

HAM RADIO HORIZONS

Field Day Fun

July 1980 / \$1.50

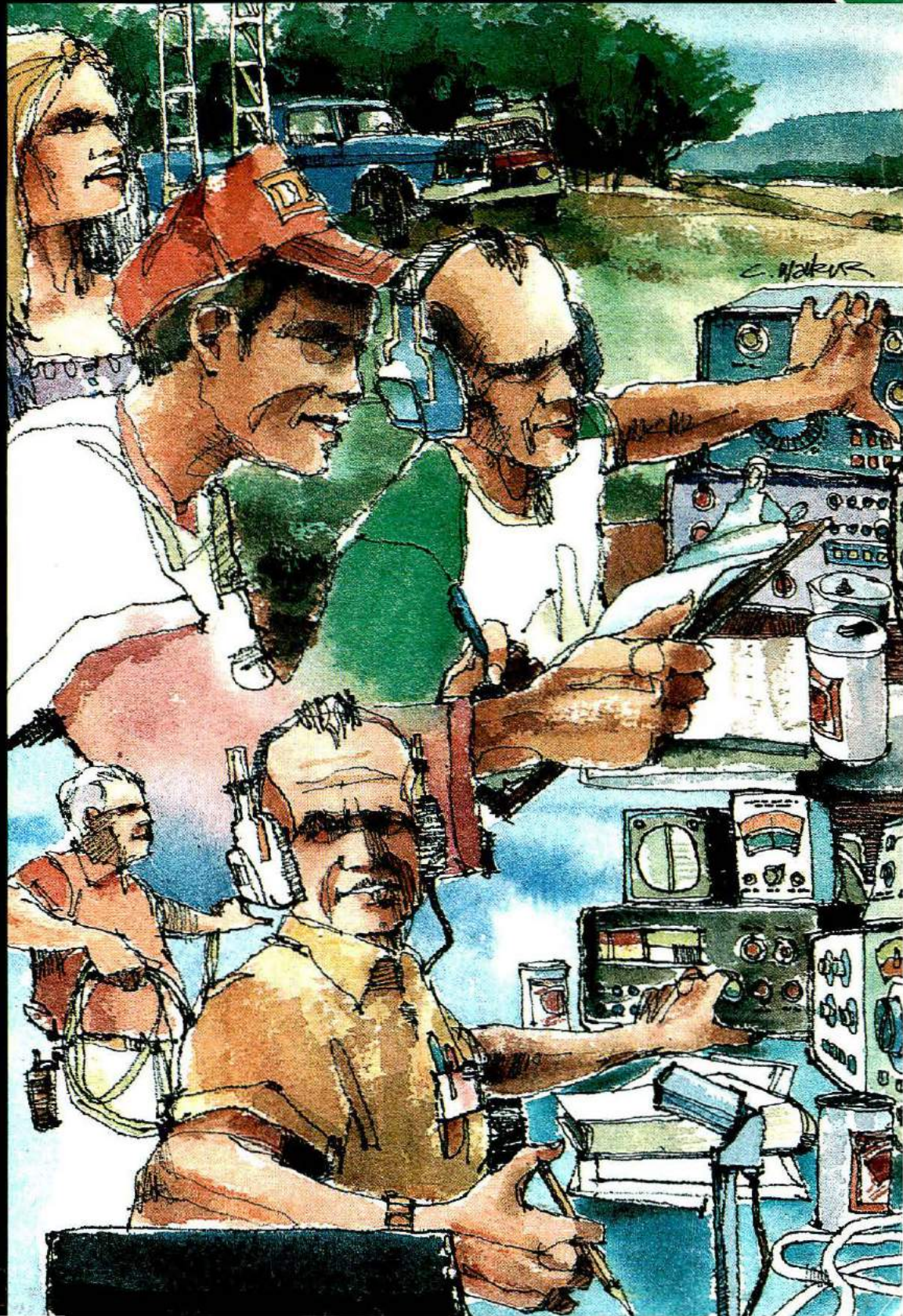
“How To” Tips
From a DX
Station

Surplus P.C.
Boards: Hidden
Treasures

Ham Convoy to
North Dakota

The D.B.I. Caper

Plus
Bill Orr
DX by K5FUV
Q & A Section
and more



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DELTA — the symbol of change—the name of a great new TEN-TEC transceiver. A transceiver for changing times, with new features, performance, styling, size and value.

TOTAL SOLID-STATE. By the world's most experienced manufacturer of hf solid-state amateur radio equipment.

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OFFSET TUNING. Moves receiver frequency up to ± 1 kHz to tune receiver separately from transmitter.

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SUPER AUDIO. A TEN-TEC trademark. Low IM and HD distortion (less than 2%). Built-in speaker.

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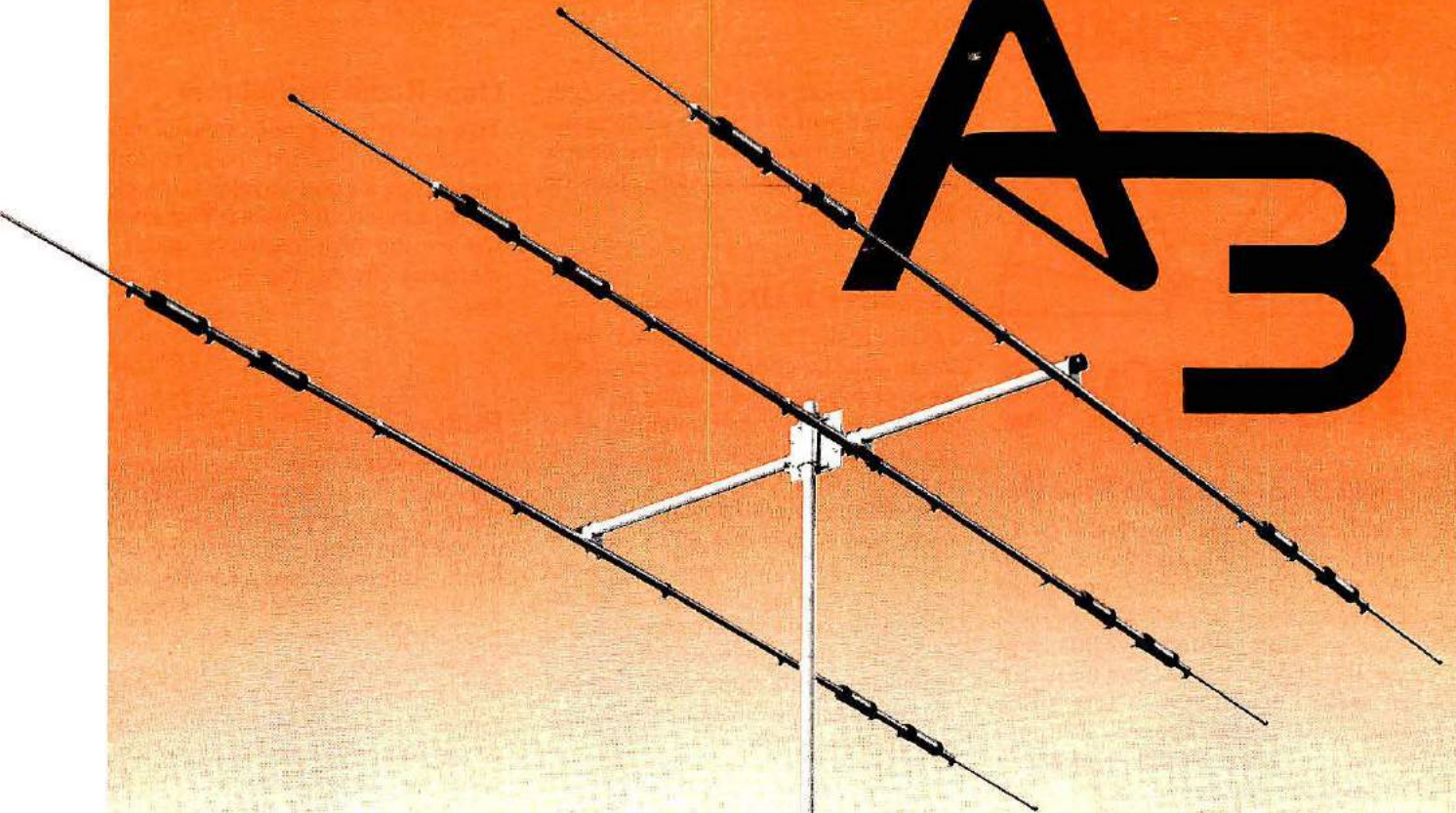
MODULAR/MASS-TERMINATION CONSTRUCTION. Individual circuit boards with plug-in harnesses for easy removal if necessary. Boards are available.

FULL ACCESSORY LINE. All the options: Model 282 200 Hz CW filter \$50; Model 285 500 Hz CW Filter \$45; Model 280 Power Supply \$139; Model 645 Dual Paddle Keyer \$85; Model 670 Single Paddle Keyer \$34.50; Model 247 Antenna Tuner \$69; Model 234/214 Speech Processor & Condenser Microphone \$163; Model 215 PC Ceramic Microphone \$34.50. Model 283 Remote VFO, Model 287 Mobile Mount, and Model 289 Noise Blanker available soon.

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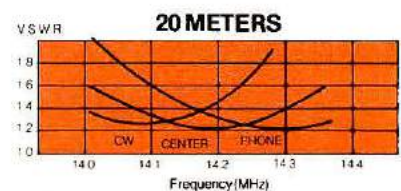
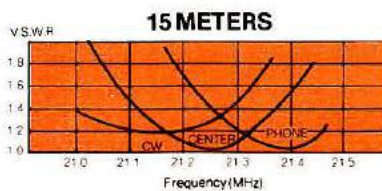
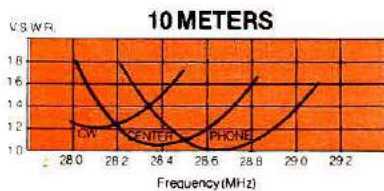
Forward Gain	8 dBd
Front to back ratio avg.	25 dB
V.S.W.R.	1.2-1 Typical
Average Bandwidth	500 KHz
Power Rating	2000 w PEP
Feed Point Impedance	50 Ω
Connector	Twin terminal stainless steel takes all coax.
Boom	1 1/8" - 1 1/2" x 14'
Elements/Longest	1 1/8" - 1/2" x 27'9"
Wind Sfc. area	5.6 Feet ²
Weight	35 Pounds
Turn Radius	15'6"
Mast Diameter	1 1/4" min. 2" max.
Material	6063-T832 Seamless aluminum
Fasteners	Zinc Plated Steel
Telescope Method	Taper tubing with full circle clamps

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No balun required

Enjoy the thrill of working rare DX with excellent A3 forward gain. Increase the pleasure of your daily contacts with A3 interference reducing front to back ratio. Use your linear amplifier with confidence in our new A3 high power traps.

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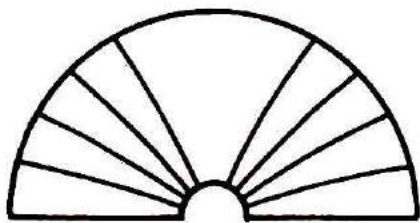


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THIS MONTH'S



HORIZONS

Field Day — Fun For Free (?)

Field Day means many things to many people, but mention it to an Amateur Radio operator and you'll probably be regaled with tales of mosquitoes, rain, thunderstorms, hot weather, cold weather, and hundreds of other "Murphysms" that strike even the best-prepared stations. However, listen closely and you'll note an underlying hint of the joy of having been through it all, and, if pressed, most survivors of Field-Day calamities can hardly wait to get back at it "next year."

We have a pair of Field-Day stories for you in this issue. They're from different sections of the country, and, although their theme is repeated every year in hundreds of locations, the tales point out the purpose of Field Day, as well as some of what can go right (or wrong) on such exercises. On page 12, W3CRG takes you through the "field-trials" of a group that decided to try two different approaches to their operating efforts. It's a lesson in what works and what doesn't, and part of what every group goes through in order to become a polished performer in the field of emergency-communications preparedness. W8FX then gives you some of the reasons for the "contest" on page 18.

The DBI Case

Almost anything electrical can find some way to cause interference to TV and Hi-Fi sets, and if you're the neighborhood ham, you are quite likely the "whipping-boy" for that interference. Here's the story of how WB5CDN handled a problem in his

neighborhood, calmly and thoroughly tracking down the culprit while maintaining good relations with the people nearby. The detective story starts on page 22.

Lessons For DX Chasers

DXing is the "in" thing these days, what with the good conditions, more new operators, and plenty of high-performance gear and antennas. This has the rare DX station under considerable strain, to put it mildly. WB5TZZ, a veteran of some DXpeditions, and holder of a DXCC total of over 200, provides some very useful tips on how to make life easier for the DX station, and increase your chances of getting through (and receiving a QSL card) at the same time. Interesting (and, perhaps, required) reading, starting on page 26.

Low-Cost Expedition

DXpeditions to rare and exotic places are great fun, take great planning, and usually cost a bundle. However, there are often plenty of opportunities for some exciting, nearby expeditions that will exercise your operating skills as well as your ability to plan and carry out such an event. If you do it right, you'll gain some excellent publicity for Amateur Radio and the things it can do. WBØZSA and friends found a good excuse to visit neighboring North Dakota with several vehicles full of Amateur gear, and the way they carried it off is a credit to any group. It must have worked, because they've been invited back.

Getting The Most Out Of Surplus PC Boards

How many times have you been tempted by those stacks of surplus PC boards that always appear at flea markets and in surplus houses? How can you resist those impossibly low prices? Does the thought of separating the parts from the board, and subsequent identification stop you? Well, there's help at hand. W6GXN tells you how to find the best buys, and further, how to salvage the parts in the speediest manner. Look on page 34.

Ham Radio Techniques

This month's collection of useful information from W6SAI includes some buying tips for you travelers to foreign lands, a bit about crossed-Yagi antennas for the high-frequency bands, a matching circuit, and some vhf stuff too.

Radio Clubs

Do you leave your radio club meetings with the feeling that it was too short, or do you have trouble staying awake? Do your officers enjoy their work, and return year after year, or is a lot of aspirin necessary as part of their diet? Is your membership roster full, or do you have to beat the bushes for new bodies? Here's an article that points out some of the reasons for problems in clubs, and suggests some cures and preventive medicine that will keep everyone in top form. If you're not an officer, read it anyway, and start a grass-roots movement to make your club and its meetings a happy happening.

Cover: Field Day Activities. Original watercolor by Chris Walker.

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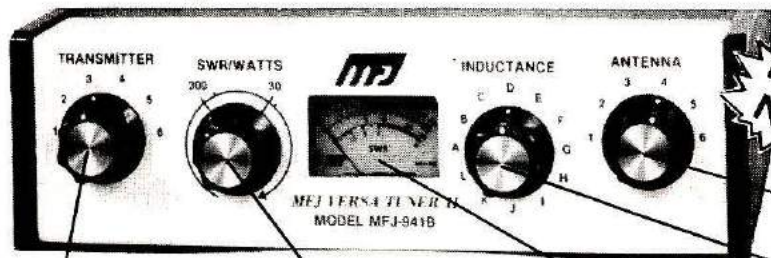
Subscription price: Domestic, one year, \$12.00; two years, \$20.00; three years, \$27.00. Canada and Worldwide, one year, \$12.00; two years, \$22.00; three years, \$30.00, payable in United States funds.

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This NEW MFJ Versa Tuner II . . .

has SWR and dual range wattmeter, antenna switch, efficient airwound inductor, built in balun. Up to 300 watts RF output. Matches everything from 1.8 thru 30 MHz: dipoles, inverted vees, random wires, verticals, mobile whips, beams, balanced lines, coax lines.

MFJ LOWER PRICES!



NEW, IMPROVED MFJ-941B HAS . . .

- More inductance for wider matching range
- More flexible antenna switch
- More sensitive meter for SWR measurements down to 5 watts output

NEW LOWER PRICE

\$79⁹⁵

Transmitter matching capacitor. 208 pf. 1000 volt spacing.

Sets power range, 300 and 30 watts. Pull for SWR.

Meter reads SWR and RF watts in 2 ranges.

Efficient airwound inductor gives more watts out and less losses.

Antenna matching capacitor. 208 pf. 1000 volt spacing.

Only MFJ gives you this MFJ-941B Versa Tuner II with all these features at this price:

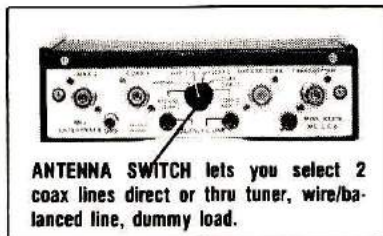
A SWR and dual range wattmeter (300 and 30 watts full scale) lets you measure RF power output for simplified tuning.

An antenna switch lets you select 2 coax lines direct or thru tuner, random wire/balanced line, and tuner bypass for dummy load.

A new efficient airwound inductor (12 positions) gives you less losses than a tapped toroid for more watts out.

A 1:4 balun for balanced lines. 1000 volt capacitor spacing. Mounting brackets for mobile installations (not shown).

With the NEW MFJ Versa Tuner II you can run your full transceiver power output — up to 300 watts RF power output — and match your



ANTENNA SWITCH lets you select 2 coax lines direct or thru tuner, wire/balanced line, dummy load.

transmitter to any feedline from 160 thru 10 Meters whether you have coax cable, balanced line, or random wire.

You can tune out the SWR on your dipole, inverted vee, random wire, vertical, mobile whip, beam, quad, or whatever you have.

You can even operate all bands with just

one existing antenna. No need to put up separate antennas for each band.

Increase the usable bandwidth of your mobile whip by tuning out the SWR from inside your car. Works great with all solid state rigs (like the Atlas) and with all tube type rigs.

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This beautiful little tuner is housed in a deluxe eggshell white Ten-Tec enclosure with walnut grain sides.

SO-239 coax connectors are provided for transmitter input and coax fed antennas. Quality five way binding posts are used for the balanced line inputs (2), random wire input (1), and ground (1).

NEW 300 WATT MFJ VERSA TUNER II'S: SELECT FEATURES YOU NEED.

NEW MFJ-945 HAS SWR AND DUAL RANGE WATTMETER. NEW LOWER PRICE

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Same as MFJ-941B but less 6 position antenna switch.

NEW MFJ-944 HAS 6 POSITION ANTENNA SWITCH ON FRONT PANEL. NEW LOWER PRICE

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NEW MFJ-943 MATCHES ALMOST ANYTHING FROM 1.8 THRU 30 MHz. NEW LOWER PRICE

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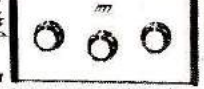


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MFJ-901 VERSA TUNER MATCHES ANYTHING, 1.8 THRU 30 MHz. NEW LOWER PRICE

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MFJ-900 ECONO TUNER MATCHES COAX LINES/RANDOM WIRES. NEW LOWER PRICE

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Same as MFJ-901 but less balun for balanced lines. Tunes coax lines and random lines.

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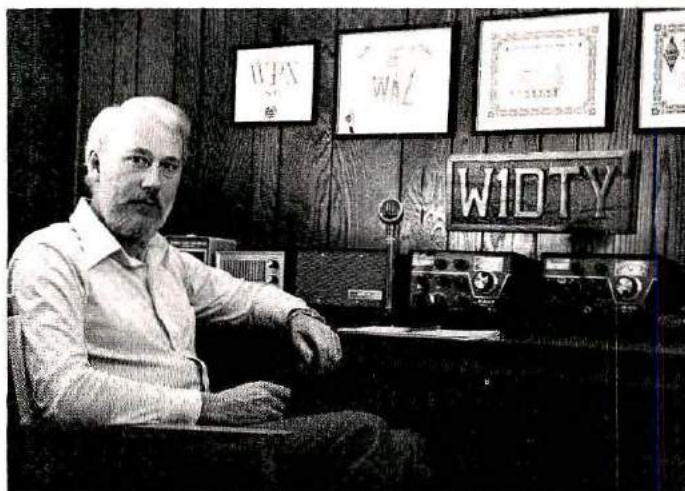
James R. Fisk

W1HR

December 12, 1934 - April 18, 1980

Ham Radio magazine, and ham radio, meant much to Jim Fisk. His concerns involved pride of accomplishment and uncompromising effort, sensing the perfection that is possible, but seldom achieved, in either electronics or publishing.

Jim's sense of what was right and proper, what makes a magazine easy and fun to read, and what it takes to put such a publication together, was honed to a fine edge from his years at the helm of *ham radio* magazine. He applied this sense to the creation of a new publication, *Ham Radio Horizons*, from the very beginning of its planning. It was no small step to turn from advanced technical excellence on one hand to the basic material that was needed for beginners and less-technical Amateurs on the other. He recognized the



need for both ends of the spectrum, as it were, even as he could see that these new people were (and are) the future of Amateur Radio.

Jim's concern with ham radio was a deep involvement. He wasn't a bystander or an onlooker, but a participant *par excellence*. And his participation often changed that in which he took part, to the benefit of all. Jim's last days with us typified this attitude of involvement, participation, and enjoyment. Above all, his first, second, and last looks were forward — to the future.

On Thursday morning, April 17, he came into the office with a lively step, a twinkle in his eyes, and moustache bristling; he was barely able to contain his excitement. "Did you get on 20 last night?" he asked. "The band was wide open; I've never heard better conditions, and . . . I cracked some pileups! I worked Mount Athos, Tahiti, Mali, and Mayotte . . . even His Majesty, King Hussein, JY1. You know, I had never worked him before, and it was a thrill I'll never forget!"

He spoke with quiet pride of his Collins station, of his four-element Cushcraft monobander at 100 feet, and of his joy at beating some of the 'big guns' at their own game. He expressed this in a letter to the *DX Bulletin*:

The DX stations available during the past 24-36 hours have really been hard to believe. At one point late last night SV1JG/A, TZ4AQS and HF0FLP were QRMing one another just below 14200! And it's been a long time since I worked three new ones in the space of a few hours . . . would have worked VK0KH, too, but he's supposed to come up again tonight.

I have now worked the necessary contacts for 5B-DXCC, but am still short a few cards on 40 and 80 meters. As a matter of fact, my countries count on 80 is actually higher than on 15, but only because I haven't had time to get my beam up on the tower.

So far as DX is concerned, April, 1980, has been a month to remember! But damn, I missed KP2A from 8Q7 . . .

Lunch that last day was a time to remember. Rush Drake, W7RM, had dropped by to visit, and the talk turned quickly to several large, high-performance high-frequency antenna systems that he had seen recently. Soon, the placemats at the local restaurant were covered with exotic sketches representing nifty ideas for multiple arrays with microprocessor controls; and Jim began to outline progress on his own exciting plans for a multi-operator super station that would be the envy of every contender. Several parts of his plan had already taken shape and some hardware was already in place. Jim hoped to have the rest finished soon. The sunspots were riding high and Jim was certainly intending to make the best of them in the months ahead.

We remember Jim's enthusiasm, his fire, his drive for perfection, his enjoyment of being who and where he was, and his long-lived love affair with ham radio, symbolized by his call: W1HR.

Yes, we remember . . .

W1XU

July, 1980
Volume 4, Number 7

HAM RADIO HORIZONS

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There are certainly few business situations that can bring two people much closer than working as publisher and editor of a small magazine during its start-up years. It was my privilege to share with Jim Fisk, then W1DTY, just such an exciting, yet often highly frustrating, experience.

We had embarked on a project which many told us was pure folly: a fourth entry in the already well-filled Amateur Radio magazine field. Success was impossible, they said. But with Jim's expertise and ambition, plus my stubbornness and determination, we felt that *ham radio* magazine had something to offer that was really different — a completely new publication, dedicated to excellence and professionalism, which would make a very real contribution to the hobby we both loved so well.

Our success is history now, but it didn't come easily. Editorial problems, printing difficulties, mailing mixups, promotional disappointments; I guess we saw them all. But working 26 hours a day, seven days a week, we overcame them one by one and gradually *ham radio* magazine established itself as the technical leader we'd envisioned, and new standards were set for both technical and graphic excellence in our field. These standards were the work of Jim Fisk, certainly the most capable and professional editor in many years to touch the pages of a ham magazine. He has set a standard that Amateur Radio editors will strive to reach for a long time to come.

But Jim was much more to our hobby than merely an excellent editor. He was at the center of new ideas and technical advances. His office was virtually a central switchboard or meeting place for the top thinkers and leaders in our hobby to exchange their ideas and discoveries, and he introduced, through the magazine, many of the contributions to Amateur state-of-the-art which have been developed in recent years.

This was probably never better demonstrated than during the 1980 Dayton Hamvention, which took place just a week after Jim's death. As our staff met literally hundreds of people who had known and worked with Jim, we were constantly reminded just how important he had become not just to our own publishing efforts but also to the continuing progress of Amateur Radio itself.

Jim will be sorely missed both here at the Ham Radio Publishing Group and in the Amateur Radio hobby at large. Fortunately, however, he has left behind much which will continue to make significant contributions for a long time to come. Thanks to his efforts, we now have a well-trained editorial staff who have learned how to do things to Jim's standards. Our future publications will act as a living memorial to Jim, as they continue to be the rallying point for excellence in Amateur matters. Although we will now be operating without him, we will continue to work to his standards. The question, "How would Jim have done this?" will be asked many times, and the answer will provide our guidelines and keep us on our toes.

In closing, I know I speak for all of us, both the *ham radio* family and Jim's personal family, when I express our thanks for all the many letters and calls we have received in recent days. They have been a great inspiration to all of us during this difficult period.

A handwritten signature in cursive script that reads "Skip".

Skip Tenney, W1NLB
Publisher

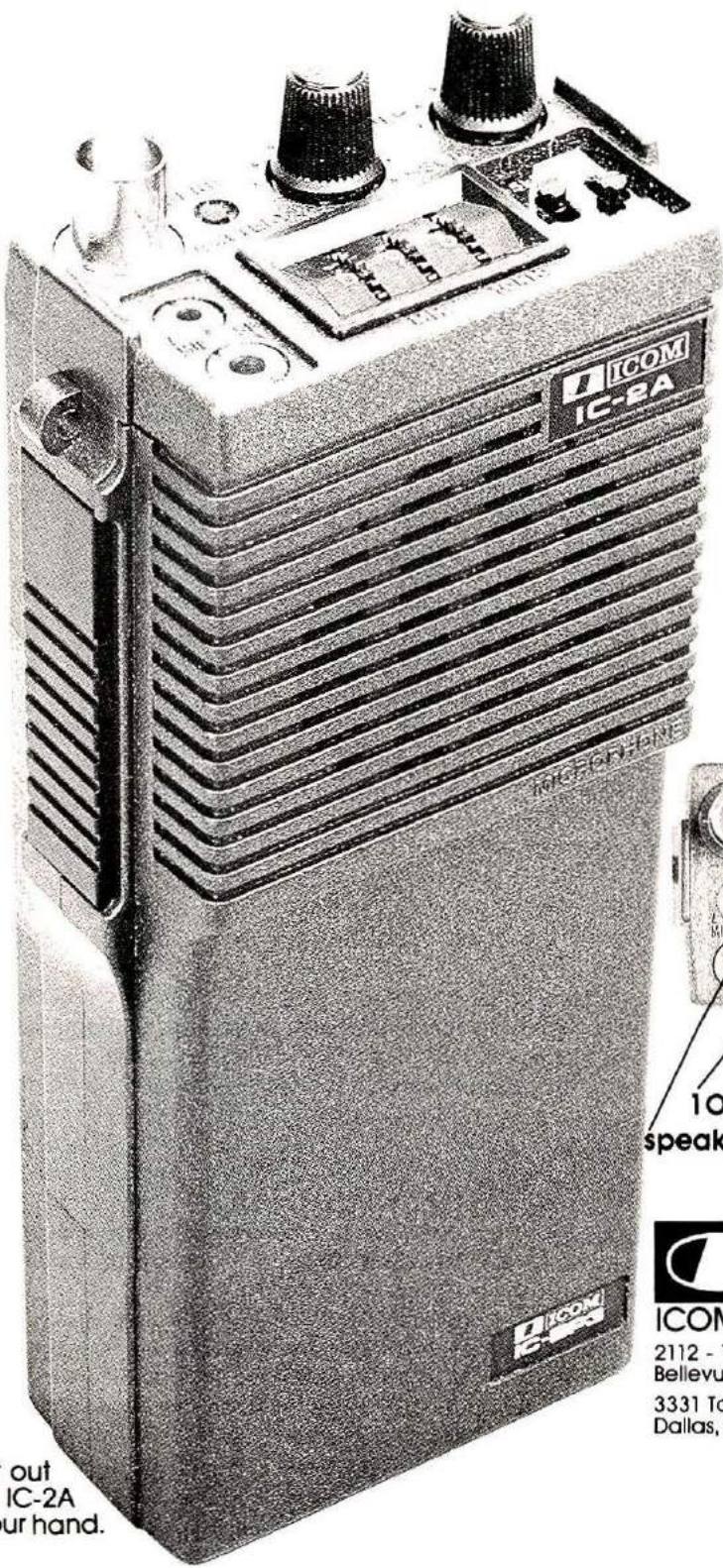
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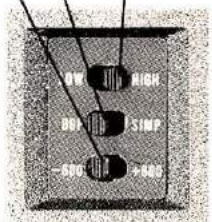
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Actual size: Cut out and put the ICOM IC-2A in the palm of your hand.

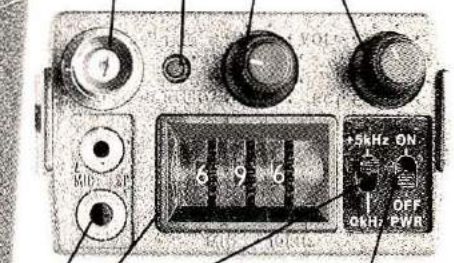
BACK VIEW
 ±600 khz offset
 simplex/duplex
 Hi/lo power



TOP VIEW

BNC antenna connector
 "Rubber Duckie"
 standard

transmit indicator
 squelch
 volume control



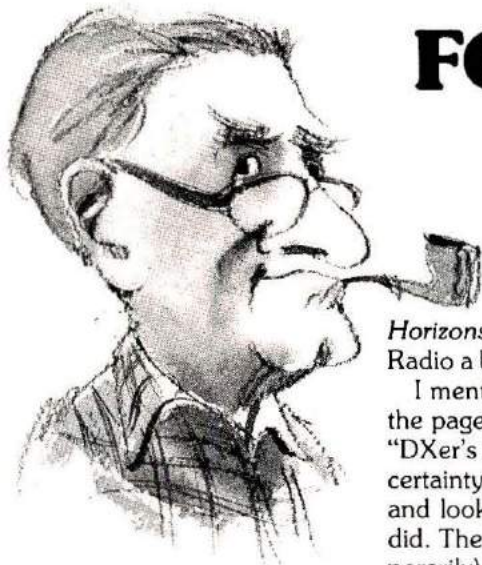
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THE ANSWER IS: NOW!

