

ICD 08241

Amateur Radio

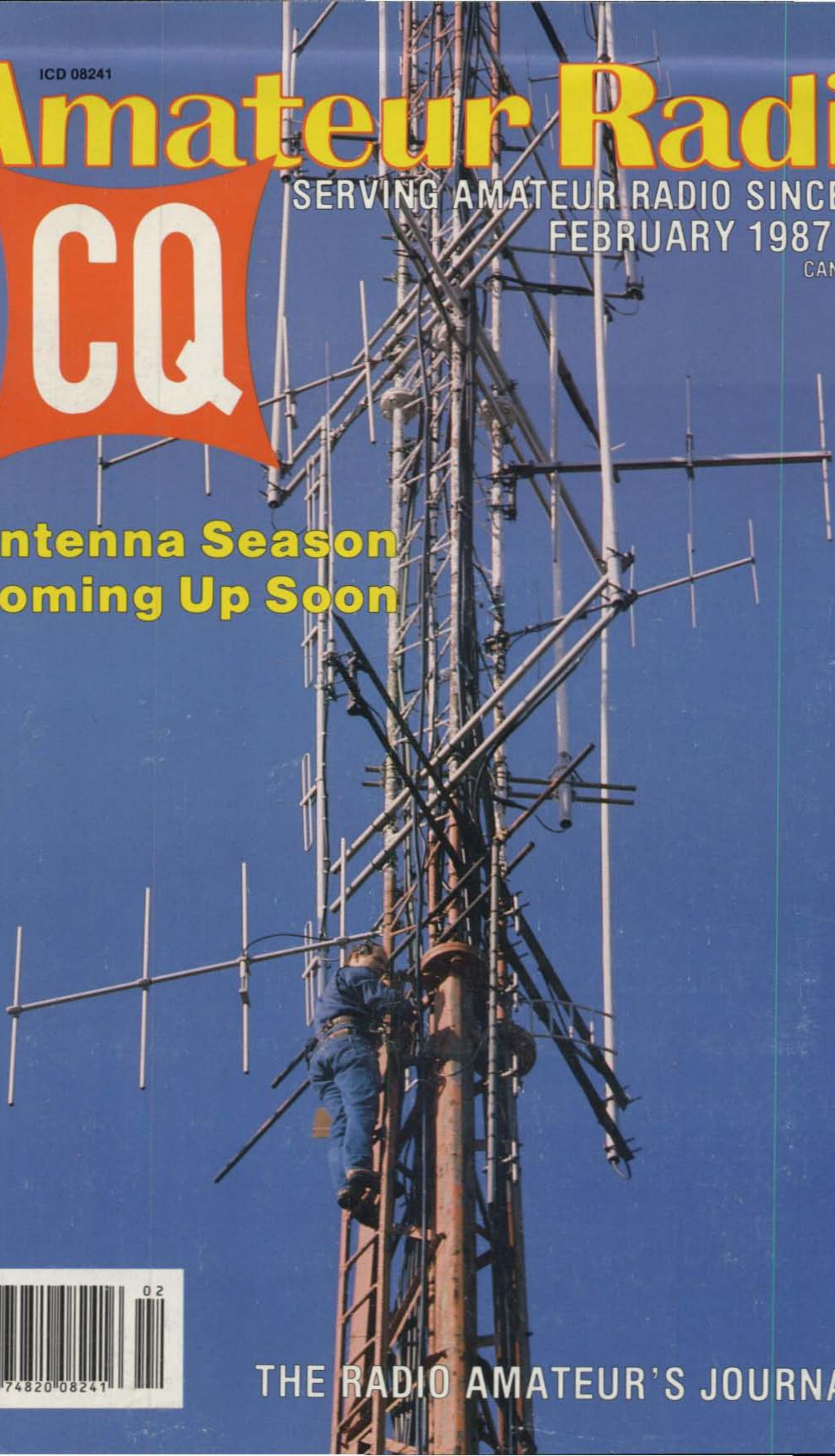
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THE RADIO AMATEUR'S JOURNAL

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The new TS-940S is a serious radio for the serious operator. Superb interference reduction circuits and high dynamic range receiver combine with superior transmitter design to give you no-nonsense, no compromise performance that gets your signals through! The exclusive multi-function LCD sub display graphically illustrates VBT, SSB slope, and other features.

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 - **40 memory channels.** Mode and frequency may be stored in 4 groups of 10 channels each.
 - **Programmable scanning.**
 - **General coverage receiver.** Tunes from 150 kHz to 30 MHz.
 - **1 yr. limited warranty.** Another Kenwood First!
- Optional accessories:**
- AT-940 full range (160-10m) automatic antenna tuner
 - SP-940 external



Interface IF-232C/IF-10B

speaker with audio filtering • YG-455C-1 (500 Hz), YG-455CN-1 (250 Hz), YK-88C-1 (500 Hz) CW filters; YK-88A-1 (6 kHz) AM filter • VS-1 voice synthesizer • SO-1 temperature compensated crystal oscillator • MC-43S UP/DOWN hand mic. • MC-60A, MC-80, MC-85 deluxe base station mics. • PC-1A phone patch • TL-922A linear amplifier • SM-220 station monitor • BS-8 pan display • SW-200A and SW-2000 SWR and power meters.



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



More TS-940S information is available from authorized Kenwood dealers.

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Kenwood brings you the greatest hand-held transceiver ever! More than just "big rig performance," the new TH-215A packs the most features and the best performance in a handy size. You will want to keep this HT "close at hand" all of the time. And our full line of accessories will let you go from hamshack to portable to mobile with the greatest of ease!

• **Wide receiver frequency range.**

Receives from 141-163 MHz. Includes the weather channels! Transmit from 144-148 MHz. Modifiable to cover 141-151 MHz (MARS or CAP permit required).

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• **New Twist-Lok Positive-Connect™ locking battery case.**

• **Frequency entry by keyboard or UP/DWN keys.**

• **Priority alert function.**

• **Monitor switch to defeat squelch.**

Used to check the frequency when CTCSS encode/decode is used or when squelch is on.



• **Large, easy-to-read multi-function LCD display with night light.**

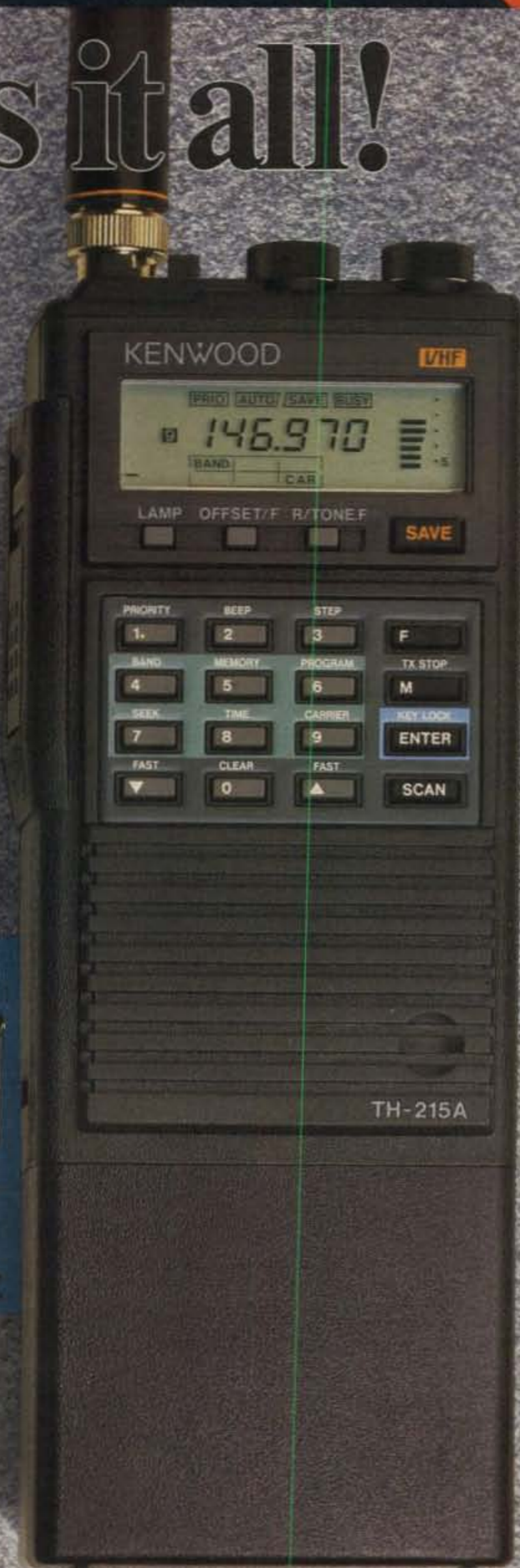
• **Audible beeper to confirm keypad operation.** The beeper has a unique tone for each key. DTMF monitor also included.

• **Supplied accessories:** Belt hook, rubber flex antenna, PB-2 standard NiCd battery pack (for 2.5 W operation), wall charger, dust caps.



Optional Accessories:

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



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Dependable Duo!

TS-830S HF transceiver.

The "Pacesetter" has become a legend in DX and contest circles.

- Covers all 10 Amateur bands (50 kHz extended coverage).
- Wide receiver dynamic range, Junction FETs in the balanced mixer, MOSFET RF amplifier at low level, and dual resonator for each band.
- Variable bandwidth tuning (VBT). Varies IF filter passband width.
- Notch filter high-Q active circuit in 455-kHz second IF.
- Noise-blanker threshold level control.
- IF shift (passband tuning).
- 6146B final with RF negative feedback. Runs 220 W PEP (SSB)/180 W DC (CW) input on all bands.
- Built-in RF speech processor.
- SSB monitor circuit.

- Built-in digital display, (fluorescent tube), with analog dial.
- Narrow/wide filter selection on CW.
- RIT and XIT (transmitter incremental tuning).

Optional accessories:

- VFO-230 external digital VFO with five memories, digital display.
- VFO-240 external analog VFO.
- AT-230 antenna tuner/SWR/power meter.

- SP-230 external speaker.
- YG-455C (500 Hz) or YG-455CN (250 Hz) CW filter for 455 kHz IF.
- YK-88C (500 Hz) or YK-88CN (270 Hz) CW filter for 8.83 MHz IF.
- KB-1 deluxe heavyweight knob.



TS-530SP HF transceiver.

This "Cents-ational" HF transceiver is recognized worldwide for superior and dependable performance.

- 160-10 meters, LSB, USB, CW, all Amateur frequencies, including new 10, 18, and 24 MHz bands. Receives WWV on 10 MHz.

- Built-in digital display (six digits, fluorescent tubes), with analog dial.
- Narrow/wide filter selector switch for CW and/or SSB.
- Built-in speech processor, for increased talk power.
- IF shift tunes out interfering signals.

- Wide receiver dynamic range, with greater immunity to overload.
- Two 6146B's in final, allows 220 W PEP/180 W DC input on all bands.
- Advanced single-conversion PLL, for better stability, improved spurious characteristics.

- Adjustable noise-blanker, with front panel threshold control.
- RIT/XIT front panel control allows independent fine-tuning of receive or transmit frequencies.

Optional accessories:

- SP-230 external speaker with selectable audio filters.
- VFO-240 remote analog VFO.
- VFO-230 remote digital VFO.
- AT-230 antenna tuner/SWR/power meter.
- MC-50 desk microphone.
- KB-1 deluxe VFO knob.
- YK-88C (500 Hz) or YK-88CN (270 Hz) CW filter.
- YK-88SN (1.8 kHz) narrow SSB filter.



More information on the TS-830S and TS-530SP is available from authorized Kenwood dealers.

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The Radio Amateur's Journal



ON THE COVER: The antenna season is coming up. Jim Capicotto, WB2WLN, gets a head start by adjusting the Mt. Beacon Radio Club's receive antenna for their ATV station in Mt. Beacon, NY. Photo by Larry Mulvehill, WB2ZPI.

FEBRUARY 1987

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Zero Bias AN EDITORIAL

February is one of those in between months. Winter is about half way through, and spring has a ways to go. So what do you do after you've built every small project in *CQ* and the other magazines? Well, for starters you could check out the "rats nest" of cables behind the operating position to see what could use tidying up or changing. I'm sure that some of the coax you've been using has "migrated" so far out that it would need a passport to come back. Probably the long winter's nights have provided a romantic interlude for cube-taps and multiple-outlets to reproduce themselves into a potential fire hazard of overheated line cords. It's also probably safe to say that most of us don't have a fire-extinguisher handy in the shack.

February is a good time to start sorting out these things and to make needed repairs. It's also a good time to check on what you may want to add or replace in the way of gear. Part of that "research" may involve the small hardship of leaving colder climates for a few days in Miami. If you could manage to be in Miami before February 7th, for example, you could attend the 27th annual Tropical Hamboree held at the Dade County Youth Fairgrounds. This is the first big one of the year, and you can see and touch just about every piece of amateur radio equipment available today. For those looking for a bargain, there are about 1,000 tables in the fleamarket area. Of course, if you're the sullen and unhappy type, there's even something for you, too: You can switch complaining about the cold to complaining about air-conditioning.

For readers in the warmer climates who are tired of talking about air-conditioning and heat, there's a perfect hamfest for you on February 1st—Wheaton, a suburb of Chicago. I can attest to how cold it can get up there this time of year, but it's worth the trip. If you have the time, this one-day affair draws a lot of people to see exhibits and check out the fleamarket. If you only have one day, and that day is usually quite cold, people are usually very motivated to strike a bargain. A lot of those same folks will probably be thawing out the following weekend in Miami.

Back To Basics

One of the things we're going to strive for this year is more articles on basic things related to amateur radio—not just how to solder on a connector, but simple ideas and bare-bones practical projects. One of the reasons why we are doing this is based on your response to similar material that we've published. It seems that for every basic article we run we get a lot of letters commenting on what the reader

has learned, tried, modified, and most importantly, used. At first one would assume that these responses come from newcomers and folks studying for their first license. Most letters come from amateurs who have been around for a while and in some cases, a long while. Perhaps we assume too much in that tenure or license class equates to knowledge. I think it is safe to assume that what was required to pass an exam has little to do with what was needed in the way of practical knowledge, and that little bit was drifting away even as you left the examining room.

One of the basic elements of amateur radio that can't be taught is enthusiasm. We all had it at the beginning and most of us still have it in various degrees from total zealot to borderline burnout. There are a few total burnouts around, but most of them will resurface after a few years of R & R. If the average amateur is not thwarted or disheartened at the beginning stages of amateur radio, then you can bet that once an amateur, always an amateur. So how do you bring back that enthusiasm, or how do you instill it in others? Enthusiasm is the promise or anticipation of something—the dream yet to come true. It deals with expectancies of things yet to happen.

When I was starting out, I would get enthusiastic about a schematic diagram, a bunch of parts, and a blank chassis. I could "see" myself before a completed rig using the finished project (which, of course, looked infinitely better than any commercial product of the day). Well, enough of the stuff that I built worked, and enough of the stuff looked pretty good, so my enthusiasm continued. The key thing here is that in amateur radio, as in life itself, enough things have to work or come true to keep the enthusiasm going. What keeps the enthusiasm going, or feeds it like a fire, is the basic fuel of FUN. The positive result, the goal achieved, the lesson learned, the wish come true is enjoyable and fun. It reinforces the anticipation of more. Amateur radio isn't that much different in that people want and expect a sense of enjoyment and fun out of it.

By its very nature, though, amateur radio starts out offering a wide variety of possible things to enjoy. If you think about it under the umbrella of amateur radio there are a tremendous number of sub-hobbies about which someone can get enthusiastic. The enthusiasm is seeded when the prospective newcomer asks the first question. He is asking you to tell him the story of how it's going to be so that he can tell if he can "see" himself in that situation. At this stage we usually downplay the subtle proviso of IF—IF you study and learn this and that to pass a series of examinations. We can hope that being on a first-name basis with people all

around the world is enough enticement to keep someone going.

Perhaps if we want to install the enthusiasm for amateur radio in more people, we should work on ideas to make the examination process part of the fun. I'm not sure exactly how that would work, but if it could be treated as a series of small goals to be achieved in a positive supporting manner, then perhaps it could be looked at as fun. It would probably require more interaction with amateurs and people running licensing courses. Perhaps instead of, or in addition to, listening to code tapes, there could be closed-link code oscillators so that people could learn code by sending and receiving actual messages to each other. It's learning by doing with immediate feedback. It might be even be fun, and people might spend more time with this "game" or challenge than with a more passive tape.

Who knows. More people may even become enthusiastic about CW instead of viewing it as a hurdle. However anyone feels about CW at the moment, it still is a requirement and therefore will be with us for some time to come. Therefore, one solution to this bone of contention should be how to make it easier to learn (i.e., more fun) rather than a brute-force obstacle to cross. It doesn't make much sense to tell someone that they have to learn this in order to pass an examination, but then they can forget it. Besides making no sense, it does nothing to add enthusiasm or remotely link the concept of enjoyment to the process.

More Fun To Be Had

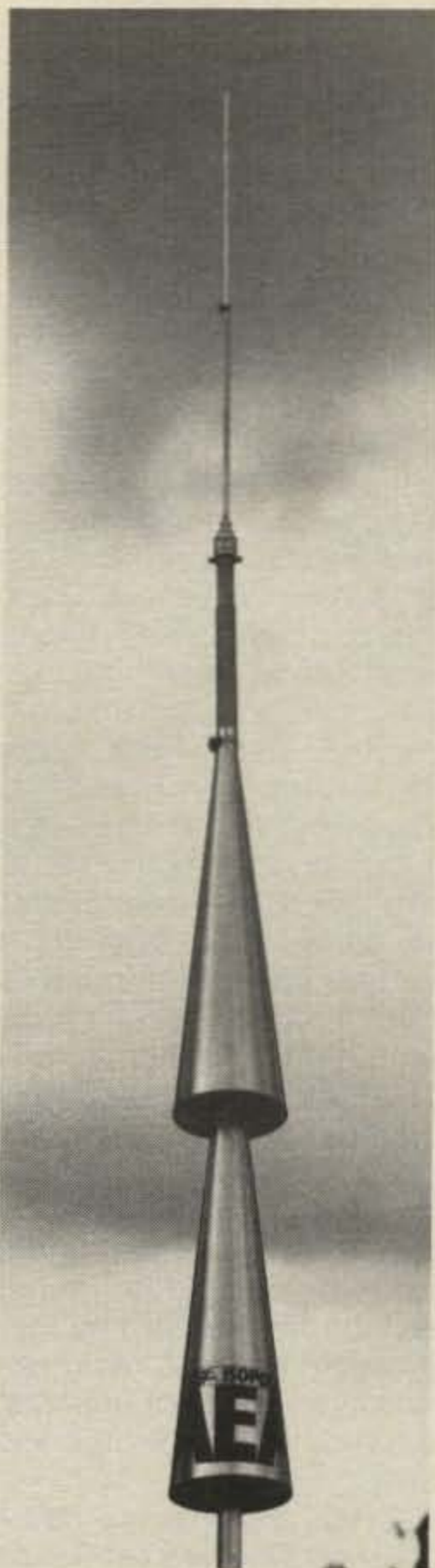
It's still early in the new year, and I guess I'm going to harp on the word FUN. I am well aware that we as amateurs do serious things and serve in times of emergency and disaster, and in every conceivable need known to man amateur radio helps out. Whatever our involvement, we enjoy it and have fun with it. Well, I'm going to suggest that more of you increase your enjoyment of amateur radio by getting out of the shack for a while (the world won't end) and attending a few hamfests. I'll bet some of the folks you talk to on the local repeater have no idea of what you look like. Who knows who you might meet, what you might see, and what bargains are around. Okay, you can take a few HTs with you if it will make you feel better and put an extra rig in the car just in case, but get out there and mingle with the rest of us. You might pick up some helpful tips and pointers from some of the lectures and discover a club or two in the area that you could join. You could probably make a few new friends, have a few laughs, eat a few hot dogs, and go home with a ton of literature and souvenirs and a very good feeling. That's called fun, and you deserve it.

73, Alan, K2EEK

Put More Punch in Your Packet

Outstanding mechanical design makes the IsoPole the only logical choice for a VHF base station, especially for Packet operation. All IsoPole antennas yield the **maximum gain attainable** for their respective lengths and a maximum signal on the horizon. Exceptional decoupling from the feed line results in simple tuning and a significant reduction in TVI potential. The IsoPole antennas are all impedance matched in the factory so that no field tuning is required. The IsoPoles have the broadest frequency coverage of any comparable VHF base station antenna. This means no loss of power output from one end of the band to the other, when used with SWR protected solid state transceivers. **Typical SWR is 1.4 to 1 or better across the entire band.**

A standard 50 Ohm SO-239 connector is recessed within the base sleeve (fully weather protected). With the IsoPole you will not experience aggravating deviation in SWR with changes in weather. The impedance matching network is weather sealed and designed for maximum legal power. The aerodynamic cones are the only appreciable wind load and are attached directly to the support (a standard TV mast which is not supplied).



High Performance Hand-Held Antenna — The Hot Rod

The Hot Rod antenna can be expected to make the same improvement to hand-held communications that the IsoPole antennas have made to base station operation. **Achieve 1 or 2 db gain** over ANY 5/8 wave two meter telescopic antenna. The factory tuned HR-1 is 20% shorter, lighter and places far less stress on your hand-held connector and case. It will easily handle over 25 watts of power, making it an excellent emergency base or mobile antenna. In the collapsed position, the Hot Rod antenna will perform like a helical quarter wave. Three Hot Rods are available; HR-1 1/2 wave 2M Ant., HR-2 for 220 Mhz, and HR-4 for 440 Mhz. Amateur Net Price on all Hot Rods is \$19.95.

For either base station or hand-held operation AEA has the perfect VHF/UHF antenna. Put more punch in your Packet station with an AEA IsoPole or Hot Rod antenna. To order your new antenna contact your favorite Amateur Radio Distributor. For more information contact Advanced Electronic Applications, P.O. Box C-2160, Lynnwood, WA 98036, or call 206-775-7373.

IsoPole Specifications

Model	144	220	440
Freq. Coverage (Mhz)	135-160	210-230	415-465
2.1 VSWR bandwidth	>12Mhz @ 146Mhz	>15Mhz @ 220Mhz	>22Mhz @ 435Mhz
Power Rating	1 kw	1 kw	1 kw
Gain**	3 dbd	3 dbd	3 dbd
Radiating Element Length	125.5" (3.2m)	79.25" (2m)	46" (1.2m)
Amateur Net Price	\$49.95	\$49.95	\$69.95

**dbd — db gain over a dipole in free space

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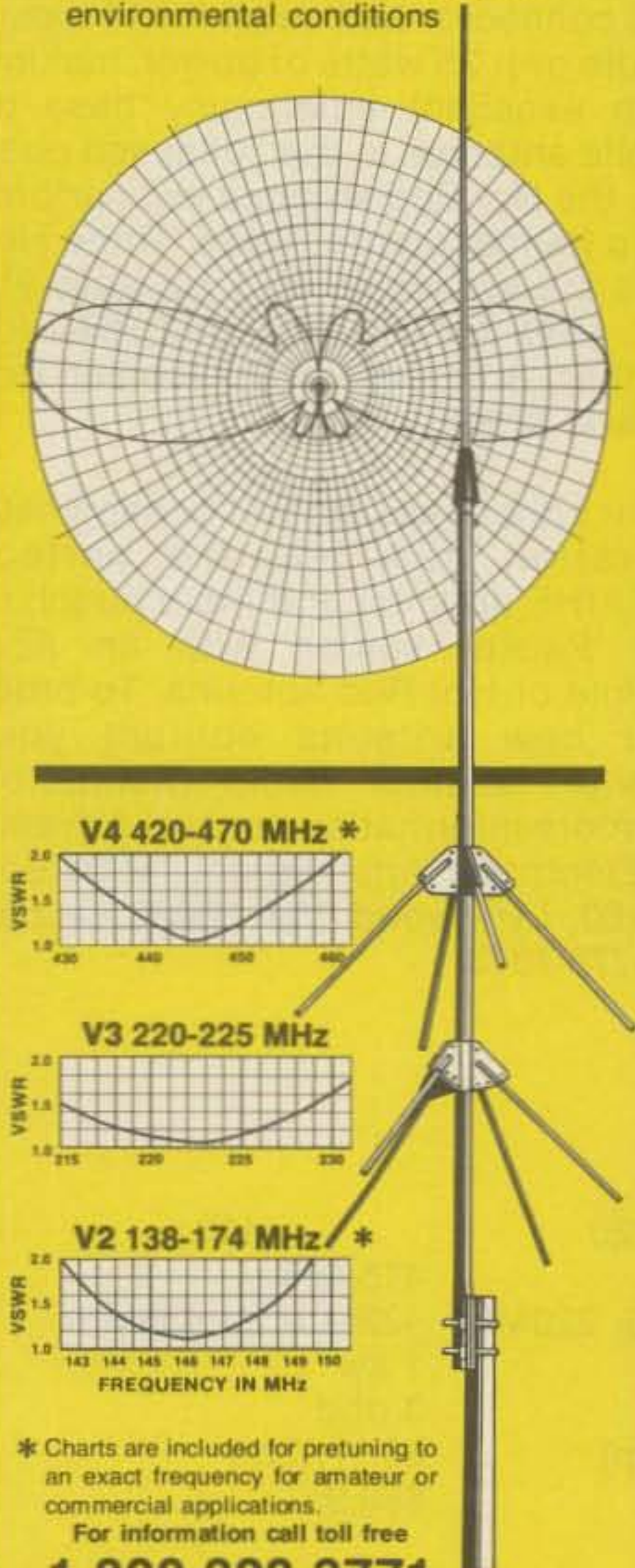
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6 • CQ • February 1987

Our Readers Say:

New Novice?

Editor, CQ:

About two years ago I was listening on the 40 meter band (Novice). I heard a CW CQ, I answered the call, and the response was slow. I was sure the call was coming from a new Novice. He gave me his name and said he'd better quit. I said, "Hey! Don't quit on me. I want to talk to you." He said he was nervous and made mistakes. I said, "That's OK. I was nervous and made mistakes when I first started. Besides, the ham hasn't been born yet who wasn't nervous at first. I could hardly remember my own name, and I still make mistakes. Also, who cares. I don't, and if the other hams don't like it, they can lump it. Besides, there is nothing to be afraid of. I can't hurt you. We are too far apart for that." Evidently, this conversation had its desired effect, and he started sending really well. We had an excellent QSO. He then told me this story. He had gotten his Novice license several months ago and called a CQ. When someone answered him, he panicked, shut the rig off, and stood trembling. He wouldn't go near the radio for months. Said it really scared him! He finally got up enough courage and called a CQ. I was the first to answer him.

I received a very nice letter from him a couple of weeks later. He thanked me for helping him get started. He was really grateful. He also said he had just finished his 34th QSO and was having a ball with his hamming. He even sent me a small digital clock with local time and universal time.

I use this clock every day—have it right in front of my new Ten-Tec Corsair II. Each time I look at it, I am reminded that I might have saved another Novice from giving it up. Makes me feel good that I was able to help him. Incidentally, I have many cards and letters from new hams thanking me for my patience and help. Older hams, if you aren't helping newer hams, you are missing a gratifying experience. Remember how scared you were?

Joe O'Neal, KE7SV
Monmouth, OR

Quality Comes First

Editor, CQ:

I buy CQ off the newsstand, and enjoy reading CQ from cover to cover! There's something refreshing about CQ that's

hard to put your finger on. But the article by Peter O'Dell, KB1N, entitled "Novice Antenna Hangups" (December 1986 issue) really adds gold to an already perfect magazine!

I have found good operators on all of the CW bands. Perhaps the most polite are on the Novice bands. When I say good, I mean those who send clean, solid CW coming at you properly spaced, all letters and numbers correctly formed without the associated swing and dots so common amongst the lid operators of today! (Speed not a factor. Quality coming first!)

I could have the best of the imports in my shack. But after one visit to a super ham's computer shack, I chose the Heathkit HW-99 just so I could put the value of challenge back into ham radio for me. I have had W6PEP since 1937. No way will I take the romance, adventure, and *hand work* away from old W6PEP. It served in the Navy during WW II and deserves a better ending than to be hooked up to an automatic keyer or to a computer board!

Clinton R. Smith, W6PEP
Meridian, ID

A Bit of Levity

Editor, CQ:

Enjoy your magazine. Super job! I wish to interject a bit of levity. Your November 1986 edition had a superlative article by Fred O. Maia, W5YI, entitled "Integrity and Credibility in the Amateur Radio Service," pp. 66 to 68, having to do with the VEC program. The levity proposed has to do with a paragraph on p. 67 that states:

"Whenever there is likely to be questions about your testing someone, it is best not to. This eliminates any possible conflict of interest. Being a close relative, it isn't legal to test your wife, but you can test your girl friend . . ."

These VEC rules make it tough on those who have both. And very difficult to live at home when only one's girl friend can be tested and not one's XYL! If a ham has tested both, it's in the best interest of decorum not to mention one or the other in conversation, to one or the other! W5YI's article was most informative. Thought I'd throw the forementioned in. Perhaps CQ could add a column for the fun time of amateur radio?

Jim McNally, KA1LJO
Florence, MA

Say You Saw It In CQ

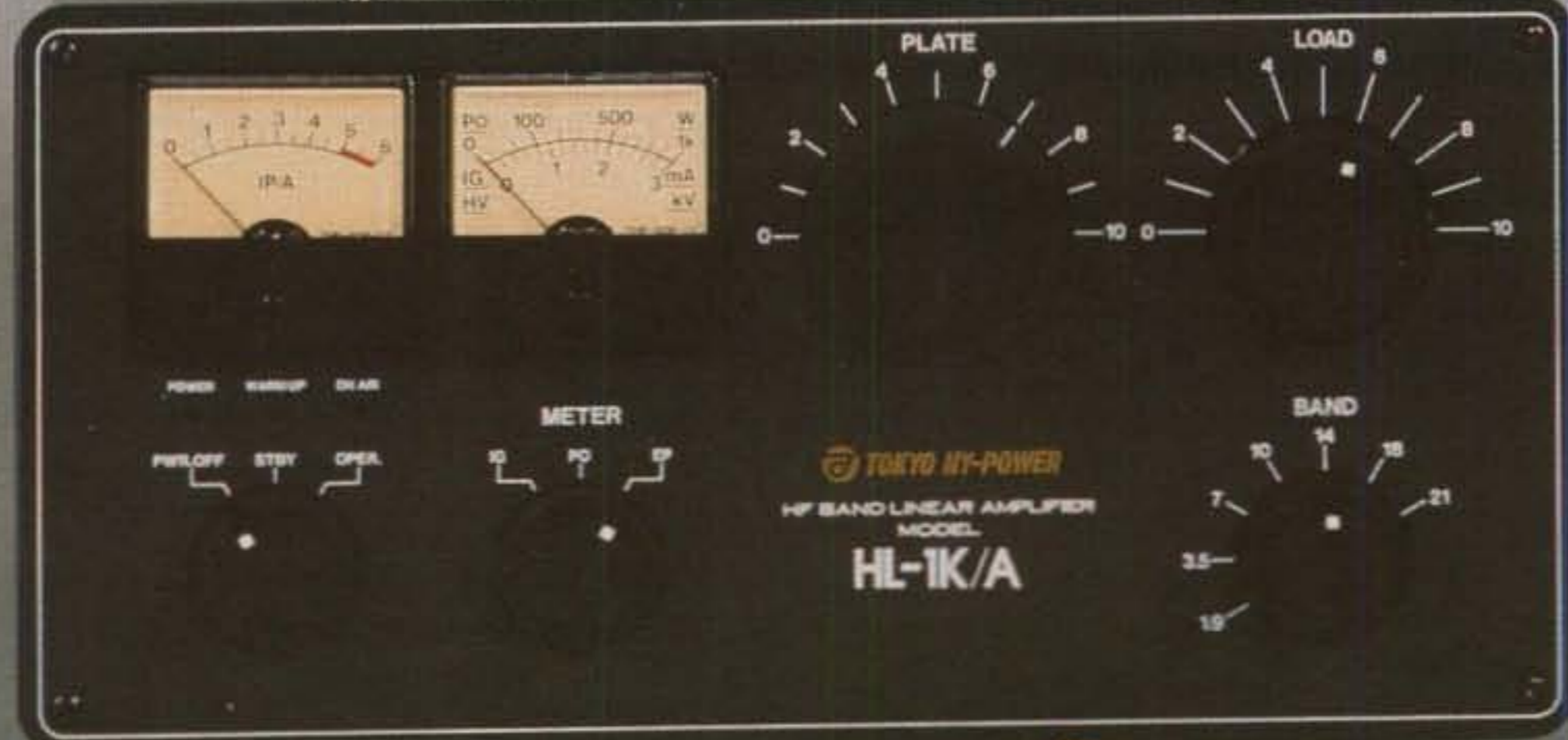
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Announcing

• **Punxsutawney ARC Special Event** - The Punxsutawney ARC will hold a Special Event on February 1 from 1300-2200 UTC to commemorate the 100th anniversary of Groundhog Day. W3QOS will be on 14.235 and 7.235. On February 2 (Groundhog Day) K3HWJ will be on 7.235 from 1300-2200 UTC. Certificate for SASE to W3QOS, P.O. Box 20, Big Run, PA 15715.

• **N8TF From Cadiz, Ohio** - The Harrison ARC will operate N8TF from the birthplace of Clark Gable on February 1. Operation will be on SSB from 1400-2200Z on approximately 3875 and 7230 MHz. For a special QSL send QSL and SASE to KC8XS, P.O. Box 362, Cadiz, OH 43907.

• **North Okanagan RAC Special Event** - The North Okanagan Radio Amateur Club will be operating special station VE7NOR February 6-15 to commemorate western Canada's largest winter carnival. Frequency will be 14.230 every afternoon. For certificate and QSL send log info and \$1.00 or 2 IRC's to NORAC, Box 1706, Vernon, B.C., V1T 8C3 Canada.

• **Special Event Station KB2WB** - The Orange County ARC will operate Special Event station KB2WB on February 14, 1500Z-2200Z, to commemorate the birthday of George Washington. Operation will be from Washington's Headquarters, Newburgh, NY, on suggested frequencies 3.860, 7.230, 14.260. Also, local 2 meter repeaters and packet will be available. For certificate, send QSL and 9" x 12" SASE (39 cents) to OCARC, c/o A. Maroney, 4 Barr Ave., Cornwall-on-Hudson, NY 12520.

• **Cherryland ARC Swap N Shop** - The Cherryland ARC will hold its annual Swap N Shop on February 14 at the Immaculate Conception Middle School gymnasium, Traverse City, MI from 8:00 am through 2:30 pm. Admission \$2.50; tables \$3.00 each. Talk-in on .52 simplex and 146.85 repeater. For info contact Mick Glaser, N8DBK, 4102 Peninsular Shrs. Dr., Grawn, MI 49637 (tel. 616-276-9203).

• **Libertyville/Mundelein, Illinois W9HOQ** - The Libertyville and Mundelein ARC (LAMARS) will operate W9HOQ on February 14th from 0000-2400Z, to commemorate 21 years of club ac-

tivity. Operation will be on the Novice and General bands. Send QSL and SASE to Jim McKinnon, N9FDT, 1808 Victoria Ave., North Chicago, IL 60064.

• **Long Island, NY, ARRL Indoor Hamfest** - This event will take place on Sunday, February 15, sponsored by LIMARC, at the Electricians Hall, Melville, LI, NY. Door opens at 9 am. Exhibitors at 7:30. Send reservations to Hank Wener, WB2ALW, 53 Sherrard St., East Hills, NY 11577 (4' x 6' tables \$12.00 each, or bring your own at \$1.50 a foot with an \$8.00 minimum. Each table sale admits one person, additional workers at \$3.25 each. Check payable to LIMARC must be with reservation. Buyers admission is \$4.00 at the door and \$3.25 in advance with SASE. Send check payable to LIMARC to LIMARC Tickets, Mark Nadel, NK2T, 22 Springtime Lane East, Levittown, NY 11756 by 2/5/87. LIMARC VHF rig clinic will be on hand. For info call at night Hank, 516-484-4322.

• **Mansfield Mid*Winter Hamfest/Computer Show** - This event will be held Sunday, February 15 at the Richland County Fairgrounds, Mansfield, Ohio. Prizes, forums, and fleamarket. Doors open at 7:00 am. Forums include DX by K8CW, Packet, and more. Tickets \$3.00 in advance, \$4.00 at door. Tables \$5.00 in advance, \$6.00 at the door. Half tables available. Talk-in, call W8WE on 146.34/94. Advanced ticket/table orders must be received and paid by February 5. For information or advanced tickets/tables send SASE to Dean Wrasse, KB8MG, 1094 Beal Road, Mansfield, OH 44905, or phone (419) 589-2415 after 4 pm EST.

• **WB7TJD Special Event** - Superstition ARC is offering a certificate to those who work WB7TJD in the 40, 15, or 10 meter Novice bands, or in the lower end of the 40, 20, or 15 meter General phone bands on February 20-21 from 1500-2400 UTC both days. QSL with either 9" x 12" SASE (39 cents postage) or business-size 22 cent SASE. Include your QSO number on your QSL and mail to: SARC, P.O. Box 1551, Apache Junction, AZ 85217-1551. CW ops should listen for "CQ LDD."

• **1987 Hamfair** - The Salem and Oregon Coast

Emergency Repeater Associations will sponsor the 1987 Hamfair on Saturday, February 21 beginning at 9:00 am at the Polk County Fairgrounds. Admission \$4.00 in advance or \$5.00 at the door. Includes ARRLVEC testing, fleamarket, exhibits, and commercial dealers. Talk-in on 146.26/86. For more information write to Salem Repeater Assn., P.O. Box 784, Salem, OR 97308.

• **Livonia ARC Swap 'n Shop** - The 17th Annual Livonia ARC's Swap 'n Shop will be held on Sunday, February 22 from 8 am to 4 pm at the Dearborn Civic Center, Dearborn, Michigan. ARRLVEC amateur examinations will be given. Tables, door prizes, refreshments. Talk-in on 144.75/35 and 146.52. Reserved table space (8 foot minimum) available. For further information, send SASE (4" x 9") to Neil Coffin, WA8GWL, Livonia ARC, P.O. Box 2111, Livonia, MI 48151.

• **Cuyahoga Falls Auction-Fest** - The Cuyahoga Falls ARC will sponsor its 33rd annual Auction-Fest on Sunday, February 22 at the Tallmadge High School. Fleamarket opens at 8 am and auction begins at 11 am. Fleamarket tables \$6 in advance (deadline Feb. 9). Admission \$4.00 at the door, \$3.00 in advance. Check-in on 147.87/27 repeater. For more information send SASE to Cuyahoga Falls ARC, P.O. Box 614, Cuyahoga Falls, OH 44222.

• **Norwich, Connecticut Auction** - The Radio Amateur Society of Norwich is sponsoring an auction at the Montville VFW Hall, Norwich, CT. Bring items to sell. Talk-in on 146.730/146.130 repeater. Setup at 9:00 am. The gavel drops at 10:00 am. Contact person is KA1IFG at 203-848-9670 for more information.

• **Hernando County ARA Hamfest** - The Hernando County ARA of Brooksville, Florida will hold its annual hamfest on Saturday, February 28. Latest rigs available for sale, used equipment on swap tables, door prizes. For advance tickets send a check for \$2.00 and SASE to P.O. Box 1721, Brooksville, FL 33512. Admission at the door is \$3.00. Swap tables \$6.00. Hamfest to be held at the Hernando County Fairgrounds about 2 miles south of Brooksville. Call (904) 796-4840 or 796-1177 for information.

Dayton Hamvention Lodging - available at this time

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Command Motel Fairborn
Cross Country Inn
Crossroads of America
Days Inn Dayton Mall
Days Inn North
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Dayton Airport Inn
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Hampton Inn (Englewood)
Holiday Inn Wright State
Holiday Inn Dayton Mall
Holiday Inn Fairborn
Holiday Inn North
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Holiday Inn Troy
Knights Inn Franklin
Knights Inn Dayton North
Knights Inn Dayton South
Knights Inn Vandalia
L & K Motel (Brandt Pike)
LaQuinta Inn South
Marriott Hotel

Motel Capri
Penny Pincher (L&K Troy)
Ramada Inn Downtown
Ramada Inn South
Red Horse Inn
Red Roof Inn South
Rodeway Inn (Dayton)
Rodeway Inn (Xenia)
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April 24, 25, 26, 1987

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- CW proficiency test • Door prizes

Flea market tickets and grand banquet tickets are limited. Place your reservations early, please.

Flea Market Tickets

A maximum of 3 spaces per person (non-transferable). Tickets (for all 3 days) will be sold IN ADVANCE ONLY. No spaces sold at gate. Vendors MUST order registration ticket when ordering flea market spaces.

Special Awards

Nominations are requested for "Radio Amateur of the Year", "Special Achievement" and "Technical Achievement" awards. Contact: Awards chairman, Box 44, Dayton, OH 45401.

License Exams

Novice thru Extra exams scheduled Saturday and Sunday by appointment only. Send current FCC form 610, copy of present license and check for \$4.25 (payable to ARRL/VEC) to: Exam Registration, 8836 Windbluff Point, Dayton, OH 45459

Slide Show

35 mm slide/tape presentation about the HAMVENTION is available for loan. Contact Dick Miller, 2853 La Cresta, Beavercreek, OH 45324

1987 Deadlines

Award Nominations: April 4

Lodging: April 4

License Exams: March 28

Advance Registration and banquet:

USA - April 11

Canada - April 4

Flea Market Space:

Orders will not be accepted **before** January 1

Information

General Information: (513) 433-7720

or DARA, Box 44, Dayton, OH 45401

Flea Market Information: (513) 223-0923

Lodging Information: (513) 223-2612

(No Reservations By Phone)

HAMVENTION is sponsored by the Dayton Amateur Radio Association Inc.

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(Please attach your name, address, and telephone number to this form.)

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 Reservation Deadline - April 4, 1987
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 Before 6 pm After 6 pm

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Grand Banquet	_____ @ \$15.00**	\$	_____
Women's Luncheon (Saturday)	_____ @ \$7.25	\$	_____
(Sunday)	_____ @ \$7.25	\$	_____
Flea Market (Max. 3 spaces)	_____ @ \$23.00	\$	_____
Admission ticket must be ordered with flea market tickets		Total	\$ _____

Make checks payable to - Dayton HAMVENTION.
 Mail to - Dayton Hamvention, Box 2205, Dayton, OH 45401

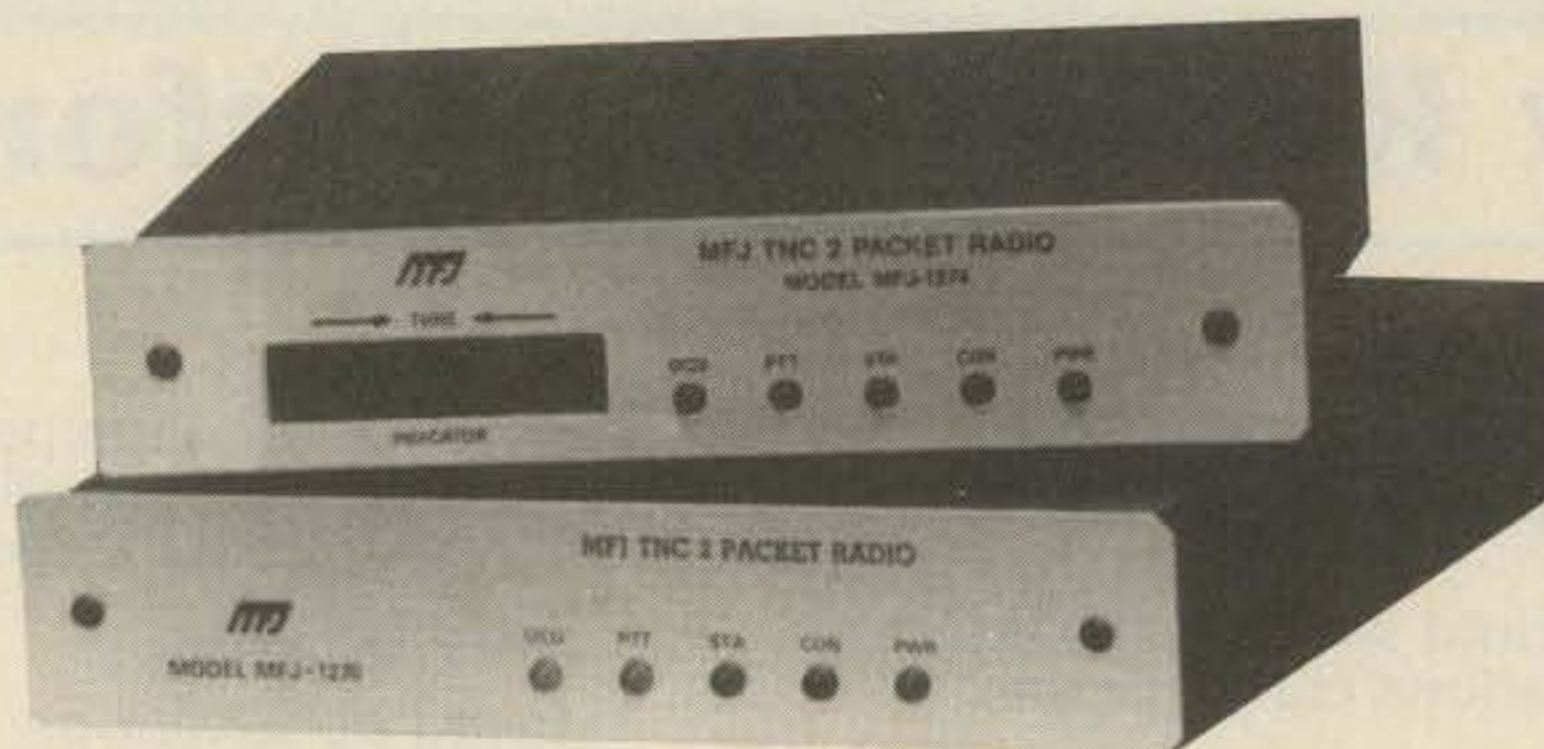
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Also speeds in excess of 56K bauds are possible with a suitable external modem! Try that with a

machine specific TNC or one without hardware HDLC as higher speeds come into widespread use.

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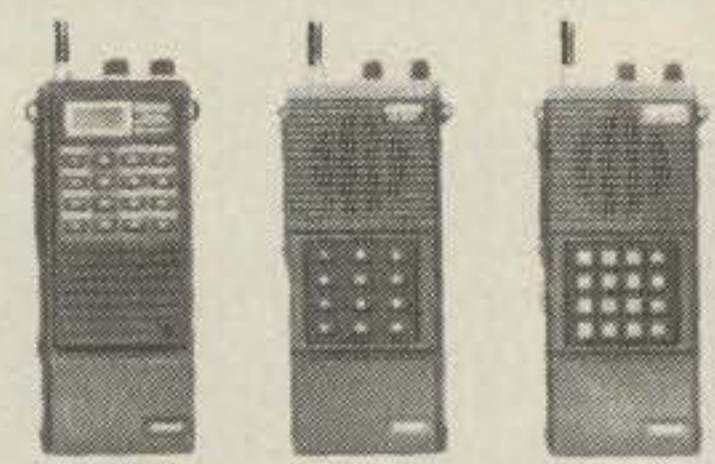
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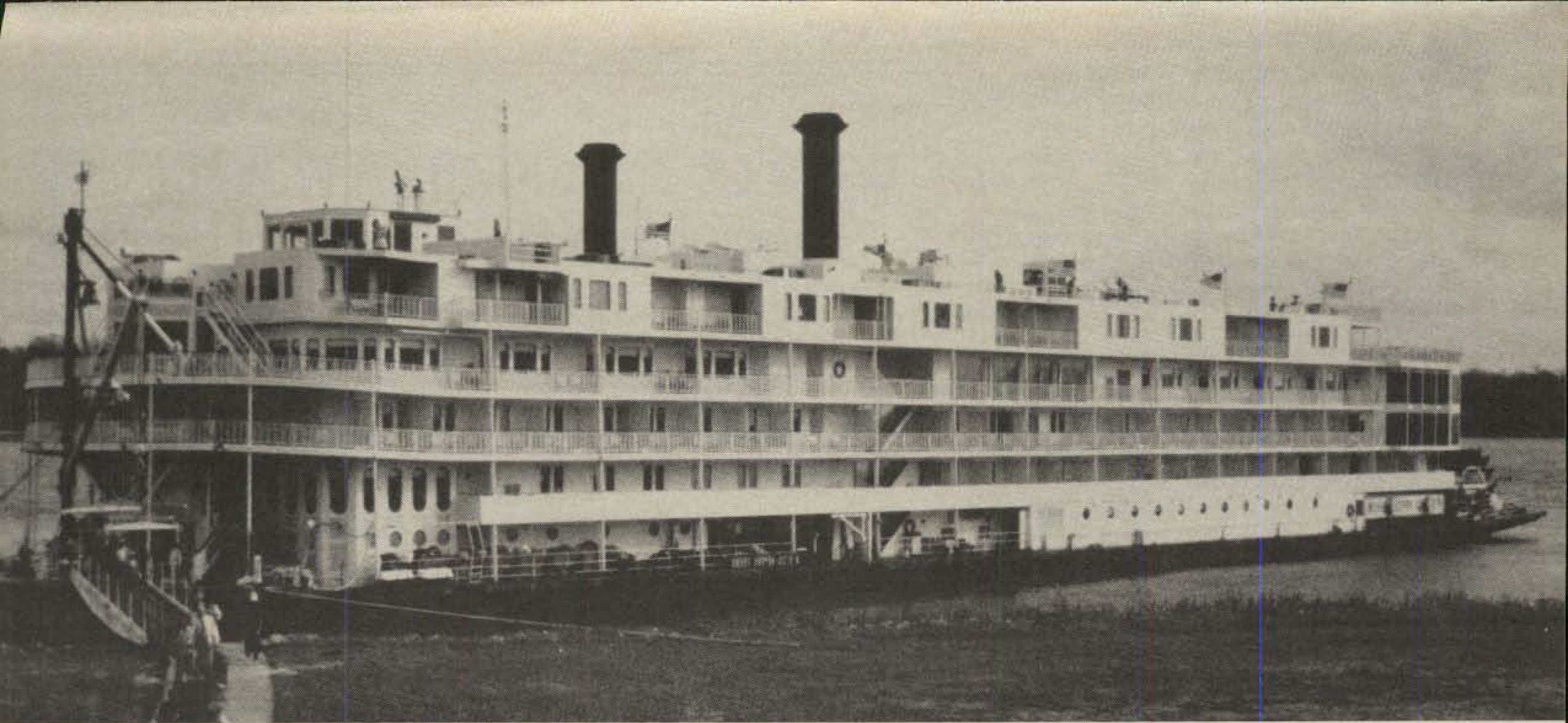
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This DXpedition has more than scores of contacts to remember. It was truly a special event in the DXpeditioners' lives.

A Special Event Shipwreck

BY AL BROGDON*, K3KMO

DXpeditions and special event stations sometimes operate under conditions that range from difficult to downright hazardous. This is the story of a special event station that started out on the opposite end of the luxuriance spectrum, but then took an unexpected turn near the end of the trip.

The Special Event

It all started when my dixieland band "Southern Comfort," was booked for a week-long jazz cruise on the steamboat *Mississippi Queen*. The cruise was to depart New Orleans on Friday, December 6, travel up river to Vicksburg, and then arrive in New Orleans the following Friday—the 13th.

When two of my co-workers heard of the trip, they decided it sounded pretty nice, and they booked accommodations for themselves and their wives—Chuck Swift, WA3LLZ, and his wife, Cindy, KA3OGR, and Wally Wallace, W3KUX, and his wife, Peggy.

Well, amateurs being the way they are, we soon decided we should take along some gear and give the amateur community the chance at a rare contact with a steamboat mobile station. I had taken along a station when Southern Comfort was on board in 1979, and my operating showed me that a lot of amateurs were anxious to work such a station and get a special commemorative QSL.

We planned to take an HF station that would be simplistic but effective—Chuck's Yaesu 757XG and Hustler mobile antenna for HF operation, and my MFJ Grandmaster memory keyer for lazy CW. (Incidentally, you old-timers might be interested in a bit of trivia: My keying paddle is a trusty old Autronic that I bought used from F. E. Handy, W1BDI, back in the early 1960s.)

For 2 meter FM I took my Kenwood 2600A, a Tokyo Hi-Power 30 watt amplifier, and a Hustler colinear antenna. For DC power I took a couple of gel cell 12 VDC packs and a charger so I could operate anywhere on the boat without having to bother about finding a nearby AC outlet. Wally and Chuck also had their 2 meter HT's along, and we used the

three HT's for intercom purposes during the week, both on the boat and during shore stops.

The 757GX and its power supply were packed in a small suitcase that Chuck carried on the airplane with him. Needless to say, it was so heavy that he didn't have to worry about anyone trying to steal it. All the various antenna components were packed into a two-gun shotgun case that was just long enough for the longest antenna elements. Also in the shotgun case were various hand tools, extra antennas, wire, string, duct tape, etc. There was no Radio Shack store on the boat, so we didn't want to find we were missing some small item *after* we were underway!

The Week's Cruise

You will find few vacations as relaxing and luxurious as a cruise on the *Mississippi Queen*. The cabins are comfortable (the more expensive accommodations are *very* comfortable!), the entertainment on board is excellent, and the food is as good as a first-class restaurant. Stops are made at historic river towns along the Mississippi, with half-day bus

*Box 60, Damascus, MD 20872

tours available for those who are interested. The historic parts of the towns are usually within easy walking distance of the river, so you can do your own self-guided tours if you prefer.

The *Mississippi Queen* is the largest paddlewheel boat ever built. It is a steam-driven sternwheel boat 382 feet long and 81 feet tall with a passenger capacity of 420 and a crew of 150. She was commissioned in 1976, and features an outside Jacuzzi (the size of a small swimming pool), gym, sauna, movie theater, beauty salon, sun deck, the Grand Saloon for shows and dancing, the Paddlewheel Bar for additional entertainment, and an elegant dining salon. The boat was built at a cost of \$27.5 million and is currently valued at \$70 million.

Operating on Board

We boarded the boat Friday, December 6. After getting settled, we installed the station. Chuck and Cindy had volunteered to have the station in their cabin on the third deck from the top of the boat, about one-third of the way back from the bow on the starboard side. They had a room with a private veranda, and Chuck mounted the Hustler mobile antenna to the veranda railing with a bracket and U-bolt. Good electrical contact was not made to the railing via the bracket, since we didn't want to scrape paint and repaint the railing. Instead, we bolted a long piece of heavy braid to the bracket and trailed it around the veranda as a counterpoise.

To mount the 2 meter colinear, we taped a short piece of PVC pipe to a railing adjacent to the shuffleboard court (near the stern, on the highest deck on the boat), and mounted the Hustler ground-plane base and colinear to it. During the cruise we left the antenna in place, so we could walk up and hook an HT to it for a few contacts, or bring up the entire 30 watt station for more serious work.

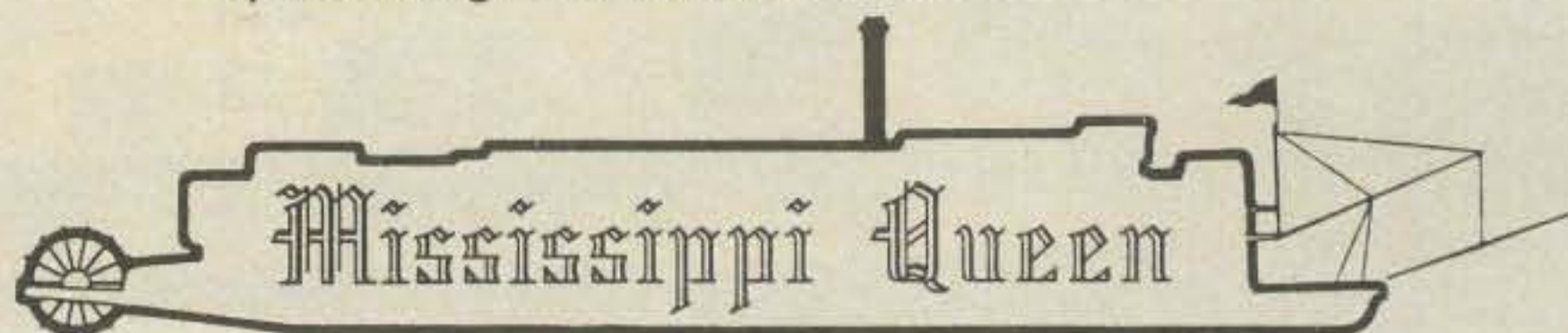
And so we were on the air. For our first HF operating we tuned up on 20 meter CW. A quick call brought a reply from WB3ILE, Chuck's friend and fellow radio club member. It was especially nice to make the first contact with a friend who had been looking for us!

During the cruise we made about 250 contacts on SSB, CW, and FM. Many of the operators we contacted had read about our operation in the *QST* Special Events column and had searched us out. After we got back, we heard of a number of operators who had looked long and hard for us and happened to miss us. We were sorry for those disappointments, but our limited operating had to be sandwiched in among our other activities (including those necessary to keep our wives happy).

One thing that surprised me was that we were never able to generate pile-ups.

□ Chuck Swift □ Al Brogdon □ Wally Wallace
WA3LLZ K3KMO W3KUX

Operating Steamboat Mobile on the



between New Orleans and Vicksburg,
December 6 to 13, 1985

The QSL card for the very memorable DXpedition.

In operations such as ours, where the special event (or DX) station doesn't have a strong signal, a pile-up helps by calling attention to the weak signal and results in a much higher contact rate. But even when purposely making long calls to try to start a run, the best we ever did was to get two replies at a time.

Southern Hospitality

On Tuesday morning we made a stop in Natchez for water. Chuck, WA3LLZ, was scanning 2 meters and made contact with Sam, N5AXV. Sam came down to the dock to meet the steamboat amateurs in person. After chatting a while, Sam took Chuck and his wife, Cindy, on a tour of the city and then to his home to meet his family. Sam's home is at a beautiful location on a 200 foot bluff overlooking the Missis-

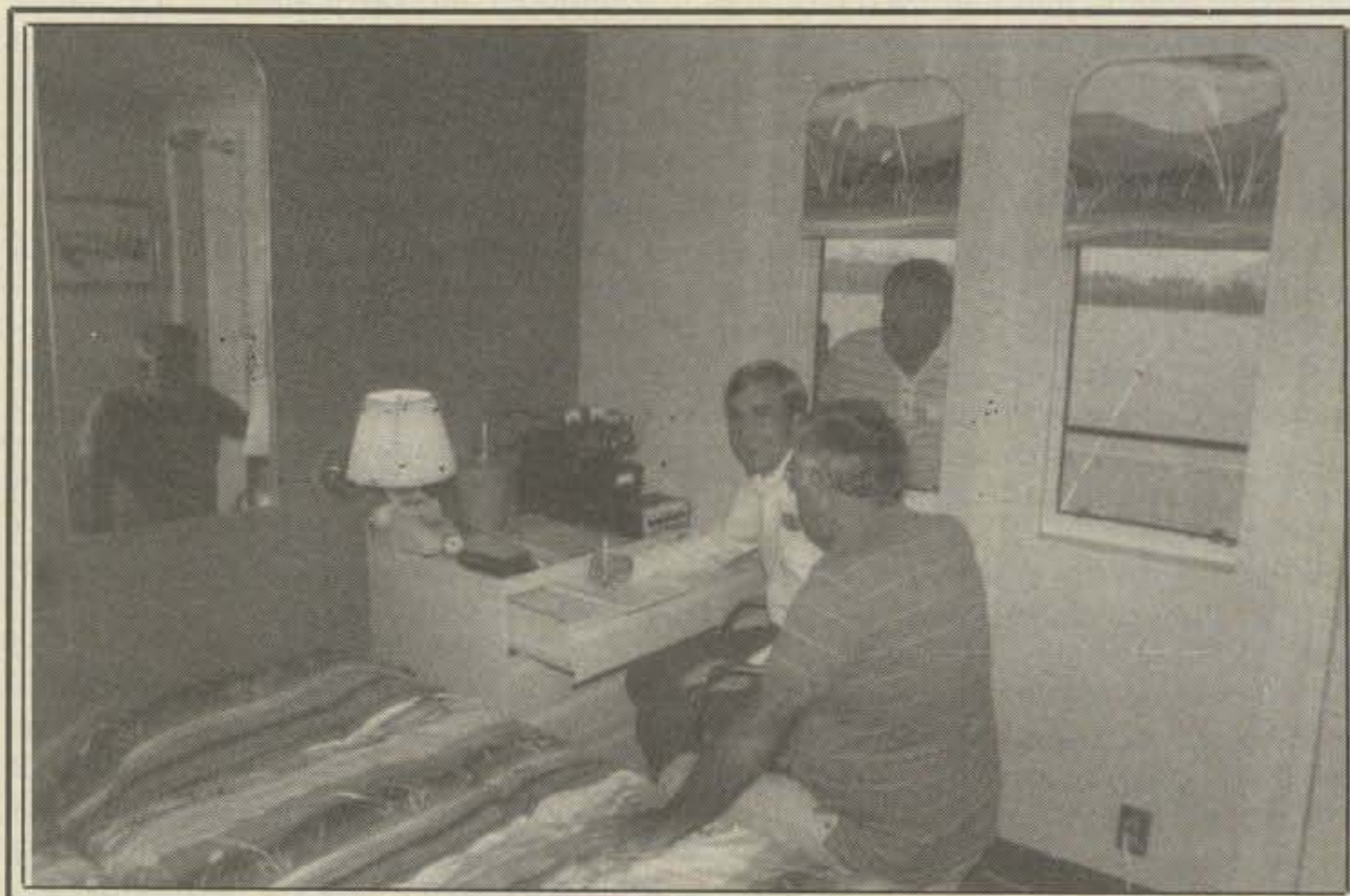
sippi, and his station is equally impressive.

