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- W2FMI on The 4:1 UNUN
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CQ Reviews:

- Standard Model C228A Dual-Band HT
- MFJ-247 HF SWR Analyzer
- Creative Design RC5 Rotators
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THE RADIO AMATEUR'S JOURNAL

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The Radio Amateur's Journal

ON THE COVER: The sweet glow of success. Contester Jerry Rosalius, WB9Z, is shown climbing one of his towers for a last-minute adjustment. (Photo by Larry Mulvehill, WB2ZPI)

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ZERO BIAS

EDITORIAL

Those New Year's Resolutions

There's something about New Year's Day that implies a new start, a new beginning, or simply a take-off point from which everything will be perfect. Usually by the afternoon we've already broken a few of our New Year's resolutions and will have to wait another year to start over. We do try, however, and our intentions are good. Maybe if we just kept our resolutions a bit simpler and less grandiose they would be easier to keep.

Perhaps in amateur radio we could achieve a measure of success by tightening our goals and making them a bit less global. I don't mean that you should give up your resolutions to work for:

1. Ending world hunger
2. Eradicating crime
3. Freeing mankind from disease
4. Truly creating peace on earth

What I mean is that you can come up with a list of things that you can change and that can be accomplished within 1993. A few things that come to mind are:

1. I will try to be less condescending. I will treat my fellow amateur as an equal, regardless of license class.
2. I will try to be less pedantic. There's a good chance I don't know what I'm talking about, so why should I confirm everyone's suspicions?
3. I will curtail my use of certain descriptive adjectives and discriminatory language. This will tend to show that you went beyond the third grade and that your parents were not brother and sister.
4. I will listen more and practice the art of comprehension.
5. I will learn more about amateur radio and broaden my appreciation of what other amateurs do. This means that I will read more and ask questions (but not in pileups).
6. I will try not to take myself too seriously and have more fun with amateur radio.

Obviously, the above doesn't apply to everyone, but you get the idea. The idea is to think about what you are going to do to make yourself and your relationship with amateur radio better. You really don't have much control over what the other guy does. It's like your cousin Ned. Everyone has a cousin Ned. If you had your choice, you wouldn't have a cousin Ned. But the reality is you do, and you're stuck with him.

Reviews and More Reviews

As this issue should reach a lot of you before Christmas, we're presenting a number of product reviews, which may give you an idea for a last-minute gift other than major equipment. I don't know about you, but I know that there's a lot of stuff that I'd like to enhance my shack and workshop with in 1993. I've been redoing my workshop for the past few years. It looks like it all will come together this year, and I expect to be up to my hips in sawdust, wood chips, and metal bits and pieces.

My shack is another story. I don't know if it will ever look as neat and clean as some of our cover shots with nary a wire and cable showing, but I keep hoping someday it will. I still think that Larry gets the subjects to pile all their "good stuff" out in the driveway until the picture is taken.

Contest Queries

This is one of those stories that's too good to let go by the wayside. First let me apologize to the caller, who simply wanted some information. It started or culminated (depending on how you look at it) the Friday before the CQ WW DX SSB Contest. The whole week before the contest we were flooded by telephone calls from amateurs wanting to know what zone they were in. By late Friday afternoon just about everyone in the office was fielding zone requests, and most of them didn't work on *CQ* and therefore didn't even know what a zone is. About 4:45 in the afternoon someone called and asked the receptionist what zone they were in, mentioning their city. The receptionist called out "What zone is XXXX City in?" Without hesitation she repeated what was said to her: "Sir, you're in the Twilight Zone" and hung up. No, it wasn't me, but I wish I had thought of it.

Changes

For the past ten years Dorothy Johnson, WB9RCY, has headed up our Awards column and *CQ*'s USA-CA Award program. Dorothy is stepping down as Director and turning the reins over to Norm Van Raay, WA3RTY. By the time you read this all of the USA-CA Award records will be at Norm's QTH, so if you have any questions, contact Norm. We're both sorry and happy for Dorothy—sorry to see her step down after all these years and happy for her in that she can enjoy more time with her family and amateur radio. Thank you so very much, Dorothy, for everything you've done, and especially for your dedication.

Silent Key

This past November contesting lost one of its strongest advocates and competitors. Al Slater, G3FXB, passed away of a heart attack at the age of 65. John Dorr, K1AR, will have more details in February's Contest Calendar.

We're also happy to announce that John Dorr, K1AR, has joined us here at *CQ* Corporate Headquarters in beautiful downtown Hicksville. John's duties will be primarily at a business level, although that can't be used as an excuse for John not to do his column or for getting it in late. Those of you familiar with John and his energy level will see no conflict in this. Our new General Factotum has even made noises about the *CQ* station that Dick and I have been talking about for years. I just think John wants a new contest station.

Contests and Awards

Gail and I would like to thank everyone who tried to cooperate this past CQ WW DX Contest season by sending in SASEs with log requests. It really is a big help in getting the contest information out to you quicker. One slight suggestion, though, for either next year or for any of our other contests. If you're going to send in a #10 envelope for your logs, there is a physical limit to how much can be stuffed into it. This diminishes with paper quality, so putting several dollars worth of postage on the #10 envelope will not change what you get and only wastes money. If you want a larger quantity, send in a large (strong) manilla envelope with appropriate postage.

There's still time to get in on our 160 Meter Contest this month, and there should still be enough time to get some logs. We've tried to speed up the process this season and get stuff back to you in a few days. Remember, if you want logs for any of our contests or award info, mark the outside of your envelope with the request. For a #10 envelope, one or two stamps is enough.

When you send back your completed logs and/or award applications, please indicate on the outside of the envelope what is contained therein. This is especially important with your contests. Please indicate the contest and mode on the outside of the envelope. This makes it much easier to sort and handle the logs, and doesn't leave us with loads of paper cuts.

73, Alan, K2EEK

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ANNOUNCEMENTS

• The following special events will take place during January:

KC2VB, from the bicentennial of the founding of Auburn, New York, and Winterfest; Auburn ARA; 1500–2100Z January 23 in lower 25 MHz of the General 40, 20, 15, 10 meter bands and corresponding Novice bands. For certificate send 9 × 12 SASE to Stan Gutelius, KC2VB, 4 Elizabeth St., Auburn, NY 13021.

W3USS, from inauguration of Bill Clinton, Russell Senate Office Building, Washington, DC; Maryland Apple Dumpling ARS; 2300Z January 15 to 2300Z January 18; phone 1.855, 3.905, 7.205, 14.270, 21.345, 28.490 MHz; CW 1.810, 3.640, 7.050, 14.050, 21.050, 28.050 MHz. Each evening the station will operate CW in the bottom of the Novice bands; 80 meters 7–8 PM, 40 meters 10–11 PM EST. Op will adjust code speed to that of calling station. For certificate send 9 × 12 SASE to Box 2468, Wheaton, MD 20902.

K4GSO, from commemoration of club station AAR4CSS and the 16,000 Army MARS phone patches placed during Operation Desert Storm, Silver Springs, Florida; Silver Springs Radio Club; 0000Z Jan. 9 to 2400Z Jan. 10 in bottom portion of the General 40, 20, 15, and Novice 10 meter phone bands. For QSL send SASE to SSRC, P.O. Box 787, Silver Springs, FL 34489.

KI6YG, from Challenger Space Shuttle Remembrance, San Diego, California; Challenger Junior High School ARC; 1500–2400Z January 28 on 14.270, 21.270, 28.270 MHz. For QSL send QSL and SASE to Frank Forrester, KI6YG, Challenger JHS ARC, 10810 Parkdale Ave., San Diego, CA 92126.

NW7H, from Chinese New Year celebration, Evanston, Wyoming; Uinta County ARC; 1500–2400Z Jan. 23–24; phone 28.395, 24.945, 21.325, 18.140, 14.245 MHz; CW 7.122 MHz. For certificate send QSL and 9 × 12 SASE to Vranish, P.O. Box 2048, Evanston, WY 82931-2048.

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

Jan. 10, **21st Annual Midwinter Swapfest**, Waukesha County Expo Center Forum, Waukesha, Wisconsin. Contact WARAC Swapfest, P.O. Box 1072, Milwaukee, WI 53201 (SASE). (Exams at adjacent Red Carpet Lanes at 9 AM)

Jan. 16, **Third Annual Northwest Missouri Winter Hamfest**, KMRN Tri-Rivers Expo Hall, on US 69 one mile north of I-35 exit 48 (Wallace State Park exit). Contact Northwest Missouri Winter Hamfest, P.O. Box 182, Cameron, MO 64429. (Exams)

Jan. 16, **1993 Hammond Hamfest**, SLU University Center, Hammond, Louisiana. Contact Ernest Bush, N5NIB, 331 Rock Road, Hammond, LA 70403 (504-567-1261 days, 504-542-0034 evenings). (Exams)

Jan. 16, **Naval Postgraduate School ARC Winterfest**, Monterey Peninsula College Armory, Monterey, California. Contact Doug, KC3RL, 408-663-6117; or Pat, KA6IRS, days only 408-649-4444, ext. 20.

Jan. 17, **27th Annual Hamfest, Electronics, Computer Swap & Shop**, Southfield High School, Southfield, Michigan. Contact Robert Younker, Southfield Senior High School, 24675 Lahser Road, Southfield, MI 48034 (313-746-8675).

Jan. 17, **Metro 70cm Network Electronic Fleamarket**, Lincoln High School, Yonkers, New York. Contact Otto Supliski, WB2SLQ, 53 Hayward St., Yonkers, NY 10704 (914-969-1053). (Exams)

Jan. 23, **13th Annual Citrus County Hamfest**, National Guard Armory, Seven Rivers Drive off US 19 south of Crystal River Airport. Contact Billy, WE4C, 904-726-2905 (10 AM to 9 PM), or write to SHARC Hamfest, 8811 Maplewood, Inverness, FL 34453.

Jan. 23–24, **Tennessee Valley Amateur Network Middle Tennessee Hamfest & Packet Conference**, National Guard Armory, Gallatin, Tennessee. Contact Bill Ferrell, 615-452-3962, or TVARN, 1120 Douglas Bd. Road, Gallatin, TN 37066. (Exams 9 AM, preregistration required)

Jan. 30, **Lockport ARA Annual Club Auction**, South Lockport Fire Hall, Lockport, New York. Contact Edmund P. Busch, N2MYM, 5316 Ernest Road, Lockport, NY 14094.

Jan. 31, **Tusco ARC Hamfest**, Ohio National Guard Armory, Dover, Ohio. Contact Howard Blind, KD8KF, 6288 Echo Lake Rd. NE, New Philadelphia, OH 44663 (216-364-5258).

Jan. 31, **Wheaton Community Radio Amateurs Mid-Winter Hamfest**, Odeum Expo Center, Villa Park, Illinois. Contact Wheaton Community Radio Amateurs, P.O. Box QSL, Wheaton, IL 60189 (708-629-8006 and 629-8889). (Exams)

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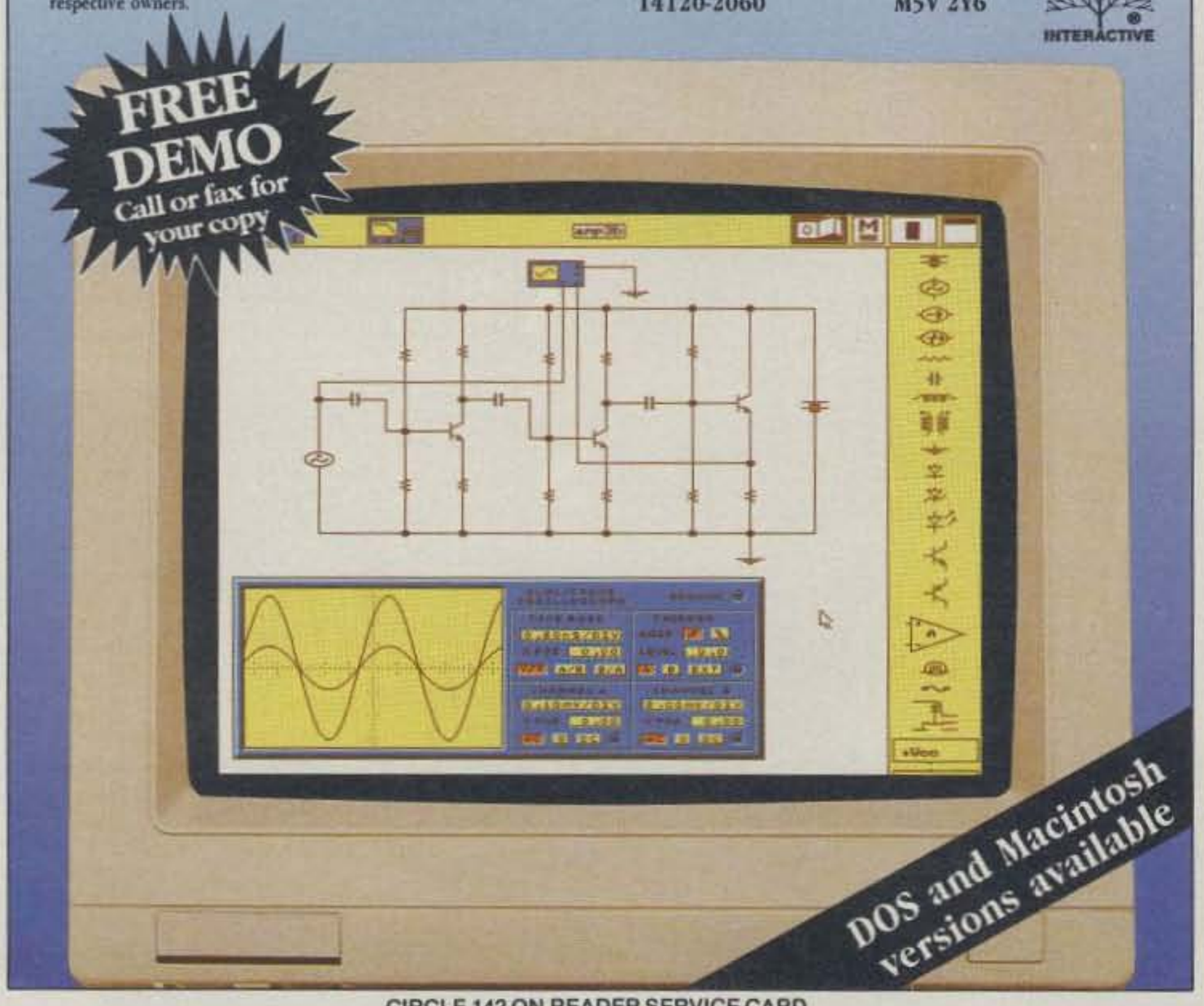

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- **Broadband with low VSWR**
- **Highest power rating**
- **Built in lightning arrester**
- **RF de-coupling radials**
- **All weather performance**
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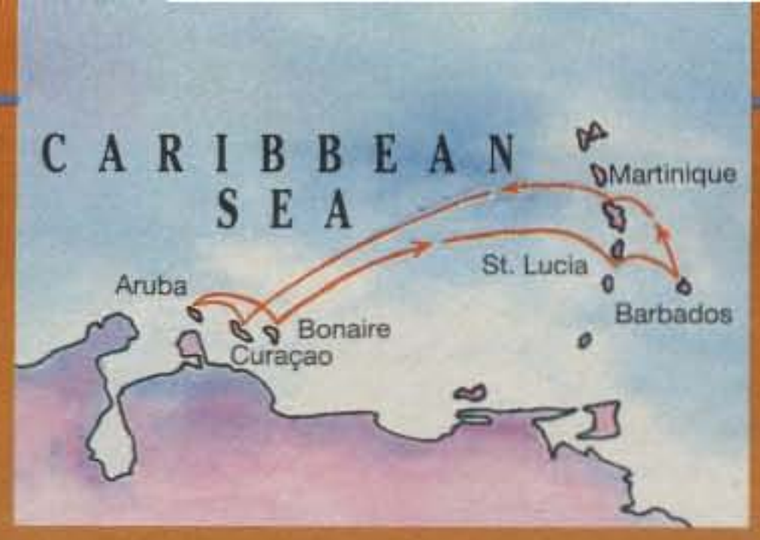

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OUR READERS SAY

An Historical Note

Editor, *CQ*:

Mr. Julian W. Jablin's article , "A Page Out of History, Edouard Branly, Inventor of the First Detector," in *CQ* for November 1992 is an excellent article, and one greatly appreciated by buffs of the history of electronics. Although the detector of Professor Branly was not the first detector of radio frequency (RF) power, it certainly was the first "effective detector," as Mr. Jablin points out.

By way of an historical note, Dr. Lee De Forest, the prolific inventor who was granted more than 200 patents between 1902 and 1949 by the U.S. Patent Office, vigorously investigated improvements to the Branly coherer as well as sought alternate RF detectors.

Dr. De Forest's interest in the coherer began during the 1890s when he was a candidate for the Ph.D. degree at Yale University. His thesis topic was "Reflection of Hertzian Waves from the Ends of Parallel Wires." He found the coherer to be a vexing device and stated in his autobiography, *Father of Radio*, "I found it (the Branley coherer) a most erratic and undependable device." Note that the proper name spelling above is as it appears in Dr. De Forest's autobiography and the parentheses are those of the writer. It is curious that the name of the inventor of the coherer was misspelled by Dr. De Forest.

As is well known, a reliable detector of radio waves did not come along until the year 1906, when Sir John Ambrose Fleming introduced his diode "valve" to the emerging art of radio. Dr. De Forest's vacuum tube detector was also introduced in 1906. In 1907 Dr. De Forest followed his vacuum tube diode with the three-element Audion which made available a more sensitive detector, an amplifier, and a power oscillator.

Len Sheer, W7WRQ
Phoenix, AZ

It's Where We Stand

Editor, *CQ*:

Thoroughly enjoyed the article by Ray Kowalski in the November 1992 issue of *CQ* ("Currents," page 11) . . . really an update on where the amateur stands in the world of radio communication.

Bruce Kelley, W2ICE-AN
Curator
A.W.A. Electronic Communication Museum
Bloomfield, NY

More Interference Problems

Editor, *CQ*:

Re: CQ, Nov. 1992, pg. 150, "Our Readers Say," Chrysler (Dodge) Caravan and RF Interference.

I read the above letter with great interest, as I have this same problem. I bought a Dodge Dakota, and when i installed my 144–440 MHz rig, I found that I also had an S9 + interference signal on 146.52. In addition I found signals on 144.215, 144.535, 145.20, 146.195, 147.11, 147.185, 147.51, and 147.65 MHz. I found no interference on the 440 band.

I presented myself at the door of the local Dodge dealer and tried to explain my problem. It fell on deaf ears. I was told to take the radio to a radio shop and have it fixed. I then showed the *CQ* letter to them, and they said to come back the next day, as the regional manager would be there. I tried to explain this to him and he said he didn't understand this "CB" stuff. I finally got through to him, so he proceeded to change radios. The same problem persisted until he installed a lower grade radio. This fixed the problem. Not wanting to take a lower grade radio after I had paid for the better one, I had the old one put back in. The local dealer has dropped this matter.

I am hoping someone has a fix for this. I'm wondering if RF beads on all power and speaker leads may fix this. I have called the Chrysler customer assistance 800 number, and they said they have never heard of such a problem. I have gone full circle and have nowhere to go. Other hams must have run into this problem, as it seems to exist in most higher grade Chrysler radios, at least the 92s and 93s. The Infinity Two radio that fixed the problem in the above-mentioned letter does not fit in my vehicle.

Any ideas? TNX ES 73.

C.W. (Win) Campbell, K7NKF
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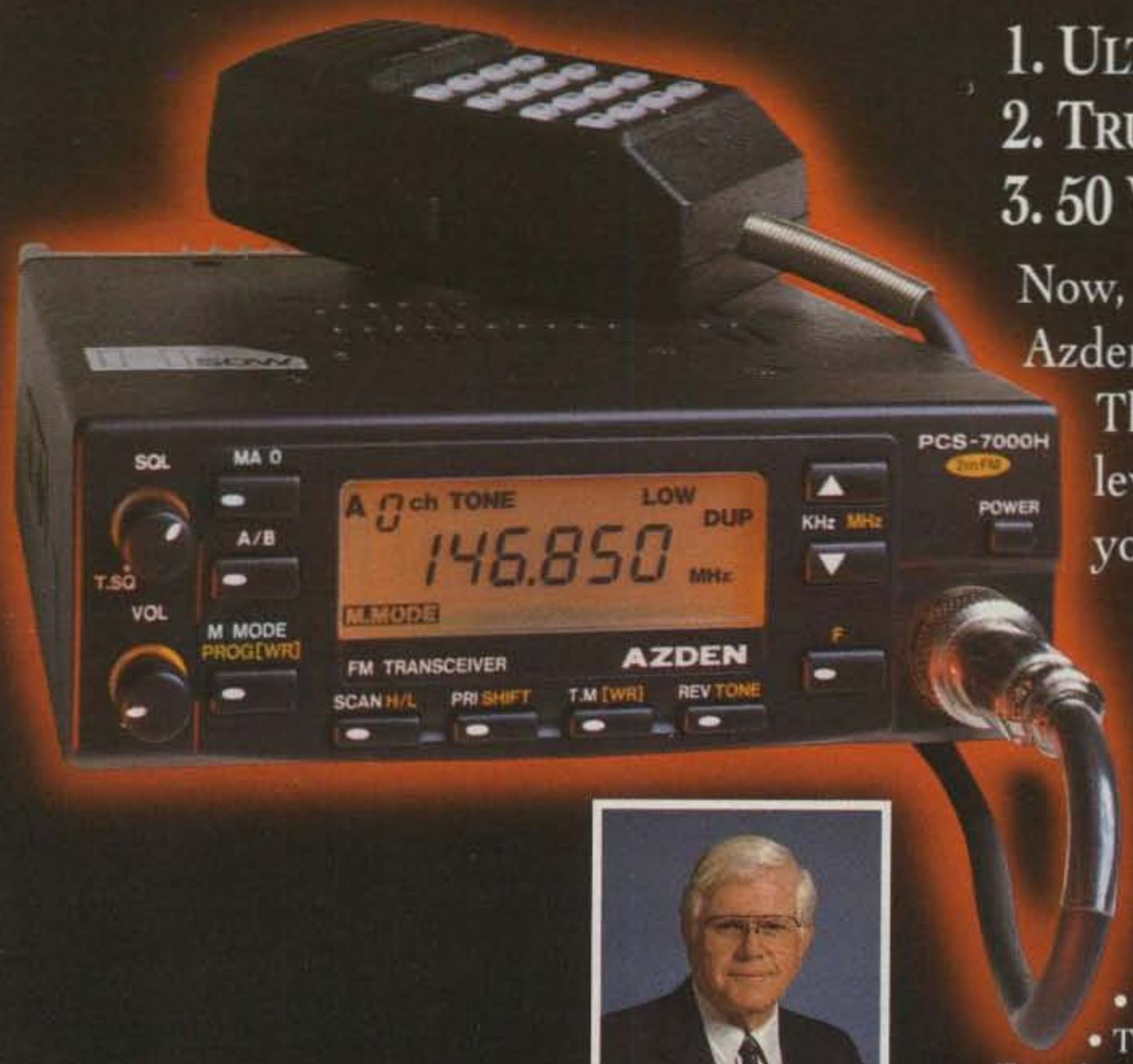

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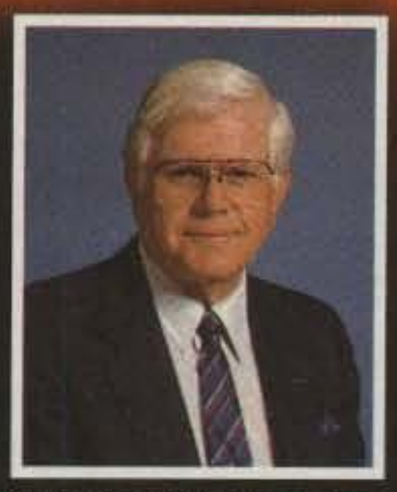

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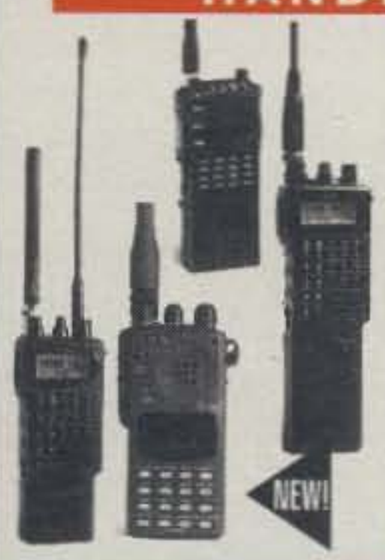

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DXpedition To The South Sandwich Island Group VP8SSI

BY TONY DEPRATO*, WA4JQS

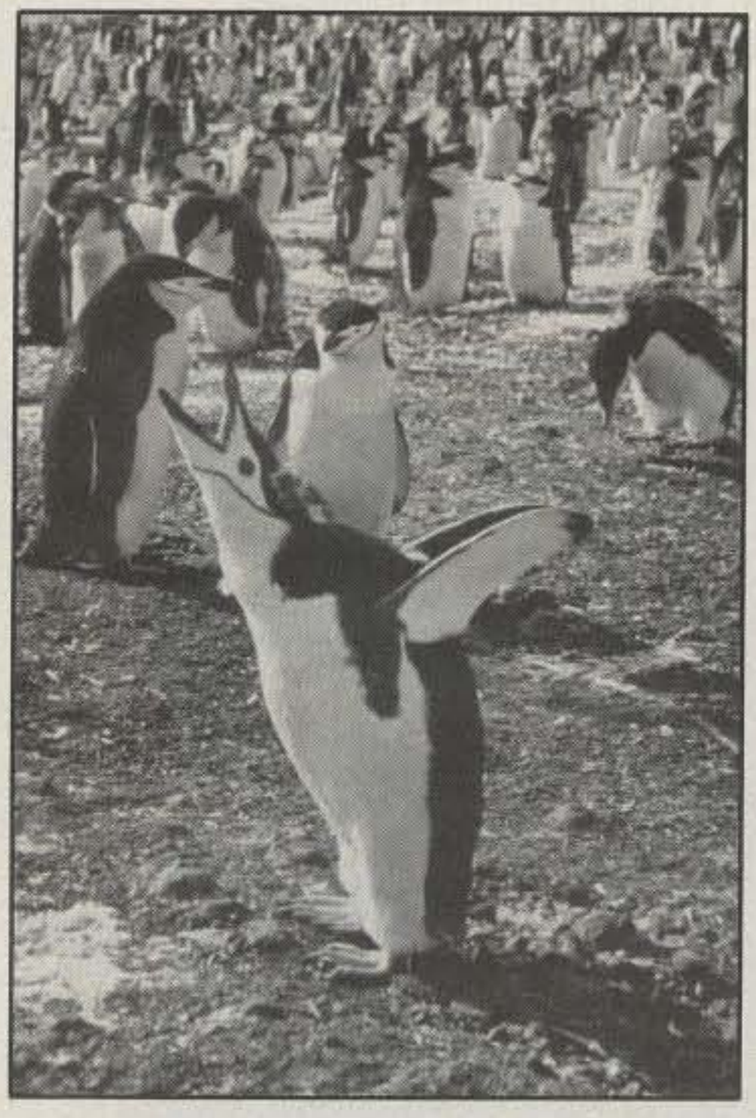
This is an account of the VP8SSI DXpedition to Thule Island in the South Sandwich group during March and April 1992. The operators on this DXpedition were KØIR, KJ9I, W7KNT, W6MKB, WA4JQS, OH2BH, JE3MAS, and WA3YVN. This six week operation covered the following stops: Port Stanley, the Falklands, Thule Island South Sandwich group, and South Georgia Island. We made over 60,000 QSOs on all bands 160 through 10 meters, including the WARC bands, on CW, SSB, and RTTY.

We would like to thank each and every person who helped us make this dream come true, and we hope that we were able to give many of you a new country during this trip. I would like to personally thank Walt Williams, W4BAI, of Somerset, Kentucky; Sam Brown, WA4IUM, of Knoxville, Tennessee; and Dan Whitsett, W4BRE, of Huntsville, Alabama for their help and work in putting the story (and subsequent slide show and video production) together.

Tony Deprato, WA4JQS/VP8BZL
Team Leader, South Sandwich DXpedition

On March 7, 1992 eight men boarded aircraft in Kentucky, Montana, Wisconsin, Florida, California, Minnesota, Japan, and Finland on the first leg of a trip that would take them to the bottom of the world to a small island with the dubious distinction of being the worst place on the face of the earth! Which island? Thule Island, the southernmost island in the South Sandwich group.

The trip on my end started out like most trips I go on. I had to transfer planes twice before I reached O'Hare airport in Illinois in order to catch the transatlantic flight and meet up with Terry, W6MKB, Ralph, KØIR, and Al, WA3YVN. As is normal for most flights these days, none were on time, and all were overbooked. In due course, however, I arrived at O'Hare with just enough time to make a mad dash from my arrival gate (#3 concourse b) to my departure gate (#33 concourse c). This is a feat I hope I never have to relive, as I was carrying a small duffel bag that weighed in at 56 pounds.



"If I told you once, I told you a thousand times: No breakers, listen up 10, last two, call area 2." An irate resident of Thule gets in on the DX action.

I was met at the gate by Ralph, who had the oddest expression of concern on this face after seeing me. By this time all I could do was gasp, point to my watch, and get out the only word that was spoken before they called our flight: "water!" I think Ralph was trying to figure out how long it would take to get a hospital crash cart to meet me, because he later told me that I looked like a man who was about to cash in his chips, and I think if I had had to carry that bag full of radios and RTTY gear another 30 feet, I would have!

The flight to England was long and tiring. We were met at Heathrow airport by members of the Chiltern DX Club, who managed to gather us and all of our gear and take us through customs. We then went to their homes, where we were shown a wonderful time, with all the best of English hospitality.

Al and I stayed with John Wright, G3VPW, who had spent a number of years in the Falklands and was very keenly interested in Antarctica. He had a large collection of books and pictures of the area.

The next evening before our flight was to depart, a party was given for us by our hosts at Brize Norton air base. I must say a nicer group would be hard to find. We are all very grateful to the Chiltern DX Club for all the kindness and help given to us on our arrival, and upon our return, to the U.K.

After a great meal and a few rounds of drinks we were taken to the departure gate to await our flight, which as all things go, was 2½ hours late taking off. Eight hours later we arrived at Ascension island, where we were met by George Talbot, ZD8GT, and Steve Hodson, ZD8LII, who managed to talk the air police into letting us leave the airport waiting area and go to the air base club station while our plane was being refueled. There Terry was given the ZD8 license he had applied for a month earlier, and he did manage to contact his brother in the States in the short time we had to visit the club station. While there we all applied for ZD8 calls in the hope of operating on our return trip. Arriving back at the airport we said our goodbyes and boarded the plane for the 8 hour trip to Mount Pleasant airport in the Falklands.

Our arrival in the Falklands will always stand out in my mind! The plane ride from London to Ascension had been long and tiring, and now we were excited and happy to see the Falklands 1000 feet below us as we began our final approach. I remember feeling anxious about the possibility of having to be rerouted to South America because of the weather conditions at Mount Pleasant, not to mention the thought of stories going around about Argentinian fighter planes tailing the R.A.F. Tristars in on their last 50 mile run to the airport.

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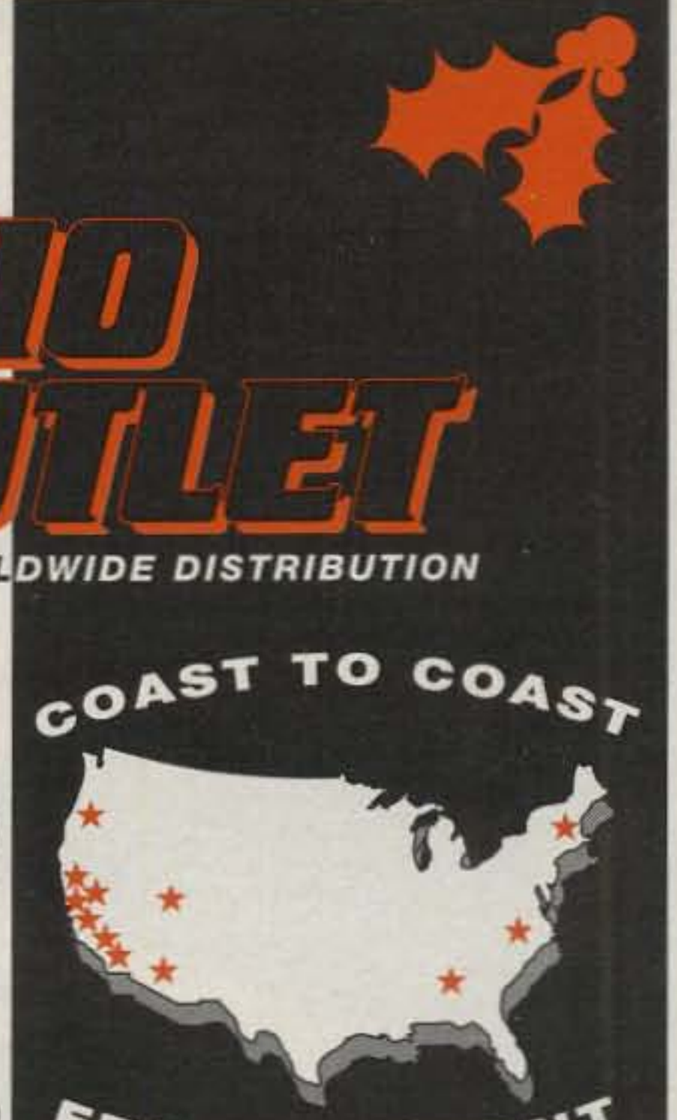

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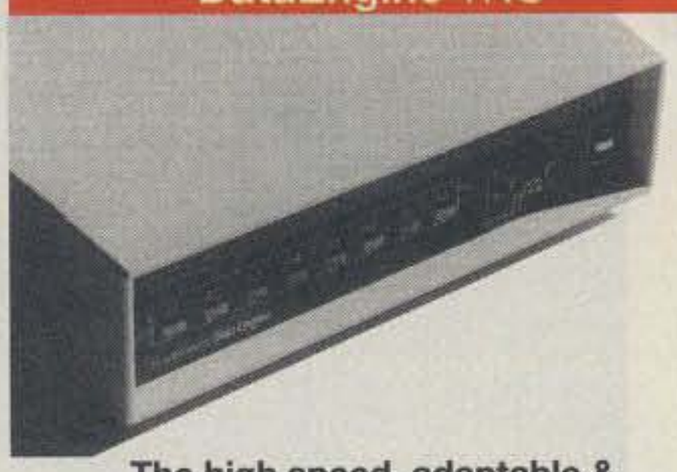

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I sat back in my seat as we passed over the outer runway markers, waiting for the wheels to touch down and thinking we were there at last! Suddenly I was thrown violently to my right, the seat belt cutting sharply into my waist! As I turned my head to my left to see what was going on outside, I was forced downward into my seat, followed by a bone-jarring thump as we hit the runway hard. Overhead luggage and parts of the lighting fixtures of the plane descended upon us at the same time. Just a split second before touchdown a fierce cross-wind had hit us and lifted the left wing of the aircraft up to a 45-degree angle, causing us to land hard on one wheel. As we came to a stop at the terminal, Terry and I looked across at each other and said, "Welcome to the Falklands!"

Since most of the arrivals were military personnel, we had to wait until they were processed before we could go through customs. I will never forget the look on the customs agent's face as eight travel-worn amateurs crowded up to her desk with four tons of luggage! But with the help of reinforcements she called from various places, we made it to our military briefing about all the hazards of unexploded ordnance that still covers 85 percent of the island.

An hour later we were allowed through to the front area, where we were met by Peter Short, VP8WA, who had worked with me for over three years putting this together! After greetings, we managed to load our gear into the three Land Rovers and the mini-bus that Peter had hired for the hour ride to Port Stanley.

The Falkland Islands are a wondrous place. I've never seen such a strange and beautiful land with rolling hills, jagged rock peaks, low flat peat bogs, and the seemingly strange flowing rivers of boulders that go on for miles as they make their way from the tops of the peaks in straight lines down toward the sea.

Arriving at the crest of a high-rising plateau, we were greeted with our first view of Port Stanley. Even in the fading light of day, one is taken back in time to the early 1800s. This was truly a scene out of a movie. Running from the crest of the hill down to the sea are row after row of tiny houses one above the other, wrapping themselves around the bay. The narrow sidewalks and foot path's winding between the houses and stores give one the impression of being in the Welsh highlands of the last century.

Following the rows of houses downward to the bay, our eyes were drawn to the opposite shore, where placed high upon on the sloping ridge are painted rocks spelling out the names of the English ships that have watched over and protected the harbor for many years: *Endurance, Brainsfield, Defiance, Beagle.* And there just below one of the names was the *Abel-J* waiting to take us on an adventure we will never forget.

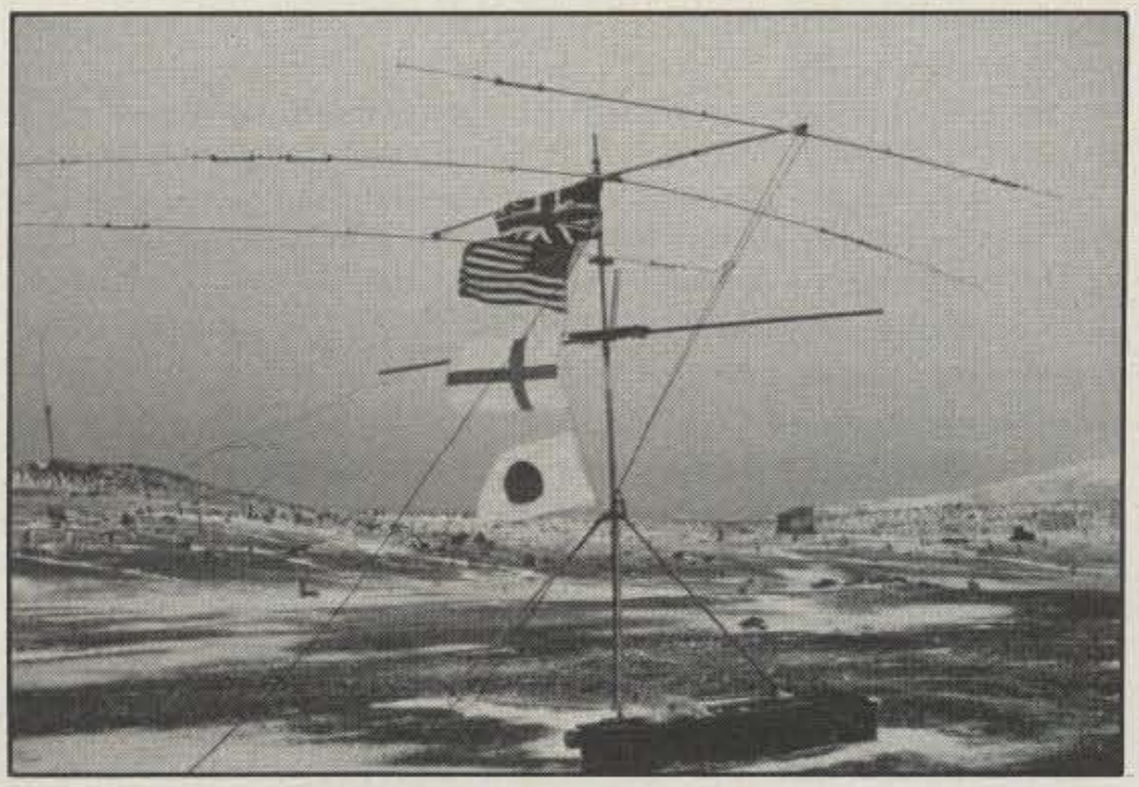
Martti, OH2BH, and John, W7KNT, dining at "Club Thule." From the looks on their faces, this must have been quite an ordeal.

The next few days were a blur of activity as we settled in on the *Abel-J*. Our equipment was removed from storage and loaded aboard ship. We also found time to explore our new home and load up on souveniers as reminders of the Falklands. One of the things that stand out in my mind is how slow and easy-going life is in Port Stanley. You learn never to be in a hurry. Poor Marty. This nearly drove him crazy, as he has never been one to put things off. One thing you can say about the Falklanders is they do things at an even pace, but with great care to detail; nothing is left undone. Our licensing and authorization to permit landing were seen to with the greatest attention paid to detail and correctness by Peter, VP8WA, and the postmaster general of the islands.

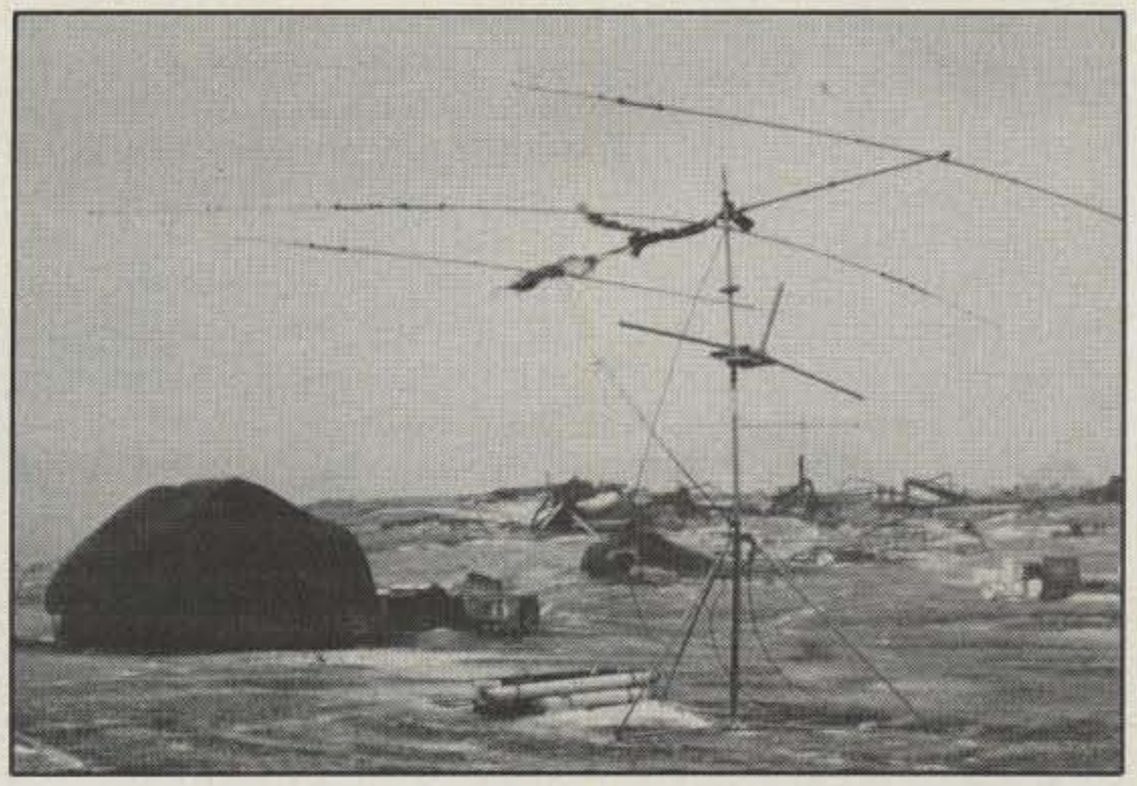
With all paperwork in hand, we were given a grand farewell party by the newly formed amateur radio club—the first ever in the Falklands. Just about every active HF operator was there, including the oldest licensed amateur in the Falklands, "VP8ML." The stories this old gentleman told us about the early days of radio in the Antarctic and around the islands were fascinating, but that is for another time.

Before we departed Port Stanley we were taken to the homes of some of the island's amateurs, and we operated VP8BZL on SSB, CW, and RTTY, giving many stations worldwide their first ever CW and RTTY QSOs, not to mention the first 160, 80, and 40 meter contacts in many years. I learned from many of the islanders that they did not operate HF because they did not like the pile-ups that always ensued once they started transmitting. They much rather enjoyed having a nice ragchew with their fellow amateurs worldwide and hearing about the world outside of their remote island world.

Upon the arrival of Richard Hill, a curator from the U.K., we set sail from Port Stanley with everyone excited and in great spirits. Unfor-



Just before the storm hit, one of the A4S tribanders proudly displayed the multi-national flags of the intrepid DXpeditioners.



The flags virtually disappeared as the ravages of the storm passed through our base camp.

MEMBERS SOUTH SANDWICH ISLAND EXPEDITION

Team leader Anthony W. Deprato, WA4JQS, VP8BZL, V31SS, WA4JQS, ZS1, ZD8JQS.
Alberto Hernandez, WA3YVN
John Vugteveen, W7KNT
Ralph E. Fedor, KØIR, VP8SSI team doctor
Hiroyuki Kozu (MAS), JE3MAS
Terry Dubson, W6MKB, team photographer
Martti Laine, OH2BH, coordinator international affairs Europe
David J. Schmocker, KJ9I

DXPEDITION SUPPORT TEAM

Jerry D. Branson, AA6BB/7, QSL manager (SSB) and treasurer
Joanie Branson, KA6V/7, QSL manager (CW and RTTY)
Paul C. Booker, KC1MH, equipment packing and transportation
Peter Short, VP8WA, coordinator U.K./Falkland affairs
Tom Anderson, WW5L, advertising and promotionals

tunately, the excitement died down quickly, about 30 minutes from shore, as the 108 foot *Abel-J* started to roll. Most of us began to turn a shade of pale green and drifted off toward our bunks. A few hearty souls managed to stay topside until Val, our French cook, called out that dinner was ready and held up a large pan of veal parmigiana. The rest of us did a quick vanishing act until breakfast the next morning, when the pills that Dr. Ralph, KØIR had given us started to do their job. Unfortunately for Dave, KJ9I, and Mas, JE3MAS, they didn't work as well as they had hoped, and they spent the next four days in bed. Ralph made frequent checks to see that they were not dehydrating.

Capt. Carter during this time had set course to Thule Island via South Georgia Island, as he feared that we would have to put in and off-load Mas and Dave if they did not show signs of improvement. But luck was with us once again, and on the morning of the fifth day Dave showed up for breakfast and Mas arrived a short time later. Both were greeted with a standing ovation!

With all now alive and nearly well, Capt. Hamilton Carter (Ham to his friends; we had arranged through Peter for him to get licensed as VP8CAY) gave the order to steam south to Thule Island, the southernmost island in the South Sandwich group. We set up one of the Kenwood TS-950SD's and the computer systems supplied to us in the fo'c'sle. We spent many hours operating as VP8BZL/MM, trying to work out the rough edges and hone our operating skills into a smooth, well-oiled operation. This truly was not an easy task. Trying to spend considerable time in the fo'c'sle of a ship at sea is not a job for the faint of heart. This is the worst of all places below decks to be in 12 to 15 foot seas. These swells, we were to learn later, were like rings emanating from the center of the spot where one might drop a pebble into a pool. This would be nothing compared to the 20 to 25 foot seas that awaited us below the convergence zone in the Antarctic!

Passing through the convergence zone is a strange and eery occurrence. This is an area where warm and cold waters meet, with a fog bank that borders this area. As you sail into it, all sounds seem to diminish. I can just imagine how the sailors on the tall ships must have felt as they watched the sails ripple above them as their ships glided through the water with never a sound to be heard.

Tony, WA4JQS, taking a break inside the well-appointed sleeping tent. As it shows from the heavy wooden braces, more time was spent trying to keep the tent up than actually sleeping in it.

As we passed through the zone, radar started picking up icebergs in the distance. Only one or two at first, then their number grew until the screen was filled with dots of all sizes and shapes lining the waters in front of us! Icebergs are a strange and wondrous site to see. You cannot get a sense or feeling as to just how big and awesome they are from movies. However, look out from your tiny ship and see them towering stories above you, stretching for miles all around, and the vastness of their size and splendor hits you. You realize just how fragile the human being really is.

Our first contact with Thule Island was a radar image 70 miles in the distance—just a tiny speck that would grow during the next 8 hours. It would be late at night when we finally reached the island. The captain wanted to be ready at first light, so the crew made ready the inflatable zodiacs and we helped unlash the 65 crates of equipment in the hold. Others in the group started transferring the 600 gallons of fuel from 55 gallon drums to 5 gallon cans for the trip to shore. It was well after dark by the time all was finished. We settled down to wait as the ship made its way the last 20 miles. There was no way I could just sit around knowing that a dream of 30 years was about to come true. I paced the wheel house with the captain and kept an eye on the radar screen as the island began to take shape.

The first thing that told us that Thule was close was the smell! At first I thought some food had gone bad and Val was cleaning it out of the galley, or the ship's head had backed up. About this time Richard Hill bounded into the wheel house and shouted "Isn't it great!" as he pushed open the sliding windows around the bridge. It was like being hit with a garbage truck that had not been washed out in months! The smell was horrendous. It was the penguins, and we were still 5 miles from the island!

As we drew closer to the island all hands crowded onto the bridge, field glasses in hand, trying to make out what we could of the island in the pale moonlight. We had arrived on the north side of the island, and I was totally speechless as I scanned my field glasses back and forth across the shear rock cliffs and glaciers that run from above the cloud line down to 200 feet above the sea and stop to drop straight down into a pounding surf. I could make out the rollers coming in and crashing on the vertical cliffs, sending foam and spray 50 feet into the air.

At this point I think we all said a little prayer, hoping for a place to land. All records we could find had stated that a landing was at best very dangerous and difficult, and in most cases impossible by small craft.

During the next two hours we made our way around the high cliffs toward Ferguson Bay and Mawson Point. We had thought that Ferguson Bay might be a landing point, but we were soon to find out differently. Ferguson Bay may provide good anchorage for ships, but it is open to the sea and 10 to 15 foot rollers pound this area constantly.

At this point Capt. Carter let us all know just how glad he was that the newly installed side-looking sonar system was operational. As we neared Mawson Point the caption decided to enter the harbor between Twitcher Rock and the low flat point of land protruding out from the south side of the island. We all held our breath as we watched the depth gauge jump up to 800 feet and start a sharp sloping rise to the surface. As we started into the narrow opening between the rocks the gauge read 600, 500, 300, 150 feet. The rock below the surface was coming up at

Say You Saw It In CQ

an alarming rate. At 50 feet I grabbed the railing around the inside of the wheel house in case we should run aground. My mind raced back through the drills the captain had held in putting on the survival suits. But in these waters they would only protect you for about 15 minutes before you started to drift into a sleep from which few have ever returned.

I gritted my teeth as the sounder pinged 30 feet below keel! But wait! What was that? It was holding at 30 feet. We traveled about 600 meters when all at once the depth started to rise again, but this time much more rapidly—100, 300, 800 feet. This was deep—1200, 1600, 2000 feet. At 4000 feet our depth gear bottomed out. It couldn't read anything deeper. We were inside the harbor!

As I stood there going over how fast and deep the sides of this harbor are, it came to me that Thule and Cook Islands are not two different islands, but more than likely were connected at one time. We were inside the crater of a volcano whose last eruption had caused the sides of the crater to break off and fall away into the sea, letting the sea water rush in and sealing this route to the surface forever. The low, narrow rock that we were looking at was part of the rim of this ancient crater.

I then realized that there was another noise starting to drown out the sounds in the wheel house. It was getting louder and louder as we approached the inside of the hook-shaped promontory we would call home for the next 14 days. I heard Richard Hill in a startled voice say, "My God, they're still here! They should be at sea this time of year!" This noise we would find out at dawn was the normal sounds of over 1,000,000 penguins that were still ashore. Worse yet, they were mating!

The next morning we were all up at first light ready for the long day ahead. The engineer and I went below and started unlashing all the gear, while the first mate and the rest of the operators set up the zodiacs and sorted the equipment into landing order stacks topside. Two hours later with all gear topside and the landing craft ready, Terry, W6MKB, Ralph, K0IR, and Al, WA3YVN, along with crew members Mike and Bob, VP8BFH, boarded the zodiac and started toward the beach. I was in contact with Ralph with our 2 meter HTs, recording the first landing by Americans on Thule Island.

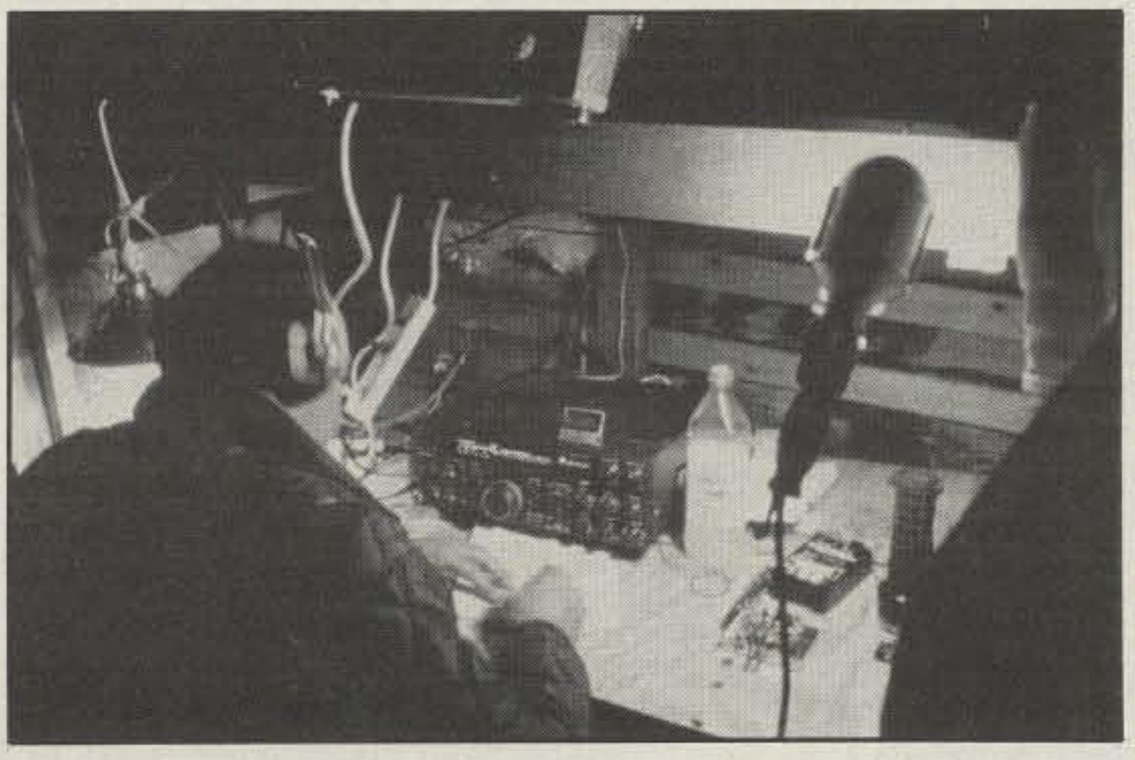
Ralph gave a great account of the coast line as they moved back and forth along the mile long beach front, trying to find a suitable landing spot. After about 30 minutes Mike found his spot, and the small craft started toward shore. The waters were unpredictable as always, and with only 5 yards to shore the current changed. They were hit broadside by a 6 foot breaker, causing the craft to rise up into the air and flip, dumping its cargo into the pounding surf. Luck was with us again, as all three team members plus the two crew men along with four crates of gear all washed ashore at about the same time. The wheel house was silent as we all held our breath waiting for word from shore that everyone was well. The stillness was broken by Ralph's shaky voice announcing that everything was okay.

It took three more tries before we found a suitable landing spot where the surf went straight into the beach. For the next 9 hours we worked without stopping, sending load after load of supplies and equipment ashore. As darkness fell, Terry, David, KJ9I, Al, and Marty, OH2BH, elected to stay ashore while the rest of us remained on the ship to finish the unloading by first light.

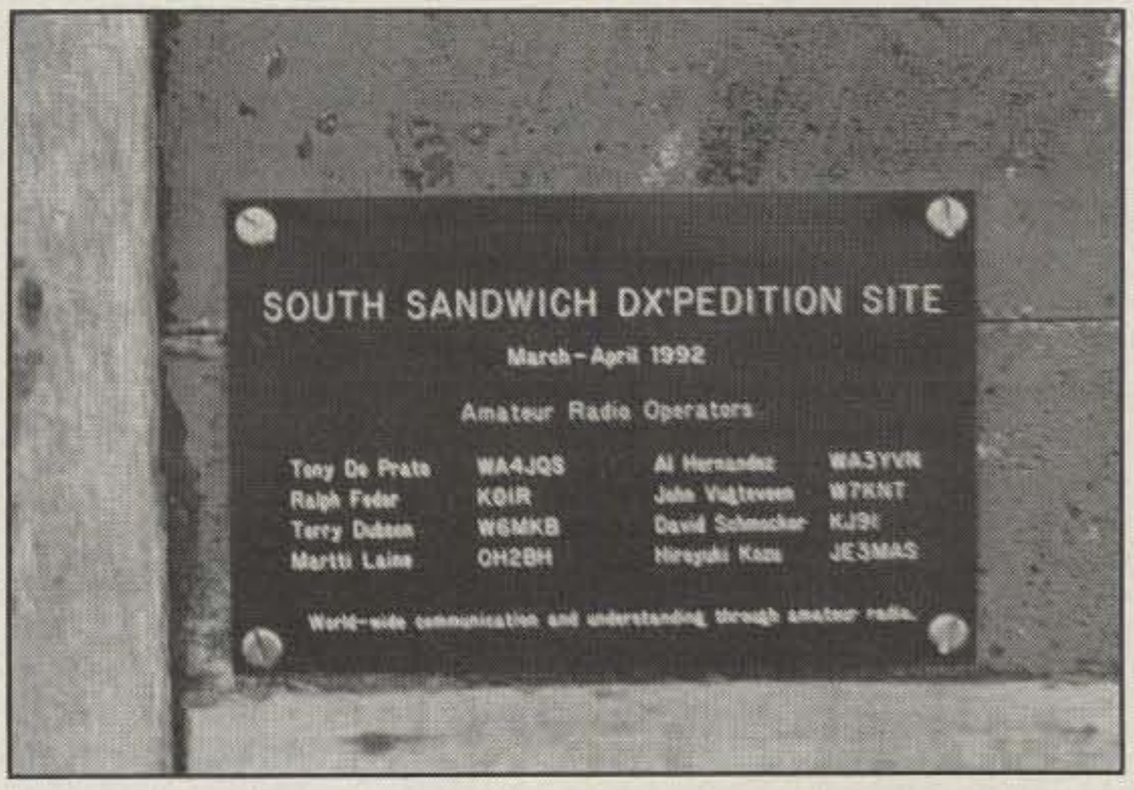
By noon the next day all equipment was ashore. I went over last-minute details with the captain as to the time and frequency schedule we would keep and then boarded the landing craft on her last trip to shore for the next two weeks. The *Abel-J* lay off shore the rest of the day as we transported what was needed to set up the base camp from the beach to the site a mile away. As darkness fell we managed to get three of the tents up and the generators going. As the last light of day faded into the ocean we watched as the *Abel-J* sailed out of the harbor and into darkness. I cannot put into words the feeling we had standing there watching the only contact with the outside world and home vanish into the dark. You cannot imagine how small and insignificant we felt at that moment.

The next two days were a buzz of activity as we went about setting up the sites, putting together the antennas, and running power and

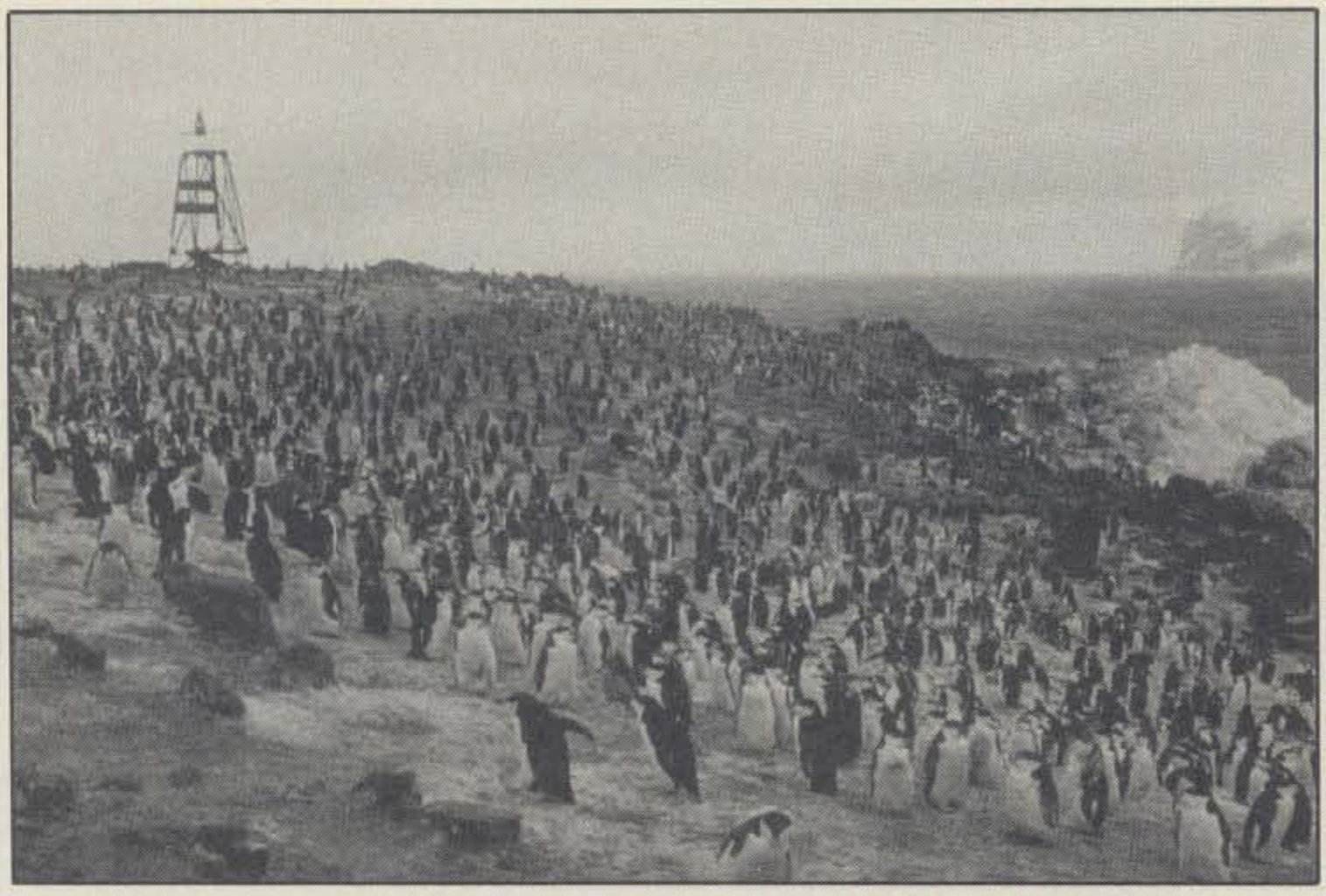
With a mild breeze blowing, John, W7KNT, steps out of the operating tent for a bit of fresh air. Mas, JE3MAS, can be seen in the background strolling over to retie the lines holding the vertical. If you look closely, you can see a few of the island's junior ops curiously checking out the goodies near the entrance to the tent.



Once we got the effluvia shoveled out of the 6 × 6 hut, it made a passable operating shack. The local residents we dispossessed were a little ticked off, but they would shortly return to clean house.



This is the DXpedition's commemorative plaque which we affixed to the old whaling shack just before we left.



A few of our new island friends gather as we prepare to leave Thule.

lighting lines for the radios and operating positions, and transporting the 100-plus crates of gear and personal items up hill from the beach. All this was accomplished while trying to avoid the fur seals and pools of foul-smelling greenish water which is the by-product of a million or so penguins and seals that cover the entire island. I will not go into detail as to how foul smelling Thule Island can be during this time of year, but I will say that you don't want to get within three feet of a penguin nest, as they have the nasty habit of bending over with their rear end facing out and marking their area for a three foot radius around the nest.

For two days as we went about setting up the site, the temperature climbed to a high of 38 to 40 °F during the day and dropped down to about 30 °F at night. We all thought this would be an easy DXpedition! Little did we know what lay ahead for us on the barren rock.

We listened to the group waiting for us on 14.195 MHz as the final connection was made and SWR checks were run. We all crowded into the forward camp site as we made ready to make the first contact ever from Thule Island with a VP8 callsign. With the rig tuned up on 14.195, all eight of us called at once into the microphone: "CQ CQ CQ This is Victor Papa Eight Sierra Sierra India." Our first contact was with Bob, W9ARV, followed by VP8ML, KB1BE, and Peter, VP8WA. The radio then erupted into a solid 40 over noise level of stations calling VP8SSI. I then gave the microphone to Marty and Dave to start working the pile-up as the rest of us went back to getting the other stations on the air.

By noon the next day we had four stations in operation and had set up our operating schedule, with each man doing his share of transporting the remaining fuel and equipment from the beach. John, W7KNT, who was used to living in the woods of Montana for weeks on end, took to setting up the cook tent and seeing to the food and water supply. That night we ate our first hot meal in three days, and those of us who were not operating at the time headed for our tents and what we thought would be a good night's rest.

Around 11:30 PM I was awakened from a sound sleep by the violent shaking of the tent and the sound of the wind tearing at the rain shield. I sat up just as Terry turned on his light, and we both stared at each other trying to figure out what was going on. At about this time a gust of wind hit the side of the tent, caving in the ½ inch supports and lifting Terry and his cot about 2 inches off the floor. As Terry reached to push against the side of the tent wall, another gust hit us, causing his cot to turn over, taking him with it! I jumped up and rushed to his side of the tent, pushing the twisting supports back into place. I was just about ready to let go, when we were hit again. This time the wind did not let up, and the supports bent inward, causing the entire tent to almost collapse. Terry jumped up, and we both spent the next 6½ hours with our backs to the tent wall trying to keep it from caving in on us.

During the remainder of the night the wind rose and fell, at times pushing against the sides of the tent with such a force that it knocked us to our knees. We tried to outlast the storm, but by dawn we were both exhausted and our muscles were in spasms from the constant strain of pushing against the tent walls. With the last of our strength we shoved our cots to one side and dove between them. The tent supports scattered under the pressure of the wind, and the walls of the tent came in on top of us. Unable to stay awake any longer, we both drifted off into a fitful sleep.

We were awakened a few hours later as Marty and David came crawling into our tent. They were soaked to the skin and looked terrible! They had been up all night holding onto the equipment in the forward site after the storm had flattened their tent. Being only about 50 feet from the cliff's edge, Marty had visions of the tent hurling through the air over the cliff into the cold sea 100 feet below with David and himself still inside!

At 10 AM the winds stopped as suddenly as they had started, and we all started making our way out of the pile of cloth that had been our tent to survey the damage.

While half of us started repairing the site, the others returned to the main reason why we were there—to make QSOs. During the next 10 days our time was spent doing the normal things one does when not operating on a deserted island. We explored the wreckage of the old base and collected items to take back with us as reminders of our visit to "the worst place on the face of the earth" *(statement from Capt. Cook's log)*. This was not always a safe and wise thing to do, as some fur seals had set up housekeeping amidst the wreckage. We had to keep our eyes open and always check behind us, as the seals liked to come up on our blind side.

We found many items of interest among the wreckage. I managed to find a couple of the 4CX1000 tubes used in the Collins 30S-1 that had once fed RF into the rhombic antennas. Unfortunately, the only other parts of the station that we found were the front panel from an amplifier and the base section of a Collins microphone. If we could have safely dug around inside and under some of the wreckage we may have found more, but 12 years of snow, ice, salt water, and the fur seals made this impossible.

During our stay on Thule we tried many times to get the remainder of the equipment up from the beach, but the constant storms and heavy wind conditions made these trips to the beach a hazardous and tiring job! The trips we were able to make brought up gasoline and much needed food and water supplies. The radio gear had to take a back seat to survival goods.

We managed to get the RTTY gear up after about five days with most of the satellite and VHF equipment. We even managed during a brief drop in storm activities to get the 6 meter beam put together and start on the 2 meter beam, but we were hit again by high winds and snow storms. During this time the winds reached speeds over 90 knots, and we learned very quickly how to operate and brace ourselves against the 2 × 6's we were using inside the tents as supports.

At about this time we were down to 2½ tents, and none were waterproof any longer. We decided we needed a survival plan. If we lost the rest of the tents, the only choice was to head to the old survival hut that had been home to a pair of fur seals for the last 12 years. They were not in the mood to vacate the premises. Those of us who were not operating spent most of one day evicting the loving pair, however temporary, and going about the task of removing their left behind belongings. Believe me, this was a very disgusting job, as seals don't care about what they live and sleep in! Many hours and two feet below what we had first thought was the floor of the hut, we hit bottom. We did manage to clean up the inside enough to make it livable if the need arose. This task completed, Mas started working on low-band antennas for the new site as Marty began transporting equipment up to the hut. I wish I could have gotten a picture of Marty's face as he entered the hut and the aroma of stale guano and urine hit him mixed with the smell of the contents of the Old Spice and Brut bottles we had removed from one of tents. Even today, four months after our return, I can still catch a hint of this strange mixture of smells when I open the foot locker where I store my foul-weather gear.

Our last few days on the island were a blur of activity made up mainly of operating and rebuilding our last two tents. I had moved the RTTY station into the cook tent. While Marty, Ralph, and Mas spent most of the time in the hut operating, the rest of us managed to keep the cook tent station on the air around the clock on SSB, CW, and RTTY.

It was during my shift at the controls that the last schedule with the *Abel-J* was to come about.

Say You Saw It In CQ

Leaving 15 meters RTTY, I dropped down to 14.117 MHz, which is a calling frequency for maritime vessels in this area of the world. I called Capt. Hamilton, VP8CAY. I heard him for a brief instant before his signal faded into the noise. Then a voice I would recognize anywhere came on frequency and called me. Denny, GW3CDP, had remembered the time and frequency of my schedule and was waiting on frequency. In a matter of minutes we were joined by a group of friends who were always on frequency to make sure we got in contact with the *Abel-J*. Daute, VP8BOQ (the XYL of Bob, VP8BFH, who was on the *Abel-J*); Gavin, VP8GAV, at Faraday Base, Antarctica; and John, VP8CGK, on Bird Island, South Georgia, were all there.

With many relays via Antarctica and Wales I was able to find out that the *Abel-J* would arrive the next afternoon. She had been fighting her way toward us through 25 foot seas and force 8 gale head-winds. She was plowing through the sea toward Thule at her top speed of 14 knots, at times never gaining ground. For three days the *Abel-J* had been fighting this storm. The same storm that had hit us from the south southwest had then veered north, only to change direction again and head north northwest, straight toward South Georgia island and the path the 108 foot *Abel-J* was taking for VP8SSI at Thule base. I relayed this information to the rest of the crew, and we all rested a bit better that night knowing that it was to be our last night on the island. Or so we thought.

That next day passed very slowly for most of us, even though we all were busy trying to get things packed and into some type of order to be transported back down to the beach. As this was our last day on Thule, I wanted to get in as much RTTY operation as possible and was in the cook tent typing away, stopping every hour to call the *Abel-J* on the 2 meter HT I had inside my jacket pocket. Nothing! I tried the 14 MHz and 7 MHz calling frequencies we had set up. Still nothing.

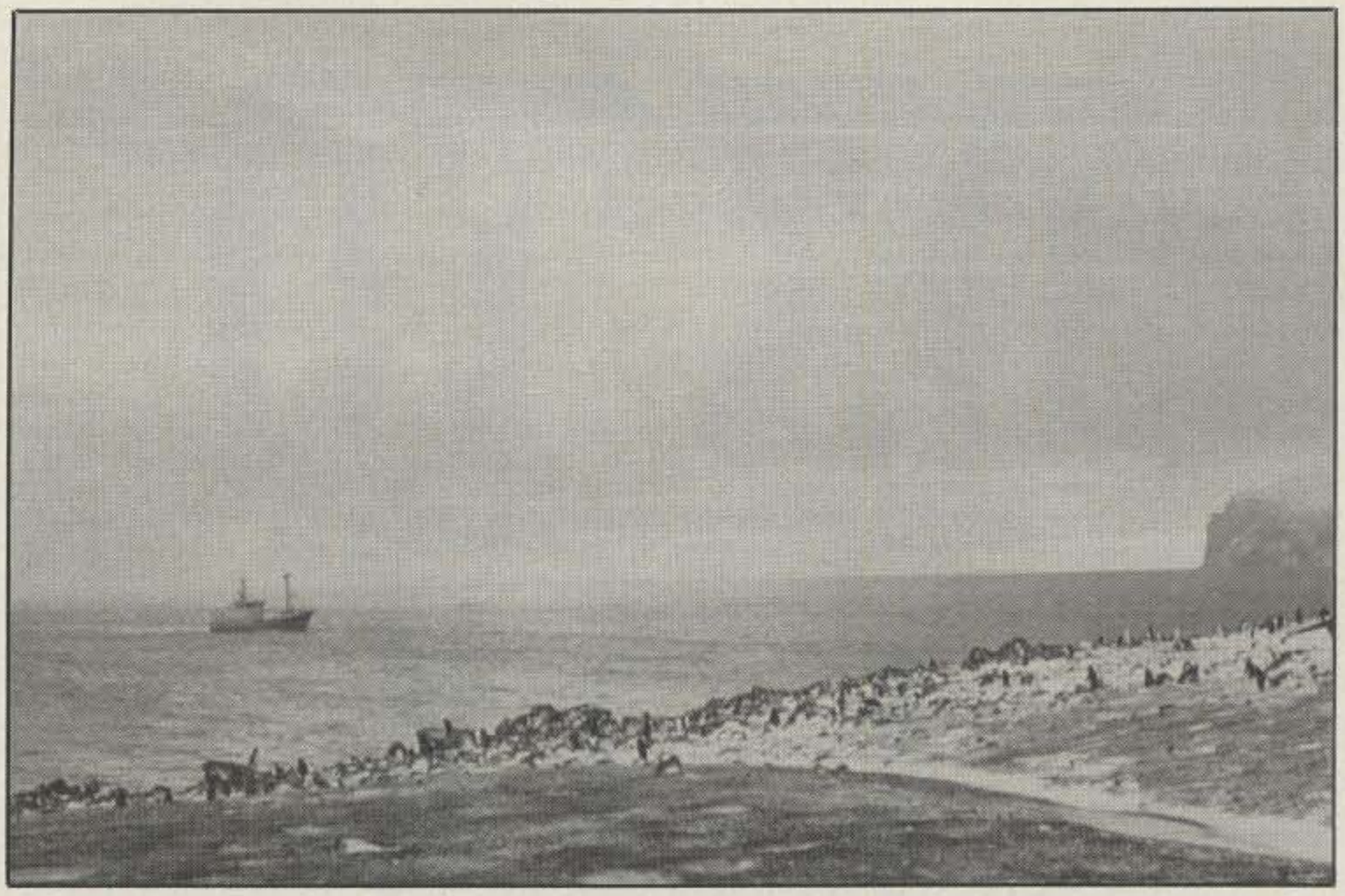
About dusk everyone started drifting into the cook tent with worried looks on their faces. They all were asking the same question: "Have you heard from the *Abel-J*?" I had to give the same answer: "No." Then just before the last of the light started to fade, someone outside started yelling, and then they were joined by others!

Just then the squelch on the radio inside my jacket broke, and I heard Captain Carter calling us. Running outside and trying to answer him at the same time, I saw one of the eeriest and most welcome sights I can ever remember seeing! The *Abel-J* was coming into sight through the fading light, her masts, rigging, and decks covered with gleaming gray ice!

It took the captain and the entire crew until 4:30 AM to chip and chisel the ice off the deck and make their way forward to where the zodiacs were stored. During this time we all talked to the captain and the crew, each telling tales of what had happened while we were on Thule and expressing how glad we were to see the *Abel-J* again! The spirit of the group seemed to rise, and we spent the night packing and moving the rest of the gear to the beach.

Finally, at about daybreak we made our last contact as VP8SSI from Thule and started taking the stations apart and making ready to depart this place we had called home for the last 14 days.

We thought we would never see the bottom of the huge mound of equipment we had on the beach as we loaded boat load after boat load, watching as it made its way to and from the *Abel-J*. Finally, as dark was fast approaching we loaded the last of the equipment aboard the zodiac and dropped to the rocky beach wet, cold, and exhausted to wait for her return to get us.



The Abel-J *returns to pick us up. You have no idea how good it was to see the ship again and start our voyage home.*

Ralph, KØIR, John, W7KNT, and David, KJ9I, had spent most of the time in the freezing water catching the rubber boats and pushing them back off shore again. They were just about beyond going. Ralph could hardly move his arms and his hands were blue. We hunted for things to wrap around the trio to keep them warm and the wind out, as it was starting to build again.

The boat finally returned, but we could not all make the trip at the same time. Ralph, John, and David, who were the only ones with waders, elected to stay and get the rest of us off the beach. Back safely once again on the deck of the *Abel-J*, we watched as Mike and Bob made the last trip back to Thule to retrieve the three operators. We had to lift them out of the boat as she came alongside us, as they were all numb with cold and unable to use their arms anymore. We got them all below deck and into showers as fast a possible. Luckily they revived in a matter of minutes under the warm water of the shower.

