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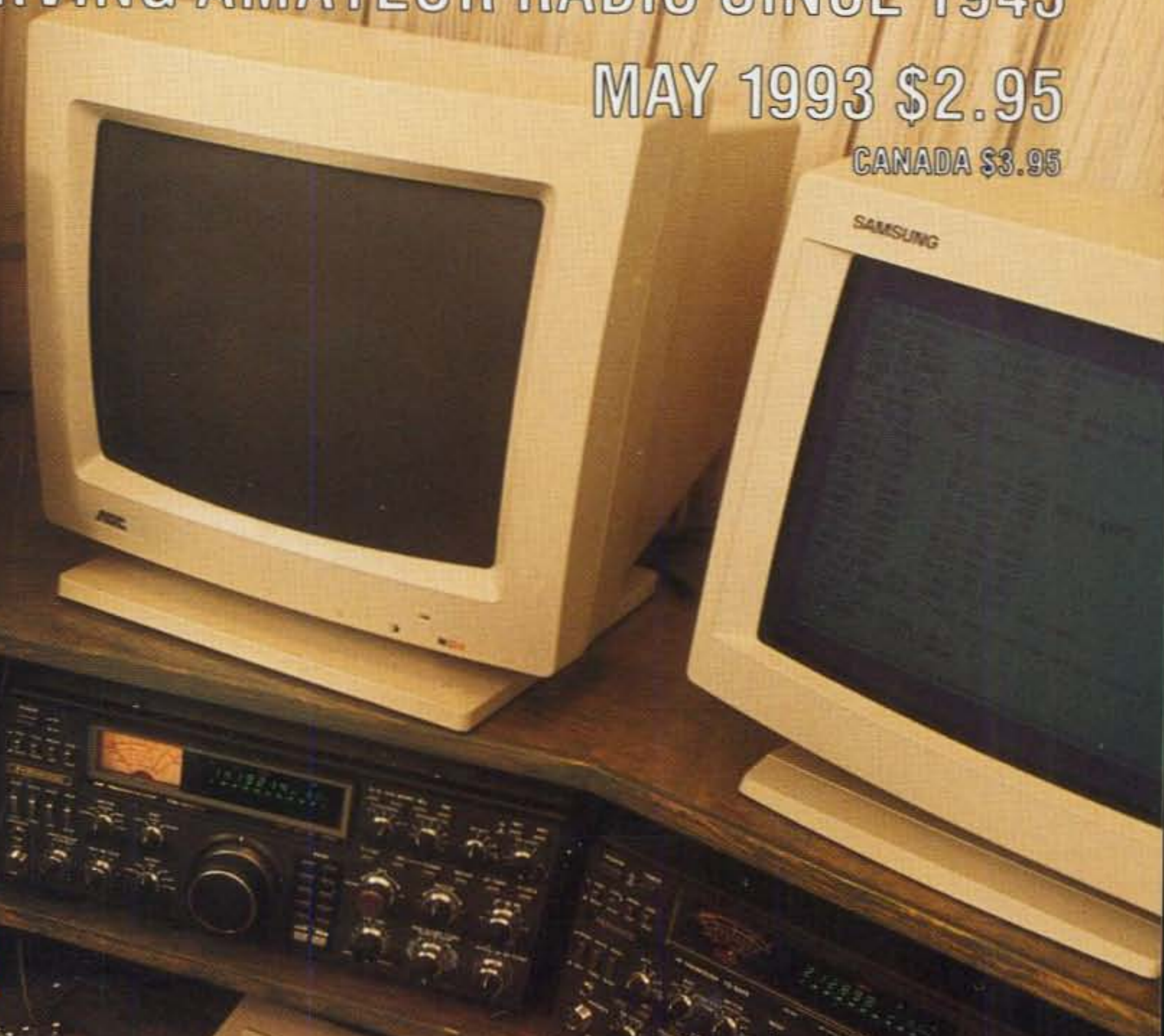
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MULTIMETER

# CQ



**1992 CQ WPX CW Contest Results  
Full Report Begins on Page 13**

**DXpedition Special:  
Weekend on Market Reef,  
VHF Mountain-Topping for the 90's  
YA5MM—The Jaws of the Dragon  
The Jan Mayen Story**

**CQ Reviews:  
The JRC JRL-2000F  
Linear Amplifier  
The Alinco DJ-180 2 Meter HT**



On the cover: N4RJ, Loganville, GA



THE RADIO AMATEUR'S JOURNAL

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- Tunable IF notch filter
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- **Choice of accessories**  
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AMATEUR RADIO PRODUCTS GROUP  
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# The Radio Amateur's Journal

## ON THE COVER:

Among the many noteworthy "RJ's" in Amateur Radio contesting circles is the one on this month's cover... Georgia's Hugh Valentine, N4RJ, of Loganville, GA. Inset is a bird's-eye view of the antenna farm. We wanted to run a shot of Hugh himself atop this tower, but in the photo he disappeared into a barely-visible dot! (Photo by Larry Mulvehill, WB2ZPI)



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# ZERO BIAS

## EDITORIAL

**Y**ears ago amateur radio had heroes and stars. These heroes and stars achieved their status by virtue of what they accomplished. There were legendary DXers, innovators, writers, and columnists who inspired countless thousands of amateurs to be better than they were. I can remember in 1953 when I became KN2EEK my father would drive me to various amateur radio club meetings and hamfests so that I could meet other amateurs and perhaps talk to one of these heroes and stars. Today, of course, that would be considered naive and hokey.

Today it is far more common for a given amateur to become famous simply for the achievement of notoriety. In absolute terms, compared to the total amateur population, the number is quite small, but the actions stand out. Somehow we've dropped the notion of heroes, and we are quite content to deal primarily with stars, albeit supernovas. There are probably "stars" on every band and every mode searching for that audience and looking for someone to rise to the bait.

The recent DXpedition to Kingman Reef and Palmyra was no exception. The operator from Palmyra competed for his operating frequency with sound effects and hostile comments for about a half hour, while the Kingman Reef group had some real angry folks yelling and screaming at each other for the longest time on the calling frequency. Obviously, this took place as he was listening for 2s. Apparently, some of the unworthy thought that they were worthy enough to disregard instructions as to where the operator was listening. Instead of joyously hearing "Echo Kilo 5/9" come back at me, all I and many others heard were the salient facts on how these folks were going to perform unimaginably, physically impossible quadrisexual acts on each other. A few took umbrage at these physical challenges and came back with ethnic, racial, and religious slurs, as if to say "Oh, yeah?!" I would guess that there were no more than six or seven people involved, but that's all it takes these days to become a star.

It is more than likely that every band has its share of stars, and that the total number of these stars is under 50. That's not very many considering the total number of amateurs. You can toss in a few more people who vituperate in print, and you have our angry, ineffectual, and frustrated amateur who yearns for that place in the firmament. These people want and need attention in order to be somebody. When we get angry and respond in kind on the air, we tend to lose track of why we were there in the first place. The name calling does focus attention on the person who craves it, but it also keeps you from working that

particular station. Either way, you lose.

There are also amateurs who become stars or centers of attention simply out of ignorance, with no malicious intent. Having an amateur radio license does not make one a savant. Common sense and patience cannot be legislated or enforced. Having enough money to buy any and all equipment available will not guarantee one a slot on anyone's Honor Roll. Being notorious or inept is not a first-amendment guarantee, nor does it have anything to do with freedom of speech. There is no great point to be made nor great virtue in being either malicious or ignorant.

In a sense, most of this is preaching to the choir, as most of you readily understand these situations. What may not be so clear these days is who our heroes and stars really are. If we attend any of the major hamfests and observe which forums are standing room only, it becomes obvious in terms of numbers that the DX and contesting forums are where it's at. Our heroes these days are the doers, not necessarily the thinkers. Most of us can rattle off names and calls associated with DXpeditions and contest operations, but we would fall woefully short in coming up with a list of the few amateurs who shaped the technology we now use and take for granted.

Our heroes these days traipse around the globe searching for that edge in a contest or activating some rare country that we all need, and sometimes both. Our heroes endure horrible weather conditions, political conflict, and extremely hazardous travel arrangements just to make us happy. Let's face it; most of us wouldn't like to experience the downside experiences nor put up the money it takes to do these things purely to make someone else happy. Though we all seem to covet those special QSL cards, there aren't too many of us willing to sit down before a mountain of requests and check and reply to each one. The fact that it all gets done by someone sooner or later keeps most of us happy and content. Our heroes and stars seem to be able to do it all, and with a certain style and ease.

Well, therein lies the lesson. Those who are malicious and envious feel that they have a right to disrupt what is going on so that they can feel good, at the expense of the rest of us. The ignorant really don't understand what's going on, why it's important, and whether it's important enough for them to get involved. Again, they do this at everyone's expense by occupying the one frequency to which everyone is listening. The situation is not eased by six other people coming on to either curse, educate, or police the individual. If you really think about it, it doesn't take too many signals to create the feeling of bedlam and chaos.

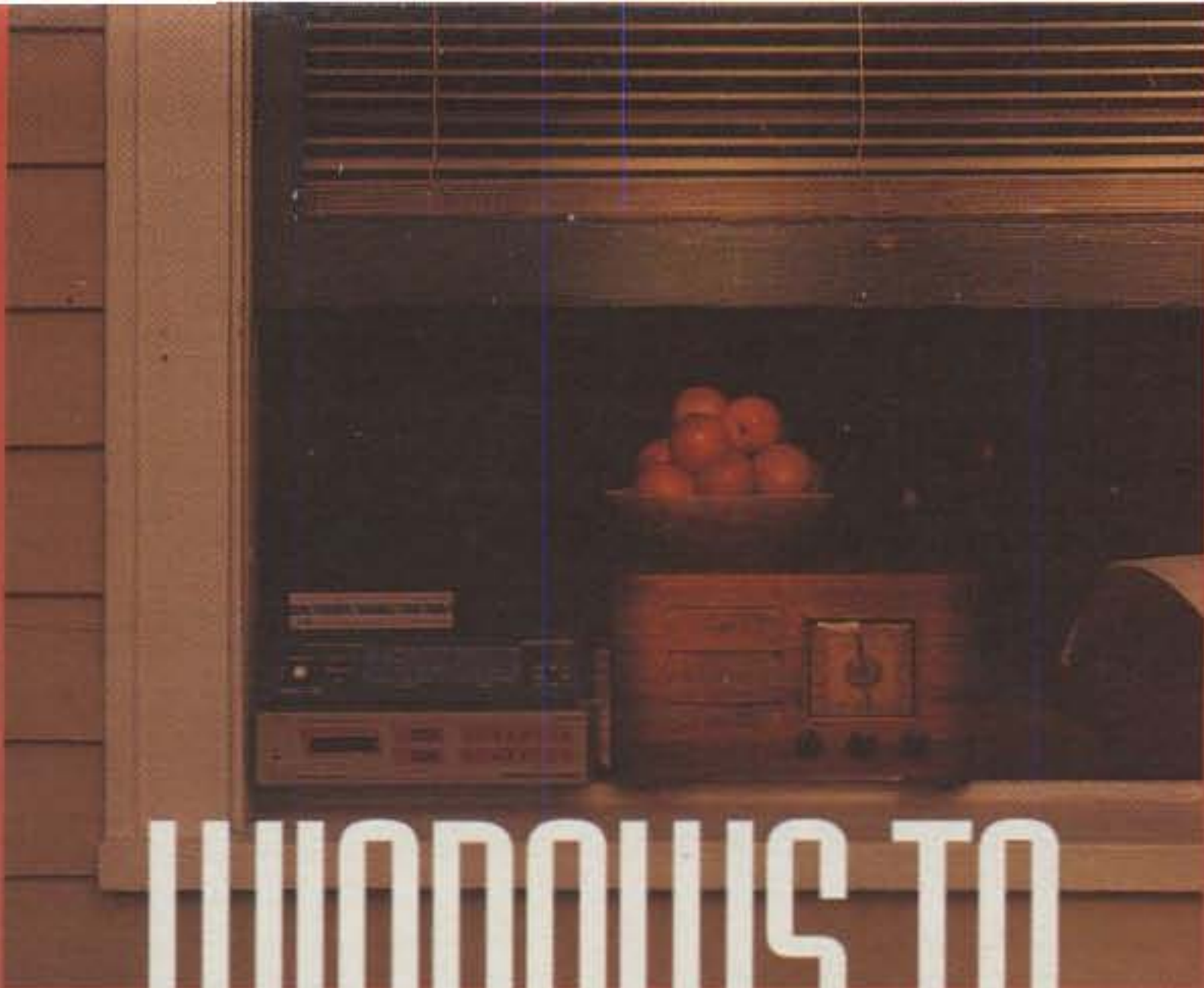
I do know that the malicious, if ignored, generally go away. The ignorant, however, just keep asking questions, expecting the ether to impart wisdom and knowledge, sort of like thinking out loud. In short order, though, our ignorant friend will be educated as if by magic. By doing nothing and especially by saying nothing, our friend will soon be informed as to the call, location, listening frequency, and QSL route. It's amazing how much you can learn by doing nothing and keeping your mouth shut—sometimes far more than you can get out of any book.

If we look at our heroes and stars objectively, they share several important traits such as drive, persistence, and patience. They are goal oriented. These are the exact same traits that are required to be successful in any pastime, plus a healthy dose of compulsiveness. While we certainly can't emulate all of these qualities, we can at least learn about what it takes to be a hero and star these days. If you read about the exotic operations and DXpeditions in this issue plus check out the contest results, you'll get an idea of what it takes in terms of money, physical endurance, and dedication. This is what separates the few from the many.

Amateur radio is no longer a passive hobby. It is a complex pastime with many goals. We've made it an entity far beyond a service, and almost a way of life. The spectacular developments in technology and miniaturization have allowed countless numbers of amateurs to efficiently operate from just about anyplace on earth, and a few amateurs even operate from space. The nameless wizards who in a sense created the technology, also by extension created our heroes—the people who do marvelous and astounding things with it. Today most amateurs feel technically superior if they can figure out how to use 117 concentric controls and a few thousand memories, much less try to design that rig.

With all of this going for us, the best is yet to come. I've been fortunate in that I've been able to meet and come to know most of my heroes in amateur radio. They were and are the thinkers, the innovators, and yes, the doers. It's important to have heroes, to admire what they have accomplished and especially to learn from them. Stars come and go, sometimes very quickly. Heroes have a way of shaping tomorrow. It all takes a great deal of patience. What we as amateurs will be doing ten years from now is probably fomenting in the mind of some burgeoning hero. I know that it will be different, that some of us will become angry and malicious, and that most of us will seize the opportunity to maximize whatever it is, and still want more.

73, Alan, K2EEK



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# ANNOUNCEMENTS

• **Young Operators International Radio Club** – YOP is an international organization of young people (under age 30) intended to promote friendship and a better understanding of one another through radio. Hams, SWLs, and those who are interested in joining the radio ranks are welcome. A newsletter or small magazine will also be published. For more information, contact Mike Pagel, WB9QFW—University of Wisconsin, Stevens Point, WI 54481, and include a brief description of yourself.

• **2nd Signal Service Battalion U.S. Army Signal Corps.** – Members of this battalion who served during WW II have been meeting at 11 AM EST on 7190 kHz SSB every Wednesday. Former members who would like to join in are welcome. A reunion of members is planned for October at Vint Hill Farms Station, Warrenton, VA. Contact Robert Zikowitz, 7605 Gaylord Drive, Annandale, VA 22003 for information.

• **The following Special Event stations will be on during May:**

**NT1I**, IOTA DXpedition from Martha's Vineyard (NA-046), Dukes County, Massachusetts; WF1N, NT1I, and KA1DIG; April 30 to May 3 on or near usual IOTA frequencies. QSL to NT1I direct or via the bureau.

**2-land**, from Marconi Memorial Tower Radio Site, Wall Township, New Jersey; Ocean-Monmouth ARC; 1600Z May 15 to 1600Z May 16; CW up 10 kHz from bottom of Novice subbands and 10.145, 14.045, 18.080 MHz and bottom General 80 through 15 and Novice 10 meter phone subbands. For certificate send 9 x 12 SASE (or \$1.00 US) to OMARC, P.O. Box 75, Bradley Beach, NJ 07720.

**K2KN**, from Samuel F.B. Morse home, Poughkeepsie, New York; Poughkeepsie ARC; 1300Z May 29 to 0100Z May 30, and 1400 to 2100Z May 30; CW 3745, 7145, 14045, 21045, 28045; SSB 3855, 7255, 14255, 21355, 28455 (+/-QRM). For certificate (9 x 12) or QSL send SASE to K2JMY, 4 Bishop Dr., Poughkeepsie, NY 12603.

**K3SSC**, from 350th anniversary of founding of

Commonwealth of Pennsylvania, Philadelphia, Pennsylvania; Delmont Radio Club; 1600-2400Z May 8 and 1300-2000Z May 9; lower portion of General 15, 20, 40 meters phone, 147.165 MHz, and Novice 40 meters (approx. 7.133 MHz). For certificate send QSL and 9 x 12 SASE to Jack Jones, W3NTD, 3908 Jeffrey Road, Huntingdon Valley, PA 19006.

**KB3MF**, from 149th anniversary of "What Hath God Wrought" message, Baltimore/Washington, DC area; Bay Area ARS; 1300-2000Z May 15; CW 7.125, 14.035, 21.145, 28.245 MHz. For 8.5 x 11 certificate (SWL reports okay also) send QSL or detailed report (SWL) with SASE to Ray Robley, Bay Area ARS, 211 Laurel Rd., Linthicum Hts., MD 21090.

**WA3BAT**, from Battle of Manilla Bay 95th anniversary, Philadelphia, Pennsylvania; Olympia ARC; 1300Z May 1 to 2000Z May 2; SSB 3.895, 7.245, 14.245, 21.365, 28.365, 145.270. For certificate send QSL and 9 x 12 SASE to Olympia ARC, P.O. Box 928, Philadelphia, PA 19128.

**WO3C**, from 100th anniversary of Pennsylvania State Park system, Wellsboro, Pennsylvania; Tioga County ARC; 1500Z May 29 to 1700Z May 31; lower portion of General 80, 40, 20, 10 meters and Novice 80, 40, 20, 10 meters. For QSL and certificate send QSL and 9 x 12 SASE to Darlene Rahn, WO3C, RD 6 Box 200, Wellsboro, PA 16901.

**KC4JMH**, from fish shooting season on Clinch River, Dungannon, Virginia; Scott County ARS; 1400-2300Z May 8; General 75, 40, 20 15 meter phone subbands and Novice 10 meters phone. For certificate send QSL and 9 x 12 SASE to SCARS, P.O. Box 396, Gate City, VA 24251-0396.

**AB4RE**, from Alabama Jubilee, Point Mallard Park, Decatur, Alabama; Morgan County ARC; 0900-2100 Central Standard time May 29; General portion of 40 meters and Novice 10 meters. For certificate send QSL and 9 x 12 SASE to AB4RE/KD4KTV, Steve Simmons, 1603 First Ave. SW, Decatur, AL 35601.

**WA4UMU**, from Sumter County Iris Festival,

Sumter, South Carolina; Sumter ARA; starting at 1700Z for 24 hours, May 22-23; General 80, 40, 20, 15 meters and Novice 10 meters. For certificate send QSL and 9 x 12 SASE to KC4SZG, Callbook address.

**W4ZBB**, from Armed Forces Day, Fort Walton Beach, Florida; Playground ARC; 1600-2200Z May 15; General portion of 40, 20, 15 meters and Novice 10 meters phone. For certificate send business-size SASE and contact number to PARC, P.O. Box 873, Fort Walton Beach, FL 32549.

**W4EM**, from Memphis in May International Festival, Memphis, Tennessee; Mid-South ARA; 1500-2200Z May 1; lower 50 kHz of SSB General 40-12 meters, and Novice 10 meter subbands, and AMTOR 21.080, 14.100, 7.080, 3.580 MHz (+/-QRM). For certificate send QSL and 9 x 12 SASE to MARA-W4EM, c/o Pat Lane, 3390 Northwood Dr., Memphis, TN 38111.

**WD4FVO**, from Armed Forces Day Special Event, Marine Corps Base, Camp Lejeune, North Carolina; Onslow County ARC; 1300-1900Z May 15; Novice and General portions of HF bands. For QSL send 9 x 12 SASE to OARC, P.O. Box 841, Jacksonville, NC 28540.

**5-land**, from 10th anniversary of emergency service coordination, Fannin County, Texas; Fannin County ARC; during May; General portion of 40, 20, 15 meters, and Novice 10 meters. For QSL send QSL and 9 x 12 SASE to op worked or Gary Stone, N5PHT, P.O. Box 305, Savoy, TX 75479.

**K5GH**, from 12th annual Texas Star Party, McDonald Observatory, Davis Mountains, west Texas; Astronomical League members; May 17-22 (no times given); 28365, 21365, 14265, 7265, SSTV and CW contacts on request. For QSL send QSL/SWL report and SASE to K5GH-TSP, 2619 Bordeaux, McKinney, TX 75070.

**W5AUU**, from annual "Toad Suck Daze," Faulkner County, Arkansas; Faulkner County RC; beginning at 1600Z May 1; on 14.270 and 28.490. QSL with 9 x 12 SASE to FCARC, W5AUU, P.O. Box 324, Conway, AR 72032.

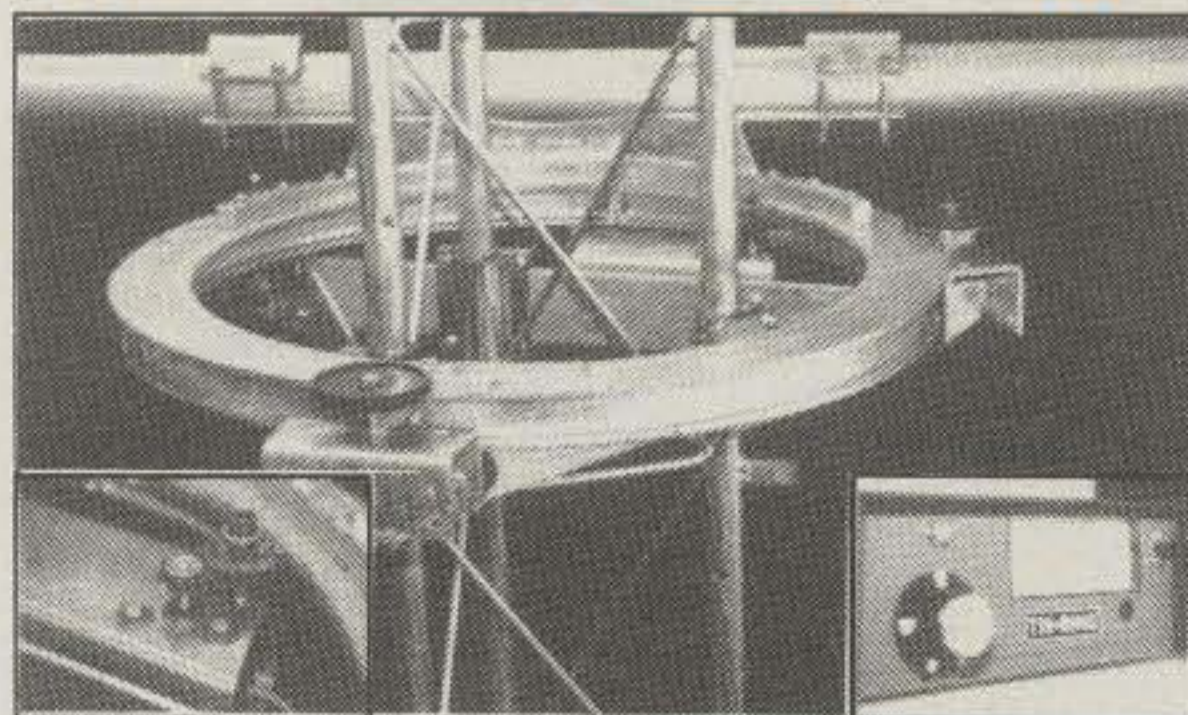


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**N5IKB**, from Tex Ritter Museum, Carthage, Texas; Carthage ARS; 1400-2100Z May 8; near middle of General 40, 20, 15 meters and Novice 10 meters. For certificate send contact number, QSL, and business-size SASE to N5IKB—Del, 221 Browning, Carthage, TX 75633.

**NL7JE**, from commemoration of driving of Golden Spike, Promontory Summit, Utah; Ogden ARC; 0001-2100Z May 10; 3.970, 7.270, 14.280, 21.375, 28.415 MHz. Send QSL and SASE to Ogden ARC, P.O. Box 3353, Ogden, UT 84409.

**KG7TE**, from beginning of summer vacation celebration, Kaysville, Utah; Davis High School ARC; 1600-2200Z May 6-7; CW 14.050, 21.050, 28.050; Phone 7.285, 14.285, 21.285, 28.375, 145.59. For certificate send SASE to KB7OTZ, Sara Otterson, 1549 N. Honeybee Circle, Farmington, UT 84025.

**KB7AO**, from opening of spring paddle fishing season, Intake, Montana; Lower Yellowstone ARC; 0000Z May 15 to 2400Z May 16; General phone subbands 40, 20, 15 meters and 10 meters phone, Novice CW subbands on 40, 15, 10 meters. For certificate send business-size SASE to Wally Braun,

KB7AO, P.O. Box 101, Savage, MT 59262.

**N7LMO**, from Mountain Man Rendezvous, Logan, Utah; 1600Z May 29 to 0200Z May 30; Novice 10 meter phone subband and lower 25 kHz of General 15 and 20 meters phone. For certificate QSL send 8.5 x 11 SASE (2 oz. postage) to Dean Stevens, P.O. Box 332, Millville, UT 84326.

**W8BAP**, from Feast of the Flowering Moon Festival, Chillicothe, Ohio; Scioto Valley ARC; 1400-2000Z May 29 and 30; lower portions of General phone bands on 40, 20, 15 meters, Novice 10 meters, possible CW on 40, 20, 15 meters. For certificate and QSL send QSL and 9 x 13 SASE to SVARC, P.O. Box 353, Chillicothe, OH 45601.

**W9DUA**, from anniversary of dedication of Illinois Vietnam Veterans Memorial, Springfield, Illinois; Sangamon Valley RC; 1400Z May 1 to 2200Z May 2; General portions of 160-15 meters and Novice 10 meters. For QSL send business-size SASE to W9DUA SPLEV, Sangamon Valley RC, Red Cross Bldg., 1025 S. 6th, Springfield, IL.

**W9DUP**, from Armed Forces Day Special Event, First Division Museum, Cantigny, Wheaton, Illinois;

DuPage ARC; 1600-2300Z May 15-16; SSB 7.250, 14.290, 28.400, 145.25 repeater. For certificate send QSL and SASE to Jack Carr, NV9S, DARC, P.O. Box 71, Clarendon Hills, IL 60514.

**WB0HSI**, from Lewis and Clark Rendezvous, St. Charles, Missouri; St. Charles ARC; 1300-2100Z May 15-16; 7.265, 14.265, 21.365, 28.465, 146.67, AO-13 Modes B and J. For certificate send QSL and 9 x 12 SASE to St. Charles ARC, P.O. Box 1429, St. Charles, MO 63302-1429.

**KB0IUV**, from Hanska, Minnesota celebration of anniversary of constitution of Norway; New Ulm ARC; 1600-2359Z May 16; 3.875, 7.250, 14.250, 21.350, 28.350. For certificate send QSL and 9 x 12 SASE (2 units 1st class postage) to KB0IUV, NUARC, RR 4 Box 14-A, New Ulm, MN 56073. (SWLs welcome.)

**CJ3RCL**, from World Red Cross Day, London, Ontario, Canada; London ARC; 0000Z May 8 to 2400Z May 9; begins on 75 meters around 3.810 MHz and changes bands every 2 hours; on 3.810, 7.210, 14.270, 21.270, 28.270 MHz. For certificate send \$4.00 donation (recommended) and QSL to Canadian Red Cross, 840 Commissioners Rd. East, London, Ontario, Canada N6C 2V5, Attn.: Joyce.

**XO7G**, from 1993 Friendship Radiosport Games and Hamfest, Victoria, BC, Canada; Friendship ARS of Victoria; 2100-0500Z May 1 to June 30 in General class subbands. QSL direct or via the bureau. For certificate of working XO7G plus 5 stations with XO7 prefix (other Society members) send log info and 9 x 12 SASE to FARS—Victoria, c/o Camosun College, Box 128, 3100 Foul Bay Rd., Victoria, BC V8P 5J2 Canada.

• The following hamfests, etc., are slated for May:

May 1, **Southern Tier Hamfest**, Marvin Park Fairgrounds, Owego, New York. Contact Southern Tier ARC, P.O. Box 7082, Endicott, NY 13761-7082. (VE exams.)

May 1, **South Central Oregon Hamfest**, Klamath Falls, Oregon. Contact South Central Hamfest, c/o Sue Buzzard, N7QZH, P.O. Box 294, Keno, OR 97627. (Exams.)

May 1, **Valley of the Moon RC, WB6DWY, Hamfest, Breakfast, Special Event**, Sonoma Developmental Center, Glen Ellen, California. Contact Darrel, WD6BOR, 707-996-4494. (Exam registration 10 AM, testing 11 AM; special event station WB6DWY on General phone bands 10, 20, 40 meters, QSL with SASE for certificate.)

May 1, **Arrowhead RAC Swapfest '93**, Good Fellowship Community Center, Morgan Park (Duluth suburb), Minnesota. Contact Duane Flynn, KB0LC, 4907 Peabody St., Duluth, MN 55804 (218-525-4580).

May 1-2, **ARRL West Texas Section Convention & Hamfest**, Abilene Civic Center, Abilene, Texas. Contact Peg Richard, KA4UPA, 1442 Lakeside Dr., Abilene, TX 79602 (915-672-8889). (Exams.)

May 2, **Metro 70cm Network Electronic Fleamarket**, Lincoln High School, Yonkers, New York. Contact Otto Sopliski, WB2SLQ, 914-969-1053. (Exams.)

May 2, **Paul Bunyan ARC, Bemidji, MN, Hamfest**, Moose Club, Bemidji, Minnesota. Contact Roben Beyer, P.O. Box 524, Bemidji, MN 56601 (218-751-4801). (Exams.)

May 2, **South Bend, IN Hamfest and Swap & Shop**, Parking Garage, downtown on U.S. 33, South Bend, Indiana. Contact Wayne Werts, K9IXU, 1889 Riverside Dr., South Bend, IN 46616, or call 219-233-5307.

May 8, **Mancorad RC Hamfest**, Manitowoc County Expo Center, Manitowoc, Wisconsin. Contact Red 414-684-9097 days or Ron 414-793-4733 evenings. (Exams.)

May 8, **Murfreesboro, Tennessee Hamfest**, Rutherford County Agriculture Center, Murfreesboro, Tennessee. Contact Jerry Sartain, KC4ALG, 615-890-9358. (Exams 9 AM.)

May 9, **Athens County ARA Hamfest**, City Recreation Center, Athens, Ohio. Contact Carl J. Denbow, KA8JXG, 63 Morris Ave., Athens, OH 45701-1939.

May 14-16, **Green Country Hamfest & ARRL Oklahoma Section Convention**, Tulsa, Oklahoma. Call 918-272-3081. (Exams; Novice and Tech exam preparation class Friday night.)

May 15, **Yakima ARC Hamfest**, Selah Middle School Gym, Selah, Washington. Contact KF7ZS, 509-697-8080, or N7HHU via packet at YKM. (Exams 10 AM, walk-ins.)

(Continued on page 158)

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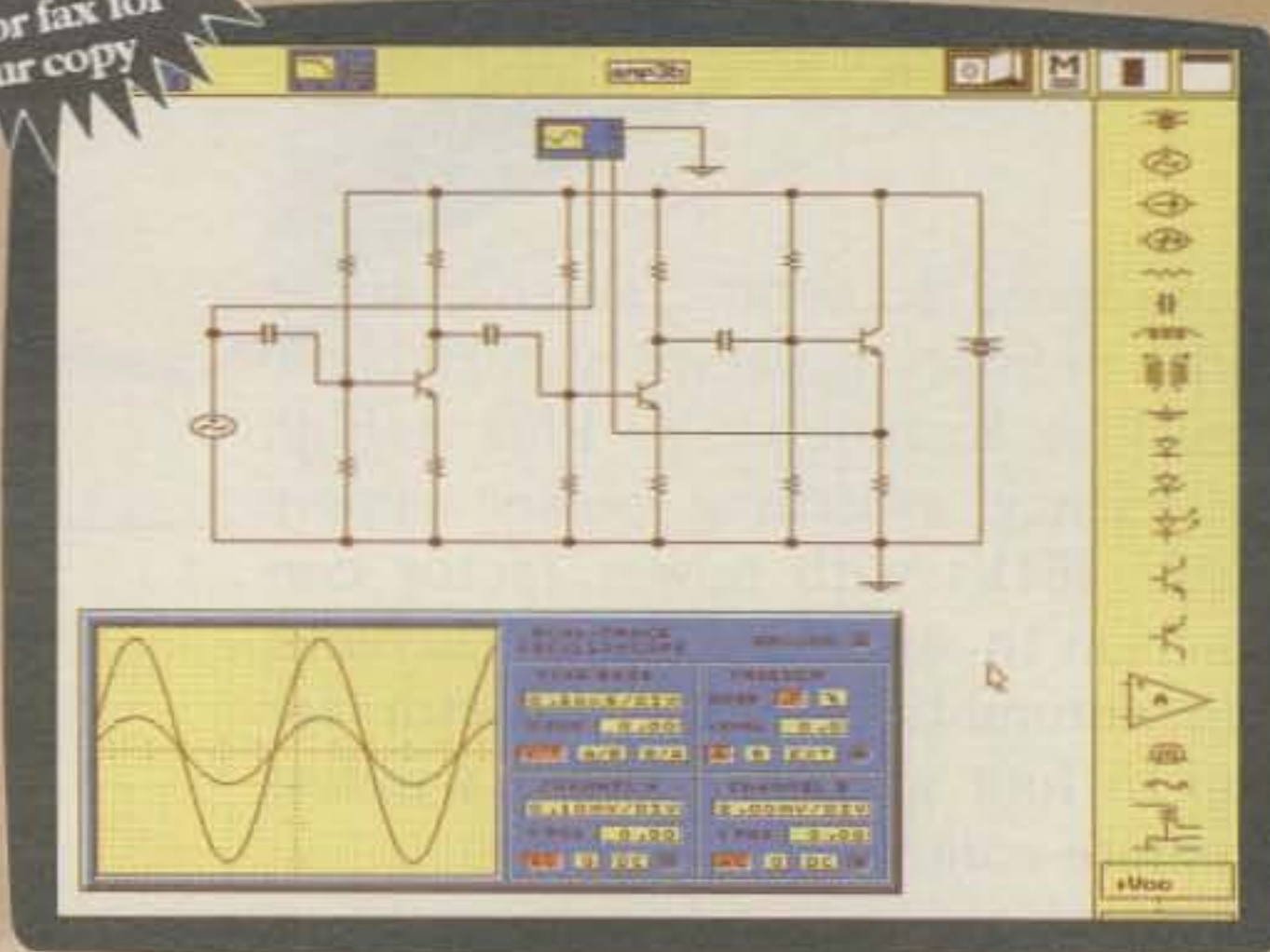
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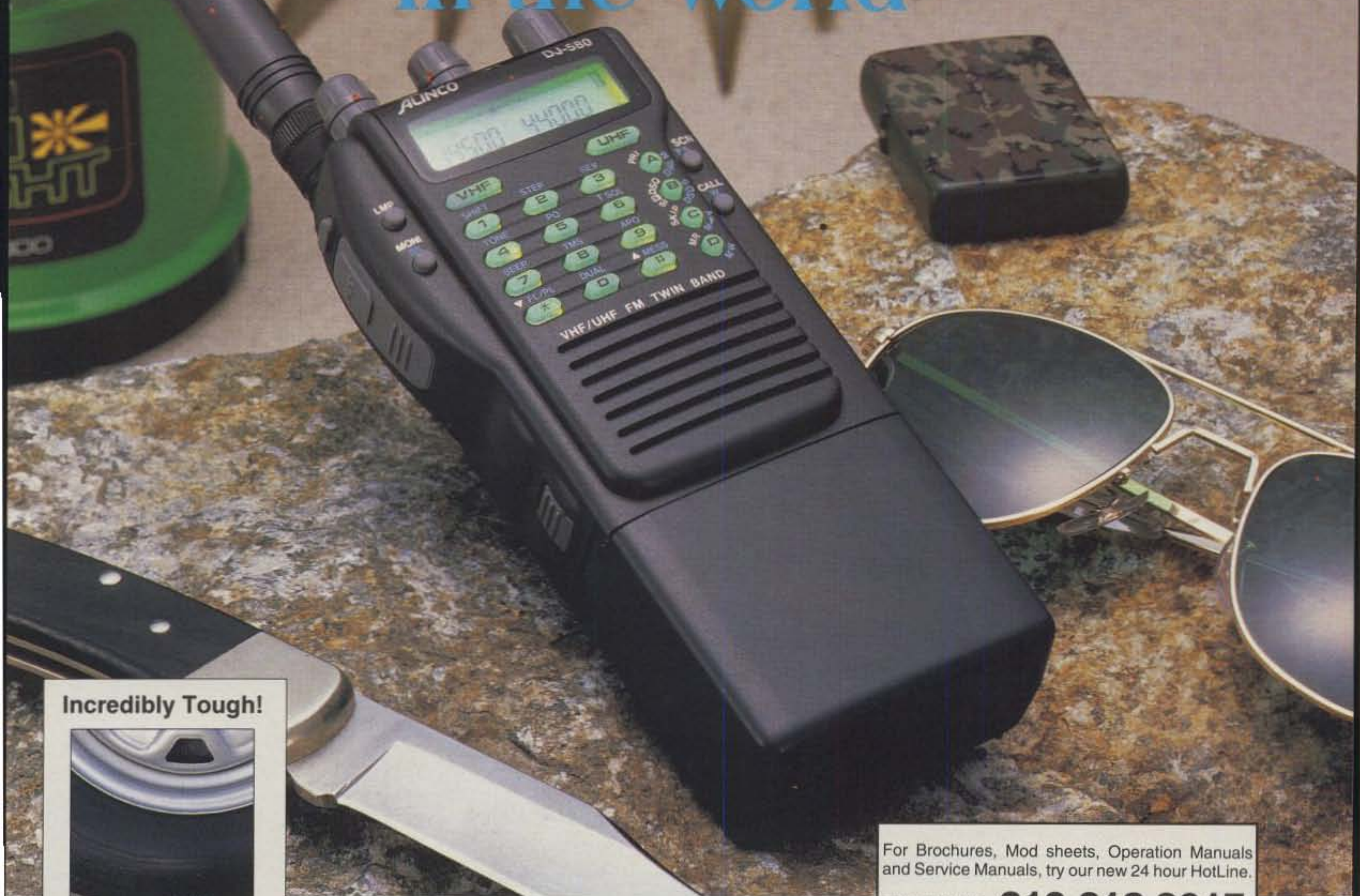
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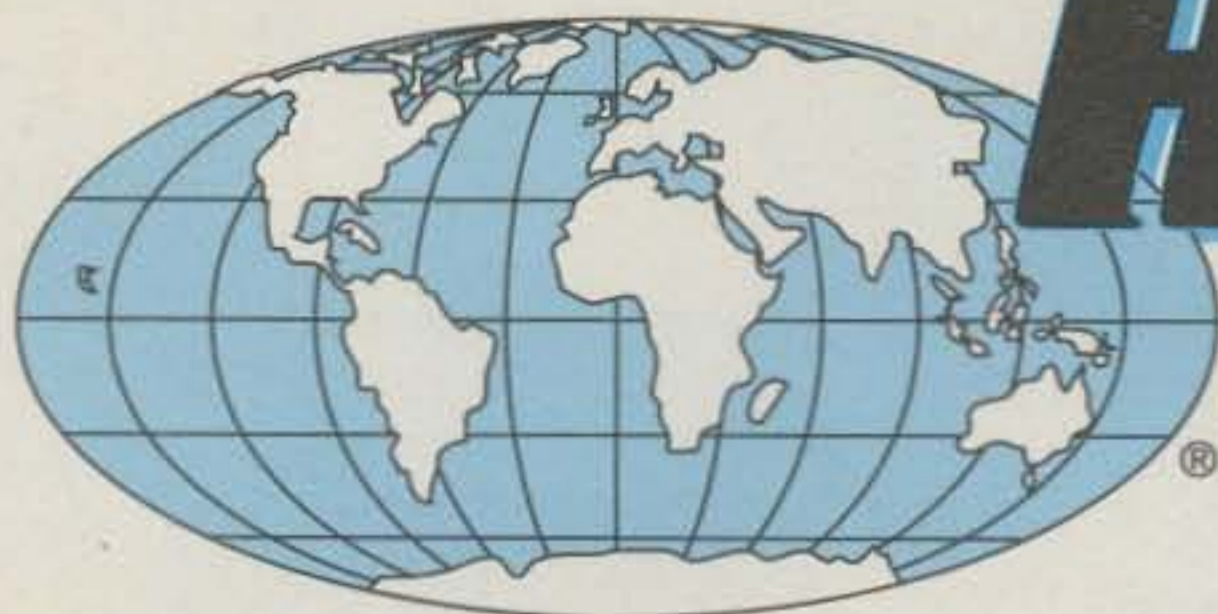
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# Results of the 1992 CQ World-Wide WPX CW Contest

BY STEVE BOLIA\*, N8BJQ

**T**he last weekend of May 1992 will not be remembered as a great one for propagation, but I won't forget it anytime soon. I hope that it will be the only time I operate a contest standing up (due to my earlier back surgery). CW is not meant to be sent that way (hi). Overall, conditions were probably average for the time of year, with a few unusual openings for those who were looking in the right direction. Despite the increase to 36 hours of operating, the record sheet did not take a beating. Only two world records were set. However, several continental records did fall.

## DX

Rasa, YU1RL, moved a little farther south from his 1991 stint as 4M2BYT to set a new single operator record as ZV5A from PY5EG's QTH. I guess that is called following the propagation. Second place went to 5B4ADA with the special call P31A. Olli, OH0XX, found a warm spot in Barbados and placed 8P9EA number three, followed by Marko, OH6DO, at PJ9X. VA8A operated by Tim, KQ8M, topped the VE's and finished number 5, with ZF1A operated by KT6V number six. Top USA entrant KM1H again operated by KQ2M was number seven, followed by VE3EJ, GB8FX (now a silent key), and VE7SZ.

ZD8LII ran away with the 10 meter title. Second place went to low-power entry 9M8DX. TU4SR operated by OH8SR captured the top spot on 15 meters, with Chris, ZS6EZ (ex-ZS6BCR), second and Tine, YT3AA, third. LZ5W (LZ3ZZ Op.) set a new European 20 meter record and captured a world championship. H23W with 5B4WN at the key was second, with 7L1GVE third. Number one on 7 MHz was AM9TY, with HA9BVK and LU6EBY very close behind. G4FAM set a European record with his fine effort at GW8GT. G3LNS finished second and 4N1A third. Top-band honors went to 4N2X, with YL2GVW second and low-power entry UA3LID third.

In the low-power category C6A/KD6WW turned in an outstanding 4 million point effort to lead the 100 watt entrants. He also finished number 11 in the world overall. Second place went to FY5FY, with 7Z2AB and NP2I third and fourth. 9M8DX took the top spot on 10 (and number 2 overall), followed by 7P8SR. LU4FD was top gun on 15 meters. H23W led the way on 20, followed by YU3HA and SV1RP. DL1IAO led the 7 MHz low-power entrants, with G4ZOB second. UB4QYA topped the 3.5 MHz list, with ON4ACB only 10K behind. UA3LID edged out OG3MMF for top-band honors.

## USA

Bob, KQ2M, made it a double-double with his number one finish at KM1H. Bob has had first-

\*4121 Gardenview, Beavercreek, OH 45431



This is Bob, KQ2M, who pulled off a rare double-double with his back-to-back victories from KM1H in both modes.

place finishes in both modes for two consecutive years. Second went to Fred, K3ZO, with WR3E, NR1E, and WN4KKN/6 in close pursuit. In a very close three-way race WE3C eeked out a win over KS3F and KU2Q (K5NA Op.) for the 10 meter title. Less than 700 points separated the top three. KA2AEV turned in a fine effort to win the 15 meter title, followed by N0BSH. John, K2VV, returned to the top 20 meter spot, with WS1M (W2SC Op.) and WU3V/5 (W5MYZ Op.) providing stiff competition. Twenty was the hot band in the US with eight stations topping one million points. Steve, W3BGN, was the new 40 meter champion, followed by NR2H and K8MFO. N6SS topped the list on 3.5 MHz with K2ONP close behind. All alone on top band was WT3Q, who found 118 stations to work.

WR3G operated by Randy, K5ZD, topped the low-power entries with 1.3M points. K5RX was Randy's main competition. Jim also topped one million points. KV8Q, WA6IET, and K9LJN rounded out the top five. KQ1V was the 10 meter champ. WT8P was tops on 15, with WB4TDH edging W8UMR for the 20 meter honors. W3CPB turned in a nice score to win the 40 title.

## Multis

South American station LU8DPM led the way among the multi-single entries with N4WW less than 200K behind. Third went to the MF Island expedition (4J1FS), with OL1A and F5IN rounding out the top five. The gang at HG73DX was the top multi-multi with an excellent 13 million point effort, followed by EZ6L and LY2WW.

In the USA N4WW set a new US record on their way to the top spot, followed by WC4E and KW8N. WZ1R topped the multi-multi entries, with AA6TT providing lots of competition.

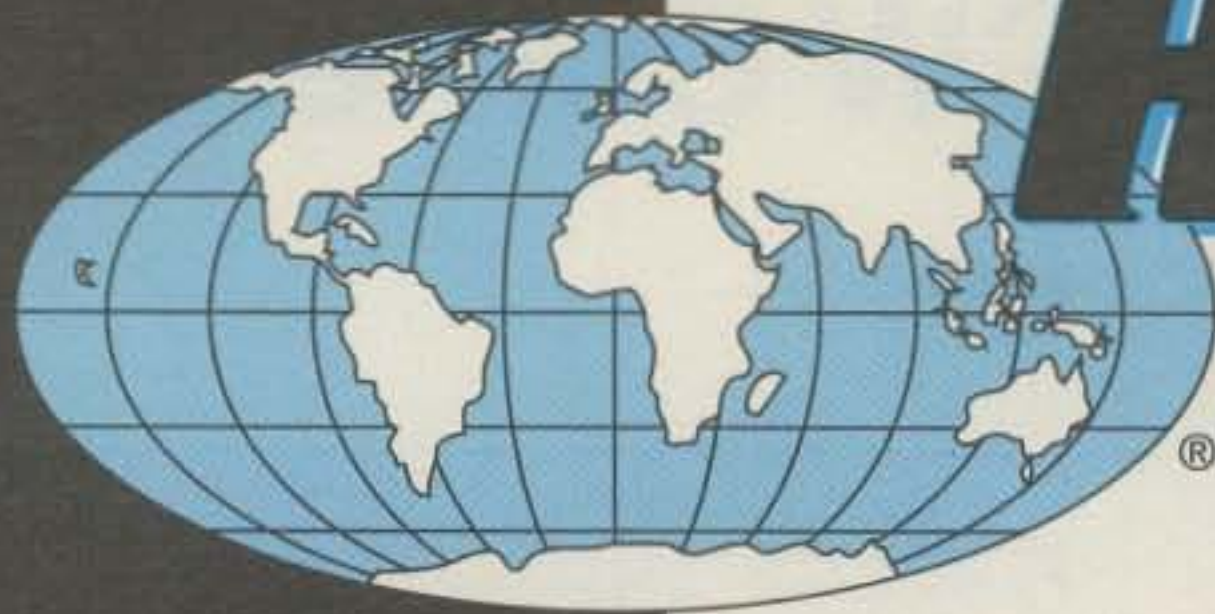
## Log Checking

Many of you may have noticed some pretty healthy score reductions. The majority of these are the result of "busted calls" or miscopies. For the CW contest, 120 logs were entered into the database from logs received on disk and those entered by hand. These logs were from all categories and all areas of the world. Over 25,000 different calls were logged by at least one station. Unique rates ranged from as low as less than 1% to as high as 18% for those entered in the database. Logs with a high "unique per-



Dave, CI2ZP (VE2ZP), seems quite pleased with his 40 meter effort.

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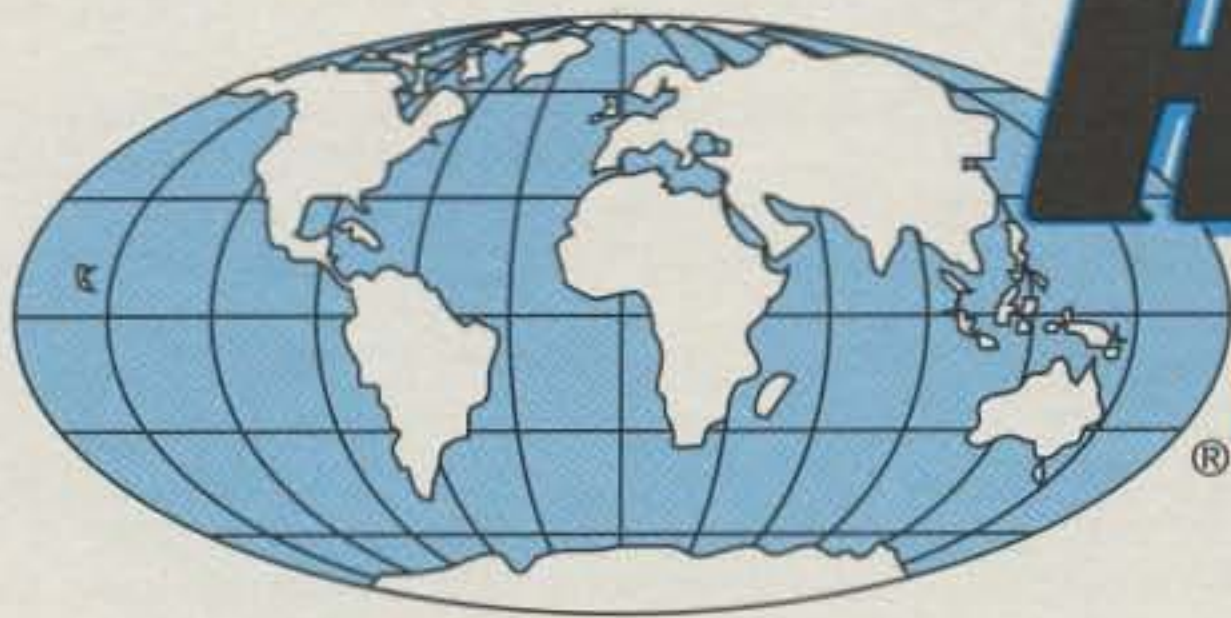
2W standard, 5W opt.  
82 Mems, Dual in-band Rx  
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This is expedition trophy winner 8P9EA (OH0XX Op.). Olli was tops in North America and third in the world.

centage" were almost always found to have a very high number of busted calls, incomplete calls, miscopied reports, or typos. After cross-checking, several scores were reduced by as much as 10%. These big score reductions caused some position changing among the leaders, and in one instance did cause a station to lose a world championship.

At the moment, the WPX Contest Committee does not assess additional penalties for calls removed, but that may be subject to change in the very near future. If you are not sure what you heard, ask again. It is wise to check your typing also. If I only get the log on disk, the call submitted is all we have to go by. In the future, large score reductions for busted calls or reports will result in disqualification.

### Club Competition, Low Power, And More

As VE3EJ put it, "There sure are some strange calls out there!" In addition to the multipliers provided by the FCC, many others take the opportunity to get a special call for the WPX Contest. For the award chasers, many unusual prefixes appeared for the contest. Among them were P31, VA8, ZF1, YQ4, RT9, SO3, H23, CI2, 5Y4, XA5, V40, 7Z2, EZ9, RL0, EG4, TM3, GX0, OI5, OR0, ZW2, and SZ1. In addition, the EA stations used the special AM prefixes, and many of the Finnish stations were allowed to use OG instead of OH. Several expeditions were active, as well as a good assortment of DX. Thanks again to all for making the effort to put on a new prefix, to go on an expedition, or to participate. Your efforts are appreciated.

In the club competition the Northern California Contest Club continued their domination. This year's efforts resulted in a new record of over 97 million points. Finishing second was the Araucaria DX Group from Brazil, followed by the



Here is Andy, UX3D, who was the top low-power station in Russia.

## TROPHY WINNERS

### SINGLE OPERATOR, ALL BAND

- WORLD:** Terry Baxter, N6CW Trophy. Won by: **Station ZV5A operated by Radivoje Lazarevic, YU1RL.**
- USA:** Steve Bolia, N8BJQ Trophy. Won by: **Station KM1H operated by Bob Shohet, KQ2M.**
- \*JAPAN:** The DX Family Foundation Trophy. Won by: **Shigeaki Furukawa, JA3ZOH.**
- OCEANIA:** Tom Morton, KT6V Trophy. Won by: **Alan Viegas, AX8AV.**
- \*CANADA:** Canadian Amateur Radio Federation (CARF) Trophy. Won by: **Station VA8A operated by Tim Herrick, KQ8M.**
- EUROPE COMBINED SSB & CW:** Les Nouvelles DX Group Trophy. Won by: **Harri Manitla, OH6YF (OG6YF).**
- USA COMBINED SSB & CW:** Oklahoma Comm Center Trophy. Won by: **Bob Shohet, KQ2M.**
- WORLD QRP/p:** QRP Amateur Radio Club International Trophy. Won by: **John Crovelli, W2GD.**
- WORLD COMBINED SSB & CW:** Carlos Monsalvo, LU6EBY & Martin Monsalvo (Jorge Bozzo, LU8DQ Memorial). Won by: **John Sluymmer, VE3EJ.**

### SINGLE OPERATOR, SINGLE BAND

- WORLD:** Pedro Piza, Jr., NP4A (Pedro Piza, Sr., KP4ES Memorial) Trophy. Won by: **Station LZ5W operated by Aleko Savkova, LZ3ZZ (14 MHz).**
- OCEANIA:** D. Craig Boyer, AH9B Trophy. Won by: **Joel Chalmers, KG6DX (21 MHz).**
- WORLD 7 MHz:** William D. Johnson, KV0Q Trophy. Won by: **Florencio Hernandez Gomez, AM9TY.**
- WORLD 3.5 MHz:** Lance Johnson Engineering Trophy. Won by: **Station GW8GT operated by Cris Henderson, G4FAM.**
- USA:** Kansas City DX Club Trophy. Won by: **John Yodis, K2VV.**
- USA 28 MHz:** Walt Smith, K1DWQ (Bernie Welch, W8IMZ Memorial) Trophy. Won by: **John Rodgers, WE3C.**
- USA 21 MHz:** Wayne Carroll, W4MPY Trophy. Won by: **Michael Samanka, KA2AEV.**
- USA 14 MHz:** Gene Walsh, N2AA Trophy. Won by: **Station WS1M operated by Thomas Georgens, W2SC.**
- USA 7 MHz:** Dennis Younker, NE6I Trophy. Won by: **Steven Sussman, W3BGN.**

### MULTI-OPERATOR, SINGLE TRANSMITTER

- WORLD:** Ron Blake, N4KE Trophy. Won by: **Station LU8DPM operated by LU8DPM, CX8BBH, LU5UL, LU7UAF.**
- U.S.A.:** Austin Regal, N4WW Trophy. Won by: **Station N4WW operated by N4WW, K0LUZ, NX4N, AB4OM, K4SA.**

### MULTI-OPERATOR, MULTI-TRANSMITTER

- WORLD:** Roger Burt, N4ZC Trophy. Won by: **Station HG73DX operated by HA1's TH, TD, DAC, DAE, AH, HA5's GF, IW, WX, AWH, ML, CCC, UA, FM, VB, RY, HA6's NF, OQ, NY, ON, ND, PX, HA8's IE, IB, LKE, LLK, PG, HA8-806.**

### CONTEST EXPEDITION

- WORLD:** Ed Roller, N4IA Trophy. Won by: **Station 8P9EA operated by Olli Rissanen, OH0XX.**

### CLUB (SSB & CW)

- WORLD:** CQ Magazine Trophy. Won by: **Northern California Contest Club.**
- USA:** Oklahoma DX Association Trophy. Won by: **Yankee Clipper Contest Club.**

*\*Donor is responsible for trophy.*

Les Nouvelles DX Group from France and the Yankee Clipper Contest Club. Over 150 clubs were represented in 1992. To give your club the proper credit, please show the club name on your summary sheet.

The low-power category is becoming increasingly popular, with almost half of all single operator entrants using 100 watts or less. Some excellent scores were turned in, and I would expect to see more entries in this category in future years. Remember to mark your summary sheet low power or 100 watts to be included. Anyone wishing to sponsor a trophy (or more than one) for this category, please contact me. Over half of our logs come from Europe, and over half of all single operator entries are in the all band class. Twenty meters was the most popular single band, followed by 15 and 40 meters.

The jury is still out on a packet assisted category. I have had very few comments either way. With the proliferation of nodes throughout the world, a large percentage of stations are within reach of a packet network. Several who have used packet have entered in the multi-op category. If you think packet is a benefit in the WPX Contest, drop me a note. I can be reached at the N8BJQ cluster node for those in the midwest, at N8ACV for those who have access to the PBBS system, and my prodigy id is FXTD51A. US mail also works fine most of the time. Comments received will be reviewed for a possible rule change in 1994.

I apologize for not publishing high-claimed scores this year. Due to back surgery I was not able to get around much during the time I would normally have spent opening envelopes and put-

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## rfconcepts

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## Kantronics

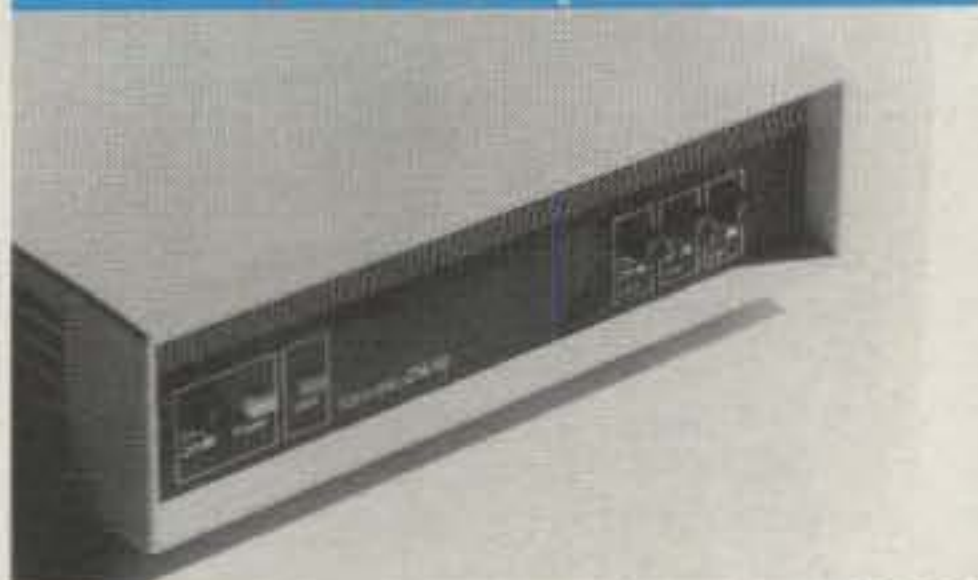
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K3ZO	3,999,310
WR3E	3,572,044
NR1E	3,449,320
WN4KKN/6	3,240,068
N3RS	2,837,115
KB0G	2,739,825
NI8L	2,563,990
K1XA	2,466,585
KA5W	2,365,915
AD5Q	2,137,734
K4POL	2,071,818
ND3A	1,963,920
AE6E	1,911,806
W8BI	1,909,766
4U1WB	1,794,481
KD2NE	1,766,656
N6TV	1,692,297
AA3B	1,616,220
K2PS	1,585,743

#### 28 MHz

WE3C	31,725
KS3F	31,320
KU2Q	31,050

#### 21 MHz

KA2AEV	1,405,072
N0BSH	713,673
WV5S	95,161

#### 14 MHz

K2VV	2,000,130
WS1M	1,690,120
WU3V/5	1,466,496
N4ZZ	1,201,662
W1FEA	1,197,369
W6RGG	1,166,364
W5FO	1,133,652
AA7NX	1,121,000
N9KAU	966,688
K8OQL	748,880

#### 7 MHz

W3BGN	1,251,212
NR2H	631,414
K8MFO	502,740
K7JYE	180,840
NQ1W	145,416
WJ2O	107,072

#### 3.5 MHz

N6SS	68,376
K2ONP	52,170
W3AP	10,998

#### 1.8 MHz

WT3Q	6,560
------	-------

### LOW POWER SINGLE OPERATOR ALL BAND

WR3G	1,397,682
------	-----------

K5RX	1,114,540
KV8Q	703,392
WA6IET	424,380
K9LJN	351,750
K9MMS	326,808
N8LM	312,480
KX4R	289,149
K2SHL	286,058
K4BAI	275,156

#### 28 MHz

KQ1V	2,272
------	-------

#### 21 MHz

WT8P	55,142
WX3R	38,016

#### 14 MHz

WB4TDH	264,480
W8UMR	193,242
W7HS	135,072
NJ3K	92,220
N8AA	79,100

#### 7 MHz

W3CPB	57,584
KX7L	45,892
KB9BIB	34,568
W8AKS/6	7,564
KU6T	6,840

#### QRP/p

W2GD	A	741,802
AA2U	A	732,018
N7IR	A	266,952
WA6FGV	28	1,485
KS5H	21	15,330
N0AX	14	229,848
NJ1T	14	223,816
W8QZA/6	7	26,894
AA6XX	3.5	4,576

### MULTI-OPERATOR SINGLE TRANSMITTER

N4WW	7,168,734
WC4E	4,958,194
KW8N	4,089,852
NQ0I	3,624,640
AG6D	2,309,985
K3WW	1,563,983
WE0B	1,437,296
AC8W	1,416,070
KC1F	1,232,072
WJ7M	1,222,980
AD1S	1,096,480
KC5DX	1,002,318

### MULTI-OPERATOR MULTI-TRANSMITTER

WZ1R	6,824,800
AA6TT	5,439,000
WD8LLD	3,071,900
NG1J	130,764

ble like 3X0, ZD8, FY5, and TU4 . . . XA5T. I am amazed I worked anyone. I am in temporary quarters; all my furniture has been shipped back to the US in preparation for my return to Virginia. I kept the rig out to make this one last effort at contesting from Israel. See you next year. . . . 4X/AA4KD.

First time in 10 years to enter from Japan. Really enjoyed the Marathon software for the Macintosh. . . . 7J1ABV. This is my first experience to get in this contest. Thanks. . . . 7K2GMF. It's 13 years ago when I last operated in contest on 20 meters seriously. Happy to be back again. . . . 7L1GVE. Two dipoles were built. One is for W's and the other is for EU's. They worked well, so I could work W's and EU's at the same time. . . . 7M1MCT. QRP and low power combo was lots of fun. . . . 7Z2AB. I love all kinds of CW contest, but during May/June is very bad wx condx out here. Lightning and thunderstorms almost every night, so cannot work many DX this time. . . . 9M2FK.

This is truly one of my favorite contests, the other being the CQ WW DX Contest. This year propagation was not very favorable as can be seen from my total number of QSOs. . . . 9M2NA. My third DXpedition to 9M8 for a third contest. Aug. 91—VK2DXI/9M8 (WAE CW), Nov. 91—9M8DX (CQWW CW), May 92—9M8DX (WPX CW). Great hospitality of local hams (9M8FH) and great QTH—Holiday Inn hotel. . . . 9M8DX. Maybe next year an outdoor antenna or computer. Love it! . . . AE2N. I lost one tube in amplifier halfway through the contest, and came away only 30 QSOs short of a new VE record. . . . CI2ZP.

This was the first time I used a balloon-supported antenna. I started contest and worked 5 hours quite successfully. After the band went

dead I switched off. Nine hours later I got up and wanted to start again, when the balloon burst. . . . DF4SA. Nice contest es good condx. Had only 20 hours because the local QRM by our new baby was too big! . . . DF4ZL. Only two stations worked from USA, but all continents on 10 meters. In Europe was a lot of sporadic-E, but not everybody noticed that. . . . DK2PH. This was my first WPX, but I suppose you'll hear me again. . . . DL0ER.

It is nice for a DL to get a call by rare DX like C6, ZF, ZP, 6Y, VP5, etc. That's WPX! . . . DL4MCF. First year (after 12 years) that I needed to go to work during the CQ contest, so not enough time for the contest. See you next year. . . . EA6GP. EF3VK is special call for WPX Contest SSB/CW from EC3CTU. . . . EF3VK. As I live in an apartment, I have set up my antenna in my room. Calling stations is quite tough. . . . FIJE2SOY. No doubt that sunspots are in decline! . . . GB8FX. This was the first year in WPX CW Contest running GX5QX. Due to severe re-



OH8SR operated TU4SR to the top spot on 21.

strictions operation was limited to 19 hours on the air. . . . GX5QK.

Fantastic, I never made so many QSOs. The bands were so crowded. It was hard to find a free kHz to call "CQ Test." . . . IK0HBN. My first contest WPX! . . . IS0UWX. Good discipline and good manner. Especially U.S.A. stations. . . . JH1AOU. My target was 200 QSOs but cycle 22 help me over the 350 QSO even 100 watts and 2-ele quad! . . . JR4GPA. Many American contest operators have good antenna and good ears (hi).



The voice of P31A, Ivo, 5B4ADA, stands in front of his 14-element log periodic.

## CW & SSB CLUB COMPETITION

<b>NORTHERN CALIFORNIA CONTEST CLUB</b> .....	<b>97,527,906</b>	HOOSIER CONTESTERS.....	5,149,006
ARAUCARIA DX GROUP.....	61,733,318	EASTERN HIGHLANDS AMATEUR RADIO CLUB.....	5,099,601
LES NOUVELLES DX GROUP.....	56,387,895	YOUNG TECHNICAL PALACE CLUB.....	5,064,150
<b>YANKEE CLIPPER CONTEST CLUB</b> .....	<b>49,776,389</b>	SOUTHWEST OHIO DX ASSN.....	5,012,073
CT3M RADIO SPORT TEAM.....	41,324,256	NORTH WEST AMATEUR RADIO CONTEST GROUP.....	4,955,720
DHAHRAN AMATEUR RADIO CLUB.....	41,324,256	URE.....	4,921,557
NORTH TEXAS CONTEST CLUB.....	39,356,114	RADIO CLUB ARGENTINA.....	4,801,443
FRANKFORD RADIO CLUB.....	36,286,851	SOUTHEASTERN DX CLUB.....	4,793,531
NORTH COAST CONTESTERS.....	30,464,328	CT DX CLUB.....	4,529,316
R.C. OF KAUNAS UNIVERSITY OF TECHNOLOGY.....	23,995,682	WEST SIBERIA DX CLUB.....	4,282,192
BAVARIAN CONTEST CLUB.....	20,536,531	FRASER VALLEY DX CLUB.....	4,199,789
PRINCE GEORGE CONTEST CLUB.....	20,228,367	KENTUCKY CONTEST CLUB.....	4,012,079
OKLAHOMA DX ASSN.....	19,733,419	ARI MILANO.....	3,989,764
FLORIDA WESTCOAST DX RING.....	19,348,293	GLOUCESTER COUNTY ARC.....	3,882,750
MAD RIVER RADIO CLUB.....	19,253,764	REGINA AMATEUR RADIO ASSN.....	3,746,613
POTOMAC VALLEY RADIO CLUB.....	19,113,032	THE ENGLISH SCHOOL RADIO CLUB.....	3,694,490
TEXAS DX SOCIETY.....	15,998,726	RADIO CLUB CORDOBA.....	3,554,550
WESTERN WASHINGTON DX CLUB.....	14,596,160	SCHENECTADY AMATEUR RADIO ASSN.....	3,522,534
PRIE NERIES.....	13,973,983	ALBANY AMATEUR RADIO ASSN.....	3,513,944
SOUTHERN CALIFORNIA CONTEST CLUB.....	13,343,654	THE NORTHERN CORRIDOR RADIO GROUP.....	3,510,912
RESEAU DES EMETTEURS FRANCAIS (REF).....	12,949,233	TUPY DX GROUP.....	3,473,655
RHINE RUHR DX ASSN.....	12,584,826	ASCENSION ISLAND RADIO CLUB.....	3,242,034
OASIS AMATEUR RADIO CLUB.....	12,408,321	NYORE CONTEST CLUB.....	3,099,420
NEW MEXICO BIG RIVER CONTESTERS.....	12,102,376	CITY OF BRISBANE RADIO SOCIETY.....	3,088,176
MARTLESHAM DX & CONTEST GROUP.....	12,001,386	ST. CROIX AMATEUR RADIO CLUB.....	2,852,460
SOCIETY OF MIDWEST CONTESTERS.....	11,894,536	UKRANIAN CONTEST CLUB.....	2,708,946
CHILTERN DX CLUB.....	11,769,777	GRAND MESA CONTESTERS.....	2,686,919
CENTRAL VIRGINIA CONTEST CLUB.....	11,655,686	MILANO ITALY DX GROUP DELTA MIKE.....	2,664,792
CONTESTGROEP OUDE MAAS.....	11,509,968	SP DX CLUB.....	2,662,803
CENTRAL FLORIDA DX ASSN.....	11,459,411	ASOCIACION DE RADIOAFICIONADOS DE VENEZUELA.....	2,411,520
LOCOS DX GANG.....	10,009,980	MINNESOTA WIRELESS ASSN.....	2,388,160
KICAE RADIO CLUB.....	9,659,146	PARLINC.....	2,369,180
RADIO SOCIETY OF KENYA.....	8,837,731	THE BULLMERTZ.....	2,355,392
CONTEST CLUB OPOLE.....	8,402,912	BLACKHAWK DX & CONTEST CLUB.....	2,309,991
MAUI DX ASSN.....	8,394,030	PERMIAN BASIN DX ASSN.....	2,205,404
SAO MIGUEL DX TEAM.....	8,345,826	ORARI.....	2,155,766
KANSAS CITY DX CLUB.....	7,999,787	RCA.....	2,091,672
CHENGDU CQ RADIO CLUB.....	7,960,456	WESTERN NEW YORK DX ASSN.....	2,086,865
VARGINHA DXGROUP.....	7,873,680	WIESBADEN A.R.C.....	2,080,068
ALASKA DX ASSN.....	7,545,246	WOODBIDGE WIRELESS ASSN.....	2,004,407
A.R.A.R.M.....	7,394,504	LEFT COAST CONTEST CLUB.....	1,939,753
TOP OF EUROPE CONTESTERS.....	7,208,951	DAUBERVILLE DX ASSN.....	1,926,045
MACHINE CONTEST CLUB.....	6,936,583	WINNIPEG DX CLUB.....	1,908,724
MILE HI DX ASSN.....	5,971,982	SOUTHEND AND DISTRICT RADIO SOCIETY.....	1,547,440
RCP APDX.....	5,876,110	NORTHERN CALIFORNIA DX CLUB.....	1,496,391
FALL CREEK CONTEST CLUB.....	5,802,963	UTAH CONTEST CLUB.....	1,465,203
TEUVA RADIO CLUB.....	5,729,159	RADIOTEAM FINLAND.....	1,450,790
LEGION OF INDIANAPOLIS DX'ERS.....	5,280,093	GRUPO DX PANAMERICANO.....	1,443,278

... JR5EHB. I miss 10 meters! ... K2PS. Boy, do I miss those few extra hours of sleep! ... K2VV. Low flux evident in reduced QSOs on 10/15, but 80 surprisingly good. ... K3ZO.

My first effort at WPX. Bad conditions but 40 meters is always fun! ... K7JYE. Don't know what was more exciting, the contest or having the State Police stop by thinking I was a thief. ... KA2AEV. Smoked amp; put backup in line and continued. Smoked backup amp; fixed main amp and finished contest. ... KB0G. A 15-year-old's dream weekend—two large pizzas, six liters of Mountain Dew, and an FT-1000. ... KF8QE. More Q's and more mults than last year but less score. ... KM0L. Heard Europe both days on 10 meters but could not get them. ... KQ1V. Lots of QRN to fight this year—spotty condx—but still enough new prefixes to keep up interest. ... KS7T.

Secret weapon this year was to guest-op at my wife's station and to use her 5-element Yagi at 200 feet. Didn't need a rotator; the beam stayed pointed south all weekend. ... KU2Q (K5NA Op.). Forget deficit spending, taxes, and all that other political garbage. I'm voting for the guy who will guarantee "proper gation" for the next contests. ... KV8Q. I heard a rumor that

"WPX" stands for "Weekend of Poor Condx." ... KX7L. We lost Jorge Bozzo, LU8DQ, a great person and a top CW contester. This is the first WPX without him, so I would like to dedicate this test to his memory. Chau, Jorge. ... LU6EBY.

Poor condx on 21, 28 MHz second day. Not a very good effort this year. ... LZ3DX. The long path to Europe both nights on 15 meters was a neat little treat. ... N0BSH. Worked hard, got a little practice for field day. ... N4LJS. This is my first world-wide single operator contest. Really enjoyed it. ... N9KAU. XYL likes CT—no paperwork. ... NJ3K. A fb contest and the condx were good in OZ. Hope the log is ok; my PC and I still ain't too fast, but we will train and hopefully get faster. ... OZ5ABD. Too much paperwork with 3734 QSOs in my log. ... P31A.

\* Tnx again for a nice weekend. ... PA3ELD. Seven MHz was great! ... PW2A. UAU! They are an army! ... PY3LHB. Unfortunately condx to W and JA was too bad. That is why mult isn't so high as before. Hope to see more DX from overseas next time. 73! ... UT5UGR. Look for me from another DX spot next year. ... V40ITU. This was my first contest and it was great except for getting tired and stupid. Wish I had stuck to one band. ... VE1ST. Very first CQ WPX Con-

test. It was great. I will be there next year for sure! ... VE2GHI. Nice to hear FK8CP coming through on 160, but shame no takers to his many CQ's. ... VE3DO.

There sure are some strange calls out there! ... VE3EJ. Was very happy to work two new countries in the limited time I had. ... VE5MX. European stations will have to learn to call CQ and work stations instead of riding piggyback on others. ... VU2NTA. First time in this contest (it usually comes on Memorial Day weekend). Had fun doing it the "old fashioned way"—computerless. ... W2HTX/0. Working everything I heard with only the transceiver at 80 watts. Fun fighting the pileups with low power! Especially proud of my 7 MHz contacts with only 80 watts. ... W4YN.

K2VV is tough. ... W5FO. Intermittent problems in rig cost me a lot of op time! ... W7HS. Gad—where did the propagation go? Went on a picnic Saturday. ... W7WHY. Generally poor conditions on the high bands due to low flux levels, but a few nice surprises on 20 meters. Good low-band conditions had me wishing for longer nights! ... W8BI. Too many US stns hogging freq and drowning out DX stns. One DX stn kept saying to QSY, freq occupied. ... W8UMR.

FRENCH DX FOUNDATION	1,395,968	ARI SEZ. COLLI EUGANEI	187,380
SOUTH GERMAN DX GROUP	1,393,349	CRAWFORD AMATEUR RADIO SOCIETY	173,520
ARI	1,303,500	CLUB DE RADIO AFICIONADOS DE EL SALVADOR	172,656
MOSCOW DX CLUB	1,229,475	NORTHERN LITHUANIA DX GROUP	167,301
DX CLUB CHITA	1,225,350	ARI DX CLUB	164,318
FALMOUTH AMATEUR RADIO ASSN.	1,195,110	NAKED CHICKEN CONTEST CLUB	153,204
CALGARY AMATEUR RADIO ASSN.	1,164,289	STERLING PARK ARC	145,808
SNAKE RIVER CONTEST CLUB	1,121,000	KETTLE MORAINES RADIO AMATEUR CLUB	145,530
UCLA ARC	1,073,754	GREAT DISMAL SWAMP DX ASSN.	145,416
PROVIDENCE RADIO ASSN.	1,018,810	LAKE WETTERN DX GROUP	144,300
NEC FUCHU PLANT AMATEUR RADIO CLUB	903,420	NORTHERN OHIO DX ASSN.	137,106
CANADIAN INTERNATIONAL DX CLUB	864,280	VALLEY RADIO CLUB OF EUGENE	135,762
NAGOYA DX CLUB	834,980	THE GREAT DISMAL SWAMP DX ASSN.	128,164
ARCTIC AMATEUR RADIO CLUB	795,450	MALAYSIAN AMATEUR RADIO TRANSMITTING SOCIETY	115,767
DX NEWS MAGAZINE	792,048	OHIO VALLEY AMATEUR RADIO CLUB	113,004
RED DRAGON DX CLUB	740,440	TORONTO DX CLUB	108,290
SPLITROCK ARA	732,018	RIP VAN WINKLE AMATEUR RADIO SOCIETY	94,348
NIAGARA PENINSULA AMATEUR RADIO CLUB	722,362	LES BACORES DX	91,107
SHASTA DX/CONTEST CLUB	691,821	RADIOCLUB BUCAREST	90,000
RADIOAMATEUR CLUB ZAGYVARONA	689,991	SAN FERNANDO VALLEY RADIO CLUB	86,436
ORDER OF BOILED OWLS	644,612	EASTERN NEW MEXICO AMATEUR RADIO CLUB	82,038
FOX CONTEST CLUB	639,941	ALFORD MEMORIAL RC	77,035
CENTRAL ARIZONA DX ASSN.	636,389	REDE DOS EMISSORES PORTUGUESES	75,255
YU DX CLUB	633,784	RADIO CLUB OF FINNISH PARATROOPER SCHOOL	73,950
CAROLINA DX ASSN.	615,750	SAVANORIU RADIO KLUBAS	71,945
LITHUANIAN CONTEST GROUP	614,880	HAMFESTERS RADIO CLUB	68,475
ST. LOUIS AMATEUR RADIO CLUB	600,710	YV DXPERS TEAM	67,050
DIXIE DX'ERS CONTEST CLUB	587,636	POWAY A.R.S.	62,992
SOUTHERN CALIFORNIA DX CLUB	559,471	BEARS	62,040
ROCHESTER DX ASSN.	547,998	EASTERN IOWA DX ASSN.	51,832
NORTHERN LITHUANIA CONTEST GROUP	527,922	TRINITY COUNTY ARC	47,838
BLOSSOMLAND AMATEUR RADIO ASSN.	522,070	HIGHWAY GENTLEMEN RADIO CLUB	43,632
LONE STAR DX ASSN.	482,034	FAGERSTA AMATEUR RADIO CLUB	33,840
GRUPO ARGENTINO DE RADIOTELEGRAFIA	428,796	WEST PARK RADIOPS	33,345
MAXWELLTOWN A.R.C.	396,664	ARI SAN DONATO MILANESE	31,624
WILLAMETTE VALLEY DX CLUB	391,322	SOUTHERN OREGON DX ASSN.	31,120
SHEN VALLEY CONTESTERS	349,928	MIDDLE TENNESSEE DX CLUB	31,024
C.R.A.N.T.A.C.	340,607	COLUMBUS AMATEUR RADIO ASSN.	17,111
SALT CITY DX ASSN.	293,880	SOUTH JERSEY RADIO ASSN.	16,374
NORTHSEA DX CLUB	269,416	VICTOR 63 FISHERIES ACADEMY	14,484
NO DOT DX'ERS	262,350	GREAT SOUTH BAY AMATEUR RADIO CLUB	13,835
KINGSPORT AMATEUR RADIO CLUB	249,275	MERIDEN ARC	13,400
ARI ITALIA	241,230	TOKYO INTERNATIONAL AMATEUR RADIO ASSN.	12,408
SIERRA FOOTHILLS A.R.C.	238,700	SAN DIEGO DX CLUB	9,880
KREMALA CONTEST GROUP	236,022	MVARC	2,050
NORTH JERSEY DX ASSN.	232,350	ELFA HAM GANG	2,028
SAWYER COUNTY CONTEST AND FISHING CLUB	226,920	E-SYSTEMS ARC	432
STRATFORD AMATEUR RADIO CLUB	208,172		

The last hours on Sunday I was having a bad time getting anyone to hear me—and finally looked down at my output meter and found that I was down to 10 watts. Don't know what happened, but rig is in the shop. . . . W9HE.

This shows what happens to the limited antenna station when 10 meters is dead! . . . W9WI. New World Record low score. . . . W9XR. Low power is fun, but it is hard to maintain a good QSO rate. . . . WA6IET. Thanks for instituting the low-power category. It was fun despite the rather poor condx. . . . WB4TDH. Two new zones towards 5BWAZ. . . . WC5D. Enjoyed the test immensely. Will try harder next year. . . . WC7Q. First contest as Frankford RC member and with relatively rare prefix. Loved it and can't wait for next one. . . . WN3K. The change from 30 to 36 hours was a real pain, especially from the West Coast. . . . WN4KKN/6.

