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Amateur Radio

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CQ



Results of the 1983 CQ WW DX C.W. Contest



**W2LZX works
"Non-DX" via computer
See page 38**



THE RADIO AMATEUR'S JOURNAL

KENWOOD

...pacesetter in amateur radio

TS-930S "DX-traordinary"

TS-930S

We call it "DX-traordinary" because the TS-930S has now become the favorite rig of the serious contester! Its superior capability for full break-in split-frequency operation, the speed and convenience with which its eight memory channels can be accessed, its unsurpassed receiver dynamic range and its remarkable ability to select the desired signal during periods of heavy QRM, utilizing VBT, Slope tuning, IF Notch filtering, and tuneable audio filtering, have all combined to make this the rig that gives you the EXTRA EDGE!

The TS-930S is loaded with all the special features that you always wanted in an HF transceiver. Full coverage of the 160 through 10 meter bands, including the new WARC frequencies, (easily modified for HF MARS), plus a general coverage receiver that can tune any frequency from 150 kHz to 30 MHz. Operation in the SSB, CW, FSK, and AM modes, with selectable full or semi CW break-in. All solid-state, with 250 watts PEP input on SSB,

CW, FSK, and 80 watts input on AM. SWR/power meter. Triple final protection circuits plus two cooling fans built-in. 10-Hz step synthesized frequency control. Available with optional automatic antenna tuner built-in, another industry first! Dual digital VFO's. Eight memory channels that store both frequency and band information, with internal battery back-up, (batteries not supplied). Dual mode adjustable noise blankers, especially effective in eliminating "woodpecker" type interference. SSB IF slope tuning, for maximum rejection of interference. CW variable bandwidth, with pitch and side-tone control. IF notch filter. Tuneable audio peaking filter. Unique six digit white fluorescent tube digital display is easy-on-the-eyes during those long contests. RF speech processor, for higher average "talk-power." SSB monitor circuit. 4-step RF attenuator. VOX. 100-kHz marker. AC power supply built-in, 120, 220, or 240 VAC.

TS-930S Optional Accessories:

AT-930 automatic antenna tuner, SP-930 external speaker, with selectable audio filters, YG-455C-1 (500 Hz), YG-455CN-1 (250 Hz), YK-88C-1 (500 Hz) CW filter, YK-88A-1 (6 kHz) AM filter, all plug-in type. SO-1 commercial stability TCXO, MC-60A deluxe desk microphone, MC-80 and MC-85 communications microphones, MC-42S mobile hand microphone, TL-922A linear amplifier (not for CW QSK), SM-220 station monitor, PC-1A phone patch, SW-2000 SWR/power meter, 160 ~ 6 meter, SW100A SWR/power/volt meter 160-2m HS-4, HS-5, HS-6, and HS-7 headphones.

Isn't it about time you stepped into the winner's circle?

More information on the TS-930S is available from authorized dealers of Trio-Kenwood Communications, 1111 West Walnut Street, Compton, California 90220.



Specifications and prices are subject to change without notice or obligation.



KENWOOD

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TS-830S

TS-830S...a "top notch" field proven performer.

The TS-830S is the HF transceiver that delivers the performance the others can only talk about.

Kenwood's TS-830S offers you every conceivable operating feature built-in for 160-10 meters, including the WARC bands. Key operating features

such as wide receiver dynamic range, variable band width tuning, notch filter, adjustable noise-blanker, IF shift (pass-band tuning), and receive capability of WWV on 10 MHz, have established the TS-830S as the first choice of the serious Amateur.

Two 6146B's in the final assure you of rugged, reliable service. The fluorescent tube digital display, RF speech

processor, narrow/wide filter selection on CW/SSB monitor circuit and receiver (RIT) and transmitter (XIT) incremental tuning, add to the operating ease and enjoyment of the TS-830S.

Yes, all these features along with unprecedented reliability have made the field-proven TS-830S truly "top notch."

Optional accessories:

- SP-230 external speaker.

- VFO-230 remote digital VFO with five memories, digital display
- VFO-240 remote analog VFO.
- AT-230 antenna tuner.
- YG-455C (500 Hz) or YG-455CN (250 Hz) CW filter for 455 kHz IF.
- YK-88C (500 Hz) or YK-88CN (270 Hz) CW filter for 8.83 MHz IF.
- KB-1 deluxe heavyweight knob.



TS-530SP

TS-530SP... "Cents-ational" in performance and value.

No other HF transceiver gives you all these features at such an affordable price.

The TS-530SP covers 160-10 meters, LSB, USB, CW, including WARC bands and it also receives WWV on 10 MHz.

When you turn on your TS-530SP, the IF shift tunes

out interfering signals, and the tunable audio notch filter also helps eliminate QRM. Your frequency is displayed in six digits by the fluorescent tube display, with an analog dial for added convenience. Other key features include wide receiver dynamic range, narrow/wide filter selection for CW and/or SSB, built-in speech processor for extra talk power, adjustable noise-blanker and RIT/XIT to allow independent fine-tuning

of receive or transmit frequencies. All this along with two 6146B's in the final to allow for lasting, dependable operation.

The TS-530SP, solid dependability at a price everyone can afford!

Optional accessories:

- SP-230 external speaker with selectable audio filters.
- VFO-240 remote analog VFO.
- VFO-230 remote digital VFO.
- MC-50 desk microphone.

- AT-230 antenna tuner/SWR/power meter.
- KB-1 deluxe VFO knob.
- YK-88C (500 Hz) or TK-88CN (270 Hz) CW filter.
- YK-88SN (1.8 kHz) narrow SSB filter.

More information on the TS-830S and TS-530SP is available from authorized dealers of Trio-Kenwood Communications, 1111 West Walnut Street, Compton, California 90220.

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Proven, Reliable HF Compact Transceiver



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**ONE MEMORY
PER BAND**

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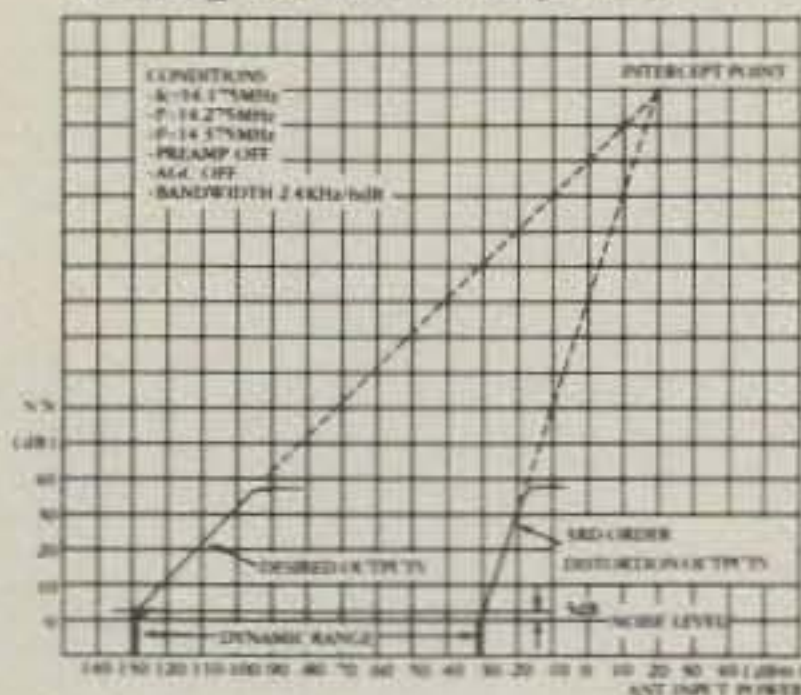
**TUNING
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**LARGE RIT
TUNING
KNOB**

ICOM's IC-730 go-anywhere HF all-band SSB/CW/AM transceiver, the best value on the market, has a proven record of high performance, ease of operation and durability. Compact in size, yet full-featured, the IC-730 has gained an incomparable reputation.

Receiver Performance.

Utilizing ICOM's DFM (Direct



Feed Mixer), the IC-730 obtains a dynamic range of 100dB and an intercept point of 19.5dBm.

Superior front-end receiver performance, coupled with a switchable preamplifier and IF shift or passband tuning (optional), gives the IC-730 receiver flexibility yet allows it to be easy to operate.

Compact. The IC-730 is sized to be used mobile — either in a car, airplane or boat — to be carried in a suitcase, or to be used as a base station. Only 3.7 inches high by 9.5 inches wide by 10.8 inches deep, the IC-730 is a very compact package. Still the IC-730 sports a large tuning knob, large RIT knob, and large bandswitching knob to make mobile operation easy. The RIT control is conveniently located in the lower right corner to make access by touch easy while operating the unit mobile.

Convenience Features.

The IC-730 has important features that make the unit easy to operate in a mobile environment. Two VFOs are easily accessed at the push of a button. Normal or split operation and three separate tuning rates for fast QSY or slow tuning are available. The dial lock deactivates the main tuning knob for rock-solid stability without the possibility of moving off frequency. One memory per band is provided to allow storage of net frequencies or favorite frequencies at the push of a button.

Full-Featured. The IC-730 has additional features which make it a joy to operate. A full 200W PEP input transmitter provides a powerful signal on SSB and CW (40W carrier power on AM). Eighty through 10-meter coverage is provided including the bands at 10, 18, and 24MHz. A speech processor

is included as standard. Popular features such as digital readout, selectable AGC, VOX, SWR meter and noise blanker are also included as standard in the IC-730.

Complete. The IC-730 comes complete with a handheld microphone and power cord. The IC-730 is ready to use and ready to go when you are.

Affordable. Dollar-for-dollar, the ICOM 730 packs more punch and performance into a small package than ever thought possible.

Listen to IC-730s on the air and hear the sound of ICOM quality. The IC-730 is your best buy for a second rig for mobile portable operation or for your main HF station. See the IC-730 at your local ham equipment supplier today!

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The Radio Amateur's Journal



ON THE COVER: CQ's own Jack Gutzeit, W2LZX, gives AEA's Doctor DX a real workout. See the review on page 38. Photo by Larry Mulvehill, WB2ZPI.

OCTOBER 1984

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Zero Bias

AN EDITORIAL

The summer season of *CQ*'s travels wound down to two hamfests in July. Dick covered the one in Rossville, Georgia, simply because we thought they named it after him (they didn't). Dick reported a good, enthusiastic crowd for this first-time hamfest. From what he said, there were some good bargains to be had in hardware, tools, and what affectionately is called "good stuff."

Herb, Jack, and I geared up to do the ARRL National in New York. Holding a major hamfest in midtown New York has never really worked out, and this one was no exception. Even with Dr. Owen Garriott, W5LFL, as a draw, I don't think that the crowd ever exceeded about 1200 people. With over 50,000 amateurs in the tri-state area it wasn't a particularly good turnout. The LIMARC fleamarket held in Islip, Long Island, draws 3000 to 5000, depending on the weather, proving that people will turn out for something they want. Apparently, they didn't want a big-city convention with no fleamarket, few exhibitors, \$7.00 tuna-salad sandwiches, and limited facilities.

Something New

October will see a new magazine on the newsstands. *Modern Electronics*, a magazine for electronic and computer enthusiasts and all-around electronic hobbyists, will be produced by us. Heading up the staff is Art Salsberg, formerly Editorial Director of Ziff-Davis Publishing Company's *Popular Electronics*, a magazine with which many of us got started. It's a very interesting and exciting concept that has had us all buzzing this summer. Pick up a copy this month and check it out.

On Target

The Olympic Games of '84 ended with all the flourish that Hollywood could muster. Americans took pride in the fantastic achievements of our athletes and the number of gold medals won. One athlete in particular stands out doubly in our books—Darrell Pace. Darrell won the gold medal in archery. He is also N8FTS. ABC TV did a background feature on Darrell in which he was shown involved with amateur radio. Next time you need to get a long wire up through the trees you know who to call. You can't get any better.

Kudos go to the other amateurs who worked diligently to bring about one of the most popular TV programs ever. These are the TV network people and technical people who spent the past two years making what we saw a reality. ABC's Michael L. LoCollo, N2EW (he's a VP in r.f. planning), Dave Elliott, N6EGM, Elliott Bloch, K6ELX, and Rich Aronson, K2RVM, are to be commended. NBC had Al Kaul, W6RCL, and Roy Neal, K6DUE. These are just a few of the hundreds of amateurs involved in putting this spectacular event on the air.

Law Not Soft On Software

The practice of software piracy suffered a jolt when a few pirates were legally forced to walk the plank. In a recent letter to all editors, Mike Forsyth, Marketing Director of Kantronics, stated that the blatant practice of stealing copyrighted programs could no longer be tolerated. He told of attending a hamfest where one exhibitor was selling pirated copies of Kantronics software that he had duplicated. Mike bought a copy, and that in turn was used as evidence. It proved to be a costly day for the hamfest exhibitor, as the case went to court and the exhibitor lost handily.

Creating software these days is a very expensive proposition, and I would expect that Kantronics will not be alone in the fight to protect that investment. Pirating is just another way of saying stealing or taking something that doesn't belong to you and using it for your own gain. I don't think that it was a pleasant or easy decision for Mike and the folks at Kantronics to pursue the matter, but they now have established a precedent, and as I said others probably will follow.

73s to 73?

In August there were rumors galore as to something happening up at 73 by the end of the month. In mid-August in the Peterborough newspaper there was an article entitled "CW Considering Sale of 73." CW Communications' PR Director James Leonard confirms that CW is planning to sell the magazine so they can concentrate on their other magazines in the microcomputer field. In the same article Leonard stated that one other magazine

in the group, *jr* (a magazine for IBM PCjr users), would be terminated with the September issue. Although no timetable is given nor potential buyers listed for the sale of 73, perhaps Wayne is considering buying it back. Without Wayne, it wouldn't be much of a buy for anyone.

The October "Big One"

The *CQ* World-Wide DX Phone Contest is coming up at the end of the month, and I would suggest that you spend some time going over the rules in our September issue. There were a few changes for this year's contest. Keep in mind that all logs should be sent here to the *CQ* offices in Hicksville, as both Larry and Bob will still be in the midst of moving their respective QTHs. There's still time to send in for log forms/summary sheets. Include first-class postage with your s.a.s.e., or air-mail postage for foreign entries. I know that you all can't win, but you all can have fun in amateur radio's biggest contest. Good luck, obey the rules, and please try to be considerate of non-contesters.

The Battle For 220 MHz

At this writing last-minute efforts were being mounted to head off the potential loss to the 220 MHz amateur band. What was written about extensively in *CQ* over the past year or so seems to be coming to pass. In July at the ARRL National, FCC Private Radio Bureau Chief Robert Foosner simply restated what he had said in his interview with *CQ* (May 1984). He said that since the intended "No-Code" licenses were to be allowed to operate on 220 MHz, that piece of spectrum was held in abeyance. Since the "No-Code" didn't go through, the FCC had other pressing needs for the spectrum. There are two commercial proposals for rule making at issue now, and they will be decided on by the end of August. We may be in for some changes, or perhaps a miracle can be worked and the band will remain the same. The recent demands for 220 MHz began in earnest last January, and devotees of 220 MHz either didn't believe what was written here (and elsewhere) or hoped it would blow over. Chief Foosner's remarks at the National apparently stirred some life in various 220 MHz groups.

73, Alan, K2EEK

Try an AEA Breakthrough

ADVANCED ELECTRONIC APPLICATIONS, INC. was the first company to introduce a single chip microcomputer-based product (the AD-1 Auto Dialer) to the consumer market back in 1977. Since that time, AEA has developed a reputation for engineering design excellence (in both hardware and software), high manufacturing quality, outstanding customer service and prices that are competitive with products providing much less value. If you have never owned an AEA product, ask others who have and you will find a real pride in ownership resulting from years of reliable and enjoyable service.

MICROPATCH™ Low-Cost/High-Performance Interface with Software



The **MICROPATCH™** computer interface is our latest example of engineering excellence bringing you superb value at a low, low price. The MICROPATCH is a COMPLETE RTTY/CW/ASCII PLUG-IN HARDWARE/SOFTWARE PACKAGE for either the Commodore 64 (model MP-64) or VIC-20 computer (model MP-20). The MICROPATCH includes MBATEXT™ software which is currently the most extensive and most user-friendly communications software available for the VIC-20 or C-64 computers. The hardware outperforms any competitive unit we have tested under \$200, but is easily up-gradeable to the CP-1 Computer Patch™ without sacrificing \$90 worth of software. You can also use it with any other computer by making use of the MICROPATCH hardware and procuring new software. The MICROPATCH is extremely easy to integrate into your station by simply wiring a mating microphone connector onto a cable pre-wired to the MICROPATCH and by providing audio to the 3.5 mm jack on the MICROPATCH from your receiver external speaker jack. The MICROPATCH comes complete with keyboard overlay prompting aid and operator's manual. Operates from 12VDC (power supply not included). For more information, see your dealer or use the coupon below.

COMPUTER PATCH™ Deluxe Interface

The **COMPUTER PATCH™** interface has earned a solid reputation for outstanding performance at a very reasonable cost. The COMPUTER PATCH features dual-channel Mark and Space filtering with a sophisticated Automatic Threshold Correction (ATC) circuit that allows for good copy even when either one of the tones is totally obliterated. The COMPUTER PATCH has become the new standard of excellence for computer interfaces. 117VAC wall adapter supply is included. AEA now has software available for most popular computers, including AMTORTEXT™ for the C-64 when used with the CP-1 or MICROPATCH.



MORSEMATIC™ Advanced Keyer/Trainer



AEA has developed the most sophisticated line of automatic microcomputerized Morse keyers and trainers in the world. AEA keyers and trainers are the standard against which all others have been judged and have fallen short. Two of our trainers (Model BT-1 and KT-3) are designed for people who have never learned the Morse Code. The BT-1 and KT-3 utilize our basic training program which actually teaches the code at 18 or 20 WPM character speed and allows you to go to 99 WPM. The proficiency training programs in the MM-2 and KT-2 are designed for the person who already knows the Morse Code, but wants to upgrade in the shortest time possible. All AEA keyers operate from 12VDC (power supply not included).

The **ISOPOLE™** patented antenna has caused more excitement in innovative VHF antenna design than any antenna in recent history. Initially called a "gimmick" antenna by our competitors, all the laughter has long since subsided as the ISOPOLE has proven to be a high performer, rugged yet sleek appearing, and easiest of all to assemble, with little chance for installation or tuning errors.

In the same vein, the AEA **Hot Rod™** antenna is shorter, lighter and less bulky than competitive 5/8 wave two meter handheld whips. Equally important, the Hot Rod does not have an out-of-phase current at the base that distorts the pattern as in the case of the 5/8 wave competitors. This means actual on-the-horizon gain for the Hot Rod relative to the 5/8 wave. In spite of the fact that a tuning network to match an end fed half-wave is far more difficult to achieve than for a 5/8 wave, the Hot Rod is priced to compete.

Since our beginning in 1977 with one unique and innovative product, our product line has grown to over 30 catalog items. For your free catalog describing all our fine products in detail, please fill out and return the attached coupon or better yet, see your dealer.

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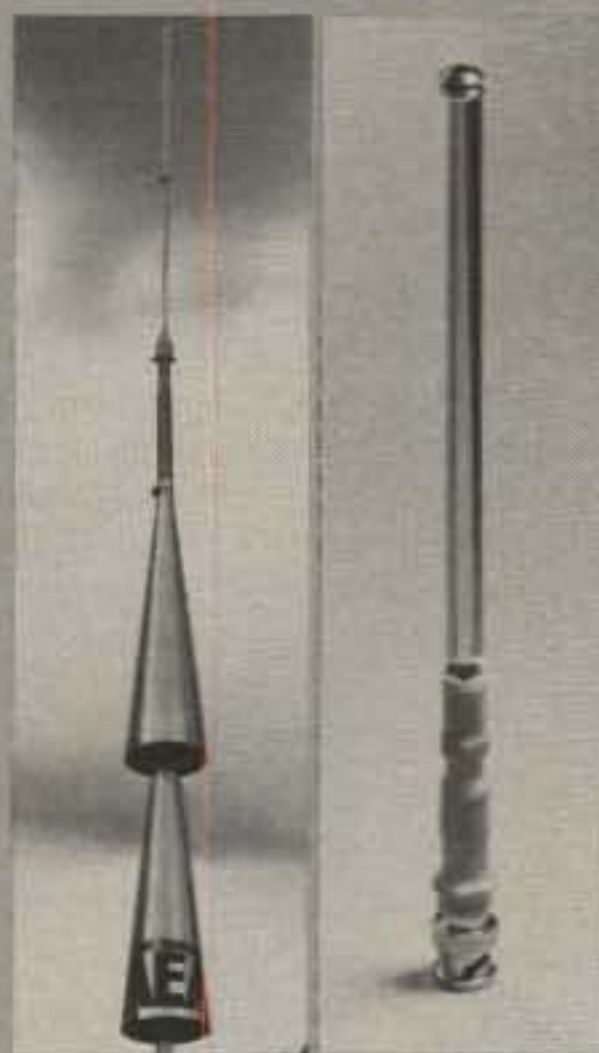
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FM mode is still the FUN MODE to many people, and the LS-202A works all the repeater frequencies from 144 to 148 MHz with the normal ± 600 kHz offset. Good, crisp audio comes from the internal mic, and there is the capability of using an external speaker mic of the popular variety.

Santec and SSB simply just got better. See one today at your Santec dealer.



Technical Talk

SPECIFICATIONS SSB/FM

Freq. Range	144.000-147.995 MHz
Synthesizer	5 kHz Steps + VXO
Modes	USB (A3J), LSB (A3J), FM
Voltage Range	6-12 VDC
Current Drain	30 mA RX Standby 750 mA TX Peak
Power Output	2.5 W PEP (9 V) 3.5 W PEP (10.8 V)
Receiver Bandwidth	2.4 kHz (-6 dB) SSB
Sensitivity	15 kHz (-6 dB) FM 0.25 μ V (12 dB S/N) SINAD
IF Frequencies	10.695 MHz SSB, 10.695 MHz and 0.455 MHz FM
Spurious	-60 dB

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220 MHz - 25W

NOW ALL KDK MODELS HAVE THE ENCOMM TWO-YEAR EXTENDED SERVICE PERIOD IN ADDITION TO THE 90-DAY LIMITED WARRANTY.



MAXPAC STACK

440 MHz

220 MHz

144 MHz

50 MHz



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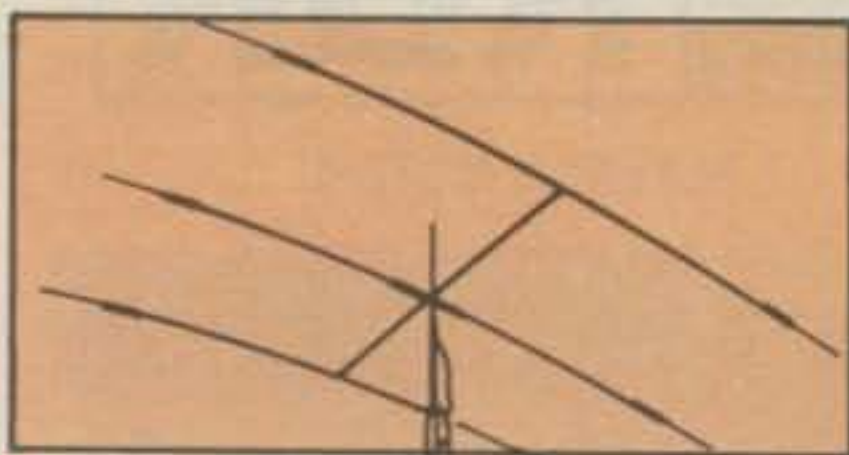


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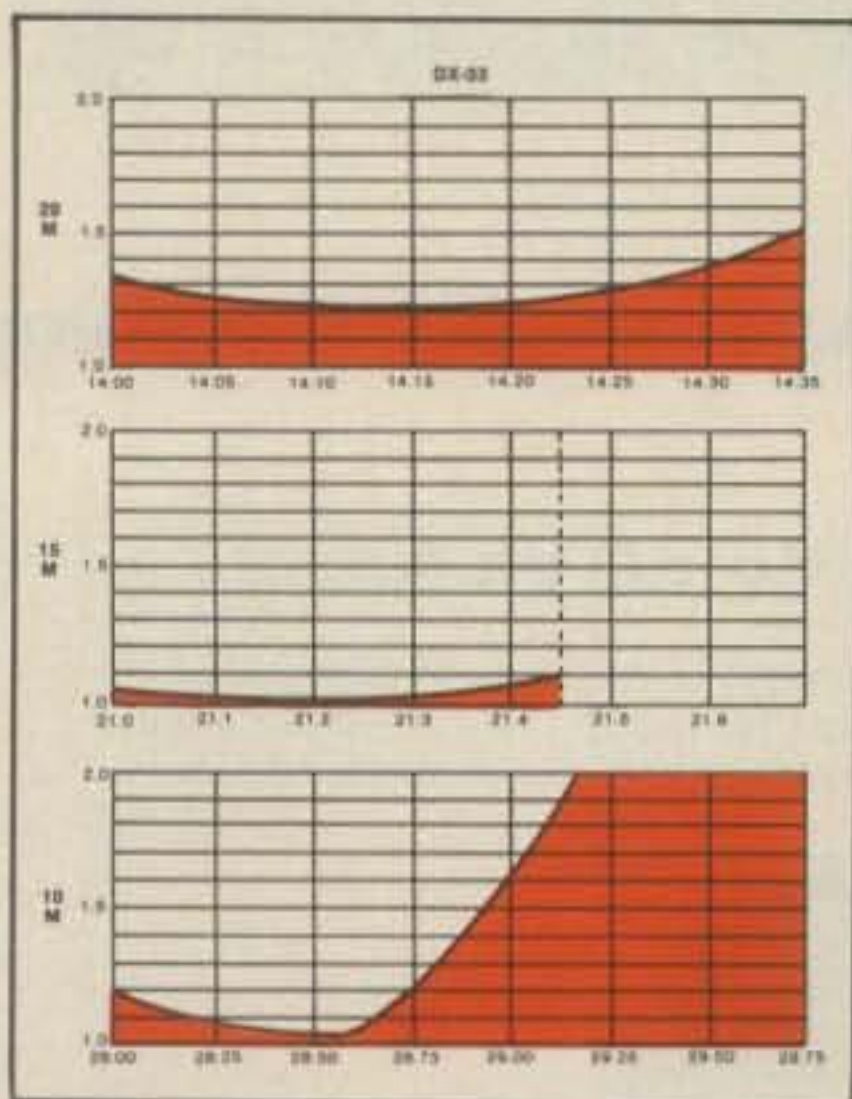
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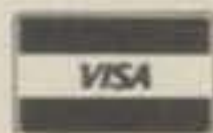
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Our Readers Say:

A Fantasy, Perhaps

Editor, CQ:

I read Bill Lowry, W1VV's article on how to work DX in the June issue of CQ with some concern. As a reformed DXer and contester of some notoriety, I take exception to his lack of sensitivity for the mainline amateur usage of the bands.

Bill uses the expression "reasonably clear frequency" throughout his text. I wondered what he really meant by that phrase. Relatively clear of other stations calling the DX station? Relatively clear of stations of any operating persuasion? What exactly is relatively clear? I always thought a clear frequency was kind of like being pregnant. Either it is or it isn't, or you are or you're not.

I can only assume that Bill meant a frequency devoid of strong signals. That's fine unless that less than strong signal happens to be me! Do I have less than an equal right to that frequency if I don't have a strong signal? Is amateur radio a hobby for only those with the strongest signals? Does the non-DXer have any rights in the amateur radio society? Or do our rights become forfeited whenever a so-called "rare" station appears on the band? I thought we all had equal rights to the frequency spectrum; no more, no less. Perhaps DXers and DXers-to-be should keep that in mind.

I don't condone jamming of any kind. I view with disgust people who intentionally interfere with others. I am not surprised, however, when the transmit frequencies of certain DXpeditions are intentionally jammed. I've seen 70 kHz of the 20 meter c.w. band reduced to one gigantic pileup on certain operations. Does anyone care about the hundreds of QSO's that were terminated by this onslaught of DXers trying for a new one? What is the difference between the jammer and the thoughtless DXer who calls crossband without first checking to make certain that his transmit frequency is clear? In my mind, gentlemen, there's no difference, no difference at all. Both forms of interference are intentional.

Bill sites the problem of non-identification. It was you, the DXers, who pressured the ARRL (and the FCC) to negate the requirement that a station first identify the called station prior to signing his own call. Now you can tail-end to your heart's delight. You DXers have brought this on yourselves. So often you can't hear the DX station because there are dozens of your fellow DXers on his transmit frequency asking, "What's your call?" So what have you gained? I'll tell you what, madness. I'm glad I got my 312 when the

getting was good and sane operation was more or less the mode of the day.

Articles like W1VV's are perhaps the work of good intentioned amateurs, but they do not necessarily represent good operating practices.

I only hope that the ARRL comes to the sober realization that we, the mainline of amateur radio, deserve some rights to the frequency spectrum, too. Perhaps someday this organization (as well as CQ and other sponsoring organizations) will take our rights into consideration and limit DXpeditions and contests to a reasonable portion of the bands. This doesn't, however, include all of the Extra or Advanced portions, as many of us are Extras (and Advanced) and don't consider these upgraded licenses synonymous with DX and contests.

Let's try to remember that the bands are for everyone: ragchewers, DXers, RTTY, traffic people, etc. No one group should have the right to take frequencies from the other. It's first come, first serve as it's always been since the beginning of amateur radio. The bully system will only prompt folks to run the full legal limit (or more) to communicate over a path that requires much less power. This is wrong and most certainly is illegal.

Perhaps, we've all (DXers in particular) overlooked the FCC regulation that states that only the minimum amount of power be used to sustain communication over a given path and time. You might say that it's not realistic to make an effort to abide by this rule. But wouldn't the bands be more usable for all of us (DXers included) if everyone abided by the power rule? If we all complied, no one station would have an advantage over the other. A fantasy? Perhaps, perhaps not.

Steven Eichman, WA6IVN
Stockton, CA

Pioneers of Radio Not Forgotten

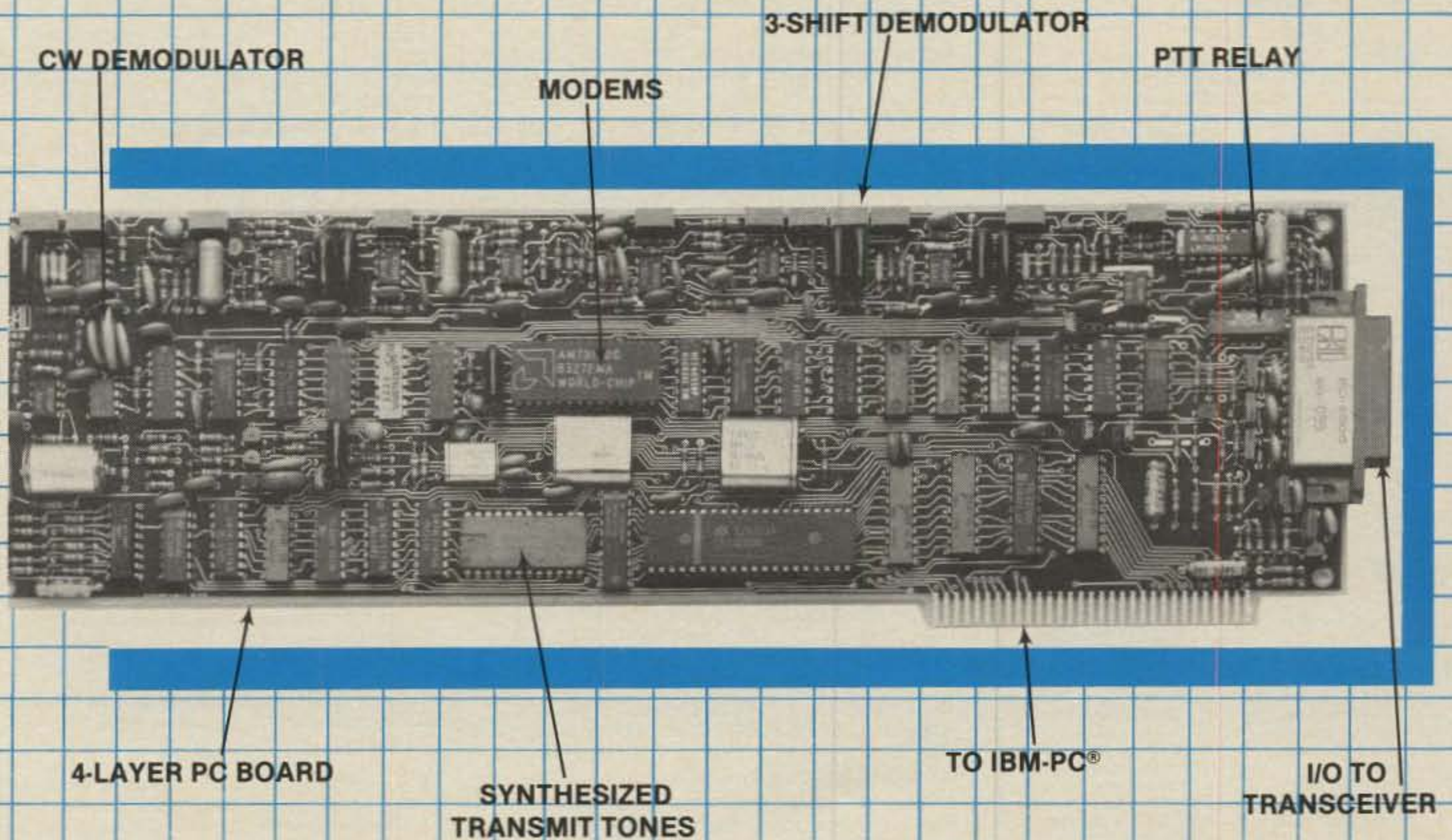
Editor, CQ:

I enjoyed your interview with Mr. William Halligan immensely (*August issue*). For us oldtimers, a series of articles such as the one with Mr. Halligan, and with people like Messrs. Art Collins, Lloyd Hammarlund, William Ready of National, and the people from firms such as RME, Scott, Patterson, Howard Radio, *et al*, who made communications equipment of the 1930's and early 1940's would, I am certain, be of extreme interest and would be welcomed with open arms.

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•**DARA VEC Licensing Exam Schedule** - The following are the dates in November for exams given by the Dayton ARA. Exams are given by appointment only. An s.a.s.e. and completed form 610 with a copy of license attached must be received by the deadlines given by the contact persons listed herein. Exam date Nov. 10; place Toledo, OH; 610 deadline Oct. 13; contact Elmer Zieroff, KU8B, 2614 106th St., Toledo, OH 43611. Exam date Nov. 17; place Albion, MI; 610 deadline Oct. 22; contact Barry A. Polack, AI8D, P.O. Box 2, Pleasant Lake, MI 49272.

•**Michigan All Saints Day** - Southeastern Michigan ARA will sponsor this event from 1500-2100Z Oct. 6 with stations in the 9 cities named after saints. Phone in General portions of 20, 40, and 80 meters, plus 147.480 repeater. Look for KC8JX, N8BAR, NI8L, W8GV, WB8TTA, KD8CW, WA8AEG, KD8CG, and WA8DLO. QSL with #10 s.a.s.e. and log to N8COY, 161 Lothrop, Grosse Pointe, MI 48236.

•**Hammond, IN Special Event** - The Inland ARA will operate K9DWI from 1400-0000Z Oct. 6 on phone General portions of 10, 15, 40, and 80 meters; c.w./Novice portions of 10, 15, 40, and 80 meters; and 2 meter f.m., 146.42 simplex. Send legal-size s.a.s.e. for certificate to N9DTG, 812 E. 40th Place, Griffith, IN 46319.

•**Central Kansas ARC Event** - W0KQU will operate from Lebanon, KS from 1700Z Oct. 6 to 1900Z Oct. 7 10 kHz up from the lower end of the General 10-80 meter bands. Certificate via KB0BH, 2358 Aurora Ave., Salina, KS 67401.

•**W2GSA From Treasure Island** - The Garden State ARA, W2GSA, will operate from Treasure Island, NJ on Oct. 6-7 from 1600-1600Z on 3.910, 7.235, 14.235, and 21.360. QSL with \$1.00 or five 20¢ stamps to WA2SSH, 7 Carol Ave., Neptune, NJ 07753.

•**St. Peters ARC Special Event** - KB0J will be on the air from St. Charles County, MO on Oct. 6-7 from 1700-1700Z on 3.915, 7.240, 14.280, and 21.420 ± QRM. Send \$1.00 or 3 IRC with calls and time of contact to WA0TSY, 128 Lake Point Dr., St. Peters, MO 63376.

•**K5MHZ and KN5D From Albuquerque** - The stations will be on the air from Oct. 6-14 at various hours mostly on s.s.b. with some operation on RTTY, c.w., and SSTV. Primary frequencies will be 3900, 7230, 14250, 21350, and 28550 kHz, and 147.510 MHz simplex. QSL to P.O. Box 997, Corrales, NM 87048 (s.a.s.e.).

•**Special Event Station KA0IAR** - The Jefferson County ARC will operate KA0IAR on Oct. 13 from 1500-2400Z on the lower end of the 40, 20, and 15 meter General bands with some c.w. in the Novice portion of the band. Certificate for QSL and s.a.s.e. to KA0IAR, 3009 High Ridge Blvd., High Ridge, MO 63049.

•**N4GMT From Clarksville, TN** - The Clarksville Amateur Transmitting Society will operate N4GMT on Oct. 13 from 1400-2400Z and Oct. 14 from 1800-2200Z on s.s.b., c.w., and RTTY on 21.375, 14.280, and 7.240 MHz. Certificate for s.a.s.e. to KB4EFW, Rt. 1, Box 162A, Indian Mound, TN 37079.

•**Hermiston ARC's KC7LK** - KC7LK will be on the air from Hat Rock State Park, OR on Oct. 13 from 1800-0100Z and Oct. 14 from 1800-2200Z on the General phone and Novice c.w. bands, with some 2 meter and 440 MHz operation. Send contact number and s.a.s.e. for a certificate to HARC, P.O. Box 962, Hermiston, OR 97838.

•**Pennsylvania Amateur Week** - Oct. 13-21 will be Penn. Amateur Week, with special certificates to be issued by the Nittany ARC to winners in the Pennsylvania QSO Party. For more information, contact Nittany ARC, P.O. Box 614, State College, PA 16804.

•**WA3QGA From Savage, MD** - The Laurel ARC will operate WA3QGA from 1300-2400Z Oct. 14 on 7237, 14285, 21385, 144.250 u.s.b., and 147.54 simplex. Certificate for #10 s.a.s.e. to LARC, P.O. Box 3039, Laurel, MD 20708.

•**WD4KOW From Sunbelt Expo** - The Colquitt County HRS will operate WD4KOW on Oct. 16-18 from 0900-1700 EDST each day in the General portion of the h.f. bands. Special QSL for s.a.s.e. to Colquitt County HRS, P.O. Box 813, Moultrie, GA 31776.

•**Juneau, AK Special Event** - The Juneau ARC will oper-

ate KL7GPG on Oct. 18 on 14.275, 7.275, and 3.975 MHz. Requests for skeds may be arranged. Send QSL with s.a.s.e. to WL7K, 3470 Meander Way, Juneau, AK 99801, or via the KL7 bureau.

•**Down Under DXers Contest Club From Mellish Reef** - This club plans to be on from Mellish Reef for the CQ WW DX Phone Contest using the call VK9MR, multi-single. They plan to be operational from Oct. 5 through Nov. 6 on all bands 160-10 meters. QSL to P.O. Box 31, Winmalee, NSW 2777, Australia.

•**WB3IPE From Philadelphia** - The LULU Temple Radio Unit will operate on Oct. 20-21 from 1200-2000Z on 3.950 and 14.328 MHz using the call WB3IPE. For QSL send s.a.s.e. to WB3IPE, 1603 Jill Rd., Willow Grove, PA 19090.

•**24th Infantry Div. Assoc. Special Event** - K4TF will be on the air from Merritt Island, FL on Oct. 20 approximately 10 kHz inside the General portion of each amateur band dependent on propagation. For a certificate, send QSL and 9" x 12" s.a.s.e. to K4TF, 1630 Venus St., Merritt Island, FL 32953.

•**WB7RFA Hopefully From Sao Tome** - WB7RFA hopes to operate from Sao Tome beginning on Oct. 23. If that plan fails, he will try to secure a D2 call for Angola, planning to work all bands on s.s.b. Watch the IARS and INDXA nets for more info.

•**Special Event Station ON4CLM** - ON4CLM will be on the air from Knokke, Belgium, from 1600Z Oct. 30 to Nov. 3 on s.s.b. 3.785, 7.045, 14.125 (Canada), 14.249 (USA), 21.245, 28.545, and 144.250; c.w. 3.515, 7.012, 14.020, 21.020, 23.020, and 144.020; f.m. 145.400. Fee for the award is \$5.00 or 10 IRC's. For more info and QSL reports write to Radio ON4CLM, P.O. Box 140, 8300 Knokke-Heist 1, Belgium.

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

Oct. 5-7, **Radio Society of Ontario Convention**, Ottawa, Canada. Contact RSO Convention Committee, P.O. Box 15806, Station "F", Ottawa, Ontario, Canada K2C 3S7.

Oct. 6, **Hamilton ARC Fleamarket**, Hamilton, Ontario, Canada. Contact HARC, P.O. Box 253, Hamilton, Ont. Canada L8N 3C8.

Oct. 6, **Mid-Atlantic VHF Conference**, Warrington, PA. Contact Hamarama '84, P.O. Box 311, Southampton, PA 18966, or call K3MXM at (215) 635-4942.

Oct. 6, **Hosstraders' Fall Tailgate Swapfest**, Deerfield, NH. Contact Bob Tiffany, W1GWU, Walton Rd., Seabrook, NH 03874 (s.a.s.e.).

Oct. 6-7, **Mississippi Coast ARA Ham Festival**, Gulfport, MS. Contact Mississippi Coast ARA, P.O. Box 1785, Gulfport, MS 39501.

Oct. 7, **Sandhills ARC Swapfest**, 4-H Building, Scott County Fairgrounds, Scott City, KS. (No contact given.)

Oct. 7, **Blossomland Blast**, Lake Michigan College Community Center, west of Benton Harbor, MI. Contact BARA, P.O. Box 175, St. Joseph, MI 49085, or call WD8MWT at (616) 983-1710.

Oct. 7, **Yonkers Electronics Fair**, Yonkers, NY. Contact Yonkers ARC, 53 Hayward St., Yonkers, NY 10704, or call (914) 969-1053.

Oct. 7, **Northern New Mexico Hamfest**, Pecos River/Terrero Group Shelter, east of Santa Fe, NM. Contact Northern New Mexico ARC, c/o Bob Norton, N5EPA, Rt. 3 Box 95-15, Santa Fe, NM 87501, or call on 3.939 MHz at 0100Z.

Oct. 12-13, **3900 Club Hamboree and Iowa State Convention**, South Sioux City, NE. Contact James Boise, 22 LaSalle, Sioux City, IA 51104.

Oct. 13-14, **DXPO 84**, Falls Church, VA. Contact Stuart Meyer, W7GHK, 2417 Newton St., Vienna, VA 22180, or call (703) 525-6286 (office), (703) 281-3806 (home).

Oct. 14, **Lima Hamfest**, Lima, OH. Contact NOARC, Box 211, Lima, OH 45802.

Oct. 20, **Irwin Area ARA Swap & Shop**, Circleville V.F.D., PA. Contact Don Myslewski, K3CHD, 359 McMahon Rd., N. Huntingdon, PA 15642, or call (412) 863-0570.

Oct. 20, **Tri-Cities Hamfest**, Gray, TN. Contact Tri-Cities Hamfest, P.O. Box 3648 CRS, Johnson City, TN 37601.

Oct. 20, **Tri-City ARC Auction**, Poquonock, CT. Contact WA2RYV at (203) 464-6555.

Oct. 20, **Middlesex ARC Fleamarket**, Dover, MA. Contact Irv Geller, KO1N, 1450 Worcester Rd. #422A, Framingham, MA 01701 (s.a.s.e.).

Oct. 21, **CCRL Hamfest**, Chicago, IL. Contact Norman Geuder, KA9EZA, 6345 N. Magnolia Apt. I-1, Chicago, IL 60660.

Oct. 27-28, **Hamfest Chattanooga**, Chattanooga, TN. Contact Hamfest Chattanooga, P.O. Box 3377, Chattanooga, TN 37404, or call N4DON at (404) 820-2065.

Oct. 28, **Heart of Ohio Ham Fiesta**, Marion, OH. Contact Paul Kilzer, W8GAX, 393 Pole Lane Rd., Marion, OH 43302.

Oct. 28, **Ham 10 FM Club Hamfest**, Kalamazoo, MI. Contact KA8RUA, 2825 Lake St., Kalamazoo, MI 49001.

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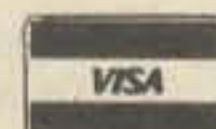
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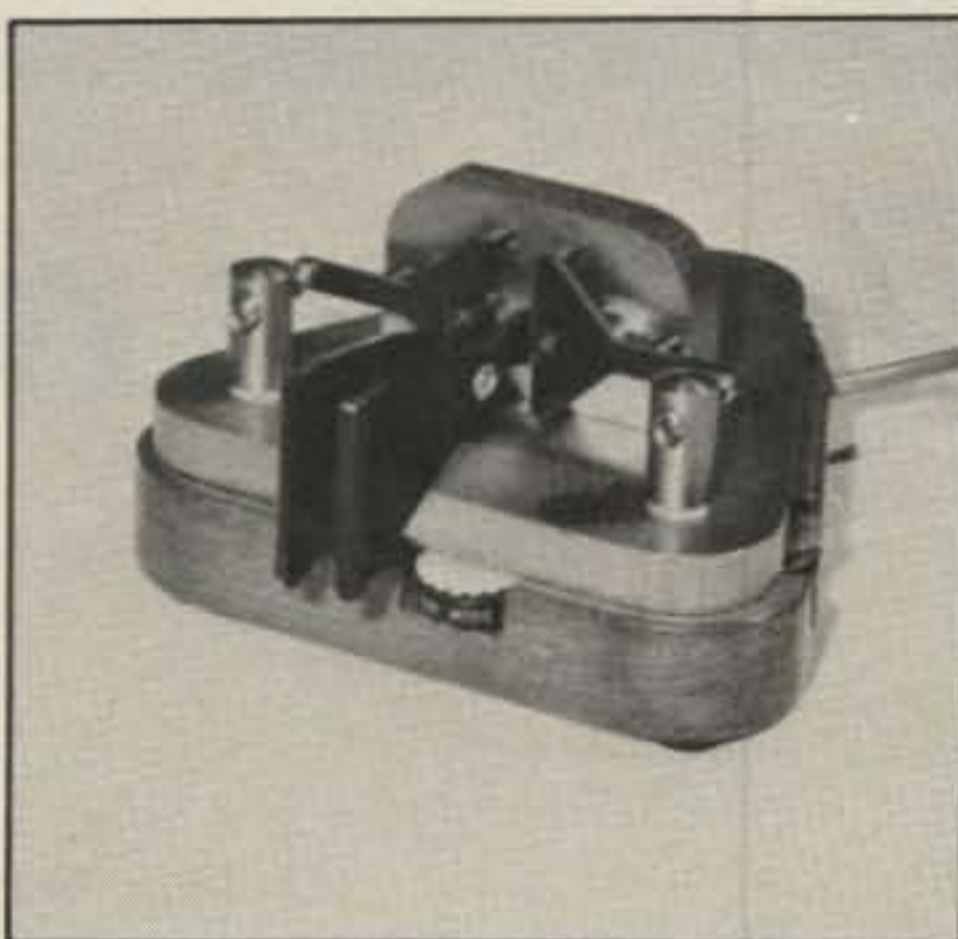
How To Improve The Vibroplex EK-1 "Brass Racer" Keyer

BY ALBERT H. JACKSON*, VE3QQ

Next time you open your EK-1 to replace the battery, or just to satisfy your curiosity, take a close look at its heart: the Curtis 8044 keyer chip, a state-of-the-art device and an excellent choice by the Vibroplex company. If you remove the keypost screws, and note the unused socket terminals on the foil side of the circuit board, you'll begin to realize that there may be some additional features not brought out in the Brass Racer, and you'll be right. The three blank IC connections are for sidetone, and there are other capabilities which can be added to the circuit, as well.

This is not a step-by-step construction article, but rather a guide to what can be done with an existing, but not quite complete, design. With a little care and not much expense, you can finish the wiring and bring the unit up to the full maturity of its unique CMOS circuitry, or just connect the extra operations that interest you. In the process you can eliminate a quirk or two and extend this keyer's versatility.

To begin, remove the battery, refer to the photos and diagrams, and carefully drill the circuit board to take the new components in appropriate locations. Insert the leads from the top and connect underneath with fine wire and spaghetti. Use clip-on heatsinks at sensitive locations and tack-solder the joints with a small, grounded iron. If you're careful, the IC can remain in its socket without harm. There's not much extra room, so keep things as close to the board as possible, particularly in the vicinity of the sidetone output transducer, if you plan to install it.



A right-hand shot of the modified EK-1. The weight control locates conveniently below and close to the paddles.

Sidetone

Although most modern rigs have their own sidetone, a built-in keyer version makes for easy warm-up before going on the air. A small, high-impedance crystal earphone (Armaco type CR)¹ gives sufficient output for practice at the keyer and requires much less room than a conventional speaker.

Carefully cut the front of the earphone's housing just ahead of the diaphragm drive-pin and remove the terminal cover to reduce its height to a minimum. Mount in the hardwood base as indicated later. For teaching a code class you can add a miniature output jack (not done on this keyer) and plug in a small amplifier/speaker combination such as the Radio Shack #277-1008. Fig. 1(A) shows the circuit additions.

Weight Control

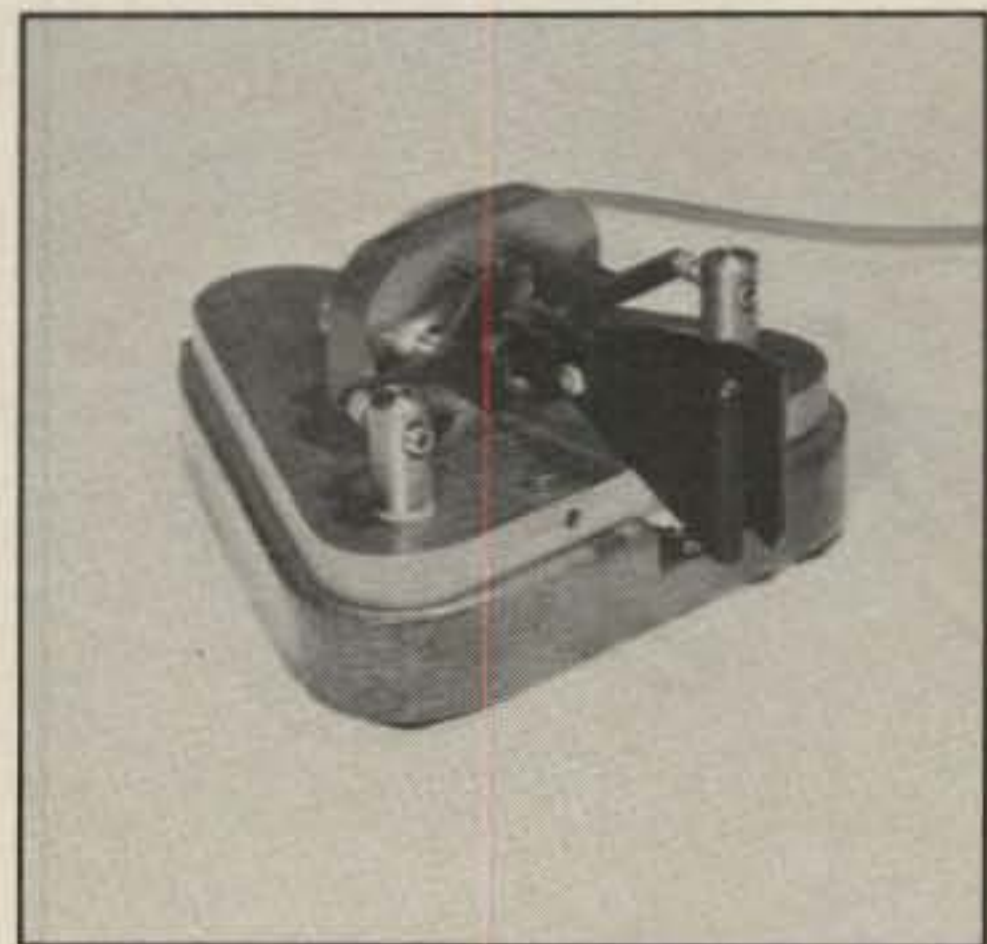
If you prefer a more solid sound to your c.w. than the somewhat "ticky" dots of

the usual 3:1 ratio, just install the pulse-stretching circuit of fig. 1(B). The potentiometer terminals straddle the front edge of the circuit board, and the two outside ones are bent up through holes drilled to accept them. Remove a section of the pin-8 foil to clear these points, and bridge the gap with insulated wire. Attach a lead underneath from the pin-15 foil to the clockwise lug (seen from the knob side) and then cement the control in place with 5-minute epoxy. Lift the pin-15 end of R5 and connect it to the center terminal with bus wire.

You can also remove the redundant diodes D6 and D7. They were required originally as static suppressors on a straight-key input not present in the Vibroplex. (You don't really need or want a hand-key connection, do you?) Some of the remaining holes can be used as modification progresses.

An External A.C. Power Supply

The internal EP-175 mercury battery is expensive, and its life can be unexpect-



The left side, with the tune push-button and its mounting set-screw at the front.

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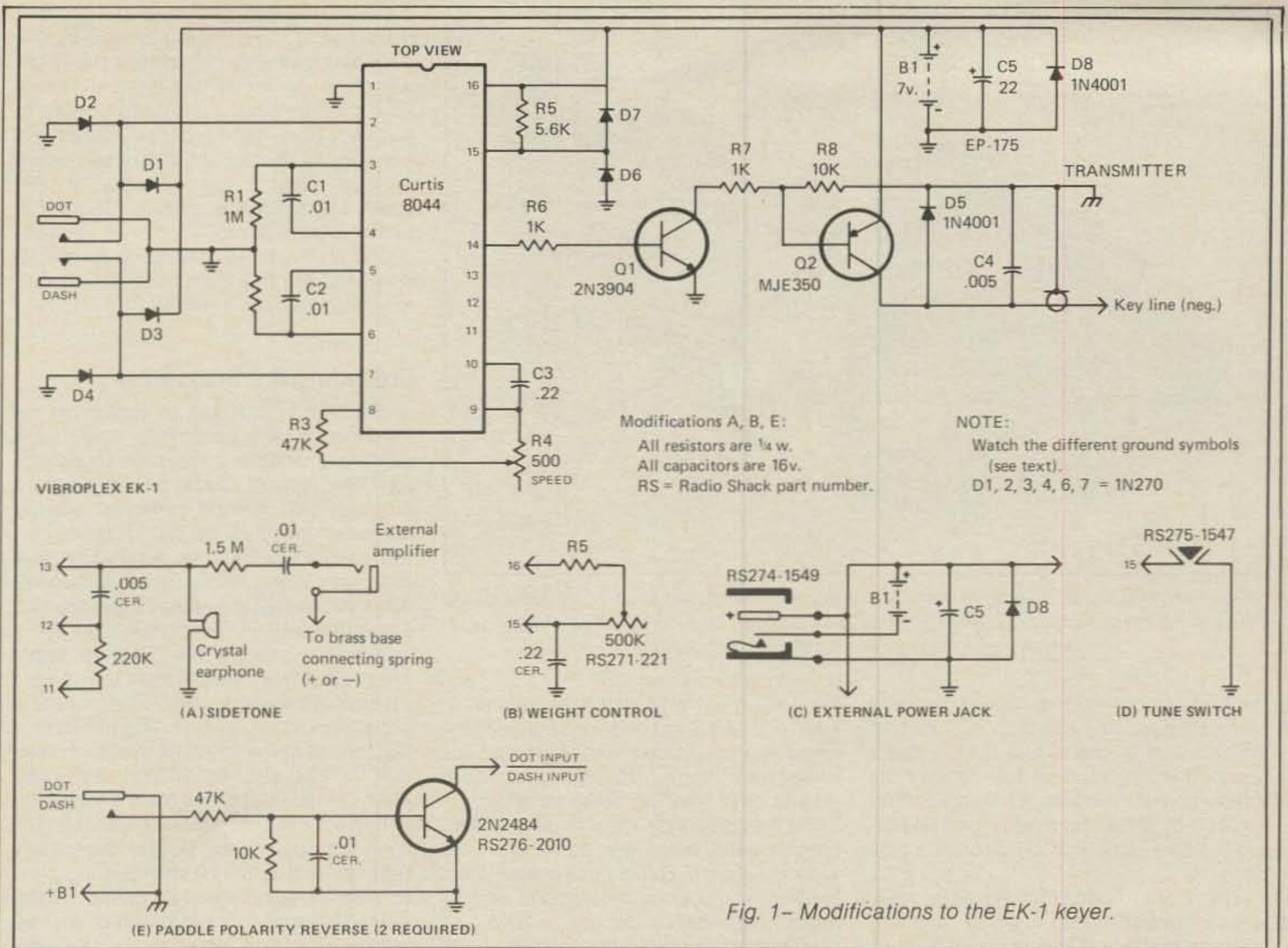
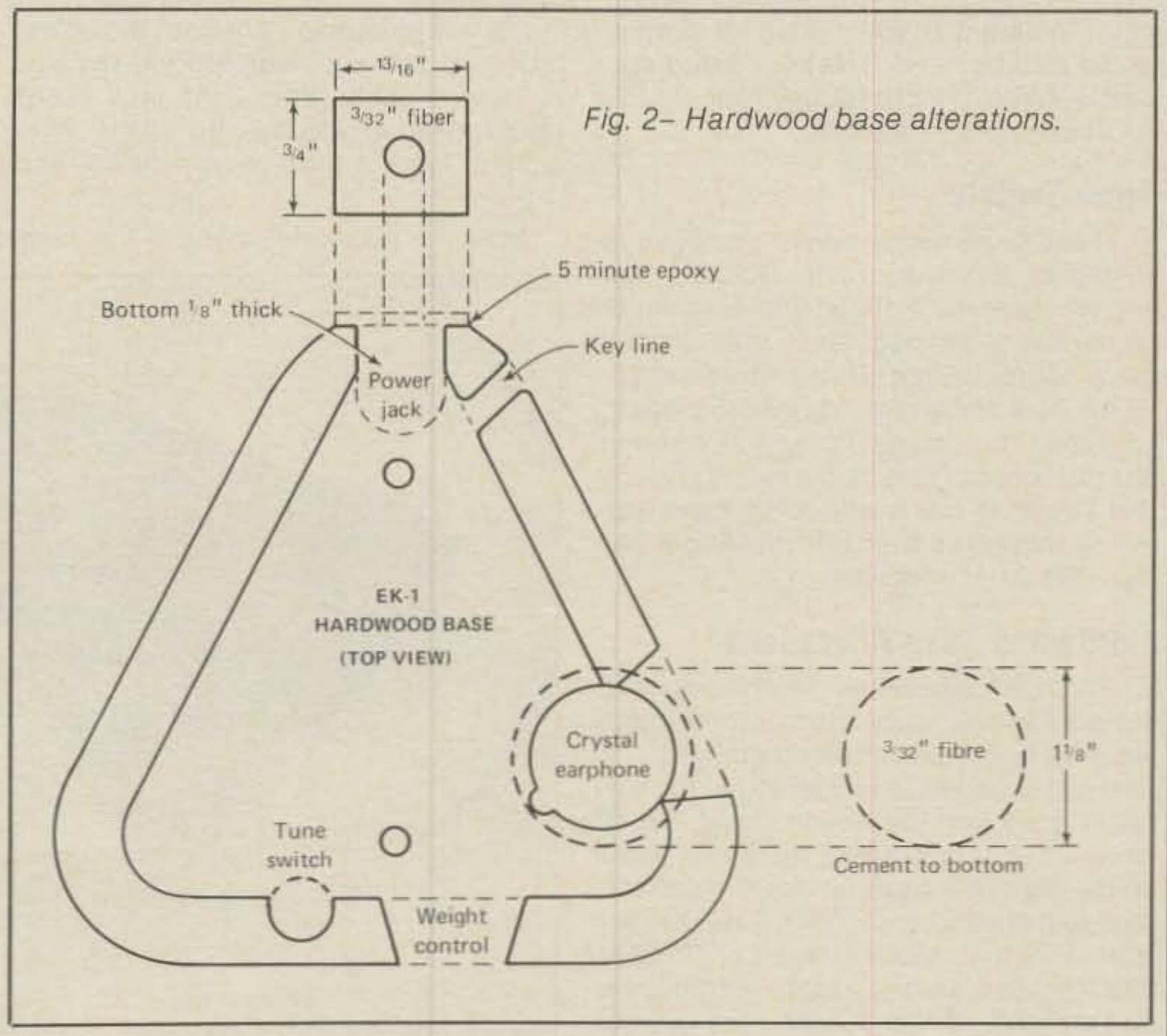


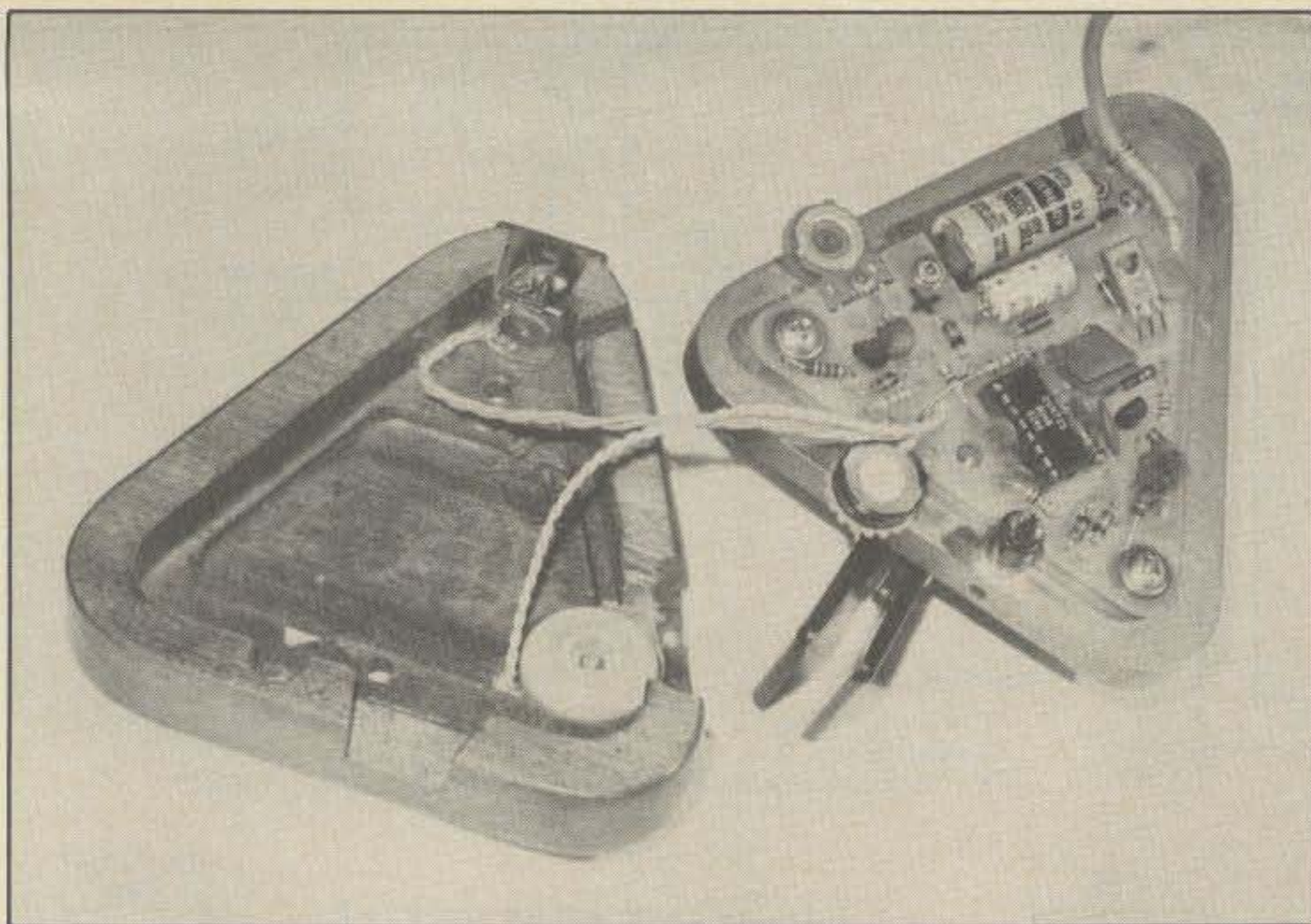
Fig. 1— Modifications to the EK-1 keyer.

edly brief if you happen to push the metal base of the keyer against the grounded cabinet of your transmitter or other equipment. For negative keying, this battery short-circuiting non-feature is inherent in the Curtis design, which places the keyer frame at its supply voltage above ground. It would be a hazard for any external source as well, but more on this as we proceed.

In any case, an a.c. supply is a convenience, and you can still use the battery as an auxiliary if you install a disconnecting jack such as the Radio Shack #274-1549. On the circuit board, clear the negative battery bracket by cutting the foil on both sides of it. Reconnect the severed lines to each other and wire in the power jack as shown in fig. 1(C) and detailed below. Leave the brass-base connecting spring in place, unless you incorporate the grounding modification recommended here.

Since the keyer load can vary from a few microamperes to 15 ma or more, the supply must be regulated. One such unit was described by me in CQ some time ago.² Unfortunately, its basic Radio Shack adapter is no longer available, but similar units now on the market can be handled in much the same way. A better





This open view shows the base-installed sidetone transducer in the foreground and the external power-supply jack at the apex. Some of the new components may be distinguishable in position on the circuit-board.

method of opening the case is to make four hacksaw cuts about $\frac{1}{8}$ inch in from and parallel to the sides, $\frac{1}{8}$ inch deep, around the top. You can then remove the cut portion of the cover, and replace it afterward by smoothing the edges and filling the saw slots with (ABS) plastic pipe cement.

The Curtis specifications allow chip supply voltages from 4 to 10, and any value in the 7 to 9 volt range should be satisfactory. Although physically larger than the EP-175, a much cheaper externally mounted 9 volt transistor battery could also be used. The key-closed current would then increase from about 14 to an acceptable 18 ma or so.

Tune Switch

This can be handy if your rig requires tuning in the c.w. mode. There's just room between the circuit foils outside R2 to the left of the paddles to take a small push-button switch (Radio Shack #275-1547). Notch the circuit board to clear it, and drill a $\frac{1}{4}$ inch mounting hole through the brass base plate at this location. Lock the switch in place with a headless set-screw tapped through from the edge. See fig. 1(D) for connections.

Hardwood Base Alterations

Remove the key-line, steady the wooden base with a couple of screws through its mounting holes into something solid, and cut a close-fitting opening at the forward apex for the power jack. Fig. 2 shows the details. Bring the key-line out to the right of the circuit board, anchor it in place, and cut a notch in the base to accommodate it. Make another opening at the front to clear the weight control, and cut an inner groove for the tune switch.

Include an extra $\frac{1}{32}$ inch thick washer at each of the key-post positions between the circuit board and the brass base when you reassemble them. This will give added clearance for the two potentiometers.

On the underside, gently pull off the Vibroplex label, and reposition it when the work is finished. Use a coping saw to cut a hole for the crystal earphone and its leads. Close the bottom with a fibre disc (Vectorbord or other material) cemented to the wood, and fix the little earphone, open side up, in the hold above it.

Cut the mounting ears from the power jack, and connect it with light wire twisted to form a cable. Epoxy the jack in the place provided, and then install the cover plate in front. A drop of cement will hold

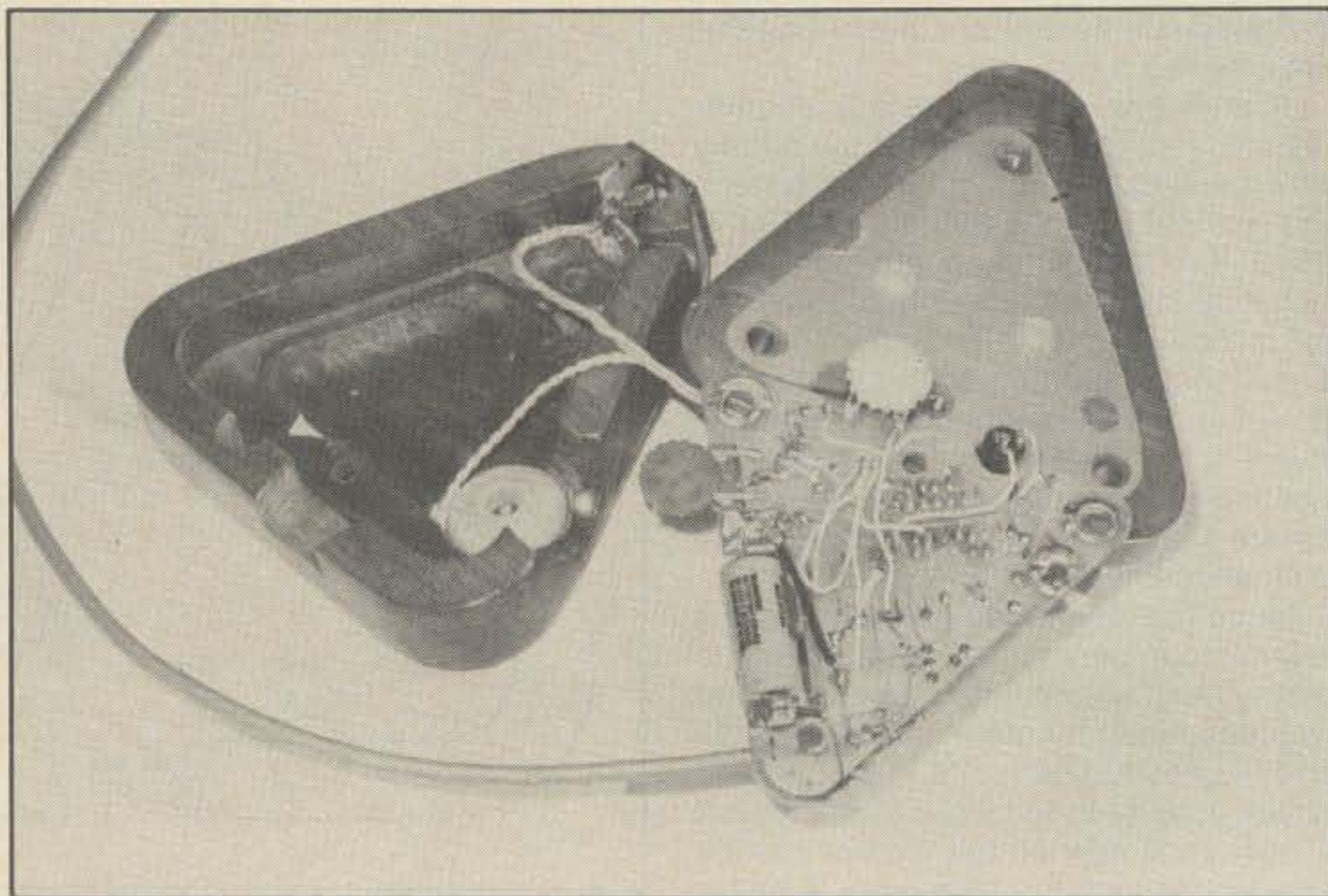
the wires against the wood and prevent breakage at the soldered joints. Apply a little dark oak stain to restore the finish wherever the wood has been exposed. Drill another hole in the circuit board to pass the power and earphone leads and connect to the foil on the back. Leave enough slack to permit easy access when changing the battery. Check the wooden base for fit. You may have to scoop a little more clearance for the IC corner at the front, and also for the battery bracket near the rear.