Two hours later as we stowed the last of the gear below decks, we all stopped and took a long last look at Thule Island and the site where our camp had been. I felt both sorrow and relief as I watched the tiny outline of the hut and the A4S

Here we all are aboard the Abel-J *back in Port Stanley. As you can see, it was considerably warmer here than where we had been. It sure looks as though we all could use a long rest after the trip.*

tribander fade into the darkness. The last thing I remember seeing as we left the crater and rounded the point making for open sea was the dark clouds gathered around the top of the mountain being driven down the slopes of the glacier toward where our tiny camp had been. The Union Jack strained against its ropes on the flag pole, and the Gap vertical antenna bowed in the wind.

As I sat here writing this article, I had to think back many years to when I was very young and remember what my father told me: "Son, just remember anything is possible if you just set your heart and mind to the task." This account of our adventure in the south Atlantic is dedicated to that memory.

Silent Key
Franklin L. (Uncle Clabber) Deprato, WA4LLK
1921 to 1988

Acknowledgments

I cannot end this article without thanking the following people, without whose help and support this DXpedition could not have taken place.

In Port Stanley, the Falklands: Peter R. Short, VP8WA; Emily Short, VP8ZV; Charlie McKenzie, VP8ML; Maud McKenzie, VP8NY; Mario Zuvic, VP8ALJ; Bob Vallor, VP8BHF; Daute Vallor, VP8BOQ; and all the other radio amateur operators who made us feel at home in Port Stanley.

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Antarctica: Gavin, VP8GAV, Faraday Base.

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Aboard the research vessel Abel-J: Captain Hamilton Carter, VP8CAY, Master research vessel *Abel-J*; Mike Whitley, VP8CKL, engineer; Mike McLaughlin, first mate; Bob Vallier, VP8BFH, seaman and Assistant Postmaster South Sandwich Islands; Valerie Billot of Rennes, France, ship's cook.

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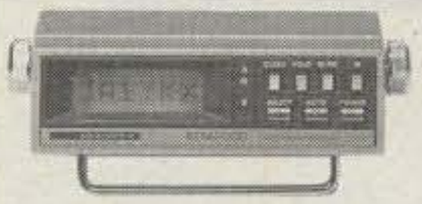

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CQ REVIEWS:

The Standard Model C228A Dual-Band HT

BY LEW McCOY*, W1ICP

The Standard C228A is one of the latest models of handhelds to be produced by Standard Amateur Radio Products. This unit covers two bands—the 144 MHz and 220 MHz amateur bands. Actual frequency coverage is 130 to 170 MHz receive, 144 to 147.995 MHz transmit on 2 meters. For 220 MHz the receiver covers 200 to 245 MHz in 5 kHz steps, while the transmitter goes from 220 to 224.995 MHz in 5 kHz steps.

The receiver is a double conversion superhet with the first IF at 21.8 MHz and the second IF at 455 kHz. For 220, the first IF is at 23.05 MHz, and the second is at 455 kHz. The receiver sensitivity on both bands is 0.158 uV for 12 dB SINAD. (SINAD is signal + noise + distortion divided by noise + distortion.) Squelch sensitivity is 0.1 uv. The transceiver is 6¼ inches high, 2⅝ inches wide, and 1⅜ inches deep and weighs 16.9 ounces.

Those are the basics, but there is a great deal more to the C228D.

Three power levels are provided: low (350 milliwatts), medium (2.5 watts), and high (2.8 watts with the 7.2 volt standard battery pack). Twenty memory channels are available for *each* band, plus a separate repeater offset and tone frequency which can be stored along with the operating frequency in each memory channel. The memory can be expanded to 40 channels with some storage limitations. Either pause or busy scan functions can be selected. Scanning of the dial frequency covers 1 MHz scan, all scan, or program (favorite scan).

Frequency entry is unusual (and a nice feature) in this unit. Frequencies can be entered via the touchtone pad numbers or by a unique rotary switch. I have been around repeaters since the outset, from the original crystal-controlled handhelds until now, with these up-to-date units. Many of the rotary-knob devices have become cumbersome to use with repeaters the input of which range from 145 MHz clear up to 148 MHz. However, this transceiver lets you change frequency very quickly. You can move the frequency step arrangement in increments of 5, 10, 12.5, 20, 25, or 50 kHz steps. Also, and this is a feature I like, by holding in the function button and turning the rotary knob, you can move in 100 kHz steps. This gets you around in a hurry. In addition, there are two buttons, **UP** and **DOWN**, which put the transceiver in a scan mode, down or up, rapidly.

Additionally, there are two VFOs, one for 144 MHz and another for the 220 MHz band. The transceiver will only transmit on the selected band, but crossband operation is available. Selection is accomplished via two pushbuttons just below the display. Also, it is possible to receive both bands simultaneously. (There are separate audio and squelch controls for each band.)

Shown in fig. 1 is the drawing of the readout panel of the transceiver. When the 144 MHz button is pushed, the display on the left will be shown, with **MAIN** visible to show on which band the unit VFO is set. The large letter **M** shows that the unit is in the memory mode.

Fig. 2 shows the top of the transceiver with the various knob controls. The rotary switch for the VFO is at the right. As can be seen, there are terminals for external mike and speaker(s)—one for 144 MHz and another for 220 MHz).

A tone squelch feature is built in for use with PL-type repeaters. This has all the standard tones used in PL operation. There is also DTMF function built in, which permits the use of touch-tone operation from the front pushbutton panel. Also available is a code squelch function which permits you to hear only stations that have the same code. This function is particularly useful, for example, at a hamfest when you want to stay in touch with your friends, but prefer not to hear all the noise. A tone that opens the transceiver for reception is transmitted.

Other features include an auto-power-off function which reduces battery drain if

This is the Standard C228A dual-band HT. It has many, many valuable features, as described in the text.

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

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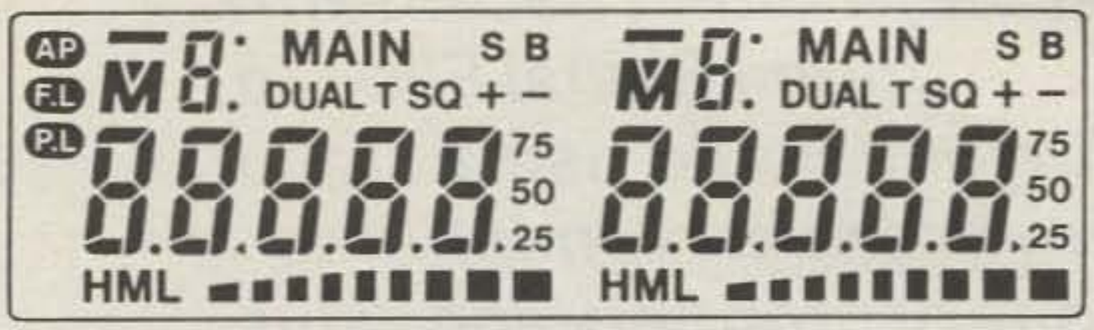

Fig. 1– From the instruction manual, this illustrates the LED back- lit readout.

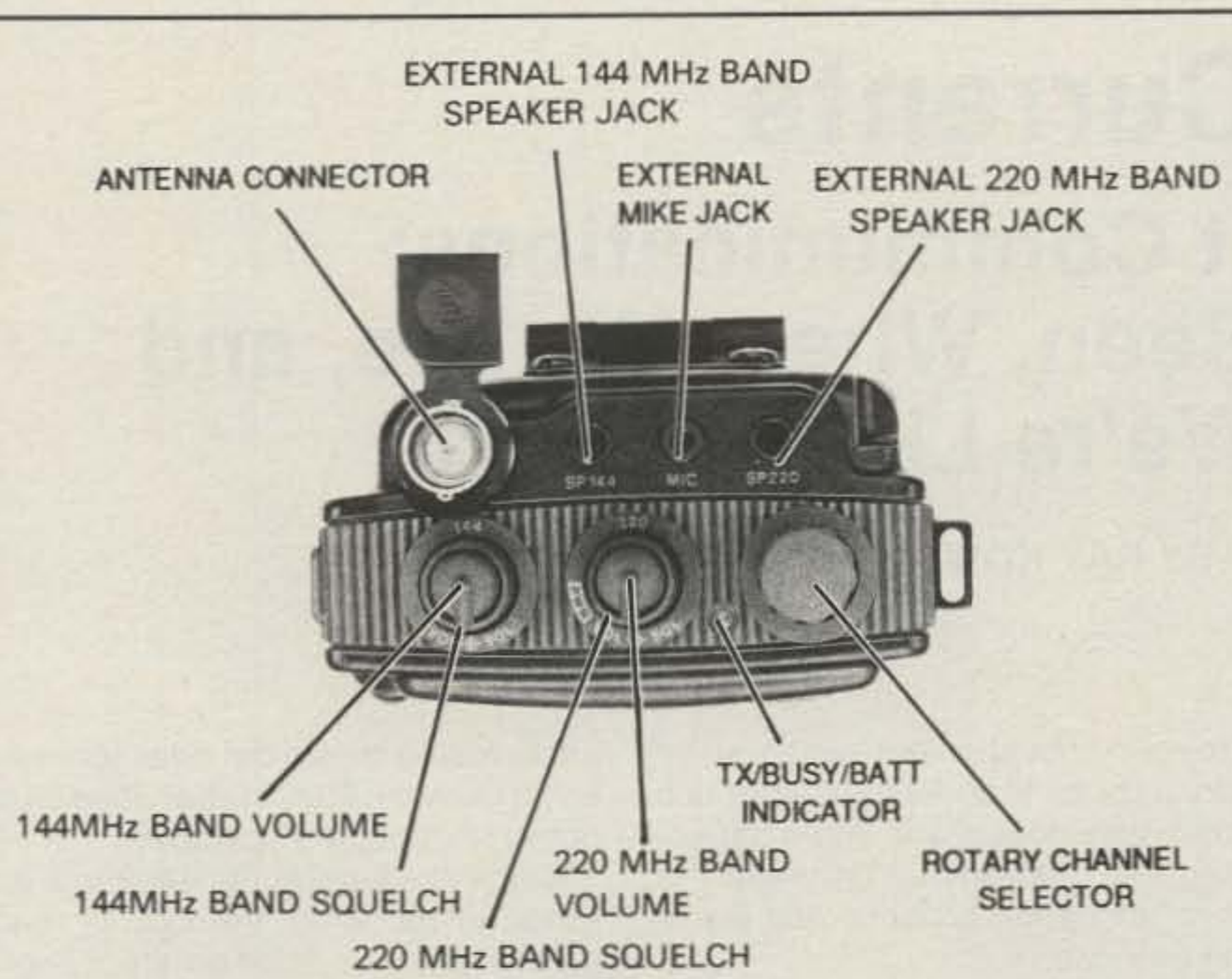

Fig. 2– Also from the manual, this is the top of the handheld showing the various controls.

you forget to turn off the transceiver. Also, a single press of one of the panel buttons lets you know the volume setting of the squelch control—a handy little feature. Another special feature is a paging function which allows you to page one or more specific stations, or all stations in a group, by means of a three-character DTMF (dual tone modulated frequency signal). When this paging signal is received, the other station sounds a beep, and the transceiver's display indicates that it has been paged.

Some other features allow selected frequencies to be locked to prevent inadvertent changes. Also, the PTT can be locked to prevent inadvertent transmission.

I found in actual operation that the transceiver did an excellent job. I checked it in areas I call "intermodulation alleys" to make sure the transceiver was "clean," and it certainly was. What is important about this rig is that more areas now have both 144 and 220 MHz repeaters, making this transceiver very desirable.

If there is one thing I really like, it is a detailed instruction manual that is clear cut and easy to follow. The C228A's manual is truly an excellent piece of work. It is extremely detailed, and the instructions are very simple. It is a book of just under 100 pages with step-by-step drawings to show and explain the setting of the various functions.

The transceiver comes with a nickel-cadmium 7.2 volt, 700 maH battery, plus dual antenna and a charger. There are many accessories available, including larger batteries and a dual mike/speaker handheld. One item that should be mentioned: The AC charger plug has the inner pin negative and the outer shell positive. This merely means caution should be observed when using a cigarette lighter cord for mobile power. In other words, the positive portion of the plug could be exposed and contact with mobile ground avoided.

There is a host of accessories available: larger battery packs, desk-top chargers, mike/speaker, etc. Suggested amateur net price is $719.00. The transceiver is manufactured by Standard Amateur Radio Products of Japan and distributed by Standard Radio Products, Inc., P.O. Box 48480, Niles, IL 60648. CQ

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When man invented the signal fire, it didn't necessarily mean that it was followed up with United Signal Fire Ltd. showing up on Wall Street. Anyone could use a signal fire with impunity. Somewhere between semiphores and substrates came the options of propriety and value. This month Ray discusses those notions and how they affect amateur radio.

Currents

A Look at Communications: Where We've Been, Where We Are, and Where We're Likely To Go

BY RAY KOWALSKI*

Pioneers. The word conjures up images of men with stubble beards and women in homespun crossing the western prairies of the United States in Conestoga wagons. They pushed the boundary of the western frontier until settlements took hold and the frontier ceased to exist. It was a time long ago.

We also speak of pioneers and frontiers in the context of telecommunications. This extension of the concept is apt, since land and spectrum are so similar. Land and spectrum are both natural resources that can support productive activities. Both must be tamed with technology to force them to yield their useful products. Both are finite and therefore valuable.

The western pioneers and the telecommunications pioneers were contemporaries. Hollywood portrayals of the early west often feature settlers, railroads, and telegraph systems in the same reel. However, the telecommunications pioneers are still active today. Only the frontiers are different. And two words with ancient connotations have crept back into the modern telecommunications lexicon: "pioneer" and "wireless."

In the telecommunications legal arena, the most frequent appearance of the word "pioneer" is in the phrase "Pioneer's Preference." The Pioneer's Preference program was established in 1991 by the Federal Communications Commission in an attempt to spur innovation by rewarding the innovator. In order to understand why such a program was necessary, you must understand the relationship between the spectrum allocation process and the licensing process.

The FCC's rules contain the Table of Frequency Allocations. This table is the master plan that specifies the way in which each segment of the radio spectrum is used in the United States. If someone wants to use a segment of spectrum in a way that is inconsistent with the use specified in the table, that person must file a petition for rule making to amend the table. Almost any previously uncontemplated communications technology would be inconsistent with the table.

A good example of a spectrum reallocation proceeding was concluded by the FCC in September 1992. The FCC was faced with numerous petitions for spectrum to support the next generation of emerging technologies. They therefore went into the Table of Frequency Allocations and changed three segments that had been allocated for fixed, microwave systems to segments that could be used for future mobile services.

Once the Table of Frequency Allocations is amended to allocate spectrum for a specific purpose, a second rule-making proceeding is usually necessary. This second rule-making proceeding is needed to establish or modify the operating rules for the radio service that will use the spectrum that was allocated for it in the first proceeding. Continuing our emerging technologies example, a rule-making proceeding is now underway to create the rules for new Personal Communications Services on some of the re-allocated spectrum.

Once the operating rules are established or modified, the FCC is ready to grant licenses. Unlike amateur licenses, which allow all amateurs of a particular class to operate on all of the frequencies associated with that class, these licenses often authorize operation on a given frequency in a given geographic area on an exclusive basis. This means that if you are granted a license, no other licensee will be authorized to operate on your particular frequency in your geographic area. This also means that the number of available licenses is limited.

When the FCC announces the availability of licenses in a new radio service, there is usually fierce competition for such licenses. Before the Pioneer's Preference program, there was no guarantee that the person who conceived of the new radio service and petitioned for spectrum to support it—the pioneer—would eventually get a license.

The rule-making process is long, arduous, and expensive. The pioneer must fend off proponents of competing uses for the spectrum and alternative operating techniques and, often, providers of existing services who oppose competition. If that obstacle course has been run successfully, to obtain a license that same pioneer must compete on an equal footing against all other applicants. In recent years this has meant that the pioneer ends up in a lottery, with the same chance of winning a license as anybody else.

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Can you imagine going to the expense of developing a new technology, researching the market, and pushing the FCC for rule changes, only to find out at the end of the process that you were not lucky enough to be awarded a license to use your own technology? The FCC was concerned that the lack of a guarantee of a reward for spectrum pioneers was discouraging innovators from even beginning such efforts. Accordingly, the FCC established a program to award a "Pioneer's Preference" —that is, a guaranteed license—to spectrum innovators. The Pioneer's Preference simply means that a true spectrum innovator is guaranteed to get a license if he or she successfully persuades the FCC to allocate spectrum and create a radio service that uses the new technology.

The announcement of the Pioneer's Preference program brought "pioneers" out of the woodwork. The FCC has been deluged with applications for experimental licenses and petitions for rule making from dozens of companies. Most of these petitions are from companies who hope to provide one of the emerging new Personal Communications Services mentioned in our example above. The FCC, however, has been extremely stingy with its awards of such preferences.

Only two Pioneer's Preference awards have been announced to date, and the first one went to Volunteers in Technical Assistance (VITA) for their work in developing communications via low earth orbiting satellites. Their pioneering work began on amateur radio satellites. (While I was chief of the Private Radio Bureau's Special Services Division, I remember getting briefings from Perry Williams, the Washington Area Coordinator for the American Radio Relay League, on the progress being made by VITA. None of us could have known the reward that awaited them for their efforts.)

The award of a Pioneer's Preference to VITA is significant because it continues the heritage of radio amateurs in advancing the radio art. It continues the lineage of the pioneers at station 1BCG. It validates Section 97.1(b) of the rules for the Amateur Radio Service. It reinforces the Amateur Radio Service as a national resource.

The PCSes

"Wireless" is a word that I associate with pioneers such as Marconi. It is a curious word, one which defines a communications technology in terms of what it is not. It is an antique word, really, suited for use in the same breath with "Atwater Kent." How odd, therefore, that this word, which could encompass drums and semaphores, now connotes the most modern of communications technologies, the emerging Personal Communications Services (PCSes). A growing number of pioneering companies that claim to be preparing to offer PCS have the word "wireless" in their names.

No one, not even the FCC, knows for sure what PCS is. But amateurs will have no trouble understanding the concept when some concrete manifestation of it finally emerges, since the essence of PCS is addressable communications. For example, at the present time, when I want to place a telephone call to you, I call the number of the telephone set that is located where I think you are. I am not really calling *you*. Rather, I am calling your desk, your car, or your kitchen wall.

In one PCS scenario you will have a "smart card," probably the size of a credit card, that will be encoded with information that is unique to you, especially information about how the call can be billed. Wherever you are, you will be able to "log on" to the PCS network by inserting your card in a card reader. Then, when I call your unique number, the phone will ring wherever you happen to be: whether you are walking past Buckingham Palace with your miniature phone in your pocket, at your desk, in your car, or on an airplane.

This is the new meaning of "wireless" communications. Some have used the word "untethered" to describe the PCS

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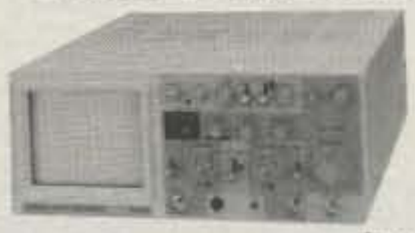

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concept, but that word just does not have the same informational content as "wireless." When we hear terms like "wireless modems," "wireless LANs," and "wireless PBXs," we have an instant perception first that the technology being discussed is a communications technology, and second that the technology employs radio rather than wires.

These terms contain within them a clue to the phenomenon that is driving the development of the emerging technologies—namely, the combination of previously distinct technologies to create entirely new technologies. A wireless LAN (local area network) represents a combination of radio and computer technology. A wireless PBX (private branch exchange) represents a combination of radio and telephone technology.

Until recently, the life cycle of a given technology has been birth as a theoretical concept, adolescence as an experimental application, and maturity as a commercial system. Some examples of mature, commercial systems that we see in use today are radio, television, telephone, computers, pagers, and satellites.

However, the next phase in the cycle is not the death of the technology and its replacement with something else. Rather, like the plot in some science fiction movie, these creatures of technology have started to combine with each other to produce mature hybrids that go on living. These hybrids have remarkable capabilities, such as cellular telephones, mobile data systems, satellite messaging, and interactive video.

The hybrid technologies are starting to create hybrid service providers. For example, in July 1992 the FCC allowed local telephone companies to offer "video dialtone" services. You may soon be able to receive video programming over the telephone lines that come into your home. In short, the telephone industry is about to go into competition with the cable TV industry for video programming service.

Conversely, a large cable TV company recently successfully completed a trans-Atlantic telephone call over cable TV lines without using traditional telephone switching. This paved the way for the cable TV industry to compete with the telephone industry for local-exchange telephone service.

So the question is, should the telephone industry be regulated with cable television regulations? Or should the cable television industry be regulated with telephone industry regulations? The answer is probably neither.

Changes Are Coming

The FCC was created by the Communications Act of 1934. The Act has been amended over the years to keep pace with developments, but now the Act is starting to show its age, as the accelerating pace of developments has outstripped Congress's ability to keep the Act current. The broad concepts found in the Act—broadcasting, common carriage, and private systems—are losing their meaning in the face of hybrid communications systems and service providers. Increasingly, there is a bad fit between the telecommunications industry and telecommunications regulation. A complete re-write of the Communications Act is inevitable.

In the meantime, the FCC will cope as best it can. In a major address given in September 1992 to the Federal Communications Bar Association, Commissioner Ervin S. Duggan suggested that one way to cope with the new realities of the telecommunications industry would be to reorganize the FCC. The plan he outlined would abolish the Private Radio Bureau, the Bureau that regulates the amateur Radio Service, and replace it with a "Mobile Services Bureau."

In any reorganization of the Federal Communications Commission or in any rewrite of the Communications Act, the Amateur Radio Service will be affected. Never mind that the Amateur Radio Service is quite comfortable with the regulatory structure that it has known for years. Never mind that it is other radio services, emerging wireless services, and hybrid commercial service providers that are necessitating the changes. Change is coming, and amateur radio is going to be swept along.

I do not think that this is cause for alarm. I do not think that there is any immediate threat to amateur spectrum or operating parameters. But I do think that the Amateur Service is in danger of being plucked from a part of the bureaucracy where it has deep roots and transplanted to a part of the bureaucracy where its roots must be reestablished. When that happens, amateur radio's illustrious past, built on the exploits of the early wireless pioneers, will be of little consequence. But its spectacular present, riding the success of people like the pioneers at VITA, will serve it in good stead.

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This month W2FMI picks up his discussion of ununs with a description of the 4:1 unun and an overview of the work done by Guanella and Ruthroff.

The 4:1 Unun

BY JERRY SEVICK*, W2FMI

A careful study of the transmission line transformer reveals that the works of two men continue to dominate the field. They are Guanella[1] and Ruthroff.[2] Interestingly enough, they used two different approaches in designing their 1:1 and 4:1 baluns. Although the record doesn't show that Guanella considered an application for the unun (unbalanced-to-unbalanced transformer), his technique of connecting transmission lines in a parallel-series arrangement has extended the high-frequency capability of these devices.[3]

One might argue that recent amateur publications[4-7] on current, choke, and voltage baluns have added significant information to the field. But the literature shows[3,8] that the current or choke baluns are really Guanella's designs and the voltage baluns, Ruthroff's. To make it more confusing, someone (probably a radio amateur) took Ruthroff's three-conductor 1:1 balun design and put the third wire in parallel with the other two (trifilar), resulting in an inferior (so-called) voltage balun. This is the design that mainly has been used for the comparisons with the "new" coaxial cable 1:1 baluns.[4-7] Ruthroff originally proposed that the third wire (which extends the low-frequency response over the two-conductor Guanella 1:1 balun) be wound on a separate part of the toroid.

In looking further into the field, one finds that there are a lot of choices to make regarding the design of these very broadband and efficient transmission line transformers. They include: (1) Ruthroff's or Guanella's designs; (2) wire or coaxial cable transmission lines; (3) coiled or beaded lines; (4) rods or toroids; (5) low-power or high-power designs; (6) HF, VHF, or UHF designs; and (7) the trade-offs in efficiency for low-frequency response or for high VSWR.

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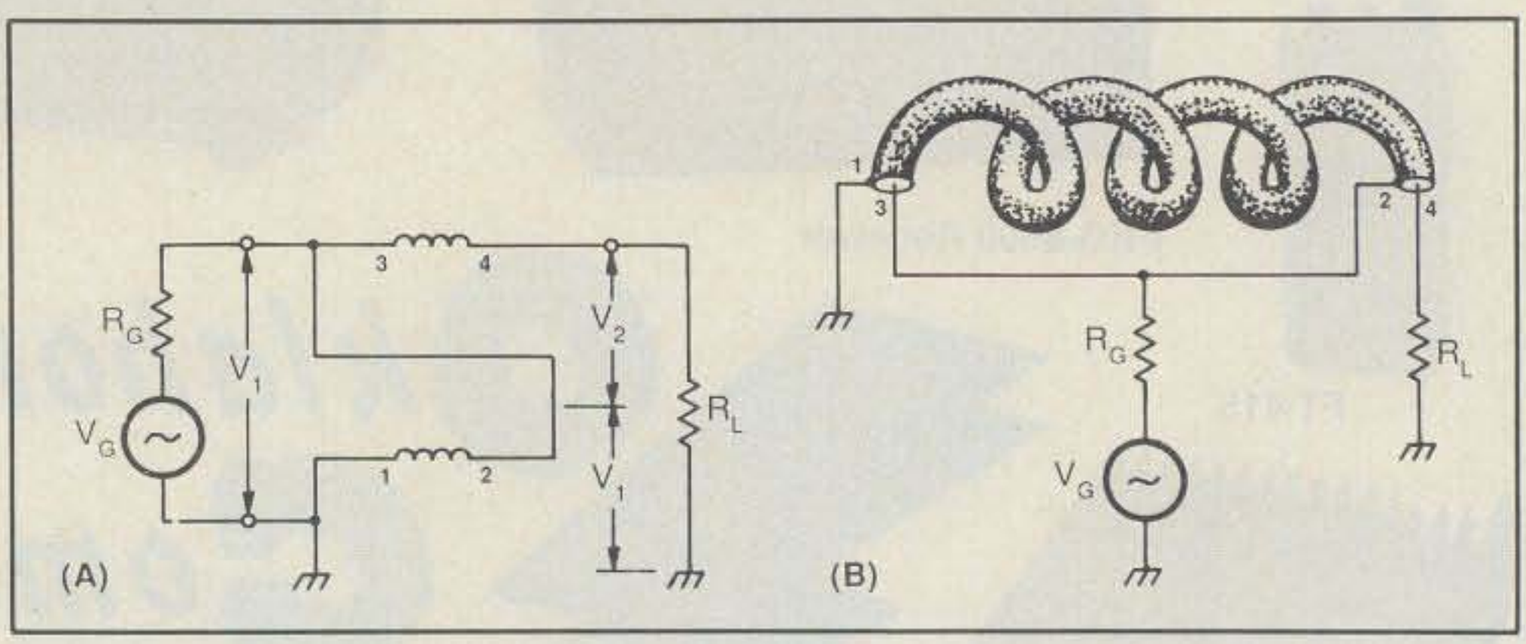

Fig. 1– Ruthroff 4:1 unun ($R_L = 4R_G$): (A) coiled bifilar winding. (B) coiled coaxial cable.

The 4:1 unun, which first appeared in Ruthroff's classic 1959 paper,[2] exemplifies (more than any other transformer) the many choices that can be made in its design. It is also the most prevalent of all the ununs. This article attempts to show the reader many of them.†

The Ruthroff 4:1 Unun

Fig. 1 shows two versions of Ruthroff's approach[2] in obtaining a 4:1 unbalanced-to-unbalanced transformer (unun). As can be seen, one uses a coiled wire transmission line while the other uses a coiled coaxial cable. Depending upon the frequency, beaded transmission lines can also be used.

Ruthroff's design uses a single transmission connected in what I call the "bootstrap" configuration. That is, terminal 2 is connected to terminal 3, lifting the transmission line (at the high-impedance side) by the voltage V_1. If the reactance of the coiled winding or beaded line is much greater than R_G, then only flux-cancelling transmission line currents are allowed to flow. It can also be seen that the output voltage is the sum of a direct voltage V_1 and a delayed voltage V_2 which traversed a single transmission line. This delay in V_2 eventually limits the high-frequency response. For example, if the electrical length of the line is a half-wave, the output is zero. Ruthroff also found that the optimum value of the characteristic impedance of the transmission line (for maximum high-frequency response) is $R_L/2$.

Therefore, the electrical length and characteristic impedance of the transmission line play major roles in Ruthroff's design. Since his work was mainly concerned with small-signal applications, he was able to obtain broad bands of a few tens of kiloHertz to over a thousand megaHertz. This was possible since he used a few turns (5 to 10) of fine wire (No. 37 and 38) on high-permeability toroids as small as 0.08 inches in OD. Thus, the phase-delay with these very short transmission lines was very small. However, in large-signal (power) applications, it is a different matter. For operation in the HF band (including 160 meters), transmission lines vary between one to three feet in length (depending upon impedance level). Consequently, phase-delay can play a major role, as will be seen in the following examples.

50:12.5 ohm ununs. Photo A shows two examples of efficient and broadband 4:1 ununs matching 50 ohms to 12.5 ohms. The rod version (on the left) has 14 bifilar turns of No. 14 H Thermaleze wire on a low-permeability (125) ferrite rod 0.375 inches in diameter and 3.5 inches long. The connections are shown in fig. 1(A). The cable connector is on the low-impedance side.

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The response is flat from 1.5 MHz to 30 MHz. In a matched condition, it can easily handle the full legal limit of amateur radio power. Since a tightly wound rod unun yields a characteristic impedance very close to 25 ohms (the optimum value), this is quite likely the easiest one to construct that covers the above bandwidth.

The toroidal version (on the right in photo A) has 6 turns of homemade, low-impedance coaxial cable on a 1.5 inch OD ferrite toroid with a permeability of 250. The connections are shown in fig. 1(B). The cable connector is on the low-impedance side. The inner conductor is No. 14 H Thermaleze wire and is covered with Teflon® tubing. The outer braid is from a small coaxial cable (or from ⅛ inch tubular braid). It is also tightly wrapped with Scotch No. 92 tape in order to obtain the desired characteristic impedance. In matching 50 ohms to 12.5 ohms, the response is flat from 1.5 MHz to 50 MHz. Since the current is evenly distributed on the inner conductor, this small unun has an exceptionally high power capability—at least 5 KW of continuous power and 10 KW of peak power (in a matched condition).

Photo A– Two versions of the Ruthroff 4:1 (50:12.5 ohm) unun: coiled wire rod (on the left); coiled coaxial cable toroid (on the right).

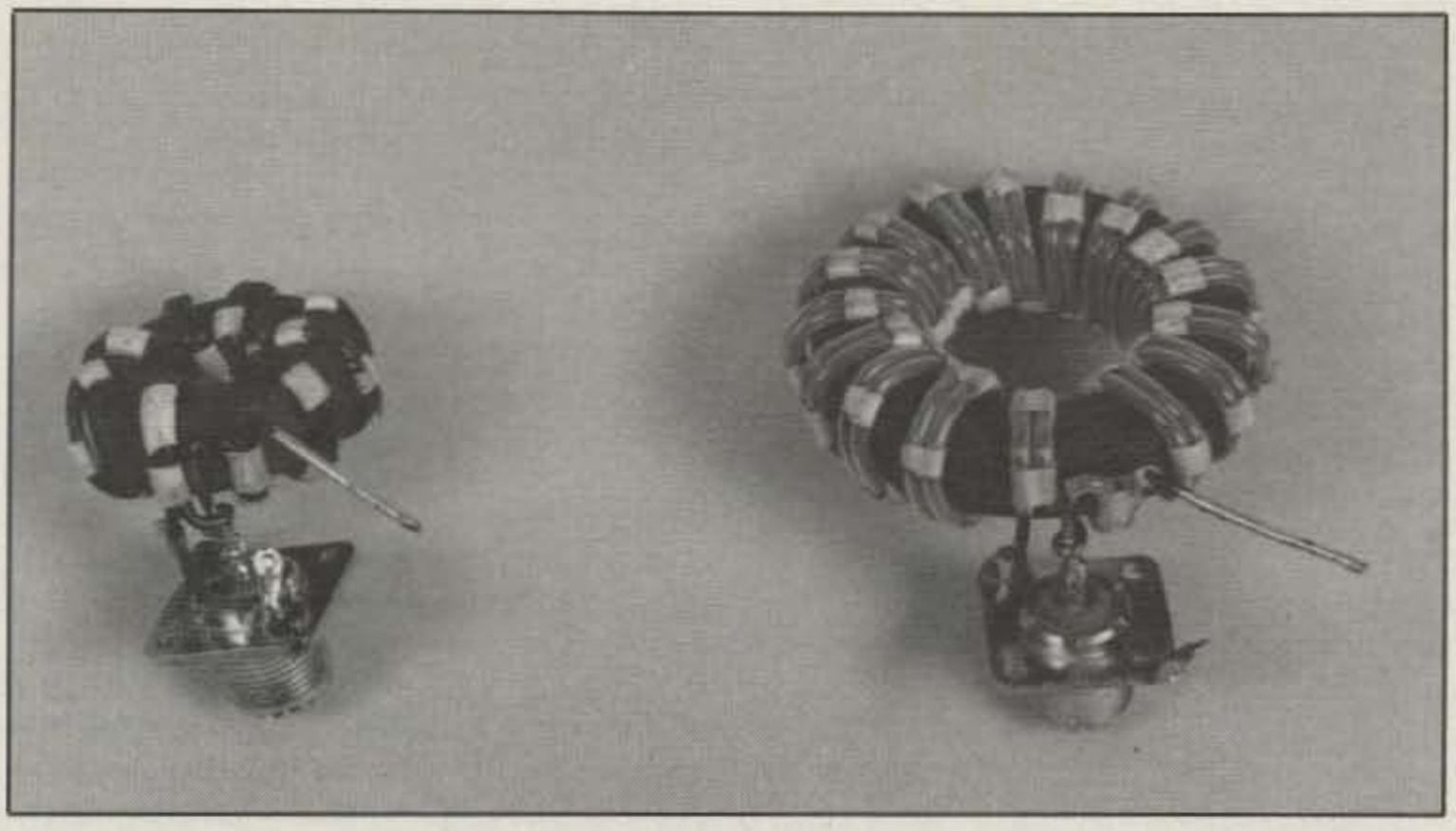

Photo B– Two higher impedance Ruthroff 4:1 ununs: 100:25 ohm (on the left); 200:50 ohm (on the right).

100:25 ohm unun. In some combiner applications, an unun matching 100 ohms to 25 ohms is required. The smaller toroidal version on the left in photo B shows a Ruthroff design that can satisfy many of these requirements. It has 8 bifilar turns of No. 14 H Thermaleze wire on a 1.5 inch OD ferrite toroid with a permeability of 250. One wire is also covered with one layer of Scotch No. 92 tape, giving a characteristic impedance close to the desired value of 50 ohms. In matching 100 ohms to 25 ohms, the response is essentially flat from 1.5 MHz to 30 MHz. This unun can easily handle the full legal limit of amateur radio power.

200:50 ohm unun. This is the area where the Ruthroff approach cannot yield the broadband response of the lower impedance designs shown above. Since more turns are required in order to obtain the necessary choking reactance, and a 100 ohm characteristic impedance which requires more spacing between the wires is used, the cores have to be considerably larger. This results in longer transmission lines. Thus, the high-frequency response is now limited by the greater phase-delay of this high-impedance unun.

The larger transformer on the right in photo B is my optimized version of a Ruthroff 200:50 ohm unun. It has 16 bifilar turns of No. 14 H Thermaleze wire on a low-permeability (250) 2.4 inch OD ferrite toroid. Each wire is covered with Teflon tubing, resulting in a characteristic impedance of 97 ohms. Because of the long transmission line (36 inches), the impedance transformation ratio (in matching 200 ohms to 50 ohms) varies from 4 to 4.44 from 1.5 MHz to 30 MHz. A conservative power rating (under a matched condition) is 2 KW of continuous power and 4 KW of peak power. Since this higher impedance unun has a larger voltage drop along the length of its windings, its loss (a dielectric-type[3]) is a little greater than the lower impedance ununs described before. In a matched condition, it is about 97 percent, while the others are 98 to 99 percent.

The Guanella 4:1 Unun

Even though Guanella's investigation[1] was directed toward developing a broadband balun to match the balanced output of a 100 watt push-pull, vacuum-tube amplifier to the unbalanced load of a coaxial cable, his technique of connecting transmission lines in a parallel-series arrangement has only recently been recognized as the design for the widest possible bandwidth in an unbalanced-to-unbalanced application.[3] Some have labelled his approach the "equal-delay network."[9] The major difference in Guanella's approach (from Ruthroff's) is that by summing the equal-delay voltages of coiled (or beaded) transmission lines, he minimizes the dependence of the high-frequency response on the lengths of the transmission lines. As was mentioned before, Ruthroff's method of summing a direct voltage with a delayed voltage which traversed a single transmission line has a limited application, especially with high-power, high-impedance ununs (like 200:50 and 300:75 ohms).

Furthermore, Guanella's approach is also important in designing high- and low-impedance baluns and ununs with impedance transformation ratios other than 4:1. Connecting three transmission lines in parallel-series results in a 9:1 ratio, four in a 16:1. Also by connecting a fractional-ratio unun in series with his baluns, or by using various combinations of parallel-series transmission lines,[9,10] ununs and baluns

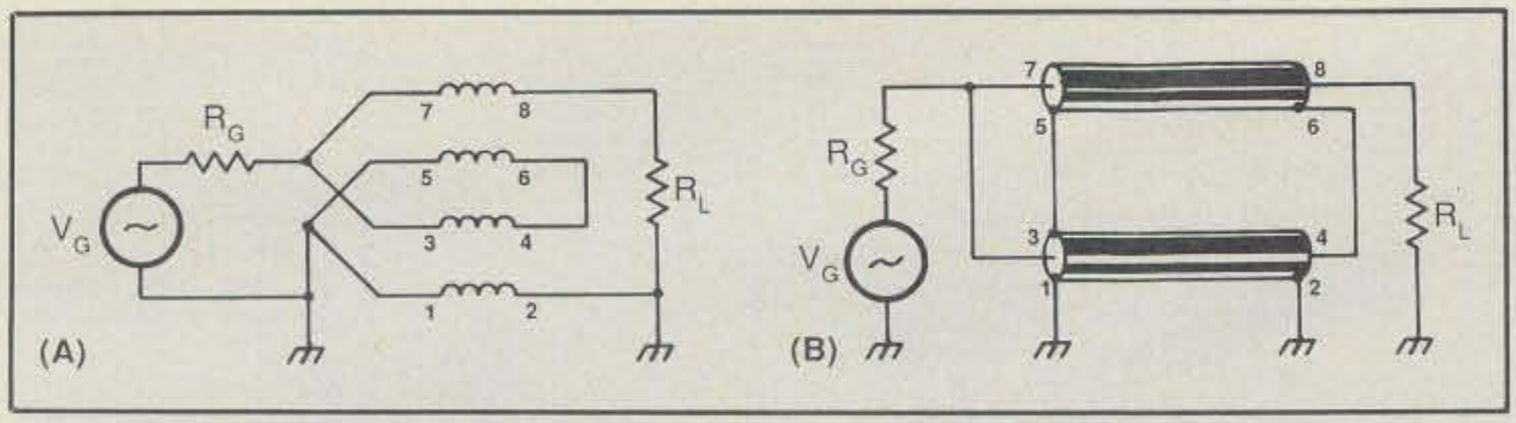

Fig. 2– The Guanella 4:1 unun ($R_L = 4R_G$): (A) coiled bifilar windings; (B) coiled or beaded coaxial cables.

are now available with a continuum of ratios from 1.36:1 to 16:1. Moreover, these ratios now make it possible to match 50 ohm cable to impedances as low as 3.125 ohms and as high as 800 ohms. A major factor in the success of these designs rests in the understanding of the low-frequency models of these various transformers.[3] This section treats the 4:1 unun using Guanella's approach. As in the Ruthroff case, the optimum value of the characteristic impedances of the transmission lines for a Guanella 4:1 transformer is also $R_L/2$.

50:12.5 ohm unun. Fig. 2 shows the schematic diagrams of the coiled-wire and coaxial cable (coiled or beaded) versions of 4:1 ununs using Guanella's technique of connecting transmission lines in parallel-series arrangements. As can be seen in fig. 2, the lower transmission lines are grounded at both ends and therefore have no potential drop along their lengths. Thus, the coiling or beading has no effect. The core only acts as a mechanical support and the beads can be removed. In essence, the bottom transmission plays the important role of a delay line. Also, the low-frequency response of this form of an unun is solely determined by the reactance of the top coiled or beaded transmission line.[3]

The top unun in photo C shows a rod version of Guanella's 4:1 unun. There are 13.5 bifilar turns of No. 14 H Thermaleze wire on low-permeabilty (125) ferrite rods O.375 inches in diameter and 3.5 inches long. For ease of connection, one winding is clockwise and the other is counter-clockwise. The cable connector is on the high-impedance side. In matching 50 ohms to 12.5 ohms, the response is flat from 1.5 MHz to over 50 MHz! This unun is capable, in a matched condition, of handling the full legal limit of amateur radio power. Furthermore, with the 50 ohm generator on the right, in fig. 2(A), and a 12.5 ohm floating load on the left (perhaps a Yagi beam), this transformer makes an excellent step-down balun.

The bottom transformer in photo C shows a beaded-coax version of a 50:12.5 ohm step-down unun designed for 2 meter operation. It has 3.5 inches of beaded coax on the top transmission line (fig. 2(B)and no beads on the bottom transmission line (actually, the bottom rod in fig. 2(A) can also be removed with no change in performance). The beads are low-permeabilty (125) ferrite. The inner conductor of the coaxial cable is No. 12 H Thermaleze wire with about 3.5 layers of Scotch No. 92 tape (two 0.5 inch tapes wound edge-wise like a window shade), giving a characteristic impedance close to the optimum value. The outer braid is from a small coaxial cable (or from ⅛ inch tubular braid). This homemade coax is further wrapped tightly with Scotch No. 92 tape in order to preserve its low characteristic impedance. The cable connector is on the low-impedance side. The response of this unun is essentially flat from 10 MHz to 100 MHz (the limit of my bridge). It can also (easily) handle the full legal limit of amateur radio power.

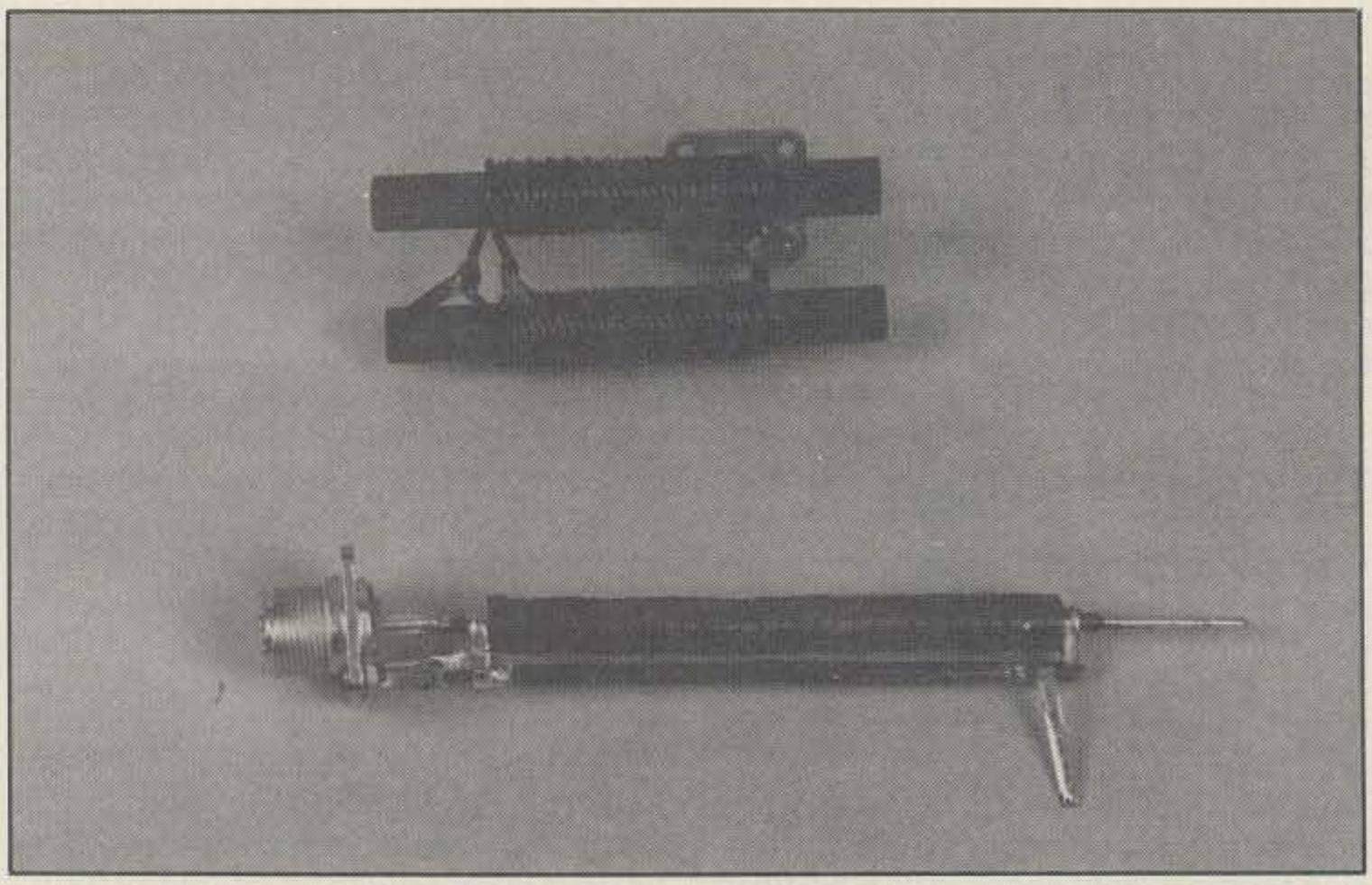

Photo C– Two Guanella 4:1 (50:12.5 ohm) ununs: rod version (on the top), 1.5 MHz to 50 MHz; beaded version (on the bottom), 10 MHz to over 100 MHz.

100:25 ohm unun. The unun on the left in photo D is a Guanella version matching 100 ohms to 25 ohms. There are 8 bifilar turns of No. 14 H Thermaleze wire on each 1.5 inch OD low-permeability (250) toroid. One toroid is wound clockwise and the other counter-clockwise. One of the wires (on each toroid) is covered with one layer of Scotch No. 92 tape. The cable connector is on the low-impedance side. The response is flat from 1.5 MHz to well over 30 MHz. This unun can also handle the full legal limit of amateur radio power.

It might be interesting to point out that as a balun (the ground removed from terminal 2), and with a 1.78:1 unun[11] in series (on the left side) with it, this compound arrangement makes an excellent balun for matching 50 ohm coaxial cable directly to quad antennas of 100 to 110 ohm impedances.

200:50 ohm unun. The transformer on the right in photo B is an excellent unun (or balun with terminal 2 removed from ground) in matching 50 ohms to 200 ohms. It has 14 bifilar turns of No. 14 H Thermaleze wire on each low-permeability (250) toroid with a 2.4 inch OD. Each wire is covered with Teflon tubing, giving a characteristic impedance of 98 ohms (which is quite good, since the optimum value is 100). Again, for ease of connection, one winding is clockwise and the other counter-clockwise. When operating as an unun or a balun, when matching 50 ohms to 200 ohms, the response is essentially flat from 1.5 MHz to 30 MHz. A conservative power rating (in a matched condition) is 5 KW of continuous power and 10 KW of peak power. This transformer has been reported to handle peak pulses of 10,000 volts!

Summary

- For ununs with impedance levels of 100:25 ohms and lower, the Ruthroff approach is recommended because of its simplicity.
- For high-impedance levels (such as 200:50 and 300:75 ohms), the Guanella approach is recommended.
- For low-impedance operation in the VHF band, the beaded-coax Guanella approach is recommended.

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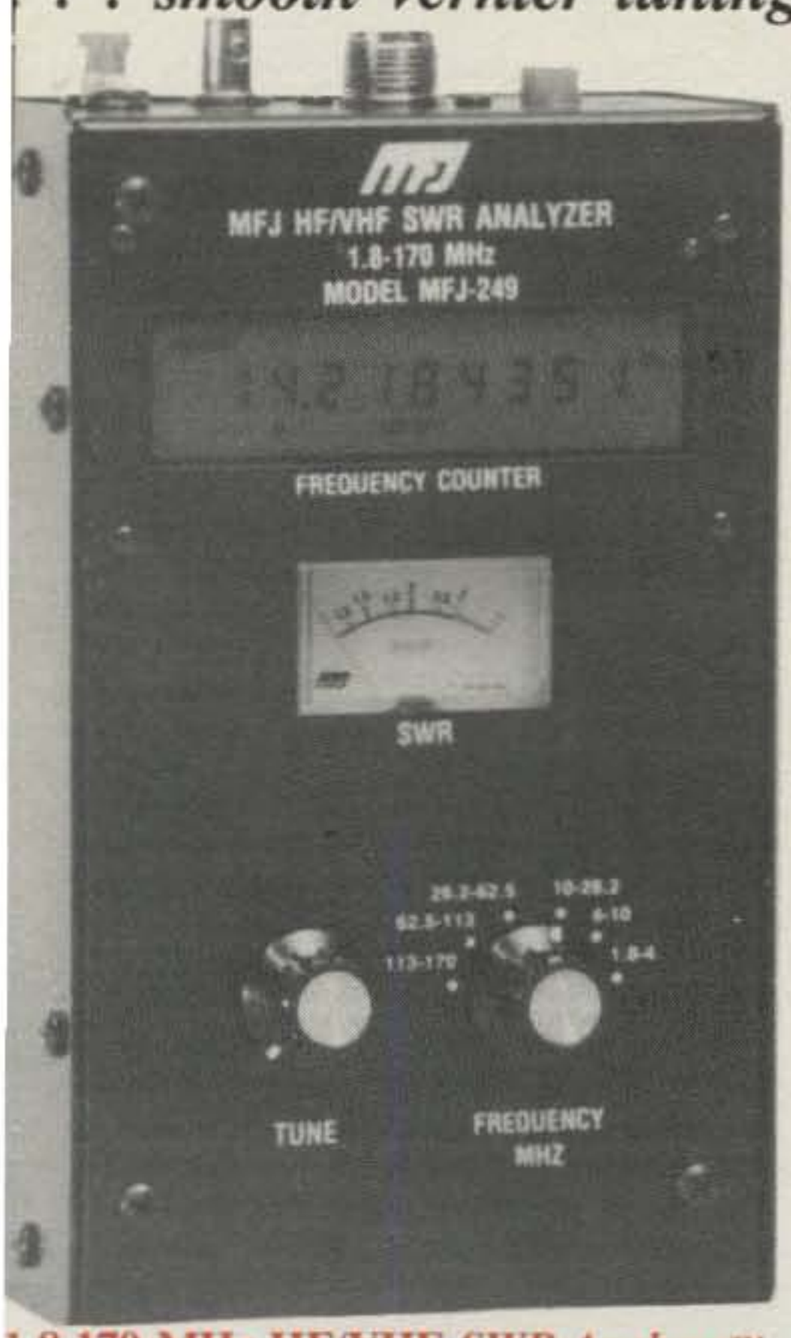

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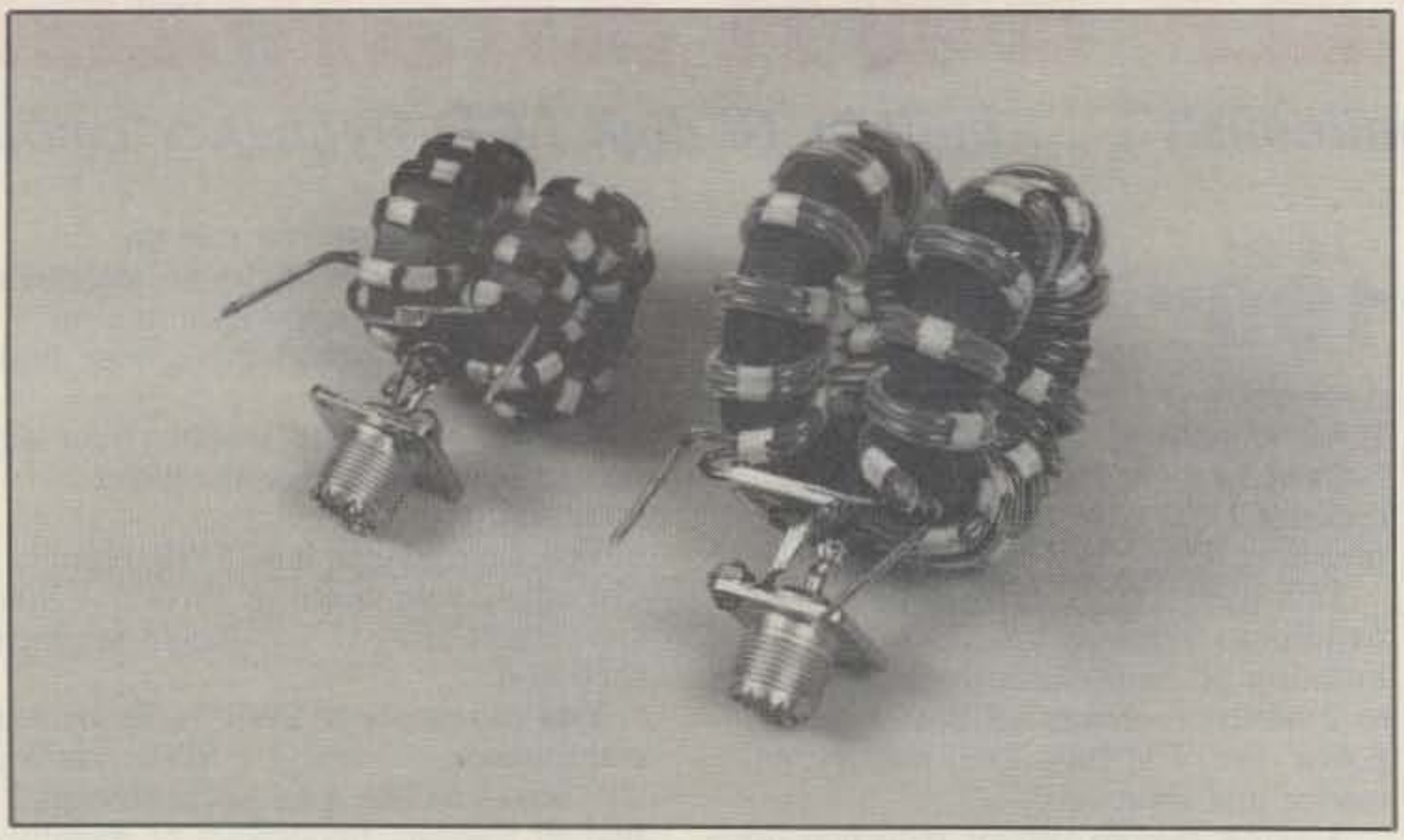

Photo D– Two higher impedance Guanella 4:1 ununs: 100:25 ohm (on the left); 200:50 ohm (on the right).

• For high-impedance operation in the VHF band, the coiled-wire Guanella approach appears to be the best choice and should be investigated. Obviously, the number of turns should be reduced from the examples shown in this article since the reactance of the winding is proportional to the frequency.

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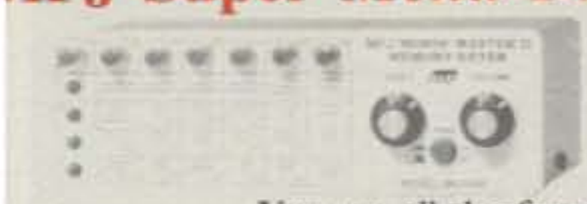

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CQ REVIEWS:

The Solder-It Soldering Kit

BY LEW McCOY*, W1ICP

There are times when a product comes along that I feel will be of special interest to our readers. The Solder-It kit is just such an item. Over the years I have written several articles on soldering. I have seen numerous methods marketed that claimed to solder dissimilar metals, and none of these methods were really successful from my observations.

At Dayton last year, however, Fred Doob, AA8FQ, displayed a soldering kit that was truly amazing. In fact, amateurs were lined up to see and buy his product.

I approached Fred with the possibility of doing a product review for *CQ*, and he gave me a complete demonstration. I really felt this was something in which a lot of operators would be interested. Fred has been a representative selling products for the automobile industry. One automotive company had a very experienced metallurgist who came up with a soldering paste and material that had better bonding charateristics than normal solder and worked at lower temperatures. Fred saw the possibilities of this paste and solder for radio amateurs, so he put to-

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

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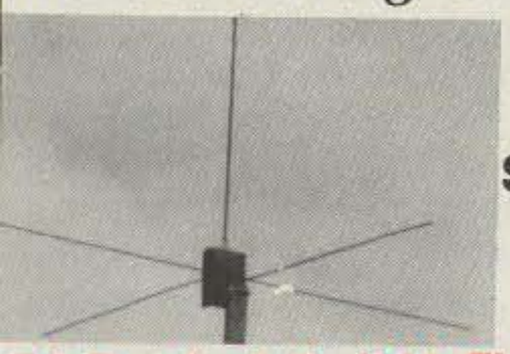

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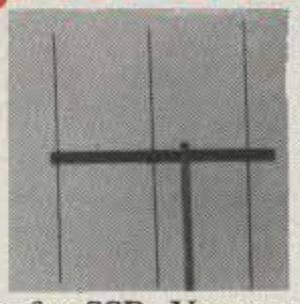

You can take it with you wherever you go and have the "oomph" and directivity of a beam.

It's easy to store and sturdy enough to use as your home station antenna.

You can mount it vertically for FM or horizontally for SSB. You can easily *center* mount it on a mast or *end* mount it on a tower leg with a single U-bolt (included). It's great for packet and PacketCluster™.

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The MFJ-1724B handles 300 watts PEP, has 15 feet of coax and has an extra powerful magnet to hold it steady — even at highway speeds.

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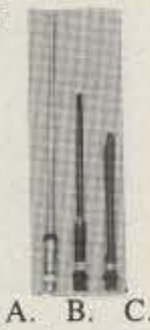

A. B. C.

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7 1/4" collapsed, 19" extended.

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CIRCLE 118 ON READER SERVICE CARD

gether a kit containing the necessary materials. Also, he designed a very small butane torch that can be used with a soldering tip or simply as a torch. The torch is refillable from one of the commonly available small butane bottles for cigarette lighters.

What will the Solder-It kit do? Simply put a slight coating of the solder paste on the materials to be soldered. Then apply the torch flame so that the paste melts. Next apply the flame tip so the solder flows along the desired area. There are four different tubes of paste provided: silver paste, copper paste, aluminum paste, and last, pot metal paste (that's right, pot metal paste).

Some technical points need to be included here. The aluminum solder paste will solder aluminum to other metals such as copper. It has a low melting point (395 degrees), and the resulting connection has a tensile strength of 28,000 PSI! In fact, small soldering jobs can be done with a match or lighter because of the low-temperature paste points. One problem with many antennas is that the manufacturers use self-tapping screws to hold elements together. These screws tend to become loose, creating noise problems. Not so with the Solder-It kit. Simply solder the screw in place. It's easy and quick and will hold as long as the element lasts.

One of my hobbies is making turquoise jewelry, and silver soldering is always a touchy proposition. Not so with the Solder-It kit. You can solder at a point to hold a piece in place, then form the metal, and move along, soldering as you go. Coax fittings become very easy and simple to solder.

Frankly, as you can tell, I was extremely impressed with the kit. I don't expect it would eliminate normal circuit-board work, but for tough soldering chores it's the answer.

The Solder-It kit comes complete with the pastes mentioned above, plus the torch and a soldering tip. Price of the kit is $59.00. For more information write to Solder-It Co., Fred Doob, AA8FQ, P.O. Box 20100, Cleveland, OH 44120 (telephone 216-721-3700).

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MFJ-9040, MFJ-9030, MFJ-9020,
MFJ-9017, MFJ-9015

$179.95 *each*

- ***NEW! 5 Bands . . . Models for 40, 30, 20, 17, 15 Meters***
- ***Write for* Free *manual***

Throw a tiny *MFJ CW Transceiver* in a corner of your briefcase and enjoy DXing and ragchewing wherever you go.

You'll turn lonely nights into exciting adventures as you contact fellow amateurs around the world.

With 5 watts you'll have plenty of power to work the world even with a makeshift antenna.

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Big gun DX'ers: Try a new DX challenge for the price of a simple station accessory.

It's good enough to be your only rig — you get a high performance superhet receiver, razor sharp 8-pole crystal filter, RIT, AGC, vernier tuning, sinewave sidetone, built-in speaker, headphone jack, adjustable semi and full QSK break-in, up to 5 watts output plus much more.

Tiny 6x6½x2½ inches. Weighs 1-3/4 lb. Uses 12-15 VDC. Optional matching antenna tuner, power pack, antenna, plug-in Curtis chip keyer and plug-in narrow audio filter.

Now 5 Bands . . .

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You get a high performance superhet receiver with a selective double tuned front end and double-balance mixer. It's sensitive enough to copy weak DX signals down to the noise floor yet resist overload when a strong local comes on.

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Weak DX signals are just as loud as strong local ones because a *graceful* Automatic Gain Control (AGC) keeps your audio level constant.

You get smooth break-in operation because MFJ's exclusive *Instant Recovery AGC™* gives you *instantaneous* transmit recovery.

True Receiver Incremental Tuning (RIT)

True Receiver Incremental Tuning (RIT) lets you dodge QRM and compensate for other's drift without moving your transmit frequency.

MFJ *Integrated* CW Station

Transceiver, tuner, power pack* fastens together *to form tiny 6x6½x8½ inch integrated CW station.

SAVE $45

$329.80

Save $45! $329.80 buys complete MFJ CW Station. Includes *MFJ CW Transceiver*, MFJ-971 tuner, MFJ-4114 power pack, portable antenna . . . order MFJ-9140B, 40M; MFJ-9130B, 30M; MFJ-9120B, 20M; MFJ-9117B, 17M; MFJ-9115B, 15M. $374.80 each if purchased separately (keyer and filter not included.) **MFJ-27**, $4.95, Handle for CW Station. Add $3.00 s/h if order separately.

Enough Power to Work the World

With 5 watts you'll have plenty of power to work the world even with a makeshift antenna.

You can use any antenna with an SWR up to 3:1. These *MFJ CW Transceivers* are rugged enough to withstand momentary antenna opens or shorts without damage.

If you're really into QRP you can reduce your power down to milliwatts.

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You also get adjustable semi and *full QSK* break-in plus adjustable automatic transmit offset.

You'll get hours of battery operation — draws only 50 ma. receive, 1 amp transmit.

Looks Great!

Each *MFJ CW Transceiver* is housed in an attractive matte-black aluminum enclosure with a deluxe brushed-aluminum front panel and matched knob set. Machine screws and pressed-in PEM nuts are used — not sheet metal screws.

Has power-on LED, transmit LED and SO-239 coax connector for antenna.

Designed by Rick Littlefield, K1BQT

The *MFJ CW Transceivers* were designed by Rick Littlefield, K1BQT. He's known worldwide for his reliable high-performance transceiver designs and countless articles.

K1BQT has given careful attention to board layout, heatsinking, mechanical rigidity, voltage regulation and component selection to ensure stable operation and long-term reliability.

It meets or exceeds all FCC requirements.

Comes fully assembled, tested and guaranteed to work

Your factory built *MFJ CW Transceiver* is ready to work DX right out of the box. It's not a kit of parts you have to put together and hope you can get to work.

Free *MFJ CW Transceiver* Manual

Manual includes operating instructions, setting up your station, DX techniques, antenna suggestions, trouble shooting guide, theory of operation, alignment procedures, parts placement, schematic, parts list and more.

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MFJ-412 Curtis chip iambic keyer, $39.95.

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Each plugs into an *MFJ CW Transceiver*. Controls on rear panel. No soldering or modifications needed.

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MFJ *Portable* Antenna Tuner

MFJ-971 **$89.95** **Tunes** coax, balanced lines, random wire 1.8-30 MHz. Cross-Needle SWR/Wattmeter has two switchable ranges: 30, 300 or user selectable 6 watt ranges. Tiny 6x6½x2½ inches matches *MFJ CW Transceivers*. Fastens to *MFJ CW Transceivers* and/or MFJ-4114 Power Pack to form single unit.

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MFJ-4114 **$69.95** **Matching** *portable* Battery/AC Power Pack for *MFJ CW Transceivers* or other low power rig. Provides power from Ni-cad D cells, regular or alkaline D cells or 110 VAC. Has charging circuit for Ni-cads D cells. 6x6½x3½ inches. Fastens to *MFJ CW Transceivers* and/or MFJ-971. Batteries not included.

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W1ICP talks about open-wire and coax, what they can do for you, and what they can do to you. Next month we'll take this information and use it to get open-wire feeders into the shack.

Let's Talk About Wire

Part I—Handling Coax and Open-Wire Feeders

BY LEW McCOY*, W1ICP

I've been writing about open-wire transmission line and coax for many years now, and I still get letters and questions pointing out the reluctance of some amateurs to run open-wire feeders into the shack to get to the Transmatch or tuner. In my own case, I use an insulated type of 450 ohm "ladder" line and have never really been concerned about bringing the line into my shack. However, a happy ham is best defined as, well, a happy ham! This article will show you a couple of ways to bring your transmission line inside your house without coming in with open wire.

I have explained using open-wire feed line with antennas many, many times in the past, but I know it will also help the reader to go over the subject once again so the problems or non-problems can be cleared up.

When one thinks of feeding an antenna, almost without exception the new amateur is led to believe that coaxial line is the only way to go. Coaxial line is normally well insulated and can be run alongside metal or other coaxial lines, through walls, under ground, or even through water (depending on the type of coax).

So why bother with open-wire line? Trust me, there are many excellent reasons for using open-wire line. First, for all intents and purposes it is a lossless line. One thing you should know about any feed line is that the losses in the line increase with the standing wave ratio (SWR). Therefore, if a line is essentially lossless, as with open-wire types, it means that even with high SWR present, the losses are insignificant—not so with coax. Second, open-wire line is considerably less expensive when compared to coax. The type of line I use, 450 ohm "ladder line" (which can handle 1500 watts) is only 14 cents a foot. Third, it can be used with a multiband dipole made only with wire. This can provide the best and most efficient type of multiband dipole.

Because of the potential for high SWR losses with a lossy line, coax should be operated at or near the impedance of the line. The impedance of the line is determined by the size of the conductors and their spacing and the type of material used to hold them apart. Usually we think of coax in terms of 50 ohms impedance, although there are numerous other values of coaxial cable manufactured. To repeat, the primary problem with coax is that the line must be operated at this characteristic impedance, or very close to it, or losses will result.

How lossy is coax? Here is one example, and admittedly it is a bad one. With 100 feet of RG-58/U on 2 meters, almost 80 percent (!) of the power transmitted is lost because of ohmic resistances in the line. To be fair, one would not use (or *should not* use) RG 58/U on 2 meters or even 10 meters. Losses with any type of transmission line increase with frequency, but RG 58/U is particularly bad. So, if more than 25 feet of transmission line must be used, don't choose RG-58.

In the golden days of amateur radio (and don't ask me why they were "golden," except that gold was $32 an ounce), we made our own open wire lines, usually with No. 12 wire that was spaced 2, 4, or 6 inches apart. These days most amateurs use what is *called* open wire line, but in actuality it is a line that is similar to TV twin lead, with the exception that it has openings every few inches to reduce losses. The impedance of this line is about 450 ohms. Keep in mind, though, that like coax, the line is insulated, although as I pointed out, much cheaper per foot.

At this point I would be remiss if I didn't state that one should not use open wire to feed a directional rotary beam—at least not without giving the problem some thought. Any very long runs of coaxial line can produce some bad losses, particularly when one is using a beam to obtain gain. The losses from very long runs of coax can negate the beam gain. However, in some cases, amateurs find it necessary to situate their beams at a considerable distance from the shack, which would result in high losses as mentioned. For runs of over 250 feet I would suggest going to open-wire line to get to the beam, then using one of Jerry Sevick, W2FMI's 9 to 1 balanced to unbalanced transformers (see *Transmission Line Transformers,* by Jerry Sevick, W2FMI, published by the ARRL). This would get you from the 450 ohm impedance of the open-wire to 50 ohms, and then you could feed the beam directly with coax.

I cannot stress enough how important Sevick's book is to amateurs interested in making baluns or transformers to get from one impedance to another. I could cover the construction of a 1 to 9, 50 to 450 ohm transformer/balun in this article, but one would profit more by studying the design in Sevick's book.

In the case of a multiband dipole such as the McCoy dipole (June 1992 *CQ*) or the G5RV type, we would definitely want to use open-wire line. With it we can tolerate extremely high mismatches without loss, which we cannot do with coax. And that leads us up to the discussion of feeding a

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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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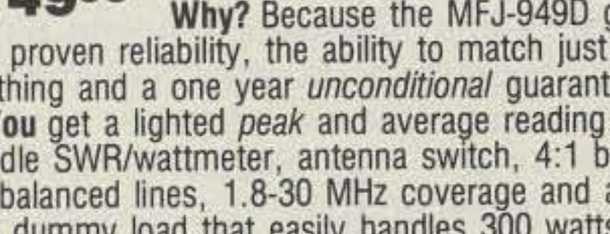
MFJ's *New 300 Watt* Tuner



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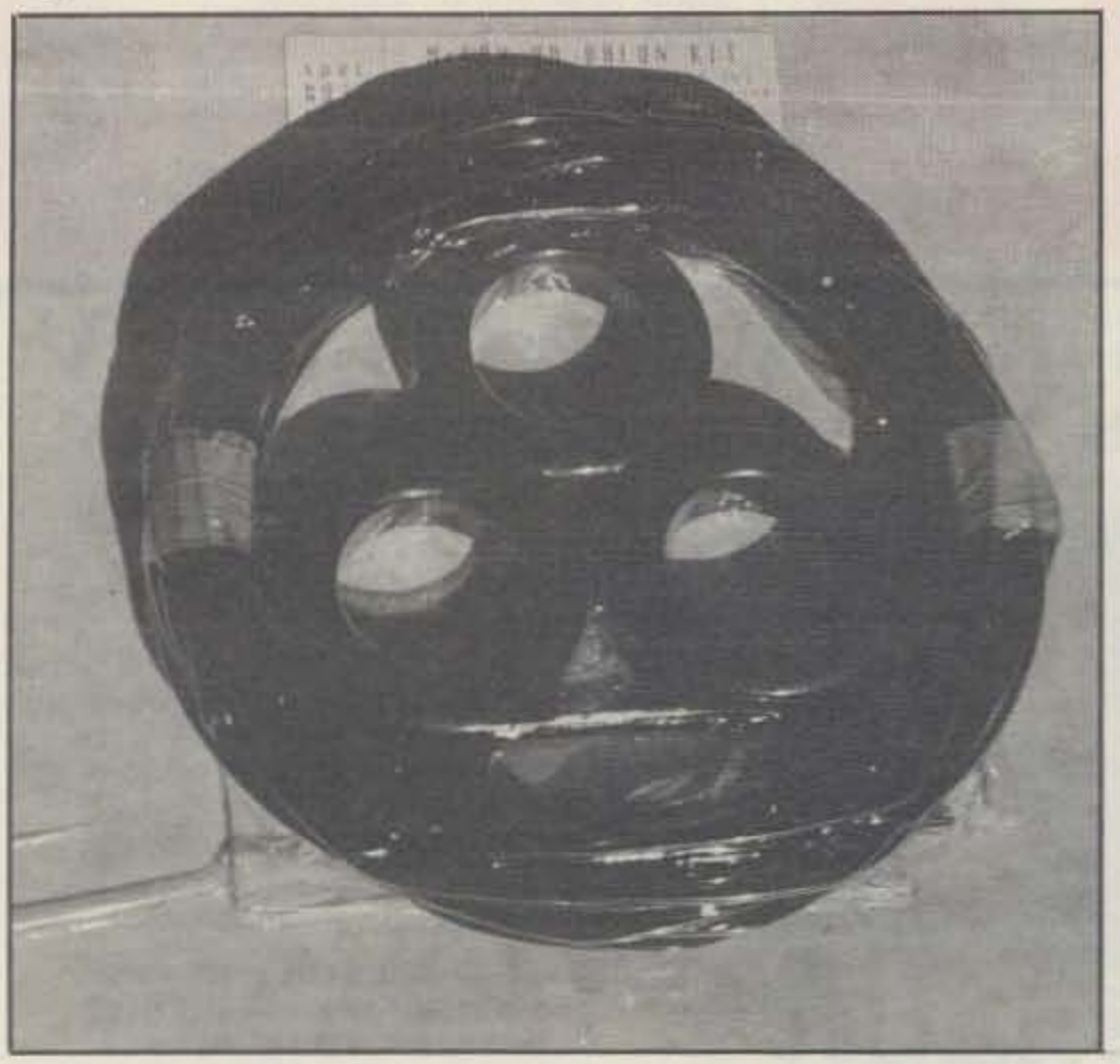
CIRCLE 55 ON READER SERVICE CARD



This is the kit of toroids, special 3-M electrical tape, and No. 14 Teflon-covered wire that is sold by The Wireman (see ads in CQ).

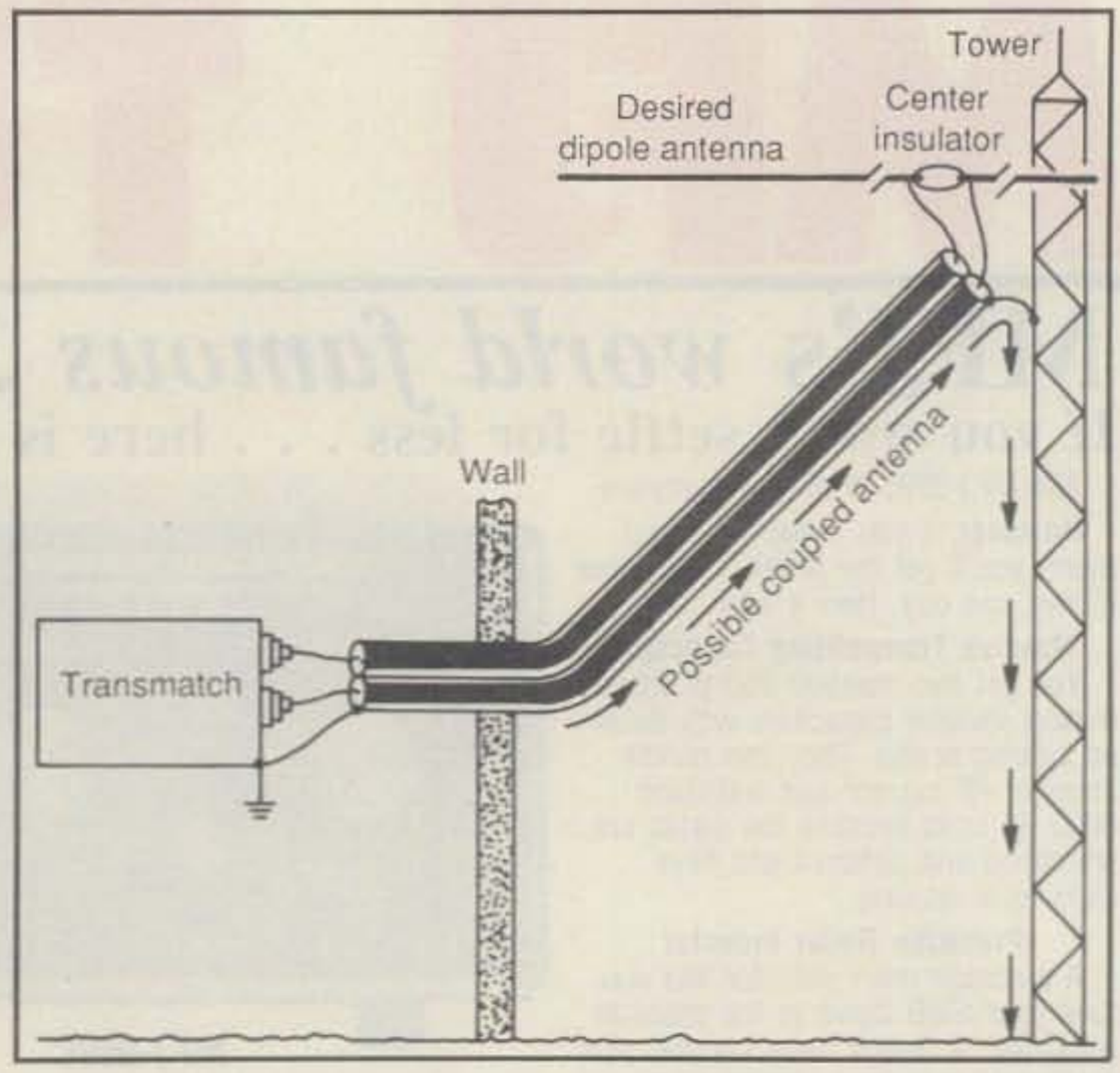


Fig. 1 – A possible "No-No" some amateurs use: dual coax out to a tower to feed a dipole. Frankly, from a technical standpoint this can be rather dumb. The outer shield of the coax, from the rig out to the tower, plus the tower itself and the guy wires can also be an antenna. All this can, or could, upset a beam pattern if there is a beam (and there usually is) on top of the tower. However, I know some readers would swear by such a system, and in that case I state McCoy's rule: "If the darn thing works, leave it alone."