Low power just couldn't puncture the high absorption. I felt like QRP! . . . WR3G. At age of 71 years, lasting as long as I did! Gotta get a hearing aid! . . . WT8P. Was nice to be the only WU5. CU next year. . . . WU3V/5. Next year new QTH; new antennas; more time. . . . WX9U. Worse than 1991. Hope next year better. . . . YB2FEA. Very good contest, second day problems antenna 14

MHz. . . . YU7AV. Expedition to Cubagua Island. . . . YY7C. Last yr as VP2VDX w/100 and tri-bander at 25 ft., this year, KW and TH7 at 95 ft., 1 million points difference, next year 40 meter beam at 80 ft. . . . ZF1A.

Rotten conditions plus RF in logging computer—not a great way to test drive my new call! (ex-ZS6BCR) . . . ZS6EZ. This was very first time I used a special contest callsign. It was great. . . . ZW2Z.

### Station Operators Multi-Op, Multi-Transmitter

**AA6TT:** AA6TT, N5FA, AI9X, K7UP, AA5B, F1JTL, W7LHO, N5SD0. **CZ7Z:** VE7AV, VE7CV, VE7DRS, VE7EME, VE7ENS, VE7MKA, VE7QO, VE7RBL, VE7SK, VE7SSS. **EZ6L:** UA6LO, UA6LV, UV6LPL, UB5IBG, UB5ITW, UA6-150-1103, UA6-150-1403. **GB5CW:** AA6MC & G3SZA. **HG73DX:** HA1's TH, TD, DAC, DAE, AH, HA5's GF, IW, WX, AWH, ML, CCC, UA, FM, VB, RY, HA6's NF, OQ, NY, ON, ND, PX, HA8's IE, IB, LKE, LLK, PG, HA8-806. **JA1YXP:** JS1INN, JQ1UXN, JE1BHJ, JJ1WYS, 7N1IAP, 7K1QOE, JI7QPV, JI2KRK, 7N1SYP, 7M1DVT, JF1QOW, JJ10JG, JS1XEX, JF0EWJ, JI6WOH, JP1AEQ.

**JA3YBF:** JE3PED, JF3HXJ, JH3NFZ, JL3TMH, JO3LDN, JF4FUF, JG4CLV, JS3CGH. **JA7YAA:** JF1CKX, JF1PQT,

JE7JZC, JF7AMB, JG7PSJ, JE0AWL. LA5F, LA9WDA & LA0GE. **LY2WW:** LY1BA, LY1DC, LY2BIJ, LY2BMW, LY2PX. LY7A: LY2's NK, OO, BFN, BMX, BNC, BOA, BUH, LY3BN, LYR-346, LYR-1751. **NG1J:** NG1J. **WD8LLD:** AF8A, WD8AUB, WD8LLD. WZ1R: WZ1R, KY1H, N2MG, AA1AS, NU1P, WT1T, NS1M, N2DU. **YT7TY:** Bosko & Dusan.

### Station Operators Multi-Op, Single Transmitter

**4J1FS:** RV1AW, UA1AKC, UA1ALZ, UV1AA, UT4UZ, UA1CFL, OH2MAM, OH5BM, OH1NOA, OH1EH. **4U7ITU:** DF1SD, DF3SP, DF7TU, DJ0YI, HB9BUN, HB9CJG. **AC8W:** AC8W, K8DD, N8COA, KJ8A, AA8EL. **AD1S:** AD1S, NJ1V, N5DLM. **AG6D:** AG6D, N1EE/6, N6IP, N6YK. **AM3KU:** EA3AIR, EA3DU, EA3FER, EA3GAS, EA3KU, EA3LL/2op. **DF0WA:** DF5UL, DL2MEH, DL2SCJ. **DK0TZ:** DL1S8F, DL1SEM, DF5EN.

**DL0CMA:** DL1EDB, DL2EBX, DL80BD. **DL0DG:** DJ4EO, DL1EIC, DG5EM, DL1EJM. **DL0UM:** DK7ZT, DK7FP, DL2ZAE. **DL3NCW:** DL3NCW & DL1EFW. **F5IN:** F5IN, F6ARC, F5QF, F6DZS. **FF0XX:** F1NYQ, F6IMS, HB9BZA, OE4BKU. **GB1RS:** G3SJJ, G3SOX, G3VHB, G4BK1, G4BUO, G4IFB. **GX4ALE:** G3UFY, G3VYI, G3WRR. **HA6KNG:** HA6KNV, KA6NW, HA6OB, HA6OD, HA6OI, HA6OY, HA6YL, HA6YW. **HA8KCK:** HA8KH, HA8FW, HA8FT, HA8EK, HA8DZ, HA8DT.

**HA8KVK:** HA8RH, HA8VK. **HB0/DA1WA:** DJ9CB & DA1DC (K3WUW). **HG3CW:** HA3NU, HA3OV, HA5OF, HA5OQ, HA8RF, HA3NS. **HS0AC:** HS1AAM, HS1CDX, G3NOM/HS0,

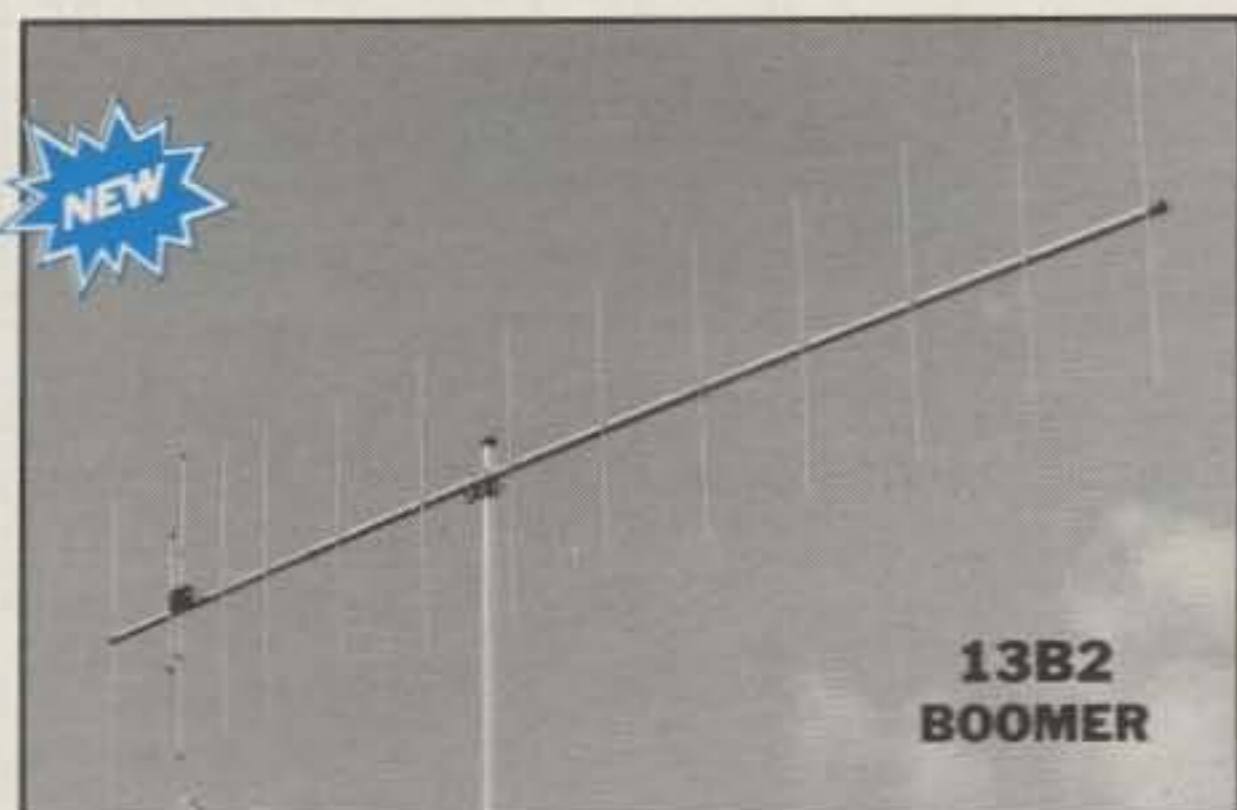




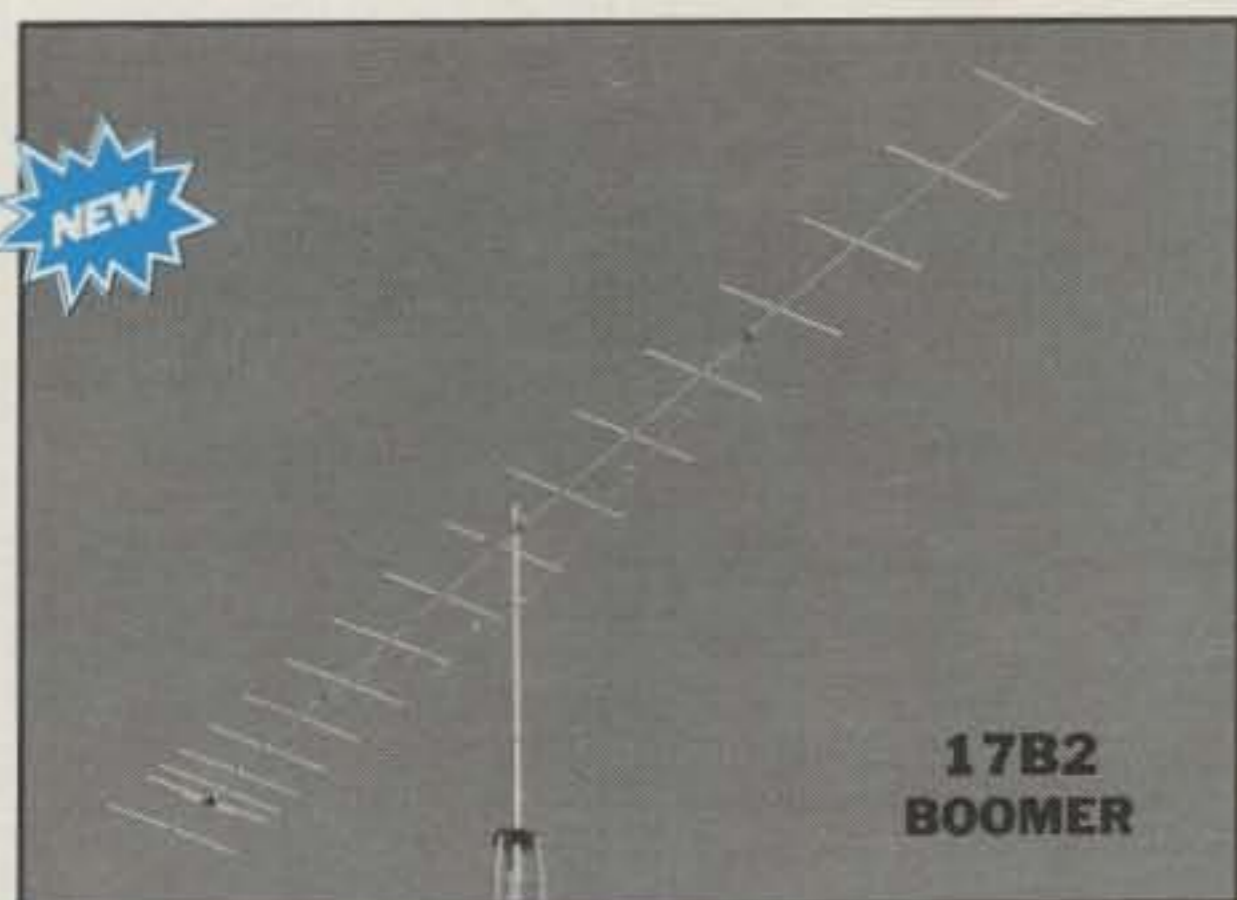
# Cushcraft

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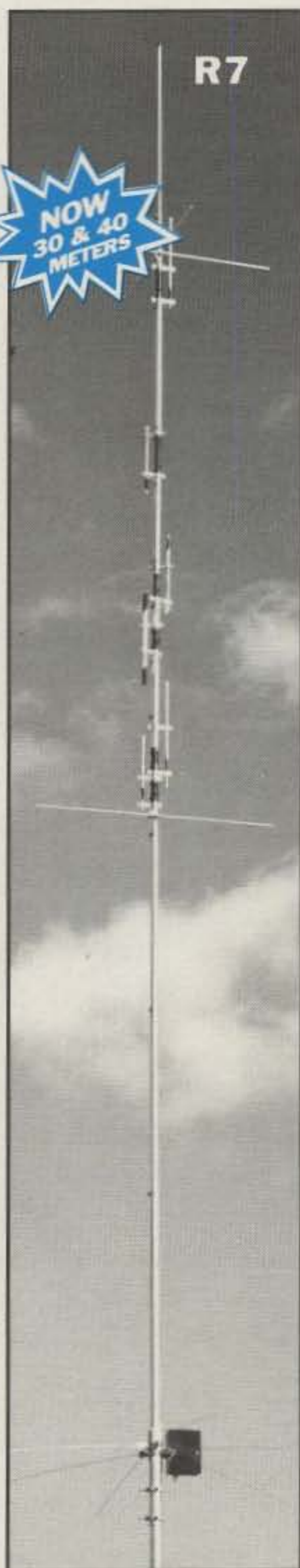
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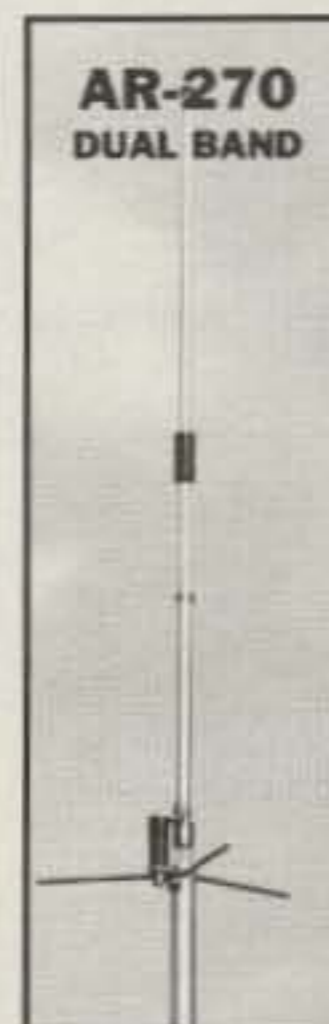
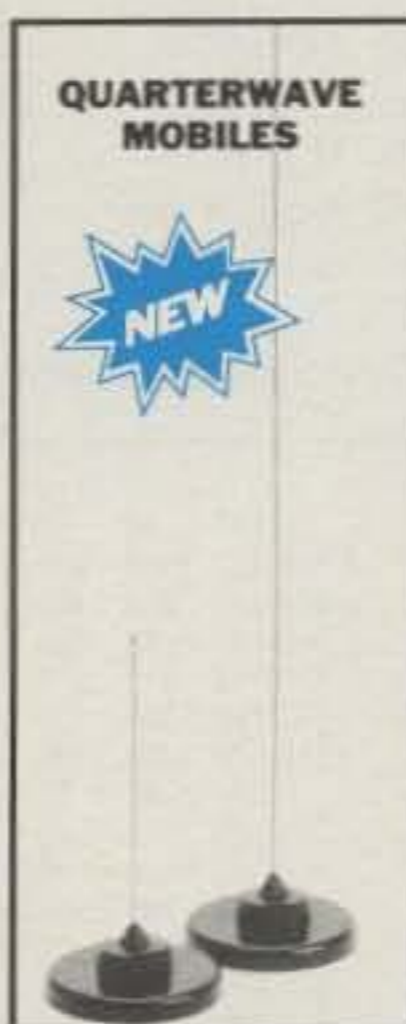
**BOOMERS.** Two new models. The contest winning 17B2 for EME, Tropo, SSB, CW or the 13B2 for FM, Packet or SSB over the whole 2 meter band. Both models have the new UltraMatch balanced feed system. Computer aided design gives you the cleanest pattern and the highest gain available.



**SKYWALKER MONOBANDERS.** 10, 15, 20 and 40 meter Yagis for more contacts, less waiting and a better signal. Preferred by contesters and DX-peditions worldwide.



**HF TRIBAND BEAMS.** A3S - The most popular compact 10, 15, 20 meter beam. A4S - A high performance 18' long wideband beam. Both models come with stainless steel hardware and have optional 40 meter add-on kits.



**DUAL BAND RINGO.** Only 45 inches tall! A must for the new dual band transceivers covering 70 cm and 2 meters. Model AR-270.

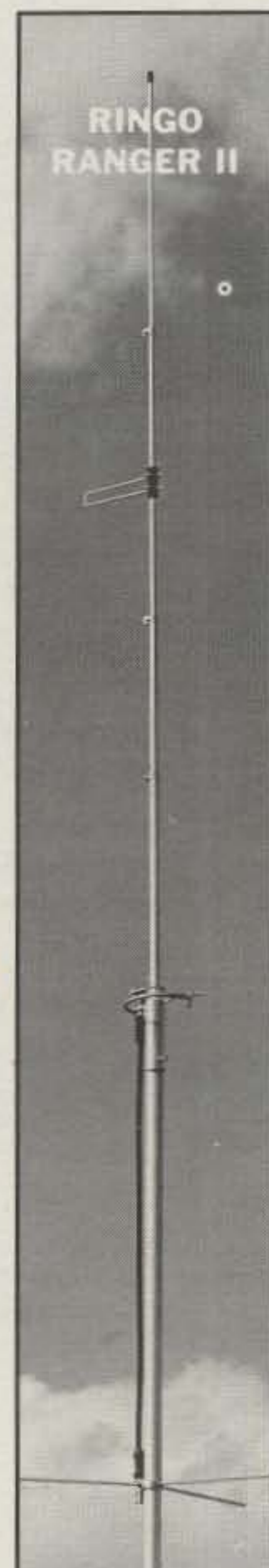
**CUSHCRAFT/SIGNALS QUARTERWAVE MAG-MOUNT.** These commercial grade high quality mobile antennas are factory tuned to give you quick and easy coverage of the 2 meter or 70 cm band. We offer a full line of high performance mobiles for 1-1/4, 2, 6, 10 meters and 70 cm.

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# CQ REVIEWS:

## The JRC JRL-2000F HF Linear Amplifier

BY PAUL CARR\*, N4PC

Perhaps Japan Radio Company is best known for its commercial marine equipment, but they also have established themselves as a supplier of high-quality radio equipment for the amateur radio market.

The first thing that impressed me when I removed the amplifier from its carton was the nice, "clean" appearance. Not only should this please the amateur, but the XYL or OM as well. The equipment will look good either in a dedicated shack or in a room shared by the entire family.

### An Overview

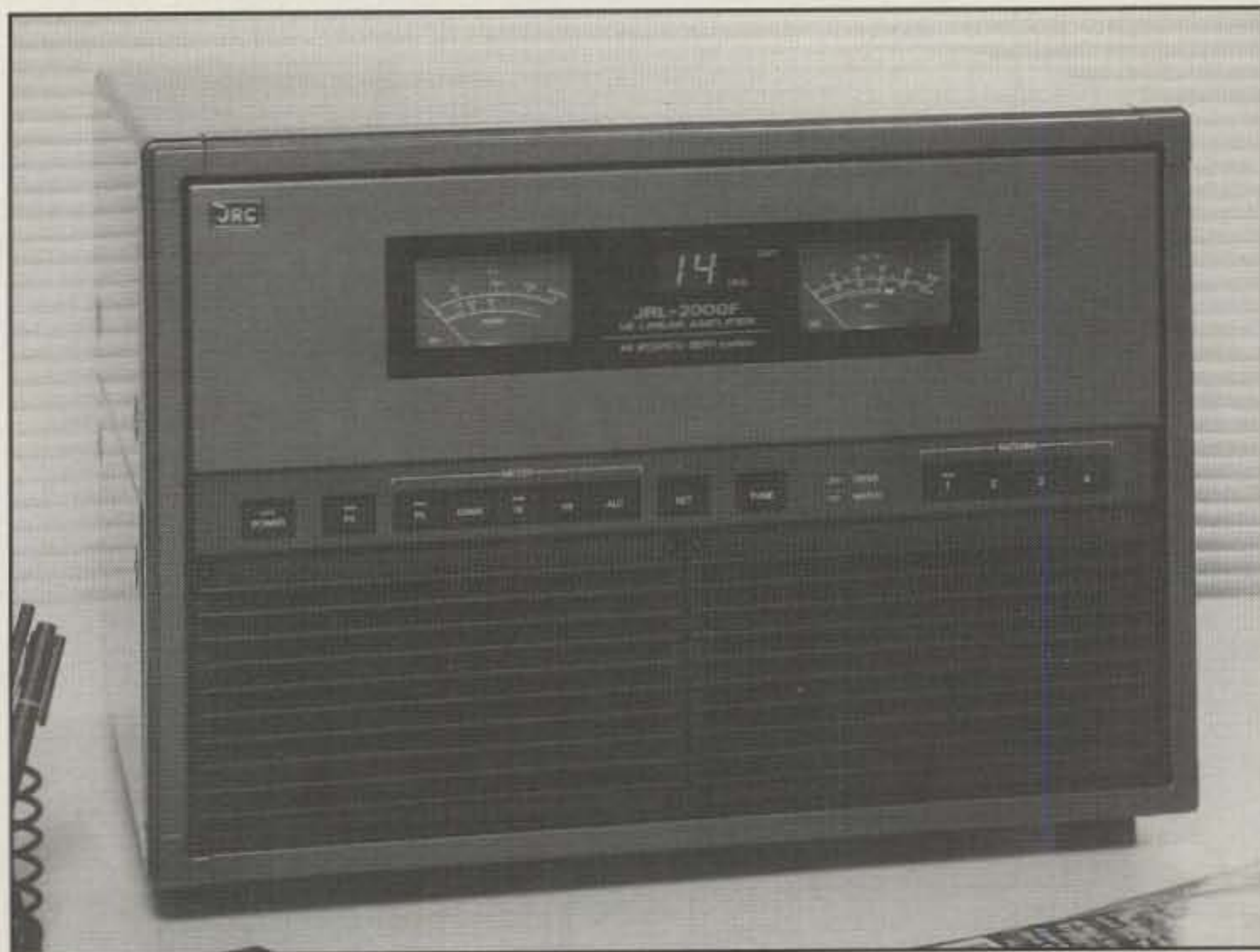
Now let's see some of the features claimed by this equipment. The JRL-2000F is a fully transistorized, fully automatic HF linear amplifier. The final, which has 48 RF power MOSFETs, has a rating of 1000 watts output at a 100%

\*97 West Point Rd., Jacksonville, AL 36265

<b>Operating frequency bands:</b>	1.8, 3.5, 7, 10, 14, 18 & 21 MHz amateur bands. (24 & 28 MHz bands: antenna tuner only)
<b>Rated output power:</b>	SSB 1 kW PEP* 100% duty cycle, 24 hour. CW 1 kW* 100% duty cycle, 24 hour. FSK/SSTV 1 kW* 100% duty cycle, 1/4 hour.
<b>Output impedance:</b>	50Ω unbalanced, VSWR 3.0 (16.7-150Ω)
<b>Harmonics:</b>	-60 dB or less
<b>Intermodulation distortion (IMD):</b>	-35 dB or less below PEP (at 1 kW output)
<b>Input impedance:</b>	50Ω unbalanced
<b>Exciting power:</b>	100W max.
<b>Frequency switching time:</b>	Less than 0.1 sec.
<b>Power supply voltage:</b>	85 to 264 VAC, single-phase
<b>Power consumption:</b>	2.5 kVA or less (at 1 kW output)
<b>Input power factor:</b>	95% or more (at 1 kW output)
<b>Temperature range:</b>	-10° to 40°C
<b>Protection circuits:</b>	PA excess current; PA overheat; PA abnormal load; AC power supply excess voltage; power supply overheat; PA failure; excessive antenna VSWR; exciting power excess; and antenna matching anomaly.
<b>Dimensions:</b>	Approx. 17"W x 12"H x 17"D
<b>Weight:</b>	Approx. 62 lbs.

\*Note: Rated output on 200-240 VAC. The rated output power on 100-120 VAC is 750 W PEP.

Table I—Specifications of the JRC JRL-2000F linear amplifier.



Front view of the JRL-2000F amplifier. The unit can be placed anywhere in the shack and remotely operated via the NCH-365 Controller.



Resembling a TV remote control, the NCH-365 Remote Controller allows you to check and change things as easily as you would switch TV channels.

### ICOM

IC-728 HF Xcvr./Gen. Cov. Rcvr. ....	\$809.00
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IC-2410H 2-Mtr./440-MHz, FM, 45W/35W .....	779.00
IC-3230H 2-Mtr./440-MHz, FM, 45W/35W .....	699.00
IC-2GAT 2-Mtr., FM, Handheld With T-T .....	334.50
IC-4GAT 440-MHz, FM, Handheld With T-T .....	299.50
IC-W2A 2-Mtr./440-MHz, FM, Mini H-H W/T-T .....	439.50
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BP-5 10.8 VDC, 425 mA, Ni-Cad Batt. Pack .....	71.00
BP-7 13.2 VDC, 425 mA, Ni-Cad Batt. Pack .....	85.00
BP-8 8.4 VDC, 800 mA, Ni-Cad Batt. Pack .....	85.00
CM-96 8.4 VDC, 1200 mA, Ni-Cad Batt. Pack .....	95.00
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13B2 144 To 148-MHz, 13-Element Beam .....	95.00
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A449-6 440 To 450-MHz, 6-Element Beam .....	38.00
A449-11 440 To 450-MHz, 11-Element Beam .....	55.00

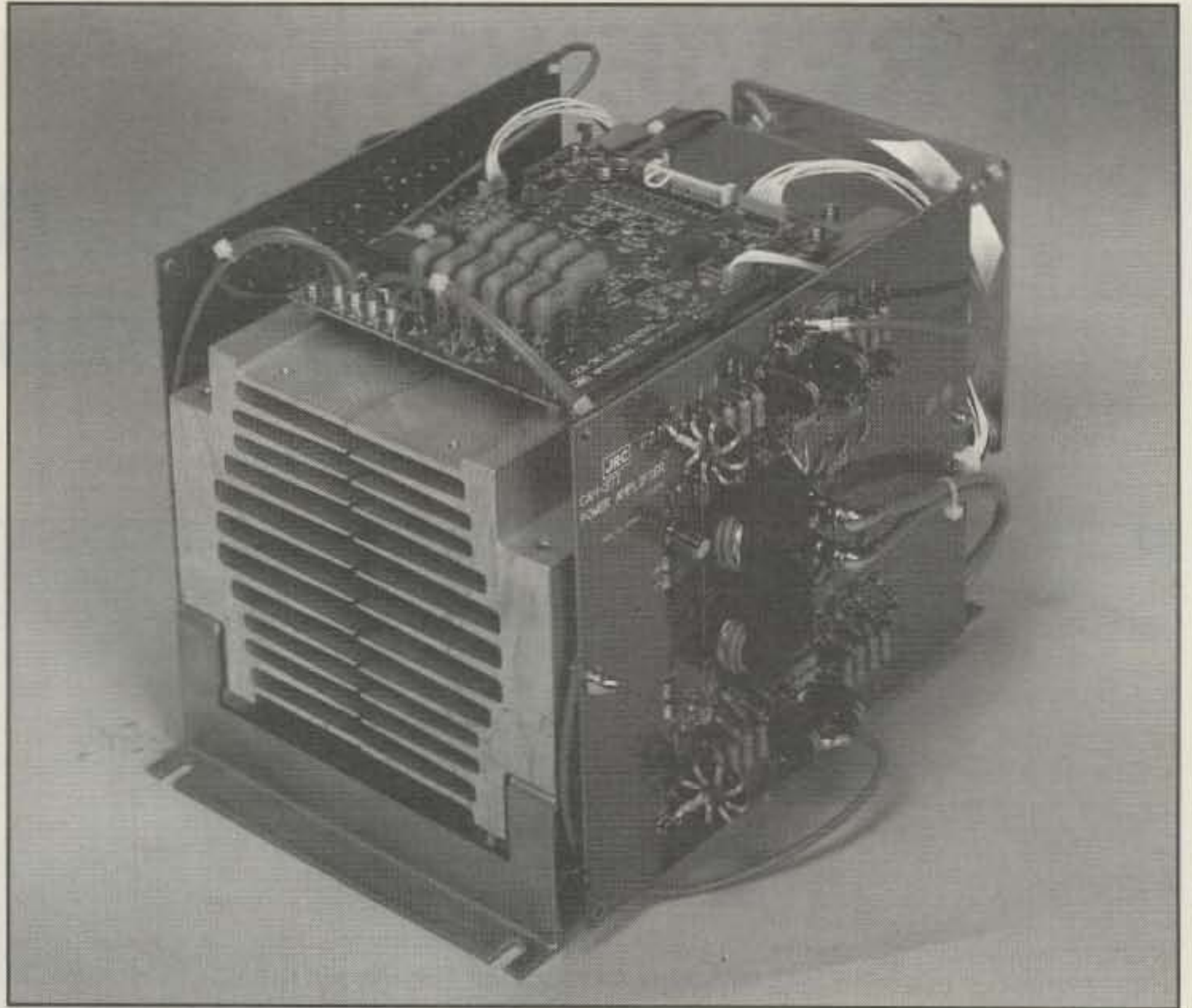
### ASTRON

RS-7A 13.8 VDC, 7 Amp Int., 5 Amp Cont. ....	\$49.50
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*This is what the solid-state PA module looks like.*

duty cycle (CW and SSB) for 24 hours. (Yes, I did say 24 hours.) The second feature that caught my eye was the built-in automatic antenna tuner. This tuner has a memory capacity of 1820 channels to provide for instant QSY. There is also a self-contained switching power supply (input voltage 80 to 264 VAC). Additionally, there are provisions for connecting four antennas that are instantly selectable by panel-mounted push-button switches.

Think you have heard everything? Not quite. There is also a remote-control unit very much like a TV remote, which allows you to mount the unit anywhere in the ham shack if you so desire.

### Specifications

Table I lists the electrical and physical specifications of the JRC 2000F. The

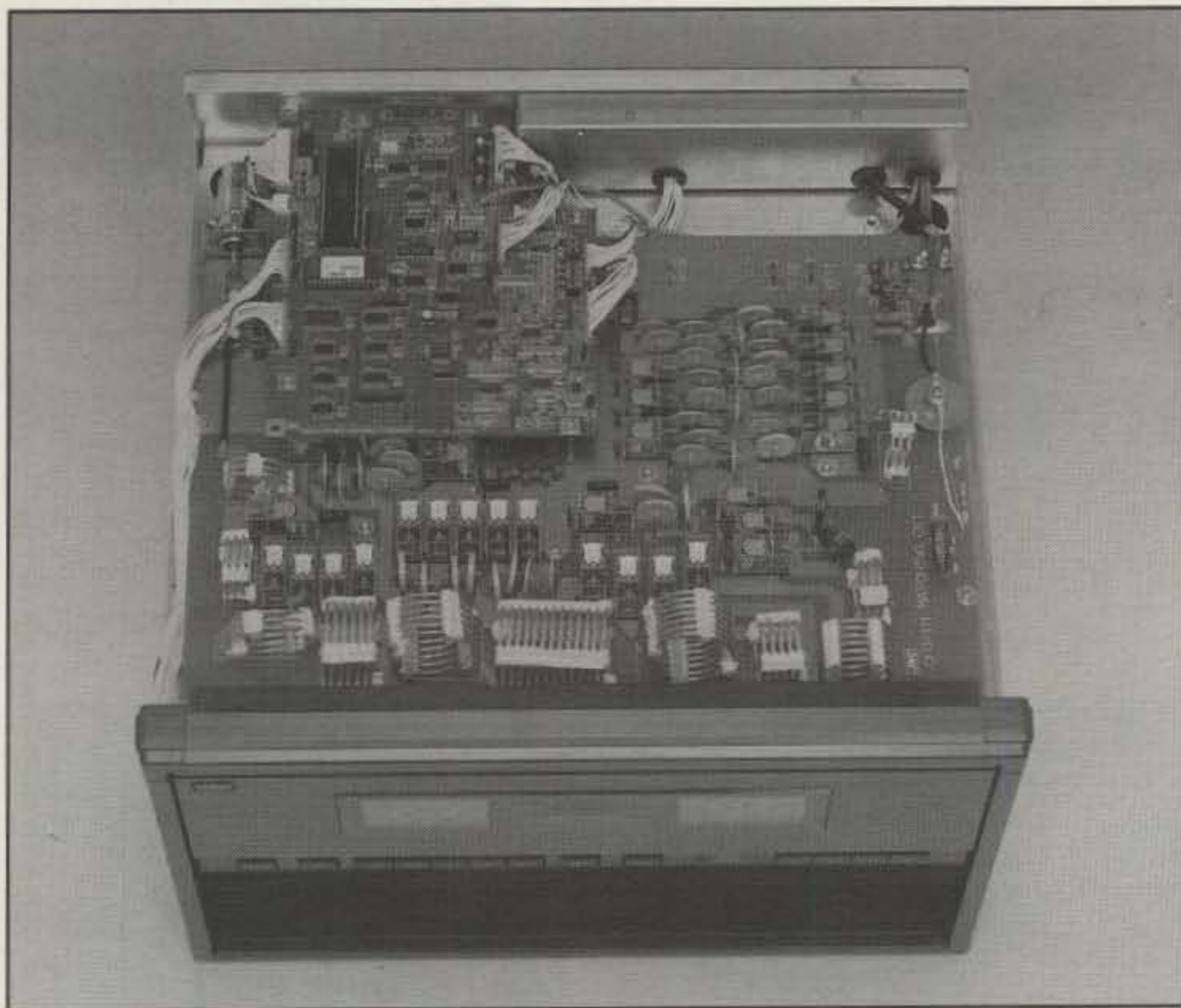
unit will develop full output power on all amateur bands from 160 meters to 15 meters. On 12 and 10 meters, only the automatic antenna tuner is functional as shipped. I found no condition where these published specifications were not met or exceeded. The amplifier can be made to operate on 12 and 10 meters by following instructions supplied by JRC. These instructions will be supplied only after receipt of a copy of a valid amateur license for those bands.

### Procedure

Any HF transmitter or transceiver with a 50 ohm output impedance can be used as an exciter for the JRC-2000F. I used the Japan Radio Co. JST-135 HF transceiver and the prefabricated interconnect cable provided, but that isn't necessary. If the maximum output of the



*An interior view of the antenna switching network.*



If you were to remove the top cover, you would see the matching network.

exciter exceeds 100 watts, the over-current circuit in the power supply may be activated and distortion may result. Be sure that the ALC control line is connected so the exciter output does not exceed proper limits.

There are provisions for four separate antennas. These antennas should have an impedance between 16.7 and 150 ohms to stay within the limits of the automatic antenna tuner (VSWR of 3:1 or less).

If the exciter is a JST-135, simply connect the prefabricated cables as shown in the instruction booklet. If your exciter is different, there are clear instructions to show proper procedures for making all necessary connections.

Perhaps a brief synopsis of the front-panel controls is in order.

**Power Switch:** Turns the main power on and off. When the power is on, the LED is lit and the automatic antenna tuner will function. When power is off, the antenna switches will function, but the amplifier or automatic antenna tuner will not function: straight-through operation is possible.

**PA Switch:** This turns on the power for the power amplifier. If the LED is not lit and the power switch is on, the automatic antenna tuner will function and the power amplifier will operate.

There are two conventional meters on the front panel, both functioning as switched multimeters. The left meter is switched to indicate VSWR or power output. The right meter can be switched

to read drain current, drain voltage, or ALC. Between the two meters there are two eight-segment readouts to indicate band of operation or other functions during the tune-up procedure.

**Tune Switch:** Automatically tunes the antenna and stores the matching data in memory. An associated LED is lit during the procedure. There is also a drive indicator. If the light is green, the drive level is okay; if the light is orange, the amplifier is being overdriven by the exciter. Simply reduce the drive power.

### The Remote-Control Unit

As indicated earlier, there is a remote-control unit (very similar to a TV remote-control unit) which has the same functions as the controls on the front of the amplifier. This allows the amplifier to be placed across the shack if desired while retaining full control at the operating position. It's a great "lazy ham" device.

### Operator Conveniences

This is the first completely computer-controlled amplifier I have had the pleasure to operate, and to say I was impressed would be an understatement. As stated earlier, I found no place where the specifications were not met or exceeded. For example, I operated the amplifier with 115V input to the power supply. The rated output from the unit is 750 watts PEP under this condi-

tion. I am happy to report that the test unit easily exceeded the rating.

Another test which is difficult to quantify was the test for TVI. My QTH is in the country about 65 miles from two VHF TV channels that I watch (there is no CATV at this location). My  $\frac{3}{4}$  wavelength 80 meter loop is located about 15 feet above my TV antenna. I use this antenna for TVI tests. If there are any problems, they should show up under these conditions. I am happy to report that the test showed only a slight flicker on a TV set located in the ham shack with the meter on the amplifier peaking at 500 watts output. That test was very impressive! Additionally, many unsolicited reports indicated a "clean" signal with plenty of punch.

The many built-in fault protection circuits make it almost impossible to put out a bad signal. The computer-controlled unit makes many critical decisions for you. You just sit back and enjoy the results!

The unit is available from Japan Radio Company, Ltd., 430 Park Ave. 2nd floor, New York, NY 10022. The price class is \$4900. This is a very impressive piece of equipment. ■

# SGC

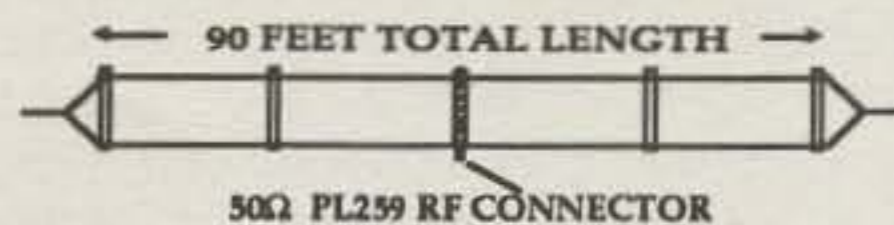
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**While most of us were gearing up for one DXpedition to Market Reef in late February, OH1VR and OHØRJ surprised a lot of us and made 3080 amateur contacts from OJØ a few weeks earlier.**

## A Weekend On Market Reef

BY Dr. Seppo Sisatto\*, OH1VR

**A** DXpedition to a rare spot is a serious undertaking for most of us. For me personally, I don't think that being serious should be the object; having fun on a DXpedition should be the goal. After all, we all got into this hobby to have a good time, didn't we?

This is the story of a simple weekend DXpedition to Market Reef (OJØ). This spot is still considered rare for a lot of DXers. However, it is located less than 500 miles from my home. Its proximity gave me the idea.

During the winter Market Reef is a cold, wet, and slippery piece of real estate. It's about 1000 feet long and 300 feet wide. The highest point of "land" is 10 feet over sea level, and its 110-year-old lighthouse has been unoccupied since 1977. The ensuing years have not been kind to the lighthouse, and it is quite run down. In any kind of windy situation, which is typical, waves and water cover most of the reef.

One doesn't simply decide to go to Market Reef and then go. You cannot land there without the Lighthouse Technician, and he only goes there a few times a year to perform routine maintenance. I was lucky enough to obtain permission to follow the technician to the reef during the first weekend of February. Lasse, OHØRJ/OHØMB, agreed to come along. However, this was just the beginning.

You have to bring everything with you! You need a generator, gas heaters (it really does get very cold there), food, water, and even some firewood. You also need all the radio equipment, big and small, and a means of transporting all of this stuff, plus the operators.

While Market Reef may be a difficult place to get to, it's not impossible. I hired a helicopter for the journey. Because of the winter weather, I decided to go with



*Don't blink your eyes or you'll miss it. This is Market Reef off the coast of Finland. It's about 1000 feet long and 300 feet wide and barely 10 feet over sea level.*

wire antennas (a windom and a dipole for 160 meters). Keeping weight in mind, I opted for my FT-1000D and brought along a TS-690S as backup. Altogether the gear added up to about 150 lbs. While I took care of the radio gear, Lasse, OHØRJ, and the Lighthouse Technician, Jouni, arranged for all the other things we would need.

Although the name Market Reef makes it sound exotically far away, it's actually only a 15 minute flight by helicopter from Mariehamn on the mainland. We arrived on February 5th, and in a little over two hours we had the generator up and running, antennas strung, and we were ready for our first contact from OJØ. At 1030 UTC, OJØ/OH1VR was on the air on 21 MHz and made the first contact with EA2CIN. This was followed by a good-sized pile-up on 18 MHz.

Our main antenna, the windom, was less than 30 feet above ground, but it

performed quite well on all bands from 160 through 6 meters. The power of the FT-1000D was more than enough to create good pile-ups. I targeted 160 meters, 80 meters, and the WARC bands for emphasis, with good results. There were some extraordinary highlights of the operation, such as working N2KK/6 on 80 meters long path as his country number 321.

We did spend some time on 10 and 12 meters. Although there were some good openings to the US, they were quite short. We did manage to work over 300 US stations during this period. We stayed for three nights. Due to the cold and moisture in the air, sleeping at best was uncomfortable. I guess we averaged 3 to 5 hours of sleep per night. The actual length of our working time was about 45 hours. We spent the rest of the time talking to Jouni about Market Reef's history, taking pictures, and watching the waves break over the rocks.

\*Lansirinteenk 23, 33400 Tampere, Finland





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- EX-243 Electronic keyer unit ..... 69.00
- UT-30 tone encoder ..... 21.00

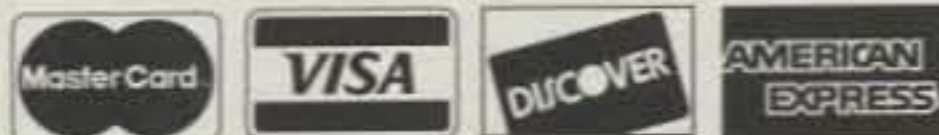


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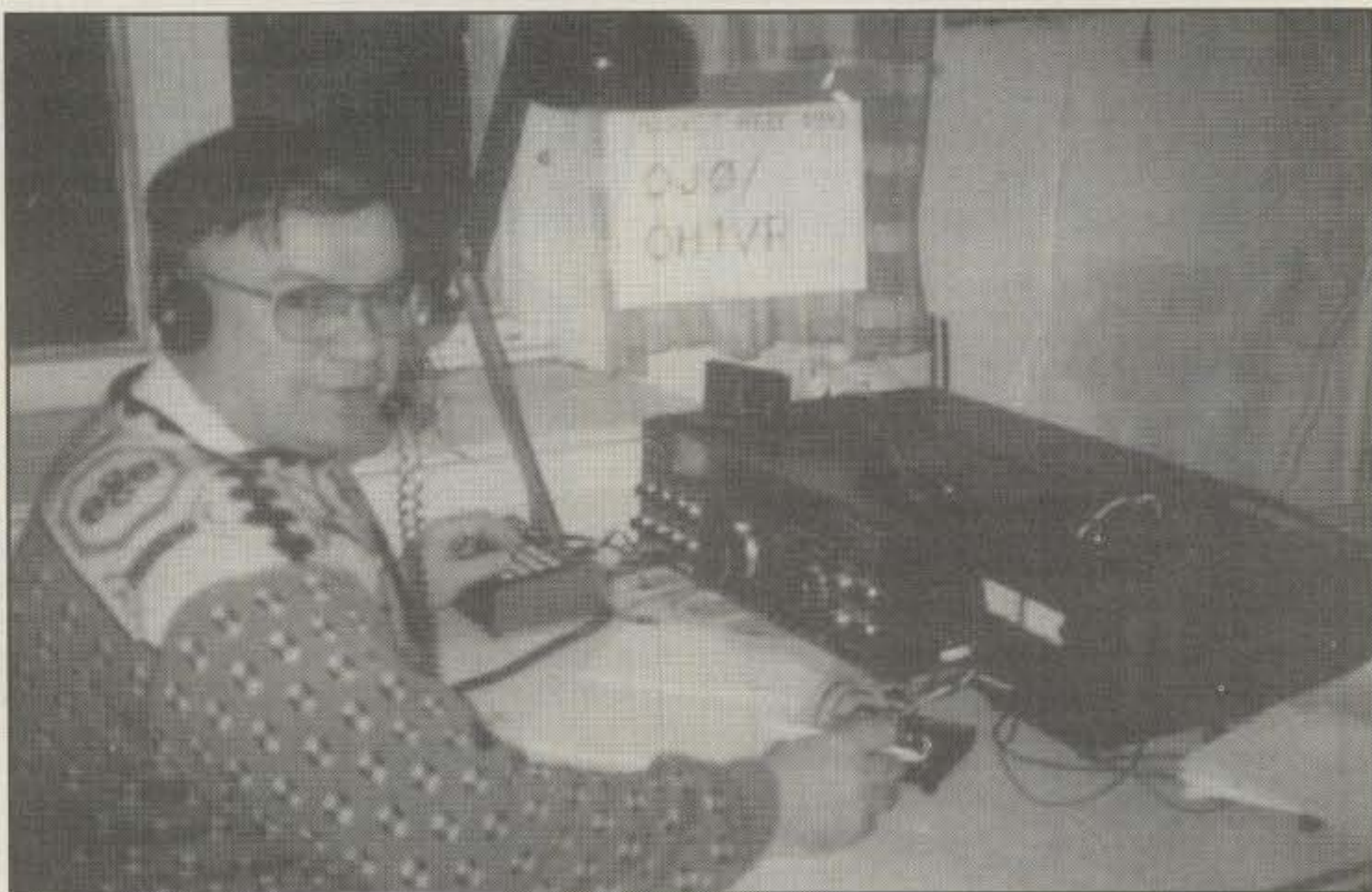
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CIRCLE 56 ON READER SERVICE CARD



Here's the author at the operating position of OJØ/OH1VR enjoying the pile-ups.

This weekend DXpedition netted some 3080 contacts and about 80 countries. The breakdown of total contacts was as follows: 160 meters 421 total contacts; 80 meters 890; 40 meters 284; 30 meters 344; 20 meters 9; 17 meters 587; 15 meters 2; 12 meters 361; 10 meters 181; and 6 meters 1 contact. Although Lasse came out primarily to help me, he made about 150 contacts as OJØ/OHØMB.

As far as mini-DXpeditions go, this one went just about flawlessly. The weather, which often is unpredictable, was certainly in our favor. On Friday when we arrived it was warm, with plenty of sunshine and low wind speeds. On Saturday and Sunday it was quite

stormy so that visibility was nil and our landing site was covered by the sea. Monday, however, was a repeat of Friday, and our departure went very smoothly.

I have to admit that I enjoyed every minute on Market Reef. It's quite exhilarating to be at the center of a DX pile-up and have what seems like the whole world trying to work you. It's a very heady experience. I think that sometimes it also proves the tenacity of the operator in that it doesn't always take a big beam and lots of power to get through. I think that KR2Q will share those feelings with me. He worked OJØ/OH1VR with 500 milliwatts on 24 MHz! ■



Lasse, OJØ/OHØMB, bundles up to take a turn on the air. He became the mainstay of the "Market Reef Power Company Ltd."

# MFJ Super Hi-Q Loop™ Antenna

... 36 inch diameter -- it's the smallest, high efficiency 10-30 MHz continuous coverage antenna ever made for ham radio ...

- Tiny 36" diameter covers 10-30 MHz continuously
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Vertical mounting gives you both low angle radiation for excellent DX and high angle radiation for close-in local contacts -- it's like having a vertical and dipole combined into one. You can also mount it horizontally for omni-directional coverage.

The MFJ Super Hi-Q Loop™ antenna is a remotely tuned high-Q antenna with a narrow bandwidth that reduces transmitter harmonics, receiver overloading and out-of-band interference. It does not need a ground, radials, counterpoise or antenna tuner. It covers 10-30 MHz continuously including the WARC bands with low SWR and handles a nominal 150 watts.

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## 10 Reasons why the MFJ Super Hi-Q Loop™ beats the competition

**Reason 1.** You radiate more power because the MFJ Super Hi-Q Loop™ has a more efficient radiator. Its large round conductor has less RF loss resistance than a thin flat strip conductor.

**Reason 2.** It's built like a tank -- 1.050 inch diameter, thick wall aluminum radiator, all welded construction, no mechanical joints, welded butterfly capacitor with no rotating contacts.

**Reason 3.** You don't need a separate control cable -- the coax feedline carries both RF power and tuning control signals.

MFJ-1786  
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**Reason 4.** MFJ's exclusive Automatic Band Selection™ auto-tunes to your desired band and lets you know with a beep.

**Reason 5.** Dual Fast and Slow tune push buttons make it easy to tune.

**Reason 6.** A two range Cross-Needle SWR/Wattmeter is built into the remote control.

**Reason 7.** No external power is needed because the remote control uses internal AA batteries (not included), but you can also use an isolated 12 VDC or 110 VAC.

**Reason 8.** It's an affordable \$249.95

## Remote Control (included) makes MFJ Super Hi-Q Loop™ easy-to-tune and extra portable

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It's extra portable because . . .

. . . you don't need a separate control cable -- the coax feedline carries both RF power and tuning control signals.

. . . you don't need a separate SWR meter -- a two range Cross-Needle SWR/Wattmeter is built-in.

. . . you don't need a separate power cord because it's battery powered -- you can also use an isolated 12 VDC or 110 VAC. 6x6x3 inches.



Super Loop™ Remote Control

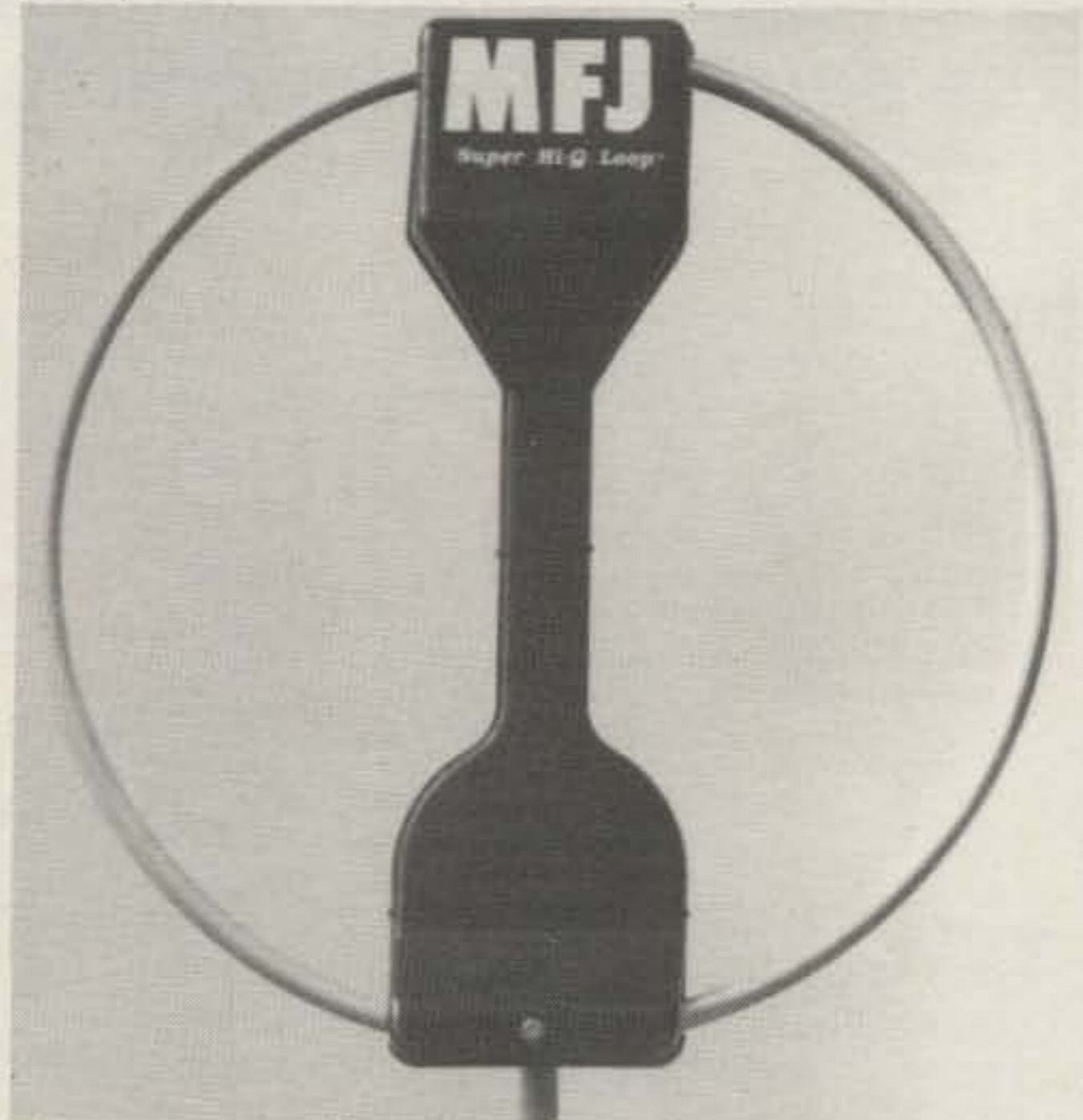
-- that's \$140 less than the nearest competition.

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**Reason 10.** For expert help, you can call MFJ's exclusive toll-free technical help line 800-647-TECH(8324) and talk to a friendly MFJ Customer Service Technician.

## Round conductor has less RF resistance than flat conductor

The following is quoted from *Electronic and Radio Engineering* by Frederick Terman, 4th edition, page 22: ". . . with a conductor consisting of a thin flat strip, . . . the current flows primarily along the edges, . . . the true or effective resistance will be high because most of the strip carries very little current . . . it is not the amount of conductor surface that determines the



resistance to alternating current, but rather the way in which the conductor material is arranged."

**Fact:** A large round conductor has much less RF resistance than a thin flat strip.

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***This article concerns a major DXpedition to a very dangerous place at a very dangerous time. It is also a tale of international cooperation and demonstrates the spirit of amateur radio.***

## **YA5MM**

# **DXpeditioning Into The Jaws Of The Dragon**

BY IGOR PETRASHKO\*, UT4UX

**T**he YA5MM DXpedition actually had its beginnings on the roof of a five-story apartment building in Dushanbe, Tajikistan in August 1991. RT4UQ (Vasily, who, like me, is from Kiev in the Ukraine), UJ8JMM (Nodir Tursun-Zade, from Dushanbe), and UJ8JCQ (Alex, whose roof we were on), and I had just returned from a successful DXpedition under the callsign UJ1K to Kulyabskaya oblast in the mountainous regions of Tajikistan. We were on UJ8JCQ's roof, helping Alex reassemble and erect his antennas, which we had used in Kulyabaskaya.


Still fresh from one expedition, UJ8JMM asked me whether I would be interested in undertaking yet another one, this time beyond our borders to Afghanistan. Of course, my answer was "Yes!"

Nodir cautioned us that our enthusiasm would get us only so far. We needed official permission to operate; equipment and antennas, all of which were small but very reliable; and hard currency. Nodir had travelled on business in Afghanistan, and knew how affairs were conducted there. One very important thing he knew is the Afghans did not care for our rubles. Because of Nodir's knowledge of the country, he was to obtain the license, and I was to try to obtain support in the form of equipment, antennas, and funds. With this division of labor, I left the next day for home. From that time on Nodir and I generally spoke once a week by tele-


\*P.O. Box 579/1, Kiev 162, 252162 Ukraine. Editorial assistance from Bill Remington, W3XU, 1078 Shallcross Lake Road, Middletown, DE 19709 USA.

### **AFGHANISTAN**

March 1992



# **YA5MM**



BY

<b>UT4UX</b>	<b>UJ8JMM</b>
<b>IGOR</b>	<b>NODIR</b>

*The QSL that made a lot of you happy—at least 16,000 of you.*

phone, as radio propagation proved too unreliable.

Meanwhile, I was carrying on my weekly Saturday schedules with my good friend Bill, W3XU. On the next sked I reported on the success of the UJ1K effort and touched upon the idea of his helping develop the YA project. Bill agreed, so the next step was to obtain the license.

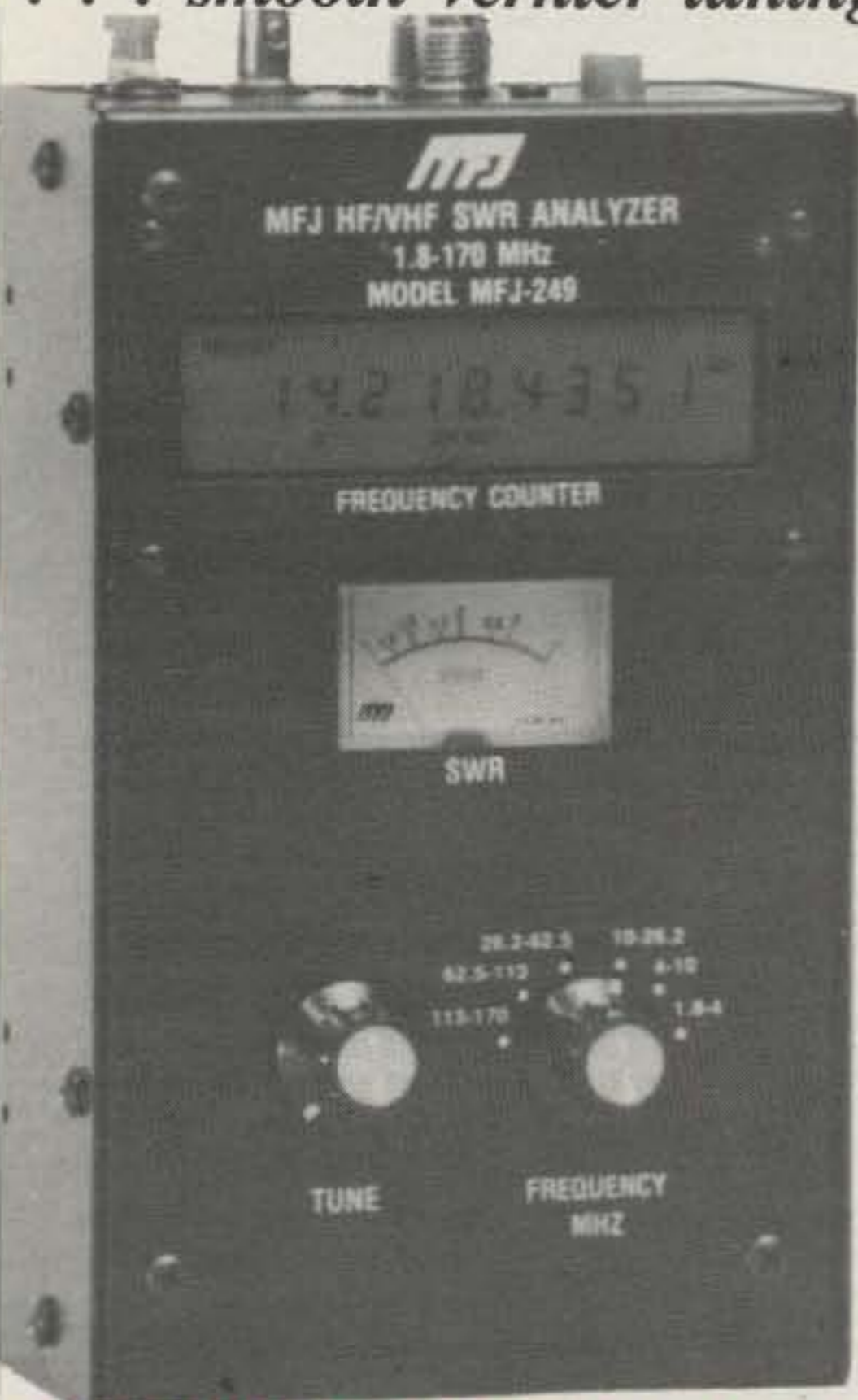
As it happened, Nodir obtained the license without too many problems. It arrived in October and was good for a crew of five operators and for a duration of two months commencing February 1, 1992. It didn't make sense to ask anyone else for support for the effort before confirming that the license documentation met ARRL requirements. The ARRL DXCC desk was most prompt and helpful. They reviewed the license within days of its submission and let us know

that with the additional future documentation to show that we were in fact inside Afghanistan, our DXpedition would be valid for DXCC credit.

We still needed funds and equipment. Because of the relative values of Soviet and then Ukrainian and other CIS republic currencies versus the "hard" currencies of the West, our own personal finances proved of no help. As an indication of this, my salary as an engineer was approximately \$10 per month. When I passed along to W3XU my estimate of the cost of a place from which to operate, cost of food, and cost of physical protection (more about this later), I could detect even over the 4800 miles between us that Bill's enthusiasm was flagging quickly. He pointed out to me that there had already been DXpeditions to Afghanistan. I countered with the observation that if we put YA on

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You can shorten or lengthen your dipole or mobile whip and see the effect immediately.

You can monitor how SWR changes as you adjust your beam or vertical -- you'll know right away if you should lengthen or shorten it.

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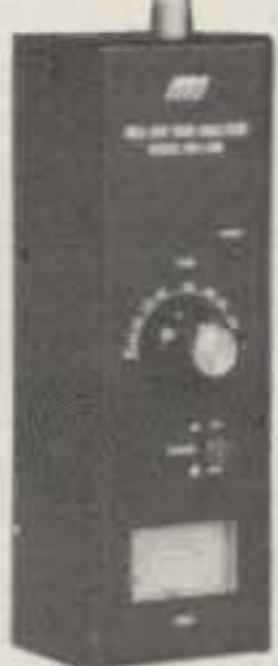
without LCD frequency counter. Has jack for external frequency counter. Use 6 AA cells or 110 VAC with MFJ-1312B, \$12.95. 4x2½x6¾ inches.

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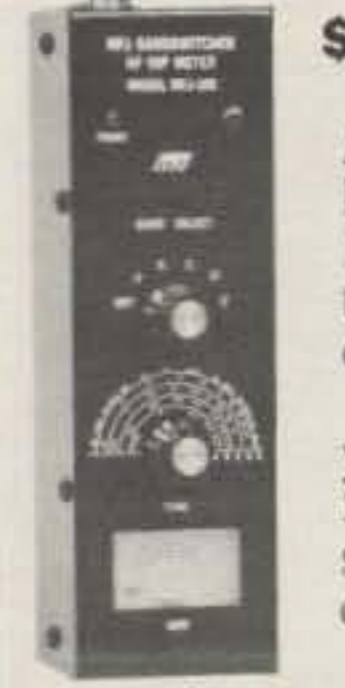
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Nodir, UJ8JMM, on the left, and Igor, UT4UX, at the Russian Consulate in Hairaton, located in the Mazer-i-Sharif region.



Igor, UT4UX, checks out the base of the Cushcraft vertical. Notice that it is painted black to decrease visibility.

the air with high-power RF output and beam antennas during high sunspots at approximately the equinox, this would enable those running low power and simple antennas the ability to work YA on the first band or on additional bands—particularly the low bands—where they have been unable in the past. Bill's spirits buoyed a bit.

As far as equipment goes, we already had one ICOM IC-735, which Bernie Mutter, N3CBW, gave me as a gift in 1991. I wish to thank him one more time for the rig. In order to have two stations

active at the same time, we needed two more transceivers (one for backup), and we also needed two antennas and a power amplifier.

During October and November 1991 Bill and Chick Allen, NW3Y, a friend of Bill's and mine whom I had met during my 1991 visit to the United States, publicized the planned DXpedition through as many means as possible (national and international publications and local club newsletters, as well as packet DX bulletins) and sought contributions. Throughout this time Ed Kritsky, NT2X,

was a great help and source of encouragement.

I also contacted F6HIZ for advice and support, and he replied with a long letter. He explained that earlier expeditions, YAØRR and T6AS, had eliminated YA from the wanted lists of most European DXers, and that we should concentrate on providing contacts for the Western Hemisphere and on looking for support there.

In fact, the help we received from the Northern California DX Foundation, the International DX Association (INDEXA),



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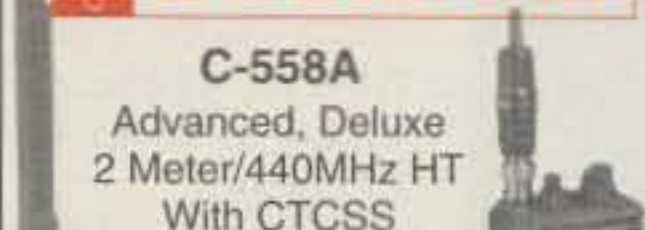
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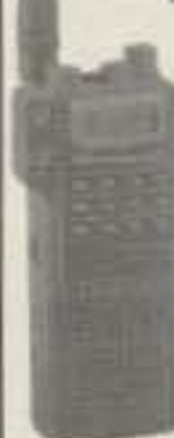
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## MFJ's Deluxe 300 Watt Tuner



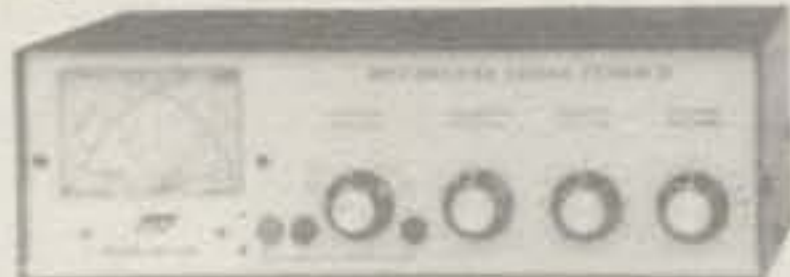
MFJ-949D **\$149<sup>95</sup>** More hams use the MFJ-949D than any other antenna tuner in the world! Why? Because the MFJ-949D gives you proven reliability, the ability to match just about anything and a one year unconditional guarantee.

You get a lighted peak and average reading Cross-Needle SWR/wattmeter, antenna switch, 4:1 balun for balanced lines, 1.8-30 MHz coverage and a full size dummy load that easily handles 300 watts of abusive tune-up power.

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MFJ-948 **\$129<sup>95</sup>** If you don't need a dummy load but want all the other features of the MFJ-949D, choose the MFJ-948 for \$129.95.

The MFJ-948 features a peak reading lighted Cross-Needle meter with a built-in lamp switch, one year unconditional guarantee and is made here in the USA.

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MFJ-941E **\$109<sup>95</sup>** The new MFJ-941E gives you a 300 watt PEP tuner that covers everything from 1.8-30 MHz -- plus you get a cross-needle meter, antenna switch and balun . . . for an incredible \$109.95. Lamp uses 12 VDC or 110 VAC with MFJ-1312, \$12.95.

Antenna switch selects 2 coax lines (direct or through tuner), random wire, balanced line or external dummy load. 4:1 balun. 1000 volt capacitors. Measures 10-5/8" x 2-7/8" x 7".

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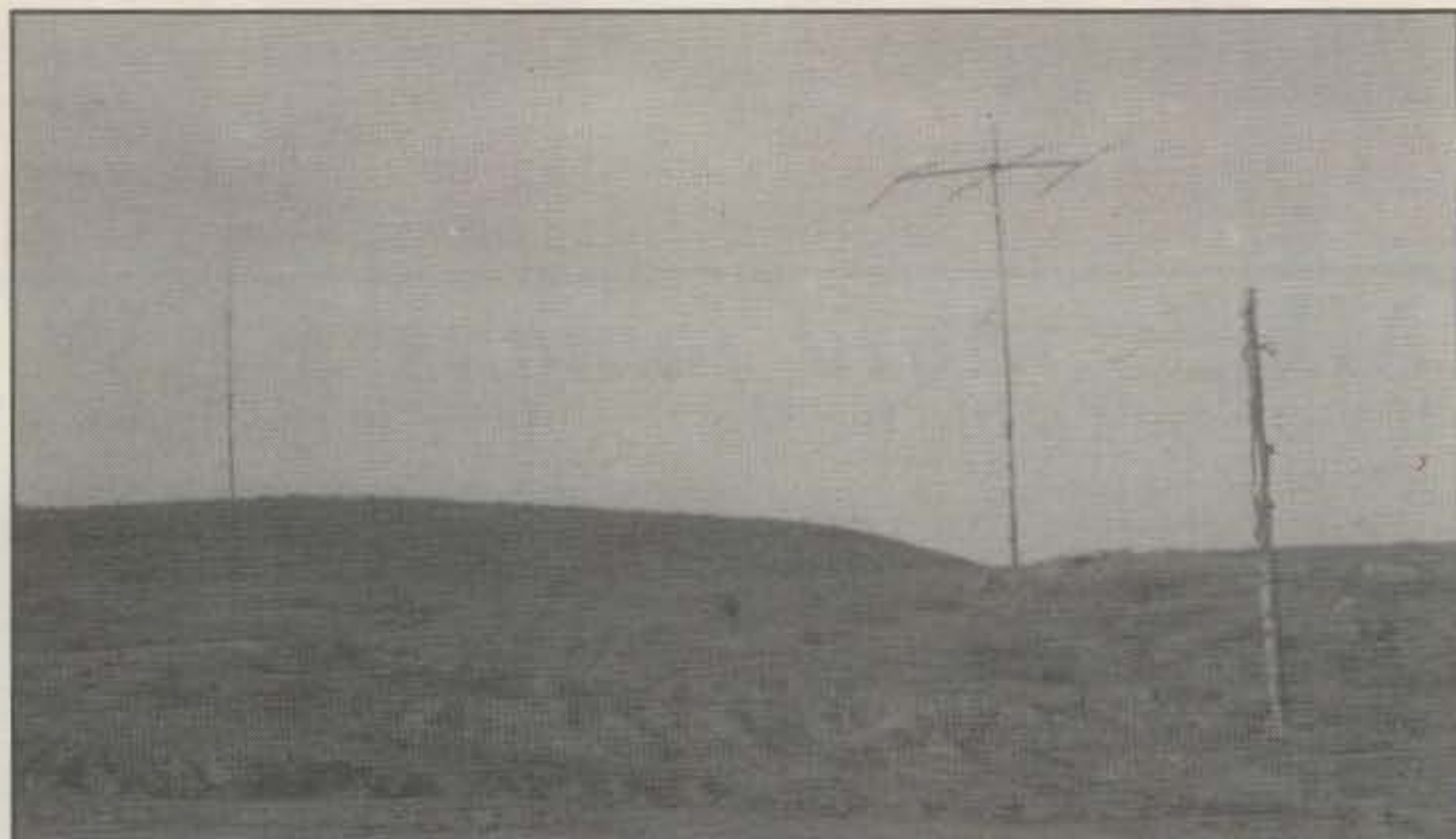


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CIRCLE 57 ON READER SERVICE CARD

40 • CQ • May 1993



The YA5MM antenna farm.

ICOM America, Cushcraft, and a very large number of contributions from individual amateurs and local clubs was critical and enabled us actually to continue forward to Afghanistan.

By early January we had ICOM IC-735 and IC-725 transceivers, a Cushcraft A3S tribander and an AV5 vertical, and some money in Bill's hands.

The next problem was how to get the equipment and funds to Kiev. Mail is slow and unreliable. Discovering that a round-trip passenger ticket was only slightly more expensive than an air-freight delivery, we opted for the security of transporting everything to Kiev by hand. With a standing invitation from Bernie, N3CBW, to visit him in Silver Springs, Maryland, I spent the next two weeks preparing for the trip.

Ed, NT2X, introduced Bill, W3XU, to New York City travel bureaus specializing in travel in and to the CIS. Bill immediately called one and managed to speak with a most friendly and seemingly helpful agent named Tanya, but promptly concluded that if there was a meeting of the minds as to what the arrangements actually were, it would be a bit of a coincidence. Ed came once again to the rescue and concluded the arrangements with Tanya in Russian, or at least *almost* concluded them. Ed's arrangements had Bill meeting me in New York City in the middle of the ARRL DX Contest. Although Ed, a Yankee Clipper Contest Club operator, denies any attempt to depress the score of W3XU's competing club, it was necessary to rearrange the dates to avoid the conflict.

My friend George Pataki, WB2AQC, met my Aeroflot flight in New York and took me to his home, where we rested and I learned of George's most recent world travels (many of which have been

published in CQ). The next day Bill met me at George's and we drove quickly to Delaware, where we met noted contesteer Dave Hawes, N3RD, and his wife Suda, and Bill's wife, Paula, for a seafood dinner and renewal of friendships.

Time passed quickly, as we needed to prepare antennas and transceivers. Ideally, they needed to be thoroughly tested, because once they were at their destination in Afghanistan there would be no second chance. In practice, we could not test the antennas. We assembled them to be sure we had everything we needed, but a combination of cold weather in Delaware and shortage of time prevented us from mounting them sufficiently high enough to test them out.

In recognition of the situation in Afghanistan, we took NT2X's advice and spray-painted the shiny aluminum a dull black, so that their visibility from the air would be limited. Cushcraft had specially prepared the antennas by making shorter than usual lengths so as to be transportable by airplane. Perhaps there is a universal rule as to maximum baggage size, but the Cushcraft configuration allowed the packages to be precisely at the limit, so I had no problem with their size on the return flight.

With the antenna parts determined to be all present and with them all camouflaged and marked for easy reassembly, we had the weekend free for a multi-operator, single transmitter entry in the ARRL CW DX Contest at W3XU. We had a lot of fun and it appears we finished third in the USA in that category.

A few more days were spent in Delaware packing all gear (and some baby clothes for my new baby, Dima) and antennas into boxes. Then, after one more night with George, WB2AQC, in New York, I was on the plane to Kiev

Say You Saw It In CQ



at last. Vasily, RT4UQ, met me at the Borispol Airport in Kiev with some good news. He had constructed a power supply for an ICOM radio. So with one more power supply, all equipment needs would be met. I headed home thinking everything was in order.

When I arrived home after two weeks overseas, my wife, Tanya, greeted me with news that I had to take my passport with the Afghan visa to Moscow for more official approvals. With only four days between arrival from the US and the flight to Dushanbe, our point of departure for Afghanistan, this was a real imposition on my family. Apparently there was no way to avoid going to Moscow, however, so I had to comply.

On Monday, March 2 I left from Kiev to Dushanbe by plane. As baggage, I carried the transceivers, two antennas, one power supply, and one laptop computer. After seven hours on board the plane the equipment and I arrived safely in Dushanbe. I was very happy to see Nodir and his father, Masud, UJ8JM, at the airport.

Dushanbe, by the way, is a city of about 300,000 people located approximately 5000 feet above sea level in the mountains. As it is susceptible to earthquakes, the highest buildings stand only about 9 stories. Even then, they still move during minor earthquakes, which occur frequently. Though Dushanbe was founded during the 19th century, it took on its present name only about 80 years ago. "Dushanbe" means "Monday," the local market day. As most of the buildings in the city are relatively new, the architecture does not reflect the city's Islamic origins and culture.

We spent five days in Dushanbe building another power supply, checking everything once more, and racing around looking for food and everyday items needed to sustain us in Afghanistan. Food for the trip was primarily potatoes and packets of instant dehydrated meals. Alex, UJ8JCQ, helped with a tower for the tribander and provided a power supply from work, which we had to rebuild to provide more current at 13.8 volts. The power amplifier came from Alex, UJ8JJ. In fact, I had built the amplifier by hand five years earlier, and two years ago had given it to Alex. It had come in handy on all our previous expeditions to the Pomir mountains as RJ7R, UJ5K, and UJ1K.

The night before we departed, everybody, except Faridun, our driver, was too busy and excited to sleep. We tried to check every little piece, because there would be no margin for failure once we were in Afghanistan. The designated chief of the preparations was Nodir's father, Masud, UJ8JM, because of his many years of experience with

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2.25:1-HU112.5	112.5:50-OHMS	\$45.00	2.25:1-HB112.5	112.5:50-OHMS	\$120.00
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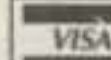
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CIRCLE 27 ON READER SERVICE CARD

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DXpeditions in Middle Asia. Nodir and I packed everything. RJ&JM, Nodir's younger brother, took care of hot coffee and rendering advice, which, though unsolicited, was not unwelcome.

At last it was early morning on March 7. One of us prepared breakfast, while another of our friends tried to stop us from leaving because of the dangerous situation in Afghanistan. He said we were stupid radio fanatics and worse. Nevertheless, we were committed to carrying this expedition off, and we wanted to be successful.

Once all our gear was put into the car, its owner, Faridun (who was also our driver), informed us that the weight of our baggage exacted special conditions on us. We had to guarantee that in case of breakdown we would provide for repair or replacement of his car. We had a quick breakfast (and found later that the meal was to be our lunch and dinner, too) and left Dushanbe City.

After one hour of driving, we were on the Tajik (UJ) Uzbek (UI) border. Customs control checked all our gear for twenty minutes, after which the officer said he would have to stop us as we would, he claimed, need official permission to take the aluminum tubing with us.

For the next two hours we showed one paper after another: documents from the Foreign Ministry and the Ministry of Communications of both Tajikistan and Uzbekistan, as well as the ever influential articles from CQ. Nothing helped. This was Saturday, so we did not see any possibility of getting the seemingly required official license until Monday. Luck was with us, however. Fortunately, officers on the border change every few hours. Thirty minutes after our outright rejection, a new customs officer reported for duty. This one may have been smarter than the first one, but more to the point, he was born in the same area as our driver, Faridun. With only a few minutes of discussion, we got permission to proceed, after also promising to bring back jeans for the officer. (The jeans were purchased for about \$6 near the Russian Consulate in Mazer-i-Sharif City, Afghanistan, and duly delivered to the officer on our return trip.) This is a typical example of the "Russian" manner of transacting business in the former Soviet Union.

From the UJ-UI border we drove about 2 1/2 hours before we reached Termez City, located on the Uzbek-Afghanistan border. We spent a sleepless night in Termez and then we crossed in the morning into YA-land. As soon as we crossed the border we became aware that fighting had resumed between the Tajik, Uzbek, and Turkmen people on one hand and the



The author at the operating position of YA5MM.

Pushtun people on the other.

Nodir had visited Afghanistan in November 1991 and found a good site for operating in Mazer-i-Sharif City, which is about 50 to 60 miles from the Uzbek border. Now the situation was so threatening that we did not dare to take the main road, so we took the back road—an unpaved stretch of dirt and stone.

This was my first visit to an Asian country, and I was quite fearful, and given the circumstances, not without reason. Although I had planned to look and act inconspicuous, I found this to be impossible. Even everyday activities such as washing one's hands or drinking tea are performed in ways to which I was unaccustomed, so there was no way for me not to appear foreign. As it turned out, I later learned from Nodir that I was fortunate that the Afghanistans with whom we dealt were able and willing to distinguish my nationality as Ukrainian and not Russian; without that distinction I probably would not have been able to proceed. Nodir and Faridun had a much easier time in this regard, as their own customs were not too different from those in Afghanistan.

Once in Mazer-i-Sharif, we visited the Russian Consulate, but the officials advised us to go back, as it was too dangerous to stay, especially with our equipment. After a short discussion, Nodir and Faridun went to talk with some local friends, and I stayed in the consulate. Soon Nodir returned with the first good news of our trip. He had found a good operating site, one that even had a supply of AC (220 volts)! By evening we were there, where we would spend the next two weeks.

The "shack" was in fact a shack. It was a metal guardhouse used by the military and equipped with all the amenities—

four beds, one table, and a hot plate—and situated about three-quarters of a mile from a village near Mazer-i-Sharif. At this point we had a guard (for which a fee was exacted). The guard's job was to keep us away from others, and them from us. He even followed us to the lavatory, an area in the field so designated for this purpose. Everyone was very tired, so we decided that our first contact would be the next day.

On March 9 we put up the Cushcraft AV5 ground plane and one working position—the IC-725 and a 1 KW linear. We thought this was enough for the time being. We wanted to test the local waters with the ground plane. The tribander is a very big antenna, and we wanted to gauge the local reaction to the ground plane before we tried the tribander. W3XU and I had painted both antennas black to minimize detection from the air.

With the antenna in the air and the rig set up, we were happy to hear the first sound of noise from the speaker, but we checked everything one more time, as we knew we would have little rest once the world heard YA5MM. First, however, we had to decide who would make the first QSO. A flip of a 5 kopek coin was in my favor. I sat down and checked 10 meters. It sounded good! With the first CQ and a quick answer, PB0AJV was in the log as the first QSO.

The afternoon of the same day a big wind came up. It continued for 48 hours, so we had to delay putting the tribander up until the third day. We had brought only one linear because there was no place for another in our little "Lada" car. Good propagation and the beautiful job of the Cushcraft antennas helped us to maintain a big pile-up on every band from 80 to 10 meters.