All 800 channels of it!



FOCUS & COMMENT

I'd like to tell you about a couple of new things you'll find in *Horizons* shortly — good material that will help you enjoy Amateur Radio a bit more.

I mentioned in this column last month that W9KNI would be back in the pages of *Horizons*, and predicted good things. Well, the first of his "DXer's Diary" is in print, ready for the August issue, and I can say with certainty that it has all the power needed to get you glued to your rig and looking for that rare one, just as his earlier "Far Horizons" article did. The first two of the series got me so fired up that I abandoned (temporarily) my old favorite vhf haunts, and strung up a dipole (*a dipole?*) on 20 meters, and proceeded to work a couple more or less rare coun-

tries. (Bob, you'll start the demise of vhf!)

Then, just to make things even more interesting, an offer of a series of articles about "The Novice Experience" lands on my desk. Instead of the usual "How I worked my first WA2 at 3 Words Per Minute" tale, it turned out to be a well-done story of the incentives, problems, reactions, thoughts, and results as experienced by someone who has known about Amateur Radio for some period of time, but resisted all temptation until the bug caught him with his guard down. It's fascinating reading, and those of you who have been through it will smile and nod your head in silent agreement. For would-be hams just starting down that road, it'll offer you encouragement and provide signposts for guidance along the way. You'll start reading "The Novice Experience" in our September issue.

Now for a prediction: A lot of you are going to be very disappointed with your antennas in the next three or four years.

Of course, the obvious question now is: "How do you know?"

Well, it's like this. At this part of the sunspot cycle, solar activity is high, which does great things to our atmosphere. That mirror-like ionized layer is doing its job so well that almost any signal, even a milliwatt or two, is reflected back to the far reaches of the earth, with the result that many great DX contacts are made by stations using low power and "the latest and greatest, super-special antenna." Some of these antennas border on the ridiculous, and others truly *are* ridiculous; but they work. At least, they do well right now. I haven't seen any claims to DXCC while using a salt-soaked noodle, but it wouldn't surprise me!

Now, I'm not knocking the need for innovation in Amateur Radio. Certainly there is a continuing opportunity to see how you can enjoy Amateur Radio even while confined to the unfriendly — and very restricted — atmosphere of an apartment, condominium, or mobile home. This situation requires considerable thought and experimentation in order to find an antenna that will do the job for you (without doing a job on your neighbor's TV or Hi-Fi). But, it has been done, and many of those antennas will continue to work well, even after the sun slows down, because they are based upon sound design theory and practice. Effort has been expended to determine how the antenna should work, and to install it in the best allowable condition to let it work, even though in restricted space.

I guess what I am trying to say is, just because you hooked one conductor of your transmission line to the window screen, and the other to the stove, and worked a 4X4 at high noon, don't expect to be able to do so all the time.

However, if you really can't dig this antenna theory stuff, stick around. You've only 11 years to wait for the next sunspot peak, and your window screen (or wet noodle) will work again.

Tom

Thomas McMullen, W1SL
Managing Editor

WHEN OUR CUSTOMERS TALK... WE LISTEN.



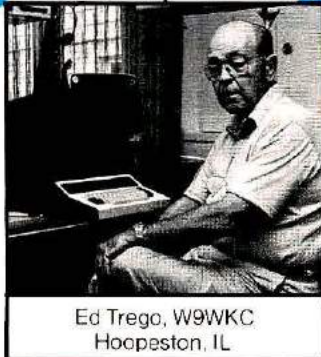
Jim Clouse, K5JN
Oklahoma City, OK



Phil Litchfield, WA1OFP
New Canaan, CT



Colin Richards, 9M2CR
Federation of Malaysia



Ed Trego, W9WKC
Hoopeston, IL



Reinhard Richter, DJ1KM
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Introducing the All New DTR Component Series.

Is your operating ability superior to the equipment you're using?

If you're a serious amateur who takes pride in his talent you should own the best, the new DTR Communication System.

Amateur Radio has developed over the years into a sophisticated hobby. We all recognize the thrill of transmitting global signals, but to many hams it is the finesse with which those signals are transmitted that determines his pride and success as a ham.

The DTR 1200 linear amplifier provides 1200 watts SSB and 1000 watts CW input, continuous duty. We used large, 3½" shadow box, back-lit meters for easy reading, and tuned input for compatibility with solid state or tube transceivers.

The DTR 3KA antenna tuner handles a full 3KW PEP. It features a built in 2KW dummy load with thermostatically controlled forced air cooling, a remote sensor box to insure meter accuracy and 50 ohm impedance.

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NEWSLINE

NON-GOVERNMENT DF OPERATIONS ON 420-450 MHz would not be discontinued after next January 1 under General Docket 80-135, a Notice of Proposed Rule Making recently adopted by the FCC. In Parts 2 and 90 of the Commission's rules all non-government radio location operations on 420-450 MHz (where Amateur Radio is secondary to government radio location) were to have ceased January 1, 1981. These operations, used principally for positioning of off-shore oil-well drilling rigs, had caused considerable controversy in the Amateur community when authorized a few years ago.

Deletion Of The January 1 cutoff was requested by Del Norte Technology, which wants to extend commercial DF use of the band to inland areas using spread-spectrum techniques. In its NPRM, however, the Commission suggests that this commercial use of the band would continue to be limited to coastal areas, authorized on a case-by-case basis and secondary to the Amateur Service. The FCC noted that almost four years of operation by HIRAN and other position-location systems in the band had produced no complaints of interference from other band users.

DR. PERRY KLEIN, W3PK, AMSAT's president and general manager, has announced his resignation. Perry has served at the AMSAT helm since the organization's inception in 1969. He guided it from its small beginnings to a worldwide organization of nearly 5,000 members.

Perry's Vast Contributions have brought wide-spread recognition and credit to this unique Amateur Radio endeavor. He will continue to serve as a consultant and becomes AMSAT's president emeritus.

Dr. Tom Clark, W3IWI, AMSAT executive vice president, becomes acting president. John Henry, VE2VQ, has been named first alternate director and will fill Perry's seat on the AMSAT board of directors. They will serve until the board meets in September and elects new permanent officers.

THE IARU REGION 2 EXECUTIVE Committee concurred on the Region 1 Executive Committee's recommendation that the new 10-MHz band be CW only, and further suggested the voluntary use of low power and avoiding contest and DXCC activities on it, at its meeting in Santo Domingo, April 16-20. In attendance were W4KFC, YV5BPG, OA4AV, VP9GO, HP1FI and H18LC with VE3CJ and DJ3KR observing.

The Committee Also reviewed WARC results, discussed planning for future WARCs, and IARU activities.

FCC EMPLOYEES' TRAVEL EXPENSES can be reimbursed by an Amateur organization for attendance at a hamfest or other club meeting, it has just been decided. In order to qualify, however, the sponsoring group must be a tax-exempt organization under Paragraph 501A and 501C3 of the Internal Revenue Service Code. Travel expenses of an FCC representative must be paid in full by the host organization or by the FCC — they cannot be shared.

This New Directive is good news for hamfest organizers, as recent FCC budget tightening has severely restricted FCC representation on the hamfest circuit.

ALMOST HALF THE AMATEUR VIOLATIONS for which citations were sent during a recent six-month period were for operation outside the authorized subband, according to an FCC review for HR Report. Next most-frequent violation was failure to transmit required ID, almost 20%. Total violations observed, however, was only 192.

GENERAL MOTORS HAS been granted an FCC license to build and operate an experimental radio station, KF2XHE, on various discrete frequencies between 1.8 and 470 MHz. It's to be used to determine the susceptibility of automotive electronic systems to electromagnetic radiation, an area in which Amateur Radio has caused problems with poorly designed electronic ignition and braking.

CALIFORNIA'S FIRST FAST-SCAN ATV repeater is on the air as W6ORV/R. Input is near 430 MHz, output near 1250; it's running color and even has visual and aural indicators to assist users to get into it properly. Another Los Angeles area ATV repeater, this one to be on Mt. Wilson, should be on soon.

BATTERY-POWERED "WAS" achieved in only 13 hours and 45 minutes by KH6GX, operating from Roundtop in the hills above Honolulu in early April using a TS-120, a Sears "Diehard," and a Hustler vertical. KH6GX and helpers KH6ILR and WH6AGM used 10, 15, 20, and 40 for their feat, got nice channel-2 TV news coverage for their trouble.

HAITI AND CANADA HAVE NOT YET reached an agreement on reciprocal licensing, despite on-the-air rumors. Negotiations are in progress, and such an agreement is likely soon. No Third-Party Traffic agreement exists between those two nations, and none is expected.

KENYA'S GOVERNMENT MAY BE trying to discourage Amateur Radio, according to word from the Radio Society of Kenya. Effective June 1, all Amateur transmitters must be type approved at a fee of \$150 each. Any modification or repair will require new type approval.

Field Day Adventures With Prince George's Wireless Association

BY DON PECK
W3CRG


*"Just Wait'll
Next Year!"*

Field Day '79 was the most exciting one ever for our group. Some of the members from the Prince George's Wireless Association Radio Club, K3CEZ/3, decided to set up at a rest stop on highway I-95 this year. Others who thought they could do better decided to split off with their own setup located on a hill in Chev-

erly, where they hoped to run up a better score than the I-95 group.

The Cheverly group, AB3A/3, started about a week early by constructing a four-element, 40-meter wire beam to be anchored in the trees at the site. Using a sling shot and a fishing rod, John, WA3RSK, shot lines up into the highest trees to pull





the wire elements into place. With help from Tyler, WA3UXU, sloping dipoles on 80 and 20 meters were erected, and a 2-meter collinear antenna was also put into service.

The I-95 group met at the local Red Cross building Saturday morning, and loaded the gear from the club station into their cars. They met the rest of the crew at the highway site, and set up five-band dipoles and a 2-meter beam antenna.

Every field day seems to have its Murphy's Law application. With the I-95 group, the problems started with the 1.5 kW-generator, which refused to start. The ignition points were cleaned, water was drained from the carburetor, and the fuel system was cleaned out, enabling the generator to run. Unfortunately the regulator was defective, and the output varied from 100 to 150 volts. This resulted in blowing the high voltage filter capaci-

tor in a Kenwood TS-520, and a diode in a Tempo 220 transceiver. The generator was finally put in service by using the Winnebago air conditioner as a stabilizing load.

Jim, WA3NSI, was able to get his rig on the air using the standby generator on the Winnebago. Jim, who is blind, has a Tempo 220 transceiver which has braille labels for the rear connectors. He has memorized the front panel controls, and uses audio tone oscillators to give him the meter readings.

About 5 PM, the state police came by and told them they had to leave because there was a three-hour time limit on the use of a rest stop, and they had no permit to use the area for Field Day weekend. The group then moved the whole operation up the

Field Day

road to the junction of Route 32 and I-95, only to be caught in a thunderstorm before they could erect the tents.

In the meantime, the Cheverly group had finished their setup by 2 PM and went on the air. Murphy's Law struck again when one of the rigs popped a circuit breaker. Jake, AB3A, began to troubleshoot the rig, with advice from all concerned, while John and Tyler operated the high fre-

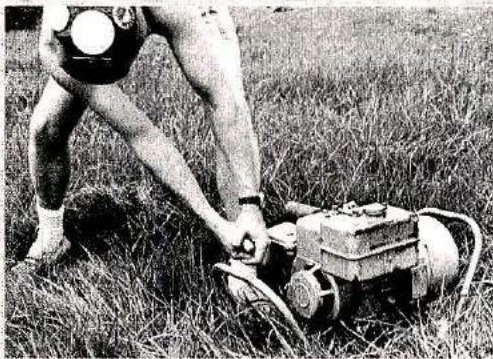
quency and vhf rigs. After the short circuit was found (between one of the heater wires and the chassis), the rig was put on the air. The same thunderstorm that caught the I-95 group also caused problems for the Cheverly group. The wind on the hill was so strong that it filled the operating tent like a balloon and started to blow it away. Three people were required to hold the tent down. The weather was so bad that the peg holding the door

flap was pulled right out of the ground. The floor of the tent got wet but, fortunately, the equipment remained dry. The time lost battling the storm cost about 100 contacts.

It is difficult to compare the two operations, to tell if the Cheverly group was justified in splitting off from the I-95 group. Ignoring the effect of Murphy's Law, the most important factor seems to be the antenna installations. The four-element, 40-meter

FIELD DAY FUNNIES

Pull!



It's time to feed the power supply.



Pull!

It's gotta start this time!



Field Day

beam on the hill at Cheverly resulted in an operation of almost continuous pileups. The higher hilltop installation of the 2-meter antenna by the Cheverly group gave them command of the calling frequencies, so it was difficult for the I-95 group to work 2 meters because of QRM. There was little activity on 10 meters, and the other bands netted about 200 contacts each, making a total of about 1500 contacts resulting in a score of

1800 points for the Cheverly group. The I-95 group, using five-band dipoles, got 348 contacts resulting in a score of 696 points, most of which were on 80 meters.

An essential part of Field Day is planning ahead. For this year's Field Day, the Cheverly group obtained a permit and spent several days preparing superior antennas.

At the July meeting of the radio club, the I-95 group discussed their

problems with this year's Field Day, and how to improve next year's operation. Plans were made to use a bicycle-pedal powered generator to pick up more points. Everyone agreed that it is essential to check out all equipment prior to use on Field Day.

Most important of all, both groups had a good time, even though they could have easily done without Murphy's Law. We plan to be back in 1980 — look for us. **HRH**

"CQ Field Day, CQ Field Day . . ." **WA3UXU**



"Ready? I've been ready since I fixed the generator!" — **WA3ZMY**

"If that's the 40-meter feedline, what's this one?"



"CQ Field Day, CQ Field Day . . ." **WA3SNI**

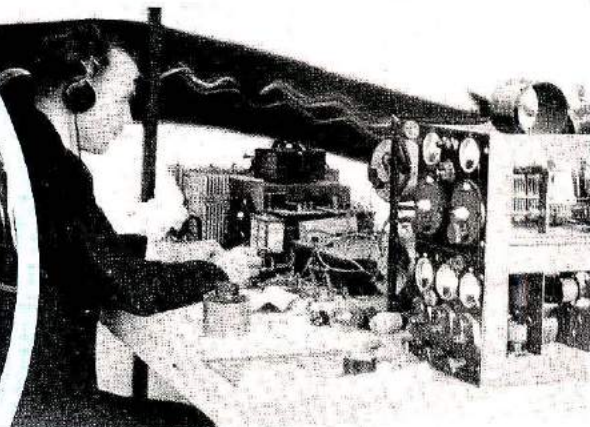
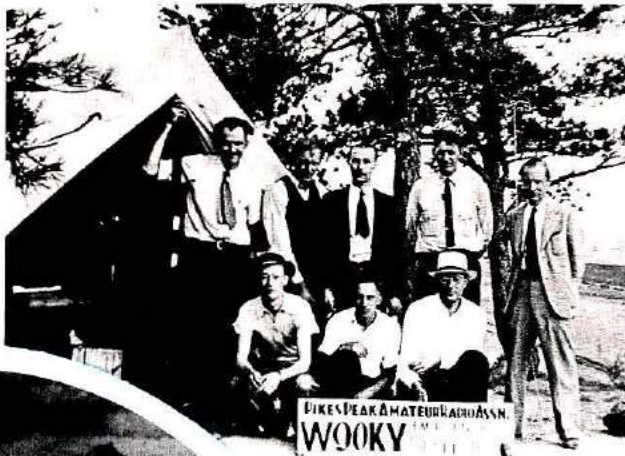


"We should've cleaned the spark plug first." — **WB3JRW and WA3ZMY.**

What About Field Days Back Then?

FIELD-DAY PARTICIPATION

CLUB SCORES	Points for QSOs	Sec's and Foreign	Score
W9ZZAL Central Illinois Radio Club	98	15	1470
W5KXC London Amateur Radio Club	35	22	770
W8GDM Buckeye Short Wave Radio Ass'n (Plus W8ZZBJ 14 mc., W5MNC, and W8BZL 56 mc., 478)	37	12	444
W5BXY Abilene Radio Club (W5BIB 1.7-3.9 mc. and W5AW 378)	24	12	268
W1FTS Hoosac Valley Radio Club	19	10	190
VE5EZ* Victoria Short Wave Club (W5MKA, W9NKN, and W9HXH, 22)	5	3	20
W3JGT Southern Minnesota Radio Ass'n (W9MKA, W9NKN, and W9HXH, 22)	5	3	20
W7BT Astoria Amateur Radio Ass'n	5	3	20
W9RWJ Pikes Peak Radio Ass'n	5	3	20
OTHER LEADING SCORES			
W1PAW W4AIL-W4AZF-W4BOT-W4AWS	62	22	28
W2BPP Mr. Boyd Phelps and YF (7 and 3.5 mc.)	63	22	28
W9LOV W9HES-BFL-IHW (Pr. 46w on 7 and 14 mc.)	53	22	28
W9NEV W9ALW (50 watts on 7032 and 14064 kc.)	52	22	28
W5RR (10 TNT, 22 watts on 7 mc.)	51	22	28
W5HUC 510; VE3CT 683; W9MKI 612; W9FD 418; W7AAL 418; W9ZZAP 340; W4PEL 238; W9ZZ 180; W4PAL 168; W8ZZAC 112; W5GI 102; W9P 78; W8HSG 68; W1FEE 52; W5CTZ 38; W8ZC 2; W9...			



International Field Day— June 10th—11th

CLUBS, 56-mc. operators, all hams with licenses for portable stations, attention!! Starting Saturday at 4 p.m. local time (June 10th) and ending Sunday at 7 p.m. local time (June 11th), all U. S. A. and Canadian station owners are invited to schedule "field activities," excursions with concentrated operation of portable transmitters and receivers. Only portable stations, actually in the field, away from the "home" address are eligible to submit field day scores.

The object will be for each "portable" station to work as many other amateur stations as possible—each to count one point toward a score. Any or all amateur frequency bands may be used, voice or c.w. telegraph likewise. The "total" of such points may be multiplied by the number of A.R.R.L. Sections worked. Contact with another portable station at any point except its base, or home address, will "rate" double credit, or two (instead of one) points. Two-way work with a foreign station shall entitle the operator of the "portable" to triple credit, or three (instead of one) points, in addition to which

each foreign country (prefix) may be added to the number of Sections to increase the "multiplier." The R.S.G.B., N.V.I.R. and R.B. are sponsors of similar national field days in Europe, and we hope this may assume an international complexion. All amateurs with licensed portable stations are invited to take part . . . each such station will please report its power and frequency band used, and its log of operation and score for the period given, within the week following the Field Day. Also, gang, don't forget to comply with F.R.C. regulations for portable station operation. Notify your Radio Supervisor of the approximate location and time of intended operation of the "portable" by postal or letter, just in advance of the "field" radio work. We shall be interested to know how many clubs plan outings, and also suggestions for a similar activity for 1934 (if you want one) will be welcomed.

Besides offering an opportunity to get out in the open in this fine spring weather, the real object of this contest is to test "portables" wherever they may be available. If successful we want to make it an annual affair.

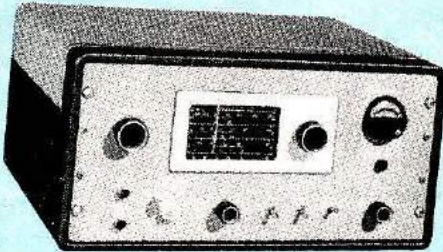
— F. E. H.

Top: Pikes Peak Amateur Radio Association 1937 Field Day site on Austin Bluffs, Colorado Springs, Colorado. Back row, left to right: Unknown; George Dickinson, W9PRF; G. Edward Drumeller, W9FXQ; Unknown; Unknown. Front row, left to right: Tom Roark, call not remembered; Unknown; Carl C. Drumeller, W9EHC (photo courtesy of W5J).

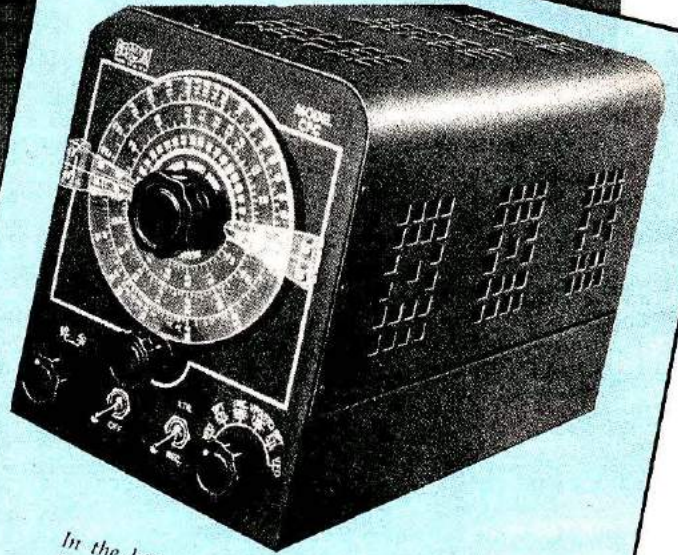
Left: 1934 Field Day of the Pikes Peak Amateur Radio Association. The people are Carl C. Drumeller, W9EHC; and George Dickinson, W9PRF. The Willys Knight car belonged to Dickinson. The transmitter-receiver was built by G. Edward Drumeller, W9FXQ. It was operated off battery power on 40-meter CW (photo courtesy of W5J).

Right: G. Edward Drumeller, W9FXQ, now a Silent Key, operating at the 1937 Pikes Peak Amateur Radio Association Field Day. No details are known about the equipment being used, as it was made up of gear provided by a number of club members (photo courtesy of W5J).

Look At All Those "Portables!"



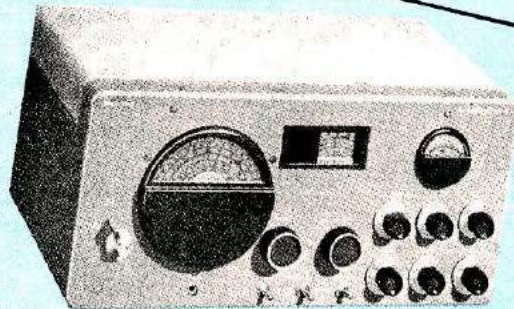
Field Day, 1948-style, meant lugging huge transmitters to the field and setting up shop with them — backbreaking work. A real boon was rigs such as this compact, 125-watt transmitter from Hallicrafters. It covered all the CW bands from 80 through 10 meters, and its built-in VFO gave the contest operator a real edge over the competition, most hams were "stuck" with crystals and couldn't move around the band. How times have changed!



In the late 40's, almost all hams were "rock-bound" — they used crystals to control their operation frequencies. A Field Day contester who used a VFO, or variable-frequency oscillator, had a big advantage over his competition in being able to "move out" after the DX. This Sonar "calibrated oscillator" was an early VFO; it could be used alone as it put out a whopping 5 watts, or it could be used to drive a higher powered transmitter.



In earlier years, Novices were limited to crystal control and low power input. Thus, most field day setups had a "Novice position" using rigs like this Jelectro CW transmitter side-by-side with the big rigs to let the newcomers try their hand. This rig could also be used on AM phone as well, though with much lower power output.

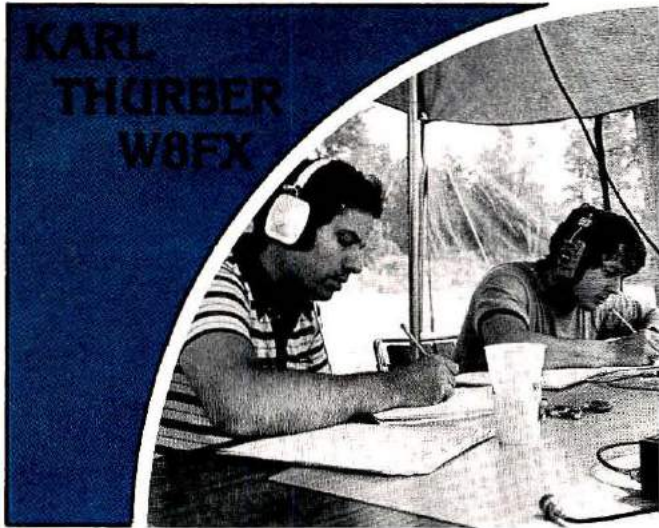


What about Field Days "back then"? There were few, if any, transceivers then, so bulky, separate transmitters and receivers were the order of the day. This Hallicrafters SX-43 was a top-of-the-line communications receiver popular in 1947 Field Day operations. It did a good job on CW and AM — there was almost no SSB then.

1940's Style Field Day

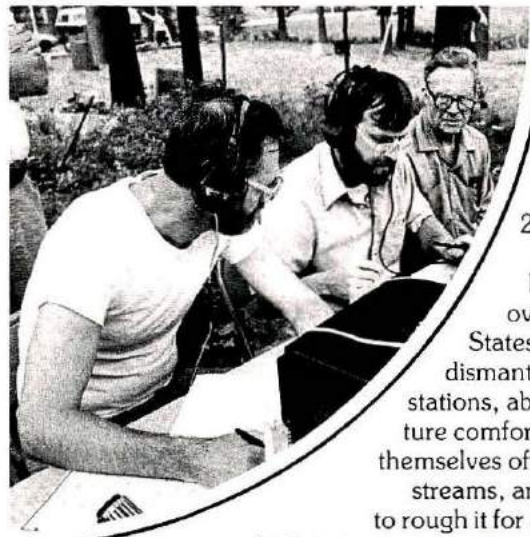
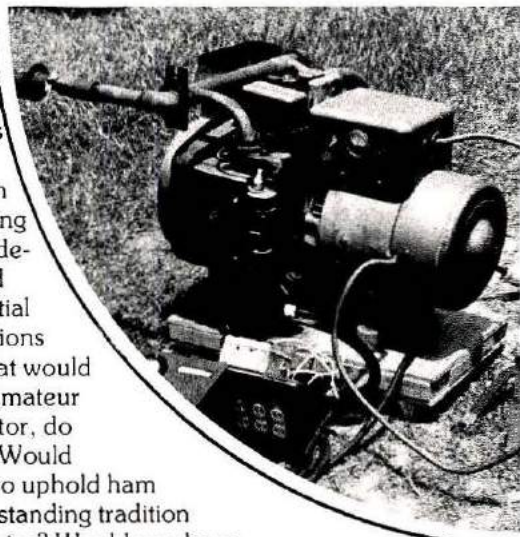
It's an outing,
it's emergency
preparedness,

it's...! **Field Day**



If a major disaster or other serious emergency hit your town or city, causing widespread destruction and loss of essential communications facilities, what would you, as an Amateur Radio operator, do to help out? Would you be able to uphold ham radio's long-standing tradition of public service? Would you have portable, emergency-powered equipment ready to go into the field when the lights are out? And, would you be able to erect an antenna in a flash to get things going at a hastily designated command post?

Perhaps your answer to all these questions is a resounding yes. More than likely, it's a hopeful maybe. For this reason, it's important that emergency plans and equipment be tested periodically to ensure that both will function smoothly when called on under *real* emergency conditions. This is the primary purpose of Field Day; while it's billed as a "fun" contest, it's also very much a serious test of emergency preparations and equipment readiness.



Usually held the fourth weekend in June (June 28-29, 1980), thousands of hams from all over the United States and Canada dismantle their home stations, abandon "creature comforts," and pack themselves off to the fields, streams, and mountains to rough it for a weekend of

high-intensity, nonstop hamming in order to make as many contacts as possible, using a complex set of scoring rules that specify various entry classifications, power-source multipliers, and special bonuses for message-handling, satellite contacts, and even publicity efforts.

A contest it is. Sponsored annually by the American Radio Relay League, it is probably the biggest and most popular of the major contests — indeed, there is no other contest like it.

Top Left: The 40-meter station at Nashua Radio Club's 1979 Field Day site. Operators are Woody Brown, K1LB, (left) and Rick Norton, AD1Y, (right). **Top Right:** Mobiles can get in on the fun too. They're in a different scoring class from the in-the-field set-ups. Antennas can be anything that works. **Lower Left:** The real purpose of Field Day is to prove that hams can handle emergency communications when the lights go out. This gas-driven generator doesn't look like much, but it does the job and earns a 100-point bonus for the operation because of independence from commercial power mains. **Lower Right:** Open-air operating position at the Nashua (New Hampshire) Radio Club's 1979 Field Day set-up. Left to right are John McKeen, W1TN; Rex Lint, K1HI; and Eliot Ware, N1AIX (photo by W1HR).

Serious Fun and Games

As mentioned, the real purpose of Field Day is to promote and demonstrate the ability of Radio Amateurs to handle communications for a real-life disaster or other emergency, using hastily set up, low-power equipment, operated independently of commercial power mains. It's primarily a group effort, tailor-made for club participation, though many individual hams participate every year under a separate scoring classification. And don't let anyone kid you — the competition is fierce!

In recent years, Field Day has been more exciting than ever, because we are sitting atop the 11-year sunspot cycle, meaning that generally good operating conditions abound, especially on 15, 10, and 6 meters. The many new hams who have entered the hobby in the past few years have boosted the recent Field Day entrant tally to more than 22,000 operators, using over 1600 stations. Talk about QRM!

Sounds interesting? The scoring rules get to be a bit tricky, but they are far from impossible. *QST* magazine gives the rules in the May issue, and results are normally published in November. Any Amateur can enter — Novice, Technical, General, Advanced, or Extra, and all bands can be used. The objective is to work as many stations as possible, with some special twists thrown in, during a grueling 27-hour period from Saturday afternoon to Sunday afternoon.



Just like camping out — almost. After a few hour's operating from an open-air site, most operators agree that the most important accessory is the cooler full of beer and soft drinks. This scene is from the Ft. Walton Beach (Florida) Field Day site in 1979.

