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Amateur Radio

SERVING AMATEUR RADIO SINCE 1945
FEBRUARY 1983 \$2.00

CQ

Modify Your
Older Gear
For The New
30 Meter
C.W. Band
... pages 23 & 31

CQ Interviews:

Dr. William Schneider, K2TT

Under Secretary Of State ... page 11

THE RADIO AMATEUR'S JOURNAL





TR-9130

All mode (FM/SSB/CW) 25 watts, plus...!!!

The TR-9130 is a powerful, yet compact, 25 watt FM/USB/LSB/CW transceiver. Available with a 16-key autopatch UP/DOWN microphone (MC-46), or a basic UP/DOWN microphone.

TR-9130 FEATURES:

- 25 Watts RF output on all modes, (FM/SSB/CW).
- FM/USB/LSB/CW all mode. Selectable tuning steps of 100-Hz, 1-kHz, 5-kHz, 10-kHz.

- Six memories. On FM, memories 1-5 for simplex or ± 600 kHz offset, using OFFSET switch, Memory 6 for non-standard offset. All six memories may be simplex, any mode.
- Memory scan.
- Internal battery memory back-up, using 9 V Ni-Cd battery, (not KENWOOD supplied). Memories are retained approx. 24 hours, adequate for the typical move

- from base to mobile. External back-up terminal on the rear.
- Automatic band scan.
- Dual digital VFO's.
- Transmit frequency tuning for OSCAR operations.
- Squelch circuit for FM/SSB/CW.
- Repeater reverse switch.
- Tone switch.
- CW semi break-in; sidetone.
- Compact size and lightweight.
- Covers 143.9 to 148.9999 MHz.
- High performance noise blanker.



TR-9500

70 CM SSB/CW/FM transceiver

- Covers 430-440 MHz, in steps of 100-Hz, 1-kHz, 5-kHz, 25-kHz or 1-MHz.
- CW-FM Hi-10 W, Low-1 W, SSB 10 W.
- Automatic band/memory scan. Search of selected 10-kHz segments on SSB/CW.
- 6 memory channels.

- HI/LOW power switch. 25 or 5 watts on FM or CW.
- RF gain control. • RIT circuit.

Optional accessories:

- KPS-7A AC power supply.
- PS-20 AC power supply (TR-9500 only).
- BO-9A system base with memory back-up supply.
- SP-120 external speaker.
- TK-1 AC adapter for memory back-up.

TR-7730

Dyna-"mite" ... miniaturized, 5 memories, memory/band scan.

The TR-7730 is an incredibly compact, reasonably priced, 25 watt, 2 meter FM mobile transceiver, with five memories, memory scan, automatic band scan, plus other convenient operating features. It is available with a 16-key autopatch UP/DOWN microphone, (MC-46), or with a basic UP/DOWN microphone.

TR-7730 FEATURES:

- Dimensions: 5-3/4 W x 2 H x 7-3/4 D, inches. Weighs 3.3 lbs.
- Extended frequency coverage, 143.900-148.995 MHz, in 5 or 10-kHz steps.

- 25 watts RF output power, with HI/LOW power switch.
- Five memories. Simplex or repeater operation, with transmit offset switch. The 5th memory stores receive and transmit frequencies independently, for non-standard splits. Memory back-up terminal on rear panel.
- Memory scan, plus automatic band scan. Locks on busy channel, resumes when signals disappear, or when scan switch is pressed. Scan HOLD

- or PTT switch on microphone cancels scan.
- UP/DOWN manual scan on microphone, either version.
- Four digit LED frequency display.
- S/RF bar meter. LED indicators for BUSY, ON-AIR, REPEATER operation.
- Tone switch for internal tone encoder (not Kenwood supplied).
- Offset switch ± 600 kHz, or simplex. Fifth memory for non-standard offset.

Optional Accessories:

- MC-46 16-key autopatch UP/DOWN microphone.
- SP-40 Compact mobile speaker.
- KPS-7A Fixed station power supply.



TR-8400

Synthesized 70-cm FM mobile rig

- Covers 440-450 MHz, in 25-kHz steps, with two VFOs.
- Transmit offset switch for ± 5 MHz. Non-standard offset uses fifth memory.
- HI/LOW power switch selects 10 or 1 watt RF output.
- Similar to TR-7730 in other features, including five memories, memory scan, automatic band scan, UP/DOWN manual scan, four digit display, S/RF bar meter, LED indicators, tone switch, and same optional accessories.
- Basic UP/DOWN microphone supplied with unit.

KENWOOD

TRIO-KENWOOD COMMUNICATIONS
1111 West Walnut, Compton, California 90220



R-600

"Now hear this" ...digital display, easy tuning

The R-600 is an affordably priced, high performance general coverage communications receiver covering 150 kHz to 30 MHz in 30 bands. Use of PLL synthesized circuitry provides maximum ease of operation.

R-600 FEATURES:

- 150 kHz to 30 MHz continuous coverage, AM, SSB, or CW.
- 30 bands, each 1 MHz wide, for easier tuning.
- Five digit frequency display, with 1 kHz resolution.
- 6 kHz IF filter for AM (wide), and 2.7 kHz filter for SSB, CW and AM (narrow).
- Up-conversion PLL circuit, for improved sensitivity, selectivity, and stability.

- Communications type noise blanker eliminates "pulse-type" noise.
- RF Attenuator allows 20 dB attenuation of strong signals.
- Tone control. • Front mounted speaker.
- "S" meter, with 1 to 5 SINPO "S" scale, plus standard scale.
- Coaxial and wire antenna terminals.
- 100, 120, 220, and 240 VAC, 50/60 Hz. Selector switch on rear panel.
- Optional 13.8 VDC operation, using DCK-1 cable kit.
- Other features include carrying handle, headphone jack, and record jack.

Optional accessories for R-600 and R-1000:

- DCK-1 DC Cable kit. • SP-100 External Speaker.
- HS-6, HS-5, HS-4 Headphones.
- HC-10 Digital World Clock.



R-1000

High performance, easy tuning, digital display

The R-1000 high performance communications receiver covers 200 kHz to 30 MHz in 30 bands. An up-conversion PLL synthesized circuit provides improved sensitivity, selectivity, and stability.

R-1000 FEATURES:

- Covers 200 kHz to 30 MHz.
- 30 bands, each 1 MHz wide.
- Five-digit frequency display with 1-kHz resolution and analog dial with precise gear dial mechanism.
- Built-in 12-hour quartz digital clock/timer.
- RF step attenuator.
- Three IF filters for optimum AM, SSB, CW.
- Effective noise blanker. • Tone control.
- Built-in 4-inch speaker. • Dimmer switch.
- Wire and coax antenna terminals.
- Voltage selector for 100, 120, 220, and 240 VAC. Operates on 13.8 VDC with optional DCK-1 kit.



TS-130SE

"Small talk" ...IF shift, Processor, N/W switch, affordable.

A compact, all solid-state HF SSB/CW transceiver for mobile or fixed base station, covering 3.5 to 29.7 MHz.

TS-130SE FEATURES:

- 80-10 meters including the new 10, 18, and 24 MHz bands. Receives WWV on 10 MHz.

- TS-130SE runs 200 W PEP/160 W DC input on 80-15 meters, 160 W PEP/140 W DC on 12 and 10 meters. TS-130V version at 25 W PEP/20 W DC, all bands, also available.
- Digital display, built-in.
- IF shift circuit.
- Speech Processor, built in.
- Narrow/wide filter selection on CW and SSB with optional filters.
- Automatic SSB mode selection (LSB on 40 meters and below, USB on 30 meters and up). SSB reverse switch provided.

- RF attenuator, built-in.
- Effective noise blanker.
- Final amplifier protection circuit assures maximum reliability. Output power is reduced if abnormal operating conditions occur. For very severe operations, optional cooling fan, FA-4, is available.
- Dimensions: 3-3/4 H x 9-1/2 W x 11-9/16 D (inches). Weight: 12.3 lbs.
- Other features: VOX, CW semi break-in with sidetone, one fixed channel, and 25 kHz marker.



Optional DFC-230 Digital Frequency Controller

Frequency control in 20-Hz steps with UP/DOWN microphone (supplied with DFC-230). Four memories and digital display. (Also operates with TS-120S, TS530S, and TS-830S.)

Optional accessories:

- PS-30 matching power supply (TS-130SE).
- KPS-21 power supply (TS-130SE).
- PS-20 power supply (TS-130V).
- SP-120 external speaker.
- VFO-120 remote VFO.
- FA-4 fan unit (TS-130SE).
- YK-88C (500 Hz) and YK-88CN (270 Hz) CW filters.
- YK-88SN (1.8 kHz) narrow SSB filter.
- AT-130 antenna tuner.
- MB-100 mobile mounting bracket.

KENWOOD

TRIO-KENWOOD COMMUNICATIONS

1111 West Walnut, Compton, California 90220



HL-32V VHF AMPLIFIER — The first of our super compact amplifiers for use with handheld radios. For VHF operations, this unit produces up to 25W output with drive from your 0.5W to 3W handheld. Low insertion loss on receive and selectable power level design provide low VSWR to the transceiver.

Excellent for mobile use in snugly fitted smaller cars, this little beauty can be stowed under the seat, out of sight and out of mind.

The HL-32V operates linear mode for SSB or FM (switch selected), and the best news of all: the price is only \$89.95 Suggested Retail!

Meets or exceeds FCC specifications.

TOKYO HY-POWER LABS, INC.

For catalog, send OSR card to
Department Q
2000 Avenue G, Suite 800, Plano, Texas 75074

All stated prices and specifications subject to change without notice or obligation.



HL-160V VHF AMPLIFIER — This is our big 160W 2 meter linear amplifier which can work with a radio of 10W or even 3W output. This setup is achieved with a pair of rugged VHF R.F. transistors, using highly reliable one-board construction, and with the HL-160V's built-in 12db MOS-FET preamp.

The HL-160V has convenient front panel controls and select switches, LED indicators and a very reliable RF wattmeter. This big amp works SSB, CW, FM and AM modes, and it has a true coaxial relay on the output side.

When you need the power, the HL-160V is the power you need. \$349.95 Suggested Retail.

Meets or exceeds FCC specifications.

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2000 Avenue G, Suite 800, Plano, Texas 75074
Phone (214) 423-0024 TLX 79-4783 ENCOMM DAL



HC-200 ANTENNA COUPLER — This small sized, big quality antenna tuner can be used on rigs of up to 300W PEP input and with all of the new solid state type transceivers which like 50 ohm antennas best.

The HC-200 can replace the wattmeter/VSWR bridge and the coax switch (for up to three antennas) as well as smooth out the VSWR on the line. The HC-200 has a two range, switch selectable wattmeter for more accurate readings, plus a VSWR function for tune-up. Other quality features include ceramic coils and the ability to select direct hook-up bypass. Quite a bit of quality for just a few of your hard earned bucks. \$99.95 Suggested Retail.

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HC-2000 ANTENNA COUPLER — THL's top quality 2kW antenna coupler, which can take the legal max from your amplifier. This is the ultimate in quality transmatch design and construction for HF all band operation, WARC bands included.

For DX on the edges of the band, this is your kind of coupler. It can provide a matched antenna, while ready for both forward and reflected power at the same time on its accurate dual meter VSWR/wattmeter. The HC-2000 works 4 coaxial outputs (one for a dummy load), one single wire and one balanced wire antenna (Balun included), and it provides for direct bypass hook-up. All this, coupler, coax switch and wattmeter, for only \$349.95 Suggested Retail.

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2000 Avenue G, Suite 800, Plano, Texas 75074
Phone (214) 423-0024 TLX 79-4783 ENCOMM DAL



HL-20U UHF AMPLIFIER — This is another super compact from THL, and it's beautiful, with the controls on the brushed metal face panel to make operations as easy as touch and go.

The ultra-compact HL-20U is a basic amplifier for all UHF handheld radios, and it can accept input levels from 200mW to 3W, to provide a big 20W output signal. Fixed attenuator design allows for full output from as low as 200mW drive.

Your UHF handheld operations have never experienced anything like this surprising little amplifier. \$119.95 Suggested Retail

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For catalog, send OSR card to
Department Q
2000 Avenue G, Suite 800, Plano, Texas 75074

All stated prices and specifications subject to change without notice or obligation.



HL-90U UHF AMPLIFIER — Our new 80W output big-power UHF amp, with GAS-FET preamp and drive requirements as low as 10W, is designed for the 70cm amateur band.

It features stable and powerful amplification along with excellent linearity, which is especially effective on SSB. With its built-in receiver preamp, the HL-90U enables you to enjoy more comfortable DX QSO's. Accurate output power can be read with the built-in precision directional coupler, and power can be reduced by one half by the power level switch.

The HL-90U works FM, SSB, and CW, it provides a remote control terminal, and it comes to you for \$389.95 Suggested Retail.

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The Radio Amateur's Journal



ON THE COVER: Here we see Ed Cottrell, WA2CRP, working on an HW-101. Ed is showing the theme of this issue—namely, that a lot of older gear can be put on 30 meters. Photo by Larry Mulvehill, WB2ZPI.

FEBRUARY 1983

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Zero Bias

AN EDITORIAL

This month we are running several features on our new band, 30 meters. American amateurs have jumped on the 30 meter bandwagon, demonstrating that there is fun and a significant amount of DX to be had. I expect that you will be seeing in print more and more 30 meter modification articles, antenna articles, and the like. The power and frequency limitations should make some of our older, more "mature" gear more desirable at ham-fests, much in the same manner as when there was a resurgence of 160 meter activity. Suddenly the old, trusted war-horses increased in value as the demand increased. Rigs such as the Johnson Rangers and the Heath DX-100's took on a new charm when one considered the price of a new piece of equipment. Of course, the new synthesized rigs can easily be pressed into service on 30 meters. The only thing to remember is the power limitations. In a way, it's one of the great things about this new band. The lower power can make it fun for a lot of people and it is a great equalizer.

Travels To CQ

We had some visitors to CQ this month. First, John Devoldere, ON4UN, stopped by on his way to JFK Airport. John is the author of *80 Meter DXing*, CQ's first 5 Band WAZ winner, and an old friend. Another old friend, Eric Sjolund, SM0AGD, stopped by in early December. Eric had been traveling around the U.S. visiting various DX groups to give slide presentations of his famous DXpeditions. He, too, was on his way to JFK to take a flight home to Sweden.

The World of Ideas

This month we've changed the title of Dave Ingram's column from The World of Video to The World of Ideas. It's a simple change of one word, but that one word opens up a myriad of topics that can be covered, including video. Dave has an enormous variety of interests, and so we are opening up the column in a sense to give him free reign to share these interests with you. Sometimes it's just fun to let your imagination soar in different directions.

R2D2 Is Not Part of Fig. 1

No, we're not talking about a resistor/diode combination, but rather, we are

talking about robots. The word itself comes from a Czechoslovakian word meaning to do work. It was first used to describe manlike machines built by a character called Rossum in a play by Karel Capek entitled R.U.R. (Rossum's Universal Robots). The manlike machines, or "robots," were designed to do the hard manual work that humans were doing.

Well, robots in any form are intriguing, and the study of robotics (yes, it's an entire field of study now) is not nearly as simple as it sounds. This is by way of a long introduction to tell you that I recently went to a demonstration of a new product to be marketed by Heath Company. They are now in the robotics business and have a great new kit to build—your own robot. The robot is called HERO 1 (Heath Educational RObot 1), and it is basically a robot to teach the fundamentals of robotics. It hears, sees, talks, and moves, and has a functional arm and "hand." It responds to a full range of stimuli and is programmable with a 4K RAM and 8K ROM memory. No, HERO 1 is not going to help you directly to work through a pile-up on 20, but it is fascinating to consider the technology that goes into making it work. The price of the kit (\$1500.00, or about \$2500 fully assembled, tested, and talking) puts it out of the toy category, but it definitely isn't a toy anyway.

I guess what I found exciting about the concept was that it triggers the imagination. Heath evidently counts on this factor. When I brought up a few suggestions or questions about adding a few functions, I was shown a direct-access solderless breadboard on the robot's "head." You can tinker away adding whatever you want. Strictly speaking, it would be hard to tie in the robot with amateur radio, other than to say that it does spark an innate curiosity as to how things work, and it does make you reach beyond your immediate knowledge and frame of reference.

The Volunteer Examiner Program

The term *volunteer* brings to mind the definition that I learned during my sojourn in the military service. It was one of those things you were either picked for, or something unpleasant that you "didn't have to do, but may wish you had done." Let's face it: most people shy away from the unpleasant realities, the unglamorous and often unrewarding tasks that make up everyday life.

The Volunteer Examiner Program looks great on paper. There is a great sense of "we" as amateurs gathering together and doing a very constructive, positive job to ensure the quality and number of new amateurs. There is also the altruistic sense of helping one's government in pressing economic times. The plus side of the ledger is all there, written out in big, bold letters. In fact, the concept is described extremely well by Steve Place, WB1EYI, in the December 1982 issue of *QST* under the heading "The Ideal" (page 9). But that's exactly what it is—the ideal.

"The Real" and "The Practical" that follow in this editorial are also ideal. While I am sure we can and will reach a consensus on the types of exams, the questions, the scoring, etc., we will also reach a consensus on who can administer the exams, handle the paperwork, etc. The one real and practical question left to be answered is "Who is going to pay for it?" Perhaps a better question should be "How much will the program cost?" As has been reported, the FCC does spend about three million dollars (\$3,000,000.00) plus on amateur radio each year. As we also know, that figure has never been enough to do all that was required. One way around that is deregulation—make fewer things required. By backing off on essential services, the money can be stretched somewhat.

If we back out the cost of labor and assume that we can be more efficient, it should still cost between one and two million dollars a year. Less would restrict the program to a level far below what is being done now by the FCC. It would have the effect of spiraling amateur radio down in a time when it should be expanding. I cannot foresee sufficient numbers of examining teams and clubs to underwrite this venture. It would be grossly unfair and unrealistic to assume that the ARRL could fund the program. Dues would probably have to be raised to \$150.00 per year to cover it. The plain truth is that there is not one group, manufacturer, or publisher in a position to underwrite that kind of money either. That's the problem in a nutshell.

We asked for something and we got it. Now the problem lies with us. I wish I had a good answer at the moment, but I don't. All I've done is "volunteer" to define the problem from a perspective that seems to have been glossed over.

73, Alan, K2EEK

More Transceiver

Contest or rare DX – the world is waiting to hear from a new breed of HF operators who'll have the power of a microcomputer at their instant command. The Heath SS-9000 signals a new era in Amateur Radio, full of exciting promise. Challenge. And opportunity...



MORE WORLD HORIZONS

In the SS-9000, we met a major design goal: *provide the highest-tech, most versatile transceiver possible.* Our objective? Nothing less than setting the pace for transceiver performance in the next decade. And transforming the state-of-the-art in amateur telecommunications potential.

As a microprocessor-based, fully-synthesized nine band Transceiver, your SS-9000 leads the new revolution in computer-enhanced hamshacks – with an array of applications yet to be

discovered. At your command under direct or RS-232 control, it could break all known records for station performance.

MORE MICRO CONTROL

Harness the SS-9000 to a video terminal, ASCII teletype or home computer. Commands are available to select, display and change all 27 operating and memory frequencies, assign and toggle T/R/Tr status on the dual readout, and freely manipulate the three stored frequencies on each band, with full diagnostic error-prompting.

Keyboard command also allows you to set and switch the band, mode, passband shift, baud and scan rates, plus switch to one of five antennas automatically.

MORE POWER AS A PAIR

The PS-9000 AC Power Supply has an in-cabinet speaker and two digital 12 or 24-hour clocks. Both units benefit from thermal and over-current protection with high VSWR cutback. Test-prove the assembled System 9000. Get a hands-on tryout at your nearby Heathkit Electronic Center.*

MORE DETAILS IN CATALOG



FREE! For complete details and specs, get a copy of the latest Heathkit catalog.

Write: Heath Company, Dept. 012-984, Benton Harbor, MI 49022.

There's more for the Ham at Heath

*Units of Veritechnology Electronics Corporation in the U.S., a subsidiary of Zenith Radio Corp.



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Heath
Company

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FOR
10-15-20 METERS

VERTICAL
OMNI-GAIN

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END FED

NO RADIALS

NO REFLECTED
POWER

BROADBAND

FIXED OR
PORTABLE

REMOTE TUNING

2 KW PEP

UPS SHIPPABLE

R3

R3 may be the perfect antenna for condominiums, apartments, small lots or any limited space situation. It is a great antenna for hams who are concerned about neat appearance and maximum performance.

R3's self supporting radiator is only 21ft-6.4m high x 1ft .304m wide at the base. Assembly is quick and easy for portable, marine, field day, DX-peditions, or fixed installations. It is complete with remote tuner.

AVAILABLE THROUGH
DEALERS WORLDWIDE



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CORPORATION

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Manchester, NH 03108 USA
TELEX 953050



Our Readers Say



Greenwich Is Not At Greenwich!

Editor, CQ:

This may be a "mean time" to tell your readers (pun intended), but I discovered last month that Greenwich is not at Greenwich!

My wife and I were on one of our trips to England (we come from there originally) and, as a comparatively new ham, I felt it necessary to make a pilgrimage to Greenwich Observatory, which provides the basic standard for time-keeping throughout the world.

The former observatory is now a fascinating museum located in a park a little way from the south bank of the River Thames in London. It is, of course, a famous historical part of London. The actual building is atop a fairly steep hill, a fact I should mention in that we two 60-year olds were obliged to stop for a breather more than once as we trudged skyward. We had already "done" the Tower of London earlier that afternoon.

I recommend that other hams make a similar pilgrimage. The place is chock full of early telescopes and clocks, all beautifully preserved, with full descriptions of their inventors and usage way back into history. Some of the clocks are still ticking away.

However, back to the time. At 3 p.m. we suddenly heard the Greenwich time signal and asked one of the officials if we could see the actual clock producing the signal. "Oh no, sir," he replied. "They had to move it into the country because of haze pollution. It is 60 miles from here in Herstmonceux Castle, East Sussex." You could have knocked me down with a quarter-wave whip. It was like being told the Vatican is no longer in Rome!

Anyway, it has been an interesting topic on the air waves since arriving back in Canada, but, this morning, my education was furthered still. I was rag-chewing about this with Cal who operates K4NTY in North Carolina, and he asked when the Greenwich observatory first started. Since he was operating a Drake with 2 kilowatts (don't all Americans?) and I was struggling through barefoot with my not-so-humble Icom 730 into a Butternut vertical, I sat up and promised to do some digging.

I dug. Lo and behold, the Greenwich time clock move started in 1946 and was finalized in 1953. They apparently took their time.

The observatory was founded by King Charles II in 1675 to keep accurate tables

of the moon's position for the calculation of longitude by English ships. A continuous photographic record of sunspots was made daily from 1873 on, weather conditions permitting. Also, the satellites of the planets Neptune and Uranus were discovered by English astronomer William Lassell through the observatory's 24-inch Newtonian telescope in 1846 and 1851, respectively.

May I suggest that time-conscious hams who elect to face east and trek their way to Greenwich as I did should take along their cameras. A brass plaque on the floor marks Longitude Zero, and they can stride the marker while having their picture taken. I didn't have my camera, but then I'm a professional photographer by occupation, so we cannot expect everything, can we?

Fred Waterhouse, VE7BPG
100 Mile House, B.C., Canada

The More Things Change The More They Stay The Same

Editor, CQ:

I immensely enjoyed rereading your August issue Antenna Special. Everything regarding antennas always interests me, and doubly so when I read the article by E. P. Swyner, VE3CUI, describing his "A Tree Mounted Yagi Array," which most certainly made me smile and recall old, old times, period.

If VE3CUI will refer to a copy of the old *Radio Magazine*, the predecessor to *CQ Magazine*, way back in 1938 (or was it in 1939?) when Larry LeKashman, W9IOP, was its editor and I was operating ZC6AA, a description was given of a "Hanging Beam" antenna for the 14 MHz band but with *no* rotator. There were *no* rotators 43 years ago, and the feed point was at the bottom of the antenna, rotated by hand. Hence, it was later on changed into a W8JK configuration with most excellent and gratifying results.

Incidentally, the rig at ZC6AA was an old Thordarson Transformer Company's kit using a 42 tube as a crystal controlled oscillator, a 46 tube as buffer/doubler/tripler/quadrupler, and a pair of 48 tubes as push-pull amplifiers. Frankly, I'm not sure of the exact sequence of the tubes, but then it was 43 years ago. Hi!

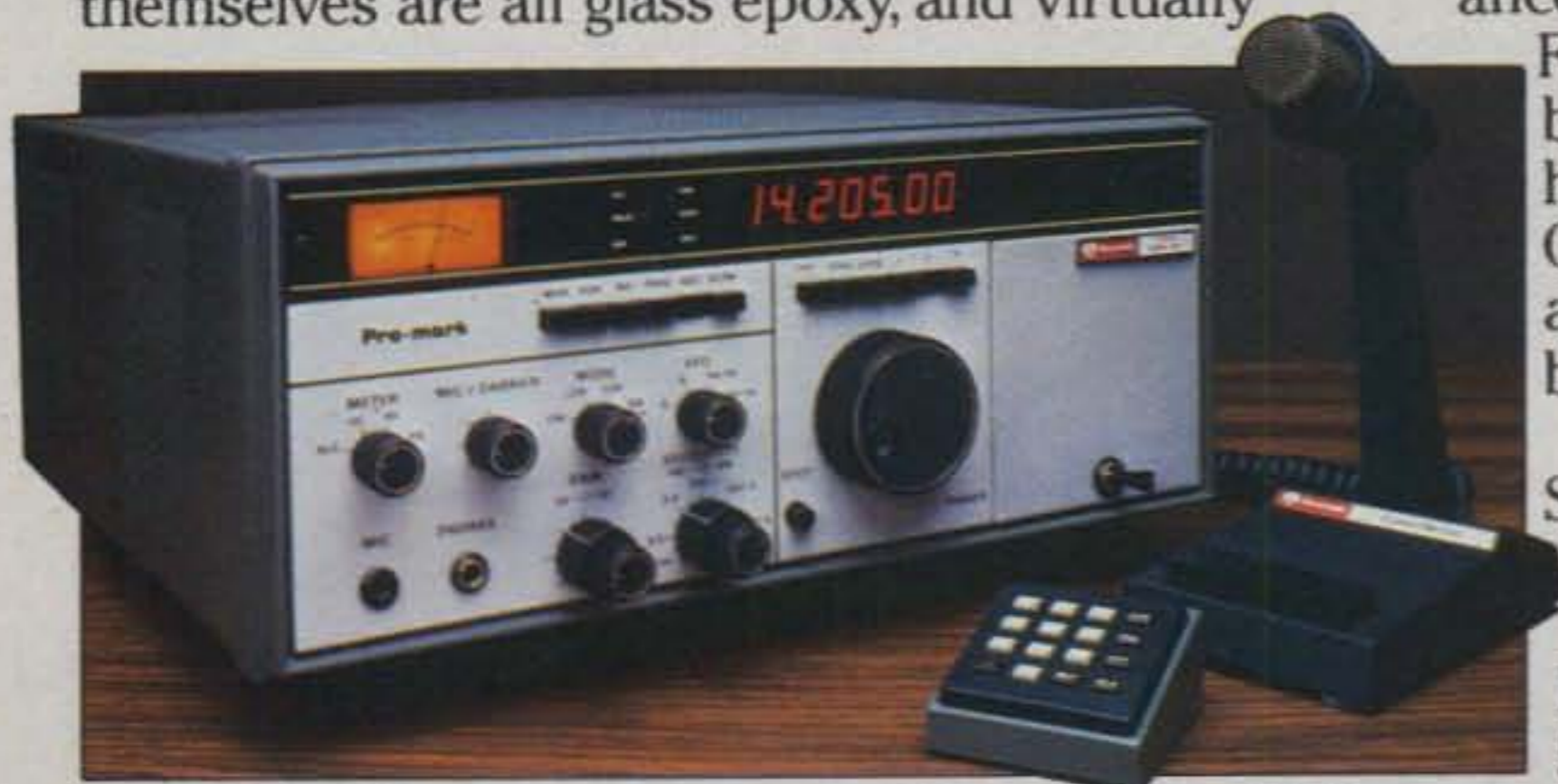
Good to know that hams still think along the same lines as we old timers did so many years ago, but still, there is nothing new under the sun.

Bob Avigor, 4X4CJ
Tel-Aviv, Israel

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HAM IV	15.0 sq. ft. (1.4 sq. m)	N/A
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Announcing

● **Special Event Station K6LY** - The Naval Post-graduate School Amateur Radio Club in Monterey, California, will operate a special event station, K6LY, during the 42nd Bing Crosby National Pro-Am Golf Championship. The station will be located near the eighteenth green at Pebble Beach. Operating hours will be 1800-2400Z daily February 3-6, 1983. K6LY will operate on the lower part of the General Class phone band on 15 and 40 meters. Stations contacting K6LY and wishing to receive a commemorative Crosby Pro-Am QSL card should send their QSL card to WB6ZSB, 831 Avalon Place, Monterey, CA 93940.

● **VHF FM Society Winter Convention** - This ARRL-approved convention will be held on February 5-6 in Brownwood, Texas. Planned are dealer displays, swap fest, lectures, and prizes. For more information, contact the Brownwood Amateur Radio Club, P.O. Box 3080, Brownwood, TX 76801.

● **New Hampshire QSO Party** - Sponsored by the Concord Brass Pounders Inc., this event will be held to promote the Worked New Hampshire Award. Operating periods will be 1900Z February 5 to 0700Z February 6, and 1400Z February 6 to 0200Z February 7. See this month's Contest Calendar column for details.

● **Wheaton Community Radio Amateurs Hamfest** - This hamfest will be held February 6 at Arlington Park Race Track Expo Center, Arlington Heights, Illinois. Free flea market tables and plenty of floor space. Large commercial area including computer section. For general information call W9JTO at 312-231-9524. Tickets will be \$3.00 at entrance, \$2.50 in advance. Send s.a.s.e. to WCRA, P.O. Box QSL, Wheaton, IL 60187. Talk-in on 146.01/61 and 146.94. Doors open at 8 a.m.

● **Mid-Winter Hamfest/Auction** - The Mid-Winter Hamfest/Auction will be held on Sunday, February 13, at the Richland County Fairgrounds in Mansfield, Ohio. Prizes, auction, and flea market. Large heated building. Doors open to the public at 8:00 a.m. Tickets are \$2.00 in advance and \$3.00 at the door. Tables are \$5.00 in advance, \$6.00 at the door. Half tables available. Talk-in on 146.34/94. For additional information, contact Harry Frietchen, K8HF, 120 Homewood Road, Mansfield, OH 44906, or phone (419) 529-2801.

● **LIMARC Hamfest** - LIMARC, the Long Island Mobile Amateur Radio Club, will hold their indoor hamfest at the Electricians Hall, 41 Pine-lawn Road, Melville, Long Island, New York, located just north of exit 49 of the Long Island Expway (495). Open from 9 to 5; general admission \$3.00. Sellers tables (4' x 6') in advance only by sending \$10.00 to Hank Wener, WB2ALW, 53 Sherrard Street, East Hills, NY 11577 or call 10 p.m. to midnight at 516-484-4322. Door prizes, food, and refreshments. For more information, contact Sid Wolin, K2LJH, 516-379-2861 evenings.

● **Lancaster, Pennsylvania, Hamfest** - The 1983 Lancaster Hamfest will be held on Sunday February 20 at the Guernsey Sales Pavilion, U.S. Rte. 30 East, Lancaster, PA. Hours: 0800 to 1600, Dealer setup at 0600 by reservation. Table fees: \$10 in the main display area, \$6 in the annex area. General admission \$3. Tailgating if weather permits. Talk-in on 146.01/61, 147.615/015, 146.52 MHz. Send reservations

to Hamfest Committee, RD #1, Box 56V, Blue Ball, PA 17519. Checks should be made payable to Sercom, Inc.

