If I had to do it over again, I would not put in the XIT. I have seldom used it, and it's one more thing to go wrong. Anyway, here's the circuit for my RIT/XIT, but other than those mentioned, you'll have to find your own parts—see fig. 2.

Neither the QRP-20 nor the QRP-15 includes an electronic keyer, something that I consider another necessity in a CW QRP rig. I don't like outboard devices if I can help it, and since there isn't any room on the circuit board for such a unit, an auxiliary board has to be used. I built a keyer, using the Curtis 8044 chip, on a 1" x 1½" piece of Vectorboard using "ugly" construction, and mounted it above the circuit board using a spacer and a longer circuit-board mounting screw. I placed it about ¾ inch above the circuit board towards the back of the rig, near the rear panel and close to the key jack. Fig. 3 shows the circuit of the keyer using a minimum of components.

In his article Rick mentioned that if the supply voltage drops below 12 VDC, the voltage regulator will drop out. I fixed that by using the low dropout LM2941T regulator. The rig will work okay with a voltage as low as 10.5 volts, but the power is way

down. I set the regulator up so that the output voltage stays at 11.2 VDC until the input voltage drops below 11.4 VDC. Then it loses its grasp. This setup works great even with gel-cells nearing the end of their charge. Fig. 4 shows the circuit that can be substituted for the one in either the QRP-20 or QRP-15 with no change in overall component layout. (See the article by Mitch Lee, KB6FPW, in the November 1990 issue of QST for more information on this device as well as sources.)

I also added a "spot" switch and circuitry to my QRP-20. This is a relay-switched varactor that temporarily shifts the receive frequency to the transmit frequency so that the VFO can be zero beat with the incoming signal. I would not recommend that this be done. It just adds circuit complexity for little advantage. Now that I'm used to the rig and its transmit offset, I seldom use it. For the sake of completeness, see fig. 5.

Okay, the kit parts are all there, and mods planned and parts obtained. What else? The usual hand tools are all that are needed. Several times I used a drill press that was available, but that wasn't necessary. A hand drill would have been adequate. Make sure that you have a small soldering iron. A 10 watt is plenty. I don't like the solder guns for this type of work. Also, get *good* thin multi-core solder, not the thick stuff. The usual collection of drills, files, etc., will be needed, and a "nibbler" is desirable. This is a very handy device for removing a bit of metal or

circuit board. Also, add some masking tape, a good 6 or 8 inch metal rule (marked down to 1/32 inch), a scribe, center punch, and a year's supply of old-fashioned patience!

Onward! If you are not going to make any external changes in the QRP-20, the instructions provide easily followed layout drawing for chassis and component holes. In any case, when laying out the front and rear panels, make absolutely sure that you measure all components and locate their position on a full-scale drawing of the front or rear panel *before* drilling any holes. Then do it again. Next cover the front and rear panel with paper (using the masking tape) and lay out the centers of the holes to be drilled. Check again. Then center punch the location of the holes, which will keep the drill point from skidding around.

Okay, now drill (using a sharp drill, please) and be prepared to file, and file some more, until everything fits the way you want it to. Photo B shows the seeming lack of progress after two weeks of work. All this planning and metal wacking takes time. In this picture all the components on the front and rear panels are in place, and the VFO dial mechanism is complete—something that took quite a bit of time, and was well worth it.

Since the VFO dial mechanism is the most used control on the rig, and its smooth functioning is important to the operation of the rig, a few words of explanation are in order. The VFO dial setup as

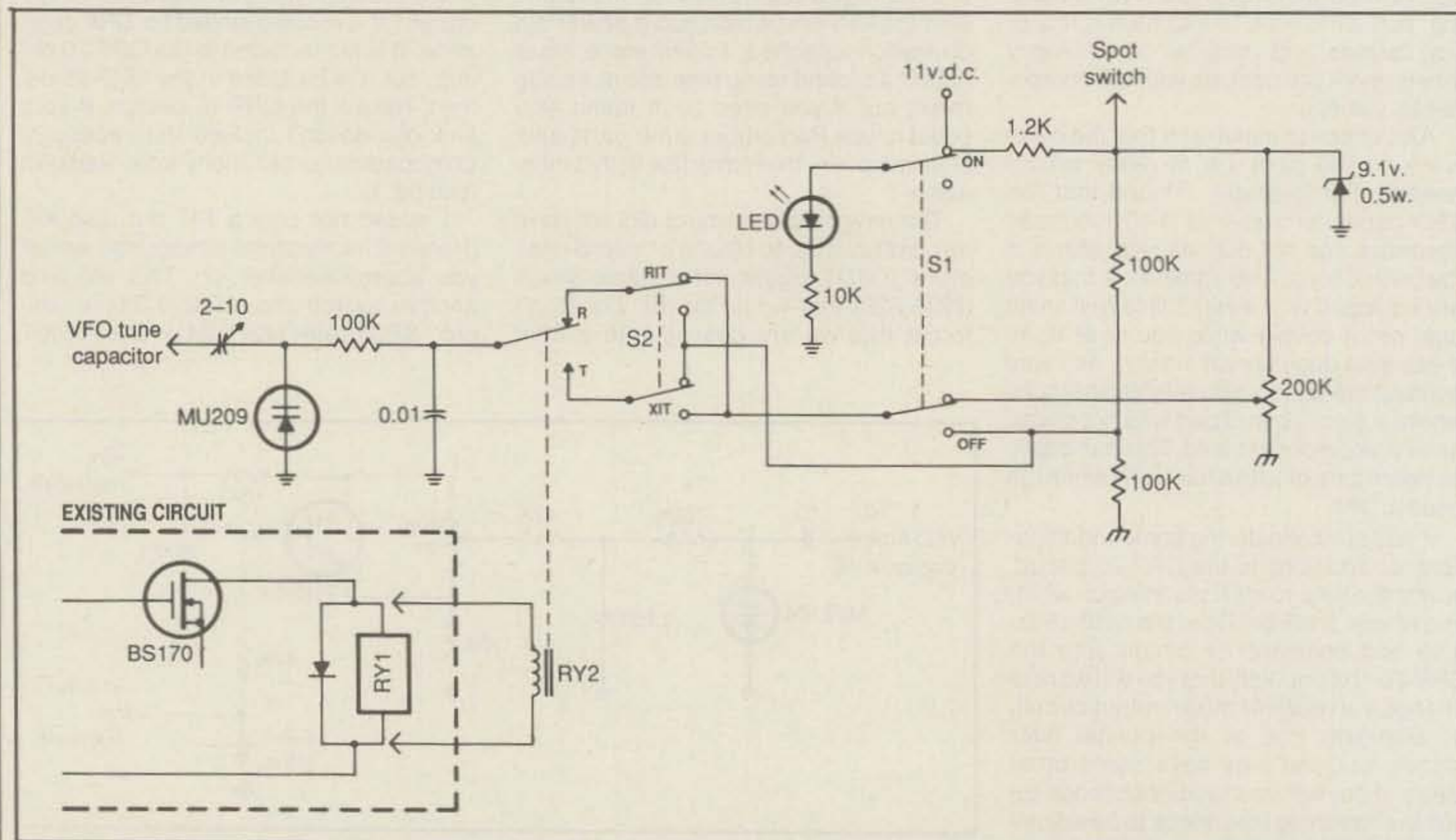


Fig. 2- The modified RIT/XIT circuit for the QRP-20.



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MODEL: <u>SG-230</u>	PURCHASED FROM: <u>SGC</u>		
DATE PURCHASED: <u>1 MAY 89</u>	DATE INSTALLED: <u>1 DEC 89</u>		
INSTALLED BY: <u>J. MARTINO (OPERATOR)</u>			
CAPE TOWN DEPT OF STATE WASH DC 20521 2982			
<small>* refer to owners manual for full warranty terms</small>			

PERFORMANCE INFORMATION	
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DISTANCE COMMUNICATED: <u>USSR/JAPAN/N.Z.</u>	<u>AMATEUR BAND USING SAILBOAT BACKSTAY</u>
Circle One	
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TUNING: <input checked="" type="radio"/> Simple <input type="radio"/> Difficult	
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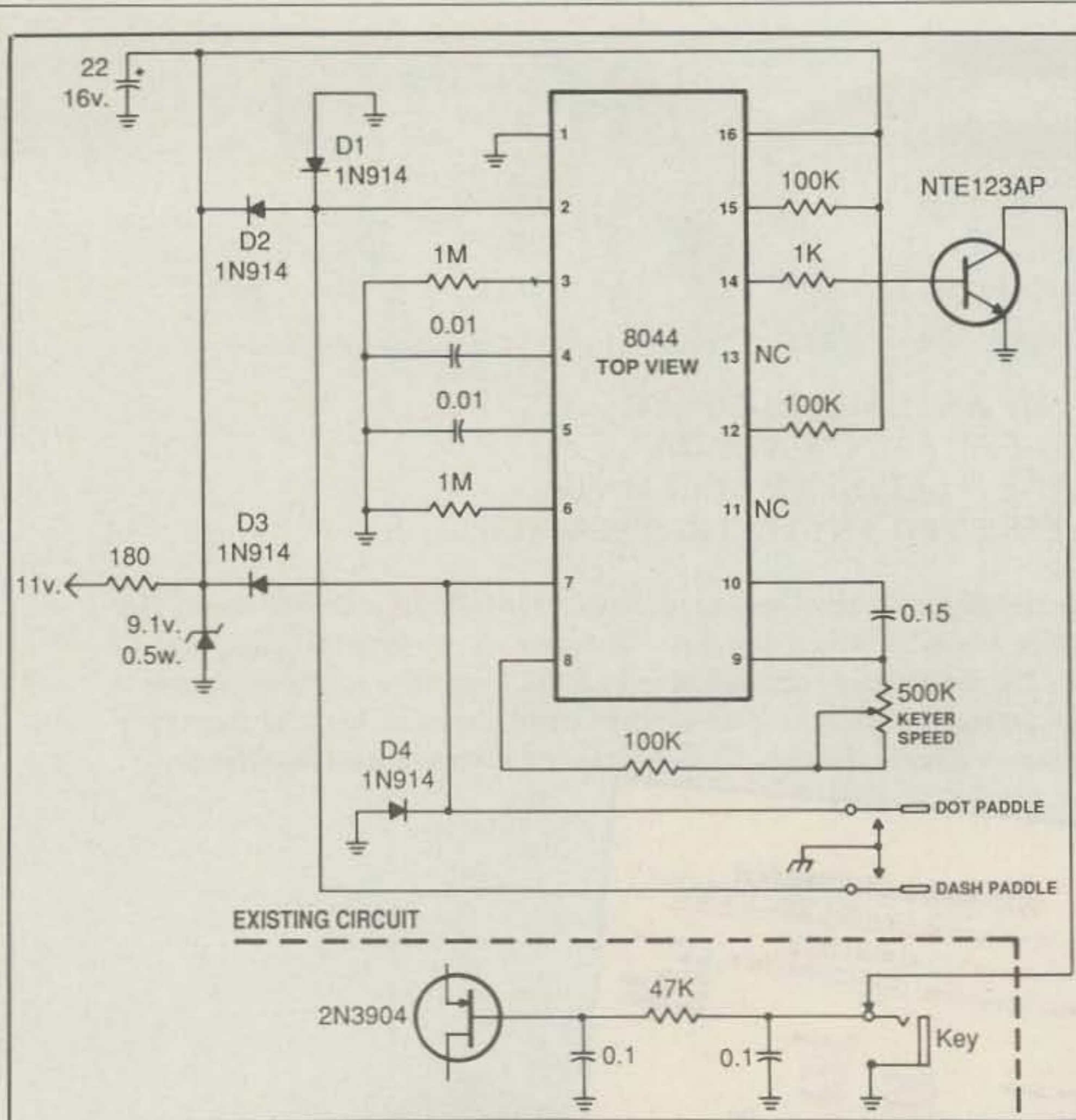


Fig. 3—Circuit for the built-in keyer which uses the Curtis 8044 chip.

proposed in the instructions is to be avoided if at all possible: its friction-fit approach won't work for longer than a couple of weeks at the most, and could never be trusted for calibration purposes at all.

That wouldn't do. I started from scratch with some $\frac{1}{16}$ inch plastic sheet, cut out a circle of the size needed for the dial (about $1\frac{1}{4}$ inch in diameter), drilled a $\frac{1}{4}$ inch hole in the center, and "super glued" a plastic collar to the back. This collar was made from a $\frac{1}{4}$ inch plastic shaft coupler cut off and filed down so that it barely had enough thickness to accept the set-screw that came with it. This

collar fits snugly to the front of the VFO capacitor and is kept in place with a set-screw! The VFO capacitor is spaced back from the front panel by about $\frac{1}{8}$ inch. This distance was determined by the thickness of the dial collar, clearance needed between it and the front panel, and the length of the capacitor tuning shaft needed for a VFO knob. To get this right took a number of iterations of "file it down a bit, try it, it's still too thick, take off some more . . .," etc.

This took about five evenings of work to accomplish the desired results. The dial indicator panel was made from scrap

clear plastic, drilled and tapped for 2-56 hardware that holds it in place. I think it looks neat, but an indicator arrow would be simpler and quicker to make and install.

While you are fitting the various front- and rear-panel components, make sure that the circuit board will still fit. For example, the VFO dial arrangement set the VFO capacitor far enough back so that I had to shave off a bit of the circuit board material. Also, in my case the RIT/XIT circuitry intruded on the right side of the circuit board near the VFO, so I had to judiciously "nibble" away some of the material so it cleared. Drill the VFO adjustment hole in the bottom of the chassis only *after* you have located the VFO capacitor in its final position. With careful measuring of its location, you will find that you can drill a $\frac{1}{4}$ inch hole instead of the $\frac{3}{8}$ inch recommended. One less place for dirt and moisture to enter.

With all the front- and rear-panel components installed, you may find that you will have to shave the circuit board a bit here and there to get it in and out. **Quick Hint #3:** After you drill and deburr the holes for the circuit board mounting, put the mounting screws in from the bottom and hold each in place with a piece of masking tape over the head of the screw. This will allow you to turn the case over (i.e., right side up) and put the spacers on the screws. Now you will be able to put the circuit board in and take it out without having the screws drop out. You'll be doing that a lot before the kit is finished.

Start with the electronics now? Finally? Yep. What first? I started with winding the various toroids and the VFO coil. It's an easy way to get things going, and the instructions are good. Don't be discouraged if it takes you several tries to get the VFO coil right. You'll use quite a bit of the #32 wire provided as well as make a dent in the supply of patience available.

Next, component placement on the board. The instructions lead you along with what to put in where and when. You *must* be certain that the specified component goes in the correct place. Changing it later on (after the smoke clears) could

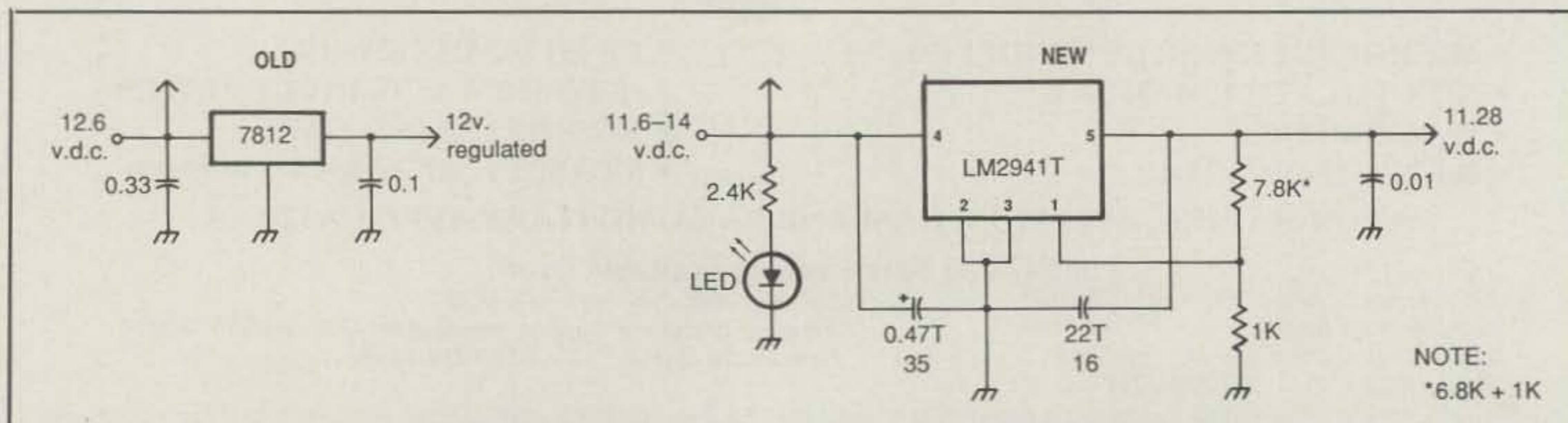


Fig. 4—The replacement "low-overhead" voltage regulator circuit.

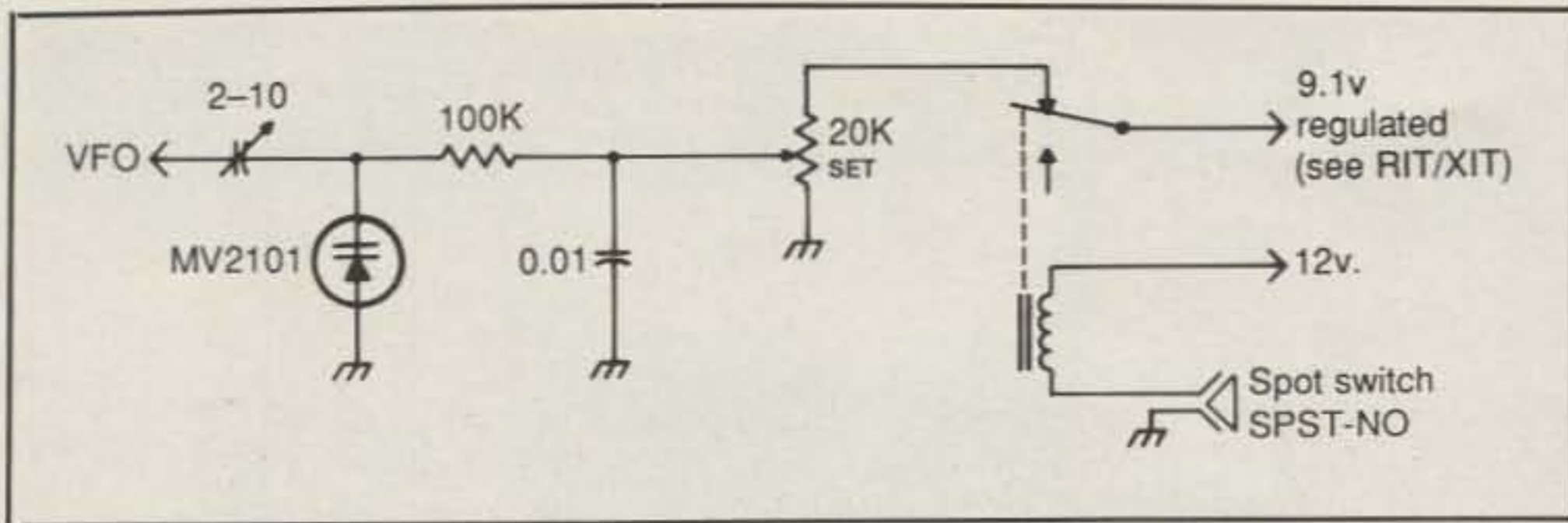


Fig. 5- The transmit frequency spot-switch circuit.

be a real chore. Photo C shows a week's progress. The circuit board is almost complete. Behind the board in the photo is a copy of the larger-than-lifesize component layout drawing included in the instructions. I marked each item in red as I put it in. Hence the various scrawls shown in the photo.

If you are going to letter the front and rear panels, do it before you mount the components for the final time. The letters I used were Chartpak's 8 point Helvetica Medium dry transfer letters (#M10008CL at \$5.95 for a sheet of numbers and lower- and upper-case letters) that I bought at an art supply store. These match the size of the rig, but are tedious to apply because you have to put them on one by one. **Quick Hint #4:** Write out beforehand what labels you intend to use and count letters to be able to center the words. **Quick Hint #5:** Start at the center of the label and work to each end. That way you have a better chance of getting it centered correctly. Be prepared to spend quite a bit of time on this phase of your

construction. Use several coats of the clear matte spray (I used DataKor's "DataKor Matte," catalog #04178) and let them dry at least 24 hours (two days is better) before mounting components.

Before mounting the circuit board for the final time, mentally rehearse how you will install the final transistor. It's soldered to the circuit board, but fastened to the bottom of the case. Twist the "ears" on the VFO coil shield can just enough to hold it in place but not so much that it can't be removed. You will have to do that when calibrating the VFO. After all is finished, you can solder it in place when the circuit board is mounted (remember, a small iron, not a big one).

Also make sure that the pre-soldered leads from the circuit board to various panel-mounted components are correctly installed and identified. Screwing up the identification of the leads to the audio filter switch was the source of the only problem I had with the rig. Make sure you do the usual check for unfilled component-lead-holes in the circuit board to



Photo B- Two weeks and a lot of work later, some of the components are mounted.

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turn up missing jumpers or wrong component location. Check carefully for solder bridges. **Quick Hint #6:** Hold the component side of the board up to a strong light, and look carefully from the other side for any solder bridges, particularly near the NE602's. The circuit traces are thin and close together, and it's easy to get a whisker of solder where you don't want it.

If you take your time, and use the supply of patience that you have allotted, the rig *should* turn out well—and work the first time. The instructions are excellent on how to proceed with the calibration of the VFO and subsequent tuning of the rig. The calibration of the VFO is eased if you have a general-coverage receiver with which to find the VFO signal. I used a small Sony 2002 all-wave receiver on "scan" and found the signal around 3.2 MHz. A prudent pruning of the coil turns got it up to the desired 4.0 MHz region. Then the 14 MHz signal was found on the station receiver, and that was used for final calibration—range 13.94 MHz to 14.106 MHz.

Photo D shows the interior of the completed rig. The keyer board is in the lower left-hand part of the photo, and the RIT/XIT relays and associated components are in the upper right-hand part of the photo.

The completed rig tunes up well (follow

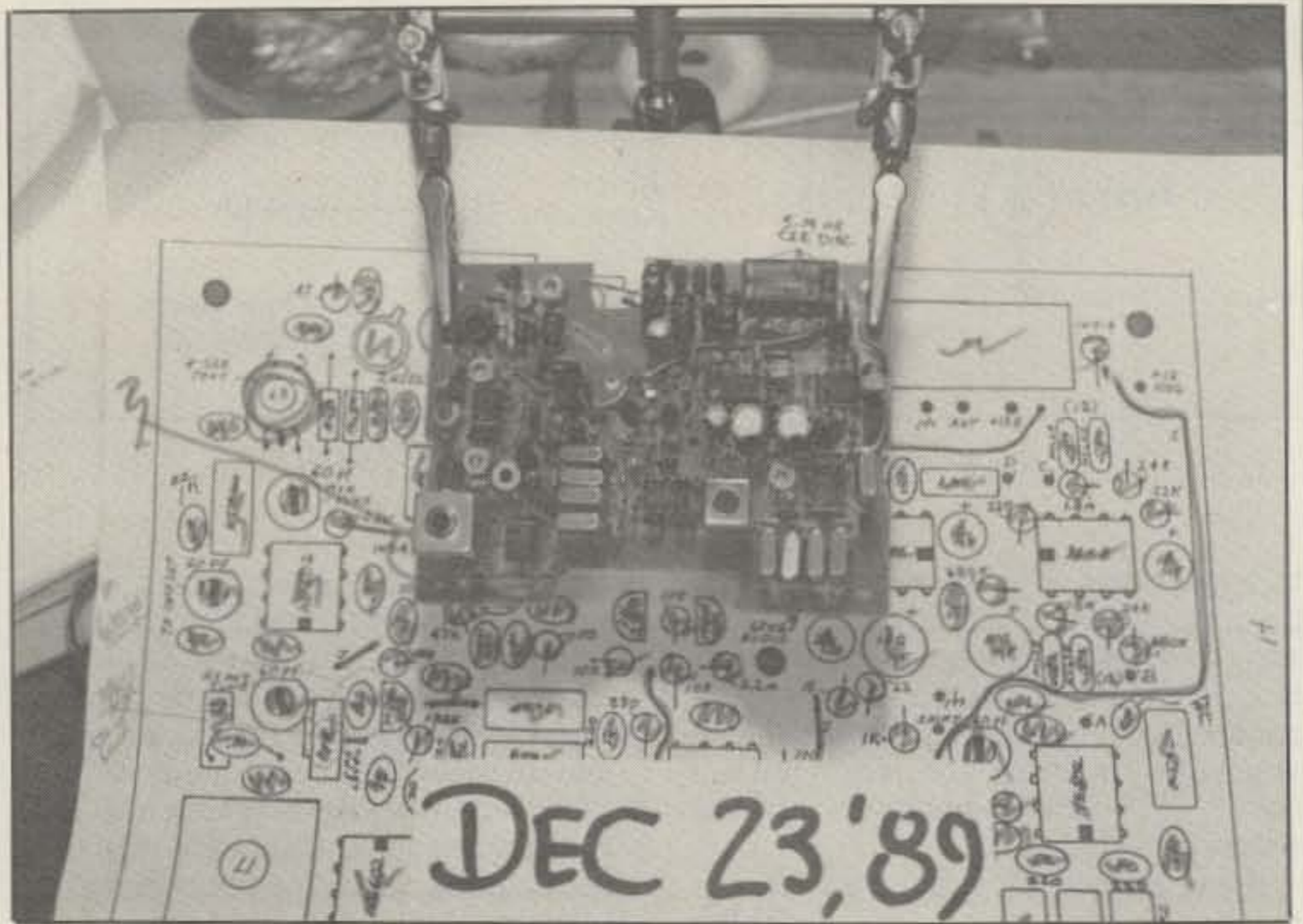


Photo C— The almost completed printed circuit board is held over an enlarged parts placement diagram.

the directions). With a 12.6 VDC supply, the current requirement on receive (with an average signal, and the RIT in use) is about 0.061 amps, and there is more than

adequate audio for headphone. On transmit it takes 0.682 amps and has a measured output of 3.2 watts. With a 13.8 volt source, receive goes to 0.068 amps, and

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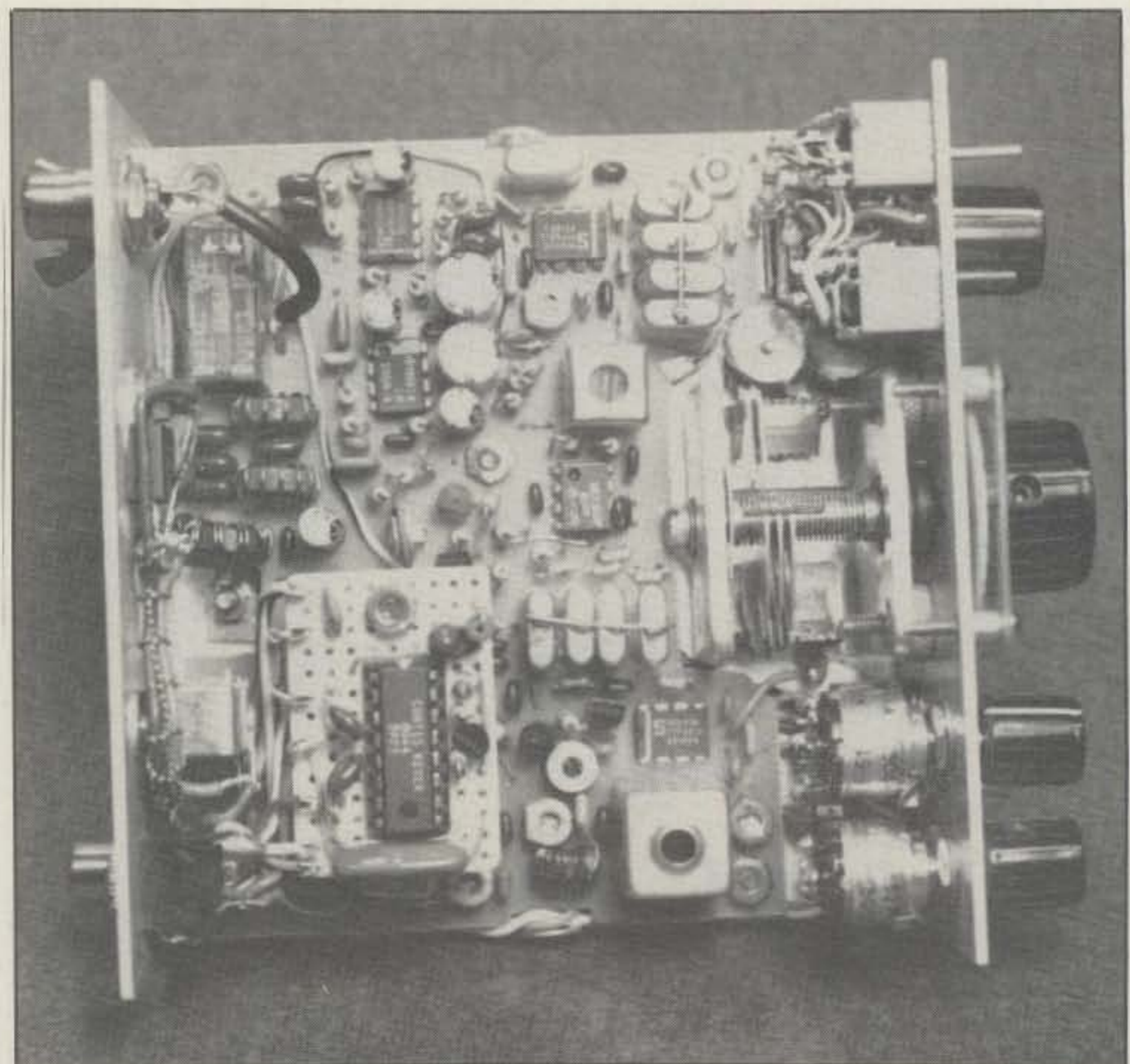


Photo D— Once you've managed to wedge and squeeze everything in, this is what it should look like.



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Photo E- A little over four months from day one, the completed project.

transmit goes to 0.863 amps and 4.2 watts out.

By April 23 the rig was finally finished (see photo E and the lead photo). Was it worth it? You bet, and the time and use of the full allotment of patience is evident.

Does it work? Absolutely (see photo F, first QSO on April 24 [Zulu], with station antenna and gel-cells for power, a RST 439 from Rick, NV9P, in Chicago). As further proof, during the summer of 1990 the QRP-20 was taken on a trip some 9000



Photo F- The acid test! It didn't smoke and it works great.

miles around the US. Using a "stunted" vertical (a 12 foot, collapsible centerloaded whip) and gel-cells for power, I was able to have at least one QSO from each of the ten US call districts—not bad for modest power (3.2 watts) and a mediocre antenna (see photo G, "himself" hard at

work in QSO with a WA3; QTH, a roadside park in Illinois, rig on the table, gel-cells on the ground alongside, and antenna clamped to the fence post in the background).

I use a pair of inexpensive fold-up stereo headphones from Radio Shack (RS



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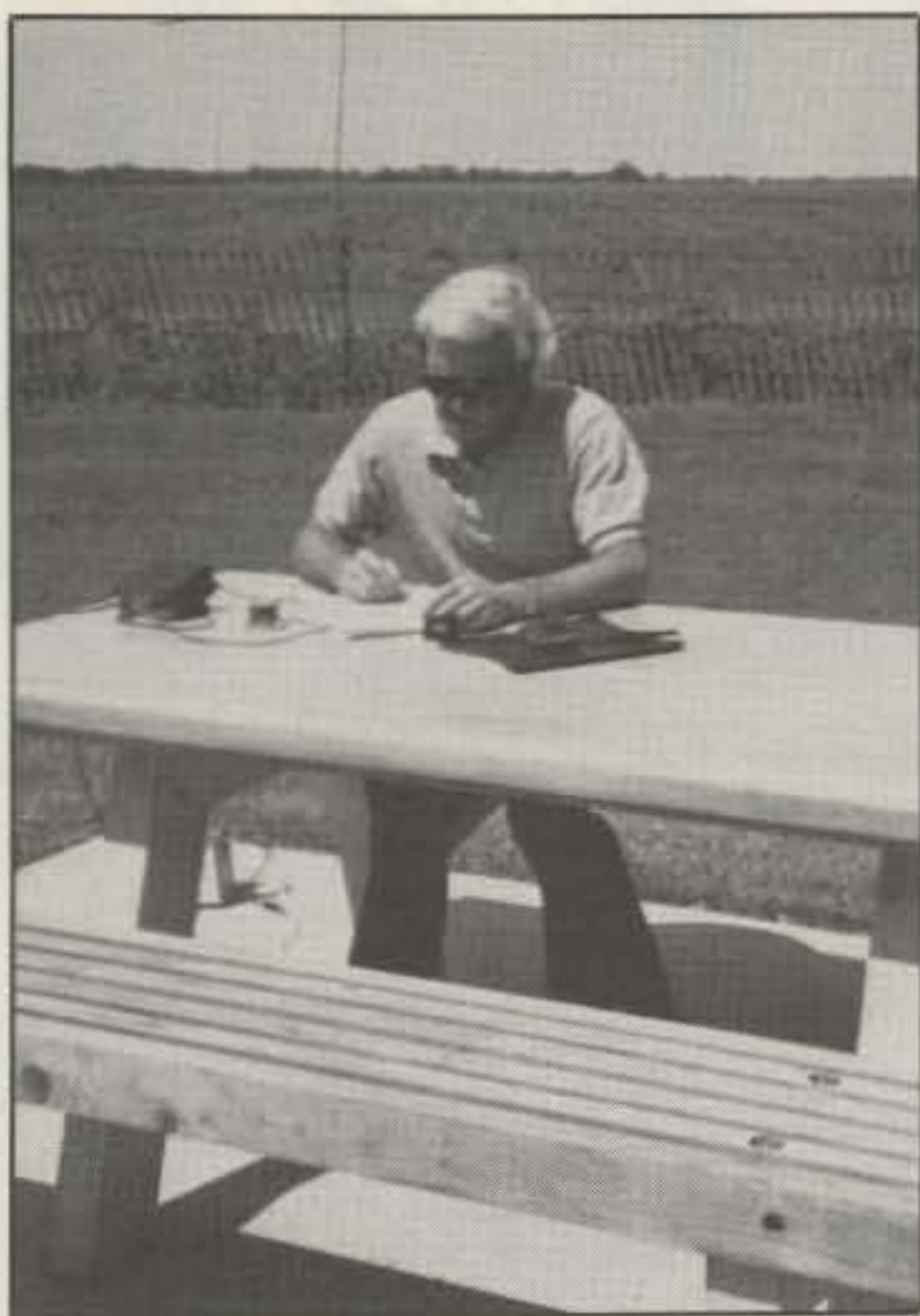


Photo G— This was taken at a rest stop along I-80 in Illinois. Here I am, W6NZ/9, in QSO with a WA3.

#33-2003 at \$15.95, often on sale for less). The gel-cells shown in a couple of the photos were picked up at a swap meet. However, Radio Shack has an interesting substitute—a 6 volt, 2.5 amp/hr cell for \$10.95 (#23-181). A pair of these in series will run this rig for days, and will fit in a package about 3" x 4" x 5". A 12 volt 5 watt solar panel will keep these batteries well charged, but it's easy enough to use a small 12 volt transformer (RS #273-1385) as the basis of a charger. I used a solar panel made by Solarex and obtained from SunLight Energy. The key paddle shown is from the Galbraith Branch of the New Zealand Association of Radio Transmitters, the ZL equivalent of the ARRL.

I have used the rig for a year now, mainly as a portable unit. I have never been at a loss for a QSO whenever I set it up. The sensitivity is such that I can always hear more than I can work. Granted, the rig's selectivity is not the equivalent of the regular station equipment, but it is more than adequate for portable use. Drift is almost non-existent. Problems? Sure. The NE602 is prone to cross-modulation from strong adjacent signals; perhaps the circuit improvements in the QRP-15 version would reduce this, but even as it is, it is not a major concern. While the keying is good, the sidetone is not as good as I would like, and its volume is not easily adjusted. For someone with large hands, there is a potential problem. For me, the rig is about the ergonomic minimum in size. In other words, if it was any smaller, my fingers would be too big!

In summary, the rig really fits its intended purpose—to have a completely portable QRP rig that allows casual hamming

just about anywhere and anytime. The whole system—rig, batteries, solar panel, antenna, key, connecting cables, etc.—fits into a small briefcase and weighs less than 10 pounds. It's great to be able to have a complete amateur radio system that can be home-built, and when finished looks good, is ready to go, and is easy to set up and use. With something like this, you can operate from almost anywhere—even at home!

Parts Sources

Keyer Chip: Curtis Electro Devices, Box 4090, Mountain View, CA 94040.

Keyer Paddle: Galbraith Projects, P.O. Box 1773, Christchurch, New Zealand.

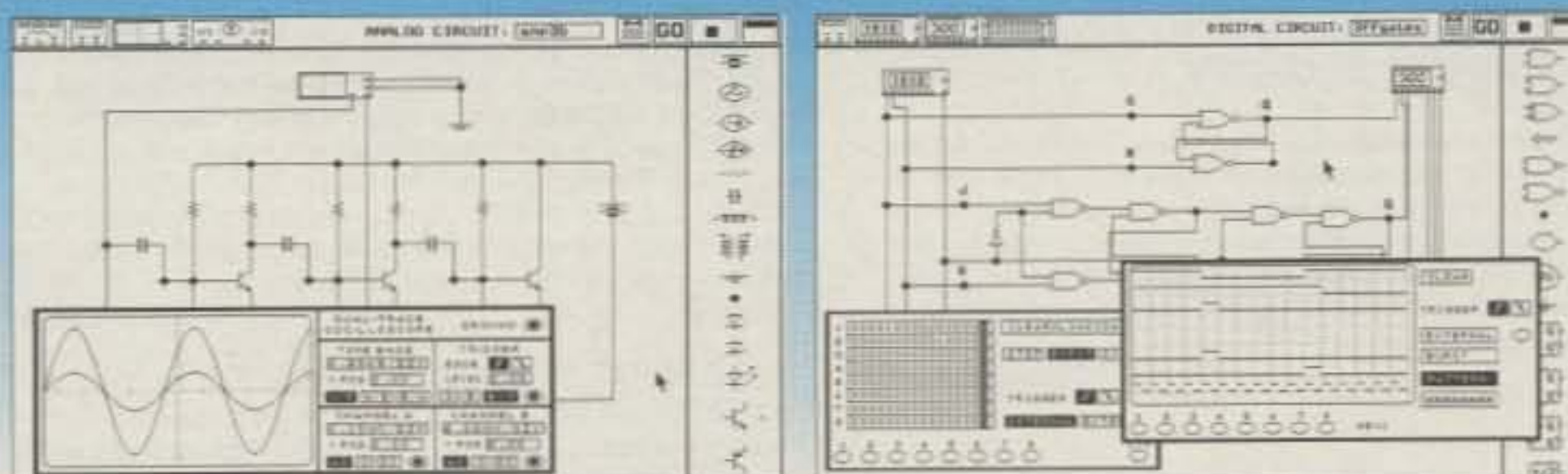
Solar Panel: SunLight Energy, 12225 Mayflower NW, Massillon, OH 44647.

Kit: RadioKit, P.O. Box 973, Pelham, NH 03076 (tel. 603-635-2235).

Circuit Boards only for the QRP-20 and QRP-15 available from: FAR Circuits, 18N640 Field Court, Dundee, IL 60118.

QRP Parts: Oak Hills Research, 20879 Madison Street, Big Rapids, MI 49307. Jameco Electronics, 1355 Shoreway Road, Belmont, CA 94002 (tel. 415-592-8097). Circuit Specialists, Inc., P.O. Box 3047, Scottsdale, AZ 85257 (tel. 800-528-1417). 

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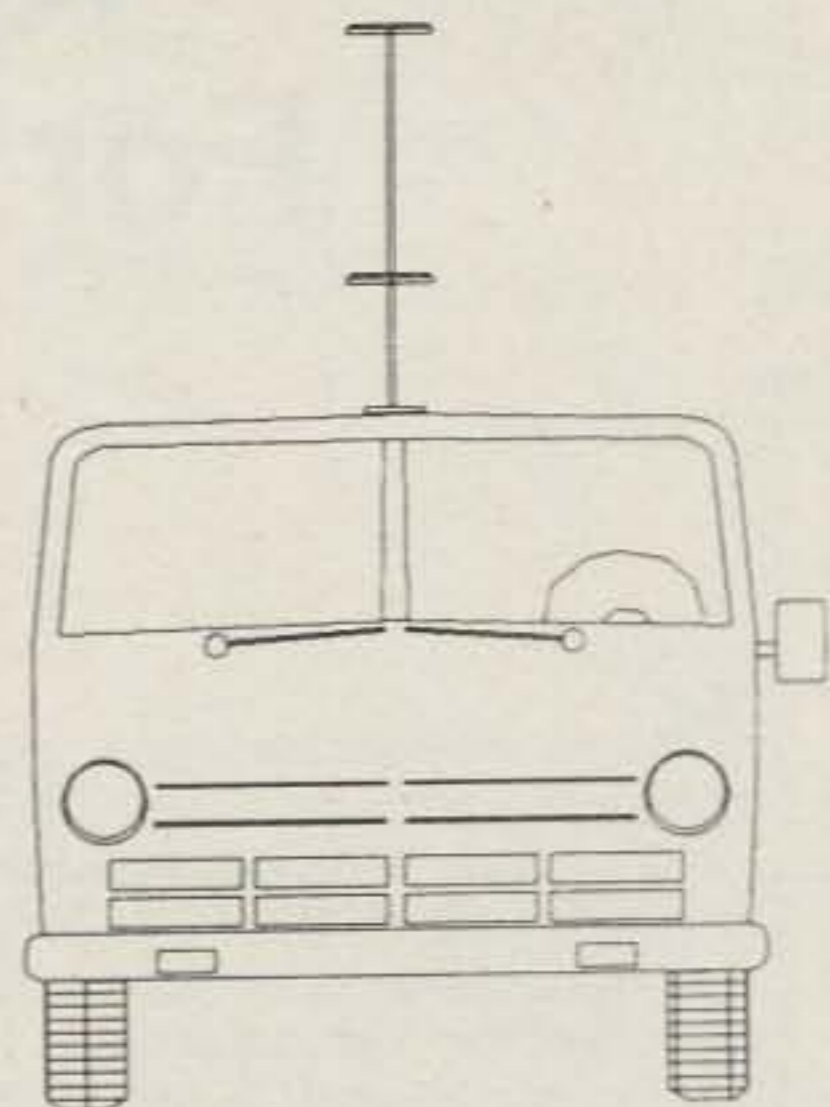
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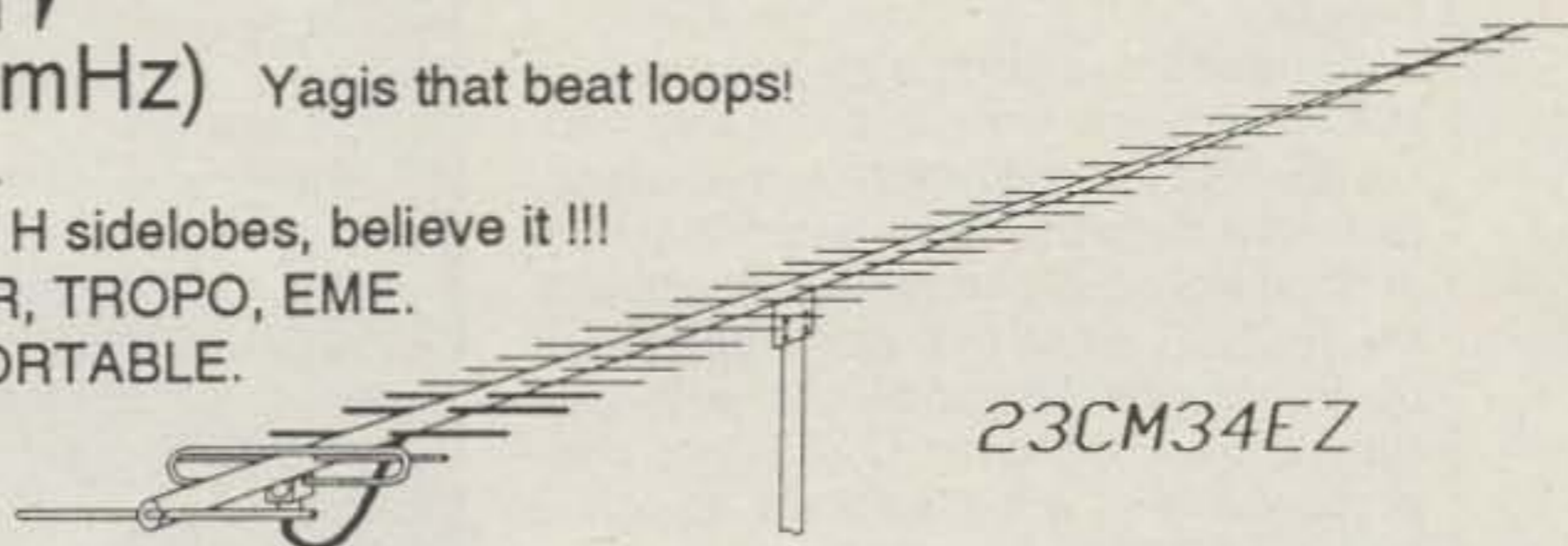
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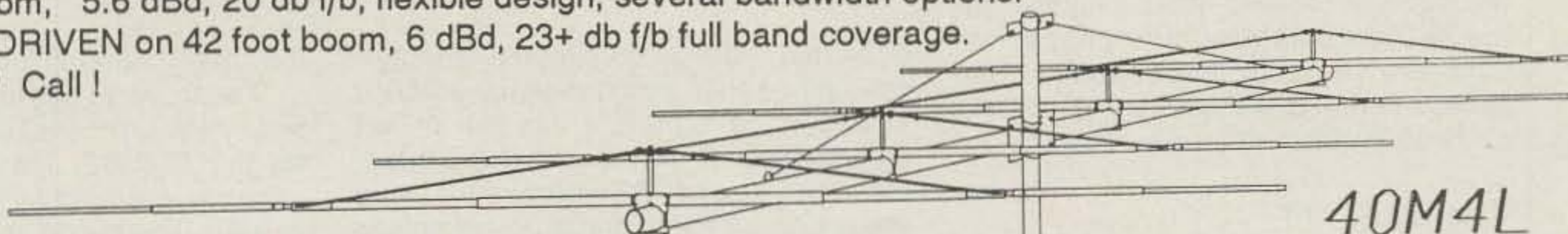
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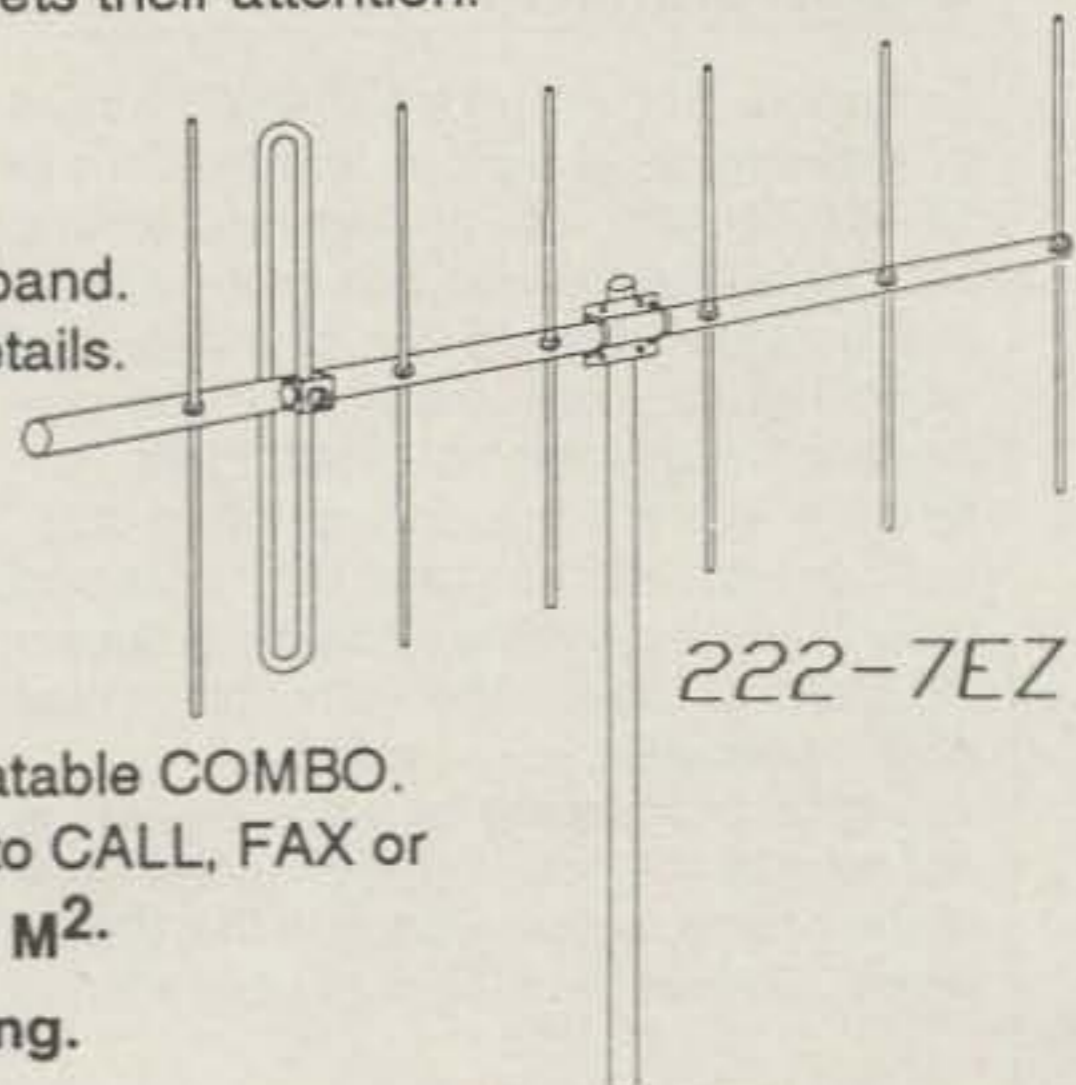
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CQ REVIEWS:

A Trio of Accessories For the Kenwood TS-850S HF Transceiver

BY JOHN J. SCHULTZ*, W4FA

Kenwood seems to have made an all-out design effort with the TS-850S transceiver concept. As was mentioned in the review article on the TS-850S,¹ although the transceiver does carry over some features from other Kenwood transceivers, it is definitely a new, stand-alone design.

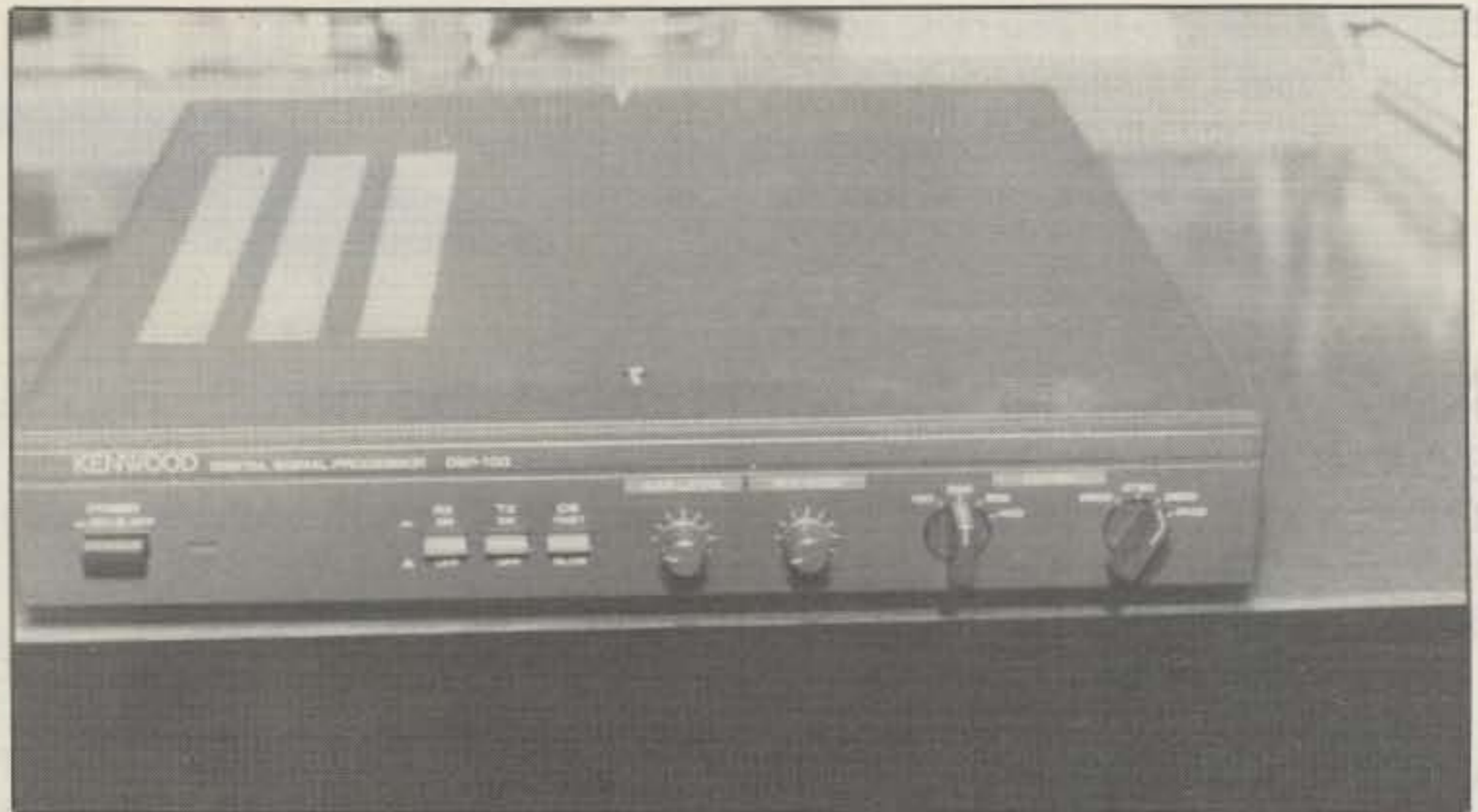
Kenwood has gone a step further, introducing some unique accessories for the TS-850S. At the moment, it would appear that the accessory items to be described were designed solely for use with the TS-850S, since they can immediately be interconnected and used with that transceiver. However, I suspect they probably also will interface with future Kenwood HF transceiver designs.

The three accessory items to be described are the DSP-100 Digital Signal Processor, the AT-300 Remote Automatic Antenna Tuner, and the DRU-2 Digital Recording Unit. These certainly are not all of the accessory items available for the TS-850S, but I thought they had something unique about them and/or represented items that would most interest Kenwood equipment users.

The DSP-100 Digital Signal Processor

Kenwood first introduced digital signal processing as a built-in feature on the TS-950SD and as an option for the TS-950S. Anyone who has heard digital processing in use on one of those Kenwood transceivers knows that the processing produces a distinctive difference. It's not a super quantum step, but there is no denying that the "crisp and clean" audio provided by digital processing catches one's attention and makes SSB, especially, sound great.

Digital processing of voice signals is not new, by the way. I've lost my file copy of the article, but way back in the 1960s, when *CQ* was still being published in 6" x



Front view of the DSP-100. It's not quite as large as it appears in some advertisements. An extremely good feature of the DSP-100 is that all the frequently used controls are "up front."

9" format, I did an article on a commercial device that would digitally process analog voice signals. I thought at that time, and I think the promise is still there, that narrow-band SSB would be the wave of the future. I wrote that article simply to provide food for thought. The commercial device I described "digitized" an analog voice signal so the digital signal stream could be processed by encryption devices.

The DSP-100 certainly has no relation to encryption schemes, but the idea is there that once an analog signal is "digitized," it can be processed, formed, etc., in *controllable* ways that are not possible if one attempts to deal directly with the analog signal. Even relatively slow "on-off" signals, such as CW, can benefit from digital processing, since the relatively fuzzy off-on-off transitions can be controlled precisely.

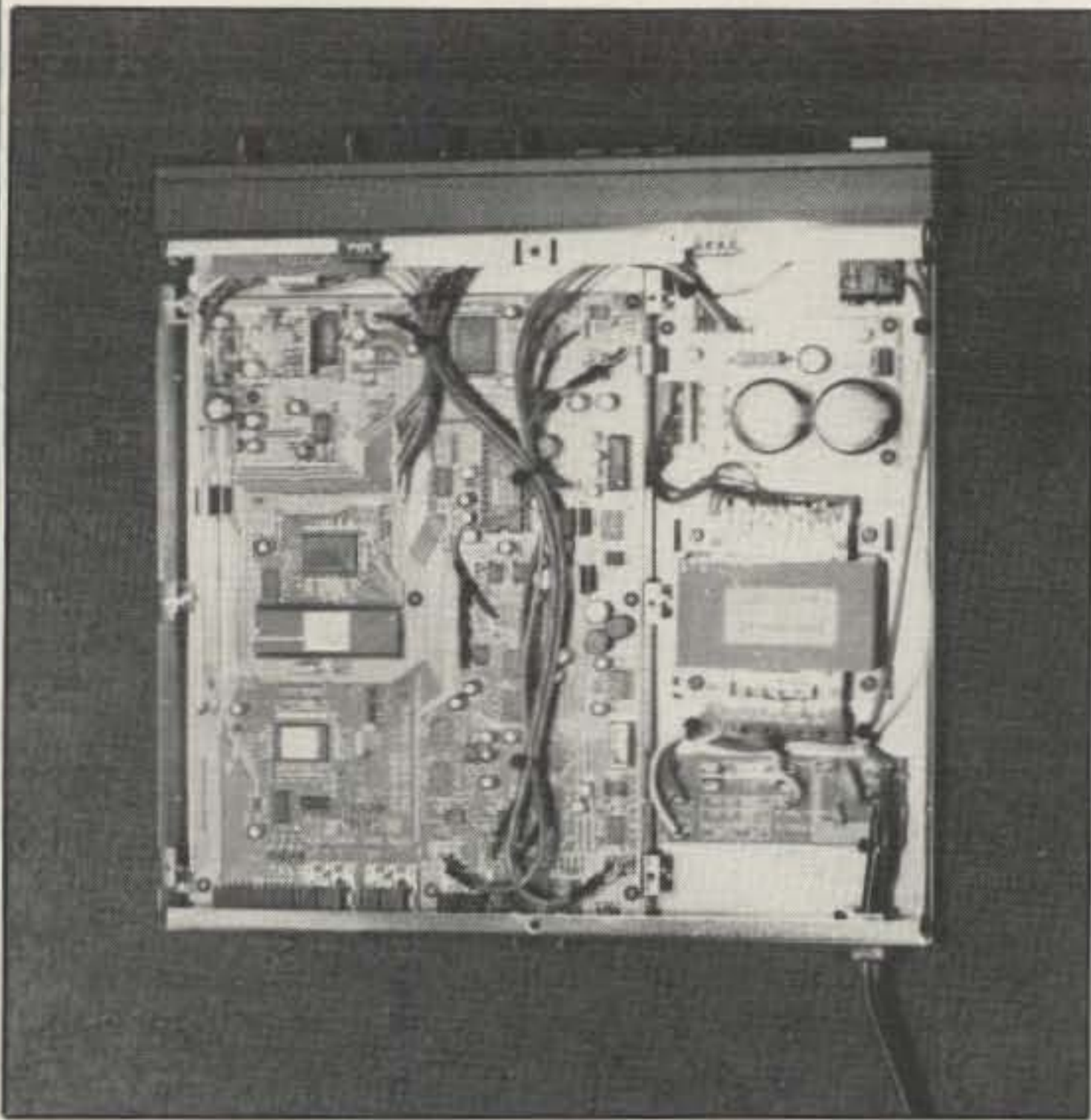
Some Kenwood advertisements show the DSP-100 sitting on top of a TS-850S. The size of the DSP-100 is somewhat exaggerated because of the angle of the photography. In reality the DSP-100 sits very neatly on top of a TS-850S and measures only 1 1/2 inches in height, excluding

the small mounting feet.