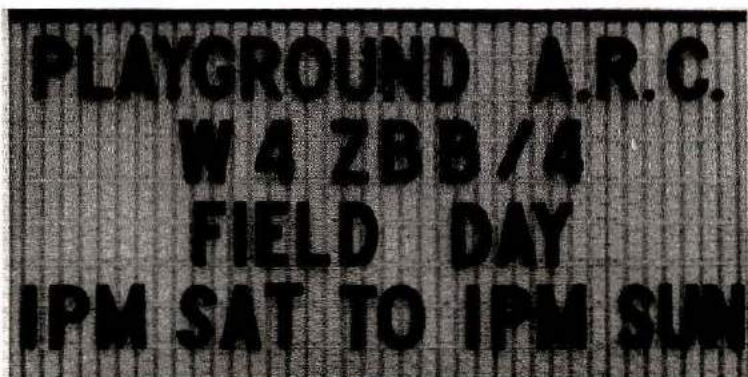
There are five entry classifications, to make things sporting and competitive:

1. *Class A*: Club efforts set up under field conditions using an emergency power source
2. *Class B*: Like Class A, but operated by non-club groups of two or less
3. *Class C*: Mobile stations (capable

of being operated while in motion)

4. *Class D*: Regular fixed (base) stations using commercial ac power
5. *Class E*: Like Class D, but using emergency power sources

Scoring rules promote the lower-power, emergency-powered aspects of disaster preparedness. There is a five-point multiplier, for example, for using power levels under 10 watts and battery/solar powered operation;



It pays to advertise Field Day — this sign announces activities taking place in a municipal park by the Playground Amateur Radio Club (Florida) in June, 1979. In addition to letting the general public in on the happenings, you can earn a 50-point bonus for operating from a public place or getting a media "plug" for the event.



increasing power levels qualify for smaller multipliers. There are also some neat bonuses to add "spice" to the contest. There is a 100-point bonus for emergency power operation of *all* equipment at the Field Day site; there is also a 50-point bonus for public relations — earned by either operating from a public place (such as at a shopping center or mall) or getting a media "plug." There is also another 50-point bonus for sending a properly constructed Field Day message to the ARRL SEC (Section Emer-

gency Coordinator) or SCM (Section Communications Manager) during the operating period. And, since the event demonstrates preparedness to handle emergency message traffic, there is a five-point bonus for each message sent and received during Field Day. Finally, entrants can win another 50-pointer, this bonus given to stations who successfully complete at least one QSO (contact) via satellite.

If you missed Field Day activities last year, be sure to mark your calendar for this year's festivities — June 28 and 29. Seek out a local club group or an informal "gaggle" that is looking to challenge the "big guns," and lend a hand. Everyone is welcome at Field Day — non-hams, prospectives, and just plain spectators — many of whom can help out with the work of station setup and logging, as well as the multitude of administrative and housekeeping chores that surround Field Day doings.

Whatever class of license you hold, or even if you're not licensed, come on out. You'll be glad you did!

A Special Kind of Field Day: QRP_p

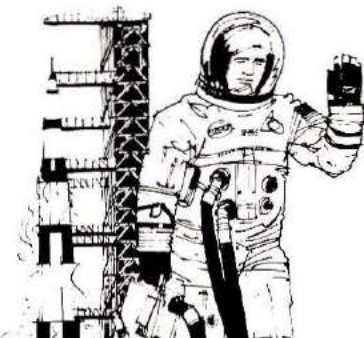
Many hams are familiar with regular Field Day activities, but do you know that there is another Field Day, held at the same time as the ARRL event? It's "Milliwatt Field Day" for that special breed of QRP (low-power) and QRP_p (low-low-power) operators who also like to get out in the field. Each year since 1970, a special trophy has been awarded to the high-scoring under-five-watt station in this most interesting contest.

The scoring is simpler than regular ARRL FD scoring: The number of QSOs (contacts) times the power multiplier ($\times 4$ for 5 watts, $\times 5$ for 1 watt) times 1.5 for battery or solar-powered operation, plus 150 points for portable operation away from the regular QTH, gives the result. Entries are limited to two operators per station running a single transmitter. Interestingly, not all the trophies have been awarded to the 5-watt operators — a few have gone to those entrants running as little as 1 watt!

Milliwatt Field Day results are published in *CQ* magazine's QRP_p Column, and entrants can also send their results in as regular Field Day entries to QST, just like the "big boys." Contest details are available from Ade Weiss, K8EEG/WØRSP, 83 Suburban Estates, Vermillion, South Dakota 57069. Results go to him, too.

If you're really "into" QRP operations, you may want to consider joining the QRP Amateur Radio Club International, the worldwide association of under-100-watt Radio Amateurs. Membership details can be obtained by writing to the Secretary/Treasurer, Joseph C. Szempias, W8JKB, 2359 Woodford Ave., Toledo, Ohio 43605. (See pages 15 and 16 of November, 1979, *Ham Radio Horizons* for more on QRP clubs.)

Try Milliwatt Field Day this year for some on-the-air competition to the "QRO" (high-power) types. You'll likely be surprised by the results!



Neil Armstrong Commemorative

July marks the 11th anniversary of Neil Armstrong's historic moon landing, and a group of Amateurs in his home town will be on the air as part of the Celebration.

The Neil Armstrong Air and Space Museum in Wapakoneta, Ohio, is the location, and local Amateurs will have a station operating there on July 19 and 20. Contacts will be primarily on SSB, with CW used also if equipment and operators are available. A special QSL card will be sent for all contacts.

Look for WD8RVZ on 7240 - 7300 and 28,600 - 28,650 kHz, primarily, or on 3950 - 4000 and 21,355 - 21,385 if propagation is poor on 7 and 28 MHz.

CW frequencies, if used, will be 3750 - 3770; 7120 - 7145; 21,200 - 21,250; and 28,450 - 28,500.

Hours of operation will be from 9:00 AM local time Saturday to 8:00 PM Sunday.

U.S. and Canadian Amateurs can QSL direct to WD8RVZ, and an SASE is required; other stations use the Bureau.

Operation through the Amsat Phase-3 satellite is possible, depending upon the availability of the satellite and upon equipment and operators at the Museum site.

Visitors to the Museum will be able to see "The World of Amateur Radio," plus video tapes about satellite communications. Other plans include a mobile van with an Amateur Radio station for viewing by the general public, and two-meter fm operation on 146.52 MHz.

HRH

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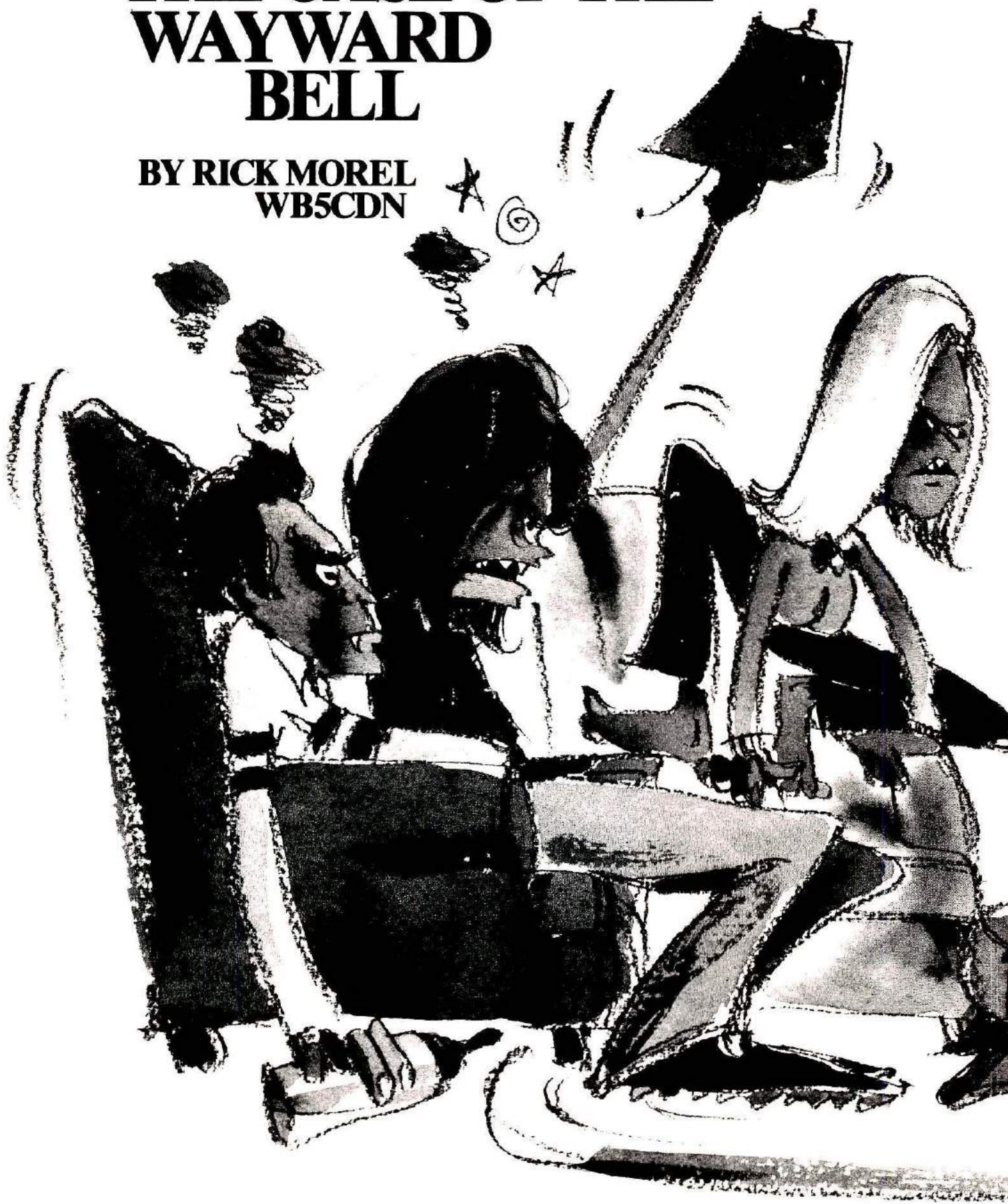
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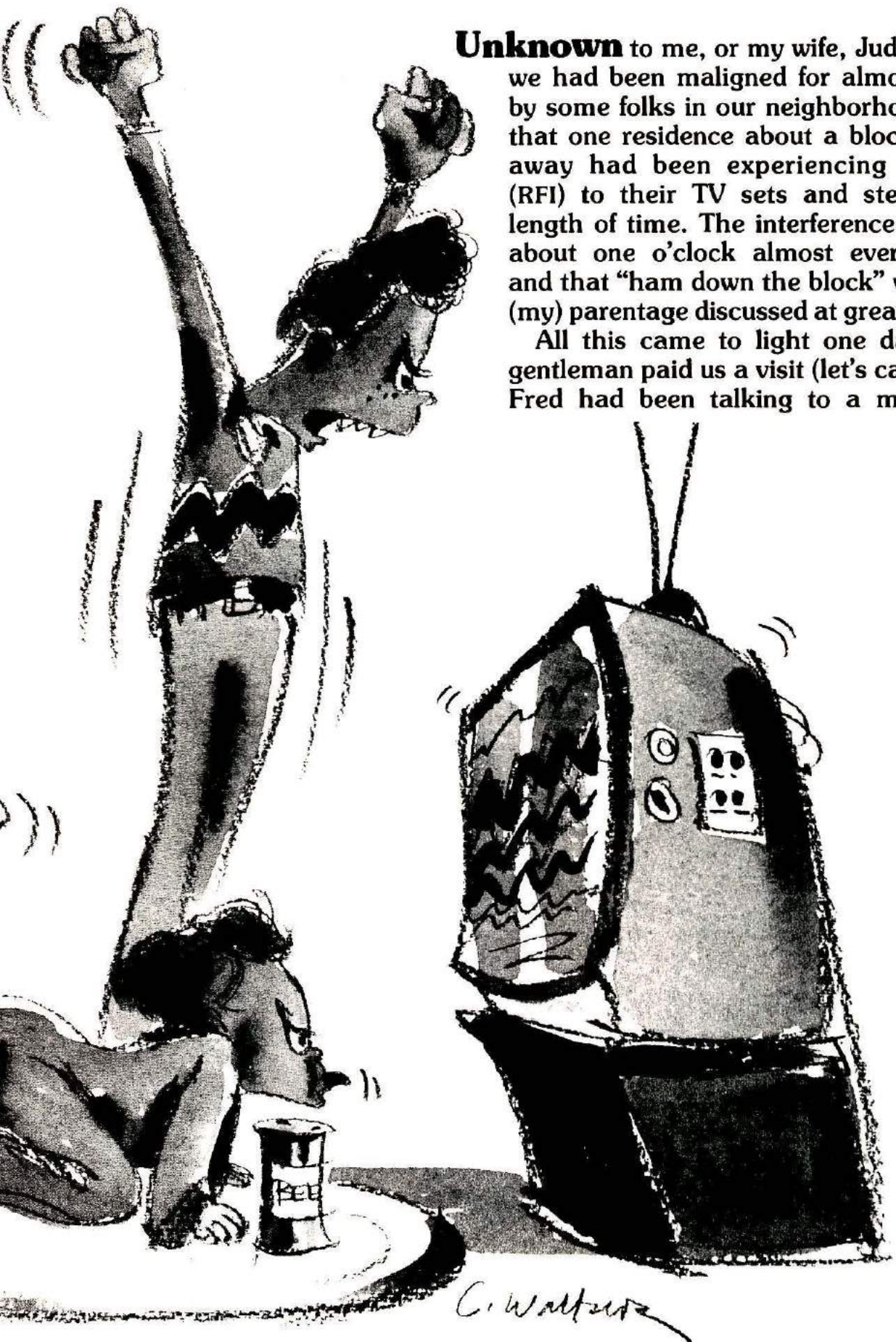
THE CASE OF THE WAYWARD BELL

BY RICK MOREL
WB5CDN



Unknown to me, or my wife, Judy (WB5QFI), we had been maligned for almost two years by some folks in our neighborhood. It seems that one residence about a block and a half away had been experiencing interference (RFI) to their TV sets and stereo for that length of time. The interference would begin about one o'clock almost every afternoon, and that "ham down the block" would get his (my) parentage discussed at great length.

All this came to light one day when the gentleman paid us a visit (let's call him Fred). Fred had been talking to a mutual friend,



With apologies to Dr. Watson and friend.

who also is a ham. His friend suggested that he visit me, and assured Fred that I would do all in my power to help him out.

Fred approached us in a very nice way, but he did seem a little dubious when Judy and I assured him we had not been operating our radio equipment during the times he was experiencing problems. He also told us of his unsuccessful contacts with the

FCC, the power company, and local cable TV company. He described the RFI

as a "noise" on the TV and stereo, and as a kind of "snow" on the video.

I invited him in and showed him around the shack. I also brought out my Jerrold field-strength meter and search antenna, then demonstrated how it could be used to find the direction and signal strength of a signal. I asked for his phone number and gave him mine, then mentioned that if he would give me a call when he was experiencing

the interference, I would run right over with the field-strength meter. I did tell him though, that if the RFI was from a CBer, he was on his own when it came to dealing with the person.

All's quiet?

A couple of weeks went by with no word from



Fred, then one day Judy and I noticed Fred and his wife in their yard as we drove by. We decided to stop in to see if they were still having the problem. They were. They told us they hadn't called because they didn't want to put us to any trouble! I guess being honest and polite has its points!

At any rate, I took a look at their TV and saw what looked like classic power-line hash. I promised I would return and went home to pick up the field-strength meter.

It seemed the hash was strongest at about 25 MHz, and coming from at least five different directions. I finally tracked it down to the power lead coming from a transformer to their neighbor's house. Two leads came from the transformer; one to their house, the other to the neighbor's house. The neighbor was very cooperative and allowed me to tramp around his home looking for the possible source of the hash.

The conclusion was that it must be at the power company's transformer. It was strange that the strongest signal was from the neighbor's line and that, of the two, the only one with RFI was Fred. I put that down to possibly a more RFI-resistant TV at the neighbor's.

False hopes

I called the power company and filled them in on what I had found (they know me quite well down there), and I told Fred to call me if the power company hadn't done anything within three days.

And that was that, another case solved quickly and efficiently by Superham. At least that's what I thought for a few days until one of the engineers from the power company called to tell me they had found a line arcing to a tree limb a block and a half away. They wanted to know if that had cleared up the problem. I told them I would check and if not, I'd let them know.

I gave Fred a call and his wife told me there was no change — about one each afternoon the interference began. I asked if she would object to my poking about her house in Fred's ab-

sence. She informed me that not only would she not object, but would be overjoyed. I told her I'd be over in about an hour, and I then proceeded to construct a loop antenna (six turns of enameled wire about 7 cm in diameter). I mounted the loop on the end of a dowel to get a little reach.

After some thought, I had decided the source of RFI must be somewhere in their house because no one else in the neighborhood was having any trouble. Just the same, I turned the meter on while I was walking to Fred's and, yep, there it was at about 25 MHz. I began picking up the signal about half a block away. This time, it

“The signal was definitely originating from something within the house . . .”

seemed to be coming from a cross street . . . no, it's about 90 degrees off from . . . no it's back over . . . it seemed that with every step I took, the signal was originating from a different spot.

By the time I reached Fred's door, I had decided that the signal was definitely originating from something in the house and being re-radiated by resonant sections of power lines in the vicinity — or that there was an invisible Martian ham running around the neighborhood with a hand-held 25-MHz pulse rig.

The loop snoops

That little loop antenna really did the trick. Within a few minutes I had needle-banging signals from the vicinity of the front door. Turning lights out and appliances off had no effect, but the farther I got from that front door, the weaker the signal. I decided it might be a good idea to check out the entire house, a room at a time.

Every room except the entrance had just normal “background” levels with some increase in the vicinity of

the house wiring. And then it happened. I had been walking rapidly through the hallway from room to room with the loop dangling near the floor, but this time I stopped in the hall to talk to Fred's wife. I had the dowel resting on my shoulder and the loop up behind my head. The level here was even higher than at the front door! I glanced about and my eyes locked on the doorbell chime. I moved the loop against it and the signal went up to 40 mV!

Right next to the chime was an access door for the central air conditioning unit. The top of this was open to the attic. I borrowed a flashlight and located the doorbell transformer, and then poked the loop right up next to it. Wow! 155 mV!

The circuit-breaker for the doorbell (and a little-used room) was found, and the breaker flipped off. Silence. The TV cleared up and the field-strength meter settled down to a nice hiss. They both stayed that way during a coffee break.

Fred replaced the transformer the next day, and his TV and stereo have been RFI-free ever since. He and his wife have also been telling anyone who'll listen about what great people hams are.

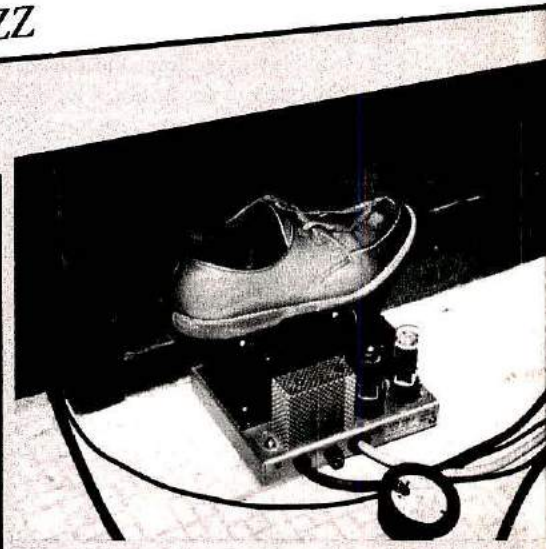
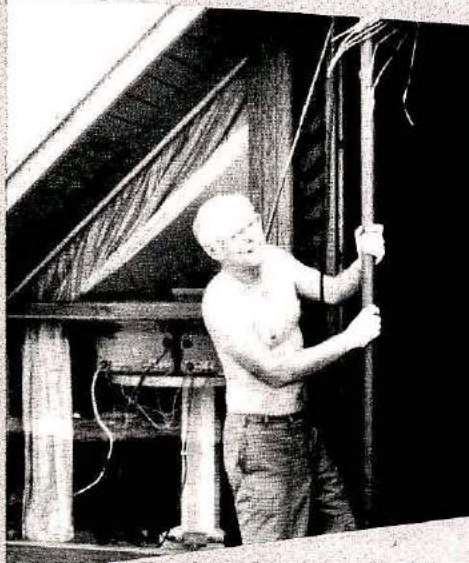
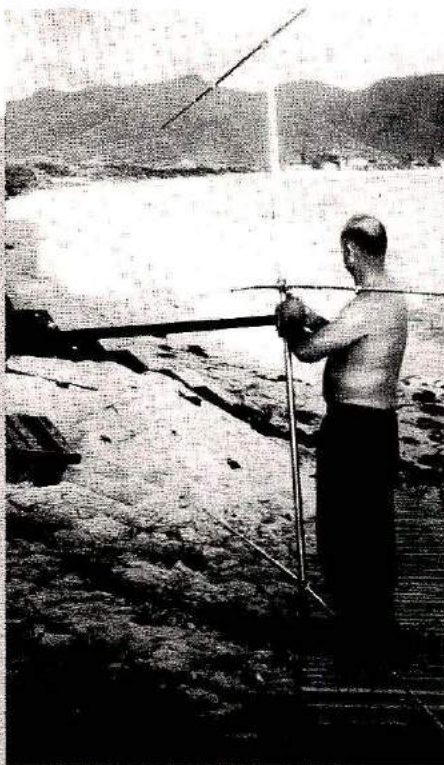
The moral of this little episode is that, when dealing with “power-line” type interference, be prepared to do a lot of walking and poking and searching. The power company's spider web of lines can do all sorts of things to an rf signal, and often masks the true origin of RFI. Some sections of a line a distance away will be resonant with the signal or one of its harmonics. If it's a harmonic, and you are tuned to that harmonic, you might get a stronger signal from that distant section of line than from a point near the origination of the signal.

In short, don't assume you've located the problem when you get a boomer of a signal. Cut power to the circuit if you can. If that's the circuit, restore power and check each switch and device in the line. Keep looking, if you can't cut power, until you find a stronger signal or run out of things to check.

HRH

Lessons You Learn (On a DXpedition)

BY JACK BICKMAN
WB5TZZ



*Make things run smoothly, for you
and the other guy*

Left to Right:

Behind the scenes — Gil Wood, W5NUT, finishes assembly of the 10-meter beam used by the W5NUT/PJ8 team on St. Maarten. The beam was lost by the air line for the first two days of the expedition.

Armstrong method — The W5NUT/PJ8 team used the "armstrong method" of rotating the beam, here demonstrated by the author, WB5TZZ. Mast was stuck in the sand and tied to the frame of the shack.

More than one way — The power supply for the Collins gear is also useful for drying wet shoes!

With band conditions excellent, and all that wallpaper to be won, the chasing of DX today seems an almost universal sport. It's too bad that all newcomers to DX can't have the experi-

ence I enjoyed last November (1979) on a ten-day DXpedition to St. Maarten, Netherlands Antilles. If you sit on the other end of a DX pileup just once — and later sort through the mountains of QSL cards — you'll learn some valuable lessons about both operating and QSLing for the best results.

I was the second operator for W5NUT/PJ8, going to the sunny island east of Puerto Rico with DXCC Honor Roll member Gil Wood, W5NUT. Although my own DXCC total is now past 200, the trip gave me some helpful hints on working the DX — and getting that all-important card.

Using Collins gear, a three-element monobander on 10 and a dipole on

20, Gil and I managed about 4,000 QSOs, WAS, WAC, and DXCC during the stay. We missed three WAZ zones. For the first three days we did not have the beam (the airline had lost it) and on the last day we were dismantling the station. We got in a lot of sightseeing. When we were on the air, however, we tried to work them as fast as we could, as well as we could, and almost all on phone. What follows is a list of observations about DX operating that I gleaned from the experience.

Pileups galore

In the first place, it ought to be said that we were far from a "big" DXpedition, and hardly very rare. Neverthe-

less, when I turned the beam (mounted over a palm tree beside our beach shack) each morning a little after dawn and gave a brief CQ from W5NUT/PJ8, the European-Russian pileup always followed swiftly. Despite the fact that we often had more than one hundred stations calling on frequency, we were usually able to work three or four a minute because most of the operators at the other end were good, and played by the rules.

The same can be said about the Ws and Ks we worked in the afternoons, and the flocks of JAs in the evenings. Our pileups were amazingly well behaved. We suffered very little malicious interference, and when we called a station out of the pile, almost always everything fell quiet while those waiting allowed us to work our selection. This says a lot for Amateur Radio, and the good behavior certainly let us work a lot more stations in the long run.

Timing and forethought seemed a lot more important, in terms of who got through to us, than high power. This is moral No. 1: *Listen first, and study how your DX target is working.*

We, for example, refused to work tail-enders — those who tried to slip their call in while we were working someone else — or “breakers.” It may be all right to try tail-ending, if the man you’re seeking will tolerate it. Few will, however, because it leads to chaos as everyone out there quickly gets the idea, and are all calling so persistently that you can’t exchange signal reports with anyone. *Listen!* If he isn’t taking tail-enders, don’t try it. All you’ll do is antagonize him and he may refuse to work you at all.

We gave full station ID, location, QSL information, and operator name every 6-8 calls, roughly every 2-3 minutes. Yet an amazing number of stations called us, unidentified, and asked, “What’s your call?” or “Where are you?” or “Name, please?” This slowed us down and may have deprived others of the time to work us. At no time did we go more than five minutes without our whole litany of information, and yet some people couldn’t wait. *Wait.* You may not only learn all the information, but also might get a tip on how the operator is working. We had a few who almost got tossed out of the log book because

they didn’t even wait long enough to hear we were working by districts, and got in out of turn.

In calling DX, if there is a pileup, you must imagine his conditions; he is working as fast as he can. The chances are that he is hearing a dull roar in the headphones every time he lets the VOX drop. While you should certainly



Ready to go — A 10-meter beam and a 20-meter dipole serve as the antenna “array” for W5NUT/PJ8.

give his and your full call the first time you try to call him, and periodically thereafter, it might get you through if your calls in between “major” calls were only a part of your full call, perhaps only a letter called repeatedly. That’s often all the DX station will hear anyway — a “Quebec” somehow popping out of the roar, and then perhaps a “Tango,” and then maybe a “Bravo.” Use the standard phonetic for the last letter of your call. Repeat it often, letting your VOX drop every second or two to make sure he isn’t already working someone else. Call two or three times. Wait. If all you hear is pileup, call a couple more times. He may be logging partial calls of several he hears, and then will call several without another QRZ. (Of course, if this is his practice, you already know it because you *listened*

first, right?)

When you get through to the DX station, if there is a pileup, *make it brief!* There is nothing more maddening than to have a hundred stations waiting, and then recognize a guy who comes back to you with something like, “W5NUT/PJ8, this is XX4XXX, thanks for the call, I’ve never worked PJ8 before, so by golly, you’re a new one for me. The name here is Joe, common spelling, Junk-Oboe-Easy, and we’re in Hoboken, South Carolina, home of the prefabricated Zilch and near the headwaters of the Great Muddy River. Rig here is a homebrew, 6146-B finals, getting out about 200 watts PEP, my wife’s name is Gladys, and I don’t want to hold you, OM, I know there are people waiting, but by golly this is just wonderful talking to you, and you might pass along to me your rig and antenna and microphone and what brand of coax you’re using, and whether you log with a pencil or pen, right- or left-handed, and I don’t want to hold it, so back to you, oh, I almost forgot, you’re three and three here in Hoboken with QSB, so that’s another reason not to hold it, HI . . .”

You get the message?

He should have said: “W5NUT/PJ8, this is X-ray X-ray four X-ray X-ray X-ray. Thank you for the call. You are three and three in Hoboken, South Carolina, name is Joe. Juliet Oscar Echo. Your report is three and three. W5NUT/PJ8, XX4XXX.”

That takes about 15 seconds even if you drawl, and is as long as you should *ever* get in a pileup. Unless the operator has been asking for names, you should leave that out. Your call, repeated for safety, and the report, repeated for clarity, are all that’s necessary. Anything more may brand you an idiot *when there is a pileup.*

Please understand: if there is no pileup, or you know the guy, then the ground rules may be considerably different!

S-9 plus, readability 0

Another point, check your mike gain and/or speech processor. A surprising number of stations called us repeatedly, splattering all over the place, and never did get worked although they were VERY loud. *Their gain was so high they were unreadable!* For some reason, Italian stations seemed the worst offenders. We gave

Lessons You Learn

some 3 and 9 reports and told those we could identify to turn everything down a few notches, and invariably their audio was much better. So, frequently check your signal quality with a friend who will tell you the truth.

Persistence

Try to learn the difference between being persistent and being a menace. The guy who quietly gives his call one time in a pileup will need the angels on his side to be picked out. The guy who screams his call forty times, never bothering to notice that the station has worked four others through his mindless QRM, *will* be heard, but probably will *never* be recognized either.

Once you work the station, log it right then and there. Use GMT — nothing else is any good! If you look at your clock and figure it's 0028 or

It's in the cards

Now about sending the card . . . you *did* listen to the operator over there, didn't you? Where did he say to send the card? Did he want SASE, green stamps, IRCs, or what? Follow *instructions!* It's dismaying to tell a W or K station, "Please QSL to the home call, W5NUT, okay in the Call-book," and have him come back with something like, "QSL, OM, QSL via the bureau!"

Now as to cards. If you have ever gone through a mountain of cards, you will never again send out one of your own that has the call sign on one side and the data on the reverse side. You'll get some printed like one I picked at random from our mail that has everything on one side, in a neat and logical fashion.

You will also (please!) get the time right in GMT, the date right, and all the other data filled out legibly. You will also:

that humidity had permanently sealed in the mail: impossible to open.)

2 — Enclose the proper stamps, green stamps or IRCs as directed. It costs a small fortune to mount even a modest DXpedition, and we are not a charitable institution. Providing stamps for return of cards can quickly send the DX op to the poorhouse — or your card to the trash can.

3 — On the outside back of your envelope carrying everything else to the DX op or manager, write neatly the *date* of the contact, the *time* of the contact, the *band* of the contact, and the *mode* of the contact. (Both the worked station's call and your call should be in their respective places on the front of the envelope.) This will help the operator or his manager to bulk-sort cards by date and time with-

One of the QSL cards received by the W5NUT/PJ8 team. This one is likely to bring joy to the heart of any QSL manager or busy QSLer. Points to note: all information is on one side of the card, date is filled out with clarity, and the GMT (Z) time is used. The operator's use of a typewriter is also encouraging; someone who takes such pains probably has his data right, too.

Spartanburg South Carolina WA4VZA

QSO VERIFIED WITH	DATE (GMT DATE)	MHZ BAND	TIME GMT	(RST)	Z-WAY
W5NUT/PJ8	22 NOV 79	28.520 or	2222	59	SSB

PSE QSL/TKS
Gaines Hall
530 Barnwell Rd.
Spartanburg, S. C. 29303
U. S. A.

U.S.A. DX, 73, Cuagn

de *Gaines*

something like that, and your calendar shows today to be the 17th, stop and think a minute: it's already the 18th, Zulu time, and both your log and the card you send should reflect that. A stunning number of operators sent us cards proving that they literally didn't know what day it was when they worked us.

1 — Enclose an SAE. You will fold this envelope so that the folded portion is NOT at the top of your mailing envelope where a letter opener at the other end can slice open the first envelope and rip your return envelope in half with the same slash. You will fold the flap of your return envelope backwards, or put a bit of waxed paper between the glue edge and whatever it will touch. (We got an amazing number of return envelopes

out having to tear open envelopes and otherwise spoil his good humor.

There are other tips that might be passed along, but these are the major ones that come to mind. Some might seem picky, but the good operators follow them — and make a high percentage of the contacts they attempt — and get back a high percentage of return QSLs in record time.