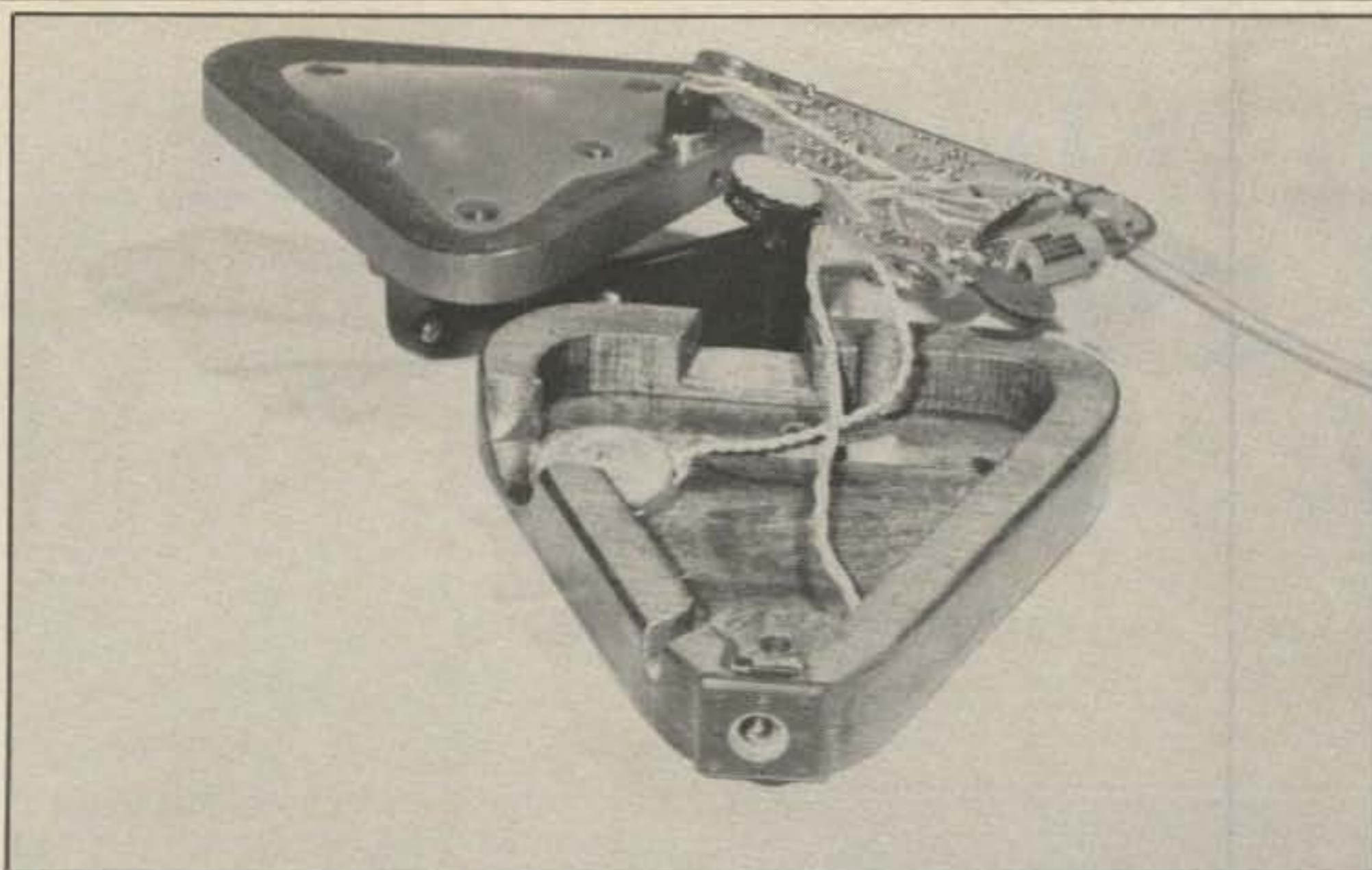
Grounding the Brass Base

No, it *isn't* grounded, regardless of the markings on the schematic, and this is why it's so simple to short the keyer supply. The original Curtis circuit diagram employs two ground symbols, making confusion less than difficult. This one (\perp) represents the negative supply line (and the brass keyer frame in this instance), and this one (\perp) indicates actual ground. The same distinction applies in fig. 1.

You can modify the EK-1 to really ground its metal base by adding a polarity reversing transistor, two resistors and a capacitor to the respective paddle inputs. Cut the foil at the key-post eyelets and insert the circuit of fig. 1(E) on each side. Then remove the brass base connecting spring from the negative line and reinstall it on the positive foil beside the battery bracket. Notch the base-insulating plastic sheet to accommodate it, and presto, no more supply shorting problems! This method retains the direct key-line grounding of the Curtis system, instead of routing the transmitter return through the keyer d.c. supply as is done in some other circuits. As a safety precaution, run a wire paralleling the very narrow foil connection from the key cable shield to the positive battery termination.

Note the additional wiring in this folded-back, foil-side glimpse of the circuitry.





A nose-on look at the wooden base and the external supply input.



A bottom view of the completed keyer. A Vectorbord disc covers the hole for the crystal earphone, and the diagonal dark patch is the relocated, but apparently unphotogenic, Vibroplex label.

Output Circuit

The Curtis company rates the MJE350 output transistor to maximums of - 300 volts and 200 ma with R7 at 330 ohms. In the Vibroplex version, D5 and C4 may be 50 volt types and may therefore limit the keying range accordingly. Higher voltage items can be substituted and the resistor changed, if individual circumstances warrant it. However, lowering the resistor value will increase supply current, and this should be considered, especially with a battery source.

Positive Keying

They 8044 IC can also be used for positive keying, but that's beyond the scope of this article. With some transmitters, the deceptively simple method of revers-

ing the key-line connections to Q2 could place unsafe voltages on the ungrounded frame of the keyer, and grounding it, accidentally or otherwise, would short the keyer supply through this transistor when conducting.

The Curtis design uses an NPN type for the output in a much better circuit where both key-line and keyer ground directly to the transmitter. Alternatively, Q1 can positively key low-power rigs within its current and voltage ratings, and the keyer frame again would ground securely in the same way. In either case, there's no need for the paddle polarity changes described above. More information on the 8044 chip and its descendants may be obtained by writing to the manufacturer.³

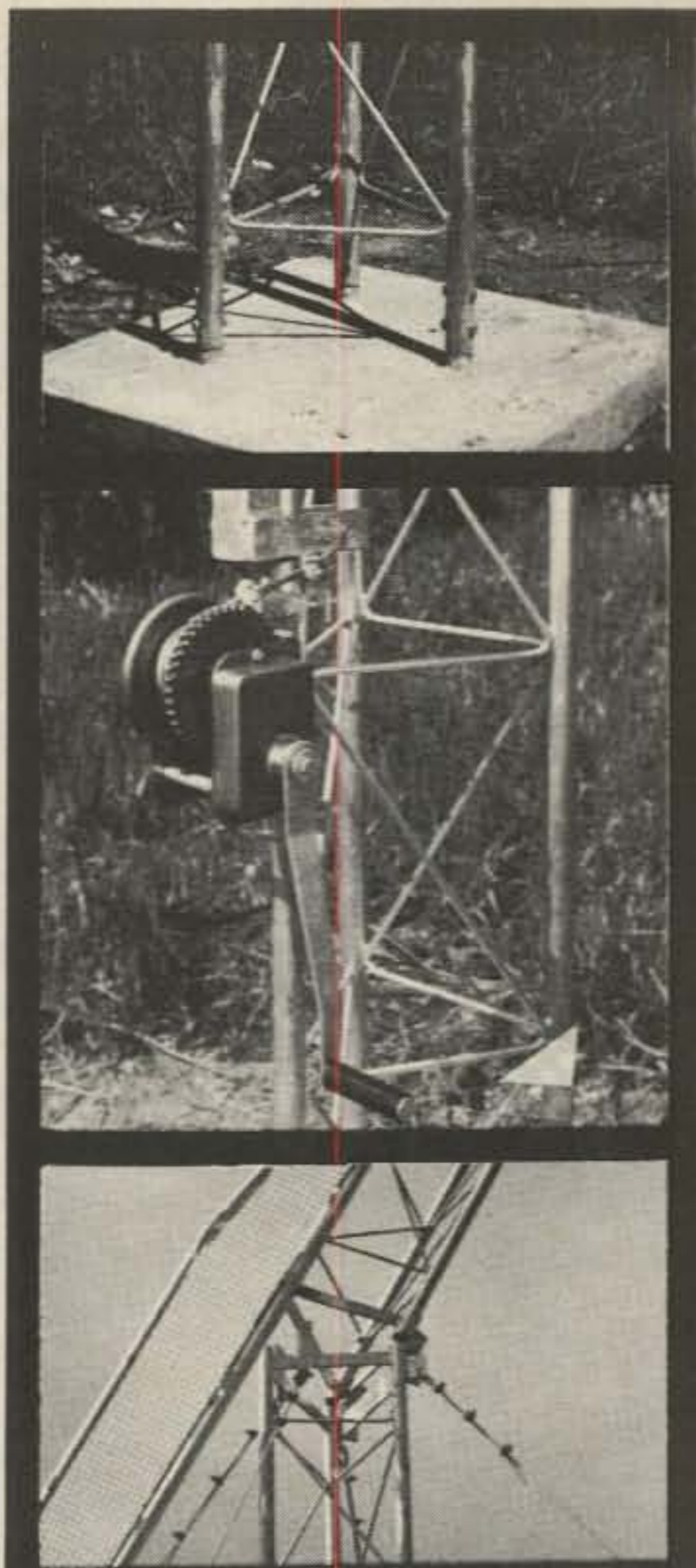
Conclusion

Although it displays a slight speed versus temperature variation unnoticeable in another keyer in which C3 is mylar, not ceramic, the EK-1 ranks with the best as a hand-operated, negative electronic key. However, I would like to have seen the Vibroplex people go one step further by substituting capacitive touch-control⁴ (don't call any key the ultimate until you've tried it) for the different, yet still old-style, contact-making, gay-nineties, mechanical paddles. Of course, I'm prejudiced!

My thanks to Don, VE3OHO, for permitting me a free hand to modify his nice Vibroplex as described here. 

References

- ¹Listed by: Electro Sonic Inc., 1100 Gordon Baker Rd., Willowdale (Toronto) Ontario, Canada, M2H 3B3, Price: about \$2.
- ²Jackson, A. H., "A Plug-in Supply for the Curtis Kit Keyers," *CQ*, June 1978, p. 38.
- ³Curtis Electro Devices, Box 4090, Mountain View, CA 94040.
- ⁴Jackson, A. H., "Touch Control for the Curtis Chip Keyers," *CQ*, July 1977, p. 17.



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1983 CQ WORLD-WIDE DX CONTEST C.W. RESULTS

BY BOB COX*, K3EST, AND LARRY BROCKMAN**, N6AR/4

Preparation for the competition of the CQ WW DX Contest usually begins months before the starting bell. This includes putting up new antennas and repairing old ones, getting that state-of-the-art modification, and finally adjusting your strategy to fit your contest goals. Those who want to increase the thrill of the chase or the thrill of being chased plan and carry out the work of going on a DX-pedition, in which trucks, boats, planes, and trains are used to transport equipment and operators to far-away QTH's.

Finally it starts. Boy, what fun competing against Hans, Yoshi, Vlad, Carlos, or Bob, and trying to do a little better than last year. Over 200 countries all on the air during the 48-hour contest allows you to pick up the rare ones you're missing and increase your operating skills.

The reasons are many for entering the contest, and the result is the same: concentrated fun. Taking into account all the human factors which govern the contest's outcome, it seems that nature always has the last say. This year propagation on 40, 80, and 160 meters was excellent, making up for decreasing openings on 10 and 15. In addition to radio phenomena, nature threw gale-force winds across Europe, the U.S., and parts of Asia. Many entrants commented that they kept going in spite of having an antenna blow down. Our hats are off to all the planning, work, and perseverance of the thousands of contest-minded amateurs throughout the world.

When the dust cleared, the all-band winner for the world was 9Y4VT operated by Richard Norton, N6AA. Richard made 4,961 QSO's to beat out NP4A operated by K3UA. Phil had the top multiplier count of any single operator in the world. Third place goes to ZS1CT operated by DK3GI. What a score from the tip of South Africa. In spite of a drastic reduction in 10 and 15 meter band openings, 9Y4VT still broke the existing single operator all-band

*6548 Spring Valley Drive, Alexandria, VA 22312

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JA3YBF ops JG3IUG (front) and JA9TOZ shown at the operating position.

record. The top U.S. score was turned in by W1KM out on Cape Cod in Massachusetts. He had more contacts and country multipliers than any other U.S. entrant. Second place went to perennial high-scorer K1AR, and third place was N2LT.

The Low Bands Set New Records

The major story on 1.8 MHz was how good it was. A careful count of over 500 logs showed that there were over 100 countries available. The activity on the top band was so furious that it sounded like 20. Repeating his record-setting pace from the phone section of the contest, UP2BBT/ U6V almost doubled the existing world record. Congratulations! Second was Wally, LZ2CJ, who set a near European 1.8 record. By doing so he worked 59 countries! PA0HIP and G3SZA, long-time beacons on 1.8, were third and fourth, respectively. A new Asian 1.8 record was set by 4X4NJ with 34,200 points. The top U.S. scorer was K1ZM, followed very closely by AA1K/3.

YT3T contest team (from left to right): Peter, YU3HZZ (sitting); Slavka, YU3TUX; YL Lily, YU2CBV; and Robert, YU3EIJ.



VP2KAC operated by N4RJ set a new world record on 80 meters. In doing so, he made 1,302 QSO's. In addition, new continental records were set by EA9EU (second high in the world), UV9AX, and 4M3AGT. In the U.S.A. W1FV took top 7 MHz honors.

An incredible job was done by N4PN operating at VP2KAA to set a new all-time 7 MHz world record. He vacuumed the band clean with 104 countries and 2,461 QSO's. New continental records for 7 MHz were set by EA9TL/9, UB5JMR, and 9Y4VU. For the U.S. W6AM operated by N6AW just edged out K1KI for top 7 MHz honors.

High-Band Scores

YW5R led the way over PY4OD to claim the high score for 14 MHz in the world. In the U.S.A. Bill, W0ZV, took first place. On 21 MHz YX5A finished number one just ahead of 5Z4MX (who incidentally set a new African 21 MHz record). NA5R turned in the top score on 21 MHz in the U.S., beating out N4WW. You had to be somewhat south of the equator or near it in order to finish with a high score on 28 MHz. C53T took band honors over N4TO/KP4, while top 28 MHz in the U.S. went to KZ5M.

Multi-Operator Scores

The multi-single category is always a popular class of entry. This year HH2VP



The NP4Z team (from left to right): Hector, NP4CC; Rafy, KP4HA; Luis, NP4C; Carmelo, KP4C; Felipe, NP4Z; and Tim, KP4BZ. Not shown is Carlos, WP4CRS.

topped the pile-up. They sure put Haiti on the map, making more QSO's than any other multi-single station. They were followed by an expedition to UF6V by Ukrainian amateurs who not only gave everyone RF6V, but also had more country multipliers than their competition. In the U.S. K1GQ in New Hampshire topped W2YV for the top multi-single score.

In the battle of the giants the boys from Chelybinsk, RW9A, also known as UZ9AYA, put the southeast Urals in everyone's log with a little over 8 million points. XE2SI ran a close second with more QSO's than anyone else (7,668). They just beat the top U.S. score of N2AA. AH0C way out on Saipan set a new continental record for Oceania.

Club Scores

The Northern California Contest Club led all clubs with a total of over 112 million points. If you look at their various entries, you will find that their strategy was to emphasize as many DXpeditions as possible. That not only made the club score higher, but also provided all of us with more multipliers. Congratulations to all the members! With 4O3WCY and YT3A leading the way, the YU DX Club topped the pack of DX club entrants. They were followed closely by the Ontario Contest Club and the South German DX Group.



From left to right are Dean, W8ZF, operator of 4V2C; host, Dan, HH2MC; and Steve, K4JPD, operator of HH2CQ.



Roger, G3SXW, surveys the damage after gales struck the cliff-top DXpedition of GJ3SXW.



Andrew, SP2UU, shown at his operating position.



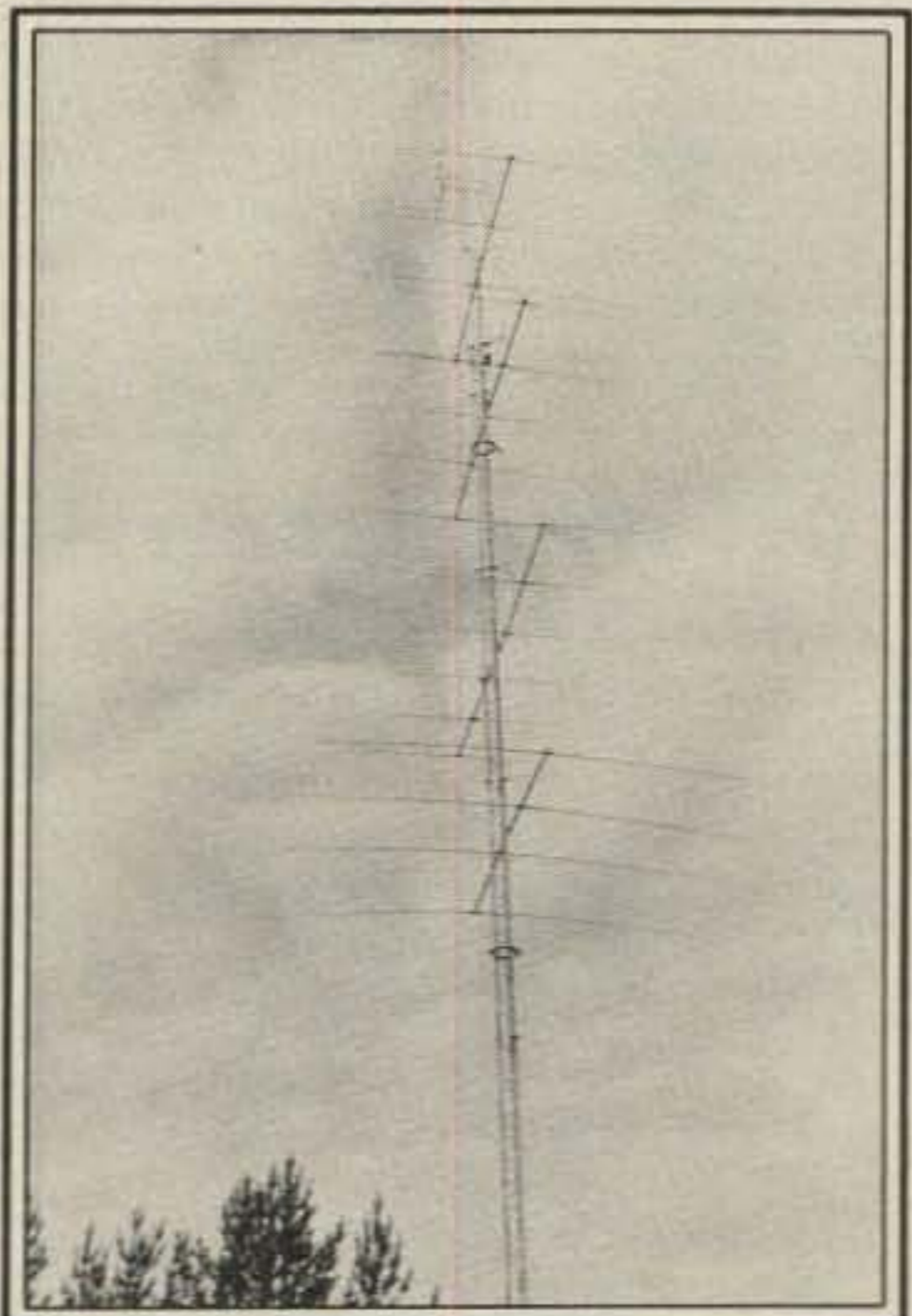
W7DRA at the bench.

Remember

Please always make sure that you look at your log after the contest so that all duplicate contacts are removed. None of us enjoys this task, but it must be done so that the proper winner is recognized. There is no reason for submitting a high-scoring log that contains duplicates or broken calls. There are even log-checking services available if you don't have the time to check your own log. If you notice, this year the rules require a stiff penalty for duplicates left in the log.

Finally, a special thanks to the members of the Contest Committee whose expertise and time make accurate reporting possible: AD6C, K1AR, K2SS, K2VV, K6NA, K9DX, KR2Q, N2AA, N3ED, N6AW, N6CW, N6ND, W1WY, and W7EJ. From all the committee, all the best of luck in the 1984 contest, and remember that all logs for the 1984 contest must be sent to CQ Magazine, 76 North Broadway, Hicksville, NY 11801 U.S.A.

73, Bob, K3EST, and Larry, N6AR/4



OF8AV's operator Jack, OH8PF, who operated single band 14 MHz.

U.S.A. QRM

After years with PVRC, it was an eye-opener to try it with only low power and a vertical from the West Coast . . . W3XY/7. Snagging four new ones on 80 meters was great . . . KD7H. CQing by U.S.A. station buries the DX . . . W7GUR. Bad conditions, good fun anyway . . . WB7FDQ. We all underestimate the capabilities of the 160 meter band . . . KG7D. Broken rotor, broken heart . . . N8II. Poor propagation will show us the skillful operators . . . K8MNG. My first contest. Learned about my equipment capabilities in a hurry . . . N8EFB. Enjoyed working all the — WCY stations . . . WB8JBM. Logic should tell us that extra-long calling on 160 meters serves no purpose . . . K8MFO. My sympathy to PY3YXZ/PP2 for the longest callsign in the contest, and my kudos to him for sending it regularly! . . . W9GXR.

TVI got me Saturday night . . . KG9N. Most of us suffered down-time and antenna damage due to gigantic ice storm . . . K0LUZ. Found out I can work the same stations as the Big Guns do when I operate from home . . . KM0L. Static discharges from blizzard winds threatened my solid-state receiver, but it lived . . . W0ZV. Not only one KH6 on 160, but two! . . . WB4OSN. I got my feet wet anyway. Being a minister makes putting in full-time on a weekend tough . . . KC4HN. What a difference a lack of 10 meters makes! Think sunspots! . . . W5OSJ. OH2MM/EA8 has my vote as best op in this contest . . . N5HB. Operated two single op all-band stations from same QTH . . . W6OKK and W6PBI. Chased RW9A, Zone 17, all morning only to have him answer my CQ! . . . W6DN. "DX IS" but "CONTESTS ARE" . . . W6US. Super signal on 160 from D68GA . . . K5UR.

Getting too old for single op stuff . . . K2RD. Love that early morning "gray line" on 80 meters . . . K3ND. On the air since 1936, but this was my first DX test. Enjoyed it! . . . W2HBE. First C.W. Contest. Be back next year . . . NC2V. Blew it when my intended one hour nap turned into eight hours! . . . K1TO. Condx took a nose dive the second night . . . AA1K. El Stinko the second night . . . K1ZM. UK1PGO answered my CQ . . . K12P.

DX QRM

A storm with 80 mph winds damaged my small HF antenna, and damaged roofs of the houses next door, so I had to QRT! Hi! . . . DF4ZL. AH0C came in 20 dB over S9 all the time . . . DK8NG. Strong QRM due to high activity. Hi! . . . DJ4AX. The question was not how I would do in the test, but how my antennas would survive the heavy windstorm. All went fine! . . . F3JL. My first full-length effort. Great fun. Two pens ran out during contest . . . G4BUO. Good to hear Africa so well represented . . . G3UKS. First CQ contest I've never worked JA! Biggest surprise working ZL3GQ an hour after 15 meters band gone dead . . . G3HCT. Wish I could get some points for my dupes! . . . G4CNY. Lower bands overcrowded with endless CQ callers. People are getting too lazy to listen in . . . HB9AGA. VY poor condx due to aurora borealis. Mainly European stations heard . . . JW5NM.

Because of TVI, I couldn't work much on Sunday. A storm destroyed the reflector of my antenna . . . LX1WW. Could hear JA's on 80 and 40 meters, but they couldn't hear me . . . OZ8AE. During the second night the band was wide open to North America (80 meters), but my power supply started burning, so I had to QRT . . . SM6CPY. Greatest thrill was strong storm on Europe on contest weekend . . . DL4AAE. This was my first contest weekend . . . DL4AAE. This was my first contest I ever was active. I enjoyed it, and next year I want to move up . . . DJ0OC. Anten-

na insulators burned the first night and had to be repaired in the dark. Hi! . . . DK5AD.

Had to work stations thru S7 noise due to rain on ant . . . G3XWZ. Came just to 50,000 QSO's (since 1949) . . . HB9KC. Great to work a few hours in the world's best contest . . . HB9CSA. Low power + low conditions = low score, but it is still fun to be with you in this contest . . . OZ5WQ. A terrible storm broke down all antennas on Saturday evening . . . PA0LVB. Every year the Big Contest! . . . PA0TA. Next year we will use special call OK6WW . . . OK1KTA. Had to shut down Saturday night because of breakthrough with a disco! What is a cross-check log? . . . GB2WCY. The quad broke Saturday in a storm, broken 7 MHz dipole, TVI by the neighbors, DL5BAD at home, VY band condx, enough beer, our mobile antennas were stolen from our cars during the night. See you 1984! . . . DF0DG/P. Thank you very much for the very nice contest . . . HA1KRR. This DXpedition was especially made for CQ WW DX . . . GD4UFB. An ill-fated DXpedition: we lost 16 hours due to winds gusting hurricane force which flattened all antennas. Never say die. We'll do it again next year! . . . GJ3SXW. Finished antenna work Friday night! Condx were real poor this weekend and QRN 9 + 20 from snow showers for long periods. Some fun anyway, especially our QSO with ZS1CT on 80 meters through a big EU pileup! . . . LA1H. At least our score was easy to compute (9,537 points)! . . . 4U1VIC.

Very poor condx this year. Should be more JA activity. We need better antennas . . . CX7CO. Multi-single is the way to go. Had great time with top-notch group of operators/friends . . . HH2VP. First C.W. test from outside continental U.S.A. U.S.A. operators had tremendous discipline in pileups—best in world . . . A16V/KH6. New ops, new station, first C.W. multi-single, lots of fun . . . NP4Z. Great contest . . . TI2BEV. First DX trip out of country. Forty meters unbelievable—wide open to all ports . . . V3A. One amp made it hard to snare those multipliers. Low JA contacts . . . VK2WU. Too many dupes! Do the European stations never write multiplier checklist? . . . 5H3WCY. Where were the California kilowatts—missed Zone 3 multiplier! . . . UA3AMB. Thank you for another fine contest. Conditions were not so good on 160 meters this year . . . UA9CBO. My first try in the CQ WW operating single/single. Look forward to next CQ WW! . . . UA9ADY. This year's propagation was poorest since last sunspot minimum . . . UK2RDX. Where were all the BY's this year? . . . UK2BAS.

Sometimes (during darkness) 160 meters was even more crowded than 20 meters (beautiful band) . . . PA2REH. First time; what a noise! . . . PA3CNI. VY GLD to work even the west coast of the U.S.A. with my 28 MHz inverted Vee on 21 MHz . . . PA0HOP. My first CQ WW Contest on C.W. It was nice, but they have so "high speed C.W." . . . SM2NTU. Enjoyed this contest for the first time in spite of bad propagation . . . OK1DMA. Had to work for every QSO—not one new country . . . OE1ZES/W1HUE. I got liberation from school when I said I was to participate in radio amateurs' world championship. Hi! . . . OF6EE. A lovely contest. I caught three new ones. Good luck with the logs . . . OH2BIF. Zones 7, 8, 9 were loud, but propagation to U.S.A. was very poor . . . OH1PY. Antenna is 14 AVQ first used in 1964 . . . OH2BFS. Many stations wondered about my frosty signals; we had -27°C outside during the contest . . . OH8PF (op. of OF8AV).

It seems U.S. West Coast did not notice the 40 meter opening to N. Scandinavia around 09-1000 Z . . . OH8SR. Missed the "sure ones"; VS6DO, ZL3GQ, PY1ARS; the double multipliers. Don't know if they have become old or me . . . OH6TI. First year 1.8 MHz available in SV. Lots of fun; two new countries. Many extended periods of receiver hiss . . . SV0AA. Very, very good conditions on 80 meters . . . HABIE (op. of

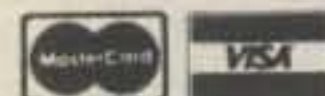
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- VOLT & AMP METER ON MODELS RS-12M, RS-20M & RS-35M.
- Separate Volt and Amp meters, with Voltage adjustable from 5-15 Volts on VS-20M and VS-35M.
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MODEL VS-50M

PERFORMANCE SPECIFICATIONS

- INPUT VOLTAGE: 105-125 VAC.
- OUTPUT VOLTAGE: 13.8VDC ± 0.05 volts. (Internally Adjustable: 11-15 VDC)
- RIPPLE: Less than 5mv peak to peak (full load & low line)
- REGULATION: ± 0.5 volts no load to full load & low line to high line.

Models	Continuous Duty (amps)	ICS* (amps)	Size (in.) H x W x D	Shipping Wt. (lbs.)
RS-50A, RS-50M, VS-50M	37	50	6 x 13 3/4 x 11	46
RS-35A, RS-35M, VS-35M	25	35	5 x 11 x 11	27
RS-20A, RS-20M, RS-20S, VS-20M	16	20	5 x 9 x 10 1/2	18
RS-12A, RS-12M, RS-12S	9	12	4 1/2 x 8 x 9	13
RS-10A	7.5	11	4 x 7 1/2 x 10 1/4	11
RS-7A, RS-7B	5	7	3 1/4 x 6 1/2 x 9 4 x 7 1/2 x 10 3/4	9
RS-4A	3	4	3 1/4 x 6 1/2 x 9	5

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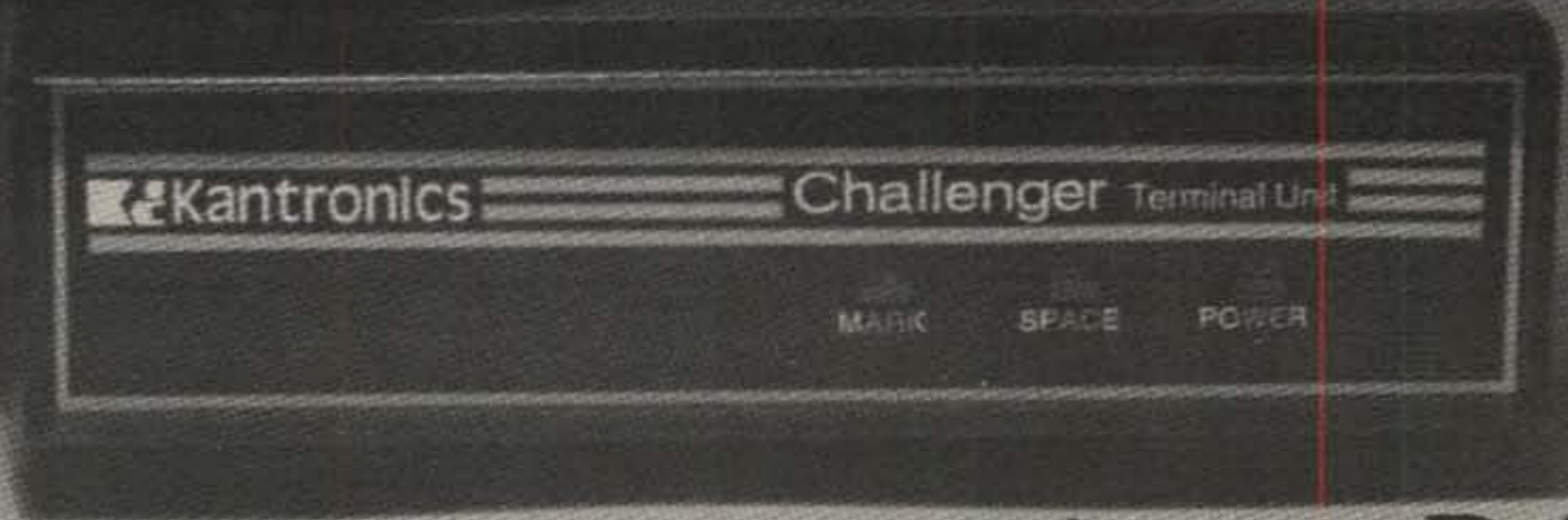
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Please send all reader inquiries directly.

TOP SCORES

WORLD Single Operator All Band		USA Single Op All Band	
9Y4VT	7,153,434	W1KM	2,699,775
NP4A	6,027,752	K1AR	2,374,344
ZS1CT	5,549,304	N2LT	2,201,625
OH2MM/EA8	4,923,660	W3GRF	2,042,880
KV4FZ	4,917,768	K1TO	2,040,300
CT3BQ	4,708,626	N5AU	1,971,050
N6XI/4X	3,109,722	K2VV	1,872,582
4V2C	3,038,732	WA8YVR	1,844,602
W1KM	2,699,775	W4RX	1,758,038
K1AR	2,374,344	N6QR	1,688,850
Single Op Single Band 28 MHz		Single Op Single Band 28 MHz	
C53T	290,420	KZ5M	37,345
N4TO/KP4	232,845	WA6FGV	23,394
CT1BOL	112,690	W4ORT	19,728
YV7QP	104,949	K1UO	16,388
PY3YXZ/PP2	74,045	K0KX	13,725
VK4XA	65,559	KA8NUV	8,200
21 MHz		21 MHz	
YX5A	825,888	NA5R	347,340
5Z4MX	820,338	N4WW	311,911
CX5AO	634,365	K1ZX	274,040
CX1JM	480,000	W6YA	224,880
LZ2KTS	419,920	W5VX	217,160
AD0O/VP9	395,520	WB4TDH	190,592
14 MHz		14 MHz	
YW5R	730,989	W0ZV	412,416
PY4OD	687,152	W8TA	346,622
Y24GD	670,644	N5CR	315,980
OF8AV	582,120	WB8JBM	308,085
EA2IA	431,892	W1IHN	303,232
W0ZV	412,416	N9NC/0	273,372
7 MHz		7 MHz	
VP2KAA	837,366	W6AM	267,624
VP2EEW	562,080	K1KI	262,680
9Y4VU	453,879	K4XS	230,139
UB5JMR	448,318	K1BW	171,392
LU8DQ	438,783	K4PI	168,099
VE3BMV	361,845	K3TW	161,168
3.5 MHz		3.5 MHz	
VP2KAC	332,880	W1FV	83,729
EA9EU	229,150	W9LT	37,062
LZ2PP	181,888	N7RM	26,376
4O1WCY	184,575	WA8DXB	24,817
UV9AX	173,445	W8UVZ	22,989
DJ4AX	157,964	KA5W	22,490
1.8 MHz		1.8 MHz	
UP2BBT/U6V	83,160	K1ZM	15,677
LZ2CJ	54,747	AA1K/3	15,006
PA0HIP	45,066	W8LRL	12,996
G3SZA	40,887	K5UR	10,835
YU3EF	38,808	K1NA	9,306
YU4CF	37,356	N6DX	7,518
Multi-Op Single Transmitter		Multi-Op Single Transmitter	
HH2VP	7,208,271	K1GQ	3,712,412
RF6V	6,326,963	W2YV	3,063,684
PJ7A	5,630,310	W3BGN	2,919,478
V3A	4,929,372	N4AR	2,854,338
5H3WCY	4,170,880	W4NL	2,704,248
NP4Z	4,019,424	N3BB	2,502,864
Multi-Op Multi-Transmitter		Multi-Op Multi-Transmitter	
RW9A	8,035,971	N2AA	7,812,341
XE2SI	7,878,600	KN3O	6,581,568
N2AA	7,812,341	W3LPL	5,357,664
YT3A	7,176,312	K6UA	4,595,340
AH0C	6,877,750	N9MM	4,254,000
KN3O	6,581,568	K6HNZ	3,830,092

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Editing ★ Receive Message Storage ★ Variable Buffer sizes ★ Diddle ★ Word Wraparound ★ Time and Text Transmission.

Hamssoft/Amtor — Includes all features of Hamssoft plus communication in all three modes of AMTOR.

Amtorsoft — Includes all the features of Hamtext but is for use with AMTOR ONLY. The Apple program is available only as a Hamtext/Amtorsoft combination.

Supertap — Receive Only CW, RTTY, ASCII, AMTOR ★ Decode inverted, bit inverted, and unusual bit order ★ Multiple line display ★ “SCOPE” feature for baud rate measure.

Specifications

Input Filter — Four pole Switched Capacitance Filter with 170Hz Shift RTTY bandwidth of 260Hz nominal. Copies any shift.

Audio Input — Minimum level 5mvRMS. Input impedance is 600 ohms unbalanced. Accepts baudot or ASCII code up to 300 baud. Max input level is 12VRMS.

AFSK Output — Crystal controlled. Mark-2125Hz; Space-2295Hz (170 shift). Level 100mvpp (35mvRMS) standard. Optional 500mvpp (175mvRMS). Output impedance 600 ohm unbalanced.

FSK Output — Open Collector +40 VDC Max. Polarity can be reversed.

Scope Output — 10K ohm output impedance.

PTT Output — Open Collector +40 VDC Max.

Computer Connection — TTL Compatible. Inputs also RS232 level compatible.

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Number groups indicate: QSO's/Zones/Countries on each band.

WORLD TOP SINGLE OPERATOR—ALL BAND

Station	160	80	40	20	15	10
9Y4VT	94/6/8	421/18/53	838/20/69	1439/31/80	1288/27/76	881/25/73
NP4A	153/11/24	400/21/64	1191/28/79	1164/32/88	1000/25/75	629/22/69
ZS1CT	1/1/1	91/17/83	377/24/56	1119/32/87	1560/31/90	806/23/72
OH2MM/EA8	14/5/11	388/12/45	956/20/62	485/25/61	1468/21/74	622/21/63
KV4FZ	141/8/16	353/19/47	673/20/67	1239/28/76	1220/26/78	811/23/64
CT3BQ	5/2/5	414/14/45	1068/20/64	1008/26/74	1145/20/71	291/14/47
N6XI/4X	2/1/2	397/9/38	880/18/58	869/23/57	1025/17/59	219/6/30
4V2C	151/8/11	509/16/34	743/20/51	980/26/59	832/21/48	883/14/26
W1KM	19/8/15	367/24/71	326/25/78	612/30/94	463/25/94	50/18/34
K1AR	31/10/20	122/20/60	225/25/74	667/32/97	544/27/89	48/18/32

USA TOP SINGLE OPERATOR—ALL BAND

Station	160	80	40	20	15	10
W1KM	19/8/15	367/24/71	326/25/78	612/30/94	463/25/94	50/18/34
K1AR	31/10/20	122/20/60	225/25/74	667/32/97	544/27/89	48/18/32
N2LT	13/8/11	158/19/62	337/27/77	710/34/91	349/26/75	39/16/29
W3GRF	14/9/30	172/19/59	271/24/68	421/33/87	553/26/82	65/19/44
K1TO	20/9/13	67/18/46	265/27/76	741/32/90	442/23/77	35/13/26
N5AU	22/11/16	112/24/44	367/30/71	355/34/95	454/29/76	85/22/47
K2VV	19/8/12	69/17/50	182/27/66	698/35/101	407/25/75	50/16/29
W8YVR	20/11/15	93/23/54	305/32/76	621/34/93	262/24/68	48/16/32
W4RX	28/12/17	151/21/62	294/29/79	447/30/87	282/24/73	59/19/40
N6QR	31/10/10	105/17/27	416/32/65	467/32/85	291/28/58	147/19/34

WORLD TOP MULTI-OPERATOR SINGLE TRANSMITTER

Station	160	80	40	20	15	10
HH2VP	142/8/15	562/21/62	1193/28/83	1238/34/105	1586/30/94	749/24/63
RF6V	180/12/41	811/18/82	1088/27/108	1006/31/110	992/27/104	289/26/100
PJ7A	124/7/13	404/17/47	1134/19/79	1051/24/84	1390/25/81	663/22/68
V3A	36/7/7	604/17/48	1390/21/61	996/31/73	1335/28/81	672/19/41
5H3WCY	—	26/11/26	317/26/57	1013/33/85	1260/33/86	533/23/68
NP4Z	11/7/9	216/13/37	798/23/66	1324/31/83	1165/27/80	387/20/51

USA TOP MULTI-OPERATOR SINGLE TRANSMITTER

Station	160	80	40	20	15	10
K1GQ	26/13/26	165/25/81	597/34/103	776/34/109	483/26/93	43/19/44
W2YV	18/12/17	152/20/70	521/33/84	792/33/96	486/27/88	41/17/36
W3BGN	33/13/26	174/21/74	302/28/84	778/34/107	437/29/93	54/20/49
N4AR	21/12/20	88/24/69	435/32/86	775/35/105	585/33/79	271/21/46
W4NL	33/13/25	114/19/60	189/31/78	833/36/97	468/29/93	69/20/51
N3BB	23/10/17	94/19/63	425/31/92	425/30/97	571/28/92	49/20/47

WORLD TOP MULTI-OPERATOR MULTI-TRANSMITTER

Station	160	80	40	20	15	10
RW9A	350/16/47	869/22/70	1244/34/103	1340/36/87	1099/34/88	298/17/43
XE2SI	300/12/14	811/16/36	1594/31/58	2219/34/90	1704/29/73	1040/20/37
N2AA	93/17/38	436/28/90	917/37/108	1378/37/124	779/33/108	149/23/65
YT3A	373/12/49	849/20/78	1533/37/105	1341/38/119	758/35/101	229/27/76
AH0C	45/10/8	522/23/39	868/25/59	1305/35/80	1765/32/76	664/24/40
KN30	61/15/32	377/24/81	724/35/113	1403/36/118	746/29/98	150/23/60

USA TOP MULTI-OPERATOR MULTI-TRANSMITTER

Station	160	80	40	20	15	10
N2AA	93/17/38	436/28/90	917/37/108	1378/37/124	779/33/108	149/23/65
KN30	61/15/32	377/24/81	724/35/113	1403/36/118	746/29/98	150/23/60
W3LPL	80/17/38	196/22/68	661/36/110	998/36/109	788/30/102	133/22/58
K6UA	98/15/21	371/30/57	835/37/98	692/38/105	585/33/79	271/21/46
N9MM	75/16/31	137/23/63	590/34/89	1095/36/118	489/29/88	169/22/51
K6HNZ	208/17/23	230/21/40	760/33/74	867/37/108	409/30/71	282/21/43

WORLD TOP 10 QRPP (5w input) All Band

1. UB5UCJ 416,643
2. KZ2E 345,321
3. K8IA 273,408
4. DF4RD 232,674
5. UB5AAL 207,603
6. UA3AGW 101,870
7. SM5CCT 92,700
8. K3WS 88,810
9. DL9CE 73,805
10. JA7AS 66,148

W2TZ	**	194,636	356	63	134	W3YFV	**	40,365	120	51	84	N4ZZ	**	165,600	503	31	89	
W2FTY	**	151,420	249	77	149	K3JGJ	**	32,844	116	36	66	KC4HN	**	45,120	173	26	68	
W2SR	**	136,752	231	73	149	W3FQE	**	17,248	81	29	48	W4AAV	14	216,000	524	36	114	
W2GKZ	**	112,750	218	68	137	W3QIR	**	16,564	72	41	60	W4GTS	**	38,857	154	27	64	
W2AYJ	**	107,310	203	66	133	KC3II	**	6,174	48	16	33	K4XS	7	230,139	696	30	87	
K2SB	**	90,117	194	60	111	W6GMZ/3	28	4,400	50	16	28	K4PI	**	168,099	443	36	101	
KW2J	**	87,325	205	62	113	W3AZ	21	97,745	303	26	87	N4UA	**	114,712	401	26	78	
N2SS	**	80,325	174	70	119	N3RR	14	127,680	373	31	89	W4YE	**	38,976	159	22	65	
WB8RIJ/2	**	70,680	187	51	104	W3SOH	**	2,310	29	13	22	W4FDA	**	25,004	120	20	56	
N2AIF	**	69,440	160	57	103	K3TW	7	161,168	507	31	81	KF4UG	**	22,839	126	18	51	
W2PHT	**	58,520	156	49	84	N3BS	**	146,327	397	35	96	K4XO	**	17,745	100	20	45	
W2DW	**	44,298	133	46	92	W3GG	**	54,600	212	25	66	K4JRF	**	6,120	59	15	25	
K82NU	**	43,173	136	35	82	AD8J/3	**	1,540	23	11	17	N4MO	3.5	20,650	112	17	53	
W2RQ	**	39,852	139	40	68	K13L	3.5	13,725	86	16	45	AA4FF	**	14,941	91	16	51	
K2MN	**	31,472	102	37	75	K3ND	**	13,110	71	20	49	N4TZ	**	11,284	74	16	46	
N2BNB	**	22,345	85	43	66	A13Q	**	9,168	76	16	42	K4JSI	**	8,470	61	14	41	
KC2DE	**	20,301	84	40	61	AA1K/3	1.8	15,006	116	17	44	KC4GR	**	8,466	70	15	36	
NA2Q	**	18,894	80	33	61	W3AP	**	665	18	9	10	W5OG/4	**	6,656	53	15	37	
WA2ASQ	**	16,128	72	36	60	W4RX	A	1,758,038	1261	135	358	N4CC	**	4,300	38	15	28	
W2KTF	**	15,928	68	32	56	K4RZ	**	1,458,175	1204	119	306	N4SU	1.8	6,750	59	16	34	
KT2D	**	8,064	50	26	38	(Opr. K4PQL)						KG4W	**	5,334	55	15	27	
W2HBE	21	270	10	7	8	W3VT/4	**	914,500	826	95	304	N4IN	**	5,043	54	14	27	
K12P	14	203,962	566	32	95	W4WJ	**	751,554	731	118	269	N4KE	**	4,116	41	15	27	
WA2LOG	**	69,678	252	27	71	NQ4I	**	736,134	756	114	243	WA4SVO	**	3,672	52	12	24	
N2UN	7	31,652	143	23	59	N6AV/4	**	513,009	525	105	252	K4JEE	**	1,375	27	11	14	
KF2O	**	18,282	105	18	48	AA4CM	**	467,190	492	110	248	W4PZV	**	1,265	27	9	14	
NC2V	**	14,558	90	19	39	W400	**	373,428	492	89	186	N5AU	A	1,971,050	1395	150	349	
W2KHQ	**	11,055	78	17	38	KA2DIV/4	**	367,780	388	112	243	(Opr. K5ZD)						
WA2IFS	**	5,586	51	12	30	K4KUZ	**	367,680	361	129	254	N5JJ	**	1,108,485	972	127	278	
N2AU	3.5	20,216	105	21	55	K4JLD	**	365,148	427	102	222	K5TSQ	**	700,352	713	114	239	
W2HG	**	4,708	43	12	32	WC4E	**	282,095	453	74	149	N5JB	**	585,276	653	113	210	
W3GRF	A	2,042,880	1496	131	349	AA4S	**	273,504	376	90	174	N5AW	**	427,452	455	125	233	
(Opr. K8DQ)						WB40SN	**	251,034	316	107	194	K5BDX	**	362,979	470	93	186	
N2FB/3	**	1,603,980	1328	120	300	K4PB	**	159,960	288	69	146	K5LP	**	362,934	475	99	183	
N3AD	**	1,544,643	1316	114	300	WMAZ	**	120,400	242	65	135	KV5Y	**	223,560	382	87	143	
W3XU	**	1,346,604	1319	96	258	W9TS/4	**	119,853	237	66	141	W50SJ	**	136,010	268	77	126	
K3ZZ	**	979,080	871	115	283	K4FPF	**	91,683	209	53	114	W5PWG	**	118,188	264	77	124	
W3GU	**	664,950	735	101	229	W4KO	**	81,506	170	61	105	W5JC	**	74,360	163	65	104	
N3AM	**	532,877	601	95	222	K4BAM	**	74,256	177									



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N5TP	**	19,152	103	24	48	W6RR/7	**	543,780	660	94	171	W8BJM	**	308,085	767	36	105	W9RN	**	5,593	50	16	31	VE1BNN	28	14,818	100	20	42
KZ5D	**	13,334	86	17	42	W7AYY	**	177,632	355	72	110	(Opr. W8BAUB)						K8BAC/9	1.8	207	21	5	4	VE1YX	1.8	7,436	169	14	30
K5NU	**	10,620	78	20	39	W7IIT	**	175,230	369	62	103	W8TWA	**	115,560	380	30	77	K4VX/Ø	A	1,578,260	1217	138	322	VE2AYU	A	601,020	933	83	188
NJ5U	**	7,392	61	18	30	W7FGT	**	167,890	378	60	103	N8AKY	**	72,450	249	32	73	KØLUZ	**	996,391	960	120	259	VE2DPO	**	198,940	656	53	92
K5UR	1.8	10,835	125	19	36	W7OM	**	158,424	346	65	103	W8AFX	**	18,525	101	20	45	WØWP	**	869,000	840	122	273	VE3DZV	A	304,008	636	71	141
N6QR	A	1,688,850	1457	138	279	W7TC	**	124,108	316	66	76	W8VUU	**	16,043	100	22	39	WØRS	**	269,500	397	94	156	VE3HPI	**	70,000	267	43	69
N6GG	**	892,584	969	114	208	W7EKM	**	98,527	245	58	85	N8RA	7	104,967	367	30	77	WØRSG	**	230,688	407	79	137	VE2WA/3	**	46,010	157	55	106
N6HR	**	405,880	528	106	172	W7KSA	**	94,975	286	46	85	W8LU	**	75,495	254	28	77	KMØL	**	207,501	327	87	154	VE2AEJ/3	**	5,365	60	14	23
W6BSY	**	404,448	521	94	170	K7JU	**	71,672	197	53	83	W8DXG	**	4,294	42	13	25	WØEJ	**	176,460	327	74	130	VE3NBE	14	47,916	302	21	45
K6HIH	**	397,245	670	84	129	W7KSA	**	59,605	164	51	80	W8DXB	3.5	24,817	114	22	61	KØBJ	**	146,200	269	73	127	VE3BMV	7	361,845	1149	33	96
W6OKK	**	339,160	501	93	151	K7KJM	**	59,148	233	37	56	W8DXB	3.5	24,817	114	22	61	NØZA	**	146,200	269	73	127	VE3INQ	1.8	10,636	214	10	16
N6AN	**	337,484	514	91	147	KC7V	**	46,592	137	52	76	W8UVZ	**	22,989	126	25	54	WØVX	**	146,016	277	85	123	VE3MFA	**	10,179	173	12	17
W6YKM	**	293,092	579	70	118	KN7L	**	39,050	145	50	60	W8LND	**	20,596	106	22	54	KIØJ	**	103,455	225	62	109	VE4AEX	A	47,385	169	45	74
W6FSJ	**	255,148	409	88	139	W7IEU	**	36,396	125	46	62	AØB	**	12,412	97	18	40	KØUK	**	93,240	287	50	61	VE4AIY	**	43,928	251	25	51
K6DR	**	247,544	408	88	144	W3XY/7	**	31,668	144	30	54	W8KKI	**	8,692	60	15	38	KMØR	**	91,656	209	62	109	VE5AE	14	18,202	223	15	23
KD9E/6	**	239,598	365	86	157	W7OEM	**	24,510	100	34	52	W8LRL	1.8	12,996	98	18	39	KJØG	**	86,041	236	59	80	VE6OU	**	138,330	637	26	64
WB6JMS	**	232,065	363	93	150	KA7FEF	**	20,992	104	36	46	K8MFO	**	4,017	46	14	25	NØBSH	**	79,758	176	71	118	VE7WJ	A	2,076,000	2489	121	225
WA6HAE	**	229,229	359	86	143	KD7H	**	18,250	94	33	40	AØBI	**	3,564	46	14	22	WØRXL	**	47,402	145	54	83	(Opr. KE7V)					
N6JL	**	205,540	425	65	107	W7GUR	**	3,762	43	16	17	K8BTH	**	1,776	39	10	14	W6FN/Ø	**	45,296	145	55	94	VE7IQ	21	3,816	86	10	8
W6CS	**	200,644	354	78	128	W87FDD	21	120,640	419	31	73	K9DX	A	1,506,505	1166	136	319	KCØXK	**	45,076	152	48	70	VE7BS	1.8	7,182	164	11	10
W6WB	**	180,294	328	70	129	N7RO	**	80,964	380	26	52	K9CAN	**	418,880	478	98	222	W8BZRL/Ø	**	28,035	104	45	60						
K6DC	**	174,736	375	64	99	K7ZA	14	170,202	518	34	80	KV9S	**	389,918	464	112	219	W8ØTKJ	**	22,359	100	38	49						
K6YK	**	152,468	304	74	114	AG7M	**	70,880	299	27	53	K9B	**	366,267	456	118	245	NØDJ	**	8,733	52	27	44						
K6LAN	**	144,109	312	67	106	K7UR	7	111,552	401	30	66	K9B	**	366,267	456	118	245	NØCNV	**	7,440	59	19	29						
AA6EE	**	104,140	238	64	100	KC7EM	**	37,440	159	28	52	W9OP	**	313,472	465	77	171	WØMJA	**	680	14	8	12						
K6OC	**	97,474	219	59	104	N7RM	3.5	26,376	174	19	37	W9NA	**	203,376	330	75	153	KØKX	28	13,725	86	17	44						
W6BZE	**	98,592	228	58	98	W7DRA	**	2,060	40	8	12	W9KE	**	178,752	312	73	155	WØYK	21	133,860	529	28	69						
W6NKR	**	92,020	198	66	106	N7CKD	1.8	3,614	66	13	13	W9GIL	**	178,623	290	73	150	NØJR	**	59,290	225	26	72						
W6BYH	**	89,640	191	73	107	KG7D	**	1,980	61	10	10	AF9Y	**	156,960	250	74	144	WØZV	14	412,416	982	36	108						
N6UW	**	56,280	156	56	84	W8YVR	A	1,844,602	1349	140	338	W9WQ	**	137,808	288	56	120	N9NC/Ø	**	273,372	723	33	99						
N6IC	**	51,388	160	44	72	N8II	**	1,028,040	927	114	276	AK9Z	**	127,890	236	78	132	KØZJ	**	188,727	522	35	94						
W6OUL	**	49,776	159	56	66	KE8M	**	328,356	459	78	174	K9G	**	124,407	223	73	134	WØJU	3.5	7,098	72	13	26						
WA6TKT	**	45,492	169	42	60	N8BJQ	**	301,624	385	99	197	K9AB	**	111,125	247	58	117	WØKEA	1.8	4,480	86	12	20						
W6MFZ	**	40,950	129	43	74	W8BQP	**	274,428	400	82	170	KS9U	**	103,179	186	84	127	WØHW	**	810	24	8	10						
W6PBI	**	39,346	142	44	59	K8SS	**	221,010	308	97	181	K9MDO	**	75,680	172	65	107												
K6CSL	**	26,754	135	36	42	K8QWY	**	209,990	334	84	146	W9HRO	**	60,445	157	60	97												
KS6H	**	19,716	136	23	30	W8IXE	**	204,544	309	82	174	W8SJKI	**	55,944	146	57	91	ALASKA											
N6ADK	**	12,900	76	28	32	K8MNG	**	187,669	325	81	153	W9GXR	**	43,524	134	44	80	KL7RA	A	981,120	1840	86	133						
W6OVO	**	11,904	73	30	34	KZ8Y	**	172,208	282	80	149	KØGE	**	42,108	122	51	81	K4FW/KL7	**	9,275	111	18	17						
WB6CUA	**	7,704	48	34	38	K8MR	**	130,009	219	73	150	K9BQL	**	20,210	87	40	54	KL7AN	14	5,796	75	13	15						
W6SX	**	3,596	46	14	15	K8NZ	**	129,156	217	72	157	KA9ACS	**	19,106	87	34	48	WL7E	3.5	8,993	158	10	13						
K6RK	**	2,847	26	18	21	W8QID	**	120,328	264	58	111	W9TNZ	**	11,832	69	24	44	ANGUILLA											
KAGIX	**	2,479	57	20	17	W8GOC	**	113,430	219	69	130	W9REC	**	8,094	50	31	40	VP2EAG	14	288,456	1530	20	64						
W6ODE	**	1,176	28	4	10	W8UPH	**	67,758	192	46	92	W9YDP	**	1,581	21	12	19	(Opr. KJØØ)											
WA6FGV	28	23,394	219	18	24	K8CW	**	61,851	157	52	107	K9QVB	21	108,330	339	29	86	VP2EAW	7	562,080	1929	28	92						
KM6K	**	1,984	25	13	19	W8BYG	**																						

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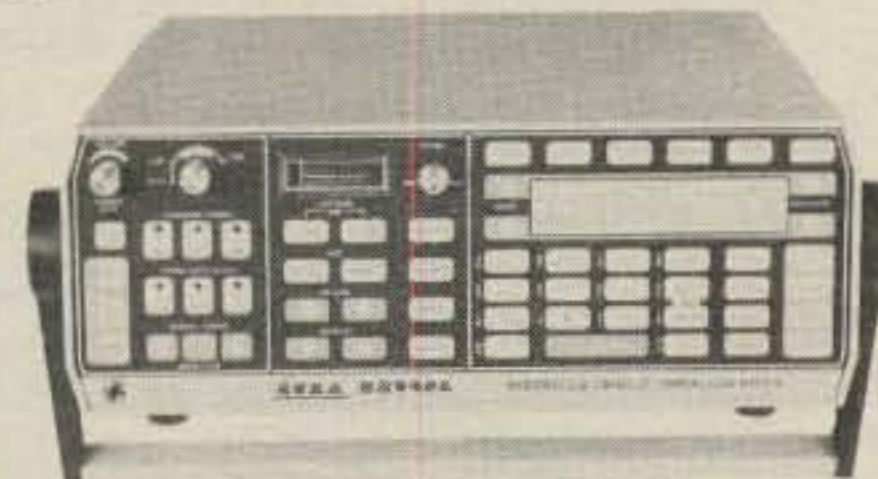


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\$99⁹⁵ MFJ's fastest selling tuner packs in plenty of new features.
New styling! Brushed aluminum front. All metal cabinet.
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New antenna switch! Front panel mounted. Select 2 coax lines, direct or through tuner, random wire/balanced line or tuner bypass for dummy load.

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300 watt
Versa
Tuner II.

Matches everything from 1.8 - 30 MHz, coax, randoms, balanced lines, up to 300W output, solid state or tubes.

Tunes out SWR on dipoles, vees, long wires, verticals, whips, beams, quads.

Built-in 4:1 balun. 300W, 50-ohm dummy load. SWR meter and 2 range wattmeter (300W and 30W).

6 position antenna switch on front panel, 12 position air-wound inductor; coax connectors, binding posts, black and beige case. 10 x 3 x 7 in.



MFJ-989 3 KW ROLLER INDUCTOR VERSA TUNER V

\$329⁹⁵ Meet "Versa Tuner V". It has all the features you asked for, including the new smaller size to match new smaller rigs - only 10 3/4"W x 4 1/2"H x 14 7/8"D.

Matches coax, balanced lines, random wires — 1.8 to 30 MHz. 3 KW PEP - the power rating you won't outgrow (250 pf-6KV caps).

Roller inductor with a 3-digit turns counter plus a spinner knob for precise inductance control to get that SWR down to minimum every time.

Built-in 300 watt, 50 ohm dummy load, built-in 4:1 ferrite balun.

Built-in 2% meter reads SWR plus forward and reflected power in 2 ranges

MFJ-940B, \$79.95, 300 watts, SWR/Wattmeter, antenna switch on rear.

No balun. 8 x 2 x 6 in. eggshell white with walnut grained sides.

MFJ-945, \$79.95, like MFJ-940B with balun, less antenna switch.

MDJ-944, \$79.95, like MFJ-940B with balun, antenna switch on front panel, less SWR/Wattmeter.

Optional mobile bracket for 940B, 945, 944, \$5.00.

MFJ-900 200 WATT VERSA TUNER

Matches coax, random wires 1.8-30 MHz. Handles up to 200 watts output; efficient airwound inductor gives more watts out.

\$49⁹⁵
(+\$4)

5x2x6 in. Use any transceiver, solid state or tube.

Operate all bands with one antenna.

OTHER 200 WATT MODELS:

MFJ-901, \$59.95, like 900 but includes 4:1 balun for use with balanced lines.

MFJ-16010, \$39.95, for random wires only. Great for apartment, motel, camping operation. Tunes 1.8-30 MHz.

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Run up to 1.5
KW PEP **\$229⁹⁵**
(+\$10)

and match any feedline continuously from 1.8 to 30 MHz; coax, balanced line or random wire.

Built-in SWR/Wattmeter has 2000 and 200 watt ranges, forward and reflected power. 2% meter movement. 6 position antenna switch handles 2 coax lines (direct or through tuner), wire and balanced lines. 4:1 balun

250 pf 6 KV variable capacitors. 12 position inductors. Ceramic rotary switch. All metal black cabinet and panel gives RFI protection, rigid construction and sleek styling.

Flip stand tilts tuner for easy viewing. 5 x 14 x 14 inches.

(200 and 2000 watts). Meter light requires 12 VDC. Optional AC adapter MFJ-1312 is available for \$9.95.

6-position antenna switch (2 coax lines, through tuner or direct, random/balanced line or dummy load). SO-239 connectors, ceramic feed-throughs, binding post grounds.

Deluxe aluminum low-profile cabinet with sub-chassis for RFI protection, black finish, black front panel with raised letters, tilt bail.

MFJ-981, \$239.95. 3 KW, 18 position switched dual inductor. SWR/Wattmeter. 4:1 balun.

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MPT3100—the acknowledged top-of-the-line system for both commercial and serious amateur RTTY and CW stations. HAL pioneered the radio mailbox technique with the MPT3100, and now the new DSK3100 disc drive option gives you 326,000 characters of message storage. The system is designed particularly for the amateur, commercial, or military operator who has to handle a large amount of traffic. You can collect, edit, and retransmit traffic perfectly with a minimum of effort. The ST6000 is renowned for its weak-signal performance and reliability. Add the ARQ1000 for full AMTOR operations, including an AMTOR mailbox. If you are serious about your code and need high performance and reliability, this system is the proven world leader.

CT2200 + KB2100 + ARQ1000 + RS2100 + KG12:

The CT2200 and KB2100 give you an integrated system that includes video, RTTY demodulators (high, low, modem low, and modem high tones), and many advanced features. Operate Baudot or ASCII at 45–1200 baud and CW at 5–99 w.p.m. Add the ARQ1000 for ALL AMTOR features (not just *some* of them). The RS2100 RTTY Scope gives you the acknowledged best tuning indicator for a complete RTTY system. Also included in the CT2200 is selective-call ASCII printer output, split screen, 36 or 72 characters per line, smooth scroll, and 2 or 4 pages of display memory. In addition, the CT2200 has 2 HERE IS and 8 large "brag-tape" memories that are programmable and non-volatile. This is our most popular system, used by thousands of amateurs around the world.



CRI-200:

At last, a computer interface that *really* works and has an accurate tuning indicator. Take advantage of HAL's years of experience in RTTY and see how good computer RTTY can be. Best of all, it's universal and you can select the computer and software of your choice. Why be frustrated with computer RTTY? Hook-up the CRI-200 and work ALL the stations!



CWR6850:

Have a space problem or want portable RTTY? The CWR6850 is a one-package complete RTTY system. All you need is your transceiver and 12 VDC—the rest is in the CWR6850, including the screen. The high-performance RTTY demodulator for all shifts and either high or low tones is built-in. AND, the system is expandable! Add the ARQ1000 for AMTOR, the RS2100 RTTY Scope, and an ASCII printer, and you have a no-compromise base station for all modes.



HAL COMMUNICATIONS CORP.
BOX 365
URBANA, IL 61801 • (217) 367-7373

Table of international call rates for various countries including I.T.U. GENEVA, PORTUGAL, RHODES, ROMANIA, SCOTLAND, SICILY, SPAIN, SWEDEN, SWITZERLAND, WALES, YUGOSLAVIA, NORWAY, POLAND, GREECE, HUNGARY, ICELAND, IRELAND, ITALY, and EUROPEAN U.S.S.R. Each entry lists a country code, a number, and several columns of rates.

Country/Region	Code	Frequency	Power	Channels	Notes
UA2EC	7	30,422	238	18	64
UA2FCW	1.8	48	5	4	4
KARELIA-FINISH					
UA1NBD	A	92,302	514	39	94
UA1NAY	..	63,252	257	38	88
UA1NBF	..	6,321	112	12	31
UN1CD	14	5,206	94	12	26
LATVIA					
UQ2GDQ	7	277,211	1302	31	90
UQ2GA	..	39,776	320	24	64
UQ2GMI	..	14,276	168	7	79
UQ2PC	..	1,050	36	6	19
UQ2GBN	3.5	10,419	151	5	64
UQ2GKM	1.9	11,365	221	9	32
LITHUANIA					
UP2BAO	A	792,313	1350	88	271
UP2BEI	..	518,375	1071	75	200
UP2BAR	..	453,840	907	83	222
UP2BBF	..	301,994	720	73	186
UP2BEX	..	296,948	795	63	191
UP2PAQ	..	249,306	722	56	166
UP2PAW	..	226,243	607	66	167
UP2OQ	..	170,200	618	52	133
UP2BFE	..	115,668	413	59	130
UP2BB	..	100,640	511	34	114
UP2BBI	..	93,825	499	29	110
UP2DV	..	73,920	315	44	116
UP2BIO	..	63,840	481	23	97
UP2PBM	..	61,589	383	32	89
UP2BFU	..	55,076	284	27	71
UP2BCT	..	54,390	252	37	110
UP2BOX	..	53,160	350	31	89
UP2PCX	..	20,504	179	17	61
UP2BEG	..	16,340	153	23	63
UP2BKZ	..	12,035	70	30	53
UP2BIP	..	9,035	78	22	43
UP2PCE	..	5,523	118	19	42
UP2BCV	..	1,649	65	7	29
UP2BLR	28	7,866	64	20	37
UP2BEL	21	62,118	255	30	72
UP2ND	..	23,940	62	10	21
UP2BDO	..	4,032	53	12	24
UP2NK	14	332,640	1131	33	99
UP2BJM	..	71,981	439	24	67
UP2BHO	..	60,038	414	21	56
UP2XX	..	45,175	369	19	46
UP2BC	..	15,149	200	12	39
UP2OU	7	62,900	553	18	67
UP2BLE	..	17,171	143	18	59
UP2BKT	..	14,043	263	7	42
UP2PCU	..	3,306	80	7	31
UP2BCR	3.5	77,679	775	16	65
UP2CY	..	72,759	768	14	65
UP2BFH	..	51,819	640	15	54
UP2CT	..	37,240	570	14	42
UP2BEN	..	29,150	506	11	42
UP2BNA	..	16,464	344	8	34
UP2BMX	..	14,023	343	7	30
UP2BMC	..	5,124	167	8	20
UP2BCG	1.8	8,073	186	6	33
MOLDAVIA					
UO5OWC	A	136,155	743	55	90
UO5DEK	28	132	9	3	3
UO5ODA	21	10,653	83	20	33
UO5OGQ	..	512	18	4	12
UO5GR	3.5	6,300	104	9	33
UO5ODB	1.8	9,009	214	7	32
UKRAINE					
UB5EC	A	1,780,680	2238	117	339
UB5ILD	..	1,010,808	1282	117	287
UB5ICS	..	433,722	819	89	228
UB5IET	..	308,000	878	63	161
UB5FDM	..	222,615	573	67	188
UY5TE	..	206,976	643	62	162
UB5ENV	..	169,136	667	42	134
UB5TAM	..	146,652	504	54	148
UB5CBA	..	137,376	577	43	116
UB5TN	..	115,662	308	55	167
UB5UGO	..	110,124	322	50	157
UB5UKJ	..	89,166	394	42	112
UB5IPJ	..	78,705	310	48	117
UB5UKW	..	78,208	148	81	127
UB5QFE	..	75,509	307	42	119
UB5AEZ	..	69,961	511	34	88
UB5IAN	..	69,918	411	32	97
UB5LAL	..	67,522	397	55	108
UB5MVJ	..	61,698	355	29	84
UB5DW	..	59,200	190	47	101
UB5OAP	..	56,430	303	33	77
UB5VK	..	53,656	270	53	99
UB5IIO	..	49,046	212	43	94
UB5WAR	..	45,234	216	44	82
UB5LJD	..	32,054	221	26	68
UB5TR	..	31,744	205	38	90
UB5ENI	..	27,257	191	28	69
UB5LLE	..	25,200	163	33	72
UB5EEP	..	17,670	138	23	72
UB5MST	..	17,464	151	22	52
UB5QKC	..	14,999	105	28	59
UB5UCC	..	10,440	107	19	41
UB5VAL	..	9,658	82	22	45
UT5HP	..	9,500	57	27	49
UB5CN	..	8,976	78	19	49
SOUTH AMERICA					
ARGENTINA					
LU1EWL	A	469,798	999	66	95
LU6EF	..	436,977	731	80	127
LU7JI	..	41,230	204	32	38
LU4FDM	21	325,080	1053	28	77
LU4IAB	..	103,970	500	23	51
LU6HAA	14	53,298	292	25	38
LU8DQ	7	438,783	1340	33	78
LU9EIE	1.8	2,624	59	8	8
BRAZIL					
PY2DLK	A	498,183	1168	51	96
PY200	..	348,140	697	63	106
PP7JCO	..	136,869	368	50	79
PT7AQ	..	135,410	436	40	70
PY2CAR	..	63,875	185	51	74
PY2KP	..	46,515	159	46	59
PY2RNJ	..	45,576	294	25	29
PY2ERA	..	29,792	95	49	63
PY2RUB	..	24,130	93	38	57
PY1AYE	..	10,619	94	18	23
ZV2ACZ	..	10,360	61	30	44
PY1PL	..	8,304	121	12	12
PY2LGV	..	6,176	69	14	18
PP3YXZ/
PP2	28	74,045	425	21	38
PY2AC	..	19,845	151	19	30
PY2BTR	21	124,845	496	24	63
PT7AA	..	99,468	449	21	60
PP2JT	..	56,166	310	22	44
PY1APS	..	20,336	172	17	24
PY1DGB	..	12,095	105	16	25
PY3CNW	..	7,548	72	18	19
PY2UJJ	..	5,694	53	13	26
PT9RMF	..	3,016	41	13	13
PY40D	14	687,152	1838	35	99
PY5VX	..	84,692	463	20	..
PY2GCW	..	35,160	199	22	38
PY2SLS	..	7,974	151	9	9
PY2FRW	..	1,386	21	5	17
PY7ZZ	7	125,496	500	24	60
PY1BOA	..	7,138	60	16	27
CHILE					
CE1ADG	A	165,636	659	40	46
CE6EAT	..	77,300	269	51	49
CE5EMZ	14	18,315	170	13	24
CE3DNP	3.5	7,560	157	9	9
COLOMBIA					
HK3NBB	A	1,944,162	2212	91	206
HK1AMW	..	878,397	1343	78	145
EASTER ISLAND					
CEBAE	A	15,933	115	24	23
ECUADOR					
HC1SK	3.5	102,660	583	16	44
PERU					
OA4SS	A	109,275	500	39	36
TRINIDAD & TOBAGO					
9Y4VT	A	7,153,434	4961	127	359
<i>(Opr. N6AA)</i>					
URUGUAY					
CX5AO	21	634,365	1804	31	96
CX1JM	..	480,000	1403	31	89
CX8DT	3.5	25,040	221	17	23
VENEZUELA					
YV4BOU	A	6,270	40	25	30
YV7OP	28	104,949	522	22	47
YV3BNJ	..	48,960	264	21	43
YX5A	21	825,888	2503	26	86
4M7PF	..	111,975	514	27	53
YV4ABR	..	97,455	458	22	51
YV5R	14	730,989	1999	32	91
4M3AGT	3.5	133,152	617	21	52
YV2IF	1.8	14,790	163	10	24
YV10B	..	7,180	122	7	13
MULTI-OPERATOR SINGLE TRANSMITTER NORTH AMERICA					
UNITED STATES					
K1GQ	3,712,412	2090	151	456	
K1YR	1,456,248	1349	107	269	
KS1N	1,084,914	1120	88	245	
W1HNZ	435,214	621	74	173	
W1BR	426,213	587	78	183	
AK1L	351,390	560	72	149	
K1TR	126,630	263	68	121	
KS1Y	70,835	177	56	99	
K1FWF	68,000	154	53	107	
WB1CNM	7,449	284	26	65	
W2YV	3,063,684	2010	142	391	
K2BU	2,085,424	1604	125	326	
N2RM	1,767,676	1353	120	337	
K2GHV	1,682,230	1445	121	289	
W2AZO	717,885	818	93	222	
K2BK	633,384	669	98	244	
W2UI	311,082	418	84	191	
K2TD	127,758	232	74	140	
W3BGN	2,919,478	1778	145	433	
N3BB	2,502,864	1587	138	408	
N3LR	1,022,250	940	94	281	
AA3B	719,614	743	97	246	
KB3MM	647,636	637	97	262	
K3UEI	317,900	418	94	181	
WB3JRU	96,030	201	74	120	
W3GNO	27,324	105	31	68	
N4AR	2,854,338	1801	154	412	
W4NL	2,704,248	1706	148	404	
N4KG	1,258,650	1029	130	320	
K4CEF	1,123,584	899	127	329	
N4XM	668,420	640	112	268	
W48BBH	311,181	387	102	201	
WA4QQV	294,768	415	86	181	
WB4GNT	5,836	69	38	5	

HA7KSR	1,225,500	1835	104	271
HG1Z	1,206,322	1802	96	242
HA5KCC	1,146,992	1733	96	247
HG8U	1,068,953	1549	103	280
HA1KRR	818,082	1485	80	202
HA8KCK	688,510	1220	88	222
HG19HB	581,854	1120	86	213
HA7KLG	577,709	1062	98	221
HA6KNI	527,310	1186	73	206
HA8KVK	434,196	943	67	185
HA3KGC	431,469	1113	65	186
HA2KMR	360,725	842	68	167
HA7KLF	196,648	710	51	137
HA7KPW	114,576	397	53	123
HA7KSF	8,064	108	18	46

IRELAND

EI3DP	159,276	657	39	117
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ISLE OF MAN

GD4UFB	2,587,130	3262	111	344
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ITALY

ID2UIY	1,021,649	1728	88	235
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JERSEY

GJ3SXW	2,004,702	2415	102	311
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NETHERLANDS

PA8GN	1,012,424	1562	99	259
PA3AQL	78,202	368	35	87

NORWAY

LA1H	1,177,290	1358	100	281
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POLAND

SP9KVW	89,540	677	79	192
SP8WCY	57,845	363	30	85
SP6PDT	24,684	140	37	65
SP9PDG	1,612	40	10	21

ROMANIA

Y05KAU	376,068	960	76	201
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SPAIN

EA3VY	3,729,792	3569	125	403
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SWEDEN

SL2ZZU	1,259,020	1745	98	242
SK6RR	778,794	1590	76	217
SK6JA	568,508	1139	87	224
SK7GC	213,032	443	69	179
SK6EI	116,820	475	45	120

SWITZERLAND

HB9ADD	785,232	1061	104	232
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U.N.—VIENNA

4U1VIC	9,537	133	16	35
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EUROPEAN U.S.S.R.