● **Algonquin ARC Hamfest** - The Algonquin Amateur Radio Club will be holding its annual flea market on Sunday, February 20, at the Marlborough Jr. High School, Marlborough, Massachusetts. Door will open at 9 a.m. for dealers and 10 a.m. for buyers. There will be refreshments and a raffle. Admission is \$1.00, and children under 12 admitted free. Advanced table reservations are \$7.00 before February 12, and \$10.00 at the door. Talk-in on 146.01/61 and 146.52. For table reservations or more information, contact Algonquin ARC, P.O. Box 258, Marlborough, MA 01752.

● **Martin County ARA Hamfest** - The Martin County Amateur Radio Association will hold its annual free hamfest, Saturday, February 26, from 8 a.m. to 4 p.m. at Langford Park on Route 707, Jensen Beach, Florida. Free admission, free table or tailgate space. Food will be available. Bring the family, area for cooking and playing. Talk-in on Stuart repeater 146.46/147.06. For more information, write to MCARA, P.O. Box 1901, Stuart, FL 33495.

● **Midwinter Madness Amateur and Computer Fest** - This event is being sponsored by the Robbinsdale Amateur Radio Club, KØLTC, and will be held on February 26 at Sacred Heart Church school auditorium, 4087 West Broadway, Robbinsdale, Minnesota. Doors will open for commercial exhibit and flea market setup at 7 a.m. General admission will open at 8:30 a.m. The day's activities include seminars on antennas, towers, computer interfacing, as well as a slide presentation on the voyage of the viking ship Hjemkomst. Grand prize drawing will be held at 2 p.m. Lunch will be available in the building. General admission is \$2.00 in advance and \$3.00 at the door. Commercial exhibit space is available at \$15.00 per table; contact Bob Reid, NØBHC, 19725 Jackie Lane, Rogers, MN 55374. Flea market space is available at \$3.00 per space; contact Barry Blazevic, WBØFBN, 5437 Virginia Ave. N., New Hope, MN 55428.

● **Livonia ARC Swap 'n Shop** - The 13th Annual Livonia Amateur Radio Club's Swap 'n Shop will be held on Sunday, February 27, from 8 a.m. to 4 p.m. at Churchill High School in Livonia, Michigan. There will be plenty of tables, door prizes, refreshments, and parking. Talk-in on 144.75/5.35 and 52 Simplex. Reserved table space of 12-foot minimum available. For further information, send s.a.s.e. (4" x 9") to Neil Coffin, WA8GWL, c/o Livonia Amateur Radio Club, P.O. Box 2111, Livonia, MI 48151.

● **Winterfest™ '83** - The 10th annual winter season hamfest, Winterfest™ '83, celebrating the 20th anniversary of the Vienna Wireless Society, will be held at the Community Center, 120 Cherry Street, Vienna, Virginia on Sunday, February 27, beginning at 8 a.m. A c.w. contest, displays by major electronic manufacturers and dealers, prizes, an indoor flea market, and outdoor Frostbite tailgating will be featured. Sales tables are \$5 and \$10. Parking is free. Tickets are \$4. Talk-in will be on 146.31/91 and 146.52 Simplex. For full information send s.a.s.e. to Winterfest '83, P.O. Box 418, Vienna, VA 22180, or call Jeff Wilkes, W4NFA, at 703-281-4249.

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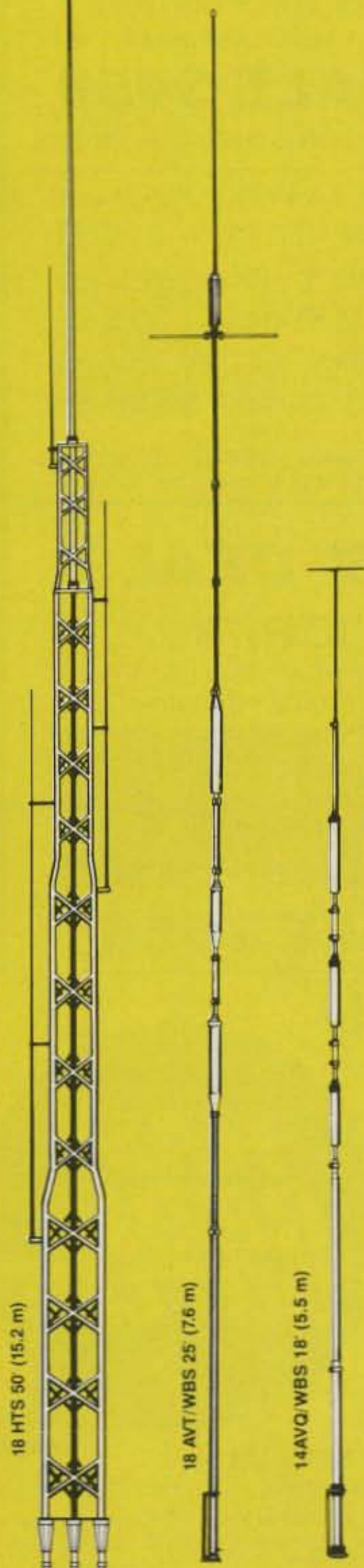
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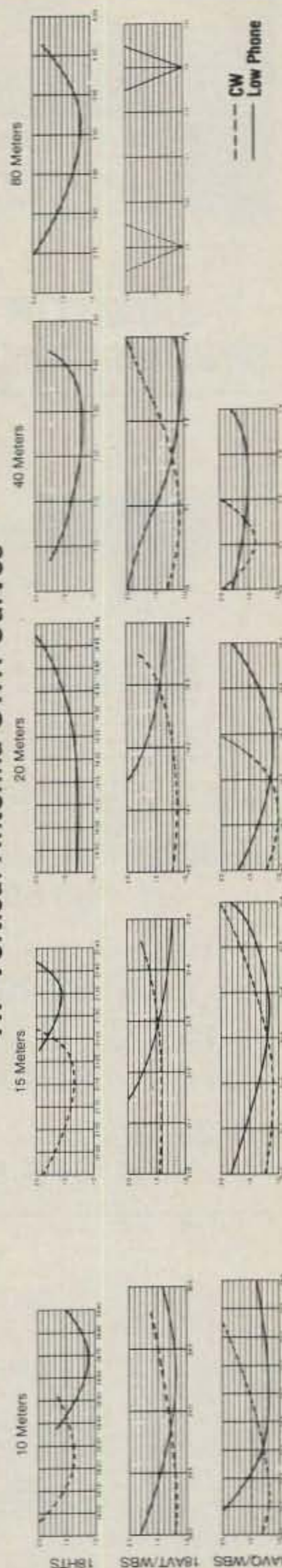
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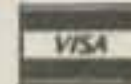
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A CQ Exclusive
CQ Interviews . . .
Dr. William Schneider, K2TT
Under Secretary of State
For Security Assistance, Science and Technology
Department of State, Washington, D.C.

BY THEODORE J. COHEN*, N4XX

Dr. William Schneider, Jr., K2TT, is the Under Secretary of State for Security Assistance, Science and Technology. He joined the Administration as the Associate Director for National Security and International Affairs at the Office of Management and Budget prior to being nominated as Under Secretary.

Dr. Schneider is an economist and defense analyst. He was formerly a Staff Associate of the Subcommittee on Defense and of the Committee on Appropriations in the U.S. House of Representatives. He has also served as a consultant to the Hudson Institute in New York.

Prior to joining the House of Representatives staff in 1977, Dr. Schneider was a U.S. Senate staff member and a Professional Staff member of the Hudson Institute. At the Hudson Institute he contributed to studies on strategic forces, Soviet affairs, theater nuclear force operations, and arms control.

Dr. Schneider is the author of several works on defense policy, including an annual review of defense budget issues entitled Arms, Men, and Military Budgets (Transaction Press); Why ABM? Policy Issues in the Missile Defense Controversy (Pergamon, 1969); and numerous arti-

cles and monographs on Soviet military policy, U.S. strategic forces, and defense budget issues. He is also the author of a study of economic warfare, Food, Foreign Policy, and Raw Materials Cartels (Crane, Russak, 1976).

Dr. Schneider received his Ph.D. degree from New York University in 1968. He is a member of the American Economic Association, the Econometric Society, and the International Institute for Strategic Studies.

It is with great pride that we now present this exclusive interview with Dr. William Schneider, Jr., K2TT.

CQ: Bill, tell us a little about your new position and responsibilities.

Schneider: Well, Ted, I have the responsibility for U.S. international telecommunications and information policy. Because it is not possible to make a clear distinc-

tion between "domestic" and "international" questions in this field, I also have to maintain close coordination with "domestic" agencies such as the FCC, the Department of Commerce, and others, through the Interagency Group on Telecommunications and Information Policy. By the way, I chair this group.

CQ: What part of your position relates directly to amateur radio?

Schneider: Part of my duties deal with U.S. participation in the ITU. As such, I am responsible for the treatment of amateur radio in the ITU regulations. In addition, I deal with ITU spectrum management issues which are of interest to the FCC, NTIA (*National Telecommunications and Information Agency—ed.*), and other U.S. government agencies. As you know, U.S. positions on ITU issues are developed on an interagency basis by means

*Media-Tech, 8603 Conover Place, Alexandria, VA 22308

of active public participation in various advisory groups and FCC proceedings. The final products, subject to review by a senior level group which I chair, are the bases for developing instructions for U.S. delegations to ITU meetings. The Department of State is also responsible for the work of these delegations.

CQ: What, in general, is the relationship between the Department of State and the international telecommunications community?

Schneider: The Department of State is responsible for maintaining good relations between governments. A portion of the Department's efforts, therefore, involves matters pertaining to international telecommunications. The FCC and the NTIA are responsible for our domestic telecommunication policies, but we work closely with these and other agency in order to protect our interests and meet our objections in the international arena.

The amateur radio community was well prepared and well represented at WARC-79.

CQ: How well was the amateur community prepared for WARC-79?

Schneider: The amateur radio community was well prepared and well represented at WARC-79. Moreover, the results of the WARC, as reflected in the new WARC allocations at 10, 18, and 24 MHz, underscore the notion that the amateur services were successful in the WARC. (Note that there are two services: the amateur [terrestrial] service and the amateur-satellite service.—ed.)

The results of the WARC, as reflected in the new WARC allocations at 10, 18, and 25 MHz, underscore the notion that the amateur services were successful in the WARC.

CQ: In retrospect, Bill, what, if anything, should the amateur community have done which would have better served amateur needs at WARC?

Schneider: Rather than go over old ground, let me just say that amateur radio is best served when it remains well informed on the work in the ITU and the CCIR (the technical arm of the ITU—ed.). Then, too, the amateur services should provide their views clearly, forcefully, and at an early date to receive full consideration in preparation for international conferences.

CQ: How important are the actions of the International Radio Consultative Committee (CCIR—ed.) to the amateur services?

Schneider: The CCIR has considerable influence over the evolution of international telecommunications policy. As a consequence, it imparts an important but indirect influence on the amateur services.

The amateur services should provide their views clearly, forcefully, and at an early date to receive full consideration in preparation for international conferences.

CQ: There are several ITU conferences scheduled for the 1980s. Which ones do you consider to be the most important to the amateur services and why?

Schneider: Perhaps the ITU conference with the most direct bearing on the amateur service will be the Broadcasting WARC. This WARC could have an important effect on the practices which now govern the international broadcasting field . . . practices which currently result in substantial interference to the amateur service on several of the h.f. bands. In addition, the field of telecommunications is evolving so rapidly that decisions taken in the various ITU conferences could have a profound influence on the development of the amateur services for years to come. None of the ITU meetings and conferences can be overlooked by the amateur community.

The problem of allocating the spectrum will be complicated by the large number of national claimants compared to the number we had in the 1950s.

CQ: With respect to frequency allocations, which services will be competing with the amateur services for spectrum space during the 1980s?

Schneider: Just about all of them, Ted. The competition for space in the r.f. spectrum will be fierce for the balance of this century, with multiple users employing "advanced" as well as "traditional" communication techniques. The problem of allocating the spectrum will be further complicated by the large number of national claimants compared to the number we had in the 1950s.

CQ: Bill, do you see any "problem areas" surfacing in the ITU which the amateur services should address now?

Schneider: It is difficult to predict which areas will emerge as problems in the sense of a "threat" to the amateur services. After all, the planning process is just beginning for many of the conferences which will be held later in the 1980s. The amateur community needs to familiarize itself with the content of these conferences, and it should clearly identify its interests in areas of concern so that sound preparation can be carried out on a timely basis.

CQ: The U.S. has bilateral agreements with various countries regarding amateur operations. While such agreements are generally considered beneficial to both parties, a number of foreign amateurs operating in the U.S. abuse their phone-patch privileges. How is this situation viewed within DOS?

Schneider: Abuses of privileges contained in bilateral agreements are a threat to the

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ability of the DOS to sustain those agreements which are now in existence. Such abuses also threaten our ability to negotiate new agreements with other nations who have expressed an interest in such bilateral agreements.

CQ: Are there problems of a specific nature between the U.S. and any other administration which relates to amateur operations?

Schneider: No . . . at least none that are known to me, Ted.

CQ: What is the current status of the WARC Treaty in the Senate?

Schneider: At this time (*late November 1982—ed.*), the WARC Treaty is pending ratification in the Senate.

CQ: Ratification of the WARC Treaty was stalled for many months because Sen. Schmidt of New Mexico felt it necessary to call attention to problem areas he identified in the ITU. Could you briefly review the Senator's concern and provide some idea of State's position in this matter?

Schneider: Senator Schmidt urged better coordination of international telecommunication policy with the Executive Branch. I believe we are now well down the road towards having a better mechanism for coordination, and as such, I expect the Senate will act soon on the WARC-79 treaties.

The impression held of the amateur services is a good one internationally because these services exhibit continued participation in "state-of-the-art" communication techniques.

CQ: The ITU met in late 1982 for the purpose of reviewing its decision-making procedures. Can you comment on the main issues addressed and on pertinent U.S. positions in these matters?

Schneider: The ITU Plenipotentiary Conference met at Nairobi from September 25th to November 6th, 1982 to develop a new treaty governing the operation of the ITU. The issue of main concern to the U.S. was the continued, efficient operation of the Union within a reasonable budget which is allocated fairly among the countries of the ITU.

CQ: Bill, what are the perceptions of the amateur services within the international telecommunications community?

Schneider: The impression held of the amateur services is a good one internationally because these services exhibit continued participation in "state-of-the-art" communication techniques.

CQ: What are a few of the reasons why

some countries oppose the development of amateur services?

Schneider: The few nations which oppose the development of amateur radio do so out of concern—however mistaken—that it would be misused for purposes hostile to the existing government. The number of such nations is small, and I expect such inhibitions to fade away over time.

We are making every effort to encourage the USSR to comply with their treaty obligations.

CQ: Bill, for years, Russian over-the-horizon, high-frequency radar systems (*the so-called "Woodpeckers"—ed.*) have been interfering with the worldwide communications of many telecommunication services, and, in particular, with operations of the amateur service. What steps has the U.S. taken, and what steps are we now taking, to force the Soviet Union to comply with the ITU Rules and Regulations in the operation of these radar systems?

Schneider: We are making every effort to encourage the USSR to comply with their treaty obligations. In this regard, I hope we will be more effective in the future than we have been in the past.

CQ: Given our nation's technological capabilities, and given our growing dependence on telecommunications for civilian and government applications, isn't the "one nation, one vote" rule in the ITU harmful to U.S. interests?

Schneider: Ted, "one nation, one vote" has been urged by the U.S. constantly since the end of World War II. Our influence in the ITU and in other organizations

is not limited by our having only one vote. There are drawbacks to the "one nation, one vote" rule, of course, but other arrangements have more problems.

CQ: Have any studies been performed to determine the connection between the technological capabilities of a country and its amateur population? That is, is there any evidence to suggest that countries with strong amateur services have strong communications and electronics industries?

Schneider: I am not aware of any specific studies, although it would be a most interesting subject. However, anecdotal evidence suggests that a high level of amateur activity is consistent with an indigenous ability to absorb advanced technology.

CQ: Bill, on a lighter note, what aspects of amateur radio interest you the most? Do you find much time to get on the air?

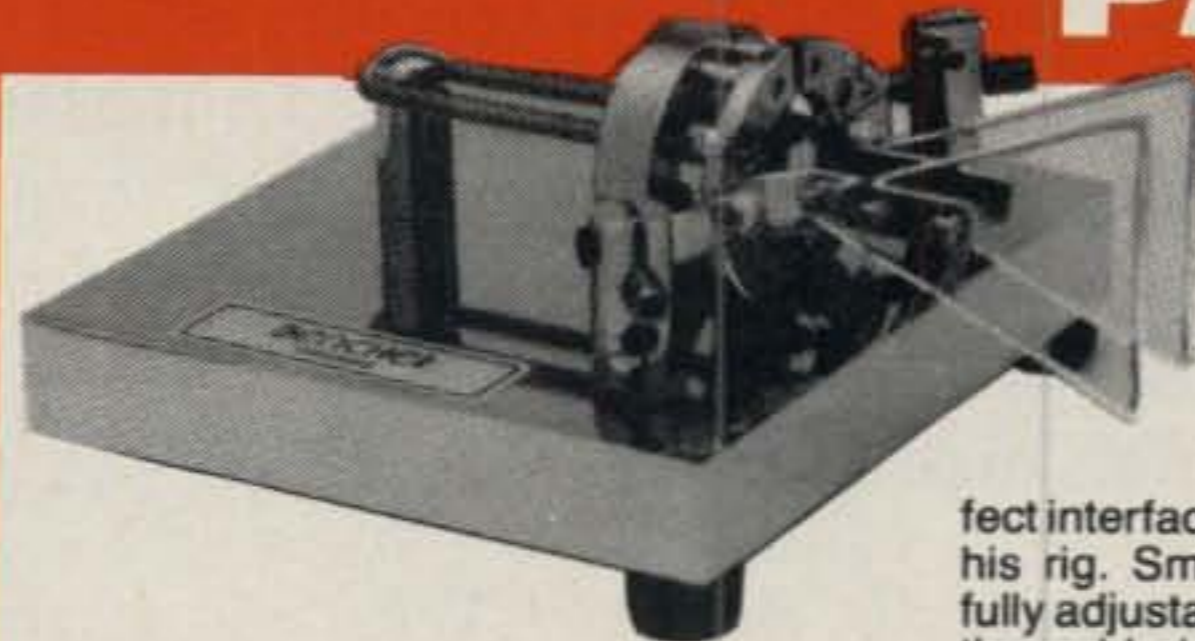
Schneider: I am most interested in DX and contest work on the h.f. bands . . . especially on 7 and 14 MHz c.w. In particular, I am especially active in the major DX contests from K2GL/N2AA, although more often than not, you'll find me throughout the year mainly on 14 MHz c.w. Though I haven't tried the new 10 MHz band yet, I expect to do so shortly—hopefully with an antenna more effective than the dipole I have been using as a receiving antenna on this band.

CQ: Bill, thank you for being with us today. The staff of CQ magazine joins me in congratulating you on your new position and in wishing you the best of luck in your work!

Schneider: Thank you, Ted. I enjoyed the exchange.

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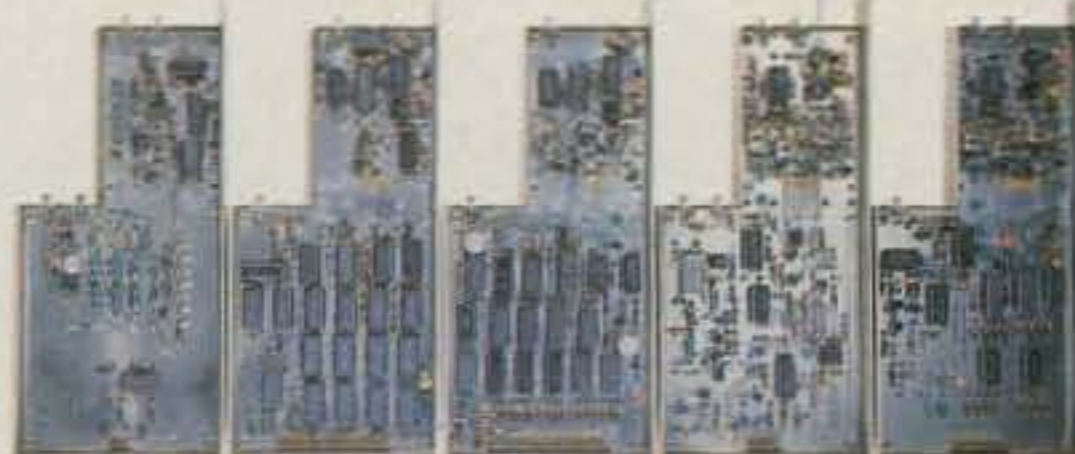
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K4TWJ gives us an overview of our newest band. He includes how to get some currently available gear on 30 meters, plus antenna hints for getting that signal out.

30 Meters Is Here

BY DAVE INGRAM*, K4TWJ

Becoming reality in an expected yet somewhat time-surprising manner, the first WARC acquired amateur h.f. band was opened for use by U.S. amateurs on the afternoon of October 28, 1982. This 30 meter allocation of 10.100 to 10.109 MHz and 10.115 to 10.150 MHz thus is now available on a secondary basis to all radio amateurs holding a General Class or higher license. In addition to protecting the yet reserved range of 10.009 to 10.115 MHz, we should also avoid interfering with any commercial stations appearing within our allocations.

Operation on the 30 meter band is limited to a maximum of 250 watts, and the permitted modes are c.w. and RTTY. Considering the relatively small amount of available spectrum, these parameters seem quite logical. Indeed, we strongly suggest avoiding RTTY and using c.w. exclusively until activity begins to settle to a more normal pace in this very busy range. The opening of 30 meters brings back memories of the first days when new OSCAR satellites were released for amateur communications. Everyone clamored to join the action, and resultant interference was tremendous. Several months later, crowds thinned and operations shifted to an enjoyable, calm pace. If 30 meter activity seems hectic at this time, be patient for a few more months or try operating during the wee hours; the most inopportune times yield the greatest returns.

A number of countries authorized amateur operations on 30 meters during mid to late 1982; consequently, DX opportunities are great. Japan, Australia, and numerous European countries, for example, can be worked on the band almost every morning or evening with relatively few problems. Considering the small amount of available spectrum and the comparatively large number of users, it should be obvious that a sharp c.w. filter is highly desirable for serious 30 meter operating and DXing. An efficient antenna with a degree of directivity is also quite beneficial.

*Eastwood Village No. 1201 So., Rt. 11, Box 499, Birmingham, AL 35210

The Band

Propagation characteristics of 30 meters appear to be a cross between those noticed on 40 meters and 20 meters with a favoring aspect toward 40 meters. Atmospheric noises are noticeable, but not overly irritating, and DX chasing usually meets with success (probably due to the fact that everyone has a sporting chance on this "power equalizing" band). Optimum operating times appear to fall when darkness is midway in a particular path. European and African signals, for example, are relatively strong into the United States between 0400 and 0600 GMT, while Australian and Japanese stations roll in around 1100 to 1300 GMT. I've personally noticed that patience and perseverance are keynotes to productive 30 meter DXing. Anyone willing to "hang in there" for a few minutes will usually realize success in an easier manner than experienced on 20 meters. This 250 watt limit is great!

Another attractive aspect of 30 meters involves its convenient operation with today's all solid state transceivers. This instant-on, no tune-up, and near maximum power capability arrangement permits 10 or 15 minute operating stints which usually would be discouraged when using tube rigs. While writing this article, for example, we took a 20 minute break and worked Oregon, Venezuela, and France on 30 meters. The setup was an IC-730 and dipole; the time was 10:00 p.m. on Saturday evening. Don't expect all DX stations to be weak; many of them have surprisingly good signal strength!

Thirty meters seems to be an ideal band for QRP operations. Five watt signals stand a reasonable chance of survival in a 250 rather than a 1000 watt world. As an example of this 1:50 ratio, consider the number of 20 watt licensed Japanese stations consistently working U.S. amateurs on the upper h.f. bands. Ten-Tec's Argosy transceiver is already equipped for QRP operations, and its 30 meter success seems imminent. Low-power homebrew transmitters for 10.1 MHz also hold merit, but v.f.o. control or "crystal warping" is vital for dodging QRM.

NOTES:

1. Remove the blue wire connected to terminals S1e (2) and S1d (4).
2. Remove the gray wire connected to terminals S1e (2 and S1d (8).
3. Unsolder and remove the blue wire on terminal S1d (6) and connect it to terminal S1d (7).
4. Unsolder and remove the blue wire on terminal S1d (6) and connect it to terminal S1d (5).

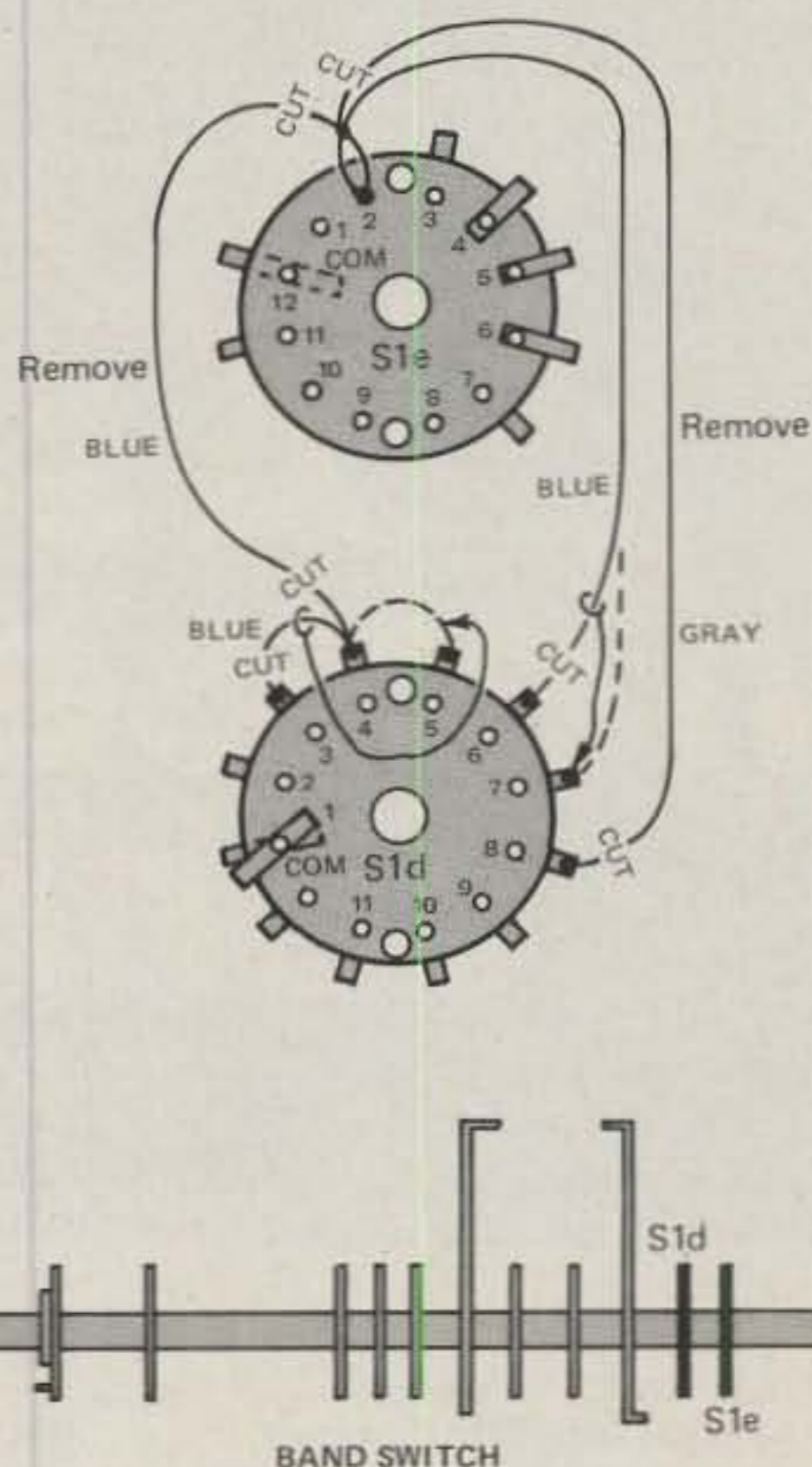


Fig. 1—Thirty meter WARC modifications for Yaesu's FT-101ZD (late models only).

Enabling WARC-Equipped Transceivers

Assuming you possess a WARC band equipped h.f. transceiver, your prime question at this time will probably be how to make it capable of transmitting on 10.100 MHz. I'll provide some directives, but please also refer to your particular unit's instruction manual (who should know a transceiver's circuitry better than its manufacturer?). Most of the WARC

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NOTES:

1. Remove the gray wire connected to terminals S1h (a) and S1g (8).
2. Remove the blue wire connected to terminals S1h (a) and S1g (4).
3. Unsolder and remove the blue wire on terminal S1g (6) and connect it to terminal S1g (7).
4. Unsolder and remove the blue wire on terminal S1g (2) and connect it to terminal S1g (5).

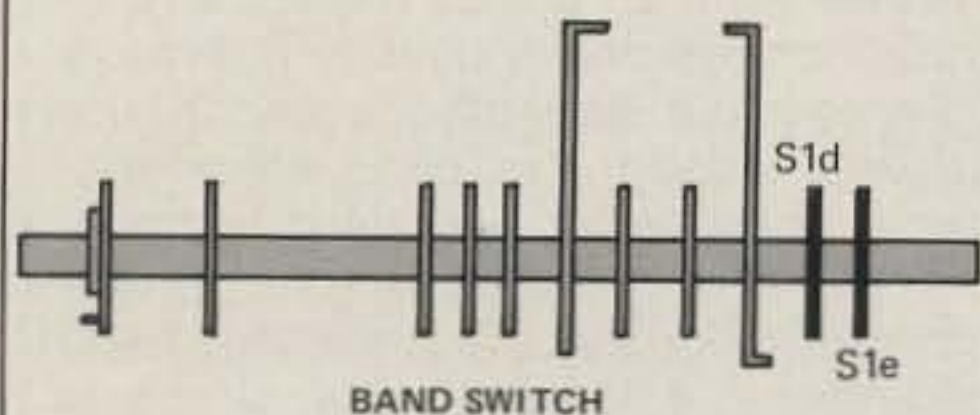
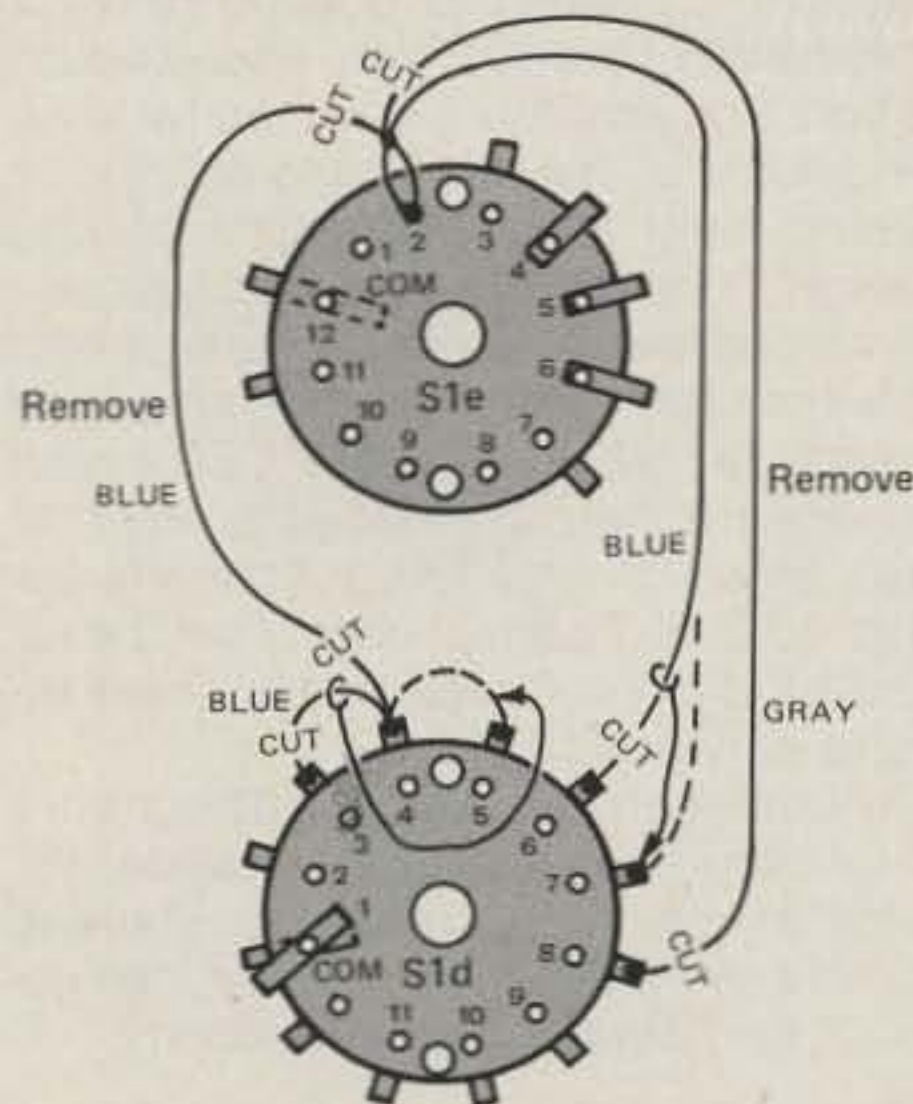


Fig. 2—Thirty meter modifications for Yaesu's FT-902DM.

band equipped transceivers manufactured prior to 1983 employed transmit inhibiting diodes or missing jumpers to prevent accidental operations before government authorized activities. Once these relatively simple changes are made, you're ready to enjoy the fun.