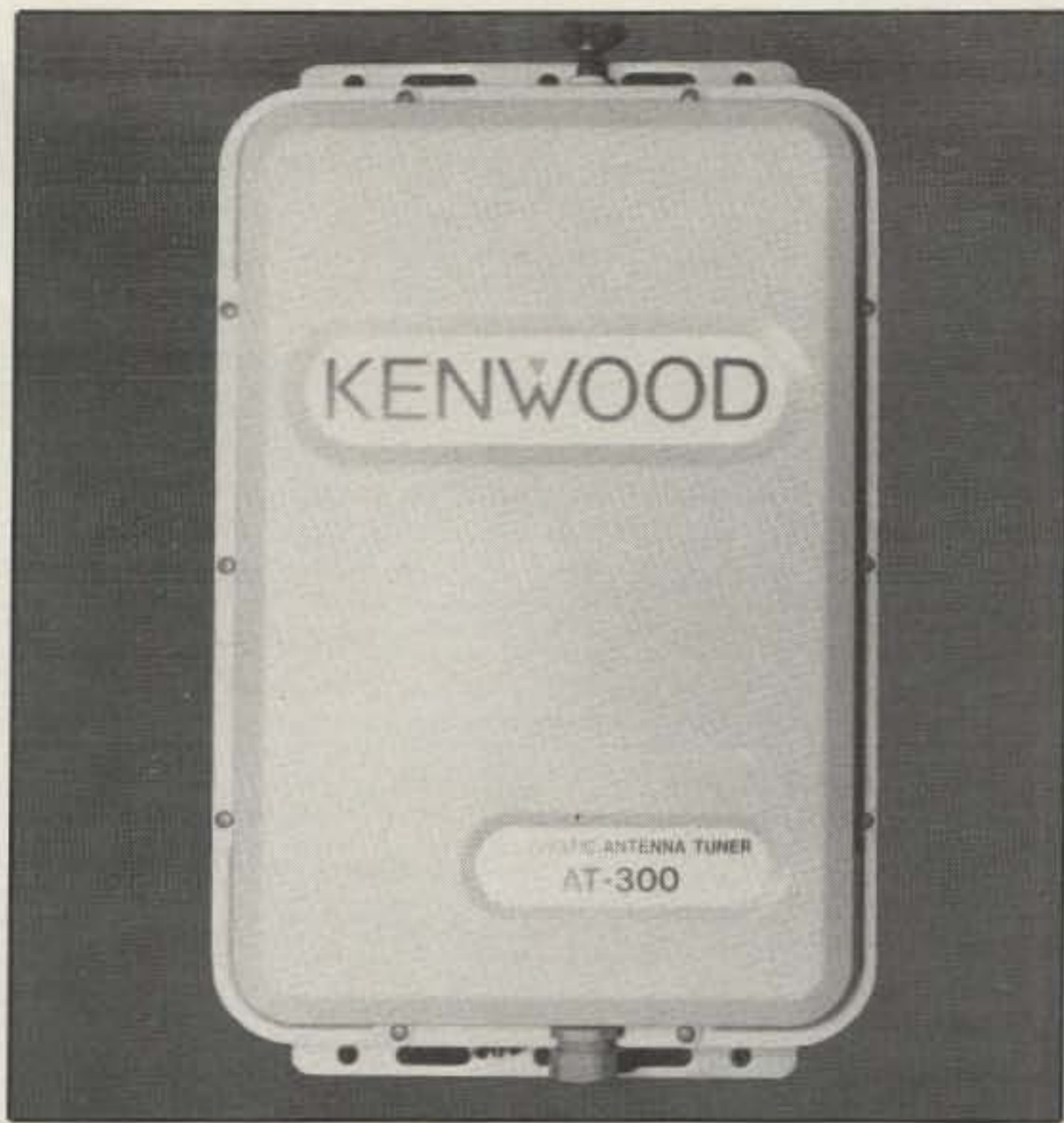
The circuitry used in the DSP-100 is basically similar to that used in the DSP-10 for the TS-950S. The circuitry revolves around a great many standard and custom ICs. There's not too much to be seen from a schematic of the unit, except to be impressed by the extensive circuitry involved, so I'll skip over that detail, although I feel rather sad doing so. As an electronics engineer myself, I couldn't help but be very impressed by the array of 44 ICs, 29 transistors, and almost countless passive components used in the DSP-100. Although the core circuitry of the DSP-100 does appear to duplicate that of the DSP-10, the DSP-100 is not simply a repackaged DSP-10. The DSP-10 had three PC boards, whereas the DSP-100's main processing circuitry is all on one large PC board. There are also numerous differences regarding the external controls.

Well, what does the DSP-100 really do in practical terms? It can digitally process the transmit and/or receive signal at the 36.891 MHz IF and is operative in the SSB, CW, AM, FSK, and FM modes. On

302 Glasgow Lane, Greenville, NC 27858



Looking inside the DSP-100. Some shield covers have been temporarily removed. One large PC board contains the processor circuitry with a vast number of ICs and surface-mounted R/C/transistor components, while a separate AC power supply section is off to the side.



The AT-300 is housed in a sturdy, weatherproof plastic enclosure. Metal end brackets allow the tuner to be mounted on a flat surface or on a mast. A complete set of mounting hardware, 50 feet of control cable, and a neon RF tester come with the unit.

SSB transmit, unwanted sideband and carrier suppression is enhanced (to almost -60 dB), and the transmit audio passband can be tailored using the front-panel controls. A low-frequency cutoff of 100, 200, 300, or 400 Hz can be selected as well as a separate high-frequency cutoff of 2600, 2750, 2900, or 3100 Hz. Due to the digital processing, the filter slopes are quite sharp. If the 200 Hz low-frequency cutoff is chosen, for instance, the response will be down at least 12 dB at 100 Hz. Almost regardless of the microphone being used and in conjunction with the processor/high-boost features in the TS-850S, the transmit audio can be tailored from a very sharp sound to penetrate pile-ups to a softer response for prolonged ragchews on 75 meters. However, I would hasten to add that the evaluation of the sound of transmitted audio is a "very subjective" affair. Some stations will report that digital processing makes little difference, while others will report a distinct improvement in "clearness and crispness" using the digital processing.

As an alternative to shaping the transmit audio, the front-panel filter controls can be used to shape the audio on SSB receive and the transmit audio will continue to be influenced by the processor/high-boost features in the TS-850S. The RX and TX switches on the front panel of the DSP-100 determine if the unit tailors the receive or transmit audio.

For CW transmit operation the DSP-

100 can be used to set the carrier level and the rise and decay times of the CW waveform. A front-panel control sets the carrier level and a front-panel switch selects slow or fast rise/decay times. Normally the slow/fast times would be 4 and 2 ms, respectively. However, they can be changed to 8 and 6 ms, respectively, by means of a rear-panel DIP switch. The 8 ms time is too long for full break-in operation, but some operators may prefer it for soft keying. On CW receive the front-panel filter controls can be used, if desired, to influence the audio passband. On FM and FSK the DSP-100 generates a carrier which can be set by the carrier-level control. On AM the DSP-100 takes over the functions of the carrier-level and microphone-gain controls on the TS-850S.

The DSP-100 does have a rear-panel SSB output level adjustment, and there is even a two-tone signal generator built into the DSP-100. Normally you would not need to make any adjustment. But if you wanted to perform a sort of "system" alignment now and then, the possibility is there. The rear-panel DIP switch can be used to alter a wide variety of operating parameters. Table I presents a listing. Some rather interesting possibilities are present, such as being able to generate a DSB instead of an SSB signal and being able to modify the generated waveform for packet radio.

I found the DSP-100 to be a far more versatile unit to use than the DSP-10 as-

sociated with the TS-950S, although the signal enhancement provided by both units is basically the same. The fact that the DSP-100 has almost all of its operating controls "up front" allows the user to try out or modify adjustments very easily. As with the DSP-10 for the TS-950S, the DSP-100 for the TS-850S is an accessory that I would think would appeal to those amateurs who enjoy trying to fine tailor their CW or voice transmit quality.

The AT-300 Remote Antenna Tuner

The AT-300 is a *remote* automatic antenna tuner that can be controlled by a TS-850S. The tuner can be used in a mobile situation to resonate a short 9 foot whip or in a portable/stationary situation to resonate a wire-type antenna. The tuner is connected to the transceiver by a four-conductor control cable *and* a coaxial line for the RF connection. The tuner can, in theory at least, be mounted at any distance from the transceiver, although in a practical situation you would have to watch that the voltage drop in the control cable does not become excessive. The attenuation introduced by the coaxial line is likely to be less of a problem, assuming a good low-loss cable is used, since the line is operating at, or very near to, a 1:1 SWR.

Table II presents the specifications for

DIP Switch Setting

Switch No.	Position (ON/OFF)	Description		
1	LPF In/Out	Turns the LPF (Low Pass Filter) on or off. This filter determines the high-cut frequency for transmit and receive.		
2	FSK/PSK	Determines the type of waveform generated in the FSK mode.		
3	SSB/DSB	Allows a double sideband, suppressed carrier to be generated during SSB operation when turned ON.		
4	Carrier Suppression notch filter In/Out	Controls the carriers suppression notch filter during transmit operations.		
5	CW waveform Rise-Decay time select FAST/SLOW	Selects the desired CW waveform characteristics. ON FAST: 2 mS, SLOW: 4 mS OFF FAST: 6 mS, SLOW: 8 mS		
6, 7	FILTER switch transmit/receive selection.			
	Switch No.6	Switch No.7	The LPF/HPF switches on the front panel are controlled by the FILTER switch during transmit or receive. It is also possible to fix the filter of transmit or receive at the 100 Hz Low-cut and 3100 Hz High-cut bandwidth.	
	ON	ON		Front switches control RX and TX
	ON	OFF		Fixed during RX.
	OFF	ON		Fixed during TX.
OFF	OFF	Controlled by transceiver.		
8	Receive HPF control	Controls the receiver HPF that determines the low frequency cutoff point.		
9	Transmit HPF control	Controls the transmit HPF that determines the low frequency cutoff point.		
10	Remote Control	Usually turned on. Allows DSP-100 to control frequency response.		

Table I- DSP-100 DIP Switch listing.

the AT-300. Taking a look at Table II and the photograph of the AT-300, one can obtain some feel for the physical size and makeup of the unit. It is definitely a rugged unit that is meant to be used indoors or outdoors and operate over extreme temperature ranges. Note particularly from Table II the range of antenna lengths the AT-300 will accommodate when "working" those lengths against ground (a vehicle ground, radials, or some form of earth ground). A quite wide range of lengths can be accommodated, but of course the efficiency of the antenna system will be pretty much in direct relationship to the length of the antenna used. Random-length wire antennas always tend to be tricky to judge with regard to performance, but the old adage "the higher and the longer the better" certainly holds true for almost any installation.

As can be noted from Table II, the tune-up time can be as low as 1/2 second for frequencies which have been programmed as pre-tuned! Of course, 1/2 second is far faster than you can select a frequency on a transceiver. The reason for the fast response time is that the AT-300, unlike most automatic tuners built into transceivers, does not use any motor-driven variable capacitors. There would appear to be something like 500K + LC combinations which can be formed, although I'll hedge a bit about the validity of my math.

Using relay-switched LC components adds quite a bit to the size of the tuner, but it provides extreme reliability, especially for mobile or outdoor tuner installations. I also like it from the viewpoint of serviceability. If a LC or relay component should fail, there is at least some possibility that you can field service or at least jury-rig a temporary repair fairly easily.

The large band of inductors and relays can be seen in the photograph of the AT-300 with the top cover removed. The fixed capacitors grouped around the relays are a bit harder to discern, but they are quite accessible. Extensive shielding is used around various of the ICs for the control circuitry.

Used with a TS-850S, you only have to press a "tune" switch on the TS-850S, and the AT-300 will tune and the tuner setting will be stored. If a low SWR situation cannot be found, a warning tone will sound after about 20 seconds to indicate that a different antenna length or grounding connection is necessary. Kenwood goes through a lot of detail in the AT-300 manual to explain that random-length wire antennas worked against ground at times can introduce various sorts of feedback problems, RF burns if touched at high-voltage points, etc. In fact, they even supply a small neon tube tester with the AT-300 so you can check if a transceiver's enclosure has become "hot"

Frequency range	1.8 MHz to 29.7 MHz
Power Supply requirement	13.8 VDC \pm 15% Negative Ground max. 2 A (supplied from radiotelephone)
Power Capability	150W PEP (100W continuous)
Operating temperature	-20 °C to +60 °C (-4 °F to +140 °F)
Input Impedance	50 Ω
VSWR	Less than 1.5
Tuning Power	8~15 W
Antenna Required	12 to 23 m(39 to 75 feet); 1.8 to 29.7 MHz 2.7m(9 feet)whip; 3.5 to 29.7 MHz
Tuneup Time	Within 2 to 15 sec (Within 0.5 sec on pre-tuned frequencies)
Dimensions	W258 x H425 x D90 [mm] (10-5/32" x 16-23/32" x 3-17/32")
Weight	3.0 kg (6.6 lbs)

Table II- AT-300 specifications.

from stray RF! I never used it, but it's a nice touch.

Using the AT-300 initially is a bit of fun. You can hear all of the relays very lightly chattering as all those LC combinations are tried, and then there is silence. I tried the AT-300 with some random-length wire antennas worked against a cold-water-pipe ground and never encountered any problems with stray RF. The ground lead to the water pipe was of #12 wire and only a few feet long.

The AT-300 is an extremely solidly constructed unit, and I would estimate it could easily survive for years in harsh environments considering either temperature, moisture, dust, or vibration. I surely wish I could have had a unit like the AT-300 available as I roamed around the world and tried to operate from various QTHs. However, I sort of wonder why Kenwood didn't put a balun in the AT-300. It would have been extremely easy to incorporate one internally, but you can always use an external unit. Then you would have the additional flexibility of being able to use the tuner with outdoor wire-type delta loops or even, at the other extreme, with attic-mounted balanced antennas in situations where there isn't a good ground available.

By the way, I didn't test it out completely, but there seems to be no reason why the AT-300 cannot be used with transceivers other than the TS-850S as long as a control voltage can be supplied to the tuner and a temporary grounding action over a control cable to set the tuner into its tune-up mode. There are many situations in which the use of a remote tuner, such as the AT-300, will provide far better results than having "hot" RF lines from an antenna running into a shack.

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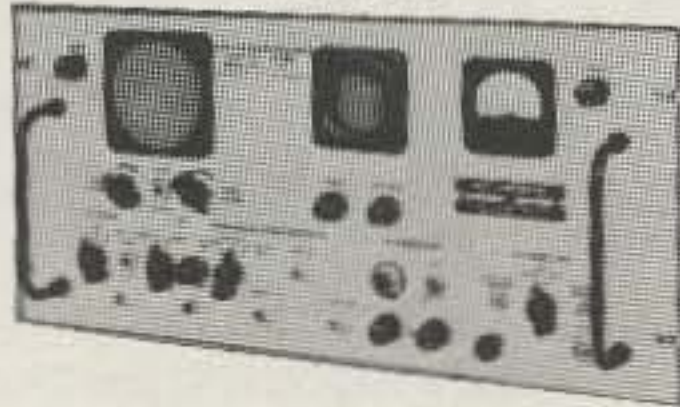
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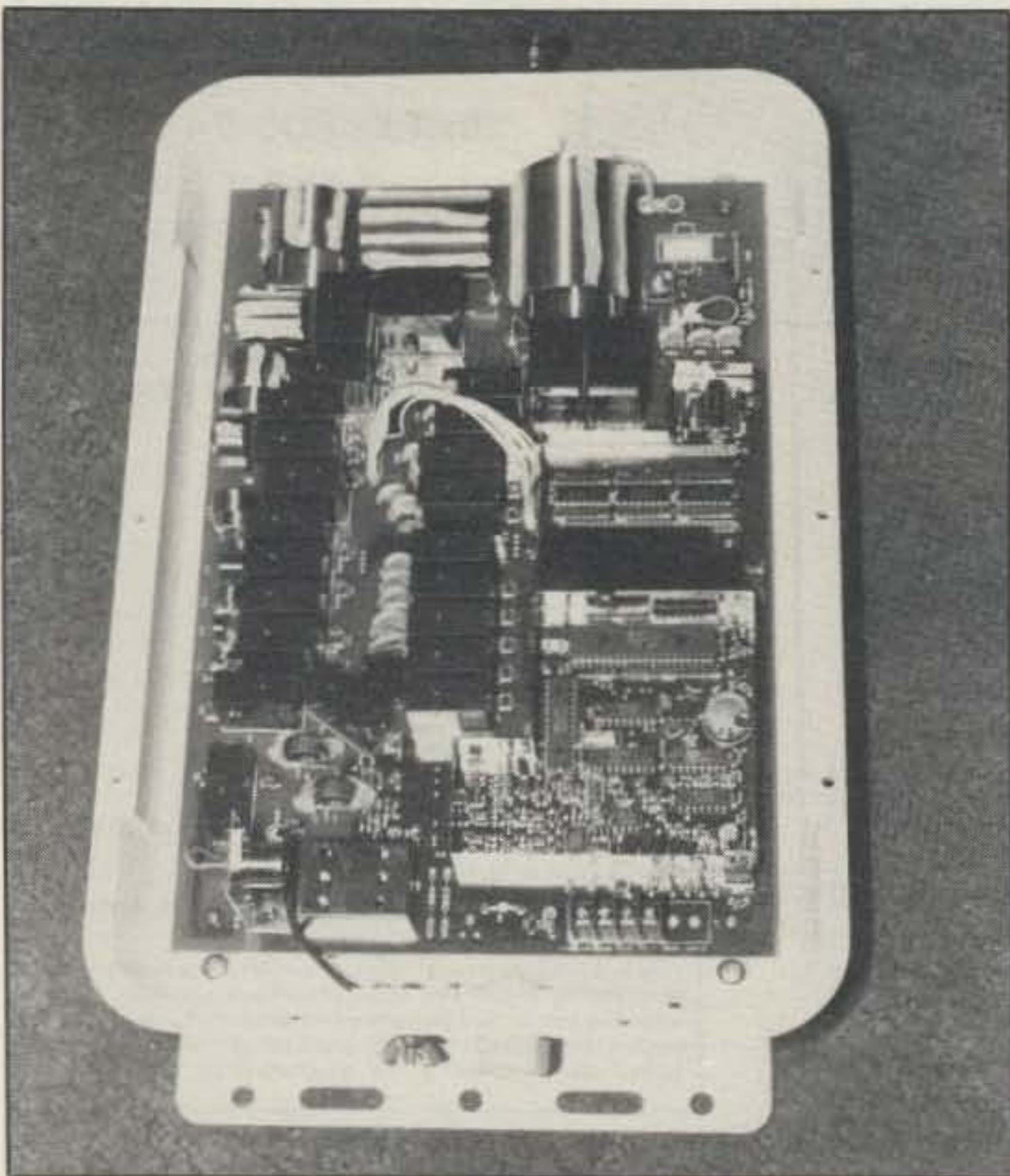
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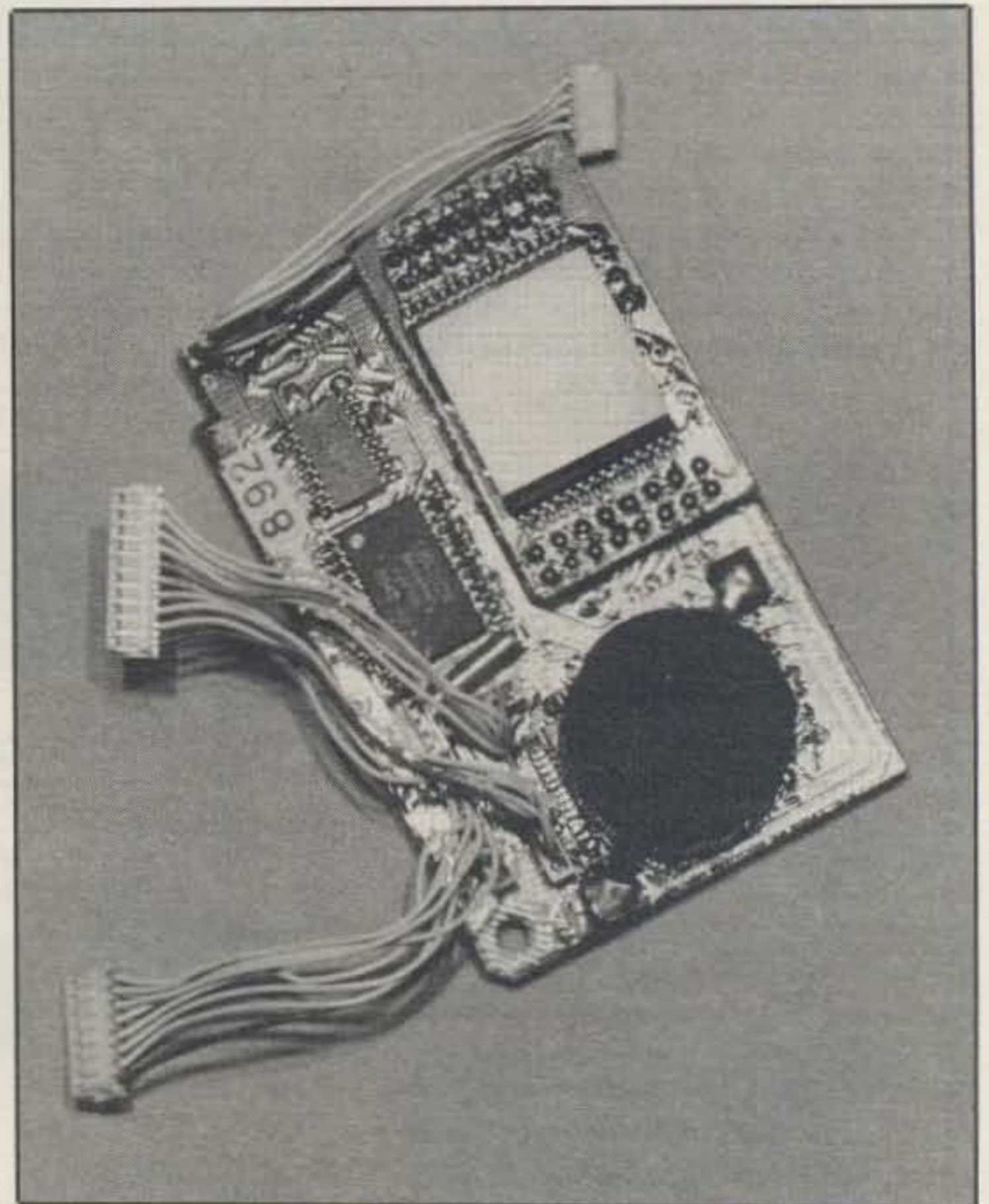


- Frequency of 30-500 MHz/sec
- Power from 2 to 80 W (Ranges are 0-15W and 0-60W or 0-20W and 0-80 W)
- Coaxial output circuit, 51.50 nominal
- Type of modulation: CW, AM, FM, or TV-type signals

This absorption wattmeter is designed to measure output power and facilitate tuning of transmitters. Power is measured under non-radiating conditions, i.e. with the transmitter disconnected from its antenna and feeding into the wattmeter only.



Looking inside the AT-300 a large 8" x 12" PC board can be seen. Various internal shields were removed temporarily for clarity. Note how the eleven coils are neatly aligned at right angles to each other. It's not obvious, but there is a test push-button and "tune" LED so a "tune" sequence could be initiated right at the tuner for setup or test purposes.



The DRU-2 Digital Recording Unit which mounts inside the TS-850S. It provides very good CW/voice record/playback capabilities. An on-board lithium battery (the circular black area) provides memory retention.

The DRU-2 Digital Recording Unit

The original review article on the TS-850S contained a photograph showing a latch cover on top of the transceiver. The cover didn't expose any hidden controls, but was meant for one-time use so the DRU-2 option could be installed. The DRU-2 mounts in place by one holding screw and three cable connections which plug di-

rectly into the TS-850S. It's a very compact piece of technology with ICs mounted on top of ICs and a multitude of surface-mount components on the underside of the main PC board. The unit itself does not have any control adjustments. It has a replaceable 3 volt lithium battery, which might have to be renewed every few years for memory retention.

The DRU-2 will record and playback CW messages or voice signals in any voice mode. FSK is the only mode for

which it cannot be used. Three sets of keys marked **PLAY 1/REC 1**, **PLAY 2/REC 2**, and **PLAY 3/REC 3** on the front panel of the transceiver control the operation of the unit. The 1, 2, and 3 refer to three separate record/playback segments available for any combinations of CW/voice usage which have lengths of 8, 8, and 16 seconds, respectively. However, by means of the alternative function selection scheme described in the article on the TS-850S, the time length for any given segment can be doubled to provide maximum segment lengths of 16, 16, and 3 seconds, respectively. That's a lot of storage capability.

CW recording must be done using the keyer built into the TS-850S, while voice recording is done using the station microphone. A digital display will confirm the recording segment being used and count down the seconds left for recording! Recorded messages (CW or voice) can be played back for confirmation purposes without actually transmitting them. Actual transmission can be done using manual PTT or VOX. If VOX is used, the transceiver will, of course, revert to receive whenever a recorded message has ended regardless of whether the message filled a recording segment. If **PLAY 1**, **PLAY 2**, and **PLAY 3** are pressed in turn,

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all three recorded segments will be played back in succession for either continuous confirmation or transmitting purposes.

The DRU-2 has recording/playback segments of great enough length such that their use can be very varied for anything from short contest calls, to directional CQs, to general CQs, to sked calls, etc. I didn't try it, but I can well imagine that if the VOX delay is set short enough, the DRU-2 can be used to transmit a call very effectively while trying to crack a pile-up. All the operator would have to do is keep hitting the playback button at the appropriate time until his call was recognized by the DX station. Frankly, it sounds too automated to me, but I guess the capability is there.

As with most state-of-the-art digital recorders, I found the DRU-2 delivered an output which sounded somewhat quieter and crisper on playback than the original voice input signal. I liked the sound, but as I said before, the evaluation of the sound of audio tends to be very subjective. The DRU-2 is not set up to record receive audio, although I suspect there must be some way to modify it to do so. In any case, at its relatively modest price the DRU-2 option is quite interesting to consider both for its test capabilities if you like to more objectively evaluate your own CW or voice "sound" or for its use for a multitude of on-the-air applications.

Summary

These days there are so many accessory items available for transceivers that it becomes difficult to pick and choose. However, I think it's better to have that difficulty while manufacturers such as Kenwood maintain a bottom, basic price on a basically excellent transceiver such as the TS-850S. Accessory items, to my mind, fall either into the categories of those items which provide performance enhancement or those which enhance operating convenience. Some operators, for instance, might prefer to first spend their money on a desk microphone, such as the MC-85 for the TS-850S, as an operating convenience rather than on a performance-enhancement device such as the DSP-100. I think if you just take a look at your station setup and operating preferences, the logical addition of accessory items will fall into place. Of course, hopefully one purpose served by review articles such as this is to give operators a bit more insight into the functioning of various accessory items than is possible by a simple perusal of the advertising literature.

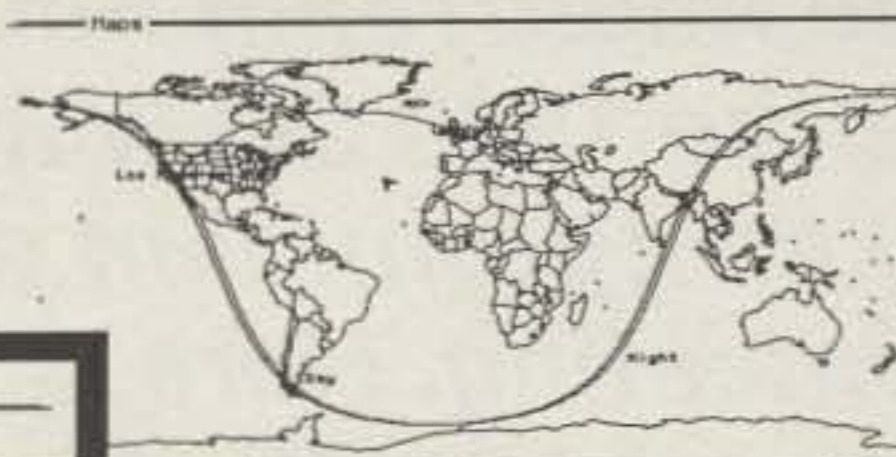
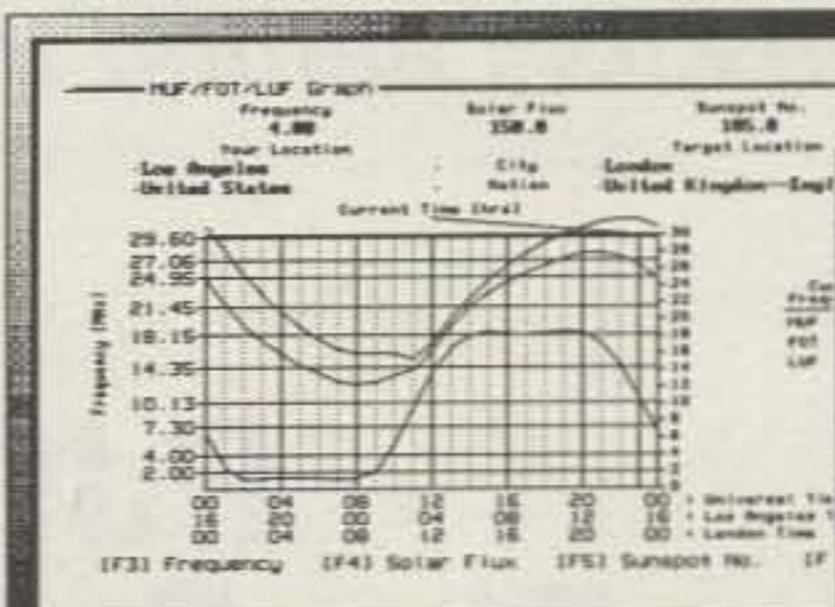
The TS-850S and its accessories are manufactured by Kenwood USA Corp., P.O. Box 22745, Long Beach, CA 90801-5745. The DSP-100 is priced at \$629.95; the AT-300 is \$589.95; and the DRU-2 is \$121.95.



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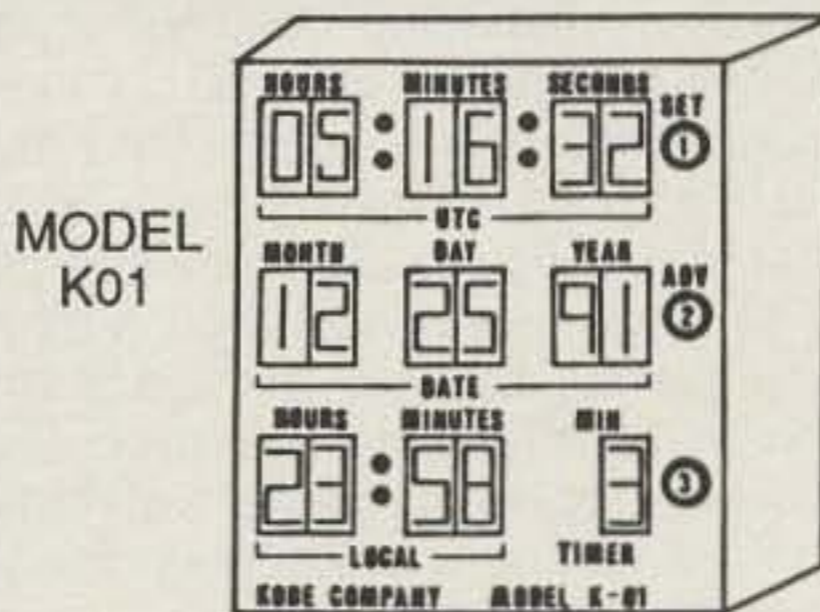
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The RadioTeam Finland DXpedition to Curacao for the 1990 CQ WW DX Contests has certainly taken a prominent place in the history of DX and contesting. Here is the story behind this most impressive effort.



PJ9A/PJ9W The Spirit of Victory

BY FRANK REID SMITH*, AA7FM

The Finns describe their now-famous DX-venture to the Island of Curacao as the transformation of a humble beginning into a magnificent victory. One might expect such reserved language from the Finns, but what transpired in the 1990 fall CQ WW DX Contests at PJ9A/PJ9W has now become unquestionably the largest ever DX/contest operation in the history of amateur radio.

They say journalists should avoid such superlatives, yet anyone in the doubters column has only to look at a few figures. After many years of planning and organizing, the team leaders of RadioTeam Finland, as it is now known worldwide, put out the call for able SSB and CW contest operators. Ultimately, then, this "small" country of Finland would dispatch close to 100 of their best operators, each making the expensive journey from their Nordic homeland of the Midnight Sun to far-away, exotic Curacao of the Netherland Antilles.

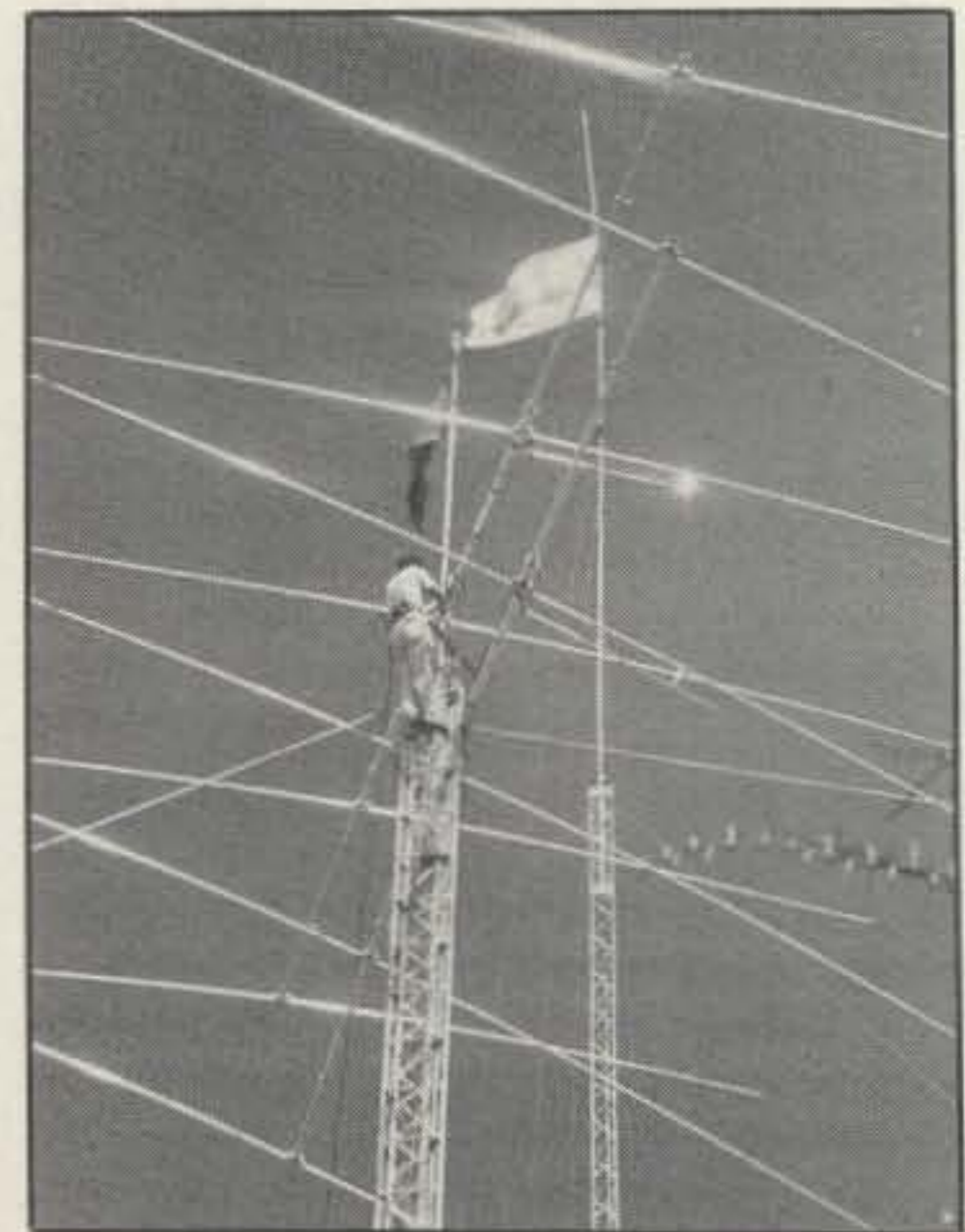
The human effort didn't begin, however, with the assembly of so many talented operators. The assemblage of equipment alone is stupefying. Well over ten tons of handcrafted aluminum towers and beam antennas were shipped in no less than three full-size sea-cargo containers from Finland to Curacao. This included 18 crank-up towers, some as high as 180 feet, and 25 monobander Yagis, including several stacked arrays, all representing a grand total of 508 meters of aluminum piping.

In addition to the many Yagis there were half-sloper beverages for 160 meters, various vertical antennas, and sev-

eral dipoles. Of course, all of this, towers and all, had to be reassembled at the other end!

Naturally, these statistics are only the beginning. Accompanying this aluminum mine were 10,300 feet of coax, 4500 feet of rotator cables, 8600 feet of guy wires, 11,300 feet of nylon rope, and close to 3000 feet of 240 volt/AC electrical wires. Even more enviable were the 15 brand-new Yaesu FT-1000 digital transceivers, each with its full complement of station accessories, including just as many brand-new logging computers.

Unbelievably, the antennas and towers were all manufactured by one highly dedicated individual—Touko Kapanen, OH6RM, whose shop is located in Istmaki, Finland. Touko's manufacturing company, KapaSystems, was an obvious giant in the long list of sponsors of RadioTeam Finland. The firm otherwise manu-



Touko, OH6RM, in final installation of 2 x 5 on 20 meter stacked array. (Photo by K4EIH)



RadioTeam Finland CQ WW SSB participants pose before returning to Finland after the contest. (Photo by K4EIH)

*Consulate of Finland, Phoenix, Arizona

factures sophisticated antennas for use in the military and government services. In fact, the rooftops of many foreign embassies located in Finland's capital, Helsinki, proudly bear KapaSystem's beam antennas.

Along with three other avid DX/contest colleagues—Carl-Heinz "Hessu" Ikaheimo, OH6XY/OH1MXY, Timo Korhonen, OH6NU, and Keijo Veijanen, OH6FT—Touko served as designated team leader of RadioTeam Finland. Among all his amateur friends, he is known by his now-familiar nickname, "Mr. Aluminum."

A multi-multi, worldwide contest effort of this unprecedented magnitude of course could not evolve without years of planning, or in this case some intriguing history. RadioTeam Finland's beginnings actually go back to 1984, but not even to Finland. Actually, it all began in Portugal.

On one cold arctic January day in 1984 Carl, OH6XY, was casually listening in on 20 meter sideband. Tuning across the band, Carl happened across a familiar voice coming in from faraway Portugal—that of the Grand Old Man of Finnish amateur radio, Armas Valste, OH2NB/CT1BCM. (Armas, who is credited with inspiring many new-country DXpeditions [4J1-, OJ0-] became a silent key on March 16, 1991.)

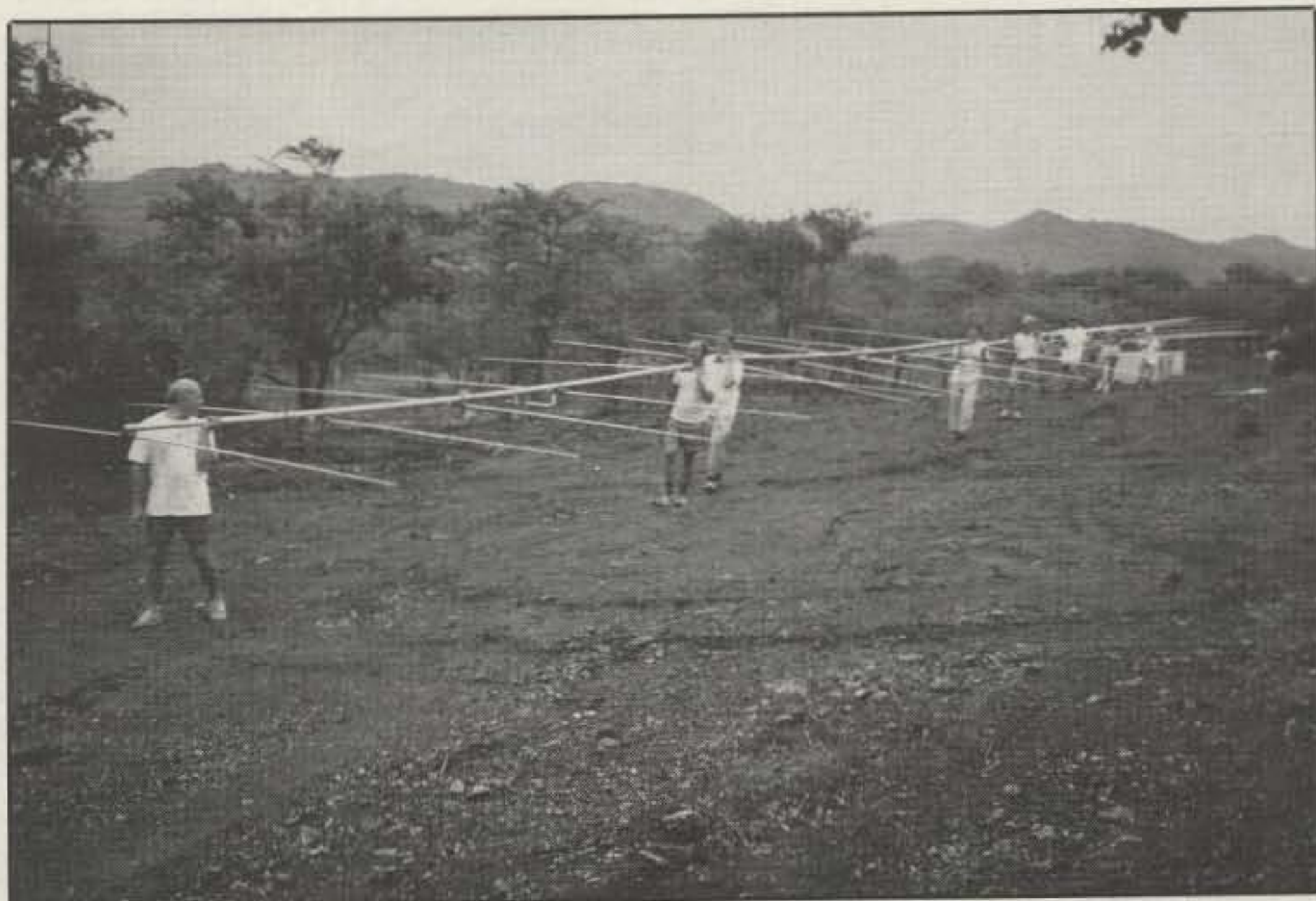
Armas was in a QSO with Carl's good friend Touko, OH6RM, and was discussing plans for one of Touko's towers to be welded together for transport to Portugal. As it turned out, Carl and Touko would drive the tower to Portugal, and the luck of the journey took them to Andorra, C3. The two instantly fell in love with the magnificent scenery they saw in Andorra and wasted no time deciding to return there again, but next time with rigs for a DXpedition.

Carl obtained an Andorran operating license and operated from Andorra in March 1986. All alone for five days, he operated from the broadcasting studios of RADIO SUD. "I can say that the days there were very colorful . . . especially when a hurricane twisted the elements on my Yagi antenna and came close to blowing the whole tower down!" recalls Carl.

In October of the same year Carl organized a multi-single contest expedition, again to Andorra. With the assistance of Jaime Gabot ("Jack") Balda, C31LK, and Ricardo Pallerola, C31ON, Carl obtained permission to operate with a larger group of amateurs and again in the confines of RADIO SUD. Using the call C31LDL, the team produced a score of 3.6 million.

The following year the team participated in the CQ WW Contest using the call C30W and placed eighth overall and fourth from Europe with a total score of 4.6 million.

With new recruits from Finland—



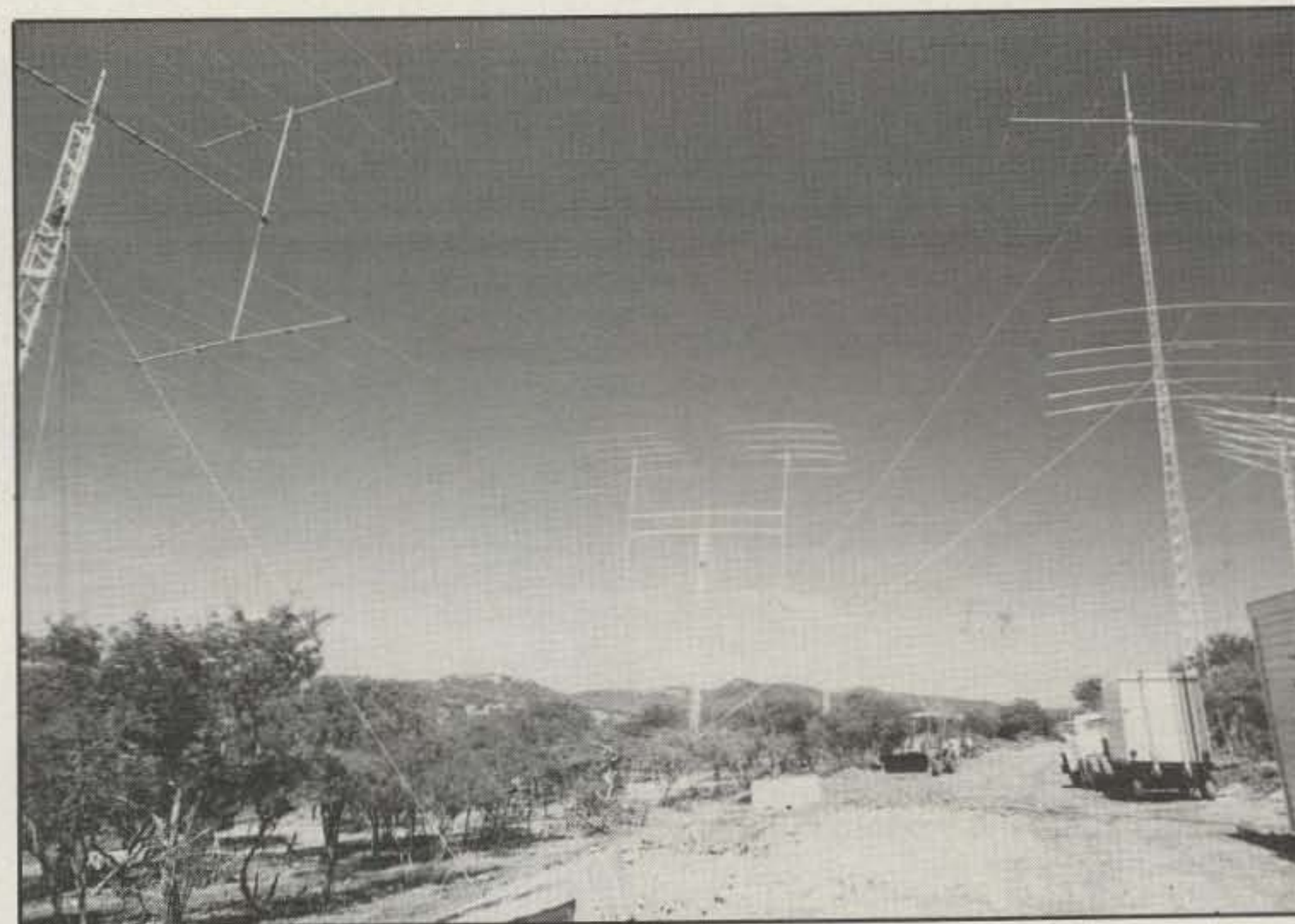
RadioTeam Finland members marching with beams from assembly area to tower site at Devil's Hill. (Photo by WA7LNW)

namely, Timo Korhonen, OH6NU, and Ari "Affe" Vepsalainen, OH6MW—the team discovered their as yet to be revealed secret to success, finishing with an impressive score of 11.7 million, placing fourth overall and second from Europe.

An unexpected nightmare struck RadioTeam Finland in 1989 when the team received word that foreign amateurs were henceforth being denied operating permission in Andorra, the outcome of decisions resulting from apparently mis-

directed policies being promulgated by telecommunications authorities in Spain, France, and Andorra. (Currently, foreign operators can obtain operating permission from Andorra.)

Fearing the worst, Hessu's team then looked into operating from the Island of Guernsey, and did in fact secure operating permission there. It has been said that when one door slams shut, another one opens. The door of better fortune opened up for RadioTeam Finland when one of



Left to right: 20 elements on 15 meters, 20 elements on 10 meters, both stacked, and two 20 meters, one fixed on USA and one fixed on Europe. (Photo by WA7LNW)



Historical Willemstad waterfront buildings, a very popular tourist site. (Photo by WA7LNW)

RadioTeam Finland on Videotape

Sponsored by Yaesu Corporation USA, professional videographer Jack Reed, WA7LNW, has produced a 48-minute commercial-quality videodocumentary of RadioTeam Finland in Curacao. Entitled "Spirit of Victory," the film has won accolades internationally. Premiered in a special viewing for the Central Arizona DX Association in May of this year, the film has been hailed as the new standard by which all DX videos will be compared. It is expected to be released soon to European television broadcasters.

Copies of the film are available at cost in the United States directly from Jack Reed, WA7LNW, 4216 West Redfield Road, Phoenix, Arizona 85023. Make checks payable to Jack Reed in the amount of \$19.95 (Arizona residents please add \$1.00 sales tax).

In Europe, PAL-version VHS cassettes are available from RadioTeam Finland. Please send inquiries to Carl-Heinz Ikaheimo, P.O. Box 1, Korppoo, Finland, or preferably by telefax: 358-26-41194.

CQ magazine's WW DX Contest Directors, Bob Cox, K3EST, flew from America to Finland to hand out a bagful of victory plaques to the Finns.

Upon hearing about the Finns' problems with the Andorrans, Bob gave a quick response: "Why don't you go to Curacao; besides, you won't have to freeze to death!" The Finns are still wondering to this day if Bob could then have imagined the scope and sheer size of the contest operation the Finns would ultimately put together at his suggestion.

Having made the commitment, RadioTeam Finland then went to work with lightning speed as their friends sat by thinking these amateurs had completely lost their minds and gone totally crazy. "It was somewhat reminiscent of Noah of

PJ9W			
Band	QSO	Count	Zone
160	377	46	15
80	1,307	89	22
40	2,306	123	30
20	1,963	159	30
15	5,387	168	37
10	5,011	150	37
Total	19,351	735	179
Multiplier 914			
Summary 52,2M			

PJ9A			
Band	QSO	Count	Zone
160	506	45	13
80	1,873	99	27
40	2,004	122	35
20	3,903	139	38
15	3,689	128	35
10	2,821	126	36
Total	15,676	659	36
Multiplier 843			
Summary 39,269,469			

Table 1—Summary of the PJ9W/PJ9A effort in the 1990 CQ WW DX Contest.

Biblical times," one team member recalls, "where we had to produce under the pressure of severe time constraints but without losing sight of the vision we had set out for ourselves, while the rest of our friends laughed! Now look who's laughing!"

In just three weeks after Bob Cox's visit to Finland, the first overseas shipping container, packed full of RadioTeam Finland's towers and antennas, was off on its voyage to Curacao. Getting wind of this entire operation, Dick Robinson, K4EIH, president of Electronic Equipment Bank, journeyed to Finland to get a

first-hand, behind-the-scenes tour of Touko's factory in Istinmaki. Soon afterwards, two other shipping containers were dispatched to Curacao.

As the first of nearly 100 amateurs began arriving in Curacao, many with their families, the arduous task of assembling the towers and antennas began. With the Coral Cliff Resort and Beach Club designated as official headquarters and chief operating site for the PJ9A/PJ9W operation, the work commenced.

The team hauled in an 18-ton crane and began raising the towers on a hilltop site which the government of Curacao



RadioTeam Finland in the contest. Four stations were manned at this portable operating building. (Photo by WA7LNW)

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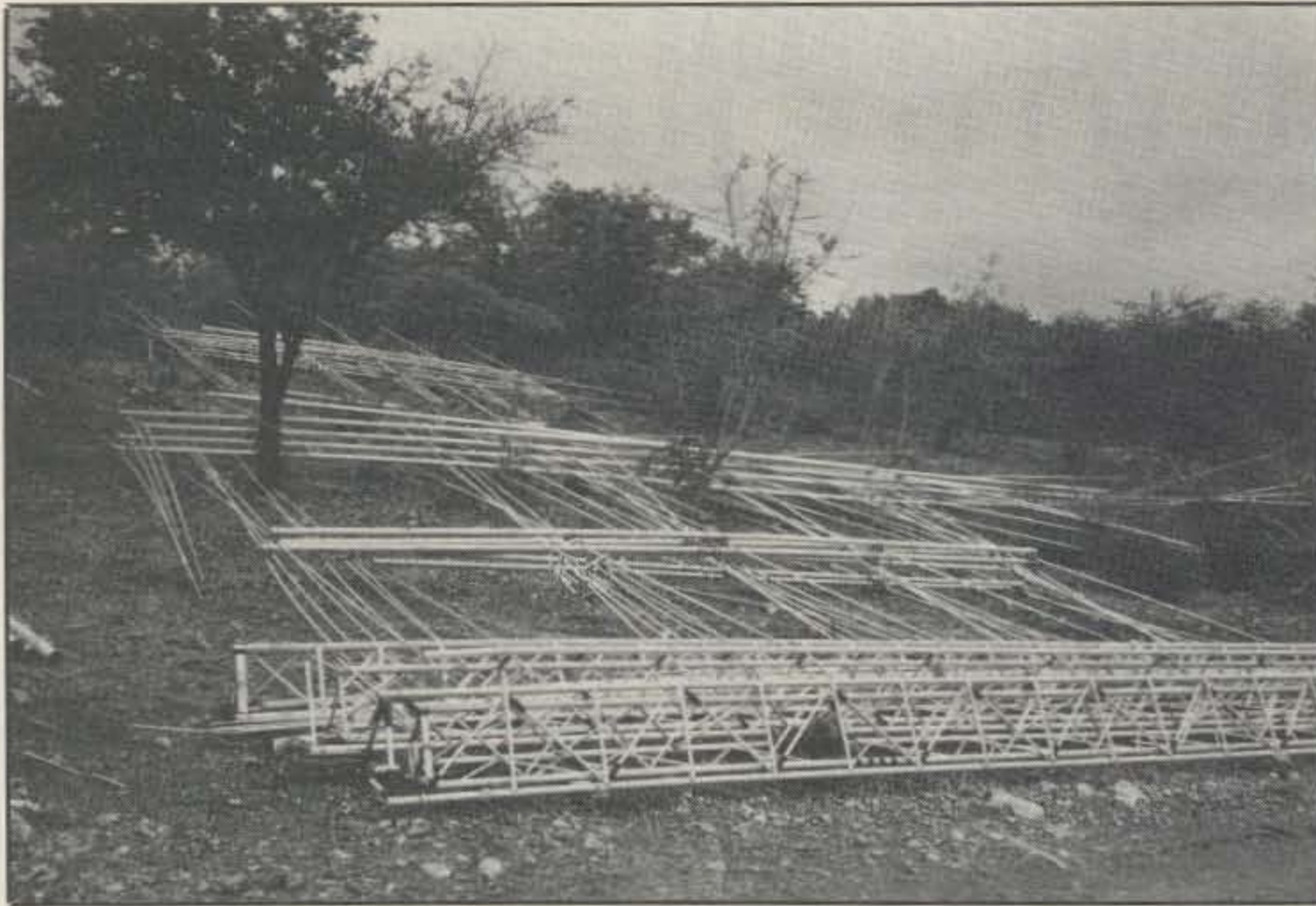
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Inventory of aluminum shipped from Istinmaki, Finland, awaiting assembly under the direction of Touko Kapanen, OH6RM, who manufactured all antennas and towers for RadioTeam Finland. In the foreground are three of the fifteen crank-up towers used in the contest. (Photo by WA7LNW)

shaved of all shrubbery to accommodate their Finnish visitors. After just two hours, observers found themselves awestruck as three monolithic giants rose to take command of this Caribbean landscape. In all their majesty, three 150 foot crank-up towers now stood, the center one bearing a 3-element 80 meter Yagi flanked by its companions bearing 4-element 40 meter counterparts.

Even though the Finns were sensing early signs of victory, it was felt that many difficulties would surely set in. As an example, in their preparing of tower footings, team members discovered that the entire island consisted of little more than decomposed coral. This put well-known Finnish ingenuity to the test. A special anchoring system would have to be devised quickly lest Touko's towers and antennas succumb to the strong winds of the area.

So with help from locals, the Finns found a solution: 3.5 ton pre-cast concrete-block anchors were located on the island and then trucked to the site.

Further aggravating the situation was word that two of the FT-1000s had been stolen at John F. Kennedy Airport during transport to Curacao. And just a day and a half prior to the contest, a major weather front set in, dumping over 2 inches of rain and forcing all work to a virtual standstill.

Just one day before the contest, which turned out to be the hottest, steamiest day of the week, the local electric company arrived unexpectedly and shut off the electricity. This was settled with some traditional Finnish diplomatic maneuvering. Twenty minutes later the disconnect order was rescinded and electricity was restored.

Late that same afternoon freight trucks arrived from Willemstad to deliver two portable operating buildings, each equipped with windows and air-conditioning units. After installation of the team's logging computers, Risto Lund, OH3UU, conducted a fast session in computer logging, and the computers were loaded with copies of MUF-MAP and Mini-Prop. Final preparations were completed just two hours before the contest as the crank-up towers were all elevated to their maximum heights.

A listening station was made ready approximately 18 miles away at the Holiday Beach Hotel. Commanded by Lars Nikko, OH0RJ, of Market Reef fame, the two groups stayed in touch with each other via 70 cm and 2 meter link.

As the contest ended, silence set in as Ville Hillesmaa, OH2MM, and Timo Korhonen, OH6NU, quickly tallied the results. Upon hearing the raw score of 52.2 million, the team erupted with spontaneous cheers undoubtedly heard in faraway Willemstad. The team would later claim a new world record in the CQ WW CW contest November of last year, with a score of 39.3 million.

With all well-earned sense of jubilation aside, it is obvious that an operation this big demands big money as well. So far the turnover of funds in connection with the RadioTeam Finland project has exceeded a half-million dollars. By comparison, this figure is well in excess of even the most exotic DXpeditions of recent memory. Many of the leadership figures in this effort supported their own commitment by taking out personal lines of credit with Finnish Banks. So far the group has received contributions in the meager sum of \$30,000. The team's financial objective is to balance out all bank debits by the fall of 1993. (Donations to RadioTeam Finland are most welcome. They may be sent to RadioTeam Finland, Carl-Heinz Ikaheimo, P.O. Box 1, SF-21711, Korpoo, Finland.)

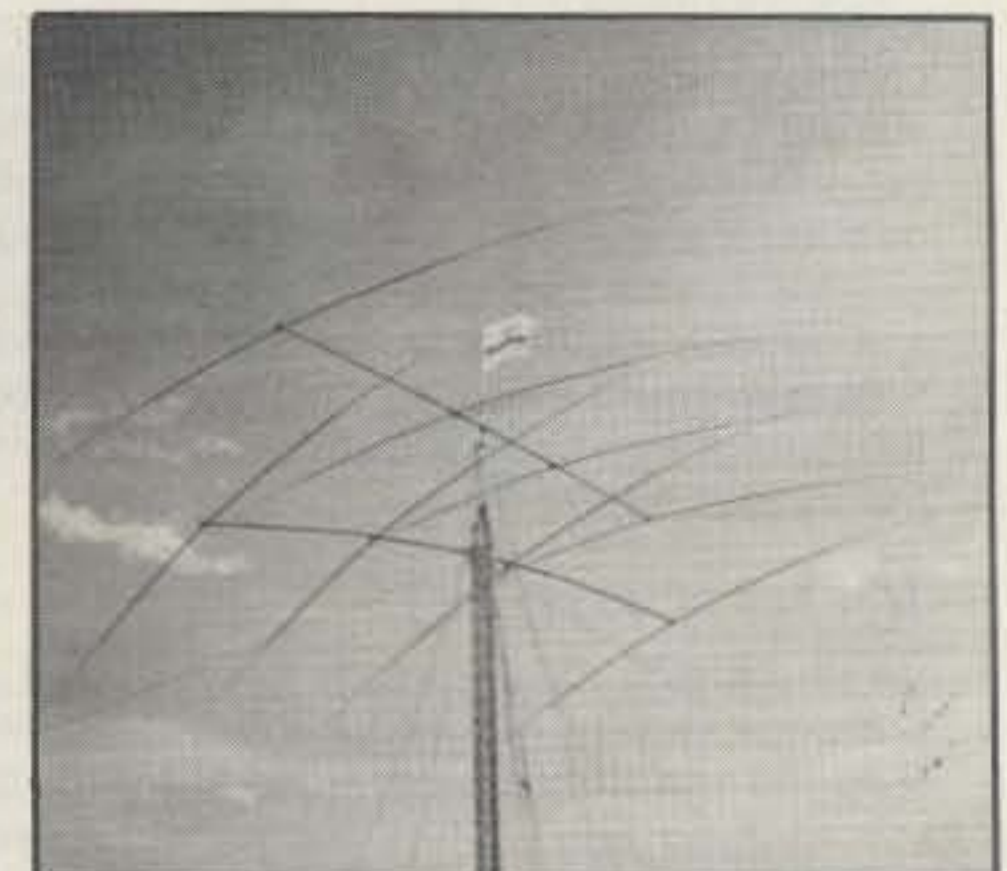
Now, just about a year later, the team reflects upon the victory of success as



Touko Kapanen, OH6RM, "Mr. Aluminum," making the first contact on 80 meter sideband. His 3-element beam worked perfectly. (Photo by WA7LNW)



Partial inventory of supplies, which included over 10,000 feet of coax and 4,500 feet of rotator cables. (Photo by WA7LNW)



The 2 x 4 on 40 meters. (Photo WA7LNW)



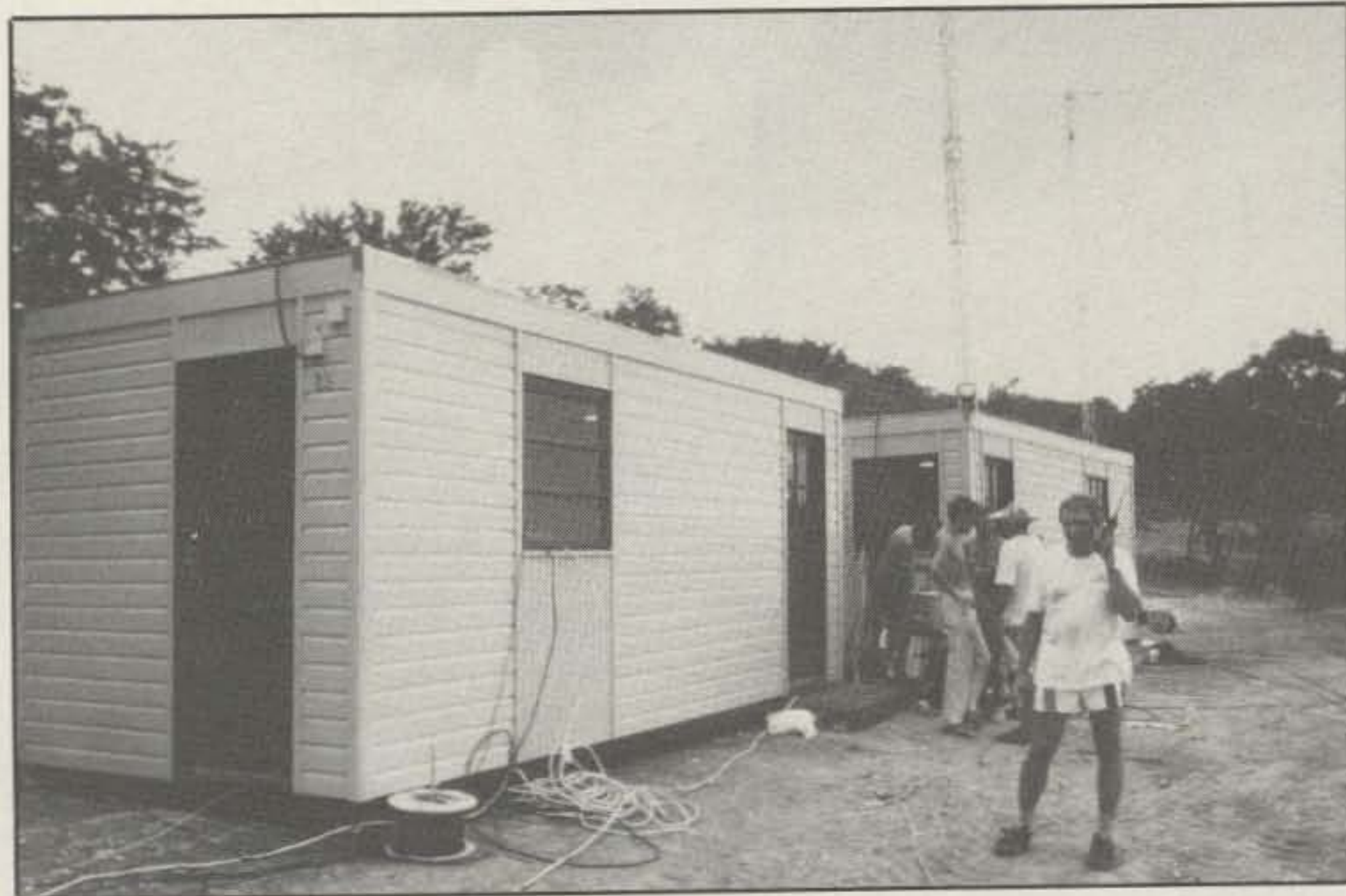
The 300 KW mobile generator being trucked to the operating site.

they plan for the future. Thinking ahead, team leaders paid a visit to several American contesters earlier this year to recruit operators for what in 1991 will be a joint American-Finnish team in Curacao.