BYELO-RUSSIA

UK2AAB	847,704	1371	75	211
UK2ABC	423,260	1196	68	217
UK2WAF	121,184	350	62	129
UK2WAY	79,983	556	44	96
UK2LAN	18,765	261	22	47
UK2WAE	10,010	134	18	37
UK2AAP	5,504	61	15	28

ESTONIA

UK2RDX	2,478,112	2338	149	443
RR2WCY	273,064	937	65	167

EUROPEAN S.S.R.

RV4WCY	2,711,790	3279	131	391
RV6WCY	1,575,999	3028	102	267
UK4WAB	1,538,249	1974	115	314
UK4WAA	700,260	1265	87	243
UK1TBB	504,210	953	83	211
UK4PAE	491,398	1001	81	193
UK3GAF	487,809	1168	72	189
UK6AJA	356,421	922	69	178
UK4UAL	355,431	863	68	189
UK6LEZ	316,602	585	55	231
UK3TBY	218,688	711	44	174
UK10DP	201,292	599	51	131
UK3DBV	191,208	643	52	134
UK1AAW	175,525	775	43	132
UK6HAA	170,625	661	48	147
UK3XAB	133,974	423	44	118
UK3TCJ	100,595	425	41	114
UK3DDU	36,957	206	45	82
UK1ADR	33,568	614	33	77
UK3SAA	23,436	103	25	68
UK1ACT	22,145	131	22	55
UK3XAV	21,082	341	25	81
UK3ABS	11,286	120	19	47
UK3TBF	195	9	6	9

KALININGRADSK

UK2FAA	2,461,888	2606	141	397
UK2FBR	99,203	426	79	90

KARELO-FINISH

UK1NAP	61,271	450	34	68
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LITHUANIA

UK2PCR	1,932,280	2100	153	362
RP2WCY	1,732,125	2552	112	335
UK2PRC	1,680,096	1913	129	344
UK2BAS	1,011,681	1622	89	274
UK2BCC	799,000	1373	81	259
UK2BAG	673,685	1178	86	249
UK2BBX	486,640	1133	68	218
UK2BBF	410,982	951	68	218
UK2BCM	213,888	700	50	142
UK2BBQ	135,716	656	35	113
UK2BBE	21,212	377	11	42

MOLDAVIA

RO5WCY	711,744	1890	99	165
UK5OBD	154,886	523	49	125
UK5OAR	27,311	239	33	54

UKRAINE

RT5WCY	2,234,947	2944	115	318
UK5MCO	1,879,995	2681	107	296
UK5YAA	1,589,965	2292	105	296
UK5QBE	957,296	1510	98	278
UK5SAB	634,680	1399	58	188
UK5CAT	588,071	1262	89	188
UK5LAN	334,488	914	60	171
UK5IFN	309,262	955	67	135
UK5MBQ	246,512	732	61	156
UK5DAA	130,272	515	47	130
UK5VAV	93,684	470	42	106
UK5MDI	85,910	471	36	85
UK5ICX	61,919	271	47	96
UK5HAB	49,848	211	55	79
UK5WCA	32,628	330	21	68
UK5WAZ	14,446	216	12	50
UK5SBL	10,701	317	11	18
UK5UAP	10,230	79	23	39
UK5WCB	3,894	104	7	26

YUGOSLAVIA

YT3T	969,969	1536	92	265
407WCY	578,716	1325	82	216
YT3L	478,270	1577	42	127
4N3A	421,750	852	61	189
YU4CBC	108,864	312	46	98
YU2AKL	54,069	447	22	45

OCEANIA

AUSTRALIA

VK2WU	1,761,375	2486	95	180
VK3BUR	230,575	677	49	66

FRENCH POLYNESIA

F08FW	958,410	1433	95	135
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HAWAII

AI6V/KH6	2,051,308	2837	104	140
AH6AZ	1,586,015	2298	100	135

SOUTH AMERICA

ECUADOR

W6QL/HC1	1,469,832	1841	91	182
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URUGUAY

CX7CO	2,757,650	2666	108	242
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**MULTI-OPERATOR
MULTI-TRANSMITTER
NORTH AMERICA**

UNITED STATES

N2AA	7,812,341	3801	176	537
KN3D	6,581,568	3511	162	502
W3LPL	5,357,664	2856	173	485
K6UA	4,595,340	2852	164	406
N9MM	4,254,000	2555	160	440
K6HNZ	3,830,092	2756	159	359
W3GM	3,510,500	2179	150	445
K5LZO	3,417,414	2334	153	393
N6RO	2,988,937	2312	147	322
K1RX	2,781,475	2061	132	353
K3ZUF	2,507,618	1622	140	398
N6TU	2,446,732	1856	149	330
W8AIIH/9	2,417,435	1968	143	362
K6RU	2,337,750	1829	139	311
AA6T	2,136,816	1831	138	288
K1XM	1,154,198	1009	118	291
AK6T	923,835	899	124	239

ALASKA

KL7Y	2,361,594	2932	119	208
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CANADA

VE3PCA	2,493,424	2575	121	291
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MEXICO

XE2SI	1,878,600	7668	142	308
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ASIA

ASIATIC U.S.S.R.

RW9A	8,035,971	5200	159	442
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JAPAN

JA9YBA	4,839,968	3516	164	332
JA2YKA	4,692,792	3349	167	340
JA3YKC	3,066,750	2650	144	291
JA3YBF	2,455,916	2209	148	256
JA2YEF	1,131,000	1354	113	187
JA7YFB	869,550	3410	104	151

SAUDI ARABIA

HZ1AB	3,120,307	2994	105	274
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EUROPE

ENGLAND

GB4ANT	3,321,614	4421	121	322
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FED. REP. OF GERMANY

DL8KF	4,047,819	3745	147	424
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FINLAND

OH1AA	3,487,000	3452	138	412
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NORWAY

L65LG	425,500	1002	64	166
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POLAND

SP7KTE	64,246	149	65	117
SP1KNU	14,976	259	9	39

YUGOSLAVIA

YT3A	7,176,312	5083	169	528
YU1EXY	5,788,687	4536	160	469

OCEANIA

MARIANAS ISLANDS

AH8C	6,877,750	5164	149	302
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QRPP

UB5UCJ	A	416,643	739	81	212
KZ2E	"	345,321	415	70	163
K8IA	"	273,408	400	86	170
DF4RD	"	232,674	522	67	180
UB5AAL	"	207,603	629	58	175
UA3AGW	"	101,870	349	46	143
SM5CCT	"	92,700	397	37	113
K3WS	"	88,810	203	54	112
DL9CE	"	73,805	321	38	107
OZ5WQ	"	72,500	227	37	90
JA7AS	"	66,148	251	39	53
UP2BFC	"	53,856	272	43	101
OK1DKR	"	53,605	265	37	114
F9YZ	"	52,704	214	35	73
WR4K	"	50,172	133	49	



HF Equipment
IC-740* 9-band 200w PEP xcvr w/mic \$1099.00 **899⁹⁵**
***FREE PS-740 Internal Power Supply & \$50 Factory Rebate - until gone!**

- | | | |
|--------------------------------------|--------|-------------------|
| PS-740 Internal power supply..... | 159.00 | 149 ⁹⁵ |
| *EX-241 Marker unit..... | 20.00 | |
| *EX-242 FM unit..... | 39.00 | |
| *EX-243 Electronic keyer unit..... | 50.00 | |
| *FL-45 500 Hz CW filter (1st IF).... | 59.50 | |
| *FL-54 270 Hz CW filter (1st IF).... | 47.50 | |
| *FL-52A 500 Hz CW filter (2nd IF) | 96.50 | 89 ⁹⁵ |
| *FL-53A 250 Hz CW filter (2nd IF) | 96.50 | 89 ⁹⁵ |
| *FL-44A SSB filter (2nd IF) | 159.00 | 144 ⁹⁵ |
| SM-5 8-pin electret desk microphone | 39.00 | |
| HM-10 Scanning mobile microphone | 39.50 | |
| MB-12 Mobile mount..... | 19.50 | |

***Options also for IC-745 listed below**

- | | | |
|-------------------------------------|-----------|-------------------|
| IC-730 8-band 200w PEP xcvr w/mic | \$829.00 | 599 ⁹⁵ |
| FL-30 SSB filter (passband tuning) | 59.50 | |
| FL-44A SSB filter (2nd IF)..... | 159.00 | 144 ⁹⁵ |
| FL-45 500 Hz CW filter..... | 59.50 | |
| EX-195 Marker unit..... | 39.00 | |
| EX-202 LDA interface; 730/2KL/AH-1 | 27.50 | |
| EX-203 150 Hz CW audio filter | 39.00 | |
| EX-205 Transverter switching unit | 29.00 | |
| SM-5 8-pin electret desk microphone | 39.00 | |
| HM-10 Scanning mobile microphone | 39.50 | |
| MB-5 Mobile mount..... | 19.50 | |
| IC-720A 9-band xcvr/.1-30 MHz rcvr | \$1349.00 | 899 ⁹⁵ |
| FL-32 500 Hz CW filter..... | 59.50 | |
| FL-34 5.2 kHz AM filter | 49.50 | |
| SM-5 8-pin electret desk microphone | 39.00 | |
| MB-5 Mobile mount..... | 19.50 | |
| IC-745 9-band xcvr w/.1-30 MHz rcvr | \$999.00 | 769 ⁹⁵ |
| PS-35 Internal power supply..... | 160.00 | 144 ⁹⁵ |
| CFJ-455K5 2.8 kHz wide SSB filter | 4.00 | |
| HM-12 Hand microphone | 39.50 | |
| SM-6 Desk microphone | 39.00 | |

- | | | |
|-----------------------------------|--------|-------------------|
| PS-35 Internal power supply..... | 160.00 | 144 ⁹⁵ |
| CFJ-455K5 2.8 kHz wide SSB filter | 4.00 | |
| HM-12 Hand microphone | 39.50 | |
| SM-6 Desk microphone | 39.00 | |

***See IC-740 list above for other options (*)**



- | | | |
|--------------------------------------|-----------|-------------------|
| IC-751 9-band xcvr/.1-30 MHz rcvr | \$1399.00 | 1199 |
| PS-35 Internal power supply..... | 160.00 | 144 ⁹⁵ |
| FL-32 500 Hz CW filter (1st IF)..... | 59.50 | |
| FL-63 250 Hz CW filter (1st IF)..... | 48.50 | |
| FL-52A 500 Hz CW filter (2nd IF)... | 96.50 | 89 ⁹⁵ |
| FL-53A 250 Hz CW filter (2nd IF)... | 96.50 | 89 ⁹⁵ |
| FL-33 AM filter..... | 31.50 | |
| FL-70 2.8 KHz wide SSB filter | 46.50 | |
| HM-12 Hand microphone | 39.50 | |
| SM-6 Desk microphone | 39.00 | |
| CR-64 High stability reference xtal | 56.00 | |
| RC-10 External frequency controller | 35.00 | |
| MB-18 Mobile mount..... | 19.50 | |

- | | |
|--------------------------------------|----------------------------|
| Options: 720/730/740/745/751 | Regular SALE |
| PS-15 20A external power supply..... | \$149.00 134 ⁹⁵ |
| EX-144 Adaptor for CF-1/PS-15.... | 6.50 |



ICOM

Options - continued

- | | | |
|--|--------|-------------------|
| CF-1 Cooling fan for PS-15..... | 45.00 | |
| PS-20 20A switching ps w/speaker ... | 229.00 | 199 ⁹⁵ |
| CC-1 Adapt. cable; HF radio/PS-20 | 10.00 | |
| CF-1 Cooling fan for PS-20..... | 45.00 | |
| EX-310 Voice synth for 751, R-71A | 39.95 | |
| SP-3 External base station speaker ... | 49.50 | |
| Speaker/Phone patch - specify radio | 139.00 | 129 ⁹⁵ |
| BC-10A Memory back-up..... | 8.50 | |
| EX-2 Relay box with marker | 34.00 | |
| AT-100 100w 8-band automatic ant tuner | 349.00 | 314 ⁹⁵ |
| AT-500 500w 9-band automatic ant tuner | 449.00 | 399 ⁹⁵ |
| MT-100 Manual antenna tuner..... | 249.00 | 224 ⁹⁵ |
| AH-1 5-band mobile antenna w/tuner | 289.00 | 259 ⁹⁵ |
| PS-30 Systems p/s w/cord, 6-pin plug | 259.95 | 233 ⁹⁵ |
| GC-4 World clock..... | 99.95 | 94 ⁹⁵ |

HF linear amplifier

IC-2KL w/ps 160-15m solid state amp **1795.00 1299**

VHF/UHF base multi-modes

IC-251A* 2m FM/SSB/CW transceiver **\$749.00 549⁹⁵**

***\$50 Factory Rebate - until gone!**

- | | | |
|-------------------------------------|----------|-------------------|
| IC-551D 80 Watt 6m transceiver..... | \$699.00 | 599 ⁹⁵ |
| PS-20 20A switching ps w/speaker | 229.00 | 199 ⁹⁵ |
| EX-106 FM option..... | 125.00 | 112 ⁹⁵ |
| BC-10A Memory back-up | 8.50 | |
| SM-2 Electret desk microphone | 39.00 | |
| IC-271H 100w 2m FM/SSB/CW xcvr | 899.00 | 799 ⁹⁵ |
| IC-471H 75w 430-450 SSB/CW/FM xcvr | 1099.00 | Call |
| PS-35 Internal power supply..... | 160.00 | 144 ⁹⁵ |
| PS-15 20A power supply..... | 149.00 | 134 ⁹⁵ |
| IC-271A 25w 2m FM/SSB/CW xcvr... | 699.00 | 619 ⁹⁵ |
| AG-20/EX-338 2m preamplifier | 56.95 | |
| IC-471A 25w 430-450 SSB/CW/FM xcvr | 799.00 | 699 ⁹⁵ |
| PS-25 Internal power supply | 99.00 | 89 ⁹⁵ |
| EX-310 Voice synthesizer | 39.95 | |
| HM-12 Hand microphone | 39.50 | |
| SM-6 Desk microphone | 39.00 | |

VHF/UHF mobile multi-modes

IC-290H 25w 2m SSB/FM xcvr, TTP mic 549.00 **489⁹⁵**

IC-490A 10w 430-440 SSB/FM/CW xcvr 649.00 **579⁹⁵**

VHF/UHF/1.2 GHz FM

IC-22U 10w 2m FM non-digital xcvr **299.00 249⁹⁵**

EX-199 Remote frequency selector 35.00



Closeout item

- | | | |
|---|---------|-------------------|
| IC-25H 45w, 2m FM w/up-dn TTP mic | 389.00 | 299 ⁹⁵ |
| BU-1H Memory back-up | 38.50 | †10 ⁰⁰ |
| † BU-1H \$10 purchased with IC-25H, otherwise | \$38.50 | |

- | | | |
|--------------------------------------|--------|-------------------|
| IC-27A Compact 25w 2m FM w/TTP mic | 369.00 | 329 ⁹⁵ |
| IC-27H Compact 45w 2m FM w/TTP mic | 409.00 | 369 ⁹⁵ |
| IC-37A Compact 25w 220 FM, TTP mic | 449.00 | 399 ⁹⁵ |
| IC-47A Compact 25w 440 FM, TTP mic | 469.00 | 419 ⁹⁵ |
| UT-16/EX-388 Voice synthesizer ... | 29.95 | |
| IC-120 1w 1.2 GHz FM transceiver.... | 499.00 | 449 ⁹⁵ |

6m portable

IC-505 3/10w 6m port. SSB/CW xcvr **\$449.00 399⁹⁵**

- | | |
|-----------------------------------|-------|
| BP-10 Internal Nicad battery pack | 79.50 |
| BP-15 AC charger..... | 12.50 |
| EX-248 FM unit..... | 49.50 |
| LC-10 Leather case | 34.95 |



Hand-held Transceivers

- | | |
|------------------------|--------------------------|
| Deluxe models | Regular SALE |
| IC-02A for 2 meters \$ | 319.00 289 ⁹⁵ |
| IC-02AT w/DTMF..... | 349.00 314 ⁹⁵ |
| IC-04A for 440 MHz | TBA |
| IC-04AT w/DTMF..... | 379.00 339 ⁹⁵ |
| Standard models | Regular SALE |
| IC-2A for 2 meters \$ | 239.50 214 ⁹⁵ |
| IC-2AT with TTP | 269.50 219 ⁹⁵ |
| IC-3A for 220 MHz... | 269.95 234 ⁹⁵ |
| IC-3AT with TTP | 299.95 239 ⁹⁵ |
| IC-4A for 440 MHz... | 269.95 234 ⁹⁵ |
| IC-4AT with TTP | 299.95 239 ⁹⁵ |

Accessories for Deluxe models

- | | |
|--|-------|
| BP-7 800mah/13.2V Nicad Pak - use BC-35 | 67.50 |
| BP-8 800mah/8.4V Nicad Pak - use BC-35... | 62.50 |
| BC-35 Drop in desk charger - all batteries.... | 69.00 |
| BC-16A Wall charger - BP7/BP8..... | 10.00 |

Accessories for both models

- | | |
|--|-------------|
| BP-2 425mah/7.2V Nicad Pak - use BC35.... | 39.50 |
| BP-3 Extra Std. 250 mah/8.4V Nicad Pak | 29.50 |
| BP-4 Alkaline battery case..... | 12.50 |
| BP-5 425mah/10.8V Nicad Pak - use BC35 | 49.50 |
| CP-1 Cig. lighter plug/cord - BP3 or Dlx | 9.50 |
| DC-1 DC operation pak for standard models | 17.50 |
| LC-2AT Leather case for standard models.... | 34.95 |
| LC-14 Soft case for Deluxe models..... | 17.95 |
| HM-9 Speaker microphone | 34.50 |
| HS10 Boom microphone/headset..... | 19.50 |
| HS-10SA Vox unit for HS-10 (dlx only) | 19.50 |
| HS-10SB PTT unit for HS-10..... | 19.50 |
| ML-1 2m 2.3w in/10w out amplifier..... | SALE 79.95 |
| ML-25 2m 2.3w in 20w out amplifier | SALE 179.95 |
| 3A-TTN Optional TT Pad - 2A/3A/4A | 39.50 |
| SS-32M Commspec 32-tone encoder..... | 29.95 |



Shortwave receivers

- | | | |
|---------------------------------------|----------|-------------------|
| R-71A 100 Khz-30 Mhz digital receiver | \$799.00 | 689 ⁹⁵ |
| FL-32 500 Hz CW filter..... | 59.50 | |
| EX-310 Voice synthesizer | 39.95 | |
| RC-11 Wireless remote controller... | 59.95 | |
| CR-64 High stability oscillator xtal | 56.00 | |
| R-70 100 Khz-30 Mhz digital receiver | 749.00 | 599 ⁹⁵ |
| EX-257 FM unit..... | 38.00 | |
| IC-7072 Transceiver interface, 720A | 112.50 | |
| FL-44A SSB filter (2nd IF)..... | 159.00 | 144 ⁹⁵ |
| FL-63 250 Hz CW filter (1st IF)..... | 48.50 | |
| SP-3 External speaker | 49.50 | |
| CK-70 (EX-299) 12v DC option..... | 9.95 | |
| MB-12 Mobile mount..... | 19.50 | |



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CQ REVIEWS:

The AEA Doctor DX Morse Code DX and Contest Simulator

BY BOB LOCHER*, W9KNI

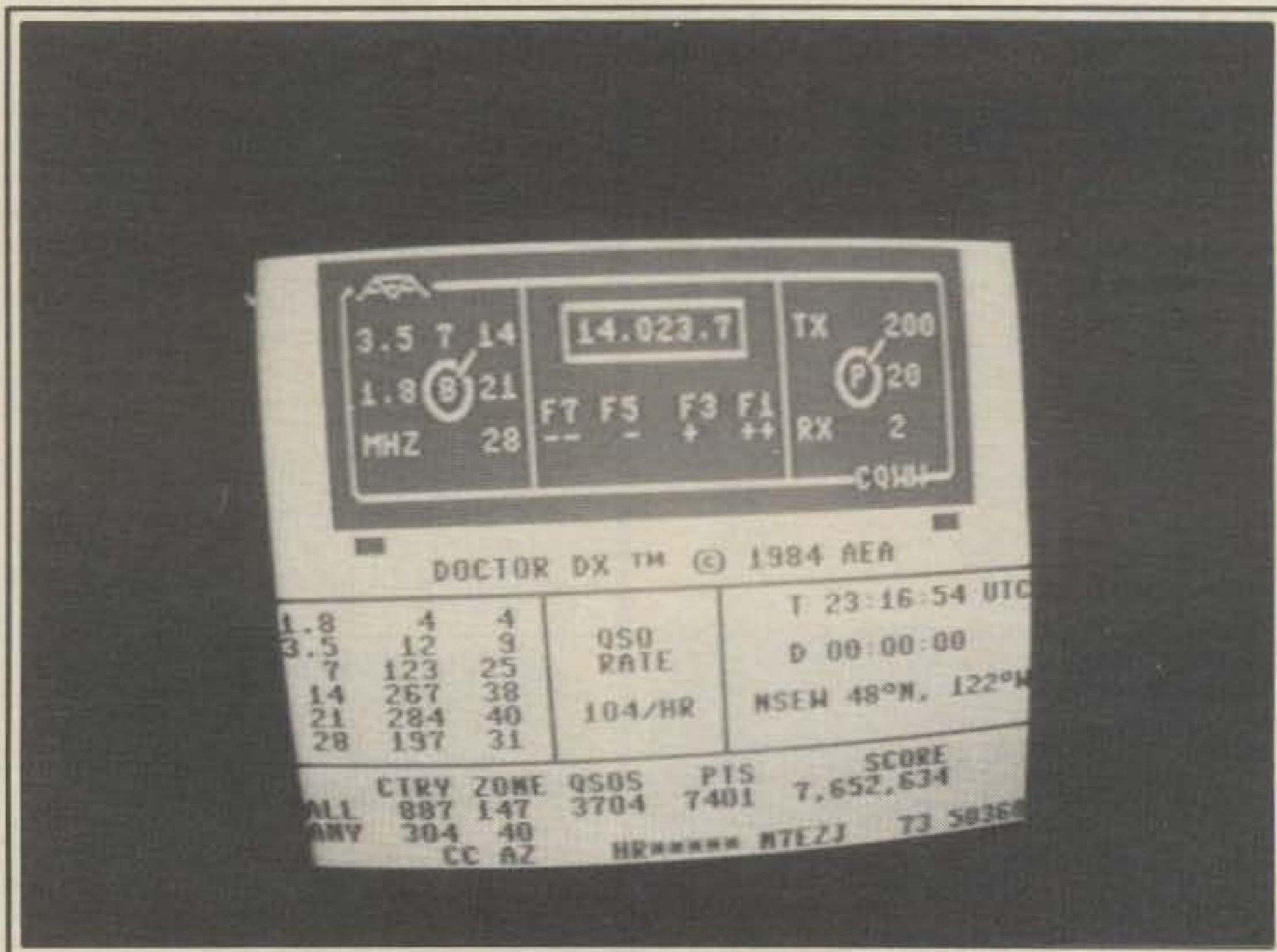
For this unusual product review we enlisted the aid of "Mr. C.W." himself, Bob Locher, W9KNI. Bob is a noted c.w. DXer, who is presently the top-ranking member of the CW-DXCC Honor Roll. His recent book, *The Complete DX'er*, published by Idiom Press, has earned a great deal of attention and a number of most favorable reviews, and it has already become a classic in the field. This was to be the ultimate test of man and machine. —K2EEK

Somewhere out there is a man, a brother amateur, with a warped, very sick mind. I do not know who he is, but he knows me, and his fiendish paraphernalia has made me a slave to his electronic wizardry. I do not know if he is the fellow who invented Space Invaders, but if he is not, he surely is *related* to that other sick mind, except that his condition is now worse—yes, far more diabolic and dangerous—and his ability to derange the minds of innocent amateurs has grown even more malevolent. Yes, losing even your sanity now has a price, and that price is less than \$200.

Let me start at the beginning, however, when I was still naive and unsuslided, whole and vital. It began innocently enough at the annual pilgrimage to Dayton. I had had a long day of exploring the fleamarket and drooling over the new boxes at the manufacturers' booths, mixed with many joyful meetings of old friends not seen since the year before. I was taking my ease and quenching my honest thirst with a well-earned cooling beverage at a DX hospitality suite at a downtown hotel, which, for that matter, I cannot remember, and in any case I am sure by now it has been destroyed by fire and brimstone.

A good friend, W2LZX, saw me across the room and waded through the crowd to take me by the hand. "Bob," he said, "there's something here you have to see. Come with me." He dragged me through the crowd to a table with a large group packed around it. I could hear Morse being sent, then another signal coming back, exchanging reports in a high-speed contest format.

"Here. Here's W9KNI. Let him have a go at it," Jack announced as he dragged me



The screen of Doctor DX.

through the ring of people. There it was, a small homebrew-looking transceiver sporting all the usual dials and laid out in a clean, economic design. "Here you go, Bob. It's a new transceiver from AEA. It's strictly a prototype, of course, but does it ever work! Give it a try!"

I looked doubtfully at the little box. It *did* look nice—a clean, pleasant little box with a Bencher paddle plugged into the front and the friendly glow of the digital frequency readout. However, all it was sporting for an antenna was a 3 foot telescoping vertical, obviously swiped off a Zenith Transoceanic receiver, with a little 12 volt 4 amp supply for a power source. I know a QRP rig when I see one, and here was a classic example. Whoever had been operating moved out of the chair and sat me down. "Here," he said. "There's nothing to it. Use about a 500 Hz offset, and you'll be all set. You're on 20 meters. Go ahead." He showed me the other important controls, such as the keyer speed control for the built-in keyer, the volume control, etc.

I asked about bandwidth. "Oh, that's fixed.

It's strictly a c.w. rig, so it has only a narrow-band filter in it." I took the seat and tentatively started tuning the dial. Almost immediately I heard a VU2 calling a CQ coming from the built-in speaker. "Hey," said Jack, standing next to me, "there's a VU! Go ahead and call him, but let me adjust the antenna. Go ahead and use your own call." As the VU called, Jack turned the antenna slightly. I could detect no difference.

No way was this going to work. Hah! I didn't know what kind of power I had at my disposal, but with that little power supply it couldn't be more than 20 watts, and with a lousy antenna to boot—a telescoping vertical with no radials—and in the middle of a highrise building. Oh, we were on the eighth floor, nice and high, but there had to be steel all around me.

The VU signed. I called him. I listened. The little transceiver had VOX, so all I had to do was stroke out my call on the gleaming Bencher paddle. Yes, there was the VU coming back all right, but to someone else, just like I expected.

"Wait," Jack counseled. "Try him again

*1445 Northwoods Circle, Deerfield, IL 60015

when he's done, and don't forget that the offset is about 500 Hz." I moved the tone of the VU down a bit, closer to 500 Hz. The VU was passing out fast contest-style reports. I mentally tried to recall what contest would fall on a Dayton Hamvention weekend, but without success. There, he finished, and called a short CQ again. I called again.

I almost fell out of my chair. He came back to me with a 579 report! I banged back a 569 to him, he confirmed, then called CQ again, as I slumped back in shock. "You've got to be kidding," I muttered as Jack was congratulating me. "See," he addressed someone, "I told you that he was a good operator!" He turned to me again. "Keep tuning, Bob. Maybe you'll find something else good." I did.

Within five more minutes I had nailed a UG6, a TA1, and an HZ1. My mind was reeling. The band just hadn't been that good the night before when I checked out things a few minutes before packing for Dayton. And here it was fantastic! Signals were crisp and clean. Background noise was low. The rig tuned smoothly. QRM seemed minimal. I was starting to really get into it, when I was gently moved over to let someone else have a go. I couldn't blame him; this rig was fantastic. Jack stood by, rubbing his hand.

"Wasn't that fantastic?" he asked. And that rig will be only \$1,000." I asked Jack why he was rubbing his hand. He grinned. "I got a bit of an r.f. burn when I was adjusting that antenna. They use a bimodal active antenna design there for both receive and transmit. Pretty effective, huh?"

As I was slowly returning to reality, little bells belatedly started ringing in the back of my mind. "Hey, now wait a minute, Jack. Run that by me again." He chuckled as he saw my expression change. "Okay, pal. It's all over. I won't kid you any more. Come over here and I'll explain it." And he did.

The "transceiver," in fact, was nothing more than an interactive computer programmed to emulate a real transceiver in a contest situation. If you tuned the knob to the right, the frequency as displayed on the digital counter went up, and different signals slowly moved through the audio passband, going from low note to high note. Tune the knob in the other direction, and the "frequency" went down. Call the station that you heard, and if you were close to his frequency and to his transmitting speed, he came back to you. Be off frequency and you were ignored. The received station might have called CQ again, or another station might have called him and worked him. In fact, the computer would respond to actions with very highly believable responses.

The more I listened, the more impressed I became. Of course, this was not a radio at all, but rather a whole DX contest wrapped up in a computer with virtually all the moves. And in wildly improbable circumstances, it had fooled me and a lot of others as well. It was to a DX hunter what a flight simulator is to a pilot, a make-believe contest world so close to the real one that it was eerie.

I was in awe. Then Mike Lamb, N7ML, of AEA came up to us. "Well, Bob, what do you think of that?" Mike asked. I told him, and he smiled. "That's great. We're really proud of that little box. Look, I can't stay, but we'd like you to fill out this market survey for us on that machine. We're thinking about marketing it." He handed me a form. Answering the questions was easy, not that it was going to make

much difference. I know an expensive piece of hardware when I see one. The bottom question really got a chuckle from me. "Would you buy a simulator if the price was less than \$200?" As I checked off the yes box, I was laughing.

One Saturday 2½ years later I got a call from Mike. "Bob, you remember that contest simulator you liked so much at Dayton a couple of years ago?"

How could I forget? "Yeah, Mike, I sure do. That was really neat!"

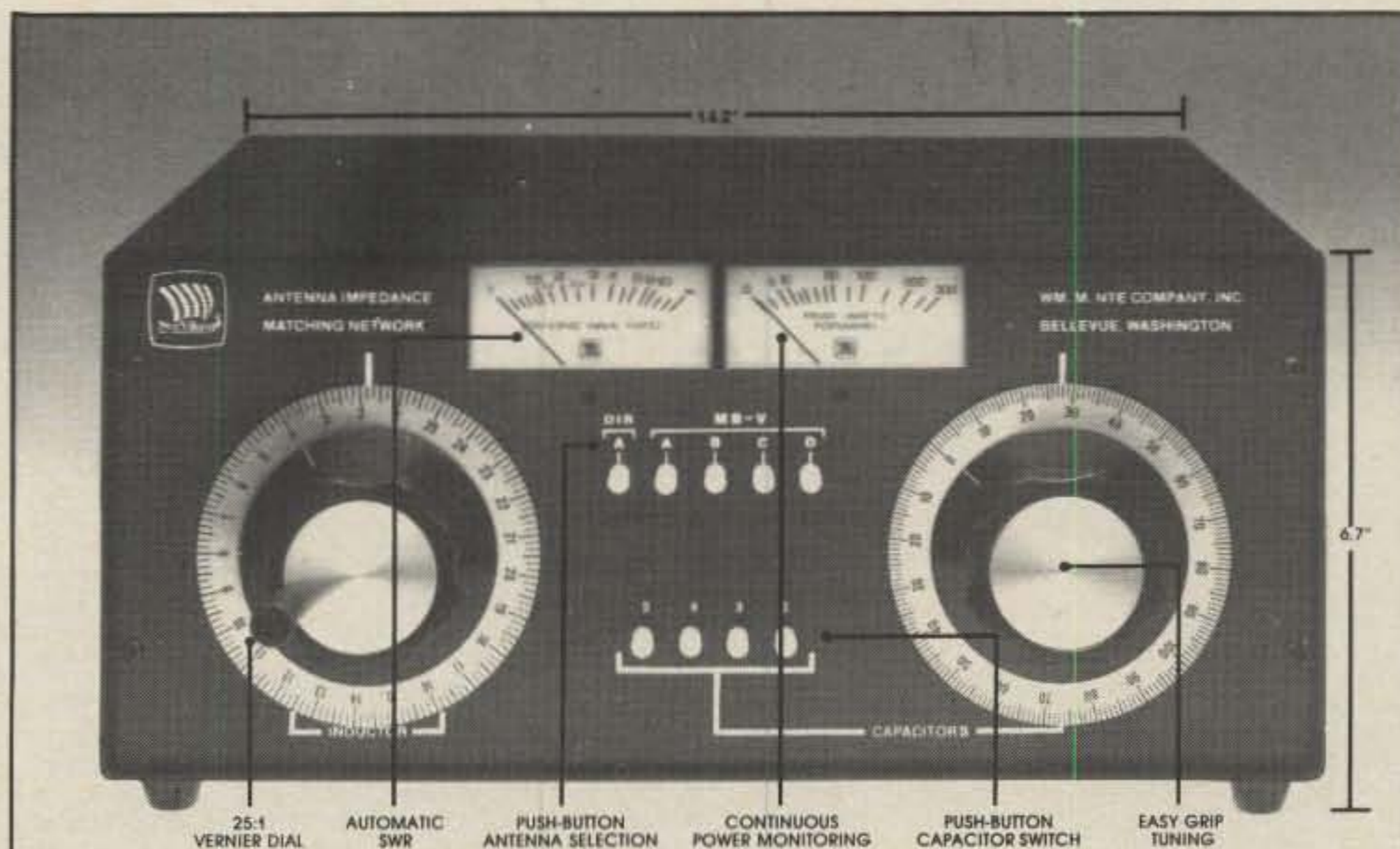
"Great, because we are going to bring it out. We're going to call it 'Doctor DX.' CQ magazine asked us to ask you if you would like to do a product review?"

"Yeah, Mike, I would," I replied, "but how much is it going to sell for? That's a pretty complex gadget."

"That's the truth! But we've reworked it so that it works through a Commodore 64 computer, and we're going to sell it for under \$200. What do you think of that, Bob? . . . Bob? . . . Bob, are you there?"

A few days later the box arrived. At first I was sure that the shipping department at AEA had made a mistake; the box was smaller than a cigar box. I opened it, and there sat a small circuit board with an edge connector for the Commodore 64 and the documentation. Normally I'm from the "plug it in and fire it up" school, but for once I figured that perhaps I'd best read the instruction book first. I'm not much for computers, and I was a little afraid of the whole thing.

At this point let me say without qualification that the instructions for the Doctor DX Trainer are absolutely the finest of their type that I've



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ever seen. They are clear, lucid, and easily understood, especially when you consider how new the concept is to most amateurs. Within moments after reading the instructions I was hooked up and running.

After plugging the simulator module into the Commodore 64, and the paddle and keyer into the module, turn on the computer and the TV. Bang, there on the TV screen is the image of a transceiver and a box for scoring. There is a place to set the time and also to set your latitude and longitude. On the transceiver you set the power level with a choice of 2, 20, or 200 watts. Select the desired band from 160 to 10 meters. You have a choice of seven colors for the screen, and you have control of an audio filter, setting the tone most desirable for you TV audio output and your ear.

One of the really interesting aspects of the device comes in the setting of the latitude, longitude, and time. You can place yourself anywhere in the world at any time, and the Trainer actually generates propagation appropriate to your instruction! I set myself in, 42 degrees north latitude, 87 degrees west longitude. I put the rig on 15 meters and set the time (in UTC) for 0000Z. Last, I hit the RETURN button on the computer. I got a brief "Good Luck" on the screen, and suddenly I heard an HL calling CQ. I looked at the digital readout on the TV screen; I was at 21050.

I started to move down the band by depressing the F5 key on the computer, and slowly started down. I decided that I would rather get quickly to the bottom of the band. I hit the F7 key and the frequency excursion speeded up

considerably; in no time I was at 21000. I then depressed the F3 key, and slowly the receiver began moving up the band. (Note: There are four F, or function, keys all in a row on the right of the Commodore 64 keyboard.)

Ah, there was a JA calling CQ. I moved the frequency back down a bit. There, a lighted star on the TV screen started to blink in sync with his c.w. I hit the "X" key, and the audio filter cycled through its range until I released it at the optimum point for my ear. I checked the power level; yes, I was at 200 watts. He signed. I called him. He came back! "W9KNI DE JA1RFB 5NN25 K," I responded; "R 5NN04 K." He responded, "R TU CQ TEST ..." I was on the air!

By now, you have figured that the simulator is designed to work in the CQ World-Wide DX Contest mode. Your goal is to work as many countries in as many zones on as many bands as possible. The simulator automatically logs the QSOs for you, scores for you, and watches for dupes. And this is one place where changing one character in a call won't sneak you another QSO; remember, it knows what call you are supposed to be working. If you call a station that you have already worked on that band, you get a dupe message from the other station.

Scoring follows the rules of the CQ World-Wide DX format, with the exception that additional QSO points are earned by working stations at one of the designated lower power levels. And, as is proper for the CQ World-Wide DX test, IT9's in Sicily count as a separate country from Italy for another multiplier. This

is different from the DXCC countries list, and demonstrates a small part of the astute thinking that went into this clever device.

As you continue on in the WW DX Contest, conditions change, as would be expected in the real world. Ten dies out as the hours lengthen, and then 15 goes. Forty, 80, and 160 open and improve later in the evening. Different paths open and close as the hours go by, all as a hot contester would expect. Some signals are quite strong; others are rather weak, almost buried in the noise. However, if you can hear them you can work them. CQ calls on your part will raise DX, some of the calls quite rare. One of the tantalizing aspects of the simulator is to hear a really good one answer a station calling CQ, and there appears to be no way to raise that station except perhaps by your own CQ calls, just as in the real world. Open bands are full of other stations calling CQ, some of them W's, others DX.

I was interested to see what sophistication of DX technique was workable with "Doctor DX." For example, there is no real provision at all for split frequency operation, and tail-ending was not one of my better techniques. On the other hand, proper timing and length of calls proved very rewarding when the simulator gave some competition to work against. The device obviously has a number of operator-oriented sophistications designed in, and I have not found all of them yet.

Doctor DX is a real joy for the operator, both experienced and inexperienced. Any operator capable of copying code will come out of a few sessions with the good Doctor a better operator, or a *much better* operator.

It is a real joy. It comes miraculously close to matching the thrills of a big-time contest. It takes very little imagination to enter its magic domain. Five minutes after you start using it, you are excited by working the A6X that you still need in the real time world; you despair when you hear the A51 answer a JA's CQ and you can't touch him; you swear when you get gunned down by another station, and cheer when you ace out a pileup.

AEA has an award program being set up for users of the Doctor DX simulator. No QSL'ing! But remember, they know the calls that are in the machine, so you'd best be sure that you got them logged right before applying for one of the awards.

Anyone who loves DX will love this machine. If you are a frustrated DXer living in an apartment, or a hired gun who doesn't get enough air time between contests, Doctor DX is for you. If you love contests and want to keep sharp through the summer months, you had better place your order. And, it will help you lengthen your contest attention span. A DXer who travels a lot would love it, if he could also take a Commodore 64 with him. This is a serious Trainer for anyone interested in contests or DX; I guarantee it will make you a better operator.

But enough of this. I have to get back to 20 meters. Let me see here. Yes, back to 200 watts. Okay, it's nearly 1400Z; long path into the Middle East ought to be coming in. What's that signal? 4W1 what? Ah, good, he's calling CQ again; guess he had no takers. Yes, it's 4W1FC. Move him closer to 500 Hz, quick. Right. Call. Call. Darn. Call.

Somewhere out there is a man, a brother amateur, with a warped, very sick mind. I do not know who he is, but he knows me, and his fiendish paraphernalia has made me a slave to his electronic wizardry.

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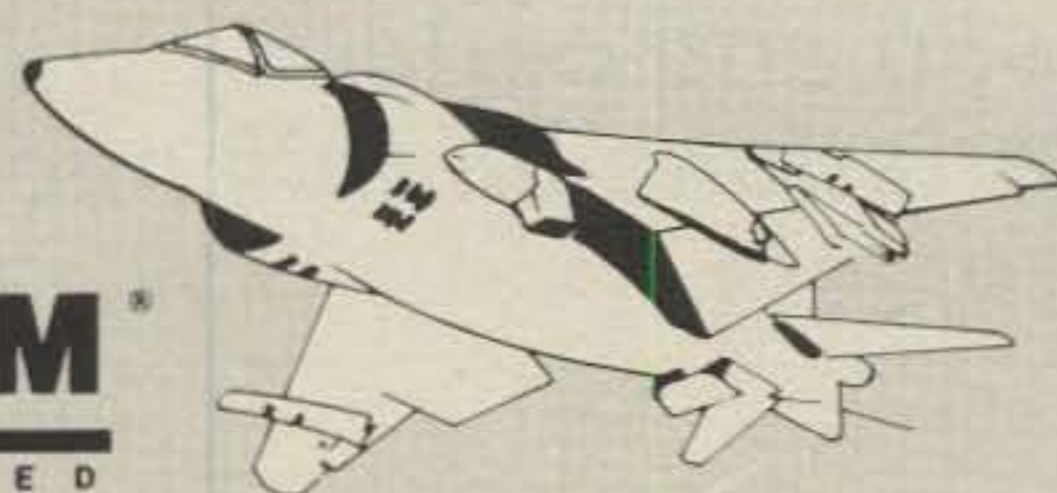
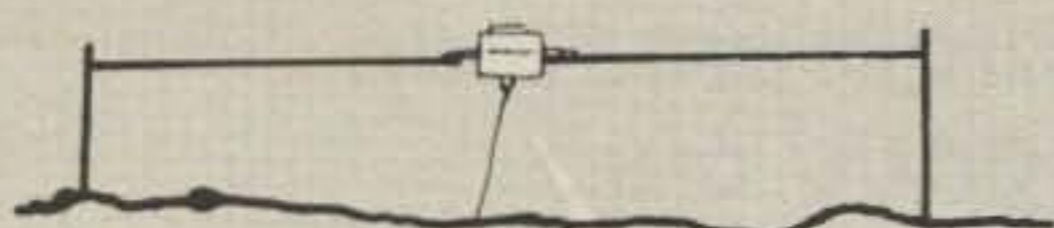
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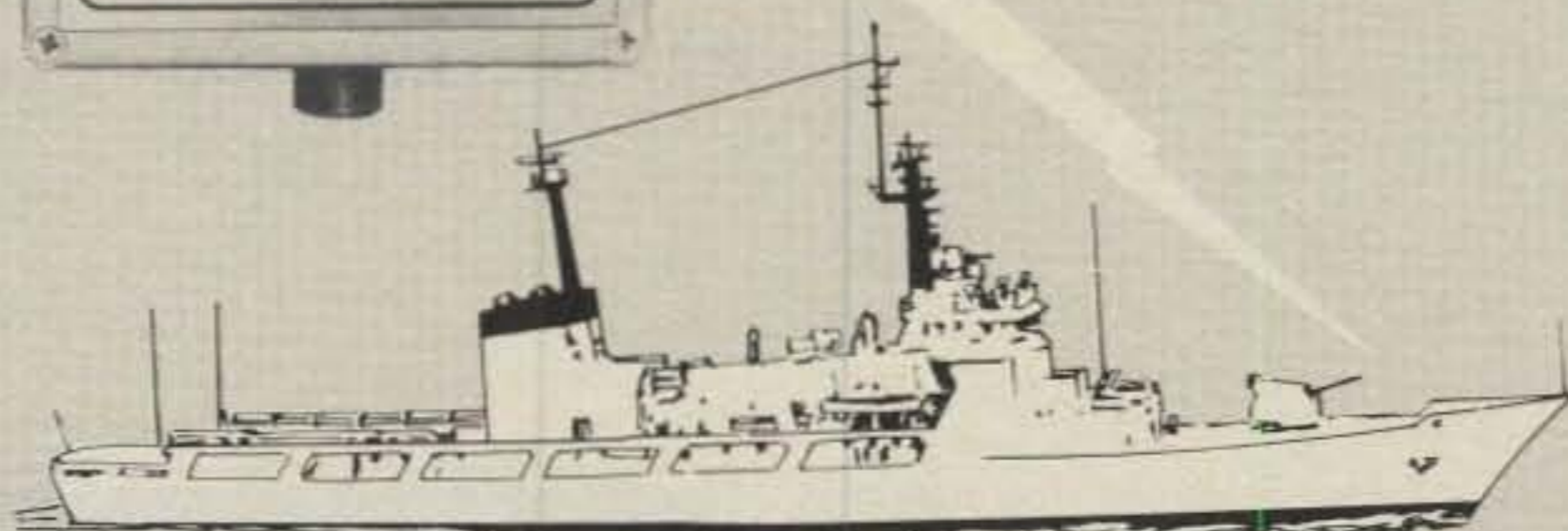
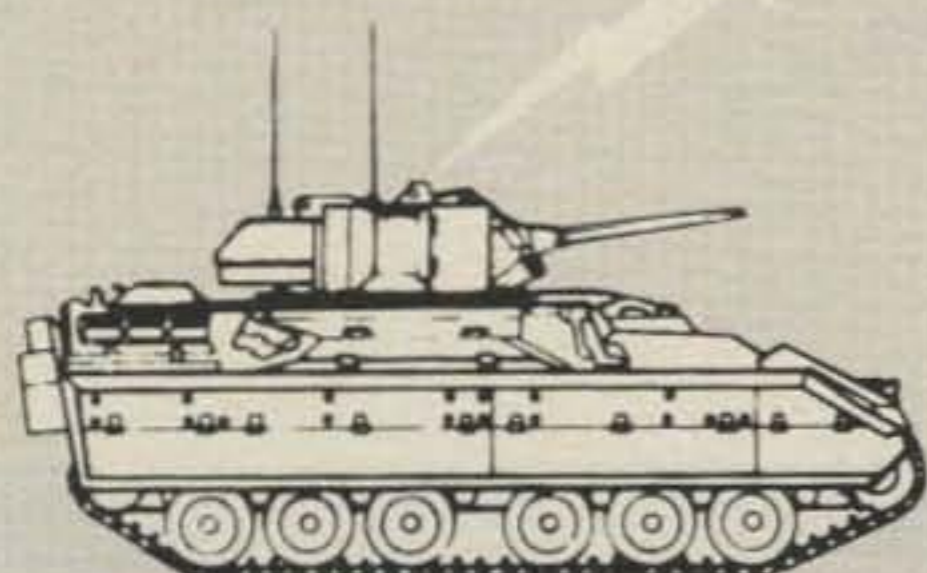
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Here's a mechanical marvel that looks like fun to build and certainly will help out a fellow amateur. Variations on this might also make good club projects.

Frequency Control For A Blind Amateur

BY ART STEWARTSON*, KA1BRG

You should know right off that the "BRG" in my calls stands for "Blundering Rube Goldberg." With that understood, I will tell you what happened when I decided to come up with a frequency readout gadget for Bob, WA1HSG, who has been blind for about 16 years.

First I turned to several of my much more knowledgeable friends, the electronics experts. They came up with a number of possibilities involving an assortment of IC chips—decoders, gates counters, etc. Most of these approaches involved either building or buying an outboard frequency counter to avoid invading the innards of Bob's Kenwood TS-130S with a fist full of wires, and then getting the rig, the counter, a tone generator, etc., all interfaced. I was a bit discouraged at that point because all these schemes seemed very involved and complicated, not just to make, but more importantly, complicated to use. Then Larry, W1HJF, my friend and electronics expert, came up with the idea of making a relatively simply mechanical frequency indicator hooked onto the tuning dial shaft with a small chain drive instead of the string arrangements many radios have. Well, the Rube Goldberg in me lit up like a Christmas tree at that, and I jumped into the project with both feet.

The photos show you what I came up with. Before I get into the construction details, however, let me tell you that Bob has been using that gadget for over a year now. He says it works great, and he would rather have his instant, if unsophisticated, readout than any of the electronic-tone or talking-chip gadgets he has heard about because it is simpler and faster to use, both for finding out where he is and for moving to some other frequency. He says he has been enjoying tuning up and down the bands and knowing for the first time exactly where in frequency he is hearing what. Bob

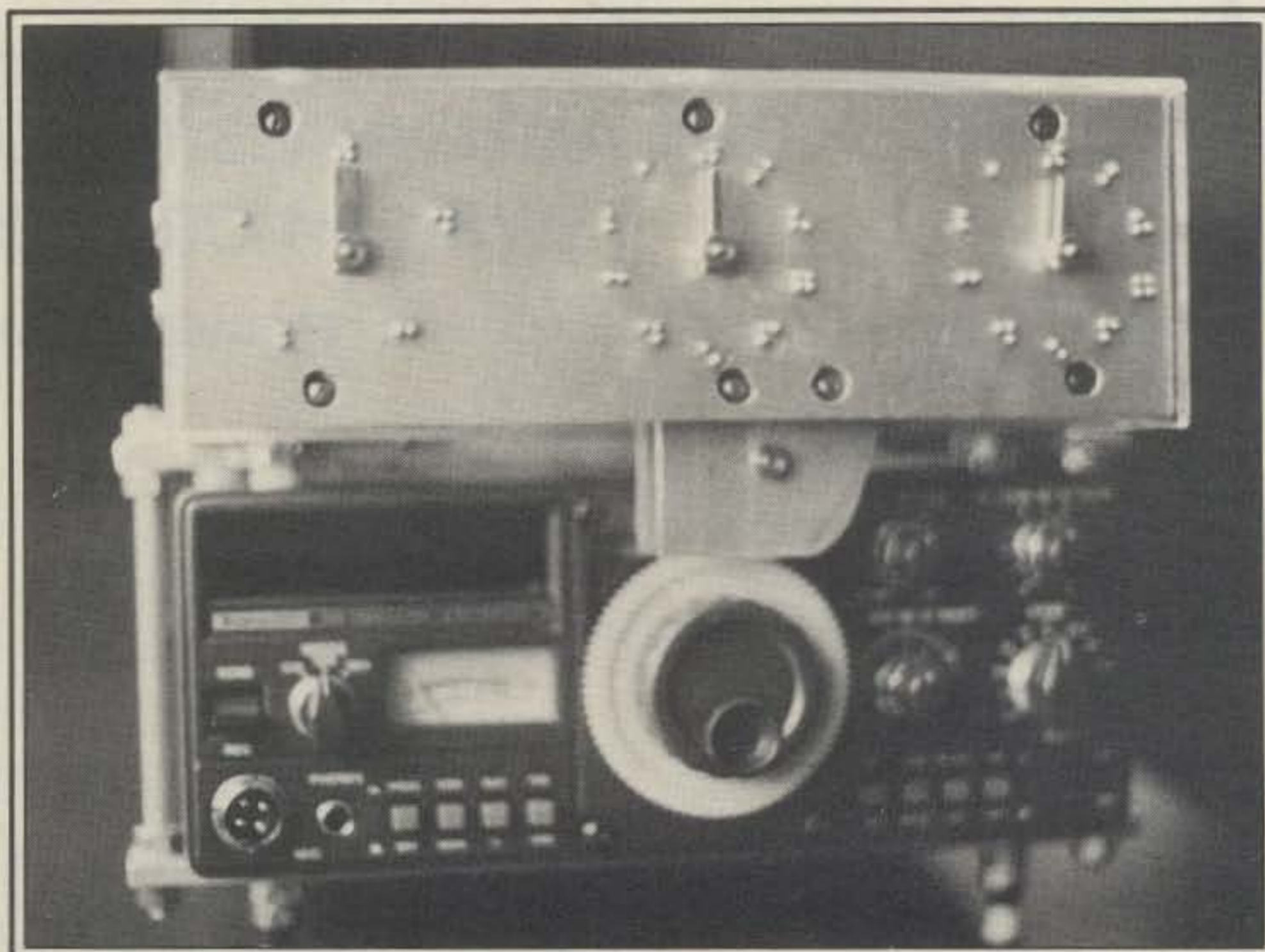


Photo 1— The completed project. The three pointers indicate (from right to left) units, tens of kHz, and hundreds of kHz.

says touching those pointers is almost as good as seeing the frequency display. He can follow and read his frequency while turning his dial. He does not have to move an estimated amount, then stop and take a reading, then move some more, then stop again and take another reading, etc. In fact, once he sets his bandswitch to the MHz he wants and turns his dial to the hundreds of kHz he wants, he tunes his rig the rest of the way by turning the tens and units pointers themselves—directly without touching the radio dial at all. His readout gadget tunes the radio for him. Bob's gadget

has another practical advantage in that it takes up no additional desk space. It also took a minimum of time and effort to learn and get used to.

For the benefit of anyone who wants to be of practical help to a visually handicapped amateur or such an amateur who wants to get a friend with a few tools to make one of these gadgets, here is what I did, improving and "inventing" as I went along.

After fumbling around on paper the first thing I found out was that gear ratios in a series do not add. They multiply. Live and

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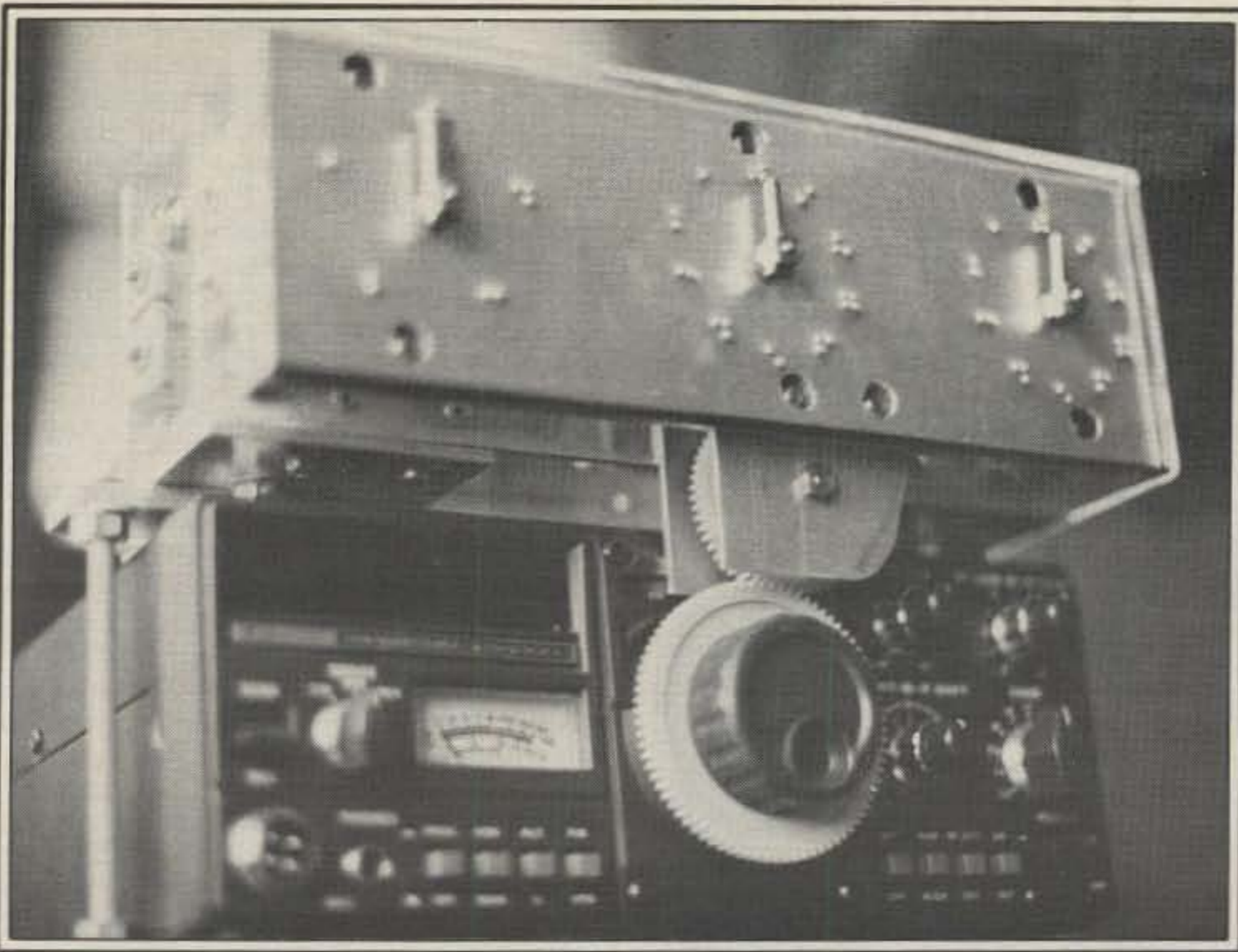


Photo 2— The frequency readout device connects to the rig via the main tuning dial.

Gears	Shaft No.					Drive/Driven Ratio	
	1	2	3	4	5		
Gear Teeth	32—80					1:2.5	Units pointer on shaft 1
Gear Teeth		20—80				4:1	Tens pointer on shaft 3
Gear Teeth			16—80			5:1	
Gear Teeth				56—56		1:1	Hundreds pointer on shaft 5

Fig. 1— The gear ratio plan for the frequency controller for the Kenwood TS-130.

learn. Once I got that through my head, the rest progressed fairly smoothly.

Bob's tuning dial cranks up 25 kHz per revolution: 4 revolutions go 100 kHz, and it takes 20 revolutions to go 500 kHz to the stop at the high end. He can get his MHz numbers from the position of his bandswitch either by feel or by counting clicks, so all he really needs is a way to identify just the last 500 kHz tuned by the rotary dial. Therefore, the gear-box gadget has three pointers which give him units of kHz on the right, tens of kHz in the middle, and hundreds of kHz on the left. I made each of the pointers a different shape to facilitate his identification—units a sharp point, tens a rounded point, and hundreds a blunt square. They are $\frac{3}{4}$ " long from tip to shaft center (photos 1, 2, and 6).

The gear box has 5 shafts, which I numbered 1 to 5 from right to left as you face the radio (photo 4). Shaft No. 2 is the first one driven from the rig's tuning dial shaft, and they turn at the same rate. Shaft No. 1 has the units pointer on it, so shaft 2 has an 80-tooth gear and shaft 1 has a meshing 32-tooth gear, giving a driver to driven ratio of 1 to 2.5, which turns the units pointer 10 kHz per revolution of shaft 1, and 25 kHz per revolution of shaft 2. Shaft 2 also has a 20-tooth gear on it, which meshes with an 80-tooth gear on shaft 3, on which the tens pointer is mounted. This gives a driver to driven ratio of 1 to 0.25, so 4 turns of shaft 2 (at 25 kHz) per turn revolves shaft 3 one revolution, which equals 100 kHz. The face-plate dials for the units and tens pointers are marked at 36 degrees of arc spacings for 10 points showing 0 through 9 (photos 1, 2, and 6).

Continuing on up the gear train, shaft 3 also has a 16-tooth gear which meshes with an 80-tooth gear on shaft 4, which gives a driver to driven ratio of 1 to 0.2, or 5 to 1, so 5 turns of shaft 3 (at 100 kHz per turn) turn shaft 4 one revolution, which equals 500 kHz. However, shaft 4 is too close to shaft 3 to use it for

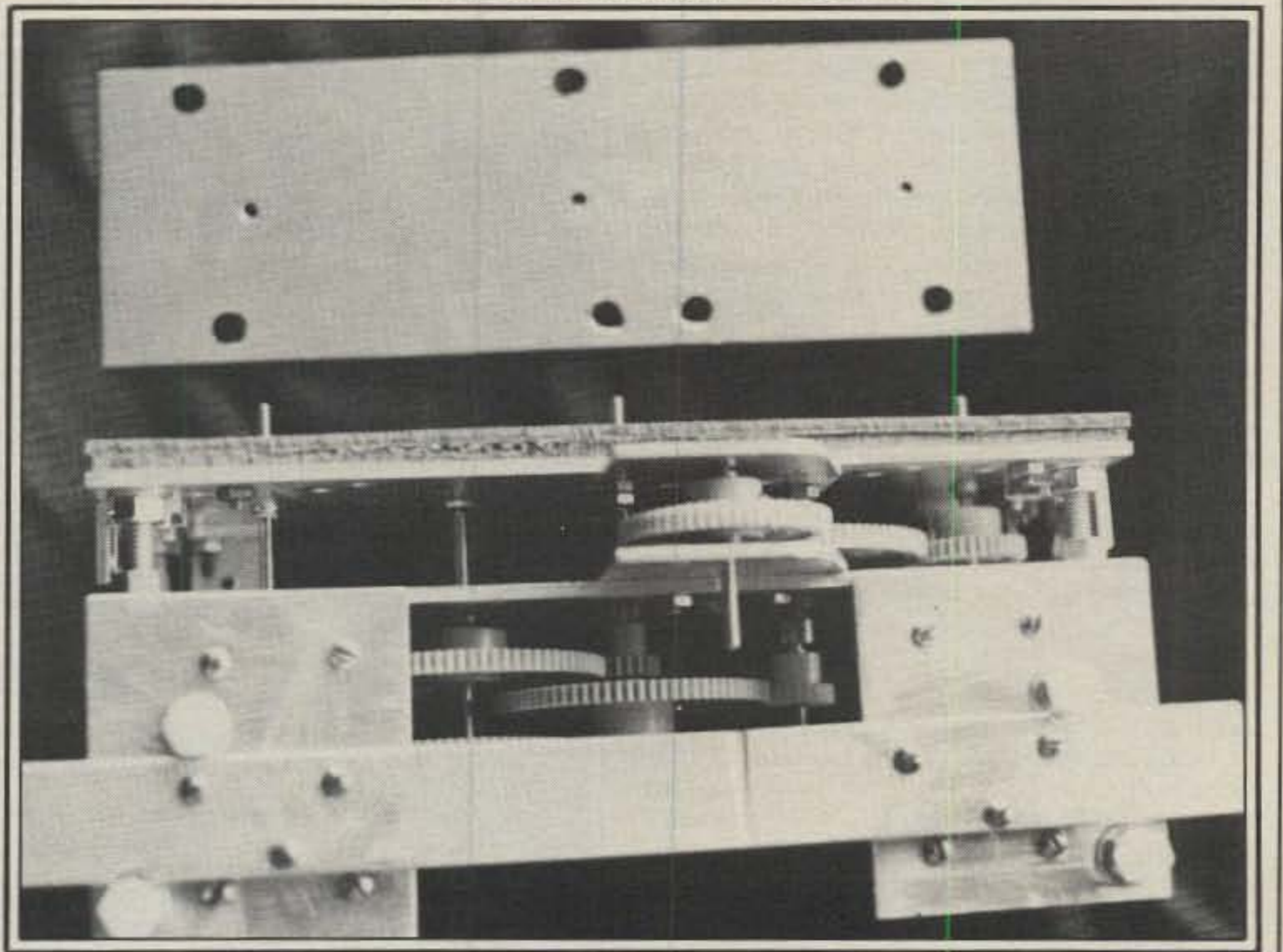
mounting the hundreds pointer, so I also put a 56-tooth gear on shaft 4 which meshes with another 56-tooth gear on shaft 5, on which the hundreds pointer is mounted, and that 1 to 1 ratio turns shaft 5 at the same 500 kHz per revolution rate as shaft 4 (photo 4). The face-plate dial for the hundreds pointer is marked at 72 degrees of arc spacings for 5 points showing 0 through 4 for the 500 kHz on this dial (photos 1, 2, and 6). To recap these gear ratios, see fig. 1. Arrows show direction of driving force, with shaft 2 driven from tuning shaft.

As it works out, this turns all the pointers counter-clockwise as Bob tunes upward in frequency, but I decided he could learn to live with that rather than trying to squeeze in another shaft and gear with its extra drag to make the pointers go clockwise.

I got all the parts for this project from local hardware stores and Small Parts, Inc., 6901 N.E. Third Ave., P.O. Box 381736, Miami, Florida 33138. I think most any gears giving those same ratios would do the job, and gears with all bores the same size as the shaft and with set screws installed would have made it much easier. Even gears with ready-made bushings would have helped, as you will see. The problem would be to find them.

The gear "box" was made with 8 aluminum plates $\frac{1}{8}$ " thick, 3" high, and $9\frac{1}{4}$ " wide (photos 4 and 6). Bob's rig is $9\frac{1}{2}$ " wide, so I allowed $\frac{1}{4}$ " for cover plates on the 2 sides of the box. I used a poor grade of aluminum—much too soft—resulting in tremendous burrs when I drilled the holes. I even had to stop the drill and knock the chips out of the drill-bit flutes with an ice pick on every hole. A good grade of hard machinable aluminum would have saved hours of work. Anyhow, I clamped together the 3 aluminum box plates plus two $3" \times 9\frac{1}{4}"$ pieces of scrap masonite for the face-plate backing and drilled $\frac{1}{4}"$ holes in the 4 corners far enough in to clear the nuts and washers on the $\frac{1}{4}"$ threaded steel rods which hold them all together. (I put nuts and washers on each side of each aluminum box plate at each corner so they can be adjusted to get the three plates parallel and the right distance apart to clear all the gears and shaft collars. Photos 3, 4, 5, and

Photo 3— Bottom view of the gear box.