The following information was supplied from related equipment manufacturers and distributors in an effort to (1) assist amateurs in getting on WARC frequencies as quickly as possible, and (2) to relieve the unbelievable number of inquiries received. Our sincere thanks for their assistance with this information.

ICOM. The IC-740 is WARC-enabled by cutting a single wire going to transmit inhibit diodes. Look on page 22 of the instruction manual, and remove the rig's cover to gain access to the RF unit board. Find the first L.O., and J1 (upper left). Diagonally above J1, the manual shows a white dot. On the RF unit that's a white resistor "standing upright" with a wire loop at its top (easily spotted, because there's a drop of solder on it). Cut the loop, and it's ready to go.

The IC-730 is also WARC-enabled by cutting its jumper on the RF unit (left side of rig near mike connector). Refer to page 23 of the manual, and locate the 1 inch

long green wire marked with a D at both ends (a flashlight may be helpful). Clip the wire, and you're ready for action.

The IC-720 is opened on all bands by cutting the light-blue wire underneath its top access door (watch those v.f.o.'s to prevent out-of-band transmissions!). Raise the door and locate the only visible connector with several attached wires. There will be a pure blue and a light-blue wire on the plug. Cut only the light-blue wire. Switch on and enjoy immediate activity.

Kenwood. Kenwood transceivers include the TS-130, TS-530, TS-830, and TS-930. Kenwood simply says "cut the diode jumper as per instruction manual." We've found, however, quickest and easiest access to that wire on the TS-530 is via the bottom AF unit board. **TS-130:** Refer to the manual's page 19, and clip the brown wire on J5. WARC-enabling the TS-930 is slightly different, requiring the addition of a short jumper "as per instruction manual."

Yaesu. Associated transceivers here include the FT-107M, FT-101ZD, FT-707 Wayfarer, FT-901DM, FT-902DM, and FT-102. As this article is being written, Yaesu is busy preparing "30 meter inclusion kits" and/or information sheets on the previously mentioned rigs. If you contact them for these items, remember to include an s.a.s.e.

If the FT-107M is WARC-equipped, remove D16, D17, and D18 on RF mother pcb. If it is not WARC-equipped, contact Yaesu for their "mod kit." Remember to include the serial number. (Yaesu WARC-equipped units include 30 meters on bandswitch. Non-WARC units must use "aux" position on bandswitch.) The FT-101ZD: If WARC-equipped, refer to fig. 1. If not WARC-equipped, contact Yaesu for "mod kit." The FT-707 is 30 meter enabled by removing its top cover, locating the RF unit board and disconnecting D21, D71, and D72 (positioned near J04 and Q05). The FT-102 is 30 meter operational as supplied, and a grand rig. The FT-

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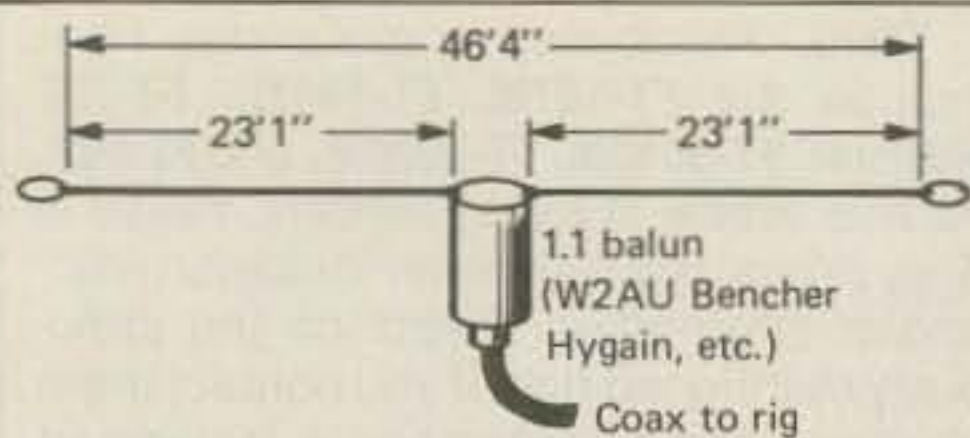


Fig. 3— Dimensions for a 10.120 MHz dipole antenna.

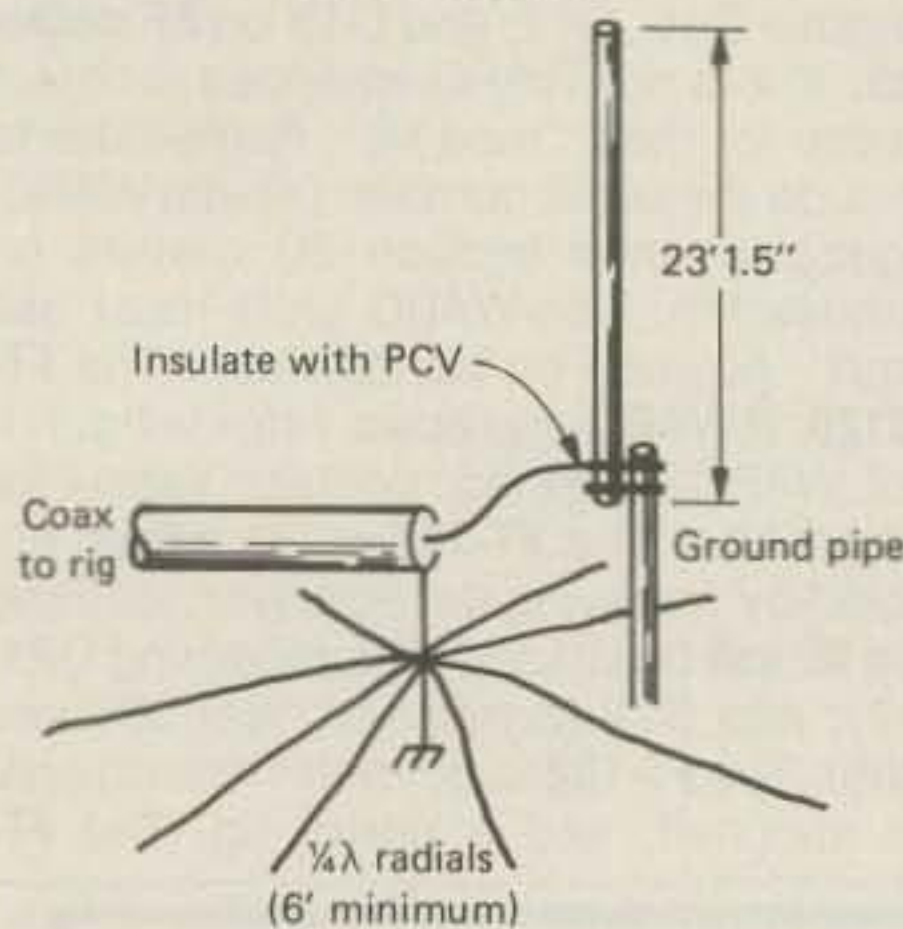


Fig. 4— Dimensions for a $\frac{1}{4}$ wavelength vertical radiator for 10.120 MHz. The vertical should have a fairly clear view of the horizon and be at least $\frac{1}{4}$ wavelength from power-absorbing obstructions.

902DM is shown in fig. 2. Yaesu is still working on the FT-901DM mod kit.

Drake. The TR-7 and TR-7A transceivers are WARC-enabled by installing their AUX board, and then plugging into it either the RTM-7 for 30 meter operation only, or the WARC kit board for coverage of all three bands. The TR-5 is ready to operate as supplied.

Ten-Tec. The Delta and Argosy are ready to operate as supplied. The Omni series A or B requires a kit available from Ten-Tec. The kit contains a few coils and capacitors that go on bandpass filters and Lo-

pass filters. A simple and brief tune-up is required after installation.

Collins. Gearing the KWM-380 for WARC-band transmission calls for replacing a ROM on the control card with an SB10 ROM, as detailed by John Schultz, W4FA, on page 58, CQ, November 1982. This chip will either solder or plug in, depending on the particular unit's serial number. There are some 40 screws in the top card cage cover which must be removed for card access, so allow a couple of hours for . . . err . . . removing and replacing them.

Antennas for 30 Meters

Thirty meters with its reasonably short wavelength is adaptable to some rather unique antenna designs. The band is still a new toy as this article is being written, however, and the majority of antennas in use thus far are conventional dipoles, verticals, and longwires. Obtainable results with these basic radiators are quite impressive; indeed, one quickly gets the impression that this band is a "sleeper." Working DX with 100 watts and a dipole definitely shows merit. Want to try 30 meters tomorrow evening? Cut a dipole according to the dimensions in fig. 3, add a balun, and slingshot-erect the wires as high as possible. If you are a devoted vertical or ground plane user, fig. 4 has details on a $\frac{1}{4}$ wavelength radiator. Remember the ground must reflect a mirror image of the vertical section: the more radials, the better this mirror.

A 20 meter beam modification idea is shown in fig. 5. Lightweight wires are added "truss fashion" from each end of the driven element to a 2 or 3 foot thin-wall PVC extension placed inside the rotor's pipe. Insulators are used to "break" wire extensions at the 23.1 foot points. A similar arrangement can be added to the reflector element, if desired, for creating a close-spaced Yagi. Although I've yet to

try it, this lashup should also work smoothly with tri-band beams (assuming use of kilowatt-rated traps and 200 watts on 30 meters to avoid possible trap breakdowns).

Another 30 meter directive array suggestion is shown in fig. 6. Guy wires or antenna wires are cut for resonance on 30 meters and extended downward in a combination inverted Vee and V-beam fashion. Egg insulators are used for insulating wires at specific points and for insulating from tower legs. One pair of wires is connected to the transmission line via clip leads attached to balun ends, while the other pair of wires is jumpered to provide reflector action. Extension jumpers are then also added to reflector wires (near ground level). Properly assembled, the "beam's" signal can be rotated by moving feedpoint clips and reflector jumpers.

A number of other antenna designs are easily adapted to 30 meters: vertical J's, Bruce arrays, V beams, etc., showing promise. We will, however, leave their selection and design to your ingenuity.

Summary

A brief tune across 30 meters any afternoon or evening should be indicative of its amateur acceptance and future success. Indeed, this band holds substantial promise for upcoming low sunspot years, and it should also provide some relief for adjacent amateur band congestions. A large number of operators are chasing 30 meters Worked All States and Worked All Continents awards, so have your QSL's nearby when joining the fun. This article is being written during early November 1982. Thirty meters has been open nearly two weeks, and I already Worked All Continents. DX is everywhere. Come on in and join the action. Want to add more life to your h.f. operations? Try 30 meters. It's great!

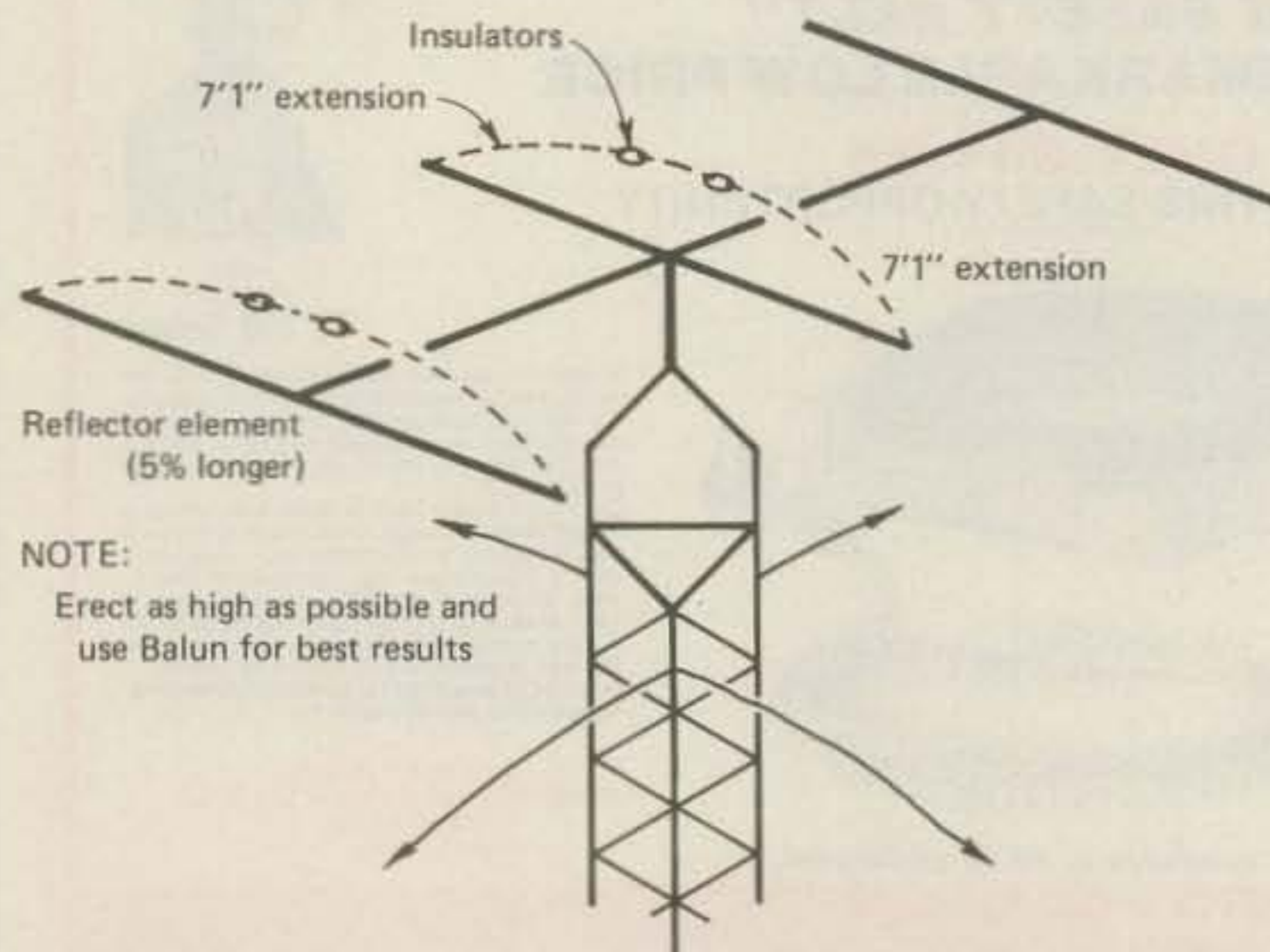


Fig. 5— The general outline for modifying a 20 meter beam to cover 30 meters. The four guy lines are a side view of what is depicted in fig. 6.

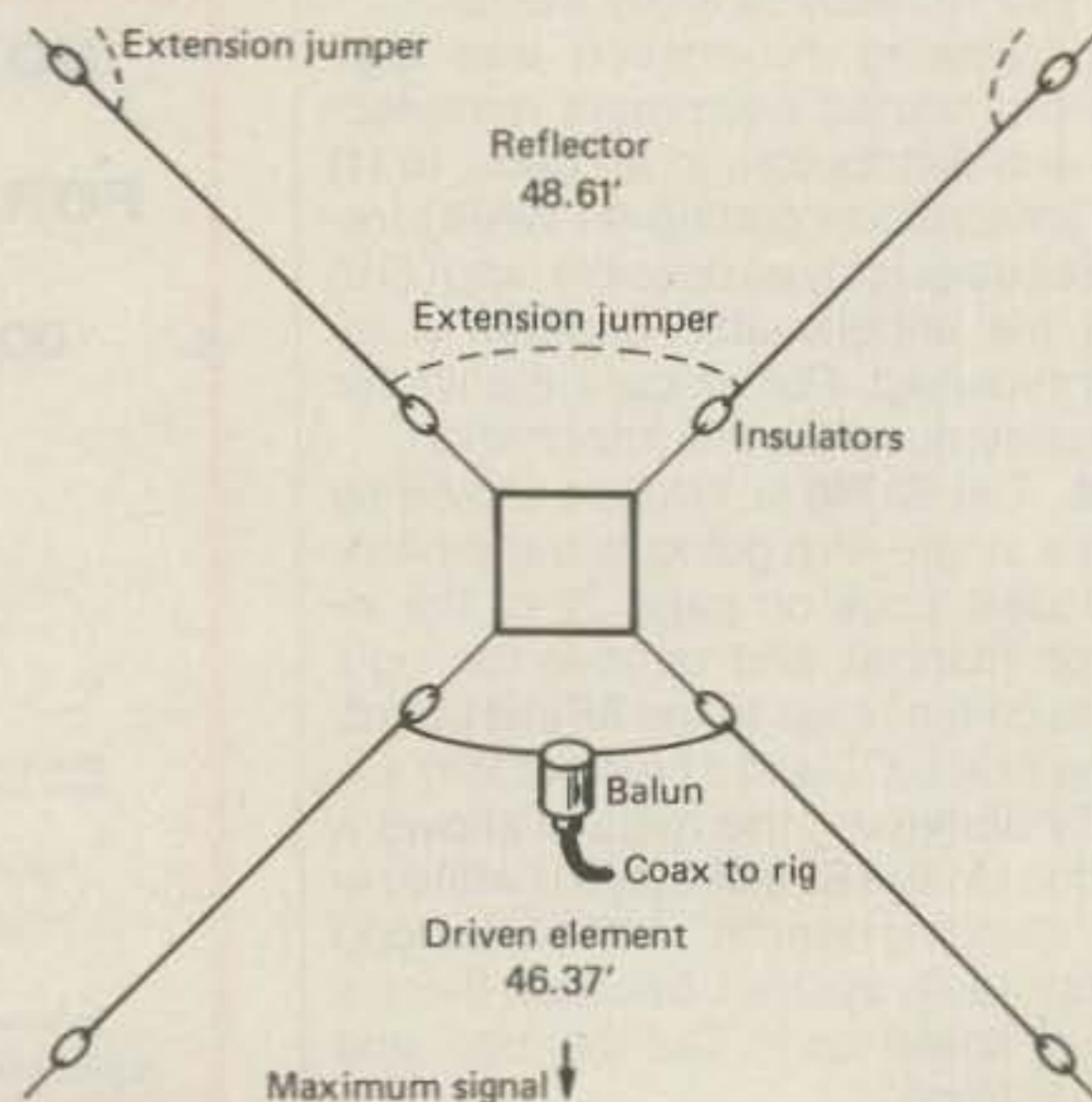


Fig. 6— The top view of the 2 element wire beam for 30 meters. Short leads from the balun are fitted with clips for quick signal rotation. Remember to include all jumper lengths in antenna calculations.

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It's time to check the local fleamarket and classified ads for a good and reasonable Swan 350C. Here's a one- or two-evening project that will get that rig on 30 meters. Although this conversion indicates that either c.w. or l.s.b. is optional, remember that 30 meters is c.w. and RTTY only.

Converting The Swan 350C To 30 Meters

BY RALPH J. ROMIG*, WA0KHV

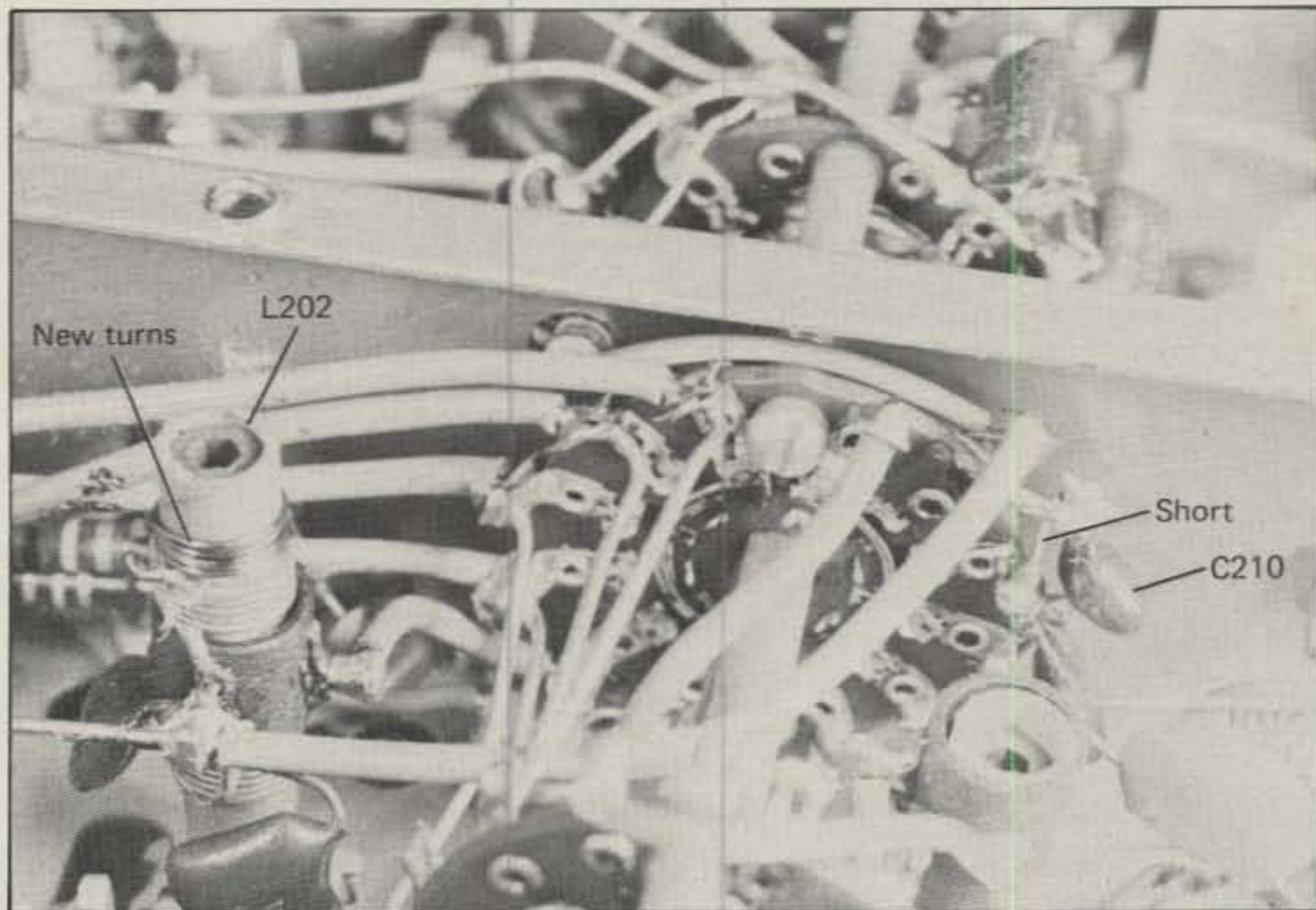
Want to work the new 30 meter band but don't have a rig capable of it? Unable to shell out the necessary money to get one? Own an old Swan 350C and willing to sacrifice 15 meters? If your answer is yes to all these questions, here is a quick, easy, and simple modification that will put your Swan 350C on the new 30 meter band.

I recently was faced with the same problem when I considered my options and possibilities for undertaking operation on 30 meters. My trusty old veteran Swan 350C was still an excellent side-band transceiver, and still capable of holding its own on 80 through 10 meters, but it had no factory provisions for operating in any other areas of the spectrum.

This is a *really* simple modification, and the only thing it takes to do it is some common small hand tools, a soldering iron and solder, about 12 inches of number 28 enamelled wire, and a grid dipper. It modifies the Swan 350C (and probably the 500C and the Cygnet as well) to cover 10 MHz to 10.45 MHz at the expense of giving up coverage of the 15 meter (21 MHz) band, and it takes less than an hour to accomplish. If the amateur who does the modification isn't happy with it, there is nothing permanent about it; things can easily be changed back to normal in another hour or less by merely reversing the process.

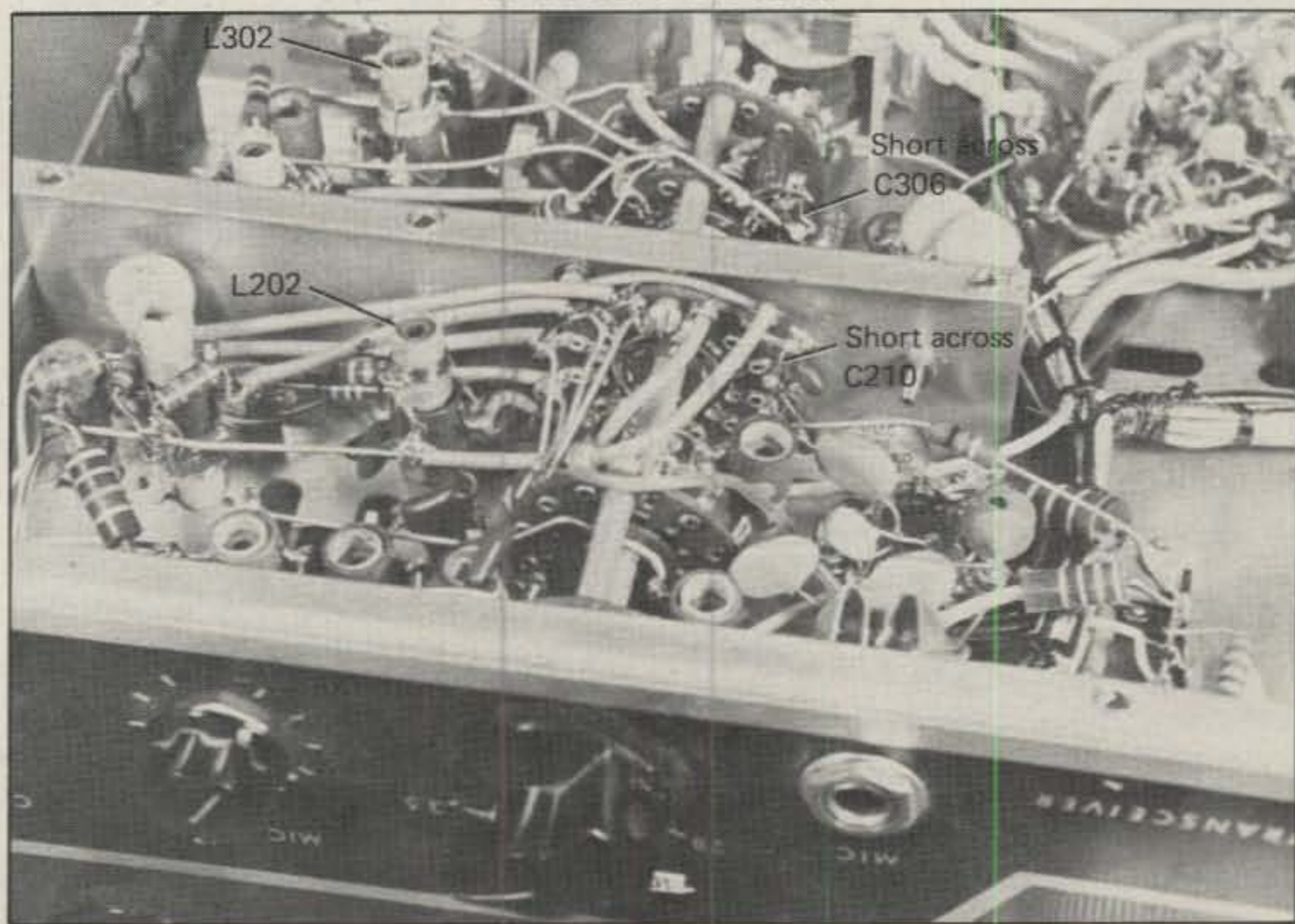
The 350C generates the basic side-band signal on a frequency of 5500 kHz using a crystal oscillator, a balanced modulator, and a crystal filter to pass one sideband to the transmitting mixer stage. This basic 5500 kHz signal is then heterodyned into one of the amateur bands above or below its original frequency by mixing it with a signal from the v.f.o. The resultant amateur band signal is then amplified by linear amplifier stages and is fed to the antenna.