Both of us normally operated 18 hours

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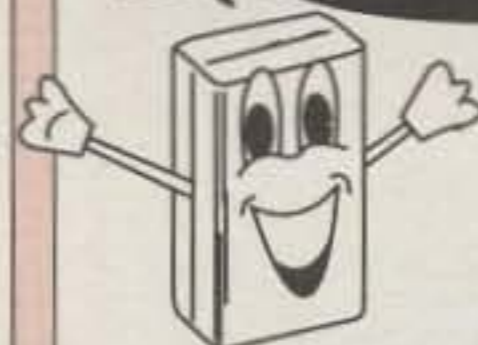
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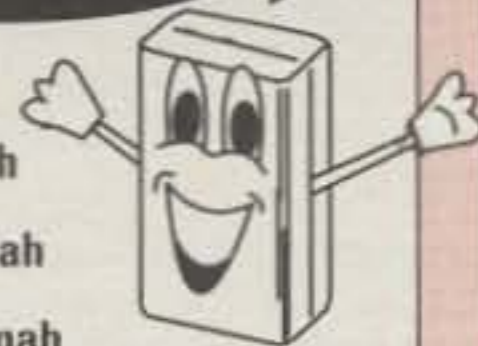
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From left to right: Igor, UT4UX; Masud, UJ8JM; Nodir's mother; and Nodir, UJ8JMM, toasting the success of the DXpedition.

per day. Very often we changed from SSB to CW simply so we could eat. We tried to maximize every minute to make contacts, because we really had no assurance from one moment to the next how long we would be able to remain in Afghanistan. By the same token, how-

ever, we did hear some rifle shots, but saw no actual fighting.

After a few days we found a good timetable for operating. I took a few hours in the nighttime for sleep, while Nodir slept for a few hours during the day. This fit in with our operating preferences, which fortunately complemented each other. Nodir likes the low bands, while I as a contester like high-speed pile-ups. Normally we had to spread stations out over 100 kHz; otherwise it was very difficult to pick up even a few letters from a callsign.

After the first week we started to use nets with our low-power position. We know that this is somewhat controversial. Many big guns even alleged—incorrectly—that we *only* worked nets. We found that with a good net control station we could make up to 170 QSOs per hour with stations on the other side with 100 watts and simple dipoles or ground planes. We believe that the limited use of nets allowed us to give more YA QSOs than we otherwise would have been able to. At the same time it gave us some rest compared to the pile-ups.

We also made a concerted effort to spend time on 40 and 80 meters. Other YA expeditions did not have high-power capability, so we tried to help with DXCC on those bands. We always tried to be on the low bands for sunrise and sunset to North America. The AV5 antenna did a great job! It was very funny when one day KM1H called us on 10 meters and said that some pirate was working at our sunrise every day on 3795 and giving everybody 59, so KM1H worked him just in case. You cannot believe how happy KM1H was when we told him this

"pirate" had him in the log on 75 meters at 2337 UTC!

Good conditions and the fine AV5 gave us a chance to make contacts with more than 150 stations from North America on 80. For this region this is remarkable, as the heading for Texas is 0 degrees! Some more DX from our log on 80: PYØFF, ZF8AA, KP2A, WP4U, VK6HD, VS6WV, and many others.

We were very fortunate with our ICOM equipment and our linear, as there were no real problems during 2 weeks of 24 hour per day operation. On the morning of March 18 we made dipoles for WARC bands (12 and 17 meters) fed together with one cable. It was made and in the air (only about 6 feet!) in about 90 minutes. We had no idea that this antenna would result in 3000 WARC band QSOs! We also made 200 QSOs on RTTY on 20 and 15 meters with an MFJ-1278 and the IC-735.

On the night of March 18 we were informed that political power was changing hands in Mazer-i-Sharif City. It sounded very bad for us, so we started to use the IC-725 as a broadcast receiver and tried to catch "Radio Afghanistan" to check this information. It was true.

The first thought that came to mind was to flee as soon as we could. The next morning Nodir met with some important local people who helped us, and they recommended that we stay awhile longer until the situation became clear. At last, on the morning of March 20 we received information that we had to depart the next day.

After the last pile-up at sunrise on March 21 and after 25,000 QSOs with 16,000 different stations, within three hours we had packed all our gear into the "Lada." We didn't get to cross the border, however, until March 23. On the evening of March 23 we were back at Nodir's house in Dushanbe. How happy my XYL, Tanya, was to hear my voice on the telephone after three days of silence! During the celebration of our safe return home we vowed no more DXpeditions to anyplace where people are still fighting! However, who knows?

Many thanks to all who helped us develop this DXpedition. Special thanks goes to the Northern California DX Foundation (NCDXF), the International DX Association (INDEXA), ICOM America, Cushcraft, and W3XU, NW3Y, UJ8JM, UJ8JCQ, NT2X, RT4UQ, RJ8JM, WB2AQC, LZ1HA, RT5UL, UJ8JJ, and UJ8JX. And thanks to WØJRN, who after traveling in Central Asia came up with the characterization "Jaws of the Dragon," used in the title of this article.

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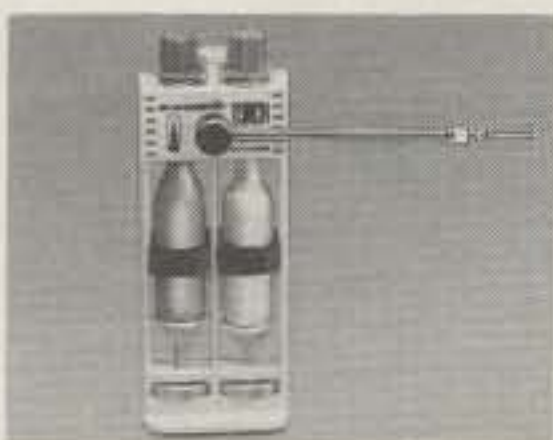
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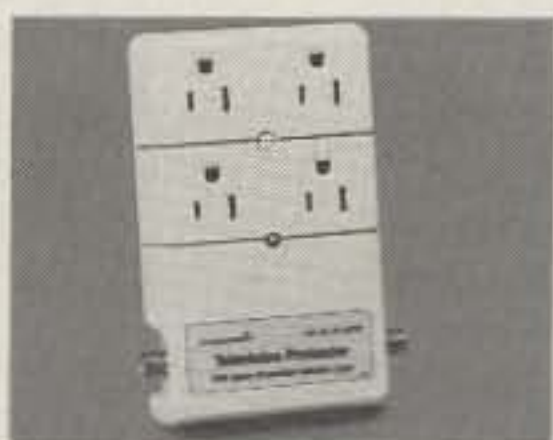
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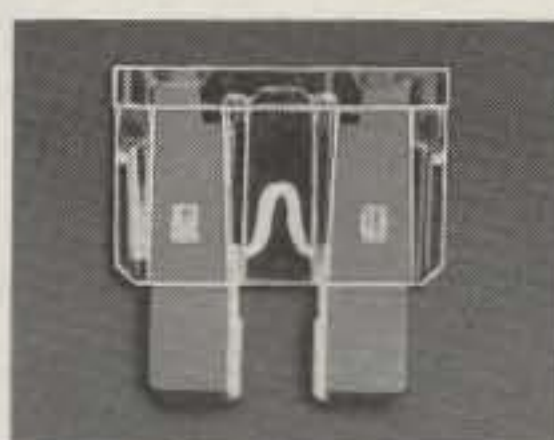
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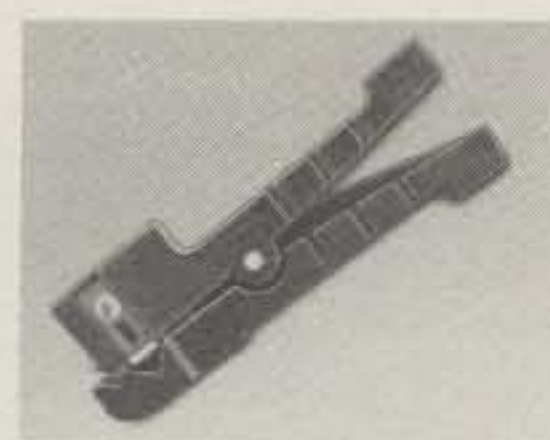
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# CQ REVIEWS:

## The Alinco DJ-180 2 Meter FM Handheld

BY DAVID L. THOMPSON\*, K4JRB

**A**lthough my favorite interest is working 160 meters, I also enjoy occasionally chatting with friends on 2 meters and was thus honored to recently review Alinco's new DJ-180 FM handheld.

We all have heard how each new rig has its own special attractions, and this new 2 meter handheld is no exception. The DJ-180 may not be a whiz-bang super rig that requires an hour's worth of study before use, but it has all of today's most popular features, and it can be enjoyed without even referring to the manual. The DJ-180 is small, lightweight, economical, and exceptionally easy to operate. It is the kind of rig you see in a dealer's showroom or at a hamfest and cannot resist purchasing on the spot. After all, there is no rule limiting an amateur to only one mobile rig or even one handheld. The more you have the better!

### Overview

The DJ-180 truly qualifies as a pocket-size talkie, measuring only 5"H x 2"W x 1-1/16"D. By comparison, it is approximately one-half inch shorter than Alinco's dualband DJ-580, and three-quarter inch taller than the DJ-F1T handheld. The case is dark-gray high-impact plastic with the strength of metal and the texture of vinyl.

The speaker and microphone are located in the center, which is a good idea for serious handheld users, because the rig can be held like a telephone when transmitting, and the antenna will be positioned back from your head rather than in front of your eyes.

Continuing on to the pertinent facts, the DJ-180 receives from 137.0 to 173.9 MHz and transmits from 144.0 to 147.9 MHz. As factory-supplied, there are 10 memories which store any frequency and repeater offset. Optional modules are available for 50 memories (EJ-14U)



*The Alinco DJ-180 is a 2 meter FM handheld that has all of today's most popular features.*

or 200 memory channels (EJ-15U). Power output with the supplied 700 MAH battery pack is 2 watts, with a low-power setting of approximately .5 watt. An optional 12 V/700 MAH battery will increase output to 5.0 watts. I should also mention the DJ-180 and Alinco DJ-580 battery packs are interchangeable (although there is a slight difference in their case texture).

The front keypad is used only for

autopatching to "keep it simple," and all special functions are integrated into six separate front-panel buttons. This concept is really neat. You can pick up the handheld and operate it immediately simply by pressing a button for its main function (printed in white). To access the secondary feature, you just hold the side "Function" button and press the button marked in blue. In my opinion, the DJ-180 is perfect for new amateurs or operators who use 2 meters only occasionally and tend to forget special keystrokes for fancy functions.

The DJ-180 is supplied with a belt clip, wrist strap, 700 MAH battery pack, and neat little 100 mm ducky antenna that makes the talkie seem really compact. Its included charger is also new in design and completely contained with only an AC line cord extending. An LED illuminates during charging.

A new DJ-180 only receives from 144-148 MHz, and its extended range mod is not described in the manual. Remember the following step to add that coverage if you are considering purchasing a DJ-180. Depress the lamp button and switch on the handheld. The handheld can then be quick-tuned into the NOAA weather band by depressing the "Function" switch above the push-to-talk while rotating the main tuning knob until the 162 MHz range is accessed. Sensitivity in the NOAA weather and 150 MHz public service bands, incidentally, is very good and provides many hours of interesting monitoring.

### Neat Features

As previously discussed, the Alinco DJ-180 comes with 10 memories and is expandable to 50 or 200 memories with optional modules. It also has memory and full band scanning with selectable steps of 5, 10, 12.5, 20, and 25 kHz; a call button for single-punch access to memory 0; automatic power off function; keyboard and push-to-talk locks, plus built-in PL encoder and decoder. If you compare that list of bells and whistles

\*4166 Mill Stone Court, Norcross, GA 30092

with other super-deluxe rigs, you will see the DJ-180 fills most needs without over-doing it.

Although upper and lower limits cannot be set for band scanning with the DJ-180T, it does have the convenience of quick-reversing directions. If the handheld is scanning up from 146-147 MHz, moving the top tuning knob one or two clicks changes it to scan back down toward 146 MHz. On the other hand, letting the handheld continue scanning on to the 150 MHz public-service bands produces some very interesting listening during casual times. Scan delay is set to stop on a busy channel for five seconds and then continue regardless of the activity, and a skip function is not included. Personally, I do not find this a problem. If scanning stops on a frequency I wish to monitor further, I simply press the PTT. When it stops on a NOAA weather station, I just move the tuning knob one click for scanning to continue.

The DJ-180's auto-power off function is a real asset. It is really appreciated when you are busy doing three things at once (plus listening to the handheld) and forget to switch the unit off before going on to another task. After approximately 30 minutes of nonuse, the rig automatically plays a brief tune and switches itself off. Later, when you pick up the DJ-180 and discover the volume control is still set for listening, simply switch the rig off and back on to restore normal operation.

Alinco apparently realized some amateurs may use the DJ-180 for portable packeting. Therefore, they included top-mounted speaker/mic sockets plus incorporated on/off selection of the automatic-power off function. While on the subject of battery consumption, we should point out the DJ-180 includes a battery-saver mode which automatically reduces current consumption. If you like carrying a handheld in your pocket, the push-to-talk lock and frequency control lock are easily activated by holding down the "Function" switch and pressing the lamp button.

Finally, a subaudible tone encoder and decoder are included in the DJ-180 for accessing PL-limited repeaters. All popular PL tones from 67 Hz to 250 Hz are accessible by pressing the "tone" button and rotating the top tuning knob. A second press of the "tone" button switches the PL encoder on. Press the "tone" button again to switch on only the PL decoder; another punch of the "tone" button switches on both the encoder and decoder.

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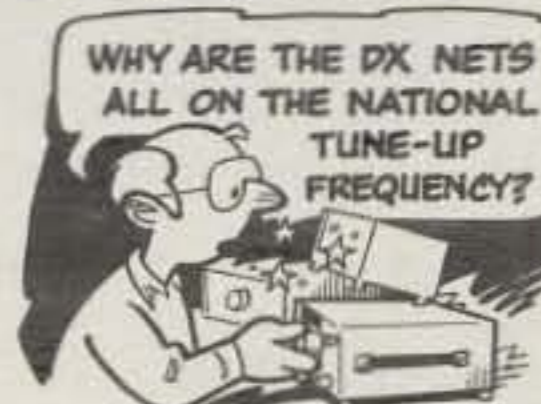
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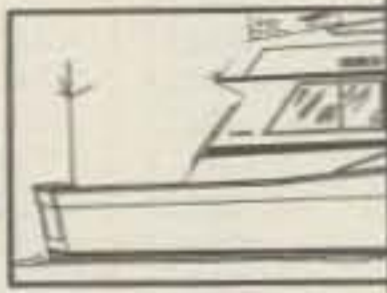
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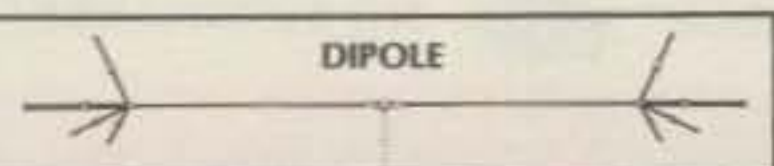
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PL paging may take some study in various areas of the country, however, as some repeaters utilize PL tone filters and may not pass certain tones. Which tones depends on the filters' center frequency and broadness of response. A repeater with an 88 Hz filter may pass 250 Hz or it may attenuate it; trial is the best way to check this out. Alternately, tone paging works great on direct frequencies such as 146.520 MHz.

**Using the DJ-180**

The DJ-180 proved to be a real pleasure to operate right from turn-on. As I mentioned earlier, front buttons are color-keyed according to functions. They are easy to understand, so studying the manual beforehand is not absolutely necessary. I found it quite convenient to pick up the handheld and chat with local friends without having to stop and think of keystrokes. Everyone I talked with was very impressed with the good audio quality and asked what type of handheld I was using. Some of them even requested meeting for lunch so they could see the new transceiver first hand. On the receiving end I find the DJ-180's audio most impressive. It sounds great for a small rig. The keypad works smoothly, and manually dialing numbers for autopatching is no problem.

The DJ-180 is very easy to use at night thanks to its brightly illuminated LCD readout. In fact, I can even tune the band and change offsets in a dark room. Speaking of offsets, that change merely involves holding the function button then pressing the V/M button once, twice, or three times for plus, minus, or no offset showing in the readout. During the latter steps the usual 600 kHz offset appears in the display, and rotating the top tuning knob changes to any desired odd offset.

Long-winded transmissions with the DJ-180 with high power (2 watts) produced only a slightly noticeable warming of the rear case. Battery life proved exceptionally good, and the rig continues to prove a great traveling companion. Although I have not had time (yet!) to try it in actual operation, the DJ-180 should also work well for transmit-uplinking to the Russian RS-10/11 low-orbiting satellite via Mode A. In this case, a key (connected in series with a 10K ohm resistor) can be plugged into the external microphone socket for transmitting CW on 2 meters while an HF

rig is used for receiving downlinked CW on 10 meters. The key would activate the handheld's PTT line and the plug would disconnect the internal microphone to avoid FMing. Frequency steps would be limited to 5 kHz; that is an acceptable trade-off for impromptu or portable operation. Two watts of power, incidentally, produces an adequate uplink signal for the Russian satellites; they are quite sensitive and sharp performers. Maybe some readers would like to pursue this idea of using an FM handheld on CW for satellite operations and share their success with all of us via a CQ article. Any takers?

Only minor problems were noted with the DJ-180. The low-power position, with the supplied rubber duck antenna, is practically useless. Use a better antenna or run high power. Close talking the microphone causes distortion. Stay 6 inches away for best audio results. The memory write procedure described in the manual in Section 4-7 is incorrect. After a few minutes of frustration, I reread the manual and found that the Tone/MW button on page 8 writes both the frequency and related data to the selected memory channel. Alinco has a new one-page addendum to alert buyers to this problem.

I have trouble with "little buttons" on most handhelds, so I really appreciate the way the DJ-180 makes life easy with well-spaced and multi-functional controls. I only wish the DJ-180 covered AM like the DJ-580 so I could use the handheld to track down power-line noise problems.

**Conclusion**

Considering the DJ-180's ease of operation, inclusion of the features most of us have come to expect in 2 meter rigs, and economical price tag, this handheld promises to be quite popular. I expect the DJ-180 to be a big hit among young amateurs with limited funds, but at the same time that opinion may seem too restricted. I also see the DJ-180 as being quite popular among HF enthusiasts who prefer a simple 2 meter rig for emergency communications and to use in inclement weather.

The DJ-180's suggested amateur net price is \$244.95. The handheld is backed with a one-year limited warranty and complemented with a full line of optional accessories such as EMS-9 speaker mic, EME-10K headset with VOX, ESC-18 vinyl case, EDC-45 quick charger, and EBP-28N 12 V/700 MAH battery pack. For more information, contact the people who know this radio best: Alinco Electronics, Inc., 438 Amapola Avenue, Suite 130, Torrance, CA 90501. ■



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FNB-12	12v @	500 MAH
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*Same size case as FNB-12		
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**Announcing:**

# The 1993 CQ World-Wide VHF WPX Contest

**Starts: 1800 UTC Saturday, July 10, 1993**  
**Ends: 2100 UTC Sunday, July 11, 1993**

**I. Contest Period:** 27 hours for all stations, all categories. 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 27-hour period, to promote VHF and above activity, to allow VHF and above operators the opportunity to experience the enhanced propagation available at this time of year, and for interested amateurs to collect VHF and above prefixes and Maidenhead locator grid squares for awards credits.

**III. Bands:** All authorized amateur radio bands above 50 MHz may be used, as authorized by local law and license class.

**IV. Class of Competition:** (1) Single op fixed station. (2) Multi-op class I fixed station. (3) Multi-op class II fixed station. A fixed station is defined as one that is a regular home station location. You may operate from your home station or you may be a "hired gun" at another home station to qualify for a fixed station category. A multi-op class I station is one which operates on all authorized amateur frequencies above 50 MHz. A multi-op class II station is one which operates on four or less of the authorized amateur frequencies above 50 MHz. (4) Single operator portable station. (5) Multi-op class I portable station. (6) Multi-op class II portable station. A portable station is defined as one which you set up away from a regular home station location. (7) Rover station. A Rover station is one which is manned by no more than two operators, must travel to more than one prefix and/or grid square and must sign "Rover" or /R. Please note: contacts from your home station cannot count as Rover contacts. These contacts must be submitted separately, in a separate category from the Rover category. Also, the spirit of this class is to encourage operation from rare grid squares by persons who are

inclined to do so. It is not the intent of this class to encourage one operator to move from one super station to another super station in another prefix or grid square in order to compete in this category. (8) QRP station. This is a new category for this year. Anyone operating a station running 25 watts output, or less, is eligible to enter this category. There are no location restrictions. You can operate from your home QTH, or from the highest mountain you can find. However, you cannot run more than 25 watts output on any band.

**V. Exchange:** Callsign and Maidenhead locator grid square (4 digits—e.g., EM15). Signal reports are optional and need not be included in the log entry.

**VI. Multipliers:** The multiplier is the number of different prefixes worked plus the number of different grid squares worked per band. A "Prefix" and a "Grid Square" are counted once per band. Exception: The Rover who moves into a new grid square or prefix can count the same prefix and/or grid square more than once per band as long as the Rover is himself or herself in a new prefix or grid square location. Such change in location must be clearly indicated in the Rover's log. It is required that Rover category operators maintain separate logs for each grid square and/or prefix location.

**A.** The letter/number combinations that form the first part of the amateur callsign are considered the prefix. Examples: N8, Y22, WB3, ZS65, etc. Any difference in the numbering, lettering, or order of prefix will form a separate prefix. An operator on the air from a DXCC country different from his or her callsign is required to sign portable. The portable prefix must be an authorized prefix of the country or call area of operation. In the portable operation, the portable designator becomes the prefix. Example: N8BJQ, operating from Wake Island, signs N8BJQ/KH9 or KH9/N8BJQ. Conversely, KH6XXX, op-

erating from Ohio, cannot sign /KH8, which is American Samoa's prefix. Nevertheless, that operator can sign /W8, /N8, /K8, etc., or any other prefix authorized in the US 8th call district. However, if the license you are issued designates a prefix as part of the callsign, that is the prefix you must use. Examples: W4/GØXYZ counts as W4; VP2M/N6CL counts as VP2. Portable designators without numbers will be assigned a zero (Ø) after the second letter of the designator to form the prefix. Example: WA4VCC/PZ becomes PZØ. All callsigns without numbers are assigned a zero (Ø) after the first two letters and/or numbers that form the prefix. Examples: 9NGHK counts as 9NØ; RAEM counts as RAØ. Aeronautical mobile (/AM), maritime mobile (/MM), mobile (/M), /A, /E, /J, /P, /R, or other portable or interim license class identifiers (/KT) do not count as prefixes.

**B.** A station in a call area different from that indicated by his or her callsign is not required to sign portable. However, the prefix of that station can be counted only once, and then only for the actual prefix. Example: N6CL is permanently located in Oklahoma (grid square EM15). However, N6CL chooses not to sign N6CL/5. If you work N6CL, you count the prefix only as N6, not N5, or N6 and N5.

**C.** The Rover who changes location during the course of the contest is free to contact as many other stations as he or she wishes. The Rover becomes a new QSO to the stations working him or her when that Rover changes either grid square or callsign district and indicates the change in prefix. Example: K5CPZ operates from EM16 in Oklahoma. When you work her you count the grid square (EM16) and the prefix (K5). While in Oklahoma she moves to EM06. You work her again. You then can count her from the new grid square (EM06). When she moves into Kansas and signs K5CPZ/Ø from EM07 you work her

again. You then can count the grid square (EM07) and the prefix (KØ). Assuming you work her only on one band, you may claim credit for three QSOs with the potential of five multipliers (EM16, EM06, EM07, K5, and KØ), presuming you work no one else with the same prefix or in the same grid square. She in turn is able to count you as three separate QSOs and whatever multipliers you give her. That is, she can count your prefix and your grid square each time, for a total of six multipliers, assuming you stay in one location. Please note: Rover category entrants must maintain separate log sheets for each grid square and/or prefix.

**D.** The grid square is the Maidenhead grid locator to four digits (FM13).

**E.** Special event, commemorative, and other unique prefix stations are encouraged to participate.

**F.** Aeronautical mobile stations are not eligible to compete. However, an aeronautical mobile station can be worked for prefix credit only. Maritime mobile stations, however, are eligible and encouraged to compete from rare water-bound grid squares. A maritime mobile station is eligible to compete in the Rover category, provided it meets the necessary requirements to be considered a Rover station.

**VII. Scoring:** One point per QSO on 50, 70, and 144 MHz; 2 points per QSO on 222 and 432 MHz; 4 points per QSO on 903 and 1296 MHz; 6 points per QSO on 2.3 GHz and above. Work stations once per band, regardless of mode. Multiply total QSO points times total number of prefixes (PX) plus the total number of grid squares (GS) worked. This differs from the scoring for the CQ WW HF WPX Contest, where a prefix counts only once regardless of band (and countries, rather than grid squares, are the multipliers). Contest entrants may not transmit on 146.52 MHz, or your country's national 2 meter FM simplex calling frequencies, or commonly recognized repeater frequencies for the purpose of making or requesting contacts. Contacts made within your own country, in the DX window of 50.100 to 50.125 MHz, are discouraged. Contacts made on the SSB calling frequencies of 50.110 MHz, 50.125 MHz, and 144.200 MHz are discouraged. Contest participants are required to use UTC as the logging time.

**Incentive scoring:** Operators completing two-way CW or MCW contacts may add one point to the QSO value for each contact.

Example: W1XX works stations as follows:

37 QSOs, with 3 QSOs on CW ( $34 \times 1 = 34$ ;  $3 \times 2 = 6$ ;  $34 + 6 = 40$ ) and 12 PX's and 10 GS's (22 multipliers) on 50 MHz.

45 QSOs ( $45 \times 1 = 45$ ) and 18 PX's

and 8 GS's (26 multipliers) on 144 MHz. 26 QSOs ( $26 \times 2 = 52$ ) and 10 PX's and 4 GS's (14 multipliers) on 222 MHz.

38 QSOs ( $38 \times 2 = 76$ ) and 11 PX's and 5 GS's (16 multipliers) on 432 MHz.

2 QSOs ( $2 \times 4 = 8$ ) and 2 PX's and 2 GS's (4 multipliers) on 903 MHz.

6 QSOs ( $6 \times 4 = 24$ ) and 3 PX's and 2 GS's (5 multipliers) on 1296 MHz.

W1XX has 245 QSO points ( $40 + 45 + 52 + 76 + 8 + 24 = 245$ )  $\times$  87 multipliers ( $22 + 26 + 14 + 16 + 4 + 5 = 79$ ) = 21,315 total points.

**VIII. Awards:** Engraved plaques will be awarded to the top-scoring stations in each category in the world (for a total of eight plaques). Parchment certificates suitable for framing will awarded to the top-scoring stations in each category in each continent. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Certificates will be awarded to top-scoring stations in each category in geographic areas where warranted. Geographic areas include states (U.S.), call areas (Japan), provinces (Canada), and countries, and may also be extended to include other subdivisions as justified by competitive entries.

**IX. Miscellaneous:** An operator may sign only one callsign during the contest. This means that an operator cannot generate QSOs by first signing his callsign, then signing his daughter's callsign, even though both callsigns are assigned to the same location. All contacts above 300 GHz must use coherent radiation on transmissions and employ at least one stage of electronic detection on receive. A station located exactly on a dividing line of a prefix and/or a grid square must choose only one grid square and/or prefix from which to operate for exchange purposes. A different multiplier cannot be given out without moving the complete station at least one hundred meters.

**X. Log Submissions:** With the inclusion of the QRP category, this contest has been revised slightly from last year. Therefore, while the old log sheets are still usable, the old summary sheets are not. You must request logs and summary sheets from: the CQ VHF WPX Contest, CQ Magazine, 76 N. Broadway, Hicksville, NY 11801. Please include an SASE with your request.

Completed logs must be postmarked no later than August 31, 1993 to be eligible for awards. All logs should be mailed to: Joe Lynch, N6CL, VHF WPX Contest Chairman, P.O. Box 73, Oklahoma City, OK 73101. Please mark "VHF Contest Logs" on the envelope. Logs may be submitted on disk, provided a hard copy of the log is sent with the disk and the data is in an ASCII format compatible with an IBM-PC type computer. ■



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CIRCLE 58 ON READER SERVICE CARD

**Here's a DXpedition of a different sort—VHF mountaintopping. Whether you're a newcomer or have been around for a while, this might be for you.**

## VHF Mountaintopping For The '90s

BY JOHN F. LINDHOLM\*, W1XX

**T**he recent influx of no-code VHF operators with other newly licensed amateurs increases for everyone the potential crop of contacts to be made above 50 MHz. Further, with the sunspots now in decline, continued and reliable worldwide communications on the 15 and 10 meter bands can no longer be expected. Consequently, some new amateurs are prime for the discovery of an ancient radio activity—VHF mountaintopping, where nature is utilized to elevate your antenna up to several thousand feet! Imagine if you had your 2 meter FM antenna in your backyard on a thousand foot tower connected to your rig with nearly no-loss coax. You can do just that by bringing Mohammad (you and your radio) to a mountain!

### The Times Are Still a Changin'

Back in 1986 I reported on the mountaintop scene "for the '80s" and the impact of newer compact portable radios.<sup>1</sup> Mountaintopping can trace its heritage to smoke signals and semaphores and in radio to the 5 meter band of the 1930s, if not before. Some of the earliest amateur VHF experimentation was done from hilltop locations. Selden Hill located in West Hartford, Connecticut (where I once lived in the 1950s) was the scene of some of this VHF pioneering.

Today's newcomer probably has limited exposure to long-distance (i.e., DX!) contacts on VHF, resulting from experience with normal local coverage of the typical FM repeater. Though obviously FM operation from a mountaintop copycats the capability of the repeater station for DX, you will not tap the potential for VHF DX until SSB or CW is employed. Range then typically expands to 200 miles or more even on a dead 2 meter band.

The juices start to flow when you make

\*567 Broadview Terrace, Hartford, CT 06106



*Operating from a picnic bench covered by a tarpaulin, W1XX enjoys the outdoors in the ARRL UHF Contest from Overlook Mountain, NY (FN22).*



*Author W1XX operates the 125 and 33 cm stations from 4U1UN, the United Nations Headquarters in Manhattan, in the CQ VHF WPX Contest. Two contest expeditions by this team were conducted to the UN building, giving many stations a new DXCC country on 6 meters through 10 GHz.*

a solid VHF or UHF contact of several hundred miles on SSB with two watts and a collapsible Yagi beam antenna, a fete possible from a good location. For example, during the ARRL 432 MHz Spring Sprint last year, K1JX and I

worked K4QIF in Virginia from Mt. Higby overlooking the Connecticut River valley, a 900 foot elevation. This is a distance of over 400 miles with two watts! What was the difference? We had a 900 foot antenna mast! My first mountaintop experience was with a small, portable 2 meter radio and a 30 watt amplifier powered by the car battery. I was at the side of the road on Hogback Mountain, Vermont, when I worked North Carolina! I've been hooked on mountaintopping ever since!

The good news for the 1990s is that mountaintopping is now better than ever. It beckons the new crop of amateurs—maybe even you.

### Pick Your Mountain

Mountaintops come in a variety of forms, depending on your locale. Some are real mountains, as in the east, with heights of a few hundred up to about 5000 feet. In the Rockies or far west, elevations of 10,000 feet or more are common. In Kansas or Nebraska it might be a silo or water tower. One of my favorite high spots is Sankaty Lighthouse on



Extended K1FO antennas for 432 MHz courtesy of NC1I at the W1XX/3 multi-op station at the Blue Knob ski area in rare grid FN00. The team finished second nationally in the 1989 September VHF QSO Party.

Nantucket Island, Massachusetts (in rare grid FN51). On the very edge of the Atlantic Ocean, it's only 114 feet above sea level, but you can see forever. This is good news for the propagation of your VHF radio signal. Find a location with a commanding view, the more prominent the better.

Whatever operating site you select, remember you are sharing the environment with others. Never leave behind a trace that amateur radio has been there, be it a Coke can or wad of electrician's tape. Generally you will find the public interested in and curious about your radio activity. Take time out to do a little PR.

Always have permission to set up operations. This requires some advance planning. Often park rangers on fire watch can be most helpful in pointing out the proper official route for gaining authorization. Don't be afraid to toot amateur radio's horn in regard to its fine public-service record in emergencies. Competitive contests can best be described as emergency test drills, which they are! With a positive approach, you will find authorities sympathetic to your need to "test" amateur radio from their fine mountaintop site. I've had success in securing permission at the local, state, and national (in national parks) levels, and even at the

international level, atop the United Nations Headquarters in New York. Be a good ambassador for amateur radio and it will pay big dividends in providing prime operating sites. Always follow up after the contest with a "thank you" letter.

## Power Sources

You will probably need to provide your own power. One option is battery power. Radios with internal batteries usually are limited to a couple of hours of use. A gel cell will power a QRP radio for an entire contest weekend and is sufficiently lightweight for backpacking. This is an attractive option for the QRP portable contest category (10 watts output) designed for operation from remote sites without AC power. Using the car battery (connect with heavy-duty jumper cables directly to the car battery) is another option as long as you can get your vehicle to the operating site. Caution: Don't run down the battery so much that you can't start the vehicle's engine.

Another option, especially if using a basic radio with an amplifier (100 watt solid-state amplifiers are common), is a small generator. Relative quiet, portability, and reliability are prime considerations. The Honda 650, for example,

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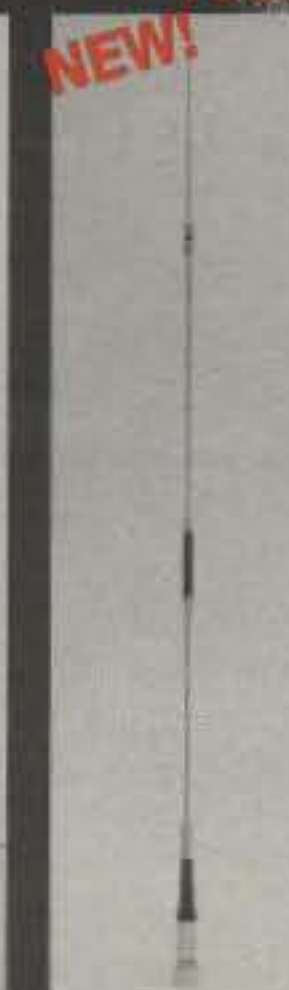
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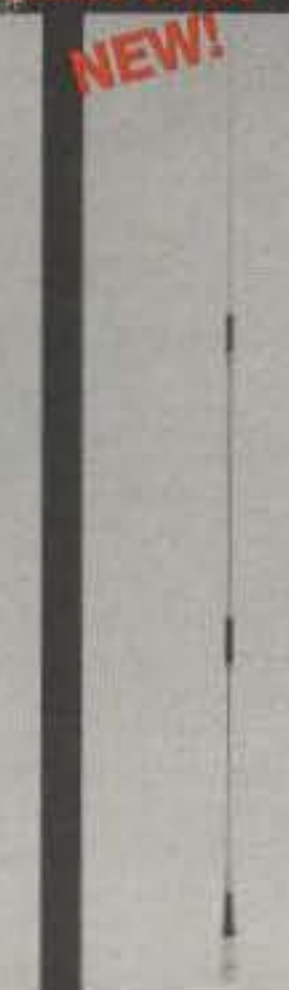
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Connector:  
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Gain & Wave:  
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446MHz 7.2dB  
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**CX-224**  
Gain & Wave:  
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222MHz 3.6dB  
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446MHz 6.0dB  
5/8 wave x 2  
Max Power: 100 watts  
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NMO (CX-224NMO)



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7/8 wave  
446MHz 7.0dB  
5/8 wave x 3  
Max Power:  
150 watts FM  
Length: 4' 10"  
Connector:  
UHF (PL-259)



**CA-2x4SR**  
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5/8 wave  
446MHz 6.2dB  
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Connector:  
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NMO (B-20 NMO)



**B-10**  
Gain & Wave:  
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1/4 wave  
446MHz 2.15dB  
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CIRCLE 32 ON READER SERVICE CARD



Mike, W1OD, atop the observation platform at Ice Caves Mountain, New York in FN21 during W1XX/2 multi-op setup. This was during the June 1986 VHF Contest, which featured a tremendous 6 meter E-skip opening.

weighs in at 43 pounds, makes less noise than a lawnmower, and doesn't look like it was salvaged from Guam after WW II. It will power a couple of 100 watt stations, lights, and a laptop computer for logging, with power to spare.

Of course, the ideal situation is Mt.

Everhigh with a paved access road and an AC outlet marked "For amateur use only!"

### Antennas

Here's where the little "homebrewer" in

many of us can shine. There are any number of construction projects for small Yagi antennas for portable operation that you can tackle. But if you're like me, you'll go right to your favorite radio store. Typical boom lengths (available from several manufacturers) that are do-able with even one or two people are 12 feet on 6 meters, 15 feet on 2 meters, and 18 feet on 70 cm. When going to more ambitious antenna systems, an argument rages as to which is preferable: two medium-sized stacked antennas or one very long antenna. I've tried both configurations and based on both performance and practicality, I find two stacked antennas preferable. With 3 dB gain it is equivalent to doubling your power. Very long antennas are cumbersome and tend to have too sharp a beamwidth.

### Antenna Supports

For starters, inexpensive Radio Shack mast available in 5 and 10 foot sections can get your antenna off the ground. Since nature has supplied 99 and 44/100 per cent of your antenna height, just make sure any trees or obstructions are cleared. (Safety consideration: Be sure that UHF antennas are well above any humans, either you or passersby.)

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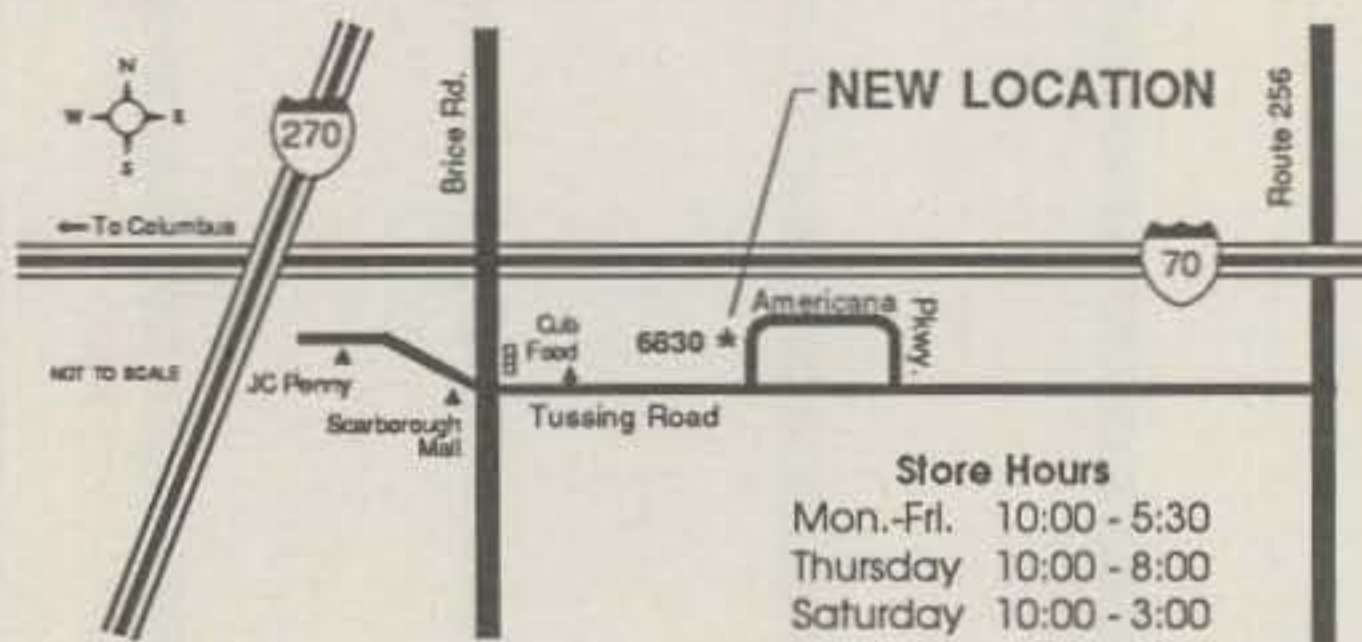
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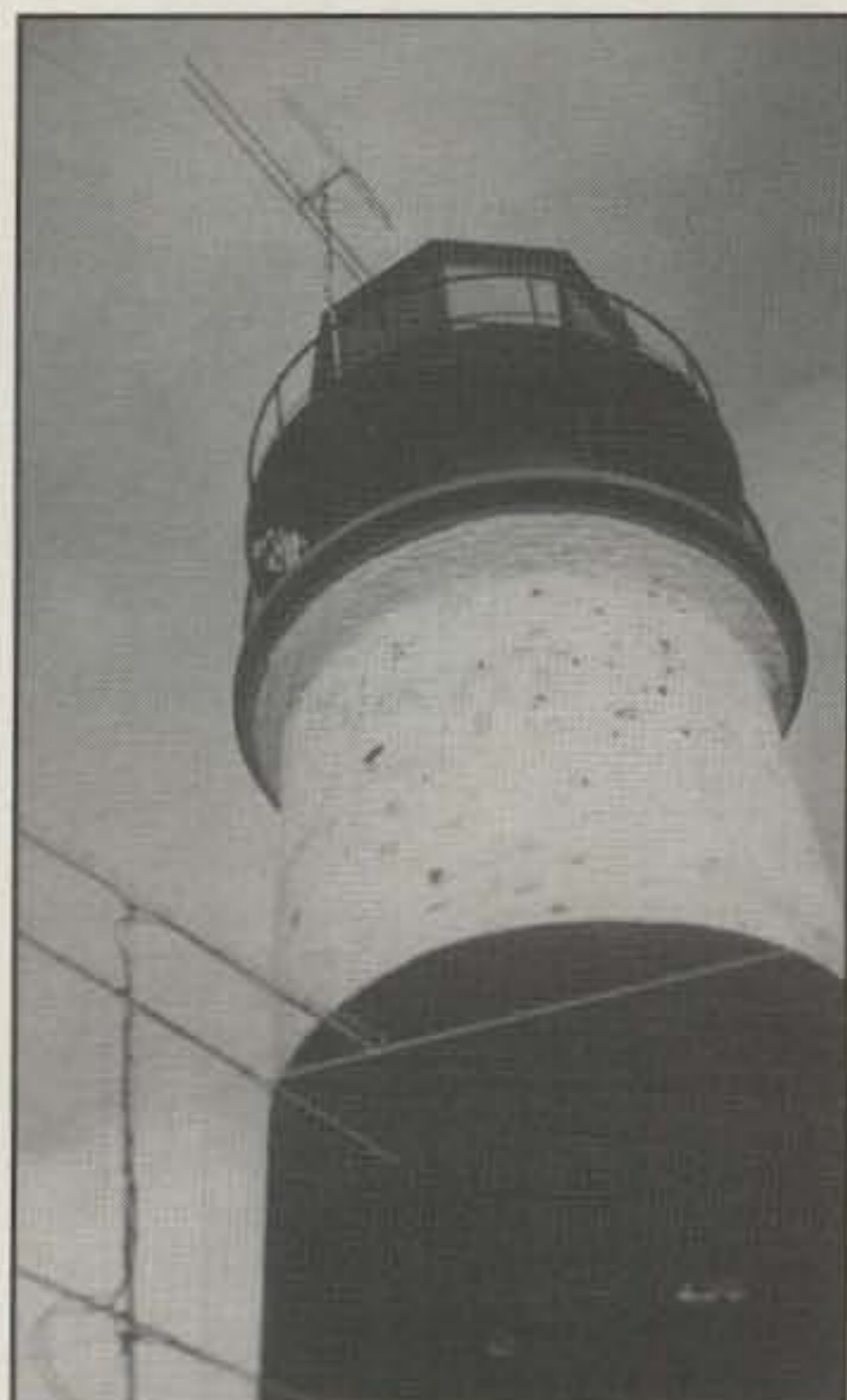
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70-cm:	432.100 MHz Calling Frequency
33-cm:	903.100 MHz Calling Frequency
23 cm:	1296.100 MHz Calling Frequency
13 cm:	2304.100 MHz Calling Frequency

Activity Hours: During contests, certain hours are designated to concentrate activity according to the following schedule:

7 PM—2 meters (144 MHz)  
8 PM—125 cm (222 MHz)  
9 PM—70 cm (432 MHz)  
10 PM—13 cm (1296 MHz)

Activity Nights: During the week, evening hours of certain days are designated to concentrate activity according to the following schedule: Monday 2 meters; Tuesday 125 cm; Wednesday 70 cm; Thursday 13 cm; Friday 33 cm.

Table I— VHF/UHF SSB/CW operating frequencies guide.



The U.S. Coast Guard sanctioned the W1XX January VHF Sweepstakes operation from the Sankaty Lighthouse. Antennas are 903/222/432 MHz with 1296 and 2304 MHz antennas atop the lighthouse. A tremendous aurora gave many 8's and 9's this rare FN51 grid.

(hand rotated) technique can be quite adequate (it can be an advantage in pointing your antenna quickly). Bolt a cross-piece handle to the mast at a convenient height to facilitate turning. If using motor-driven rotators, I recommend base mounting and turning the whole mast guyed with slip rings. I've done a portable 6 meter monster 55 foot stacked array of 5 over 5 over 5 (that's three 5-element antennas stacked on a single mast), turning the whole thing with a base-mounted Tailtwister!

## Camping

If your mountaintopping expedition to the wilderness turns into an overnigher, you will need the necessary camping gear. If you don't already own the necessary survival equipment, many sports equipment stores rent it at reasonable rates. A tent is the most important piece of equipment needed. With an unfamiliar tent, always practice setting up in advance so you don't end up with what looks like the house that Jack built. Most everyone can handle the necessary check list of items needed, but don't for-

get insect repellent. Forgetting this could turn an otherwise enjoyable outing into something comparable to Chinese water torture. If you're the outdoor type, though, waking up to the aroma of sizzling bacon and brewing coffee can almost top a rip-snorting tropo duct on the 2 meter band.

## Grid Squares

Just as working and collecting DX countries drives the engine of the HF DX bands, grid squares are the prime operational motivator on VHF.<sup>2</sup> Those elusive

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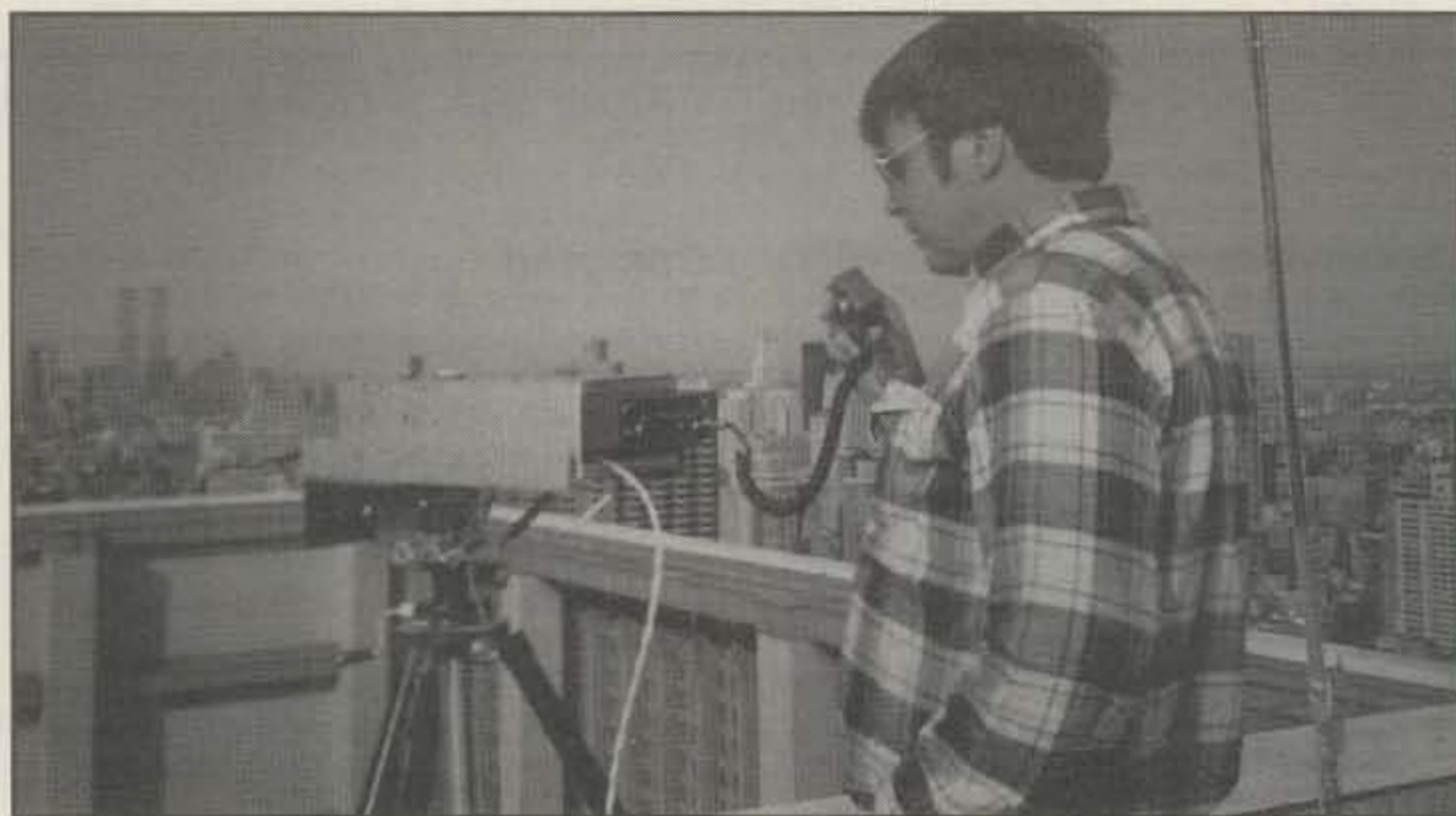
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Mid January	ARRL VHF Sweepstakes
Early April	ARRL 2 meter Spring Sprint
Mid April	ARRL 222 MHz Spring Sprint
Late April	ARRL 432 MHz Spring Sprint
Early May	ARRL 903, 1296, 2304 MHz Sprint
Late May	ARRL 6 meter Sprint
Mid June	ARRL June VHF QSO Party
Mid July	CQ World-Wide VHF WPX Contest
Early August	ARRL UHF Contest
Mid September	ARRL September VHF QSO Party

Table II- VHF/UHF contests. (See "Contest Calendar" in the appropriate issue of CQ for details.)



Warren, WA2ONA, makes the first 10 GHz contact ever from 4U1UN atop the UN building during this ARRL June VHF QSO Party for a top-10 plaque winning effort. Note the Manhattan skyline.

underpopulated or those mostly ocean-bound grid squares can provide both the station worked and the gridpeditioner a rush comparable to working JY1 on 80 meters.

Access to remote sites in such rare grids can be a mystery. Topographic maps and hiking maps (available in back-country sporting goods stores) can reveal trails to remote peaks. If you're not backpacking with lightweight gear, a four-wheel drive vehicle may be needed to reach such remote overlooks.

### Getting It On

The best time to get your feet wet in mountaintopping is in one of the many VHF contests (see Table I) such as the CQ WPX VHF Contest, where you can maximize your QSO potential. Making lots of rapid-fire contacts will get the adrenalin flowing and demonstrate the value of your close-to-heaven location. Non-contest activity, especially from rare grids, can usually stir up a beehive of activity with an appearance on the calling frequency (see Table II).

If this is to be your first go at it, try 2

meters, a staple bread-'n-butter band that yields high QSO totals while utilizing a manageable multi-element gain antenna. The drive to branch out to other bands will increase exponentially with the excitement experienced from 2 meter mountaintopping.

### Addendum

I've had the pleasure of sharing my mountaintopping experiences with hundreds of amateurs at hamfest seminars, sharing hints and kinks learned in the field from Cadillac Mountain in Maine to Mt. Frasier in California, to the seashore at Virginia Beach. I would be glad to try to assist anyone, especially newcomers, with questions with an SASE.

### Notes

1. J. Lindholm, "VHF Mountaintopping for the '80s," *QST* March 1986, p. 51.

2. J. Lindholm, "VHF/UHF Century Club Awards," *QST*, January 1983, p. 49. Reprints available from American Radio Relay League, Awards Branch, 225 Main Street, Newington, CT 06111.



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## Book Nook '93

**H**ave I got a big stack of books, magazines, newsletters, and catalogs this month! Let's dig right in and clear off my desk for the next load.

**The Radio Amateur's Digital Communications Handbook.** Digital communication is the fastest growing area in amateur radio, but well-written tutorial material is scarce. Jonathan L. Mayo, KR3T (who also is a contributor to *Digital Digest*), fills the void with a book whose time definitely has come. *The Radio Amateur's Digital Communications Handbook* is a carefully written, 224-page volume. Priced at \$14.95, it covers the full spectrum of amateur digital communications, including all the standard modes as well as recent developments such as digital signal processing (DSP).

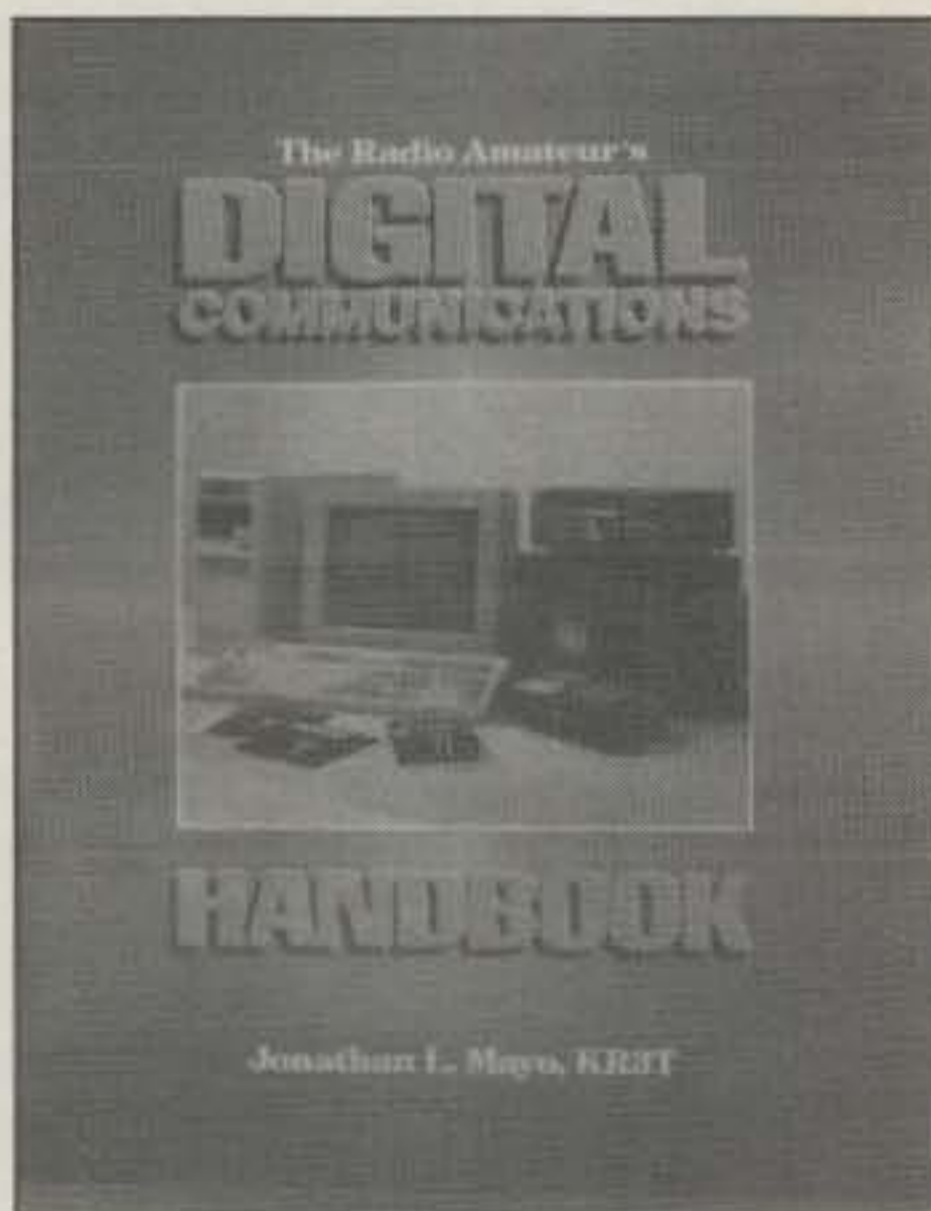
See your bookseller, or contact Tab Books, Blue Ridge Summit, PA 17294-0850 (telephone 1-800-822-8138 or 1-800-233-1128).

**Two from Tiare Publications.** First up is *Ham Radio Contesting*, by Robert J. Halprin, K1XA. Bob gives readers a thorough, "how-to" treatment on the art of contesting. The book offers much practical information for amateurs who want to join the fun for the first time, as well as those who have been at it for a while but feel they aren't getting the results they would like. The Tiare book is 73 pages and is \$14.95 plus \$2 shipping/handling.

Second is *Weather Radio* by Anthony R. "Tony" Curtis, K3RXX. Tony's book is a complete guide to picking up NOAA weather information, marine weather and VOLMET broadcasts, NavTex, Weather FAX transmissions, and the Coast Guard. A handy master list of weather-related frequencies is included. It's 125 pages and is \$14.95 plus \$2 shipping/handling from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147.

**AMRAD Newsletter.** AMRAD is the Amateur Radio Research and Development Corporation, a small but enthusiastic group of radio and computer experimenters. Its focus is on developing skills and knowledge among members in radio and electronic technology, advocating design of experimental equipment and techniques, and promoting research. It mails the *AMRAD Newsletter* six times a year to members; technical articles, product announcements, and news are featured. Membership in AMRAD, which is \$15 annually, includes the newsletter. Contact the Amateur Radio Research and Development Corporation, P.O. Drawer 6148, McLean, VA 22106-6148.

**Discover DXing!** For SWLs, Universal Radio offers a concise, 50-page introduction to DXing the AM, FM, and TV bands. Written



*In The Radio Amateur's Digital Communications Handbook Jonathan L. Mayo, KR3T, has come up with a one-stop resource for practically everything you might need to know about digital modes, including packet radio and digital signal processing (DSP). Also provided is operating information on HF, VHF, UHF, and satellite communications, as well as a glimpse of the digital-based future of amateur-radio. (Photo courtesy KR3T)*

by John Zondlo, topics include propagation, seasonal conditions, radio equipment and antennas, reference material, obtaining QSL cards, logging, and DX clubs. The book is \$4.95 plus \$1 shipping/handling.

Also, Universal Radio again has updated their popular Communications Catalog. The 100-plus page catalog is an excellent sourcebook for amateur, SWL, and scanner equipment, accessories, and books. It's \$2 from Universal Radio, Inc., 6830 Americana Pkwy., Reynoldsburg, OH 43068 (1-800-431-3939).

**Spread Spectrum Scene.** Are you "into" spread spectrum? If so, a specialized newsletter you might consider is *Spread Spectrum Scene*. It's dedicated to the spread spectrum professional and is committed to being a major source of news and information about this emerging science. SSS provides a forum for publication of technical and engineering information, editorials, opinions, and news of the field.

The newsletter is published monthly. It's \$29.95 for 12 months from RF/Spread Spectrum (RF/SS), P.O. Box 2199, El Granada, CA 94018-2199 (1-800-524-9285). (They'll mail you a complimentary copy if you

send them a self-addressed, 9" x 12" envelope with 75 cents U.S. postage attached.)

**Prizm Resources Books.** Small seems to be better at Prizm Resources, which distributes technical and reference books with a flair for the unusual. They specialize in shirt-pocket-size technical reference books, including *Pocket Ref* and *Pocket PCRef* (both of which we've reviewed in the column), *Electronics Pocket Handbook*, several *Passport Travelmate* editions (*World Atlas*, *U.S. Atlas*, and *Diary*), and *The ARRL Repeater Directory*. They also carry regular-size amateur radio, computer, intelligence, electrical, and electronics books. For a catalog, contact Prizm Resources, Inc., P.O. Box 557, Morrison, CO 80465 (1-800-873-7127).

**Artsci Amateur Publications.** Artsci specializes in reference publications for the radio amateur. Their catalog shows a number of unique, specialized publications, including the *Amateur HamBook* (a reference compendium); *Radio/Tech Modifications No. 4* (for Alinco, Kenwood, ICOM, Yaesu, and other radios); *Lost Users Manuals* (condensed programming instructions if your original operating manual was deep-sixed); *Federal Government Frequency Assignments*; *U.S. Repeater MapBook*; and the *North American Shortwave Frequency Guide*. For a free catalog, contact Artsci, Inc., P.O. Box 1848, Burbank, CA 91507 (818-845-9203).

**Time Out for Voodoo.** Two how-to books by Kay Yarborough Nelson, *Voodoo DOS: Tips and Tricks with an Attitude* and *Voodoo Windows: Tips and Tricks with an Attitude*, have attracted a good deal of attention. They're collections of DOS and Windows tips that provide solid computer-guru style advice in formats that are refreshing changes from the usual, dull operating system references. Rather than just spew out the hundreds of operating tips in each book, she presents them in a distinctive, entertaining, and irreverent "black magic, sorcery, and wizardry-based" voodoo theme. While that theme may wear thin, especially for advanced DOS or Windows users, she does present a wealth of serious, substantive material in a very palatable manner.

Each book is \$19.95 from Ventana Press, P.O. Box 2468, Chapel Hill, NC 27515 (1-800-877-7955).

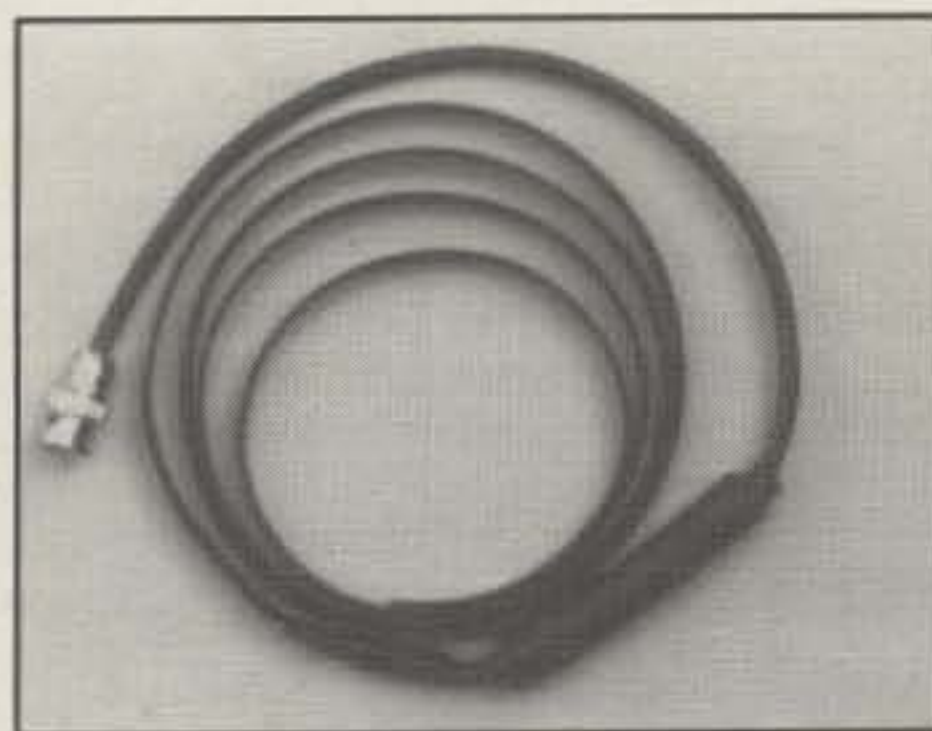
**Two from Osborne McGraw-Hill.** One of my favorite computer and electronics publishers, Osborne McGraw-Hill, recently sent me two excellent computer books I'll share with you. Both should be available at major booksellers.

First is *Dvorak's Inside Track to DOS & PC Performance*, by computer columnist John C. Dvorak and programming expert Nick Anis. At \$39.95, it's a thick (879-page)

317 Poplar Drive, Millbrook, AL 36054



The Nye Engineering FS 73 Signal Cube is an untuned, broadband device that covers 0.1 to 450 MHz and can be used for absolute readings with its built-in dipole antenna. It's equipped with a 3.5 digit LCD display that indicates RF amplitude. (Photo courtesy Nye Engineering Co., Inc.)



The MFJ-1730 Pocket Roll-Up is a half-wave vertical "J" antenna for use when traveling, on vacation, or attending hamfests. The \$14.95 omnidirectional antenna doesn't require a ground plane; you just hang it in a convenient spot and plug its BNC connector into your handheld radio. (Photo courtesy MFJ Enterprises, Inc.)

book/disk combo that has a wealth of information on using DOS 5, along with valuable insights, tips, and techniques for expanding the capabilities of IBM PCs and compatibles. The 3.5 inch included diskette contains more than 70 useful utility programs, most of which are shareware.

Second is *Jamsa's 1001 DOS & PC Tips*, by Kris Jamsa. Like the Dvorak book, it includes a 3.5 inch disk filled with utility and batch programming files. The book's (count 'em) 1001 tips are presented bullet-style, organized by classifications such as computer system, memory, keyboard, disk, batch file, DOS shell, hardware, printer, maintenance, and others. The publisher says it's aimed "at every user," although in my opinion the book's technical level is more for the intermediate or higher customer, as is the disk. The 896-page book/disk opus is \$39.95.

**Three from Prentice-Hall.** Three computer books Prentice-Hall recently sent me I found quite useful and readable. Most interesting to me was *Jim Seymour's On the Road: The Portable Computing Bible*. This one lays out just about everything you need to know about traveling with a computer. It's invaluable if you have, or are thinking about purchasing, a portable PC (laptop, notebook,

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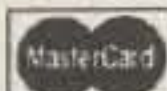
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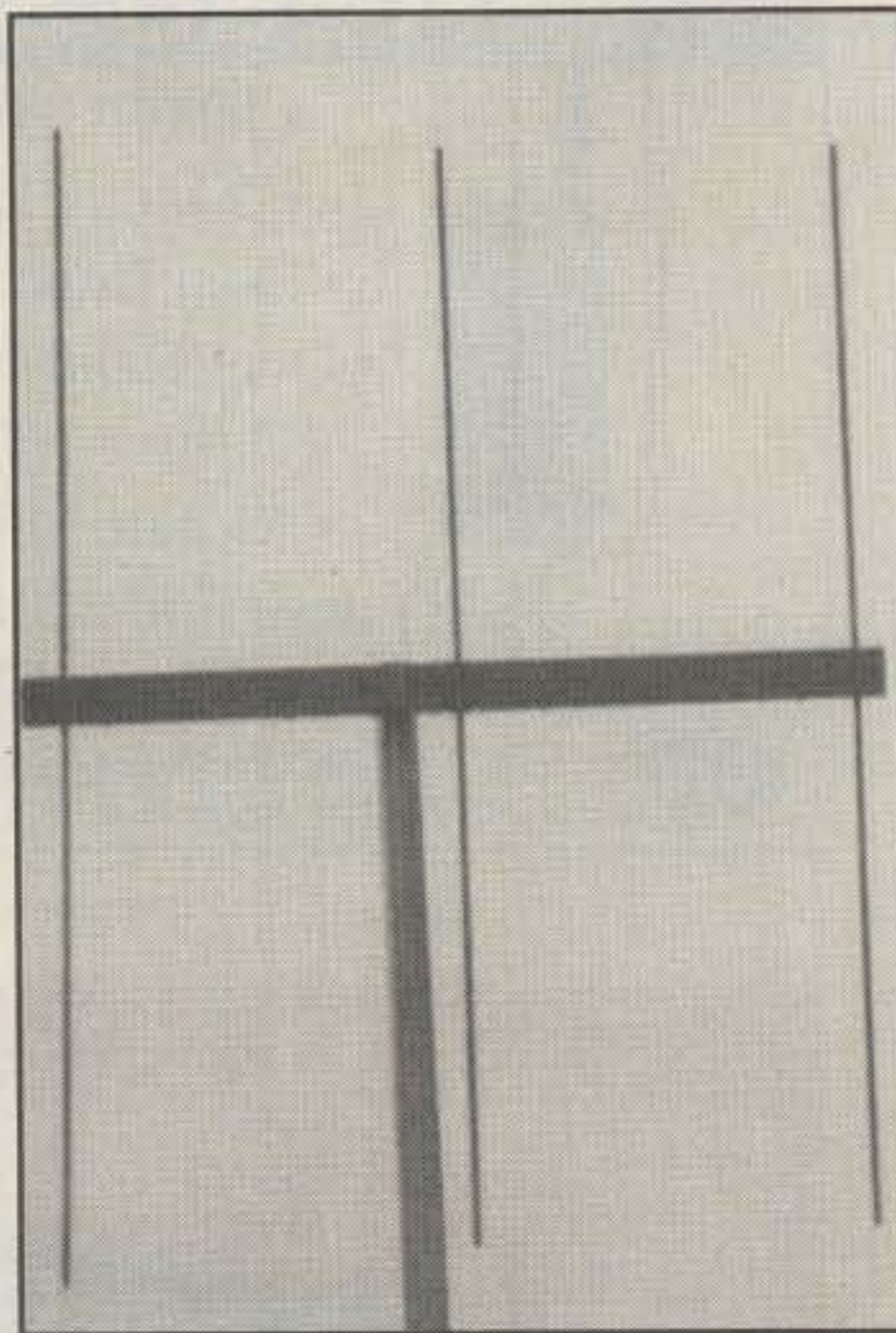
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**YO 5.0** automatically optimizes monoband Yagi designs for maximum forward gain, best pattern, and minimum SWR. YO models stacked Yagis, dual driven elements, tapered elements, mounting brackets, matching networks, skin effect, ground effects, and construction tolerances. YO optimizes Yagis with up to 50 elements from HF to microwave. YO runs hundreds of times faster than MININEC. YO is calibrated to NEC for high accuracy and has been extensively validated against real antennas. YO is intuitive and highly graphical. YO 5.0, \$75. YOC 5.0 (assembly language, much faster), \$100. NEC/Yagis 1.0 (professional accuracy reference), \$50.

AO, YOC, and NEC/Yagis require a math coprocessor; MN, MNH, GUY, and YO come with both coprocessor and noncoprocessor versions. All disks include extensive documentation. Inquire about commercial licenses. Add 7.25% CA, \$5 overseas. Visa, MasterCard, U.S. check, cash, or money order. For IBM PC, 3.5" or 5.25" disk.

Brian Beezley, K6STI  
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The MFJ-1763 portable 3-element beam is for 2 meters. With its 2.75 ft. boom, the antenna offers good gain and directivity. Using threaded elements that screw into the boom, the antenna is easy to store and transport, and it can be set up or taken down quickly. It's sturdy enough for fixed station use, and it can be mounted on a tower leg. (Photo courtesy MFJ Enterprises, Inc.)

subnotebook, etc.). I recommend the book to all DXpeditioners who use portables to do their real-time logging and transfer their files later. It's 283 pages and priced at \$26.95.

As a "PC utilities junkie," I found Rob Krumm's *Inside The Norton Utilities 6.0*, Third Edition, a very good resource for both new and experienced users to help realize the full power and versatility of The Norton Utilities programs. It's filled with a wealth of inside hints, tips, and ideas, and it shows clearly the technical stuff that DOS can't do but Norton can. Updated through DOS 5.0, Krumm's 637-page book is \$21.95.

If you're frustrated by your PC's performance, or if you are unable to use the latest software, are unsure of what options to add, or are intimidated by thoughts of upgrading your PC yourself, consider The Winn L. Rosch PC Upgrade Bible. The 621-page, \$26.95 how-to book provides the guidance you need to decipher how things come apart and fit together, what parts fit where, and what corners you can and can't cut.

### New Stuff

**High-Performance Digital FSM.** Nye Engineering has come up with a high-quality, precision digital field strength meter (FSM) in its FS 73 Signal Cube. The Nye unit is untuned and broadbanded, covers from 0.1 to 450 MHz, and has a large digital display to indicate RF amplitude. Interestingly, the unit can be used not only for relative readings, but also for absolute readings, as it includes a calibration chart to determine actual volts/meter. The unit is operated by a 9 volt

battery and costs \$159. It's from Nye Engineering Co., Inc., 4020 Galt Ocean Dr., Suite 606, Fort Lauderdale, FL 33308 (305-566-3997).

**Two Goodies from MFJ.** Last year MFJ introduced two interesting portable antennas for 2 meters. One is the MFJ-1730 Pocket Roll-up "J," a half-wave vertical that's a good bet when traveling, on vacation, or when attending hamfests—especially to improve the result obtained with handheld radios' rubber duckies. The \$14.95 omnidirectional antenna doesn't need a ground plane, and it can be rolled up and stuck in your pocket while on the go.

For more sophisticated 2 meter portable work consider the MFJ-1763 portable beam. With its 2.75 ft. boom, the three-element antenna provides good gain and directivity. Using threaded elements that screw into the boom, the antenna is easy to store and transport, and it can be set up in seconds—yet it's sturdy enough for fixed station use. A ferrite choke balun is included for feedline decoupling. It's \$39.95 from MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 (1-800-647-1800).

**ANTENNA MODEL.** Teri Software has thrown its hat in the antenna modeling derby with ANTENNA MODEL™. It's an easy-to-use, general-purpose MININEC-based computer modeling program that helps solve both Yagi and wire antenna problems. The core modeling program is accompanied by companion editing and pattern plotting modules, ANTENNA EDIT and ANTENNA PLOT, respectively. The three programs may be used separately or together.

ANTENNA MODEL automatically recognizes most symmetrical antennas, and the program can use all available conventional memory to solve the mutual impedance matrix. The editor module features cut-and-paste capability, and a pop-up calculator does the arithmetic needed to define an antenna. The pattern plotting module works in polar or rectangular modes, and you can display as many as three patterns simultaneously. The program features a script-driven automatic mode that lets you set up long or repetitive jobs in advance for unattended operation. You can define sources in terms of voltage or current, and the program accommodates as many as 200 wires, 50 loads, and 10 ground media (zones). The number of segments and pulses is limited only by the free conventional memory in your PC. The program includes a very comprehensive and well-written, 132-page user's guide.

ANTENNA MODEL is available in several different versions to match your system's hardware. It's \$50 postpaid from Teri Software, P.O. Box 277, Lincoln, TX 78948. Fig. 1 shows the load antenna definition dialog box, while fig. 2 depicts a typical far-field radiation pattern produced by the program.

**SMART RIG.** Steven P. Katzman, WA6MUO, at Agate Software Co., recently introduced SMART RIG™. It's a computer-aided tuning (CAT) rig control program for use in the Microsoft Windows™ environment. The program takes advantage of several graphical user interface features of Windows to convert conventional "knob-twisting" tuning procedures into simple, point-and-click mouse operations. The program lets you

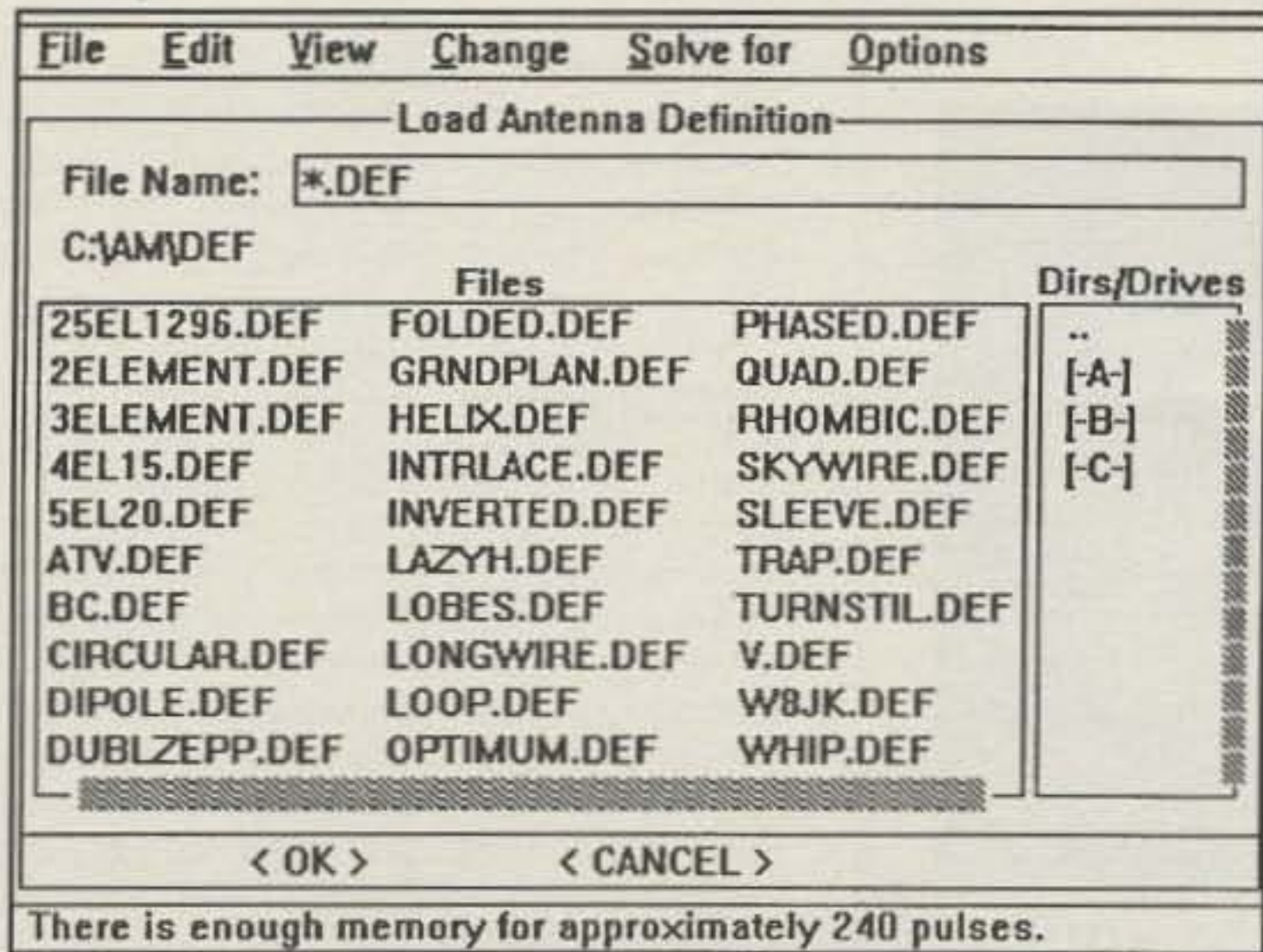


Fig. 1—ANTENNA MODEL: load antenna definition dialog box. Antennas are defined or described by definition files: before ANTENNA MODEL can do anything useful, an antenna definition must be loaded. Pressing a hotkey pops up the dialog box shown here, from which you select the definition file with which you want to work. The program checks the file for errors as it loads into memory.

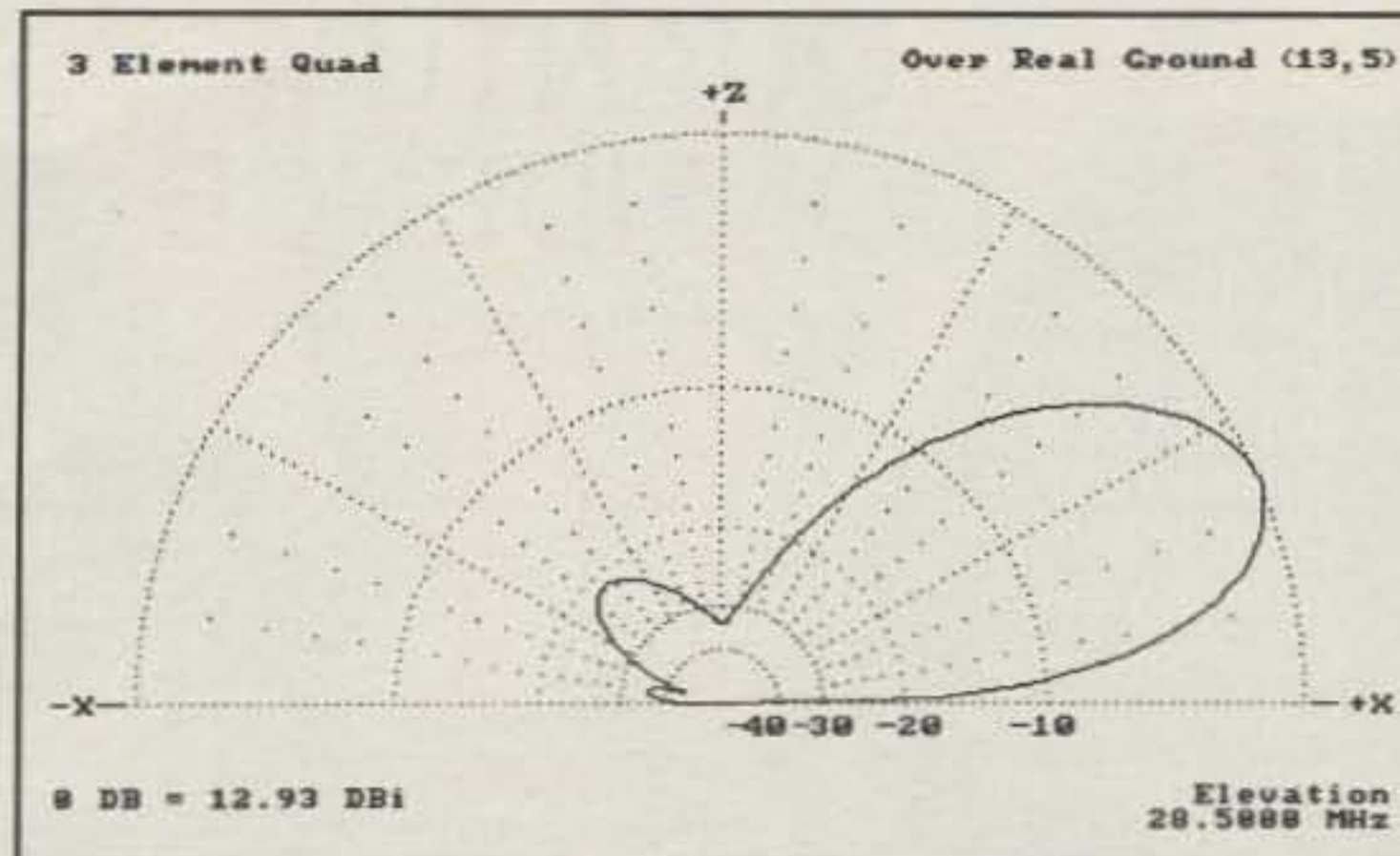


Fig. 2—ANTENNA MODEL: typical far-field radiation pattern. After a pattern file is created, you can use it as input to the plotting module, which puts your PC's video adapter into graphics mode and displays the antenna's far-field radiation pattern. Shown here is a typical radiation pattern displayed by ANTENNA PLOT. You can display the pattern during the modeling session, or later using the plotting module in stand-alone mode.

enjoy all of the benefits of PC control for most Kenwood low-band transceivers and the R5000 receiver, and—because it's a true Windows application—it lets you run your other Windows programs at the same time.