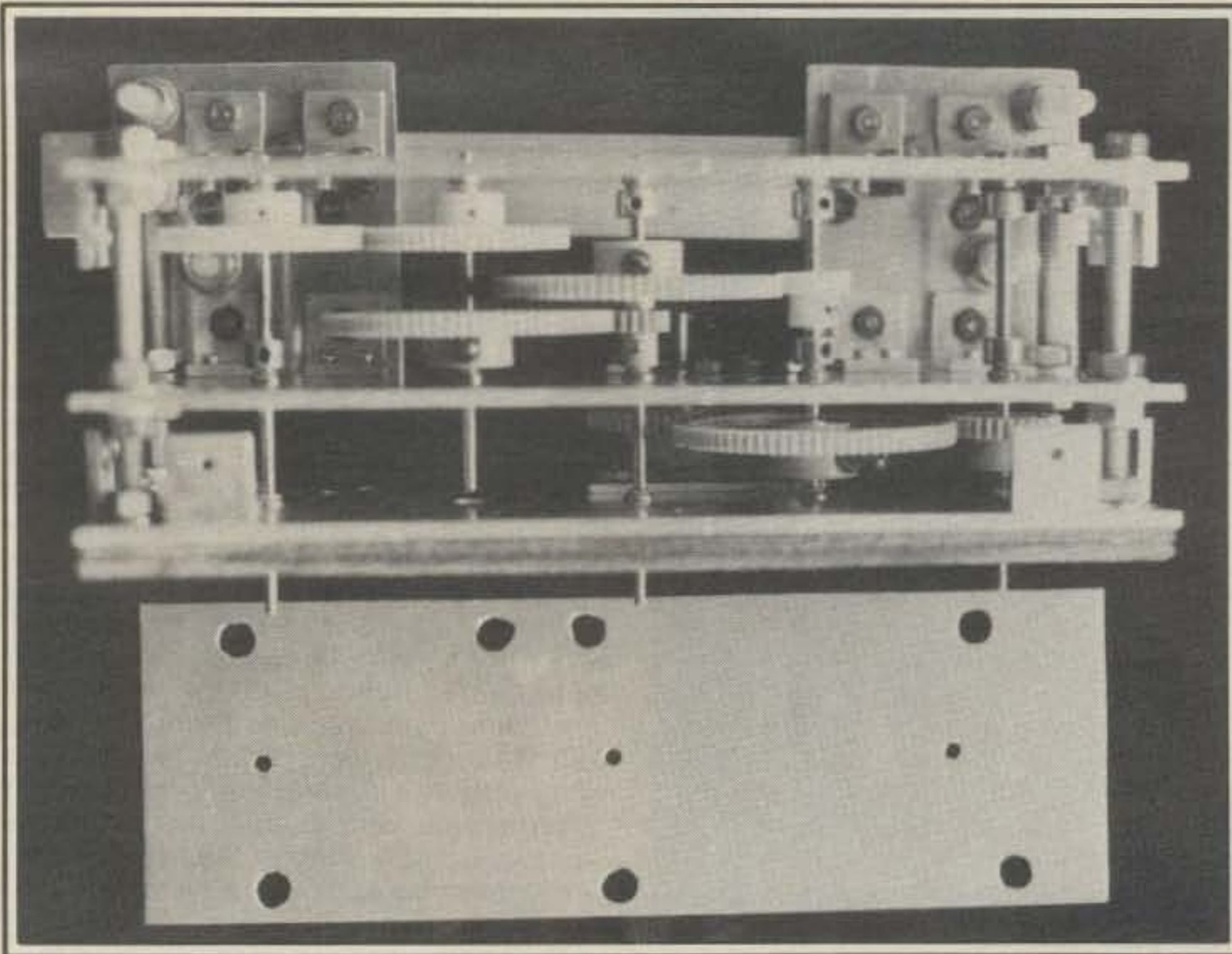


Photo 4— Top view of the gear box.

6.) I then bolted them all together so all the holes would stay aligned as I drilled them through all the plates and masonite at the same time.

I then scored a line across the middle of the first plate from side to side and drilled a $\frac{1}{8}$ " hole on that line about $1\frac{1}{2}$ " in from the right side for shaft 1. Next I put a piece of $\frac{1}{8}$ " shafting into that hole, dropped the 32-tooth gear on it, put its mating 80-tooth gear in a meshing position, and marked the spot on the center line for shaft hole No. 2, and so on up the gear train, making each pair of meshing gears show me exactly where to drill the shaft holes in sequence. I got two of them a little too tight—too close together—and had to file the gears a bit because of slight eccentricity, so anyone making such a gadget should keep the gears slightly loose when marking the shaft holes.

The gears I used were Delrin, 32-pitch, $\frac{3}{16}$ " face width, with $\frac{3}{16}$ " hub projection, all of which I had to drill and tap for set screws (Small Parts, Inc.). I used 4-40 $\times \frac{1}{4}$ " socket-head set screws except on the 80-tooth gears, where longer screws seemed safer to me. These gears came with different sized shaft holes, or bores. Originally I planned to use telescoping brass tubing for bushings to get from my $\frac{1}{8}$ " solid brass rod shafts to the various gear bores, but I found they were too loose and wobbly, so I had to stop and make aluminum bushings on my small lathe one at a time to fit each gear by boring out the $\frac{1}{8}$ " center hole, turning down the outer diameter, cutting the piece off, and then drilling a side hole to pass the set screw. Perhaps a more competent machinist or tinkerer could come up with a better solution.

Anyhow, after I got the $\frac{1}{8}$ " shaft holes positioned and drilled, and the gears fixed with set screws and bushings, I drilled another batch of holes along the sides and top and bottom edges of the box plates to fasten angle brackets to be used to hold cover plates on the two ends and the top of the gear box, and also to hold plates on the bottom to which the legs are fastened. The angle brackets were cut from a "do it yourself" aluminum angle bar.

They were fastened on with 6-32 brass screws and nuts along the top so they can be removed to get the gears back out if necessary, but with pop rivets along the sides and bottom, except for a few spots where I lacked clearance for the rivet tool (photos 4 and 6).

Next I redrilled the $\frac{1}{8}$ " shaft holes to $\frac{15}{64}$ " for inserting "Spyralign" press bearings (Small Parts, Inc.), which are stainless steel retainers holding Delrin bushing bearings for the shafts to turn in easily (photos 3 and 4).

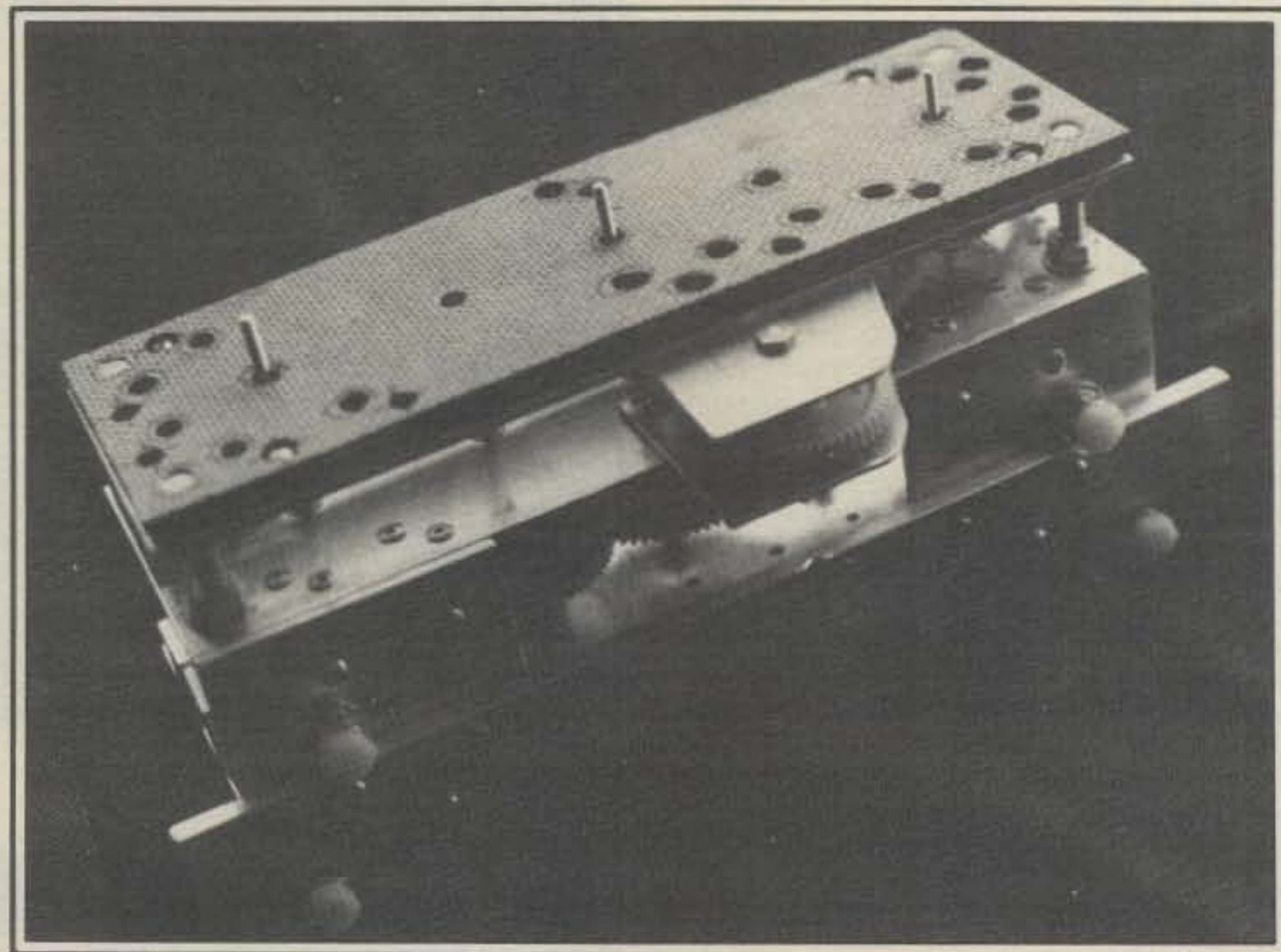
I also decided instead of using a chain drive to try connecting the gear box to the radio-dial shaft by means of an 80-tooth gear on the dial shaft, which goes to an idler gear, which goes to the 80-tooth gear on shaft No. 2. Therefore I drilled some more holes in the bottom edge of

the box plates to hold two aluminum plates projecting down about $1\frac{1}{4}$ " below the bottom edge. These two projecting plates hold, and also cover, a 56-tooth idler gear on a short piece of $\frac{1}{8}$ " shafting, which was positioned the same way as the other shafts (photos 2 and 3). I mounted this idler gear differently in that the shaft is fixed and does not turn, while the gear revolves on short pieces of telescoping brass tubing, lightly oiled. The front end of the shaft is threaded, the front projecting plate is threaded, and a nut on the shaft holds it firm. The idler gear has a set screw turned down gently on the outermost piece of telescoping tubing to keep the gear from wandering back and forth and losing its mesh with the other gears. That gives this idler gear a little more play than any of the other gears to make it easier to get a good easy-turning mesh with the tuning dial gear. Adjustment of the mesh between this idler gear and the 80-tooth gear on the radio tuning-dial shaft was made by raising or lowering the whole gear box on its adjustable nylon bolt legs before clamping the box down on top of the radio (photos 2, 3, and 5).

After I got the 3 aluminum box plates adjusted parallel and far enough apart to hold the gears and the shaft collars needed to keep the shafts from sliding back and forth (photo 4), I threaded the front ends of the 3 shafts holding the pointers, made the pointers from a piece of $\frac{1}{8}$ " $\times \frac{1}{4}$ " brass bar stock, drilled and tapped them, and screwed the pointers on with nuts both under and on top of them (photo 6). I then adjusted all the gears and shaft collars so all the set screws are up when all the pointers are up (to facilitate maintenance later) and tightened them enough to mark the shafts. I then pulled the shafts out and filed deep ($\frac{1}{4}$ shaft diameter) flats on the shafts for the set screws. I also polished the shafts on a buffing wheel where they turn in the bearings.

With the 3 aluminum box plates adjusted and spaced, I marked and drilled 2 more aluminum plates, one at each end of the bottom of the box, to hold the four $\frac{1}{4}$ "-20 \times 2" nylon bolts I used for adjustable gear box legs (photos 3, 4, and 5). The left front nylon bolt had to be cut off short to clear the gear on

Photo 5— The sandwiched face-plate backing and the adjustable legs can be seen here.



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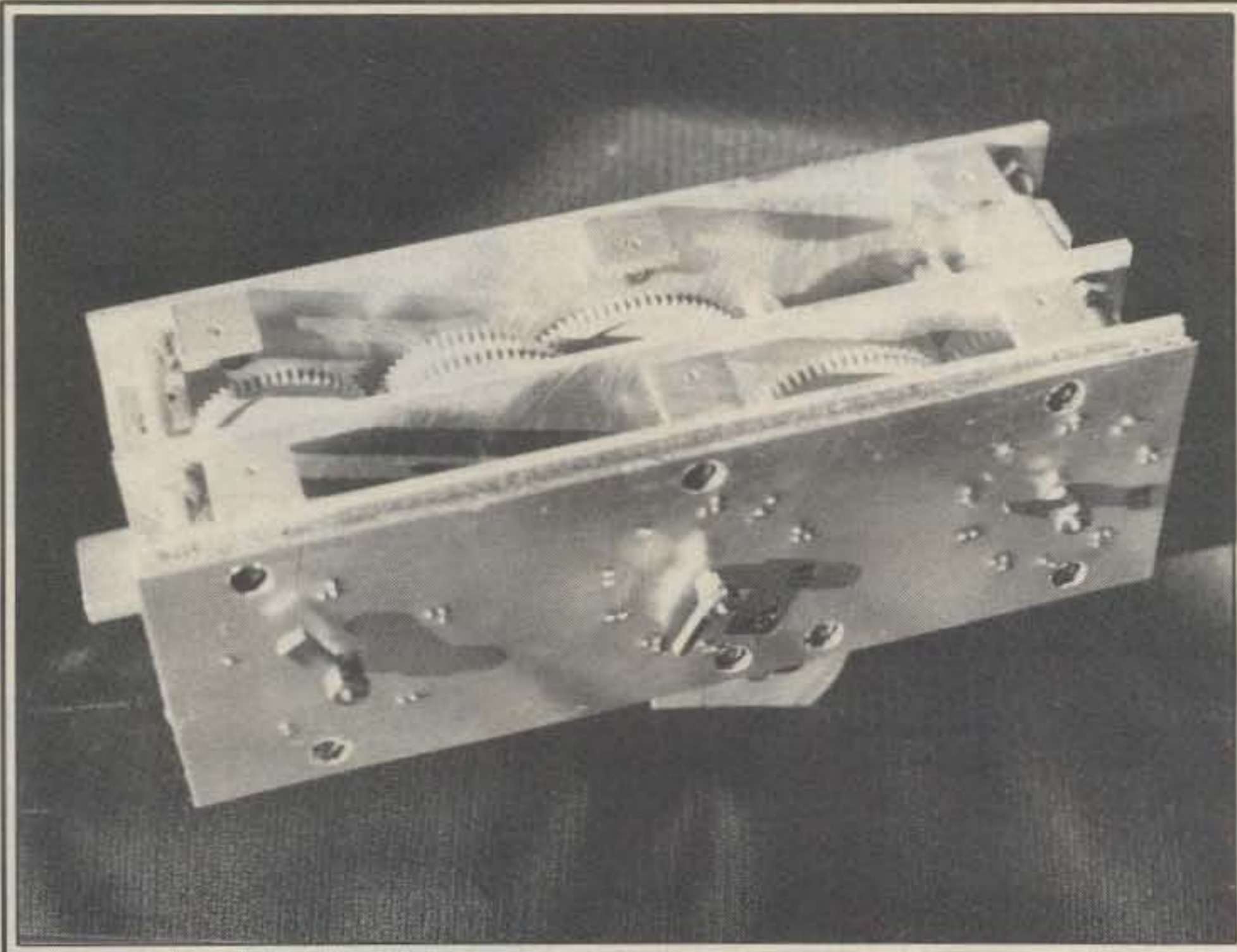


Photo 6- The completed face plate. The brackets are for mounting the clear-plastic top cover.

shaft 5. These 2 bottom plates were fastened flush with the middle box plate and projecting out the back side. A rectangular "do it yourself" aluminum bar 1/4" x 1", used to clamp the gear box down on top of the radio, was also fastened to the bottom of the gear box between the nylon bolt legs (photo 3). Another 1/4" x 1" rectangular bar was fastened to the bottom of the radio chassis with 2 more 1/4"-20 x 2" nylon bolts going through the radio's front leg holes (after removing those legs), and the clamp was completed with a 1/4"-20 threaded steel rod on each side going through the 2 rectangular bar ends along the outside of the radio (photos 1 and 2). The two nylon bolts through the radio's leg holes also serve as new front legs for the whole thing, with small rubber caps on the ends, which came from the XYL's household junk box. I added extra nuts on each one for more stiffness and strength for the new legs. Incidentally, I had to get out a 1/4"-20 NC die and thread all 6 nylon bolts all the way to their hex heads (photo 1).

When the radio's tuning knob and clutched bezel were removed, I found that the tuning shaft was just long enough to hold the 80-tooth gear and the tuning knob without the bezel. The only permanent and irreversible change I made in the radio itself was to grind and file a flat on its tuning shaft for the gear set screw. Otherwise the gear box could be removed and the legs and bezel replaced to make the radio exactly as was originally.

The outer face plate is a 3" x 9 1/4" sheet of thin, soft "do it yourself" aluminum. On the back side I scribed a circle around each pointer shaft hole just short of the screw holes around the plate edges, marked the 10 points for 0 through 9 at the units and tens pointers, and marked the 5 points for 0 through 4 at the hundreds pointer. I then took a sheet of paper Bob had typed for me on his Braille typewriter giving me the Braille numbers 0 through 9, and made a template of thin, clear plastic with 4 pin holes spaced exactly the same as Bob's Braille dots. With this template and a steel needle, I marked each point around the circles with the Braille numbers (inside out, of course).

I then clamped the face-plate outside down on a piece of soft wood and tapped the Braille dots down into the back of the aluminum with a sharp center punch and a light hammer, which gave me raised dots on the front side (photos 1, 2, and 6).

I then enlarged all the holes in the inner masonite sheet to clear all the nuts and bolts, except for 3 holes along the edge and 4 holes along the bottom edge. These 7 holes were left small to hold the screw heads and washers which fasten the face-plate assembly onto the gear box (photos 5 and 6). I enlarged all the holes in the outer masonite sheet except the four 1/4" corner holes, which were left at 1/4" size so the threaded rods in these 4 holes would keep the face-plate assembly aligned. I made this cover-up a bit easier by putting 2 quarter inch nuts on a scrap of threaded rod in a vise and carefully hacksawing them in half to get 4 thin nuts for the front corners. These 4 thin nuts go into the inner masonite sheet, but are covered by the outer masonite sheet. Thus, the 7 screws holding the face-plate assembly snug to the box can be taken out to remove the face plate without unbolting the box itself. Next I glued the 2 masonite sheets together, keeping the holes aligned as best I could. After the glue had set and hardened, I cleaned the glue out of the holes and made them fit down over all the screw heads, nuts, and washers using a dental burr in a high-speed Dremel moto-tool. (It pays to make friends with your dentist. Get him so save you a handful of various size and shape burrs, which make great hobby tools even after they are a bit dull for medical-level use.) The aluminum face plate was then epoxied onto the masonite and those holes "doctored" as necessary to get the screws and washers in place and the whole face-plate assembly on the gear box. All this was done to get a removable face plate with no screw heads or other projections for Bob to feel. All he can feel are the pointers and the Braille numbers, except for the screw holes, which could not be confused with the numbers (photos 1, 2, and 6).

Thin, clear-plastic sheets were then made

Say You Saw It In CQ

to cover the two sides and top of the gear box and were fastened with sheet-metal screws and washers. At the suggestion of my XYL, Marie, KA1BRF, the covers extend about $\frac{1}{8}$ " out over the face plate to protect Bob's fingers from its rough edges. Incidentally, I had put the angle brackets in a vise and "threaded" the holes with the sheet-metal screws in advance, so no great force was needed to tighten them down on the thin plastic covers. I used clear plastic for the covers so the kids and kibitzers can see the gears go around, and so one can see whether there is trouble in the gear box if any set screws come loose and the gears slip (photos 1 and 2).

Of course, such a gadget would not work on some other radios with different tuning arrangements. However, I have looked at 2 others for which I think such a gadget could be made by changing 2 or 4 of the gears. (1) Kenwood TS-820, where the tuning dial goes 20 kHz per revolution, or 5 revolutions for 100 kHz, or 25 revolutions for 500 kHz to the stop (see fig. 2). (2) Kenwood TS-520, where the tuning dial goes 20 kHz per revolution, or 5 revolutions for 100 kHz. However, in this case the dial goes 600 kHz to the stop, so the tuning dial has to go 30 revolutions on this one, and the last shaft with the hundreds pointer has to indicate 600 kHz. (And so would the face-plate dial have to have 600 kHz marked at 60 degrees of arc spacing.) Therefore, changing 4 of the gears in this case would produce the desired results (see fig. 3). There are no doubt many others for which the gear ratios could be worked out. In any case, I should think that anyone who is visually handicapped would give considerable weight to the frequency control options available for any radio being considered, so here is another possibility.

Gears	Shaft No.					Drive/Driven Ratio	
	1	2	3	4	5		
Gear Teeth	40-80					1:2	Units pointer on shaft 1
Gear Teeth		16-80				5:1	Tens pointer on shaft 3
Gear Teeth			16-80			5:1	
Gear Teeth				56-56		1:1	Hundreds pointer on shaft 5

Fig. 2- The proposed gear ratio plan for the TS-820.

Gears	Shaft No.					Drive/Driven Ratio	
	1	2	3	4	5		
Gear Teeth	40-80					1:2	Units pointer on shaft 1
Gear Teeth		16-80				5:1	Tens pointer on shaft 3
Gear Teeth			12-72			6:1	
Gear Teeth				56-56		1:1	Hundreds pointer on shaft 5

Fig. 3- The proposed gear ratio plan for the TS-520.

There was one minor and unexpected disappointment with no solution. The gear-box gears are fixed, and so are the gears in the radio's internal tuning mechanism; they cannot be made variable. Therefore, nothing can be done about the fact that the v.f.o. does not precisely track the turns of the tuning knob. According to the digital readout, the units pointer gets as much as $2\frac{1}{2}$ kHz ahead of the actual frequency on some parts of the amateur bands. But, as Larry points out, $2\frac{1}{2}$ is only 0.5% of 500 kHz, which is a pretty small error, and with practice Bob has learned to compensate for that and gets mighty close.

There is one added refinement on my project list, which is to come up with some sort of brake, or quick release lock, to hold the gears steady at any set frequency. Bob says he

would like something like that so he cannot accidentally knock the radio off frequency by just brushing the tuning knob or the pointers after he lets go to jiggle his key, turn his gain control, or whatever. The whole thing turns that easily. Adding such a brake will also have to be a cut-and-try, file-and-fit job because I have no engineering drawings, specifications, or measurements beyond the above description to go by. Of course, I did not have even that much when I started this project.

Hopefully others will make more such gadgets and will come up with improvements and better techniques and then write them up. I will not be able to make any more of them myself, but I offer this to anyone who is interested in considering this alternative frequency-control option.

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CQ REVIEWS:

The Radiokit U.H.F. Converter Kit

BY LEW MCCOY*, W1ICP

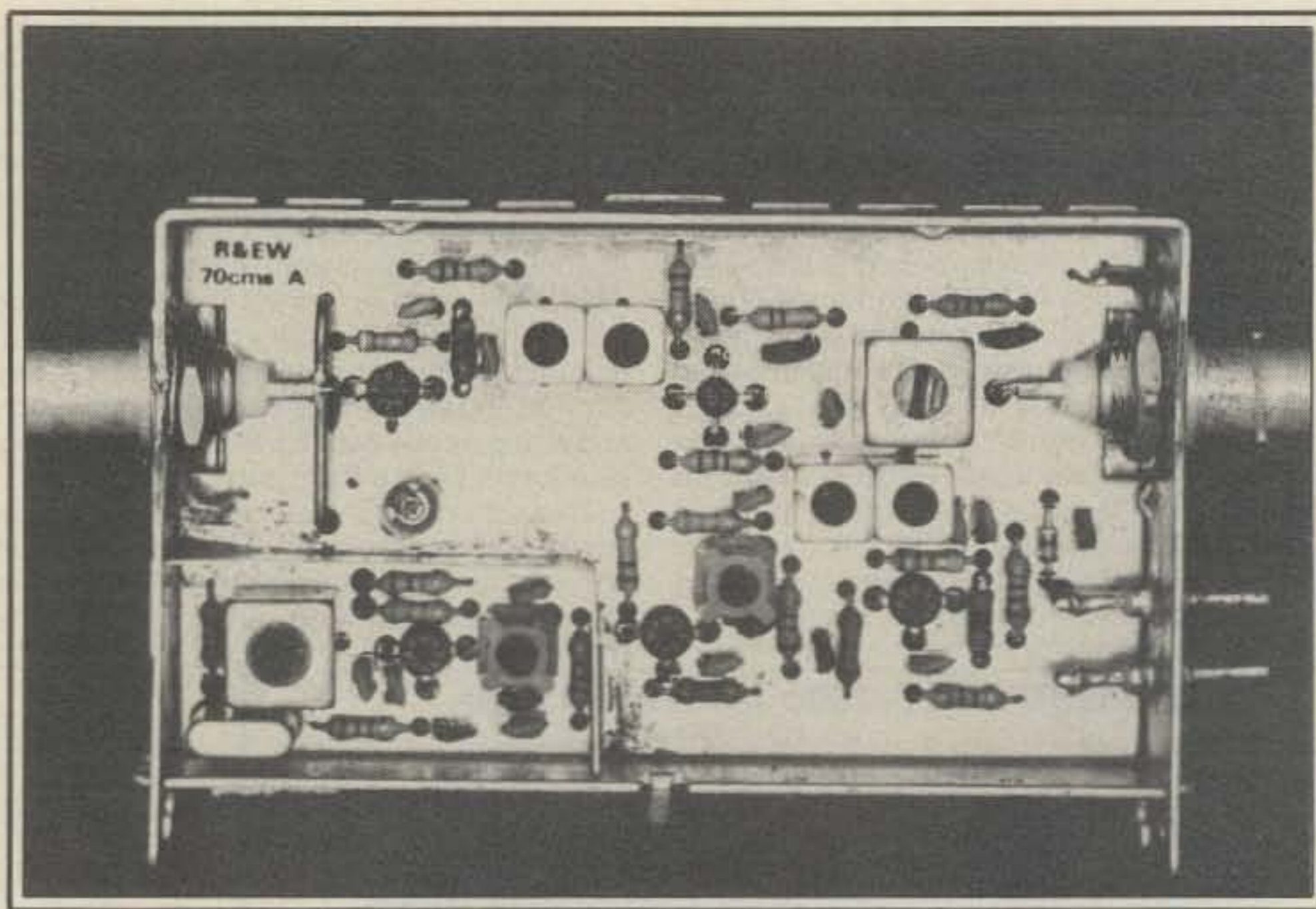
Radiokit Co. of Greenville, New Hampshire, has been making kits for various amateur projects for some years now. I have known the owner, Bob Wilson, for a long time. However, I never had a chance to review any of his products until now. I see Bob at the Dayton Hamvention (and a few other shows) each year, and this year we had a chance to talk about one of his newer kits, a 450 MHz to 10 meter converter. He asked if we (CQ) would like to review the kit and I said yes—a strong yes, in fact.

This converter is a "down" converter in that a signal received in the 432 to 434 MHz region is converted down in frequency to 28 to 30 MHz. The converter is powered by a 12 volt d.c. supply (not provided). Terminations are 50 ohms in and out, and the designer rates it at 28 dB gain, nominal. He rates the noise figure at 1.8 to 2.5 dB.

Before discussing the kit, let me editorialize a little about amateur radio and the present state of the "technical art." Unfortunately, while a large number of amateurs like to experiment and build, it has become a real headache to buy parts for any given project. Let me make another point: many of our present crop of amateur radio operators would like nothing better than to say "I build my own gear," but unfortunately, unless you are very savvy, building your own gear is extremely difficult. You almost have to have experience as a purchasing agent, get all the amateur publications (and I don't mean just magazines, but all the surplus flyers, catalogs, etc.), plus attend at least a few major fleamarkets every year. My point is simple: it is very difficult to be an experienced builder in this day and age, even though most of us would like to be. One answer, of course, is a person such as Bob Wilson. He does the shopping for us, packages various projects, and tries to select projects we all like.

So what about the u.h.f. converter?

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



This is a top view of the Radiokit u.h.f. to 10 meter converter.

The converter was taken from an article by Timothy Edwards, who built and described the unit in *Radio and Electronics World*, a British electronics magazine, in the November 1981 issue. What Radiokit markets is a complete kit as described in the article. This is not a step-by-step construction article. A copy of the original article, with some additional information, is provided with the kit of parts. It is the same as if you bought the magazine and then decided to build the unit from the article, except in this case Radiokit provides all the parts.

The u.h.f. converter works just about the way the author described it, which in our judgment is very well indeed. The completed unit was tested with all the best modern test equipment, and while the noise figure of our particular unit wasn't quite up to what the author specified, it certainly met with our approval.

Several small problems cropped up when working from the article. The British methods for listing component values are

slightly different from the American methods, and this caused some confusion. However, Bob Wilson corrected that problem by providing an American component list.


The converter is built on an etched circuit board. The etched board provided in the kit is of excellent material—a good etching job, plus it is all predrilled. Even if you have never worked on 70 cm projects, where component lead lengths are so critical, the etched board tends to minimize such problems. The photograph is a top view of the converter in its case, and this view is better than a thousand words.

The circuit uses a BFR91 for the r.f. stage which is a bipolar transistor. Some u.h.f. people may raise their eyebrows at this, but the designer states his reason. He justifies the use of the bipolar because of its low noise figure of 1.5 dB at 432 MHz. It is used in conjunction with a TOKO 7HW series filter. These are based on helical filter design and offer a very high Q.

The mixer is a dual-gate MOSFET, which is fed from a crystal-controlled oscillator (BFW92) at 44.88 MHz, which is first multiplied by three and then by three again to provide output to the mixer at 404 MHz. A buffer and multiplier are used following the oscillator.

The completed converter is housed in a small metal case 2" x 3 1/2" x 3/4". Building time is only a few hours, making this a one-evening project. We were careful to keep all lead lengths as short as possible. If there was a serious complaint, it would be about drilling the holes in the case to fit the BNC connectors. The case is fairly small, and one needs a vise to hold the metal work; otherwise, it is easy to bend and mess up the case attempting to get the holes drilled. A pre-drilled or punch case would have been more satisfactory.

As I said earlier, the noise figure didn't quite come out to what the designer said it would be. However, the performance was more than satisfactory. For someone who likes to roll his own, this project is certainly inexpensive enough to let him try out OSCAR reception and other signals on the 70 cm band. We certainly would recommend it.

The price of the kit is \$38.50 plus \$3.00 for shipping and handling. It is available from Radiokit, Radio Components and Accessories, Box 411, Greenville, NH 03048 (telephone 603-878-1033). 

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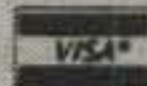
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Here's an operating aid to help you understand the new Soviet callsigns.

NEW SOVIET CALLSIGNS

BY BOB ELDRIDGE*, VE7BS

Many stations were caught by surprise when dozens of new prefixes suddenly appeared in the Soviet Union on the weekend of the May 1984 CQ WPX C.W. Contest. The whole Soviet callsign allocation system was changed effective May 1, 1984. Here is a description of the principles of the new arrangement put together from information received from Dexter Anderson, W4KM, Boris Stepanov, UW3AX, and the Central Radio Club of the USSR.

The first letter of the prefix is U or R for both h.f. and v.h.f./u.h.f. stations and identifies the USSR. Prefixes EZ and EY have been discontinued. The second letter of the prefix identifies the republic (Ukraine-Latvia, etc.). Callsigns of collective stations which began with UK have been replaced with prefixes which identify the republic. They have six-character callsigns. In the Russian Republic (RSFSR) the prefix is UZ; in the other republics the regular second letter is used (B or T in the Ukraine, for example). Collective stations can be distinguished from individual stations by the second and third letters of the suffix. Individuals have calls ending in AA to VZ, while collectives end in WA to ZZ. (Previous individual calls that ended with WA to ZZ were changed to conform to the new system.)

The smallest geographical unit identified by callsign is the oblast (roughly a county, and often referred to by Soviet amateurs as "region"), or the equivalent. Moscow, Leningrad, Kiev, Minsk, Alma-Ata, Tashkent, and Sevastopol are equivalent to an oblast, and each now has an oblast number. In the Russian Republic the oblast is identified by the number and the letter following it (4P, 9M, etc.). In the others the oblast is identified by the letter in front and the letter behind the number (like-B5L—). In the oblasts of Alma-Atinskaya and Tashkentskaya (except for the cities of Alma-Ata and Tashkent) and in the cities of Kiev and Sevastopol, all previously assigned six-character calls have been changed by changing one letter (for example, UL7GAL became UL7QAL and UB5UAT [in Kiev] became UT5UAT). *Five-character calls (2 + 2's) have not been changed, even if they do not correspond to the new system, unless the holder of the call wishes to change it to a six-character call. An upgraded amateur may keep a six-character call if desired, but when moving to another oblast the call is changed to conform to the new system.*

In order to maintain some sort of continuity, the agency responsible for assigning new calls has tried to adopt the same numbering system wherever possible. For example, 9's and 0's are reserved for use in the Asian regions, and lower numbers are reserved for use where they previously would have been used.

When hunting for a specific oblast, a list of new letter-number allocations would be useful. Included here is a list by callsign which will facilitate rapid identification of a location when a new call is heard.

OBL NR.	Call Series	Republic	oblast
001	UD/RD/UK6D..	Azerbaijan	
002	UD/RD/UK6C..	Nakhichevan	
003	UD/RD/UK6K..	Gorno-Karabakh	
004	UG/RG/UK6G..	Armenia	
005	UC/RC/UK2L..	Byelorussia	Brestskaya
006	UC/RC/UK2W..	Vitebskaya	
007	UC/RC/UK2O..	Gomelskaya	
008	UC/RC/UK2I..	Grodnenskaya	
009	UC/RC/UK2A,C..	Minskaya	
010	UC/RC/UK2S..	Mogilevskaya	
011	UC2	Molodetskaya	
012	UF/RF/UK6F..	Georgia	
013	UF/RF/UK6V..	Abkhazian ASSR	
014	UF/RF/UK6Q..	Adjar ASSR	
015	UF/RF/UK6O..	South Ossetia	
016	UL/RL/UK7B..	Kazakhstan	Celinogradskaya
017	UL/RL/UK7I..	Aktubinskaya	
018	UL/RL/UK7G..	Alma-Atinskaya	
019	UL/RL/UK7J	E. Kazakhstan	
020	UL/RL/UK7O..	Gurievsckaya	
021	UL/RL/UK7T..	Jambulskaya	
022	UL/RL/UK7M..	Uralskaya	
023	UL/RL/UK7P..	Karagandinskaya	
024	UL/RL/UK7K..	Kizil-Ordinskaya	
025	UL/RL/UK7E..	Kokchetavskaya	
026	UL/RL/UK7L..	Kustanaiskaya	
027	UL/RL/UK7F..	Pavlodarskaya	
028	UL/RL/UK7C..	N. Kazakhstan	
029	UL/RL/UK7D..	Semipalatinskaya	
030	UL/RL/UK7V..	Taldy-Kurgansk	
031	UL/RL/UK7N..	Chimkentskaya	
036	UM/RM/UK8M..	Kirghiz	
032	UM8..	Nil since 1959	
033	UM/RM/UK8Q..	Issyk-Kul'skaya	
034	UM/RM/UK8N..	Oshskaya	
036	see just above		
035	UM8..	Nil since 1959	
037	UQ/RQ/UK2G,Q..	Latvia	
038	UP/RP/UK2B,P..	Lithuania	
039	UO/RO/UK5O..	Moldavia	

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040	UJ/RJ/UK8J..	Tajik
041	UJ/RJ/UK8S..	Leninabadskaya
042	UJ/RJ/UK8R..	Gorno-Badakhshan
043	UH/RH/UK8H..	Turkmen
044	UH/RH/UK8E..	Maryyskaya
045	UH/RH/UK8W..	Tashauzskaya
046	UH/RH/UK8Y..	Chardzhouskaya
047	UI/RI/UK8F..	Uzbek
048	UI/RI/UK8L..	Andi janskaya
049	UI/RI/UK8C..	Bukharskaya
050	UI/RI/UK8O..	Kashkadar
051	UI/RI/UK8I..	Namanganskaya
052	UI/RI/UK8T..	Samarkandskaya
053	UI/RI/UK8A..	Surkhan Darinsk
054	UI/RI/UK8G..	Tashkentskaya
055	UI/RI/UK8U..	Ferganskaya
056	UI/RI/UK8Z..	Khorezmskaya
057	UB/RB/UK5N..	Kara-Kalpak
058	UB/RB/UK5P..	Ukraine
059	UB/RB/UK5M..	Vinnickaya
060	UB/RB/UK5E..	Volinskaya
061	UB5..	Luganskaya
062	UB/RB/UK5X..	Dnepropetrovsk
063	UB/RB/UK5D..	Nil since 1963
064	UB/RB/UK5Q..	Zhitomirskaya
065	UB/RB/UK5U..	Zakarpatskaya
066	UB/RB/UK5V..	Zaporojskaya
067	UB/RB/UK5J..	Kievskaya
068	UB/RB/UK5W..	Kirovgradskaya
069	UB/RB/UK5Z..	Crimskaya
070	UB/RB/UK5F..	Lvovskaya
071	UB/RB/UK5H..	Nikolaevskaya
072	UB/RB/UK5K..	Odesskaya
073	UB/RB/UK5I..	Poltavskaya
074	UB/RB/UK5S..	Rovenskaya
075	UB/RB/UK5A..	Doneckaya
076	UB/RB/UK5B..	Ivano-Frankovsk
077	UB/RB/UK5L..	Sumskaya
078	UB/RB/UK5G..	Ternopol'skaya
079	UB/RB/UK5T..	Kharkovskaya
080	UB/RB/UK5C..	Hersonskaya
081	UB/RB/UK5R..	Hmelnickaya
082	UB/RB/UK5Y..	Cherkasskaya
083	UR/RR/UK2R, T..	Chernigovskaya
084	UA/RA/UK9W..	Chernovickaya
085	UA/RA/UK0D..	Estonia
086	UA/RA/UK6W..	Russian SFSR
087	UA/RA/UK6X..	Bashkir
088	UA/RA/UK1N..	Buryat
089	UA/RA/UK6I..	Daghestan
090	UA/RA/UK9X..	Kabardino-Balkar
091	UA/RA/UK4S..	Karelia
092	UA/RA/UK4U..	Kalmyk
093	UA/RA/UK6J..	Komi
094	UA/RA/UK4P..	Mari
095	UA/RA/UK4W..	Mordovia
096	UA/RA/UK6P..	N. Ossetia
097	UA/RA/UK4Y..	Tatar
098	UA/RA/UK0Q..	Udmurt
099	UA/RA/UK9Y..	Checheno-Ingush
100	UA/RA/UK9Z..	Chuvash
101	UA/RA/UK6A..	Yakut
		Altai Territory
		Gorno-Altai
		Krasnodar

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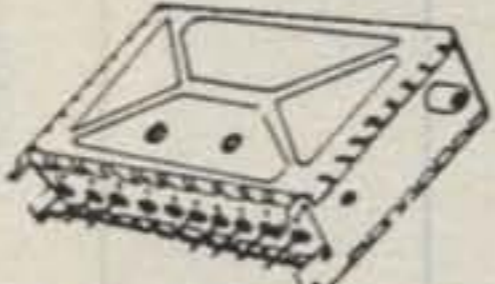
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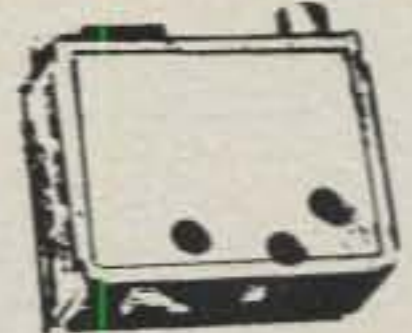

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102	UA/RA/UK6Y..	Adigei	149	UA/RA/UK1W..	Pskovskaya
103	UA/RA/UK0A..	Krasnoyarsk	150	UA/RA/UK6L..	Rostovskaya
104	UA/RA/UK0W..	Khakass	151	UA/RA/UK3S..	Riasanskaya
105	UA/RA/UK0B..	Taymyrskiy (D-N)	152	UA/RA/UK4C..	Saratovskaya
106	UA/RA/UK0H..	Evenkiyskiy	153	UA/RA/UK0F..	Sakhalinskaya
107	UA/RA/UK0L..	Primorye	154	UA/RA/UK9C..	Sverdlovskaya
108	UA/RA/UK6H..	Stavropol	155	UA/RA/UK3L..	Smolenskaya
109	UA/RA/UK6E..	Karachai-Cherk.	156	UA/RA/UK4A..	Volgogradskaya
110	UA/RA/UK0C..	Khabarovsk	157	UA/RA/UK3R..	Tambovskaya
111	UA/RA/UK0D..	Jewish Aut Reg.	158	UA/RA/UK9H..	Tomskaya
112	UA/RA/UK0J..	Amurskaya	159	UA/RA/UK0Y..	Tuvinskaya
113	UA/RA/UK10..	Archangelskaya	160	UA/RA/UK3P..	Tul'skaya
114	UA/RA/UK1P..	Nenetskiy	161	UA/RA/UK9L..	Tiumenskaya
115	UA/RA/UK6U..	Astrakhanskaya	162	UA/RA/UK9J..	Khanty-Mansiysk
116	UA4..	deleted before 1970	163	UA/RA/UK9K..	Yamalo-Nenetskiy
117	UA/RA/UK3Z..	Belgorodskaya	164	UA/RA/UK4L..	Ulianovskaya
118	UA/RA/UK3Y..	Brianskaya	165	UA/RA/UK9A..	Cheliabinskaya
119	UA/RA/UK3V..	Vladimirskaya	166	UA/RA/UK0U..	Chitinskaya
120	UA/RA/UK1Q..	Vologodskaya	167	UA/RA/UK9S..	Orenburgskaya
121	UA/RA/UK3Q..	Voronejskaya	168	UA/RA/UK3M..	Yaroslavskaya
122	UA/RA/UK3T..	Gorkovskaya	169	UA/RA/UK1A,B..	Leningrad City
123	UA/RA/UK3U..	Ivanovskaya	170	UA/RA/UK3A,B..	Moscow City
124	UA/RA/UK0S..	Irkutskaya	171	various	Arctica) deleted in
125	UA/RA/UK2F..	Kalingradskaya	172	UA/4K..	Antarctica) 1984
126	UA/RA/UK3I..	Kalininskaya			
127	UA/RA/UK3X..	Kaluz'skaya			
128	UA/RA/UK0Z..	Kamchatskaya			
129	UA/RA/UK0X..	Koryakskiy	173	UI/RI/UK8D..	Syrdarinskaya
130	UA/RA/UK9U..	Kemerovskaya	174	UA/RA/UK0T..	Ust-Ordynskiy
131	UA/RA/UK4N..	Kirovskaya			Buryatskiy AO
132	UA/RA/UK3N..	Kostromskaya	175	UA/RA/UK0V..	Aginskiy Buryat.
133	UA/RA/UK4H..	Kuibeshevskaya	176	UL/RL/UK7Y..	Turgayskaya
134	UA/RA/UK9Q..	Kurganskaya	177	UM/RM/UK8P..	Narynskaya
135	UA/RA/UK3W..	Kurskaya	178	UL/RL/UK7R..	Dzhezkazganskaya
136	UA/RA/UK1C,F..	Leningradskaya	179	UL/RL/UK7A..	Mangyshlakskaya
137	UA/RA/UK3G..	Lipeckaya	180	UH/RH/UK8B..	Krasnovodskaya
138	UA/RA/UK0I..	Magadanskaya	181	UI/RI/UK8V..	Dzhizakskaya
139	UA/RA/UK0K..	Chukotskiy	182	UJ/RJ/UK8K..	Kulyabskaya
140	UA/RA/UK9F..	Permskaya	183	UJ/RJ/UK8X..	Taldy-Kurgansk.
141	UA/RA/UK9G..	Komi-Permyatskiy	184	UM8	Talasskaya
142	UA/RA/UK3D,F..	Moscow	185	UI8	Navoinskaya
143	UA/RA/UK1Z..	Murmanskaya	186	UT/RT/UK5U..	Kiev City
144	UA/RA/UK1T..	Novgorodskaya	187	UT/RT5J..	Sevastopol City
145	UA/RA/UK9D..	Novosibirskaya	188	UC/RC5J..	Minsk City
146	UA/RA/UK9M..	Omskaya	189	UI/RI.A..	Tashkent City
147	UA/RA/UK3E..	Orlovskaya	190	UL/RL.G..	Alma-Ata City
148	UA/RA/UK4F..	Penzenskaya	191	UH/RH.A..	Ashkhabad City

New Additions

Table 1- New Soviet callsigns by oblast. These callsign allocations became effective on May 1, 1984.

RSFSR (A, V, W, Z)	3F - 142 Moscovsk	4A - 156 Volgogradsk
1A - 169 Leningrad City	3G - 137 Lipetsk	4C - 152 Saratovsk
1B - 169 Leningrad City	3I - 126 Kalininsk	4F - 148 Penzensk
1C - 136 Leningradsk	3L - 155 Smolensk	4H - 133 Kuybyshevsk
1F - 136 Leningradsk	3M - 168 Yaroslavsk	4L - 164 Ul'yanovsk
1N - 088 Karelsk	3N - 132 Kostromsk	4N - 131 Kirovsk
10 - 113 Arkhangelsk	3P - 160 Tul'sk	4P - 094 Tatarsk
1P - 114 Nenetsk	3Q - 121 Voronezhsk	4S - 091 Mariysk
10 - 120 Vologodsk	3R - 157 Tambovsk	4U - 092 Mordovsk
1T - 144 Novgorodsk	3S - 151 Ryazansk	4W - 095 Udmurtsk
1W - 149 Pskovsk	3T - 122 Gor'kovsk	4Y - 097 Chuvashsk
1Z - 143 Murmansk	3U - 123 Ivanovsk	6A - 101 Krasnodarsk
2F - 125 Kaliningradsk	3V - 119 Vladimirska	6E - 109 Karach-Cherkessk
3A - 170 Moscow City	3W - 135 Kursk	6H - 108 Stavronolsk
3B - 170 Moscow City	3X - 127 Kaluzhsk	6I - 089 Kalmytsk
3D - 142 Moscovsk	3Y - 118 Bryansk	6J - 093 Severo-Osetinsk
3E - 147 Orlovsk	3Z - 117 Belgorodsk	6L - 150 Rostovsk

- 6P - 096 Chech-Ingushsk
- 6U - 115 Astrakhansk
- 6W - 086 Dagestansk
- 6X - 087 Kabard-Balkarsk
- 6Y - 102 Adygeysk
- 8T - 174 Ust'Ordynsk/Buryatsk
- 8V - 175 Aginsk Buryatsk
- 9A - 165 Chelyabinsk
- 9C - 154 Sverdlovsk
- 9F - 140 Permsk
- 9G - 141 Komi-Permyatsk
- 9H - 158 Tomsk
- 9J - 162 Khanty-Mansiysk
- 9K - 163 Yamalo-Nenetsk
- 9L - 161 Tyumensk
- 9M - 146 Omsk
- 9O - 145 Novosibirsk
- 9Q - 134 Kurgansk
- 9S - 167 Orenburgsk
- 9U - 130 Kemerovsk
- 9W - 084 Bashkirsk
- 9X - 090 Komi
- 9Y - 099 Altaysk
- 9Z - 100 Gorno-Altaysk
- 0A - 103 Krasnoyarsk
- 0B - 105 Taymyrsk
- 0C - 110 Khabarovsk
- 0D - 111 Yevreysk

- 0F - 153 Sakhalinsk
- 0H - 106 Evenkiysk
- 0I - 138 Magadansk
- 0J - 112 Amursk
- 0K - 139 Chukotsk
- 0L - 107 Primorsk
- 0O - 085 Buryatsk
- 0Q - 098 Yakutsk
- 0S - 124 Irkutsk
- 0U - 166 Chitinsk
- 0W - 104 Khakassk
- 0X - 129 Koryaksk
- 0Y - 159 Tuvinsk
- 0Z - 128 Kamchatsk

Ukraine (B, T)

- B-A - 075 Sumsk
- B-B - 076 Ternopol'sk
- B-C - 080 Cherkassk
- B-D - 063 Zakarpatsk
- B-E - 060 Dnepropetrovsk
- B-F - 070 Odessk
- B-G - 078 Khersonsk
- B-H - 071 Paltavsk
- B-I - 073 Donetsk
- B-J - 067 Krymsk
- B-K - 072 Rovensk
- B-L - 077 Kharkovsk
- B-M - 059 Voroshilovgradsk
- B-N - 057 Vinnitsk
- B-P - 058 Volynsk
- B-Q - 064 Zaporozhsk
- B-R - 081 Chernigovsk
- B-S - 074 Ivano-Frankovsk
- B-T - 079 Khmel'nitsk
- B-U - 065 Kiyevsk
- B-V - 066 Kirovogradsk
- B-W - 068 Lvovsk
- B-X - 062 Zhitomirsk
- B-Z - 069 Nikolayevsk
- T-J - 187 Sevastopol City
- T-U - 186 Kiev City
- B-Y - 082 Chernovick

Belorussia (C)

- C-A - 188 Minsk City
- C-C - 009 Minsk obl
- C-I - 008 Grodnensk
- C-L - 005 Brestsk
- C-O - 007 Gomelsk
- C-S - 010 Mogilevsk
- C-W - 006 Vitebsk

Azerbaijan (D)

- D-D - 001 subord rayons
- D-K - 003 Nagorno-Karabakhsk
- D-N - 002 Nakhichevsk

Georgia (F)

- F-F - 012 subord rayons
- F-Q - 015 Yugo-Osetinsk
- F-G - 014 Adzharsk
- F-V - 013 Abkhazsk

Armenia (G)

- G-G - 004 subord rayons

Turkmenia (H)

- H-A - 191 Ashkhabad City
- H-B - 180 Krasnovodsk
- H-E - 044 Maryysk
- H-H - 043 Ashkhabadsk
- H-W - 045 Tashauzsk
- H-Y - 046 Chardzhouk

Uzbekistan (I)

- I-A - 189 Tashkent City
- I-B - 053 Tashkent'sk obl
- I-C - 049 Kashkadarinsk
- I-D - 173 Syrdarinsk
- I-F - 047 Andizhansk
- I-G - 054 Fergansk
- I-I - 051 Samarkandsk
- I-L - 048 Bukharsk
- I-O - 050 Namangansk
- I-Q - 185 Navoiysk
- I-T - 052 Surkhandarinsk
- I-U - 055 Khorezm'sk
- I-V - 181 Dzhizak'sk
- I-Z - 056 Karakalpak'sk

Tadzhikistan (J)

- J-J - 040 subord rayons
- J-K - 182 Kulyabsk
- J-R - 042 Gorno-Badakhshansk
- J-S - 041 Leninabadsk
- J-X - 183 Kurgan-Tyubinsk

Kazakhstan (L)

- L-A - 179 Mangyshlak'sk
- L-B - 016 Tselinogradsk
- L-C - 028 Severo-Kazakstansk
- L-D - 029 Semipalatinsk
- L-E - 025 Kokchetavsk
- L-F - 027 Pavlodarsk
- L-G - 190 Alma-Ata City
- L-I - 017 Aktyubinsk
- L-J - 019 Vostochno-Kazak
- L-K - 024 Kzyl-Ordinsk
- L-L - 026 Kustanaysk
- L-M - 022 Uralsk
- L-N - 031 Chimkent'sk
- L-O - 020 Guryevsk
- L-P - 023 Karagandinsk
- L-Q - 018 Alma-Atinsk obl
- L-R - 178 Dzhezkazgansk
- L-T - 021 Dzhambul'sk
- L-V - 030 Taldy-Kurgansk
- L-Y - 176 Turgaysk

Kirgiziya (M)

- M-M - 036 subord rayons
- M-N - 034 Oshsk
- M-P - 177 Narynsk
- M-Q - 033 Issyk-Kul'sk
- M-T - 184 Talassk

Moldavia (O)

- P-B - 038 Lithuania (P)
- Q-G - 037 Latvia (Q)
- R-R - 083 Estonia (R)

Table II - Oblasts by identifying letters.

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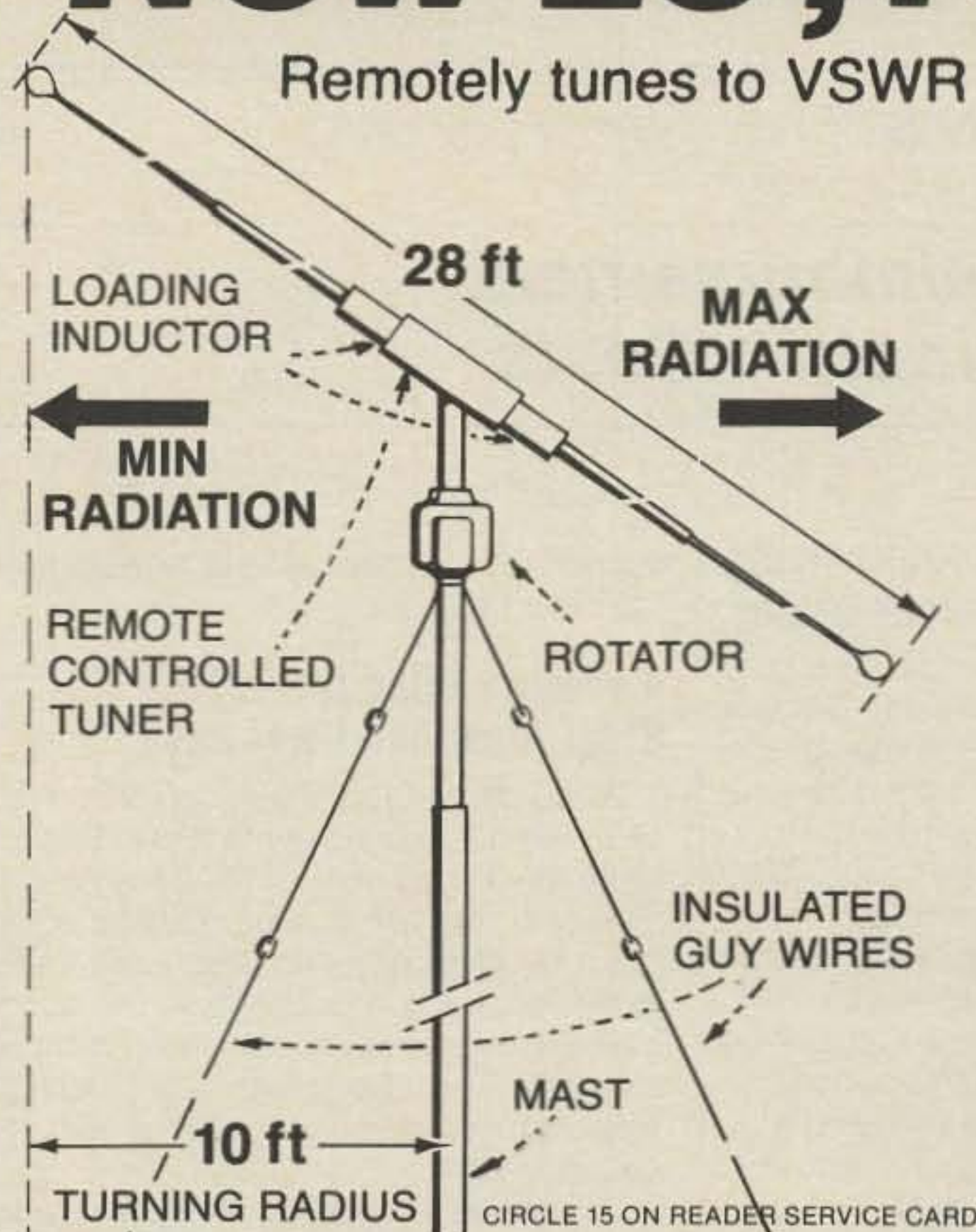
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FCC Provides for Reimbursement of Volunteer Examination Costs

In the matter of PR Docket 84-265, the Commission has amended Part 97 of its rules to provide for the reimbursement of out-of-pocket expenses incurred by volunteer examiners (VEs) and volunteer examiner coordinators (VECs) in the preparation, processing, or administration of examinations for amateur licenses above the Novice class. The new rules provide that:

- The total allowable cost to be reimbursed per examinee may not exceed \$4.00; the figure will be adjusted each January for changes in the Department of Labor Consumer Price Index.

- The amount of reimbursement from any examinee for any one examination at a particular session regardless of the number of examination elements taken must not exceed the published maximum.

- VEs and VECs must maintain records of their out-of-pocket expenses and reimbursements, and must certify to the FCC annually that all reimbursed expenses were necessary and prudently incurred.

- VEs and VECs must make arrangements among themselves for the collection and distribution of reimbursements.

The implementation of the cost-reimbursement provisions in the rules apparently clears the way for the ARRL to participate in the Volunteer Examiner Program. Before this happens, however, it will be necessary for the League and the Commission to sign a Memorandum of Understanding (MOU) which will set forth the agreed-upon manner in which the League will participate in the Program. Of particular concern to the Commission is the fact that the ARRL is a publisher of amateur-related material; as such, it must convince the Commission that there will be no interaction between the League's publishing activities and its work as a VEC. As we go to press, the text of the MOU is under consideration by the FCC's General Council. Approval is likely, but by no means assured, by the time this is read.

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Commission Relaxes Requirements For Preparation of Amateur Exams

In response to comments filed by the Capitol Hill Amateur Radio Society (CHARS) in the matter of PR Docket 83-27, the Commission has eliminated the requirement that the FCC design written examination elements 3, 4(A), and 4(B). However, rather than permitting volunteer examiners to immediately design amateur operator exams above the Novice class, a two-year transition period was implemented. During this period, only VECs may design the examinations.

FCC Issues NPRM on H.F. Broadcasters in 40 Meter Band

According to Ray Kowalski, Chief, Special Services Division, Private Radio Bureau, the FCC has issued a Notice of Proposed Rulemaking regarding use of the 7100-7300 kHz subband by U.S. international broadcasters in ITU Region 3 (this Region consists of the Pacific Ocean west of Hawaii, and Asia). Use of the subband by broadcasters in Region 3 is provided for under the Radio Regulations adopted at WARC 79, although the U.S. has yet to license stations in the manner proposed. Because there is concern in amateur circles that broadcasting stations on U.S. islands in the Pacific could produce interference to amateur operations in Region 2 (North, Central, and South America), the ARRL, among others, is expected to file comments.

Commission to Consider Amateur Rebroadcast Rules

In still another action by the Commission, an NPRM was adopted regarding rebroadcast rules for the amateur and CB services (BC Docket 79-47). Previously the subject of a Notice of Inquiry (NOI), the FCC now proposes to permit broadcasters to rebroadcast amateur and CB communications without obtaining permission from either the parties involved or the Commission. Even if the provisions of the NPRM are adopted, however, it would still be illegal for amateurs and CBers to intentionally use their stations in

support of a broadcaster's newsgathering activities.

Amateurs Cited in Great American Giveaway

According to *The Washington Post*, for years amateur radio operators in San Antonio have lined up "for what they called 'goody boxes' of surplus military equipment ranging from cameras and TV sets to aircraft gun components." The goods came from a warehouse at Fort San Houston which Congressional investigators claimed was bulging with goods of all description.

A review of records from the warehouse revealed that in a practice that was halted in 1983, amateurs were given 11,612 types of items with a list value of \$55 million. However, the Army maintained that the equipment given amateurs included miscellaneous parts and outdated models which were worth far less than the \$55 million the equipment originally cost.

The Post did cite the fact that the Army traditionally gave members of its Military Affiliated Radio System (MARS) surplus equipment to maintain their communications capability. However, in at least one case an Army MARS official was quoted as saying that the gifts were made "to keep the volunteers happy."

The Army MARS program under which surplus equipment is distributed to member operators is now under revision, since according to the Army, most amateurs have "no immediate need" for most of the items stockpiled.

City of Livermore, CA Not To Limit Antenna Heights

According to Don Johnson, KD6DT, the City Council of Livermore, CA heard and rejected two ordinances prepared by the Livermore Planning Department proposing to regulate amateur radio and CB antennas and towers, plus small earth station satellite dishes. The action originated following a resident's complaint to the Livermore City Council in 1983 that there was no regulation on either the height or number of amateur radio anten-

nas in residential districts. The object of the resident's ire was a neighbor's 80 foot tower which supported a number of antennas.

Planning Commission hearings in 1984 resulted in the preparation of proposed ordinance amendments regarding both the location and number of antennas as well as permissible tower heights. However, after a review of the amendments, the City Council felt the proposed legislation was confusing and unenforceable. Furthermore, since there had been no new complaints since the issue was raised in 1983, the Council declined to act.

FCC Considers Relaxation of Rules Governing Permissible Communications

Two unrelated, but strikingly similar, Commission documents suggest that the FCC is moving ever closer to creating what some are calling "do anything" radio services.

The first document is a Staff Report prepared by Alex Felker and Kenneth Gordon of the Office of Plans and Policy: "A Framework For a Decentralized Radio Service." The Report "recommends that the Commission establish a new radio service without any technical or operational restrictions beyond those necessary to control interference." Licensees in this service, say the authors, would be free to offer entertainment programming, land mobile services, or any other services. That is, they would be free to tailor the spectrum allocated to meet their needs without FCC involvement. Felker and Gordon recommend that the service be introduced into the existing u.h.f. TV band.

In a similar vein, the Private Radio Bureau earlier this year introduced PR Docket No. 84-109, which proposes to eliminate restrictions on permissible communications in the Private Land Mobile Radio services. Under current rules, licensees must restrict their communications to matters pertaining to their official or business activities. But, says the PRB, "once basic eligibility has been established, licensees should have discretion to decide which communications are essential to the efficient and effective operation of their businesses."

Neither of these issues is directly applicable to the Amateur service . . . yet! This is not to say, however, that the current climate of "unregulation" found within the Commission could eventually result in a similar relaxation of the rules governing our service. Stay tuned!

Spread-Spectrum System Subject of FCC Inquiry

An inquiry is in process into the proposed use of spread-spectrum systems for certain civil applications. Specifically, the FCC proposes to authorize the use of

certain spread-spectrum systems over any range of frequencies above 70 MHz. No restrictions would be placed on the occupied bandwidth, but limits would be imposed on radiated field strength.

Spread-spectrum systems use a transmitted bandwidth that is significantly larger than the information bandwidth. The "spreading" of the signal is accomplished in a number of ways, including a technique called *frequency hopping*. Here a narrow-band signal is hopped from frequency to frequency over a wide band of frequencies. A receiver locked to the instantaneous frequency of the transmitted signal effectively "despreads" the hopped signal, which is then demodulated in the conven-

tional manner. Spreading of the transmitted signal lowers the spectral energy density of the transmitted signal, thereby reducing interference to conventional communications systems. Spreading also provides resistance to interference from other emissions in the same band (i.e., an anti-jam capability).

Currently, most spread-spectrum systems are operated by the U.S. government and the military, although some experiments using spread-spectrum modulation techniques have been performed by amateurs associated with the Amateur Radio Research and Development Corporation (AMRAD).

For more information on the FCC's spread-spectrum inquiry, contact Dr.

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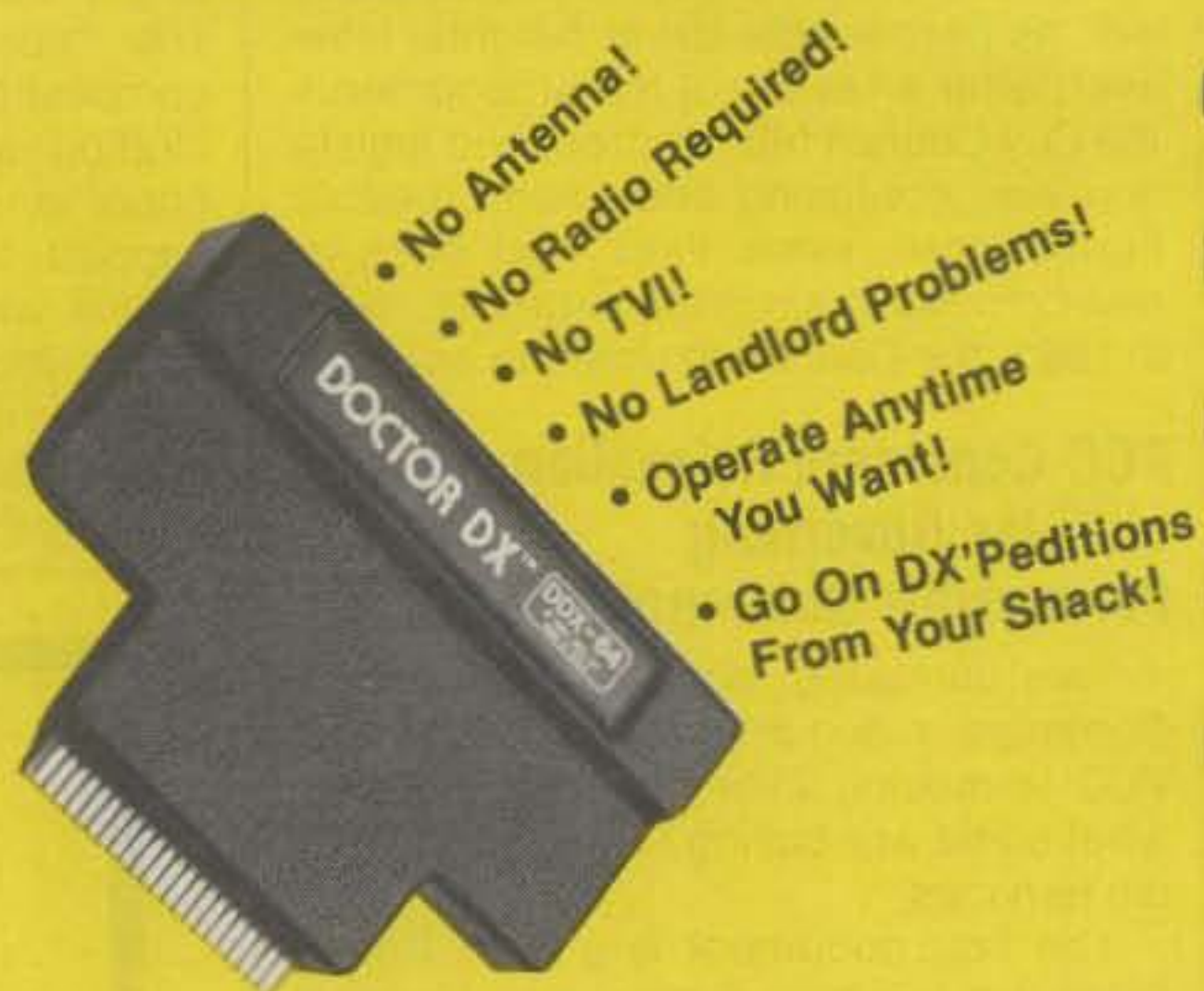
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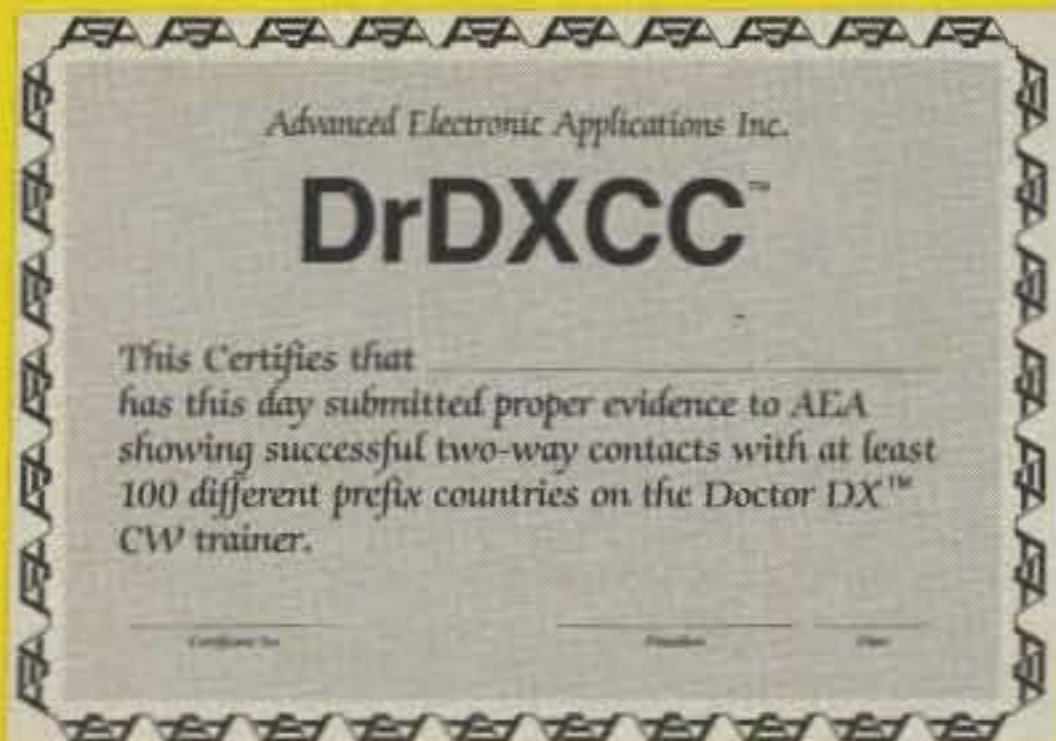
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In addition, acting on a petition of Randall F. Sobol, KH6XX, the FCC will permit amateur radiotelephone operation by U.S. licensed stations from 7025-7100 kHz within and bounding certain ITU Region 3 areas, including Hawaii (KH6) and Alaska (KL7). The remainder of the Commission's action closely paralleled comments filed on Docket 82-83 as filed by the ARRL. (The above was excerpted from the July 27 issue of The Westlink Report.)

Michael Marcus, Office of Science and Technology, FCC, 1919 M St. NW, Washington, DC 20554, or call (202) 632-7040.

EPA To Seek Limits on Radiation

According to *The New York Times* and other sources, the Environmental Protection Agency plans to recommend that the Federal Government impose limits on the levels of radiation from radio and television transmitting antennas. The Agency's concern stems from a recent report that suggests non-ionizing radiation may affect our nervous and immune systems. The subject of radiation-induced disorders is still very controversial, but the FCC has been persuaded by recent studies that a need for limitations exists.

Of major concern are radio and televi-

sion broadcast antennas, many of which are located in dense urban areas. If tight radiation standards are approved, some broadcasters could be forced to cut their power, raise their transmitting antennas, or move their antennas to less populated areas.

It is interesting to note that in general the broadcast industry favors some form of regulation in this area. The reason for this is that the patchwork of local, county, and state radiation ordinances is hindering their operations.