The v.f.o. runs at 15,500 kHz to 15,950 kHz when the Swan 350C is operating on the 15 meter band, and the mixer stage adds the product of the two oscillators to-

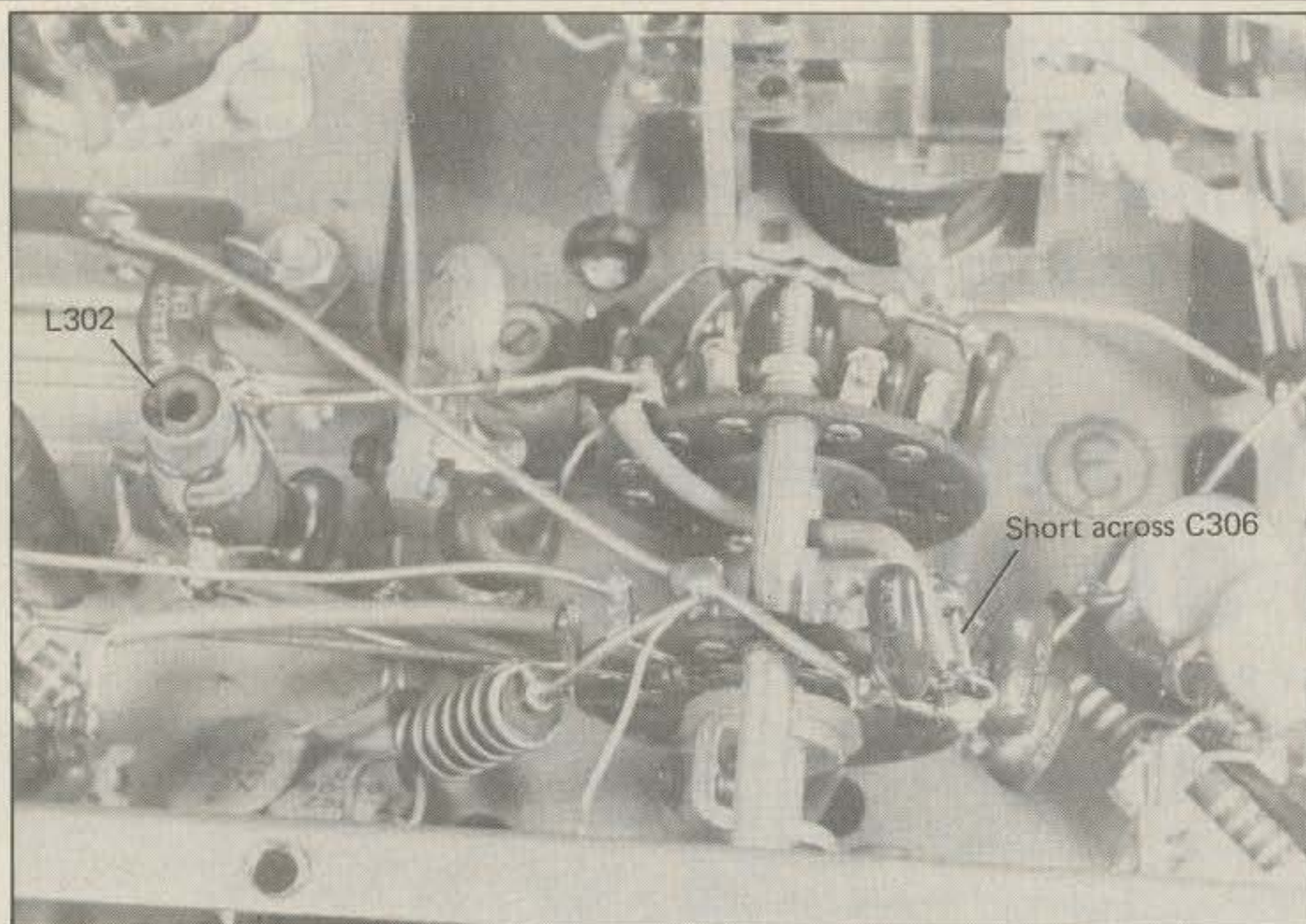


L202 is located in front of the first partition supporting the bandswitch, S4. C210 is to the right of the switch.

A general underside view of the Swan 350C showing L202, L302, and the shorts across C210 and C306.



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Looking down at L302 and the short across C306.

A close-up view of S4(F) showing the changed tap on the bandswitch.



gether to produce an output signal at 21 MHz to 21.45 MHz. If you were to subtract the frequency of the crystal oscillator from the v.f.o. and use the difference signal, you would have a possible range of 10 MHz to 10.45 MHz—squarely on top of the 30 meter band, with some left over on both sides!

All it takes to change the heterodyning process from product to difference generation is to change the resonance in two tuned circuits, and all it takes to feed this signal to your antenna at high power levels is to change one connection on the pi network in your final amplifier. Following is how you do it. (In the following, all component numerical designations are those used in Swan's original manual and schematic diagram for the 350C. Refer to the schematic diagram in your manual when making these modifications.)

Disconnect your transceiver from the power supply, antenna, microphone, and auxiliary relay contact connections, if used, and lay it upside down on the bench with the front of the rig facing you. Set the bandswitch on the 15 meter band and remove the bottom cover. The changes will be in the area of S4, the bandswitch.

L201 and L202 are both wound on a common coil form, and with the rig upside down and facing you as described, L202 will be wound on the upper half of this coil form. Locate L202 and identify the pin on the coil form to which the uppermost turn of the coil is connected. Carefully break this connection and pull about a half turn of the top winding of the coil off the form, scrape it clean, and solder about 6 inches of enamelled number 28 wire to its end. Do a nice neat job, and clip off any excess wire from the spliced

connection. Using the added length of wire you have spliced on, take five additional turns around the coil form, tamp them snugly down against one another, scrape the end of the wire clean, and resolder it to the same pin from which you removed it. Clip off any excess wire left wrapped around the pin, and give the new turns a coat of coil varnish if you have some handy. What you have done, provided you did it right, is increase L202 by five turns.

C210 is located on the rotary bandswitch, **S4(C)**, placed just to the right of L201/L202. Locate C210 and solder a short piece of bare wire across the leads, shorting them together.

Set the P.A. grid control, on the face of the transceiver, to the middle of its range at 12 o'clock. Using a grid dipper, adjust the slug in L202 until you get resonance at 10 MHz. Don't change the setting on the P.A. grid control while making this adjustment; leave it alone. In fact, leave it alone from now until you are completely finished with the project. The reason will become apparent later on. Forget about it for a while.

L301 and L302 are also wound on a common coil form and are located on the other side of a small shield from L201/L202. L302 is at the top end of this coil form, the same as L202 was. Locate L302 and pull a half turn off the topmost winding of the coil, splice about 6 inches of enamelled number 28 wire on the end, add five turns to the coil, and solder it back in place, just as you did with L202.

C306 is attached to bandswitch section **S4(D)**, which is located just to the right of L301/L302, and just the other side of the shield from **S4(C)**. Solder a short piece of bare wire between the leads of C306 and short them together, just as C210 was treated.

Use your grid dipper and tune the slug in L302 to resonance on 10 MHz. This completes the modifications to the tuned circuits in the low-level stages. Check to make sure no solder drops have shorted anything inside the set, and that none are left lying about inside the chassis. Put the bottom plate back on the transceiver and turn it right side up.

Now comes the hard part! Remove the top cover from the transceiver and lay it aside. Remove the top cover from the cage around the finals, pull the 6LQ6 tubes and lay them aside, and remove the two perforated sides from the cage enclosure. You will have to unsolder the connection to the coaxial connector to get off the cage completely.

Locate the 10 and 15 meter tap on the tank coil (a common tap is used on this coil for both bands), and follow its lead down to the ceramic bandswitch, **S4(F)**. Note that there is an unused connection on **S4(F)** located one step clockwise from where the 10/15 meter tap is connected. Unsolder the 10/15 meter tap connection from **S4(F)** and resolder it to the (formerly)



Front view of the modified Swan 350C. The 21 position has been changed to 10.

unused connection. This step involves working in some tight quarters with limited visibility, but if I did it with my big hammy hands and king-size soldering gun, so can you.

If you have done it right, this will have the effect of shorting out the coil on all but the 10 and 15 meter section when the bandswitch is set to 10 meters. When you move the bandswitch to the 15 meter (or rather the new 30 meter) position, the same section of coil is used as in the 20 meter position. There is sufficient capacitance in the plate tank capacitor, C417, to accommodate this dual duty on 30 and 20 meters.

Put the cage back around the final, resolder the coaxial connector to the output lead, place the 6LQ6's back in their sockets, check to make sure nothing is shorted by stray solder drops, and replace the top cover on the transceiver. As a final step, relabel the bandswitch on the transceiver's face "10" instead of 21.

You are now ready to peak the tuning in L202 and L302. Hopefully, you haven't touched or changed the P.A. grid control during all these proceedings. Stand the transceiver on its side so that the slugs in L202/L302 are accessible through their holes in the bottom plate. Connect the power supply, connect the antenna connector to a dummy load, and plug in the microphone. Set the main tuning dial to the middle of the 30 meter band, 125 on the green scale. Set the coarse and fine loading controls at maximum values, the P.A. tune at minimum (3 o'clock), the microphone gain at minimum, and the carrier balance control to null out the carrier. Turn the set on and let it warm up.

When the set has warmed up, press the microphone button and offset the carrier balance control to obtain a little plate current. While the microphone button is keyed, adjust the slugs in L202/L302 to

obtain peak indicated plate current. Keep the plate current under 100 ma by adjusting the carrier balance control while tuning the slugs, and make the adjustments as quickly as possible, as the final is out of resonance. If your grid dipper was reasonably accurate, the coils should be fairly close to resonance already and should only require minor adjustment. The gross amount of plate current obtained while making these final touches to the tuning is unimportant; all that matters is to peak them.


Once you have L202 and L302 peaked, the transceiver is ready to tune up into

the dummy load. At this point, you can remember that you have a P.A. grid control and use it to peak current in the final. If you have tuned it correctly, peak current will occur with the P.A. grid control set exactly where it was during the initial preliminary tuneup: 12 o'clock. There will probably be two peaks of current: one at about 3 o'clock, which is false and represents the 15.5 MHz oscillator signal, and the proper one at 12 o'clock. The final's plate current should dip at a P.A. tune control setting of about 10 o'clock.

You should be aware that it is possible to tune up on the wrong frequency. If you have the P.A. grid circuit amplifying the 15.5 MHz oscillator signal and obtain a dip with the tune control at around 2 o'clock, you are going to be transmitting a beautiful signal on 15.5 MHz, and will probably get QSL cards from shortwave listeners all over the world, be jammed by Radio Moscow, and receive a huffy letter from the FCC inquiring who authorized you to operate on international shortwave broadcast frequencies.

Follow normal tune-up procedures. Your transceiver now operates normally in all respects on the 30 meter band and covers a range of 10.0 MHz to 10.45 MHz. The band will be located between 100 and 150 on the green portion of your dial. Ten MHz WWV comes in near zero on the dial and can be used to accurately calibrate your dial.

I have not inspected the insides of a Swan 500C, but I would be willing to bet that exactly the same conversion could be done on one, as well as on the lower power Swan Cygnet.

Good luck, and good 30 meter DX! 

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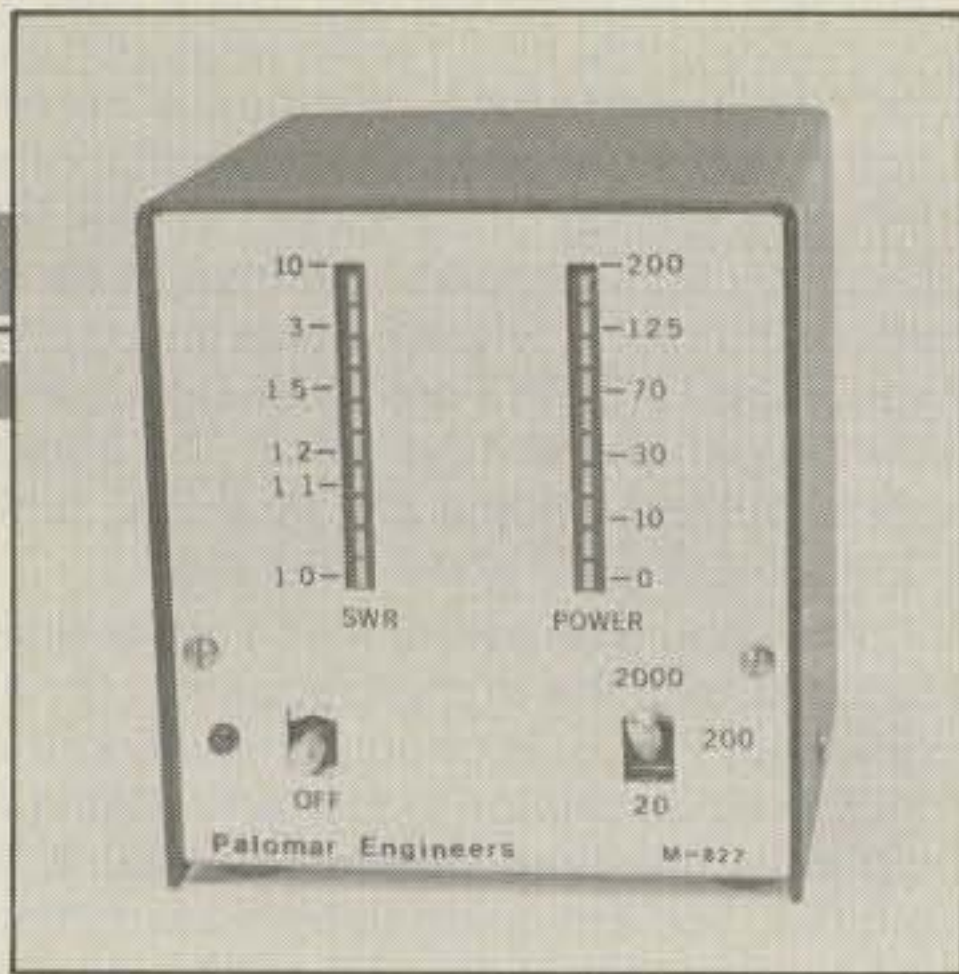
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With changes in the power regulations imminent, W1ICP steps in to save the day by explaining these changes, how to measure power accurately, and how to comply easily.

How To Meet The New Proposed Power Rules

BY LEW McCOY*, W1ICP

By the time this article appears, it is quite possible that the new power rules (Notice of Proposed Rulemaking 82-624) will be enacted by the FCC. These changes, which will be drastic compared to the old rules, will provide the high-power operator with much more flexibility. Before getting into details of the new proposals and how to observe them, let's talk a little about the old rules and the need for new ones.

In the past, the FCC has rated the maximum power input permitted at 1 kilowatt to the final amplifier (the last stage preceding the antenna). This applied to c.w. or phone and there were no exceptions. However, in the early 50's, single-sideband transmission became popular and because of its nature, accurate power measurements of s.s.b. transmissions became extremely difficult for the average amateur. We started to talk in terms of "peak envelope power" instead of d.c. input.

Without going into a long technical discussion, which would probably tend to lose the reader, s.s.b. is much different than c.w. when it comes to power mea-

surements. It is easy to measure the plate current and plate voltage by holding down the transmitter key and observing the meters. For example, we know that if there is 2500 volts on the final tubes and they are loaded to 400 milliamperes, the result is 1000 watts input. With s.s.b., when no voice is present, there is no output, and if we talk into the microphone, the plate current meter moves too fast to obtain a meaningful reading. A sustained whistle into the microphone (or applied tone) could produce an indication of total power input on s.s.b. However, such a reading would not be accurate. In s.s.b., when voice is applied, there will be an instantaneous power input that will reach peak envelope values, but the average power will be lower.

Because of this inconsistency in determining power input, there were many amateurs on s.s.b. (and manufacturers of s.s.b. gear) who felt that they should be permitted to run an "average" power of 1 kw input on s.s.b. Because of this, amateur radio found itself in a gray area as far as the rules were concerned. Suddenly we had a combination of 1 kw d.c. input or 2 kw p.e.p. Some amateurs mistakenly believed that 1 kw d.c. input was equal to 2 kw p.e.p. Unfortunately, life just isn't

that simple, and forgive the cliché, we don't get something for nothing.

Over the years, the FCC has asked the amateur fraternity for some clear-cut method of measuring power that could easily be applied by all amateurs. Unfortunately, to accurately—and we do mean accurately—measure power you need many instruments beyond the purse, and maybe the capabilities, of the majority of amateurs. As you will see from reading on, a good oscilloscope is a requisite for measuring r.f. envelopes. That leads us to another point about power measurements. In these days with power bridges and other devices, it is much easier to measure power output rather than power input (and that is exactly what the FCC proposes).

Scope Measurements

I am going to attempt to put the problems of power input/output measurements into simple language, so bear with me. Let's assume we have a transmitter capable of 1 kw input to the final amplifier, and further, let's say that it is 75 percent efficient. For 1 kw in, we'll get 750 watts out. Next, assume we connect a scope to the r.f. output of the rig so we can look at the r.f. envelope of 750 watts.

*200 Idaho St., Silver City, NM 88061

We close the key and observe a solid r.f. envelope of 750 watts on the scope.

Now assume we switch to s.s.b. Until we talk into the microphone, we don't have any indications on the scope. When we talk into the microphone we will see r.f. output on the scope, with some peaks higher than others depending on the voice characteristics. If we are lucky, voice peaks will reach the top of the envelope as observed with our key-down c.w. condition, and that point is peak envelope power (p.e.p.). However, our average voice signal is somewhat lower than 750 watts. If we increase the average power by raising the input, the peak envelope power would, of course, be over 750 watts, and relating that back to our input, we would be running more than the legal limit of 1 kw d.c. input. One can quickly see that in order to get 2 kw p.e.p., the input has to be at least 2 kw! Keep another point in mind: In order to get over 2 kw input, the power supply, final tubes, and components have to be upgraded. Let the buyer beware!

A New Ball Game

The new proposal by the FCC is essentially a simple one: The maximum legal power will be 1500 watts p.e.p. output. As interpreted by this writer, that is the maximum power output whether it be p.e.p., c.w., RTTY, or whatever. There is a proviso to maintain 1 kw input for a.m. (amplitude modulation) for 5 years. While the 1500 watts output measure doesn't solve all the problems, it comes close.

One problem, for example, is voice characteristics when operating s.s.b. In fact, the FCC has asked for suggestions on handling different voice characteristics in relation to power output. In other words, a person could tune up his rig for 1500 watts output and have a voice with predominantly low tones in it. He turns the mike over to someone with lots of highs in his (or her, most likely) voice, and the power output peaks can rise over 1500 watts. This is not a very serious problem, but nevertheless, it does exist if one wants to stay strictly within the letter of the law.

In conversations with FCC representatives, it was pointed out that the older method of investigating power violations was dangerous to FCC enforcement personnel and was complicated, to say the least. The plan is to use standard power bridges, available to any amateur, for enforcement personnel in making power measurements. And that leads us to the point of how you, the amateur who runs the legal limit, will measure the output.

Power Bridges

There are scores of different power bridges available to the amateur, and there will be no attempt to list them all in this article. Some are better than others, and usually the better ones cost more. The average amateur can easily build his

own bridge. In fact, I described one in a recent issue of CQ.¹ However, what most amateurs don't realize is that all power bridges have some inherent weaknesses. The weaknesses must be taken into consideration when making power measurements.

First is the problem of accuracy, and that can be serious. Before an amateur goes to a radio store and buys a good bridge, expecting it to keep him legal, a few questions should be asked. Does the meter have "hang time" to provide averaged peak power? What is the greatest error percentage for a given reading? Does the unit have an expanded scale in the area concerned (around 1500 watts), or is it compacted? Let's explain what this means. Some of the better meters claim 5 percent accuracy "of full scale." If full scale is 2000 watts (the most common value), then we are talking about 100 watts inherent error. Your 1500 watts could be 1600 watts! Some have greater errors than that, so it is wise to question before you buy. Compacted scale? Take a good look at most any bridge and you'll find that the meter isn't equally spaced with regard to power divisions. Unfortunately, the divisions are usually squeezed together near the higher power ends of the meter. This tends to increase the chances of errors in making readings.

True and False Power Readings

As if that isn't enough, one must keep in mind that if the standing wave ratio is not unity (1:1), then other considerations must be made when reading the average power meter. When there is a mismatch on the transmission line, the power bridge will indicate forward power, and when switched, reflected power. The actual or real power output will be the difference between these two readings.

For example, suppose in the forward reading we had 1500 watts showing, and in the reflected position, 200 watts indicated. The actual power output from the rig would be 1300 watts. This is assuming no feed-line losses (the power bridge placed very close to the rig in the line). Don't be misled by reflected power readings; they are phoney! To repeat, the actual or true power is the difference between the two readings.

However, we have a serious problem with many commercial bridges in that they only show two things: forward power and s.w.r. They do not show reflected power, and if a mismatch exists on the antenna feed line, then the forward power is not an actual power reading, being something less than that observed! However,

¹McCoy, "S.W.R.—How Much Is Too Much?" CQ, February 1982.

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do not despair. CQ will rescue you. With the type of bridge just described, you know two things: the forward power and the standing wave ratio. The formula using those two knowns to find the reflected power doesn't seem to exist in any of the technical manuals. At least I couldn't find it. In any case, here is is:

$$\left(\frac{V.S.W.R. - 1}{V.S.W.R. + 1} \right)^2 \times \text{Forward Power} = \text{Reflected Power}$$

However, no one wants to do the math if it can be avoided, so I have included Table I, which shows the reflected power for s.w.r.'s up through 3:1. Actually, if you are running 1500 watts output, your s.w.r. better not be over 2:1 at the most! So how do you get 1500 actual watts output with a mismatch? Simple.

Looking at Table I, let's assume you are tuning up and you want your full 1500 watts output. Further, assume you have a

Forward Power is 1500 watts

V.S.W.R.	Reflected Power (in watts)	True Radiated Power (in watts)
1.0	0	1500
1.1	3.40136	1496.6
1.2	12.3967	1487.6
1.3	25.5199	1474.48
1.4	41.6667	1458.33
1.5	60	1440
1.6	79.8817	1420.12
1.7	100.823	1399.18
1.8	122.449	1377.55
1.9	144.471	1355.53
2.0	166.667	1333.33
2.1	188.866	1311.13
2.2	210.938	1289.06
2.3	232.782	1267.22
2.4	254.325	1245.67
2.5	275.51	1224.49
2.6	296.296	1203.7
2.7	316.654	1183.35
2.8	336.565	1163.44
2.9	356.016	1143.98
3.0	375	1125

Table I— Reflected power for s.w.r.'s up through 3:1.

2:1 s.w.r. If you adjust your amplifier to show 1500 watts output, your actual output with that s.w.r. will be 1333.33 watts out! How to get the full 1500 watts? Tune up for an indicated output of 1660 watts (the reflected power from Table I for a 2:1 s.w.r. is 166 watts plus the desired 1500 watts). You'll be within 1 percent of 1500 watts actual output. For those amateurs with computers, and most have them these days, there is a simple short program in Basic for determining actual power output knowing the forward power and s.w.r.

Hang Time for Power Bridges

I used the expression earlier of "hang time" to describe what to look for in a power bridge. Some bridges are made so that they will read forward (or reflected) power without any delay built into the bridge circuit. When using s.s.b., the voice peaks will hit the desired maximum output, but the bridge meter may not respond quickly enough to show these peaks. This can be fixed by incorporating meter delay time into the bridge circuit so that the meter will hang up longer near the maximum output peaks, providing a more accurate reading. While this is not the most accurate method for measuring p.e.p. (a scope is the only good way), the bridge method just described is what we believe the FCC plans to use, so it should be adequate.

```

160 PRINT
500 INPUT "ENTER FORWARD POWER (WATTS): ";F
600 INPUT "ENTER MAXIMUM VSWR: " VM
700 INPUT "ENTER STEP SIZE:";S
950 PRINT "FORWARD POWER IS";F;
    "WATTS"; PRINT "VSWR"; "REFLECTED POWER"; "TRUE RADIATED POWER"
1000 FOR V = 1 TO VM STEP S
1160 R = F * (((V - 1) / (V + 1)) * ((V - 1) / (V + 1))) : T = F - R
1170 PRINT V,R;"WATTS",T;"WATTS"
1180 NEXT
1190 PRINT CHR$(140);
1200 END

```

Fig. 1— A Basic program for determining reflected power.

The most important item when buying a bridge is to know its accuracy so you can guide yourself accordingly to stay within the legal limits. It is not believed that the FCC will hold everyone strictly to the 55 m.p.h. limit, give or take a few m.p.h. However, when you get past 60 you could be in serious danger of getting that citation! If it were me, and I wanted to run near the limit and stay safe, I would take into consideration the inherent errors in measuring equipment. That, in turn, would mean running about 5 percent or more on the low side—say 1400 watts. One thing for sure, the difference between 1400 and 1500 watts as far as DX pile-ups are concerned isn't that important—so why get cited?

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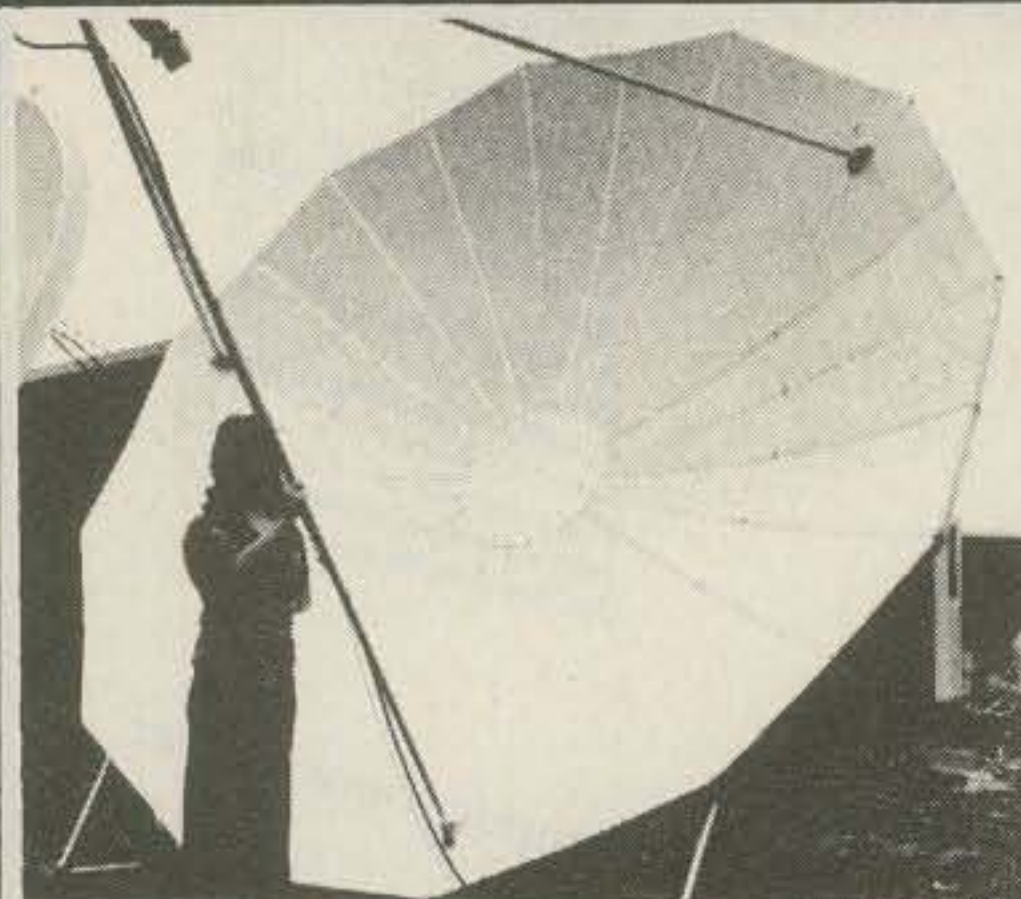
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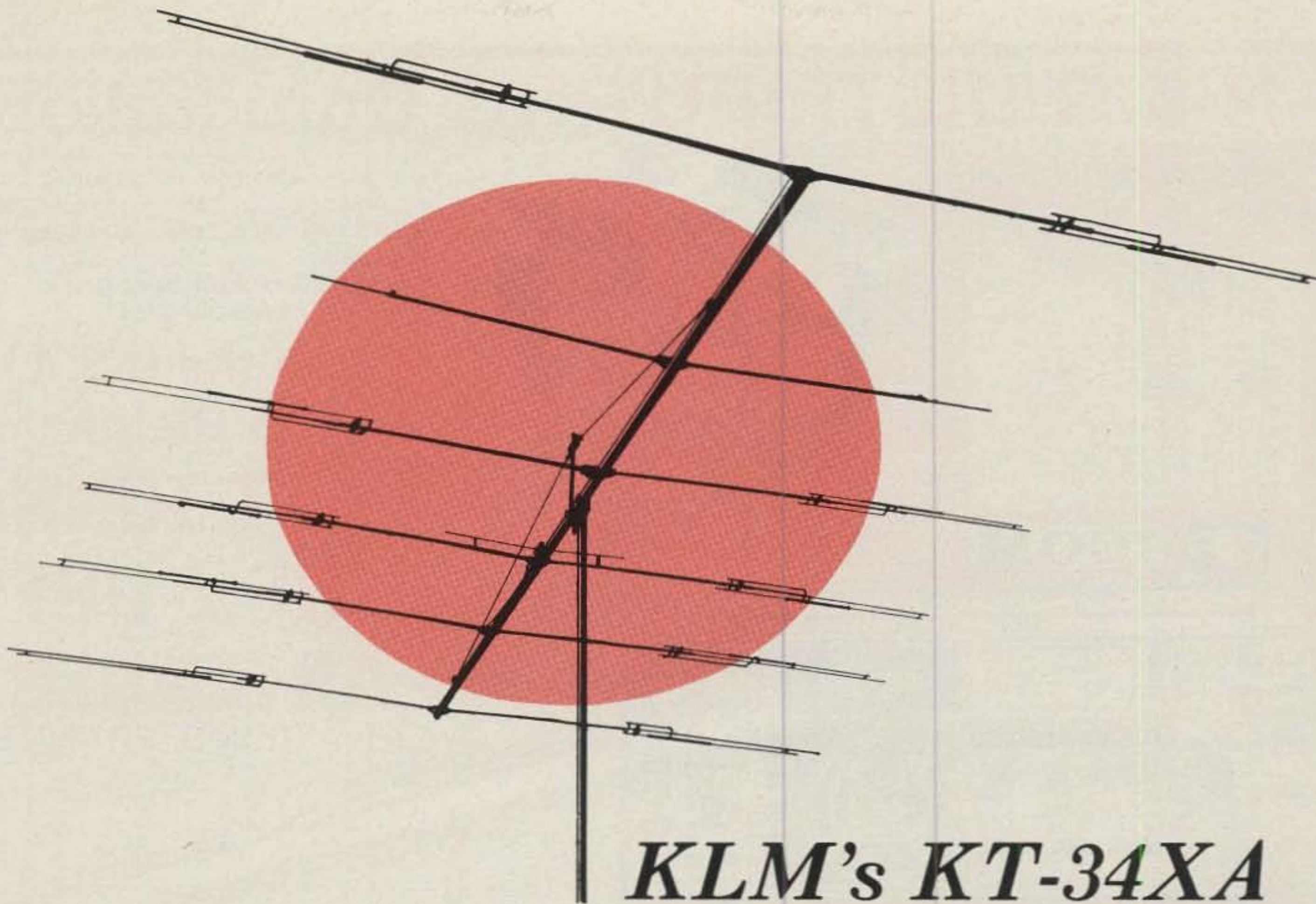
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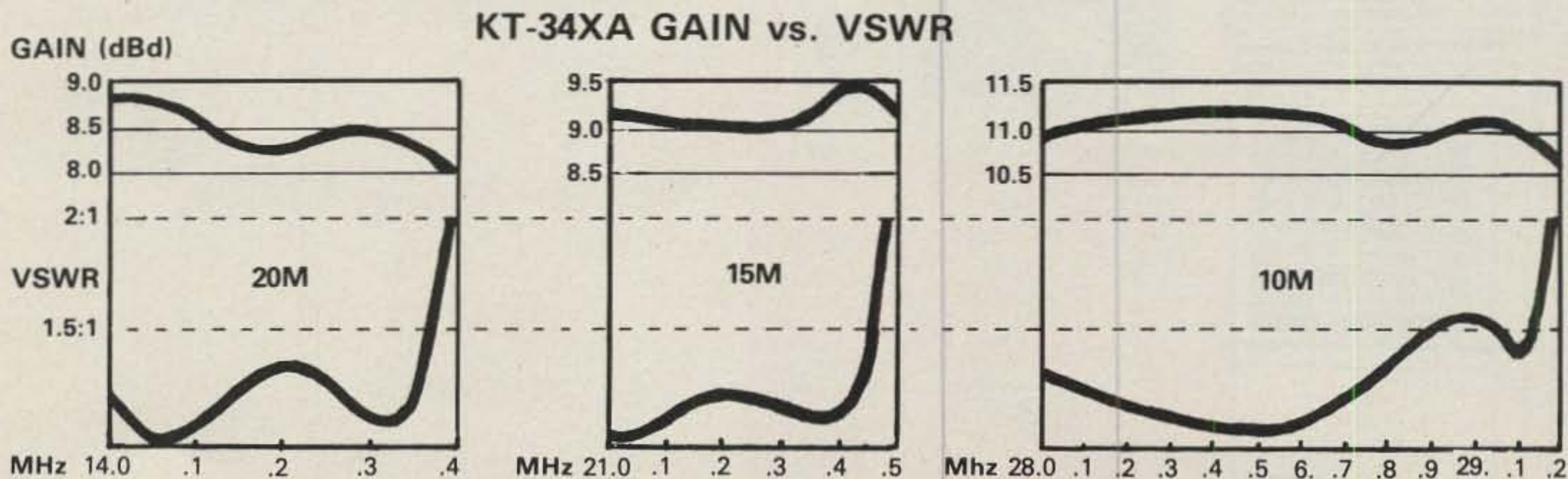