And that's what DXing is all about, isn't it?

73, and good DX!

HRH

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arma
small business association

Expedition to

NoDak

BY GORDON JUVELI, WBØZSA

A low-cost event that brought high enjoyment

Being on the receiving end of a pileup was a new experience for almost all of the members of the Hennepin County Technical Vocational Institute (South Campus) Amateur Radio Society, of Eden Prairie, Minnesota.

Dave Blair, WBØYUC, Dave Ruch, WDØFOF, Gene Thurston, NØAMD, and I, WBØZSA (former CB comrades in Bloomington, Minnesota), decided to leave the ranks of mediocrity by operating "Portable Ø" from the wheat fields of North Dakota.

The idea sounded good, but, to be a success, the expedition needed a goal, or a theme for the mission. We also needed a good, temporary "NoDak" QTH.

I had flown out of Fairbanks, Alaska, for a couple of years, and knew of the Alaskan aeronautical hero, the late Carl Ben Eielson. I also knew Carl Ben's hometown had been Hatton, North Dakota, just west of the "NoDak" Minnesota border. Through the "Sons of Norway," I had been in contact with one of Carl Ben's cousins in Los Altos, California. Carl Ben Eielson and his mechanic, Earl Borland, had been killed while on a rescue flight to the ship *Nanuk*. The *Nanuk* was frozen in the ice north of Siberia and west of the Diomed Islands and Alaska.* The accident occurred about 50 years ago. Thus, the theme became clear — an Ama-

teur Radio activity that tied in with a commemorative event in Hatton.

The next step was to contact any Amateurs who might be operating in that North Dakota area, and to obtain their cooperation and advice. Dave, WBØYUC, had worked the President of the Goose River Amateur Radio Club, so, looking for his help, I con-

with the emissaries from the Hennepin County Technical Vocational Institute (South Campus) Amateur Radio Society was highly productive. Operation was set for the last weekend in July — the 27th, 28th, and 29th. Specific assignments to handle logistics were made by both clubs. Gene and I were delegated to transport basic equipment to Hatton, using Gene's camper and my small station wagon.

July was spent building portable masts and antennas, plus gathering camping gear such as tents, tables, coolers, and comestibles.

"Convoy . . ."

On Monday, July 23, we drove to Hatton in our mini-convoy. Communications were maintained on both CB and 2-meter simplex. Just west of Minneapolis, CB contact was made with an eighteen wheeler bearing the words "Hatton, North Dakota" on the door. The trucker, on being advised that the convoy destination was Hatton, stated, "You guys must be the Minneapolis hams they're waiting for." As it turned out, he was also a ham, having recently received his Novice ticket. He advised that an interview with me had been printed in the *Red Riverland Traveler* magazine, and that the entire area was enthusiastically awaiting the operation.

En route along Interstate 94, Gene and I went through one of the darkest, most violent thunderstorms either of us had ever experienced. Contact was maintained, using the 2-meter band with no difficulty. I stopped to check out an overturned tractor-trailer, but discovered the driver was not around. With the help of a passing mailman I marked the scene with a warning flag.

◆ HATTON NORTH DAKOTA ◆
TRAILL COUNTY

WBØYUC/Ø DAVE 73
 WBØZSA/Ø GORDY
 WDØFOF/Ø DAVE
 NØAMD/Ø GENE

PORTABLE EXPEDITION

QSO WITH	COMMUNICATIONS LOG						
	DAY	TIME	CALL	UTC	MODE	TEST	Q WAY

tacted him by letter — only to discover he had moved to Illinois. However, contact was soon established with Elroy Lindaas, WØKZU, the current club president.

The idea of an Amateur operation was accepted, and expanded to include issuing certificates to all hams working Hatton hams and visitors during Commemoration days. Also, an invitation was extended to the Minnesota group to attend a meeting of the North Dakota group during the first weekend in June, 1979.

On Friday, June 1, Dave, WDØFOF, Gene, NØAMD, and I drove to Mayville, North Dakota, in Gene's camper. A portable mast, a slinky dipole, an SB-104A, and a Swan 6-meter rig were taken along in order to do some preliminary testing.

Unlike most meetings, which turn out to be gatherings of the inept run by the incompetent, the meeting of the Goose River Amateur Radio Club

*Part of *Nanuk's* story was told by author Bob Gleason, W3KW, in the March, 1980, issue of *Horizons*.

The March story, "Adventure in the Siberian Arctic," was an excerpt from Gleason's book, *Icebound In The Siberian Arctic*, which is available from Ham Radio's Bookstore, Greenville, New Hampshire 03048. Price for the softbound edition is \$4.95 plus \$1 shipping and handling. Editor

North of Fargo, contact was made with Mary Carlson, WAØCSL, on the Mayville repeater. Mary is well known among 6-meter aficionados. She told us to call WAØQBN for information regarding their reserved camping spot. Paul, WAØQBN, was at work but his wife, Nancy, said we were to have facilities at the local campground and that Dave Olson, the Superintendent of Parks, would meet us there to assist in getting settled.

We continued unpacking and setting up the camp on Tuesday morning. There was plenty of help from Paul, WAØQBN, Dave Olson, and "Rick," the local policeman. At this time, we discovered that the mast-

support tripods had somehow been left behind. A tripod was obtained from a local hardware store so a schedule could be kept Tuesday night. Also, we discovered that a spike on the mini quad had broken, despite extraordinary protective measures taken while moving it.

The problem of the missing tripods was handled by arranging for Dave to pick them up before driving up Thursday afternoon. The broken spike was replaced with a short piece of welding rod which was beautifully machined by Paul's father-in-law, who lives in Hatton.

Gene and I met with the Board of Directors for the Hatton-Eielson Me-

morial Museum. I learned that the president, Guy Thorson, who is an octogenarian, grew up with a long-time acquaintance and former neighbor of mine in Zumbrota, Minnesota. As a result of the meeting, it was decided to have at least one station in operation on the museum lawn during their annual Ice Cream Social on Sunday, July 29.

The camp was set up, the rigs were operational, and all problems solved, leaving time for us to socialize and "walk about."

The past returns

Forty years ago, in 1939, Gene had been selected by lottery for a



The station was set up in a park, and was housed in various tents, vans, and campers. Coverage was on 80 through 6 meters, and sometimes pileups were created when it became known that a North Dakota station was on! One neat trick for temporary mast support was the use of tripods mounted on 2 x 4 "T" frames.

HATTON, NORTH DAKOTA

1897 - 1929

THE CARL BEN EIELSON HISTORICAL SOCIETY
AND THE GOOSE RIVER AMATEUR RADIO CLUB

PROUDLY CONFIRMS CONTACT
WITH STATION

ON THIS _____ DAY OF _____

In commemoration of **CARL BEN EIELSON**, famed Pioneer Arctic Explorer
Born in Hatton, North Dakota, July 20, 1897

- 1924 Pioneered first aerial plane in Alaska. His Jenny transported mail, supplies, and sick people. Yukon Indians so admired him that they named him "Moose Ptarmigan" (Brother of the Eagle).
- 1928 Pilot of Wilkins Arctic Expedition Over-the-Top-by Lockhead-Vega. This 2500 mile flight lasted 34 hours, twenty minutes. For this they received world acclaim.
- 1928 Pilot for Wilkins-Hearst Antarctic Expedition.
- 1929 Died in Mercy Mission in Bering Straits.



CARL BEN EIELSON

Station Call _____ Operator _____

Address _____

Sponsored by Carl Ben Eielson Historical Society
and Goose River Amateur Radio Club

This handsome certificate was designed for the Commemorative operating event, in conjunction with the Eielson Historical Society. Look for the crew to return for a replay this July, and you may earn one of these for your wall.

year's Army service. He, at that time, was operating a service station garage at Klotten, North Dakota — some fifty miles west of Hatton. All he could do was lock the door and heed the bidding of Uncle Sam.

We drove to Klotten, and discovered that the station was still locked up, and a big elm tree had grown in front of the main entrance: The next stop we made was at the local grain elevator to inquire about an old friend of Gene's, a farmer who lived about 10 miles to the west. While Gene was talking to the elevator manager, the friend walked in — their first meeting in forty years and calling for many a "Hvordan store til?" and "Bare bra takk," ("How are you?" and "Very good, thank you" in Norwegian). On Wednesday and Thursday many visitors came to the campsite. Some were hams and some were interested local townspeople. WA0QBN and his wife, Nancy, had invited us over for one of those fabulous, farm-type Norske noon dinners, complete with fantastic chicken gravy. Instead of cooking meals as planned, we ate most of them at a local restaurant — there was a roundtable meal constantly in progress, and prices were so reasonable that we couldn't stay away.

Cooperation from the townspeople

was of unparalleled excellence. For instance, a yard light in the camp needed replacing. Within an hour, Northern States Power's "Corney" Thompson, W0HSR, was there with his "cherry picker," which is capable of reaching sixty feet up. Corney, in addition to repairing the light, also placed antennas up in trees, and while unobserved, took some cameras aloft and shot pictures of the campsite.

Thursday night, WB0YUC and WD0FOF (Dave and Dave) were talked in on the Mayville repeater. Friday, they were joined by Jim Robertson, WD0EUS, and Scott Stubbs, WD0BLR. Jim was to later work me by transmitting CW using his car door and a defective dome light. His QSL card called attention to the feat and added to the excitement of the times.

The last of the Minnesota group to arrive were Jim Green, N0AQO, and Jim, Jr., WD0AWP.

Operational time had been minimal during the week. A few contacts had been made on 6 through 80 meters, for demonstration and test purposes. Now, with the whole gang in attendance, WA0CSL and W0KZU provided handout sheets stating that they were Carl Ben Eielson Memorial Stations, operating from his old home-

town of Hatton, North Dakota. Certificates would be provided to all stations who supplied two of their QSL cards plus two stamps. One QSL would be for the Hatton operator and the other would go on permanent display at the Eielson Museum.

Most of the Hatton area hams operated from their home stations. However, Paul, WA0QBN, joined us at the campsite nightly and showed, by example, how a smooth ham operates, and also how to rack up a formidable number of contacts.

Late Saturday evening, I checked into the 3905-kHz Century Club Net, only to have the Net control announce, "We have a North Dakota station on the net!" For the next hour, one station after the other was worked. This was my baptism into the receiving end of a pileup.

Sunday afternoon, we initiated the Ice Cream Social action by operating from the museum lawn, using Paul's rig. The operation was photographed by reporters from the Mayville paper.

By late Sunday, the Minnesotans had departed, leaving Gene and me to button up the site prior to returning Monday.

On Monday, the Parks Superintendent, Dave, and the local constabulary helped pick up and pack. Dave and his son (a hopeful future ham who'd stick around until 3 AM watching operations) also provided hamburgers and fries as a parting meal.

As Gene and I rode away into the east, Paul and Elroy talked to us as far as Fargo through repeaters and on simplex. They invited us to make this an annual event, and we willingly and exuberantly agreed. Was it a success? You bet!

Epilogue

The Goose River Amateur Radio Club has invited WB0ZSA and the group back for the second year's operation.

It will take place on the last weekend in July, the 25th, 26th, and 27th. If all goes as planned, it will be kicked off by a QSO with the Eielson Air Force Base Amateur Radio Club.

All bands from 6 through 80 meters will be worked, and Novice segments will be covered. Look for us!

HRH

Carl Ben Eielson



"Carl Ben Eielson was very well known in Alaska for his promotion of aviation, and especially for his efforts in obtaining the first contract from the Post Office Department to fly the winter mail routes. In 1924 he personally flew the mail from Fairbanks to McGrath, making all stops, and in a few hours accomplishing delivery that normally took 20 days by dog team." After pursuing some exploratory work . . . "He returned to his dream of aviation's really serving Alaska, and his certainty that eventually Alaska would become a hub for air routes not only between America and Asia but even between Europe and Asia."

A Gold Mine of Parts

BY HANK OLSON, W6GXN

Have you ever seen the piles of "Printed Circuit" (PC) boards for low prices in surplus stores, at junk dealers, flea markets, or even advertised in "by mail" flyers? The question always occurs as such opportunities come up: "Will I really get my dollar's worth if I buy some of these?" The answer is a conditional yes; you will almost always get more than the purchase price of the board in dollars worth of components, but these components may or may not be of any use to you.

A lovely PC board could, for instance, yield a dozen ICs of some logic family like RTL. Such ICs have a high dollar value (if you had to buy them new), but are of little use to anyone building circuitry of modern design. Older logic cards that contain myriads of 2N404s and other Germanium transistors also have limited use in today's circuitry; I generally avoid such cards — unless they are *very* low priced. Cards that contain semiconductors with "in-house" parts numbers on them are really poor buys. These numbers are put on semiconductors that are bought by major electronic system manufacturers in huge quantities from large semiconductor manufacturers. The "house" numbers are generally meaningless, except to the producers and to the manufacturer that bought them, and usually neither producer nor buyer will divulge what the specs are. As a "for-instance," who would know that a TO-66 case type semiconductor from a Hewlett-Packard board marked 1884-0088 is really a 2N3228 SCR? Unless you are privy to house-number information (which probably means that you obtain *your* surplus boards at the company at which you work), leave boards with these meaningless numbers alone. Leave them to the metal salvagers. Occasionally, one can find two identical boards, one with in-house part numbers, and one with conventional part numbers. These electronic "Rosetta stones" can then provide the cross reference that

you need. The equivalent numbers should be immediately written down and kept in one's semiconductor data file.

As to what kind of boards to buy, the answer depends on what is available and what your interests are, electronically. My own interests are rather broad and so I like to have a wide variety of all sorts of semiconductors, separated into little plastic "fishing tackle" partitioned boxes, for whatever application comes up. Even though older Germanium transistors are not too useful in my new designs, the 2N404s, 2N388s, 2N1305s, and 2N1306s make excellent replacement parts for fixing older transistor radios. RTL, DTL, and CTL ICs in stock in my "junk box" allow me to repair older electronic circuits that others cannot. I recently was able to "save" a very nice Hewlett-Packard 103AR (1-MHz standard), because my collection of surplus parts included a 2N384 (an older Germanium drift-type PNP transistor). Generally speaking, however, after one has "stocked-up" on older parts (a few assorted boards of these should be a lifetime supply), what one looks for are boards with newer silicon transistors and modern ICs.

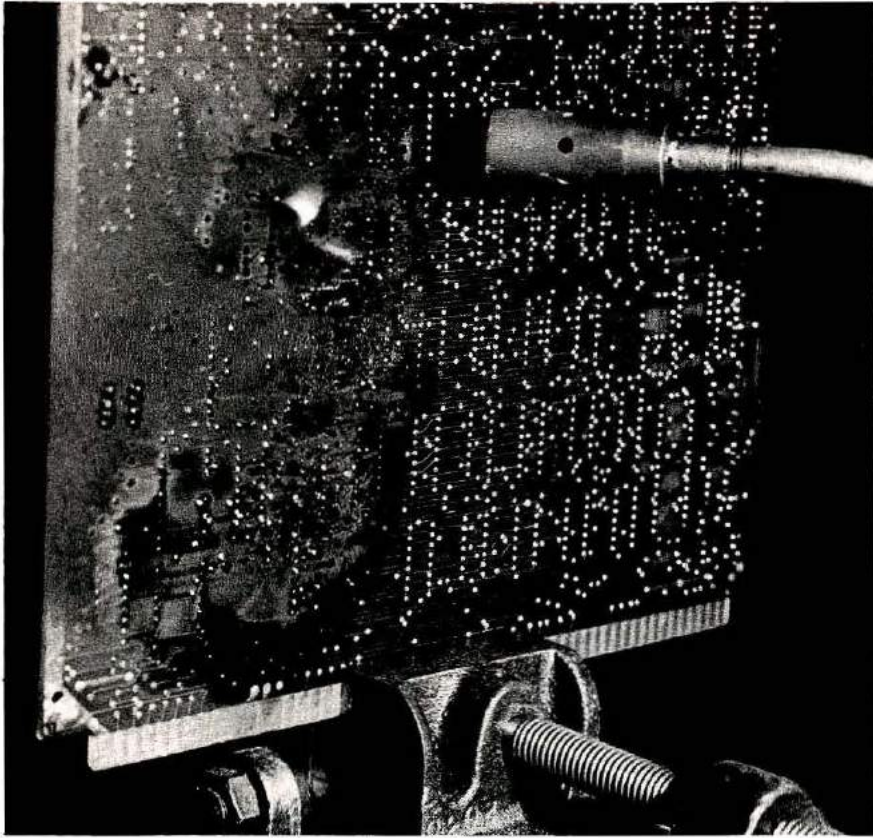
The identification of semiconductors is something one acquires with experience and access to data sheets. The "Data, Inc." books are probably

the best source of information on this subject, but they are quite expensive for the experimenter. The section on logos in these books is particularly useful, as it gets you "into the ballpark." Once the logo tells you who made the device, you can usually then figure out which of the several numbers on the package are useful, and which are non-useful numbers (such as date or batch codes). The "Data, Inc." books mentioned above (45 U.S. Highway 46, Pine Brook, New Jersey 07058) and the "IC Master" by United Technical Publications (645 Stewart Ave., Garden City, New York 11530) are really the best sources of data on semiconductors. Since these are revised at yearly intervals (or more often in the case of some of the "Data" books) old copies are periodically disposed of by many companies. These older copies are just fine for experimenters, since they pertain to the vintage of components that one is likely to find.

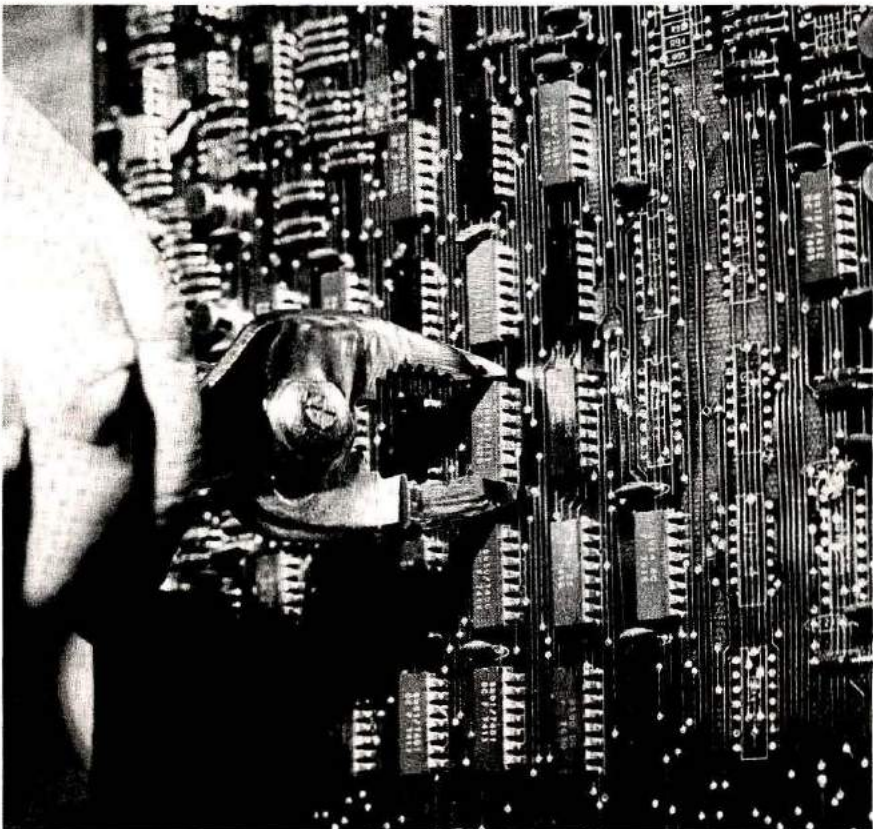
The boards from military contracts, and those made by large system houses, are the ones most likely to have parts with meaningless numbers. The military boards are also likely to have parts on them that are quite old. The best boards come from small or medium sized electronics manufacturers — those that are still too small to negotiate orders with the semiconductor houses for specially numbered parts. These smaller companies also have a different point of view, in that they are selling innovative, not conservative, design and the parts on these new boards will generally be of the latest, most-advanced types.

Where to buy boards is again dependent on your circumstances. The mail-order route is probably the worst way; you get whatever the supplier wants to send you. If his flyer tells you what the boards have on them, then he's already put in considerable time and effort and the price will be high. If he doesn't tell you what's on the boards, then it's a pig-in-a-poke and you could get nearly anything.

A few thoughtful moments at a flea market or surplus house can bring a veritable bonanza.



Using a propane torch to heat the pads for quick removal of components as devices.



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A Gold Mine of Parts

The purchase of boards from a surplus electronic dealer where you personally can handle the merchandise is a pretty good way to go. But, since this surplus dealer is in the electronics business, you can be sure that he has "high-graded out" the most valuable boards for sale to special segments of his market. For instance, any boards with micro-processors, RAMs, ROMs, or related ICs will be gone. You'll find these boards up at the front counter, for a much higher price! If you just want garden variety parts, however, the surplus electronics dealer's boards are not a bad source, but you'll find few "mistakes" (like a card-full of RAM IC's for a dollar).

The best source of parts is in the cards that one buys from surplus metal dealers; those who attach very little value to the electronic components themselves, but rather only wish to recover metals. The metal dealers generally want the aluminum from boards with heat sinks on them, and the gold that is used to plate edge connectors and circuit traces. I generally like to buy boards from these dealers after they have removed the heat sinks and sheared off the edge connectors. The price is usually between 50 cents and one dollar per pound. Most of these dealers do not want to fool around with less than \$10.00 worth, and you must *always* pay them in cash. When scrounging in the metal dealers' yards, use common sense or you will be declared persona non grata. Do not unnecessarily bother the dealer, do not pocket anything, do not tease his vicious dogs, do not interrupt his lunch, and do not preoccupy his underpaid workers with idle chatter. I carry a "Swiss Army" knife (with screwdriver) and small angler's spring scale (and a string bag) to get a feel for the weight

Table 1. A list of the yield from approximately 10 pounds of surplus boards. You may do better in some cases, but the possibilities are obvious. Some of these numbers may help you identify the goodies.

Type	Manufacturer	Description	Quantity
1N751A	JEDEC	5.1-volt Zener diode	5
1N758A		10 volt Zener diode	5
1N4001		50 volt, 1 A., Silicon Rectifier	7
1N4004		400 volt, 1 A., Silicon Rectifier	5
1N4007		1000 volt, 1 A., Silicon Rectifier	4
1N5408		1000 volt, 3 A., Silicon Rectifier	10
1N6096		25 volt, 25 A., Silicon (Schottky) Rectifier	2
A14F	G.E.	50 volt, 1 A., Silicon Rectifier	4
MR504	Motorola	400 volt, 3 A., Silicon Rectifier	4
MR820		50 volt, 5 A., Silicon Rectifier (Fast Recovery)	6
MR824		400 volt, 5 A., Silicon Rectifier (Fast Recovery)	1
—	—	Misc. 1 A. Silicon Rectifiers	6
—	—	Misc. signal diodes	94
—	—	Red LEDs	5
2N2219A	JEDEC	Transistor, NPN, Si.	5
2N3439		Transistor, NPN, Si. (450 V)	1
2N3606		Transistor, NPN, Si.	5
2N3643		Transistor, NPN, Si.	10
2N3644		Transistor, PNP, Si.	4
2N4126		Transistor, PNP, Si.	2
2N4258		Transistor, PNP, Si.	5
2N4275		Transistor, NPN, Si.	20
2N5172		Transistor, NPN, Si.	4
2N6545		Transistor, NPN, Si. (850 V) power T03	5
MPS-U60	Motorola	Transistor, PNP, Si. (300 V) power plastic	1
T1P29C	T.I.	Transistor, NPN, Si. power plastic	5
T1P31		Transistor, NPN, Si. power plastic	5
T1P32		Transistor, PNP, Si. power plastic	5
T1P35A		Transistor, NPN, Si. power plastic	5
T1P36A		Transistor, PNP, Si. power plastic	5
T1P49		Transistor, NPN, Si. (350 V) power plastic	2
C122F	G.E.	SCR, 50 volt, 8 A.	1
CA3046	Fairchild	IC, Transistor Array (5 - NPNs)	15
CA3130T	R.C.A.	IC, Op. Amp. CMOS	10
LF356H	National	IC, Op. Amp. FET - Input	4
LM319N		IC, dual comparator	3
LM339N		IC, dual comparator	10
MC1408-8	Motorola	IC, 8-Bit D to A Converter	1
MC1496L		IC, Balanced Modulator	2
MC7542P		IC, Dual Driver NAND Inputs	3
N5558V	Signetics	IC, Dual Op. Amp.	5
NE540L		IC, Audio Power Driver	5
μ A723	Fairchild	IC, Voltage Regulator	2
μ A733		IC, Differential Video Amplifier	2
μ A741		IC, Op. Amp.	1

of the material I'm selecting. A magnet in one's pocket is also occasionally handy to check whether what appears to be copper or aluminum is really steel. (This last point is only useful in negotiations with the metals dealer.)

Assuming you've done all the correct things in selecting and purchasing your surplus boards — you've hauled, say, 10 pounds of "treasure" home — what next? The next step is to carefully go over the boards, and, using a

μ A747		IC, Dual Op. Amp.	12
IH5011	Intersil	IC, 4-Ch. SPDT, FET switch	3
MCT2E	Monsanto	IC, Optical Isolator	1
74LS00	Tl, Others	IC, TTL (low power) Quad, 2-Input NAND	6
74LS04		IC, TTL (low power) Hex Inverter	8
7406		IC, TTL Hex Inverter Buffer	2
7408		IC, TTL Quad, 2-Input, AND	1
74LS08		IC, TTL (low power) Quad, 2-Input, AND	6
74LS10		IC, TTL (low power) Triple, 3-Input, NAND	1
7413		IC, TTL Dual, 4-Input, NAND-Schmitt	1
7426		IC, TTL Quad, 2-Input, NAND	3
74LS26		IC, TTL (low power) Quad, 2-Input, NAND	3
74LS30		IC, TTL (low power) 8-Input, NAND	2
74LS32		IC, TTL (low power)	10
74LS74		IC, TTL (low power) Dual, D-type Flip Flop	6
7478		IC, TTL Dual, J-K Flip Flop	1
74LS86		IC, TTL (low power) Quad, 2-Input, Excl. OR	2
74LS112		IC, TTL (low power) Dual, J-K Flip Flop	2
74LS123		IC, TTL (low power) Dual One Shot	2
74LS125		IC, TTL (low power) Quad Bus-Buffer	3
74157		IC, TTL Quad, 2-Input, MPX	1
74LS161		IC, TTL (low power) Sync, 4-bit, counter	2
74LS191		IC, TTL (low power) Sync, up-down, 4-bit, counter	8
74LS221		IC, TTL (low power) Dual one-shot	2
—	?	Miscellaneous house-numbered ICs	6
	Misc.	3, 5, 10, and 20-watt Ceramic Resistors	36
	Allen Bradley	1 and 2 watt Molded Carbon Resistors	26
		1/2 watt Molded Carbon Resistors	35
		1/4 watt Molded Carbon Resistors	556
		1/4 watt Film-Type Resistors	168
	Dale	0.2 ohm, 3%	12
	Misc.	Miniature Trimpots	20
		3/4" d. Trimpots	7
		1000 μ F, 35 V. Electrolytic Capacitors	4
		1000 μ F, 25 V. Electrolytic Capacitors	5
		Miscellaneous small Electrolytic Capacitors	20
150D	Sprague	Miscellaneous Tantalitic Capacitors	23
196D	Sprague	Miscellaneous Tantalitic Capacitors	65
		0.002 to 1.5 μ F, 100 to 1600 V. Mylar Capacitors	45
		0.002 μ F, 400 V. Polystyrene Capacitors	5
		Misc. small Mylar Capacitors, 0.022 to 0.001 μ F	38
		Misc. Dipped Silver-Mica Capacitors	65
	Erie	0.1 μ F, 50 V. Ceramic (Rec Cap) Capacitors	10
		0.1 μ F, 25 V. Ceramic Disc Capacitors	37
		Misc. Ceramic Disc Capacitors	20
CK05	Aerovox	0.01 μ F, Ceramic Capacitors	10
	Misc.	Misc. Glass-encapsulated Ceramic Chip Capacitors	91
		Misc. (Marked) Molded RF Chokes	7
		Assorted Ferrite-Cored Cores and Transformers	20
		Miniature Toggle Switches (SPDT)	5
		Heat sinks	2

tors melt quickly, and are best removed with an iron. Also, IC sockets are best desoldered pin-by-pin with an iron and a solder sucker; attempts at removing them by more rapid means will usually melt the plastic, or will pull individual pins out of the sockets.

Now comes the procedure that will absolutely panic the average electronics experimenter: use a propane torch on the solder side of the PC board to remove the rest of the components. With many boards, the components will fall right out when the torch is applied; with others (crimped in) the pliers will be needed. *Do this operation out of doors!* The fumes from burning fiberglass board are evil-smelling at the least, and possibly even noxious. Try to keep the board from actually catching fire, by playing the flame around a bit. This operation is nasty, smoky, and spatters solder, but in spite of all the smoke and fury, I do not believe it has ever cost me an overheated component. This is simply because fiberglass is one of the best heat insulators known to man, and only the metal leads of the components get hot. Do not try to get every last component using the torch, concentrate mainly on ICs and other multi-lead components, and also on items that have large solder-in mounting tabs like transformers and heat sinks. Resistors, capacitors, and diodes can be removed with the iron if they don't just fall out with the torch treatment. If this seems destructive, remember: we are *not* trying to save the board!

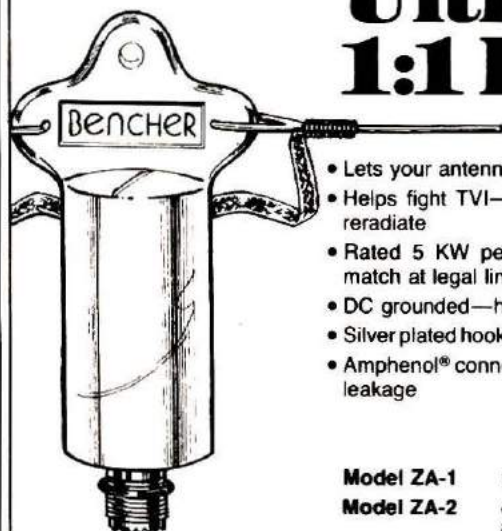
Figure 1(a) shows how the 100-watt soldering iron is positioned on the solder side of the board when removing a component such as a transistor (T05 or T018 case). Figure 1(b) shows how the iron is positioned for an in-line transistor such as the plastic T092 case. The photograph shows an actual propane-torch operation, wherein components are being removed by means of the heat applied with a flame to the solder-side of a PC board.