Some key program features include a unique graphical band display, customized main and incremental tuning controls, smart bandswitching, push-to-talk (PTT) and PTT-lock functions, automatic mode selection, band-to-band frequency memory, and a highly informative digital frequency display.

The program comes with a professionally prepared, 25-page user's guide; a separate computer interface is required. SMART RIG is \$34 plus \$3 shipping/handling from Agate Software Co., P.O. Box 1237, Brea, CA 92622 (714-777-0855). Fig. 3 shows the SMART RIG Program Window screen layout.

**HamWindows.** HamWindows™ is a Windows program developed and supported by California Software and marketed by Kenwood U.S.A. for most Kenwood radios. It basically is a logger and awards tracker, but its nine program modules make it much more.

Besides logging and awards tracking, HamWindows offers callsign and other information lookup; a grayline propagation map and numerous regional maps; a SWL window tracking over 9000 station frequencies with operating schedules; an amateur-radio-oriented almanac; a terminal node controller (TNC) window for packet DX spotting; a control window for most Kenwood radios; several utility routines; a setup window for system configuration; and detailed online help.

The callbook module accesses various callsign databases, including SAM and HamCall™. Other features include import of country list data from other loggers, screen display of beam heading and distance, and the ability to store notes for each contact. Add-on options include the CIA World Fact Book Almanac and online Windows versions of Kenwood users manuals.

The program is \$139.95. Information is available from Kenwood dealers or from California Software, Inc., 2121 E. Pacific Coast Hwy. #220, Corona del Mar, CA 92625-3235 (1-800-245-2741).

### Software Soapbox

**Software As We Like It.** I receive lots of software, much of it hamshack-based shareware—some very good, some very bad, and

some just so-so. While I'm not a programmer, I do know some qualities good software should have to make installation easier and programs simpler to run. For the benefit of budding hamshack software entrepreneurs, here are some of them. (You might want to grab a cup of coffee first, because my list is a long one!)

1. The program should be written in a high-level programming language. Except perhaps for some very simple software routines

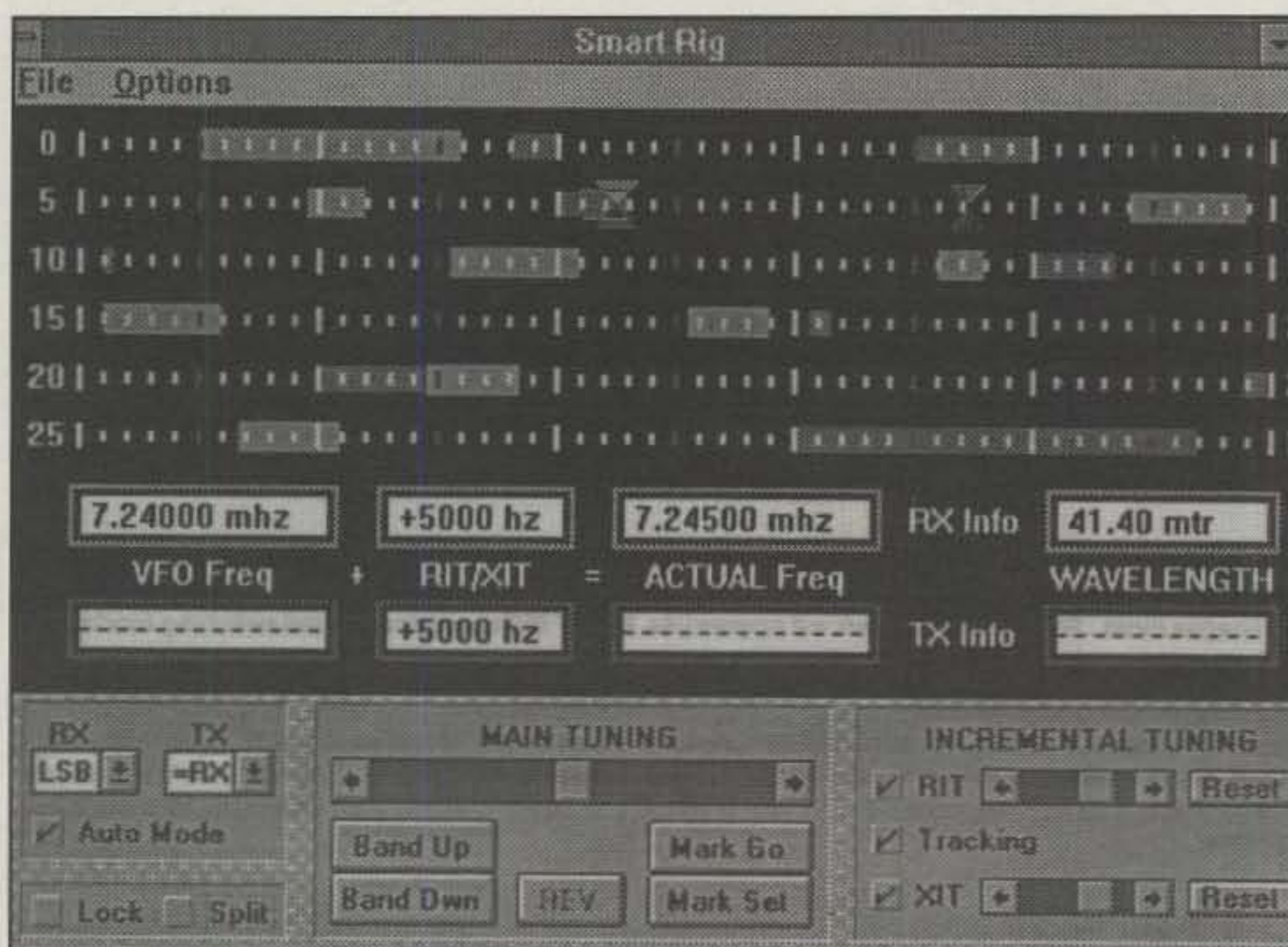


Fig. 3—SMART RIG program window screen layout. Agate Software's SMART RIG features a unique, colorful graphical band display that makes frequency selection simple—just a point and a click and you're there. The display clearly features amateur allocations and shortwave broadcast bands as highlighted areas. The program boasts that all you need to control your radio is a mouse; there's no need to touch the keyboard at all.

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and games, practically any program should be written in a high-level language or in machine language in the interest of speed of execution, ease of use, and performance. This caveat is especially true when very fast response is needed, as in logging programs. BASIC normally won't do.

2. *The program should be fully functional.* It's one thing to offer a clearly labeled demo or trial program, but the widely distributed version should be fully functional to allow the prospective buyer to completely evaluate it in his hamshack operating environment—no crippleware, please! Shareware versions that expire upon reaching a certain date or upon the user running the program a certain number of times are shaky procedures since they limit honest program evaluation.

3. Program installation should be easy and intelligent. Inflexibility here is my number one annoyance. The program you're installing should let you install from *any* floppy drive to *any* hard drive—not just from the usual Drive A to Drive C. The program should tell you how to manually install it should the automatic installation program fail. The application also should recognize the presence of an earlier version of the program and give you the option of saving your old customization files, if any, to avoid unnecessary setting-up.

4. *Installation should be selective and well-mannered.* The program should tell you how much space it's going to take up. It should warn you if you're low on disk space and let you back out of the process. If the program is a large one, it should let you install only the parts of the program you actually need and optionally install help files, tutorials, templates, and add-on modules, in the interest of conserving disk space. This approach is much better than having to later delete files you don't want or use. Above all, installation program shouldn't modify important files without warning, nor should it in most cases place any files in your root directory.

If the new program modifies your AUTOEXEC.BAT, CONFIG.SYS, WIN.INI, SYSTEM.INI, and other critical system or configuration files, the program should make backups of them and tell you the filenames of the backed-up files. (*Tip:* Trust no new software completely. Make manual backups of these important files before installing new programs so you can easily put things back as they were if installation goes awry.)

5. *Program documentation should be complete.* A no-no is to justify the lack of documentation with the statement that the program is so simple that none is needed! For shareware, on-disk documentation is fine (at least for non-registered versions), but for a commercially marketed program the purchaser expects to receive a complete, neatly printed, and readable manual.

Some documentation elements that are especially important are a pleasant layout and format, a table of contents and index, an overview of the program's capabilities, a troubleshooting guide, a technical section, a list of error messages, customer support and upgrade information, a warranty statement, and a registration card. If the program is complex, a tutorial, command summary, and separate quick reference cards are helpful. Shareware applications, especially, should include a file that tells you all of the files that are part of the package; this lets you know



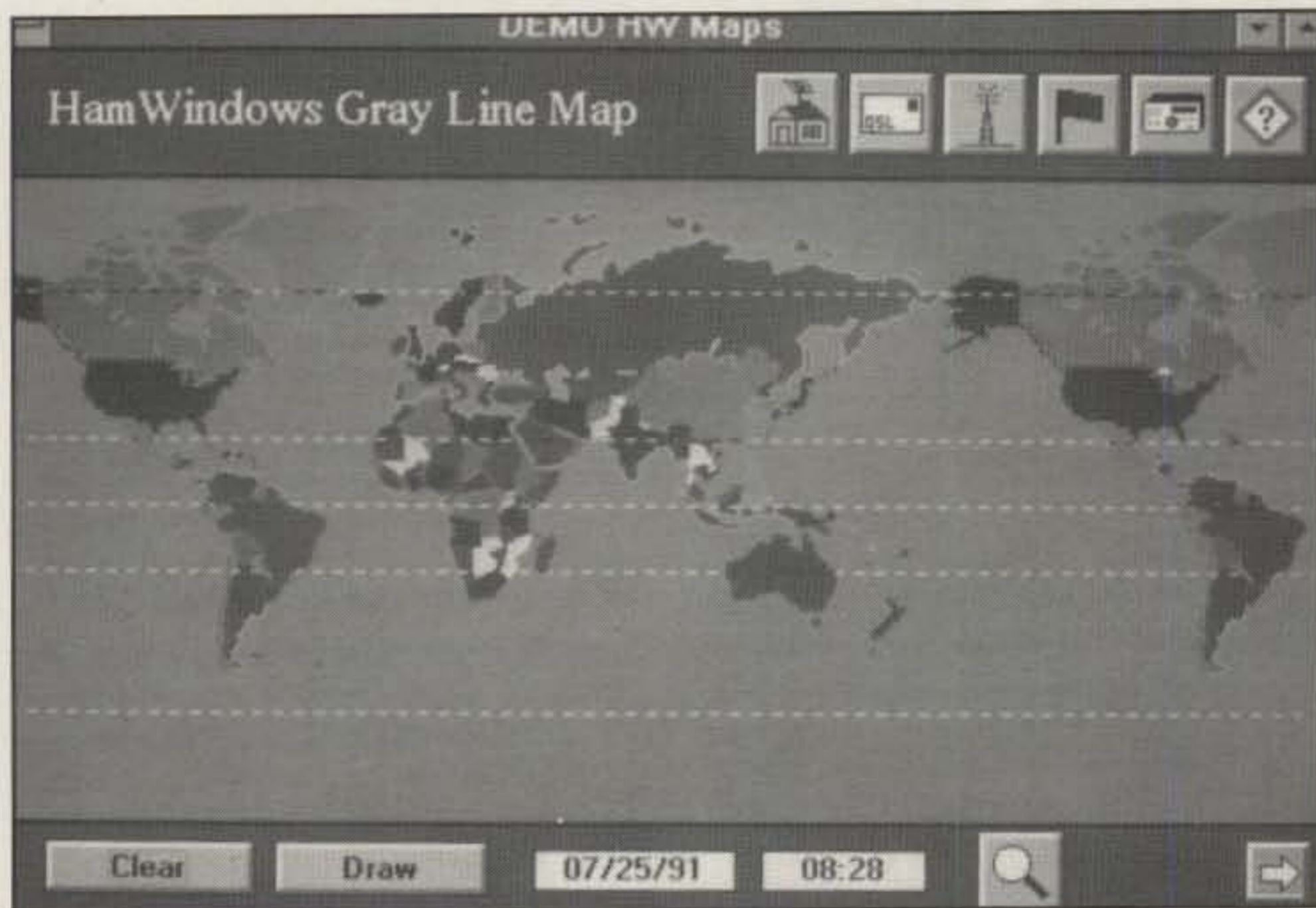
Shown in the photo using HamWindows is Joe Rudi, NK7U, a former player with the Oakland Athletics and the California Angels. With him is son Shaun; together they make good use of the Windows-based integrated logging program in their radio hamshack. (Photo courtesy Kenwood U.S.A. and California Software)

that you have all of the needed program files.

Surprisingly, something that's often lacking in shareware documentation is a brief, concise, but comprehensive statement of the program's purpose and just what it does! Lack of an overview is especially frustrating to a reviewer who may immediately lose interest in conducting the review if he or she can't

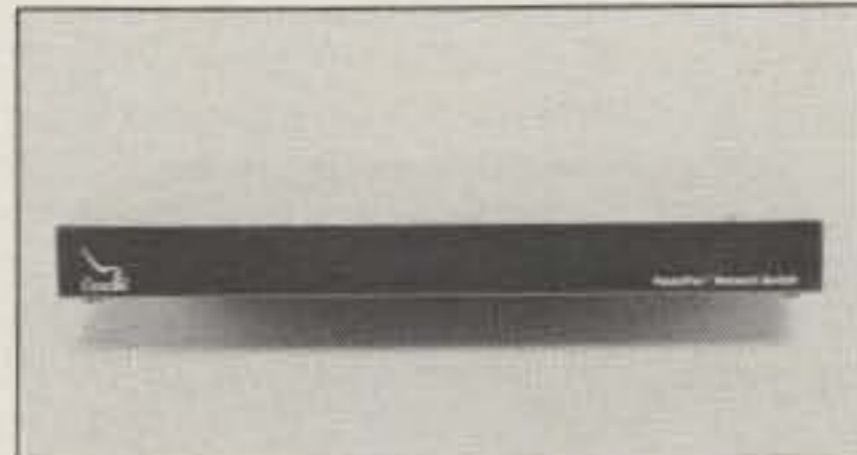
figure out the program's basic reason for existence!

6. *Color selections should be flexible.* The application shouldn't assume that you have a particular type of video display card or monitor, or that you prefer the same color choices as the author. Users should be able to select display type (color vs. mono) in the



HamWindows is a logger and awards tracker, but it includes nine modules that make it much more. Besides logging and awards tracking, and several other features, the program offers a grayline propagation map and numerous regional maps. The grayline map, shown here, displays the day and night boundary to help you find the best time to make DX contacts. Clicking the grayline icon lets you see the current day/night terminator on-screen. (Photo courtesy Kenwood U.S.A. and California Software)

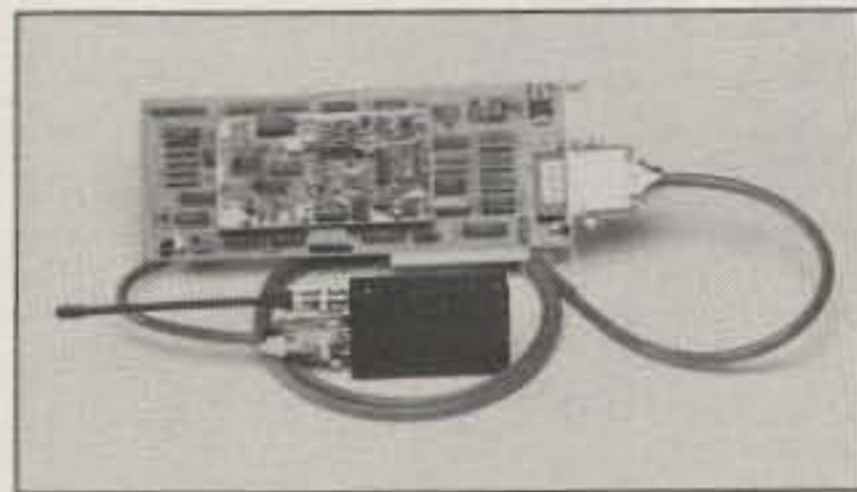
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program setup. Preferably, they should select display colors as well, either individually or in color scheme sets. They should be able to save their color selections.

7. *Menus and commands should be standardized but user-customizable.* Menu displays and keyboard shortcuts should follow generally acceptable conventions as closely as possible (for example, ALT-X or CTRL-Q to exit, CTRL-S to save, etc.) to avoid confusion. On the other hand, users should be able to reassign keyboard shortcuts including function keys. While most users probably like to work from menus using a mouse, others prefer command line options for major program functions; users should be given a choice of a menu-driven or command line approach. The program should feature "bulletproof" recovery from errors (such as from wrong keypresses, file loading and disk errors, failure to connect a printer, etc.) that often send a poorly error-trapped program into the bit bucket.

8. *Program exit should be clean.* Exiting a program shouldn't upset your system in any way; open program files should be closed. Often, exiting from a program leaves your display showing different colors than when you entered the program, or scrambles your

PC's memory. Even worse, some applications tend to lock up the PC when exiting even though they appear to work well otherwise. This problem probably indicates that the author didn't test the program with a variety of systems and configurations.

9. *Data import and export should be easy.* As much as possible, programs should be able to read each other's data; the "not invented here" syndrome has no place in computer software, at least from the user's standpoint. Thus, you should be able to import files from a variety of existing (even competing) programs and also export files in several file formats.

10. *Uninstallation should be smart and complete.* Ideally, the application's installation program should have an uninstall option to remove all traces of the installation and to put things back to where they were, should you want to remove the program. This is especially important in the case of complex Windows applications that also modify various .INI files and stash files in directories that you may not even be aware of. Unfortunately, few programs, commercial or shareware, have comprehensive uninstall options to fix this bucket-of-worms situation.

11. *Don't keep good software a secret!* If

you've written a program you feel would be of interest to others, and would like a shareware distributor to consider including it in their catalog, send them a copy. The disk should contain all files and documentation exactly as you desire them to be released. Label the disk with the name and version number as it should appear in their catalog. You should include a brief description of the program's major features and intended use. Make sure what you send to a disk distributor or upload to a bulletin board system (BBS) is neither bug infested nor virus infected!

**A Reviewer's Plea.** If you're a writer of shareware software and want reviewers to take a look at it, fine. But recognize the quantity of software most reviewers receive, and help them do a good review. Keep these things in mind.

1. *Furnish printed documentation.* Send reviewers a printed copy of the documentation, complete instructions on how prospective users can obtain the software, and its price, including upgrades. Most reviewers receive too much software to manually print out DOC files for every program they receive.

2. *Furnish final versions only.* In most cases you should send reviewers only final versions of software, just as it will be distributed, not beta test versions. Most reviewers are unable to give program authors personal feedback; they usually won't contact the author unless there's a fundamental problem. You'll likely only learn what the reviewer thought of your program when you see the review results in print. And make doubly sure that disks you send to reviewers actually work! The operative rule is, what you see is what you get—no more, no less.

3. *Update only as necessary.* There's usually no need to update the reviewer on every minor software revision; doing so tends to confuse reviews. Wait until there is a major rewrite or bug fix, or after the initial review is actually published, before you update the reviewer.

4. *Include some extras.* If you can send along good, reproducible screen dumps of key menus and other screens, do so. These are helpful in explaining and illustrating your program for readers. If yours is a database-type program, including a small sample database speeds review. Again, don't forget to send printed DOCs to reviewers.

## Correction

In last February's column we mentioned the latest version of MINIPROP PLUS™ and we said that the price was \$49.95 postpaid. That's not correct. The price is \$60 postpaid in the US and Canada, and \$65 elsewhere. The address we showed (Sheldon C. Shallon, W6EL Software, 11058 Queensland St., Los Angeles, CA 90034-3029) is correct. Our apologies to Shell!

## Wrapping It Up

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

Overheard: Seems that the main thing that's wrong with problems is that they are caused by solutions.

73, Karl, W8FX

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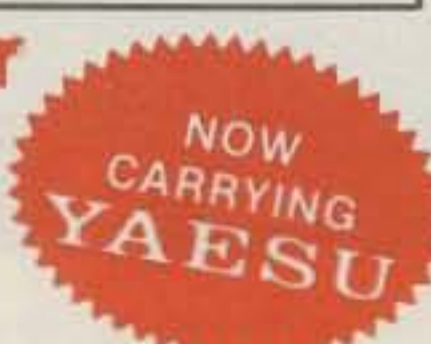
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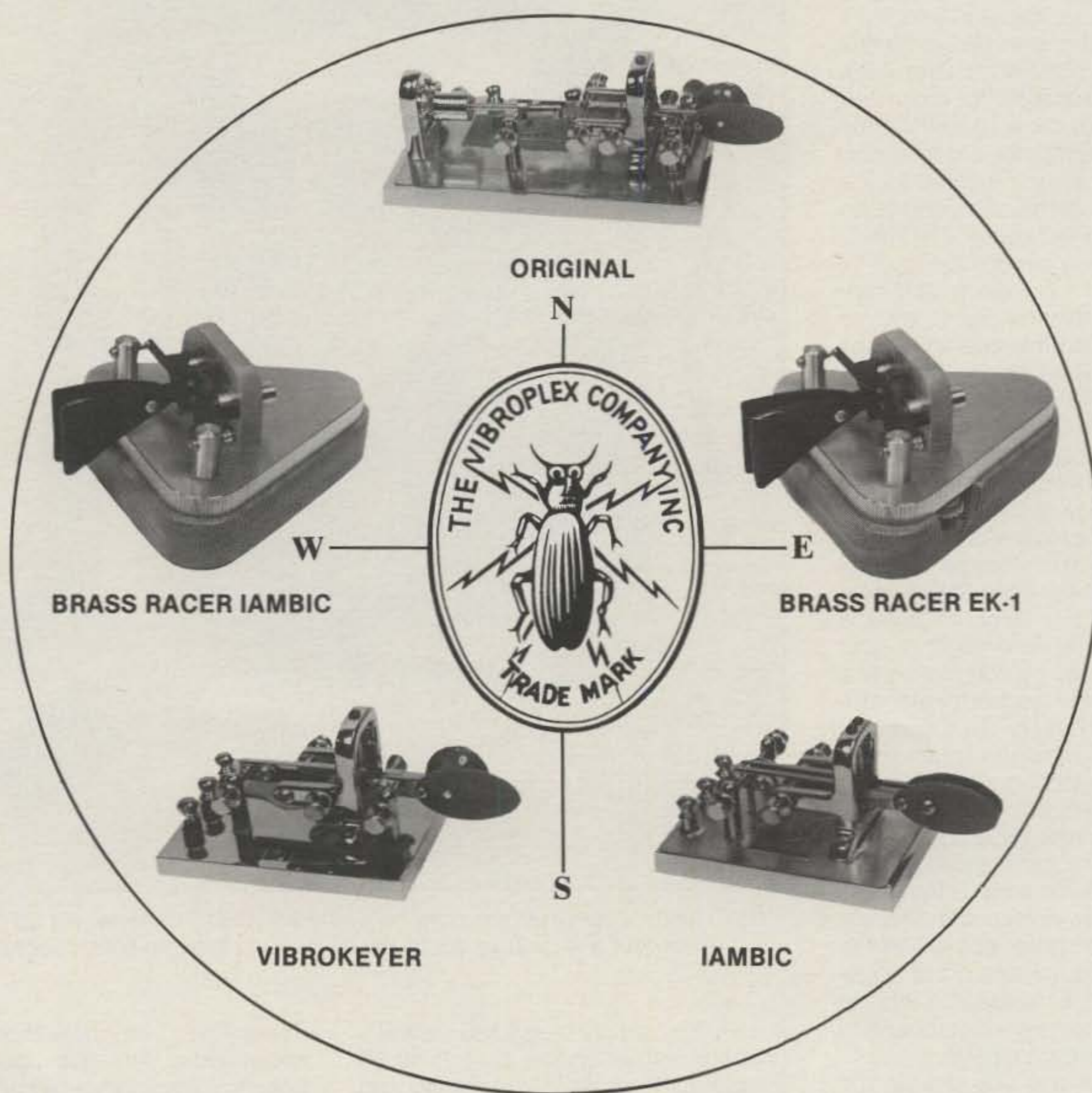


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# CQ REVIEWS:

## The Innova Cordless Battery Charger And Portable DC Supply

BY DAVE INGRAM , K4TWJ

If you pursue portable or mobile operation to any reasonable extent or if your car's battery is over a year old, the item featured in this review should be of particular interest.

It is called the Innova Power Charger, and it differs from the portable Ham Power Pack featured in recent Innova advertisements in two ways. First, it is a 15 volt output recharger for a car battery, and second, it is a 12 volt/10 amp rechargeable battery for big-time portable hamming. A top-mounted rocker switch selects each function, and LEDs continuously monitor status. All protection and operating circuits are built-in, making the unit completely self-contained and easy to carry. Even if you are not involved in portable operations, the Power Charger is an item you will definitely appreciate having during an emergency.

The unit measures 10"H x 7"W x 3"D, and weighs 8 pounds. Also supplied but not shown is a heavy-duty wall charger for home use. The cigarette-lighter plug connects to the wall charger's output socket or a car's cigarette-lighter socket for charging (8 to 10 hours at home or 2 to 3 hours while mobile). It also serves double duty by connecting to a car's cigarette-lighter socket for recharging the vehicle's battery. If the car is not equipped with a cigarette-lighter socket, an adapter supplied with the Power Charger permits direct battery connection with large alligator clamps.

During non-use the cigarette-lighter plug and its cable store inside the Power Charger's top carrying handle. There is also a cigarette-lighter socket on the front for quick-connecting a transceiver. Additionally, grooved mounts on each side provide an easy means of carrying handheld transceivers.

During typical use you charge the Power Charger at home, and then toss it into the car for emergency preparedness. When such an occasion arises (like an over-enthusiastic mobile stint that leaves your vehicle's battery dead), the benefit of owning this item really



*The Innova Power Charger. This hefty unit will power transceivers up to 45 watts output and charge car batteries via the cigarette-lighter socket.*

shines. You simply plug it into the car's cigarette lighter socket, wait 15 to 30 minutes for the battery to recharge, and then start the car and drive away. Notice the convenience and security; there is no reason to leave the safety or warmth of your car, and in most cases the battery is recharged before road service could even have reached you. The

Power Charger's applications are also not limited to cars. It is a good item for boating, starting all-terrain vehicles, and more.

Technically speaking, the Power Charger uses a deep-cycle and fully sealed lead-acid battery with a power booster circuit (for attaining 15 volts to charge vehicle batteries) and electron-

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ic charging circuit (which automatically switches off the unit at full charge). This arrangement makes the unit quite easy to use. You just charge it in the house, and then carry it on the car's back seat until needed. After use it can be recharged again in the house or through the car's same cigarette-lighter plug previously used to charge the car battery. Assuming normal use, the unit can be recharged up to 1000 times.

My car's battery was in good condi-

tion when the Innova Power Charger arrived, so I charged it in the house and set it aside for later emergency use. The charger's yellow LED lit while charging; then it extinguished and the green LED illuminated to show it was fully charged and ready for use. The charging circuit disconnected the battery from the wall charger automatically, so there was no concern with overcharging. A few days later, I used the Power Charger to DC-power my transceiver at 40 watts output

on 30 meters. It worked perfectly for several operating stints, and I was surprised it recharged to "full" in only a couple of hours. This is one heavy-duty pack that will not run down quickly.

A few days later a neighbor's car wouldn't start because the battery was dead and the Power Charger faced its second challenge. When I plugged it into the cigarette-lighter socket, its red LED illuminated, indicating a short circuit. I then disconnected one of the car's battery leads and connected the Power Charger directly to the battery for 30 minutes. The car's battery lead was then reconnected and the vehicle started (although the unrepaired short discharged it soon thereafter). The Power Charger was then recharged at home and it was ready for use again.

Its next big test occurred approximately two months later when XYL WB4OEE's car would not start due to a defective ignition module in the distributor. The Power Charger did not correct that malady (we had the car towed to a repair shop!). It was a sheer blessing to keep the car's battery charged enough to start on its own power after repairs and plenty of at-home starting attempts.

I understand Innova Electronics Corporation initially developed the Power Charger for use with small aircraft. Its secondary use is with cellular telephones, and it is a natural for amateur radio applications. It will power a medium-output transceiver for several hours and jump start a car after 15 to 30 minutes. You can carry it in one hand without extra cables protruding.

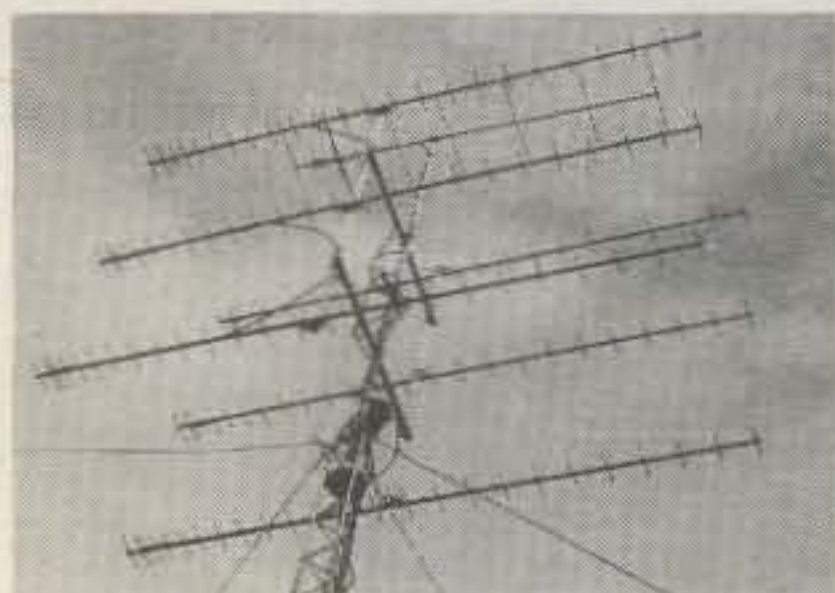
In my opinion, this gem is an item that is definitely better to have and not need than to need and not have. Only one emergency use will more than repay its initial cost, and it is a real blast for working portable in the wilderness! Assuming a mounting bracket that mates with the charger's side grooves is fabricated, the user could bolt on an FM mobile transceiver and antenna, and have a 45 watt output hand-carried portable transceiver! Better yet, attach a compact HF transceiver and Hustler antenna to the pack, and you have a complete hand-carry HF station. Now that could be a real treat during your next jaunt to the beach!

While concluding this review, I leaned back and pondered how many amateurs will read this review and agree it is a great item, then yawn, fall asleep, and forget it until that unfortunate time when it is desperately needed. Surly that cannot happen to you, right?

The Innova Power Charger retails for \$99.95. For more information, contact Innova Electronics Corp., P.O. Box 8999, Fountain Valley, CA 92728-8999 (telephone 714-241-6800). ■

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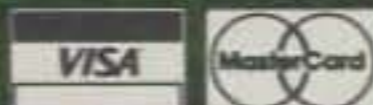
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## The Jan Mayen Story

BY PER-EINER DAHLEN\*, JX7DFA, AND TERJE J. BERG, JX3EX

**J**an Mayen is an isolated arctic island situated between Iceland and Svalbard. Jan Mayen, Bouvet, and Peter I island were annexed by Norway in 1929. Jan Mayen is probably the most remote island in Europe. It has no harbor, and the airstrip is frequently closed due to bad weather. During the summer the island is generally covered by fog, and during Winter the wind, snow, and ice make life very difficult. The island is of volcanic origin and is mostly covered by moss, sand, and glaciers. A few polar foxes are the only animal life.

The current population is 19 men and 6 women. We supply the outside world with the following services: Loran-C for navigation 100 kHz, 250 KW, 625 ft. antenna; Meteo for weather observation; and Radio for maritime communication LF/MF/HF/VHF.

### Amateur Radio

The people on the island live in Olonkin City, situated on the eastern side of the island. To work the USA is really difficult. The lowest angle of radiation to the US is about 30 degrees! But with maximum legal power and reflections from a nearby mountain, we still are able to make contacts during good propagation.

Last summer we installed a diesel generator set at "the old met station" on the western side of the island. This gave us the location we had dreamed about. Shortly after I came to Jan Mayen in October 1992, I erected a 2-element tribander at the western site. The same weekend we worked more W stations on 28 MHz than we did in a year from the eastern side.

As mentioned earlier, weather can be rough on Jan Mayen. The next weekend we went there, the antenna had been reduced to a single-element "Yagi," and two weeks later—nothing. We then erected a delta loop for 20 meters, and it is still up and working fine.

We can only go to the west site during our days off from work (i.e., two weekends a month). Normally we choose to go there by foot or on skis. It

\* 8099 Jan Mayen, Norway



The "old-met station" site on Jan Mayen. The two-element beam can be seen.



The other side of the microphone. Here's Per Einar Dahlen, JX7DFA. Per also is known as LA7DFA, CT3M, and W6/LA7DFA.

takes about 3 hours each way. It can be quite a challenge, and we have to consider bad weather and polar bears, so we carry a rifle, compass, food, and a VHF radio.

As JX7DFA, I have made over 40,000 contacts since 1989, while Terje, JX3EX, has worked 15,000 since 1991. Terje is, however, the most active at the moment.

This season we've been active on 6

and 2 meters. Terje made the first-ever contact from Jan Mayen on 6 meter ES. I managed to make the first 15 contacts on 2 meters during the *Geminids* meteor showers. I hope to be active on EME before leaving the island in April. I will, however, leave my RTTY/packet gear, along with an FL-2000 so that Terje can be active on other modes.

Usually when Terje and I travel to the west side of the island we are joined by some of our co-workers. Some of you may have heard about a YL operator named Marit. Marit is actually one of our crew and not a licensed amateur. To date there has never been a YL amateur operating from here.

It's not easy to leave a big US pile-up on our signal, but when we do, it's only to enjoy a wonderful dinner being served. After a long and arduous trip to get here, hot and delicious food plus some French red wine somehow win out. We do come back and do try to work you all.

The QSL routes for the two operators are: Per Dahlen, Box 105, 6520 Rensvik, Norway; and JX3EX via LA5NM. ■



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## WHAT'S NEW AND HOW TO USE IT

### Shop Notes

As most of my loyal regular readers are aware, I am and always have been a proponent of homebrewing and extensive experimentation. I think, in fact, that this is the best part of the hobby and feel that everyone who considers himself or herself a true amateur radio operator should at least build something, even if it is only a simple continuity tester or field strength meter. This leads me to the topic of this month's column.

There is a new software package being advertised and offered by Interactive Image Technologies Ltd. of Toronto, Canada (telephone 416-361-0333). It immediately caught my attention, as it seemed it would eliminate what I had been preaching since the 1970s. This package is called the "Electronics Workbench," subtitled "The Electronics Lab in a Computer," and it promises to allow "electronics students" to build and simulate a wide range of analog and digital circuitry on a computer. No soldering, wires, or electronic components are necessary. The computer simulates everything, including the test equipment.

"Well," I thought, "how do you like that!" Needless to say, the company was instantly contacted, and in a few days I received a package containing a high-quality, 120-page, printed instruction manual along with four 5 1/4 inch 360K floppy disks containing the program. A card offering a 30-day money-back guarantee was also enclosed.

Installation was simple, straightforward, and required about ten minutes and a megabyte of space on my hard drive. I also installed a Microsoft compatible mouse at the same time, as the program will not operate without one. If you do not have a hard drive, don't worry. The program can also be run from two disk drives, but you must have a mouse.

Once installation was complete, the program offered the choice of working with analog components or digital ones. Simply typing "EWBA" brought up the analog screen shown graphically in fig. 1. Referring to the manual, I then followed the instructions in chapter 1, and

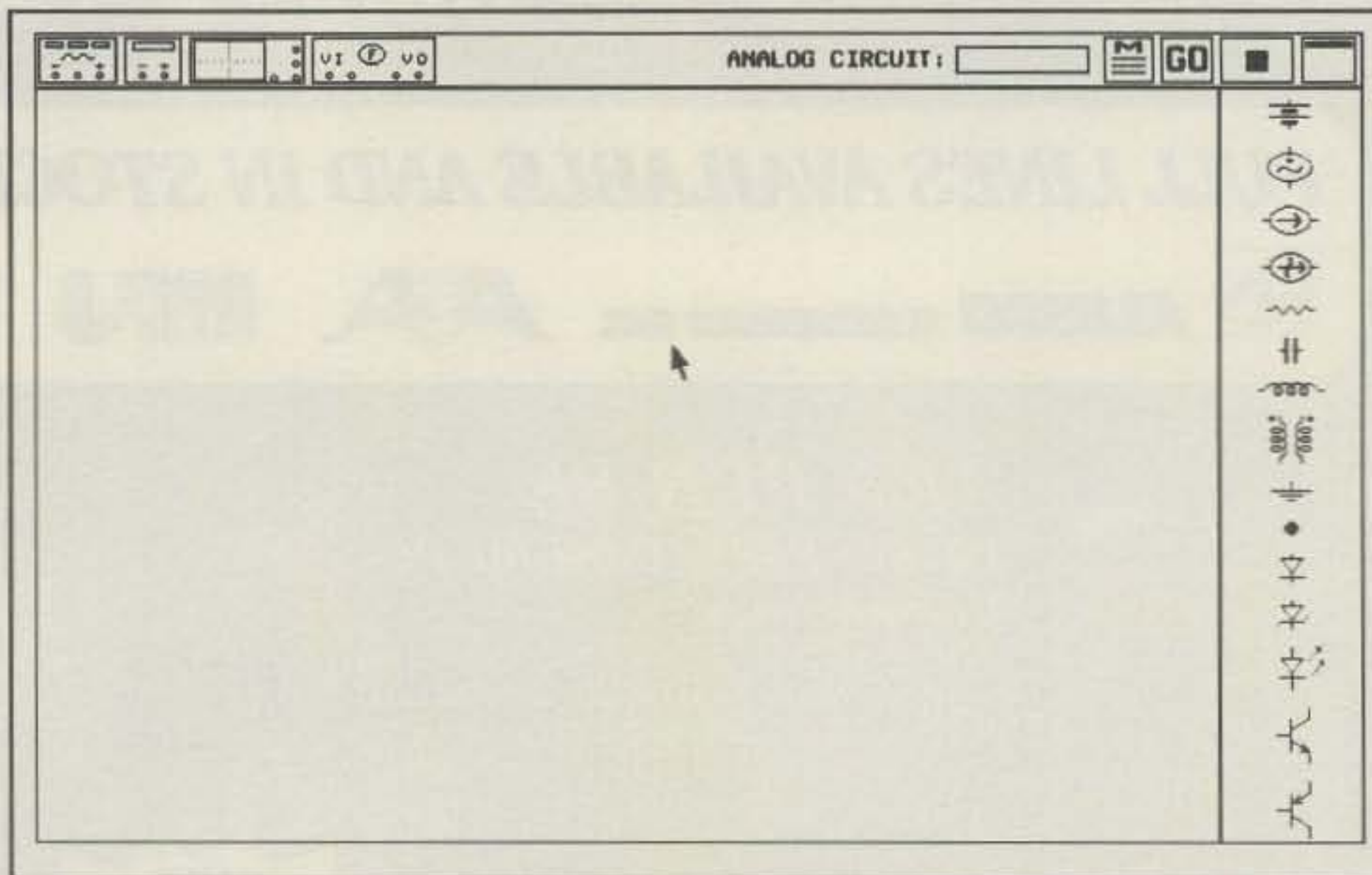


Fig. 1- Basic analog design screen.

in about 20 minutes, after learning how to manipulate the various components, I was ready to "build" my first circuit. Chapters 2 and 3 in the manual take you through the steps necessary to do this,

and then I suggest that you go through them at least once. I did it a few times until I was familiar with all of the operations, and in a couple of hours I was actually "building" circuits.

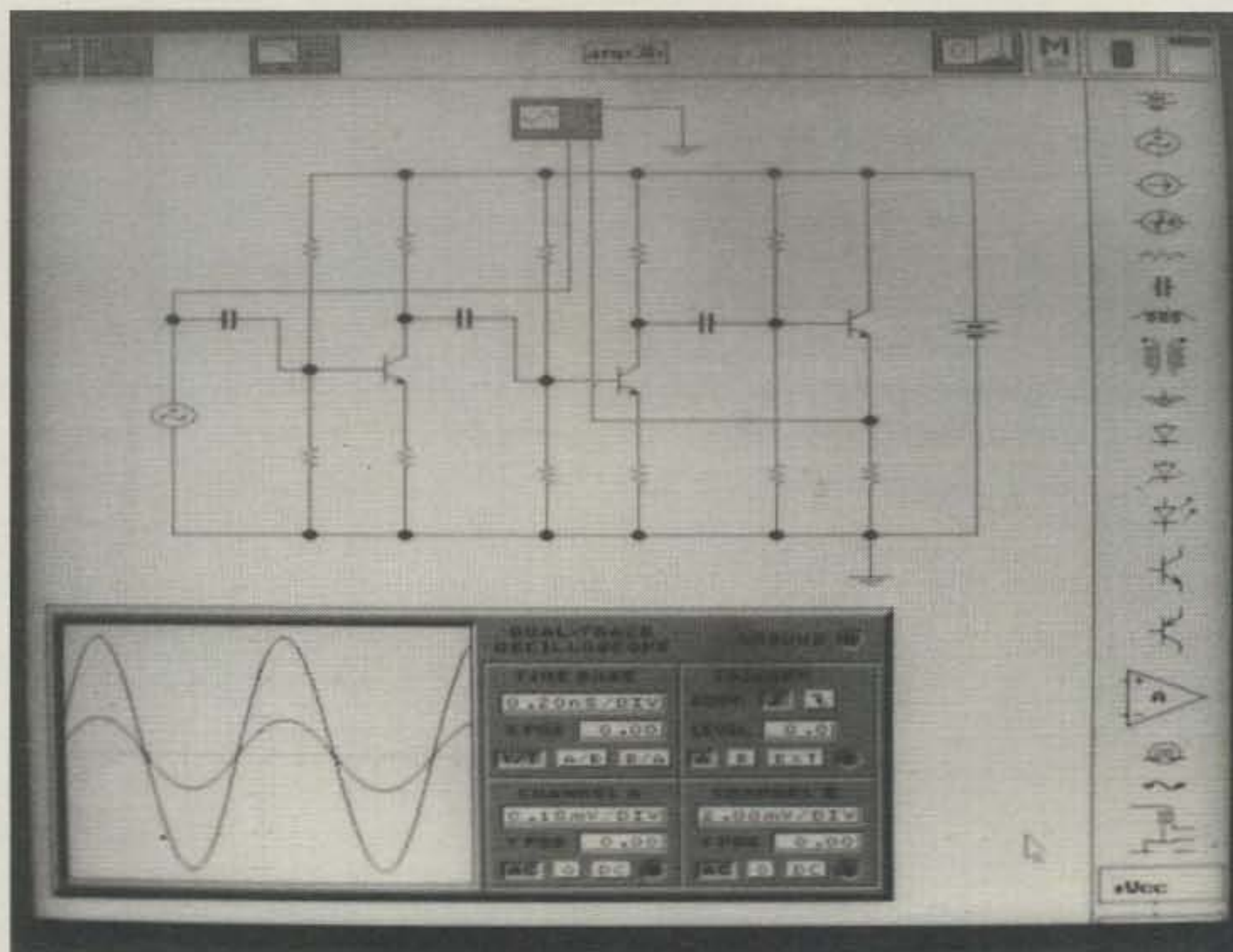


Fig. 2- RC-coupled amplifier design on "Electronics Workbench."

c/o CQ magazine

I have to admit that after I learned how to move and connect the various components with each other and the test equipment, I was really amazed. The circuits worked, and the software "scope" accurately displayed the wave shapes you would expect. There was no shortage of components, and the only thing missing was the smell of rosin and the pain of burned fingers. I want to tell you, you could really get hooked on this program!

"Electronics Workbench" is organized into two "modules," as the manufacturer calls them. One handles analog circuitry and the other handles digital circuits. It is not possible to merge the two, however, which in my opinion is one of the only two shortcomings I found with the program. The other is the lack of propagation delay calculations in the digital module, which does not allow circuits that rely on this parameter to be properly analyzed.

The analog module has resistors, capacitors, batteries, op-amps, chokes, transformers, diodes, NPN and PNP transistors, etc., as well as a function generator, spectrum analyzer, oscilloscope, and multimeter. The digital module has an assortment of gates, inverters, flip-flops, etc., as well as a logic analyzer, truth table calculator, multimeter, and word generator. There is even the provision for "making" complex chips out of various gates and flip-flops.

All modules are very easy to use, and the instruction manual is extremely well written and easy to follow. Almost nothing is left to your imagination. A nice feature for the more advanced experimenter is the detailed explanation in the manual of how the circuits are analyzed by the program.

Fig. 2 is a photograph of an RC-coupled amplifier connected to the program's "scope" and generator to give you an idea of how the program is used. At this point I must say that I am a hardware man. I like the feel of a finished circuit in my hand, and I like to operate the various controls.

"Electronics Workbench," however, comes very, very close to the real world in operation and is ideal for the amateur without the space for a real workbench. The circuits work as they would if they were made of actual components, and the user can get a great deal of pleasure from using the program.

My personal solution to the hardware/software issue this program raises in my mind is to do my designs on "Electronics Workbench," and then use the correct operating results to build the circuits in the "real world."

In conclusion, I give "Electronics Workbench" an excellent rating.

73, Irwin, WA2NDM

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# PACKET USER'S NOTEBOOK

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

BY BUCK ROGERS, K4ABT

## Only One Hour Away From 9600 Baud

**A**fter reading this month's "Packet User's Notebook" you could be *one hour away from 9600 baud packet operation.*

With this month's column we are going to set a milestone by implementing a real-time, fully functional 9600 baud station. When we have completed the minor changes to the transceiver, this TNC and radio combination will provide us with the foundation for building any kind of packet station, ROSE switch, TheNet node, or DX spotting node that we need for VHF and UHF operation.

To explain, this 9600 baud user level station can also be implemented as a ROSE switch or a TheNet node. Here then are the beginnings of what may become the SYSOP's dream-machine and the packeteer's ultimate packet station.

In May 1992 we discussed how to do 9600 baud through what we might now view as a bit of "hacksaw and crowbar" construction. During those days we would borrow a modem here, take a TNC from there, and try to find a transceiver that would work in the project we were undertaking.

### We Never Had A Lot of Choices

We have one of two ways to go with packet radio. Either we diversify our bands by adding more spectrum (and we know that will not happen), or we get off our duffs now and increase the amount of data that can be transferred in a given time period.

### A Simple Solution: Increase The Baudrates

With the files that are being exchanged by packeteers across the country and the spectrum load that has resulted, the need for a common-sense approach to data handling has arrived.

With the ROSE network traffic, the BBS forwarding networks, and the DX Spotting nodes, we are now passing everything from hen eggs to bowling balls via packet. To be factual, we are indeed moving so much data that many

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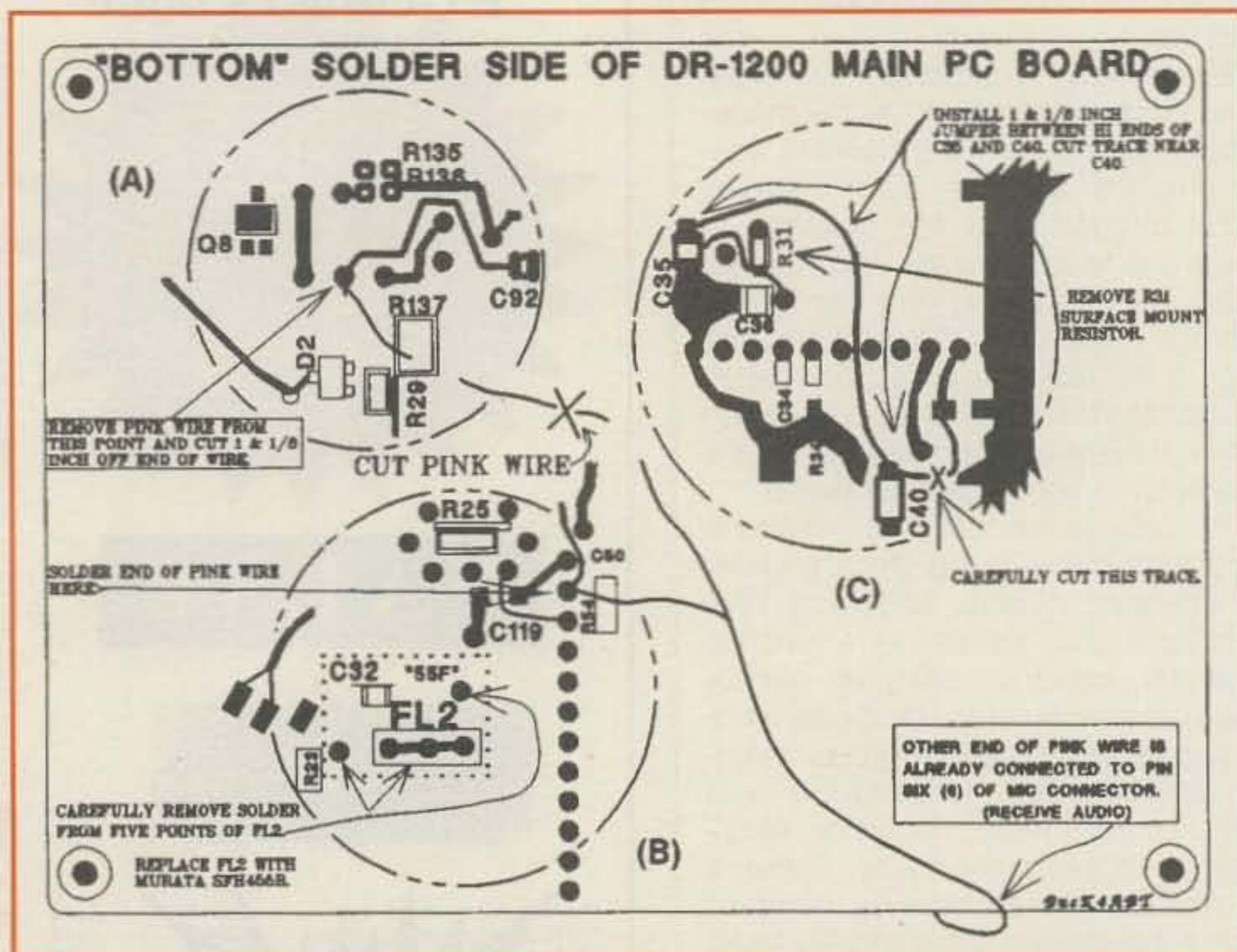


Fig. 1— This drawing illustrates the approximate location of the three areas where changes are to be made to allow the DR-1200 to support 9600 baud FSK. Caution must be your first consideration when attempting these modifications. (See text for more details.) Notice that resistor R31 at "C" is removed.

bulletin-board systems have resorted to using compression techniques when forwarding messages between BBSes. One reason is to reduce the access time on the (limited number of) frequencies so other BBSes may have time to forward return traffic to them.

On the "off-the-beaten-path" frequencies we are again passing everything from 256-color, high-resolution pictures and video, to digitized voice that is sampled up to 22,000 times per second.

Digital audio requires a large amount of storage space, but even more demanding is the requirement for transmission speed. Already we have the capability to pass both digital audio and digital video—both at the same time. We don't have to be Nostradamus to predict that we may very soon need: (1) the increased speed capability and (2) the spectrum to handle the increased load.

The old 1200 baud was good, but there is a limit to the number of connects that can take place on one frequency. For the future we are rapidly outgrowing

1200 and 2400 baud. The same frequency that is now carrying five QSOs (ten target stations) operating at 1200 baud can carry many times that amount of traffic at 9600 baud.

The system we constructed in the May 1992 column was built from the G3RUH modem, installed in a TAPR TNC-2 clone, and attached to a Kantronics D4-10 440 MHz transceiver. That system was great, except that we were operating in a UHF environment where line of site influences the signal, and direct 9600 baud users are few.

This is why I continue to profess how much better we would be if an optimistic OEM would market a 25 to 35 watt data transceiver for 223 MHz. Then we would have the best of both worlds—signals that would traverse beyond the horizon, and the additional spectrum that is needed for wide-band data transmission.

### Back To The Future—Now

You don't have to be a rocket scientist to figure out why we need these trunk

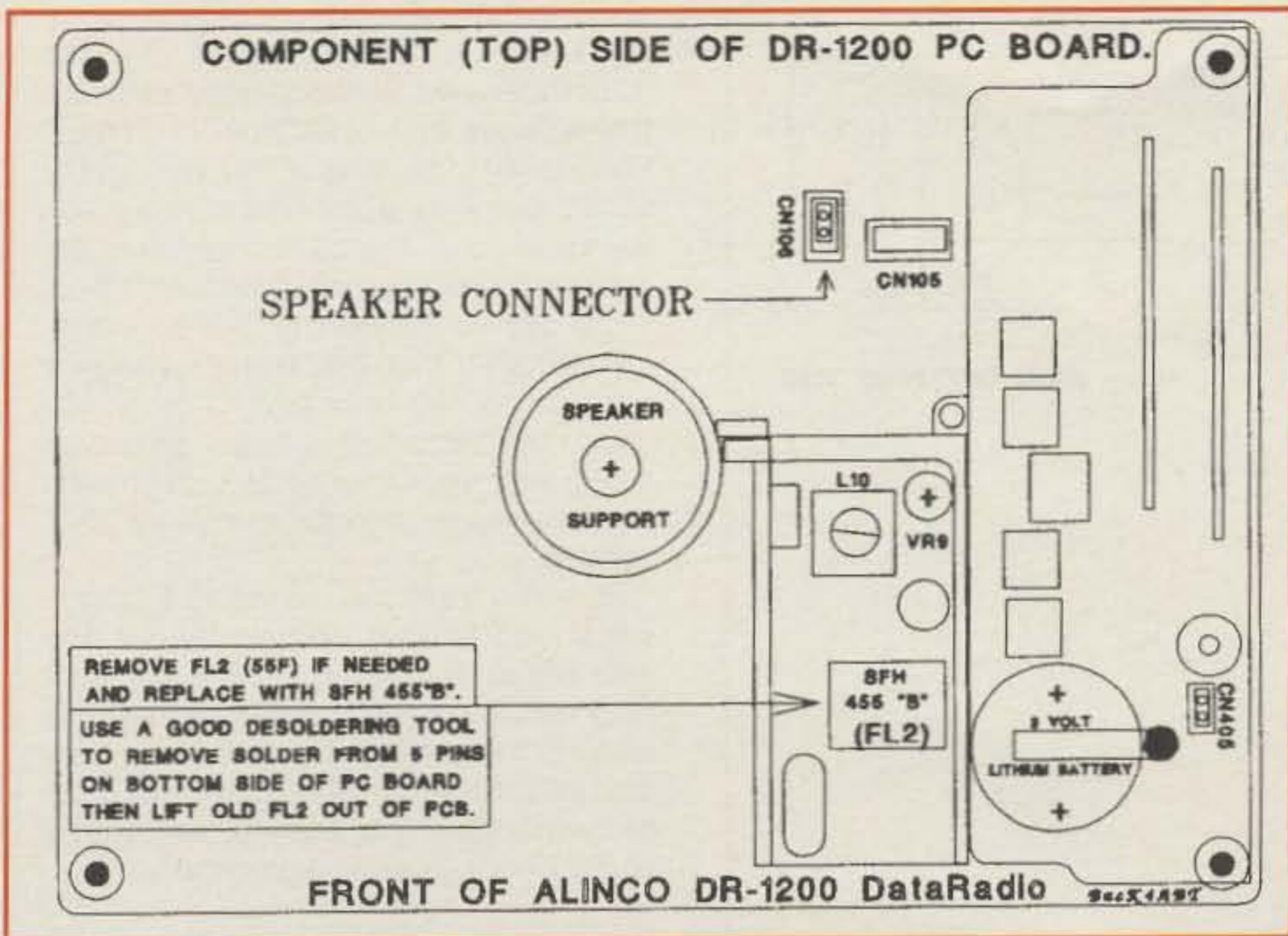


Fig. 2— The DR-1200 may operate at 9600 baud without replacing FL2. However, better performance can be realized when FL2 (55F) is replaced with a wide-band-pass filter similar to the SFH455B. Note: The "B" suffix indicates the type to use for 9600 baud operation.

and backbone changes. That's right. The user level will soon be 9600 baud.

Even if the user speeds are 9600 baud, we need networks to support the same speed. Our 1200 baud switches and nodes simply will not support 9600 baud. To think otherwise would equate to thinking we can pass a cannon ball through a garden hose.

As for the 9600 baud systems we described last year, well, they were a bit crude, yet they got us off to a good start. Although practicality emerged, it is reality that has broadsided us like a brick bat.

With the rapid change in telephone modem technology, there has come a new wave of digital bandwidth compensation that enables other types of modulation techniques inside the small blue, almond, and dark-color boxes (phone modems). Part of this new modem technology may be the new Fast Frequency-Shift Keying (FFSK) that has given us the boost above 2400 baud and into 9600 and 14,400 baud via the landlines. Why then has it been so difficult for us to acquire a true-blue 9600 baud TNC for packet radio that is also ROSE and TheNet compatible?

### DRSI Read Our Plea And Responded

DRSI has put together a 9600 baud TNC called the DPK-9600. It is compatible with the other packet modems that are available in the packet marketplace. The difference is this 9600 baud modem

is surrounded by a TNC. No cutting, scratching, or biting with this ready-to-fly TNC. It is complete. It has the standard 5-pin DIN connector that is used on many of today's TNCs. This makes the rest of the TNC-to-transceiver hookup seem like a piece of cake.

Likewise, Alinco listened to us two years ago when other OEMs did not. Alinco engineered a DataRadio from the Alinco line of transceivers and gave us a transceiver that was less expensive, yet it offered us the 25 watt power level along with the frequency agility we needed. Best of all, it was kinder to our wallets.

This brings us to the topic of this month's column. The marriage of the two devices I've just mentioned will provide us with a set of economical tools that will help us upgrade our networks. At the same time, this modification is simple enough to enable the end-user packeteer to enter a totally new world of packet radio. The DRSI DPK-9600 TNC and the Alinco DataRadio (DR-1200) interface is simple and thus it's a hacker's dream.

### Off To The Races

There's not much left except the connections to the modulator and discriminator of the transceiver, and we are going to walk you through this exercise in such a way that you should be enjoying your 9600 baud station after only one evening's work.

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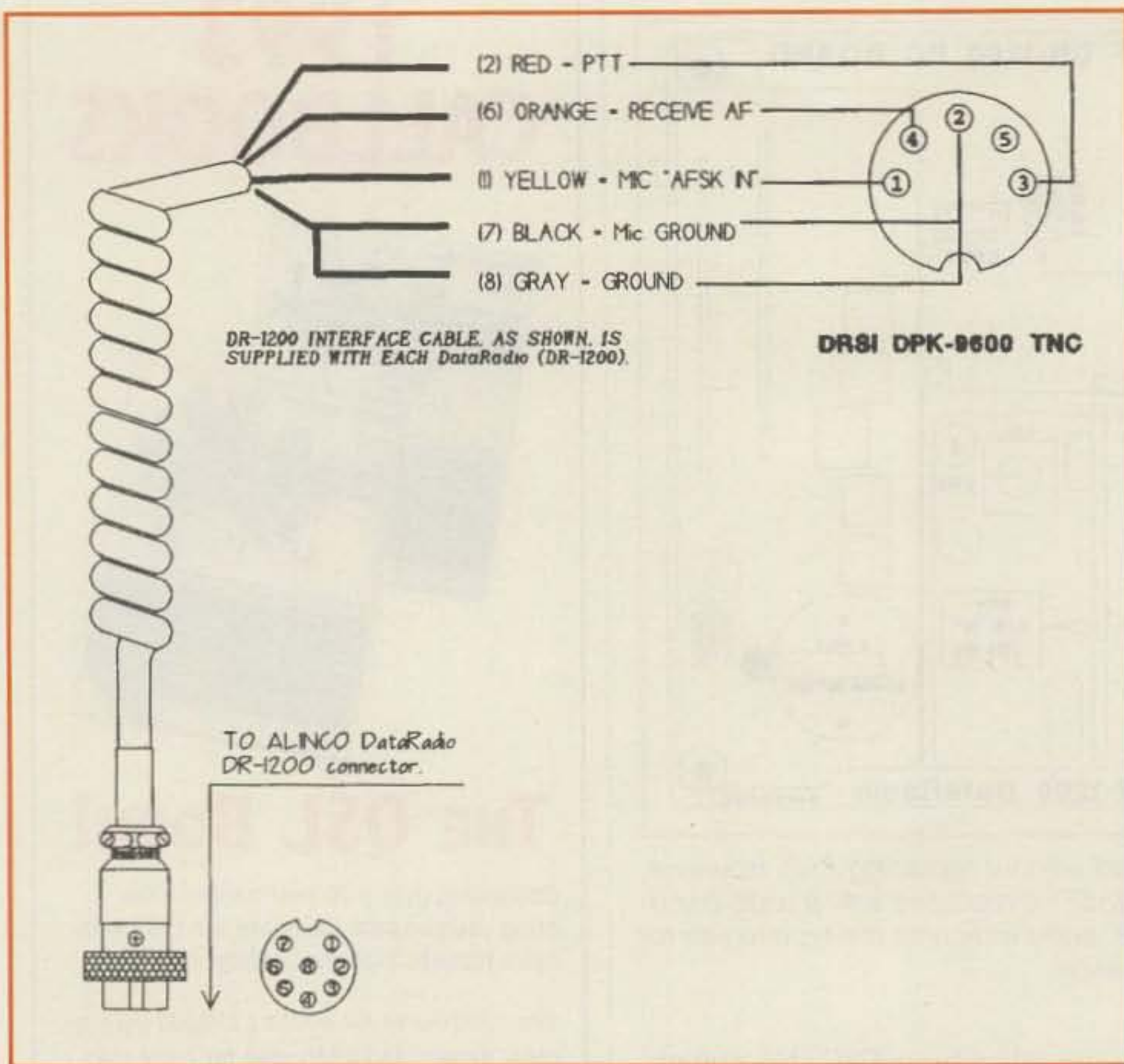


Fig. 3- Interface cable supplied with the Alinco DR-1200 DataRadio. Pins 3, 4, and 5 are not used in the connector. Therefore, only five wires are extending from the TNC end of the interface cable.

about to make a connection to the Alinco DR-1200 modulated stage. Please remember, we strive to stay with the transceivers that have "true" or "direct" Frequency Modulation (FM). For data at 9600 baud the varactor is the best place to input our digital information for speeds that are greater than 2400 baud.

To use a phase-modulated transceiver rather than one using frequency modulation, we only add to our problems by including phase distortion along with any other noise or distortion that may have ingressed into our data stream.

In some transceivers we've found IF passband limiting caused by the 455 kHz ceramic IF filter. An R/C network may be used to broaden or bypass this filter, but this sacrifices both sensitivity and selectivity. An alternative would be to exchange the filter(s) for one with a wider bandpass characteristic.

### Take The Alternative!

**Note: Persons attempting these changes should be familiar with micro-circuit soldering techniques.**

In the transceiver that we are about to modify, we are making a change to one of the components to enable full use of the IF passband in the DR-1200. It can and does support 9600 baud FSK.

At 9600 baud the needed IF pass-



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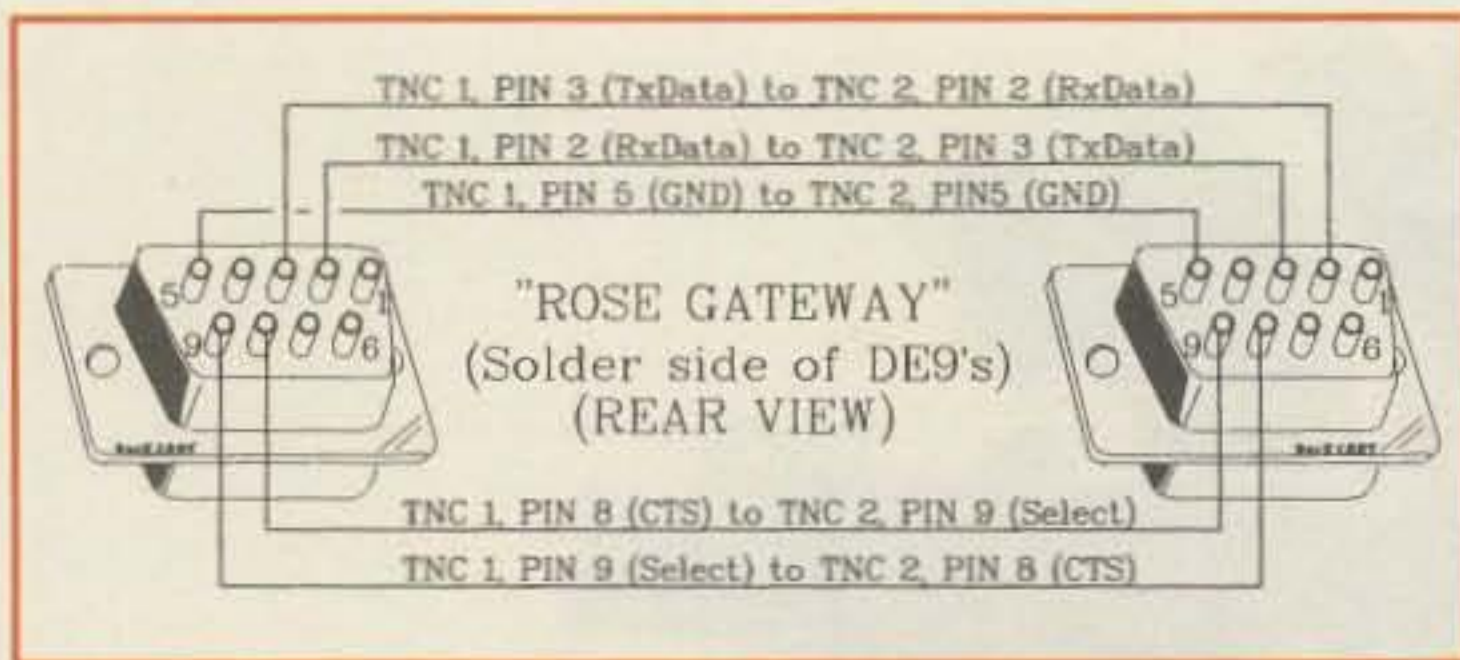


Fig. 4- Cable configuration to interface the DRSI DPK-2 and DPK-9600 for use as 1200 baud to 9600 baud gateway.

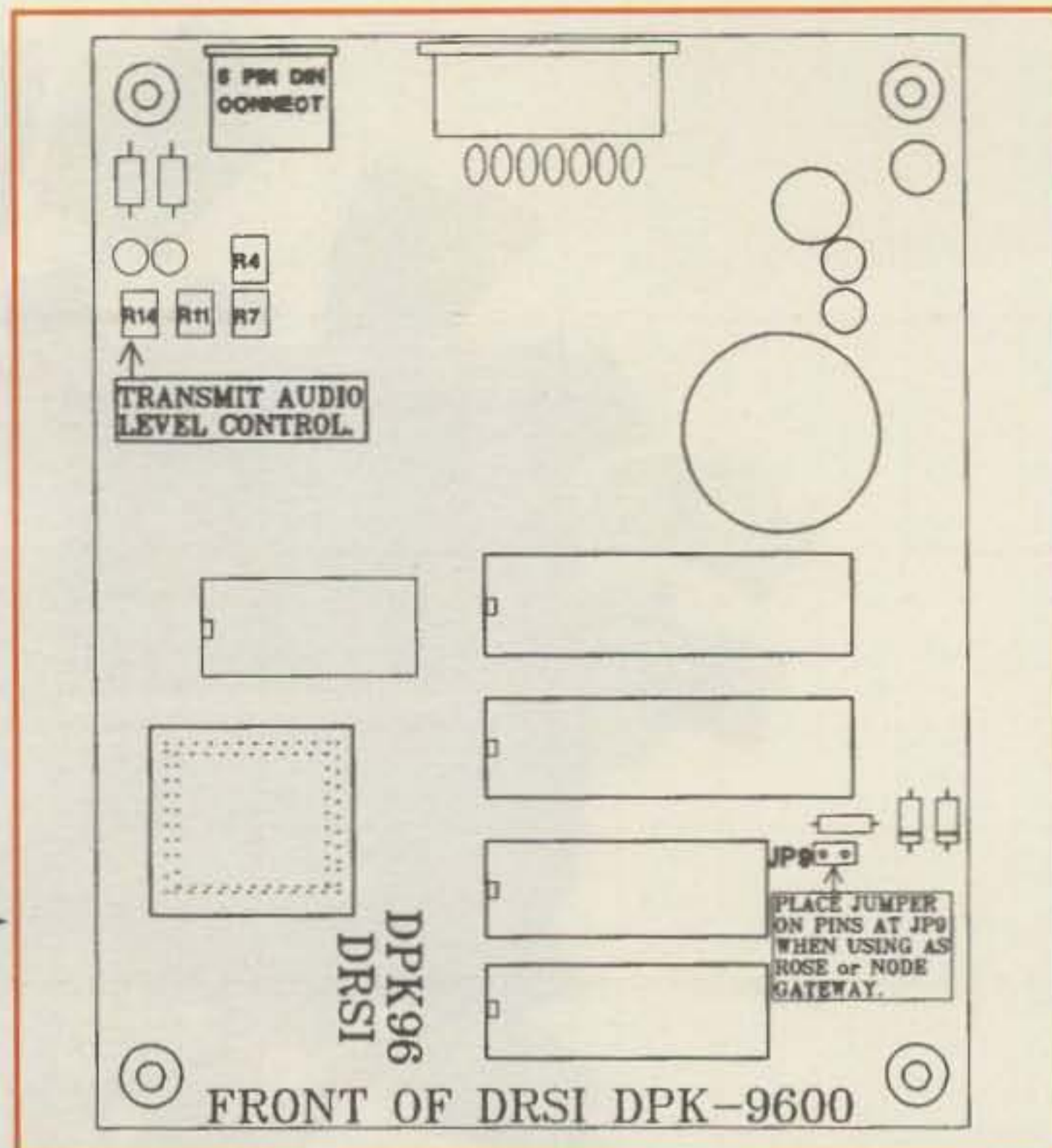


Fig. 5- Overhead view of the DRSI DPK-9600 TNC. Notice the location of JP9 near right front and R14 transmit level control, near left rear.

band is approximately 17 kHz. In most 2 meter voice transceivers the IF bandwidth is closer to 7 kHz than 17 kHz. To increase the IF bandwidth of the DR-1200 we will need to order a replacement part called a Murata SFH455B "Ceramic Filter." It is available for

\$11.45 each from Alinco Electronics. This ceramic filter is how we increase the IF bandwidth and enable our DR-1200 to pass 9600 baud.

We will remove the present ceramic filter designated FL2 (55F) and replace it with the SFH455B. Please make a note

of the "B" suffix, as this is the key identifier you will need to use when placing an order for the filter. The SFH455B has a bandwidth of  $\pm 15$  kHz at the 6 dB points.

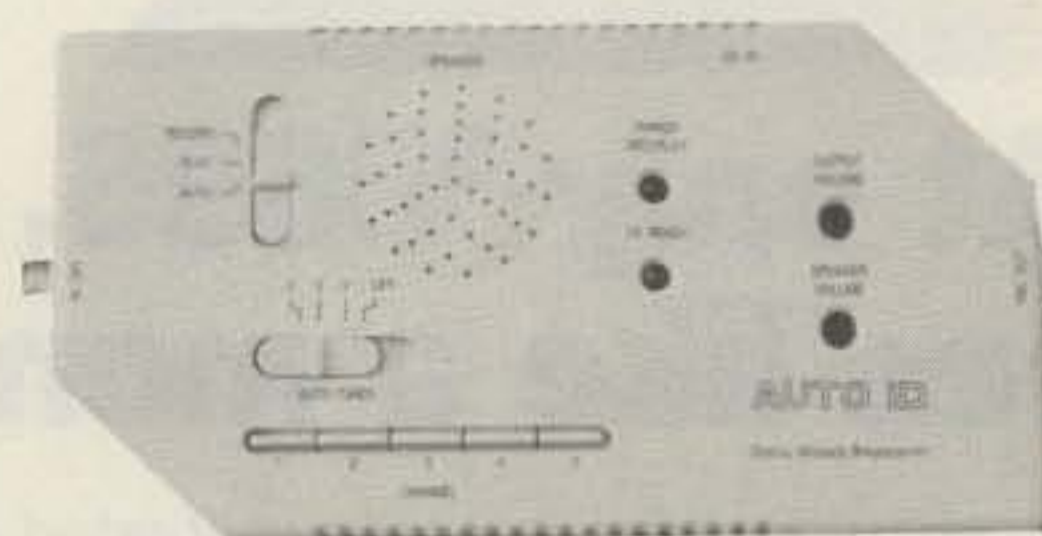
When connecting the 9600 baud TNC to the transceiver use shielded wire to

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the transmitter modulator. Use a separate shielded audio wire from the discriminator output for the receive audio.

### Tools of The Profession

You will need a 35 to 50 watt soldering iron with a small tip (the kind used when making repairs in tight places and to micro-circuitry). A needle-nose plier is the second item on the list. The third and important item (if you are among those of us who are beyond the half-century mark) is a magnifier, or a LUXO lamp with the large magnifier in its center. An Xacto knife or fine-tip Dremel is needed when we make one cut to a trace near C40, as shown in fig. 1(C).

### Making The Mods

If your DR-1200 is new—that is, fresh out of the box—connect it to your power source and run the normal tests to make sure you understand the operation of the unit(s).

Throughout this article I've tried to convey to the reader and builder exactly what to look for when making these modifications. I've taken extra steps to provide as much guidance as possible to help circumvent any mistakes. Short of being there beside you, I hope the illustrations I've drawn represent how the circuitry might appear when you remove the covers from the transceiver. In addition, I've drawn portions of the printed circuit board and the related traces in the hope they too will help you locate the correct interface points. See fig. 1(A), (B), and (C).

Remove both the top and bottom covers of the DR-1200 by extracting the two screws at the front and rear of each cover. Release the covers by loosening the two crimp screws on each side of the transceiver. Place the top and bottom covers out of your work space for now. Turn the transceiver to the side that has the speaker in it. Unplug the speaker and place it out of harm's way.

Now return to the side that has the solder traces exposed and prepare the soldering iron.

On the solder side (bottom) you will notice a pink wire soldered to the solder area shown at fig. 1(A). Remove (unsolder) the end that is attached to the PC board at fig. 1(A). Cut off about 1 1/8 inch of the pink wire. DO NOT throw this 1 1/8 inch of wire away!

The other end of the pink wire that remains is attached to pin 6 of the microphone connector. Leave the mic connector end as it is. Remove about 1/16 inch of insulation from the cut end of the pink wire and carefully solder it to the trace near the number "4" of the label R54; see fig. 1(B). This is where the magnifier will come in handy.

While you are in the area circled in fig. 1(B), you may wish to desolder the five connections of FL2. You will need a long-nose plier to remove FL2 (55F) from the other side of the circuit board (see fig. 2). Don't exert too much pressure, as FL2 should come out with only a slight tug. Any more pressure could damage the traces on either side of the PC board.

I've found that a good desoldering tool or solder sucker will help clear the excess solder away from the pins of FL2. In addition, I sometimes use a round toothpick to open the holes wider after the component is removed so the replacement will fit more easily into the vacant slot. In either case, USE EXTREME CAUTION, as I'm not responsible for damages to your transceiver or TNC. While we are working in the area shown in fig. 1(B) we should proceed with the installation of FL2. **Insert the new SFH455B into the holes where the old FL2 (55F) was removed.** Solder the five pins on the trace (solder) side of the PC board.

The final area of our modification is centered in the area circled at fig. 1(C). This is a crucial point in the mod, since we will be making the only cut to a trace on the circuit board of the DR-1200.

The Xacto knife is used to cut away a small section of the trace that joins the output of the microphone amplifier to the VCO of the transceiver. The input side of the circuit will be disabled when we remove R31; we will get to that next.

In fig. 1(C) notice the small trace that connects to the high side of C40. While holding the PC board in the position shown in the drawing, with the Xacto knife *carefully* cut (open) the trace just to the right of C40. See fig. 1(C).

Next unsolder and remove the surface-mounted resistor at R31. The surface-mounted resistor is quite small and can be a problem if you are not accustomed to working with them. Here all you need to remember is to remove it.

Remember the 1 1/8 inch piece of wire we removed from the pink wire? Locate it and clear 1/32 inch of insulation from each end, and tin with a *small* amount of solder. Solder each end of this jumper in place as shown in fig. 1(C).

Check your work, reconnect the speaker, and test the transceiver. If everything functions okay, then replace the covers.

This completes the modification of the Alinco DR-1200 for use with the DRSI DPK-9600 TNC.

### Interfacing The Transceiver and TNC

I'll restate the comment made earlier: **Use shielded audio wire from the**

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If you have the cable that is supplied with the DR-1200 transceiver, use it. This cable is already wired for use with the Alinco DR-1200, and has the shielding needed with the DRSI DPK-9600. The DRSI DPK-9600 comes with the 5-pin DIN connector to mate the DPK-9600 end of the cable.

The transmit audio from the DRSI DPK-9600 TNC is taken from pin 1 of the 5-pin DIN connector just as it is on other TNC-2 clones. The receive audio is connected to pin 4 of the 5-pin DIN, and Push-To-Talk is connected to pin 3 of the 5-pin DIN. Pin 2 of the DIN connector is the common, or ground, point. The Alinco DR-1200 transceiver is shipped with the radio cable already wired. Therefore, all that needs to be done is to connect the free ends of the transceiver-to-TNC interface cable to the 5-pin DIN connector (see figs. 3 and 4).

## Minor Adjustments

Because we have disabled some of the speech circuit, and the controls that control the level and deviation of the DataRadio, from this point on the levels will be controlled by the TNC.

There are three small, blue, 20-turn trim pots in the DPK-9600 located on the left side of the circuit board. These three pots are in a row towards the rear of the DPK-9600. The blue pot labeled R14 closest to the left edge becomes our transmit data level control (see fig. 5).

The transmit level of the DPK-9600 was set to near perfect when we interfaced the two units. The level was set close enough that if I lowered the level I would lose data, so I increased the 20-turn pot one full turn and I was able to pass a full 100,000 byte file, retry and error-free.

Setting the TXDelay is really the easiest part of operating at 9600 baud. Don't let the horror stories about TX-

Delay for transmitters operating at 9600 baud bother you. Case in point: I've listened to many stories about how the transceiver "up-time" (that's the length of time in milliseconds that it takes the transceiver to reach full power) determines the amount of TXDelay that can be used at 9600 baud. In most cases, where the short "up-time" occurs is where the transceiver is only running a few watts (between 2 and 10). In the case of the Alinco DR-1200, the transceiver was designed to be used in a 1200 and 2400 baud environment. In addition this is a 25 watt transceiver, and therefore it takes longer to reach the full power level.

Also to be considered is the fact that the DR-1200 is a synthesized transceiver. This simply means there will be more time (in milliseconds) for the PLL to "lock" in transmit mode.

So for this application the TXDelay will be set between 15 and 22, depending on the manner of cabling, and the software used to send and receive data. The FRack can be set at 3 to 7 seconds, depending on channel congestion, 7 being heavy traffic and 4 being clear, or little use.

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## ROSEs and Nodes

In fig. 4 I've included the interface cable that will enable communications between two DRSI TNCs when used as ROSE switches or node gateways. If you plan to use this same transceiver-to-TNC configuration to build a ROSE or node backbone, then be aware that jumper JP9 in the DRSI DPK-2 and DPK-9600 must be in place when used in a gateway application (see fig. 5).