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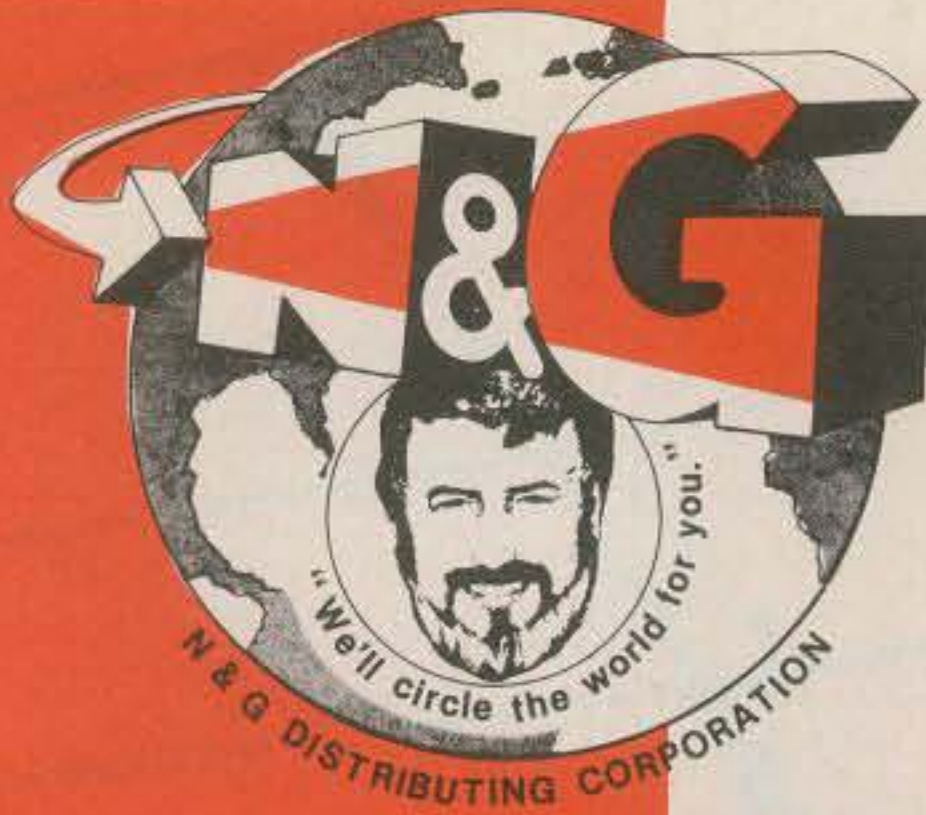


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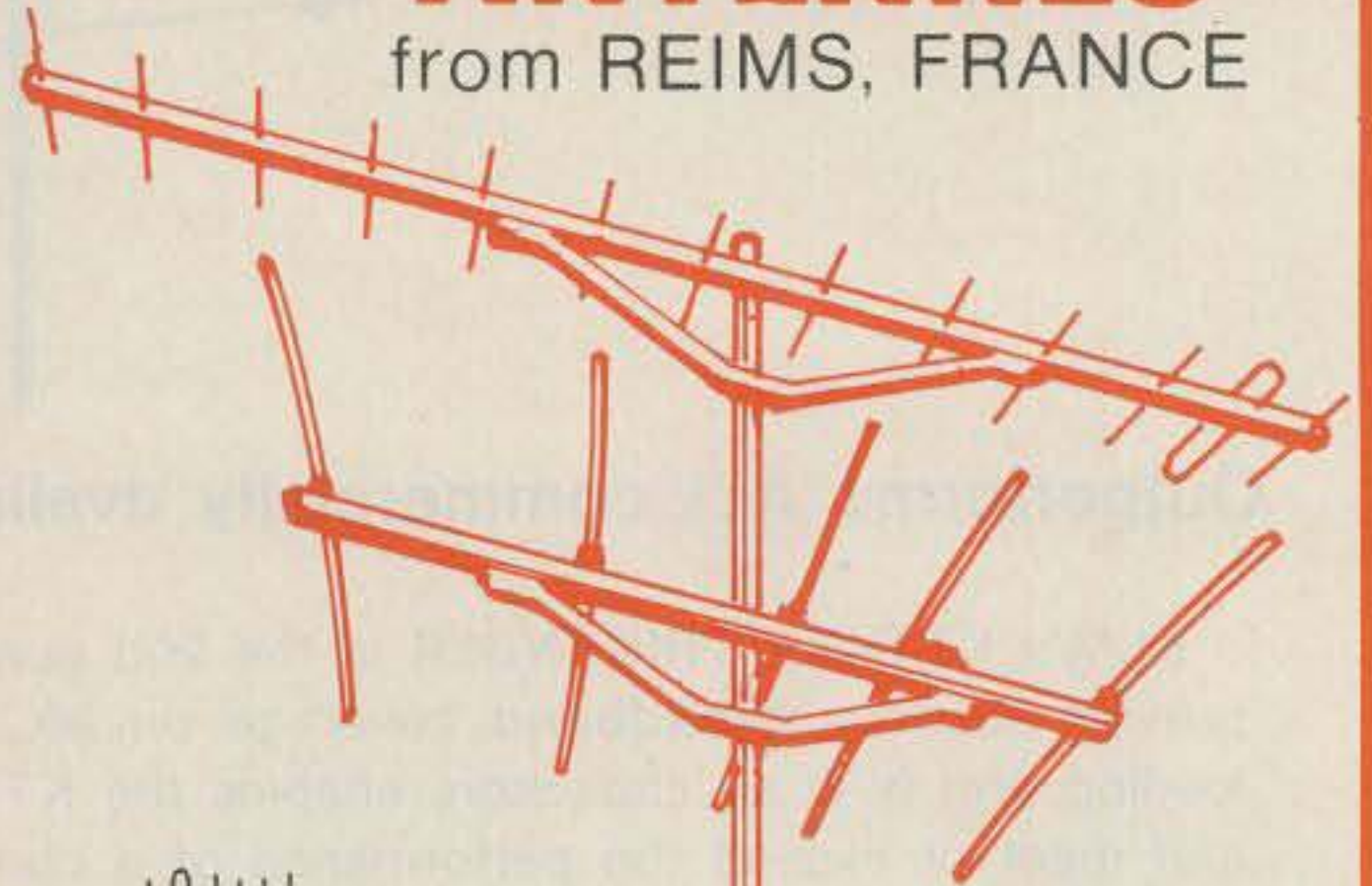


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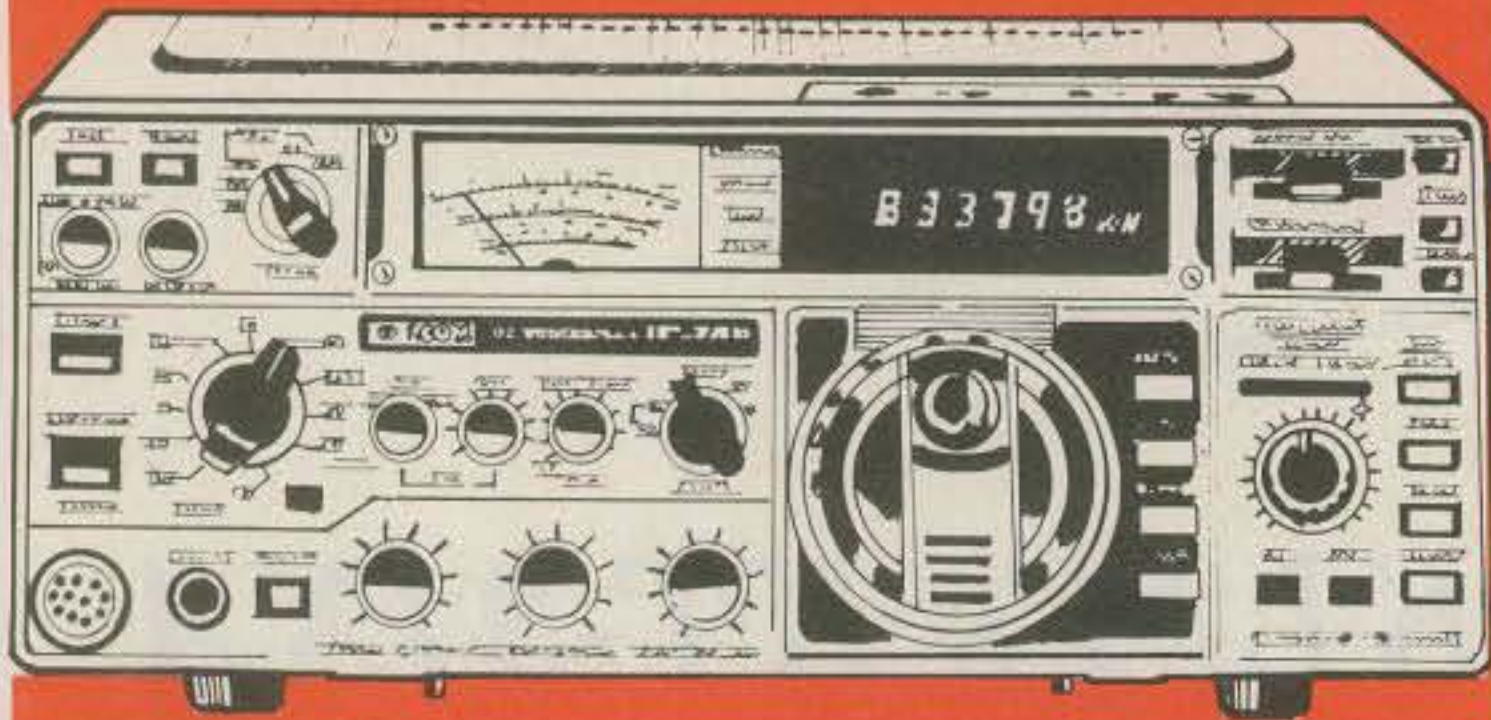
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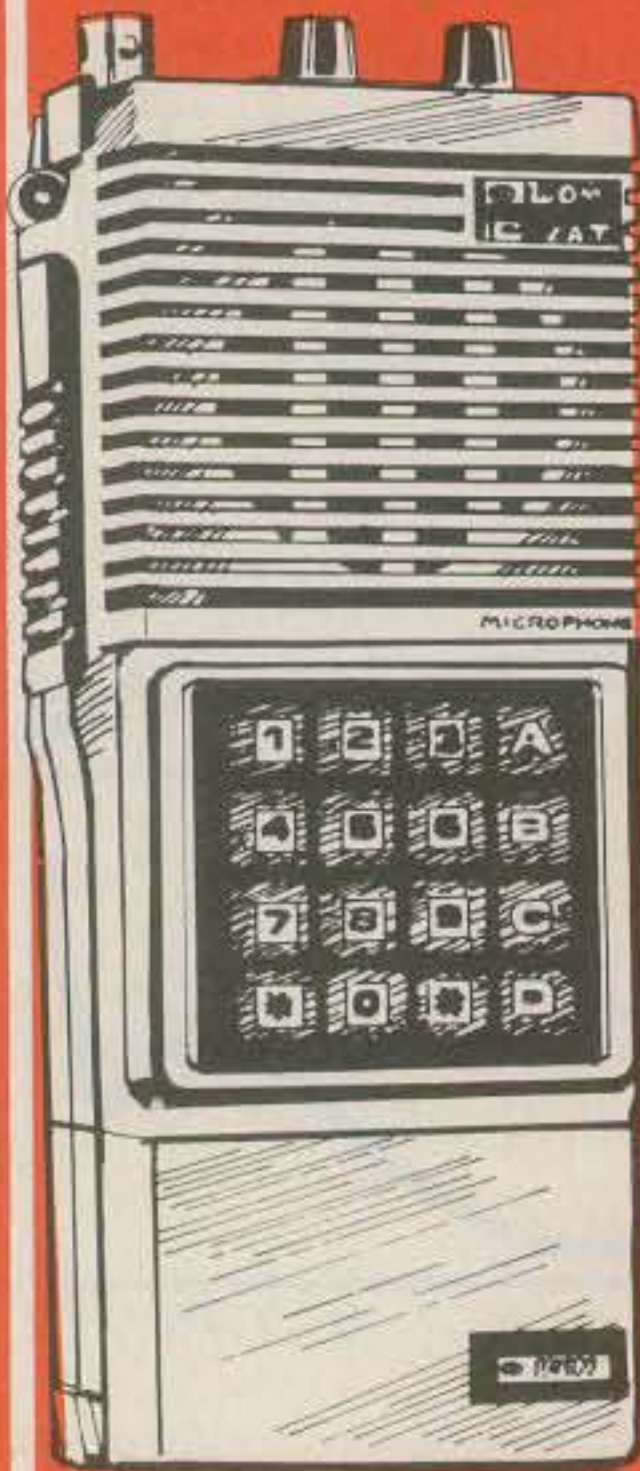
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W4MB presents modification considerations for updating some of our more "mature" gear to operate on new amateur bands.

New Amateur Band Capability For Older Receivers And Transmitters

BY R.P. HAVILAND*, W4MB

With one new band here and two more in the offing, it's natural to think about how to get on them when the time comes. Perhaps the existence of beacon signals—KK2XGH (via N4DR) and KK2XJM (via W4MB)—has also given a little incentive.

It's nice to run out and come back with one of the new WARC units, or even one of the recent true "all band" designs. I did it myself as part of setting up my beacon experiment. Precision monitoring capability seemed to be a must. However, it may not be necessary. It's no great problem to get new band coverage in existing equipment. It's easier if the new band or bands can replace one of the current ones, but even band addition is not too bad. Just as an example, the transmitter at KK2XJM is currently a 20-year-old SBE 33 with the original 15, 20, and 40 meter band coverage changed to 12, 18, and 30 meters. You might want to change your main unit, or even an older or spare unit, in the same way.

What you will need to do depends on the design of your particular receiver, transmitter, or transceiver. I haven't looked at every type on the market, and I don't have copies of the instruction books needed to work out the details of such modifications, but the basic ways of getting band coverage give a quick guide to the modifications you would have to make. These, plus the instruction book, should make band addition or change relatively painless and only slightly tedious.

First we should note that some equipment really requires no changes at all. This is true for the new transceivers on reception, although they have a little "anti-transmit" circuit blocking "out-of-authorized band" use. The factory can supply data on the changes needed. In older equipment such coverage was really rare. The only all-band receiver that comes to mind is the Racal, but the price of this put it beyond the means of many amateurs.

There is a much larger group of equipment which needs only a band-setting crystal to reach a new band. This equipment comes in two variations. In one, the tuning coils for the antenna, r.f., and mixer circuits either overlap for all-band coverage or have continuous coverage. The second type includes provisions for one or more added bands, often at a band selector position marked **AUX**. (Unfortunately, a number of these were marketed with the selector marked 27 MHz, and were functional, one of the factors fueling the illegal CB operation fad.)

Of the type with all-band tuning provisions, Collins gear is probably the most common. The instruction books give the data needed to get coverage on any frequency, except the band used by the v.f.o. If you have one of these units and haven't made the change yet, there are also crystal selector switch and socket assemblies available with up to 24 band capability. (Also see the article by VE3EB in January 1982 *QST*.)

Some equipment may have this all-band capability in disguised or limited form. This is the case in the SBE 33 and 34, which use a three-gang continuous-coverage LC assembly, but with a detent system which limits coverage to specific band segments. A quick way to get the all-band coverage is to remove the detent assembly, bringing out one control shaft for the capacitor and another for coil positioning and for crystal selection. Be a little careful with this, though. The increased coverage also increases the danger of tuning up on an image, giving out-of-band operation. This risk is high if the design uses a relatively low frequency variable i.f., such as the 3.2 to 3.4 MHz of the SBE designs. (See below for an alternate method.)

The designs which have one or more unused band-switch positions are relatively easy to modify, but usually only for one band. Coils which drop into blank mounting locations should be available from the factory. Adding the band-set crystal gives transmit and receive capability.

An alternate to this is to install the crys-

tal, but to jumper the tuning coil switch contacts to the coils for the closest adjacent band. These may be the only changes needed, but some units have limited tuning range and may require some of the changes described later.

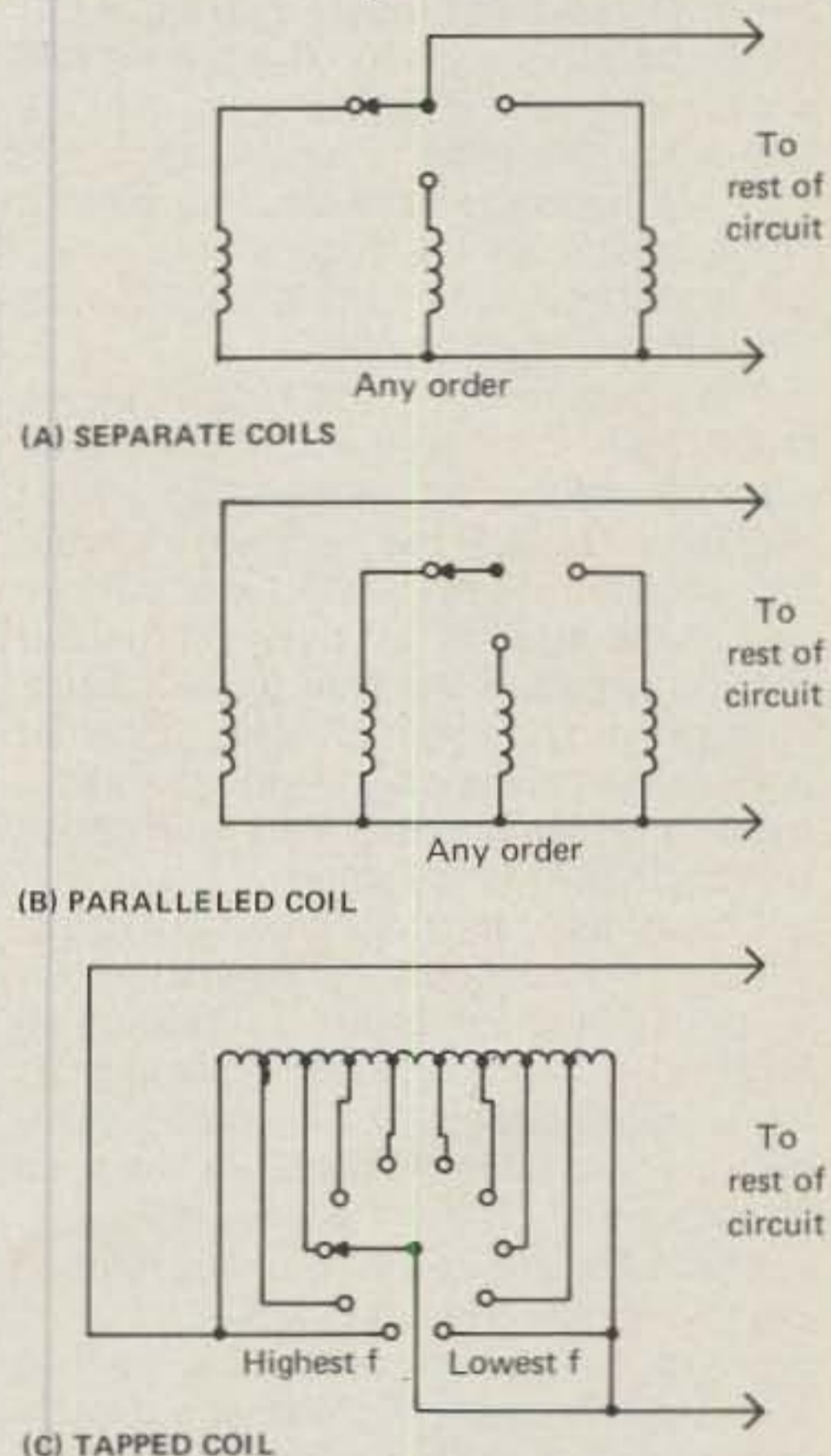


Fig. 1—Methods of varying inductance.

Some designs may have partial capabilities for one of the bands built in. The TS-520, for example, covers 10 MHz, but for reception only, for standard time signals. The transmit elements are omitted, although all needed switching is there. Adding a coil (and possibly a few jumpers) will get these units operational on transmit.

Some designs may offer an added possibility. For example, the TS-820 has 15 MHz standard time coverage. Changing the band setting crystal and retuning the coils will change this to 18 MHz reception

*2100 S. Nova Rd. Box 45, Daytona Beach, FL 32019

coverage. Adding a transmit coil gives operational capability on this band. The AUX position can be used for one of the other bands, probably 10 MHz, which also retains WWV coverage.

If you have one of these "simple to change" designs, you've got an easy job. However, most designs will require more work. To see how this can be done, let's look at the common methods of band change and tuning.

Fig. 1 shows the most common ways of coil switching during band change. At (A), a separate coil is used for each band. There is sometimes full shielding of each coil, although some designs have only an interstage shield. Usually, the band switch has a progressive shorting set of contacts to prevent unused coils from acting as suck-out traps, giving a dead spot in the band in use.

Another design, at fig. 1(B), parallels the coil for the lowest frequency band by another coil to give the correct inductance for the band in use. If your instruction book requires tune-up starting at the lowest band, your unit probably uses this switching system. There are also designs that place the coils in series, as in fig. 1(C), with a progressive shorting switch. The indicator for this type is an instruction book requirement to start tuning with the highest frequency band.

The popular HW-101 uses series switching in the signal circuits, but uses separate coils in the band-setting crystal oscillator. None of the coils are individually shielded. The TS-830 uses parallel coils in the antenna and mixer circuit, but separate coils in the final driver circuit. There are no band-set crystals, since the unit has synthesized band-set oscillators, most for a single band. Both use series switching in the final stage.

Collins gear has made extensive use of variable inductance for preselector-mixer stages (and for the v.f.o.). The inductance variation is continuous, which gives the all-band capability. The unique variable L, variable C system of SBE has been mentioned.

There are also variations in the method of varying tuning capacity. One, shown in fig. 2(A), breaks each capacitor section into subsections, progressively switching-in more capacity in going from high to low frequency bands. This is used to give essentially a constant width of tuning, rather than the constant percentage which would result if the capacity range was the same on all bands.

The same effect is also secured by using a single size of variable capacitor, with small capacitors switched in series on the higher frequencies to limit the tuning range, as shown in fig. 2(B).

In both of these methods there may be added parallel capacitors. They may be variable, but it appears that fixed capacitors are more common, the adjustable inductance giving sufficient alignment accuracy. Diverse designs such as the

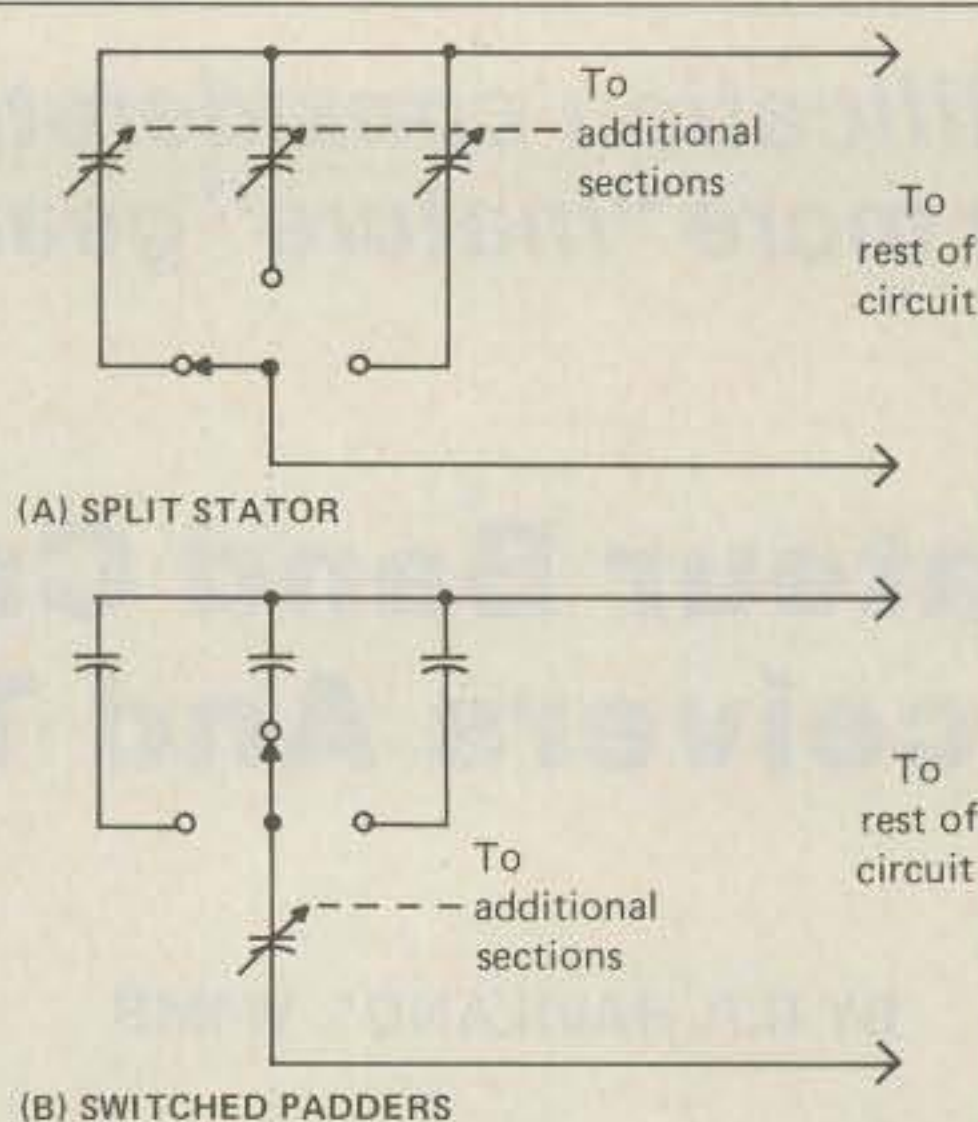


Fig. 2- Various methods of changing the tuning range.

HW-101 and the TS-830 combine the methods, using series and parallel capacitors in combination with a split tuning capacitor.

At one time, tapped coils for band-spreading were common. Such designs seem to be found only in very old equipment.

It is evident from the above that there are many possible combinations of switching and tuning, and it's not uncommon to find two or three different combinations in a single unit. This variability means that there is no single approach to adding new bands. It also means that some designs are going to be more difficult to change than others. You'll have to look at the schematic of your unit, weigh the possibilities, and then decide whether it is practical to make the necessary changes. Some ideas for doing this are given below.

If you do modify, it's probably best to choose a course that allows the modifications to be removed easily, and preferably without a trace. You may not be satisfied with performance as modified and want to change back, or you may want to sell the unit. If you do make a permanent change, say involving a front-panel hole for a switch, do it neatly. Try to match the panel lettering, the knobs, and the general layout pattern. Done well, you can improve the salability of the unit.

The coverage changes can be grouped into low-level stages, crystal oscillators, and high-level stages. Problems and possibilities are somewhat different for each. In the low-level stages, the easiest approach is to exchange old bands for new. While this won't be possible if you are one of the rare all-band operators and want single package operation, it's easy if you have a spare to convert or band-switch positions that you never use.

If you follow this approach, you may be able to get to the new band simply by re-tuning the affected coils. In doing this, you may have to start at the end of coverage and adjust coils in turn. For example,

the 29-30 MHz coil could be adjusted to 28-29 MHz, and that coil moved to 24.9 MHz, and so on. *Hints:* If the slugs haven't been touched in a long time, be careful to avoid breaking one. A grid dipper will be a big help. If the coil is shielded, couple the dipper by a 2.5 pF capacitor, and use a frequency meter to read the resonant frequency at the dip.

If the band you don't want is too far from the new band, or if the coils don't have sufficient adjustment range, it will be necessary to replace coils. If you do this, it is suggested that you keep the original coil fastened into the unit securely. It makes later restoration much, much simpler. The new coils may have to come from the factory if the mount is unusual and may have to have turns added or removed. Again, the dipper is a big help.

If you want to keep the original bands and add new ones, it is probable that the easiest way to go is to reduce the inductance of an existing band coil or coils by shunting these with another coil as shown in fig. 3(A). The switch shown can be a ganged switch or a relay. "Crystal can" relays are small enough to go almost anywhere. It's probably best to do this on the coil for the next adjacent band: 7 MHz for 10 MHz coverage, 14 MHz for 18 MHz coverage, and so on. However, as indicated in fig. 3(B), it is possible to place the shunt coil across any of the lower frequency coils.

You can find the coil size by cut and try or by calculating the inductances from the circuit capacitance, which is usually shown on schematics. Just remember that parallel inductors follow the same law as parallel resistors.