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multiband dipole with open-wire line. When I say a "multiband" dipole, I mean a wire dipole opened at the center and fed with open-wire line (or it could be an end-fed dipole, but I have never encouraged the use of end-fed antennas). One conductor goes to one side of the dipole and the other conductor to the other side.

As I pointed out in the June 1992 *CQ* article, the dipole length is not really important, but attempt to make it more than a quarter wavelength long at the lowest band used—in other words, at least 60 feet for 80 meter operation. You may hear many discussions about how long the feed line should be, but simply, it should be long enough to reach the shack. A problem arises here in that sometimes we end up with *RF voltages* in the shack, usually indicating the antenna system load may be operating at a very high impedance. The very simple answer to this is to change the feed line length by adding more line. If you are using the type of insulated "open wire" line I mentioned, it is no problem to simply coil up some lengths of the line and insert this new piece in the feed point at the tuner. How much line? A complete change would be a quarter wavelength of line, but the answer is to try different lengths to change the load. You may not need a quarter wavelength.

I have received calls and letters with questions about open-wire feeders that bear answering here. For one thing, some amateurs have had problems of Transmatches not being able to handle the antenna system, and they have experienced arcing or some other weird problem. Simply put, because a 150 watt Transmatch means exactly that—it is capable of handling 150 watts, regardless of the load or system. However, some open-wire-fed dipoles, on some bands, will exhibit high RF voltages, and the capacitors in the specified Transmatch experience RF voltages that can cause arcs or flashover. This really means the doggone thing won't handle the 150 watts! I have just discussed how to change this condition by changing the load impedance by altering the length of feed line.

What about using two lengths of coax and only using the inner conductors to create a "shielded" open-wire line? (See fig. 1.) It is possible to do this, **but** there are several problems which may arise, and I'll attempt to cover them. First, one would assume here that the impedance of the line using two 50 ohm conductors would be 100 ohms. But that is not important—at least if we are going to "tune" the line as we would do with open wire. But let me digress for a moment.

Years ago I wrote an article called "When Is a Feed Line Not a Feed Line?" (Naturally, the answer is when the feed line radiates and becomes an antenna.) This

article went into considerable discussion about feed line radiation, and it was based on an event that at first was very baffling.

It seems two amateurs had bought identical beams and towers and had very similar locations. However, the one amateur's antennas had good front-to-back ratios on 10 and 20 meters, while the other's did not. Keep in mind that these stations were identical—almost! They wrote to me and asked why this happened.

At the time I was on a TVI lecture tour and would be in their area, so I agreed to stop by. As I said, upon examination, their antenna installations appeared identical. They had the same beams, they both had baluns installed at the antenna, and the only real difference I could see was the actual length of their respective coaxial feed lines. I reasoned, and as it turned out correctly, that the problem was feed line radiation (parallel standing waves), and this feed line radiation was upsetting the normal beam patterns. We used a grid dip meter and dipped the *outside braid* of the coaxial lines. The station that had the poor front-to-back ratio turned out to show a grid-dip resonance on the outside of the line on both 10 and 20 meters.

Keep in mind that any wire or metal in the vicinity of the antenna *that is resonant to the frequency of the power in the antenna* can couple power from the antenna and reradiate it. We changed the length of his coax to get rid of this resonance and the problem disappeared. His patterns became identical to those of the other station. And one more thing: Both stations had baluns at their antenna, which is supposed to cool off the lines and cure such problems. Naturally, I came to the correct conclusion that a balun may or may not help such a problem.

Getting back to our dual coax, we can connect the inner conductors to the balanced output of the Transmatch in the shack and ground the shields. But what about the shields out at the dipole? Most amateurs who have done this have left the topside shields just "hanging." Similarly, if the center of dipole is suspended from a tower holding a beam or beams, the shield is grounded to the tower. Fig. 1 illustrates such a setup.

In fig. 1 what we have is essentially two antennas—that's right, two antennas. The first antenna is a dipole fed by the inner conductors, and the second is an antenna consisting of the tower, from its ground up to the shields and then the shields back to the Transmatch and its ground. In our world of multiband antennas—from 160 through 10 meters—almost certainly that ground shield antenna is going to be resonant on one of these bands. And if so, it will certainly couple power from whichever antenna is being used. If you have such an installation, grid dip the shields to find the bands it might be resonant on, and change the ground lengths to move that resonance out of the band.

Once again going back to our dual coax, keep in mind we still have relatively lossy feed lines, plus the fact that these losses shoot up dramatically when high SWR conditions exist. SWRs of 20 to 1 or higher are common on tuned lines with multiband use. The real problem here, aside from losses, is the high RF voltages that can develop on the lines, with the likelihood of line destruction. Frankly, such an installation is just not my cup of tea.

In Part II we'll get to decide to bring open-wire line into the shack—or not to.

(To Be Continued) CQ

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2:1-HDU100	112.5:50-OHMS 100:50-OHMS	$50.00
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1.5:1-HU50	50:32-OHMS	$45.00
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CIRCLE 35 ON READER SERVICE CARD

PACKET USER'S NOTEBOOK

BY BUCK ROGERS, K4ABT

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

Taking The Mystery Out of the Packet Commands— Conclusion

Last month (last year) we covered many of the packet commands and discussed the list of features that are generic in nature to all Terminal Node Controllers (TNCs). As I mentioned in the first part of this article, it might be a good idea to keep these packet command lists nearby until you feel comfortable with the meanings and the manner in which you invoke each command.

Link Control Commands

AX25L2V2: Provides compatibility between the older version of AX.25 and the new level 2 of the AX.25 protocol.

When ON, the TNC will automatically adapt to the version being used by a connecting station. Most packet controllers allow digipeating using AX.25, level two and version 2.

CONOK: Defaulted ON, the TNC will automatically acknowledge a connect request.

If the CONOK is turned OFF, connect requests from other stations will not be acknowledged and a DM (disconnect message/busy) will be sent to the requesting station. A message "connect request from XXXXX" will be output to the terminal.

CONMODE: Determines the mode your controller will be in, following a connect.

This command selects the mode of the TNC if the NOmodecommand is OFF. When ON, the controller will automatically enter the converse or transparent mode. This will depend on the setting of the command, either CONVERSE or TRANSPARENT.

CONVERSE: Sets the packet controller into converse mode, when connected.

Converse has no default. It is an immediate command. By typing a K or CONV at the cmd: prompt, the controller will go to the CONVERSE mode. Once in the CONVerse mode, a carriage return will force a packet to be sent.

TRANSPARENT: To enter the transparent mode.

The transparent mode allows the sending and receiving of binary and control characters without affecting the operation of the controller. Some control characters will lock the controller if sent in the CONVERSE mode. This problem is alleviated when in the TRANSPARENT mode.

DIGIPEAT: Default ON, allows digipeating by other stations.

This is part of the foundation of packet radio. The ability to store and forward packets and communicate over long distances is what packet is based upon. The DIGIPEAT command is defaulted ON, which allows your station to be used as a relay or digital repeater (digipeater).

By using several stations via which to "digipeat," we are able to send data over long paths, even at VHF and UHF frequencies. Each station listed in the digipeat or via list will be used as a "stepping stone" to the next station until the packet has made its journey.

MAXFRAME: Establishes the maximum allowed number of outstanding, unacknowledged frames.

Maximum value is between 1 and 7. A frame is usually 128 characters in length.

NEWMODE: When ON, the TNC will return to command mode when it receives a disconnect.

When ON, the TNC will return to command mode when it receives a disconnect. If more than one connect exists, the controller will return to the command mode only if it is on the selected stream of the disconnect.

RETRY: Retry may be set to n times, n = 0 to 15, with 0 being infinite tries. Default is 15.

FRAMES are transmitted n times before a "retried out" occurs. The time between tries is determined by FRack.

USERS: Is used to determine the number of streams that can allow a connect.

This command may be given any value between 0 and 26. This value specifies the number of streams that are available for connects.

If USERS is set to 3, then a connect request will connect to the lowest available channel/stream A, B, or C. If all three streams are busy, then a <DM> packet will be issued to the requesting station.

A "connect request" and callsign of the requesting station will appear on the screen of the terminal.

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	PIN 3	Push–To–Talk (PTT)
	Ext Spkr (3.5 MM)	Receive Audio
	PIN 1	Ground/Shield
YAESU (8 PIN)	PIN 8	AFSK INPUT
	PIN 6	Push–To–Talk (PTT)
	Ext Spkr (3.5 MM)	Receive Audio
	PIN 7	Ground/Shield
KENWOOD TM–231A	PIN 1	AFSK INPUT
	PIN 2	Push–To–Talk (PTT)
	PIN 5	Receive Audio
	PIN 7 & 8	Ground/Shield
RANGER AR–3500	PIN 8	AFSK INPUT
	PIN 6	Push–To–Talk (PTT)
	Ext Spkr (3.5 MM)	Receive Audio
	PINS 2 & 7	Ground/Shield
ICOM 228 & IC–735	PIN 1	AFSK INPUT
	PIN 2	Push–To–Talk (PTT)
	PIN 8	Receive Audio
	PINS 6 & 7	Ground/Shield

Table I– The transceiver microphone pin number(s) and the function associated with the pin. The Kenwood TM-231A, Ranger AR-3500, and ICOM IC-228 have eight-pin mic connectors.

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CIRCLE 29 ON READER SERVICE CARD

Monitor Commands

HEADERLN: Used to insert a carriage return between the header line and the text of monitored packets.

This command causes the text and header line to be separated.

MONITOR: When ON, all packet data and addresses are displayed.

Callsigns are separated from the text by the ">" (greater than) symbol. See also the MC ON command.

MALL: As defaulted, both connected and unconnected packets are monitored.

The MALL command determines the category of monitored packets. This is the setting used if you wish to communicate as a group. The MALL command is also handy for running some types of diagnostics.

MCON: MCON OFF, the controller will monitor only connected stations in the connected state.

To monitor packets from stations other than the station to which you are connected, set MCon ON. This command is active when connected.

MCOM: When ON, this command will allow monitoring of all frame control sequences and numbering.

This command is active when the MONitor command is ON. This command will allow monitoring of all frame control sequences and numbering such as <I> frames, unnumbered information frames <UI>, disconnects <D>, unnumbered acknowledge <UA>, disconnect messages <DM>, and connect requests <C>.

MRPT: Displays the calls from the origination and destination station in the monitor mode.

When ON, all paths to and from originating or destination stations will be displayed. When this command is OFF, it will display only the calls from the origination and destination stations. The MONitor command should be ON.

Timing Commands

AXDELAY: The period the controller will wait in addition to the time set by the TXDelay.

This command is time in addition to the TXDelay setting. AXDelay is used in conjunction with voice repeaters which are used to pass packet data.

This command is most often used when slow relay switching of voice repeaters is employed for use with packet.

AXHANG: Specify the necessary "HANG TIME" of voice repeater which is used in packet service.

If the repeater squelch tail is long, it is not necessary to wait AXDelay time after keying the transmitter if the transmitter is still transmitting.

CHECK: Used to set the period before

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checking for connection or timeout.

Where n = 0, n may be set any value between 0 and 30, with each increment specifying 10 second intervals. When n is set to a number larger than zero, a periodic "check" packet will be sent to the connected station to ensure connectivity. If no response, a time-out and disconnect will occur.

CMDTIME: Used to set the "transparent" escape time interval.

CMDTIME may be configured to any value from 1 to 15, with each increment being 1 second. The escape characters must be entered three times, within CMDTIME of each other to enter the command mode from the transparent mode. A guard time of CMDTIME is added after the last escape character entry is made. Any entry during this latter CMDTIME will abort the escape to command mode.

DWAIT: Used to set the period after a packet is heard on the channel before keying the transmitter.

Where n = 0 to 255 in 10 millisecond intervals, DWait can be set to wait n*10ms after hearing the last packet activity on the channel.

FRACK: The period to wait for ACK, after transmitting. Where n = 1 to 15 in 1 second intervals. The controller will wait "FRack" seconds before transmitting again.

If the number of tries is exceeded as specified in "RETry," the operation is aborted. Abbreviation of "FRame ACKnowledge."

HBAUD: Establishes the actual baud rate setting for the on-the-air, "station to station" communications.

This baud rate has no relation to the terminal-to-TNC baud rate. The Hbaud is selective, since we are restricted for some unclear reasons to 300 baud on frequencies below 28 MHz.

RESPTIME: Sets the delay period in 100 ms intervals before keying the transmitter to send an acknowledgment.

The number specified for RESPtime may be set between 0 and 255, with each increment representing 100 milliseconds. This setting then becomes the "minimum" delay period before an acknowledge packet is sent.

This command may run concurrent with DWait and other random delays which are in effect.

TXDELAY: Sets the period between actual transmitter turn-on (PTT activate) and the beginning of data flow.

The TXDelay command tells your controller how long to wait (in n*10 milliseconds) after keying the transmitter, before it begins sending valid data. Below I have listed some TXDelay settings for various types of packet stations and radios.

TXD 9—Optimum For 9600 Bauds. Maximum TXDelay at 9600 bauds should not exceed 14, or 140 milliseconds!

TXD 30—Crystal-controlled radios with diode switching.

TXD 35—Synthesized radios.

TXD 40—Radios with relay.

TXD 45—Radios with external power amplifier.

Feature Commands

CTEXT: Used to enter connect text. To activate, set CMSG to ON, or PBBS.

Connect text may be entered as any combination of letters and numbers. The connect text can be used to give directions, announcements, or instructions—e.g., Buck is not here at the moment; you may leave a message in the K4ABT-10 mailbox.

MHEARD: Used to view a list of the 15 or more most recent stations that were heard by your station. The command is issued by you, from the command mode, and displayed on your terminal.

The MHeard command is issued at the command prompt to display the most recent stations heard by your station. In some TNCs there is a related command called the JHeard, or "Just Heard" feature. If the JHeard command is associated with the mailbox, or PBBS, this feature may have an expanded command call that includes a "time-stamp" addition. In addition to the "time-stamp," there may also be a bonus to the JHeard feature called the "Jheard Long" (JL). If the J<space>L is executed while connected to a mailbox/PBBS bearing this feature, you will receive a listing of stations heard.

There are a few commands not covered either in last month's or this month's column because space does not permit expanding on TNC commands that relate to manufacturers' specific features. Therefore, I've embodied only the optimum usage command(s) to reduce the chance that it may create more confusion than clarification.

As you become more proficient with your TNC, you may no longer need to study these commands. However, for those times when you need the meaning or acronym for one of the commands, keep this information nearby as a ready reference.

Happy New Year es Happy Packeting!

73, de BucK4ABT

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CQ REVIEWS:

The MFJ-247 HF SWR Analyzer

BY KARL T. THURBER Jr.*, W8FX

In the August 1991 issue of *CQ*, Gordon West, WB6NOA, showed how to tune your antenna and check your standing wave ratio (SWR) without using a transceiver ("Tuning Antennas Without A Transceiver," p. 60). Gordon paired up the popular MFJ-207 HF SWR Analyzer with an Optoelectronics UTC3000 frequency counter. The result: A precision system that paints a picture of antenna SWR over an entire band, without using a transceiver or other gear.

Apparently, the folks at MFJ were reading Gordon's mind. Late last year MFJ announced a combination SWR measuring instrument, the MFJ-247 HF SWR Analyzer™ with a built-in LCD frequency counter. It is three instruments in one: an SWR bridge, a low-power RF signal generator, and a 150 MHz counter.

There's really nothing new here, as amateurs have used these devices for years. What *is* novel is that only recently have the three instruments been integrated so nicely in a single device.

Measuring SWR: The Conventional Way

Most antennas and antenna tuners must be tuned to achieve optimum performance. There are various ways to do this, but minimizing SWR is one of the most common and convenient ways.

Unfortunately, as Gordon pointed out, tuning an antenna using an SWR bridge usually was a two-person operation. To tune an antenna to resonance and match it to a coax feedline took one person at the antenna to make the adjustments and another in the hamshack to sweep the band with a VFO transceiver and observe the SWR meter dip. Doing so was poor operating practice at best and illegal at worst.

Measuring SWR: Getting Fancier

MFJ advanced the art less than two years ago when it introduced the MFJ-207 HF and the MFJ-208 VHF SWR Analyzers. They are tunable oscillators, calibrated with a rough VFO dial, that resemble old-style "dip meters." The analyzers contain a built-in SWR bridge. When you sweep the band on which the antenna is supposed to be resonant, you get an estimate of the antenna's resonant frequency by observing the dial frequency at which the SWR dip occurs.

To fine-tune the point of minimum SWR, you need a more precise indication of frequency. You may calibrate the analyzer's output frequency, either by listening to its signal on a receiver or by feeding the output to a frequency counter. Gordon did the latter, using the analyzer's frequency counter output jack. He found that doing so worked well and let him sweep the band and not disrupt any QSOs in the process.

Measuring SWR: A New Way To Do It

MFJ has combined the three instruments in a single package, the time of which has come. The MFJ-247 HF SWR Analyzer works over the range 1.75 to 33.5 MHz in five not-quite-continuous bands: 1.75–2.9, 3.2–5.3, 6.5–11, 12–21, and 18–33.5 MHz. It requires six AA alkaline batteries or an optional 12 VDC power supply.

The SWR computing circuitry automatically computes SWR and displays it on the built-in meter. To measure SWR, all you need do is connect your antenna's feedline to the analyzer's **Antenna** input, set the **Tune** knob to the desired frequency, and directly read the SWR on the meter. Or, you can make a quick sweep of the dial while watching the counter readout; doing so approximates the resonant frequency of the antenna by displaying the frequency at which lowest SWR occurs. You can quickly see which way to adjust antenna elements to bring an antenna to resonance, or you can use the analyzer to fine-tune an antenna tuner.

You can make your measurements at the hamshack end of the coax. However, because the analyzer is a battery-operated, handheld portable, you also can take it to the antenna and adjust its length or matching device yourself, if that's your preference, without the need for an assistant.

The MFJ-247 SWR Analyzer™, with a built-in LCD frequency counter, is designed for measurement convenience. It's actually three instruments in one: an SWR bridge, a low-power RF signal generator, and a frequency counter. There's really nothing new here, as amateurs have used these devices for years. What is novel is that only recently have the three instruments been integrated so nicely in a single device. (Photo courtesy MFJ Enterprises)

The built-in frequency counter normally is used simply to read the frequency of the internal oscillator. However, you can attach an RF probe or short piece of wire to the BNC-style **Freq In** connector. This lets you measure accurately the frequency of an *external* RF source.

While the RF signal generator, SWR bridge, and SWR computing circuitry are designed to cover 10–160 meters, the frequency counter—which has a 1 ppm, 10 MHz crystal time base—works to at least 150 MHz. Its four gate times (.01, .1, 1, and 10 seconds) let you select the resolution you need. A nice plus: the large (quarter-inch), high-contrast LCD digits don't wash out in bright sunlight.

MFJ makes several suggestions on uses for their SWR analyzers. I've added some of my thoughts to their suggestions.

- Finding an antenna's resonant frequency at the feedline.
- Monitoring SWR changes as you adjust the antenna, lengthening or shorten-

*317 Poplar Drive, Millbrook, AL 36054

Say You Saw It In CQ

ing elements and seeing the effect immediately.

- Adjusting your antenna tuner without transmitting (just remember that in adjusting your tuner you can't change the SWR at the antenna, only on the line between tuner and transmitter).
- Seeing how an antenna's SWR changes over an entire band, and quickly finding the "usable" (say, 2:1 or 3:1) SWR bandwidth for the system.
- Checking multiband dipoles and verticals to see where the minimum SWR points are on the various bands.
- Adjusting mobile whip placement, resonance, and matching without generating QRM.
- Checking the SWR of your linear amplifier's input circuit.
- Seeing the SWR effects of swinging your beam toward a power line or other object.
- Seeing how rain or snow affects your antenna's SWR.

Okay, But Know What You're Measuring

Used intelligently, the MFJ-247 may revolutionize how you measure SWR—whether you use it at the antenna or in the ham shack. However, a few SWR measurement cautions are in order.

A high SWR isn't terrible in itself, although a low SWR may give you confidence that your antenna system is "okay." But going to great effort to get the SWR to 1:1, or even below about 2:1, usually isn't worth the extra effort. Also, a low SWR doesn't ensure that your antenna system is working efficiently. After all, your dummy load's SWR probably reads a pleasing 1:1, but it doesn't radiate worth a darn.

There's a sort of anomaly at work here. If the SWR as read at the transmitter is 1:1, then the SWR at the antenna is 1:1 also; on a lossless transmission line, the SWR at the transmitter is the same as the SWR at the antenna. However, the SWR as measured at the hamshack will be slightly *lower than* if you had measured it at the antenna, due to line loss.

Recognizing this scenario, the instruction manual includes a handy chart that lets you calculate the SWR at the antenna, regardless of transmission line length. All you need to know is the line loss (which is fairly standard for different types of coax) and the SWR at the transmitter. MFJ also includes a blank ruled plotting sheet on which you can plot SWR vs. frequency. The manual suggests that you make photocopies to use with different antennas. I also recommend reviewing some of the suggested readings on SWR and antenna basics found at the conclusion of this article.

So, How Well Does it Work?

There's not much I can say, because the MFJ-247 is one of those neat accessories that you just turn it on and use it with little fuss. It does a very good job of accomplishing its intended purpose. Spot-checks with several conventional SWR bridges showed comparable results across the HF bands.

Was there anything about the MFJ-247 that I *didn't* like? There were a few things. The built-in oscillator was not terribly stable, but was stable enough to measure SWR. The ten-page instruction manual was satisfactory, but the operation of the front-panel **Gate** pushbutton wasn't described, and no schematic was provided. Consequently, there was no indication of the external power jack's pin polarity, should I use my own 12 VDC power supply instead of batteries or MFJ's optional MFJ-1312 supply. All these are minor points that don't detract much from overall utility, but that might be improved upon later.

The analyzer carries MFJ's full 12-month warranty, which is quite liberal. Particularly impressive: You *don't* void the warranty if you attempt to repair the unit yourself, and MFJ even provides free technical consultation on its new toll-free 800 number telephone line.

Summary

The MFJ-247 is produced by MFJ Enterprises, Inc., Box 494, Mississippi State, MS 39762. It is available direct or at various retail outlets. Retail price is $189.95.

Further Reading

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McCoy, Lew, W1ICP. "Basic Antenna Information." *CQ*, June, July, and August 1990.

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ANTENNAS & ACCESSORIES

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

BY KARL T. THURBER, JR., W8FX

Antenna Update—Continued

In this, part five, of the "Antenna Update" series, we will continue to aquaint you with some of the innovations in antennas and related items and areas.

Antennas, etc.

"Mobilizing" Rubber Ducks: Two Approaches. Oak Bay Technologies has come up with a clever rubber duck window mount, the AM-101B, to improve mobile handheld operation. The mount, which is intended for emergency, rental car, and vacation use, simply clips over a vehicle window and allows you to connect your handheld's rubber duck via a BNC or TNC connector. The mount is made of stainless steel for durability, and it includes 6 feet of RG-174/U coaxial cable. For pricing contact Oak Bay Technologies, P.O. Box 911, Woodinville, WA 98072-0911.

Another approach is taken by Trionics. It offers a car-window antenna mount, the BWM-1, designed to get the duck outside the car and slightly elevate it above the roof. Of heavy-duty aluminum construction, the mount features a BNC-to-BNC bulkhead connector that allows you to easily change the coax cable if needed. The mount, which works with any BNC-type duck or whip, is $13.95; with 6 feet of RG-174/U coax, it's $23.00. Contact Trionics, P.O. Box 1434, Rancho Cordova, CA 95741-1434.

Safe Tower Climbing Lanyards. In the February 1992 column we profiled ONV's product line, taking special note of the new ONV Safety Belt with seat harness ($89.95).

ONV also offers rope lanyards (safety lines) for use with a safety belt; versions are available that have snap hooks on either one end or both ends. The lanyards can be looped or directly spliced to the "D"-ring on the belt or harness. Three lanyard styles in 3, 4, or 5 foot lengths are available and are priced between $31.95 and $35.95. Newly offered is a tower-climbing lanyard 3 feet in length that has large gorilla hooks to clip on the ONV Safety Belt. It's $39.95.

For more information, contact ONV Safety Belt Co., P.O. Box 404, Ramsey, NJ 07446.

EP 800 MHz Scanner Antenna. UHF Scanner enthusiasts, take note: Electron Processing has introduced the DANA series of 800–950 MHz scanner antennas, the DANA-1 and the SUPER DANA. Both antennas use a multi-element collinear design for broadband use, encased in a rugged CPVC tube. The unamplified DANA-1 also can be used for transmitting, making it practical for extending the range of cellular telephones. The SUPER DANA has a built-in 15 dB preamplifier and is for receive use only. Both antennas are 35 inches long and are supplied completely assembled with mounting clamps for masts up to 1.5 inches in diameter. The DANA-1 is $35 and the amplified SUPER DANA is $80.

For more details, contact Electron Processing, Inc., P.O. Box 68, Cedar, MI 49621.

ASA Antenna Catalog. ASA offers a 14-page catalog of fixed and mobile amateur and scanner antennas. These include a variety of verticals; rubber duckies; scanner, cellular, and cordless telephone antennas; and mobile mounts and accessories.

One of ASA's more novel offerings is its suction-cup antenna, designed for apartment and emergency mobile use. The $24.95 antenna is available for 220 MHz or 440 MHz. ASA also specializes in dual-band and triband mobile and fixed designs covering 2 meters, 220 MHz, and 440 MHz. A variety of scanner antennas covering 30–1000 MHz also are offered. For details, contact ASA, P.O. Box 30162, Charlotte, NC 28230.

IIX Communications Accessories Catalog. We discussed the IIX product line in the November 1989 and June 1991 columns. Their catalog seems to have grown thicker and now is about 20 pages; it's replete with antenna and tower hardware. Included are mast adapters, beam mount and boom-mast plates, standoff brackets, mast climbing steps, rotor mounts, multiple tower antenna mounts, rooftop "quad pods," guy-wire anchor plates, and mobile mounts.

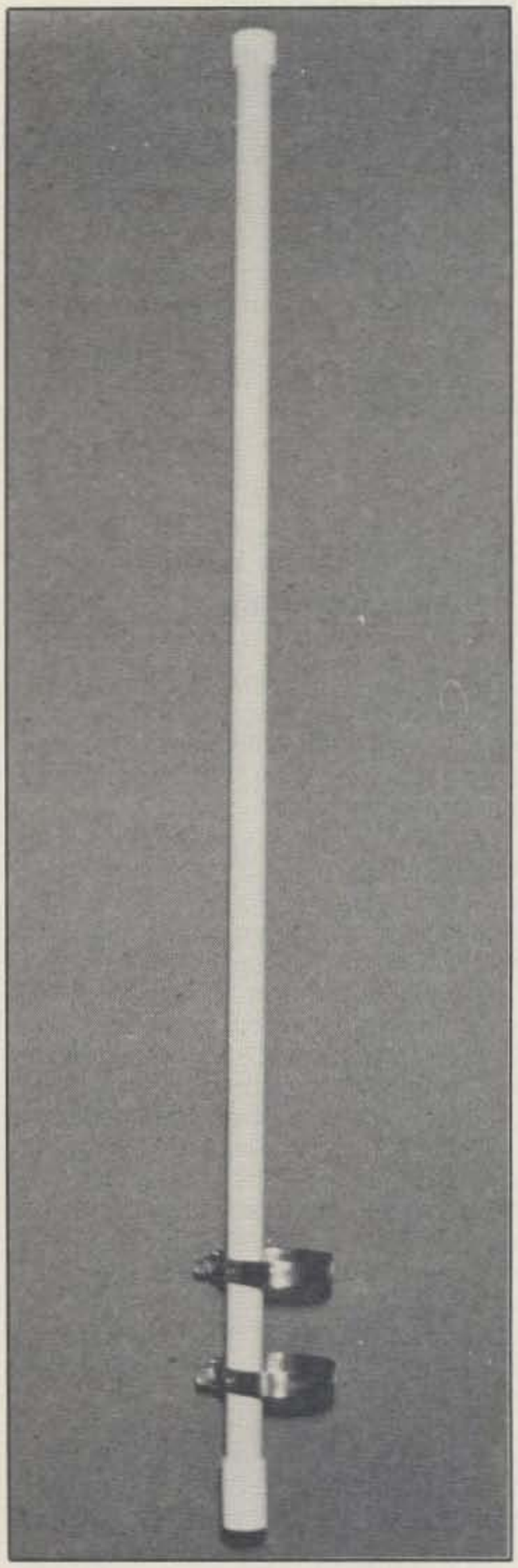
Recent editions of the catalog have prominently displayed and described their Ginpole line and have offered some specific suggestions on how to safely use Ginpoles. IIX offers three types of steel Ginpole kits of varying construction to use with stamped open-leg towers, towers using legs of tubing from 1 to 1½ inch O.D., and towers with close-spaced "W"-bracing. Complete Ginpole kits range from about $170 to $200; pulleys and clamp assemblies are also available separately. For a catalog, contact IIX Equipment, Ltd., P.O. Box 9, Oak Lawn, IL 60454.

Soft Topix

RealTrak. In recent years computer programs for satellite tracking and moonbounce have proliferated; several are quite sophisticated. Unfortunately, not all such programs are easy to use. To remedy this situation, Michael R. Owen, W9IP, designed RealTrak for serious satellite and moonbounce operators who want accurate azimuth and elevation positions and real-time antenna control in a single, fast, powerful, and user-friendly program.

RealTrak tracks up to 100 earth-orbiting satellites, the Moon, the Sun, planets, noise sources, and other celestial objects. The program operates in real time, continually updating the orbiting object's azimuth, elevation, distance, Doppler shift, and other information.

RealTrak controls antennas through the Kansas City Tracker or other rotor interface cards. Its tracking functions include fully automatic



Both the DANA-1 and the SUPER DANA are multi-element collinears. The unamplified DANA-1 can be used for transmitting; the SUPER DANA has a 15 dB preamplifier built into the antenna and is for receive only. Both antennas are 35 inches long and are supplied completely assembled with mounting clamps for masts up to 1.5 inches in diameter. (Photo courtesy Electron Processing, Inc.)

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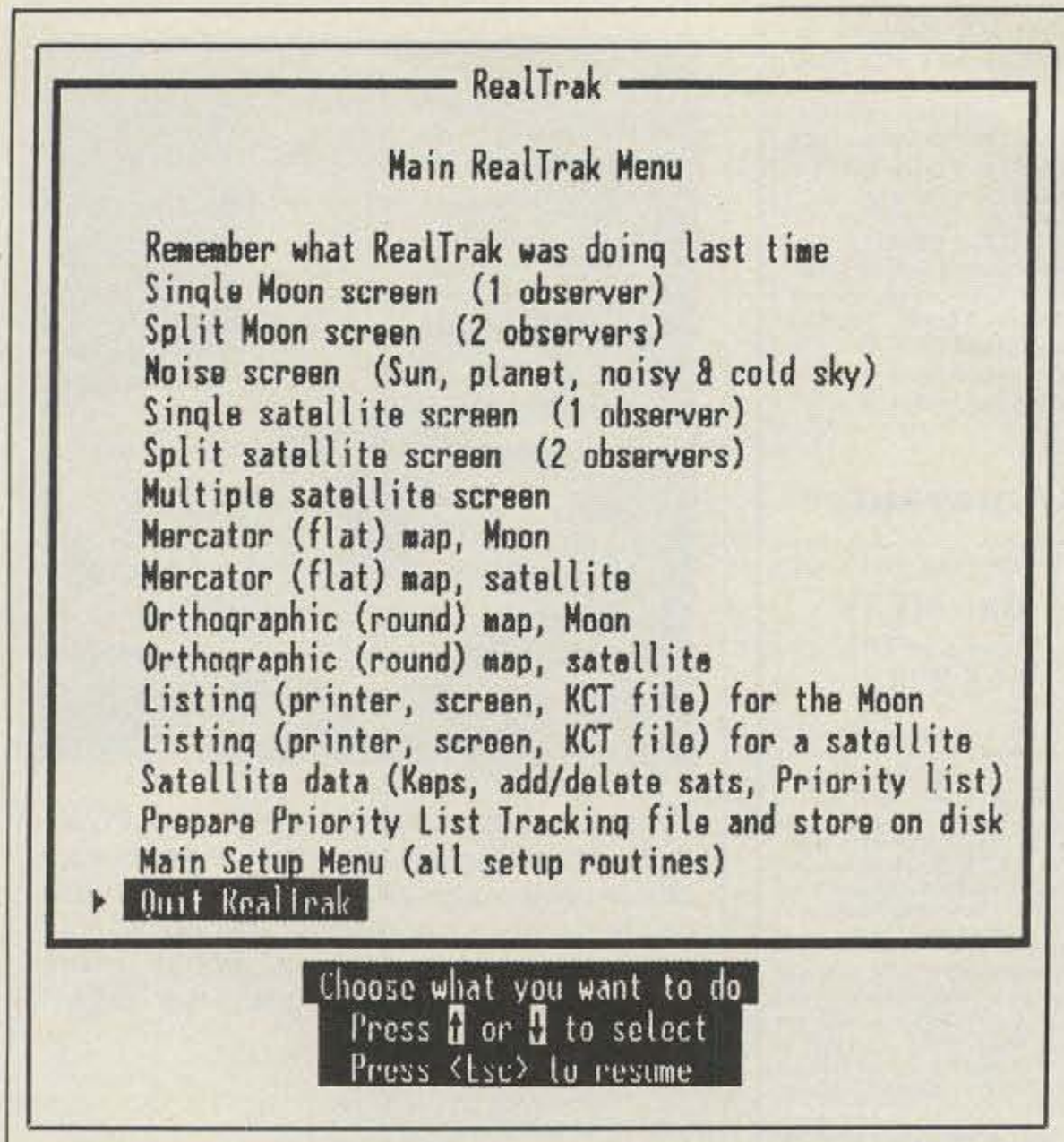

Fig. 1– Main RealTrak menu. Michael R. Owen, W9IP, designed RealTrak for serious satellite and moonbounce operators who want accurate azimuth and elevation positions and real-time antenna control. RealTrak tracks earth-orbiting satellites, the Moon, the Sun, planets, noise sources, and other celestial objects. As the name suggests, the program operates in real time, continually updating the orbiting object's azimuth, elevation, distance, Doppler shift, and other information. The program controls antennas through the Kansas City Tracker or several other rotor interface cards.

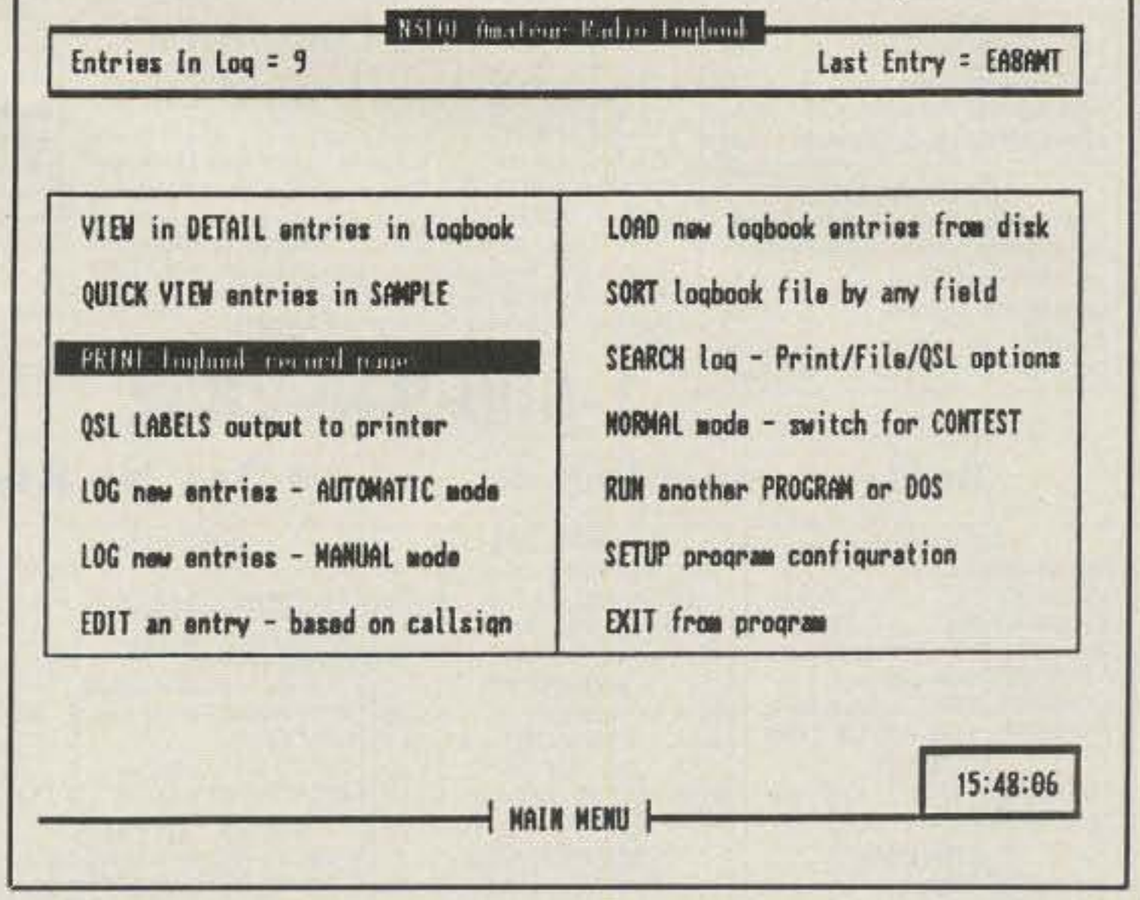

Fig. 2– Main LOG-EQF menu. LOG-EQF, by Tom Dandrea, N3EQF, is a full-featured electronic logbook when used alone on an IBM PC compatible computer. If the program is used on a computer connected to a Kenwood transceiver via the RS-232C serial port and a suitable interface, many additional logging and control features are enabled.

antenna guidance, priority list tracking of groups of satellites one after the other, flip-mode tracking for gap-free following of overhead passes, and manual cursor-arrow antenna control. The program also includes a pop-down "dumb" terminal for packet communications while tracking, timed CW transmission of stored messages, two kinds of animated high-resolution maps, and callsign lookup from EME databases. A recent enhancement lets you load the time/target table in the Kansas City Tracker with a priority list schedule, permitting pass-after-pass tracking of multiple satellites, even with RealTrak turned off and the computer doing something else. Fig. 1 shows the Main RealTrak Menu.

RealTrak is available in several configurations, working with PCs with or without a built-in math coprocessor or expanded memory; a graphics card is required only for the map displays. The complete program with a 26-page user's manual is $50, and a fully functional (but time-limited) demo disk is $2. For further information, contact Northern Lights Software, Star Route, Box 60, Canton, NY 13617.

KIY Computer Interface. Rich Assarabowski, K1CC, offers an innovative computer interface that's compatible with three major radio types—Kenwood, ICOM, and Yaesu.

The KIY interface, designed by Zbig Baranski, KB2ES, is used to connect your PC's serial port to your radio to allow control of the transceiver or receiver from the computer. Selection of the radio (Kenwood, ICOM, or Yaesu) is made using an internal DIP switch. Computer control of the radio is available from most logging and contesting programs, various software for radio memory management, interfaces between PacketCluster™ and DX database programs, and the like.

The interface is housed in a metal case with LED indicator, and a six-conductor DIN plug (for Kenwood and Yaesu) and a ⅛ inch plug (for ICOM) can be wired in parallel, making the interface universal. Rich points out that this feature is convenient for multi-operator stations, where the interface can be part of the computer system and various radios added by visiting operators. Software is furnished on disk for controlling various radios.

The unit is $59.95 plus $2 shipping from Rich Assarabowski, K1CC, 306 Vernon Ave., Vernon, CT 06066.

Kentrol for Windows. Brain Gilhuly, VE3BGB, says he doesn't see much enthusiasm among software publishers to develop amateur-radio-based Microsoft Windows™ software, so he went to work developing a Windows-based program, Kentrol for Windows.

Kentrol is a control, logging, and memory management program that takes advantage of the Windows graphical user interface and works with all recent Kenwood HF radios. It's designed to provide features in software beyond those built into the radio. Complete support is provided for '40-series radios, including the TS-140S, giving '40-series rigs '50-series abilities and more.

Radio control features are implemented primarily through the Tuner Window, which tunes both VFOs and selects memory channels via the scroll bar; automatic scrolling of frequencies and split- frequency operation are supported. With a single mouse click, the program logs the correct UTC date and time, frequency, mode and band, along with your notes, to an ASCII log file that you can edit at any time. Kentrol also manages radio memory: you can read its memories into a window, or you can open an empty memory set and enter frequencies. The same memory file format is used for all radios, so files are fully transferable between rigs.

The program, which includes a 40-page printed manual, is $39 (U.S.) or $49 (Canadian). It's available from Brian Gilhuly, VE3BGB, 490 Concord Avenue, Toronto, Ontario M6H 2P8, Canada.

Log-EQF Update. More than three years ago Tom Dandrea, N3EQF, developed an IBM PC shareware logbook program called LOG-EQF. It includes control routines for Kenwood radios so that the radio's mode and frequency are accessed and displayed on the PC screen.

We covered LOG-EQF as it matured in four previous columns—December 1989, March 1990, and March and August 1991. To recall, the program is a full-featured electronic logbook when used alone on an IBM PC compatible computer. If used on a computer connected to a Kenwood transceiver via the RS-232C serial port, additional logging and control features are enabled.

Tom recently advised us of a major update to LOG-EQF, to Version 4 (see fig. 2). Since we last mentioned Log-EQF in the column, he has added many new features, mostly derived from user suggestions. Log-EQF now includes full support for TNCs and automated DX announcements via PacketCluster™. Other new features include mouse control of menus, notepads for comments on each QSO, and selectable date formats for entry and printouts.

Tom requests a $25 registration fee that includes newsletters, notification of program updates, and telephone support. However, to test drive the program you can send him $5 for a shareware copy. For more information, contact

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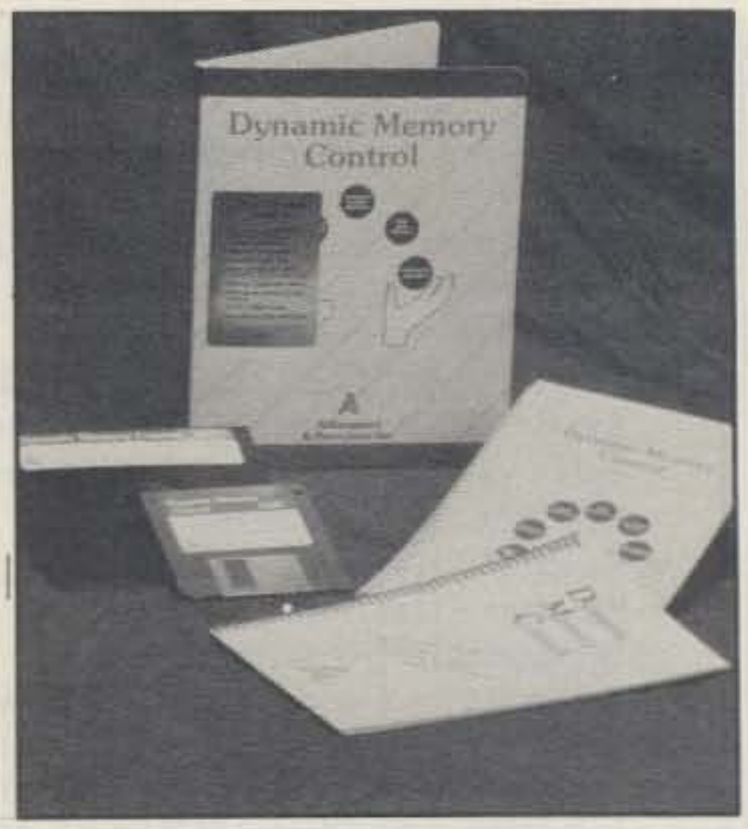

Dynamic Memory Control is a very handy PC optimization utility that lets you load and unload device drivers and memory resident programs on the fly, while you're using your PC, without the need to reconfigure and reboot. (Photo courtesy Adlersparre & Associates, Inc.)

Tom Dandrea, N3EQF, 396 Sautter Drive, Coraopolis, PA 15108.

Walnut Creek CDROM. CD-ROMs are the rage today. If you peruse the small classified ads in *Computer Shopper*, *PC Magazine*, and other PC publications, you'll find a growing number of CD-ROM publishers and distributors offering their byte-stuffed wares.

One such firm is Walnut Creek CDROM, which offers several large but inexpensive archives of public-domain and shareware programs. Among the eight or so discs Walnut Creek offers, I found three of particular interest. One is the Simtel20 MSDOS Archive, which contains about 550 MB in more than 8000 files of many different types, including amateur radio programs; it's $24.95.

Another is the CICA Microsoft Windows CD-ROM, also at $24.95, which contains over 80 MB of Windows-related programs. These include many demos, drawn from the CICA Windows collection at Indiana University. The third is the Desktop Library, a $39.95 CD-ROM that includes over 1000 titles, including classic literature, historical documents, and reference works. These can be viewed with an included file viewer or printed out. The Simtel20 and CiCA discs are updated quarterly, and you can sign up for automatic updates for one year to save $5 per disc.

For a flyer, contact Walnut Creek CDROM, 1547 Palos Verdes Mall, Suite 260, Walnut Creek, CA 94596.

Dynamic Memory Control. I'm a nut for computer utility programs, and I wasn't disappointed when I received a copy of Adlersparre's Dynamic Memory Control. It's a nifty optimization tool, a "RAM-cram fighting" program that lets you load and unload device drivers and memory resident programs on the fly, while you're using your PC, *without* the need to reconfigure and reboot.

The program effectively solves the problem of juggling resources such as device (including CD-ROM) drivers, multiple RAM drives, terminate-and-stay-resident (TSR) programs, and memory management software within the PC's limited memory. So instead of needing a num-

ber of different AUTOEXEC.BAT and CONFIG.SYS files and rebooting the PC to accommodate different applications' configuration requirements, you can load and unload resources in any memory area on demand. This capability lets you work interactively with device and network drivers and TSRs from DOS, a batch file, or even a menuing system. Included are several utilities, including one to convert any device driver or TSR into a self-removable TSR you can unload from memory at any time.

While the program is really intended to be run from the command line, the publisher includes a hand-holding, intuitive interface of pull-down menus you can work by a mouse or cursor keys. A built-in memory display program maps the contents of all the different types of memory your PC includes.

The program, which I found to be easy to learn despite the complexity of what it's actually doing, works with a variety of memory managers including DOS 5.0, QEMM, and 386MAX. It's priced at $79.95 (U.S.) and is available through software distributors or directly from Adlersparre & Associates, Inc., 1803 Douglas St., Suite 501, Victoria, British Columbia, Canada V8T 5C3.

Cryptanalysis and The Cipher-Ace Series. Charles W. Stewart, WA2NZX, sent me a sampling of an unusual series of computer programs he markets. His programs are for the computer-assisted purpose of making and breaking secret ciphers in hobby, professional, and educational contexts. While I'm not "into" cryptography, and the FCC frowns on amateurs' encrypting data over the air, I found his programs to be fascinating.

Charles makes available a series of five disk packages, each containing five ciphers, which cost $35 each. These are furnished on 5.25 inch 360K diskettes and work with any 80-column MS-DOS computer system. The programs let you enter cipher text messages up to 1000 characters for decrypting or enter plain text from the keyboard or a disk text file for enciphering. You also can perform several utility and statistical functions. He also offers the classic, 237-page "how-to" manual by Helen F. Gaines, *Cryptanalysis* (at $5 plus shipping) as well as other courseware for the serious student of this rather arcane art and science.

For more particulars contact Charles W. Stewart, WA2NZX, 1197 Pickerel Circle, Orlando, FL 32839.

Book Nook

The ARRL Operating Manual, Fourth Edition. This solid and authoritative ARRL publication, edited by Steve Ford, WB8IMY, is an excellent primary reference covering on-the-air operating practices. Each of the 16 chapters has been revised by authors who are experts in their fields. The book admirably attempts to be a single source of information that encompasses almost all types of on-the-air activities. To that end, it includes a comprehensive reference section that includes callsign maps, sunrise/sunset tables, award applications, maps, and more.

While not a license study manual, the ARRL book makes an effort to be the entry vehicle for "no-code" Technicians. Of special interest to Tech beginners are the chapters on shortwave listening, basic and VHF/UHF operating, FM and

This month we take a look at crytanalysis and the Cipher-Ace programs offered by Charles W. Stewart, WA2NZX. Amateur code breakers may be interested in this three-rotor "Enigma" electromechanical cipher machine of World War II fame. The machine, on display at the Smithsonian Institute in Washington, D.C., has no print capability, but uses a 26-character light board to display, in turn, each ciphertext letter. (W8FX photo)

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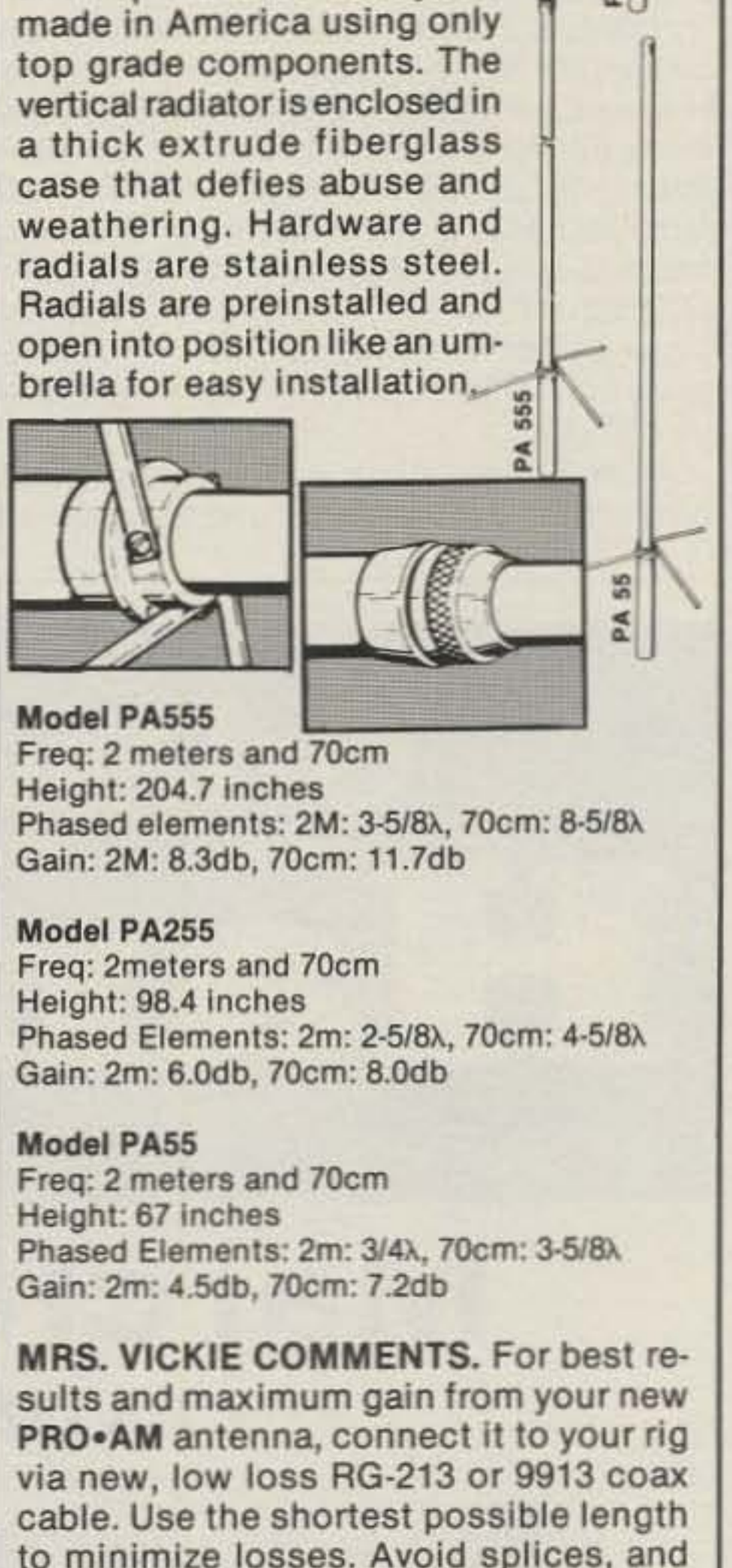

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repeaters, and emergency communications. Other chapters are for beginners or veterans and include an orientation to the amateur spectrum, DXing and DXpeditions, contests and operating awards, RTTY/AMTOR and packet modes, and image (TV and FAX) communications.

The 8½" × 11" ARRL book is available from the League (225 Main St., Newington, CT 06111) for $18. In my view, it makes a good companion to Harry Helms, AA6FW's new book, discussed below.

All About Ham Radio. This is an all-new introduction to amateur radio aimed at those without prior knowledge of the hobby or of electronics. In about 300 pages Harry Helms, AA6FW, uses humor and a conversational, friendly writing style to introduce newcomers to amateur radio and gently guide them. I know, because my XYL, Millie, has been studying diligently for her Tech license. She gives Harry's book high marks on its readability, understandability, and humor as contrasted with some other technically adequate but boring beginner books on amateur radio.

Harry's book isn't a complete license study course, nor is it an A-to-Z operating reference. However, unlike many other beginner books, this one devotes as much attention to what amateurs *actually do* and to the culture of amateur radio as it does to technical, formal operating topics, topics covered well in *The ARRL Operating Manual*. Contesting, DXing, and ragchewing are stressed more than the "service aspects" of traffic handling and emergency preparedness.

All About Ham Radio evaluates the relative pros and cons of the Novice and Technician licenses as entry points into the hobby. And, since the book is published independent of any organization or manufacturer, it straightforwardly covers topics without equivocation or doubletalk—although the author's strong views on certain controversial topics do manage to sneak through. The book even discusses the often contentious roles played by the FCC and the ARRL, and it reviews current amateur radio magazines and license study materials.

The 6" × 9" softcover is $19.95. It's available from radio equipment dealers, technical bookstores, or directly from the publisher with $3 shipping. Contact HighText Publications, Inc., 7128 Miramar Road, Suite 15, San Diego, CA 92121.

Dayton: Transcripts and Proceedings. Does your busy schedule prevent your making it to Dayton? It's not uncommon for transcripts of lectures and seminars presented in professional technical symposia to be made available to those who can not make the sessions, or to attendees who don't care to take detailed notes. But I haven't heard of transcripts being published for hamfest presentations.

Tim Duffy, K3LR, has changed all that with his creatively subtitled "unofficial proceedings of certain Dayton events." These are transcripts of the contest, DX, antenna, and other proceedings from the 1992 Dayton HamVention; presumably, he will be doing the same thing in 1993 and beyond. What Tim offers are printed presentations, transcribed verbatim from tape recordings made during the talks and supplemented by most of the speaker's audiovisual materials and handouts.

The 1992 proceedings are available for $29 postpaid; the 1991 Dayton DX and contests presentations are $19; $45 takes them both. For a flyer, contact Tim Duffy, K3LR, at LTA, P.O. Box 77, New Bedford, PA 16140.

Two from Tiare. Bill Welsh, W6DDB, *CQ*'s "Bill's Basics" editor, recently introduced *PSE QSL*, issued by Tiare Publications. Subtitled "An Expert's Guide to Amateur Radio QSL'ing," it's a complete handbook covering amateur radio QSLing, with tips and techniques to help you on your way to DXCC, WAS, WAZ, and other awards. It may be a little overblown to suggest, as the book's advertising does, that it will "turn your mailbox into a QSL magnet." But the 63-page guide does contain hundreds of practical tips, tricks, and techniques to help you confirm more of your contacts, especially the rare ones. The guide is written in Bill's customarily authoritative and thorough style that reflects his more than 40 years of experience in teaching others about amateur radio. It's $9.95 plus $2 shipping.

Another goodie from Tiare of interest to SWLs is its *RTTY DATACARD*, an operating aid designed to be used in conjunction with many commercially available RTTY decoders. It's a large (8½" × 11") laminated card that presents and explains the so-called Yarbrough Matrix method of RTTY tuning, developed by Chuck Yarbrough, a long-time RTTY hobbyist. One side of the card lists and explains RTTY emission modes (Baudot, ASCII, ARQ, FEC, and spread) and the Yarbrough system. The other side contains the matrix tuning table that lists baud rate and the various RTTY transmission methods falling under narrow, medium, and wide shifts for that tuning rate. It's $6 plus 50 cents shipping.

Both items are available from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147.

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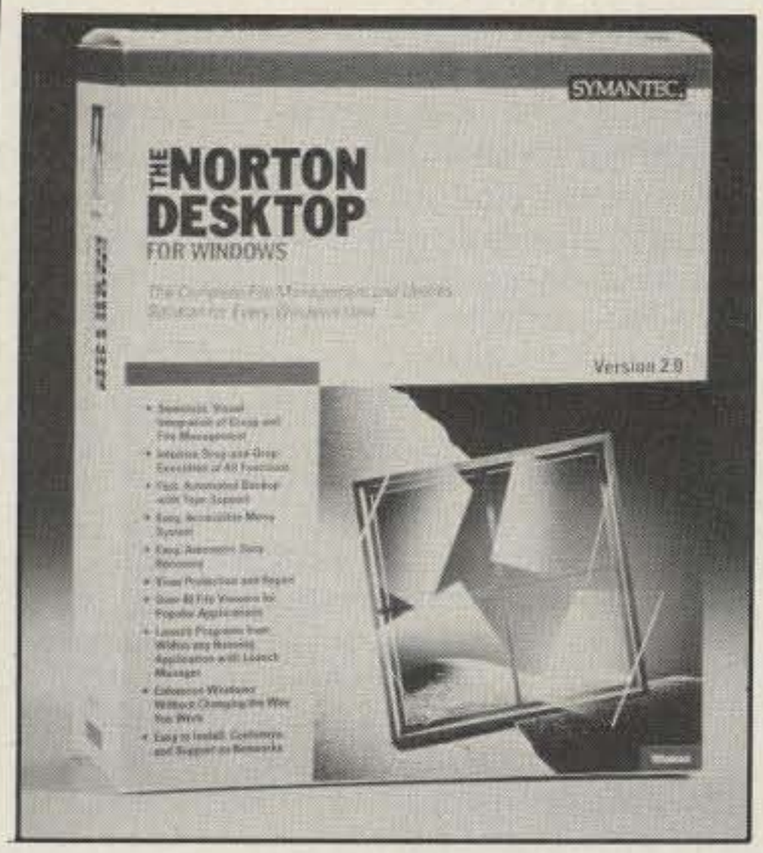

Did you catch last month's column? There we discussed several Symantec IBM PC utilities. One of these was the acclaimed Norton Desktop Version 2.0 for Windows, a popular Microsoft Windows add-in enhancement. Another was The Norton Desktop V1.0 for DOS, which provides a Windows-like interface for DOS users who are not quite ready to move to the Windows environment. Don't miss the software discussions and reviews in the text of this month's column. (Photo courtesy Symantec Corporation)

All About Oscilloscopes. Stan Griffiths, W7NI, sent me a copy of his fascinating book, a "labor of love" called *Oscilloscopes: Selecting and Restoring a Classic.* Stan is the owner of more than 50 restored Tektronix instruments, all of which are more than 20 years old and in museum-like condition. Stan's been involved with Tektronix oscilloscopes, particularly in servicing them, since 1960.

The book has a narrow focus, that of helping the buyer of a classic Tektronix scope get the best buy for his money and make the most of his investment. While the seven chapters and three appendices focus on restoring Tektronix scopes, there are chapters devoted to topics such as determining instrument condition and properly cleaning equipment that have useful tips applicable to restoring any electronic equipment, including amateur radio gear. The 372-page book is $19.95 postpaid from Stan Griffiths, W7NI, 18955 S.W. Blanton, Aloha, OR 97007.

Dvorak Does It Again Department. In the August 1990 column we reviewed *Dvorak's Guide to PC Telecommunications.* We were impressed with the comprehensive guide, authored by noted computer columnist John C. Dvorak and programmer Nick Anis. Now the second edition is available, and it includes a 3.5 inch diskette of telecommunications related programs and utilities.

Both the original and the updated book present users with easy to understand information on modems and telecommunications software, how they work, and how to best use them. The authors include detailed information on each of the major electronic mail systems and bulletin board services, what they are, and how to employ them to best advantage. Also included are tips and tricks on linking PCs, file transfer protocols, telecommuting, and more.

The new edition has been reorganized into 6 parts, including 35 chapters and 8 appendices

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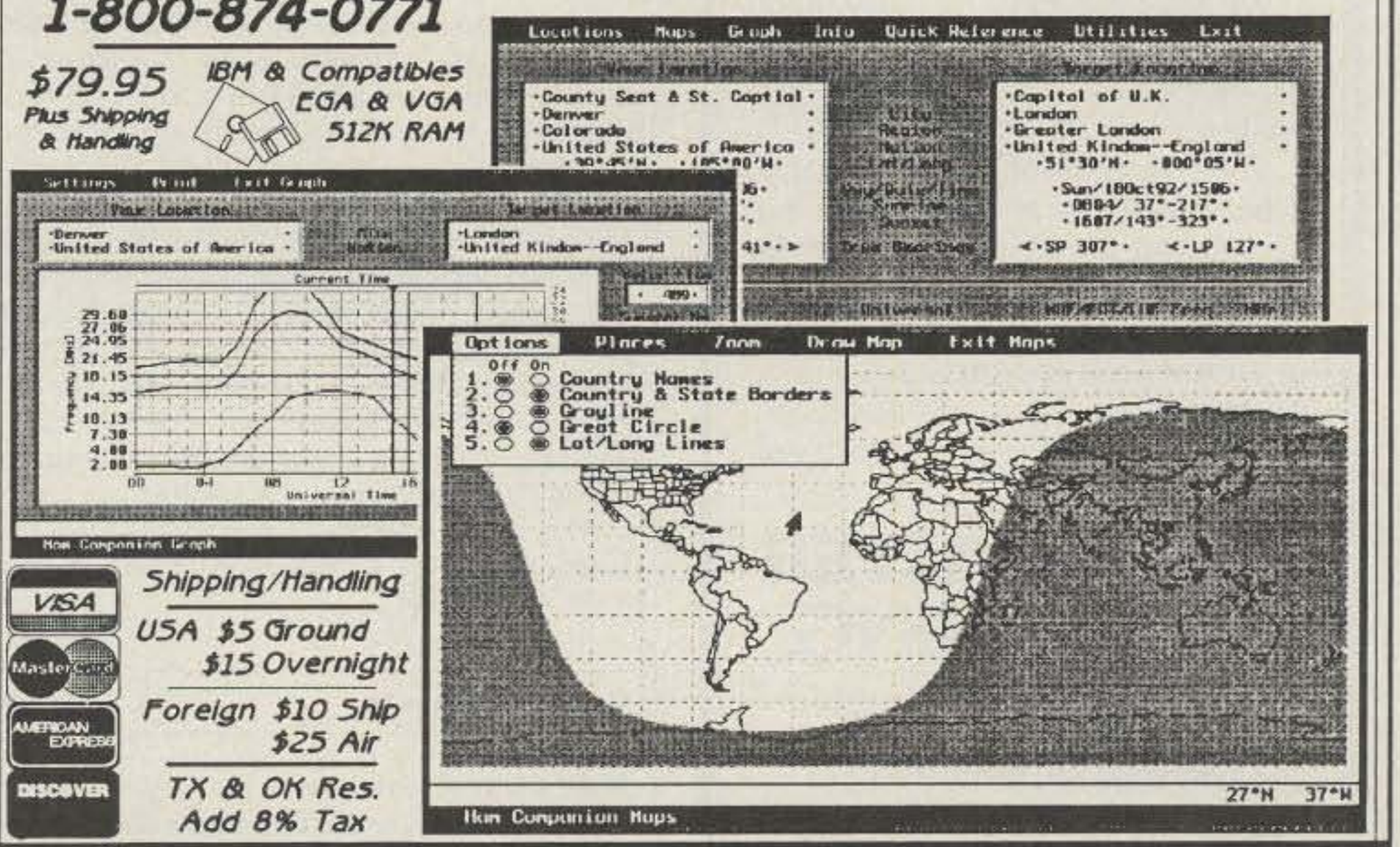

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that include BBS listings, access numbers, suggested software, and important resources. The authors also cover the major commercial and shareware communications packages and online services. A separate section provides user guides for the shareware software contained on the diskette included with the book. The text clocks in at about 1100 pages and is priced at $39.95, which is down $10 from the price of the first edition.

As before, the Dvorak and Anis book is available in most of the larger chain booksellers, or contact Osborne/McGraw-Hill, 2600 Tenth St., Berkeley, CA 94710 for a catalog.

Fun Computer Book Reading. I confess to being a sort of technojunkie when it comes to computer books, particularly those which describe the strong personalities of the computer industry. I've found two new books in this area to share with you.

The first is *Accidental Empires*, by Robert X. Cringely, a computer columnist writing for *InfoWorld*. This compelling book's subtitle tells a great deal about what lies between its covers: "How the Boys of Silicon Valley Made Their Millions, Battle Foreign Competition, and Still Can't Get A Date."

From Jobs and Wozniak ("the Woz") of Apple, to Gary Kildall of Digital Research, to "Chairman Bill" Gates of Microsoft, among others, the author presents a high-spirited tour of the industry and its people, one presented from the cynical and irreverent viewpoint of an uninvited business consultant. Cringely entertainingly chronicles the development of the industry, telling a story of creativity, daring, and ego of the key players who have enjoyed "high-tech success without adult supervision."

This provocative but fun-to-read book is 324 pages and is $19.95 from bookstores or Addison-Wesley Publishing Company, 1 Jacob Way, Reading, MA 01867.

While we're in the area of inside-track computer gossip, a second, more narrowly focused book earns high marks for readability. It's *Hard Drive: Bill Gates and the Making of the Microsoft Empire*. It is, of course, all about the legendary "Chairman Bill," who despite his preeminence in the software industry, only merits a single chapter and occasional other mentions in *Accidental Empires*.

The picture of Gates that *Hard Drive* presents has been criticized by some reviewers because it presents him as a two-dimensional caricature: an incredible computer genius in one dimension, an immature "software bully" in another. It's hard to objectively judge this type of book since the reader rarely is in an inside position to know how to separate fact from fiction. But this fascinating and tantalizing text by *Seattle Post-Intelligencer* reporters James Wallace and Jim Erickson does make for very entertaining reading. It also provides insight into Gates's business philosophy and suggestions as to why Microsoft has become the software juggernaut that it is. All this leads the reader to an understanding of where all the hype about Microsoft Windows™ came from and where it's headed.

This one is 426 pages and retails for $22.95 from John Wiley & Sons, 605 Third Ave., New York, NY 10158.

Short Bursts

Bugcatcher Business. In the August 1992 column we pointed to the popularity of these relatively efficient HF mobile antennas, and similar large-coil types offered commercially by several sources, such as WB5TYD, W4UWF, WD4BUM, and others.

A feature of some Bugcatcher-style designs is the capacity (top) hat. Since most of the loss in loaded mobile antennas is in the loading coil, it's important to reduce the inductance required. By adding a top hat, the resonant frequency of the antenna is lowered considerably so that a sizable amount of the loading coil can be removed. So far, so good.

Life isn't always fair, however. There is a dilemma of electrical efficiency vs. mechanical soundness in antennas that use a top hat. This dilemma was communicated to me by noted ARRL Technical Advisor (TA) Walt Maxwell, W2DU. Walt explains that while most designs place the top hat directly above the loading coil, which is reasonable from a *mechanical* standpoint, this definitely isn't the best position from an *electrical* standpoint.

Walt points out that the proper electrical placement of the top hat is at the *top* of the upper radiator. This placement ensures maximum capacity to ground (which we want to reduce the required coil inductance), and at the same time ensures minimum capacitance to the coil. The latter is capacitance that we *don't* want because the top hat-to-coil capacitance decreases the Q of the coil much as would decreasing the turn spacing or allowing shorted turns. It's truly unfortunate that mechanical and electrical requirements differ so widely: mounting the hat directly on the coil is great for stability but represents a poor choice for efficiency.

Chapter 6 of Walt's book *Reflections* (the second printing of which we reviewed last June) discusses radiation resistance in general and top hat placement specifically. Also, there's a discussion of top hat placement in *The ARRL Handbook*, written by Walt and found in chapter 33 in all editions since 1986.

We'd also like to thank Don Johnson, W6AAQ, for writing us to critique top hat placement directly over the loading coil, as shown in fig. 1 in the August column, p. 77. Don, you may remember, is the author of the 112-page *40 Years of HF Mobileering* compendium which we highlighted in the April 1990 column. He alludes to the mechanical problems associated with capacity hat placement on p. 3 of his compendium.

Don also reminded me that he's generated a great deal of interest in a homebrew HF mobile antenna design that's competitive with the big Bugcatcher types. His automatic, no-relays DK3 design can be used to cover 10, 20, 40, and 75 meters. Hopefully, he still has some copies left of his 17-page DK3 design manuscript that we mentioned in last May's column. These are $5 postpaid from Don Johnson, W6AAQ, 26659 Capay St., Box 595, Esparto, CA 95627-0595.

WPX Record Keeping Program Note. Dick Genaille, W4UW, wrote to tell us that the correct price of his program is $35.95, not $39.95 as indicated in the October 1992 column, p. 74. Dick also mentioned that he had upped the program's limit of 3000 calls and prefixes to 4200, which should accommodate almost anyone.

Wrap Up

That's all for this time. Next month, more Antennas & Accessories topics of current interest.

Overheard: Usually, most electronic equipment works better if you remember to plug it in.

73, Karl, W8FX

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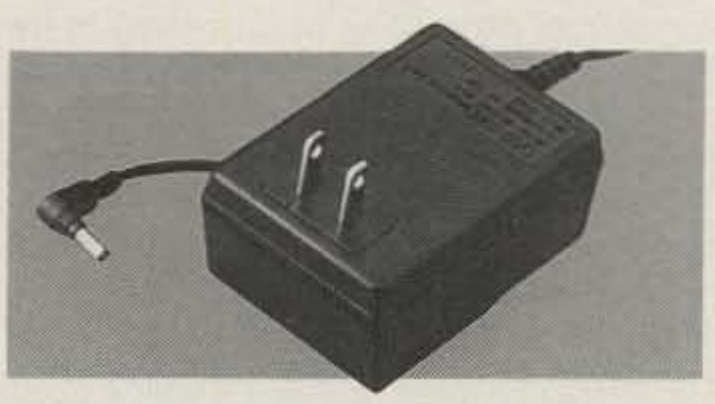

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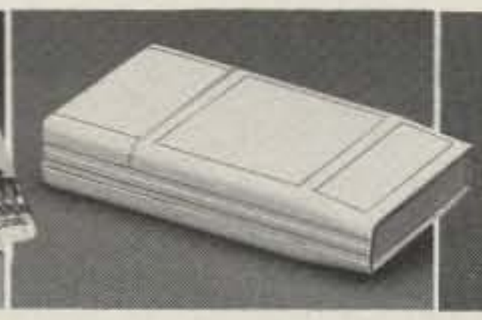

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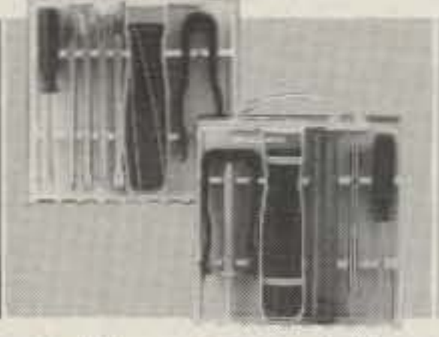

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The Creative Design RC5 Rotators

BY LEW McCOY*, W1ICP

Some time back I reviewed the RC5A3 Creative Design rotator, and since then I have received many questions regarding the performance of the lower cost model, the RC51, and some of their other models.

First I should point out that I have had the Creative RC5A3 up for several years now, rotating a DJ6UT beam and a long-boom 2 meter Yagi. The DJ6UT beam weighs in at 66 pounds plus the supporting mast, which is heavy-duty steel, adding another 30 pounds and the 2 meter beam at 15 pounds. This is a considerable load to rotate, plus a rather heavy windload. My location is at 6400 feet above sea level on the Continental Divide with very strong winds on many days. In fact, 30 to 50 MPH winds can be a daily occurrence in the winter and spring. In all that time I have had absolutely no problems with the rotator, which I think tells a great deal.

I installed the RC51 on another of my towers (mast) and mounted several different antennas (at different times) on the mast to test the torque and wind loading. Up to this point, and this is through a whole year of testing, this lower priced RC51 has done an outstanding job. My conclusion is that the entire line of Creative Design rotors is very well designed.

Table I gives a breakdown of the three most popular rotor models. The RC51 (listed in the table as RC5-x) has 6 kg/m, (one kilogram equals 2.2 pounds) rotation torque. This compares to the 16 kg/m rotation torque and about one half the braking torque of the RC5A3. The '51 has a braking torque of 70 kg/m. Briefly, to help you understand the figures, a braking torque of 70 kg/m means that the rotator will not budge when 70 kg of force is applied one meter from the rotor axis. Rotation torques have the same meaning.

You can make other comparisons from the table. The RC5B-x shown is not one that I have tested, but it certainly must be rugged indeed as indicated by the figures. I

The RC51 model rotator. The unit weighs 5 kilograms (11 pounds).

Model No.	RC5-x	RC5A-x	RC5B-x
Rotation Torque	6 kg/m	16 kg/m	22 kg/m
Brake Torque	70 kg/m	150 kg/m	200 kg/m
Mast Size (mm)	48 ~ 65	48 ~ 65	48 ~ 65
Vertical Load	400 kg	700 kg	700 kg
Horizontal Load	800 kg	1000 kg	1000 kg
Rotation Speed (sec.) 50 Hz	75 ~ 180	75 ~ 180	75 ~ 180
Reversal Delay (sec.)	None (Type 1) 1 sec. (Type 3)	2 sec. (Type 2) 3 sec. (Type 3)	3 sec.
Preset Control	None (Type 1) Provided (Type 3)	None (Type 2) Provided (Type 3)	Provided
Required Power 120, 230 VAC	80 VA (Type 1) 90 VA(Type 3)	140 VA (Type 2) 140 VA (Type 3)	160 VA
Indicator Accuracy	4° max.	±4° max.	±3° max.
Control Cable	7-core	7-core	7-core
Weight (rotator unit)	5 kg	7 kg	8.5 kg

Note unit of torque: kg/m = 100 kg/cm

Table I– This shows the specifications of the various Creative Design rotators.

*Technical Editor, CQ, 200 Idaho Street, Silver City, NM 88061

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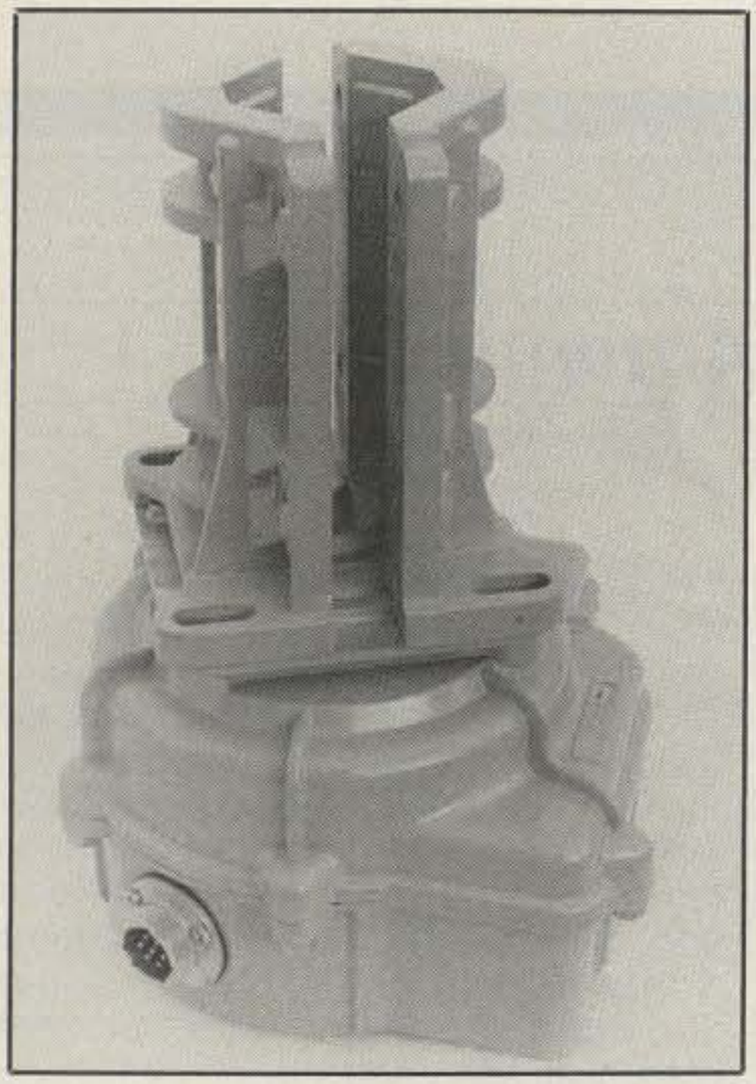

The rotator control meter face is graduated in degrees. The direction switch is just below the meter. At the right is the speed control.

should state here that I mounted the RC51 on a truck body, as I did with the original unit I tested, and using a pipe for the rotating arm, I tested for the rotating and braking torque. The rotator easily handled the amounts shown, and I went at least 25 percent over those figures with ease. I suppose I could have added weight until the rotator wouldn't function, but that seemed just a little foolish, considering the rotor handled well over what the manufacturer has specified.