When setting up a ROSE switch or TheNet node the first time, I suggest that you set the TXDelay in area of 220 to 240. For the ROSE switch, set the L2CHECK to 900 and the L3CHECK to 1800. FRack can be set to 2 or 3 for the 9600 baud side, and 4 to 6 for the 1200 baud gateway port.

I would like to thank Greg Pearson, N6ZSW (7J3ABT); Taka Nakayama, KC6VGY (JA3GES); Andy Demartini, KC2FF; Gregg Juett, N4THY; and Travis Brann, WA5RGU. The beneficial aid of these amateurs helped make this project a success.

The products used in this month's "Packet User's Notebook" are available from Alinco and DRSI dealers and distributors. For additional information about either of the products we discussed this month you may write or call the addresses and phone numbers listed: Alinco Electronics, 438 Amopola Avenue, Suite 130, Torrance, CA 90501 (310-618-8616); Digital Radio Systems Inc. (DRSI), 2065 Range Road, Clearwater, FL 34625 (813-461-0204).

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**YAESU FT-212RH/C8 (right)** • 2m FM mobile. 140-150MHz transmit, 138-174MHz receive. 45/5W. 12V DC @ 10A. 1 1/2"h x 5 1/2"w x 6"d, 2.8 lbs..... **LIST \$405.00**  
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**YAESU FT-811 (A)** • 2w, 430-450MHz ..... **LIST 394.00**  
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## NEWS/VIEWS OF ON-THE-AIR COMPETITION

### Contesting from Taiwan

Every once in a while I receive a fascinating account of someone's operating experiences in a contest such as the CQ WW. This month I am proud to present the recent low-band experiences of Mark Pride, K1RX, while operating the 1992 CQ WW CW Contest from Taiwan.

#### Taiwan on 80 Meters At Long Last!

By Mark S. Pride, K1RX

Prior to arriving in Taiwan on business, I was pleased to learn that Taiwan had finally gained acceptance into the ITU, and with that came the release of the 80 meter band by the government for use by Taiwanese amateurs. For many years no operation on this band was permitted, depriving the DX community of working this beautiful country. Only once before have I heard of an 80 meter BV operation, and that was when Senator Barry Goldwater, K7UGA, obtained special permission to operate on 75 meters SSB using the callsign BV0BG. The 80 and 160 meter bands have been under the control of the Taiwan military and other authorities, preventing any operation by amateur operators. In recent years, however, it was becoming obvious to the amateurs in Taiwan that these frequencies were not really being used. After considerable work on the part of the China Radio Association and special help from BV2FB, club secretary, the Government agreed to release two frequencies on a temporary basis to the amateurs, just in time for the 1992 CQ World-Wide CW Contest. The allocation was 3505 and 3515 kHz ( $\pm 3$  kHz).

I had planned to operate the contest long before hearing this great news about 80 meters. Needless to say, this added 30 dB to my excitement level. Arrangements had been made with William, BV2VA, to operate his station during the CQ WW CW test on the usual bands—40 through 10 meters. William sports an IC-781 and IC-4KL amplifier; his antennas include two Create tribanders. With the news of the availability of 80 meters, a Friday night antenna raising party was formed to erect something—anything (remember, the contest starts on Saturday morning in BV-land). Our first attempt was a trap inverted-vee from the top of a 45 foot tower, but it simply did not work. We then tried a  $1/4$ -wave sloping dipole, fed against the tower using the tribander as a capacity hat.

All of the antenna raising took place in less than an hour! When we finished, it was already dark and raining lightly. Fortunately, all the antennas are located on the top of a five-story building, so we had a fighting chance that our installation would perform well. Murphy did prevail slightly as a first

c/o CQ magazine  
Internet address: p00259@psilink.com

#### Calendar of Events

Apr. 24-25	Swiss Helvetia Contest
Apr. 28-29	DX-YL to NA-YL YLRL SSB
May 1	ARRL UHF Spring Sprints
May 1-2	ARI International Contest
May 1-2	Oregon QSO Party
May 1-2	MARAC County Hunter's CW
May 8-9	CQ-M DX Contest
May 15-17	Michigan QSO Party
May 22-23	ARAL DX Contest
<b>May 29-30</b>	<b>CQ WW WPX CW Contest</b>
Jun. 12-14	ARRL June VHF QSO Party
Jun. 12-13	ANARTS WW RTTY Contest
Jun. 19-20	All Asian CW DX Contest
Jun. 26-27	ARRL Field Day
<b>Jul. 10-11</b>	<b>CQ WPX VHF Contest</b>



W1NH shown receiving his long sought-after QSL card from Taiwan for 80 meters from Mark, K1RX (on right). Bob only needs a few more to have worked them all on 80 meters. On the first day of operation from BV, Bob blew up a balun on his 80 meter vertical array while calling Mark, but managed to fix it in time to catch him the next morning during the contest! Hand-delivering the QSL seemed like the only neighborly thing to do (Mark lives less than a mile from W1NH).

check revealed that the antenna was somewhat long, calling for BV2AP to jump into action and shorten it via directions called out on 2 meters from the shack.

The time was now 1044Z, Friday, November 27, 1992. A quick CQ generated a pile-up, and a BIG one! JA stations were flooding in at 20 to 30 dB over S9, and at a

#### May's Contest Tip

This may sound like common sense, but it's worth a try. When calling in a big CW pile-up, don't be afraid to move your transmit frequency a little off the center of the chaos. If you put yourselves in the shoes of the DX station, it begins to make sense. Except from the biggest stations or rare propagation advantages, brute-force calling almost never pays off!

QSO rate of 100+ per hour. After a short time, I wondered if any USA stations were listening. Around this time, propagation was best to the East Coast of the USA from Southeast Asia. At 1057Z, WL7E called in with an S7 signal. I then started calling for USA-only, and at 1129Z, K3ZO was in my log as the first USA station. Other early winners included W8OSM, W0ZV, KM1H, K3NW, K8YSE, W4DR, and many more—WOW! I later learned from Bill, W0ZV, that I had the entire East Coast calling. Guess my signals were better than I thought, and I was sure to be ready for the contest that weekend.

During the CQ WW Contest I managed to work about 100 North Americans, 70 Europeans, and approximately 450 Asians. I could have worked more stations, but I just couldn't hear weaker signals (a beverage was out of the question at William's location). Feedback from some of the USA stations after the contest said that my signals were coming from the southwest (skewed path) on the first morning and more direct the second day.

My activity for the contest was in the single operator, all band category. This forced me to move to other frequencies to keep scoring points, but a special effort was made to catch the East Coast USA and European openings. I also checked the long path around 22Z a few times, but no signals were heard.

One final thought has to do with 160 meters. This band turned out to be an even bigger surprise. It wasn't until the middle of the first night that I realized that 160 was also available on a temporary basis. Somehow in the scramble to get on 80 meters, I missed the comment made by BV2AP that 160 meters was authorized as well. So, back to the rooftop we went in an attempt to figure out a plan for that band.

The obvious answer was to add wire to the existing 80 meter antenna. With newly acquired materials in hand, we added the necessary wire to the antenna. In order to fit the antenna in William's location, we threw the added wire down the side of the building, past air conditioners, external plumbing, etc. It worked well enough to make 21 QSOs in 3 countries and 3 zones. Unfortunately, no USA stations were heard, even with an attempt to work N6DX! With the local city

noise problems, this band is very difficult to use in Taipei. After working the band for 30 minutes, it was back to the roof to QSY to 80 meters!

Since the contest, permanent permission has been granted to Taiwan amateurs to operate anywhere in the 80 and 160 meter bands. The time has finally come to start looking for those BV callsigns on a regular basis.

It was truly a thrill to be one of the early arrivals on 80 and 160 from BV-land. A very special thanks goes to the gang from BV2VA and BV2FB for their efforts in making so many DXers around the world much happier today. QSLs for the BV/K1RX operation can be obtained via the W1 QSL bureau or direct with an SASE to 205 Amesbury Road, Kensington, NH 03827. See you in the next one!

## 1993 Dayton Hamvention Forums

Tim Duffy, K3LR, has been kind enough to provide me with an early view of this year's antenna and contest forums at the Dayton Hamvention. Without a doubt, this year's line-up is top notch and should not be missed. Here's the itinerary at press time:

### Antenna Forum

W0UN: Low Frequency Antennas  
 WA3FET: New Revelations on Antenna Computer Modeling  
 W3LPL: Solar and Geomagnetic Effects on Long-Distance Propagation  
 WA2WVL: Wire Antennas for 80 Meters  
 K5IU: A New Method for Determining Wind Loading of Yagi Antennas  
 NI6W: Yagistress—The Computer Modeling Program

### Contest Forum

KQ2M: Contest Operating Tips  
 VS6WO: Multi-Multi From a Rooftop—CQ WW from VS6WO  
 K3WW: Single Operator Plus Packet—The New Category  
 VE3EJ: The VE3EJ Station  
 K3LR: The K3LR Station  
 WZ3Q: Contesters Speak—A Video Presentation

Can you afford to miss out on this agenda? If I were you, I'd get there early unless you like to stand!

## Final Comments

Recently I obtained the rate sheet for Trey Garlough's (WN4KKN) TI1C operation in the '93 ARRL CW DX Contest (see Table I). Having never operated a CW contest from "over there," I never cease to be amazed by the consistent rates that good operators such as Trey achieve each time they operate. To give equal billing (and keep my friends), Trey's claimed score was slightly behind the efforts of VP5F (KR0Y operator), another incredible effort. I think it would be fun to do a more exhaustive analysis of QSOs rates for various contests. Do you agree?

There has been a lot of talk lately about operating style and how it relates to ethics. For example, how far should we go in checking an apparent clear frequency before

Hour	160 CW	80 CW	40 CW	20 CW	15 CW	10 CW	Total	Accum
0	0	0	0	204	8	0	212	212
1	0	0	0	195	0	0	195	407
2	0	0	173	11	0	0	184	591
3	0	0	207	0	0	0	207	798
4	145	17	29	0	0	0	191	989
5	51	94	14	0	0	0	159	1148
6	1	38	117	0	0	0	156	1304
7	32	55	23	3	0	0	113	1417
8	19	77	5	0	0	0	101	1518
9	7	11	0	5	0	0	23	1541
10	1	39	0	0	0	0	40	1581
11	10	55	41	4	0	0	110	1691
12	0	9	42	44	0	0	95	1786
13	0	0	26	39	47	0	112	1898
14	0	0	8	6	114	20	148	2046
15	0	0	0	0	0	206	206	2252
16	0	0	0	0	0	189	189	2441
17	0	0	0	2	20	161	183	2624
18	0	0	0	1	19	134	154	2778
19	0	0	0	0	74	84	158	2936
20	0	0	0	0	209	0	209	3145
21	0	0	0	0	203	2	205	3350
22	0	0	0	0	128	61	189	3539
23	0	0	0	0	109	40	149	3688
0	0	0	0	123	51	0	174	3862
1	10	5	0	137	0	0	152	4014
2	0	84	36	3	0	0	123	4137
3	32	81	3	0	0	0	116	4253
4	7	0	5	87	0	0	99	4352
5	0	0	78	11	0	0	89	4441
6	0	0	68	0	0	0	68	4509
7	0	0	0	0	0	0	0	4509
8	0	0	0	0	0	0	0	4509
9	7	30	1	0	0	0	38	4547
10	1	10	49	1	0	0	61	4608
11	8	52	0	9	0	0	69	4677
12	0	0	1	68	0	0	69	4746
13	0	0	45	5	42	0	92	4838
14	0	0	0	17	17	43	77	4915
15	0	0	0	0	0	123	123	5038
16	0	0	0	0	36	98	134	5172
17	0	0	0	3	0	143	146	5318
18	0	0	0	0	79	62	141	5459
19	0	0	0	0	73	61	134	5593
20	0	0	0	0	145	0	145	5738
21	0	0	1	1	96	29	127	5865
22	0	0	0	22	34	74	130	5995
23	1	0	6	156	0	0	162	6158
TOTAL	332	657	978	1157	1504	1530	—	—

Table I—The amazing QSO rates during the ARRL CW DX '93 from TI1C (WN4KKN op.).

unloading a CQ with both barrels? Stay tuned for some thoughts on this controversial topic next month.

Finally, please remember that the deadline for the August issue is June 1st. Again, just a reminder one more time: You can send your contest announcements to me on diskette (ASCII or WordPerfect 5.1 formats are fine) or direct to my Internet address (shown at the beginning of this column). Obviously, this saves a great deal of time rekeying your information.

73, John, K1AR

## ARI International Contest

2000Z Sat., May 1 to 2000Z Sun., May 2

This is the annual operating event sponsored by the Association Radioamatori Italiani. The ARI DX Contest is managed by

veteran contester I2UIY and should offer a significant amount of activity. Stations are allowed to work each other worldwide.

**Classes:** Single Operator SSB, CW, or RTTY, Single Operator Mixed, Multi-Single Mixed, and SWL Mixed.

**Frequencies:** 160 through 10 meters (no WARC bands) according to the IARU band plans. All stations (including single operator) must adhere to the standard 10-minute rule.

**Exchange:** Italians send RS(T) and province; all others send RS(T) and serial number.

**Points:** QSOs within your own country count only for multiplier credit. Count 1 point for QSOs within your own continent, 3 points for QSOs outside your continent, and 10 points for Italian QSOs. Stations can be worked once per band and mode (e.g., 15 CW, SSB, and RTTY).

**Multiplier:** Italian provinces (95) and

DXCC countries (not I or ISØ). Credit multipliers once per band.

**Scoring:** Final score is sum of QSO points times sum of multipliers.

**Awards:** A plaque will be offered to the highest scoring station in each class. In addition, a certificate will be awarded to the top two to five placing stations as well as the leading scorers in each DXCC country. QSOs made during the contest are eligible for other existing Italian awards (CdM, WAIP, ITA, etc.).

Free logging software is available for the ARI Contest. You may obtain your copy directly from the contest manager (\$5 or 10 IRCs for expenses) or via Roger Burt, N4ZC, Rte. 1, Box 246, Mount Holly, NC 28120. Logs must be mailed 30 days from the end of the contest and addressed to: ARI Contest, I2UIY, P.O. Box 14, 27043 Broni (PV) Italy.

### Oregon QSO Party

0000Z Sat., to 0000Z Sun., May 1-2

This one is jointly sponsored by the Central Oregon Radio Amateurs ARC and the Central Oregon DX Club. Stations may be contacted once per band and mobiles every time they cross county lines. The sponsors will be activating the real rare ones in Oregon (e.g., Wheeler, Gilliam, Sherman counties).

**Exchange:** Oregon stations send serial number and county. Other stations exchange serial number and State/Province/DXCC Country.

**Frequencies:** CW—1810, 3540, 7040, 14040, 21040, 28040 kHz. SSB—1860, 3850, 7230, 14250, 21300, 28400 kHz.

**Scoring:** Score 2 points per phone QSO and 4 points for CW contacts. For final score, Oregon stations multiply QSO points by states/provinces/DX countries worked. Others multiply QSO points by total number of Oregon counties worked (maximum 36).

Send your SSB entries to: Bill Sawders, K7ZM, 19821 Ponderosa St., Bend, OR 97702. CW entries go to: Mahlon Hale, WA7ZBL, 22840 Tumbleweed Ct., Bend, OR 97701. All logs must be postmarked no later

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### MARAC Country Hunters CW Contest

0000Z Sat., May 1 to 2400Z Sun., May 2

The Mobile Amateur Radio Awards Club is pleased to sponsor the 25th annual County Hunters CW Contest. Mobile and fixed stations from every county in the U.S. are invited to participate. Mobiles may be worked each time they change counties and must identify by signing "/M" after their callsign.

**Exchange:** QSO number, category (mobiles), RST, county, and state for US (Province/DXCC country for others).

**Scoring:** Fixed station QSOs are worth 1 point. Mobiles and DX QSOs are worth 3 points. Final score is total QSO points times the total number of U.S. counties worked.

**Frequencies:** 3575, 7055, 14060, 21060, 28060 kHz.

**Awards:** Certificates will be awarded to

the winning fixed stations in each state, province, and DXCC country (1000 points minimum). Other certificates are available to the winning mobile in each state operating from 3 or more counties (10 QSOs/county minimum). Plaques will be awarded to the Top-2 scoring mobile and North American fixed stations, and DX station.

Completed logs, summary sheets, and county lists (required or entries with over 100 counties) must be received by June 2, 1993. Send your logs to: Jerry Burkhead, N6QA, 7525 Baltic Street, San Diego, CA 92111. Include a #10 SASE for contest results.

### Massachusetts QSO Party

1500Z Sat., May 8 to 2100Z Sun., May 9

This year's Massachusetts QSO Party is sponsored by the Boston Amateur Radio Club. As usual, stations are allowed to be worked once on each band/mode. Portables and mobiles may be counted as new contacts each time they operate from a new

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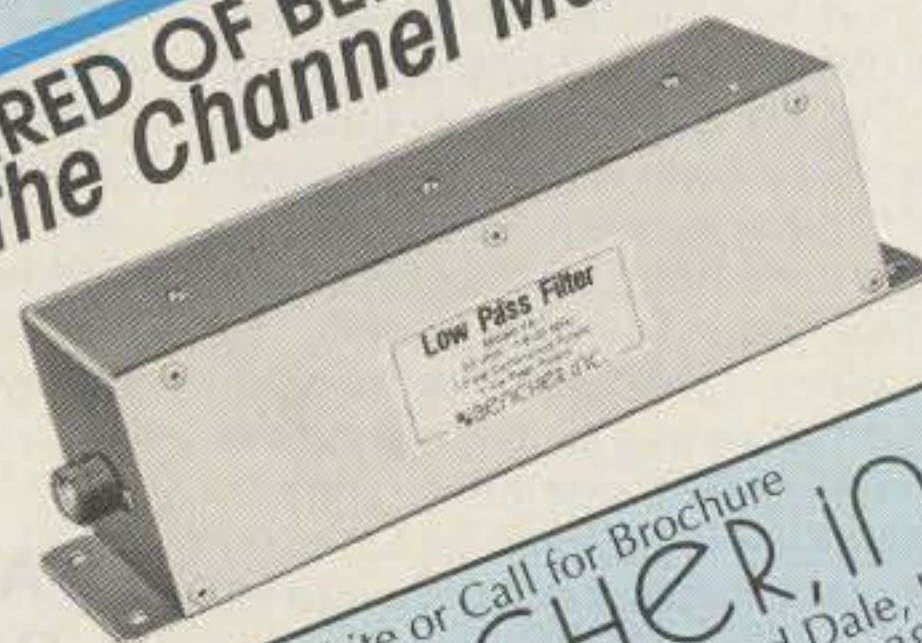
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**DR-570T 2m/70cm Twin Band Mobile** • Two radios into one! Covers 2m/440MHz transmit with broadband receive including 130-170, 340-470 and 870-890MHz with MARS/CAP modification. 45W out (2m) 35W (70cm). Full duplex cross band operation (transmit on one band and simultaneous receive on the other). Large, dual digital LCD display, illuminated front panel controls. Volume, squelch and tuning controls for each band. 20 memory channels, 4 scanning modes, priority. CTCSS encode/decode, internal duplexer. 16-key DTMF microphone with UP/DOWN key. 5½" w x 2" h x 6¾" d, 3½ lbs ..... **\$509<sup>95</sup>**



**ALINCO DR-600T 2m/70cm Twin band FM Mobile** Two radios in one! Combines rugged construction, wide frequency coverage, and *high-tech* features to produce a dual band FM transceiver suited for both mobile and base station use. Covers 144-148 and 440-450MHz, plus receives 150-173 and 420-470MHz. Modifiable for aircraft band receive and MARS/CAP transmit. Output: 45W 2m/35W 70cm The front panel can be separated from the transceiver's main body with an optional kit for a custom installation. 40 memory channels, multi-function scanning. Remote controls from any DTMF capable 2m or 70cm transceiver. Separate VHF and UHF outputs. Full duplex cross band operation allows for transmit on one band and simultaneous receive on the other. Large dual LCD and separate volume and squelch controls for each band. CTCSS and DTMF encoders built-in. 5½" w x 2" h x 7" d, 3½ lbs..... **\$619<sup>95</sup>**



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**ALINCO DJ-580T 2m/70cm Twin Band HT** **A Great Value!** 2m/440MHz tx, rx 130-174 and 410-470MHz. Mod. for MARS/CAP tx, + 118-136MHz & 800MHz rx. 40 memories, CTCSS encode/decode, DTMF encode, DSQ. Full duplex cross band repeat, 8 scan modes, autodialer, back-lit keypad. Simultaneous receive on both bands with separate squelch and volume controls. **Super Audio!** 2.5W; 5W w/12V or opt. 6½" h x 2¼" w x 1½" d, 0.97 lbs .. **\$394<sup>95</sup>**

**ALINCO DJ-162T 2m FM HT** • 130-174 MHz rx (modifiable for 118-136MHz aircraft rx and MARS/CAP tx). 2.5W out; 5W with opt. battery or 12V. Keypad, 20 memories, autodialer, CTCSS, DTMF encode, DSQ paging. 5½" x 2¼" x 1½", ¼ lb ..... **\$239<sup>95</sup>**

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county. All modes are permitted including digital, video, and phone.

**Classes:** Operating classes for Massachusetts entries include Single operator, Multi-Single, Multi-Multi, and non-fixed stations. All other stations are categorized as single operator, non-Massachusetts entries.

**Exchange:** RS(T), QSO number, QTH (county for Massachusetts stations, state/province/country for others). Massachusetts Bonus Point Club Stations add "club station" or "/c" to their exchange.

**Scoring:** For Phone QSOs, credit 1 point/QSO times (States + Countries + Massachusetts counties). Each non-phone contact is 2 points/QSO. Credit 50 bonus points for each contact with bonus point club stations. Maritime mobiles shall be counted as a QSO but not as a multiplier.

**Frequencies:** CW 1810, 3550, 7050, 14050, 21050, 28050, 144070, and 432090 kHz. Phone 1850, 3890, 7290, 14270, 21390, 28390, 144220, 146550, 432150, 446000 KHz. Novices operate 30 kHz up from the band edge.

**Awards:** An award will be given to the highest scoring station in each of the five operating categories. Additionally, awards will be provided to the high single op/Mass. county, high score in each state/province/

DXCC country, Mass. Bonus Point Club, and Mass. Novice/Technician. Certificates will be awarded to the second- and third-place winners in each category.

Mailing deadline for logs is 30 days after the end of the contest. Logs should be sent to: Massachusetts QSO Party, Boston Amateur Radio Club, P.O. Box 15585, Kenmore Station, Boston, MA 02215. Include an SASE for a copy of the final results.

### Michigan QSO Party

1800Z Sat., May 15 to 0300Z Sun., May 16  
1100Z Sun., May 16 to 0200Z Mon., May 17

This year's Michigan QSO Party will be sponsored by the Oak Park Amateur Radio Club. As usual, stations are allowed to be worked once on each band/mode. Portables and mobiles may be counted as new contacts each time they operate from a new county.

**Exchange:** RS(T), QSO number, QTH (county for Michigan stations state/country for others).

**Scoring:** Michigan stations 1 point/QSO times (States + Countries + Michigan counties). Each CW contact is 2 points/QSO. KL7/KH6 count as states and VE is consid-

ered a country. Credit 5 bonus points for each contact with the W8MB club station. Non-Michigan stations use similar scoring except multipliers/QSOs are limited to Michigan counties. Maximum multiplier is 85.

**Frequencies:** CW 1810, 3540, 3725, 7035, 7125, 14035, 21035, 21125, 28035, 28125. SSB/VHF 1855, 3905, 7280, 14280, 21380, 28580, 50125, 144025, 146520.

**Awards:** Michigan plaques are available to the high multi-operator/single transmitter score, high Michigan (Upper Peninsula), high Michigan, high aggregate club score, high Michigan mobile, and high VHF entry (100 QSOs minimum). Certificates will be awarded to the high score in each Michigan county. Non-Michigan high out-of-state plaque will be awarded and certificates for the high score in each state and country.

Mailing deadline for logs is July 1, 1993. Send your logs to Mark Shaw, K8ED, 27600 Franklin Road, Apt. 816, Southfield, MI 48034. Members of the Michigan QSO Party committee are not eligible for awards. Include an SASE for a copy of the final results.

### ARAL DX Contest

1600Z to 2300Z Sat., May 22  
0700Z to 1400Z Sun., May 23

This is a new one sponsored by the Amateur Radio Association of Leiria (Portugal) and is open to all single operator and SWL participants around the world on SSB and CW.

**Exchange:** RS(T) and Serial number (e.g., 599001).

**Scoring:** Each QSO is worth 5 points. Portuguese stations working each other can only credit 1 point on 40 and 80 meters. VHF QSOs are worth 1 point and UHF contacts receive 3 point credit. The same station can be contacted once per band and mode provided 30 minutes separates each QSO. There will be a special station, CT6ARL, operating during the weekend. This station must be contacted at least once during the contest to be eligible for awards. No mention of multipliers was included with the rules, so assume the final score is the total of your QSO points.

**Awards:** There is an impressive array of awards, including a surprise award for the first-place winner/high scorer. In addition, winner cups will be provided to the top scores in the USA, Spain, Top 10, and winning country outside of the USA. Medals will be also be awarded to the top 20 winners. Any participant scoring at least 30 points will receive a diploma.

Mail your entries no later than June 15, 1993 to: ARAL '93 Contest, P.O. Box 296, Leiria Codex 2403, Portugal.

### CQ WPX CW Contest

0000Z May 29 to 2400Z May 30

Complete rules were in the January issue of CQ. Rules and summary/log sheets can be obtained from CQ Magazine, 76 N. Broadway, Hicksville, NY 11801. Check the current rules for the trophy list. Results of the 1992 contest can be found elsewhere in this issue.

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**Dual Channels** for operation with one or two connected radios. Separate equalizers, PTT paddles, and output cables for each channel.

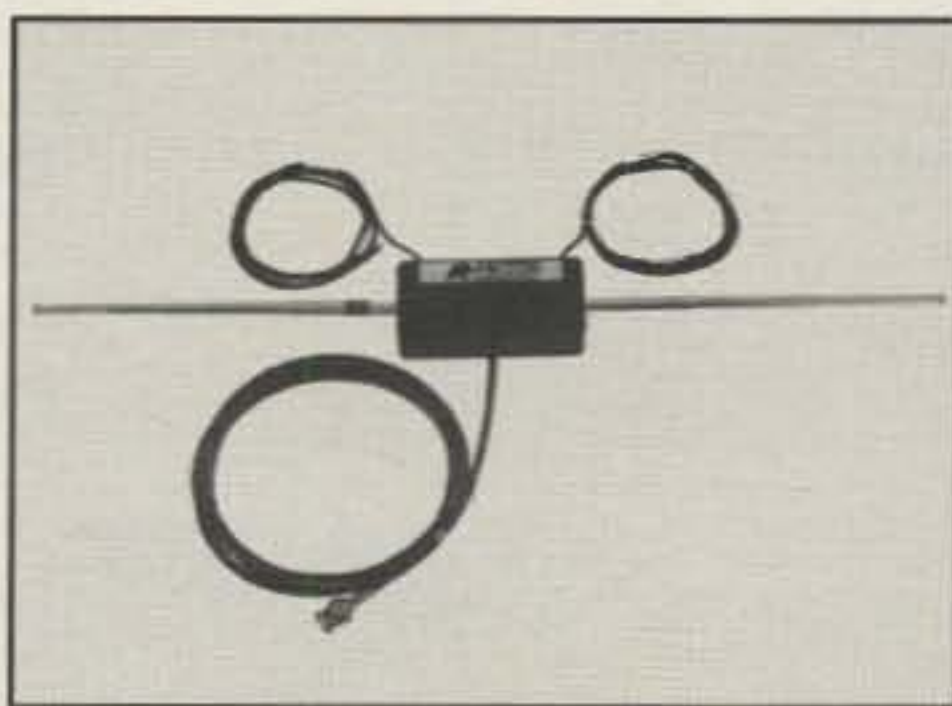
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**Ready To Plug In And Use!** Supplied complete with two preinstalled mike plugs and cables that fit all HF, VHF & UHF transceivers with 8-pin mike connectors. Wiring is field changeable using only a screwdriver! Requires 4-1.5v cells or 6-25 VDC ext. power. A super mike you will enjoy year after year, rig after rig!

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**F121A PORTATENNA** The ideal portable VHF/UHF antenna for FM handhelds and scanners! Retracts to only 8.7 inches long for carrying, yet extends into full size, ground-independent half-wave dipole for 2 meters, 222MHz, 70cm, and all frequencies in between. Produces significantly greater range than "duddy" antennas.

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**Internal Amplifier.** Inputs are highly isolate and maintain a constant 10 ohm impedance. Volume remains steady when adding or removing an input or an output. Low output Z. Gain internally adjustable from 0-12dB. Requires 13.8 VDC power. Inputs are RCA phone jacks. Outputs are screw terminals on a plug-in terminal strip.

**Two Models.** F251A has single amplifier with 7 switch-selectable inputs and 4 switch-selectable outputs. Dual Channel F252A has 2 amplifiers, each with 7 inputs and 4 outputs. "Brings your shack together" in a neat and effective manner!



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# CQ World-Wide WPX CW Contest All-Time Records

The contest is held each year on the last full weekend of May. The All-Time Records will be updated and published annually. Data following the calls below are: year of operation, total score, and number of prefix multipliers.

## WORLD RECORD HOLDERS

### Single Operator

1.8	UP3BP/UF('85)	125,240	101
3.5	YX3A('89)	1,004,060	305
7.0	VP2VCW('86)	4,641,120	586
14	YW1A('91)	4,617,456	732
21	ZD8LII('91)	5,118,527	743
28	ZS6BCR('91)	3,621,173	617
AB	ZV5A('92)	12,184,011	861

### Multi-Operator Single Transmitter

YM5KA('90)	13,098,790	839
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### Multi-Operator Multi-Transmitter

UP4A('88)	16,204,961	1013
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## U.S.A. RECORD HOLDERS

### Single Operator

1.8	K5UR('85)	13,668	102
3.5	K1ZM('91)	247,744	224
7.0	N5RZ('85)	1,754,664	452
14	K2VV('86)	2,525,880	582
21	K6LL/7('88)	2,163,388	557
28	N5RZ('89)	162,134	259
AB	KM1H('92)	5,313,160	760

### Multi-Operator Single Transmitter

N4WW('92)	7,168,734	887
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### Multi-Operator Multi-Transmitter

NS0Z('88)	10,870,380	922
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## CLUB RECORD

Northern California Contest Club('92)	97,527,906
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## WPX (Prefix) RECORD

HG73DX('91)	1,120
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## QRPP RECORD

VP2MU('91)	1,554,735
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## CONTINENTAL RECORD HOLDERS

### AFRICA

1.8	ZS6BCR('85)	20	5
3.5	EA8RL('84)	453,456	201
7.0	AM9TY('92)	2,007,990	404
14	9J2AL('90)	1,333,724	436
21	ZD8LII('91)	5,118,527	743
28	ZS6BCR('91)	3,621,173	617
AB	5L7T('87)	8,619,225	679

### ASIA

1.8	UP3BP/UF('85)	125,240	101
3.5	UP2NK/UF('85)	701,012	221
7.0	UP2NK/UF('86)	2,084,880	365
14	4Z6DX('91)	4,614,030	743
21	7L1GVE('91)	2,811,478	601
28	4X4UH('81)	1,081,262	338
AB	P3AA('92)	10,293,858	762

### EUROPE

1.8	UA2FF('87)	117,424	134
3.5	GW8GT('92)	740,440	346
7.0	DF9ZP('85)	1,998,372	482
14	LZ5W('92)	4,222,665	837
21	4N3E('90)	3,239,453	721
28	9H1EL('88)	805,552	398
AB	LZ3DX('91)	4,713,706	863

### Multi-Operator Single Transmitter

AF	ZD80V('91)	10,938,352	848
AS	YM5KA('90)	13,098,790	839
EU	ZB2X('91)	8,618,823	881
NA	KP2A('89)	12,843,135	835
OC	AG9A/AH2('91)	9,005,641	787
SA	P43GR('90)	10,990,482	790

### NORTH AMERICA

1.8	VE3BMV('86)	43,428	77
3.5	HK3MAE/HK0('87)	456,280	187
7.0	VP2VCW('86)	4,641,120	586
14	WC4E/KP4('86)	3,613,248	656
21	FS5T('89)	4,552,470	702
28	HI8JKA('89)	891,242	374
AB	V27T('89)	9,408,672	819

### OCEANIA

1.8	KX6DC('88)	12,240	45
3.5	KX6DC('89)	258,258	143
7.0	V73AS('90)	1,793,840	340
14	ZL3GQ('89)	2,775,744	576
21	N7DF/WH2('89)	3,243,450	525
28	KG6DX('81)	1,238,806	334
AB	NH6J/NH0('88)	4,484,760	532

### SOUTH AMERICA

1.8	YV1OB('86)	11,550	35
3.5	YX3A('89)	1,004,060	305
7.0	YX5A('87)	2,999,977	479
14	YW1A('91)	4,617,456	732
21	LT0A('91)	4,290,988	686
28	CE3DNP('89)	2,857,038	582
AB	ZV5A('92)	12,184,011	861

### Multi-Operator Multi-Transmitter

AF	EA9CE('84)	4,383,308	482
AS	JE2YRD('91)	8,388,942	866
EU	HG73DX('91)	16,468,480	1120
NA	WL7E('88)	12,826,296	952
OC	KH6XX('85)	8,551,399	647
SA	LQ5A('89)	8,290,016	784

## QRPP

AF	5Y4FO('92)	649,057	311
AS	4X4UH('82)	1,028,904	344
EU	LZ2BE('91)	1,137,488	506

NA	VP2MU('91)	1,554,735	469
OC	FO8JP('86)	572,131	259
SA	OA8V('81)	444,768	246



## NEWS OF CERTIFICATE AND AWARD COLLECTING

The Story of the Month for May is:

**Eugen "Gene" Goffriller,  
OE2EGL  
USA-CA All Counties #703  
All SSB, 4-1-91**

This month we salute OE2EGL, the first Austrian to receive the basic USA-CA 500 #754, 11-6-69. Twenty-two years is a long time to pursue an award. Congratulations to Gene for his tenacity. Congratulations to Gene for his tenacity.

Gene was born in Salzburg in 1931. He earns his living as a tax collector. He became interested in radio as a young boy during the war years. Just listening to foreign radio stations was a capital offense. The BBC broadcasted German-language programs on three medium-wave frequencies. His main interest was American Jazz.

One of Gene's activities during the war was following the air battles over Europe. A friend shared a copy of the Luftwaffe Air Control Map. By listening to the German Army frequencies he could find the locations of airplanes from the map coordinates broadcast to German fighter pilots. In a classic understatement Gene says, "Radio was exciting during those years." Gene was also a competitive tester, leading all OE amateurs in CQ and ARRL competitions for ten consecutive years. Contests were two full weekends in those days.

Gene's DX station is on a lake eleven miles from Salzburg in a hut heated by a wood stove. A fellow amateur, Hans, OE2ZL, helped build dipoles for 80 and 40 meters. One year for the March contests the snow was four feet deep, and they had to move the Heath equipment on a sleigh from the nearest village to the lakeside shack. On those cold weekends he would make about 2500 contacts. Gene writes that during one contest he was patrolling 20 meters when he came across a station giving out a county. "... I was hooked, when I checked my contest logs and they showed 500 confirmed counties from fixed stations.

In 1982 Gene's County Hunting was interrupted by the untimely death of his wife, Helga. "Helga was a wonderful friend, wife, and helper with my files and award documentation. From this time on I had to raise my two daughters, then 8 and 13 years old. This required much of

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*Gene Goffriller, OE2EGL, CQ's USA-CA #703, All SSB, April 1, 1991.*

my time, and my County Hunting had to be delayed."

In addition to his amateur radio activity, Gene also collects American 78 RPM records and American G.I. comic books from the forties. He is willing to swap with other interested collectors. OE2EGL wishes to thank the hundreds of Mobiles and fixed stations that made USA-CA 703 a reality.

### Awards Issued

Charles Steele, N2JNE, submitted a complete book for USA-CA All Counties #796 dated 2-22-93.

Norman Friedman, NK7B, came through for his USA-CA 3000 #821 2/22/93. We'll be pulling for him to contact those last 76 to get his USA-CA All Counties.

Lawrence S. Cahoon, WD3P, submitted his second book for USA-CA 1000 #1265 dated 2-22-93.

Initial USA-CA 500 certificates went to three DX stations this month:

Vanni Duca Stefano, IK2AEQ, USA-CA 500 #2660 Mixed, 2-22-93.

Jose Mendez Saez, EA7OH, USA-CA #2661 Mixed, 2-22-93.

Bartolomeo Furimo, IØER, USA-CA 500 #2662 Mixed, 2-22-93.

### Awards Available

Oasis Amateur Radio Club. The Oasis Amateur Radio Club, 7Z2AB, Jeddah, Saudi Arabia, is offering attractive QSL cards and a handsome certificate. The QSL cards come in a series of six photo cards: two with desert scenes, two with cultural activities, and two with historic buildings in the city. Several club mem-

### USA-CA Special Honor Roll

Charles Steele, N2JNE  
USA-CA All Counties #796  
Mixed, 02-22-93

### USA-CA Honor Roll

3000		1500	
N2JNE	820	N2JNE	1065
NK7B	821		
2500		1000	
N2JNE	898	WD3P	1265
2000		500	
N2JNE	975	IK2AEQ	2660
		EA7OH	2661
		IØER	2662

The total number of counties for credit for the United States of America County Award is 3076. The basic award fee for subscribers to CQ is \$4.00. For nonsubscribers it is \$10.00. Initial application must be submitted in the USA-CA Record Book, which may be obtained for \$2.00 each from CQ Communications, 76 North Broadway, Hicksville, NY 11801 USA. To qualify for the special subscriber rate please send a recent CQ mailing label with your application. To be eligible for the USA-CA Award applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 15, 1991. A complete copy of the rules may be obtained by sending an SASE to Norm Van Raay, WA3RTY, USA-CA Custodian, Star Rt. 40, Box 76, Pleasant Mount, PA 18453-0076 USA. DX stations must include extra postage for airmail reply.

bers have also prepared their own cards.

Two QSOs are required to apply for the certificate. The basic certificate is issued for working 7Z2AB for any of the following: two bands, two operators, two modes, two QRP contacts, two different satellites. The first award with earned seals is US \$5.00, or 5 IRCs. Additional seal endorsements are US \$2.00, or 2 IRCs. All applications with log details and fees should be sent to Dana Howard, AAØBC, P.O. Box 33, Kearney, MO 64060.

The club has been in operation since February 1992. They regularly appear on the bands during contests and power up the rigs periodically. Equipment includes an ICOM 725, Kenwood 140s, and Yaesu 2m/440 satellite capable rig. An extensive antenna farm completes the club station.

Marconi Amateur Wireless Society. From December 1 through December 31 1992 the Marconi Amateur Wireless Society operated Special Event Station VA1S. Operation was on all bands (160 through 10 meters) SSB and CW. Approximately 10,000 QSOs were made to all parts of the world. The event commemorated the 90th anniversary of the first successful transatlantic west to



One of the cards sent out by the Oasis Amateur Radio Club, 7Z2AB.

east transmission made by Guglielmo Marconi from Glace Bay, Nova Scotia to Cornwall, England on December 15, 1902. The callsign VA1S is similar to the callsign VAS, which was issued to Marconi for his station at Glace Bay.

The certificate and QSL are being offered to stations which had at least one QSO with VA1S during 1992. The cost for this certificate is US \$4.00, or 8 IRCs. Applications for certificates need not include a return envelope. QSL requests should include a stamped SASE, however. Applications should be made to Alan Leith, VE1AL, 846 George Street, Sydney, NS B1P 1L9, Canada.

We have been informed that after May 31, 1993 the route for the Ascension Island Awards will be via Steve Hodgson, GØLII, 6 Broughton Road,

West Ayton, Scarborough, YO13 9JW North Yorkshire, England.

Worked All Latium Provinces (WALP) Award. The ARI Club Nazio/Nettuno issues the Worked All Latium Provinces (WALP) award to any licensed radio amateur or SWL the world over. All contacts on or after January 1, 1984 (founding date of ARI Club Anzio/Nettuno) count for this award. To qualify for the award it is necessary to contact all the provinces of Latium and one amateur of the ARI Club Anzio/Gnathion.

Latium Provinces followed by first numbers of postal code: Roma 00, Viterbo 01, Rieti 02, Frosinone 03, Latina 04. The award is available in two classes: (A) HF—1.8, 3.5, 7, 14, 18, 20, 24, 28 MHz; (B) VHF—50, 144, 432 MHz). Contacts may be made on SSB, CW, or

RTTY. Contacts via repeaters do not count.

Application for the WALP award must include a statement by two licensed amateurs that the necessary cards have been checked. A list showing the following details: date, time, frequency, mode, call, RS(T) exchanged, and provinces.

Every year one third of the proceeds will be contributed to UNICEF. A list of the applicants and a copy of the payment made in favor of UNICEF will be sent to the administrative office of Amateur Radio, Italia. Send your application with 10 IRCs or US \$5.00 to: Sezione ARI Anzio/Gnathion, WALP Award, P.O. Box 116, 00042 ANZIO (Roma), Italy.

Russian Robinson Club (RRC). Life membership in the Russian Robinson Club (RRC) is offered to any radio amateur possessing a personal or SWL callsign. Stated RRC goals are as follows:

1. Consolidation of radio amateurs, working or having worked on the islands, drift ice research, arctic and marine stations, with personal callsigns or on the staff of DXpeditions.

2. Popularization of amateur radio communication activity on the islands of Russia and other states.

3. Organization of and the carrying out of amateur radio expeditions to the

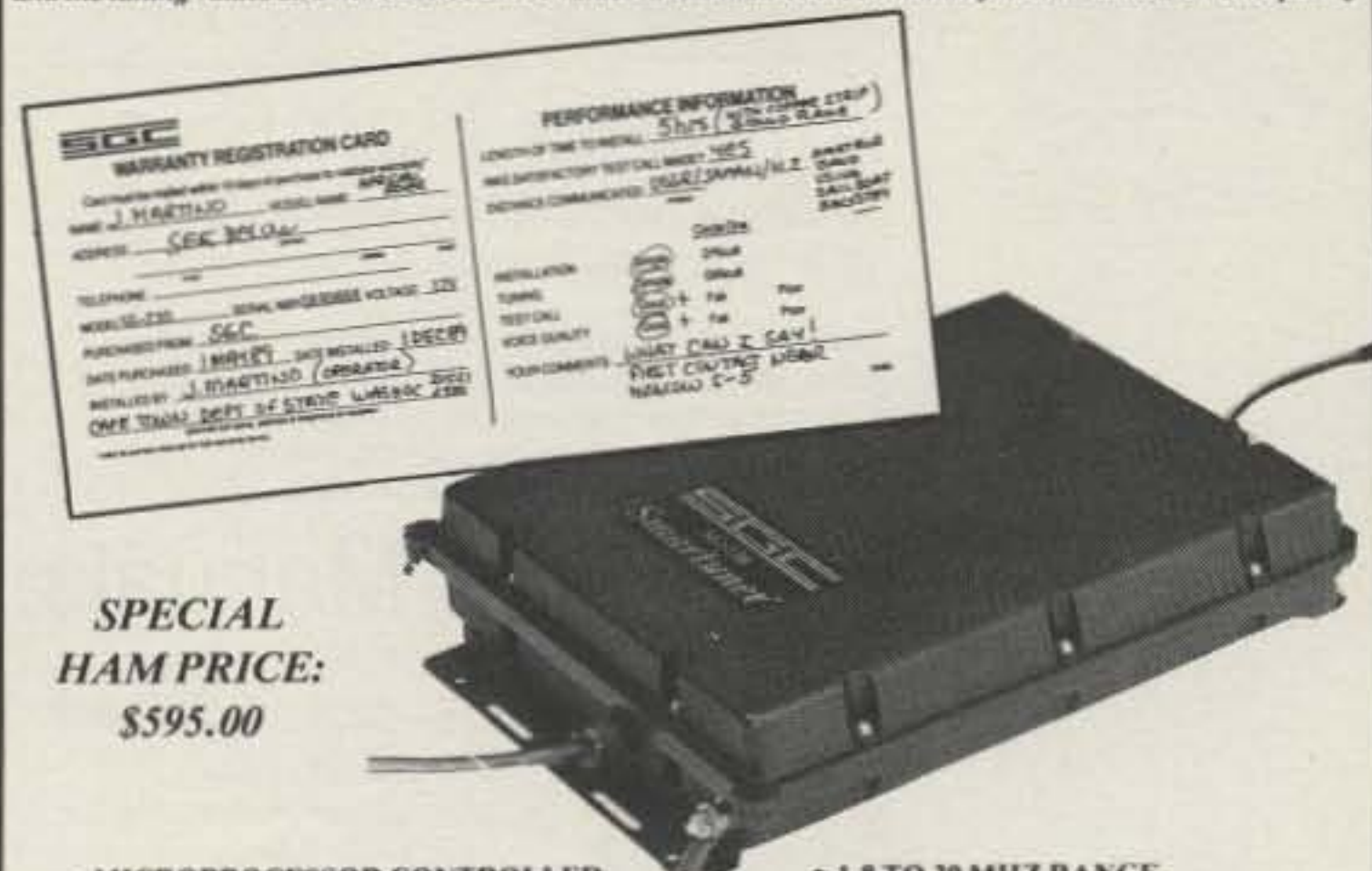


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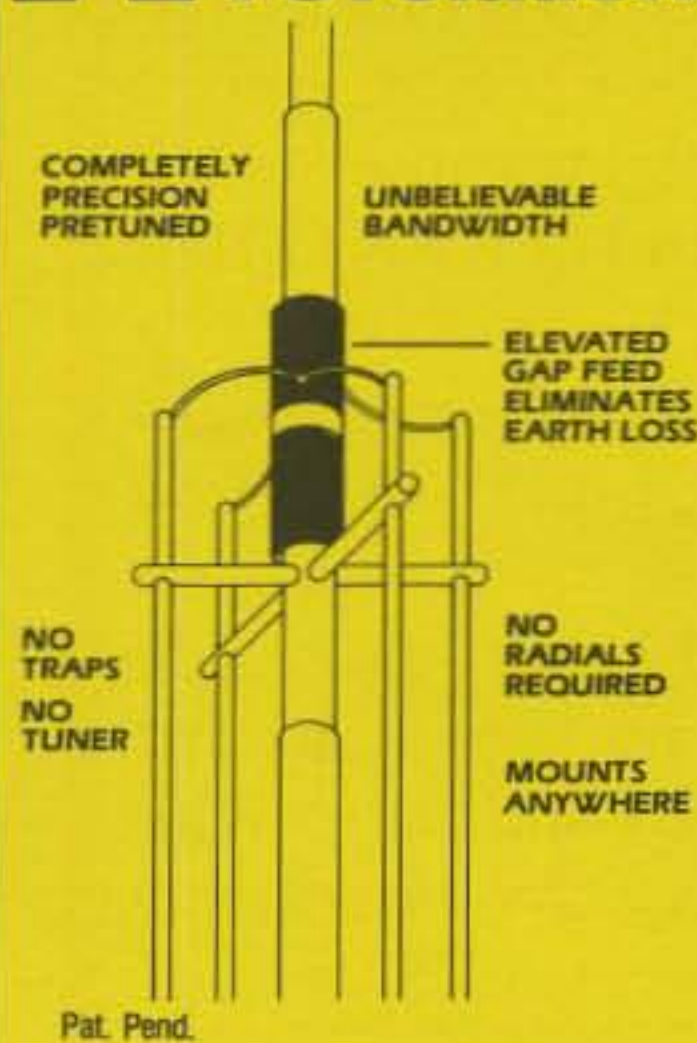
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islands of Russia and other states, which generate a certain interest for DXCC, R-150-S, IOTA, and RRA.

4. Popularization of the IOTA programs on the territory of Russia and other states.

5. Rendering assistance in obtaining amateur radio licenses for operating from the islands of Russia and other states.

6. Organization of and conducting of "round tables" for members of RRC as well as DX nets with participation of radio stations communicating from the islands, arctic and maritime mobile stations of Russia, and other states.

7. Rendering assistance in establishing radio communication with the mainland for radio amateurs from remote islands, arctic and maritime mobile stations.

8. Promotion of information and advertising arctic and maritime subject matter in the radio amateur publications of the world.

9. Rendering assistance in printing QSL cards for RRC members; rendering service as QSL manager for RRC members from the islands, arctic and maritime mobile stations.

10. Coordinate and issue the Russian Robinson Award diploma, and create a separate numbering system of Russian islands for RRA. An applicant for mem-

bership must recognize and support the objectives of the club and conform to ONE of the following conditions:

1. Has visited an island as a member of a DXpedition.

2. Is communicating or has communicated FROM a continental arctic station.

3. Is communicating or has communicated FROM a drift-ice arctic station.

4. Is communicating or has communicated FROM the antarctic regions.

5. Is communicating or has communicated FROM a maritime mobile station.

6. Has been granted a first-class RRA diploma or any IOTA (Islands On The Air) diploma.

Entrance fee is US \$10 or 20 IRCs. A club member is issued a numbered club certificate and is permitted to use the club emblem on his QSL cards. The officers of RRC are V. Sushkov, RW3GW, president, and Y. Zaruba, UA9OBA, vice-president. In order to be admitted, the aspirant must submit an application and biographical info, including:

1. A short description of a winter stay in the Arctic or Antarctic with the call-sign used.

2. A short description of documented navigation on sea vessels using a call-sign /MM.

3. A short description of an island

DXpedition in which the applicant has taken part.

4. QSL card confirming communications from islands, polar or marine stations.

5. DXpeditioners should reference publications which gave coverage of the DXpedition in which the amateur took part.

6. Those possessing "IOTA" or first-class "RRA" diplomas should report the number and the date of the diploma.

If possible, a photograph should accompany the application.

The application and fee should be sent to the headquarters in the United States (SNI Ltd. (RRC), 429 South 321 St., Place #E10, Federal Way, WA 98003) or Italy (Gianni Varetto, I1HYW, P.O. Box 1, Pancalieri, 10060 (Torino) Ital).

The Russian Robinson Club conducts round-table meetings every Sunday on 14.165 MHz, as well as every Wednesday on 7.065 MHz.

### Announcement

Effective immediately the USA-CA Custodian will accept submissions for USA-CA 1000 and up on floppy disk. Please convert to ASCII file. The USA-CA County Award Record Book will continue to be required for USA-CA 500.

73, Norm, WA3RTY

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## "HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

### Amateur Radio Callsign License Plates—Part II

**T**he first part of this article provided introductory comments, plus the data that applies to callsign plates issued in Alabama through Indiana. This part covers Iowa through North Dakota.

**Iowa:** Department of Transportation, Office of Vehicle Registration, Park Fair Mall, 100 Euclid Avenue, P.O. Box 9204, Des Moines, IA 50306-9204 (515-237-3109). Initial additional fee is \$5 and the additional annual renewal fee is \$5. Applicant must own the vehicle. Applicant must possess a valid FCC license, and must show it when application is submitted. If your license becomes invalid, the amateur plates must be surrendered. Amateur plates may be used on automobiles, light delivery trucks, panel delivery trucks, and pickup trucks.

**Kansas:** Department of Revenue, Division of Vehicles, Robert K. Docking State Office Building, 915 S.W. Harrison Street, Topeka, KS 66626-0001 (913-296-3601; FAX 913-296-3852). One dollar additional initial fee, and \$1 additional annual renewal fee. Applicant must own the vehicle. Applicant must possess a valid FCC license, and must submit a copy of it with the application. These special plates may be used on private passenger motor vehicles and on trucks licensed for gross weights of not more than 16,000 pounds.

**Kentucky:** Transportation Cabinet, Department of Vehicle Regulation, Division of Motor Vehicle Licensing, Frankfort, KY 40622. Additional initial and annual renewal fee of \$13.50. Deteriorated plates replaced at no charge. Five-year special plate issued. Applicant must own (or lease) vehicle. Special plates must be removed from any vehicle to be sold or transferred. A \$1 fee applies to transferring amateur plates to a different vehicle. "AMATEUR RADIO" is imprinted on these plates.

**Louisiana:** Department of Public Safety and Corrections, Public Safety Services, Office of Motor Vehicles, P.O. Box 64886, Specialized Processing Unit, Room 208, Baton Rouge, LA 70896 (504-925-6335). Initial additional fee is \$1, and annual renewal fee is \$1. Applicant must own vehicle. Amateur may



*Callsign license-plate collection of Vern Dameron, K1DRN.*

transfer this plate from one to another of her/his vehicles. Applicant must possess a valid FCC license, and a copy of it must accompany the initial application. License copy is no longer required at renewal. Amateur plates may be used on private passenger automobiles, pickup trucks, vans, and private buses. "HAM OPERATOR" is imprinted at the top of these special plates.

**Maine:** Secretary of State, Motor Vehicle Division, State House Station 29, Augusta, ME 04333-0029. Additional fee is \$15 initially and annually. Applicant must own vehicle. Applicant must possess a valid FCC license, and application must be accompanied by notarized proof of valid FCC license. A temporary facsimile plate can be issued for use during the 60-day period required to produce the permanent plate. Amateur plates may be attached to motorcycles, motor homes, passenger vehicles, pickup trucks, station wagons, and taxicabs owned by amateurs.

**Maryland:** Department of Transportation, Motor Vehicle Administration, 6601 Ritchie Highway N.E., Glen Burnie, MD 21062 (301-787-2991; teletype for

the deaf 1-800-492-4575; FAX 410-768-7506). Additional initial fee \$5. Additional annual renewal fee \$5. Applicant must be a Maryland resident who owns the vehicle to which callsign plates are to be attached. Applicant must provide a copy of her/his valid FCC license with the application. These special plates may be used on passenger cars, multi-purpose vehicles (blazers, jeeps, motor homes, etc.), and trucks up to 10,000 pounds gross weight.

**Massachusetts:** Registry of Motor Vehicles, 100 Nashua Street, Boston, MA 02114-1197. Twenty dollar ordering fee for amateur plates, plus \$45 additional annual renewal fee. Use Form 20284 Application for Distinctive Initial Number Plates and write HAM OPERATOR along its left edge. Plates take about four months to be made. Amateur plates may only be used on passenger cars.

**Michigan:** Department of State, Special Registration Unit, Lansing, MI 48918 (517-322-1469). Regular plate fee plus \$2 service fee for an original plate. Five dollar fee for replacement plate; \$8 fee for plate transfer. No addi-

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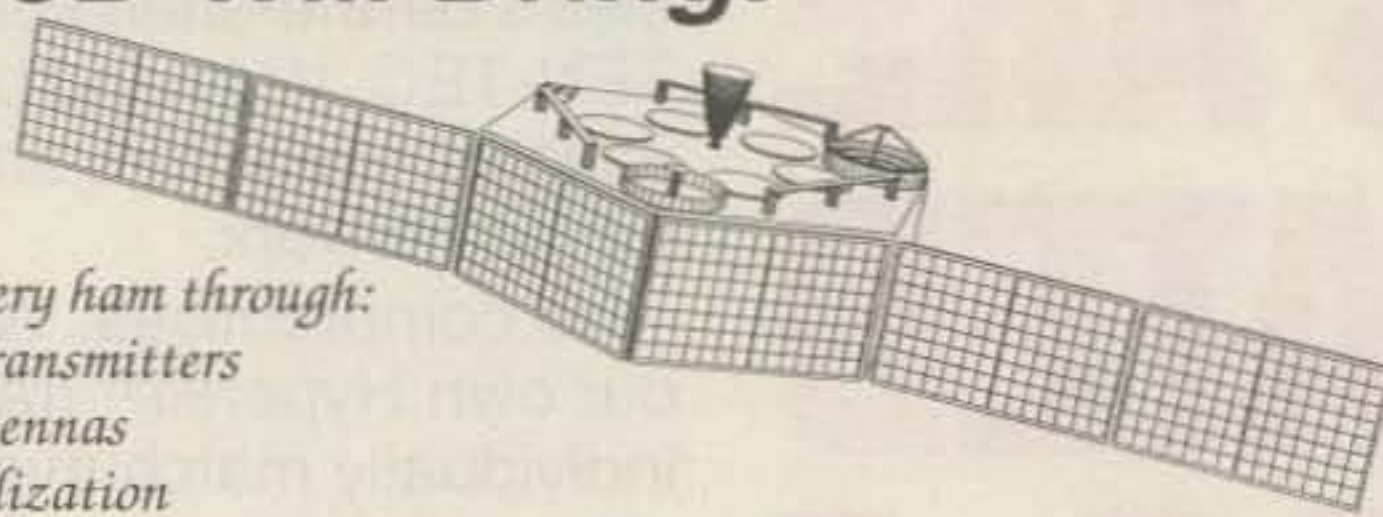
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tional renewal fee. Valid FCC license (above Novice) required of applicant, and a copy of it is required with application. Amateur must own vehicle. Amateur plate expires on owner's birthday. If FCC license becomes invalid, plates must be surrendered. Plate surrender is also required when an amateur dies. Amateur plates allow you to have an amateur rig that is capable of receiving police radio frequencies.

**Minnesota:** Department of Public Safety, Driver and Vehicle Services Division, 395 John Ireland Boulevard, St. Paul, MN 55155 (612-296-6911). Initial additional fee is \$10 per set. A second set (marked #2) is available at the same price. Transfer fee is \$5. No additional renewal fee. Applicant must be owner or co-owner of the vehicle, plus a resident of Minnesota. Amateur must possess a valid FCC license. Amateur plates may be attached to a passenger automobile, van, pickup truck, or a self-propelled recreational vehicle.

**Mississippi:** State Tax Commission, Motor Vehicle Licensing Division, P.O. Box 1033, Jackson, MS 39215. Additional fee of \$15 required per year for amateur plates.

**Missouri:** Department of Revenue, Motor Vehicle Bureau, P.O. Box 100, Jefferson, City, MO 65105-0100 (314-751-4509). Fifteen dollar additional fee for amateur plates, plus \$15 annual additional renewal fee. Notarized statement that you hold a valid FCC license (with stated callsign) is required with application.

**Montana:** Department of Justice, Motor Vehicle Division, Scott Hart Building, 303 North Roberts, Helena, MT 59620-1419 (406-444-3292). Additional fee is \$5. Applicant must possess a valid General (or higher class) FCC license. Applicant must be a Montana resident who owns the vehicle. One pair of plates per amateur. Chief of Police in each incorporated city, Sheriff in each county, Civil Defense Director, and State Highway Patrol Chief among public officials furnished with lists (updated by 1 July each year of names, addresses, and call-signs of amateurs in their jurisdictions who have amateur plates on their vehicles. Tags expire 31 December.

**Nebraska:** Department of Motor Vehicles, P.O. Box 94789, Lincoln, NE 68509-4789, Attention: Registration Section. Initial additional \$5 fee. Four to six weeks plate processing time. Applicant must possess a valid FCC license. Applicant must be a Nebraska resident and must own the vehicle. Amateur plates may be used on passenger automobiles, self-propelled mobile homes, and commercial trucks.

**Nevada:** Department of Motor Vehicles and Public Safety, Registration Di-



Nine-year-old Thomas Donovan, N2STY, of Garden City, New York progressed from a Novice license to an amateur Extra Class license in six months. Tommy has contacted other amateurs in 11 states and 18 countries. His best DX contacts so far are Caracas, Venezuela, and Moldova, Russia. His father is N2SPO (John), his brother is KB2OZO (John, Jr.), and his mother (Karen) recently passed Novice and Technician examinations. Tommy gave his fourth grade class at the Stewart School a 30 minute talk on amateur radio. He also hosted a Cub Scout den meeting devoted to amateur radio.

vision, Special Plate Section, 555 Wright Way, Carson, NV 89711-0760 (702-687-3281). In addition to regular fees, amateur plates require an initial fee of \$35 and annual additional renewal fee of \$20. "RADIO AMATEUR" is stamped on these plates. Applicant must be a resident of Nevada who owns the vehicle. Applicant must possess a valid FCC license, and a copy of it must accompany application. Amateur plates may be used on private passenger cars, trailers, travel trailers, and non-commercial trucks.

**New Hampshire:** Department of Safety, Division of Motor Vehicles, James H. Hayes Safety Building, 10 Hazen Drive, Concord, NH 03305 (TTY/TDD relay 603-225-4033). Twenty-five dollar additional fee for amateur plates. Replacement fee is \$5. Applicant can be requested to supply a copy of her/his valid FCC license. Amateur plates are not available for use on motorcycles.

**New Jersey:** Department of Law and Public Safety, Division of Motor Vehicles, Special Services-Plates, CN-015, Trenton, NJ 08666-0015 (1-609-292-0800). Ten dollar one-time-only additional fee. No additional renewal fee. Applicant must be New Jersey resident and must own the vehicle. Applicant must possess a valid FCC license, and must include a copy of it with application. Second set (#2) of amateur plates

is available. Amateur plates may not be used on commercially registered vehicles.

**New Mexico:** Taxation and Revenue Department, P.O.Box 1028, Sante Fe, NM 87504-1028. Initial additional \$3 amateur plate fee, plus \$3 annual additional renewal fee. Applicant must be a New Mexico resident. A copy of one's FCC license must be submitted with the application.

**New York:** Department of Motor Vehicles, Special Registration Section, Empire State Plaza, Albany, NY 12228-0231 (518-474-6660). Initial additional amateur plate fee is \$17.25, and annual additional renewal fee is \$5. Vehicle must be registered to applicant. Applicant must possess a valid FCC license, and must submit a copy of it with the application. Application processing time is about 4 weeks and plate fabrication time is about 7 months. Plate imprinting is not centered; it is justified left. Consequently, only 2 by 3 call signs (such as WA2USN) look okay. It apparently does no good to put a note on the original application to center the lettering. Simply reject the original non-centered plates and return them with a note stating that you want your call sign centered on the plates. This system requires you to wait twice as long to get satisfactory plates, but patience pays off. Additional (#2, #3) sets of plates are allowed. Amateur

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plates are just intended for use on passenger cars.

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This completes the second part of this three-part article. The (last) segment will provide data regarding callsign plates issued in Ohio through Wyoming. Concluding comments in the third segment complete this article.

## VHS Tape For Beginning Amateurs

The first of CQ Productions' VHS tapes, "Getting Started in Ham Radio," can help new amateurs select optimum equipment, set up efficient stations, and get started on the air. It is well suited to

viewing at club meetings, as well as by individual amateurs at home. Throughout this film amateurs tell what got them interested in amateur radio, and which equipment they used in their initial stations.

This tape covers features, capabilities, mountings (where applicable), and connections of handheld, mobile, computer, and HF stations. Easy transition from handheld to mobile application is covered, plus antenna installation, electrical wiring, hands-free operation, and RF power amplifier use in mobile stations.

Repeaters are explained in simple language, telling what they do and how they accomplish their function. Transmit to receive splits (offsets) are covered, plus PL access tones, autopatch, and telephone call features. The need for financial support of repeaters is explained for the benefit of new amateurs.

The presentation of the variety and types of currently available mobile gear is good. Easy transition between mobile and fixed (home) uses of equipment is included in this film. Dual-band rigs and the most useful frequencies are covered as an introduction to where you can expect to hear activity. Multi-mode equipment is included in the coverage, plus the need for station accessories. Amateur activities are mentioned briefly at several points of this tape; these include things such as award chasing, contesting, DXing (working foreign countries), meteor-scatter operation, moonbounce operation, ragchewing (chatting), re-

peater operation, satellite operation, and TV/ATV operation.

Packet radio equipment, installation, and operation are presented clearly, including packet uses and frequencies, typical receptions, TNC functions, digipeaters, nodes, and switches. The Packet Bulletin Board System is covered in detail, along with the many uses of packet radio.

High-frequency stations are thoroughly explained, including necessary accessory items such as antennas, antenna tuners, computers, dummy loads, feedlines, headsets, keys, low-pass filters, microphones, rotators, speakers, SWR/power meters, and towers. The antenna coverage is excellent, and it is easily understood. The purchase of new versus used gear is helpful. Station location is included. Station grounding and lightning protection are provided in simple language, plus the need to observe safety precautions.

Last, but not least, this tape contains a very helpful segment on soldering, which is a capability all amateurs must acquire. These soldering tips alone are worth the cost of the tape. This is an extremely useful presentation. The title of this VHS tape is "Getting Started in Ham Radio." It is the first of a series of tapes being produced to help new amateurs get a good start on the air. Other available tapes include "Getting Started in Amateur Satellites," "Getting Started in Packet Radio," and "Getting Started in DXing." They are available from CQ Communications, 76 North Broadway, Hicksville, NY 11801. The price per tape is \$19.95, plus a \$3.50 first-class mail shipping and handling fee per tape in the US and possessions (\$7.00 overseas).

## Printed Aids

My previous columns contain information that is useful to new and aspiring amateurs. Many of these items have been reprinted for distribution to students of licensing courses I instruct. For ease of use, these printed aids have been separated into six categories. These categories include introduction, code, theory, station, operating, and miscellaneous. Outdated items are continually replaced with newer material. Fifteen dollars brings a complete set of current printed aids, including shipping costs. A list of these printed aids will be sent to anyone who requests it and sends a business size (#10) self-addressed and stamped envelope to my California address. Licensing-course instructors are welcome to revise and/or duplicate these items to suit their requirements.

73, Bill, W6DDB

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## A LOOK AT THE WORLD AROUND US

### Another World-Class Special—Part II

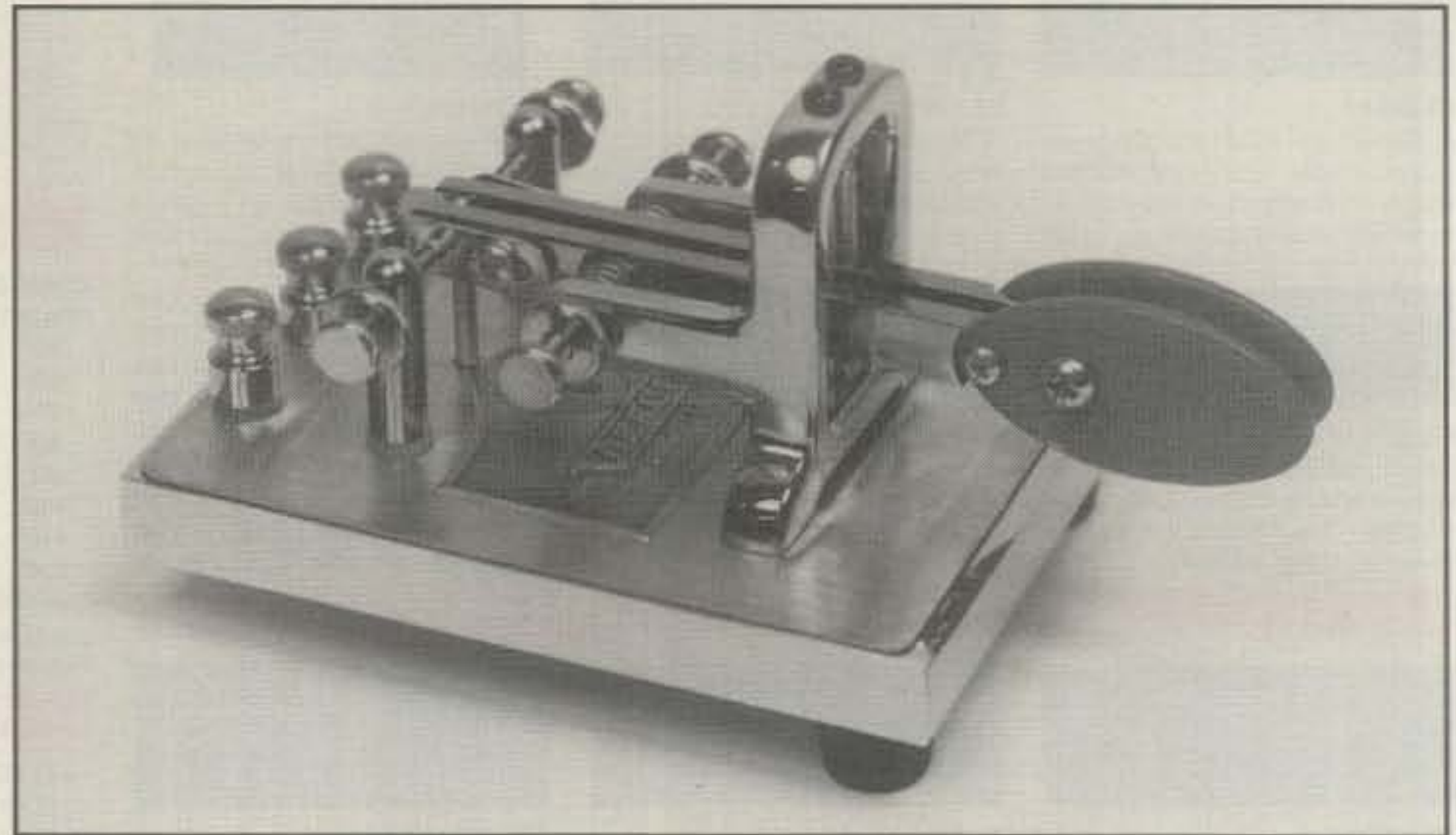
Last month's views of custom paddles and bugs were dedicated to high-speed CW enthusiasts and fellow collectors with a special appreciation for unique items. This month we shift perspective to view basic-style pump and miniature keys appealing to slower paced CW operators and the numerous collectors interested in more traditional style keys. Your continuing enthusiasm for these hand-manipulated Morse delights, incidentally, is most commendable, and key collecting appears to be at an all-time high. Jolly good show! The more keys we rescue from extinction, the more we preserve our proud heritage. I have also noticed there are two informal groups of key collectors: those who mainly enjoy displaying their pride and joy, and those (like myself) who use their collected keys on the air in a "petting zoo" manner. Both viewpoints are fine. Just keep on collecting those beautiful keys!

Speaking of on-the-air operations, we just received some exciting news from Mark Allen, WJ7X. During each weekend of June 1993 two special-event stations will operate 40 and 20 meters from the E.F. Johnson Company museum. They will use serial number 1 equipment. Calls will be WAØCJU and 9ALD (Johnson's original!). Listen for them, mainly on CW!

Now let's focus on this month's key photos courtesy of our guest collectors: Mike Zbrozek, K8XF; Arnold Sayre, W8WVM; Joe Bowerman, WA4LXP; Robert Butt, N1KPR; and Maurice Ravenscroft, G7APJ.

Before delving into beautiful pump keys, however, let's recognize your requests for views of two always popular paddles that could not be squeezed into last month's column: Vibroplex and Bencher. Our previous "keys" columns carried views of these American-made paddles customized with mods, MFJ-422X add-on keyers, pearl fingerpieces, etc., but overlooked standard production models. Rest assured the oversight was not intentional (so many keys, so little space!).

**Photo 1.** Traditional Vibroplex quality and style are vividly apparent in this Presentation model iambic/dual-lever

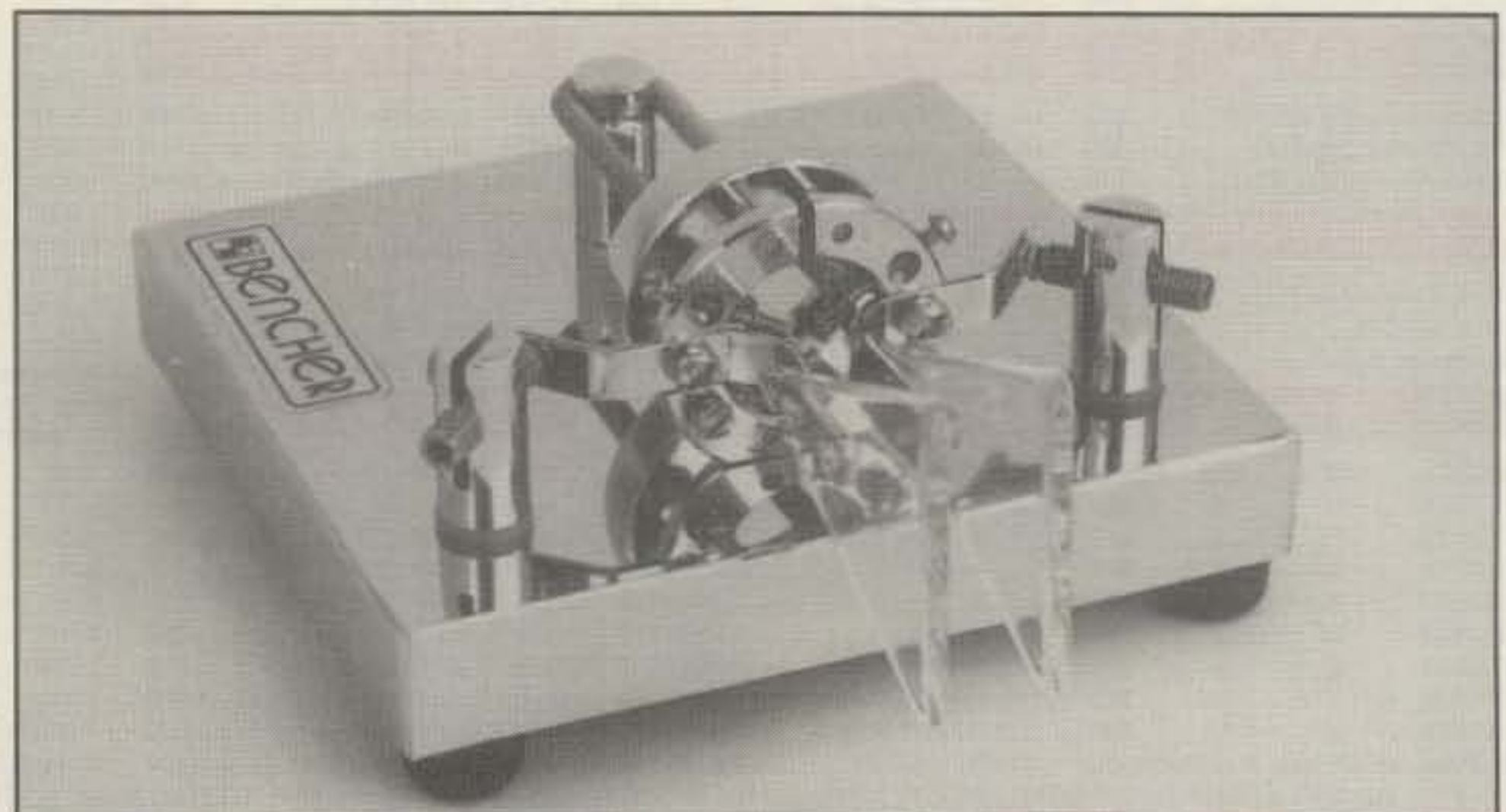


*Photo 1—The classic Vibroplex iambic/dual-lever paddle. This beautiful item is styled like the famous "Original" model bug, and continues the company's proud tradition of quality Morse instruments.*

paddle available from dealers nationwide. The yoke, base, and fingerpieces are similar to the Original model Vibroplex bug we envied as kids. All adjustments are quite precise, and the paddle's feel is superb. This particular model's combination of chrome mechanism and base with gold upper plate plus twin jewel movement and red fingerpieces makes it a real show-stopper. Most impressive!

**Photo 2.** Bencher's deluxe chrome-plated iambic/dual-lever paddle was a

significant departure from conventional designs when first introduced, but it caught on quickly and now enjoys great popularity among amateurs nationwide. The main mechanism is integrated in the round upper frame, and a long expansion spring extending around the rear post maintains tension on both levers. Dot and dash contacts are mounted on the base's front rather than the rear, resulting in a very clean appearance. The paddle handles smoothly and it is very enjoyable to use.



*Photo 2—Bencher's popular iambic paddle has a round vertical mainframe, self-adjusting needle bearings, and gold-plated contacts. A very nice item!*

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Photo 3— Hi-Mound HK-702 pump key presently being imported by K8XF. This is one glamorous key with chrome and silver mechanism sitting on a white marble base. Dust cover protects the workings while permitting access to the knob. Mike is more than an importer, incidentally. He collects and uses keys, especially on 30 meters.

**Photo 3.** While discussing ready-for-purchase CW goodies, here is a flashy oriental pump key you can mail order and use on the air today. This Hi-Mound HK-702 is 3.6"H x 3.5"W x 5.75"D and weighs 2.2 pounds. It has a chrome and silver mechanism mounted on a marble base, and includes adjustments for both tension and spacing. The key is complete with bottom rubber cushion and top clear-plastic dust cover. This neat CW instrument is being imported, along with Hi-Mound's MK-705 dual-lever iambic paddle and BK-100 bug (that's

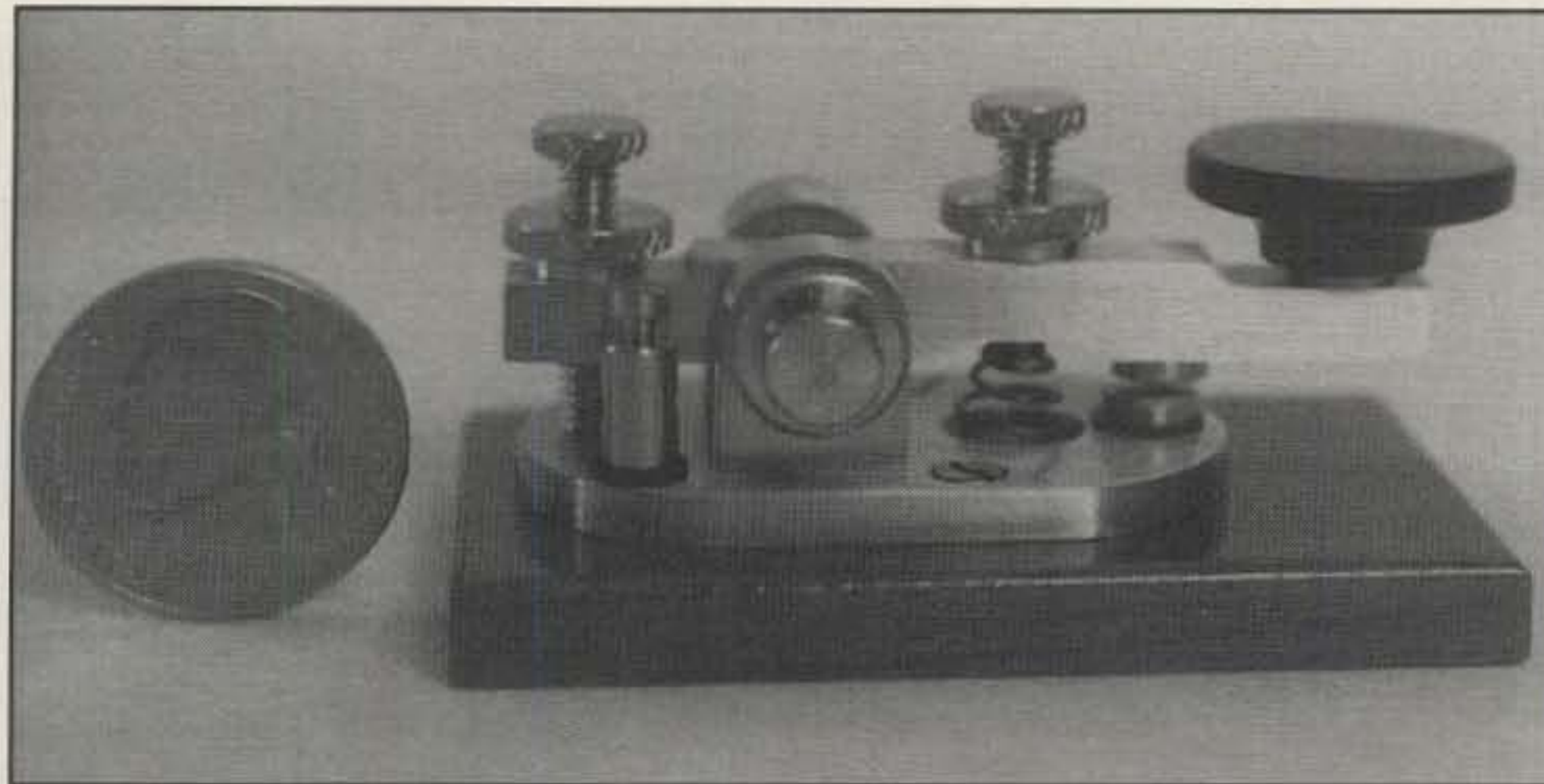


Photo 4— Miniature hand key made from scratch by W8WVM. Unit is only 2.25 inches long and has a brass mechanism on a cherry-wood base.

right, an oriental bug!), by Mike Zbrozek, K8XF, 9929 Fox Squirrel Drive, Newport Richey, FL 34654. Drop Mike a letter if you would like to add some extra flare to your station with a classic Hi-Mound key or paddle.