As the visit was coming to an end, Sam's wife, Frances, took an ornament from their Christmas tree and presented it to Cindy as a holiday gift. For Chuck and Cindy, it will be a pleasant remembrance of that day for years to come.

Chuck related this story to another amateur on a repeater further up river, and was told that Sam is well known by hundreds of amateurs for his hospitality and kindness. Sam is the kind of person who represents the best of amateur radio, and it was a pleasure to meet him.

As we departed Natchez we used 2 meters to coordinate 15 meter contact with Sam. Chuck and Wally worked him on SSB, and then I called him on CW for a contact on that mode.

We are pleased to report that Sam, N5AXV, that grand old gentleman of



Chuck Swift, WA3LLZ, takes a turn at operating while Wally Wallace, W3KUX, watches and K3KMO peers in the window listening in.



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Natchez, was the only amateur we contacted on all three modes!

The Unexpected Event

On Thursday, December 12, near the end of the week on the boat, the *Mississippi Queen* had left Baton Rouge for New Orleans. The boat had passed through a thunderstorm and was sailing along in the clear at dusk, going around a horseshoe curve near Donaldsonville, Louisiana. We had just dressed for the Captain's dinner, the big social event of the week, and were attending a pre-dinner party in another passenger's cabin, when (at 5:15 pm CST) we saw that the steamboat was passing a tugboat pushing a tow of 25 grain barges.

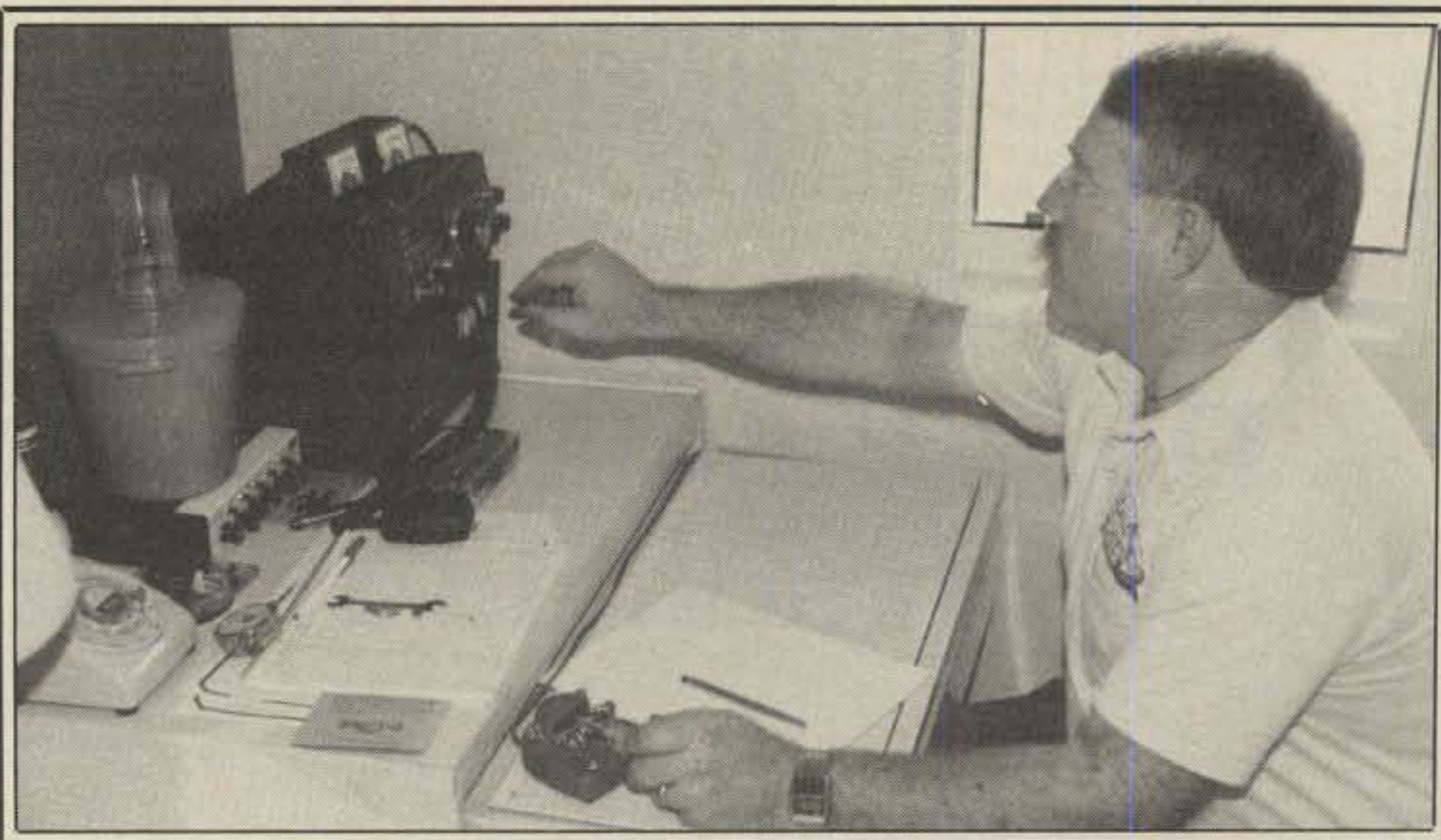
Suddenly, we felt a lurch. The tugboat and the *Mississippi Queen* had collided! The tug's screws, acting like a giant can-opener, tore a hole about 3 feet high and 15 feet long below the waterline on the starboard side and near the stern of the *Mississippi Queen*. The steamboat had been holed in two of its six watertight compartments, and it started taking water at a fast rate.

Within a minute the steamboat's captain had sounded the life-jacket alarm and had sent out the distress call on the VHF marine radio: "MAYDAY MAYDAY. THE MISSISSIPPI QUEEN IS SINKING." All passengers and crew members returned to their cabins and put on their life jackets, as we had done in the life-jacket drill early in the week. The crew then went to their emergency stations, and the passengers assembled in the Grand Saloon to await further instructions.

The members of the two bands on board, Southern Comfort and the Jim Dugan Band, played music to help keep the passengers calm, while waiters served snacks and beverages to the passengers. Comparing notes later, many of us found that we had all been thinking about the same thing—how similar the scene was to the movie about the *Titanic*!

By this time the captain of the *Mississippi Queen* had taken the steamboat away from the shipping channel (over 100 feet deep) to the side of the river, where he grounded it on a sandbar to keep it from sinking. The large boat came to rest on the sandbar with the starboard side of the stern well down in the water. The engine room and electric generators were under water, as were half of the crew quarters and about 15 of the passenger cabins.

After the boat was firmly grounded, the captain gave the command to evacuate the boat. By this time several tugboats that had responded to the distress call were alongside, and they ferried the passengers and crew to the opposite side of the river, where there was a small dock. Pickup trucks carried the evacuees from the dock to the other side of the levee, school buses took us from the levee



The author taking his turn at operating the HF station aboard the *Mississippi Queen*.

to the nearby Houmas House plantation, and a fleet of Greyhound buses transported us from Houmas House to New Orleans. The refugees arrived in New Orleans (50 miles distant) about four hours after the steamboat was hit, a remarkably fast evacuation.

Wally's wife has a heart condition, and she was taken to a nearby hospital as a precaution. She tested all okay and was released later that night, but she and Wally were separated from the rest of us and didn't reach New Orleans until the following day.

Wally and I took our HT's with us when we were evacuated, and we were able to use local repeaters to pass health and welfare messages to the folks back home for ourselves and other passengers. As an example of the value of those messages, my in-laws received the "everyone is all right" message within 20 minutes after they heard of the accident on TV news. Sometimes ham radio works very well! Our special thanks to KD5SL, N5CPE, W5ARU, and WA5RRT for their help with those relays, and to the several other amateurs who quietly stood by for the traffic to be passed. (My sincere apologies to any helping amateurs whose calls are not listed here; we weren't keeping logs while being evacuated from a shipwreck in the rain, and we compiled this list of call signs from memory.)

In New Orleans we were taken to two hotels. Since we had escaped with nothing more than the clothes on our backs, we were each given a small plastic bag with basic toilet items, checked into the hotel, and given dinner. The following day, steamboat company officials made arrangements for airline tickets to be issued to replace all the tickets left behind on the boat, and provided transportation to the airport for us.

The captain, officers, and crew of the

Mississippi Queen performed flawlessly with the amazingly fast evacuation of the vessel. The passengers all stayed calm and did everything asked of them, quietly and smoothly. The river community assembled quickly and worked efficiently in evacuating the steamboat's passengers and crew. The only injuries were minor ones to one passenger and one crewman; those two were taken immediately to a nearby hospital for treatment. A potential disaster was turned into only an inconvenience.

The boat's officers went on board the following day and packed all the passengers' belongings (no small task), which were returned via UPS within the next three weeks. Fortunately, Chuck had already carefully packed the major pieces of amateur equipment before the accident. The only damage and loss of equipment was a cracked plastic meter face on Chuck's VSWR bridge, and the loss of my collapsible $\frac{5}{8}$ -wave whip (small and black, it would have been easily lost, and so it was).

Salvage efforts during the few days following the accident placed a temporary patch on the *Mississippi Queen* so it could be towed to the Avondale ship yard for repairs. This incident was the *Mississippi Queen*'s first major accident, and the only one in her history to require an evacuation. Although the water damage was fairly extensive, the boat was back in service within four months.

Conclusion

The hamming was moderately successful, and we talk of steamboat mobilizing another time. We now have a real river story to tell, full of excitement and high adventure. And when you ask any of us who were on board that night if we would go steamboating again, we will tell you, "Any time!"



CQ REVIEWS:

The Yaesu FT-727R Dual-Band (144 and 440 MHz) Handheld Transceiver

BY LEW McCOY*, W1ICP

The Yaesu FT-727R is a handheld transceiver that covers both VHF (2 meters) and UHF (440 MHz). That sounds like a simple statement, but in truth, the 727 is a rather fantastic piece of equipment. The U.S.A. version covers 144 to 148 MHz and 444 to 450 MHz. There are two power output positions for both bands, either 500 milliwatts or 5 watts. This is with a 12 volt supply. I checked the transceiver with a power output indicator working into a 50 ohm dummy load and found the power specs to be right on the nose.

Before going into details about the transceiver, I feel a few personal observations are in order. Having come up through the era when most gear was homemade, it is impossible for me to take for granted the wonders of present-day equipment. Not too long ago, the main topics of conversation among amateurs were things such as "How much drift does a VFO have?"; or "How much backlash does the tuning show?"; "What is the warm-up time?"; and so on. Microprocessor chips and solid state components have certainly turned things around since those days, and there is no better example than in the Yaesu FT-727R.

The FT-727R

The amount of "radio" built into a cabinet that measures 7½ inches high, 2½ inches wide, and about 1 inch deep is really amazing. I have included photographs and drawings from the instruction manual to give you a rough idea of all the (forgive the expression, but it really applies here) bells and whistles.

For starters, there are 10 preset frequencies available with any mix of VHF and UHF. These can be repeater frequencies or simplex, as desired. All of the presets can be used for split inputs and out-

puts—in other words, VHF input and UHF output, or vice versa.

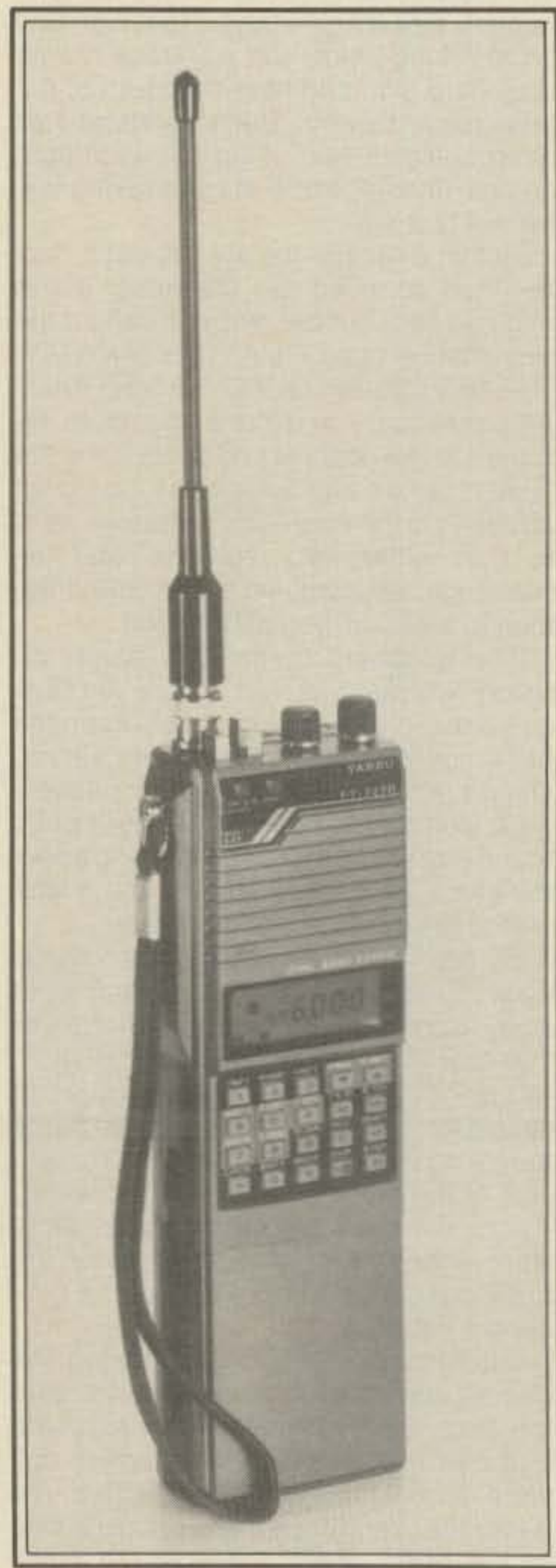
A Multifunction Keypad

There is a multifunction keypad (20 keys!) that is used to control the many functions that are available. Keys one through zero are the numbered keys for entering frequencies, and they also serve as the ten memory storage keys. The following functions are also available via these keys (and the remaining keys). No. 1 is -RPT (for installing the correct offset), No. 2 is SIMPL, No. 3 is +RPT, No. 4 is SAV-T, No. 5 is DEC.T, No. 6 is T-SET, No. 7 is SAVE, No. 8 is T.ENC, No. 9 is SCAN, * is LOCK, 0 is BATT, and # is BEEP. A few of the above functions are self-evident, but others bear explanation. There is a FUNCTION key (which we will designate "F" in our review) located on the upper side of the transceiver, and this must be depressed to activate the additional keypad functions.

The Power-Saver Feature

For example, F+SAVE activates a power saver that provides minimum power drain while waiting for a call. When the SAVE function is activated, the receiver will "sleep" for a preset time, from 1 to 9 seconds between ½ second checks for activity on the preselected channel. The function F+SAV-T provides a visible showing in the liquid-crystal front-panel display of the amount of time at which the power saving is set. Obviously, the POWER SAVER is a valuable feature of the FT-727R.

F+DEC is used to toggle the tone squelch encoder and F+T-SET permits you to set the desired tone from the encoder. Key No. 9 is the F+SCAN, and when it is switched, the word "SCAN" will appear in the upper left corner of the display. There are two more keys to the right of No. 3, and these are up and down arrows. When SCAN is turned on, either of these keys can be depressed and held for



In this view the push-to-talk switch is at the left and the function switch (on the side) at the right.

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

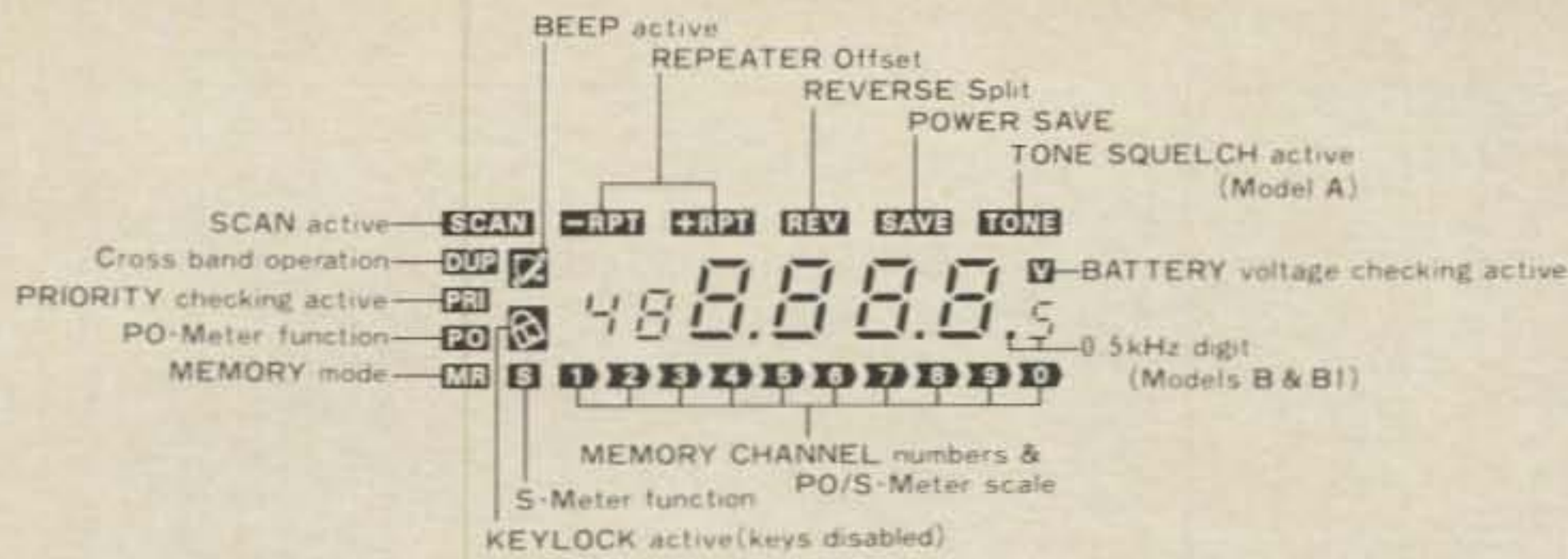


Fig. 1— This is a drawing of the liquid crystal display showing some of the readouts.

half a second and the transceiver will go into a scan mode. One can scan memory channels or "step" scan in increments of 12.5 or 25 kHz on UHF and 5 or 10 kHz on VHF. When scanning, the receiver will pause on a channel when a signal is received strong enough to open the squelch and resume a few seconds after the squelch closes.

Additional "Priority" Memories

I said that there are ten memories, but actually, I found the unit had twelve. The "CALL" channel is a special memory that can instantly be recalled with a single press of "*" key. This is a priority opera-

tion in that the channel stored at the "*" key will take precedence over everything else. You can store both a VHF and UHF channel in the "*" setting.

The "*" key is also used for F + LOCK, and when in this mode, all the keys on the keypad are locked out. This eliminates the nasty error of accidentally bumping a key and losing the channel (another very nice feature). Talking about features, the F + BATT key (No. 0) provides a digital voltmeter reading on the display (accurate to within .5 volt). It is easy to check the battery condition at all times, even under transmit operation. F + BEEP key toggles the audible beep associated with

the various keys when a DTMF tone is sent. (And the FT-727 has a complete set of dial tones including the asterisk and pound sign.)

There is a V/U key for selecting the alternate band, and it is also the F + DUP. The F + DUP is used to set up the transceiver for crossband "semi" duplex operation. This permits the transmission on one band and reception on another.

The D key is used to put the transceiver in the DIAL mode. When in the dial mode, after keying a frequency on the keypad, the D key should be pressed to enter the displayed data and change to a new operating frequency. Earlier I mentioned the step scanning, and the D key is also the F + STEP function which allows the selection of the desired step increments.

The C key is used to clear any wrong data that may be entered. This is also the F + MC key used for clearing undesired memories.

There is a key with left and right pointing arrows, and this is the REVERSE key for instantly changing transmit and receive frequencies such as on a repeater when you want to listen to the input frequency and transmit on the output frequency. This is also the F + SHIFT for changing the repeater offset frequency to any desired value. The M key is used to store frequencies into memory. It is also the F + TX - M key. This is used to store

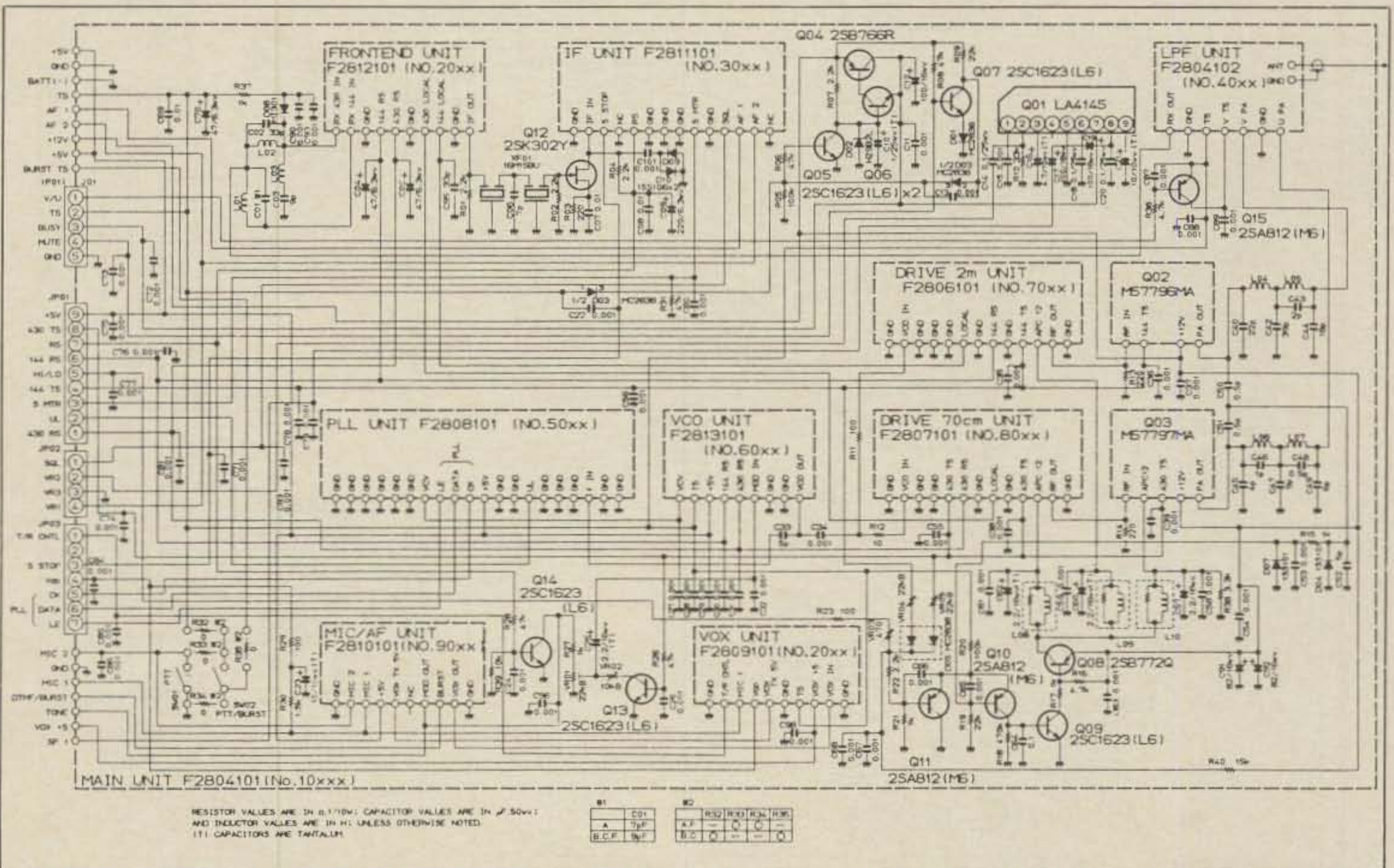


Fig. 2— Partial circuit diagram of the Yaesu FT-727 main unit. I am sorry we can't blow these up to a larger size, but I needed a magnifier to read the original. There are a really large number of components here and in fig. 3. Just imagine how much more complex this unit would be if there weren't ICs and CPUs!

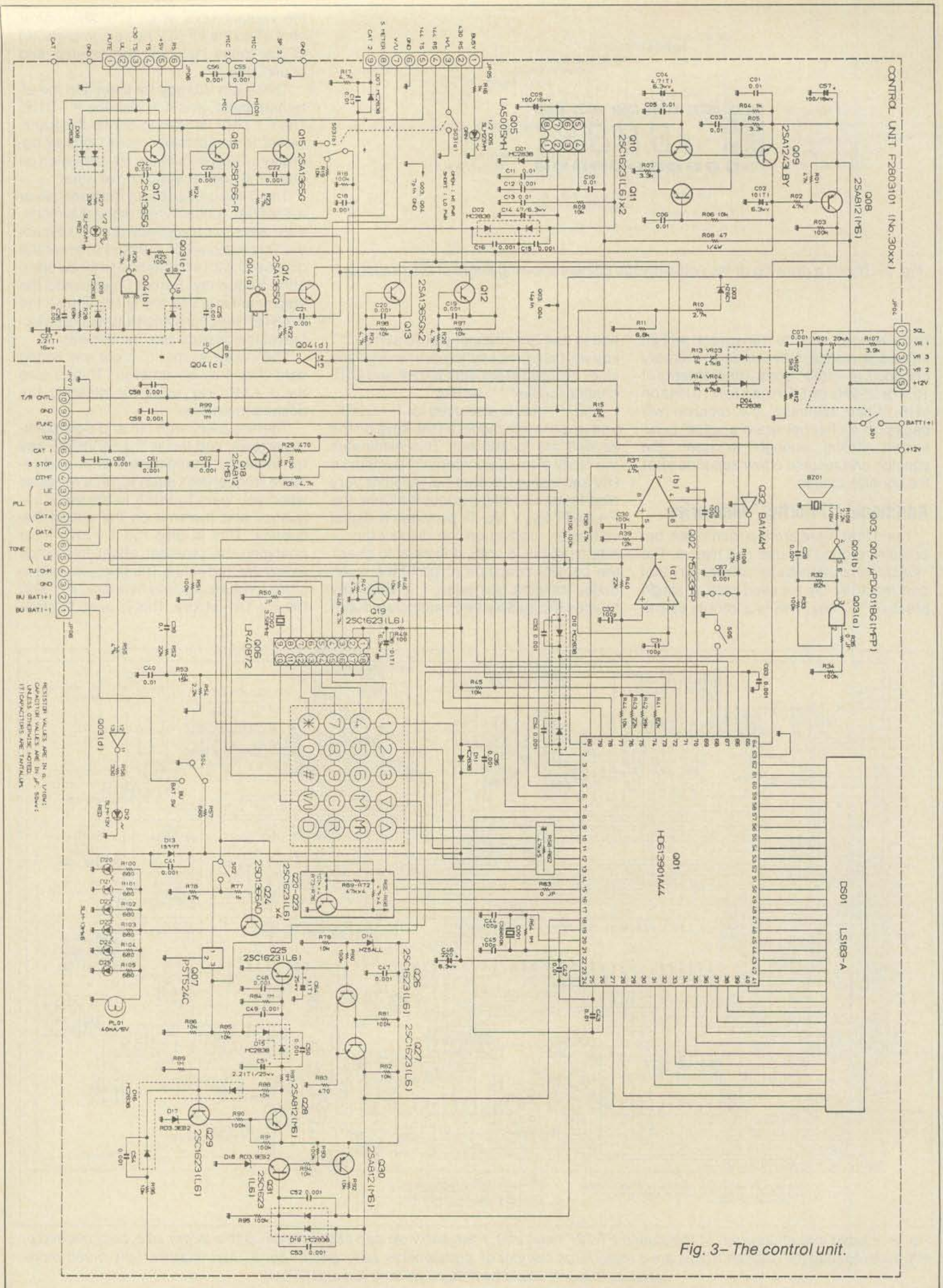


Fig. 3- The control unit.



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FL-32 500 Hz CW filter (1st IF)	66.50	
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IC-28H 45W 2m FM, UP/DN mic		459.00	399 ⁹⁵
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UT-28 Digital code squelch		37.50	
UT-29 Tone squelch decoder		43.00	
HM-16 Speaker/microphone		34.00	
IC-3200A 25W 2m/440 FM w/TTP		599.00	499 ⁹⁵
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AH-32 2m/440 Dual Band antenna		37.00	
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RP-3010 440 MHz, 10W FM, xtal cont.		1229.00	1089
IC-120 1W 1.2 GHz FM Mobile		579.00	499 ⁹⁵
ML-12 1.2 GHz 10W amplifier		379.00	339 ⁹⁵
IC-1271A 10W 1.2 GHz SSB/CW Base		1229.00	1069
AG-1200 Mast mounted preamplifier		105.00	
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TV-1200 ATV interface unit		129.00	119 ⁹⁵
UT-15S CTCSS encoder/decoder		92.00	
RP-1210 1.2 GHz, 10W FM, 99 ch. synth		1479.00	1289



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IC-2AT with TTP		299.00	259 ⁹⁵
IC-3AT 220 MHz, TTP		339.00	299 ⁹⁵
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IC-02AT 2-meters		399.00	329 ⁹⁵
IC-03AT for 220 MHz		449.00	399 ⁹⁵
IC-04AT for 440 MHz		449.00	389 ⁹⁵
IC-u2A 2-meters		299.00	269 ⁹⁵
IC-u2AT with TTP		329.00	289 ⁹⁵

Accessories for u2A/T Call

IC-12AT 1W 1.2GHz FM HT/batt/cgr/TTP	459.00	399 ⁹⁵
A-2 5W PEP synth. aircraft HT	599.00	499 ⁹⁵

Accessories for IC series

		Regular	SALE
BP-7 425mah/13.2V Nicad Pak - use BC-35		74.25	
BP-8 800mah/8.4V Nicad Pak - use BC-35		74.25	
BC-35 Drop in desk charger for all batteries		74.50	
BC-16U Wall charger for BP7/BP8		20.25	
LC-11 Vinyl case for Dlx using BP-3		20.50	
LC-14 Vinyl case for Dlx using BP-7/8		20.50	
LC-02AT Leather case for Dlx models w/BP-7/8		54.50	

Accessories for IC and IC-O series

		Regular	SALE
BP-2 425mah/7.2V Nicad Pak - use BC35		47.00	
BP-3 Extra Std. 250 mah/8.4V Nicad Pak		37.50	
BP-4 Alkaline battery case		15.25	
BP-5 425mah/10.8V Nicad Pak - use BC35		58.50	
CA-5 5/8-wave telescoping 2m antenna		18.95	
FA-2 Extra 2m flexible antenna		11.50	
CP-1 Cig. lighter plug/cord for BP3 or Dlx		13.00	
CP-10 Battery separation cable w/clip		22.50	
DC-1 DC operation pak for standard models		23.25	
EX-390 Bottom slide cap		5.50	
MB-16D Mobile mtg. bkt for all HTs		24.50	
LC-2AT Leather case for standard models		54.50	
RB-1 Vinyl waterproof radio bag		34.95	
HH-SS Handheld shoulder strap		16.95	
HM-9 Speaker microphone		47.00	
HS-10 Boom microphone/headset		23.25	
HS-10SA Vox unit for HS-10 & Deluxe only		23.25	
HS-10SB PTT unit for HS-10		23.25	
ML-1 2m 2.3w in/10w out amplifier		SALE 99.95	
SS-32M Commspec 32-tone encoder		29.95	

Receivers

		Regular	SALE
R-71A 100 kHz-30 MHz, 117V AC		\$949.00	799 ⁹⁵
RC-11 Infrared remote controller		67.25	
FL-32 500 Hz CW filter		66.50	
FL-63 250 Hz CW filter (1st IF)		54.50	
FL-44A SSB filter (2nd IF)		178.00	159 ⁹⁵
EX-257 FM unit		42.50	
EX-310 Voice synthesizer		46.00	
CR-64 High stability oscillator xtal		63.00	
SP-3 External speaker		61.00	
CK-70 (EX-299) 12V DC option		12.25	
MB-12 Mobile mount		24.50	
R-7000 25 MHz-2 GHz scanning rcvr		1099.00	969 ⁹⁵
RC-12 Infrared remote controller		67.25	
EX-310 Voice synthesizer		46.00	
TV-R7000 ATV unit		131.95	119 ⁹⁵
AH-7000 Radiating antenna		89.95	(13)

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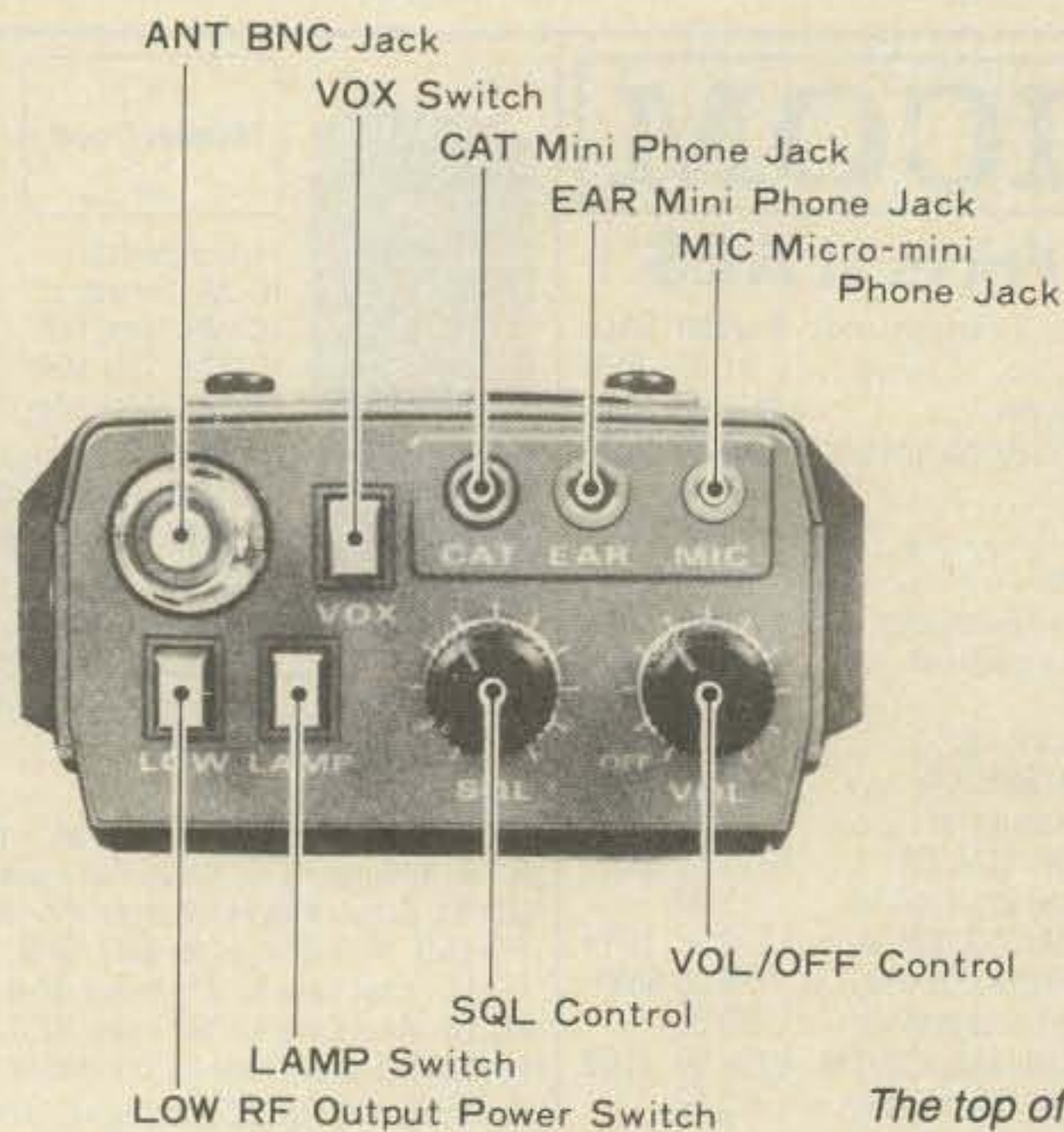
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The top of the FT-727R.

CAT three-contact miniature jack. The center contact outputs a 1-byte digitized indication of received signal strength for external processing by an external computer or controller. The middle ring contact accepts control command input from an external computer (corresponding to the key functions on the transceiver). The outermost contact of the jack provides 12 VC from the battery (another jack, the EAR, is used for a DC ground). Digital data is transferred at 4800 bits/s, with inverted (positive) start bit, 8 data bits, and 2 inverted stop bits. The other two jacks are EAR and MIC. These can be used with an external speaker/microphone (accessory).

The Liquid Crystal Display

Fig. 1 is the liquid crystal display with most of the functions shown. Items such as battery voltage, squelch tone settings, and so forth will appear at the right when brought up via their respective keys.

Operating Observations

At the outset, let me say that I was extremely impressed by the performance of the FT-727R. Audio quality is excellent on both transmit and receive. I found that the transceiver met or exceeded manufacturer's specs. I'll admit it was a little frus-

the transmit frequencies for dual-band operation. The MR key is memory recall, and it is also the F = S/CH; this is used to turn on the display to show memory number in use.

The scan up arrow key is also F + PMS. This is a programmable scan function key and provides limited band scanning (1 to 99 steps) upward from the dial frequency.

Step size can also be preset. This is accomplished via the F + P - SET, which is the last of the keys.

The top of the FT-727 has the usual ON/OFF/VOLUME and the SQUELCH control. Also on the top is the HIGH/LOW power switch and the lamp switch. The lamp illuminates the LED display. There are three jacks on the top. The first is the

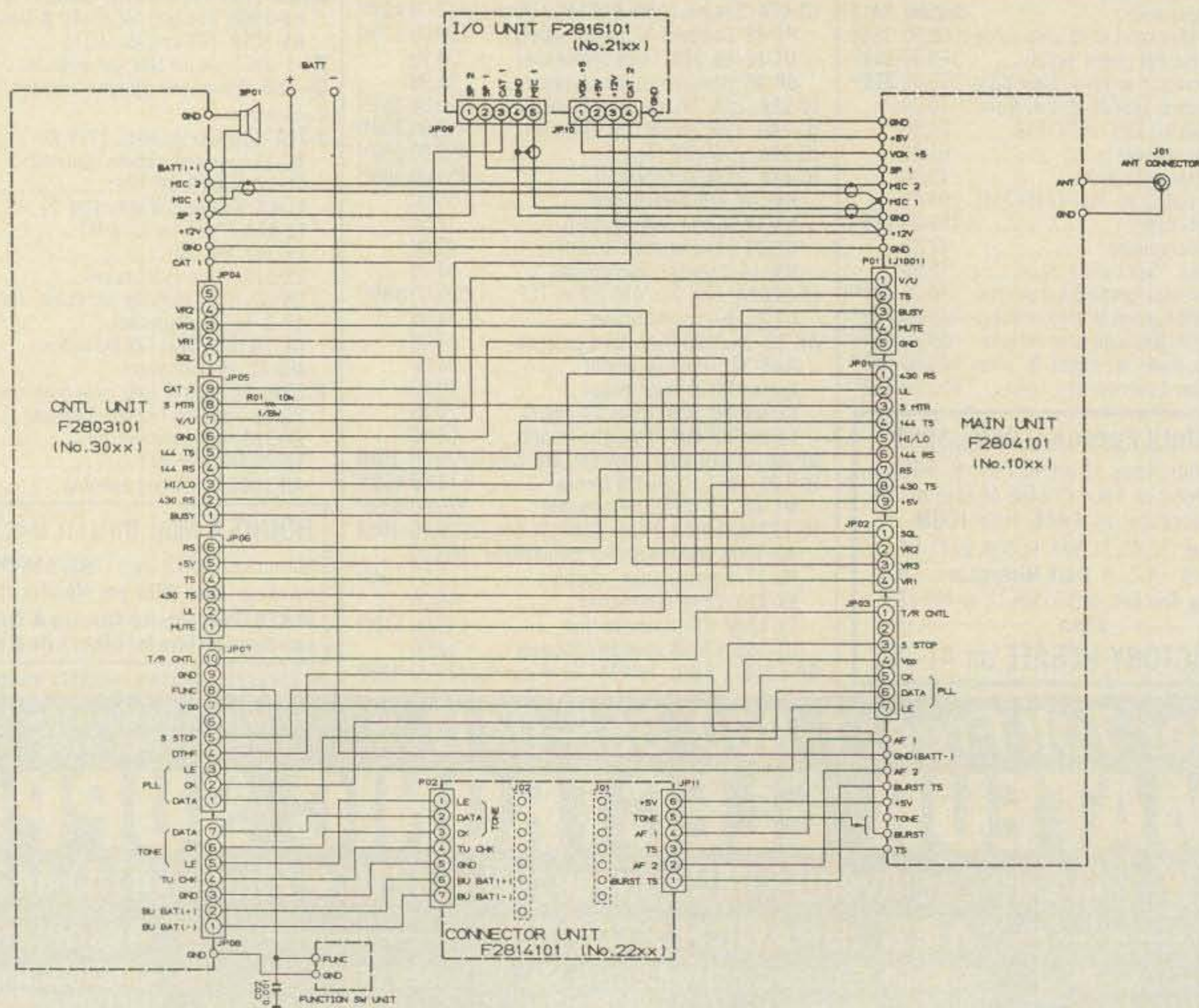


Fig. 4—Connection diagram.


trating becoming familiar with all the controls, but once mastered, using the unit is a piece of cake. I have talked to other amateurs using the FT-727 and almost without exception they were more than pleased. There was one amateur who liked his FT-727 but his complaint had to do with the earliest model of the transceiver. These earlier units only had the ability to set up four of the memory channels for dual-band (VHF/UHF) operation. As I mentioned earlier, all ten keys or channels are now available for that type of operation. The modification for updating the 727, which requires a different CPU, is available from Yaesu for a slight charge (\$30).

There is one other point that should be touched on—two-band operation with a handheld. I have had considerable experience with repeater operation all around the country, but mostly in the east, and repeater and remote base operation for the last ten years here in the west. All one needs to do is to look at the latest *ARRL Repeater Directory*, which contains well over 10,000 repeater listings! A good portion of these listings are 450 machines. I should also point out that the book doesn't list most of the remote base frequencies (which are closed systems but coordinated frequencies). I belong to a remote base group here in New Mexico and Arizona, which, in turn, is tied to a rather overwhelming system that covers the West Coast. The FT-727R is just about ideal for this type of operation, and to be honest, I haven't had this much fun in amateur radio in a long time. My point is a simple one: Many of us operate both 2 meters and 450 MHz, and it is a whole lot easier using and carrying a single handheld rather than two with all the paraphernalia required. This is a very big plus for the FT-727R.


The 727 comes with a dual-band antenna which is about a quarter-wavelength long on 450. It apparently uses base loading on 2 meters to achieve a quarter wave on that band. Frankly, this is far from the world's greatest antenna, but it is no worse than most rubber-ducky types. I substituted an Austin dual-band whip (see the review in this issue), and the difference was outstanding, to put it mildly.

Accessories

The battery pack is a slide-on type, and the transceiver comes with the FNB-4A, which is a 12.5, 500 maH nickel-cadmium pack. A slightly smaller pack, 450 maH nickel-cadmium, is available. A headset with microphone for VOX operation is another nice accessory. Extra accessories include an external microphone/speaker, a mobile charger, a quick charger, and DC supply, the NC-15. These and other accessories are shown in the manual.

The FT-727R lists at \$499 and is manufactured by Yaesu Musen Co., Ltd., USA distributor Yaesu USA, 17210 Edwards Rd., Cerritos, CA 90701 (213-404-2700). 

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CIRCLE 33 ON READER SERVICE CARD

The Third Annual CQ World-Wide VHF WPX Contest

Starts: 0000 UTC Saturday, July 18, 1987
Ends: 2400 UTC Sunday, July 19, 1987

I. Contest Period: 48 hours for all stations, single or multi-operator. Operate any portion of the contest period you wish.

II. Objectives: The objectives of this contest are for amateurs around the world to contact as many amateurs as possible in the allotted 48-hour period, to promote VHF/UHF activity, and to allow VHFers the opportunity to experience the enhanced propagation available at this time of year, and for interested amateurs to collect VHF prefixes for award credit.

III. Bands: The 50, 70, 144, 220, 432, 902, and 1296 MHz bands may be used, as authorized by local law and license class.

IV. Type of Competition: 1. Single operator—(a) all band; (b) single band; (c) all band, low power; (d) single band, low power. 2. Multi-operator—(a) all band; (b) single band. 3. Portable (with temporary power source only). 4. FM only. The "portable" category is for single or multi-operator stations. Low power is defined as 30 watts PEP output or less. Stations may select one category of competition only. All transmitters must be located within a 500 meter diameter, or within the property limits of the station licensee's address, whichever is greater. The antennas must be physically connected by wires to the transmitters.

V. Exchange: Callsign and "Maidenhead" locator grid square (4 digits, e.g., FN20). Signal reports are optional and need not be included in the log entry.

VI. Scoring: One point per QSO on 50, 70, and 144 MHz; 2 points per QSO on 220 and 432 MHz; 4 points per QSO on 902 and 1296 MHz. Work stations once per band, regardless of mode. Multiply total QSO points times the **total** number of prefixes (PX) worked. This differs from the scoring for the CQ HF WW WPX Contest, where a prefix counts only once regardless of band.

Example: W1XX works stations as follows:



The coveted CQ WW VHF WPX Trophy is a valued addition to any hamshack. Why not enter the '87 contest and try for one?

37 QSO's and 12 PX's on 50 MHz
45 QSO's and 18 PX's on 144 MHz
26 QSO's and 10 PX's on 220 MHz
38 QSO's and 11 PX's on 432 MHz
6 QSO's and 3 PX's on 1296 MHz
W1XX's total score is: 234 QSO points ×
54 PX's = 12636.

VII. Multipliers: The multiplier is the number of prefixes worked, additive on a band-to-band basis. A prefix is considered to be the three letter/number combination which forms the first part of an amateur radio callsign (N1, W2, WB3, K4, AA6, WD8, 4X4, DL7, G3, IT9, NP2, PY7, VK4, Y32, Y33, KT4, JE3, etc.). **A station in a call area different from that indicated by his callsign is required to sign portable.** This applies even for home stations (e.g., WB2OTK has a licensed station location in SC, but is required to sign /4 for contest purposes only. In all cases, the portable

prefix is the multiplier. **Example:** NV60/2 counts as NV2; KT2B/VE3 counts as VE3; KR2Q/C6A counts as C6A; 4X4FN/W2 counts as W2. **Special-event, commemorative, and other unique prefix stations are encouraged to participate.** A station who changes location during the course of the contest is free to contact as many other stations as he wishes; however, the moving station counts as only one QSO and PX **unless he changes call areas** during the course of operations, in which case his prefix changes by definition, thus becoming a new QSO and PX.

Example: K2SMN operates from the NJ/PA border; he may be counted as K2SMN for one QSO and one PX (K2) by all those he contacts from NJ. He may be counted as K2SMN/3 for one QSO and one PX (K3) by all those he contacts from PA, including stations previously worked from NJ. Changing "grid squares" does not justify a new contact.

VIII. Awards: Engraved trophies will be awarded to the top-scoring stations in each category and major geographic area where competition is indicated. Parchment certificates suitable for framing will be awarded to the top-scoring stations in each category and minor geographic area where competition is indicated. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Major geographic areas include North America, Europe, and Japan as of this writing, but may be extended to include other areas as justified by competitive entries. Minor geographic areas include states (U.S.), provinces (Canada), countries (Europe), and call areas (Japan), and may also be extended to include other subdivisions as justified by competitive entries.

Logs must be postmarked no later than August 31, 1987 to be eligible for awards. Logs should be mailed to the CQ VHF WPX Contest, c/o S.C.O.R.E., P.O. Box 1161, Denville, NJ 07834, or to CQ Magazine, 76 N. Broadway, Hicksville, NY 11801.

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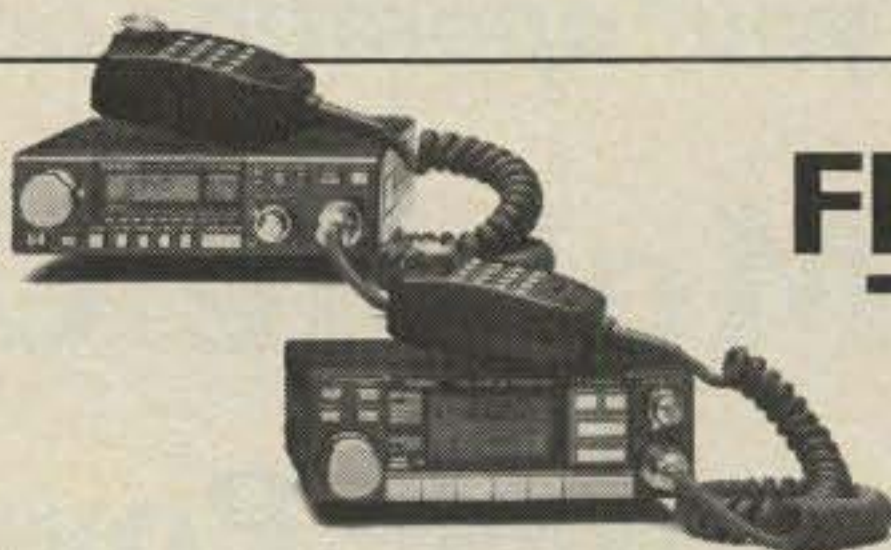
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Get out with 5 watts on 2 meters, or 4½ watts on 440 MHz. There's a battery saver for extended monitoring. Microprocessor-based functions offer 10 memories for

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FT-727R is a completely self-contained VHF and UHF FM hand portable transceiver providing up to 5W or 0.5W RF output on user-selectable channel steps across both 2m and 70cm amateur bands.



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"Mini-handly". Odd splits on 7 memories, standard splits on all 10. Six digit frequency display, plus memory channel, CTCSS information,

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The Mobile One

A Ubiquitous Base Power Supply

BY DAVID F. PLANT*, NA7K

Getting a few amps of well-filtered DC into the ham shack can be extremely useful for powering mobile rigs in fixed-station use. This double-duty use of equipment can represent quite a savings, but the catch is that the typical transceiver needs extremely well-filtered DC and it wants it at 13+ volts under varying load conditions.

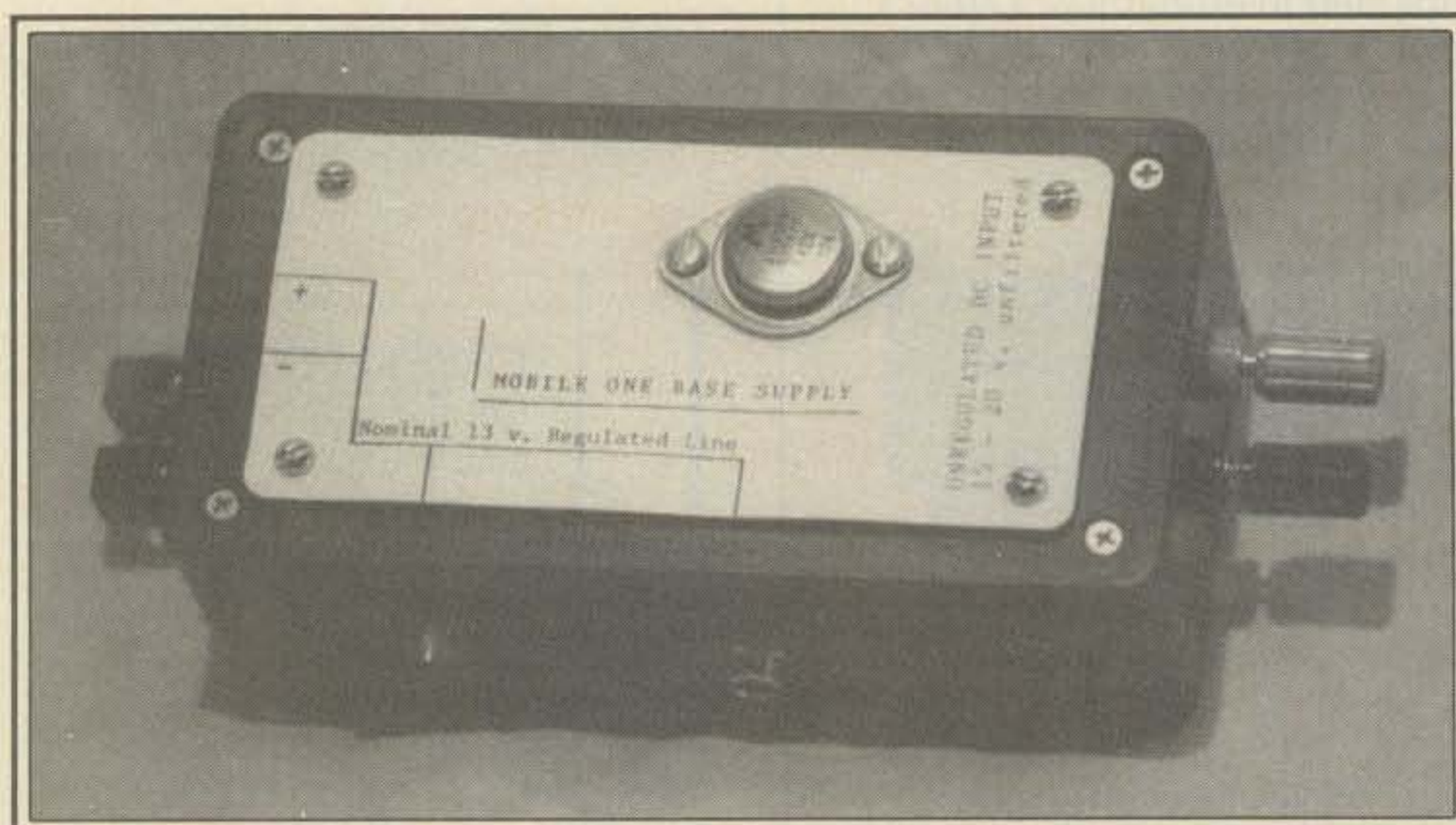
Off-the-shelf IC regulators can be obtained, but their standard voltages are typically 12 volts, and they carry a rating of an amp or less. A typical 2 meter transceiver running 5 watts needs at least 2 amps at 13.5 volts to transmit and keep its various LEDs, etc., lit.

The other part of the problem is how to find a 4 or 5 amp transformer at enough voltage to regulate down to the nominal 13 or so volts required for storage battery gear. The answer—a 4 amp battery charger found in the garage and a handful of parts bought at the local parts emporium.

Automobile Battery Chargers

Fig. 1 shows the circuit of a battery charger used at NA7K. Having pulled two apart recently, I found each to use a full-wave 120 Hz configuration with an ammeter and circuit breaker (CB) in series with one output lead. Neither charger uses any capacitor filtering, which is consistent with findings that pulsing DC does the best job in charging secondary batteries such as wet and gel cells, and nickel cadmiums.

The full-wave circuit makes filtering easier than the typical half-wave configuration usually associated with nickel-cadmium chargers. The output voltage was also found to be higher under load than half-wave. This is mentioned, as some



The completed Mobile One power supply. The heat sink is constructed from spare aluminum stock and covered with a paper label. Three outputs are provided from the battery charger input at the unit's right side.

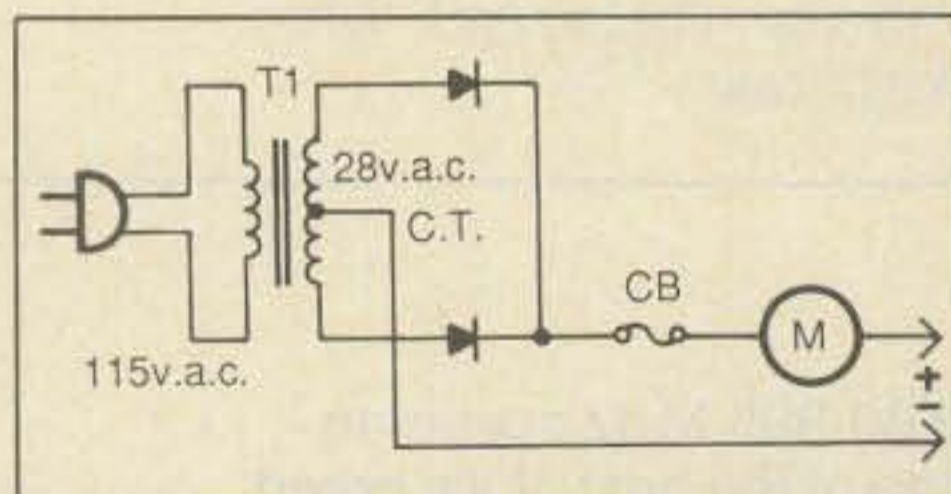


Fig. 1—The circuit for a full-wave battery charger. CB is a bi-metallic circuit breaker and M is a 6 amp meter.

builders may wish to construct the power supply with their own power transformer and not tie up a battery charger. This approach will yield a completely self-contained lab-quality power supply that can provide not only power to two-way gear, but useful voltage for other projects as well.

For those of you technically curious,

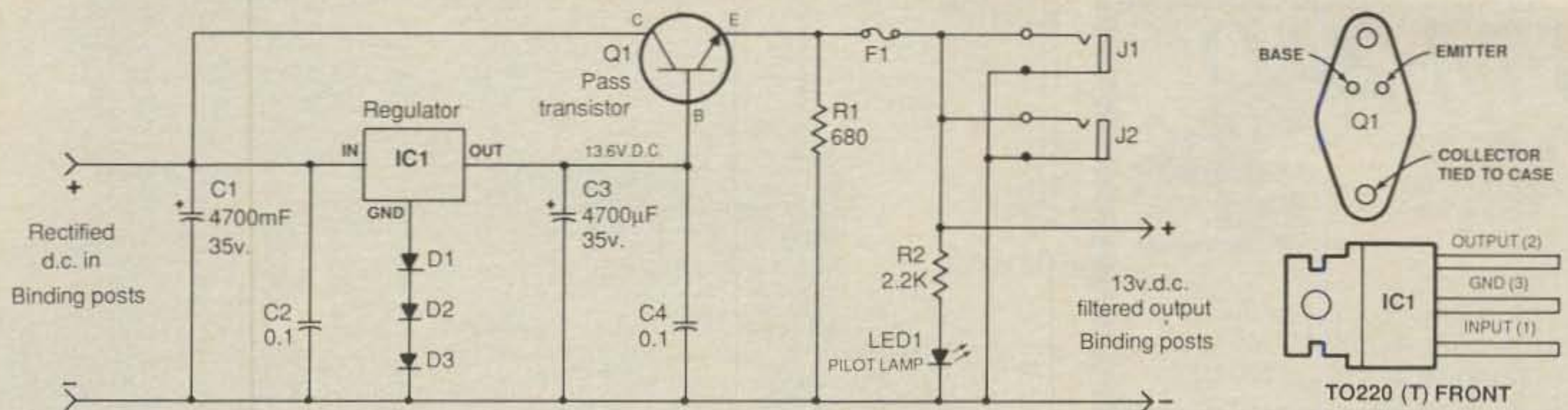
the raw charger output showed a 4 volt ripple centered at 18 volts under a load of 750 ma, as measured on a calibrated DC scope.

I strongly recommend a fuse in the primary circuit if you build with your own transformer. Incidentally, the bi-metallic circuit breaker found in commercial chargers is next to useless with electronic gear. Not only are they slow (fine for storage battery charging), but they will kick back in when they cool. I noticed this phenomenon when a shorted pass transistor drove a heat sink into a quickly melting plastic box.

The Circuit

Referring to fig. 2, the box consists of two active sections—a fixed voltage regulator, and an emitter follower pass transistor to amplify the drive from the regulator. With two exceptions, the circuit is off-the-shelf conventional and the compo-

*1822 9th St. West, Kirkland, WA 98033



Parts List

IC1: 7812 12 v regulator
 Q1: 2N3055 NPN power transistor, or equivalent
 C1, C3: 4700 mFd, 35 v electrolytic
 C2, C4: .1 mFd, 50 v disk capacitor

D1, 2, 3: IN4001 one amp, 50 volt silicon diode, or equivalent
 F1: 4 amp fuse and holder
 R1: 680 ohm, 1/2 watt resistor
 Misc.: Binding posts and output jacks; container and heat sink
 Optional: LED1 typical mounted LED; R2—2.2K at 1/4 watt

Fig. 2—Schematic diagram for the Mobile One power supply. Most, if not all, of the parts can be found at your local Radio Shack.

nents can be purchased at Radio Shack with a 15 minute buying spree of \$12.

The first unconventional thing done was the addition of a diode string in the ground lead of the 7812 regulator. This brings the entire system up the equivalent of three diode voltage drops of .6 volts each. One of these drops gets chewed up by the 2N3055 base emitter drop, and the other two contribute roughly 1.2 volts to bring supply output to 13+ volts. This was done because mobile equipment really appreciates the last 10 percent over 12 volts. Point of fact here was an ICOM 25A transceiver that went from a Bird wattmeter reading of 2 watts to 6 watts by moving the power supply from 12 to 13.2 volts.

The other thing done, possibly off the beaten track, was the addition of a filter capacitor (C3) from the pass transistor (Q1) base to ground. This is a trick known as electronic filtering, because the value of the capacitive filtering is theoretically multiplied by the gain of the active device involved.