Further, RadioTeam Finland has let it be known that for the 1991 contest an ultra-secret contest weapon has emerged from production in Finland and has been sent to Curacao in its own special cargo container. Team leaders will leave it only to the imagination of readers and inquirers as to what this stealth weapon will be. This writer guesses that it may have something to do with the 160 meter QSO count! The only way to really find out is to

stay alert during this month's CQ WW. Good luck in the contest!

RadioTeam Finland wishes to thank its many sponsors who so graciously assisted with this massive effort: Yaesu Corporation USA, Electronic Equipment Bank "EEB"—K4EIH, ICE—W9SU, KLM Royal Dutch Airlines, LandsRadio (Curacao), Coral Cliffs Hotel and Beach Club (Curacao), Benefon Corporation (Finland), Teleste Corporation (Finland), Okobank of Finland, Okobank of Konnevesi (Finland), Pension Varma (Finland), JOT System, KapaSystems—OH6RM, CQ magazine, Salt River Project (Phoenix, Arizona), and Jack Reed, WA7LNW. 



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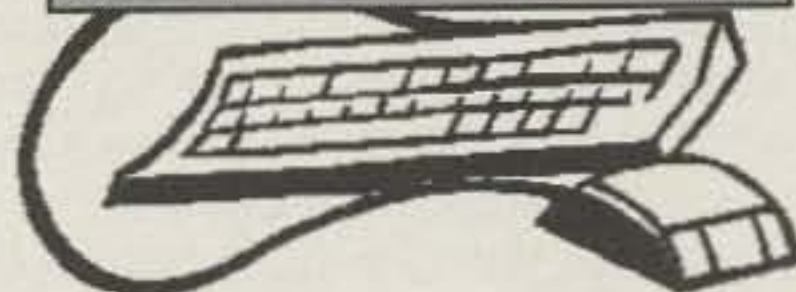
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Now that this series is just about talked out, it's time to make a trip to the hardware store and put some of this talk into practice.

Let's Talk Antennas—Part III

BY LEW McCOY*, W1ICP

In the first two parts of this series I discussed what to look for in gain, and so on. However, all of us are very conscious of the cost of things. Being a notable cheapskate, I would be remiss if I didn't describe some way to beat the high cost of hamming when it comes to antennas.

In Parts I and II of this series I described some low-cost wire antennas. However, inexpensive (meaning really cheap) rotary antennas are hard to find. We shouldn't blame the manufacturers of antennas, as aluminum tubing has gone out of sight as far as costs are concerned. But there are methods to come up with rotary antennas that are relatively cheap by anyone's standards, including mine.

Rotatable Dipoles

I know every amateur gets excited about beam antennas, but you should keep in mind that a rotatable dipole is really a beam antenna. Granted it has no front-to-back ratio, but it does have directional gain versus the very high rejection of side lobes. Also, remember from my earlier discussion that the beams are usually measured compared to a dipole. And this is important—the beam's gain figure usually is represented by no more than 1 to 1½ S-units. With skip signals on the 20 through 10 meters, an S-unit doesn't amount to that much. Also keep in mind that the angle of radiation from a beam as well as a simple dipole is primarily dependent upon the height of the antenna above ground.

Normally, you would use the formula 468 divided by the frequency to determine a half-wave dipole length. However, sometimes as a means to an end, it helps to juggle the antenna lengths. Some years ago, because electrician's thin-wall tubing came in 10 foot lengths and was very cheap, I made a rotatable dipole

for the 21 MHz band that was slightly less than the normal dipole length. The actual dipole length (20 feet) was slightly short of that of a half wavelength by about 2 feet (which would be about 22 feet normally for 21,250 MHz). This shorter length resulted in a feed impedance of about 50 ohms (instead of 72 ohms) plus introduced some capacitive reactance which I eliminated by the use of a small coil. This antenna was (and is) very popular, and many amateurs have worked well over 100 countries on low power using the antenna.

I later used the same technique for the other bands with great success. One

Frequency	Length
14.2 MHz	30 feet
18.1 MHz	24 feet
21.3 MHz	20 feet
24.9 MHz	17 feet

Table 1—Rotatable dipole lengths using reactance coil.

would naturally ask, "Why deliberately shorten an antenna when you could make it a half wavelength long?" The answer is relatively simple when you think about it. Because the criteria for our transceivers

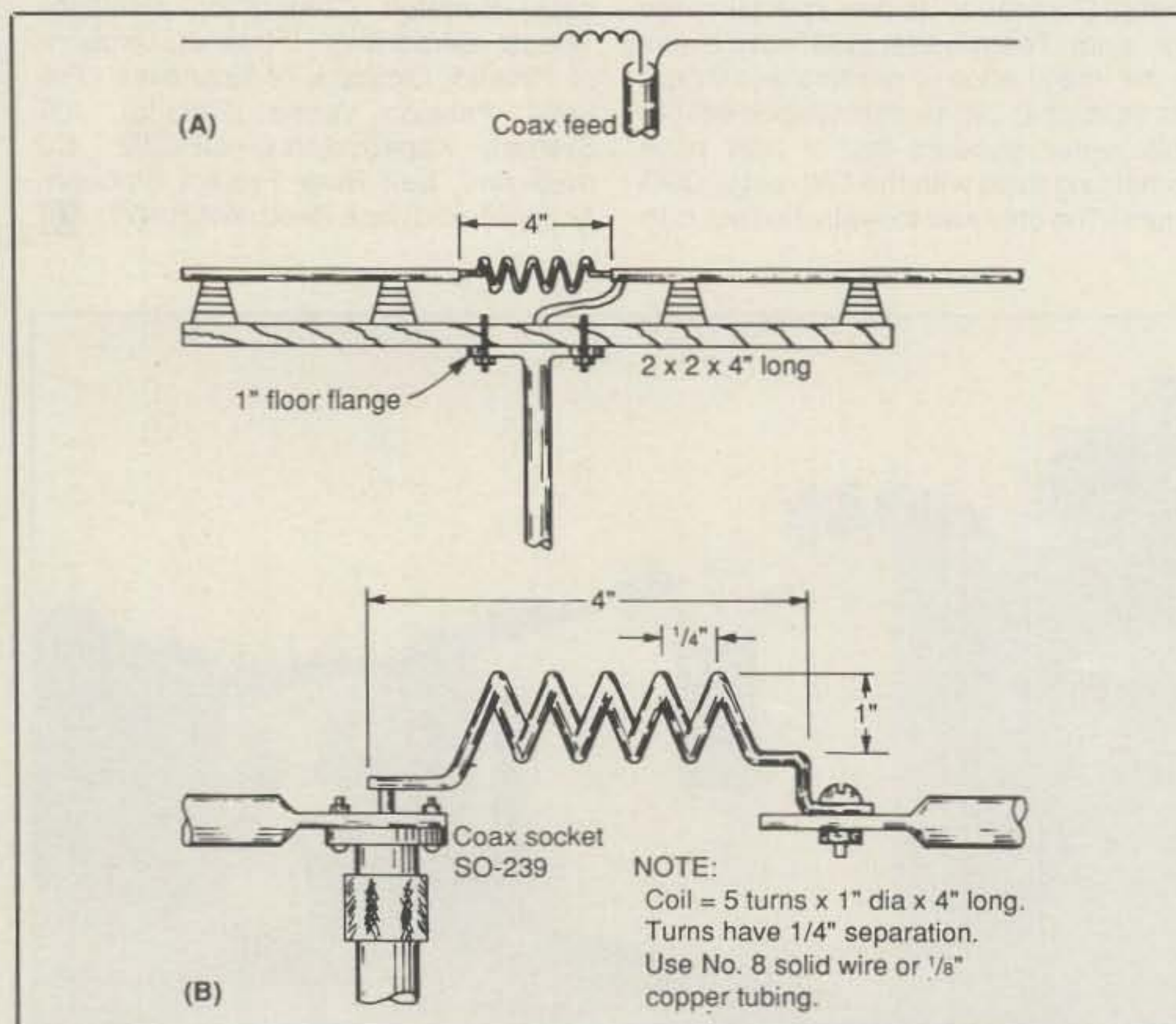
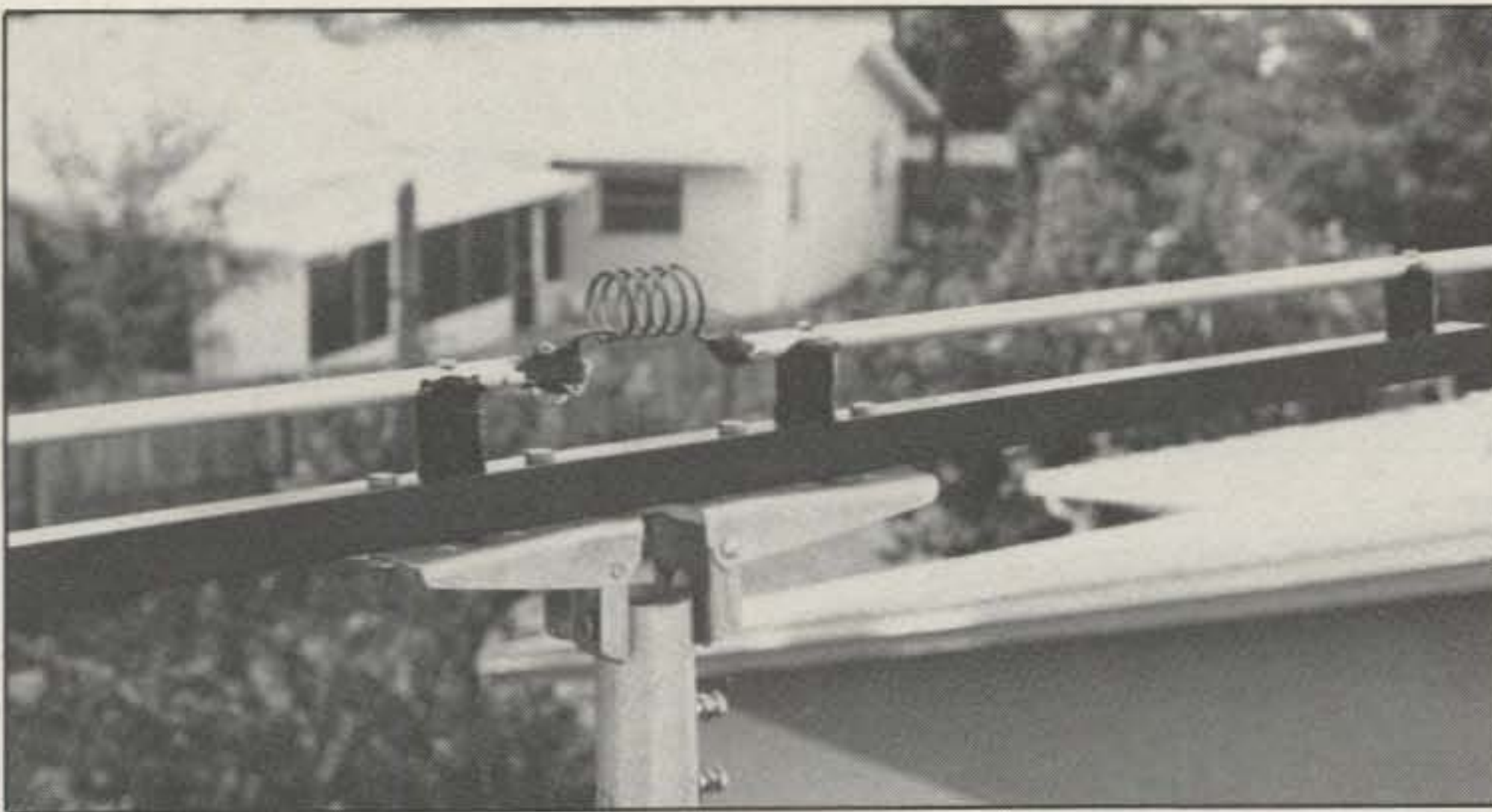


Fig. 1—(A) The rotary dipole described in the text. At (B) the coil is shown mounted on the antenna. The coil can be made from solid No. 8 copper wire or 1/8 inch diameter copper tubing. For antenna lengths for the various bands (shortened dipoles) see Table 1.

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



This is a photo of the 12 meter rotatable dipole antenna made by K4TTO. He made his coil from No. 8 solid copper wire. The support is a Radio Shack roof mount. It is supporting a 1 inch square aluminum support which in turn has four nylon standoffs to hold the antenna proper. As pointed out in the text, a wood 2 by 2 could be used for the element support.

is a 50 ohm load, the concept of using a slightly shortened dipole to get a perfect match is a good one. Using my computer program, I went through the various bands (including the WARC bands) from 20 through 10 to get the correct antenna length for a good match with a specific coil (reactive) size. In other words, one coil fits all the antenna lengths specified for a 50 ohm match.

Let me digress for a moment here. I know that I discussed matching and bandwidth, but a few points should be emphasized. If you can obtain a perfect 1 to 1 match, it means the antenna will exhibit a better bandwidth, as far as working with modern rigs. With the exception of 10 meters, these shortened matched dipoles will exhibit very low SWR across the bands.

As to actual rotatable dipole construction, the antennas need to be made from tubing that is strong enough to support itself. I have had excellent results with electrician's thin-wall tubing, which is very inexpensive and, as I said, comes in 10 foot lengths (and it really isn't too heavy). If you are planning to make a 20 meter rotatable antenna, you'll need on the order of 30 feet. In this case you might have to use slightly larger tubing and telescope smaller sections into the ends. (I wouldn't recommend this material for 40 meters, as the dipole would be too big and heavy (60 or so feet long).

In making these dipoles you have to use your amateur ingenuity and examine what the electrical supply houses have in stock in order to find suitable telescoping sizes. However, aside from 20 meters, one diameter in 10 foot lengths can be used for all bands, including 18.1 MHz and higher. The length for 18.1 MHz

works out to be 24 feet. Two 10 foot lengths of tubing plus two pieces of stiff wire each about 2 feet long should do the job. The wires are mounted on the ends of the dipole (tubing) to electrically lengthen the antenna.

The dipoles can be mounted on a 2" x 2" or 2" x 4" using homemade standoffs (PVC pieces, etc.). See the drawings I have included. The feed point is made by flattening the end of the thin wall for a distance of about 2 inches (see photo). Use a hammer and a flat piece of metal (vise). Next mount an SO-239 coax fitting on this flattened area. Likewise, flatten the opposite side of the dipole end and drill a hole to take a nut and bolt. The coil will fit between the SO-239 center tip (solder) and the nut and bolt on the other section. In this way the shield or outer conductor will feed one side of the antenna, and the inner conductor will go via the inner section of the fitting, through the coil, to the other side of the antenna. The coil can be made from 1/8 inch diameter tubing or No. 8 copper wire.

The 2" x 2" can then be mounted on a floor flange (inverted) and a pipe mast used. Keep in mind the dipole only has to be rotated 180 degrees. (A cheap TV rotor will handle the job.) As I stated above, one of the more popular antennas I designed was a one-element rotary for 15 meters. I used the two 10 foot lengths of thin wall. I inserted a small coil in the center of the antenna to get rid of the reactance resulting in an impedance of 50 ohms. Fig. 1(C) is an electrical drawing of this antenna.

The impedance of a half-wave dipole is on the order of 70 ohms, so using a direct feed with 50 ohm coax would give us a mismatch that could cause problems. The shortening of the antenna slightly,

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plus the coil, puts the impedance at 50 ohms, an excellent match. (You could use a coax stub to get an exact 50 ohm match.) In any case, don't overlook the rotatable dipole. It is a superior antenna and will do darn near as well as a beam.

Incidentally, while I haven't tried it, there is no reason why you couldn't stack dipoles above each other, possibly mounted at right angles to each other and fed with the same feed line. It would be worth a try.

Some amateurs have added reflectors to make a true beam out of the rotary dipole. I don't have the dimensions, but it could be done experimentally, as a reflector would be 23 feet 2 inches long (approximately) for 21,250 MHz. A length of wire at each end of the dipole and some at the center could be added to make up this length. The idea is to make the reflector 5 percent longer (electrically) than the driven element. Properly adjusted, the two-element beam should provide 15 to 29 dB front to back ratio. Adding a reflector will change the impedance slightly, but you still could have a good match, assuming an element spacing of 0.150 to 0.2 wavelength.

For 10 meter amateurs a three-element beam would be a natural using the thin wall. A director, driven element, and reflector, using a gamma match (see any antenna handbook), would give you a 7 dB gain antenna, not to mention having good front to back, etc. All this could be done for probably less than \$30 or \$40. In this case (10 meters) you don't need to lengthen the thin wall tubing, but rather cut it to size for each of the three elements. I would recommend Bill Orr, W6SAI's *Beam Antenna Handbook*, as this has all the details for making beams and matching them. It is available from CQ's Bookstore (\$11.95 plus \$4.00 shipping). What I am really saying here is that there are many ways of beating the high cost of beams. You have to think in terms of cheap tubing and low-cost supports (two by fours, etc). Again, to emphasize, these beams will perform as well as some more expensive ones.

At the Dayton Hamvention this past year Metal and Cable Corp. was selling aluminum tubing and other extruded aluminum types. I hadn't seen or heard of anyone else marketing tubing, so I felt it worthwhile to pass this information along. This company lists, for example, 6061-T6, 1/2 inch diameter tubing, .058 wall, for \$16.95 per 12 foot length. Unfortunately, their minimum order is \$50, so if you plan on a rotary antenna, you might just as well go for two or three elements. They have a two-sheet list of their products available, but I would suggest a business-size SASE: Metal and Cable Corp. Inc., 2170 E. Aurora Road, P.O. Box 117, Twinsburg, OH 44087 (216-425-8455).

My final point is that you can save some dollars by building your own beam.

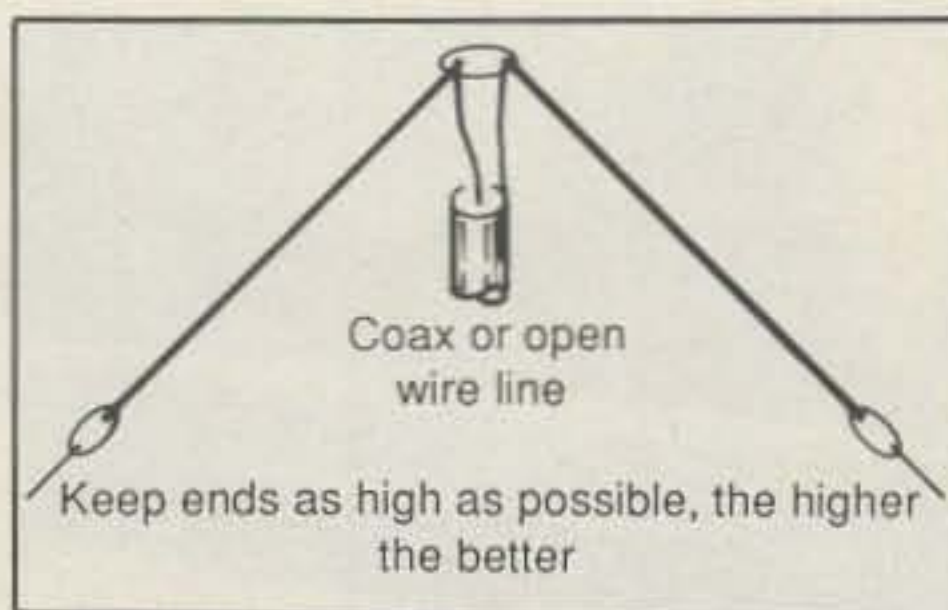


Fig. 2- The inverted-Vee is a very popular antenna. It can be a half wavelength overall. However, the McCoy dipole (make 'em as long as possible) could be used if the antenna is fed with an open-wire type line and a Transmatch. The object is to make the antenna center as high as possible and also keep the ends as high as possible.

Inverted-Vee Antennas

Many amateurs are not fortunate enough to have two supports to put up a horizontal dipole. All the wire antennas I have discussed thus far can be put up in an inverted-Vee configuration and will do a very creditable job. Many years ago, clear back at the inception of amateur radio, amateurs found that obtaining two supports or towers wasn't practical. Hence, the inverted-Vee was born. In this case (fig. 2) a dipole was suspended from the center and the ends made as high as possible.

There are a few facts to keep in mind about an inverted-Vee. First, it is never as efficient a radiator as a horizontal dipole. However, usually the amount of difference is not worth considering unless you are talking about truly "high above the earth" dipoles. Also, an inverted-Vee, depending on the band, frequency, etc., can produce some low-angle vertical radia-

tion which a similar horizontal dipole will not do.

Still another method of obtaining broadbanding (bandwidth) when using coax feeders is to make dipoles that have a 50 ohm non-inductive resistor at the center. These antennas will provide broadbanding, but you must also be aware that as much as 50 percent of your power will be lost. In other words, a good deal of the transmitted power will be dissipated as heat; usually at least half your power is lost this way. But if you want to accept the power loss, such antennas will present an approximate 50 ohm load to your transceiver.

Random Or "Long" Wire, Antennas

A popular type of antenna is simply a random-length wire that is brought directly into the Transmatch and used on all bands. Many amateurs mistakenly call such antennas "long wires." However, a long-wire antenna by definition is one that is several wavelengths long at the lowest used frequency. The primary criteria here is to put the far end of the wire as high as possible and insulate the wire where it enters the house. Keep in mind that even running relatively low power, you can get some rather high RF voltages present on the wire. You should use a ground on the Transmatch, although it isn't absolutely necessary. And that brings up another point—grounds.

Grounds

Many amateurs mistakenly believe that if they use a beam, they should have a good ground at the base of the tower because they feel this will influence their signal. I have known amateurs who run out hun-



Here is another view of K4TTO's antenna. He employed a U100 lightweight rotor to turn the antenna. He also used Penetrox on all connections.

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dreds of radials just to get such a ground. The only thing that such a ground might do is to help establish the impedance of the beam, because height above ground has a lot to do with determining the antenna impedance. However, as to actual signal radiation, such a ground at the base of a tower will have little effect on a horizontally polarized antenna.

For example, let's assume the major vertical lobe from your beam is 20 degrees. There are actually two of these "major" lobes coming from the beam—one above the plane of the beam and one below. The upper beam goes on up into the ionosphere without any ground effect on it to speak of. Let's assume your beam is 60 feet above ground. The lower 20-degree angle travels out a considerable distance from the tower before it strikes the earth. Where it strikes the earth, and the condition of that earth, is what is important, because the signal is reflected back up from the earth to join the upper-angle signal.

There are many other factors involved here, including the ground loss, phase of the two signals, etc. However, what is important is that we really have no control over the earth conditions, because they are so distant from the antenna. This is why I consider extensive grounds immediately below the antenna of little concern.

Grounding Equipment And Lightning

It is always recommended that we have a good earth ground for our equipment. There are a couple of points you should be aware of here.

We run our equipment off the electric mains. Where the power company installs the electricity entrance they usually install a ground. Keep in mind that good old Mother Earth is always our reference for electricity. Let's for a moment, and forgive me for trying to oversimplify this, assume that we have a house that is 60 feet long—not an unusual situation. Let's also assume that our electric entrance is at the opposite end of the house from our station. Suppose we put a ground rod



I dug this out of my old scrap pile and photographed it to show how the SO-239 fitting is mounted on the end of the element. (But don't be sloppy like me; use four nuts and bolts on the fitting.)

down just outside the station and ground all our equipment. This ground establishes the value of the AC voltage entering the house. The ground from our AC entrance is carried to the outlet by the radio equipment. To ground the equipment, many of us install a ground rod at the station. There may be a difference in the earth's resistance between the entrance ground and the station ground, meaning a voltage difference, enough so that we may get "bites" off our equipment.

I am always being asked how to protect equipment from lightning strikes. There are devices available which will help in protecting against minor nearby strikes. Even though a storm may be miles away, your antenna can pick up enough energy to damage solid-state equipment. That's why things such as coaxial in-line arresters are a good idea. However, there is no real protection for direct strikes. I would recommend a large master switch that would disconnect all antennas and feeders from the equip-

ment and lines connected to earth ground. Also, it is smart to disconnect the equipment from the AC mains if you plan on being away for any length of time. Of course, if you are selling your spouse or parents on letting you put up a tower, you might point out that a well-grounded tower will offer a zone of protection for your home—hi!

Conclusions: Transmatches

Should you always use a Transmatch? Well, the answer should be apparent. If your rig doesn't like the load, you need a Transmatch. Do I use one? Always! Even though I use a beam that has a low SWR, I still feed it through a Transmatch. In fact, nothing comes out of my transmitter that doesn't go through the Transmatch. My reasoning is quite simple. The transmitter (and receiver) of my transceiver was designed for 50 ohm input on all bands, all frequencies. The simplest method of meeting this required condition is to always use a Transmatch. Therefore, I do.

In addition, the Transmatch offers a certain degree of selectivity in that it can improve reception simply by the fact that it puts another tuned circuit in series with the receiver (transceiver). Many amateurs who live near an AM broadcast station are bothered by interference from the BC station, particularly on 160 and 80 meters. A Transmatch will go far in eliminating this problem.

It is obvious from this series that a 1 to 1 load is a very desired condition. The only real way to ensure this condition on all bands and all frequencies is to use a Transmatch.

More Conclusions

This material is designed to make you a more astute antenna, or antenna system, user. It is well nigh impossible to tell someone what to use or what to buy. My advice here is to seek help from other more experienced amateurs. For one thing, you must set goals for yourself. Do you want to be a DXer? Maybe you would prefer aiming at contest work, or possibly handling traffic. Or like many amateurs, perhaps you would prefer to just work them as they come.

Join a radio club and ask questions. Amateurs are great people for volunteering information whether it is correct or not! And most important, I would suggest obtaining the *CQ Antenna Buyer's Guide*. There is a wealth of information available in the book. Be sure to write to the suppliers listed in this book, as much valuable information can be obtained from their literature.

Please don't write to me asking me to design your antenna system. At 75-plus, I am getting far too old for the time involved. Now isn't that a heckuva way to end an article?



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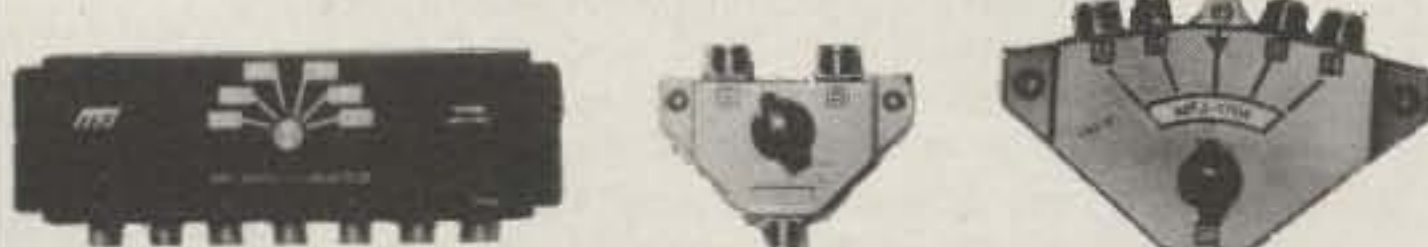
Covers 2 Meters and 220 MHz. 30 or 300 Watt scales. Also reads relative field strength 1-170 MHz and SWR above 14 MHz. 4 1/2 x 2 1/4 x 3 in.



MFJ-812B \$29⁹⁵

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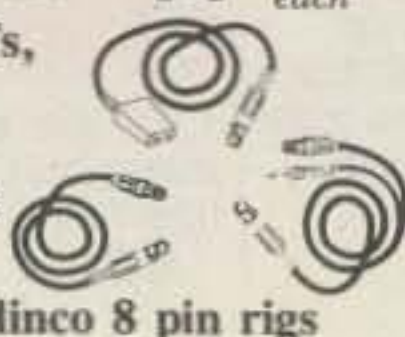
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Improved 1/4 wave ground plane

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For \$12.95, you get an improved 300 watt 1/4 wave ground plane for 2 Meters that'll bring up repeaters as well as or better than any 1/4 wave ground plane — even if it cost twice as much.

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Elements simply screw into the boom. It's easy to store and sturdy enough to use as your base station antenna.

The extra gain and directivity from this 3 element beam could get you through when a vertical can't. It'll make the difference between "you're breaking up . . . can't copy you" and "OK, go ahead with your traffic. Solid copy."

You can center mount it and use it vertically on FM or horizontally for SSB. By rotating it you can minimize QRM. Unique design also lets you end mount it vertically or horizontally on the leg of a tower . . . great for packet and PacketCluster™.

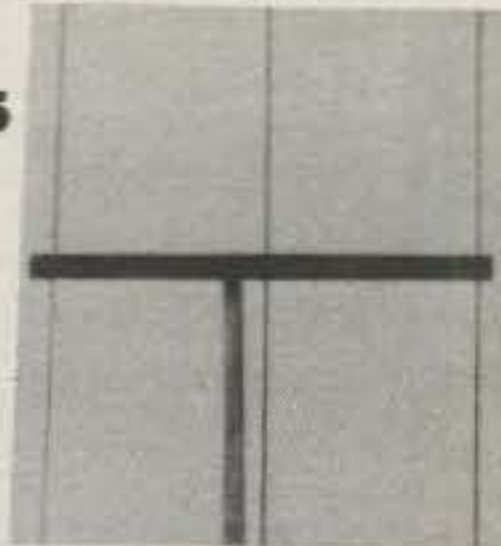
Its compact 2¾ foot boom gives you a calculated gain within 1 dB of a four element Yagi with a boom nearly twice as long.

Extra thick elements maintain high gain and directivity over virtually the whole 2 Meter band. A ferrite choke balun gives you excellent feedline decoupling. Coax coupling is further reduced by mounting the SO-239 connector behind the reflector.

Elements and boom are made from strong lightweight aluminum. They're protected by MFJ's Permanent Molecular Bonding Technology™ — MFJ's exclusive new coating that's so tough it won't come off unless metal comes off.

Weights just 2 pounds. Boom is 30½" x 1¾" x 1¼". Mounts easily to mast or leg of a tower with single included U-bolt. Mast not included. Made in USA.

For a well spent \$39.95, you can take the MFJ-1763 2 Meter portable Yagi with you wherever you go and have the "oomph" and directivity of a beam. Get yours today.



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2 Meter Halfwave Vertical J antenna

MFJ-1730

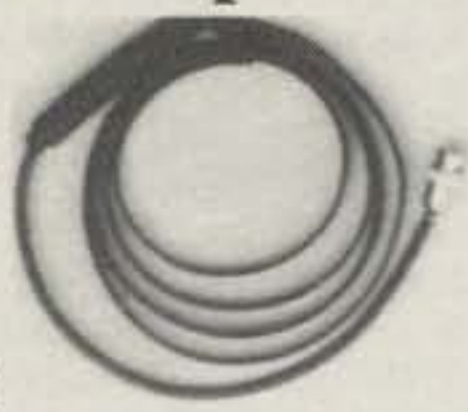
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Roll up this half-wave 2 Meter J-antenna and stick it in your pocket!

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Get base station performance on the go. Just hang your Pocket Roll-Up in the clear, plug the handy BNC connector into your handheld and find nice comfortable couch to enjoy some QSOs.

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The Dual Bander™ for 2 Meters and 440 MHz. MFJ-1712, \$14.95. Got a new dual band handheld or separate units? One antenna fits all. It's a 1/4 wave for 2 Meters and a 5/8 wave with gain for 440 MHz. 7¼" collapsed, 19" extended.

The Pocket Linear™ 3/8 Wave, 2 Meters. MFJ-1710, \$9.95. Carry this pen size antenna in your pocket like a ballpoint pen. When you're using your rubber ducky, on the fringe and noisy, put on The Pocket Linear™, extend it to 24½" and carry on your QSO. Has pocket clip. 5¼" collapsed.



Tri-Band mobile antenna

MFJ-1724

\$14⁹⁵

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MFJ-949D

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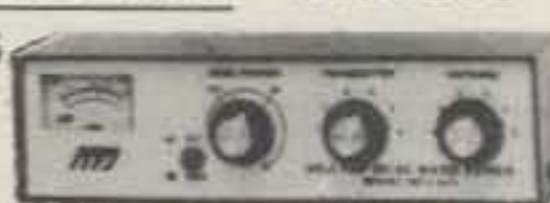
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THINGS TO LEARN, PROJECTS TO BUILD, AND GEAR TO USE

TVI Revisited

Today's modern HF solid-state transceivers are pretty good as far as harmonic suppression is concerned. All the well-known brands meet or exceed the FCC specification for signal purity (Part 97.307 [d] of the Rules), which restricts the harmonics of today's HF rigs to a specific level. As an example, for a 100 watt transmitter the harmonics must be "40 dB down" from the fundamental signal.

Most equipment easily reaches this level of suppression. "Forty dB down" sounds like a lot of harmonic suppression, and it is. But many times it isn't enough to keep your signal out of your neighbor's TV set! Channel 2 is a real bummer, as the second harmonic of 10 meters and the fourth harmonic of 20 meters fall right in this channel. The third harmonic of an 18 MHz signal falls into channel 2, too! Channel 3 is very susceptible to TVI. The higher channels can also prove troublesome, particularly in an area of low TV signal strength. What to do about it? Additional harmonic suppression for the transmitter will help a lot.

The Low-Pass Filter

The best solution to harmonic problems is the addition of a low-pass filter to the transmitter, plus other suppression measures (fig. 1). You can build a low-pass filter (see the various handbooks), but adjusting it for maximum harmonic suppression is a tricky job. My advice is to buy a good one, as the units are not expensive.

Table I gives you an idea of what you can expect with a good low-pass filter. In this case, the filter tested is the Nye-Viking model 020-001, rated at 2 KW PEP. It is a 50 ohm filter with less than 0.5 dB attenuation below 30 MHz. It provides over 40 dB additional protection to channel 2 and more than 80 dB protection for channel 3. Attenuation at higher channels is better than 65 dB. Another filter tested, the Drake TV-3300-LP, provides better than 80 dB protection of channel 2. Channel 3 protection is about 74 dB. Both of these filters achieve a high attenuation on a particular channel due to series-tuned notch circuits incorporated in the design.

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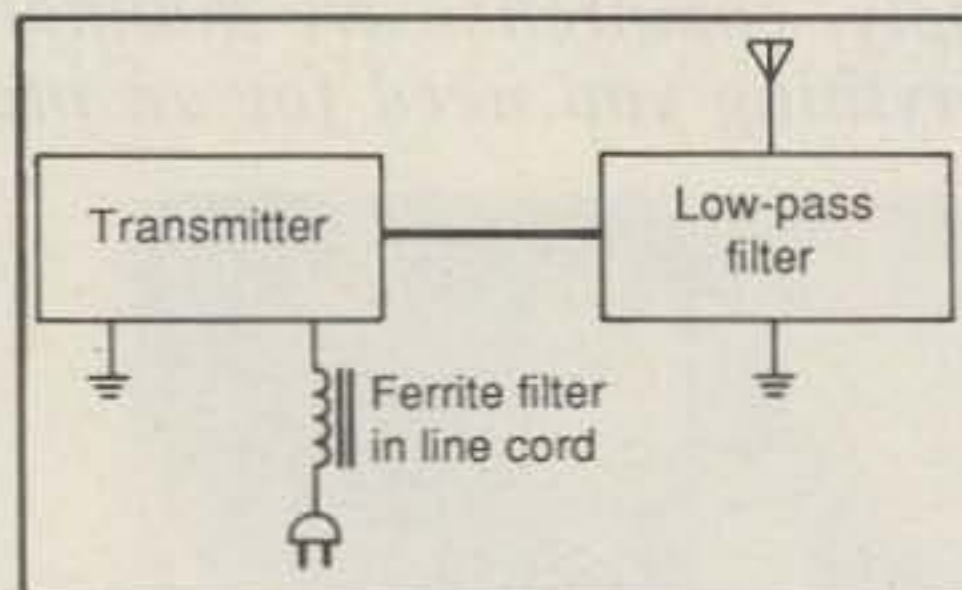


Fig. 1—Low-pass filter, line cord filter, and good ground termination on transmitter help to cut harmonic radiation.

Freq. (MHz)	Attenuation (dB)
3.5	0
28.0	0
29.7	>0.5
40.0	0.5
47.0	1.0
49.0	-10
50.7	20
52.5	30
54.6	40
56.5	50
58.3	60
59.6	70
60.6	80
62.8	90
65.0	80
67.0	75

Channel 2
↑
↓
(Resonant Point)

Table I—Results of tests using a Nye-Viking 020-001 filter rated at 2 KW PEP.

My observation is that in a low TV signal area about 30 dB additional attenuation (above that provided by the transmitter itself) is required for protection of a 100 watt signal, and an additional 10 to 15 dB protection is required for a high-power rig. In a high-signal area you can probably get away with no low-pass filter at all, provided you stay off 10 meters and run 100 watts or less.

In any event, I recommend a low-pass filter in every instance. It is good insurance. And if you are ever investigated by a local TVI committee, one of the first things they will look for is the low-pass filter on your transmitter. They know that even the weakest harmonic can enter the TV receiver and get mixed up with the signal, producing distressing lines on the screen or audio problems.

Back-up Your Low-pass Filter!

Some years ago I found to my sorrow that transmitter harmonics bottled up by placing a low-pass filter in the antenna coax will try to escape by other routes! An easy escape path is the power line. To eliminate this path an RF choke is incorporated in the line. This can be accomplished by wrapping the line around a 1/2 inch diameter ferrite rod about 6 inches long. Hold the line in place with cable ties or plastic electrician's tape. This power-line filter plus the low-pass antenna filter should reduce harmonic radiation to a level that will not interfere with a nearby TV set.

Some 10 meter operators have found that if the microphone cable is about a quarter-wavelength long (8 feet), it will radiate transmitter harmonics. Touching the microphone will produce TVI on channel 2! An easy solution is to detune the offending cable by shortening it a foot or two. Wires to a key, or to a computer, that are multiples of a quarter-wavelength at the operating frequency are also objects of suspicion. In cases of severe TVI all of these items must be examined closely and possibly decoupled by wrapping the conductor around a ferrite core or rod.

Protecting Coax Connections

Paul, N8CKV, passes along some methods of sealing coax connectors from the weather. He has used these ideas for years and says the seals have survived exposure to rain, heat, cold, and snow.

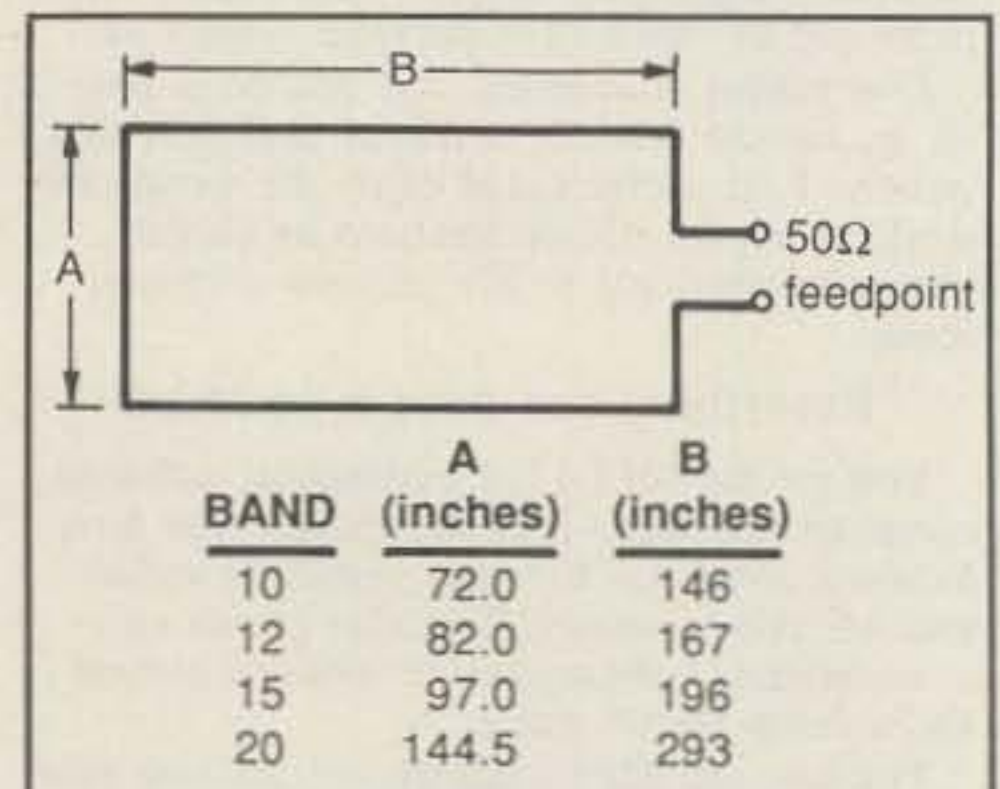


Fig. 2—Oblong quad loop provides figure-8 pattern and gain over a dipole.

One product he uses is a spray can of automobile undercoating. It dries to a black, solid surface. Another product is similar to the popular "coax seal" tape. It is a pliable putty used by NASA in the space program to seal wiring harnesses, connectors, and other electrical items exposed to moisture and corrosion. Paul uses the putty-like sealer and then oversprays with the auto undercoating. One name of the putty is "Dux-seal," which is made by General Electric Co, and is available at various electrical supply outlets. It comes in 5 pound cans, and as Paul says, you can get a thousand seals from the can. It will last a lifetime!

A "50 ohm" Quad Loop

The single quad loop is a popular antenna. It is easy to erect and provides about 0.8 dB gain over a dipole. This is almost something for nothing! The problem with this loop is that the feedpoint impedance is around 120 ohms. This is a sticky value to match with a 50 ohm coax line. It can be done with a quarter-wave transformer made of 75 ohm coax, but this is a nuisance to construct and install.

A better idea is to use an oblong loop (fig. 2). This simple antenna has the regular dipole figure-8 radiation pattern, but the feedpoint impedance is very close to 50 ohms. And best of all, it provides additional gain—about 1 dB more than a square loop. Now this is really something for nothing!

Loop dimensions for the higher HF bands are given in the drawing. The antenna is fed directly with 50 ohm coax. The purist will slip ferrite beads on the line at the feedpoint, or use a balun, to reduce radiation from the shield of the coax. The experimenter will hook the coax directly to the quad loop, see how it works, and then determine if he has to go to the bother of adding a balun or beads on the line. Good luck with this simple gain antenna!

Shop Talk

Do you want to remove oil and grease stains from your concrete garage or workshop floor? Easy with cat litter and cola!

Cover the oil or grease stain with a layer of cat litter. Grind the litter into the stain with your shoe. Now sweep it up and dispose of it. Cover the area with a cola beverage and let it set for 10 or 15 minutes. Don't let it dry. Rinse the cola off and you will be left with a white stain that you can whiten with one cup of laundry detergent and one cup of chlorine bleach mixed in a gallon of hot water. Scrub the area with a stiff broom or brush. Caution! First make sure there is adequate ventilation, meaning plenty of fresh air coming

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in. Wear rubber gloves and eye protection to avoid injury. Rinse with water and the floor should be clean as new.

There have been more letters coming in concerning the removal of masking tape and other labels from panels. Bob, AA5AF, suggests the use of "Goof-off" or "Oops," sold in many hardware and paint stores. He says these products will not injure the painted surface. KD3YA recommends cigarette lighter fluid, KD4BOB suggests using WD-40, and WF8H proposes using a heat gun (with due caution). Many thanks, gentlemen. And thanks also to Richard Wassall, who sent me a startling postcard from Ipanema Beach, Brazil, showing the new "mini-thong bikini" swimsuit worn by the local XYLs. Prudence and modesty prevent me from reproducing the card in this column.

A nice note from Jack, ZF1HJ, points out that there were errors in the schematic of his two-tone generator in my July column (fig. 8). Apologies to all, and fig. 3 is the correct schematic.

The correct adjustment procedure is to first measure the output of the rig and adjust R1 for equal power with either tone (making sure the transmitter is not overdriven). Overall two-tone level is controlled by R2. Because of different audio response from one transmitter to another, readjustment of the level of each tone may be required.

The jumpers may be replaced with di-

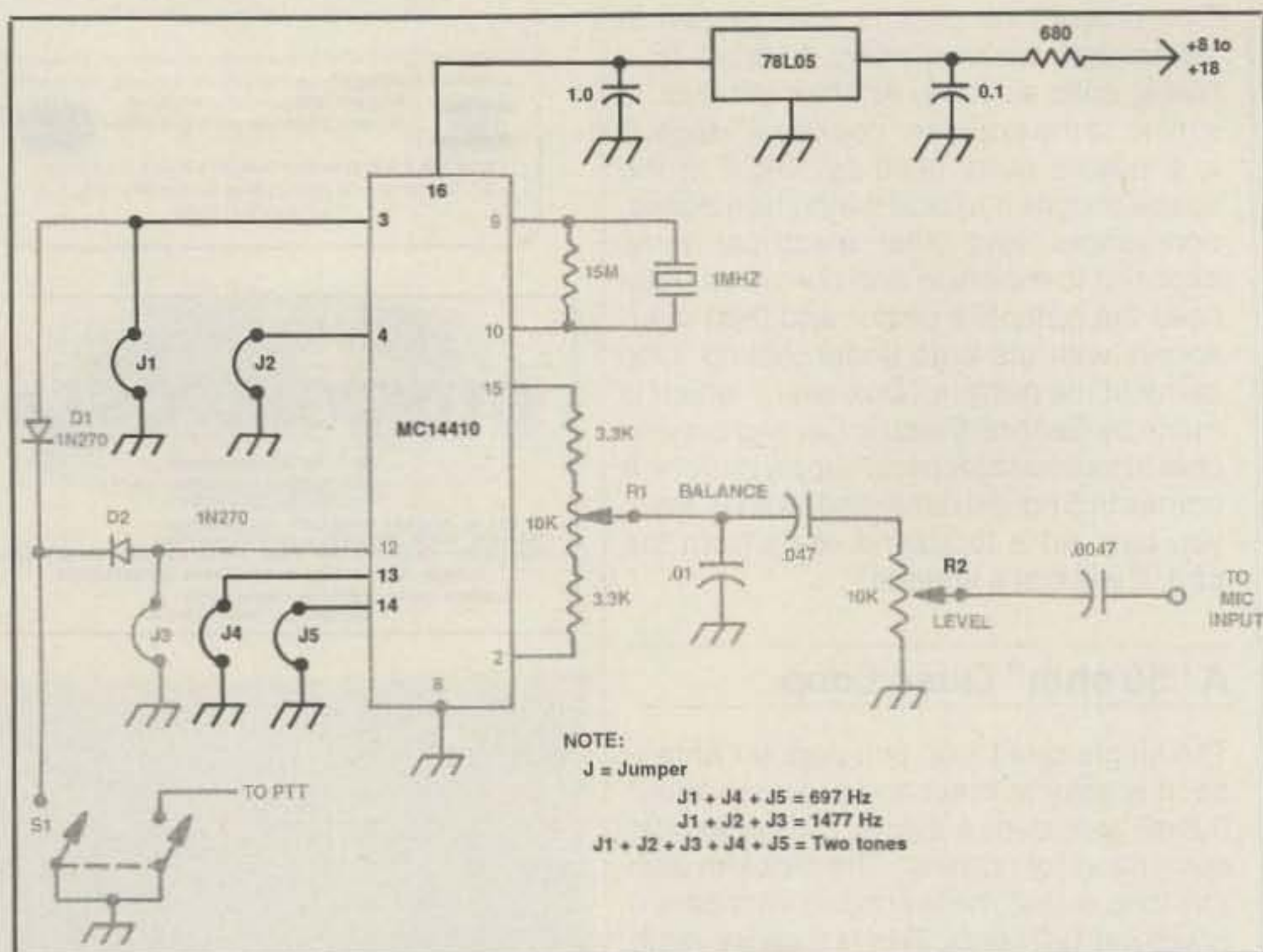


Fig. 3—Two-tone generator. By jumpering points indicated, single tones of 697 or 1477 Hz are generated.

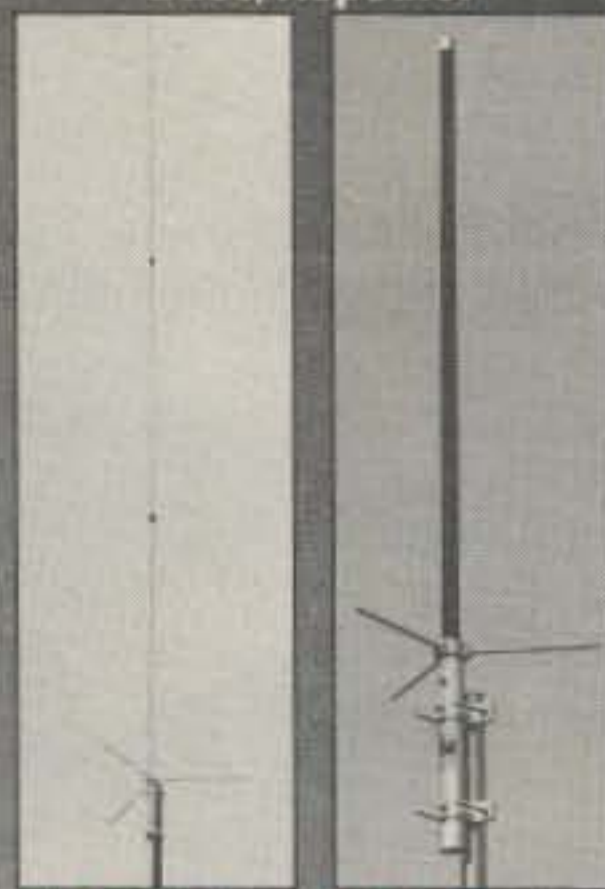
odes instead of links. The anodes of one group of 3 diodes are connected to pins 3, 13, and 14 of the IC; cathodes are common and grounded by a switch. Anodes of second group go to pins 3, 4, and 12 and

cathodes are common and grounded by a switch. This is more convenient if frequent adjustment of the balance control is required when using the unit with different transceivers. 73, Bill, W6SAI

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Length: 17' 8"
Connector: UHF

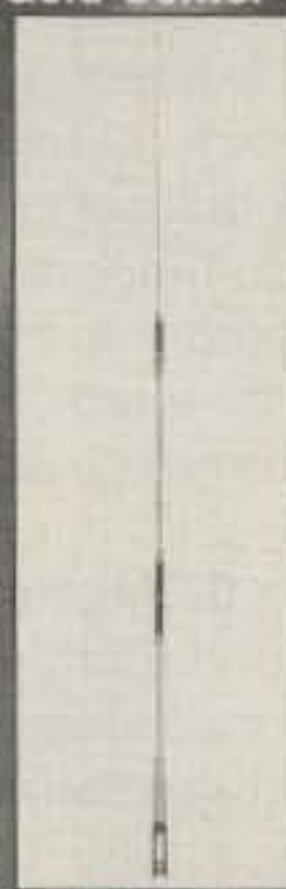
CA-2x4SR
Gain:
146 4.5dB 446 7.2dB
Max Power: 200 watts
Length: 5' 11"
Connector: UHF



COMET PRESTIGE
24 Karat Gold Center Conductor



GPH-5800
Gain & Wave:
146MHz 5.0dB
7/8 wave
446MHz 7.6dB
5/8 wave x 3
Max Power: 120 watts
Length: 5'
Connector: UHF



GPH-5600
Gain & Wave:
146MHz 4.3dB
5/8 wave
446MHz 7.0dB
5/8 wave x 3
Max Power: 120 watts
Length: 4' 6"
Connector: UHF



GPH-5400
Gain & Wave:
146MHz 3.5dB
1/2 wave
446MHz 6.0dB
5/8 wave x 2
Max Power: 120 watts
Length: 3' 2"
Connector: UHF

2x4 Series
Best Sellers

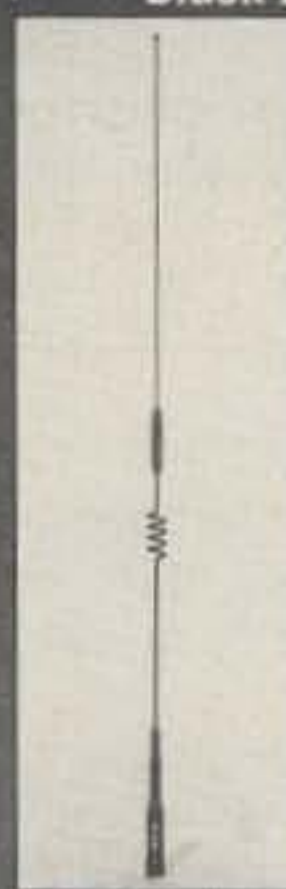


CA-2x4MB
Gain & Wave:
146MHz 4.5dB
7/8 wave
446MHz 7.0dB
5/8 wave x 3
Max Power:
150 watts FM
Length: 4' 10"
Connector: UHF



CA-2x4SR
Gain & Wave:
146MHz 3.8dB
5/8 wave
446MHz 6.2dB
5/8 wave x 2
Max Power:
150 watts FM
Length: 3' 4"
Connector: UHF

NEW B Series
Black Anodized



B-20
Gain & Wave:
146MHz 2.15dB
1/2 wave
446MHz 5dB
5/8 wave x 2
Max Power: 50 watts
Length: 30"
Connector: UHF



B-10
Gain & Wave:
146MHz 0dB 1/2 wave
446MHz 2.15dB
1/2 wave
Max Power: 50 watts
Length: 12"
Connector: UHF



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ANTENNAS & ACCESSORIES

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

BY KARL T. THURBER, JR., W8FX

Antenna Notes—Part I

This month we'll touch on a potpourri of current antennas and accessories topics. There's a good deal to cover, so let's begin.

Antenna Notes

Austin Custom Antenna Designs. Recently I received a brochure from Austin Custom Antenna, a firm that's been in business for over 25 years and now offers about 80 different antenna designs and variations. Their mobile, marine, and fixed station designs are for commercial and government users in addition to amateurs, and the antennas they supply range over the spectrum from 300 kHz to 26 GHz. The company also does custom design and fabrication. Its amateur products focus on the VHF and UHF bands from 50 MHz up, and many of their designs offer multiband transmit and receive capabilities.

Some of the more unusual amateur designs are the 3500C series of multiband base station antennas. These vertical antennas allow operation on the 144, 220, and 440 MHz bands simultaneously, making them a good choice for heavily loaded towers where space for additional separate antennas is at a premium; other band combinations also are available. The centerfed, halfwave antennas are ground independent, so no ground radials are required. They offer a three-band triplexer that allows simultaneous unswitched operation with three separate radios; port isolation is claimed to be 50 dB or greater and insertion loss less than 0.5 dB. These antennas are priced at \$169.95, and the triplexer is \$130.

Another quite interesting design is the Ferret®. Primarily for scanner buffs, it is a multiband receiving antenna which provides reception over the 30 to 1280 MHz range. The antenna uses a system of "dielectrically tuned chokes, multi-tuned parallel resonant circuits, and asymmetrical elements." It also offers transmit operation at 40, 100, 122, 146, 310, 465, 865, and 1280 MHz. The Ferret is housed in a lightweight, white fiberglass "radome" that is 8 feet long and 1 1/8 inches in diameter. The antenna is terminated in an "N" connector, and an aluminum mounting tube is provided for installation to a mast or side brackets. For reception only, a 10 dB gain antenna-mounted preamp is available. The Ferret is \$269.95, or \$299.95 with preamp.

Another of the more unusual designs is the Spectra. Of greater interest to scanner owners than amateurs because of the band coverage (although several VHF and UHF amateur bands are included), the antenna is unique in that it offers four-band operation in a single 33 inch mobile antenna. The multi-section anten-

na, which weighs less than 4 pounds, covers various overlapping ranges, including the VHF low band, VHF high band, and several UHF ranges to 1000 MHz. The antenna will handle 100 watts; a quadplexer is available for simultaneous four-band transceiver operation. Fig. 1 shows the antenna.

For more information, contact Austin Custom Antenna, 10 Main St., Gonic, NH 03839.

Signalcraft FSO. An unusual audible field-strength oscillator (FSO) is offered by the Signalcraft Company, 1555 14th St., Santa Monica, CA 90404. The FSO allows you to "listen" to your field strength, making it useful for remote adjustments. The FSO generates a tone relative to the RF field it is detecting. An increase in field strength produces a rise in tone, while a decrease yields a lower tone. Measurement resolution and sensitivity to small changes in field strength are said to be excellent.

With the ability to listen to your transmitted signal's field strength, you can make relative measurements and corresponding adjustments simultaneously and remotely—that is, you can monitor the audible tone at a distance from the antenna or hamshack while you make adjustments at the antenna or within the hamshack.

The FSO covers 100 kHz to 1 GHz, comes with an 18 inch antenna, and has separate RF and audio gain controls. Price is \$64.

CAT Wire and Cable. CAT Wire and Cable Corporation offers a variety of products and services, including the design, production, and testing of electronic wire and cable. The firm sells wire of 10 through 26 AWG, stranded or solid conductors, bare or tinned copper, up to 50 conductors or 25 pairs, with foil or braid shielding. Various custom operations are also available, including extrusion, twisting, cabling, and respooling.

For a flyer contact CAT Wire and Cable Corporation, 1139 NW 72nd St., Miami, FL 33150.

NCG/Comet Antennas. The Japanese-based Comet Antenna Co., Ltd. line of HF, VHF, and UHF monoband, dual-band, and tri-band antennas is distributed by NCG. The product line has grown again if the size of the current NCG flyer (14 pages) is any guide. (You may recall that we briefly described the product line in the November 1989 column.) A feature of many of the Comet dual-band and multi-band base station antennas is the so-called "Super Linear Converter" (SLC) system which boasts low SWR and wideband operating characteristics without the need for tuning adjustments.

The new NCG catalog features a variety of base station and repeater verticals, vertical and horizontal beams, and mobile antennas. These are offered in single band and a variety of single band or dual/triband combinations covering 50 through 2400 MHz.