**Photo 4.** We now shift views to highlight a very impressive miniature designed, machined, and assembled by W8WVM. Notice the size-comparing nickel, and understand this photo was shot through an enlargement lens for clarity. The mechanism is brass with knurled adjusting nuts on pivots, spac-

ing, and tension. It has a bakelite knob and sits on a cherry wood base measuring 2.25" x 1.4". Arnold "christened" this little tyke by making a moonbounce contact with it on 2 meters. That is quite a distance for such a small key.

**Photo 5.** Top view of W8WVM's pocket key reveals its fine workmanship and exquisite beauty. I particularly like the close spacing between the arm and its supports. This palm-size gem begs for portable action with a QRP rig!

**Photo 6.** Another W8WVM delight is this full-size solid-brass key built from

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Photo 5— Top view of W8WVM's key shows narrow gap between arm and pivot points. Unique design reminds me of classic Chubbok key in its closely spaced fulcrum.

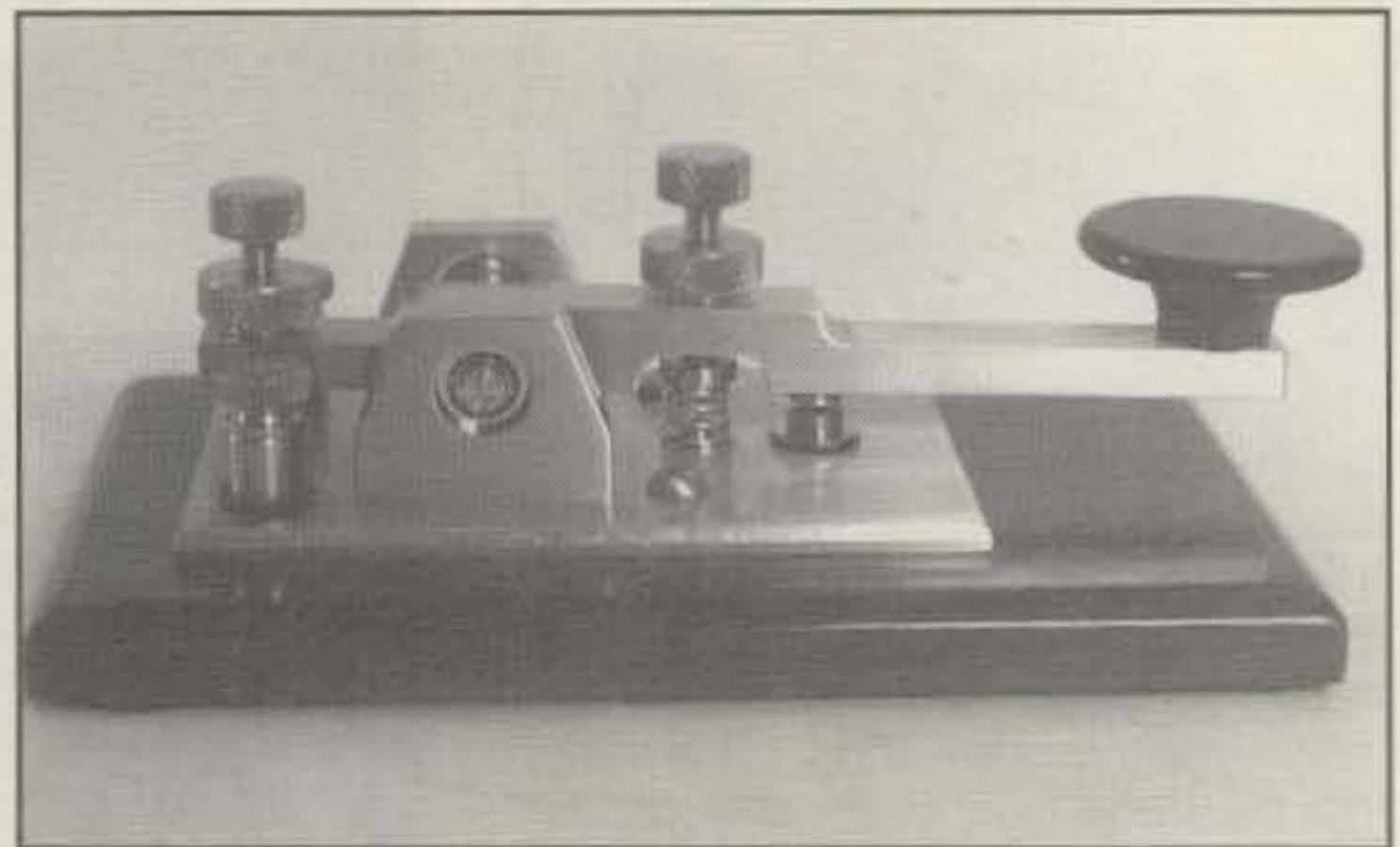


Photo 6— Full-size brass key built from scratch by W8WVM. Superb workmanship is obvious in the fulcrum design. Arnold uses this key with many of his classic rigs featured in previous columns.

scratch. It has ball-bearing pivots and silver-alloy contacts, and sits on a walnut base finished in plastic varnish. Very impressive! Readers of our previous columns highlighting classic rigs will remember W8WVM's reproduction of several featured items. He always "goes us three better" by making true showpieces, and the tender loving care of his endeavors is again reflected in his homebrewed keys.

**Photo 7.** Joe Bowerman, WA4LXP, steps forward with the latest novelty

since my own Wild Woody WARC Keys: the turtle key. Dual eyes on the extended neck/arm and mechanism-covering shell indicate this item is designed for real low-speed CW. Indeed, messages sent via this critter may require a year to reach their destination! Every key collection needs at least one humor item, and our congratulations to WA4LXP on this one! We will feature more of Joe's keys in future columns. Incidentally, I still have some Wild Woody WARC Keys available to appreciative on-the-air con-

tacts (presently up to S/N 230). Ask about one when we contact.

**Photo 8.** We now shift focus to view some of N1KPR's handcrafted keys, and they are real show-stoppers. The ultra miniature in this photo really works, and it is small enough to carry in an empty pocket-watch case. Possibly that explains why Robert nicknamed this conversation piece his "Sunday key." It measures 1" x 1/2" inch and has a simulated ivory knob. Close investigation also reveals adjustments for both gap

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RM-12M	9	12	5 1/4 x 19 x 8 1/4	16
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RM-60M	50	55	7 x 19 x 12 1/2	60

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RS-4A	•	•	3	4	3 3/4 x 6 1/2 x 9	5
RS-5A		•	4	5	3 1/2 x 6 1/8 x 7 1/4	7
RS-7A	•	•	5	7	3 3/4 x 6 1/2 x 9	9
RS-7B	•	•	5	7	4 x 7 1/2 x 10 3/4	10
RS-10A	•	•	7.5	10	4 x 7 1/2 x 10 3/4	11
RS-12A	•	•	9	12	4 1/2 x 8 x 9	13
RS-12B		•	9	12	4 x 7 1/2 x 10 3/4	13
RS-20A	•	•	16	20	5 x 9 x 10 1/2	18
RS-35A	•	•	25	35	5 x 11 x 11	27
RS-50A	•	•	37	50	6 x 13 3/4 x 11	46
RS-70A	•	•	57	70	6 x 13 3/4 x 12 1/4	48

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MODEL RS-35M

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
• Switchable volt and Amp meter				
RS-12M	9	12	4 1/2 x 8 x 9	13
• Separate volt and Amp meters				
RS-20M	16	20	5 x 9 x 10 1/2	18
RS-35M	25	35	5 x 11 x 11	27
RS-50M	37	50	6 x 13 3/4 x 11	46
RS-70M	57	70	6 x 13 3/4 x 12 1/4	48

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VS-12M	9	5	2	12	4 1/2 x 8 x 9	13
VS-20M	16	9	4	20	5 x 9 x 10 1/2	20
VS-35M	25	15	7	35	5 x 11 x 11	29
VS-50M	37	22	10	50	6 x 13 3/4 x 11	46
• Variable rack mount power supplies						
VRM-35M	25	15	7	35	5 1/4 x 19 x 12 1/2	38
VRM-50M	37	22	10	50	5 1/4 x 19 x 12 1/2	50

### RS-S SERIES



MODEL RS-12S

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MODEL	Colors		Continuous Duty (Amps)	ICS* Amps	Size (IN) H x W x D	Shipping Wt. (lbs.)
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RS-10S	•	•	7.5	10	4 x 7 1/2 x 10 3/4	12
RS-12S	•	•	9	12	4 1/2 x 8 x 9	13
RS-20S	•	•	16	20	5 x 9 x 10 1/2	18
SL-11S	•	•	7	11	2 3/4 x 7 5/8 x 9 3/4	12

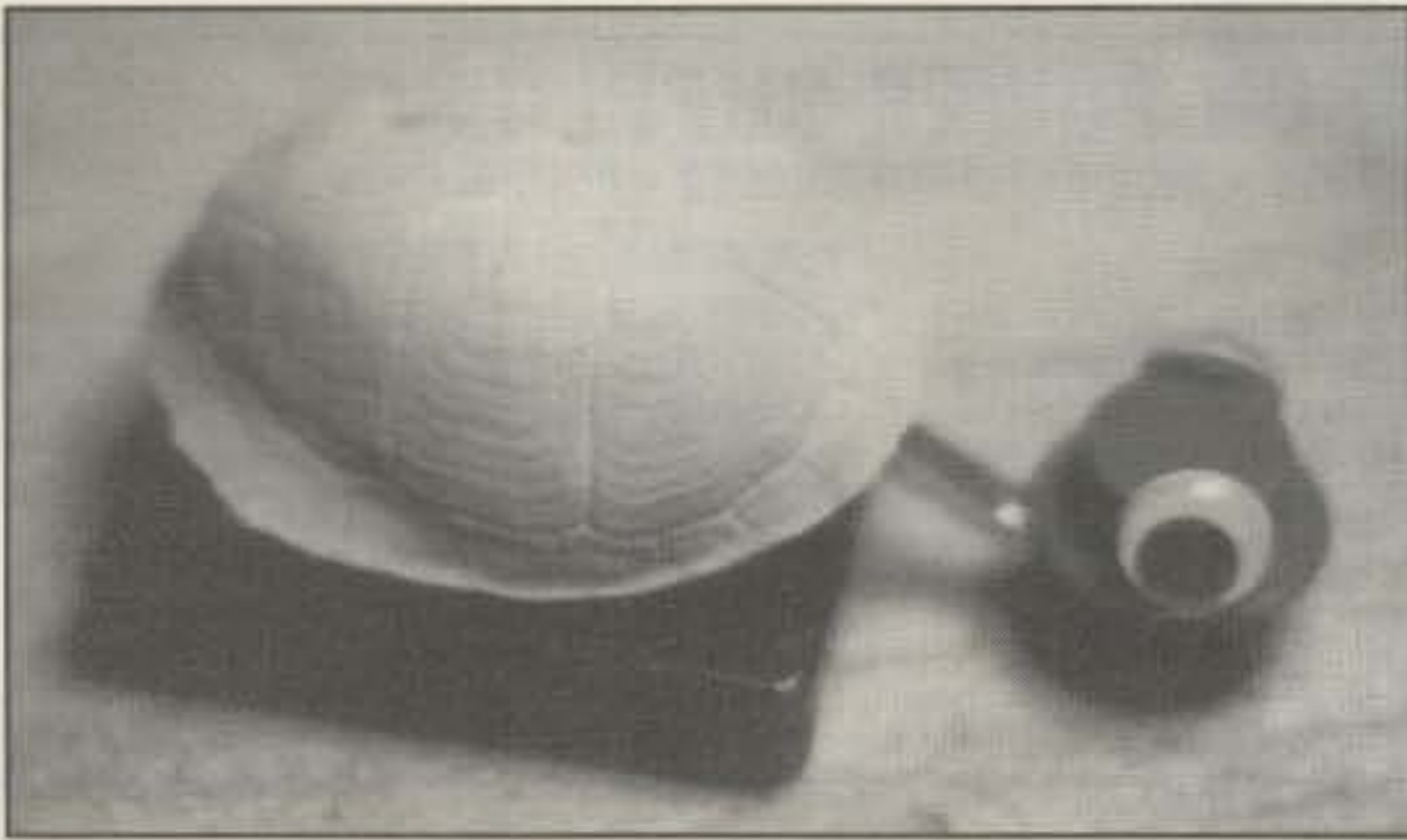


Photo 7— WA4LXP shares views of his ultra-slow-speed "turtle key." Definitely an item for chasing late-night QSOs.

Photo 8— We all have seen some very small miniature keys, but this one-of-a-kind gem handmade by N1KPR is something else! The key really works, and it can be carried in the empty pocket-watch case shown. Now that is small!



and tension, and the rear binding posts are threaded to accept small cable-securing screws. This key and G4ZPY's new miniature pump key (featured in my December "Christmas Gifts" column) are the smallest I have seen, and they are good candidates for the *Guinness Book of Records*. Can such a small key be used for actual on-the-air operation? Sure. I use mine quite often, and it is a real treat!

**Photo 9.** Even dear old Jess (Bunnell) would envy this miniature key made by N1KPR. Robert calls this homebrewed midget the "QRPer," because it is a perfect mate for a pocket-size rig. The key measures 2" x 5/8" and has adjustments for both tension and spacing. Notice the key is mounted on a (sliding) lid for its storage box, which serves as protection for carrying or doubles as a base mount for use. Clever!

**Photo 10.** Many times items salvaged from readily available electric components are useful for homebrewing a key of special design. One such example is N1KPR's "Test Key" shown here. The key's brass mechanism is set into a bakelite mount which was previously a fuse holder. The knob looks like it was rescued from an old car radio, but seems perfectly at home in its new application. This little gem even has reflections of German designs, with its rear pivot point. Sort of makes you want to start dinking with those extra fuse holders in the junk box!

**Photo 11.** Okay, junior CW enthusiasts, here are three homebrewed keys that should not be extremely difficult to duplicate. N1KPR assembled these little gems using momentary pushbuttons and plastic-cased baluns/connectors for portable TVs. The lower item cap-

tures my interest immediately, as I have one of these extra 75/300 ohm baluns in my box of TV paraphernalia. Yes, just pop open those two little side ears, replace the connector's center pin with a wire, add a pushbutton, and you have a super-small palm key. Look inside one of these baluns (preferably one without a "Taiwan" label), and you will find all the hard work is already done and push-button hookup takes only a minute. Your own miniature key may be as close as the local Radio Shack! The upper-left item in photo 11 is a combination iambic paddle or pump key using two push-buttons. It is also assembled in a balun case, and has a top-mounted switch for selection of handkey or paddle operation. The item on the right is also a combination straight key (with terminals on left side) and pushbutton iambic paddle (with three terminals on lower side).

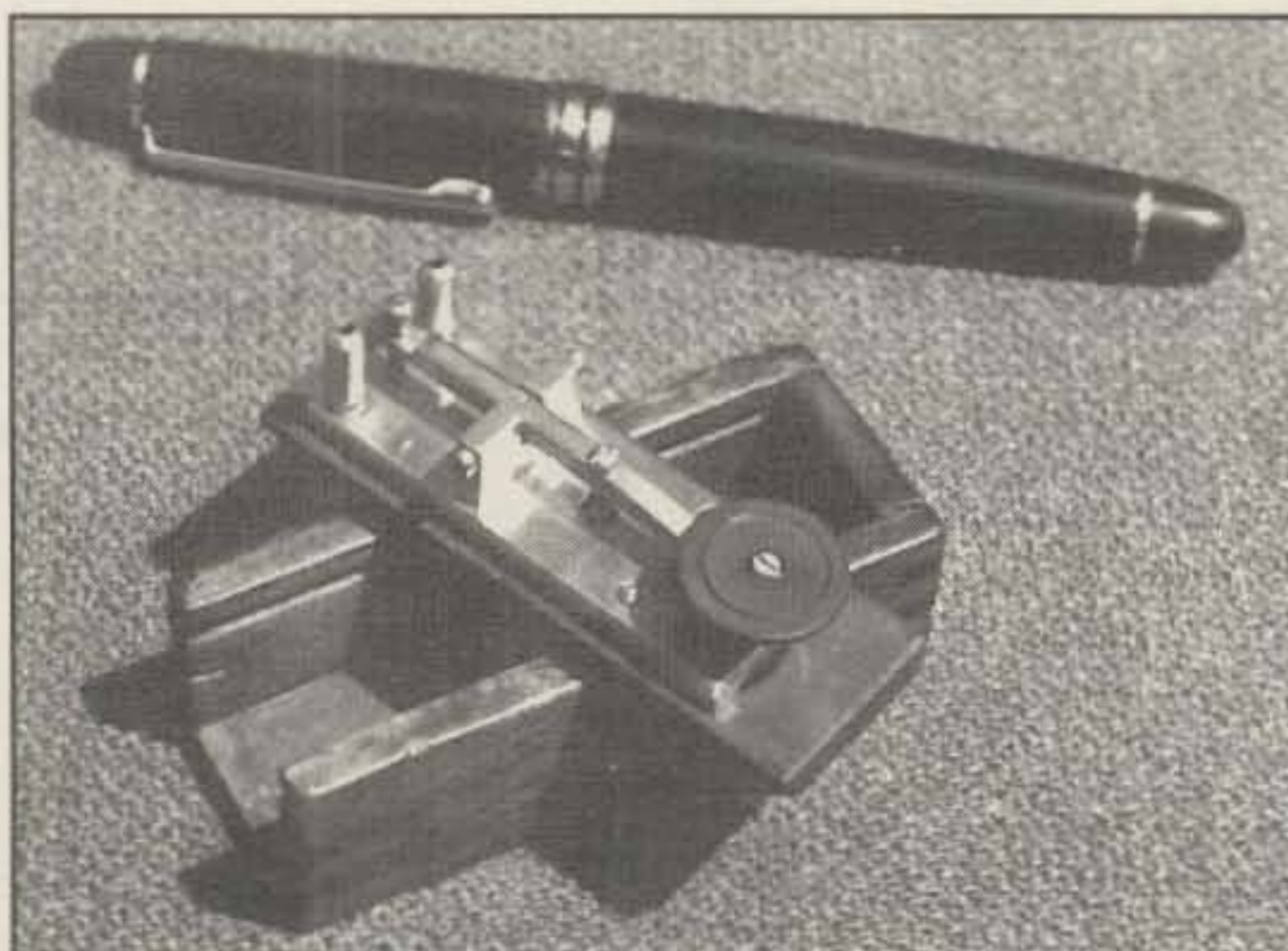


Photo 9— N1KPR's homemade midget "QRPer" key. This gem is mounted on the lid of a tiny storage box which doubles as a base mount for the key.



Photo 10— This N1KPR home-assembled key was made with parts of a fuse holder. Incredible what can be accomplished with a little imagination.

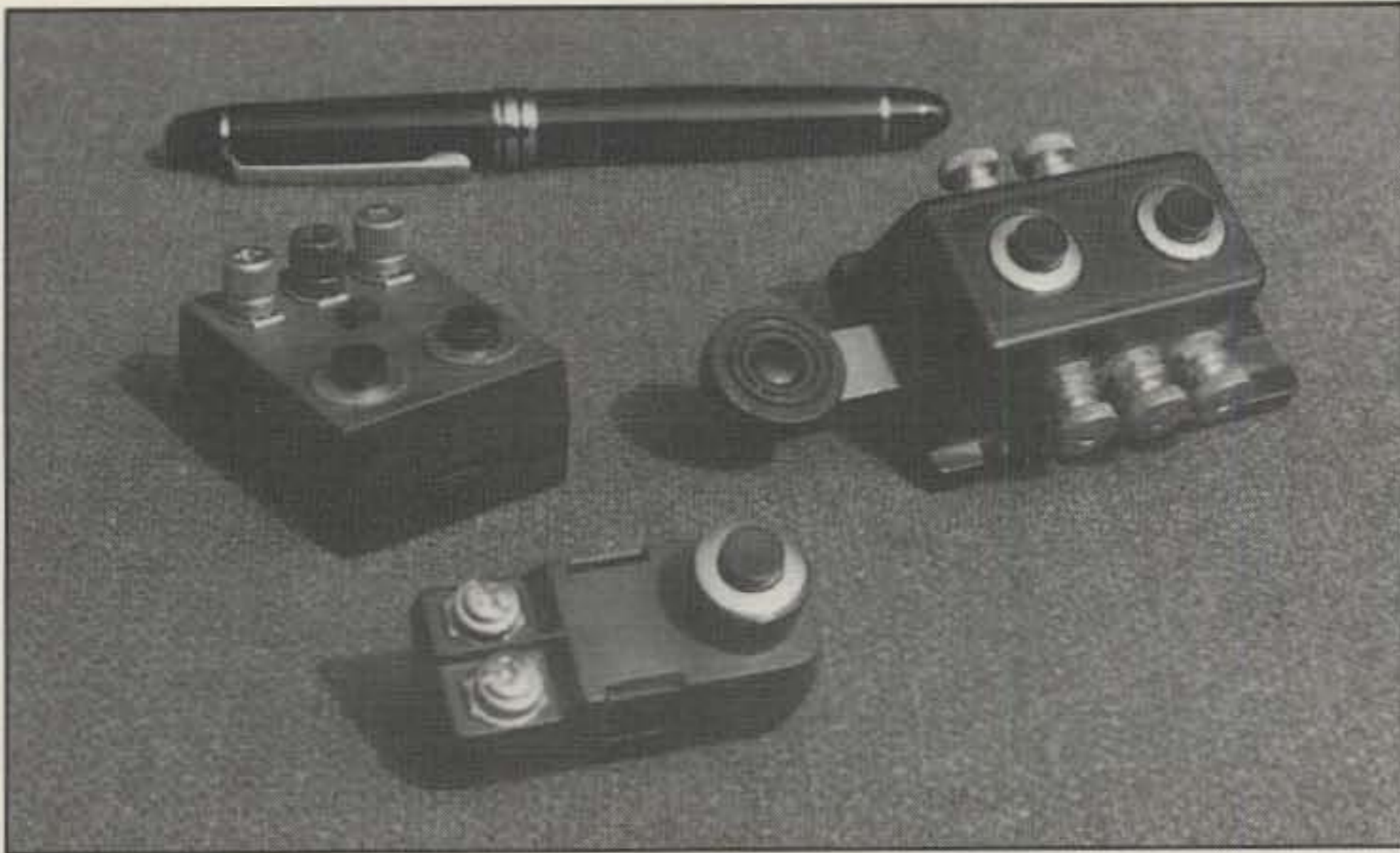


Photo 11— Three homebrewed keys built by N1KPR from TV balun boxes. Do you recognize the lower item? It is used with many TVs and is usually available at Radio Shacks nationwide.

Hmmm . . . this combo key should also appeal to our bicycle mobile friends.

**Photo 12.** N1KPR calls this incredible maze of mechanics the "Apex," and it appears to have everything! The key is set up for land-line or spark-gap use, and can be wired for closing contacts on "make" and/or "break." Robert points out it has axial (thrust), radial (rotational), and lateral (positioning) trip bearing construction (do not ask me to explain all that!). The pivot system is amazing with its machine work, and double locknuts are included on all the adjustments. Wire this animal up with an old-time transmitter and receiver so it lifts ground from the receiver's RF amplifier while closing contacts on the transmitter, and

you have a full break-in system right at the key.

**Photo 13.** Our final N1KPR delight for this time is the all-bronze three pound beauty shown here. Notice the large ( $\frac{5}{8}$  inch) contacts (which Robert tested at 60 amps!), and fancy double locknuts on all adjustments. Bakelite terminal posts also cover rear connections neatly. N1KPR calls this key the "Spark." However, I see a striking resemblance to the famous Steiner key. Either way, it is definitely a work of homebrewed art worthy of praise. Although not visible in our black-and-white photo, this key's bronze texture is beautiful in color.

**Photo 14.** Maurice, G7APJ, sent this photo of his 1930s-style British key after

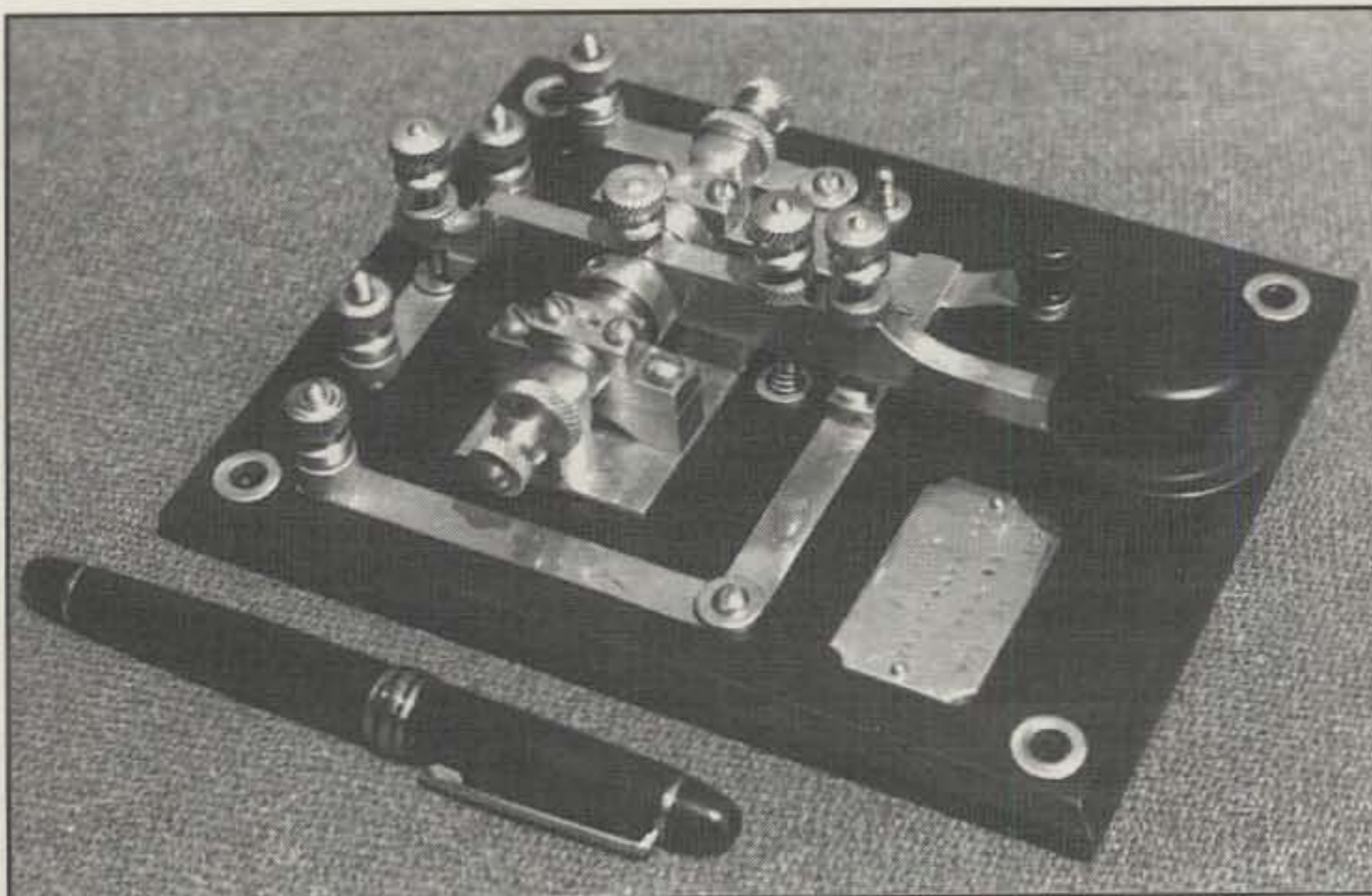


Photo 12— Ultra-deluxe pump key home-assembled by N1KPR. It has axial, radial, and lateral triple bearing construction. Mechanics on this key are fascinating!

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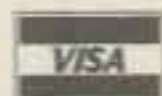
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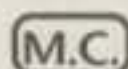
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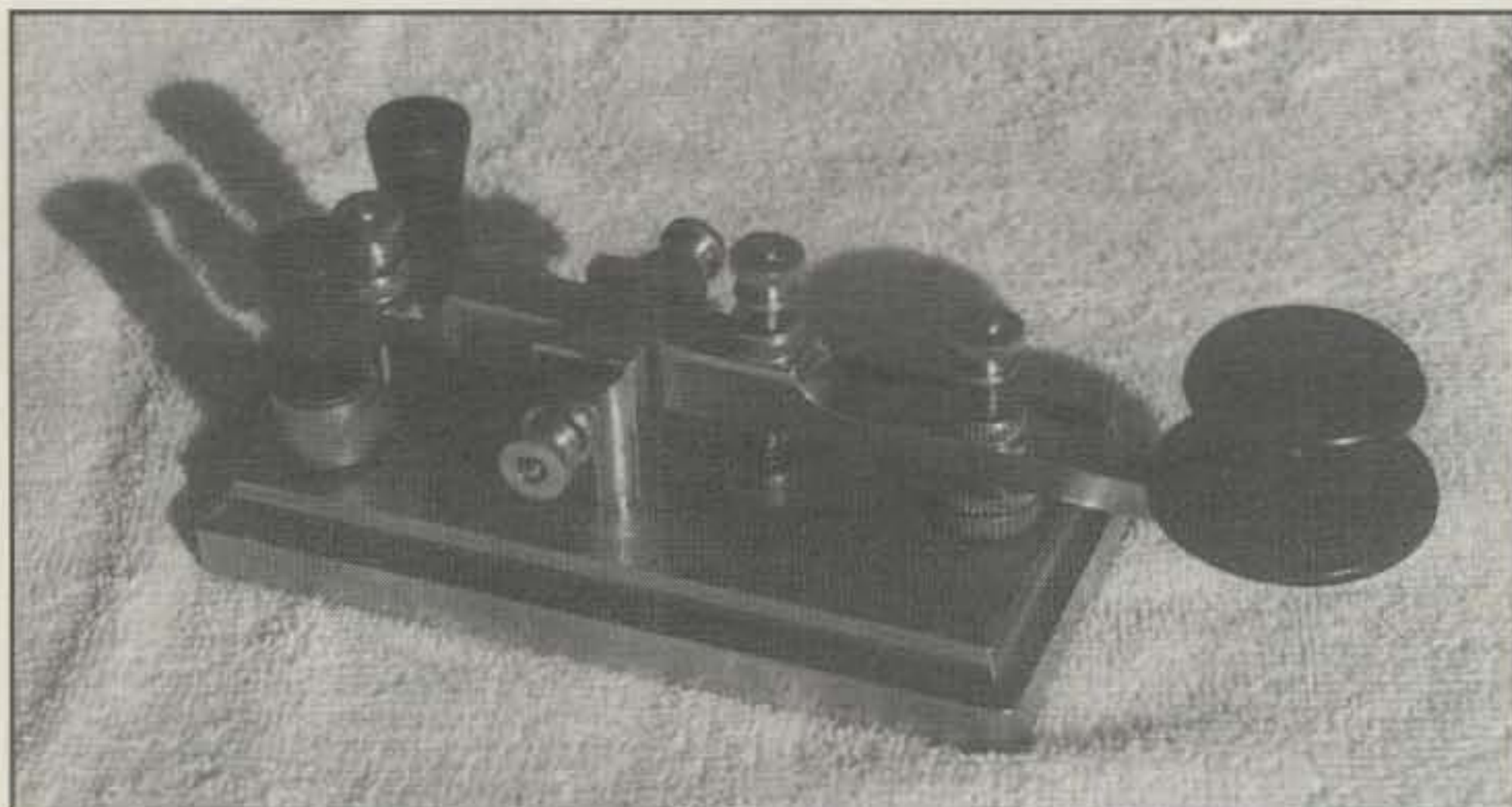


Photo 13- All-bronze Steiner "look alike" key home-assembled by N1KPR. Contacts were tested at 60 amps. Color photo of this key brings out its full beauty.

reading my book *Keys, Keys, Keys* and becoming enthusiastic about key collecting. Maurice says the key previously belonged to G8ML, who was licensed in 1930 and was a "voluntary interceptor" of secret messages during the early 1940s. Maurice points out that knowing something of a key's history and its previous owner always makes it a special collectible. How true indeed! Traditional British influence is quite apparent in this gem. Notice the fulcrum design; it has a steel tapered pin that inserts on each side of the arm and is secured via a steel bolt on the support's end, which is locked tight via the top screw on the left side. Notice also the large contact directly below the key's knob.

**Photo 15.** Top view of G7APJ's British key shows fulcrum details more clearly. Label on right side reads "A. Mason, Belmont, Surrey, Sutton. 348." If keys

could speak, this one surely could tell some interesting stories! Our special thanks to G7APJ for sharing views of this classic British item.

**Summary**

That winds down another "Keys Special" double feature, gang, and we trust you enjoyed the views as much as we enjoyed sharing them with you. Considering all the terrific keys and paddles available to modern amateurs, there's no reason to continue plodding along with a dusty old J38. Add a brilliant new or refurbished old (or both!) key or paddle to your setup and start having some real fun on CW! A neat Lionel or Dow Key bug and Johnson Ranger plus Hallicrafter's SX-100 would make a terrific 30 meter rig, a G4ZPY miniature paddle and Yaesu FT-890 would be a

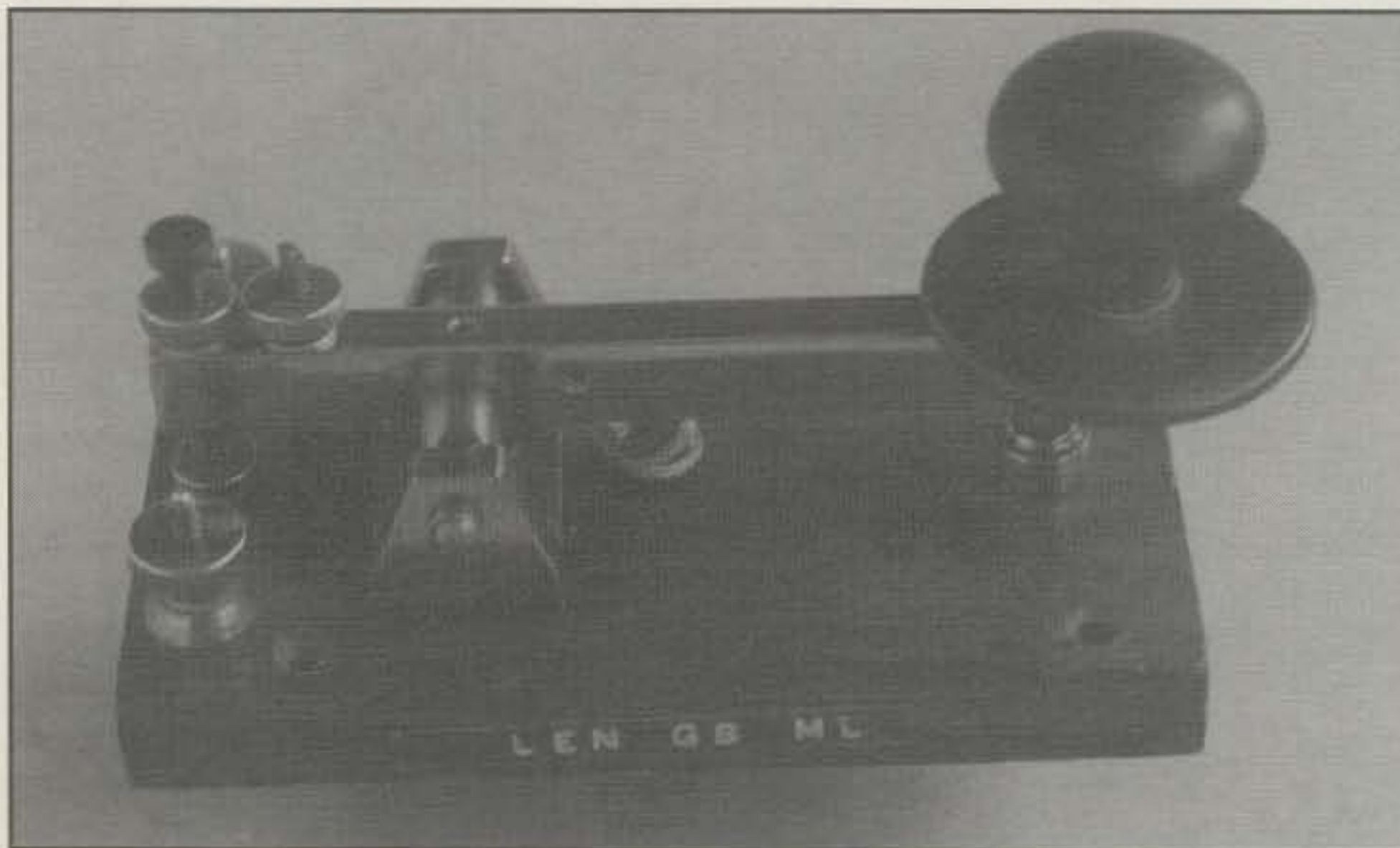


Photo 14- 1930s-style British key presently owned by G7APJ. Notice the contact directly below the knob. Maurice traced this little gem's history right back to its time of origin.

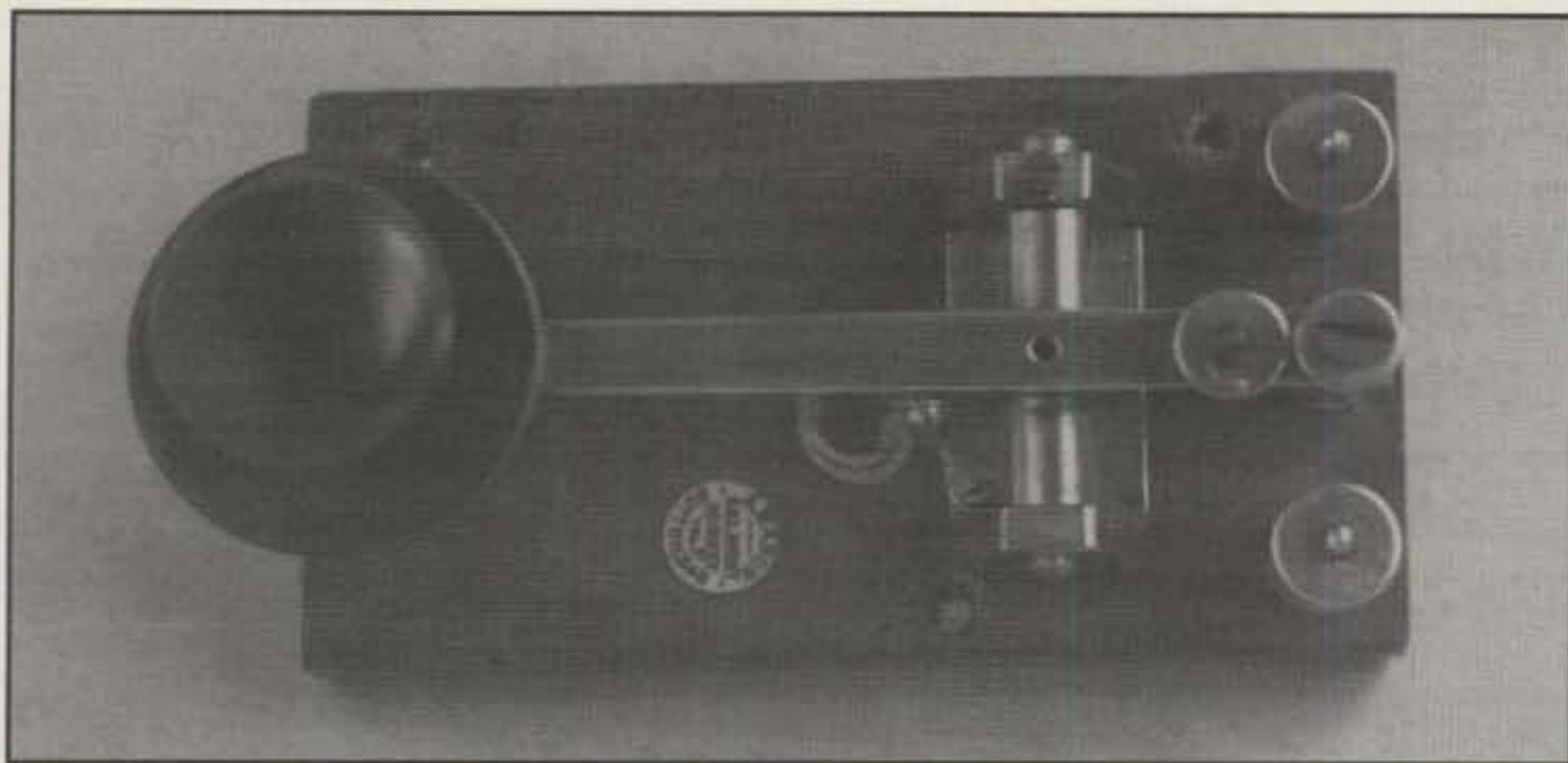


Photo 15—Top view of G7APJ's 1930s-style key. Pinion bar at fulcrum is held in position by set screws with top-mounted locking screws.

blast portable, and a no-holds-barred N2DAN/Mercury paddle combined with an ICOM IC-781 would comprise a home dream station. Don't just read about this fun. Gear up with your own personal choice of key, and we will look for you on 30 meter CW! Our special thanks to all the contributors this time, and photos permitting, our next "Keys Special" should be even better!

When writing to our guest collectors or me (K4TWJ), please remember to include an SASE and be patient for

replies. Our mailbox usually overflows after these columns, and there are simply not enough hours in the day for formal replies. Please understand! Some of you have asked if I have a list of previous "Keys Specials," and I regretfully report that that informal list was lost in a past move. Information and photos concerning at least 100 additional keys, however, are available in my book *Keys, Keys, Keys* available from CQ's Book Shop.

73, Dave, K4TWJ

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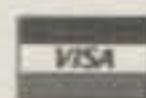
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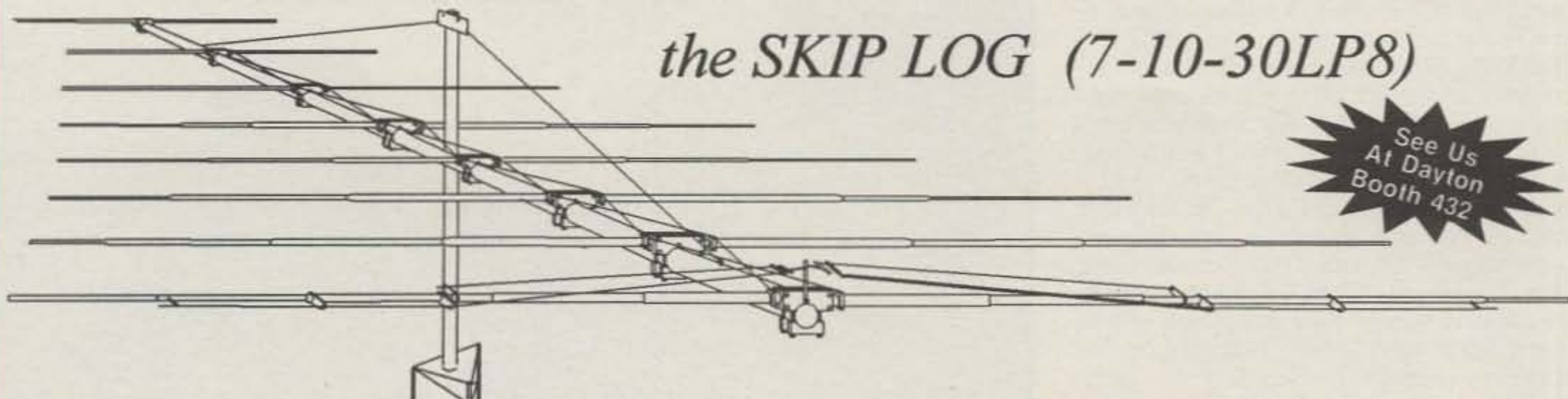
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## ALL ABOUT THE WORLD ABOVE HF

### What Is A Rover?

**R**ecently you heard a station sign "This is Whiskey Alpha Eight November Juliett Romeo (pause) Rover." You first wondered if the word *Rover* was a new phonetic for the letter *R*. Then you realized that there were too many letters following the number in this guy's callsign. Your curiosity was piqued. After you worked him, you asked him what it meant. He replied that he is roving from grid square to grid square—hence the term *Rover*. Let's take an in-depth look at this particular type of VHF+ operation.

By definition, the Rover is a one- or two-person team that sets up portable operations from at least two grids during a given time frame. Rovers have been known to operate from as many as 15 grid squares during a contest. The average, however, is closer to four or five grids during a given trip.

Rover operation has been around in one form or another for many years. Before grid squares, mobile stations would travel to rare states and put them on the air for others who needed them. After grid squares were adopted the interest increased as more mobile stations were able to travel to relatively close and relatively nearby rarer grid squares. (For example, I need only travel 45 miles, to the other side of El Reno, Oklahoma, to be inside EM05, a grid square rarer than my home grid square, EM15, whereas the closest "rare" state is South Dakota, three states to the north.)

The Rover concept really got a boost by augmenting club station operation in contests. A club station such as the Pack Rats or the W2SZ Contest Group would enlist the aid of a mobile station to go to a nearby state, and set up and give contacts to the club station. The concept grew until based on a recommendation from the Contest Advisory Committee of the ARRL, the League adopted a Rover category for the June 1991 VHF QSO Party. (The idea of including a Rover category, as well as the limited multi-op category, was originated and promoted by Emil Pockock, W3EP, Curt Roseman, K9AKS, Ray Veldran, N4KWX, and Mike Owen, W9IP, within several of the "VHF-UHF Contesting!" columns in the *National Contest Journal*, beginning with the September/October 1989 issue. The idea really gained steam when the results of a survey they published in the March/April 1990 issue indicated overwhelming support for it.) The category proved to be an instantaneous success, with nearly 50 stations submitting entries.

Riding the success, the League decided to adopt the category for the January and September VHF contests, as well. And based on feedback from fellow contest operators, I adopted the category for the revised CQ WW VHF WPX Contest. In last year's contest

#### VHF PLUS CALENDAR

May 1	ARRL 902-2304 MHz Sprints, 7 PM to 11 PM, local time.
May 2	Very good EME conditions.
May 4	Perigee.
May 5	Eta Aquarids meteor shower. Scheduled peak 0304 UTC.
May 6	Full moon.
May 9	Very poor EME conditions.
May 13	Last quarter moon.
May 15	Apogee.
May 15-19	W5AL and N4EL to Belize, grid square EK56. (See text for details.)
May 16	Good EME conditions.
May 21	New moon. Partial solar eclipse.
May 21-23	West Coast VHF/UHF Conference, Ventura, California. (See text for details.)
May 22-23	ARRL 50 MHz Sprint, 2300 to 0300 UTC.
May 23	Moderate EME conditions.
May 28	First quarter moon.
May 29-31	Possible XE2MOO operation from DL79. (See text for details.)
May 30	Very Good EME conditions.

Rovers accounted for nearly ten percent of the entries. Clearly, there is a strong interest in the category. (Interestingly, one of the reasons for creating the category was to wean the captive Rover stations away from the super contest stations and into competing among themselves. Indeed, this justification has now been taken to its opposite extreme. As I reported last month, a group from the Hampden County [Connecticut] Radio Association set up teams to work principally each other during the January VHF Sweepstakes contest. In so doing, each team scored a previously unheard of 1.2+ million points.)

While it has become an official part of contests, its popularity has also been growing on its own. During the summer months especially, a group of operators will get together

and travel to rare grids in order to give others the opportunities to fill in holes on their grid square maps.

Why is it so popular? As previously stated, it is relatively easy for most people to drive to a rare grid square and put it on the air. And with the inclusion of the category in contest rules, Rovers find themselves competing among each other to be the best. There is also what I call the "being DX" factor. Once on the air, the Rover finds that contacts with him or her are "in demand." Although not anywhere near as intense as an HF DX pile-up, the thrill of being the "hunted" is just as real. Dave Hallidy, KD5RO, reports that one of his biggest thrills as a Rover is giving out new grids on 2304 MHz to operators who are new to that band and are running minimal stations. Also, far from being a "cheap thrill," it



Gary Colborne, WA1EHL, his son, and Bob, N4YZJ, are almost ready for departure on their grid expedition during the June contest. Notice the travel trailer, the trailer for the tower, and the van. These guys are prepared! No wonder they placed third in the nation their first time out as Rovers. (Photo courtesy WA1EHL)

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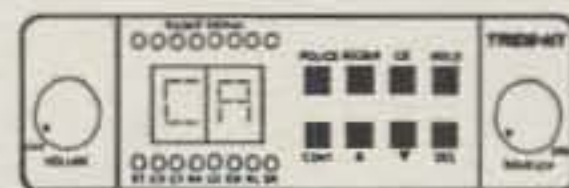
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can be, and most often is, relatively inexpensive to pursue. Rover operation can even take you places to observe interesting events. Tim Marek, NC7K, reported that while he was setting up his equipment in a shopping-center parking lot on a recent trip, he watched open-mouthed as the local police busted a drug dealer right in front of him.

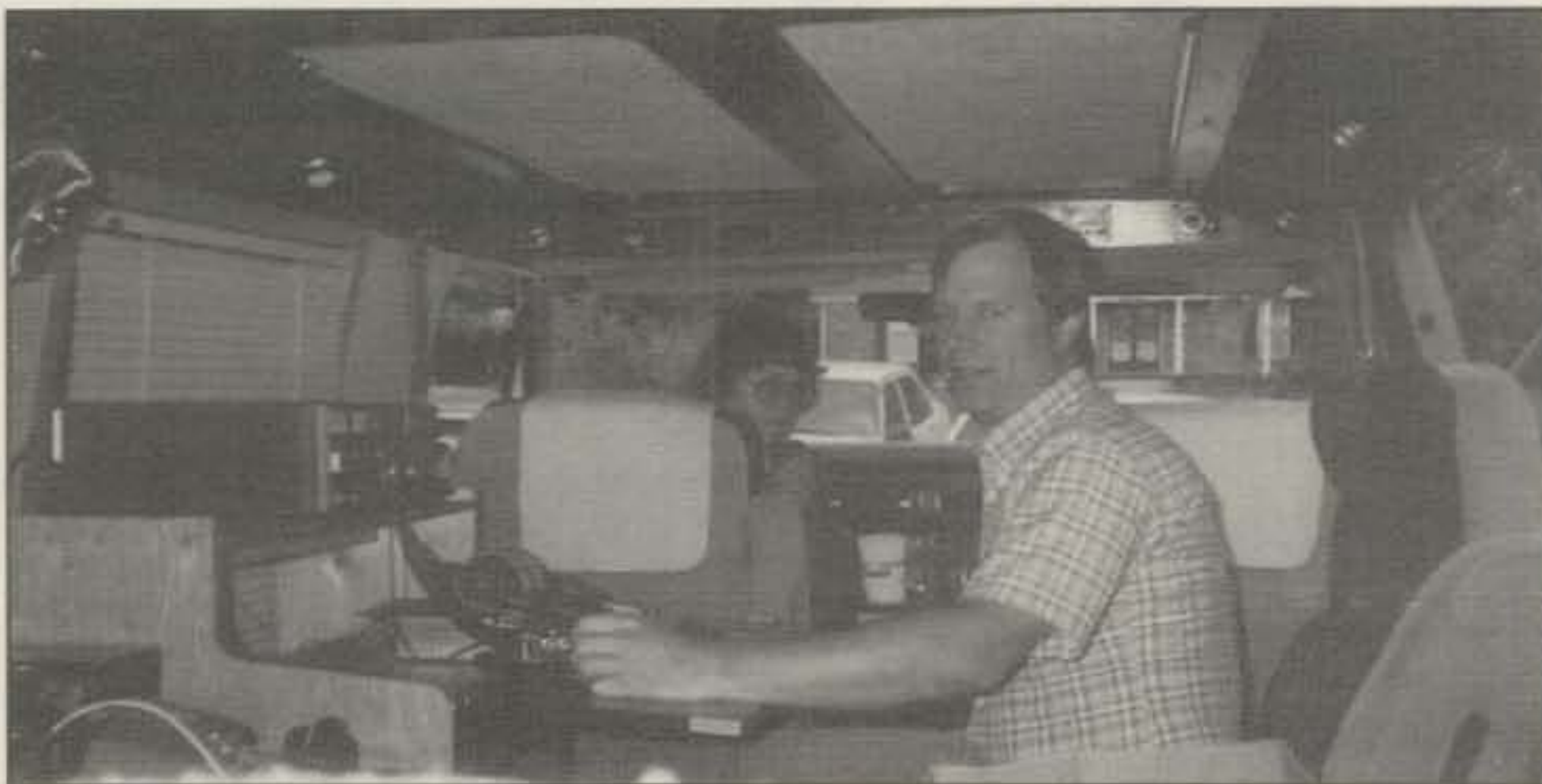
So how do you achieve a successful Rover expedition? I interviewed or researched the operations of a number of successful Rover operators. Among the Rovers were Ted Goldthorpe, WA4VCC, Gary Colborne, WA1EHL, Denise Hagedorn, AJ0E, Tom Bishop, K0TLM, Dave Hallidy, KD5RO, John Walker, WZ8D, Emil Pocock, W3EP, Jerry Becker, WA8R, Byron Swainey, WA8NJR, Ron Hammil, KC6WLC, Tim Marek, NC7K, Kent Britain, WA5VJB, Frank Moorhus, AA2DR, John Lindholm, W1XX, Chip Angle, N6CA, Wayne Overbeck, N6NB, and Geoff Krauss, WA2GFP. What follows is a compilation of their experiences.

Perhaps the paramount factor in all successful Rover trips is planning. Planning includes, among other things: how far in advance will you plan for your trip, where will you go, how long will you stay within a particular grid square, what kind of equipment will you take, what kind of vehicle (or vehicles) will you drive, what time of year will you take your trip, how long will your trip be, and who will go with you. Planning also includes making a check list of all of the above items and checking them off as you work through them. Below is an in depth examination of these items.

First, let's look at where you will go. In a large part, where you will go will be dictated by the rarity of the surrounding grids. For example, in the panhandle and western part of Texas there are several grids that are relatively rare. A Rover might start in DM96 and work down to DM91, spending most of the time in the most rare grid square, DM94.

However, unless you are out for a Sunday afternoon drive and you just happen to have the 6 meter rig in the car, you will be better off for your trip if you have a good idea where the high points are within the grids you plan to visit. This means that you almost have to travel the route ahead of your trip or at least know someone who has done so and has pictures. For example, if you are looking for a place to go in Nevada, contact Tim Marek, NC7K, 360 Prestige Ct., Reno, NV 89506, or call him at 702-972-4722. He has maps and photos of potential sites throughout the state.

Next to knowing where these sites are located is securing permission for operating from them. This means getting permission from all concerned, which may be very difficult. For example, the team of Gary Colborne, WA1EHL, and Bob, N4YZJ, were run off their location on Rich Mountain during the June ARRL contest by the local authorities because they were blocking an access road. Even though no one lived on property accessed by the road, a neighbor did not want them at that location and complained. The authorities used the "access road blockage" problem as the basis for dispersing the Rover team. As disconcerting as that was, it did not compare with the experience of being hauled in for questioning for roving around your own neighborhood, as was the experience of Geoff Krauss, WA2GFP, during the



*The Rover team of Denise Hagedorn, AJ0E, and Tom Bishop, K0TLM, is often found in logs during the contests. Barely visible at the driver's seat is Denise and at the very comfortable operating position is Tom. (Photo courtesy K0TLM)*

January VHF Sweepstakes contest. Fortunately, his lawyering skills helped "bail him out" once he was at the police station.

After your trip be sure to thank your host for allowing you the use of the property for your hobby. It was not by accident that Bryan, WA8MZO, asked me to convey his appreciation to his hosts, including the Royal Canadian Air Force, in my write-up of his trip of last summer.

How long will you stay at a given location? Here are several questions to consider. Are you on an extended trip or are you in a contest? As mentioned before, is the grid you are within relatively rare, and thus worth the effort of spending the extra time? Are you in the contest to win, or are you just having a good time? If you are in a contest, how long will you stay to work every last station before moving on? Is it worth it to you to stay just so someone can finally complete that contact on 1296 MHz, even though you are delayed an hour? During contests, some of the on-the-air intimidation from the intense operators on the other end can be relentless. Remember, you are in control. You make the decision when

to pack up and move on.

Denise Hagedorn, AJ0E, and Tom Bishop, K0TLM, have often been faced with helping someone complete one of these types of contacts when time has expired for their schedule. On one occasion they stayed "too long" to attempt to complete a contact (that was eventually never completed). When they finally got on the road, they were only able to travel a short distance before being too exhausted to go any farther. They stopped at a motel and got rooms for the night. Unfortunately, they had guaranteed rooms at another motel farther away through the use of their credit cards. While not too expensive, it was nevertheless a bit disconcerting to have to pay to stay in two different places, while receiving the benefit of only one of them.

The kind of equipment you take depends on how many bands you want to operate. For ease of operation, many operators choose the multiple-bands-in-a-box radios. The Yaesu FT-726 and FT-736 are very popular radios because of the ability to operate on more than one band. The benefit to these



*With all those antennas atop the van near misses do occur. Here Tom, K0TLM, examines just how close they came to destroying their antenna array when they backed into their parking space at the motel. (Photo courtesy K0TLM)*



While not entering the Rover category, Frank Moorhus, AA2DR, has all the trappings of being a Rover. Here Frank operates from Montauk Point on Long Island, New York. Frank proves that planning like a Rover has cross-over benefits. (Photo via AA2DR)

radios is also the drawback. If there is more than one of you on the team, operating on one band will keep one of you very busy, while the other one is standing around awaiting a turn at the mike (or key). If you plan more than one band on the air simultaneously, you will have to take equipment necessary for that venture.

You also need back-up equipment. If something fails, you can't easily go home and replace it. This also includes extra microphones, extra coaxial cable, and plenty of extra connectors. Connectors include mike connectors, coaxial connectors, and phone plugs. Also, bring all the tools that you think that you will need, and then some. What about a soldering iron? Radio Shack sells a butane-powered one for around \$30. Also, don't forget the solder.

Antennas and how to rotate them is also a challenge. Some, such as Denise and Tom, choose to mount them atop the van. This solves setting them up and disassembly. However, your rotator is the vehicle. Others, such as Gary and Bob, bring along a tower. It takes longer to get the antennas up, but they are also higher in the air. Still others, such as Ted, WA4VCC, and Itice, KB4CSE, Goldthorpe, opt for something in between. They assemble their antennas on a single mast and attach the mast to the van. They use an "armstrong" rotator (you know, your strong arm) or an inexpensive TV antenna rotator that is powered by the generator or an inverter (that is equipped to power a motor). John Lindholm, W1XX, has gone so far as to punch out a hole in the top of the van, install a PVC-type fitting, and run the mast down inside the van. When operating,

he merely reaches over and "rotates" the antennas from the comforts of the interior of the van.

What kind of power you run tends to dictate how your equipment is powered. If you run more than a brick (100-150 watts) then you will need either a small gas generator or deep-discharge marine-type batteries. Notice, I said batteries. Even if you use just a brick, a marine battery is something to consider. It was awfully mortifying for me to be standing by the road holding my jumper cables in the air on Sunday morning of the June contest. Fortunately, I did not have to answer too many embarrassing questions once a very kind motorist stopped to assist me. Faced with a similar experience in the

past, Denise and Tom have decided to keep the engine running in the van all of the time.

How do you keep track of your contacts? You can use a lap-top computer. However, most of the people I have talked with who have tried this method have returned to pencil and paper logs. The chief complaint is that the software used is not versatile enough to accommodate the logging needs of the Rover, plus the computer is just one other item to take that can break. If you go with paper logs, bring plenty of pencils and paper. Have a safe place to stow them. Near the operating positions keep a glass or jar full of sharpened pencils, because you never know when you will drop or break one.

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The space between the two captain's chairs is just perfect for the FT-736R, the radio that Ted, WA4VCC, and Itice Goldthorpe, KB4CSE, use when they are roving. Ted and Itice traveled to several grids and even changed grids while crossing the Chesapeake bridge during the June contest. Several 6 meter operators got two grids from Ted and Itice in short order. (Photo courtesy WA4VCC)

going to run meteor schedules, you must have an accurate source of time for the sequencing. Tom treated himself to the Heathkit "Most Accurate Clock." (The Most Accurate Clock, which can lock onto one of three WWV signals—5, 10, or 15 MHz—has been replaced by the Most Accurate Clock II, which is tuned to 10 MHz. It sells for \$349.95, plus shipping and handling from Heath Company, P.O. Box 8589, Benton Harbor, MI 49023-8589.) If you do not choose to afford that luxury, then you will need an HF radio and an antenna that will pick up the WWV signal, plus a clock on which you can control the "seconds" setting.

How are you going to operate CW? The cheapest way is a hand key. However, some operators use keyers that can double as beacons. The choice is up to you. Bring a hand key as a back-up, however. You never know.

What kind of vehicle makes a Rover station? The most popular seems to be a full-size passenger or panel van. Chip Angle, N6CA, and Wayne Overbeck, N6NB, both have elaborately equipped panel vans for this kind of operation. Denise and Tom use a passenger van that has been partially converted for camping out. Gary and Bob use a small travel trailer. Ted and Itice use a passenger van and set the equipment between the two captain's chairs. Whatever the vehicle, it is imperative that it be in excellent running condition (all the way down to the tires) for the trip. Your automobile club towing service will never find you in some of those locations you might choose. Also, know how to drive what you are driving. If you are towing something, it takes a certain set of skills. If you are driving something with limited side and rear vision, it takes another set of skills. If you are driving something with limited vision and towing something, then your work is really cut out for you.

Along with the consideration of the kind of vehicle you will use is where will you stay.

This goes back to planning your route. If you stay inside the vehicle, be sure that you are protected from the elements. If you choose to stay at a motel, know where one will be once you arrive at a given destination.

What about operating while in motion? If you are in a contest, then the temptation exists to make as many points as possible. One source of points is FM simplex (if you are near a metro area that supports this type of activity). The other is via 6 meters, if the band is open. I operated while traveling from grid square to grid square using the FT-726, a brick, and the base mast of a Hustler whip mobile antenna. However, it is safest to have a co-pilot do the operating. Trying to operate contest style and log at the same time can be very distracting and potentially very dangerous. If you choose to do this and find yourself in a pile-up, pull over. If you don't, you might find yourself in another type of pile-up.

What time of year is the best time for Roving? Obviously, the best time is when the band is anticipated to be open. And that often seems to be summer. However, when planning for your trip, plan for any kind of weather. Yes, you can run into snow in June if you are in that part of North America.

Who will you take on your trip? You may want to go by yourself. However, the long stretches between band openings makes for lonely times. If you choose to go with someone, check out your compatibility before you go on a long trip. Not only is compatibility important, but so is trust. I watched a video tape that showed Jerry, WA8R, and Byron, WA8NJR, walking in front of the pickup that John, WZ8D, was driving very slowly across a rickety old bridge in the middle of nowhere in northern Canada. Trust is knowing that your friends are going to lead you across the right spot. Trust is also knowing that your friend is not going to run over you.

Planning for your trip should also include checking out your equipment exactly as it is



Ron Hammel, KC6WLC, loves to go to the races on the salt flats of Bonneville, Utah. While there, he does what all good Rovers do—get on the air! Ron has handed out many grids to the guys in Nevada and California during his many trips across the desert. (Photo courtesy KC6WLC)

to be used on the trip. Chris, WA3HMK, when he operated from VP5, discovered this in a dramatic way. Once at VP5, he found that things did not go together quite as he expect-

ed. On your trip you will find the same thing. Knowing what to expect before you go will save you from yet another headache.

Probably the most important part of your

planning is letting someone know of your itinerary. If something were to happen to you, your friends would not necessarily know where to look for you. Yes, your family, especially, cares for you, not to mention your many friends on the VHF+ frequencies. They want you to have fun on your trip. However, they want you to come back home or at least know how to find you if you can't make it back.

What about publicity? When you let someone know about your itinerary, let me know about the trip, in general, so that I may publicize it. Remember, the more publicity, the better the success of your trip.

Above all, have a safe and wonderful time. We all look forward to working you and contributing to each other's fun.

### Conventions and Contests

**This Month:** The West Coast VHF conference is scheduled for 21-23 May. This is a conference that you will not want to miss. Each year it gets better and better. There will be conference speakers all day Saturday. Among the speakers are the following: Jim Bogdan, WB6IMV, speaking on test equipment; Tim Marek, NC7K, speaking on VHF contesting; Chuck Swedblom, WA6EXV, on amateur microwave bands and their use; Peter Onnigian, W6QEU, on computers and antenna design; Jim Vogler, WA7CJO, on traveling wave tubes; Dave Glawson, WA6CGR, on techniques for stabilizing microwave oscillators; Al Ward, WB5LUA, on UHF construction techniques; Doug Sharp, WB2KMY, on the W2SZ Contest Group; Jim Fortney, K6IYK, on packet radio; Carl Lodstrom, W6/SM6MOM, on RF coaxial

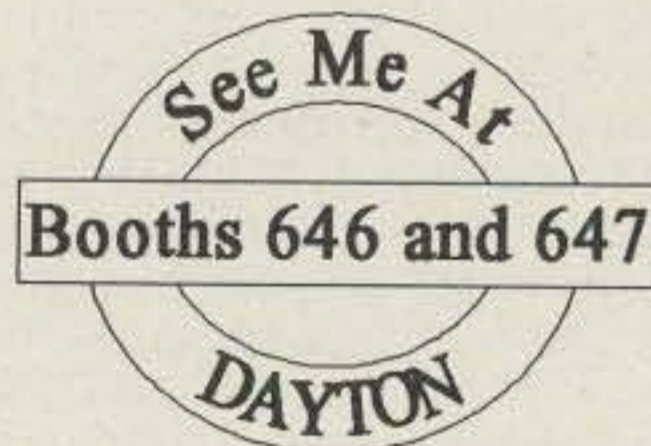
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relays; Rus Healy, NJ2L, on the state of the art of microwave transverters and a fantasy tour of the QST equipment review labs; and your editor, who will speak on the *Perseids* meteor shower. The banquet speaker will be Julian Macassey, N6ARE, who will speak on...well, come to the banquet and find out. The breakfast speaker will be Wayne Overbeck, N6NB. His topic is RF hazards to the body from VHF on up. (You can digest his talk just after you digest your fried bacon.) There will be an ARRL Forum, conducted by Southwestern Division Director Fried Heyn, WA6WZO. It will be at the Ventura Holiday Inn, right on the beach. Special conference rates are \$58 per night. Call them toll free at 800-842-0800, and ask for the conference rates. The fees for the conference are as follows: registration (by May 7, for pre-registration prizes) \$15; banquet (advance registration required) \$25; breakfast (reservations should be received by May 7, to guarantee a seat) \$10; and *Proceedings* (available at the conference) \$10, after the conference \$12 (plus \$3.50 shipping and handling from the ARRL). Make your checks payable to the Ventura County Amateur Radio Club. Send them to VCARC, P.O. Box 2103, Oxnard, CA 93033. For more information, call Steve Noll, WA6EJO, at 805-647-4294.

The ARRL VHF Sprints conclude this month. The 902-2304 MHz Sprints are on 1 May, from 7 PM to 11 PM, local time. The 50 MHz Sprint is on 22-23 May, from 2300 to 0300 UTC. The exchange for these contests is your grid square. Note: the 902-2304 MHz contest is separate from the 50 MHz contest. Submit your logs to the ARRL. Results of all Sprint contests will be published in *NCJ* at a future date.

**June:** The dates for HamComm, the major hamfest in Arlington, Texas, are 4-6 June. Among the sessions are two presented by NTMS. I will speak on the *Perseids* meteor shower. The 15th Nordic VHF-UHF-SHF Meeting is scheduled for 11-14 June. The conference will be held at the former school of Freerslev, near Haslev, Denmark. It is the site of the original conference in 1985. Among the programs are lectures on low-noise pre-amps, microwave techniques, and AMSAT. Accommodations are available on campus. For more information contact Uffe Lindhardt, Ostrigsgad 49,m 2.tv, DK-2300 Kobenhavn S, Denmark, or phone +45 31 598970.

Among the contests this month are the ARRL VHF Contest, the SMIRK contest, and Field Day. The ARRL VHF contest is scheduled for 12-14 June, SMIRK, 19-20 June and Field Day, 26-27 June. Full rules for this year's ARRL VHF QSO Party are published in May *QST*. The exchange for the SMIRK contest is your SMIRK number and grid square. For more information on the SMIRK contest, contact Pat Rose, W5OZI, at P.O. Box 393, Junction, TX 76849, or call him at 915-446-2252.

A new bonus rule has been added for this year's Field Day contest. You can earn 100 bonus points for working ten stations (other than packet) on VHF and above frequencies. The *spirit* of the rule is to encourage weak-signal operation. While it is possible to easily achieve this bonus by working ten people on FM simplex, the challenge will be to work ten people on SSB or CW. I encourage you

to take up the challenge and promote weak-signal operation at your Field Day site. Full rules for Field Day also can be found in May *QST*.

**July:** The Central States VHF conference is scheduled for 29 July through 1 August at the Lincoln Plaza Hotel, Oklahoma City, Oklahoma. Contact me for more information. If you are planning to present a paper, contact Tommy Henderson, WD5AGO, at 12476 E. 13th, Tulsa, OK 74128, or call him at 918-438-0099. The deadline for including your paper in the *Proceedings* is 1 June.

The **CQ WW VHF WPX Contest** is scheduled for 10-11 July, from 1800-2100 UTC. Full rules are found elsewhere in this issue. However, new this year is the QRP category. You can enter this category if you are fixed, mobile, or portable. Just do not run more than 25 watts output. Logs and entry forms may be obtained by sending an SASE to CQ, 76 N. Broadway, Hicksville, NY 11801. Send your entries to me, at P.O. Box 73, Oklahoma City, OK 73101. Incidentally, Allen Huber, WG3E, has written a software program that will, for the most part, accommodate this contest. I have tried it in practice, and the one bug I found is the inability to add the incentive point for CW or MCW contacts. Other than that little problem, it is a fine little program. Send Allen a self-addressed, stamped diskette mailer, along with either a formatted 5.25 or 3.5 inch double-sided double-density disk, to 46 Reynolds Avenue, Pottstown, PA 19464-5250 for a copy of the most recent version. Additionally, Steve Morgan, WABQNR, advises me that the LOGIC program available from Personal Database Application, 2616 Meadow Ridge Dr., Duluth, GA 30136-6037 (phone 404-242-0887, FAX 404-449-6687) will log any contest.

### Current and Coming Expeditions

**Belize:** Len Parsons, W5AL, and Richard Beerman, N4EL, are planning a trip to Belize between 15 May and 19 May. They plan to primarily operate satellite. However, Len will have the FT-736R with a 6 meter module in it. He plans to look stateside when not on the satellites. Their callsign is unknown at press time. Their grid square will be EK56 and QSLs will go to W5AL at his *Callbook* address.

**Mexico:** I plan to be a part of the Lawton-Ft. Sill (Oklahoma) Amateur Radio Club team that will operate XE2MOO from Ojinaga during the CQ WW WPX CW contest. Look for me on 6 meters and maybe 2 meters between 28 May and 31 May. The grid square will be DL79. QSLs for *my contacts only* will go to me.

From 1 July through 5 July a group that includes Pat Rose, W5OZI, Paul Stein, K5AWK, and John Godwin, KB5IUA, will travel through several grids within Mexico. These grids are DL98, DL97, DL96, and possibly DL95. They will be on 6 meters, primarily, with 22 meters available if warranted. Listen for them primarily on 50.115 MHz. The callsign they will use is XE2AWK, and QSLs go to W5OZI at P.O. Box 393, Junction, TX 76849.

**Canada:** Beginning 20 June and lasting through 24 June Dave Bostedor, Jr., N8NQS, and his wife, Linda, will operate from grid

squares in Quebec. Depending on their ability to complete their schedule, they will travel through FN16, FN26, FN17, FN27, and FN18, in that order. They plan to be on 6 and 2 meters. They will be on 50.125 and 144.200 MHz, as well as monitor 28.885 MHz during their operating times. They will operate between 2300 and 0200 UTC and 1100 and 1400 UTC daily and more if propagation warrants. QSL to Dave via 434 Pattie Ave., Jackson, MI 49202. If his health permits, Dave, Sr., K8WKZ, and his wife, Pat, N8PYO, will join them on their trip.

**Equatorial Guinea:** Mike Staal, K6MYC, has tentative plans to be active from Equatorial Guinea during June. More information will be forthcoming as his plans become more firm. He plans to be on 6 and 2 meters EME.

**Nauru:** Mike is also planning an EME trip to Nauru. However, the plans for this trip are even more sketchy. I will keep you informed as I find out.

## Current Meteor Showers

The *Eta Aquarids*, a three-day long (between 4 May and 6 May) shower, is predicted to peak around 0304 UTC 5 May. However, this is a broad-based peak with several sub-peaks possible. It is best to stay alert over the entire three-day period. This shower is more popular in the southern latitudes because of the low (-1°) elevation of the radiant. Nevertheless, stations in the southern portion of the U.S. and stations in Central America can benefit from propagation caused by this shower. While not a productive shower, it did produce in excess of 110 rocks per hour in 1980. The best paths for propagation are northeast to southwest and southeast to northwest. East to west propagation is fair and north to south propagation is poor.

Additional potential for meteor-scatter contacts may exist at the end of the month as the first signs of the *Arietids* begin to make their appearances. Additionally, the minor showers of *Herculids* (19 May to 14 June, peak 3 June) may have some effect on elevating the number of meteors available. The *Scorpiids* (29 May to 20 June, peak 5 June) is a southern latitude shower. Stations in the southern hemisphere may benefit from the slightly (ten rocks per hour) elevated number of meteors entering the atmosphere.

## 222 MHz FCC Actions

As of press time the date for comments on Docket 92-289 had expired. According to Chris Imlay, N3AKD, counsel for the ARRL, most of the comments favored granting Novice Class licensees full frequency privileges for the 222 MHz band. However, almost all comments opposed granting control operator privileges to Novices. With regard to setting aside the 150 kHz portion, opposition has emerged from southern California (as expected) and from northern California and Nevada. The northern California and Nevada comments centered around seeking to limit the size to 130 kHz to accommodate an auxiliary link that is presently on 222.140 MHz. According to Chris, he anticipates that the League's reply comments will answer

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that reservation by referring to Docket 93-40, the NPRM that will, if adopted, grant 1 MHz of spectrum between 219 and 220 MHz for packet operation. Dates for comments and reply comments for this NPRM were not available at press time.

## On The Air

**6 Meters:** The biggest activity on the band has been generated by **VR6JJ**. On 21 February they worked ten stations in southern California, including **Jack Henry, N6XQ, Chip Angle, N6CA, and Wayne Hoffman, WB6WLR**, plus a couple of stations in Las Vegas, Nevada. Then on 8 March Jack worked **LU3EX** and **LU2EIO**, and the day before was heard by **VR6JJ**. Among the other DX reported by **VR6JJ** was a contact with a station in the Ivory Coast, also on 8 March.

**Jim Foster, NN7K**, reports that since he moved, his beacon on 50.074 MHz has been off the air. He says that it will remain QRT until he can find it a new home in the area of his new home near the Reno-Sparks area of Nevada. We will let you know when everyone (and everything) is home.

On the moon **Bob Magnani, K6QXY**, and **Dave Batcho, N5JHV**, completed a contact via EME in late February. **Jim Treybig, W6JKV**, and **Bob** ran schedules with a number of stations over the first weekend of March, but with no success. They report that several operators in Europe are in the process of building stations for EME. Among them is **OZ1EME**.

**2 Meters:** Very little terrestrial propagation had been reported by press time. However, aurora was reported Monday night (9 March UTC) from Georgia to northern Kansas. Among the stations reporting activity were

**KM4ID, NØLL, WB4DBB, and KC4YO.**

**Larry Murdoch, K6AAW**, is looking for skeds to complete all the grids in the following states: California, DM22, DM23, and DM24; Nevada, DM27; Oregon, DN05; and Idaho, DN14, DN15, DN22, DN23, and DN25. Any leads? Give Larry a call at 916-529-3523.

**Mark Moulding, KE7NS**, reports that he has completed VUCC on 2 meters. He states that it took him six years of on and off chasing. His big push came during last year's *Perseids* meteor shower. He says that he is going to try to get a local club to make a serious effort during the June contest.

On the moon, **Tim Marek, NC7K**, reports his second and third contacts via EME. His second was with **Franco Giorgi, I2FAK**. It was incredible that this contact took place at all. Tim reported that his hard-line connector had filled with water. When he discovered it, he disconnected it from his beam on the tower. Then he was faced with keeping his sked with Franco. Therefore, he stuck his homebrew 12-element beam on a short mast, pointed the beam at the rising moon, ran 25 feet of coax into the house through the back door, hooked everything up, and completed the sked! No big deal! His next contact was with **Gary Crabtree, KB8RQ**, which was almost anticlimatic after his contact with Franco.

**432 MHz and Up:** **Paul Wilson, W4HHK**, reports that he soon will have 5 watts on 3456 MHz into a loop Yagi pointed west-southwest. He hopes to replicate the fete of **Dave Meier, N4MW**, by working **Al Ward, WB5LUA**.

On the moon, **Ron Barlow, N4GJV**, reports that on 24 January he was listing right at his moonrise. He heard **Mart Sakalov, 9M2BV**, calling CQ! After picking himself up off the

floor and calming his nerves, he gave **Mart** a call. They easily worked. Remarkably, **Ron** and **Mart** have only a ten minute common window at **Ron's** moonrise and none at moonset because of an obstruction.

**Al Katz, K2UYH**, reports that activity on 2300 MHz EME is sharply rising, with the number of stations on that band near the level that was on 1296 ten years ago. While it takes a bit more elaborate array and parts are harder to find, QSOs are easier to make than on the lower bands (once the equipment obstacle is overcome). The problems with noise are greatly reduced on these higher frequencies. In fact, as the moon moves into a noisier orbit in a couple of years these higher frequencies will look even more attractive.

**Paul Wilson, W4HHK**, reports that the active number of stations on 2300 MHz EME is around two dozen. He says that **I6PNN** is due to be on anytime and that **K2IQU** can receive and soon will be able to transmit. Additionally, **F1ANH** is now on the moon on this band. Paul also relates that using a couple of relays, he reconfigured his station so that with a flip of a switch he can listen to both the normal and the British and German segments (2320 MHz) of the band. He says that the mantle of the "big gun" on the band in North America has been passed to **Charlie, W7GBI**, who is running 500 watts (from a TWT) to a 25 foot dish. Additionally, Paul states that **SMØPYP** and **OE9ERC** are the big guns for European contacts.

**Marcel Gilissen, ON4UV**, reports that he soon will join the exclusive 10 GHz EME club.

## And Finally

Last month in this space I was high on integrity. However, in the interim I received the following, which is reprinted from the "VHF/UHF DXer" newsletter:

"**2 Metre EME Cheats,**" by **Tony Read, GØGMS**. After a number of years of working 2 metre DX with some good results, I moved on to try EME which resulted in some very good fun, but I soon discovered that 2m EME is suffering from a lot of *cheating*. I have now received far too many QSL cards for QSOs that I didn't even have. I have been asked on the VHF Net if the QSO was complete. I have heard people saying how loud my signal was when I was not QRV. Some of these stations are very well respected on 2m EME. I feel very sorry that 2m EME has fallen foul of such poor operating. There are far too many people just wanting to add to the score... even when they didn't hear the other station. Due to this situation I have now gone QRT on 2m EME. I hope that I don't find the same on 70cm EME. Well, good luck to all newcomers to EME, just please stick to the spirit of Ham Radio and have valid QSOs. (signed) 73, Tony."

I would like to thank all who contributed to my piece on Rovers and the following newsletters: "Terrestrial VHF+," "West Coast VHFer," "432 and Above EME News," "VHF/UHF DXer," "Cheese Bits," "Upper Midwest VHF/UHF Newsletter," "Feedpoint," "The Rochester VHF Group Journal," and "2-meter EME news," and all of you who support this, your column. Remember, if you have a hot scoop for your column, call me at 405-528-6625.

73, Joe, N6CL

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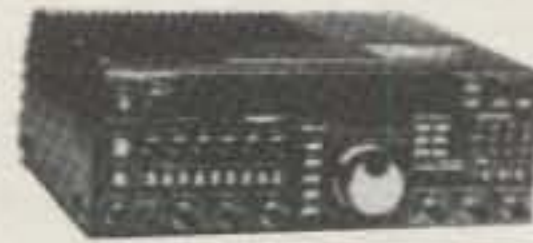
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THINGS TO LEARN, PROJECTS TO BUILD, AND GEAR TO USE

## A Wideband Short Dipole for 80 Meters

**A** lot of information has been published in the various amateur radio magazines on the virtues of a broadband 80 meter antenna. Most of these schemes work, but some are quite tricky. And they are all variations of big dipoles.

Well, what about the guy who wants to zip back and forth across the 80 meter band but who has only a small lot with little space to erect a half-wave antenna? He can go up in the air with a vertical, but that antenna isn't as effective for short-range communication (up to 1000 miles) as is a horizontal job. Horizontal polarization is the way to go, but the length of the antenna often rules that out!