As the project evolved with on-the-air testing, .1 disks were also added (C2, C4) across the filter caps to remove RF that entered the plastic box when the transmitting antenna was in close proximity to the supply. These disk capacitors should be included, as the loop gain of the regulator is quite high.

The rest of the circuit is conventional power supply with R1 serving as a bleeder. The pilot lamp, LED 1, was placed after the fuse to act double duty as a blown fuse indicator.

Construction

Building is straightforward, and as there is no audio or RF involved, layout is not critical. My unit fit nicely into a stock Radio Shack blue plastic box measuring 6" x 3" x 2" with plenty of room. I found no need for terminal strips, as the com-

ponents seemed to find places to attach themselves.

The pass transistor is the one thing that may deserve attention. The device will run slightly warm under extended use and should have heat sinking such as shown in my two units. Using an auto brake-lamp as a 4 amp load, the pass transistor did feel warm to the touch after

an hour's burn in. Obviously, this is a worse-case situation.

At NA7K the heat sinks were made from aluminum covers stolen from plastic boxes. The sheets were spaced off the Mobile One housing by standoffs, and Q1 was directly bolted to the material. The collector of Q1 is hot to charger-input-plus, and could short to ground.

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

*ICS - Intermittent Communications Service (50% Duty Cycle)

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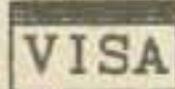
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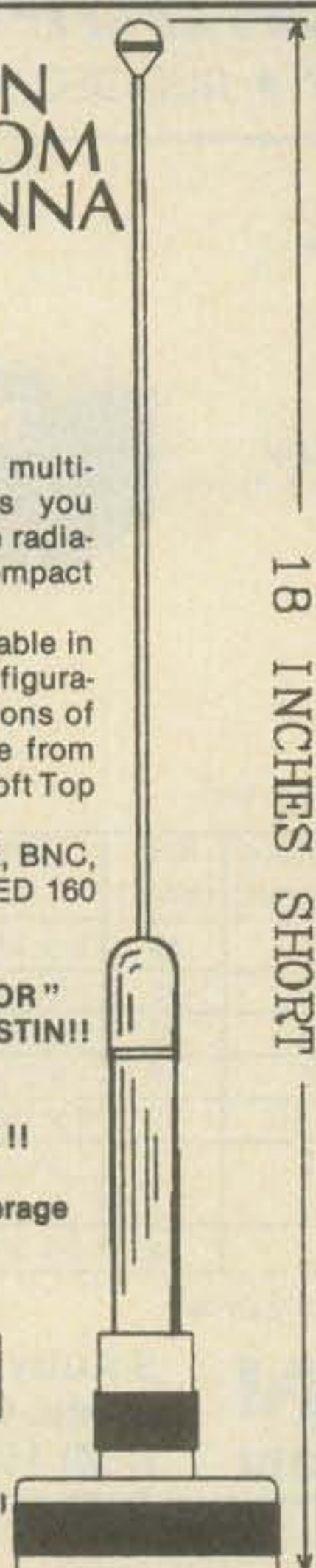
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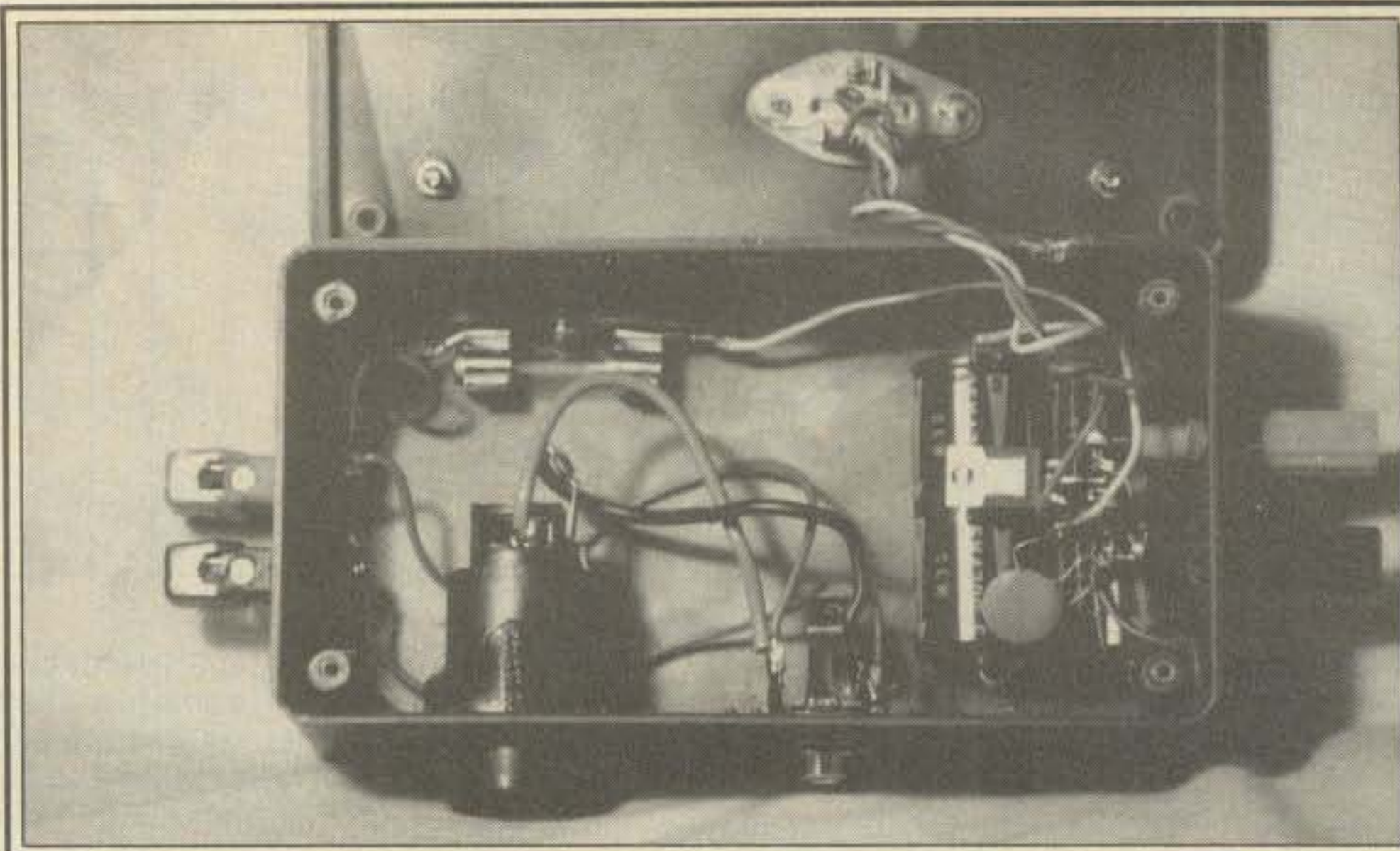
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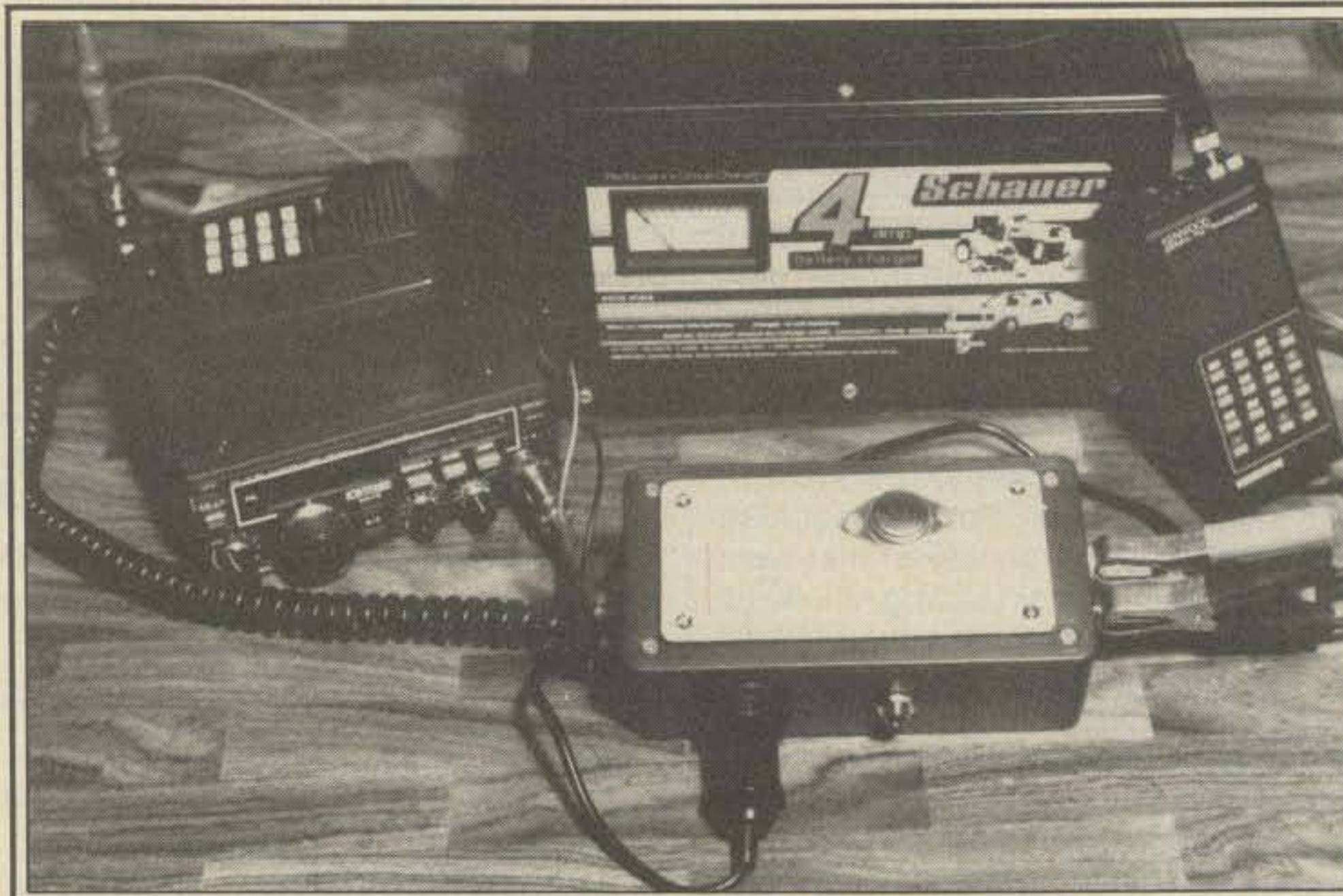
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Closeup of the unit's interior. The fuse could be a chassis mount, if desired. The important thing is to include it. The 7812 regulator is centered over filter C3. The majority of components are supported by their own leads.



The Mobile One shown here powering an ICOM 2 meter rig on the left and a Kenwood 220 handie-talkie on the right. This is the actual setup used by the author while a new house was being built.

Load	Ripple	Voltage
No load	5 mv	13.3 v
500 ma	15 mv	13.2 v
3 amps	20 mv	13.15 v

Table 1- Typical characteristics for the Mobile One power supply.

If your application is such that the supply may be able to contact ground, you may look to insulating the transistor case. In the six or so units built in Seattle, the problem never came up.

The jacks used to apply power to and get power from the project are strictly a matter of your individual standard. I chose 1/4 inch phono jacks as a standard

in a previous project (Utility Box, CQ, July 1984) and stayed with them here. The lighter socket was added to plug in a commercial DC-to-DC converter for hand-held, and the push-type posts allow flexibility for various experiments.

Obviously, the unit could be built into any available enclosure. Be sure to insulate the pass transistor if you use metal, however. Remember that Q1's case is input high.

Performance

The project, as it evolved, does rather an amazing job in my opinion. Table 1 reflects output characteristics under three different load conditions, and they compare favorably to lab supplies costing a great deal more.



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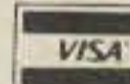
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The concluding part of this four-part series takes us through using bulletin boards and discusses the exciting future of packet radio and where it's going.

An Amateur Radio Packet Primer

Part IV – Bulletin Board Operation

BY JONATHAN L. MAYO*, KR3T

This is the final article in a four-article series on amateur packet radio. The first article, published in the November 1986 issue, provided an introduction to packet radio's capabilities and digital communications in general. The second article covered the Terminal Node Controller (TNC) and the other components of a packet station. Last month's article described the particulars involved in operating packet radio. This article discusses bulletin board operation and the future of amateur packet radio.

Portions of the articles have been excerpted from my book *The Packet Radio Handbook* published by TAB Books, Inc. in January 1987. The book is featured in TAB's current trade catalog, and the cost is \$14.95. If all goes according to schedule, the book should be available by the time you receive this issue. For more information, write to TAB at P.O. Box 40, Blue Ridge Summit, PA 17214.

Bulletin Board Operation

Bulletin boards allow for non-real-time operations. It is possible for two users to access a **BBS** (Bulletin Board System) at different times and still transfer information. All bulletin boards provide for some form of message storage. A user may connect to the BBS and send a message to be stored on the BBS. Another user may then connect to the BBS later and read the message. Once a message is stored on a BBS it can usually be read an unlimited number of times. Thus, bulletin boards are an excellent method for sending messages to a large number of users.

Just as the TAPR TNCs have become the *de facto* standard for design and user interfaces, one bulletin board system has emerged as the standard in amateur packet radio. This BBS was developed by Hank Oredson, WØRLI, and is in use worldwide.

The first WØRLI BBS (or mailbox) went on the air in February 1984 in Massachusetts and has been spreading ever since. Hank's first BBS was modeled after an electronic message system that he had developed while working for Sperry Corporation. The system has been heavily modified over the years by Hank in response to comments and suggestions by users.

The original WØRLI BBS ran on an IMSAI system but was ported over to a Xerox 820 CP/M machine in March 1984. The basic WØRLI configuration consists of a Xerox 820 computer board with keyboard, a monitor, one or two disk drives, and one or two TNCs with radios. The WØRLI system has been under constant development since it was first brought out in 1984. Starting at Version 2.0, it has progressed into a final form at Version 11.6. Although Hank expects to continue to make minor revisions, he is finished with all hardcore modifications at this time.

The WØRLI system has been ported to many other computer systems besides the Xerox 820 with a high degree of compatibility. These "WØRLI clones" include an IBM-PC version written in Pascal by WA7MBL, a Commodore 64 version by WB4APR (not completely compatible), an OS-9 version by VE3FXI, a DEC Rainbow version written in Pascal by AK1A, and a version for the DEC PDP-11 by KA1T. Versions of the WØRLI system have also been written for the TRS-80 Model 100 and Kaypro computers.

The WØRLI BBS features a message system whereby messages can be stored on the BBS for retrieval by other users or forwarded to other WØRLI compatible BBSs. There are files available for downloading such as general information (i.e., user lists and newsletters) and computer programs. On many WØRLI BBSs there is available a provision, known as a **gateway**, for linking to other frequencies through the BBS. Also included are a frequency activity monitor and a message beacon which lists those stations who have messages waiting for them on the BBS.

To use a WØRLI BBS just connect to the station as if it were a regular user station. Connecting through digipeaters is fine, although some BBS owners (known as **SYSOP's** for **SYSTEM OPERATOR**) have imposed a limit on the number of digipeaters that may be used. The Sysop's callsign is usually the callsign of the BBS.

A short time after your station receives the connect acknowledgement from the BBS station, an opening message will appear. The opening message usually gives the station's call, the Sysop's name, and the station's location. At the end of the opening message will appear a prompt which usually includes your call, the date and time, and sometimes an abbreviated list of available commands. The prompt

always ends with a **>** sign. The prompt will appear at the end of each BBS operation and indicates the BBS is waiting for you to send a command.

There are available many commands that are used to control the BBS. All commands are composed of a single letter, although many can be expanded further by the addition of another delimiter character which restricts the range of the command. The commands can be broken down into groups by the BBS function they control.

Mail System

The first group of commands covered is used to interact with the message (or mail) system, the most heavily used part of the BBS. Messages are sent to specified users by call-sign. The user's call is automatically entered as the originating, or **FROM**, station. A BBS station can be specified to forward the message to.

The first mail command most new users like to try is **L**. The **L** command instructs the BBS to send the user a listing of all the new messages added since he last logged onto the system. The format of the listing is as follows: message number, message status, message size, FROM call, TO call, BBS call, date sent, and message title (see fig. 1).

All messages are numbered sequentially, and that number is the message number. The message status indicates the message type and whether it has been read by the recipient. There are several types of messages including bulletins, private messages, and traffic.

Bulletins (indicated by a message type **B**) are messages meant to be read by all who log onto the system. These include items for sale, upcoming events, system changes, and other news. Private messages (indicated by a message type **P**) are meant to be read only by the sender and recipient. They will not show up on a message listing to anyone other than the sender, the recipient, and the Sysop; however, when sending or receiving private messages, they may be monitored by other users. Traffic includes any messages meant to be forwarded by the **National Traffic System (NTS)**. They are indicated by message type **T** and are usually read by a local traffic operator and then entered into the traffic net on some other mode, as packet is not yet fully utilized by the NTS. Regular messages may be listed and read by

*1817 Saratoga Court, Allentown, PA 18104

Msg#	TR	Size	To	From	@ BBS	Date	Title
125	N	126	K3XYZ	KB2AC		861120	Listing Msgs
124	BN	241	ALL	KR3T	WA3ABC	861120	TNC for sale
123	AN	567	ALL	W1AW	WA3ABC	861119	W1AW Bulletin
122	PY	1248	KR3T	AA3F		861119	Hi Jon
120	Y	125	KB2AC	K3XYZ		861118	Messages

Fig. 1—A sample message listing from a BBS. The TR heading indicates message Type and if the message has been Received. See the text for a complete explanation.

all users. The message type for regular messages is left blank.

The indicator as to whether the message has been read by the intended recipient shows an **N** if it has not been read by the intended recipient and a **Y** if it has. The indicator will not change if someone other than the intended recipient has read the message.

The message size consists of a number indicating the length of the message in bytes. The FROM call indicates the station that stored the message on the BBS. The TO call indicates the callsign of the intended recipient of the message. The BBS call is the callsign of the W0RLI compatible BBS that the message is to be forwarded to. The date gives the date that the message was stored on the BBS. The message title is entered by the user who sent the message.

The **L** command will also accept several delimiters and arguments to allow users to selectively list messages. The addition of a **B** after the **L** restricts the listing to all the bulletin-type messages stored on the system (i.e., **LB**—List Bulletins). By typing an **M** rather than a **B** after the **L**, the system will list all the messages either sent by or for him (i.e., **LM**—List Mine).

The remainder of the list commands require the addition of an argument after the one- or two-letter command. The addition of a second **L**, a space, and a number (i.e., **LL 4**) causes the system to send a listing of the last specified number messages (except private messages not to or from the user) starting at the latest message and working backwards.

The **L** command, a space, and a message number will cause the BBS to send a listing of all messages stored on the BBS starting with the message number specified up to the last message number (i.e., **L 1000**). The **L** command with a **<** character, a space, and a callsign will cause the BBS to send a listing of all messages from the specified callsign (i.e., **L < KR3T**); the private message restriction applies here and in the following examples also. The **L** with a **>** character, a space, and a callsign causes the BBS to send a listing of all messages addressed to the specified callsign (i.e., **L > KR3T**). The **L** command with an **@** character, a space, and a BBS callsign will cause the BBS to send a listing of all messages with the specified BBS callsign entered by the sender for forwarding (i.e., **L @ W0RLI**).

The eight list commands mentioned above (**L**, **LL #**, **L #**, **LB**, **LM**, **L <** call, **L >** call, and **L @** BBS call) are very useful, and being familiar with them can help reduce the time needed to find a particular message out of the several hundred normally stored on a BBS. Notice that the command and delimiter are not separated by a space and that a space is required after the command (and optional delimiter) before an argument.

The next mail command to be discussed is

the read command. The read command, **R**, is used to read messages. There are only two forms of the **R** command—**R#** and **RM**. The **R**, a space, and a message number will cause the BBS to send the entire text of the specified message number. It is not possible to read a private message not to or from the user or a message that does not exist. If either should be attempted, the BBS will respond with an appropriate message and redisplay the prompt. The **RM** command stands for Read Mine and causes the BBS to send the user the full text of all his messages that have not been read.

The third mail command to be discussed is the send command. The send command, **S**, is used to instruct the BBS to store a message. There are several versions of the send command. The first method is to send the BBS and **S**. This will cause the BBS to prompt for the destination callsign and the message title. Once these are sent, the message can be transmitted. Once the message has been sent, a CTRL-Z is used to indicate that the message is over. The system will then save the message to disk, add it to the message list, and redisplay the prompt.

An easier method is to include the addressee and optional BBS call with the **S** command (i.e., **S KR3T** or **S KR3T @ WA3XXX**). The BBS will not ask for the destination callsign if this method is used. The **S** command can include delimiters to indicate the type of the message (i.e., **SP**—Send Private, **SB**—Send Bulletin).

The fourth and last mail command is used to kill a message. The kill command is **K**. The **K** command must have a message number as an argument (i.e., **K 1203**). If a **K** command is sent and the user's call is in the TO or FROM field, the message will be deleted. However, if the user's call is not in the TO or FROM field of the message indicated by the message number argument, the message will not be deleted, and a message informing the user that he may not kill the message will be sent by the BBS followed by the prompt. The **K** command followed by the **M** delimiter instructs the BBS to delete all messages addressed to the user (i.e., **KM**—Kill Mine). It is considered good practice to kill a message after it has been received if it is not of general interest.

File System

The next group of commands deals with the file system. The file system allows users to upload and download various files from the BBS. A file may consist of a list of local hamfests, a computer program, a list of new packet operators, and almost anything else that can be represented in ASCII characters. Files are stored in a separate section of the BBS from messages. However, the commands are somewhat similar.

All files are stored on disk drives on the BBS computer. Each file is assigned a name when it

is stored on the BBS. This name is referred to as the filename. The filenames on a W0RLI BBS are composed of up to eight characters, a period, and a three character extension (i.e., **HAMFESTS.MAY**). The filename is usually descriptive of the contents of the file. Obtaining a list of all the filenames on a particular disk is known as **getting a directory**.

The W0RLI command to get a directory of the files stored on the BBS is **W** (for What's available). The **W** command alone will cause the BBS to get a directory of each disk and send a list of the files on each disk along with their sizes to the user. The total amount of space consumed and the total amount of space remaining on each disk is also sent. It is also possible to get a directory of a specified disk. Suppose a BBS has three disk drives available for files labeled A, B, and C. A user could request a directory for each of the drives individually by sending the BBS the command **WA**, **WB**, and **WC** respectively.

Now that the files stored on the BBS are known, it is possible to download a file. The command to download a file from the BBS to the user's station is **D**. The command **D** is followed by a space and the filename (i.e., **D HAMFESTS.MAY**). The drive designator may be optionally included (i.e., **D A:HAMFESTS.MAY**); however, the BBS will search all drives for the specified file automatically if no drive designator is included. The download consists of straight ASCII text with no error checking beyond that which is provided by packet itself.

It is also possible to upload files to the BBS. The command to upload a file from a user's station to the BBS is **U**. The **U** command is followed by a space, the drive designator, and the filename with extension. Be sure to select a filename not currently in use. One other very important point is to make sure there is enough space on the disk to save the file with room to spare. It is possible to disable (crash) the BBS if a file upload is attempted without adequate storage space on the disk. Once the BBS receives the command, it will prompt for uploading to begin. When finished sending the file, a CTRL-Z is sent to close the file.

There is no kill command for files; only the Sysop may delete files. There is a wide range of files available for downloading. *The ARRL Gateway Newsletter* and the *W5YI Report* are common files along with local maps that when printed out give a rough map of digipeaters, BBSs, and users in a specified area. Other files commonly available are listings of hamfest dates, tutorial files for new users, equipment modification instructions, computer programs, and lists of local users.

Gateway System

The next BBS area covered is gateway operations. A BBS gateway is usually a BBS with a TNC on each serial port (usually two) of the

computer. Each TNC is connected to a radio operating on a different frequency, often on another band. A user accessing the BBS on one frequency and TNC can instruct the BBS to forward his transmissions to the other TNC and transmit on the other frequency. The command to access the gateway functions on a BBS is **G**. When the BBS receives the **G** command, it presents the user with a new gateway prompt. The new commands available on the gateway prompt are **C**, **R**, and **U**. **C** is the command used to initiate a connection through the other TNC. The **C** command is followed by a space and a callsign; it is very similar to the TAPR connect command. When the **C** command and callsign are received by the BBS when the gateway mode is activated, the BBS instructs the other TNC to send a connect request to the specified callsign. The **U** command is used to send unnumbered information frames (beacons) through the other TNC; it allows the user to broadcast data from his station, through the BBS, and onto the other frequency. The **R** command is used to return to the regular BBS prompt.

Other Commands

The remainder of the BBS commands are covered below.

The **J** command lists all the stations heard by or connected to the BBS along with times that their transmissions were received. This can be useful for monitoring activity or meeting new users. The **T** command is used to page the Sysop by ringing a bell at the BBS. If the Sysop is nearby, he will "turn off" the BBS and QSO directly with the user.

The **N** command is used to tell the BBS your name (i.e., N Jon). The BBS will then know the user's name for customized prompts. The **X** command is used to obtain an extended menu which lists all the commands available along with brief explanations. The long menu can be changed back to the short prompt by sending

the **X** command a second time. The BBS will usually use the short prompt upon connection. New users may be more comfortable using the long menu for the first few BBS sessions, but it should not take long to learn the commands. The **H** command is used to cause the BBS to send a somewhat lengthy help file explaining the general usage of the BBS. The **I** command causes the BBS to send a brief file describing the equipment used at the BBS.

The last command used during BBS session is the **B** command. **B** means Bye, and indicates to the BBS that the user is through using the system. The BBS will then disconnect automatically and ready itself for the next connection.

There are some additional messages that the BBS may send during a session with a user. These include messages such as ***** What or *** I don't understand** when the user sends an improper command, ***** K3XXX just tried to connect** when another station attempts to connect to the BBS while the user is connected, and ***** Standby, the Sysop wants to chat with you** when the Sysop is switching from the BBS mode to the direct QSO mode. These messages are configurable by the Sysop, so they may vary from system to system. The BBS also send beacons containing the calls of the stations with new mail waiting for them.

The Future of Packet

Amateur packet radio is a rapidly evolving communications mode. While there have been many advancements since the original amateur packet activity in Canada, there are still many more improvements being worked on today. These changes will provide additional capabilities and expand the usefulness of amateur packet radio.

High-Speed Modems

Work on higher speed modems has been going on almost as long as packet radio has been

in existence. The Bell 202 standard was chosen for amateur packet operation on the VHF and UHF bands because of the readily available components, the ease of interfacing with most radios, and the availability of Bell 202 modems on the surplus market. Their 1200 baud transmission speed is a big improvement over the 300 baud and lower speeds usually used in amateur digital communications. However, as packet grows, even 1200 baud is not fast enough.

With many users sharing the same channel, it is beneficial to minimize transmission time. There are alternatives to 1200 baud Bell 202 modems being proposed, but developing and selecting one optimum for packet operation has not been easy.

Because VHF and UHF are usually reliable and interference free, most modulation techniques and much higher speeds are feasible. Limitations are imposed by FCC regulations and the TNCs and transceivers being used. Many transceivers may require modifications for use with high-speed modems. These modifications may include the removal or bypass of filters and other components designed to support voice transmission and reception. Since most amateurs will not want to modify their radios for packet use, modem systems which interface simply to the transceiver through the standard microphone and audio connectors are most desirable.

Digital Radios

The problems associated with interfacing high-speed modems to regular voice grade transceivers will eventually be solved by the development of digital transceivers. Digital transceivers will be designed expressly for use with high-speed modems and, as such, their components will be carefully chosen to meet this objective. These radios will probably not be able to operate in the voice mode. They most probably will take the form of modular RF decks that will be incorporated into the modem design. Preliminary work is being done in the area of digital radios, and it will not be too long before they will be in use in amateur packet radio.

Amateur Packet Radio Satellites

Packet radio satellites promise to add many additional capabilities to packet radio. World-wide networking is feasible via satellite, and there are several packet satellites planned for launch in the near future. Individual users may access the satellites directly or through shared ground-based gateway stations equipped to automatically track the satellites and relay all traffic sent to the gateway through the satellite selected. For more information on amateur satellites and operating conditions consult the *The Satellite Experimenter's Handbook* by Martin Davidoff, K2UBC, or contact AMSAT.

One of the packet satellites is the Phase IIIIC, which will be launched into an orbit similar to that of OSCAR 10 (Orbital Satellite Carrying Amateur Radio), the Phase IIIB satellite. Phase IIIIC will contain a device known as **RUDAK**, which will serve as a spaceborne digipeater. **RUDAK**, which was designed by the West Germans, contains memory for use as buffers and for future uploading of programs from the ground. The program space gives **RUDAK** the ability to adjust to new protocols or operating conditions. Because of the modulation characteristics chosen, special modems will be needed for use by ground stations that want

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to communicate with RUDAK. Phase IIIC is scheduled for launch later this year (1987).

The next packet satellite is known as **JAS-1**. JAS-1, now known as **FO-12** (Fugi OSCAR-12) or Fugi, was launched in early August 1986. FO-12 was developed by JAMSAT, the Japanese affiliate of AMSAT, and features an on-board "flying mailbox" similar to terrestrial packet BBSs.

FO-12 carries two separate Mode-J transponders (2 meter uplink/70 cm downlink). The JA transponder is a standard linear transponder similar to those on current amateur satellites. The JD transponder is a digital transponder featuring four input channels. FO-12 also requires a special modem because of its modulation methods.

Another packet satellite, **PACSAT** (PACKet SATellite), is currently being developed by AMSAT. This satellite is designed exclusively for packet operation and will feature a full-blown "flying mailbox" with over 1 megabyte of memory. Launch was to be via a Space Shuttle "get-away special"; however, because of the setback in the shuttle program and some funding problems, it is doubtful that PACSAT will be launched in the near future.

Protocols

Protocols have been an area of concern and development since the beginning of packet radio. There are many protocols in existence (and being developed) which might be acceptable to the expanding amateur packet radio environment. The problem is knowing what features we need, what features we do not need, and the best way to implement them.

Networking

The future of amateur packet radio will reveal many changes in the way we can use the amateur packet radio network. Packet operating practices will have to change to reflect the many new capabilities the amateur packet radio system will gain over time. Currently, our operating practices for the existing packet network are causing severe congestion in heavily populated areas. This is due, in most part, to our current practice of overusing one or two channels.

Because most BBSs are on the same channel (for mail forwarding), most users tend to congregate on the same channel out of habit or to monitor BBS activity. Digipeaters are on the frequency to allow for expanded mail forwarding and increased communications range. When new users arrive, there is no other active channel, so they join in. As a result, the congestion is unbearable, and at times almost no traffic can get through.

By spreading out the activity over a number of channels, the congestion on each channel would be much lower. In one approach, 2 meter FM channels could be left to individual users for keyboard-to-keyboard communications, BBS operations, file transfers, and experimentation. A less-used frequency such as 220 MHz or 440 MHz could be chosen for BBS forwarding.

With this system, using current technology future congestion problems can be reduced by expanding the number of channels proportionally to the number of users. One disadvantage is that a single station cannot monitor activity on all the channels at once as was done when all activity occurred on a single channel. But that is a small price to pay for the reduced congestion.

The network will need to adapt as new hard-

ware (such as high-speed modems) is implemented. High-speed modems could be used first for BBS forwarding and "long haul" linking. In the transition period, these "foreign" modems would thus be hidden from the individual users.

One potential problem with a network based on many users on different channels in the same area is linking with other stations using current digipeater technology. Each user will have to keep a list of what digipeaters on what channel will take him to his desired destination. And if he has a choice of two or more paths, how does he know which is the best to choose? And how does he know which channel his friends are on at any given time?

These problems may be solved by the addition of higher level "packet switches" (network nodes). The use of network nodes will give rise to the local area packet network. Users in a certain area will operate on the same frequency. Other users in another locale will operate on a different frequency so the two won't interfere. Users in one area will communicate with users in another area through the network nodes. It will not matter if the area is a few miles away, a few hundred miles away, or a few thousand miles away; the network node will choose the optimum route to get the data to the proper destination. The route could include VHF, UHF, satellite, HF, or a combination thereof.

All the individual user will need to know is the location of the station with which he wishes to communicate; the network node will determine how to reach it. VHF DX operation will no longer be necessary, nor will connecting to a station through an inordinate number of digipeaters. Digipeaters may still be necessary for users who cannot directly reach their node. The users in a given area will form a **Local Area Network (LAN)** with their own BBS and other facilities. With HF and satellite capability included in the network, worldwide networking will be possible.

The technology certainly exists to make this system a reality. All that is needed are funds, time, and volunteers. This network will make amateur packet radio a reliable and efficient means of worldwide communications.

Conclusion

This article has covered bulletin board operation and some predictions about the future of amateur packet operation. Packet is a rapidly changing mode. It is no longer a revolution with a few participants, but is undergoing an evolution with thousands of avid users. Each step that is made in developing packet radio helps to achieve the ultimate goal of a worldwide, error-free, efficient amateur radio data communications system.

This article is an appropriate ending to this series. I hope you recognize the potential of packet radio and have formulated your own ideas of what you would like to get out of packet and what you would like to contribute to it. Understanding the theory behind packet radio is meaningless unless you do something with it. I wish you the best of luck with amateur packet radio and hope that it is as much fun for you as it has been for me.

If you have any questions, comments, or suggestions regarding the article series, my packet book, or packet radio in general, please contact me. You can write to me at the address listed; however, if you would like a quicker response, leave me a message on CompuServe (ID 72276,2276).



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CQ REVIEWS:

The Austin Dual-Band 2 Meter and 70 cm Antenna

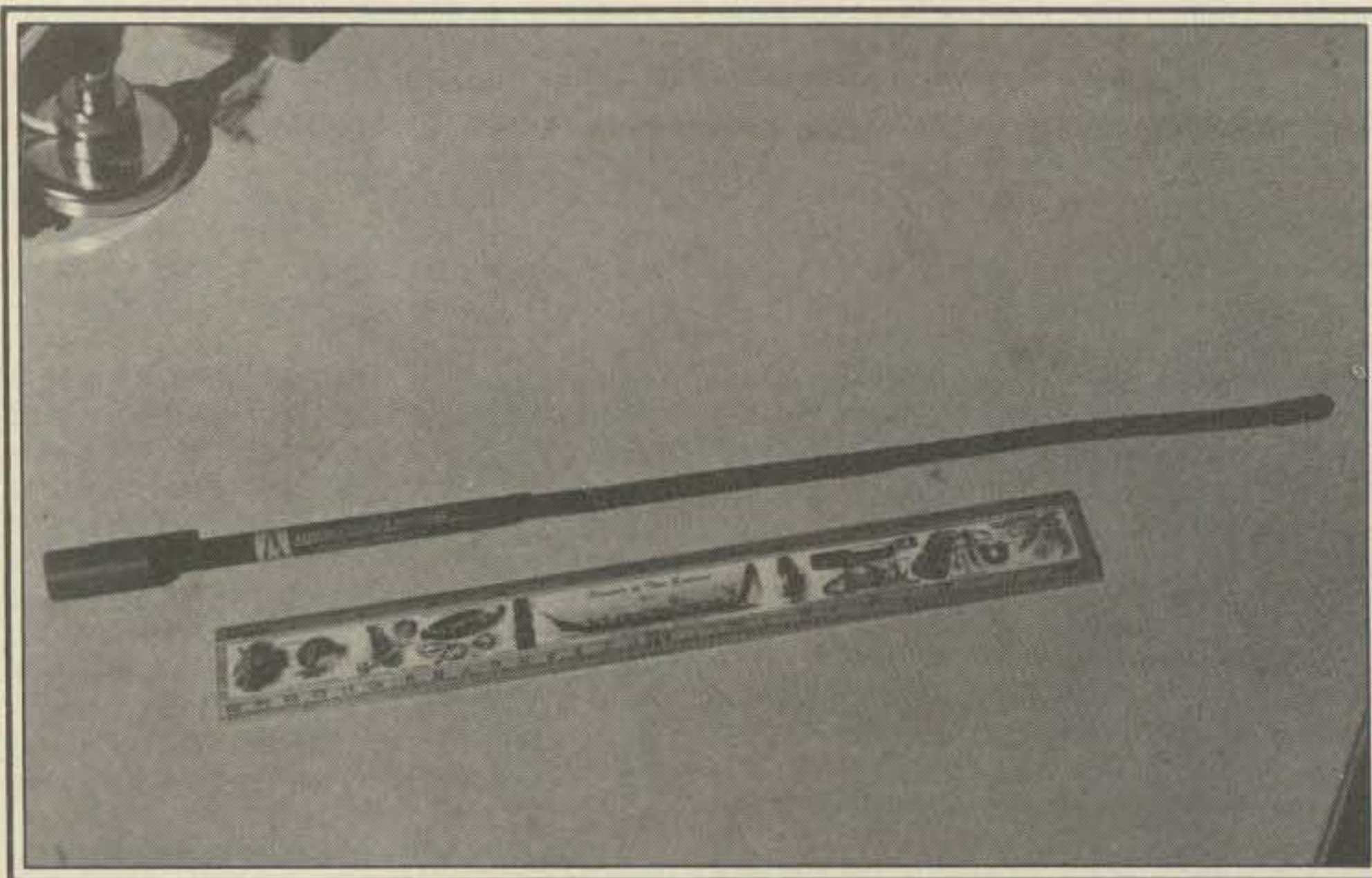
BY LEW MCCOY*, W1ICP

If there is one thing I can be sure of in amateur radio, it is that Dick Austin of Austin Custom Antennas has unusual creativity when it comes to designing antennas. Recently at the New England Convention at Boxboro, Massachusetts, Dick showed me a new dual-bander whip he had created for both handhelds and mobile. The antenna was so unusual that I asked him if I could review it in *CQ*. This antenna really appealed to me because it is something that many amateurs can use.

The short whip (19 inches overall) is designed to cover 144 MHz and 450 MHz without any compromises and does so very well. Basically, the top section is a 450 MHz half-wavelength dipole which is end fed via a coaxial cavity. Matching and feeding the high impedance of the dipole end is accomplished by a patented method in the coaxial cavity. The feed point for the entire antenna is at the top of the coaxial section for both bands (although the actual antenna connector is at the base of the antenna). The outer section of the coaxial section, along with the 450 MHz half wavelength antenna, make up a quarter-wavelength on 2 meters.

There are two different mounting versions of the antenna available—one with a BNC fitting for handhelds and the other with a Motorola-type mount for mobile work. Both versions are shown in the photos.

At the same time that I got the antennas from Austin for testing, I acquired the dual-band handheld from Yaesu for product review. This gave me an excellent chance to test the antenna against the dual-band antenna that came with the Yaesu unit. The Yaesu antenna was designed to be small—a quarter wave long on 450 MHz (about 6 inches overall). It uses a base loading system to work on 2 meters, so it is a definite compromise an-




This is the handheld type. The BNC fitting is covered by the poly material.

tenna. When working near a repeater, the short antenna was fine, but there was no comparison at all at longer distances. I found that with both handheld and mobile operation the Austin antenna was outstanding, to put it mildly.

The handheld version of the antenna is very flexible from the coaxial section on out to the end. The coaxial section, about 7 inches long, is rigid. The entire antenna is encased in a dark gray poly-type material. On the mobile version, the entire antenna from just above the mounting fitting is rigid. However, at the mount the antenna has a short flexible section—so flexible, in fact, that the antenna can lay over 90 degrees in the event the antenna strikes something when operating mobile.

I did SWR checks across both 2 meters and 450 MHz, and the match remained below 1.2 to 1 across either band. Power rating on the antennas is 200 watts.

The price of either type is \$29.95. They are available from Austin Custom Antennas, P.O. Box 357, Tenny Road, Sandown, NH 03873 (603-887-2926). 



Here is the mobile version mounted on a magnetic roof mount.

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

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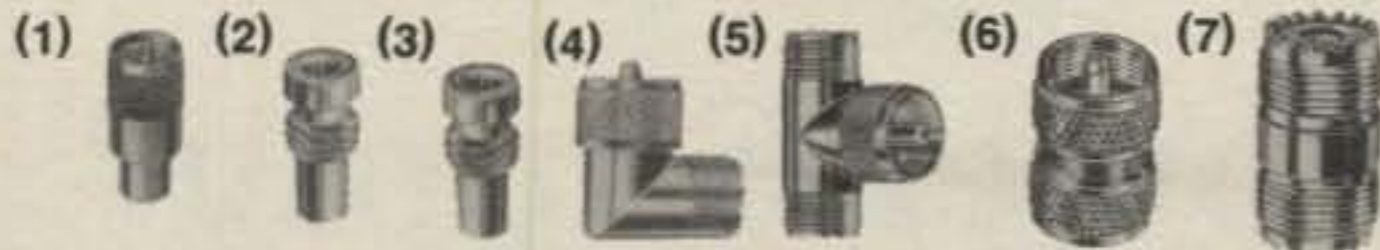


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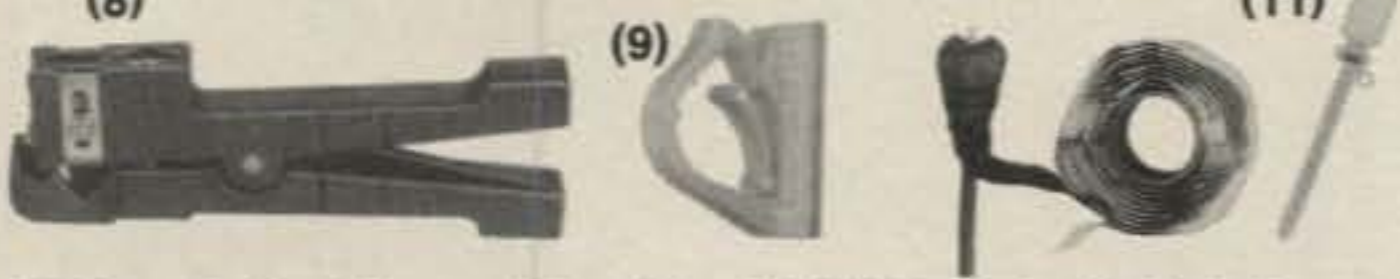
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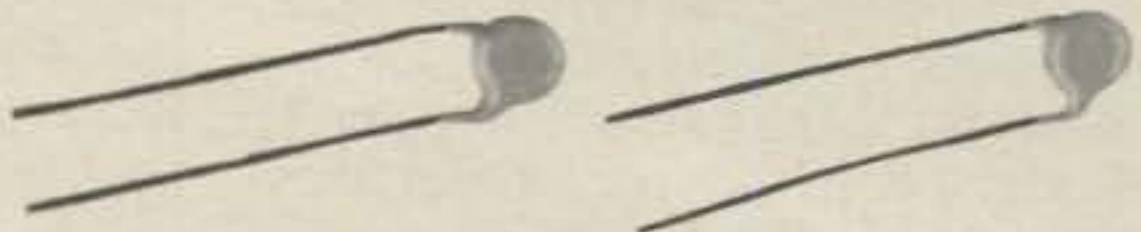


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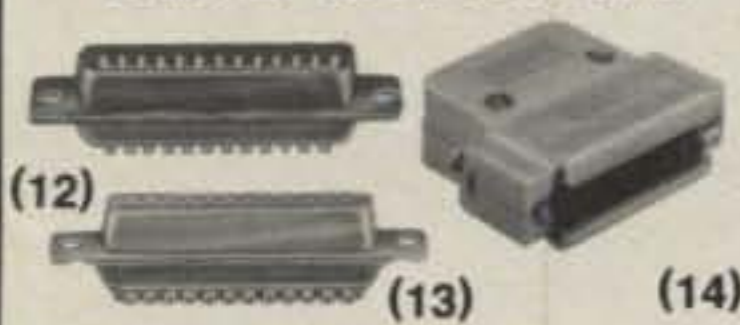
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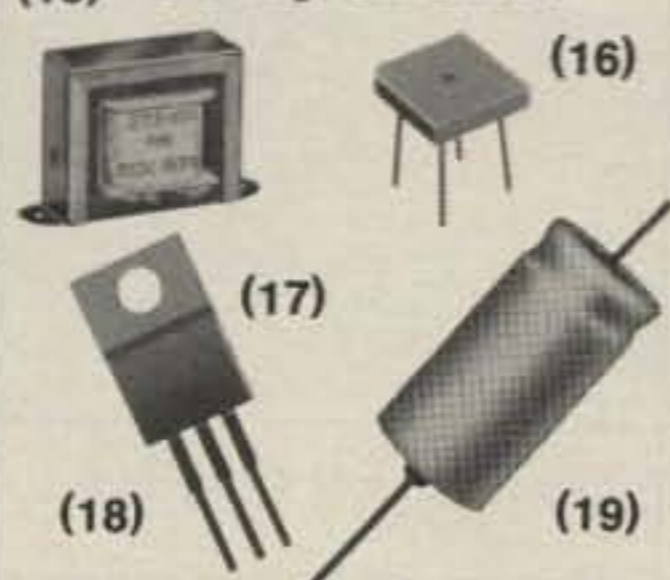
μF	WVDC	Cat. No.	2-Pack
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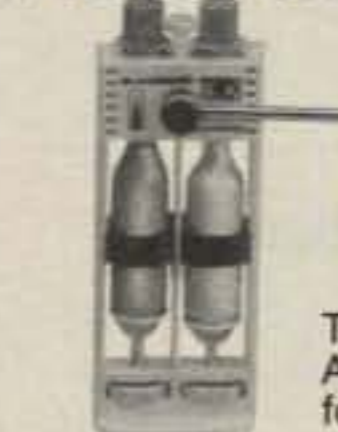
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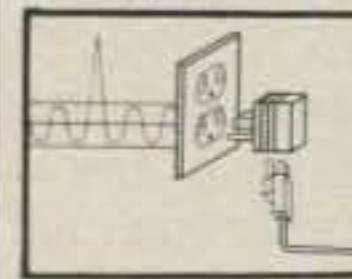
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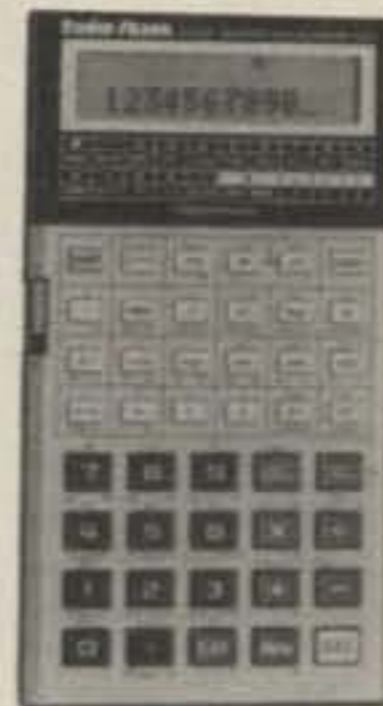
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What! Another Power Supply?

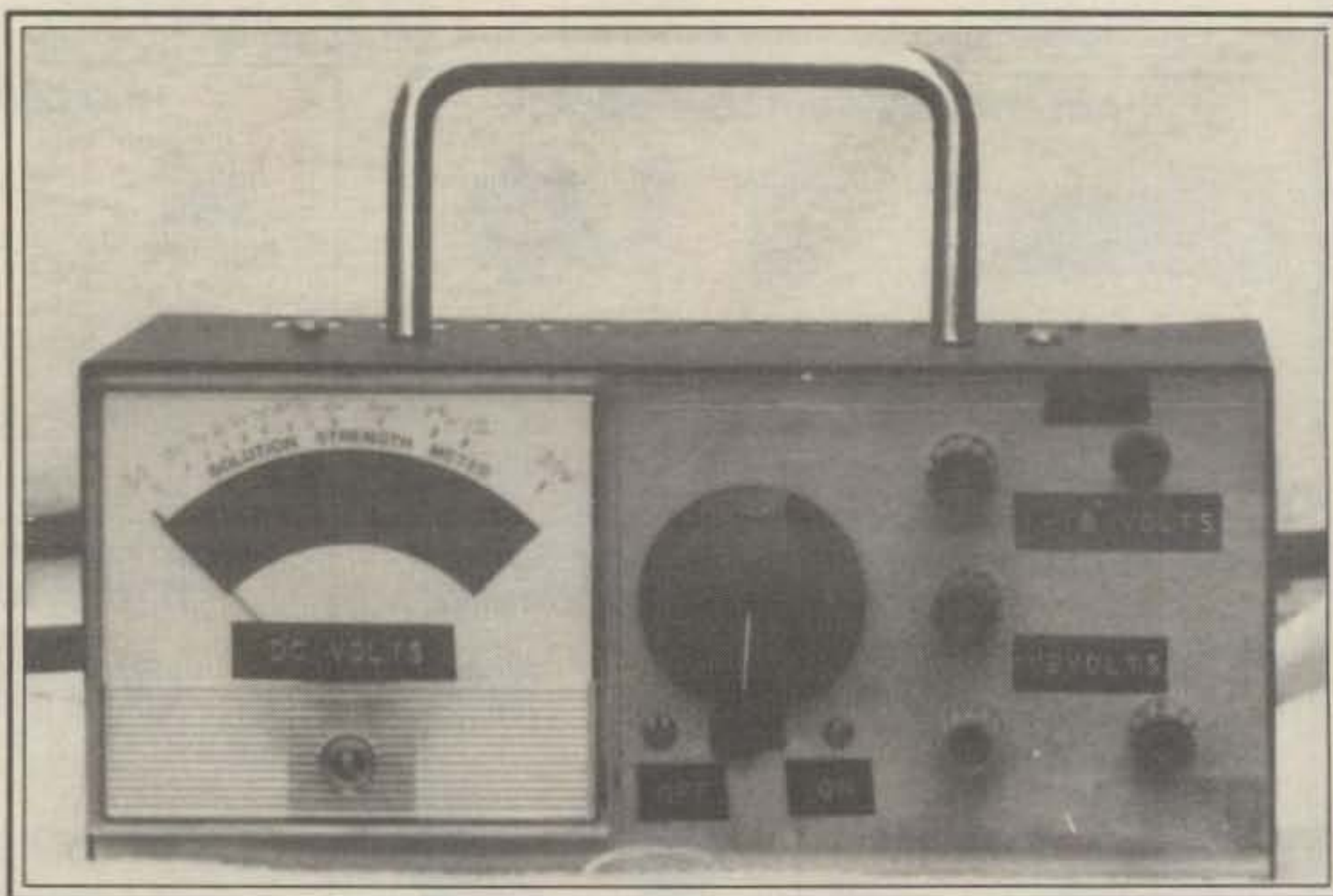
BY GORDON W. PATTERSON*

If you spend a fair amount of your time experimenting with integrated circuits, then you know the necessity of a good power supply. The unit which I built can be used for linear and digital circuits, as well as for a power source for a low-power transceiver. The supply utilizes the ever-popular LM317 and UA7912 regulators. The version I built provides 0 to 20 volts and a fixed 12 volts negative. Most of the parts can be found in the advertiser's index of this magazine and other electronics journals. The builder with a well-stocked junk box should have no trouble locating the necessary components.

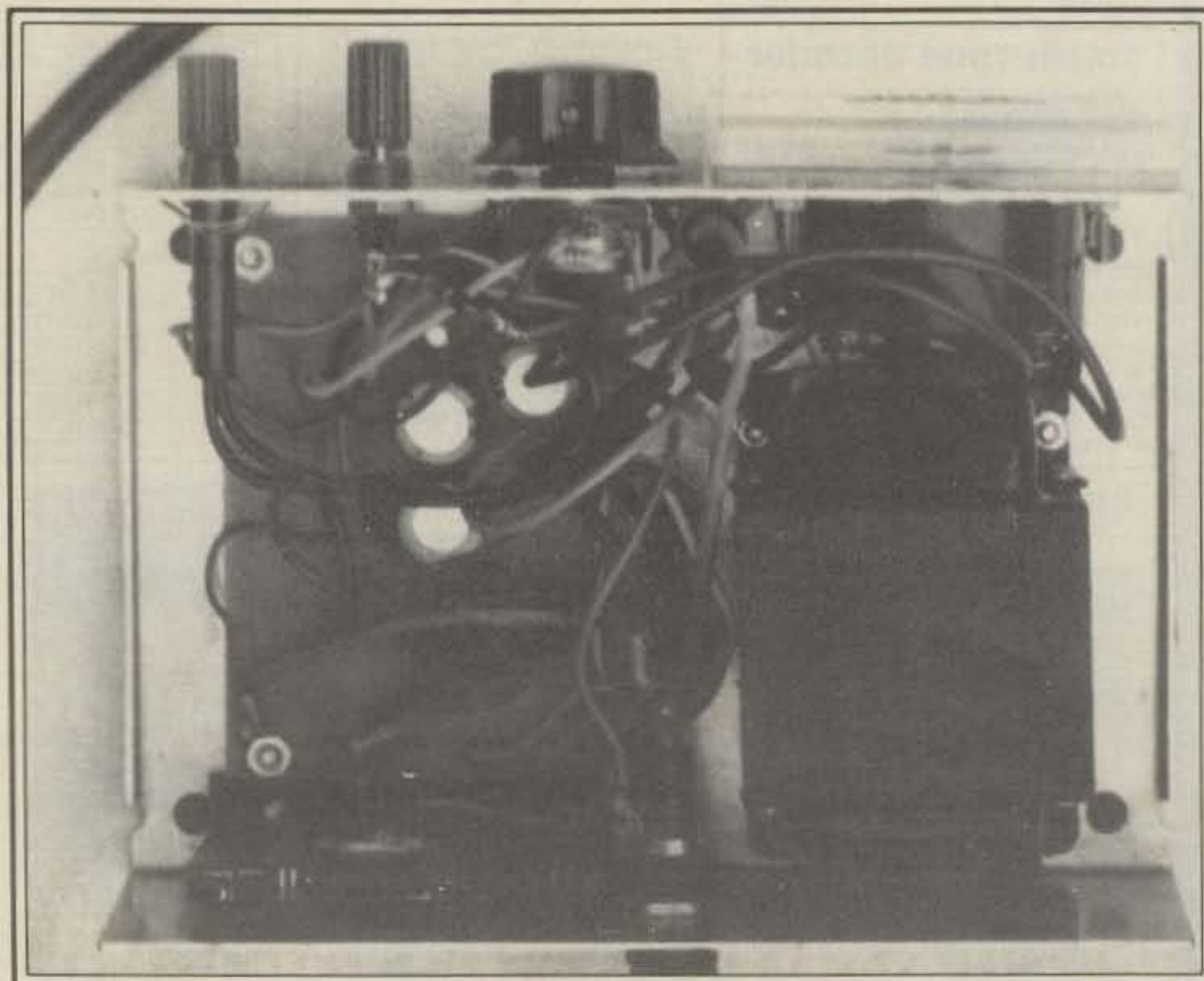
Theory of Operation

The power-supply circuit can be divided into two sections—an unregulated supply and a voltage regulated section. The unregulated section consists of the transformer, T1; diodes D1 to D4 in a full-wave bridge configuration; and filter capacitor C1.

The regulated section consists of the LM317, MC7912, C2, C5, C6, C3, R1, R2, R3, C4, D5, and D6. (See fig. 1.) The LM317 chip requires that the output of the unregulated section across C1 be limited to a maximum of 40 volts. This is easily met by C1. Its theoretical peak output voltage under no-load current conditions is approximately 34.5 VDC. Under full-load current conditions of 1 amp the DC output voltage of the unregulated section is approximately 27 VDC. The reference voltage is applied directly across R1, establishing a constant reference current of 5 ma flowing through R1. This current also flows through the potentiometer R2 and the parallel padding resistor R3. An increase in R3 results in a larger output voltage, while a decrease in R3 results in a smaller output voltage. The minimum DC output voltage can never be smaller than 1.2 volts, which is the reference voltage. An AC ripple voltage is present on the input terminal of the regulator chip at full load currents of 1 ampere; this ripple

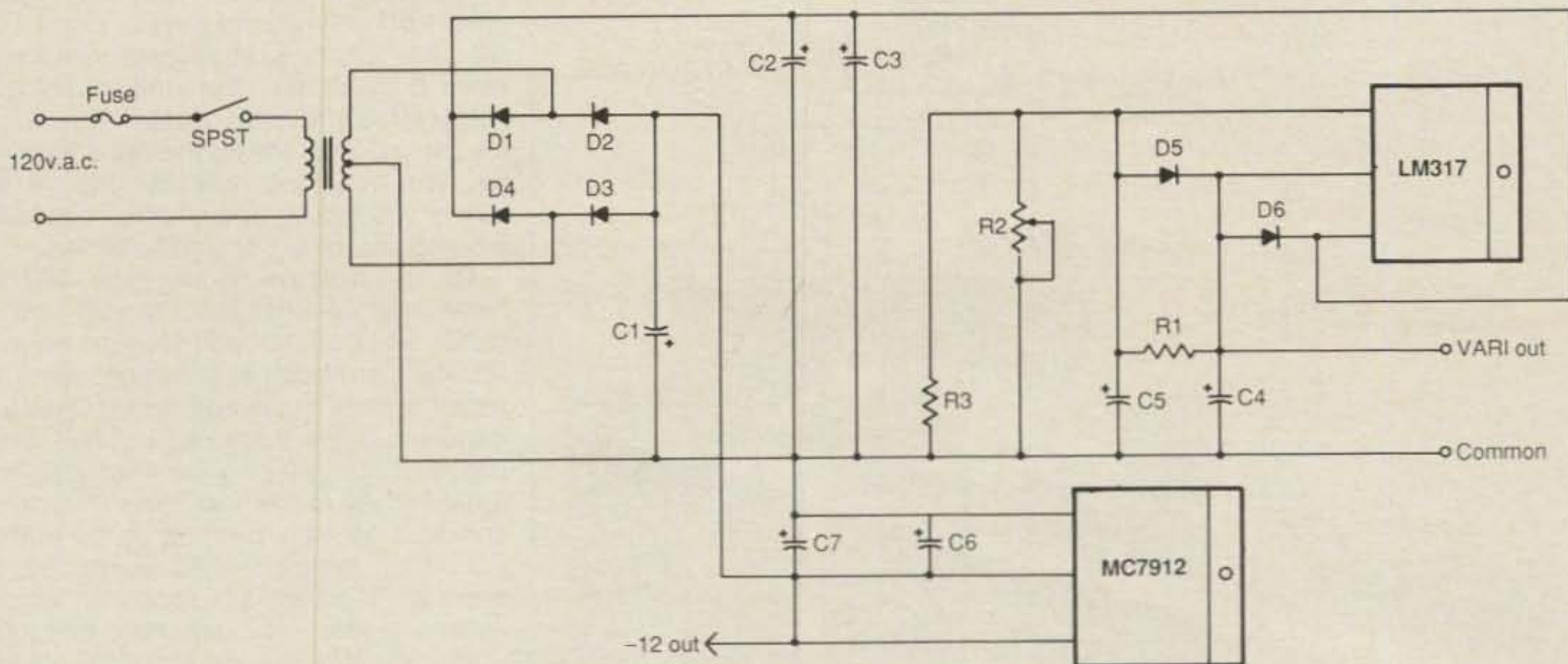


Front view of the regulated power supply.



Interior view of the power supply. Although a PC board was used, any readily available method of construction will do.

*5775 Vine St., Apt. 101, Niagara Falls, Ontario L2J 1K8, Canada



Parts List

Resistors

R1: 220 ohm 1/2w
 R2: 10K ohm 2w control pot
 R3: 4.7K ohm 1/2w

Capacitors

C1, C2, C3: 1,000 uF/35v electrolytic
 C4: 4.7 uF/35v electrolytic
 C5: 10 uF/35v electrolytic
 C6-C7: 1 uF/35v tantalum

Semiconductors

D1, D2, D3, D4: 1N5402 rectifiers
 D5, D6: 1N4005 diodes
 A1: LM317T voltage regulator
 A2: UA7912 voltage regulator

Miscellaneous

One 44 volt center-tap/2 amp transformer
 4 Banana jacks
 1 SPST switch
 2 Regulator mounting hardware

1 Fuse holder

1 Enclosure 7 7/8" x 3 1/2" x 5 1/2"
 4 Spacers 3/8"
 1 Power cord
 Eight 1/8 bolts with nuts
 Two 5/32 bolts with nuts
 Four 3/32 bolts with nuts

Options

0 to 20 volts DC meter
 Pilot light

Fig. 1—Schematic diagram for the regulated power supply.

can be as high as 5 volts peak-to-peak. On the output terminal of the regulator there is essentially no ripple voltage (5 mv or less). The ripple voltage that is present at the input terminal is absorbed by the regulator. Capacitor C3, which has a value of 1,000 uF, acts like a peak rectifier. Capacitor C4 is connected from the output terminal of the regulator to common to improve the transient response of the regulator.

Construction

The supply was constructed on a printed circuit board upon which most of the components are mounted. I've included an etching pattern (figs. 2 and 3) for those builders who prefer to use a PC board. You could build the supply on perf-board or use point-to-point wiring, as construction is not critical.