The RC51 rotor control has an indicator (see photo) with a direction scale divided into 360 degrees. Also provided is a cutout world map that can be fitted over the meter face. There are three maps provided: East, Central, or West Coast. The rotor control has a speed setting knob so that the rotation speed can be set between 75 and 180 seconds for one full revolution. Turning the speed control knob causes a variation in the voltage derived from a triac in the control circuitry. This changes the overall speed of the motor by varying the periods of motor rest. Speed control is thus different than with ordinary rheostat systems, and maintains full torque and reliable starting, even at low speeds.

If desired, available is a different rotor control that has a preset control for setting your beam heading. There is also a turning limit indicator that lights up when you reach the turning limits of the rotor. (You can go slightly past 360 degrees [380 degrees] before limit switches turn the unit off.) What makes these units unique is there are no braking "devices" in the rotor. Speed-reducing gears are used in the rotor, and the ratios of the gears are such as to provide the necessary torque. I might add that the specifications shown are for a wind velocity of 30 m/sec (90-plus MPH).

The initial gear in the RC51 rotors is a 1/60 worm gear, making for quiet operation and effectively countering any backlash from the antenna. The worm gear mechanism is enclosed in a sealed grease chamber to reduce the coefficient of friction. Broad 30 mm teeth are used on the final gear, which is the most vulnerable point in the assembly. Three-stage speed reduction takes the speed down to an overall rate of 1/1800.

A potentiometer for detecting direction is linked to the rotor shaft and gears. The drive motor is a high-starting torque type, 28 VAC capacitance unit. The primary difference between the RC51 and the other models is the motor size. (As I stated earlier, the RC51 is lower priced.) Motor output capacity is 12 watts with RC5 rotors and 30 watts with RC5A rotors.

The RC51 is designed to handle 10 square feet of antenna, while the RC5A series will handle 25 square feet. I tried the RC51 with a trap beam for 10 through 20 and had that up for several months with no problems. I also tried some long-boom stacked 2 meter antennas, and in another test I used a multiband quad. This plus the torque and rotation tests proved to me the rotator is quite rugged. If you have a really big array, as I have with the DJ2UT and other antennas on the tower, then I would go for the RC5A or RC5B.

I also like the instruction manual very much. It is completely detailed, including all the circuit diagrams plus many photos showing construction details. Not that I ever had to, but servicing should be no problem with the information provided in this manual.

Creative Design products are made by Creative Design, Ltd., Kawasaki, Japan and are handled in this country by EDCO Electronic Distributors, 325 Mill St., Vienna, VA 22180 (1-703-938-8105.) You can write to them for additional literature. The list price of the RC51 is $369.95. CQ

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Radio FUNdamentals

BY BILL ORR, W6SAI

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

More About the W6SAI OCF Antenna

Last month I discussed the off-center-fed (OCF) dipole antenna and described one that I built. My antenna is shown in fig. 1. It is designed for 40-20-15-10 meter operation. As a nice bonus, I found that it also works on 18 MHz. Operation on 10 or 24 MHz is not possible due to extremely high SWR on the balun and feedline.

The antenna has been up for about six weeks and performs very well. It took a little effort to remove RF from the outside of the coax line. Once that was accomplished with ferrite isolators, the line length could be varied without a change in the SWR reading. I've worked plenty of DX with the antenna, and it provides a modest amount of gain on the higher bands (see Table I).

The only direct comparison I could run was on 18 MHz, where I compared the OCF against a ground-plane antenna, well located, with the base about 10 feet above ground. In the great majority of cases (including contacts in Europe and Asia), the OCF dipole was at least a good S-point better in both transmission and reception than the ground plane. On the other bands I had no comparison antenna.

On 40 meters during my weekly sked with W6GNX (about a mile away from me) and W6FR in Fullerton (about 380 miles away), Marv reported no difference in signal comparisons between my signal and W6GNX, as judged against previous contacts when I used a 40 meter, center-fed dipole.

On 20 meters DX could be worked, but it was often difficult in the face of competition from high-power stations with big beams. If I had a good shot at the DX, I usually raised it. Ten meters was generally dead, so the reports were few. However, the OCF was a hot antenna on 18 and 21 MHz. It was easy to break the pile-up on F6BLQ/D2 (Angola) on 18 MHz, and on a good opening on 21 MHz 10 Europeans in a row were worked on first call in less than 30 minutes. All of the above contacts were made with 100 watts.

48 Campbell Lane, Menlo Park, CA 94025

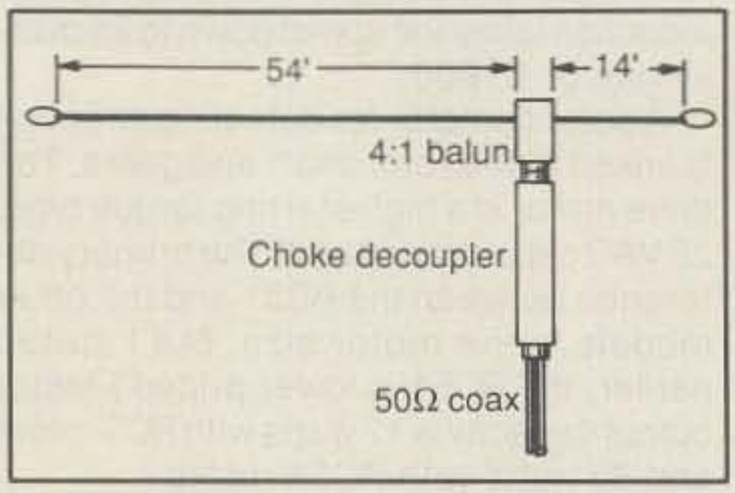

Fig. 1– The W6SAI experimental OCF multiband dipole. Balun is B4-2KX and decoupler is C1-2K (both by Radio Works).

Gain Over λ/2 Dipole	
Band	**Gain (dBd)**
40	0
20	0.4
17	0.6
15	0.9
10	1.4

Table I– Gain of OCF antenna on HF bands.

Pattern Plots of The OCF Antenna

The computer-derived pattern plots for the HF bands are shown in figs. 2 through 5. The antenna is oriented as shown in fig. 1. On 40 meters the classic dipole pattern exists with a slight unbalance in the plot (see the 90 and 270 degree points). At an elevation of 40 feet the main lobes are maximum at an elevation of 50 degrees above the horizon.

On 20 meters a clover-leaf pattern exists with a slight cant to the longer wire. Angle of elevation of the lobes is at 25 degrees. On 15 meters the lobes split again, with a decided advantage to the directions off the longer wire. Even so, the difference in pattern symmetry is only about 2 dB. The

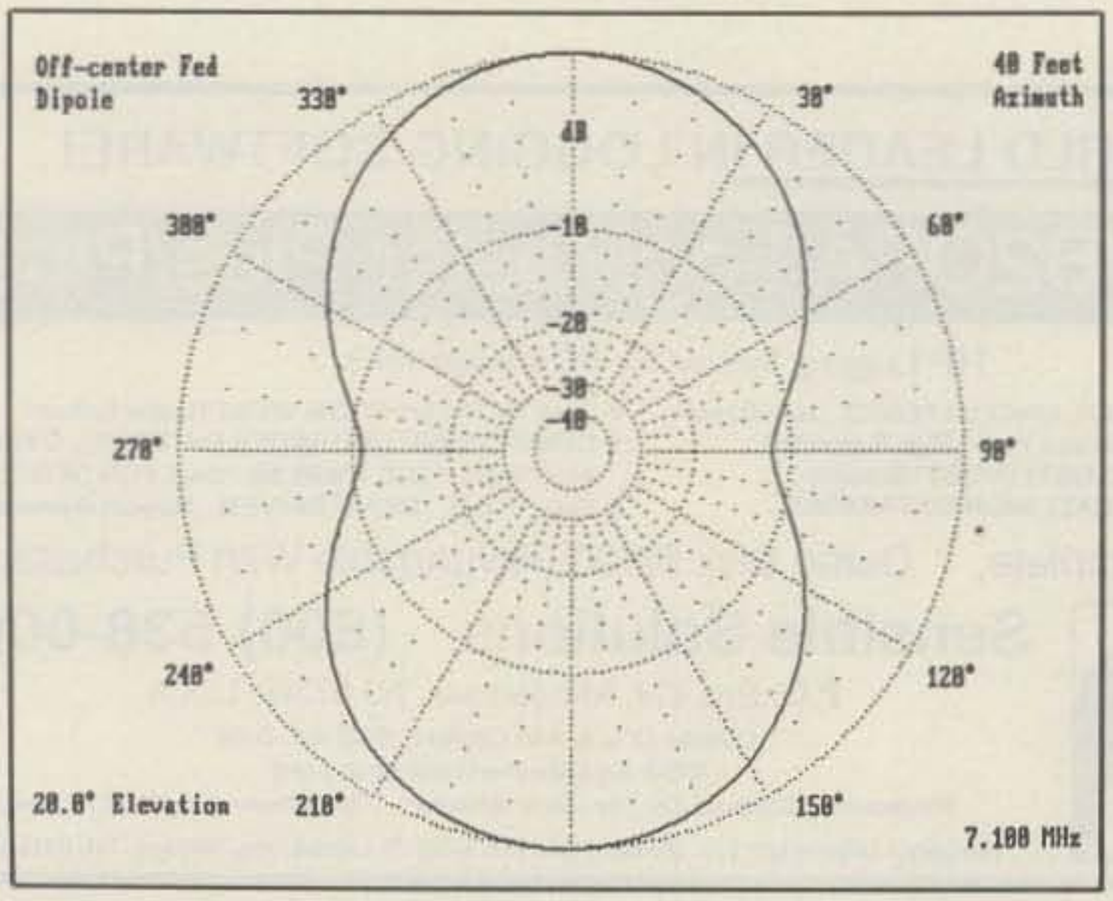

Fig. 2– Azimuth plot of OCF dipole on 7 MHz. Note on 270-90 degree axis the pattern is slightly canted to the left.

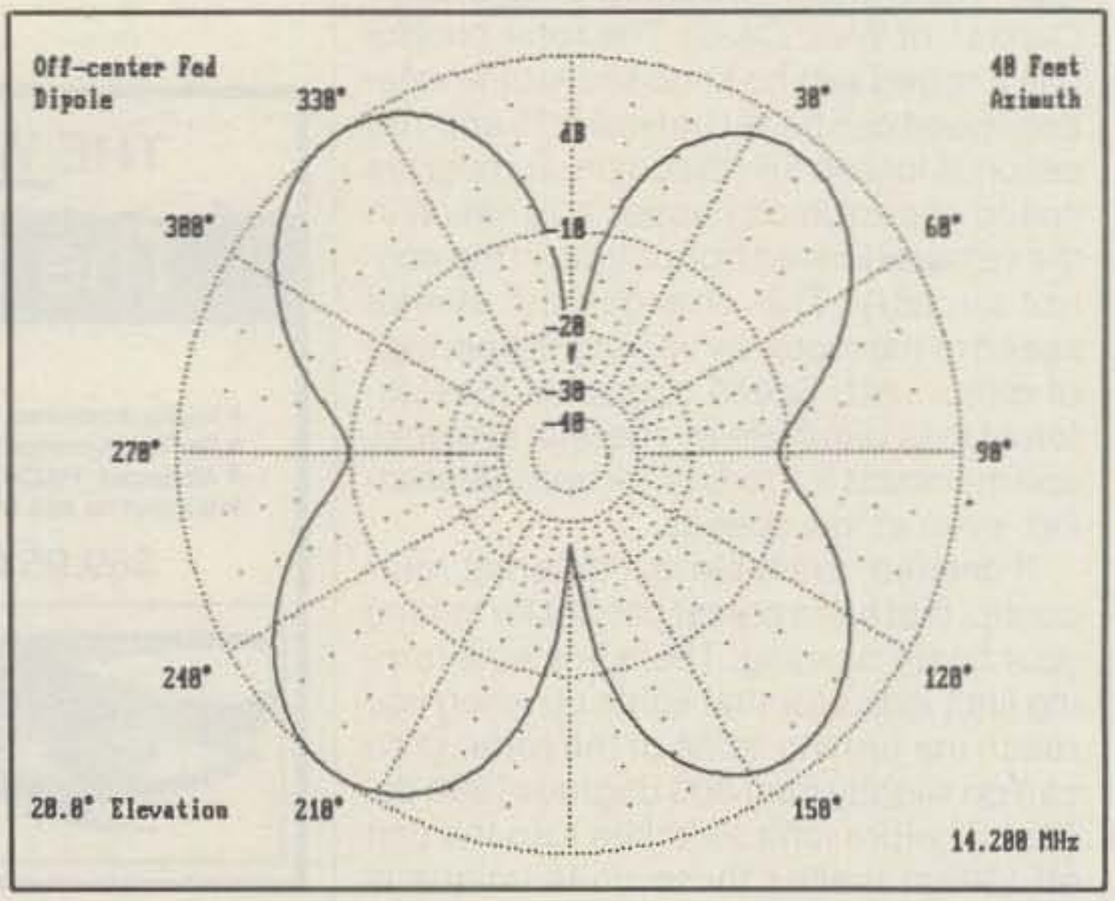

Fig. 3– Azimuth plot on 14 MHz. Slight cant on clover-leaf pattern can be seen.

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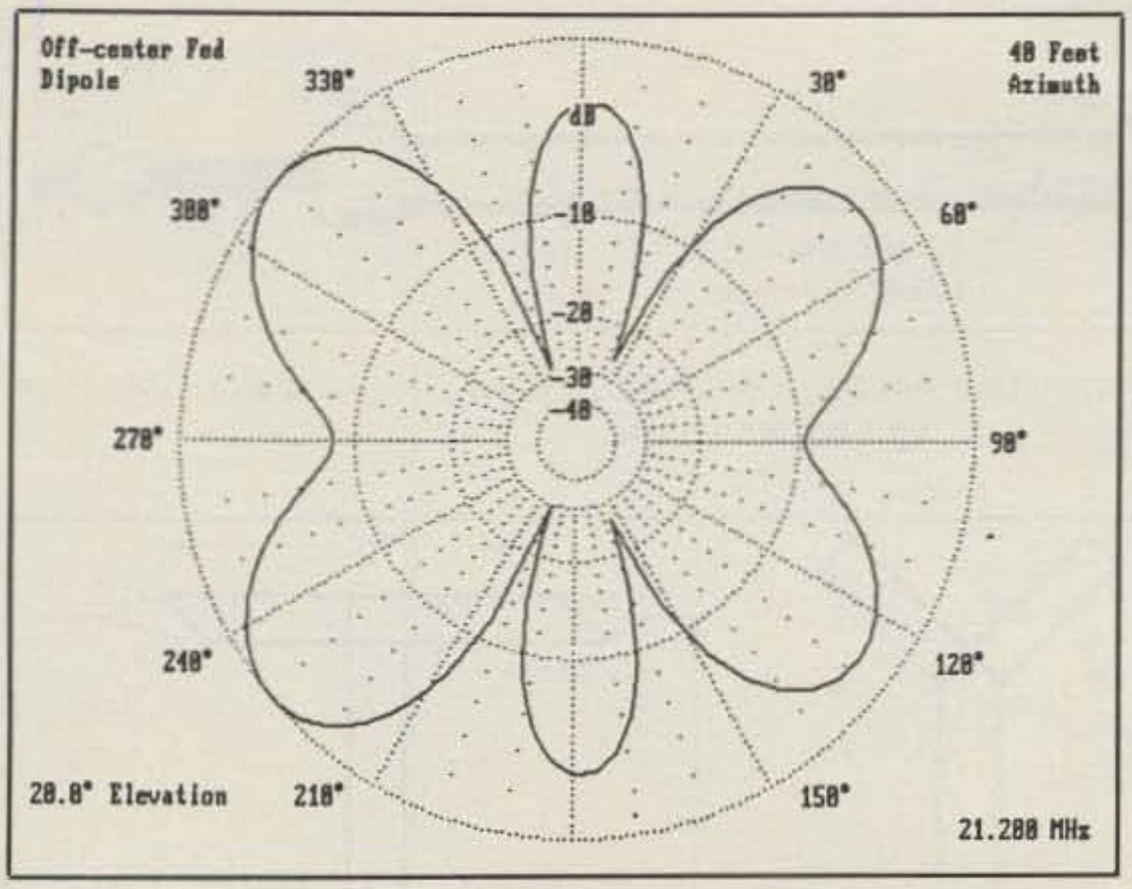

Fig. 4– Azimuth plot on 21 MHz. Cant amounts to about 2 dB on major lobes.

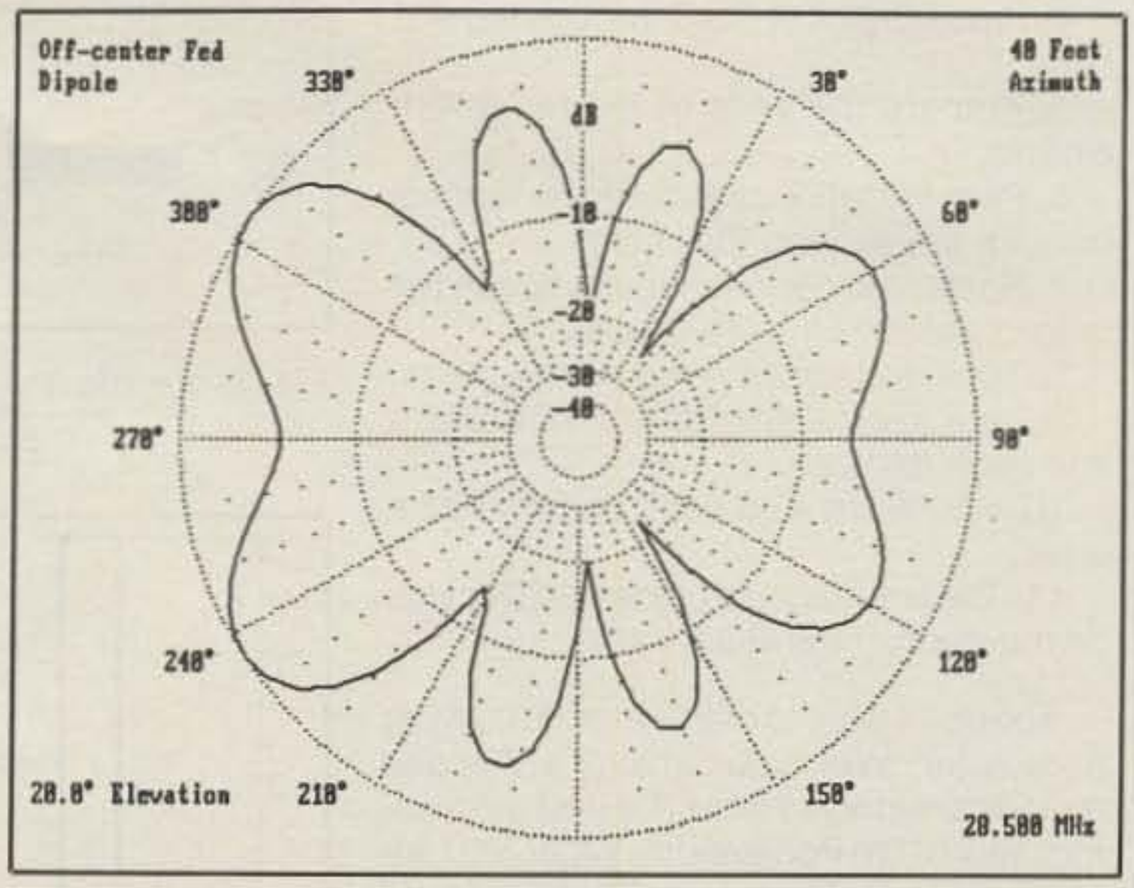

Fig. 5– Azimuth plot on 28 MHz. Cant is 3 dB on major lobes.

angle of elevation for the main lobes is about 15 degrees.

On 10 meters there is further lobe splitting with maximum radiation at an angle of about 30 degrees to the axis of the wire. Elevation of the main lobe above the horizon is about 10 degrees.

The elevation plots are controlled by antenna height above ground. In my case antenna height is about 40 feet. It should be noted in real-life the deep nulls shown in the patterns are probably washed out because the imperfect ground beneath the antenna blurs the reflection pattern.

Bandwidth Response of The OCF Antenna

I still haven't determined why the antenna exhibits such good SWR bandwidth. Possibly the interaction between the antenna and the 4:1 balun have a nullifying action on system reactance. It would be interesting to try a W2DU-style ferrite-bead balun in place of the ferrite-core balun presently used. This begs investigation, but I doubt if I will get around to it!

The computer program suggests that the antenna provides a good match on 50 MHz! I have no gear for that band, but someone, someday, will try the antenna on 6 meters and determine if the computer projection is correct.

Transmitter Loading

Although SWR is quite reasonable on the harmonically-related bands, it is higher than I like on 18 MHz (about 3:1). In addition, solid-state rigs don't like to work into even a modest SWR, and protect themselves by cutting power in response to the SWR level. Since this (or any other multiband antenna) exhibits SWR levels detrimental to operation of such transmitters,

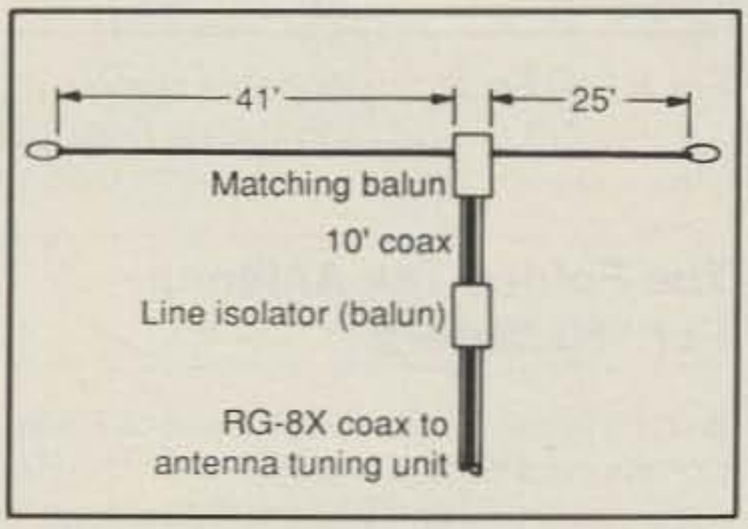

Fig. 6– The "Carolina Windom" for 40–10 meters by Radio Works. Larger versions cover 80–10 meters and 160–10 meters.

an antenna tuner is mandatory for optimum transmitter operation. The built-in tuner in some modern rigs does the job, or an external antenna tuner should be used. A low-loss, multiband antenna that doesn't require an antenna tuner, in my mind, doesn't exist yet. Perhaps more experimental work on off-center-fed systems may solve that problem. Oh happy day!

The "Carolina Windom"

A variation of the OCF design is the so-called "Carolina Windom" antenna (fig. 6). In its simplest form it permits a certain amount of feeder radiation to take place. This is accomplished by placing the current balun some distance down the coax below the feedpoint, allowing the current on the top portion of the line to radiate, presumably making things better. The idea is to fill in the nulls of the OCF pattern.

Well, I have no way of determining if this scheme works. My feedline drops down very close to the support tower (the OCF hangs from a yardarm on the tower) and close to the 8-wire rotor cable going up to the beam. I'd be coupling the coax into this bunch of wires with unknown results if I allowed feedline radiation.

It is an interesting idea, and someone who has the means to mount the OCF clear of the tower or nearby conductors can try this scheme and see if there is any merit to it. Keep me posted.

Building a Ferrite Line Isolator

Building a line isolator is not a big deal. The Wireman, Inc., 261 Pittman Rd., Landrum, SC 29356 (Press Jones, N8UG) furnishes an isolator kit consisting of 50 ferrite beads and a length of teflon coax (kit # 833) for under $10. It's easy to assemble an isolator from this kit (fig. 7).

You'll need a 12 inch length of gray PVC pipe, ¾ inch outer diameter used in sprinkling systems. This can be bought with both ends threaded. You'll also need two end caps of white PVC, schedule 40 type used for plumbing. The gray pipe will just thread itself into the white end caps.

The first task is to thread the beads onto the teflon coax and hold them in position with small plastic cable ties. The coax shield ends are twisted into pigtails and tinned. The next thing is to drill the end caps to pass RG-8 size cable. Use a ¾ inch drill and enlarge the holes, if necessary, to pass the cable. This should be a tight fit. The ends of the RG-8 cables are stripped, pigtails are made of the braid, and they are spliced to the ends of the teflon line after the line is passed through the PVC pipe. The inner conductors are wrapped with electrical tape, and the pigtails are connected together with a short length of tinned wire.

The assembly sequence is as follows:

1. Place the beads on the teflon cable and hold them in position.
2. Prepare the ends of the teflon cable.
3. Drill the end caps.

4. Pass lengths of RG-8 through the end caps.

5. Prepare the ends of the RG-8 with pigtails.

6. Pass the teflon coax (with the ferrites) through the ¾ inch PVC pipe.

7. Solder the connections between the teflon coax and the RG-8 coax.

8. Tape and insulate the connections.

9. Pour a small amount of PVC cement into each end cap.

10. Screw the end caps onto the pipe ends.

11. The last step is to place PL-259 plugs on the ends of the RG-8 cable.

You don't want to diddle around building an isolator? Well, you can buy a nifty one already assembled from The Radio Works, Inc., Box 6159, Portsmouth, VA 23703 (Jim Thompson, W4THU), item C1-2K. This will set you back $18.95, plus shipping.

The Four-to-One Balun

You can build a 4:1 balun from a kit (item 835) from The Wireman for $17.50 (plus shipping). Press also sells an assembled balun (item 824) for $36.95, plus shipping. The Radio Works sells a 4-to-1 balun (B4-2KX for $39.95), plus shipping.

So there you are. You can save money and build your own isolator and balun, or you can spend some more bucks and get them ready-made. The choice is yours.

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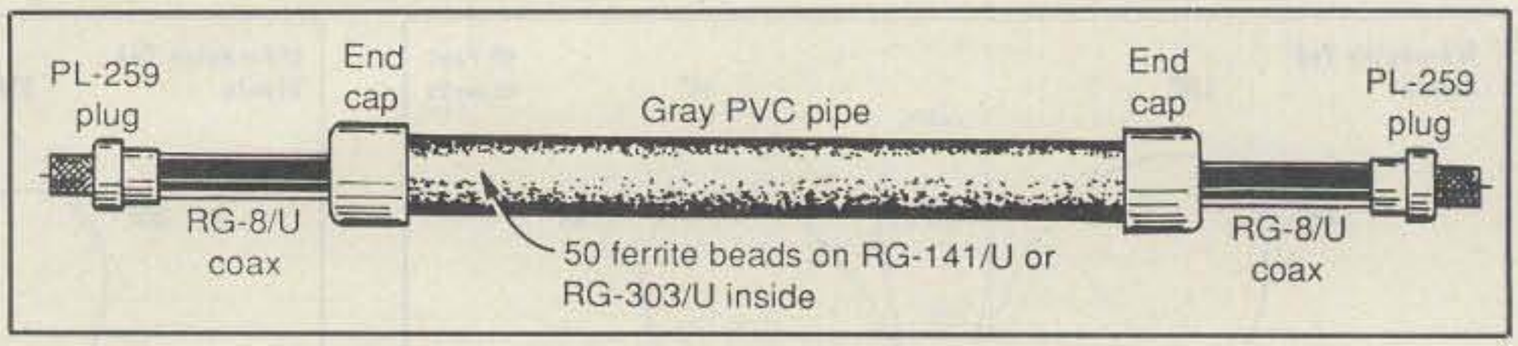

Fig. 7– Ferrite line isolator. Use Amidon FB-73-2401 beads. The kit is available from The Wireman, Inc.

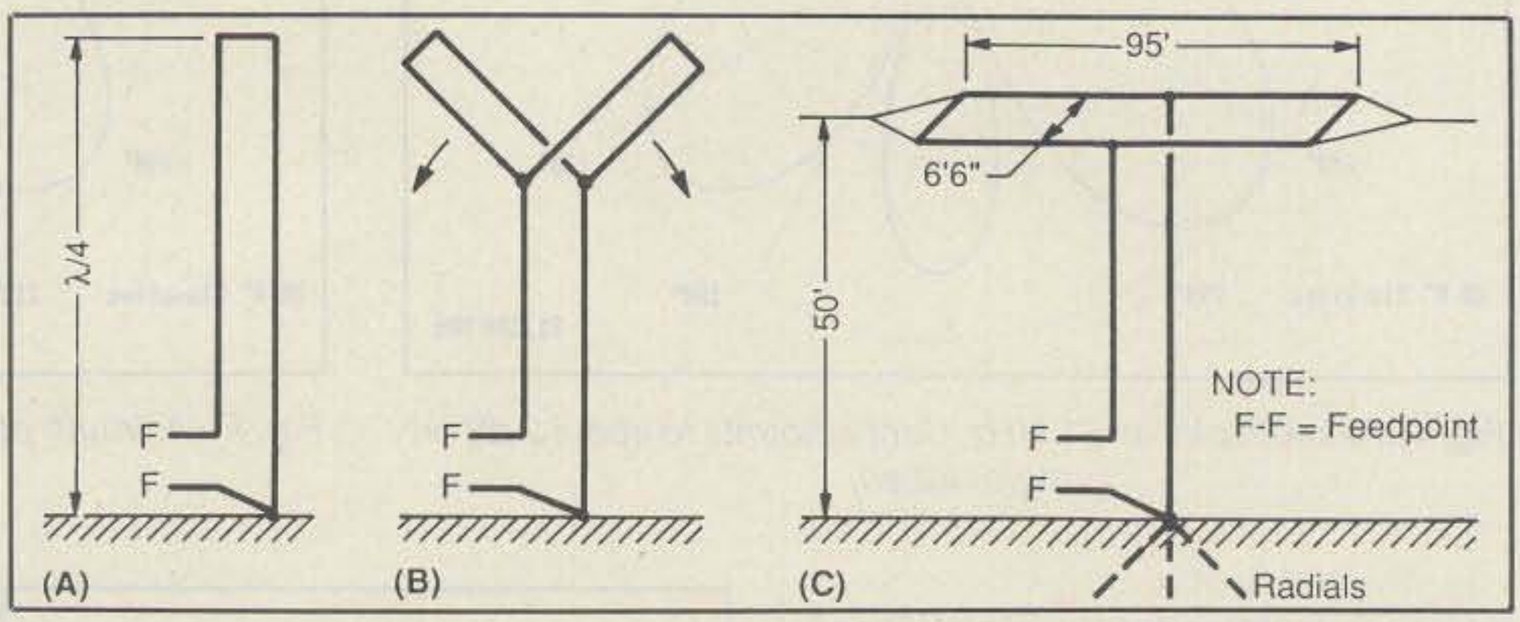

Fig. 8– (A) Folded monopole antenna. (B) Top portion divided into "T" configuration. (C) Dimensions from 1.85 MHz folded "T" antenna.

The Folded-Tee Antenna For 160 Meters

Writing in the August 1992 issue of *Radio Communications*, a publication of the Radio Society of Great Britain, Pat Hawker's Technical Topics column discusses an interesting low-band antenna. The information comes from Tony Preedy, A45ZZ/G3LNP (Sultinate of Oman). The design was first proposed for use in Saudi-Arabia to enable MF transmitters to be tuned rapidly to various frequencies and was used during the 1991 Middle East conflict. The derivation is shown in fig. 8. It is based upon the folded monopole concept (A) and provides a convenient impedance step up to match a 50 ohm feed system (B and C). A height of about 0.1 wavelength is suggested.

Adjustment is simple. The height is varied a bit to obtain a 50 ohm feedpoint, and the top lengths are trimmed symmetrically for resonance. The low portion of the band (1.8–1.9 MHz) can be covered with low SWR and without the use of an auxiliary ATU.

Tony also suggested this antenna could be scaled for 80 or 40 meter operation and used in conjunction with elevated resonant radials or counterpoise. Sounds good to me!

The Dead Band Quiz

With the sunspot cycle flagging and continued solar outbursts, the fall and winter DX season can't hold a candle to that of 1991. Spring 1993 may turn out to be pretty good, but it's downhill in the shade after that. Thus, there will be plenty of time for you to devote your mental energies to the "Dead Band Quiz" I inflict upon you from time to time.

This is an easy one for Old Timers of the early Big Band era. Give the title and subject matter of the following portion of a song recorded by Clyde McCoy on a Decca record circa 1933:

"Tear it down from the wall,
Lordy, oh Lordy, hear it fall,
Dog-gone you, slats and all,
Don't you go away folks,
'Cause that ain't all!"

In closing, I want to bring the following bit of forgotten technical history to your attention. Ted Chernin, KH6GI, brought it to my attention.

Ted says he recently read a story about Alexander the Great and how he had such phenomenal success as a military strategist. It seems that he was ingenious enough to make use of a photochromic liquid derived by his alchemist (the secret of its composition having been lost in antiquity). Alexander had his army commanders tear strips of cloth from rags, soak them in this liquid, and tie them around their wrists.

As the sun rose higher in the sky, the strips would darken from exposure to sunlight, acting very much like crude wrist watches. He was thereby able to synchronize his attacks when the strips turned very dark. At that time, he attacked his enemies from different directions. The idea worked so well that it has gone down in historical records as the first, the original, Alexander's Rag Time-band! (*Don't blame me; blame KH6GI.*)

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FT-6200 • 35/10w, 440MHz/1.2GHz ..... **LIST $799.00**
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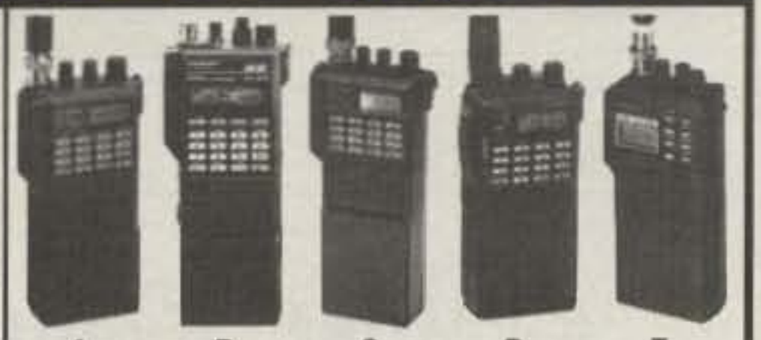

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BILL'S BASICS

BY BILL WELSH, W6DDB

"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

The 1993 Novice Roundup
A "Must" Event for Novice and Tech-Plus Operators

The American Radio Relay League (ARRL) sponsors the annual Novice Roundup (NR) Contest. This is a nine-day contest which sandwiches a full week in between two weekends. It is a pleasant low-pressure contest for Novices and Technicians who may otherwise have little (or no) interest in contesting. You can participate for just a few minutes, or for as long as 30 hours (maximum) in the NR.

With 10 meter band operating conditions greatly degraded since last year's NR, it is extremely important for Novice and Technician-Plus operators to use the 1993 NR as a code training exercise. The NR provides an excellent opportunity to increase code proficiency. No one has a code speed that is too low for NR activity. Mistakes are not just tolerated in the NR; they are expected.

You must acquire reasonable code proficiency to upgrade to higher class licenses. The NR gives a great boost toward increasing code proficiency. If you don't want to just wait for the 10 meter band to open again (it will be a long wait), participate in the NR to ge ta good start on upgrading to increased operating privileges.

I look forward to contacting many of you during the Novice Roundup, and I am good for a QSL. If you are listed correctly in the current *Callbook*, you will receive my card if we have a contact. If you are not listed there correctly, just send QSO (contact) information to me, and you will receive my QSL. On the 10, 15, and 40 meter Novice bands I can usually be found on 123 or 144 (7123 or 7144 kHz, for example). I operate close to 3700 kHz in the 80 meter Novice band. I always respond to the weakest signal I hear.

Name. The name "Novice Roundup" was established many years before Technician licensees were granted code operating privileges in the so-called Novice bands. The name remains appropriate because operation remains confined to the frequency segments (sub-bands) available to Novice class licensees, on a shared basis with all classes of American amateur radio licensees other than codeless Technicians. Technician-Plus licensees have full operating privileges above 50 MHz, but their NR activities are limited to frequencies shared with Novices.

This photograph shows Les Taylor, WA0QIT (left), and Ron Wood, KB9HKB. Les has done a good job of increasing the number of amateur radio operators in the Duluth, Minnesota area during the past 25 years. He has tested more than 350 prospective amateurs, and his shack is always open to those who want some hands-on experience. Ron is one of several ex-students who have been guests at WA0QIT.

Objective. The objective is for Novice and Technician-Plus operators to contact as many amateurs as possible. The contest score is multiplied by the total number of ARRL/CRRL sections and foreign (DX) countries contacted.

Participants. This contest is primarily for American Novice and Technician-Plus licensees, but General, Advanced, Extra, and foreign (DX) operators are also invited to operate in it. Novice and Technician-Plus amateurs can work all amateurs (Novice, Technician-Plus, General, Advanced, Extra, and DX), but General, Advanced, Extra, and DX amateurs are only allowed to work Novice and Technician-Plus amateurs in the contest. This is a good rule, because it guarantees that at least one Novice or Technician-Plus is involved in each Nr contact. This contest is open to all Novice and Technician-Plus operators in the 50 states, plus those who are in U.S. possessions and territories.

Rules. A basic condition of entry for NR contest participants is that they abide by the ARRL NR rules, decisions of the ARRL awards committee, and the regulations of the FCC. Failure to abide by these requirements is reason for disqualification. It is common to have other amateurs ask you what "NR" is, or what the NR rules are, during the first few days of this contest. It is unreasonable for them to expect you to lose operating time providing such information; it is suitable to simply direct these operators to the January issues of *CQ* or *QST* for NR details. Know the NR contest rules and abide by them. Read this article carefully a couple of times before getting on the air in the contest.

Benefits. I advise you to operate in the NR even if you have a poor station and/or low code proficiency. It will be nice if you get a certificate for working at least 200 NR contacts, and you will have just cause to be extremely proud if you are the top scorer in your ARRL section or division, or one of the top ten scorers in the country. However, you do not need to achieve these lofty accomplishments to benefit from NR activity. This contest provides a great opportunity to contact amateurs in many counties, states, and countries. You can probably work more contacts during one day of the NR contest than you normally work in a month. These contacts can help you qualify for hundreds of operating awards. Novice contacts remain valid after one upgrades, even if the callsign is changed.

NR operation will let you judge your operating skills and station performance against those of other operators. NR participation can also help you increase code receiving and sending proficiencies to help you prepare to pass license upgrade tests. You can benefit in many ways by operating in contests.

Competition and Awards. This contest provides a unique opportunity for Novice and Technician-Plus amateurs to compete on the air against other Novice and Technician-Plus operators in their own ARRL sections, plus against those who operate from other ARRL sections. Novices just compete against Novices, and Technician-Plus amateurs only compete against Technician-Plus operators; Novice and Technician-Plus amateurs do not compete against each other in this contest.

The ARRL issues a nice certificate to each Novice and Technician-Plus amateur who participates in the contest. These certificates are endorsed appropriately for the

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Say You Saw It In CQ

top-scoring Novice and Technician-Plus amateurs in each ARRL section and division.

General, Advanced, Extra, and foreign (DX) amateurs are invited to take part in the NR contest, but they are not eligible for NR certificates. These operators provide contacts, cards, and code practice for Novice and Technician-Plus amateurs.

No certificates are awarded to DX Novices who operate in the NR. However, American Novices greatly appreciate opportunities to contact DX amateurs, and I hope many DX amateurs will be on the Novice bands during this contest. Novice and Technician-Plus amateurs are likely to be happy with a few DX contacts.

Dates and Times. The NR contest starts at 0001 UTC on the 30th of January, and it ends at 2359 UTC on the 7th of February. Simply stated, it starts Friday evening (January 29th) local time, and it ends early Sunday evening (February 7th). If you are not familiar with Coordinated Universal Time (UTC), you can listen to WWV (Fort Collins, Colorado) on 5 or 10 megaHertz to hear the plain-language statement of time (UTC) every 5 minutes. Simply note the time difference (in hours) between UTC and your local time. The NR starts 1 minute past 4, 5, 6, and 7 PM PST, MST, CST, and EST, respectively. Similarly, the NR ends 1 minute before 4, 5, 6, and 7 Pacific, Mountain, Central, and Eastern Standard Times, respectively.

The NR contest length is 215 hours and 58 minutes. Novice and Technician-Plus are allowed to work a maximum of 30 hours in the NR. The NR log must show each time you go on and off the air during the contest, and the minimum allowable time off the air is 15 minutes. Listening time on the air counts as contest operating time, and it must be shown as time on the air. I advise you to be completely honest in all contest matters; it helps you to accurately gauge your improvement in subsequent contests.

Frequencies, Modes, and Output Powers. The 80 meter Novice subband is 3675–3725 kHz. Only code (A1A) may be used. All classes of USA amateurs are limited to 200 watts maximum output power in this subband.

The 40 meter Novice subband is 7100–7150 kHz. Only code (A1A) may be used. All classes of USA amateurs are limited to 200 watts maximum output power in this subband.

The 15 meter Novice subband is 21.1–21.2 MHz. Only code (A1A) may be used. All classes of USA amateurs are limited to 200 watts maximum output power in this subband.

The 10 meter Novice subband is 28.1–28.5 MHz. Code (A1A) is allowed throughout this subband, but it is commonly used just in the 28.1–28.3 MHz segment, where RTTY (radioteletype) and packet radio are also allowed. The suggested simplex packet radio frequencies on this subband are 28102.3 and 28104.3 kHz. Voice contacts are restricted to the 28.3–28.5 MHz segment of this subband. Only Novice and Technician-Plus amateurs are limited to 200 watts maximum output power in the 28.1–28.5 MHz Novice subband; all other classes of U.S.A. amateurs may operate at up to 1500 watts PEP (peak envelope power) maximum output power on this Novice subband.

The 1.25 meter Novice subband is 222.10–223.91 MHz. Novices and Technicians may operate all modes available to all other classes of USA amateurs on this band. However, Novices (only) are limited to 25 watts maximum output power on this subband. The national simplex packet radio frequency is 223.40 MHz, and the national simplex voice calling frequency is 223.50 MHz. It is standard practice to make the initial contact on a calling frequency and to shift up or down one channel to complete the contact. However, if the calling frequency is not busy, it is okay to complete the contact on the calling frequency.

The 23 centimeter Novice subband is 1270–1295 MHz. Novices and Technicians may use all modes that are authorized for use by all other classes of USA amateurs on this subband. However, Novices (only) are limited to 5 watts maximum output power on this subband. The national simplex calling frequency is 1294.5 MHz.

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Categories. Most entries are by single operator stations wherein the individual Novice or Technician-Plus operator transmits, receives, and logs all contacts without assistance. Multi-operator entries will be accepted. The assistance may be operating and/or logging help during the NR.

Operating. All NR contacts must be made in the Novice subbands. A Novice or Technician-Plus operator must be involved in each NR QSO (contact). General, Advanced, Extra Class, and DX amateurs should not contact each other while they are participating in the NR contest.

Crossband contacts are not allowed, such as receiving on 10 meters and transmitting on 15 meters. Crossmode contacts are no longer allowed, such as listening to a DX voice station on 15 meters and transmitting to her/him using code (A1A). NR contacts are not allowed on any repeater frequency. Packet radio digipeater contacts do not count in the NR.

The same station may be contacted two times during the NR. One contact must be digital (A1A code, radioteletype, or packet radio), and the other contact with the same station must be voice (SSB or FM). Any subsequent digital or voice contact with the same station is invalid, regardless of the subband that is used.

It is beneficial to use at least two bands so you will have a reasonable chance of contacting amateurs in many countries and ARRL/CRRL sections. The 15 and 10 meter bands provide the best opportunities to contact amateurs in other countries (DX), plus amateurs in the Canadian (CRRL) provinces and distant parts of our own country. Use 10 and 15 during the daylight hours. Switch to 40 and 80 at night when 10 and 15 close down. This type of operation provides the best possibilities of working desired states, provinces, and countries. When operating on the high-frequency (3–30 MHz) Novice subbands, it is advisable to start at the low end and to shift up through the band as contacts are made. Most NR contest activity will be evenings of weekdays, plus night and day of weekends. If you can do so, schedule your operating time to be on the air during periods of maximum activity.

Identification. Novice add /N and Technician-Plus amateurs add /T to their callsigns during this contest to indicate their eligibility to all amateurs participating in the NR. As examples, a Novice with a callsign such as KB6RXU uses KB6RXU/N, and a Technician-Plus amateur with a callsign such as WA6FNM uses WA6FNM/T during the contest. Out-of-area operation is also indicated in callsigns to minimize confusion. As an example, if a Technician-Plus operator with an apparent California callsign, such as WA6FNM, is operating in the NR from Louisiana, he would identify as WA6FNM/5T to indicate that he is operating from ARRL Louisiana (LA) section instead of the Los Angeles (LAX) section.

General, Advanced, and Extra Class licensees are not required to indicate class of license as part of the callsign used in the NR. However, many of us use /G, /A, or /E to make it very clear to other General, Advanced, Extra, and DX amateurs that we are not valid NR contacts for them; we are only valid NR contacts for Novice and Technician-Plus operators. This additional identification is particularly useful in cases in which General, Advanced, and Extra Class amateurs have retained callsigns that could indicate they are Novice or Technician-Plus licensees.

Exchange. The on-the-air NR contest exchange is limited to a signal report (RST for code, or RS for voice) and one's ARRL section. The ARRL sections are listed in Table I for your information. This information must be exchanged both ways for the contact to count.

Where more than one identifier is shown, the preferred (shorter) identifier is listed first. You must know your ARRL section to participate in the NR. Fortunately, most ARRL sections are entire states or provinces.

Since the objective is to work as many amateurs as possible, in as many countries and ARRL/CRRL sections as you can contact in the NR contest, it is helpful to maintain a check sheet that shows at a glance which countries and sections you have already worked during the contest. It is simple to start with a list showing all

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November 18, 1992
FROM: Anthony W. Deprato WA4JQS/VP8BZL
Team Leader, South Sandwich Island
Antarctic DXPedition VP8SSI

TO: GAP Antenna Products
6010 N. Old Dixie Hwy. Bldg. B
Vero Beach, Florida 32967

I would like to take this time on behalf of myself and the entire South Sandwich Island DXPedition Team to thank you for your support in making the VP8SSI Operation a success. I must say that the first time I saw the Voyager-IV was at the Dayton Hamvention and my first thought was that it would not stand up in a high wind area! Well, your antenna has made me take back those words. I was never so fooled by a product in my life! I was sceptical when I first learned from Ralph Kolr that we would be taking this antenna along. It was new and I had not heard any reports on it good or bad. I was soon to learn a lesson.

We had been on Thule Island in the South Sandwich group and operating as VP8SSI for about four days before we were able to start setting up for low band operations. We unboxed the Voyager and about two hours later had it assembled on the ice and ready to raise. Two of the team raised the antenna and we used 3/16" Dacron rope to install one set of guy wires about mid way up the antenna.

During the next ten days, we were pounded by storm after storm with constant winds of 50 to 70 mph. We clocked winds at over 132 mph during one very intense storm. During all this, the Voyager never once came down and the last site I saw as we departed Thule Island was your antenna standing where the VP8SSI camp had been!

Looking at the logs upon our return, we noted that we had logged 5,793 QSO's world wide on 40m, 745 QSO's on 80m and even though we only logged 3 QSO's on 160m, I have been informed by hams all over the U.S. that we were heard with a very good signal on 160m, but conditions were just not on our side for receiving. You can be proud of the fact that your antenna went to "the worst place on the earth" (quote from captain's log when Capt. Cook discovered the South Sandwich Islands) and withstood conditions very few hams are ever going to have to face.

At this time, the South Sandwich Antarctic DXPedition Group is working on plans for an operation from "Peter the First" island and the Voyager will be on our packing list! I will also be installing one for use at my home Qth in Kentucky. It is hard to find outstanding products in this day and age, but the Voyager-IV is definitely one of those products

With best regards,

A.W. (Tony) Deprato WA4JQS/VP8BZL
Team Leader, DXPedition VP8SSI

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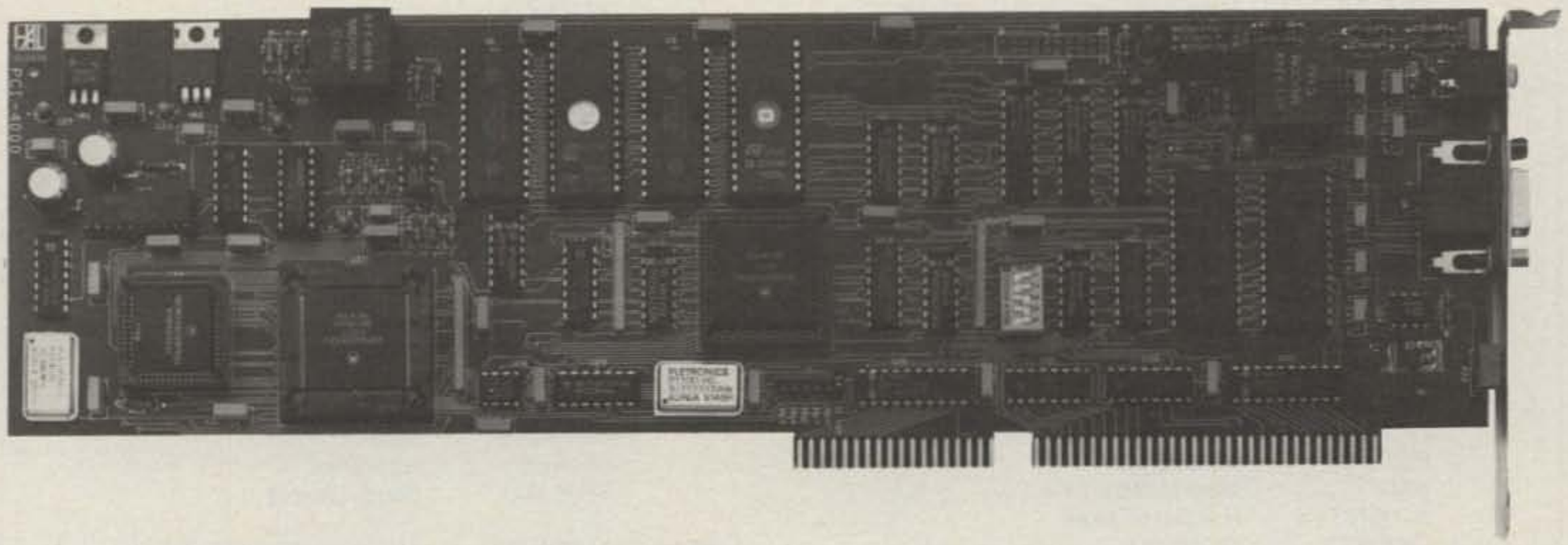

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	NLI	New York City/Long Island
	NNJ	Northern New Jersey
	SNJ	Southern New Jersey
	WNY	Western New York
3	DE/DEL	Delaware
	E PA/E PENN	Eastern Pennsylvania
	MDC/MD or DC	Maryland/District of Columbia
	W PA/W PENN	Western Pennsylvania
4	AL/ALA	Alabama
	GA	Georgia
	KY	Kentucky
	NC/N CAR	North Carolina
	N FL/N FLA	Northern Florida
	SC/S CAR	South Carolina
	S FL/S FLA	Southern Florida
	TN	Tennessee
	VA	Virginia
	WI/W IN	West Indies (KG4, KP4, KV4, etc.)
5	AR/ARK	Arkansas
	LA	Louisiana
	MS/MISS	Mississippi
	NM	New Mexico
	N TX/N TEX	Northern Texas
	OK/OKLA	Oklahoma
	S TX/S TEX	Southern Texas
	W TX/W TEX	Western Texas
6	EB/E BAY	East Bay
	LAX/LA	Los Angeles
	ORG	Orange
	PAC	Pacific (KC6, KH6, etc.)
	SB/S BAR	Santa Barbara
	SCV	Santa Clara Valley
	SD/SDG	San Diego
	SF	San Francisco
	SJV	San Joaquin Valley
	SV/SAC V	Sacramento Valley
7	AK/ALAS	Alaska
	AZ/ARIZ	Arizona
	E WA/E WASH	East Washington
	ID/IDA	Idaho
	MT/MONT	Montana
	NV/NEV	Nevada
	OR/ORE	Oregon
	UT	Utah
	W WA/W WASH	West Washington
	WY/WYO	Wyoming
8	MI/MICH	Michigan
	OH	Ohio
	WV/W VA	West Virginia
9	IL/ILL	Illinois
	IN/IND	Indiana
	WI/WIS	Wisconsin
Ø	CO/COLO	Colorado
	IA	Iowa
	KS/KANS	Kansas
	MN/MINN	Minnesota
	MO	Missouri
	ND/N DAK	North Dakota
	NE/NEB	Nebraska
	SD/S DAK	South Dakota
VE1	MAR/NFLD	Maritimes/Newfoundland
VE2	PQ/QUE	Quebec
VE3	ON/ONT	Ontario
VE4	MB/MAN	Manitoba
VE5	SK/SASK	Saskatchewan
VE6	AB/ALTA	Alberta
VE7	BC	British Columbia
VE8/VY1	NWT/YUK	Northwest Territory/Yukon

Table I– ARRL sections are needed as part of the NR contest exchange.

the ARRL/CRRL sections grouped by callsign areas and just cross out each section as you work it. Maintain a second list showing the callsign of the first amateur contacted in each country worked during the NR.

Each time a new section or country is worked, it must be indicated (in sequence) in the NR log. Simply start with number one and continue up as you earn multipliers, including countries other than Canada and the United States.

Typical Contacts. As is true in all contests, NR contacts should be as brief as possible. A typical good NR code contact between KB6RXU and W6JEP in the first few days of this contest could be as follows:

CQ NR CQ NR CQ NR CQ NR
CQ NR DE KB6RXU/N
CQ NR CQ NR CQ NR CQ NR
DE KB6RXU/N KB6RXU/N
CQ NR CQ NR CQ NR DE
KB6RXU/N KB6RXU/N KB6RXU/N K
KB6RXU KB6RXU DE W6JEP
W6JEP NR K
W6JEP DE KB6RXU $\overline{BT}$ 579
LAX 579 LAX $\overline{BK}$
$\overline{BK}$ R 589 LAX 589 LAX DE
W6JEP $\overline{BK}$
$\overline{BK}$ R 73 CQ NR CQ NR CQ NR
DE KB6RXU/N KB6RXU/N NR K

Look at the preceding typical exchange and evaluate it very carefully with regard to the comments in the rest of this paragraph. In the initial call, KB6RXU included the /N each time with his callsign to indicate contest eligibility to all other amateurs. Notice also that the number of CQ NR transmissions decreased from five to three, and station identification increased from one to three during the calling sequence, and the NR contest activity was again indicated prior to the invitation to transmit (K) at the end of the third CQ NR sequence. When W6JEP answered the call, she just identified both stations twice, left off the /N, and indicated contest participation by sending NR before the invitation to transmit. Once the two-way contact has been established, there is no need to continue using /N or /T.

The KB6RXU reply to W6JEP is very brief; the callsigns are just sent one time each, and only at the beginning of the reply. The RST report and ARRL section are sent twice to minimize possible requests for repeats. Neither the term *RST* nor the word *section* precedes the report and League section, since it is obvious what both are, and the break sign ($\overline{BK}$) is used to eliminate unnecessary identifications. During contest activity a series of short transmissions is not likely to extend past 10 minutes, and the identification shown in the sample exchange suffices. Note that the W6JEP response is short; the R advises that the KB6RXU contest data has been received. W6JEP then sends the report (RST) and her section twice, identifies with just her callsign to give KB6RXU assurance that he is copying the correct signal, and sends the break sign to invite KB6RXU to respond.

Say You Saw It In CQ

When KB6RXU answers, he sends R to indicate the contest data has been received. He may send best regards (73), and he then sends a short contest call in case another station is waiting for a contest contact. When the short call is sent, the /N is again added to indicate contest eligibility to all amateurs. This indicated brief exchange is further abbreviated after the first few days the contest has been in progress, but the sample exchange is suitable at the at the start of each year's NR. Remember to zero your RIT control, or to turn off receiver incremental tuning, prior to tuning in a station you intend to answer. This will put you on the same frequency as the other station, improving your chances of being heard.

After the first few days of NR activity, shorten the call to a single 3 by 3 or 2 by 2 (CQ NR CQ NR DE KB6RXU/N KB6RXU/N NR K, as an example) and listen carefully (above and below your transmitting frequency) for answers before repeating this call. The rest of the previous explanation holds true when using this preferred shorter calling procedure.

A typical NR voice contact could be as follows:

CQ Novice Roundup (2 or 3 times) this is WA6FNM Technician Whiskey Alfa Six Foxtrot November Mike Over
WA6FNM this is KB6SOH Novice Kilo Baker Six Sierra Oscar Hotel Over
KB6SOH from WA6FNM 5 by 9 in Los Angeles Section Over
WA6FNM from KB6SOH 5 by 9 in Los Angeles Section Over
Thank you KB6SOH This is WA6FNM Technician Whiskey Alfa Six Foxtrot November Mike calling CQ November Roundup Over

The voice procedure is basically the same as for a code contact. Again, the calling sequence is abbreviated after the contest has been running a few days.

Brevity. Do not routinely exchange normal contact information during contest contacts. In other words, do not send your name, location (QTH), rig, antenna, weather (WX), or mailing address information as parts of contest contacts. Keep each contact brief. Do not send faster than you can receive accurately; let the other fellow slow down to a speed you can copy. If the other operator sends too fast, tell her/him to send more slowly (QRS).

If you contact a county, state, or country you need to have confirmed, simply request a QSL when you send your card. I send a card to each amateur contacted for the first time, which is not a common practice among most amateurs. However, most amateurs send a QSL in response to each card received. If all amateurs just responded to cards received, none would be exchanged. Nevertheless, if received cards initiate completion of the QSL exchange, that is okay; the person who wants the other amateur's card is simply the one who begins the exchange.

Required Log Entries. Your NR log must show the time each contest contact started. It is preferable to use Universal Time Coordinated (UTC) when logging radio contacts, since it eliminates possible time zone confusion. Most experienced amateurs only use UTC. UTC is still called Greenwich Mean Time (GMT), Greenwich Civil Time (GCT), Zebra time, or Zulu (Z) time by many amateurs, and they are all meant to indicate the same time. However, UTC has been the correct term since 1 January 1974 and it should be used. The other amateur's callsign (/N and /T indicators not required) and ARRL/CRRL section (or country) must be logged for each contact. Received and sent signal (RST/RS) reports must both appear in the NR log. Your station callsign, frequency, and dates of contest operation are also required.

It is best to maintain separate logs and check sheets for voice and digital contacts.

Scoring. The following scoring information applies to the NR.

Contact Points. One point is earned for each station contacted by voice while on the air in the NR, whether or not contacted amateurs are participating in the contest, as long as the report and ARRL/CRRL section (or country) are obtained. Each digital (A1A code, RTTY, or packet radio) contact counts for two points.

Code Proficiency Points. If you have an ARRL code proficiency certificate, your stated receiving speed (words per minute) is added to the point total for the stations

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you contacted. If you do not hold an ARRL code proficiency certificate, or if you want to increase the rate shown on your certificate, you can submit your January or February W1AW or W6OWP qualifying copy with your NR material to claim these extra points.

Multipliers. The total number of points derived from your contest contacts and your ARRL (not FCC) certified code proficiency rate are multiplied by the number of foreign countries and ARRL/CRRL sections you contacted during your NR contest operation. Remember that Alaska, Canadian Provinces, Hawaii, and the West Indies (Guantanamo Bay, Puerto Rico, and Virgin Islands) are ARRL sections, and they do not count as countries in this contest.

Forms. It is advisable to request one set of NR contest forms from the ARRL, preferably before the contest starts. If you send a self-addressed and stamped business (#10) envelope to the ARRL with your request for a set of NR material, they will send two log sheets, two dupe (duplication avoidance) sheets, and one NR contest summary sheet. You are welcome to duplicate League material to meet your needs. The ARRL mailing address is 225 Main Street, Newington, Connecticut 06111.

NR logs do not have to be mailed to the ARRL until 30 days after the contest ends, so you have time to request logs from the ARRL, fill them in, and mail them. If you transcribe NR contest entries from your original log, be sure to repeat all contact information on the forms to be turned in. If you make more than 200 contacts, you must include a sequential listing of callsigns worked, using the *Callbook* sequence system. Callsigns are arranged by number (one through zero/ten), then by suffix, and last by prefix.

Submitted Material. The contest material submitted to the ARRL is not returned, so do not send your only (original) log sheets. It is a simple matter for most of us to duplicate material before mailing it to the ARRL. Take your time and try to submit correct material that is easy to read. Checking contest entries is a tough job, but you can make it easier for League checkers by turning in good material. The League appreciates receiving check logs from General, Advanced, Extra, and DX operators who take part in the NR.

Incomplete and/or late logs are just used as check logs. They are not eligible towards NR awards or *QST* listing.

Closing Comments

NR contest activity has always been slow at the start, and it is common to have other operators request an explanation of contest rules. As previously stated, I advise you to direct them to the NR coverage in this column or in other magazines, which is simpler and better than trying to give all this information to each amateur who requests it. NR activity continues to build as the days pass and more amateurs become aware of it. By the last few days of the contest, activity is excellent. If you get this issue before the contest starts, please mention the Novice Roundup to every amateur you contact to let them prepare for this excellent contest.

I hope to contact you on one of the Novice bands. I work about 1000 Novice band contacts every year, and I have participated in each Novice Roundup. When the NR contests were held in the 1952 through mid-1970 era, the Novice license was just valid one year; it could not be renewed, and it was not available to anyone who had previously held any class of amateur radio operator license. In that time frame, no Novice could compete in more than one NR as a Novice, and newer Novices seldom participated at all. Novice licenses are now valid a maximum of ten years and they can be renewed, which means that many Novices have acquired experience in previous NR contests, and improved scores should result. Similarly, a change allows Technician-Plus amateurs to use the Novice code bands. Enjoy this contest by putting your station in top condition and reserving adequate good operating time during the NR.

We appreciate the cooperation of the NR Contest Manager, Billy Lunt, KR1R, who informed us of no changes in this year's NR contest.

73, Bill, W6DDB

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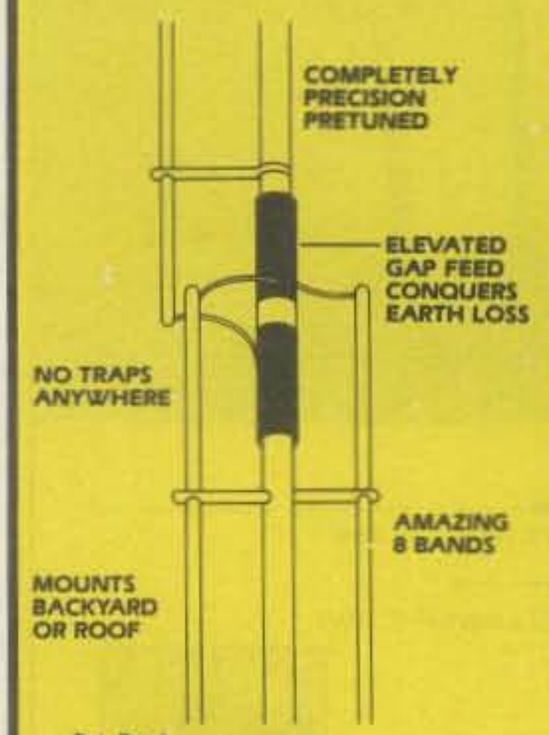

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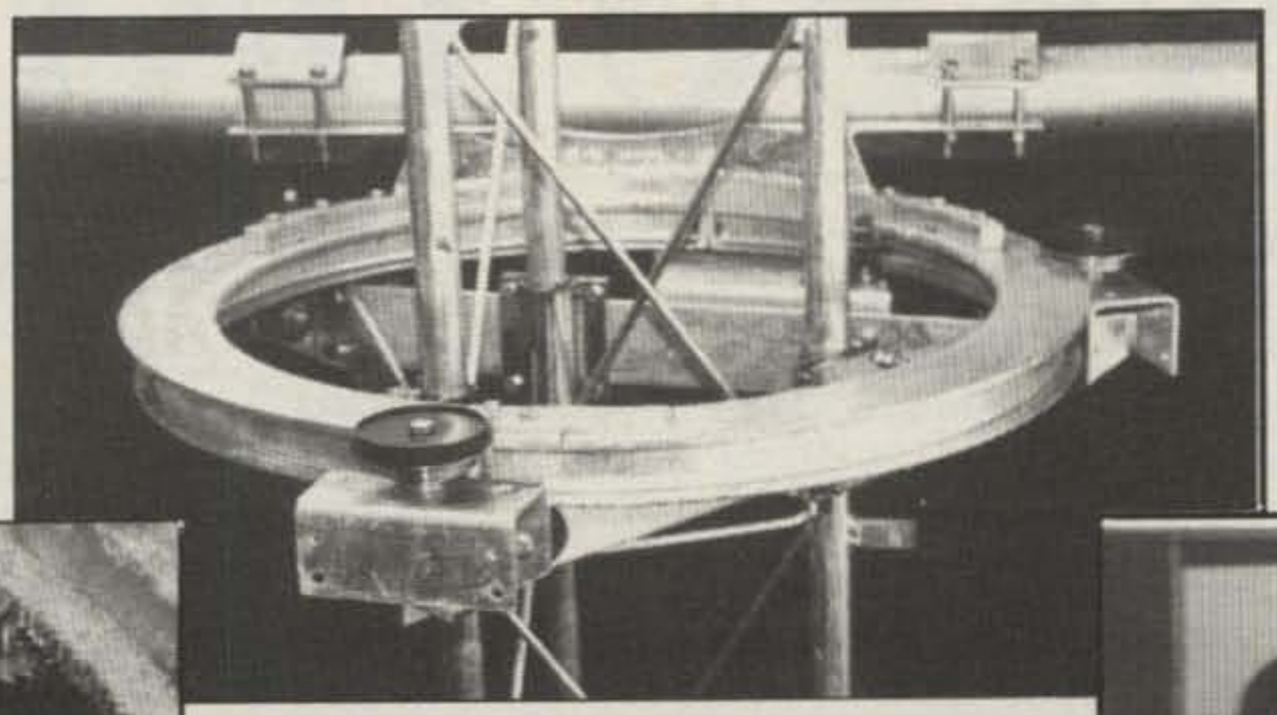

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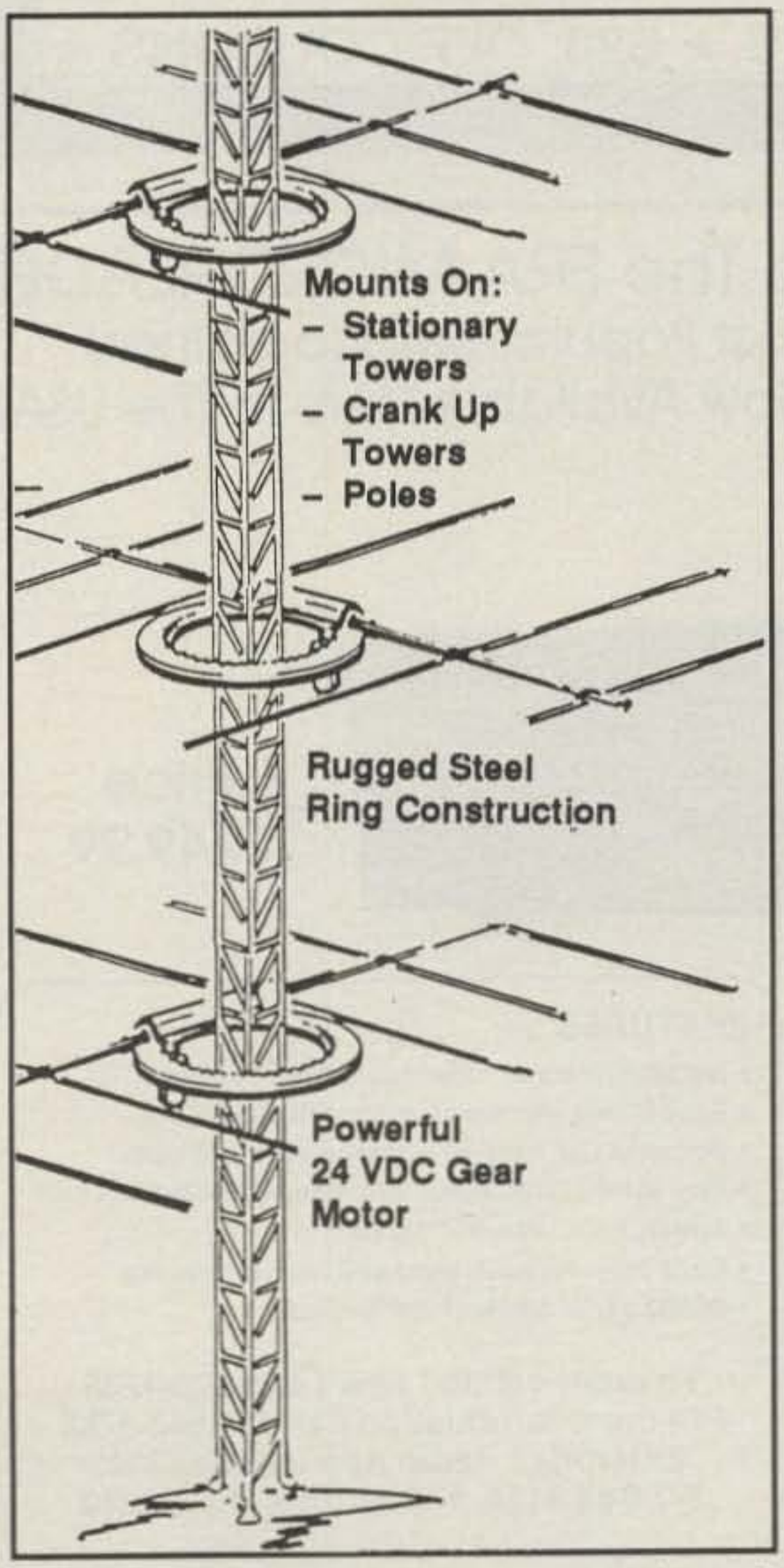

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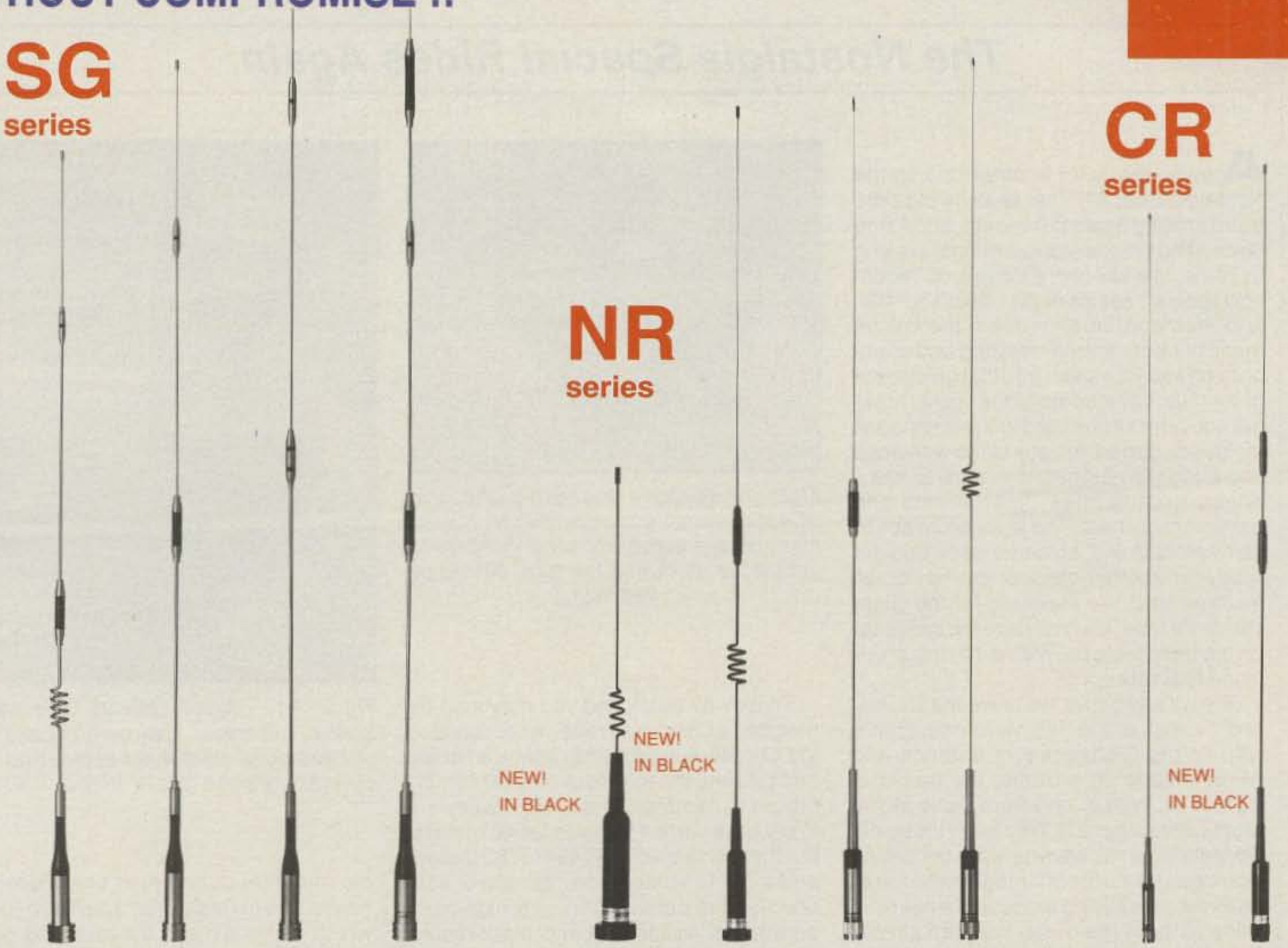

SG7200NMO SG7500 SG2000 SG7900 NR72BNMO NR73BNMO NR770R NR770H CR214S CR320A

MODEL	BAND	GAIN(dBd)	POWER (w)	MOUNT	HT (IN)	ELEMENT PHASING
NR-72BNMO	2m/70cm	2.15	100	NMO	13.8	1/4 λ ,1/2 λ
NR-73BNMO	2m/70cm	2.15/5.3	100	NMO	33.5	1/2 λ ,2-5/8 λ
NR-770SA	2m/70cm	2.15/2.15	100	UHF	16.9	1/4 λ ,1/2 λ
NR-770HA	2m/70cm	3.0/5.5	200	UHF	40.2	1/2 λ ,2-5/8 λ
NR-770HNMO	2m/70cm	3.0/5.5	200	NMO	38.2	1/2 λ ,2-5/8 λ
NR-770RA	2m/70cm	3.0/5.5	200	UHF	38.6	1/2 λ ,2-5/8 λ
NR-790A	2m/70cm	4.5/7.2	120	UHF	57.5	6/8 λ ,3-5/8 λ
SG-7000	2m/70cm	2.15/3.8	100	UHF	18.5	1/4 λ ,6/8 λ
SG-7200NMO	2m/70cm	3.2/5.7	150	NMO	36.6	1/2 λ ,2-5/8 λ
SG-7500A	2m/70cm	3.5/6.0	150	UHF	40.6	1/2 λ ,2-5/8 λ

MODEL	BAND	GAIN(dBd)	POWER (w)	MOUNT	HT (IN)	ELEMENT PHASING
SG-7900	2m/70cm	5.0/7.6	150	UHF	62.2	7/8 λ ,3-5/8 λ
SG-2000	2m	5.2	150	UHF	62.6	7/8 λ
NR-140A	1-1/4m	3.8	100	UHF	36.2	5/8 λ
NR-124	23cm	8.4	100	N	25	4-5/8 λ
CR-214S	2m/1-1/4m	2.15/3.4	120	UHF	37	1/2 λ ,5/8 λ
CR-224A	2m/1-1/4m	5.0/6.0	150	UHF	68.5	7/8 λ ,2-5/8 λ
CR-320A	2m/1-1/4m/ 70cm	2.15/3.8/5.5	200/ 200/100	UHF	37.4	1/4 λ ,1/2 λ , 2-5/8 λ
NR-2000NA	2m/70cm/ 23cm	3.15/6.3/9.7	100	N	39	1/2 λ ,2-5/8 λ , 5-5/8 λ

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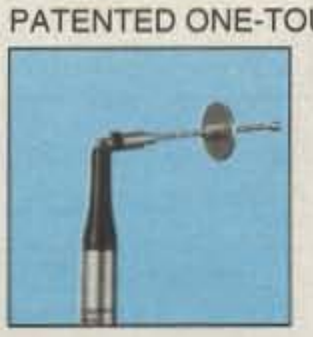

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WORLD OF IDEAS

BY DAVE INGRAM, K4TWJ

A LOOK AT THE WORLD AROUND US

The Nostalgia Special Rides Again

Are you ready for another ride on the Nostalgia Special? That favorite old-time train is rolling again this month, and some fascinating whistle stops are lined up along its route. We will tour a couple of "economy special" setups of the 1950s and '40s, and then continue on down the tracks many of us remember walking and stumbling on as a youngster into that golden era of the '30s. Located along the scenic route are souvenir shops filled with schematics of rigs you can carry back to the workshop and build with authentic era parts scavenged from hamfest fleamarkets and basement corners. The jaunt promises to be heartwarming, so settle back and get ready for another blowout journey down memory lane. We are going for the gusto one more time, and you have the best seat on the train. Hold on. We're moving at our usual fast rate!