As noted by *The Times*, the strictest limitations would be imposed for operations near the f.m. band (88-108 MHz). Here an adult human being standing on the ground behaves electrically as a quarter-wave vertical antenna, and the resonance effects experienced could,

according to some scientists, cause biological damage.

If the EPA is successful in issuing Federal rules on permitted radiation levels, it will be up to the various Federal agencies to promulgate these rules. In the case of the Amateur and Amateur-Satellite services, the Federal Communications Commission, of course, would be the cognizant agency. In any event, continued wrangling between regulators and anti-regulators within the EPA could hold up action on Federal radiation guidelines for months.

AMSAT Prepares To Give First Notice to FCC For PACSAT Operation

A humanitarian organization known as Volunteers in Technical Assistance (VITA) has provided the Radio Amateur Satellite Corporation (AMSAT) with the information needed to file a first notice with the FCC for the operation of PACSAT. Readers will recall that PACSAT is a packet-switching satellite designed to carry transponders that operate in the 144-148 and 420-450 MHz bands.

The satellite is being developed by VITA with the assistance of AMSAT for use by amateurs. However, during the first year of operation, and assuming that the necessary waivers can be obtained from the FCC, one of the transponders and its corresponding computer will be "loaned" to VITA in order to determine how store-and-forward message-handling satellites can be used as mail systems for developing countries. The availability of such message-handling systems is particularly vital to VITA since a major portion of its work involves the dissemination of technical material to its volunteers around the world.

It is expected that by the time this is read AMSAT will have filed its first notification with the FCC of intended PACSAT operation. In addition, efforts should be underway to secure the waivers needed if VITA is to participate in this exciting space experiment.

NASA Names WA4SIR as Astronaut

If all goes as planned, Dr. Ron Parise, WA4SIR, will fly as a Payload Specialist on at least two shuttle missions scheduled for later this decade. Trained as an astronomer, Dr. Parise currently works for Computer Sciences Corp. at the Goddard Spaceflight Center in Greenbelt, MD.

Dr. Parise's first flight opportunity will come in March 1986, when he is scheduled to participate in mission 61F to observe Halley's Comet from space. On this flight he will operate three ultraviolet telescopes, including the Ritchie-Chretien telescope which he helped to design. In addition, Dr. Parise has enthusiastically endorsed the idea of operating an amateur radio station during his missions, although he has asked the ARRL and

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AMSAT to spearhead the proposal effort required to secure NASA's permission for such activity.

Prior to Dr. Parise's flight, amateurs can look forward to a March 1985 shuttle flight which will carry, among others, Dr. Troy England, W0ORE. The ARRL/AMSAT proposal for amateur radio activity on this flight has already been submitted to NASA. The first amateur to operate in space, of course, was Dr. Owen Garriott, W5LFL, whose historic 1983 shuttle flight was the beginning of this country's Ham-In-Space program.

Packet Radio Comes to Life

Although packet radio is considered by many to be one of the more esoteric areas of amateur radio, advocates of this communications mode are doing everything within their power to help us use this technology. And when over 300 amateurs gathered at the Packet Radio Forum of the Dayton Hamvention earlier this year, it was living proof, said the ARRL publication QEX, that "the bearded experimenters have emerged from their basements!"

According to QEX, about 1700 terminal-node-controller (TNC) boards have been sold, with about 1300 now operational. The largest users, by the way, appear to be the nationwide members of the Tucson Amateur Packet Radio Group. However, new packet switching networks are springing up around the U.S. every day, so be sure to monitor the activities of local experimenters if packet radio interests you.

For more information on packet radio and on how to get in on the ground floor of computer-based communications, contact Mr. Paul Rinaldo, W4RI, Editor, QEX, 225 Main Street, Newington, CT 06111.

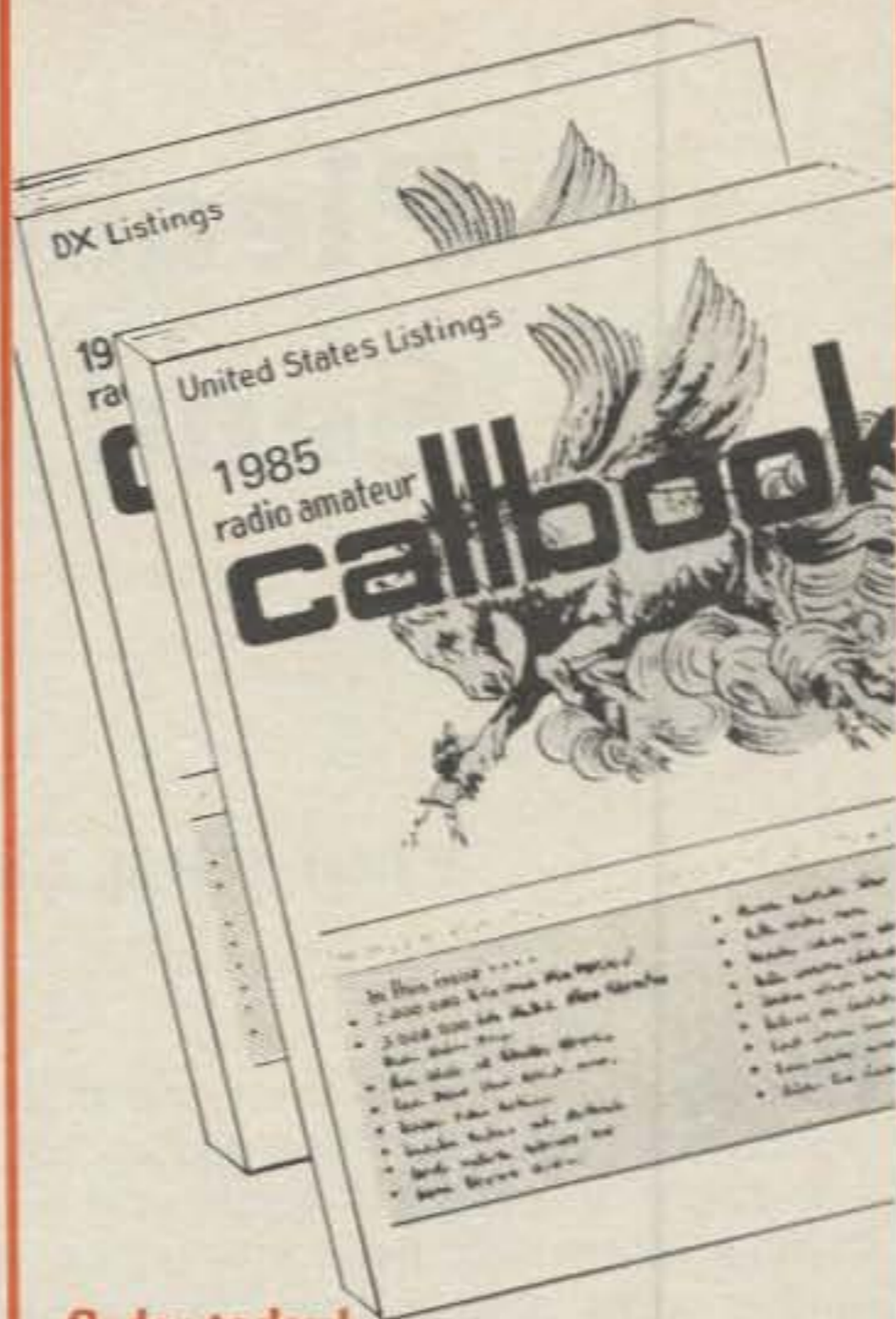
AMSAT Offers Free Information Kit On Gateway Stations

While the traditional way of working stations through amateur satellites has been to set up and operate one's own earth station, more and more amateurs are now being introduced to satellite communications through the use of "gateway" stations. Simply put, a gateway station is an earth station that takes your signal and retransmits it to a satellite for you. The signals received from the satellite at the gateway station in turn are retransmitted by that station for you to hear.

Gateway stations often operate using local terrestrial repeaters. Thus, even those amateurs using hand-held transceivers can participate in contacts through satellites such as OSCAR 10.

To foster the use of gateway stations, and to expose as many amateurs as possible to the world of satellite communications, AMSAT now offers a free information kit on gateway stations and their operation. To receive this kit, send a business-size s.a.s.e. to AMSAT, P.O. Box 27, Dept. GW, Washington, DC 20044.

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Never let it be said that amateurs are satisfied with the ordinary. Here's proof that they are not.

Please QSL — Send Spoon!



BY MAYER D. ZIMMERMAN*, W3GXK

Being an avid DXer, I not only enjoy working that "new one" in a pile-up, but I also appreciate a good ragchew with a friendly foreign amateur. I really enjoy getting cards directly from diverse and faraway places such as New Zealand, Japan, South Africa, and eastern Europe. No doubt the XYL's uncle enjoys receiving from me the envelopes and stamps which greatly enhance his collection. I always ask for stamps when QSL'ing direct.

And that's where the problem arises. Since I'm basically a very friendly and good person, I like to accommodate all of the unusual requests I receive along with the QSL cards and stamps. You would not believe some of the items foreign amateurs have asked me to send them! (Of course, they always offer to pay for the items and even the postage, which I always refuse, despite the fact that I am not independently wealthy. Only the XYL thinks so.)

Some of the requests are not unusual. A friend in Bulgaria asked for a map of the world with amateur prefixes on it. That was an easy request to honor. A quick trip to the local radio store followed by an equally quick post-office run took care of my Bulgarian friend very nicely and with minor expense. The thank-you letter arrived several weeks later and was recompense enough.

Another interesting but not unusual request was from a friend in East Germany who asked for a copy of *CQ* magazine containing the list of winners of the *CQ* WW DX Contest. Again, a quick trip to the local radio store followed by a quick post-office run took care of his request in short

order with minimal expense and difficulty. So much for the easy ones. Now for the good ones.

One QSO with a new friend in VK-land left me with a request for a used license plate. He collects them. No problem. Off to my collection of items never discarded (every good amateur has such a collection, no doubt). We found the XYL's expired tags from last year, and off I went to the post office again. The reward? An unsolicited, x-rated QSL card of a special beach in VK-land.

The latest and perhaps most unusual request arrived earlier today and was the inspiration for this article. A recent enjoyable QSO with a South African YL ended with my frequent suggestion to QSL direct, along with stamps from ZS-land. A couple of weeks later a fat envelope with stamps, some dating back to World War II. Beautiful stamps, gorgeous QSL card, friendly letter with the inevitable request and offer to pay for the requested item and the postage. The request? A request for a spoon with the word "Maryland" on it. Yes, the young lady collects spoons with the names of states on them, and she needed one from Maryland. And you thought WAS stood for Worked All States. No! It's really Worked All Spoons! Perhaps she will eventually hold a QSO with my friend from Australia and send him a license plate or two in exchange for some miscellaneous silverware. Maybe they'll even get together at a DX convention sometime, somewhere, and compare spoons and license plates!

So, if you have any spoons with the name of your state on them, or if you have not yet discarded last year's license plates, please let me know. I can tell you who wants them. Meanwhile, please QSL direct, and send stamps!

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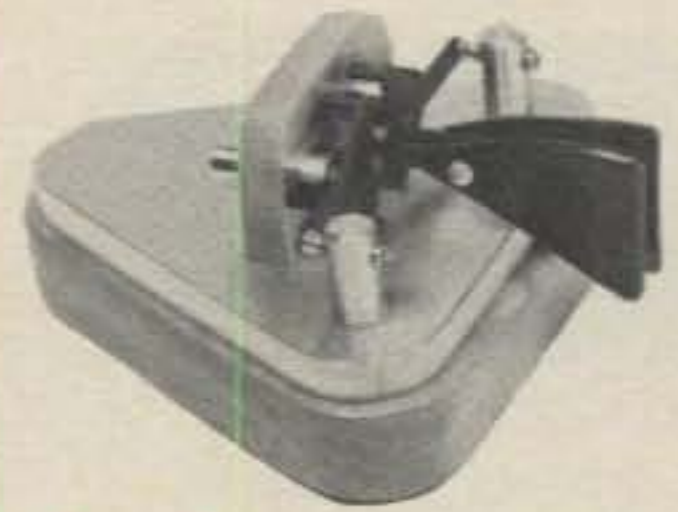


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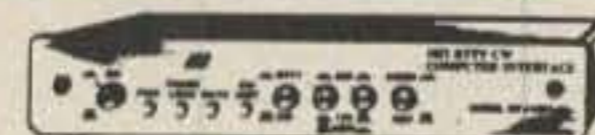
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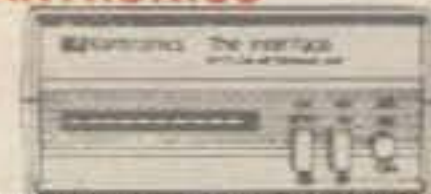


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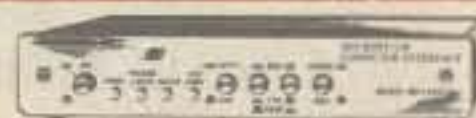
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B1016	2M	Yes	10W	160W	20A	\$249
B3016	2M	Yes	30W	160W	17A	\$199
C22	220	No	2W	20W	5A	\$ 79
C106	220	Yes	10W	60W	10A	\$179
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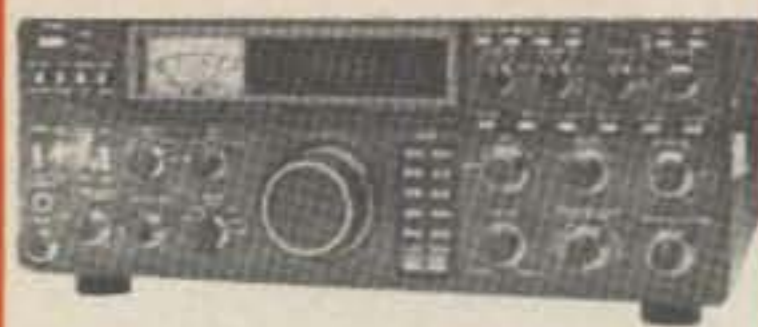


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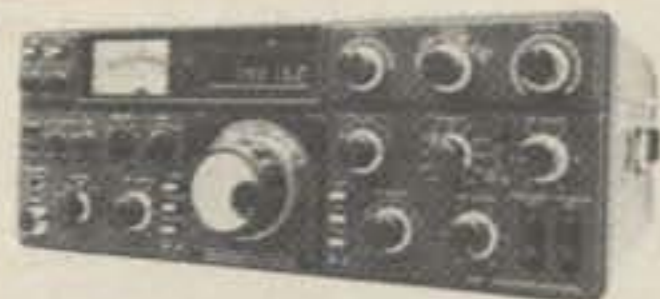
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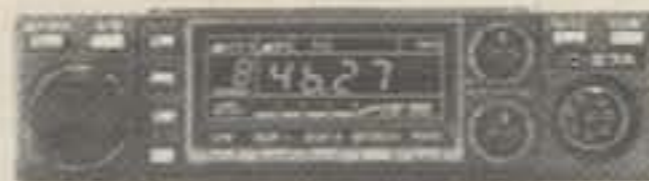
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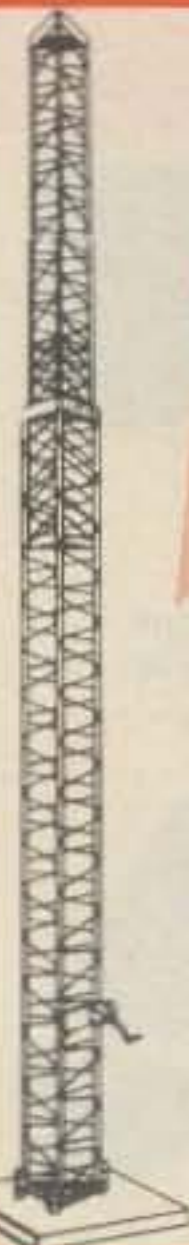
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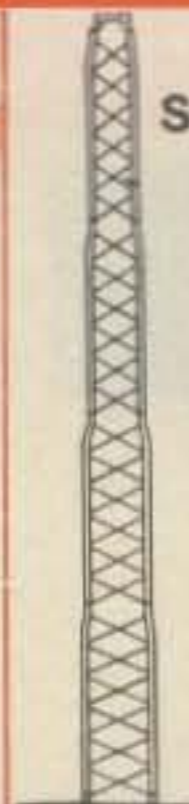
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RG8X	52	.8	1.2	3.5	6.8
RG-58/U	52	1.4	1.9	6.0	12.5
1/2" Alum	50	.3	.5	1.2	2.2
1/2" Heliax	50	.2	.4	.9	1.6
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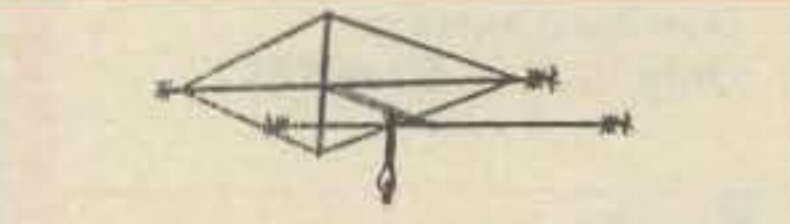
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	FK4544	44 ft	34.8 sq ft	\$1159
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"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

Operating Privileges

Each time an amateur radio operator upgrades her/his license class, she/he earns additional operating privileges in the form of more frequencies and/or more types of emissions. The privileges of General, Advanced, and Extra class licensees are the same on the 10 meter band (28.0-29.7 MHz) and all higher frequency amateur bands (6 meters and up). The operating privileges of Technician through Extra class licensees are basically the same on all amateur bands above 10 meters. Consequently, the high-frequency (3-30 MHz) bands contain the differences in operating privileges for all five grades of licensees.

This article is intended to give you an in-depth understanding of the increased operating privileges one earns in the 80, 40, 20, 15, and 10 meter bands as one upgrades in license class. You will see that the greatest gain in privileges occurs when one upgrades from Technician to General. The General class licensee may operate every band and every mode (emission type, such as voice, code, radioteletype, TV, etc.) that may be operated by Advanced and Extra class licensees. The new h.f. bands at 10, 18, and 24 MHz are not included in this breakdown of operating privileges because two are not used by American amateurs and the third (10.1 to 10.15 MHz) is just partially used by American amateurs.

Emission Designations

This article contains many references to emission designations, such as A1 meaning carrier on-off (amplitude) radiotelegraphy (code). Table I shows correlations between old (present FCC) emission designations and new ones that are slowly being accepted and used. The new emission designations were adopted during the 1979 World Administrative Radio Conference (WARC) of the International Telecommunications Union (ITU, a United Nations specialized agency) held in Geneva, Switzerland.

The key to the new emission designations is as follows:

First Character (type of emission modulation)

A—amplitude modulation, double-sideband

C—vestigial sidebands

F—frequency modulation

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Old	New	Emission Description
A0	N0N	Unmodulated, with no information transmitted.
A1	A1A	Telegraphy keyed on and off, for aural reception.
A2	A2A	Amplitude-modulated telegraphy keyed on and off, for aural reception. Tone(s) modulation.
	A2D	Amplitude-modulated double-sideband single channel containing digital information and using a modulating subcarrier for data transmission, telemetry, or telecommand.
A2J	J2A	Amplitude modulation by tone(s) keyed on and off. Single-sideband, suppressed carrier. Single channel containing digital information and using a modulating subcarrier to transmit telegraphy for aural reception.
	J2D	Single-sideband suppressed-carrier single channel containing digital information and using a modulating subcarrier to transmit data, telemetry, or telecommand.
A3	A3E	Double-sideband amplitude-modulated single channel containing analog information. Telephony (voice).
A3J	J3E	Single-sideband, suppressed-carrier, amplitude-modulated single channel containing analog information. Telephony (voice).
A4	A3C	Double-sideband amplitude-modulated single channel containing analog information. Facsimile images for viewing in a permanent form.
A5	C3F	Single channel containing analog information and vestigial (imperfect, one sideband suppressed) sidebands. Television images for viewing in a temporary form.
	A3F	Double-sideband amplitude-modulated single channel containing analog information. Television images for viewing in a temporary form.
F0	N0N	Unmodulated, with no information transmitted.
F1	F1B	Switched between two frequencies. Single-channel frequency modulation containing digital information, without using a modulating subcarrier. Telegraphy for automatic reception. Commonly referred to as frequency-shift keying (FSK) radioteletype.
F2	F2A	Frequency/phase modulated by switching tones. A single channel containing digital information, using a modulating subcarrier. Telegraphy for aural reception.
F2	F2B	Frequency/phase modulated by switching tones. A single channel containing digital information, using a modulating subcarrier. Telegraphy for automatic reception. Commonly referred to as audio frequency-shift keying (AFSK) radioteletype.
	F2D	Frequency/phase modulated by switching tones. A single channel containing digital information, using a modulating subcarrier. Data transmission, telemetry, or telecommand.
F3	F3E	Frequency/phase-modulated single channel containing analog information. Telephony (voice).
F4	F3C	Frequency/phase-modulated single channel containing analog information. Facsimile images for viewing in a permanent form.
F5	F3F	Frequency/phase-modulated single channel containing analog information. Television images for viewing in a temporary form.
P	P1B	Sequence of unmodulated pulses in a single channel containing digital information, without using a modulating subcarrier. Commonly referred to as pulse telegraphy.

Table I—Old and new emission designations.

J—single-sideband, suppressed carrier
 N—unmodulated carrier emission
 P—sequence of unmodulated pulses

Second Character (nature of modulation signal)

0—no modulating signal
 1—a single channel containing digital information, without using a modulating subcarrier
 2—single channel containing digital information, using a modulating subcarrier
 3—a single channel containing analog information

Third Character (type of transmitted information)

A—telegraphy for aural reception
 B—telegraphy for automatic reception
 C—facsimile
 D—data transmission, telemetry, telecommand
 E—telephony
 F—television
 N—no information transmitted
 All frequency segments stated in this article apply to American amateurs oper-

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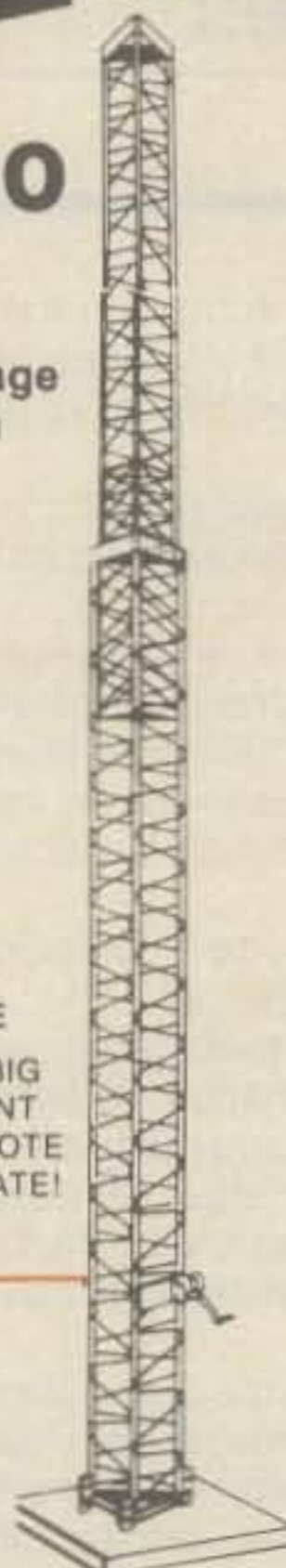
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RM 10, 15	10&15 mobile resonator (std)	10.00
	10&15 mobile resonator (sup)	15.80
RM 20	20m mobile resonator (std)	14.00
	20m mobile resonator (sup)	20.00
RM 30	30m mobile resonator (std)	15.25
RM 40	40m mobile resonator (std)	15.80
	40m mobile resonator (sup)	22.15
RM 75, 80	75 & 80m mobile resonator (std)	16.70
	75 & 80m mobile resonator (sup)	33.95
BM-1	Bumper Mount	15.25
SSM-2	Stainless Ball mt	16.70
QD-1	Quick disconnect	13.25
SF-2	2 meter mobile 5/8 wave	10.00
SGM-2	2 meter 5/8 mag mt	25.60
HOT	Trunk mt w/swivel ball	15.80

KLM

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KT34XA	5 element triband	485.95
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SB25G	short base section	20.65
AS25G	accessory shelf	10.85
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45AG(2,3,4)	top sections	122.85
SB45G	short base section	48.75
AS45G	accessory shelf	26.25
20G	10 ft. stacking section	32.45
20AG	top section	35.90
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*HDT-10KD	10 ft. Tri-Pod Roof Tower†	42.00
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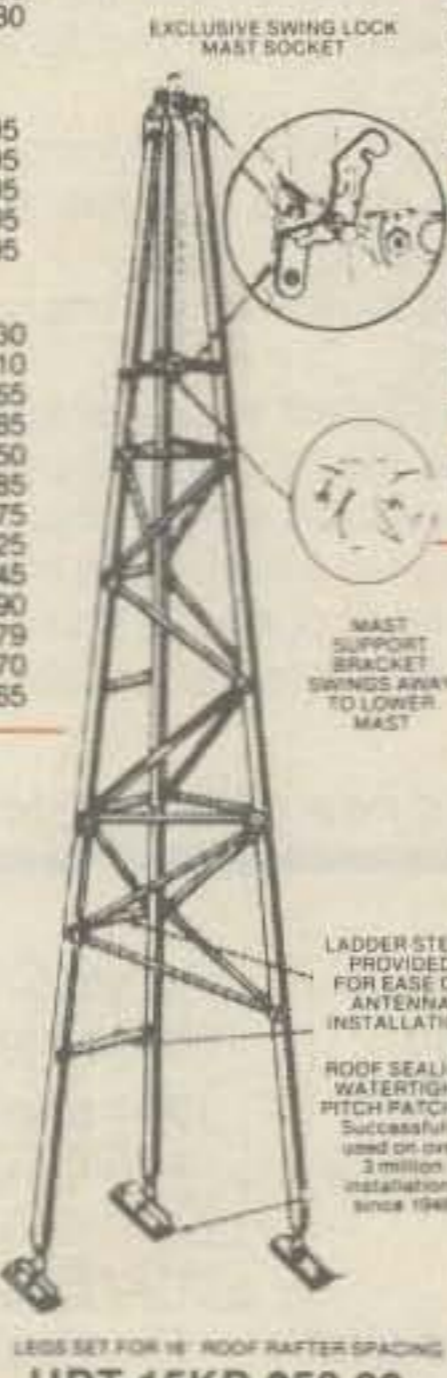
*Accommodates Masts up to 1 1/4" O.D.
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TH3JRS	3 element 750W PEP	212.95
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R-3	10, 15, 20 remote tuned vert.	260.95
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214B/FB	14 element 2 meter boomer	75.95
424B	24 element 70 cm boomer	77.00
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ARX-2	2 meter vert. "ringo ranger"	28.00
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RG8	2.1	3.1	5.0	29/ft.
RG8 Foam	1.8	2.6	3.8	29/ft.
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MV3AHR	7/21/28 MHz w/radials	80.95
MV4BH	7/14/21/28 MHz	48.95
MV5BH	3.5/7/14/21/28 MHz	76.95

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SQY-06	6 Element, 144 MHz	55.95
SQ-61	2 Element, 50 MHz	76.95
SQ-10	2 Element, 28 MHz	118.95

BEAMS

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GR-1	Up to 2" O.D. Steel	3.96

*Mast can be rotated freely

ating in ITU Region II, which is North, Central, and South Americas. Different privileges exist outside of ITU Region II because the amateur bands are not always the same in Regions I and III as they are in Region II. Basically, ITU Region I is Europe and Africa, whereas ITU Region III is Australasia, India, and the rest of the Southern Hemisphere.

Novice and Technician licensees have identical operating privileges on the 10-80 meter bands. They are allowed to operate A1/F1 radiotelegraphy in the segments shown in Table II. General licensees have operating privileges on the h.f. (3-30 MHz) amateur bands as shown in Table III. Table IV shows operating privileges in the h.f. amateur bands for Advanced class licensees, while Table V shows the same for Extra licensees.

Band (meters)	Frequency Limits
10	28.1-28.2 MHz
15	21.1-21.2 MHz
40	7100-7150 kHz
80	3700-3750 kHz

Table II- Novice and Technician operating privileges.

The information in Tables II, III, and IV shows that Extra class licensees have the exclusive use of 170 kHz as follows:

Band (meters)	Frequency Segments (MHz)
80	3.500-3.525, 3.775-3.800
40	7.000-7.025
20	14.000-14.025, 14.150-14.175
15	21.000-21.025, 21.250-21.270

Advanced and Extra class licensees share the exclusive use of 295 kHz of frequency spectrum as follows:

Band (meters)	Frequency Segments (MHz)
80	3.800-3.890
40	7.150-7.225
20	14.175-14.225
15	21.270-21.350

The following shows the total frequencies available to each class of licensee in the 10-80 meter bands:

License Class	MHz Total	% of Extra Class Privileges
Novice	0.300	9.09
Technician	0.300	9.09
General	2.835	85.91
Advanced	3.130	94.85
Extra	3.300	100.00

Notice that upgrading from Novice to Technician does not increase one's operating privileges in the 3-30 MHz (high-frequency) bands. However, Technician licensees have many operating privileges above 10 meters which Novices do not have available to them. When one upgrades from Novice or Technician to General, one's h.f. privileges go from ap-

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Joseph Chabus, KA2UOX, of Brooklyn, New York, received his Novice license on his birthday in March 1984. He prepared himself to pass the code portion of the test by listening to code practice transmissions of the Kings County Repeater Association. His father (Sidney, N2DNY) taught him the material needed to pass the rules and theory test. Their station includes a Yaesu FT-101-EE transceiver, mini-quad, vertical, and multiband dipole. Joseph particularly enjoys operating the 15 meter band. His dad sticks around to help him with the long words.



Jeff R. Ekstrom, KA9QYA, is a 15-year-old high school sophomore in Sugar Grove, Illinois. He thanks his dad (K9BQL) and the Fox River Radio League for giving him a good start in amateur radio. His station includes a Kenwood TS-120S transceiver, Collins KWM-2 transceiver, Collins 75S-1, Mosley CL-33 Triband Yagi-Uda, 40 meter dipole, and 80 meter dipole. Jeff has worked all continents, 38 countries, and 48 states since he obtained his Novice license in December 1983.

proximately 9 to 86% of all Extra class operating frequencies, which amounts to increasing one's operating frequencies about 9.5 times. This increase in frequencies is the big step up in privileges. Upgrading from General to Advanced provides approximately 9% more of the Extra class privileges. Upgrading from Advanced to Extra class gains about 5% more frequencies that one may use. Simply stated, there is less and less incentive for one to upgrade from General to Advanced (9%) and from Advanced to Extra class (5%). However, the existing allotment of operating frequencies can be changed very quickly, and it is wise to upgrade to Extra class if you can do so.

The figures in this article clearly show

Modes	10 Meters	15 Meters	20 Meters	40 Meters	80 Meters
A1	28.0-29.7	21.025-21.25 21.35-21.45	14.025-14.15 14.225-14.35	7.025-7.15 7.225-7.3	3.525-3.775 3.89-4.0
A3/A4/A5 and F3/F4/F5	28.5-29.7	21.35-21.45	14.225-14.35	7.225-7.3	3.89-4.0
F1	28.0-28.5	21.025-21.25	14.025-14.15	7.025-7.15	3.525-3.775

Table III- General class operating privileges (in MHz) on the h.f. bands.

Modes	10 Meters	15 Meters	20 Meters	40 Meters	80 Meters
A1	28.0-29.7	21.025-21.25 21.27-21.45	14.025-14.15 14.175-14.35	7.025-7.3	3.525-3.775 3.8-4.0
A3/A4/A5 and F3/F4/F5	28.5-29.7	21.27-21.45	14.175-14.35	7.15-7.3	3.8-4.0
F1	28.0-28.5	21.025-21.25	14.025-14.15	7.025-7.15	3.525-3.775

Table IV- Advanced licensees have the above operating privileges (in MHz) on the h.f. amateur bands.

Modes	10 Meters	15 Meters	20 Meters	40 Meters	80 Meters
A1	28.0-29.7	21.0-21.45	14.0-14.35	7.0-7.3	3.5-4.0
A3/A4/A5 and F3/F4/F5	28.5-29.7	21.25-21.45	14.15-14.35	7.15-7.3	3.775-4.0
F1	28.0-28.5	21.0-21.25	14.0-14.15	7.0-7.15	3.5-3.775

Table V- Extra class operating privileges (in MHz) on the h.f. bands.

that the major, immediate objectives are to get on the air as a Novice or Technician and to then upgrade to General. It is much more important to develop operating capability than it is to run through an upgrading program. I believe we have too many license holders, but not enough operators, in our Amateur Radio Service. I strongly encourage our licensing program students to get on the air and to operate as much as possible. It is a good idea to operate code (radiotelegraphy) on the Novice bands approximately one

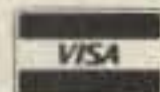
year before upgrading to the General license. Once you earn a General license, I advise you to operate as many bands and modes as possible. You may find that you like some form of operating you did not think you would enjoy. Do not knock contesting, chasing awards, county hunting, rag chewing, DXing, slow-scan TV, fast-scan TV, radioteletype, traffic handling, or anything else before you have tried it. Try everything to find out what you like to do on the air; there is no better way to determine what is of interest to you. **CQ**

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A LOOK AT THE WORLD AROUND US

Future Views—Part II

A variety of favorable comments and related inquiries were received following our May 1984 column feature "Future Views of Amateur Radio." Will overall directions in amateur radio soon shift into a number of diverse paths rather than retain traditional h.f./v.h.f. concepts, do we have the internal strength/enthusiasm to actually bring such visions into full reality, when might such evolutions begin taking place, and will our commercial markets recognize and support these demanding changes were the most popular questions. The points raised were significant and were examples of our modern interest in things of the "new" category. Indeed, our present rate of expansion almost dwarfs placid times of yesteryear. This is truly our Golden Age of Radio!

As a justified and accurate means of answering your queries, we surveyed a cross section of noted figures within the amateur radio industry. A glimpse of their views not only lets us know how we stand product/equipment-wise, but also might serve as a yardstick for calculating the time of those evolutions. The results of these interviews and opinions are included in this month's column. It's interesting to note that all of the opinions and comments were unbiased by personal direction, yet their relation to each other and to our May "Future Views" column was surprisingly similar. Such common thinking, in my opinion, indicates upcoming developments which can affect almost every individual and/or organization within our ranks.

Before delving into our fascinating array of notes and opinions, let's briefly review some of the notables who contributed to this mini-survey. First off, sound engineer and recipient of the 1982 Radio Amateur of the Year award, Bob Heil, K9EID, should be recognized by all. Bob's superb audio products have established refreshing trends in beautiful sounding s.s.b. signals. Next, Mike Lamb, N7ML, President of Advanced Electronic Applications, a company involved with products for today's "hot" areas: v.h.f. antennas, RTTY/AMTOR, packet radio systems, etc. Both Bob and Mike exemplify young U.S. manufacturers proceeding with tomorrow's concepts. Evelyn Garrison, KA7LPK, is the dynamic force

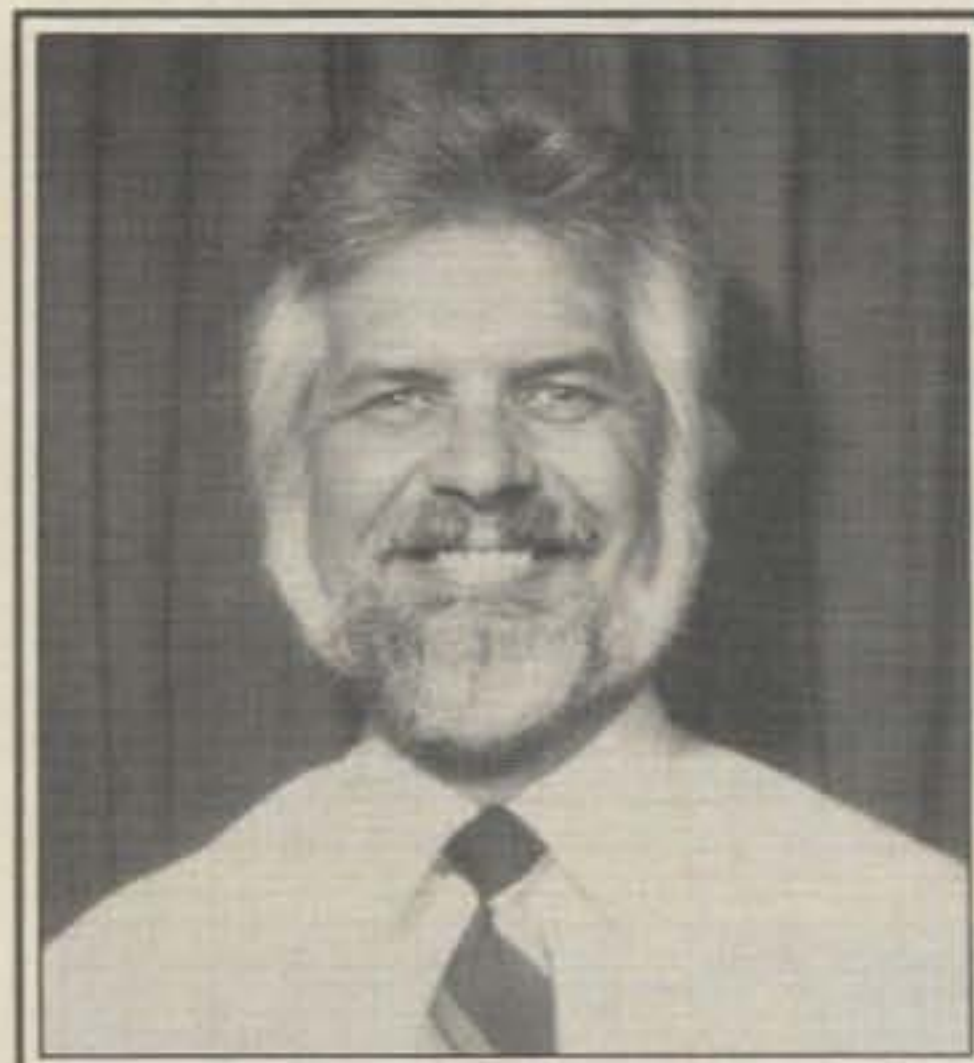


Mike Lamb, N7ML, of AEA, Inc., related some interesting views on printed-word communications, present and future.



Bob Heil, K9EID, 1982 Radio Amateur of the Year, and audio products manufacturer. Bob feels that each of us should devote special efforts toward initiating curious newcomers into our world of international friendship and goodwill.

of ICOM America and instigator of "ICOM Day" promotions of recent popularity. ICOM units, you may recall, were first to feature innovations such as dual v.f.o.'s and microprocessors. Tom Wineland, U.S. Sales Manager of Kenwood's amateur division, is another individual highly aware of and informed about the amateur radio industry. Tom Gentry, K5VOU, is both an active/enthusiastic amateur and a U.S. distributor of several outstanding lines: Santec, Welz, KDK, Tokyo High Power Labs, etc. Tom's interest in and devotion to the amateur world are extremely inspiring. Evelyn, Tom Wineland, and Tom Gentry are importers of products manufactured overseas. In order for importing to succeed, a significant base of end users must be available.



Chet Lambert, W4WDR, of Computer Trader magazine. Chet feels that increased numbers of newcomers in our ranks and expanded use of v.h.f./u.h.f. bands are waves of the future.

Three highly qualified and modern publishers round out the interviews: Dick Ross, K2MGA, of our own *CQ* magazine; Chet Lambert, W4WDR, of *Computer Trader* (computers/amateur radio); and Tom Harrington, W8OMV, of Universal Electronics (innovative publications plus amateur equipment sales, service, and assistance).

Common Views in Every Light

Although each of the survey's discussions or interviews was conducted under isolated circumstances, unprompted echoes of certain points almost sent us checking for "bugs" or ghosts. Everyone's first reaction was the need for young newcomers within our ranks. Evelyn of ICOM brought to light that Japan is smaller in area than the U.S., but it boasts some 500,000 licensed amateurs. The average JA is 25 years of age, whereas the average U.S. amateur is 50 years of age. Large-volume manufacturers need large-volume consumers—both now and later.

Next were "full majority" statements that amateur satellites and v.h.f. bands are truly our mediums of the future. Almost everyone also felt that expanding world populations would soon escalate mass communications concepts over our present one-to-one operations. The previous areas overlap with some interesting results: earth-based amateurs

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Other Hy-Gain vertical multiband antennas are available though not shown here. The 12AVQS (20, 15, 10 meter) is similar to 18AVT above but with VSWR of 1.5:1 or less on all bands. The 18VS (80-10 meter) comes with a base loading coil and may be installed on a short mast driven into the ground. All include stainless steel hardware.

PHASE FOR GAIN

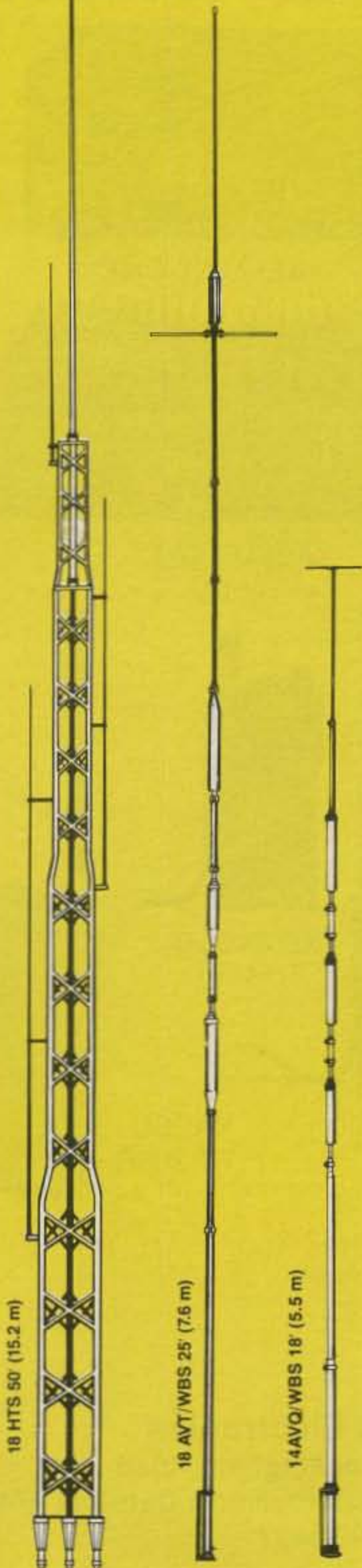
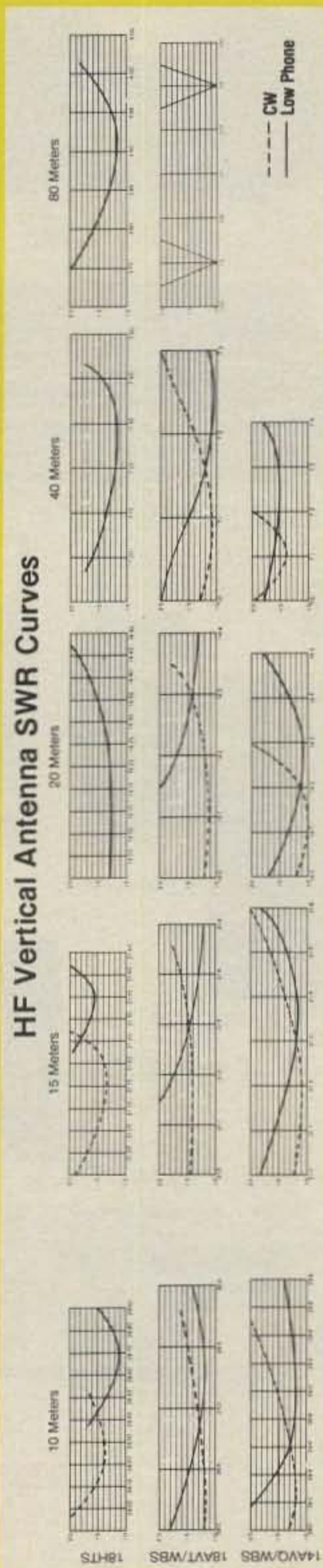
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communicating broadband or timeshare style through sophisticated repeaters/satellite gateways to acquire worldwide range (via interlinking). The communications modes themselves could be audio (s.s.b.) or data.

Radical expansions in the h.f. area were not immediately foreseen, but rather expected to maintain status quo in concept. These bands will continue to offer the unique challenge and thrill of ionospheric communications. Two types of rigs will probably evolve: one of conventional layout with minimum-count large knobs and one of deluxe layout with numerous front-panel controls. Both will be chock full of useful frills.

There are some fascinating activities formulating on our near horizon, many of which are being pioneered at this very time: satellites, packet radio, interties, etc. We should realize, however, that life's true rewards evenly balance with their required efforts. We can't sit back and wait for industry to hand us a finished dream product if we don't show interest and enthusiasm in the product's initial use. Future amateur satellites will not be built without *our* support, financial and otherwise. Newcomers will not join our exciting world unless we inspire them, and we must also rekindle our own enthusiasm for our future to become reality.

V.H.F. and Amateur Satellites

The areas of v.h.f., u.h.f., and amateur satellites are presently flourishing in unique concepts and exciting gear, but those are only previews of coming attractions. Mass communications mediums such as packet radio networks and audio gateways will become widespread, up-linking to future amateur satellites and achieving worldwide range right from a micro-size talkie. The first waves of that era are in existence at this very time. Our new OSCAR 10 satellite is providing globe-spanning communications each day among enthusiastic amateurs using low-power setups and small antennas. Equipment manufacturers are recognizing this soon-to-mushroom market and are introducing equipment specifically directed towards satellite operations. A few examples of that gear are dual-band satellite systems, GaAsFET preamps for in-rig or antenna mounting, 70 cm s.s.b./c.w. amplifiers, and wattmeters usable to 500 MHz. Acceptance of those items even at this early date has been overwhelming. Tom Gentry pointed out that amateurs caught in the throes of antenna restrictions can set up an OSCAR array in a corner of a yard or "looking through" a house window. That alternate activity is actually today's most exciting frontier!

Watch for more multi-mode v.h.f./u.h.f. rigs with truly useful features, multi-mode talkies, and even smaller f.m. talkies (!) to be introduced during coming times. F.m. itself may level off in popularity until broadband mode converting systems

and gateways gain a foothold, but newer model talkies will keep interest booming (Kenwood's new HT-21 is one example of that situation—instant communications right in your pocket).

Data communications systems such as AMTOR and electronic mailboxing are growing in popularity on h.f. bands (have you followed the "billboards" on 40 meters or noticed the "chirping crickets" on 20?). Packet radio networks on 2 meters are growing like wildfire. In fact, the U.S. probably will be linked coast to coast within the next few years via 2 meter packet networks. We're almost to that point now. (Is there a packet network near your area?)

It's interesting to ponder whether voice or data communication concepts will become our most popular format of future times. On one hand, E mail concepts are time flexible and permit operations at one's leisure. On the other hand, not all amateurs are interested in learning to type or typing their life away (heck, it's enough challenge learning and maintaining Morse skills). We've heard of one area, however, which uses straight voice E mail techniques. Aural messages are converted to digital equivalents, stored, and retrieved by password-informed parties at a later date. Now if we could program our amateur radio interfaced computer accordingly . . .

Before leaving this v.h.f./u.h.f. and amateur satellite oriented area, I must reiterate that future satellites are only possible with our help. These multi-kilobuck wonders are not merely "born." That's why AMSAT (P.O. Box 27, Washington, D.C. 20044) exists.

H.F. Concepts and Rigs

A variety of interesting developments will affect this area during the rather near future. Many of these developments were introduced through deluxe v.h.f. rigs or scanners. Remote-controlled and fully computer-interfaced setups will let one enjoy DX operations from any easy chair, an outdoor patio, or possibly a "down the road" stretch of open air. The system will be capable of scanning bands while noting areas and types of incoming activity, filing that information for later operations according to programmed interests (but rig, I just wanted to talk with a few old friends on 40 tonight!), acting as a translator for various data codes and foreign languages, or even conducting its own personality-inspired QSOs while you sit alongside and watch the action.

C.w. mailboxing systems will soon establish an "h.f. form" of packet radio usable among any and all amateurs, directing messages while you sleep and while your rig keeps an ear on worldly communications. Retrieved messages can be reviewed and answered at your leisure, and the system will forward each message with "unattended" operator convenience. This unattended form of opera-

tion is under serious scrutiny by the ARRL and the FCC at this time. A loss of this capability or station interties would be a step backward in technology.

Voice synthesizers such as those presently used with some v.h.f./u.h.f. rigs will probably soon join the h.f. scene on an expanded basis. If you haven't experienced those "fills," you've missed a treat; they rapp frequency, memory channel, rig status, etc., at various speeds and volumes—a cheerful station touch when bands are dead and DX is scarce.

Our present situation of compact and larger-size transceivers will probably shift towards "multi-knob super function" and "basic/contemporary panel layout but super function" units. The conventional approach will not be shortcut in features; it will merely be oriented toward "easy operating" actions.

Closing Thoughts

Looking at both our present and our future directions kindles an enthusiastic attitude that's difficult to contain. How could non-amateurs possibly avoid stumbling over themselves to join our world of electronic dreams! Ours must be one of today's best kept secrets!

While upcoming developments in amateur radio will truly open new doors in communications enjoyment, our present era is also a very special Golden Age which shouldn't be taken for granted. Most of us still enjoy, for example, switching on a rig purely at random and matching our operating skills with ionospheric effects to talk on a one-to-one basis with DX stations. Many of us still know the warm glow of vacuum tubes and the tuning of final amplifiers, the listening to DX through QRM and QRN, and the pumping of a hand key for sheer enjoyment. Surely we will miss such romantic times during future eras.

Amateur radio's directions are diversifying today more than ever before. H.f. s.s.b./c.w. and v.h.f. f.m. are comparable to only two chocolates in a Whitman Sampler, and each of us is free to enjoy as many of the other favors as desired. What a blast! Amateur radio equipment would be wise to also recognize these changing times and plan their moves accordingly. Multi-mode v.h.f./u.h.f. gear is definitely "in." Ditto data packet systems (notice your market here; these are usually group sales), RTTY/AMTOR software/hardware, fast-scan/slow-scan gear with multiple formats and accessories, discrete GaAsFET preamps (they can be used with almost any rig), etc. Our amateur world is changing in many ways, and every aspect can only be described as fantastic. If you haven't been overly active in on-the-air happenings lately, we urge you to jump back in on the action. Today's Golden Age and tomorrow's dreams should not be whimsically bypassed!

73, Dave, K4TWJ

DESIGN, CONSTRUCTION, FACT, AND EVEN SOME FICTION

Reader Recap

As the leaves just begin to turn, antenna thoughts generally gravitate to sedentary pursuits. This month author Thurber collects a number of topics that are "just right" for the days ahead.

Last time we got together, we took a look in the mailbag, discussed the Bearcat CompuScan™ 2100 scanner and antennas suitable for it, and covered several interesting software offerings. We also highlighted the Polar Research Rotating Antenna Mounts and the ER-1 Elevation Rotator System.

In this month's issue we'll again catch up on the mail. Following that, we will take a look at some of the mail-order sources of antenna parts, wire, and transmission lines. We'll cover several new and interesting products, touch on some software topics, and highlight Dave Ingram's new RTTY book. First, to the mailbag.

Reader Report

Our several previous columns on the so-called Double Bazooka antenna continue to elicit letters from readers. Although we have indicated that this antenna just doesn't live up to the claims for its performance over and above the ordinary dipole, many amateurs have expressed to us their apparent good results using this type of antenna, despite its technical shortcomings. One reader wrote:

"The argument on the Coaxial Dipole or Bazooka will go on unresolved, but I am a great supporter of this antenna. Granted, it is still a dipole, with no gain but inherently balanced. As an amateur of over 50 years I find it will cover the 80 or 40 meter bands, s.w.r.-wise, better than any singlewire job, and on-the-air testing it against the conventional wire (dipole) it does have a slight edge . . . not much, but the efficiency probably accounts for these results. It does have to be grid-dipped during construction, and the out-board sections (should be made) preferably of open line and cut to the lower side of resonance. I find the (s.w.r.) deterioration is more rapid on the high-frequency side, if we are to consider the full 500 kHz on 75/80 meters."

Wayne L. Brandon, KC5UD, wrote us a nice letter which contained a question:

"I really enjoy your antenna feature in

CQ and your computer information also. I just got a Vic-20 myself and so am interested in learning about Vic-20 applications to amateur radio But what I am writing about is a statement I read in an antenna handbook. The author says that ". . . since the bottom of the Marconi (vertical) is at ground potential, care must be taken to have a voltage node at that point." Why does there have to be a voltage node at that point? The answer must be so simple that I am missing something! An explanation would be appreciated."

Wayne included a sketch with his letter that correctly showed the voltage and current distribution on a quarter-wave vertical or Marconi antenna. Regarding the question as to the voltage node at the ground (feedpoint) of the antenna, it's helpful to recall that the vertical ground plane or "grounded" antenna is, in a sense, a special case of the dipole. The current and voltage distribution patterns of the dipole apply, since the "missing half" of the antenna is provided by the electrical mirror of the ground plane or earth beneath the antenna.

Assuming that the vertical is resonant, or has some means of being tuned to resonance, you should have a voltage node at the feedpoint. By the author you cited stating that care must be taken to have a voltage node at the feedpoint, he probably means that the antenna should be resonant as a quarter-wave vertical for the voltage node to exist at that point. Recalling Ohm's Law relationships, since current is "high" at the base feedpoint, the antenna impedance will be low (50 ohms or less), making the antenna suitable for feeding with coaxial cable. If you were to try to feed the vertical at some point above ground, the impedance would rise as the voltage rises and would no longer be at a "node." A higher impedance transmission line (singlewire, openwire, or twinlead, for example) would be more suitable than coax for feeding at other than a voltage node (current loop).

If this is still confusing, the "Antenna Fundamentals" chapter of the *ARRL Antenna Book* goes into considerable detail on voltage and current distribution within both half- and quarter-wave antennas.

Reflected Power Program Lives On!

The Reflected Power Program started out with a very simple Basic program by Lew McCoy, W1ICP, which was published

in the February 1983 issue of CQ. I made some changes to it to make it run on the Commodore 64 computer and provided a program listing in the September 1983 issue. Various program modifications ran in subsequent columns. I'm amazed at the interest in this simple program, and the volume of mail received asking for different versions of the program.

This short but instructive program enables one to input the forward power level and the maximum s.w.r. to be considered, and to display both reflected power and "true" radiated power for various increments of s.w.r. Thus, the program has a good educational value, as the relationships between s.w.r., forward power, and reflected power are easily seen. One can also determine the actual forward power level to which to tune up in order to yield a given power under known s.w.r. conditions.

John McKnight, of Durham, Ontario, Canada, wrote to us asking if a Vic-20 version of the program is available. As it turns out, the Commodore 64 version just needed a little bit of "tweaking" to run correctly on the Vic, and we provided John with an updated copy of the program. This Vic program is shown in fig. 1. Note, however, that the program as presented here requires a printer for proper operation.

Gary Huff, K9AUB, sent us a modified version of our '64 program to use with the then-new Commodore 1526 printer, and we published that listing in the February 1984 issue. As it turned out, however, the manufacturer made some changes to the 1526 printer which subsequently made it incompatible with Gary's program, and he's received a good deal of mail from amateurs who would be quite satisfied with a program that doesn't require a printer at all.

Gary therefore again rewrote the Reflected Power program for those who do not own a printer. He has also made some other improvements to the program to handle integer manipulation better by limiting the maximum s.w.r. that may be entered to 3.5:1.

His program is displayed in fig. 2. As presented, it will work with the Commodore 64 and a TV set or monitor, and it calculates forward and reflected power for any power output into an antenna with an s.w.r. of up to 3.5:1. It gives readings calibrated in "steps" of s.w.r. To use the program, simply enter (1) your forward power; (2) the maximum s.w.r. your an-

317 Poplar Drive, Millbrook, AL 36054

```

100 REM *** VIC-20 REFLECTED POWER
110 REM *** BY LEW MC COY, W1ICP
120 REM *** CQ, FEBRUARY 1983
130 REM *** VIC-20 BY K. THURBER, W8FX
150 PRINT"<CLR>"
160 PRINT
170 PRINT "<RON>DETERMINING REFLECTED POWER<ROF>"
180 PRINT:PRINT:PRINT
500 PRINT "ENTER FORWARD POWER      (WATTS)"
525 INPUT F
550 PRINT
600 PRINT "ENTER MAXIMUM VSWR"
625 INPUT VM
650 PRINT
700 PRINT "ENTER VSWR STEP SIZE"
725 INPUT S
900 REM *** PRINT ROUTINE
910 OPEN 4,4:PRINT#4
960 PRINT#4, ""SPC(18)"< FORWARD POWER IS";F;"WATTS
>"
970 PRINT#4:PRINT#4
980 PRINT#4,"      VSWR";SPC(12)"REFLECTED PWR (W)";
982 PRINT#4, ""SPC(9)"TRUE RAD PWR (W)"
985 PRINT#4
1000 REM *** CALCULATION
1010 FOR V=1 TO VM STEP S
1160 R=F*((V-1)/(V+1))*((V-1)/(V+1));T=F-R
1170 PRINT#4, CHR$(16)"04"V;CHR$(16)"22"R;CHR$(16)
"48" T
1180 NEXT
1190 CLOSE4
1200 PRINT"<CLR>"
1210 END
1215 REM *** PRINTER LISTING ROUTINE
5000 CLOSE4:OPEN4,4:CMD4:LIST
5010 PRINT#4:CLOSE4

```

READY.

Fig. 1- Vic-20 Reflected Power Program.

tenna might show (3 is probably a good number); and (3) the step size (try 0.1 here). The program will display both reflected and "true radiated" power.

While the program is designed for the '64, the program should function with minimal revision on the Apple, TRS-80, IBM-PC, IBM-compatible machines, and most other brands of computers that use some version of Basic. Some experimentation will be required for use on non-Commodore machines, but the K9AUB version shown in fig. 2 has eliminated wherever possible commands exclusive to Commodore.

A tip of the hat to Gary for going out of his way to help readers get their programs up and running and for sending us this revision!

Antenna Parts: Where?

For the amateur who lives near a major electronic parts supply house or who frequents the hamfest circuit, obtaining reasonably priced antenna parts is generally not too big a problem. However, for the amateur who is distant from a walk-in supplier or who doesn't follow the hamfest calendar, getting various types of insulators, wire, feedline, connectors, and

other small but essential antenna components can present some difficulty. After all, one doesn't generally simply walk down to the local franchised electronics store to obtain 500 feet of 450 ohm openwire or hardline!

Mail-order is a good bet in such situations, and for our readers' convenience, we've prepared a sampler of suppliers who specialize in selling many of these items and parts by mail. Our list is shown in fig. 3. By no means is it an exhaustive listing, but it's a place to start.

Interestingly, in a flyer from one of the suppliers we included in the listing, Kilo-Tec, we saw a handy preprinted chart which should be quite useful to amateurs in plotting s.w.r. curves on an antenna. We've reproduced this chart in fig. 4.

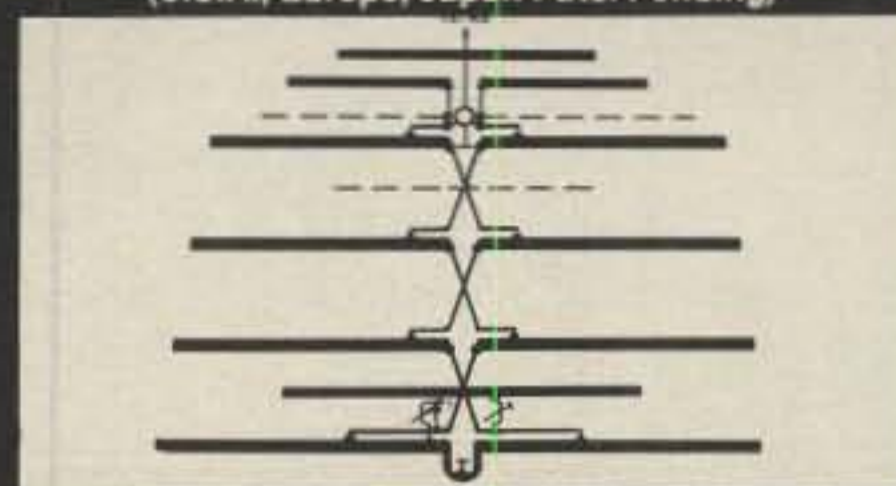
Scanning the Antenna Marketplace

From time to time in the column we'll survey some new antennas and related products which have come to our attention. These products will not be presented as hands-on reviews, but rather as a sharing of information on antenna products and sources. Let's look at a few items, the information on which has crossed our desk in the past few months.

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Hamfests and swap meets are excellent sources of antenna construction components, parts, and feedlines—and usually at bargain-basement prices. You may have to do some searching, but most of these items are available by mail order, too, so note the listing of suppliers we've compiled in this month's column.

From H. Stewart Designs comes word of the "DX Hidden Asset" (DXHA) Loop Antenna. The antenna's configuration resembles that of the familiar quad, but it is smaller, intended to be installed in a cubical space approximately equal to $\frac{1}{4}$ wavelength on a side. The loop couples directly to 50 ohm coaxial cable, is broadbanded (3–5% of selected resonance), and features low s.w.r. (1.2 to 1 or less at resonance). The antenna is omnidirectional when mounted for vertical polarization and bidirectional when installed for horizontal polarization. According to the manufacturer, the antenna is easy to assemble; the only critical requirement is that the coax be brought away at right angles for at least $\frac{1}{2}$ wavelength. For more information, contact H. Stewart Designs, P.O. Box 643, Oregon City, OR 97045.