After the trial-by-fire, the components are separated into categories: resistors, capacitors, diodes, transis-

good 100 watt soldering iron (get out the old American Beauty!), remove any components which are either of high value to you, or which you know to be particularly heat-sensitive. The parts that have more than three or

four pins will be difficult to remove in this manner, unless you use a solder-sucker, one pin at a time. I find the best thing for gripping the component to be removed is a pair of common slip-joint pliers. Polystyrene capaci-

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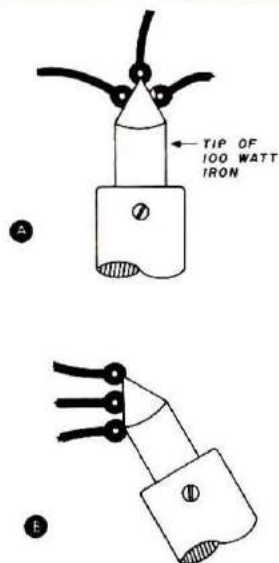


Fig. 1. Position of soldering-iron tip to heat PC board pads to remove a TO-5 transistor, A, and for in-line leads such as a TO-92 transistor, B.

tors, IC's, coils, transformers, relays, etc. The components that were removed from a representative 10-pound pile of boards are listed in **Table 1**. The value of the listed semiconductors runs into the hundreds of dollars (assuming that they are all good). Even the value of simple things like 1/4-watt and 1/2-watt resistors is well above the \$10.00 price tag. It has been enough work to list all the components in this salvage example, and I'll not bother to figure up the detailed total value. Suffice to say that I certainly got my money's worth on this batch!

If you consider the time spent in searching out, choosing, haggling, unsoldering, and sorting, there is no way that anyone making more than the minimum wage can justify parts salvage. However, if you consider these hours as a part of your hobby, then the time cost drops to nearly zero, and the yield in dollars-worth of hobby products is tremendous. I personally find that the best time to do the rather monotonous job of desoldering is during "net" hour — if your ham shack and work bench are in the same room. The hour or so just before you "turn-in" is also a good desoldering time, when you just need a "non-think" manual job (ladies like knitting at this hour for the same purpose). Watching an hour-long "sit-com" on the TV is almost as relaxing, but desoldering (or knitting) will do you more good.

HRH

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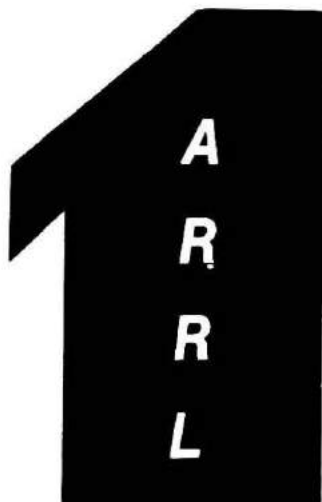
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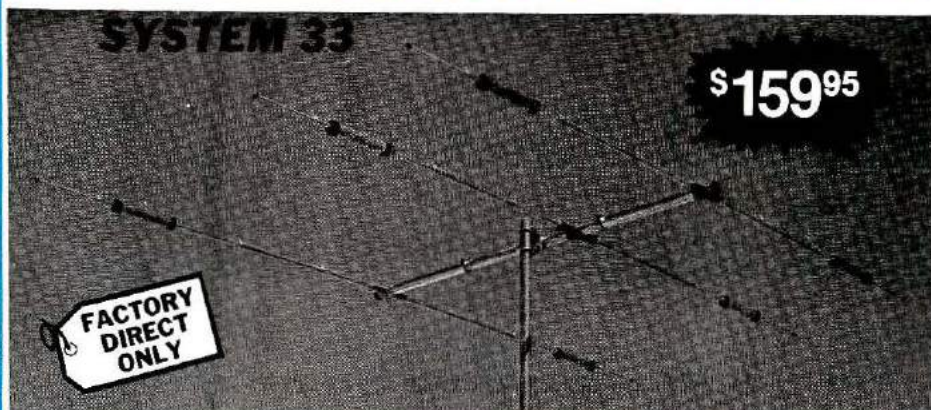
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A complete step-by-step illustrated instruction manual guides you to easy assembly and the lightweight antenna makes installation of the **SYSTEM 33** quick and simple.

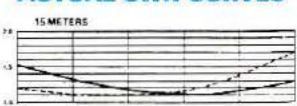
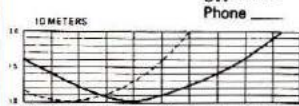
SPECIFICATIONS

Band MHz.....14-21-28
Max. power input... Legal limit
Gain (dbd)..... Up to 8 dB
VSWR at resonance..... 1.3:1
Impedance..... 50 ohms
F/B ratio..... 20 dB or better

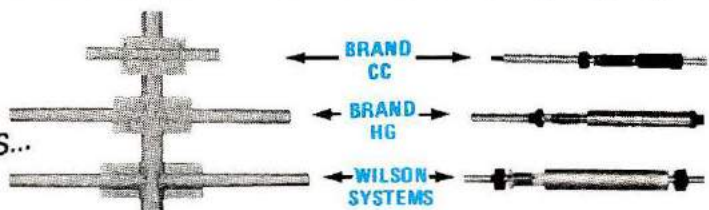
Boom (O.D. x length) 2" x 14'4"
No. elements..... 3
Longest element..... 27'4"
Turning radius..... 15'9"
Max. mast diameter... 2" O.D.
Surface area..... 5.7 sq. ft.

Wind load @ 80 mph... 114 lbs
Assembled Wt..... 37 lbs
Shipping Wt..... 42 lbs
Direct 52 ohm feed
no balun required
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Compare the size and strength of the boom to element clamps. See who offers the largest and heaviest duty. Which would you prefer?

Wilson Systems traps offer a larger diameter trap coil and a larger outside housing, giving excellent Q and power capabilities.

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Now you can have the capabilities of 40-meter operation on the **SYSTEM 36** and **SYSTEM 33**. Using the same type high quality traps, the 40-meter addition will offer 200 KHZ of bandwidth at less than 2:1 SWR. The new 33-6 MK will fit your present SY36, SY33, or SY3 and use the same single feed line.

The 33-6 MK adds approximately 20' to the driven element of your tri-bander, increasing the tuning radius by 5 to 6 feet. This addition will offer an effective rotatable dipole at the same height of your beam. The 33-6 MK will not interfere with the operation of 10, 15 or 20 mtrs.

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WV-1A

4 BAND TRAP VERTICAL (10 - 40 METERS)

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Easily assembled, the WV-1A is supplied with a base mount bracket to attach to vent pipe or to a mast driven in the ground.

Note: Radials are required for peak operation. (See GR-1 below)

SPECIFICATIONS

- 19' total height
- Self supporting — no guys required
- Weight — 14 lbs.
- Input impedance; 50 Ω
- Powerhandling capability: Legal Limit
- Two High-Q traps with large diameter coils
- Low angle radiation
- Omnidirectional performance
- Taper swaged aluminum tubing
- Automatic bandswitching
- Mast bracket furnished
- SWR: 1.1:1 or less on all bands

GR-1

\$14.95

The GR-1 is the complete ground radial kit for the WV-1A. It consists of: 150' of 7/14 stranded copper wire and heavy duty egg insulators, instructions. The GR-1 will increase the efficiency of the GR-1 by providing the correct counterpoise.

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 **KENWOOD**

For the Amateur who demands quality. This "big little rig" transceives on 80 thru 10 meters and receives WWV on 15 MHz. With up to 200 W PEP input, the TS-120S requires no transmitter tuning adjustments and includes a large digital readout, making it ideal for mobile operation. Other features include IF shift, built-in cooling fan, VOX, noise blanker, built-in 25 kHz marker, advanced PLL circuit, and a protection circuit for the final transistors. Power requirements: receive - 13.8 VDC, 0.7A; transmit - 13.8 VDC, 18A.

629.75
List Price 699.95



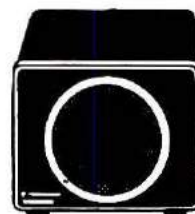
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**PANASONIC RF-2600
FM/AM/SW portable radio**

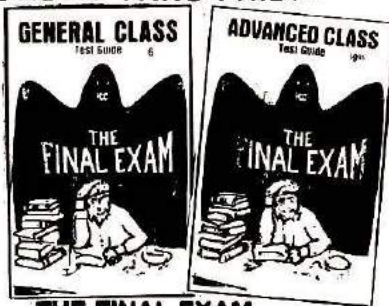
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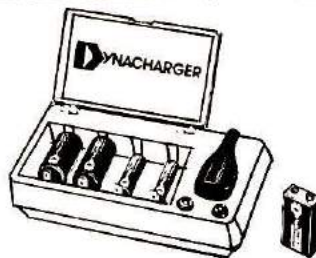
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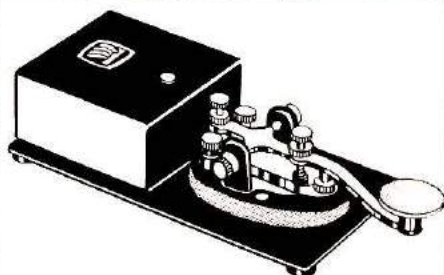
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Ham Radio Techniques

BY BILL ORR, W6SAI

"Visit the Exotic Orient — 18 days all-inclusive!" "Vacation in Japan — Formosa — Singapore — 13 days!" "Round-trip to Japan via Hawaii and Guam. Go now."

"Aha," says Joe Ham, "that sounds like a good idea. I'll take Marge along and she can buy some dresses and I'll buy myself a transceiver in Tokyo."

Some hams have done just that. They've taken the vacation trip, had a glorious time and have come home with a Japanese transceiver, bought in Tokyo. And some of them aren't very happy with the results.

If you are accompanied by a Japanese guide and translator, however, a visit to some of the Japanese ham stores can be exciting and interesting. You'll see a lot of equipment that is not imported into this country.

But, before you spend your money on a "bargain," be sure you understand all the pitfalls in such a transaction. Here are some guidelines that may help you in this regard:

1. Various models of well-known equipment exist in Japan that are not seen in this country. For example, the popular Yaesu hf transceiver FT-101 comes in four models, two of which are limited to 10 watts power output

to comply with Japanese regulations for the equivalent of the Novice license. In addition, the transceiver may be wired for either 115 volts, 220 volts, or 100 volts primary source. And, finally, the instruction manual is in Japanese.

2. The vhf transceiver situation is even more confusing, as the same equipment may come in various models with different repeater splits and channels to accommodate band conditions in Japan, Australia, Europe, or America.

So make sure you know exactly what you want before you buy it! Store prices, in general, run about 15 per cent below the "discount" cost over here, but additional U.S. duty levied upon bringing the equipment to this country may wipe out about half the savings. I've been told that the posted price in Japan includes a large sales tax, and that sometimes the equipment can be bought cheaper in Hong Kong than in Japan because of the elimination of the sales tax.

In any event, the trip is worthwhile even if you don't buy anything. I'll be interested in hearing from any readers who have bought ham equipment while in Japan, and I'll be happy to pass their remarks along.

I'm sure you've heard the rumor about some ham, a mythical airline pilot, who bought equipment in Japan at a great savings. Well, I haven't met him yet and am still looking for this character who is said to fly back and forth to Japan buying low-cost ham gear. Mythical pilot, please step forward!

The crossed-Yagi array

Amateur Radio, the estimable publication of the Wireless Institute of Australia, had an interesting article on the use of "crossed-Yagi" beam antennas. It seems these antennas have been in use extensively for vhf work, but little information has been given about their operation on the high-frequency Amateur bands. Lance Ferris, VK2NVF, discusses these interesting antennas in a recent issue of the Australian magazine.

With the over-the-air help of W5KHN (George) and W4YHF (Jim), Lance built up a crossed-Yagi array. This consisted of two three-element, 10-meter beams mounted on one boom: one set of elements was horizontal and the other set vertical (**Fig. 1**). A phasing harness made of coax cable was used to feed the arrays simultaneously, one array being phased 90 degrees electrically

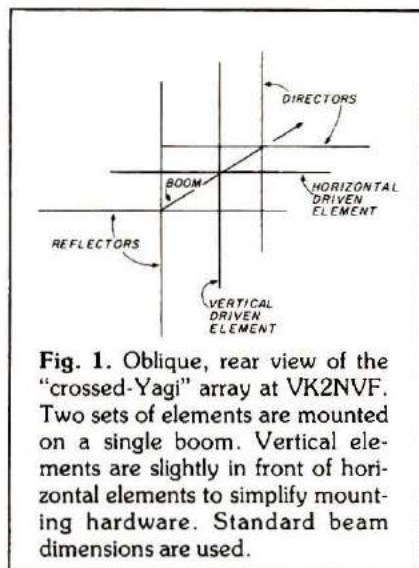


Fig. 1. Oblique, rear view of the "crossed-Yagi" array at VK2NVF. Two sets of elements are mounted on a single boom. Vertical elements are slightly in front of horizontal elements to simplify mounting hardware. Standard beam dimensions are used.

behind the other (Fig. 2). By swapping the feedpoint from A to B the "sense" is determined; that is, phasing is either clockwise or counterclockwise.

Lance's theory was that a reflected signal loses its original polarization after ionospheric reflection and the crossed-Yagi array would be more responsive to random polarization. The four-element beams had conventional dimensions, and with the aid of a coaxial switch or relay, Lance could switch phasing while listening to a DX signal.

"The results were amazing," he says. "Fading on DX, caused by polarization change, was reduced and, in many cases, eliminated." Lance also found that reception of vertically polarized mobile signals was enhanced and says that "discovery of new properties of the array seems to be never-ending." He would like to hear from any other hams who have tried a similar system on the DX bands.

The 144-MHz "super quad"

In the same magazine, an interesting antenna for 2 meters is described. The original design is attributed to HB9BIX (Switzerland) and is shown in Fig. 3. The antenna is a combination of four quad elements which are coupled together by sharing common elements. The antenna has a claimed gain of 11.5 dB over a dipole and a front-to-back ratio of about 25 dB.

The all-metal array requires no insulators other than the one at the

feed point. While detailed construction information is lacking, it looks as if the horizontal portions of the quad may be made up of copper-plated welding rods or small aluminum tubing. The vertical sections can be made of the same material, or light copper wire. A simple gamma matching system is placed at the center of the driven element to permit a match to a 50-ohm coaxial transmission line.

This antenna should be simple to build and easy to get into operation. Because of element stacking, bandwidth should be very good. I'll be interested in hearing from any energetic vhf operators who want to experiment with a promising antenna concept. How about it?

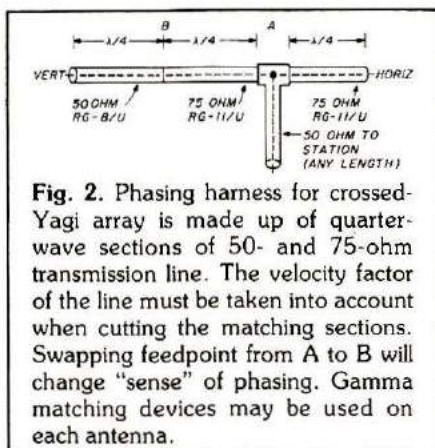


Fig. 2. Phasing harness for crossed-Yagi array is made up of quarter-wave sections of 50- and 75-ohm transmission line. The velocity factor of the line must be taken into account when cutting the matching sections. Swapping feedpoint from A to B will change "sense" of phasing. Gamma matching devices may be used on each antenna.

A matching unit for solid-state transceivers

Turning from Australia to England's *Radio Communication* magazine, the publication of the Radio Society of Great Britain, we find a very interesting antenna-matching unit designed to be used with solid-state transceivers that "don't like" to work into an antenna exhibiting a high value of SWR. To obtain full power output, the transceiver has to work into a matched load, and most antennas don't present this.

This unit (Fig. 4) was written up by I. H. Crowther (G3KLF) for use with the Yaesu FT-7 transceiver. It will, however, work with other high-frequency transceivers on the market. It was designed for use with a trapped 10-15-20 meter vertical, dipole, or Yagi antenna. Component data is given in the circuit diagram.

Inrush current

I've received several letters concerning inrush current to a linear amplifier, and its effect upon tube life. Inrush current is that abnormally heavy current drawn by the equipment in the first second or two after it is turned on.

The filament of a large transmitting tube has a very low resistance when it is cold, and a much higher resistance value when it is warm. The filament resistance of a 3-500Z, for example, has a cold value of about one-tenth the hot value. Thus, the filament current can be as high as ten times the normal amount until the tube comes up to operating temperature.

Inrush current is limited somewhat by the capacity of the filament transformer to withstand the sudden surge of current. Many filament transformers can deliver eight to ten times the rated current for a period of a second or two, depending upon the resistance of the windings and the core size.

No quantitative data exists on the effect of filament inrush current on the overall life of a vacuum tube. However, it is observed that large commercial transmitters protect their tubes with a current-limiting circuit, and many tube data sheets list the maximum filament inrush current recommended. Common sense tells us that turning a light bulb on and off severely shortens its life.

Measuring filament inrush current is not an easy job unless a recording

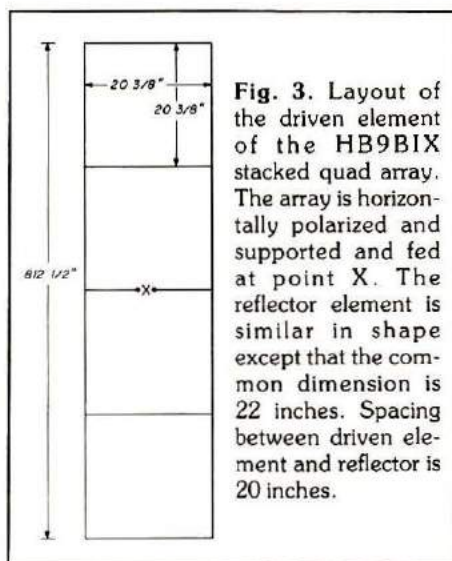


Fig. 3. Layout of the driven element of the HB9BIX stacked quad array. The array is horizontally polarized and supported and fed at point X. The reflector element is similar in shape except that the common dimension is 22 inches. Spacing between driven element and reflector is 20 inches.

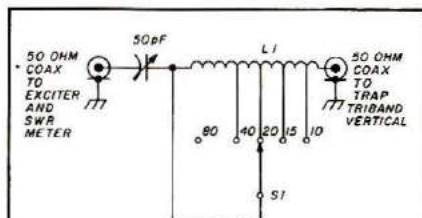


Fig. 4. The G3KLF antenna matching unit for use with solid-state transceivers. The capacitor is a small, receiving-type variable. Note that both terminals are "hot" and capacitor must be insulated from ground if the unit is built in a metal box. The switch is a ceramic, single pole, single-deck device, such as a Centralab 2501 (two to six position, nonshorting). The coil consists of 48 turns of No. 20 tinned wire about 3 inches long (spaced wire diameter). The 40-meter tap is about 7 turns from the capacitor end of the coil; 20-meter tap, 25 turns; 15-meter tap, 40 turns; 10-meter tap, 46 turns. Turns on coil may have to be adjusted depending on whether low- or high-frequency end of the 80-meter band is preferred.

ammeter is at hand that can measure the pulses of current for each cycle. A representative picture of filament inrush current is shown in Fig. 5.

Limiting amplifier inrush current also helps to protect the diodes in the power supply and the filter capacitors. The inrush current can be particularly heavy when, by chance, the primary switch is closed near the peak of the line power cycle.

A simple solution to this problem is described in *Radio Communication* by G2BY (H. E. Watley), and is shown in Fig. 6. A series resistor is placed in one primary lead to the amplifier and is shorted out with an auxiliary switch. This simple circuit can be built up in an auxiliary box and placed in the power line. If the box is placed adjacent to the amplifier, it can be switched on with one hand and the amplifier turned on a second or two later with the other hand.

If switch S2 is a double-pole switch, it is possible to place a 120-volt pilot lamp in the box, wired to signify that the surge resistor is shorted out of the circuit. I'll leave the details up to you.

The period of inrush protection is brief; two or three seconds. If you count to three and then throw the switch, your timing will be very close.

An inexpensive harmonic filter for 144 MHz

Here's a final article of interest from *Radio Communication*. It is an easily constructed and inexpensive add-on filter for 144 MHz that doesn't require expensive test equipment to align it. The filter is built in a small cast-aluminum box, or one made up of printed circuit board, and consists of two air-wound inductors and a mica variable capacitor. The unit was designed and built by G8IPQ (A. R. Badcock), and is shown in Fig. 7.

If the dimensions are followed closely, alignment may be made by listening to an on-the-air signal near the middle of the 2-meter band and peaking the capacitor for maximum received signal. If desired, the filter may be followed by an output meter, and the capacitor adjusted for a maximum forward-power indication. The 3-dB bandwidth of the filter is about 6 MHz, and insertion loss is less than 1 dB. Attenuation of out-of-band frequencies is better than 40 dB, and the tuning range of the center frequency (adjusted by the capacitor) is ± 30 MHz.

The VE2CV vertical J-antenna for 144 MHz

The J-antenna has been around a long time, and a lot of misinformation has been published about it. Basically, it is an end-fed, half-wave radiator that is matched and fed by a tapped

quarter-wave line (Fig. 8). John Belrose, VE2CV, of the Communications Research Centre of the Department of Communications of the Government of Canada has documented a practical and inexpensive J-antenna that was recently described in *The Canadian Amateur*. The following is a summary of the information therein.

Various advantages accrue to the J-antenna as contrasted to the simple ground plane antenna. First, the J-antenna requires no ground plane, making it an ideal radiator for portable or mobile operation. Second, the base of the antenna can be grounded directly to the supporting structure for base-station application, since the antenna is almost completely decoupled from the transmission line and supporting structure. And, third, if the J-antenna is mounted on a ground plane (the flat surface of a vehicle or a larger ground plane for the base application), the bottom end of the radiator is then one-quarter wavelength above the ground plane. The antenna plus its "image" then acts as a simple collinear array providing about 3.27 dB gain over a ground plane antenna.

Dimensions for the antenna are shown in the drawing. The half-wave antenna sits atop one leg of a quarter-wave transmission line which is attached to a coaxial balun providing unbalanced (50 ohms) to balanced (200 ohms) transformation.

The dimension of the quarter-wave line is:

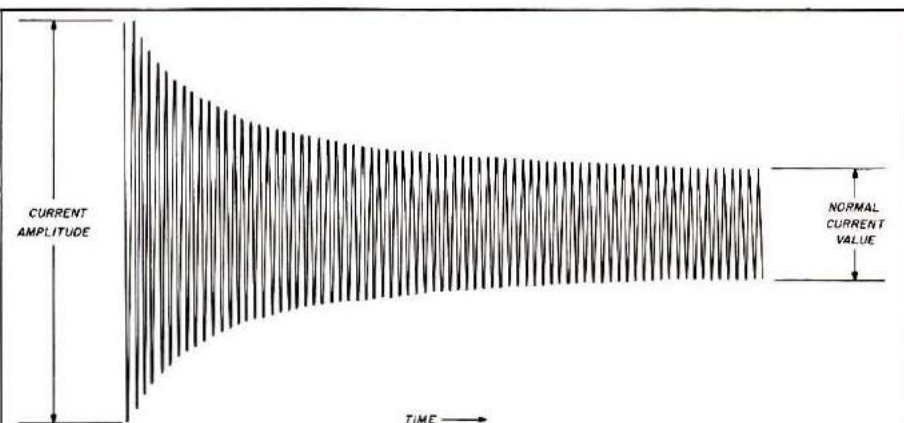
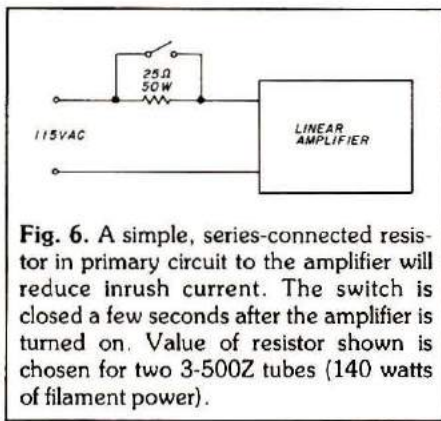


Fig. 5. Graphic representation of filament inrush current for a pair of 3-500Z tubes. When filaments are lit (left) maximum inrush current is 120 amperes, dropping to normal value of about 30 amperes after less than a second. Maximum inrush current, in this example, was limited by capacity of the transformer which was rated at 30 amperes. Heavy-duty filament transformer can cause damaging inrush currents if tubes are not protected.

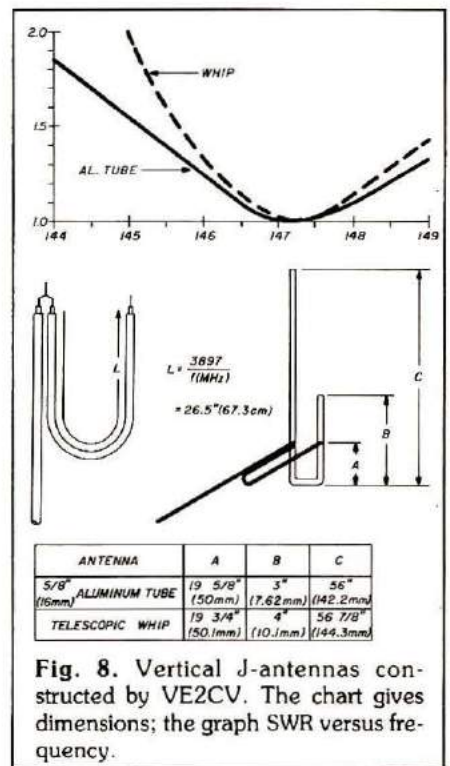


$$\frac{2878}{f(\text{MHz})} \text{ inches}$$

And the dimension of the half-wave radiator is:

$$\frac{5904 k}{f(\text{MHz})} \text{ inches}$$

where k is a factor by which the physical length of the antenna is decreased, due to end effect and the diameter of the element. For a 5/8-inch diameter element used in this an-



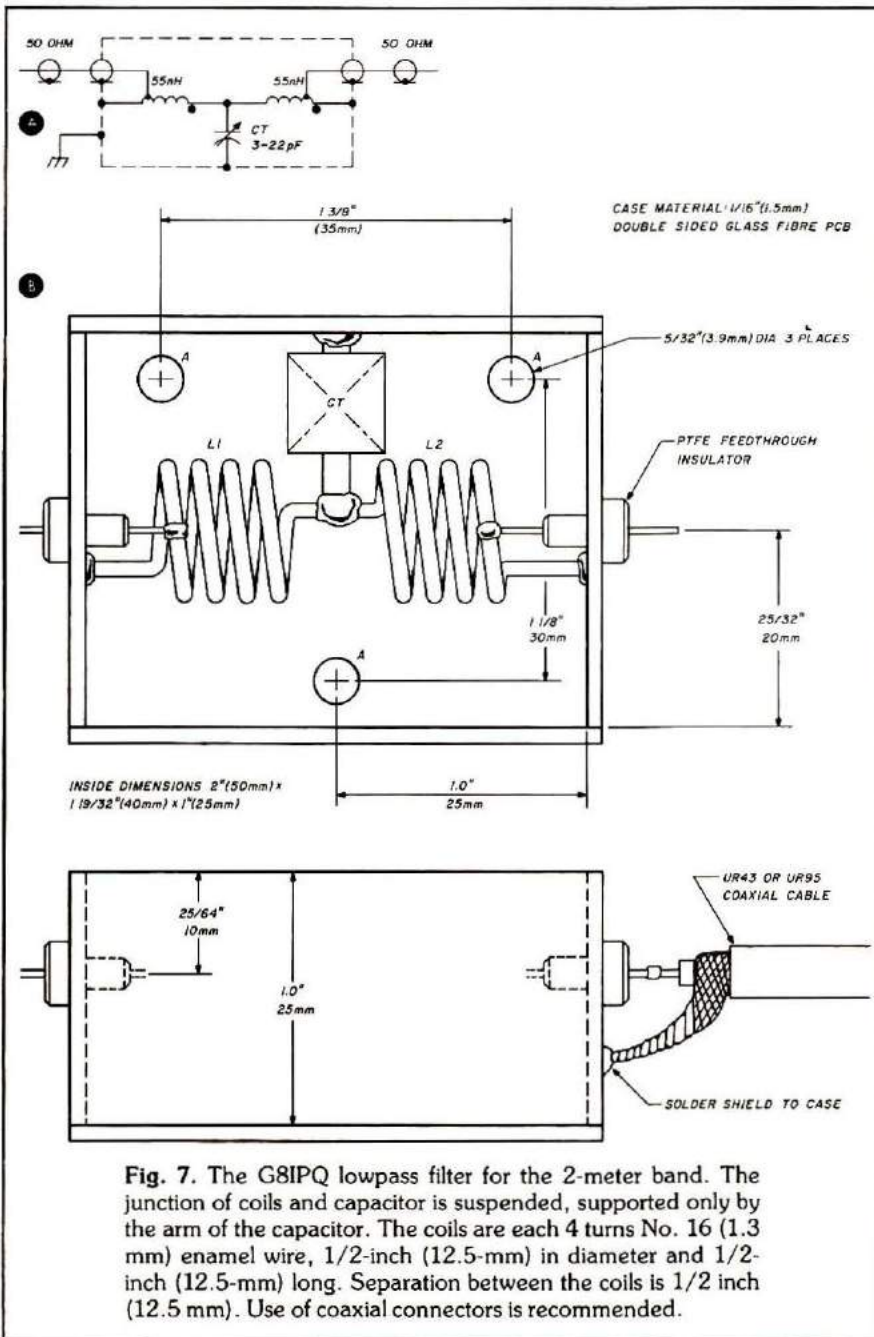
tenna, the factor $k = 0.907$. Dimensions for an antenna adjusted to 147.3 MHz are given in the illustration. Antenna bandwidth (exclusive of the matching system) is ± 5 MHz, so it covers the 2-meter band well.

The half-wave balun is made of either RG-58/U or RG-8A/U line, and its length is determined by the second equation with the factor $k = 0.66$ employed. Again, a representative dimension is given in the illustration.

When mounted in position and set to the dimensions given, final adjustment is achieved by varying the tap point of the coaxial balun and the length of the radiator. The tap point is adjusted for lowest SWR on the transmission line at the desired design frequency, then radiator length is adjusted to further decrease the SWR. A final adjustment to the tap point will show essentially no reflected power at that frequency.

A comparison between this antenna and several commercial, so-called "gain antennas" showed no measurable difference at a repeater distance of 65 miles. This speaks well for the design of this simple and inexpensive antenna.

HRH



DX Horizons

By Bill Kennamer, K5FUV

Sometimes the difficulty in doing this column is most reflected in that it must be done so far in advance. At present, I am enjoying the first whiff of springtime, but by the time you read this, it will be the heat of July which greets you as you walk out to study your antennas. Here, I have found the summer months to be an excellent time for working DX in the Pacific, and refurbishing the antenna system for the fall DX season. Perhaps your planning this year should include something better for 80 and 40 meters, as excellent conditions may be found on 20 meters, both phone and CW. In any case, get the antennas prepared, as good DX awaits around the corner.