One way to shoehorn a half-wave antenna into a small space is to load it with inductors. Placing loading coils in the flattop certainly reduces antenna length, but it also reduces SWR bandwidth and feedpoint impedance. I once had a 45 foot loaded dipole for 80 meters. It worked well, but the pass-band between the 2:1 SWR points was only about 30 kHz. I trimmed the antenna for 3800 kHz and worked plenty of DX with it, but I could not wander far off-frequency until I bought an antenna tuner. That helped a lot, but it was an expensive way to gain bandwidth.

### The AG9C Wideband Antenna

Robert Morrison, AG9C, pondered this problem and has designed an unusual 80 meter antenna that provides good bandwidth in a small space. The following is a summary of the information he sent me.

Dipoles shorter than a half-wavelength typically use 2-element matching networks, such as a loading coil in each antenna arm and a matching coil across the feedpoint. The resulting bandwidth for such an 80 meter design can be a disappointment. (*How well I know—ed.*)

On the other hand, 3-element networks can provide greater bandwidth, but are difficult to adjust without laboratory equipment. However, the matching network described below combines wide bandwidth with easy adjustment (fig. 1).

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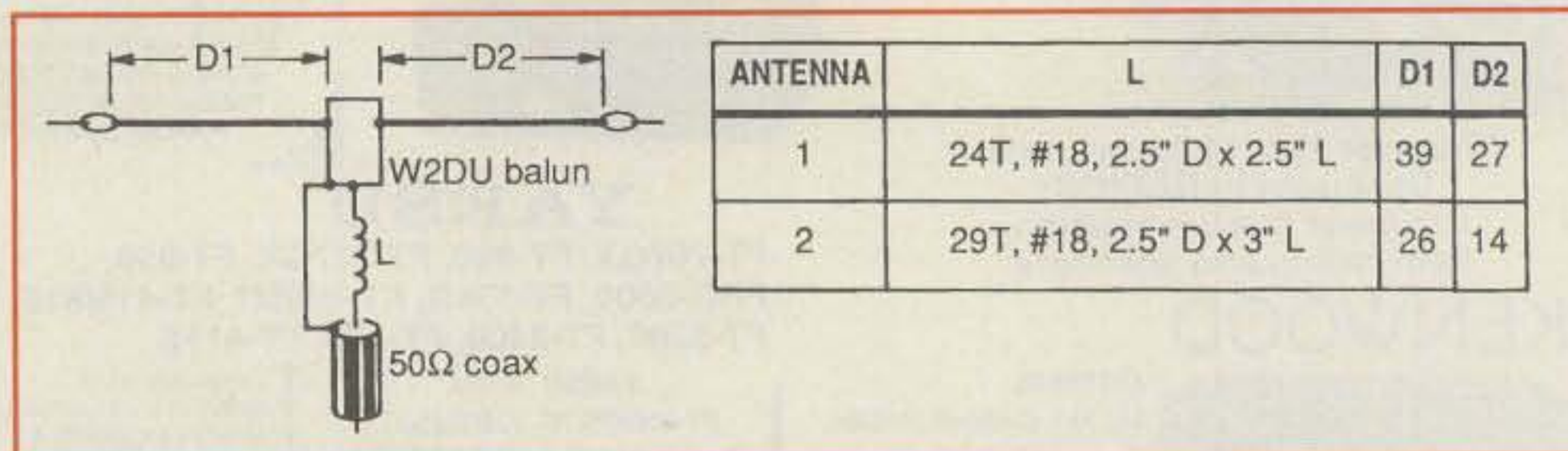


Fig. 1—The AG9C compact, wideband 80 meter dipole. Coils are air core wound on PVC tubing. Design frequency of #1 is 3730 kHz; #2 is 3760 kHz. SWR at resonance is about 1.25/1.

This short antenna is off-center fed with a W2DU-type balun<sup>1</sup> consisting of 50 (#73) ferrite beads slipped over 10 inches of small coax cable (RG-303/U). The bead balun serves two functions. First, the beads keep RF current from the unbalanced antenna from flowing down the outside braid of the transmission line. Without the beads, the outside of the line becomes part of the antenna and the electrical characteristics of the system become unpredictable. Line length and position affect the impedance presented to the transmitter at the input end of the line.

Second, at 3.5 MHz the 10 inch length of balun coax approximates a 25 pF lumped capacitance which becomes part of the matching network. A transformer-type balun will not work in this design, as it supplies neither adequate line isolation nor the correct lumped capacitance value.

### The Matching Network

The equivalent circuit of the antenna is shown in fig. 2. The inductor (L), balun capacitance (C), and offset antenna feedpoint emulate a 3-element network the proper adjustment of which permits a good impedance match over a wide bandwidth. The coax line, of arbitrary length, merely connects the transmitter to the network.

Since the antenna is short and close to the ground in terms of wavelength, the impedance at the antenna center is quite low—in the neighborhood of 20 ohms. The antenna feedpoint, therefore, is moved off-center to find an appropriate 50-ohm point. (This is the same technique used in the off-center-fed antennas I have discussed in previous columns.)

The inductor (L) is placed immediately below the balun. In this instance, an air-core inductor was used, although a powdered-iron toroid may be substituted. Thirty-five to 45 turns of no. 18 enameled wire and an Amidon T-200-2 toroid are suggested.

The inductor is placed in a nonmetallic enclosure to protect it from the weather. UV-stable plastic film can provide temporary protection. A jumper connects the transmission line shield to the shield of the balun.

### Antenna Adjustment

For those who wish to fine-tune the antenna to a particular point in the band, the matching procedure is as follows:

1. For best results, select the longest antenna length that will fit in your yard. The examples shown are for a 66 foot or 40 foot flattop.

2. With the balun in place, adjust inductor L to obtain the desired resonant frequency.

3. Readjust the balun feedpoint location for minimum SWR. The inductor may be readjusted to fine-tune the SWR at antenna resonance.

Note that the coax line is coupled to

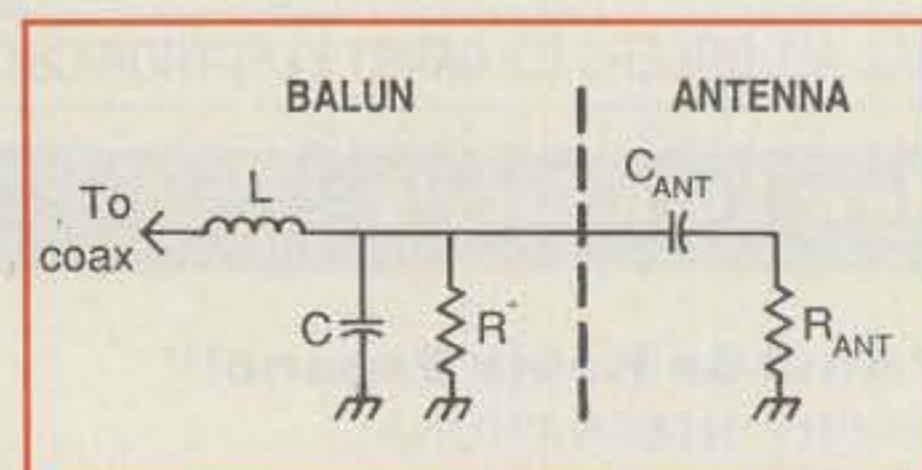
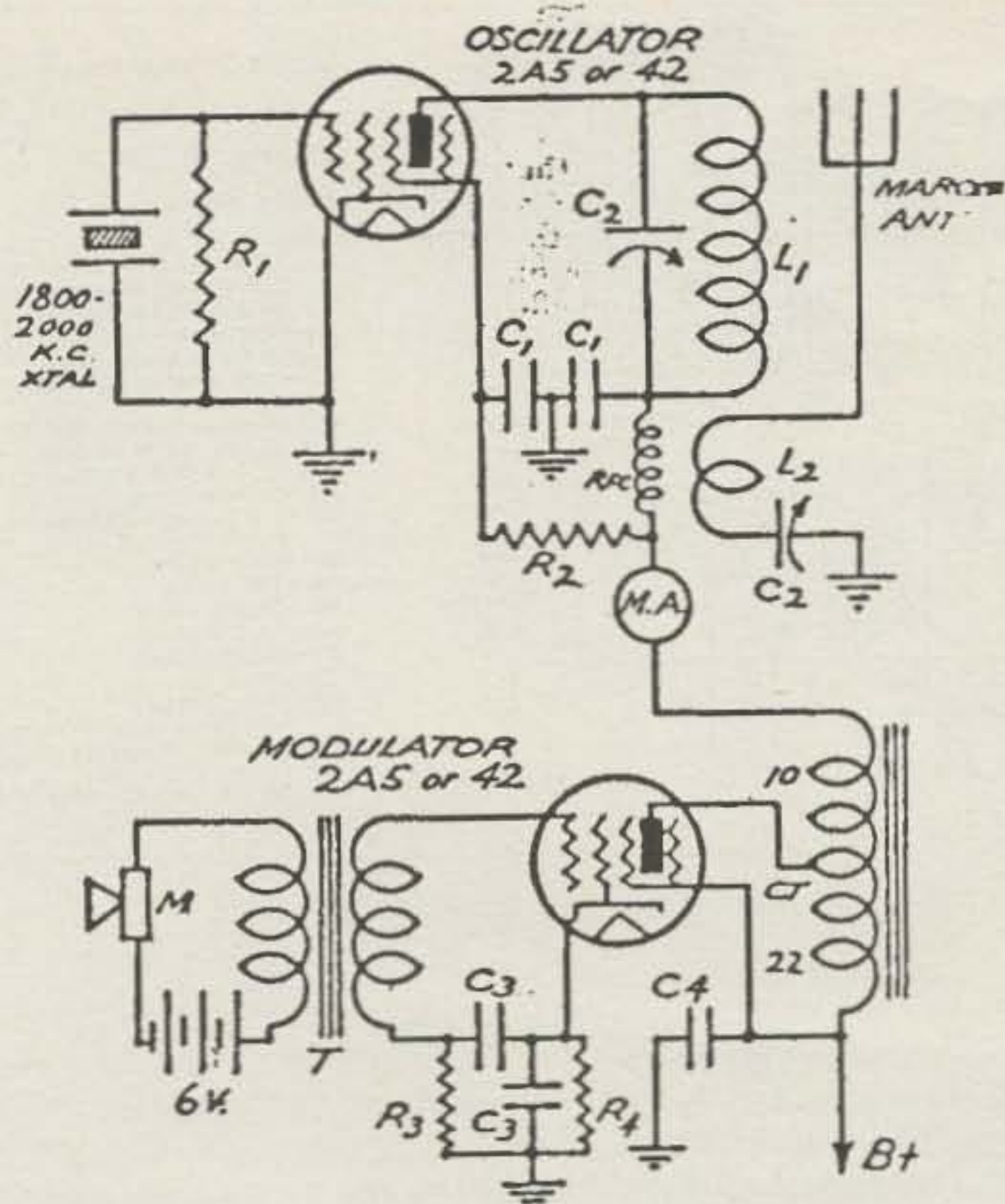


Fig. 2—Equivalent circuit of AG9C antenna. C and R are balun capacitance and loss, respectively. Antenna constants are to right of dashed line.



### The "Junkbox Special" Circuit Diagram and List of Parts

- R1—50,000 ohms.
- R2—30,000 ohms.
- R3—100,000 ohms.
- R4—400 ohms.
- C1—.01 mfd.
- C2—.00035 mfd., variable.
- C3—.5 mfd.
- C4—4 mfd. or more.
- T—Mike-to-grid transformer.
- CH—Center-tapped choke 60 MA and all the henries you can get. Don't put two chokes in series.
- L1—45 turns No. 14 wire space wound on 2 1/2" form.
- L2—22 turns No. 14 wire, space-wound on 2 1/2" form.
- M—Single button carbon microphone.
- Milliammeter—0-500 MA.

Fig. 3—The first "junk-box" phone for 160 meters.

the field of the antenna due to proximity and the off-center-fed point. Small changes in transmission line length (such as 10 or 20 feet) can affect the SWR null depth and bandwidth of the antenna. The experimenter can take advantage of this effect to optimize his SWR curve. Minimum shield current will be achieved if the coax line is located at right angles to the antenna. AG9C achieved better than 2:1 SWR bandwidth over 300 kHz with both antennas.

### Balun Loss

This antenna is subject to balun loss, as is any other antenna using a balun of this type (refer to fig. 2). Near resonance, feedpoint impedance is low

compared to balun loss impedance. Hence balun loss is low. Off-resonance, antenna impedance is higher than the balun loss impedance and a portion of the RF power is absorbed by the balun.

Studies are underway to determine balun loss at various load impedances. Balun power loss should not deter the user of the antenna, as other matching and resonating techniques, such as loading coils, also exhibit a degree of loss.

Ground loss is incurred with any low, short antenna because of lowered radiation resistance leading to conductor loss and increased near-field loss produced by higher antenna current.

Having said that, AG9C finds the antenna works, and works well. He esti-

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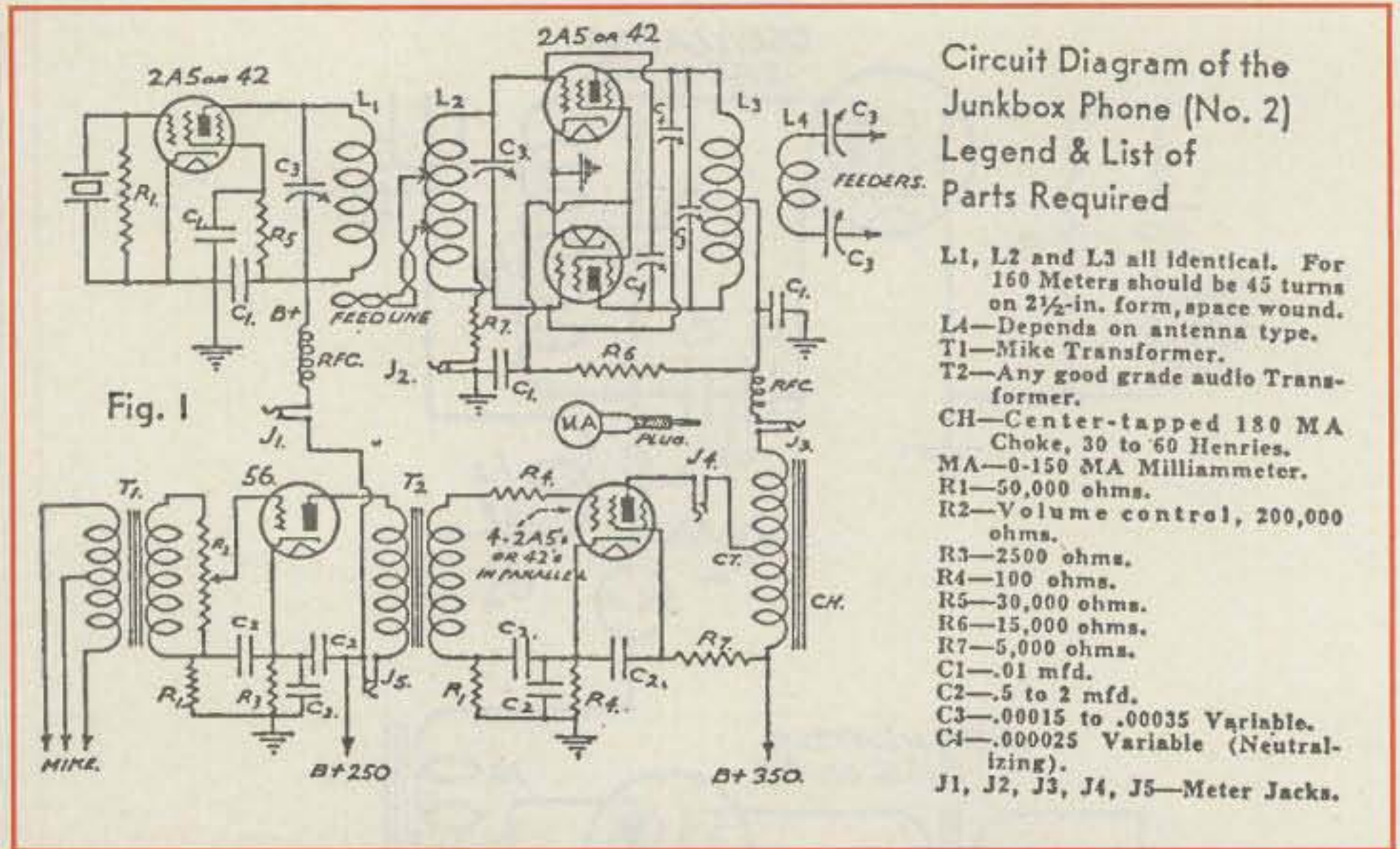


Fig. 4—The high-power "junk-box phone."

mates the 66 foot version radiates a signal approximately one-half to one S-unit less than a full-size dipole at the same height. That's not a bad trade-off for a small antenna.

### The "Junk Box Phone"

The late 1930s were difficult times for new amateurs. Dollars were scarce and components were expensive. A lot of thought went into the concept of an inexpensive phone for 160 meter operation. This was where a majority of newly licensed amateurs took their tentative first steps into the exciting radio world.

Responding to this desire, *Radio* magazine<sup>2</sup> instituted the "Radiotelephony" column by J. Hawkins, W6AAR. Each month an inexpensive beginner's AM phone rig was described in detail, along with tuning instructions.

The January 1934 issue of the magazine featured a two-tube 160 meter phone that provided a modulated carrier of about 4 watts (fig. 3). With a 135 foot Marconi antenna an operating range of about 20 miles was possible during the afternoon hours.

The circuit is extremely simple. A tetrode crystal-controlled oscillator is plate modulated by a second tetrode. A

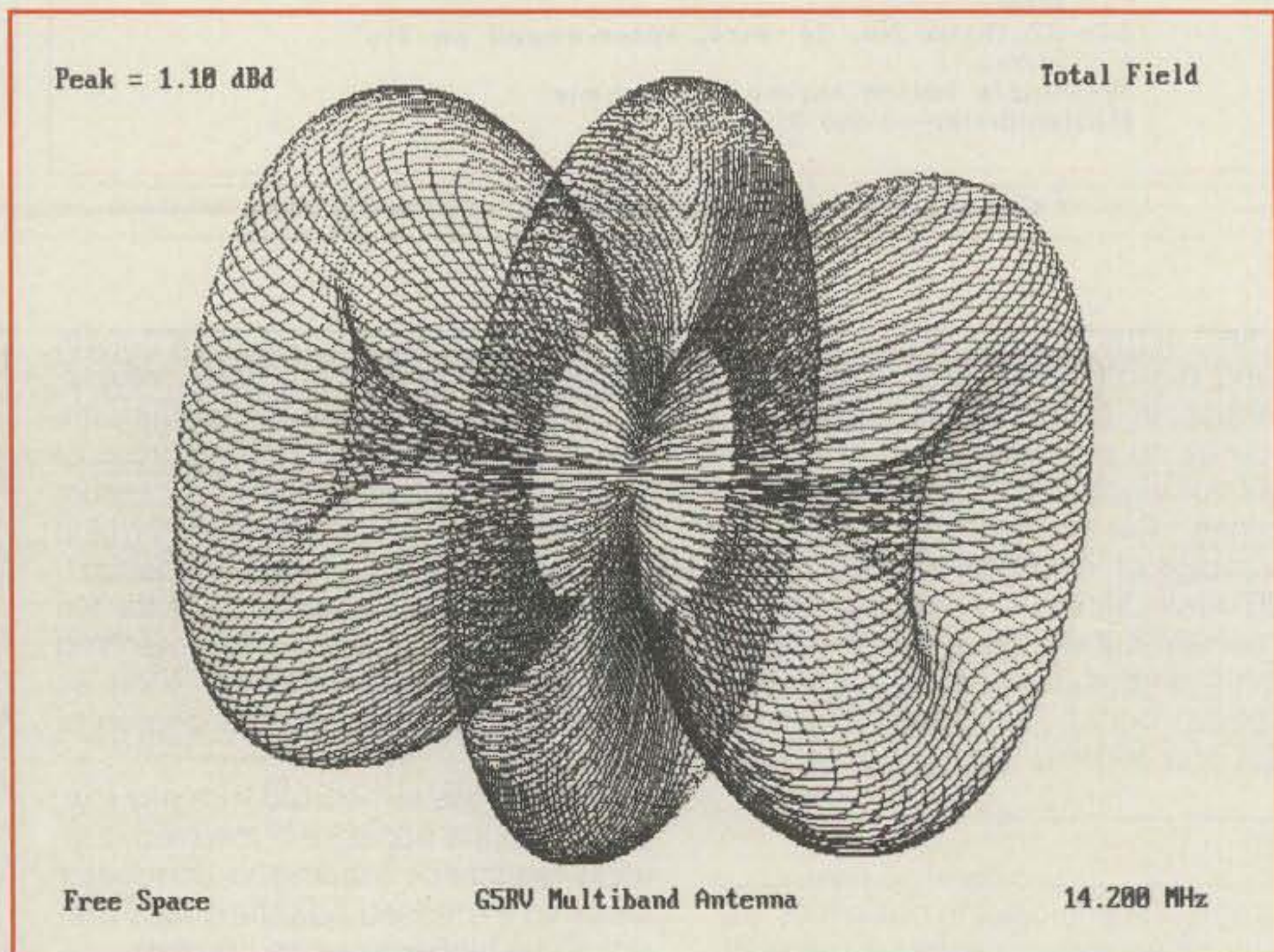


Fig. 5—Three-D printout of G5RV on 20 meters.

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single-button carbon microphone running at 6 volts provides plenty of audio drive for the modulator. A center-tap audio choke couples the modulator to the oscillator. A level of about 80 percent modulation can be reached before the signal starts to break up. By adjusting oscillator tuning and varying the distance between operator and microphone, a reasonable-sounding signal can be achieved.

The single-button microphone was often "requisitioned" from a pay telephone booth. The frequency control crystal, on the other hand, had to be purchased for about three dollars. Some amateurs ground their own crystal from a rough blank. The rest of the parts could be obtained from a junked broadcast receiver. Two inexpensive receiving-type tubes plus a few parts and the builder was ready to go on the air!

Since used tubes could be obtained for less than a dime, it was natural that most beginners added more tubes for a more powerful transmitter. The next step up was shown in the February 1934 issue of *Radio*. Seven tetrodes were used: an oscillator, two in push-pull as an amplifier, and four in parallel as a modulator. An additional triode tube served as a speech amplifier, and a double-button carbon microphone was used for improved voice quality (fig. 4). Other refinements, such as interstage

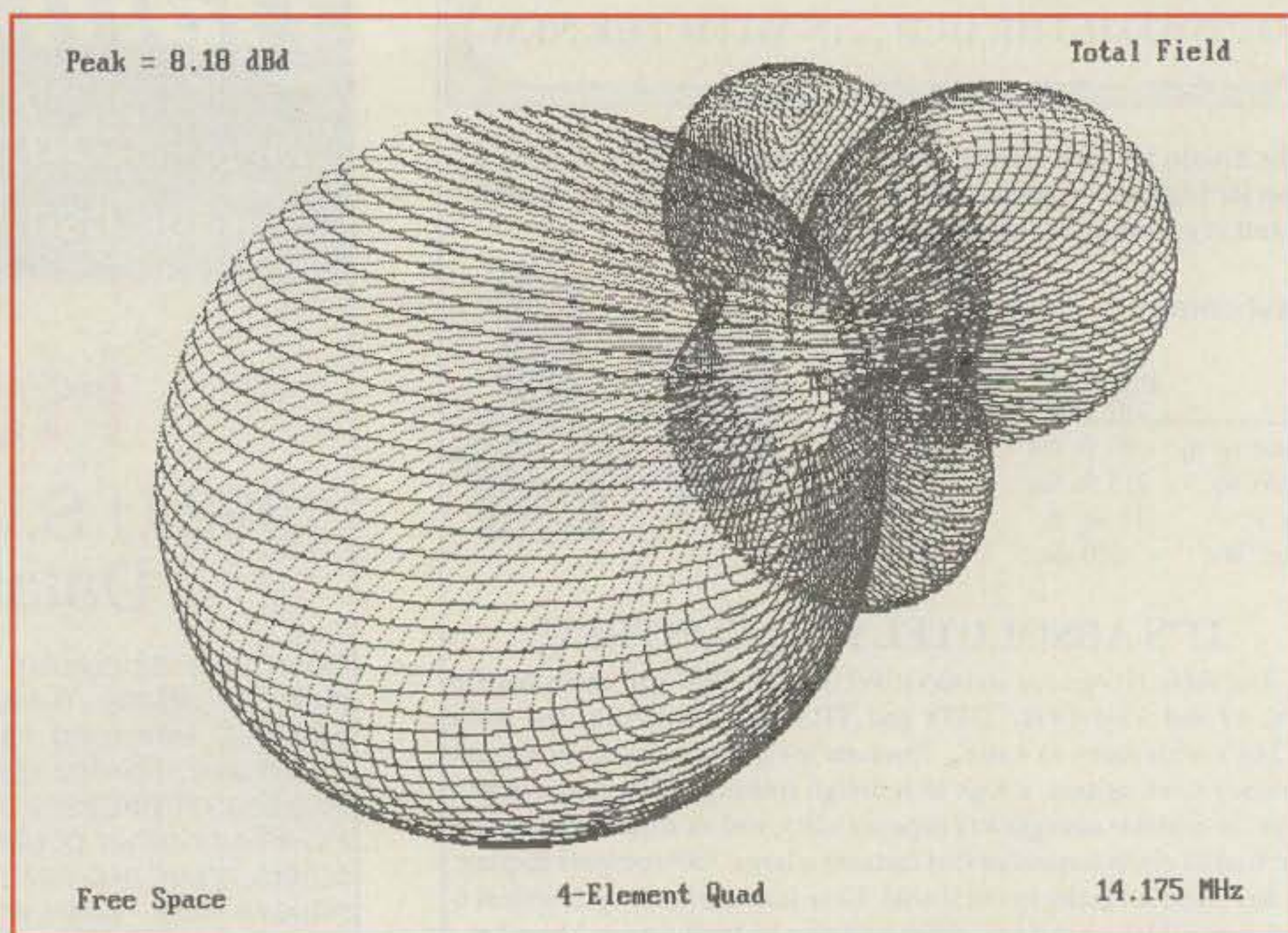


Fig. 6—Three-D printout showing vertical side lobes of quad.

link coupling and meter jacks were included in the design. Power output was about 20 watts, fully modulated. This was a real rock-crusher! After having built and operated this design, the experimenter eagerly awaited the next issue of *Radio* for the newest and latest

version of an upgraded "Junk Box" phone.

### Antenna Optimization

Back in the Good Ole Days antenna tuning and adjustment was done on a hit-or-miss basis. Serious amateurs with field strength meters fiddled with their beam antennas to try to achieve maximum meter reading. Others twirled their beams about, measuring front-to-back ratio. Most just gave up and cut their antennas to predetermined dimensions and let it go at that.

Over the years it became apparent that most Yagi beams were quite forgiving as long as the user did not demand too much. Forward gain was easy to obtain. In most cases, it was not the maximum value available, but it seemed sufficient. Good front-to-back ratio, however, was another matter. It was not easy to achieve. Most beam users ignored it and accepted whatever their antenna provided in the way of rear-signal rejection. In many cases it was pretty poor.

### Antenna Analysis Programs

The advent of the home computer changed all this. In 1970 the Antenna Modeling Program (AMP) was developed for the Naval Research Laboratories. It was later upgraded and renamed NEC (Numerical Electromagnetic Code), one of the first of many computer codes for HF and VHF antenna design. NEC was developed in 1981 and has evolved over time to include features useful in modeling large or

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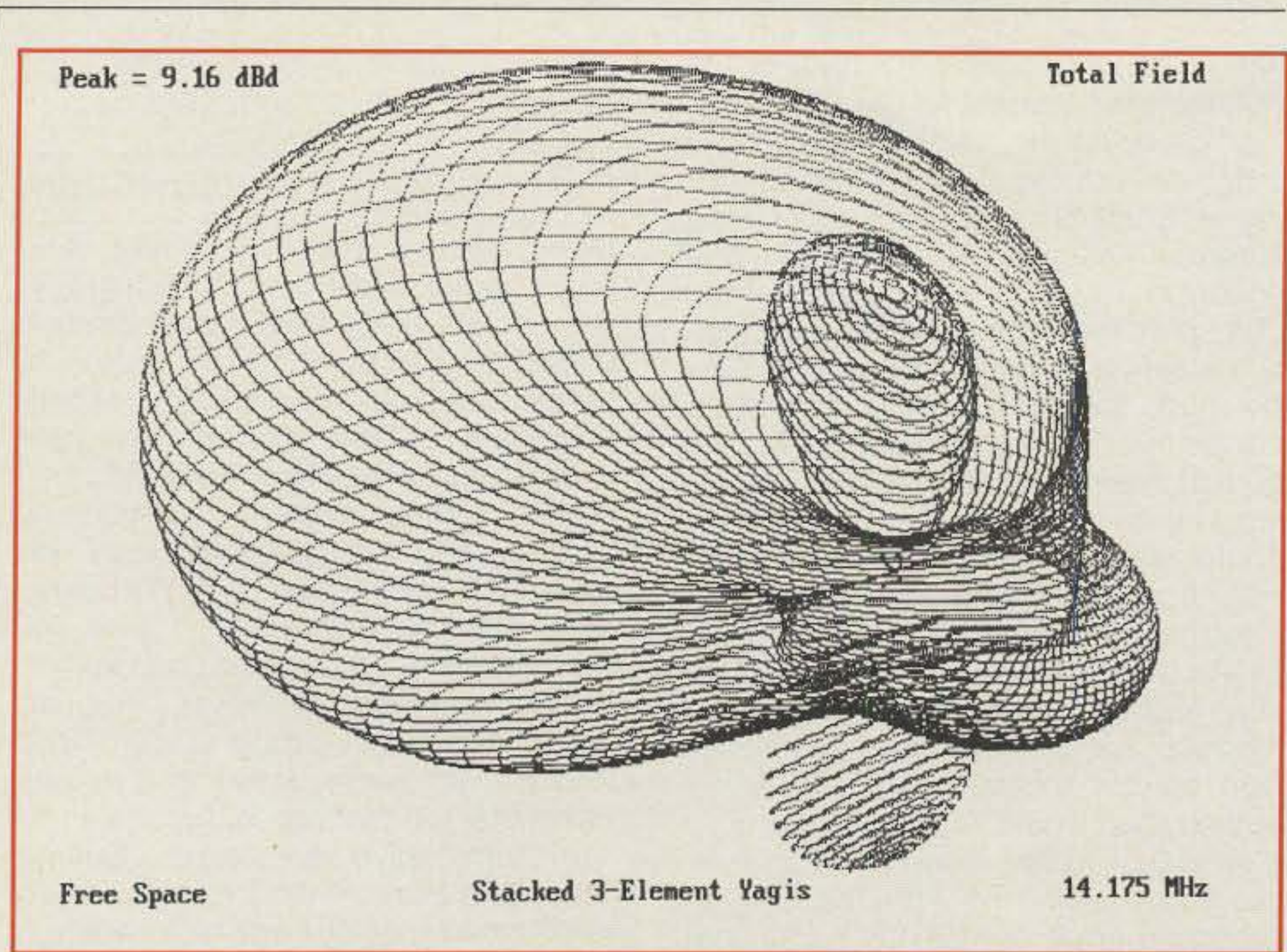


Fig. 7—Three-D printout showing complex field of stacked Yagis.

small antennas. The programs are very extensive and most of them are not user-friendly.

Some years ago a simplified version of NEC was made available for personal computer (PC) users. The stripped-down version of this program was known as MININEC and was designed for keyboard entry on a PC. The program had less capacity than NEC, but was sufficient to analyze most amateur antennas of limited complexity.

Over the years certain problems appeared in both NEC and MININEC. The NEC program had problems with tapered elements, such as are commonly used in Yagi antennas. NEC introduced an unwanted frequency offset and variations in currents and phasing into the solution. MININEC also exhibited frequency offset and, while it worked okay with tapered elements, it didn't like bent-wire elements, such as in a cubical quad.

Work has been done recently with both programs to nullify these glitches. Some programs, available to experimenters, take advantage of the attributes of both NEC and MININEC, while avoiding the shortcomings of both.

### Yagi Optimizer Program (YO 5)

One outgrowth of the MININEC program is a Yagi antenna optimizing program, whereby the user specifies certain desired antenna characteristics (forward gain, front-to-back ratio, input impedance, etc.) and the computer iterates the program until the desired

design is achieved. One of the most effective and well-known programs of this type is the YO 5 Optimizer, developed by Brian Beezley, K6STI<sup>3</sup>. This program automatically optimizes mono-band Yagi designs for maximum gain, pattern quality, and minimum SWR. It is specifically designed for the Yagi and produces excellent results. It does not, however, work with other antenna types such as the quad or phased arrays.

### New Antenna Optimizing Program (AO 5)

Recently K6STI has announced a new antenna optimization program that will accept arbitrary-geometry antennas as well as Yagis. Called AO 5, the program is a combination of advanced MININEC and the YO optimizer. Antenna optimization now is free of the Yagi-only restraint of other available programs.

This opens up a whole new world of antenna analysis. Even stacked and interlaced arrays can be analyzed and automatically optimized according to the specifications inputted to the program by the user.

Of great interest is the so-called 3D (three dimension) graphic feature of the program. A 3D representation of the radiation pattern of the G5RV antenna is shown in fig. 5. The antenna is viewed at a slight angle to enhance the 3D effect. Normal 2D representation is also provided.

Another 3D printout is shown in fig. 6. This is the pattern of a 4-element quad. The front and back lobes are clearly visible, as are the small, vertically polar-

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ized lobes existing at right angles to the main pattern. The 3D pattern of stacked 3-element Yagis is shown in fig. 7. (Note that these are all free-space patterns.)

The AO program uses symbolic dimensions which allow the user to quickly make changes in the antenna structure without a lot of keyboard manipulation. It is fascinating to input your chosen antenna dimensions and then ask the program to optimize for maximum gain, front-to-back ratio, optimum input impedance, maximum SWR bandwidth, or a combination of these factors.

The user quickly learns that there is no free lunch in beam antenna design. Maximum antenna gain means poorer front-to-back ratio, restricted bandwidth, and low input impedance. Some degree of gain must be sacrificed to provide usable values of the other parameters. The trade-off ability of the AO program allows the user to juggle these

attributes until he achieves the antenna parameters he wants.

I must admit the fascination of the AO program seduces the user into spending a great deal of time examining antenna designs at leisure. On one occasion, my XYL, exasperated at the OM spending hours fiddling with various antenna designs, exclaimed, "Why don't you forget that computer and go out and flirt with other women, like any normal male?" It was difficult to explain the lure of antenna optimization. How could she understand that an optimized, narrow-bandwidth 2-element Yagi could provide almost as much gain as a popular 4-element Yagi design? No way. And telling her about polar and rectangular plots, skin-effect modeling, wire current displays, and automatic optimization would fall on deaf ears.

Needless to say, taken in moderation like a fine wine, the Antenna Optimization program of K6STI is a valuable

adjunct to any amateur station having a modern DOS-driven computer.

## Getting Started in Ham Radio

Many newly-licensed amateurs have only a vague idea of what amateur radio is all about, aside from the information picked up from friends and magazines. Local clubs help and on-the-air experience is invaluable. Much of the ham lingo is incomprehensible to the newcomer. I know. When I received my license, long ago, there was only one amateur in town, and he wasn't about to help a brash newcomer. I built my receiver and a little junk-box transmitter. It took two weeks to work my first station, after hours of calling. Once I made contact with some active and helpful amateurs, the rest was easy.

An informative video tape, "Getting Started in Ham Radio," has just been announced by CQ. I was lucky enough to get a copy of the tape and quickly played it, before it was snatched away as a training tool by a local radio club.

It's a fun tape! Even a jaded old-timer will enjoy it. It has plenty of live action showing on-the-air operation and walks the viewer through the pains and uncertainty of setting up his first station.

The production was created by three-time Emmy Award winning producer Richard Mosesson, NW2L, and he and his crew did a bang-up job. I thoroughly enjoyed the tape and suggest that it is a great thing to have at hand when you are accosted by someone who wants to know all about ham radio in 50 minutes.

I wish something like this had been available when, the proud possessor of a new ticket, I made my first attempts to build a rig, get it going, and make an antenna work. Alas, few build rigs these days, but the problems of antennas and getting a station on the air are still here. The new video tape is a great aid in solving these difficulties!

## Footnotes

1. W2DU-type baluns are available from Certified Communications, 261 Pittman Rd., Landrum, SC 29336; Unadilla Antenna Mfg. Co., Box 4125, Andover, MA 01810; Amidon Associates, 2216 East Gladwick St., Dominguez Hills, CA 90220; and Amateur Electronic Supply (AES) outlets.

2. *Radio* magazine commenced publication in 1917, in San Francisco, California. It passed through various stages and in 1933 became a publication devoted to amateur radio. It continued until World War II, at which time it ceased publication.

3. Brian Beezley, K6STI, 507-1/2 Taylor St., Vista, CA 92084.

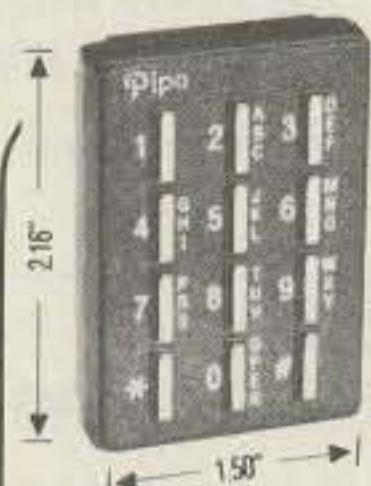
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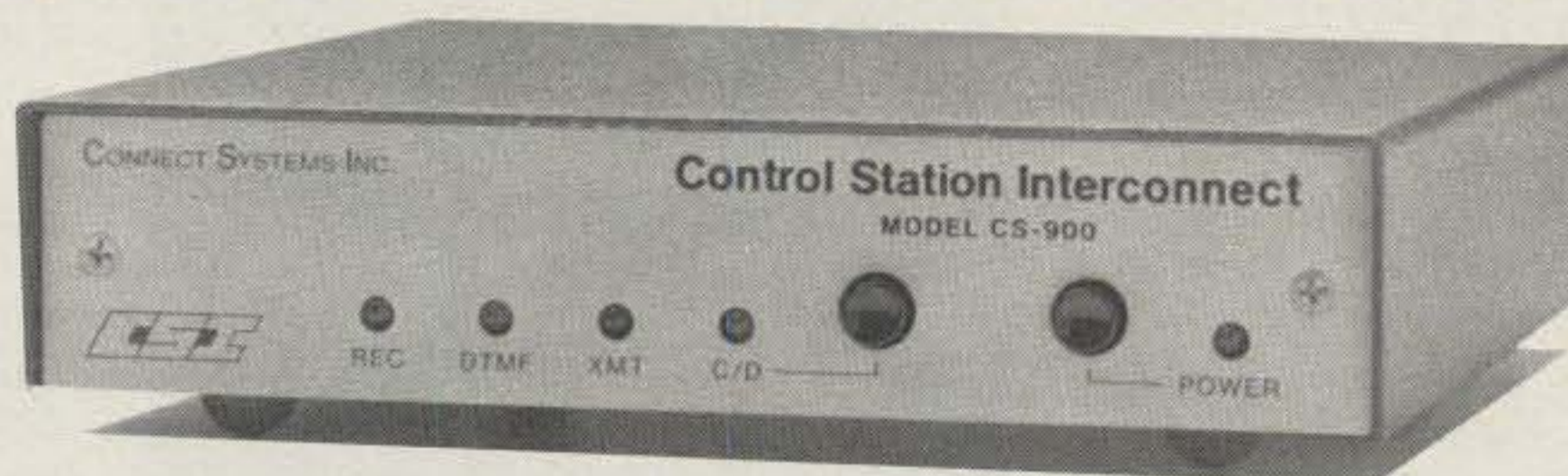
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## NEWS OF COMMUNICATION AROUND THE WORLD

*The "More Wanted" Countries*

**T**he 100 Most Wanted DXCC Countries list is a very popular document. Potential DXpeditioners, DX Foundations, and equipment manufacturers pore over the list, seeking possible spots to activate and operations to fund or support. However, an amateur operation from most of the countries on the Most Wanted list is out of the question for all but the best-equipped and best-connected DXpeditioners. Many more casual DXpeditioners are looking to visit and put on the air places that are in demand, but still within the possible range. These might be called the "More Wanted" countries.

In its annual Most Wanted countries survey, *The DX Magazine* also compiles information on the More Wanted. DXers who complete and return the computer-graded Most Wanted survey are invited to indicate those countries which they "need," but which are not on the Most Wanted survey. These data must then be compiled by hand, a time-consuming process. However, the results are finally in, and DXers can look at the following list of the More Wanted to find potential DXpedition sites within the range of the average DXpeditioner.

The complete list of some 325 DXCC countries breaks down rather clearly into four categories. (The exact number of DXCC countries depends on timing; the number of countries on the list varies as countries are added and deleted.) The first category is the "Not Wanted." The DXers returning the Most Wanted survey forms had an average of 280 countries confirmed. These are obviously accomplished DXers. Some 160 DXCC countries received no more than a single vote as needed. Essentially all European, North and South American, and Caribbean countries fall into this Not Wanted category, with a few exceptions noted below.

This is not to say that a DXpedition to one of the Not Wanted countries will call endless unanswered CQs. A trip to any country that doesn't have a reasonable population of active amateurs on the HF bands can easily result in thousands of contacts. When I lived all the time on Montserrat, I made some 85,000 con-



*Luis Mathieu, HP1ALX, operates from this well-appointed shack in Panama.*

tacts as VP2ML. Yet I still generated enormous pile-ups when I came on the air. When I remarked that I thought I had worked everyone who wanted Montserrat, one DXer pointed out that DXers breed faster than I can work them. That is, there are more new amateurs and those new to DXing coming on the air every day to work them all. So merely because a country is in the Not Wanted list shouldn't preclude a casual DXpedition. You might not work very many DXers who have more than 250 countries confirmed, but you can make many thousands of QSOs, and experience the thrill of being on the other end of a pile-up.

Getting back to the More Wanted: In addition to the Most Wanted and the Not Wanted, the middle group of More Wanted countries divides into those needed by 10 to 20 percent of DXers responding to the survey, and those needed by less than 10 percent. The former group contains countries that are in about as much demand as the bottom 25 of the Most Wanted list. In fact, many of these countries will appear on the 1993 Most Wanted survey, so the "need" for same can be analyzed in more detail.

The Most Wanted of the More Wanted is **Cameroon TJ**. Casual research doesn't reveal any obvious problems with amateur operations from this African country. However, there has been only limited activity from Cameroon in recent years. Perhaps this would be a good target for a French-speaking DXpedition team.

The next More Wanted country is

neighboring **Equatorial Guinea 3C**. 3C1EA is sporadically active, and Eric, SMØAGD, recently operated from 3C on his way to Annobon 3CØ. Amateur licensing doesn't appear to be a problem, as shown by both SMØAGD and an offer by a frequent visitor to Equatorial Guinea to host a multi-member DXpedition. Ability to speak Spanish would be useful here.

The **Maldives 8Q** rank next on the More Wanted list. Again, licensing does not appear to be a problem. The Maldives do have fine tourist facilities, and many DXers (especially Japanese operators) stage limited-scale operations from the island chain. The Maldives are somewhat remote and expensive to visit and a long haul from the US, but they should be higher on DXpeditioners' planning lists than at present.

**Mali TZ** is yet another African country on the More Wanted list, especially on CW. TZ6VV is probably the most consistently active station, with other TZ stations sometimes showing up in SSB nets. A French-speaking DXpeditioner might consider an extended operation favoring CW from this poor country.

Number 5 on the More Wanted is **St. Helena ZD7**, in the South Atlantic. A handful of ZD7's are sometimes available on SSB nets, but CW activity has been scarce. Since the resident population of the island is so small (about 7000 inhabitants), perhaps the best bet to get St. Helena off the More Wanted list would be for a UK amateur to wrangle a tour of duty there.

**Pitcairn Island VR6** was in the sixth position on the More Wanted list when the survey was conducted last summer. This is despite what is probably the highest percentage of amateurs among the resident population of any country! At least four of the 68 residents have amateur licenses and are active on a regular basis. However, CW activity has been minimal. Fortunately, two Japanese operators chose Pitcairn for an extended stay in early 1993. Nob Ichino, WK3D, and Hiro, VK4CPU, spent about two months on the island operating VR6JJ and VR6BB as power availability permitted. Pitcairn should move well down the More Wanted list in the 1993 survey.

**Walvis Bay ZS9** is yet another African

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## The WPX Program

### SSB

2361.....ON6CQ 2362.....11WXY

### CW

2771.....KF4FP 2773.....11WXY  
2772.....WD80

### WPNX

278.....KD4GLC

Mixed: 450 W2EZ, WD80, KB2R, 500 W2EZ, WD80, 700 K1CVF, 950 IT9BCC, HP2CWB, 1050 HB9DDZ, 1200 KU0A, 1450 KA0ZFX, 1500 WB2ABD, 1550 WB2ABD, 1600 W3KH, 1650 W3KH, 2000 WB2YQH, 2250 HA0HW, 2900 W2FXA, 3000 SM3EVR.

SSB: 350 WB4UMQ, 400 CP1FF, 450 CP1FF, 500 N1IBQ, N3DRO, CP1FF, 550 VE2DRN, KD5ZD, CP1FF, 600 VE2DRN, VE1RJ, CP1FF, 650 VE2DRN, CP1FF, 700 VE2DRN, CP1FF, 750 VE2DRN, CP1FF, 800 CP1FF, 900 HP2CWB, 1050 NG9L, IK2AEQ, 1100 NG9L, KU0A, 1250 EA3BD, 1300 EA5BD, 1350 EA5BD, 1400 EA5BD, 1450 EA5BD, 2500 NJ0C.

CW: 450 WA8DFF, 500 EA2CKP, 700 HB9DDZ, 850 W4UW, IK0ADY, 900 IK0ADY, 950 IK0ADY, 1000 IK0ADY, 1050 IK0ADY, 1100 IK0ADY, 1150 IK0ADY, 1200 IK0ADY, 1900 K8MFO, 1950 K8MFO, 2450 N2AC.

10 Meters: 11WXY  
15 Meters: KT2C, 11WXY  
20 Meters: KT2C, 11WXY, N3DRO  
40 Meters: KT2C, 11WXY  
80 Meters: N6IBP, KT2C, 11WXY

So. Amer: KF7RU, KT2C, 11WXY  
Europe: N1IBQ, KB2R

Award of Excellence: 11WXY

**Award of Excellence Plaque Holders:** 18YRK, W4CRW, SM8AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4OX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GO, VK9NS, DE8DXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, W4BQY, I8JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, H18LC, KA5W, K8JN, W4VQ, KF2O, K3UA, HA8XX, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QM, EA7OH, K2POF, DJ4XA, IT9TQH, W8ILC, K2POA, N6JV, W2HG, ONL-4003, VE7DP, K9BG, W5AWT, KB0G, HB9CSA, F6BVB, W1BWS, YU7SF, G4BUE, N3ED, DF1SD, K7CU, I1POR, LU3YL/W4, NN4Q, KA3A, YB0TK, VE7WJ, VE7IG, K9QRF, YU2NA, N2AC, W4UW, NX0I, W9NUF, N4NX, SM0DJZ, DK5AD, WB4RUA, DK5AD, WD9IC, W3ARK, I6DQE, LA7JO, VK4SS, K6JG, I1EEW, I8RFD, I3CRW, VE3FXR, N4MM, KC7EM, ZS6BCR, CT1YH, IV3PVD, KA5RNH, ZP5JCY, F1HWW, KC8PG, NE4F, VE3MS, K9LJN.

**Award of Excellence Plaque Holders with 160 Meter Endorsement:** FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, PY2DBU, W3ARK, H18LC, KA5W, UR2QD, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM8AJU, KF2O, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, IT9TQH, DL9RK, N6JV, ONL-4003, W1JR, W6OUL, W5AWT, KB0G, F6BVB, W4BQY, YU7SF, W5UR, N4NO, DF1SD, K7CU, I1POR, W8RSW, N4KE, I2UIY, YB0TK, W8ILC, W1BWS, VE7WJ, K9QRF, NN4Q, W4UW, K9OFR, NX0I, G4BUE, LU3YL/W4, I4EAT, WB4RUA, VE7WJ, N4NX, DE8DXM, VE7IG, K9BG, I1EEW, AB9O, CT1YH, IV3PVD, KA5RNH, ZP5JCV.

Complete rules and application forms may be obtained by sending a business-size self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to: "CQ WPX Awards," 880, CR13, Clovis, NM 88101-9511 USA.



Alberto Simao, XX9AS, is one of the most active amateurs from the More Wanted country of Macao. (Thanks to CT1EEB for the photo.)

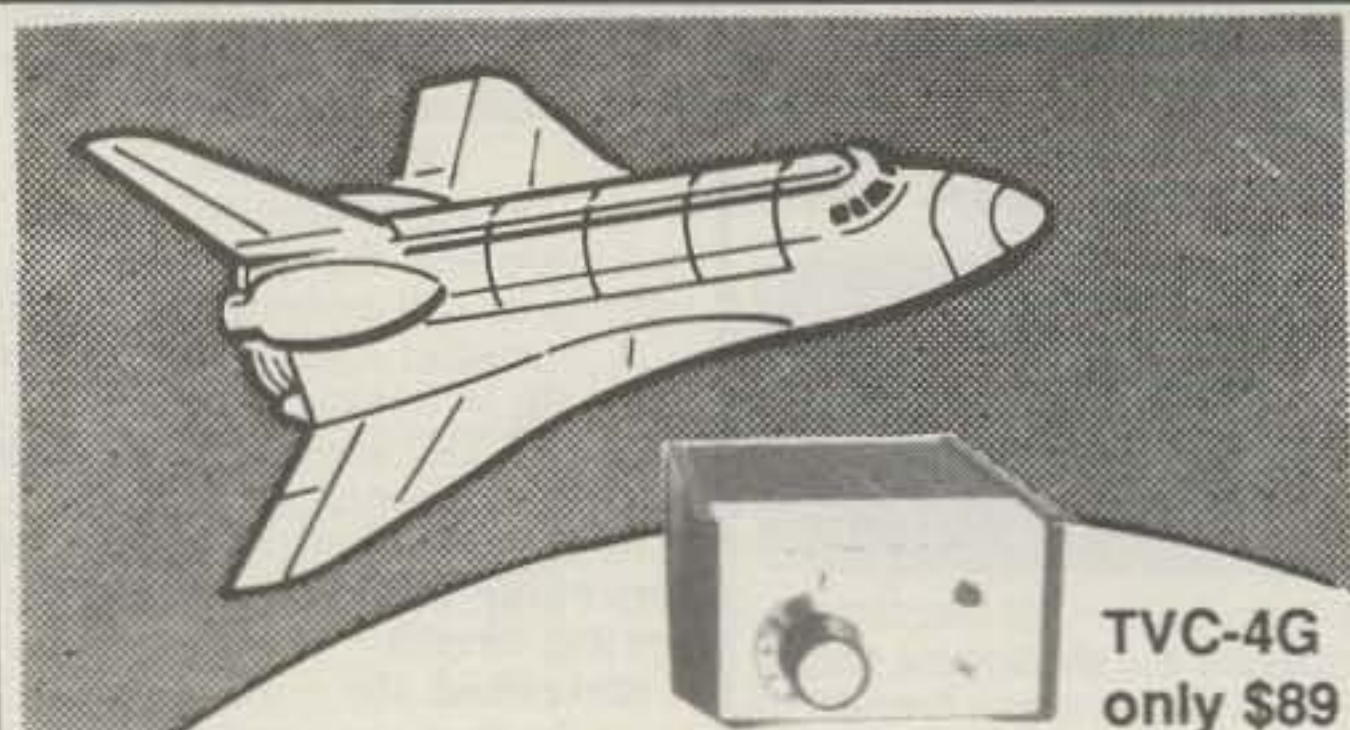
that may well lead to its deletion as a separate DXCC entity. Potential DX-peditioners should set up an operation soon, before it is too late.

The tiny country of **Monaco 3A** is one of the very few European countries on the Most or More Wanted lists. The country is only about a mile long, and boasts the distinction of being the second smallest independent state in the world. (Can you guess the smallest? It's the country with lowest birth rate in the world.) Monaco is a very popular resort, and gets about 25 percent of its annual income from tourism. However, too

country on the list. Resident ZS9A has been joined by several teams of visitors, including Chris Burger, ZS6EZ, Martti Laine, OH2BH, and the Colvins in recent years since the enclave gained sepa-

rate DXCC country status. However, Ian seldom works the long path to the West Coast and isn't heard on CW. Surrounding Namibia is negotiating to take over this important port city, an action

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many visiting amateurs have abused their license privileges, caused interference to the wealthy residents, and upset the local amateurs. The actions of a few bad apples have made 3A licenses harder to obtain. A well-organized team of diplomatic DXers, including some experienced CW operators, could make a real dent in the demand for Monaco.

**Guinea 3X** is the next on the More Wanted list. 3XØHNU and 3XØHLU are the only active stations from this former French colony in western Africa. Political problems may limit the availability of amateur licenses. The ability to speak French would be very helpful in any proposed Guinea operation.

Rounding out the Top Ten More Wanted is **Bahrain A9**. KI3V operated from Bahrain as A92FN during Desert Storm, but otherwise A9 contacts have been extremely limited. As with many other Persian Gulf countries, CW activity has been in especially short supply. A potential DXpeditioner would need some sort of local contact to obtain operating permission, but the possibility seems worth exploring.

There are several countries in the rest of the More Wanted list that won't be there in the 1993 survey. **Mozambique C9** is now well represented by C9RJJ and a host of others. Once a Most Wanted country, Mozambique is rapidly moving into the Not Wanted category.

**Lebanon OD** is another semi-rare country that has enjoyed significant activity recently, as SP7LSE and SP1MHV have been extremely active during their UN tour in Lebanon, including lots of CW contacts. Look for Lebanon to drop significantly in the 1993 survey.

Other More Wanted countries that DXpeditioners might consider putting on the air are **Djibouti J2, Seychelles S7, Gibraltar ZB2, Crete SV9, and Docedanese SV5**. Other countries in the More Wanted list that may be more formidable targets include **Pakistan AP, Mayotte FH, Oman A4, Sudan ST, and San Felix CEØX**.

Moving down to the next group of the More Wanted countries, potential DXpeditioners find some opportunities close to home. **Haiti HH** and the **United Nations 4U1UN** are the only two North American countries on the list. The **Vatican HV** and **Andorra C3** are a couple of European countries that could use some additional activity.

Many of the More Wanted countries are regular tourist spots, and licensing is not a problem. Some of these include **Eastern Kiribati T32, Macao XX9, Lord Howe Island VK9L, Chatham Island ZL7, and Jordan JY**. Numerous African countries populate the More Wanted list, such as **Swaziland 3DA, Tanzania 5H, Nigeria 5N, Kenya 5Z, Lesotho 7P, Malawi 7Q, Morocco 7X, Zambia 9J,**

**Sierra Leone 9L, Botswana A2, Cape Verde D4, Central Africa TL, Namibia V5, and Zimbabwe Z2**. Many of these countries have at least one very active long-term resident operation, such as 3DAØBK, 5Z4FM, 7P8SR, 7Q7XX, 7Q7RM, 9J2BO, A22MN, D44BC, and Z21HS. Others are more sporadically represented on the bands.

Other possible More Wanted DX locations include **Guyana 8R, Kuwait 9K, the Malaysias 9M, Taiwan BV, Tonga A3, Thailand HS, Saudi Arabia HZ, Fernando de Noronha PYØ, and Wake Island KH9**. Good luck in planning your next DXpedition!

### May Activities

A couple of DXers will be hitting the DXpedition trail this month. Jakob Laib, HB9TL, will be operating from a variety of Pacific locations from May 5 to June 20. His planned itinerary includes stops at Papua New Guinea P2, Solomon Islands H4, Vanuatu YJ, Fiji 3D, Wallis FW, Tonga A3, Western Samoa 5W, and American Samoa KH8. He'll favor 32 kHz up on CW, and 14192, 14242, 18132, 18141, 21215, and 21275 kHz on SSB. QSL any contacts to his home address: Einfangstr. 39, 8580 Amriswil, Switzerland.

In late May some intrepid Islands On The Air (IOTA) DXpeditioners will

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### The WAZ Program

#### Single Band WAZ

##### 10 Meter SSB

450 ..... K2EEK 451 ..... KA2ANK

##### 20 Meter SSB

911 ..... KA8ZFX 914 ..... OE1KW  
912 ..... JR1DUP 915 ..... NU8Z  
913 ..... N7MLN

##### 15 Meter CW

241 ..... BV2TA

##### 20 Meter CW

429 ..... UC2WAZ 430 ..... DL6UNF

##### 80 Meter CW

34 ..... ON5NT

##### 17 Meter Mixed

16 ..... KB4SA

##### ALL CW

21 ..... HB9BGV 22 ..... W4DMT

##### RTTY

79—Mixed ..... WA7BPI

##### WNZ

9—Mixed ..... WB4UMQ (31 zones)

#### All Band WAZ

##### SSB

4003 ..... WB3D 4034 ..... DF5CT/A  
4029 ..... N5AHS 4035 ..... DK6WF  
4030 ..... W4DMT 4036 ..... KB3X  
4031 ..... K4LRX 4037 ..... WB5EUC  
4032 ..... KC4PCX 4038 ..... N4VRR  
4033 ..... NY3T

##### CW/Phone

7308 ..... NA2Q 7313 ..... KB3X (CW)  
7309 ..... DK8EE 7314 ..... SM6PRX  
7310 ..... WW8W 7315 ..... ZS4TX  
7311 ..... IK6FTZ 7316 ..... I8IYW (CW)  
7312 ..... DL4MDU

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 cents) size 4 1/4 x 9 1/2 to the WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Rd., Sudbury, MA 01776. Applicants forwarding QSL cards either direct to the WAZ manager or to a check point should include sufficient postage for safe return of their QSL cards. The processing fee for all CQ awards is \$4.00 for subscribers and \$10 for non-subscribers. Please make all checks payable to the Awards Manager. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application. Send any questions to K1MEM by mail and include an SASE (please do not telephone).

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Model 422	DC-30 Mhz.,	12KWPEP/6KWDC	\$72.00
Model 425	DC-54 Mhz.,	600WPEP/300DC	\$32.00
Model 426	DC-54 Mhz.,	6KWPEP/3KWDC	\$44.00

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Model 406	30 Meters	Model 412	6 Meters
Model 407	20 Meters	Model 413	2 Meters
Model 408	17 Meters		

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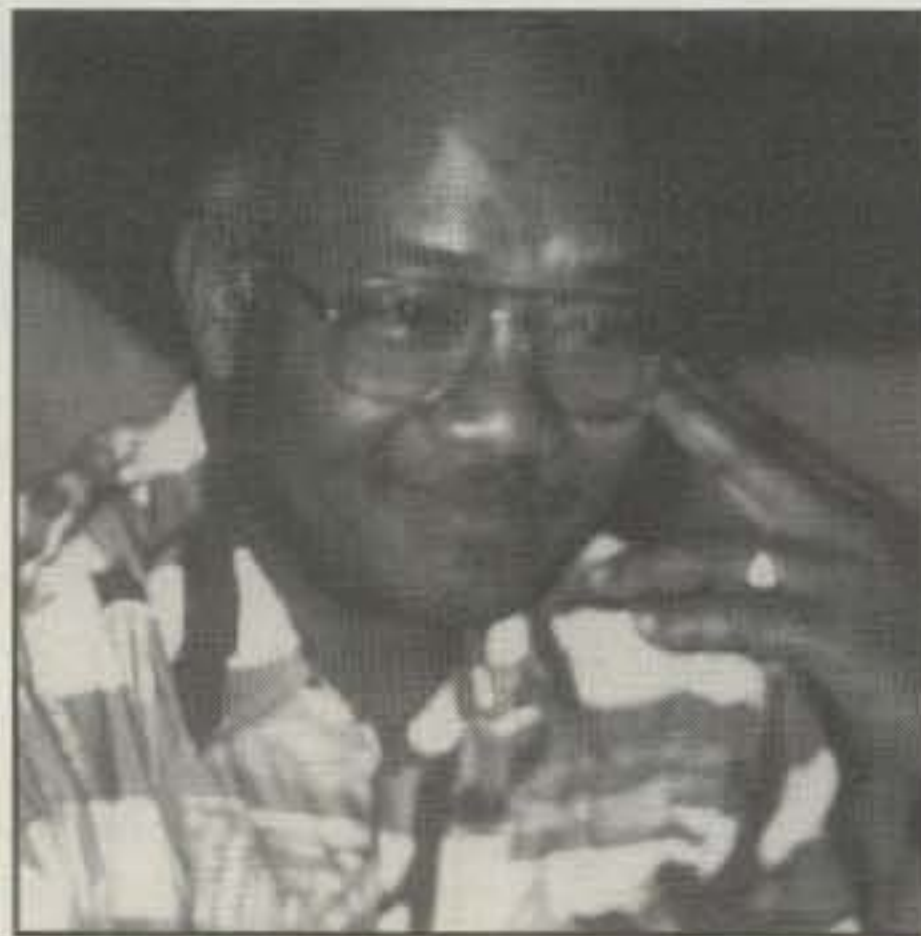
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John Fung-Loy, PA3CXC, operates from Most Wanted and More Wanted countries in Africa. (DK7PE photo)

information on this popular convention, contact Jim Fenstermaker, K9JF, 10312 NE 161st Avenue, Vancouver WA 98682.

### IRC Redemption

Many DXers "recycle" International Reply Coupons (IRCs) by sending them out with their QSL requests. However, sometimes stateside DXers attempt to exchange IRCs for postage at local post offices. Unfortunately, the majority of local post offices do not know how to properly handle such a request. A misleading memo has been cropping up in many local post offices, resulting in a tremendous misunderstanding of the exchange rate of valid IRCs. Perhaps this will help clear the air.

Any valid IRC, regardless of the date of sale, may be exchanged at any USPO for postage equal to the minimal airpost rate to another country. That is currently \$0.50. (A valid IRC is one of the current format, available since 1975, that is stamped by the issuing post office on the left side, and not stamped on the right.) The appropriate reference in the International Mail Manual is 392.3 (b). If your local post office won't agree to abide by this exchange rate, take your IRCs to another office, where the clerk can read and understand the IMM.

(In theory, IRCs sold in the US may be exchanged for postage equal to one penny less than the value printed on the IRC, but only by the original purchaser. This is usually interpreted as redeemable only at the post office of origin, and that place is stamped on the left side. In practice, don't count on this happening.)

Note also that you cannot get money for IRCs, only US postage. In fact, international regulations prohibit the resale of IRCs, a practice widely used by



Paul Young, K1XM, operated from the More Wanted country of the Seychelles as S79S in CQWW CW last year. Here he installs a low-band sloper on an handy water-tank tower.

DXers all over the world.

Again, if your local postal clerk won't give you \$0.50 in US stamps for your valid IRCs, go someplace else. Don't accept the incorrect interpretation floating around many post offices as to pro-

### 5 Band WAZ

As of January 31, 1993, 351 stations have attained the 200 zone level.

New recipients of 5 Band WAZ Award with all 200 zones confirmed:  
KB0G

The top contenders for 5 Band WAZ are:

N4WW, 199	W8SEY, 199
SP9PT, 199	N7RT, 199
K6YRA, 199	VE7AHA, 199
PY7ZZ, 199	W1FZ, 199
DL9WW, 199	IK2GNW, 199
K0CS, 199	W9CH, 199
AA4KT, 199	AC0M, 199
K7UR, 199	I8IGS, 198
K9EL, 199	SM6AHS, 198
NA0Y, 199	K1ST, 198
VE7DX, 199	4X4DK, 198
W0PGI, 199	UA3AGW, 198
W2YY, 199	KL7Y, 198
W9WAO, 199	VO1FB, 198
K6EID, 199	S59VM, 198
IK8CNT, 199	W6TC, 198
W1JR, 199	

The following have qualified for the basic 5 Band WAZ Award:

K4IQJ, 193 Zones  
AC0M, 199 Zones

811 Stations have attained the 150 zone level as of January 31, 1993.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 cents) size 4 1/4 x 9 1/2 to the WAZ Manager, Jim Dionne, K1MEM, 31 De Marco Rd., Sudbury, MA 01776. Applicants should include sufficient postage for safe return of their QSL cards. The processing fee for all CQ awards is \$4.00 for subscribers and \$10 for non-subscribers. Please make all checks payable to the Awards Manager. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application. Send any questions to K1MEM by mail and include an SASE (please do not telephone).



## CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries for the mode indicated. The ARRL DXCC Countries List is used as the country standard. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. Deleted countries do not count and are dropped from listing as they occur. Total countries are now 326. To remain on the CQ DX Honor Roll, annual updates are required. Honor Roll updates may be made at any time, in any number. Updates indicating "no change" will be accepted to meet the annual requirement. All updates must be accompanied by an SASE for confirmation. The fee for endorsement involving the issuance of a sticker is \$1.00.

### CW

K2TQC.....326	SM6CST.....323	K4XO.....321	N5FW.....318	KB8DB.....315	DJ2PJ.....311	K1HDO.....303	KA7T.....299	AA2X.....282
YU1HA.....326	AA4KT.....323	OK1MP.....321	N6CW.....318	F3TH.....315	W3BBL.....310	KB9XG.....303	OH3NM.....297	AG9S.....282
K3UA.....326	W2UE.....323	N2KW.....321	K8LJG.....318	K8NA.....314	K4CXY.....310	KY5DQ.....302	KA5TOF.....295	N3DON.....280
N4MM.....326	K1MEM.....323	EA2IA.....321	W7ULC.....318	ISXIM.....314	K2JF.....310	K9DDO.....302	WD9IX.....295	W2LZX.....279
K2FL.....325	K6JG.....323	W8SR.....320	AA6AA.....318	W1NG.....314	N4AH.....309	WA4DAN.....302	G3KMQ.....295	HB9AFI.....278
DL1PM.....325	K2OWE.....323	DL8CM.....320	I4EAT.....317	PA8XPQ.....314	W6DN.....308	W8XD.....301	NC9T.....295	KA3R.....277
WA4IUM.....324	K9BWO.....323	K9IW.....320	G4BWP.....317	KQ9W.....314	IT9VDO.....308	KA2DIV.....301	N1HN.....294	KF5PE.....277
W9DWO.....323	W6PT.....322	W9WAQ.....320	IT9ZGY.....317	I8WY.....314	W9RY.....307	K4JLD.....301	IK2LH.....293	WB6OKK.....277
ON4QX.....323	K9QVB.....322	W0HZ.....320	K8BV.....317	WD9IIC.....313	K4CYX.....307	VE7DX.....301	KB3X.....289	YV5ANT.....276
K6LEB.....323	K2ENT.....322	WB4RJA.....320	K9TI.....317	I2QMU.....313	K2JLA.....307	WA8YTM.....300	VE1RJ.....288	WG5G/QRP.....276
K9MM.....323	W2FXA.....322	N6AV.....319	WA8DXA.....316	IT9QDS.....312	K1VHS.....306	W6YQ.....300	W1WLW.....288	OZ5UR.....276
N4JF.....323	W0IZ.....322	SM3EVR.....319	AA5NK.....316	WA2HZR.....312	SM6CTQ.....305	KU8S.....300	W7IT.....287	W7UJ.....276
N6AR.....323	K9AB.....322	DL3RK.....319	N7MC.....316	W0JLC.....312	W8URM.....305	YU2TW.....300	WA9RCQ.....286	DF3FJ.....276
K4CEB.....323	KZ4V.....322	W1WAI.....319	W7CNL.....316	W4OEL.....312	N8MC.....303	G2FFO.....300	CT1YH.....284	4N7ZZ.....275
N4KG.....323	W4BOY.....321	WA4JTI.....319	N7RO.....316	IT9TOH.....311	WB5MTV.....303	NN4Q.....299	KP4P.....283	

### SSB

F9RM.....326	W9OKL.....323	VE7DX.....323	WA4DAN.....321	KB3OQ.....317	KA6V.....313	IN3ANE.....308	OE7SEL.....300	VE3IMO.....283
W8YDB.....326	W6EUF.....323	K4POV.....323	AA6AA.....321	SM6CST.....317	AA6BB.....313	KB8O.....308	N6PTI.....300	XE1LI.....283
YU1HA.....326	OA4OS.....323	CX4HS.....323	K7LAY.....321	KU9I.....317	W1LOQ.....313	W8URM.....308	I8IGS.....299	AB4UF.....283
K4MZU.....326	W3AZD.....323	I4LCK.....323	KB3X.....321	WA4WTG.....317	W4SSU.....313	K3NEE.....308	VE4AT.....299	EI6FR.....283
W4NKI.....326	ZL3NS.....323	VK4LC.....323	KE4HX.....321	YV1CLM.....317	I8INW.....307	N6AV.....307	K5DUT.....299	WA9BXB.....282
KS0Z.....326	K4XO.....323	N2KW.....323	WA4ECA.....320	IK1GPG.....317	W5XQ.....313	WA2FKF.....307	I2ZGC.....299	WK3N.....282
K2FL.....326	ZL1AGO.....323	K2JF.....323	KR9O.....320	I8LEL.....316	W7ULC.....313	WD5P.....307	N1CWA.....299	YB3CEV.....282
K2TQC.....326	N4KG.....323	I2QMU.....323	IT9TGO.....320	KC8EU.....316	LU7HJM.....313	TI2TEB.....307	NW5K.....299	N5HSF.....282
VE1YX.....326	W4UW.....323	AA5NK.....323	K9QVB.....320	W6SN.....316	K8CMO.....312	VE3DLR.....307	WB6GFJ.....299	YC3OSE.....282
W4DPS.....326	DL6KG.....323	W7OM.....322	W6DN.....320	AG9S.....316	TI2KD.....312	F6BFJ.....306	KB2FC.....298	TG9EP.....281
DL9OH.....326	K9BWO.....323	I8KCI.....322	KB5FU.....320	K8ZZU.....316	K8NWD.....312	WA2MID.....306	4N7ZZ.....298	VE3NUP.....281
K3UA.....326	K2ENT.....323	SV1ADG.....322	W3GG.....320	DU1RG.....316	KC4MJ.....312	XE1MDX.....306	SV8CS.....298	KA1LMR.....281
WA4IUM.....326	WB1DQC.....323	K2JF.....322	AA4AH.....320	KV2S.....316	K8YVI.....312	VK3JF.....306	WA8TKJ.....298	KD5ZD.....281
W9SS.....326	AA4KT.....323	ZS6LW.....322	NJ2C.....320	N4WF.....316	ZS6BBY.....312	NAKE.....305	KF5DX.....297	WF9QI.....281
N4MM.....326	OE3WWB.....323	OE2EGL.....322	G4GED.....320	W5LLU.....316	N6CGB.....312	K3LUE.....305	NP4CC.....297	VU2DVP.....281
K5OVC.....326	WA3HUP.....323	WB3DNA.....322	NJ8C.....320	YT7DX.....316	WA9IVU.....312	NC9T.....305	VE3CKP.....297	WB/DL2SCA.....281
EA2IA.....325	W8MGO.....323	I8AMU.....322	W7FP.....320	WA9RCQ.....316	KA5TOF.....312	WA6DTG.....305	XE1OW.....296	N8HUR.....280
K2JLA.....325	K9HDZ.....323	K4CYX.....322	W7EHI.....320	WE2L.....316	KB7VD.....312	WF9K.....305	EA5RJ.....296	NX0I.....280
KB8DB.....325	K0GT.....323	KF7SH.....322	NY5L.....320	KB9OC.....316	WD0BNC.....312	YV5IVB.....305	HP1JC.....296	YU1TR.....280
N7RO.....325	K4MQG.....323	I8AA.....322	EA1QF.....320	W6MFC.....316	I2MQP.....311	NI5D.....305	I4CSP.....295	WN5K.....279
A18M.....325	KZ2P.....323	K9AB.....322	WB5TED.....319	KF5AR.....316	NN4Q.....311	EA1QF.....304	VE3XO.....294	WB8TLI.....279
KZ4V.....324	IT9ZGY.....323	VE2WY.....322	XE1CI.....319	K4JLD.....316	IK2GNW.....311	K4RIG.....304	EA3KW.....294	K5AOL.....279
WZ4I.....324	4Z4DX.....323	K8NA.....322	IT9TOH.....319	N4KEL/M.....316	K0HQW.....311	KB1JU.....304	W0IYR.....294	VU2CVP.....278
DJ9ZB.....323	OK1MP.....323	KS2I.....322	CX1TE.....319	KI3L.....315	N1ALR.....311	ZL1BOQ.....304	WD9IIC.....293	K4BYK.....277
W9DWO.....323	W4UNP.....323	W8SR.....322	IK8GCS.....319	KB2HK.....315	XE1ZLW.....311	EA3EQT.....304	IT9VDO.....293	WA9BDX.....277
W4EEE.....323	YV5CWO.....323	KD8V.....322	W9JT.....319	W0LSD.....315	KB2MY.....311	N5ORT.....304	TI2LTA.....292	WB0UFL.....277
W2SUA.....323	K8LJG.....323	G4ADD.....322	W6NLG.....319	IK7DBB.....315	KD5ZM.....311	WA1DHM.....304	K9EC.....292	WN5MBS.....277
K9MM.....323	XE1AE.....323	W6BCQ.....322	K9TI.....319	KC2FC.....315	KE5PO.....311	AC8A.....303	KE7UL.....292	KG9N.....277
W2FXA.....323	YS1GMV.....323	VE2PJ.....322	WD8PUG.....319	W0ULU.....315	KA5RNH.....310	KB9LN.....303	VE6PW.....292	I8WYD.....277
OZ3SK.....323	I8ACB.....323	PY4OY.....322	K1UO.....319	N5FG.....315	Ti2JJF.....310	KB8SY.....303	SV1JG.....291	WP4AFA.....277
VE3MR.....323	N6AHU.....323	LA7JO.....322	WB6OKK.....319	YV5DFI.....314	I8IYW.....310	AB4PY.....303	CP5NU.....290	KA9I.....277
KM2P.....323	K9IW.....323	OA4ED.....322	W2FGY.....319	W9RY.....314	VE2GHZ.....310	RA3YA.....302	4X4JO.....290	CT1AHU.....277
VE3XN.....323	W8SFU.....323	I4WZK.....322	K2ARO.....319	KU9Z.....314	N6AHV.....309	W2LZX.....302	I4UFH.....289	G4NXG/M.....276
K6WR.....323	YV5AIP.....323	CT1FL.....321	KA9ABC.....318	HR1KAS.....314	I5EFO.....309	XE1KS.....302	W9TA.....288	WB4UHN.....276
N4JF.....323	Ti2HP.....323	WS9V.....321	KQ9W.....318	A92BE.....314	I1POR.....309	WB2JZK.....302	YB2OK.....288	KJ6HO.....276
VE3MRS.....323	OZ5EV.....323	A18S.....321	WB6PSY.....318	K4SBH.....314	G4GED.....309	WA5HWB.....302	TI5RLI.....287	VE7HAM.....276
K6YRA.....323	VE7WJ.....323	K8CSG.....321	WB3CQN.....318	XE1OX.....314	KP4P.....309	WB4TGB.....301	OK1AWZ.....287	NX4Y.....275
YU1AB.....323	VE3GMT.....323	VE4AT.....321	9H4G.....318	OH5KL.....314	XE1MD.....309	VE6PW.....301	EA8TE.....287	WA4PGM.....275
N6AR.....323	I8XTX.....323	KE4VU.....321	PA8XPQ.....318	W0DMN.....314	WA8YTM.....309	NO4J.....301	N8BJQ.....285	HP6AYV.....275
K6JG.....323	WA6OET.....323	IK8CNT.....321	I4ZSQ.....318	ZS6AOO.....314	CE7ZK.....309	W3SOH.....301	FD1OZF.....285	TI2SD.....275
YV1KZ.....323	YV1AJ.....323	KC8EU.....321	G4CHP.....318	KB1JU.....314	PY2DBU.....309	YU2TW.....300	KB7IVU.....285	KJ6GC.....275
I8ZV.....323	I4EAT.....323	ON5KL.....321	IK8IOL.....318	K4LR.....313	WB4DBB.....309	N4CRU.....300	IK8BMW.....284	KA5YCM.....275
W4JVV.....323	I8YRK.....323	IK8BOE.....321	K1HDO.....318	K1VHS.....313	WD9IIX.....308	WT4T.....300	NZ7D.....284	KI4FW.....275
WA4JTI.....323	KA4HU.....323	KA3HXO.....321	ZL1BIL.....318	I2EOW.....313	YV2EJU.....308	W7KSK.....300	KB5RF.....284	WA4OPW.....275
EA4DO.....323	N5FW.....323	W2CC.....321	N4CRU.....317	WB4PUD.....313	N3ARK.....308	VE3FJE.....300	NU4Y.....283	AB4NS.....275
WB4UBD.....323	Ti2CC.....323	K9HQM.....321	XE1XM.....317	W1NG.....313	W4BOY.....308	WB4NDX.....300	KB9AIT.....283	DK5WQ.....275

rated values. (Many thanks to Sandy Farley of the USPS for confirming this information.)

### QSL Information

Baldur Drobnica, DJ6SI, says to send QSL requests for CW and RTTY **5X5WR** contacts directly to him. "No other person have my log and no person is authorized to write QSL!" Note that Baldur requires a minimum of US\$2 (not German stamps), will not answer requests for more than one card at a time, and closes his logs six months after the operation. His address is Zedernweg 6, D-5010 Bergheim, Germany. QSL the SSB contacts of **5X5WR**, including

those contacts made by Baldur, via the usual route: DJ5RT.

QSL the July 1992 operation of **ZA1A** via Eric Heikinen, OH2BBF, P.O. Box 53, SF-10901 Hanko, Finland. He received the cards from Japan in late January. QSL the first ZA1A operation via the NCDXF, Box 2368, Stanford, CA 94305. QSL the 1992 CQWW SSB contest operation of **ZA1A**, as well as the ZA1-s that give HB9BGN as their "manager," to Albert Muellen, HB9BGN, Im Hubacker, CH-8311 Bruetten, Switzerland. Put the ZA1- callsign on the outside of the envelope. Albert doesn't open these, but gets them to Albania via a safe route. The individuals ZA1-s then answer the cards from Albania. Eric

says he will forward the 1992 CQWW ZA1A cards he received to Albert; no need to send duplicates.

QSL **OJ0/OH1VR**, **PJ2/OH1VR**, **OG1-0M**, and **PJ9U** to Seppo Sisatto OH1VR, Lansirinteenk 23, SF-33400 Tampere, Finland.

Peter Watson, **ZL3GQ**, says he no longer has outgoing QSL bureau service, and can only answer cards received with sufficient return postage: P.O. Box 11 071, Christchurch, New Zealand.

QSL the Mocha Island **XR6M** operation via the Radio Club Temuco, P.O. Box 1234, Temuco, Chile, or via the Bureau Federachi, P.O. Box 72, Valpariso, Chile.

Getting QSL cards from stations in war-torn **Bosnia-Herzegovina 4N** is very difficult. However, Lonnie Miller, KA9WON, will confirm contacts for **4N4XA** and **4N4ANT**, as well as **9A2PM** in Croatia. Lonnie's address is 12031 Blue Spruce Dr., Roscoe, IL 61073-8958.

The **4J1FS** QSLs for the May 1992 operation are due to arrive at OH2BU's QTH this month. Please be patient.

QSL **ZD8LII** after May 31, 1993 via operator Steve Hodgson, GØLII, 6 Broughton Road, West Ayton, Scarborough YO13 9JW, North Yorkshire, England.

QSL **KA2OIG/HR3** via Kris Merschrod, 161 West Norwalk Road, Norwalk CT, 06850.

QSL the 1992 Fernando de Noronha operation of **PXØF** via Claudio Gimenez, PY2KP, P.O. Box 13535, 03399-970 Sao Paulo SP, Brasil.

QSL Sakalas Uzdavinys, **LY2BO**, at Perkuno 9-57, 2050 Vilnius, Lithuania.

N2PNG needs OSL information for **9L1MR**.

### QSL Routes For Contest Operations

QSL the 1992 CQ WW CW operation *only* of EA6ZY and EA6/N6RA via N6RA.

QSL the 1992 CQWW CW operation of **CR3W** via operator DF5UL.

All **4U1VIC** contacts from the 1992 CQWW CW operation will be confirmed via the bureau system. Please don't send cards direct. Cards for satellite and VHF/UHF contacts may be confirmed via DG6MGP.

QSL the 1992 CQWW SSB operation of **CEØY** via K6VNX.

QSL the 1992 CQWW CW operation of **PQ1V** via operator Marcos Vahia, PY1DEA, Rua Tupis 199, 24360-400 Niteroi RJ, Brazil.

QSL the 1992 CQWW CW operation of **PX2A** via Claudio Gimenez, PY2KP, P.O. Box 13535, 03399-970 Sao Paulo SP, Brasil.