Herb Johnson, founder in 1961 of Swan Electronics and in 1973 of Atlas Radio,

```

100 REM CBM-64 REFLECTED POWER
105 REM ("LISTING" VERSION WITH SPACES AND LOTS
    OF REMS)
110 REM ORIGINAL ARTICLE BY LEW MCCOY W1ICP CQ SEPT
    1983 P56 & KARL THURBER W8FX
120 REM MODIFIED FOR SCREEN DISPLAY ONLY ON CBM-64
130 REM BY GARY HUFF K9AUB
140 :
150 REM VARIABLES USED IN THIS PROGRAM ARE:
160 REM F = FORWARD POWER IN WATTS
170 REM VM = MAXIMUM VSWR CALCULATED
180 REM S = STEPS OF VSWR CALCULATED
190 REM X = TIMING DELAY
200 REM V & V$ = VSWR
210 REM R & R$ = REFLECTED POWER
220 REM T & T$ = TRUE RADIATED POWER
230 REM A$ = HOLDS DISPLAY ON SCREEN
240 :
250 POKE 53280,6 : POKE 53281,6 : REM BLUE SCREEN
    (CHANGE TO SUIT YOURSELF)
260 PRINT CHR$(5) : REM WHITE LETTERS
270 PRINT CHR$(8) : REM DISABLE COMMODORE KEY
280 PRINT CHR$(142) : REM UPPER CASE
290 PRINT CHR$(147) : REM CLEAR SCREEN
300 PRINT
310 PRINT CHR$(18):: REM REVERSED TITLE
320 PRINT " *** DETERMINING REFLECTED POWER ***
    "
330 PRINT
340 REM INPUT VARIABLES
350 INPUT "ENTER FORWARD POWER (WATTS) "; F
360 IF F = 0 THEN 350
370 PRINT
380 INPUT "ENTER MAXIMUM VSWR "; VM
390 IF VM = 0 THEN 380
400 IF VM > 3.5 THEN PRINT "LIMIT MAX SWR TO 3.5"
    : GOTO 380
410 PRINT
420 INPUT "ENTER VSWR STEP SIZE "; S
430 IF S=0 THEN 420
  
```

has ventured into the manufacture of antenna systems with his new company, Vector Radio. Of special note are Herb's new remote-controlled antenna tuners. The tuners are available in two versions, the VT-3 for mobile use and the VT-4 for

fixed-station use. The devices allow fingertip control of the antenna from the hamshack, with the coax-fed tuner mounted at the antenna's feedpoint for good impedance matching and low line loss. They are designed to work with half-

Amp Supply Co.
2071 Midway Ave., Box 421
Twinsburg, OH 44087

The Antenna Bank
516 Mill St., N.E.
Vienna, VA 22180

CZ Labs
P.O. Box 95
55 Railroad Ave.
Garnerville, NY 10923

ege, Inc.
13646 Jefferson Davis Hwy.
Woodbridge, VA 22191

Kilo-Tec
P.O. Box 1001
Oak View, CA 93022

LaRue Electronics
1112 Grandview St.
Scranton, PA 18509

Madison Electronics Supply
1508 McKinney
Houston, TX 77010

W9INN Antennas
P.O. Box 393
Mt. Prospect, IL 60056

Amateur Electronic Supply
4828 W. Fond du Lac Ave.
Milwaukee, WI 53216

Spectronics, Inc.
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Oak Park, IL 60304