VKØ Heard Island

As this is being written, VKØRM/MM has been heard en route to rare Heard Island, southwest of Australia. You'll be hearing a lot about this expedition upon their return, and so I thought it would be interesting to take a look at an earlier expedition to Heard.

Coast Guard Commander Bill Rohrer, W7IJ, was the operations officer in charge of a party assigned to take an army group to Heard in March of 1979. Recently, I spoke

with him on the telephone about his trip.

Bill operated with the call sign VKØWR. The other operator was Henry Roseing, whose present call sign Bill can't recall. Henry was the regular radio operator on the *Southwind*, and got his ticket just before the mission, at Bill's urging. As a result of his experience on Heard, he continued to be active as an Amateur.

The mission was to take a U.S. Army group to build shelters for a party which was to remain for several months. This party was to operate a station for satellite photography in connection with a project for accurately measuring the size and shape of the earth.

No ice was seen on the way down, and the temperature was around 40 to 50 degrees Fahrenheit during the time of the visit. There was a building left from an Australian weather station, and new facilities were built for the army group.

Bill and Henry took with them a two-element beam and a vertical antenna for use on the island, but a windstorm the first night totally destroyed them. There were some radio towers on the island, so a variety of wire antennas were tried. Best results were with a long-wire tied to a

tower on one end, slanting down to a tombstone on the other end. Equipment used was a Heath transceiver and a Swan 350. No amplifier was used, due to Australian power limits.

They found propagation conditions to be poor at best. For the entire time they were there, 24-hour-a-day operation was attempted. The only signals heard were on 20 meters; there was a variable magnetic storm the entire time of the stay. When propagation was in, it shifted from all directions, even between transmissions. Many stations reported having to change beam headings while listening to them. During their stay, Bill and Henry managed about 3000 QSOs, with about one-third of them on CW. VKØWR's efforts were greatly appreciated by DXers.

By now, you know of the problems at VKØRM this year. Due to equipment failure, only a handful of contacts were made. However, good probability exists for a return voyage in early 1981, with ham radio in mind.

QSL tips

Much of the information here has been mentioned in various publications before, but some of my conversations with QSL managers indicate that proper procedures are still not

being followed. Following these procedures will increase your rate of return.

First, start by looking at your own QSL card. Of course your call is on the front. Possibly the QSO information is also. If not, turn your card over. Now, look for your call. Is it on the back, along with the other QSO information? If not, throw it away and start again. Nothing gives a DX station or manager a "glass arm" faster than having to flip a card over to get all of the information from it. This was most graphically pointed out to me over the weekend after filling out a thousand or so cards received from contest activities. The constant flipping to get all the information pointed out that most cards are not designed for volume processing.

Now, look at the QSO information block itself. Is it designed so that the information may be easily obtained, or must one put much thought into location of pertinent information? For example, we have seen cards where the call of the station worked was not included. Also, the report came before date, and mode and band were separated. Information should be arranged in most logical order for speed in processing. A good example would be call of station worked, date, time, band, report, and mode.

Now that your card is in shape for readability, it's time to pay attention to how the information is put onto the card. The station's call sign should be printed plainly. The date should have the month written out. Something like 3-12-79 should not be used. In the U.S., this would probably be considered March 12, 1979. However, in the rest of the world, it would be 3 December 1979 — nine months difference. Also, note the time. Use universal coordinated time (UTC, GMT, ZULU, Etc.). Believe me, if it's in Pacific Coast time, you'll get it back with a "not in log" note. Of course, band in use and report are self-explanatory, but mode should be indicated as two-way if the contact was not cross mode.

When sending cards to a manager who handles cards for more than one station, be sure to use a separate en-

"Sending a card . . . without a return envelope or postage is the surest way to get one into a wastebasket."

velope for each station. Otherwise, your card may sit around for months waiting for the logs for all stations to arrive so that your cards may be sent together. Also, if the card is going to a manager, it's a good idea to put your call on the outside of the envelope, along with the call of the station you worked, date, and time worked. This way, if the card and envelope get separated, chances are still good that you'll receive a card. Also, don't make the mistake that some neophyte DXers make of sending a card to a manager without a return envelope or return postage. That's the surest way to get one into a wastebasket.

If you're sending a card to a DX station, a note or sometimes a photograph will be helpful in securing a return.

Following these tips won't guarantee a return, but will greatly improve your odds.

9Q5 Zaire

Dr. Vince Thompson, K5VT, is a specialist in surgical procedures, and his work takes him all over the world. Last year he traveled to SV5 and 5H3, and just recently returned from Zaire, where he was active for about three weeks as 9Q5VT. Even though basically on a work mission, he was able to make over 3000 QSOs, all on CW.

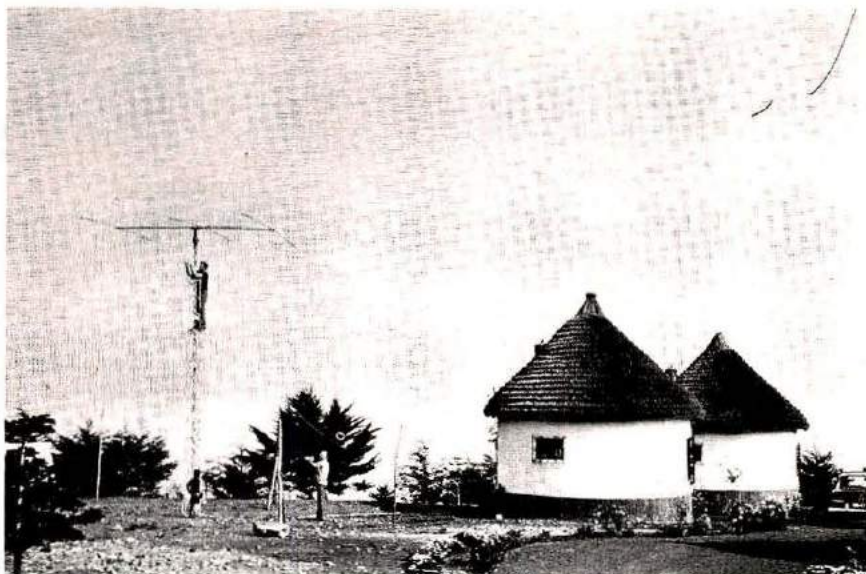
While in Africa, Vince made several side trips, but was unable to do any Amateur operation. He went to TN8, but could not find TN8AJ. He also went to 9U5 for two days, but was unable to get a license in such a short time. However, he did lay the groundwork for his trip there in the fall, when he will stay for two weeks. QSLs for the 9Q5VT operation go to Vince Thompson, K5VT, 4028 Perlita, Apt. 4, Los Angeles, California 90039.

ST0 Southern Sudan

Chuck, K5LBU, has advised us that he will be in Juba, Southern Sudan, for about four years. He plans operation from 160-10 meters and



Martti Laine, OH2BH, operating his Drake twins as CT3BZ from the Madeira Islands during the 1978 World Wide DX Contest. This was the first time a single operator made more than 5.1-million points (photo courtesy W1HR).



CT3BZ location used by OH2BH in the 1978 DX test was 2000 feet off the sea on the northernmost Madeira Island. According to Martti, the only QRM was the passing clouds! (photo courtesy W1HR).

Oscar, and has a Dentron HF200A, and is awaiting an SB-220 amplifier. Antennas initially will be a Mor-Gain dipole and Butternut vertical. He hopes to begin operations as K5LBU/STØ and will obtain an STØ call as soon as possible.

HKØ Baja Nuevo

HK3DEU, president of the RCA, reports receiving the call sign of HKØAB for a projected Baja Neuvo operation this month. He also expects Malpelo operation, with HKØAA the anticipated call.

5V7 Togo

Gerland Edwards, 5V7GE, is active from Togo, but on a somewhat infrequent basis. He's a ragchewer, so don't be surprised if you get drawn into a conversation with him. He says there's another local station, but he's not very active. Right now, it's QSL direct, but work is being done to try to secure stateside QSL management so that his activity may pick up.

Operating Technique?

Recently, I've spent some time listening on the phone bands, and, quite frankly, wonder how anyone works any DX. It seems that no one appears to have a receiver anymore. As soon as a DX station announces

his presence on frequency, the pack goes into C.C. (continuous call). The howl continues for several minutes, drops down in level while a QSO goes on, and increases in intensity again. No request from the DX station will

shut the pack up. I find most U.S. stations don't seem to know what call area they're in, as W2s seem to respond to the DX station's request for W6s. Also, many stations appear to feel that the DX station hears better if his (the DX station's) transmitter is working, so they call while he is transmitting. What can be done? How about a little self-restraint? Why not try listening more and transmitting less?

Your chances will be increased, because, if the DX station doesn't have to take five minutes between QSOs, then he can work more stations thus increasing your chances. For better operation on the bands, try the following:

Drop your call into a pile-up only twice, then shut down and listen carefully. If you didn't bust the first time, no point in contributing to the QRM.

Don't make it a point to give your call last in the pile-up. All that happens when you try that is to get two more guys to try it, which inspires two more and so on, and so on. This seems also to inspire the DX



Operating position of Oaks Ohkoshi, JH8DSC, in Sapporo on Hokkaido Island in Japan has a nice choice of operating equipment including a Kenwood TS-820S and Drake twins (photo courtesy W1HR).

station to sneak away to another frequency or go QRT.

Many operators indicate that they believe that being the last to call in a pile-up is referred to as "tailending." It is not. Tailending is a sophisticated operating technique,

and will not be explained here, as it is also one that must be used with extreme discretion and caution. Improper use only creates mayhem and confusion on the bands, and most DX stations don't like it.

Listen to the DX station. Don't call

if you can't hear. If you can hear, follow his instructions. If he says 6s, only 6s should call.

If it's hopeless, give up for awhile. If you don't have propagation on your side, all you're doing is contributing to the general confusion. Wait till the propagation begins to fall in your favor.

Following these few tips won't completely clean up the bands, but if everyone would follow them, perhaps it would be for the greater pleasure of all.

3B9 Rodriguez

Moossa Atchia, 3B8AE, is a new ham who has just received a two-year assignment to Rodriguez. He is scheduled to arrive early in March, and is taking along a crystal-controlled SSB rig. He will be operating around 14.240 MHz, and will be there long enough to satisfy the demand, if he's not driven off the band the first week he's there. The address (too new for the *Callbook*) is 3B8AE, Moosa Atchia, 7 Napier Broom St., Beau Bassin, Mauritius.

Most Wanted

QRZ DX, a weekly DX newsletter, recently took a poll of its readers. The following represents the countries most wanted by that particular sampling of DXers in January, 1980:

- | | |
|----------|-------------------|
| (1) BY | China |
| (2) XZ | Burma |
| (3) VS9K | Kamaron Island |
| (4) VU7 | Laccadive Islands |
| (5) VKØH | Heard Island |
| | FB8W |
| (6) 3Y | Crozet Island |
| | Bouvet Island |
| | ZA |
| (7) VU7 | Albania |
| | Andaman and |
| | Nicobor Islands |
| (8) CEØX | San Felix |
| | 3X |
| | Republic of |
| | Guinea |
| (9) XU | Khmer Republic |
| | (Cambodia) |
| | 7O |
| | South Yemen |
| (10) TZ | Mali |

Needless to say, the list most likely will have changed by the time it is printed, with activity from two of the spots occurring at the present.

QSL Route

Station	QSL via		
AH8A (from 1 Mar, 1980)	WB6FBN	OD5LX	SMØGMG
A35SM	Box 111, Nuku-Alofa, Tonga	OD5ML	WA2RPN
A4XGY	K2RU	OD5MR	HB9ABV
A4XIQ	K2IJL	SU8JE	SU1JE
A7XA	DJ9ZB	SV1JH	DJ9ZB
A7XE	DF4NW	SV5JH	DJ9ZB
A9XBE	Direct	SVØAJ	American
CO2JA	Jose, Box 2004, Havana, Cuba	TA1MT	Embassy, APO NY
C31XA	U.R.E.	TA1TT	09253
DJ1US/ST3	DF2RG	TU2DP	DJ9ZB
DJ7SC/TJ1	DL6KB	UA1PAL	DJ9ZB
EA9AH	Box 567, Ceuta, Satiz, Spain	VK9NS	Via N4BZV, K4MQL, W6MVV, or
EA9HA	Box 567, Ceuta	VK9NS/LH	Direct with
EP2GY	JH1PLL	VKØRM	IRCs, No
EP2TY	JR3WRG	VP1CS	Bureau
FCØZN	DJ9ZB	VP1SWC	UA1OSM
FGØAYO/FS	W2KN	VP2A	P29JS
FK8DD	WB3JUK	VP2AZG	P29JS
FOØDX	K1MM	VP2KAH	VK3AKK
FM7WO, K5VT/ SVØ	K5VT	VK2KAL	KØCS
SVØAA/5 (1979)	4028 Perlita, Apt. 4	VP2KAM	KAØBCW
5H3KS (1979 CW)	Los Angeles, CA 90036	VP2VEG	K4PJ
FRØACB/G	DK9KD	VP5NHX	OE3ALW
FRØACC/G	DK9KD	VP8SU	YASME
HKØBKX	WB4QFH	VQ9DM	WB8LDH
HP1XDS	Dave, Box 2244, APO Miami, 34002	VQ9KJ	WB8LDH
HP1XRK	K1RQ	VS6DO	WØDVZ
HR3JJR	Box 207, La Ceiba	VU2CK	WA4FBH
HV3SJ	IØDUD	VU2CP	G3RCA
HZ1TA	I8YCP	VU2FC	K1BZ
JW5IJ	LA5NM	VU2RX	KØKJ
JY5YK/OD	I8YCP	WD4RCO/8R1	K4CIA
JY9HQ	DJ9ZB	W6SOT/LX	K3GL
J28AZ	18JN	W7KHN/KH9	DJ9ZB
JY9KP	DJ9ZB	XE1RL	DJ9ZB
J28CB	18JN	XT2AU	W2LOG
KX6QC	Box 65, APO SF 96555	XT2AW	WA7IRD
N4ADJ/KG6	WB4CCT	XT2AX	KA5CCO
N4GS/DU2	Via S.C. Box 3015, APO SF 96286	YBØACL	W7KHN, 1980 Callbook only
		ZD8TC	WD8NKT
		ZK1AC	WA1ZEZ
			KN1DPS
			DJ8XF
			W4QO
			N2CW
			Box 529, Rarotonga
			3B8CF
			G3TBK
			VE3IPR
			WA4WTG
			K4BF

HRH

Questions & Answers

Entries for this column must be by letter or post card, only. No telephone requests will be accepted. All entries will be acknowledged when received and those judged to be most informative to the most Amateurs will be answered in this column. No questions will be answered by return mail. Questions must relate to Amateur Radio.

Readers are invited to send a card naming the question they feel is most useful in each issue. Each month's winner will receive a prize, and there will be a prize for the most popular question of the year. In case of two or more questions on the same subject, the one arriving here the earliest will be used.

Did you vote?

We're really happy to see the number of questions coming in for this column, and their variety makes it relatively easy to choose some interesting ones for presentation.

But we're still waiting for some votes from you readers on which question and answer you found the most useful for each issue. C'mon, now, how're we going to award the prizes (books, subscriptions, used gum wrappers, etc.) if you don't tell us who deserves them? Just drop Questions and Answers a card, giving the name and/or call and the month it was in. Nothing in the rules forbids you from putting your own question on that same card, so do it!

Here's what came to the surface this month.

Band segments

Why does the FCC deny us the right to operate in certain portions of some bands, such as 14.1 to 14.2, 21.2 to 21.250, and 28.2 to 28.5 MHz? Our immediate neighbors, plus most of the rest of the world, can be heard there. — WB7UIE.

Let's not get the terms mixed up — rights and privileges are not the same

thing. We have operating privileges in certain slices of spectrum, and these privileges are earned by our actions in passing exams, obeying the rules, and presenting a favorable image to the rest of the world (who often look with some disfavor on Amateur Radio).

Also, it's not really the FCC's fault. They are bound by international laws and treaties, as well as our own regulations, in what they can allow or prohibit.

No one nation owns the airwaves, and they cannot keep radio signals from crossing their borders, either going out or coming in. Therefore, agreements must be made between nations so that all can use the radio spectrum in a reasonable manner. These agreements must be carefully worked out, and the process involves a lot of give-and-take on both sides. Just because we have more Amateurs than the rest of the world (possibly excepting Japan), does not give us the right to expect all the frequencies. In order to get enough frequencies so that American Amateurs will not be impossibly crowded, we have to agree that our neighbors, and others, can have segments where they will not be buried under the thousands of high-powered signals that most of the

U.S. hams put out. These segments are worked out at regional and international conferences, such as the World Administrative Radio Conference (WARC) that just ended (last November) in Geneva. Our government (including the FCC) abides by the results of those conferences, and so must Amateurs.

A couple of parting thoughts — you're not prohibited from operating in those segments, you can work all the CW you want to there. Also, where would you rather listen for a weak, rare DX station — in a band segment that was relatively quiet, or buried under a pile of local rag-chewers running kW finals? Split-frequency operation is not only legal, but often is the only way to work some of the rare ones.

Spurious letters

When I receive QSL cards, there are often letters "ARS" or "ARO" before my name. What do these letters mean? Also, when I receive an RST report, they sometimes include the letter "N," as in "RST 56N." What does that mean? — KA4LZG.

The letters "ARS" and "ARO" stand for "Amateur Radio Station" and

"Amateur Radio Operator." They are often put on a card by well-meaning hams as a personal whim, or to inflate your ego by implying that you are worthy of special attention because you run a radio station. Perhaps you are, but many hams would just as soon the practice were discontinued, because it calls attention to the fact that there is a ham station in the neighborhood, and therefore all the TVI and hi-fi problems can be blamed on this station, whether it is the ham's fault or not. The letters are not official, and not a required part of your address.

The letter "N" as part of an RST report is a shorthand way of saying "9." Try it yourself. Send "589" and then "58N." Notice the difference in ease and time. Another "shorthand" letter sometimes used is sort of a long "T," or stretched dash. This is often used in place of a zero, as in "power here is 2TT watts," with each T being slightly longer than normal. This cannot be done to substitute for the zero in an Amateur call, however, "WDTXYZ" is not a legal and proper identification; "WDØXYZ" is.

Voltages

I have noticed that there is a potential difference of several volts between the chassis of my Apache TX-1 transmitter and the Mohawk RX-1 receiver when they are not grounded. This condition disappears when they are both connected to a common ground, but reversing the ac line plugs of either or both of them does not cure the problem, although it does change the value somewhat. Why is this? Should I worry about it? — K8COI.

Here's why it happens. The ac line is usually bypassed to the chassis with a couple of husky capacitors, as shown in Fig. 1. A capacitor will allow ac to pass through it, and the amount that passes depends upon the value of the capacitor and the frequency of the ac voltage. With the usual values found in Amateur equipment, say 0.001 to 0.05 μF , the amount of power that flows through the capacitors is not enough to add anything to your electric bill, but the voltage can be enough to feel — even

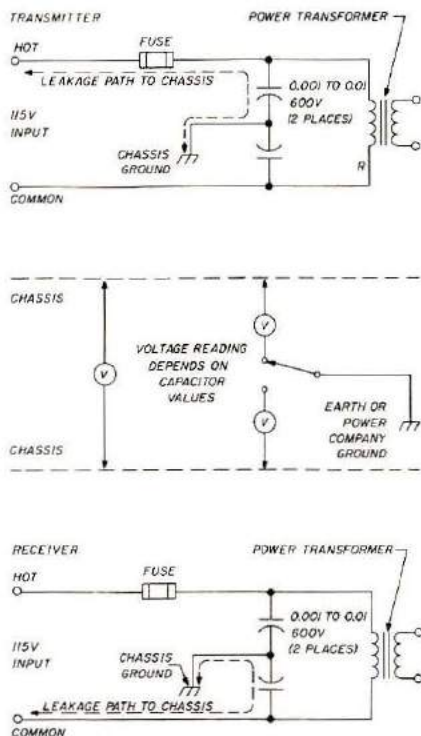


Fig. 1. An ac path exists between the "hot" side of the ac line and the chassis of the transmitter or receiver. A similar path is between the "common" terminal and the chassis. If the transmitter and receiver are not connected together (as through a common ground point), a voltage can be measured between the two chassis, or between either one of them and ground. The amount of power available through the capacitors is small, and usually not harmful unless a capacitor becomes shorted. In such cases, it could be fatal. Moral: Ground the chassis!

to startle you sometimes. It generally ranges from 10 or so volts up to 50 or 55, but the current is in the micro-ampere range.

The reason for the capacitors is to filter out any noise that may be coming in on the ac line, and, since most of this equipment is attached to a good ground (or should be), the noise and the small ac voltage that leaks through the capacitors is shunted safely away.

However, here's where you should be concerned: if one of the capacitors should become a short circuit (due to age, a nearby lightning strike, or some other surge on the ac line), it can then apply the full line voltage, at full current, to the chassis. If the chassis is grounded, a fuse blows, and you can

then find out why, and replace the defective capacitor.

However, if the chassis is not grounded, you could complete the path to ground from the chassis, and your fuse is impossible to replace! This is one of the main reasons that equipment manufacturers, authors, and publishers of handbooks strongly recommend that you have a good, heavy ground wire connected from your equipment to the power-company's ground. This is also the strongest argument I know of for using the new three-prong ac line connectors on all of your equipment.

Oscar calendar

Are there any calendars showing the 1980 equatorial crossing data for Oscar 8? — R. R. Belk.

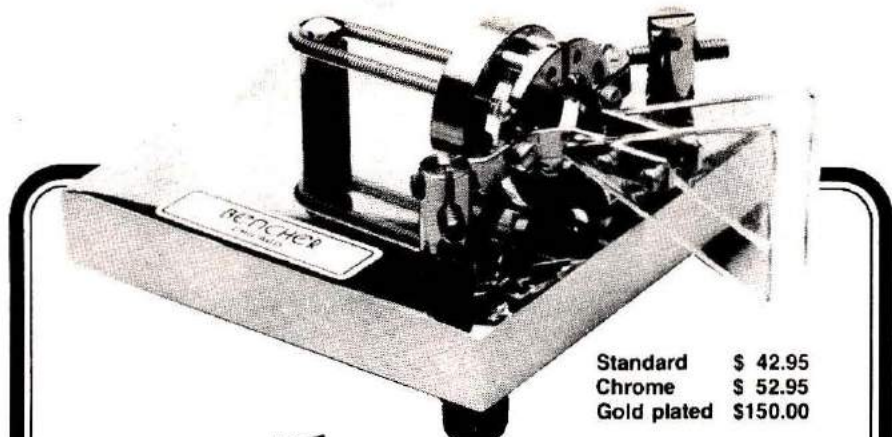
Yes. Data sheets are available from Project OSCAR, Foothill College, Los Altos, California 94022. Send them an SASE for information and price. They previously had a complete calendar, but it was based on faulty tracking data, making it increasingly difficult to figure out how great the error was for any particular orbit. The new data sheets are accurate to a few seconds.

Close encounters

I have a dipole antenna strung a few feet from where I operate. Will the signal from my CW rig harm me in any way? — KAØGCN.

It's not clear how much harm it will do, but it certainly won't do you any good. From your letter, it is hard to tell how much power you run, and on what band. There would be little effect from low power on the lower-frequency bands, and the effect most likely will increase as you increase either power or frequency.

Also, how close is close? Five feet? Twenty feet? Fifty? Which part of the antenna are you near — the end or middle? These things determine the strength of the rf field you are in, and, without some measurements and lengthy calculations, there's no way of knowing how strong the field is at your location. Some hams have been known to run high-power rigs feeding a dipole lying on the attic floor



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just a couple of feet above their heads, but then, they don't seem to be very active lately.

There are many government and industry studies being done on the effects of rf on people, and the answers are not yet clear. Until we know more about it, the best bet is to keep the rf as far from you as possible, or run the lowest power you can use. Ten watts into an antenna 10 feet away, on 80 through 10 meters, I wouldn't worry about. If you run more power than that, you'll feel better about it if the antenna is farther away.

Hot spot

Is there test equipment available to help me determine where to locate a vertical antenna? I have one for 80 through 10 meters, located about 15 feet from a house with aluminum siding and a vertical CB antenna. My TV antenna in the attic did not work until it was moved a few feet, where it picks up local channels very well. — KA2BUF.

The most sensitive test equipment you have is your receiver, especially if it has a good S-meter and you keep the rf gain control at one setting as you try different antenna locations while listening to the bands.

But, it may not work, and certainly will not be the same location for all bands. Your TV antenna works at frequencies where a move of 3 or 4 feet is an appreciable portion of a wavelength. This allows one or more "hot spots" and "dead spots" to occur within the length of an average house attic or roof. These peaks and valleys are the result of reflections from nearby metallic objects such as aluminum siding and other antennas.

A wavelength at 80 meters is large — 262 feet. That's a long way to "fish" for a hot spot. Once you find it, you might then have to look for another one for 40, 20, etc. If you cannot put the vertical on the roof, or on 20 or 30 feet of guyed TV mast (use the guy wires as radials), then you'll just have to plant it as far from the metal siding as possible, and live with the result.

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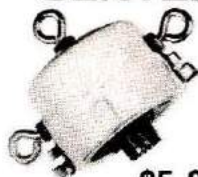
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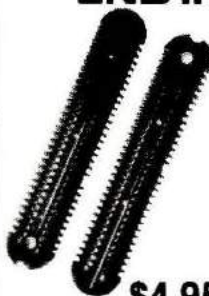
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D-20	20	33'	24.95	20.95
D-15	15	22'	23.95	19.95
D-10	10	18'	22.95	18.95
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SD-80	80/75	90'	31.95	27.95
SD-40	40	45'	28.95	24.95
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PD-8010	80, 40, 20, 10/15	130'	39.95	35.95
PD-4010	40, 20, 10/15	66'	33.95	29.95
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Radio Clubs — Have a Good One

How to keep your club on a "standing-room-only" basis.

BY GEORGE WILSON, W1OLP

Many clubs seem to drift along, and frequently have to struggle to merely stay afloat. It has been my observation that most of the problems result from poor management. For this purpose, let us define "management" as the art of getting things done by others — in this case, the club members. There is no reason why being part of a club cannot be a great experience for all concerned; the management concepts required are simple. Let's look at some of the ways that can help to make any club a *great* club.

The purpose for a club's existence is probably the most important factor in making it successful. The narrower the purpose and the closeness with which the membership sticks to this purpose can determine success or failure. It is better to have a small group of dedicated members than to have a large group of members complaining that their interest is being neglected. This is not to say that a club's catering to the many facets of the hobby will not work. But it does say that the purpose of this type of club must be clearly known and its members must be well diversified in their interests. Such a club may well serve as a council for the special-interest clubs in the area. Here, its purpose would be Public Relations and the exchange of information between specific interest clubs. Its members should consist only of those interested in its purpose.

Even in the special-interest clubs, there is generally a division of interest between DX contest operators, ragchewers, and the technically inclined members. It is my conjecture that many clubs have failed primarily as a result of wrangles over contests. If your club is really a forum for contest planning, admit it — and have at it. Do not be surprised if the ragchewers are not interested in membership.

A brief set of by-laws calling for the use of Robert's Rules of Order as guidelines for conducting meetings is a necessity. The by-laws should state the club's purpose and requirements for membership, such as dues structure — typically full member, associate member, or newsletter only. A complicated set of by-laws is an invitation to wrangling during meetings, and should be avoided.

Here is the place to warn you about *Charlie Parliamentarian*. This character is always a member of your club, but usually uses a pseudonym like Bob Smith or Eddy Jones. He is an expert on Robert's Rules of Order, and will interrupt your meetings at the slightest opportunity if you deviate from the rules of order. This is why Robert's rules should be used as *guides*, not as iron-clad requirements. If you expect this sort of problem, write into your by-laws a provision that the rules may be temporarily suspended by a majority vote of those present.

The by-laws should define the format for regular meetings. The business meeting is not what people come to meetings for. Keep it short! Similarly, do not overdo the feature of the evening. A 45-minute talk followed by a question period is the general rule for success.

It is important to understand the proper use of committees and a Board of Directors. Most controversial matters are best handled by a small group of people. The annual contest, changes in the by-laws, selection of a new meeting location, and similar topics are best handled by committees. Do not use valuable general-meeting time discussing specifics related to subjects that are best handled by a group of experts within your club. Once delegated to a committee, a matter should be handled entirely by the committee unless it involves the long-term operation of the club, or a substantial financial obligation. Again, the goal is to make your meetings of general interest and to avoid tedious details.

Many successful clubs handle essentially all of their business through use of a Board of Directors. This small group can meet informally and make decisions that would use hours of meeting time if handled by the club at large. Again, long-term obligations and/or substantial financial commitments should be voted upon by the club.

Legal protection

If the club can in any way incur liability for damages, it should be incorporated under the laws of your state. This will protect the officers and members from being held liable for damages that may result from club activity. The club can be sued as a corporation, but is liable only to the extent of the club's finances — which should be small in the case of a relatively small, non-profit organization. This fact in itself will make it impractical for anyone to sue the club. However, incorporation of your club in no way protects you from liability for which you are personally responsible. Make sure you are personally covered by insurance if you can be held liable for damages to others.

The cost of incorporation for a non-profit organization is generally less than \$100, and may be well worth it to the membership and/or officers if some wild-eyed claimant decides to be unreasonable. After incorporation, make sure the proper reports and fees are filed in a timely manner. These are minimal for non-profit groups, but ensure the continuation of the protection by incorporation.

Officer selection

Club officers should remember two important things when they select people for a slate of officers for next year, as members of a working committee, or to perform any other task for the club. Whatever it is, select people who are talented along the lines of the job to be done and who want to be involved in such a job. This sounds simple, but many times the popular contest winner is proposed for President when he has no talent or desire for running things. It is far better to re-elect a good President who enjoys his job than to put a new man in office who does not really want the job.

It should be kept in mind that certain people enjoy doing a particular thing and are complimented when they are asked to do it again. A mild complaint should not be interpreted as outright rejection of the job; frequently, the incumbent is too polite to appear eager to be reappointed. Do not let the old complaint that the same people do all the work make you lose the talents of someone who does a good job and enjoys it. Some

people are competitors and some people like to run contests. And, once you have learned how to run a contest well, it is a shame to put a new person in charge — who has to learn the ropes all over again. Rather than replace a man who is doing well, see to it that he gets the help necessary to make his job a pleasure!

To be sure, a talented group of organizers will end up doing most of the work. How many talented auctioneers can you find in one club? The best way to reward these people is continued recognition by the club. Should not the Contest Director get an award along with the competitors? How about a standing round of cheers for a committee's work? Enthusiastic praise by the President for a job well done is always in order. How about rewarding the President with a dinner out for him and his spouse?