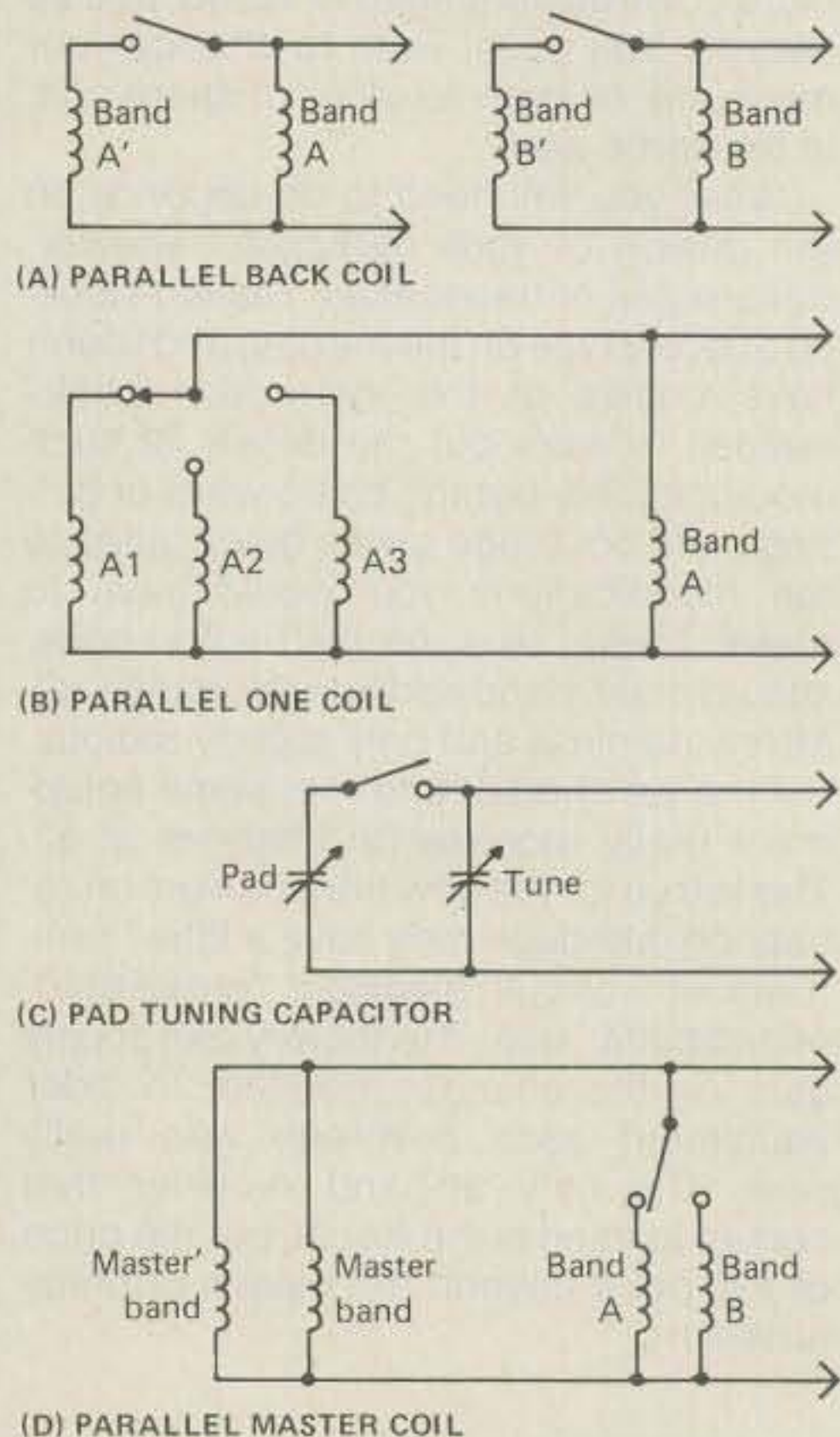
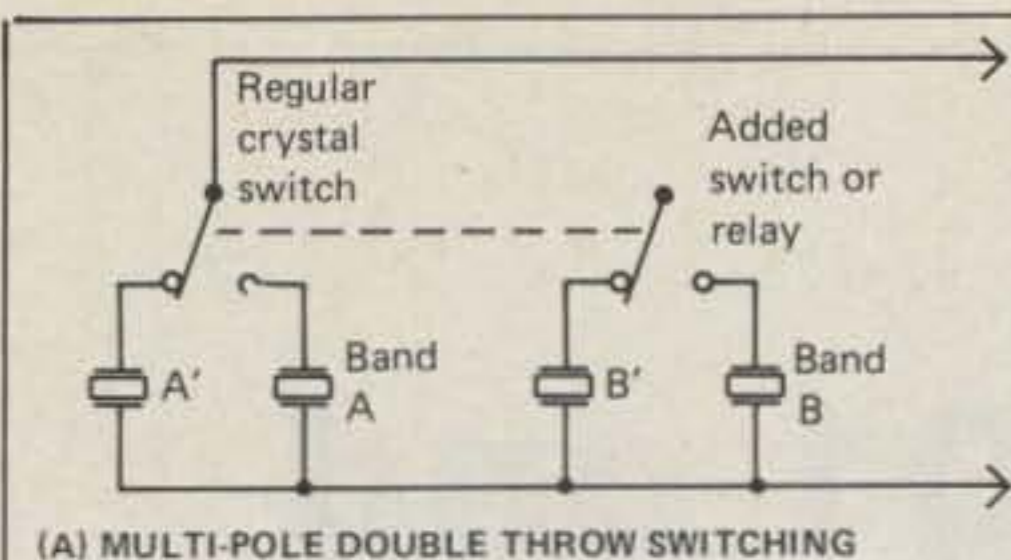
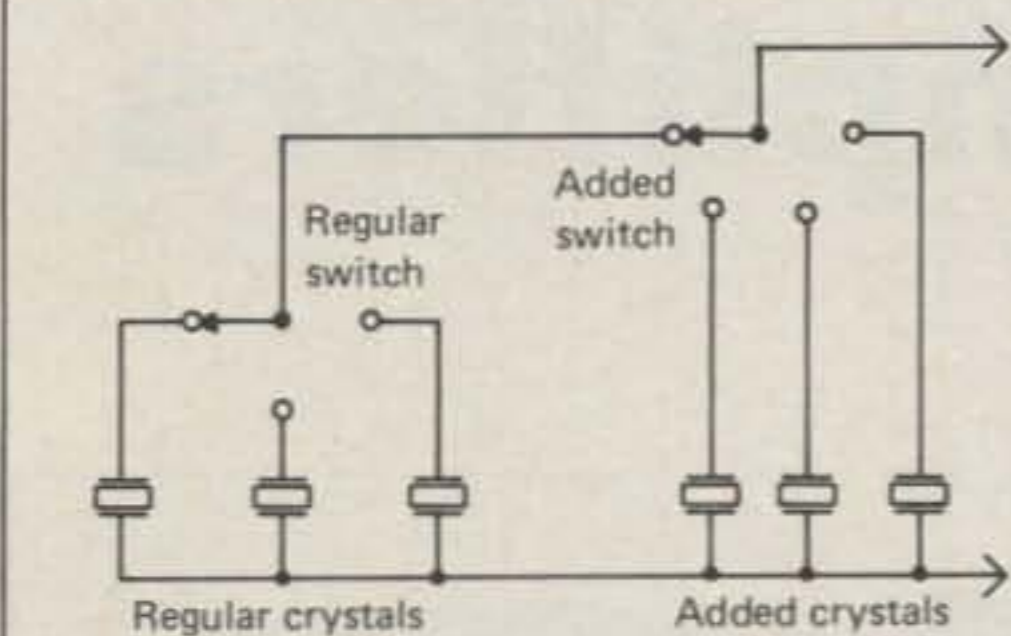


Fig. 3- Several methods of switching-in new bands.



(A) MULTI-POLE DOUBLE THROW SWITCHING



(B) SINGLE THROW MULTI-POLE SWITCH

Fig. 4—Two methods for the addition of a new crystal switch.

You may find it possible to switch-in parallel capacitances instead as shown in fig. 3(C). This has the disadvantage of reducing the tuning range of the peaking or drive control, but the new bands are relatively narrow, so the peaking may not be necessary at all. The capacitors have the advantage of small size as compared to the coil.

If the peaking range is ample and the circuit of fig. 3(D) is used, inductor or capacitor may serve to give satisfactory tuning on all of the new bands. The technique works because the new bands are nearly harmonically related. This method worked very well in the SBE mentioned above.

High-level stages may not require any work at all. Most use a pi network for output tuning with ample tuning range to cover the next adjacent new band. This is the reason for preferring coil or capacitor arrangements which use the current 7 or 14 MHz band to get to 10 MHz, and so on. If this ultra-simple approach is used, there will be a small deviation from optimum load conditions, causing a small loss in output and possibly some increase in harmonic generation. Neither should be serious. The alternate is to calculate the design loading condition and then duplicate it by adding coil taps or by a parallel inductor. Because of the power levels involved, it's much easier to accept the small departure from optimum operation.

The remaining element requiring change is the band-setting oscillator. If you are sacrificing coverage of a current band, this may require only change of the corresponding crystal. Some designs switch both crystal and output coil; these will require coil change, or padding by capacitor or inductor to get full output and/or stable oscillation.

If you are adding new band coverage while keeping all current bands, probably the easiest way is to build up an assembly of three oscillator-crystal combinations for the new bands. Arrange the switching

to turn off the original oscillator and turn on the correct new band oscillator when a new band is selected.

Alternate approaches to this are shown in fig. 4. At 4(A) a triple-pole, two-position switch or relay is used, and at 4(B) an added single-pole, four-position switch. These switchable designs may be preferable in the older-type equipment.

There are a few points to watch for in planning the conversion and when testing. Check the schematic for series or parallel traps used to control spurious emissions. You may need one or more of these as substitutes for original ones or to handle a spur which shows up because of the change. You can estimate the likelihood of these by looking at the various combinations of the i.f., LO, and band frequencies as covered in the *ARRL Handbook*. Also, before placing the unit on the air check for spurious signals. If it seems clean, it is still a good idea also to ask a

nearby amateur to check the first time you go on the air.

These conversions do take some time and care. There is another way of getting the same results, but it will take up more space on the operating table and will probably be more work. This method is to build up a set of converters or a transverter. Or, you might use a converter for reception and modify the transmitter for operation on one or more of the new bands. Make the decision after studying the circuit diagrams of your equipment (and after looking at your piggy bank!).

The schedule for these changes? Thirty meters is already here. There isn't much likelihood of early operation on 18 and 24 MHz, although there is at least one beacon signal to study and at least one country had plans (later withdrawn) for operation starting the first of January. In the meantime, it's a chance to learn about the differences in propagation.

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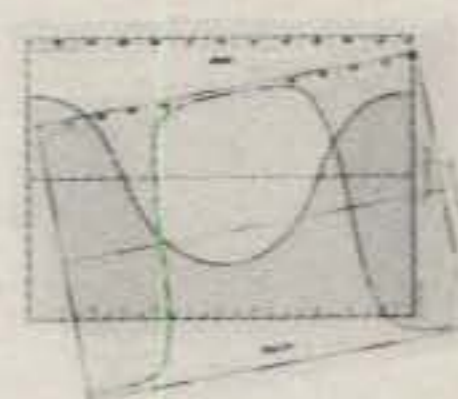
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No - 33 - 34

CQ Reviews:

The Heath SB-201 and SB-221 Linear Amplifiers

BY JOHN J. SCHULTZ*, W4FA

There are not too many products on the amateur radio market which have survived as long as the Heath SB-201 and SB-221 linear power amplifier kits (originally designated the SB-200 and SB-220 when they included 10 meter band coverage). The amplifiers, when they were first introduced, represented a very good value on a watts to dollar ratio, and that still holds true today for those amateurs who have the time and inclination to assemble kits. Another rather interesting factor is that various simple, but practically no significant, modification articles have appeared over the years concerning these amplifiers. The most elaborate modification articles have involved bias modifications for full c.w. break-in operation, but they must be considered as being of interest to only a small percentage of the amateurs who own the amplifiers. Also, one firm markets a heavy-duty outboard power transformer for the SB-220/SB-221 which is also a specialty item. Heath apparently "did it right" the first time around, and both they and radio amateurs are enjoying the benefit of time-proven designs.

Many newer amateurs, however, although they may have heard of the SB-201 and SB-221 linears, may not be aware of the design details involved in them when they reach the point of considering a linear amplifier purchase. On the other hand, many amateurs who already own the SB-201 or SB-221 linears may not be aware of some quite simple but helpful general modification ideas which add a bit of operating convenience to using the linears. This article hopefully will be of some value to both groups of amateurs as the basic design-performance features of both linears are reviewed and then some simple modifications presented which can enhance or simplify practical usage of the linears regardless of the mode being used.

The schematic diagrams of the original SB-200 linear and the current SB-201 linear are essentially the same. There is for the most part no difference in the dia-



The SB-201 is a completely self-contained, 80-15 meter, 1 kw d.c. input linear.

The "bigger brother" of the SB-201, the SB-221, is a completely self-contained 80-15 meter linear with 1 kw d.c. or 2 kw p.e.p. input.



*c/o CQ Magazine

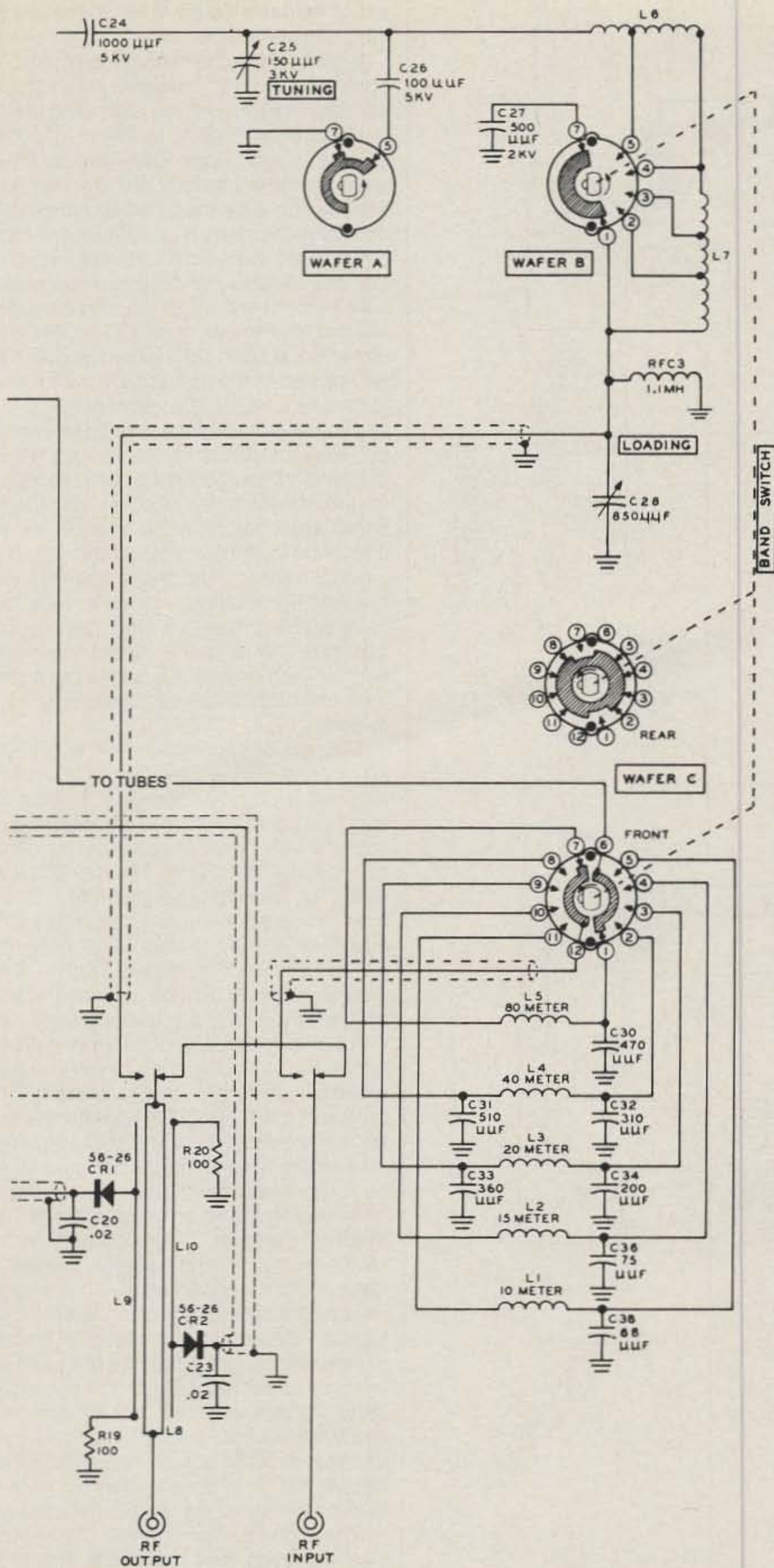


Fig. 1— Input/output circuitry of the SB-200. This unit includes 10 meter coverage.

grams except for the input and output circuitry to account for the inclusion or deletion of 10 meter coverage. This difference is shown in figs. 1 and 2.

Both amplifiers use two paralleled 572B or T160L tubes in a grounded grid amplifier circuit. With about 100 watts of drive, the tubes will load to 1 kw d.c. input on c.w. or produce about 1200 watts input on s.s.b. The output power under these conditions will vary from about 550 watts on 10 meters to perhaps 650 watts on 80 meters. These figures will vary a bit depending on the specific tubes used, care taken in construction, line voltage, etc. Heath doesn't rate the SB-200-201 for continuous carrier service such as RTTY and SSTV. However, maximum c.w. key-down time is 5 minutes, so the amplifier can probably be used safely for at least short RTTY transmissions.

The tubes used, which have a plate dissipation of 160 watts, are perhaps one of the best, low-cost (about \$30 each) types available for linear amplifier service if one considers the combination of power input, intermodulation distortion, simple cooling and socketing required, service life, etc. Many amateurs have had these tubes "in-socket" for several thousand operating hours. They require only simple fan cooling. Typical third-order IMD products in an SB-200/201 will vary between -30 and -35 dB at full input.

The cathode input circuitry to the tubes is a pi or L-type network, depending on the band in use, and the plate output circuit is a typical, bandswitched pi-network on all bands. The tuned input circuitry will provide an almost flat 50 ohm input load on all bands so the amplifier can be driven easily by solid-state transceivers. Of course, the networks weren't originally put there solely for that purpose, but rather were put there to improve the linearity of the amplifier. One can note from figs. 1 and 2 that the input circuitry does not simply have the 10 meter portion deleted in the SB-201. In the SB-201 there is another "Filter Assembly" included in the input line to the tubes after the tuned input circuits. The filter is a two-section affair which provides a sharp low-pass cutoff action above 15 meters. Since it is a fixed network which always remains in the input line, its impedance characteristic also affects the values needed for the tuned input circuitry on all bands. The 10 meter conversion of the SB-201, therefore, involves not only removal of the filter assembly, but also changing some of the tuned input circuits.

Heath will supply licensed amateurs conversion information and materials for about \$30. The conversion is not complicated, but neither is it an entirely clear-cut affair. The SB-201 sheet metal is designed to mount four input coils, and the conversion requires the mounting of five such coils. So, one has to do a bit of planning to see how to best fit all the components around the bandswitch wafer in-

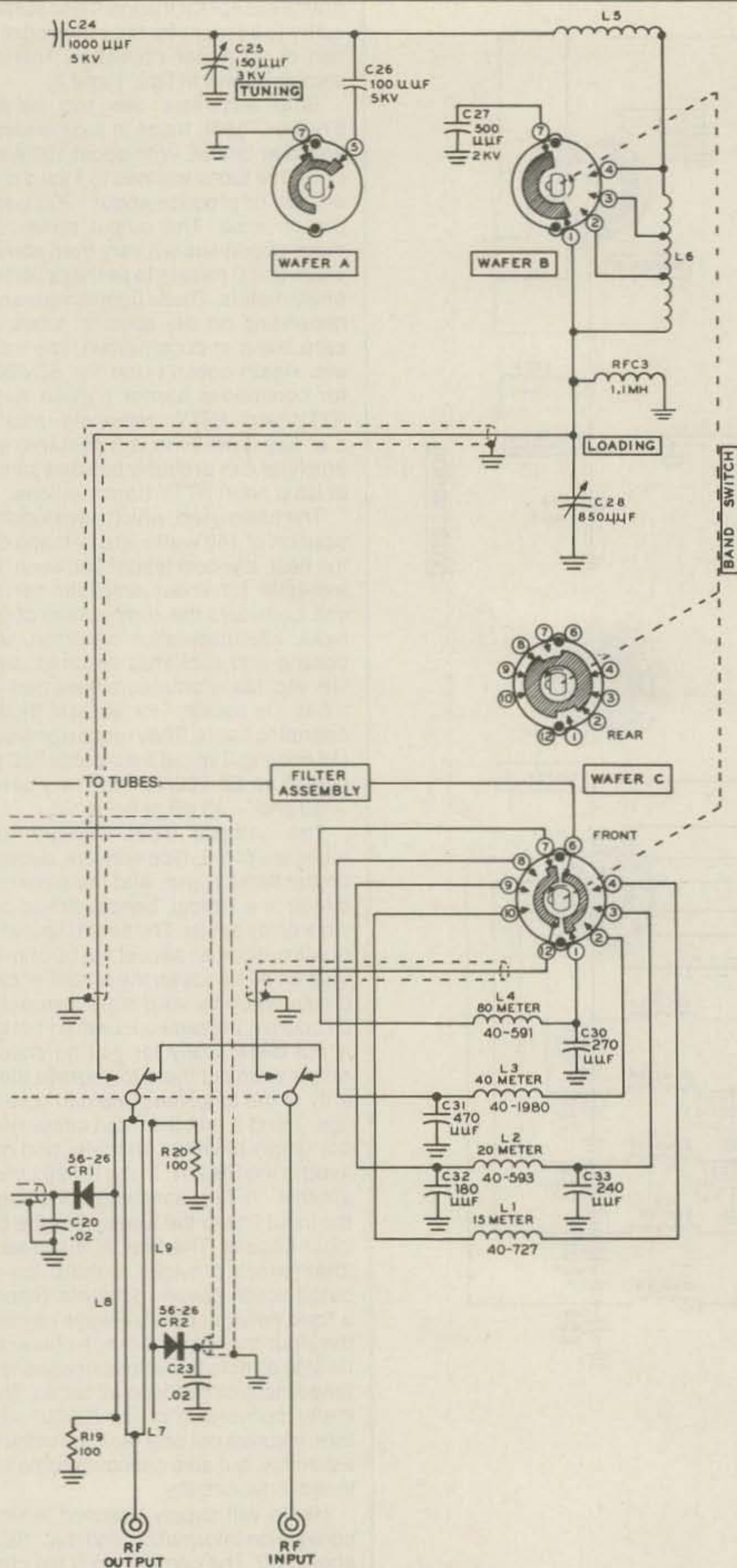


Fig. 2- Input/output circuitry of the SB-201. The 10 meter coverage is deleted and a "Filter Assembly" added to prohibit 10 meter operation.

involved. In any case, one should order the conversion kit before one starts to build an SB-201. The conversion kit includes a complete new bandswitch, and one will

not enjoy having to remove a bandswitch, once installed, to make the conversion.

The plate output circuitry does not require any conversion, as such. One just

has to solder a tap point for 10 meters on the 15 meter output coil.

It is interesting to reflect a bit on the inconsistency of FCC regulations and type-acceptance procedures regarding the 10 meter ban on linears. In the case of the SB-201, Heath apparently took a lot of pains to comply strictly with the ban. The bandswitch was modified to accommodate only four bands, a special low-pass cutoff filter was introduced (assembled and installed by the factory in an enclosure riveted to the chassis), and the tuned input circuitry was modified so it is only dimensioned correctly when the cutoff filter is wired in the circuitry by the builder. Naturally, the SB-201 received FCC acceptance. But, so did at least one imported linear currently on the market which contains all the components to modify it to almost instantly operate on 10. Its bandswitch has an extra position for 10; one simply removes a rotational stop. The 15 meter tuned input circuitry is a dressed-up multiple network with two coils which one very simply rewires into separate 10/15 meter tuned input networks. Then one puts a center tap on the 15 meter output tank coil and one is ready to go on 10.

The rest of the circuitry of the SB-200/201 concerns the power supply, metering, and switching functions. The power supply is a straight-forward voltage-doubling one with a total effective output capacitance of about 21 mF. This value is adequate for filtering purposes, but one will note a drop of several hundred volts as the amplifier is fully loaded. The metering provided is very complete in that it includes metering of plate current and voltage, grid current, and output s.w.r. The latter is a rather nice bonus if one wants to clean up an installation by removing an external, separate s.w.r. bridge. The bridge in the SB-200/201 is accurate and sensitive enough for all normal purposes, and since it remains in the coaxial input/output line even when the linear is switched off, it can be used also when operating "barefoot." The r.f. switching between transmit and receive modes is done simply enough by a d.p.d.t. relay which also bypasses the amplifier circuitry when the amplifier is shut off. The only precaution to note is that the relay coil operates at over 120 v.d.c. Some new solid-state transceivers may not be designed to switch such a relatively high relay coil voltage directly, although it should be a simple matter to develop some sort of interface circuit when, and if, necessary.

The construction of the SB-200/201 has improved over the years. The present-day SB-201 uses a very compartmentalized type of construction such that the r.f. section is well shielded and isolated from the power-supply section, r.f. input and output areas are well separated, etc. The construction involved still utilizes what seems like (but is not) a few hundred sheet-metal screws. But, one ends up

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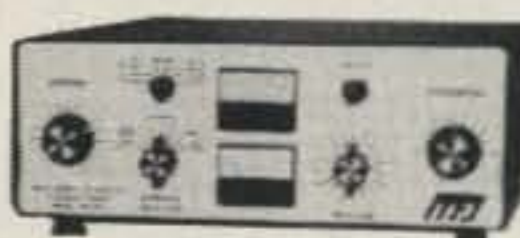
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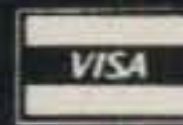
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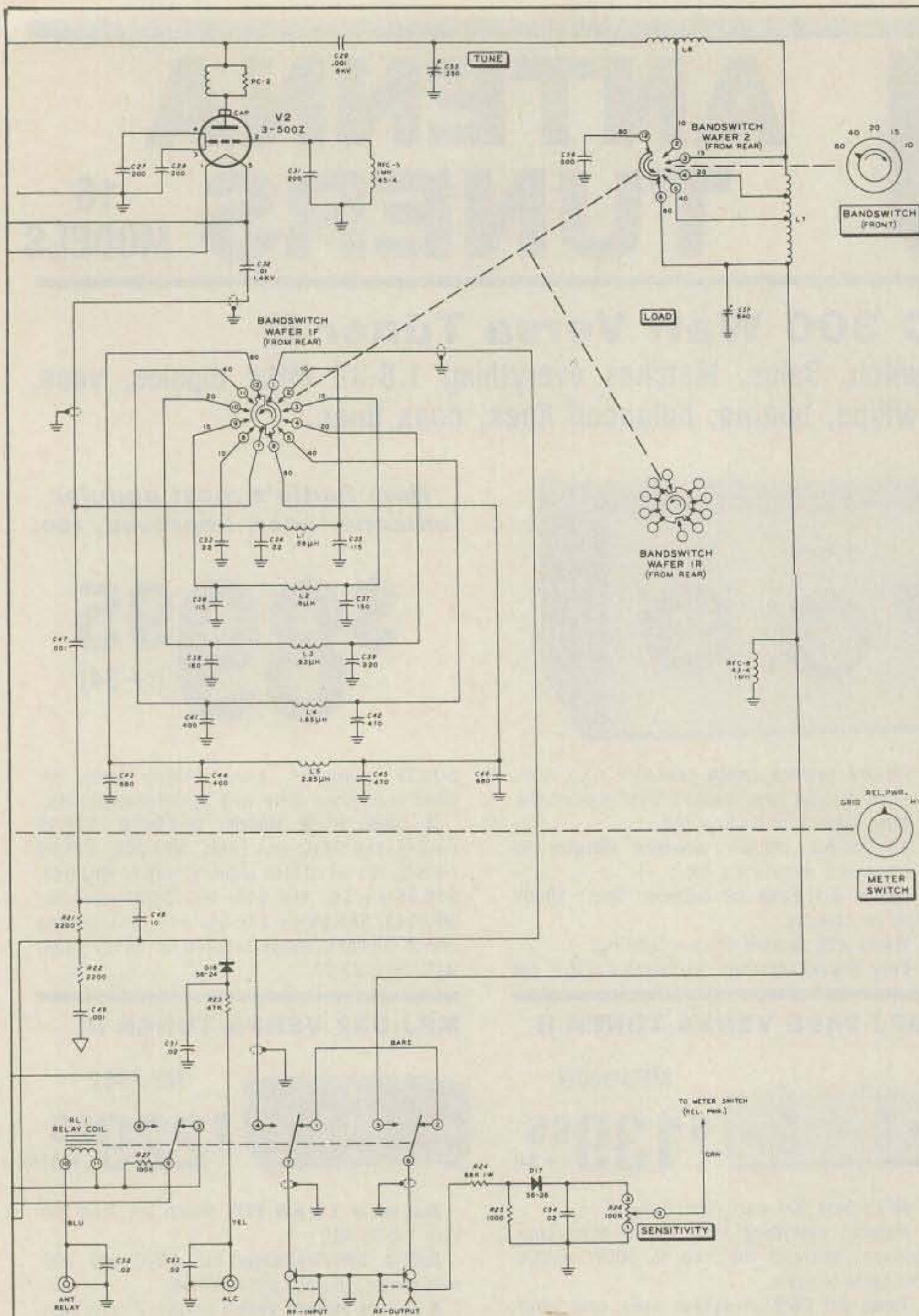


Fig. 3— Input/output circuitry of the SB-220, which does cover 10 meters.

with a very sturdy, well-shielded amplifier. Heath's catalog advertising implication that the good shielding used will eliminate t.v.i. problems is a bit overstated. But, there is no doubt that that part of t.v.i. problems which might develop from poor shielding of a linear should not be the case with an SB-200/201.

Construction of the current SB-201 should take an experienced kit builder about 15 hours, or about one week working just a bit every evening on the project. Compared to the original SB-200, the SB-201 comes with a completely assembled and cut wiring harness which greatly speeds up construction. Also, as best as I remember, the original SB-200 I built over a decade ago used a short length of coaxial cable for the s.w.r. pickup element where one had to insert enameled wire

under the coaxial braid to form the forward/reflected voltage pickup lines. It was a rather tedious process to assemble the thing. Fortunately, the present SB-201 comes with a very easy-to-assemble (and probably far more accurate) s.w.r. pickup element utilizing an aluminum U channel in which pre-cut forward/reflected pickup wire elements are held by spacers from a central conductor made of copper tubing. All in all, the quality of the parts used and the ease of construction involved have both improved as the SB-200 passed into the SB-201.

The "bigger brother" of the SB-200/201, the SB-220/221, has followed a similar line of development. The circuitry of the linears is essentially the same except for the input/output circuitry to account for the presence or absence of 10 meter

coverage, as shown in figs. 3 and 4.

Both amplifiers use Eimac 3-500Z triodes paralleled in a ground-grid circuit. One hundred watts of drive will easily produce an input level of 1 kw d.c. on c.w./RTTY and 2 kw p.e.p. on s.s.b. Maximum key-down and RTTY transmission periods are limited to 10 minutes, which is certainly adequate for most exchanges.

Primary taps on the high-voltage transformer are used to change the plate voltage on the tubes for either c.w. or s.s.b. operation. One tunes up the amplifier using the c.w. voltage tap and then switches to the tap which produces a higher plate voltage for s.s.b. operation. Amplifier efficiency, IMD products, etc., specifications are at least as good as those of the SB-200/201 amplifiers. The 3-500Z tubes are not inexpensive, costing over \$100 each on a replacement basis, but they are a very well-proven commercial design. Their life will depend upon a variety of factors, including, of course, how many hours one uses a given amplifier, how often it is switched on and off, etc. An educated guess would be that if the amplifier is used several hours a day on a regular basis, the tubes should last about five years before they grow "soft" or a typical grid-to-filament short develops. The tubes are cooled in the SB-220/221 by a single, large fan which circulates air over their entire glass envelope. An air system "chimney" arrangement is not used.

Separate tuned pi-network circuits are used for the cathode input on each band (except 15 meters in the SB-221), and the plate output circuit is a conventional bandswitched pi-network with a separate heavy-duty inductor for 10/15 meters. The story on converting an SB-221 for 10 meter operation is much the same as for the SB-201. One cannot simply short out the "Filter Assembly" shown in fig. 4 and expect the amplifier to present a constant 50 ohms input load on each band. Each of the cathode input circuits has to be rebuilt along the lines of those shown in fig. 3. Heath will supply a modification kit to licensed amateurs for about \$30. Adding the modification kit to the SB-221 is a bit simpler than in the case of the SB-201. The bandswitch supplied with the SB-201 is an articulated affair with sections joined by shaft couplers rather than one 12-inch long unbroken affair as in the case of the SB-201. So, even if one adds the 10 meter modification to an existing SB-221, it is not too tedious an affair, although it is still recommended that the modifications be installed when the amplifier is first constructed.