### QSLing ex-USSR Stations

Rolf Rahne, DL6ZFG, can confirm con-

### CQ DX Awards Program

#### SSB

1991.....	KD1CT	1995.....	EA3CKX
1992.....	OA4BTE	1996.....	WB4DBB
1993.....	JE1RRK	1997.....	KB3X
1994.....	EA1MV		

#### CW

868.....	WB6OKK	871.....	WB4DBB
869.....	JE1RRK	872.....	KB3X
870.....	EA1MV		

#### RTTY

15.....	EA1MV
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#### SSB Endorsements

320.....	F9RM/326	320.....	KB3X/321
320.....	WØYDB/326	310.....	K2ARO/319
320.....	YU1HA/326	310.....	KBØIOL/317
320.....	K4MZU/326	310.....	N5FG/315
320.....	W4NKI/326	310.....	ZS6AØØ/314
320.....	KSØZ/326	310.....	LU7HJM/313
320.....	K2FL/326	310.....	WDØBNC/312
320.....	K2TQC/326	310.....	VE2GHZ/311
320.....	VE1YX/326	300.....	WB4DBB/309
320.....	W4DPS/326	300.....	N5ØRT/304
320.....	DL9ØH/326	275.....	NU4Y/283
320.....	K3UA/326	250.....	TF5BW/257
320.....	WA4IUM/326	200.....	W1FYI/247
320.....	W9SS/326	200.....	ØA4ANR/242
320.....	N4MM/326	200.....	KB1CT/225
320.....	EA2IA/325	200.....	HP2CWØ/217
320.....	K2JLA/325	150.....	EA1MV/188
320.....	KB8DB/325	150.....	ØA4BTE/180
320.....	N7RO/325	28 MHz.....	WB4DBB
320.....	KZ4V/324	28 MHz.....	KB3X
320.....	WZ4I/324	3.5/7 MHz.....	WB4DBB
320.....	KE4HX/321	3.5/7 MHz.....	KB3X

#### CW Endorsements

320.....	K2TQC/326	310.....	KB8DB/315
320.....	YU1HA/326	300.....	K2JLA/307
320.....	K3UA/326	275.....	KB3X/289
320.....	N4MM/326	275.....	VE1RJ/288
320.....	K2FL/325	275.....	WB6OKK/277
320.....	DL1PM/325	150.....	WB6SØF/161
320.....	WA4IUM/324	150.....	EA1MV/156
320.....	KZ4V/322	150.....	WB4DBB/152
320.....	EA2IA/321	28 MHz.....	KB3X
320.....	WB4RUA/320	3.5/7 MHz.....	KB3X
310.....	N7RO/316	3.5/7 MHz.....	WB6OKK

Total number of active countries is 323. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a slicker are made free when an SASE is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business-size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for airmail reply. Please make all checks payable to the awards manager.

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59th ANNUAL

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tacts with many CIS stations: **4K2CC, 4K2/UV3CC, UV3CC/UA1F, 4K2OKV, UF6FKW, UL7ACI, \*UL7ACI, RL7AA, RA6WF, RE92C, UL1RWR, 4K4BG, 4K4BEM, 4K4BEU, 4L1FKW, ULØA, ULØACI, UL7ØE, UL7AAE, UL8AWL, R7RG, RM8MW, UM8MY.** Rolf's address is P.O. Box 15, O-3304 Gommern, Germany.

Gene Kolmakov, UA9MA, reports that many of the envelopes addressed to him do not arrive. He suggests sending cards for the stations he manages via DK8FS. These stations include the following: **UA9MA, UQ/UA9MA, UL/UA9MA, UH/UA9MA, UM/UA9MA, XV9MA, EZ9MA, UJ/UA9MA, UA1ØIL, 4K2ØIL, 4K2BDU, 4K2OKV, 4K2BAZ,**

## QSL Managers

3A2LA to DL3LU  
 3X8HLU to IK2OPZ  
 3X8HNU to F6FNU  
 3Y2GV to LA6ZH  
 4J1700GAT to DL1VJ  
 4K2MAL to UA4RC  
 4K2OKV to DK8FS  
 4L2FC to UF6FFF  
 4L3Q to DF9LJ  
 4N4ANT to KA9WON  
 4N4XX to YU4XX  
 4N5CN to YU5DRS  
 4N5ET to YU5DRS  
 4N5FB to YU5XTC  
 4N5FK to YU5DRS  
 4N5GB to YU5GBC  
 4N5GD to YU5XTC  
 4N5GX to YU5GBC  
 4N5JA to YU5XTC  
 4N5KO to YU5FSO  
 4N5M to YU5GBC  
 4N5PK to YU5XVD  
 4N5RB to YU5XTC  
 4N5W to YU5GBC  
 4O4D to YU4FDE  
 5B4ADR to 9A2TJ  
 5H3MT to JA3PAU  
 5R8DG to F6FNU  
 5W8CW to Y23UO  
 5W8UO to Y23UO  
 5W1HP to JA1OEM  
 5Z4BI to W4FRU  
 7Q7CM to N2AVR  
 7Q7XX to JH3RRA  
 8P9DX to VE3ICR  
 8Q7XX to DJ8MT  
 8R1EJ to K5EJ  
 9A2TW to YU2TW  
 9F2CW to DK7PE  
 9H1EL to LA2TO  
 9K2ZZ to W8CNL  
 9V1XQ to K2QBV  
 A22BW to DK3KD  
 A22EX to N4CID  
 A22JP to KC4UCE  
 A22MN to WA8JOC  
 C31LL to C31LBB  
 C56/G3RZ to G3RZ  
 C6AFP to N4IQQ  
 CE8ABF to LUBDPM  
 CG7DGL to KM6ON  
 CN2GF to I5DCE  
 CN8ST to K8EFS  
 EA8/DL2HBX to DL2HBX  
 EA9UK to EA9LZ  
 ER1OWQ to SP7LZD  
 ER4OWQ to SP7LZD

FG/DF5WA/P to DF5WA  
 FJ/FG5ED to FG5ED  
 FK5C to F6AJA  
 FK8FU to NA5U  
 FK8GJ to F6CXJ  
 FM5CD to F5VU  
 FP4EK to K1RH  
 FS4PL to FG4BG  
 FT4WD to F6AXX  
 FY5EW to F6BFH  
 FY5FP to ON4ZD  
 GS0STB to GM3YOR  
 HC1MD to K8LJG  
 HC8JG to WA6ZEF  
 HF0POL to SP9DWT  
 HR6/NN7A to NN7A  
 HS0ZAR to K3ZO  
 J28BS to FD1PHW  
 J37AJ to W2KF  
 J68AY to GM4ENP  
 JW0F to SP2GOW  
 JX3EX to LA5NW  
 JX7DFA to LA7DFA  
 KC6OK to OKDXA  
 KH0AC to K7ZA  
 KL7/W7SW to KC7EY  
 OD5/SP7LSE to SP7EJS  
 OJ0/OH1VR to OH1VR  
 OM3EA to OK3EA  
 OM3EY to OK3EY  
 OM3QW to OK3QW  
 OR0TT to ON7TK  
 P29DK to N4EDF  
 P4/N4BWS to WB4CKO  
 P40PI to K4PI  
 P49V to A16V  
 PJ9JT to W1AX  
 S21ZG to W4FRU  
 S51IX to YU3IX  
 S52OT to Y30T  
 S59PR to 9A2AJ  
 S92ST to K4BAI  
 T30AJ to K9AJ  
 T30B to W0CP  
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 TR8YA to F6FNU  
 TZ6NU to F6FNU  
 TZ6VV to AA0GL  
 UA2WJ to DL4LH  
 UC2AAA to F6AML  
 UI8ZAA to K9FD  
 UJ7ACI to DL6ZFG  
 US0U to K8YSE  
 UZ2FWA to DK4VW  
 V2/K1DW to K1DW  
 V2/VE3BW to VE3CPU

V51AT to DF2JQ  
 V51JM to NK2T  
 V63NI to JR7OEF  
 V73C to OKDXA  
 V73Q to KY9Q  
 VP2M/AA6MV to AA6MV  
 VP2M/KD6WW to KD6WW  
 VP2MFA to K8SJ  
 VP5/JR7MZC to JR7MZC  
 VP5/KA4NYO to KA4NYO  
 VP5P to WN5A  
 VP8VN to G4LGZ  
 VP9MZ to WB2YQH  
 VQ9AC to WN8O  
 VQ9YA to KD4YE  
 VR6BB to JF2KOZ  
 XF3X to XE2GV  
 XF4JC to XE1ECR  
 XR6M to CE6TC  
 XU8UN to VK3OT  
 XU6TQ to PA3BTQ  
 YN1CC to W3HNK  
 YS1XS to WD4AVP  
 YT5M to YU5GBC  
 YT5R to YU5GBC  
 Z21CA to NM7G  
 ZA1E to I2MQP  
 ZA1J to I2MQP  
 ZA1M to HB9BGN  
 ZA1W to HB9BGN  
 ZB2JI to G3VIE  
 ZD8LII to G0LII  
 ZK1BU to VE7CVB  
 ZK1FR to Y23UO  
 ZK1UO to Y23UO  
 ZY8FOC to PY1RO  
 9A2AA to P.O. Box 225, Split, Republic of Croatia  
 AH8E to Mike, P.O. Box 1215, Pago Pago, American Samoa 96799  
 DU7LA to Peter Sils, P.O. Box 901, Cebu 6000, Philippines  
 FO4OK to M. Eddy Tchong, Box 491, Papeete, Tahiti, French Polynesia  
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US50BS, commemorating the 50th anniversary of the Ukrainian army, can be confirmed via Bogdan L. Olejnik, UB5BAZ, P.O. Box 22, Chortkov 283600, Ukraine.

QSL UA9M/KC4UG, UM8M/KC4UG, UL9C/KC4UG, and UA9MI via Ken Carpenter, KC4UG.

QSL UA9M/DK8FS and UL9C/DK8FS via DK8FS.

QSL UB5WJ via Mike Henson, WA6CTP, P.O. Box 541, Millbrae, CA 94030.

QSL EU10, EV1S, and UA2AA via F6AML.

QSL UC9C, UH6E, RH1E, UI7F, and UB9F via DL5EG.

QSL UO1, UA2F, and UX0L via Andy Stchislenok, RC2AR/AA3BG, P.O. Box 715, Brooklyn, NY 11230.

RC2AR writes: "So-called 'QSL Bureau Chernobyl' is a private enterprise of

Mr. V. Pristavk, UC2AAA. The above bureau has not been endorsed in any way and is not representing interests of the amateurs of Belarus (Byelorussia) or any other republics. It has no authorization to receive or send cards. The one and only official QSL bureau of Belarus (UC QSL Bureau) is P.O. Box 469, Minsk-50, 220050 Belarus. Victor Digilevich, UC2AO, is the official manager of that bureau."

QSL contacts after Sept. 1, 1991 with Yuri, RC2CR, via Dick Petermann, NF2K, 79 Pompton Ave., West Paterson, NJ 07424.

QSL UA9TF and UH3E/UA9TF via Le Henderson, KB6MXH, 857 Tamarack Lane, Sunnyvale, CA 94086.

On the other hand, Steve Licht, WF2S, says he can no longer handle QSL requests for UF6VBZ/UF6VM; he has been unable to obtain logs.

73, Chod, VP2ML

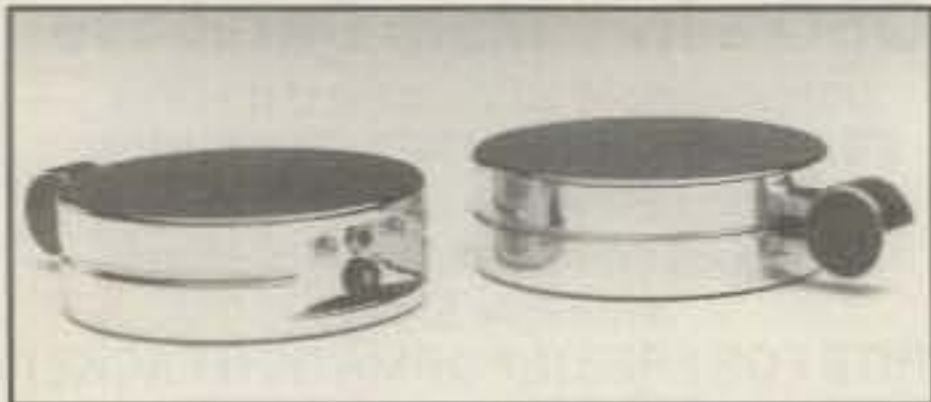
# CQ SHOWCASE



## Kenwood HF Transceiver

Described by Kenwood as the world's smallest HF transceiver, the TS-50S includes the following features: 100 memory channels, 100 watts output (adjustable to 50w, 10w), DDS with "Fuzzy" control logic, dual VFOs, wide receiver dynamic range, all mode SSB/CW/AM/FM, general-coverage receiver 500 kHz to 30 MHz, automatic gain control (slow/fast), TF-Set, IF shift, AIP (advanced intercept point), all-mode squelch, CW reverse, menu programming, computer controllable, large LCD display with dimmer control, programmable function keypad, noise blanker, select full break-in/semi-break-in, and more. The unit comes with MC-47 multi-function microphone.

The TS-50S is 7.16"W x 2.4"H x 9.32"D and weighs 6.4 lbs. Its list price is \$1199.95. For more information, contact Kenwood U.S.A. Corp., 2201 E. Dominguez St., Long Beach, CA 90801-5745, or circle number 101 on the reader service card.



## CAL-AV Labs Spirit™ Dual "Paddle" Keys

CAL-AV Labs, Inc. has introduced the Spirit™ series of dual "paddle" Morse keys, which incorporate a design and technology to eliminate contacts and all other moving

parts. The Spirit provides familiar functionality very similar to a mechanical key. Its solid-state force sensors activate when a given, preset force is exceeded. Independent left and right adjustments have infinite resolution, and will accommodate operators with a light or heavy touch. The unit weighs five pounds.

The Spirit is currently available as a limited-production edition. It is constructed of polished, solid-brass, and each key is individually serialized and can be further customized to a user's preferences. Engraving of an individual's name or call letters is available, and chrome or gold plating is optional. Detachable cabling accommodates a wide variety of keyers. An infra-red dual link eliminates the cable. Prices start at \$380. For more information, contact CAL-AV Labs, Inc., 515-B Westchester Drive, Campbell, CA 95008, or circle number 102 on the reader service card.



## JZO WWV-Format Universal Time Piece

The new Spectra-Com Universal Time Piece (copyright 1993 by JZO Research) combines WWV time and frequency services information from the National Institute of Science and Technology with a real-time analog clock. It shows WWV events and local or universal time in a 12 and 24 hour format. The information is displayed with quartz accuracy ( $\pm 1$  second), and its display is designed in red, white, blue, yellow, and

black. The unit uses one AA battery (not included) which lasts for more than a year.

Retail price of the time piece is \$49.95. It is available from JZO Research, 7140 Colorado Ave. North, Minneapolis, MN 55429, or for more information, circle number 103 on the reader service card.



## W & W Associates MasterCharger "I"

With the MasterCharger "I" and with the change of an adapter cup, the user can change from a Motorola to a G.E. to an ICOM to a Yaesu, etc., radio simply by plugging in an appropriate adapter cup. The charger can charge any battery from 6V to 13.2V. The MasterCharger "I" employs a negative Delta V end of charge detection system, utilizing a Sanyo SI-101 microprocessor chip. The unit can also be used with a simple DC cord simply by plugging the adapter cord into a car cigarette-lighter receptacle. The MasterCharger "I" will perform at the same level as from the wall outlet.

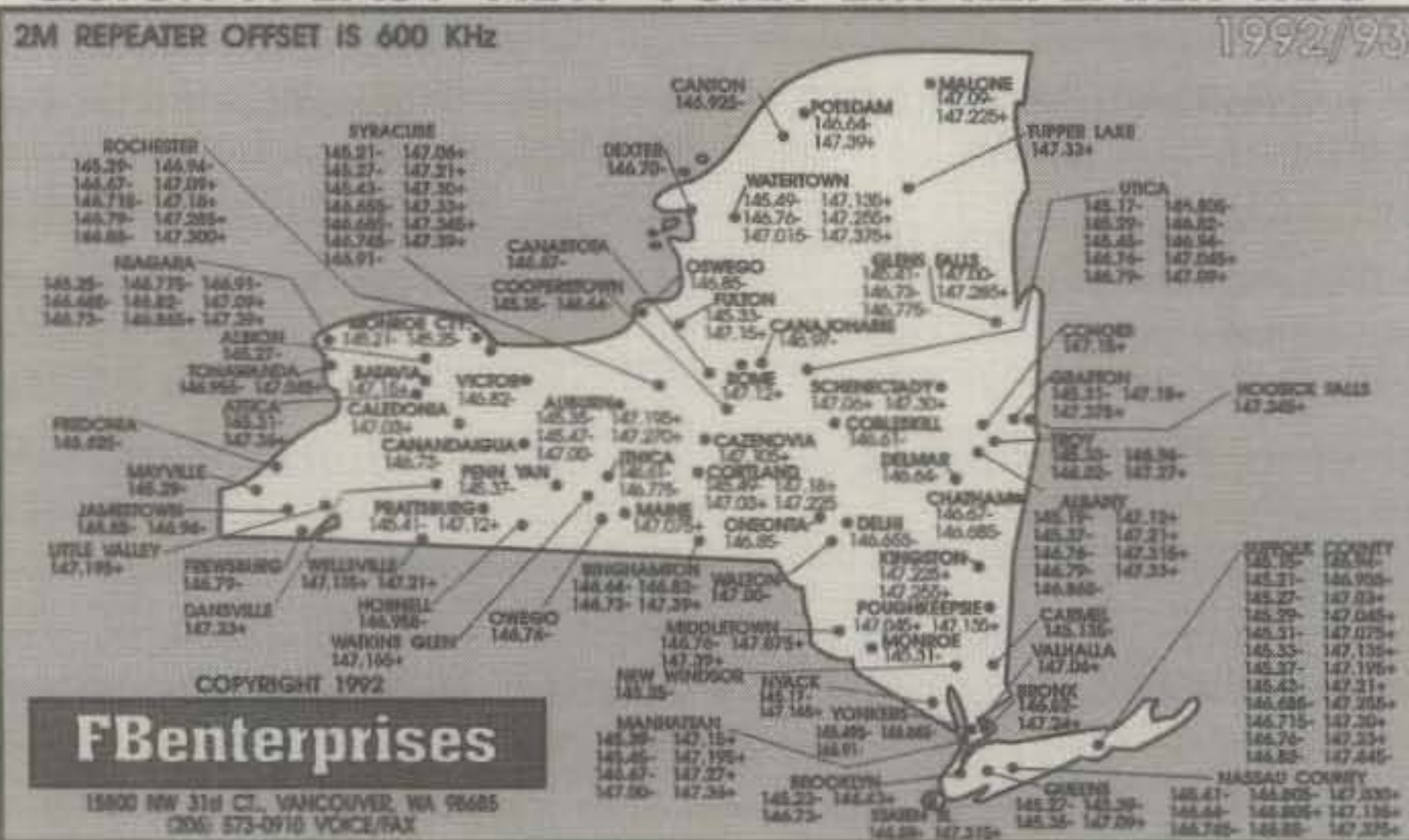
For more information, contact W & W Associates, 29-11 Parsons Blvd., Flushing, NY 11354 (800-221-0732; FAX 718-461-1978), or circle number 106 on the reader service card.

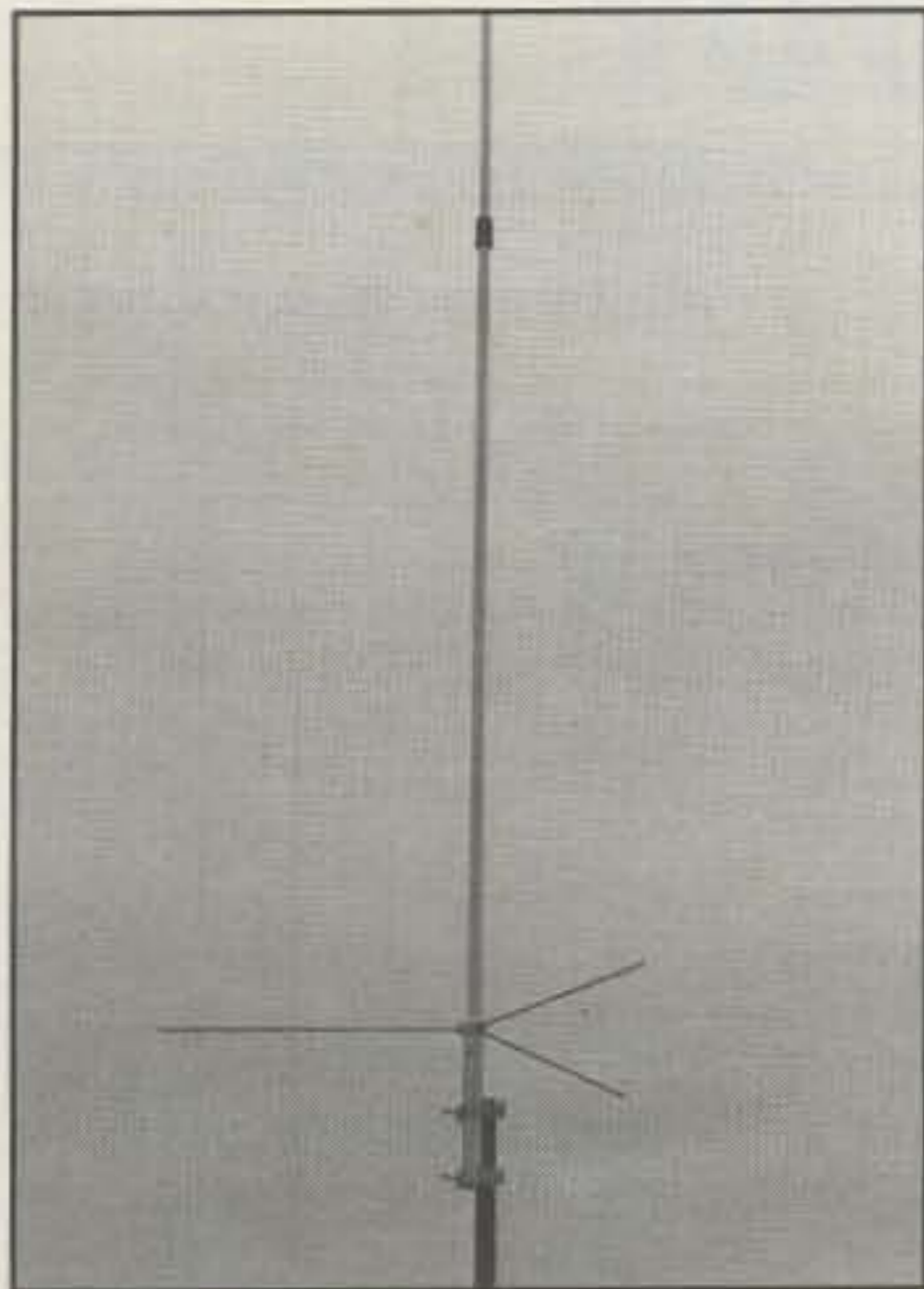
## FBenterprises Repeater Maps

FBenterprises has announced an upgrade in their repeater maps! They are now offering 2 meter maps in full color. The maps are available for all 50 U.S. States, as well as all Canadian Provinces, Central American countries, and islands in the Caribbean. The map for California is split into northern and southern California, so California residents should specify which part of the state they need. The maps show 2 meter repeaters in full color on the front of the card, and the bands between 220 and 1.2 GHz are shown on the back. The cards are 5 1/2" x 8 1/2", and are laminated in plastic.

The maps retail for \$3.95. FBenterprises can be contacted by phone or FAX at (206) 573-0910, or by mail at 15800 NW 31st Court, Vancouver, WA 98685. Catalogs are available by sending \$2.00, refunded with purchase.

## QUICK-N-EASY NEW YORK 2M REPEATER MAP





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The Model CX-333 Triband Base/ Repeater Antenna covering 2M/220/440 MHz is a two-piece white fiberglass antenna with an ABS screw-together connecting joint and compression washer for water-proofing and ease of assembly. Over-all length is 10 ft. 4 inches, with a gold-plated SO-239 connector.

Comets SLC (Super Linear Converter) design produces 6.5/7.8/9.0 dB gain. The internal element is arranged in a vertical coil, rather than a spring-type coil, producing higher gain, and a pattern with a low angle of radiation directly to the horizon, maker says. Each piece making up the element is soldered to the next, avoiding connections that could vibrate loose and corrosion. The antenna is pre-tuned and includes all mounting hardware. For more information, contact NCG Company, 1275 North Grove Street, Anaheim, CA 92806 (714-630-4541), or circle number 105 on the reader service card.



### Connect Systems Simplex VOX Patch

The CS-900 from Connect Systems Inc. is a low-cost VOX (voice activated) simplex phone patch that features 1/2 second electronic voice delay (EVD), built-in programming keyboard with digital display, 90 memory speed-dialer, last-number redial, call-progress tone detection, user programmable CW ID, and more. The CS-900 is totally VOX operated and does not use sampling. The CS-900 will interface with most any transceiver. Connections required are to the mic and speaker jacks. For more information, contact Connect Systems Inc., 2064 Eastman Ave. #113, Ventura, CA 93003, or circle number 107 on the reader service card.

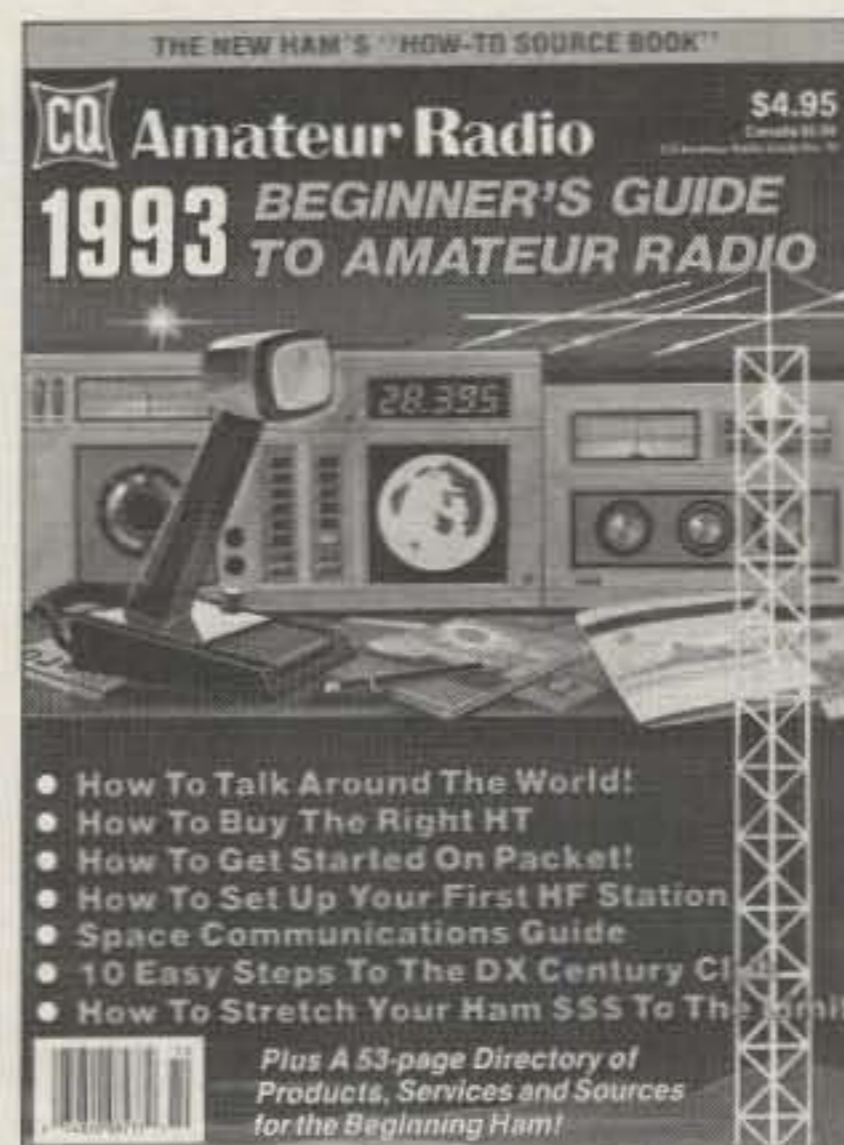
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## Commercial Radio Testing To Follow Amateur Radio Model

*"Our objective here is to establish a private sector operator examination system that meets the need of applicants for more frequent examination opportunities at convenient locations, the need of industry for examinations that reflect state of the art technology and modern operating conditions, and the need of the Commission to reduce the resources it must expend on commercial operator licensing."—FCC Report and Order, PR Docket 92-206, Feb. 12, 1993.*

The FCC has transferred the responsibility for the development and administration of Commercial Radio Operator license testing to the private sector. The program will be handled in more or less the same way as the successful examination program in the Amateur Service.

Ten years ago amateur operator license examinations for all classes (except Novice) were administered by the FCC at its outlying field offices. Diminishing Commission resources forced the FCC in 1984 to reduce amateur testing to only four times a year. The questions could not be revised quickly enough to stay current with changes in technology and regulations.

To fix the problems in the Amateur Radio Service, the Communications Act was amended to permit the use of unpaid examiners. On September 13, 1982 President Ronald Reagan signed legislation allowing the FCC to use volunteers to assist in preparing and administering amateur radio license examinations.

The FCC proposed two amateur administrative examining levels, one being the Volunteer Examiner Coordinator (VEC), the other a Volunteer Examiner (VE). The VEC would act as an administrative liaison (or coordinator) between the FCC's Gettysburg, Pennsylvania licensing facility and the VEs who would give the tests. Banks of

test questions were developed initially based on the FCC Study Guides to form the various FCC question pools. This function is now completely handled by the VECs. The entire program was called the "VEC System."

The FCC required that an agreement be entered into with the government in order to be a VEC. VECs would approve volunteer examiners who met the statutory requirements. Eventually several organizations entered into an arrangement with the FCC to coordinate amateur examinations on a regional basis. There are now 18 VEC groups.

After Congress passed legislation authorizing reimbursement of expenses, the FCC allowed the volunteer testing community to charge a test fee of \$4.00 per examination effective September 1, 1984. The FCC later rewrote the Amateur Service Part 97 Rules to create what is now Subpart F—Qualifying Examination Systems. This section of the rules provides the government guidelines for the qualification testing of amateur radio operators. A provision was made for test fee increases based on inflation. The maximum test fee that may be charged during 1993 is \$5.60. The W5YI-VEC is the nation's second largest amateur radio testing organization, second only the American Radio Relay League.

Today the VEC System is an unqualified success! In 1992 this all-volunteer program administered nearly 200,000 examination elements to more than 110,000 applicants at some 10,000 test sessions. The questions are current. Fraud and abuse are rare. The program has easily handled increases in the number of applicants stemming from the popularity of the new, codeless Technician Class license. And it is about to absorb testing for Novice Class licenses. The efficiency of the VEC System has not gone unnoticed.

### Privatizing Commercial Radio Operator Exams

In September 1986 the FCC released an Inquiry seeking comments on whether

the public interest would be served by also allowing a private organization to draft and administer all FCC Commercial Radio Operator examinations.

The FCC has been charging a \$35 fee for processing commercial radio operator license applications for more than two years now. The establishment of the fee, however, does not permit the Commission to increase the frequency or number of locations for commercial examinations, since all fees collected are deposited into the General Fund of the U.S. Treasury and do not increase the agency's appropriations in any way.

As a result of the 1986 Inquiry the FCC asked for (and received on September 28, 1990) an amendment to the Communications Act authorizing it to delegate the examination of Commercial Radio Operators to non-government organizations. The wording of the amendment is essentially the same as the language in PL 97-259, except that it refers to Commercial rather than Amateur Radio Operator licenses.

Last August the FCC's Field Operations Bureau (FOB) released a Notice of Proposed Rule Making (NPRM) which looked toward privatizing the administration of Commercial Radio Operator license examinations. The FCC restated that "... it continues to face resource constraints that prevent it from drafting and revising commercial radio operator examinations often enough to ensure examination integrity and from administering the examinations more than twice a year at its various field offices."

In October of last year the FCC's commercial radio operator licensing program was transferred from the Field Operations Bureau to the Private Radio Bureau (PRB) which also oversees Amateur Radio Service testing. Thus, it was left to the PRB to complete the administrative work on the proceeding. The public comments closed on November 2, 1992.

Currently, the FCC has nine types of Commercial Radio Operator certificates, licenses, permits, and endorsements. And a new class of license, the Global Maritime Distress and Safety System Radio Operator's License

National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101 (817-461-6443)

(GMDSS), has just been created. Following are the classes and requirements.

**First Class Radiotelegraph Operator's Certificate:** requires Telegraphy Elements 3 and 4, Written Elements 1, 5, and 6. (Must be 21 years old and one year of experience.)

**Second Class Radiotelegraph Operator's Certificate:** requires Telegraphy Elements 1 and 2, Written Elements 1, 5, and 6.

**Third Class Radiotelegraph Operator's Certificate:** requires Telegraphy Elements 1 and 2, Written Elements 1 and 5.

**General Radiotelephone Operator License:** requires Written Elements 1 and 3.

**Marine Radio Operator Permit:** requires Written Element 1.

**GMDSS Radio Operator's License:** requires Written Element 1 and 7. (GMDSS is the Global Maritime Distress and Safety Service, an automated ship-to-shore distress alerting system using satellite and advanced terrestrial communications systems.)

**GMDSS Radio Maintainer's License:** requires Written Element 1, 3, and 9.

**Ship Radar Endorsement:** requires Written Element 8.

**Six Months Endorsement:** requires minimum 6 months service as a radio operator aboard a U.S. ship. Must hold First or Second Class Radiotelegraph Operator's Certificate during the 6 month period.

GMDSS radio operators will be needed to operate the modern satellite distress alerting equipment which is just now in the process of being phased in. This system will eventually make the need for manual telegraphy unnecessary. The GMDSS license and most other licenses are valid for a five-year term, although the General Radiotelephone Operator license and Restricted Radiotelephone Operator permit are issued for the lifetime of the holder.

## Private Sector Exams Approved

At a public meeting on January 14, 1993 the FCC Commissioners made their final decision on the NPRM and approved the handling of all future Commercial Radio Operator license examinations by the private sector. The PRB pointed out that "The comments supported the proposal. The Bureau believes the privatization of commercial operator examinations would meet the applicants' needs for more frequent examination opportunities at convenient locations, meet industry's needs for examinations

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that reflect state-of-the-art technology and modern operating conditions, and meet the Commission's needs to reduce the resources it expends on commercial operator examinations.

"Additionally, this item establishes rules for implementing and administering a private commercial radio operator examination system. Many of the commenters suggested that the Commission use a system similar to the highly successful Amateur Radio Service's volunteer examiner coordinator system, which to date has administered almost one million examinations. The Amateur Service's system, which employs multiple organizations to independently administer operator examinations, provides examination opportunities in hundreds of locations each year.

"The Bureau believes that, as under the Amateur Service's examination model, the certification of multiple organizations to administer standardized Commercial Radio Operator examinations also will minimize regulation and maximize service to the public."

The FCC agreed with the Private Radio Bureau and authorized them to certify multiple organizations to administer Commercial Radio Operator examinations and specified basic duties and responsibilities to ensure the integrity of the system. These organizations will be known as Commercial Operator License Examination Managers.

## Commercial Radio Operator Testing

On February 12th the FCC released the actual text of the Report and Order detailing the specifics of its new Commercial Radio Operator testing program. Part 13 of its Rules which covers Commercial Radio Operators also was completely rewritten.

A Commercial Operator Licensing Examination Manager (COLEM) is the commercial equivalent of the VEC. Following the model established in the Amateur Service, applicants for Commercial Radio Operator licenses must pass an examination administered by a Commission recognized testing organization. COLEMs will be certified by the FCC's Private Radio Bureau after they enter into a Memorandum of Understanding (MOU) with the government in much the same manner as VECs.

The FCC Order also said that a Public Notice would be released shortly announcing a filing window for accepting requests from groups that desire to become certified examination managers. We (the W5YI-VEC) has already notified the FCC that our organization wishes to become a Commercial

Operator Licensing Examination Manager (COLEM).

And like the Amateur Service, all multiple-choice examination questions and answers will be known and widely published. Examination managers will start with FCC-developed question pools, but this responsibility probably will eventually also be transferred to the private sector. All COLEMs must use exactly the same question pools, multiple choices, and answers.

## Passing The Commercial Written Exams

The various commercial radio operator licenses will be authorized by passing one or more written or telegraphy examinations. The multiple-choice theory examination elements will be on radio law, operating practices, and technical questions. Pass rate is 75%. All commercial radio operator licenses, certificates, permits, and endorsements will be granted by these seven written and four telegraphy examinations.

Following are the Commercial Radio Operator examination elements.

**Telegraphy Element 1:** 16 code groups per minute. (A code group is random groups of letters, numerals, punctuation, and prosigns.) Amateur Extra Class operator licensee receives credit for this examination without testing.

**Telegraphy Element 2:** 20 words per minute text. Amateur Extra Class operator license also receives credit for this examination without testing.

**Telegraphy Element 3:** 20 code groups per minute.

**Telegraphy Element 4:** 25 words per minute text.

**Written Element 1:** Basic radio law and radiotelephone operating practice with which every maritime operator should be familiar. (Pool: 120 questions, 24 questions on test, passing score: 18.) (Formerly Elements 1 and 2.)

**Written Element 3:** Electronic fundamentals and techniques required to adjust, repair, and maintain radio equipment in the aviation, maritime, and international fixed public radio services. (Pool: 380 questions, 76 questions on test, passing score: 57.)

**Written Element 5:** Radiotelegraph operating procedures and practices primarily required in other than in the Maritime Mobile Services. (Pool: 250 questions, 50 questions on test, passing score: 38.)

**Written Element 6:** Advanced radiotelegraph operating procedures and practices. Contains technical, legal, and other matters, including those required in the Maritime Mobile Services. (Pool: 500 questions, 100

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questions on test, passing score: 75.)

**Written Element 7:** Global Maritime Distress and Safety Service, GMDSS operating practices and regulations. (Pool: 380 questions, 76 questions on test, passing score: 57.)

**Written Element 8:** Ship Radar Techniques. Specialized theory and practice concerning proper installation, servicing, and maintenance of ship radar equipment. (Pool: 250 questions, 50 questions on test, passing score: 38.)

**Written Element 9:** GMDSS radio maintenance practices and procedures. (Pool: 250 questions, 50 questions on test, passing score: 38.)

With the assistance of the public, a common question pool for each examination element will be established by the FCC from which all test questions must be taken. Each question pool will contain at least five times the number of questions required for a single examination. All test questions will be placed into the public domain by the FCC.

On February 17th the FCC issued a Public Notice soliciting "... private sector assistance in updating the commercial radio operator examinations. . . . Once we have selected the questions to make up the common question pool we will release the questions and the algorithm for preparing examination question sets by public notice." All examination question suggestions were to be submitted to the FCC prior to March 31, 1993.

Handicapped applicants for commercial radio operator licenses must be accommodated and special examination procedures employed if necessary. A doctor's certification indicating the nature of the disability may be required by the examination manager.

counted as a word; each numeral, punctuation mark, and prosign counts as two letters of the alphabet.

Of particular interest to amateur radio operators is that examination credit toward commercial telegraphy Element 1 and 2 will routinely be allowed Amateur Extra Class licensees who have already passed the amateur Element 1(C) 20 wpm code test. This means that Extra Class amateurs can qualify for the Second or Third Class Radiotelegraph Operator's Certificate by passing only their associated written examinations.

The FCC said a Public Notice will be issued when the COLEM appointment process is completed. At that time persons who wish to obtain a Commercial Radio Operator license will have to contact an examination manager or their examiners to take the test for any Commercial Radio Operator license needed or desired.

The FCC expects that privately administered Commercial Radio Operator examinations will be available late this summer. "The Commission will continue to issue Commercial Radio Operator licenses as well as monitor the progress of private examiners and take steps to improve the overall process when necessary."

FCC supervision of the Amateur Service testing program is received from the FCC's Washington, DC, Personal Radio Branch in the form of letters, new regulations, examination statistics, . . . and an annual VEC Conference held annually in Gettysburg, Pennsylvania. We assume a similar procedure will also be developed for the commercial services.

In any event, the construction and administration of Commercial Radio Operator examinations will closely fol-

low the model developed in the Amateur Radio Service's "VEC System," which has been fine-tuned over the past nine years. There are many examination parallels and common problems in the two services.

The FCC did not establish an examination fee schedule. Instead, they will require commercial license examination managers to include a proposed fee structure and justification, including cost estimates, when they apply to become a COLEM. "We expect fees charged to be reasonable." An annual report must be filed by the COLEM justifying any change in test fees and showing the number of examinations administered and the pass rate.

Once the requirements for a Commercial Radio Operator license are fulfilled, the applicant fills out the appropriate license application form and mails it together with the necessary valid Proof-of-Passing Certificates (PPC) to the FCC's licensing facility in Gettysburg. The PPC must be issued by the Commercial Operator Licensing Examination Manager within 10 days of completion of the examination element and is valid for 365 days from the date it is issued.

The FCC recognizes that it has a successful implementation model—the Amateur Service VEC System—already functioning in the marketplace. It will build on its proven record of success by using the same mechanism for Commercial Radio Operator licenses as it now does for amateur radio. Just as hams have led the way with new communications technologies, their VEC System has blazed a trail for efficient administration of qualifying communications license examinations.

73, Fred, W5YI

## Passing The Commercial Telegraphy Exams

There are four Morse Code tests which require one minute solid copy of "coded groups" at 16 and 20 wpm and "plain language" text at 20 and 25 wpm. Telegraphy answer formats other than one minute solid copy are not allowed. A Morse code sending examination need not be administered. "Passing a telegraphy receiving examination is adequate proof of an examinee's ability to send and receive telegraphy," the FCC said.

Commercial radiotelegraphers are responsible for knowing all letters of the alphabet, numerals 0 through 9, period, comma, question mark, slant mark, and prosigns AR, BT and SK, the same as amateur radio operators. All telegraphy examinations must contain each character at least once. Five letters are

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## THE SCIENCE OF PREDICTING RADIO CONDITIONS

### Solar Cycle Progress

**S**unspot Cycle 22 continues to decline steadily towards its minimum, much as expected.

The Royal Observatory of Belgium reports a mean sunspot number of 59.1 for January 1993. Daily values ranged from a low of 30 on January 23rd to a high of 107 on the 13th. The mean level observed during January results in a smoothed sunspot number of 91 centered on July 1992. This is a drop of six points from the previous month's level.

A smoothed sunspot number of 64 is forecast for May 1993. The smoothed sunspot count for last May (1992) was 100.

The Dominion Radio Astrophysical Observatory of Canada reports a corresponding drop in 10.7 cm solar flux levels, with a mean value of 117 reported for January 1993. This results in a smoothed value of 147 centered on July 1992. A smoothed level in the low-120s is forecast for May 1993.

#### May Conditions

During May expect lower optimum frequencies during the daylight hours, and somewhat higher frequencies during the late afternoon, early evening, and nighttime hours than were observed during the winter and early spring months. A considerable increase is expected in sporadic-E ionization, and this should result in more frequent short-skip openings on the HF bands and on the VHF bands. A seasonal increase in the static level is also expected during May.

The following is a thumb-nail sketch of HF amateur band openings expected during May 1993. For specific times of DX openings refer to the DX Propagation Charts which appeared in last month's column. This month's column contains Short-Skip Propagation Charts valid for both May and June, as well as charts centered on Alaska and Hawaii.

The Short-Skip Charts contain propagation forecasts for openings varying in distance between approximately 50 and 2300 miles. For day-to-day variations expected in propagation conditions during May see the Last Minute

#### LAST MINUTE FORECAST

Day-to-Day Conditions Expected for May 1993

Propagation Index.....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 6-7, 16, 18-19 25	A	A	B	C
High Normal: 5, 8, 14-15, 17, 22-24	A	B	C	C-D
Low Normal: 2-4, 10, 21, 28-31	A-B	B-C	D	D-E
Below Normal: 1, 12-13, 20, 26-27	B-C	C-D	D-E	E
Disturbed: 9, 11	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 S9 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 date of the month. For example, an opening shown in the charts with a propagation index of 3 will be fair-to-poor (C-D) on May 1st, good-to-fair (B-C) the 2nd to the 4th, good (B) on the 5th, excellent (A) on the 6th and 7th, etc.

Forecast which appears at the beginning of this column.

**10 Meters:** This band should continue to offer fairly good DX conditions into Central and South America, parts of Africa, and the South Pacific area. Band conditions should peak during the afternoon hours when signals should be strongest, but check at other times during the daylight hours as well. DX openings on this band should follow the sun westward. Expect a considerable increase in short-skip openings between distances of approximately 750 and 1400 miles.

**12 Meters:** Much the same pattern as on 10 meters. Since this is a lower frequency range, the band can be expected to open a bit more often than will 10 meters and stay open for an hour or so longer.

**15 Meters:** A seasonal decrease in DX openings on this band is normal for

May and the summer months, but some fairly good openings to many parts of the world still should be possible during the hours of daylight. The afternoon hours should be best for DX possibilities. Numerous short-skip openings between approximately 600 and 2300 miles should be possible on many days.

**17 Meters:** The propagation pattern should be similar to 15 meters. With decreasing solar activity and summer-time propagation conditions in the northern hemisphere, the somewhat lower frequency range of this band may well prove to be a propagation asset. On many days when conditions will not permit 15 meters to open, check this band for openings. When 15 meters does open, expect the same opening on 17 meters, but the band should remain active up to an hour after 15 meters closes. Compared to 20 meters, daytime openings may be similar, but often signals will be stronger on 17 meters.

**20 Meters:** This most probably will be the best band for DX during May. Opening shortly after sunrise, good DX conditions can be expected to one area of the world or another through most of the daylight hours and well into the hours of darkness. Peak conditions are expected during the sunrise period and again during the late afternoon and early evening. Expect excellent short-skip conditions, often with exceptionally strong signal levels, between distances of approximately 350 and 2300 miles. Quite often, particularly during the late afternoon and early evening, optimum conditions will exist for both short and long skip, and stations a few hundred miles away will be heard at the same time as DX stations several thousand miles away, causing considerable QRM!

**30 Meters:** This can be another propagation asset during the summer months. Peak openings are expected during the nighttime hours, much like 40 meters, but often with higher signal levels and somewhat lower noise levels.

**40 Meters:** Fewer DX openings are expected because of the shorter hours of darkness and the higher levels of static expected in the northern hemisphere during May, but some good openings to many areas of the world should still

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### HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters) as shown in the left-hand column of the chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate meter band column (15 through 80 meters) for a particular geographical region of the continental USA as shown in the left-hand column of the charts. An \* indicates the best time to listen for 80 meter openings.

2. The propagation index is the number that appears in ( ) after the time of each predicted opening. On the Short-Skip Chart, where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of days during the month on which the opening is expected to take place, as follows:

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

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

3. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 AM; 13 is 1 PM, etc. On the Short-Skip Chart appropriate daylight time is used at the path midpoint. For example on a circuit between Maine and Florida, the time shown would be EDT, on a circuit between New York and Texas, the time at the midpoint would be CDT, etc. Times shown in the Hawaii Chart are in HST. To convert to standard time in other USA time zones add 2 hours in the PDT zone; 3 hours in the MDT zone; 4 hours in the CDT zone; and 5 hours in the EDT zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 14 or 2 PM in Los Angeles; 17 or 5 PM in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to daylight time in other areas of the USA subtract 8 hours in the PDT zone; 7 hours in the MDT zone; 6 hours in the CDT zone; and 5 hours in the EDT zone. For example, at 20 GMT it is 15 or 3 PM in New York City.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts CW or 300 watts PEP on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts CW or 1 kw PEP on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the propagation index will increase by one level; for each 10 dB loss, it will lower by one level.

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

be possible during the hours of darkness and the sunset and sunrise periods. Good daytime short-skip openings should be possible for distances ranging between approximately 150 and 750 miles, with nighttime openings extending up to the one-hop limit of 2300 miles.

**80 Meters:** A considerable decline in DX possibilities is expected during May because of the shorter hours of darkness and seasonal increase in static levels. Some fairly good DX opportunities should continue to occur, however, for openings to many areas of the world during the hours of darkness and the sunrise period. Weak signals will often be masked by high static levels. Excellent short-skip openings should be possible during the daylight hours over distances of approximately 50 and 250 miles. During the hours of darkness short-skip openings should increase up to approximately 2300 miles. Short-skip propagation may also often be marred by high static levels.

## CQ Short-Skip Propagation Chart

### May & June 1993

#### Local Standard Time

#### At Path Mid-Point

#### (24-Hour Time System)

Band Meters)	Distance Between Stations (Miles)			
	50-250	250-750	750-1300	1300-2300
10	Nil	08-10 (0-1) 10-14 (0-2) 14-18 (0-1) 18-22 (0-2) 22-00 (0-1)	08-10 (1) 10-14 (2) 14-18 (1-2) 18-22 (2) 22-00 (1) 00-08 (0-1)	08-10 (1-0) 10-22 (2-0) 22-23 (1-0) 23-08 (1-0)
15	Nil	07-10 (0-1) 10-14 (0-2) 14-18 (0-1) 18-22 (0-2) 22-01 (0-1)	07-10 (1-2) 10-14 (2-3) 14-18 (1-3) 18-20 (2-3) 20-22 (2) 22-01 (1)	07-10 (2-0) 10-17 (3-1) 17-20 (3-2) 20-22 (2-1) 22-23 (1) 23-07 (1-0)
20	10-21 (0-1)	07-10 (0-2) 10-13 (1-3) 13-18 (1-4) 18-20 (1-3) 20-21 (1-2) 21-23 (0-2) 23-07 (0-1)	07-08 (2) 08-10 (2-3) 10-13 (3-4) 13-18 (4) 18-20 (3-4) 20-21 (2-4) 21-23 (2-3) 23-01 (1-2) 01-07 (1)	07-08 (2) 08-10 (3-2) 10-16 (4-3) 16-21 (4) 21-23 (3) 23-01 (2) 01-07 (1)
40	08-10 (1-2) 10-12 (2-4) 12-18 (3-4) 18-20 (2-4) 20-22 (1-3) 22-00 (0-2) 00-08 (0-1)	08-10 (2-4) 10-15 (4-2) 15-16 (4-3) 16-20 (4) 20-22 (3-4) 22-00 (2-3) 00-08 (1-2)	08-09 (4-3) 09-10 (4-2) 10-15 (2-1) 15-16 (3-1) 16-19 (4-2) 19-22 (4) 22-00 (3-4) 00-03 (2-4) 03-05 (2-3) 05-08 (2)	08-09 (3-1) 09-10 (2-1) 10-16 (1-0) 16-19 (2-1) 19-22 (4-3) 22-03 (4) 03-05 (3) 05-07 (2) 07-08 (2-1)
80	08-11 (4) 11-19 (4-3) 19-22 (4) 22-00 (3-4) 00-06 (2-3) 06-08 (3-4)	08-10 (4-1) 11-16 (3-0) 16-18 (3-1) 18-19 (3-2) 19-20 (4-2) 20-00 (4) 00-06 (3-4) 06-08 (4-3) 10-11 (4-0)	08-09 (1) 09-10 (1-0) 10-16 (0) 16-18 (1-0) 18-20 (2-1) 20-23 (4-3) 23-03 (4) 03-06 (4-3) 06-08 (3-2)	08-09 (1-0) 09-18 (0) 18-20 (1-0) 20-21 (3-1) 21-23 (3-2) 23-03 (4-3) 03-06 (3-2) 06-08 (2-1)
160	06-09 (4-1) 09-10 (2-0) 10-19 (1-0) 19-21 (3-1) 21-23 (4-2) 23-06 (4-3)	06-09 (1) 09-19 (0) 19-21 (1-0) 21-23 (2-1) 23-01 (3-2) 01-04 (3)	08-09 (1-0) 09-21 (0) 21-23 (1) 23-01 (2-1) 01-04 (3-2) 04-07 (2) 07-08 (1)	08-21 (0) 21-01 (1) 01-04 (2) 04-06 (2-1) 06-07 (1) 07-08 (1-0)

## ALASKA

### May & June 1993

#### Openings Given in GMT #

To:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	Nil	20-02 (1)	22-00 (1) 00-02 (2) 02-04 (3) 04-05 (2) 05-06 (1) 10-12 (1) 12-14 (2) 14-16 (1)	Nil
Central USA	Nil	21-04 (1)	22-02 (1) 02-03 (2) 03-05 (3) 05-06 (2) 06-07 (1) 12-13 (1) 13-15 (2) 15-16 (1)	08-12 (1)
Western USA	Nil	20-23 (1) 01-03 (1) 03-05 (2) 05-06 (1)	00-02 (2) 02-04 (3) 04-07 (4) 07-08 (3) 08-09 (2) 09-15 (1) 15-18 (2) 18-00 (1)	07-09 (1) 09-14 (2) 14-15 (1) 11-13 (1)*

**HAWAII**  
**May & June 1993**  
**Openings Given in Hawaiian**  
**Standard Time #**

To	10 Meters	15 Meters	20 Meters	40/80 Meters		
Eastern USA	Nil	12-15 (1) 15-17 (2) 17-19 (1)	13-15 (1) 15-17 (2) 17-19 (3) 20-04 (2) 04-08 (1)	19-20 (1) 20-23 (2) 23-02 (1) 21-23 (1)*		
	Central USA	Nil	12-15 (1) 15-18 (2) 18-20 (1)	15-16 (2) 16-17 (3) 17-19 (4) 19-20 (3) 20-22 (2) 22-04 (1) 04-05 (2) 05-07 (3) 07-09 (2) 09-15 (1)	19-20 (1) 20-21 (2) 21-01 (3) 01-02 (2) 02-04 (1) 20-21 (1)* 21-00 (2)* 00-03 (1)*	
		Western USA	13-17 (1)	09-12 (1) 12-15 (2) 15-17 (3) 17-18 (2) 18-20 (1)	06-08 (4) 08-16 (3) 16-19 (4) 19-20 (3) 20-22 (2) 22-05 (1) 05-06 (2)	18-19 (1) 19-20 (2) 20-22 (3) 22-02 (4) 02-04 (3) 04-05 (2) 05-07 (1) 19-20 (1)* 20-22 (2)* 22-02 (3)* 02-04 (2)* 04-05 (1)*

# See explanation in "How To Use Short-Skip Charts" in box at the beginning of this column.

\* Indicates best time for 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher.

Note: The Alaska and Hawaii Propagation Charts are intended for distances greater than 1300 miles. For shorter distances, use the preceding Short-Skip Propagation Chart.

For 12 meter openings interpolate between 10 and 15 meter openings.

For 17 meter openings interpolate between 15 and 20 meter openings.

For 30 meter openings interpolate between 40 and 20 meter openings.

**160 Meters:** Skywave openings are considered to be hopeless during the day on this band because of the high-absorption levels and seasonally high static levels, which combine to prevent communications. Openings up to about 1200 miles should be possible fairly regularly, however, during the hours of darkness and the sunrise period. An occasional opening beyond this range may be possible when static levels are low.

**VHF Ionospheric Openings**

May is generally a good month for ionospheric openings on the VHF bands resulting from sporadic-E propagation, meteors, trans-equatorial propagation (TE), and auroral activity.

Sporadic-E ionization increases considerably during May, and some fairly frequent 6 meter short-skip openings should be possible. These are most likely to occur over distances between approximately 1000 and 1400 miles. Although sporadic-E openings can happen at any time of the day or night, the best time to check is between 10 AM

and 2 PM and again between 6 and 10 PM local daylight time.

During periods of intense and widespread sporadic-E ionization, two-hop openings considerably beyond 1400 miles should be possible on 6 meters, and short-skip openings between approximately 1200 and 1400 miles may also be possible on 2 meters.

Some 6 meter, and perhaps 2 meter, trans-equatorial (TE) scatter openings should be possible during May. They are most likely to occur between 9 and 11 PM local daylight time on long north-south paths which cross the geomagnetic equator at approximately a right angle. TE openings favor locations in the southern third of the USA, but from time to time, openings farther north may

be possible.

The *Eta Aquarids* meteor shower should intersect the earth's atmosphere between May 4 and 6. This should be a major shower reaching maximum intensity during May 5 with an average of 20 meteors an hour. Chances are good for meteor-burst short-skip openings during the three-day period of the shower.

Some auroral activity may be possible during May, resulting in short-skip auroral-scatter-type openings on the VHF bands. Such activity is most likely to occur during periods of ionospheric storminess. Check the Last Minute Forecast at the beginning of this column for those days that are likely to be Below Normal or Disturbed during May.

73, George, W3ASK

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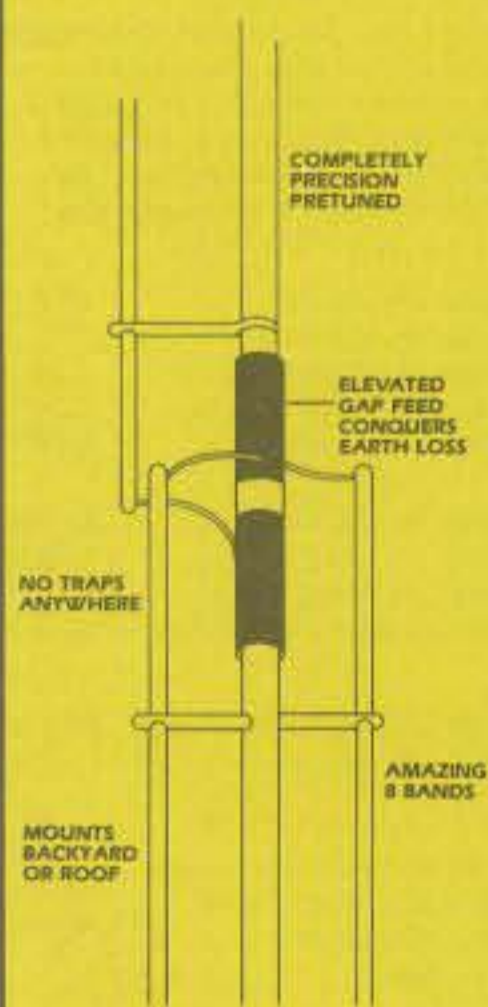
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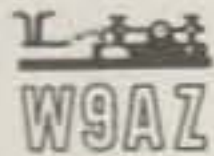
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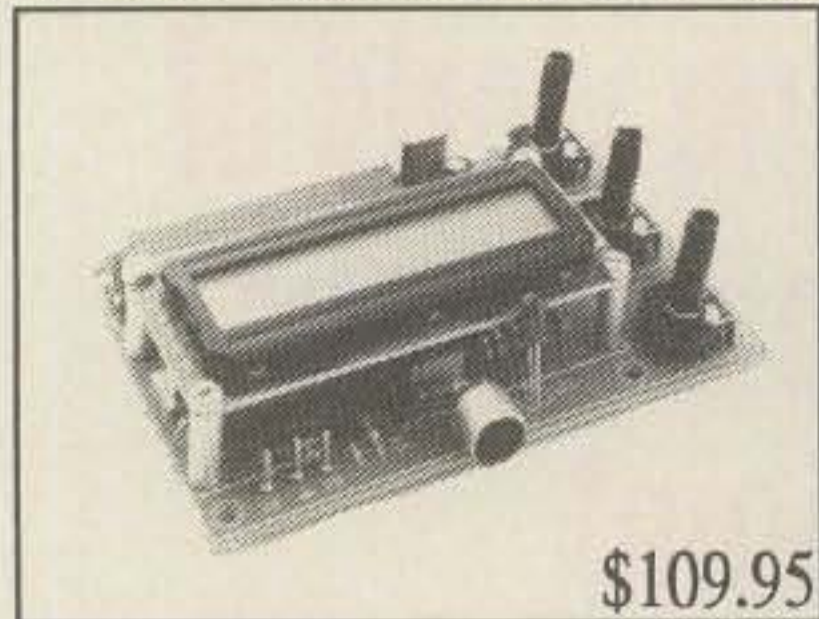
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## Announcing (from page 8)

May 15, **Wexauke ARC Swap & Shop and Eyeball QSO**, Cadillac Middle School, Cadillac, Michigan. Contact Dan Schmidt, KE8KU, 616-775-0998.

May 15, **Near North Hamfest**, Parry Sound High School, Parry Sound, Ontario, Canada. Contact PSARC, VE3PSH, 36 Beatty St., Parry Sound, Ontario, P2A 2H7 Canada (705-746-9115).

May 15, **Pikes Peak Radio Amateur Assn. Swapfest**, City Auditorium, Colorado Springs, Colorado. Contact Doug Paris, N4TGO, 719-495-9346. (Exams.)

May 15, **Rhode Island Amateur FM Repeater Service Auction and Fleamarket**, VFW Post 6342, Forestdale, Rhode Island. Contact Rick Fairweather, K1KYI, 106 Chaplin St., Pawtucket, RI 02861, or call 401-725-7507 from 7 to 8 PM.

May 15, **Central Iowa RAS Hamfest**, Marshalltown Community College, Marshalltown, Iowa. Contact Charles Lynk, W0DYS, 2460 Reed Ave., Marshalltown, IA 50158 (515-753-6925). (Exams.)

May 15, **SE Arkansas ARC Hamfest & Crafts Show**, National Guard Armory, Crossett, Arkansas. Contact Ray Haney, 1707 S. Louisiana, Crossett, AR 71635 (501-364-5957 evenings).

May 15, **Southern Berkshire ARC Hamfest**, Amenia firehouse, Amenia, New York. Contact WB1CEI 203-364-5266 or N1GIS 203-364-5976.

May 16, **NW Ohio Tri-County Hamfest**, Fulton County Fairgrounds, exit 3 off the Ohio Turnpike, St. Rte. 108, Ohio. Call 335-1684. (Exams.)

May 16, **MIT/Harvard Electronic, Computer, Amateur Radio Fleamarket**, Albany & Main St., Cambridge, Massachusetts. Call 617-253-3776.

May 16, **Great Hagerstown Hamfest**, Hagerstown Junior College Athletic and recreation Center, Hagerstown, Maryland. Contact Fred Bailey, N3HTN, 301-416-8079. (Exams by preregistration, call 304-289-3576 or 301-724-0674.)

May 16, **TSRAC Hamfest/Computer Show**, Wheeling Park, Wheeling, West Virginia. Contact TSARC, Box 240, RD 1, Adena, OH 43901 (614-546-3930.)

May 16, **LIMARC Hamfest**, New York Institute of Technology, Old Westbury, Long Island, New York. Contact Neil Hartman, WE2V, 516-462-5549.

May 20-22, **Racine, Wisconsin Hamfest**, Racine Festival Site, Racine, Wisconsin. Call Rory or Kelly at 414-636-9271. (Exams 9 to 11 AM.)

May 21-22, **Hamboree XV**, Marina Inn, So. Sioux City, Nebraska. Contact Dick Pitner, W0FZO, 2931 Pierce St., Sioux City, IA 51104 (712-258-1520).

May 22, **Lewis & Clark RC Hamfest '93**, Lewis & Clark Community College, Godfrey, Illinois. Call Ray, KA9RLK, 618-466-5919. (Exams, preregistration required, No Code Tech., contact Rich, KF9F, 618-466-2306.)

May 22, **Lancaster County Hamfest**, Ephrata Senior High School, Ephrata, Pennsylvania. Contact Tom Youngberg, K3RZF, 215-267-2514 after 6 PM. (Exams 9 AM; all sites handicapped accessible.)

May 22, **Paducah, Kentucky Hamfest**, Noble Park Civic Center, Paducah, Kentucky. Call David Fraser, KQ4IU, 502-554-7999; or Paul Smith, N4FFO, 502-898-6834. (Exams.)

May 23, **Decatur, Illinois Area Hamfest**, Richland Community College, Decatur, Illinois. Contact Cenois ARC, P.O. Box 4595, Decatur, IL 62521.

May 23, **Twenty Over Nine RC Computer/Electronic Hamfest**, Canfield Fairgrounds, Canfield, Ohio. Contact Don Stoddard, 42 South Whitney Ave., Youngstown, OH 44509.

May 28-30, **Northern Alberta Hamfest 93**, Shakers Acres RV Park, Edmonton, Alberta, Canada. Contact Jim Steene, VE6JDS, 9319 95th St., Edmonton, Alberta T6C 3X1 (403-469-2595).

May 30, **Maryland FM Assn. Memorial Day Hamfest**, Howard County Fairgrounds, West Friendship, Maryland. Contact Melvin Seyle, WA3KZR, 15809 Pointer Ridge Dr., Bowie, MD 20716 (301-249-6147).

May 30, **Chicago ARC Hamfest**, DeVry Institute of Technology, Chicago, Illinois. Call 312-666-1606 or 312-545-3622. (Exams.)

May 30, **Quebec Hamfest**, Curling Club, Tracy, Quebec, Canada. Contact VE2UL, Club Radioamateur Sorel-Tracy, Boite Postale 533, Sorel, Quebec J3P 5N6 Canada.

# OUR READERS SAY

## A Credit To Amateur Radio

Editor, CQ:

I am writing this letter to express my sincere appreciation to all amateur radio enthusiasts and one operator in particular. Thank you to Wayne, N1MUA, in Livermore, Maine for his efforts to interpret a very weak signal and get us out of a tight spot on March 4. He lived up to the Principles of Amateur Radio.

We had experienced a severe ice storm, which was confined to our local area. Trees were down everywhere, knocking out power and phones and blocking roads early in the day. High winds were uprooting trees all around our home, but all I could think of was that my children were twelve miles away with no one to pick them up from school and no way to communicate my dilemma—I thought.

Fortunately, my husband is also an amateur radio enthusiast. He had a rig which would operate from a 12 volt power source. With the antennas lying in a tangle across our deck, he hooked it up and said, "I'll give it a try."

It was around 1:30 PM on a Thursday afternoon, not prime time by any means. Luckily, Wayne was monitoring. He picked us up and spent almost two hours getting a phone number for my father over the air and putting through a long-distance call to make sure that these children were safely in proper care. He called us back over the radio to

assure us that the contact had been made and that our message had gotten out. With everything else we had to deal with at that time, knowing that we didn't have to worry about the children was a tremendous relief.

I know the experience doesn't rate as much notice as the devastation of a hurricane, earthquake, or other disaster, but I really appreciated the fact that the network was there when we needed it.

Kathleen R. Szakonyi  
Smithsburg, MD

## Some Courtesy, Please?!

Editor, CQ:

I've been getting your magazine for some time now, and I look forward to it every month. I especially like your editorial page and the DX column, propagation forecast, etc. I would like to suggest that you change your format and put the contest results and awards section at the end; but that's only a personal thing on my part.

I manage to get in about 100 QSOs a month, on CW on the various bands, and agree that DX stations (and locals on this end) should ID at the start AND the end of their QSOs. One of the best managed pile-ups I ever heard was a DXer working the areas in order, with no shift in frequency, and keeping the QSOs down to signal report, name, town, state, and that was it.

It is very frustrating for those on either

coast, when trying to get to a foreign DXer across country and having to wait for a station to tell his age, the WX, rig setup, etc., only to have conditions change before we can get a shot. As quite a few of us still like to use the basic stations with wire antennas, conditions rule the contact. My suggestion is to keep the QSO short and have consideration for the multitude of other amateurs who are waiting for "a go" at that DX station.

It has been a source of wonderment and a topic of many conversations with many hams that on some subbands an unusual but frequent occurrence has been seen. For some reason, some hams think that if conditions are marginal they can improve their chances by riding other QSOs' "waves." They like to come on the air only a Hertz or two off from each other, although this practice only ends up interfering with existing QSOs. There has recently been a growing number of Tech-plus ops trying to get their code up and annoyance levels are rising.

I hope that amateurs try to remember their courtesy on the air (and RTTY ops keep their transmissions down in the Extra, Advanced, General subbands and off the Novice portions).

Anyway, I hope to hear many more "thinking" stations out there and remember: It's better to send good slow code than fast slop, QSL?

Bob Nixon, KB6IXQ  
Valencia, CA

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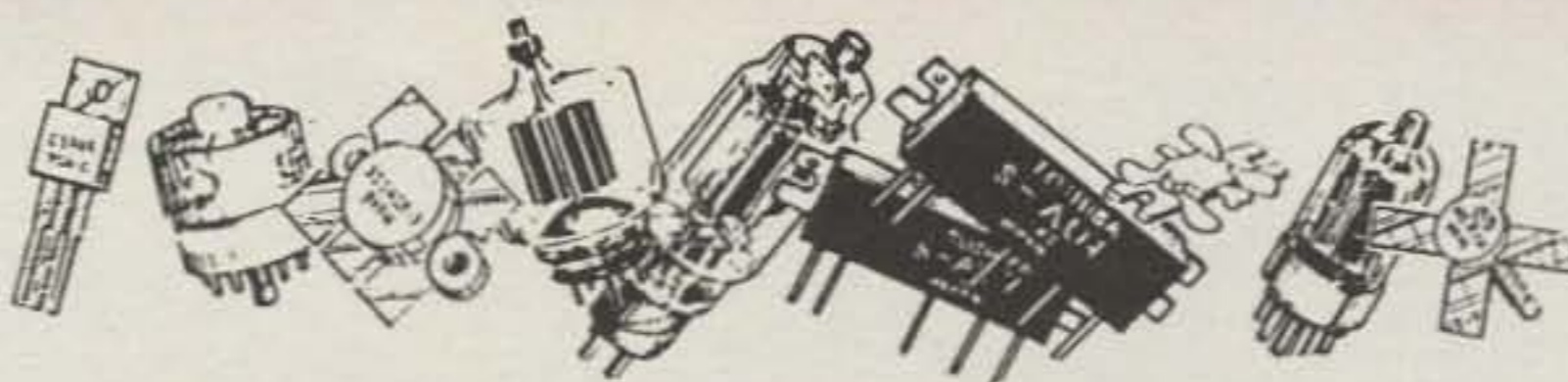
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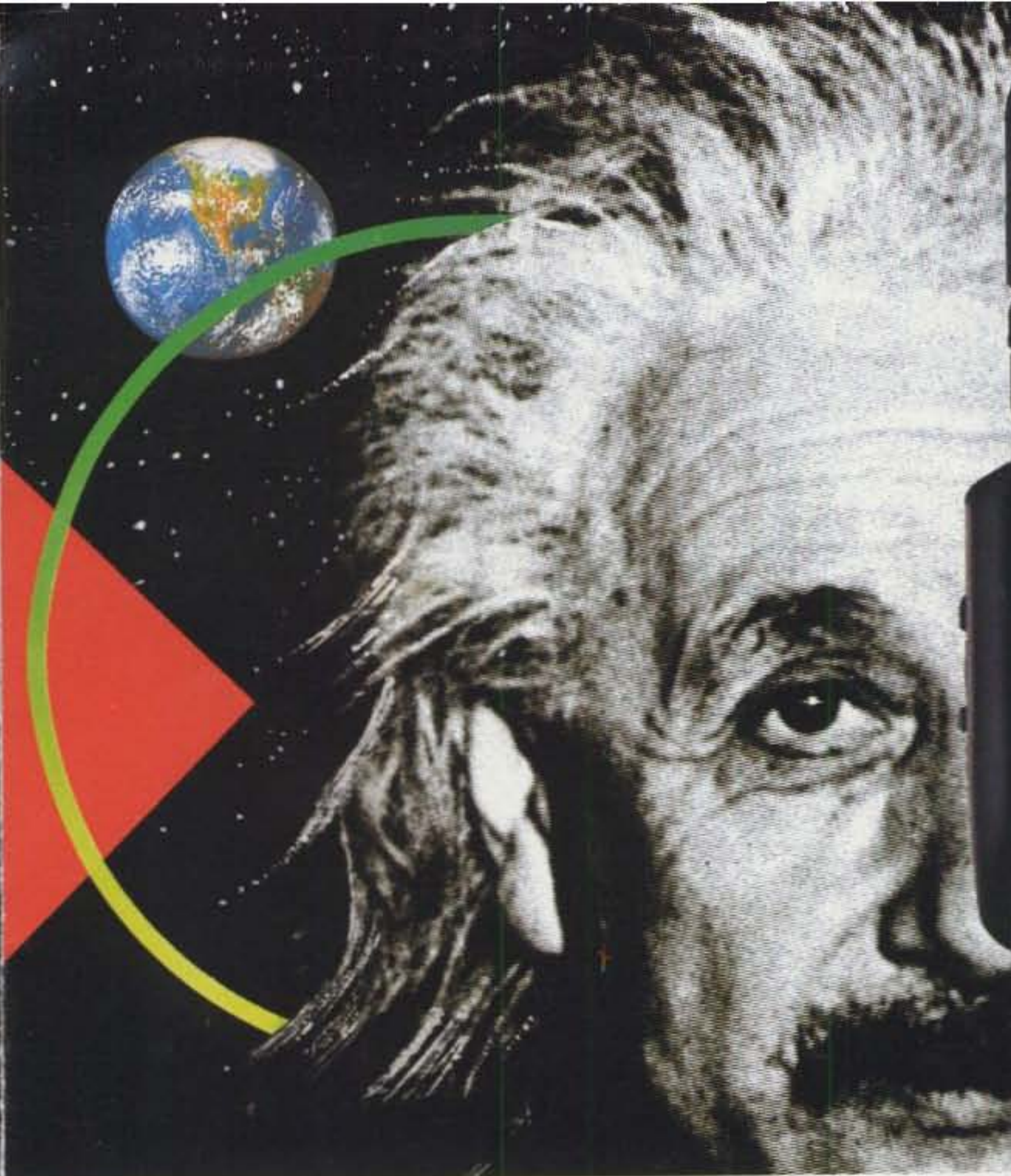
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Front Panel RX Antenna Selection

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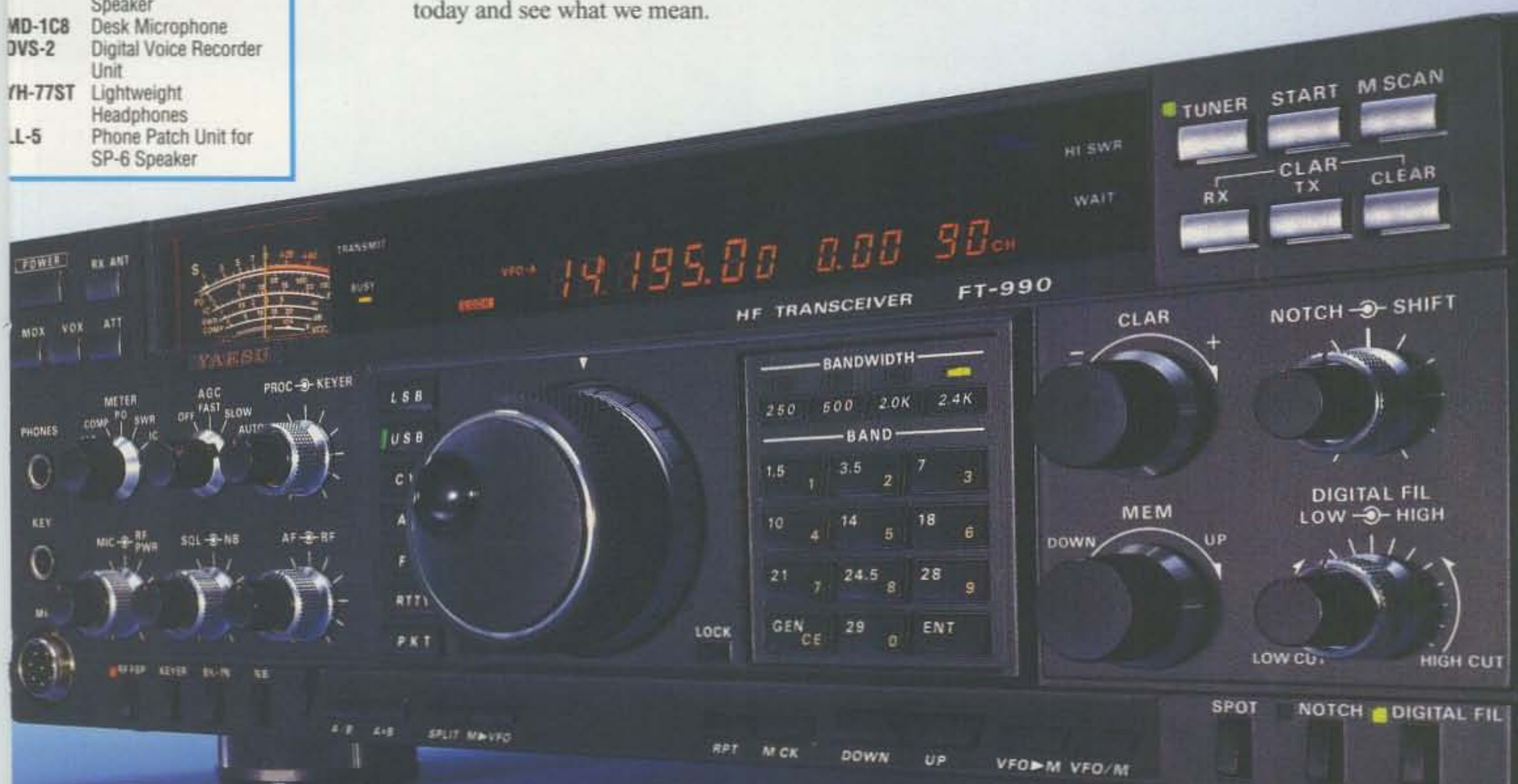
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Exceptional features are packed into the FT-2400 such as: ■ **LCD Display** — the largest display available on any 2 meter mobile ■ **Alpha Numeric** — for entering names or callsigns ■ **Backlit DTMF Microphone** — for making autopatch calls safely at night ■ **31 Memories** ■ **Odd Splits** — on any memory channel ■ **3 Selectable Power Level Outputs** — 50, 25 and 5 watts or user select ■ **Advance Track Tuning**

(ATT) — eliminates big city intermod ■ **Automatic Display Dimmer** — 4 levels ■ **FM Modulation** — for true voice clarity ■ **DTMF Selective Paging (optional)**.

Other features include: Wideband receiver coverage 140-174 MHz RX, 140-150 MHz TX • CTCSS encode built-in and selectable from the front panel • Five scanning functions: Band Scan, Limited Band Scan, Memory Scan, Memory Channel Lock-out with Selectable Scan Stops and Priority Scans • One piece die-cast construction with extra large heat sink • Automatic Repeater offset • Programmable call channel.

Options: DTMF coded squelch and paging (requires FRC-6 paging unit) • CTCSS Decode Unit (FTS-17A).

If you're serious about affordable communications, you'll want the FT-2400. Contact your Yaesu dealer today.



# YAESU

Performance without compromise.™

One-Year Limited Warranty on all Amateur Radio Products.  
Specifications subject to change without notice.

Passed MIL-STD-810  
Shock and Vibration Test



FT - 7400 UHF VERSION  
NOW AVAILABLE

NEW



"The FT-416 comes in black - or gray!"

"New sculpted design, built-in VOX,  
back-lit DTMF pad, Yaesu's  
"Straight A's"! Wow!"

"Yaesu did it again!"

## FT-416/816 2-Meter/70cm Handheld

- Frequency Coverage  
FT-416:130-174 MHz RX  
140-150 MHz TX  
FT-816:430-450 MHz RX/TX
- 41 Memories (Odd splits on any channel)
- 4 TX Power Levels  
w/FNB-25 2.0, 1.5, 1.0, 0.5W  
w/FNB-27 5.0, 3.0, 1.5, 0.5W
- CTCSS Encode/Decode
- ATS, Automatic Tone Search
- ATT, Advanced Track Tuning
- ABS, Automatic Battery Saver
- APO, Automatic Power Off
- Direct 12V DC Input (5 Watts Output) 5 Watts w/FNB-27 Battery
- Back-lit Keypad and Display
- DTMF Paging and Coded Squelch
- Built-in VOX
- **Accessories:**  
Compatible with most FT-530 and FT-415 Series accessories. Selected batteries in gray.

In great design "form follows function." Only then does breakthrough design evolve. Our new generation of HTs exemplifies this with the exciting FT-416.

An industry first, a choice of colors - traditional black or new-age gray, and a dynamic ergonomically sculpted case that fits your palm like a friend's handshake are only the beginning. New ridged Control Knobs with numbered VOL insure perfect tuning. And, there's a new molded PTT with functions so perfectly aligned they respond to the slightest thumb flex.

Packed with features, the FT-416 has built-in VOX, four-way scan, the largest, brightest DTMF key pad in its class and Yaesu's famous "Straight A's": ATS - Automatic Tone Search, ATT - Advanced Track Tuning, ABS - Automatic Battery Saver and APO - Automatic Power Off. And, Power Output up to 5 Watts.

During testing amateurs found this newest evolution in design remarkably unique. "You have to try it to believe it!"; they said. So we invite you to do just that. Contact your Yaesu dealer today and find out what true evolution in design means to you.



FT-416 choice of black or gray  
FT-816 black only

# YAESU

Performance without compromise.<sup>SM</sup>

# The newest evolution in design.

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Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.