The MC7912 regulator is mounted to the enclosure's bottom using regulator mounting hardware. The application of silicon grease is a must to provide good heat transfer from the regulator to the chassis. After the regulator has been mounted, use an ohmmeter to make sure there isn't a short from ground to any of the regulator pins. Fig. 4 shows the details on how to mount the regulators to the heat sinks. The LM317 was mounted on a homemade heat sink constructed

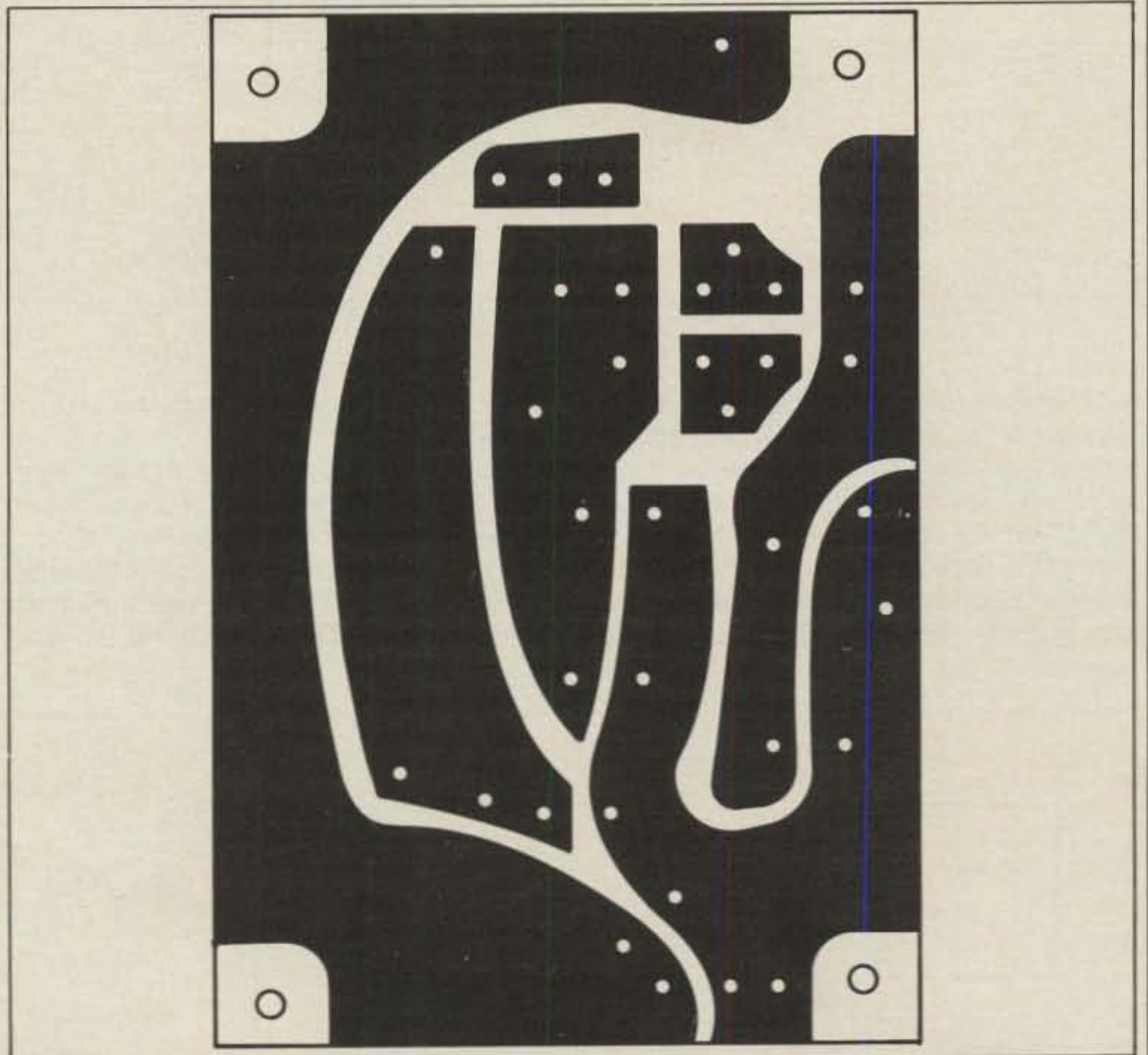


Fig. 2—Foil pattern shown actual size.

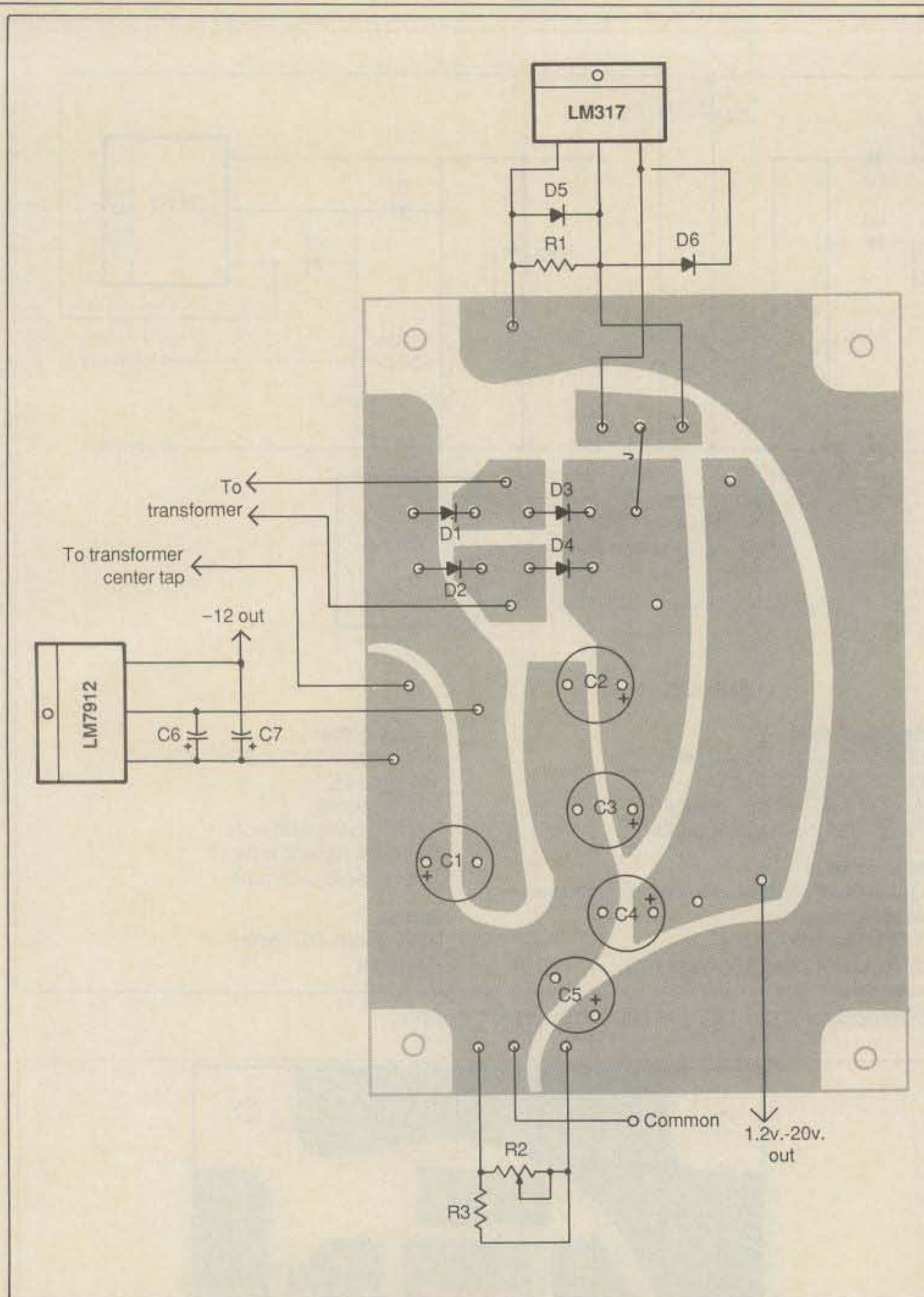


Fig. 3—Parts placement diagram.

out of a piece of stock aluminum, in which slots were cut to increase the effective area of the sink. Also solder the two 1 uF tantalum capacitors right to the pins of the MC7912, as this is what the manufacturer of the regulator calls for. Now solder three pieces of hook-up wire from each of the pins of the regulator. These wires will

later connect the regulator to the rest of the circuit.

The LM317 as stated earlier was mounted to a homemade heat sink measuring $2\frac{6}{8}$ " high \times $3\frac{3}{16}$ " long \times $\frac{3}{16}$ " thick. The LM317 is mounted to the heat sink the same way the MC7912 was mounted to the chassis. Diodes D5 and D6 are


mounted on the pins of the LM317 as well as the 220 ohm resistor. Also solder three pieces of hook-up wire to each pin of the regulator. The only other components external to the PC board are the potentiometer and the 4700 ohm resistor. The resistor can be mounted on the pot's terminals. The mounting holes for the transformer, PC board, and all other chassis-mounted hardware should be drilled.

On my particular supply I have all the outputs on the front panel as well as the meter, on-off switch, and the potentiometer. The fuse holder and line cord come in from the back of the enclosure. Once all mounting holes have been drilled, you can then start placing the hardware fixtures in their respective holes. After the components have been soldered to the PC board, mount the PC board to the chassis. I used $\frac{3}{8}$ " spacers, which worked nicely. You can now wire the leads to their respective external components. Shown in the pictures of my supply are a meter and a pilot light which were added later, after the supply had been constructed. The meter is an old solution test meter which was given to me by a friend. I added the necessary multiplier and I had a 0 to 20 voltmeter at no extra cost.

Operation

Once everything has been wired and you have gone over the circuit to check your wiring, you can apply 120 VAC to the project. Turn on the supply and check to see that nothing is arcing or smoking. If everything is okay, connect a DC voltmeter to the output of the negative regulator and check for -12 volts. If you don't get a reading, check the regulator by placing your finger on it. If it is too warm, it could mean that the regulator is shorted to ground. Next check the output of the LM317; you should get a reading of 1.2 VDC with the pot turned fully counter clockwise. Fully clockwise you should have a reading between 18 and 20 VDC.

Conclusion

The supply has been in constant daily use for several years with no problems. So warm up those soldering irons, as there is always room for another power supply. 

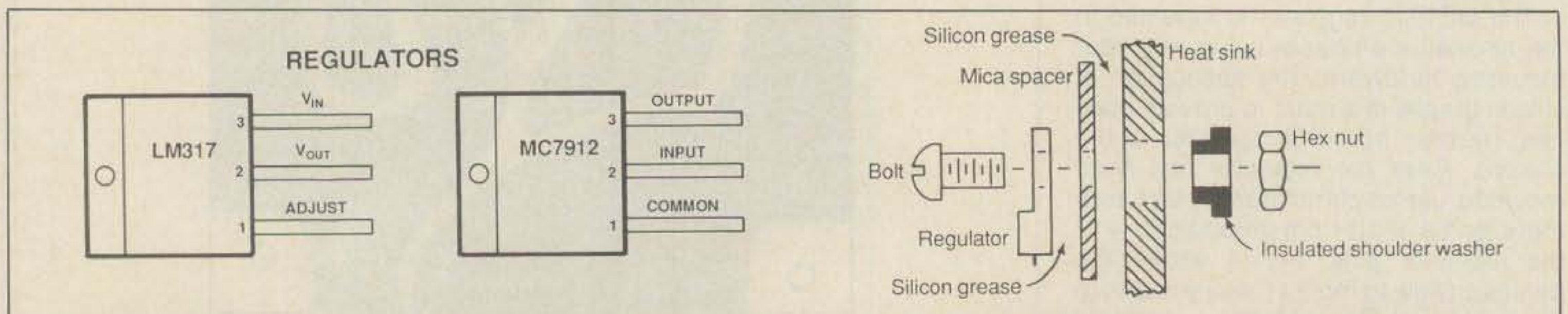


Fig. 4—How to mount the regulators to the heat sink.

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Who says you can't make anything from an old TV set anymore? N111 brings the art of amateur scrounging and ingenuity up to the computer age.

How To Turn An Old TV And \$10 Into A Computer Display

BY PAUL M. DANZER*, N111

It seems today that about half of the conversations on the bands as well as on the local repeaters are about computers. However, the normal amateur approach to this topic differs considerably from the approach of other computer hobbyists. First, some amateurs do not hesitate to open up the equipment cabinet and fire up a soldering iron, and second, most amateurs try to think of a way to build a little something for a few dollars rather than run down to the computer store and spend a few hundred dollars.

It was therefore no surprise when a few of us in my town purchased new computers in the form of IBM PC clones and the voltmeters and oscilloscopes came out. Although the problem we were trying to solve may not be of immediate interest nor use in your computerized shack, the technical information we discovered, as well as our experiences, just might save you a few hundred dollars or a big repair bill in the near future.

Objective: A Color Data Display Without Buying a New Monitor

Our group bought PC clones with a monochrome port, an RGB (color) port, and an inexpensive monochrome display. Since none of us was big on games and we were both amateurs and "serious" users, this turned out to be a good combination, especially when we looked at how much better the monochrome text appeared on the screen as compared to text on a color display. But then reality set in

A large amount of available software uses the color port, not for color, but just to access the low-resolution graphics output from what is called **SCREEN 0**. Therefore, we wanted to be able to look at the output of the color display without spending another \$350 or more for a color display. In trying to accomplish this we

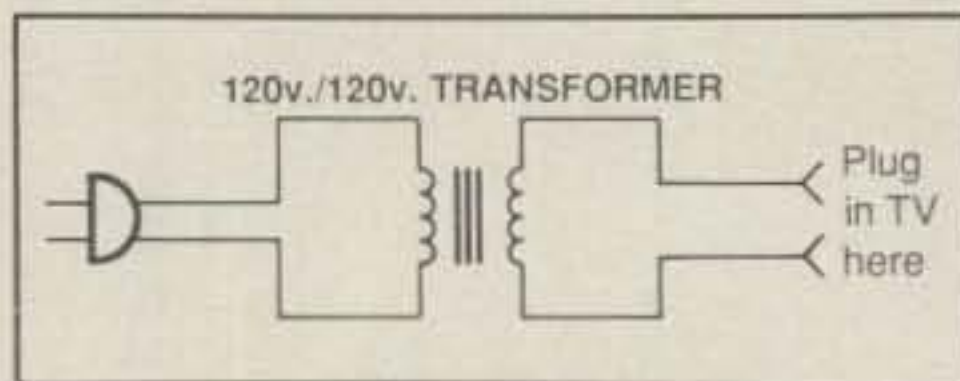


Fig. 1—An isolation transformer.

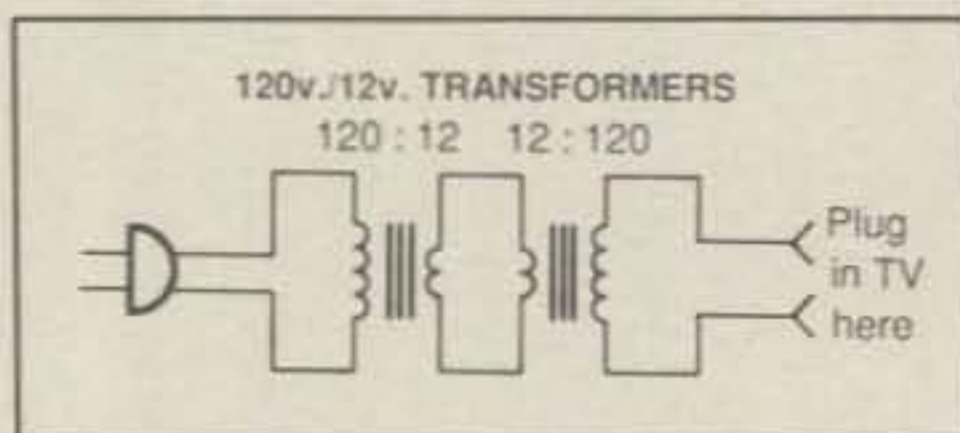


Fig. 2.—An isolation transformer made from two low-voltage transformers.

learned a few things—in some cases hard-learned lessons.

Lesson 1: A Ground Is Not Necessarily a Ground

If you want to add another TV display to your system and want, in true amateur spirit, to spend as little as possible, the first thing you might consider is buying a small commercial TV and digging into it. That is exactly what we did, only we learned that one reason why they only cost from \$50 to \$90 is because they are designed with a few parts, such as a power transformer, missing. This means that when you connect the TV in any way to your computer, you have a 50% chance of putting 120 volts AC into the precious circuitry of the computer. You know that since Murphy's law always applies, you can forget about the 50% chance, for any way you come up with to ensure that the AC neutral is always connected to the TV ground bus, you will, 100% of the time, blow up your computer.

In the good old days you ran out and bought an isolation transformer (fig. 1), but these are not the good old days, and while isolation transformers can still be

found, 12 or 24 volt power supply transformers are more common. These small TV sets typically run under 50 watts input power. If you multiply the transformer rating (volts times amps—as an example 12 volts times 6 amps), then the product—in this case 72 watts—should be larger (by a safety factor) than the 50 watts or whatever the TV set label says it requires. The two transformers should be wired as shown in fig. 2.

A second approach used the fact that most of these sets are designed for portable or battery use directly off 12 volts. In this case just run the set from a 12 volt power supply (1.5 amps, 2 amps, or whatever is required), and again the ground problem is solved. Incidentally, when picking a TV set try not to use a brand new model unless the schematic comes with it. Sam's Photofacts are still available, but it may be a year or more before your new set schematic is distributed by them.

Lesson 2: A TV Set Is A TV Set, Unless The Standard Is Set By IBM

What could be more natural than for an amateur to expect that the difference between a color display port and a black-and-white display port is just the difference between color and black-and-white, assuming the sync pulses are somehow connected properly. Unfortunately, this idea does not take into account the fact that this generation of small personal computers follows the pattern and standards set by IBM. As shown in fig. 3, IBM uses the normal 15 kHz horizontal line rate and 60 Hz vertical rate for the color port, and thus nicely matches any home TV capable of enough resolution to see text characters. But the second part of the table, labeled monochrome, tells a different story. The mono display port utilizes an 18 kHz horizontal rate and a 50 Hz vertical rate, meaning that a standard TV or perhaps an old monitor salvaged from a now defunct Apple, Commodore, or other source cannot be fed from the

*2 Dawn Road, Norwalk, CT 06851

mono port. It also means that if you buy a monochrome monitor with your computer, no amount of rewiring and cabling will allow you to use the mono monitor connected to the color port, since the horizontal and vertical sweep oscillators run at the wrong rate.

Lesson 3: A Good Book Always Helps

If you are going to start working with an IBM PC or one of its many clones, it is pretty certain that the books and documents that come with the computer won't help very much. All the little goodies we as amateurs expect to find, such as the wiring for the various connectors, are just not included in the book. While this certainly acts to encourage most owners to go to a computer store and buy \$6 worth of cables for \$35, there is at least one book you should have access to—the *IBM Technical Reference Manual*. Actually, there are two of them. The one with the shorter title—*Technical Reference*—contains schematics and hardware information, while a companion volume entitled *DOS Technical Reference* has the

Connector Pin	Horizontal Rate	Vertical Rate
Color Display	15.75 kHz	60 Hz
Mono Display	18.432 kHz	50 Hz

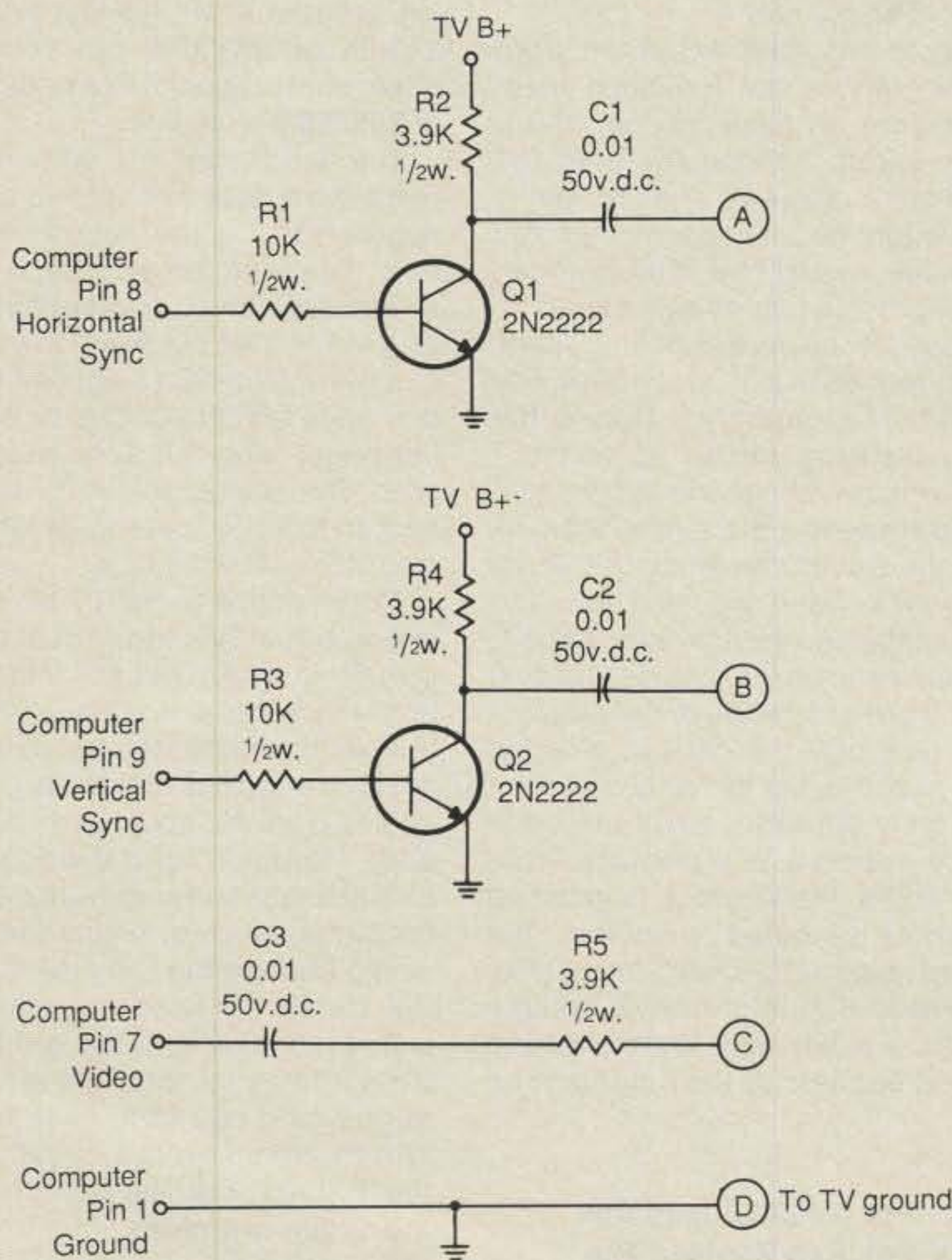
Fig. 3—Display sweep rates.

Connector Pin	Mono Display	Color Display
1	Ground	Ground
2	Ground	Ground
3	*	Red Signal
4	*	Green Signal
5	*	Blue Signal
6	Intensity	Intensity
7	Video	"RESERVED"
8	Horizontal Sync	Horizontal Sync
9	Vertical Sync	Vertical Sync

* Not used.

Fig. 4—Display connector wiring.

details of the DOS, or Disk Operating System. Ownership is not required, and in fact, the total cost for the two when last I checked was over \$100. However, access to the *Technical Reference* is very handy. While these books deal directly



Parts List

R1,R3: 10K 1/2w (Radio Shack 271-034)
R2,R4,R5: 3.9K 1/2w (Radio Shack 271-029)

C1,C2,C3: .01 uF 50v (Radio Shack 272-1065)
Q1,Q2: 2N2222 (Radio Shack 276-1617, package of 15)

Fig. 5—Video and sync interface.

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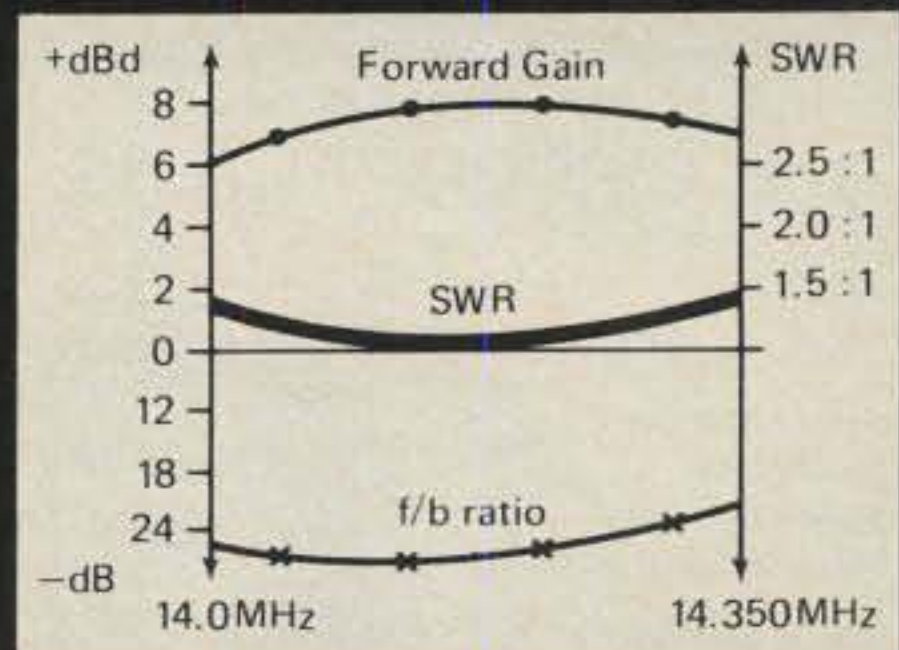
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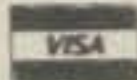
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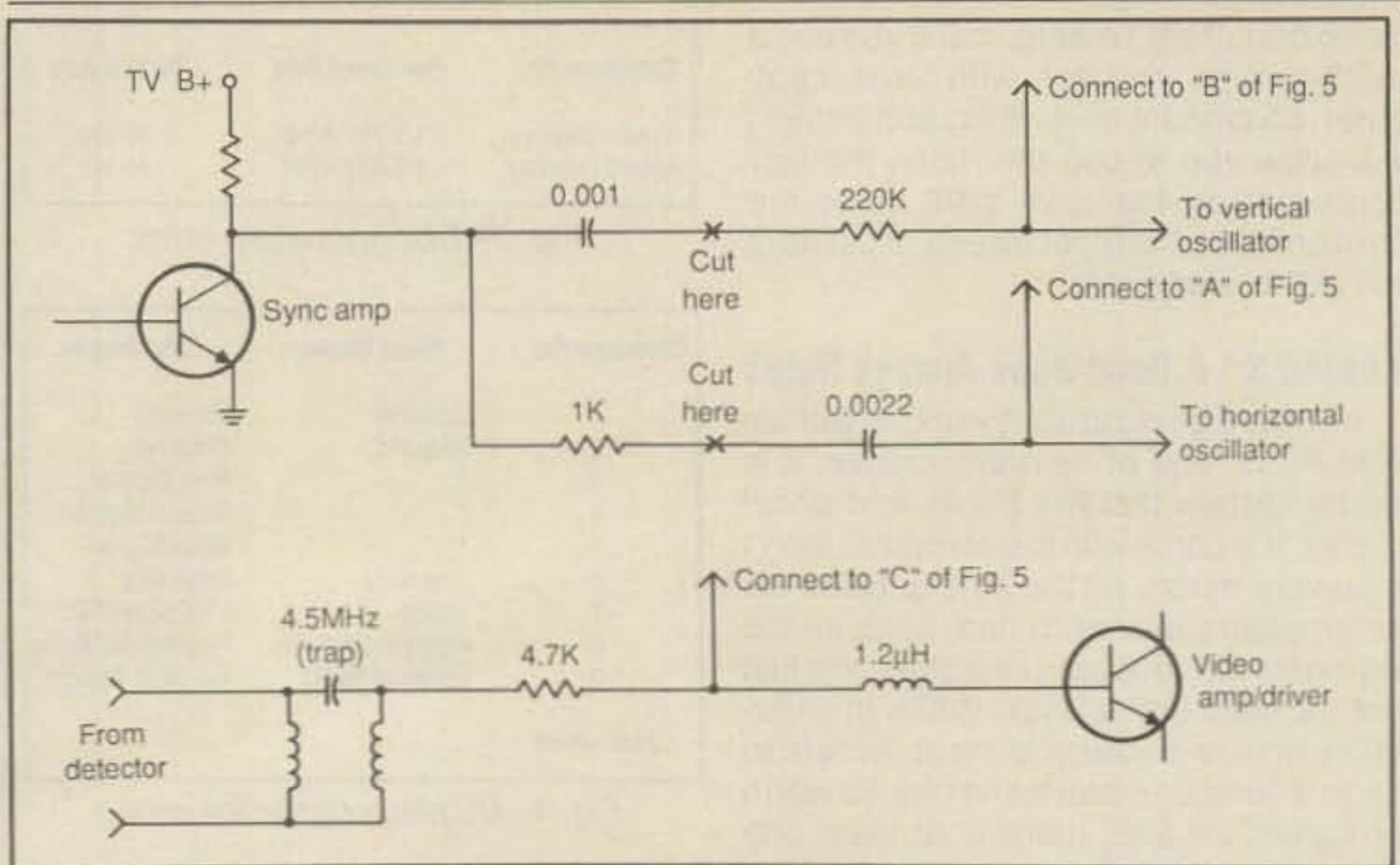


Fig. 6—Typical TV set connections.

with the IBM computers, much of what they say applies directly to the clones, since that is what a clone is by definition. The circuits may vary, but the connections and format, both hardware and software, should be the same.

Fig. 4 contains data extracted from these books and some judicious measurements with an oscilloscope, and it shows the wiring needed for both the mono and color displays. The four basic wires you might be interested in are the ground, video, horizontal, and vertical. Ground on pin 1 is just what it claims to be, and appears to serve both as a signal ground as well as a connection for any shields. Video, apparently including the necessary blanking, shows up on pin 7 with a maximum voltage measured as 4 volts peak. However, there is no sync included in the waveform, since this is not the composite video we all know and love. Horizontal and vertical sync appear as separate 4 volt positive pulses on pins 8 and 9 and are used to drive the horizontal and vertical sweep oscillators directly.

As you can see, the wiring of the color port is slightly different, since the color signals are supplied, one per wire, from pins 3, 4, and 5. Pin 7, which is video on the mono port, is labeled "reserved," but a little fast exploration with an oscilloscope showed that in the clone computers tested, a video signal similar to the mono video appears at the color port on pin 7.

Lesson 4: For A Few Bucks And An Old TV You Can Replace The Color Monitor

Now that we have dug out a few facts, the circuit shown in fig. 5 can be used to interface an old TV with the color port. It should be stated at the beginning that the results are not the greatest. You will prob-

ably get fairly good 40-column text, usable 80-column text, and fair color graphics—without the color. Games which use color extensively will be confusing at best, but printing, card, and banner making programs will be just fine, and the **BASICA** or **GWBasic** functions such as draw, circle, and the like needing the use of **SCREEN 0** work fine.

The two transistors convert the positive sync pulses to negative sync, which appears to be the polarity supplied in most TVs from the sync separator to the sweep oscillators. Incidentally, the actual polarity does not seem to matter much since the oscillators appear to use only one edge (either positive or negative going edge), and the sync pulse supplies both. The points labeled TV B+ get connected to the TV set supply which ranges from 15 to 23 volts DC.

Connections to the TV set will depend on the actual TV used. Part of a typical import TV is shown in fig. 6. Notice that for both the vertical and horizontal connection we disconnected the existing wires, which we could do since the original sync pulses were AC coupled through a capacitor. However, for the video we left the circuit intact and simply tapped in to feed the video, since breaking the wires here would change the DC biasing and upset the circuit. To keep out extraneous TV signal feed-through, the last IF (intermediate frequency) amplifier is shorted with an .01 mFd cap from base to collector. Where an integrated circuit is used for the IF stage, a similar cap is used to short the circuit to ground.

One Final Word

This was how we approached a little computer project. The next step? Well, anyone have an old color TV around? Pins 3, 4, and 5 have red, green, and blue on them . . .



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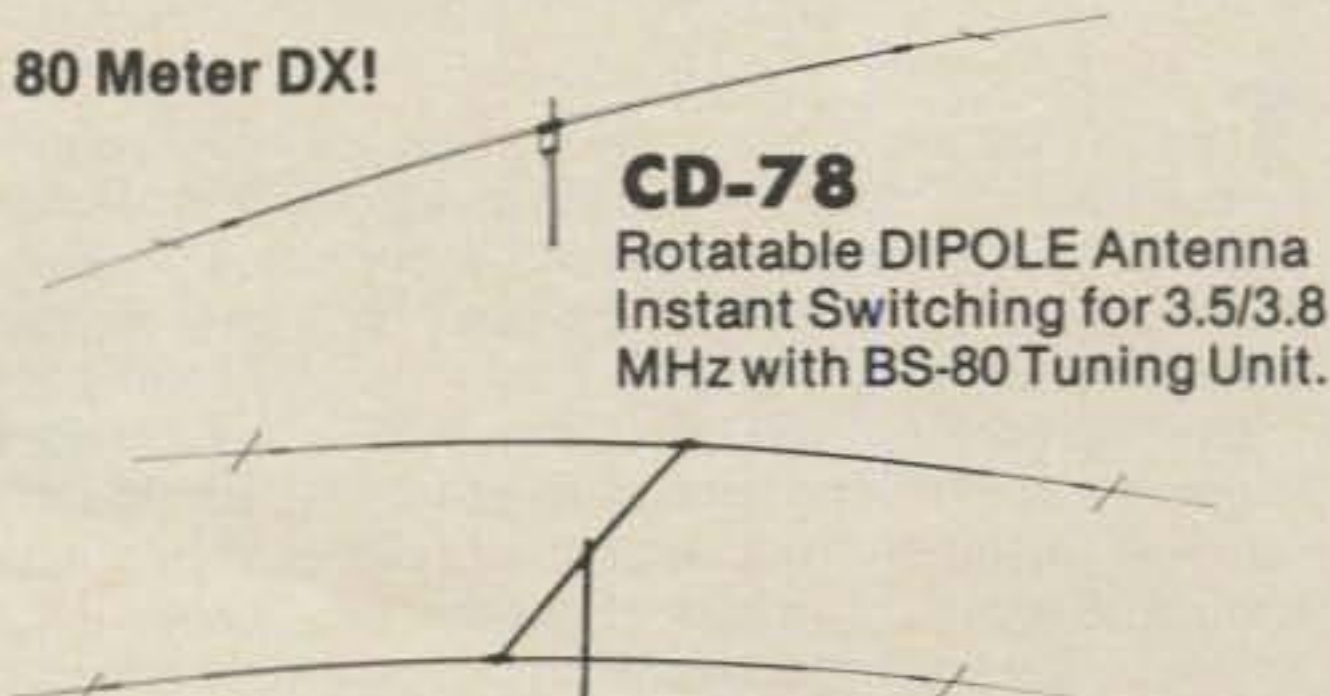
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CIRCLE 25 ON READER SERVICE CARD

INFO ON AMATEUR RADIO LICENSING

FCC Authorizes Written Examination Credit

The FCC has amended its rules to allow re-examination credit for amateur radio operator written elements passed during an otherwise unsuccessful amateur radio examination.

On February 1, 1986 the Commission initiated a rulemaking proceeding to determine whether examination credit should be given for written elements for amateur radio operator examinations coordinated by Volunteer Examiner Coordinators (VEC's). Previously, credit could be given only for telegraphy elements.

The Notice of Proposed Rulemaking (NPRM) was in response to a petition by New Mexico amateur Robert A. Scupp, WB5YYX, of Albuquerque. The FCC also inquired whether it is necessary to continue to require the filing of an FCC Form 610 application for a license every time a person takes an examination.

Prior to the VE program, the FCC routinely administered the required telegraphy examination before administering any required written tests. While one-year credit for a successfully completed telegraphy element was given, there was no provision for written element credit, since a successful applicant would be issued a license.

The FCC said that "under the new VE system, it is apparently sometimes desirable to administer written elements prior to the CW examination. Since no provision exists for written examination credit, an applicant must re-take the written examination before attempting the telegraphy test again. We see no reason to continue the procedures of the former examination structure in the existing volunteer examination system," the FCC said. "If examiners and VEC's find it useful and convenient to offer examination elements in a different order, our rules should not hinder them."

The FCC application Form 610 will still be required each time an applicant takes the exam. If passage of the examination results in eligibility for a new or upgraded license, the form will then be forwarded to the FCC by the administering Volunteer Examiners (VE's) and the coordinating VEC.

In addition, the FCC amended the Amateur Radio Service rules to clarify that Novice system VE's are not required to is-

sue a Certificate of Successful Completion of Examination (CSCE) upon an applicant's successful passing of the telegraphy or written elements. Instead, an applicant may now receive one-year examination credit for these elements from the administering VE's by producing a photocopy of a pending application which indicates the applicant has qualified for a Novice operator license.

The rule changes allowing one-year written element credit became effective on December 1st. The FCC also had to revise the FCC Form 610 to provide blank spaces for VE's to indicate that credit is being allowed for previous successfully passed written Elements 2, 3, 4A, and 4B, the Novice, Technician/General, Advanced, and Extra class theory and regulation tests.

From The Mailbag

I want to take an amateur radio operator upgrade examination. What should I do?

Sorting out the new VE system. We seem to do a lot of that! Well, here we go again.

There are approximately two dozen different VEC organizations. Some are more active than others. Some are totally inactive! Each VEC accredits volunteer examiners who follow their testing instructions. As this is being written, every VEC uses the various FCC-developed question pools and *most* VEC's (but not all) utilize the ARRL multiple-choice answers.

License Preparation Material. The first thing you should do is acquaint yourself with the questions (and answers) to the specific written exam you wish to take. There are 500 each Element 3 and 4A questions (required for the Technician/General and Advanced license) and 400 Element 4B Extra class questions. Three firms—the ARRL, Ameco, and the W5YI Report—account for nearly all of the written-element license preparation manuals being distributed. All three support the ARRL multiple-choice answers.

These manuals can be purchased directly from the publisher, your local amateur radio store, or from the W5YI Report. (We distribute all of them.) If you purchase license preparation material from a ham or book store, be *certain* that you get the right question set! *Each question pool is changed annually.* There are four different question pools, and one of them is changed every quarter.

At present the Novice questions are re-

vised in January, Technician/General in April, Advanced in July, and the Extra class set in October. If the book outlet doesn't know when each of the tests is changed, don't buy the manual. Just because the book carries this year's copyright date does not necessarily mean it covers this year's tests. The exam could have been changed in October.

When each of the question pools is revised could change. The FCC has decreed that VEC's can now maintain their own question pools. At this writing the FCC is in the process of responding to several Petitions of Reconsideration challenging this. The League wants the FCC to continue to determine each of the 1,600-plus questions. The FCC's position is that each VEC is qualified to do this, particularly in view of the cost to the taxpayer and FCC manpower needed for the Commission to do it.

While the potential exists for each VEC to have different questions, it is extremely doubtful that this will happen, since VEC's also want common question (and answer) pools. All VEC's in attendance at the 1986 Conference of VEC's held at the FCC's Washington, DC headquarters affirmed this last August. The VEC's who were there represented over 90% of all amateur tests administered. The League has said that it may appeal to the U.S. courts if the FCC permits VEC's to revise their own question pools. Probably the best way to determine which questions and answers will appear in your test is to contact the VEC and ask them. The major VEC's (coordinating over 85% of all amateur test sessions) are:

National Volunteer Examiner Coordinators: (The VEC's are authorized to test in every state.):

ARRL-VEC, 225 Main Street, Newington, CT 06111. Tel.: (203) 666-1541.

W5YI-VEC, P.O. Box 10101, Dallas, TX 75207. Tel.: (817) 461-6443 (evenings and weekends).

DeVry-VEC, 3300 N. Campbell, Chicago, IL 60618. Tel.: (312) 929-6550.

Regional VEC's:

Central Alabama VEC, 606 Tremont St., Selma, AL 36701. Tel.: (205) 872-1166 (evenings and weekends). (States of AL, FL, GA, KY, NC, SC, TN, VA.)

Western Carolina VEC, P.O. Box 16189, Asheville, NC 28816. Tel.: (704) 667-2845 (evenings and weekends). (States of AL, FL, GA, KY, NC, SC, TN, VA.)

Anchorage-VEC, P.O. Box 1987, Anchorage, AK 99501. Tel.: (907) 562-1111.

National Volunteer Examiner Coordinator,
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How to Find the Test Session. Again, contact the VEC covering your area. The ARRL has a computer printout available of all of their scheduled test sessions. They can advise you when and where the nearest ARRL test session is located. The League also makes this list available to us monthly. We use this in conjunction with our own schedule to advise inquirers (via a form letter) where and when the next testing session will be held in their locality. *Always send a large business-size stamped self-addressed envelope when writing to any VEC.*

Once you know the location of the test session, it is important to contact the VE team and make arrangements to take the needed tests. Some VE teams require preregistration and test fee payment in advance, and some sessions aren't open to the public at all. The test session could be a closed testing session for a graduating ham class, handicapped amateurs, a limited number of applicants, or any number of other reasons. No VE team is required to test anyone.

A Word About Ham Code Tests. We also recommend you inquire as to the format of the Morse code test. This is left by the FCC for the testing community to determine. While you can be pretty much assured that the written examination will be 50 multiple-choice questions (40 if you are taking Extra Class Element 4B), the code test can be given in any number of ways. It can be one minute solid copy, multiple choice, fill-in-the-blank, even true/false! Although the code test can be hand sent, it will most likely be a cassette tape. We have heard of code tests even being administered at a computer terminal! You listen to the computer generate the test and then answer questions it poses about the text on the CRT screen.

Sometimes a testing team will use the so-called "Paris" code specifications. Others use the "Farnsworth" standard. The difference is in the speed of the character versus the space between the characters. The FCC does not care which method is used. In the "Paris" standard the number of times you can send the word "Paris" equals the code speed in words-per-minute. The dits always equal one unit in duration; the dahs, three; the spaces between characters, three; between words, seven. In the "Farnsworth" timing standard the characters are sent at a much faster speed, but the spaces between characters are adjusted to re-

sult in the proper words-per-minute rate.

The ARRL-VEC provides the code test tapes to their teams and requires that their teams use them. They use the "Paris" standard. The W5YI-VEC (the number two VEC in terms of applicants tested) allows their VE teams to make the decision as to which timing method they want to use, since the FCC doesn't specify. Where VE teams ask us to provide the test tape, we provide Farnsworth timed tapes, since we believe it is easier for an applicant to progress from one code speed to another if he or she learns the code with faster code characters to begin with. It is far easier to adjust to shorter spaces in between the characters and words. Since increasing numbers of applicants are learning the code via the "Farnsworth" standard, we think it makes sense to test by the same system also.

In effect, it eliminates the so-called "hump," or plateau, that comes between 10 and 15 words per minute. There are those who maintain you almost have to relearn the code when you reach that speed. If you learn it by the "Farnsworth" method to begin with, relearning isn't necessary. The FCC used the "Paris" standard when they gave the tests, and it *did* cause some problems to applicants going from 13 to 20 words per minute.

Some test teams (such as W5YI-VEC) allow you two chances to pass your code test. You are immediately passed if you write down one minute solid copy. Otherwise, you get to answer at least seven of ten questions about the code transmission. Each five characters are counted as one word. Each punctuation mark or numeral counts as two characters. To pass one minute solid copy you must copy 25 characters in a row for the 5 wpm code test, 65 for 13 wpm, and 100 for 20 wpm. Most VE teams do not require a sending test, although they can. Again, we allow our teams to make that decision. As you can see, while written examinations are pretty much standardized, this is not the case with the code portion.

What to bring with you to the test session. You will need a photocopy of your most recent amateur radio operator license. If you have recently upgraded, but do not yet have the license in your possession, ask the VE team if you can take still another upgrade test without your most recent upgrade license in your possession. Most will let you. The VEC will hold your application until you send them the needed license photocopy.

Be sure to bring *good identification* with you to the test session. A driver's license with your photograph on it is ideal. Be aware that some VE teams require more than one form of ID. Bring the original of any recent code or written exam credit certificate with you if you claim credit for a previously passed examination. If you hold a commercial radio telegraph license, bring that too. That will get you credit for 20 wpm code.

You will need to complete an FCC Form 610 application to take the examination. While most VE teams have these available, it is a good idea to complete this in advance. You can obtain blank 610's from your local FCC field office or write the FCC at: P.O. Box 1020, Gettysburg, PA 17325. A phone call to their *Consumer Assistance Branch* can also get you a blank 610 (telephone 717-337-1212). Consumer Assistance can supply you with a quick amateur radio license replacement (actually a form letter) if you can't find your current license.

Handicapped amateurs who need special help or equipment (such as transducers, braille readers, question dictators, vibrating surfaces, blinking lights, whatever) must supply these themselves. Be certain to advise the VE team that special arrangements are necessary. In most cases a special testing session will be set up for you.

Would You Like To Be A Volunteer Examiner?

Send an SASE today for a VE Application if you are an Extra class amateur and are serious about conducting periodic amateur radio examinations in your area so that others may upgrade. Complete information will be sent by return mail. Send to: W5YI-VEC, P.O. Box 10101C, Dallas, TX 75207.



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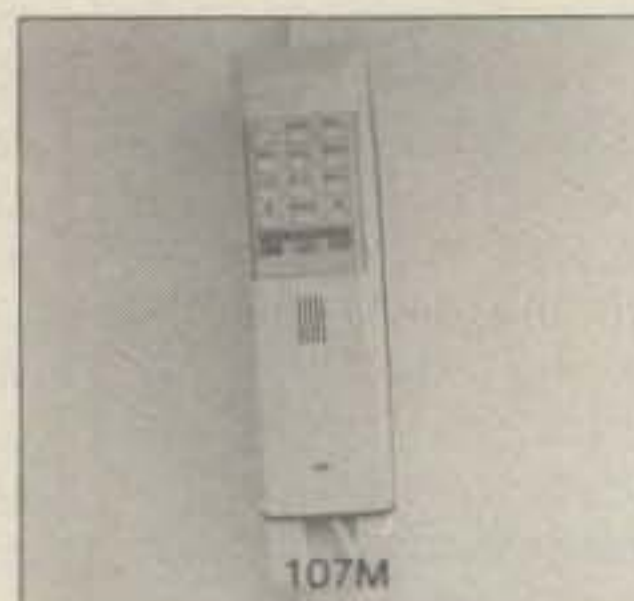
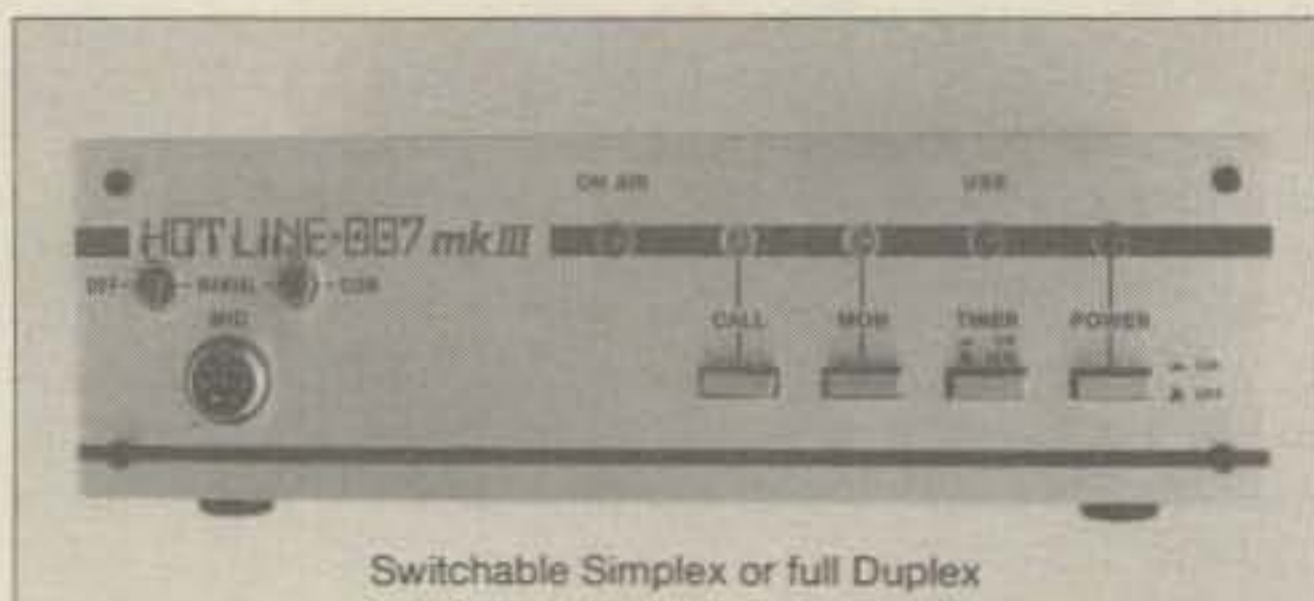
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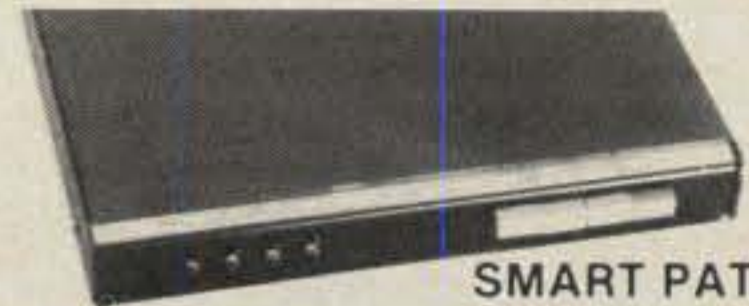
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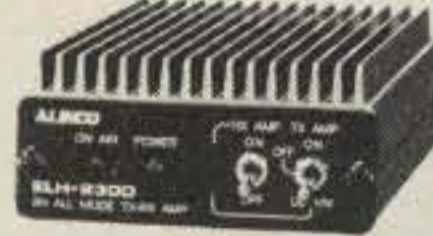
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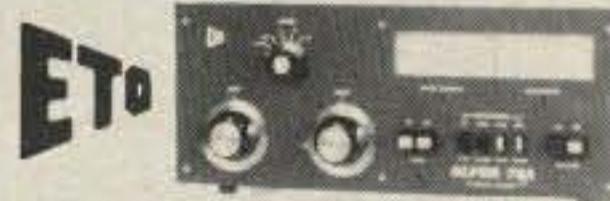


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Here's a rainy Saturday project that you probably can finish before lunch.

How To Build A Simple "J" Antenna For 2 Meters

BY JOSEPH M. PLESICH*, W8DYF

You say you've just splurged for a new 2 meter bells-and-whistles rig, but now you don't have money left over to buy the super-duper antenna to go with it. Or perhaps you'd like to have a second antenna, an omnidirectional one, for monitoring with the second rig while your other rig is on the beam working packet. Whatever your reasons are for wanting a 2 meter antenna, it's tough to beat the tried-and-true, simple "J" antenna. It's effective, inexpensive, and easy to construct and tune. Here's how I built one for just a couple of bucks, and it does a great job for me.

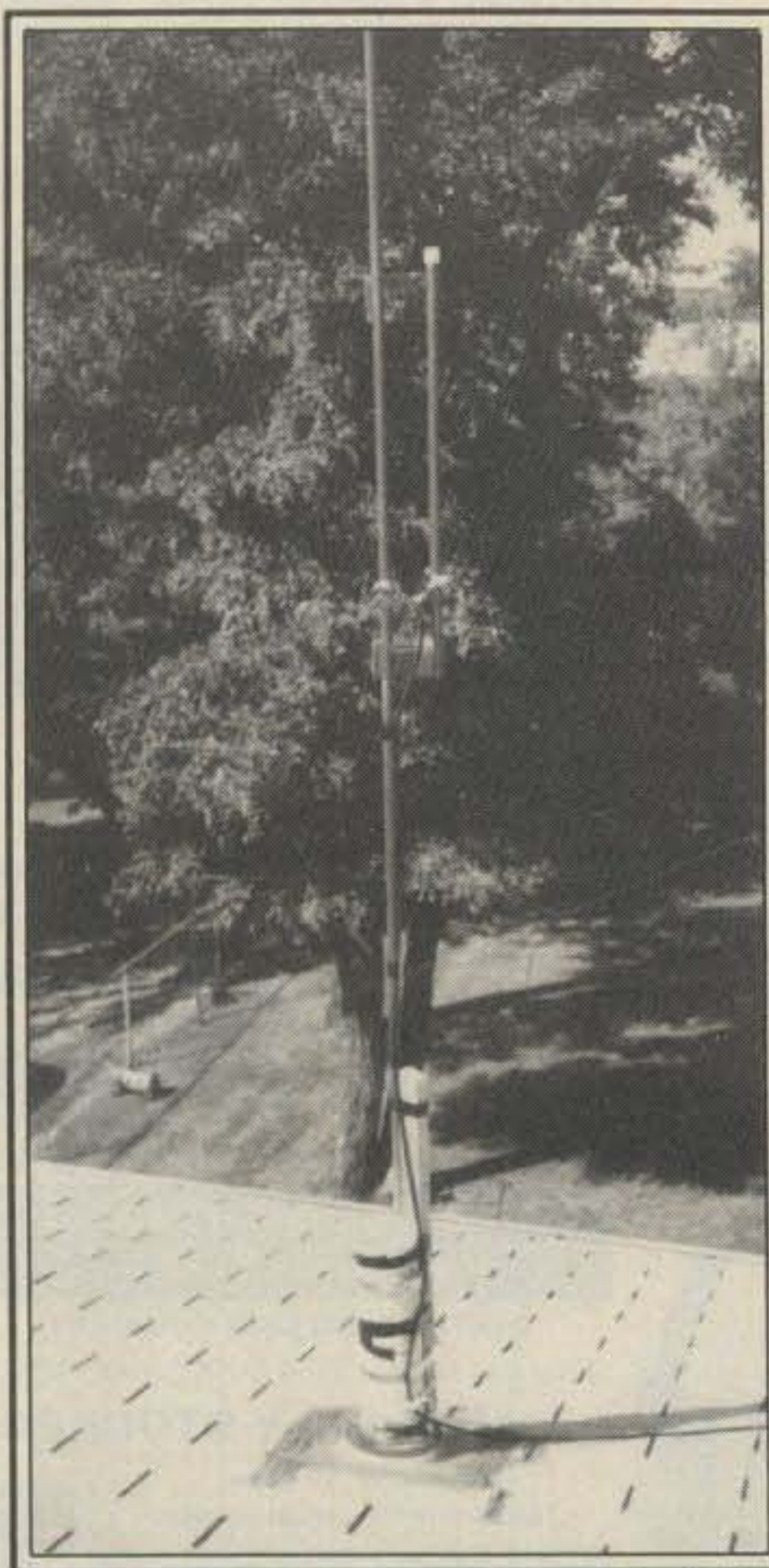
First, obtain a piece of half-inch copper tubing, 10 feet long. I bought mine on sale at a local discount store. I built my first "J" out of a piece of thin-wall electrical tubing, and it worked fine. But the copper tubing is lighter and a little easier to work with.

Next, measure 21 inches from one of the ends and cut it so that you now have two pieces of pipe—one 21 inches long and the other one 99 inches long. (See fig. 1.)

Now look at fig. 2. I used a piece of 2 by 4 inch printed circuit board to connect the two pieces of pipe. Since the PC board is so thin, I used a double thickness of it for extra strength. You can use anything you like, only make sure you short the two pieces of pipe together. Measure your pipe again and make sure you have 19 inches above the shorting strap on the small pipe and 57 inches above the shorting strap for the long pipe.

Above the shorting strap fasten a piece of acrylic or similar insulating block for stability and to maintain spacing. Your antenna will now be rigid and strong. That's it. Except for tuning, your "J" antenna is now finished.

As you know, the "J" antenna is just a half-wave radiator fed by a quarter-wave



The "J" antenna is shown on the author's QTH attached to the vent pipe by hose clamps.

matching stub. To tune it, all you have to do is put an SWR bridge in the line between your rig and the antenna. The coax is fastened to the antenna with two worm-drive stainless-steel hose clamps. I put the shield on the short pipe and the center conductor on the long pipe. I've been told you can do it vice-versa with no difference in operation.

I tuned my antenna outside on the picnic table with my hand-held and a little SWR bridge. I held the antenna on top of the picnic table with one hand and keyed

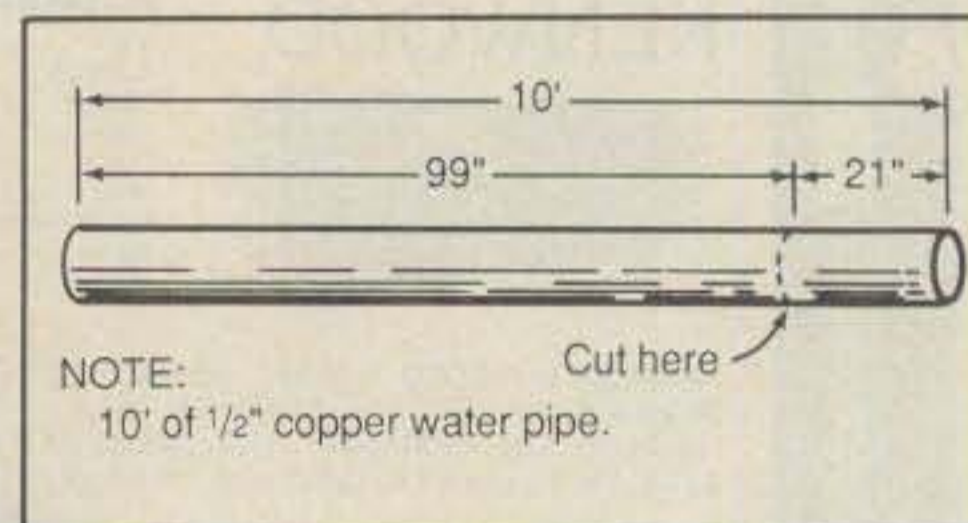


Fig. 1—The basic antenna comes from a 10 foot length of 1/2 inch copper water pipe cut as shown.

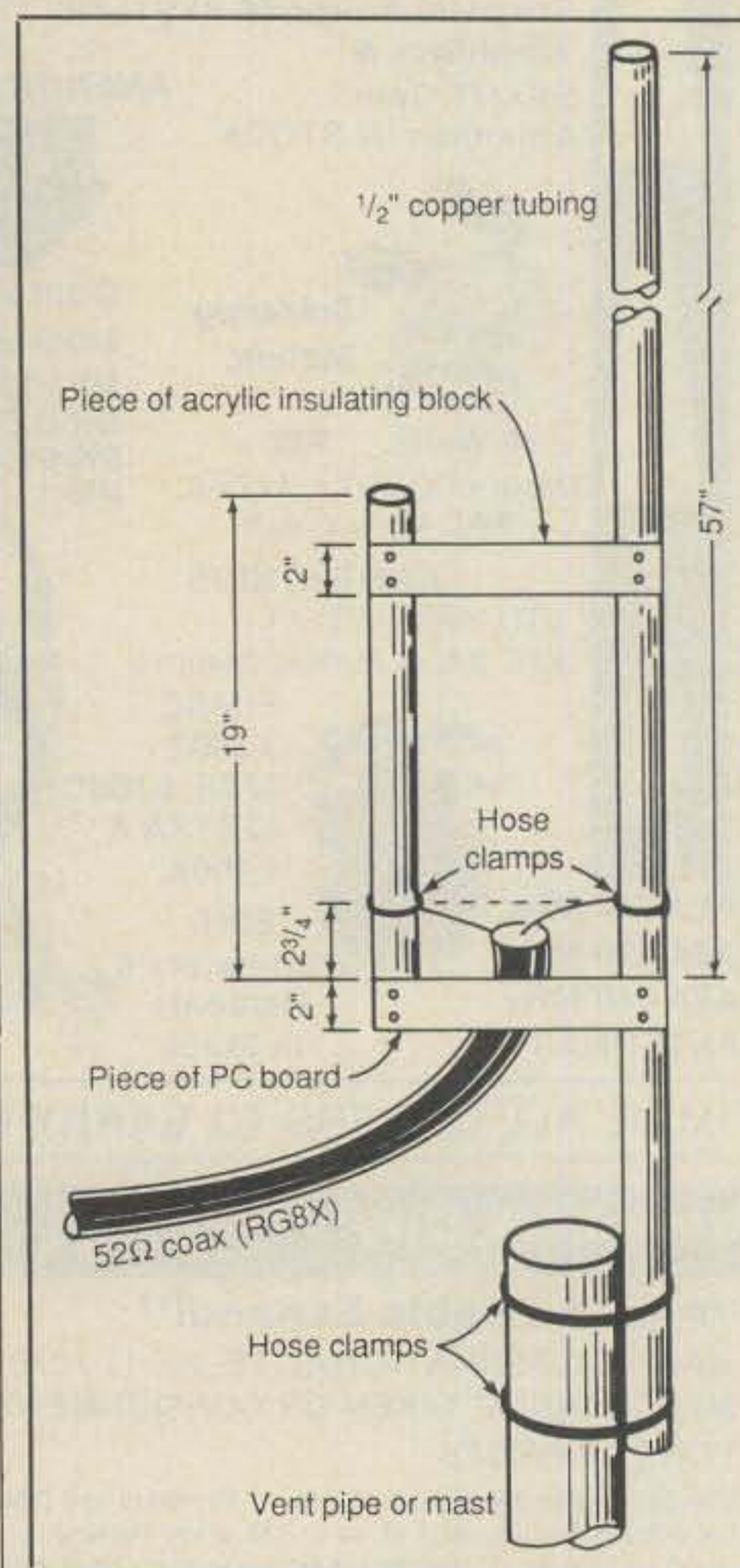


Fig. 2—The completed antenna diagram. As you can see the basic idea is simple, and it can be made with ordinary tools.