The rest of the circuitry of the SB-220/221 is conventional enough and has not changed much over the years. The SB-220/221 does have provisions for a slight amount of operating bias, to improve linearity, and also cut-off bias during receive periods. This accounts for the extra pole on the antenna transfer relay. The coil of

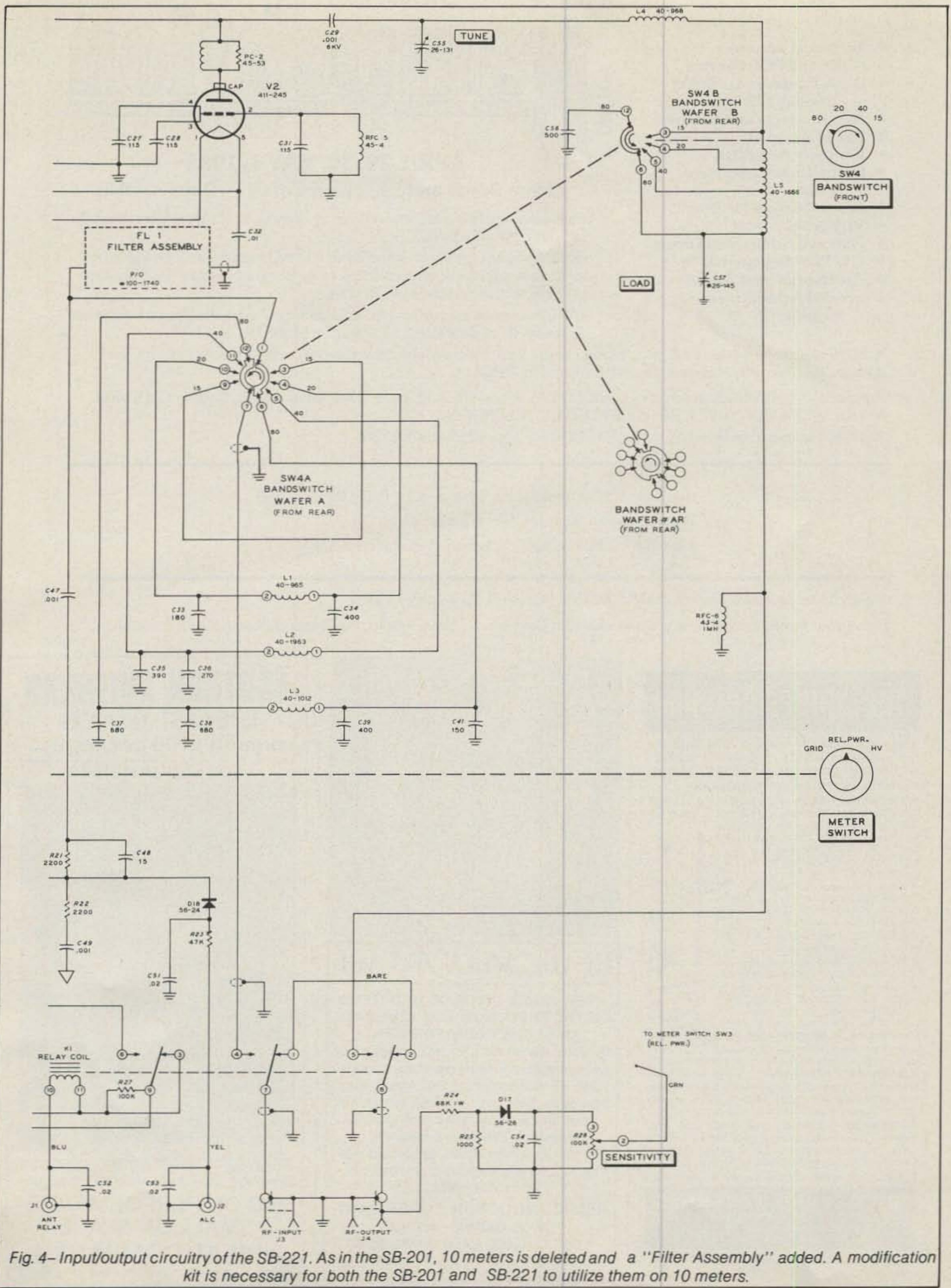


Fig. 4- Input/output circuitry of the SB-221. As in the SB-201, 10 meters is deleted and a "Filter Assembly" added. A modification kit is necessary for both the SB-201 and SB-221 to utilize them on 10 meters.

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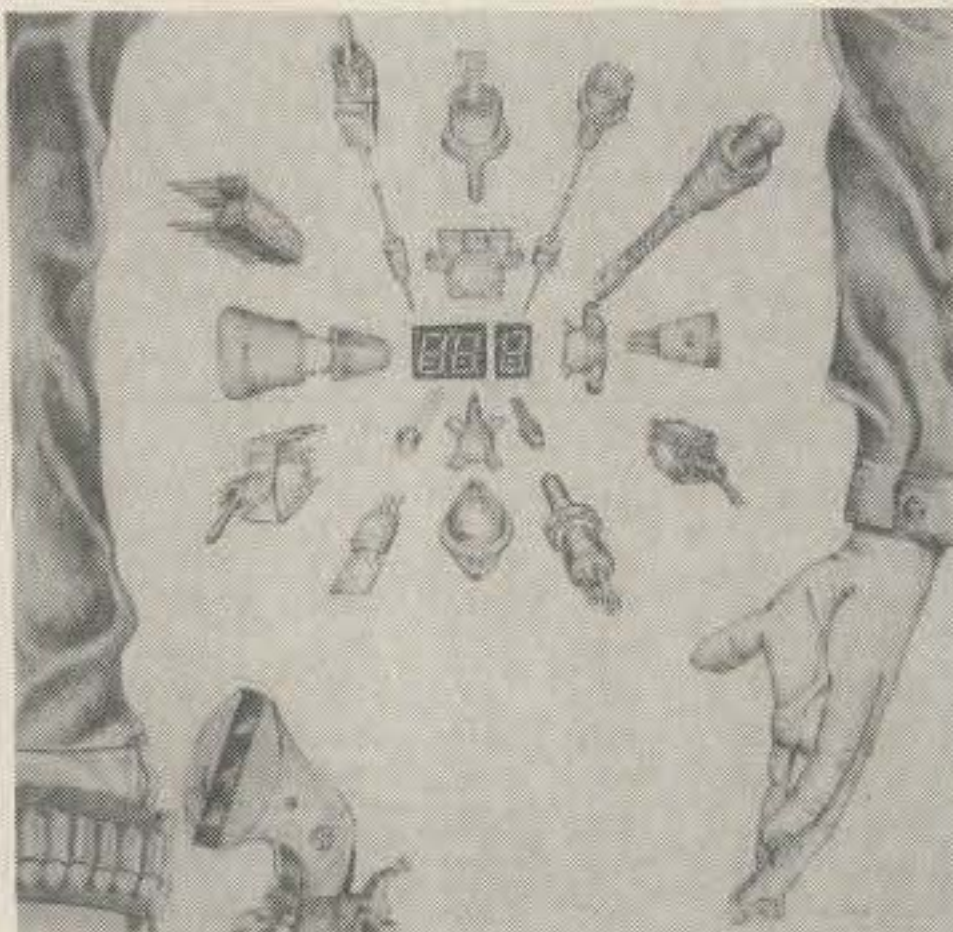
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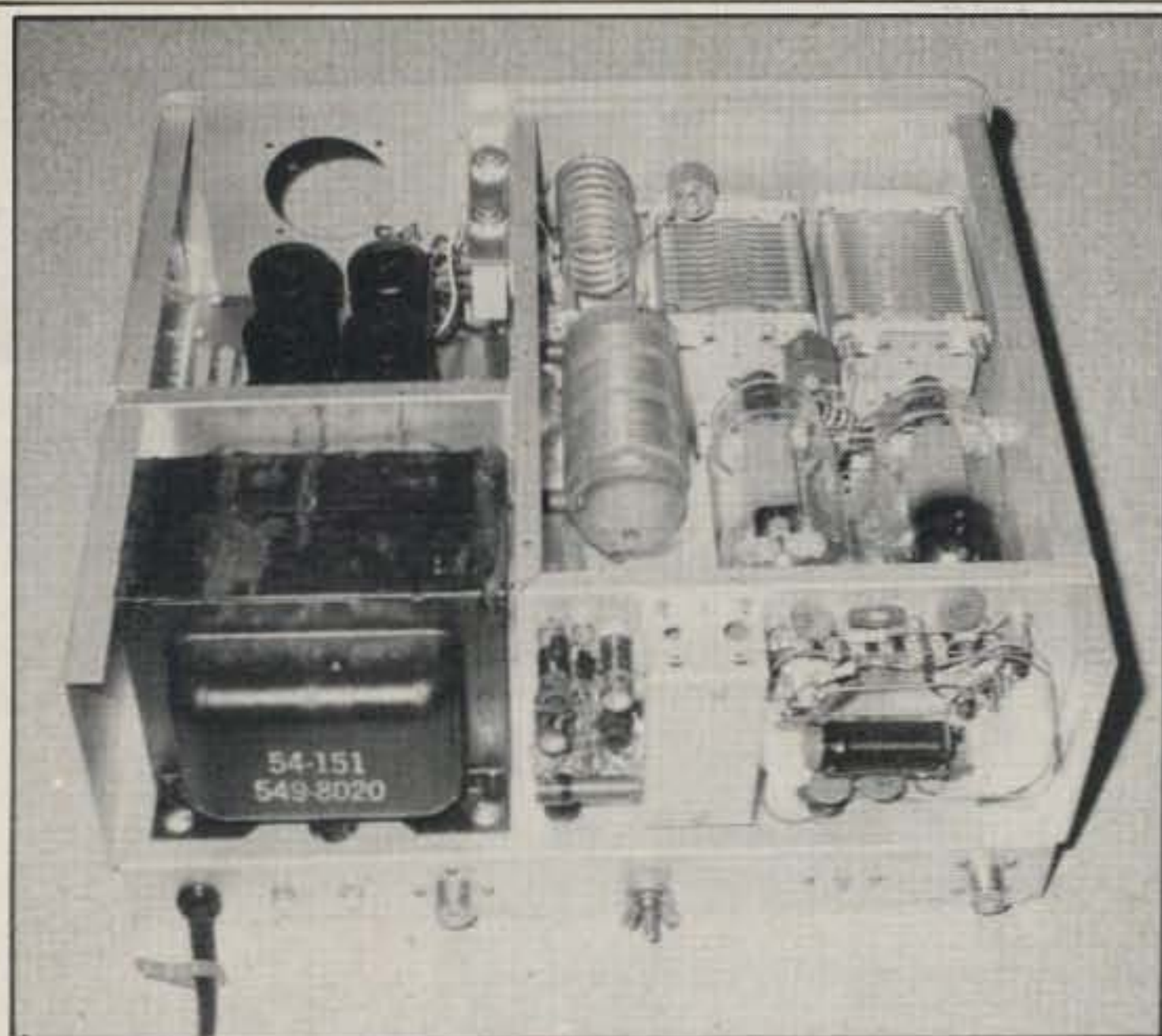
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This rear view of an SB-201 under construction shows the tuned cathode input circuitry to the right of the power transformer. Shown to the right of the input coils is the factory-installed filter assembly enclosure designed to prevent operation of the linear on 10 meters.

this relay also operates on 120 v.d.c., so one has to be sure that whatever external switching is used is compatible with this voltage. Two meters are provided, one dedicated to measuring plate current while the other can be switched to measure plate voltage, grid current, or relative power output. There is no built-in s.w.r. bridge.

In general, the construction details of the SB-220/221 follow those of the SB-200/201. The latter is illustrated by some of the photographs referred to later. In the SB-220/221 a different layout arrangement is used in which the tubes are mounted vertically, the filter capacitors are stacked vertically in an insulated housing, etc. But, the same idea of shielding and compartmentalizing different sections of the amplifier is followed. There are a lot of sheet metal screws as usual, but the construction is very sturdy and relatively compact for a linear of its power class. No wiring harness is supplied, but since the overall wiring required is somewhat less and simpler than for the SB-200/201, overall construction time is about the same as for the smaller linear.

Which linear represents a better value for the purchase cost? There is probably no simple answer to this since one can't tell the whole story by dividing the cost by watts. One has to evaluate one's operating needs as to the role that the power difference between the amplifiers would play, whether one is more oriented towards RTTY rather than s.s.b., how much of a role eventual tube replacement costs play in one's budget, etc. Also, there is the question of a.c. power-line facilities. If the SB-220/221 is really to be used at its full power input level, it should be operated from a 240 v.a.c. line or a dedicated 120 volt line. The SB-200/201 can operate from the usual 120 v.a.c. house circuit using #14 wire along with other low-power station equipment. A perhaps

smaller point is that with the SB-220/221 one should be using RG-8 or similar cable for the antenna. Smaller RG-58 cable is rated for power levels, particularly on 10 meters, which are one-third or more less than the SB-220/221 can deliver.

There are a few simple modifications for the amplifiers that one might want to consider:

1. All designs do not have a "standby" switch. Therefore, if one want to quickly switch the amplifier in or out of the r.f. line to reduce power level or for tune-up purposes, one has to turn off the power switch. The tubes used are rugged enough, but the continued shock to their filaments by such switching can only shorten tube life over an extended period. A simple solution is possible by using a switch to break the line going to the **Antenna Relay plug** when desired. This can be done in a "no-holes" fashion by replacing the **Sensitivity** potentiometer on any amplifier with a potentiometer having a pull-type on/off switch. Such units are available as TV replacement parts, or one can order a replacement potentiometer/pull-switch from Heath such as that used in their HM-35 directional wattmeters. The potentiometer on the unit is 200K and works fine to replace the 100K unit used in the amplifiers. Wire the switch so the antenna relay line is opened with the switch pulled out.

2. Fan noise is not really objectionable with any of the amplifiers. However, if one listens for long periods of time, the fan speed can be reduced during reception periods to make things even quieter. Admittedly, one can accomplish this with a bit of electronics, but the idea of simply switching a resistor in series with the fan motor leads will also suffice. One has to experiment a bit for the value of resistance needed, but a 500 ohm/25 watt unit seems to work nicely. The resistor is switched in or out by a relay having a 120 v.d.c. coil which is wired in parallel with

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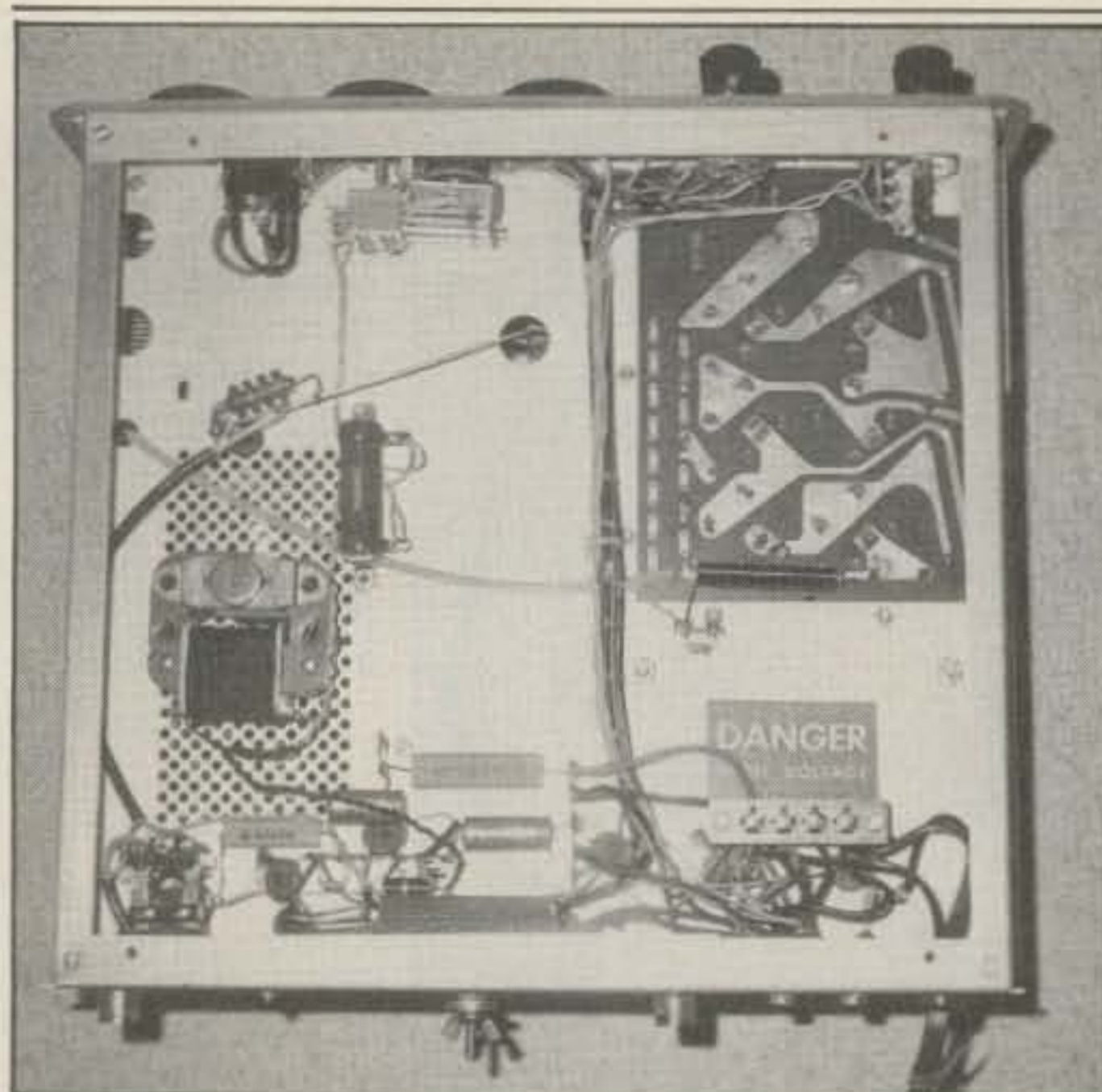
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
This under-chassis view of an SB-201 shows the potentiometer with pull-switch (upper right corner) installed in place of the original sensitivity-control potentiometer. Also, note the fan-speed-control resistor mounted to the chassis near the upper right corner of the fan motor.

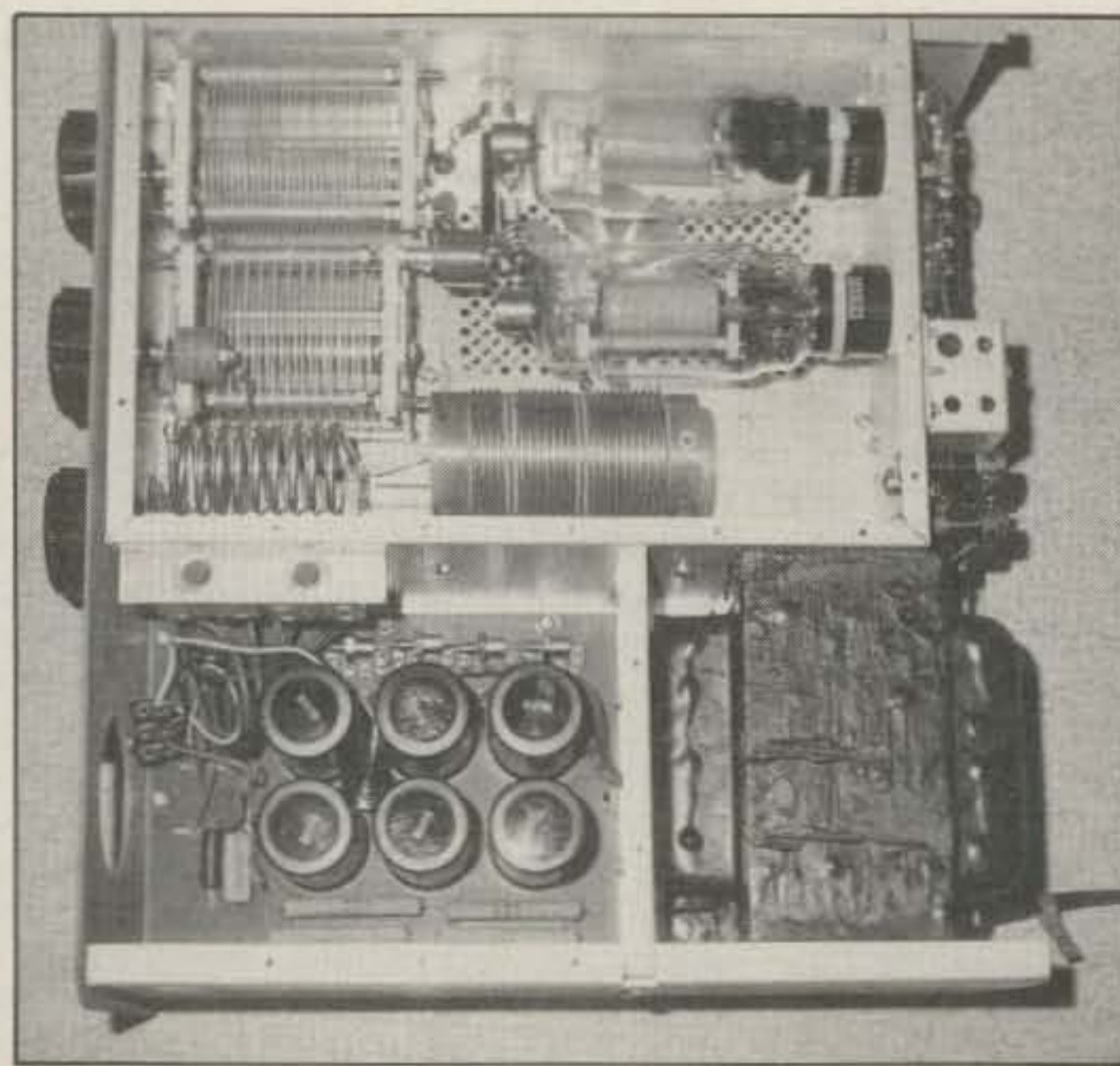
the 120 v.d.c. coil of the antenna transfer relay. A further refinement would be to use a time-delay relay so the fan remains on high speed for 10 seconds or so after transmitting.

3. The plate voltage drop in all the linears amounts to 300-400 volts between no load and full load. One could "beef-up" the output capacitor values in the high-voltage rectifier circuit to combat this. However, many amateurs have found that the simple expedient of replacing the long series strings of rectifier diodes used by Heath with one or two good quality 1500 volt, 2500 ma diodes will considerably improve the situation. One of the photographs show how 4 new diodes replaced 16 of the original diodes. In the case of an SB-201, about 75-100 watts more output power was noted.

4. One final note concerns the SB-200/201 only. The tubes in these amplifiers hang in a horizontal position. The looseness of them in their sockets does not in-

spire great confidence in their remaining in place if the amplifier is moved often or shaken about a bit. The obvious solution would be to install tube base clamps, but such items are not readily available. One expedient, as shown in a photograph, is to install metal posts flush to the tube bases and then to use sturdy plastic cable ties to secure the bases of the tubes to the posts.

Heath, besides deserving credit for the design of these amplifiers, deserves some points for the response of its replacement parts department. Over the years I have had the need to obtain various parts, and they always came speedily and exactly as ordered. As many of us have sadly learned, more than one company in the amateur radio field today seem to have a deliberate policy of offering no real after-sales service, although lip-service is paid to the idea. Heath is definitely not one of those companies; it is the extreme opposite. 



Top view of an SB-201. Note the four diodes below the lower row of filter capacitors. They replace 16 original diodes for better HV regulation. One can also note how the tubes are firmly held in place by banding around their bases to added metal posts. When finally assembled, a perforated metal shield covers the entire top area shown except for the power transformer.



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The AEA "Moscow Muffler" A Blanker For The Russian Woodpecker



The Moscow Muffler has a nice, neat appearance.

Anyone in amateur radio who operates the DX bands has certainly run into the Russian Woodpecker. This is, as far as we know, a radio signal generated in Russia and used for over-the-horizon radar detection. The signal causes tremendous interference over a wide spectrum. In fact, depending on the location of the amateur receiving station in the United States or Canada, the Woodpecker can knock out the strongest signal, as well as weak DX stations. Our government has protested very strongly about the interference through all available channels and it simply has done no good. The answer to eliminating the interference, at least for the time being, seems to be at our end by electronic means.

Mike Lamb, one of the guiding lights at Advanced Electronic Applications in Lynnwood, Washington, has come up with a device which he calls the "Moscow Muffler"™ which does an astounding job of eliminating the Woodpecker. We ran into Mike at the Boxboro Hamfest; in fact, he had the booth next to ours. He was as enthusiastic about his device as a kid who has just discovered popcorn at a Saturday matinee. We offered to try the device and do a review on it, but being a DXer, and having encountered the woodpecker, we were skeptical to say the least!

Shortly after Boxboro, Mike sent a unit to me and I hooked it up as stated in the instructions. Naturally, because I wanted the Woodpecker, he didn't show up. Suddenly one day about a week later, there he was in all his glory running about an S7 or so on the S meter. I carefully adjusted the controls on the Moscow Muffler, and bingo—no Woodpecker. I tuned the receiver away from the spot of adjustment, and there was the Woodpecker banging away. I then found a weak signal that was impossible to copy through the interference. I carefully adjusted the Moscow Muffler to eliminate the noise. The Woodpecker again disappeared, and there was my weak signal, perfectly readable. Since that initial encounter with the bird he has been back many times, and with ear-shattering strength. It is almost hard to say this, and I think it will be true in anyone's case, but there wasn't a time when I couldn't completely knock out the doggone interference.

*200 Idaho St., Silver City, NM 88061

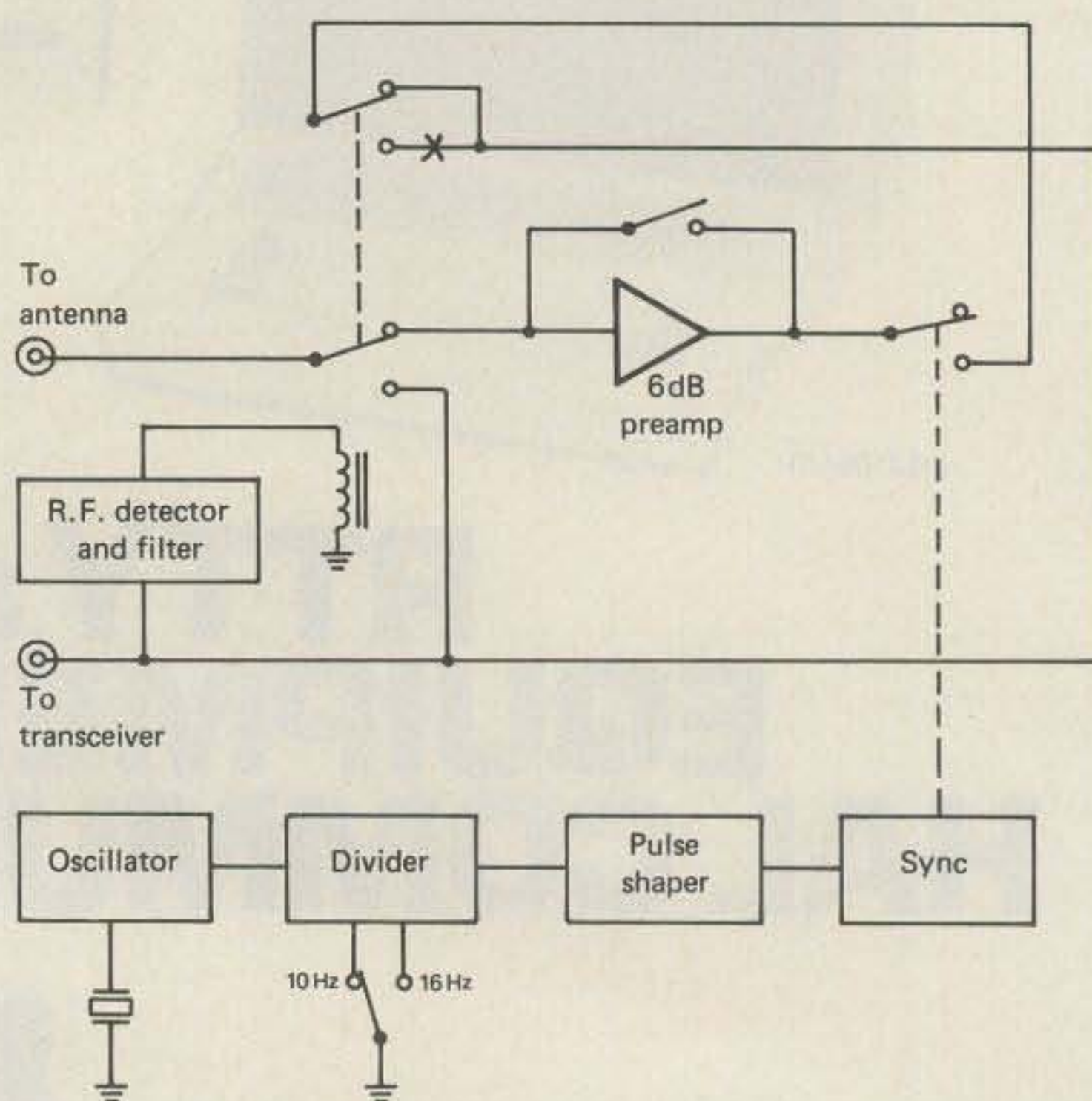


Fig. 1—Block diagram of the Moscow Muffler Woodpecker blanker.

So what's in it? I, of course, asked Mike for circuit details, and he said that at the time the details were proprietary and could not be divulged. However, he did provide a block diagram (shown in fig. 1).

The Woodpecker blanker is supplied in two models: one for a receiver only (WB-1) and the other for a transceiver of up to 150 watts output (WB-1C). In my case, I installed the unit between a Drake TR-4C and MLA-2500 amplifier. The Model WB-1C has a changeover relay that is r.f. operated. A 12 volt, 500 ma supply is needed to power the unit.

There are two important controls: **Width** and **Sync**. When the Woodpecker appears, you adjust the Width to about its two o'clock position and then adjust the Sync control to null out the interference. A little readjustment of both controls usually completely knocks out the interference. The instructions point out that at times it may not be possible to completely null out the Woodpecker because it arrives at your location via multihop transmissions. Another control, **Rate**, permits either 10 Hz or 16 Hz blanking. It is assumed that there are actually two Woodpecker stations—one in European Russia and the other in southern Siberia. Pulse rates may be different depending on which station is transmitting (or if both are transmitting). Switching from 10 to 16 Hz quickly clears up residual pulses in most instances.

The Moscow Muffler measures 2½" x 6" x 5" and weighs about a pound. The box is packed with transistors, IC's, and circuitry. The color is black (what else—it has to be a "black box"!). Price class is \$140, and we don't consider that very much for the peace of mind you get from using it. If it sounds like this review is "high" on the Muffler, it is. I think it is a necessary device for any user of the DX bands. (Of course, it works on 80 and 40 meters, too.) The unit is manufactured by Advanced Electronic Applications, Inc., P.O. Box C-2160, Lynnwood, WA 98036-0918 (tel. 206-775-7373).