National Tower Co.
P.O. Box 12286
Shawnee Mission, KS 66212

Nema Electronics
12240 N.E. 14th Ave., Dept. 4X
North Miami, FL 33161

RF Enterprises, Inc.
Rt. #7
St. Cloud, MN 56301

Texas Towers
1108 Summit Ave., Suite 4
Plano, TX 75074

Unadilla/Reyco/Inline
6743 Kinne St.
E. Syracuse, NY 13057

Van Gorden Engineering
P.O. Box 21305
South Euclid, OH 44121

Budwig Manufacturing Co.
P.O. Box 829
Ramona, CA 92065

Barker & Williamson
10 Canal St.
Bristol, PA 19007

Amateur Communications Etc.
2317 Vance Jackson Rd.
San Antonio, TX 78213

Radio West
3417 Purer Rd.
Escondido, CA 92025

Fig. 3—Antenna parts sources sampler.

```

440 IF S < .1 THEN PRINT "LIMIT STEP SIZE TO .1 OR
    GREATER" : GOTO 420
450 PRINT
460 PRINT "WHEN FINISHED WITH DISPLAY,"
470 PRINT "PRESS ANY KEY TO END PROGRAM"
480 FOR X = 1 TO 2000 : NEXT : REM DISPLAY INSTRUCTIONS
    FOR FEW SECONDS
490 REM NOW DISPLAY RESULTS ON SCREEN
500 PRINT CHR$(147) : REM CLEAR SCREEN
510 PRINT " < FORWARD POWER IS"; F ; "WATTS >"
520 PRINT " VSWR - REF PWR (W) - TRUE RAD PWR (W)
    "
530 REM CALCULATIONS
540 FOR V=1 TO VM STEP S
550 R = F * (((V-1) / (V+1)) * ((V-1) / (V+1))) :
    T = F-R
560 REM CONVERT ANSWERS TO STRINGS FOR TIDY DISPLAY
570 V$ = STR$(V) : R$ = STR$(R) : T$ = STR$(T)
580 IF LEN (V$) > 6 THEN V$ = LEFT$ (V$,6)
590 IF LEN (R$) > 13 THEN R$ = LEFT$ (R$,13)
600 REM DISPLAY ANSWERS ON SCREEN
610 PRINT V$; SPC(6-LEN(V$)); R$; SPC(13-LEN(R$))
    ; T$
620 NEXT
630 GET A$: IF A$ = "" THEN 630: REM HOLD DISPLAY
    UNTIL A KEY IS PRESSED
640 PRINT CHR$(147): END: REM CLEAR SCREEN & TERMINATE
    PROGRAM
650 :
660 REM WHEN ACTUALLY ENTERING PROGRAM, ELIMINATE
    ALL REMS
670 REM AND SPACES (EXCEPT THOSE ENCLOSED IN QUOTES)
    TO CONSERVE SPACE
680 REM SPACES ARE INCLUDED FOR EASE OF READING PRINTOUT
    ONLY
690 REM AND REMS ARE INCLUDED TO EXPLAIN STEPS OF
    PROGRAM
READY.

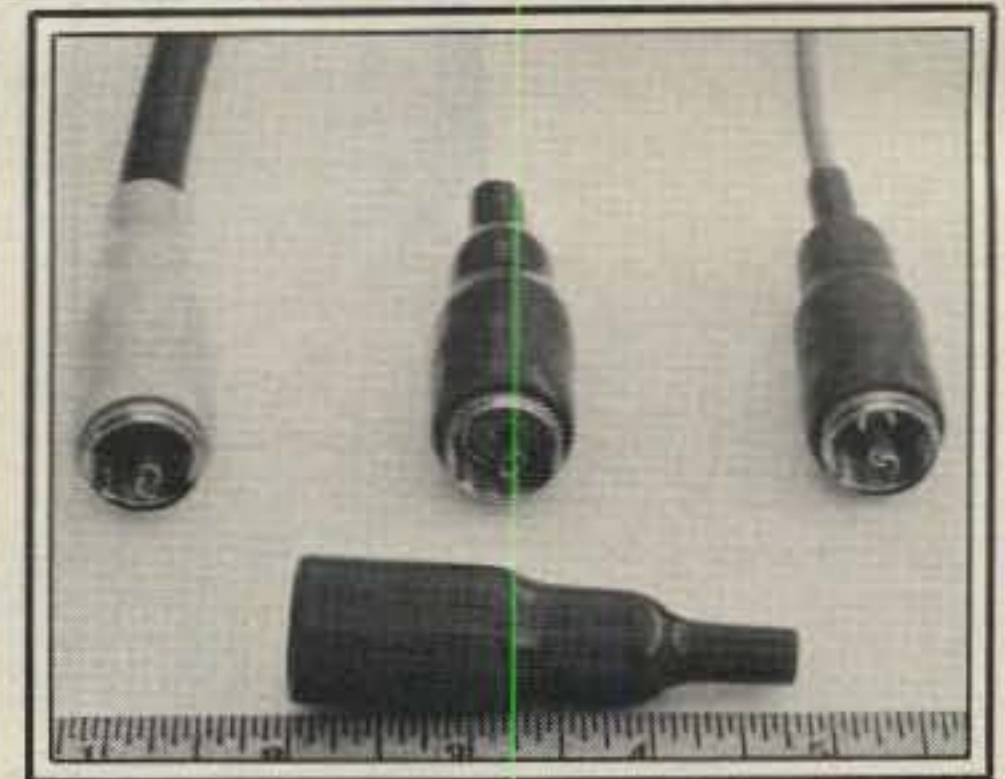
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Fig. 2- Modified C-64 Reflected Power Program.

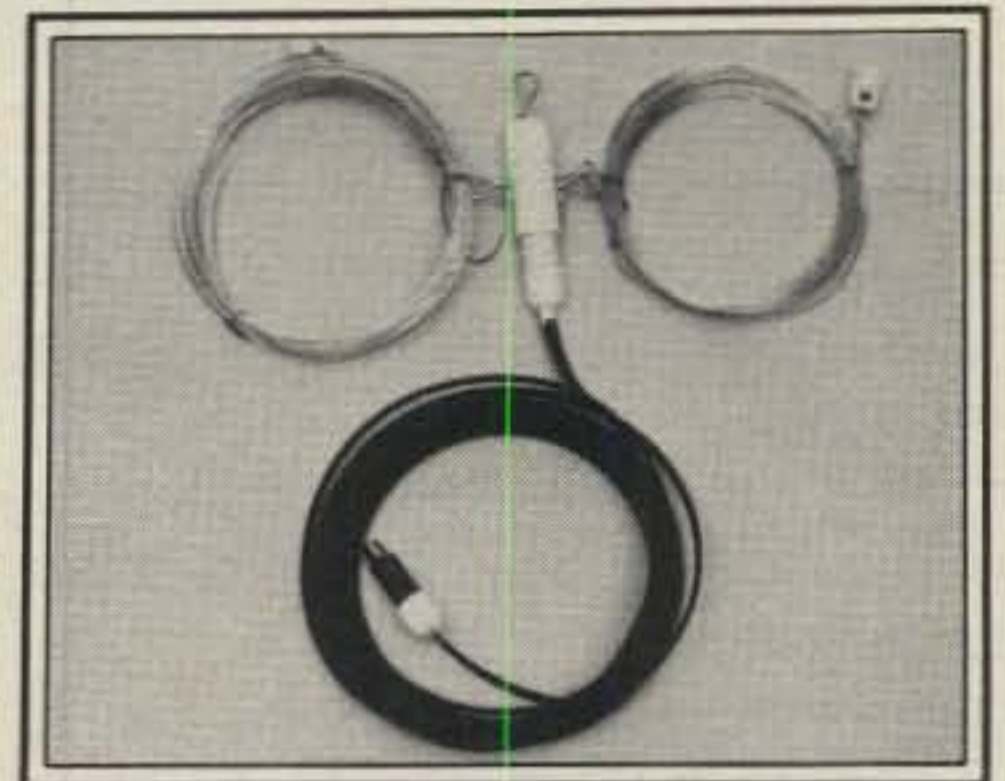
wave dipoles, single or multi-band inverted Vees, and quarter-wave verticals. Voltage-fed antennas such as the long-wire can be handled through the use of an optional inductor kit. Either version covers the range 1.8 to 29.7 MHz and re-

quires an eight-conductor control cable. A sketch showing the units' configuration is shown in fig. 5. For more information, contact Vector Radio Co., P.O. Box 1166, Cardiff, CA 92007.

Rudy Plak, W6TIK, offers a wide range



Having trouble obtaining all of the small but necessary components needed for that next antenna construction project? See our "Antenna Parts Sources Sampler," in fig. 3. Shown here are some handy coax "weather boots" from Kilo-Tec.



Kilo-Tec's multiband h.f. dipole, the KT5B, is shown here. The antenna system covers 80-10 meters through specially selected flattop and matching section lengths. Overall flattop length is 102 feet; the antenna is fed with 50-70 ohm coax through an integral matching section of heavy-duty twinlead. This type of antenna can make an excellent s.w.l. and portable antenna system using a single coaxial feedline. (Photo courtesy Kilo-Tec)

of preassembled wire antennas, including various multiband dipoles, loops, one-element quads, and triangles covering various band combinations from 160 through 10 meters. The antennas Rudy offers are preassembled and ready to go and are designed to match 52 ohm coaxial cable. There is nothing fancy in the designs offered, but they feature high-quality materials, maximum amateur power operation, and no traps or loading coils. Custom frequency designs from 500 kHz to 200 MHz are available on special request. Contact Rudy Plak, W6TIK, P.O. Box 966, San Marcos, CA 92069 for details.

From George Churpek, N6FL, of Kilo-Tec (P.O. Box 1001, Oak View, CA 93022) comes word of a preassembled, multi-band h.f. dipole, the KT5B. The antenna, designed to give relatively uniform performance on all h.f. bands including the new WARC assignments, is coax-fed but makes use of a 102 foot flattop and a matching section constructed of KW-

SWR CURVE FOR _____ ANTENNA OF AMATEUR STATION _____

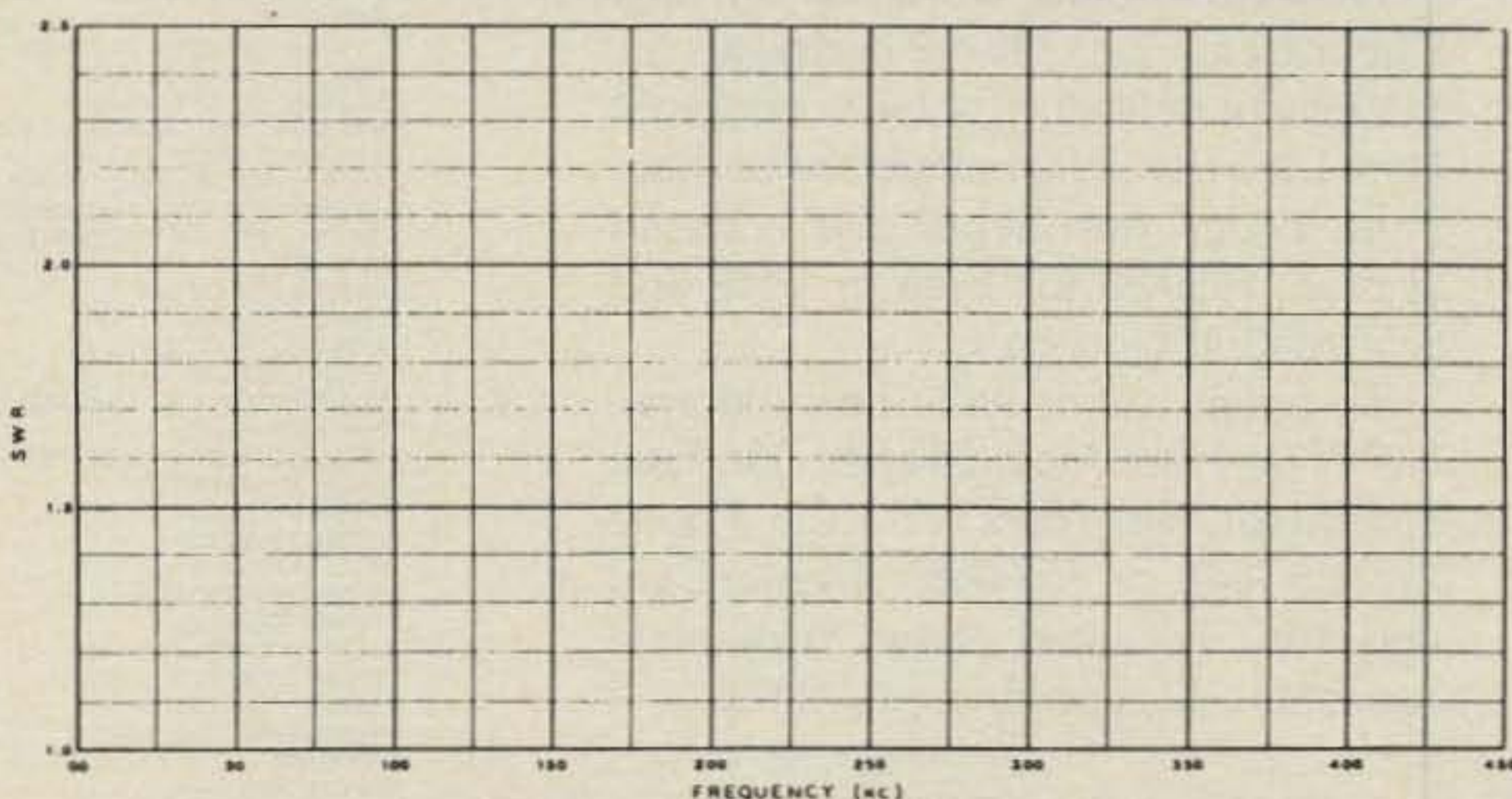


Fig. 4- S.w.r. plotting chart courtesy Kilo-Tec.

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- YAGI ANTENNAS
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- STANDING WAVES
- ATTENUATION
- ANTENNA-FEEDING MISMATCH
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- CALL SIGNS
- LOGGING REQUIREMENTS
- POWER LIMITATION
- CONTROL OF REQUIREMENTS
- R-S-T REPORTING SYSTEM
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- ZERO-BEATING SIGNAL
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- TELEGRAPHY ABBREVIATIONS
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- THIRD-PARTY PARTICIPATION
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- SELECTION OF FREQUENCIES
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- INTERNATIONAL COMMUNICATION
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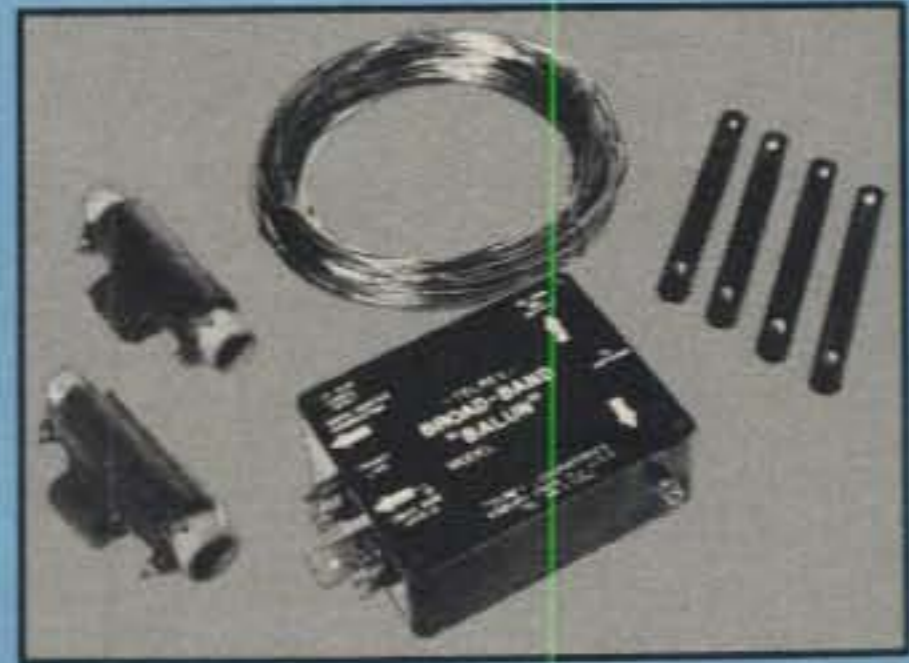
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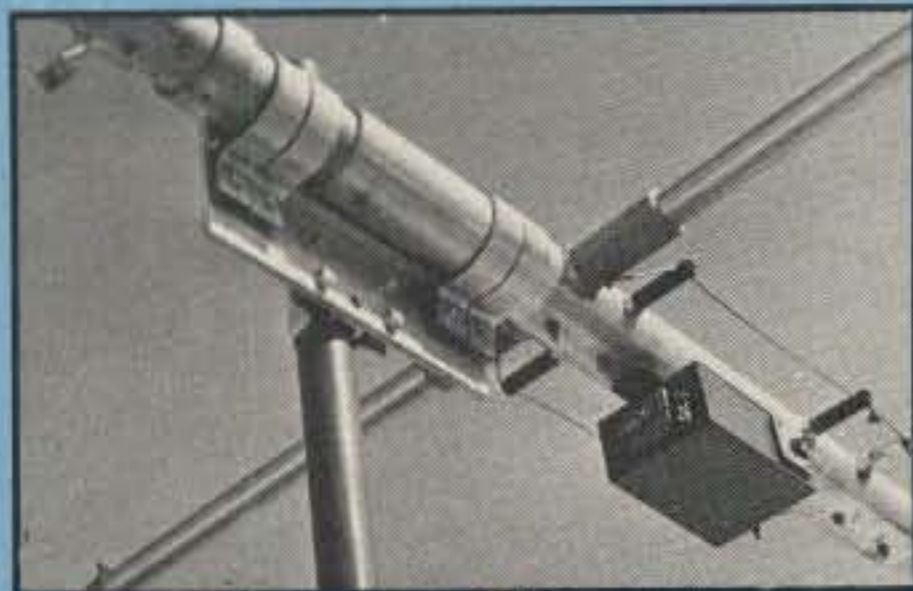


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10M636	10 Meter 6 element	(14.6 DBD)	878.00	675.00
15M532	15 Meter 5 element	(13 DBD)	631.00	485.00
15M845	15 Meter 8 element	(15 DBD)	1268.00	975.00
20M536	20 Meter 5 element	(12 DBD)	760.00	585.00
20M646	20 Meter 6 element	(14 DBD)	1294.00	995.00
40M214	40 Meter 2 element	(5.6 DBD)	865.00	665.00
40M329	40 Meter 3 element	(8.3 DBD)	1294.00	995.00
40M346	40 Meter 3 element	(9 DBD)	2210.00	1700.00
TB4EC	10, 15, 20M Tri-Band	(5.5 DBD)	318.00	245.00
TB5ES	10, 15, 20M Tri-Band	(8.5 DBD)	468.00	359.00
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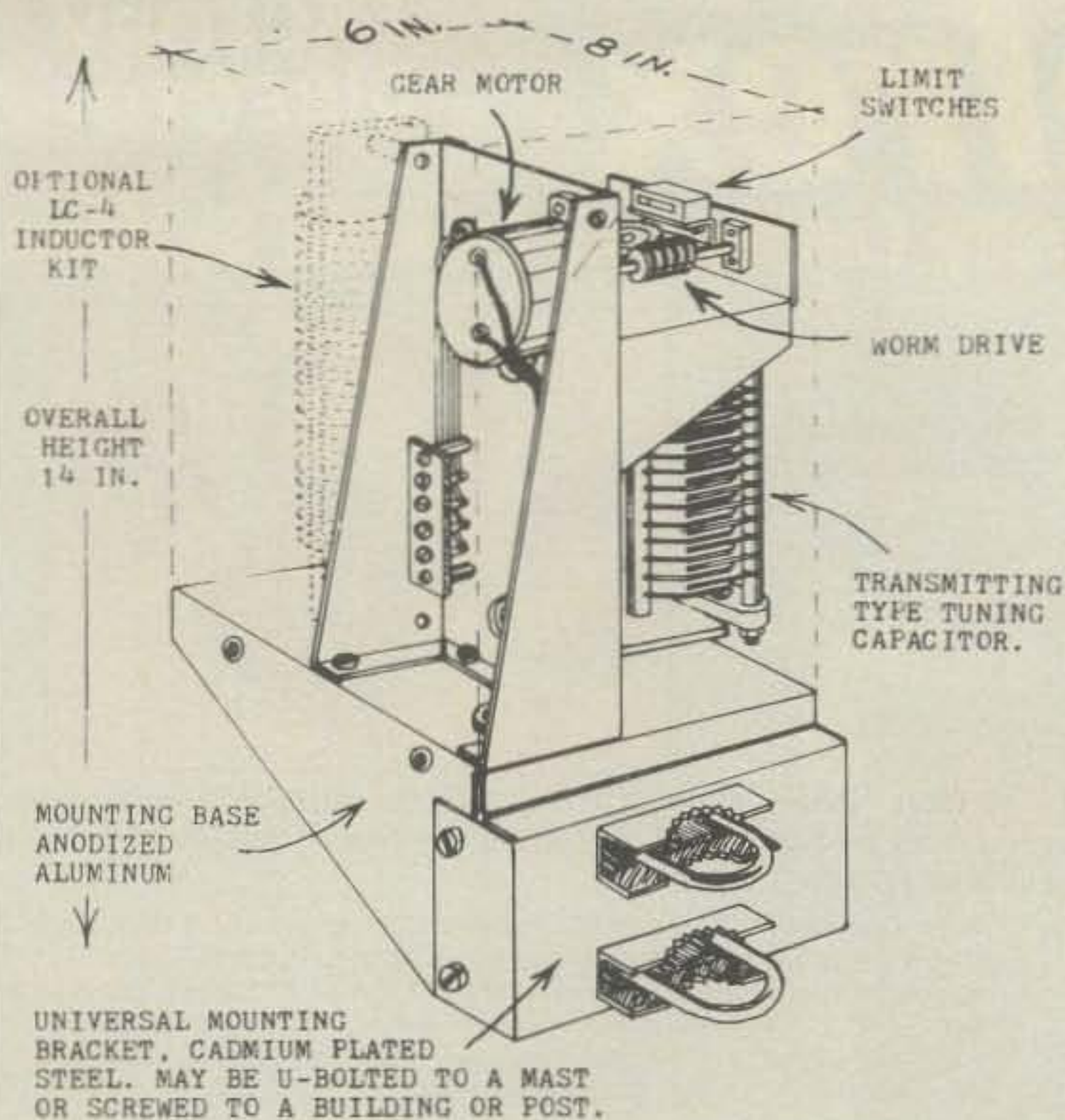
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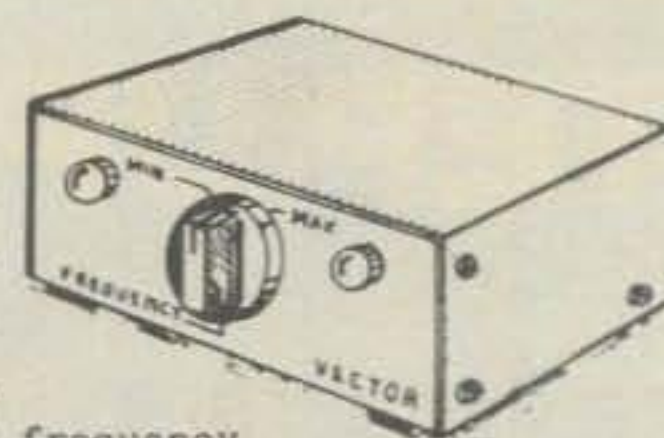
CIRCLE 139 ON READER SERVICE CARD



VT-4 REMOTE CONTROLLED ANTENNA TUNER
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VT-4 CONTROL UNIT

Operates on 117 volts A.C. Supplies 12 volts D.C. to the VT-4 remote tuner. Requires 22 Ga. 8 conductor control cable. Rotary switch actuates up and down frequency tuning. Limit switches actuate panel lights which indicate when minimum or maximum tuning limit has been reached. Black anodized cabinet. 4½ in. wide, 2 in. high, 3½ in. deep.



VT-3 CONTROL UNIT

For mobile installations. Contains toggle switch with center off. Has lights for min. and max. indicators. Operates on 12 volts D.C. Requires 22 Ga., 8 conductor cable. Only 2 in. wide, 1 in. high, 1½ in. deep.

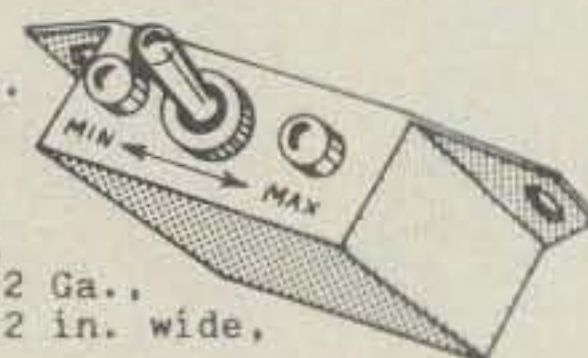


Fig. 5— Vector VT-3/VT-4 remote-controlled antenna tuner. Sketch of the antenna-mounted, gearmotor driven tuner is shown at the left, with the VT-4 fixed station control unit at right. Mobile VT-3 control unit is seen at lower right. The system covers 1.8 to 29.7 MHz.

type twinlead. The weather-sealed antenna uses no traps or coils and costs about \$60 at this writing. An inexpensive, ready-to-use, 135 foot multiband dipole fed with 450 ohm line is also available. The KT8B, being fed with openwire line (included), requires an antenna tuner for proper matching at the transmitter.

John Devoldere, ON4UN, offers an authoritative book for 160, 80, and 40 meter DXers interested in so-called "gray line" propagation: *World-Wide Sunrise/Sunset Tables*. His book provides sunrise and sunset times for about 500 geographical locations in all DXCC locations, with 100 of these in the USA. The specialized propagation information contained in the book should make it of interest to the serious medium-wave and shortwave listener, as well as to lower-band amateurs.

Contact John Devoldere, ON4UN, 215 Poelstraat, B9220 Merelbeke, Belgium.

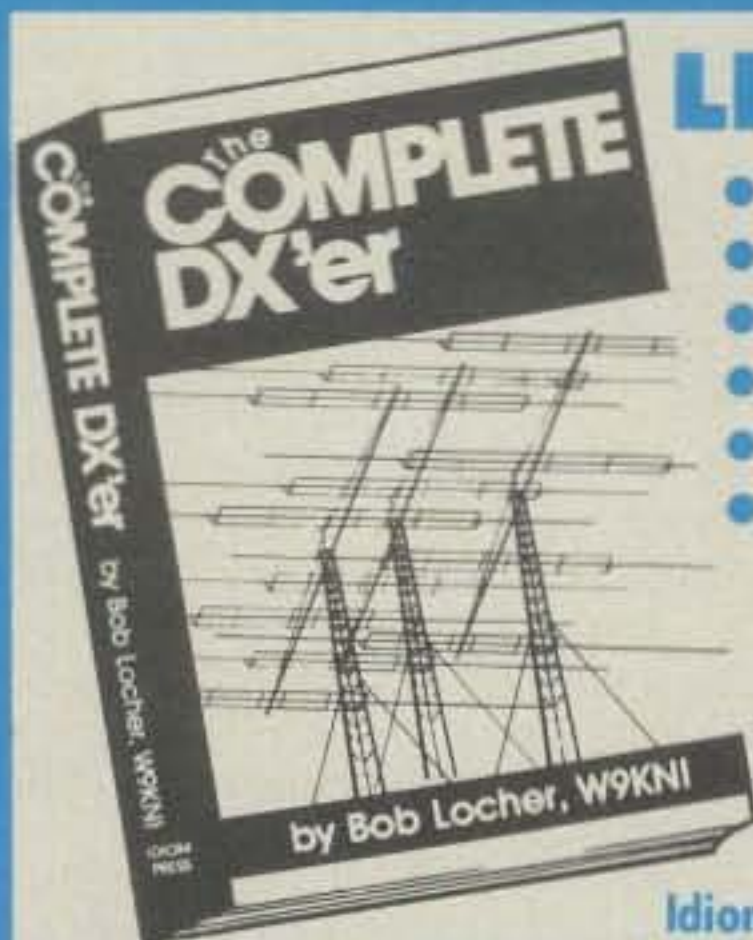
Although it is marked with a \$1.95 "optional price," filling in a reader service coupon in the February 1984 issue of *Radio Electronics* brought me a copy of RCA's interesting, 52-page booklet on video system "RF plumbing." The manual, *How to Hook Up Your Video System*, provides a wealth of detailed and useful information (including some 36 connection diagrams) on hookup of various video devices, including TVs, video cassette recorders, video games, videodisc players, TV cameras, and personal computers. While not directly intended for amateur use, there are some useful interfacing hookup ideas provided which may be of use to the amateur television, slow scan, and computer enthusiast. The book is

available for a listed \$1.95 in postage and handling from RCA Distributor and Special Products Division, P.O. Box 597, Woodbury, NJ 08096.

Software Notes

Supporting IBM-PC and XT, as well as the Heath/Zenith H89 and Z100 computers, is Technical Software Corporation, P.O. Box 579, Northford, CT 06472. As this column is written, four main sets of programs are offered, all programs being in compiled object code and requiring 64K RAM, two disk drives, and a printer. The four programs offered include an ARRL Field Day logging system (Field Pak); a complete logging and filing system (Log Pak +); a DXCC utility known as Award Pak-DXCC; and TestPak-CQWW, the latter a complete logging, scoring, and dupe-checking package for the CQ World-Wide DX contest. Free literature is available from the manufacturer upon request.

Previously in the column we've mentioned Harv Nelson, KA9KUH's logging/QLSIng programs. Harv has now finished his Zuperduper program, which is a disk-based logging and duping program for "on the air" use. The program features automatic QSO numbering as well as date/time entries, sorted and counted multiplier listing, sorted logs, serial log listing, and a dupe status check. The \$25 program is available from Harv Nelson, KA9KUH, P.O. Box 736, Stevens Point, WI 54481. A worldwide QSL bureau database and address-book program is included with purchase of the Zuperduper or other programs.



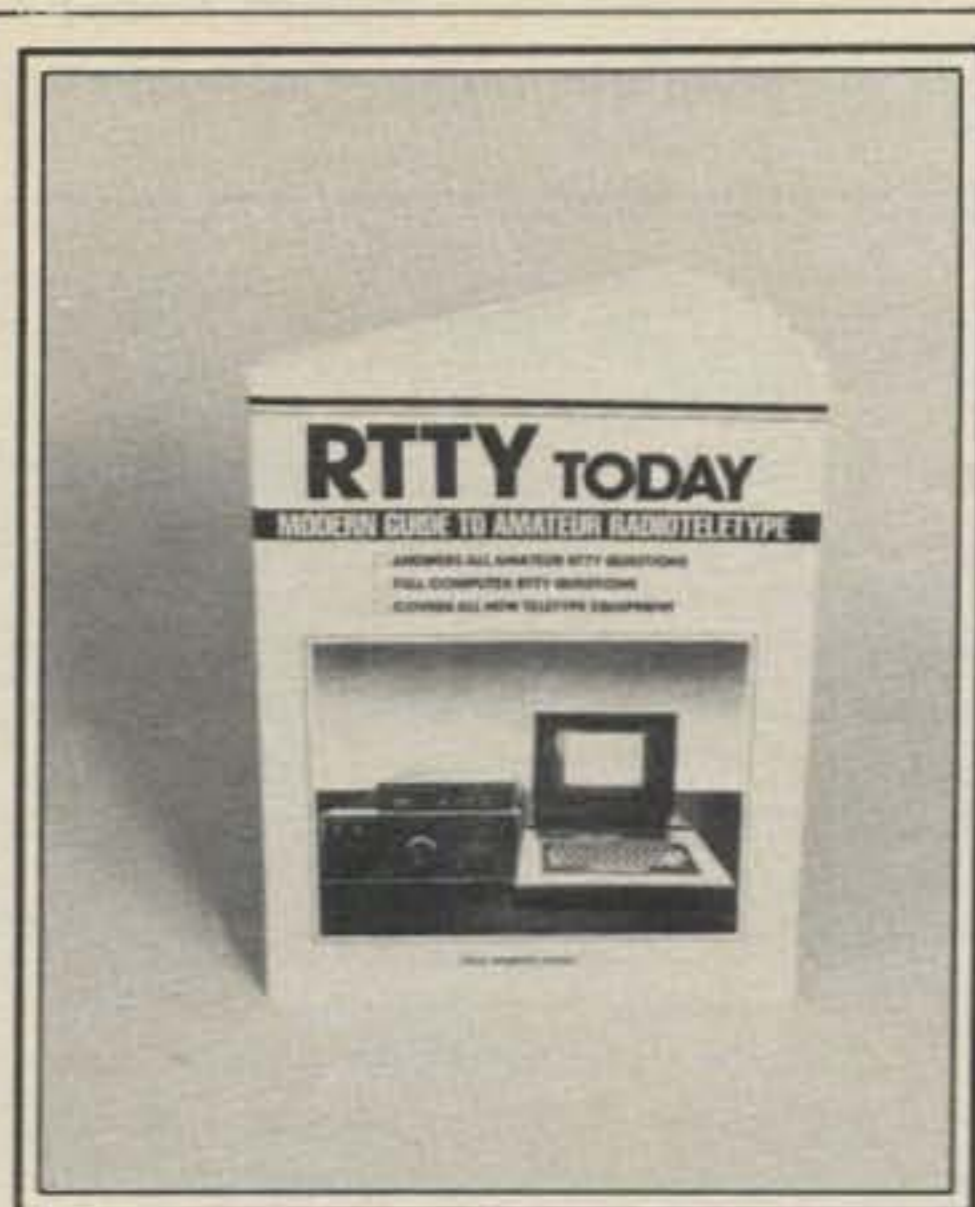
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CIRCLE 146 ON READER SERVICE CARD



Here's fellow CQ columnist Dave Ingram's new book, *RTTY Today*. It's an up-to-date publication that deals with all phases of radioteletype from the venerable Model 15 to the latest stand-alone terminals and computer interfaces. The 112-page book is available for \$8.95 plus \$2.00 for shipping and handling from CQ's Book Shop.

Dave Does It Again

Congratulations are in order for fellow CQ columnist Dave Ingram, K4TWJ, on publication of his authoritative book, *RTTY Today*. We received an early copy from Dave's publisher, Tom Harrington, W8OMV, at Universal Electronics. The book is a well-written, comprehensive guide to contemporary amateur radioteletype; it answers many "nitty-gritty" questions about amateur RTTY and includes sections covering personal computers and dedicated commercial terminals for RTTY use, while not neglecting the classic mechanical machines still in use in many hamshacks.

The book includes sections on basic RTTY parameters and concepts, RTTY systems for home computers, dedicated RTTY terminals and systems, mini-RTTY devices, and several appendices covering useful statistical data. Dave's book is available from CQ Book Shop for \$8.95 plus shipping and handling.

Wrapping It Up

In this month's column we've covered several areas of interest. We opened the mailbag for some reader notes, presented two additional Reflected Power Program versions, identified a number of sources for antenna components, and presented some "short bursts" on new products. We also touched on some new amateur software offerings and took note of Dave Ingram's new RTTY book. Next month we'll have more topics which we believe you will find interesting and informative. See you then.

73, Karl, W8FX

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Alliance, Ohio 44601

NEWS/VIEWS OF ON-THE-AIR COMPETITION

There have been many weekends saturated with contest and QSO party activity in the past, but they are nothing compared to the month of October this year. Not shown, however, are the California, Oregon, and Maryland/D.C. QSO Parties and the Y2 DX Contest normally held in October. I have not heard from these organizations, and therefore they have not been listed in this month's calendar. I cannot risk giving the wrong information and ending up with "egg on my face." So, add the above missing events to the already announced list, and we've got mass confusion in October.

As announced in this year's CQ World-Wide DX Contest rules (see the September issue), winning stations are now permitted to win the same trophy after a two-year period instead of the previous three-year waiting period. Last year in a survey of the sponsors of these awards the vote by a wide majority was in favor of the three-year period. However, this year many were of the opinion that the eligibility clause should be lowered to two years, and therefore the change has been made. To keep the dynasty of perpetual winners happy, CQ will now donate World Champion Plaques to winners who are restricted by the two-year period (single operator all band, multi-operator single transmitter, and multi-operator multi-transmitter categories).

As for the new "Team Contesting" category, I'm still of the opinion that it has no place in a world-wide-type contest. It is more suited for inter-club competition.

Deadline for the January issue is October 15th, and November 15th for the February issue. Sending material to my home address will gain additional time for you.

73 for this time, Frank, W1WY

GARTG SSTV Contest

0600 to 0600 UTC, Sat.-Sun., Oct. 6-7

This is the fifth world-wide SSTV contest sponsored by the German Amateur Radio Teleprinter Group.

Use all bands, 3.5 through 28 MHz, in that portion of the band reserved for SSTV. A 6-hour off time must be taken at any time during the contest.

Exchange: Call sign, RST, message number (001, etc.). GARTG members will also include their membership number. Exchange must be made exclusively in the SSTV mode.

Scoring: Contacts on 80, 40, and 20 meters, 1 point; on 15 meters, 2 points; and

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Calendar of Events

Oct. 6-7	Columbus Day Event
Oct. 6-7	GARTG SSTV Contest
Oct. 6-7	ARRL CW QSO Party
Oct. 6-7	VK/ZL/Oceania CW Contest
Oct. 13-14	VK/ZL/Oceania SSB Contest
Oct. 13-14	Columbus Day Contest
Oct. 13-14	ARCI QRP Contest
Oct. 13-14	ARRL Phone QSO Party
Oct. 13-14	Pennsylvania QSO Party
Oct. 13-15	Rhode Island QSO Party
Oct. 14	RSGB 21/28 MHz Phone
Oct. 17-18	YLRL Anniv. CW Party
Oct. 20-21	CLARA AC/DC Contest
Oct. 20-21	Boy Scouts Jamboree
Oct. 21	RSGB 21 MHz CW Contest
Oct. 21	Red River DX "Sprint"
Oct. 27-28	CQ WW DX Phone Contest
Oct. 31 - Nov. 1	YLRL Anniv. Phone Party
Nov. 3-5	ARRL CW Sweepstakes
Nov. 10-11	DARC Euro. RTTY Contest
Nov. 17-18	QRP Club QSO Party
Nov. 17-19	ARRL Phone Sweepstakes
Nov. 24-25	CQ WW DX C.W. Contest
Dec. 1-2	ARRL 160 Meter Contest
Dec. 1-2	TOPS 3.5 MHz Contest
Dec. 8-9	ARRL 10 Meter Contest

on 10 meters, 5 points. Add 50 bonus points for each contact with a GARTG member station. Same station may be worked on each band.

Multiplier: Each country (WAE and ARRL list) and each call area in JA, PY, VE/VO, VK, W/K worked on each band.

Final Score: QSO points \times countries \times continents plus bonus points.

There is also an s.w.l. division with the same scoring as outlined above. S.w.l. logs must contain both the report sent and received by the station logged.

Awards: Free one-year subscription to "RTTY," official organ of the GARTG, to the three top scorers.

Use a separate log sheet for each band and a summary sheet showing the scoring, etc. All entries must be received by December 10th and go to Contest Manager, Wolfgang Punjer, DL8VX, P.O. Box 90 11 30, D-2100 Hamburg 90, Fed. Rep. of Germany.

ARRL QSO Party

C.W.: Oct. 6-7 Phone: Oct. 13-14
1800Z Saturday to 0600Z Sunday

This event is similar to the annual Open CD Party, which has been phased out, and it is open to all ARRL members. Operate a maximum of 10 hours out of the 12-hour period. Off times must be at least 30 minutes and must be clearly indicated in the log.

Exchange: Your "status" and ARRL

section (MBR member, ORS official relay station, etc.).

Scoring: Total QSO's from all bands times number of ARRL sections worked (maximum of 74). Phone and c.w. are separate and require separate logs. A dupe sheet is also required if you make more than 200 contacts.

Referring you to a current issue of QST for more details is academic, since all members of course receive QST. Anyway, be sure to get your entry to the ARRL, 225 Main Street, Newington, CT 06111 within a month of the above dates.

VK/ZL/Oceania DX Contest

Phone: Oct. 6-7 C.W.: Oct. 13-14
1000Z Saturday to 1000Z Sunday

The following rules are for stations other than VK/ZL. Oceania stations can work anyone. The rest of the world is limited to working VK/ZL and Oceania stations. The same station may be worked on each band for QSO and multiplier credit.

Exchange: RS(T) plus a three-figure QSO number starting with 001.

Scoring: Same for everybody, 2 points per QSO.

Multiplier: Each VK/ZL and Oceania call area on each band.

Final Score: Total QSO points from all bands times the sum of the multipliers from each band.

Awards: Attractive color certificates to the winners in each country and each call area in the US, USSR, and Japan. Awards are for single operator, all-band operation only. Additional awards if returns and conditions justify.

There is an s.w.l. section. Only VK, ZL, or Oceania stations are reported. Call of station being worked and RS(T) sent and received must be reported. Scoring same as above, but phone and c.w. scores are combined for awards.

Include a summary sheet showing the scoring and the usual signed declaration. One IRC will get you a copy of the results.

This year the contest is being run by the NZART, and all entries must be received by the contest manager before January 31, 1985. They go to: Jock White, ZL2GX, 152 Lytton Road, Gisborne, New Zealand. (Another IRC to Jock will also get you a list of over 12 awards sponsored by the NZART.)

Columbus Day Special Event

15M Phone: 1400Z-2400Z Sat., Oct 6
40M Phone: 1400Z-2400Z Sun., Oct 7

The Columbus ARA calls this a triple salute to (1) the explorer Christopher Co-

lumbus, (2) the city of Columbus, Ohio, and (3) amateur radio worldwide.

Participation will be between Columbus, Ohio, and area suburbs with other worldwide areas, on 21375 and 7240 MHz. (Columbus stations may also contact other in-city stations.)

Exchange: Signal report, QTH, and name.

Scoring: One point per QSO, 6 points if it's with club station W8TO. A final score of at least 10 must be submitted to be eligible for a certificate.

S.w.l.'s are also eligible on a heard-basis score.

The top-scoring Columbus station wins a plaque.

Include an s.a.s.e. (3 IRCs for DX) when applying for a certificate. Applications must be received within 120 days by: Amateur Radio Station W8TO, Att. Special Event Coordinator, 280 East Broad St., Columbus, OH 43215.

Columbus Day International

1200Z Sat. to 2400Z Sun., Oct. 13-14

Here's another Columbus Day Celebration. This one is sponsored by the Miami Havana Lions Club. Rules are not too specific, but the objective is to work members of the club who will be assigned official numbers for identification. Participation will be on an international basis.

Exchange will be a signal report and QTH on 10-80 meters phone and c.w. Club members will be found on 7230, 14250, 21250, and 28915 MHz. English, Spanish, or Portuguese will be spoken. A minimum of 5 members must be worked to receive the Special Club Award (s.w.l.'s may also apply).

Send your log or QSL's and \$2.00 or 6 IRCs to: Miami Havana Lions Club, Columbus Day International Contest, P.O. Box 674, Miami, FL 33135.

ARCI QRP Contest

1200Z Sat. to 2400Z Sun., Oct. 13-14

This is the fall edition and 23rd anniversary of the QRP Amateur Radio Club International. This year activity will be found on c.w. and/or s.s.b. Participation is limited to 24 hours of the contest period, and one mode only.

Exchange: RS(T) and state, province, or country. Members will include their number, non-members their power output.

Scoring: Contacts with members 5 points; non-members 2 points if in same continent, 4 points if in a different continent. The same station may be worked on each band and mode for QSO and multiplier credit.

There is an output power multiplier:
c.w. 4-5 watts, s.s.b. 8-10— $\times 2$.
c.w. 3-4 watts, s.s.b. 6-8— $\times 4$.
c.w. 2-3 watts, s.s.b. 4-6— $\times 6$.
c.w. 1-2 watts, s.s.b. 2-4— $\times 8$.
c.w. less than 1 watt, s.s.b. 2 watts— $\times 10$.

The following bonus multipliers are also available: $\times 2$ if using solar or wind power, $\times 1.5$ for battery power. Must be used for duration of contest.

Final Score: Total per band. QSO points \times (states + provinces + countries) \times power multiplier \times bonus if any. Add totals from each band worked for final score.

Frequencies: C.W.—1810, 3560, 7040, 14060, 21060, 28060, 50360, S.S.B.—1810, 3985, 7285, 14285, 21385, 28885, 50385. Novice—3710, 7110, 21110, 28110.

Awards: Certificates to the highest scorers in each state, province, and country with two or more entries. All entries will be considered for the Triple Crown QRP Award. In addition, Adrian Weiss, WØRSP, is sponsoring a special *Milliwatt* certificate to be awarded to the highest scoring station in the less than 1 watt category, provided that there are two or more entries in that category.

Use a separate sheet for each band; include a summary sheet showing the scoring, equipment description, and other essential information; and include a large s.a.s.e. for a copy of the results. Log forms are also available.

Logs must be received by November 12th and go to: ARCI QRP Chairman, Gene Smith, KA5NLY, 8201 Chatham Dr., Little Rock, AR 72207.

Pennsylvania QSO Party

1600Z Sat. to 0500Z Sun., Oct. 13-14
1300Z to 2200Z Sun., Oct. 14

This is the 27th annual party sponsored by the Nittany ARC of State College, Pennsylvania. The same station may be worked on each band and mode for QSO points. PA stations may work other PA stations for QSO and multiplier credit. Mobiles may be worked on each county change.

Exchange: RS(T), three-digit QSO number, and QTH. County for PA, ARRL sections for others.

Scoring: One point for s.s.b. contacts, 1.5 points for c.w., and 2 points for c.w. on 80 and 160.

PA stations multiply total by ARRL sections + PA counties + 1 DX country worked. Others use PA counties for their multiplier (maximum of 67).

Mobiles add 500 bonus points for each county operated from, minimum of 10 QSOs. Mobiles on county lines give one QSO number but get credit for two multipliers.

Frequencies: C.W.—1810 and 40 kHz up from bottom edge of each c.w. band. S.S.B.—1850, 3980, 7280, 14280, 21380, 28580. Novice—10 up from bottom of each Novice band. Mobile—5 kHz below listed frequencies. Try 160 at 0300Z.

Awards: Will be made in five classes—single operator, multi-single, multi-multi,

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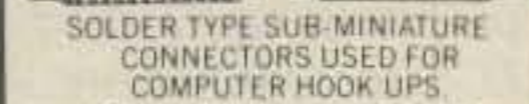
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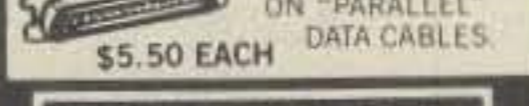
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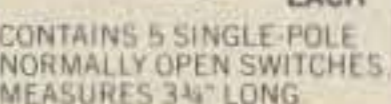
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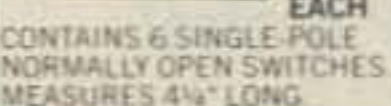
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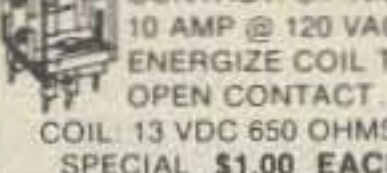
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Include a summary sheet with your entry showing the scoring, a check list of counties or sections worked, and a dupe sheet if you make 100 or more contacts. There is a severe penalty of 100 points deducted for each dupe that has not been removed.

Official log forms are recommended and are available from W3HDH. For a copy of the results send 50¢ (no s.a.s.e.).

Mailing deadline for entries is November 15th to: Douglas R. Maddox, W3HDH, 1187 S. Garner St., State College, PA 16801.

Rhode Island QSO Party

1700Z Sat. to 0500Z Sun., Oct. 13-14
1300Z Sun. to 0100Z Mon., Oct. 14-15

This one is again being sponsored by the East Bay AWA (WA1YPN). The same station may be worked on each band and each mode. RI stations may contact other RI stations for QSO points.

Exchange: RS(T) and QTH. City or town for RI; state, province, or DX country for others.

Scoring: Phone QSOs are worth 2 points, c.w. 3 points, and Novice/Tech. 5 points.

RI stations multiply total QSO points by the number of states, VE provinces, and DX countries worked. Others by the different RI cities and towns worked for their final score (39 cities and towns).

Frequencies: C.W.—1810, 3550, 3710, 7050, 7110, 14060, 21050, 21110, 28050, 28110. Phone—3900, 7260, 14300, 21360, 28600, 50110, 144.2, and 146.52. (Use of f.m. simplex is encouraged. No repeaters.)

Awards: Certificates to the top-scoring single operator station in each RI county, and each state, province, and country. The top-scoring Novice/Tech. in RI and out of state will also be rewarded, as will the winning RI multi-operator station.

Include a summary sheet with your entry showing the scoring and other essential information, and an s.a.s.e. for a copy of the results.

Mailing deadline is November 15th to: East Bay AWA Inc., P.O. Box 392, Warren, RI 02885.

RSGB 21/28 MHz Phone Contest

0700 to 1900 GMT Sunday, Oct. 14

It's the world working the British Isles on 21 and 28 MHz.

The same station may be worked on each band for QSO and multiplier credit. There are a total of 42 prefixes available on each band. Following are the rules for areas other than the British Isles.



Murphy is always sure to strike DXpeditions. The Aves Island, YV0AA, expedition by the Radio Club Venezolano last March was no exception. Here the boys are frantically working on their main source of power, a 100 kVA generator, which they found inoperative when they landed on the island. Full power was not available for the first 12 hours. Limited operation on 20 s.s.b. was made possible with the use of a small 1.5 kw generator. Jose, YV5ANT, tells you all about it in his Aves Island 1984 DXpedition story to be published in a future issue of CQ.

Sections: Single operator and multi-operator, both bands only, and s.w.l.

Exchange: RS report plus a progressive QSO number starting with 001.

Scoring: Each contact with a B.I. station is worth 3 points. Multiply total QSO points from each band by the sum of B.I. prefixes worked on each band (maximum of 42 per band). The GB prefix does not count for QSO or multiplier.

Unmarked duplicate contacts will be penalized 10 times the points claimed. Logs containing more than 5 unmarked duplicates will be disqualified.

There is also an s.w.l. section. Only B.I. stations are to be logged. Scoring is the same as indicated above. The same call sign may appear once only in every three contacts, except when the logged station is a new multiplier.

Awards: Overseas stations will be awarded certificates to the leading station in each country and the leading station in the multi-operator section, and to the s.w.l. winner in each country.

Separate log sheets are required for each band. Include a summary sheet showing the scoring, prefixes worked, and a signed declaration that rules and regulations have been observed. Logs must be received by December 1st. This year they go to: RSGB HF Contest Committee, c/o D. Lawley, G4BUO, 220 Shipbourne Rd., Tonbridge, Kent TN10 3EL, England.

RSGB 21 MHz CW Contest

0700 to 1900 GMT Sunday, Oct. 21

Like the 21/28 MHz Phone Contest, the activity in this one is between the British Isles and the rest of the world. Competi-

tion is limited to single operator stations only. There is a separate QRP section in which power input must not exceed 10 watts, and there is also an s.w.l. section.

The following rules are for areas other than the British Isles.

Exchange: RST report plus a progressive QSO number starting with 001.

Scoring: Each contact with a B.I. station is worth three points. Multiply total QSO points by the number of B.I. prefixes worked (G2, G3, GD3, etc.). A maximum of 42 is possible. (GB does not count for QSO or multiplier.)

Unmarked duplicate contacts for which credit has been taken will be penalized ten times the points claimed. Logs containing more than five unmarked duplicates will be disqualified.

Only British Isles stations are to be logged by overseas s.w.l.'s. The same call may be reported only once in every three contacts, unless the logged station is a new multiplier. Scoring is the same as above.

Awards: Certificates to the leading station in each overseas country, both transmitting and s.w.l.

Include a summary sheet with a list of prefixes worked, station description, the usual signed declaration, and your name and address in block letters. Logs from overseas must be received by December 31st and go to: RSGB HF Contests Committee, c/o R. A. Treacher, BRS 32525, 79 Granby Road, Eltham, London SE9 1EH, England.

YLRL Anniversary Party

C.W.: Oct. 17-18 Phone: Oct. 31-Nov. 1
1800Z-1800Z Wed.-Thurs.

This is the 45th annual party run by the YL Radio League. It is open to all YL's around the world, and activity is between YL's only on all bands, 3.5 through 28 MHz. Phone and c.w. are separate contests and require separate logs and awards.

Exchange: QSO no., RS(T), and ARRL section. DX stations will indicate their country.

Scoring: One point per QSO between stations within an ARRL section and between DX stations. Two points if the QSO is between a DX station and an ARRL section station. The same station may be worked *once only* regardless of the band.

Multiplier: Is figured from the number of ARRL sections and DX countries worked. There is also a low power multiplier of 1.25 if power input is 150 watts or less on c.w., 300 watts p.e.p. on s.s.b.

Final Score: Total QSO points from all bands times the ARRL sections and DX countries worked times the power multiplier.

For each duplicate contact that is removed from the log in the course of checking, a penalty of three additional and equal contacts will be exacted.

Frequencies: C.W.—3555, 7055, 14055,

21195, 28195. S.S.B.—3955, 7255, 14295, 21395, 28595. (Plus or minus 15 kHz.)

Awards: Gold cups to the top scorers in each contest. A plaque to the highest combined phone/c.w. score, and the Corcoran and Hagen memorial plaques. Certificates to the first, second, and third place overall winners and in each U.S. and VE call area and DX country. Only YLRL members are eligible for the cup and plaques.

Logs must be received no later than December 10th, and this year go to: Marty Silver, NY4H, 3118 Eton Road, Raleigh, NC 27608.

CLARA AC/DC Contest

1800Z Sat. to 1800Z Sun., Oct. 20-21

Sponsored by the Canadian Ladies Amateur Radio Association, this contest is open to both YL's and OM's.

Each station may be worked twice, once on c.w. and again on phone, or on two different bands.

Exchange: RS(T), QTH, and name.

Scoring: For CLARA members, 1 point per contact with non-members, 2 points with members, and 3 points if with a bonus station. C.w. contacts are worth double the above point value. Non-member scoring is the same as above, except only CLARA member contacts are to be counted. YL bonus stations will identify in their exchange.

Multiply total QSO points by the number of Canadian provinces/territories worked for final score.

Frequencies: Phone—3775, 3900, 7150, 14160, 14280, 21300, 28488,

28588. C.W.—3690, 7035, 14035, 21035, 28035.

Awards: Plaques to 1st place winners, both members and non-members, and 2nd and 3rd place certificates. All entries are eligible for the mini prize drawing.

Mailing deadline for all entries is December 15th, and they go to: Muriel Foisy, VE7LQH, RR #1, Pender Island, B.C. Canada V0N 2M0.

Scouts Jamboree On The Air

Starts: 0001 Local Time Sat., Oct. 20

Ends: 2359 Local Time Sun., Oct. 21

This is the 27th annual Jamboree sponsored by the World Bureau of Scouts. Activity is world wide and includes not only Scout units, but Girl Scouts and Guides, too. This is not a contest, but an opportunity for Scouts or anyone interested in Scouting to get together on the air and exchange greetings. Amateurs can invite members of Scout units or individuals to visit their stations or clubs and see how ham radio operates.

No specific exchange, no scoring, and no logs are required. However, participating post-card-size certificates issued by the World Scout Bureau are available. They may be requested before the JOTA weekend for distribution and included with your QSL's of JOTA contacts. Send a large s.a.s.e. to: Jamboree on the Air, 1325 Walnut Hill, Irving, TX 75062; 20¢ postage for 20 cards, 17¢ for each additional 8.

Suggested Frequencies: Phone—3940, 7290, 14290, 21360, 28990. C.W.—

3590, 7030, 14070, 21140, 28190. Also Novice bands, SSTV, and RTTY.

I suggest you write to W2GND for additional details. Stateside participants send reports to Harry A. Harchar, W2GND, 216 Maxwell Ave., Hightstown, NJ 08520.

Red River DX Assoc. WW "Sprint"

1200Z-2400Z Sun., Oct. 21

The Red River DX Association is sponsoring this World-Wide DX Sprint Contest as an equipment check for the coming contest season and to promote its "Missionary Outreach" project. For more information on the project, write to Henry Eschmann, WA7TZE, 5116 Fairway Blvd., Wichita Falls, TX 76310. Activity will be on all h.f. phone bands, single operator only.

Exchange: Signal report and QSO number, 001, etc.

Scoring: One point per QSO, total multiplied by the number of different DXCC countries worked.

No penalty for up to three dupes. Over that amount a like number of valid contacts will be removed from the score.

Awards: The first three places, regardless of country, will be awarded Sprint Trophies. Certificates of participation indicating score and placement will be issued to all entries. A fee of \$3.00 (or 5 IRC's for DX stations) is requested to cover costs (also to help the association in its missionary project).

Send logs to the Red River DX Assoc. "Sprint" Contest, P.O. Box 54, Wichita Falls, TX 76307.

CQ World-Wide DX Contest

Phone: Oct. 27-28 C.W.: Nov. 27-28
0000Z Saturday to 2400Z Sunday

Complete rules were published in last month's issue and are much the same as those used in the past.

The disqualification criteria have been tightened and spelled out in detail. Better watch those dupes and avoid a cut in your score, or maybe disqualification.

A new category, Team Contesting, has been added on a trial basis. It was covered in the rules in September and in this column in August.

The trophy list has been brought up to date with some deletions and the addition of new sponsors to fill the vacancies. We also expect the addition of some new trophies, which will be announced in this column from time to time.

The eligibility clause for consecutive winning of awards has been reduced by one year. It is now two years instead of the previous three years.

Logs can no longer be sent to the individual Contest Directors. This year they must all go to: CQ magazine, World-Wide DX Contest, 76 North Broadway, Hicksville, NY 11801 U.S.A. Be sure to indicate phone or c.w. on the envelope.

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CIRCLE 22 ON READER SERVICE CARD

Amateur Licensing

This column lists the current requirements for obtaining the various Federal Communications Commission (FCC) amateur radio operator licenses. For the absolute latest information, please contact the nearest FCC office or else telephone Dick Bash, KL7IHP at (415) 278-8275.

NOVICE CLASS This is the typical beginning license. The applicant must pass a 5 word per minute (w.p.m.) International Morse Code test and then pass a 20 question written test on basic theory and rules from a properly licensed examiner. The examiner must be an amateur radio operator who holds a General, Advanced, or Extra Class license and meets the requirements specified in 97.31 of the FCC Rules. The examiner will grade the exam on the spot and, if the applicant passes, will complete and forward the applicant's FCC Form 610 to the FCC in Gettysburg, PA. The FCC will then mail the applicant his/her Novice license in about a month. The Novice licensee can only transmit in Morse code on the designated HF Novice Class bands. Legal details are in 97.27 through 97.33 of the FCC's Rules & Regulations. Anyone interested in the Novice Class or in examining a Novice applicant should read these rules.

TECHNICIAN CLASS This license gives the holder Novice Class privileges on the HF bands and full amateur privileges

above 30 megahertz (MHz). The exam for the Technician consists of a 70 question written test and a 5 w.p.m. code test unless the applicant has already passed a Novice exam, in which case he/she doesn't have to retake the code test or the 20 Novice Class written questions. The "Tech" license gives you voice, television (fast- or slow-scan), radioteletype (RTTY), and facsimile privileges. It even lets you communicate via the amateur satellites that orbit the Earth!

GENERAL CLASS The General ticket gives you full amateur privileges above 30 MHz (just like the Tech ticket) but also gives you voice, RTTY, slow-scan television (SSTV), and facsimile privileges on the HF bands. You are also given additional frequencies for code. To get a General Class ticket, you must pass a 13 w.p.m. code test and the 70 question written exam mentioned in the previous discussion about the Tech license.

ADVANCED CLASS This license gives you additional HF privileges for voice, etc. If you presently hold a General Class license, you need only to take and pass an additional 50 question written exam.

EXTRA CLASS This is the highest level of license that the FCC currently has for amateur radio operators. This gives you all possible privileges and (if you presently hold an Advanced Class license) requires that you first pass a 20 w.p.m. code test and then pass a 40 question written test. All of the above licenses are valid for 10 years and are renewable.

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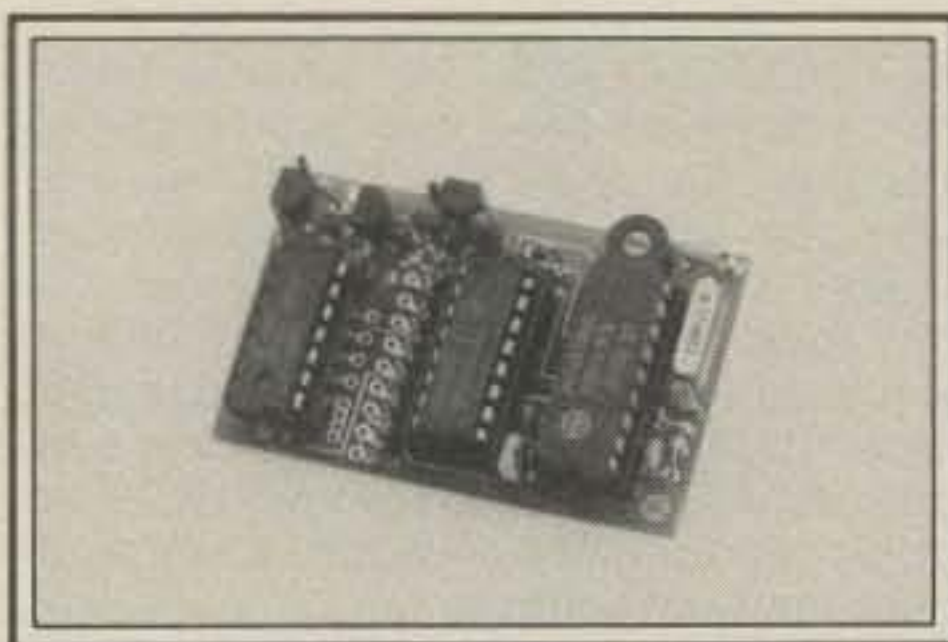
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CQ

CQ SHOWCASE



Communications Specialists DTMF Decoder

Communications Specialists has introduced a small, simple DTMF decoder. The DTD-1 is a dual-tone multi-frequency decoder which will provide a latched or momentary open collector output for single-function operations. It is capable of decoding any one of 5,040 four-digit codes and operates exceptionally well in bad signal to noise environments, maker says. The DTD-1 measures just 1.25" x 2" x 0.4" and sells for \$59.95. For more information, contact Communications Specialists, Inc., 426 West Taft Avenue, Orange, CA 92665, or circle number 101 on the reader service card.



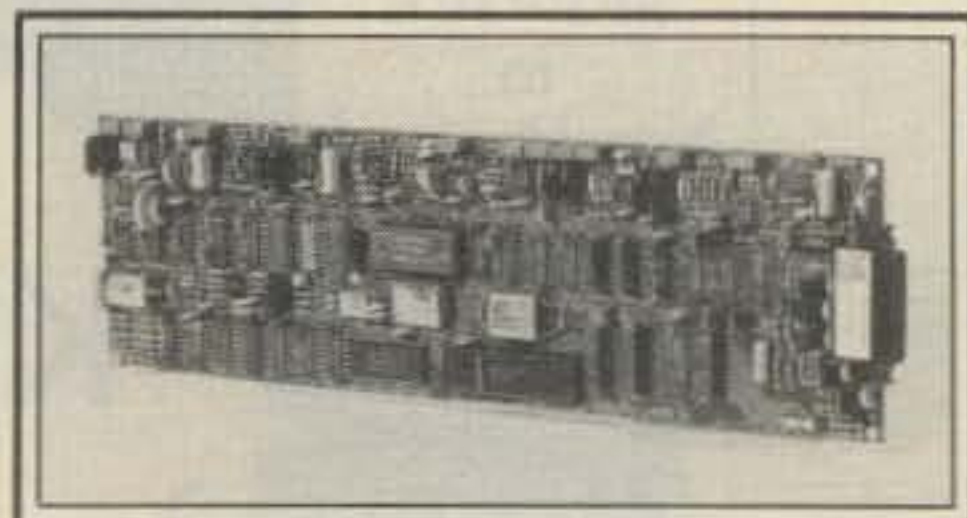
Spectrum SCR2000X Microprocessor-Controlled Repeater

Spectrum Communications' SCR2000X Microprocessor-Controlled Repeater includes the following features: full auto-patch and touch-tone repeater remote-control capability (patch AGC for constant levels); phone-line and "over the air" command modes; up to 13 "auto dial" phone numbers; touch-tone to dial pulse converter; full 16-digit decoding with crystal-controlled decoder IC; touch-tone control of all important repeater functions; up to 6 auxiliary functions (expandable); automatic c.w. ID and remote ID command; and more. The following

transmitter options are available: 2 meters—30 or 75 watts; 220 MHz—30 or 65 watts; 440 MHz—40 watts. High-power rack-mount repeater power amps and power supplies are available to 150 watts. For more information, contact Spectrum Communications Corp., 1055 W. Germantown Pike, Norristown, PA 19401-9616, or circle number 106 on the reader service card.

HAL Communications PCI-200 Personal Computer Interface

The PCI-2000 for the IBM-PC is an RTTY modulator/demodulator with all three shifts (170-425-850), transmit and receive. Full "103 type" modem for up to 300 baud may be set for either FDX (answer or originate) or HDX (either set on tones); "202 type" modem may be used HDX up to 1200 baud. It may be jumper selected for either "COM1" or "COM2" operation. It is compatible with existing PC communications software (external DAA required for phone-line connections). The PCI-2000 offers the multimode features of the CT2100 and CT2200, plus more. The companion software includes features such as split screen, TX and RX buffers, HERE IS storage, and disk message storage and retrieval. All PCI-2000 modes are set with the personal computer's FN keys.



The PCI-EXT option expands DB25 connector to phono and microphone connector for simple cables to radio equipment. The PCI-2000 Personal Computer Interface sells for \$595 (includes software). The PCI-EXT Connector expander sells for \$49. For more information, contact HAL Communications Corp., P.O. Box 365, Urbana, IL 61801, or circle number 104 on the reader service card.

AEA Packet Radio Controller

Advanced Electronic Applications, Inc. has announced the Model PKT-1 Packet Radio Controller. The PKT-1 is a packaged and warranted version of the Tuscon Amateur Packet Radio, Inc. do-it-

CQ World-Wide DX Contest All-Time Phone Records

BY FREDERICK CAPOSSELA, K6SSS

In the records listed below, boldface listings denote world records. Number groups after calls are: year of operation, total score, contacts, zones, and countries. All-band and Multi-Operator records include a band-by-band breakdown of the world leader in each category.

Single Operator/Single Band

WORLD RECORD HOLDERS

1.8	UP2BBT/U6V('83)	203,416	1,490	8	39
3.5	KV4FZ('75)	275,319	1,297	23	80
7.0	YV3BRF('82)	528,193	1,403	31	96
14	VP2KAA('81)	2,011,185	4,186	37	150
21	AH0AB('82) (Opr. JA3DOC)	1,923,840	4,509	36	108
28	YV2AMM('82)	1,839,004	3,700	37	130

AFRICA

1.8	EA8AK('82)	34,220	201	12	46
3.5	CT3BZ('79)	235,113	772	22	87
7.0	EA8CR('74)	253,528	639	31	103
14	CR6WW('74)	1,058,446	2,152	35	132
21	EL2AV('81)	1,404,936	3,087	35	117
28	OH2MM/CT3('79)	1,827,150	4,068	37	113

ASIA

1.8	UP2BBT/U6V('83)	203,416	1,490	8	39
3.5	UW9AF('83)	222,192	554	19	53
7.0	4Z4DX('81)	241,368	721	26	87
14	N2BZQ/4X('82)	1,142,964	2,347	36	135
21	4S7AAG('81) (Opr. OH2BCP)	918,925	2,897	38	137
28	4X0U('80) (Opr. 4X4UH)	1,187,200	2,555	37	123

EUROPE

1.8	LZ2CJ('83)	65,870	857	13	57
3.5	YT3A('82) (Opr. YU3DM)	154,972	806	28	84
7.0	IO3MAU('83)	355,000	1,447	31	94
14	I5NPH('80)	1,062,936	2,429	37	134
21	LZ2KTS('83) (Opr. LZ2CC)	1,368,897	2,821	39	152
28	9H1EL('81)	1,355,760	3,662	36	132

NORTH AMERICA

1.8	KV4FZ('76)	37,584	380	11	37
3.5	KV4FZ('75)	275,319	1,297	23	80
7.0	FM7CD('83)	434,412	1,450	29	103
14	VP2KAA('81)	2,011,185	4,186	37	150
21	VP2KAC('81)	1,783,500	3,941	37	137
28	KV4FZ('79)	1,482,525	4,079	39	126

OCEANIA

1.8	VK6HD('83)	5,363	62	11	20
3.5	KH6XX('82)	161,622	773	27	46
7.0	ZL1BIL('81)	443,646	1,245	33	90
14	ZM1BIL('83)	1,334,232	2,635	38	136
21	AH0AB('82) (Opr. JA3DOC)	1,923,840	4,509	36	108
28	AH0B('82) (Opr. JA2VUP)	1,788,430	4,173	36	109

SOUTH AMERICA

1.8	YV3BNJ('83)	4,160	89	6	10
3.5	YV3AZC('83)	260,916	867	23	79
7.0	YV3BRF('82)	528,193	1,403	31	96
14	FY7AK('76) (Opr. F5QQ)	1,415,329	2,950	36	127
21	CX4CR('82)	1,602,120	3,519	36	120
28	YV2AMM('82)	1,839,004	3,700	37	130

Club record: Frankford Radio Club ('79) 173,821,640

Single Operator/All Band

AF	EA8AK('81)	9,974,811	5,506	152	457
AS	UF6CR('82)	5,898,240	4,466	109	371
EU	YU3EY('82)	4,913,574	3,170	136	455
NA	HI8PGG('81) (Opr. N1GL)	9,009,721	7,190	131	392
O	KH6XX('81)	5,713,434	4,912	131	262
SA	9Y4VT('82) (Opr. N6AA)	11,954,696	7,082	146	422
QRP	TG9GI('82)	1,035,693	1,747	75	192

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	39	7	9
9Y4VT	3.5	404	17	57
(1982)	7.0	748	25	78
11,954,696	14.0	1,620	32	89
	21.0	1,476	34	96
	28.0	2,795	31	93
Total		7,082	146	422

Multi-Operator/Single Xmtr.

AF	ED9CM('83)	10,157,160	5,148	152	511
AS	RG6G('82)	12,276,352	6,012	156	558
EU	I4RYC('80)	9,918,368	5,997	139	453
NA	NP4A('82)	14,953,818	8,772	174	585
O	KC6ZR('80)	7,605,360	6,197	137	283
SA	9Y4W('82)	16,775,034	8,097	158	540

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	124	8	25
9Y4W	3.5	296	17	59
(1982)	7.0	594	27	86
16,775,034	14.0	1,953	35	127
	21.0	2,104	35	121
	28.0	3,026	36	122
Total		8,097	158	540

Multi-Operator/Multi-Xmtr.

AF	EA8CR('77)	21,351,898	10,290	153	544
AS	EW6V('82)	18,746,136	10,100	142	544
EU	OH0W('82)	19,030,501	10,773	188	729
NA	VP2KC('79)	37,770,012	17,767	175	677
O	KH6XX('79)	21,990,252	10,989	184	494
SA	P41C('81)	41,957,244	17,718	173	625

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	261	9	21
P41C	3.5	861	22	69
(1981)	7.0	1,752	30	98
41,957,244	14.0	4,837	38	156
	21.0	5,790	39	143
	28.0	4,813	35	138
Total		17,718	173	625

CQ World-Wide DX Contest All-Time C.W. Records

Single Operator/Single Band

WORLD RECORD HOLDERS

1.8	UP2BBT/U6V('83)	83,160	481	14	49
3.5	VP2KAC('83)	332,880	1,302	28	86
	(Opr. N4RJ)				
7.0	VP2KAA('83)	837,366	2,461	30	104
	(Opr. N4PN)				
14	VP2KAA('80)	1,244,782	3,111	37	117
	(Opr. N4PN)				
21	LU8DQ('81)	1,359,711	2,993	37	116
28	LU8DQ('79)	1,033,399	2,775	34	93

AFRICA

1.8	EA8AK('82)	75,768	385	15	51
3.5	EA9EU('83)	229,150	787	14	75
7.0	EA8RL('83)	329,080	1,159	22	75
14	CR6IK('74)	925,386	2,021	38	116
21	5Z4MX('83)	820,338	1,953	35	106
28	FR0MM('79)	978,012	2,590	36	90

ASIA

1.8	UP2BBT/U6V('83)	83,160	481	14	49
3.5	UV9AX('83)	173,445	662	22	71
7.0	JM1RFT('83)	288,090	928	33	77
14	4X0U('82)	735,504			
21	4Z4NUT('80)	519,831	1,500	34	83
28	4X4UH('80)	554,645	1,772	32	83

EUROPE

1.8	LZ2CJ('83)	54,747	534	18	59
	(Opr. LZ2UU)				
3.5	EA2IA('82)	199,872	1,253	23	73
7.0	UB5JMR('83)	448,318	1,727	36	105
14	OH8SR('81)	672,600	2,151	34	86
21	YU3ZV('81)	732,096	1,957	37	107
28	DK3GI('79)	592,848	1,584	31	101

NORTH AMERICA

1.8	KV4FZ('76)	42,800	390	13	37
3.5	VP2KAC('83)	332,880	1,302	28	86
	(Opr. N4RJ)				
7.0	VP2KAA('83)	837,366	2,461	30	104
	(Opr. N4PN)				
14	VP2KAA('80)	1,244,782	3,111	37	117
	(Opr. N4PN)				
21	VP2KAC('80)	1,075,407	2,955	36	105
	(Opr. N4RJ)				
28	KV4FZ('79)	653,072	2,384	32	87

OCEANIA

1.8	VR3AH('78)	20,310	238	12	18
3.5	VR3AH('76)	178,560	956	24	40
7.0	AH0C('82)	404,457	1,468	31	62
	(Opr. N6BT)				
14	KG6DX('81)	525,420	1,289	37	102
21	KH6XX('78)	816,102	2,311	38	81
	(Opr. K7SS)				
28	KG6DX('80)	801,876	2,367	35	79

SOUTH AMERICA

1.8	YV1OB('81)	25,806	258	11	23
3.5	4M3AGT('83)	133,152	617	21	52
7.0	9Y4VU('82)	400,851	1,361	24	75
14	PJ9CC('80)	1,209,022	2,914	34	105
	(Opr. K4BAI)				
21	LU8DQ('81)	1,359,711	2,993	37	116
28	LU8DQ('79)	1,033,399	2,775	34	93

Single Operator/All Band

AF	CN8CX('82)	6,234,664	4,354	121	358
	(Opr. K6NA)				
AS	UF6CR('82)	4,613,680	3,982	92	312
EU	YU3EY('82)	3,140,960			
NA	NP4A('83)	6,027,752	4,537	139	399
	(Opr. K3UA)				
O	N6BT/AH0('81)	4,241,746	4,083	121	228
SA	9Y4VT('83)	7,153,434	4,961	127	359
	(Opr. N6AA)				
QRP	UP2BIM('82)	899,932	1,351	83	279

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	94	6	8
9Y4VT	3.5	421	18	53
(1983)	7.0	838	20	69
7,153,434	14.0	1,439	31	80
	21.0	1,288	27	76
	28.0	881	25	73
	Total	4,961	127	359

Multi-Operator/Single Xmtr.

AF	EA9EU('80)	5,077,696	3,884	116	326
AS	RG6G('82)	10,394,658	5,355	166	511
EU	YU3EY('81)	7,674,190	4,051	150	345
NA	NP4A('82)	11,648,565	6,881	168	515
O	5W1AZ('76)	2,534,416	3,043	108	176
SA	P41E('81)	8,059,296	5,055	148	388

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	172	15	35
NP4A	3.5	589	23	73
(1982)	7.0	1,342	28	92
11,648,565	14.0	1,270	36	108
	21.0	1,547	34	106
	28.0	1,961	32	101
	Total	6,881	168	515

Multi-Operator/Multi-Xmtr.

AF	EA8CR('78)	17,734,970	9,799	142	463
AS	EW6V('82)	14,702,688	8,001	159	504
EU	OH0W('82)	14,371,840	9,515	184	618
NA	NP4A('80)	17,627,820	10,846	171	487
O	AH0C('83)	6,877,750	5,164	149	302
SA	P42E('82)	23,295,408	12,315	161	475

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	390	12	28
P42E	3.5	1,083	22	60
(1982)	7.0	1,995	29	81
23,295,408	14.0	2,965	36	112
	21.0	3,351	32	103
	28.0	2,531	30	91
	Total	12,315	161	475

CQ World-Wide DX Contest All-Time U.S.A. Records

BY FREDERICK CAPOSSELA, K6SSS

Tabulated below are the record-high scores achieved by U.S. Contesters in the CQ World Wide DX Contest. Number groups following calls and bands are: year of operation, total score, contacts, zones, and countries.

PHONE

Single Operator/Single Band				
1.8	WA2SPL('83)	18,483	121	18 43
3.5	W1ZM('83)	177,862	669	27 86
(Opr. K1ZM)				
7.0	N7DD('83)	217,830	701	33 73
14	K1UO('83)	727,494	1,417	34 140
21	N7DD('81)	923,945	1,998	36 121
28	N7DD('80)	754,536	1,730	36 113

Single Operator/All Band

Station	Band	QSOs	Zones	Countries
	1.8	14	6	7
AI6V	3.5	121	17	29
(Opr. WA6VEF)	7.0	479	27	51
(1983)	14.0	757	33	91
3,576,528	21.0	1,099	29	71
	28.0	477	24	47
	Total	2,947	136	296

QRP AA2Z/1('83).....509,106 585 86 235

Multi-Operator/Single Xmtr.

Station	Band	QSOs	Zones	Countries
	1.8	23	11	20
W4QAW	3.5	105	21	65
(1982)	7.0	197	28	80
4,455,190	14.0	438	38	135
	21.0	1,001	37	122
	28.0	394	32	129
	Total	2,158	167	551

Multi-Operator/Multi-Xmtr.

Station	Band	QSOs	Zones	Countries
	1.8	109	8	16
N2AA	3.5	406	24	79
(1979)	7.0	366	28	84
13,299,750	14.0	1,646	40	152
	21.0	2,198	40	144
	28.0	1,354	36	120
	Total	6,079	176	595

CW

Single Operator/Single Band				
1.8	K1PBW('76)	22,626	157	15 39
3.5	W1ZM('81)	151,497	610	22 71
(Opr. K1ZM)				
7.0	KØRF('81)	337,280	949	31 93
14	N7UA('80)	626,400	1,634	34 101
21	W1RM('82)	483,560	1,196	33 107
28	N4WW('82)	394,940	1,064	33 97

Single Operator/All Band

Station	Band	QSOs	Zones	Countries
	1.8	8	7	8
K1GQ	3.5	208	18	61
(1981)	7.0	425	24	76
3,276,768	14.0	576	32	85
	21.0	428	31	80
	28.0	473	26	80
	Total	2,111	138	390

QRP AC2U('81).....591,856 728 84 200

Multi-Operator/Single Xmtr.

Station	Band	QSOs	Zones	Countries
	1.8	17	9	16
N4AR	3.5	67	16	62
(1981)	7.0	461	28	92
4,564,350	14.0	755	34	110
	21.0	499	33	101
	28.0	686	32	97
	Total	2,485	152	478

Multi-Operator/Multi-Xmtr.

Station	Band	QSOs	Zones	Countries
	1.8	72	14	27
W2PV	3.5	427	18	70
(1981)	7.0	1,101	30	103
10,431,729	14.0	1,389	35	118
	21.0	1,228	35	103
	28.0	1,050	34	106
	Total	5,267	166	527

Club record: Frankford Radio Club ('79) 173,821,640

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CIRCLE 91 ON READER SERVICE CARD

Ticket Talk

by Dick Bash* - KL7IHP

Welcome to the October column of *Ticket Talk*, a column devoted to answering questions you may have about the amateur radio licensing structure. If you still have questions, please write me c/o CQ or else at the address shown below. A reply will be sent to those enclosing a self addressed stamped envelope. If you can't wait for an answer, either call me at (415) 278-8275 between 10AM and 6PM, Monday thru Friday, California time, or else call your local FCC Field Office.

More HF Voice Frequencies OK'd by FCC

Effective 0001 UTC on September 1, 1984, General, Advanced and Extra Class licensees have received more voice, facsimile, and SSTV privileges (A3, A4, A5, F3, F4, F5) on 80, 15, and 10 meters. For those hams who prefer these modes this is a true blessing.

The new frequencies permitted for Extra Class licensees *only* are 3750-3775 kHz and 21200-21225 kHz. Only Extra and Advanced Class licensees may use 3775-3850 kHz and 21225-21300 kHz. Extra, Advanced *and* General Class licensees may use 3850-4000 kHz and 21300-21450 kHz. Additionally, Extra, Advanced and General Class licensees may use 28300-29700 for voice communications (meaning that the bottom of the voice band was dropped from 28500 kHz to 28300 kHz).

For those FCC licensees located outside of Region 2 and also those west of 130° longitude (meaning Alaskan, Hawaiian, and Pacific stations), you received additional 40 meter voice (A3 or F3 only; no other modes permitted) privileges on 7075-7100 kHz. Please note that *this 40 meter expansion does not apply to licensees within the 48 States, Puerto Rico, the U.S. Virgin Islands, etc.*

Upgrading is Worthwhile!

As you can readily tell, it pays to upgrade if you enjoy the HF bands. The benefits of going from General to Advanced are especially significant and well worth the study time involved.

The Eyes of Texas...

Fred Maia - W5YI is a personal friend of mine and a bit of a renegade as well. He is also the Dallas, Texas based publisher of a bi-weekly ham radio oriented newsletter called *The W5YI Report*. Fred is perplexed over the volunteer exam program and wants to get the thing off dead center. So, he petitioned the FCC to become a volunteer examiner coordinator (VEC) in each of the FCC's 13 regions. So what? Well, Fred showed the FCC that he could coordinate exams for the

hams by using commercially available materials and the assistance of three approved Extra Class licensees as volunteer examiners (VE's).

If you have an Extra Class license and wish to become a volunteer examiner under the W5YI banner, **send Fred a photocopy of your ticket, an SASE, and a letter with the following statement in it on a separate sheet of paper:**

"I am a currently licensed Extra Class amateur radio operator and wish to be a Volunteer Examiner. I have never had my amateur station or operator license revoked or suspended. I do not own a significant interest in nor am I an employee of any company or entity engaged in making, preparing or distributing amateur radio equipment or license preparation materials. My age is at least 18 years old."

Send your request to: Fred Maia - W5YI, P.O. Box 10101, Dallas, TX 75207. If you have questions, call him at (214) 690-1063 (after about 6 PM Dallas time). If you would like to receive a handsome 2-color certificate suitable for framing enclose \$1.00. If you don't send the buck, you'll still be approved but will only receive a wallet sized card authorizing you to be a volunteer examiner. His program should work and easily permits 3 FCC licensed Extras to give tests *world-wide*. This is particularly of interest to military, diplomatic, and civilian personnel stationed overseas!

ARRL Can Play Too!

The FCC approved the ARRL as a VEC in all 13 regions in July and the League is also looking for folks to become examiners. While Advanced Class licensees can participate in the program, any examining team that has an Advanced Class licensee on it as an examiner will only be permitted to administer the 5 word per minute (w.p.m.) International Morse code test, the Novice Class written exam, and the Technician Class written exam. If an applicant wishes to take the 13 or 20 w.p.m. code test or the Advanced or Extra Class written exam, then the examining team must be made up of three (3) Extra Class licensees. Personally I find this arrangement a bit silly but that's the way Part 97 reads. This regulation is why I suspect Fred is limiting his volunteer examiners to just Extra Class licensees.

Conditionally Yours

For those readers who have missed earlier issues of CQ and the gems I spew forth in this column, I remind you that any exam taken with a volunteer examining team is subject to re-examination by

the FCC! This is spelled out in 97.28(i) of the current Rules. This procedure used to be called a Conditional license years ago. Some progress!

Imagine the ham who, say, on January 1st takes a 13 w.p.m. code test and Advanced Class written test with a volunteer team. Further assume that this helpless ham did all of his/her homework and legitimately passed these tests. Now on June 1st the FCC catches this same team selling licenses out the back door. Can you imagine the shock on our helpless ham's face when he/she receives a notice from the FCC to appear for re-examination within 10 days? What if the ham hasn't touched code since passing the test and donated all his/her theory books to the local club? Break out the aspirin because he/she will need it!

Moral to Story

The last time the FCC is giving exams is in November at their Field Offices (with one or two exceptions). If you have any upgrading to do, take it with the FCC and re-examination will not concern you. Eventually the bugs in the volunteer program will be ironed out. In the meantime, take your test with the FCC and be done with it. How? Send an FCC 610 Form to the Field Office and request that you be permitted to sit for their next exam. They'll send you a card telling you when. But hurry! When the Field Office reaches their quota, no further applications will be accepted.

The Alternative

At the time of this writing (August 6th), there is no published study guide from any publisher on the Advanced or Extra written. Why? Well, this publisher is putting together a package (and so, I'm sure, are the other two major suppliers—ARRL and Ameco) but there are 500 questions to cover on the Advanced and 400 on the Extra. Some things just take time.

PARIS Revisited

You may recall in the September column that I couldn't figure out where the FCC found 50 "units" in the word PARIS. Now we know! If each dit is one unit, each dah 3 units, there's a 1 unit space between dits and dahs within a letter, a 3 unit space between each letter, and a 7 unit space after the "S", you get 50 units.

That's it for this month. Upgrade now while the upgrading's good. Thanks for reading the column! See you in November. 73 de KL7IHP.

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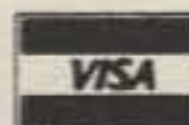
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NEWS OF CERTIFICATE AND AWARD COLLECTING

The story of the month as told by Bernie is:

Bernie Maier, WB3DWH All Counties #469, 3-21-84

"I wish I could say that my interest in amateur radio started back in 1942 when I joined the United States Air Force, but actually, at the time I had no acquaintance whatsoever with this great hobby.

"After graduating from high school in 1939, I worked for three years as a machinist's apprentice. In May 1942 I met and married my wife, Ann, and then in July 1942 I was accepted in the Aviation Cadet program of the United States Air Force. I entered pilot training, but after I was in primary training for 42 hours, Uncle Sam decided that I didn't fit the bill as a pilot. Since I still wanted to fly, I decided to try for radio operator-gunner, and subsequently I was sent to radio operator-mechanic school in Sioux Falls, South Dakota, and then to gunnery school in Harlingen, Texas. After graduation from these schools I could copy 20 w.p.m. Morse code, and thus began my interest in radio. I was assigned to an air crew, and following a period of overseas flight training on B24 Liberator heavy bombers, we were sent to the 8th Air Force based in England.

"I was in England from June 6 to December 2, 1944. Upon returning to the United States, I was assigned to Greenville, South Carolina, as a gunnery instructor until September 1945, when I received my discharge from the United States Air Force.

"I returned to my old job as a machinist and to the job of raising a family. In all, we were blessed with six children, three boys and three girls.

"My family financial obligations prevented me from pursuing amateur radio for quite a number of years, but in 1974, at the age of 53, I decided that I had to try for a ham license. I was quite inactive as a Novice until March 1976, when I attended a code and theory class provided by our local radio club. The instructors were great, so my attempt to upgrade was successful. I received my General Class ticket in June 1976. In March 1977 I again attended the classes at our club and attained my Advanced Class ticket. In the ensuing years I became a "DX nut" and chased enough DX to get DXCC with 257 countries confirmed.

"My first exposure to County Hunting was in January 1982 when I happened to



Bernie Maier, WB3DWH, USA-CA #469.



Bernie, WB3DWH, in his mobile station near the county line of Portage and Geauga counties in Ohio.

tune by the 14.336 net frequency and listened for a while. The operation sounded quite interesting and efficient, so I broke the net and asked how I might get information. The NCS was Dave, N7BKW, and he was so friendly and helpful that I decided right then and there that this was for me. Since then I have kept as active on the net as time permits, but it was not until I retired in September 1983 that I really went after my USA-CA number. I was awarded USA-CA #469 on March 21, 1983. To me this is the most rewarding experience I have had in amateur radio.

"I look forward to many more pleasurable days with the friendly County Hunters. Thank you all. 73, Bernie."

Special Honor Roll All Counties

#477 Kenneth W. Arnold, KA8ASY 6-2-84
#478 Earl E. "Pete" Gray, KC4IF 6-28-84

USA-CA Honor Roll

3000		1500		500	
KABASY	508	KA8ASY	688	KA8ASY	1950
KC4IF	509	K6YK	689	YU7KV	1951
		KC4IF	690	KD7UZ	1952
				UA9LAC	1953
				K6YK	1954
				KC4IF	1955
2500		1000			
KABASY	566	KA8ASY	845		
KC4IF	567	VE1AIT	846		
		K6YK	847		
		GM3AWW	848		
		KC4IF	849		
2000					
KABASY	621				
KC4IF	622				

Awards Issued

Kenneth W. Arnold, KA8ASY, finished them all before he sent his records to qualify for All Counties #477, 6-2-84, All S.S.B.

Earl E. (Pete) Gray, KC4IF, also completed all of this paperwork and sent for All Counties #478, 6-28-84, Mixed.

John Lee, K6YK, whom we often hear operating from his mobile station in California, has worked and confirmed 1500 counties and now has USA-CA 1500 #689, Mixed.

G. L. "Lin" Titus, VE1AIT, continues to improve his score and now has USA-CA 1000 #846, Mixed.

W. S. "Bill" Murray, GM3AWW, continues work on his certificate and now has USA-CA 1000 #848, Mixed.

USA-CA 500 certificates went to:
Kenneth W. Arnold, KA8ASY, #1950, All S.S.B., 6-2-84.

Jaso Jaroslav, YU7KV, #1951, Mixed, 6-14-84.

Gary A. Ward, KD7UZ, #1952, All S.S.B., Mixed Bands, 6-20-84.

Boris A. Shabaev, UA9LAC, #1953, Mixed, 6-22-84.

John Lee, K6YK, #1954, Mixed, 6-22-84.

Pete Gray, KC4IF, #1955, Mixed, 6-28-84.

New Awards

Central Pennsylvania DX Club. The Central Pennsylvania DX Club Award is available as follows:

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Members of CPDXC are as follows: K4JLD, KA3EEY, K3SWZ, W3ENL, W3BNZ, W3CNS, WB3JNX, WB3EFQ, AF3T, K3EQN, K12G, KA3ANG, K3LUE, KB3OQ, N3CYI, WA3RDN, WA3UBQ, WB3DNA, WB3LJS, WB3JFA, K3UFO,

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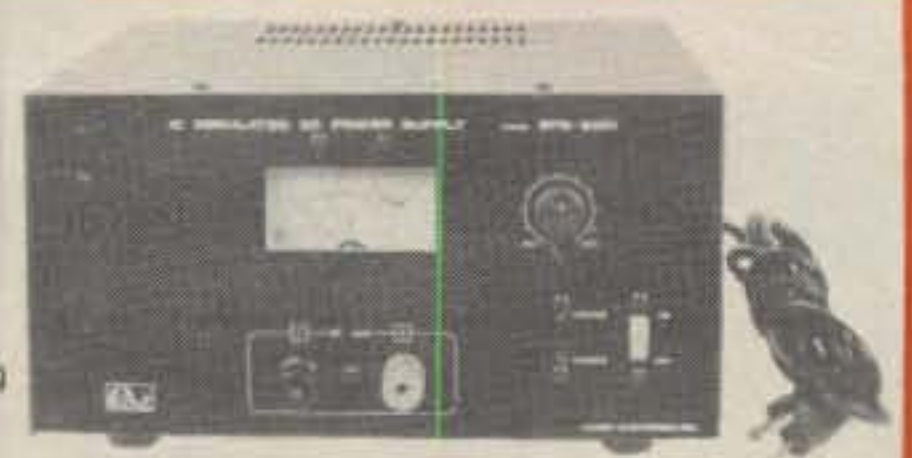
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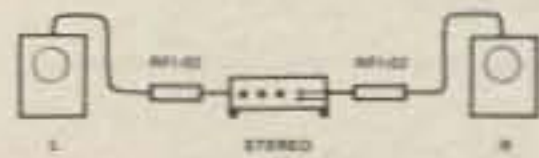
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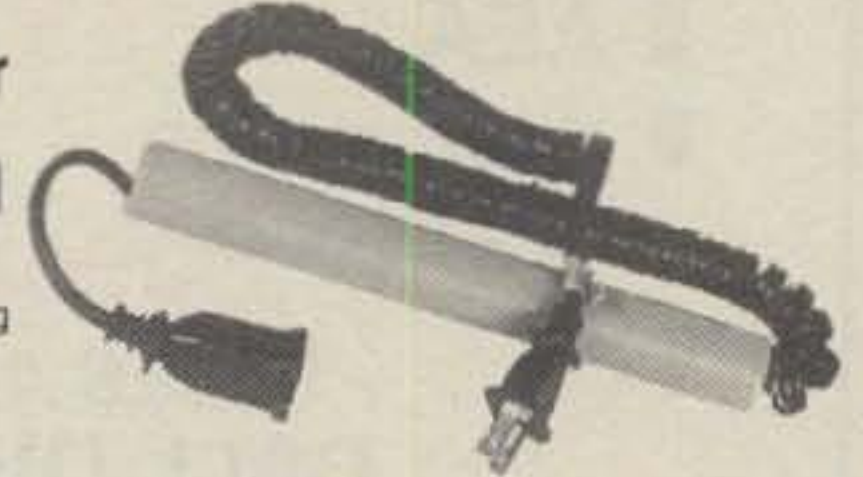
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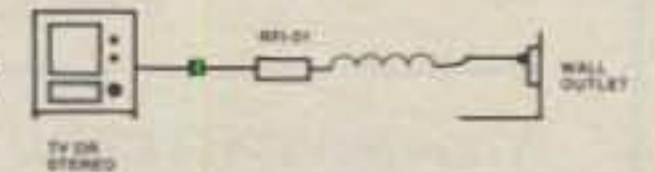
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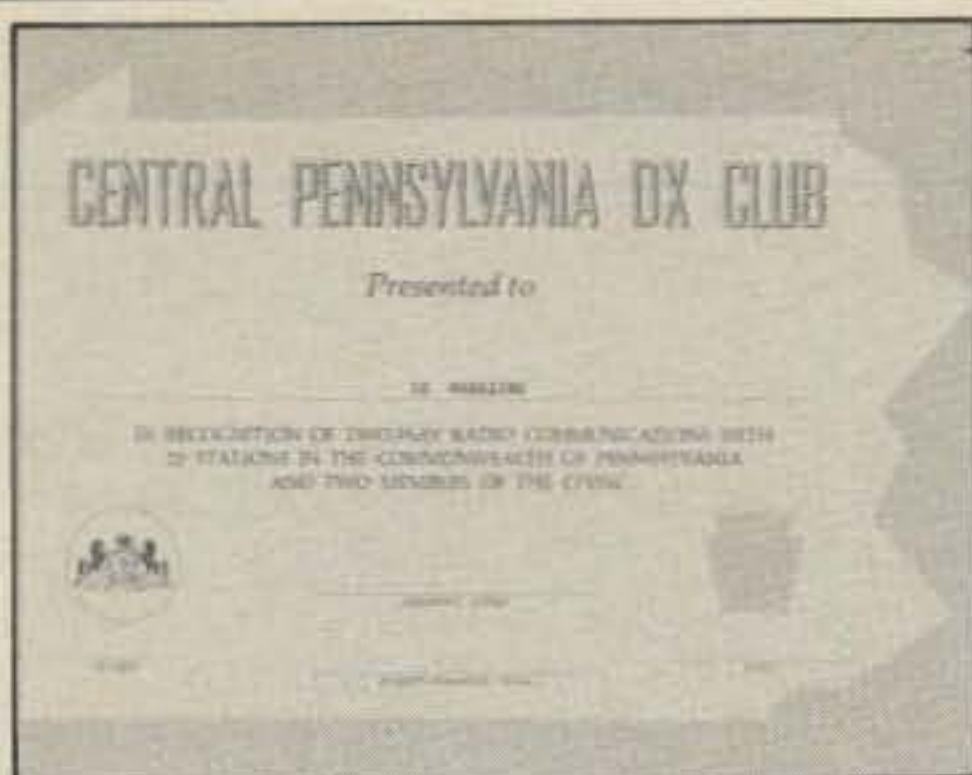
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NOTE: Prices and specifications subject to change without notice or obligation.

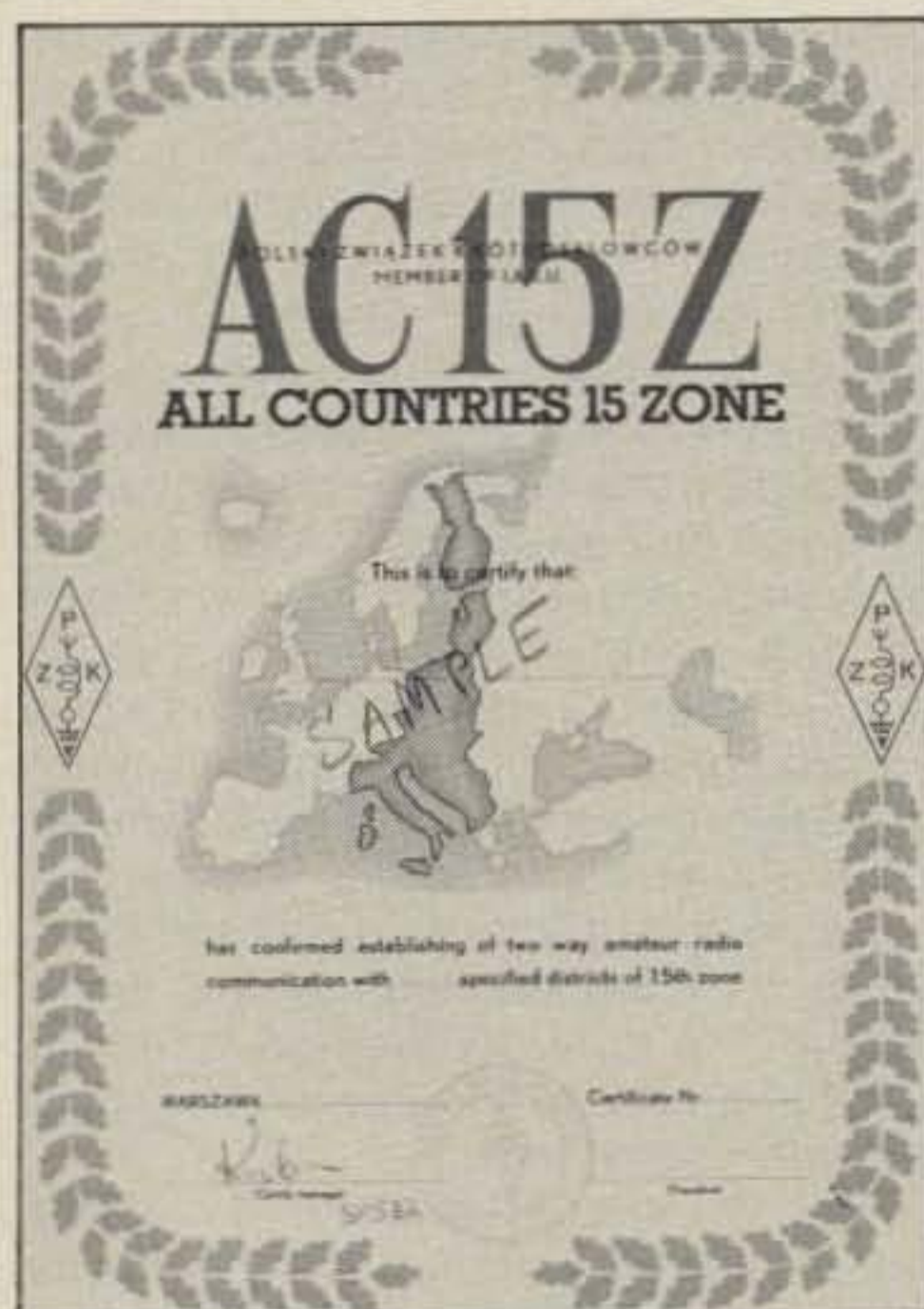
More information is available from NCG. Co., 1275 N. Grove St., Anaheim, CA 92806, (714) 630-4541



Central Pennsylvania DX Club Award.

KA3JKC, K3LHD, KA3GEQ, N3CYC, WA3HUP, KC3MS, WB3CQN, WB3KPS, WB3HNC, WB3ABS, N3BNA. DX calls used by members in 1984 are JY9AA, JY8CQ, WA3HUP/OE, WB3CQN/OE.

AC 15 Z Award. This award is issued for working 15 countries or districts located in Zone 15 WAZ. The prefixes are: FC, HA, HV, I, IS, IT, MI, OE/max 2 districts, OH/max 3 districts, OK-SP/max 4 districts, UA2-UP2-UQ2-UR2-YU/max 3 districts, ZA and 9H. Send GCR list and fee of 10 IRCs to Award Manager PZK, Box 320, 00-950 Warszawa, Poland.



AC 15 Z Award (All Countries 15 Zone).

Maple Leaf Award—Canada. Work and confirm different prefixes (not just stations) of Canada. Basic Class IV work 10 Canadian prefixes. Class III work 15 Canadian prefixes. Class II work 25 Canadian prefixes. Class I work 30 Canadian prefixes.

The cost of the flag parchment certificate and lapel pin is \$2.00, or 10 IRCs. All contacts must be made after February 15, 1965, the year in which Canada received its official flag. Send log data; do not send QSLs. There is a special ebony plaque for working 50 prefixes (cost is \$10.00); to date, more than 40 such

plaques have been issued. The highest award is a walnut plaque for working 100 or more Canadian prefixes (cost \$20.00). To date, only VE3GCO holds this award.

The award is sponsored by Garry Hammond, VE3GCO, head of the geography department, Listowel D.S.S., 155 Maitland Avenue S., Listowel, Ontario, Canada N4W 2M4.

Canadian prefix checklist: CF, CG, CH, CI, CJ, CK, CY, CZ, VA, VB, VC, VD, VE, VF, VG, VO, VX, VY, XJ, XK, XL, XM, XN, XO, 3B1-2, 3C1-8 and 3C0. (Note: 3B and 3C calls were used by Canadian amateurs during 1967 and the Canadian centennial year of celebrations. The 3B and 3C call blocks have since been reassigned by ITU.)



Maple Leaf Award—Canada.

Worked Large German Cities Award. The WLGC is available to all licensed radio amateurs and s.w.l.'s who can prove contacts with radio amateurs in large German cities (more than 100,000 inhabitants). The award is available in three classes:

Class 3 DX stations 10 cities—EU stations 20 cities.

Class 2 DX stations 20 cities—EU stations 40 cities.

Class 1 DX stations 30 cities—EU stations 60 cities.



Worked German Large Cities Award.

Each city may be listed only once. The award is available for contacts on all shortwave bands and all modes (mixed) or only for contacts on c.w. (C.W. Award). All contacts on or after January 1, 1962 count for this award. No QSLs, only GCR list and fee of 7 DM or 10 IRCs. Send application and fee to H.W. Schutte, DB3OR, P.O. Box 810660, D-3000 Hannover 81, West Germany.



Eberhard Warnecke, DJ8OT, Secretary of DIG, in his shack in Velbert, Germany.

Notes

If you would like to know more about the DIG Awards program, send 2 IRCs and a label with your address to Eberhard Warnecke, DJ8OT, Postfach 101244, D-5620 Velbert 1, Germany.

In this part of the world the trees have put on their lovely fall colors, harvest is almost completed, and we are preparing for another long winter. I hope things are going well where you are.

73, Dorothy, WB9RCY

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CIRCLE 73 ON READER SERVICE CARD

NEWS OF COMMUNICATIONS AROUND THE WORLD

*I also had my hour,
 One far fierce hour and sweet;
 There was a shout about my ears,
 And DX at every beat . . .*

One would think that with the CQ World-Wide DX Test just around the corner, every local would be dancing with anticipation. Last week one of the local types came dragging up the hill. "Sing the sad songs for me," he said, and we knew that trouble had come.

"It was a mistake I made some years back," he told us. "Then, a couple of years back when it was getting close to the time for the World-Wide DX Test, I got to thinking that I just had to have all the possible time to operate. Now I wonder how things that looked so good could turn out so bad. Maybe there are some who would not think that I made a mistake, but I sure did!"

This was getting nowhere—all the preliminaries and no action. "Tell us about it," we urged, and he finally got moving. "It was a couple of years back when we were living in the east," he told us, "and I spent a month planning for the CQ World-Wide DX Test. I wanted to work things so I could jump in right at the start of the contest and run the whole weekend without having anything to worry about. There in the east the DX test starts at seven in the evening, if you don't know that."

Don't know! Of course we knew, and for years we have listened to the complaints that the time was set to give the eastern types—the W2s, 3s, and 4s—an advantage. We ourselves may not have believed it, but there sure are a handful who do. We had this forlorn one on our hands, however, and we had to know what had gone wrong.

"It was just a couple of years ago," this one said again, "and I was sure that the key to a big score was to plan in advance. So I got all set, cleaned up the shack the previous weekend, and on Friday, the opening day of the contest, I grandly advised the XYL not to worry about dinner; we would eat out. So there I came, home from work early, flowers in hand, and we went out to dinner at a nice little Szechuan restaurant. With all the incidental things out of the way, I figured I had paid my dues and dove down to the shack, immediately finding 15 meters open. By the time the Europeans started coming in, I knew I had a start on a good score. But somehow I got the feeling that



A real DX photo. On the left is Josephine Clarke, WB6ZUC, who was on Peter I Island back in January 1983. Joe was willing, but the captain of the ship would not let her go with the shore landing crew. In the middle is the voice of HZ1AB, Bob Walsh, in the states on leave; his home call is WA8MOA. On the right is one of the venerables, Sam Canter, W6TSQ, down from the hills of Mill Valley. This photo was taken when Bob visited in Marin a few months ago.

the XYL was not exactly thrilled about all the contest operating. What the heck, though, hadn't I done everything possible to put her in a good mood?"

We gathered that he expected us to agree with him, and we nodded our heads vigorously. "Sounds as though you did not miss a trick," we assured him, but we were still puzzled as to what had gone wrong with his game plan.

"I was really proud of my planning," he said again, "and I was so pleased that a month or so later when a visiting DXer dropped by with his XYL I just had to tell him how advance planning helps runs up a big score in the Test. I kept telling him that if you did not want to miss the important opening night of the World-Wide, you had to do your planning in advance. Maybe I should have stopped to wonder why the two XYLs kept giving each other questioning looks. Maybe if I had, it wouldn't have taken me a whole year to find out what the score really was."

So far all we had heard was a report of success well deserved. The plan was made, the course was run, and the weekend for the CQ World-Wide was open and available. But what had gone wrong?

"So the following year when the time for the World-Wide got close," he continued, "I was ready to work the plan again. How could I lose? I would catch all the early stuff, work the Europeans as soon as they started to come in, work the

South Americans just about any time, and be ready for the JAs and the VK/ZLs when they started to roll in. With all the success the previous year, I was sure that I was in. I couldn't miss, not with my planning!"

We were getting the feeling that possibly he had missed, and we want to know more. "That Chinese dinner was a good move," he went on, "and I thought that with the next World-Wide coming up, I'd be wise to ride with a winning hand. I was sure that the XYL appreciated all the attention I had poured on her. During the year she had shown a lot of interest in amateur radio, wanting to know how things worked, how the rigs were hooked together, and things like that. She even started repairing some of the household appliances and was always asking a lot of questions. You know how people are. They think that amateurs know everything about electricity, and if you are a DXer they are absolutely sure of it."

We knew that what he said was true. DXers know everything. But we still did not know what the trap was that this one had fallen into. We nudged him to continue. There was a deep sigh and he was off again.

"Anyhow," he said, "I tried things pretty much the way I did it the previous year. I was home early from work, flowers in one hand, a box of candy under my arm. We drove up country just a bit to an intimate Basque restaurant, and we were home in plenty of time for the opening bars of the CQ Test. Everything had worked again, I was telling myself, and I was down in the shack with a few minutes to go and ready to run up another big score." He paused to hold his head in his hands. "What happened then you won't believe," he groaned. We had to remind him that we had to know before we could become disbelievers.

"It was terrible," he said. "I reached out to flip on the switches, everything was ready to go, and the gear just blew up. There was noise and smoke and flashes and the awful smell of burning insulation. It was terrible! I was jumping around and pulling plugs—at least pulling the ones that were not on fire. Smoke seemed to be coming out of everything, and then the power panel popped and the fuses blew. I was scared out of my wits, and all I could do was stand there and shake!"

We could appreciate that. Here the CQ World-Wide DX Test was starting and his station was ruined. "What happened?" we asked, and for a bit we thought he, a grown DXer, was going to cry. Finally, he tried hard and pulled himself together.

"Remember," he said, "how I told you about the XYL's interest in electricity and

77 Coleman Dr., San Rafael, CA 94901

The WPX Program

Mixed

1108	YU2QS	1113	YU3TFC
1109	H8KUN	1114	I6DQE
1110	YU7BPQ	1115	AD4X
1111	KB8FJ	1116	DF4NR
1112	OK3BA		

S.S.B.

1668	KB8FJ	1672	KM1I
1669	G3NDC	1673	I2BCU
1670	OE3HCS	1674	DF4NR
1671	G4IJA		

C.W.

2272	YC2BDJ	2276	OK2BYL
2273	W1WAI	2277	IK1CJT
2274	KB8FJ	2278	KQ8J
2275	W9PWM	2279	JA4ENN

VPX

239 DEK31/20064

Endorsements