*554 Lovers Lane, Steubenville, OH 43952

the rig with the other hand. I just kept sliding the clamps with the coax up and down the antenna until a good match was achieved. You should be able to get the SWR below 1.5 to 1 easily. The point at which I achieved the best match was 2 3/4 inches above the shorting strap. Yours may be different.

After tuning is completed, wrap electrical tape around the coax and put some silicone rubber on the coax where it is clamped to the antenna to prevent water from getting into the coax.

To mount the "J," you can use a couple more hose clamps to fasten the antenna to another mast. At my house I clamped it to a vent pipe on the roof and ran the coax into the shack.

Granted, you can go out and buy a vertical for \$20 to \$50 that will work just as well as or better than this simple "J." However, you will be quite pleased with the performance and durability of this little antenna for the time, effort, and money it takes to construct it. And, there is a certain amount of fun and personal satisfaction to be had by working other stations on an antenna you have constructed yourself. I have a good location and some good commercial antennas, but I still get quite a kick out of being full-quieting into a repeater 50 miles away with this "J." Try it and enjoy. That's what amateur radio is all about.



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The built-in RS-232C serial port allows the use of the DS-3200 with an external demodulator such as the HAL ST-5000, ST-6000, or ST-8000. Or, add the HAL PCI-2000 for a completely self-contained RTTY/CW terminal and demodulator. Also, with the use of a second RS-232C serial port the DS-3200 can be used with your favorite TNC on Packet!

The DS-3200 with its IBM PC XT-style architecture gives you virtually unlimited flexibility for future expansion. Here is a list of just some of its hardware features: 8088 CPU, 640KB RAM, RS-232C Serial Port, Parallel Printer Port, Clock/Calendar with Battery Back-Up, Two 360KB Floppy Disk Drives OR One 360KB Floppy and One 20MB Hard Disk Drive, HERCULES-compatible Monochrome Graphics Adapter with High-Resolution 12 Inch Monochrome Video Monitor.

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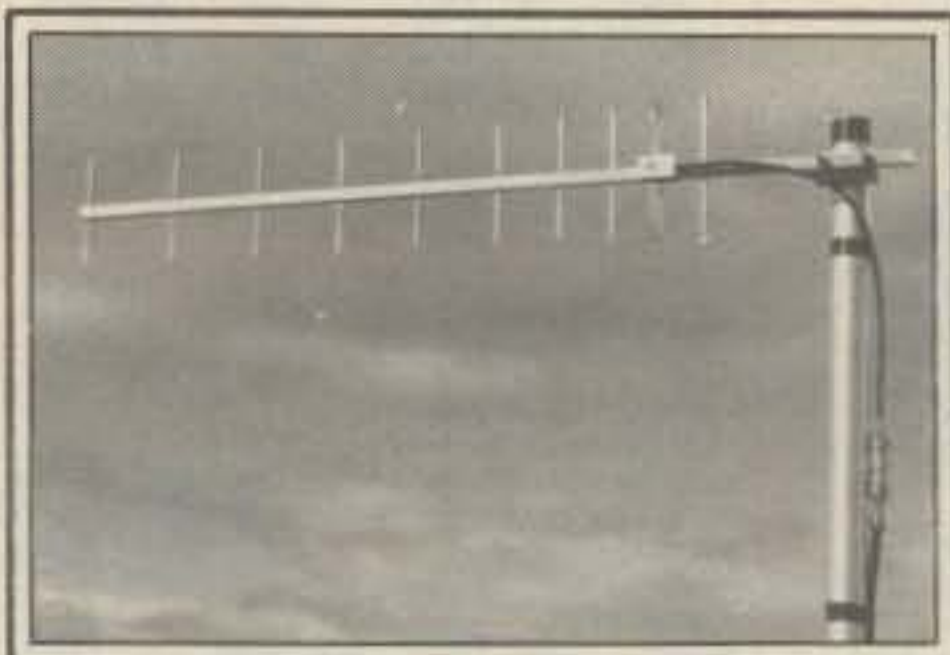
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CQ Showcase



Cushcraft 10-element Yagi

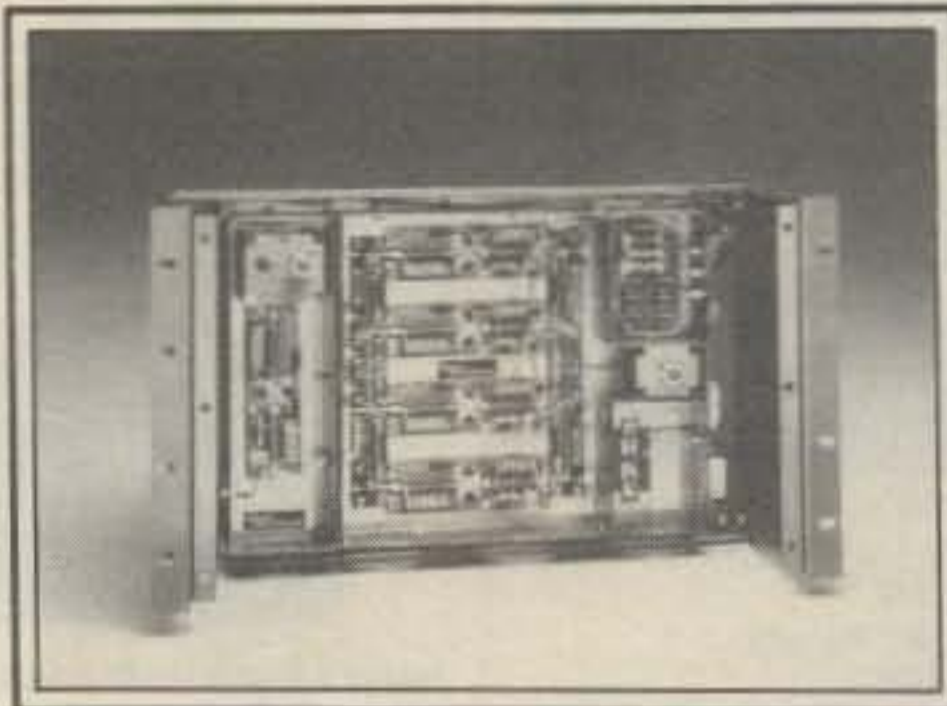
Cushcraft Corporation has announced a new 10-element Yagi antenna in the 928-968 MHz frequency range. It features solid aluminum elements and boom. The new design folded driven element is moisture sealed and it has a convenient pigtail feed with 50 ohm N connector.

This antenna may be used for RCC links, data, security, and many other applications. For more information, contact Cushcraft Corporation, P.O. Box 4680, Manchester, NH 03108 or circle number 105 on the reader service card.

Milcom International Trunking/Repeater Amplifiers

Milcom trunking and repeater amplifiers are designed for use in continuous-duty applications and are not modified mobile units. The VHF, UHF, and 800 MHz amplifiers are mounted in standard 19 inch rack configuration and are cooled by forced air. They are available in power outputs from 90 to 180 watts.

For more information, contact Milcom International, Inc., 10701 Bloomfield Street, Los Alamitos, CA 90720, or circle number 104 on the reader service card.



Yaesu FT-23R VHF & UHF Hand-Held Transceivers

Yaesu U.S.A. has introduced the FT-23R Series of compact VHF and UHF hand-held transceivers. The FT-23R (2 meters) and FT-73R (70 cm) provide 10 memories, scanning, priority channel, LCD display with full frequency display, and an optional CTCSS Unit with LCD display of the tone frequency and mode (Encode or Encode/Decode). The FT-23R and FT-73R are equipped with long-life 600 mAh nickel-cadmium batteries, which provide 2.5 watts output on the FT-23R and 2.0 watts output on the FT-73R. A broad line of battery packs and Alkaline cell holders is available, providing power outputs of up to 5 watts on both models. A top-panel tuning dial is provided or the front panel scanning controls may be used. All memories hold both standard repeater splits and CTCSS information, while seven of the memories will also handle non-standard repeater splits.



These transceivers are housed in rugged zinc/aluminum alloy cases and the rubber gasket seals provide protection from rain and spray. A full line of accessories is available, including battery chargers, DTMF pad, mobile DC adapter, speaker/microphone, CTCSS Unit, and mobile hanger bracket. For further information, contact Yaesu U.S.A., Amateur Products Division, 17210 Edwards Road, Cerritos, CA 90701, or circle number 103 on the reader service card.

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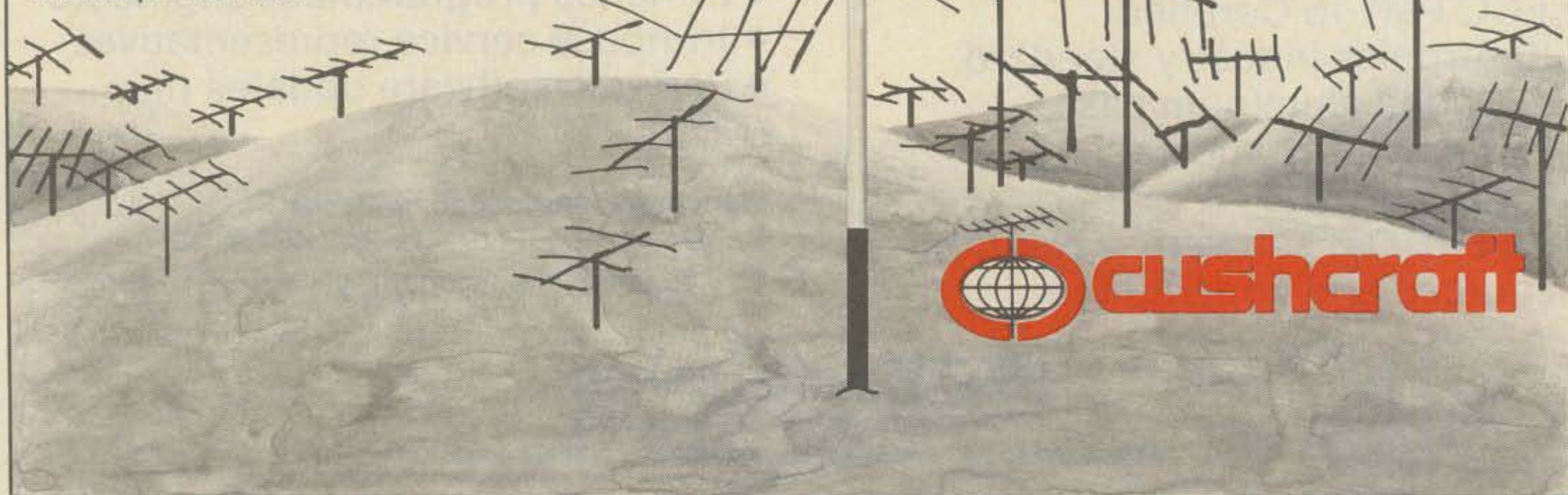
With the Cushcraft A3 you too will stand out from the crowd.

W2GD STANDS OUT FROM THE CONTEST CROWD

Using the Cushcraft A3, John set a record for a DX station in the 1985 ARRL DX CW contest while operating from VP2MGD. The A3 mounted at 35 feet produced 2,732 contacts on 10, 15, 20 with the maximum possible multiplier on 15 and 20 meters.

Using a Cushcraft 40-2CD 40 meter beam, he made 1083 contacts with 68 countries during the 1986 CQ WW CW contest while operating all band single operator P40GD on Aruba.

John, W2GD says "... I am extremely pleased with the performance and ease of construction. I consider the antennas a good choice. Keep up the fine product line."



NEWS OF CERTIFICATE AND AWARD COLLECTING

The Story of the Month for February is:

Glen O. Lavin, N9BDM
USA-CA All Counties #511
All 20M SSB, Mobile, 5-5-86

"I was first licensed as a Novice in May 1979 as KA9EKB. On December 24, 1979 I received my General with the call N9BDM. I upgraded to Advanced in February 1980.

"There were four other men who got their tickets at the same time. We all started working DX, and it became a race to see who could get DXCC first. After 5 years of chasing DX, I have 265 countries.

"I was at a Swapfest in Rochester, Minnesota when I first saw the Kenwood TS-430S and liked it very much. So on Monday I drove to Minneapolis and made a switch, trading my TS-830S for the TS-430S.

"I arrived home and hooked up the TS-430 on my desk. When I tuned in the 14.336 net, I asked for more information. WA3ZMY, Bill, said, "Up five." He told me where to send for more information. That night, K5OUK, Mike, and I had a long QSO. He filled me in on the whole County Hunting routine and the Mobile Amateur Radio Awards Club (MARAC). The next day I sent to MARAC for information and to CQ for rules and a record book. I now was hooked on County Hunting!

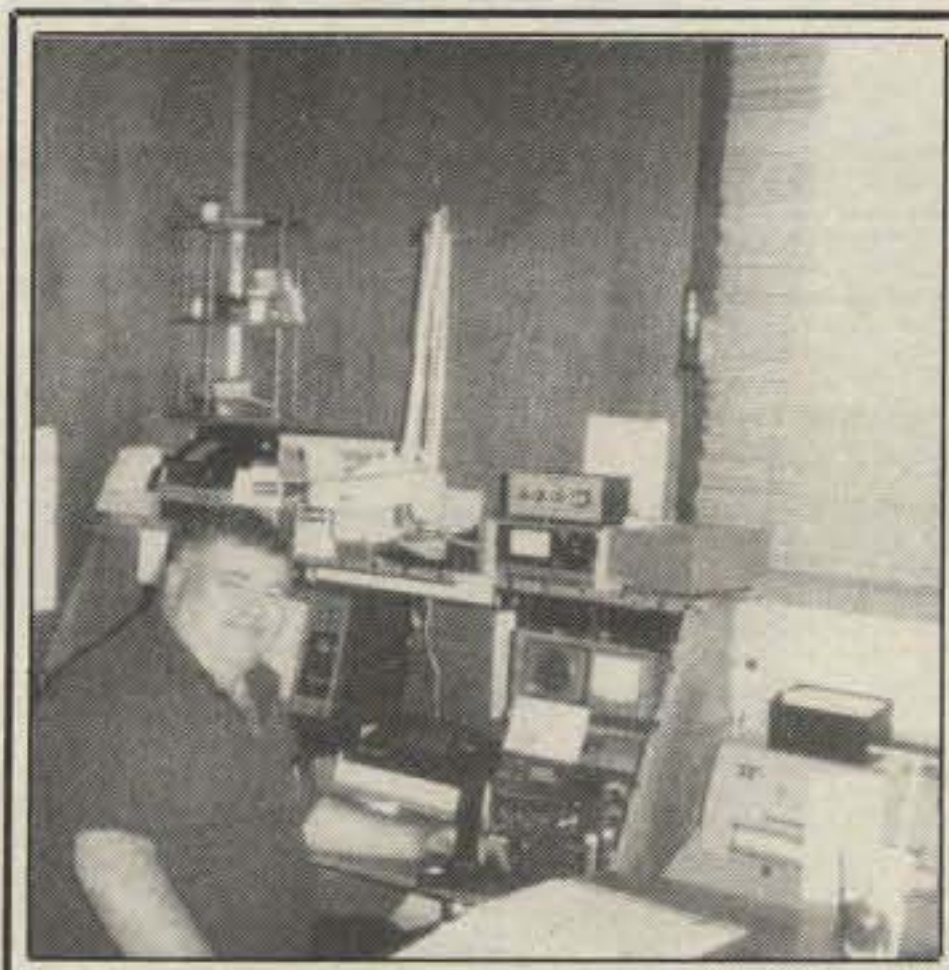
"I am 56 years old and I worked for the Wisconsin Department of Agriculture Grain Regulation until July 1981, when I was forced to retire because of health problems.

"I am married and my wife, Barbara, and I have three sons, one daughter, and three grandchildren.

"I received my USA-CA #511 dated 5-5-86 and I started over the second time around on 5-6-86.

"I attended the Annual County Hunters Convention in 1984 at Kansas City, but I had to leave early because of a family emergency. I attended the Wisconsin Mini in Oshkosh and the annual at Couer D'Alene, Idaho; also, the Mini in Hooterville, Wisconsin in 1985 and National in Asheville, North Carolina in 1986.

"There are so many I have to thank for helping me get my USA-CA #511 that if I tried to name them all, I would leave somebody out. However, I want to send a special thanks to WA3TUC for the phone



Glen Lavin, N9BDM, USA-CA All Counties #511, at his operating position in Superior, Wisconsin.

calls, and the last one for completing all the counties."

Awards Issued

Franz Kurth, WB6ALC, added a unique and enviable endorsement to his USA-CA 500, dated 6-5-82: #1 All 160 Meters, 50 States, Mixed Mode, dated 10-28-86.

Richard Sikora, NG9L, completed all his paperwork and claimed USA-CA All Counties #521, USA-CA 3000 #553, USA-CA 2500 #619, USA-CA 2000 #680, and USA-CA 1500 #765, All SSB, dated 10-2-86.

Richard Goodall, G2AFQ, got all his confirmations and qualified for USA-CA All Counties #522, 10-23-86, All Telephony.

Larry Wilson, HH2WL, celebrated the end of his tour of duty in Haiti by claiming USA-CA All Counties #523, and USA-CA 3000 #554, All SSB, 10-31-86, #1 to Haiti.



Glen, N9BDM, enjoying the convention in Asheville, North Carolina.

USA-CA Special Honor Roll

Richard Sikora, NG9L
All Counties #521, All SSB, 10-2-86

Richard Goodall, G2AFQ
All Counties #522, All Telephony, 10-23-86

Larry Wilson, HH2WL
All Counties #523, All SSB, 10-31-86

USA-CA Honor Roll

3000		1500	
NG9L	553	NG9L	765
HH2WL	554	NL4276	766
2500		500	
NG9L	619	KA0NVT	2134
NL4276	620	WB4KMH	2135
		KA0EQE	2136
		W1WLW	2137
2000			
NG9L	680		
NL4276	681		

The total number of counties for credit for the United States of America County Award is 3076. The basic award fee for subscribers to CQ is \$4.00. For non-subscribers it is \$10.00. Initial application must be submitted in the USA-CA record book which may be obtained from CQ Publishing Company, 76 North Broadway, Hicksville, NY 11801, 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 the USA-CA Custodian, 333 South Lincoln Avenue, Mundelein, IL 60060, USA. DX stations must include extra postage for airmail reply.

J. A. van der Rijt, NL4276, added the following to his good record: USA-CA 2500 #620, USA-CA 2000 #681, and USA-CA 1500 #766, All SSB, 10-28-86, All #1 to SWL, Netherlands.

USA-CA 500 certificates went to:

Clyde Kane, KA0NVT, USA-CA 500 #2134, 10-1-86, Mixed.

Phillip De Porter, WB4KMH, USA-CA 500 #2135, 10-16-86, Mixed.

Gary Ritterbush, KA0EQE, USA-CA 500 #2136, 10-16-86, Mixed.

Joe Watson, W1WLW, USA-CA 500 #2137, 10-20-86, Mixed.

Awards Available

Republic of Chile Award. Radio Club de Chile (CE3AA) has instituted a new award under the name of "Diploma Republica de Chile" (Republic of Chile Award), according to the following rules:

1. The award shall be forwarded to any licensed radio amateur of the world who

333 South Lincoln Ave., Mundelein, IL 60060.

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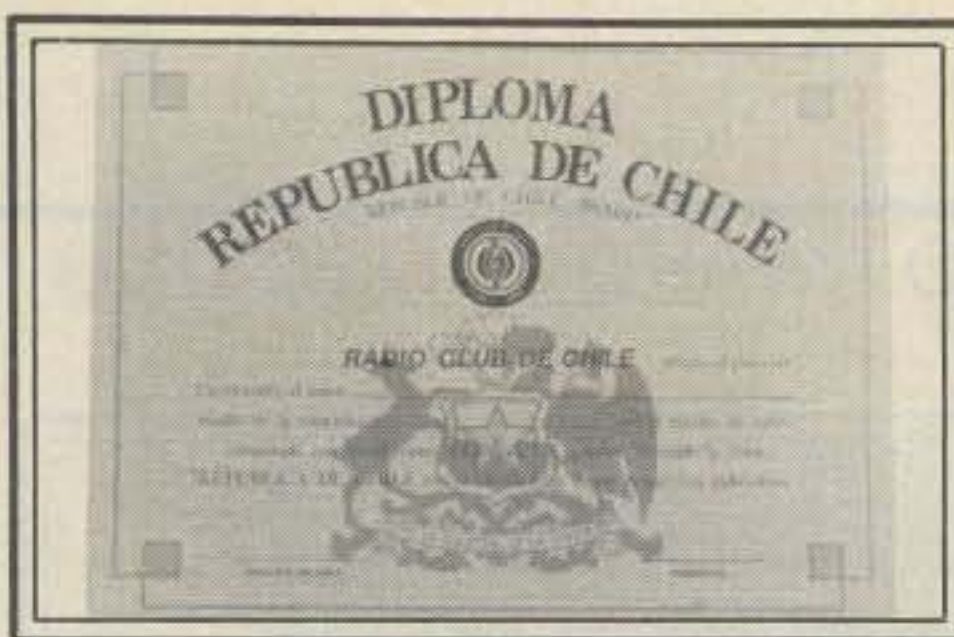
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Universal Transmatch 1 KW (8:1, 9:1 or 1:1-select one)	16.00
Universal Transmatch 2 KW (8:1, 9:1 or 1:1-select one)	18.50

CIRCLE 172 ON READER SERVICE CARD



Republic of Chile Award offered by the Radio Club of Chile, CE3AA.

makes contact with 16 different CE radio amateur stations from any Chilean Zone, so as to form the phrase "REPUBLICA DE CHILE" with the last suffix letter of their call sign.

2. All contacts will be valid starting from January 1, 1986, on any band and mode.

3. Applicants must send the corresponding QSL cards or, preferably, a list of QSOs, duly certified by an IARU member society, showing Date, Station, Band, RS(T), Mode. The list must be arranged in order to spell out the required phrase reading from top to bottom.

4. Applicants must enclose a fee of 8 IRCs, foreign stations; 4 IRCs, Chilean stations.

5. QSL cards, if submitted, will be returned at the time of sending the award. Shipment to foreign stations will be by airmail.

Applications should be sent to Radio Club de Chile, Nataniel No. 1054, Casilla 13630, Correo 21, Santiago, Chile.

Radio Club de Chile declines all responsibility for missing or lost QSLs.



Broadcast Listeners Award, by the International Listeners Association, and promoted by GW4OXB in the interest of the SWL hobby.

International Listeners Awards. The ILA awards are promoted by GW4OXB in the interest of the hobby of shortwave listening. However, licensed amateurs are welcome to submit lists of two-way contacts and awards will be endorsed accordingly. The jamboree awards are promoted in cooperation with the Radio Scouting organization and, as JOTA is intended as an Inter-Scout communications event, operators are asked NOT to contact Scout

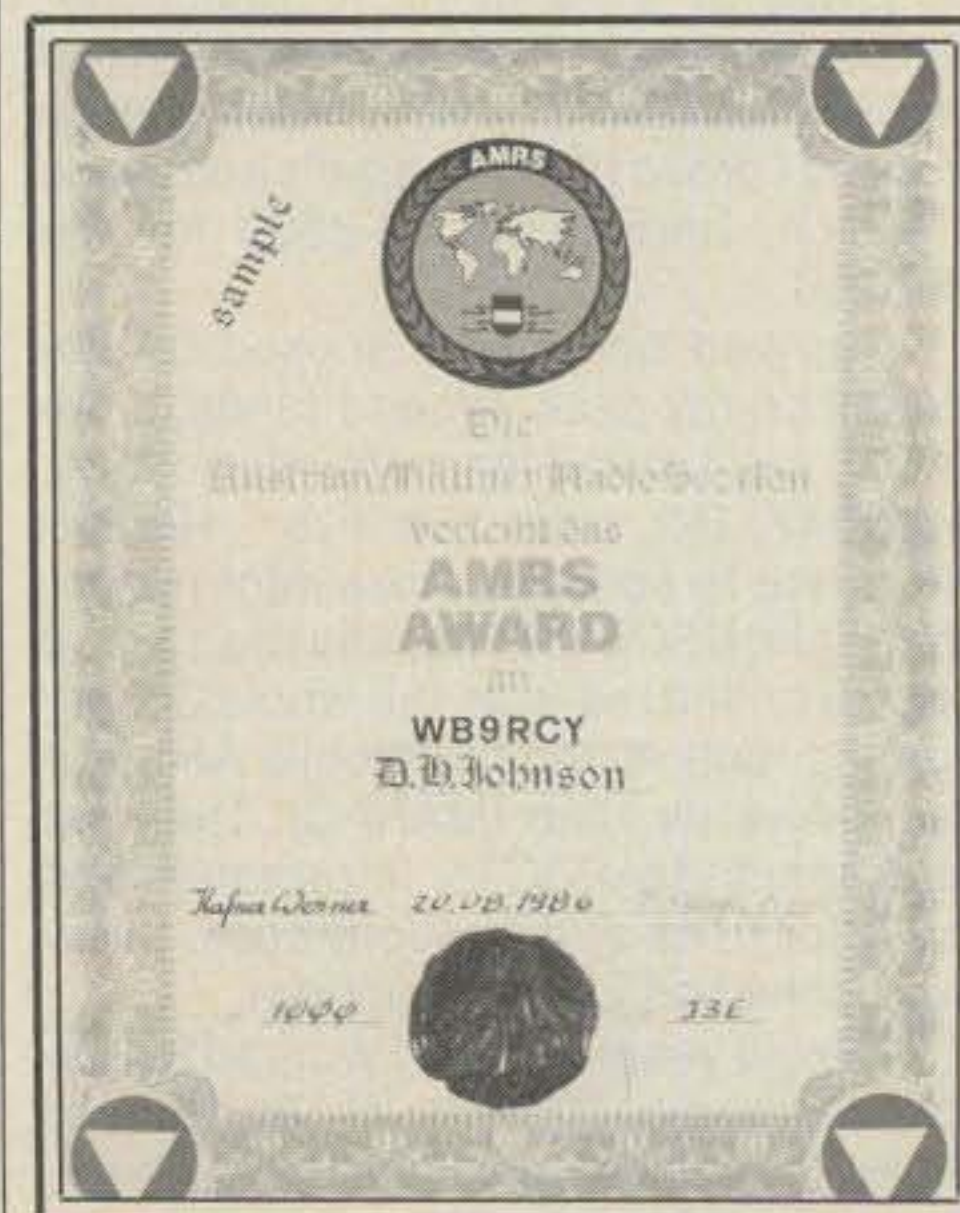
stations for the purpose of the awards. Any award can be endorsed for single-band or single-mode reception on request.

The Broadcast Listeners Award. This award is presented for logging over 100 standard broadcast stations worldwide. For the purposes of the award, stations such as Radio Vilnius (Lithuania) and Radio Kiev (Ukraine) count as separate and standard service stations in the USA. (VOA, AFRTS, WINB, etc.), and similar independent stations in other countries also count separately.

There is no fee for this certificate.

The GB2WFF Jamboree Award. This award is presented for logging Scout stations during the annual Jamboree on the Air which is held in October. Claims should consist of date, time, frequency, mode, and name of Scout Group. QSL cards are not required.

There is a fee of 50p for this award, which is donated to charity each year.



AMRS Award offered by the Austrian Military Radio Section.

AMRS Award. The AMRS Award is an official award of the OVSV. The publisher is the Austrian Military Radio Section (AMRS).

The award is available to all amateurs and SWLs. There are no limitations as to mode and band. Contacts must be made after January 1, 1961. Foreign stations need 20 points to qualify.

Each station counts one point. Club stations count two points. Austrian stations of the United Nations Forces count three points—for example, OE2WSL/5B4 Cyprus or OE2WSL/YK Syria. Each station may be counted once in each country—for example, OE8JSK/YK, 3 points, Syria; OE8JSK/5B4, 3 points (5B4EY), Cyprus; OE8JSK, 1 point, Austria.

The fee is \$5 US, postal order (airmail), or 10 IRCs. Award Manager: Werner Hafner, OE8HFL, Austrian Military Radio Section, Villach, 280986, Austria.

AMRS calls are OE1AD, BO, CHA, EFA, EHB, EKB, ENW, EPW, FOA, GFC, GFG, GFW, GGU, GLW, GPU, GRU, HGB, IE, JWS, KHW, KKW, KRW, LMA, LOW, LWA, MBA, MHL, NHK, OSW, PBW, PQ, PSU, PZA, RPS, RSS, RUA, SRW, VGW, WGC, WKA, XMA, XRC, PPC, REB. OE2AOM, AWN, BFL, BSL, BVL, DJM, EM, ERM, ESN, GCL, GNL, HZL, ICL, JKN, KOM, LDM, MCL, NGL, NTM, NWL, OHA, PAL, PFN, PPM, PZL, SCL, SJL, TKM, TWM, UIL, UNL, VAL, VEL, VRM, VWL, WSL, XJM, XRM. OE3AGW, BHB, DDW, DHB, EPA, EZW, FFB, FFC, FMB, FQU, GNA, GRU, GSA, GPA, GWC, HEB, HMW, HNC, HPA, JPK, KBP, LJW, NEA, NKA, OD, ODW, OOG, PFW, PHA, PKU, PPC, PSC, REB, RFA, RHA, RUB, SFW, SGC, SOB, UP, VMW, WWB, XMS, XRC. OE4MDA, PMB, PWW, RSA, SZW. OE5BA, BBL, BOL, BW, CA, EMN, GIM, GML, GZM, HCM, HEL, HLL, HT, JTL, KE, LKL, LSN, LXL, MEM, PNM, SPW, UYL, WSM, XAM, XCL, REB. OE6BDG, DK, FYG, IQG, KEG, LZG, NBG, NFK, NZG, PPD, PWG, SJD, TUG, UTG, WSD, GUD, MSG, POD. OE7CWJ, HHW, JLI, RKH, RMI. OE8AJK, BEK, GMK, HFL, HMK, HPK, JSK, KIK, KJK, NIK, PB, PGK, PRK, RPQ, SPK, TLK, XAQ. OE9FWI, HZH. Cyprus calls are 5B4AU, BC, BK, CX, EC, EY, EZ, HG, IE, IJ, IZ, KE, PP, LY. All 5B4 calls must be stations of the UN Forces.

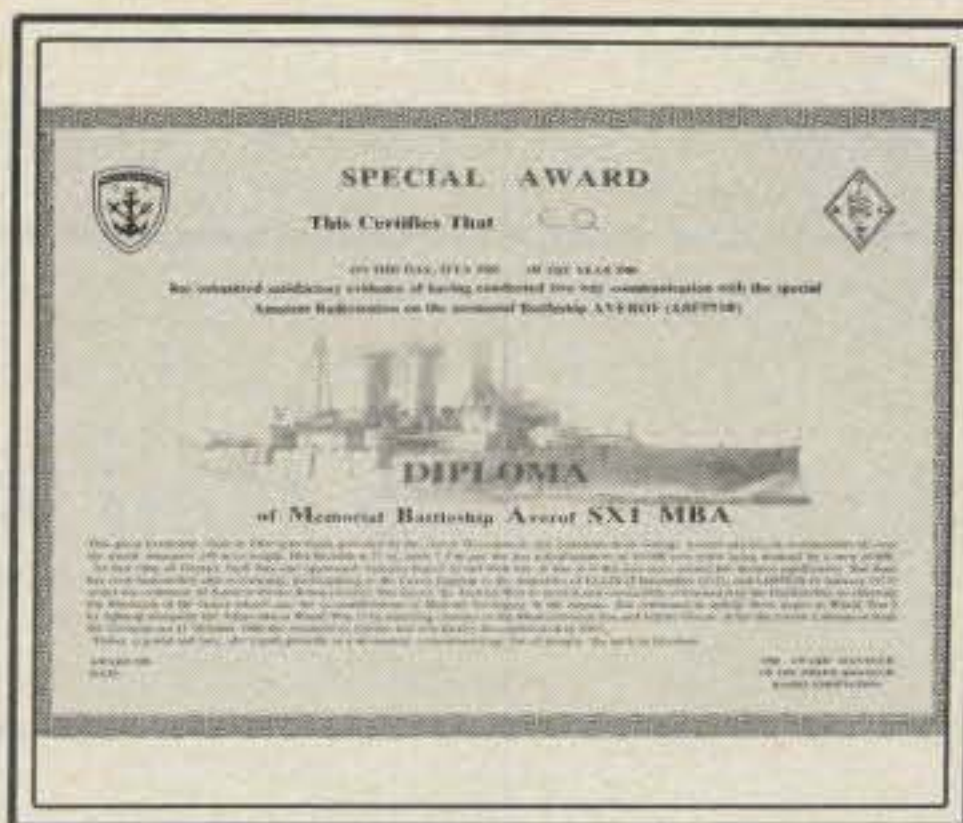
SX1MBA Special Award. The Greek Amateur Radio Association offers a special certificate for contact with station SX1MBA, aboard the memorial battleship Averof. The fee for this award is 10 IRCs or \$2 if mailed directly to the applicant; no fee if mailed via the Bureau. The RAAG Award Manager is Athanassios Athanassiou, SV1UG, P.O. Box 18184, Athens 116 10, Greece.

RKE Awards Program. RKE awards will be issued to any amateur or listener. Each claim must be accompanied by a list showing the data of the two-way communications achieved for the award concerned. Each list must be accompanied by documentary proof in the form of GCR list or QSL cards showing that two-way communication has taken place. Cards will be returned by registered mail at no additional cost. Contact with maritime mobile or aeronautical mobile stations will not be accepted.

There are three separate awards available: mixed, phone, CW. Contacts may be made from any location in the same country. The awards managers are I4ZSQ and I4NE.

All correspondence should be sent to RKE Editor I4NE, Nerio Neri, via N. dell'Arca 58,40129, Bologna, Italy; or via I4ZSQ, P.O. Box 2073, Bologna 40100, Italy.

Thousand Countries Award (TCA). This award may be claimed by any amateur or listener who can produce evidence of having made two-way communication with amateur stations located in at least



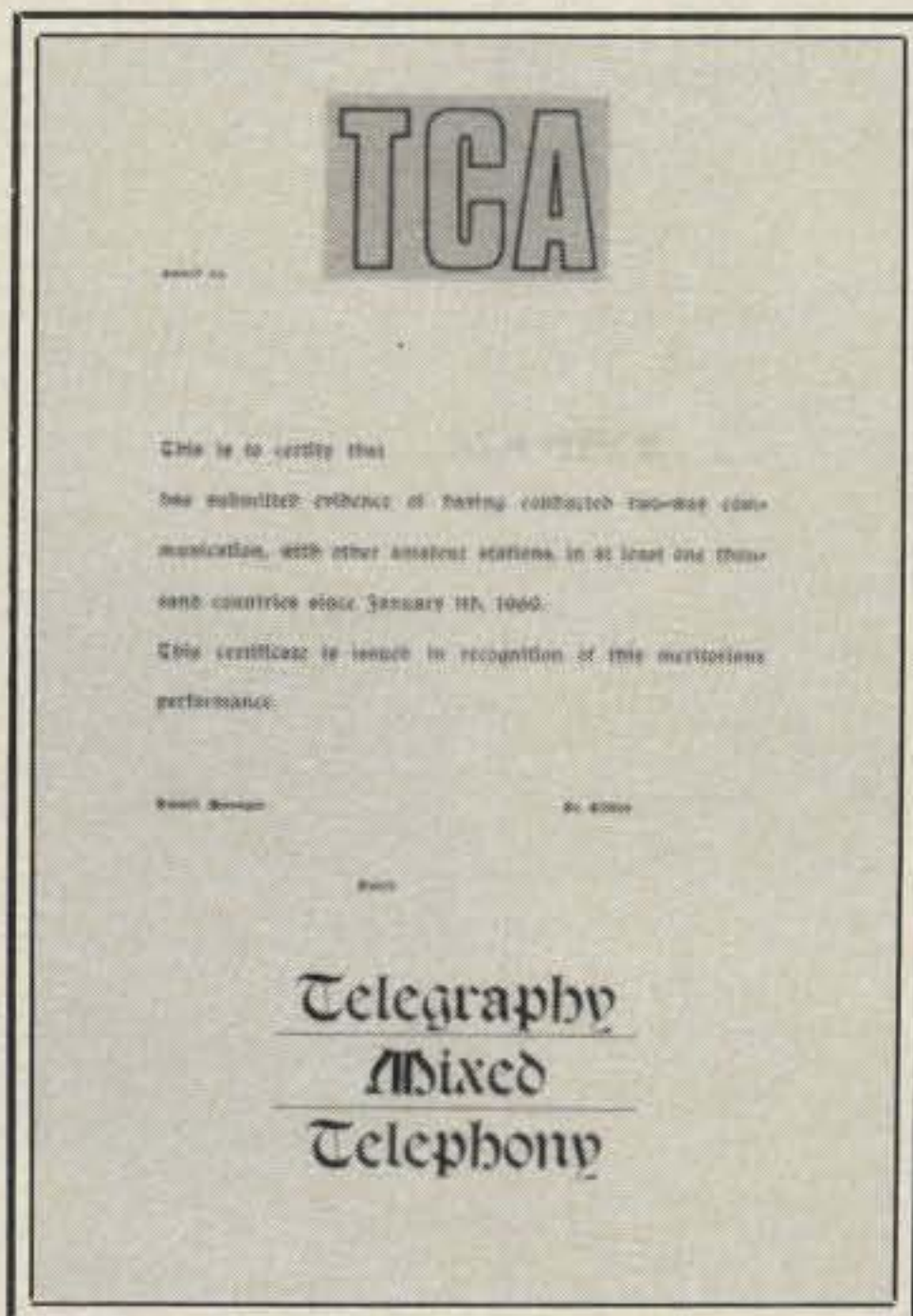
The SX1MBA Special Award denoting contact with station SX1MBA aboard the memorial battleship Averof.

1000 countries from the ARRL list since 1 January 1969, using the 10, 15, 20, 40, and 80 meter bands. Credit for deleted countries will be given following the ARRL rules.

A pottery plaque will be sent free to the first ten applicants.

Half Thousand Countries Award (HTCA). This award may be claimed by any amateur or listener who can produce evidence of having made two-way communications with amateur stations located in at least 500 countries from the ARRL list since 1 January 1983, using 10, 15, 20, 40, 80 meter bands. Credit for deleted countries will be given following the ARRL rules.

Worked Italian Prefixes (WIP). This award may be claimed by any amateur or listener who can produce evidence of having



TCA, the Thousand Countries Award, available through the RKE Awards Program, based in Bologna, Italy.

made two-way communications with amateur stations located in Italy and in Italian islands (including Sardinia) since 1 January 1983 using 10, 15, 20, 40, and 80 meter bands as follows: Class A, 40 prefixes; Class B, 30 prefixes, reserved to foreign amateurs (extra Italy); Class Extra, 60 prefixes. A pottery plaque will be sent free to the first ten applicants for the Extra class.

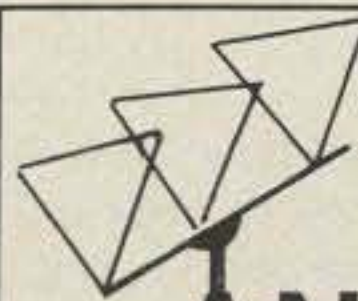
To preserve the integrity of the RKE Awards Program, the manager reserves the right to request some control QSLs, when a GCR list is submitted.

Golden Jubilee DXCC Award. The ARRL is celebrating the 50th anniversary, or Golden Jubilee, of the DX Century Club. A handsome certificate is offered for working 100 or more countries on the ARRL Countries List during 1987. The official application form and complete rules should be requested with a self-addressed envelope with one unit of postage (for US), or a self-addressed envelope from overseas, to Golden Jubilee of DXCC, American Radio Relay League, 225 Main Street, Newington, CT 06111 USA.

Notes

I hope the holidays and entry into the New Year have been happy times in your area. We found the transition to be refreshing and reassuring.

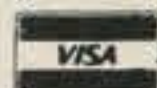
73, Dorothy, WB6RCY



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A LOOK AT THE WORLD AROUND US

WARC Band Special: The Mini 30 Transceiver

Slightly more than a year's time has passed since we've reviewed WARC band happenings, so we're updating that situation this month with a special feature. Our highlighted subject is an inexpensive and easy to assemble shirt-pocket transceiver for 30 meters. This little gem is the second generation, or evolution, of my original "QRP 30" transceiver described in June 1983 *CQ*. It features a low-noise yet sensitive receiver, 2 watt transmitter, VXO frequency control, QSK, and an internal rechargeable battery, yet it's only a couple of millimeters larger than a pack of cigarettes. (See fig. 1.) Although the Mini 30 was completed only a couple of months before writing this column, occasional use has already provided several DX QSOs and numerous stateside contacts. I've also used the rig mobile and portable with good success. Requests for schematics and construction information inspired me to include those details in this column.

Overview

The barefoot rig and CW-only restrictions on 30 meters continue to create a classic QRP haven, and the band's location between 20 and 40 meters yields good openings during both daytime and nighttime hours. Using the Mini 30 and a simple dipole antenna, I've worked around the U.S. during early mornings, middays, and evenings. QRM on 30 meters is miniscule, and most of the activity is between 10.101 and 10.108 MHz. It's great for limited-range VXO-controlled rigs and direct-conversion receivers. (Modern renditions of the classic Rush-box, eh? Blip your bug if you remember Rushboxes. Hallelujah!)

A number of ideas and operating flexibilities visualized after enjoying our QRP 30 are included in the Mini 30. A capacitor shifted crystal oscillator is used for frequency control to sidestep temperature and turn-on drift. To coin a phrase, it's rock stable. The complete unit is also constructed on a single piece of perfboard using readily available components for simplicity and compactness. The rig's internal battery pack (a spare 11.8 volt item for Yaesu's FT-208R 2 me-

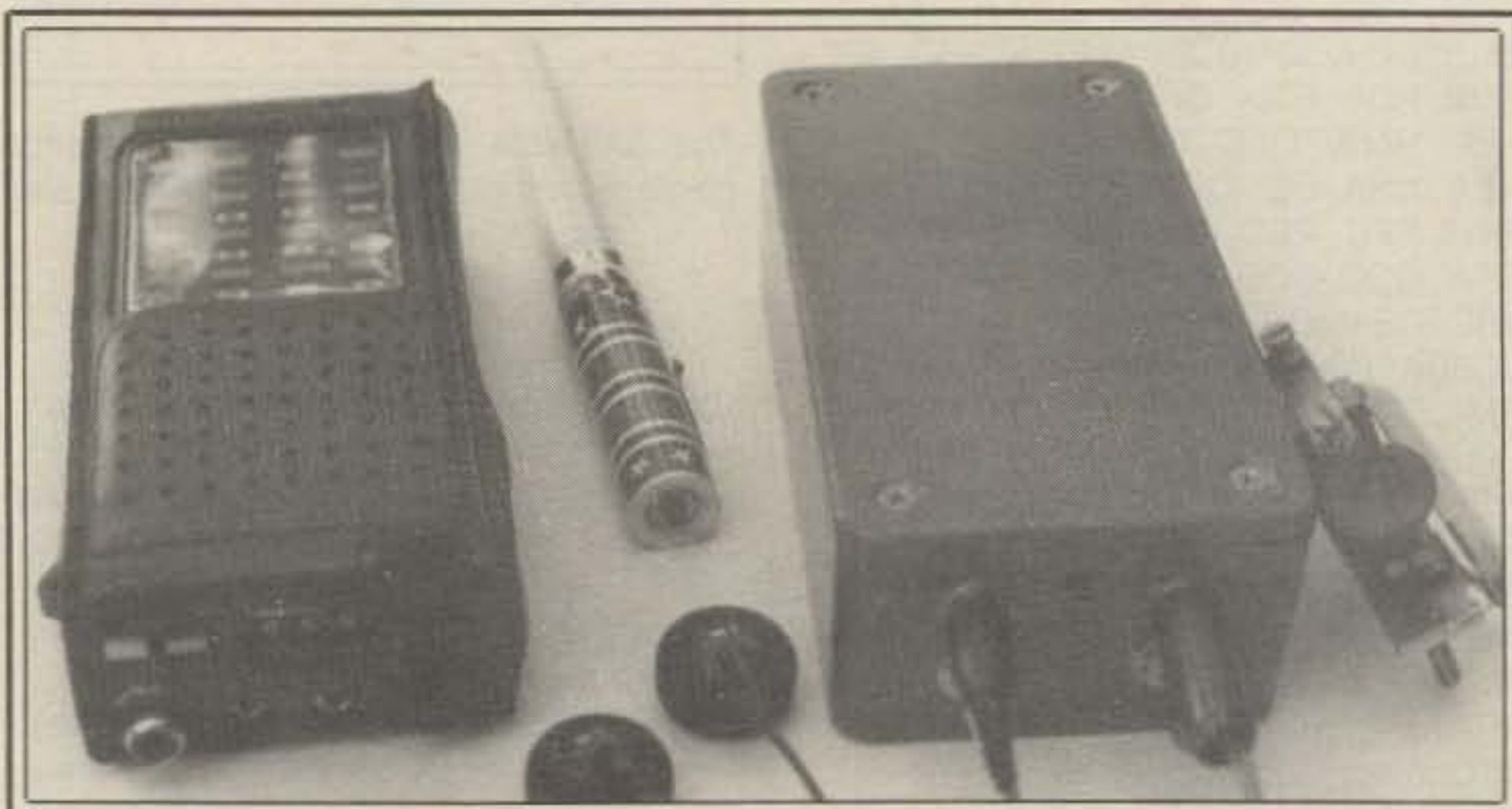


Fig. 1— The Mini 30 CW transceiver ready for action. Unit is only a few millimeters larger than a cigarette pack, yet includes its own rechargeable battery. Two meter pocket talkie is provided for size comparison. Note use of communications-quality earphones and pocket "spy key." Pen in middle houses a .5 watt, 10.104 MHz, crystal-controlled transmitter that's also complete with 12 volt battery and top key/push switch.

ter handheld transceiver) can be recharged when necessary via a rear jack. Additionally, connecting 12 to 14 volts between that jack's ground and the front key socket's shield (while leaving the front switch in its off position) permits rig operation during battery-charge times—a convenient mobiling feature.

Circuitwise, I found the receiver's 40763 MOSFET equal to the QRP 30's CA3028, but less noisy. My simple hand-wired LM-386 audio section also has substantially less background "hash" than the preassembled Radio Shack stage in the QRP 30. The resultant lack of background hiss lets you hear signals that are

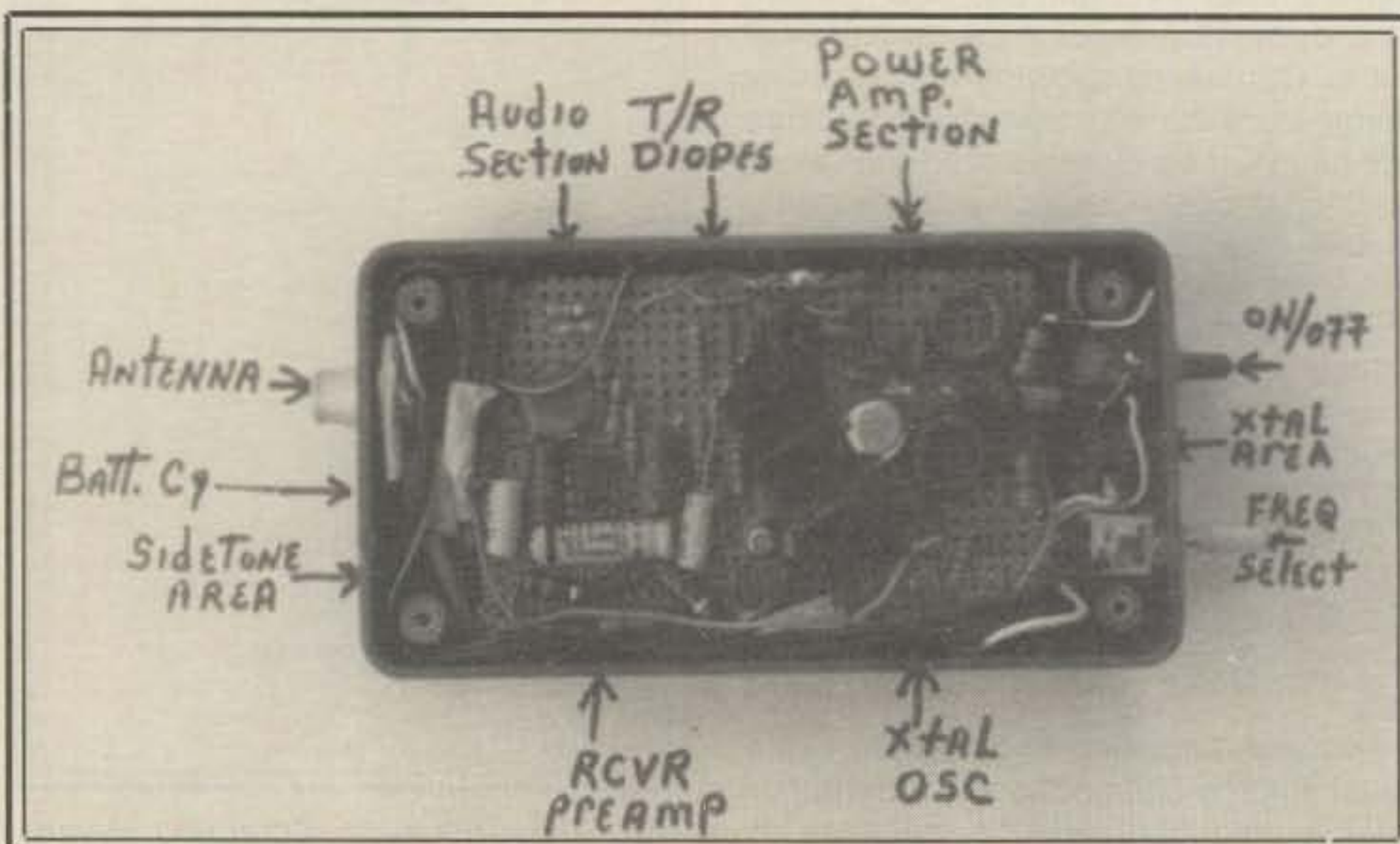


Fig. 2— Inside view of the Mini 30 after assembly. The perfboard was trimmed to fit box using diagonal cutters.

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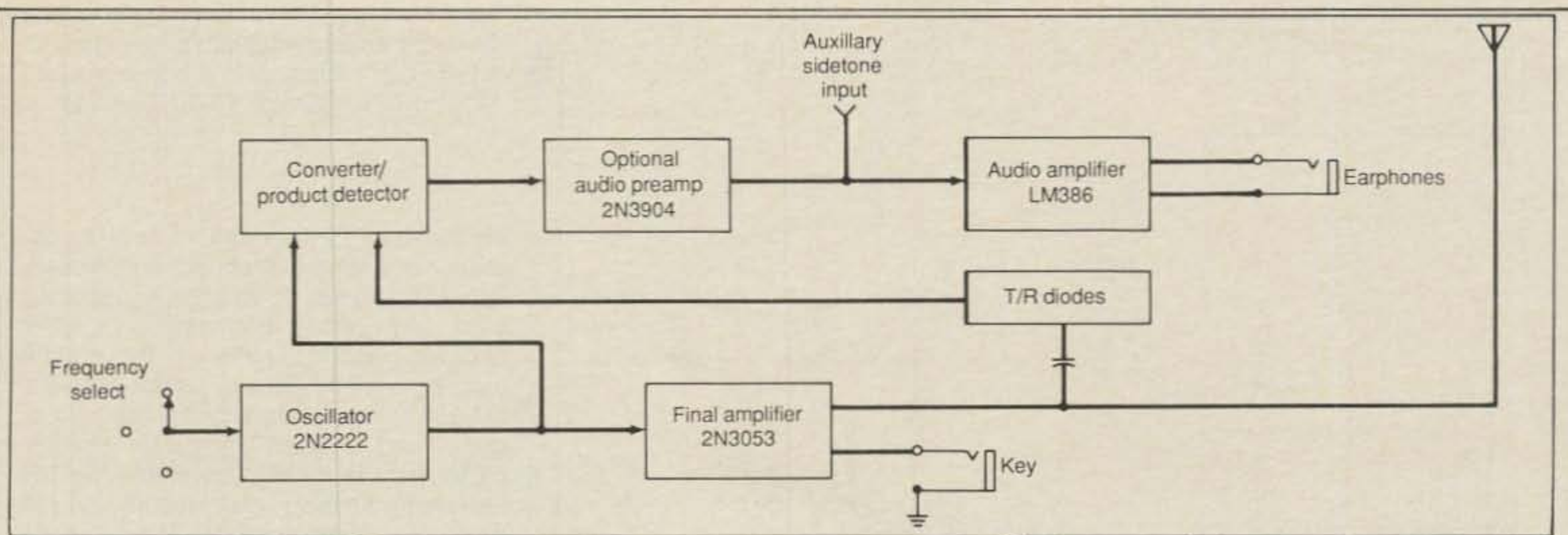


Fig. 3—Block diagram of the Mini 30.

only S1 or S2 on a Kenwood TS-930, while strong signals (above S8) really "jump out at you."

The transmitter's design is a streamlined version of the old-time classic in the QRP Club's introductory sheet, *ARRL Solid State Manual*, etc. I merely modified it for minimum parts use on 30 meters, let the oscillator run continuously (for receiver beat injection), and keyed the final. Everyone compliments its clean signal.

An inside view of the Mini 30 is shown in fig. 2, and the unit's block diagram is included in fig. 3. It's simple, but it works like a champ. The board's front half (toward switches) holds the transmitter. The rear half holds the receiver. A common ground buss runs between those sections on the board's bottom. The 10.104 MHz crystal is wedged between the on/off and frequency-selecting switches, with frequency-shifting capacitors buried in the right bottom corner. After "bottom layer assembly" (including squeezing the battery into place), shock-absorbing foam was fitted around the crystal. The main board was then placed atop the battery, and the key and earphone jacks installed. The RF choke was then soldered in place.

The receiver's "front end" is located beneath the 2N3053's large heat sink. The 40763's shiny case is visible right past that sink, and T/R diodes are located at the board's upper (right side, as viewed from front) middle area. The board's rear also holds the audio amplifier section. A bare and unconnected wire is visible in the audio section. It's a test point, and an input connection for a sidetone which I'll soon squeeze into the cabinet's left bottom area. Additional rig details will be provided as our discussion continues (this article is compact just like the rig, so read carefully).

Circuit Layout and Assembly

The Mini 30's schematic diagram is shown in fig. 4. Since variable capacitors were large and difficult to mount, I made

everything fixed-tuned and broadbanded. All parts except the crystal are available from local electronics stores or Radio Shack. I mail ordered a standard amateur-radio-type crystal with the usual 30 pF load capacitance from Jan Crystals (P.O. Box 06017, Ft. Myers, Florida 33906-6017), and it arrived ten days later. Although my Mini 30 is assembled on a 2.25" x 3.25" piece of perfboard, your version can be larger or smaller as desired. Merely remember to keep lead lengths short, especially in transmitter stages, and use small components.

I recommend temporarily laying out all parts on the perfboard's surface before starting construction to visualize interwiring and general assembly. After marking general position of stages and large components, remove all parts and begin actual assembly one stage at a time. The oscillator should go together smoothly within an hour's time. Thoroughly confirm its operation on your station's receiver before proceeding to assembly of the final amplifier. Use your station's receiver, wattmeter, and VOM to check the complete transmitter, and then assemble



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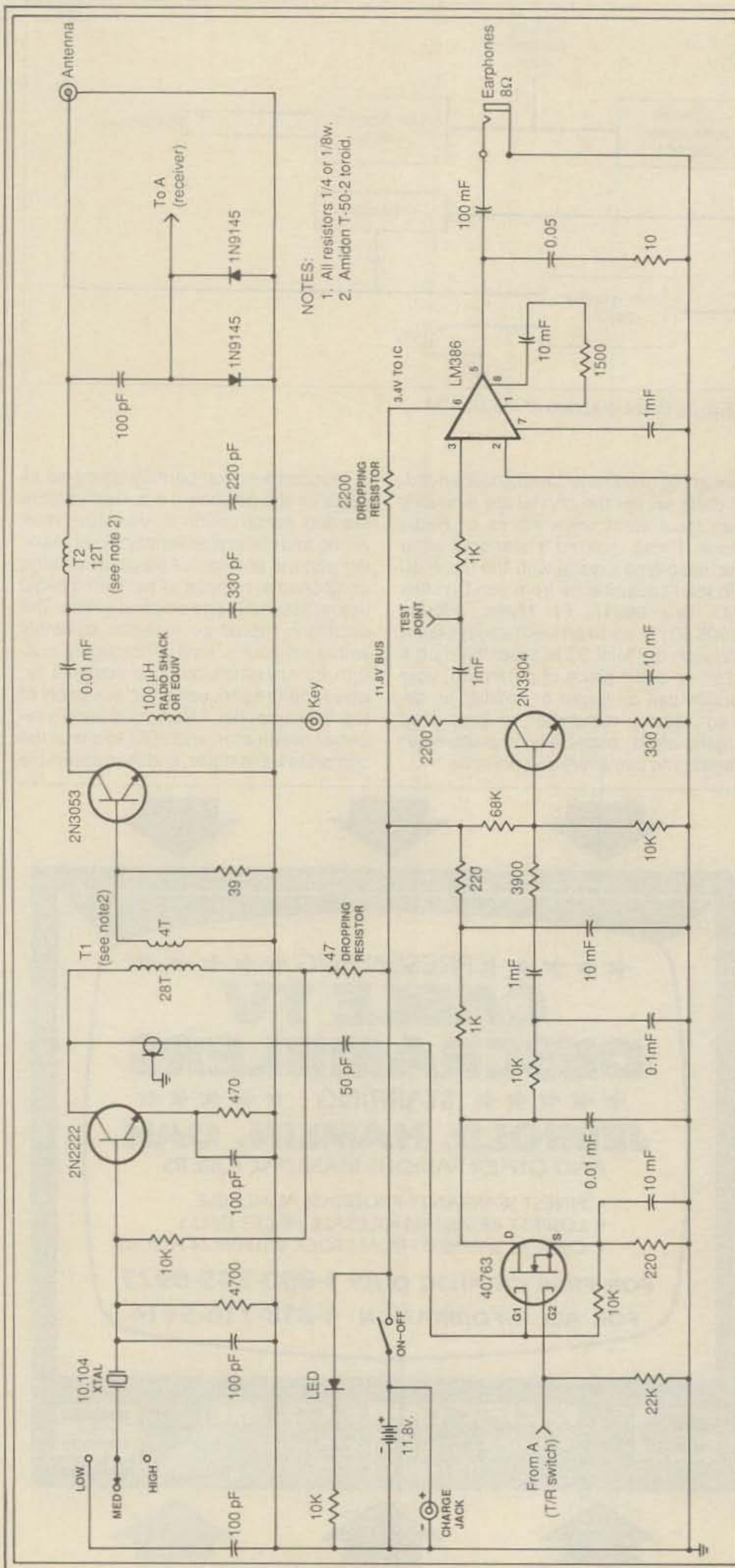


Fig. 4—Schematic diagram of the Mini 30 transceiver. All resistors are 1/4 or 1/8 watt. T1 and T2 are Amidon T-50-2 toroids.

the receiver's "front end." Check its operation by capacitively coupling the oscillator to one gate, an antenna to the other gate, and connecting a stereo or other "known good" amplifier to the drain's output circuit. Next, assemble the LM-386 stage, connect to the "front end," and confirm complete receiver performance. Finally, assemble the T/R switching section and ensure overall transceiver performance. The previous stage-by-stage, troubleshooting-as-you-go concept should sidestep problems. It's easier to find trouble in 10 components (one stage) than 60 components (the whole rig). Keep it simple, check your work as you progress, and the rig will operate from power-up.

The Transmitter

Since the oscillator's signal provides both RF amplifier drive and receiver beat injection, it's allowed to run continuously. A series dropping resistor on this stage lowers its output to the optimum level while reducing current demands to approximately 18 mA. Two small 100 pF capacitors "warp" the crystal's frequency to cover 10.102, 10.103, and 10.104 MHz using a tiny three-position switch. A miniature 365 pF variable could be substituted, but "channelized tuning" is convenient and it's also "manual RIT" if needed.

Wire for the toroid coils was salvaged from 88 uHy RTTY/telephone toroids obtained at hamfests. I found wire sizes between No. 20 and 24 worked fine. A few 10, 50, 100, and 330 pF capacitors can be "tack soldered" into the final (and oscillator) stages if desired to note output variations and confirm their resonant points. As shown, no capacitor should be needed with the oscillator's coil.

Keying the final's 12 volt line permits adding up to 3 volts in series with the key for slightly more output. Two penlight cells might be placed on each side of the key's base. Likewise, connecting 12 to 14 volts between the on/off power switch side of the key and ground (with power off) permits simultaneous operation and battery charging. Use a large heat sink plus heat-sink compound on the 2N3053, or it will go into thermal runaway and be cremated. The heat sink's wings can be flattened with pliers to fit in the rig's box. The complete transmitter will draw approximately 250 mA of current from a 12 volt source while delivering about 2 watts output.

The Receiver

The 40763's lack of a tuned input cir-

cuit may raise a few brows, but it performs very well as shown. If preferred, a T50-2 toroid wound with 29 turns of number 24 wire and paralleled with a 100 pFd trimmer could be added to the input gate (point A). The 2N3904 preamp stage is optional; if you prefer strong earphone levels, add it. Otherwise, it can be bypassed by connecting the 40763's 1 mFd output capacitor to the 1K resistor on pin 3 of the LM-386.