"Me first"

Many clubs suffer from the presence of a member who makes things unpleasant for the other members. Typically, he may monopolize the meeting time, insist that his subjects get first priority, criticize even those who are doing a great job, operate his rig illegally, monopolize the local repeater, or he may do any number of things that set the general membership on edge. An interesting solution to this problem has been devised by one club. Their experience over a couple of years indicates that it effectively solves the "Joe Obnoxious problem" without resorting to kangaroo courts or parliamentary means of solution. Their method is quite simple: require each member to be sponsored by a member* when he joins initially, and each time he renews his membership. Even the meekest member will think twice before he sponsors Joe Obnoxious, realizing that if he does, he may not get a sponsor himself the next time around.

Programs

Clubs function best by minimizing the business conducted at meetings, and by featuring a presentation that is of interest to the members and in

keeping with the club's purpose. A frequent mistake made by the Program Committees is to review the membership, rather than the subject matter, to see what can be arranged for future meetings. A better way is to determine what would be of interest and then go looking for a speaker, both from inside the club and from outside. It is surprising how many people are pleased when asked to speak — especially knowing the 45-minute limit and that others will help him prepare.

The availability of a movie projector is an asset. Even better, the availability of a viewgraph projector and the capability to make viewgraphs will make your programs easy to prepare and enjoyable to listen to and watch. The cost of viewgraph materials is small, and many businesses have projectors that can be borrowed with a little friendly persuasion.

A great place to find subject matter for meeting discussions and presentations is to review the magazines that publish material of interest to your club. Do not be afraid to stray somewhat afield of your immediate purpose: a talk by a broadcast-station engineer would be interesting to most Amateur Radio operators. A couples' night is always in order at least once a year; combine it with a catered dinner, and it will become an evening to enjoy.

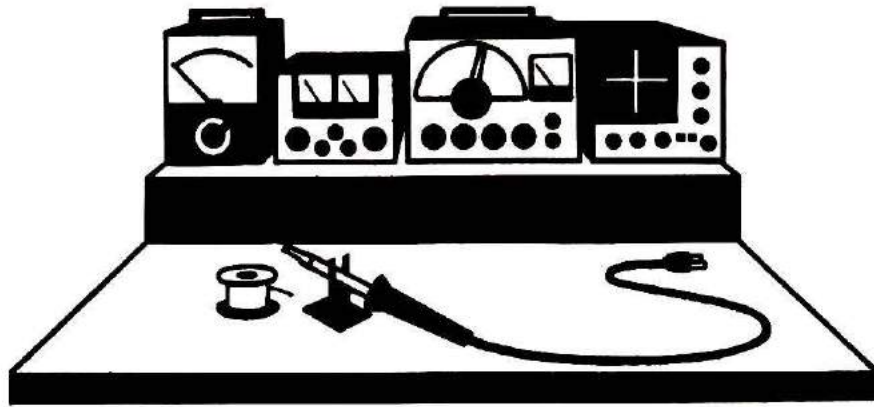
In most clubs, there is a person with some writing and editing talent who can handle a newsletter. With costs what they are, make sure you can afford the printing and mailing expenses. Better still, use the finagling technique again; many businesses are very tolerant if the cause is a good one. In any case, it is best not to attempt a newsletter if you do not have a person who will accept the job on a long-term basis; this type of talent is not easy to find. The newsletter is best omitted if it cannot be done well.

Conclusion

Good organization, a well-adhered-to purpose, and minimum debate make for a healthy club. Enthusiasm is the real spark. This can be provided in large measure by actively recognizing jobs well done. Don't wait till the wheel squeaks — use plenty of praise as a lubricant!

HRH

*If you expect any problem with two obnoxious members who could sponsor each other, require two sponsors.



BENCHMARKS

FT301-D Display-Life Cure

Having purchased an FT301-D, it has been very discouraging to need to replace the frequency-display readouts every month or so. I determined that the heat generated by the LED is the problem. My first thought was to install current-limiting resistors, but found that the LED and logic circuitry shared the same Vcc pin. I noted on the date sheets a "BI" pin to modulate both types of displays. Not being an engineer, but with true ham spirit and homebrew expertise, this is what came of my observation.

A small modification of the display board was performed by adding a couple of diodes to accomplish my goal. The circuit was added to the board, but it could be on a separate board installed just behind the "tune" control where there is space. All that is necessary is to add two diodes (1N60), and hook up an existing diode (D2101) which is already on the board, but not used. First, locate the "common" bus below the displays, on the display side of the board, going to pin 13 of Q2112, D2105, and pin 11 of Q2104. Place a jumper from the cathode of D2101 to this bus. Next, cut the land between this bus and pin

11 of Q2104, and install a diode, with the cathode to the bus, from pin 11. Cut the land to pin 13 of Q2112, and add a diode, with its cathode to the bus, from pin 13. These are all the changes to the display board. Note that edge connector pin 1 is 5 Vdc, and pin 2 is ground. The drawing shows the changes I've made. With the components selected, the display will vary from a "blink" to a dim display, and the heat generated will be greatly reduced because of the 50 per cent duty cycle. I haven't replaced a single display since the modification has been installed. The total cost is less than \$3.00.

After completion of the changes, the circuit can be tried with the board removed and plugged into the cable connectors from under the rig. This is how I was able to develop and test the circuit without having to install it.

Jerome F. Walsh, WA2LSU

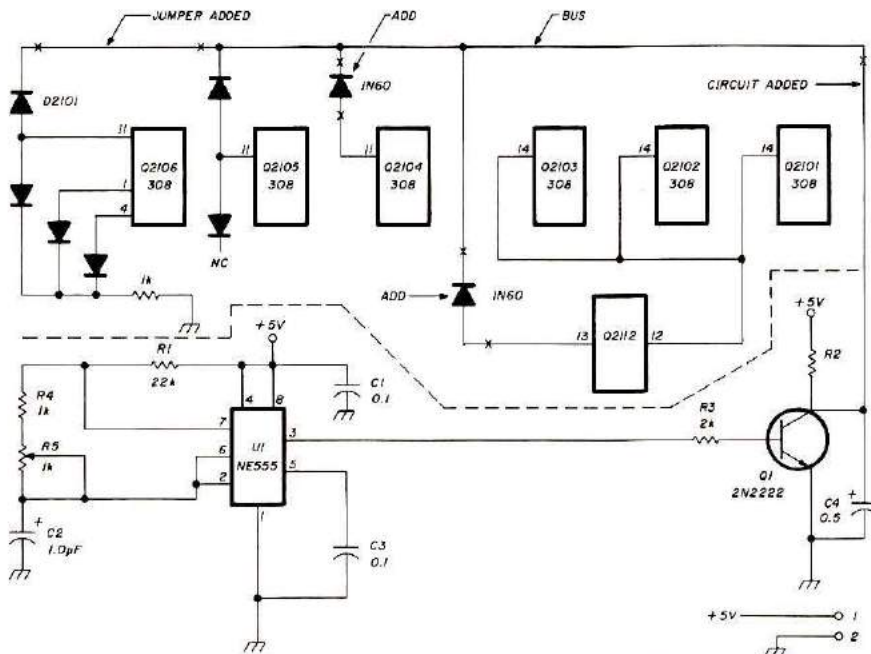
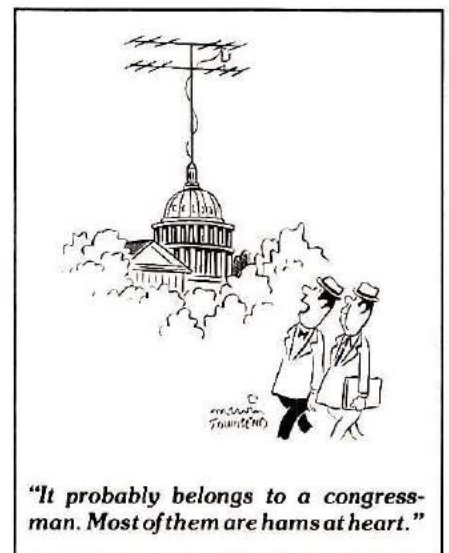
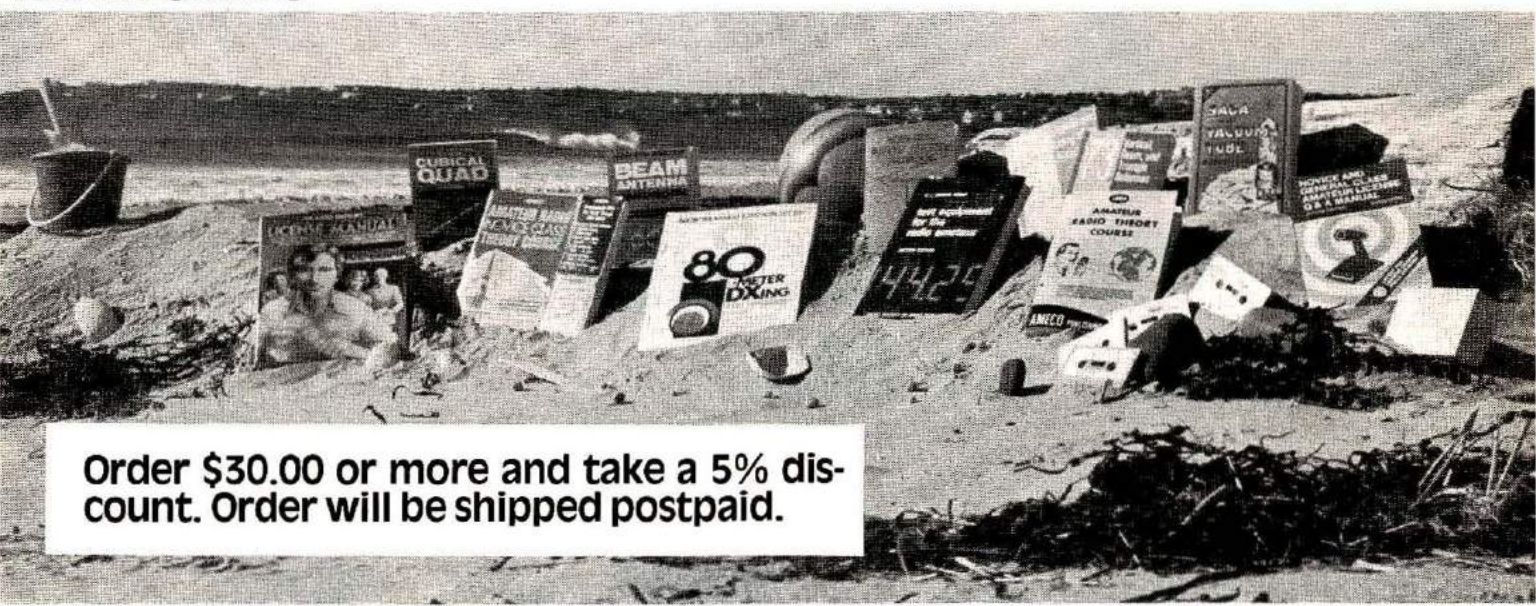


Fig. 1. All resistors are 1/4 watt, all capacitors are disk ceramic type except C2. Q1 is an inverter to correct the NE555 output. C4 is a despiking capacitor.





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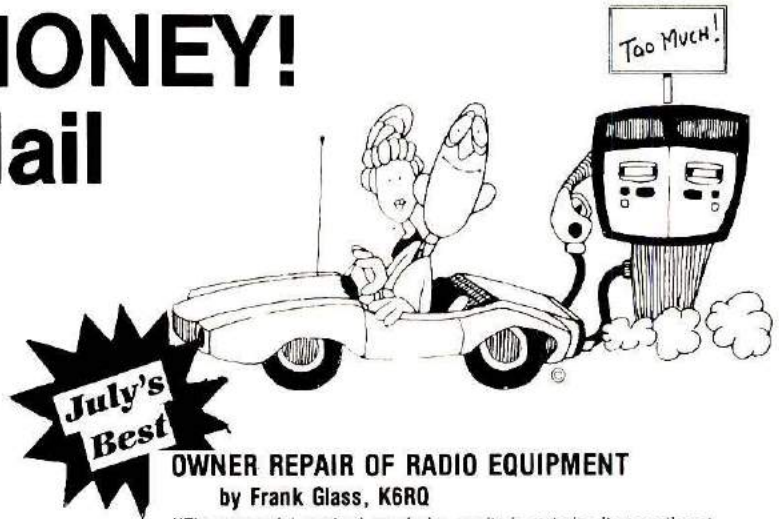
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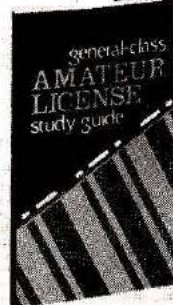
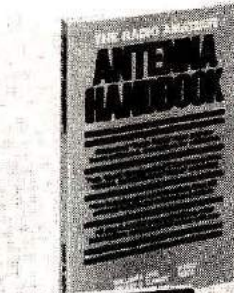
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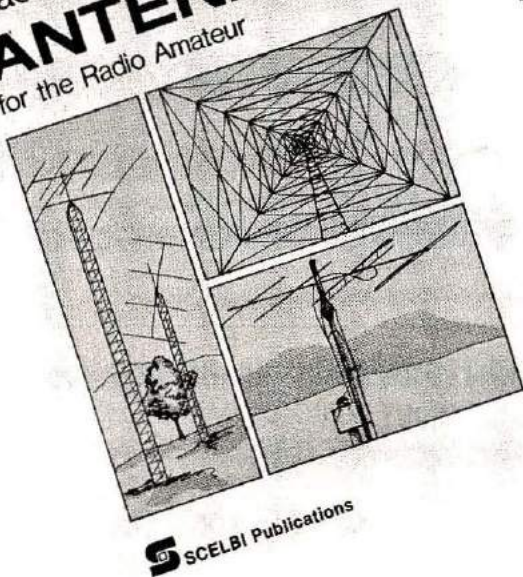
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RP-CQ Softbound \$4.75

THE RADIO AMATEUR ANTENNA HANDBOOK

by William I. Orr, W6SAI and Stuart Cowan, W2LX

If you are pondering what new antennas to put up, we recommend you read this very popular book. It contains lots of well illustrated construction projects for vertical, long wire, and HF/VHF beam antennas. But, you'll also get information not usually found in antenna books. There is an honest judgment of antenna gain figures, information on the best and worst antenna locations and heights, a long look at the quad vs. the yagi antenna, information on baluns and how to use them, and some new information on the increasingly popular Sloper and Delta Loop antennas. The text is based on proven data plus practical, on-the-air experience. We don't expect you'll agree with everything Orr and Cowan have to say, but we are convinced that *The Radio Amateur Antenna Handbook* will make a valuable and often consulted addition to any Ham's library. 190 pages. ©1978.

RP-AH Softbound \$6.95

BEAM ANTENNA HANDBOOK

Here's recommended reading for anyone thinking about putting up a yagi beam this year. It answers a lot of commonly asked questions like: What is the best element spacing? Can different yagi antennas be stacked without losing performance? Do monoband beams outperform tribanders? Lots of construction projects, diagrams, and photos make reading a pleasurable and informative experience. 198 pages. ©1977.

RP-BA Softbound \$4.95

Please add \$1.00 to cover shipping and handling.

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Dear Horizons:

I enjoyed "Airborne Games" in March HRH. I've been a frustrated gamer for years — some of the fire has gone out, but could be rekindled over the air.

I did find one hitch in the article. I question the "largest and most popular" claim for SPI, but I'm like that. I lean toward Avalon Hill of Baltimore, as that is the company I first started into wargaming with.

The address in the article for Simulation Pub. Inc. was incorrect; they now reside at 257 Park Ave. South, New York 10010.

Avalon Hill (by the way, the oldest and with the broadest line) is at 4517 Harford Rd., Baltimore, Maryland 21214.

73 and happy hamming and gaming.

Bruce L. Werner, WB8TVD
Big Rapids, Michigan

Dear Horizons:

A while back, I took the Winter, 1955, *Callbook*, and picked at random five calls from each district. I then checked in the 1980 *Callbook* and found out only thirteen calls out of the fifty were being used by the same Amateurs. Not a very good average.

Glen Winger, W9KXG (since 1932)
Robinson, Illinois

Interesting — but there's no way of knowing how many have upgraded and obtained "better" calls, how many have moved to a new call area, and how many have dropped out of Amateur Radio.

Editor.

Dear Horizons:

I look forward to receiving *Ham Radio Horizons* each month. When I do, I usually read from the cover and work to the back. As I progressed through the March issue, I came across the article by N9AKT, "Understanding Keyers." I must say, for a newcomer who has not been associated with electronics very long, I found this article very enlightening and understandable. Bill Jones must be congratulated on his talent with the written word. His explanation of how keyers work was very easy for this ham to visualize. I certainly appreciate his help and your decision to publish the article. I hope he will be willing to author additional interesting works. I think possibly there are others, like myself, who will benefit from such an effort.

Bill Rhoades, WB7RTN
Lynnwood, Washington

Dear Horizons:

I first read *Ham Radio Horizons* back in March of 1977, your first issue, after borrowing a friend's magazine.

At the time, I wasn't a ham, but after reading Bob Locher's article, "The Far Horizon, An Evening of DX," I was off to get my ticket.

Now a General, I owe my hobby to your magazine and to Bob Locher and his very fascinating evening of DX. Thanks Bob. I hope you continue the good work. Please, *Horizons*, have more of Bob's writing. Thanks.

Ron Sauer, WD8TAI

Dear Horizons:

Congratulations on WB2IBE's article on Airborne Games. Wish I'd thought of it. We played checkers and chess on six meters in Syracuse, New York, when I was W2SPJ, around 1955 or 1956. Although John gives nice tribute to checkers in several spots in his article, I'll have to take him to task for repeating the popular misconception that checkers has less "prestige" than chess and that it is not as "complex." Wrong! Also, checkers has its own notation starting with square one in the upper left-hand corner, progressing to square 32 in the

lower right! Check any dime-store board. All texts on checkers use this, and only this, notation. As a matter of fact, we used a modification of this for our chess games in those days! We added the unused squares and gave all squares a number. Many hams criticized us for playing games. (Well, a few did.)

Checkers is quite a game, and those who have mastered it are nationally famous or internationally so. Its history goes way back. I'm not a master, needless to say. But my late Uncle Larry modestly told me that he, and his dad — my grandfather — (who was a checkers editor in a Syracuse paper years ago), played "blindfolded" style while riding the streetcars in that city; they just imagined the board in their minds and called out the moves by board number. For any Syracuse-area readers, the family name is Crabtree.

Good "cross-board fireworks" to all fellow ham checker enthusiasts. I've been teaching checker clubs for eighteen years and it is a grand game. Good it see it advocated in print.

D. B. Smith, KG6JJN
Agana, Guam

Dear Horizons:

Could you please list in your magazine a list of ham nets that you have information on. They could be listed by time (GMT), frequency, mode (a-m, SSB, CW) and/or region.

I am new to ham radio and would greatly appreciate this, and believe other hams would benefit also.

I live on a sail boat and am interested in Pacific Maritime-Mobile nets. Problem is, I don't know where to tune my radio!

I built my first radio (Heath HW-8) on my boat, and now own a Kenwood TS1205. Both function very well.

I really enjoy your magazine.

Rick Schreiber
Dana Point, California

Your problem presents us with a problem, Rick. We just don't have that kind of information at our fingertips. There are thousands of nets, both formal and informal, and most of the net organizers don't keep publish-

ers up to date on what, where, and when.

You could write to ARRL, Communications Department, 225 Main St., Newington, CT 06111, and ask for their latest Net Directory. This booklet leans heavily toward formal, message-handling nets, but there are some of the less formal types listed. To find out what is going on, check into a nearby net that is listed, and start asking questions. Most regular net attendees know what is going on in their area, and would be happy to steer you to the right frequency.

Editor

Dear Horizons:

With the confidence gained from reading Janice Shillington's article "A Mode to Share," (February, 1980, *Ham Radio Horizons*), I volunteered to speak to my daughter's fourth-grade science class. I was surprised at how eagerly my offer was accepted; I was even more surprised at the enthusiasm and interest shown by all of the eighty-some students assembled.

The level of excitement grew as I tuned across 15 meters. I had hung a dipole from the suspended ceiling supports within the room. I think that the biggest hits were the QSL cards I passed around. Because the class had been studying electricity and light bulbs, I hooked up a 200-watt lightbulb as a dummy load. Observing that radio energy could light a lightbulb as well as communicate around the world was of considerable interest to the class as well.

As Janice indicated, it was a very rewarding experience for me. I wish to thank her for her inspiring article and you for printing it.

George Richards, WA9GUS
Houston, Texas

Dear Horizons:

I was somewhat amused at the article by Bonnie Speer, WD5HAM, in the January issue of *HRH*. My situation is almost reversed: I am the ham trying to interest my husband in the hobby! I'm sure somewhere there must be other women Amateurs whose husbands are not hams, but I know that's not the usual case. I've

wanted to be a ham about as long as I knew they existed but never knew one personally so I could get on the "inside." Also I had absolutely no radio background. But, with the help of two Amateurs in Melbourne, Florida, I worked up to a Technician ticket last summer, and hopefully will pass the code for General this summer while I'm in the U.S.

HRH has been great in helping to fill in some gaps in areas I know very little about. The clear way you have of presenting technical things is a great service for those of us who are amateur Amateurs!

Ginny Witte, KA4CJA
Caicara de Orinoco
Edo Bolivar, Venezuela

Dear Horizons:

I can see I'm going to learn from your new features, and am sending an order for books to Ham Radio's Bookstore.

I was especially interested in the article "Playing Games Over The Air." Your thumbnail sketch (page 2) says "How about playing chess with a partner from France, Italy, or Russia?" I thought I heard someplace that Soviet hams were only allowed to discuss technical matters on the air.

I'm an expert-rated chessplayer and I'd like to join the action someday.

David Ames
Boston, Massachusetts

Dear Horizons:

Hundreds of former Morse telegraphers are now also hams. The Morse Telegraph Club's quarterly newspaper, *Dots and Dashes*, lists these hams in every issue. Dues in the club are modest, \$3 a year.

If any of you hams who are former Morse telegraphers would like to join and get acquainted with other telegrapher-hams, we will be glad to make the necessary contacts if you can post a notice to this effect.

Many thanks and 73.

John B. Milgram, President
New York Chapter
Morse Telegraph Club
952 East 19th St.
Brooklyn, New York 11230

Dear Horizons:

According to April, 1980, Q&A, page 38 (*Legal or Not?*), the question of calling CQ by a non-ham was answered "yes." But no word of caution about illegal third-party traffic was given. If a station from one of the many countries that doesn't allow third-party traffic with us answers a CQ from the non-ham third-party, then the law has been broken. Even if the non-ham does not respond to the DX, communications was established and third-party traffic resulted. Even though by accident, the traffic was illegal.

Mark Danner, KB4SC
Rt. 3, Box 336A
Rock Hill, South Carolina

Mark, I think you have developed the art of nit-picking to the highest degree ever, but just the same, I'll refrain from ever calling CQ again, because a non-ham bootlegger might answer me, thereby causing me to initiate illegal communications. I surely don't want to get a pink ticket because the wrong guy answered me! **Editor**

Dear Horizons:

The membership of the Bristol Amateur Radio Club wishes to express to you their appreciation of your magazine's support of our club's recent DXpedition to Goose Pimple Junction, Virginia, for Ground Hog's Day.

Your magazine was one of three publications to lend their support out of five contacted. Thanks to your efforts, our DXpedition was a success despite seven inches of snow and temperatures from 0° to 10°F. We logged over 200 contacts and look forward to being there again next Ground Hog's Day.

I'm sure our membership (over 60) will remember those who gave freely of their support when deciding where to spend their subscription money.

Gentlemen, thank you again for a job well done. Please feel free to call on our club if we may assist you in any way.

David A. Bernard, WA4DHG
Secretary
Bristol Amateur Radio Club
Bristol, Tennessee



Larsen Improved Magnetic Mount

Larsen Electronics, Inc., of Vancouver, Washington has improved their Magnetic Mount design to give it even stronger holding power and reduce even further the chance of scratching the vehicle finish.

Larsen's super-strength magnetic assembly has been engineered to closer tolerances for more holding power per square inch. Every magnetic mount leaves the Larsen factory fully "charged" to maximum flux density.

In addition, the Larsen Magnetic Mount has a new boot of resilient Nordel that will not crack or harden, even with long-term exposure to weather and sunlight. This rubber-like boot also minimizes the possibility of scratching the finish of the vehicle to which it is attached.

Also, the capacitive coupling shield on the underside of the mount has been beefed up to make it less subject to accidental puncture.

For more information, write Larsen Electronics, Inc., P.O. Box 1686, Vancouver, Washington 98668.

IC-2A Hand-Held 2-Meter Rig

Icom is proud and excited to announce the availability of their compact 800-channel IC-21 hand-held rig.

The IC-2A will be marketed in three basic packages:

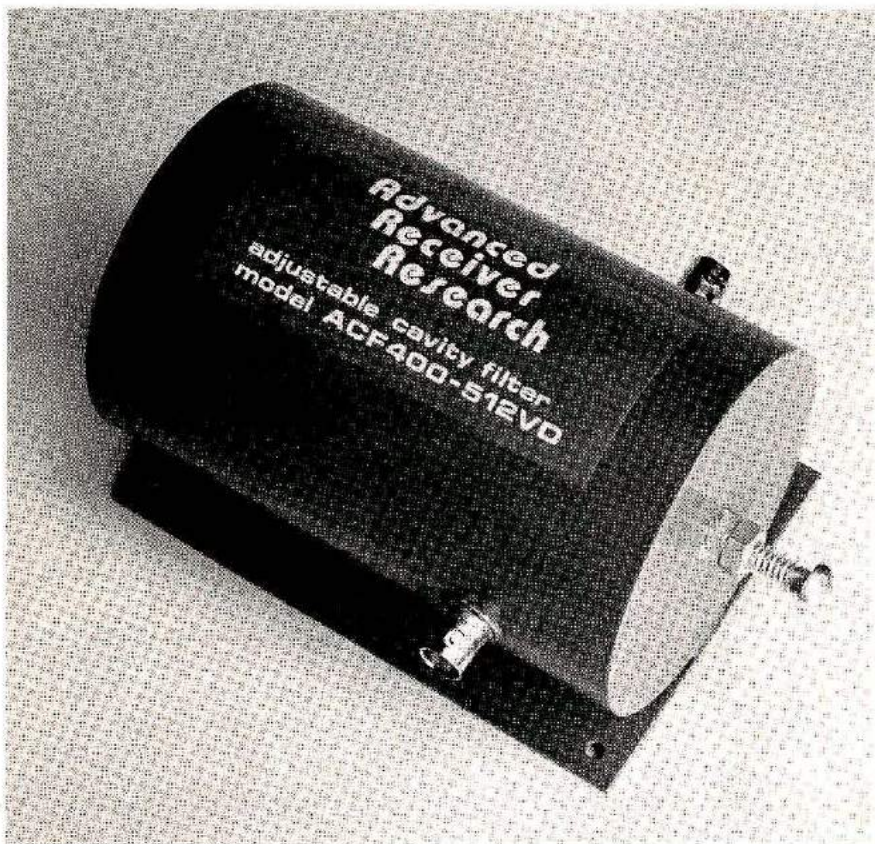
- IC-2A with alkaline battery pack;
- IC-2A with NiCd pack and wall charger;
- IC-2A with NiCd pack, wall charger, and built-in tone pad.

The NiCd pack (IC-BP3) and Charger (BC-25UO) is available separately. The Alkaline Pack (IC-BP4) without batteries is also available. The tone pad is a user-installable, plug-in option. Price and availability of additional options, including speaker-mic, drop-in desk charger, and leather case will be announced shortly. All IC-2As are supplied with a flexible rubber antenna and a belt clip.

We are sure that the IC-2A, with its extremely compact size, unique slip-on battery pack, and its easy-to-understand operational features, at a price significantly below that of any others in the industry, will be a most popular item.

In addition, the IC-502A is now available. Similar to the IC-502, it incorporates a fine-tuning control to provide excellent band spread in an economical 6-meter portable rig. See your nearby Icom dealer, or write Icom America, Inc., 2112 116th Ave. N.E., Bellevue, Washington 98004.





Cavity Filter

The model ACF400-512VD is an adjustable cavity filter designed for receive applications in the 400-512 MHz range. Typical insertion loss and 1-dB-bandwidth are 0.2 dB and 8 MHz, respectively. Return loss is 30 dB (1.07 VSWR). Capacitive coupling is used to provide excellent low-frequency rejection, with typical attenuation values as follows: at 300 MHz, 40 dB; at 200 MHz, 50 dB; at 100 MHz, 75 dB.

The unit is constructed from heavy-wall copper tubing with all surfaces silver plated to ensure deterioration-free performance. External surfaces are finished in grey enamel. Dimensions, excluding tuning screw, are 3-1/8 x 3-3/16 x 5 inches (8 x 8 x 12.7 cm) BNC connectors are standard. Other connectors or connector combinations are available. Price is \$49.95, and delivery is from stock. For more information contact: Advanced Receiver Research, Box 1242, Burlington, Connecticut 06013.

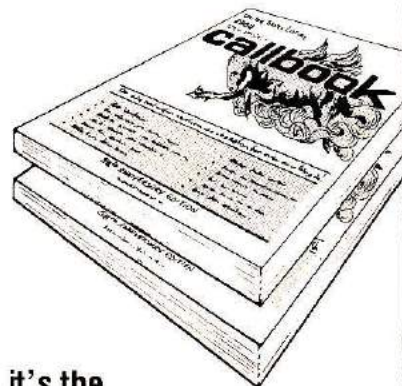
NASA Innovation Saves Energy

A new space-age device invented by NASA, and the winner of last year's "Industrial Research Award," has become a booming business for the few small companies who undertook the manufacturing of it last year. The electronic device, called a "Power Factor Converter," is simply plugged into a standard 115-volt re-

ceptacle, and it is ready to reduce the power consumption of refrigerators, typewriters, air conditioners, washing machines, or any other device which uses a 115-volt electric motor. Up to a 50 per cent savings is possible with no effect on the power output.

The unit is inexpensive (under \$30.00) and handles up to 1 horsepower ac motors. For details write to Kinco, 955 N. Lively Boulevard, Wood Dale, Illinois 60191 or call (312) 860-6800.