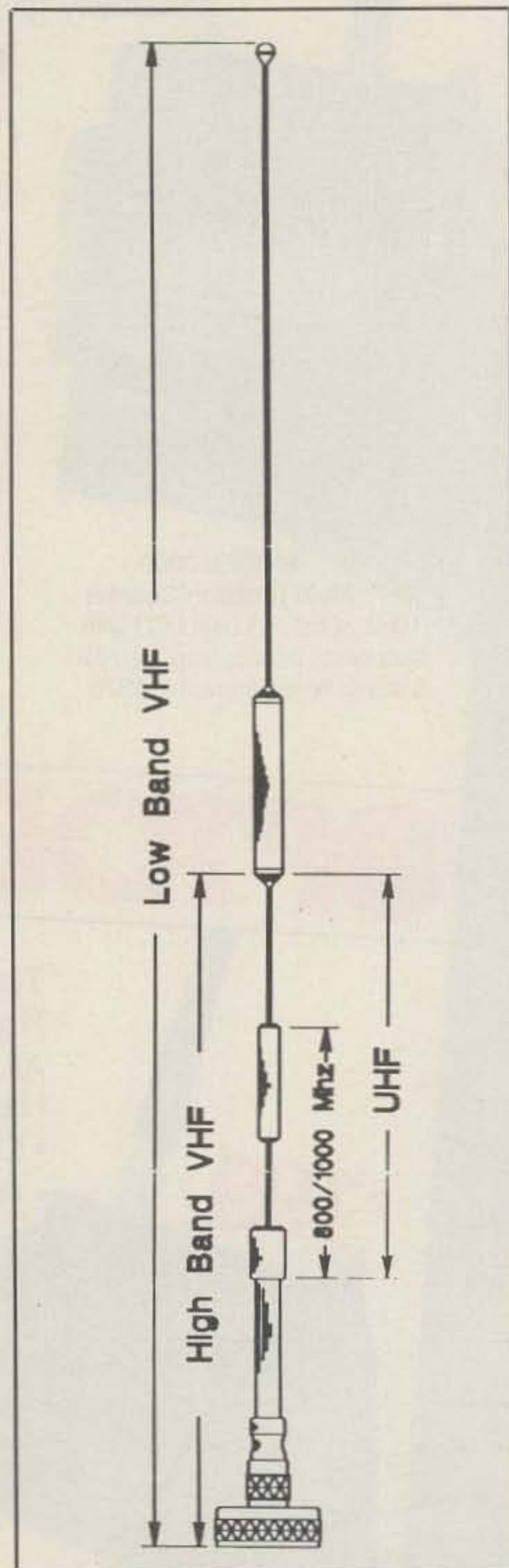


Fig. 1—Although more of interest to scanner owners than amateurs because of the band coverage, the Austin Spectra antenna is unique in that it offers four-band operation in a single 33 inch mobile antenna. The multisection antenna, sketched here, weighs less than 4 pounds.

NCG/Comet now also offers 900 MHz cellular antennas, including some handy 146/446/900 MHz combinations. Also offered are 10 meter base/repeater/mobile antennas and two discones that cover various band combinations from 50 through 1200 MHz; one discone also includes 28 MHz through the use of a quarterwave vertical section. In addition, two HF trap dipoles are offered, one covering 7, 21, and 28 MHz and the other 3.5, 7, and 21 MHz, as are mobile and fixed station "active" (preamplified) receiving antennas covering 0.5 to 1500 MHz. A variety of duplexers, triplexers, mobile mounts, coax switches, connectors, and SWR/power meters also are featured.

For a free catalog contact the NCG Companies, 1275 North Grove Street, Anaheim, CA 92806.

PolyPhaser Components. The PolyPhaser Corporation's 69-page "Lightning/EMP and Grounding Solutions" catalog is a valuable reference source for lightning and EMP (electromagnetic pulse) suppressors and protectors, grounding products, and test equipment. You'll likely want it on your bookshelf.

More than 450 commercial and military quality products are offered in the latest catalog. Products offered include numerous varieties of coaxial cable impulse protectors, twisted pair and data/telephone line protectors, DC and AC power supply and inline power mains protectors, copper straps and grounding clamps, ground rods, lightning/EMP gas tubes, bulkhead entrance panels, test equipment, and more.

I mentioned that the catalog is a valuable reference source, and it is. Several pages are devoted to discussions of the need for protection, forms of protection for different kinds of lines, and an overview of grounding principles and lightning strike effects. The company also sells a 116-page book *The "Grounds" for Lightning & EMP Protection*, a comprehensive analysis of proper grounding and protection against lightning and EMP (if you really must worry about the latter). The book's emphasis is on radio communications, telephone, computers, offices, cable TV, and TVRO use.

For a free catalog, contact PolyPhaser Corporation, 2225 Park Place, P.O. Box 9000, Minden, NV 89423-9000.

R&D ELSIE-FASER. R&D Electronics, 10511 Phelps Street, New Orleans, LA 70123, intends to make phased antennas simple.

It is well known that various types of antennas—including dipoles, verticals, inverted Vees, loops, and others—can be phased for excellent gain and front-to-back (F/B) ratio. In fact, practically any two monoband or multiband wire antennas can provide excellent signal directivity without using a Yagi. Most any antenna you can feed with 50 or 75 ohm coax can conveniently be phased, including multiband antennas such as traps, although the array's pattern does change from band to band. The bottom line is that phased antennas have been around for a long time and work well.

The "ELSIE-FASER" L/C phase unit is designed to handle full legal power levels over 80-10 meter bands, including the new WARC bands; 160-meter-only units also are available. The phaser allows you to set phase angle by adjusting inductance and capacitance from the front panel, and it does not require outside relays or delay lines. All that's required are the coax feedlines, the antennas themselves, and

the L/C unit. Five front-panel selections are offered, including endfire and in-phase; you can choose one of the two antennas being phased as a reference antenna and can bypass the L/C unit to use an alternate antenna system or a dummy load. The unit includes a nine-position inductor and 360 degree, 20-400 pF variable capacitor. Price of the 2.7 lb. unit is \$160 plus shipping.

Soft Topix

TCOM-777. Remember the Tono Theta-777 of about five years ago? If you have one, and don't favor packet operation, you're in luck. Bob Lewis, AA4PB, has one of these early multimode controllers, and he sent me a very specialized program to "take the computerese out of operating the Theta-777," he says.

"Okay, so what's a Theta-777?" you ask. It was an early Japanese multimode data communications terminal that Amateur-Wholesale Electronics imported; the terminal was reviewed in the April 1987 issue of *QST*, p. 55. My memories of the unit are dim, but Bob reminded me that it was (and still is) an excellent performer on Baudot, ASCII, AMTOR, and CW, though it's not for packet operation. Unfortunately, the Tono was unable to compete with the new multimode models that featured a built-in packet terminal node controller (TNC), and its "Escape-sequence" commands were difficult to remember and use.

Bob's solution was to write TCOM-777 for the IBM PC and compatibles to provide a friendly user interface for the TCOM-777 that generates all commands automatically. After two years of on-the-air use and numerous revisions, TCOM-777 has evolved into a nice split-screen terminal program with all the bells and whistles: pull-down menus, hotkeys, an automatic CQ caller, and a type-ahead buffer. Other features include message buffers, a logging function, mouse support, context sensitive help, automatic AMTOR SELCAL generation, and shell to DOS or editor.

Bob says that one of TCOM-777's most advanced features is an interrupt-driven, ring-configured, 30K receive buffer that's always open. Received data is sent to this buffer. When the buffer fills up, it just starts overwriting the oldest data so that you always have available the last hour or more's worth of received data. You can enter browse mode and scroll the display through the buffer at will, marking blocks of text in the buffer and saving them to disk. Unlike most terminal programs, you don't have to be concerned with initiating a "capture to disk" command in order to save incoming data, since you can find the data in the buffer later and save it after the fact. Since the buffer is interrupt-driven, received data goes into the buffer no matter what else you're doing with the program.

Bob is quite enthusiastic about TCOM-777 and considers the program to put a whole new face on the Tono unit, even though the Tono is no longer being manufactured. The program is available from Bob on either a 5.25 or 3.5 inch diskette for \$25.00; an 18-page manual is provided on disk for you to print out.

For more information, contact Bob Lewis, AA4PB, P.O. Box 522, Garrisonville, VA 22463.

Quickyagi II and Autolog Plus. In the December 1988 and February 1991 columns we mentioned some of Chuck Smith, WA7RAI's IBM PC software, discussing Yagi Antenna

Designer (now called Quickyagi) in the latter column. Chuck's been at it again, coming up with Quickyagi II.

The new program is billed as an automatic Yagi designer, optimizer, and analyzer. The user-friendly software is designed for nontechnical users and features a prompted display. It features manual, semiautomatic, and automatic calculation modes; fast elevation and azimuth polar plots in log or linear scale; calculation of forward gain, F/B ratio, and real and imaginary impedances; saving and retrieving of antenna files; tapered element calculations; metric conversions; and full documentation. The program handles 2 to 12 elements from 1.5 to 500 MHz. The current price is \$40.

Chuck also offers a second antenna design program, LW Plotter, for \$15; it's an easy-to-use program that plots longwire antennas. Features include display of radiation lobe angles, especially good for V-beams and rhombics; calculation of wire length in wavelengths and gain of the primary lobes; acceptance of inputs in either metric form or in feet and inches; and usefulness over the spectrum from LF to VHF.

Turning from antenna software to logging, Chuck also offers Autolog Plus. The \$25 automated logging system features include single keystroke menus plus hotkeys for fast operation, a scrolling display that displays five QSO records onscreen, four onscreen programmable time zone clocks, a pop-up graphic calendar, automatic country logging and QSO numbering, QSO status tracking and report/label generation, and a built-in DXCC database with beam headings as well as a personal database. A very handy feature is a notepad file with a date tag reminder that is useful as a sked tickler, since the program automatically searches for a tagged date at startup and reminds you of it.

Chuck also offers an inexpensive (\$20) Morse Code tutor that features full programmability, variable speeds to 60 WPM, fixed or variable word lengths, elapsed time counter, adjustability while "in session," and a menu driven interface.

Chuck says that he's offering as a special to CQ readers until December 30, 1991—both Quickyagi II and Autolog Plus for \$40; all programs are available on either 5.25 or 3.5 inch floppies (\$1 extra for 3.5 inch diskettes). For more detailed information, contact Chuck Smith, WA7RAI, P.O. Box 1637, Chino Valley, AZ 86323.

BMKMULTY. I thought the U.S. Navy had a lock on unpronounceable acronyms, but the Brits do one better with BMKMULTY. Seriously, BMKMULTY by M. J. Kerry, G4BMK, at Grosvenor Software, is a sophisticated but economical multimode amateur radio software package of up to six modules of your choosing.

The six software modules enable the following functions: (1) AMTOR, which allows the PC to run AMTOR transceive using a simple modem or dumb terminal unit; (2) CW, which allows Morse transceive or code practice; (3) FAX, for reception and decoding of weather satellite pictures and charts; (4) RTTY, which enables RTTY transceive at 45 to 110 baud; (5) SSTV, which decodes most black-and-white SSTV picture standards; and (6) TUNER, an audio spectrum analyzer that gives a visual histogram display of audio signals.

The AMTOR/RTTY modules are unique in



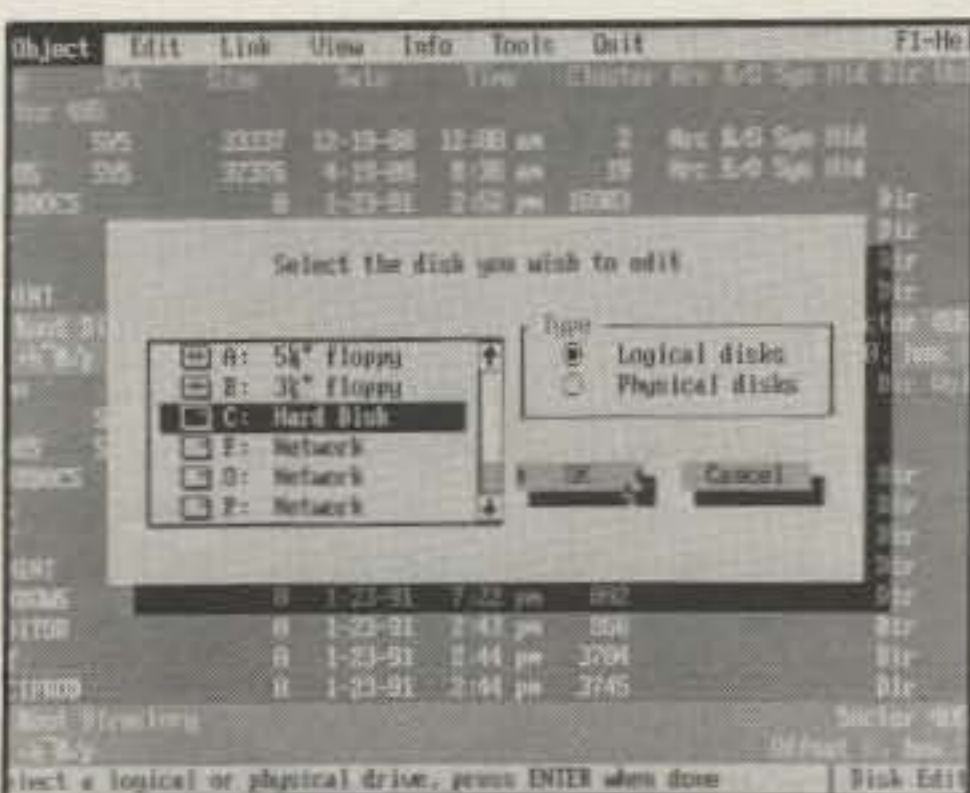
The Norton Utilities include a state-of-the-art UnErase program that makes successfully recovering files you may have inadvertently erased relatively safe and sure. The UnErase feature includes support for the new DOS 5.0 "delete tracking" feature. Operation is normally automatic, but you also can manually recover files that have been partially overwritten or that were fragmented. (Photo courtesy Symantec Corporation)

that they enable the PC or Atari ST user to receive and send with just a simple dumb terminal unit connected between the PC and the transceiver, and they offer several features not found in more expensive multimode TNCs or dedicated digital units. The terminal unit can consist of just a tone demodulator for reception and transistors to drive push-to-talk (PTT) and FSK (frequency shift keying) transmitter inputs for transmission via FSK, or a tone generator to transmit AFSK.

All six modules are available as a package for \$129, or they may be purchased individually or in several combinations. MULTYTERM, another AMTOR/RTTY/CW option (which includes the TUNER module), also is available from the company; it's \$89.

For more information contact Grosvenor Software, 2 Beacon Close, Seaford, East Sussex, BN25 2JZ, England. (Thanks to Jim Mortensen, N2HOS, for additional details on these programs.)

Finnish Logger de OH1AA and OH1MIE. What has the potential to be a very good log-



The powerful Disk Explorer feature of The Norton Utilities allows you to view and edit the entire contents of a diskette or hard disk, even disks that DOS can't recognize or access. Shown here is the screen through which you select the "object" (disk or some part of a disk) that you want to explore. (Photo courtesy Symantec Corporation)

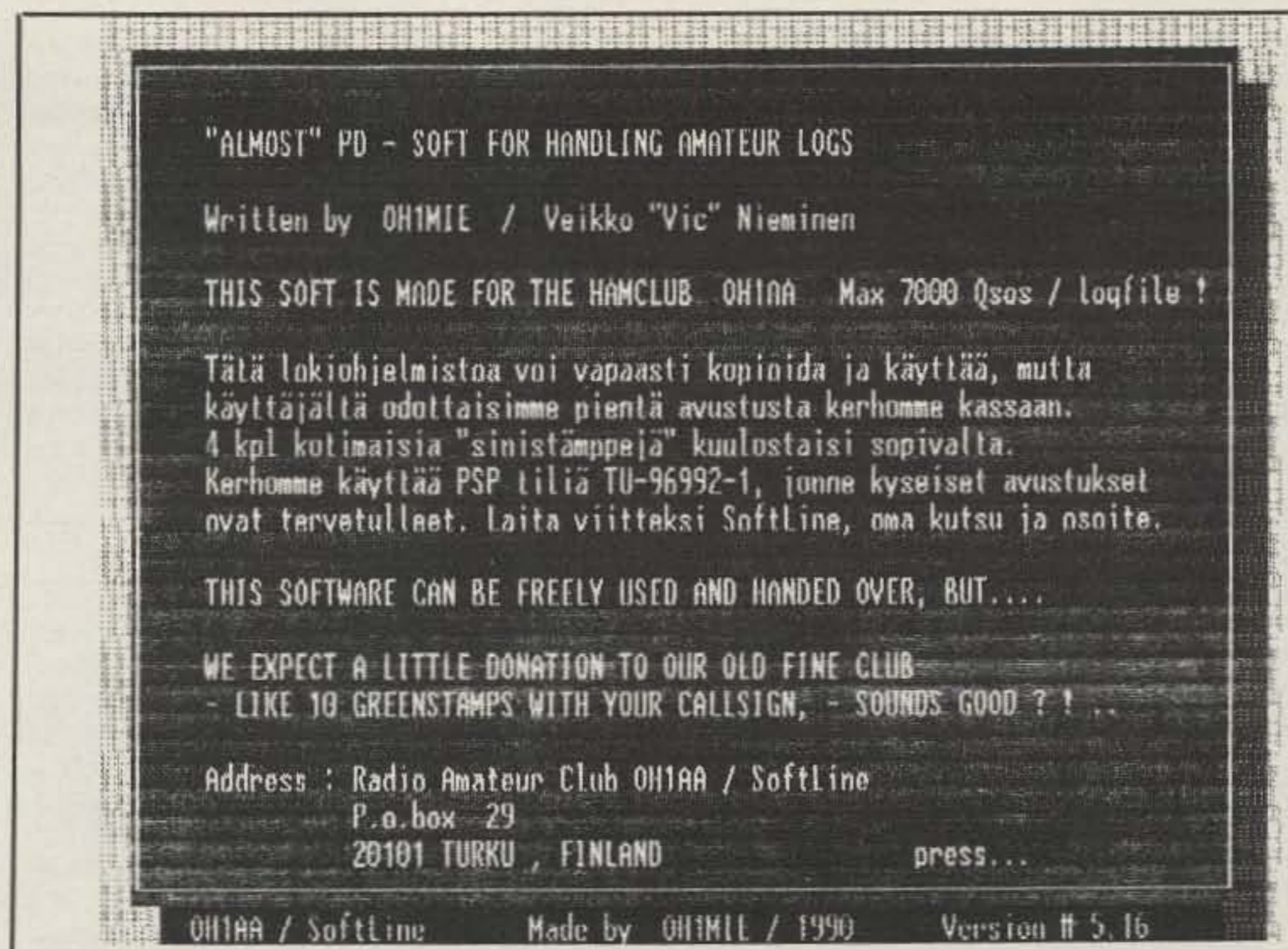
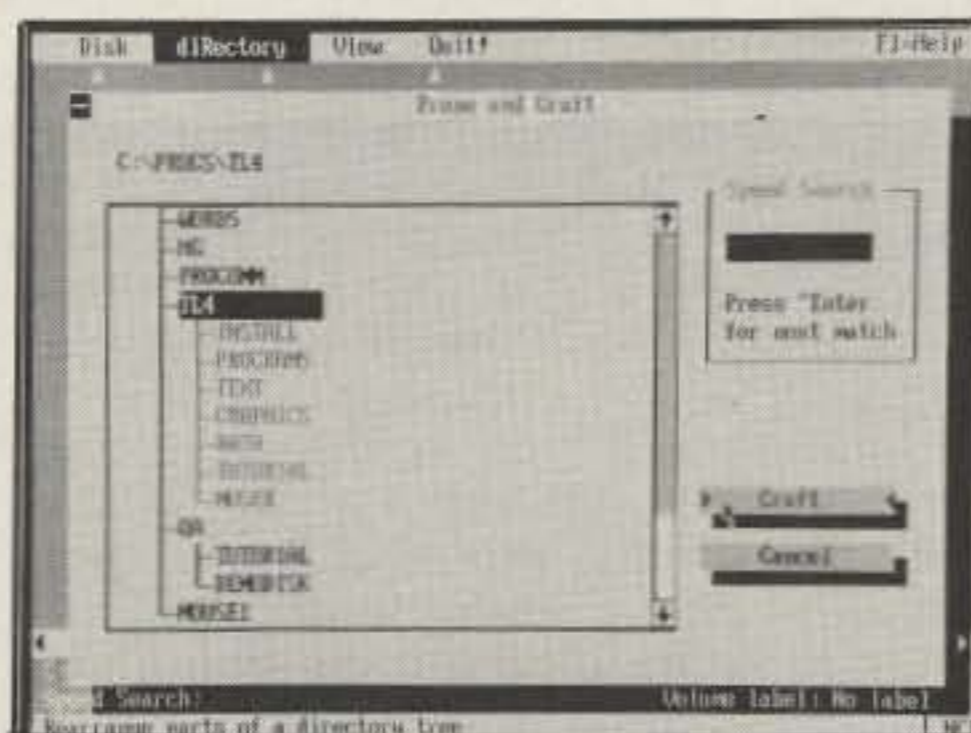


Fig. 2- Information screen for the OH1AA/OH1MIE logging program. This logger originally was written by Veikko "Vic" Nieminen, OH1MIE, for club station OH1AA's use. It is now available as public-domain software, although a \$10 contribution is requested. At the time a copy of the software was received here, only Finnish documentation was available.



Included in The Norton Utilities is the Norton Change Directory (NCD) program. With it you can navigate and manage your directory structure with an easy-to-use graphical tree display. A very handy feature is "prune and graft," which lets you move a directory and all of its subdirectories to realign the directory structure of a diskette or a hard disk. (Photo courtesy Symantec Corporation)

ging program was sent to me by Veikko "Vic" Nieminen, OH1MIE. It was designed for the Finnish radio amateur club station OH1AA and is said to handle a maximum of 7000 QSOs per log file. Although the program can be freely used, it's billed as "almost" public domain in that the club requests a small donation of \$10 along with your callsign, which is custom programmed in the software.

Unfortunately, at the time I received the program, only Finnish documentation was available (see fig. 2). Hopefully, by this time the English docs are available. For more information, contact Radio Amateur Club OH1AA/Softline, P.O. Box 29, 20101 Turku, Finland. (I'd suggest including a greenstamp or a couple of IRCs with your request.)

Norton Utilities V6.0. A fact of computing life is that each and every time you use your PC to create data, you make a considerable investment of time and effort. Protecting that investment may not mean much if you don't create data that you really need or would have a hard time replacing. But doing so is almost mandatory if, like a business user, you're really serious about your data—like your computer-based logs from the last ARRL or CQ DX contest. The Norton Utilities have long been associated with topnotch data protection and emergency data recovery, and in these areas it has really excelled. Although there are several excellent competitors on the market, I doubt that any of them offer quite the range of capabilities that Norton does.

The latest incarnation, Version 6.0, is a well-integrated and largely menu-driven collection of utilities that offers sophisticated but easy-to-use tools for protecting valuable data and also for enhancing PC performance and doing preventive disk maintenance. These utilities can best be understood by breaking them down into four major areas: data recovery and disk repair, data security, performance enhancement, and tools.

The data recovery and disk repair features lie at the heart of the program package. These utilities allow "emergency rescue" style functions such as recovering an accidentally formatted disk, retrieving erased files and managing erased file space, creating disk information datafiles to increase data recovery probability, repairing the internal file structure of several popular file formats, automatically diagnosing and repairing most disk problems, and powerful and flexible disk sector editing.

The utilities can also be used to lock up sensitive information or even delete it altogether. Security features include monitoring and detecting attempts to write in DOS reserved areas and designated files, preventing unau-

thorized access to files or an entire disk, and "wiping" (rather than merely erasing) files and slack areas of the disk so that information can't be retrieved under any circumstances.

Several utilities help ensure that the PC is performing at optimum efficiency. These include a nifty program to non-destructively low-level format and surface-refresh hard disks, a sophisticated disk cache used to store the most frequently accessed disk data in fast computer memory, and a comprehensive disk defragmenter utility that speeds access to hard disk files.

Several useful disk-tool accessories are included. These incorporate a system information utility that comprehensively reports system configuration and status, a batch file enhancement programming utility, a directory utility, a very speedy file finder, a fast and safe disk formatter, and a control center function to centrally configure many computer functions.

V6.0 has some very special new features. It now includes a complete command line shell, NDOS, which has pop-up context sensitive DOS help; new high memory support for Norton TSRs that automatically load themselves into high memory; advanced network support; excellent compatibility with Microsoft Windows and DOS 5.0; and generally speedier all-around performance.

Overall, there was little I could fault in this impressive utility package. Considering its power and the almost magical nature of the surgical operations it can perform on your PC's disks, its ease of use is truly amazing. The

five (yes, five!) user's guides and manuals are well written and clear, and they let you know when you're about to delve into areas that could cause severe or even total data loss such that you should not proceed further unless you're technically inclined.

Admittedly, all of this power comes at a price: the package's list price is a rather steep \$179, although it's widely available for considerably less at discount, and upgrades for previous Norton users are reasonably priced. Contact Symantec Corporation, 100 Wilshire Blvd., Santa Monica, CA 90401-1104.

More Books

Last month we focused on stocking the well-read amateur's bookshelf. In fact, our bookshelf overflowed, and so we'll catch up here on a few of the books, magazines, and catalogs we couldn't quite manage to cover last time.

Practical Antenna Handbook. Joseph J. Carr, K4IPV, who conducts the ham radio column in *Popular Electronics* magazine, has introduced another winning antenna book. It's the \$22 *Practical Antenna Handbook* which is at once informative, interesting, and logically presented. The chapters and sections on propagation, transmission lines, matching, measurements, and the Smith Chart seem particularly well done. The book can be used either as a reference guide or as a text.

Contact Tab Books, Blue Ridge Summit, PA 17294-0850.

A Technical Guide to the MCC at the Johnson Space Center. This is an unusual book, one that appeared without warning in my mailbox as a courtesy from the publisher, Universal Radio. Not an amateur radio publication as such, R. H. Nicholson's 96-page, 8 1/2" x 11" perfect-bound book is actually a technically oriented, behind-the-scenes tour of the Mission Control Center (MCC) at NASA's Johnson Space Center in Houston. The book offers a comprehensive technical description of communications and data processing systems used in the nerve center of the United States' manned spaceflight programs.

Written by one who spent ten years with NASA as an MCC communications technician and a technical writer, the book includes a brief history of NASA and gives some insight as to how manned spaceflight operations are conducted. A listing of NASA space shuttle frequencies, a dictionary of acronyms and abbreviations, and a glossary of terms help you wend your way through some of NASA's unique space technospeak.

To the casual reader this kind of book probably would be considered dull. But if you're really "into" spaceflight, this one's for you. It's \$11.95 plus \$1 shipping from Universal Radio, 1280 Aida Drive, Reynoldsburg, OH 43068.

Ham Radio Classifieds. A fairly new amateur radio buy-sell-trade publication is *Ham Radio Classifieds*. The issue I saw was 12 pages nicely printed on good-quality paper, a welcome treat from the usual newsprint swap rags that make your hands black with printer's ink.

The publication is divided into "buy," "sell," "trade," and "classified ad" sections. The first three of these sections are actually cryptic one-line tabular summaries of what's offered or wanted that just list a callsign as a contact; the classified section offers more detailed information. A separate contact infor-

mation section tells exactly how to get in touch with the party who placed the ad.

Subscriptions are \$18 per year. For more information, contact Ham Radio Classifieds, 739 Dobson St., Evanston, IL 60202.

AMSAT Publications. We've mentioned AMSAT software several times previously in the column, but don't believe we've taken note of the several satellite publications AMSAT offers.

One such publication is *A Beginner's Guide to OSCAR-13* by Keith Berglund, WB5ZDP; at \$7, it's a step-by-step guide to hardware and operating procedures. Another is *The Satellite Experimenter's Handbook* by Dr. Martin Davidoff, K2UBC. The handbook covers it all, including history, concepts, orbits, satellites, operating procedures, station equipment, tracking aids, and more; it's \$22.

Satellite Anthology at \$8 displays some of the best QST articles on amateur satellite operation and hardware, while the *1990 Space Symposium Proceedings* cover a number of state-of-the-art, specialized amateur satellite topics; it's priced at \$20.

For more information and an updated catalog of AMSAT publications and software titles, contact the Radio Amateur Satellite Corporation, P.O. Box 27, Washington, DC 20044.

Surplus Sales of Nebraska Catalog. We've mentioned Surplus Sales of Nebraska before, noting its many "good deals" on surplus and not-so-surplus radio and antenna parts and components. I was, however, quite surprised when I received their massive (132-page) Catalog 6, which boasts on the cover their registered slogan that they're "where the hard to find parts are found and on hand."

The new catalog nicely blends new, used, and surplus components, parts, and equipment. The catalog is particularly heavy on antennas and hard-to-find antenna supplies. For example, the new catalog includes unusual items such as two Collins 2.0-30 MHz vertical antennas, originally for their own equipment, as well as the AS-2259/GR 2-20 MHz military field antenna.

The catalog costs \$3, or \$5 by air; payment is refundable with your first \$25 catalog purchase. For a copy contact Surplus Sales of Nebraska, 1315 Jones Street, Omaha, NE 68012.

Herbach and Rademan Catalog. A very worthwhile and interesting science and industry catalog is offered by the Herbach and Rademan Company, 401 E. Erie Avenue, Philadelphia, PA 19134-1187, in business since 1934. Their catalog emphasizes a broad range of lab, shop, classroom, and field electrical and electronic components. The H & R catalog is particularly heavy on relays and switches, small AC and DC motors of practically all types, optical and laser components, fans and blowers, tools, specialized batteries, test equipment, power line conditioners and regulators, and various small mechanical components.

Wrapping It Up

That's it for this time, gang. Next time more Antennas & Accessories topics of current interest. See you then.

Overheard: To err is human, to compute is divine. So, trust your computer and not your programmer (no offense to programmers!).

73, Karl, W8FX

Enjoy NEVER CLIMBING YOUR TOWER AGAIN

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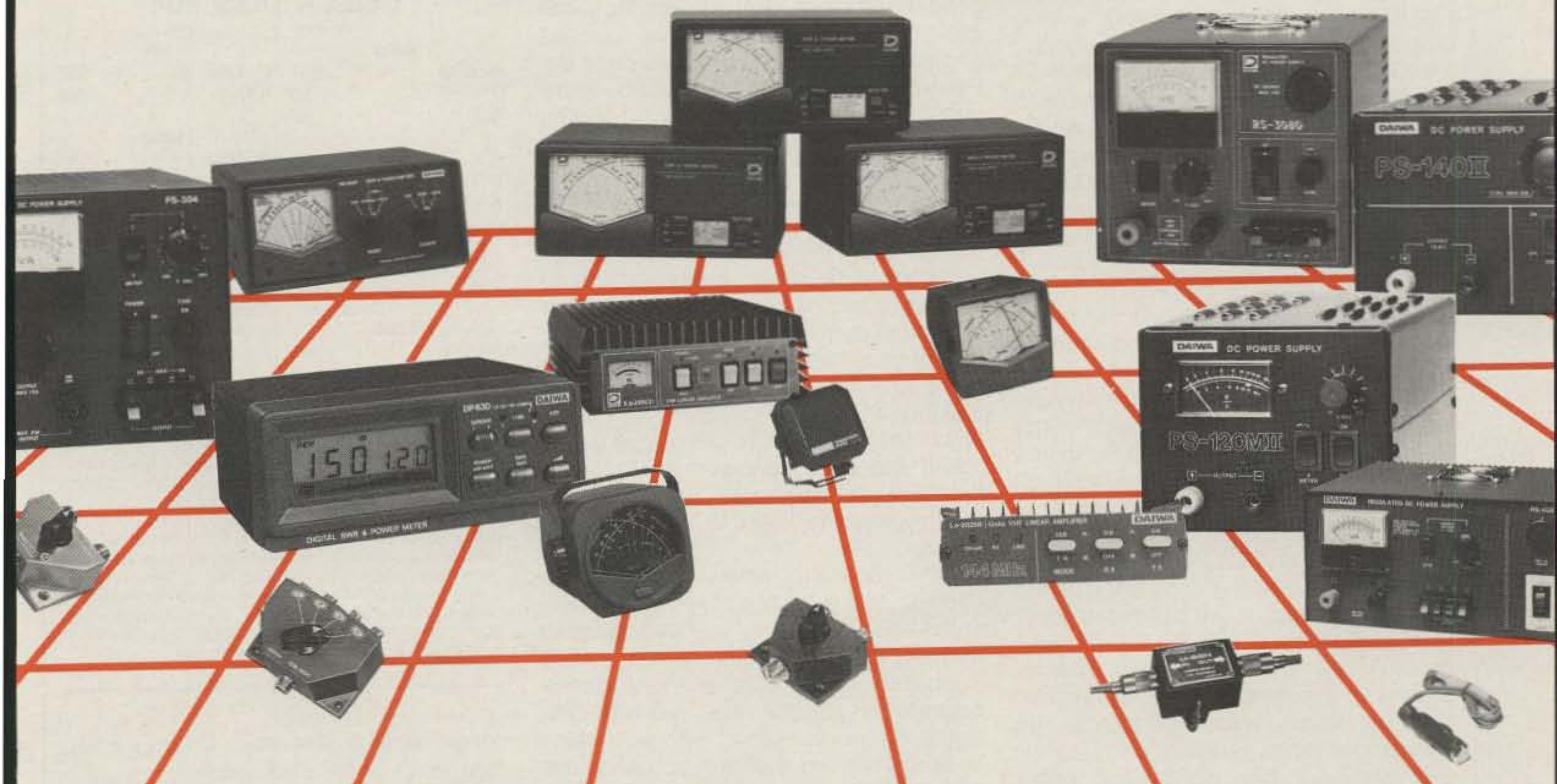
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NEWS OF CERTIFICATE AND AWARD COLLECTING

The Story of the Month for August is:

Donald L. McMinds, WD7X
USA-CA All Counties #656
All 20M SSB Mobile, 2-3-90



Don, WD7X, USA-CA All Counties #656, on the Kalawao/Maui line, March 1987.

"I first became aware of county hunting in the summer of 1969. I mentioned to someone on the air that I was going to be driving from Omaha to Aberdeen, Washington and back and planned to have my SB-101 in the car. He suggested that I check out the county hunter's net on 14.336. I did so and ran counties quite a bit throughout the trip under my call, WA0LGS. I still have the log from that trip and you really old-timers will probably remember calls such as WA0SJE, W0AYL, GW3NWV, K5RPC, and K2PFC, among others. Currently active calls in that log are K0AYO, WB2ZSO, and WA9CNV.

"For some reason I did not get hooked then, and it was not until May 1982 when I retired from the Air Force that I began in earnest. I mobiled from Illinois to Oregon twice while moving the family and ran many counties during that time. Duane, WB5CWI, nearly came unglued when I ran Holt, Missouri, as that was his last in the state and last county. At the time I wasn't sure how to keep track of counties worked and whether or not it was valid to get a county while mobile. After settling in the new home in Corvallis, Oregon, I got on and got a nice briefing on procedures from N6DUQ, and I was off and running.

"KB7QO gave me the first county—Albany, Wyoming—on July 29, 1982. I got down to about 300 to go in the summer of 1984, and then things just came to a screeching halt. If the band was good, no one was around; if the band was bad, I couldn't hear enough to know whether anyone was around or not. Between bad band conditions, work, and terrible RFI problems with one neighbor, fixed station operating hours became few and far between. I managed to get a few counties here and there, but the last 150 took nearly three years!

"At the Tennessee Mini in Murfreesboro in 1989 I was down to 13 and got promises from several folks to help out. On January 13, 1990 Willis, KJ4EJ, gave me the last six in Georgia on a special trip, and George, W3IJT, gave me the last two in West Virginia.

"That left just Perry, Tennessee, which

I had been hoarding all these years for my good friend Mitch, W4RKV. He heard me get the last two West Virginia counties and said he'd go out the next day and get Perry for me. He said he would be there by 1730Z on Sunday, January 14, 1990. I told my wife about this, and she wanted to know what time 1730Z really is. Some brief but furious calculations by my steel-trap mind produced an equivalent Pacific time of 11:30 AM (wrong!) and that's what I told her. How many county hunters do you know who'd be two hours late for their last county of all? It was only by the best of good fortune that I happened to be at the desk at the correct time of 9:30 AM that day, and even then I was on CW when Mitch first called. The old adage about 'can't add and chew gum at the same time' would seem to apply to me quite admirably. Anyway, I got that last one and all is well.

"I've been to several conventions (Denver and a couple of recent Tennessee Minis) and really enjoyed meeting many of the county hunters. At the 1989 Tennessee Mini (the first one in Murfreesboro) Mitch got me intrigued with CW, and I'm now well along with something over 500 worked. Those of you who have not tried CW should give a listen some time. It doesn't take long at all to get the hang of it, and it's a big challenge and a lot of fun. Plus, you get the privilege of listening to Ed, WA6VJP, run the net. That alone is worth the price of admission, believe me.

"I've been fortunate enough to have put out the Kalawao/Maui line twice—March 21, 1987 and March 24, 1990. On both occasions there were plenty of challenges: a locked gate on the first trip and the combination of a flooded road and a dead battery on the second. Both these trips were one-day expeditions, and next time I plan to go to Molokai and sit there

USA-CA Special Honor Roll

Henry Petersen, KJ4LG
 USA-CA All Counties #720, Mixed, 7-1-91

Robert L. Guinn, N6ERM
 USA-CA All Counties #721, All SSB, 7-20-91

Thomas G. Beasley, K4JFI
 USA-CA All Counties #722, All SSB, 7-22-91

Robert M. Smith, ND1H
 USA-CA All Counties #723, All SSB, 7-31-91

Eldon L. Sanders, W5VDW
 USA-CA All Counties #277, All SSB, 4-15-80
 Endorsed All 20M Mobile, 7-26-91

USA-CA Honor Roll

3000		1500	
N6ERM	751	N6ERM	997
K4JFI	752	K4JFI	998
ND1H	753		
2500		1000	
N6ERM	831	N6ERM	1190
K4JFI	832	K4JFI	1191
2000		500	
N6ERM	907	RB5WA	2533
K4JFI	908	KP4QL	2534
		N6ERM	2535
		DU1KT	2536
1500		K4JFI	2537
HA8XX	996	WA3RTY	2538

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.

for at least a weekend. Unfortunately, that won't be for a few years.

"Thanks to everyone on the net, SSB and CW, for all the help and friendship over the years. To those of you just getting started and those of you who are down to the last few hundred for the first time, all I can say is hang in there. If I can do it, anyone can. 73 and good hunting to all—Don, WD7X."

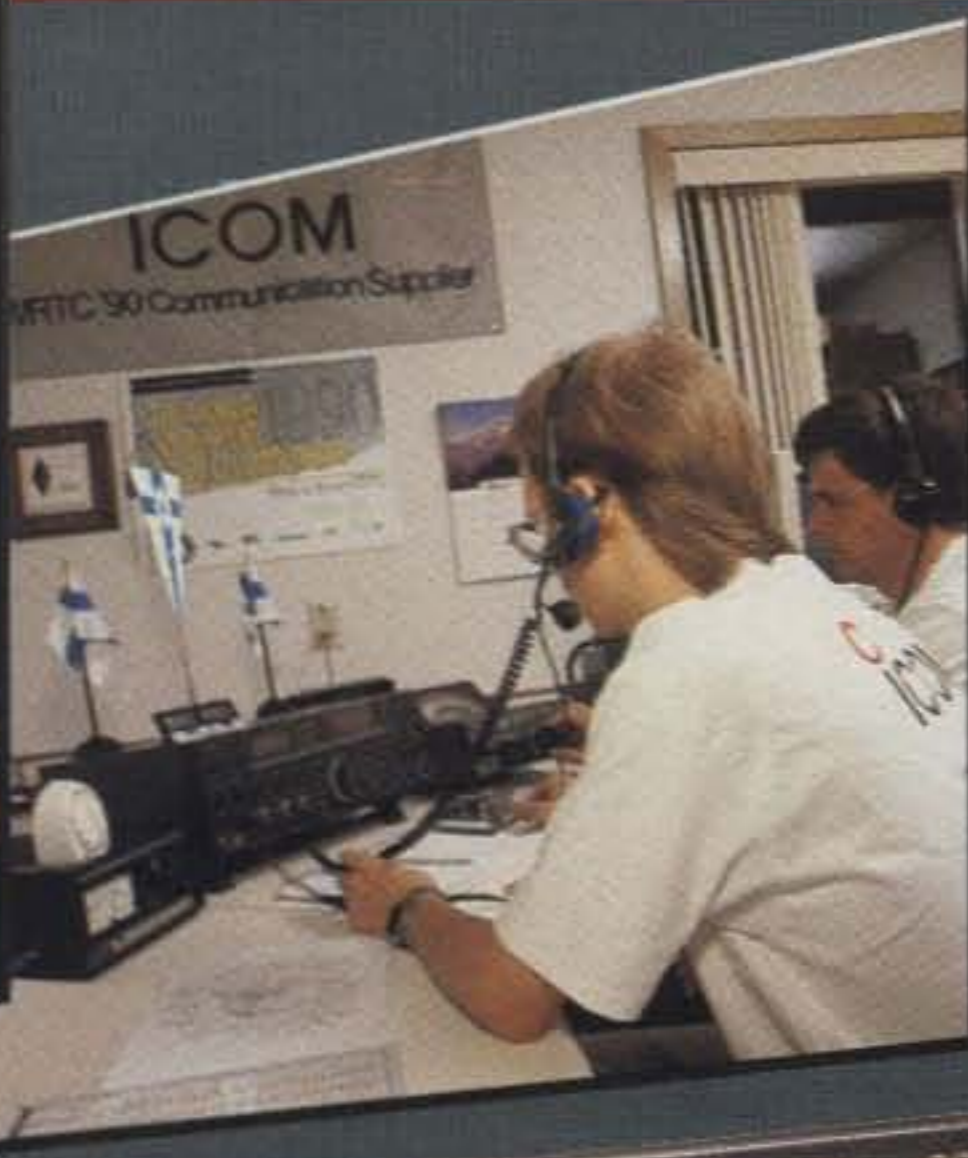
Awards Issued

Henry Petersen, KJ4LG, collected the last of his county confirmations and claimed USA-CA All Counties #720, Mixed, dated 7-1-91.

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OH3PF
Hannu Nieminen
OH1XX



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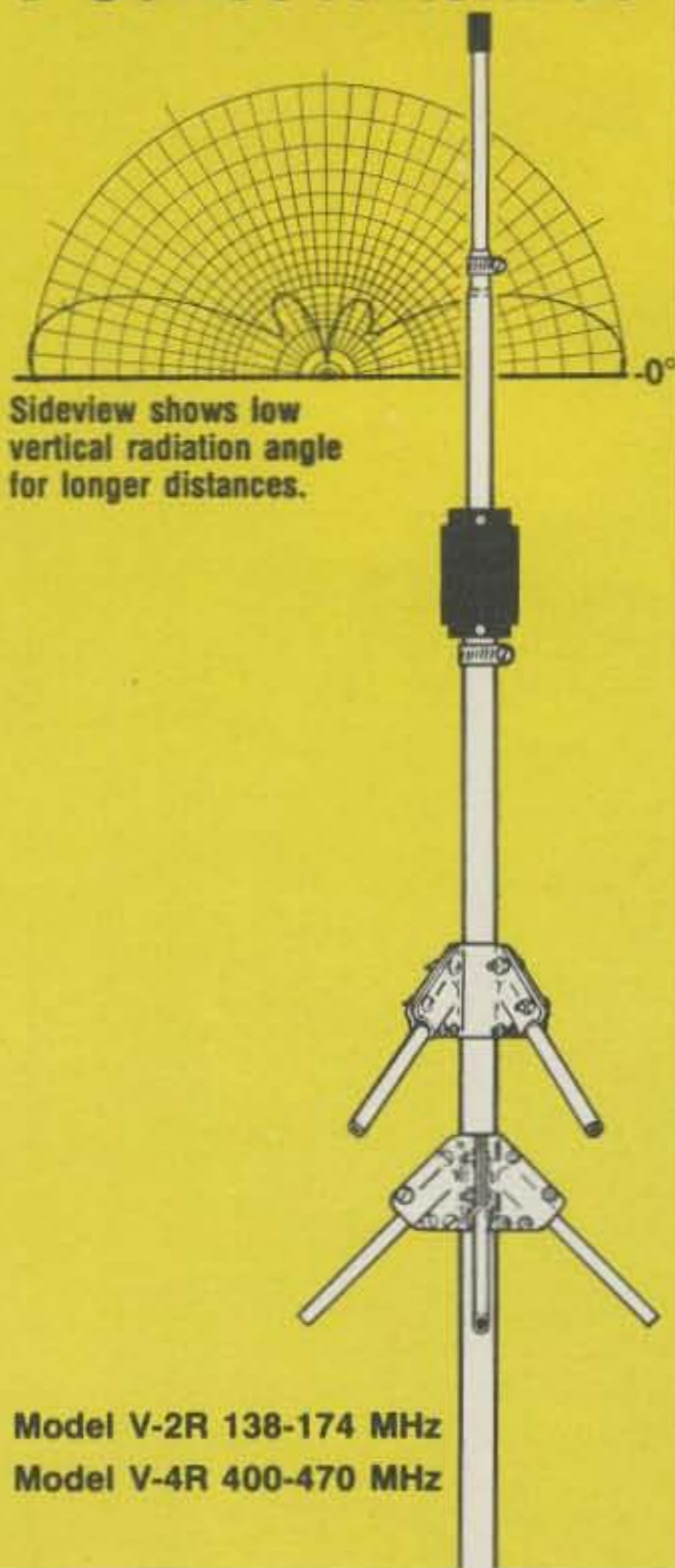
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Robert L. Guinn, N6ERM, filed his complete record of confirmed county contacts and received USA-CA All Counties #721, USA-CA 3000 #751, USA-CA 2500 #831, USA-CA 2000 #907, USA-CA 1500 #997, USA-CA 1000 #1190, and USA-CA 500 #2535, All SSB, dated 7-20-91.

Thomas G. Beasley, K4JFI, also did it all in one step and received USA-CA All Counties #722, USA-CA 3000 #752, USA-CA 2500 #832, USA-CA 2000 #908, USA-CA 1500 #998, USA-CA 1000 #1191, and USA-CA 500 #2537, All SSB, dated 7-22-91.

Robert M. Smith, ND1H, filed his good application to complete his record and received USA-CA All Counties #723, and USA-CA 3000 #753, All SSB, dated 7-31-91.

Eldon L. Sanders, W5VDW, USA-CA All Counties #277, All SSB, 4-15-80, enhanced his record by adding the endorsement All 20M Mobile, dated 7-26-91.

Dr. Miklos Danko, HA8XX, qualified for another gold seal to be added to his certificate by claiming USA-CA 1500 #996, Mixed, dated 7-12-91.

USA-CA 500 certificated went to: Helen Goncharsky, RB5WA, USA-CA #2533, Mixed, 7-3-91.

Juan Raul Escobar, KP4QL, USA-CA 500 #2534, All 10M SSB, 7-17-91.

Robert L. Guinn, N6ERM, USA-CA 500 #2535, All SSB, 7-20-91.

Roger G. Flores, DU1KT, USA-CA 500 #2536, All SSB, 7-20-91.

Thomas G. Beasley, K4JFI, USA-CA 500 #2537, All SSB, 7-22-91.

Norman E. Van Raay, WA3RTY, USA-CA 500 #2538, Mixed, 7-22-91.

Awards Available

3A CW Award. The 3A CW Award is issued by the 3A-CW Group, Principality of Monaco. It is available to amateurs and SWLs worldwide.

All contacts or SWL reports with stations in Monaco must be on 2 x CW only. Each QSO or SWL report counts as one point. A joker counts as two points (only one time). Jokers are: 3A0CW, 3A2ARM, 3A200SM, 3A7A, 3A8A, 3A9A, and 3A7JO.



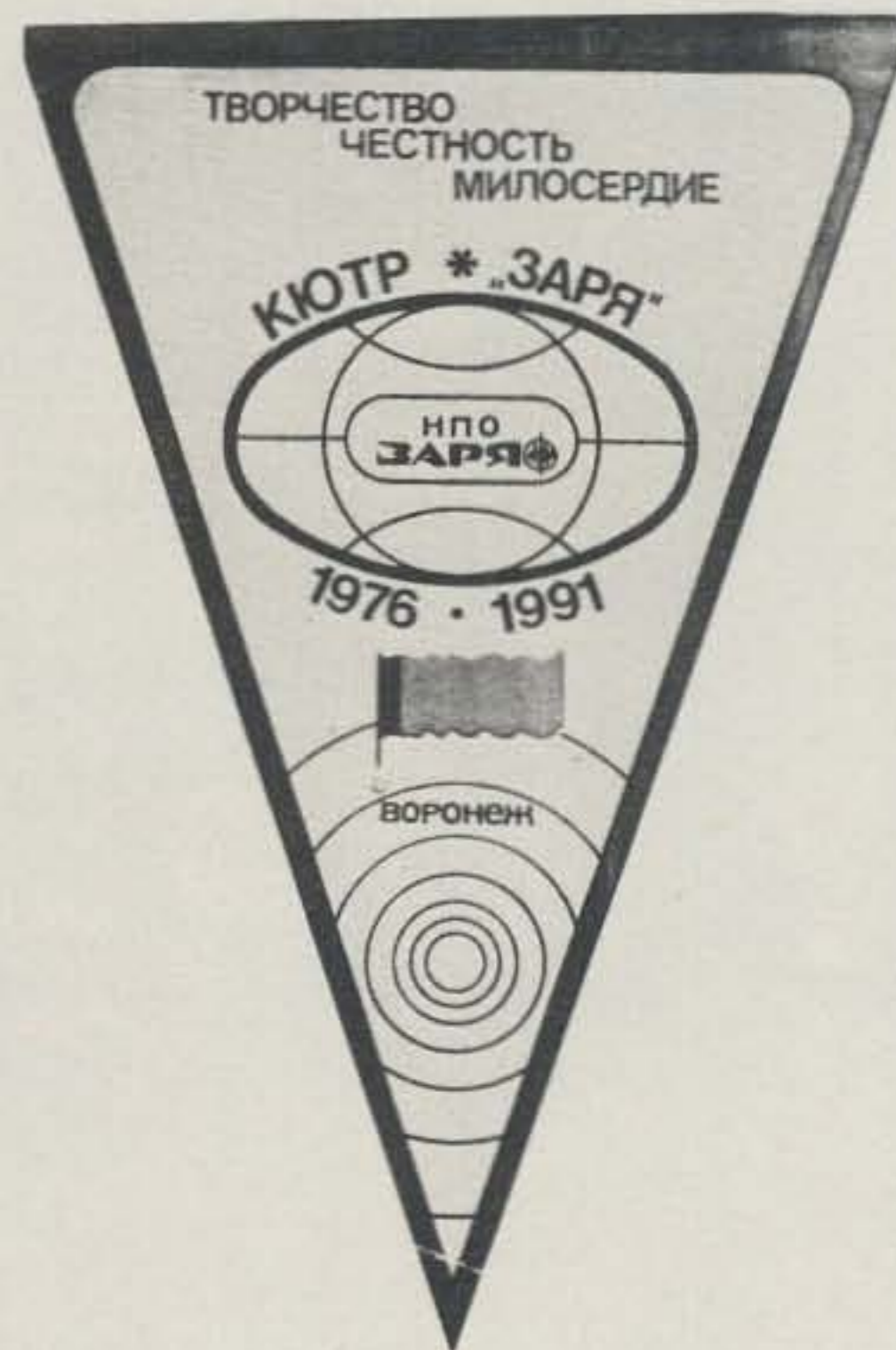
The 3A-CW Award by the 3A-CW Group, Principality of Monaco.

Several QSOs or SWL reports with the same station are permitted on different bands only. All bands, including WARC, are valid for the award. Contacts must have been after January 1, 1981. There is no minimum RST requirement.

The award is issued in three classes: Basic, First Class, and Excellence. For European applicants: Basic is 4 points; First Class 8 points; Excellence 12 points. For others: Basic is 2 points; First Class 4 points; Excellence 6 points.

The cost is 20 IRCs or \$8 US; add \$3 US or 8 IRCs for registered airmail. Upgrading costs \$2 US or 5 IRCs. Submit log book entries certified by the National Award Manager or by an official country CW Club, or submit QSLs, to Claude Passet, 7 rue de la Turbie, MC 98000 Monaco, Principaute, Europe.

Radio Club "Zarya" Award. The Radio Club "Zarya" Award is offered by the club in celebration of its 15th anniversary. The club was formed in 1976 by Victor Valchenko, UA3QR. Its purpose is to train



The Radio Club Zarya 15th anniversary pennant for working amateur stations in the Voronezh Region, USSR.

students in amateur radio, electricity, and computer-aided work. To this end, the club supports a group of engineers to oversee and carry out the construction of equipment. Construction projects have included single band transceivers, automatic keys, and triband receivers.

The award is a four-colored flag or pennant. It is awarded for communication with amateur stations of the club "Zarya" members, as well as with young pioneers and schoolmates of the Voronezh City

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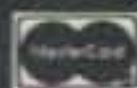
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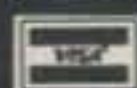


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and Voronezh region. To qualify, the applicant must carry out two QSOs with stations on the list that follows. Contacts must be made in the period January 1, 1990 to December 31, 1992. Repeated contacts in different bands will be considered, as well as QSLs of Voronezh SWLs. SWLs may receive the certificate on the same conditions as licensed radio amateurs.

To receive the anniversary flag, send only two QSL cards, along with a fee of \$3.00, to Award Manager, Alex Valchenko, RA3QR, P.O. Box 63, Voronezh 394000, USSR. It is suggested that registered mail be used, and the fee be placed between the QSL cards.

List of callsigns: RA3QL, RA3QR, RA3QW, RA3QDX, RA3QEP, RA3QMU, RA3QFB, RA3QFR, RA3QPA, RA3QRU, RW3QR, U3QL, UA3QG, UA3UJ, UA3QM, UA3QR, UA3QAH, UA3QBB, UA3QBK, UA3QBL, UA3QCD, UA3QEA, UA3QHN, UA3QKO, UA3QKW, UA3QMR, UA3QOQ, UA3QOY, UA3QRG, UA3QUK, UA3QVF, UA3QVO, UV3QA, UV3QK, UV3QAE, UV3QHF, UV3QIL, UV3QKR, UV3QLR, UV3QMU, UV3QOB, UV3QQG, UV3QQK, UV3QQU, UV3QRJ, UV3QSJ, UW3QA, UW3QT, UZ3QYA, UZ3QYB, UZ3QYC, UZ3QYD, UZ3QYT, UZ3QYW, UZ3QZM, UZ3QZO, UZ3QZQ, UZ3QZR, UZ3QZU. SWLS: UA3-121-1501 . . . 1680, UA3-121-1700 . . . 1800, UA3-121-2101 . . . 2300, UK3-121-101 . . . 200.

"Ataman" and "Quiet Dan" Awards.

The Association of Ham Radio Operators of the Don Cossak Community (Don Association) would like to establish contact with other operators having roots in the Don and other Cossak communities. The Don Association invites them to become members with the goal of participating in the rebirth of the Cossak communities by encouraging joint projects between these communities.

The Don Association has, to this end, introduced the certificates "Ataman" and "Quiet Don," devoted to the rebirth of the Cossak communities.

This certificate will be awarded to amateur radio operators involved in two-way radio contact with members of the Don Association. To be eligible for receipt of the Ataman Certificate competitors are required to fulfill the following requirements: radio stations in the USSR contact 10 members of the Don Association; radio stations in Europe contact 5 members; radio stations on other continents contact 3 members.

Radio contacts on any frequency and on any band since January 1, 1991 will be accepted. Recurring contacts will only be recognized once. This certificate does not acknowledge observers. The winners are awarded the Ataman certificate, and winners of a yearly competition by the Don Association will receive the Ataman Cup. More information on receipt and distribution of these certificates will be avail-

able at a future date.

Member of the Don Association are U4AA, UA4AAA, UA4AC, UA4AM, UA4AS, UA4AL, UA4AO, UA4AH, UA4AU, UA4ANO, UA4AJD, UA4AAV, UA4ACZ, UA4ABK, UA4AFZ, UA4ALU, UW4AK, UV4AB, UV4AB, UA4BI, UA4BD, UA4BP, UA4BT, RA4AR, RA4AG., RA4AF, U6AS, U6DM, UA6LK, U5MA, UB5ZA, UB5ZP, U3QC, UA0KG, UA6LU, U6UF, RA6LU.

The certificate "The Quiet Don" is issued on the establishment of radio contact with the amateur radio operators of the Don Association. In order to receive this certificate the competitors are required to fulfill the following conditions: radio stations in the USSR collect 100 points; radio stations in Europe collect 50 points; radio stations on other continents collect 20 points.

Each contact is worth one point. For contact with the radio station UZ-6-LHN, the station Veshinskoi (the homeland of the author M. Sholokhov), the points are doubled. Radio contact on any frequency or any band as of January 1, 1991 will be accepted. Information on the distribution and receipt of these certificates will be available at a future date.

This information about the Don Association Awards was supplied courtesy of UA4AM under the address ARDC "Don," P.O. Box 109, Volgograd 400066, USSR.

Troitsk 250 Pennant. The Troitsk 250 Pennant is offered by the Troitsk Radio Club, USSR. It is a small pennant with the applicant's call engraved on a stainless label.

To qualify for the award work three members of the Troitsk Radio Club in the period 1 July 1991 to 31 July 1993. There are no band or mode limitations. Repeated QSOs on different bands are creditable.

Send GCR list and 5 IRCs (or equivalent) to M. Tsarev, P.O. Box 124, Troitsk 457100, USSR.

TRC members are: RA9ADB, RA9AFU, RA9AFV, RA9AJQ, RA9ALW, UA9AB, UA9AO, UA9ADG, UA9AFO, UA9AGJ, UA9AIV, UJA9AKW, UA9ANI, UA9AOV, UA9AQZ, UW9AZ, UZ9AXB, UZ9AZO, UA0FHB.

Of Interest To County Hunters

The 18th edition of the B & B Shop County Hunters Directory is now available. Included in this edition is an order form for PEACH, The Print, and Edit Addresses for county hunters. This program and data file permits the user to look up names and addresses in the County Hunters Data Base, which is the source of data for the County Hunters Directory.

The cost of the directory is \$6.00 plus \$1.45 shipping and handling. Three quarterly updates are \$3.00. Write to: The B & B Shop, P.O. Box 83403, Phoenix, AZ 85071.

73, Dorothy, WB9RCY

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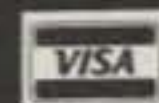


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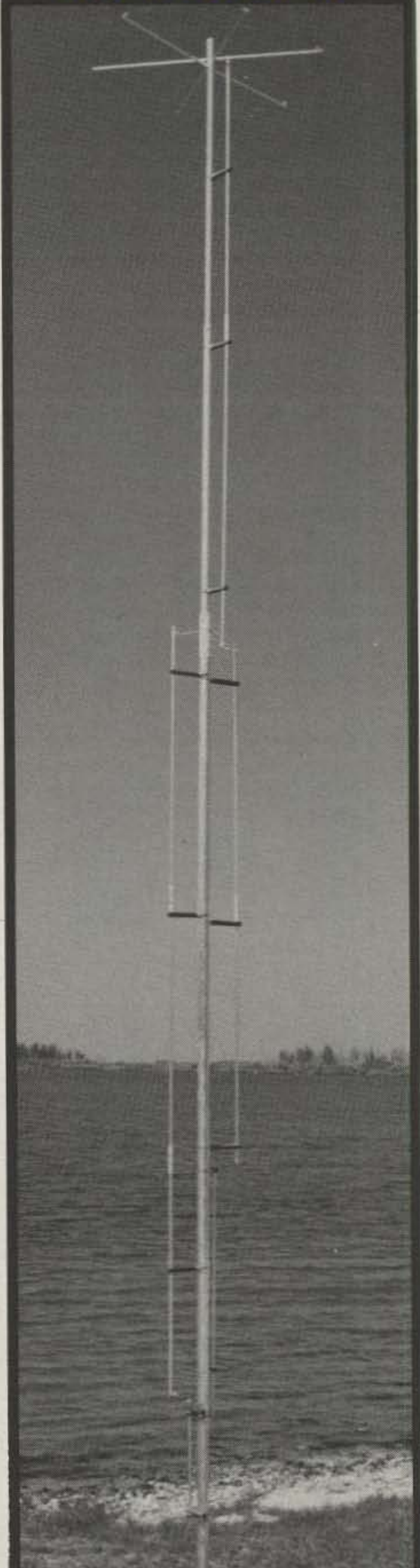


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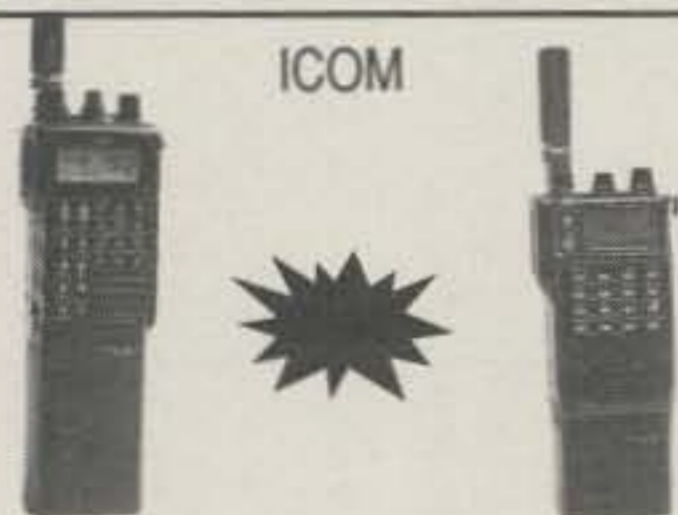
CIRCLE 14 ON READER SERVICE CARD



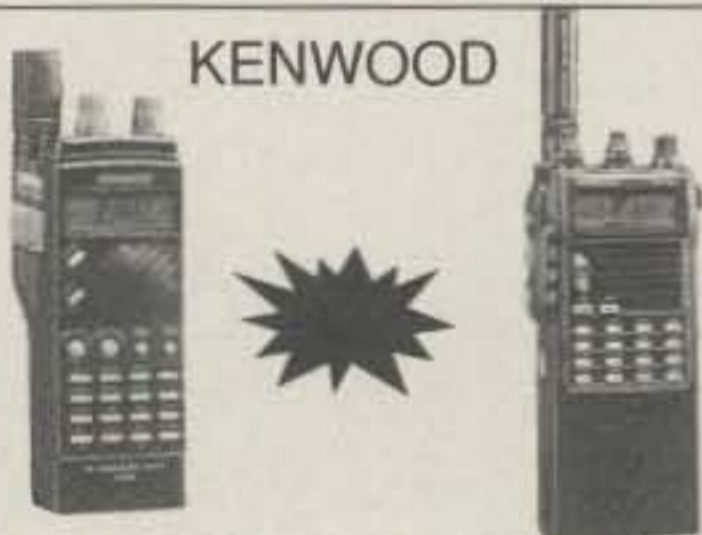
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The 1992 CQ World-Wide 160 Meter DX Contest

CW: January 24-26
Starts: 2200 GMT Fri.