The LM-386 amplifier circuit is quite conventional in design, and applying +2.9 to +3.5 volts on pin 6 provided the ideal earphone level without any operating noise or hiss. I thus used a 2200 ohm resistor to drop the battery's voltage from 11.8 to 3.4 volts and omitted a volume control. If desired, you can vary the voltage on pin 6 of the IC and set your own volume level. The receiver's "buzz" during keydown provides sufficient sidetone monitoring for me, but you might prefer adding your own circuit and connecting it also to pin 3 (the input) of the IC. Finally, I must emphasize the importance of using communications-quality earphones rather than low-cost "talkie" or "transistor radio earplugs" with the Mini 30. The popular, inexpensive, accessory-type earphones have a deep notch precisely where CW notes are best copied. CW mobilers take note! I learned that the hard way. Finally, I threw the single earplug out the window and purchased Kenwood's HS7 earphones shown with the Mini 30 (only one earphone is used mobile; I let the "left one" dangle. Safety first, you know).

Additional Notes

Antenna switching and full break-in is handled by a simple diode circuit. During receive, its 100 pFd capacitor connects the 40763's gate to the antenna. During transmit, the gate (and 100 pFd capacitor) is connected to ground. I tried a 5 pFd there, but it lowered receiver gain. Larger capacitors detuned the transmitter's tank. Experiment with other values for the 220 and 100 pFd output capacitors as you like. W1FB's *QRP Notebook* suggests adding the T/R circuit at the 2N3053's collector—a clever "double duty" use of the output tank, but I couldn't get it to work. You might be more successful.

The Mini 30 battery is charged using my talkie's wall charger. I merely monitor current and charge at one-tenth its capacity (45 mA) for 10 hours. I open-wire assembled a series circuit using a 10.5 volt zener, 120 ohm resistor, and LED for monitoring the battery. When plugged into the charge jack, it produces a 100 mA load. When the LED gets dim, it's time to recharge the battery.

The rig could have been smaller, but I couldn't find a suitable case. After two months of searching I gave up and pur-



Fig. 5—Photo of Mini 30 in operation. Rig is in shirt pocket, key is in left hand, earphone cord is in shirt, and antenna is behind camera (self-timer used for photo).

chased a common Radio Shack blue plastic box for the Mini 30. The 450 mA battery is also a slight overkill, but its life is great. The antenna jack tends to work loose from plastic, so add a drop of "Crazy Glue" to it after assembly.

Watch your wiring! Oversights are easy. I wired the 47 ohm resistor to the "collector side" of the 2N2222's coil, for example, and couldn't find the "no RF output" problem. After finally rebuilding the complete transmitter, the mistake appeared. Haste really does make waste.

Handheld Fun

Owning a pocket-size HF rig is great! You can take it with you anywhere, anytime. Due to its "barefoot" transceiver limitations, the 30 meter WARC band is also ideal for QRP operations. When traveling, I carry a thin "rollout and stick-up" dipole for the Mini 30. Thus far the call/QSO ratio is around 70 percent. Mobilizing success is closer to 50 percent.

A longwire antenna flown using a homebrew kite is being planned for our next jaunt to breezy Gulf beaches. A pocket tuner will be included for the true "walking portable" fun along the sands. A quarter-wave 30 meter whip is only 21 feet long. Several years ago I flew a 2 or 3 mile long wire (honest!) from a beach house using a newspaper and seaoat strut kite. I never recovered the kite, but the DX memories are eternal.

Thirty meters and pocket rigs such as the Mini 30 are great for light travelers. You can zip through airport terminals, snap up a thin dipole in a motel, and you're on the air. Try to avoid makeshift rinky-dink antennas that are challenging to a 100 watt rig, however. This 2 watt transceiver isn't a miracle worker.

Looking Ahead

Although my original QRP 30 was quite compact and my Mini 30 is smaller, the pursuit for a real pocket-size rig continues. Maybe I should call this the saga of the three little rigs. Gad! I'm now working on a Micro 30—one-third the Mini 30's size, same feature except .250 watt output when using its internal battery. It should fit in a flip-top Zippo lighter case.

The large number of projects at this QTH overflow a 24 hour day, however, and everything must assume a waiting place in line. Our packet radio book is now completed, but another big project is underway. Meanwhile, development continues on our "Classic 30"—a two-tube regenerative receiver, breadboard transmitter, and four-wire flattop antenna, all genuine 1930 style and easy to build in 1987. Yes, we'll include the full story here in *CQ* when it's completed. Meanwhile, enjoy the Mini 30. It's a blast!

73, Dave, K4TWJ

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"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

Getting Started—Part I of VIII

The November 1977 through March 1978 Novice columns were used to provide amateur radio station installation tips. If you plan to use older equipment, that article contains a lot of information that is still useful. Previous issues of *CQ* can be ordered at \$2.50 each by writing to *CQ*, 76 N. Broadway, Hicksville, NY 11801. The December 1982 issue provides station installation information in less detail than the earlier article. This article reflects the present situation and assumes that most readers will use equipment that is new, or that was new within the past decade.

Junk Equipment

It is important to establish a good station, and failure to do so usually lessens a new amateur's interest in operating. This unfortunate circumstance results in less time on the air and a slower increase in one's code proficiency. Each new amateur should get her/his initial station assembled and have it ready to operate as soon as the license arrives. Station equipment and accessories are covered in this article to help you set up a station that can serve you well. However, it is up to you to get the job done. The words *equipment* and *gear* are used throughout this article to mean the transceiver or the transmitter and receiver combination. The word *accessory* applies to auxiliary items such as telegraph keys, headphones, antennas, rotators, antenna tuners, and external SWR/power meters.

Do not buy junk. I often have students tell me that they are going to get something cheap just to give amateur radio a try, and that they will get good equipment if they decide to stick with amateur radio. If they do this, it usually results in one more inactive license. Junk gear costs Novices extra money, even if they quickly realize their mistake and upgrade to better equipment. Poor operating results are normal with junk gear. Poor operating results frequently cause Novices to quit amateur radio entirely.

Install the best station you can put together within your physical (space) and financial limitations.

Experienced operators can achieve remarkable results with less than satisfactory equipment. However, the begin-



Steve Czaikowski, WB4ZTR, is justifiably proud of his all-amateur family. His son Steven II, KB4UKN (9 years old), is seated at the operating position. His 11-year-old daughter (Michelle, KB4UKP) and his wife (Patricia, KB4UKO) are standing behind KB4UKN. Anyone who works all four of the Czaikowski amateurs receives the WACCO (Worked All Czaikowski Clan Operators) award, which is worth framing. Listen for them around 3720 kHz.

ning Novice has enough trouble achieving fair results, even when using excellent equipment. It does not make sense to add the burden of poor equipment to the woes of a beginning amateur. Junk gear and inexperienced operators are a bad combination.

Guidance

I have helped many Novices set up their first stations. This article contains many tips that can help you avoid time-consuming, expensive mistakes. Subject headings and sub-headings make it easier to locate desired information. You should read the entire article, and then go back through it to pick out portions that are of particular interest. It is simpler and cheaper to avoid mistakes than it is to correct them.

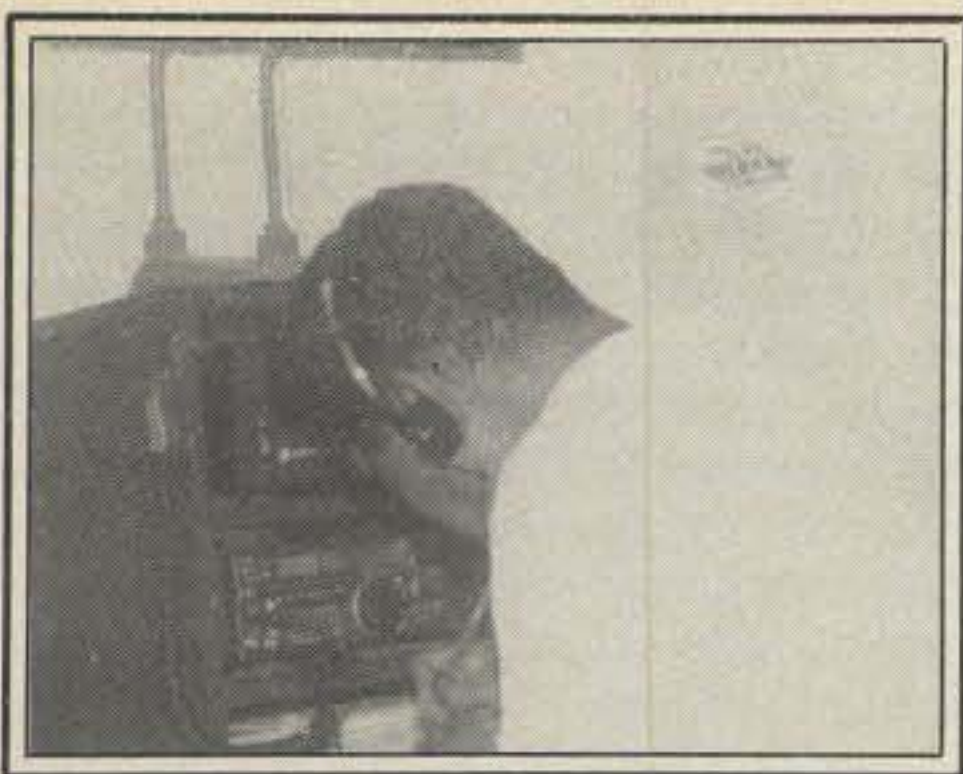
Plan every step and know exactly what you are going to do before you begin assembling your first station. Selecting equipment and accessories presents a tough challenge to most new amateurs.

Even experienced amateurs do a lot of reading, talking, and comparing before deciding which items they want for their stations. If you have an acquaintance who is an active amateur (not just a license holder who does not operate), she/he should be able to help you select suitable items. However, each final decision is yours. It is reasonable to assume that other amateurs will base their opinions and advice on their own experience. At best, they may be telling you the situation that existed when they last were in the market for equipment and/or accessories. It is possible that a well-intentioned amateur might give you bad advice due to lack of knowledge about currently available items. It is okay to listen to the advice of long-licensed hams, but when you're trying to select equipment, you should remember that this type of ham is likely to recommend gear which performed satisfactorily for them when they were Novices. However, that may have been up to 35 years ago, and the bands have changed a lot while that old gear was getting more and more obsolete. The old clunkers have been replaced by units which are smaller, lighter, and far more useful on today's Novice bands.

Magazines. Major amateur radio publications can be used to obtain an introduction to each item that is of interest to you. Equipment reviews are presented in many issues. These reviews are a bit too technical in some parts for beginners, but their concluding remarks are simple and direct. One can request additional information about specific items of interest by writing to the manufacturers, using addresses shown in advertisements. Local amateur radio stores usually have sales flyers available on a lot of items. It is my opinion that most equipment and accessory reviews have not been critical enough (where criticism is justified) to be useful. However, recent reviews appear to be more useful than previous ones. One can at least extract basic facts from reviews and use them in evaluating items of interest.

Clubs. If you have an amateur radio club in your area, it can be beneficial to attend its meetings to pick the brains of its members and (possibly) to obtain some help in setting up your first station. You would have to evaluate what you are told, but you are sure to benefit from discussions with local active amateurs.

2814 Empire Ave., Burbank, CA 91504



Edgardo Ballesteros, WH9AAD, is a Novice operating from Wake Island. He is a Filipino who has worked on Wake for two decades. His station includes an ICOM IC-731 (Japanese version of the IC-735) and a dipole antenna. Edgardo is also a photography buff. He took this picture of himself, developed it, and printed it. I am sure USA mainland Novices must be thrilled to work WH9AAD.

Clubs provide a central meeting place for many worthwhile ham activities such as auctions, licensing courses, conventions, TVI/BCI committees, silent key committees, contests, emergency communications, and contests. You'll benefit some by participating in all club activities. Newer hams are often the spark-plugs in the club, and their fresh ideas and enthusiasm are beneficial. If your local club doesn't conduct licensing courses, urge them to do so. The ARRL has a lot of material available to help instructors do the job right.

Build or Buy?

You must decide whether you are going to build your station equipment/accessories or buy commercially built units. If you decide to build your own station, you must choose between constructing kits, building from schematics (homebrewing), or modifying military surplus gear. The decision is yours. The following information is just intended to help you make the decision that is best in your specific case.

Building Kits. If you like to build, and if you have the required tools and test equipment, you may decide to build a kit. You may decide to build all or part of the equipment and accessories for your station. If you are not an experienced kit builder, I advise against building units for your initial station. I have found that most of the new amateurs should not build their initial station units from either kits or schematics because they are not yet experienced enough to properly construct, test, and troubleshoot relatively complex modern amateur gear. Also, it is unlikely that a new amateur would have the test equipment that is needed to test and/or troubleshoot completed homebrew items, nor is she/he likely to have the knowledge of how to use such test equipment.

I like to build equipment and I have homebrewed many items, but I advise inexperienced new amateurs against building. There is plenty of time to build things after one has upgraded to at least the General license. A completed kit usually reflects the experience and capability of its builder. It is very important for each Novice to start operating with a station that functions well, and good commercial gear provides this opportunity.

The popular belief that one saves a lot of money by building one's own gear is not supported by the facts. Unless one has free access to a wide variety of parts, it is cheaper to build a kit (such as Heathkit) than it is to build from a schematic. However, a modern kit costs close to the price of an equivalent commercially manufactured unit.

The advantage of building gear is that one acquires desired familiarity with it and is not hesitant to troubleshoot problems that may occur. There is also the pride in having built your gear. The kit builder learns about components, color codes, circuit symbols, and soldering, plus the proper use of hand tools and test equipment. These are good reasons for building your own.

There are disadvantages related to building gear. Equipment built from a kit has a lower resale value than comparable factory manufactured gear, regardless of how well it is made or how well it functions. Completed kits are seldom accepted as direct (cash value) trade-ins towards commercial gear being purchased. Some stores will help one sell kit gear at a commission, but many outlets will not have anything to do with kit units. Gear that one homebrews from schematics has even less resale value than items built from kits. Amateurs commonly change their station equipment; therefore, resale value is important. You "swallow the anchor" when you build gear, so be aware of the advantages and disadvantages associated with building gear.

If you decide to build a kit (or kits), it is helpful to locate other amateurs who have built (and are using) the same equipment you plan to build. You can benefit from their experience, and they may be willing to demonstrate equipment performance on the air. Fellow club members could be helpful in this regard.

Building From Schematics (Homebrewing). Building equipment/accessories from circuit designs printed in publications is usually less desirable than building a tried and proven kit. If you purchase all the required parts, your cost can be several times the price of a comparable kit. If you do not use a proven circuit design (such as in the *ARRL Handbook*), you may be using circuit design and test data that are incomplete and/or incorrect. Completed kits have known designed performance capabilities, which helps sell

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117 VAC power supply and audio patch-cord included.

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CIRCLE 17 ON READER SERVICE CARD

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them. Homebrew gear is almost impossible to sell, no matter how well it functions. Homebrew gear has the lowest resale value, and one is seldom able to recover a dime for each dollar invested in parts.

Modifying Surplus. If you decide against building homebrew or kit gear, perhaps due to limited funds, you can satisfy your urge to get your hands dirty by modifying surplus military communications equipment/accessories to meet your station needs. Old amateur radio magazines contain many surplus equipment conversion articles. There are also surplus conversion manuals available to help you do the job right. Some surplus gear just requires conversion for use with 117 VAC house power, which may only involve building a suitable power supply.

Some military gear is well suited to amateur radio, but a lot of it is not particularly useful. One must take time and evaluate

the items that are available from surplus outfits. This magazine often contains advertisements of military surplus gear. A lot of surplus communications gear has separate control panels (etc.), and it may not look as nice as commercially manufactured amateur gear.

If you are thinking about modifying surplus gear for amateur use, get catalogs from several surplus dealers and read associated conversion articles before making a final decision.

Commercial Equipment. It might sound good to tell you to build your first station, but experience has taught me that most new amateurs are better off as "appliance operators" until they have learned enough to be useful instead of being dangerous. The primary purpose of the Novice license is to provide people with an easy introduction to amateur radio. The Novice code bands give Novice and

Technician operators an opportunity to increase code proficiency to the 13 wpm General/Advanced code test requirement while enjoying on-the-air contacts. Commercially manufactured equipment and accessories provide the fastest and easiest way for beginning amateurs to get dependable initial stations on the air. If you are a typical Novice, electronic theory is probably still just partially understood. I have seldom known a Novice with a good station who failed to upgrade. However, I have known some good Novices who became discouraged and quit amateur radio due to poor operating results with junk equipment. Modern commercially manufactured amateur radio equipment is a tremendous bargain. A modern 15 to 20 pound transceiver provides more communications capability than a ton of amateur equipment provided about 30 years ago. It is no wonder that so few manufacturers build amateur radio gear. We have superb equipment available to us at low cost. I have sold industrial, marine, and medical electronic equipment. Compared to them, amateur gear sells at about one-third the price.

Whether you build or buy, get it done before your license arrives. At least, get your station operable as soon as possible after your ticket is received. Do not delay getting on the air due to time spent building station items. You do not need a license to build, and you should operate as soon as you are licensed. Commercial gear enables one to assemble a suitable station quickly and easily. The only pain is financial.

This completes the first part of this eight-part article. The second part covers transceiver considerations such as new and used gear, cost comparisons, solid state versus tube gear, and high versus low power.

Photographs Wanted

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

73, Bill, W6DDB



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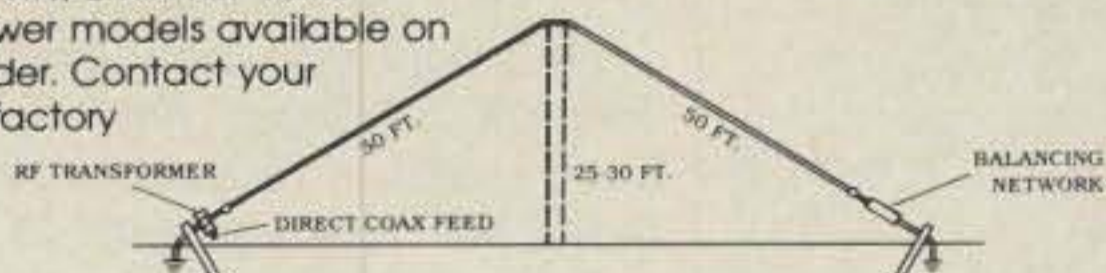
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1.8 to 30 MHz

- SWR Max 2:1, 1.4:1 average from 1.8 to 30 MHz
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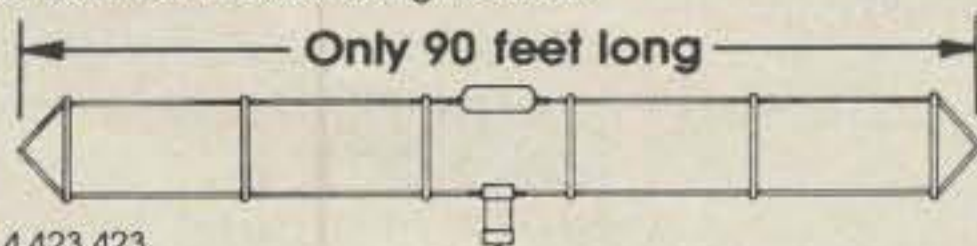
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PRINCIPLES, PRACTICES, AND PROJECTS FOR THE VHFER

As this is being written over Thanksgiving weekend, there is an amazing tropospheric duct setting up between the northeast and the midwest, enhancing signals on the bands above 144 MHz to unheard of proportions for this time of year. It's too soon to tell who worked what, and I am still not on the air yet from the new QTH (more on this later), but I'm certain that reports will roll in detailing exciting DX contacts which took place November 27-29, 1986.

I knew the bands were open because of two indicators. One, a television set I have purposely connected to an indoor "rabbit ears" antenna (instead of the cable, to which other sets are connected) went wild, with stations from Chicago/St. Louis/Kansas City overriding the local NYC/Philadelphia stations on channels above Channel 6. Two, I was hearing very distant repeaters on 2 meter FM while using just an indoor "rubber duck" antenna. When the 144 MHz band opens, the FM subbands become a mess here, with multiple heterodynes on many channels. This often prevents the listener from determining to where the band is open, or how well, but it is still an indicator.

Add to this a quickie report received from Max Trescott, K3QM, of Budd Lake, NJ, who gave me a brief accounting of the DX he worked on 144 and 432 MHz over an east-west path—some phenomenal stuff. I understand the duct played well up through at least 1296 MHz, and probably beyond. What did you work? I'd like to add some of this information to the data base I'm compiling for Sid Lieberman, WA2FXB, one of our local propagation gurus.

I understand there was some excellent Au during the month of November as well, with properly situated stations working 1000 mile paths using low-powered gear. It's all a matter of being there when it happens, as I've written before.

SMIRK

I received a letter from Ray Clark, K5ZMS, Secretary/Treasurer of SMIRK, the Six Meter International Radio Klub, a 13+-year-old organization of 6 meter enthusiasts. He asked that I reprint a rather lengthy introduction to 6 meters and SMIRK, but space limitations prevent me from doing so. Instead, I'll try to capture the highlights of his letter and will make this offer: Anyone interested in receiving a reprint of the entire K5ZMS letter on 6 meters and the SMIRK organization,

153 Rodman Court, Eatontown, NJ 07724

1986 CQ WW VHF WPX Contest High-Claimed Scores

Single Op, Single Band QRP

N8DJB	8,820
HG5OV/7	6,353
N5BFM	6,175
NB2T	5,200
HG5MY/7	4,968
AA4LE	4,872

Single Op, Single Band

GJ4ICD	89,612
KB7IJ/5	47,362
KI3L/5	34,510
NW5E	33,408
F6HMQ/p	32,206
JA6RJK	19,600

Single Op, Multi-Band QRP

NC9F	41,358
WB2ELB	25,620
WA2UDT	14,878
AB1U	12,567

Single Op, Multi-Band

W1VD	212,741
N2BJ	108,049
K5UR	93,548
WB9MSV	51,436
KD5RO	41,724
NØLL	41,180

Multi-Op, Single Band

F6IFR	133,100
N7AMA	10,812

Multi-Op, Multi-Band

I4EAT/3	339,200
W1XX	184,864
KC2PX	166,573
OK1KHI/p	89,813
WØKEA	61,204
KX2J	44,125

Portable

K7IDX/7	16,450
KB5MY/6	5,246

FM

KA7YOU	5,724
JE1PIK	3,120

Complete contest results will be published in the June 1987 issue. Awards are scheduled for mailing on April 30.

send an SASE to my home address, printed above, and I'll send a photocopy in return (no charge, of course).

SMIRK is a worldwide organization with about 5100 members in 81 countries dedicated to the study and application of the 6 meter amateur band. They provide

scientific and technical information to both fellow operators and scientists, promote 6 meter operation, support activity from new countries by equipment loans, and sponsor an in-depth awards program and an annual 6 meter contest. SMIRK also publishes a quarterly newsletter, *Six Shooter*, for members. Anyone who has spent any time at all operating the band has probably been asked, "What's your SMIRK number?" This is a clear indication of a club which has successfully reached its initially established goals, and these folks are to be congratulated for their efforts of the past 13 years.

K5ZMS wrote, "... I wish to remind you that the beginning of Solar Cycle 22 has been predicted for the beginning of 1987. Predictions... indicate a cycle which will have only slightly less smoothed sunspot values than Cycle 21 (*which was phenomenal—ed. note*)... we are in for more years of exciting F2 DX contacts as experienced in the late 1970's and into the Spring of 1984, when some of the rarest DX was worked... There were, at one time, 114 countries available to the dedicated 6 meter DX'er." Wow! This is more than I thought!

Ray goes on to say, "For those who became involved in other facets of the hobby, now is the time to gear up for 6 meters. The same applies to those who have never enjoyed the thrill of working DX on 6 meters. I have been an HF operator for many years, but there is no thrill like the one experienced when you work a G, ZS, ZL, VK, or JA on 6 meters! What is commonplace on HF causes the adrenaline to pump... when you do it on 6 meters!" He's right, you know. Anyone can drive 55 mph in his car, but how many of us have ridden a bicycle or skied downhill that fast? Think about it.

Ray's letter contains much useful information for the newcomer to 50 MHz. Write to me if you'd like a copy. If you'd like to contact SMIRK directly, write to 7158 Stone Fence, San Antonio, TX 78227. If you'd like additional specific information:

- SMIRK's technical liaison is Spencer Ritchie, KC2TX/7, P.O. Box 841, Kearny, AZ 85237;

- SMIRK's awards chairman is Don Abell, KC5TK, 6821 West Ave., San Antonio, TX 78213; and

- SMIRK's contest manager is Lisa Lowell, KAØNNO, P.O. Box 547, Hugo, CO 80821.

Initial membership in SMIRK costs \$6, which includes dues for one year. Anyone can join SMIRK (an amateur license is not required), but those having a real interest

in 6 meters are especially encouraged to join and qualify for a SMIRK membership number. Thanks, Ray, for a nice letter. Let's hope for exciting things on 6 in '87.

Getting It On

Or, getting on it, as the case may be. I am in the envious position of having to put together a station at a new QTH, which allows me the opportunity to rethink the layout, wiring, ergonomics. I, like most of us, want to have an effective station which consumes minimal space but sounds like 16 rooms of equipment on the air. I want to set it all up for easy, convenient operating, which means either rapid bandswitching or a separate station for each band commonly used. I want an antenna system which works very well but doesn't cast shadows over most of the town.

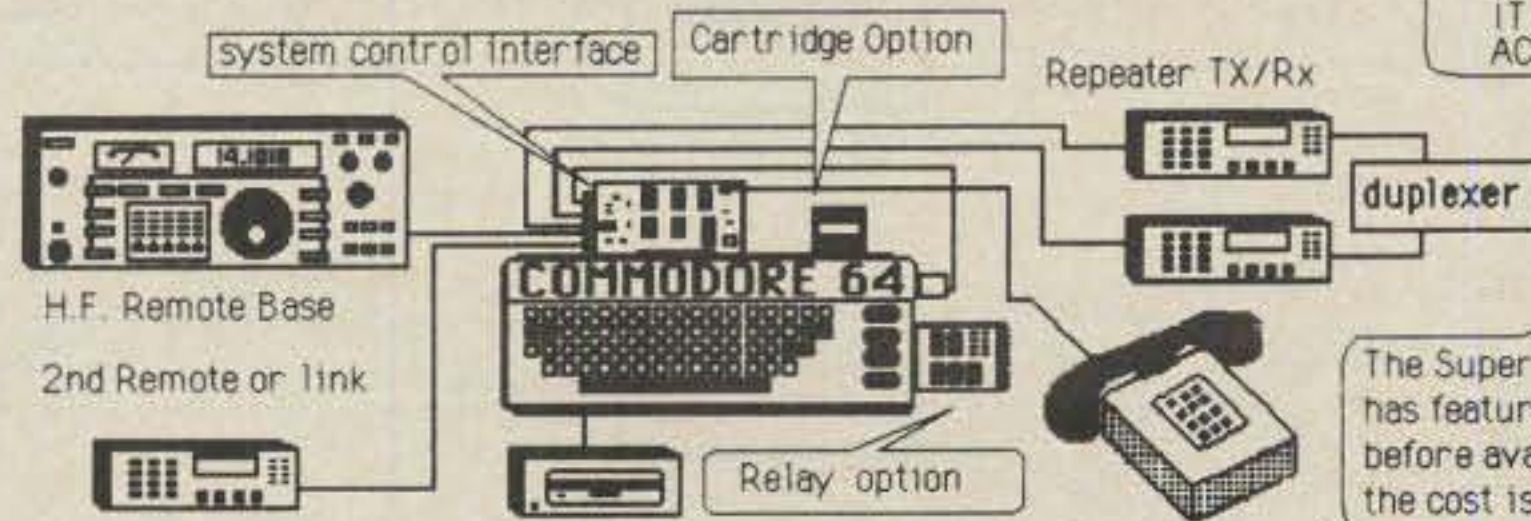
I've made progress since last month, when I wrote that Murphy was preventing me from getting the hole dug for the first ground-mounted tower at WB2WIK. Now the hole has been dug, the anchorage and foundation for the tower has been set in concrete, and the tower is about to go up. I've also installed a cute 6'6" roof tower, an Alinco ETS-210 aluminum quadrupod, on the roof of my home to support lightweight VHF-FM antennas. A review of this marvelous product is forthcoming as a stand-alone article. My hamshack is finished, extra AC service installed, much of the really necessary equipment sitting on benches. As I unpack cartons full of wires and cables, I must decide "What is the best way to do this?"

Maximum station versatility is achieved by independent stations, one for each VHF/UHF band. This probably works best in many ways, but it sure uses up a lot of space (not to mention cash). As an advocate of VHF/UHF transverters used with HF rigs, I happen to have a pile of these little boxes which I normally connect to three HF rigs: an IC-740, TS-520S, and Triton IV (ICOM, Kenwood, and Ten-Tec, respectively). My 6 meter station has always been a stand-alone, and for good reason: Six is probably the least predictable of all the VHF bands, and it can offer the widest variety of propagation; thus, I tend to leave the receiver on all the time, even while tuning around on other bands. This *modus operandus* is especially important during VHF contests, when a missed opening can mean losing to a smarter competitor. My 6 meter station occupies more than its share of volume, partially because the equipment is obsolescent at best (but it works, and it runs a lot of power).

I decided to set up my gear this way: Six meters, as I mentioned, is stand-alone and not interconnected to any other gear at all; the next two most-used bands are 2 meters and 70 cm, so I'll give them my "best" HF rig, the IC-740 (which is, incidentally, a wonderful radio for transverters). My TS-520S, obsolescent as it may

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Autopatch Specifications

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- * Incoming caller receives voice message & may select the station to be paged with 3 digit code
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- * Toll restrict-leading 1/0 and 3 digit prefix
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- * Storage of MCI/Sprint access codes
- * Call waiting allows switching to second phone line
- * Touchtones are regenerated onto the tel./speed dial
- * Touchtone or dial pulse mode
- * Ring detected while in all remote modes
- * Last number redial memory
- * Single digit resets autopatch to dial tone

Dual Remote Base Specifications

- * H.F. remote supports: Yaesu FT-757/767, Kenwood TS-440/940, Icom IC-735
- * 2nd remote or link supports: Yaesu FT 727 (VHF & UHF); Kenwood 7950/TS-2530/70 series with RAP1 (Remote-a-Pad)
- * 10 H.F. Memory channels/enter or recall
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- * Control CS-8 relay/latch option with master reset & status announcement
- * All control inputs are voice confirmed including frequency, mode, scan status, time, outputs on/off
- * autopatch audible ring while in H.F. mode

System Options

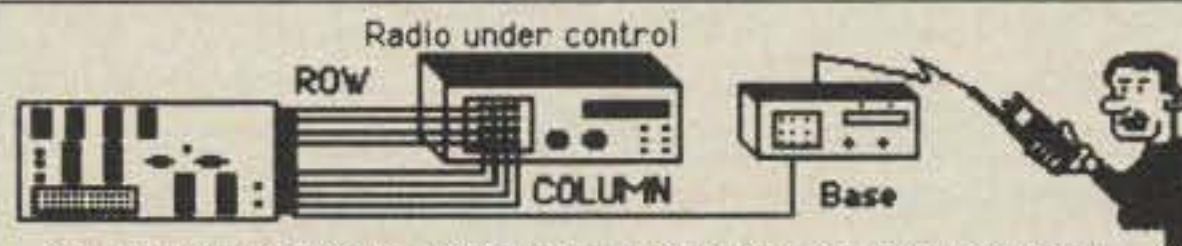
- * 8 Relay control (CS-8) \$ 79.95
- + 3 DPDT 2A relays, 5 open collector outputs
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includes: computer interface, disk, cables & manual, duplex & simplex versions are supplied (some features not applicable when in simplex mode) (add \$4.00 shipping / Ca. residents add 6%).
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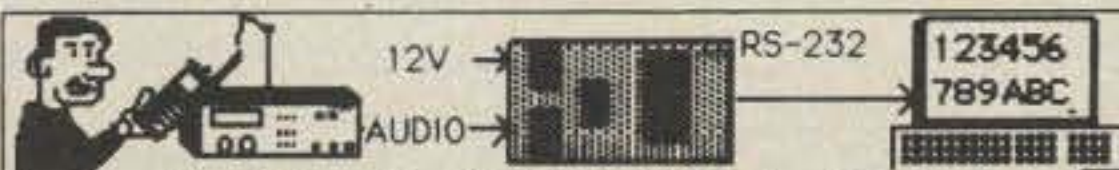
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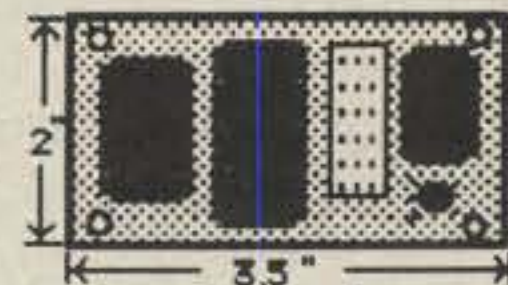
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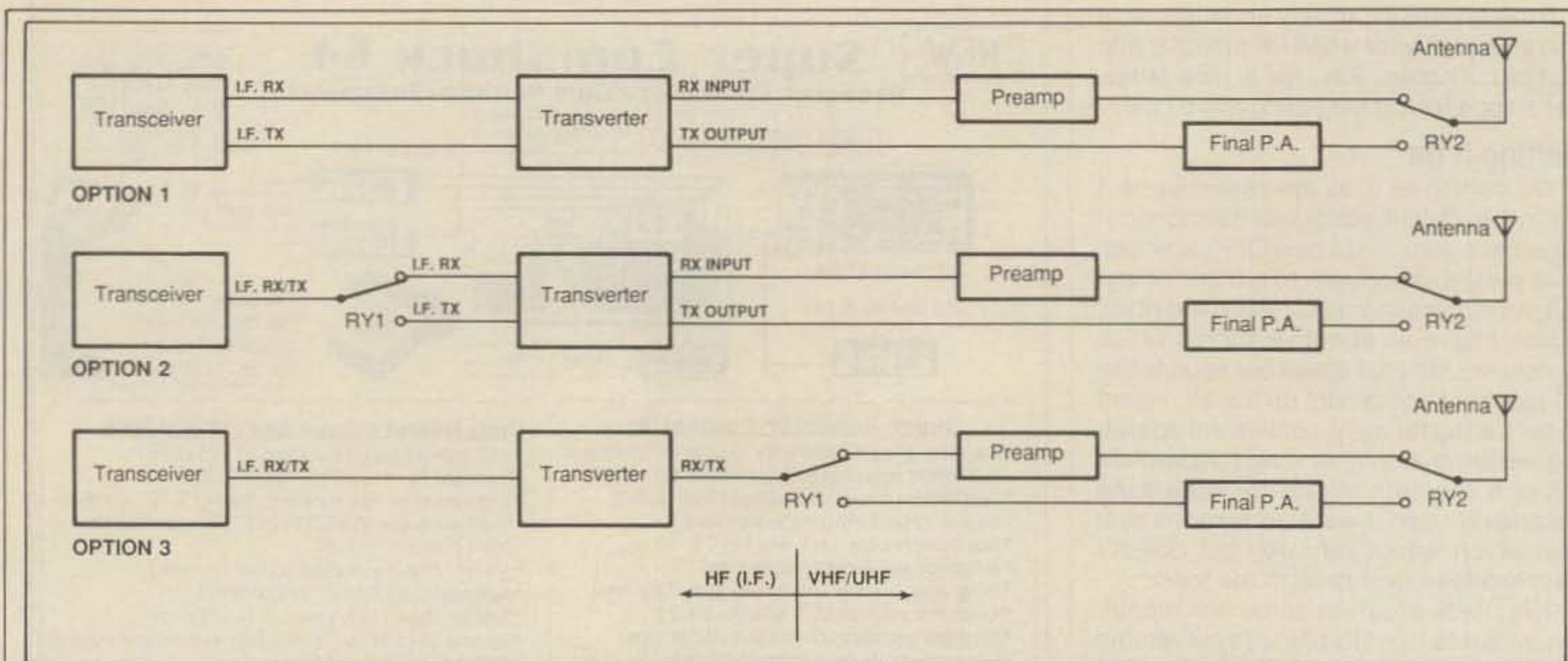


Fig. 1—Station wiring diagrams. Option 1 depicts standard wiring for HF transceiver and VHF transverter having separate IF/RF inputs and outputs. Option 2 depicts wiring for HF transceiver with single transverter line used for both TX/RX modes. Option 3 depicts wiring for VHF/UHF transverter with single IF line and single RF line used for both TX/RX modes. In all cases, RY2 is the VHF/UHF antenna relay.

be, is modified for improved dynamic range and has Fox-Tango ultra-sharp filters installed for both SSB and CW, so it really isn't a bad rig for HF work. Its noise blanker still pumps with strong signals on 160 and 80 meters, and it requires a minute's warm-up for the 6146 finals, but I like the rig and it always works, so I'll use it on the HF bands. That leaves the little Ten-Tec rig for use with the 135 cm and 23 cm transverters, which is just fine, since these are the two least-used bands.

Of course, I really should replace some of the older equipment with more modern stuff, but like old shoes, the rigs feel comfortable to me and will probably be around a while longer. Besides, most of the performance is right in the transverter boxes, which are quite state of the art. My 6 meter rig is very weird. A 19-old transmitter (much modified, of course) and a 17-year-old receiver form the heart of the station, but the performance is there where it counts—in the receiving converter and transmitter final amplifier. The exciter is an old Clegg Venus (vintage 1967), tubes and all, modified for better carrier suppression, enhanced VFO stability, and punchier modulation. The receiver is a Hammarlund HQ125 (vintage 1969), which required no modification because it's a darned good receiver (basically a solid-state version of a Collins 75S3, with Collins mechanical filters and all). But the *piece de resistance* is the receive converter, an Advanced REceiver Research R50VDA, preceded by an ARR P50VDG GaAsFET preamp. This stuff works really well, and offers receiving performance that cannot be found in any transceiver. And included, of course, is my klunky old final, a 4-1000A homebrew amplifier that loafs along at the legal limit but takes up a lot of bench space (not to

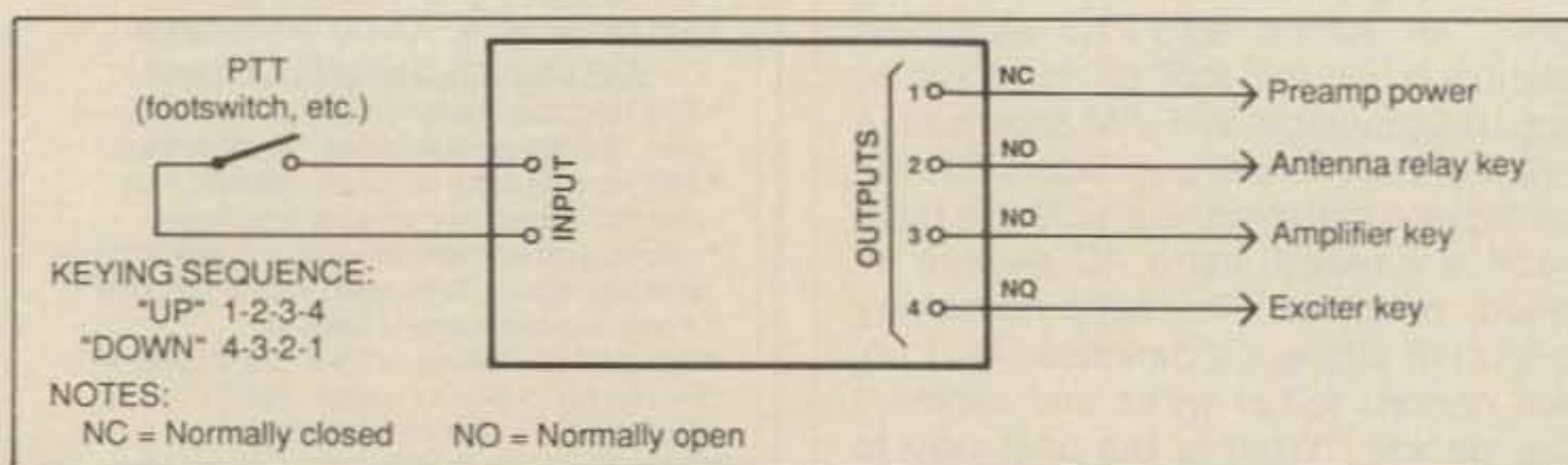


Fig. 2—Sequencer application, TRS04VD sequencer.

mention floor space for the power supply which is too heavy for the bench).

I do intend to take delivery of a shiny, new Microwave Modules 50 MHz transverter, model MMT50/28, which has a GaAsFET front end, doubly-balanced mixer, and 20 watt output PA all consolidated in one little box. This should prove a real performer, and will be reviewed in a future column. But I'll probably hang on to the older gear for old times' sake.

In my station each transverter drives a power amplifier of some kind. This creates the need to switch the antenna between the final amp and the receiver front end in the proper sequence to prevent receiver preamp deterioration/destruction and relay contact arcing. The idea, obviously, is to switch the antenna from receiver to final amp *before* the application of any transmit power to the antenna relay, and then switch the transmitter fully off prior to switching the antenna back to the receiver front end. Sounds simple until you try to do it. Plain old "push to talk" will never work, especially if the PTT circuit is wired straight into the transmitter or transceiver.

Commercially manufactured aftermarket products are available, and Advanced Receiver Research, for example, does offer a T/R sequencer which is ca-

pable of performing all that is described above in the proper order. Some newer transverters are even building T/R sequencing electronics right into the boxes, with PTT and keying lines brought to and from the transverter. But if, like me, you're using equipment which is on hand and happens not to have built-in sequencing, you'd better learn to wire your station properly to prevent "smoking" critical components.

Fig. 1 and 2 indicate typical multiband VHF/UHF station configuration and wiring. These are certainly not the only acceptable setups, but they might be a good starting point for the new VHFer. Each operator will have his own unique requirements, and I won't try to second-guess anyone. If you have specific questions regarding your own station, please feel free to write. I'll try to answer questions by drawing on my 20-plus years of experience on these bands, but I will print any questions I can't answer so we can draw comments from readers.

As this is written, I'm still wiring up my own station. Two small Yagis are on the roof tower, but 20 more antennas are nesting on the ground while they await their climb to better places. When all is together (soon!), I'll look for you on the air.

73, Steve, WB2WIK

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TM-411A FM Mobile 25w	449.95	Call \$
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TM-3530A FM 220 MHz 25w	449.95	Call \$
TH-31BT FM, 220 MHz HT	269.95	Call \$
TL-922A HF Amp	1499.95	Call \$



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VHF		
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FT-290R All Mode Portable	579.95	Call \$
FT-23 R/TT Mini HT	299.95	Call \$
FT-209RH FM Handheld 5w	359.95	Call \$
UHF		
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FT-73 R/TT Mini HT	314.95	Call \$
FT-709RH FM HT 4w	359.95	Call \$
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Contest Calendar

a monthly feature by
FRANK ANZALONE, W1WY

NEWS/VIEWS OF ON-THE-AIR COMPETITION

As I pointed out a couple of months ago, the Calendar of Events for the months of January, February, and March shows many conflicting and overlapping dates. This is mostly due to the fact that the last day of January and February end on a Saturday, and that cuts February down to only three full weekends. Since most international events are always held on preannounced full weekends, the actual calendar dates are not the same as that used the previous year.

Most of the smaller domestic events do not use the full weekend pattern, so it is inevitable that there are some conflicts. Where different bands and/or modes are scheduled there is no serious problem. Unfortunately, however, there are a couple of same band and same mode events scheduled on the same dates, and they are bound to have QRM problems.

We then have several State QSO Parties on the same weekends. These can really be confusing, especially when they are in the same call area. I'm not about to suggest a change of dates, but a better choice of operating frequencies and identification in the exchange would be very helpful. That's up to the organizers of these affairs. The problem is, however, that clubs usually have a yearly change of officers, and the outgoing managers do not always pass on the information to the newly elected officers.

I would be the last one to admit that perhaps there are too many competitive activities being scheduled, but the situation can be improved if a little time is used to check with other organizations that might be using the same dates.

On another note, add a new plaque award to our recent 1986 CQ WW DX Contest. This one is being sponsored by the South Jersey DX Association, World, Single Operator, 21 MHz CW. It is a memorial for one of their members, Gary I. Medford, N2CW.

We are reorganizing the single-band trophy award structure to make more spots available in anticipation of more requests. Interested donors should contact me for available openings.

The deadline for material for the May issue is February 15th, and March 15th for the June issue. Postal service being what it is, it is advisable for you to send all correspondence to my home address and gain a few days leeway.

73 for this time, Frank, W1WY

14 Sherwood Road, Stamford, CT 06905

Calendar of Events

- * Jn.31 -Fb.1 YL ISSB CW Party
- * Feb. 1-2 Classic Radio Exchange
- * Feb. 7-8 RSGB 7 MHz Phone Contest
- Feb. 7-8 QCWA CW QSO Party
- Feb. 7-8 Vermont QSO Party
- Feb. 7-9 New Hampshire QSO Party
- Feb. 8 N.A. CW Sprint
- Feb. 14-15 Dutch "PACC" Contest
- Feb. 14-16 YLRL YL-OM Phone Contest
- Feb. 15 N.A. SSB Sprint
- Feb. 20-22 CQ WW 160 M SSB Contest**
- Feb. 21-22 ARRL DX CW Contest
- * Feb. 21-22 RSGB 7 MHz CW Contest
- * Fb.28 - Mr.1 French Phone Contest
- Fb.28 - Mr.1 Rat's Nest & Crooked Stick
- Fb.28 - Mr.2 YLRL YL-OM CW Contest
- Mar. 7-8 ARRL DX Phone Contest
- Mar. 7-8 QCWA Phone QSO Party
- Mar. 14-15 Maine QSO Party
- Mar. 14-16 Virginia QSO Party
- Mar. 15 ZERO District QSO Party
- Mar. 15-16 Wisconsin QSO Party
- Mar. 21 YLRL East Meets West (SSB)
- Mar. 21-22 YL ISSB Phone Party
- Mar. 21-23 BARTG Spring RTTY
- Mar. 28-29 CQ WW WPX SSB Contest**
- Apr. 4-5 IBM QSO Party
- May 2 Utah QSO Party
- Jul. 18-19 CQ WW WPX VHF Contest**

* Covered last month.

Vermont QSO Party

0001Z Sat. to 2400Z Sun., Feb. 7-8

This event is again being sponsored by the Central Vermont ARC. The same station may be worked three times per band—once each on phone, CW, and RTTY—for QSO points.

Exchange: RS(T) and QTH. County for VT; state, province, or DX country for others.

Scoring: One point per phone QSO; 2 points if on CW or RTTY. VT stations multiply total by (VT counties + states + VE provinces + DX countries) worked. All others use VT counties for their multiplier (maximum of 14). Work the club station W1BD and add 20 bonus points to your score. VT Counties: AN, BN, CA, CN, EX, FN, GI, LA, OG, OL, RU, WA, WM, WR.

Frequencies: Phone—3910, 7230, 14260, 14320, 21360, 28570, 50110, 144.2 (no repeaters). CW—3540, 3720, 7040, 7120, 14040, 21040, 21140, 28040. RTTY—3620 and 90 kHz from lower edge of other bands.

Awards: Certificates to the top-scoring station in each state, VE province, and DX country, and each Vermont station submitting a log. There is an annual plaque to the highest scoring Vermont station.

The WVT Award is available to stations working 13 of the 14 Vermont counties.

Official log forms are available by sending a large SASE to WA1PDN.

Mailing deadline for party entries is March 1st to: D. Loverin, WA1PDN, 50 Liberty Street, Montpelier, VT 05602.

QCWA QSO Party

CW: Feb. 7-8 SSB: March 7-8
0001Z Sat. to 2400Z Sun.

This is the 30th annual QSO Party for the Quarter Century Wireless Association. It's a closed, fun party open to QCWA members only to renew old friendships and meet new members. Rules are the same as those used last year and were given in detail in the QCWA News. Following is a brief summary.

CW and SSB are separate activities and require separate log entries. The same member may be contacted on each band for QSO points, but the chapter and "AL" multiplier is counted once only.

Exchange: QSO number, name, chapter (name or number), and state. If no chapter affiliation use "at large," or "AL."

Points: One point for each QCWA member worked on each band.

Multiplier: Each new chapter and one "AL" contacted, counted once only.

Score: Total number of QSOs multiplied by the sum of different chapters worked, plus one "AL" contact.

Frequencies: CW—3545, 7045, 14045, 21055, 28055. SSB—3915, 7245, 14295, 21365, 28615. Plus or minus 15 kHz. Also 160 meters and 6 and 2 meters simplex.

Awards: Plaques to the top scorer in each party. Party QSOs can be applied to the many QCWA awards. Make your request on the summary sheet of your entry.

The standard QCWA log form has 20 contacts to the page. If you prepare your own, have columns for time in GMT, station worked, QSO number sent and received, name, chapter, state, band, RS(T), points, and multiplier.

Mailing deadline for both CW and SSB is March 23rd. CW go to: Jim Gundry, W4JM, 2908 Forestgreen Dr., S. Lakeland, FL 33803. SSB to: Charles Chapman, W4SVB, P.O. Box 2741, Lakeland, FL 33806-2741.

New Hampshire QSO Party

1900Z Sat. to 0700Z Sun., Feb. 7-8
1400Z Sun. to 0200Z Mon., Feb. 8-9

The New Hampshire ARA is again

sponsoring this year's party. The same station may be worked on each band and mode for QSO points, but the multiplier is counted once only. NH to NH contacts are permitted for QSO credit.

Exchange: RS(T) and QTH. County for NH stations; state, VE province, or DX country for others.

Scoring: One point per phone QSO, 2 points per CW/RTTY, 5 points per Novice/Tech.

NH stations multiply total QSO points by number of states, provinces, and DX countries worked (U.S., Canada, Alaska, and Hawaii not DX countries).

Others use NH counties for their multiplier (maximum of 10).

Add 20 bonus points to final score for each QSO with a NHARA member station: WB1CAG, WB1FFZ, N1BYQ, WB5DLV, K1RD, W1WQM, W1OC (maximum of 140).

Frequencies: CW—1810, 3535, 7035, 14035, 21035, 28035. Phone—1875, 3935, 7235, 14280, 21380, 28580, 50115, 144205 (no repeaters). Novice—3735, 7135, 21135, 28135.

Awards: Certificates to top scorers in each NH county, each state, province, and DX country (5 QSO minimum). A plaque to the highest scoring NH station sponsored by the Concord Brass-pounders.

Mailing deadline for logs is March 12th to: Mount Moriah Repeater Society, c/o Bud Valcount, N1BYQ, 19 Teague Drive, Salem, NH 03079. Include a large SASE for a copy of the results.

North American "Sprint"

CW: Feb. 8 SSB: Feb. 15
Sunday 0000Z to 0395Z (Sat. night)

This is the spring edition of the "Sprint" run by the National Contest Journal. As the name implies, it's a shorty, only four hours long.

North Americans will be contacting other North American stations as well as stations in other countries, single operator only. North American boundaries are as defined by the rules used in the CQ WW DX Contest.

Exchange: Call, QSO no., name, and QTH (state, Canadian area, or country).

Scoring: Multiply total QSOs by the sum of states, Canadian areas, and other North American countries worked for your final score. (U.S. and VE not countries; KH6 not a state.) There are eight Canadian multipliers: VE1/VO1/VO2, VE2-VE7, VY1/VE8. Non-North American countries do not count as a multiplier.

Frequencies: Three bands only: 80, 40, and 20 meters. CW—3540, 7040, 14040. SSB—3900, 7225, 14280. (Plus or minus QRM.)

Awards: A trophy to the highest scoring entrant. Certificates to the top scorer in each U. S. call area, Canada, and other

country. Also to the ten top scores, to each member of the winning team, and the highest scoring entrant on each team.

Team competition is limited to a maximum of 10 operators as a single unit. Pre-contest registration is required for each team before the start of the contest—with W6OAT for the CW and K7GM for the SSB.

There are other detailed rules, a special QSY rule, disqualifying penalties, etc. I suggest you write to W6OAT or K7GM if you do not have a copy of the *Contest Journal*.

Entries must be received no later than 30 days after the end of each "Sprint." The CW go to: Rusty Epps, W6OAT, 948-H Kiely Blvd., Santa Clara, CA 95051. The

SSB go to: Rick Niswander, K7GM, 4520 N. Central, Suite 500, Phoenix, AZ 85012.

Dutch "PACC" Contest

1200Z Sat. to 1200Z Sun., Feb. 14-15

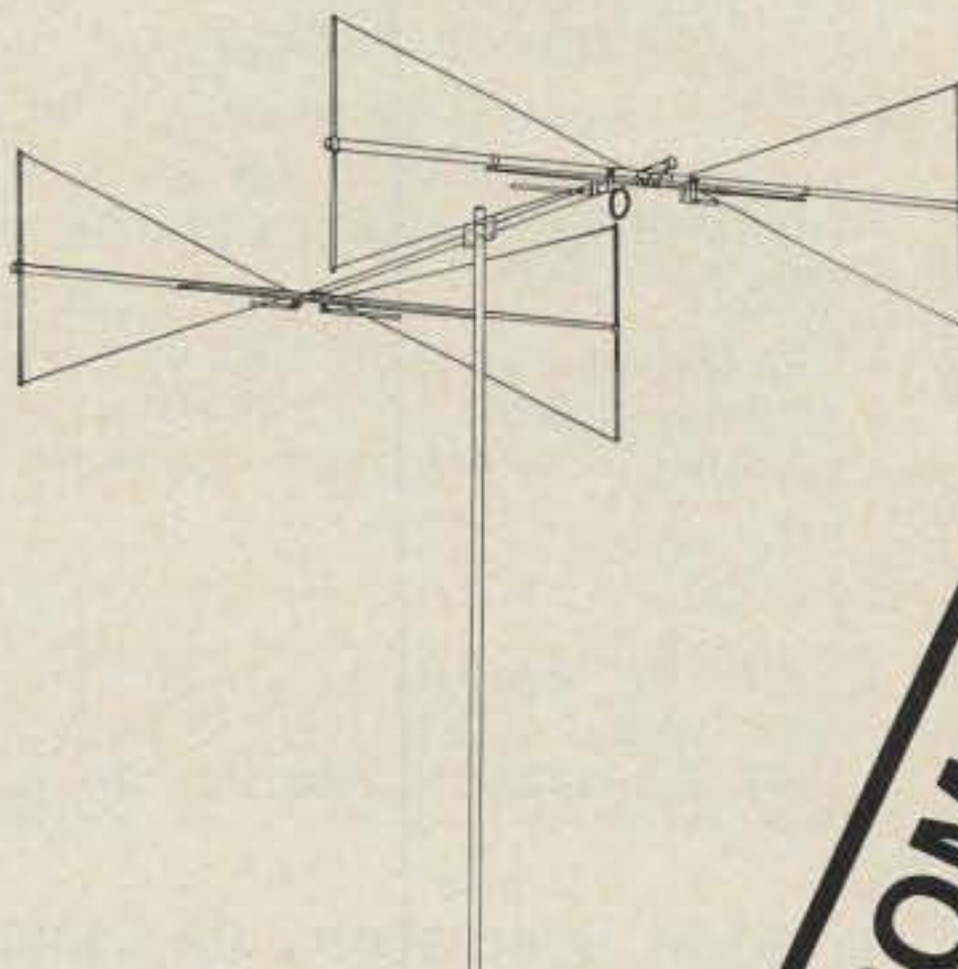
It's the world working The Netherlands on all six bands, 1.8 through 29.7 MHz, in the band sections recommended for contest operation by the IARU. The same station may be worked on each band, but on one mode only, phone or CW, for QSO and multiplier credit.

Categories: Single operator, multi-operator, and SWL.

Exchange: RS(T) plus a QSO number starting with 001. Dutch stations will add two letters to identify their province. There are 12 provinces: DR, FR, GD, GR, LB, NB, NH, OV, UT, FL, ZH, and ZL.

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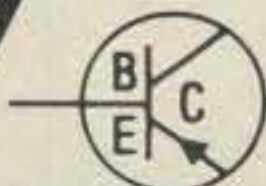
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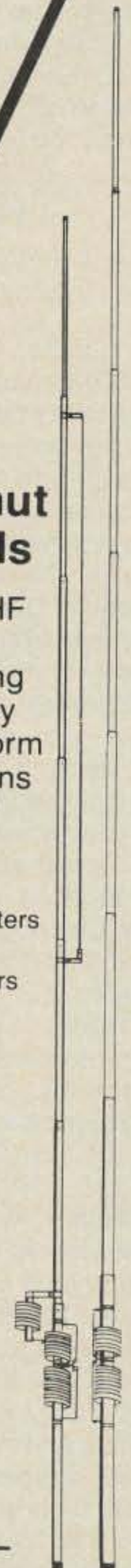
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Scoring: Each QSO with a PA/PB/PI station counts one point. DX stations determine their multiplier by the number of provinces worked on each band (maximum of 72).

Final Score: Total number of QSO's times the number of provinces worked on each band.

Awards: Certificates to the top scoring station in each category in each country and call areas of JA, LU, PY, UA9/0, VE/VO, VK, W/K, ZL, and ZS. Also second- and third-place awards if returns justify.

SWL's must log the call of the Dutch station as well as the station being worked and both serial numbers. Scoring same as above. Indicate the multiplier in a separate column in your log only the first time it is worked on each band. Include a summary sheet showing the scoring, your name and address in block letters, and the usual signed declaration.

Mailing deadline is March 31st to: PACC Contest, Att: F. Th. Oosthoek, PA0INA, P.O. Box 499, 4600 AL Bergen Zoom, The Netherlands.

YL-OM Contest

SSB: Feb. 14-16 CW: Feb. 28-Mar. 2
1400Z Sat. to 0200Z Mon.

It's the YL's working the OM's in this annual activity organized by the YLRL. All bands may be used, but cross-band contacts or contacts with stations on net frequencies do not count.

Phone and CW are separate contests and require separate logs. The same station may be worked once only regardless of band. Use only 24 hours out of the 36-hour contest period and indicate breaks in your log.

Exchange: QSO number, RS(T), and state, province, or country.

Scoring: Each QSO is worth 1 point. Multiply total by the number of US states, VE provinces, and DX countries worked.

There is also a power multiplier of 1.25 for stations running 150 watts or less on CW, and 300 watts PEP on SSB. Multiply your final score by the above factor if you qualify.

There is a penalty of three contacts for each duplicate contact removed from the log by the contest committee.

Frequencies: CW—3555, 7055, 14055, 21195, 28195. SSB—3955, 7255, 14295, 21395, 28595. Plus or minus 15 kHz.

Awards: First-place cups to both YL and OM winners in each contest; second- and third-place winners will receive certificates. Top scorers in each US and VE call area and each DX country will also receive certificates, provided there are at least two logs from that area or country with a minimum of ten contacts.

All entries must be postmarked no later than March 16th. This year they go to: The YLRL V.P., Mary Lou Brown, NM7N, 504 Channel View Drive, Anacortes, WA 98221.

CQ WW 160 Meter SSB Contest

2200Z Fri. to 1600Z Sun., Feb. 20-22

Just a reminder that the SSB section of our 160 Meter Contest will be coming up the last full weekend of this month.

Extensive coverage has been given to this event, with complete rules in the November issue and a briefing in last month's Calendar. Therefore, it would serve no purpose to repeat them again. They are the same rules that have been used these past many years and are well known worldwide.

Mailing deadline for your entry in last month's CW contest is February 28th, and March 31st for this month's SSB section.

They can be sent directly to the 160 Contest Director, Donald McClenon, N4IN, 3075 Florida Ave., Melbourne, FL 32904. And, of course, they can always be sent to the CQ office. CQ 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801. (Be sure to indicate CW or SSB on the envelope.)

1986 CQ WW 160 Meter Contest Results Addendum

The following are additions (CW) and corrections (Phone) to the results of the 160 Meter Contest published in the December 1986 issue.

CW Single Operator

Pennsylvania				
W3UHP	39,615	305	57	10
Norway				
LA7SI	9,856	68	28	28

Phone Multi-Operator

Michigan				
W8RA	128,685	825	68	16

ARRL International DX Contest

CW: Feb. 21-22 Phone: March 7-8
0000Z Saturday to 2400Z Sunday

Rules are the same as last year. However, I strongly recommend that you study the announcement in the December issue of QST for more details. Also send a large SASE (2 IRC's for DX) for sample log and entry forms.

All bands may be used, 1.8 through 28 MHz, but not 10, 18, or 24 MHz. Aeronautical or maritime mobile stations cannot be worked for contest credit. Following is a brief outline.

Categories: Single operator, both single and all band. Multi-operator, one transmitter and two transmitters. Also multi-operator, multi-transmitter. Also QRP, all band only (5 watts or less output). Multi one and two transmitter stations must remain on a band at least 10 minutes once a contact is made. Multi-transmitter stations no limit, but only one signal per band.

Exchange: RS(T) and state or province for W/VE; RS(T) and power input for DX

stations (three-digit number).

QSO points: W/VE stations earn three points for each DX contact. DX get three points for each W/VE contact.

Multiplier: Each DXCC country worked on each band for W/VE's. DX stations use US states (48), District of Columbia (DC), and VE districts VE1-8, plus VO and VY1 for their multiplier (10). (Maximum multiplier of 58 per band.)

Final Score: Total QSO points times the sum of the multiplier from each band. Entries with 500 or more QSO's must include a QSO check sheet.