Mixed: 450 YU2QS, JA4BAP, NU4N, YU7BPQ, KB8FJ, OK3BA, YU3TFC, I2EAY, I6DQE, DF4NR, 500 YU2QS, JA4BAP, NU4N, YU7BPQ, KB8FJ, K6UXO, YU3TFC, I2EAY, I6DQE, 550 YU2QS, YU7BPQ, KB8FJ, YU3TFC, 600 YU2QS, YU7BPQ, YU3TFC, 650 YU2QS, YU7BPQ, YU3TFC, WB2QEU, 700 YU2QS, YU7BPQ, YU3TFC, 750 YU2QS, YU7BPQ, DEK31/20064, 800 VE2PD, YU2QS, YU7BPQ, 850 YU2QS, K2POF, YU7BPQ, I5HOR, 900 YU7BPQ, 950 W9NO, YU7BPQ, 1000 YU7BPQ, 1050 YU7BPQ, K2OLG, 1100 YU7BPQ, WB2ZRL, 1150 YU7BPQ, 1200 YU7BPQ, W1BWS, 1250 YU7BPQ, H18LC, W1BWS, 1300 K0DEQ, YU7BPQ, W1BWS, 1350 UB5-0683, YU7BPQ, 1400 K5UR, YU7BPQ, 1450 K5UR, YU7BPQ, 1500 K5UR, YU7BPQ, 1550 K5UR, YU7BPQ, 1600 K5UR, YU7BPQ, 1650 K5UR, YU7BPQ, 1700 K5UR, YU7BPQ, 1750 K5UR, YU7BPQ.

S.S.B.: 350 KB8FJ, G3NDC, KM1I, DF4NR, 400 KB8FJ, G3NDC, KM1I, 450 W9NO, 500 K2POF, 550 WB9TDR, W7KWI, WB2QEU, 650 KK0L, 700 KK0L, 750 KK0L, 800 VE2PD, DF7QD, KK0L, 900 W3ARK, XE1XF, 950 W3ARK, WB8ZRL, 1000 W3ARK, 1200 K5UR, 1250 K5UR, 1300 K5UR, 1350 K5UR, 1400 K5UR, 1450 K5UR, 1500 K5UR, 1650 I8KDB, 1900 ZL3NS.

C.W.: 350 W1WAI, KQ8J, JA4ENN, 400 W1WAI, KT2G, I2EAY, KQ8J, JA4ENN, 450 W1WAI, 500 KN7K, W1WAI, K6UXO, 550 W1WAI, OK3CF, WB8ZRL, 600 W1WAI, 650 W1WAI, W6YMH, WA2CNF, 700 K2POF, 900 IT9VDQ, 1100 K5UR, 1150 K5UR, 1200 K5UR, 1250 K5UR, 1300 K5UR, 1350 K5UR, 1400 K5UR, 1550 W3ARK, 1600 W3ARK, 1650 W3ARK, 1700 W3ARK, 1800 N6JV.

10 meters: YU7BPQ, DF4NR.
15 meters: YC2BDJ, YU7BPQ.
20 meters: DF7QD, OK3CF, YU7BPQ.
40 meters: YU7BPQ.
80 meters: YU7BPQ.
160 meters: KA3A, YU7BPQ, JA1-23967.

Asia: W9NO, YU7BPQ.
Africa: YU7BPQ.
No. America: YU7BPQ.
So. America: YU7BPQ.
Europe: YC2BDJ, YU7BPQ, OK2BYL.
Oceania: JA4BAP, YU7BPQ.

Award of Excellence: N2AC.
160 meter Bar: K5UR.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if air-mail desired) to CQ WPX Awards, P.O. Box 1351, Torrance, CA 90505-0351 U.S.A.

things like that?" We did remember and thought it a very commendable thing for the XYL to do.

"Well," he said, "maybe she learned more than I suspected. While I was at work on that day with the CQ World-Wide Test starting in the evening, she got in and wired all the rigs into the 220 volt supply—everything but the amplifier, which was already on 220. Don't ask me how she did it; she just did. So when I got home with plans for a full evening of DX-ing, everything was booby-trapped. I

threw on the power and everything went south. Even the rotator was wired to go. Everything! And I was out of the contest before it even started. What do you think of that?"

We had to think over all of this. Certainly this local had been dealt a cruel blow. Missing the CQ World-Wide DX Test is to a DXer as the missing of Christmas is to a small child, and possibly even worse. "But what did the XYL have to say to all of this?" we asked. All he did was squeeze his eyes shut and shake his head.

"She smiled and said that now we could have the whole weekend for each other, and wasn't it fortunate that all of it happened on a weekend that meant so much to us." Frankly, we did not understand all of this, but thought it best not to ask questions. Perhaps he would get control of himself and carry on. We waited.

"It was all a mistake that I made in the past," he was finally able to say, and we immediately thought of the plan that he had pulled off the previous year. "No, no, that's not it at all!" he said. "This happened long ago when I was young—real young, maybe too young to know better. I made the mistake of getting married on the last weekend in October. But back then I wasn't a DXer and how was I to know? Why should all this happen now?"

Son of a gun! These were questions that we had no intention of even trying to answer. One can carefully plan for most

The WAZ Program

10 Meter Phone

279	JH0MXV	281	JH1QFA
280	DF9ZP		

15 Meter Phone

200 DF9ZP

20 Meter Phone

502	K8JRK	505	W9NUF
503	JA4FWM	506	KC8EU
504	DF9ZP		

20 Meter C.W.

217	JJ1UJK	219	W0NUF
218	W1GL		

All Band WAZ

S.S.B.

2860	KO3J	2866	DJ4OK
2861	I5RCR	2867	WA9YTO
2862	IT9YSW	2868	W9NUF
2863	KU9Z	2869	KO9Q
2864	WA6LOD	2870	CT4UW
2865	SM7DXQ	2871	W8HFK

C.W. and Phone

5779	OZ6ZZ	5783	JA8TMF
5780	JA4CPZ	5784	JA1VIO
5781	W9NUF	5785	YU3SS
5782	W9NUF		

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (37 cents) size 4 1/2 x 9 1/2 to the WAZ Manager, Leo Haijsman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants forwarding QSL cards either direct to the WAZ manager or to a check point should include sufficient postage for safe return of their QSL cards. The processing fee for all C.Q. awards is \$4.00 for subscribers and \$10 for non-subscribers. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application.

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FM-6033 (6-Meters) . . . \$289

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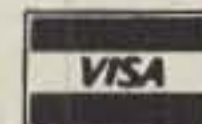
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CIRCLE 68 ON READER SERVICE CARD

everything, but plans should never be made for the last weekend in October or November for anything but DX. If one makes a mistake such as this local type did, then one can be paying the penalties forever. All this thinking did make us ready to try to help, however.

"Look at the good side," we counseled. "Maybe you will miss out on the phone weekend in October, but that should leave you free for the c.w. weekend in November. Certainly nothing will give you much trouble then, right?"

We thought that we were bringing a ray of sunshine to this troubled DXer, but he groaned aloud again. "You forget that phone is all I work," he said. "If I try to get into a c.w. test, I will be trampled under by all those c.w. types. I wouldn't have a chance at all!"

While this may have seemed the end of the road, we were not finished trying. "But you'll have almost a month to get ready," we brightly said, "a full month to learn to work that keyer you have on the shelf. If you work at it you probably will get your speed up to 35 w.p.m., and maybe a bit faster.

That did bring a smile. "You're right," he said. "I can set it for 35 w.p.m. so everything I send will be up around that speed. And I'm sure that if a station comes back, I will recognize my call at least some of the time. Good idea!"

Some may be saying, "... not this October, and please not this November."



Seated at his very neatly laid out station is Phil Weaver, VS6CT, also known as VS6 "China Town," ready to make contact with those needing Hong Kong and other Far East exotic call areas. (Photo via Jack, W2LZX)

But if you hear him in there sending at 35 w.p.m. but having trouble copying at 5 w.p.m., keep in mind what brought him to this place. He got married on the last weekend in October! No long-thinking DXer should ever do something like that.

Lord Howe Island

The Down Under DXers Contest Club plans to be on Lord Howe for the CQ WW Phone Test later this month. They will be signing VK9LHI. The club was instrumental in getting the VK9L prefix assigned to Lord Howe, and they will be out to make it available. They will have a group

of five making the trip, planning to be on Lord Howe for a number of days.

Les Cullen, VK2WU, passes along the information that Lord Howe is serviced by commercial air service, Oxley Air Lines and Norfolk Island Air making five or six flights daily to Lord Howe. The effort by the Down Unders will be the first use of the newly authorized VK9L prefix. The club was also considering opening up Norfolk Island for the contest, but several months back this was still not definite. The Down Unders hail themselves as the only VK Contest Club and plan to be heard when all the major and most of the minor contests show. They are sponsoring a trophy given each year for the CQ WW WPX Test for the top single-operator in Oceania.

The address for the Down Under DXers Contest Club is P.O.B. 31, Winmalee, NSW 2777, Australia, so you can be ready to QSL VK9LHI. Les Cullen, VK2WU, is the club president.

Gabon

J. L. Domange in downtown Libreville notes that occasionally he runs into trouble with his callsign on QSLs. His call is TR8JLD, but some cards show for TR8JL. Jean Louis says there is no such call. At first the suspicion was that some Central Africa Slim was active, but then the feeling was that it might be a mistake in copying, some taking the transmission as TR8JL De W1 . . . This bothered TR8JLD so much that he recorded his code at various speeds to see if the problem might be at the send end, but it was not.

There are so few calls issued in Gabon that most amateurs use their initials as the prefix: JLD, JCV, PJP, SJC, HWG, MYA, MAM, SDP, AHO, and CAR being the ones you might run into this fall. Jean Louis says that when a card

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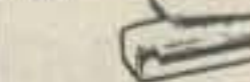
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11058	64	12.02	10.50	9.45

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12098	\$1.42	\$1.28

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Stock No.	Description	1 Bag	5 Bags	10 Bags
11310	Bag of 100 solder tail pins	\$ 4.95	\$ 4.45	\$ 3.95
11311	Bag of 100 wire wrap pins	11.95	10.75	9.50

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11292	80±40g	1.5±.5mm	3.85	3.80

TI WIRE WRAP SOCKETS. Tin plated phosphor bronze contact - 3 wrap.

Stock No.	No. Pins	1-99	499	500
11301	8	\$.40	\$.36	\$.30
11302	14	.59	.54	.45
11303	16	.64	.58	.48
11304	18	.73	.66	.55
11305	20	.99	.90	.75
11306	22	1.12	1.02	.85
11307	24	1.25	1.14	.95
11308	28	1.52	1.38	1.15
11309	40	2.05	1.86	1.55

TI LOW PROFILE SOCKETS. Tin plated copper alloy 688 contact pins with gas tight seal.

Stock No.	No. Pins	1-24	25-99	999
11201	8	\$.10	\$.09	\$.08
11202	14	.14	.13	.12
11203	16	.16	.15	.14
11204	18	.18	.17	.15
11205	20	.20	.18	.16
11206	22	.22	.20	.18
11207	24	.24	.22	.20
11208	28	.28	.26	.25
11209	40	.40	.37	.33

SUB CUB I and SUB CUB II are high quality, complete LSI Counter Modules with LCD readout. Modules plug in p.c. board (Stock No. 51071). Complete function evaluation kit (Stock No. 51070) contains: p.c. board, 4.5V battery and variable frequency oscillator to supply train of count pulses. Stock No. 51070 has LATCH, RESET and TEST functions (3 buttons). P.C. board unplugs for bread-board work.

Stock No.	Description	Price
51070	Complete Function Evaluation Kit (includes batteries but does not include display counter)	\$45.00
51071	Mounting P.C. Board only	7.50
51072	SUB-CUB I display counter module only	18.00
51073	SUB-CUB II display counter module only	24.00
51074	Panel Bezel Evaluation Kit for SUB-CUB II (does not include SUB-CUB II counter module)	12.00
51075	DATA SHEET	.25

6 Digit LSI Counter Modules with LCD Readouts and Associated Mounting Assemblies.



SINGLE ROW SOCKETS. Strip of 25 collet sockets/pins - mount odd-center components easily. Gold plated contacts.

Stock No.	1-24	25	50
10240	\$1.70	\$1.50	\$1.30

OPCOA. Single Digit Displays - Common Cathode.

Stock No.	Color	1	100
12082	Red	\$1.12	\$.99
12085	Green	1.84	1.63
12087	Yellow	1.92	1.70
12089	Orange	2.08	1.84

OPTEL LCD's with pins.

Stock No.	Description	1	10
47005	3 1/2 dig. 5'	\$ 5.95	\$ 5.50
47006	4 dig. 5'	5.95	5.50
47007	4 dig. 7'	11.90	11.00

The Battery Just Wrap™ Tool. New battery powered tool wraps insulated wire around .025" square posts without need for pre-cutting and pre-stripping. Complete with bit and 100 ft. 30 AWG wire.

Stock No.	Description	Price
13340	Battery just-wrap tool with bit and 100 ft. 30 AWG wire	\$59.95
13341	Replacement bit	10.35
13342	100 ft. blue replacement wire	7.54
13343	100 ft. white replacement wire	7.54
13344	100 ft. yellow replacement wire	7.54
13345	100 ft. red replacement wire	7.54

MICRO Charts - colorful 8 1/2" x 11" charts eliminate the need to stumble through manuals and summaries. Fully decoded - instant access - totally comprehensive - gives pin outs, cycle times, buy notes, etc., etc.

Stock No.	Reference	Price
23010	Z80 CPU	\$5.95
23011	8080A/8085A	5.95
23012	8502 (85XX)	5.95
23013	8048 and relatives	5.95
23014	54/7400 TTL Pinouts	5.95
23015	Basic Algorithms	5.95
23016	8086/8080A	5.95
23017	How to generalize from a sample	5.95
23018	Wordlist	5.95

PIN FORMING TOOL. puts IC's on their true row to row spacing. One side is for .300 centers, Flip tool over for devices .600 centers. Put device in tool and squeeze.

Stock No.	Price
11059	\$12.95
10200	\$14.95

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Stock No.	Price
13308	\$41.34

SOCKET WRAP ID. Dip socket-sized plastic panels with numbered holes in pin locations. Slip onto socket before wire wrapping to identify pins. Also write on them for location, IC part number, function, etc. Simplifies initial wire wrapping, troubleshooting and repair.

Stock No.	Price
13295	14 pin
13296	18 pin
13297	18 pin
13298	20 pin
13299	22 pin
13300	24 pin
13301	28 pin
13302	40 pin
13303	96 pin

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Stock No.	Price
22300	\$21.95

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Stock No.	Description	Price
03500	Basic Kit	\$79.95
03511	Basic board, 4.5 x 5.5	19.50
03506	Intel SBC-8010 Board, 12 x 6.75	84.95
03507	Motorola M-6800 Board, 9.75 x 6	42.95
03508	S-100 Board, 10 x 5.3	36.95
03509	Z-80 Board, 7.7 x 7.5	39.95
03510	Eurocard Board, 6.3 x 3.9	21.95

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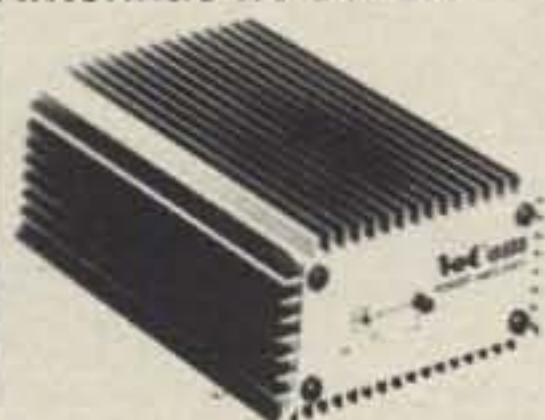
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5 Band WAZ

Standings as of July 1, 1984

All 200 zones worked:

1. ON4UN	27. SM3EVR	53. OK1ADM
2. K4MQG	28. LA5YJ	54. CT1FL
3. SM4CAN	29. DL3RK	55. WA1AER
4. AA6AA	30. N4WJ	56. N4RR
5. W8AH	31. G3MCS	57. UW0MF
6. W6KUT	32. SM5AQD	58. W4DR
7. EA8AK	33. W0MLY	59. OK1MP
8. LA7JO	34. I0RIZ	60. W1NW
9. EA3SF	35. ON5NT	61. OE1ZJ
10. OH1XX	36. OH6JW	62. HB9AHL
11. EA8OZ	37. OK1AWZ	63. HB9AMO
12. W0SD	38. IV3PRK	64. LA6OT
13. K0ZZ	39. DJ6RX	65. UR2QD
14. ON6OS	40. OH3YI	66. UK2RDX
15. OK3TCA	41. I4RYC	67. ZS5LB
16. K6SSS	42. ZL1BIL	68. F6DZU
17. ZL3GQ	43. I4EAT	69. DL4YAH
18. OK3CGP	44. ZL1BQD	70. LA7ZO
19. SM0AJU	45. TG9NX	71. W9ZR
20. OZ3PZ	46. XE1J	72. W1NG
21. I3MAU	47. F5VU	73. VK9NS
22. I2ZGC	48. W3AP	74. N4KG
23. 4Z4DX	49. YO3AC	75. YU7DX
24. N4KE	50. K3TW	76. DL8MAG
25. K5UR	51. XE1OX	77. OK3DG
26. K9AJ	52. VE7IG	78. ZL1BOO

The top 10 contenders for 5 Band WAZ:

1. DK5AD, 199	6. LA9GV, 198
2. JA3EMU, 199	7. W6GO, 198
3. N4WW, 199	8. K4CEB, 198
4. K9YRA, 199	9. OK1MG, 198
5. W8VUZ, 198	10. W2YY, 198

268 Stations have attained the 150 zone level

comes through with an incomplete call sign (TR8JL) he returns it, not knowing whether it was a problem of improper copying of the call sign or an error in preparing the card.

TR8JLD has been in Gabon for 16 years, although he only came on the air in March 1983. From 10 to 35 QSLs show on most days. With the post office closed on Sundays, Jean Louis gets nothing coming in. He also gets Wednesdays off, as no flights come into Libreville on that day.

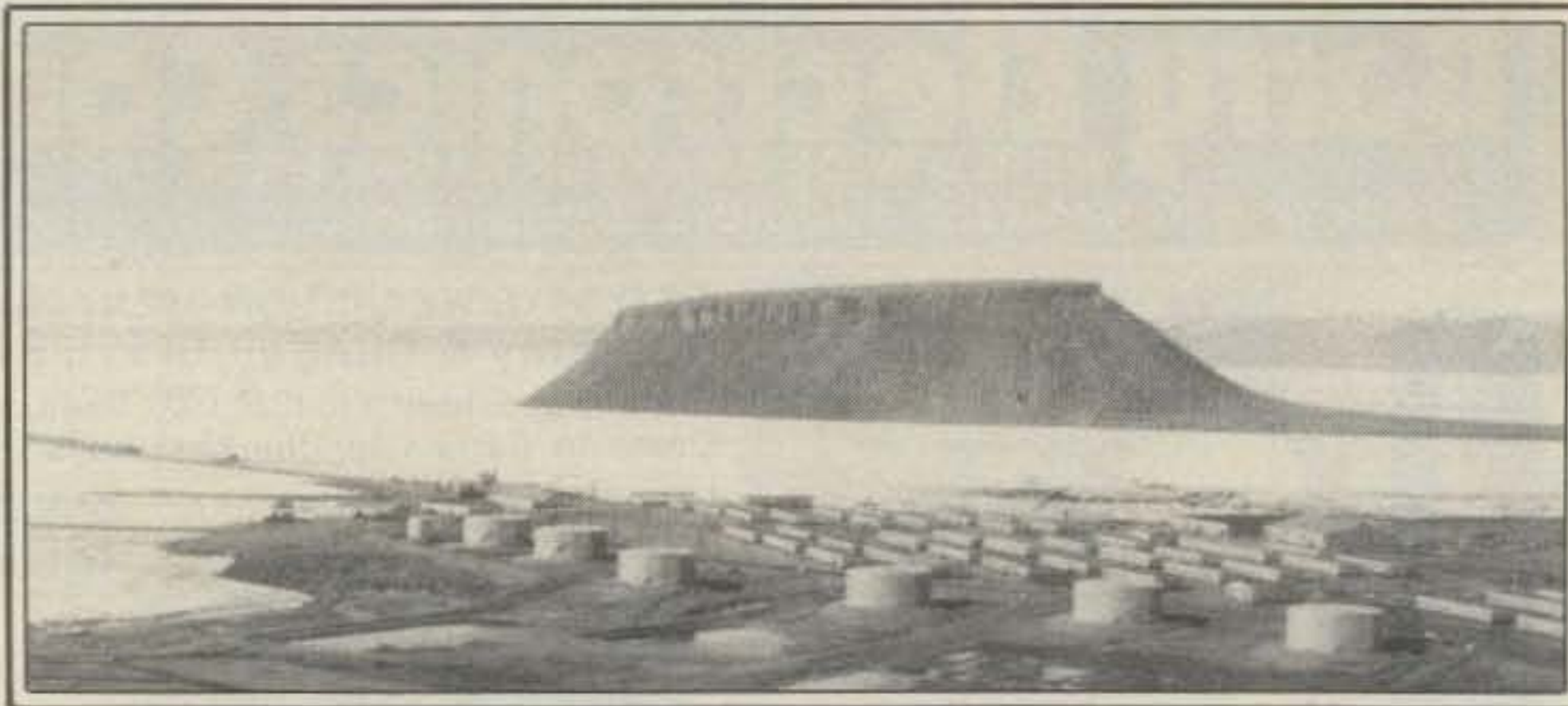
In September of last year there was a note that K6VNX is not the QSL manager for TR8JL. That call has never been issued.

Contest Operating Tips

A couple of months ago the Western Pennsylvania DX Assn. caught the attention of its members with some tips on how to run up some big scores in a DX contest. K3UA gave the true word, which should be good for the CQ WW DX Test later this month. Maybe the sunspots are down a bit, but on the other hand, your ever-developing DX expertise may be up a bit—maybe even a lot. Anyhow, try some of the following potions.

80 meters

Caribbean: Sunset to Sunrise; best 0200Z to 0400Z
 USSR: 0300-0400Z
 Western Europe: 0500-0730Z
 South America: 0300-1000Z
 Africa: 0000-0400Z
 Pacific: KH6 after 0600Z; VK/ZL 1000-1100Z
 Japan: 1100-1300Z



Thule was the Latin word for the northernmost point of the ancient habitable world. Things have not changed much since then. This is a photo of part of the area of the Thule Air Base, site of the operation by Ron F. Jacobs when he signed OX5RJ. Ron's home call is WA1FSV and QTH is Box 288, Newport, NH 03773.

40 meters

Europe: usually from 2100Z; best 2300-0300Z and after 0600Z

Africa/Indian Ocean, LP to VK/ZL: 2100-2300Z

Caribbean/South America: when band fades to Europe look south!

Asia (Japan/Siberia): 0900-1300Z

VK/ZL short-path: 0500-1100Z

20 meters (probably the best band for all-around World-Wide Contest DXing)

Europe: 1000-1900Z; best 1200-1700Z

VK: 0500-0880Z, 1100-1300Z, LP 2100-2300Z

ZL: 0400-0700Z, 1000-1200Z, LP 2000-2200Z

4X/HZ: 0000-0300Z, LP 1200Z, 2100-2300Z

JA: 0000-0200Z, 0900-1400Z, LP 2100-2200Z

VU/UM8/UH8: 0100-0200Z, LP 1200-1300Z,

2200Z

Antarctica: 0000-0400Z

So. Africa: 0300-0600Z, LP 1400-1500Z,

1900Z

SE Asia: 1200-1300Z

TR/5Z4/XT: 2000-2300Z

VQ9/Indian Ocean: 1100Z, LP 2100Z

15 meters

Europe: 1230-1700Z

Africa: 1700-2200Z

Asia/Middle East: 1400-1600Z SP

JA: 2100-0100Z

Caribbean/South America: 1200-0200Z

Oceania: 1900-0200Z

10 meters

Europe: 1400-1600Z

Caribbean/So. America: 1300-2100Z

Asia: maybe from West Coast

Africa: 1300-1800Z

Oceania: 1800-2100Z

As a rule of thumb, some DXers look for DX to be heard when both ends are in a twilight period, dawn or sunset. Years back we knew one of the locals who used a Pan-Am promotional item to look for DX. He always assumed he knew when it was dawn or dusk where he was. He'd then spin the dials on the Pan-Am give-away and find where it was either dawn or dusk elsewhere.

KI Products at Box 62, Unionville, Connecticut 06085 has a CQ World-Wide Contest aid centered on the middle of the U.S. which gives a picture of darkness or daylight around the world to help in figuring what propagation might be open. It costs \$3.75 postpaid. You may also be interested in the personal computer programs giving this information.

Anyhow, the Western Pennsylvania DX Association points in the direction of the DX, K3UA gives the time, and now all you have to remember is that DX stations by actual analysis are more apt to work the calling stations that they hear rather than the calling stations that they do not hear!

4U1VIC

The DXAC recommended against country status for this United Nations outpost. The proposal was considered from three different angles: on the basis of government, as a special UN entity, and even as a possible exception to the DXCC criteria. None of these got enough votes to push the proposal into reality. The DXAC recommendations went on to the full ARRL Board, where since this writing things might have been changed. However, they probably have not.

As long as we are working this side of the street, it might be noted that there has also been a proposal for 4U1UP. This was being talked up by Costa Rican amateurs, the claim being that the UN has the United Nations University of Peace in the process of being set up, and this naturally should qualify as a new country. However, the feeling is that the prospects are dim. It all started with 4U1ITU, and coasted along in single bliss for years, although some did wonder how a relatively small building in Geneva constituted a country. Then the UN Headquarters in New York stood up and was counted. Possibly it was hoped that things would stop there. They haven't.

There are a number of UN agencies, missions, outposts, and projects scattered around the world, a number of which have extra-territorial rights. You might remember the UNESCO Headquarters in Paris. The potential for new DXCC countries could be impressive.

These are still possible, but it might be best not to count on them. Possibly we will again hear the saddest words in the DXer's ken, "It might have been," but not this year, it seems.

Baker/Howland Islands

The DXAC in their deliberations came up with a recommendation that while a bit complicated would nevertheless eliminate the DXCC country of Baker, Howland, and American Phoenix Islands and for DXCC purposes would create a new country of Baker and Howland Islands. Possibly these were adopted at the last board meeting.

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Some of the members of the VIDA Group in Caracas are shown at the station they maintain for emergency medical services. From left to right are Alex Staszewitch, YV5IMF, Oscar Hendler, YV5IKI, Lorenzo Benatti, YV5IFJ, and Pancho Paz, YV5JBG. VIDA was founded two years ago by amateurs in the medical field to help in instances where there is an emergency or an unfulfilled need for services in treatment, transportation, or medication. They work closely with the Central University of Venezuela and the public safety agencies. VIDA maintains a 2 meter repeater at 147.060 MHz. (YV5IMF photo)

Back in 1939 the U.S. and England settled a long simmering dispute over some of the Pacific islands by agreeing to a joint administration. This brought the good times of two DXCC counters for one island; you could work British Phoenix-VR1 and Canton-KB6, both the same station, same island, two licenses, and get two counters. When Kiribati came on line in 1979, British Phoenix became Central Kiribati, and at the same time the U.S. renounced its claims to the Phoenix Islands. This treaty was ratified by Congress in 1983, and the DXCC country of Baker, Howland, and American Phoenix now consists of only Baker and Howland Islands. These were never in dispute and were not affected by the treaty signed by the U.S. However, Canton, from which most of the KB6/KH1 contacts were made, is now part of Kiribati and no longer within the boundary of the area for which Baker, Howland, and American Phoenix country credit is given.

Although it may seem that this is an even standoff, when Baker, Howland, and American Phoenix go, you lose one country through deletion. Then when Baker and Howland are created, you gain one when you work them. Don't just think of what you are going to lose; think of the new country that you are going to gain, which will leave you about where you were before all of this.

Some Quick DX Notes

W0PU should be on Crete for another year and is currently signing the XYL's call, KA0CYR/SV9. This is said to be only allowed for a year, and then a switch will be made to W0PU/SV9. Hal likes to stick with c.w. and says the best time to the states is after 0000Z and until about 0400Z. He plans to be on 160 meters late this fall and has been heard on 80. QSLs go via WB4TDB.

Willis Island has been reported with two operators—or is it the same operator, but a little old “—” being missed. Reported there and going to be there until the end of the year is Andy, VK9ZW. Also reported is Andy, VK9ZA. QSLs

go to VK6YL. Some have reported hearing Willis Island at 3795 kHz after 0900Z. Kari, the YL on Pitcairn, schedules NE5C a couple of times a week (Mondays and Thursdays). The usual frequency is 21305 kHz from 2200Z. The SP-DX Club was celebrating its 25th anniversary this summer. Although the SP stations are not being heard in the numbers they once were, things should improve, and SP9ZD and other well-known DX types will be back on the air.

By the time you read this you should be able to get your DXCC Honor Roll plaque. Early reports were that it would cost about \$40.00 to get it on your wall. We recently heard WA6AHF on the air expressing amazement over the budgets for hamfests, DX conventions, and things like that. Checking the club bulletins it is noted that the Northern California DX Club reported gross expenses for the 1983 Visalia gathering at \$24,850. The host club for the 1984 Visalia DX Meeting, the Southern California DX Club, reported a profit of \$3,727 from that meeting.

Henry Thel, VE7WJ, notes that it costs 37¢ to mail a card across the border to the U.S. Henry has been handling the cards for a number of his special-occasion calls, these including CJ7, CY7, CG7, CF7, VC7, CK7, XO7, and VY7, and the postage costs could be numbing. If there is no s.a.s.e., the cards go back via the bureaus.

It might be noted that the 1985 Northwest DX Convention will be held in the Vancouver, British Columbia area. The site will be the Richmond Inn, which is close to the Vancouver International Airport. The Fraser Valley DX Club will be the host club, and the event will be the last weekend in July (July 27–28). There are a lot of reasons to start planning for this Northwest DX Convention; it is a good gathering of DXers, and the locale will please any nonamateur spouse. Think 1985 and the Northwest DX Convention . . . and British Columbia. You can hardly miss.

This summer the U.S. signed a third-party agreement with Belize. The FCC turned down an ARRL petition to keep cable TV operations off the amateur frequencies. While turning down the petition, the FCC did wag a finger at

CQ DX Awards Program

S.S.B.

1344	G4IJA	1347	VE3CYX
1345	YU1BEF	1348	KC8EU
1346	G4RAB	1349	K8JRK

C.W.

616 15NOK

S.S.B. Endorsements

310	W0SFU/312	275	KR9O/297
310	LU3YL/311	275	NN4Q/294
310	4Z4DX/311	275	VE3CYX/285
300	K9BWQ/308	275	KC8EU/284
300	I0MBX/307	250	K0HOW/261
300	K1UO/307	250	K8JRK/261
300	VE3MRS/304	200	WB2QEU/229
300	W1LQQ/301	200	VE2PD/200
300	W9RY/301	150	I2EOW/151
275	K8VJV/298	150	VE2DRN/150

C.W. Endorsements

310	K9MM/314	250	IT9QDS/262
300	K1MEM/306	200	K4JLD/239
275	W6SN/299	150	15NOK/152
275	W9RY/293	28 MHz	W9RY
275	W6YQ/277	3.5/7 MHz	W9RY
275	NN4Q/276		

Total number of active countries is 315. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an s.a.s.e. is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

the cable firms, reminding them of the responsibility not to leak excessively and to eliminate harmful interference should leakage be within FCC limits.

If you wonder what Lloyd and Iris Colvin were doing during the summer, they were looking for someone to work on the antenna installation on the new 100 foot tower. Occasionally pilgrims heading down I-80 just north of Golden Gate Fields race track have confused the Colvin's QTH with nearby commercial broadcast station KNEW. "No longer," Lloyd promises. "Just think of us as the big ones." A lot of DXers already do.

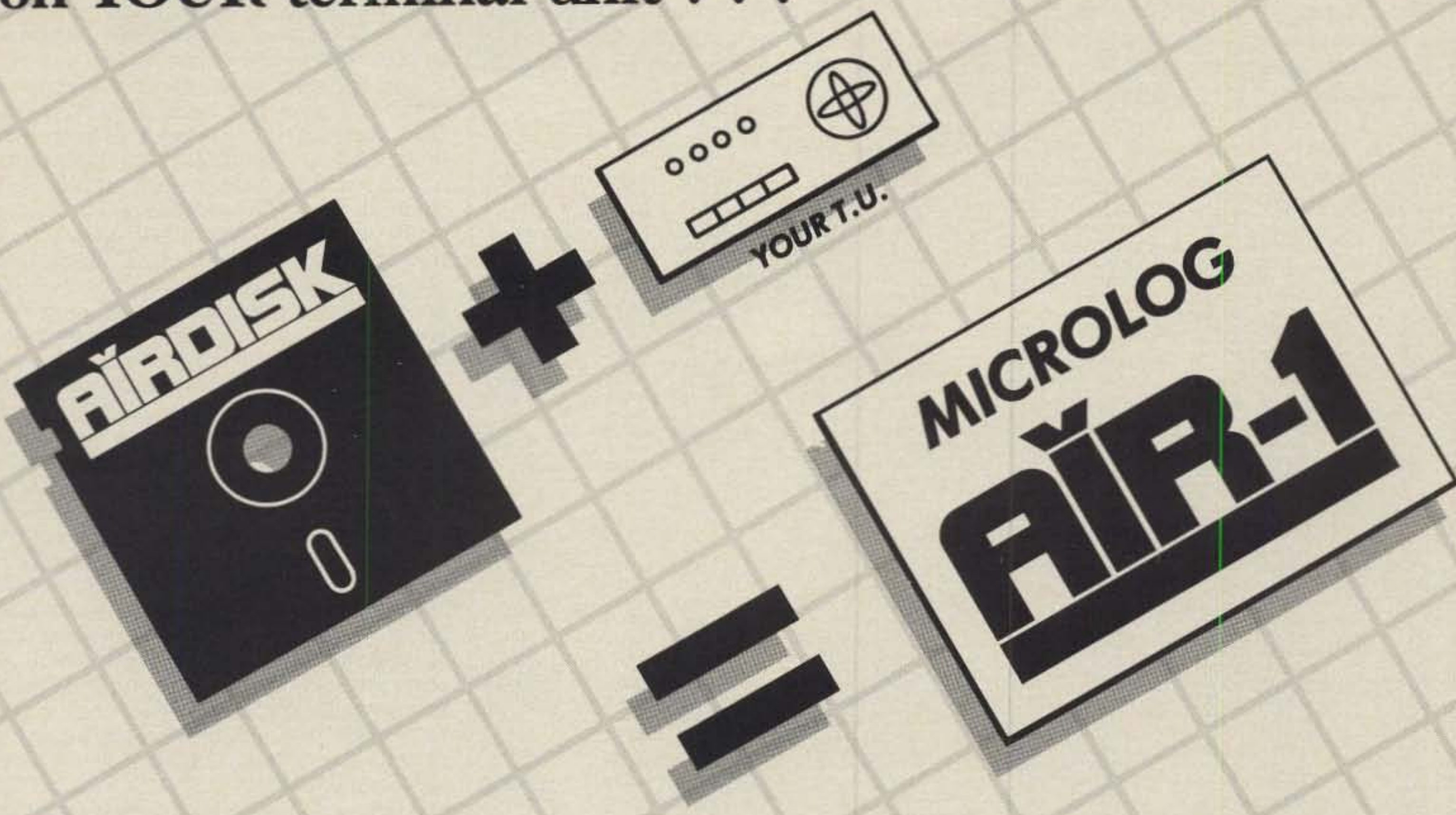
The feeling continues that a good way to improve your handling of a foreign language is to practice it, and the Grupo Argentino de CW puts out a bulletin in Spanish which will be both a help in the language and give information on some of the club's DX activity. Carlos Rodriguez, LU2DFX, is the treasurer. They say \$5.00 a year is the subscription rate, but it may go up just a bit due to the continuing inflation in LU-land.

Mike Watanabe, JH1KRC, reports that efforts were being made to keep XU1SS on the air, although last summer they had to move temporarily from the village of Ampil on the Thailand border. Battles were fought in the vicinity starting back in April; XU1SS was off the air but was back on the air in May. Many of the Ampil villagers fled to the border during the fighting, and although XU1SS operators returned to the village, many of the inhabitants did not follow immediately.

This spring XU1SS was active in the CQ WPX Test. You might listen for them in the coming CQ WW DX Test, as some of the operators have shown interest in contest operations—that is, if everything in downtown Ampil remains placid.

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- WRU, Unshift On Space, Word wrap-around, "Quick Brown Fox" & "RYRY" test messages in ROM, Break Buffer, Random Code Generator, Real-time clock and much more.

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CIRCLE 55 ON READER SERVICE CARD

The WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with CQ master prefix list. Scores are based on the current prefix total regardless of an operator's all-time count. Honor Roll must be up-dated annually by addition to, or to confirm present total. If no up-date, file will be placed into "inactive" until next up-date. Lifetime Honor Roll fee \$2.00, with no fees required for up-dates.

MIXED

3216	YU7DX	1740	K5UR	1291	K8LJG	1003	N3ED	837	VE2FOU
2653	YU1HA	1730	YU7BPQ	1240	N6AW	999	W6OUL	828	K2POF
2631	F9RM	1667	N2AC	1231	N6JM	999	KS7T	827	PY1DFF
2488	YU2DX	1660	YU7AW	1226	W7CB	999	G3ZRH	824	VE2PD
2328	W2NC	1636	YU2RTW	1212	PY4OD	994	YU2CBK	783	K7CU
2321	K6JG	1631	W8CNL	1207	NN4Q	992	W8JLC	770	WD4RAF
2267	K2VV	1594	IBYRK	1200	KL7AF	990	YU2CQ	742	JH8NYK
2237	VE3GCO	1554	YU1DZ	1187	JH1VRQ	982	N4IB	730	N2AIF
2230	K6XP	1503	K9BG	1174	W8RSW	956	WD9IIC	707	OE1KJW
2024	N4MM	1496	I6SF	1164	CT1LN	955	N3RL	701	K8HF
2000	W4BQY	1467	K6ZDL	1140	I2MQP	951	KO8T	696	KJ7N
1964	W9DWQ	1461	W0SFU	1131	W1NG	922	W6YMH	683	WB1G00
1951	YU7BCD	1426	I2PHN	1116	WB8ZRL	915	N8BJQ	675	I0AOF
1875	N4UU	1415	WA1JMP	1096	YU7KV	905	W0JIE	672	NE6I
1838	N4NO	1401	K6DT	1045	KA3A	876	DK2BL	662	K9LJN
1815	PA0SNG	1401	IN3ANE	1034	YU7AJD	865	EA1JO	657	ND6U
1814	N6JV	1388	KF2O	1018	G4FAM	855	A18S	622	KN1I
1755	N9AF	1356	N6FX	1017	K2QF	843	A16Z	619	JA6GWU
1748	N6CW	1335	SM3EVR	1006	WA8YTM				

S.S.B.

2547	F9RM	1567	CT1UA	1106	WA4OIB	956	NN4Q	792	Z21GJ
2227	I0ZV	1498	WD8MGQ	1096	W2NC	944	KL7AF	787	W2XQ
2028	I0AMU	1495	I6ZJC	1089	KF2O	939	XE1OX	765	W6LQC
1997	K6JG	1479	K5UR	1076	ZP5RS	926	KC8CC	759	CT1BY
1985	K6XP	1450	W9DWQ	1076	W2CC	908	WB6GFJ	748	N3ED
1945	K2VV	1396	YU7AW	1064	G4CHP	900	K8LJG	747	N3RL
1894	K2POA	1383	N4UU	1030	KC4OV	894	AC2J	738	W0ULU
1846	ZL3NS	1365	N4NO	1025	N6FX	889	W2LZX	707	WB6SRK
1821	N4MM	1355	W4BQY	1024	CT1FL	869	XE1XF	699	EA7AZJ
1695	I4ZSO	1341	N2SS	1008	I1HAG	864	WA2FKF	693	ON6IT
1678	HB9AAA	1341	WA4QMO	1006	CT4NH	860	KC8YM	690	WO4L
1621	OZ5EV	1217	I2PHN	1005	W6YMV	859	W1NG	667	JH5FOO
1606	I8KDB	1208	WB2NYM	996	TG9GI	846	W3GXX	636	KB0C
1604	W0YDB	1208	VE1YX	996	YU7DX	817	I1POR	615	WN5MBS
1588	PA0SNG	1203	I6NOA	992	I8KCI	811	VE2PD	612	YB0ACL
1588	I8YRK	1191	WF4V	983	N2AC	810	I0SGF	610	PY4VX
1584	I0MBX	1138	I2MQP	980	W3ARK	798	N4IB	610	VO1AW
1578	YU7BCD	1136	PY3BXW	958	WB8ZRL	795	PY4OD	606	KA3A

C.W.

2833	YU7DX	1561	W9DWQ	1278	4X4FU	990	PY4OD	744	KA3A
2095	W2NC	1544	N4UU	1274	W9FD	921	K8LJG	741	EA1JO
2010	W8RSW	1537	W3ARK	1262	LZ1XL	918	KF2O	736	AG5C
1814	DL1QT	1521	W4BQY	1256	I6SF	877	KA7T	732	JA5SIX
1806	K2VV	1515	G2GM	1227	YU3NP	871	IT9VDO	700	VE2FOU
1790	W8KPL	1493	N2AC	1180	K6ZDL	848	W11HN	694	A16Z
1776	N6JV	1469	VK4SS	1099	N6FX	847	KL7AF	687	G4FAM
1759	WA2HZR	1390	N4MM	1092	W4WJ	828	W1NG	664	YU2CQ
1714	K6JG	1389	VE7CNE	1087	N4YB	827	NN4Q	652	OE1KJW
1655	K6XP	1363	K5UR	1067	I2DMK	798	AK9Z	633	W2XQL
1638	ON4QX	1345	VO1AW	1032	I1YRL	781	N3ED	603	N2AIF
1605	N4NO	1334	YU7SF	1032	JE1JKL	776	DJ1YH	600	N3RL
1573	YU7BCD	1292	YU7AW	1005	JA1KRU				

DX Ten Years Back

JA1OCA made almost 5,000 QSOs from Nauru signing C21DX; all the action included three typhoons. The DXAC, among other things, was considering a c.w.-only DXCC certificate, the temporary deletion of a country where no amateur activity had been for ten years or longer, and opening credits for DX contacts made from anywhere within a country. Fred Laun, then LU5HFI, led the top scorers in the ARRL DX Test. The VQ9BP effort had just returned from Des Roches and said they had a good outing. UK1PAA was on Franz Josef. The South Jersey Radio Assn. was aiming for a November effort from Navassa. VS5MC was checking to see if Barque Canada Reef in the Spratlys was sacred soil for DXCC purposes. Maurice had been out scouting and patrolling and previously found that some tourists were on a number of the bigger Spratly islands apparently for the duck season, as a lot of guns were evident. VK6SW was home from Cocos Keeling, but was going to return shortly. ZL1BKL and ZL1ALE, both YLs, were headed to Chatham for the CQ WW Test. GA2SE was signing GA2SE from Gabon; said he wasn't an amateur, and that the call had been issued to the company he worked for. Made no bones about things: GA2 would be a United Kingdom prefix. Tibet was deleted, and one who thus backed onto the Honor Roll noted that all he really needed was BY, XZ, Bouvet, South Sandwich, Spratly, Iraq, Malpelo, and the Neutral States. Look what ten years since then has done for DXers. Don Bostrom, now N6IC, was looking at Wallis for the WW DX Test. VU7GV was planning to be on from the Andamans for the same test. Jim Henderson, ZM7AH, finally figured a way to get to the Tokelaus and was on the air; he was there so long that he got native-son status. On from Mauretania was 5T5AC, and the Northern California DX Foundation put 8,000 QSLs into the mail for the first-ever Kingman Reef effort. And that's the way it was in '74!

QSL Information

All the following appears with a lot of help from WB3FEX and W9LNQ, two watchers of the lonely night.

BVBJA to JA8IXM	YN1FI to VE3JDO
CT1AV to WA3HUP	YN1QG to VE3JDO
DA1WA/H88 to DJ0LJ	ZF2IB to 4Z4DX
FM7WD to W3HMK	3D8CW to G4BAC
FM7CO to F5VU	3D2FR to NE4S
F08JP to F1BBD	4N9V to YU4CA
F08FB to WB6GFJ	4U9ITU to W1RR
F08HL to WB6GFJ	4V2C to NQ4I
F08HO to WB6GFJ	5T5RD to F6IIA
F08DF to WB6GFJ	6W8AR to WB4LFM
F08HI to WB6GFJ	6W8DS to WA4OVE
F08CX to WB6GFJ	6Y5IC to KE3A
GK8JFK to G3VIE	8J1ITU to JA1RL
HH2WL to KM7Z	9H1EL to LA2TO
HL9AH to N7DOF	9M2HB to N4FFN
HL9TA to K0LST	9U5JB to ON5NT
HL9JT to N2AEW	C21DB to POB 225, Republic of Nauru
HK0HEU to HK0FBF	G4DUW/DU1 to Box 518 MCC, Makati, Manila, Philippines
IK0CAK/OX to IK0CAK	IS8WJS to Box 30, Tempio, Sardinia, Italy
I2DMK/ID8 to I2MQP	J28EB to G. Lafon, 2417 Djibouti City, Djibouti, Somalia
K2NYN/ID8 to I2MQP	K5KG/DH8 to K5TU, 8302 Clover Gardens Drive, Houston, TX 77095
JT80JT to I8YGZ	0A4DW to Dave Wilson, N4DW, 11434 Rex Baxter, El Paso, TX 79936
J88AQ to Q2MIG	VK9LHI P.O. Box 31, Winmalee, NSW 2777, Australia
K8BCYR/SV9 to WB4TDB	ZP5XDW to Dave Wilson, N4DW, 11434 Rex Baxter, El Paso, TX 79936
KX6OI to N3DLO	YB8AFA to WA7OGU
OZ1FFG/OY to OZ1FFG	
OZ5DL/OY to OZ5DL	
OZ5UR/OY to OZ5UR	
OZ8AE/OY to OZ8AE	
OX3GH to WA2TTI	
W5NOT/PJT to W5NOT	
PP2DD to W4BAA	
VE7LB/KH8 to VE7LB	
VG1ASJ to VE1ASJ	
YB3DC to KO2A	

a group of amateurs who speak Esperanto. There was a 69th Universal Congress of Esperanto held in Vancouver, British Columbia in July. In the amateur branch of the group, E. Lindberg, W2CIL, is the North American representative, while K. A. Sly, G4MR, is the International President. Drop either one a line if you would like to know more about Esperanto.

We had better quit before we get into the classifieds. However, it should again be noted that we write three months in advance of the publication date. Although a month may seem far in advance when you have a big DXpedition going, it is a couple of months late for us. Write early and often—especially early. If you are a DX station in an exotic spot, just write. There's nothing as interesting as a DXer, and DXers never tire of hearing about other DXers and DXing.

To mark the visit of the Pope to Canada in September the following prefixes were issued: Newfoundland XK1, Labrador XK2, Maritime XJ1, Quebec XJ2, Ontario XJ3, Manitoba XJ4, Saskatchewan XJ5, Alberta XJ6, British Columbia XJ7, N.W.T. XJ8, and Yukon CJ1. These prefixes were authorized from September 9-20, so if you heard one of these, this was the reason behind the call.

Club Notes

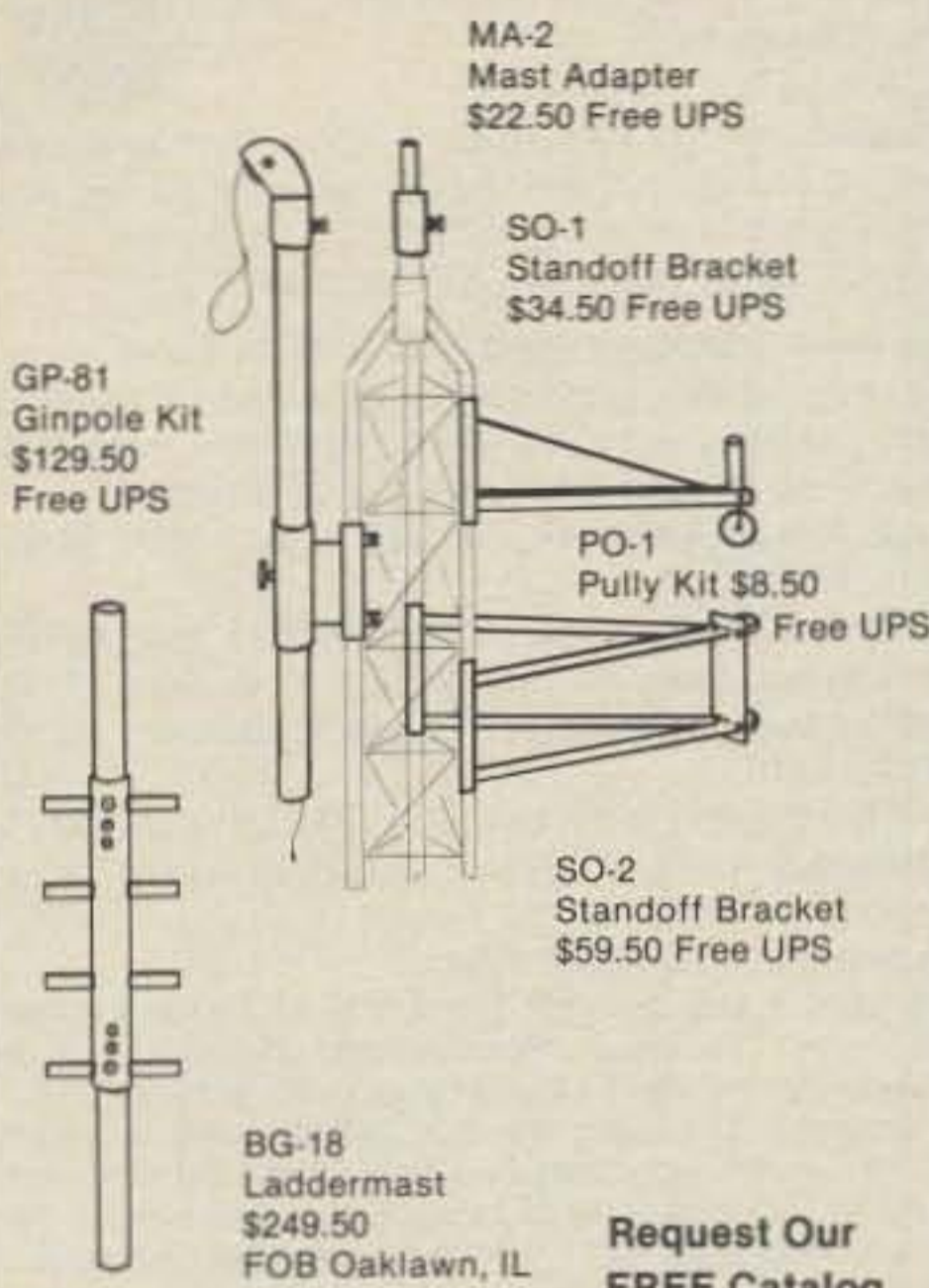
Some say that old DXers never come back, but Len Gerald, K6ANP, returned as Northern California DX Club president after first holding the position back in the 1960s. Joining with K6ANP for the coming year are Lou Beudet, K6TMB, vice-pres.; Dick Letrich, WB6WKM, secretary; and Lyle Meek, N6BLN, treasurer.

Just across the British Columbian border the Fraser Valley DX Club has a new slate of officers, two from British Columbia and two from Bellingham, Washington. Bob Johnson, WA7ZWG, is the new president, and Dick Moen, N7RO, is the new vice-pres. Bruce Light, VE7BSM, is the secretary, and Gordon Hamilton, VE7ON, the treasurer. Alex Mootoo, 3B8DA, did not make it to the last club meeting from Mauritius.

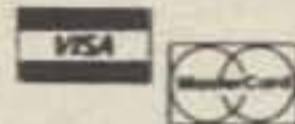
In southern Wisconsin the Madison DX Club got some fresh faces via an election. For the coming year Gary Turner, KC9LM, is the club president; Joel Kupferberg, N9CPW, the vice-pres., and Richard Burton, N9BAF, the secretary-treasurer. The club welcomes any DX types, and more information can be obtained from N9BAF at 4817 Sheboygan Ave. #509, Madison, WI 53705.

73, Cass, WA6AUD

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4X150A/7034	45.00
5AR4	6.24
5C22	165.00
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6AK5	4.91
6AL5	3.86
6AQ5	3.77
6CA7	7.41
6DJ8	2.75
6JG6A	7.53
6JS6C	8.00
6KD6	8.85
6KV6A	6.92
6L6GC	6.93
6LF6	8.85
6LQ6	8.85
6MJ6	8.99
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12AX7A	3.48
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705A	10.00
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813	40.00
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833A	145.00
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5670	4.40
5684	33.00
5687	4.00
5751	4.00
5814A	3.70
5879	5.75
5894	65.00
6005	5.25
6146B	8.75
6360	6.50
6528A	75.00
6550A	7.50
6883B	10.00
7360	12.25
7558	7.00
7591A	6.20
7868	6.68
8072	95.00
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8874	210.00
8875	220.00
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MRF-455/A	19.95
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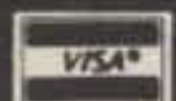
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TECH330	3 1/2-Digit Handheld Multimeter	197.10
HD-110	3 1/2-Digit Handheld Multimeter	170.10
DM25	3 1/2-Digit Pocket-Size Multimeter	71.96
DM73	3 1/2-Digit Probe-Size Multimeter	57.56
VC-201	Black Vinyl Carrying Case	10.00
DC-202	Deluxe Carrying Case	29.00
DC-205	Deluxe Carrying Case	29.00
HV-211	High Voltage Probe	55.00
RF-221	RF Probe	45.00
CT-231	AC Current Transformer	69.00
DL-241	Deluxe Test Lead Kit	12.00
TL-242	Spare Test Leads	6.00
DL-243	Deluxe Test Lead Kit	12.00

ASTRON

RS-7A	13.8 VDC, 7 Amp Int., 5 Amp Cont.	\$46.30
RS-12A	13.8 VDC, 12 Amp Int., 9 Amp Cont.	64.60
RS-20A	13.8 VDC, 20 Amp Int., 16 Amp Cont.	82.90
RS-35A	13.8 VDC, 35 Amp Int., 25 Amp Cont.	125.60
RS-12M	Same As RS-12A, With Meter	80.46
RS-20M	Same As RS-20A, With Meter	98.76
RS-35M	Same As RS-35A, With Meter	141.46

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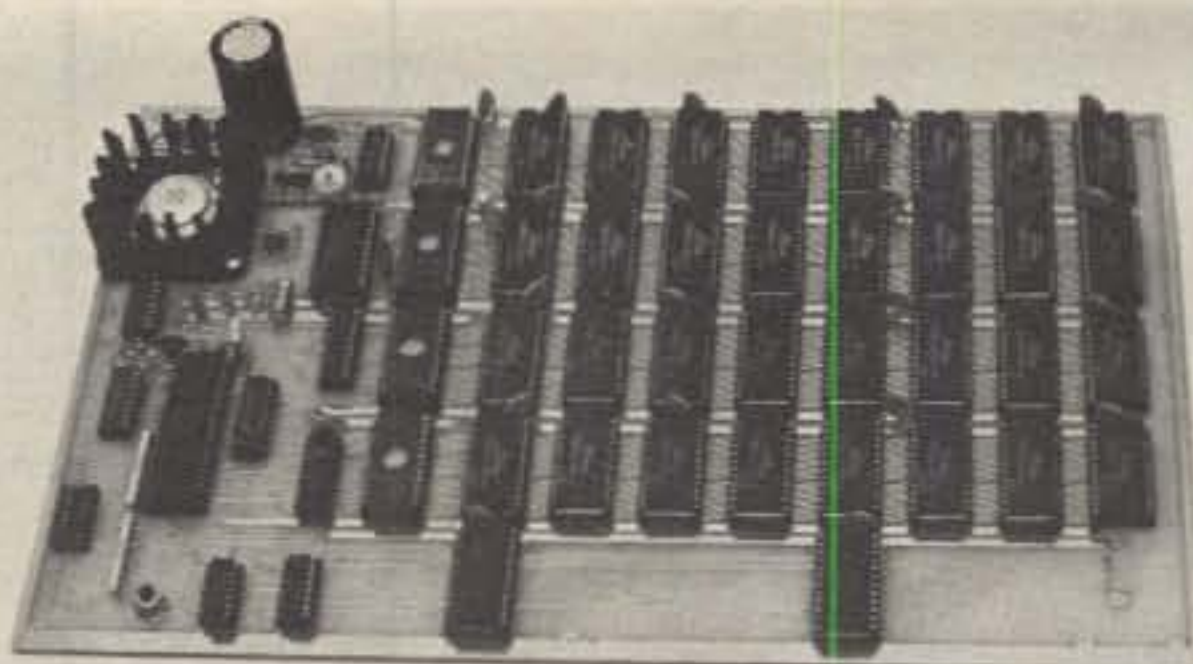
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THE SCIENCE OF PREDICTING RADIO CONDITIONS

DX Contest Special

The 1984 CQ World-Wide DX Contest will be held on the following dates:

Phone Section: 0000 GMT Sat. Oct. 27 to
2400 GMT Sun. Oct. 28
C.W Section: 0000 GMT Sat. Nov. 24 to
2400 GMT Sun. Nov. 25

Continuing with the practice of the past 34 years, this month's Propagation column contains a special forecast for use during the contest sections, both phone and c.w.

The stalled solar cycle should prove to be a bonus to participants in this year's DX contest. Solar activity is now running about 25% higher than originally expected. This means that solar activity during the contest period should be in the mid 40's rather than the mid 30's, which corresponds to a 10.7 cm solar flux level of approximately 100. Statistically this difference may not seem to be very much, but it should be enough, for example, to keep the 10 meter band open for world-wide DX, and produce good DX propagation conditions on most of the other h.f. amateur bands.

Solar Cycle

As mentioned in the previous paragraph, solar activity has remained at a considerably higher level than has been expected. The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 46 for June 1984. This results in a 12-month smoothed sunspot number of 65 centered on December 1983, as the present cycle continues to remain relatively unchanged.

Smoothed sunspot numbers of 45 and 44 are now forecast for October and November 1984, respectively. Sunspot levels of 68 and 59 were recorded during the last year's contest period.

In short, while solar conditions during the 1984 CQ World-Wide DX Contest should be considerably better than originally expected, they will be somewhat below the conditions experienced during last year's contest. Barring any sudden radio storm, however, generally good DX propagation conditions are expected on almost all of the h.f. amateur bands.

11307 Clara Street, Silver Spring, MD 20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for October 1984

Propagation Index	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 11, 15, 24	A	A	B	C
High Normal: 10, 12, 14, 20, 23	A	B	C	C-D
Low Normal: 1, 5-6, 8-9, 13, 16, 19, 22, 25-28	A-B	B-C	C-D	D-E
Below Normal: 2, 4, 7, 17-18, 21, 29, 31	B-C	C-D	D-E	E
Disturbed: 3, 30	C-E	D-E	E	E

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

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

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

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

E—No opening expected.

HOW TO USE THIS FORECAST

1. Find propagation index associated with particular band opening from Propagation Charts appearing on the following pages.
2. With the propagation index, use the above table to find the expected signal quality associated with the band opening for any day of the month. For example, an opening shown in the charts with a propagation index of 3 will be good-to-fair (B-C) on Oct. 1st, fair-to-poor (C-D) on the 2nd, poor-to-nil (D-E) on the 3rd, poor-to-fair (C-D) on the 4th, etc. Good-to-fair conditions (B-C) are expected for the WW DX Contest period Oct. 27-28.

General Conditions, Band By Band

The following is a band-by-band summary of general DX propagation conditions that can be expected during the 1984 contest period.

10 Meters: Perhaps not quite as good as last year, but some fairly good openings should still be possible to many areas of the world during the daylight and early evening hours. Openings to Europe and those in a generally easterly direction should peak an hour or two before noon, while those to South America and Africa are expected to peak during the early afternoon hours. Openings to the Far East, Australasia, Southeast Asia, etc., are most likely to occur during the later afternoon hours and the early evening.

15 Meters: Good-to-excellent DX propagation conditions are expected from shortly after sunrise through the early evening hours. Openings are forecast to almost all areas of the world, and exceptionally strong signal levels may occur

during many of them. For each geographical area of the world, conditions on 15 meters should peak about an hour or two after they have peaked on 10 meters.

20 Meters: Generally good-to-excellent openings are forecast to one area of the world or another in this band almost around the clock. DX conditions should peak an hour or two following local sunrise, and again during the late afternoon and early evening hours. Excellent openings are also forecast to many southern and tropical areas well into the hours of darkness. It should be a toss-up between 15 and 20 meters for optimum DX conditions during the daylight hours, with both bands expected to open to most areas of the world.

40 Meters: DX openings to Europe and in an easterly direction should begin during the late afternoon hours and steadily improve towards darkness, with signal levels exceptionally strong at times. Openings in a westerly direction are expected to peak shortly after sunrise, just before the band closes for DX propagation. During most of the hours of darkness, 40 meters should be the optimum band for DX propagation to many areas of the world.

80 Meters: Some fairly good DX openings should be possible on this band to several areas of the world during the hours of darkness and the sunrise period. Peak conditions are expected around midnight on paths to the east, shortly before sunrise for paths to the north or south, and shortly after sunrise for openings in a westerly direction.

160 Meters: The 160 meter band presents a particular challenge for working DX. Of all the h.f. bands, DX propagation is poorest on 160 meters, antennas are least efficient for DX, and there are restrictions on the maximum power that can be used. Perhaps it is this challenge that accounts for the increasing popularity of this band during DX contests. Considerably decreased static levels and longer hours of darkness in the Northern Hemisphere should welcome back DX openings in this band during the hours of darkness and into the sunrise period. Because of relatively high signal absorption and the lower power levels used in this band, openings often will be weak and noisy, but some fairly good ones should be possible. Best bets are for openings towards Europe and towards the Caribbean and Latin America from the eastern

half of the country, and towards the Far East, Australasia, the South Pacific, and Latin America from the western half of the country. DX openings to other areas of the world may also be possible. The best propagation aid for this band (and for 40 and 80 meters as well) is a set of sunrise and sunset tables, since DX signals tend to peak when it is local sunrise at the easternmost point of a path.

Contest Work Plans

The charts on the following pages show the times that each amateur band from 10 through 160 meters is expected to open for DX from the United States to the major areas of the world. Instructions for the use of these charts are given in the box following the Last Minute Forecast at the beginning of this column.

The information contained in the charts can easily be reorganized into several different types of operational work plans, or schedules, to serve as propagation guides during the contest period. Experience gained during previous contests has shown that such plans can be extremely useful in piling up a large number of points with a minimum of wasted time.

Table I is an example of one of the many types of plans that can be devised. For each three-hour period throughout the day it shows the areas of the world for which, in this example, 20 meter propagation conditions are expected to be optimum (a rating of 3 or higher in the charts¹). An eastern USA QTH has been chosen for this example, but similar plans can be devised for central and western locations and for other bands.

Table II is a typical multi-band operational work plan devised from the propagation charts for an Eastern USA QTH. The plan shows the times and bands when propagation conditions are expected to be optimum to various areas of the world for each two-hour period throughout the day.

¹In some cases a rating of (2) or (1) was selected when no higher rating was expected on the particular path.

Time

EST	Areas To Which Openings Should Be Optimum
00-03	A few northern and central South American openings, and perhaps to Antarctica, but not much else. Good time for some sleep.
03-06	Still not much except for some weak openings to Europe and Africa. If you didn't get some sleep in before, get it now!
06-09	Excellent period. Good openings in many directions: Europe, north and west Africa, Far East, Asia, New Zealand, South Pacific, Australasia, and South America.
09-12	Fairly good period. Openings to most of Europe, the Middle East, northern South America, and the Pacific area.
12-15	Fairly good period. Openings to most of Europe, the Middle East, some parts of Africa, northern areas of South America. Good time for lunch.
15-18	Fair openings to western and central Europe and the Middle East. Catch them now or you'll miss them. Good openings to most of Africa and South America.
18-21	Good period to pile up points. Openings to most of Africa and south America. Some also to the Far East and other Asiatic areas. Fairly good openings to the Pacific Islands, New Zealand, Australasia, and Antarctica.
21-00	Fairly good period. Openings to the Pacific and Australasia, South America, the Far East, and Antarctica.

Table I- Sample 20 meter operating schedule for Eastern USA QTH.

Time EST	Optimum Band Meters	Areas To Which Band Expected To Be Open
00-02	40	Most of Europe and Middle East; most of South America; a few African countries, possibly Antarctica.
02-04	40	Not much on any band. A good time to eat and catch up on some sleep. Some openings possible to the South Pacific, Australasia, the Far East, and other Asian areas, but generally not too good. Some fairly good openings to South America.
04-06	40	Still time to catch up on some sleep. Some openings to the South Pacific, New Zealand, and Australasia. Some also to northern and central areas of South America. A few Far Eastern and Asian, and perhaps Antarctica.
06-08	20	Good openings to most of Europe, the Pacific area, Australasia, Asia, and the Far East. Also to most of South America and parts of Africa.
08-10	15	Good openings to all of Europe and the Middle East and most of South America. A possible opening to the Pacific, Australasia, and perhaps parts of Asia.
10-12	10	Good openings to most of Europe, most of Africa, and most of South America. Catch them during this period or you will probably miss them!
12-14	15	Good openings to most of Africa and most of South America, and to the western and southern areas of Europe.
14-16	20	Good openings to most of Europe, the Middle East, most of Africa, northern and central South America, and possibly some long-path openings to Australasia.
16-18	20	Good openings to most of Africa and South America, with some also possible to the western and southern areas of Europe.
18-20	15	Fair-to-good openings to the Pacific area, Australasia, Far East, and other Asiatic areas. Good openings to central and southern South America, and a possible opening to Antarctica.
20-22	20	Openings to most of Africa, Pacific area, Australasia, Antarctica, and all of South America.
22-00	40	Most of Europe should be possible, as well as the Middle East; most of South America, and some openings to the Pacific and Australasia.

Table II- Sample multi-band work plan for Eastern USA QTH.

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CIRCLE 147 ON READER SERVICE CARD

Radio Storms

The storms discussed in this column are based on *normal* propagation conditions expected with a sunspot level in the mid 40's. If actual conditions during the contest turn out to be *above normal*, DX openings on 10, 15, and 20 meters are likely to be somewhat better than shown in the charts. On the other hand, if a radio storm should develop, with accompanying *below normal* or *disturbed* h.f. propagation conditions, fewer openings will take place on these bands. During radio storms, propagation conditions on 40, 80, and 160 meters generally also become erratic, with power openings during certain types of storm and improved openings during other types.

If a radio storm should develop during the contest, circuits passing through or near polar regions will probably become weak, fade considerably, or may even black out entirely, depending upon the severity and duration of the storm. During certain storms, while east-west propagation may become poorer, north-south openings may improve.

If a storm should occur, concentrate on working the higher frequency bands and the paths to the northeast, north and northeast during the daylight hours, and the lower bands and the paths to the east, south, and west during the evening and early morning hours.

A Last Minute Forecast made at press time for the Phone section of the WW DX Contest appears at the beginning of this column. A similar forecast for the C.W. section will appear in next month's column. For up-dated geomagnetic and solar data during the contest period, check the National Bureau of Standards Radio Station WWV broadcasts at 18 minutes past each hour. These broadcasts (transmitted simultaneously on 2.5, 5.0, 10.0, 15.0, and 20.0 MHz) contain the latest available geomagnetic K-figure and the level of 10.7 cm solar flux. They also contain a short-term forecast of geomagnetic and solar conditions given in subjective terms. Fig. 1 can be used to convert the geomagnetic and solar data given on the WWV broadcasts into expected h.f. ionospheric conditions. The hourly forecasts broadcast on WWV, along with the latest solar flux and geomagnetic indices, also may be obtained by telephoning 303-497-3235 at any time. This is a service provided by the NOAA Space Environment Services Center, but the call is not toll-free. Direct inquiries to the duty forecaster at the center can also be made 24 hours each day, 7 days a week by calling 303-497-3171 (collect calls will not be accepted).

Do-It-Yourself Forecasting

Besides using fig. 1 and the WWV transmission of solar flux and geomagnetic data to determine conditions, there are now available several aids, including soft-

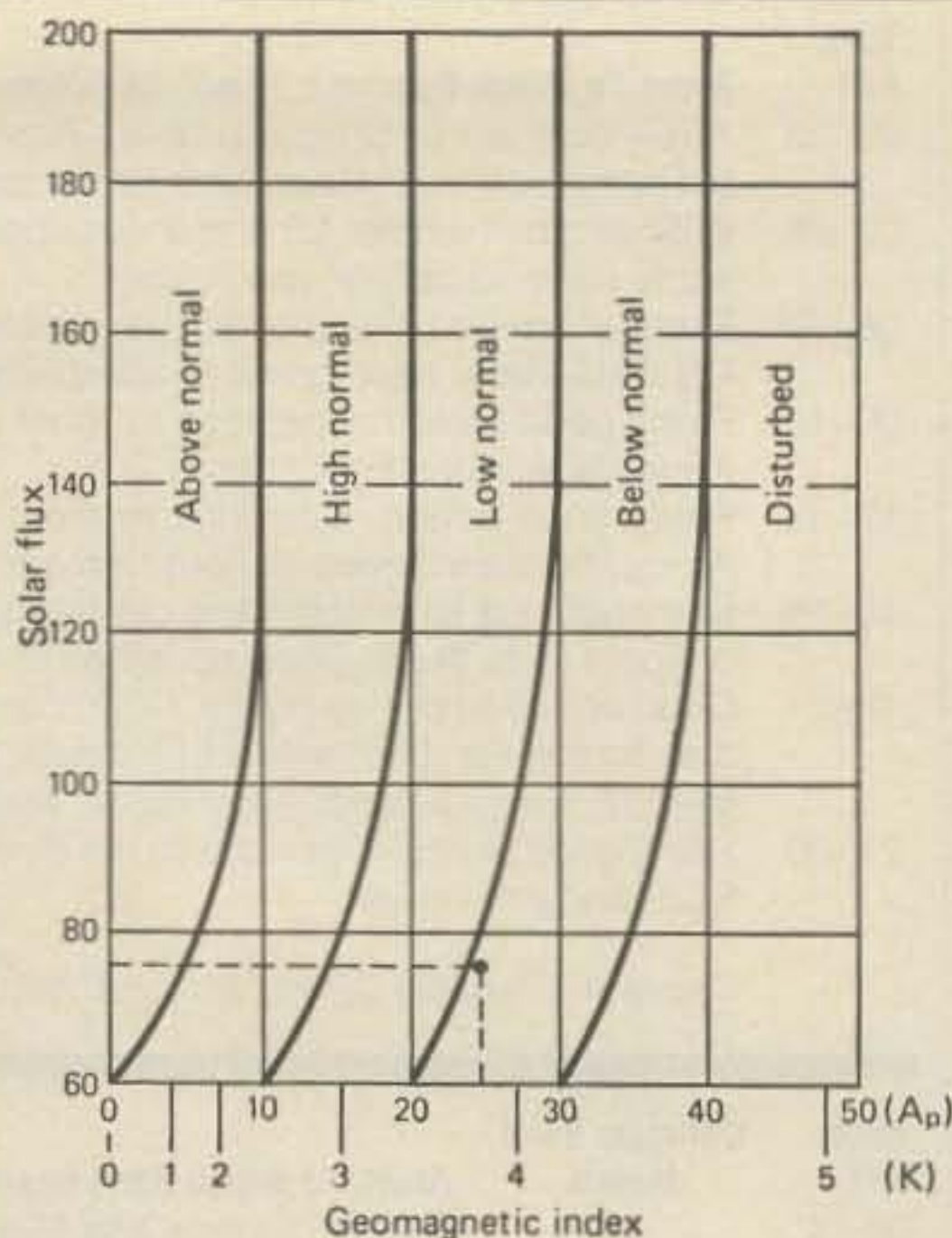


Fig. 1—Intersection of given values of solar flux and geomagnetic activity determine expected h.f. ionospheric propagation conditions. (Example: Solar flux is 75 and A_p is 25; expect Below Normal conditions.)

ware for home computers, which can be used for forecasting conditions and band openings during the 1984 WW DX Contest.

The *DX Edge*, available from Xantek, Inc. (P.O. Box 834, Madison Sq. Station, New York, NY 10159) is one of these aids which I personally use. It is a slide-rule-type device which allows you to determine quickly and easily those areas of the world that are in daylight, darkness, and twilight at any given time of day and for any month of the year. I use it for determining sunrise and sunset times at a glance, for locating the terminator, and for predicting long-path and gray-line openings. It is also great for determining local time anywhere in the world. The *DX Edge* consists of a carrier and a set of 12 monthly transparent plastic overlays. Imprinted on the carrier is a unique double world map showing the 40 CQ zones and many country prefixes. The overlays, containing sunrise and sunset data, slide along the carrier, giving a clear, instant, visual picture of daytime/darkness conditions for any time throughout the world. With the *DX Edge* came instructions which explain how it can be used for determining the best time to look for DX openings on the h.f. amateur bands. I find the *DX Edge* very useful on a day-to-day basis, and it should be a valuable aid during the WW DX Contests. Pricing and other information can be obtained directly from Xantek. See their ad in the September 1984 issue of *CQ*.

Karl T. Thuber, Jr., W8FX, reviews several software propagation programs for use with popular home computers in his two excellent articles which appeared in *CQ* earlier this year. The first, entitled

"Antennas: More This and That," can be found in the February 1984 issue, and the second, entitled "Bits, Bytes, and Beams," appeared in the March 1984 issue. Of those reviewed by W8FX, I am personally using the MUFPLLOT program on my grandson's Commodore C-64 computer. The program is available from Base (2) Systems, 2534 Nebraska Street, Saginaw, MI 48610. They tailor the program to your specific QTH, and the results are displayed graphically, including MUF, LUF, Distance, and Bearing to any target on the globe. You enter the program with date, reception point, and solar flux (either assumed or from WWV), and the program does the rest in a matter of seconds. I find MUFPLLOT extremely useful for "real time" predictions. That is, if you plug in the latest value of solar flux as received from WWV, you can watch its effect on the propagation parameters. MUFPLLOT is available for the VIC-20 and the C-64 on tape or disk, and for the Apple II on disc. For pricing and more information write directly to Base (2) Systems. The program could be of tremendous help during the WW DX Contest.

If you do not already have a copy of the *Shortwave Propagation Handbook* by Theodore J. Cohen, N4XX, and myself, then you might want to get one to read *before* the contest begins. The book still remains the most popular text for plain, everyday use and understanding of h.f. radio propagation. It contains up-to-the-minute information and charts, and guides you through producing your own propagation data. Copies can be obtained from the *CQ* Book Shop.

V.H.F. Ionospheric Openings

While the *CQ* DX Contest *does not* include the v.h.f. bands, some ionospheric activity should be possible on these bands during October.

There still is a very slim chance that some 6 meter DX openings may take place. While the solar cycle has already declined to a point where this is unlikely, it may be worth a look. The best chance is for an opening towards the Caribbean and South America during the early afternoon. Do not be disappointed, however, if 6 meter DX openings are few and far between this October.

Some fairly good meteor scatter openings should be possible on the v.h.f. bands around October 21st during the expected two-day *Orionids* meteor shower. This should be a major shower, with a maximum hourly rate of at least 25 meteors.

Auroral activity usually increases during October, and some auroral-scatter-type v.h.f. openings are expected during the month, particularly during periods when h.f. conditions are either Below Normal or Disturbed. Check the Last Minute Forecast at the beginning of this column for the days that are expected to be in these categories during October.

C.W. Contest Forecast

This month's DX Propagation Charts are valid for both the Phone and C.W. sections of the 1984 Contest. Be sure to keep them handy and for use during next month's C.W. section as well. Short-Skip Propagation Charts for use during October appeared in last month's column.

More radio amateur activity in more areas of the world takes place during the CQ World-Wide DX Contest than at any other time. For this reason the contest offers an excellent opportunity to verify the accuracy or inaccuracy of the CQ Contest predictions and forecasts. Reports received from participants in previous contests have contributed greatly to improving these predictions during the past 33 years. Comments and observations concerning this year's contest would be appreciated and should be sent directly to W3ASK at P.O. Box 1714, Silver Spring, MD 20902. Good luck in the contest!

73, George, W3ASK

October 15 to December 15, 1984 Time Zone: EST (24-Hour Time) EASTERN USA TO:

Reception Area	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Central Europe & North Africa	08-09 (1) 09-11 (2) 11-13 (1)	06-07 (1) 07-08 (2) 08-09 (3) 09-11 (4) 11-12 (3) 12-13 (2) 13-15 (1)	04-05 (1) 05-06 (2) 06-07 (3) 07-09 (4) 09-10 (3) 10-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-18 (2) 18-21 (1)	16-17 (1) 17-18 (2) 18-20 (3) 20-01 (4) 01-02 (3) 02-03 (2) 03-04 (1) 13-15 (4) 15-16 (3) 21-23 (2)* 23-01 (3)* 01-02 (2)* 02-03 (1)*
Northern Europe & European USSR	08-11 (1)	07-08 (1) 08-10 (3) 10-11 (2) 11-12 (1)	04-06 (1) 06-07 (2) 07-09 (3) 09-11 (2) 11-13 (3) 13-14 (2) 14-16 (1)	17-19 (1) 19-02 (2) 02-04 (1) 20-03 (1)*
Eastern Mediterranean & Middle East	08-09 (1) 09-10 (2) 10-12 (1)	07-08 (1) 08-09 (2) 09-11 (3) 11-12 (2) 12-13 (1)	06-10 (1) 10-13 (2) 13-14 (3) 14-16 (4) 16-17 (3) 17-20 (2) 20-23 (1) 23-01 (2) 01-02 (1)	18-20 (1) 20-22 (2) 22-00 (3) 00-01 (2) 01-02 (1) 20-00 (1)*
West & Central Africa	08-10 (1) 10-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	07-10 (1) 10-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	04-05 (1) 05-07 (2) 07-13 (1) 13-15 (2) 15-16 (3) 16-17 (4) 17-20 (3) 20-22 (2) 22-01 (1)	18-22 (1) 22-01 (2) 01-03 (1) 00-03 (1)*
East Africa	09-11 (1) 11-13 (2) 13-15 (1)	07-11 (1) 11-13 (2) 13-16 (3) 16-17 (2) 17-18 (1)	07-14 (1) 14-16 (2) 16-20 (3) 20-00 (2) 00-01 (1)	19-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
South Africa	08-09 (1) 09-10 (2) 10-12 (3) 12-13 (2) 13-14 (1)	07-10 (1) 10-12 (2) 12-15 (3) 15-16 (2) 16-18 (1)	07-13 (1) 13-15 (2) 15-17 (3) 17-19 (2) 19-22 (1) 22-01 (2) 01-02 (1)	18-19 (1) 19-22 (2) 22-23 (1) 19-21 (1)*
Central & South Asia	08-10 (1) 17-19 (1)	07-10 (1) 17-20 (1)	06-07 (1) 07-09 (2) 09-12 (1) 19-22 (1)	18-21 (1) 06-08 (1)

HOW TO USE THE DX PROPAGATION CHARTS

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

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

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

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

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

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

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

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

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

McMurdo Sound, Antarctica	14-17 (1)	06-09 (1) 15-17 (1) 17-19 (2) 19-20 (1)	16-18 (1) 18-20 (2) 20-22 (3) 22-02 (2) 02-06 (1) 06-08 (2) 08-09 (1)	00-06 (1)
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*Predicted times of 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a forecast rating of (2) or higher.

October 15 to December 15, 1984 Time Zones: CST & MST (24-Hour Time) CENTRAL USA TO:

Reception Area	10 Meters	15 Meters	20 Meters	40/80* Meters
Western & Southern Europe & North Africa	08-09 (1) 09-11 (2) 11-12 (1)	06-07 (1) 07-10 (2) 10-11 (3) 11-12 (2) 12-14 (1)	05-06 (1) 06-08 (3) 08-12 (2) 12-15 (3) 15-19 (2) 19-21 (1) 00-02 (1)	17-18 (1) 18-20 (2) 20-22 (3) 22-00 (2) 00-02 (1) 19-20 (1)* 20-22 (2)* 22-00 (1)*
Northern Europe & European USSR	08-10 (1)	06-07 (1) 07-08 (2) 08-09 (3) 09-10 (2) 10-13 (1)	06-07 (1) 07-09 (2) 09-11 (3) 11-13 (2) 13-16 (1) 01-03 (1)	18-20 (1) 20-23 (2) 23-01 (1) 20-23 (1)*
Eastern Mediterranean & Middle East	08-10 (1)	07-09 (1) 09-11 (2) 11-12 (1)	06-08 (1) 08-11 (2) 11-13 (3) 13-15 (2) 15-17 (1) 17-19 (2) 19-22 (1) 01-03 (1)	17-19 (1) 19-22 (2) 22-23 (1) 20-22 (1)*
West & Central Africa	08-09 (1) 09-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	06-10 (1) 10-12 (2) 12-14 (3) 14-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-12 (1) 12-14 (2) 14-15 (3) 15-17 (4) 17-20 (3) 20-22 (2) 22-02 (1)	17-19 (1) 19-21 (2) 21-22 (1) 19-21 (1)*
East Africa	09-10 (1) 10-12 (2) 12-14 (1)	08-10 (1) 10-13 (2) 13-15 (3) 15-16 (2) 16-18 (1)	06-14 (1) 14-17 (2) 17-20 (3) 20-21 (2) 21-22 (1)	20-00 (1) 21-23 (1)*
South Africa	08-09 (1) 09-10 (2) 10-12 (3) 12-13 (2) 13-14 (1)	07-10 (1) 10-12 (2) 12-15 (3) 15-16 (2) 16-17 (1)	07-13 (1) 13-15 (2) 15-17 (3) 17-20 (2) 20-22 (1) 22-00 (2) 00-02 (1)	18-19 (1) 19-21 (2) 21-22 (1) 19-21 (1)*
Central & South Asia	07-10 (1) 19-21 (1)	07-10 (1) 17-18 (1) 18-21 (2) 21-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 17-18 (1) 18-21 (2) 21-22 (1)	06-08 (1) 18-20 (1)
Southeast Asia	09-12 (1) 16-18 (1)	09-12 (1) 14-16 (1) 16-18 (2) 18-20 (1)	06-08 (1) 08-11 (2) 11-14 (1) 18-19 (1) 19-21 (2) 21-22 (1)	04-07 (1)
Far East	15-16 (1) 16-18 (2) 18-19 (1)	08-10 (1) 15-16 (1) 16-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-12 (1) 16-18 (1) 18-20 (2) 20-22 (1)	02-03 (1) 03-06 (2) 06-09 (1) 02-04 (1)*
South Pacific & New Zealand	11-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	08-09 (1) 09-11 (2) 11-14 (1) 14-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	06-07 (1) 07-09 (3) 09-11 (2) 11-17 (1) 17-18 (2) 18-19 (3) 19-21 (4) 21-22 (3) 22-00 (2) 00-02 (1)	23-01 (1) 01-06 (3) 06-07 (2) 07-08 (1) 00-02 (1)* 02-06 (2)* 06-07 (1)*
Australasia	09-12 (1) 14-15 (1) 15-17 (2)	08-09 (1) 09-11 (2) 11-15 (1)	17-19 (1) 19-21 (2) 21-23 (3)	02-04 (1) 04-07 (2) 07-08 (1)

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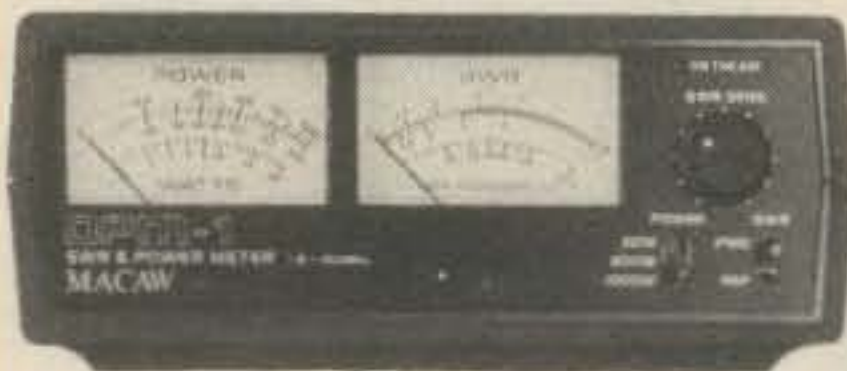
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DX HEADING MAPS for Boston, NYC, Phila., Baltimore, Detroit, Atlanta, Chicago, New Orleans, Saint Louis, Dallas, LA, 11 x 17 \$1.75 pp, 22 x 34 \$5.95 pp, specify city. W. Massey, W2HOJ, P.O. Box 397, Hainesport, NJ 08036.

Amateur Radio's NEWSpaper—WORLD RADIO. Latest info. One year subscription (12 issues) only \$10. Worldradio, 2120-D 28th St., Sacramento, CA 95818.

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WANTED: Callbook Volume 33 Issue 4 Winter 1955 \$30.00. K7MF, Rt. 1 Box 114, Vaughn, WA 98394.

WANT 72' E-Z-Way tower; SA1480 coax switch; digital GMT clock; Auto-Mate K5/50 keyer manual; two 8-ohm outdoor speakers. W4EOB, 1412 Winkler Ave., Fort Myers, FL 33901.

H*A*R*K HOTLINE (free) recording/announcing ads, anecdotes, etc. weekends, 1-612-874-9561.

HEATHKITS - VTVM \$10, Audio Sig-Gen \$18, Color Bar-Gen \$10, Audio Analyzer \$18, Electronic Switch \$5, SASE for list. K6KZT, 2255 Alexander, Los Osos, CA 93402.

SELL: Drake, Heath, etc., reasonable. SASE for price list. Joe Bedlovies, 241 Dover St., Bridgeport, CT 06610.

WANTED: LF-10 Preselector. Max Fuchs, 11 Plymouth Lane, Swampscott, MA 01907, evenings 617-599-6155.

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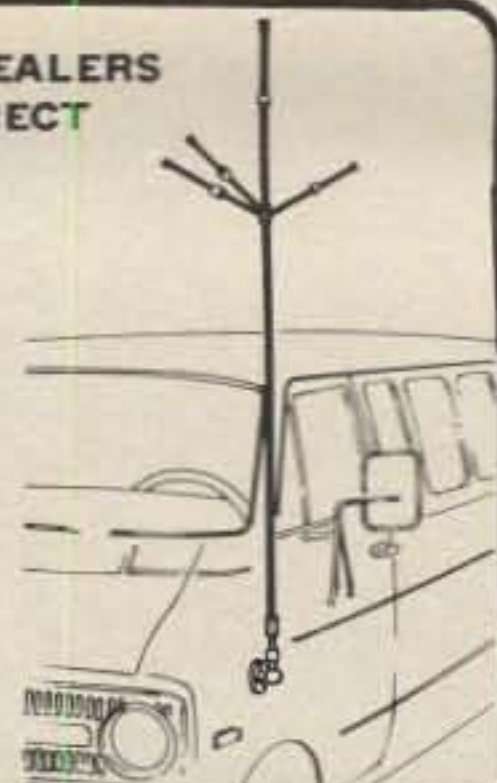
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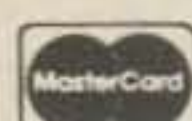
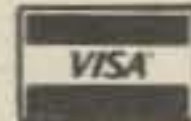


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WANTED: Operating, service, and tuning manuals for National NC-57. Contact Ken Jeffcoat, 22029 6th Avenue West, Bothell, WA 98021.

WANT: Harvey UHX-10 Transmitter, DB-20 RME Preselector. SELL: Marconi Wireless 1913 Stock Certificates, \$25. (MO) to D. Sheehan, Box 48, Ballardvale, MA 01810.

TEN-TEC CENTURY 21, 10 thru 80 meters, 70 watts c.w., solid state. Will ship in Canada. Mint Condition, \$300. Call Kieran, VE6BKX, at (403) 743-0562.

NEED: Schematic and necessary information for use of surplus amplifier, "AMPL Radio AM 4531/GR" built by Granger Associates, Palo Alto, CA. W0QAC, 1167 Smith St., Cahokia, IL 62206.

WANTED: Pre-1946 Gon-Set converter, tunes 10-11 meters. Tom Marcellino, W3BYM, Gon-Set Treasures, 13806 Parkland Dr., Rockville, MD 20853.

FOR SALE: Heath HX-10 xmitter, Ameco PT-2 pre-amp, Bencher XZ-2 filter, Timex 16K computer. Call Lou, N2CYY, (212) 296-2504.

WANTED: J-390/GR panel, C-806GR indicator for GRC-27 equipment, and TM11-856A manual. C.T. Huth, 130 Hunter St., Tiffin, OH 44883.

2KVA POWER TRANSFORMER: 120/240V pri, two 16V/63A secs. Unused, \$50 each. Add shipping, 39 lbs. W. Worley, 305 Hickory Bend, Enterprise, AL 36330. (205) 347-5281.

SELL: National NCX-5 Transceiver, PS w/Speaker, VX-501 VFO w/Cal., Shure 444D Mic., Ph. Patch. Mint cond. & w/manuals All for \$350. Doug, WA6QCL, (916) 842-3255.

WANTED: COLLINS WCS receiver for TCS 10 radio equipment and Drake Enthusiast Club. Migliore Francesco, P.O. Box 445, Modena 41100 Italy.

PALOMAR R-X Noise Bridge, never used, \$45. AVANTEK 3.7-4.2 GHz 120° LNA Model AWC-4215N with DCB-42 DC Block, never used, \$250. W7AM, Box 8173, Sisters, OR 97759.

FOR SALE: DENTRON MLA2500 2 KW amplifier, 10-160 M excellent cond., \$675. Tel. (203) 633-2756, 408 Thompson St., Glastonbury, CT 06033.

WANTED: ICOM IC-2A/2AT. Collins S-Line accessories/any condition. 811A Tubes/any quantity. W1DGJ, Ludlow, MA 01056.

HENRY 2K-4 amplifier, includes 10 meters, full legal output, \$850. KENWOOD TS-820/Digital, \$450. 250 Hz, 400 Hz, and 1.8 kHz Fox Tango Filters Available. Saul, K2XA, (518) 439-5700 evenings, (518) 474-7579 days.

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NICE COLLINS 312B-3, 75A-4 wanted. Also want Collins basket-case junkers. Sell new 6L6G and 6L6GC, \$3 or ? John Werner, WB8IPG, 26316 Falmouth, Warren, MI 48089.

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FOR SALE: Hallicrafter rcvr S-40 and Hammarlund rcvr HQ-129-X. Best Offer. Phone 716-825-3287.

FOR SALE: DRAKE 2-NT CW Transmitter, Covercraft Cover, new final, \$60. I ship. N0EHP, Box 52, Golden City, MO 64748, phone 417-537-8604.

HELP. I need info on RTTY and/or CW hardware and software for TI-99/4A and/or Atari 400 (16K-cass.). B.J. Anderson, P.O. Box 281, Penticton, BC, Canada V2A 6K4.

YAESU QTR 24 world clock, never used, \$30, I ship. KA2BUF (518) 374-6399.

WANTED: Any info on Motorola Dispatcher Radiophone, Model D33AAB-1100A, xmtr type CC3501, S/N: 38393. Gary Naus, WA2PUO, 719 82nd Street, Niagara Falls, NY 14304.

WANTED: Power Supply PS511 for Kenwood TS511. Clint Pamatat, WB6EKI, 6159 Fulcher Avenue, North Hollywood, CA 91606 (818-762-9584).

CASSETTE RECORDER to VIC-20 schematic wiring needed. J. Vega, Box 60063, Las Vegas, NV 89160.

TEN-TEC Argosy and 225 Power Supply, mint condition, \$475. Dennis Roossien, 4549 Rhodes Ave. SW, Wyoming, MI 49508.

TEXAS INSTRUMENTS Silent 700 Model 742 Programmable TTY Data Terminal in excellent condition, \$400. Mike Holley, VE7AVM, 6586 196 Street, Langley, BC Canada V3A 4P7. Tel. (604) 534-6466.

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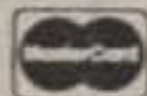
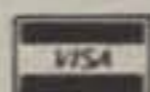
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WANTED: Old CQ and QST magazines. Howard Ziserman, WA3GOV, Dept. of Hematology, Hahnemann University, 230 N. Broad St., Philadelphia, PA 19102.

WANTED: Service manual or schematic, power pack, set of coils or winding data plus forms, for a National SW-5. Any present owner's experiences welcomed. D'Arcy Brownrigg, P.O. Box 292, Chelsea, Quebec, J0X 1N0 Canada.

WANTED: Ant tuner, small, any model. Fred, Box 706, Orange City, FL 32763.

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WHAT UPDATES are made by Drake to TR7 returned to factory? Is there a TR7 club or on-the-air net where TR7 info can be swapped? Marvin Moss, W4UXJ, Box 28601, Atlanta, GA 30358.

VS9AWR (Silent Key G3SUQ): Can anyone help me obtain a QSL for a 1964 QSO with Bill in Aden? Gerry Skloot, KE2N, 2923 Mandalay Beach Road, Wantagh, NY 11793 U.S.A.

WANTED: Galaxy 2000 or LA550 linear amp. K4BOV 607-936-3832.

FOR SALE: HP606A sig. gen. w/manual, \$475. HP5302A Counter, \$150. KWM-2/S-Line plug-in relays new set, \$20. KWM-2/S-Line M. filter new, \$35. 75A4 filter 3.1 kc, \$20. W6IEG, P.O. Box 1244, Oakhurst, CA 93644 (209-683-8430).

FOR SALE: KENWOOD TR-2400 ST-1 rapid charger, orig. box and manual. \$75.00. Bob, W5XC (713-498-8300).

FOR SALE: Heath HW-8 QRP rig incl. manual & mods. for impr. 15 meter sensitivity & keying waveform, \$140 postpaid UPS. Matt Dennis, N6GFO, Box 1336, Bakersfield, CA 93302.

FOR SALE: DRAKE TR-3 HF Transceiver with AC PS, Manual, and EV Mod 727 mike, \$250. Bert Parmeter, KH6GEY, 700 Richards St. #2509, Honolulu, HI 96813. Phone 808-521-4414.

WANTED: Pre-1950 bugs and spark keys for my collection. Vibroplex, Martin, McElroy, Marconi, DeForest, etc. Neal McEwen, K5RW, 1128 Midway, Richardson, TX 75081.

FOR SALE: Robot 400, RCA Camera, Sanyo Monitor. All like new. Shipped prepaid, \$550 MO or cashiers check. Gene Boaz, 1720 Planz Rd., Bakersfield, CA 93304.

HELP! Need conversion data for Model 19 or 25 Teletype machine for RTTY use. Sid, W3KIQ, 112 Caldwell St., McKees Rocks, PA 15136.

WANTED: HW-101 working, with or without PS. L. Markus, 7434 Kingsway #409, Burnaby B.C. Canada V3N 3B7. Phone 604-525-2266.

FOR SALE: Local Only—QST, CQ from 1930's to 1980's. Want Drake RV-4 VFO or Kenwood VFO-120. WB4CVH, 38 Elmwood Pl., Goose Creek, SC 29445.

FOR SALE: Tektronics 545A 30 MHz delayed sweep oscilloscope with two plug-ins, \$250. KP4FKU, 18 Diamond Drive, Newtown, CT 06470, phone (203) 426-8041.

DRAKE TR22C, w/8 channels (2 CAP), TT mike, \$100. Standard SRC146 5-channel handheld w/desk chrgr, nicads, \$125. Wire tuner rated at 1500 watts, 3-30 MHz, \$75. WD4KDN, 205 Bowman St., Vinton, VA 24179.

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FOR SALE: Drake T4XB; R4B, AC4, MS4 with WWV and 160 meter crystals, \$450. A.J. Masi, KM2V, 155 Connecticut Ave., Massapequa, NY 11758.

WANTED: Solid-State 80-10 meter QRP rig, CW & SSB, any condition, state price. KA0QPO, Box 95, So. Greenfield, MO 65752.

HEATH AC Power Supply, Model HWA 2036-3, mint, with manual. Sell or swap for? WA6HYB, Daniel C. Pugh, 4660-125 North River Road, Oceanside, CA 92056.

SELL: New Cushcraft AV3 Antenna \$40. New MFJ-900 Transmatch \$40. Both postpaid. K6XZ (707) 539-0316.

SELL: Kenwood TS-520 service manual \$7.00; operating manual for TS-520S \$3.00. Japanese operating manual for TS-520 \$3.00. Please send \$1.00 for postage. All like new. B. Nastoff, 320 W. 56th Place, Merrillville, IN 46410.

HW-101, power supply, 400 Hz filter, recently gotten from Heath, still in box. Sell for invoice price. HW-104, ext. speaker & power supply, remote VFO, 400 Hz filter and noise blanker. Now operating, \$450. Bruce, KA8TIO, 517-784-6777 nite, 784-3776 days.

FOR SALE: HAL Communications Corp. Model ST-6000 FSK Demodulator (new), \$550. RCA Model WA-504/44D Audio Generator, \$100. Kenwood Model TR-9000 2 meter FM all-mode transceiver, \$290. Wm. Shevtchuk, 1 Lois Avenue, Clifton, NJ 07014, phone 201-471-3798.

WANTED: Four 1000A Tube sockets and chimneys. Tom Neill, K4XG, P.O. Box 847, Brentwood, TN 37027.

MINT R/S DX-302 general-coverage receiver w/box, \$249. Mint Autek QF-1A a/filter, \$49. Gary Hansen, KA0JUM, Rt. 1, Deerwood, MN 56444, phone 218-678-2853.

WANTED: 160 meter mobile antenna. Patrick O'Bryan, WB6USZ, 1728 Townley Circle, Simi Valley, CA 93063. Phone (800) 421-1824 (x1651), or (213) 615-0311 (x1651).

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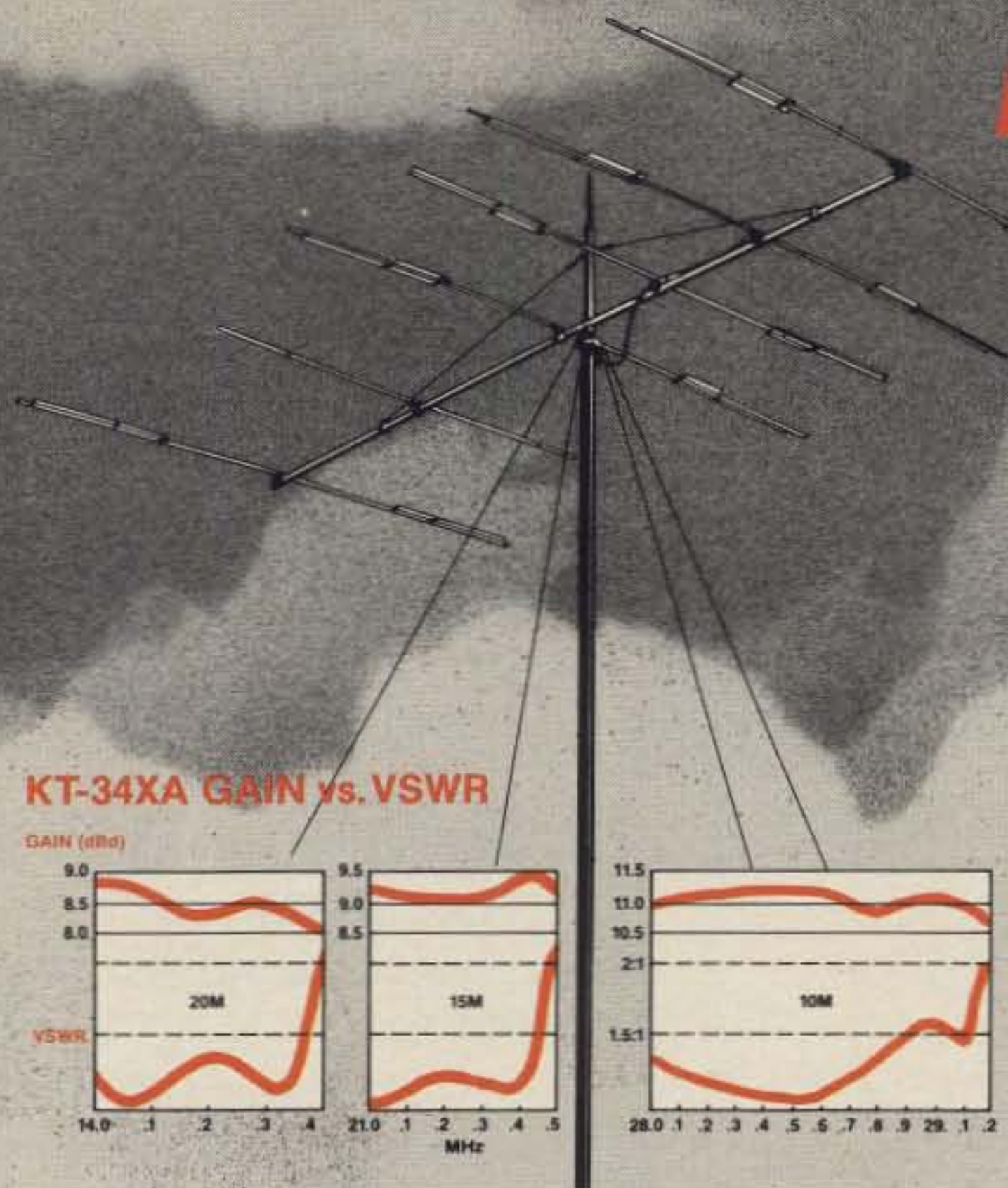
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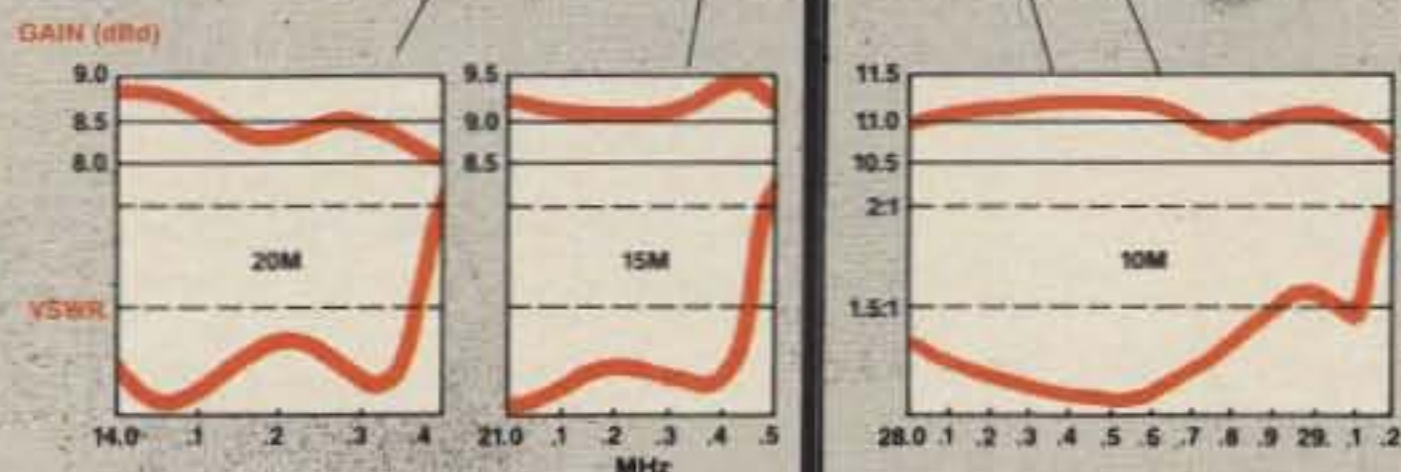
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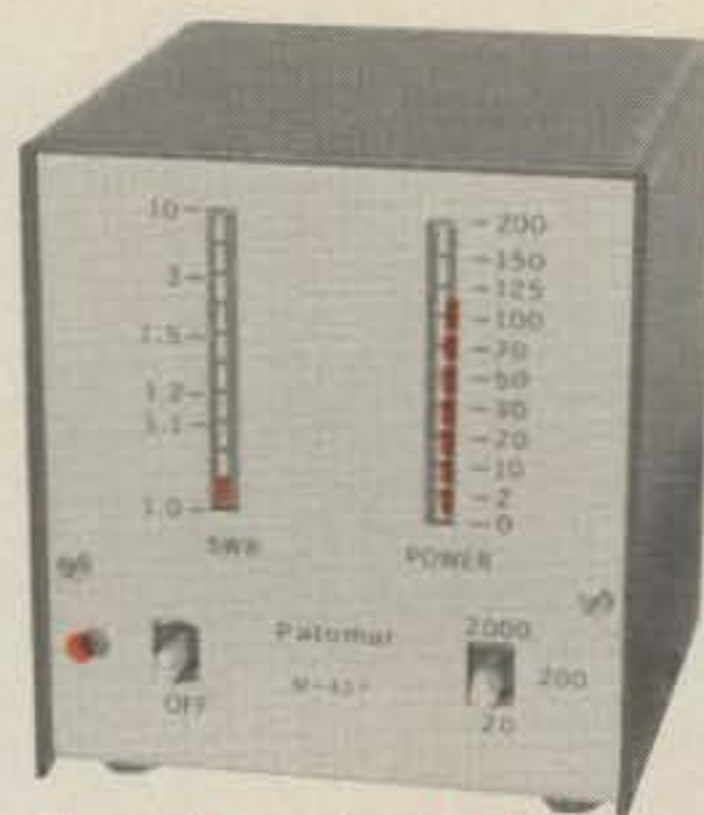
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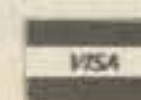
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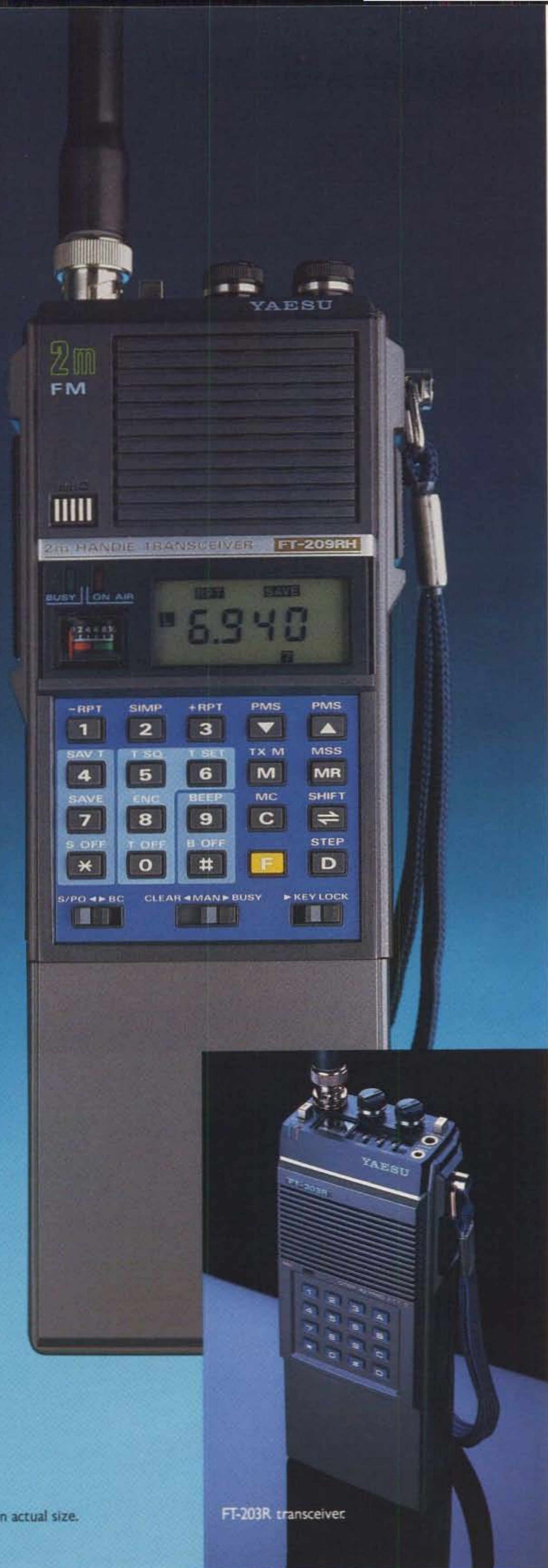
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