SSB: February 21-23
Ends: 1600 GMT Sun.

Here 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	
	CW	SSB
World	N4RJ	Southeastern DX Club
USA	WS9V	WB9Z

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/check sheets are required for logs over 200 QSOs. If not provided, the log becomes a check log. The sheets 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. If your logging is done on computer disk, a legible printout of the log must be sent in.

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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X-500NA	2m/70cm	8.3/11.7	200	17.2	N	90	2m:3-5/8λ,70cm:8-5/8λ
X-200A	2m/70cm	6.0/8.0	200	8.3	UHF	112.5	2m:2-5/8λ,70cm:4-5/8λ
X-50A	2m/70cm	4.5/7.2	200	5.6	UHF	135	2m:6/8λ,70cm:3-5/8λ

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U-300A	70cm/23cm	8.6/13.2	150	8.3	N	110	70cm:4-5/8λ, 23cm:10-5/8λ
U-5000A	2m/70cm /23cm	4.5/8.3 /11.7	150	6.0	N	135	2m:6/8λ,70cm:3-5/8λ, 23cm:7-5/8λ

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F-23A	2m	7.8	200	15.0	UHF	90	3-5/8λ
F-142A	1 1/4m	5.5	200	6.0	UHF	110	2-5/8λ
F-718A	70cm	11.5	250	15.0	N	90	18-1/2λ
F-1230A	23cm	13.5	100	10.5	N	90	25-1/2λ

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—QST Magazine

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—Radio Communications (U.K.)

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—CQ Magazine

"Until now a RF output power of 100 watts applied as the norm for semiconductor component shortwave transceivers; some newer high class units offered 150 watts. The FT-1000 is set for a maximum RF output of 200 watts. During normal SSB and CW use the power transformer remains hand warm—an improvement over the past when a transformer would occasionally 'burn up'..."

—cq DL (Germany)

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—73 Magazine

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ALL ABOUT THE WORLD ABOVE HF

Record-Breaking QSOs

Another month passes and another record is broken! This month I can report on two records being broken. On July 28 Chip Angle, N6CA, and Paul Lieb, KH6HME, managed two record-breaking QSOs on SHF. The first was on 3456.1 MHz and the second, an hour later, was on 5760.1 MHz. These two QSOs establish new terrestrial records of 2469 miles for each band.

Chip reported that his homebrew equipment was used on both ends of the path. Each station was running 5 watts into a 4 foot dish. Chip was operating near the Palos Verdes City Hall at an elevation of 400 feet. Paul was operating from an elevation of 8200 feet on the 13,680 foot Mauna Loa volcano. The mode of propagation was tropospheric ducting, a phenomenon that results in VHF and above signals being trapped in a duct formed by hot air converging on cooler air (like a tube), causing the signal to be carried for very long distances.

What is more remarkable about this record is that the QSOs took place at all. Earlier this summer I spoke with Paul and he was a bit disappointed that very little propagation had taken place between Hawaii and California. (It has become a regular event for people on the west coast to work Hawaii on 2 meters SSB in late June to early July.) At that time Paul doubted that any realistic propagation would take place this summer. However, Chip and Paul decided to try for the record anyway. Weather reports were monitored daily. On the 28th the weather reports indicated the possibility of a tropospheric duct being formed between California and Hawaii.

Chip set up his station in anticipation of the possible opening. Paul drove up to his beacon site on the volcano from his home in Hilo, about an hour and a quarter drive away, to fire up his end of the path. (Paul often relies on phone calls from people on the west coast hearing his beacons on the volcano to alert him to drive up the volcano. He has beacons on 144, 432, and 1296 MHz. Fortunately for the west coast VHFers Paul packs up supplies in order to stay on the volcano for days at a time.)

Finally, the band started to cooperate. Paul started giving out contacts on 144

and 432 MHz. All the while Chip and Paul used 144 MHz for liaison and monitored 1296 MHz for band openings. Ultimately, they were able to establish contact on 3456 MHz. Then an hour later they made contact on 5760 MHz. The contacts took place on CW, and Chip reported that there was tremendous QSB on both bands, but that for periods as long as 30 seconds they had copyable signals, making for the official contacts. Chip reported that both antennas were aimed precisely at each other. However, Chip says that they did have a margin of error of about three degrees on these frequencies. Normally Chip sets up at his home QTH at the 1200 foot level. However, they found that this duct pipeline was at an unusually low level, requiring that Chip set up at the 400 foot level.

The previous 3456 MHz record of 614 miles was held by Chip and Jack Henry, N6XQ, operating within Mexico. Paul and Chip have set their sights on the 10 GHz band for their next attempt to break a record. That record is now held by the Italians. Chip also would like to break the Australian 2304 MHz record and set a record at 902 MHz. When these events happen, you will read about them here. As of late August there have been no further openings on this path since these record-breaking QSOs.

Thanks to Chip, Paul, the *ARRL Letter*, Gordon West, WB6NOA, and the *West Coast VHFer* for input into this report. For more information on tropospheric duct propagation, you might want to read Gordon's well-researched article entitled "Tropo Time is Now!" which appeared in the July 1991 issue of *73 Magazine*. Gordon is trying for a 434 MHz ATV record on the same path. The day of these record QSOs Gordon reported hearing the sidebands of the video signal but could not pull out a sufficiently loud signal to convey any intelligence.

Eric Roy, TI2NA

I previously mentioned that I had made a trip to Costa Rica in July. I was part of a team from my church that performed construction work in Matina (a small town about 20 miles from the east coast of Costa Rica), following the devastating earthquake in April. I thought I might be able to get on the air, but the trip was a



The station of Eric Roy, TI2NA. (For details, see text.)

busy one that kept me very occupied and with little time for amateur radio. However, I did manage an all too short visit with Eric Roy, TI2NA.

On the last night I was in the country Eric invited me over for dinner. Before dinner I got the grand tour of the QTH of the most active VHF operator in Costa Rica.

Eric has been active on VHF since 1957. He has maintained a beacon on 6 meters for many years. In his early days he built a mechanical scanner that physically moved the dial of his radio. He presently scans from 50.100 to 50.110 MHz with his ICOM 575. He cannot scan higher in the band due to a local birdie on 50.113 MHz. As you can see from the picture, Eric has a modest station but manages many contacts on 6 meters. Eric explained that 6 meters is the only band he operates, since there is not enough activity on 144 MHz. He also said that 220 MHz is plagued by bootleggers and 432 MHz is presently hampered by other radio services interfering with weak signal activity. Besides, when you are the only one active, whom else can you contact?

Eric also explained that living in a valley prevents him from mounting much of a terrestrial effort on 144 MHz. He pointed out that although he lives in the shadow of the Irzu volcano, it presents him with no opportunity, since every other VHF service in Costa Rica has a transmitter on the volcano. He did cite one interesting anecdote about the volcano. A group of hams maintain a digipeater on the volcano. One morning they discovered that they had picked up traffic from Stateside, indicating that, at least for a short time, there was terrestrial propaga-

P.O. Box 73, Oklahoma City, OK 73101

tion between the two countries. Eric has operated EME on 432 MHz. However, he has made only five contacts, three of them with the same station. He plans no future effort from his present location, since the path most favorable for EME has him pointing his antenna right over the RF hot volcano.

Eric has a very interesting solution to local TVI problems. He has installed a huge parabolic reflector on his roof for satellite reception, and he picks off several TV stations with that antenna. He has built a very low-power transmitter that broadcasts on several TV channels that are not being used in the San Jose area. With that transmitter he rebroadcasts some of the TV stations he receives with his parabolic antenna. The coverage is only a few hundred feet, but sufficient enough for his surrounding neighbors to have reception of these TV stations. His neighbors have learned not to complain about his occasional interference to their televisions from his 6 meter activity, for fear that they might lose the reception of these other TV stations.

VHF Survey

This month I have included a survey in this column. A number of questions will be addressed in the survey, with the results to appear in either the March or April column. As you will see, it is divided into seven parts. Each part represents some interest in an activity expressed by an amateur or a group of amateurs interested in that activity.

The first part deals with the VHF WPX Contest. The second part deals with the possibility of CQ initiating a VHF county award. The third part deals with the possibility of CQ establishing a VHF WPX award. The fourth part deals with asking you if you want CQ to sponsor any other VHF awards. The fifth part asks you, the readers, if you want to see AMSAT-related news in this column. As a guest writer in Bill Tynan, W3XO's September 1991 QST "World Above 50 MHz" column, Mike Owen, W9IP, asked rhetorically whether or not everyone should be vertically polarized on 222 MHz. Therefore, the sixth part asks you to answer Mike.

The final part relates to the DX window on 6 meters. Since the establishment of the window between 50.100 and 50.125 MHz, very little Stateside to Stateside activity takes place. As I mentioned above, Eric, TI2NA, cannot scan above 50.113 MHz. Therefore, he feels that he misses out on openings that may be there but not hearable by him. The question deals with your opinion of limited Stateside to Stateside contacts, just to let the rest of the world know of propagation.

The survey is to be sent to my home address and is to be postmarked by January

20, 1992 in order to be part of the tabulation.

Central States VHF Society Conference

From all reports, the Central States VHF Society conference, held over the last weekend of July, was a great success. All seminars went off without a hitch. Marc Thorson, WB0TEM, made several contacts with his 1296 MHz EME demonstration. Unfortunately, the 10 GHz EME demonstration did not fare quite as well. The guys in Cedar Rapids could hear KY7B's signal but not visa versa.

The Chambers Award, for technical ex-

cellence, was won by Jim Vogler, WA7CJO. The Wilson Award for service to the Society and/or VHF in general was won by Kent Britain, WA5VJB. Kent is one of two society members to have won both awards (the other being Al Ward, WB5LUA). Plans were made to work with the ARRL to produce a video for presentation to the FCC to offer the weak signal's perspective.

Next year's convention will be held from July 16-19 at the Y. O. Hilton Inn in Kerrville, Texas. The officers for next year are: Bill Tynan, W3XO, President; Derwin King, W5LUU, Vice-President; Larry Hazelwood, W5NZZ, Secretary; and Charles Shennault, WA5YOU, Treas-

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surer. Derwin is also the program chairman. If you are interested in putting on a program, contact him at his *Callbook* address.

Larry Nichols, W5UGO Silent Key

visiting the site of the Tulsa Amateur Radio Club (overlooking Keystone Dam) I drove the short distance across the valley for an eyeball QSO in Larry's home. He was so excited to talk about the skeds he had been keeping with Ron Gamel, N5WX, while Ron was grid mobiling through Colorado on 432 MHz. Larry showed me his station and his junk room

(one and the same). He showed me his VUCC awards, all nicely framed and mounted on the wall. He held VUCC for If you were at the convention, you might have run into Larry Nichols, W5UGO. My friend Larry became a silent key on July 29.

I had met Larry several times at various hamfests and had talked with him on 2 meters SSB innumerable times. He was always there to welcome someone new to the wonderful world of VHF and above. He always had time to chat with his friends—and you were one of them when you first met him.

I last visited with Larry on June 22, the Saturday of Field Day weekend. After

144 MHz (No. 302, with endorsements for 175 grid squares), 432 MHz (No. 158, with endorsements for 110 grid squares), 3.4 GHz (No. 20), and 5.7 GHz (No. 5, with endorsements for 25 grid squares). Incredibly, he had worked 30 grid squares on 5.7 GHz.

Larry showed me the new radio he had won at the (Tulsa, Oklahoma) Green Country Hamfest only a month before. (He had used it to talk me into his QTH.) He showed me the microwave dish he used for various bands by switching in different homemade feedhorns. He showed me his newly acquired tower (actually, old construction scaffolding that he had gotten at "such a deal that [he] could not pass up") which he was going to use to mount that dish and a 432 MHz antenna. I think of all the things he showed me, the one which gave him the most pride was his wild flower collection. He talked about how groups would come up his hill and photograph the flowers when they were in full bloom.

Larry was strongly influenced in his VHF and above activities by his father, Ray, W5HVF, who was one of the founding fathers of the Central States VHF Society. Larry was also one of the founding fathers and the first president of the society. He was an experimenter's experimenter. It is hard to list all of his accomplishments, except for one. He touched so many lives in such a positive way. That, I think, is probably his most important accomplishment. Knowing Larry, I think that he is probably now trying to bounce signals off the distant galaxies. We, on earth, though, will miss you very much, Larry. 73, good friend.

Senate Considers Spectrum Protection Bill

In my first column I mentioned HR 73, the U.S. House of Representatives bill that would protect the amateur radio frequencies from further encroachment. Now comes word that Senator Al Gore (D-TN) has introduced a parallel bill in the Senate. His proposed legislation has been assigned the number S. 1372. It was co-sponsored by Senator Carl Levin (D-MI) and Senator Joseph Lieberman (D-CT). If you are interested in seeing legislation pass that would provide some measured protection to our frequencies, then I would urge you to write to your senator and congressman (if you have not already done so) and recommend to them that they sign on as co-sponsors of the respective bills.

Station Activities

I received a nice note from Peter, PY5CC, concerning his 6 meter activity during Ju-

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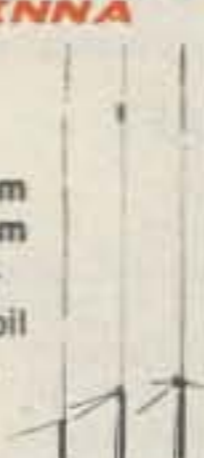
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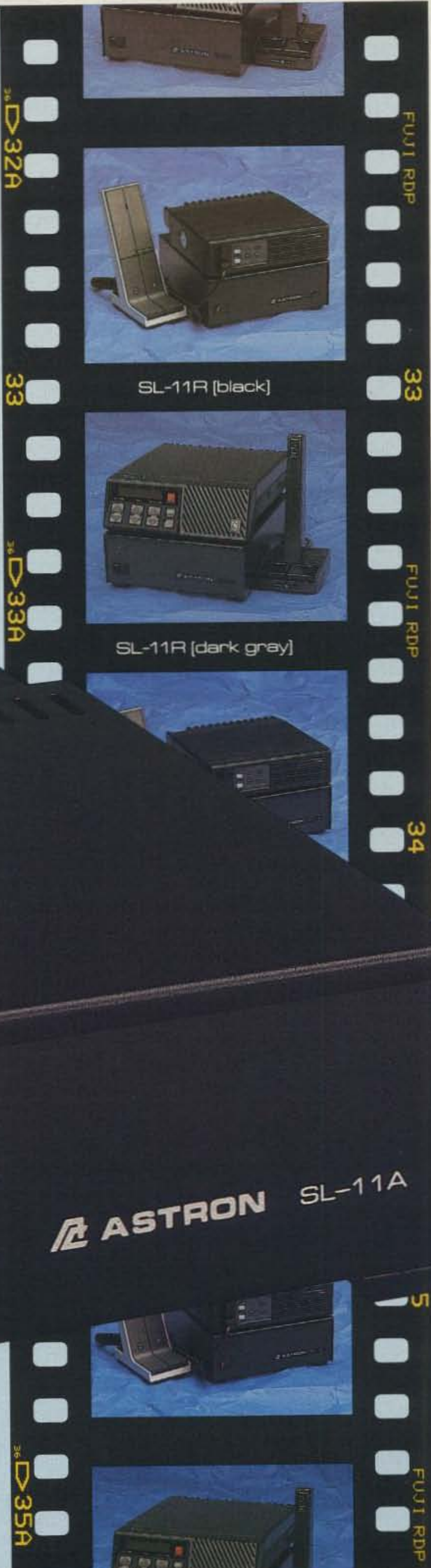
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SL-11R [black]

SL-11R [dark gray]

ASTRON SL-11A

VHF PLUS COLUMN SURVEY

Your Callsign (optional): _____

Years active on VHF and above: _____

Bands active on VHF and above:

50 MHz 144 MHz 222 MHz 432 MHz

902 MHz 1296 MHz 2.3 GHz 3.4 GHz

5.7 GHz 10 GHz 24 GHz

Other (please indicate which ones) _____

Laser? _____

Amateur Satellites? _____ Which one(s)? _____

EME? _____ What frequencies(s)? _____

Do you consider your station a "super station" (i.e., tall towers, more than a brick for an amplifier, etc.)?

Yes No

CQ World-Wide VHF WPX Contest

1. Should the date of the contest be moved?

Yes No

2. If yes, to what new month?

a. June

b. August

c. Some other month (you specify) _____

3. Should Grid Squares be used as a multiplier?

Yes No

4. Should Countries Worked be used as a multiplier?

Yes No

5. Should Prefixes be eliminated as a multiplier?

Yes No

6. What, if any, changes should be made to the exchange?

7. What changes in categories would you like to see in the contest?

8. Should the starting and ending times of the contest be staggered to reflect the different parts of the world?

Yes No

9. If Yes, what times should the contest start and end in ITU Region I (Europe and Africa)?

10. If Yes, what times should the contest start and end in ITU Region II (North and South America)?

11. If Yes, what times should the contest start and end in ITU Region III (East Asia and Oceania)?

12. What other changes in the contest would you like to see?

VHF County Hunting Award

1. Should CQ sponsor a VHF-only county award?

Yes No

2. If Yes, your comments on the award. _____

VHF WPX Award

1. Should CQ sponsor a VHF-only WPX award?

Yes No

2. If Yes, your comments on the award. _____

Other Awards

1. Should CQ sponsor any other type of VHF-related award (a grid square sprint award has been suggested)?

AMSAT News

1. Do you want to see AMSAT news in the VHF PLUS column?

Yes No

2. If Yes, what percentage of column space? _____

3. If No, do you want to see a separate column?

Yes No

222 MHz

1. Do you think that everyone should operate vertically polarized on 222 MHz?

Yes No

50 MHz DX Window

1. Do you think that there should be very limited stateside to stateside activity on 50.110 MHz (i.e., contacts would be for very short duration for the purpose of establishing that propagation exists for DX that might be listening)?

Yes No

2. If Yes, why? _____

3. If No, why? _____

What other comments do you have about operating on VHF and above? (Use an additional sheet if necessary.)

Send survey to:

Joe Lynch, N6CL

P.O. Box 73

Oklahoma City, OK 73101

Deadline: January 20, 1992



The Paragon... General Coverage Versatility.

The Paragon receiver tunes from 100 kHz to 30 MHz with impressive selectivity, sensitivity and quietness. The transmitter operates at 100 watts output from 1.8 to 30 MHz. LSB, USB, QSK CW, real FSK and optional FM. AM is receive only through an outstanding 6 kHz AM filter.

Dual VFO's with displayed TX or TX offset with a range of +/- 99.9 kHz. The momentary "REVERSE" button allows you to listen to, or set, the transmit frequency. An extremely agile frequency control system. Sixty-two tuneable or scan-able memories that store frequency, mode, filter selection, channel number plus a 7 character alpha-numeric "Tag" feature. Great for channel I.D. or storing amplifier or tuner control settings.

Fast receiver recovery provides excellent FEC/ARQ and QSK CW performance. All five I-F filter slots are selectable independent of mode. Pass-band tuning to optimize filter effectiveness. Rear panel inputs and outputs, using phono jacks, for interfacing auxiliary equipment. Provisions for separate RX antenna, transverter, digital gear and a QSK or conventional amplifier. Adjustable pitch and level cw side tone plus a sideband monitor. Optional RS-232 interface.

Other standard features include a 24 hour clock, calendar, speech processor and noise blanker. For the vision impaired operator an optional synthesized voice board will announce the displayed frequency and an ALC annunciator will simplify mic gain and speech processor adjustments.

Our unique amplifier design protects the power transistors with a current limiting system. This allows full input power operation at an SWR of greater than 2:1 and eliminates the need for an internal tuner. The transceiver operates at 12-14 Vdc. An external power supply is used. This design approach simplifies use of alternate power sources and contributes to cool operation, without a fan.

All aluminum construction. Top quality components and all PC boards are G-10 epoxy glass. Field serviceable to the board level. The Paragon is a top performing, do-everything rig. And even more good news, it is one of the least expensive premier transceivers available. Check it out.



The Omni V... Ham Bands Only, But Wow!

The Omni V is unique in all the World. It uses a crystal mixed oscillator, rather than a synthesized oscillator, and a phase locked loop frequency tuning system. You trade general coverage operation for ultimate performance in the ham bands. Phase noise is eliminated as a significant variable, in both TX and RX! The sensitivity, quietness, selectivity and dynamic range are most impressive.

The I-F filtering system is pretty awesome too. There are slots for four filters in the 6.3 MHz I-F, and two in the 9 MHz I-F. Eight pole, 2.4 kHz, crystal filters are standard in both I-F's. When the optional filter in the 9 MHz I-F is in use, it is cascaded with the 2.4 kHz filter in the 9 MHz I-F. Up to 24 poles of crystal ladder filtering is possible. The resulting selectivity adds new meaning to the term.

The transmitter delivers 100 watts output 160 through 10 meters. USB, LSB, QSK CW and real FSK for the digital modes. FM is optional. Rear panel connections, using phono jacks, for virtually any auxiliary equipment, including a separate RX antenna input. Adjustable CW sidetone and monitor for SSB. RS-232 interface is standard.

The front panel features a large, easy to read, frequency display that doubles as a time and date display. The panel layout is spacious and user friendly. Dual VFO's with A=B, SPLIT, A/B controls that result in the most simple frequency management system around, and provides unlimited range offset tuning. The momentary "REVERSE" button allows you to hear and/or set your transmit frequency. There are 25 tuneable memories, using battery independent nonvolatile RAM, plus the "scratch pad" feature to quickly store and recall a configuration.

Quality components and G-10 epoxy glass PC boards assure long term performance stability. Field serviceable to the board level. All aluminum construction. Power amplifier protection is with our current limiting circuit which allows full input power at an SWR of 2:1, or higher, without an internal tuner.

If you operate for extended periods, you will love the optional, Model 301, remote frequency tuning encoder. You will also appreciate the reduced fatigue factor that results from the quality (less than 2% THD) audio and superb signal to noise ratio.

The Omni V is a delight to operate whether you prefer a single mode or work them all. This rig is simply outstanding, and at a very attractive price for equipment in this class.

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ly. He reported that on the 10th he worked 21 Europeans, with most of them in England. On the 16th he worked 9H5EE. On the 22nd he had another good European opening, working eight stations throughout western Europe. On the 26th he worked two more Europeans, and on the 29th he heard the Greek beacon, SV1SIX. Peter says that he stands at 104 countries worked and 90 confirmed.

From your "on the air" comments and from the few reports I have received, the Perseids meteor shower produced a number of successful QSOs. It appears that the best day and time was Monday, August 12 between 1500 and 1600 UTC. A number of stations, particularly on the northeast to southwest path, reported good random QSOs, with long bursts of signals from the stations they were working. In particular, Ted Goldthorpe, WA4VCC, and his wife, Itice, KB4CSE, completed 17 of 23 skeds and made 22 random QSOs, in 19 states and 2 Canadian provinces. Ted stated that Monday morning conditions were similar to a sporadic-E opening. Terry Baxter, N6CW, operating from DM11, in Mexico, had 7 completed skeds and 13 random QSOs. Terry said that this was the best shower he has ever been in and that he heard lots of big signals with long burns.

I would like to include your impressions in a future column, especially those of you who participated in the shower for the first time.

Several stations reported excellent 6 meter openings around the midwest, southwest, southeast, and northeast parts of the States and into Argentina on August 23 and August 24. Pete Petri, WA5JCI, among others, reported working LU2DEK, as well as several Stateside stations on these two days.

On Sunday evening, August 25 Rich Zwirko, K1HTV, worked Ron Graham, VK4BRG, on 50 MHz. Rich heard several stations calling Ron, but with no apparent success. So Rich called Ron on 28.885 and told Ron to listen for him on CW. Ron said to send very slowly. Rich said that when he called Ron, it seemed like the whole world stood by for the QSO. Ron gave Rich a 529 and Rich sent a 53 signal report to complete the QSO.

Rich suspects that the propagation path was probably F2 to the midwest, with a sporadic-E enhancement link to Maryland. Rich noted that in one of the propagation reports he receives at work, it reported that a proton enhancement occurred that caused the MUF to go over 50 MHz for the hour surrounding the QSO. Rich, along with several others, was also able to work KP2A/KP5 on August 28, for his second new country in one week.

This month again features sporadic-E openings on 50 MHz. This time of the year the east coast will probably have one more good shot at Africa and Europe.

Check George Jacob's Propagation column for possible good days for openings this month and stay tuned to 28.885 for current activities.

Current Contests

The second weekend of the International EME Contest is the first weekend of this month. See last month's writeup in John Dorr's Contest Calendar column for contest rules.

Final Thoughts

Again, I thank you for your input in this column. This is your column. If you do weak signal operating above 50 MHz, you

are participating in pioneer amateur radio activity. In many ways you are on the cutting edge of technology. What you discover about propagation, what equipment works well on what frequency, how to bounce a signal off the moon more efficiently, how to use meteors as a viable source of communication, and other exciting aspects of operating on VHF and above are things you can treasure as your contribution to amateur radio and to technology in general.

I want to hear from you about your discoveries, and I do appreciate hearing from those of you who have sent material to me somewhat in blind faith that this column was going to last. Well, it will last with your continuing contributions. Until next month . . .

73, Joe, N6CL

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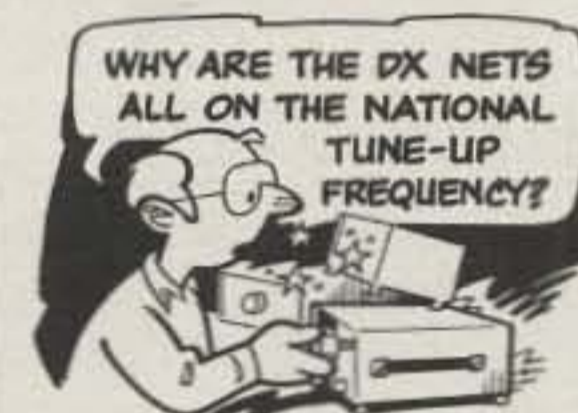


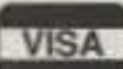

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
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CIRCLE 85 ON READER SERVICE CARD

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More (Solar) Power To You—Part II, Conclusion

Sun power, solar power—either of these say something to us about today's technology. Few will really stop to consider just how much the sun provides for us; even fewer will attempt to harness some of this free-for-the-taking energy.

Last month we began this two-part segment about how we can utilize the power from the sun for our hobby. This is nothing new, yet this series of articles may provide just the vehicle that is needed by many readers to get a project like this underway. The information contained herein has been tried and proven.

Working Together

Think about this for a moment: When did your club or packet users group work together on a project? This may be the reason why so many clubs and organizations have dwindled in size or otherwise become divided. It has something to do with a phrase that begins "Idle hands . . ."

There was a time when we had some kind of club function that supported more than a fish fry, cookout, and field day activities. Building something useful and beneficial had a way of bringing everyone together. After the project was completed, it gave the participants a feeling of accomplishment. The results were there as a tangible entity for everyone to be proud of and remember. All in all we soon discovered that a new camaraderie had developed within the organization.

Having said all that, here is the second installment, or Part II, of the solar project which we began last month. This is a project that can be used in several applications, whether it is the club's voice repeater or the digital packet switch.

From last month's photos you were able to see how the RF and data platform was fabricated. We also displayed the manner in which the complete enclosure, or canister, was prepared (sealed) and buried to provide a more controlled temperature environment. This also gave the enclosure some added protection from the elements.

The Dynasty GEL-type batteries were used in this application for several reasons, two of the reasons being to keep



Photo A— Near the top of the panel is the M8 Sun Selector charge controller.

down the charging gasses, and to reduce or better yet minimize any battery maintenance that could otherwise become an annoyance.

Putting It All Together

Tying this system together on the surface may appear to be easy, but there are some precautions which must be considered and applied before proceeding.

When using photo-voltaic (solar panel) devices that are designed to supply charging voltage for a large battery bank, remember this step first: **Never** connect

a PV cell (solar panel) directly to the battery (or batteries). When you read the "Real-Good" book (catalog) of alternative energy information, you will understand why this is a such high-priority caution. For openers, solar panels can generate voltages in excess of 20 volts direct current. This alone could cause damage to expensive electrical device(s).

Enter The "Charge Controller"

Looking at the system flow diagram shown in fig. 1, we find the first device following the solar panels is something

Mac Pinouts	Signal	Description	232 Pinouts
1	HSKo	Output Handshake	4 = RTS Input
2	HSKi	Input Handshake	5 = CTS Output
3	TxD -	Transmit Data Line	2 = RxD
4	Gnd	Signal Ground	7 = Gnd
5	RxD -	Receive Data Line	3 = TxD
6	TxD +	Transmit Data Line	NC
7	NC	No Connection	NC
8	RxD +	Ground for RS-232	7 Gnd

Table I— Pinouts from the MINI DIN-8 Macintosh connector to the TNC RS-232 connector.

P.O. Box 158673, Nashville, TN 37215

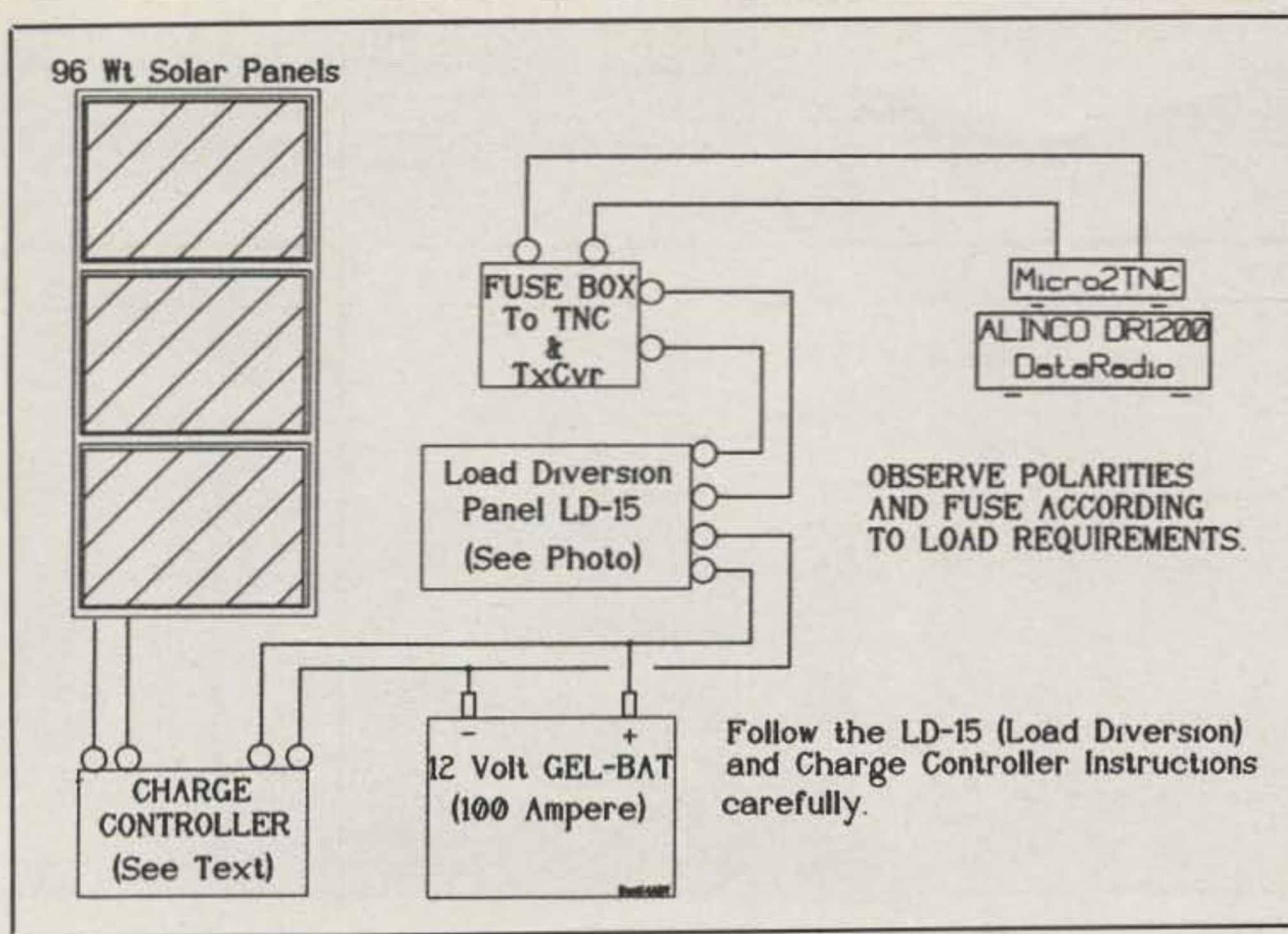


Fig. 1—Flow diagram of the Skitt Mountain solar-powered ROSE switch. It is highly recommended that you connect the "charge controller" directly to the battery terminals. Wires from the controller to the battery must be as short and as large as possible.

called a "charge-controller." This device may be either the M8 or the M16 Sun Selector charge controller. If the M8 (shown near the top of the panel in photo A) is used, connect the **brown** wire to the battery negative (-) post and the **orange** wire to the positive (+) post. The manufacturer recommends using a 15 amp in-line fuse in the orange wire.

The **red** wire is attached to the positive terminal of the solar panel, and the **white** wire is attached to the solar panel negative (-) lead. If the M16 is used, it is recommended that a 25 amp fuse be used in the orange wire. The M16 is to be used when the charging currents are above 8 or 10 amps. The maximum charging current should not exceed 20% more than the rated device current-handling capability.

There are four LED status indicators

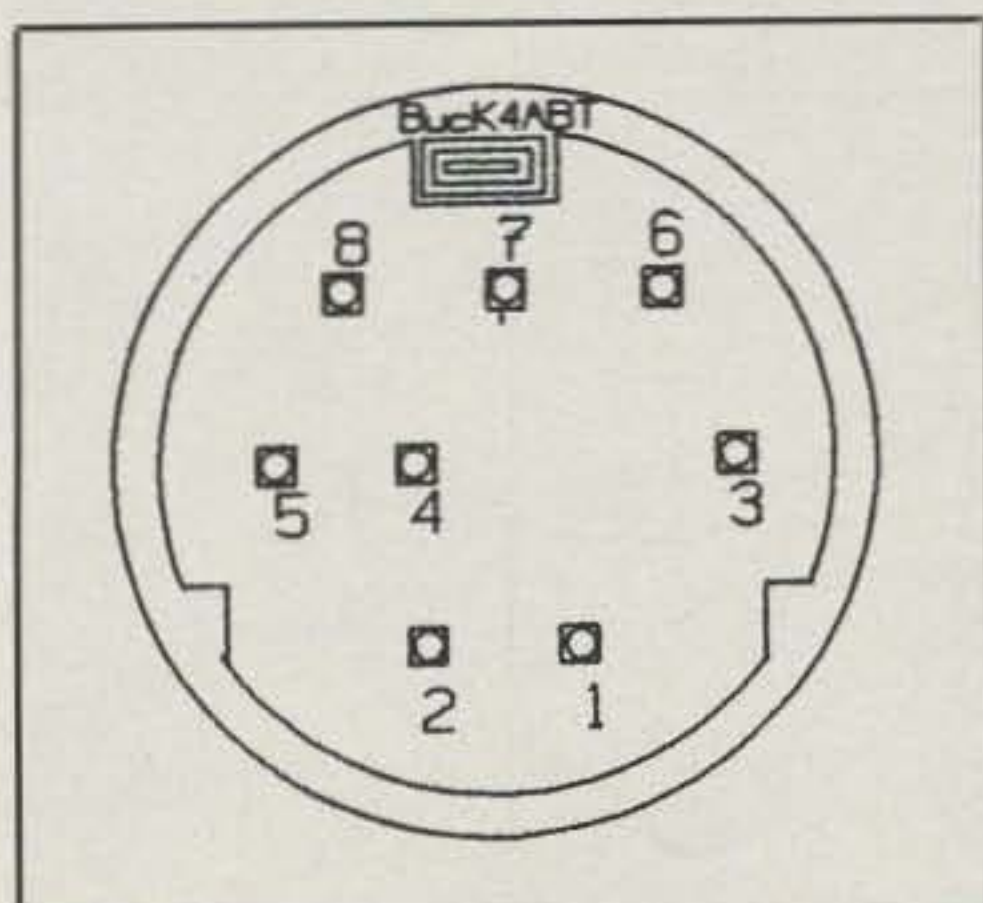


Fig. 2—Macintosh "serial" port (see text).

on the charge controller. Following is a description of the purpose/status of each.

PV Ready—Illuminates when the solar panel is emitting sufficient energy to charge the battery.

Analyzing—Illuminates when the controller has temporarily suspended the charging current to the battery. This is to allow proper chemical (action) mixing inside the battery, which in turn prevents cell damage. In 30 to 60 seconds the charging LED will re-engage.

Charging—Illuminates when full charging current is flowing to the battery.

Finishing—Begins a slow flash rate as the battery reaches full charge. As the battery voltage rises, the flash rate of the LED will increase. This can be used as an indicator to determine battery-charge/voltage-swing condition.

We have just learned that a solar panel should never be connected directly to the battery without a "governor" to maintain a prescribed level of voltage and current. Now that we have covered the battery considerations, it's time to look at the "load" application.

Before the battery we inserted the "charge controller," which in reality protects the down-stream load (equipment). It is now time to consider the battery and the charging devices back up-stream.

"Load Diversion" Equals Added Protection

In the system we put together at the Skitt Mountain site, an LD-15 load disconnect

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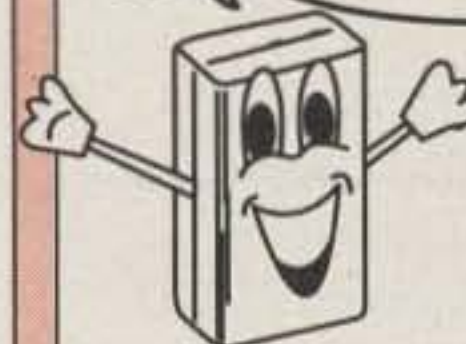
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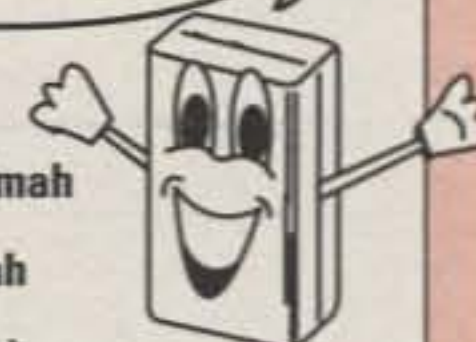
FNB-4SH	12V	1000mah	\$71.00
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Photo B- The LD-15 Load Disconnect, shown at the bottom of the photo, is used to ensure that the transceiver and TNC (load) do not discharge the batteries below the preset level of 11.5 volts, or approximately 25% of the battery capacity.

was used (see fig. 1). The LD-15 pictured at the bottom of photo B is used to ensure that the transceiver and TNC (load) do not discharge the batteries below the preset level of 11.5 volts, or approximately 25% of the battery capacity. The load disconnect will remove the load from the batteries until they are recharged to 12 volts. If and when this happens, the load is then reconnected and the system is at optimum performance.

The "Holly" LD-15 therefore provides protection for the battery and other ener-

gy conversion devices up-stream by preventing deep discharge that could cause permanent damage to the batteries. In addition, the LD-15 enables more rapid recharge of the storage system from the solar panels.

Dotting The "i's" and Crossing The "t's"

So without great fanfare we built a digital store and forward station on a remote

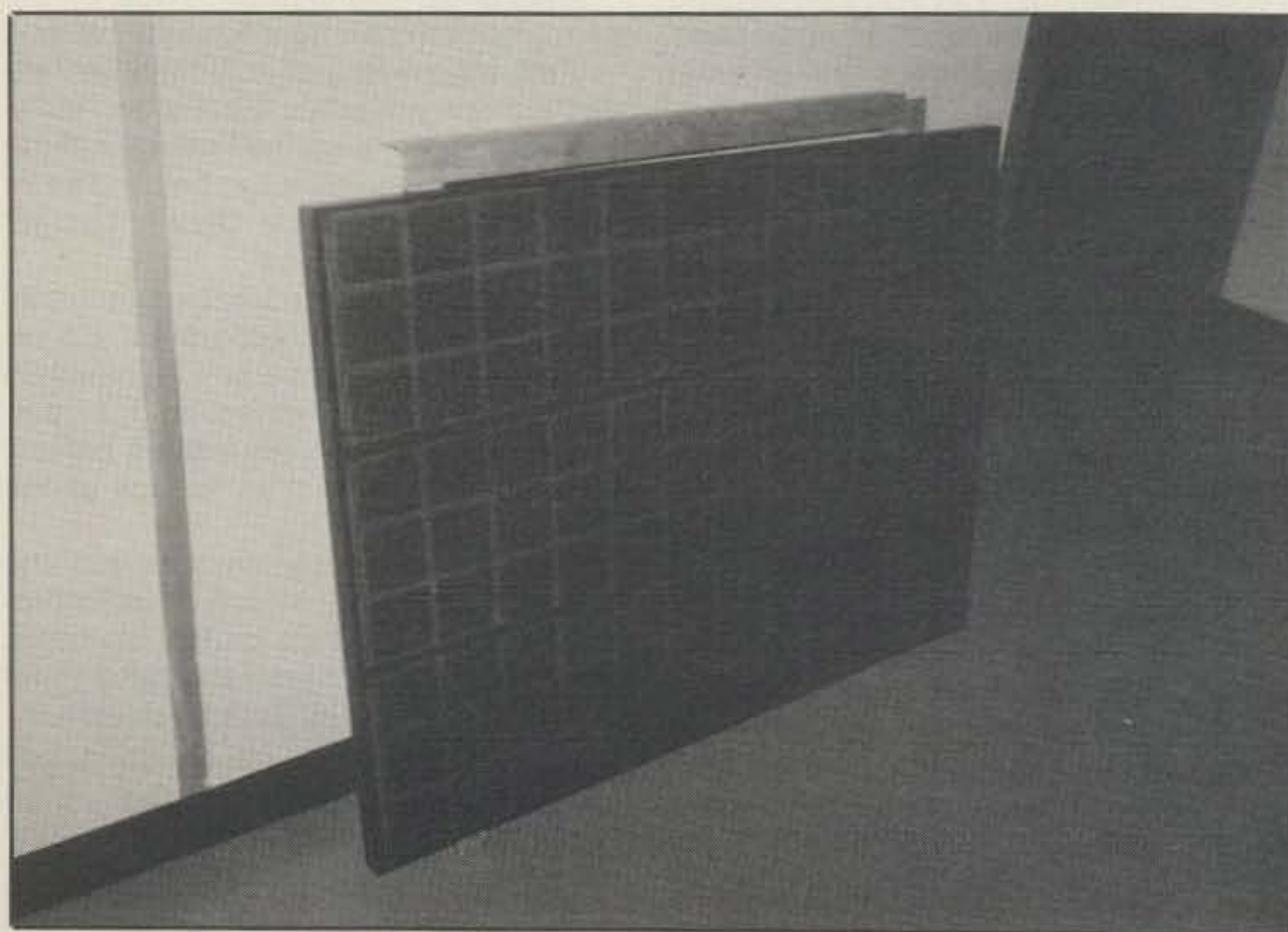


Photo C- The ARCO three-panel set of 96 watt solar panels.

mountaintop where no manmade electrical power existed. We are proud of the Skitt Mountain ROSE switch for more reasons than are stated here. But most of all, it is more proof that man can harness and use clean, safe, and above all, *free* energy from the heavens.

The following is a list of product vendors that were used as points of reference and assistance in the construction of this system. The list also contains part numbers and sources which may be of interest to the prospective solar station builder.

Alinco DataRadio (at your Alinco dealer): DR-1200.

Real Goods (966 E. Mazzoni Street, Ukiah, California 95482): Holly solar products, LD-15 load diversion panel, M-8 charge controller, Loctite Superflex, Ultra-Blue Silicone 587, ARCO three-panel set of 96 watt solar panels (see photo C, P/N 11-130).

Voltex Batteries Inc. (Doraville, Georgia): three 100 amp hour Dynasty GEL-type lead-acid batteries.

Prime Technical Services (PTS) (Atlanta, Georgia): Cable Innovations "CLPS-35" Lightning Protector (see photo D).

PacComm Inc. (Tampa, Florida): PacComm Micropower-2 (CMOS version of the TINY-2).

ROSE (RATS Open System Environment, Bergenfield, New Jersey).

And thanks to these dedicated team

members for their relentless contribution, which made this project work: Chuck Beckham, N4XZV; Mark Forrest, WB4HJG; Steve Idler, KA9UIE; Neal Johnson, KC4LU; Buck Jones, KB4PO; Don Burch, N4KHV; and Richard Barnes, W4IXN.

Special thanks to our landlord, Ron Wiley, for the use of his mountaintop.

KNAT-BYTES

I've received a lot of mail asking how the TNC-2 and other controllers can be attached to the Macintosh to support the KISS mode. The answer for this month's KNAT-BYTE is the contribution to the Macintosh packet users by Doug Thom, N6OYU.

Software handshaking that is normally used with various TNCs in the KA9Q TCP/IP KISS mode is not effective when operating the TNC and Mac in the KISS mode.

The Macintosh Classic, Plus, II/IIx, and SE make use of a serial port with a connector similar to the female connector shown in fig. 2. I have illustrated the connector and terminal to TNC pin connections just as Doug labeled them. Table I shows the pinouts from the MINI DIN-8 Macintosh connector to the TNC RS-232 connector.

Doug also included some notes for the AEA PK-232 user. On the PK-232, pins 4



Photo D- The Cable Innovations Lightning Protector used in the project.

(RTS) and 20 (DTR) must be "high" for data to be received. Both pins are pulled up by a 10K ohm resistor inside the PK-232. Pin 8 (DCD) may be used as an active/high "connect" indicator. Because pin 6 (DSR) is not used in the PK-232, it is permanently pulled high via a 4.7K resistor. The same application note may be used with the TNC-2 and clones when used in the KISS mode.

We are having fun digitally!

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FT-4700RHT, 2m/70cm



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HF Amplifier
FL-7000



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A LOOK AT THE WORLD AROUND US

The Quest For Beautiful Sounding Audio

This month's column is a double-barrel special with something for everyone. The first part describes how to glamorize your transmitted SSB audio, and the second part continues that theme plus highlights some little-known or often-overlooked notes on the popular 3-500Z amplifier tube. I also have a direct in-the-socket report on Amperex's new-style 3-500Zs, and they are terrific tubes. If you read only a single article in any amateur radio magazine this month, make it this one! We have a large amount of ground to cover in a limited space, so let's get started.

Ever since the early days of radio, amateurs have strived to improve the audio quality of their transmitted signals. During the grand old era of AM, for example, professional-grade microphones, wide-range plate modulation transformers, and large-value coupling condensers were used to acquire beautiful broadcast-sounding audio. This classic point of reference was altered somewhat with the introduction of SSB, but looking back from the present, we see many early tube-model phasing rigs actually had outstanding audio. Subsequent evolutions brought us crystal filter rigs, narrow 2.1 and 2.3 kHz bandwidths, solid-state transceivers, and electret microphones.

Beautiful-sounding SSB audio may be more scarce today, true, but it definitely has not vanished! Further, a few simple station changes can make your modern SSB rig sound like a million dollars and make it stand 10 dB above the others in quality. Honest!

Recapturing fabulous audio basically involves using a good-quality microphone that complements your own voice, adding speech compression only to emphasize audio "presence," and regaining the classic "vacuum tube sound" by upgrading your linear amplifier. Let's begin with a closer look at those variables.

Reflections and Opinions

A convenient way to visualize audio "dropout" in modern equipment involves reviewing when all-tube Collins SSB rigs dominated the airwaves with their superb-

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Fig. 1—The Heil HM-10 microphone is tops in audio quality. It is available with an HC-4 and/or HC-5 element as discussed in the text, or you can substitute an older HC-3 element for either element. Mic shown with optional AB-1 boom at K4TWJ.

sounding signals. What made them so special? First, a high-impedance crystal microphone was used to emphasize presence and clarity. The injection oscillator in each transceiver also seemed to be adjusted to a precise point within the crystal filter's (transmit) passband where it enhanced American voices. Ditto coupling capacitors in various rig stages. New glass-envelope tubes in the mating desk amplifier also sported an ideal surface for emitting electrons over a long period of time. It was a combination that could not miss! Understand here, I am talking about the tubes' first 1000 hours of use and not their extended (and "flat") life of many more years. More details on that later.

Could some of the previous ideas be integrated into modern gear for improving transmit audio? Yes indeed, but adding a high-impedance crystal microphone to your modern low-impedance transceiver or slipping a tissue roller tube over an MC50-type mic is not the answer. You want to ensure full response while emphasizing an upper range rather than simply peaking highs.

My own long-term search for the

"best" microphone produced some interesting results worth mentioning here. The overall winner by a mile is Heil's desk, hand, or headset boom mic fitted with a Heil HC-3 or HC-5 element. This mic, shown in fig. 1, is available from amateur dealers nationwide, or from Heil Sound, Ltd., No. 2 Heil Drive, Marissa, IL 62257 (phone 618-295-3000).

Next best is ICOM's 4-band graphic equalized SM10 microphone, but it has recently been dropped from production and dealers may have sold remaining stock.

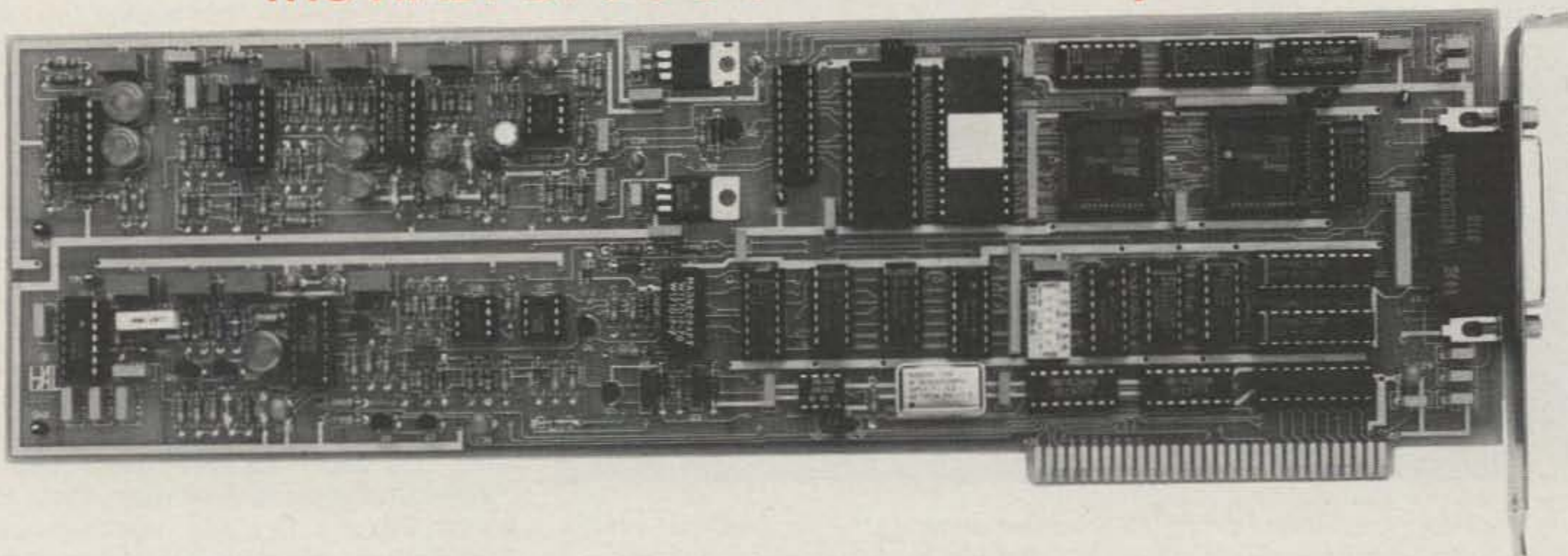
Finally, the Shure 526T microphone can be modified for better than stock, supplied with transceiver microphone sound by discarding its base preamp and wiring only the mic element to your rig.

At this point I must emphasize that just like one color and style suit does not look attractive on everyone, no single microphone element complements every amateur's voice. Nor can I suggest which mic you should choose without hearing your on-the-air signal. Your best bet is trying several mics/elements while listening in an "electronic mirror." In other words, connect your rig to a dummy load, listen

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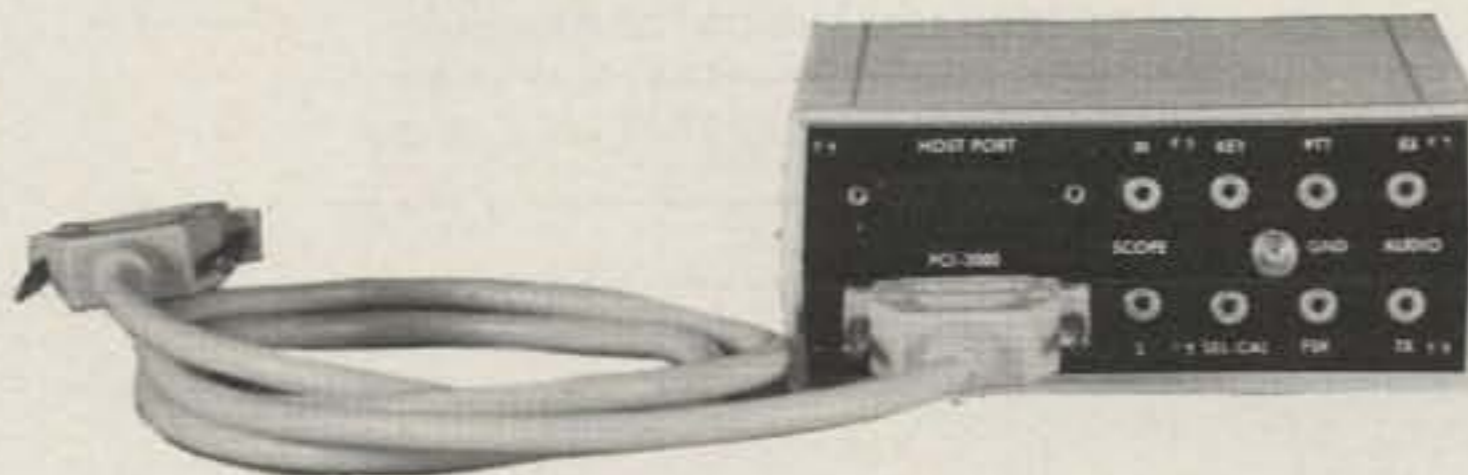


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FIL-1 AMTOR/RTTY Filter

If your transceiver doesn't have good RTTY filters, install the FIL-1 in your Spectra-Tune. The FIL-1 is a 500 Hz wide filter centered at 2210 Hz to optimize AMTOR and RTTY copy. The FIL-1 greatly reduces the noise input to the PCI-3000. This can mean the difference in barely detecting a signal and solid copy.



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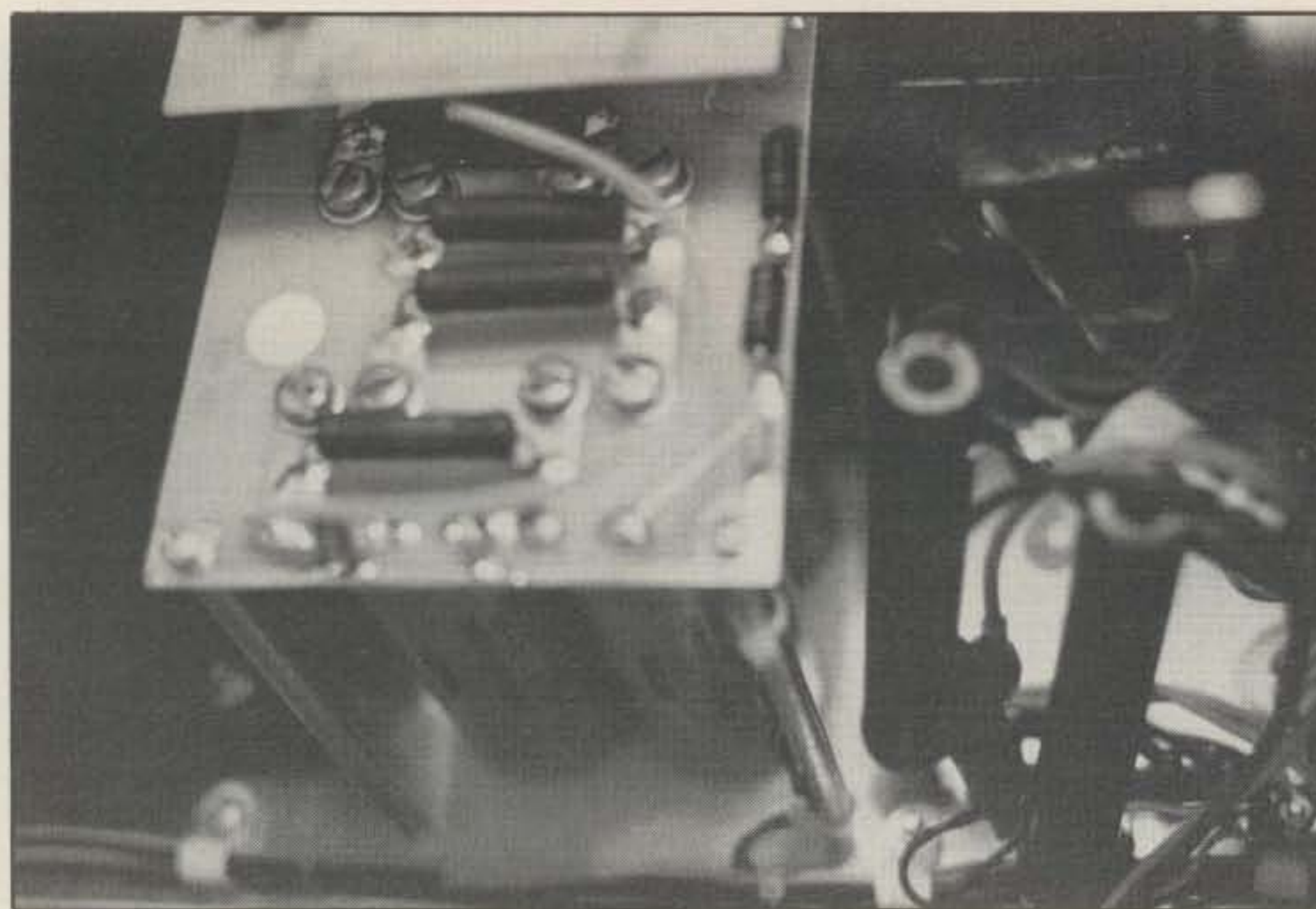


Fig. 2— Inside view of my Ameritron AL-82 amplifier, showing the two (added) filament voltage-dropping resistors mounted vertically. The clip leads were used to short out resistors during testing and compare results of high/low voltages.

to your signal on an auxiliary transceiver, and then switch between mics while scrutinizing audio quality.

Study the full range, not just highs or lows. Ask the opinion of one or two friends who know your voice. Other tricks such as using your transceiver's monitor do not work here. You are using the mic element's frequency response to compensate for passband response variations, coupling capacitor rolloffs, etc., and thus "tailoring" your rig to your voice.

In my particular case Heil's popular HC-5 element was a fraction too mellow, the HC-4 "DX element" was slightly too high pitched, and the (older) HC-3 element was perfect. You too will know when you find the right mic or element. You will sound better on the radio than you do in person!

Your transceiver's speech compressor can also enhance "tailored" audio, but I hesitate to mention this point because a high compression level splatters

and sounds worse than using a stock microphone. Use your compressor only to emphasize highs or add sibilance. Lower its gain or the mic level until ALC meter readings are less than half suggested values in the manual. You and your on-the-air neighbors will love the results.

Some Notes On Tube Linears

Modern "big bottle" amplifiers can also glamorize the sound of your SSB signal, especially if they use economical glass-envelope tubes such as the 3-500Z. That is an open-ended statement, however, and requires further explanation.

We've all heard that vacuum tube radios and amplifiers have a sound quality that cannot be equalled by transistorized gear, so I researched the subject and uncovered two reasons for this. First, high-velocity electrons bombarding the plate or anode in a high vacuum tube pro-

duce second or even harmonic distortion which is pleasing to the ear, while transistors produce third or odd harmonic distortion which humans perceive as brash. Large bands, rock groups, and many theaters endorse this philosophy and continue using only large vacuum tube amplifiers. Second, new vacuum tubes have a unique "full bodied" sound that lasts 600-1000 hours before "going flat." Top entertainment equipment thus receives new tubes each year to retain its spectacular "new" sound. What . . . every year? Pull out good tubes? (Now you see the benefit of using low-cost 3-500Zs.) Relax. I have some ideas to extend that "new tube" life. Read on!