Awards: Certificates given in each category, in each country, and in each ARRL section, plus a wide selection of plaques. Also certificates to DX stations making over 500 QSO's.

Disqualification regulations will be strictly enforced and are listed in the official rules. Mailing deadline for all entries is April 7th, and they go to: ARRL DX Contest, 225 Main Street, Newington, CT 06111.

Rat's Nest and Crooked Stick Sprint

2300Z Sat. to 0400Z Sun., Feb. 28-Mar. 1

The Issaquah Amateur Radio Club of Bellevue, WA is sponsoring this unusual contest with a funny name. Requirements are that you use a homebrew wire antenna in any configuration as long as it includes the use of crooked stick for a support. (*Wonder if a crooked tree qualifies?—ed.*)

Exchange: Name, QTH, and type of antenna. Club members will indicate their membership (Y or N).

Scoring: CW contacts 5 points, SSB 3 points. The multiplier is determined by the number of states, provinces, and countries worked, $\times 2$.

Bonus: To encourage "Elmering" and participation of everyone interested in amateur radio, the following bonus points are in effect.

Contacts *with* an apprentice—add 2 points. Contacts *by* an apprentice—add 5 points. (An apprentice is a Novice to Tech needing assistance in getting on the air.)

Frequencies: CW—7050 to 7150. SSB—7225 to 7300. Maximum of 250 watts DC input.

Awards: (A) Highest score by a Novice/Tech. (B) Highest score using a Crooked Stick antenna. (C) Highest CW score. (D) Highest SSB score. (E) A "Rat Catcher" certificate will be awarded to everyone making contact with three or more members of the Issaquah ARC.

Include a summary sheet with your entry showing the scoring, license class, and description of antenna and equipment used. Indicate your contacts with IARC members.

Logs go to: Contest Chairman: Steve Pack, WB7VAS, 4609 158th Ave. S.E., Bellevue, WA 98006.

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

More "This and That"

This time it's a look at several antennas and accessories topics, including rotating tower systems and several new antenna products. Columnist W8FX also takes note of some new amateur applications software for the hamshack.

—K2EEK

Last time we got together on the pages of your favorite amateur journal we embarked on a discussion of a variety of subjects. We discussed some important guy-wire length considerations, and we revisited a handy HF antenna length chart which appeared in a previous issue of *CQ*. We also highlighted several new antenna products which have recently come to our attention, and we covered some new amateur software of note. Finally, we pulled down from the bookshelf some interesting reading matter.

This month we will continue with the theme of last month's column. We'll first examine the rotating tower systems offered by the Texas firm of the same name. We'll then take a look at some new antenna products we've researched, and wrap up with some hamshack computer software you should likely find of interest. First, a look at a novel product offered by a Texas firm.

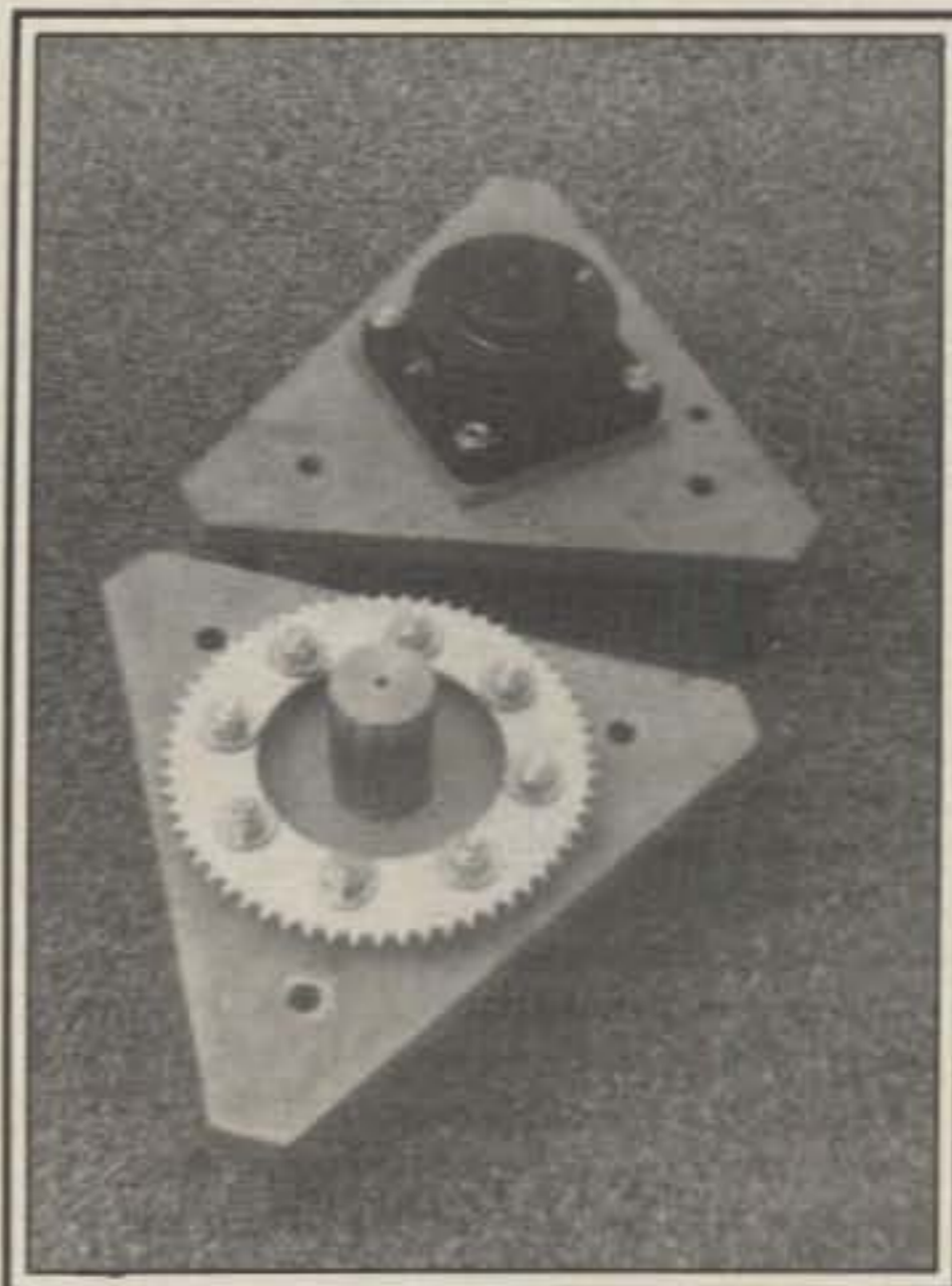
Rotating Tower Systems

Sometimes when I view an especially impressive antenna and tower installation I'm tongue-in-cheek tempted to remark that it would be simpler and cheaper to rotate the tower under the antenna, rather than rotate the antenna that adorns the top of the tower. Well, Dick Weber, K5IU, has done something along this line, but what he's done is "for real."

Dick sent us an interesting package of information on his "rotating tower systems," which he sells through his firm of the same name. As his literature indicates, Dick's product effectively multiplies your "tower real estate" to efficiently rotate stacked arrays, principally by means of a rotating base which can be installed at any height and sets of guy-wire bearings. Capitalizing on the old saw that a picture is worth a thousand words, the accompanying series of photos (all courtesy K5IU) show how the rotating tower systems are configured. Too, it's instructive to extract portions of Dick's correspondence with me:

"This whole venture started as a nice project for N5RM's new antenna farm at his retirement home. Well, things got out of hand as word-of-mouth got around, and I had people calling me to say they would like to have one if the hardware was for sale. That is how Rotating Tower Systems, Inc., got started.

"To date [summer of 1985], I have provided hardware to do five systems. The prototype is



Rotating Tower Systems production model base assembly shown on the ground. The base may be installed at any height, minimizing the number of guy bearings required.

at N5RM's and the later pre-production version is at my QTH. The other three systems are at N5UA, KB5XQ, and W6GO.... His [W6GO's] 150 foot tower and all beams were put up in less than two hours with a helicopter.

"The first system at N5RM's is a design entirely different than the systems I am selling.

His rotating base is very close to the production unit, but the guy-wire bearings are totally different and not for sale. The second system, at my house, has the production guy-wire bearings and a base like N5RM's as both were built at the same time. The [other] three systems are totally the production design.

"There are several things about my design which are unique and in the process of being patented. The bearing and sprocket which are under the tower can be replaced without taking the tower down. The bearing which holds up the tower has a static thrust load rating of 17,000 pounds and is a commercially available bearing. So, if it fails, it can be easily replaced. The 'cam followers' which are used on the guy-wire bearing unit are easily replaced and can be purchased at a bearing supply store. All bearings are sealed and can be lubricated with a grease gun.... All the hardware is hot-dip galvanized, except for a few parts which are stainless steel or aluminum. The sprockets are clear cadmium plated. All the parts are designed to be at least twice as strong as the tower sections they mate to."

According to Dick, the rotating base can be installed at any height, being specifically designed for use with a Rohn 45 or 55 tower, allowing the use of a minimum number of guy-wire bearings. Although the base bearing is said to have an essentially indefinite life with a 10,000 lb. thrust load, the base bearing assembly can be replaced easily without tower disassembly; a simple modification to the rotor unit recalibrates the indicator. The 2:1 chain drive on the HDR-300 rotor yields 10,000 inch-pounds turning torque. Dick advises that his own base is at the 50 foot level, while that of W6GO's tower is at the 70 foot level.

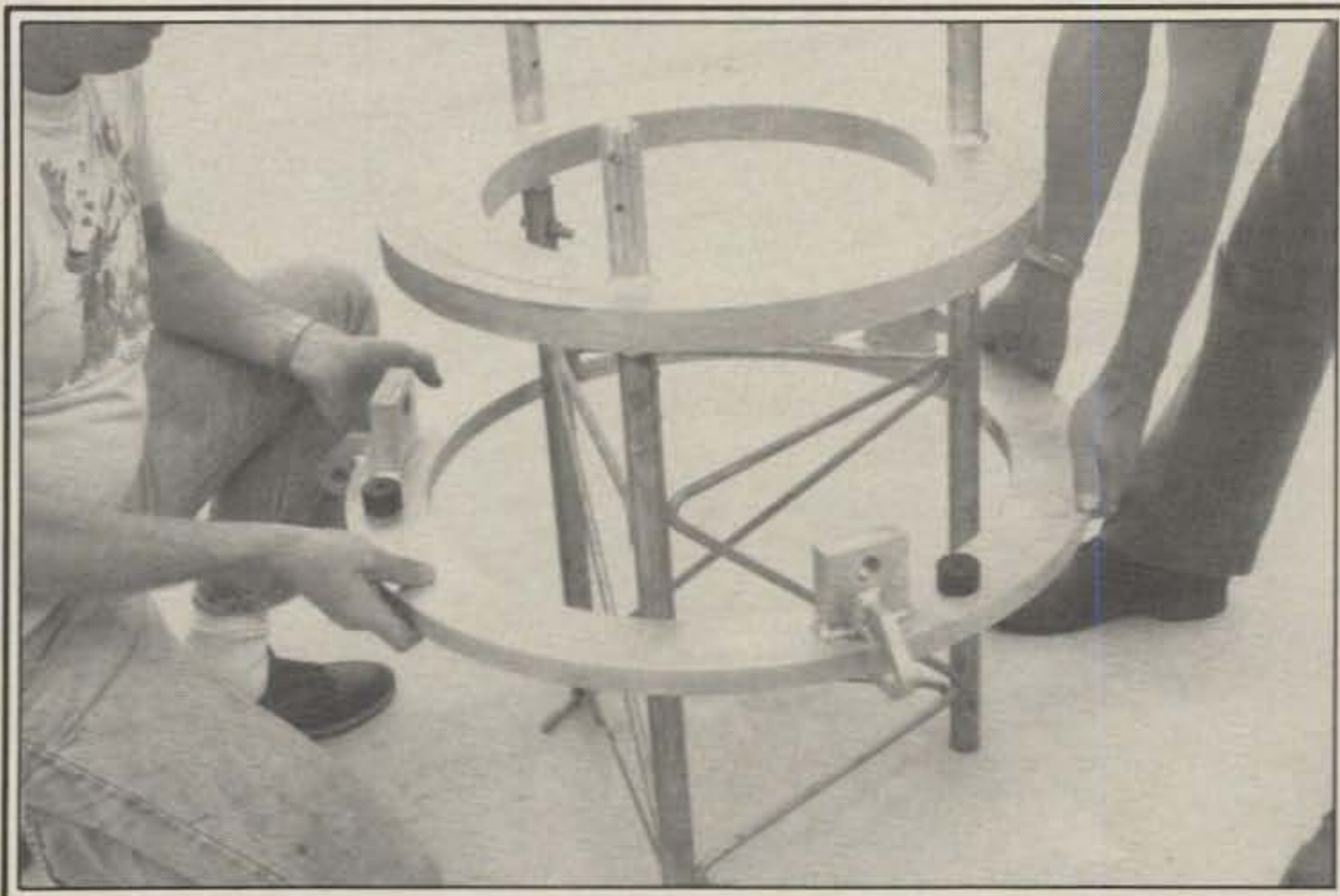


Photo shows Rotating Tower System guy bearing system being assembled.

317 Poplar Drive, Millbrook, AL 36054

Both systems (his and W6GO's) use two guy-wire bearings. The guy-wire bearing system uses individual cam follower bearing units rated for 11,000 pounds each; the bearing units are sealed but are easily lubricated through grease fittings. Thankfully, Dick advises that the guy-wire bearings, like the base bearings, are easily replaced without disassembly of the tower.

For more information, contact Dick Weber at Rotating Tower Systems, Inc., Box 44, Prosper, TX 75078.

More Antenna Products

Spider HF Mobile Antenna. The Spider™ HF Mobile Antenna represents a departure from the typical mobile antenna with its 8 foot mast cut in the middle to insert a loading coil or resonator, typically one for each band of operating interest. Instead, the Spider antenna uses a rather unusual type of resonator in which tuning within a given band is effected by sliding a plastic-coated tuning sleeve along the side of the resonator; there are no electrical connections between the tuning sleeve and the coil itself. Each resonator (one for each band) has its own visible logging scale to index the tuning sleeve's position. The antenna is adjusted to resonance using a chart of resonant frequency as a function of the logging scale. The antenna is furnished with resonators for 40, 20, 15, and 10 meters, while an 80/75 meter resonator is available as an option. The antenna, once adjusted, will be simultaneously resonant on multiple bands, thereby facilitating quick and easy band changes.

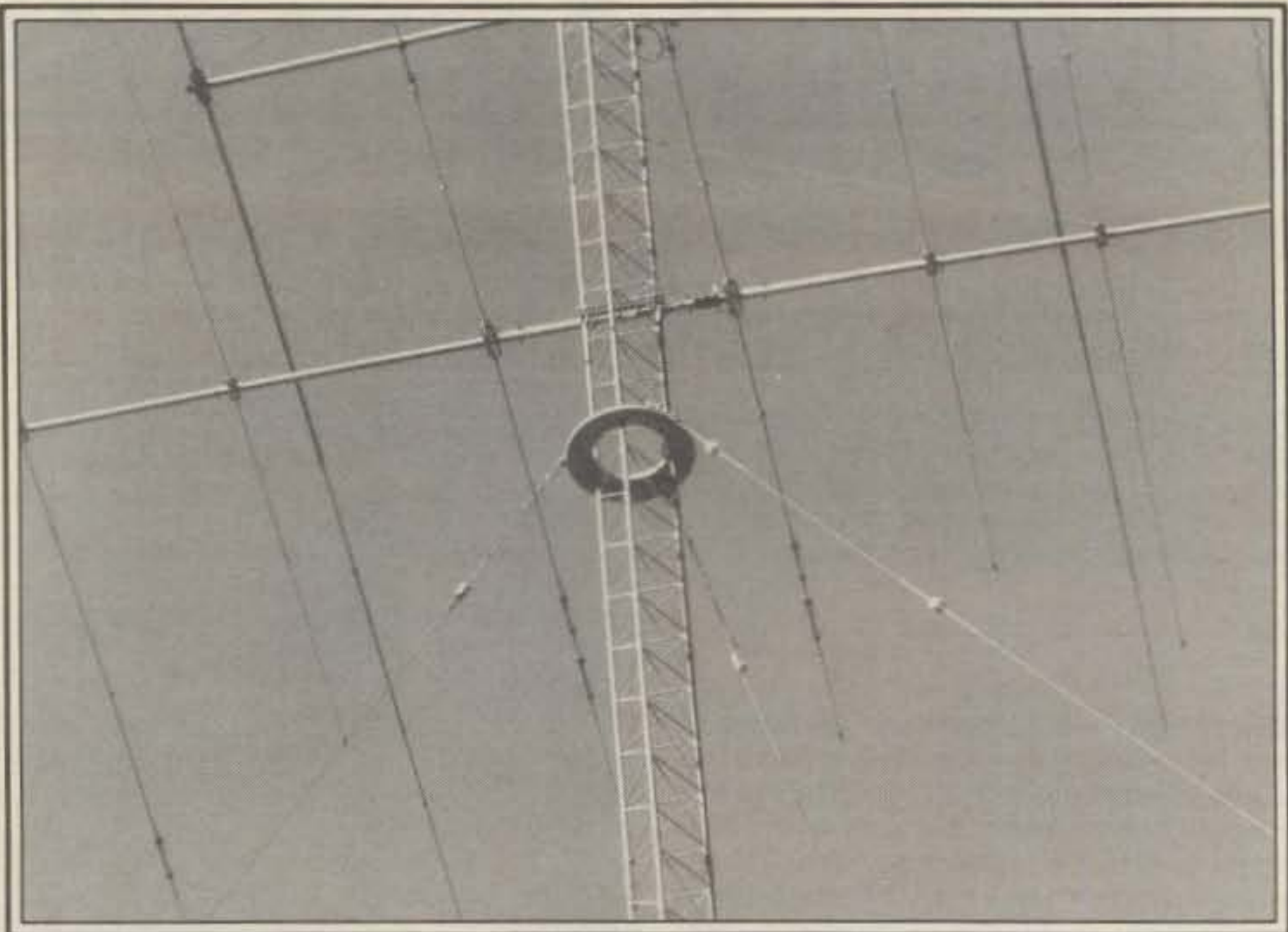
The Spider is rated for use with transceivers having an output of up to 200 watts, and it may be mounted on a car using a standard bumper mount. While the antenna is designed primarily for mobile work, it may also be used in an apartment or condo setup in which you can't install a conventional antenna. For example, the Spider may be fastened to the metal railing of a patio or porch, and a few radials used to form a ground plane.

The basic antenna is priced at about \$140 with four radiators and an antenna mast. If you have an existing mast, the four (40, 20, 15, and 10 meter) resonators may be purchased alone for about \$83. For more information on the Spider antenna, contact Multi-Band Antennas, 7131 Owensmouth Ave., Suite 363C, Canoga Park, CA 91303.

Coax from KA2QEP and KA2RVQ. There's no doubt that the high cost of quality coaxial cable figures significantly when erecting antennas. Some relief from the stratospheric per-foot coax prices can be had from QEP's, 110-4 Route 10, E. Hanover, NJ 07936. A recent flyer from the firm shows various types of RG-8, RG-213, and RG-214 cables, along with the Belden number and cable specs. Most helpfully, a short description of each type of cable's suitability for various uses is also provided.

I noted reasonable prices on Belden 9913, 8267, 8214, 8237, and 9258 cables, as well as Belden 8268 double-braid silver RG-214 type cable. The coax is sold by the foot or in 500 foot rolls. Bill, KA2QEP, and Jim, KA2RVQ, boast same-day UPS shipping. Write to them for a flyer if you're looking for coax for that next antenna project.

Fluxless Brazing Rod. Everyone knows how difficult it is to solder or weld aluminum. There are, however, several brazing rods available which can be used to do things such as eliminate high-resistance joints, repair damaged



Shown here is an in-place guy-wire bearing unit. The system makes use of individual "cam follower" bearing units rated for 11,000 pounds each.

antennas, and generally fabricate, repair, and maintain aluminum as well as zinc alloys. The M.S.S. Wonder Rods, sold by William A. Yeager, W9OCS, are one such product; we reported on them previously in the column.

Another aluminum repair rod is the "Miracle Rod"™, which is sold by Miracle Rod, P.O. Box 791, Glasgow, KY 42141. This fluxless rod is especially useful in working with antenna elements, masts and towers, hardware, boats, engine propellers, gears, jigs and fixtures, irrigation pipe, and motor housings. The low melting point of the rod—732 degrees Fahrenheit—makes it suitable for use with an ordinary

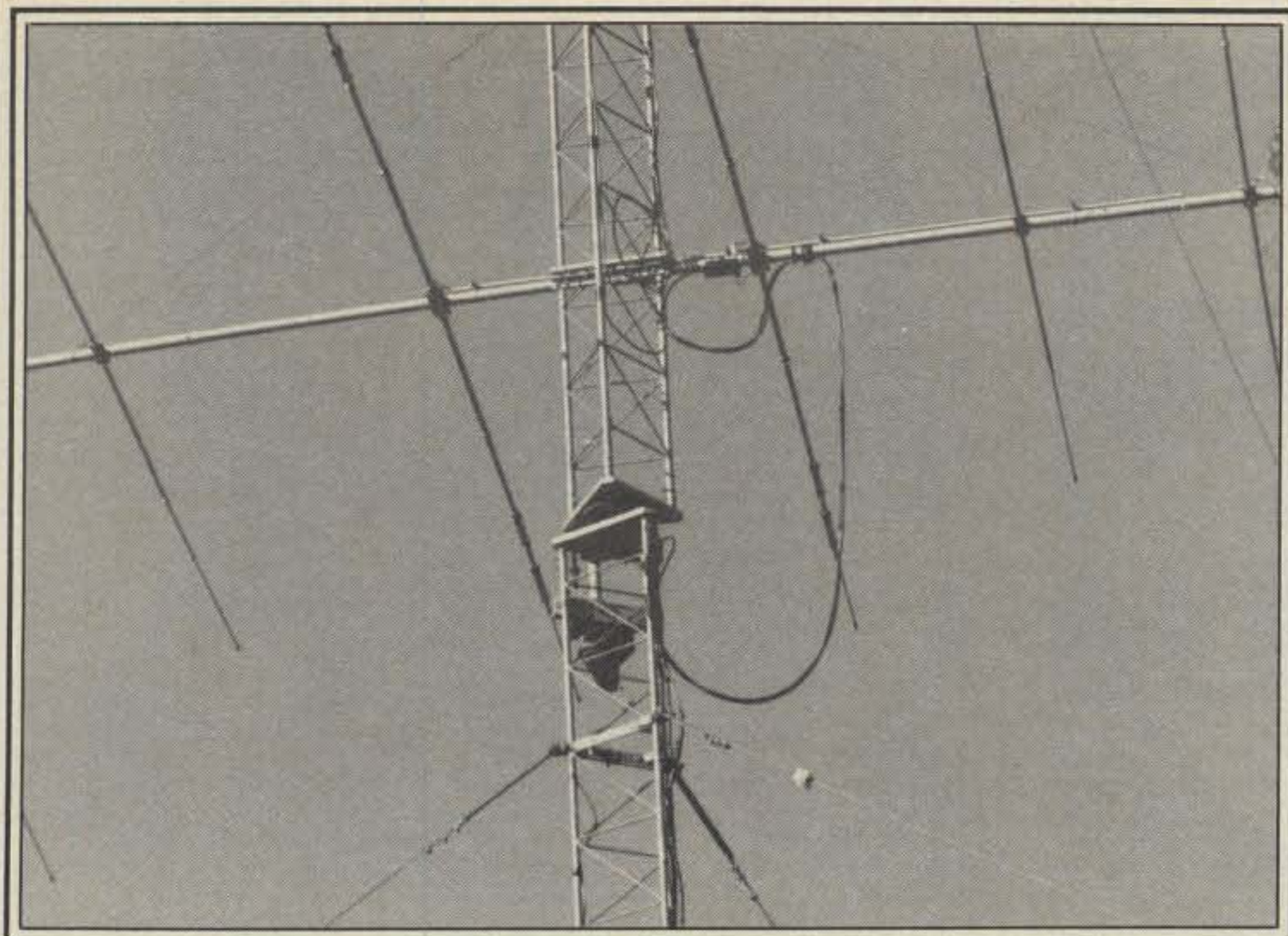
propane torch; a stainless steel wire brush is used for cleaning. Zinc-based materials may also be handled using the Miracle Rod.

Sommer DJ2UT Antennas. Some time ago Pete Theiler, KI4KN, took over the US distribution of the well-known European line of high-quality Sommer antennas. Included in the line are the XP multiband beams, a 70 cm helix antenna, and the TCS-80 vertical antenna system.

The Sommer "bread-and-butter" antennas are the rugged, no-trap XP-406, XP-506, and XP-706 beams which cover 10, 12, 15, 20, 30, and 40 meters. The 17 meter (18 MHz) band can be added to these antennas with an expan-



Photo shows the "guts" of the K5IU Rotating Tower System. The rotor can be seen in the foreground. A 2:1 chain drive with the HDR-300 rotor yields 10,000 inch-pounds "turning torque."



The "heart" of the fully installed K5IU rotating tower system, which shows the 2:1 chain drive HDR-300 rotor behind the tower.

sion kit. Also available is an economical tri-band version of the XP-400 series, the XP-403. This antenna, priced at about \$300, is intended to replace more conventional tri-band trap antennas, and is claimed to have at least the performance of a three-element monobander on 10, 15, and 20 meters.

A new product is the TCS-80 vertical ground-plane antenna system for continuous coverage from 3 to 30 MHz. Rated for full legal power, the antenna is remotely adjusted for the desired frequency from the operating position. An unusual antenna, according to Pete the TCS-80 works much as a transmission line (Lecher line), the electrical length of which can be adjusted within a range of about 7 to 30 feet. The vertical radiator is 16-18 feet long; the system also makes use of a counterpoise with untuned radials 6 to 20 feet in length. Using a 42 foot radiator, it is possible to extend the range of the system down in frequency to cover 160 meters. The antenna is also said to be adaptable to 6 and 2 meters as a longwire. Both low-power (300 watt) and high-power (full legal power) versions are available. Price is from \$350 to \$430, depending on the power rating desired.

For more details and technical literature contact Pete Theiler, KI4KN, at H. J. Theiler Corp., P.O. Box 5369, Spartanburg, SC 29304.

Software Sampler

Winner's Edge Software. Pete Smith, N4ZR, has been kept busy preparing a line of real-time contest software for the Commodore 64 and 128. Pete says that while he is, of course, biased, he feels that his Contester II package breaks new ground in performance in what is perhaps the most demanding area of competitive amateur operation.

The Contester II program, with the Basic Module, permits operation in any contest, while optional contest modules provide additional functions tailored to specific contests. The program maintains multiplier checklists,

dupe sheets, and the contest log; sends CW, including pre-programmed and user-specified contest transmissions; and maintains a running score, multiplier tallies, and other statistics for the purpose of assisting the operator to plan contest strategy.

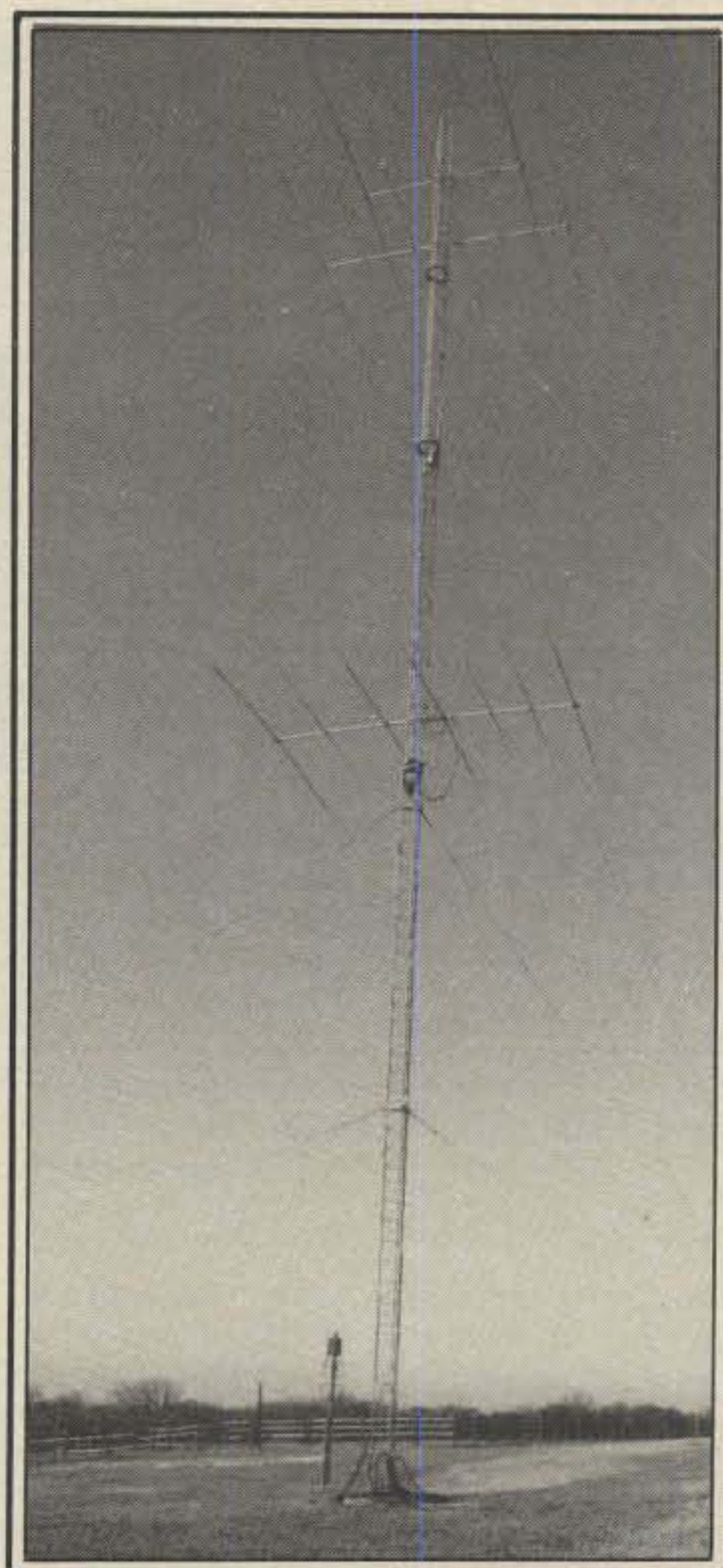
The package has a capacity of over 2000 QSOs on an all-band basis, or 1000 QSOs per band on as many as six bands. Up to 15 pre-recorded CW messages are available, including a full set of frequently needed contest transmissions, each being sent by means of a one-keystroke command. Automatic serial-number generation and date/time tracking are provided.

The Contester II also features perfect CW transmission with keyboard selectable speed from 5 to over 50 WPM. Connection to the transmitter or transceiver is through a simple, one-IC, one-transistor interface (a schematic is provided, or kits or finished units may be purchased).

Additionally, a series of individual "contest modules" are available which are designed to work as an integrated part of the Contester II system. These modules allow for "fine tuning," or tailoring the system to the needs and requirements of specialized contests—to maintain the logs in accordance with the sponsor's submission requirements, calculate the multipliers automatically, and provide real-time scoring and other useful operator information. At this writing, custom modules are available for the CQ WPX Contest, ARRL Sweepstakes, and ARRL DX Contest. Other modules are planned and may be available by the time this issue of CQ reaches you.

The Contester II program, with the Basic Module, is priced at \$39.95. There is an additional charge for the interface and optional contest modules. For more details, contact Winner's Edge Software, 2003 Sarazen Place, Reston, VA 22091.

Grosvenor Software. A note from Ken E. Crowston, VE5BBP, advises us that he's been appointed the North American distributor for En-



In-place Rotating Tower System as installed at K5IU's QTH. The rotating base is at the 50 foot level of the 120 foot tower.

gland's Grosvenor Software, which includes several ham products for the Radio Shack Color Computer, popularly and affectionately known as the CoCo. These are programs developed by M. J. (Mike) Kerry, G4BMK, for CW, RTTY, and AMTOR operation. According to Ken, these programs are very popular with amateur operators in Europe. They are full featured programs at reasonable prices, and are sold separately for those who only want one operating mode, or at a reduced group price for those who wish two or more modes of operation. Each module is custom made and has the user's call installed in the program. Interfacing information is supplied, including detailed plans for a CW tuning unit. The three programs offered include the G4BMK Morse Transceive Program; G4BMK RTTY/ASCII Transceive Program (Mk 3); and G4BMK AMTOR. The first two programs are priced at \$28 (Canadian) each, while the latter program is \$45 (Canadian). The programs are available either on cassette or on disk.

Ken advises that he also offers a slow scan television (SSTV) send and receive program, from SoftCircuits, for the CoCo. Ken advises that this program, along with the separately sold video editor, gives the CoCo amateur user an inexpensive but very effective way of getting into SSTV, and the SWL a nice tool for just "seeing what's going on" on amateur SSTV.

The SSTV package is comprised of two programs, which, incidentally, have been recog-

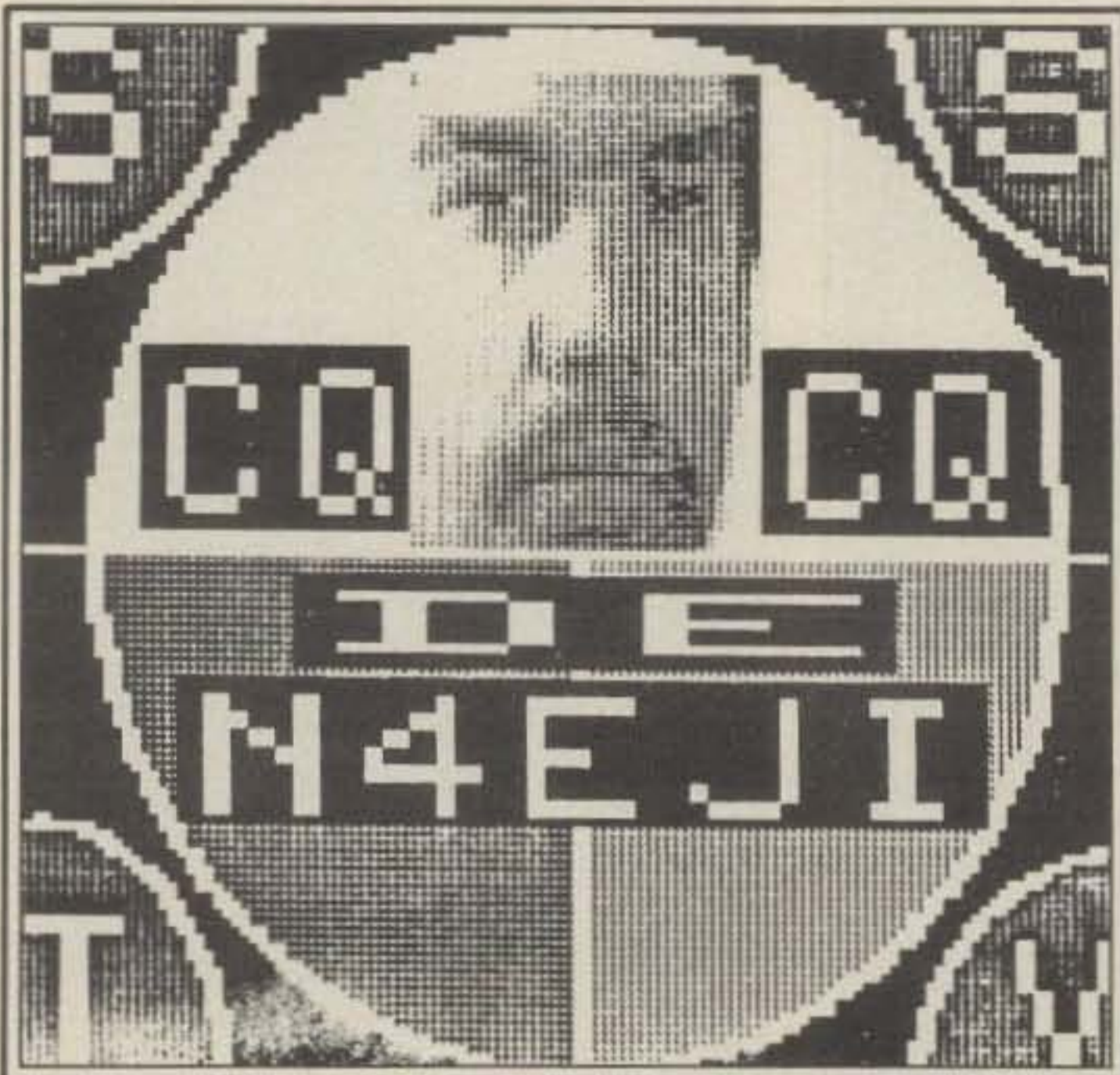


Fig. 1- Shown here are several sample SSV printouts from the SoftCircuits, Inc. View-II SSV program for the Radio Shack CoCo. These were made using a Star-Micronics Gemini 10X printer. The View-II program and accompanying View-Edit program are available from Crowston Enterprises, P.O. Box 1064, Shellbrook, Saskatchewan S0J 2E0 Canada.

nized by *Rainbow* magazine's "Received and Certified" consumer protection program. The two products are (1) VIEW-II, an 8-second all-software SSV transceiver program; and (2) VIEW-EDIT, an image editor for the images that VIEW-II handles. Importantly, no interface is required to connect the CoCo to the trans-

ceiver. The former disk-based program essentially turns the 64K CoCo into an SSV transceiver. As no hardware is required, the CoCo's cassette port is simply connected to the transceiver. You can save and load via diskette, 8-second, 128 x 128 SSV images; printouts can be made using an Epson or Gemini printer.

The latter program is a menu-driven editor that works in conjunction with VIEW-II. This program allows you to perform a wide range of editing and enhancement functions on SSV images. Each of these programs is priced at \$43 (Canadian) plus shipping.

A sample printout of the VIEW-II images is shown in fig. 1. For more information, contact Crowston Enterprises, P.O. Box 1064, Shellbrook, Saskatchewan S0J 2E0 Canada.

More CoCo Stuff. From the same folks who bring you *Spec-Com*, the specialized amateur communications journal, comes a line of amateur radio applications software specifically for the Radio Shack CoCo. The *Spec-Com* catalog includes two especially interesting and economical programs, CoCoRTTY and SloScan. The former program transmits and receives 60 WPM RTTY without the need for an external terminal unit; the latter program receives SSV signals without an external interface.

In addition to these two programs, the *Spec-Com* catalog contains a number of other amateur radio applications programs on disk and cassette to support the CoCo. The catalog of CoCo-based amateur software may be obtained by sending an SASE to *Spec-Com*, P.O. Box H, Lowden, IA 52225.

LADPAC Software. Our technically oriented readers may be interested in the LADPAC software package for the IBM-PC and compatibles, for the design and analysis of electronic ladder circuits. The package consists of five menu driven, interactive programs which generate or read disk files, providing communications between the various routines.

At the heart of LADPAC is the GPLA, or General Purpose Ladder Analysis program. This program calculates and displays in graphs and tables the transducer gain (in dB), phase, return loss, and group delay for an arbitrary filter of up to 49 elements. Filter elements may include resistors, capacitors, inductors of finite "Q," as well as numerous complex elements such as parallel and series resonators, transmission lines, quartz crystals, and even a half-

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wavelength dipole. Parallel branches may be included.

The other programs provided in the LADPAC package include: LPF, used in the design of Chebyshev or Butterworth filters; BPFDES, for the design of coupled-resonator LC filters; XFILDES, used to design lower sideband ladder crystal filters; and Schematic Draw, which reads a disk file generated by any of the other programs in the package to draw the filter schematic on the monitor screen. The program disk is furnished with a detailed user's manual in a looseleaf notebook.

The LADPAC program is priced at \$149, postpaid. Contact Hayward Electronic Systems, Inc., 7700 SW Danielle Ave., Beaverton, OR 97005.

Public Domain Software. Anyone reading this column knows that we're staunch supporters of, and believers in, public domain software. Although there is a good deal of fairly worthless public domain software available for the taking, this is easily counterbalanced by the many software "gems" one finds in the public domain. One way to help locate and obtain these "gems" is to join a public domain software distribution network or users group. Doing so not only helps locate such gems, but also helps you to cull out the junk software, saving valuable time and effort in the process.

One such outfit which focuses on the IBM-PC, is Public Domain Software, 3080 Olcott St. #B-130, Santa Clara, CA 95054, which charges a membership fee of \$15 per year to make use of their extensive software library. Several hundred disks are found in the catalog; the disks are sold for \$5 apiece. A catalog disk featuring the group's offerings is available for \$7 plus \$3 postage. The group publishes the "Public Domain SW Newsletter" which describes new offerings and specials.

Another similar group is the PC Software-Interest Group, 1030 E. Duane, Suite J, Sunnyvale, CA 94086. Membership in the PC-Sig is \$15 annually, and includes a 350-page paperback directory, a subscription to the quarterly newsletter "Soft Domain," and discounts on quantity disk orders. I was impressed with the newsletter. The 32-page sample issue which I received listed more than 450 disks as available for purchase (at \$6 each), and included a good deal of useful information on new library programs, tips and techniques, and reviews of some of the more popular programs found in the PC-Sig library.

Buttons. An unusual, concept-oriented approach to software packaging and marketing is taken by Straightforward, 15000 Halldale Ave., Suite 115, Gardena, CA 90247. This firm is a leader in PC "vertical market software," offering a variety of products (currently over 200 programs) to perform basic functions unique to each profession or "vertical market." These include specialized software applications in fields such as business statistics, marketing and sales, real estate, small business, leasing, math, physics, chemistry, several engineering areas, and others.

The idea behind the Straightforward concept is to furnish a comprehensive family of software to support the daily activity of a particular field, with emphasis on each package making full use of the PC screen for ease of user interface. Each specialized program is known as a "button," since each function is to be available "at the touch of a button."

Each button is designed to be a simple, fast, and efficient software package with friendly user inputs, prompts, explanations, and result-

ant output. All buttons in the product line are independent, yet are integrated under one user-friendly interface whose design allows new users to work with extensive prompts at their own speed, while experienced users may enter data and get results with minimum prompting or interference by the screen. The buttons are designed for use with the IBM-PC, XT, and AT computers, as well as most PC DOS compatibles.

CQ readers may be interested in one of the button "bundles" which support professional antenna design. Individual buttons are available for 13 specialized applications including loaded vertical and dipole antennas, parabolic antenna computations, RF path loss, short-wave transmission path calculations, antenna beamwidths, Rhombic antenna gain, linear array beam patterns, and more. The buttons come in the standard "S" version (32-bit accuracy) and the fast "F" version (64-bit accuracy); the latter supports the 8087/80287 math coprocessor. The "S" version buttons are priced at \$5 each, while the "F" buttons are

\$4. The bundle of 13 Antenna Buttons is also available for \$40 in the "S" version, or \$32 for the "F" version.

In addition to the button software we described, Straightforward also offers FORTY-ONE, a fast and powerful programmable software calculator which emulates the popular Hewlett-Packard HP41CV handheld computer. This program, which runs existing HP41 user software, is designed to run on the PC and compatibles as well as the HP Vectra. A catalog showing the full product line is available from the manufacturer.

Wrapping It Up

This month we examined K5IU's novel rotating tower systems, took a look at several other new antenna products, and scanned some amateur radio applications software that we trust you've found interesting.

Next month we'll be back with more antennas and accessories topics of current interest. See you then.

73, Karl, W8FX

THE JOY OF QRP: STRATEGY FOR SUCCESS

Reviews: **Bill Welsh, W6DBB**, Novice Ed. CQ: "151 pages covering QRP from basics to fine points in 8 interesting chapters. . . . Novices will have no difficulty understanding the explanations." **Doug DeMaw, W1FB, QST**: "I would have no hesitation in recommending WØRSP's book to any Amateur interested in QRP operation. In fact, it will provide great reading for nearly any active ham." **R.S.G.B., Radio Communications**: "Chap. 3, 'Planning for QRP Operation', is essential reading not only for low power enthusiasts, but for all who operate on the hf bands, particularly those who are relatively new to the hf bands. . . . The author has used a thorough and in-depth approach to all the topics covered in this book, but in doing so he has maintained an easy-going and entertaining style. It would be difficult for anyone to read this book and not gain something from it."

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CIRCLE 121 ON READER SERVICE CARD

THE SCIENCE OF PREDICTING RADIO CONDITIONS

There is an increasing amount of evidence, but not yet conclusive, that a new sunspot cycle, Cycle 22, is about to begin or may have already begun!

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 36 for October 1986. This is the highest monthly mean level recorded since July 1984. It results in a 13-month running smoothed sunspot number of 13.8 centered on April 1986. This is a point *higher* than the smoothed number reported for March.

Meanwhile, on the sun's surface there is further evidence. The number of reversed polarity sunspots are on the increase. For example, during the last week of October, four of the five visible spotted regions were reported to be "new cycle" spots.

What does this mean? It could indicate the beginning of the new cycle on the one hand, but it could also mean that solar activity is entering another short-period plateau, which is not uncommon. It will be several more months before we know for certain.

The provisional value of 10.7 cm radio solar flux as reported by the Canadian Observatory at Ottawa was 80 during October 1986.

WW DX Phone Contest Critique

The surge in solar activity during October could not have happened at a more opportune time—during the CQ World-Wide DX phone section weekend of October 25-26. On October 25th the 10.7 cm solar flux level soared to 96, remaining at the 95 level throughout the 26th as well. Provisionally, the sunspot count on both days was approximately 60. A period of exceptionally quiet world-wide geomagnetic conditions coincided with the rise in solar flux. Observatories at mid and low latitudes reported an A-index of between 2 and 3 for both days. More important, measurements made in the propagationally critical polar regions reported levels between 5 and 7.

The combination of high solar flux and low world-wide geomagnetic indices produced High Normal to Above Normal HF propagation conditions throughout most of the world during the entire Phone Contest weekend.

The 1985 Phone Contest weekend also occurred during a brief rise in solar activity, but it seems that conditions during

11307 Clara Street, Silver Spring, MD 20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for February 1987

Propagation Index	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 6-7, 14, 23	A	A	B	C
High Normal: 3, 8-9, 13, 15, 21-22, 24	A	B	C	C-D
Low Normal: 1, 4-5, 11-12, 16-17, 20, 27-28	A-B	B-C	C-D	D-E
Below Normal: 2, 10, 19, 25	B-C	C-D	D-E	E
Disturbed: 18, 26	C-E	D-E	E	E

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

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

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

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

E—No opening expected.

HOW TO USE THIS FORECAST

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

1986 were even better. Early reports received from contest participants bear this out. Ten and 15 meters really came to life during the contest weekend, 20 meters was a world-wide DX band again for most of the day, and conditions on 40, 80, and 160 meters seem to have sounded better than they have for many years.

In the bulletin in my November column I called for Low Normal conditions for the entire contest weekend, pointing out that "despite exceptionally low solar activity, this could be a fairly good DX Contest period." It was that and then some!

February Conditions

A smoothed sunspot number less than 10 is forecast for February 1987. This means that not much difference is expected between conditions this February and those observed during February of 1986.

Low solar activity coupled with seasonal changes in HF propagation conditions are expected to result in few 10 meter DX openings during February. The band should, however, occasionally open towards southern and tropical areas during the daytime when conditions are High Normal or better. There's a considerably

better chance for 15 meter DX openings to many parts of the world during the daylight hours, particularly when conditions are High Normal or better.

Twenty meters should continue to be the best band for DX propagation during February. Expect a window of an hour or two duration, beginning just after sunrise, during which the band should open to most areas of the world. DX should be possible throughout the day, with another peak in conditions occurring during the early afternoon. When conditions are High Normal or better, 20 meters may remain open towards the south and the west well past sundown and into the hours of darkness.

Somewhat improved and often good nighttime DX propagation conditions are expected on 40 meters during February. The band should open towards Europe and the east an hour or two before sundown, peaking during the early evening. South America should be within range from about an hour or so after sundown, through the hours of darkness, and until sunrise. Openings towards the Caribbean area should be possible for an hour or more before sundown and until an hour after sunrise. Look for openings towards the South Pacific, Asia, and the Far East from about an hour or two *before* to about an hour *after* local sunrise. Good 80 meter openings are also forecast to most areas of the world during the hours of darkness. Be sure to also check 160 meters between sundown and sunrise for some fairly good DX openings to some areas of the world.

A seasonal increase in static levels may begin to be noticeable on the HF bands during February.

Short-Skip Conditions

On 160 meters no significant skip is expected during the daylight hours, but groundwave openings over several dozen miles should be possible. During the hours of darkness expect fairly good openings over distances up to 1300 miles and beyond. On 80 meters look for openings up to about 250 miles during most of the daylight hours, with the skip lengthening to between 400 and 1300 miles just after sundown, and up to between 800 and 2300 miles by midnight. On 40 meters daytime openings should be possible between distances of approximately 200 and 750 miles, extending to between 750 miles and 2300 miles during the early evening. During the hours of darkness 40 meters should be optimum for openings between approximately 1500 and 2300 miles. Daytime skip on 20 meters should

HOW TO USE THE DX PROPAGATION CHARTS

1. Use Chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8 KP4, KG4 and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9 and 0 areas; the Western USA Chart in the 6 and 7 areas, and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 Meters) for a particular DX region, as shown in the left-hand column of the Charts. An * indicates the best time to listen for 160 meter openings.

3. The propagation index is the number that appears in () after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

- (4) Opening should occur on more than 22 days
- (3) Opening should occur between 14 and 22 days
- (2) Opening should occur between 7 and 13 days
- (1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this 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.

4. Times shown in the Charts are in the 24-hour system, where 00 is midnight, 12 is noon, 01 is 1 A.M., 13 is 1 P.M., etc. Appropriate standard time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 8 hours in PST Zone, 7 hours in MST Zone, 6 hours in CST Zone, and 5 hours in EST Zone. For example, 13 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 04 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts c.w., or 1 kw, p.e.p. on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the propagation index will increase by one level for each 10 dB loss, it will lower by one level.

6. Propagation data contained in the Charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado, 80302.

**February 15-April 15, 1987
Time Zone: EST (24-Hour Time)
EASTERN USA TO:**

	15 Meters	20 Meters	40 Meters	80 Meters
Western & Central Europe & North Africa	10-12 (1)** 08-10 (1) 10-12 (2) 12-13 (1)	06-08 (1) 08-11 (2) 11-12 (3) 12-13 (4) 13-14 (3) 14-15 (2) 15-17 (1)	16-17 (1) 17-19 (2) 19-20 (3) 20-00 (2) 00-02 (3) 02-03 (2) 03-04 (1)	18-20 (1) 20-21 (2) 21-01 (3) 01-02 (2) 02-03 (1) 20-22 (1)* 22-01 (2)* 01-02 (1)*
Northern Europe & European USSR	09-12 (1)	06-07 (1) 07-09 (2) 09-11 (1) 11-14 (2)	17-19 (1) 19-02 (2) 02-03 (1) 11-13 (2)	20-22 (1) 22-00 (2) 00-02 (1) 20-00 (1)*
Eastern Mediterranean & Middle East	09-11 (1)	06-07 (1) 07-09 (2) 09-11 (1) 11-13 (2) 13-14 (3) 14-15 (2) 15-17 (1)	18-20 (1) 20-23 (2) 23-01 (1)	19-23 (1) 20-22 (1)*
Western Africa	10-13 (1)** 09-10 (1) 10-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	06-07 (1) 07-09 (2) 09-12 (1) 12-14 (2) 14-16 (3) 16-17 (2) 17-19 (1)	18-19 (1) 19-00 (2) 00-02 (1)	19-21 (1) 21-23 (2) 23-01 (1) 21-01 (1)*
Eastern & Central Africa	11-13 (1)** 09-11 (1) 11-14 (2) 14-15 (1)	13-15 (1) 15-18 (2) 18-19 (1)	19-22 (1) 22-00 (2) 00-01 (1)	20-00 (1)
Southern Africa	10-13 (1)** 09-10 (1) 10-12 (2) 12-13 (3) 13-14 (2) 14-15 (1)	07-14 (1) 14-16 (2) 16-17 (3) 17-18 (2) 18-20 (1)	18-20 (1) 20-22 (2) 22-00 (1)	21-23 (1) 21-23 (1)*
Central & South Asia	09-11 (1) 16-18 (1)	06-07 (1) 07-09 (2) 09-11 (1) 18-21 (1)	04-07 (1) 17-21 (1)	04-07 (1) 18-20 (1)

**February 15-April 15, 1987
Time Zones: CST & MST
(24-Hour Time)
CENTRAL USA TO:**

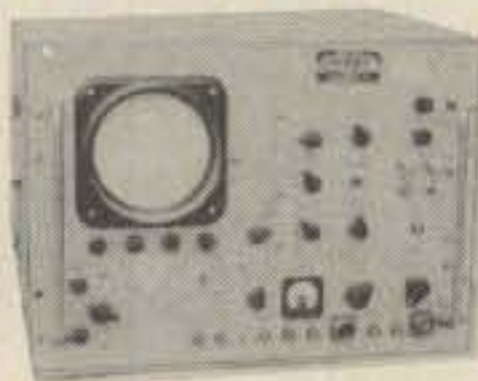
	15 Meters	20 Meters	40 Meters	80 Meters
Western & Southern Europe & North Africa	08-09 (1) 09-12 (2) 12-13 (1)	06-08 (1) 08-12 (2) 12-14 (3) 14-15 (2) 15-17 (1)	16-18 (1) 18-21 (2) 21-00 (1) 00-02 (2) 02-03 (1)	18-20 (1) 20-00 (2) 00-01 (1) 20-00 (1)*
Northern & Central Europe & European USSR	08-11 (1)	07-08 (1) 08-10 (2) 10-12 (1) 12-13 (2) 13-15 (1)	19-22 (1) 22-00 (2) 00-02 (1)	20-01 (1) 21-01 (1)*
Eastern Mediterranean & Middle East	08-11 (1)	07-11 (1) 11-14 (2) 14-16 (1) 22-00 (1)	19-20 (1) 20-22 (2) 22-23 (1)	20-22 (1)
Western Africa	09-12 (1)** 08-10 (1) 10-13 (2) 13-15 (1)	07-12 (1) 12-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	18-20 (1) 20-22 (2) 22-01 (1)	21-00 (1) 21-23 (1)*
Eastern & Central Africa	08-11 (1) 11-13 (2) 13-14 (1)	07-12 (1) 12-14 (2) 14-15 (3) 15-16 (2) 16-18 (1)	19-23 (1)	19-22 (1)
Southern Africa	10-12 (1)** 08-10 (1) 10-11 (2) 11-13 (3) 13-14 (2) 14-15 (1)	07-13 (1) 13-15 (2) 15-16 (3) 16-17 (2) 17-19 (1) 22-00 (1)	18-20 (1) 20-23 (2) 23-00 (1)	19-22 (1) 20-22 (1)*
Central & South Asia	09-11 (1)	06-07 (1) 07-09 (2) 09-11 (1) 19-21 (1)	04-08 (1) 17-21 (1)	05-07 (1) 17-19 (1)
Southeast Asia	10-13 (1) 17-19 (1)	06-07 (1) 07-10 (2) 10-12 (1) 17-21 (1)	04-08 (1) 17-19 (1)	05-07 (1) 17-18 (1)
Far East	16-18 (1)** 16-17 (1) 17-18 (2) 18-19 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-22 (1)	02-04 (1) 04-07 (2) 07-08 (1)	04-07 (1) 05-07 (1)*

South-east Asia	17-19 (1) 06-07 (1) 07-09 (2) 09-11 (1) 19-21 (1)	06-07 (1) 07-09 (2) 09-11 (1) 17-20 (1)	05-08 (1) 19-21 (1)	06-07 (1) 19-21 (1)
Far East	16-19 (1)	06-07 (1) 07-09 (2) 09-11 (1) 17-20 (1)	05-08 (1) 17-19 (1)	06-07 (1) 17-18 (1) 06-07 (1)*
South Pacific & New Zealand	14-16 (1) 12-15 (1) 15-18 (2) 18-19 (1)	15-19 (1) 19-22 (2) 22-07 (1) 07-09 (2) 09-11 (1)	00-01 (1) 01-02 (2) 02-06 (3) 06-07 (2) 07-08 (1)	02-03 (1) 03-06 (2) 06-07 (1) 02-07 (1)*
Australasia	15-17 (1)** 09-11 (1) 22-16 (1) 16-18 (2) 18-20 (1)	06-07 (1) 07-09 (2) 09-15 (1) 15-17 (2) 17-18 (1) 18-20 (2) 20-22 (1)	03-05 (1) 05-07 (2) 07-08 (1)	04-05 (1) 05-06 (2) 06-07 (1) 04-07 (1)*
Caribbean, Central America & Northern Countries of South America	11-16 (1)** 07-08 (1) 08-09 (2) 09-11 (4) 11-13 (2) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	05-06 (1) 06-07 (2) 07-09 (4) 09-10 (3) 10-14 (2) 14-16 (3) 16-18 (4) 18-19 (3) 19-21 (2) 21-23 (1)	18-19 (1) 19-20 (2) 20-03 (3) 03-05 (2) 05-07 (1)	19-21 (1) 21-04 (2) 04-06 (1) 20-02 (1)* 02-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	12-15 (1)** 08-09 (1) 09-11 (2) 11-13 (1) 13-14 (2) 14-15 (3) 15-16 (2) 16-17 (1)	06-07 (1) 07-10 (2) 10-14 (1) 14-16 (2) 16-17 (3) 17-19 (4) 19-20 (2) 20-22 (1) 22-23 (2) 23-00 (1)	19-21 (1) 21-04 (2) 04-07 (1)	21-06 (1) 01-05 (1)*
McMurdo Sound, Antarctica	15-17 (1)	17-19 (1) 19-22 (2) 22-00 (1) 07-09 (1)	22-00 (1) 00-04 (2) 04-06 (1)	00-04 (1)
South Pacific & New Zealand	14-17 (1)** 11-16 (1) 16-18 (2) 18-20 (1)	06-07 (1) 07-10 (2) 10-18 (1) 18-19 (2) 19-21 (3) 21-23 (2) 23-02 (1)	22-00 (1) 00-01 (2) 01-06 (3) 06-07 (2) 07-08 (1)	00-02 (1) 02-06 (2) 06-07 (1) 03-07 (1)*
Australasia	14-17 (1)** 12-16 (1) 16-18 (2) 18-20 (1)	06-07 (1) 07-09 (3) 09-12 (2) 12-15 (1) 15-17 (2) 17-19 (1) 19-21 (2) 21-00 (1)	01-04 (1) 04-06 (3) 06-07 (2) 07-08 (1)	04-05 (1) 05-06 (2) 06-07 (1) 05-07 (1)*
Caribbean, Central America & Northern Countries of South America	11-15 (1)** 07-08 (1) 08-09 (2) 09-11 (3) 11-13 (2) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	05-06 (1) 06-07 (2) 07-09 (4) 09-10 (3) 10-15 (2) 15-16 (3) 16-18 (4) 18-20 (3) 20-22 (2) 22-00 (1)	18-19 (1) 19-20 (2) 20-02 (3) 02-05 (2) 05-07 (1)	19-21 (1) 21-04 (2) 04-06 (1) 20-02 (1)* 02-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	12-14 (1)** 07-08 (1) 08-10 (2) 10-12 (1) 12-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	05-07 (1) 07-09 (2) 09-12 (1) 12-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-22 (1) 22-00 (2) 00-01 (1)	19-20 (1) 20-04 (2) 04-06 (1)	21-05 (1) 01-04 (1)*
McMurdo Sound, Antarctica	15-17 (1)	16-19 (1) 19-22 (2) 22-00 (1) 07-10 (1)	22-01 (1) 01-04 (2) 04-06 (1)	01-04 (1)

**February 15-April 15, 1987
Time Zones: PST
(24-Hour Time)
WESTERN USA TO:**

	15 Meters	20 Meters	40 Meters	80 Meters
Western & Southern Europe & North Africa	08-11 (1)	06-07 (1) 07-09 (2) 09-11 (1) 11-12 (2) 12-14 (1) 22-00 (1)	19-22 (1) 22-00 (2) 00-01 (1)	19-22 (1) 20-22 (1)*
Northern & Central Europe & European USSR	08-10 (1)	06-07 (1) 07-09 (2) 09-11 (1) 11-12 (2) 12-13 (1) 22-00 (1)	19-21 (1) 21-22 (2) 22-23 (1)	19-22 (1) 20-22 (1)*
Eastern Mediterranean & Middle East	08-10 (1)	07-10 (1) 10-11 (2) 11-13 (1) 22-00 (1)	18-21 (1)	18-20 (1)
Western Africa	09-10 (1)** 08-09 (1) 09-12 (2) 12-14 (1)	05-07 (1) 07-08 (2) 08-11 (1) 11-13 (2) 13-15 (3) 15-16 (2) 16-18 (1)	18-22 (1)	19-21 (1) 19-21 (1)*
Eastern & Central Africa	09-11 (1)	06-08 (1) 11-13 (1) 13-15 (2) 15-16 (1)	18-21 (1)	18-20 (1)
Southern Africa	09-11 (1)** 08-10 (1) 10-13 (2) 13-14 (1)	05-06 (1) 06-08 (2) 08-13 (1) 13-17 (2) 17-18 (1) 23-01 (1)	18-22 (1)	19-21 (1) 19-21 (1)*
Central & South Asia	08-10 (1) 18-20 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-21 (1)	05-08 (1) 17-19 (1)	05-07 (1) 17-18 (1)
Southeast Asia	16-18 (1)** 08-10 (1) 16-17 (1) 17-18 (2) 18-19 (1)	02-07 (1) 07-09 (2) 09-11 (1) 16-17 (1) 17-19 (2) 19-20 (1)	02-04 (1) 04-06 (2) 06-08 (1)	05-07 (1)
Far East	14-16 (1) 16-18 (2) 18-19 (1)	06-07 (1) 07-09 (2) 09-14 (1) 14-16 (2) 16-19 (3) 19-20 (2) 20-22 (1)	01-02 (1) 02-04 (2) 04-06 (3) 06-07 (2) 07-08 (1)	02-03 (1) 03-06 (2) 06-07 (1) 03-06 (1)*

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TS-1379A solid-state SPECTRUM ANALYZER for single sideband equipment. Input 485-515 KHz and 2-30 MHz. Sweep: 150, 500Hz, 3.5, 7, 14, 30 KHz. Large 5" display;

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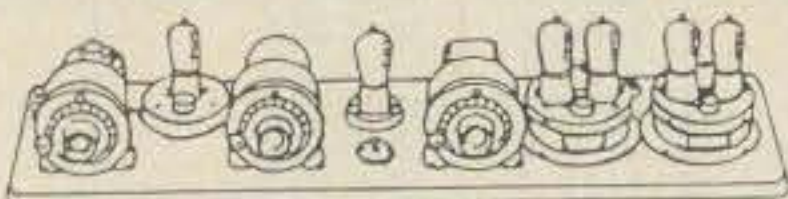
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CIRCLE 137 ON READER SERVICE CARD

AMATEUR TELEVISION



KPA5 1 WATT 70 CM ATV TRANSMITTER BOARD

- **APPLICATIONS:** Cordless portable TV camera for races & other public service events, remote VCR, etc. Remote control of R/C airplanes or robots. Show home video tapes, computer programs, repeat SSTV to local ATVers. DX depends on antennas and terrain typ. 1 to 40 miles.
- **FULL COLOR VIDEO & SOUND** on one small 3.25x4" board.
- **RUNS ON EXTERNAL 13.8 VDC** at 300 ma supply or battery
- **TUNED WITH ONE CRYSTAL** on 426.25, 434.0, or 439.25 MHz.
- **2 AUDIO INPUTS** for a low Z dynamic and line level audio input found in most portable color cameras, VCRs, or home computers.
- **APPLICATION NOTES & schematic** supplied for typical external connections, packaging, and system operation.
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South Pacific & New Zealand	15-17 (1)** 11-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-20 (1)	06-09 (1) 09-11 (2) 11-16 (1) 16-18 (2) 18-19 (3) 19-21 (4) 21-22 (3) 22-00 (2) 00-04 (1)	21-22 (1) 22-06 (3) 06-08 (2) 08-09 (1)	22-00 (1) 00-06 (2) 06-07 (1) 22-00 (1)* 00-06 (2)* 06-07 (1)*
Australia	15-17 (1)* 14-16 (1) 16-19 (2) 19-20 (1)	07-08 (1) 08-11 (2) 11-17 (1) 17-18 (2) 18-20 (3) 20-21 (2) 21-23 (1)	00-02 (1) 02-03 (2) 03-06 (3) 06-07 (2) 07-08 (1)	02-03 (1) 03-06 (2) 06-07 (1) 03-06 (1)*
Caribbean, Central America & Northern Countries of South America	10-14 (1)** 07-08 (1) 08-12 (2) 12-14 (3) 14-16 (2) 16-17 (1)	05-06 (1) 06-07 (2) 07-09 (4) 09-14 (2) 14-16 (3) 16-18 (4) 18-20 (3) 20-22 (2) 22-02 (1)	18-19 (1) 19-20 (2) 20-01 (3) 01-04 (2) 04-06 (1)	19-20 (1) 20-03 (2) 03-04 (1) 20-01 (1)* 01-03 (2)* 03-04 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-15 (1)** 07-08 (1) 08-10 (2) 10-12 (3) 12-13 (2) 13-15 (3) 15-16 (2) 16-17 (1)	06-07 (1) 07-09 (2) 09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-21 (2) 21-23 (1)	18-20 (1) 20-03 (2) 03-05 (1)	21-04 (1) 22-03 (1)*
McMurdo Sound, Antarctica	13-15 (1) 15-17 (2) 17-18 (1)	16-19 (1) 19-22 (2) 22-02 (1) 06-07 (1) 07-09 (2) 09-11 (1)	22-02 (1) 02-05 (2) 05-06 (1)	02-05 (1)

* Indicates Best Time For 160 Meter Openings

** Indicates Best Time For 10 Meter Openings.

range between 750 and 2300 miles through the late afternoon, when it should lengthen to between 1500 and 2300 miles. The band should be out for short-skip by about 8 PM on most nights. On 15

meters, skip should range between 1300 and 2300 miles during most of the daylight hours, with the band going dead for short-skip about an hour or so after local sundown on most nights. Occasional short-skip openings may also be possible on 10 meters during the daytime hours. Unusual sporadic-type short-skip openings may also be possible on 20, 15, and 10 meters during periods of radio storminess.