The whistle blows, we leave the station, and . . . look at that '48 Merc convertible with its big Globespanner antenna and AF-67 mobile rig crossing the tracks in front of us. Where, oh where, have all the Multi-Elmacs gone?! Why even those old Gonsets super 6 converters are becoming scarce as hen's teeth! Imagine the fun of an all-tube mobile rig today with a neat CW transmitter in the trunk. You can almost hear the whine of that dynamotor under the hood!

Our first stop is emerging straight ahead, and by jove, that looks like an old Army surplus store to its side.

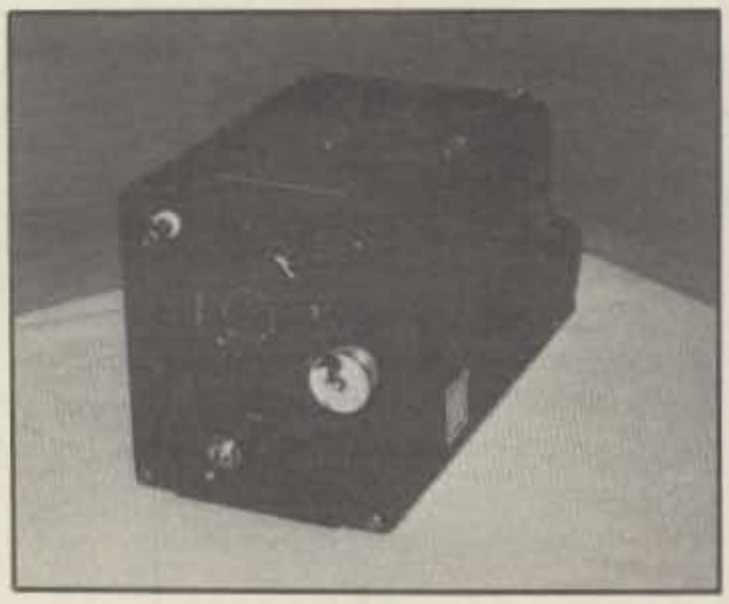

Fig. 1– Inexpensive receivers such as this BC455 presently owned by W0YNL helped many of us overcome financial burdens to get on the air during the '50s. (Photo by W0YNL)

Fig. 2– Ah . . . those fabulous radio magazines of yesteryear. Look carefully and you will see dogs were even popular on the covers during the '20s! (Photo by W0YNL)

Think way back, and you may also remember a Command receiver conversion in *CQ* describing a transmitter that could be fitted into the rear section after removing the dynamotor. Most "BC" receivers in my area were 455 units for 40 meters, but there was also a BC 454 for 80 meters and a BC 453 that made a terrific IF section used in conjunction with high-band converters. A vast number of these receivers were available in the good 'ole days, but they are sure hard to find today!

As W0YNL shows us in fig. 2, a captivating variety of magazines supported our radio interests during eras past. Most renowned were *Radio Craft* and *Radio News*, which reminds me of the following story.

A few years ago W6SAI and I co-authored a "nostalgia special" section that will probably appear here in *CQ* in the future. I may be over enthusiastic, but one

First Stop: The 1950s

Our first view, the infamous BC-455 receiver shown in fig. 1, is compliments of Walter Berry, W0YNL. Many of us "low budget" schoolboys started out with these 6-tube delights purchased from a local Army surplus store for a scant four or five dollars. Converting their filaments from 28 volts to 12 volts and adding a volume control plus AM/CW switch to the front pull-out panel was a big-time challenge, but *CQ*'s yellow-faced "Command Sets" manual guided us through the steps beautifully. If we were lucky, we even found a genuine Spinner knob for the dial such as shown on the one in fig. 1.

4941 Scenic View Drive, Birmingham, AL 35210

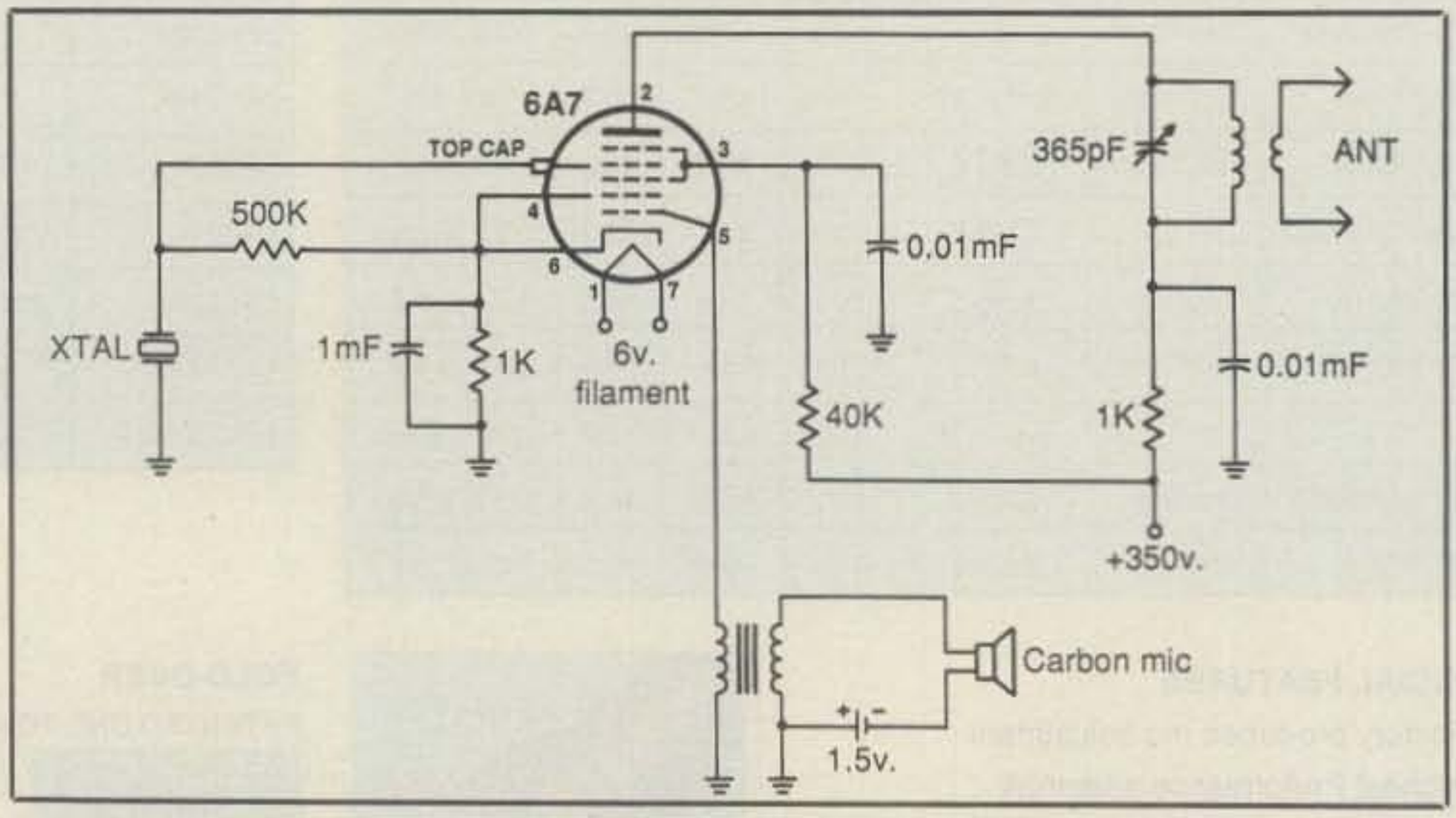

Fig. 3– Schematic diagram of the little "PeeWee" AM transmitter built around an AM receiving tube. See discussion in text. (Diagram courtesy KY7C and W3CKU)

Say You Saw It In CQ

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Fig. 4– Beautiful reproduction of 1940s-style Two Tube Receiver built today by WB9GVO.

of the tales regarding *CQ*'s history begs to be told at this time. Bill has exact dates in his story; my records have been lost in two moves. Understand this is by memory.

During the 1910s (heyday of spark), young men were signing up as ship wireless operators. In 1917 an exciting new magazine, *Radio*, was started up in California. For decades this magazine was the undisputed leader in the field of radio communications, giving coverage to commercial broadcast and audio subjects as well as amateur radio.

By WW II each sub-field had matured sufficiently to warrant its own specialty publication, and in 1944 *Radio* was split into three separate magazines. *Radio* continued as the title of the broadcast magazine. The audio coverage was channeled into *Audio* magazine. And the amateur radio coverage was assumed by *CQ*. The first issue of *CQ* appeared as the war still raged in Europe and Asia, bearing the January 1945 issue date.

In 1979 Dick Ross, K2MGA, and Alan Dorhoffer, K2EEK, purchased *CQ* and became publisher and editor, respectively. I am sure you agree with me that *CQ* is still tops today. Congratulations, Dick and Al. *CQ* continues to do an outstanding job of presenting the amateur radio community with a fine publication!

That's enough history. Now let's return to the '50s.

Fig. 5– Rear view of 1940s Superhet receiver. It has four variable tuning capacitors and is a real thrill to operate. (Photo courtesy WB9GVO)

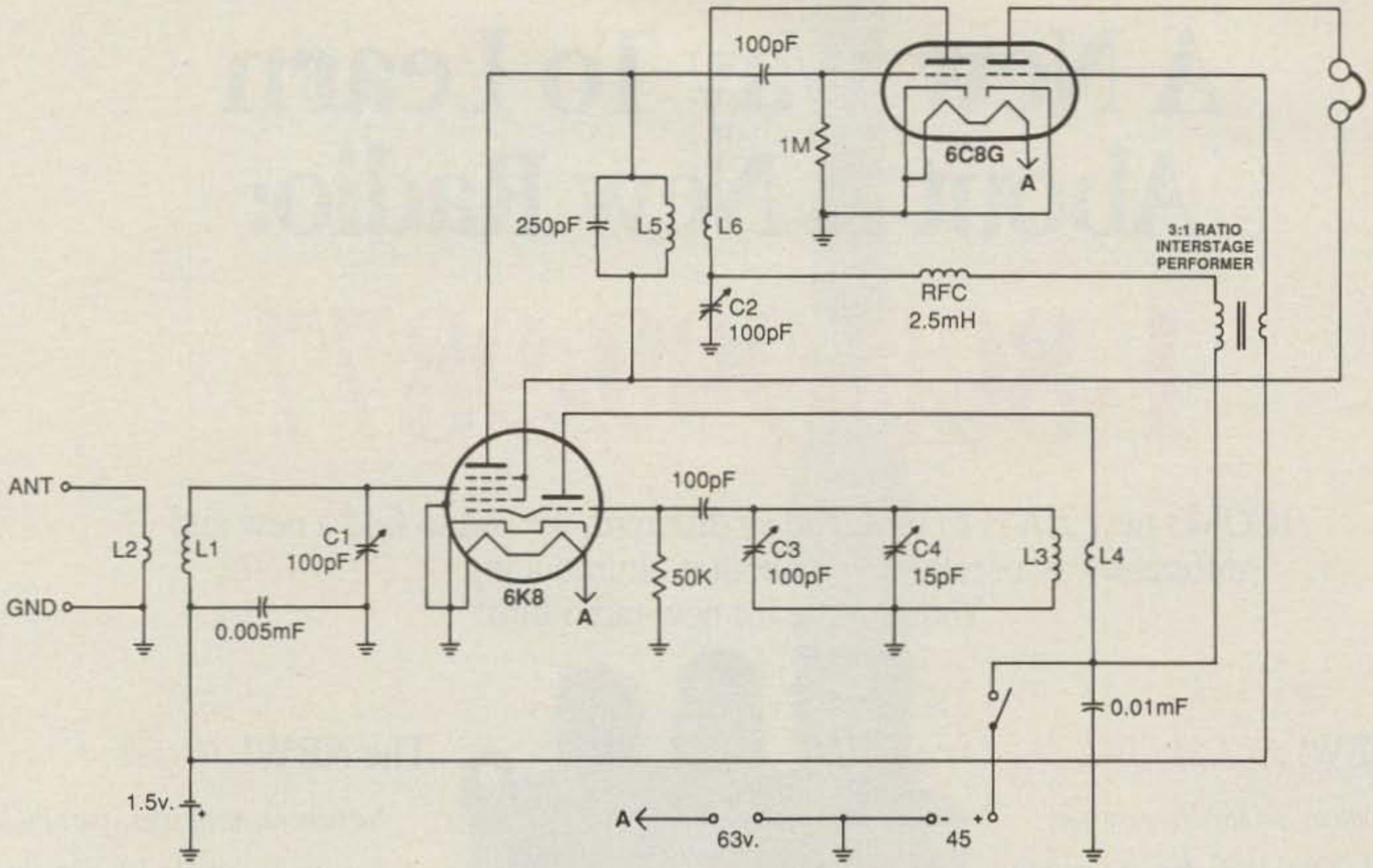

Fig. 6– Schematic diagram of the 1940s Superhet receiver. See discussion in text. (An original version appeared in the 1943 ARRL Handbook.)

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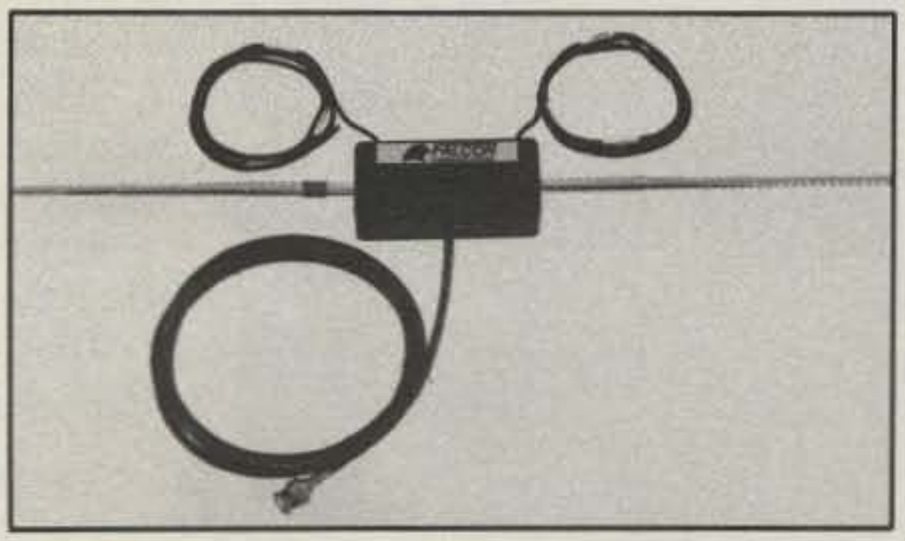

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Many school kids, such as myself, who were limited to "BC" receivers necessarily worked CW with a homebrewed one- or two-tube transmitter and only dreamed of operating AM. If we had only known of simple transmitter circuits such as the "Pee-Wee" shown in fig. 3, our sheltered lives would have been much more fulfilling. This circuit was passed on to me by Bob Hunt, KY7C, only last year, and Bob received the schematic from W3CKU shortly before that time. Notice a single 6A7 pentagrid converter tube like those used in many AM radios is the heart of this little gem. Hmm . . . an enterprising amateur might rework an old AM radio using a 6A7 into this transmitter and use its remaining section to wire up a mating receiver in the same cabinet. Now that would be a blast!

The "PeeWee" is relatively straightforward in design and should not be difficult to reproduce today, except for finding a carbon microphone transformer and maybe genuine Millen plug-in coils. A good microphone transformer (if you are fortunate enough to find one) is the Stancor A4351. Alternately, other carbon microphone transformers occasionally surface at hamfest fleamarkets. In desperation, try a small medium- to low-impedance audio transformer. The main criteria is wide frequency response—not 60 Hz power transformers. Carbon microphones operate like variable resistance according to speech, so a small penlight battery must be connected in series with it and the transformer's primary. The plate coil (No. 18 to 22 wire) is wound on a plug-in form 1½ inches in diameter. If you cannot find a plug-in form, substitute a tissue roller wrapped with masking tape and glued to an old tube base.

The coil consists of 42 turns for 160 meters, 22 turns for 80 meters, and 15 turns for 40 meters. The antenna pick-up coil is wound below the plate coil, and consists of 16 turns for 160 meters, 9 turns for 80 meters, or 6 turns for 40 meters. You may need to juggle turns on the tank coil to mate with a different value tuning capacitor and/or achieve maximum output (which will typically be 1 to 2 watts).

Testing and operation of the completed "PeeWee" is quite simple. First double check your wiring to ensure all pin tube connections are correct. The plate coil and crystal should coincide with your desired band of operation, and one wire from the crystal's socket should connect to the 6A7's top grid cap. After warming up the filament, apply plate voltage and tune the variable capacitor for maximum output as indicated by an in-line SWR meter or the "S" meter on a receiver. Finally, snap on your earphones, talk into the mic, and marvel at the robust quality of amplitude modulation.

Several hearty amateurs continue to keep AM alive on the high end of 160 meters today. They are often known as SPAM (Society for the Promotion of Amplitude Modulation), and this little transmitter is a good foot in the door for joining the action. It definitely is not big-time and plate modulation, but it is a good stepping stone until you find one of those genuine classics.

What's that? The train's whistle blows to move on just as we spot a neat old "Tailender" made by placing metal strips on a piece of wood for calling CQ on the wall (the first memory keyer!). But it's time to continue the journey. Quick! Grab some sheets on that critter and we will tell you about them later!

Second Stop—The '40s

We have traveled only a short distance, and already sounds of Big Band music are emanating from our stop straight ahead. Walking softly inside that combination depot and museum, we find the warm little Two Tube Receiver shown in figs. 4 and 5. This early model Superhet was built by Ross Wert, WB9GVO, during 1991 from in-

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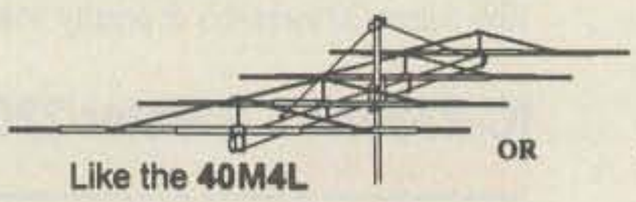

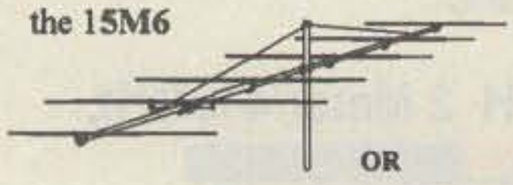

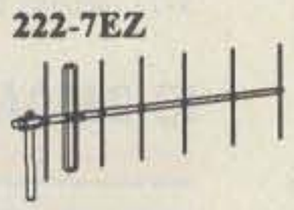

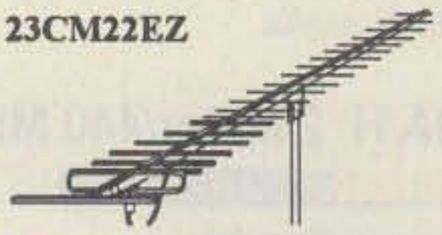

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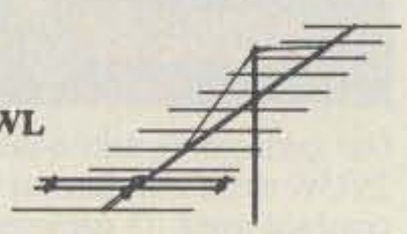

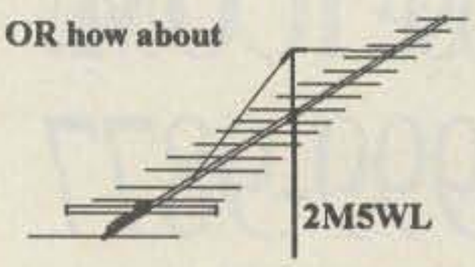

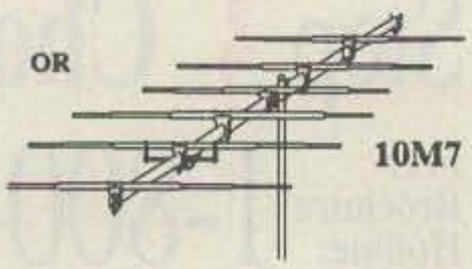

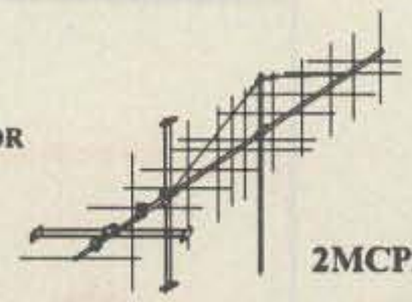

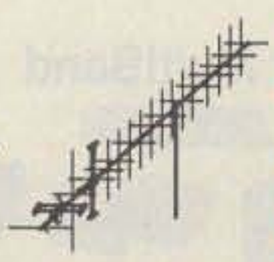

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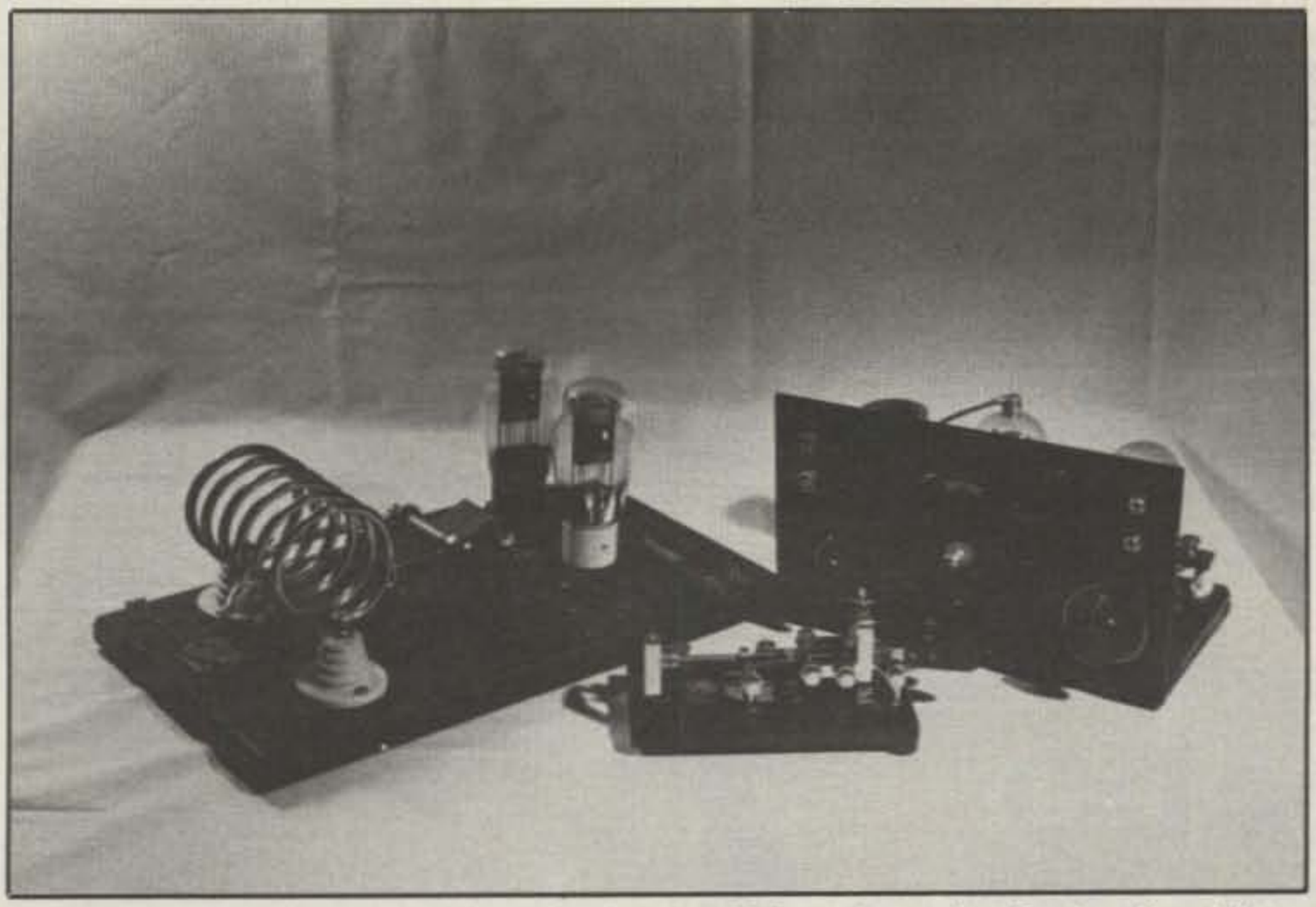

Fig. 7– KY8I's 1990 reproduction of a classic 1930s-style station. Push-pull oscillator on the left is flanked by a "Two Stepper" receiver on the right.

formation in the 1943 *ARRL Handbook*. Isn't the receiver's rear view great? The two coils and center tube function as an RF amplifier and converter, and the right tube (6C8G) functions as a regenerative detector and audio amplifier.

You naturally would want to see the receiver's schematic, so it is shown in fig. 6. C1 is the antenna trimmer, C3 is band setting, C4 is the main tuning, and C2 sets regeneration. The RF choke is a regular 2.5 mHy, and the transformer is a regular interstage type with 3:1 ratio. Old-time high-impedance earphones are necessary with this receiver. The regenerative detector coil, L6 and L5, is a National PRF-2 (40 mHy) and is mounted below the chassis. You can homebrew an equivalent by winding 55 turns of No. 30 enamel wire on a ¾ inch diameter form. Wind 18 turns in the same direction and directly below that coil for L6. Vary tickler turns as necessary for smooth regeneration. This detector stage should oscillate around 1600 kHz, and the RF stage should likewise convert 80 or 40 meters to 1600 kHz.

The 6K8's plug-in coils are wound on 1½ inch diameter forms using No. 22 enamel wire. L1 and L3 consist of 56 turns for 160 meters, 32 turns for 80 meters, and 18

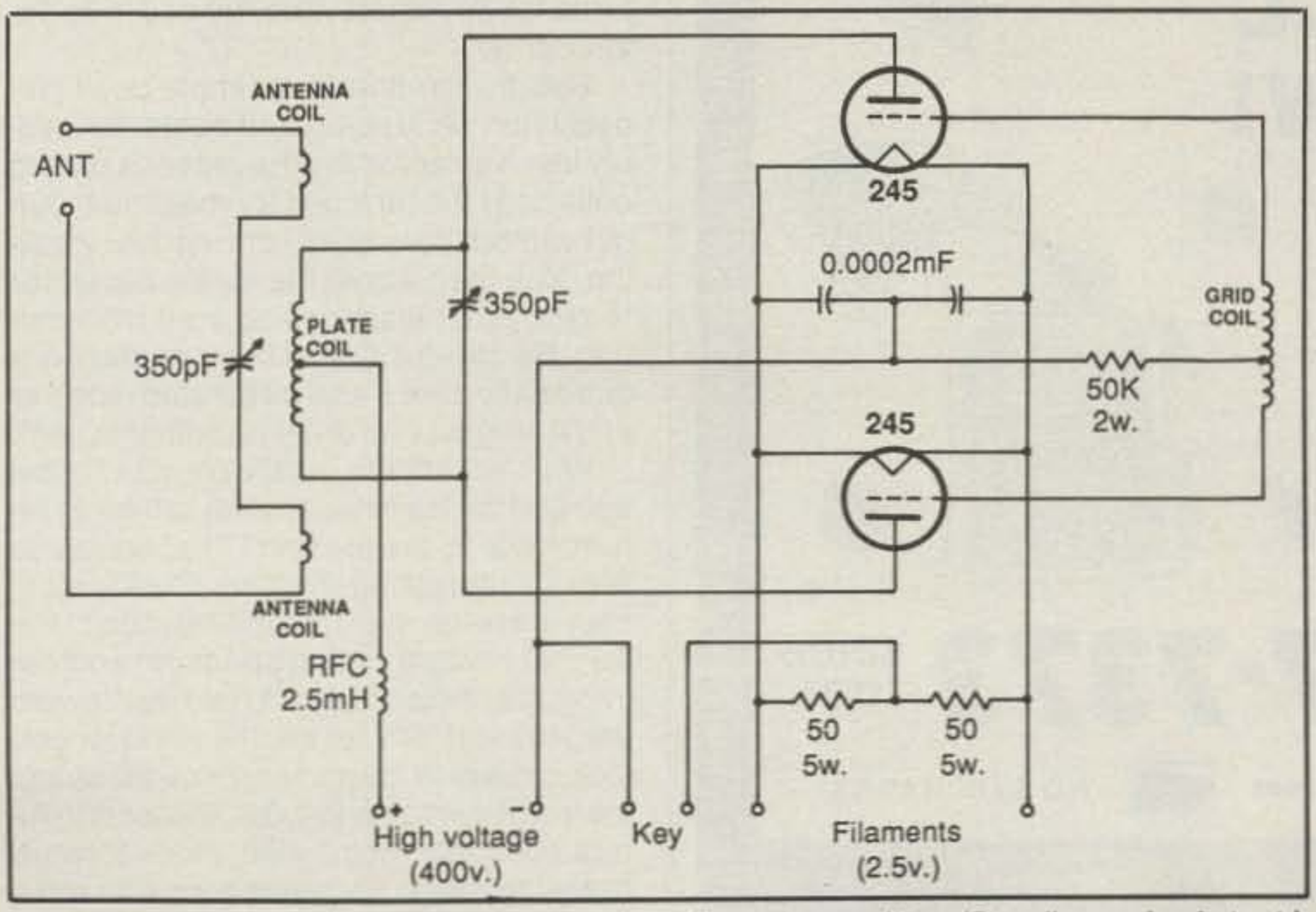

Fig. 8– Schematic diagram of the push-pull oscillator transmitter. (See discussion in text.)

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turns for both 40 and 30 meters (plenty of overlap!). Coils L2 and L4 are 10 turns for 160 meters, 8 turns for 80 meters, and 7 turns for 40 and 30 meters. They are wound in the same direction and directly below L1 and L3.

Tune-up and operation of the receiver begin by adjusting C2 to the point of regeneration (and swapping L6 connections or adding turns if regeneration does not occur). Next, peak C1 and adjust C3 until "hitting" a ham band. Fine-tuning is then performed with C4.

This little gem is a challenge to build and get perking, but it can sure be a treat when combined with a similar era transmitter and used on today's bands. It definitely proves the operator rather than the rig makes the difference!

What? The train whistle is blowing again? One could get whiplash on this nostalgia ride!

Revisiting The '30s

Our short travel becomes more quaint and simple, and we roll to a stop beside a neat little frame building. Inside, KY8I reveals his modern-day reproduction of a magnificent Push-Pull Oscillator and Two-Stepper Receiver plus the beautiful old bug shown in fig. 7. The receiver was built from a description in my book *Golden Classics of Yesteryear*, which is still available from MFJ Enterprises, and Tom's handiwork in assembly is beyond description. This rig looks magnificent! The big knobs and velvet Venier dial are set onto a black crinkle panel that looks brand new. The transmitter was also described in my *Golden Classics*, and uses a pair of 245 tubes to run between 5 and 10 watts output.

This rig is a true collector's item, and when used in a responsible manner (in other words, continuously monitored for good quality and in-band operation), it produces a very good signal on today's bands. The transmitter's diagram is shown in fig. 8. The plate coil is ¼ inch copper tubing wound with an inside diameter of 2½ inches. Six turns are used for 30 meters (as shown), 8 turns are used for 40 meters, and 12 turns are used for 80 meters. The coil is stretched to a length of 5 inches for good bandspread. Although not shown in the photo, similar coils of three turns each are used for antenna pickup. The coil is tapped in its center for applying high voltage. The grid coil is wound close-spaced on a 1 inch form with No. 28 wire. It has 28 turns for 30 meters, 40 turns for 40 meters, and 72 turns for 80 meters. Tap the coil in its exact center.

This transmitter is a simple push-pull oscillator, so tune-up and operation simply involves adjusting the antenna pickup coils near the tank coil for maximum output without "arc over" or frequency pulling. You then adjust the tuning capacitor to zero other stations and start transmitting. Be careful: Out of band operation is quite easy. Use a well-calibrated receiver and a single-band antenna with this gem.

What's that? The whistle blew 5 minutes ago and the train has already left on its return route to the present? That leaves us with an interesting decision. Shall we just stay here or start traipsing down the tracks? Hmmm . . . that brings yet another intriguing decision. Should we head toward the '40s and '50s for another (and longer) look, or toward the present? You tell us and we will strive to honor your requests in future columns. Meanwhile, I look forward to seeing you on 30 meters soon with some genuine old-time classic rigs!

73, Dave, K4TWJ

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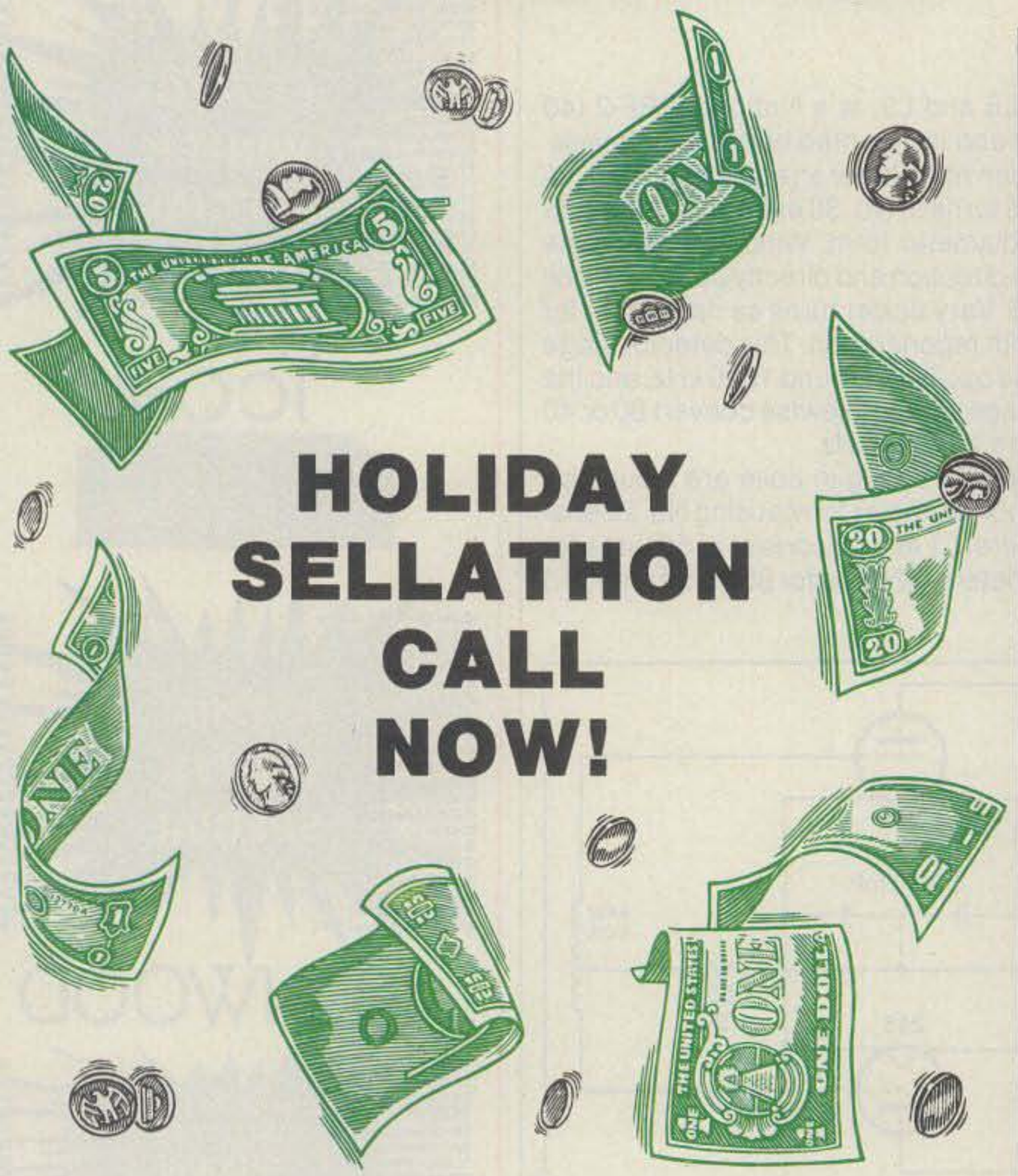

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Band	3.5MHz	7MHz	14MHz	21MHz	50MHz
Length	131'	65'	32'	21'	9'

(Power Rating IKW PEP)

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7/21 MHz Dual Band Zepp

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Inverted V Wire Antennas

MT-240XK (5 Bands)

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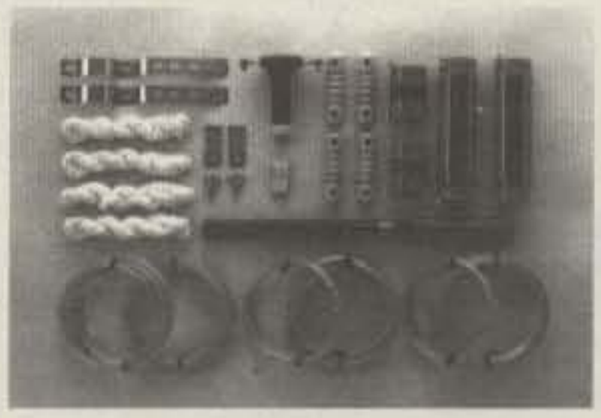

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Model	*Bands*	*Length*
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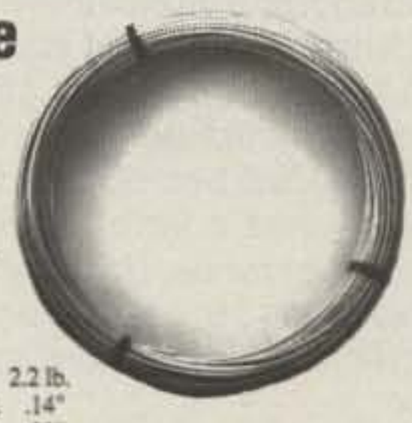

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CQ REVIEWS:

Software Systems Consulting PC Slow Scan TV System

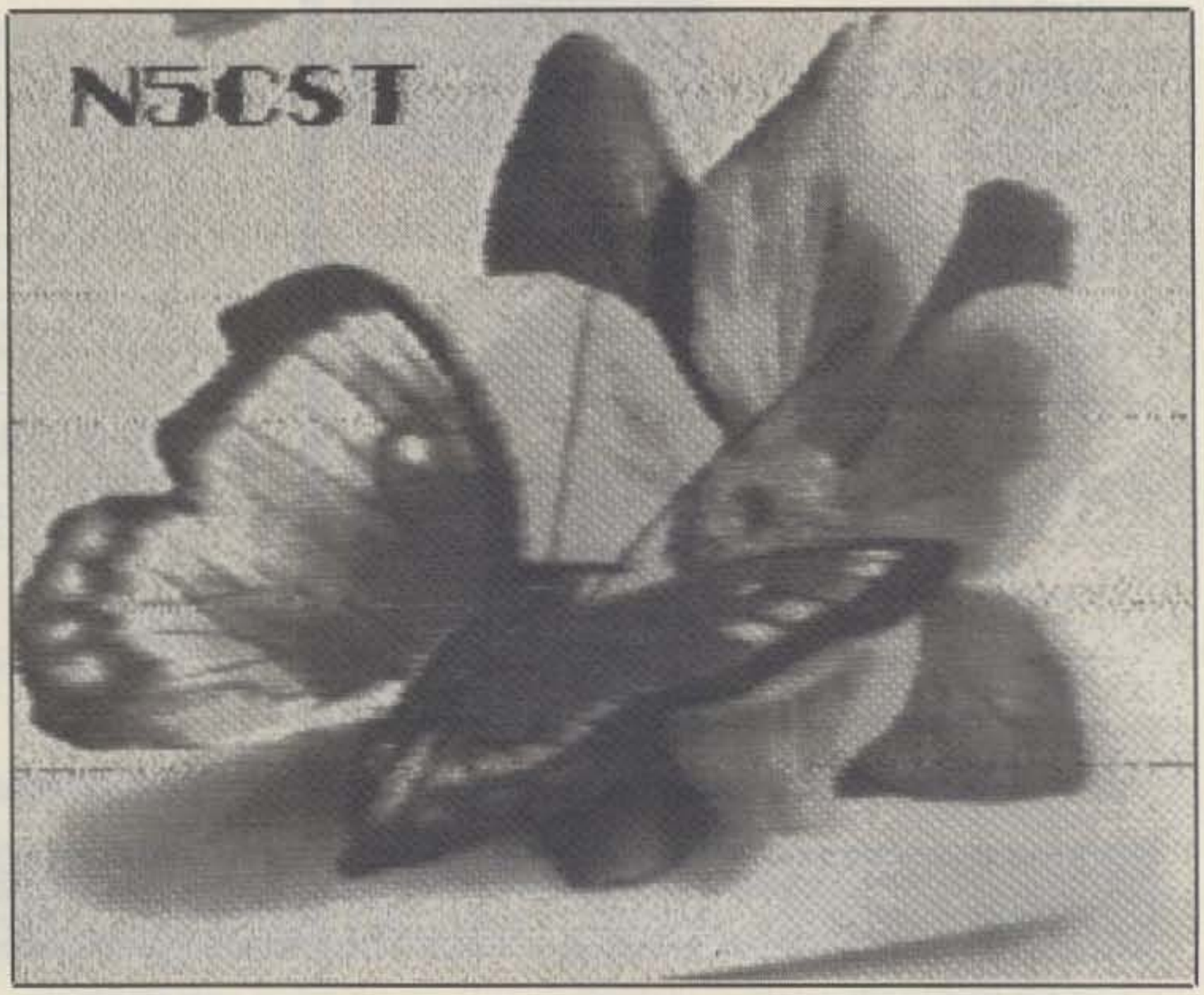
BY BUCK ROGERS*, K4ABT

A picture is worth 1000 words when it is a beautiful yellow and violet butterfly hovering above a magnolia blossom, displayed on my color SVGA screen after having received it via HF SSTV, 72 second color (14.233 MHz) from Johann Gyllenband, N5CST, in Denison, Texas.

By now the readers of this column are aware of my adoration of the digital video communication modes. In years past I've written about the many ways we have to send and receive pictures and graphics using amateur radio. This craving for pictures goes back to the days of the model 15 when we could send a punched-tape cartoon that had been entered one letter at a time. I used a letter/number character scheme to render this crude tapestry that when printed to paper would resemble an airplane, house, flower, or sometimes a face.

I also found enjoyment in trapping a rare slow-scan picture on a scope-tube with a slow decay rate (P-11 phosphor) that would hold the image, however ragged it might appear, until I had time to snap a photo. Not only was this receiving apparatus homebrew, but if we wanted to preserve the image, we sometimes used a special Brownie camera onto which we had attached a number of lenses, so we could capture a celluloid print for posterity. Even then we had to wait for the film to be developed to be sure the light and dark green image somewhat resembled the original.

The purpose of this review is to reacquaint the reader with some of the latest innovations that have entered the video marketplace. The novelty of digital video transfer is a part of the amateur radio hobby that is much like packet radio, and in some cases is a part of packet. **Digital Image Transfers** are continually attracting interest and growing in technological advances.



Printout of an image displayed on K4ABT's color SVGA screen after having received it via HF SSTV, 72 second color from N5CST.

DIT and DAT

No, my grammar has not hit an all-time low, although there are times I'm made aware of my southern heritage when Gail at *CQ* makes me look good after she corrects my dialogue. I'm not trying to destroy the English language, but the two three-letter groups, DIT and DAT, are acronyms that I created back in 1984. At that time they were used to describe how computers performed "Digital Image Transfer" and "Digital Audio Transfer."

Some of you will remember the fun we had with the Tandy Color Computer (COCO I, II, and III). In those days we drew a picture with our favorite paint or drawing program such as "GRAPHICOM," and afterward we could save it and then transmit it via packet to another station as a binary file. The file was captured and saved by the receiving station, and then later displayed as a very "high resolution" (Ha Ha) picture in four basic "artifact" colors. (An artifact color is a color that may be used to represent several other colors that are related in shade.) Even then we felt that any picture composed of more than 16,000 pixels was high resolution. That amounts to 88 pixels vertical, and 192 pixels across, or horizontal (88 × 192 = 16,896). By current standards, that number won't come close to our CGA monitors.

The Color Graphic Adapters (CGA) today have better resolution, but about the same number of colors in the display. As the CGA systems gave way to the Extended Graphic Adapter (EGA), so did my COCO, I, II, and IIIs give way to my first PC compatible. It was a Radio Shack/Tandy model 1000. No, it was not an "A" or "B" model; it was the first of the run, just a plain model 1000. Later I added the EGA monitor to the "old" model 1000, and behold, I had a 16 color display—a moderate increase in resolution and a significant increase in colorimetry.

All this time there was another display type in the making, and I was to experience another addition to my network of compu-

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N5CST's image as it appeared on K4ABT's screen.

ters. The five COCOs went away, and in their place came the present set of PC compatibles. Between Randy Bridges (Sierra Technologies) and Tandy (Radio Shack) I'm supporting two 80386's, two 80486's, and one 80286 laptop. The old model 1000 is now relegated to the corner of this computer room as *the* ROSE EPROM burner (if I had a dollar for every EPROM birth that has emerged from that ole clunker).

VGA and SVGA—What Next?

The entry of the Video Graphics Adapter (VGA) and the Super Video Graphics Adapters (SVGA) has paved a new avenue for the transmission, reception, and display of very high resolution pictures. We've now reached a point in time where our slow-scan pictures are near the resolution and color quality of a television picture.

VGA has enabled us to develop our SSTV techniques to allow the display of pictures that are 640 by 480 pixels. Easy arithmetic tells us quickly that we have picture quality well over a quarter of a million pixels in size. This is where the present-day slow-scan pictures excel over the same techniques that were in use a few years ago.

In some of the present slow-scan picture formats each pixel is assigned a hexadecimal address and saved to disk in a binary format. This file can later be displayed to the screen, printed to hard copy, or sent to another station.

Cost versus Technology

This is one of those times when the digital amateur has seen the most significant change in the cost of equipment related to our hobby. While technology has improved, cost has declined. Depending on the level of equipment, SSTV modem, etc., the user could invest above $2000 in a slow scan system, and the price does not include the camera/digitizer, computer, and display.

Today you are about to discover how you can enter the hobby of slow-scan television for less than $150. Again, this does not include a PC or compatible, and it does not include the digitizer, such as a video hand-scanner or camera.

Enter "PC Slow Scan TV" by John E. Hoot of Software Systems Consulting (SSC). This modulator/demodulator (modem) is not a big box that takes up as much room as the PC, nor is it a card that must be installed in a vacant slot inside the PC.

There is already a large supply of pictures available just for the time it takes to convert them from the PCX (a trademark of ZSOFT) or GIF (a trademark of H&R Block) into the slow-scan mode that you

The PC Slow Scan TV system by John E. Hoot of Software Systems Consulting.

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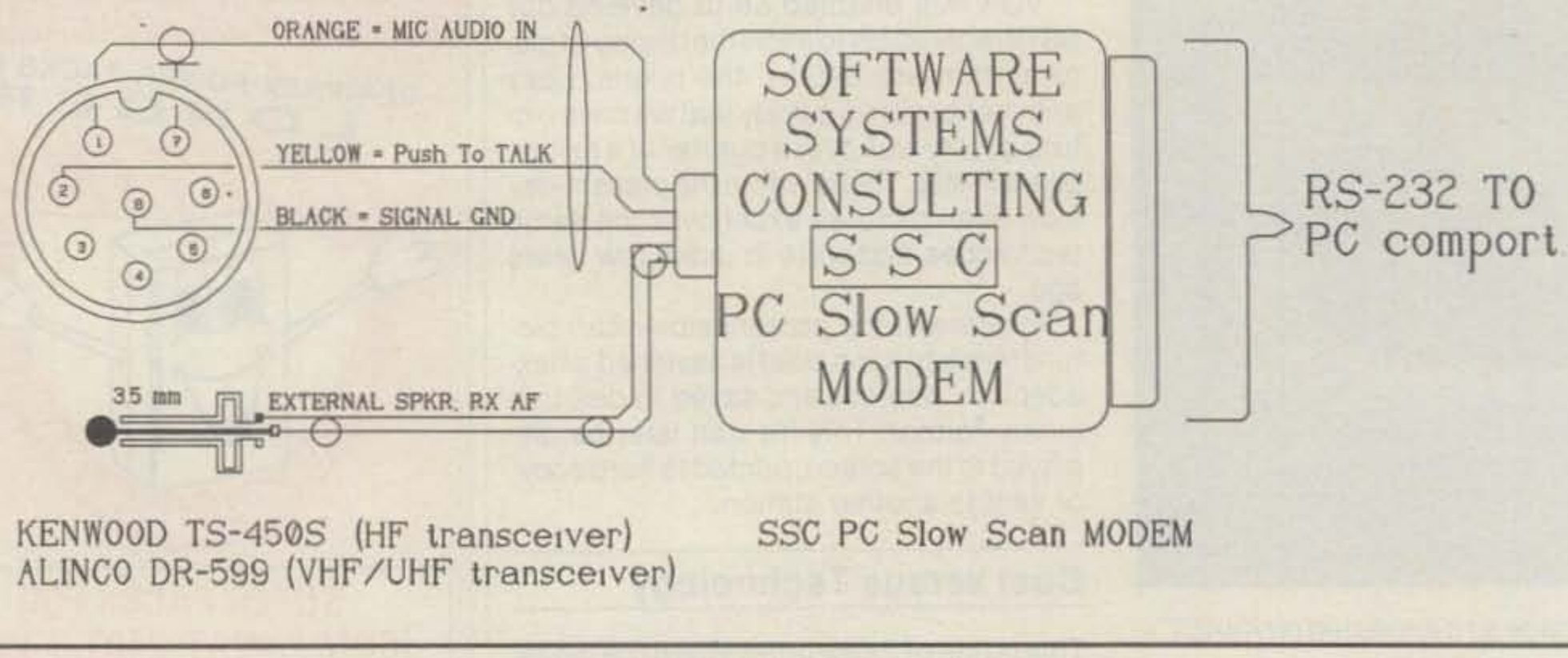

Fig. 1- Interfacing the PC Slow Scan modem to the Kenwood TS-450S/Alinco DR-599.

wish to send or receive. Later this year John plans to introduce a frame grabber that will enable the SSTV enthusiast to capture a picture from a video tape or from an attached video camera. With the integration of the frame grabber, our SSTV setup should provide a near real-time "shoot and send" feature.

Accompanying this new state-of-the-art modem (hardware) is software version 5.0, which supports the 15 SSTV modes listed here: 12 second color, 24 second color, 36 second color, 72 second color, 8 second B&W, 12 second B&W, 24 second B&W, 36 second B&W, Scottie 1, Scottie 2, Martin 1, Martin 2, AVT 90, AVT 94, and AVT 125.

The Hardware

The modem is 1 inch thick, by 2 inches wide, by 4 inches long. It has two small cables extending from one end, and on the other end there is a DB-25 socket that attaches to the serial port of your PC, or compatible. The two cables are the transceiver I/O, and push-to-talk control for the associated HF or VHF transceiver.

The modem has only one control, and it is the **FSK MIC** level control that is set to the required input (transmit) level of the transceiver. This is easily accomplished while using the **Key Test Tone** command in the main menu of the PC Slow Scan TV program.

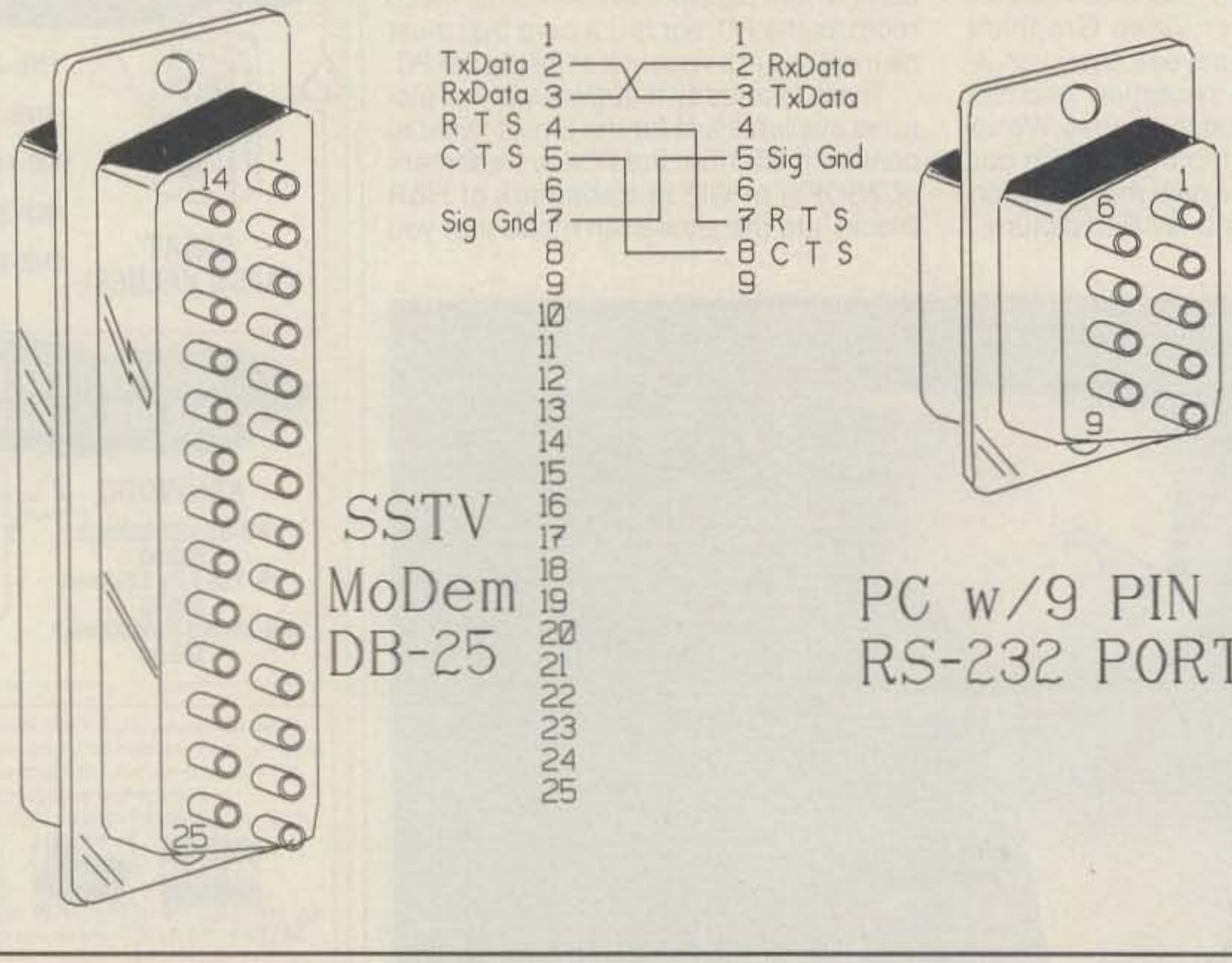

Fig. 2- Adapter for use when the PC comport is equipped with a 9-pin connector. Radio Shack part number for the ready-made adapter is 26-269.

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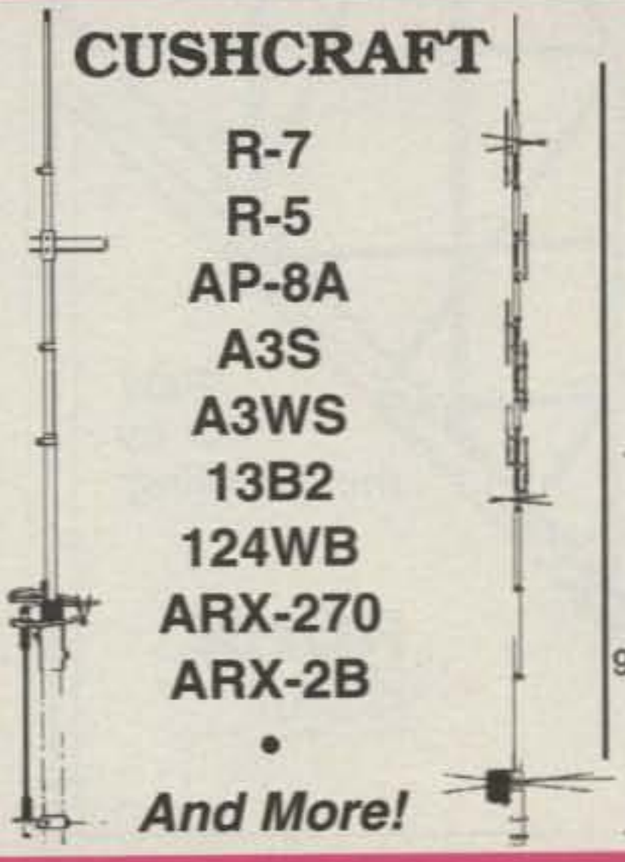

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There are no switches to flip, knobs to turn, or buttons to push. The transceiver control and all commands are executed from software. If the user wishes to include microphone to slow-scan TV switching, the PTT circuit of the modem can be utilized to enable an external relay for this kind of interface control. The PTT circuit of the PC Slow Scan modem should not switch more than 35 volts.

The Software

The software that accompanies PC Slow Scan is nothing short of fantastic. Included on the disk with the PC Slow Scan program are other utilities that enable conversion of various picture formats.

There are programs that allow the user to capture a picture from the screen and save it into one of the formats used for PC Slow Scan use. The program enables set-up and calibration of the system, from tuning in of SSTV signals to setting the internal PC clock.

It also allows the user to View, Print, Save, and Edit a picture. The use of the display screen as an "O" scope is an addition, since it provides a real-time display of the incoming signals. This way the user may tune the SSTV signal according to the scope displays shown in the well-written and illustrated 60-page manual. The document is hard copy and not a disk text file.

Supporting the manual is an audio tape that may find other vendors paying close attention when they discover how much help it can provide to a new user. The audio tape solves many problems before the new user has to resort to numerous long-distance calls to obtain information that may not be covered in detail in the manual. I made two phone calls to John Hoot before listening to the audio tape. After listening to the tape, I found all the information that would have explained most of my inquiries.

There is another nice feature included on the tape, and that is there are several slow-scan TV pictures of various modes that can be used to test and/or align your new PC Slow Scan station.

CIRCLE 135 ON READER SERVICE CARD

System Requirements

To enable the use of PC Slow Scan, the following items are needed: HF or VHF transceiver, IBM PC or compatible w/640 kByte of memory, VGA or SVGA graphics adapter, serial port available for PC Slow Scan, MS/DOS version 2.1 or above, tape cassette (for setup only).

Slow-scan television signals on HF are usually found at 14.230, 14.233, and 28.680 MHz. On VHF the frequency sometimes used for SSTV is 145.55 MHz FM.

Interfacing

The only way to describe the ease of interfacing the modem to the PC and transceiver is "a piece of cake." In fig. 1 I've interfaced the modem to transceiver using the microphone input.

Yes, I'm aware of the Kenwood TS-450S accessory port (ACC2) problem. When the microphone and a TNC, or any other type of data/AFSK controller, are connected to ACC2, the microphone audio is reduced to a very low level. Because of this "bug" in the ACC2 port of the TS-450S, I've elected to use the mic input as the FSK I/O.

Because the modem is supplied with the RS-232 (DB-25) socket already wired and ready to attach to the PC RS-232 (DB-25) port, the only remaining task is to configure the PC Slow Scan software for comport 1 or 2.

If the RS-232 port of your PC is equipped with the 9-pin (DB-9) connector, then a 9-pin to 25-pin adapter must be used to interface to the modem (see fig. 2). If you prefer to purchase a ready-made DB-25 male to DB-9 female adapter, the Radio Shack part number is 26-269.

The PC Slow Scan system is available from Software Systems Consulting, 615 S. EL Camino Real, San Clemente, CA 92672 (714-498-5784). The modem, complete with the software, is priced at $149.95. CQ

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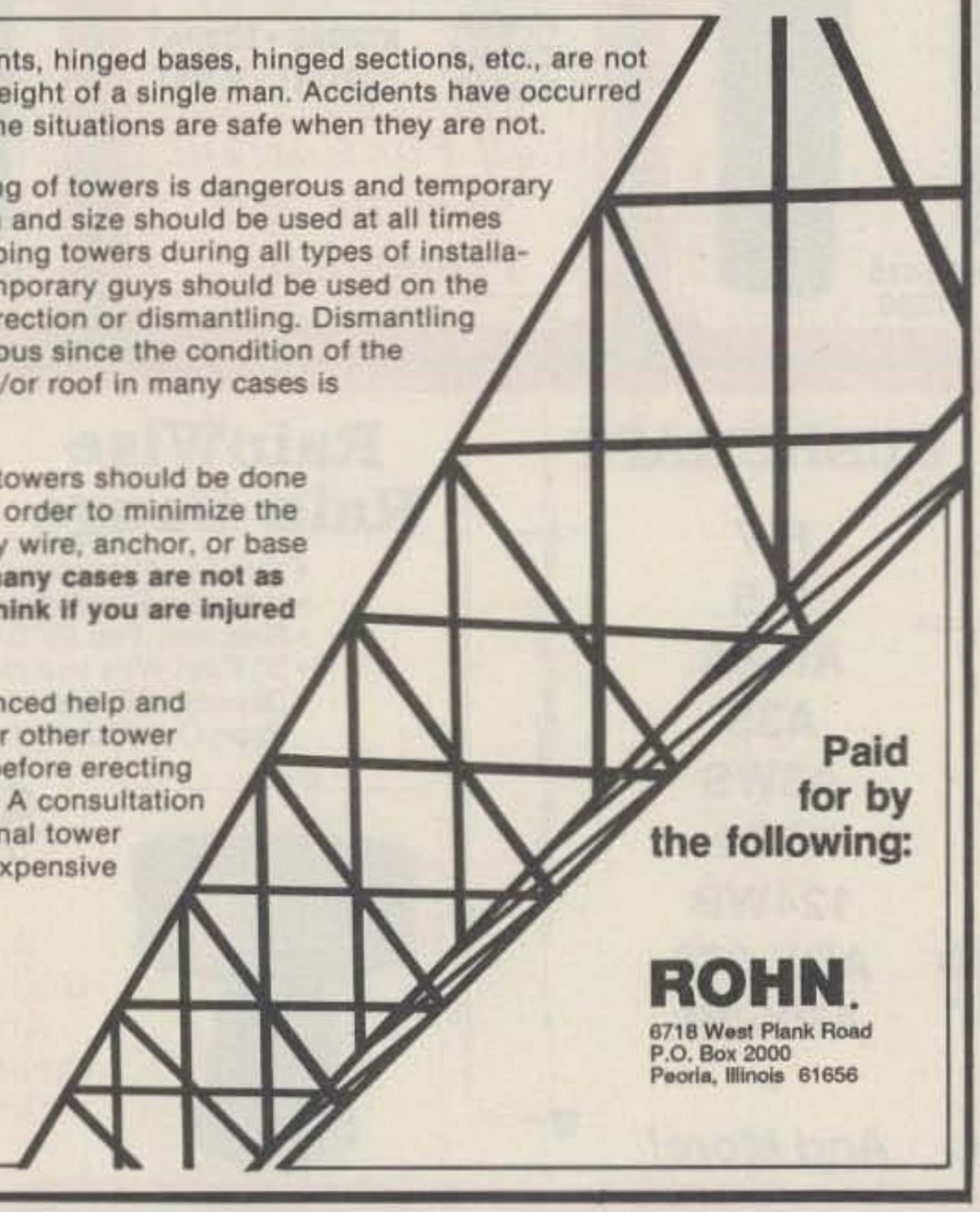
The dismantling of some towers should be done with the use of a crane in order to minimize the possibility of member, guy wire, anchor, or base failures. **Used towers in many cases are not as inexpensive as you may think if you are injured or killed.**

Get professional, experienced help and read your Rohn catalog or other tower manufacturers' catalogs before erecting or dismantling any tower. A consultation with your local, professional tower erector would be very inexpensive insurance.



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AWARDS

BY DOROTHY JOHNSON, WB9RCY

NEWS OF CERTIFICATE AND AWARD COLLECTING

The Story of the Month for January is:

Jerry Goetsch, KF7RU USA-CA All Counties #746, All SSB, 2-25-92

"My introduction to the hobby of amateur radio goes back to my youth, when my father purchased and assembled a Knight Kit SW radio. It was very simple, and you had to change coils to get the various bands, but I started to listen to a whole other world of information. I got into SWL, and QSLed with many of the commercial/state SW stations around the world.

"Then in 1958, during the eighth grade, I was given the opportunity to be in a program to enhance my school education. I could choose an auxiliary subject to have the county school district help me learn. I chose ham radio. I built my transmitter (a 75 watt xtal-controlled CW model) from the *ARRL Handbook*, and had an S-89 Hallicrafters receiver, together with a longwire antenna (actually the neighbor's old AM radio antenna). My dream as I got on the air, as WV6FOC, was to work all states. Then we moved, and I lost my 'Elmers' and was restricted to a vertical antenna, which didn't work very well, and I didn't get my CW speed up. Soon the license lapsed, the equipment was sold, and I was busy with school and part-time work in a grocery store.

"After a couple of years of college, I was confused about what direction in life to go, and decided that I should enlist in the Air Force for a while to sort things out. I was selected for linguist training and learned the Russian language. I spent a number of years overseas in Japan, Turkey, and Germany. I didn't get back into the amateur radio hobby, but it was the only time I got to work with Collins gear.

With nearly eight years of service, and a wife and two children by that time, I went back to school and eventually became a pastor of a small church on the Oregon coast (Curry County) and later a church in Lassen County, California. I have been pastoring now for sixteen years. When I came to my present pastorate five years ago—Blachly, Oregon—I had ham radio on my resume as a hobby that I had enjoyed in the past. One of the pastoral search committee members said, 'If you become pastor, you will have to get your license again.' (He had ulterior motives: he wanted to get his.) The church organist and her husband were hams, as were the neighbors across the street (husband and wife), and sure enough we had Elmers and code classes and theory classes. At one time we had eight hams in the population of about 750. Thus, the organist stated, 'We now qualify as a HAMlet!'

"I worked all states CW as a Novice on dipoles. Soon I upgraded to Advanced and got a G5RV, followed later by a rotatable two-element Gem Quad up about 40 feet (on top of a used power pole). I now have worked all states on three bands, and lack only eleven more band states on 40 and 80. I got started in county hunting, however, on those days when I couldn't hear DX and was looking for some more WPXs. My earliest efforts were on the G5RV with my barefoot FT-101E through an antenna tuner. I was trying to replace the about 50 counties I had only on CW. I kept getting more and more as I had time, often while working in the office on the bulletin or letters or filing at the same time.

"My original dream of WAS had now been replaced with USA-CA on low power from a single fixed location. So many of those on the net were very helpful and really cared if you could get relayed into control, etc. It was (and is) a different ball game than the DX pile-up. I tried to do most of the counties without asking for special favors, but towards the end several individuals really helped out.

333 South Lincoln Ave., Mundelein, IL 60060

Jerry Goetsch, KF7RU, USA-CA All Counties #746.

USA-CA Special Honor Roll

Roger W. Parks, N4SMH
USA-CA All Counties #782
All SSB, 9-3-92

Robert S. Jackson, WD4NEG
USA-CA All Counties #783
All SSB, 9-10-92

Norm Beavers, W3DYA
USA-CA All Counties #784
All CW, 9-17-92

"Especially demonstrating the spirit of helpfulness and 'instant friendship' found on the county hunters net was WA2UJH, who was just getting back into mobile operating after a number of years. When he found out that I needed several counties close to his location, he was determined to get me my last counties in WV and KY. Then when someone turned up in my next to last (which was in VA), he drove to the center of VA to get the last one for the whole country. Many, many people helped me throughout the entire two years it took me to work them all, but here was someone who knew me for a couple of months maximum and helped me out so much with hundreds of miles of travel. That's the kind of people who have kept me at the project. *Thanks to them all.*

"Future goals: I continue to work DX—

USA-CA Honor Roll

3000		1500	
N4SMH	807	WD4NEG	1052
WD4NEG	808		
KA1CLV	809	**1000**	
		WA2ITJ	1251
2500		WD4NEG	1252
N4SMH	887		
WD4NEG	888	**500**	
		DK8SR	2631
2000		WD4NEG	2632
WD4NEG	963		

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

Say You Saw It In CQ

have 285 worked with 278 QSLed. I hunt oblasts (over 125 QSLed). I am also working for the WPX Award of Excellence and have nearly 1900 prefixes worked. I still need the endorsements for 80 meters, AF and SA (mostly awaiting QSLs). But will I go around again? Yes, I have nearly 2200 worked for the second time and need about 190 for Bingo. I hope to get a mobile antenna and go out and put out some counties.

"I have an idea for a super award that would exemplify the true spirit of amateur radio, so maybe there will be another challenge for us in the future. I enjoy the measurability of working towards a goal and achieving it (much of my work is not that way). Thanks for all the super work that the awards custodians do, and thanks again to those who gave me the privilege of putting you in my log. 73, Jerry."

Awards Issued

Roger W. Parks, N4SMH, put the finishing touches on his good record and was awarded USA-CA All Counties #782, USA-CA 3000 #807, and USA-CA 2500 #887, All SSB, dated 9-3-92.

Robert S. Jackson, WD4NEG, took it all in one jump with his application for USA-CA All Counties #783, USA-CA 3000 #808, USA-CA 2500 #888, USA-CA 2000 #963, USA-CA 1500 #1052, USA-CA 1000 #1252, and USA-CA 500 #2632, All SSB, dated 9-10-92.

Norm Beavers, W3DYA, rounded out his good record and qualified for USA-CA All Counties #784, All CW, dated 9-17-92.

Barry C. Dutcher, KA1CLV, took the penultimate step in his quest by claiming USA-CA 3000 #809, All CW, dated 9-17-92.

Robert C. Bruno, WA2ITJ, filed his qualifying application for USA-CA 1000 #1251, Mixed, dated 8-31-92.

Michael J. Eilers, K8OOK, upgraded his USA-CA 500 #1762 (8-9-82) by adding the 6 meter endorsement dated 9-16-92.

USA-CA 5000 certificates went to:

Paul Fuchs, DK8SR, USA-CA 500 #2631, Mixed, 9-4-92.

Robert S. Jackson, WD4NEG, USA-CA 500 #2632, All SSB, 9-10-92.

Awards Available

Diplome de la Zone 2. The Diplome de la Zone 2 is issued by Club FER-HAM VE2RGA de Fermont, Quebec, Canada. The award is available to licensed radio amateurs and SWLs. Contacts after 1 January 1980 are valid. There are no band or mode limitations.

Confirmed contacts are required with three prefixes (VE2, VO2, VE8) included in the northeast area of North America: VE2 stations located in Quebec and north of the 50th parallel; as well as stations in the portion of the Northwest Territories (VE8) east of 102 degrees west longitude and north

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- **Getting Started In Packet Radio** shows you how to set up the necessary equipment and actually get on the air on Packet. No theory . . . just the nuts and bolts of how to do it.
- **Getting Started In DXing** shows the DX'ers station, and how to root out and work the rare DX. Top DXers share their tips and techniques to help you hold your own with the "Big Guns."

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Diplome de la Zone 2, offered by Club Fer-Ham, VE2RGA, Fermont, Quebec.

of 50 degrees north latitude. All VO2 stations are in zone 2.

Do not send QSL cards. A list showing full details of the contacts and certified by two licensed amateurs must be submitted. The fee for the award is $3.00 US, or 8 IRCs. The address for applications is Gilles Soucy, VE2GSO, P.O. Box 46, Fermont, QC. GØG 1JØ, Canada.

Russian Robinson Award. The Russian Robinson Award is issued by The Russian Robinson Club. It is issued for QSOs/SWLs with amateurs on islands belonging to Russia. The diploma has three classes:

1st Class: 20 different stations on 10 different islands.

2nd Class: 16 different stations on 8 different islands.

3rd Class: 10 different stations on 6 different islands.

QSOs count double for stations/SWLs located on islands. Dates of QSOs, bands, and modes are not limited.

The fee for each class is 12 IRCs, or $6 US. The fee for a list of Russian islands with their numbers (RRA list) is 2 IRCs, or $1 US.

Send GCR list (no QSLs) and fee by registered letter to manager UA3GPA: Valery Sushkov, P.O. Box 3, 398000 Lipetsk, Russia.

Babenberger Award—Klosterneuburg. The Babenberger Award is available from Award Manager Horst Nurschinger, OE3HCS, Agnesstr.51/4/7, A-3400 Klosterneuburg, Austria. The fee, with first-day stamp, is AS 70, DM 10, or US $7. For the normal award the fee is AS 50, DM 7, or US $5. Send only a log list. There are no date limitations.

To qualify for the award DX stations need 20 points, including one Klosterneuburg station. EU stations need 30 points, including one Klosterneuburg station. All OE3 stations are worth the following point

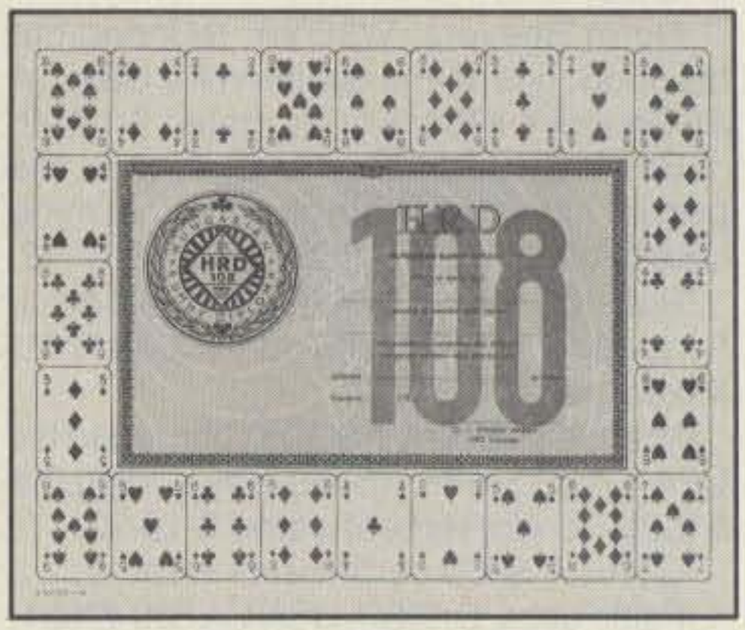
Babenberger Award (Austria) available from Manager Horst Nurschinger, OE3HCS.

counts: FM 2 points; SSB 4 points; CW/RTTY/packet 6 points; 160 meters 10 points.

Klosterneuburg stations are OE1ES; OE3AHC, CDW, CEW, CHC, EBS, FOC, GIG, GZ, HCS, ICS, KVA, LFA, LTB, LZS, MHU, NDA, NLA, NSC, OE, RYW, SKB, SKU, UHU, VO, WAC, WOS, WYC, ZK, HPU.

Hungarian Rummy Diploma (HRD). The Radioamateur Society of Somogy county issues the HRD Awards. The applicant must submit proof of contacts made on or after September 1, 1972. The HRD Award is issued in three degrees:

Bronze—"Hand rummy" collecting 14 cards in accordance with the rules of the game.



The Hungarian Rummy Diploma issued by the Radioamateur Society of Somogy County.

Silver—Full collection of one of the four series plus one joker of the same color. For example, diamond 2 . . . A plus red joker (14 cards).