Remember all the unsolicited reports of "fantastic audio," "beautiful sounding signal," etc., you received when your linear amplifier was brand new? Slowly they changed to "sounds good," "no problem," only when you asked, right? I also traveled that route several years ago with a used Drake L4B. Later I installed new 3-500Zs and audio compliments poured in.

A few months ago I replaced the L4B with a new Ameritron AL-82, and audio compliments flourished like never before. Why? This new style 3-500Z amplifier "pours on the coals" (3700 volts on the plate rather than 2400 volts) and is biased class AB2 for SSB. Audio quality is thus superb. The 3-500Zs also act supercharged at this high voltage; you can keep on loading them and keep on increasing output. This key is knowing when to stop (800 ma plate current is maximum for two to three 500Zs, but there's no reason to push to this limit. One-thousand watts output with "spare headroom" is fine), and maintaining a good (3.5 or 4.0:1) plate/grid current ratio.

The Two Lives of 3-500Zs

It is a well-known fact that 3-500Zs are one of today's most rugged and long-lasting amplifier tubes. They sound incredibly great during their first approximately 1000 hours of use, and then go "flat," still sound good, deliver full output, and last many years unless severely abused. Wouldn't it be nice if we could triple or quadruple that first life, then sell the tubes to a CW buff for half price and install a new pair? That would make everyone happy and cost you \$40 a year to have one of the best-sounding SSB signals on the air.

So how do we pursue this extended life? Maintain a high plate-to-grid current ratio, lower filament voltage slightly, and increase bias/lower tube idling current for CW.

A good 3-500Z plate-to-grid current ratio is 3.5:1 for plate voltages of 2000 to 2700 volts and 4:1 for plate voltages of 3000 to 3700 volts. In the latter case that

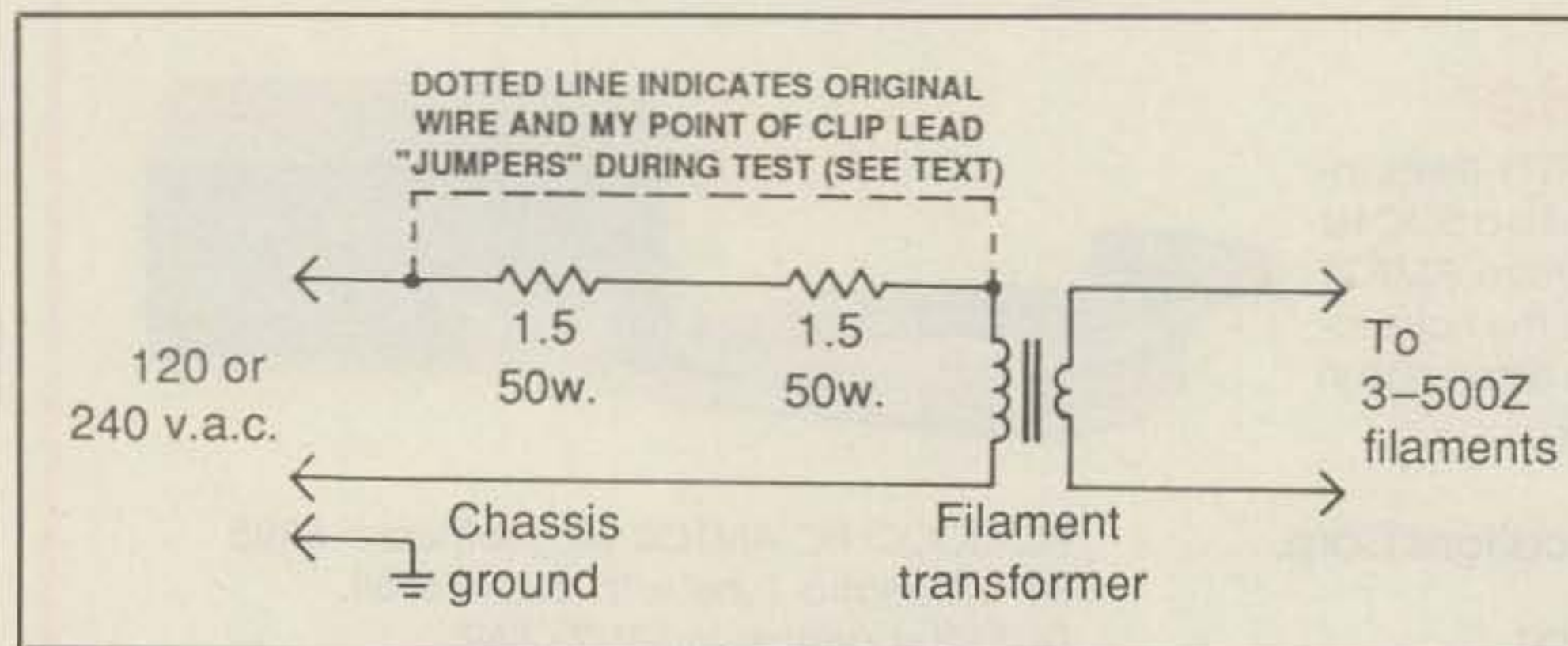


Fig. 3— Schematic of filament voltage dropping method.

means loading the plate circuit heavy enough so the tube(s) plate works harder while the grid works less (and terrific linearity results). Typical (3000 to 3700 volt) parameters are 100 ma grid, 400 ma plate (one tube: max) or 150 ma grid, 600 ma plate (two tubes cruising). Say you are running 250 ma grid and 600 ma now? No problem. The tubes still sound good on CW. Live and learn.

Several new legal-limit amplifiers apply 5.1 volts to 3-500Z filaments to really turbocharge performance. Nice, but unnecessary (and detrimental to good tube cooling). I ran extensive tests and found absolutely no loss of quality or output resulted by lowering filament voltage to 4.9 volts, but the tubes ran cooler and their lives were obviously extended. Why boil off more high-velocity electrons than necessary? Spread them over a longer time period!

I also found an easy way to accomplish this: Use the old TV picture-tube booster technique in reverse. Lower filament voltage on new tubes (their first life is doubled or tripled), then increase the filament voltage to normal and "start over" with new tubes two or three years later! I did this in my own (Ameritron AL-82) amplifier by inserting two 1.5 ohm 50 watt resistors in series with one 220 AC lead of its filament transformer (see fig. 2). This is a simple "move only one wire mod," plus I can later short out one or both resistors to get "new" tubes (see fig. 3). A similar mod should work fine on other amplifiers.

My final life-extending mod can also be applied to most models of 3-500Z amplifiers. I reduced the tubes' idling current from 100 ma to 30 ma for CW and thus al-

lowed them to run cooler in class B operation (why use more high velocity electrons for great-sounding audio on CW, right?). Since high voltage, power output, and audio quality were identical on original amplifier SSB and CW switch positions, I also lowered SSB idling current from 225 ma to 110 ma (between SSB and CW values). This was accomplished as follows.

The AL-82 uses two 7.5 volt zeners in series with the filament transformer's center tap for CW (class AB1) and shorts out one 7.5 volt zener (class AB2) for SSB. I changed the "unshorted out" zener to 12 volts. The SSB bias thus became -12 volts instead of -7.5 volts (original SSB) or -15 volts (original CW). CW bias became -19.5 volts rather than (original) -15 volts. Tube plate coloring also became less, and I can only visualize that as extending "beautiful audio" life.

Finally, I made a quick-reference chart of optimum plate and load settings for each band. The amplifier is still not as easy and enjoyable to use as a fully automatic solid-state amplifier (they are absolutely wonderful), but such are the breaks.

Amperex 3-500Zs: A Great Find

One of my sideline pursuits is broadcast engineering, and that naturally involves periodically changing modulator tubes in AM transmitters to maintain top-quality audio. As a result, I recently met Larry Broome of Richardson Electronics and learned they are importing heavy-duty Amperex 3-500Zs made in France. A

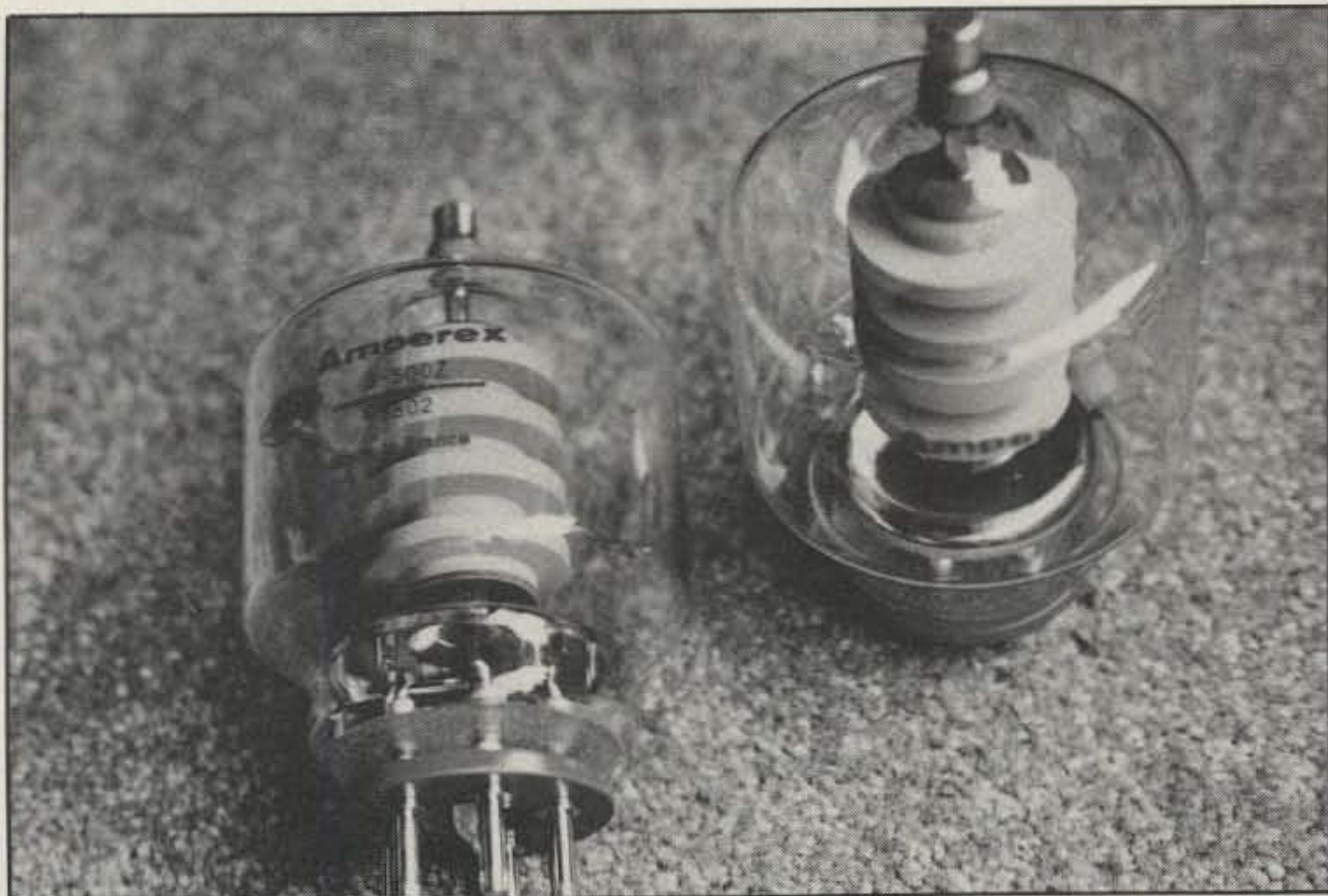


Fig. 4— Our brand-new Amperex 3-500Zs unwrapped and anxiously awaiting their time in amplifier sockets. Notice heavy-duty plates and massive horizontal rings. These tubes are fantastic!

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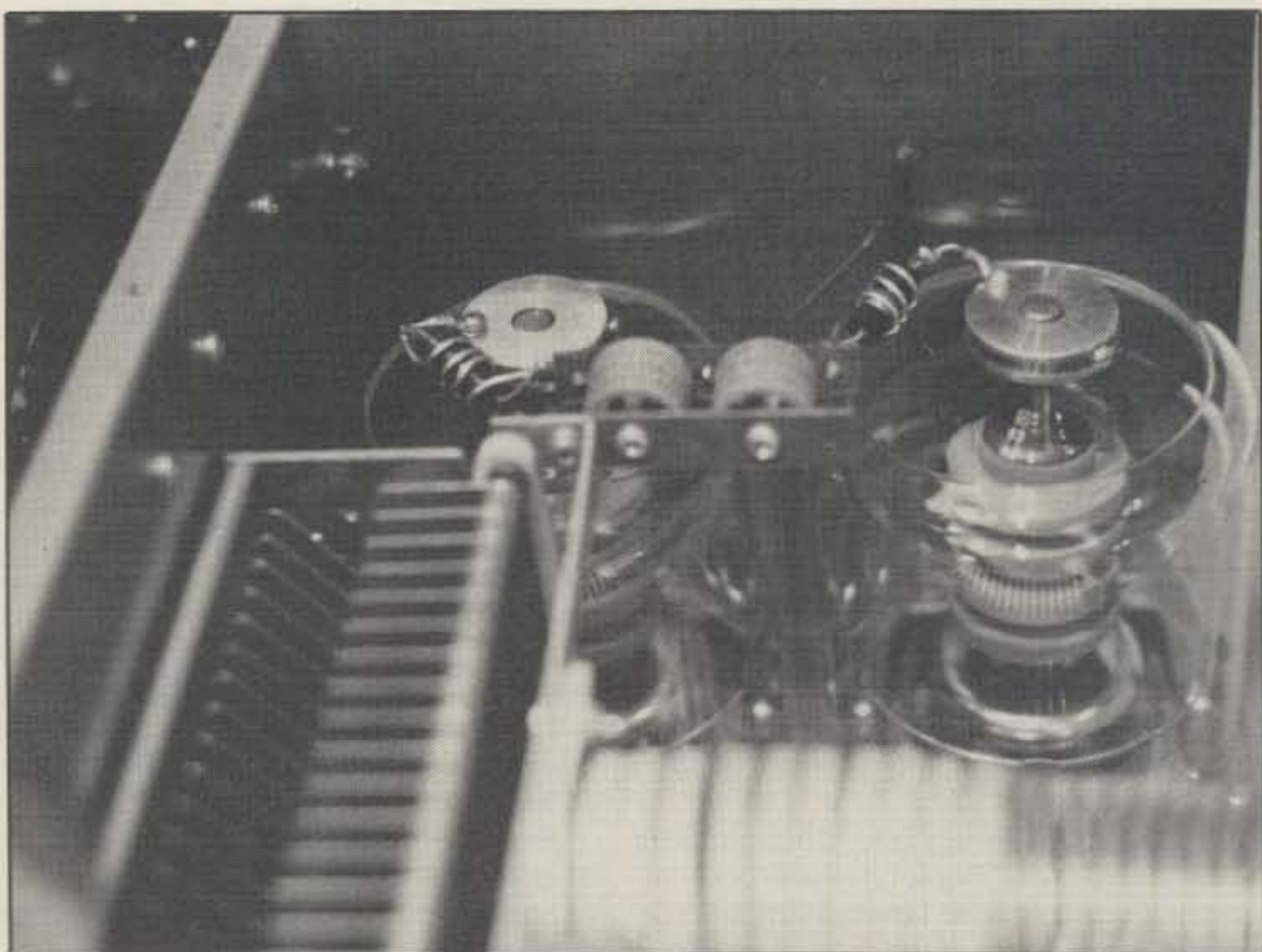


Fig. 5- The new Amperex 3-500Zs installed in my AL-82 amplifier. Plate is fully enclosed at top and fits over grid/filament structure like a shroud. The tubes perform great and sound like a million dollars on SSB. (Details in text.)

brief discussion of these tubes revealed they have a heavy graphite plate to withstand brief overloads, the plate is zirconium coated for extended life, and the tubes' warranty is 18 months or 3500 hours use rather than (usual) 12 months or 3000 hours use. Impressive! I acquired my own set of Amperex 3-500 super Zs soon thereafter, slipped them in my Ameritron AL-82's sockets, and the results have been too good to keep secret. Here is the story in a nutshell.

My pair of new Amperex 3-500Zs is shown in fig. 4. The phenolic-type pin spacer on the base was incorporated in all 3-500Z designs several years ago. If your Zs lack this spacer, they are good old soldiers worthy of retirement and replacement.

Notice the Amperex tube's hearty plate, or anode. It is quite thick with three massive horizontal rings rather than conventional vertical fins. By comparison the anode on regular 3-500Zs looks like a tin can, and the anode on Amperex Zs looks like a bullet-proof plate!

Fig. 5 shows the new Zs in my AL-82. Look closely at my photo and notice the plate/anode is fully enclosed at the top and covers the filament/grid structure like a shroud. Light from the filament shines only from below the plate and reflects off the tubes' inner supporting structure. The tubes look like two cannons and deliver a comparably powerful signal!

I was (and continue to be) delighted with the tubes' performance. My original/new Zs showed a fair amount of red on

their plates on both CW and SSB even when only idling at 120 ma with no drive on SSB. The Amperex Zs have yet to show any red whatsoever on either mode, even with 1000 watts output. (I prefer running less than legal-limit output rather than pushing gear unnecessarily. If I can't work DX with 1000 watts output, it is time to go QRP and perfect operating techniques.)

Direct on-the-air comparisons and reports consistently indicate the Amperex Zs sound at least as good, or better than, regular Zs. And the good news is they cost no more than regular Zs! Now you can really upgrade equipment performance rather than simply replace aged tubes!

No, don't write to me for Amperex Zs. I am not selling them (but do include an SASE if you write to me about this column!). You can order Amperex 3-500Zs from Richardson Electronics, Ltd. at 40W267 Keslinger Road, LaFox, IL 60147, or by telephoning Susan Wicher-sham at Richardson Electronics at 1-800-323-1770. Tell her Dave sent you.

Want to hear how "super Zs" sound on the air? I frequent 14.180-14.225 Sundays 2200-2300Z, and 17 meters on Saturday or weekdays around 1500 and 2200Z. I also still have some genuine Wild Woody WARC keys to award friends, so ask about them when we contact (see May '91 CQ column). Meanwhile, keep those SSB signals sparkling and CW bugs humming!

73, Dave, K4TWJ



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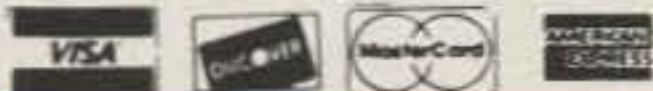
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"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

Goodies—Part II, Conclusion

Here is the concluding segment of this two-part article. The first segment covered ARRL, bail/tilt stand, belt buckles, bumper stickers, the CQ Bookstore, clocks, clothing, and cups/mugs. If you intend to purchase any of these specialty items for use as Christmas presents, your orders should be placed as soon as possible.

Engraved Anodized Aluminum Replicas

Engraved replicas (on anodized aluminum) of your amateur radio license, QSL card, and operating awards are available from One Call Ham Products, Box 34308, Los Angeles, CA 90034-0308 (telephone 213-441-0193). A 2.5 by 7.5 inch license replica sells at \$35.95, whereas the 5 by 7 inch license replica cost is \$9.95. An older style license and QSL replica combination, mounted on a single plaque, costs \$74.95. Each 8.5 by 11 inch award replica sells at \$159.95. A 2 by 3.5 inch QSL card paperweight costs \$24.95. Last, but not least, a gold and black QSL business-card case is available at \$24.95. Add \$5 to each order to cover shipping and handling costs (\$12, outside the USA). Allow 4 to 6 weeks for domestic delivery.

Eyeball QSL Cards

MFJ Enterprises, Inc. sells 500 eyeball QSL cards at \$39.95. These 2 by 3.5 inch cards are particularly useful at conventions, swapfests, and radio club meetings. The address is P.O. Box 494, Mississippi State, MS 39762.

ICOM

ICOM America, Inc., offers free VHF/UHF and HF frequency charts, stickers, key chains, and a quarterly newsletter entitled "Radio News." Their address is 2380 116th Ave NE, Bellevue, WA 98009-9029.

Identification Tags

JPW Enterprises sells high-quality stain-

45527 Third Street East, Lancaster, CA 93535-1802



Stainless-steel identification tag available from JPW Enterprises (paper clip is included for size reference.)

less-steel identification tags at \$4.29 each ppd. These dog tags are 1.125 by 2 inches and each one weighs less than one-quarter ounce. You can have up to 17 digits (letters, numbers, and spaces) embossed on one to five lines. You may want to order these tags for your children, luggage, and pets, as well as for yourself. A 24 inch chain is supplied with each dog tag. The address is P.O. Box 353, Logan, UT 84321.

Jewelry and Patches

Callsign lapel pins, tie tacs, pendants, rings, and gifts are available in 14 karat gold (plus other precious and non-precious metals) from Harold Sasnowitz, KB2MB. His company's address is H & M Jewelry, 26 Edgecomb Road, Binghamton, NY 13905-4017 (1-800-285-8587). Callsign pins range in price from \$39.95 to \$275.95, OM Operator Rings range from \$189.95 to \$479.95, and YL Operator Rings range from \$189.95 to \$359.95. He also has watches, station clocks, and other gifts. The photographs show several of Harold's excellent products. A \$5 discount is available to amateurs who mention this column when ordering. I suggest you call or write to request the free catalog.

Medals, Pins, and Embroidered Emblems. Larry Plotkin, K4JXI, sells a nice assortment of these items, plus ribbons and trophies. Their assortment is too extensive to cover in this article. Information can be requested by writing to Lane 4 Awards, P.O. Box 693944, Miami, FL 33269. Their telephone number is 305-



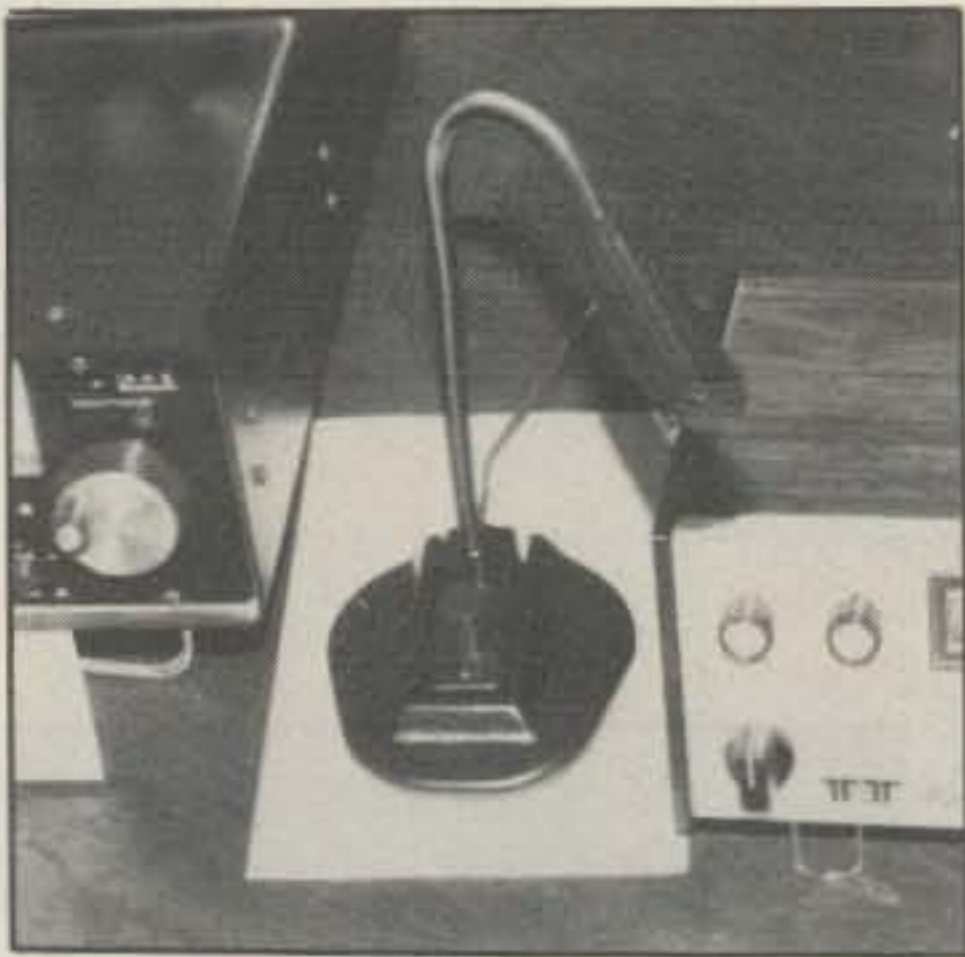
Callsign jewelry such as this ring are available from H & M Jewelry.



This "Universe" quartz world time clock is also available from H & M Jewelry.



Amateur radio callsign license plates are an effective way to advertise the amateur radio service.



This variable-intensity desk lamp is available in a variety of forms and has a variety of accessories. A flyer can be requested from Littlite/CAE, Inc.

653-9434 and their FAX number is 305-592-5854.

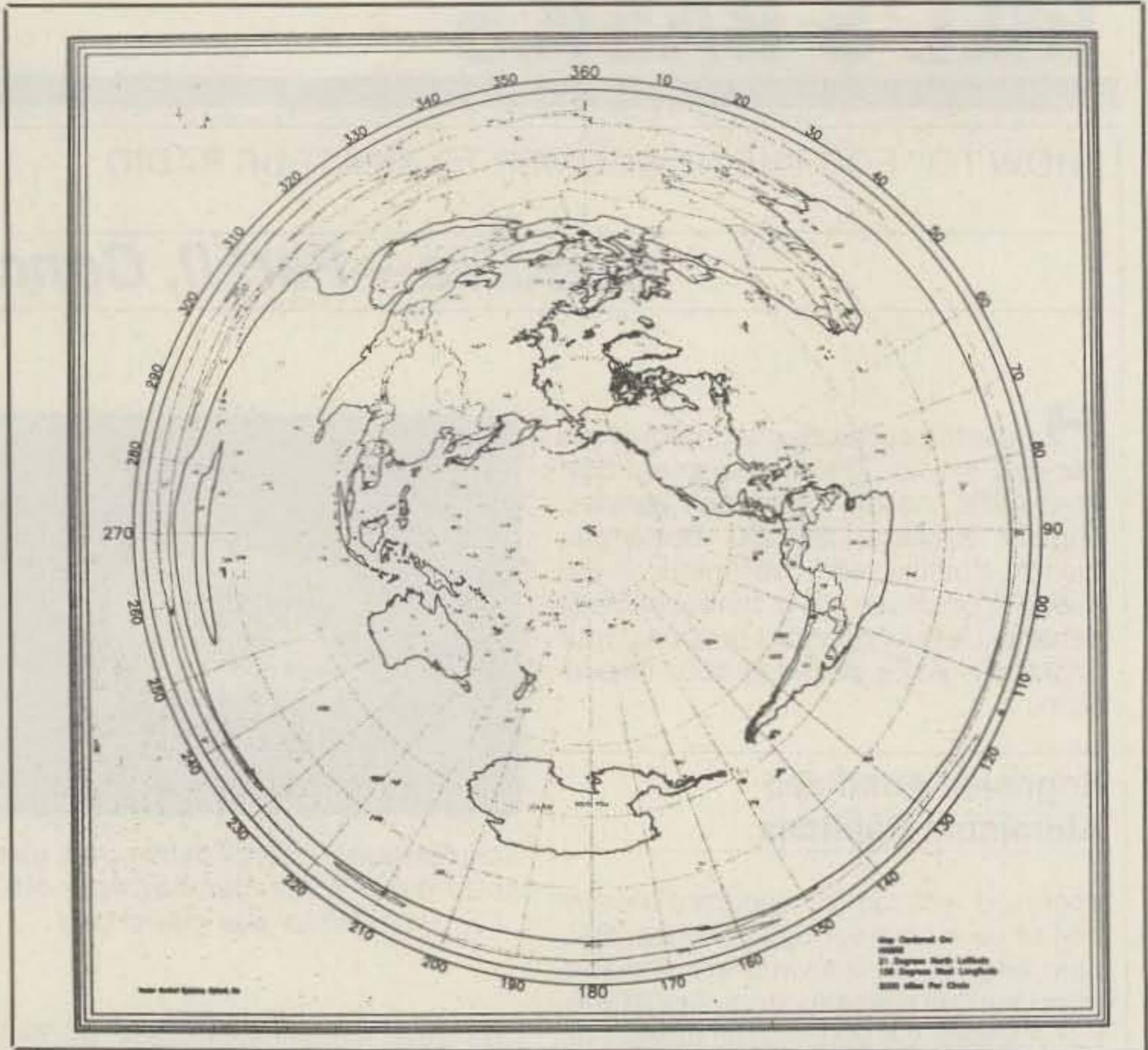
License Plate Keychains. You can buy a 2.25 by 1.25 inch keychain showing your callsign on a miniature version of your state's license plate. The price is \$5.25 each, prepaid. The address is Andrew Plaks, N6RKO, 3241 Fleetwood Drive, Riverside, CA 92503.

Patches and Jewelry. Embroidered patches and woven patches are among the many specialty items which are offered by Logo Imprints, P.O. Box 9685, Sacramento, CA 95823-0685 (916-393-0646, FAX 916-393-3742). They also sell appliques, award jewelry, blazer buttons, cloisonne jewelry, enamel jewelry, golf divot kits/bag tags, key holders, metal decals, and pocket knives. Their line is so extensive that you need their catalog to fully appreciate what is available from this company.

Patches. Another source of custom-embroidered patches is Hein Specialties, 7960 S.W. Manitou Trail, Glen Arbor, MI 49636-9711 (telephone 616-334-4385, FAX 616-334-4521). Custom-embroidered key fobs are also sold by this company. In addition, they market custom-enameled emblems (cloisonnes). It is advisable to send an SASE (#10 envelope) with your request for details of their entire product line.

Pins. Fallert's Engraving sells callsign pins of one line (1 by 3 inches) at \$1.25, two lines (1 by 3 inches) at \$1.50, and three lines (1.5 by 3 inches) at \$2 each ppd. Any desired logo (ARRL, CD, MARS, etc.) can be added at 75 cents more per pin. The address is 27 Verlynn Avenue, Hamilton, OH 45013.

Rings. M.G. Allen, N1BLY, sells hand-engraved sterling-silver and 14-karat yellow-gold rings. Prices start at \$92. If you want detailed information, send a self-ad-



Vector Control Systems offers this plastic-laminated great circle map.

dressed stamped envelope to P.O. Box 112, Waverley, MA 02179.

Tie Tacs and Lapel Pins. One-of-a-Kind Jewelers sells silver tie tacs and lapel pins with callsign engraved on them. Their size is about 1 1/8 by 5/8 inch. Each costs \$19.95. Visa and MasterCard are accepted. The address is 145 East 6th Street, Durango, CO 81301 (telephone 303-247-5884).

Kenwood

Kenwood has special promotion items available at shows and conventons. Visit the Kenwood booth at the next show you attend.

License Plates

Amateur radio callsign license plates are available for use on our vehicles. They provide an effective way to advertise our amateur radio service. If you use such plates, I hope you drive very courteously to improve our image with the general public.

Littlite

The best accessory I have added to my station during the past decade is a simple variable-intensity desk lamp. It can be

operated on 12 VDC or 115 VAC. It has a weighted base and color filters available as accessories. This lamp is available in a variety of forms, and it has a useful variety of accessories. A printed flyer can be requested from Littlite/CAE, Inc., 10087 Industrial Drive, P.O. Box 430, Hamburg, MI 48139. The lamp can be secured in place using the velcro fasteners which are supplied with the lamp. Also, screws are provided for use in mounting the lamp directly to a desired surface.

Map

Vector Control Systems offers a plastic laminated great circle map of the Earth. The overall size is approximately 22.5 inches wide by 21.5 inches high with a pertinent (information) size of about 20.25 inches wide by 19.5 inches high. The diameter of the Earth presentation is 18 inches. The continents are outlined in black on the white background and the countries are outlined in green. Amateur radio callsigns of countries are shown in red. Your stated location is shown at the center of the map with lines every 10 degrees showing true beam headings to all parts of the world. Distances are shown by 2000 mile rings centered around your station. The cost is \$35 postpaid. This map is a useful and decorative addition to

AMATEUR RADIO

W6DDB

Signs such as this 2.25 by 8 inch magnetic mount flexible plastic strip are made by SIGN ON.

a shack. The address is 1655 N. Mountain, Suite 104-45, Upland, Ca 91786 (telephone 714-985-6250, FAX 714-985-3482).

QSL Wall Display

Joe Saunders, K3UAL, has clear-plastic QSL card holders which enable an amateur to display received cards without having to damage them with tape or thumb tacks. I have used this type of QSL display for many years. It has the added flexibility of allowing you to quickly and easily change the cards displayed. These plastic display holders sell at \$5 for a package of 3. Each holder can be used to display up to 20 QSL cards. Joe is also a QSL card printer. His address is 1520 Jutewood Avenue, Hyattsville, MD 20785 (301-773-9383 and 301-773-5074). If you want samples of his cards, send 50 cents (stamps or cash) with your request.

Rubber Stamps

Three lines available at \$6, prepaid. SASE brings information. Address is Gary L. Pierce, K6CAQ, 5521 Birkdale Way, San Diego, CA 92117.

Signs

The Sign Center offers an excellent 8 by 19 inch 100% magnetic sign at \$9 each, plus a \$5 shipping charge. The overprint-



Signalcraft sells an RF-actuated callsign display which lights up when you are transmitting 5 watts or more on any HF, VHF, or UHF frequency.

ing is black and orange against a white background. The Amateur Radio Emergency Service (ARES) insignia is accompanied by large lettering "AMATEUR RADIO COMMUNICATIONS." An area is reserved to add a callsign below the word "RADIO." Another area is reserved for a name or group insignia. The part number is AR819. Additional amateur radio items are available from the Sign Center. A combination order form and brochure can be requested. The address is the Sign Center, Inc., P.O. Box 4097, San Diego, CA 92104 (toll-free for Californians 1-800-553-7446; all others 1-800-654-5373).

SIGN ON sells 2.25 by 8 inch custom signs featuring the words "AMATEUR RADIO" and a callsign in white lettering



Jim Veverka, KA9WHK, sells standard-size callsign license plates.

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Model	Pin (W)	Pout (W)	Ic (A)	Gain/NF (dB)	(13.6 V) Type
50 MHz					
0508G	1	170	28	15/0.6	Standard
0508R	1	170	28	+	Repeater
0510G	10	170	25	15/0.6	Standard
0510R	10	170	25	+	Repeater
0550G	10	400	60	15/0.6	HPA
0550RH	10	400	60	+	Repeater HPA
0552G	25-40	400	55	15/0.6	HPA
0552RH	25-40	400	55	+	Repeater HPA

Model	Pin (W)	Pout (W)	Ic (A)	Gain/NF (dB)	Type
144 MHz					
1403G	1-5	10-50	6	15/0.6	LPA
1409G	2	150	25	15/0.6	Standard
1409R	2	150	24	+	Repeater
1410G	10	160	25	15/0.6	Standard
1410R	10	160	24	+	Repeater
1412G	25-45	160	20	15/0.6	Standard
1412R	25-45	160	19	+	Repeater
1450G	10	400	54	15/0.6	HPA
1450RH	10	400	54	+	Repeater HPA
1452G	25	400	50	15/0.6	HPA
1452RH	25	400	50	+	Repeater HPA
1454G	50-100	400	45	15/0.6	HPA
1454RH	50-100	400	45	+	Repeater HPA

Model	Pin (W)	Pout (W)	Ic (A)	Gain/NF (dB)	Type
220 MHz					
2210G	10	130	20	12/0.7	Standard
2210R	10	130	19	+	Repeater
2212G	30	130	16	12/0.7	Standard
2212R	30	130	15	+	Repeater
2250G	10	220	42	14/0.7	HPA
2250RH	10	280	45	+	Repeater HPA
2252G	25	220	36	14/0.7	HPA
2252RH	25	280	40	+	Repeater HPA

Model	Pin (W)	Pout (W)	Ic (A)	Gain/NF (dB)	Type
440 MHz					
4410G	10	100	19	10/1.1	Standard
4410R	10	100	18	+	Repeater
4412G	20-30	100	19	10/1.1	Standard
4412R	20-30	100	18	+	Repeater
4450G	10	175	34	12/1.1	HPA
4450RE	10	175	34	+	Repeater HPA
4452G	25	175	29	12/1.1	HPA
4452RE	25	175	29	+	Repeater HPA



MODEL 1410G



MODEL 1450G

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RX Preamplifiers

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50 MHz	0520B	.5	25	BNC
50 MHz	0520N	.5	25	N
144 MHz	1420B	.5	24	BNC
144 MHz	1420N	.5	24	N
220 MHz	2220B	.5	22	BNC
220 MHz	2220N	.5	22	N
440 MHz	4420B	.5	18	GNC
440 MHz	4420N	.5	18	N



Consult your local dealer or send directly for further product information. All Products Made in USA.

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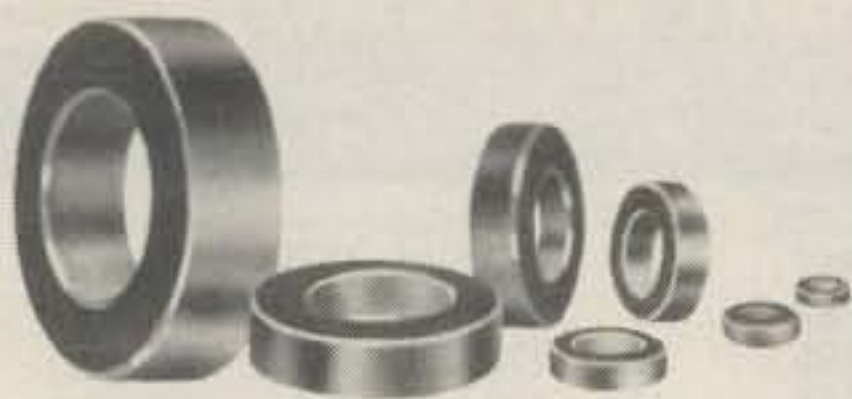
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TELEPHONE: (818) 341-5460

W6DDDB

Laser-printed callsigns suitable for display on an operating table or in the rear window of a vehicle are available from Computer Budget Shopper.

on black, blue, or red all-weather flexible plastic. These signs are sold with suction cups for mounting on a vehicle's rear window, as well as a magnetic-mounted version for trunk mounting; you must state which type is desired. The price is \$10.80 each, or two for \$18.85. The address is 1923-Q Edward Lane, Merrick, NY 11566. SIGN ON has served amateurs well during the past decade.

Callsign Display. Signalcraft sells an RF actuated callsign display (Model CSD-1) which lights up to display your callsign while you are transmitting 5 watts (or more) on any HF, VHF, or UHF frequency. The price is \$49.95. An optional DC adapter (Model DC-1) is available at \$9.95 to supply the required 12 VDC power. Three to four weeks is required to fill each order. The address is 1555 14th Street, Santa Monica, CA 90404. A delay is built in to eliminate flickering during transmissions.

Callsign Items. LQV Engraving markets callsign desk plates, identification badges, and small signs. Your request (with an SASE) will bring a data sheet with prices. The address is Box 4133, Overland Park, KS 66204-0133.

Callsign License Plates and Magnetic Signs. Jim Veverka, KA9WHK, sells standard size (6 by 12 inch) callsign license plates. They are made using 0.024 inch aluminum and they are slotted to fit a standard front license-plate bracket. Six digits maximum for callsign. City and state (or amateur radio) added above and below callsign. Plate is finished in white baked enamel with letters printed in weatherproof black, blue, or red enamel (state desired color). Each plate sells at \$12, prepaid. White magnetic strips have callsign screen printed in black, blue, or red weatherproof enamel, plus a border. These strips are 2.5 by 8 inches. They sell at \$10.00 each, prepaid. The address is 6434 Woodridge Drive, Woodridge, IL 60517 (312-964-8445).

Callsign Signs. The Computer Budget Shopper (CBS) sells laser-printed callsigns which are suitable for display on an operating table or in the rear window of a vehicle. If you commonly monitor one frequency, it can be printed on the heavy-grade paper below your callsign at no extra charge. The price is \$3 each, post-paid. The address is 2203 Park Avenue, Cheyenne, WY 82007 (307-635-2173).



Vibroplex offers several items, including baseball caps, key chains, mugs, T-shirts, and more.



Here is 11-year-old sixth grader Stephanie Hassan, KA3WMS, of Sharon, Pennsylvania. Her father is Joe, KA3RYY. She is an Honor Roll student who collects cats and hopes to become a veterinarian. In addition to amateur radio, Stephanie is interested in bicycling, stamp collecting, and swimming.

Jim Hassler, WB7TRQ, offers an excellent 48-page catalog of public-domain computer software at \$2.

Vibroplex

The Vibroplex Company, Inc. offers several items which may be of interest to code enthusiasts. Each item features the famous Vibroplex logo (bug) in some way. Their baseball-type light-blue hat (\$6.95) is fully adjustable. It has the Vibroplex emblem in black, red, and gold. The key chain (\$6.95) is cast solid brass, and it features the bug logo. Their black-glaze English ironstone mug (\$8.95) shows their bug logo in 22-karat gold. Their black polyester patch (\$3.95) shows the Vibroplex name and logo in gold and red threads. An 8 by 18 inch black-felt pennant (\$3.95) shows the Vibroplex name and logo in gold. Their light-blue T-shirt (\$11.95) is half cotton and half polyester. It is available in small, medium, large, and extra-large sizes. It features the bug logo. A \$5 shipping charge applies to orders being shipped to U.S.A. addresses. The Vibroplex address is 98 Elm Street, Portland, ME 04101. Their toll-free telephone number is 1-800-262-8387, which is also 1-800-AMATEUR. Their FAX number is 207-775-7710. Vibroplex offers several other items that are of interest to amateurs. Vibroplex has been in business since 1890, which means their centennial occurred during 1990. I have used their bugs for 46 years, and a Vibroplex presentation bug is an essential part of my home station.

Yaesu

The following items are available from Marketing Unlimited, 3783 East Desert Inn Road, Las Vegas, NV 89121. Each item shows the Yaesu emblem and/or

name. Crest is embroidered on corduroy caps (\$5.95 each), jackets (\$38 each), pinnacle V-neck sweaters, and polo shirts (\$21 each). Silk screening is used on sweatshirts (\$13.50 each) and T-shirts (\$6.80 each). Jackets are silver polyester/cotton. The adjustable-size caps are navy blue or silver. All other items are available in navy blue, red, or white. Shipping charges are extra. Write for a brochure if you are interested in these Yaesu-related items. Their telephone number is 702-456-3609.

Caveat Emptor

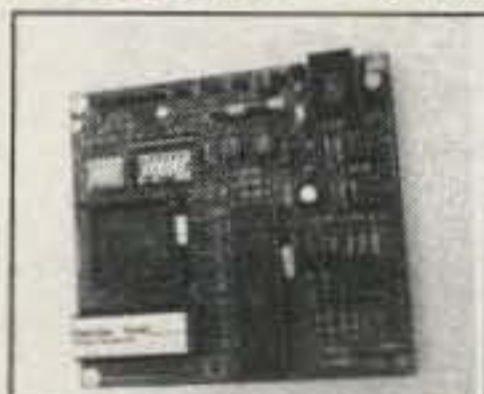
Several months elapsed between the time I started gathering information for this article and when it appeared in print.

All prices are subject to change. They are just stated in this article to provide indications of costs. It is advisable to confirm prices before ordering merchandise.

If you know similar "goodies" which could have been included in this article, please send information to my California address. There are a few items which have been sold in the past but are no longer advertised. Some letters to previous suppliers were not answered, causing me to believe that they are no longer in business. If you become aware of outfits which should be added to (or deleted from) this article, please send such information to my California address. Your suggestions for improving future versions of this article would also be appreciated.

73, Bill, W6DDB

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NEWS/VIEWS OF ON-THE-AIR COMPETITION

Should Contesting Be Abolished?

Nothing like a catchy column title to grab your attention. In case you're wondering, I already know what you are thinking. K1AR has been working too many hours, written one too many contest columns over the past 2½ years, and completely overloaded on contest QSOs during last year's contest season. However, the question this month is not being asked by testers, but is certainly a concern on the minds of many amateurs with other interests in our community.

Before I focus on some of the items that we try not to talk about publicly, let's spend a moment thinking about the virtues of contesting. Contest sporting has been an aspect of amateur radio which has truly stayed the test of time. The ARRL Sweepstakes is a brilliant example, beginning in the 1930s, sharing the long and outstanding traditions of some of our leading contest clubs. And who can forget to mention some of the "ole-time" testers who were banging away on CW while we banged a bottle on the side of our baby cribs. I'm sure you're thinking of the likes of W3GRF, W3GM, W6BIP, KH6RS, and many others.

One of the hobby's most controversial subjects is the use of our valuable frequency spectrum. This has especially come to the forefront with the FCC's erroneous allocation of a portion of our 220 MHz band to commercial use. It seems that various avocations in the hobby have established a portion of the bands for their use. We all know that 14230 +1- is sacred for slowscan. Don't ever consider enjoying a QSO near the 14226 or 14256 DX nets (. . . Xray-Bravo make your call . . .). And who would dare attempt to conduct their Saturday morning schedule with Dad on 21201 during a major DX contest? The business of our operating styles and techniques should be on the minds of all amateurs.

This month I'm focusing on an aspect of amateur radio that appeals to most of the readers of this column—contest operating. You may have noticed a question in the contest survey I am currently running that asks, "Is contesting an asset or liability to amateur radio?" Of course, with the survey's respondents dominated by testers, that's like asking Presi-

Calendar of Events

Oct.	26-27	CQ WW SSB DX Contest
Oct.	30-31	YLRL SSB Anniversary Contest
Nov.	2-4	ARRL CW Sweepstakes
Nov.	8-10	Japan Int'l SSB DX Contest
Nov.	9	ALARA YL/OM Contest
Nov.	9-10	WAEDC RTTY DX Contest
Nov.	9-10	OK-DX Contest
Nov.	16-18	ARRL SSB Sweepstakes
Nov.	23-24	CQ WW CW DX Contest
Dec.	7-8	ARRL 160 Meter Contest
Dec.	14-15	ARRL 10 Meter Contest
Dec.	15	ARCI QRP CW Sprint
Dec.	31	ARRL Straight Key Night
Jan.	4-5	ARRL RTTY Roundup
Jan.	24-26	CQ WW 160M CW Contest
Feb.	15-16	ARRL DX CW Contest
Feb.	21-23	CQ WW 160M SSB Contest
Mar.	7-8	ARRL DX SSB Contest

dent Bush how he feels about his standard of living. Nevertheless, contest operators have a heritage of technological and operating leadership that we can describe with pride. It is that leadership which should prompt even the most ardent opposition to at least pause for a minute and hear us out.

For the most part testers are widely known as the best operators in the hobby. In striking contrast, overall amateur radio operating techniques have taken a decided turn for the worse in recent years. I'm not sure exactly when it happened or why. The situation is all too obvious when one takes a quick spin down 20 Meter Lane. One scan of the band today might be enough to make a potential amateur consider model railroading as a better alternative to his pursuit of a new hobby. The practice of signing the last two letters in our callsigns, leaning on net operations exclusively for DX work, and senseless rambling about "content-free" topics such as the weather or radio manufacturers are just a few examples. While waiting for dinner the other night, I spent a few minutes tuning around 20 meter SSB. I heard an East Coast station complaining endlessly about the inequities of not being placed on a DX list for 3B8CF/3B7. Of course, the events turned into a "free-for-all" as dozens of stations felt compelled to present their opinions with nary a callsign heard.

The hobby as a whole has lost its core group of operators who had the enviable

background as former navy radio operators with trained skills as communications experts. One of the few vestiges of improvement in this critical aspect of the hobby remains with the contest operator. This becomes clear in other ways such as when we witness the amateur management of disaster communications. With due respect to the good-intentioned operators manning the disaster nets around the globe, our efficiency leaves much to be desired in many cases.

Compare this scenario to the events of Lithuania witnessed on amateur radio approximately six months ago. As the whole world listened, critical and potentially live-saving information was directed largely by contest operators. It was something for testers and amateur radio itself to be proud of.

This type of operating proficiency is exactly the point. Contest operators, by definition, are creatures of accuracy and efficiency—attributes that each competitor needs to excel at the sport. Furthermore, they are operators who require and have the best "operating ears" and efficient operating style. In a natural disaster affecting my location, I'd take a contest operator running the communications any day!

Another characteristic of contest operators is their ability to push the technological state of the art. One example of this is our widespread use of packet radio. While many amateurs have geographical limitations in accessing packet networks, there are few serious DXers who do not use a packet spotting system as a fundamental element of their station. The progression of DX packet spotting from its inception as a tester's tool has revolutionized amateur radio as a whole. In a similar vein, the integration of the computer in the tester's station has grown in popularity throughout the hobby.

Prior to the packet and computer reformation, testers were driving advances and knowledge in antenna design, voice and CW, propagation, and overall improvement in aspects of the hobby that we often take for granted now. The 1970 Yagi designs of W2PV are one of the many standards still in use today. Similarly, antenna stacking was pioneered by testers. Ever wonder how you can install a monoband Yagi on the

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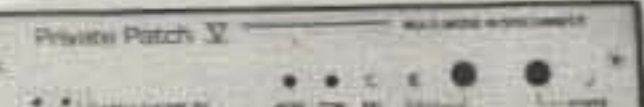


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1990 CQ WW Contest Errata

SSB Corrections

The following logs were not listed: KD5IA QRP should be #2 in the world on 14 MHz (score 59,732, QSOs 200, zones 28, countries 81; AA4MM should be #2 in the USA on 1.8 (score 4,625, QSOs 54, zones 11, countries 26); KD9MF all band (score 518,755, QSOs 646, zones 80, countries 209; N3AD single op assisted (score 3,538,623); N6RO multi-multi (score 8,324,190, QSOs 4260, zones 179, countries 551), ops N6RO, N6IG, N6TIB, AD6E, K6TMB, WX6M, W6RGG; LX2AA on 14 MHz (score 21,228, QSOs 263, zones 13, countries 48); the operator of WC6H was NU6S.

The following logs were listed incorrectly: W9LT/4 should be multi-single with W9LT/4 and N4QIV operators; K1TKJ/5 on 3.7 MHz was listed incorrectly as K5TKJ/5; NN7L all band was a CW log; JE2YRD was multi-multi, making JA2YKA the certificate winner in the JA2 multi-single; JA8RWU's QSO total was 3074 not 1074; JE6ZIH was multi-single, so JA6LDD was #1 in JA6; DL0CS should have been listed as fourth place multi-multi Europe in the Top Scores box.

CW Corrections

The following logs were listed incorrectly: K8RWL 28 MHz 50,715 was an SSB log.

The following CW logs were not listed:

EA3FQV	28	237,621	945	27	76
EA7CWA	"	168,311	661	30	77
EA7ARK	"	79,458	277	33	90
EA7BHO	"	78,056	465	25	63
EA3DZZ	"	51,049	385	22	49
EA7FHR	"	49,218	323	22	56
EA4EP	"	41,720	286	20	50
EA5AN	"	29,880	158	20	63
EA5FAG	"	17,420	166	21	44
EA1ETN	"	17,388	105	16	47
EA5ETP	"	6,396	66	16	25
EA2AOO	"	5,002	59	14	27
EC3CVR	"	1,988	49	8	20
EA7AXF	"	714	21	7	14
EA3BER	21	556,452	1509	37	119
EA5GIG	"	67,320	414	22	61
EA1EVW	"	50,904	417	18	54
EA4EER	"	50,268	303	19	52
EA3ELM	"	49,920	240	24	72
EA1DHB	"	48,223	295	21	62
EC1CTH	"	37,076	259	21	71
EA5FNE	"	24,288	120	22	66
EA7CYS	"	17,424	140	18	48
EA4DKS	"	16,500	143	14	52
EC2ATG	"	12,559	194	19	44
EC1CWU	"	8,855	97	14	41
EC1DBJ	"	5,069	68	14	23
EA3GCT	14	95,920	510	26	83
EA3GCN	"	42,768	261	24	64
EA5ND	"	36,720	238	21	64
EA5DVL	"	26,600	173	19	57
EA3FNI	"	12,996	110	20	56
EA3DWX	"	7,050	90	13	34
EA1EWH	"	576	19	6	12
EA7DHP	7	36,750	282	18	57
EA3DEE	"	13,150	152	15	55
EA1ECE	"	1,947	50	7	26
EA7EL	3.7	83,895	445	16	67
ED5CGU	"	29,172	336	11	57
EA4KD	"	9,856	127	10	46
EA5AL	"	3,016	69	7	22
ED5CXL	1.8	1,590	50	5	25

side of a tower and turn it 300-plus degrees? Ask a contester who has been using this concept for years.

In a small way, you might say the contester's situation compares to the way we evaluate the benefits that come from the NASA space program. As taxpayers, we have often questioned the billions of dollars spent on space missions. Yet who could imagine the world without micro-electronics and velcro? Such is the contribution of the contester. Although many amateurs question the value of contesting, our hobby has been profoundly and indisputably improved by its existence.

I believe one of the most revealing features of the average contester appeared in the survey I managed last year entitled "Are Contesters Real Hams?" While the results were dominated by responses from contest operators, you simply can't deny the facts. No surprise to me, the results showed that contesters are involved amateurs by any measure. They are busy administering VEC exams to new amateurs while "elmering" others to that point. We respond to QSLs amongst the best and are as active in the hobby as any group you can find. We not only build equipment and antennas, but have had a major role in setting the standards for designs that all amateurs enjoy.

There is Another Side

It may surprise the non-contesting reader for me to admit that not all aspects of contest operating are perfect. Any activity that utilizes the amateur spectrum to the extent that we do warrants occasional introspection.

Contesting is by definition a feature of the hobby that has its "bad apples" as well. Contest operators are a competitive group. The most competitive of us are not operating to work new countries, but are intent on winning. It would be naive for me to assume that situations do not exist where contest operators have violated the spirit of friendliness and cooperation with non-contesters during the heat of battle. As major users of the amateur spectrum, we have even a greater responsibility to respect the interests and activities of our fellow amateurs while we operate. That means we should avoid net operations and phone patches, even when we disagree with their purpose. Our basic charter should say that if a contest operator moves in too close to an established QSO, the contester should be the one to move. At the risk of stating the obvious, we should treat the playing field with respect, avoiding the temptation to steal a weaker victim's "clear" frequency as if we own it.

The simple fact is that no one owns the amateur spectrum. Just because a contest is scheduled on a particular weekend does not give us carte blanc rights to

"search and destroy" on the bands. Contesters, more than most, should respect the privileges we all enjoy as amateurs.

Some Final Thoughts

I expect to see some interesting mail in response to this month's column. There is nothing like a controversial topic to bring people out of the paperwork. My intent is for you to try to see both sides of this important issue.

The real point is not whether contesting should exist, but rather that amateurs around the world can value each other's parochial interests in the hobby while contributing in their own individual ways. When put to the test, we could probably construct a scenario that would leave the bands silent when considering the negative attributes of each and every amateur avocation. A real amateur radio operator isn't defined as a rag-chewer, DXer, or contester. Instead, a real amateur is one who gives something back to the world's best hobby. That begins with the way we operate and that includes you and me!

Here's A Book You Won't Want to Miss

Recently I had the occasion to obtain a copy of a rare treasure and new book entitled *Don C. Wallace, W6AM: Amateur Radio's Pioneer*, written by Jan Perkins, N6AW. This masterpiece is a wonderful hardbound, cloth-covered volume complete with gold embossing. Beyond the impressive look is an amazing compendium of pictures, tables, charts, and words that adeptly describe one of amateur radio's finest statesmen. Don Wallace, W6AM, was famous for his California rhombic farm and contest station. After perusing the first few pages, you will quickly discover that he is known for much more. In his 320-page volume, Perkins (not a stranger to contest circles himself) successfully captures both the man and the progression of amateur radio from its earliest days.

If I've piqued your interest, I suggest that you look for a more in-depth review, which can be found in September *QST*. However, if you want to find a book that truly can't be put down, I'd advise you to skip over the review and submit your order immediately. This one is a must for any amateur. Ordering information is: Wallace & Wallace, 11823 E. Slauson Ave., Suite 38, Santa Fe Springs, CA 90670. The retail price is \$29.95.

Closing Comments

If you haven't yet, please take a few minutes and fill out the contest survey in last month's contest column. I'd encourage

you to bring a copy to your local contest club meeting and spread it around. Remember to send your responses directly to my QTH and not to CQ magazine.

As always, the deadline for the February issue is December 1st.

73's, John, K1AR

ARRL Sweepstakes

CW: Nov. 2-4 Phone: Nov. 16-18
Starts: 2100Z Sat. Ends: 0300Z Mon.

This is the 58th 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.

Taking off on last year's highly successful program, the ARRL will be offering SS pins to participants with 100 QSOs or more (cost is \$3 p.p.). In addition, SS coffee mugs will be made available to participants achieving a "clean sweep" (\$8 p.p.).

Logs must be postmarked no later than 30 days after the contest and go to: ARRL Communications Dept., 225 Main Street, Newington, CT 06111.

Japan International DX Contest

2300Z Fri. to 2300Z Sun., Nov. 8-10

This is the fourth 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 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. 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 59, 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. 9

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 acceptable, and they must be received by December 31st. They go to: Mrs. Marilyn Syme, VK3DMS, P.O. Box 91, Irymple, 3498 Vic. Australia.

Czechoslovakian Contest

1200Z Sat. to 1200Z Sun., Nov. 9-10

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.

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.

European RTTY Contest

1200Z Sat. to 2400Z Sun., Nov. 9-10

Rules for the WAEDC RTTY contest are mostly the same as for the CW and Phone sections held in August and September.

There is one main difference, however. To generate more activity and increase the QSO points, contacts with stations worldwide are 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 Com-

mittee, Postbox 1328, D-8950 Kaufbeuren, Germany.

CQ WW DX CW Contest

0000Z Sat. to 2400Z Sun., Nov. 23-24

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 Low Power 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., Dec. 6-8

This is the 22nd 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, high, low, and QRP; and multi-operator single transmitter.

Exchange: RST and ARRL section for WVE. 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 WVE). (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 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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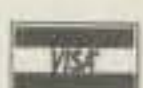
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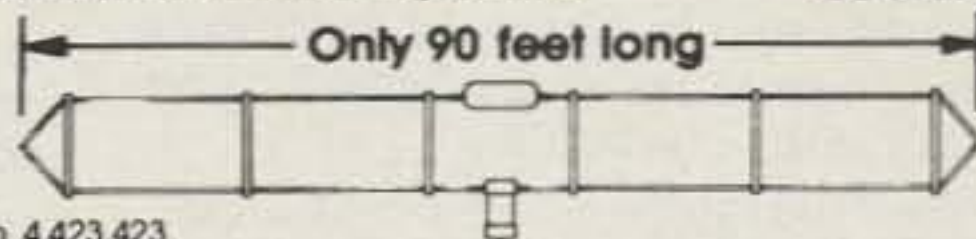
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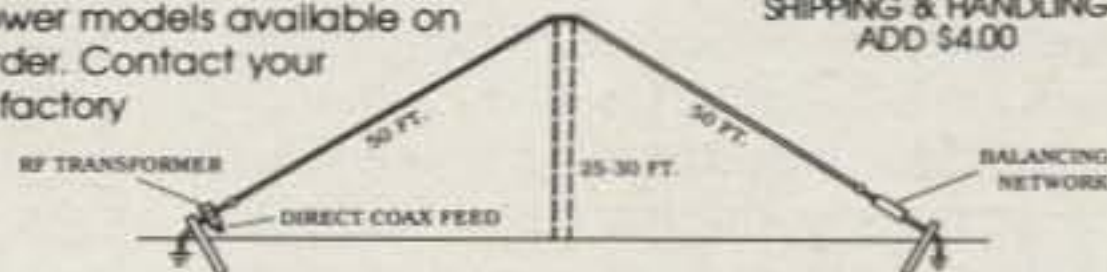
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November 1991 • CQ • 107

REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

Receiving Your Amateur Radio License From The FCC

This month's column was suggested by inquiries from readers. By all means, keep them coming. It let's us know where your interests and concerns lie.

Why Does It Take So Long To Receive A License?

Another variation of this same question is "Where is my new operator license! I have been waiting for two months and the others who took the test with me have already received their licenses." First, a little background on amateur testing is in order. There are actually two amateur radio operator examination schemes—the Novice program and the VEC System.

Depending on the testing program, the volunteer examiners (VEs) who administer your license examinations will either forward your amateur radio license application (known as a Form 610) directly to the FCC's Gettysburg, Pennsylvania, licensing facility or to a Coordinator. A VEC, which stands for Volunteer Examiner Coordinator, acts as the administrative contact between the testing community and the government which issues the amateur radio operator license.

Beginning Novice applications are usually sent directly to the FCC by the examiners, while Technician through Amateur Extra class Form 610s are forwarded to a VEC who screens the application for the government. While both the Novice and the Technician class are entry-level classes, Novices are examined informally by two licensed amateur radio operators in the community.

All other classes are examined under the newer VEC System, which requires a team of three senior-level amateurs who serve as VEs. The Coordinator forwards the application to the FCC once all requirements have been met for a specific license class. Basically, the VEC arranges for the testing function that used to be accomplished in the FCC's field offices. There are several VECs, each with many (sometimes thousands) of examiners who administer the tests and return the results and applications. Eighty percent

of all examinations, however, are coordinated by the ARRL and W5YI-VEC.