VHF Ionospheric Openings

Best chance for unusual ionospheric openings should be during periods of radio storminess on the HF bands. Check the Last Minute Forecast at the beginning of this column for days during February that are likely to be Below Normal or Disturbed. Be sure to check the VHF bands and 20, 15, and 10 meters for unusual auroral-type and sporadic-E short-skip openings on these days.

No significant meteor showers are expected during February.

This month's Propagation charts contain band opening predictions for the major DX paths for the period February 15 through April 15, 1987. A short-skip propagation forecast for February appeared in last month's column. Instructions for the proper use of these charts appear elsewhere in this column.

73, George, W3ASK

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NEWS OF COMMUNICATION AROUND THE WORLD

*DX is an endless cycle of song,
 A medley of extemporania.
 So why, when they tell me my signal is
 strong,
 Have I never worked Albania*

Back a week or so we awakened one morning to hear the muffled throb of the ceremonial DX log back in the hills. Often in February here in the western reaches there is a warm spell, the days fair, the skies blue, and the trees in bloom. DXers respond to the season, hailing the coming of new DX activity and the advent of Cycle 22. And most days you will hear the thump of the DX log as the Believers perform their rites of spring. Winter may briefly return, but for DXers spring goes on forever.

Far back in the hills and deep in a canyon is the ancient DX log. A hollowed madrone bole, it has been tuned for resonance by shaving either side of the slot cut on top of it. The near side thumps, the far side tocks, and it is worn by the years of use by DXers hailing the new DX season. Tolling like a distant drum, you can easily read the message: "Thump-tock-tock. Thump-tock-tock-thump." We raced to join the spring ritual. No true-blue DXer has ever been known to resist the call. We even brought our own hand-carved hickory cudgels. When one beats the DX log, one needs the best.

The DX log is in a hidden glade back in the canyons, deep in what has long been known as an "energy area." Most of the high hills hereabouts are considered to be "energy areas," some DXers stoutly claiming that the higher the hill, the stronger the energy radiated. Whatever the energy is, back among the hills is the DX log, and DXers for generations have energetically pounded on it.

Joyfully we joined in the pile-up. We found a space, flexed our muscles, and got down to some joyous thumping. Usually two DXers, sometimes even more, work the DX log at a time. There are the old, traditional rhythms, the beats easily recognized by any DXer, and we fell quickly into the familiar patterns of the beat. We ran through "QRZ," ". . . the handle here is" "five and nine" or "five, nine, niner," even the hopeful "CUL" with quick calls for "73s" or "88s" to vary the routines. At times on some of the calls one thumper would turn



When DXers go traveling, what do they look for? Other DXers, naturally! Here in Dubrovnik in Yugoslavia last July the CTs met the YUs. From the left are Miro Santos, CT1UA, Branko, YU1FW, Luis Teixeira, CT4NH, and Tom, YU2AA. (CT1UA photo)

clever and slip in a tricky signal such as substituting "VE" when the prosign "SN" might be expected. The end of any stage is always marked by a lightning delivery of "SK," and when one of the thumpers shouts "Contest!" everyone immediately shifts to a 45 wpm beat. Certainly beating the DX log must always be an unforgettable experience. One can again realize that there are joys in DXing known nowhere else. DXers beat everything!

The morning hours passed, DXers drumming on the DX log and enjoying the good times. Then one of the Locals, possibly alerted by the thumps and tocks rolling down from the high hills, found his way to the hallowed glade. There was an immediate hope that this one came as a novice to learn the ancient rhythms sounded on the DX log. It was a short hope. This one came not to learn but to ask questions.

He came asking about deleted countries. For a moment there was a pause in the DX drumming as we listened to his questions. What puzzled him was indicated by his first question. "Why are there dual numbers on the Honor Roll listing?" he asked in apparent innocence, and the ball was on.

The DXCC is based on logic, and all old-time DXers easily understand this logic. It was explained to the Local that the first number in the Honor Roll listing indicates the number of current DXCC countries. The number after the slant bar is the current plus deleted countries. All this is so obvious that there was wonder why such a question had to be asked.

"Deleted countries?" echoed the Local "What's that?" At this point there was a feeling that while it might be bad enough to have the opening day of DX drumming

interrupted, the questions asked certainly were not of a level that a qualified DXer should be asking.

"What's the real problem?" we asked, and it was time again to learn that there are always those who will fret and worry over something that they can do nothing about. "I found out the other evening," the Local told us, "that those dual numbers after the calls on the Honor Roll include deleted countries. Did you know that?"

We did. But there was something not right here, and we pressed the Local further. "You knew that, too," we said. And he had not just learned it either. Then we got the story.

"Some of those countries have been deleted since 1949," the Local said, revealing that he possibly knew a bit more than initially indicated. "After I've worked all the current DXCC countries, I will be a disadvantaged DXer because there are a lot of countries which were deleted before I got a license, some even before I was born. Thus, I will never be able to say I worked all the current countries plus all the deleted ones. Does that sound right?"

Truthfully, even to worry about it did not sound right, and at that point we were more interested in working on technique than expanding future, minor, and improbable possibilities into current problems. We wondered if this one was insecure and required proof of any DX greatness. But right then we wanted to get back to the ceremonial DX log. "You've got a point there," we advised casually. "Certainly you wrote to the DXAC when they were looking for ideas a couple of months back. You did, didn't you?" He had not.

His words turned from explanation to expectation. We had to wonder if his wishes would ever be implemented by his deeds. "You've got a good point there," we said again, offering a minimum of solace, and headed back to the DX log. This was a beautiful day, and there were important things to do now. Every spring brings its own good days, and we did not intend to miss even one of them. With better things to do we picked up our cudgels and rapped out a steady stream of "QRK 1 QRK 1 QRK 1," hoping that the Local would get the message. He did not.

What does one do in such a situation? One does the best thing one can. So we concentrated on the DX log. The tempo was fast, the rhythms intricate, and the day glorious. Certainly we were deep in the enjoyment of the moment, thumping and tocking in a vast and endless DX cycle extending far beyond the seasons and

The WPX Program

Mixed

1239 AA4SL 1241 G4OBK
1240 I2YWR

S.S.B.

1850 JG3QZN 1853 EL2AY
1851 OZ1GLN 1854 NC9I
1852 HC1RF 1855 WK4F

CW

2406 LA8CE 2407 I3ZRL

WPX

247 WDX4KEF

Endorsements

Mixed: 450 AA4SL, I2YWR, G4OBK, EL2AY, KS3F, I1WXY, 500 I2YWR, G4OBK, EL2AY, I1WXY, 550 I2YWR, G4OBK, EL2AY, I1WXY, 600 I2YWR, G4OBK, I1WXY, 650 I2YWR, JA4BWP, I1WXY, 700 I2YWR, I1WXY, 750 I1ZEU, I2YWR, I1WXY, 800 I1ZEU, I2YWR, I1WXY, 850 I1ZEU, I2YWR, AC2J, I1WXY, 900 I2YWR, AC2J, I1WXY, 950 AC2J, 1000 AC2J, 1150 KC8CC, OK3IF, 1350 N6JM, 1400 N6JM, SM3EVR, 1450 SM3EVR.

S.S.B.: 350 FD1HWP, G4KDV, WK4F, 400 FD1HWP, G4KDV, WK4F, 450 FD1HWP, G4KDV, WK4F, 450 FD1HWP, G4KDV, WK4F, 500 G4KDV, WK4F, 550 KP4CZ, WK4F, 600 KP4CZ, WK4F, 650 WK4F, 750 I8HZZ, I8WYD, K2POF, 800 K3IXD, I8HZZ, I8WYD, 850 I8WYD, 900 I8WYD, 1000 KC8CC, 1300 NJ0C, 2100 N6JV, 2250 K2POA.

C.W.: 350 I3ZRL, 400 I2ZRL, 450 I3ZRL, 500 I3ZRL, 550 I3ZRL, 600 I3ZRL, 650 JA3ARM, I3ZRL, 700 PT2CW, I3ZRL, 750 PT2CW, 950 W1WAI, 1000 W1WAI, 1050 K2POF, 1150 JA1KRU, 1200 JA1KRU, 1250 JA1KRU, 1750 I6ZJC, 1900 G2GM.

VPX Endorsement: 350 WDX4KEF, 400 WDX4KEF, 450 WDX4KEF, 500 WDX4KEF.

15 meters: YB3CEV
20 meters: EL2AY
40 meters: N2CIC
160 meters: N6JM

Asia: YB3CEV, I1WXY
Africa: I1WXY
No. America: EL2AY, I1WXY
So. America: WDX4KEF
Europe: EL2AY, YB3CEV, I1WXY, N2CIC
Oceania: YB3CEV

Award of Excellence Holders: OK1MP, N4NO, ZL3GQ, W4BQY, I0JX, WA1JMP, K0JN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, W8RSW, WA4QMQ, W8ILC, VE7DP, K9BG, W1BWS, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, K6JG, N4MM, I8YRK, W4CRW, SM0AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA.

Award of Excellence Holders with 160 Meter Endorsement: VE7WJ, VE7WJ, W9NUF, N4NX, SM0DJZ, DK5AD, W3ARK, LA7JO, W4VQ, K6JG, W4CRW, N4MM, SM0AJU, KF2O, K5UR, OK1MP, N5TV, W8CNL, W1JR, W6OUL, W4BQY, W5UR, N4NO, W8RSW, N4KE, I2UIY, W8ILC, W1BUS, NN4Q, G4BUE, LU37L/W4.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if air-mail desired) to CQ WPX Awards, P.O. Box 1351, Torrance, CA 90505-0351 U.S.A.

the years. We were flying. Then the Local had to speak again, breaking into the magic moment.

"You fellows ever try sending CQ DX?" he asked. "Maybe someone might answer you." That did it.

There was hardly a pause before every Believer working the log was beating out a string of "BCNUs." The roar of the beat pounded through the glade and then suddenly stopped. All the drummers stared



Here is Paul Bailey, VS6DO, with friend in Hong Kong. Paul, on the left, has been active from VS6 for years and is active on 160. (DK7PE photo)

at the Local, one in the rear asking, "Did you read that?"

First he started to speak, but then he quickly moved to leave the DX glade. At a safe distance, however, he paused to shout, "What makes you fellows think you're DXers? Beating a hollow log is not DX!" Then he was gone down the hill.

Did his words bother us? Not at all. In the irretrievable yesterdays the first DX country had been worked by a Believer beating on a hollow log, sending his message to any who could read it. And while one may be quick to acquire the new, one should be slow to abandon the old. With peace and understanding again in the glade, we enthusiastically pounded the ceremonial DX log, serene in our belief that we were finding more joy and fulfillment than we would have in worrying about countries deleted almost 40 years back.

Maybe we were no longer young and afraid of losing out. But there in the deep canyon the DXers knew that right then it was the moment to live, and they were living. Most DXers usually do.

Every DXer should have a DX log. And when a new country is involved, you can bet that they usually do.

North Korea

It's a bit difficult to recall working a North Korean station, but apparently that might be a universal problem. Last fall North Korea sent a team to Yugoslavia for the International Radio Direction (RDF) competition. JA1HOG, Ang Arisaka, a DXer and a member of the JARL Board of Directors, was also in Yugoslavia for the competition and immediately figured that this was the big opportunity to find out about amateur radio activity in North Korea. Ang quickly learned that the North Korean competitors were runners not amateurs, amateur radio being a totally unfamiliar topic.

What would a callsign be for a North Korean station? Should you check the ITU prefixes, all you might find is HL and HM for Korea—no mention of North or South. But then again, with

no activity from North Korea, the matter of a prefix may not have had its day as yet. In other places there are notes saying that no distinction between the two Koreas has yet been made by the DXCC Desk. Under all of this might be an eventual new country. Just wait and be ready. Just do not be impatient.

Gough Island

Years back one of the Locals worked Europa Island and tossed the QSL aside saying that it counted for nothing as it was not mentioned in the country list. Apparently, he was not the only one suffering from incomplete pre-flighting. The Country List now lists together both Juan da Nova and Europa. You will also find Gough listed with Tristan da Cunha, and that's one you might want to catch when he checks in with W4FRU, his QSL manager.

ZD9BV frequently meets W4FRU around 21265 kHz from 1700Z. You can also find the station showing on Snooky's Net at 14183 kHz, where there sometimes is also an appearance. Other operations down that way have been shifting around. ZD9CK has left and ZD9CL has arrived or is it the other way around, both versions being reported. Anyhow, there is agreement that there is an operator on the island who will be there all this year, and the QSLs are handled by W4FRU. When we started to type this item it all seemed simple and straight forward. Somehow it does not seem to have ended that way. But don't worry too much. Just get the call right when you work 'em.

Alternatives For Personal Communications

That was the name on a paper the FCC released through its Office of Plans and Policy a couple of months back, this to give an analysis of the current situation in personal communications as well as to anticipate what the future will bring in the field and a number of recommendations for possible future implementation. The paper covered communication in the amateur field, CB, and the General Mobile Ser-

The WAZ Program

10 Meter Phone

310 JA1ETO

15 Meter Phone

238 JH6CDI

20 Meter CW

250 JA4TF

All Band WAZ SSB

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3060 KN6H 3063 KC0GC
3061 KB4CWO 3064 IK8DOI

Phone and CW

6010 JE1NWL 6014 VE3JCV
6011 W9OFF 6015 HB9CDZ
6012 IK6CGO 6016 IK5CXL
6013 VE6BBI 6017 PA3CBV

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (39 cents) size 4 1/2 x 9 1/2 to the WAZ Manager, Leo Haijsman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants forwarding QSL cards either direct to the WAZ manager or to a check point should include sufficient postage for safe return of their QSL cards. The processing fee for all C.Q. awards is \$4.00 for subscribers and \$10 for non-subscribers. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application.

5 Band WAZ Standings as of November 1, 1986

New recipients of 5 Band WAZ with all 200 zones worked:

- 126. DF9ZP
- 127. Assigned

The top 18 contenders for 5 Band WAZ are:

- | | |
|----------------|-----------------|
| 1. JA1BWA, 199 | 10. G3GIQ, 199 |
| 2. JA3EWU, 199 | 11. SP6KTE, 199 |
| 3. N4WW, 199 | 12. SP6JCY, 199 |
| 4. K5YRA, 199 | 13. W3GG, 199 |
| 5. W8UVZ, 199 | 14. LU6GV, 198 |
| 6. F6BEE, 199 | 15. W2YY, 198 |
| 7. JA0CWZ, 199 | 16. K7UR, 198 |
| 8. W6GO, 199 | 17. K9GX, 198 |
| 9. K9CEB, 199 | 18. DJ9ZB, 198 |

394 Stations have attained the 150 zone level.

vice. Briefly, though CB has declined from a high of around 15 million licenses back in 1979 to a current estimate of 2.7 million, that service would continue on 11 meters as a recreational/travelers service though other alternatives might be considered. There was no call for a CB service around 900 MHz, that spectrum being considered as better utilized with another service.

The paper recommended cutting back in the 8-channel General Radio Mobile Service in the 460 MHz range, commercial use being diminished but auto-patch being allowed. Personal communications would be allowed in the Special Mobile Radio Service in the 800-900 MHz area by relaxing eligibility requirements. Currently they are limited and the cost of equipment is high.

A possibility was mentioned to allocate 900 MHz, and possibly also the 1200-1300 MHz area, maybe with some joint use of the 1215-1300 MHz amateur channel. Such studies might be clues to changes coming in the future, the study also giving some attention to the scant growth in amateur radio, a figure of only an 1100 gain in ham licenses in the previous year being cited as the sign of stagnation. Citing the need of the public interest, the study looks at examination procedures, business limitations, and examination barriers such as code proficiency as hampering the growth in the use of some parts of the spectrum. All this should be watched, as it is possible that the studies are portents of changes coming in the next decade or so. Overall, there appears to be a continuing look for frequen-



Here is Victor, 4S7VK, a signal out of Sri Lanka. Work Victor and DJ9ZB will supply the QSL.

cies for the General Mobile and the Special Mobile Services, these to be used to expand recreational, traveler, and personal use. You will note that the frequencies mentioned are generally in the UHF area, possibly the use of amateur frequencies there being a significant factor on their future retention. All this is a part of ongoing changes, and whether directly affected or not, DXers might be well to keep an eye on and an ear attuned for future developments.

And as long as we are working this side of the street, we would still like to point out that WESTLINK is undoubtedly the best source of information on background, out-front, and other developments in matters affecting amateur radio. Always there is something going on you should know more about.

Revilla Gigedo

Years back Revilla Gigedo showed regularly. Jose Levy, XE1J, and the Colima Radio Club made regular trips out to the island to put it on the air, often during DX contests. This was about 20 years back, they signing XE1PJP from Isla Benito Jaurez in 1967. But things slowed, Revilla Gigedo became less and less heard, and today it is considered to be a much more needed one than Clipperton.

But that situation should not last long. In March some of the tireless operators from the Clipperton efforts of recent years, plus a good number of XE amateurs, will make a trip to the island and will put XF4ZU on the air. It is reported that they have the XE license, landing permission for the island group, and the itch to go. Look for them a week in March. The details will be more explicit as the date for the effort nears. They are planning an all-band/all-mode effort.

The Revilla Gigedo Islands are located at 19:00° and 111:30°W in the Pacific almost directly west of Manzanillo.

Kermedec

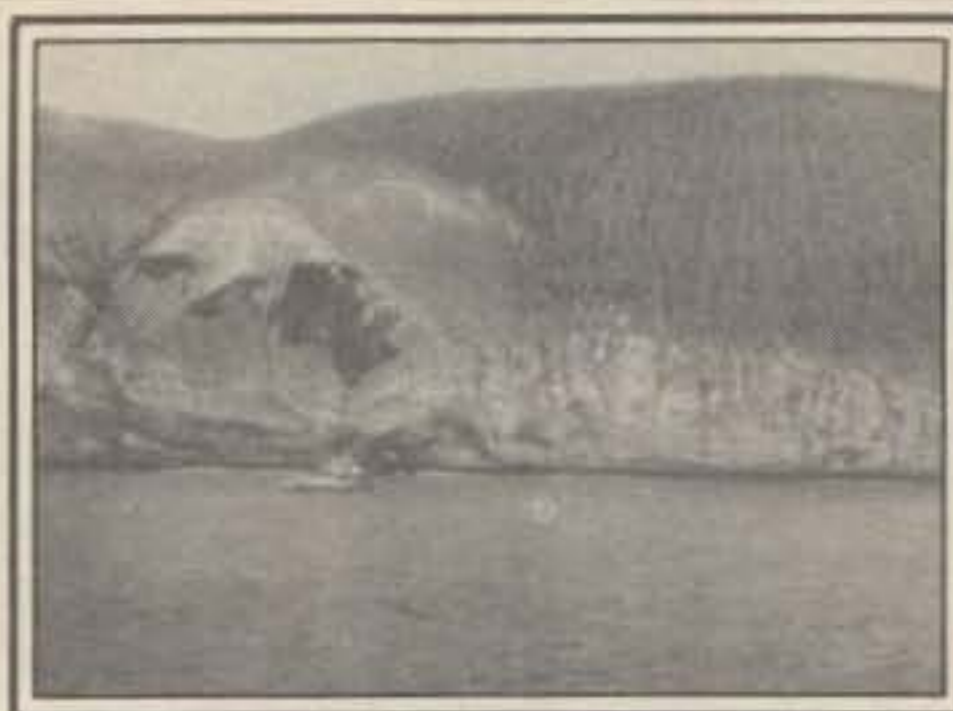
Peter Fisher, formerly ZL9AA, arrived on Kermedec a few months back and will be there to the end of this year signing ZL8HV. The weather station was severely jolted a few months back when a good-sized earthquake was centered close to the islands. ZL8HV plans to handle his own QSLs.

Falklands

There are always some DXCC countries moderately rare—not plentiful, but then again, not scarce. Some look for the Falklands, while others work them regularly. Along the way one can easily learn that often rarity depends on your own QTH. Europe always seems to be looking for something in the Pacific, and the JAs in the western Pacific usually need something in the Caribbean. Anyhow, VP8BKK is a current DX hope for the Falklands, and Bob will be there until the end of the year at least. You might watch for the VP8 around 21305 kHz after 1700Z, and maybe even on 10 meters around 28505 kHz from 1600Z. QSLs go south to P.O. Box 260, Mount Pleasant Airport, Falkland Islands. Some even say to steer it via England, but either route should get results.

What An Operation!

As most DXers already know, that is a standard DXer's expression able to go in either direction—high in exultation, low in disgust. All you have to do is change the tone of voice to emit approbation or condemnation. Strange as



This is Revilla Gigedo Island, which you should be hearing next month. The island will be put on the air by XEs and the Clipperton group signing XF4.

it may seem to the uninitiated, it often is used in either direction for the same operation. If you worked it and needed it, it was a smooth, well-organized and well-operated effort. If you missed it and you needed it, what a mess! Some recent efforts have been noted as catching the double-ended report. FO0XX was given the turned down corner of the mouth greeting by many European operators, and the compliment was returned by some North American operators for the 3C0A operation.

In reply to some comments in the Canadian *Long Skip*, one European looked at things from his perspective. One complaint went: "... it has not been too appreciated the method used in handling the pile-ups from FO0XX, like working split the Ws, and working Europe on zero-beat CW. . . . heard them working five European stations in ten minutes, they were listening only on 14205 kHz and everybody was there calling. But the best was when they worked Europe on 40 SSB with 1 kHz of split. Here it was almost impossible to hear them; they were completely covered by the pile-up one kHz above."

Now when that writer said "What an operation!" and was thinking about FO0XX, how do you suspect the subtle nuances in his speech sounded? But wait! Let us look at the 3C0A operation. The same writer says, "... it was very easy to work them on all bands from southern Europe. They have called for hours and hours on 15 meters with not too many customers. It was enough to call just a couple of times to work them, apart from the first two days. Their signal was strong also on 40 and 80 meters, even if on this last band they worked on lists and a lot of people made QRM. On 10 meters the propagation was peculiar, but they were worked in the mornings, in the afternoons, and sometimes also during the night. The signal was not strong, but they were workable as late as midnight local time. I worked them on all bands, CW, SSB, and on 20 meter RTTY. Maybe this is the reason why I do consider them good operators." Now when this operator remembers the 3C0A operation, would you say that the smile turns up at the corners or down? Of course, it turns up and dazzles everyone for miles around with its happy brilliance. But the operator goes further with his European perspective and says, "... it is always the same old story. If you work them, they were good; otherwise the blame is only on them. But with the propagation conditions, it is not only a matter of quality of the expeditioners, it is a roulette game."

But it still hurts when you miss them. Some years back after an effort at the bottom of the

The WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with CQ master prefix list. Scores are based on the current prefix total regardless of an operator's all-time count. Honor Roll must be up-dated annually by addition to, or to confirm present total. If no up-date, file will be placed into "inactive" until next up-date. Lifetime Honor Roll fee \$2.00 (U.S.) for each mode, with no fees required for up-dates.

MIXED

3001	YU2AA	1836	I8YRK	1490	CT1LN	1194	W7CB	917	W6YMH
2865	F9RM	1829	K0BLT	1481	I2MQP	1189	JH1VRQ	914	EA1CIM
2803	K2VV	1792	YU7BPQ	1470	K8LJG	1181	K2QF	901	W0JIE
2685	W2NC	1786	W9NUF	1433	SM3EVR	1169	K2OLG	883	W14K
2532	K6JG	1782	SM7TV	1420	EA9IE	1153	N2AIF	853	K7CU
2502	K6XP	1752	WA8YTM	1414	IT9QDS	1123	3A2LF	821	KX1A
2416	VE3XN	1701	W0SFU	1401	N6JM	1117	NC8JC	820	W2XW
2366	W9DWQ	1675	I2PHN	1391	IS0LYN	1114	N8BJQ	816	I1EEW
2269	W4BQY	1668	I6SF	1359	KL7AF	1108	SM0AJU	800	I2TZK
2224	N4NO	1662	YT7DX	1347	I2UIY	1060	WD9IIC	791	N2CIC
2218	N4MM	1661	K9BG	1322	NN4Q	1038	YU2CBK	764	I2EAY
2198	YU2TW	1654	4X4FU	1312	LA7JO	1028	PY1DFF	747	OE1KJW
2103	YU7BCD	1644	YU7AW	1308	W6OUL	1025	WD4RAF	745	VE6VW
2074	N6JV	1617	IN3ANE	1305	DK5AD	1012	AI8S	715	KL7VZ
1985	N9AF	1597	KF2O	1283	K2POF	1007	AI6Z	680	K6UXO
1898	PA0SNG	1575	N5TV	1266	YU2CQ	1000	AC2J	678	W4WKQ
1895	YU1AB	1562	PY1APS	1247	YU7AJD	995	KC2RS	664	G4SDJ
1890	N2AC	1537	N6AW	1247	W5PWG	973	VE5FX	650	JO1BMV
1868	K5UR	1516	WA1JMP	1234	SV1PL	943	I0AOF	640	N3KR
1863	I2PJA	1516	PY4OD	1227	WB8ZRL	922	VE2PD	633	Y44UI
1855	N4UU	1512	K7NN	1215	G4FAM	917	NE6I		

SSB

2789	F9RM	1592	K5UR	1079	N2AC	930	N4IB	714	SM0AJU
2538	I0ZV	1569	CT4NH	1078	ZP5RS	929	I8WYD	710	N2AIF
2360	K2VV	1479	WF4V	1075	I1POR	922	CT1BY	707	K9BQL
2223	K6JG	1470	WA4QMQ	1073	N6FX	921	IK5ACO	703	YB3CEV
2221	ZL3NS	1466	I2MQP	1071	NN4Q	909	I0SGF	699	I2KKL
2210	K6XP	1451	VE1YX	1060	TG9GI	902	VE2PD	692	XF4MDX
2162	K2POA	1431	I4CSP	1048	PP2ZDD	896	WA2FKF	686	W6YMH
2070	I0AMU	1413	CT1LN	1048	I2UIY	896	PY4VX	680	IT9ONV
2016	CT1UA	1341	W9NUF	1037	KC4OV	888	I5AFC	669	I3ZSX
1993	N4MM	1339	KF2O	1035	WB8ZRL	878	W14K	666	JA1XDA
1904	I4ZSQ	1312	W3ARK	1032	CT4UW	871	EA4KK	663	CT1AHU
1900	W0YDB	1303	CT1FL	1030	F6BVB	845	I2EOW	662	VO1AW
1859	I2PJA	1283	XE1OX	1017	I4LCK	818	IN3AHO	661	KC2FC
1832	I3ZKD	1274	N5TV	1012	KC8YM	817	ON6IT	659	I4UFH
1803	WD8MGQ	1264	G4CHP	1008	SM6DHU	805	EA8AKN	654	KX1A
1765	I6ZJC	1243	AC2J	996	K5RPC	798	K3IXD	652	CP8HD
1724	YU7BCD	1234	LA7JO	992	HI8GB	797	I1EEW	649	AI6Z
1693	N4NO	1201	I8KCI	989	W4UW	792	AG2K	646	OE5BGL
1688	OZ5EV	1199	W2NC	981	K8LJG	788	W6OUL	643	KE6KT
1667	I8YRK	1171	W2CC	967	LA2TO	769	KK5P	638	AB9O
1666	W4BQY	1130	NJ0C	950	PY4OD	758	WB6SRK	616	NE6I
1661	PA0SNG	1112	KK0L	945	EA3AQC	744	EA5BCX	607	YB3CDL
1642	W9DWQ	1095	KL7AF	936	W3GXK	744	N2CIC	606	WA8YTM
1599	I8YZP	1088	KC8CC	935	XE1XF				

CW

2554	W2NC	1569	YU7SF	1201	KA7T	889	F6HKD	669	ZS6ACR
2266	K2VV	1551	LZ1XL	1116	IT9VDQ	823	G4FAM	667	W2XQ
2066	N6JV	1526	N4MM	1098	K2POF	818	AK2H	663	LA7JO
2025	WA2HZR	1481	K5UR	1026	K8LJG	800	JH1VRQ	659	KA1CLV
1924	N4NO	1446	VO1AW	1000	I7PXV	799	SM5DAC	655	K6UXO
1912	ON4QX	1436	I6SF	952	SM6DHU	797	W9PWM	654	W0JIE
1901	K6JG	1378	W9NUF	943	KL7AF	767	TI4BGA	647	WB8ZRL
1878	W9DWQ	1357	N4YB	936	N2AIF	753	KN7K	646	JA2GCW
1873	K6XP	1329	W4WJ	922	OH3TO	751	VE1ACK	642	I2EAY
1836	W3ARK	1290	K9QVB	909	DJ1YH	747	WA8YTM	641	NE6I
1805	VE7CNE	1287	PY4OD	906	W6OUL	725	SM0AJU	628	W6YMH
1798	W4BQY	1250	N5TV	904	NN4Q	724	VE4AEX	621	CT1LN
1772	G2GM	1246	JA1KRU	904	YU2CQ	700	N4IB	611	W4RHZ
1701	N2AC	1234	I1YRL	901	AK2H	689	OE1KJW	603	I8YRK
1672	YU7BCD	1233	I2DMK	899	I2UIY				

sunspot cycle we tried to ease some of the sharp edges of some not having worked the operation by noting that they tried and tried hard, that the cost per QSO was something to give pause, and generally, as Kit Carson said when he galloped his horse along the base of the hill here years back, "Don't shoot the piano player. He's doing the best he can!" Was the suggestion welcomed? Hardly at all. We got roused out one midnight by a telephone call from a European amateur. This one was

pleased neither by the operation nor our words of balm.

Don't think that such reactions are isolated incidents. But, as Sam down the county would sometimes be heard to say, "Anyone who goes on a big bore DXpedition at the bottom of the sunspot cycle is asking for trouble." They do seem to get it, too—often more anger than applause. For truly it is still as Albert would often say in those other nights when we waited for a needed or new country to show: "All

things are relative; some more so!" And any appraisal of the quality and success of a DXpedition will always depend on whether or not you worked it.

Some DX Notes

Martin laasen, OY7ML, wants it known that Slim was using his call last year and this activity, mostly in October, has brought a lot of QSLs which OY7ML cannot answer. The signal was coming from central or southern Europe and definitely was not the true-blue. Martin notes that Slim has also used OY3AX, all these good times being on 14 and 21 meter CW. Martin also notes that there is a new ZIP code for the Faroes, it now being FR-110.

KD7P left and headed south a couple of months back, there being reports that he was on a Coast Guard vessel and might try to put Peter I Island on the air. The plans for this one did not get very far, but you might hear him from a number of south and mid-Pacific spots. He may even show in this year's CQ WW WPX SSB Test. In December 3G9SBY was from Deception Island in the South Shetlands, this initially aimed at Base Velcho on the Palmer Peninsula. QSL to CE8PD.

The International DX Association shipped out some gear to get FT8ZA on the air, this being Amsterdam and St. Paul Islands in the southern Indian Ocean. There is also a possibility of putting FT8W Crozet on the air. SM3CXS, who has handled SM0AGD's QSLs over the years, has retired after running over 200K QSLs through the mill. Erik will handle his own QSLing from now on at Radjursvagen 13, S-134 00 Gustavsberg, Sweden.

ZL1AMO was on from Christmas Island a couple of months back. Some may long for a Christmas Island QSL, but the law of supply and demand may sometime soon fill in some of the crevices existing in the needed country list for them. There are reports which if brought to full flower will have both Christmas Island and the Andaman/Nicobar Islands on the air regularly. First, there is a report that Australian interests are aiming to establish casino resorts on Christmas Island, this to attract the sporting crowds from Indonesia, Malaysia, and Singapore. Aiming to work the same side of the street is India, which is looking to develop similar efforts in the Andaman/Nicobar areas and aiming for the same business.

XU1SS has been heard again, workable but with not an especially strong signal. The station has run schedules with DU9RG on Sundays at 14180 kHz at 1200Z and at 14032 kHz at 1330Z other times.

Jim and Kristi Smith, VK9NS and VK9NL, were not successful in landing on the recent Australian Heard Island trip. That does not mean they will not continue to look for further opportunities. If you need something in the Pacific or SEAsia, you might check in with Jim on his net.

One of the special calls out of Argentina a couple of months back, AZ1ARU, was being sent by Jose M. Ahumada, LU2DX. You might have worked Jose before. He was the head of the first South Sandwich operation a number of decades back. He was long living in the Washington area, and both he and his XYL were active in DX tests. In other times he also signed the special call L2X.

One DX bulletin a month or so back noted the behind-the-scenes machinations and manipulations going for some rare countries, one being a Mt. Athos effort scuttled last summer. As a side development in some rare countries,

there has, officially or unofficially, developed what some tend to view as "franchised" DXCC countries. Without being overly specific, try thinking of some DXCC countries which can only be activated by the local national society, by a special group, or in some instances only with governmental help, assistance, direction, or participation. It should not be hard to come up with examples where, for one reason or another, operations from a DXCC country are controlled and restricted by and for a selected few.

There are also instances where "donations" are openly solicited for some of these countries, these to cover "expenses" or "documentary preparation and processing." At times the amounts mentioned are such that they can be considered far out of line with either anticipated or justified costs. Some of these are only allowed to be activated at long intervals, the word being that too much activity would lessen the demand for such DXCC spots. And should any effort not under the aegis of the annointed ones be attempted, they often quickly run into roadblocks and thwarted

efforts. Possibly there is a bit more to such franchises than one might realize in passing.

An envelope came recently from the QSL Bureau, mostly cards coming back from contest QSLing of a few years back. But one caught our attention. It had a receipt date at the QSL Bureau of October 1986. It was for a UB5 contact in April 1969. Never give up hope. In the Heard Island DX Bulletin a recent item noted that a C6-Bahamas station showed on the net, C6's being a rare item out in the far Pacific. And the Old Timer said more than once: "DX is relative, and mostly relative to how badly you need it!"

In the listing for the single-band WAZ some months back there was some slippage. We got a note telling us to check the December 1975 CQ and we did. To get things right, on 15 meter phone Franz Langner, DJ9ZB, was the number one plaque winner, and Charles Jackson, SV0WTT, was the number one 15 meter CW winner. SV0WTT now signs SV0AA, changing his callsign under the reciprocal agreement with Greece. To go a bit further, because the

CQ DX Awards Program

SSB

1501	VE7DX	1504	JJ1CWX
1502	KG9N	1505	YB3CEV
1503	G4ADD		

CW

685	K2OWE	686	W9VA
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SSB Endorsements

300	SM4CTT/308	250	N2CIC/272
300	G4CHP/308	250	I1WXY/263
300	VK3JF/307	250	G3YBH/250
300	VE7DX/303	200	YB3CEV/225
300	N5FW/302	150	IN3VZE/161
300	KZ2P/301	150	TF5BW/151
275	KG9N/278	150	CX2AAL/150
275	G4ADD/278		

CW Endorsements

300	SM3EVR/307	275	G2GM/277
275	N5FW/294	275	K2OWE/275
275	W6YQ/282	1.8 MHz	SM6CST

Total number of active countries is 316. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an s.a.s.e. is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

WAZ years back was handled by a number of dedicated volunteers, there are some unresolved items in the overall list. So believing that the quickest way to find out how right you are is to print it, we did.

Every time we see that DJ9ZB callsign pass by we have to stand up and salute one of the top DXers going. And from the vantage of the years it has to be asked, "How can one so young do so much?" A check through the DX activities of the last decade or two will find DJ9ZB in a lot of DX spots, some of them up in the rare category such as Clipperton in recent years, and back away some such as 4W1, a recent Mellish effort. Some years back at the California International DX Convention we spied a young fellow sitting in a chair against the wall in the everlasting outdoor happy hour that marks the start of the evening hilarities. As one does, we read the name badge. DJ9ZB! It was one recognized. Later we had to wonder how one so quiet, and relatively so young, could be involved in so much DXing. DJ9ZB is consistent. He goes out working the rare ones over the long years.

The great DX gathering mentioned above is almost at hand, the first weekend in April this year, April 3-5, at the Grosvenor Hotel in Visalia—same place as before, only the name is changed. Len Gerald, K6ANP, and Lyle Meek, WW6F, the co-chairmen this year, with the Northern California DX Club the host. Take heed! The time is near for the annual DX migration! DX Prevails!

The sunspot cycle? It's coming! Most mornings will find DXers on their house tops scanning the east for the rising sun and the sign that Cycle 22 is at hand. Join them there in the clear dawn, the best time of the day. The Great Days of DXing are approaching, and as the Hero of Mafeking would often say, "Be Prepared!"

73, Cass, WA6AUD

DX Ten Years Back

In February 1977 Garth Hamilton, who in

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U.S. Patents 4349825, 4460896

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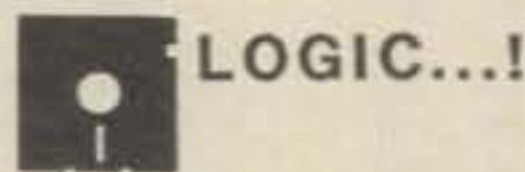
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CIRCLE 23 ON READER SERVICE CARD

1970 put Zanzibar up for DXers, was in Transkei signing S8AAA. Many SWL reports were being filled out for the Poltava Pestilence. W1BB noted working 151 stations on 160, these in 60 DXCC countries, all this in 1976. PY1CK was thinking of putting out some QSLs for the PY0ZAE Trinidad effort. K4FOK was headed for Zambia; the Colombian Radio Club was aiming for a Malpelo effort in March 1977. FR7ZL/T was on from Tromelin and Bouvet was expected . . . it always was. VK9ZM was on from Willis, and DXers were packing for the Great International DX Convention at the Hilton in Fresno the first weekend in April. Wayne Warden, W9MR, was heard from Niue signing ZK2AT. VR3AH and VR3AR were tilling the DX fields in the mid-Pacific with stops scheduled for VR1, 3D2, VR8, FK8, FW8, 5W1, and ZK2. Geoff Watts returned to the publishing scene with his *DX News Sheet* after a spell of ill health. Jim Cain, WA1STN, was appointed headquarters liaison with the DXAC, the president of the ARRL taking the time to note that the advisory committees advise, while headquarters makes the policy, and the decisions. Ten years later it still seems they are trying to settle that matter. Martin Laine was sending out the QSLs for his C5AZ and CT9AT efforts. A51TY was showing at times on the SEAnet, and JA1TES/5A was being heard from Libya. VR1AA was leaving Tarawa and headed home to Wales. W0VEA offered ten acres of land in North Platte, Nebraska for a relocated site for W1AW and was turned down. Someone passed up the chance of a lifetime. San Hutson, then K5QHS and now K5YY, was back filling out QSLs for his D6A and FH8 operations, San putting the new countries, after partition, on the air for the first time ever.

QSL Information

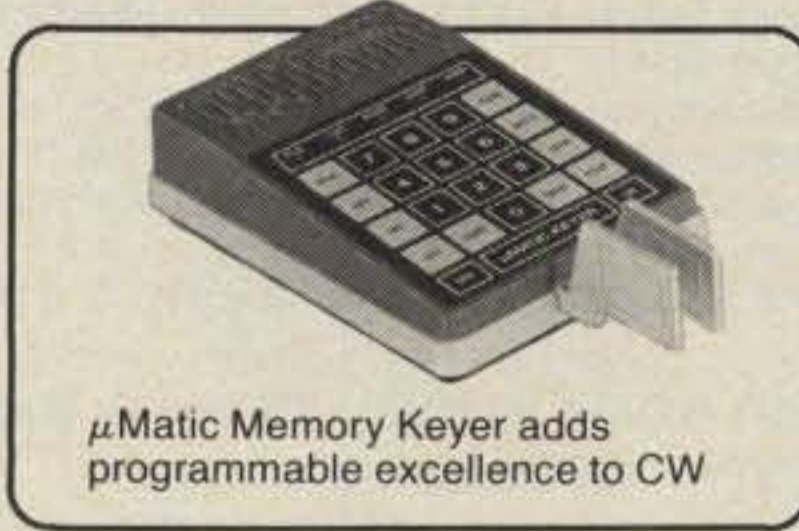
Dennis Brevik, KZ1D, is ready to stand up and be a QSL Manager for any number of DX stations. If someone seeks a trained and ready paper manager, write to Dennis at 250 Millham Street, Marlboro, MA 01752. Also, all of the following were compiled with midnight help from Bob Truhlar, W9LNQ.

AA4VK/PJ7 to AA4VK
 A15P/PA to W3HNC
 A22BW to DK3KD
 A82AY to N5GAP
 A82BN to N5GAP
 DP0GVN to DL2NF
 EF6RCD to CA5QZ
 FG/AA4VK/FS to AA4VK
 FO8ZA to OH7ZAA
 FT8YA to F6DZU
 HD8G to KT1N
 HG1S to HA1KSA
 JG1FVZ/5N26 to JF1EEK
 JX1AC to LA3TC
 JY7Z to K6VNX
 K4YT/4D9 to KE3A
 OE6MKG to KB7SG
 ON7IP/ST2 to ON7IP
 P43GD to N2MM
 SM0OIG/LU to SM0KCR
 PY2RRG/PY0T to PY1DFF
 TJ1CH to F6FNU
 TU2MY to WB5EPL
 V2AK to WA4WTG
 V31FA to YV5JEA
 VE0MAG to VE2BHC
 VP2MM to AB1U
 VP2MW to N3BHF
 VP9QM to W4QM
 WD4R/HP1 to WD4R
 XQ3D to CE3DPD
 Y61Z/p to Y26 Bureau
 ZV9WAS PY4AG
 ZY0FB to PS7KM
 ZF2BJI to W4KA
 3G3E to CE3EEO
 3G9BSY to CE8PD
 3C1MB to EA7KF

4N4A to YU4SBH
 4Z4IK to IK8DYP
 5B4UC to SM6DIN
 5T5S to W4FRU
 5V7WD to WB4LFM
 C30BBE to Box 271, SF 41161, Tki, Finland
 CO7KR to Box 5343, Camaguey, Cuba
 FO8XA to J. Calvo, 5-10-5 shimomequro, Meguru-Ku, Tokyo, 153 Japan
 HD2A to B.P. 5757, Guayquil, Ecuador
 KC7UU/5B4 to Doris Peyerson, 845 Ramona Dr., Santa Rosa, CA 95404
 KG4XD GARC, Box 73, FBPO, Norfolk, VA 23593
 OY7ML to Martin Haasen, Landavegur 79, FR-100, Torshavn, Faroe Is.
 SM0AGD to Erik Sjolund, Radjursvagen 13, S-134 00, Gustavsberg, Sweden
 SV0AA to C.H. Jackson, Box 722R, APO New York 09223-5362
 TA1E to Box 794, TR 34335, Sirkeci, Turkey
 TG9NT to Box 89C, Guatemala City, Guatemala
 V31PC to Box 7, Punta Gorda, Belize
 VK2CUP to Box 10, West Perth, Western Australia 6005
 802FTJ to Box 369, Gaborone, Botswana



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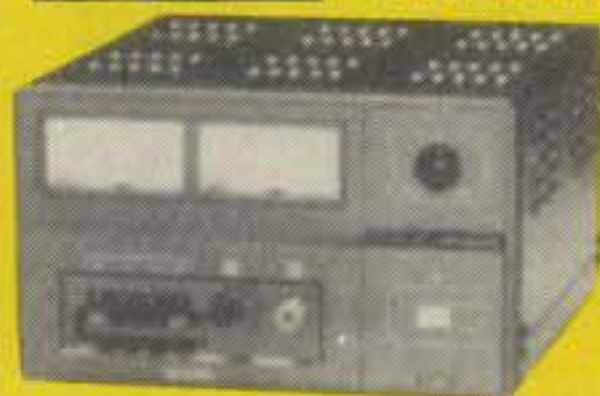
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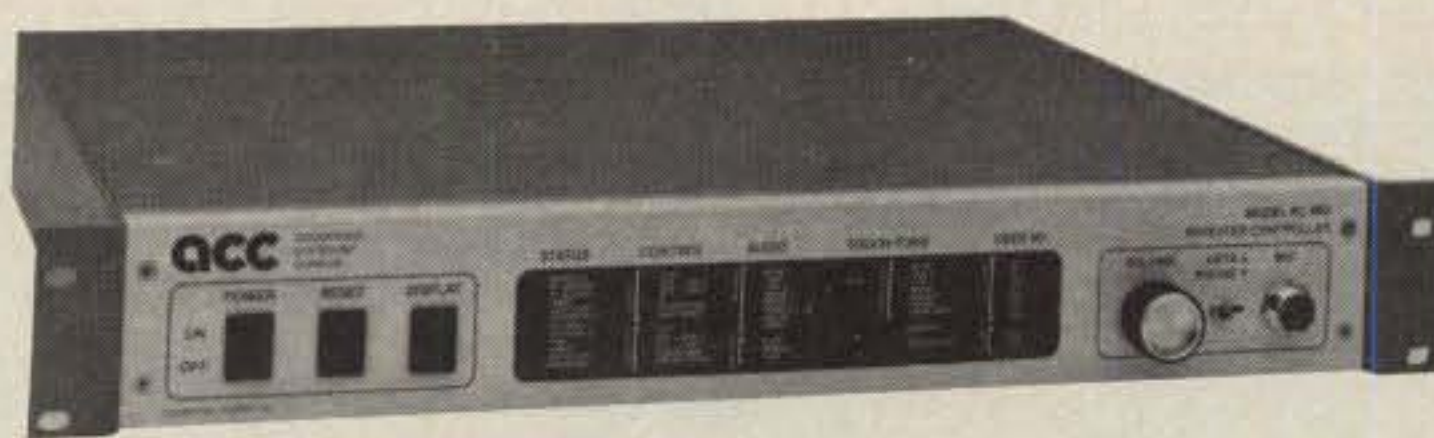
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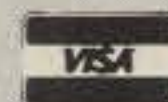


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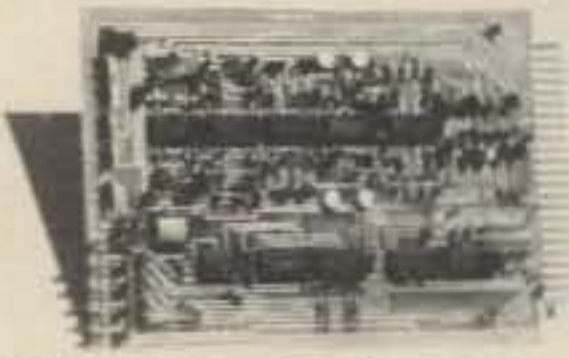
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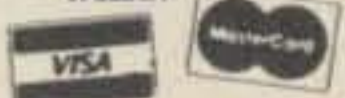
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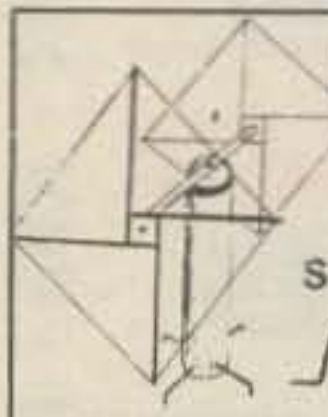
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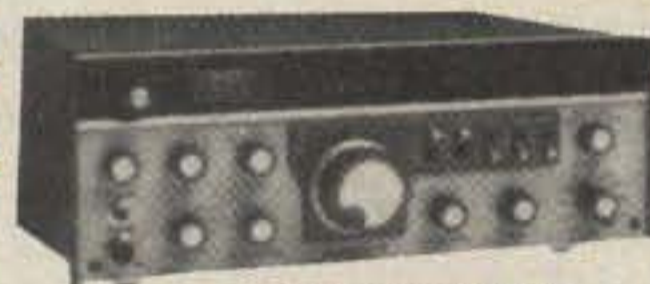
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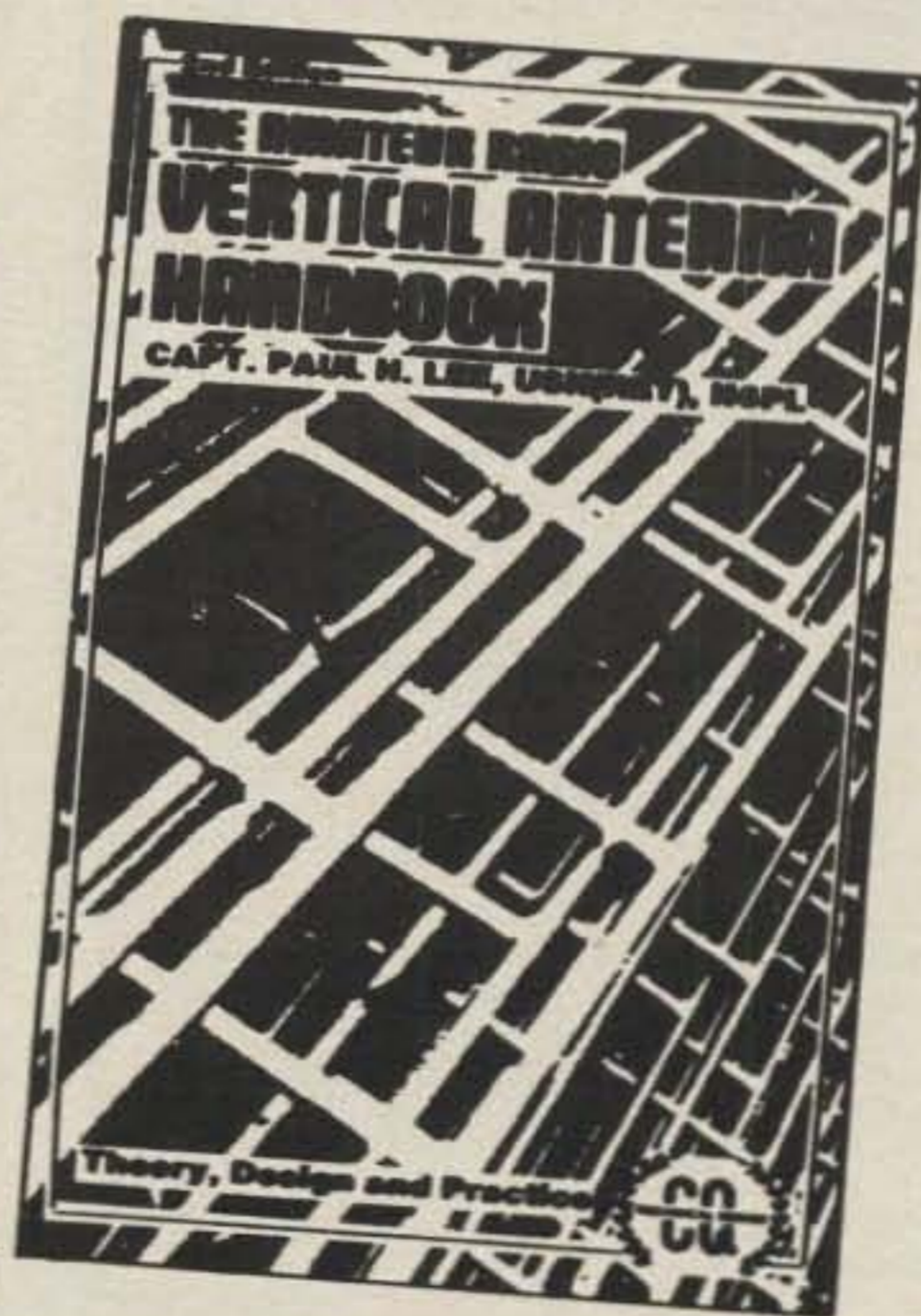
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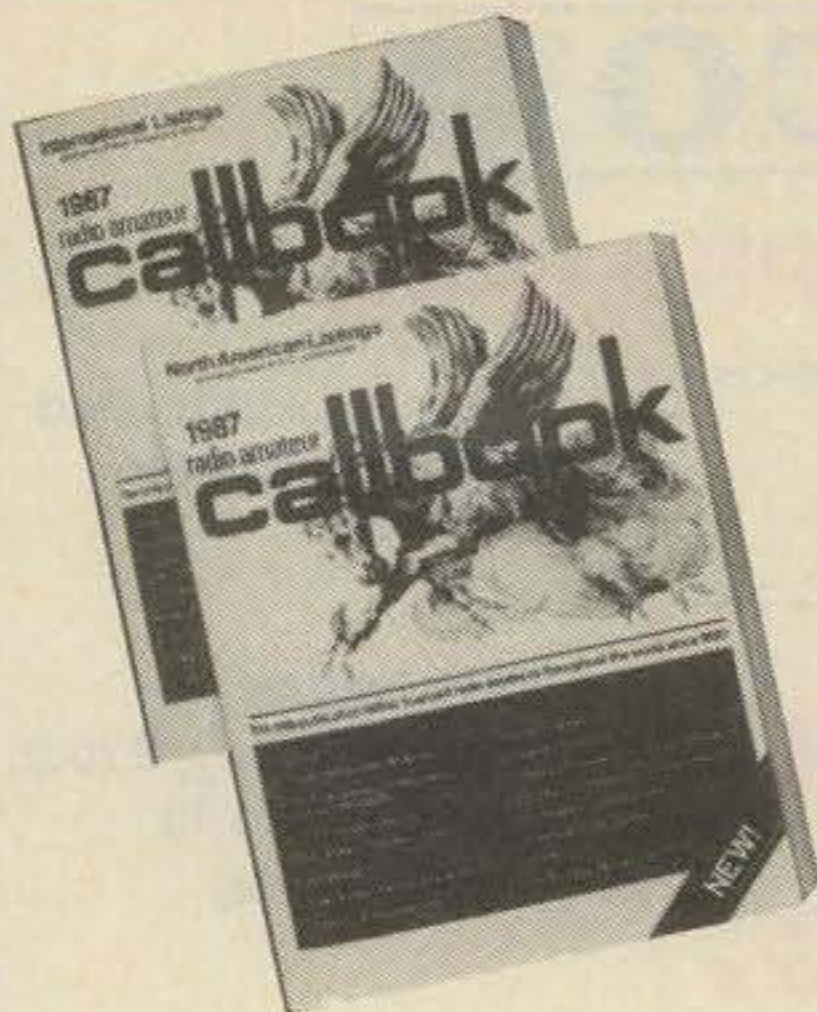
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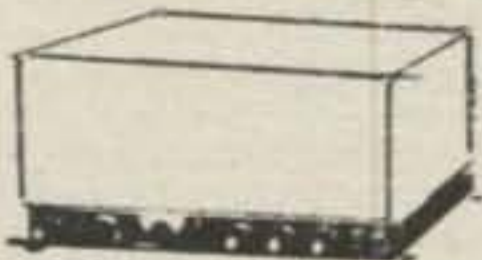
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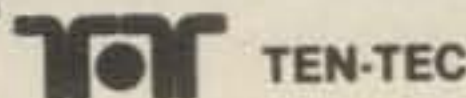
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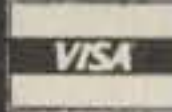
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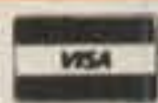


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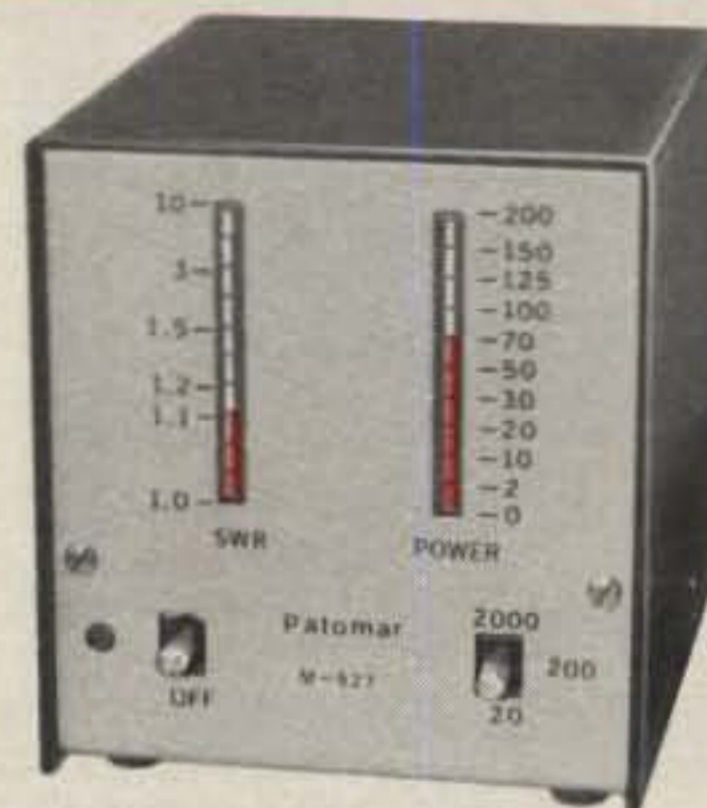


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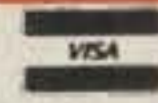
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