Gold—Full pack, containing 54 cards. HRD-108: Two packs of QSL cards are necessary for the award from 108 different stations.

Hungarian Canasta Diploma (HCD). Three canastas (21 cards) have to be confirmed in accordance with the rules of the game.

The canasta contains 7 cards of the same figure. Two of them can be equivalent—for example, 7 cards of figure 5, 7

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cards of figure 8, and 7 cards of kings. Not more than 3 cards may be substituted by the four jokers and the "little-jokers" (figure 2) in one canasta. Note: Contacts on or after April 4, 1980 are valid for HRD-108 and HCD.

Amateur stations belonging to radio club "Tivadar Puskas" can send any kind of HRD cards for the QSOs. These stations are HA, HG3, GA, GB, GD, GH, GL, GM, GR, GU, HD, HF, HH, HS, HV, HX, HY, KGO, KGL, HM, KGR, KGU, KHC, KHJ.

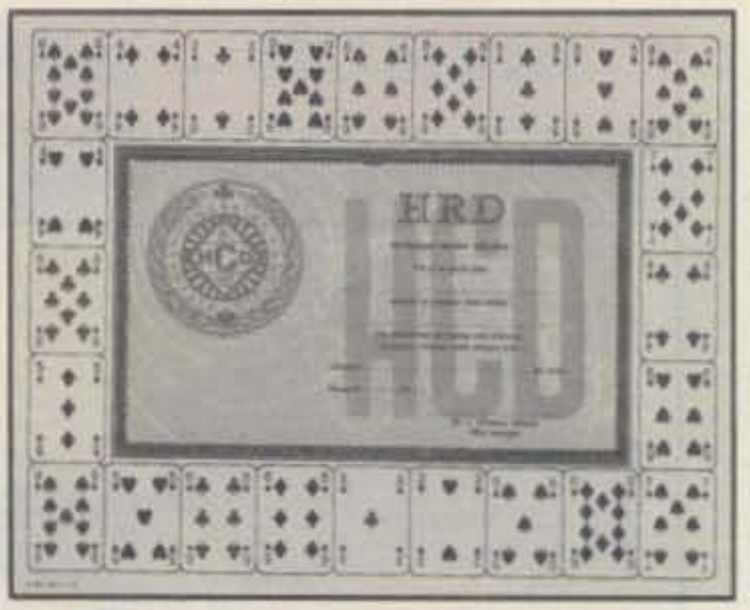
Allocation of the HRF cards:

HA/HG call area 1—spade/heart R/a = A; diamond/club R/b = J
HA/HG call area 2—spade/heart R/a = 2; diamond/club R/b = J
HA/HG call area 3—spade/heart R/a = 3; diamond/club R/b = J
HA/HG call area 4—spade/heart R/a = 4; diamond/club R/b = J
HA/HG call area 5—spade/heart R/a = 5; diamond/club R/b = Q
HA/HG call area 6—spade/heart R/a = 6; diamond/club R/b = Q
HA/HG call area 7—spade/heart R/a = 7; diamond/club R/b = K
HA/HG call area 8—spade/heart R/a = 8; diamond/club R/b = K
HA/HG call area 9—spade/heart R/a = 9; diamond/club R/b = K
HA/HG call area 0—spade/heart R/a = 10; diamond/club R/b = K
??? red and black Joker = Y =.

Manager: Dr. Janos Mihalyfy, HA3GA, BAJCSY-ZS.u.24, III/2, Kaposvar, Hungary H-7400.

On To Other Things

Beginning 1 January 1993, your USA-CA Director and Contributing Editor for the Awards Column will be Norm Van Raay, WA3RTY, Box 76, Pleasant Mount, Pennsylvania 18453-0076 U.S.A. All applications and correspondence regarding the USA-CA Program should be directed to Norm.



The Hungarian Canasta Diploma available from the Radioamateur Society of Somogy County.

I have truly enjoyed my association with *CQ* and the USA-CA Program, but the time has come, after ten years, for me to go on to other things. I will be leaving you in good hands, however.

To all my friends, old and new, I wish you well.

73, Dorothy, WB9RCY

From The New USA-CA Director

My interest in amateur radio stems from service as a Radio-Man in the U.S. Navy from 1948 to 1952. I was licensed in 1972 and have been an active ham since.

I have been county hunting since I retired and have confirmed 2,589 counties. Other amateur radio activities include contesting and DXing. I am a small gun in contests, but feel the big guys need lots of little guns to get their big scores. Traffic handling and Assistant Coordinator for Northeastern Pennsylvania for Navy-Marine Corps MARS round out my amateur activities.

I retired three years ago after a thirty-year career in Pennsylvania's Mental Health/Retardation system. I held senior management positions in County Mental Health programs and State Psychiatric Hospitals. My last assignment was assistant superintendent of a state hospital. My wife, Carol, and I operate a home for elderly people. I graduated from Muhlenberg College and hold a Masters degree from Penn State University.

I look forward to serving the amateur community as Director of the USA-CA Program and contributing editor for *CQ*'s Awards column. It will be difficult to fill Dorothy's shoes, and I join the *CQ* family in wishing her well, and thanks for a job well done.

Maintaining the integrity of the USA-CA Program will be the highest priority for me. 73, Norm, WA3RTY

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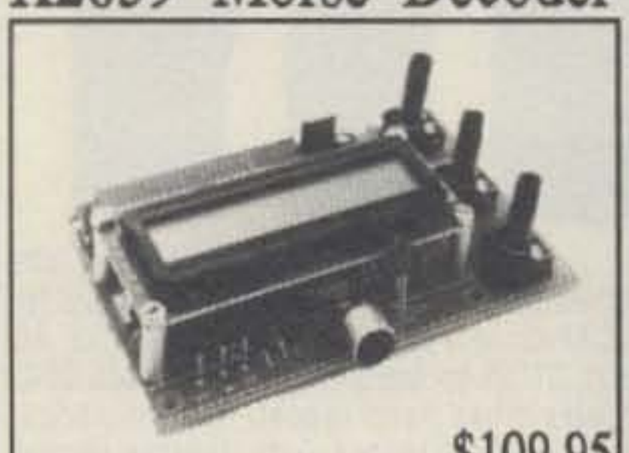

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ALL ABOUT THE WORLD ABOVE HF

1992 Microwave Update A Splendid Success

VHF-PLUS CALENDAR

Dec. 28 to Jan. 5	KP5 DXpedition by NØTG Group. (See text for details.)
Jan. 3	*Quandrantids* meteor shower, expected peak 1234 UTC. Moderate EME conditions.
Jan. 8	Full moon.
Jan. 10	Perigee. Excellent EME conditions.
Jan. 16–18	ARRL VHF Sweepstakes. (See text for details.)
Jan. 17	Moderate EME conditions.
Jan. 20	Noisy EME conditions. Sagittarius A.
Jan. 23	New moon. Poor EME conditions.
Jan. 25	Apogee. Poor EME conditions.

What is known as the premier microwave conference, the 1992 Microwave Update, was held at the Holiday Inn Holidome, in Rochester, New York, 15–18 October. In attendance were over 100 microwave experimenters. Thanks to the hard work of the two conference co-chairmen, Frank Pollino, K2OS, and Dave Hallidy, KD5RO, and the behind the scenes work of so many members of the Rochester VHF Group, the conference lived up to its expectations as an excellent forum for exchange of knowledge pertaining to the microwave frequencies.

Those participants who made it to the conference site by Thursday participated in an all day surplus tour, where some members of the tour picked up valuable goodies for use in their equipment.

The Friday morning session was moderated by Dave Hallidy, KD5RO. The first speaker, Geoff Krauss, WA2GFP, covered microwave systems principles. Next, Barry Malowanchuk, VE4MA, spoke on HEMT preamps for 2.3 and 3.4 GHz. Drawing incentive from the work done by Al Ward, WB5LUA, on HEMT preamps, Barry has made modifications on the printed circuit boards which resulted in improved noise figure measurements. His documentation of these improvements was the basis for his talk (and his paper in the *Proceedings*).

Al Ward, WB5LUA (who recently upgraded to Extra class), spoke on the use of television video carriers for propagation indicators. Al showed a grid square map depicting locations of receptions of various UHF television station video carriers and described how these aided him in determining when a particular amateur band was open in a specific direction. A paper on his topic also appears in the *Proceedings*.

Dave Meier, N4MW, who has active beacons on frequencies up to 5.7 GHz, spoke of a design for a series of beacon transmitters, covering 902 MHz to 5.7 GHz, that uses a common oscillator and commercially available "no tune" transverter boards. His system also would include radio frequency link control and remote access to the keyer message. His paper is also part of the *Proceedings*.

The afternoon session was moderated by George Anderson, KB3PW. Dick Frey, WA2AAU, the linchpin of the highly successful W2SZ contest operations, spoke of the effective use of 24 GHz rovers. He spoke of the limitation of propagation on this band and the subsequent necessity of strategically placing rover stations for maximum contact completion for the contests. A friendly discussion took place between him and Kent Britain, WA5VJB, concerning the preference of mode (FM versus SSB), with the conclusion that while SSB is the preferred mode of operation for propagation, FM is the more practical mode because of its simplicity in circuit design.

Being inspired by Paul Shuch, N6TX's talk on sun noise at the 1991 Microwave Update, Mel Grave, WRØI, developed a couple of computer programs for use in making sun noise and other microwave computations. A paper pertaining to his talk is in the *Proceedings*, and information on how to obtain a copy of his software can be received by sending an SASE to Mel at 705 E. 117th N., Sedwick, KS 67135.

Kent Britain, WA5VJB, fascinated us with the simplicity of getting on microwaves. Later Kent talked about stealth designs of various aircraft types and their effectiveness or lack thereof in reducing radar detection. A paper on his topics is contained in the *Proceedings*.

Between Kent's two talks, Dave Hallidy, KD5RO, reported on his 902 MHz meteor-scatter attempt with Al Ward, WB5LUA, during the *Perseids* meteor shower. While the QSO attempt was unsuccessful, Dave nevertheless encouraged us with the potential and the prospects for future attempts. Because of the anticipated meteor storm during next year's *Perseids* shower, anticipation is high for successful completion of an attempt at that time. He also discussed the possibilities of aurora communication on this band. Dave's paper on this topic can also be found in the *Proceedings*.

The usual Friday evening swapfest and noise figure measurements took place between 7 PM and midnight. It gave the various participants opportunities to visit with each other and more often than not put a face to a familiar callsign.

The Saturday morning session was moderated by Frank Pollino, K2OS. Rick Campbell, KK7B, entertained us with his often humorous talk on no-tune microwave transceivers. He feels that if the QRP HF operators can do it, so can we. A paper on his topic can also be found in the *Proceedings*.

Al Ward, WB5LUA, made his second presentation. This talk was on the design and construction of HEMT LNA's for 2.3, 3.4, 5.7, and 10 GHz. Those of us who were unfamiliar with Al's work

More than 100 microwave enthusiasts attended the Microwave Update Conference held at the Holiday Inn Holidome, in Rochester, New York, from 15–18 October 1992.

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Say You Saw It In CQ

Dave Hallidy, KD5RO, and Frank Pollino, K2OS, co-chairmen of the Microwave Update Conference, pictured at the Saturday night banquet.

when we heard Barry's talk found that this talk by Al provided the necessary background for understanding what Al has been designing using the HEMT devices.

Paul Shuch, N6TX, challenged and entertained us with a talk entitled "Fiber Optics—Waveguide of the Future." His challenge was for us to figure out how we can use fiber optics as a transmission device for microwave signals. Shucks, Paul, I thought you would have all the answers.

Because Bill Olson, W3HQT, was recuperating from triple bypass surgery, Steve Kostro, N2CEI, presented Bill's talk. We got better acquainted with Down East Microwave and the various products available through this company and with Bill, thanks to some very kind words by Steve. Bill, we wish you continued and speedy recovery from your surgery. A paper prepared by Bill also appears in the *Proceedings*.

Paul Wade, N1BWT, described construction of mixers and other components for use on 5.7 GHz. Paul conveyed the concern that too little is being done inexcusably in operating on this band. He gave many examples of the simplicity of getting on the band and encouraged us to do so. A paper on this topic prepared by him is in the *Proceedings*.

Dennis Mungham, VE3ASO, gave a slide presentation on the Algonquin Park 150 foot dish that was planned for use on 432 MHz during the second weekend of the EME contest this past November. We awed and drooled over the antenna and made plans to work VE3ONT during the contest. Results of the success of the operation will be in next month's column.

Because of some unexpected aurora openings, Tom Richmond, WB2IEY, presented a talk on a proposed aurora detection system. He solicited ideas on what the system would or could contain and asked for further comments to be mailed to him. You can send your suggestions to him at 56 Woodland Rd., Pleasantville, NY 10570.

Ed Walker, WA4DFS, gave a very brief talk on drilling holes in PC boards, specifically the WB5LUA preamp boards. As a dentist, he has an intimate familiarity with which drill bit to use. He has found that a particular bit is ideal for drilling certain holes required for assembly of the boards.

Following all of the talks, a business meeting was conducted concerning the site selection for the 1993 Microwave Update conference. Atlanta, Georgia was proposed as a tentative location. The unofficial working committee will be studying the possibilities of this location. When a decision is made, I will report it in this column.

The banquet speaker was Bruce Kelly, W2ICE, from the Antique Wireless Association. He gave a historical perspective on VHF and above activities by presenting various slides of historical VHF and above equipment and events. Among the slides was a copy of the monthly report that Paul Wilson, W4HHK, sent to Ed Tilton, W1HDQ (for Ed's *QST* column) on his 2 meter meteor scatter work with Tommy Thomas, W2UK. A very pleasantly surprised Paul was applauded by the audience in recognition of his contribution to the work on VHF and above.

Following the banquet, a hospitality suite was open until 1 AM. Again, we were able to meet with and brag to our friends who operate the microwave frequencies. The last of us to leave included Kent Britain, WA5VJB, Dave Hardy, G8ROU, and Reg, GW8VHI.

Dan, N4YKD, and Ray Veldran, N4KWX, raising their antennas in 40 mph winds during the September ARRL VHF contest. (Photo courtesy N4KWX)

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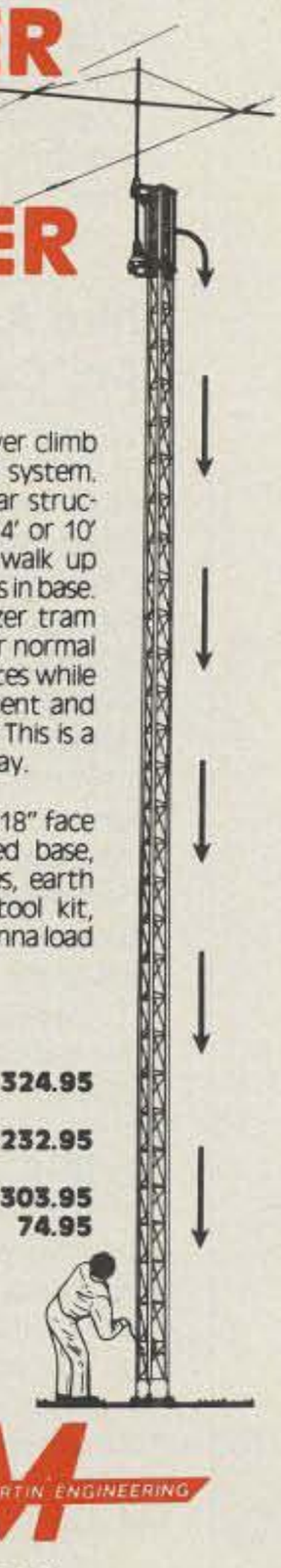

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CIRCLE 38 ON READER SERVICE CARD

For the more than 100 conference participants it was a time of renewed acquaintance and education. The conference was the place for microwave enthusiasts to share their experiences with each other. If you are into microwave and you did not attend last year's conference, please make plans for this year. You won't regret that you did.

Not all of the speakers included papers for the *Proceedings*. However, some who were unable to make presentations did submit papers for it. Therefore, you should look into obtaining a copy for yourself. Copies are available from the ARRL for $12.00. Incidentally, the League is planning to publish a microwave projects book later this year. When announced, you will read about it in this column.

OZ1UM operating from Spodsbjerg (JO55wx). On 13 June at 1550 UTC they set the European record of 90 km, for 47 GHz, with a QSO between them and DB6NT, DF9LN, and DF2CA, operating from Trehoje Mols (JO56gc).

Fifth International EME Conference

The fifth International EME Conference was held in Thorn, The Netherlands, between 31 July and 2 August 1992. There were over 120 participants from 5 continents and 23 countries. Among the programs were the following: Allen Katz, K2UYH, outlined the history of EME; Russ Miller, N7ART, discussed 432 MHz power amplifiers; Ranier Bertelsmeier, DJ9BV, talked about LNA designs; Hannes Fasching, OE5JFL, discussed modeling of dish antennas; and Jim Vogler, WA7CJO, presented a talk on optimizing traveling wave tube amplifiers.

Out of the discussions on Sunday came an agreement to allocate the segment between 432.020 and 432.030 MHz for QRP operation. QRP operation was generally defined as a station that uses 400 or so watts into a multi-element array or 1 KW into a single long-boom antenna.

Copies of the *Proceedings* are available by contacting Reg, GW8VHI, via his *Callbook* address.

Third Annual 2 Meter EME Conference

The third annual 2 meter EME conference was held on the Isle of Ibiza (EA6) during 24–27 September 1992. Among the conference talks were a slide presentation on the C53GS DXpedition by Michel, ON7EH; a video show on the C3URA operation presented by Jose, EA3DXU; a talk on path degradation and future optimum weekends by Derwin King, W5LUU (more on this subject later in this column); and a presentation on computerized Yagi design by Lionel, VE7BQH.

An open session was held where a number of recommendations were put forward for consideration by the 2 meter EME fraternity. Among them were the following:

1. Two-minute sequences for schedules, one-minute sequences for random contacts and CQs, with the possibility of shorter sequences during contests.

2. Stations answering CQs should send the other station's callsign once followed by "DE" followed by their callsign three to five times before repeating the sequence.

3. The frequency range of 144.025–144.030 MHz was to be reserved for QRP stations during last fall's EME contest. Should this arrangement prove satisfactory, consideration should be given to permanently reserving 144.020–144.030 MHz for QRP operation. It was the intent of this recommendation to encourage small stations to call CQ.

4. The European community is to be encouraged to initiate an open mail-box arrangement, such as a telephone or packet BBS, in order to transfer schedules and other information in a timely matter.

5. North Americans are to be encouraged to volunteer to be QSL managers for European EMEers and DXpeditions. (WA6MGZ volunteered to handle the C53GS QSLing.)

6. Because of the unstable value of the IRC, persons requesting QSLs from some European countries were encouraged to send green stamps sufficient to cover the postage.

7. Operators who worked DXpeditions were encouraged to send additional green stamps as a way of helping to offset the DXpeditioners' expenses.

The conference participants reported that they had time to be with their families and to be tourists. If you are into 2 meter EME and need a vacation, then plan to attend the next conference. Details will be made available through this column.

More on EME

EME Contest, First Weekend: This column is being written in early November. Therefore, coverage of only the first weekend is available. Next month's column will cover the second weekend.

6 and 2 Meters: Fred Fish, W5FF, and his wife, Lee, K5FF, report contacts with OH2BH, K6QXY, and W6JKV. Reports of 2 meter activity, while sketchy, indicate that conditions were fair. Many stations reported that Faraday rotation proved to be quite a problem. Among the reports received are the following.

Jeff, AA4FQ, reported 22 new stations in the first weekend. Among them were: JA4BLC, JA4LKX, JL1ZCG, CX9BT, 4X1IF, DX9ZY, EA2AVY, F1GHP, G4KLX, IK4DCX, K2LME, K6AAW, K7ICW, PA0CIS, SM0FFS, SM2BYA, SM3PXO, and W1XR.

Grant, VE6TA, reported contacts with I1ANP, OZ4MM, G0RUZ, K5GW, WA6PEV, G0LBK, and LZ2US.

Pete, K1FJM/6, using a single F9FT Yagi and 300 watts, made contacts with Dave, W5UN and Gary, KB8RQ, on 18 October.

432 MHz and Above: Thanks to the "432 and Above EME News," reports were more extensive on the microwave bands. Allen Katz, K2UYH, the editor, indicated that reports received showed generally mixed conditions. Among the active stations were: Hoppy, AA6WI, Chris, DF9CY (who was plagued with a wasp's nest inside his elevation actuator and a break in his TX feedline, keeping him off the air for most of the weekend), Markus, DL5YET, Jan, DL9KR, Peter, EA6/DF5JJ, Philippe, F2TU, Simon, G3LQR, Peter, G3LTF, Piero, I5TDJ, Gabriele, I6QGA, Yoshiro, JA4BLC, Syo, JA5NNS, Akihiko, JH1XUJ, Bill, K0RZ, Steve, K1FO (who has recently installed his sixth EME array in eight years), Rusty, K4QIF, Scott, KD4LT, Ron, N4GJV, Erich, OE9ERC, Paul, SM0PYP, Lars, SM4IVE, Doug, VK3UM, Doug, W2CRS/0, Clark, W8TN (in WV), Szigy, YO2IS, and Allen, K2UYH (with the assistance of Woody, AK2F).

Incidentally, Clark Stewart, W8TN, dropped me a note telling me of his new station on 432 MHz. During the first weekend he worked DL9KR, SM4IVE, K0RZ, F1FEN, K1FO, N4GJV, F1FHI, K2UYH, WB0TEM, W7FN (he was his 49th state), N2IQU, K4QIF, and JL1ZCG. He is using a pair of 3CX800A7s into four K1FO 25-element Yagis. He is presently the only station on 432 EME from West Virginia (EM98). For skeds you can reach him at 304-273-4680. His address is 104 Henrietta St., Ravenswood, WV 26164. For you 2 meter enthusiasts who need WV, he has been known to run meteor scatter as well.

Another new operator on 432 EME is Doug Allen, W2CRS/0, in Woodland Park, Colorado (DM78lx). He is using two 4CX250s driving four 14 WL M^2 antennas. His first operation also came by way of the first weekend. He completed contacts with W0KJY, K0RZ, SM4IVE, DL9KR, F1FEN, F1FHI, K2UYH, and JL1ZCG. For skeds he can be reached at 719-687-3549.

I reported in November that you should be on

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CIRCLE 51 ON READER SERVICE CARD

Marshall Goldblatt, W4EMB, and Pete Hein, K1FJM, examine the remains of Marshall's M² 2 meter antenna array, which was demolished by Hurricane Andrew. (Photo courtesy W4EMB)

the lookout for Bob Jones, KH6O. However, no thanks to Hurricane Iniki, the beautiful array that graced the August cover is now history. I will let you know when Bob is back on the air.

Allen Katz, K2UYH, in his newsletter clarifies some of the short-hand procedures. He points out that the signal reports consist of either a "T," an "M," or an "O." He states that a "T" indicates a partial reception of callsigns, and is not an acceptable signal report for a complete QSO; an "M" indicates a marginal reception of both callsigns; and an "O" indicates a good copy of both calls. He also discusses the responses "YYY" and "GGG." He states that the meanings of these are as follows: "YYY" is similar to QRZ, and "GGG" means "Please send your grid square."

This Month's EME Expectations: If you were at the CSVHF conference in Kerrville last July, you had the opportunity to hear Derwin King, W5LUU, make an excellent presentation on the future of EME communications.

For those of you who were not there, let me tell you that Derwin told us that this month we can expect some excellent EME conditions. He states that the weekend of 10 January will be one of those times. He also indicates that 3 January and 17 January will not be too bad either. In fact, the next three months also contain excellent opportunities for EME communications. (Check the "VHF Plus Calendar" at the beginning of this column for the exact dates.)

Have you built your EME station yet? Remember, even if you are only using a long boom antenna and a 150 watt brick, you can be heard by a big gun.

If you were not at the conference, you can obtain a copy of the presentation, plus Ray Soifer, W2RS's presentation on QRP EME, and many others related to VHF, by ordering a copy of the *Proceedings* of the 26th CSVHF conference by sending $12.00 to the League.

Current Contests

VHF Sweepstakes Contest: The VHF Sweepstakes is scheduled for the weekend of 18–20 January. The complete rules for the contest are in this month's Contest Calendar column and last month's *QST*. However, the exchange and scoring are similar to the June and September contests. While this contest occurs during a time of an absence of propagation, last year saw sporadic-E openings throughout the south and southeast and an opening between New Zealand and parts of the U.S. Therefore, "be prepared" as always is applicable.

Incidentally, look for W1AW, operated by Rusty Shaw, NM1K, on 50, 144, and 432 MHz SSB, and 144 and 222 MHz FM during this contest. Additionally, Ray Veldran, N4KWX, is planning a return trip to the West Virginia mountains in EM98 during this contest.

Spring Sprints: Because of a decline in activity, the ARRL has proposed combining the 902, 1296, and 2304 MHz Sprints onto one night. They would remain separate contests and be scored differently. The proposed date is 1 May. The logic behind this decision is that operators would be encouraged to move from band to band to complete contacts. The other remaining Sprints will continue as separate contests on separate days. If you have an opinion regarding this proposal, contact your VUAC representative. There is one for each ARRL Division. If you do not know who your representative is, contact the contest branch.

Current Grid Expeditions

Desecheo: The group that went to Navassa last year is expected to show up from Desecheo from 28 December to 5 January. Look for them on 6 meters on 50.110 MHz. Callsigns expected to be used are AA4VK/KP5 and AA4NC/KP5. QSLs go to N0TG. Yes, they will also be on the HF bands.

Current Meteor Showers

The Quads: The *Quandrantids* (or *Quads*, for short), a brief (14 hour long) but prolific meteor shower is expected to show on 3 January. The

Say You Saw It In CQ

anticipated peak time is 1234 UTC. The best paths are north-south. Long duration meteors can be expected about 1½ hours after the predicted peak. As always, look to 3818 or 3843 kHz in the evening hours for opportunities for schedules.

Meteor Schedule Sequences: Some readers have asked me to review the procedure for meteor contacts. If you set a schedule, you will run for probably a half hour. You will transmit for 15 seconds and then listen for 15 seconds. If you are the westward station, you go first. Some operators will break at the end of 7 seconds and listen briefly for the other station. Be sure to clarify that with the other station before beginning your sked. The initial exchange is the other station's callsign and your callsign, without saying "this is."

For example, if I, in Oklahoma, grid square EM15, were running with Jack, AB4CR, in Kentucky, grid square EM78, I would start by saying "AB4CR N6CL" over and over again for 15 seconds. I would then listen for Jack to say "N6CL AB4CR" over and over again during his 15 seconds.

After one of us has heard "complete callsigns," then the receiving station starts transmitting a signal report. Back to the example. When I have heard both my call and his call (not in any particular order), I then start saying "S-2" over and over again during my 15 second segment, while interspersing our callsigns, just in case Jack has yet to hear complete callsigns. Assuming that Jack has heard both calls and the signal report "S-2," he will start saying "Roger, S-2," over and over again during his 15 seconds. Once I have heard "Roger, S-2," I then say "Roger" over and over again. Once Jack has heard my "Rogers," then the QSO is considered complete. As an option, Jack can come back and say "Roger, 73" over and over again during his sequence. However, it is not necessary for considering the contact complete.

Occasionally, the sequence can be broken. For example, when I ran with Ted Goldthorpe, WA4VCC, during the *Perseids*, I heard Ted give callsigns during the last 3 to 4 seconds of his 15 second segment. I immediately said, "WA4VCC N6CL. WA4VCC N6CL. S-2, S-2, break." Hearing me, he came back and said, "Roger, S-2. Roger, S-2, break." Continuing to hear him, I replied, "Roger, Roger, Roger, Break." Hearing my "Rogers," Ted responded, "Roger, 73. Roger, 73. Break." I then said, "73, 73." At that point, the contact was considered more than complete by both of us after only 3 minutes into the half hour schedule.

For many, running the meteors is the most fun in operating on the VHF + bands. Have you gotten in on the fun yet?

On The Air

6 and 2 Meter Propagation: As of this writing there has been little 6 meter propagation in North America during October and early November. A few reports from California, Arizona, and Nevada of QSOs with ZL and KH6, a few Texas stations reporting TE contacts with Argentina, a couple of very brief sporadic-E openings in the midwest, and a spotting of PY5CC in the southeast are all that have been relayed to your editor. While Jim Treybig, W6JKV, was in FG he experienced some TE propagation to South America. However, he had only one stateside QSO on 6 meters, that being with Ray Rector, WA4NJP via EME. Nevertheless, he did complete 14 EME contacts on 2 meters. Among the fortunate ones

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were: KB8RQ, WB5LBT, SM7BAK, I2FAK, SM5FRH, SM2CEW, DL8DAT, DL1MAE, VE7BQH, a VE1 (named Joel), WA6MGZ, and (just barely) W5UN.

Michael Gallo, N2RYU, reports two sporadic-E openings. One took place between KØGBZ and him on 14 October, and the other took place between W4TKE and him on 23 October. He stated that the latter lasted for over an hour. Michael has recently returned to amateur radio (ex-WA2LSK) and 6 meters. He wonders where all the activity he used to hear has gone. He suggests that we get on the band more often and "make some noise." He finds that he can regularly contact a station 300 miles from him and would find the band much more interesting if others got on it as well. He suggests that we reactivate the old AM calling frequency of 50.4 MHz with our old AM radios and have some fun. Good suggestions, Michael.

While little propagation has been reported in North America, Europe and other parts of the world have been enjoying a bit of resurgence in F2 propagation. Ted Collins, G4UPS, reports that Peter, PY5CC, has worked several Europeans during October. Other stations either being worked or heard in Europe include ZP5JCY, 7Q7CM, ZS6XJ, 3X0HNU, ZS6WB, 7Q7JL, V51VHF beacon, and ZS9A.

In addition, Ted reports that Jan Mayen is now on 6 meters. The first QSO on that band took place between JX3EX and SM3JGG on 13 October. On the heels of that QSO was one between JX3EX and LA9ZV. Plans are for the two operators, JX3EX and JX7DFA, to be there through April. There is now a beacon using the callsign of one of the operators, JX7DFA, operational on 50.079 MHz, running 10 watts to a 3-element Yagi. QSL for JX3EX is via LA5NM and QSL for JX7DFA is via LA7DFA.

Ted also reports that Samir, OD5SK, is now running a 160 watt brick into a 5-element Yagi, the former being donated by JA1VOK. Samir also reports that the OD5SIX beacon seems to be temporarily lost in shipment to him, possibly being held up in Cyprus.

Additionally, Ted reports that the change in countries/prefixes that has affected Yugoslavia has affected the old 4N3SIX beacon, on 50.015 MHz. It now is operated under the call of S55ZRS. Other changes include the following Slovenia, which operated under the former YU3 prefix, is now S5, plus a figure from 1-9, followed by a two-letter designation. You will need a whole new *Callbook* to figure out who is who, because most operators opted for entirely new calls. For example, S59UN is the former YU3ZV. S57AC is ex-YU3OV and S53ZW is ex-YU3ZW.

Croatia, the former YU2 prefix, is now 9A. Bosnia-Hercegovina continues to operate under its former YU4 prefix. Macedonia also continues to operate under its former YU5 prefix. Additionally, Serbia continues to operate under the YU1 and YU7 prefixes. Only YU2 and YU8 continue to count as Yugoslavia.

While we are on the subject of counting, don't count anything yet for new countries. The ARRL has yet to make a final decision on the former and present YUs or Czechoslovakia (OK), which is expected to count as two separate countries as of the first of this month.

A report that Ted relays from Arne, SM7AED, indicates that George, 5R8AB, intends to make a serious effort to be on 6 meters (hopefully by the time this goes to press).

Ted also reports that two beacons appear to be off the air. The first, K1NFE, was destroyed by lightning and will not be replaced. The second, 9L1SL, has not been heard in over a year and appears to be QRT.

Ted sent a log containing his daily observations, which included aurora and meteor-scatter contacts throughout Europe (we should be so lucky in here in North America).

Peter, PY5CC, sent a copy of his September 6 meter log. During the month he made contacts with CE3EU, NP4NP, EH8ACW, ON4KST, LX1JX, DL7QY, PA0HIP, PA0LSB, DJ9KG, DJ8ZJ, TG9AJR, G4CVI, G8VR, G3NSM, EH7AH, CT1LN, TI2NA, 9H1PA, CT1BGE, 9H5EE, W5GVE, EH7AG, NI6E/KH6, and HK4BHA. Oh, to live at his QTH.

Other Operating Reports: Terry Baxter, N6CW, reports that Dave Mann, VP2EHF, is expected to be back on 6 meters (and 2 meters) as soon as his FT-736 is returned by Yaesu (again, hopefully by press time). Terry hopes that he will have reduced the demand for VP2E a bit during his stay there in November.

Shel Remington, NI6E/KH6, reports that the F2 season is off to a slow start. To date he has only worked around 25 countries in 5 continents (lacking Africa).

Jim Frye, NW7O, reports that during 1992 he was on the air from DM18, DM19, DM25, DM26, DM27, DM28, and DM29. During this year he expects to be on from DN01, DN01, DN10, DN20, DN21, and DM29. When he roves, he operates principally on 6 and 2 meters. However, he may include the microwave bands on future expeditions.

Juan, TG9AJR, reports that he is active on 6 meters and wants to build a station for 2 meter meteor scatter. Hopefully, meteor skeds can be set before too long with Juan.

FM24 Grid Expedition Skuttled: Ray Veldran, N4KWX, and Dan, N4YKD, planned a trip to FM24 for the September contest. However, Mother Nature intervened. When they arrived at Hatteras Island on Saturday their captain advised them that it was too treacherous to make the trip out to sea. They therefore set up operation at the beach, in FM25. They operated there until the next day, when they once again approached the captain. He advised them that the weather was rougher than the previous day. They cancelled their plans and made ar-

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rangements to charter the boat in June (for what else—the June contest). They finished up their operation at a cabin they had rented, still in FM25. Ray was especially appreciative of the hard work that Chip Margelli, K7JA, performed in getting a 222 MHz module for the FT-736 just in time for their departure.

2 Meters, Equatorial: I have two reports that are a bit dated but very relevant to this column. First, Esteban Acosta, YV4AKK, wrote me a long letter indicating several contacts with Argentina on 2 meters FM from 16–18 February 1992. Additionally, he has worked P43AS and P43TAT during January 1992. He feels that contacts into CO and XE are possible from YV and is hoping someone from those countries is willing to try.

The second report comes from Jose Montes, KP4EIT. Jose reports a contact between him and LU8YYO, in the Patagonia area of south Argentina, on October 5, 1991. While this is not the first report of 2 meter TE, it does attest to continuing existence of this propagation path on this band. Perhaps more needs to be explored on propagation near or over the equator on this and higher bands.

The Microwaves: Again, not much has been received by your editor. However, Dave Meier, N4MW, reported that on 14 October he worked K5LLL in EL29 on 902 MHz. He also had another contact with WB5LUA on 3456 MHz and was heard by WA5VJB (EM12) and WQ5S (EM13). Additionally, he reports that he heard W5VY (EL29) on 1296. Finally, he reports that his wife, N4ZRW, also worked Al on 3456 MHz for her fourth grid and third state.

New European 47 GHz Distance Record Set: During the European GHz Activity week (13–19 June 1992) a group of amateurs set a new European 47 GHz distance record. A German team, consisting of DB6NT, DF9LN, and DF2CA, operating from Trehoje Mols (JO56gc) made contact with OZ1UM (operated by OZ1UM and OZ8AO), operating from Spodsbjerg (JO55wx) on 13 June at 1550 UTC via FM. The distance was 90 km, just shy of the world record of 104 km.

The German team used a transverter with 5 mw out and an RX noise figure of 15 dB into a 30 cm parabolic reflector fed with a Cassergrain feeding system. The Danish side used a DF9LN transverter with 100 (micro)W output and an RX noise figure of 15 dB. The antenna was a 25 cm Procom parabolic dish with open waveguide feed system.

More on Other Publications

"Sanelli Technology," a technical newsletter, has been created for the radio amateur. You are invited to submit technical articles for the newsletter. Examples of topics are: VHF, UHF, microwave, ATV, packet radio, test equipment, propagation, spread spectrum, satellites, and antennas (did I leave anything out?). For more information, write to: Sanelli Technology, P.O. Box 416, Kiowa, CO 80117.

I met the editor of the "VHF UHF DXer," Dave Hardy, G8ROU, at the Microwave Update conference. Dave gave me copies of all issues to date and advised me that they are "going great guns." If you wish to subscribe, send $14.00 (in U.S. postal money order form) or 28 IRCs, to Dave at: Thorntree House, Wensley, Matlock, Derbyshire DE4 2LL, United Kingdom.

The "VRZA EME Newsletter" reports a new address. You can obtain your copies of this worldwide EME newsletter by sending to: H. Rippet, Zuidbuurtseweg 1, 3133 KC Vlaardingen, The Netherlands. It is distributed free. However, contributions will not be turned down.

And Finally

No, Thank You, No "Light" for Me: I do not like the term "No-code Technician." And I abhor the phrase "Tech-Light." I know where the latter came from. Those who drink beer know that the "lights" have fewer calories. They think that something has been left out. This logic is derisively transferred to the new Technician class licensee just because he or she may not have learned the Morse code. Unfortunately, this distinguishing of these licensees is negative!

The FCC does not differentiate. It declares that the licensee is a Technician whether or not he or she passed the code test. As a matter of convenience, we in the industry refer to those licensees who have passed the code test as "Tech-Plus," only to indicate that they have passed the basic requirements, plus the code. While not entirely solving the problem of discrimination, it does get away from the negative connotation that the other references make.

Besides, the term "no-code" is somewhat of a misnomer. The FCC has stated that these new Technician class licensees have all amateur privileges above 30 MHz. This means that their privileges start at 50.0 MHz, a CW portion of 6 meters, and they *must* operate CW on that portion of the band or be in violation of FCC rules. The FCC allows this mode to these licensees partially as a way of learning and practicing the code for those who are inclined to do so.

This editorializing is not to say that I do not want our new brethren to learn the code. I do, because two forms of propagation almost require knowing the code. Aurora contacts are best completed at very high speed CW and EME contacts are almost always completed using CW. However, so much of the spectrum and so many different modes of propagation are open to all of us who operate on the VHF + frequencies.

It is up to us older and (hopefully) wiser members of the fraternity to welcome these new Technicians, whether or not they have passed the code. How can we do this? We can incorporate the welcome mat within our contest teams and our clubs. Indeed, the Pack Rats, the W2SZ Contest Group, and the Rochester VHF Group have all used newly licensed Technicians, regardless of their knowledge of the code, on recent contest outings. Additionally, Dave Hallidy, KD5RO, tells me that the RVHFG is making a serious effort to attract newly licensed amateurs to its organization because its leadership realizes that the future of the hobby is to be found amidst these new amateurs.

These endeavors are steps in the right direction. However, we must continue to make every effort to make our new amateurs, regardless of their class of license, welcome within our fraternity. The best way of extending that welcome is with our language.

So "lighten up" with the discriminatory language. Recruit that new amateur and put him or her on your team. If you don't, you might find his or her callsign listed among a competitor's line in a contest result entry.

This is all the room for all the news this month. Drop me a note if you have some news of your operating activities or of your club's efforts to include new members. If your news cannot wait, call me at 405-528-6625. Until next month . . .

73, Joe, N6CL

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CONTEST CALENDAR

BY JOHN DORR, K1AR

A Cookbook for Low-Power Contesting— Conclusion

This month I am concluding our discussion of low-power contesting by providing you with input from a number of winning operators across the United States. Even though I have never done the analysis, it would not surprise me to discover that there are substantially more low-power participants than kilowatt boys in most contests. Certainly this is true from a DX (non-USA) perspective.

Each of our contributors this month will give you advice from their respective geographic area. In total, however, they offer sound strategy that can help any contest effort. Without further delay, read on and take notes. After all, nothing beats hearing war experiences from "the horse's mouth"!

Operating a Low-Power Contest Station

By James F. S. Eppright, K5RX

In beginning this discussion, I think it is important to describe my station and low-power experience for a point of reference. The station consists of a single 70 foot tower with a TH7 at 70 feet, a Cushcraft 40-2CD at 80 feet, and a KT-34A on a rotating side mount at 38 feet. On 80 meters, two of the guy wires are fed at the bottom through a Beam Steering Combiner, resulting in essentially a pair of continuously variable phased quarter-wave verticals spaced a quarter wave. The tower is Omega matched on 160 meters. The radio is a TS-930S. I am located on a city lot with above-average line noise problems and average RFI/TVI difficulties.

I have operated in four DX contests in the low-power category: CQ WW DX SSB 1991, ARRL CW and SSB 1992, and CQ WPX CW 1992. The previous contest season I operated most of the DX contests QRP. Previously, I operated every DX contest with full legal power beginning in 1967.

In any of my contest operations, my goal is always to achieve the highest score I can. This means operating as many hours as I possibly can. That being my objective, there is no other goal setting for me which I have found to be useful. This is because conditions vary from year to year and day to day, and conditions typically overwhelm the effect of other score determinants (e.g., I had a bigger score QRP in the 1990 CQ SSB than I did operating low power in the 1991 contest). Indeed, setting arbitrary QSO or multiplier goals per band can divert one from a more score-productive tactic.

However, for the less-serious contester, any of the standard goals can be chosen, such as breaking last year's score, challenging and beating a cross-town buddy (this is a great one if you can arrange it), working so many multipliers or QSOs, etc. Operating a contest without some goal strikes me as a particularly unexciting and unrewarding pursuit.

Keep in mind that I am speaking as a W5. Northeasterners will have little to gain from my remarks on operating strategy. However, if you are Midwesterner accustomed to listening to the East Coast "wall," these comments are for you. Operating with low power is very much like operating QRP at times and QRO at other times. From W5, with QRP SSB, no one answers your CQs. On QRP CW you can CQ all weekend and you will receive fewer than 50 replies. With low power, CQ-ing is much more productive. Rates to Europe and Japan are lower and the runs are much shorter. It is unusual to have a run longer than 30 minutes.

One can think of any opening to Europe in terms of having windows that open and shut to larger and smaller areas of Europe continuously during an opening. Every frequency is a window. The windows open and close as a result of propagation and QRM. With low power, the windows are fewer and are open for shorter periods of time. If you are running on a big band (e.g., any band on CW, 10 meters on SSB, or one of the other bands where for some reason QRM is low), it pays to go find an open window rather than to wait for the one you had been pulling contacts through to reopen.

If a window allows me to pull three or four contacts through it, I am happy. The majority of the time I am in both the search-and-pounce and run modes. As I tune the band, I call every station I haven't worked and I call CQ on every clear frequency I tune across. I constantly make use of the A/B VFOs and memories. For example, if I am tuning up the band and find a station I have not worked who does not respond to my call, or if the station is just beginning a QSO, I hit the A=B button. If it is a multiplier, I also put it in a memory. I then switch to the "B" VFO and continue tuning upward. If I haven't found a clear frequency on which to CQ or a station to work by the time I think the original station should have completed his QSO, I switch back to the "A" VFO. If it is a multiplier, I put it in a memory.

There are times I put one VFO high in the band (to lessen the chance of someone taking my frequency) and will call CQ on it, and then search and pounce on the other VFO after every second CQ or so. Once I make one search-and-pounce QSO, I go back to the CQ VFO. Obviously, there are other ways to perform this technique on multiple bands with a second radio.

Not having the ability to run stations as with high power, I check bands at times that I would normally avoid. Since it does not cost me as many points as it would if I were abandoning a run, I will hit the low bands briefly very early and the high bands after they are normally unproductive. It is common to pick up European multipliers on 40 that sometimes don't show at their sunrise for some reason. Good Pacific, Asian, and even African multipliers pop up on 10, 15, and 20 after almost everyone else has gone to the low bands. It takes no time to spot these stations, since there is usually only a handful of signals on the band at such times. They stick out like sore thumbs!

I have noticed over the last few years that the close-in DX stations do not regularly go to 160 on the hour as they used to. Consequently, I frequently check 160 at other non-standard times.

My operating style is to never call a multiplier more than three times without working another station. It is neither fun nor productive to sit in a pile-up calling fruitlessly for any longer period. Ten or twenty minutes later, propagation will likely change and the multiplier can be easily worked. Furthermore, I often find another station from the same country up the band with no pile-up whatsoever.

A thorough knowledge of propagation is invaluable. In addition to increasing your score, it can help you avoid considerable frustration. Calling JAs on 80 or 40 when they are deceptively loud before local sunrise can be very frustrating. Catching them at the peak of propagation makes QSOs almost too easy. Signals are then generally 10 to 20 dB louder. Even QRP

c/o CQ magazine

Calendar of Events

Jan.	1	ARRL Straight Key Night
Jan.	2-3	ARRL RTTY Roundup
Jan.	2-3	Michigan QRP Club CW Contest
Jan.	2-3	AGCW-DL QRP Winter Contest
Jan.	9-10	JA Int'l CW Contest (Low Bands)
Jan.	9-10	North American CW QSO Party
Jan.	16-17	HA DX Contest
Jan.	16-17	North American SSB QSO Party
Jan.	23-25	ARRL VHF Sweepstakes
Jan.	**29-31**	**CQ WW 160M CW Contest**
Jn.30	- Feb.7	ARRL Novice Roundup
Feb.	6-7	QCWA CW QSO Party
Feb.	6-7	YL-ISSB CW QSO Party
Feb.	7-8	1993 Classic Radio Exchange
Feb.	13-14	New Hampshire QSO Party
Feb.	13-14	YLRL YL-OM CW Contest
Feb.	13-14	Dutch PACC Contest
Feb.	13-14	EA RTTY Contest
Feb.	20-21	ARRL DX CW Contest
Feb.	**26-28**	**CQ WW 160M SSB Contest**
Feb.	27-28	RSGB 7 MHz CW Contest
Feb.	27-28	YLRL YL-OM SSB Contest
Mar.	6-7	ARRL DX SSB Contest
Mar.	13-14	QCWA SSB QSO Party
Mar.	13-14	YL-ISSB SSB QSO Party
Mar.	20-21	Bermuda Contest
Mar.	**27-28**	**CQ WW WPX SSB Contest**
Apr.	10-11	JA Int'l CW Contest (High Bands)
May	**29-30**	**CQ WW WPX CW Contest**

Say You Saw It In CQ

QSOs are easy at the peak. Working Europe on 40 SSB can be frustrating no matter how much power you run. Although it is generally a good idea to give every station you hear a couple of calls, 40 SSB to Europe can be an exception during the period before European sunrise. It is hard to enumerate all the factors that make me forsake 40 SSB during that period. Some are that the European station is having trouble hearing even the big signals, each QSO is a struggle, only I's are coming through, signals just don't sound right, etc.

From W5 it is essential to get a big multiplier, since QSOs are hard to come by. It is all too easy, though, to exert yourself futility on multipliers. Knowledge of propagation and self-discipline are needed to prevent beating your head against the wall of bad QRM in Europe on 40, monster African pile-ups on 10 and 15 on Sunday afternoon, etc. With low power, you lose many battles in the pile-ups. Sometimes it's just better to get up and walk outside or read the newspaper.

Many low-power operators wonder about the correct time for sleeping. Not unlike high-power operation, I normally sleep a couple of hours the second night after European sunrise. Unless 20 is open to Europe, there is not very much to work which can't be worked two or three hours later. With low power I more than make up for the time off with the increased alertness the rest gives me.

Using a computer logging program is a great benefit. The amount of energy you save not having to make multiple entries in log and dupe sheets, to visually scan dupe sheets, to call dupes that didn't make it into the dupe sheet, to manually tally QSOs and multipliers during the course of the contest, etc., can be directed toward better operating and decision-making. Instantly being able to determine on what bands you need a multiplier is more important with low power than with high power. You often will not have a second chance to move a multiplier to a needed band, since with low power fewer multipliers will answer CQs.

I have found low-power contesting from a city lot particularly attractive for two reasons. First, my persistent line noise (the electric utility gladly fixes problem poles, but new sources appear weekly, if not daily) covers up many stations that I can work with high power, but far fewer of those that I can work with low power. Since I don't have huge antennas at great heights, I am at a disadvantage being heard. That is bad enough, but I cannot stand to not hear stations that can hear me. Second, TVI/RFI is non-existent. I have heard of cases where RFI occurred at the 100 watt level, but where it does, remedial action will certainly be easier than at the 1.5 kW level.

One gets a much better sense of the contest by tuning around than by running stations. This was particularly apparent to me the first time I operated QRP. However, having at least a few runs during the contest adds to the experience of the contest as well. QRP SSB does not allow for that. Accordingly, of the three categories, low power leaves me with the fullest sense of a contest.

With all the contests I have worked over the years, it really takes something unusual to leave an indelible impression. There is one anecdote that comes to mind from one of the SSB DX contests. I found myself the second night without a ZL on 40. ZL is a pretty easy path from Dallas on 40, so I thought I should be able to raise one if one were on even with low power. I pointed the Cushcraft 2-element 40 to ZL, found a clear frequency to transmit on, and let loose with the CQ and announced my listening frequency. Sure enough, a station with an accent called me on my announced receiving frequency. It turned out to be a G off the back of the beam. The antenna has about 15 dB front-to-back, so it was quite a shock. I swung the antenna around to Europe, and another G and an EA answered my CQs. I turned the beam back to ZL, whereupon a ZL called in. This goes to prove that it never hurts to try something with low power. The vast majority of DX stations run only 100 watts, so if you can hear them, they can usually hear you. You just have to be in the right place at the right time—and low power means there are fewer of both.

Low-power contesting can be exciting and fun. Hopefully with a little experience and perseverance your scores will continue to climb, too!

Low-Power Contesting

By Les Kemble, KG1D

My QTH is located in the rolling hills of Vernon, Connecticut. Participating as an active contester since 1979, I have a fairly modest station, consisting of a KT34XA at 70 feet, a 40-2CD at 85 feet with a dipole on 80 meters, and a ¼-wave sloper on 160. Most of this hardware is fairly new with the majority of my experience coming from a station using a tribander at 40 feet and wires for the low bands.

One of the best ways to make any contest more fulfilling is to set personal goals prior to the start of the competition. This goal can be as simple as challenging someone in your local radio club who might be a little better than you when looking at last year's score.

Another way to maximize your fun is to enter in the Single-op Assisted category. If you're new to contesting and need to learn what's going on, then this is the category for you. Even if you are not new to contesting, you should give this mode a try. It's a real fun way to operate a contest.

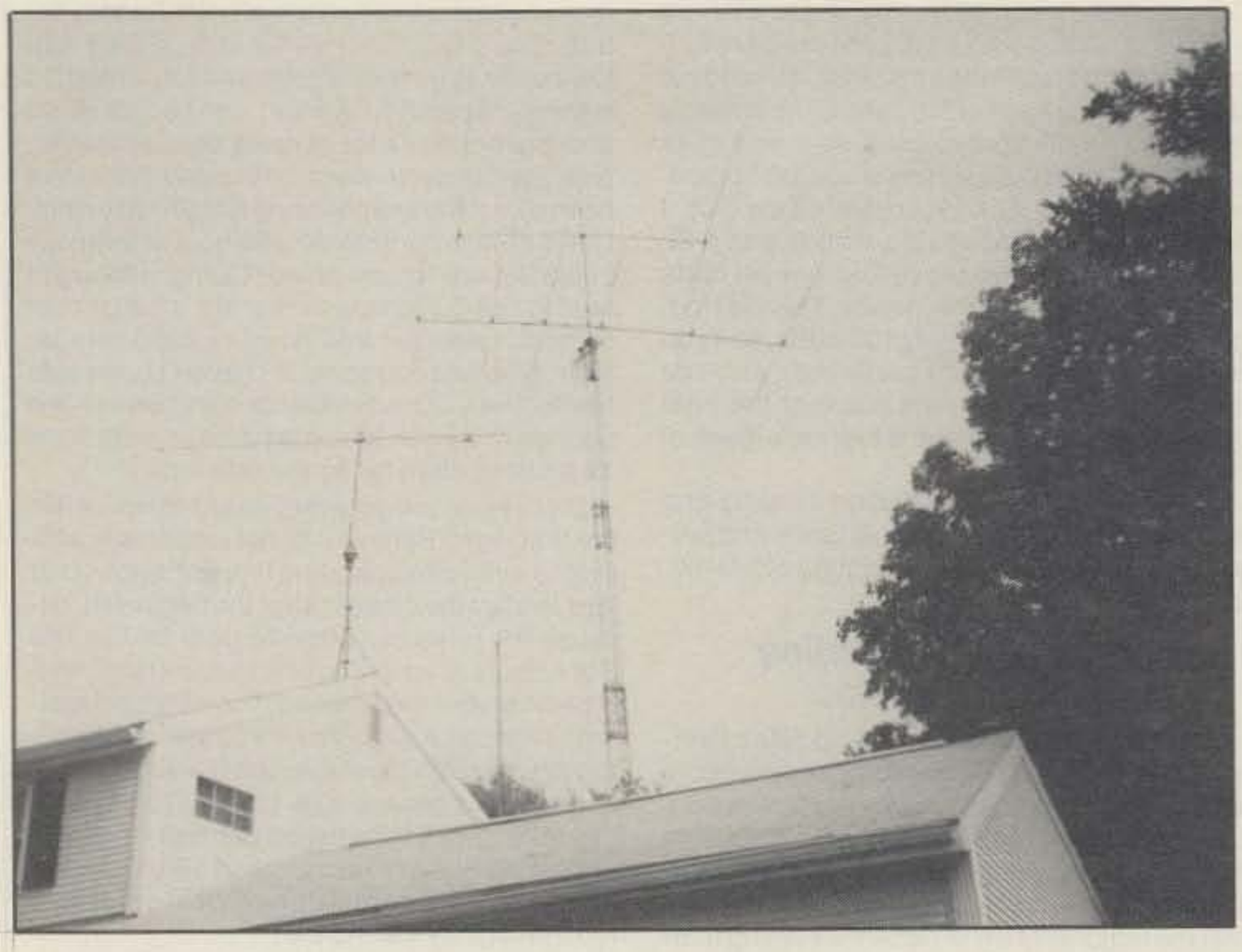
My operating strategy has always been the same. I try to call CQ whenever possible. In many contests I've had to wait until Sunday before I could CQ. From my location, CQing with low power is generally reserved for 10 and 15 meters. "Search & Pounce" can be a lot of fun and it generates a lot of multipliers. However, pickings can get real slim on Sunday if you have been searching and pouncing since Friday night. I have always considered a 60/hour to be an acceptable rate for low-power CQing, although I tend to call CQ as long as the rate is better than 30/hour. I feel that a 40/hour is a good hour for searching and pouncing. If I haven't been able to effectively CQ by Sunday morning, search and pounce rates can become pathetic, with 10 or 15 an hour often being the rate limit.

DX pile-ups are generally easier to work after the first night. Believe it or not (especially with limited available operating time), it's not a bad idea to start the contest after the beginning, because the rates can often be poor for the first 3 or 4 hours. If you're not careful, you can easily destroy your motivation for continuing the effort! With some exceptions, you should be able to work through most pile-ups if your timing is correct. As a general rule, I try to avoid spending more than 5 minutes on Saturday in a pile-up, but on Sunday I may spend 10 minutes (if necessary), depending on how well I am able to run stations by calling CQ.

The one piece of equipment that I consider essential is the computer. The use of computer logging makes contests fun. No longer do you have to spend hours and days after the contest duping and checking for multipliers. At this stage, I would probably not do any contesting if I didn't have a computer to take the drudgery out of the paperwork.

It is essential to work as many countries on 40, 80, and 160 as you can. It can be very difficult to work stations on these bands, but don't despair, as they are workable. Limit your time calling stations in countries that you have already worked on that band. If you have a small tower, you should consider using vertically polarized antennas. I have been able to work sta-

The compact operating position of Les, KG1D.



Here's the winning antenna farm at KG1D. Anyone have a few spare trees?

tions in Europe on 160 meters with an inverted-L at 35 feet!

If you are running single-op and have a second receiver, try tuning up the band rapidly and stopping whenever you hear a pile-up. A lot of the pile-ups are generated by "packet spots," but if you keep track of who is on the band and where they are located, you will be able to tell if it's a new pile-up or not. With patience and good timing, this operating technique can generate many extra multipliers for your score.

In general, the same rules apply to low-power contesting as to high-power contesting. From the East Coast you want to be on the highest band that is open to Europe. Also, be sure that you run the allowable power limit. Some radios suffer from reduced output on 10 and 15 meters. Since these are the most important bands to the low-power contester, it pays to make sure your radio is capable of the full output allowed. Believe it or not, the difference between 50 watts and 100 watts output is significant.

I hope you enter the ranks of low-power contesting. It is a fantastic training ground for anyone wanting to learn the ropes in contesting. See you in the pile-ups!

Operating with Low Power

By Fred Groner, W2TZ

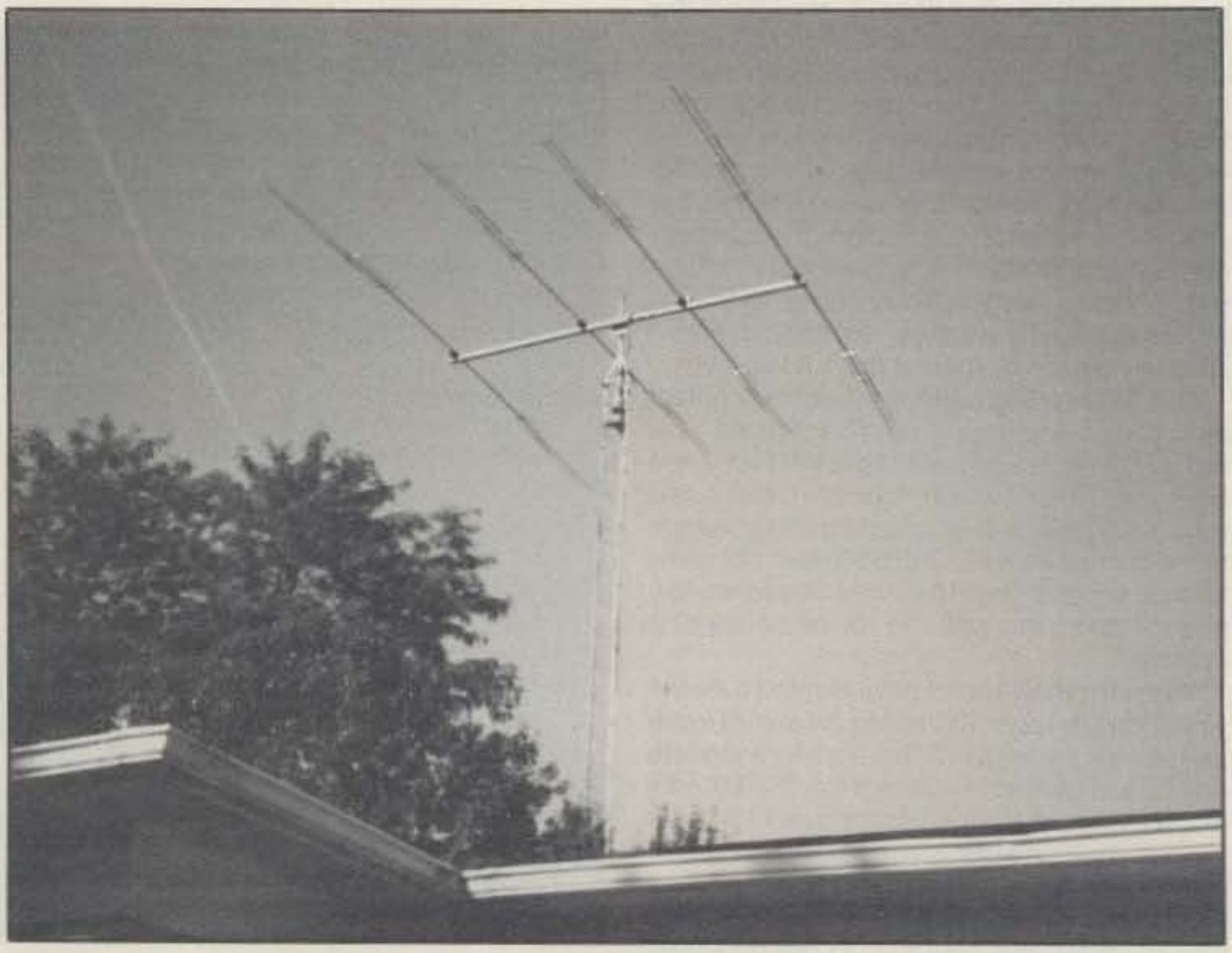
When operating in the low-power category it is very important to know the capabilities and signal limitations of your station on each band. This must be done prior to the contest of interest, and will dictate the actual contest strategy. For example, many of us must obey antenna height restrictions which severely limit the erection and use of the necessary low-angle radiating antennas needed to be competitive on 40, 80, and 160 meters in DX contests. As a result, high-angle radiators of limited DX effectiveness must suffice as contest antennas. These antennas must be evaluated for effectiveness in terms of first simply being heard, and second for the ability to break through pile-ups. If pre-contest testing indicates that you can't be heard well, for example in Japan, but you can be heard in Europe, a strategy must evolve which precludes even trying to seriously work JAs during the actual contest but encourages attempts to work Europe. The strategy is simple: Don't waste time trying to work contest stations who can't hear you.

Running stations is the contester's version of advertising. The strong signal necessary to run stations can be heard far and wide and attracts a crowd. Running stations at high QSO rates is the preferred method in any power class to accumulate QSOs. It is also very important to run stations even at low rates, since running stations allows you to work the many other contest stations who never engage in running themselves, but limit their operation almost entirely to searching and pouncing. Any station forced to operate in this mode 100% of the time, usually due to a weak signal, will have a very low probability of working other stations who also only search and pounce. They simply don't cross paths. If a low-power station can run stations on any band, especially the lower bands, that station has a significant competitive edge over stations who must always search and pounce, and most likely will emerge a low-power winner.

If the low-power station must predominately search for QSOs, he should try so as fast and with as much stealth and cunning as possible. Open your filters wide, and when working one station, be prepared to listen off to the side of your receiver pass-band for the next station to work. Speed and concentration are very important for good search-and-pounce rates. Sometimes it is possible to equal and in fact exceed running rates if good operating techniques are used.

My station consists of a FT-1000D (I formally used a Corsair II prior to winter '92). For antennas I have a KT-34 at 45 feet next to the house facing high trees into Europe and a KT-34XA about 120 feet from the house at 50 feet with a clear shot to Europe. For 40 meters I use a quarter-wave sloper off tower, a folded dipole at 50 feet, and a vertical inverted Vee off tree with the top at 50 feet. On 80 meters I have installed a folded dipole at 50 feet, a vertical inverted Vee with bent ends off a 60 feet tree, and a quarter-wave sloper off my tower fed with a simple loading coil. One-sixty meters is nothing more than a quarter-wave sloper off the tower fed with another loading coil. And yes, I have no computer! Needless to say, you can be successful without a big station.

I have very little interest in contests without



Forty-five foot high KT3Y tribander at W2TZ with sloping wires for 40 and 80 meters.

Say You Saw It In CQ

low power or QRP classes. I really like to compete, but only on a playing field that is as level as possible, realizing that geographical differences are a fact of life. Where geographical differences do dominate the top ten finishers such as the 5's, 6's, and southern 4's in the ARRL Sweepstakes, my objective is to still reach for #1, but being the only 1st, 2nd, or 3rd call area representative in the Top 5 is a great accomplishment and represents, in my opinion, an excellent "non-geographically assisted" contest accomplishment.

Having operated many low-power contests, I have given thought to ways to enhance this popular operating category. The low-power class, if a rules or a spirit change can be effected to maintain the existing power restriction of 100 watts output but also limit participation to stations with tribanders and wires at heights less than 50 feet, would provide a very popular, equitable, and as a result, even more competitive contest class. This would provide a unique aspect to contesting, since comparative scores in the low-power class would then be much more driven by operator ability. Operation in the low-power category with both modest antenna and power-output resources forces operators to learn operating techniques rather than simply running stations and playing "king of the hill" to maintain a running frequency at the lower band edges, which is the present strategy of many high-power and multi-operator stations.

Personally, over the last ten years I have used essentially the same tower and wire height restricted antennas. I feel that the increase in my competitive standing was the result of station engineering, strategy selection improvements, and overall improved contest operating techniques. In my opinion this is what contesting is all about, and makes contesting an excellent creative and constructive aspect of amateur radio. Best of luck!

Final Comments

Next month we be investigating the toughest operating category of all—QRP contesting. In addition to anecdotal commentary, we'll have a surprise view of QRP from overseas as well!

Here's to you and yours—all the best for 1993! And of course, please remember that the deadline for the June issue is April 1st.

73, John, K1AR

Michigan QRP CW Contest

1200Z Sat. to 2359Z Sun., Jan. 2–3

This is the 13th annual CW contest sponsored by the Michigan QRP Club. The contest is open to all amateurs and all are eligible for awards.

Classes: (A) Less than 250 milliwatts. (B) 250 milliwatts to 1 watt. (C) 1 watt to 5 watts. (D) Over 5 watts.

The same station can be worked on each band for QSO and multiplier credit.

Exchange: RST; state, province, or country; and Club membership number. Non-members send power output.

Scoring: Contacts with members 5

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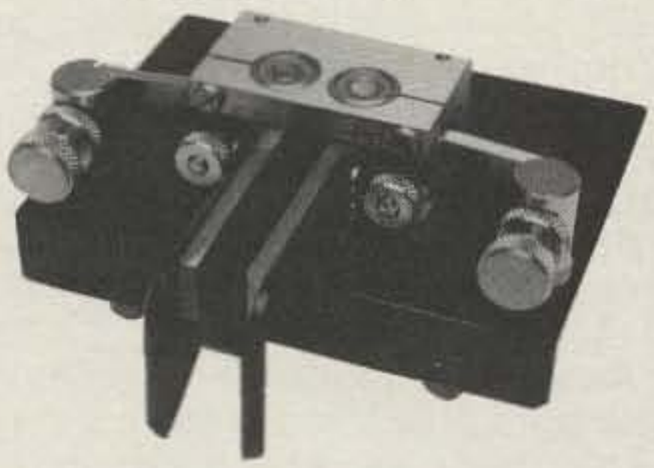

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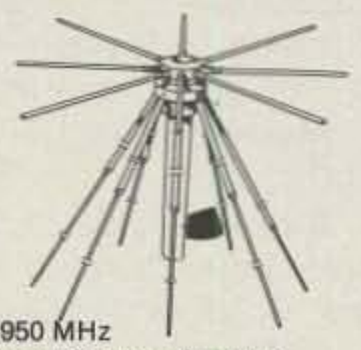

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CIRCLE 37 ON READER SERVICE CARD

January's Contest Tip

A careful review of the previous year's log before a contest can help you in a number of ways. In addition to revealing a scoring target to beat, it can be helpful to make a list of the top 10 to 15 actions you could have taken to improve your score that year and place that list in front of you as a reminder for this year's contest.

points. Non-members 1 point. Bonus of 1.25 if power used is 100% battery, and 1.5 for natural power.

Final Score: Total QSO points × states, provinces, and countries worked per band × power bonus if applicable.

Frequencies: 1810, 3560, 7040, 14060, 21060, 28060, 50060. Novice—3710, 7110, 21110, 28110 kHz.

Awards: Certificates to top scorers in each state, province, and country.

Use a separate log for each band and include a summary sheet showing the scoring, operating class, and equipment used, plus the usual signed declaration.

Logs must be received no later than Feb. 6th by L.T. Switzer, N8CQA, 654 Georgia, Marysville, MI 48040. Include a large SASE for a copy of the results or for sample forms.

ARRL RTTY Roundup

1800Z Sat. to 2400Z Sun., Jan. 2–3

This is the 5th annual all-digital contest sponsored by the ARRL. Any station may work any other station worldwide. You may operate more than one digital mode, but QSOs and multipliers are counted once only regardless of modes used.

Operation is limited to 24 hours out of the 30-hour contest period. Two rest periods must be taken in two separate blocks of time and clearly marked in the log.

Modes: Baudot, RTTY, ASCII, AMTOR, and packet.

Bands: 3.5–30 MHz on those frequencies recommended for digital operation (no 10, 18, or 24 MHz).

Categories: Single operator, multiband, (1) less than 150 watts output, (2) 150 watts or more. And multi-operator, single transmitter, all band.

Exchange: Signal report and QTH. State for the U.S., province for Canada. DX will send a serial QSO number.

Scoring: One point per QSO. A station may be worked once per band for QSO credit.

Multiplier: Each US state (48), each VE province (12), and each DXCC country, counted only once, not once per band. (KH6 and KL7 are countries; VO1/VO2 counts as one VE province).

Entries with 200 or more contacts must submit a duplicate QSO check sheet.

Awards: Certificates to the top-single operator, both low and high power, and multi-operator scorers in each ARRL/CRRL section, and each DXCC country. Novice/Tech entrant with at least 50 QSOs will also receive a certificate.

Detailed information appeared in the November issue of *QST*. Contest forms are available from the ARRL for an SASE and two units of first-class mail and are recommended.

Postmark your entry by February 3rd and send it to: ARRL RTTY Contest, 225 Main Street, Newington, CT 06111.

1993 North American QSO Party

CW: 1800Z Sat. to 0600Z Sun., Jan. 9–10
SSB: 1800Z Sat. to 0600Z Sun., Jan. 16–17

The object of this one is to work as many North American stations (and/or other stations if you are in North America) as possible during the contest period. North American stations are defined by the rules of the CQ WW DX Contests with the addition of KH6.

Classes: Single operator and multi-operator, two transmitters. Multi-operator stations shall keep a separate log for each transmitter and must have at least 10 minutes between band changes. Use of helpers or spotting nets by single operator entries is not permitted. Single operator entrants may only have one transmitted signal at a time. Output power must be limited to 150 watts for eligible entries. Multi-operator stations may operate for the entire 12 hour period. Single operator stations may operate 10 out of 12 hours. Off times must be at least 30 minutes in length and must be clearly marked in the log.

Mode: CW only in CW parties. Phone only in phone parties.

Bands: 160–10 meters only (no WARC bands). You may work a station once per band. Suggested frequencies are 1815, 3535, 7035, 14035, 21035, and 28035 (20 kHz up from band edge for Novice) on CW; and 1865, 3850, 7225, 14250, 21300, and 28450 on phone. Try 10 meters at 1900Z and 2000Z, 15 meters at 1930Z and 2030Z, and 160 meters at 0430Z and 0530Z.

Exchange: Operator name and station location (state, province, or country).

Scoring: Multiply total valid contacts by the sum of multipliers worked on each band. Multipliers are states (including KH6 and KL7), Canadian call areas (VE1–VE8, VO1, VO2, VY1, and VY2) and other North American countries. Do not count USA, Canada, KH6, or KL7 as countries. Non-North American countries do not count as multipliers, but may be worked for QSO credit.

Team Competition: Team competition is limited to a maximum of five single operator stations as a single entry unit. *Pre-*

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For more information on Bearcat radio scanners or to join the Bearcat Radio Club, call Mr. Scanner at 1-800-423-1331. To order any Bearcat radio product from CEI call 1-800-USA-SCAN.

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PWB-C Passport to Worldband Radio
LIN-C Latest Intelligence by James Tunnell
NPD-C Uniden National Police Directory
FBE-C Uniden Eastern Frequency Directory
FBW-C Uniden Western Frequency Directory
ASD-C Air Scan Directory
TSG-C Top Secret Registry of U.S. Govt. Frequencies
TTC-C Tune in to Telephone Calls
CBH-C Big CB Handbook/AM/FM/Freeband
TIC-C Techniques for Intercepting Communications
EEC-C Embassy & Espionage Communications
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contest Requirement: To qualify as a team entry, you must register the name, callsign of each operator, and callsign of the station operated should the operator be a guest at a station other than his own (e.g., N4RJ op. by KM9P). Teams must be registered with KZ2S.

Penalties: For each unmarked duplicate QSO, you lose that contact plus an additional three contacts; for each QSO for which you are not in the other station's log, you lose that QSO plus an additional one contact; and for each QSO for which the log data is incorrectly copied in any respect, you lose that contact. Entries with score reductions greater than 5% will be disqualified.

Awards: A total of five trophies will be awarded for the high score in each of the following categories: Single Operator CW and Phone, Multi-Operator CW and Phone, and Single Operator Combined score. Certificates of merit will be awarded to the highest scoring entrant with at least 200 QSOs from each state, province, and North American country.

Send all North American QSO Party entries to John Golomb, KZ2S, 107 Bailey Corner Road, Wall, NJ 07719. Entries must be postmarked not later than 30 days after the party to be eligible for trophies and awards. Logs may be submitted on disk in the form of files generated by K8CC's NA program or MS-DOS ASCII files.

HA DX Contest

2200Z Sat. to 2200Z Sun., Jan. 16-17

Sponsored by the Hungarian Radioamateur Society, this is one of several very popular Eastern European contests. The contest is CW only and stations may be only worked once per band.

Exchange: RST plus serial number (599001). HA stations will also send a two-letter code corresponding to their county. The possible codes are: BA, BE, BP, BN, BO, CS, FE, GY, HA, HE, KO, NO, PE, SA, SO, SZ, TO, VA, VE, ZA.

Scoring: Count 6 points per HA QSO and 3 points for non-HA QSOs on other continents. Final score is total QSO points times sum of HA counties worked per band.

Entries are due 6 weeks after the contest and should be sent to: Hungarian Radioamateur Society, Box 86, Budapest H-1581, Hungary.

ARRL VHF Sweepstakes

1900Z Sat. to 0400Z Mon., Jan 23-25

This is the 46th ARRL January VHF Sweepstakes. ARRL Headquarters recommends that you use the official log forms. It will make your log keeping and the scoring much easier. A large SASE to Newington will get you the necessary forms.

Complete rules will be found in the December issue of *QST*. They are a bit complicated, so look them over carefully.

CQ WW DX 160 M Contest

CW: Jan. 29–31 SSB: Feb. 26–28
2200Z Friday to 1600Z Sunday

Complete rules were published in the November issue. The following is a brief rundown.

Exchange: RS(T) and QTH. State for the U.S., areas for Canada, country abbreviation for DX.

Scoring: Contacts with stations in own country 2 points, other countries in same continent 5 points, and with other continents 10 points.

Multiplier: Each U.S. state (48), Canadian area (13), and DX country. (ARRL and WAE country lists and WAC boundaries are the standards.)

Awards: Certificates to the top-scoring stations in each U.S. state, Canadian area, and DX country. And an assortment of 14 plaques for U.S. and world winners.

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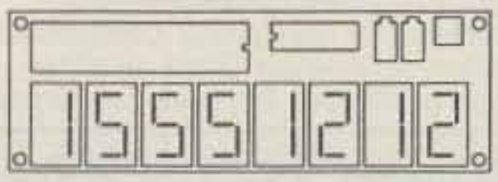

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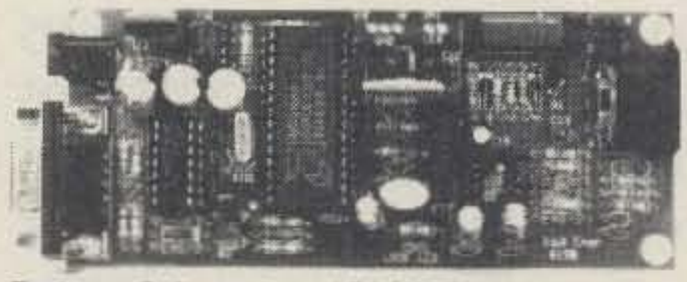

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B1-5K	5KW Precision 160 - 10 M, SO-239 in, WIRE out	$28.95
C1-2K	2KW 'Retro-Fit,' Balun, PL-259 in & PL-259 out	$18.95
4KRF-LI	4KW 'Retro-Fit' Balun, SO-239 in, PL-259 out	$23.95
4K-LI	4KW RFI Line Isolator, SO-239 in & SO-239 out	$19.95
4KV-LI	4KW Line Isolator for Verticals, SO-239 in, PL-259 out	$23.95
Y1-4K	4KW 'Yagi Balun' 160-10M, for beams, SO-239 in, WIRE out	$24.95
Y1-5K	5KW 'Yagi Balun' 160-10M, for beams, SO-239 in, WIRE out	$29.95

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B4-2K	Precision 2 KW 80-10M balun, SO-239 in, WIRE output	$27.95
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CIRCLE 59 ON READER SERVICE CARD

Penalties: Three contacts will be deleted for each duplicate that has not been removed.

Disqualification: Taking credit for excessive duplicate contacts, and the usual assortment of rules violations and unsportsmanlike conduct.

Mailing deadline for logs is February 28th for CW entries and March 31st for the SSB section.

They can be sent directly to the 160 Contest Director, David L. Thompson, K4JRB, 4166 Mill Stone Ct., Norcross, GA 30092. They can also be sent to *CQ* 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801. **Be sure to indicate CW or SSB on the envelope.**

ARRL Novice Roundup

0001Z Sat. Jan. 30 to 2359Z Sun. Feb. 7

It's a nine-day long contest, but only 30 hours of actual operating time is permitted for scoring.