With that as background, let's talk about the actual mailing of the license. The FCC has a very big job to do! Last year the FCC in Gettysburg received nearly 20,000 Novice applications sent directly from VEs, and another 65,000 applications for various classes from the VECs. To that, add another 50,000 applications from amateurs who submit applications to modify information on their existing licenses. At any given time the FCC has up to 10,000 or more applications for amateur radio licenses in the ham license pipeline in various stages of processing.

Keep in mind that Gettysburg is busier than ever before due to the creation of the new popular Codeless Technician class. There are more applications to process with less people to do it! The Amateur Section at Gettysburg contains only two full-time and one part-time person. It wasn't too many years ago when they had a dozen people. The government's cost-cutting program has taken its toll.

Remember, too, that the Gettysburg facility not only handles license processing for amateur radio, but for all other private radio stations as well, including the aviation, General Mobile, industrial microwave, land transportation, business, marine, local government, and public-safety services. In fact, they have so many different radio licenses to issue that the applications of each service are color coded so they may easily be recognized and dispatched to the correct section. Amateur radio Form 610 applications are buff color.

The data from the amateur application is input into a terminal in the "key stroke" section after preliminary review by the Gettysburg processing people. Key strokers at these same work stations also handle the other radio services as well. Amateur radio waits its turn.

After information input, the application data is electronically compared with the FCC's data base which is located more than 100 miles down the road in Washington, DC. The week's Form 610 data used to be output on magnetic tape and trucked down to Washington, but it is now transmitted over the phone lines directly into the FCC's computer. This procedure exists to screen out applicants who, for one

reason or another, should not be issued an amateur ticket and to avoid duplicate licenses on the same individual. It also catches many errors on the application by comparing data with previous information on file.

After comparison, the FCC in Washington transmits the application data back to Gettysburg. Some applications hit the "error list." If your application makes it through the comparison process, your license will be printed and mailed to you by the FCC in its normal weekly run.

Applications kicked out during the comparison process must be corrected and "recycled," and your wait increases dramatically. The FCC's Gettysburg computer automatically generates a sequential callsign appropriate for your class as part of the license printing procedure once it makes it through the system.

Due to sheer volume and the fact that many applications are in various stages of processing, the FCC really does not know if they have your application until the callsign has been issued and the record posted in their information system. Many applicants are dismayed to learn that the FCC has "no record" of their application when they call to inquire about the status of their operator license. This only means the license has not yet been mailed.

Believe it or not, one of the commonest causes for license delay is poor handwriting! If data from a subsequent application is keyed in different than a previous license, it gets rejected during the comparison process and must be researched and recycled.

A normal license issuing "cycle" is currently taking about two months—and it can be longer. Applications going through the VEC System necessarily take more time since the examiners have ten days to get your successful Form 610 to their VEC, who in turn has ten days to submit it to the FCC.

Another common cause for license delay is that your application may be on "hold" at the VEC Office. Coordinators are not permitted to submit applications to the FCC unless the examinee's most recent operator license is attached. Applicants are taking examinations and submitting Form 610s faster than the FCC can possibly process and issue the licenses! At any given time the VECs have

National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101

hundreds of applications awaiting receipt of recently received licenses that must be appended to the Form 610 before submission to the FCC.

Frequently applicants are administered examinations under different VEC programs, which means your applications may be in a "holding pattern" at separate offices. You will automatically receive notification if a VEC is holding your application. Be certain that you forward your new upgraded operator license to the appropriate VEC when you receive it. The W5YI-VEC has a special 24-hour FAX line (817-548-9594) for applicants who wish to submit their operator license via telecopy. (The ARRL-VEC FAX number is 203/665-7531.)

Also take into consideration that amateur operator license issuance necessarily takes a little longer during peak periods. The FCC receives more amateur applications during the spring than at any other time of the year. They slow down somewhat once school lets out and the hamfest (amateur convention) season is over.

To answer the question, plan on a minimum of six to eight weeks, and it could take as long as two to three months for your ticket to arrive in the mail. But suppose it doesn't! The fact that others who were tested with you have received their license and you haven't is not cause for alarm. It happens all the time. There are dozens of legitimate reasons why this may happen.

Remember the rules allow you to operate your station with your newly obtained privileges for up to a year before license receipt. The Certificate of Successful Completion of Examination (CSCE) that the VEs issued you also serves as your temporary operating authority.

If your operator license has not arrived 90 days after examination (or receipt of your first license if you have upgraded twice), then you should:

1. First contact the VE team to be certain they submitted your application to the VEC. (It may be necessary for the VE team to have you prepare a duplicate Form 610, which they will certify from their test session records.)

2. If the VE says they sent the application to their coordinator, then contact the VEC (ARRL-VEC 203-666-1541 or W5YI-VEC 817-860-3800) to ensure they received and forwarded it to the Commission. The VEC will ask you the testing date and city of examination so they may check their files. And last . . .

3. Contact the FCC (717-337-1212) to determine if your license has been issued.

Do not call the FCC unless 90 days has passed and you have first contacted the examiners and the coordinator. When you do contact the FCC, you will be speaking to a Public Service representa-

tive who will attempt to call up your record on her terminal. Remember the FCC will have "no record" of your new operator license until it has been issued, even though the application may have been "in house" for many weeks! It is not possible for the FCC to do a desk-by-desk search for your application. If they did, they would never have time to process the ones they have. Patience!

How Do or Why Should I Become A Ham Operator?

This is the most common question from readers by far! Different versions are "What are the advantages?" "What can you do?" "Where do I start?" You could almost write a book answering this one—and some writers have!

Amateur radio is a many-faceted hobby covering just about every possible form of communications activity. There is something for everybody, and there are all levels of expertise! Many beginners simply chat locally with other amateurs over the local 2 meter repeater. You certainly do not have to be technically inclined to get an amateur radio license these days!

The two other most popular activities seem to be DX-chasing and computer-to-computer "packet" radio. Once you get into the hobby, you can branch out into some of the more sophisticated modes such as satellite uplink/downlink communication, even your own over-the-air television station.

Talking to friends with similar interests in foreign countries requires a high-frequency (two-way shortwave) radio and at least a Novice license. The greatest interest in amateur radio these days, however, is at the VHF (above 30 MHz) level. In fact, it is literally exploding! It used to be that amateur radio meant shortwave and Morse code knowledge. Today most communications and experimentation take place above 144 MHz, the beginning of the popular 2 meter amateur band. To communicate at the VHF level you need at least a Technician class license.

Both the Novice and Technician tickets are "entry level"—that is, beginning amateur classes. Newcomers to amateur radio can easily qualify for the needed licenses in just a couple of weeks! The licensing system has changed drastically over the last decade. Instead of wandering down to the local FCC office to take a Morse code and written examination of unknown content, you simply pass a multiple-choice test on known questions that is administered in your own neighborhood. Lists of these questions complete with answers are available everywhere. Nothing could be easier. Somehow people have the notion that amateur radio is just for those trained in electronics. It simply isn't true.

Inexpensive Equipment

The fact is amateur radio has become a consumer item, something which some of the old timers are less than excited about. Times have changed, and with today's equipment advances there is simply no need to be technically inclined. Sure, there are regulations and safety considerations you need to know to keep out of trouble, but you certainly do not have to know how to build a radio. When I started in amateur radio (in the 1950s) things were different! Most amateur gear was homebrewed, and the government meticulously (and necessarily) tested you on construction techniques. Whether we like it or not, by and large amateur radio today is basically a self-training and public-service communications hobby.

Proof that the amateur radio hobby is appealing to the masses is right at your corner Radio Shack store—all 7000 of them! They now carry all the essentials for entering the hobby—Novice and Codeless Technician training manuals, complete with all the verbatim questions, multiple choices and answers, and beginning transmitting equipment. (We also distribute a book called the *Ham Radio Handbook*, which completely covers everything you need to know to become a licensed operator (\$9.95 plus \$2.00 shipping and handling from W5YI Group, P.O. Box 565101, Dallas, TX 75356; VISA and MasterCard orders to 1-800-669-9594 toll free).

Radio Shack has low-priced 10 meter (high-frequency shortwave) base stations and 2 meter hand-held radios. All you need do is lash a wire antenna to the 10 meter radio and you can talk around the world! The 2 meter transceiver comes with its own antenna and can be used to access your local repeater or packet (computer-to-computer) bulletin board.

Packet Radio

We cannot say enough for packet radio. There is nothing neater than being able to communicate worldwide right from your own personal computer, linked by the free radio waves instead of the expensive telephone lines. Packet radio is the space-age version of radioteletype. Instead of demodulating an RTTY signal, a radio modem converts your computer's output to audio tones and transmits it into the packet radio network. Your signal gets mixed in with many others.

Incoming messages for you stop at your computer, or you simply have an electronic mailbox at another amateur's packet station which you check into to pick up traffic! The secret to the amateur packet network is the ability of a packet station to "digipeat"—an amateur-

coined word meaning automatic digital retransmission or repeating.

Your packet station is made up of three components: a two-way radio, a personal computer, and an interface between the two called a terminal node controller, or TNC. It is also a repeater, automatically retransmitting traffic down the line that is not for you! We can thank the amateur fraternity for this technique. Inexpensive TNCs and the technology were developed by experimenting amateur operators in the 1970s. Today there are over 100,000 amateurs on packet—a technology that could offer much for the general public! Imagine people being able to send and receive personal mail worldwide without cost!

The National Amateur Radio Association has a publication entitled "Amateur Radio, King of Hobbies," which tells you the steps you need to take to get that needed first license. It also lists hundreds of our W5YI-VEC testing points, which your author heads up, all over the U.S. The W5YI-VECs have helped thousands of people like yourself enter the hobby! The publication is free from NARA, 16541 Redmond Way, Suite 232, Redmond, WA 98052.

Amateur Radio News

The American Radio Relay League has filed a petition with the FCC asking that the Amateur Service be allowed to operate point-to-point links at 216 to 220 MHz. This is just below the 220-222 MHz spectrum that was taken away from Amateur Service use and reassigned to narrow-band business use. The League believes that amateur stations can peacefully coexist with the Maritime

Mobile Service, which presently is allocated the 216 to 220 MHz band. The petition points out that wider bandwidths are needed by amateurs for inter-city packet radio operation due to the speed of the communications and the traffic volume.

The FCC is expected to issue a new ruling on operator responsibility for third party message traffic moving through automatically controlled amateur networks. As it stands now, adhering to the proper message content statutes is the responsibility of every station licensee, including amateurs operating voice and packet repeater stations. The issue resurfaced when several packet radio stations were cited by the Commission for automatically retransmitting what was thought to be a questionable business-oriented message about the war in Iraq. Most amateurs believe the liability for message content should be placed on the amateur station that initiates the traffic rather than those who unintentionally retransmit a message. A compromise petition has been accepted for comment by the FCC which assigns primary responsibility for third-party traffic to the communication originators, with automatic retransmitting stations being held accountable on a secondary basis.

Administrative fines for amateur radio violations are going up! The FCC has increased its forfeiture standards which also now provide for adjustments. These adjustments take into consideration the nature, circumstances, extent, and gravity of the violation, degree of guilt, history of prior offenses, and ability to pay when determining the final monetary penalty. Among others, the schedule provides for fines of \$8000 for false distress communications, \$7500 for failure to permit station inspection, \$7000 for

the importing or marketing of unauthorized equipment, \$5000 exceeding power limits or using unauthorized frequencies, and \$1000 for failure to give station ID. The Commission also designated a \$500 amount for "... miscellaneous violations." The FCC said that its new monetary forfeiture policy is intended to "... aid our enforcement efforts by making clear in advance the likely consequences of violations."

The good news is a formal reciprocal amateur operating arrangement has been signed with Mexico. Reciprocal licensing comes about when countries agree to recognize the amateur radio operator qualifications of another. This permits amateur operators to operate their equipment in a foreign land without a further demonstration of technical or operating skill. The bad news is that you have to go through much bureaucratic red tape to comply with Mexico's administrative requirements to obtain the reciprocal permit. Basically, you must submit an application to the Secretary of Telecommunications in Mexico City 60 days in advance of your planned operation and pay a \$60 fee. You also must notify the Mexican authorities of the place and length of your amateur radio activity. The U.S. State Department had hoped the reciprocal licensing procedure with Mexico would be similar to the arrangement the United States has with Canada. According to a 1952 treaty, Canadian and U.S. amateur radio operators are automatically licensed in the neighboring country. Amateurs simply append a geographical suffix to their own callsign and operate under the laws of the country they are visiting. There is no paperwork to submit and no fee to pay.

The FCC has clarified the telegraphy exemption policy for handicapped amateurs. About a year ago the Commission agreed to exempt doctor-certified severely disabled amateurs from having to pass the higher speed Morse code examinations. Three objecting Petitions for Reconsideration were filed with the Commission. One amateur said it was not reasonable to exempt a licensing requirement; another wanted a list of approved disabilities included in the rules. The American Optometric Association argued that eye specialists should be permitted to certify blindness or vision impairment. While denying all petitions, the FCC did agree that temporary disabilities do not qualify for the 13 and 20 wpm telegraphy exemption. The Part 97 Rules are being changed to specify that a severe handicap is defined as a disability, "... the duration of which extends for more than 365 days beyond the date of [doctor] certification . . ." Severe handicaps will continue to be certified only by medical doctors (M.D.) and osteopaths (D.O.).

Until next month . . . 73, Fred, W5YI

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NEWS OF COMMUNICATION AROUND THE WORLD

Amateur Radio In Albania

The European country of Albania has been absent from the amateur bands for more than 20 years. Albania has steadily moved up in the Most Wanted Countries list through the past 20 years, reaching the coveted number one position in 1984, and remaining there through the 1991 survey (more on the 1991 survey results next month).

Even prior to the last accredited amateur operation from Albania in 1971, there were only a handful of DXpeditions active from the country. Martti Laine, OH2BH, operated as OH2BH/ZA in 1970, but made only about 800 contacts. Martti returned the next year and made many DXers happy with his ZA5C operation. Meanwhile, Frank Turek, DL7FT, led a German team to Albania in June 1971. Most DXers who have DXCC credit for Albania have a ZA2RPS QSL card. Since ZA2RPS closed down, there have not been any legitimate amateur operations from Albania.

DXers had reason for hope in recent years after Albania's long-time Communist dictator Enver Hoxha died in 1985. The advance of democratic reforms and the crumbling of one of the world's most enduring walls against any form of outside influence demonstrated that the three million Shqiptars (Eagle-men, as the Albanians call themselves) were ready to acknowledge the existence of the rest of the world. Increasing trade with other countries, the re-establishment of diplomatic relations with the US, and other actions signaled that amateur operations would happen soon.

In mid-1991 the ZA DX rumor mill was working overtime. Masses of misleading and ill-informed information circulated through the DX nets. The number of bogus ZA stations on the bands increased from the usual one per week to nearly continuous operation. The enterprising Hungarians who had such success gaining operating permission from Laos, Vietnam, and Kampuchea came very close to breaking the Albania DX-logjam in August. Unfortunately, they were not able to obtain the final permission they needed, and returned to Hungary without making a contact.

Even as they were on their way out of Albania, however, members of the Alba-



Baldur, DJ6SI, operated from the Holy Community of Mt. Athos earlier this year.

nian PTT were headed for Tokyo, site of the Japan Amateur Radio League's enormous annual convention. There, together with International Amateur Radio Union (IARU) President Dick Baldwin, W1RU, Martti Laine, OH2BH, and many other officials, Agim Muco, Secretary General of the Albanian PTT, announced the establishment of amateur radio in the country. The IARU news release said:

It was announced today [August 24] in Tokyo that a program has been established which will lead to the introduction of Amateur Radio in Albania.

Mr. Agim Muco, the Secretary General of the Albanian PTT, made the announcement. During a short address at the Tokyo Hamconvention, he announced the foundation of the Albania Amateur Radio-transmitters Society. He also announced that as a result of support from the IARU, several of its member societies, and certain honored individuals, amateur radio transmissions from Albania would commence on 15/16 September, 1991.

Under the sponsorship of the IARU, and with assistance from the JARL (Japan), the ARRL (USA), the ARI (Italy), and NCDXF (USA), and Yaesu (Japan), a program of instruction and introduction has been adopted by the Albanian government which is intended to form the beginning of amateur radio in Albania. Mr. Richard L. Baldwin, W1RU, Mr. Seppo Sisato, OH1VR, Mr. Kan Mizoguchi, JA1BK, and Mr. Martti J. Laine, OH2BH, in his capacity as a consultant to the Albanian PTT, have all been instrumental in the early phases of this project. Part of the overall program will consist of training selected Albanian students as well as operation of amateur stations by instructor/opera-



Don McCall, YB8ASX, operates from this tidy battery-powered shack on Halma-hera Island, which has the Islands On The Air designation of OC-145. Thanks to VE3XN for the photo.



Morgan Godwin, W4WFL, occasionally operates from 3A2ARM in Monaco. He shows excellent taste in reading material. (3A2LF photo)

tors. Amateurs from a number of nations will take part in the operation.

Mr. Muco's address reveals more about the history of amateur radio, and society in general, in Albania:

Honoured Ladies and Gentlemen. First I would like to express our great happiness and gratitude to you for our visit to your nice country and our participation in the proceedings of this conference.

I would also like to recognize Mr. Dick Baldwin, President of the World Amateur Radio-transmitting Society, Mr. Shozo Hasa, President of the Japanese Amateur Radio-transmitting Society, Mr. Seppo Sisato and Mr. Martti Laine, representatives of the Finnish Amateur Radio-transmitting Society, Mr. Kan Mizoguchi, assisting Japanese Amateur Radio-transmitting Society, and representatives of Yaesu Corporation who have all sincerely supported

The WPX Program Mixed

1518	RA3YA	1522	IK3DRO
1519	J17KEP	1523	WA5DTK
1520	JA6QDU	1524	IK2GPO
1521	KC8PG		

SSB

2253	EA5ETP	2257	N1IBQ
2254	G4XRL	2258	KC8PG
2255	WB0GFV	2259	HA9PP
2256	GI4OCK		

CW

2698	EA6QK	2701	KC8PG
2699	HA9PP	2702	YU3MJ
2700	JA5CAV	2703	F1HWB

Endorsements

Mixed: 450 RA3YA, J17KEP, KC8PG, WV2B, WA5DTK, IK2GPO. 500 RA3YA, W0IZV, KC8PG, WA5DTK, IK1GPO. 550 RA3YA, W0IZV, JA6QDU, KC8PG, WA5DTK, IK2GPO. 600 RA3YA, W0IZV, JA6QDU, KC8PG, WA5DTK, IK1GQ. 650 RA3YA, W0IZV, JA6QDU, KC8PG, WA5DTK, IK2GPO. 700 RA3YA, W0IZV, KC8PG, WA5DTK, IK2GPO. 750 RA3YA, W0IZV, KC8PG, WA5DTK, IK2GPO. 800 RA3YA, W0IZV, JA4BAR, KC8PG, WA5DTK, IK2GPO. 850 W4USW, RA3YA, CT3CU, KC8PG, WA5DTK. 900 RA3YA, CT3CU, KC8PG, WA5DTK. 950 RA3YA, CT3CU, KC8PG, WA5DTK. 1000 RA3YA, W3FDU, KC8PG, WA5DTK. 1050 OE1-0140, KC8PG, WA5DTK. 1100 KC8PG, WA5DTK. 1150 KC8PG, W3KH, W9IAL, WA5DTK. 1200 IK2ILH, W3KH, KC8PG, WA5TK. 1250 IK2ILH, KC8PG, WA5DTK. 1300 WB2YQH. 1700 WE2L. 1750 WE2L. 2150 W2FXA. 2400 I1EEW. 2450 I1EEW. 2500 I1EEW. 2600 SM3EVR. 2700 I2PJA. 2750 I2PJA. 2800 I2PJA. 2900 N4NO. 2950 N4NO. 3000 N4NO.

SSB: 350 G4XTA, KC8PG. 400 G4XTA, KC8PG. 450 G4XTA, KC8PG. 500 G4XTA, KC8PG. 550 G4XTA, KC8PG. 600 G4XTA, KC8PG. 650 KC8PG. 700 OE6CLD. 750 OE6CLD. 800 OE6CLD, KB8DAE. 900 K2EEK, W5ILR. 950 K2EEK, W5ILR. 1000 W5ILR, KF7RU. 1050 W5ILR, IK8BMW. 1100 IK8BMW. 1150 WK4F, IK8BMW, KC9DS. 1200 WK4F, IK8BMW. 1250 I8IYW, IK8BMW. 1300 I8IYW. 1600 LU8ESU. 1650 LU8ESU, WE2L. 1700 LU8ESU. 1750 K5RPC. 2050 WF4V. 2100 N4NO, I1EEW. 2150 N4NO, I1EEW. 2200 N4NO. 2250 NJ0C. 2650 I2PJA. 2700 I2PJA. 2750 I2PJA. 3250 ZL3NS. 3300 ZL3NS.

CW: 350 EA6QK, KC8PG, F1HWB. 400 EA6QK, KC8PG, WA0DF, F1HWB. 450 KC8PG, F1HWB. 500 KC8PG, F1HWB. 550 KC8PG, F1HWB. 600 W4TYU, G3JTO, KC8PG, F1HWB. 650 KC8PG.

700 KC8PG, LA3GI. 750 KC8PG. 800 KC8PG. 850 AH6JF, KC8PG, JG2LGM. 900 WA2EYA, KA1CLV, KC8PG. 950 WA2EYA, KA1CLV, KC8PG. 1000 WA4QMQ, KC8PG. 1050 VS6UN, KC8PG. 1100 I1EEW, VS6UW. 1150 I1EEW. 1350 G3VQO. 1450 G4SSH. 2500 N4NO. 2550 N4NO. 2600 N4NO. 3050 WA2HZR.

10 Meters: OE6CLD, IK8BMW, KC8PG, KU0A, G3VQO

15 Meters: IK8BMW, KC8PG

20 Meters: IK8BMW, KC8PG

40 Meters: KC8PG

80 Meters: KC8PG

160 Meters: I2MQP

Asia: IK8BMW, KA1CLV, KC8PG, WA5DTK

Africa: DJ1YH, DK5WQ, OE6CLD, IK8BMW, KC8PG

No. Amer.: KB6RKR, OE6CLD, KC8PG, WA6DTK

So. Amer.: WB3DNA, IK8BMW, I2EOW, KC8PG

Europe: KC8PG, WA5DTK

Oceania: OE6CLD, IK8BMW, KC8PG, KB7DAE, WA5DTK

Award of Excellence Plaque Holders: I8YRK, W4CRW, SM0AJU, K5UR, DL3R, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, K6XP, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GQ, VK9NS, DE0DXM, DK4SY, UR2**, AB90, FM5WD, I2DMK, W4BOY, I0JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, H18LC, K85W, K0JN, W4VQ, KF20, K3UA, HA8XX, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QMQ, EA7OH, K2POF, DJ4XA, IT9TQH, W8ILC, K2POA, N6JV, W2HG, ONL-4003, VE7DP, K9BG, W5AWT, KB0G, HB9CSA, F6BVB, W1BWS, W4BUE, G4BUE, N3ED, DF1SD, K7CU, I1POR, W8RSW, N4KE, I2UIY, YB0TK, W8ILC, W1BWS, VE7WJ, K9QFR, NN4Q, W4UW, K9QFR, NN4Q, W4UW, NX0I, G4BUE, LU3YLW4, I4EAT, WB4RUA, VE7WJ, N4NX, DE0DXM, VE7IG, K9BG, I1EEW, AB90.

Award of Excellence Plaque Holders with 160 Meter Endorsement: FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, PY2DBU, W3ARK, H18LC, KA5W, UR2**, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM0AJU, KF20, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, IT9TQH, DL9RK, N6JV, ONL-4003, W1JR, W6OUL, W5AWT, KB0G, 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, N4NX, DE0DXM, VE7IG, K9BG, I1EEW, AB90.

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," 880, CR13, Clovis, NM 88101-9511 USA.

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401	KA6ING	404	N6RJY
402	VE2WY		

15 Meter SSB

391	JH5FCT	394	VE2WY
392	IK0IOL	395	DU1KT
393	K9IW		

20 Meter SSB

854	IK0IOL	856	VE2WY
855	LU6EJP	857	WP4AFA

40 Meter SSB

72 IK0IOL

10 Meter CW

116 AB1U 117 HB9DDZ

15 Meter CW

211 NQ1W 212 JI1PGO

12 Meter Mixed

5 HB9ALO

17 Meter Mixed

5 K1MM

WNZ

38-10M SSB KA6TVL
39-10M SSB KA6PUW

Phone

602 OE2WR

All Band WAZ SSB

3800	IK8HEO	3807	IK0EIM
3801	YB2FRR	3808	W7KEU
3802	KF2BH	3809	N4HNS
3803	WA3EBA	3810	W5KWX
3804	G0LOG	3811	WB2RQX
3805	I2CKT	3812	KU0A
3806	LA5XGA	3813	WK0F

CW/Phone

7051	JA6QDU	7062	KA6ING
7052	K8AAI	7063	XE2LV
7053	N2MG	7064	VE3DIT (CW)
7054	JR5KLZ (CW)	7065	KB8CFE
7055	AA6JZ (CW)	7066	W5HNS (CW)
7056	AA7FK (CW)	7067	LA4WJ (CW)
7057	AA7FK (CW)	7068	N4JQQ (CW)
7058	JA1QUT (CW)	7069	G3NKC
7059	I3FOM	7070	G3FIC (CW)
7060	SM6TEU (CW)	7071	BV2TA (CW)
7061	JA9BM (CW)	7072	W2QV

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 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).

many will be attended by participants from many different countries, including Mr. Tarjan, General Secretary of the ITU. Several Albanian amateurs will, for several weeks, attend a theoretical/practical course of study. I have full confidence in the positive results of this course.

It is evident that the Albanian Amateur Radio-transmitters Society has found, in you, the very sincere friends it has needed since the

the foundation of the Albanian Amateur Radio-transmitting Society, and radio transmitting from Albania.

Dear friends, I would like to present a brief summary of the unsuccessful road of amateur radio-transmitting to and from our country. The reasons for this bad situation reflect the social-political situation. For forty-five years the hard-line communist regime considered radio transmitting a dangerous hobby prohibited by law for Albanians and especially foreigners. Why? Because radio transmitting has been considered as an aid to foreign spying. Those operating radio transmitters were looked upon as possible spies. Isn't this to be laughed at? Yes, dear friends. But this is an undeniable fact. The isolationist, hard-line policy of our former regime angered many amateurs from all over the world who had officially requested permission for amateur radio transmitting in Albania. All of these requests were thrown into the waste basket.

During all those years under that regime,

the right was given locally to only one sport federation of very limited membership, using only Morse code. Present-day pluralism and the complete failure of communism has brought forth conditions which will not only allow the foundation of the Albanian Amateur Radio-transmitting Society, but also amateur radio transmitting to and from societies and individuals throughout the world.

On this occasion, I have the pleasure to announce to you the good news that the general Directorate of the Albanian PTT has approved the foundation of the first Albanian Radio-transmitters Society, with its center in Tirara.

I would also like to inform you, very briefly, about the current situation and prospective of radio-transmitting in Albania. I would like to stress here, that thanks to the help of the above-mentioned honoured gentleman, we have compiled a concrete working program. According to this program, we shall have the first amateur radio transmissions from Albania on September 15/16, 1991. The initial cere-

day it was founded. We shall never forget this. This important day will also be considered as the first day of Albanian amateur radio transmitting history.

I think you know very little about my country, which geographically is very small. Socially it is gripped by a powerful political-economic crisis. But my people are very proud and full of hope and love for every beautiful thing of life. My people want to make up for the time they have lost under the dictatorial regime. That's why the doors of our country are widely open to sincere friends. Now, side-by-side with politicians, businessmen and bankers we will see the first amateur radio transmissions coming from abroad to our country.

Dear friends! Allow me, again, to greet you and assure you that the newly founded Albanian Amateur Radio-transmitters Society will be a worthy partner in the future.

Thank you.

For DXers, this means that not only will there be a major operation from Albania, sufficient to drive the country right off the Most Wanted Countries list, but also that there will be Albanian amateurs on the air on a regular basis in the future. As happened with China, another country will go from the rarest of the rare in DX to commonplace. How long will it be before one hears in a contest, "The ZA stand by; the YU, go ahead." Or PacketCluster™ SYSOPs activating the ZA filter, to prevent spots of ZAs from clogging the networks? Great news for DXers. And congratulations to the Albanians, and to those many individuals who helped make amateur radio a reality in Albania.

DX News

In other news, the ARRL DXCC desk says that 3X1SG and 3X1AU are now acceptable for DXCC credit. No, this is not a result of our "modest proposal" about accrediting extending, undocumented amateur operations. In the case of these two Guinea stations, the long-awaited documentation finally arrived, and the ARRL approved same. If your Guinea card was turned down for DXCC credit



Karl Proffen, DJ7RD, finally snagged Zones 31 and 39 on 80 meters to complete his 5 Band Worked All Zones, using a barefoot rig and a 26 meter random wire! He combines DXing with family activities with his wife and four sons.

previously, send it in again. And if you have held off confirming your Guinea contact because it did not count for DXCC, contact QSL manager ON6BV for your card now.

In other DXCC news, the backlog of unprocessed endorsements has finally been eliminated, thanks to the hard work and long hours of many members of the ARRL headquarters and several groups of volunteers. Chuck Hutchinson, K8CH, who oversees the DXCC processing, deserves sincere congratulations for clearing up a sore point in DX.

Two more changes in the DXCC processing: The DXCC desk will be putting former DXCC records on computer as endorsements arrive. For the past year, new DXCC applications have been entered into the League's computer, a procedure that makes updating and additional band or mode DXCC applications easier. Now, when a DXer sends in an endorsement request, his or her former

5 Band WAZ

As of July 31, 1991, 325 stations have attained the 200 zone level.

New recipients of 5 Band WAZ Award with all 200 zones confirmed:

RT5UY
IK0IOL
JA2ODS

The top contenders for 5 Band WAZ are:

N4WW, 199
SP9PT, 199
K6YRA, 199
PY7ZZ, 199
DL9WW, 199
K0CS, 199
KB0G, 199
ZS6BCR, 199
UA4RZ, 199
AA4KT, 199
K7UR, 199
K9EL, 199

NA0Y, 199
VE7DX, 199
W0PGI, 199
W2YY, 199
W9WAQ, 199
I8IGS, 198
VE7AHA, 198
SM6AHS, 198
K1ST, 198
W1JR, 198
4X4DK, 198

729 Stations have attained the 150 zone level as of July 31, 1991.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 cents) size 4½ x 9½ 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 CO 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 CO mailing label with your application. Send any questions to K1MEM by mail and include an SASE (please do not telephone).

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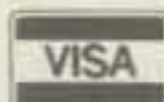
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H15-4	15 m	8.80	1.65	\$340
H10-3	10 m	6.46	1.79	\$190
H6-6	6 m	9.41	1.91	\$200
H144-5	2 m	9.10	1.70	\$ 50
H144-15	2 m	13.73	1.68	\$145
H220-5	1.25 m	9.10	1.70	\$ 50
H220-17	1.25 m	13.53	1.29	\$150
H432-24	70 cm	16.14	1.76	\$145

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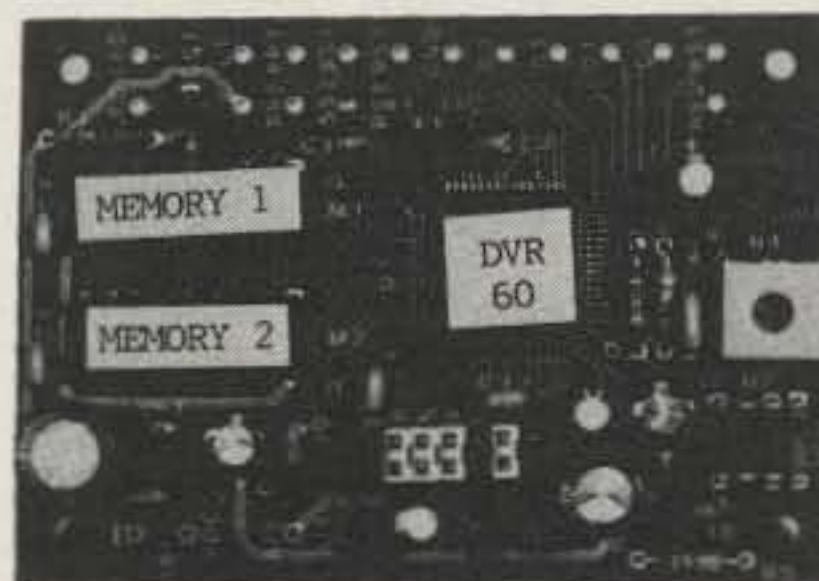
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CIRCLE 119 ON READER SERVICE CARD

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries for the mode indicated. The ARRL DXCC Countries List is used as the country standard. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. Deleted countries do not count and are dropped from listing as they occur. Total countries are now 322. 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

W9DWO	323	N4MM	321	W0SR	317	WD9LIC	313	AA6AA	308	I4EAT	302	K8LJG	296	KU0S	290	N3DQN	280
K2FL	323	N4KG	320	N6AR	316	WA2HZR	312	W6DN	308	K9TI	302	WA4DAN	296	W1WLW	288	K7ZR	279
K2TQC	323	OK1MP	320	K4XO	315	WA4JTI	312	W9RY	307	NY5L	302	WD9IIX	295	W4BV	288	W2LZX	279
ON4QX	323	DL8CM	320	K9IW	315	W0JLC	312	N7RO	307	K9DDO	302	KD8V	295	G2GM	288	KB9XG	279
K6LEB	323	K1MEM	320	N4PN	314	W4OEL	312	DJ2PJ	306	WA8DXA	301	W6YO	295	K8NA	287	W9NUF	279
N4JF	322	N6AV	319	KQ9W	314	W7CNL	312	SM6CTQ	305	YU2TW	300	K1VHS	295	WB5MTV	287	HB9AFI	278
K4CEB	322	SM3EVR	319	DL7AA	314	W9WAO	311	K4CXY	304	I3OBO	300	KB8DB	295	G2FFO	286	KA2DIV	278
SM6CST	322	DL3RK	319	I5XIM	314	K6EC	311	W2UE	304	WA8YTM	300	K2JF	294	W9SC	286	NC9T	278
K9MM	322	N2KW	319	W1NG	314	IT9TQH	311	IT9QDS	304	DL9QW	299	W3BBL	293	G3KMQ	286	KA3R	277
YU1HA	322	W4BOY	318	EA2IA	314	DJ1XP	310	I8WY	304	NN4Q	299	N5FW	293	K2JLA	285	DL1QT	276
DL1PM	321	N6CW	318	K2OWE	314	W6ID	310	AA5NK	304	F3TH	299	VE7DX	292	KA7T	284	YV5ANT	276
K6JG	321	K3UA	318	W0HZ	314	K9QVB	310	KZ4V	304	I2QMU	299	PA0XPQ	292	KP4P	283	K1HDO	276
W2FXA	321	W0IZ	317	W1WAI	313	K8PYD	309	AB4H	303	K3FN	297	K4JLD	292	AG9S	282	DF3FJ	276
K9AB	321	W7ULC	317	IT9ZGY	313	WB4RUA	309	N8MC	303	IT9VDO	297	N5DX	290	JH1VRQ	281	K4SE	275
W6PT	321	AA4KT	317	K9BWO	313	WA4IUM	309	N4AH	303	DJ7CX	296	KB0G	290	W8URM	281		

SSB

K2FL	323	YU1AB	321	ZS6LW	318	K9LKA	314	K0HOW	311	N0AMI	306	K7LAY	300	IT9VDO	293	YV5IVB	282
VE1YX	323	K5OVC	321	W0SFU	318	OH5KL	314	K1HDO	311	N6CGB	306	KB9KD	300	WD9IIC	293	WK3N	282
F9RM	323	TI2HP	321	G4CHP	318	OZ8BZ	314	W4SSU	310	K1VHS	306	KB2MY	300	K4SE	293	AE2B	281
DJ9ZB	323	I8ACB	321	W7FP	318	YV5DFI	314	K6EC	310	N4KE	305	I2EOW	300	KC8JH	292	AI9R	281
W9DWO	323	K9AB	321	KR9O	318	W8RY	314	K8NA	310	K3LUE	305	WD0DMN	300	AI5I	292	TG9EP	281
W0YDB	323	KZ2P	321	I2QMU	318	K8CSG	314	NJ0C	310	CX4HS	305	W7KSK	300	W9NUF	292	VE4NUP	281
VE3XN	323	CT1FL	321	W4UNP	318	KU9Z	314	XE1OX	310	WA6DTG	305	VE4AT	299	KD5ZM	292	N1ALR	281
K2TQC	323	OA4OS	321	ZL1BIL	318	PY4OY	314	WE2L	310	K8YVI	305	SV8CS	299	VE6PW	292	VU2DVP	281
W2SUA	323	KS2I	321	K2JLA	318	AA5NK	314	W6MFC	310	VE3DLR	305	I2ZGC	299	TI2LTA	292	4X4JO	281
K9MM	323	I0AMU	321	KQ9W	318	IK8CNT	314	KA5RNH	310	N4KEL/M	305	NW5K	299	YV1CLM	292	PY2DBU	280
YU1HA	323	DL6KG	321	W8ILC	317	HR1KAS	314	K9TI	310	KZ8Y	304	WB6GFJ	299	W3SOH	292	NX0I	280
W6EUF	322	W7OM	321	N6AR	317	A92BE	314	KZ4V	310	K8VFE	304	JH1VRQ	299	WA4LOF	291	YU1TR	280
N4JF	322	K3UA	321	WA4DAN	317	KB3OQ	314	W0ULU	310	EA1QF	304	I8IGS	299	AC0A	291	G4FAM	279
VE3MR	322	N2KW	321	W9JT	317	K7EHI	314	W5LLU	310	K4RIG	304	ZL1BOQ	299	VE3FEA	291	W9VA	279
4Z4DX	322	WA4ECA	320	YV5CWO	317	I2LLD	313	IK1GPG	310	I4WZK	304	K5DUT	299	VP9CP	291	WB8TLI	279
W4EEE	322	OE3WVB	320	K4CXY	317	W1NG	313	DK2BL	309	KD5ZM	304	RA3YA	299	W8LKG	291	W5XO	279
W4DPS	322	VE3MRS	320	YV1AJ	317	W1LQQ	313	AA6AA	309	KB1JU	304	WA0TKJ	298	SV1JG	291	K5AOL	279
EA4DO	322	VE7DX	320	N4CRU	317	SM4CTT	313	AB9O	309	KB7VD	304	I6PLN	298	KE7UL	291	KB5DN	278
DL9OH	322	SV1ADG	320	I8XTX	317	KE4VU	313	KU9I	309	IN3ANE	304	KA8T	298	VE3IPR	290	EA6DE	278
W3AZD	322	WD8MGQ	320	WA4WTG	317	EA4LH	313	N6AHV	309	KD8V	303	KB2FC	298	W4JFE	290	JH8NYK	278
YV1KZ	322	IT9TGO	320	KA9ABC	317	WB6OKK	313	KB6OC	309	KC8YM	303	DJ7CX	298	I4CSP	290	KX5V	278
OK1MP	322	W3GG	320	IK8BQE	317	WB6PSY	313	K1MIZ	309	KB0SY	303	WD0BNC	298	VE3CKP	289	WN5K	278
VE3GMT	322	N4KG	320	G6ADD	317	WB4PUD	313	IV3YRN	309	W7ULC	303	K9SM	297	I4UFH	289	VU2CVP	278
ZL1AGO	322	W4UW	320	W6BCQ	317	KF7SH	313	I5EFO	309	KA9TNZ	303	JH4PRU	297	W9TA	288	K4BYK	277
ZL3NS	322	W6DN	320	DJ1XP	316	KA6V	313	I1POR	309	WA2FKF	303	EA9IE	297	JA5PUL	288	VE3IUE	277
K6WR	322	AA4KT	320	KD8VM	316	AA6BB	313	G4GED	309	KB9LN	303	XE1HI	297	AI9U	288	DF6EX	277
I4LCK	322	I4EAT	320	N4WF	316	W8PCA	312	KP4P	309	XE1KS	302	KF5DX	297	LU7HJM	288	KG9N	277
K8LJG	322	N6AHU	320	K4POV	316	N2SS	312	WA9RCQ	309	W2LZX	302	NP4CC	287	YB2OK	288	I8WYD	277
W9OKL	322	W0SR	320	I8LEL	316	OE2EGL	312	XE1MD	309	KB0U	302	VE2GHZ	297	OK1AWZ	287	CE7ZK	277
EA2IA	322	WA4JTI	320	KC8EU	316	K0GT	312	WA8YTM	309	WD5P	302	HY1JC	296	EA8TE	287	KA9I	277
K4MQG	322	NY5L	320	K9HQM	316	W2FGY	312	N4PN	308	W4BOY	302	YU7KV	296	EA3KW	286	WA9BDX	277
OZ5EV	322	YS1GMV	320	W6SN	316	G3VOF	312	WD9IIX	308	XE1XM	302	ZE1OW	296	AB9E	286	WA5HWB	277
K4MZU	322	IT9ZGY	320	AG9S	316	K8CMO	312	K9QVB	308	TI2JJP	302	W9SC	286	W9SC	286	WB0UFL	277
I8AA	322	EA1QF	320	K8ZJU	316	KI3L	312	N3ARK	308	F6BFJ	302	NC9T	296	PA0XPQ	286	WN5MBS	277
TI2CC	322	NJ2C	320	K2JF	316	TI2KD	312	W4BOY	308	N5FG	301	WB3GPR	295	N8BJQ	285	W4PTT	276
KM2P	322	KS0Z	320	DU9RG	316	K8NWD	312	OA4ED	308	I3OBO	301	KB3KV	295	N9CPW	285	I8IYW	276
VE7WJ	322	KB8DB	320	OE2EGL	316	KC4MJ	312	K4LR	308	K9UAA	301	I0SGF	295	K9MNT	285	XE1DU	276
W9SS	322	WA4IUM	320	9H4G	316	F2MO	311	K4JLD	308	KP4EQF	301	KB0G	295	KB5RF	284	G4NXG/M	276
WB4UBD	322	WB3DNA	320	VE2PJ	316	W0SD	311	YV2EJU	308	N5FW	301	EA4AK	295	KF5AR	284	N7ASL	275
VE2WY	322	KB5FU	320	WD8PUG	316	K9RF	311	VK4VC	307	IK8GCS	301	W0IYR	294	IK8BMW	284	WA4OPW	275
K6YRA	322	OZ3SK	319	W6NLG	316	K9HDZ	311	N6AV	307	VE6PW	301	KK0C	294	G4SZD	284	KC2RS	275
W4NKI	322	K9IW	319	K9PYD	316	LA7JO	311	AI8M	307	IK7DBB	301	G3XTT	294	NZ7D	284	NO4J	275
N4MM	322	IT9TQH	319	K4XO	315	LU3YL	311	KC2FC	307	WB4TGB	301	VE3XO	294	KC7EM	283	KA5YCM	275
WA3HUP	322	K1UO	319	AI8S	315	N6OC	311	I0MBX	307	VE3FJE	300	I7UNX	294	KR9F	283	KI4FW	275
YV5AIP	322	W2CC	319	WB1DQC	315	NA5W	311	KV2S	306	WB4NDX	300	K3NEE	294	WB3HAZ	282	NX4Y	275
I0ZV	321	VK4LC	319	WZ4I	315	W8ILC/QRPP	311	VK3JF	306	YU2TW	300	W8URM	294	VE3MV	282	WA4PGM	275
I8YRK	321	KB4HU	319	KE4HX	315	I2MQP	311	VE4SK	306	N4CRU	300	I5BD	293	ZP5JCY	282	KE5PO	275
K9BWO	321	XE1CI	319	XE1AE	315	NN4Q	311	WA2MID	306	KZ0C	300	WB3CQN	293	I8DVJ	282	KM5R	275
K6JG	321	I8KCI	319	KA3HXO	315	IK2GNW	311	XE1MDX	306	N8BKF	300	KB8O	293	YB3CEV	282		
N7RO	321	I4ZSQ	318	KB2HK	315	SM6CST	311	WB5TED	306	WT4T	300	VE5FX	293	WA9BXB	282		
ON5KL	321	W2FXA	318	I8KDB	314	AA4AH	311										

DXCC record will also be entered into the computer. The League expects to put more than 3,000,000 DXCC credits into their computer database over the next year.

The other change in DXCC processing is the establishment of field checking of initial DXCC applications. The full details on the process, and on how to apply to be a DXCC field checker, are in the September issue of QST.

A final note: The actual DX Advisory Committee (DXAC) vote on adding the

Penguin Islands to the DXCC countries list was not 9 to 7 as mentioned in this column two months ago. There were two abstentions, so the vote count was 9 in favor of adding the Penguin Islands to the list, and 5 against. According to DXAC procedures, abstentions are not counted as votes.

DX Club News

The Northern California DX Foundation (NCDXF) has elected its directors and of-

ficers for the 1991 - 92 term. Re-elected as directors are Lou Beudet, K6TMB, Howard Brainen, WZ6Z, Bruce Butler, W6OSP, Josephine Clark, WB6ZUC, Eric Edberg, W6DU, Kip Edwards, W6SZN, Rusty Epps, W6OAT, Stan Kiesel, K6UD, Dave Leeson, W6QHS, Rich Stempien, WA9WYB, and Steve Thomas, N6ST. New NCDXF officers are: W6DU President; K6TMB Vice-President, W6OSP Treasurer, W6ISQ Corresponding Secretary, and K6UD Recording Secretary.

The Northern Ohio DX Association has

QSL Information

1A8KM to 1Q1J	C38EFA to DL8OBC	JW8GB to WB42BI	UF7WR to UF6FAL	ZP6CW to ZP6XDW	P-9400 Porto Santo Madeira Isl., Portugal
1Z9B to KA6V	C38EHA to DL2MEH	JX3EX to LA3EX	UH8EA to W5BWA	ZW7AB to PS7AB	ES1WW to Box 1649, Tallin, Estonia
3D2CA to I4ALU	C38ENA to DH1OAH	KH3/KB6VUP to KB6VUP	UL8AWL to UL7ACI	ZW8AM to PS8AK	ES2WX to Box 13, Viimsi 203006 Estonia
3V8RL to DL6RL	C38EUA to HB9MM	LY9IBM to LY3BM	UR7G to RB7GG	ZZ2XX to PP5AS	F05KF to G. Leroi, Box 3, Raiatea Isl, French Polynesia
3W4DK to UA3DK	C31LL to C31LLB	OK3CLA/5NB to OK3LZ	UR8G to RB0GG	3D2ER to Box 184, Suva	F05NK to A. Salic, Box 5006, Pirae, French Polynesia
3X1AU to ON6BV	C53GB to FD1MXH	OY1R to W2KF	UY7U to RT4UF	4K1J to P.O. Box 496, Leningrad 196244 USSR	GM3POI to "Clide," P.O. Box 20, Orkney Islands, U.K.
4B2SOL to XE2JNE	CEBZZZ to CE3BFZ	OY2VO to OZ9DP	UY8U to RB5UU	4S7EF to E. Edrissinghe, 21 Inilum Rd., Dehiwela, Sri Lanka	HK8NAF to Box 111, San Andres
4F3BAA to NR8Y	C06CG to HK5LEX	P29BT to N5FTR	UZ8QXY/4K4 to UA0KCL	4S7WP to Box 80, Colombo	HK8PPY to Box 537, San Andres Isl., Colombia
4K1A to UZ1PWA	CR5A to CT1AHU	P29DX to G3LOP	UZ2FWA to UA2FM	4Z9N to Box 4099, Tel Aviv 61040 Israel	JY5CI to R. Firmawi, Box 616, Amman, Jordan
4K1ADQ to UA1ADQ	CR7DQI to CT1QI	P29OK to KE4EW	UZ3AYR to WB2RAJ	4Z9N to Box 4099, Tel Aviv 61040 Israel	JY9SR to Box 354, Amman, Jordan
4K1AFM to UA1AFM	D2ACA to L22DF	P29PL to VK9NS	V27T to YU1RL	5N8BRC to Box 509, Kano, Nigeria	KH3AE to Box 764, APO San Francisco, CA 96305
4K1B to UV6AAP	DL1SCQ/TF4 to DL6DK	PJ2/AA6TT to AA6TT	V31LY to VE6LU	5U7AS to A. Saley, Box 133, Niamey, Niger	KH4AF to Box 43, FPO San Francisco, CA 96614
4K2BDU to UA9MA	EA8/DL2DBU to DL2DCC	PJ4/WG3I to WG3I	V47RF to WA2SPL	6W2QF to Box 396, Ziguinchor	OD5ZZ to Box 782, Tripoli, Lebanon
4K2OIL to UA9MA	EA8/DL2DBU to DL2DCC	PY8SR to PP5JD	V51GB to ZS3GB	7P8DX to E. Douglass, Box 1570, Maseru 100 Lesotho	P29KH to Box 997, Madang, Papua New Guinea
4K2PGO to RA9LA	ED21ZD to EA2LZ	PZ5C to WN5C	V51JM to NK2T	7X2DG to D. Goumiri, Box 2, Arger, Algeria	PJ8AD to W. Fageol, Box 518, Saba, The Netherlands
4K4/UA9KW to UA9KI	EJ7FRL to EI2BB	R428A to UA4AM	V73AT to K2CL	7X2LZ to Box 2, Bouderbala	RD8580YL to Box 594, Baku
4K4I to UY5XE	EK1NWB to UA1NRU	R7BG to UL7BJ	VK8KC to VK4BB	9J2CP to C. Cotton, Box 21991, Kitwe, Zambia	TA8C to Box 13, TR-27002 Gaziantep Turkey
4K4POL to UA0KCL	EK25ORA to UA9OBA	R9FE to UA9FAR	VK9LM to DJ5CQ	A22AA to C. Lewis, Box 38, Selebi-Phikwe, Botswana	TF3DX to V. Kjartansson, Box 1522, Belize City, Belize
4K4QD/UN8 to RA1QQ	EK9Z to UA9YAB	RABAL to W3HCW	VO58AA to VO2AA	A35KB to K. Burke, Box 1, Nuku'Alofa, Tonga	UD858AI to Box 73, Baku 370092
K5ZI to K4RKI	EL2UN to HB9AUZ	RB3JA to UB4JJR	VP2EI to KD6WW	A41KN to A. Kalsi, Box 826, Muscat, Oman	UF6FIM to Box 21, Tbilisi 380002
4L1NV to UA1NCI	E08M to UM8MDX	RF6FP to UF6DZ	VP2EST to KT8Y	A71CD to Box 80074, Alkawkar, Qatar	V51KC to C. Anderson, Box 1232, Swakopmund 9180 Namibia
S7CF to 9V1JY	EP2VV to UW9LA	RH8E to W5BWA	VP2EXX to KC8JE	BY1QH to Box 2654, Beijing, China	V51P to Box 9080, Windhuk, Namibia
4U1UN to NA2K	ES7R/8 to ES7FU	RH8Y to UH8AE	VP2MAO to W5NO	BY3AA to P.O. Box 7, Tainljin, China	V85FC to Box 1311, BSB 1913 Brunei
4X/YU3PR to YU3PR	ET2A to F6HIZ	RI10A to KB8RJ	VP2MLD to KC4DWI	BZ4DFJ to Box 08/205, Shanghai, China	VQ9TB to Box 55, FPO San Francisco, CA 96685
5B4ADA (non-USA) to YU4YA	EX1FAL to UF6FAL	RJ1J to UJ8JMM	VP2VM to KU2Q	C21DX to Box 225, Nauru	YL91IFF to Box 50, Riga
5B4ADA (USA) to K2VHW	EX7F to UF6FFF	RW9H/UL7PJH to RL7PEO	VP5VDI to K1RIF	C21JM to J. Motiti, Box 359, Nauru	ZB2AZ to T. Kelly, 78 Alameda House, Gibraltar
5R8AL to F6HUJ	FJ/FG5ED to FG5ED	RY1R to UB4RWW	VP5VDR to N6ZJM	C6ADC to L. Scott, Cay Haven Man O War Cay, Abaco, Bahamas Island	ZC4MT to Box 413, Lanarca, Cyprus
5V8/OZ1LGF to OZ1LGF	FK8FI to F6GZA	RY1U to UT4UXW	VP5VPX to W4NPX	C6AFW to P.O. Box N-1316, Nassau, Bahamas	ZP8Y to L. Kemper, Box 416, Ascuncion, Paraguay
5W1CW to ZL1AMO	FMSFE to FD1HVT	S2NQ to W4FRU	VP8CEM to CE3ABW	C91TDM to Box 25 Maputo, Mozambique	ZS9S to Box 2480, Walvis Bay, RSA
5W1IU to JA1WHG	FM5WE to W4FRU	S79QZ to DJ0QZ	VP8CFM to GM4KLO		
5Z4BH to KE3A	FN9R to F9RM	S02PBA/P to LA4DCA	VP8CFQ to DK6AO		
5Z4FO to KB4EYK	F08IGS to F6EEM	ST8DX to WA2NHA	VP8GAV to GM0LVI		
6V1A to 6W Bureau	FP14DX to FP5DX	SU1HV to IS0LYN	VP9/WA9AEB to WA9AED		
7Q7JH to K7UP	FR5AI/T to FR5AI	SV8DV/9 to WB4TDB	VP9HE to KD8IW		
7Q7MS to FD1LRQ	FR5FA to F6DGT	SV8HV/9 to KA5EJX	VP9MN to WB2YOH		
7Q7TA to JH10GC	FT4WC to F6GVH	SV1AEU/5 to 5V1AEU	VQ9FM to ND1V		
7X2CR to IS0LYN	FT4YD to FD1NZO	SV8/OZ1LGF to OZ1LGF	VQ9KA to KD7OD		
7Z1AB to WB2QMP	FW/AA7AF to WA6ZEF	T28AA to N4FJL	VQ9RR to N3GQK		
9J2WS to 9L2WS	FY5YE to W5JLU	T31AF to DL2MDZ	VQ9WM to K7IOO		
9K/N6BFM to W8CNL	GB4JUL to RSGB	T3Z2 to N7YL	VU2LE to K6JG		
9K2JH to KE4JG	GH4WKS to G0GNF	T6AS to IT9AZS	VU2MS to W8XM		
9K2MC to AB4WG	GW80NY to GW4WJO	T18SUN to T14SU	XF8C to XE1BEF		
9K2SH to OE6EEG	H44SX to G3SXW	TJ1CW to F6EEM	XT2BW to WB2YQH		
9L1US to WA8JOC	HBB/DL2YEF/P to DL2YEF	TJ1FN to I2RRI	XU1NQ to OR1NQ		
9L3BM to VE3KKU	HF8POL to SP3HLM	TK8KP to FD1JMH	XV5KA to JA1AH		
9M2HB to AA6BB	HH2CL to F6AXY	TK5CW to TK0KP	Y8SOP to Y66ZA		
9M2NA to VE3CHZ	HK8EOP to HK0NZY	TR8GL to F6IXI	YJ8RN to N9DRU		
9M6GB to DJ1UJ	HP1XTP to AE3Y	TR8JH to W3HCW	YS1DRF to W2PD		
9M6UY to DK7UY	HP6CWB to N4YWY	TY2LS to IK8DOI	Z08VJ to G4ZVJ		
9M8AX to 9M2AX	HR1LW to JA1LW	UABHAE/UABK to UB4MM	Z08WD to G4RWD		
9M8GB to DJ1UY	HS8AC to KM1R	UA1N/UV3VJ to UZ3VXV	ZF2AH to WA6VNR		
9M8WB to DK7UY	HZ1AB to K8PYD	UA9F/NN7A to NN7A	ZF2QJ to WA1IML		
9U5QL to YASME	IE9/I1SNW to I1SNW	UD6DRW to W3HNC	ZF2QM to W6OSP		
9VIXQ to K2QBV	IG9/IT9FTP to IT9VQC	UF6FWR to UF6DG	ZF2QO to JA7XBG		
9X5HG to DJ3FW	IS/IBER to IQER	UF7FWR to UF6FAL	ZK1CQ to A4AMO		
A35CA to I4ALU	J28FO to F6FNU	UF7FWW to UF6FFF	ZK1CQ to ZL1AMO		
BV2BV to WU6X	J6LSS to J6LQC	UF7FXA to UA3TT	ZL9DX to JH4RHF		
BV2FB to AA6BB	J73A to N6CW				

elected new officers for the 1991-92 term. They are: Tedd Migliotta, KB8NW President; Dwaine Modock, WA8MEM Vice-President; Ron Regal, W8GMH Secretary; and Mary Michaelis, N8DMM Treasurer.

The Anguilla Amateur Radio Society has also elected new officers. They are: Dave Mann, VP2EHF President; Dorothea Mann, VP2EE Secretary; Jim Hendricks, VP2EJH Treasurer; Larry Stott, VP2EL Social Secretary; and John Rouse, VP2EBN/KA3DBN US Liaison. Anguilla amateurs can sign VP25E instead of VP2E through May of 1992 to commemorate the 25th anniversary of the separation of Anguilla from Nevis/St. Kitts. A certificate will be available for \$5 for working a commemorative callsign. The proceeds from these certificates will be used to refurbish the Boy Scout/Girl Guide station VP2EQ on Anguilla.

Finally, new officers of the Liga Colombiana de Radioaficionados (LCRA) are:

Jose Miguel Reynoso Martinez, HK5DRQ President; Alberto Villegas Botero, HK4FZ Vice-President; and Alberto Cardona Ramirez, HK3MNR.

DX Events

Several US amateurs are traveling to Southeast Asia this month to stage the first American-Vietnamese DXpedition. Team members Paul Scipione, AA2AV, Dennis Vernacchia, N6KI, Dennis Kopecky, WJ2R, Terry Dubson, W6MKB, John Fenoglio, AB6BH, and Mike Castellano, KM1R, will operate on all bands for about 10 days. The group has help from ICOM America in the form of a pair of IC-751As and 2KL linear amplifiers, but could use additional support. If you can help, send your contribution to the group at Box 875, Rahway, NJ 07065, or include a little extra with your QSL card. Callsign and QSL route will be announced later.

Another group looking for help with DXpedition expenses is the Soviet Snake Island crew. Snake Island in the Black Sea is Russian territory, but separated from Russia by the Ukraine. With the possible official separation of the Ukraine from the Soviet Union (USSR), Snake Island might count as a new DXCC country, by virtue of DXCC country criterion Point 3. In fact, since the Ukraine is the only Soviet Republic that is a member nation of the United Nations, Snake Island has a chance of separate DXCC status even if the Ukraine is not recognized as an independent country. In any case, the 4Z5ZI crew wants to return to the island for the CQ WW SSB and CW Contests this year, but needs help with expenses to get to the island. Anyone wishing to help should send their contribution to Paul Soeldner, DJ1MH, Schlecker Weg 4, D-4175 Wachtendonk, Germany.

As should be expected at this time of year, several DXers are traveling to inter-



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17" x 12".....	\$4.00
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1000's Meters, Transformers, Tubes.....	Call
100 MFD/450 VDC.....	\$4.00
60 MFD/450 VDC.....	\$3.00
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Penta 6146B.....	\$12.00
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Jean-Jacques Roche, F6BFI, lives in the birthplace of the Montgolfier brothers, who made the first hot-air balloon ascent in 1783, which his QSL card reflects.

esting countries for the CQ WW CW Contest at the end of November. Brian Coyne, G4ODV, will be touring West Africa beginning November 14. He'll start as C56/G4ODV from the Gambia for a week, and then go to 6W6JX's QTH for the contest. He'll probably try for a 15 meter monoband entry. He has asked for a call-sign ending in DV or ODV, but hasn't heard back from Senegal yet. After the

CQ DX Awards Program

SSB

1893 I0KHP 1896 KB7IVU
1894 A92BE 1897 7J1AAL
1895 JE6LDS

CW

832 N3DQN 834 N0WM
833 I0KHP

RTTY

7 W2ZZ 8 W4EEU

SSB Endorsements

320 DJ9ZB/323	310 W5LLU/310
320 VE3XN/323	300 K4JLD/308
320 F9RM/323	300 VE3DLR/305
320 K6YRA/322	300 VE2GHZ/301
320 WB4UBD/322	300 WB4TGB/301
320 N4MM/322	275 RA3YA/299
320 YV5AIP/322	275 4X4JO/281
320 WA3HUP/322	275 KM5R/275
320 K3UA/321	250 I0KHP/251
320 N2KW/321	150 KB7IVU/181
320 WB3DNA/320	28 MHz A92BE
310 A92BE/314	28 MHz JE6LDS
310 KC4MJ/312	28 MHz KB7IVU
310 IK1GPG/310	3.5/7 MHz A92BE

CW Endorsements

320 K6LEB/323	300 N7RO/307
320 ON4QX/323	300 DJ2PJ/306
320 W6PT/321	300 N0AMI/306
320 N4MM/321	275 K4JLD/292
310 DL3RK/319	275 KA7T/284
310 N2KW/319	275 N3DQN/280
310 K3UA/318	200 WB4UBD/203
310 W0HZ/316	

RTTY Endorsement

200 WB4UBD/204

Total number of active countries is 323. A new CQ DX RTTY award is now available. 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.

contest he will try to operate from Guinea-Bissau J5 for a couple of weeks, before returning to the UK on December 12. Brian is a CW op and can usually be found on 3508, 7003, or 15 or 25 kHz up on the higher bands, often listening up 2-3 kHz. QSL to his home address, or direct to Box 100 Truro, Cornwall, England. Please include a self-addressed envelope and 2 IRCs or US\$1 per call-sign. Any number of contacts for one call-sign per request, but please don't mix different call-signs in the same envelope, as the QSLing will be handled by different people. Putting the requested call-sign on the outer envelope will help.