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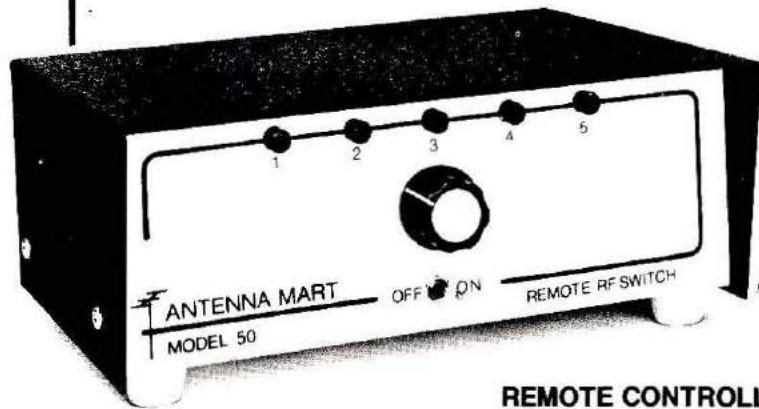
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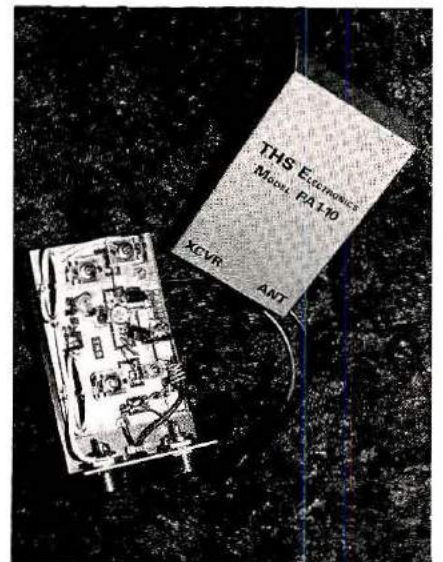
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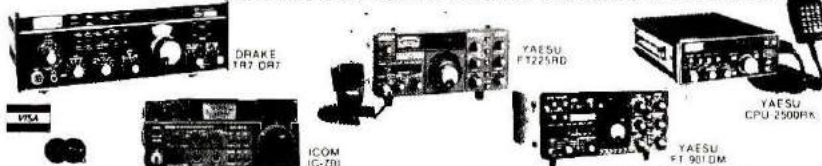
A new, solid-state vhf power amplifier covering the 2-meter band is being offered by THS Electronics. The amplifier, which may be used in fixed or mobile service, is particularly intended for the vhf'er who has a low-power hand-held or similar portable rig that needs a pair of "shoes" to facilitate repeater operation from greater-than-usual distances, or must operate direct over poor terrain. The PA1-10, as it is called, accepts inputs of up to 3 watts, and provides a power gain of 10 dB, plus or minus 1 dB. The dc input voltage required is nominally 12-14 volts, negative ground, at a current of 2 amperes. Insertion loss (on receive) is less than 1 dB, duty cycle is 50% (Class-C operation) and the size is 5 x 3 x 2 1/4 inches (12 x 7.6 x 5.7 cm).

T-R switching is accomplished by diodes and quarter-wave stubs which are ac-coupled to ground. The amplifier is factory-tuned for the 144-148 MHz Amateur band, plus or minus 1 MHz for CAP or MARS operation. Rugged, balanced-emitter power transistors ensure long life and high-SWR protection. The price is \$79.95 net. More information may be obtained from your dealer, or direct from THS Electronics, Route 1, Box 195, Greene, New York 13778. Tell them you saw it in *Ham Radio Horizons*.



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Bob
WA2MSH

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Alliance HD-73 Heavy-Duty Rotator For 1980

The new Alliance HD-73 heavy-duty rotator, combining wind and ice resistant features plus two-speed rotational control never before incorporated into a unit of its size and performance, features an improved meter with greater degree increments and numbers.

The new meter, a taut-band D-Arsonval type, is calibrated in 5° instead of 10° increments as with previous models, and features more numbers for even more sensitive fine-tuning. In the 1980 model, the control unit's silver bezel has been replaced with a black one to reduce reflection. The meter also is calibrated in bold S-W-N-E-S as well as degree-graduated scale for full 360° position recording.

Designed especially for the serious amateur who wishes to increase his capability with either in-tower or mast mounting option, the HD-73 features a unique, dual-speed control providing a one-minute-per-revolution speed for rotating over an extended arc, and slower speed permitting pinpoint fine adjustments for the best signal on receiving and transmitting.

Improved automatic brake action not only simplifies positioning, but reduces risk of antenna damage by sudden stops that impose high inertia

stresses on antenna, tower, and rotator.

Designed to operate antennas with a maximum of 10.7 square ft. of load capacity, mast mounted, the HD-73 develops a wind load bending moment of 10,000 in. lbs., capable of withstanding the prevailing wind conditions. Icing, another weather nemesis for rotators, is overcome by a starting torque of 400 in. lbs., made possible by the heaviest steel, hardened-pitch gear teeth of any rotator in its size and price range. Consistently high performance of the unit in all-weather conditions is enhanced with a lifetime, factory-installed lubricant that withstands temperature ranges of 120° to -20°F.

Of heavy duty aluminum cast construction and weighing only 9-1/8 lbs. with one set of brackets, the HD-73 rotator nonetheless provides a remarkably high vertical balanced weight capacity of 1,000 lbs., due to two full raceways of hardened ball bearings. A unique support bracket design permits a centering procedure for in-tower application without shims or difficult trial and error adjustments. Ease of installation is enhanced by a base design that permits easy four-bolt, in-tower mounting without spacers. For more information, write Alliance Manufacturing Co., Alliance, Ohio, 44601, or see your nearby dealer.

QRP Transceiver from Tedco

Here's a QRP transceiver that has been value engineered to cut out the "frills," but still provide you with good, old-fashioned operating capability on the 80-meter band. This compact battery-operated rig is not intended to be a multi-band or multi-mode transceiver. Instead, it has been designed and fabricated (it's not a kit) with the ham in mind. The Mark I version covers 3685 to 3755 kHz for General and Novice use, while the Mark II covers 3500 to 3600 kHz for Extra Class Amateurs. CW operation at 1/2-watt output is VFO controlled, and there is a separate receiver-tuning feature to help avoid QRM. The rf output impedance is adjustable to match most of the popular antenna

feed systems, including 50-100 ohm balanced or unbalanced line.

The low-distortion sidetone output also permits the unit to be used as a code-practice oscillator. The receiver portion features direct conversion, but employs an rf amplifier and a sharp audio filter for sensitivity and selectivity. Long-lived operation is obtained with 9 built-in 1.5-volt carbon-zinc D cells. Packaged in a 9 x 5 x 8 inch cabinet, the transceiver is intended for use with (optional) earphones. An instruction manual is included. All you need to go on the air are batteries, key, antenna, 8-ohm phones, and a dc voltmeter (used to tune the rig to your antenna). Priced at only \$79.95, with a 30-day money-back guarantee, this transceiver is available from Tedco, 9 Canonicus Avenue, Newport, Rhode Island 02840.

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Please register me as a ...

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PURCHASED	BRAND NAME	B. 100 - 199
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		D. 300 - 399
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KENTUCKY — Bluegrass A.R.S. hosts the Central Kentucky Bluegrass Hamfest, August 10, 1980, at the Fasig-Tipton Sales Paddock, Newton Pike, Lexington, Kentucky. Gates open 8 AM. Admission \$3 advance, \$3.50 at gate, includes parking. Prizes, forums, exhibits, flea-market. Food service available. Talk-in 146.16/.76. Details from Edward Bono, WA4ONE, Bluegrass Hamfest, 2077 Dogwood Drive, Lexington, Kentucky 40504.

NEW JERSEY — Gloucester County A.R.C. Hamfest, Sunday, August 24, 1980, 8 AM to 3 PM at Gloucester County College, Tanyard Road, Sewell. Tailgaters set up at 7 AM, indoor and outdoor spaces available. Food and prizes. Tickets \$2 advance, \$2.50 at door. Dealers and tailgaters \$5. Talk-in on 146.52 simplex and 147.7/.18. Info and tickets: Bob Grimmer, KN2QWO, 229 William Avenue, Barrington, N.J. 08007.

PENNSYLVANIA — South Hills Brass Pounders and Modulators Hamfest, Sunday, August 3, 1980 on the South Campus of Allegheny Community College, off Route 885 in West Mifflin Borough, south of Pittsburgh. Air-conditioned indoor facilities, outdoor flea market, dealers, forums, demonstration, food prizes. Doors open 11 AM. Talk-in 146.13/.73 and 146.52 simplex. For information contact Doug Wilson, WA3NZP, 185 Orchard Avenue, Ensworth, PA 15202.

KLM KT-34XA Antenna

KLM Electronics' new KT-34XA Tribander delivers broadband coverage on 20, 15, and 10 meters at performance levels equal to or exceeding that of many stacked monoband systems. With reduced weight and wind-load, and tower and rotator requirements, overall system costs can be kept to a minimum with no sacrifice in performance.

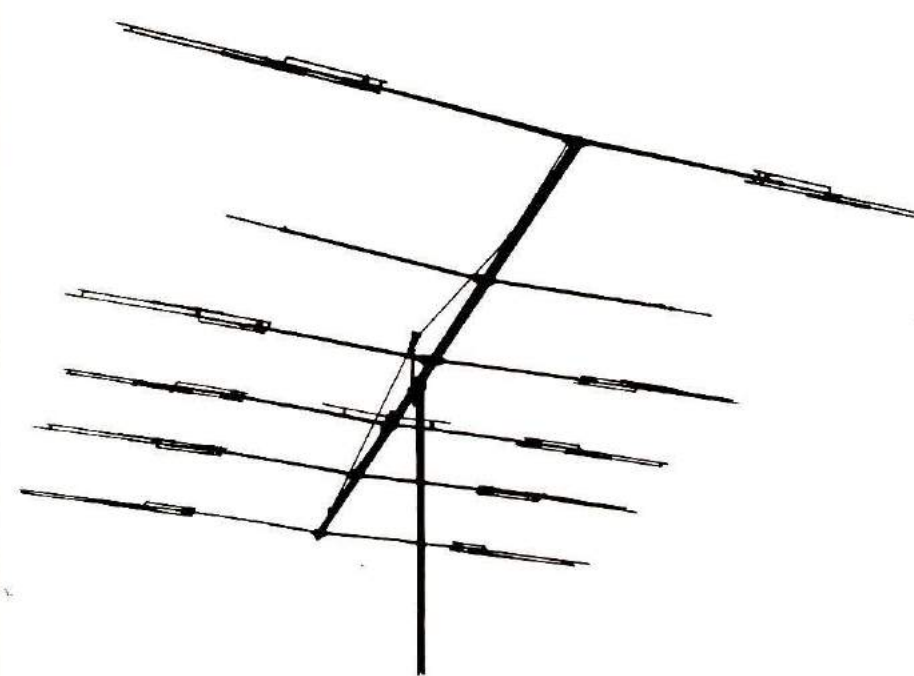
KLM's field-proven, four-element KT-34 is the heart of the new "X" tribander. Doubling the boom length and adding one more tri-resonant element and one full-sized 10-meter element has increased the gain to 11-11.3 dBd on 10 meters, 9-9.5 dBd on 15 meters, and 8.5-9 dBd on 20. Two driven elements are used to make the KT-34XA unusually broadband (a concept applied to many KLM antennas). Gain is virtually flat across each band except for 10 meters which has been optimized for the DXer, 28-29 MHz.

The traps, coils, and capacitors of conventional tribanders have been discarded in favor of integral linear loading and Hi-Q air capacitors, all

composed of aluminum tubing. These give the KT-34XA a conservative power-handling capability of 4 kW PEP, and a high level of operating efficiency. Linear loading also makes full quarter-wave elements possible on 10 and 15 meters, and brings 20 meters much closer to the desirable quarter-wave than any conventional tribander.

Mechanically, the KT-34XA has been built to survive. All aluminum, including the boom, is tough, weather-resistant 6063-T832 alloy. All electrical hardware and guy cables are stainless steel. Virtually indestructible Lexan insulators, just like those used on KLM's linear loaded 40-meter "Big Sticker," are used for mounting the elements and insulating them from the boom. KLM's 3-60 MHz 4:1 ferrite balun is supplied with the KT-34XA for direct connection to any 50-ohm coax feedline.

U.S. price of the KT-34XA is \$519.95. Special kits to upgrade the KT-34 are also available for \$159.95. For more information, contact KLM Electronics, 17025 Laurel Road, Morgan Hill, California 95037.



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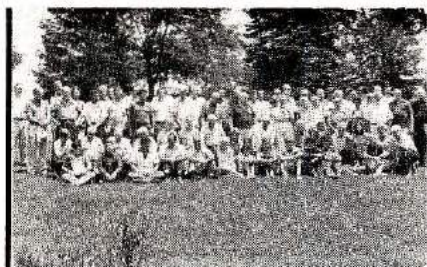
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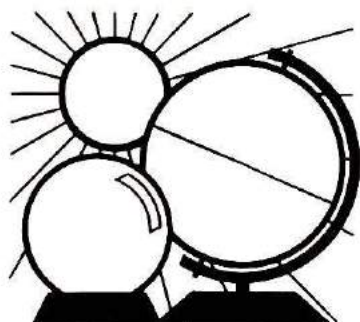
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DX FORECASTER

Last-minute predictions

Ionospherically speaking, July is likely to be an uneventful month. There is the possibility of a minor disturbance on the 4th and 5th, another about the 10th, and an unsettled period of several days centered on about the 17th and again on the 28th. The unsettled periods are likely to render high-frequency communications erratic, but not impossible. The disturbed periods are likely to have a somewhat more severe, if shorter-lived effect. Perigee is on the 4th, and full moon on the 27th. A penumbral eclipse of the moon is expected on the 27th when the moon passes into part of the earth's shadow, but is not fully eclipsed.

Band-by-band forecast

Ten meters should provide excellent daytime propagation, particularly north-south path DX to South America, Africa, and Pacific areas. Expect conditions to peak during the afternoon hours. There will also be some good short-skip, and even Sporadic-E conditions on many days of the month, to distances of between 500 and 1500 miles (800-2400 km) or more.

Fifteen meters will provide good worldwide DX during the daylight and early evening hours on most days of the month. You can expect conditions to peak during the late afternoon, and short-skip signals out to distances of between 500 and 2500 miles (800-4000 km) will be common into the evening hours.

Twenty meters will be open to some area of the world or another for the entire twenty-four hour period on most days of the month. The band

should peak in all directions just after local sunrise, and again toward the east and south during late evening hours. During the hours of darkness, the band will peak toward the west, in an arc from southwest through northwest, and will take in Pacific areas at this time. Short skip during the day will extend from about 350 to 2500 miles (560-4000 km), and during the darkness hours will extend from about 1000 to 2500 miles (1600-4000 km).

Forty meters can often provide good DX from sunset, through the hours of darkness, until just after sunrise, in spite of the atmospheric noise levels (static) mentioned earlier — provided you pick times when storm-related static is at a minimum, coinciding with favorable days for propagation. Not exactly like shooting fish in a barrel, but not bad. Short daytime skip out to about 750 miles (1200 km), and out to about 2500 miles (4000 km) at night will prevail.

Eighty meters can sometimes provide openings to DX areas during the hours of darkness and at sunrise, but signals will be weak and static will be strong. For these DX conditions, coastal stations often have a better chance of snagging rare ones than do stations in the center of large land masses. Daytime skip to 250 miles (400 km) will be limited by absorption levels, but at night you can work stations out to 2500 miles (4000 km).

One-sixty meters is not quite hopeless during the hours of darkness, but during the daytime, forget it! However, be advised that "DX" here means about 1000 miles (1600 km), and will be limited by static interference on many evenings.

HRH

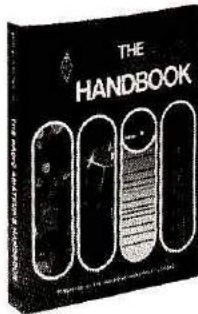
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0200	7:00	—	20	—	20	20	15*	15	—	8:00	15	20	—	—	20*	20	15	15	15	10:00	—	20	—	—	20	15	15	15	10:00	—	20	40	20*	20	15	15	—
0300	8:00	—	20	—	20	20	15*	15	—	9:00	15	20	—	—	20*	20	15	15	15	11:00	—	20	—	—	20	15	15	15	11:00	—	20	40*	20*	20	15	15	—
0400	9:00	15	20	—	20	20	15	15	—	10:00	15	20	—	—	20*	40*	15	15	15	12:00	20	20	—	—	20	15	15	15	12:00	20	40*	—	20	20	15	15	—
0500	10:00	15	20	—	20	20	15	15	—	11:00	20	20	—	—	40*	40*	15	15	—	12:00	20	20	—	—	20	15	15	15	1:00	20	40*	—	20	20	20	20	—
0600	11:00	15	20	20	20	20	15	20	20	12:00	20	20	—	—	40*	40*	20	20	—	1:00	20	20	—	—	20	15	15	2:00	20	20	—	—	20	20	20	—	
0700	12:00	—	20	20	20	20	20	20	20	2:00	—	—	—	—	20	20	20	20	—	3:00	—	—	—	—	20	15	15	3:00	—	—	—	—	—	—	—	—	
0800	1:00	20	—	20	40*	20	20	20	20	4:00	—	—	—	—	40*	20	20	20	—	5:00	—	—	—	—	20	15	15	4:00	—	—	—	—	—	—	—	—	
0900	2:00	20	—	—	40*	20	20	20	20	6:00	—	—	—	—	40*	20	20	40*	—	7:00	—	—	—	—	20	15	15	7:00	—	—	—	—	—	—	—	—	
1000	3:00	20	—	—	40*	20	20	40*	20	8:00	—	—	—	—	40*	20	40*	20	—	9:00	—	—	—	—	20	15	15	8:00	—	—	—	—	—	—	—	—	
1100	4:00	20	—	—	—	40	40*	40*	20	10:00	—	—	—	—	40*	40*	40*	20	—	11:00	—	—	—	—	20	15	15	9:00	—	—	—	—	—	—	—	—	
1200	5:00	20	—	—	—	40	40*	40*	20	12:00	—	—	—	—	40*	20	40*	20	—	1:00	—	—	—	—	20	15	15	10:00	—	—	—	—	—	—	—	—	
1300	6:00	20	20	—	—	40	40*	20	—	2:00	20	20	—	—	20	20	20	20	—	3:00	20	20	—	—	20	15	15	11:00	—	—	—	—	—	—	—	—	
1400	7:00	20	20	20	—	—	40*	20	—	4:00	20	20	—	—	20	20	20	20	—	5:00	20	20	—	—	20	15	15	12:00	—	—	—	—	—	—	—	—	
1500	8:00	20	20	20	—	—	40*	20	—	6:00	20	20	—	—	20	20	20	20	—	7:00	20	20	—	—	20	15	15	1:00	—	—	—	—	—	—	—	—	
1600	9:00	15	15	20	—	—	20	20	—	8:00	20	20	—	—	20	20	20	20	—	9:00	20	20	—	—	20	15	15	2:00	—	—	—	—	—	—	—	—	
1700	10:00	15	15	15	—	—	—	—	—	10:00	15	15	15	—	—	—	—	—	—	11:00	15	15	—	—	20	15	15	3:00	—	—	—	—	—	—	—	—	
1800	11:00	15	15	15	10	—	—	—	15	12:00	15	15	15	—	—	—	—	—	—	1:00	15	15	—	—	20	15	15	4:00	—	—	—	—	—	—	—	—	
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2000	1:00	15	—	—	10	—	—	—	15	4:00	15	—	20	10	—	—	—	—	—	5:00	15	15	—	—	20	15	15	6:00	—	—	—	—	—	—	—	—	
2100	2:00	—	—	—	15	—	—	—	15	6:00	—	—	—	10	—	—	15	—	—	7:00	—	—	—	—	20	15	15	7:00	—	—	—	—	—	—	—	—	
2200	3:00	—	15	—	15*	—	—	—	15	8:00	—	15	—	10	15	15	15	—	—	9:00	—	15	—	—	20	15	15	9:00	—	—	—	—	—	—	—	—	
2300	4:00	—	15	—	15*	—	—	15	15	10:00	—	15	—	10	15	15	15	—	—	11:00	—	15	—	—	20	15	15	11:00	—	—	—	—	—	—	—	—	
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	Florida Ham News — Swap Net By the Broward ARC 146.31 91 at 7:30 PM Glenhurst Radio Society Trans- mits Amateur Radio News — 222.66/224.26 MHz via WR2APG and 21.400 MHz USB West Coast Bulletin Edited & Transmitted by W6ZF 8:00 PM PST 3549 MHz A 1, 22 WPM	AMSAT Eastcoast Net 3850 kHz 9:00 PM EDST (0100Z Wednesday Morning) AMSAT Mid-Continent Net 3850 kHz 9:00 PM CDST (0200Z Wednesday Morning) AMSAT Westcoast Net 3850 kHz 8:00 PM PDST (0300Z Wednesday Morning)				South Milwaukee Amateur Radio Club — Swapfest '80 — Algonquin Legion Post #439, Oak Creek, Wisconsin — WB7TEK The Charleston Amateur Radio Society, Inc. — 7th Annual "Charleston Hamfest" — Omar, Strain Temple, Charleston, South Carolina — 12-13
6	7	8	9	10	11	12
Indiana Amateur Radio Convention and Hamfest — Nanton County Fairgrounds — 13 Hamfest — St. Louis County Fairgrounds, Hibbing, Minnesota — WD8CGM — 13	Florida Ham News — Swap Net By the Broward ARC 146.31 91 at 7:30 PM Glenhurst Radio Society Trans- mits Amateur Radio News — 222.66/224.26 MHz via WR2APG and 21.400 MHz USB	AMSAT Eastcoast Net 3850 kHz 9:00 PM EDST (0100Z Wednesday Morning) AMSAT Mid-Continent Net 3850 kHz 9:00 PM CDST (0200Z Wednesday Morning) AMSAT Westcoast Net 3850 kHz 8:00 PM PDST (0300Z Wednesday Morning)	National Blueberry Festival — Black River Amateur Radio Club — South Haven, Michigan — W8RAGC — 16-20			The Cary Amateur Radio Club, Inc.'s 8th Annual Mid-Summer Swapfest — Cary, North Carolina — K6BWC — 19 The 1980 Arkansas Army MARS Convention — National Guard Armory, Elcheville, Arkansas — WB5CNY / AAF65H — 19-20 Maine QSO Party — Portland Amateur Wireless Association — 1600Z July 19 to 2000Z July 20 — K1JJ — 19-20
13	14	15	16	17	18	19
The Two Rivers Amateur Radio Club of McKeesport, Pennsylvania's Annual Hamfest — Penn State University, McKeesport, Pennsylvania — 20 Beaver Valley Amateur Radio Association, Inc. — Beaver Valley Hamfest — Community College of Beaver County, Monaca, Pennsylvania — 9AM-5PM — WB3HVV — 20 The Detroit Lakes Amateur Radio Club's 4th Annual Picnic and Swapfest — Long Lake Park — N9ARZ — 20 The West Jersey Radio Amateurs, Inc.'s Hamfest — McCune AFB, Wrightstown, New Jersey — 9AM-4PM — N2ME — 20	Florida Ham News — Swap Net By the Broward ARC 146.31 91 at 7:30 PM Glenhurst Radio Society Trans- mits Amateur Radio News — 222.66/224.26 MHz via WR2APG and 21.400 MHz USB West Coast Bulletin Edited & Transmitted by W6ZF 8:00 PM PST 3549 MHz A 1, 22 WPM	AMSAT Eastcoast Net 3850 kHz 9:00 PM EDST (0100Z Wednesday Morning) AMSAT Mid-Continent Net 3850 kHz 9:00 PM CDST (0200Z Wednesday Morning) AMSAT Westcoast Net 3850 kHz 8:00 PM PDST (0300Z Wednesday Morning)			26th National ARRL Convention — Sea Tac Airport, Red Lion Motor Inn, Seattle, Washington — 25-27 Black Hills Amateur Radio Club's 1980 Annual South Dakota Hamfest — Subeck Center Rapid City, South Dakota — WB0NGP — 25-27	Delaware Lehigh Amateur Radio Club (W3OK) and Lehigh Valley Amateur Radio Club (W3OH) — Hamfest, Campdetest, Electronics Fair — Francis Farm, Bethlehem, Pennsylvania — SAM-4PM — WB3CJDL — 20 The Zero-Beaters ARC — Washington Hamfest — Washington Fairgrounds — Washington, Missouri — 20 The Case County Amateur Radio Club's 3rd Annual Hamfest — 4-H Fairgrounds, Logansport, Indiana — WB5PKN — 20 6th Annual Shawnee Amateur Radio Association Hamfest and Michigan News Picnic — McCurdy Park, Coramie, Michigan — 20 The Sky Riders, Illinois, Big Thunder ARC's Hamfest — Boone County Fairgrounds — 20 RMRL — Golden Colorado Highway 93 — W4UGUN — 20
20	21	22	23	24	25	26
Nashville Hamfest — National Guard Armory, Nashville, Tennessee — 27 Baltimore Radio Amateur Television Society — Annual Maryland Hamfest — Howard County Fairgrounds, West Friendship, Maryland — 27	Florida Ham News — Swap Net By the Broward ARC 146.31 91 at 7:30 PM Glenhurst Radio Society Trans- mits Amateur Radio News — 222.66/224.26 MHz via WR2APG and 21.400 MHz USB	AMSAT Eastcoast Net 3850 kHz 9:00 PM EDST (0100Z Wednesday Morning) AMSAT Mid-Continent Net 3850 kHz 9:00 PM CDST (0200Z Wednesday Morning) AMSAT Westcoast Net 3850 kHz 8:00 PM PDST (0300Z Wednesday Morning)				
27	28	29	30	31		

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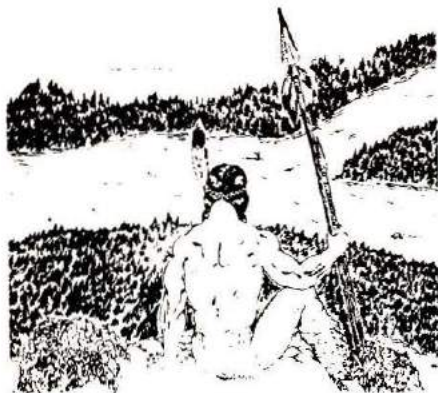
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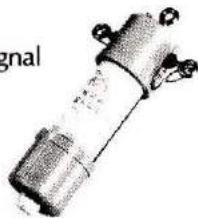
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- **Front-panel keyboard**

For frequency selection, transmit offset selection, memory programming, scan control, and selection of autopatch encoder tones.

- **Autoscan**

Entire band (5-kHz or 10-kHz steps) and memories. Automatically locks on busy channel; scan resumes automatically after several seconds, unless CLEAR or mic PTT button is pressed to cancel scan.

- **Up/down manual scan**

Entire band (5-kHz or 10-kHz steps) and memories, with UP/DOWN microphone (standard).

- **Repeater reverse switch**

Handy for checking signals on the input of a repeater or for determining if a repeater is "upside down".

- **Separate digital readouts**

To display frequency (both receive and transmit) and memory channel.

- **Selectable power output**

25 watts (HI)/5 watts (LOW).

- **LED bar meter**

For monitoring received signal level and RF output.

- **LED indicators**

To show: +600 kHz, simplex, or -600 kHz transmitter offset; BUSY channel; ON AIR.

- **TONE switch**

To actuate subaudible tone module (not Kenwood-supplied).

- **Compact size**

Depth is reduced substantially.

- **Mobile mounting bracket**

With quick-release levers.

See your Authorized Kenwood Dealer now for details on the TR-7800... the remarkable 2-meter FM mobile transceiver!

NOTE: Price, specifications subject to change without notice and obligation.

MATCHING ACCESSORY:

- KPS-7 fixed-station power supply



Announcing the Heathkit VF-7401 2-meter FM Digital Scanning Transceiver



LED indicates 5 kHz position.

The 0 kHz/5 kHz Switch gives you an effective choice of 800/2-meter channels in 5 kHz steps.

Dim/Bright Switch for bright illumination of frequency read-out and meter for daytime, and lower intensity for safe mobile operation at night.

The Manual/Scan Switch lets you choose your frequency manually or have the VF-7401 find an active channel for you.

Lock/Latch Switch. In Scan Latch mode, a channel latch-up signal inhibits scan circuits when signal is detected, and the 7401 stays on that frequency. If it detects a 4-8 second break in received signal, scanning resumes. In the Scan-Lock mode, once the receiver scans to a signal, it remains on that channel until reset.

Optional Micoder II Microphone/Auto Patch Encoder lets you phone through repeaters with auto patch input. Draws power from the 7401, so no mike battery is necessary.

The Squelch Control also functions as the receiver's sensitivity control to stop scanning only upon reception of "full-quieting" signals, skipping the weak ones.

The 100 kHz Selector button controls the VF-7401's tuning in 100 kHz increments. The 7401's 1 MHz Selector button lets you choose any 1 MHz segment of the 2-meter band.

The 10 kHz Selector advances in 10 kHz steps. In Scan, as it recycles from "9" to "0," it also causes the 100 kHz readout to advance by one digit. Depress once to resume scan function.

More features that make the VF-7401 the 2-meter rig that belongs in your shack and vehicle

No more searching through repeater guides while mobiling in unfamiliar territory - your new Heathkit VF-7401 will find the active channels for you. It will even alert you to band openings. You're going to enjoy building your VF-7401... and you're going to love using it. The VF-7401, the ultimate 2-meter rig... from the more than 200 Hams at Heath.

- Adjustable, 15-watt (nominal), solid-state, narrow-band FM Transceiver. Fully synthesized digital circuitry provides full-band coverage without need for added crystals.

- All-new, state-of-the-art circuits provide the exciting, exclusive features of 1 MHz bandwidth scanning, and Scan Lock/Latch capability on 2-meters.
- A receiver hotter than Heath's HW-2036A features dual-gate MOSFET front-end to minimize overload and adjacent-channel interference.
- "Power-up" on a pre-programmed frequency of your own choice, such as your favorite repeater.
- Convenient detachable mike using 4-pin connector.

- Power to the Micoder II Microphone (if used) eliminates need for a battery.
- Sturdy SO-239 rear-panel antenna jack.
- Chassis-mounted power and external speaker plugs.
- Improved synthesizer, eliminating need for panel mounted sync lock light.
- Tuning for Power Amplifier and output power level adjustment is accessible without removing case.
- Capability of mobile or base operation (with Model VFA-7401-1 AC Power Supply - 13.8 V at 4A nominal, transmit).



SEND FOR FREE CATALOG

The new VF-7401 is featured in the latest Heathkit Catalog. For a free copy write: Heath Company, Dept. 348-674, Benton Harbor, MI 49022. Or visit the nearest Heathkit Electronic Center in the U.S. or Canada where Heathkit products are displayed, sold and serviced. See the white pages of your phone book for location. In the U.S., Heathkit Electronic Centers are units of Veritechnology Electronics Corporation.

This device has not been approved by the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained.



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THERE'S MORE FOR THE HAM AT HEATH!