Novice/Tech will work each other and higher class licensees who, of course, are limited to contacting Novice/Tech only. All bands and modes open to Novice/Tech can be used.

Exchange: Signal report and ARRL section (country for DX stations).

Scoring: One point for phone QSOs, two points for CW, including RTTY and packet.

Multiplier: Each ARRL section plus each DXCC country. There is also a bonus for stations holding a code proficiency certificate.

Final Score: Add your code bonus to your QSO points total and multiply that total by your multiplier.

Awards: Certificates to every Novice/Tech who submits a valid entry. Higher class licensees are not eligible for awards.

The use of official forms is not only highly recommended, but is a *must*. A large SASE to ARRL Novice Roundup will get you a contest package with all the necessary forms. The January issue of *QST* had a detailed announcement with suggestions and operating details not covered here.

Postmark your entry no later than March 7th to: ARRL Novice Roundup, 225 Main Street, Newington, CT 06111.

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This one is sponsored by the Belgium Amateur Radio Union (U.B.A.) and is any station working any other worldwide. Numerous operating awards are available and contest QSOs may be credited towards these awards.

Classes: 5 categories exist—Single Operator, All Band/Single Band, Multi-Operator/Single Transmitter, QRP 5 watts, and SWL.

Frequencies: CW—3500-3560, 7000-7035, 14000-14060, 21000-21060, 28000-28060 kHz. SSB—3600-3650, 3700-3800, 7040-7100, 14125-14300, 21175-21350, 28400-28700 kHz.

Exchange: RS(T) and consecutive serial number. Belgian stations also give their province abbreviation.

Multipliers: All Belgian Provinces, prefixes: ON4-9, DA1-2, and European Community countries.

Scoring: QSOs with ON count 10 points. European QSOs count 3 points. All others are 1 point. Final score is total QSO points times total multipliers.

Awards: There are several awards available, including trophies and certificates to the high scorers in each operating class.

Send your final results no later than 30 days after each contest mode to: UBAHF Contest Committee, Galicia Jan, ON6JG, Oude Gendarmeriestraat 62, B-2220 Heist Op Den Berg, Belgium. Note that logs may also be submitted on disk in K1EA or ASCII format.

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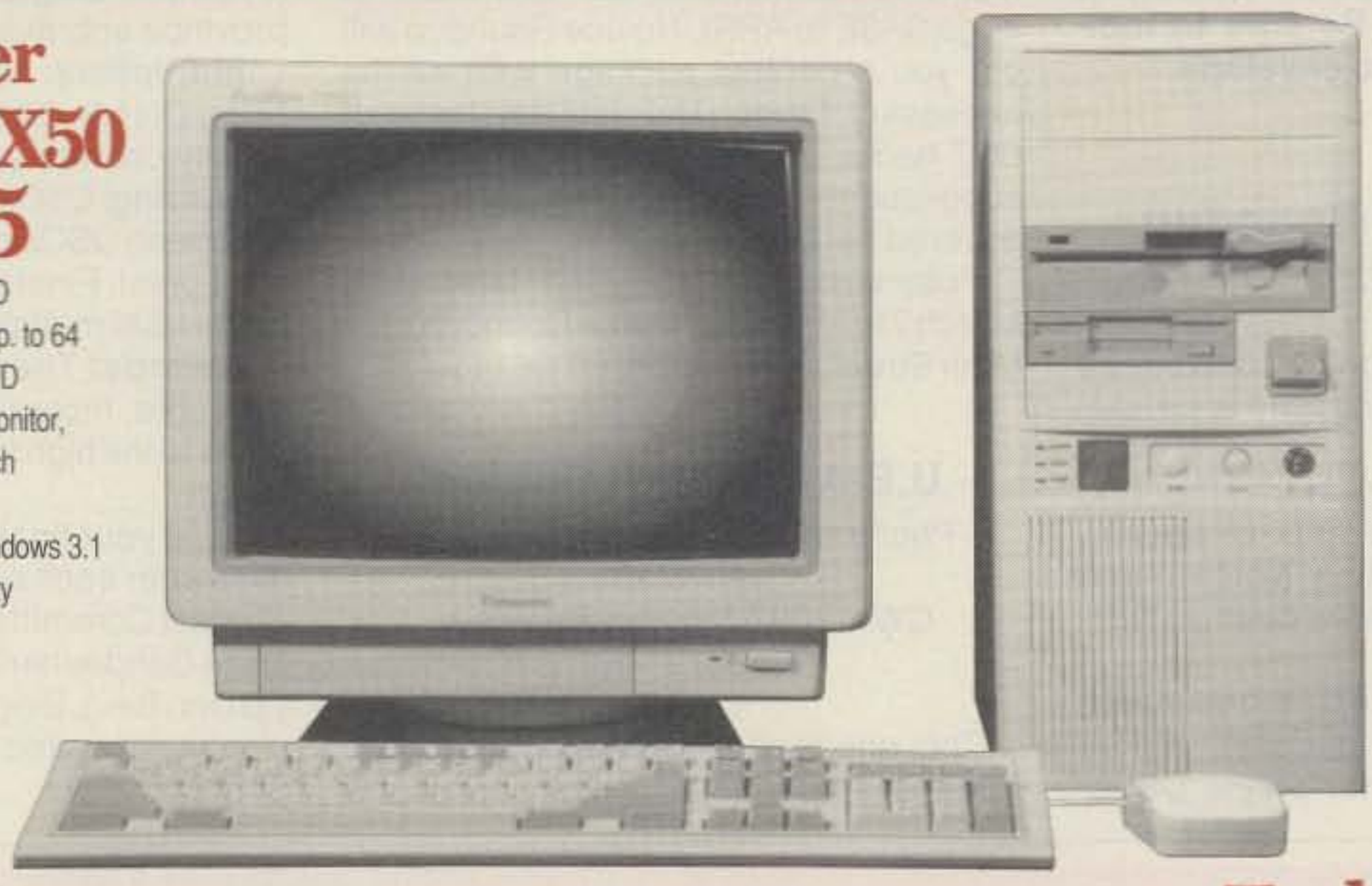

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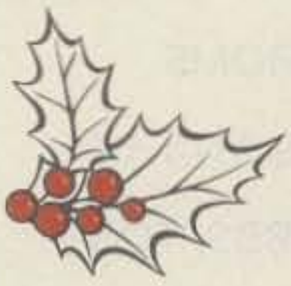

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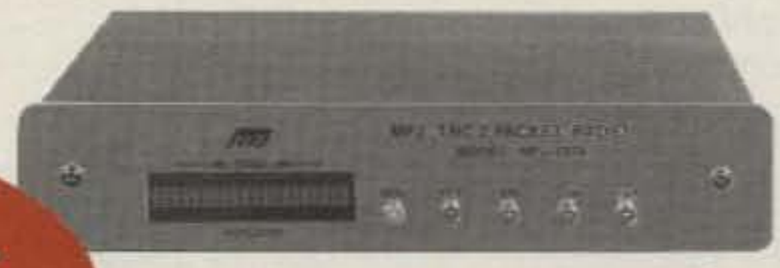

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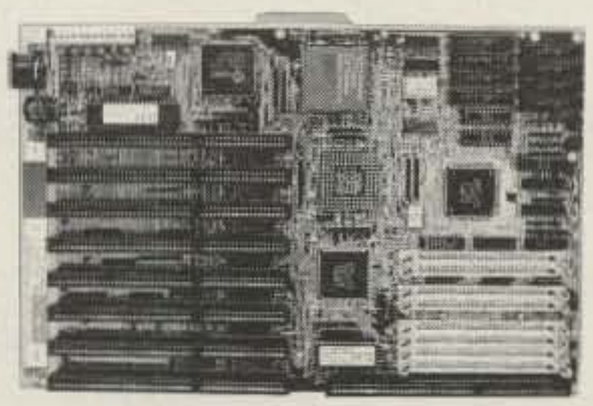

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CIRCLE 179 ON READER SERVICE CARD

MATH'S NOTES

BY IRWIN MATH, WA2NDM

WHAT'S NEW AND HOW TO USE IT

First of all I would like to wish all of my readers a very Happy New Year with the hope that all of your dreams will be fulfilled in this coming year.

Before starting, I would like to thank all of you who have written with your nice comments on my "memorial tribute" last fall to the Heath Company and the sad demise of Heathkits. In particular, I would like to thank WA3WZX, W5OEV, WB5UDA, and W3IK for their comments. It is sad when "institutions" go by the wayside, but ever and onward, as they say. Now down to business.

The need for a high-frequency amplifier is, at least in my shack, a fairly common occurrence. Whether for a driver stage or receiver front end, quite often the need arises for something more than can be provided by a simple op-amp or general-purpose transistor. With experimentation routinely moving up to the GHz region, building efficient, wide-band, low-noise amplifiers at a reasonable cost is an even more challenging task.

This month's column will examine a simple solution to high-frequency amplifier selection in the form of a series of integrated devices manufactured by Mini-Circuits (P.O. Box 350166, Brooklyn, NY 11235-003). These devices are their MAR-series of low-cost, high-frequency amplifiers. While not necessarily state of the art in performance, they are certainly hard to beat, especially by the average experimenter. Table I shows the various important parameters and costs of the individual units.

As you can see, performance and price are ideal for amateur (and commercial, for that matter) purposes. The MAR-6 makes a great front end, as it exhibits 20 dB of gain and a noise figure of only 3 dB all the way to 2 GHz. The MAR-3 and MAR-4 are fine drivers offering 8 to 12 dB of power gain and a maximum output of +10 to +12 dBm (approximately 10 milliwatts). The MAR-8 offers the unheard of 32.5 dB gain, an output greater than 10 milliwatts, and a noise figure of 3.3 dB. These are clearly devices with which to be reckoned.

Using the MAR-series is quite simple if a few precautions are taken. The amplifiers are provided in tiny surface-mount-type plastic housings as shown in fig. 1, and a typical amplifier circuit is shown in fig. 2. No other components are necessary. Although gain is present down to DC, there is a DC offset due to biasing, and the use

Device (No.)	Cost (1-24)	Bandwidth (MHz)	Gain (dB)	Output (dBm)	Noise Figure (dB)
MAR-1	$0.99	DC-1000	18.5	1.5	5.5
MAR-2	$1.35	DC-2000	12.5	4.5	6.5
MAR-3	$1.45	DC-2000	12.5	10.0	6.0
MAR-4	$1.55	DC-1000	8.3	12.5	6.5
MAR-6	$1.29	DC-2000	20.0	2.0	3.0
MAR-7	$1.75	DC-2000	13.5	5.5	5.0
MAR-8	$1.70	DC-1000	32.5	12.5	3.3

Table I– Parameters and costs of the MAR-series amplifiers manufactured by Mini-Circuits.

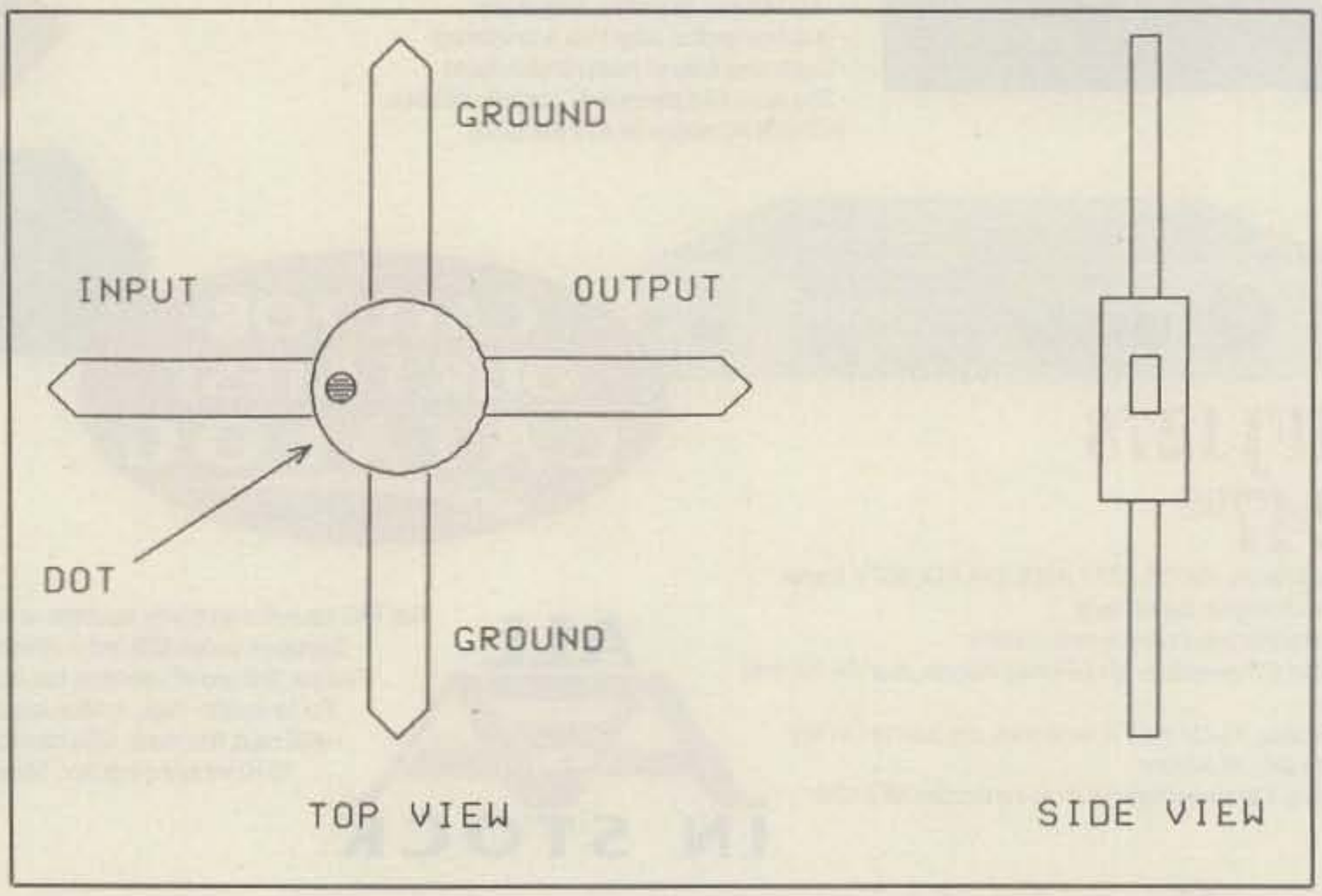


Fig. 1– Typical MAR-series amplifier.

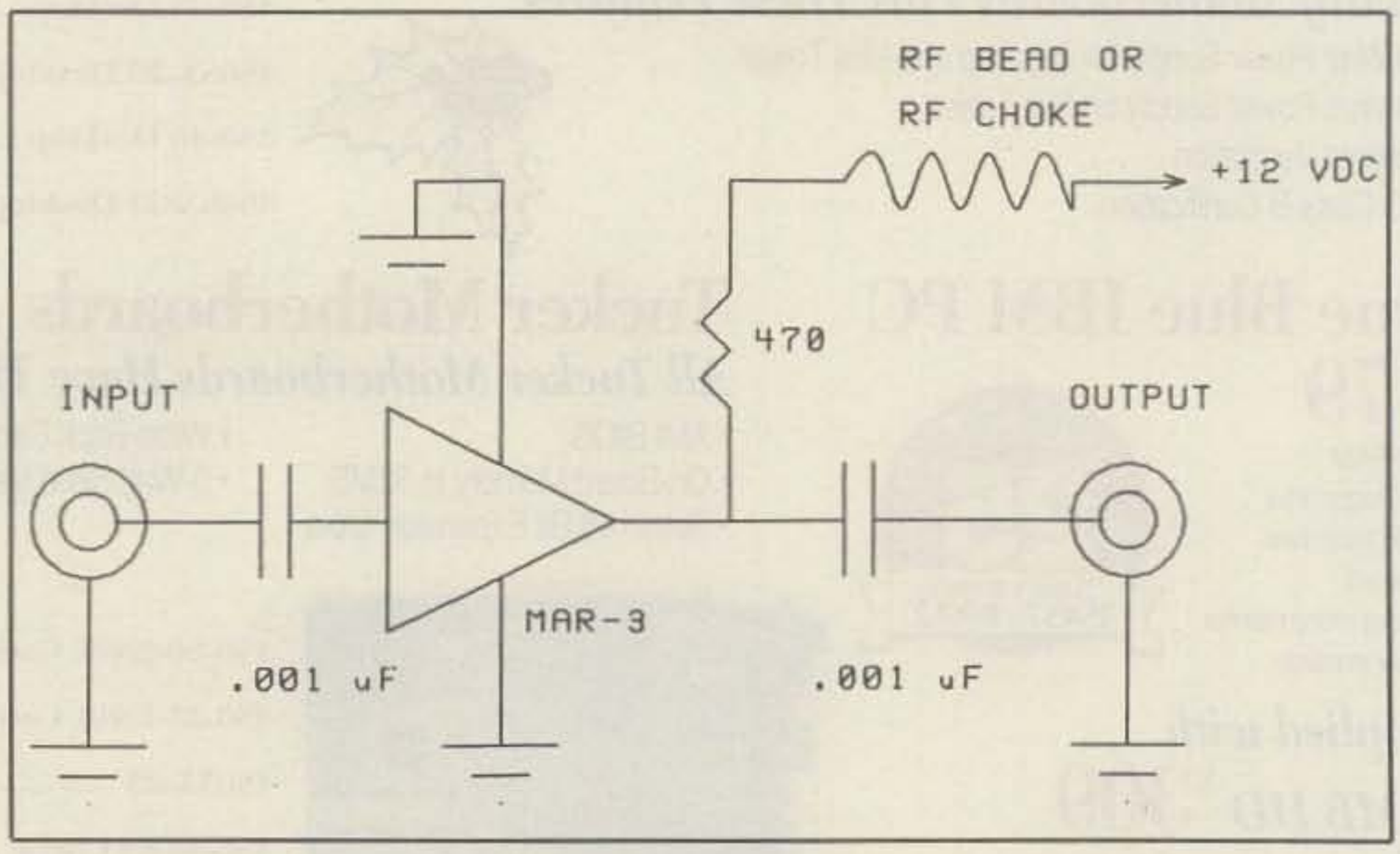


Fig. 2– Typical MAR amplifier circuit.

c/o CQ magazine

Say You Saw It In CQ

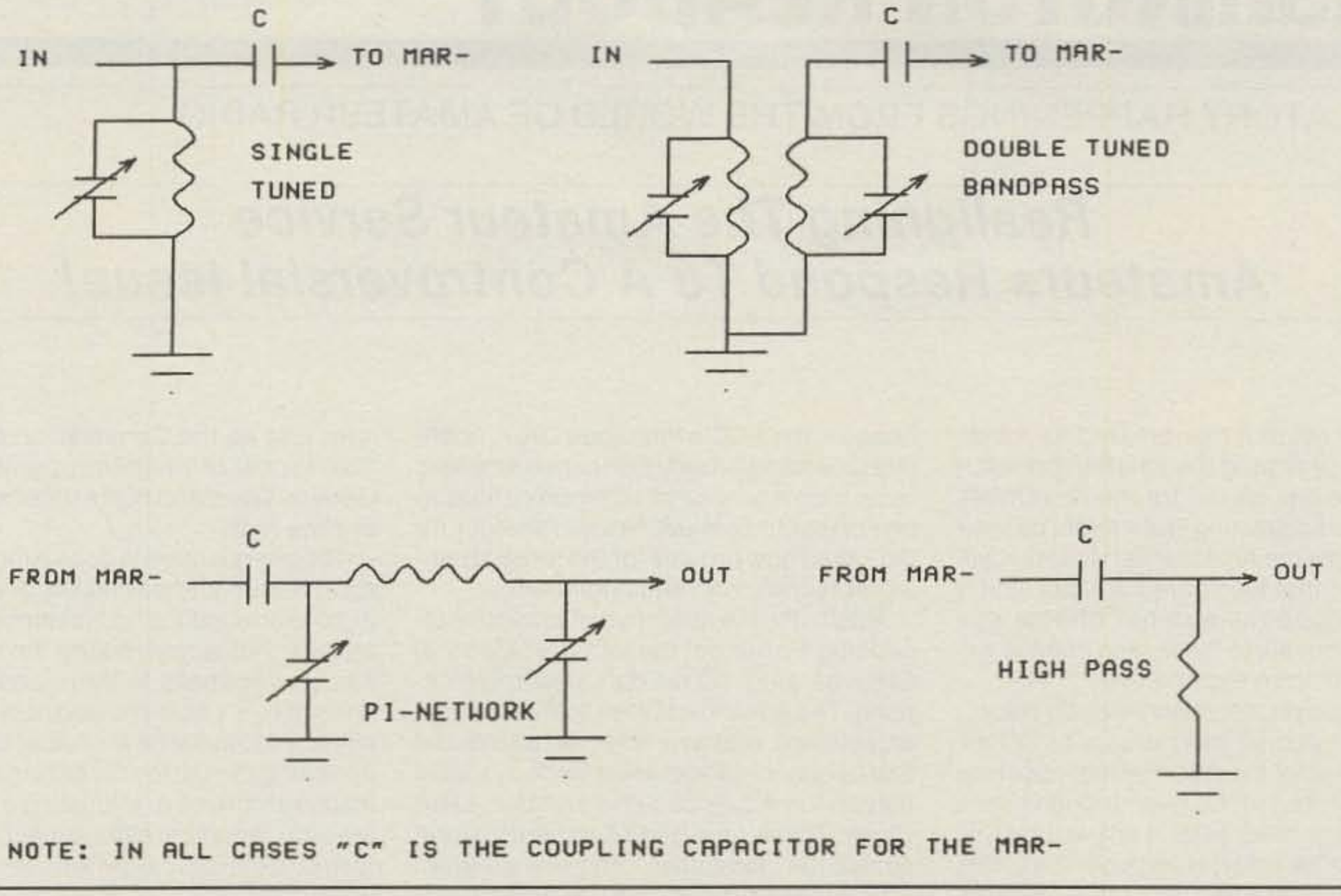


Fig. 3– Typical tuned-circuit inputs and outputs.

of coupling capacitors as shown is recommended.

Because the MAR-series amplifiers are very-high-frequency devices, shielding, bypassing, and a p/c ground plane are a must or they will oscillate (believe me). A double-sided G-10 circuit board with one side etched for connections and the other side unetched for ground works quite well. As with any amplifier, keep input and output leads away from each other. In the case of a tricky circuit, you might even wish to orient a small piece of unetched circuit board material over the ground pins to shield input and output.

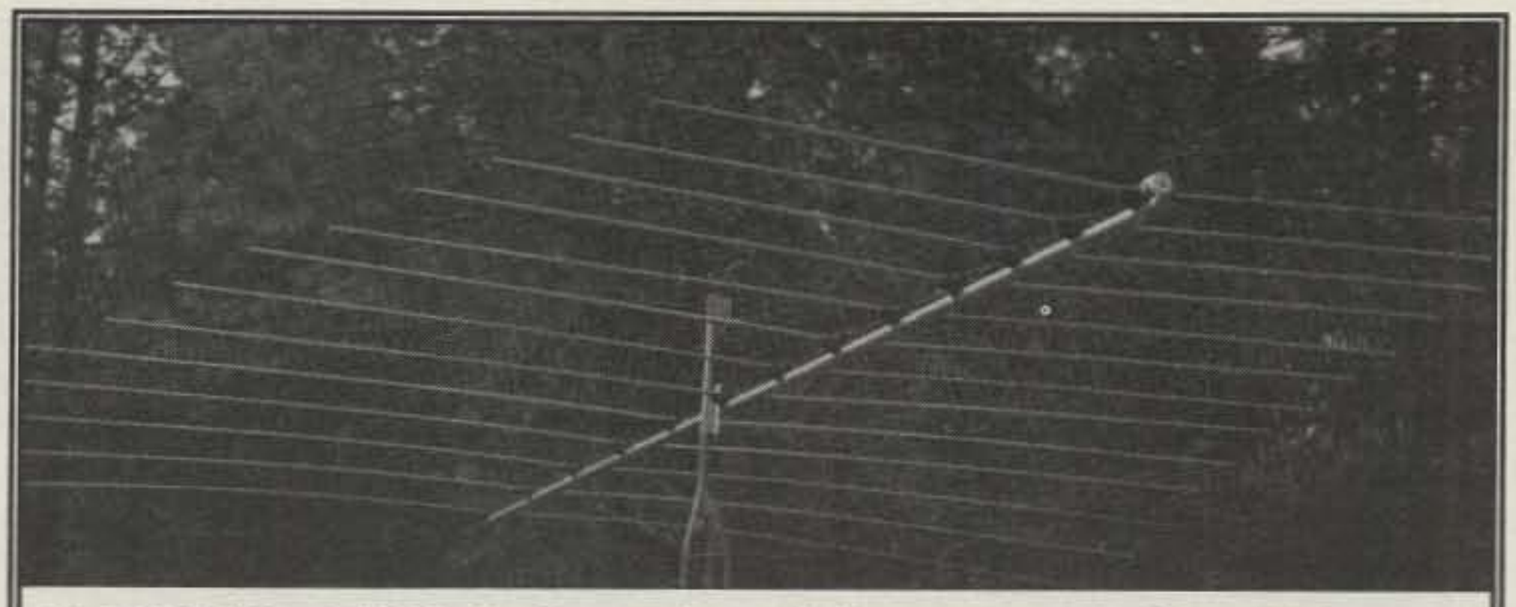
The circuit shown in fig. 2 can be modified by adding tuned circuits to the input or output to vary the bandpass, if desired. All amplifiers exhibit a 50 ohm input and output impedance, and the tuned circuits should be designed accordingly. A couple of examples of various types of tuned circuits that can be experimented with are shown in fig. 3. The value of the coupling capacitor can also be chosen to limit the low-frequency response. Since the amplifiers are basically 50 ohm devices, the .001 uF caps shown will give a low-frequency roll-off of about 2.5 MHz. The use of .01 uF caps will lower this to 250 kHz, while 0.1 uF caps will result in a low-frequency roll-off of 25 kHz. Since elaborate feedback networks are not required with these amplifiers, external bandwidth controlling devices are not dependent on the amplifier itself. Finally, you can stack units to obtain even more gain, but be careful that you do not exceed the maximum output level and that you isolate inputs and outputs. They can and will easily oscillate if you do not use good high-frequency RF practices.

For those experimenters who would like to apply these devices, Mini-Circuits has a designers kit, called the DAK-2, that contains 5 of each MAR amplifier for a total of 35 devices. This kit costs $59.95 and is available from them by calling 718-934-4500 during normal working hours. (Mini-Circuits accepts VISA and American Express.)

I would be interested in any amateur-radio-oriented devices that you build with these amplifiers, and will be glad to publish the more versatile circuits for the rest of our readers.

See you next month.

73, Irwin, WA2NDM



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CIRCLE 32 ON READER SERVICE CARD

WASHINGTON READOUT

BY FREDERICK O. MAIA, W5YI

REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

Realigning The Amateur Service
Amateurs Respond To A Controversial Issue!

No *CQ* column has created as much controversy among the amateur community as the one we did for the November 1992 issue suggesting that it might be time to streamline the Amateur Service. You will remember that we floated an idea which would reduce the number of amateur classes from six to three, and license examinations from eight to five.

Due to production lead time, it is necessary that I submit this column to *CQ* six weeks ahead of the date that the magazine will be distributed. So even though this is the January 1993 issue, I am writing this column on Monday, November 2nd. This issue should appear in your mailbox somewhere around the third week in December. I bring this to your attention only to emphasize that the November issue has only been "out there" for just a couple of weeks, and by far, the majority of responses have yet to come. I have gotten dozens and dozens of replies already, however, enough to pretty much know where the amateur community stands on the issue.

Before we go into the amateur reaction to realigning the U.S. Amateur Service, we feel it is appropriate to tell those who may not have seen the November issue just what this is all about.

The United States has the most amateur radio license classes and qualifying license examinations of any country in the world. Most countries seem to have three classes—usually a beginning class, a no-code VHF class, and an all-band class. We have what amounts to six license classes —Novice, Technician, Technician Plus Code, General, Advanced, and Amateur Extra—which are granted by passing eight different written and telegraphy examinations. We wondered if they are all necessary. We said that we thought the entire Amateur Service testing and licensing system had become overly complex and is in need of simplification and reorganization.

It has been some 25 years since the last major overhaul of U.S. amateur classes. Supported by the American Radio Relay League, the FCC's infamous 1967 Incentive Licensing program changed amateur radio from a service of communications to one of electronics education. Amateur radio would now provide for the forced training of technicians and engineers.

Basically, the objective of Incentive Licensing was to get the lethargic General Class amateur off his duff to learn something. The Advanced Class license was reestablished, and new reserved phone and CW frequency blocks were made available only to the Advanced and amateur Extra Class. These new band segments represented the "incentive." The new program affected every class, and as a whole, existing amateurs lost frequency and operating rights. If you got more proficient at amateur radio, you got them back. It didn't go over well at all.

The Incentive Licensing Docket No. 15928 (released August 29, 1967) provided for seven examinations which conferred five license levels. In 1987 Element 3 was split into 3(A) and 3(B), and we now have eight different examinations. And due to 1991's No-Code proceeding, there are now six different amateur radio classes. As you no doubt know, we now have both code and no-code Technician versions.

Was Incentive Licensing accepted by the amateur community back then? Absolutely not! Actually, the average amateur was outraged. And how has it worked out since then? It apparently has not. The same problems given as the reason behind Incentive Licensing still exist today, only more so.

Today amateur radio is a different ball game. The entry level is now the no-code Technician and not the Novice Class. The number of applicants choosing the Novice "code" path is now drastically reduced. We have to give the FCC credit where credit is due. They wanted to abolish the Novice class and let beginning amateurs learn the code later. While I didn't share that position, it appears that is exactly what new amateurs are doing!

FCC statistics for Fiscal-1992 show 40% less newcomers chose the Novice route than the previous year. The number beginning at the Technician level, however, has more than doubled. Clearly, the newcomer is choosing no-code entry into the hobby. And they are learning the code later just as the Commission predicted. The number of amateurs upgrading to the General Class and higher licenses is at an all-time high.

The big question is does America need six amateur license classes conferred by eight examinations? In November I floated an idea that would reduce the number of amateur licenses to three and examinations to five. I also showed how this could easily and legally be implemented without upsetting the current licensing and examination programs or infuriating existing amateurs. Canada greatly simplified and restructured their Amateur Service two years ago.

I said one way restructuring might be accomplished is to reduce the number of license classes from six to three and examinations from eight to five by:

1. Combining the Novice and Technician to a no-code BASIC Class.
2. General would become the INTERMEDIATE Class, except the code requirement would be 5 wpm.
3. Advanced and Extra Class would be combined into an EXPERT Class with 13 wpm telegraphy.
4. The three written examinations would be 50 questions each. The current question pools would be combined and used.

Mail and Phone Calls Galore!

I asked November readers of this publication to tell us how they felt about reducing the complexity of the U.S. amateur radio licensing structure. Well, a bunch of amateurs were inspired to take pen in hand to tell us—and some in no uncertain terms! As of this writing, the November issue has just "hit the street," but we have already gotten over 150 pieces of mail and phone calls. Every day they come in!

Many of the responses were just simple QSL postcard-type messages in agreement (or disagreement), such as that from Bob, W4NWF, of Venice, Florida. Bob (who holds QCWA membership No. 3562 and OOTC No. 122 going back some 60 years) simply said "Fred, I agree with your realignment proposal for licenses." But we also got a lot of well-argued letters and phone calls, too. Here is a representative sampling so far.

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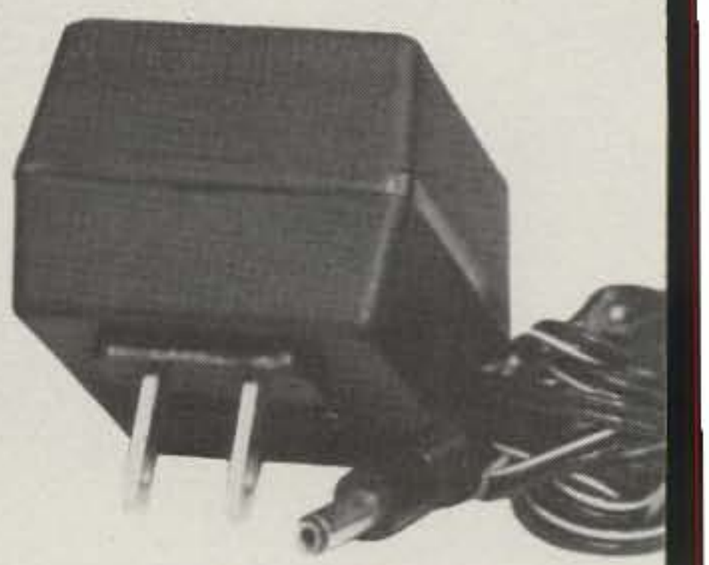

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CIRCLE 173 ON READER SERVICE CARD

"We need to do as the FAA has done and begin a program of periodic proficiency reviews to retain the privilege (not right) of using the Amateur Radio Service. Pilots have a two-year obligation to prove their skills and knowledge to a certified flight instructor to retain their flying privileges.

"If CW was half as important as claimed, we should be required to periodically demonstrate our CW skills, regulations and theory knowledge. . . . There are only four license levels for pilots, and two of those are really professional rather than private licenses. The lowest license, recreational, requires the basic skills for local flight and [licensees are] prohibited from leaving a 50 mile radius. This corresponds rather well to the VHF privileges of the current no code license. The private rating allows the pilot to fly a U.S. registered aircraft anywhere in the world . . . worldwide communications if you will.

"The purpose of amateur radio is not the enjoyment of the operators, that is a side benefit, but to meet several vital national interests. Those would be enhanced by your proposal. I have been licensed for 12 years and also hold foreign license YN1LCB." . . . *Larry, KA5HKR, Jackson, Mississippi*

"Forget the names [Basic, Intermediate, Expert]. It is far better to call them Class I, II, III; or Class A, B, C. I believe Germany has but one test, with the class of license determined by how many questions are answered correctly. That would simplify matters, for sure. I believe an 'Intermediate' should hold their license at least 12 months before becoming eligible to hold an 'Expert' license. The person could take the exams at any time, but the privileges could not be used until the time limit is passed.

"I am sick and tired of dealing with Amateur Extras and Advanced licensees who know nothing or little about operating. The theory would have to be fairly tough and appropriate to today's usage. Incentive licensing almost stopped amateur radio growth in its tracks and alienated many Generals at the time. My major concern is your program may lower technical requirements. While the no-code license was at least 30 years overdue, let's not make it too easy to get a higher class license." . . . *Robert, AACY (ex-WN2MCB, 4X6FY, KT2D), Littleton, Colorado*

"I wish to write representing many very upset amateur radio operators who, like me, have survived the back-stabbing Incentive Licensing fiasco of the sixties which blatantly 'removed' our privileges and caused countless good hams I'd known to sell their equipment and quit. To this day there remains a bad taste for what occurred.

"Are Extra Class hams any better than Advanced or General? Listen to the Extras on 14.313 or 14.205 MHz or all across 20 and 75 meters for that matter.

"This proposal of yours has turned the local repeater into chaos. Everyone's afraid of what happened in the sixties. I'll be darn if I want to lose my privileges again. *(Editor's note: Actually no one loses privileges; all* existing *privileges would be 'grandfathered.' To become an 'Expert,' however, an Advanced would have to pass Element 4[B].)*

"Has Incentive Licensing worked? Everyone associated with the hobby over 15 years or so knows very well it has failed in every way. If it were my idea, I'd grandfather all the Generals with 20-plus years experience along with all Advanced and Extras into one class. In doing so there would be at least some retribution for past privileges lost and a feeling of 'Okay, someone cares and is trying to help bring us back together again.' Incentive Licensing divided us when we once walked together as one." . . . *Steve, K3DEM, Bethlehem, Pennsylvania*

"Stop trying to fix what isn't broken! Amateur radio is no different than any other club or organization. You have to do certain things to stay a member or to join a group. 'New' may work better, but old is more fun. Leave it alone." . . . *Anonymous/Unsigned*

"It is our belief that CW is an archaic and totally outmoded form of communication which is now hindering the expansion of the Amateur Radio Service. It is also our belief that many people are just not able to advance in the skill of CW despite years of practice. I have been a licensed Technician for over 15 years. After countless hours of practice, I can still not pass 13 wpm. I've already taken the test 5 times this year. Due to my CW inability, I am banned from operating voice on all amateur HF frequencies save for the small sliver on 10 meters which I actively use. I know of several people who are now obtaining 'disability' waivers to avoid having to pass CW tests. Many of these people are hardly disabled unless you consider them to have CW learning disabilities. I have owned and maintained a 220 MHz repeater for nearly 15 years. I have WAS on 10m SSB and have received the ARRL Public Service Award for disaster communications—all as a Tech.

"We are fully aware that some of the 'old guard' still clings to CW as a 'right of passage' to keep the lids, kids and space cadets out of the hobby. But if you listen to all the garbage currently on HF and look up the license class of the 'problem' operators, you will find that many are

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Advanced and even Extra class operators. This surely kills the argument. We certainly feel that 5 wpm is more than adequate to fulfill the international treaty requirements for HF operation." . . . *Tom, WB8VMI, Lexington, Kentucky*

"I agree with you completely. The whole procedure has gotten ridiculous in its complexity. Let's get it simple and straight forward again. I was first licensed in 1939 when there were only two grades of privileges. It worked then and it should work again now." . . . *Robert, W9BAR, Eau Claire, Wisconsin*

"I have read some of your other articles, most of which I didn't like either. It seems to me, for whatever perverted reason, you want to give the ham bands away to a bunch of illiterates. . . . it would be nice if they could at least own a soldering iron and attach their own coax connectors. . . . I have talked with many other people that say there is little or no intelligent life between .3 and .5 on 28 MHz and on 2 meter FM. These are the same duds that you want to give the ham bands away to. Keep the ham bands the way they are." . . . *John, WADYU, Pocatello, ID*

"I want to express my displeasure with the complete idea, but approval partially to help any streamlining that may be needed. My age is 67 years old and I got started in ham radio at age 66. I passed my 20 wpm and Extra written exam on Sept. 5, 1992.

"I worked and worked and sweat blood to get all the code and math required to pass all the tests and proud to have been able to do it. When you work hard to obtain a goal you appreciate it more than if you don't.

"At the current rate new licenses are being issued, all frequencies will be completely overrun very soon. If you aren't careful, ham radio will be like CB radio. There are already a lot of bad apples on the air.

"I do not object to your three new question pools or licenses, only that to obtain them should not come easy and band access should not change significantly from what it is now. Personally, I do not like CW, but in order to obtain 'Expert,' I feel 18 to 20 wpm should be part of the requirement." . . . *Wally, NPMI, Rogersville, Missouri*

"I am all for it and so are 12 other senior citizens I know. I am 78 and it is very difficult [for me] to get the 13 wpm code test. I enjoy 10 meter phone and I hear hams calling CQ on 15 and 20 meters and I cannot reply. Not every General uses the code. . . . As long as we can pass 5 wpm, that should be enough. Hams today have top equipment and do not have to be radio engineers." . . . *San, N9MHM, Northbrook, Illinois*

"The present system is needlessly complicated. . . . My guess is there is going to be strong opposition from the 'Old Timers.' But perhaps enough new blood will be heard to accomplish something. I was originally WN3FZY back in 1956, then K4PCN and later K1RNS. I have just gotten back after a 25 year vacation as N8OEE. Am a Tech with a BSEE." . . . *Tom, N8OEE, Kent, Ohio*

"It is about time people like you should stop playing with the lives of amateur radio operators such as what you have been trying to do over the years. . . . I did not become a radio amateur until the age of 42 years. I obtained a Novice call (WN2OZW) and a Technician license which I never used. I am now 70 years old and believe any change from an Incentive Licensing type structure and making it easier to obtain a ticket would crowd the bands and make this another CB band. Listen anywhere between 26 and 28 MHz when the band is open. I feel strongly we should pay a reasonable fee and this money should go directly to the FCC and not to the General Fund. This money should be used to examine all grades of licensing.

"Morse code . . . is another language to most of us. Its ability to get through is a documented fact. Downgrading 20 wpm to 13 wpm is not the answer, and giving the candy store away to others just to simplify the testing system does not ring true in my thinking. When one sends and receives 30 to 35 wpm with QSK (full break in) it is a different world. Why screw up the first 25 kHz on most bands? Listen to those sending with new Amateur Extra calls. Many sound [like] they should be on the Novice portion. Stop playing God for us amateurs." . . . *Paul, K2OZ, Park Ridge, New Jersey*

"Recently several of us had been discussing that very subject. We thought the FCC should streamline the licensing classes. It will make it easier to understand who has what privileges and it is bound to help the FCC with administration with less classes to keep up with. It certainly would make the classes more in line with real world operating. Good luck with the proposal. I am sure there will be a lot of opposition from the 'I had to do it so you should have to do it' group. I agree with your proposal, although I am not sure it might not be better to go with two classes—code and codeless—but I am sure that would have even more opposition." . . . *Dennis, N4ZHR (M.D.), Tullahoma, Tennessee*

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"Every now and then, someone begets an idea that makes so much sense that we all wish we had given birth to it! Your treatise on the reorganization of amateur licensing in the November issue of *CQ* is such a bombshell!

"Oh, I can already hear the 'old boys' saying that it will mean the end of Amateur Radio, and moaning about the demise of 'real QSOs.' But they are wrong again, just as they were wrong about no-code licensing. The 'flood' of new guys into the amateur ranks via the no-code has been good for the hobby, bringing in people who have good ideas, have quickly learned good habits, and are not the ones who attempt to ruin a QSO by illegally interfering. It has been a shameful blot on the hobby that the ones caught in such miserable activity by the FCC have been long time licensed hams. . . . I don't dislike CW operation. I just do it the modern way—with a computer." . . . *Wil, N6FNR, Boise, Idaho*

"Five classes of licenses is unnecessary and always has been. My support is not selfish. I have no real need or desire to upgrade. I am a Tech Plus currently. The time for a national revamp is NOW!" . . . *Mac, KB8FNQ, VP Madison County Amateur Radio Club, Columbus, Ohio*

"I was licensed in 1958 as Technician Class at that time requiring 5 wpm code and the full written General test. I think the restructuring as you stated will give both new prospective and old hams greater access to friends throughout the world. Thanks for a great article! I hope this article will bring you a few thousand letters." . . . *Burt, K8SNT, Coconut Creek, Florida*

"I have felt for many years that the present set up of incentive licensing has been wrong right from its original start in the 60s. Many of my friends are still General Class because they feel that losing the privileges they once had was an insult to their intelligence. In effect, one day smart and the next day stupid. Myself, all I had to do was go take the exam. No study was required for me to pass. However, I lost a day's work and pay. I have never forgiven the ARRL for this stupid program of incentive licensing. It has not and will not accomplish a thing." . . . *Ken, KN2A, San Jose, California*

"I worked for 7 years to upgrade from Advanced to Extra Class. I finally completed the last hurdle in March when I passed the code test after several unsuccessful tries. Now you, and others like you, want to take it away from me, or at least cheapen my accomplishment, by giving away what I had to work for, to all existing Advanced Class. I say, enough is enough! Your proposal is a great example of what is wrong with this country today. Those who are not willing or motivated to work for what they want are constantly calling for lower standards. I sincerely hope that your proposal falls on deaf ears for the sake of the Amateur Service. Unfortunately, this proposal will appeal to many who stand to gain something for nothing. The real loser is the Amateur Service and our country's reputation. This is but one more step towards making this country second rate." . . . *Jack, K7EHI, Ogden Utah*

"I believe that while incentive licensing is not all bad, the present structure has not been as conducive to amateur radio growth as intended. Thus, it's time to take some corrective measures.

"Reducing the classes of licenses from 6 to 3 is a worthwhile step and your suggestions for

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SL-11R	•	•	7	11	2⅝ × 7 × 9¾	12
SL-11S	•	•	7	11	2⅝ × 7⅝ × 9¾	12
SL-11R-RA		•	7	11	4¾ × 7 × 9¾	13

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RS-4L	3	4	3½ × 6⅛ × 7¼	6
RS-5L	4	5	3½ × 6⅛ × 7¼	7

RM SERIES

MODEL RM-35M

- 19" RACK MOUNT POWER SUPPLIES

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H × W × D	Shipping Wt. (lbs.)
RM-12A	9	12	5¼ × 19 × 8¼	16
RM-35A	25	35	5¼ × 19 × 12½	38
RM-50A	37	50	5¼ × 19 × 12½	50
RM-60A	50	55	7 × 19 × 12½	60
• Separate Volt and Amp Meters				
RM-12M	9	12	5¼ × 19 × 8¼	16
RM-35M	25	35	5¼ × 19 × 12½	38
RM-50M	37	50	5¼ × 19 × 12½	50
RM-60M	50	55	7 × 19 × 12½	60

RS-A SERIES

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MODEL	Colors Gray	Colors Black	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H × W × D	Shipping Wt. (lbs.)
RS-3A		•	2.5	3	3 × 4¾ × 5¾	4
RS-4A	•	•	3	4	3¾ × 6½ × 9	5
RS-5A		•	4	5	3½ × 6⅛ × 7¼	7
RS-7A	•	•	5	7	3¾ × 6½ × 9	9
RS-7B	•	•	5	7	4 × 7½ × 10¾	10
RS-10A	•	•	7.5	10	4 × 7½ × 10¾	11
RS-12A	•	•	9	12	4½ × 8 × 9	13
RS-12B		•	9	12	4 × 7½ × 10¾	13
RS-20A	•	•	16	20	5 × 9 × 10½	18
RS-35A	•	•	25	35	5 × 11 × 11	27
RS-50A	•		37	50	6 × 13¾ × 11	46

RS-M SERIES

MODEL RS-35M

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H × W × D	Shipping Wt. (lbs.)
• Switchable volt and Amp meter				
RS-12M	9	12	4½ × 8 × 9	13
• Separate volt and Amp meters				
RS-20M	16	20	5 × 9 × 10½	18
RS-35M	25	35	5 × 11 × 11	27
RS-50M	37	50	6 × 13¾ × 11	46

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VS-12M	9	5	2	12	4½ × 8 × 9	13
VS-20M	16	9	4	20	5 × 9 × 10½	20
VS-35M	25	15	7	35	5 × 11 × 11	29
VS-50M	37	22	10	50	6 × 13¾ × 11	46
• Variable rack mount power supplies						
VRM-35M	25	15	7	35	5¼ × 19 × 12½	38
VRM-50M	37	22	10	50	5¼ × 19 × 12½	50

RS-S SERIES

MODEL RS-12S

- Built in speaker

MODEL	Colors Gray	Colors Black	Continuous Duty (Amps)	ICS* Amps	Size (IN) H × W × D	Shipping Wt. (lbs.)
RS-7S	•	•	5	7	4 × 7½ × 10¾	10
RS-10S	•	•	7.5	10	4 × 7½ × 10¾	12
RS-12S	•	•	9	12	4½ × 8 × 9	13
RS-20S	•	•	16	20	5 × 9 × 10½	18
SL-11S	•	•	7	11	2¾ x 7⅝ x 9¾	12

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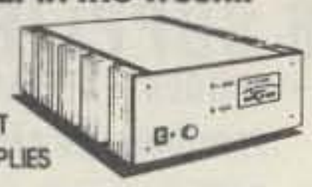

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re-arranging and combining seem reasonable. And dropping the 20 wpm code requirement leaving 5 wpm and 13 wpm in place is a laudable move. Personally, I have been a ham for 60 years and hold an Advanced Class ticket and am fully prepared to take the Extra Class written exam and can reasonably copy 20 wpm. But being 75 years of age, I cannot write fast or legibly enough to put down the full text being sent at 20 wpm so I have not taken the Extra Class exam. Frankly, many hams feel as I do that 20, 25, or 30 wpm is fine if you are an ardent CWer but not a necessary skill for a quality Amateur Radio Service, especially in today's technical environment. Good luck with your efforts and thanks for having the best interests of amateur radio at heart." . . . *Keith, W5SQS, Buchanan Dam, Texas*

"Having passed my Extra Class exams at the age of 69, I consider this license readily attainable by anyone with a serious interest in ham radio. The key word is 'serious.' Softening of the requirements for the various classes of licenses will not develop the quality of the radio ham, merely increase the number of equipment operators. Getting a ticket today is far different from getting one in 1946 when I got my Class B ticket . . . having to drive all night to get to the Federal Building in Buffalo, New York to take the FCC administered exam. The code test was 10 wpm and we had essay-type questions and drew circuits. Making the tests any easier is going to put more QRM on the bands, not grow a crop of smarter and more capable hams. The No-Code ticket is as far as we should go on simplifying getting a ham ticket. Let's drop this license revision idea—FAST!!!" . . . *Carl, W2RWH, Leesburg, Florida*

"I am writing to say that I completely agree with the conclusions you reached in your article. You make the case well that the Amateur Radio Service has evolved dramatically over the years, and the current state of equipment and new modes of communications are far different from the early days of radio. CW is no longer the mainstay of communications in the Amateur Service and as such should no longer be the artificial barrier to upgrading one's license. Certainly there will be those who believe that the lessening of this requirement will open the floodgate [of beginners who will use] the sacred air space of those who had to master CW.

"Current realities of communications are such that the amateur radio community must take action to safeguard and guarantee the lifeblood of our service, our frequencies granted by the FCC. It is clear that the existence of our frequency privileges is contingent upon our use of them and moreover upon the future commercial demands outside of amateur radio for access to them.

"I am now looking forward to taking the test for a General license. Out of necessity I have worked for months to improve my proficiency at sending and copying CW. I have to confess that I now get more enjoyment out of CW than talking on Phone. So true to the original objectives of incentive licensing, I'm working to develop my skills so that I may gain greater access to the various bands available to General and higher licenses. Yet, having said this, I still come to the conclusion that providing broader access to HF without the code barrier would be an ideal way to expand the use of those frequencies." . . . *Doug, KB5SZZ, Socorro, New Mexico*

"After reading your article in *CQ*, I can't help but wonder just what our hobby will be like in years to come. . . . it always appears that obtaining an amateur license is getting easier. I've seen Novices get voice privileges of HF and no-code licenses. Years ago, when tested by the FCC, you really needed an understanding of electronic theory as well as knowing the code . . . rather than just studying questions and answers in a book. I believe a license is something that is worth working for, and not just handed out. To me, it seems that is the direction in which the amateur community is headed and it worries me. I used to be a CBer many years ago and I don't want to see the hobby I enjoy so much going in that direction. . . . *Joe, KA3CNC, Levittown, Pennsylvania*

"I have been in ham radio since the 1930s and have written many articles for ARRL in both *QST* and the *Handbook*. Most of the vacuum tube amplifiers in the handbook over the past 15 years have been built and designed by me. This is in no way tooting my own horn, but to show you I have some technical background.

"I concur 100% with your thoughts. I was against the present incentive licensing program from the start as being more of an ego trip than an incentive. I am sure you can get full support from QCWA and other groups. I suspect that QCWA can come up with some additional ideas for you to ponder." . . . *Dick, W1QWJ, Winchester, New Hampshire*

"My main crusade is for a truly technically oriented Amateur Radio much more consistent with the art and science of wireless. The ideal with current allocations would be a two class structure. First, a 50 MHz and up, no-code [license] with a written test difficulty of Extra as the Basic Class. Then a second [class] for all bands with a stiffer test, also no-code. Since my childhood, the service has been a dear interest, but one that missed its potential and I've lost heart in it." . . . *Lee, N3LC, Lorton, Virginia*

"Let's go one more step: a no-code class and a code class, period! International rules state that only a knowledge of code is needed for an amateur radio license, 5 wpm in most countries. I was first licensed in 1970 as WN4WUQ, then as a Tech as W4WUQ. The garbage I hear on the low bands, language, attitudes, etc., has played a big role to keep me from going on and upgrading over the years. CW plays an important part in the operating I do on VHF, UHF, and SHF . . . especially on moon bounce. There is, however, not an importance on how fast I can go, but the accuracy of the contact!

"The majority of traffic being passed in today's radio communications is not CW but packet. There is more accuracy in packet than CW ever knew. Today's appliance operators don't need a skill of fast CW to plug in a radio and start talking." . . . *Dalton, N4OYS, Murfreesboro, Tennessee*

"I'm here to tell you that I'm fed up with this kind of foolishness! America in general is becoming illiterate and selfish in its policies. Selfish meaning that anyone should (and can) get whatever they want, whenever they want it. Most hams who are active in the hobby do not like anything that has happened with the licensing structure to date. Those who operate on anything but 2 meters, which is an 11 meter extension thanks to you and your co-horts, are dead against an easier path towards licensing. We are tired of guys like you cheapening the system." . . . *Patrick, KM5L, Lancaster, Texas*

"Will miracles ever cease! Finally someone has seen the light regarding amateur radio exams as they are now composed. [We should] stop trying to make mathematical geniuses instead of amateur radio operators. There is a need for basic electrical knowledge and how to apply it to antennas, TVI/RFI, and operating procedures. With today's vast commercial developments, however, who in heaven's name even thinks he can build a rig. It's time for a change and convincing the League will be a huge obstacle.... I am in complete support of your proposal to restructure license exams. . . ." . . . *Gene, WA6HAD, Los Gatos, California*

"When I tune around the bands, I hear any number of explicit sexual acts being described and kidded about, people, for lack of the English language, cursing in every sentence they utter, arguments falling short of a fist fight, injections of perversion in QSOs, people who go around jamming QSOs and nets, out of license class operation.... The greater majority are Generals and Advanced. I will oppose any petition through my Congressman and Senator to bring or unite my class of license with any lower class." . . . *Harry, NI4P, Robards, Kentucky*

"Amateur radio is changing from a high tech hobby of the 50s to a personal communications hobby of the 90s." . . . *Jim, WB9CEP, Indianpolis, Indiana*

"I do not enjoy CW but I spent the time (a lot of time) and effort to get the Extra Class. The code did not come easy for me, but at age 57 I passed my Extra requirements. Now someone proposes lowering standards and giving Advanced Class the same benefits of Extra without any effort at all. Two wrongs do not make a right. The error of 1967 will become the error of 1992. I feel that I and all Extra Class hams would have been cheated." . . . *Salvatore, NX2R, Closter, New Jersey*

"Your ideas to simplify the licensing structure make a lot of sense. Press onward with them." . . . *Bruce, KA8TIO, Dodge City, Kansas (General Class and an M.D.)*

"It is past time for changes. I would go even as far as to say that two classes of license would be better. When I came into ham radio in November 1955 while in high school at Macon, Georgia, I started with Novice and six months later was General with all privileges. Later I passed the re-added Advanced which was no license incentive. It was just plain recouping a loss of what was already earned. I want your group to do all it can to bring things up to date...." . . . *Hugh, K4GVG, Dry Branch, Georgia (OOTC and QCWA)*

For the record, we have received about 150 responses so far with 75% in favor of some form of restructuring of the Amateur Service and simplifying licensing. And we are still *very much* interested in your views! Please send them to us in any form you can, but preferably a letter with arguments, to: The W5YI Group, P.O. Box 565101, Dallas, Texas 75356.

Until next month . . .

73, Fred, W5YI

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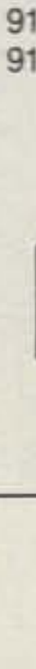

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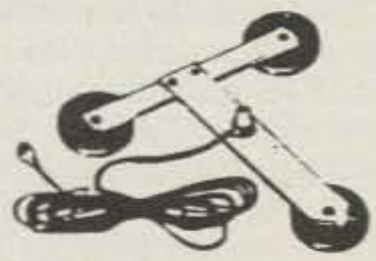

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UG255 SO239 to BNC plug adapter, Amphenol	4.75
UG255TS SO239 to BNC Teflon Silver	5.95
SO239AM UHF chassis mt receptacle, Amphenol	.89
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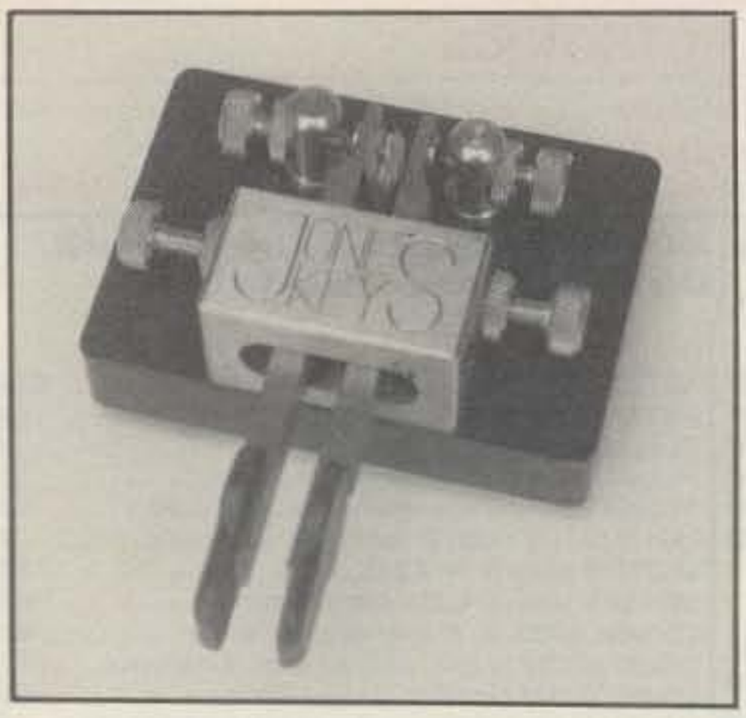
CQ SHOWCASE

Alinco SR4 and SR4-D Repeater Controllers

Alinco's SR4-D is a multi-mode repeater controller capable of simplex and duplex repeat. Both the SR4 and SR4-D also offer a voice-mail system, automatic voice or CW IDer, time-out timer, and 2.8 minutes of digital voice storage. The SR4 has all of the above functions with the exception of duplex operation. It can be upgraded to SR4-D specs with the addition of a plug-in board (the DK-4), which can be installed by the user.

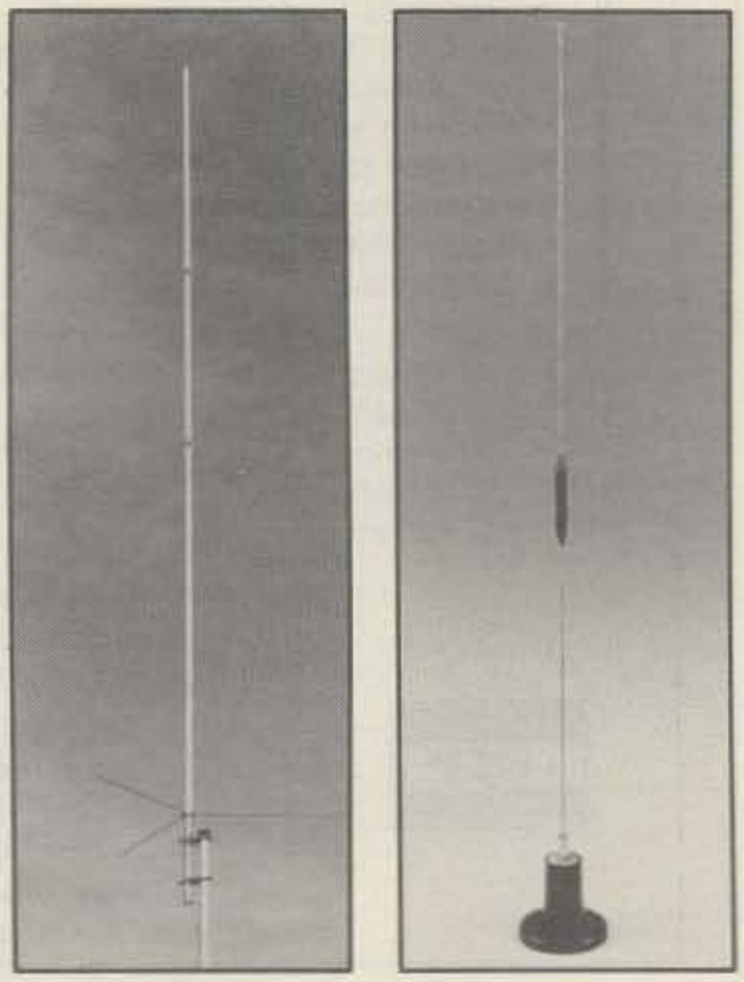
The units are designed and produced in the USA and are boxed in 16-gauge steel cases. Dimensions are 1.75" × 6" × 10.5". Both units are configured with a 5-pin mobile mic connector wired for Alinco mobiles. Optional adapters are available for hookup with Kenwood, ICOM, and Yaesu mobiles, and a bare wire interface cable is available for other specialized installations. The SR4 is priced at $399.95; SR4-D $534.95; DK-4 (upgrade kit) $154.95. For more information, contact Alinco Electronics, 439 Amapola Ave, Ste. 130, Torrance, CA 90501 (310-618-8616), or circle number 105 on the reader service card.



Jones Dual Paddle Key From Palomar Engineers

The new dual paddle key from Peter Jones of England is for the experienced CW operator and has design features requested by members of the First Class Operator's Club. It has a one-piece brass block enclosing four rotary ball race bearings and two tension springs. There are individual adjustments for each paddle for spring tension, contact spacing, and paddle height. Paddle spacing is also adjustable. Fine pitch brass screws with instrument knurled heads are provided for tension and contact spacing adjustment (no tools required).

The brass mechanism is mounted on a steel plate finished in lustrous red cellulose. Total key weight is 3½ pounds. Each key has a serial number engraved on the brass block. Price is $135 plus $4.00 shipping/handling. For more information, contact Palomar Engineers, P.O. Box 462222, Escondido, CA 92046 (619-747-3343), or circle number 106 on the reader service card.



Dual-Band Antennas From Cushcraft

The dual-band,high-gain fiberglass base antenna, the ARX270, with 9 dB VHF and 12 dB UHF gain, features non-metallic joints to eliminate pattern distortion and maintain a low angle of radiation. The antenna has a VSWR under 2:1 for the 2 meter and 70 cm bands. The 16.5 foot, 5 pound ARX270 incorporates a PC matching network for high-stability operation and has a wind survivability of 90 mph. A factory-installed pigtail feed facilitates weatherproof connections. Available with either UHF or type N connector (a no-charge option), the ARX270 is factory-tuned and includes steel mounting hardware.

The CS270M is a high-gain, dual-band mobile magnetic-mount antenna for 2 meters and 70 cm. The antenna is 36½" high and offers 3.7 dB gain on 2 meters and 6 dB gain on 70 cm. The antenna also has a low angle of radiation. The CS270M comes with a 90 pound pull magnetic mount, low-loss Ultralink cable, and a standard PL259 connector. The all-brass, 50 ohm constant impedance mount eliminates seizing, making the whip easy to remove.

For more information, contact Cushcraft Corp., P.O. Box 4680, 48 Perimeter Rd., Manchester, NH 03108 (603-627-7877), or circle number 103 on the reader service card.

Ham View Products From PDK Company

PDK Co. has announced a line of MS Windows based software and hardware products for amateur radio. The Ham View Products line includes separate but integratable programs for logging, packet, and rig control, plus rig interfaces for Yaesu, ICOM, and Kenwood. Log View provides real-time QSO entry and database windows, award tracking, real-time and batch QSL management, contest modes, keyboard keyer, and more, and is priced at $85. Pack View provides point and shoot DX spot selection and communicates spot information to Log View and Rig View for automatic log information and rig tuning; it is priced at$35. Rig View comes in three different models—Yaesu, ICOM, and Kenwood—and is priced at $35. PLUS 232 is a 50 MW active cable that connects the rig to the computer's RS232 port; price is $49.95.

For more information, contact PDK Co., 46 Oak Street, Dunstable, MA 01827 (508-649-4360), or circle number 107 on the reader service card.

The "Perth" From Outbacker

Outbacker Antenna Sales has introduced a low-profile, high-performance, all-band, HF mobile antenna built in western Australia by Terlin Aerials. The antenna is composed of a 4 foot fiberglass shaft and a 3½ foot stinger. The shaft offers fast and easy manual band switching, and the stinger provides simple SWR adjustments. The Perth can be installed on any standard 3/8 × 24 mount, bumper, or trunk lip, and is rated at 150 watts PEP. The stinger retracts inside the fiberglass shaft for stowage. Seventy-five through 10 meter band switching is accomplished via a wander lead, a shorting lead used on the exterior of the shaft.

For more information, contact Outbacker Antenna Sales, 330 Cedar Glen Circle, Chattanooga, TN 37412 (615-899-3390), or circle number 110 on the reader service card.

Northern Lights Software *RealTrak* v. 8.3

Northern Lights Software has announced *RealTrak*, version 8.3, a computer program for

(continued on p. 130)

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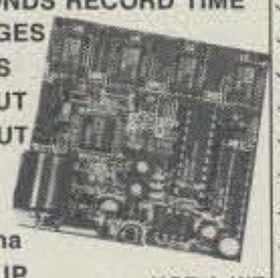

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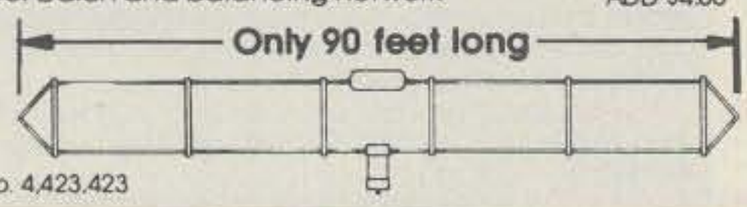

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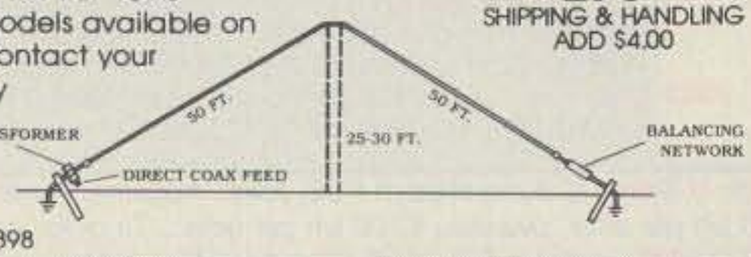

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CQ SHOWCASE *(from p. 128)*

satellites and moonbounce. The program tracks Earth-orbiting satellites, the Moon, the Sun, planets, noise sources, and other celestial objects. *RealTrak* operates in real time, continuously updating the orbiting object's azimuth, elevation, distance, Doppler shift, and other information. Data are calculated approximately once every second on PC-XT class computers, 50–60 times/second on '486 computers. *RealTrak* controls antennas through the Kansas City Tracker or several other inexpensive A/D boards. Its tracking functions include fully automatic antenna guidance, Priority List Tracking of groups of satellites, flip-mode tracking for overhead passes, and manual cursor-arrow control of antennas.

RealTrak is available in several configurations, including non-coprocessor and optional coprocessor, with or without EME support. A graphics card is not necessary for the majority of *RealTrak*'s functions; only the maps require graphics (EGA/VGA/Hercules monochrome). Fully functional demonstration disk is $2; complete program with 25-page documentation $50. For more information, contact Northern Lights Software, Michael R. Owen, W9IP, Star Route Box 60, Canton, NY 13617 (315-379-0161), or circle number 102 on the reader service card.

VALTEK Software's DX LUMBERJACK

VALTEK Software has announced the release of DX LUMBERJACK, a computerized DXing system. Features include: log report generator, which makes hundreds of custom reports possible; QSL and envelope label printing; calculation of beam headings and distances from your QTH; QSL manager list; tracking of 10-X numbers, states, and counties; reports that include "needed" list for all major DXCC categories and country summary reports by band and mode; fully automatic country and zone recognition; unlimited telephone technical support; and user's manual.

The software is available for $39.95, or a demo program sells for $5.00 (credited to the purchase of DX LUMBERJACK). Shipping and handling is $3.50. Written by KN4NO, the system is available from VALTEK Software, P.O. Box 1266, Smiths, AL 36877 (205-480-9494), or for more information circle number 101 on the reader service card.

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CIRCLE 90 ON READER SERVICE CARD

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Dynamic ALC™ doubles average SSB power

The AL-80B's exclusive *Dynamic ALC™* gives you high-level low-distortion RF processing. When activated, it can more than double your *average* SSB power and produce up to 6 dB improvement in intelligibilty. It maximizes your talk power without distortion and splatter.

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Instantaneous RF Bias™ eliminates heat

The AL-80B's exclusive *Instantaneous RF Bias™* completely turns off the Eimac 3-500Z tube (except filaments) between words and dots and dashes. It eliminates hundreds of watts wasted as heat to give you cooler operation and longer component life.

Gutsy Heavy-Duty Power Supply

The guts of the AL-80B is its heavy ***heavy*** duty power supply. A 26 pound transformer using a high silicone steel core, computer grade capacitors, heavy duty bleeders and ten 3 amp, 1000 V power rectifiers give you a stiff 2700 volts fully loaded. Many amplifiers using *two* 3-500Zs use such small power supplies they don't deliver much more power output than the AL-80B.

NEW! $1195 Ameritron AL-80B Suggested Retail

Genuine Eimac® 3-500Z Tube

The AL-80B uses a *genuine* Eimac® 3-500Z tube warranted by Eimac® -- not cheaper, less reliable 3-500Zs used by some competitors.

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A tough low cost linear with REAL transmitting tubes!

Ameritron's new AL-811 linear amplifier gives you plenty of power to bust thru QRM. You get a quiet desk top linear that's so compact it'll slide right into your operating position -- you'll hardly know it's there . . . until QRM sets in. And you can conveniently plug it into your nearest 120 VAC outlet.

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Step-Start Inrush Protection™ stops damaging inrush current with a start up sequence that's *easy* on your tube and power supply components.

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Plus more . . .

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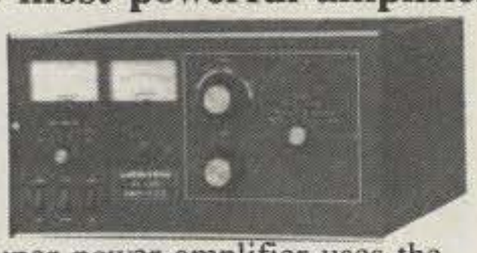

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Ameritron's 3CX1200A7 linear

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RCS-8V, DC-UHF 5 KW Coax Switch. Replace 5 coax feedlines with one with this Remote Coax switch. Weatherproof box mounts outdoors on your tower or mast. Attractive control unit sits on your operating desk. Low SWR to 450 MHz. Low loss. Rated at 5 KW to 30 MHz, 1 KW at 150 MHz. **RCS-8VN, $169.95** with "N" connectors.

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CIRCLE 159 ON READER SERVICE CARD

DX

BY CHOD HARRIS, VP2ML

NEWS OF COMMUNICATION AROUND THE WORLD

New Countries in Europe

The DX Advisory Committee (DXAC) voted to add four new countries to the DXCC countries list. All four New Ones are former Yugoslavian republics and received at least 12 of the 16 votes on the DXAC. The "start date" for each of the new countries is that country's declared independence date.

The new countries, and their effective dates, are Croatia 9A, June 26, 1991; Slovenia S5, June 26, 1991; Bosnia-Hercegovina YU4, October 15, 1991; and Macedonia YU5, September 8, 1991. *(Note that as of late October the ARRL Awards Committee at ARRL Headquarters had not confirmed these new countries, nor has the DXCC desk set a date to begin accepting cards from these new countries. Don't send cards for these countries until after the announced acceptance date.)* The former Yugoslavia YU continues, in the form of the republics of Serbia YU1 and Montenegro YU6, and the autonomous regions of Vojvodina YU7 and Kosovo YU8. (YU9 and YU0 are special-event prefixes used throughout the former country.)

The addition of the four new countries from the remains of Yugoslavia did not come as a surprise to knowledgeable DXers. An article in *The DX Magazine* two years ago described the DX possibilities of the turmoil in ex-Yugoslavia. Perhaps a little review of the political situation in the region may shed light on the emergence of these new DXCC countries.

The country we called Yugoslavia (until recently) was founded in 1918 as an independent kingdom of Serbs, Croats, and Slovenes. It was carved out of the former Austro-Hungarian empire, in large part, and included the South Slav populations of that empire, plus independent Serbia and Montenegro. Differing religions, histories, and ethnic pride made governing the country difficult. Attempts to centralize control and reduce ethnic barriers repeatedly failed. The various regions of the country retained a considerable measure of autonomy. The roots of the break-up were deep-seated.

The country was named Yugoslavia (land of the South Slavs) in 1929. The country disappeared in 1941, under Axis rule and internal dissension. Marshall Tito was instrumental in pulling the country back together at the end of WW II.

P.O. Box 50, Fulton, CA 95439

Russ Wilson, VE6VK, operates horse mobile from the back woods of British Columbia. Shadow, the horse, had to have amateur radio explained to her before she would consent to the load.

Tito held the diverse populations together practically single-handedly. Many observers predicted the country would fall apart soon after Tito's death in 1980. The country actually survived more than 10 years before ethnic and economic factors led to the splintering of the country back into independent republics in 1991.

Croatia and Slovenia declared their independence of Yugoslavia in mid-1991. Bosnia-Hercegovina joined the independence movement in October. Armed conflict over final boundaries and the reluctance of the Serbia-dominated Yugoslavian government to lose its richest, most advanced republics delayed international recognition of the new countries. However, the European Committee recognized all three in early 1992, and Yugoslavia acceded to the independence declarations and recognized them as independent countries in April. The three were admitted to the United Nations in May 1992.

They did not replace the old Yugoslavia; three additional seats were added to the General Assembly. The continued recognition of the Serbian government as the legitimate successor to the former Yugoslavia led the DXAC to continue this country as the old Yugoslavia and not delete it. The new deletion criteria of the DXCC countries rules covers this situation nicely:

Ely Camin, IN3VZE, operated as 7Q7CE from once-rare Malawi last July.

Achmad, YC9DWH, runs 150 watts on all HF bands except 20 meters from his home in Bali. (WB2AQC photo)

The WPX Program

Mixed

1578	WB5EUC	1580	JA4DUD
1579	OH8NYO	1581	G5MN

SSB

2340	IK1GKE	2343	N5PIX
2341	NJ1T	2344	JA4DUD
2342	W3SAI		

CW

2759	PY4IU	2760	KU0A

Endorsements

Mixed: 450 WB5EUC, JA4DUD, G5MN. 500 WB5EUC, JA4DUD, G5MN. 550 WB5EUC, JA4DUD, G5MN. 600 WB5EUC, JA4DUD. 650 WB5EUC. 700 WB5EUC. 750 WB5EUC. 800 VE6LB, WB5EUC. 850 VE6LB. 900 VE6LB, N7JB. 950 VE6LB. 1050 W0IZV. 1150 KDX1A. 1200 WB8AAX, KDX1A. 1250 WB8AAX. 1300 WB8AAX, LU8DY. 1350 WB8AAX, LU8DY. 1400 WB8AAX. 2250 KF2O. 2300 KF2O. KF2O. 2650 ZP5JCY. 2700 ZP5JCY. 2750 ZP5JCY. 2800 ZP5JCY. 2950 SM3EVR.

SSB: 350 N5PIX, JA4DUD. 400 JA4DUD. 450 IK1GKE, JA4DUD, VE1RJ. 500 IK6JYY, JA4DUD. 550 JA4DUD. 600 WB8AAX, JA4DUD. 650 WB8AAX, N7JB. 700 KE7UH. 750 KE7UH. 800 KE7UH. 850 K0REF. 900 K0REF. 950 K0REF. 1000 IK2AEQ, K0REF. 1050 K0REF. 1100 K0REF. 1150 K0REF. 1150 K0REF, I0RIZ. 1200 ZS6EZ, KC7DS, K0REF, I0RIZ. 1250 ZS6EZ, I0RIZ. 1300 ZS6EZ, LU8DY, I0RIZ. 1350 LU8DY, I0RIZ. 1400 KF7RU, I0RIZ. 1450 I0RIZ. 1500 G3VQO, I0RIZ. 1550 HK3JJH, I0RIZ. 1600 HK3JJH. 1650 KL7AF, HK3JJH. 1700 HK3JJH. 1950 KF2O. 2000 KF2O. 2450 NJ0C. 2600 ZP5JCY. 2650 ZP5JCY.

CW: 500 N7JB. 650 K1CVF. 800 VE5BOB. 850 HI8LC. 900 HI8LC, ZP5JCY. 950 WB8AAX, JG2LGM, HI8LC, ZP5JCY, PA0BEJ, VE7AVC. 1000 WB8AAX, HI8LC, ZP5JCY, PA3BEJ, VE7AVC. 1050 WB8AAX, HI8LC, ZP5JCY, VE7AVC. 1100 WB8AAX, HI8LC, ZP5JCY, VE7AVC. 1150 HI8LC, ZP5JCY. 1200 HI8LC. 1250 HI8LC. 1450 KF2O. 1500 KF2O. 1550 KF2O. 1650 G4SSH.