Another Brit on the road for the CW contest is Steven Muster, G4UOL, who will be active as GD4UOL from the Isle of Man again this year. Try 12 kHz up on any band, including the new bands (30, 17, and 12 meters), November 15-29. QSL to Steve's home address: Flat 4, 60 Genesta Road, West Cliff on Sea, Essex SS0 8DB, England.

Also on the road will be Andy, G4ZVJ. During the last three months of 1991 Andy expects to operate from Fiji as 3D2VJ, Tonga as A35VJ, Western Samoa as 5W1JV, American Samoa as KH8/G4VZJ, and perhaps other spots in the region. He'd appreciate a little extra with your QSL cards to cover some of the expenses of the trip.

Some of the special event stations that are scheduled to be active this month include AZ1DSR, GB50ATC, and GB6SA. AZ1DSR will be on November 10-14 from Jabali Island. Try 10 kHz up on CW, and 3690, 7090, 14190, 21290, and 28590 kHz on SSB. GB50ATC will be on Nov. 20-23 celebrating the 50th anniversary of the British Air Training Corps. Try 3710, 7045, and 14290 kHz. QSL via the bureau or direct to G4PSH. And GB6SA will be on November 30 from the Summerlee Museum in Scotland, celebrating International St. Andrew's Day. Other special event stations from Russia and Greece will also celebrate the day.

QSL Notes

Charlie Carpenter, **ex-KA2CC**, says he is still getting QSL cards addressed to his former, Japan, address. For a faster response, try his new address: 1423 Juniper Dr., Alamogordo, NM 88310.

IK6FHG says that QSL cards for his **HV0HH** Holy House contacts should be sent to him via his *Callbook* address, or to Box 40, 61100 Pesaro, Italy. (Soviet amateurs can get their cards via UW3LZ.)

Mike Castellano, KM1R, can answer North American QSL cards for **HS0AC**, for contacts after July 1, 1991. His address is 631 Great Hill Road, Guilford, CT 06437.

Mark Kawasaki, JJ1TBB, says he can answer QSL requests for **XV2A** for June

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811A tubes resist premature failure in two ways.

First, they're constructed with widely spaced elements that minimize the chance of elements touching and causing a short -- even if the plate gets hot enough to melt.

Second, they use a directly heated thoriated tungsten filament cathode that prevents the electron emitting layer from instantly stripping off -- even if mistuning causes a sudden, severe current overload.

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The Ameritron advantage: extra heavy duty power supply that gives you peak performance year after year

The heart of the AL-811 power supply is



its heavy duty power transformer with a high silicone steel core weighing a hefty 17 pounds.

A full wave bridge using 52.5 ufd of total capacitance (four 210 ufd, 470 volt capacitors) produces 1500 volts under full load and 1700 volts no load. That's excellent high voltage regulation!

Full height computer grade filter capacitors with screw terminals are used -- not short stubby, light duty soldered-in "high technology" capacitors that can't dissipate the heat generated by high current.

The rectifier diodes are rated for a massive surge current of 200 amps. They won't blow even if you accidentally short the high voltage supply.

Wire wound, 7 watt, 50 K ohm equalizing resistors safely protect each filter capacitor -- not 2 watt, 100 K ohm carbon composition resistors that can open and cause your filter capacitors to explode or fail.

The Ameritron AL-811 power supply is built tough so you get peak performance year after year.

Tuned input provides excellent load for any rig

A Pi-Network tuned input provides a 50 ohm load for your rig. Even fussy solid state rigs can deliver their full drive to AL-811.

Low loss slug tuned coils -- tunable from the rear panel -- let you optimize performance. High quality low drift silver mica capacitors maintain proper tuning.

Output tank: optimum Q on each band

The low loss pi-network output tank of the AL-811 has been carefully designed for optimum Q on each band and built with quality RF components.

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A ball bearing vernier reduction drive makes plate tuning precise and easy.

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9-17, 1991. This includes both his QSOs, and those made by Vietnamese amateurs. Outside of this time period, QSL XV2A to JA1AH. Marks address is 4-36-10, Kasuga, Nerima, Tokyo 176, Japan.

Jos, **YN1CC**, reminds DXers that the Nicaragua QSL bureau works only in the incoming direction, *not* outgoing. Also, **W3HMK** is *not* Jose's manager; QSL direct. Finally, his cards have been delayed at the printer due to lack of paper; please be patient.

Dr. Miklos Danko, **HA8XX**, reports that all direct and bureau requests for cards from his Pacific operations have been handled. If any DXer has not received the requested card, try again to Dr. Danko at

P.O. Box 127, H-6201 Kiskoros, Hungary. Calls used were **ZK1XX**, **ZK1XL**, **ZL0ADN/ZL7**, **ZL0AAD/ZL7**, **ZK2XA**, and **ZK2XB**.

The **ZS9A/ZS1** Penguin Island QSL cards will all be out by mid-August.

Patrick Bittiger, **F2DX**, is back in France after two years of operating as **FP5DX**. However, his **F2DX** address is *not* current. To confirm **FP5DX**, or the **CY9DX** St. Paul Island DXpedition, write to him at his **FP5DX** address. His mail will be forwarded to France: Box 4204, St. Pierre & Miquelon, via Canada.

Tom Bridges, **EL/W7LN**, is back from Liberia and can confirm his contacts via his new address: 3109 Chesapeake Dr.

#201, Dumfries, VA 22026.

The May St. Peter and St. Paul Rocks **PY0SK/PY01SR** operation made 20,348 contacts, mostly SSB. Cards received with US\$1 or two IRCs will be answered via the bureau, as that amount doesn't cover the present US\$1.46 airmail postage outside of Brazil. QSL via **PS7KM**.

The **OG-M** callsigns active in April and May promoted the Conference on Disaster Communication in Tampere, Finland. QSL **OG1M**, **OG2M**, etc., to Seppo Sisat, **OH3MMM**, Lansirinteenkatu 23, 33400 Tampere, Finland.

Corrections, Amplifications, And Not Managers

TJ1CR QSLs via **F6AXD**, not **TY1CR**, as typed previously.

W3HMK reports getting lots of cards for **V31AD**, but Joe is *not* the manager. QSL direct to Thomas Lacey, Corozal Town, Belize.

Likewise, **W7HPI** reports getting cards for **TI2LAK/KP4**. These should go direct to Luis at Box 71690, San Jose, Costa Rica.

The manager for **LX2PA** is **PA3DKC**, not **PA3DK**.

Ekendra Edrininghe, **4S7EF**, says his manager is *not* **N1HBF**. QSL via is *Callbook* address, or c/o Hayleys Ltd., Box 70, Colombo 10, Sri Lanka.

Anyone who worked a weak **A71KP** (?) in December should request a **A41KP** QSL card from **DL7FT**. Frank says to include "a few US\$1."

QSL cards for **WN4KKN/ZP5** should go to **AA5BT**, who promises an "immediate" reply.

And Hartmut Gumpert, **9X5HG**, reports that since the revaluation of the currency in Rwanda, it is no longer necessary to send more than US\$1 for a airmail envelope return. US\$1 or 2 IRCs are sufficient. His address is B.P. 420, Kigali, Rwanda.

USSR QSL News

RY1U is the 1991 contest call of club station **UT4UXW**; QSL via the regular club call, or via **J. N. Onipko, UT4UZ**. He also has logs and cards for **EO6AAS**, **ER5U**, **EM5T**, **EU5T**, **EW5T**, **RK5O**, **RT1U**, and **RT7U**. His address is P.O. Box 785/1, Kiev-58, USSR.

RT5UY/D2 and **UT4UM/D2** cards should be sent to the same address as cards for the main operation of **D2ACA**: **LZ2DF**. A pirate signed **UT4UM/D2** at times, and may have signed other cards.

QSL **4K2DX**, **4K3DX**, and **4K4DX** direct only to Mrs. A. Dimde, P. Kaste 18, Riga 226048, Republic of Latvia, Europe.

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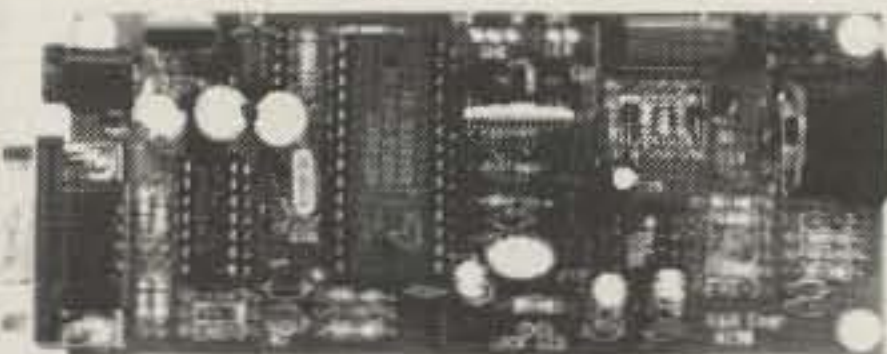
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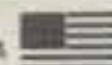
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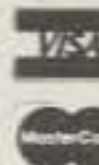
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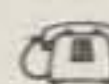
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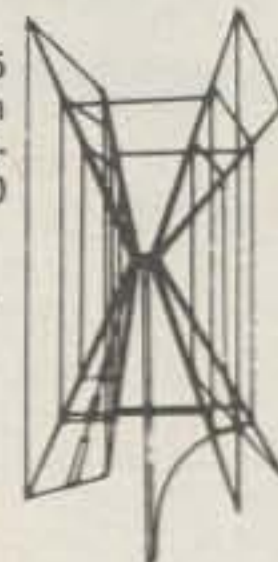
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CIRCLE 69 ON READER SERVICE CARD

THE SCIENCE OF PREDICTING RADIO CONDITIONS

CW Contest Weekend Special

Bulletin

Since this issue of *CQ* should reach most subscribers prior to the start of the CQ World-Wide DX SSB Contest weekend of October 26-27, here is an updated forecast made at press time for the general propagation conditions expected during the SSB contest weekend. It now appears that there is a 33% chance that conditions at the beginning of the contest may be Below Normal, but chances are very good that they should improve to Low Normal later in the day. I am calling for generally fair conditions on Saturday, with some periods that may be poor, and other times when good openings should be possible to most areas of the world. Conditions look much better for Sunday, October 27th. High Normal conditions are expected to most areas of the world, with good openings on most bands. All in all it looks like quite a good weekend coming up for the SSB contest period.

The initial forecast for the CW contest weekend of November 23-24 looks great. High Normal conditions are expected for the entire period, with generally good conditions to all areas of the world. The CW weekend could be another record breaker!

A fine-tuned update for the CW contest weekend will appear as a bulletin in next month's column.

The CW weekend for the CQ World-Wide DX Contest is November 23 and 24. 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. Sample operating schedules derived from these predictions appear in Tables I and II.

This year's contest is being held during a period of continuing very high solar activity. The Royal Observatory of Belgium reports a monthly mean count of 176 for August 1991. This results in a 12-month running smoothed sunspot number, upon

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LAST MINUTE FORECAST

Day-to-Day Conditions Expected for November 1991

Propagation Index	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 12-13, 15, 27	A	A	B	C
High Normal: 3, 7, 14, 18, 23-24, 26, 30	A	B	C	C-D
Low Normal: 4-6, 10-11, 16-17, 19, 22	B	C	D	D-E
Below Normal: 1-2, 8, 20-21, 25, 29	C	C-D	D-E	E
Disturbed: 9, 28	C-D	D	E	E

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

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

C—Fair opening, signals between moderately strong and weak, varying between 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.
3 dB 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 fair-to-poor (C-D) on November 1 and 2; good (B) on the 3rd; fair-to-good (C-B) on the 4th, 5th, and 6th; good (B) on the 7th; etc.

which the sunspot cycle is based, of 147 centered on February 1991. The corresponding smoothed level of 10.7 cm solar flux was 206, as reported by a new Canadian Observatory located at Penticton, B.C.

Solar activity in the mid 130s or higher is expected during the 1991 WW Contest weekends, with an expected 10.7 cm solar flux level in the low 200 range.

This means that solar activity during this year's contest will not be significantly lower than the 141 level that occurred last year. The potential is there for another great CW contest weekend, as long as a surprise radio storm does not occur.

Computer Program

Last month's column contained a listing of seven computer programs which contain propagation and other information that could be useful during a WW DX Con-

test. Another program has come to my attention which should be added to this list. This is the IONSOUND™ program developed by Jacob Handwerker, W1FM.

The program is intended for IBM PCs and compatibles, and it is a state-of-the-art software tool for predicting ionospheric openings to any part of the world (see Karl Thurber's "Antennas & Accessories" column in the September 1991 issue of *CQ* for a more complete review of this program). Additional data concerning the program can be obtained directly from Jacob Handwerker, W1FM, 17 Pine Knoll Road, Lexington, MA 02173.

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 towards 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 those on 80 meters, but signals will be weaker and noise levels higher.

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

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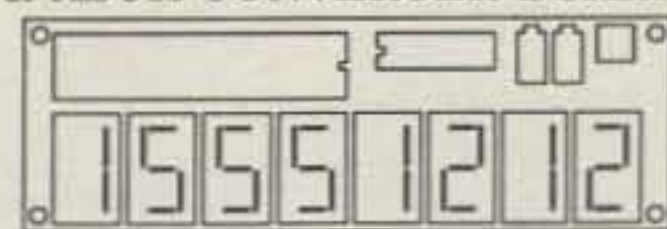
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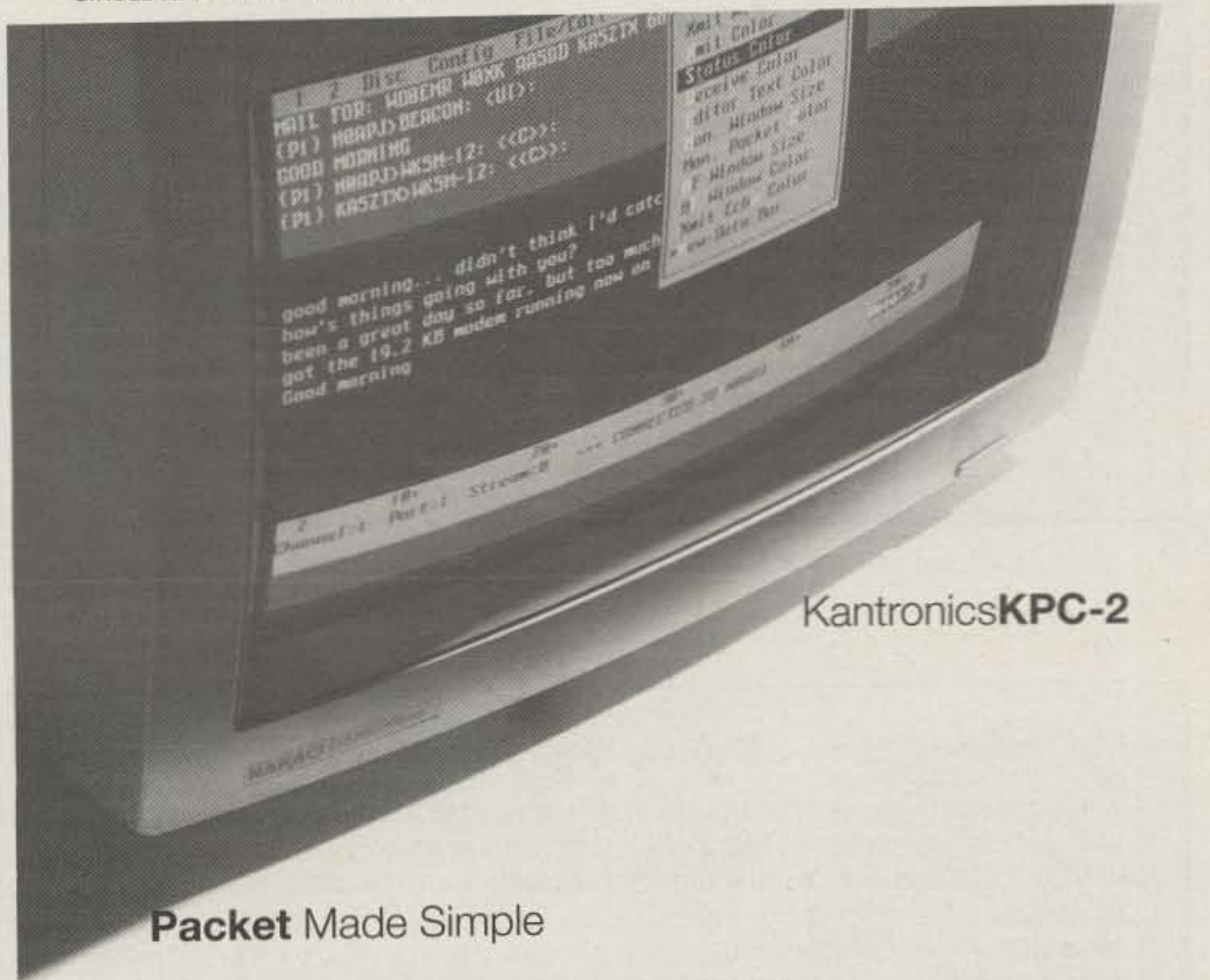


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CIRCLE 27 ON READER SERVICE CARD

Say You Saw It In CQ

HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Charts 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 charts. 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 parentheses () after the time of each predicted opening. In the Short-Skip Charts where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of days during the month on which the opening is expected to take place, as follows:

- (4) Opening should occur on more than 22 days
- (3) Opening should occur between 14 and 22 days
- (2) Opening should occur between 7 and 13 days
- (1) Opening should occur on less than 7 days

Refer to the Last Minute Forecast at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

3. Times shown in the charts are in the 24-hour system, where 00 is midnight, 12 is noon, 01 is 1 AM, 13 is 1 PM, etc. In the Short-Skip Charts 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 New York 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 PM, in Los Angeles; 17, or 5 PM, in Washington, DC; 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 PM, in New York City.

4. The Short-Skip Charts are based upon a transmitted power of 75 watts CW or 300 watts PEP on sideband. The Alaska and Hawaii charts are based upon a transmitter power of 250 watts CW or 1 KW PEP on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels the propagation index will increase by one level; for each 10 dB loss it will lower by one level.

5. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the US Dept. of Commerce, Boulder, Colorado 80302.

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.

Contest Work Plan

The accompanying sample work plan for the CW contest section is intended to maximize contacts with a minimum of wasted time. It is devised from the DX Propagation Charts which appeared in last month's column. The plan shows the times when propagation conditions are expected to be optimum to various DX

areas of the world (with a propagation index of 3 or higher) for each 3-hour period throughout the day. This particular example is for the 20 meter band and for locations in the Eastern Time Zone. Similar plans can be devised for other bands, for multi-band operation, and for other zones.

Sample Single Band Operating Plan 20 Meters Eastern Time Zone

Time (EST)	Areas to Which Optimum Openings Can Be Expected
00-03	Far East, South Pacific and New Zealand, Australasia, Antarctica, Caribbean, Central and South America, Africa
03-06	South Pacific and New Zealand, Australasia, South America
06-09	Europe, Central and South Asia, Southeast Asia, Far East, South Pacific and New Zealand, Australasia, Caribbean, Central and South America
09-12	Europe, Caribbean and Central America
12-15	Europe, Caribbean and Central America
15-18	Europe, Africa, Caribbean and Central America, Eastern Mediterranean and Middle East
18-21	Europe, Eastern Mediterranean and Middle East, Africa, Southeast Asia, Caribbean, Central and South America
21-00	Europe, Eastern Mediterranean and Middle East, Africa, Central and South Asia, South Pacific and New Zealand, Caribbean, Central and South America, Antarctica

Table II— Sample single band (20 meters) contest operating schedule, Eastern USA.

CQ Short-Skip Propagation Charts November & December 1991 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)	07-09 (0-2) 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)

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File...	Range...	Contest...	Log Views...	DXCC/AWARDS	View				
LOG LIST									
GMT			Seq	Name	DXCC	Ch			
09/19/91	11:29	0P61PH			ZL7	Ch			
09/24/91	19:04	1777			ZL8	Re			
09/24/91	23:52	U96V0			ZL9	Su			
09/25/91	08:21	081A			ZP	Pa			
09/27/91	00:20	0487		ALL	Z8	Se			
09/26/91	23:57	487M			Z83	Na			
09/27/91	03:23	KP2A/KP5			Z50	Pr			
09/29/91	03:02	KP2A/KP5			Z89	Wa			
Log Entry									
DATE/UTC	Award Type	Mode	140	80	40	20			
09/25/91	00:38:35	DXCC [ZC]	5	SSB					
Cell	Name	BST	Freq	QTH					
ZC4AB	Allen	57	21.250						
750	SSB	E	59	buro or zc4ba pg 27 in i					
Qth	Mde	Award ID	Comment						
Prefix	Country	Cont	Bearing	Distance					
ZC	Cyprus (Dr. bases)	AD	56 DEG	5166	[H]				

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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.

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 CQ World-Wide DX Contest, and be sure to let me know how these special contest propagation forecasts work out.

73, George, W3ASK

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 1991 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)	06-06 (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 1991 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.

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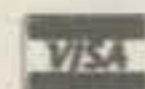
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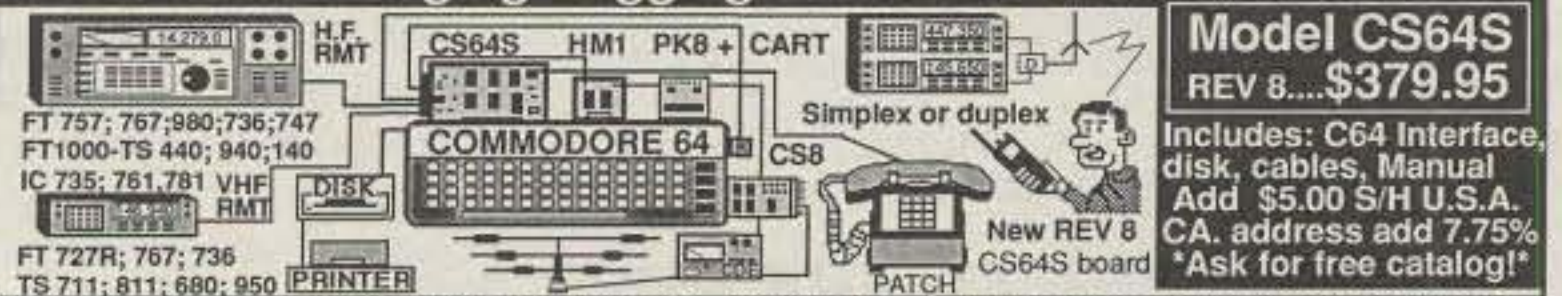
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ANNOUNCEMENTS

(from p. 8)

Bill Ferrell, N4SSB, 615-452-3962.

Nov. 9, **6.91 Friendly Fest**, Serb Hall, Milwaukee, Wisconsin. Contact The Milwaukee Repeater Club, P.O. Box 2123, Milwaukee, WI 53201 (414-444-4589). (Exams)

Nov. 10, **SCARA Indoor Ham Radio & Computer Fleamarket**, North Haven Park and Recreation Center, North Haven, Connecticut. Contact Scara Flea Market, P.O. Box 81, North Haven, CT 06473, or call Brad, WA1TAS, at 203-265-6478 (7-10 PM).

Nov. 10, **HAMEXPO**, Suffolk County Community College, LIE exit 62, Long Island, New York. Contact John Mark, KB2QQ, 516-689-6336. (VE exams)

Nov. 16, **Mayflower ARC Fleamarket**, Plymouth Memorial Hall Building, Plymouth Center, Massachusetts. Contact Jon, WS1K, 508-746-0162 (evenings).

Nov. 16, **Montgomery, Alabama Hamfest**, Garrett Coliseum, South Alabama State Fairgrounds, Montgomery, Alabama. Contact Phil, 205-272-7980 (after 5 PM CST, or weekends). (Exams at 8 AM)

Nov. 16-17, **19th Annual Fort Wayne, Indiana Hamfest**, Allen County War Memorial Coliseum Exposition Center, Fort Wayne, Indiana. Contact with

SASE ACARTS, P.O. Box 10342, Ft. Wayne, IN 46851 (219-484-3317 evenings). (Exams)

Nov. 17, **Chicago ARC Ham Auction**, DeVry Institute of Technology, Chicago, Illinois. Contact Chicago ARC, 5631 West Irving Park Rd., Chicago, IL 60634 (545-3622).

Nov. 23, **Socorro, New Mexico ARA Hamfest**, Finley Gymnasium, Socorro, NM. Contact Sid Ashmore, 609 Neel, Socorro, NM 87801 (505-835-0428). (Exams at 10 AM)

Nov. 23, **1991 Westshore Hamfest**, Holland Civic Center, Pine Ave. Contact Jack Tiggelman, KA8FQS, 2782 Floral Drive, Zeeland, Michigan 49464 (616-772-1846 from 5-10 PM Monday through Saturday).

Nov. 23-24, **Suncoast Convention 1991**, Expo Hall, Fairgrounds, Tampa, Florida. Contact R. D. Lee, WB4TEJ, Convention Chairman, P.O. Box 7931, Clearwater, FL 34618.

Nov. 30, **Superstition ARC Hamfest**, P&M Rodeo Grounds, Apache Junction, Arizona. Contact Chuck Kruppenbacher, KB7ICP, 602-986-3060.

Dec. 1, **Hazel Park, Michigan ARC Swap & Shop**, Hazel Park High School, Hazel Park, Michigan. Contact HPARC, P.O. Box 368, Hazel Park, MI 48030.

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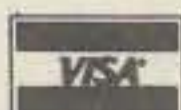
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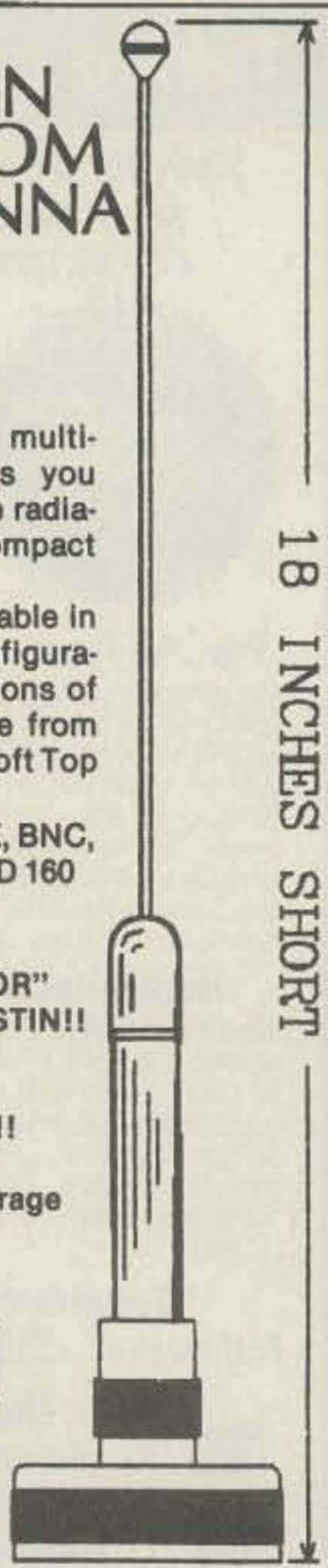
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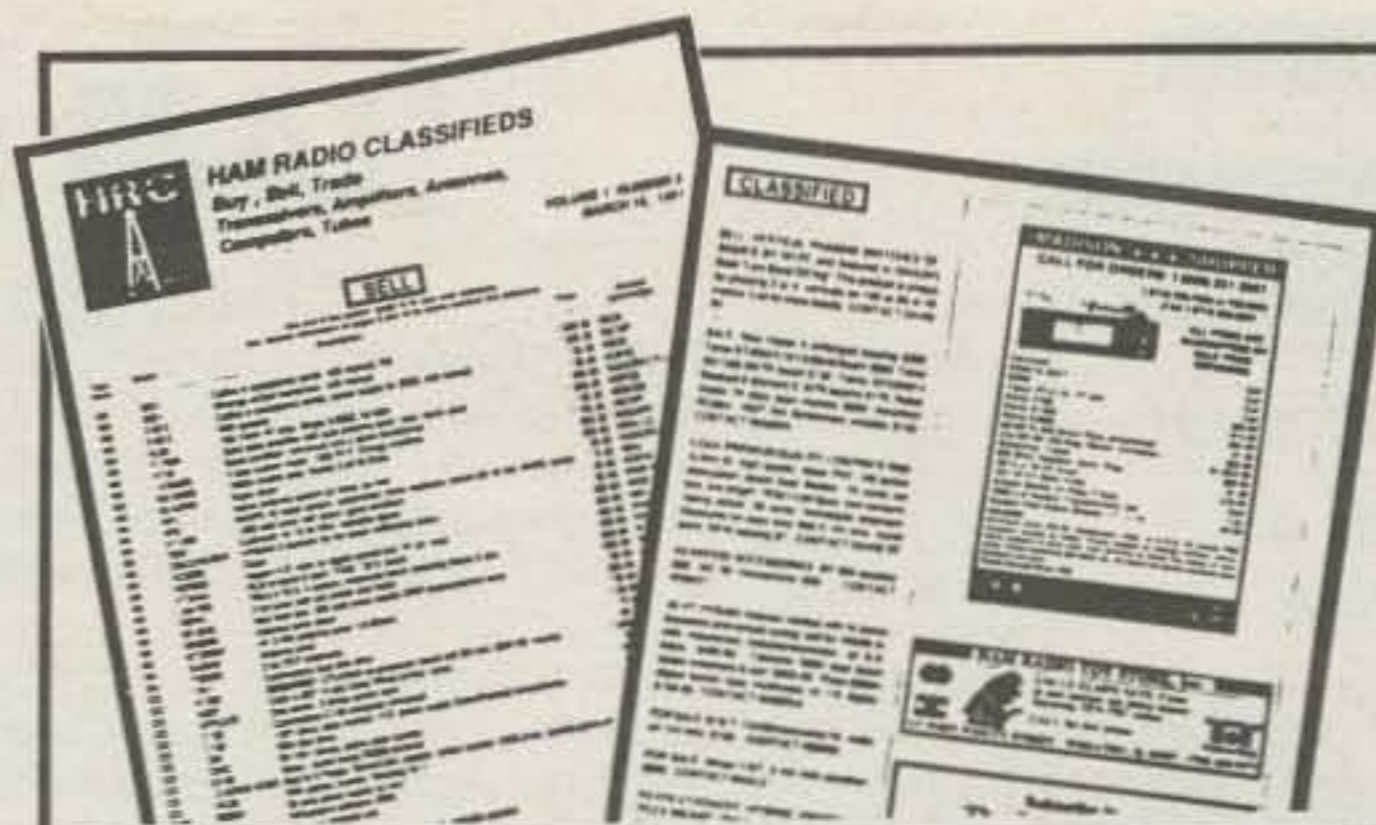
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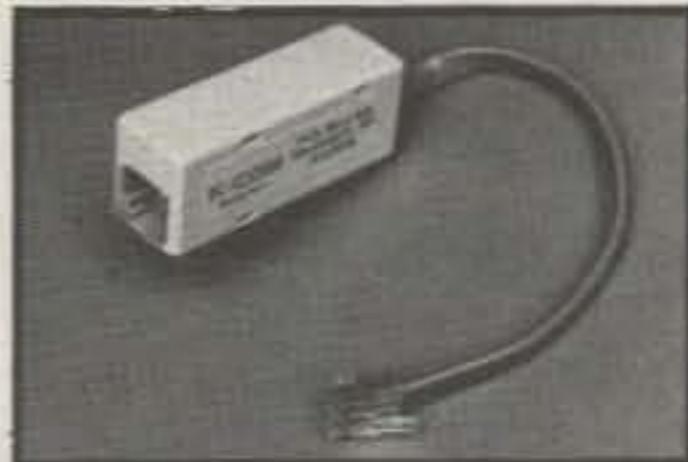
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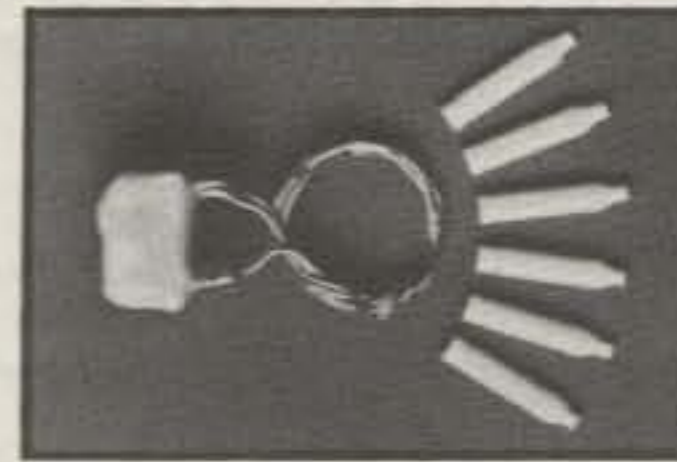
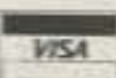
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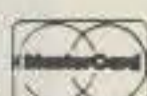
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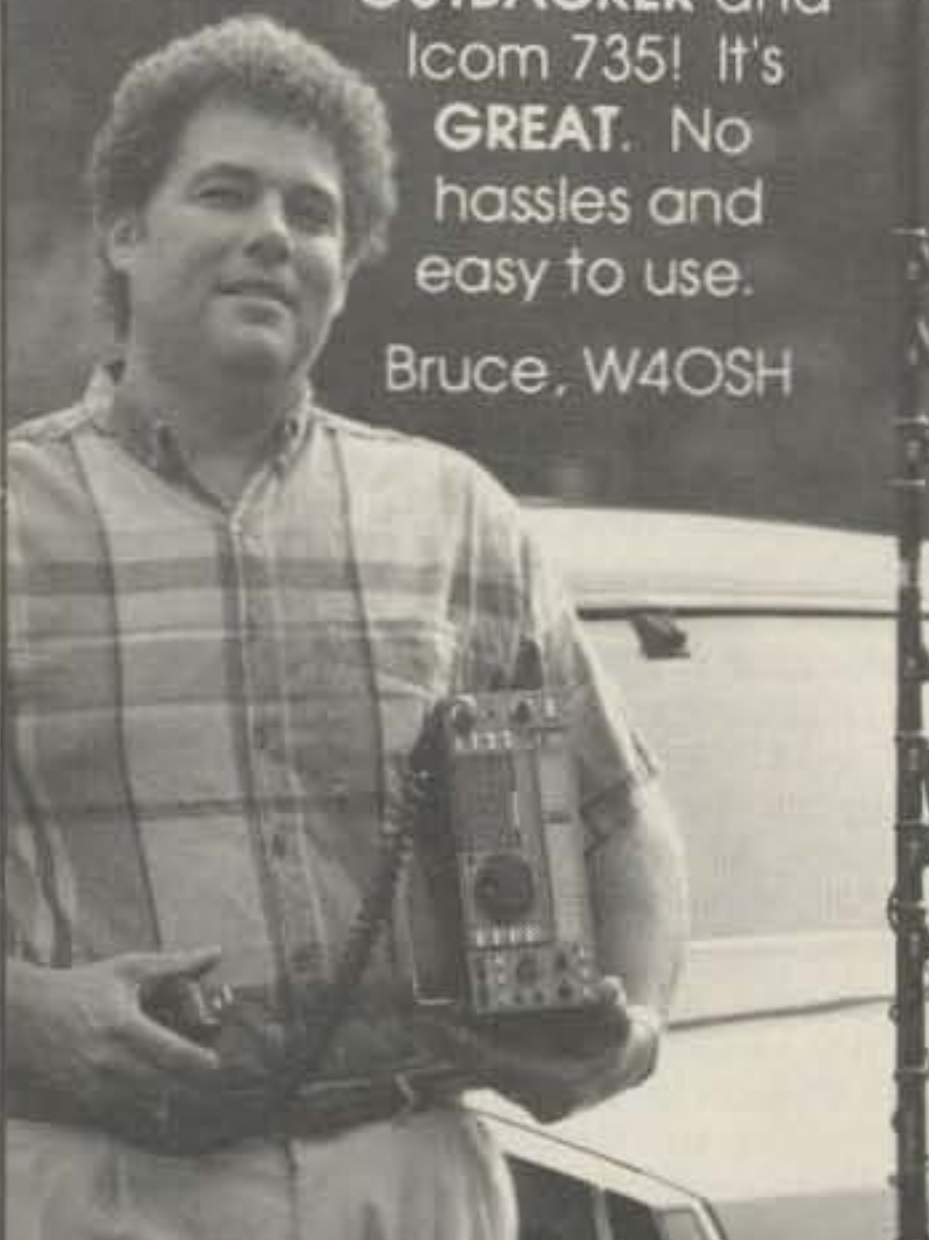
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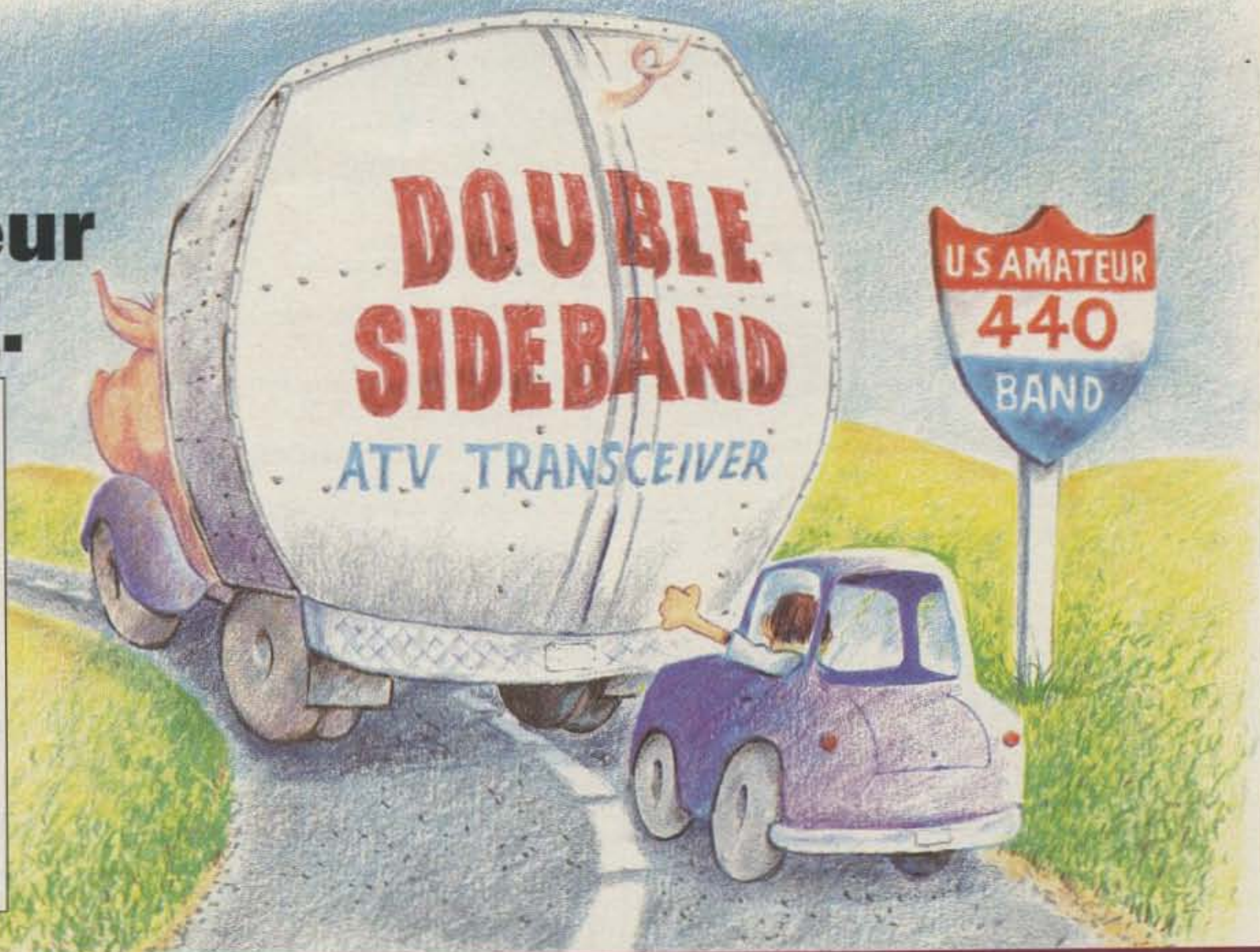
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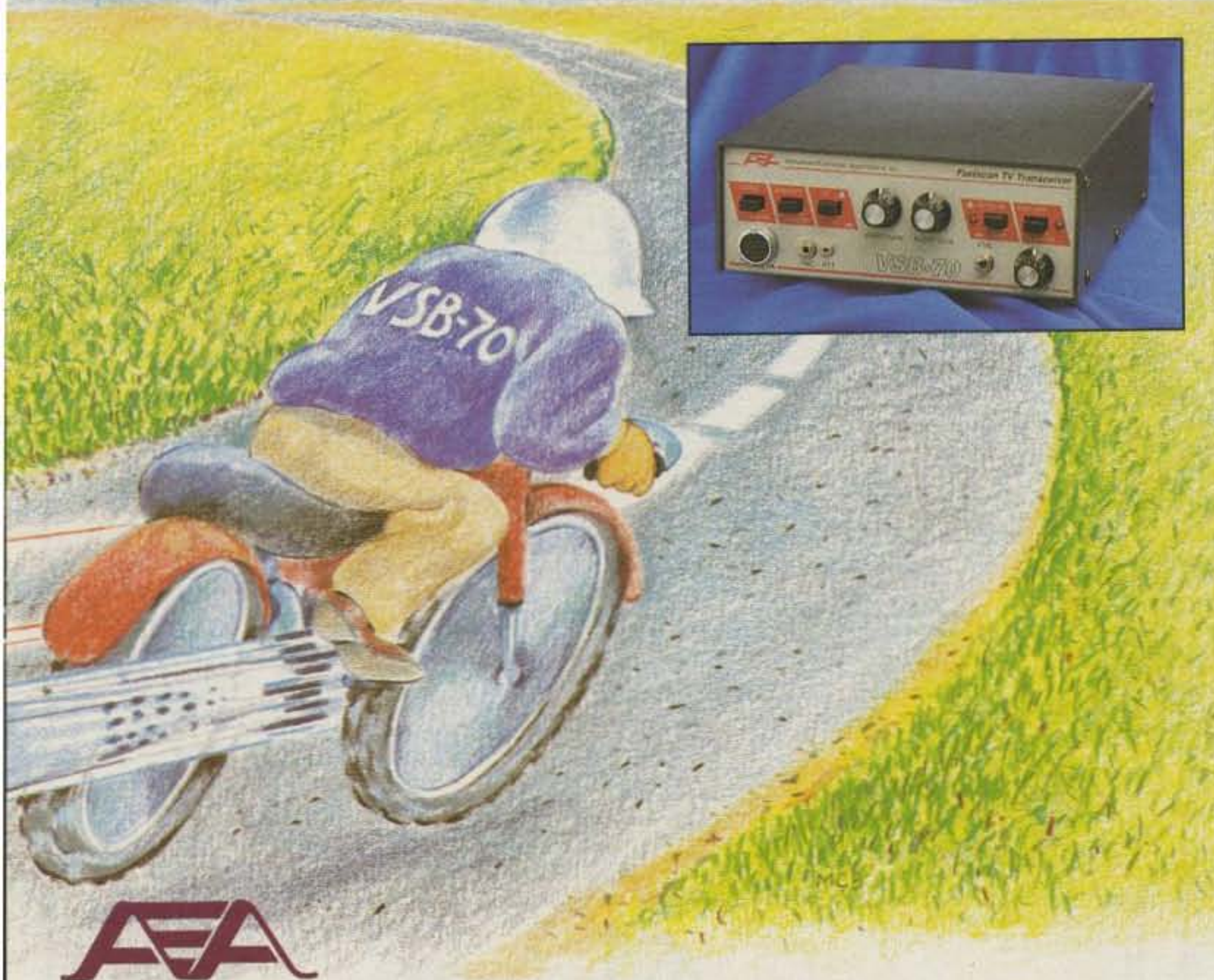
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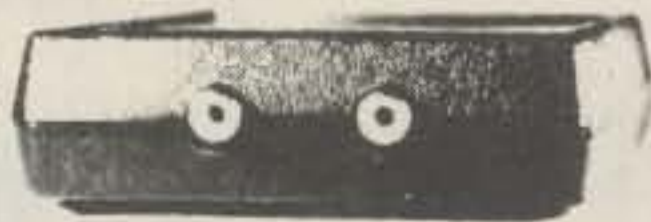
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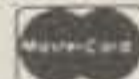
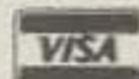
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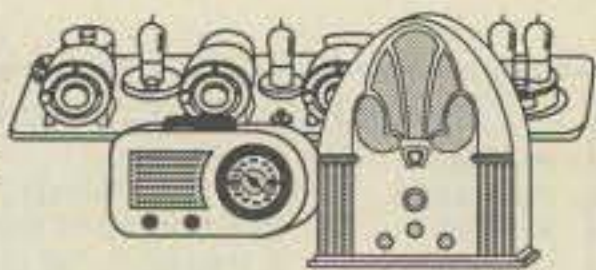
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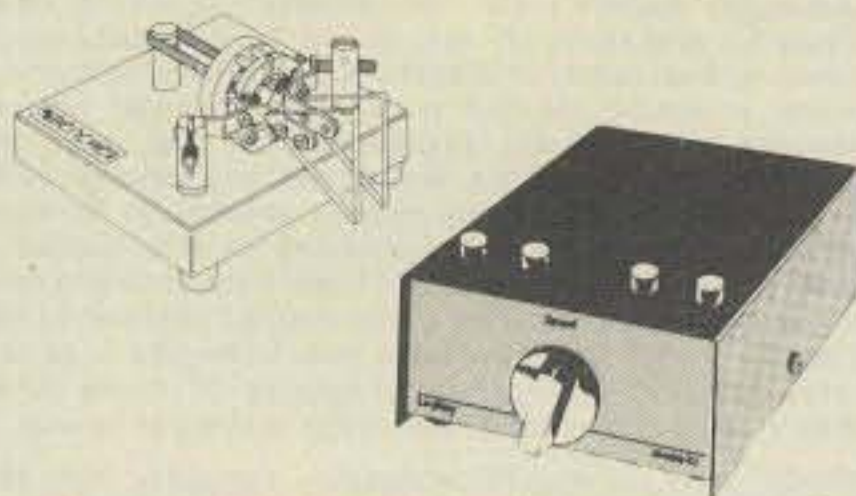
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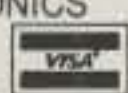
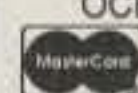
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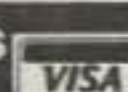
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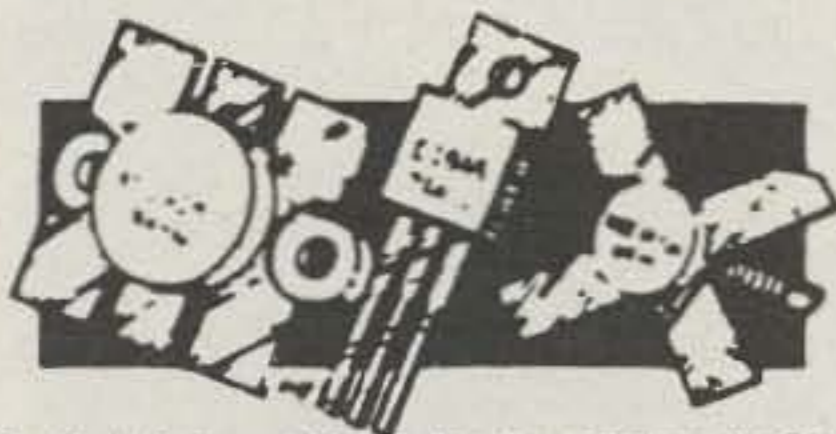


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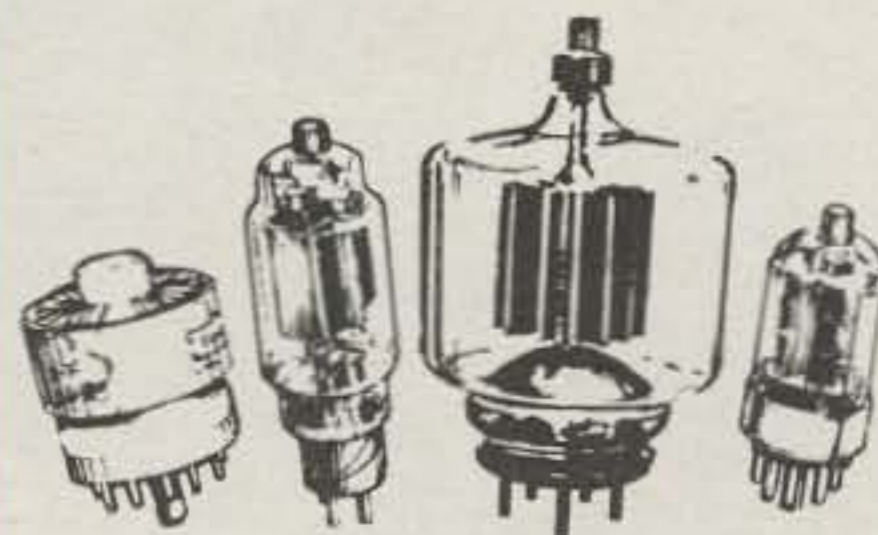
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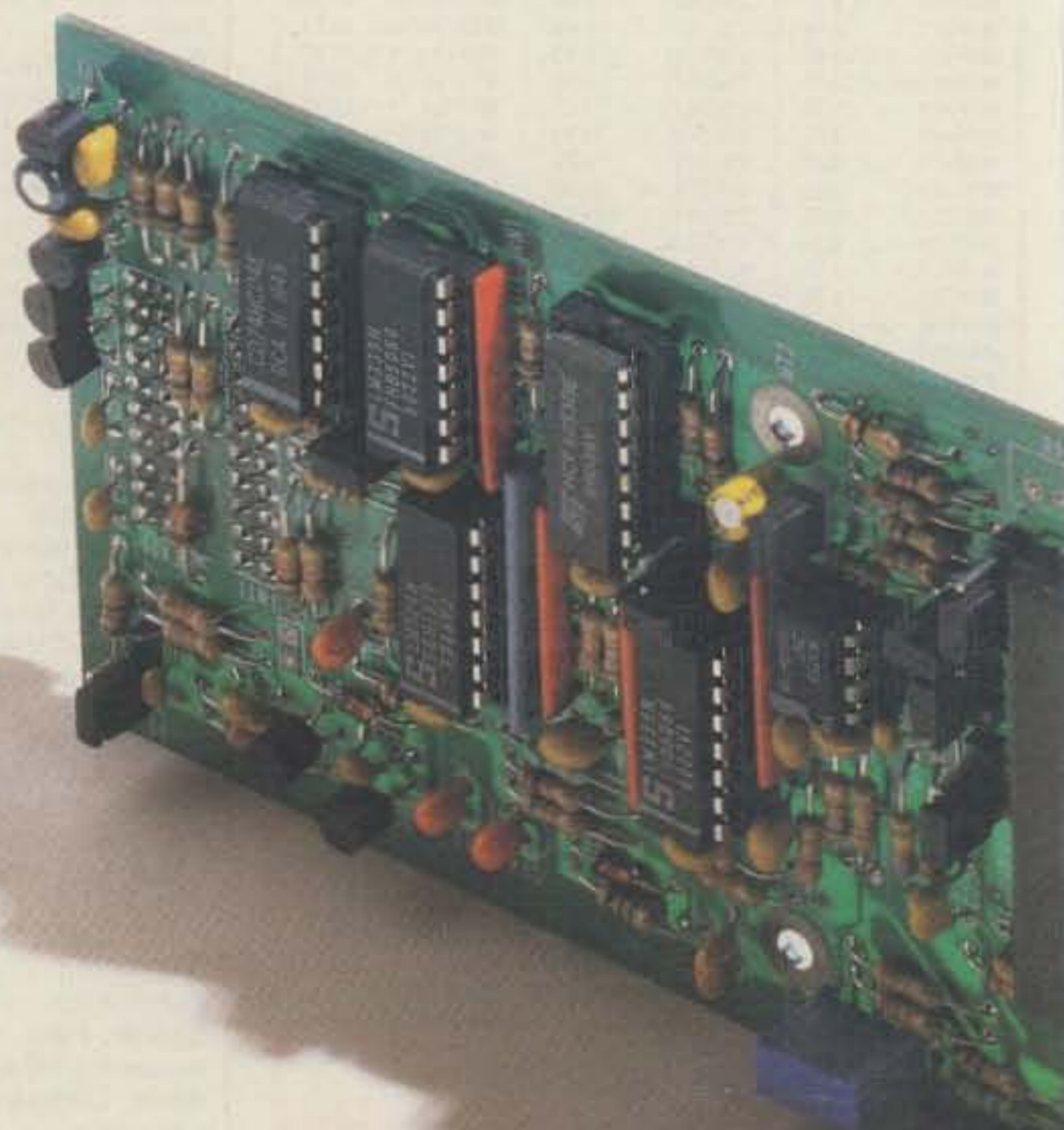
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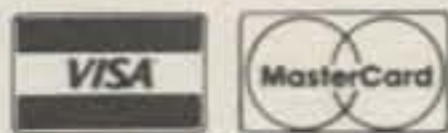
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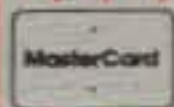
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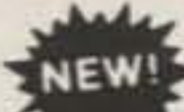
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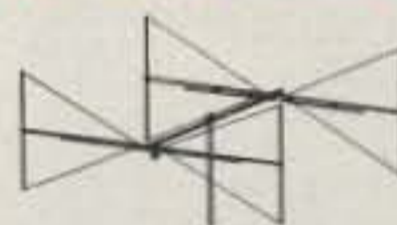
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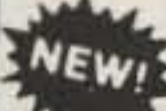
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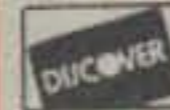
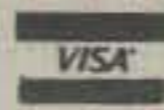
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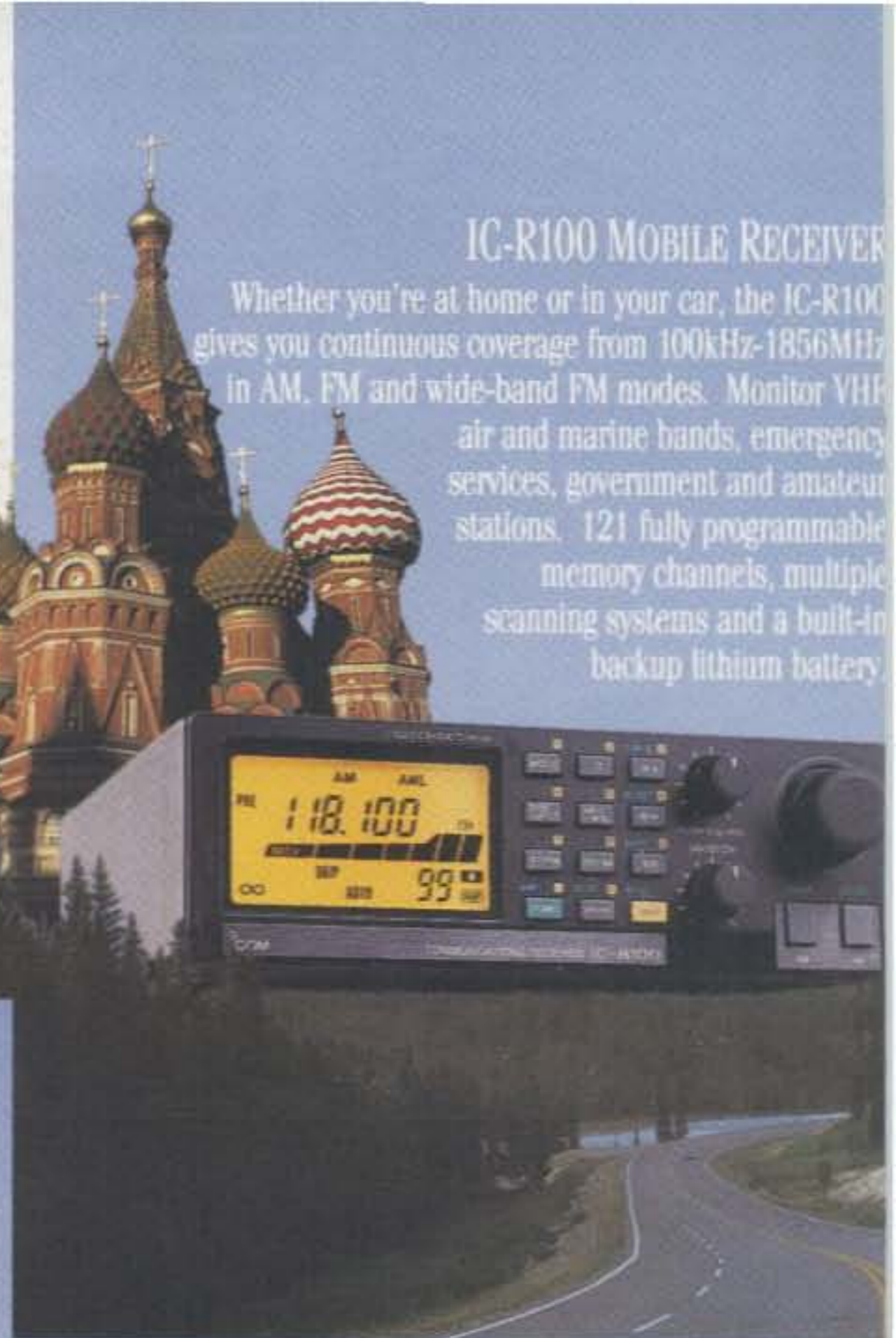
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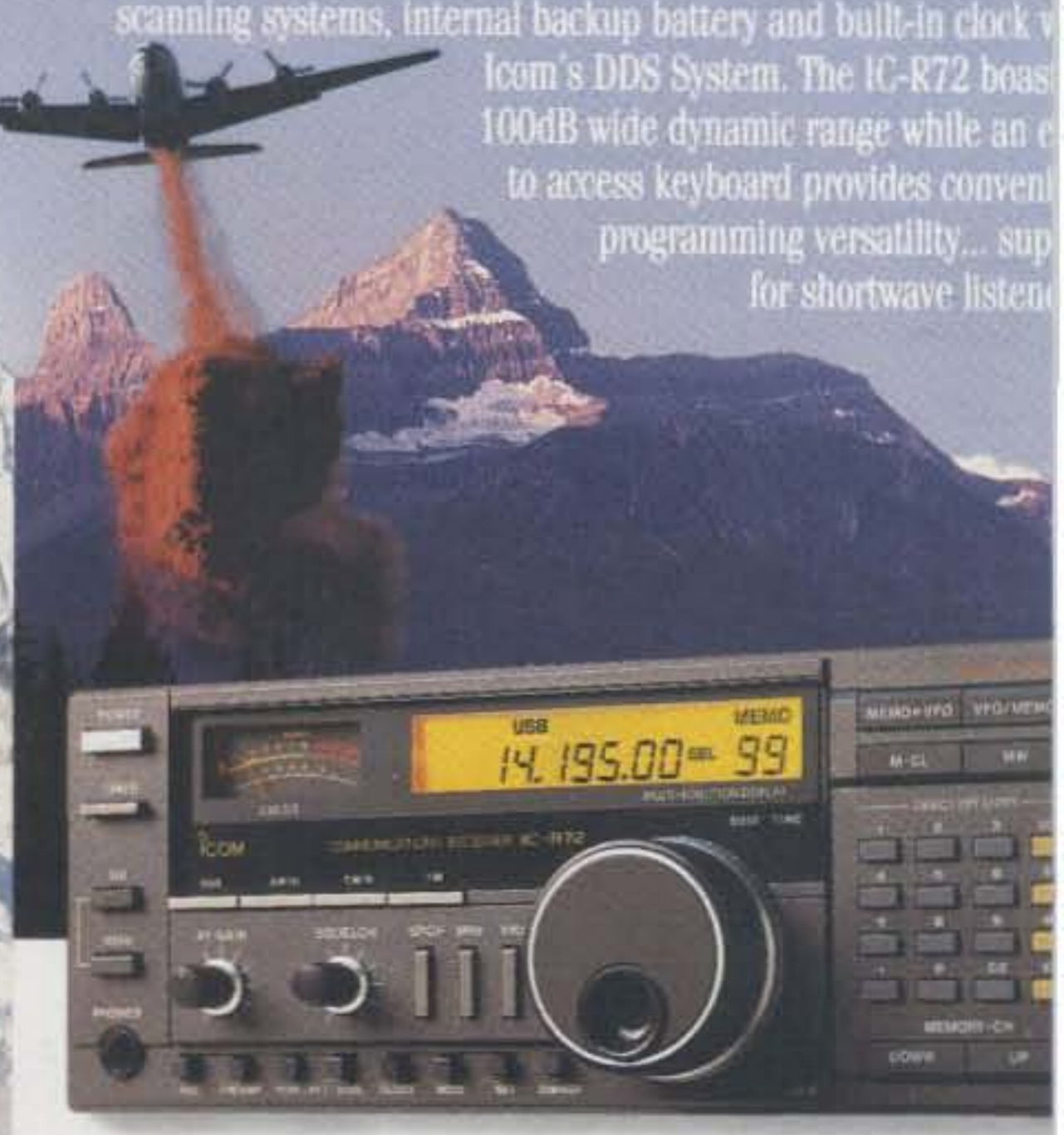


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