15 Meters: K8MDU, JA4DUD
80 Meters: K8MDU
160 Meters: KF2O

Asia: CT1EEB, JA4DUD, WB5EUC
No. Amer.: N1IR, PA3BEJ, CT1EEB, WB5EUC
So. Amer.: DK5WQ
Europe: N1IR, CT1EEB, JA4DUD, WB5EUC
Oceania: JA4DUD

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Award of Excellence Plaque Holders with 160 Meter Endorsement: FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, PY2DBU, W3ARK, HI8LC, KA5W, UR2QD, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM0AJU, 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, K9QFR, NN4Q, W4UW, K9QFR, NX0I, G4BUE, LU3YL/W4, I4EAT, WB4RUA, VE7WJ, N4NX, DE0DXM, 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 air-mail desired) to: "CQ WPX Awards," 880, CR13, Clovis, NM 88101-9511 USA.

Brett, VS6BG, gets around the prohibition against amateur license plates in Hong Kong with this sign. (WB2AQC photo)

"When one country is divided or partitioned into two or more countries, one DXCC country is deleted and two or more DXCC countries are created . . . The partition category is not employed when the original political entity continues on some form. That is, if part of country A splits off to form country B, the original DXCC country (A) is retained and one new DXCC country (B) is added."

Since the "original political entity" (Yugoslavia) survives "in some form," the now-smaller Yugoslavia remains the same DXCC country as the pre-breakup Yugoslavia, and DXers will not have to rework (and reconfirm) YUs.

Note, however, that DXers will have to work and confirm the four new DXCC countries, with contacts made after the above start dates. It won't make any difference which callsign the station used. QSOs with YU3s after June 26, 1991 count for Slovenia; you don't need to wait for a new S5 card.

Macedonia YU5

The foregoing discussion has side-stepped the fourth new DXCC country: Macedonia. Macedonia declared itself independent of Yugoslavia on September 8, 1991 and was recognized as such in April 1992. However, wider international recognition of Macedonia has been held up by protests by Greeks over the name of the new country.

The currently independent country of Macedonia was in the middle of the Balkan Wars of 1912–13. The settlement of that conflict divided the region into three parts between the three neighboring countries: Serbia, Greece, and Bulgaria. Thus, the present-day Macedonia was part of the

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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 works from HF to microwave with Yagis of up to 50 elements. 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 and YO come with both coprocessor and noncoprocessor versions. All programs 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.

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SP9PT, 199	IK8CNT, 199
K6YRA, 199	W1JR, 199
PY7ZZ, 199	W8SEY, 199
DL9WW, 199	N7RT, 199
KØCS, 199	VE7AHA, 199
KBØG, 199	W1FZ, 199
AA4KT, 199	IK2GNW, 199
K7UR, 199	I8IGS, 198
K9EL, 199	SM6AHS, 198
NAØY, 199	K1ST, 198
VE7DX, 199	4X4DK, 198
WØPGI, 199	UA3AGW, 198
W2YY, 199	KL7Y, 198
W9WAQ, 199	VO1FB, 198

The following have qualified for the basic 5 Band WAZ Award:
JE1TTI, 187 Zones
K3ANS, 181 Zones

800 Stations have attained the 150 zone level as of September 30, 1992.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (75 cents) size 4½ × 9½ to the WAZ Manager, Jim Dionne, K1MEM, 31 De Marco Rd., Sudbury, MA 01776. Applicants should include sufficient postage for safe return of their QSL cards. The processing fee for all 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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441	DL8MEJ		

20 Meter SSB

902	K3ANS	904	OH3OJ
903	PY6WT		

10 Meter CW

134	WB5MTV

15 Meter CW

235	JF6TEI	236	SM6DHU

20 Meter CW

425	K3ANS	426	SP6CPF

WNZ

8—Mixed	KB4ZMR	52—10M SSB	KB2NEK

All Phone

613	K3ANS	614	LA1ZE

RTTY

72—Mixed	JA1BYL	75—Mixed	IK1HSR
73—Mixed	AB4PY	76—Mixed	AA4M/6
74—Mixed	W9RY		

All Band WAZ SSB

3995	DL4MEH	4000	N1CPC
3996	K3ANS	4001	HB9BGV
3997	SM6DHU	4002	HC4L
3998	IK7NXO	4003	K6ONE
3999	VE7CV		

CW/Phone

7266	KN7W	7274	K6ZTQ
7267	AB4PY	7275	N4ZR
7268	IV3ZAC	7276	HB9BHY
7269	N4WP (CW)	7277	VE7CV
7270	W5EHM (CW)	7278	JP1PCK (CW)
7271	K3ANS (CW)	7279	WA2YEX (CW)
7272	K3ANS	7280	JAØOIK
7273	W1YIF		

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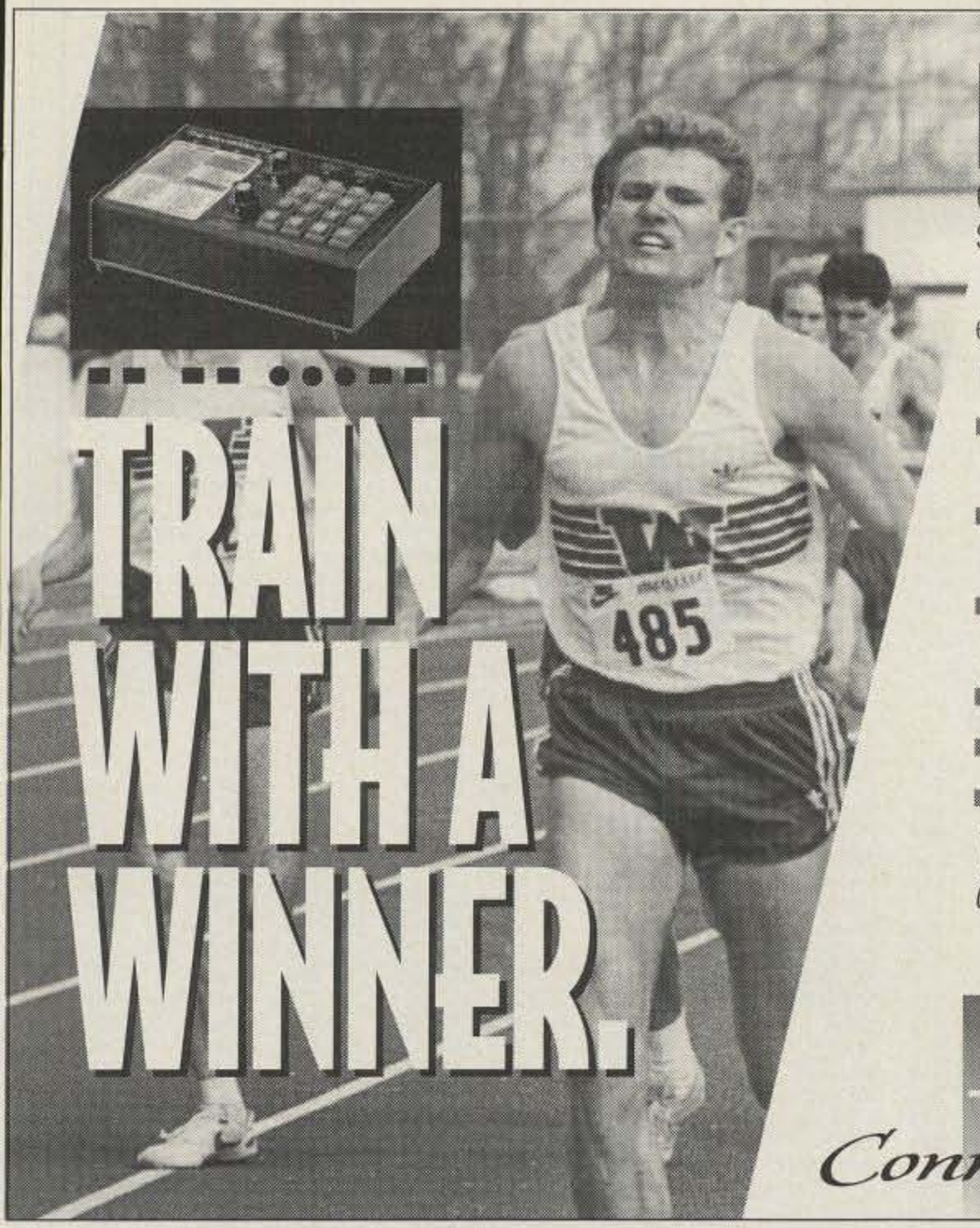
original Serbian kingdom. However, during the fighting against the Axis occupiers in WW II, Tito tried to get Communists in northern Greece to join with supporters in the newly named province of Macedonia to form an independent country. This effort was ultimately defeated by the Greeks.

However, the Greeks feel that an independent country with the name Republic of Macedonia implies a territorial claim on some Greek land (which became Greek in 1913). They further say that they have exclusive rights to the name Macedonia, thanks to Alexander the Great, a Greek-born who united the region and named it Macedonia more than 2000 years ago. For these reasons the Greeks have successfully fought wide international recognition of the new country. Macedonia was not admitted to the United Nations last May, nor has the United States recognized the country.

The DXAC took the position that Macedonia is clearly an independent country now, despite lack of international recognition. Its former parent country, Yugoslavia, has said Macedonia is independent; what more do you need? The problem of the name of the new country may drag on for years. Fortunately for DXers, we won't have to wait until this thorny question is resolved to work a New One.

It is of some interest that the DXAC voted overwhelmingly to use the declaration of independence as the DXCC country start date. They could have used less controversial dates, such as recognition by the United States, admission to the United Nations, or the date Yugoslavia recognized their independence. By picking a self-proclaimed independence day, the DXAC opens itself to New DXCC Country petitions from handfuls of self-proclaimed independent countries. Many African countries harbor "independent" tribes at odds with their parent country. There are other



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CQ DX Honor Roll

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CW

W9DWQ	323	K1MEM	323	K9IW	320	W9WAQ	317	KQ9W	314	WB4RUA	309	NY5L	302	OH3NM	297	AG9S	282
K2FL	323	K6JG	322	N6AV	319	W1WAI	317	I8WY	314	W6DN	308	K9DDO	302	KA5TQF	295	N3DQN	280
K2TQC	323	W2FXA	322	SM3EVR	319	KD8V	317	N7MC	313	IT9VDQ	308	WA4DAN	302	WD9IIX	295	W2LZX	279
ON4QX	323	DL1PM	322	DL3RK	319	K9TI	317	WD9IIC	313	W9RY	307	K2JLA	302	K1VHS	295	HB9AFI	278
K6LEB	323	W6PT	322	N2KW	319	KZ4V	316	W7CNL	312	K4CXY	307	W8XD	301	VE7DX	295	VE1RJ	277
K9MM	323	K9QVB	322	W0HZ	319	EA2IA	316	IT9QDS	312	N4AH	307	KA2DIV	301	G3KMQ	295	KA3R	277
YU1HA	323	K2ENT	322	W0IZ	318	WA8DXA	316	WA2HZR	312	SM6CTQ	305	K4JLD	301	NC9T	295	DF3FJ	276
N4JF	323	K2OWE	322	N6CW	318	AA5NK	316	W0JLC	312	I2QMU	305	G2FFO	300	KA7T	294	YV5ANT	276
N6AR	323	W4BQY	321	K9BWQ	318	KB8DB	315	W4OEL	312	K2JF	303	WA8YTM	300	N5FW	293	IK2ILH	276
K4CEB	323	K4XO	321	K8LJG	318	PA0XPO	314	N7RO	312	N8MC	303	W6YQ	300	W1WLW	288	WG5G/QRP	276
N4KG	323	K9AB	321	W7ULC	318	K8NA	314	IT9TQH	311	WB5MTV	303	KU0S	300	WA9RCO	286	OZ5UR	276
SM6CST	323	K3UA	321	AA6AA	318	I5XIM	314	DJ2PJ	311	W3BBL	303	YU2TW	300	CT1YH	284	WF9K	276
AA4KT	323	OK1MP	321	WA4IUM	317	W1NG	314	F3TH	310	KB9XG	303	NN4Q	299	KP4P	283	K1HDO	276
N4MM	323	W0SR	320	I4EAT	317	IT9ZGY	314	K4CXY	310	I4EAT	302	W8URM	298	AA2X	282	4N7ZZ	275
W2UE	323	DL8CM	320	WA4JTI	317												

SSB

K2FL	323	W4UW	323	I4LCK	322	VE2PJ	320	K8ZZU	316	K8YVI	312	VE2GHZ	306	I8IGS	299	XE1ILI	283
VE1YX	323	K3UA	323	K8NA	322	CX4HS	320	DU1RG	316	ZS6BBY	312	VK3JF	306	VE4AT	299	AB4UF	283
F9RM	323	DL6KG	323	KS2I	322	KB5FU	320	KV2S	316	N6CGB	312	N4KEL/M	306	K5DUT	299	EI6FR	283
DJ9ZB	323	K9BWQ	323	W0SR	322	I2QMU	320	W5LLU	316	WA9IVU	312	N4KE	305	I2ZGC	299	WA9BXB	282
W9DWQ	323	K5OVC	323	KD8V	322	AA4AH	320	YT7DX	316	KA5TQF	312	K3LUE	305	N1CWA	299	WK3N	282
W0YDB	323	K2ENT	323	W7OM	322	KZ4V	320	WA9RCQ	316	LA7JO	311	NC9T	305	NW5K	299	YB3CEV	282
W4DPS	323	WB1DQC	323	VK4LC	322	G4GED	320	WE2L	316	I2MQP	311	WA6DTG	305	WB6GFJ	299	N5HSF	282
K2TQC	323	AA4KT	323	I8KCI	322	PY4OY	320	KB9OC	316	NN4Q	311	WF9K	305	KB2FC	298	VU2DVP	281
W4EEE	323	OE3WWB	323	SV1ADG	322	WZ4I	320	IK0IOL	316	IK2GNW	311	YV5IVB	305	4N7ZZ	298	TG9EP	281
W2SUA	323	WA3HUP	323	K2JF	322	W7FP	320	KF5AR	316	K0HQW	311	NI5D	305	SV8CS	298	VE3NUP	281
K9MM	323	W4NKI	323	ZS6LW	322	K1UO	319	K4JLD	316	K1HDO	311	W8URM	305	WA0TKJ	298	KA1LMR	281
YU1HA	323	WD8MGQ	323	OE2EGL	322	WB6OKK	319	KE4HX	315	K4LR	311	EA1QF	304	KF5DX	297	WA0QII	281
W2FXA	323	K9HDZ	323	WB3DNA	322	WB5TED	319	KB2HK	315	N1ALR	311	K4RIG	304	NP4CC	297	YU1TR	280
OZ3SK	323	K0GT	323	I0AMU	322	XE1CI	319	W0LSD	315	XE1ZLW	311	KB1JU	304	VE3CKP	297	PY2DBU	280
DL9OH	323	K4MQG	323	K4CXY	322	IT9TQH	319	IK7DBB	315	KB2MY	311	ZL1BOQ	304	HP1JC	296	N8HUR	280
VE3MR	323	KZ2P	323	KF7SH	322	CX1TE	319	KC2FC	315	KD5ZM	311	EA3EQT	304	XE1OW	296	NX0I	280
EA2IA	323	IT9ZGY	323	CT1FL	321	IK8GCS	319	W0ULU	315	KE5PO	311	I8IYW	304	EA5RJ	296	K5AOL	279
K4MZU	323	4Z4DX	323	K9AB	321	W9JT	319	K2ARO	315	KA5RNH	310	KA9TNZ	303	I4CSP	295	WN5K	279
KM2P	323	OK1MP	323	N2KW	321	W6NLG	319	YV5DFI	314	YV1CLM	310	AC0A	303	W0IYR	294	WB8TLI	279
VE3XN	323	W4UNP	323	ON5KL	321	K9TI	319	W9RY	314	IK1GPG	310	KB9LN	303	VE3XO	294	VU2CVP	278
K6WR	323	YV5CWO	323	IK8BQE	321	WD8PUG	319	KU9Z	314	WD0DMN	310	KB0SY	303	EA3KW	294	WP4AFA	277
N4JF	323	K8LJG	323	VE7DX	321	I4ZSQ	318	HR1KAS	314	LU7HJM	310	W4BQY	302	IT9VDQ	293	K4BYK	277
VE3MRS	323	XE1AE	323	KA3HXO	321	G4CHP	318	A92BE	314	N6AHV	309	RA3YA	302	WD9IIC	293	WA9BDX	277
K6YRA	323	YS1GMV	323	W2CC	321	ZL1BIL	318	K7EHI	314	I5EFO	309	W2LZX	302	VE6PW	292	WB0UFL	277
YU1AB	323	KS0Z	323	K9HQM	321	KA9ABC	318	XE1OX	314	I1POR	309	ZS6AOO	302	TI2LTA	292	WN5MBS	277
N6AR	323	I8ACB	323	WA4DAN	321	KQ9W	318	OH5KL	314	G4GED	309	XE1KS	302	K9EC	292	KG9N	277
K6JG	323	N6AHU	323	AA6AA	321	WB6PSY	318	W6MFC	314	KP4P	309	K1VHS	302	KE7UL	291	I8WYD	277
YV1KZ	323	K9IW	323	AI8M	321	WB3CQN	318	KB1JU	314	XE1MD	309	WA5HWB	302	SV1JG	291	CE7ZK	277
I0ZV	323	W0SFU	323	AI8S	321	OA4ED	318	I2EOW	313	WA8YTM	309	WB4TGB	301	4X4JO	290	KA9I	277
W4JVU	323	YV5AIP	323	K8CSG	321	9H4G	318	WB4PUD	313	WD9IIX	308	N5FW	301	CP5NU	290	CT1AHU	277
N4MM	323	TI2HP	323	VE4AT	321	PA0XPO	318	W1NG	313	YV2EJU	308	VE6PW	301	N5ORT	290	W8/DL2SCA	276
WA4JTI	323	OZ5EV	323	KE4VU	321	N4CRU	317	KA6V	313	N3ARK	308	NO4J	301	I4UFH	289	G4NXG/M	276
KB8DB	323	VE7WJ	323	IK8CNT	321	WA4WTG	317	AA6BB	313	W4BQY	308	W3SOH	301	W9TA	288	WB4UHN	276
EA4DO	323	VE3GMT	323	KC8EU	321	G4ADD	317	W1LQQ	313	IN3ANE	308	YU2TW	300	YB2OK	288	KJ6HO	276
W9SS	323	I8XTX	323	WA4ECA	320	W6BCQ	317	W4SSU	313	KB7VD	308	N4CRU	300	TI5RLI	287	WA4PGM	275
WB4UBD	323	WA6OET	323	W6DN	320	XE1XM	317	I8INW	313	N6AV	307	WT4T	300	OK1AWZ	287	NX4Y	275
W9OKL	323	K2JLA	323	W3GG	320	KB3OQ	317	W5XQ	313	WA2FKF	307	WD0BNC	300	EA8TE	287	VE7HAM	275
W6EUF	323	YV1AJ	323	AA5NK	320	SM6CST	317	W7ULC	313	WD5P	307	KB8O	300	N8BJQ	285	HP6AYV	275
OA4OS	323	I4EAT	323	NY5L	320	KU9I	317	W2FGY	312	TI2JJP	307	W7KSK	300	FD1OZF	285	TI2SD	275
W3AZD	323	I8YRK	323	EA1QF	320	N4WF	316	K8CMO	312	TI2TEB	307	VE3FJE	300	IK8BMW	284	KJ6GC	275
ZL3NS	323	WA4IUM	323	NJ2C	320	K4POV	316	KI3L	312	VE3DLR	307	WB4NDX	300	NZ7D	284	KA5YCM	275
N7RO	323	KB4HU	323	NJ0C	320	I8LEL	316	TI2KD	312	F6BFI	306	K3NEE	300	KB5RF	284	KI4FW	275
K4XO	323	I8AA	322	K9OVB	320	KC8EU	316	K8NWD	312	WA2MID	306	OE7SEL	300	KB9AIT	283	WA4OPW	275
ZL1AGO	323	TI2CC	322	KR9O	320	W6SN	316	KC4MJ	312	XE1MDX	306	N6PTI	300	VE3IMO	283	AB4NS	275
N4KG	323	VE2WY	322	IT9TGO	320	AG9S	316										

cases in the Pacific, such as Bougainville and Papua New Guinea.

Also, by recommending that Macedonia be added to the DXCC countries list, a country without international recognition, the DXAC again opens the door for a flood of petitions from quasi- countries. There are dozens of "countries" that have claimed their independence, from Hutt River in Australia to the Kingdom of Redondo in the Caribbean.

Even the timing of the DXAC vote has drawn criticism. Some DXers feel that we shouldn't push for new DXCC countries in a region torn by a bloody war. However, these New Ones have been independent for almost a year and a half, and were admitted to the United Nations (expect for Macedonia) more than six months ago. The DXAC can hardly be accused of rushing things here.

In any case, DXers will have four new DXCC countries to chase in the embers of ex-Yugoslavia. Croatian 9A and Slovenian S5 amateurs have been all over the bands. YU5 and YU4 stations are not rare. (These countries will apply for, and use, new ITU-assigned prefixes soon.) However, DXers should realize that former Yugoslavia is the scene of the worst bloodshed in Europe since WW II. More than 25,000 persons have been killed in the ethnic fighting, and entire towns have been destroyed. Many amateurs are using their communication skills and equipment to maintain their side of the war effort and are not inclined to work masses of DXers. Also, mail service remains spotty, depending on international restrictions and the ebb and flow of battle. DXers should understand the difficult conditions in ex-Yugoslavia and be patient. There will be plenty of opportunity to work all four New Ones on as many bands and modes as desired in the near future. (For more background on the internal conflicts in ex-Yugoslavia, see *National Geographic* magazine, August 1990, pages 92–123.)

While we're on the topic of mail, we should mention a point of courtesy in addressing envelopes to newly independent countries in Europe and Asia. DXers should take care to use the correct country name on their envelope. For example, don't use "Yugoslavia" on mail addressed

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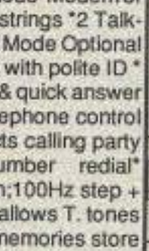

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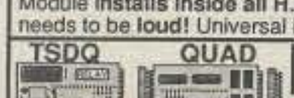

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to Croatia, Slovenia, etc. Use the name of the new country. If you are concerned that USPS personnel might not recognize the new names (a very reasonable concern), you can add "Via Europe" in the lower left corner of the envelope. That will get it started in the right direction.

There may well be more new DXCC countries appearing in Europe. Czechoslovakia has voted to dissolve itself and form two separate countries. This clearly falls under DXCC Country Criterion III C: partition. In this case there will not be any surviving political entity; the old Czechoslovakia OK will be deleted, and two new DXCC countries will come into being on the effective date of the split. Late in 1992 the date under discussion was January 1, 1993; check current news reports and DX newsletters for current status of Czechoslovakia. While the two halves of ex-Czechoslovakia will undoubtedly be new DXCC countries, note that the DXAC hadn't even received a petition of separate country status as of October 1992. The formal decision on these new ones will take several months.

Other DXAC Votes

The DX Advisory Committee included four "advisory votes" along with the balloting for the four new countries. Advisory votes provide DXAC Chairman Ted Pauck, K8NA, an indication of the interest of the DXAC on pursuing various topics. The DXAC has many topics on its open agenda, and advisory votes help determine where the DXAC members will concentrate their efforts.

The DXAC voted 14 to 2 against pursuing changing the DXCC country status of the former USSR republics. There had been some discussion about whether the break-up of the USSR might affect DXCC country status for the various republics. This DXAC vote confirms the status quo for these countries.

The DXAC also voted 13 to 3 against continued consideration of relaxing Rule 8, which prohibits contacts made from aboard ship. Some DXers thought that ships tied up to a dock, or anchored in a harbor, should count differently than a vessel underway. In particular, a ship anchored in the lagoon at Diego Garcia in the Chagos Islands falls under the radio jurisdiction of the VQ9 license board. However, DXCC rules don't permit credit for contacts with anchored ships. While there was some interest in relaxing the rules, especially when the radio operation was under the same conditions as purely land-based operations, the majority of DXers, and DXAC members, felt that relaxing the rule would lead to immediate abuse. How close would the ship have to be anchored to count? Does a single fishing line thrown onto the beach count as being tied up to a dock? Given the potential for abuse and the difficulty of administering a more relaxed rule, the DXAC voted to stop further consideration of relaxing Rule 8.

Further consideration of a Master DXCC Award was also voted down, 12 to 3, with 1 abstention. The rationale behind a Master DXCC Award is that many DXers have now "worked them all," thanks to the multiple major DXpeditions to rare countries over the past few years. Many thousands of DXers are now on the Honor Roll. These DXers need a continuing challenge to keep these DXing skills keen. The Master DXCC Award was supposed to identify the master DXer out of the thousands of Honor Rollers. However, interest in the Master DXCC Award was small, and the idea of burdening the DXCC desk with yet another award when they are months behind handling current business didn't appeal to anyone.

Finally, in yet another vote on the Country That Won't Die, the DXAC voted 13 to 3 against further consideration of changing the DXCC country status of 4U1VIC, the Vienna International Centre, in Austria. 4U1VIC has been under discussion as a possible separate DXCC country for many years, dating back before the prohibition in the DXCC country rules against "offices of the United Nations agencies or related organizations." All the votes have been against separate DXCC country status for the Centre. However, some procedural errors on the part of the DXAC provided some hope for reconsideration. This latest vote was yet another attempt to put the question to rest. (4U1VIC remains a separate "country" on the Worked All Europe country list, and thus counts as a separate multiplier in CQ and WAE contests, but not in the ARRL contests.)

The DXAC has managed to strike four items from its current agenda by the above votes. It also resolved the question of new DXCC countries from ex-Yugoslavia. However, these actions have hardly made a dent in the pile of open issues before the DXAC members. Among the topics pending before the Committee in October were possible deletion of Abu Ail A1, a DXAC manual, expanding the DXCC field-checking program, looking at the long-term future of DX, operating ethics, QSLing practices, and possible separate DXCC country status for the Temburong District of Brunei. Also, the DXAC will probably soon receive a petition for separate DXCC country status for the two parts of Czechoslo-

QSL Information

1Z9A to KA6V
3D2EF to JR7OEF
3D2ZG to JH9ZXG
3Z0EMC to SP6FER
4J4JJ to UG6JJ
4K4BDU to UA9MA
4K4CC to UA6LC
4K4LC to UA6LU
4K4NN to KC4UG
4K4POL/A to UA0KCL
4K5ZI to DF8BK
4L0FWW to UF6FFF
4L1FII to UF6FII
4L1FJ to OZ1HPS
4L9DZ to UF6DZ
4N5RB to YU5XTC
4O4K to YU4EKK
4U1UN to W8CZN
4V4H to KA9RLJ
4Z4DX to WA4WTG
5B4ADR to 9A2AJ
5H3SW to SM7OXT
5N0CEP to KI5NF
5N3/KD4JRE to WB4GDL
5T5EV to WB8LFO
5V7DP to N6MMF
5W1MS to DJ3QG
5W1VJ to G4ZVJ
5Z4BI to W4FRU
5Z4TT to SP5BUD
7P8CY to W5AHC
7P8FE to OH3GZ
7Q7RM to G0IAS
7Q7XX to JH3RRA
7X4AN to DJ2BW
8A2PU to YB2UIJ
9A1CRU to YT2IX
9A2PM to KA9WON
9A3NR to WA4JTK
9A4AA to 4N2AA
9H1AF to G4VBH
9H1EL to LA2TO
9H3PB to DF4EK
9J2FR to I2ZZU
9K2GS to WB6JMS
9K2JH to KE4JG
9K2MC to 9K2KM
9K2MU to 9K2AR
9M2ER to AB4MD
9M2NA to VE3CHZ
9M2SG to YU2AJ
9M2YY to AB7E
9M6NA to JE1JKL
9Q5PL to OE7MCJ
9X5AB to DF3ZJ
9X5AB to DF3ZJ
9Y4VT to W3EVW
A22GH to G3KMQ
A22GH to G3KMQ
A35IG to JA3IG
A35VG to P29AA
A41KJ to N5FTR
AM5OL to EA5OL
AM9UK to EA9LZ
AO8AXM to EC8AXM
BV2TA to N7RO
BV4CT to NO0C
C9RJJ to W8GIO
CN2MB to I3JTE
CO2VG to I0WDX
CO6CG to HK5LEX
CQ1A to WA1ECA
CR7EEN to CT1EEN
D2EL to EA7EL
D2FGC to OK1AJN
D44AJ to D44BC
EA6WX to N7RO
EA8BYR to WA1ECA
ED2IZO to EA2LZ
EH4MC to EA4CP
ES1QD to KC7EY
FE1LG/6W to 6W1AAD
FG4GC to FG5BG
FK8GJ to F6CXJ
FM5BH to W3HNK
FO5BI to F6HSI
FY5EW to F6BFH
FY5FA to F6GNG
FY5FO to F6BYZ
FY5FX to F1MGZ
HF0POL to SP9DWT
HH9HH to KJ6YR
HP2CWB to N4YWY
HP2CWB to N4YWY
HR2BDC to AA5ET
HT1T to SM0KCR
J28YC to FD1ONC
J5UAI to NW8F
J88AQ to W2MIG
JD1BFI to JA5FFJ
JW1CCA to LA1CCA
KG4DD to N5FTR
LA/DL2SCQ to DL6DK
LG5LG to SM0HUK
OD5SK to KB5RA
OG9AR to OH9RJ
OH0W to OH2BH
OX3KM to F6FNU
OX3OA to OZ1FAO
OY1HJ to OY6FRA
OY2H to I0WDX
P29DK to N4EOF
P40P to NX1L
PA/ES5IB to DJ0IB
PY0TUP to PY1RO
R30OF to RZ6AYA
RO20OT to G3MTL
RO40A to SP9HWN
RT4UA to DK1RV
S21A to W4FRU
S21ZD to G4APV
SO5ASL to G4ASL
SP0BOS to SP6BOW
SP1KYB/1 to SP1EUS
SQ1A to SP1AEN
SV0II/SV5 to N5PIX
T32CW to NI6T
T32GG to KE6GG
T32LN to VK4CRR
TA3D to DL5YCA
TI2LAK/TI6 to EA4KK
TL8DF to FE1LBM
TL8GR to F5XX
TM5TBN to F6BFH
TN1AT to F6FNU
TR8JH to W3HCW
TR8YA to F6FNU
TU2MA to OH7XM
TU4EA to KB5TBE
UA0B/UA9CDE to UA9MA
UA0Y/UZ0AM to UZ0AM
UA9QCP/R10 to UA9QCP
UB6F/UD6DFA to UD6DFA
UC2AAA to F6AML
UC2AKP to DL1OY
UD6DKW to Y42DA
UI8AA to G3SWH
UJ8JI to IK3HHX
UL0A to Y25FG
UL1RJR to DL6ZFG
UM8QA to UA9MAA
US76BL to UB4BYU
UW2F to DK4VW
UY7U to RT4UF
V29SW to DL1HH
V51JM to NK2T
V63AK to JG1EGG
V63FB to JF2RZJ
V63SM to JQ3EEL
V85XF to G3TXF
VA32B0M to VE3XN
VK9CY to VK6XW
VP5P to WN5A
VP8CGK to VK4MZ
VP8GAV to GM0LVI
VQ9WM to K7IOO
VU2TE to K9JJR
XO5CUS to K1RH
XX9AS to KU9C
YB3OSE to W7TSQ
YB6HX to KA6KKN
YJ0AFU to NA5U
YV50BIARU to YV1JV
ZA1E to I2MQP
ZA1Q to HB9BGN
ZA1Z to HB9BGN
ZB2JI to G3VIE
ZD8Z to VE3HO
ZF1WD to G4RWD
ZF2KI to K1KI
ZK1AL to I4ALU
ZK1HJ to G3MCN
ZK2VJ to G4ZVJ
ZK2XF to ZL2TT
ZK2XS to DJ3QG
ZL8RS to ZL4DO
ZY0RW to PT7WA
4L0FXC to P.O. Box 16, Tbilisi 380002, Georgia
4L1FL to Igor, Box 1, Tbilisi 380002, Georgia
5N0ZKJ to P.O. Box 1009, Lagos, Nogeria
6Y5CE to P.O. Box 319, Kingston, Jamacia
9A1CCB to P.O. Box 28, Garesnica, 43280 Croatia
HI8OMA to P.O. Box 3272, Santa Domingo, Dominican Republic
R40Z to P.O. Box 62, Kitee 82501, Finland
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857	W2EBM	859	KK6XN

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320	I8YRK/323	310	KE5PO/311
320	KB4HU/323	300	WF9K/305
320	WA4IUM/323	300	N6PTI/300
320	K4CXY/322	275	CT1AHU/277
320	KC8EU/321	275	AB4NS/275
310	WD8PUG/318	250	KD9CN/270
310	K4JLD/316	200	AC4DT/206

CW Endorsements

310	W0HZ/319	300	K4JLD/301
310	WA4IUM/317	275	CT1YH/284
310	I4EAT/317	275	WF9K/276
310	PA0XPQ/314	200	I8YRK/245
310	K4CXY/310		

Total number of active countries is 323. The basic award fee for subscribers to CQ is $4. For non-subscribers, it is $10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are $1.00. Updates not involving the issuance of a sticker are made free when an SASE. is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

vakia and for Eritrea, based on a recent operation from the Red Sea region. *(More about Eritrea in a future column.—ed.)* No chance of DXAC members running out of things to do soon.

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With at least four, and most likely six, new countries in Europe, East Coast contesters will have that many more multipliers to work on all bands. This will widen the spread between the coasts by increasing the multiplier advantage from the East.

January Events

Joe Adams, VE3BW, hits the DXpedition trail again as V2/VE3BW from Antigua from January 1–29. He'll concentrate on the new bands (30, 17, and 12 meters), mostly CW. He'll also enter the CQ WW 160 Meter CW Contest. QSL via his previous call: VE3CPU.

The Quannapowitt Radio Association has organized a DXpedition to Aruba under the callsign P4/W1EKT, January 11–18. Operators are Jim Fisk, W1HL; Mike Rioux, NW1J; Bill Plumber, N1NGK; and Bob Reiser, AA1M. All bands, on CW, SSB, and RTTY, with special emphasis on the 10 meter Novice band. QSL to Bob Reiser, AA1M, 6 Savin St., Burlington, MA 01803.

QSL Notes

The **Chinese Taipei** Amateur Radio League of Taiwan reports that the new address of their QSL bureau is P.O. Box 93, Taipei, Taiwan ROC.

Bob, W7TSQ, reports that he brought back plenty of **YB3OSE** QSL cards from Indonesia, and will be answering the backlog immediately. **YB2ARO** cards are going out slowly; his own **YB3ASQ** cards will follow shortly.

QSL **3A/I1RBJ, IO1A** (WAE SSB), **4U1ITU** (Sept. 10, 1992 only), and **IP1/I1RBJ** via Gian Carlo Paul Bavassano, I1RBJ, Via Monte 7, I-101026 Torino, Italy.

QSL **7Q7CE** via Ely Camin, IN3VZE, Corso 3 November I36/2, 38100 Trento, Italy.

QSL **3V8AL** (1982) and **8Q7BW** (Nov. 1983) via Ulli Helgert, DL5MBY, Appenzellerstr. 53, 8000 Munich 71, Germany. Ulli wants to close out his logs at the end of the year; please review your QSOs, and QSL immediately.

QSL **4S7SGG** (Jan. 1982), **8Q7QJ** (Jan. 1982 and Nov. 1983), and **VP2M/DK3QJ** (Sept. 1988) via DK3QJ.

HP1XQN reports difficulty receiving cards via the Panamanian bureau; try direct to Mark Nill, WT3K, PSC 2 – Box 56, APO AA 34002.

Laci, HA0HW, reports receiving QSL requests for **HB0/** operations from this year. He can handle cards for **HB0/HA0ET, HB0/HA0KB,** and **HB0/HA0HW** only: Szabo Laszlo, P.O. Box 24, Puspoklandany, Hungary.

ZS6EZ (ex-ZS6BCR) says all direct ZS0Z QSLs are in the mail; anyone still needing a card should try again via P.O. Box 4485, Pretoria 0001 RSA. Note that it takes two IRCs to send a letter from South Africa to the US.

Corrections, Amplifications, And Not Managers

Kappy Kaplan, WA4WTG, reports that he is no longer manager for **4Z4DX, 4Z2DX, 4Z5DX, 4Z6DX, 4Z8DX, 4Z0DX, ZC4DX, ZF2IB/4X**; QSL direct to 4Z4DX.

QSL **PS0SK** and **PS0SR** from St. Peter & St. Paul Rocks via PS7KM only (not via W3HCW).

QSL **VP8CBC** via WA3YVN, not via AA6BB.

Wayne, W9GW, reports receiving QSLs for **PZ1DV**; he is not the manager. Try direct or via the PZ Bureau.

The QSL address for **V85HG** is H.G. Hassan, P.O. Box 222, Bnandar Seri Begawan 1902, Negara Brunei Darussalam.

SV9BGH reports that we listed his P.O. Box incorrectly in the June 1992 issue. His address is P.O. Box 136, Chania, Crete Island 73100, Greece.

QSL Help Provided

K6NA reports that he is "in the process of answering cards from his recent **9Y4H** CQ WW contest operations. Please be patient. *(Thanks, KA1NCN.)*

The **YX0AI** Aves Island cards finally arrived by boat in Venezuela; they are going out slowly and should all be out by the end of the year. *(Thanks, YV5DJA and WA8JOC.)*

K2VHW says that QSLs for **5B4ADA** and **YU2OO/5B4** are on the way out now, at about 100/week; again, please be patient, and don't send duplicate requests.

Mongolian QSL cards do arrive, but may take many months. Those having trouble with JT cards might try the Mongolian Radio Sports Federation, P.O. Box 639, Ulaanbaatar 13, Mongolia, with SAE and postage.

QSL Help Wanted

K3UA seeks help with **5X5FS** for Feb. 1983; QSL manager EI9G does not reply. Ideas?

W8KTH has been trying to confirm **T27DX** by 4X6TT for four years. Three direct requests with US$2 have gone answered. Anyone have suggestions on how to get a card out of 4X6TT?

N0ABA seeks a QSL route for **V73DO**, May 30, 1992.

WA4FTM seeks QSL information on **ZD7RII** (which looks suspiciously like a mis-copied ZD8LII.)

WB2WPM wants help with **8Q7AC** from Aug. 1989 (direct to the Maldives doesn't work), and **FT5GH** from Oct. 1990; N5GRC is not the route.

K1ST and others seek a direct address for FC1MNQ, QSL manager for **J28TY** on RTTY in Jan. 1990.

VE7KDU seeks QSL routes for **JW0C** and **RH3A.**

73, Chod, VP2ML

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PROPAGATION

BY GEORGE JACOBS, W3ASK

THE SCIENCE OF PREDICTING RADIO CONDITIONS

1993: Fewer Sunspots But Not A Bad Year

Flash!

The forecast for the 1992 World-Wide DX Contest Phone weekend of October 24 and 25 appears to have been right on the money. Observers throughout the world reported High Normal conditions or better on both days. The 10.7 cm solar flux levels during the weekend were relatively high for this period of the solar cycle, with 147 reported on the 24th and 161 on the 25th. The geomagnetic field was exceptionally quiet, with a worldwide average A index of 2 reported for the 24th and 5 for the 25th. This low level of geomagnetic activity and the brief strengthening of the ionosphere during the contest weekend were responsible for very good worldwide conditions on all of the amateur HF bands.

Although a considerable decline in the sunspot cycle is forecast for 1993, it still looks as if a fairly good year can be expected for ionospheric propagation on the HF amateur bands. The year should begin with a smoothed sunspot count, upon which the cycle is based, in the low 70s. By the end of 1993 the cycle is expected to drop to an index in the low 50s. While this is a sharp drop from the high levels observed over the past five years, it is still within what is considered to be a moderate range of solar activity.

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for January 1993

	Expected Signal Quality			
Propagation Index	**(4)**	**(3)**	**(2)**	**(1)**
Above Normal: 10, 12-13, 20-21	**A**	**A**	**B**	**C**
High Normal: 7, 9, 11, 14-15, 19, 22	**A**	**B**	**C**	**C-D**
Low Normal: 2-3, 5-6, 8, 18, 23, 25, 28-30	**B**	**C**	**D**	**D-E**
Below Normal: 4, 16-17, 24, 26, 31	**C**	**C-D**	**D-E**	**E**
Disturbed: 1, 27	**C-D**	**D**	**E**	**E**

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

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

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

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

E—No opening expected.

3 dB per S-unit.

HOW TO USE THIS FORECAST

1. **Find *propagation index* associated with particular band opening from Propagation Charts appearing on the following pages.**

2. **With the *propagation index*, use the above table to find the expected signal quality associated with the band opening for any day of the month. For example, an opening shown in the charts with a *propagation index* of 3 will be poor (D) on January 1st, fair (C) on the 2nd and 3rd, fair-to-poor (C-D) on the 4th, fair (C) on the 5th and 6th, etc.**

HF Propagation—1993

Compared to the past five years of intense and very high solar activity, conditions expected on the HF bands during 1993 are very likely to be somewhat different, particularly on the higher frequency bands. Here is what can be expected during 1993 on each amateur band between 6 and 160 meters.

6 meters: Considerably fewer F-2 ionospheric DX openings, but some may still be possible during the equinox months on generally north-south interhemisphere paths. An occasional east-west opening also may be possible during the winter months, but they will be far less frequent than during the past few years of higher solar activity.

10 meters: Considerably fewer DX openings are expected on this band during 1993, but it should continue to be a fairly good band to many areas of the world during the daylight hours of the equinox and winter months. During the summer months, east-west DX will likely be very spotty, if at all, but north-south openings should hold up fairly well.

12 meters: Should behave very much like the 10 meter band, but remain open for DX an hour or two longer than 10 meters.

15 meters: Despite decreased sunspot activity, this is expected to be the optimum band for worldwide DX during the daylight hours of 1993, particularly during the equinox and winter months. East-west DX openings are expected to decrease considerably during the summer months, but north-south openings should hold up very well, often extending well into the evening hours.

17 meters: Should behave much like 15 meters, but remain open for DX an hour or two longer.

20 meters: Not too much change from previous years expected on this band during the hours of daylight, with worldwide DX openings possible throughout the year. DX conditions on this band tend to peak for a few hours after local sunrise and again during the sunset period. Somewhat fewer nighttime DX openings are expected, but generally good DX conditions should be possible during much of this period during the equinox and summer months. Nighttime DX openings during the winter months are expected to be fewer and somewhat more spotty than during the past few years.

30, 40, 80, and 160 meters: These are basically nighttime DX bands, and there is a tendency for propagation conditions to *improve* somewhat as solar activity decreases. Good worldwide DX should be possible on 30 and 40 meters between sunset and sunrise, during all seasons, and on 80 and 160 meters during the equinox and winter months.

Sunspot Cycle 22 Progress

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 63 for September 1992. This results in a smoothed running sunspot number of 108 centered on March 1992. A smoothed index of approximately 73 is forecast for January 1993. Canada's Dominion Radio Astrophysical Observatory in Penticton, B.C. reports a corresponding mean 10.7 cm solar flux level of 117 for September 1992. This results in a smoothed level of 169 centered on March 1992 and a predicted level of approximately 140 for January 1993.

Table I is a listing of smoothed sunspot numbers observed to date for Cycle 22, the present solar cycle, and a forecast of activity expected through 1993. Cycle 22 began in September 1986 with a smoothed count of 12. It reached a peak of 159 during July 1989. Cycle 22 is the third most intense solar cycle observed in the nearly 250 years in which records have been kept.

For additional information concerning the future course of Cycle 22, see the August 1992 *CQ* Propagation column, and "DX The Progress of Sunspot Cycle 22," an excellent article by Chod Harris,

11307 Clara Street, Silver Spring, MD 20902

Month	1986	1987	1988	1989	1990	1991	1992	1993
January		18	58	142	151	148	124	*73*
February		20	65	145	151	148	116	*71*
March		22	71	150	152	147	108	*69*
April		24	78	154	149	146	*103*	*66*
May		26	84	157	147	146	*99*	*64*
June		28	94	158	144	145	*95*	*62*
July		31	104	159*	141	146	*92*	*60*
August		35	114	158	141	147	*88*	*58*
September	12	39	121	157	142	145	*85*	*56*
October	13	44	125	157	142	142	*83*	*54*
November	15	47	130	158	142	138	*80*	*52*
December	16	51	138	154	144	132	*77*	*50*

Table I– Progress of sunspot Cycle 22 and predictions for 1992. Predicted values are shown in italics. The peak of Cycle 22 is shown with an asterisk.

VP2ML, appearing in the October 1992 issue of *CQ*.

January Conditions

Typical wintertime HF propagation conditions are expected to continue through January. Maximum usable frequencies are expected to remain high during the daylight hours, dropping to seasonally low values during the hours of darkness. Atmospheric noise levels (static) are expected to be at their lowest values of the year in the northern hemisphere, and signal levels are predicted to be exceptionally strong during many band openings.

Although some good *10* and *12* meter openings are forecast to many areas of the world, *15* meters should be the best band for DX propagation conditions during the daylight hours. Good openings to almost all areas of the world are forecast during a window extending from shortly after sunrise through sundown. Openings generally will follow the sun on *10*, *12*, and *15* meters, first towards Europe and the east before noon, then towards the south during the early afternoon hours, peaking last towards the west during the later afternoon hours.

Good openings to most areas of the

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 A.M.; 13 is 1 P.M., etc. On the Short-Skip Chart appropriate *standard* time is used at the *path midpoint*. For example on a circuit between Maine and Florida, the time shown would be EST, on a circuit between N.Y. and Texas, the time at the midpoint would be CST, etc. Times shown in the Hawaii Chart are in HST. To convert to standard time in other USA time zones *add* 2 hours in the PST zone; 4 hours in the MST zone; 3 hours in the CST zone; and 5 hours in the EST zone. *Add* 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 14 or 2 P.M. in Los Angeles; 17 or 5 P.M. in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to *standard* time in other areas of the USA *subtract* 8 hours in the PST zone; 7 hours in the MST zone; 6 hours in the CST zone; and 5 hours in the EST zone. For example, at 20 GMT it is 15 or 3 P.M. in N.Y.C.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts c.w. or 300 watts p.e.p. on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts c.w. or 1 kw p.e.p. on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level for each 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.

CQ Short-Skip Propagation Chart January & February 1993 Local Standard Time at Path Mid-Point (24-Hour Time System)

Band (Meters)	Distance From Transmitter (Miles)			
	50-250	250-750	750-1300	1300-2300
10	*Nil*	*Nil*	07-09 (0-1) 09-15 (0-2) 15-17 (0-1)	07-09 (1) 09-11 (2) 11-15 (2-3) 15-17 (1-2) 17-19 (0-1)
15	*Nil*	08-16 (0-2)	07-08 (0-1) 08-09 (2) 09-11 (2-3) 11-16 (2-4) 16-18 (0-2) 18-20 (0-1)	07-08 (1-2) 08-09 (2) 09-11 (3) 11-16 (4) 16-18 (2-3) 18-20 (1)
20	11-15 (0-1)	08-09 (0-2) 09-11 (0-3) 11-15 (1-4) 15-17 (0-2) 17-00 (0-1)	08-09 (2-3) 09-11 (3-4) 11-15 (4) 15-17 (2-4) 17-18 (1-4) 18-21 (1-2) 21-00 (1) 00-08 (0-1)	08-09 (3-4) 09-10 (4) 10-14 (4-3) 14-18 (4) 18-21 (2-3) 21-00 (1-2) 00-07 (1) 07-08 (1-2)
40	07-08 (0-1) 08-09 (1-3) 09-10 (2-4) 10-16 (4) 16-17 (3-4) 17-19 (1-3) 19-20 (1-2) 20-00 (0-1)	02-07 (0-1) 07-08 (1-2) 08-09 (3) 09-11 (4-3) 11-15 (4-2) 15-17 (4) 17-19 (3-4) 19-20 (2-3)	07-08 (2) 08-11 (3-1) 11-15 (2-1) 15-17 (4-2) 17-19 (4) 19-20 (3-4) 20-23 (2-4) 23-02 (2-3)	07-08 (2-1) 08-15 (1-0) 15-17 (2) 17-19 (4-3) 19-23 (4) 23-02 (3-4) 02-04 (3) 04-07 (2)

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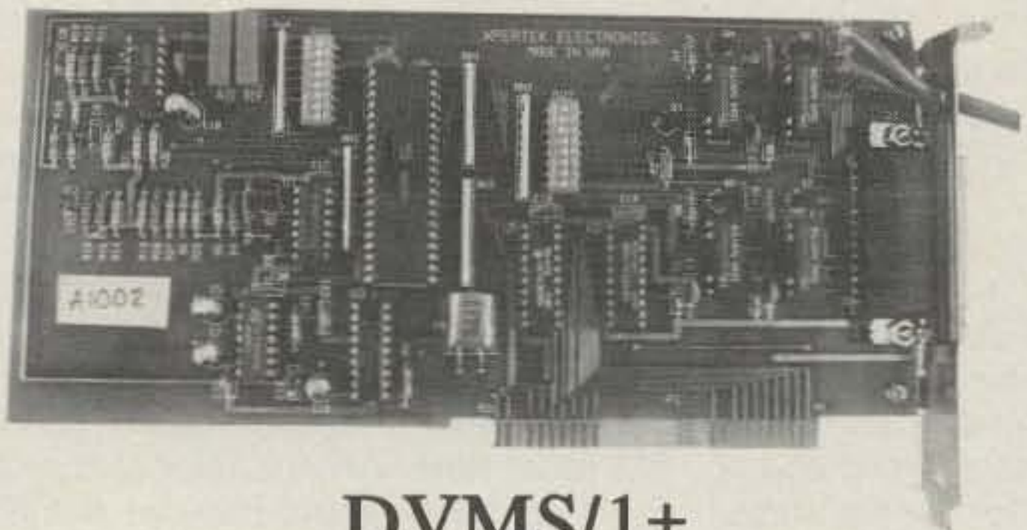

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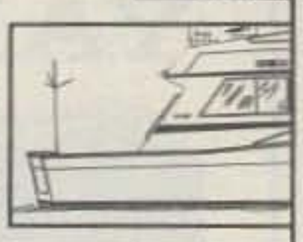

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ALASKA
January & February 1993
Openings Given In GMT#

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	18-20 (1) 20-22 (2) 22-23 (1)	17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	11-16 (1) 16-18 (2) 18-21 (1) 21-22 (2) 22-00 (3) 00-01 (2) 01-03 (1)	04-13 (1) 07-12 (1)*
Central USA	18-20 (1) 20-23 (2) 23-01 (1)	16-19 (1) 19-21 (2) 21-00 (3) 00-01 (2) 01-03 (1)	11-17 (1) 17-19 (2) 19-21 (1) 21-23 (2) 23-01 (3) 01-02 (2) 02-04 (1)	03-14 (1) 07-12 (1)*
Western USA	18-21 (1) 21-00 (2) 00-02 (1)	17-19 (1) 19-21 (2) 21-00 (3) 00-02 (2) 02-04 (1)	11-17 (1) 17-20 (2) 20-21 (3) 21-00 (4) 00-01 (3) 01-03 (2) 03-05 (1)	04-05 (1) 05-12 (2) 12-15 (1) 15-16 (2) 16-17 (1) 05-12 (1)* 12-15 (2)* 15-17 (1)*

HAWAII
January & February 1993
Openings Given In Hawaiian Standard Time

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	07-08 (1) 08-11 (2) 11-13 (3) 13-14 (2) 14-15 (1)	06-07 (1) 07-10 (2) 10-12 (3) 12-14 (4) 14-15 (3) 15-16 (2) 16-17 (1)	12-15 (2) 15-17 (3) 17-20 (2) 20-02 (1) 02-04 (2) 04-12 (1)	17-19 (1) 19-21 (2) 21-00 (3) 00-03 (2) 03-04 (1) 19-21 (1)* 21-01 (2)* 01-03 (1)*
Central USA	07-08 (1) 08-10 (2) 10-14 (3) 14-16 (2) 16-17 (1)	06-07 (1) 07-08 (2) 08-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	13-14 (3) 14-17 (4) 17-19 (3) 19-21 (2) 21-04 (1) 04-06 (2) 06-08 (3) 08-13 (2)	17-19 (1) 19-20 (2) 20-03 (3) 03-04 (2) 04-06 (1) 19-21 (1)* 21-03 (2)* 03-05 (1)*
Western USA	06-08 (1) 08-10 (2) 10-14 (3) 14-16 (2) 16-17 (1)	06-07 (1) 07-08 (2) 08-09 (3) 09-15 (4) 15-16 (3) 16-18 (2) 18-19 (1)	06-07 (2) 07-10 (4) 10-14 (3) 14-16 (4) 16-18 (3) 18-22 (2) 22-06 (1)	16-18 (1) 18-19 (2) 19-22 (4) 22-02 (3) 02-04 (2) 04-09 (1) 19-20 (1)* 20-22 (2)* 22-04 (3)* 04-05 (2)* 05-07 (1)*

*Indicates best times to listen 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.
**Indicates best times to listen for F-2 layer openings on 6 meters.
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.

world are also forecast for *17* and *20* meters from dawn through the evening hours, with conditions peaking shortly after sunrise and again during the late afternoon hours.

Good openings to most areas of the world are also forecast for *30* and *40* meters, beginning in the late afternoon hours, and continuing through the hours of darkness and until shortly after sunrise. *Eighty* meter DX openings to many areas of the world are also forecast for the nighttime period. Some *160* meter DX openings should also be possible during the hours of darkness and the sunrise period. DX openings on the *30, 40, 80,* and *160* meter bands tend to follow the day-night terminator, with signals peaking when it is sunrise on the most eastern end of a circuit.

VHF Ionospheric Openings

Some meteor-scatter-type VHF openings may take place during the first week of January, when the *Quadrantids* meteor shower is expected to occur. The Quadrantids is generally a moderately active shower.

Some sporadic-*E* propagation and auroral-scatter openings may take place during periods of radio storminess. Check the Last-Minute Forecast to see what days during January are expected to be Below Normal or Disturbed. These are the days when such openings are most likely on the VHF bands.

January should be a poor month for trans-equatorial scatter propagation on *6* meters, but an occasional opening may be possible between approximately 7 and 10 PM local time. An occasional *6* meter *F2*-layer DX opening may be possible towards South America from about an hour or two before to about an hour to two after noon. Openings are most likely to occur when conditions are High or Above Normal.

Short-Skip Charts

This month's column contains a Short-Skip Chart for use in the continental United States for distances between 50 and 2300 miles. Special propagation charts centered on Hawaii and Alaska are also included. The charts are valid through February 1993. See last month's column for detailed DX propagation charts for use during January.

73, George, W3ASK

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Please write to **Lodging, Dayton Hamvention, Chamber Plaza, 5th & Main Streets, Dayton, OH 45402-2400** or refer to our 1992 Hamvention program for a listing of hotel/motels in the Dayton area.

Special Awards

Nominations are requested for Amateur of the Year, Special Achievement and Technical Excellence awards. Refer to the Hamvention Program for nomination form or contact Hamvention Awards Chairman, Box 964, Dayton, OH 45401-0964.

1993 Deadlines

Award Nominations: March 1
Advance Registration and Banquet:
USA - April 2 Canada - March 26
Flea Market Space: February 1

Flea Market

Flea Market Tickets (valid all 3 days) will be sold IN ADVANCE ONLY. No spaces sold at gate. A maximum of 3 spaces per person (non-transferable). Electricity is now available in a portion of the last Flea Market row for $40 additional per space. Rental tables and chairs are not available in the Flea Market. Vendors ***MUST*** order an admission ticket when ordering Flea Market spaces. Please send a separate check for Flea Market space(s) and admission ticket(s). Spaces will be allocated by the Hamvention committee from all orders received by February 1. Please use 1st class mail *only*.

Notification of Flea Market space assignment will be mailed by March 15, 1993. Checks will not be deposited until after the selection process is complete.

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Dayton Hamvention 1993

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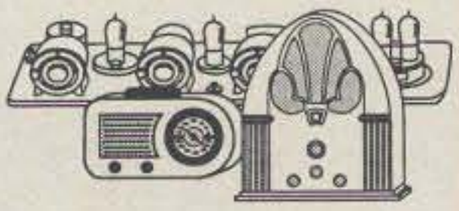

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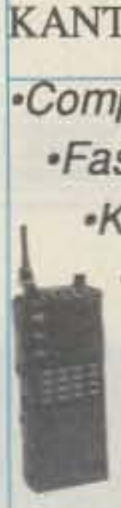

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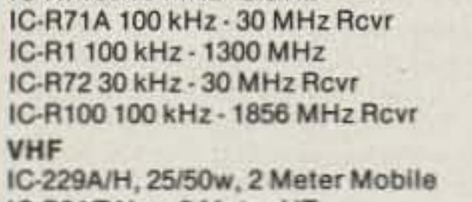

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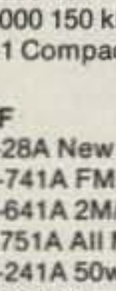

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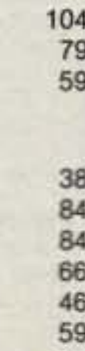

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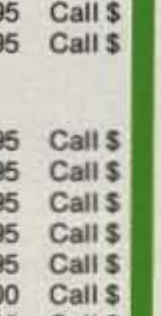

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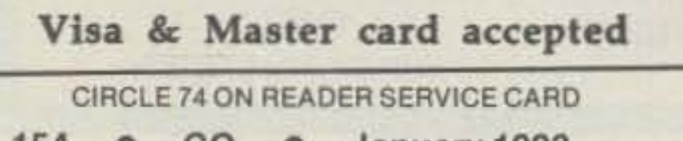

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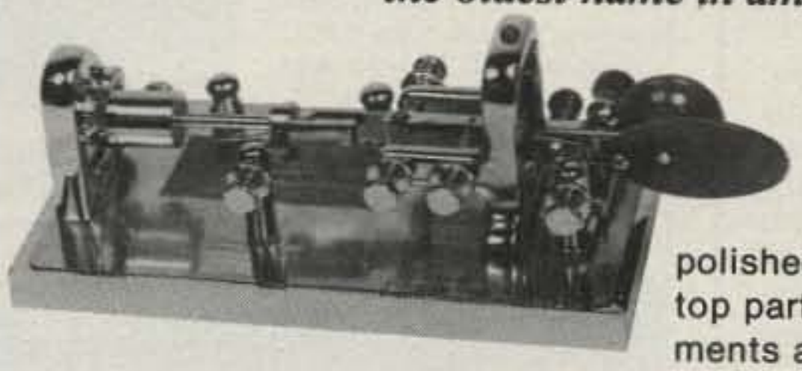

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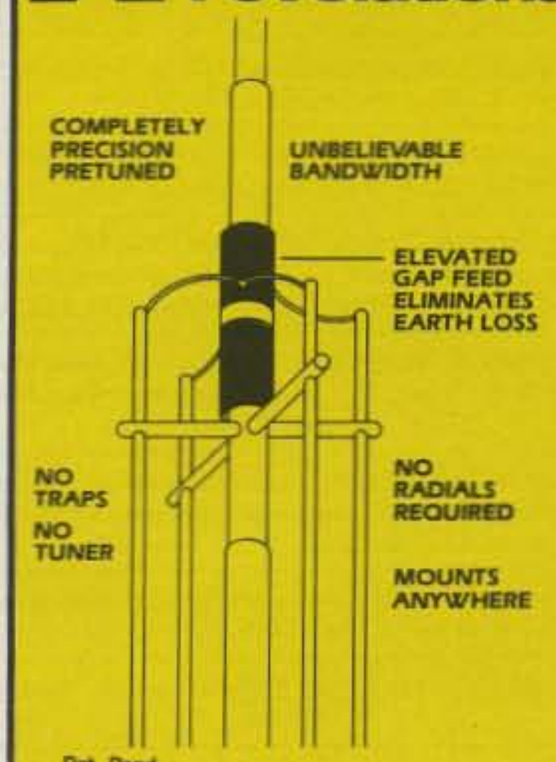

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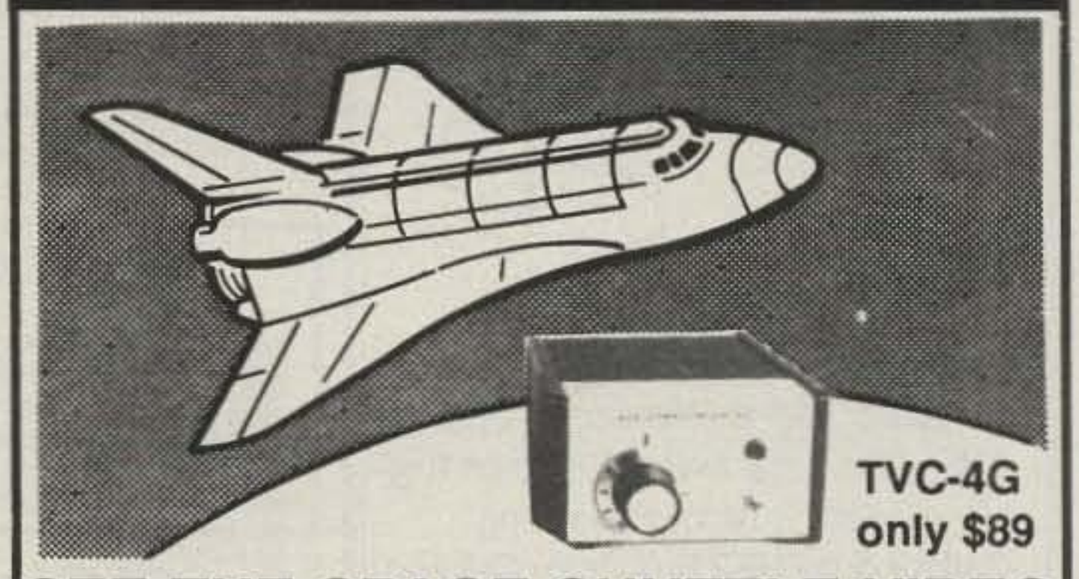

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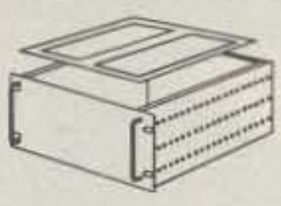

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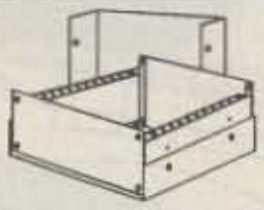

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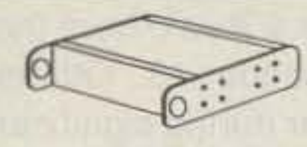

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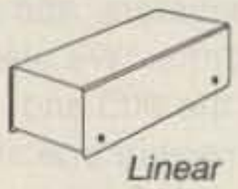

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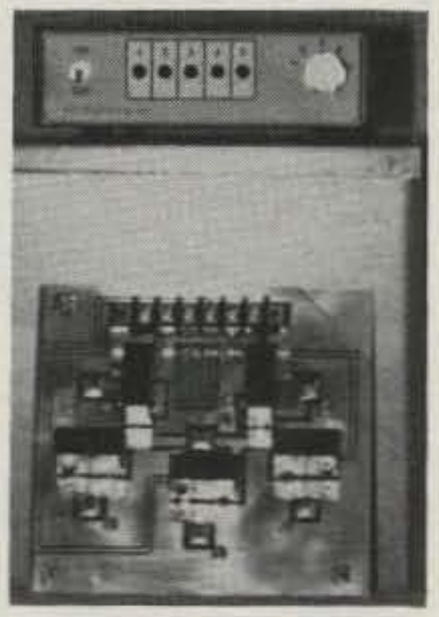

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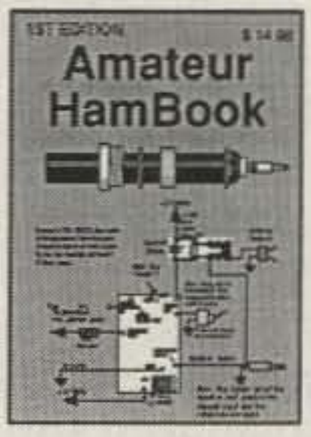

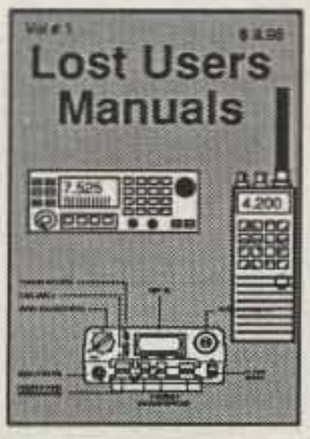

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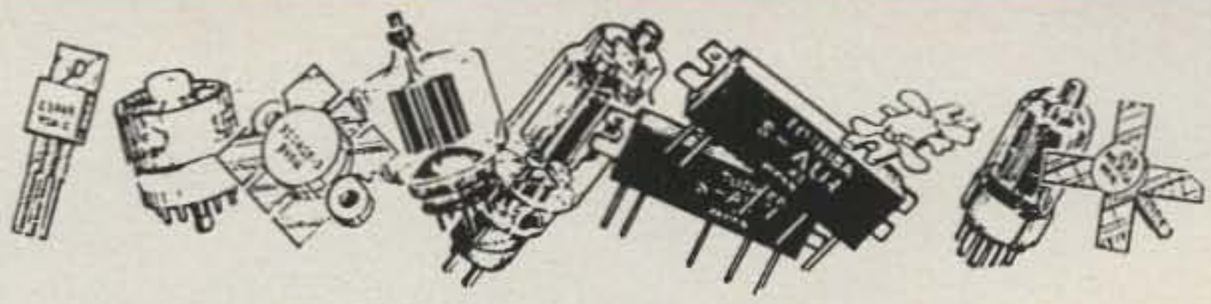
RF POWER
TRANSISTORS AND TUBES



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MRF150MP	148.75	2N4048	12.95	2SC2783	59.85
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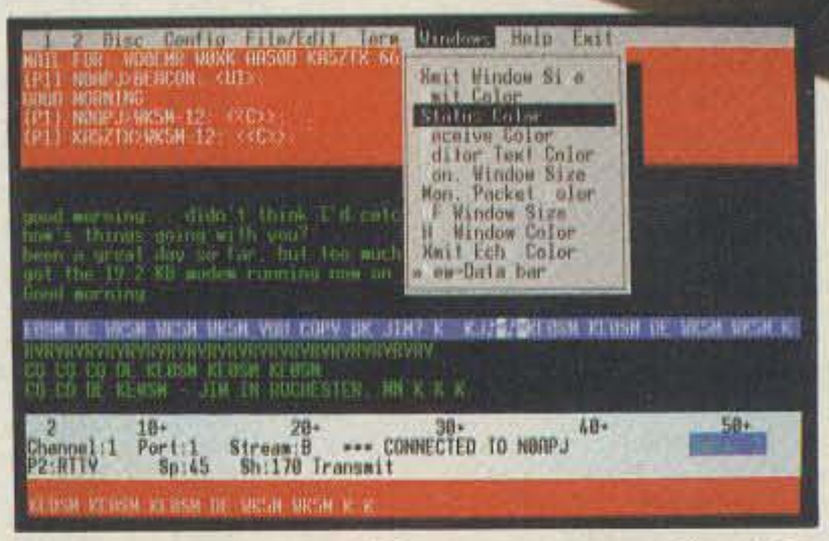
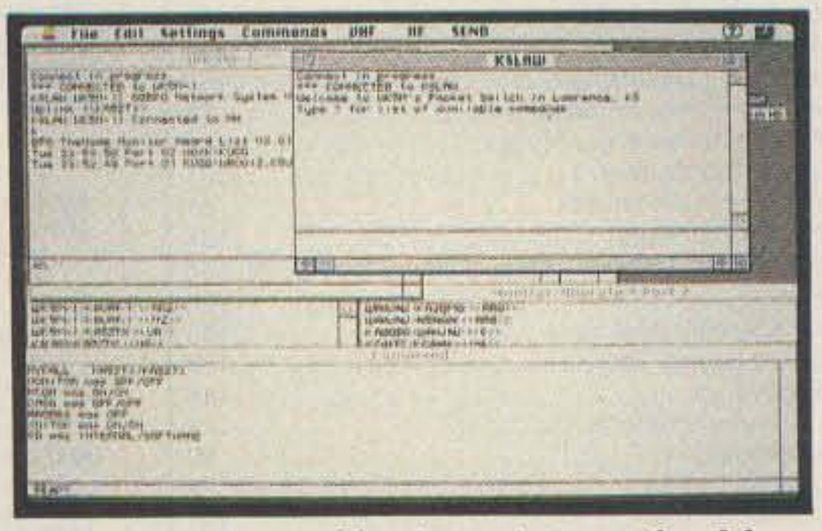
The standard KAM is version 5.0. The new **Pactor** option (version 6.0) is available now for all KAMs, with or without version 5.0 firmware. Contact your favorite dealer or Kantronics today and join users world-wide who are enjoying **Pactor**.

Kantronics KAM . . . the leader in all-mode digital communications.



Hostmaster on the PC



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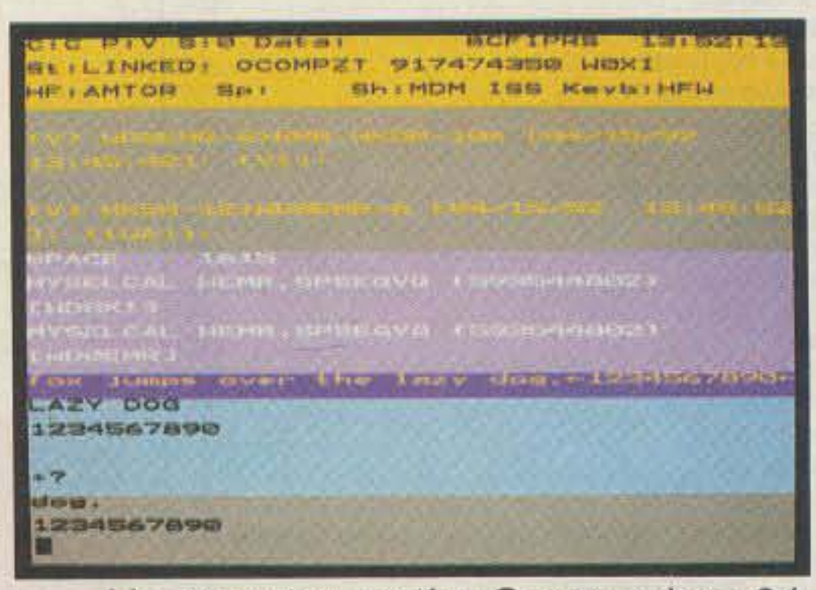

Hostmaster on the Commodore 64

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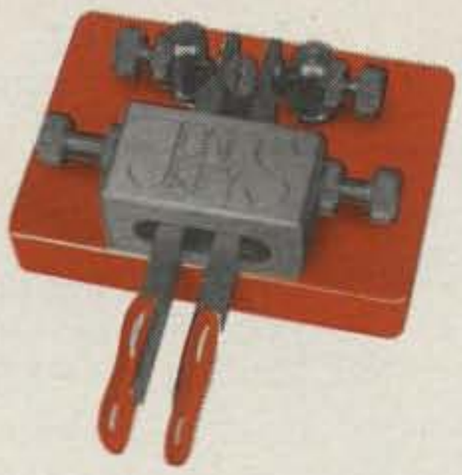

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All stated specifications are subject to change without notice obligation. All ICOM radios significantly exceed FCC regulati limiting spurious emissions. Δ1A6P2

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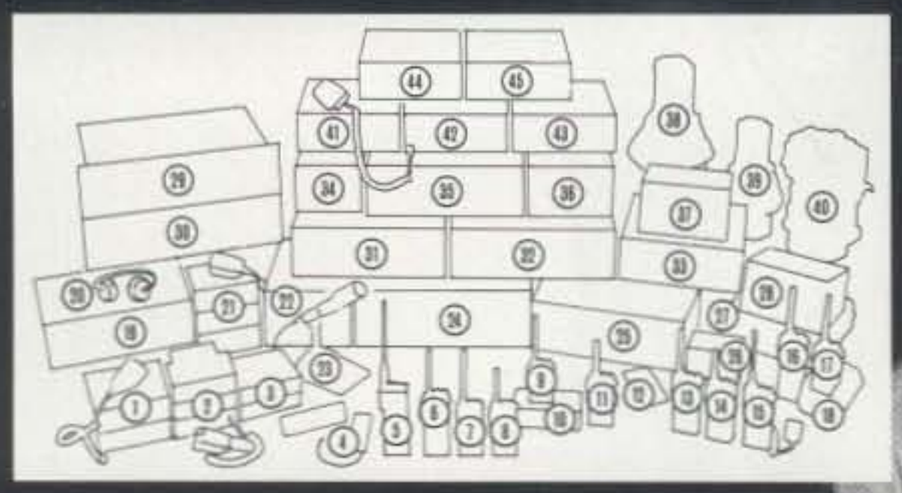

1. FT-2400/7400 2-Meter and 440 MHz Mobiles
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3. FT-5200 and FT-5100 2-Meter/440 MHz Dual-Band Mobiles
4. MW-1 Wireless Remote Control Microphone
5. FT-470 Dual-Band HT
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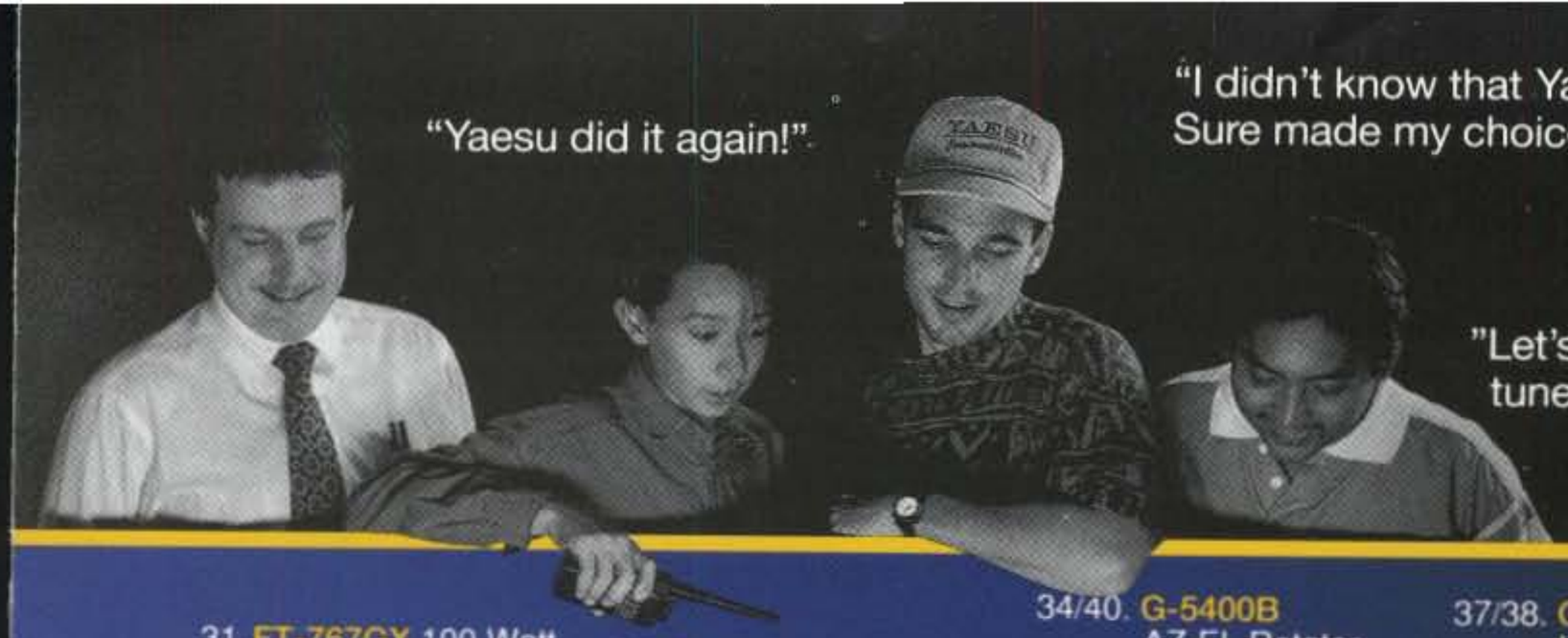
8. FT-815 440 MHz HT
9. FT-26 2-Meter HT
10. NC-42 Rapid Charger
11. FT-76 440 MHz HT
12. DVS-2 HF Digital Voice Recorder
13. FT-411E 2-Meter HT
14. FT-811 440 MHz HT
15. FT-911 1.2 GHz HT
16. FT-33R 220 MHz HT
17. FT-23R 2-Meter HT
18. NC-37 Rapid Charger
19. FRG-8800 General Coverage Receiver
20. YH-77ST Stereo Headphones
21. FT-290/690/790RII 2-Meter, 6-Meter and 70 cm All Mode Mobiles
22. SP-5 External Speaker
23. MD-1C8 Desk Microphone
24. FT-1000 200 Watt HF Transceiver
25. FT-990 100 Watt HF Transceiver
26. YS-60/YS-500 Power/SWR Meters
27. FC-800 External Automatic Antenna Tuner
28/39. G-800 Rotator
29/30. FTR-5410/ FT-2410A 2-Meter/ 440 MHz Repeaters



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