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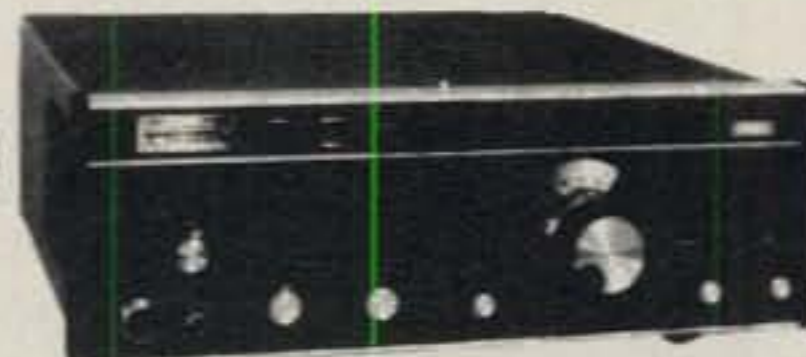
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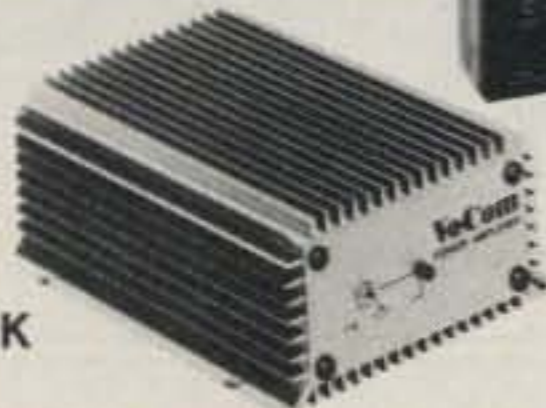
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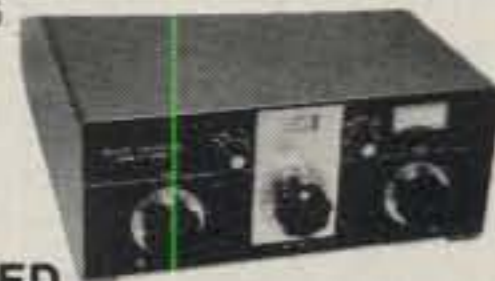
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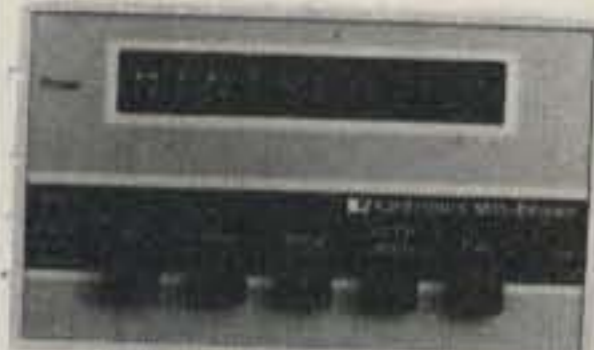
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Refinements and ease of operation need not be major tasks. PY6SB shows how some simple changes added to the versatility of his station.

Customizing The Macrotronics C.W./RTTY Interface

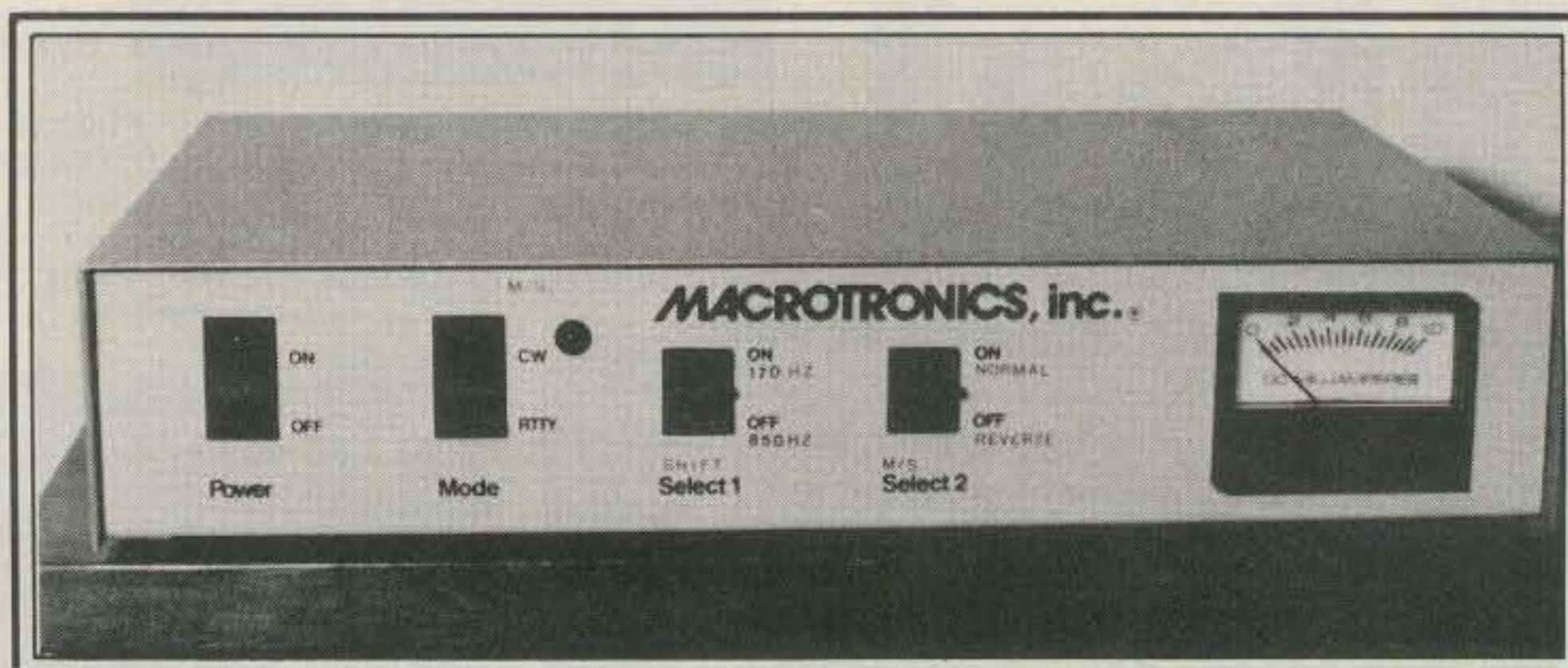
BY RICARDO SILVA*, PY6SB

After operating the Macrotronics M80/M800 c.w./RTTY hardware/software interface for some time, the conclusion you would arrive at, as I did, is that it is a great piece of equipment. In my shack there is one interfacing a TRS-80 Mod I, Level II and a Yaesu FT-101ZD plus an amplifier. The only problem it gave me was r.f.i.; when using my amplifier to run over 150 watts input the program would crash. This was easily solved by borrowing some aluminum foil from the kitchen and taping it around the cable that connects the interface to the computer. I should also note that my antenna is a 3-element Yagi about 80 feet from the computer. Reception is hardly bothered with this setup, with only a few "birdies" present. My dipole and vertical are virtually useless, though, because of r.f.i.

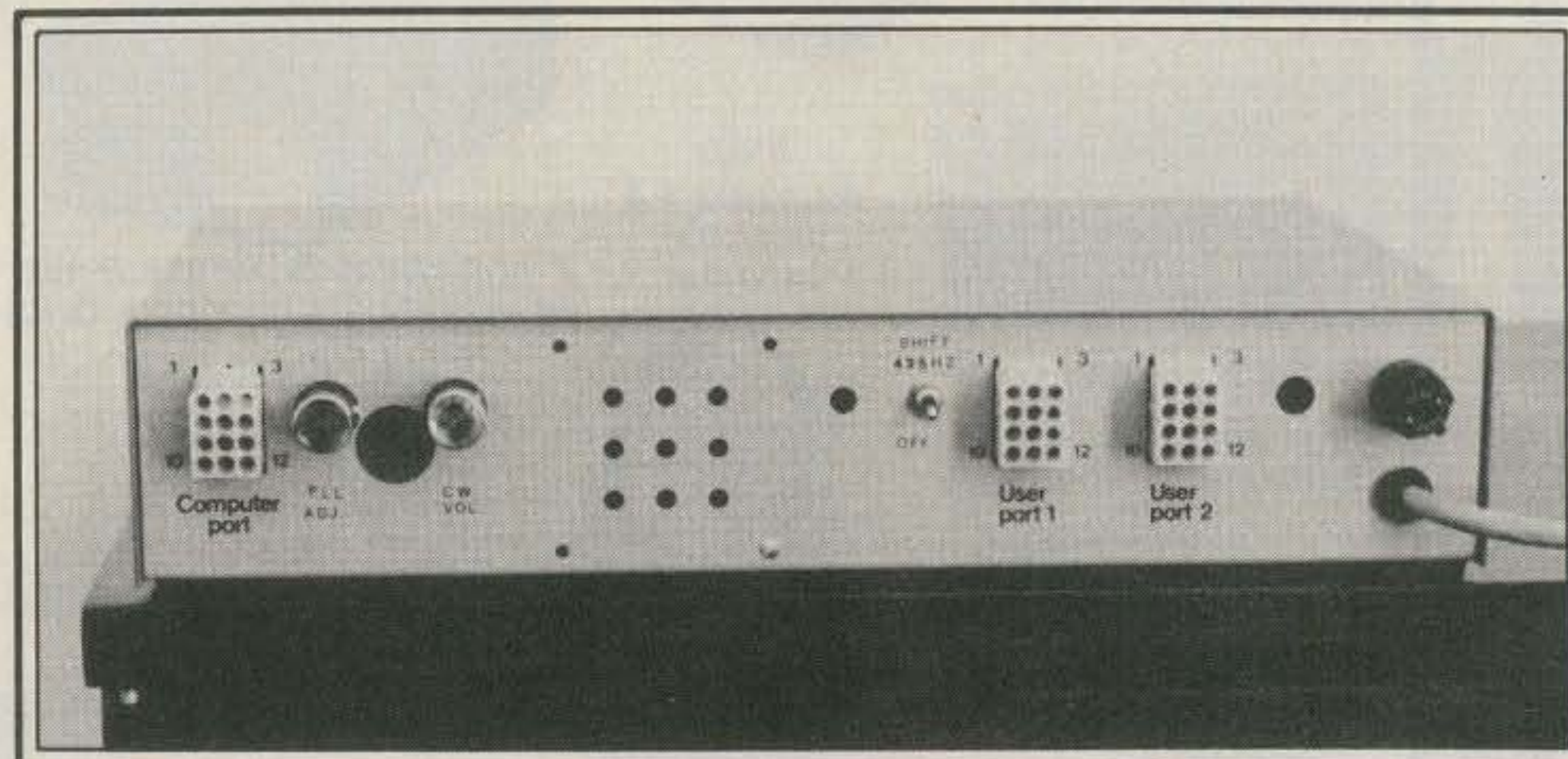
The M800T (RTTY only) software is very good, allowing practically all the options one could use with a cassette-based system. The ones I find most useful and interesting are the "split-screen" operation, the controlled speed output, and the WRU function. One drawback, though, is that the *External Program* function still does not allow for the interchange of computer programs and data or computer gaming over the air.

The operation on c.w. and RTTY runs smoothly, but I found it necessary to make some minor modifications which can easily be copied by anyone. They are as follows:

A. External control of PLL adjustment and c.w. sidetone volume. Since I have my system enclosed in a metal cabinet, I found it necessary to substitute the trim pots which adjust the PLL frequency for c.w. reception and control the c.w. sidetone volume. This can be done easily by installing a couple of 10K linear potentiometers on the rear panel and connecting them to the same points where the trim pots were connected. The panel is already drilled in the appropriate spots.



Front view of the modified unit. The additional LED can be seen next to the CW indication by the Mode switch. Additional lettering is also added to denote the new functions of Select 1 and Select 2.



The rear view shows the addition of the PLL adjustment control, the CW sidetone volume control, and the 425 Hz Shift switch.

This modification comes in handy especially for working c.w. via v.h.f.-f.m. (c.w. classes, anyone?). The PLL has to be adjusted because of varied tones and the lack of a "clarifier" on f.m. The sidetone comes in handy, on the other hand, to feed the microphone input and transmit, adjusting the volume accordingly (impedance should be matched through a transformer).

B. Provide a 425 Hz shift on RTTY reception. Most news agencies on RTTY operate with the 425 Hz shift which is not provided with the interface. This is easily added with the circuit shown in fig. 1,

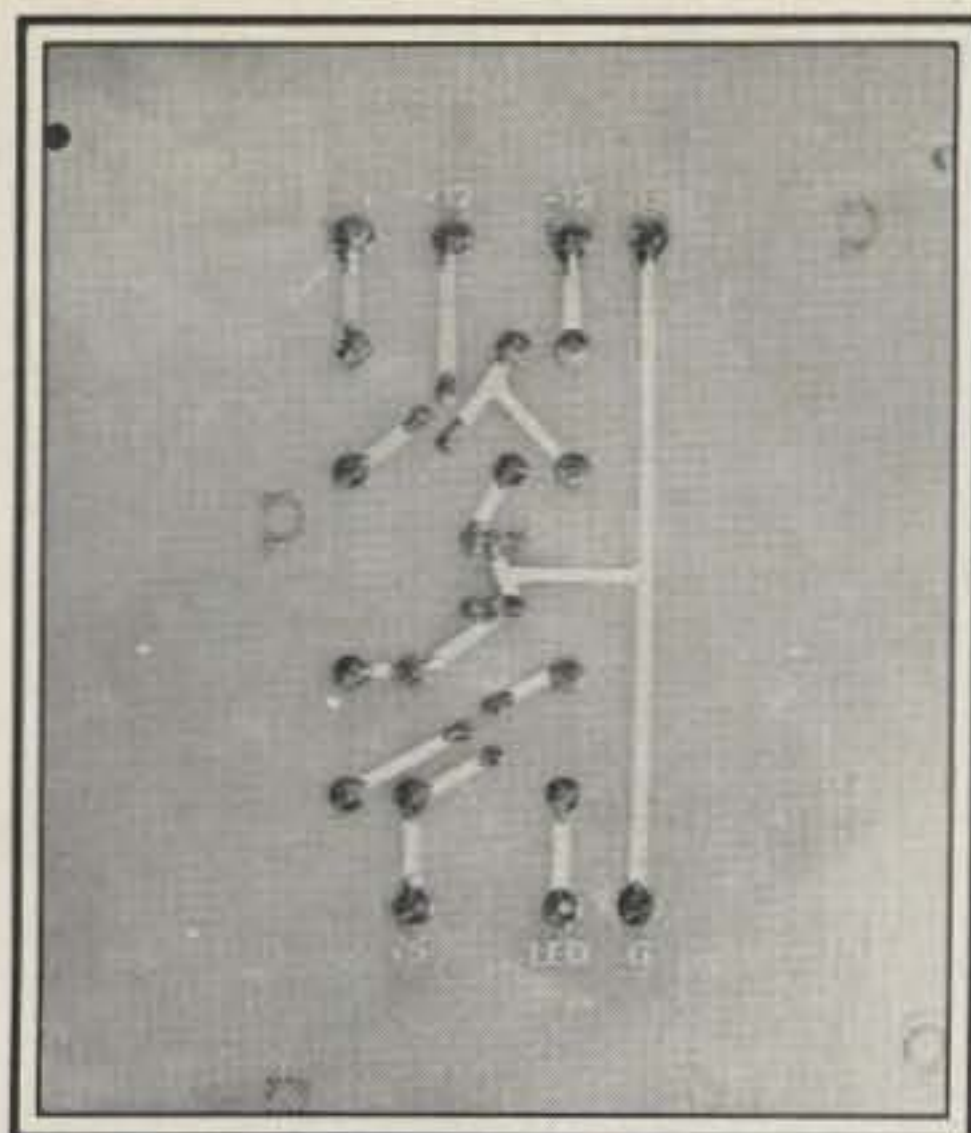
which is a section of the Macrotronics FSD-1 Demodulator circuit. This circuit uses part of the existing circuit for the shifts, and I chose to install S1 on the rear panel. Add jumpers to the S4 switch from S4-1 to S4-6 and from S4-3 to S4-4 (see appendix A, page 18, of "FSD-1 Demodulator User Guide" for details).

Parts List:

- S1—S.P.D.T. switch
- R1—4.7K ohm trim pot
- R2—18K ohm resistor, 1/4 watt

The adjustment of the trim pot should be done following procedures similar to the ones described on page 10 of the

*Telebahia S.A., Rua Silveira Martins, 355 Salvador, Bahia Brazil 40000



PC board for the additional LED circuitry.

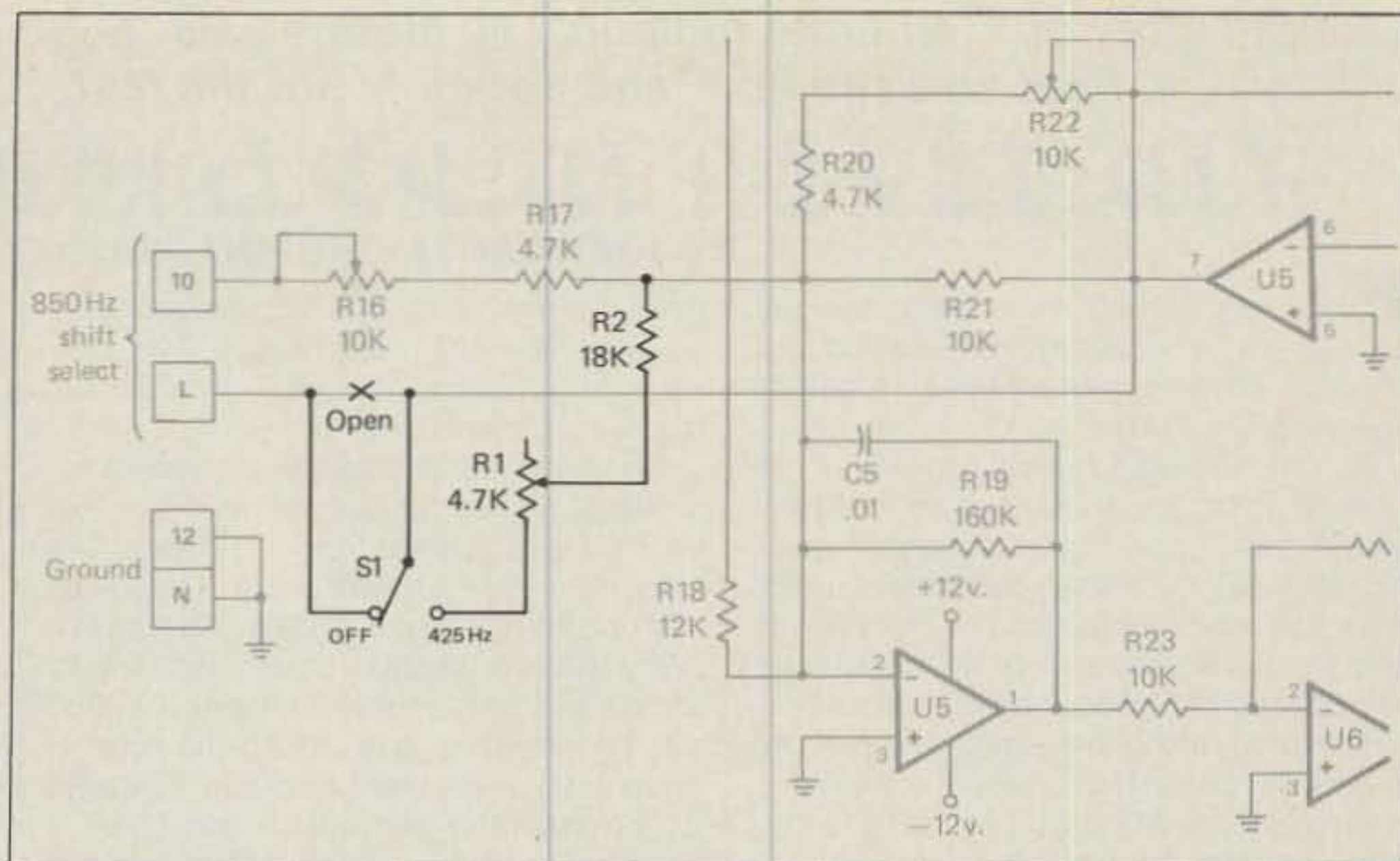


Fig. 1—The portion of the Macrotronics FSD-1 demodulator circuit that is added for 425 Hz shift.

"FSD-1 Demodulator User Guide." This time the shifted input signal should be 2575 Hz.

When S1 is on the "425 Hz shift" position, the demodulator works on this shift. When it is switched off, control is passed back to the front switch (either 170 Hz or 850 Hz shift).

C. Additional LED for Mark/Space indication. The interface comes with only one LED to indicate either Mark or Space on RTTY reception. This makes it a little harder for tuning, especially for the news agencies, which may operate on any shift or mode (Normal/Reverse). The addition of another LED facilitates things a bit. This can be done with the circuit shown in fig. 2, which can be made on a PC board.

Parts List:

- IC1—Opto-isolator (TIL III or equivalent)
- T1—2N2222 transistor
- T2—BC 179 transistor
- Resistors (all 1/4 watt):
- R1, R2—2.2K ohm
- R3—1K ohm
- R4—10K ohm
- R5—33K ohm
- R6—330 ohm
- LED

Connections are as indicated, where G is common ground; IN indicates the input signal from switch S4-5; +12 v comes from J5-B; -12 v comes from J5-2; +5 v comes from J4-M.

Mounting the board is easily accomplished with long screws and spacers as seen in the photos. The final appearance can be seen by again looking at the photos. Some titling is a must so that you do not have to remember what Select 1 or Select 2 means.

I would like to encourage all my fellow M80/M800 users to make these modifications.

Acknowledgement: To the friends at Telebahia who helped with the calculations and to Paulo, PY6PA, who helped with on-the-air testing, my many thanks.

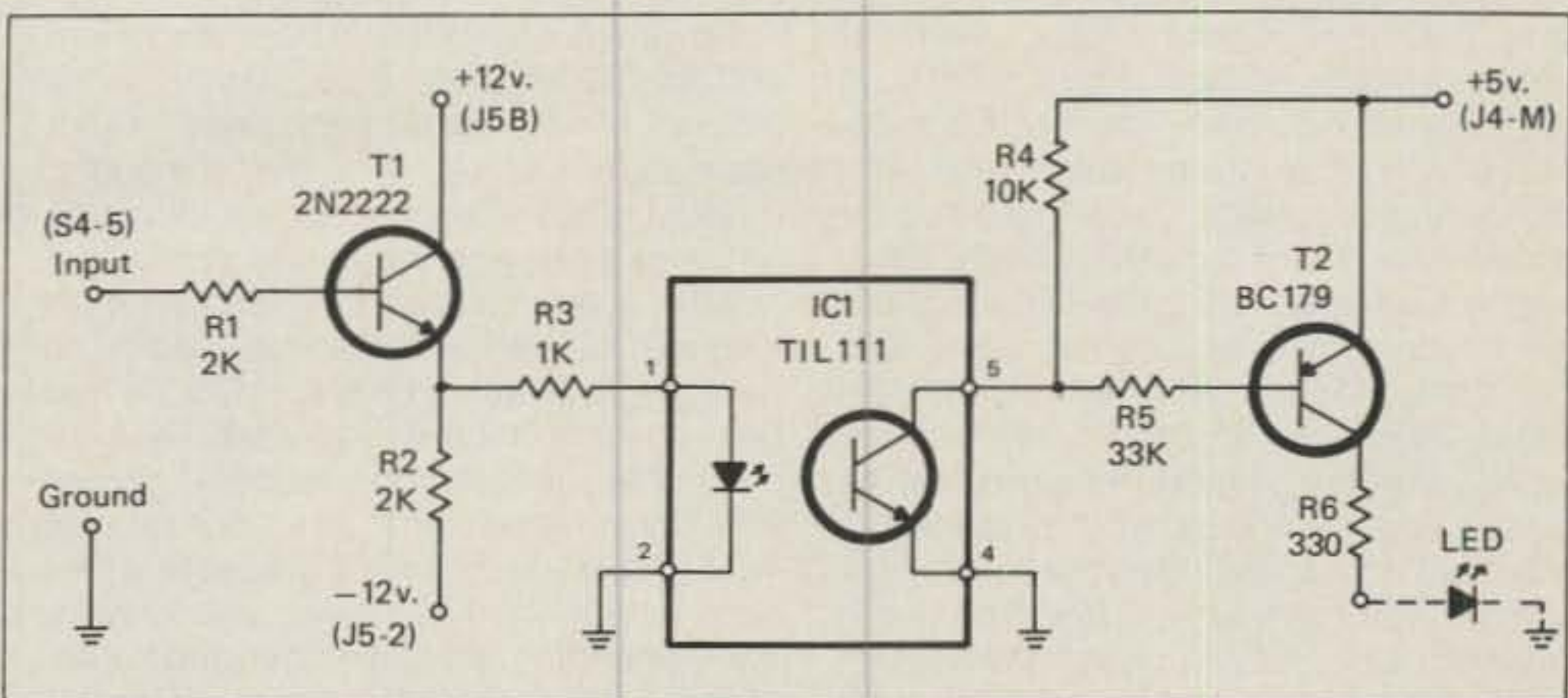
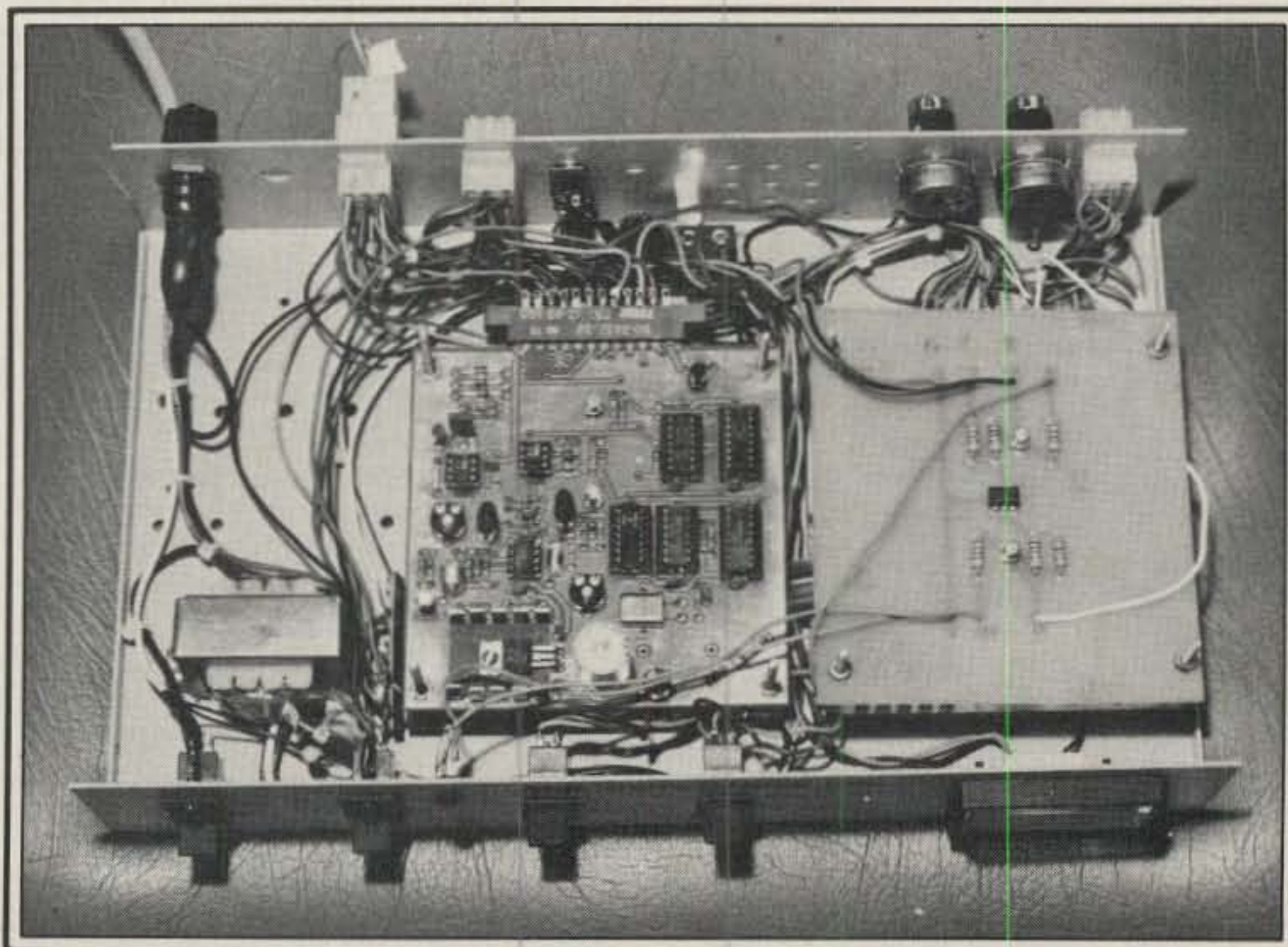


Fig. 2—The addition of another LED for either Mark or Space indication.



The interior view shows the additional PC board mounted in the right side of the cabinet.

Like the story of "Ten Little Indians," 40 meters was beginning to thin out . . . one by one. Fred was the first and certainly not the last.

WHATEVER HAPPENED TO FRED?

BY JOAN TANYA CHOPIN*, WA6BXT

Fred was a mild mannered, serious c.w. operator who enjoyed a good rag chew on 40 meters every evening before watching the news.

By day he was a typical American. He worked at a good job in a moderately large office, spending about one-third of his work day calling on customers in the area. He was well thought of by his boss and his co-workers, and his customers considered him pleasant and reliable.

His family life was basically happy, routine, and generally unspectacular. He was married to a fine woman name Henrietta, who devoted much of her time to keeping a nice home for him and their moderately well-mannered children.

Fred had many friends on the band and he found comfort in QSO's with them over the years. Some nights, when he couldn't sleep, he would turn on the rig and chat with some friends until the rhythmic lullaby of 30 w.p.m. relaxed him into pleasant drowsiness. Once in a while he would work DX if it popped up on the band where he happened to be listening, but his major activity was to rag chew with his many friends with whom he had grown close over the years. He felt as if he knew many of them as intimately as family, and in some cases they shared as much as if they had been related.

Fred was there when Bill in San Diego returned from his youngest child's high school graduation and was feeling a bit depressed about growing older. Fred was also on hand to soothe Ben in San Francisco when Ben's wife was in the hospital and he was so upset. Fred was there to share the joy of the arrival of a new baby in the life of Paul in Seattle. He had shared so many sensitive moments with these old friends on 40 c.w., that it's little wonder that they all began to ask one another about him when he didn't get on at his usual time for a few days, then a week, and then two.

"Hey," Bill asked Paul, "what's become of Fred?"

"Dunno. I've been kinda looking for him myself," Paul replied.

So it went among the group, week after week, until one day Fred's buddy, George, finally decided to break his self-imposed ham rule and make a long-distance phone call to Fred's home. Henrietta answered, and when George asked about Fred, the dear lady fell apart. She proceeded to describe the events of the previous weeks to a shocked George,

who could think of little to console her.

"Two meters," she said. "Two meters! I don't even know what it means, but it's ruining our lives!"

She told George about the innocent beginnings of the chain of events that caused Fred to disappear from 40 meters. She said that Fred had been out on a business call and he had had a flat tire. He was in a hurry to keep an appointment with a customer and was unable to make a call to say he would be late. Being the reliable chap that he was, he was quite frustrated at his inability to contact the customer or his office, and it was then that he decided to put a 2 meter radio in his car. It would, of course, be just for emergencies, since he was a devoted c.w. man. In fact, he didn't even own a microphone.

So he went to the local ham emporium and bought a modest little, 10 watt, crystal-controlled 2 meter transceiver and a quarter wave spike. Certainly, he thought, it would be an adequate station to handle any emergency he might encounter.

After a few days of monitoring the six frequencies he had in his new radio, he decided to break in on a few QSO's that he had heard on his way to work. The people on the repeaters told him that he was "making the machine" o.k., but he was not full quieting. They suggested that perhaps a 5/8 wave antenna would help. Well, one thing led to another and he decided to buy a larger, synthesized 2 meter radio that ran a hefty 25 watts. This was quite a chunk out of his ham budget, but he told himself that he needed it, just for emergencies, of course.

While scanning the band on the new radio, he found a repeater with auto-patch. He certainly could use that capability, so he bought a touch-tone pad and sent a check for membership to the repeater. Realizing that he was really over extending himself, he put his old c.w. rig on the repeater swap net to make a few extra bucks.

Now that he no longer had equipment for 40 meters, he decided that he needed something in the house, just in case of an emergency you understand, so he bought a multi-mode 2 meter station for home. He played with it to make sure it worked o.k. while the warranty was still in effect, and realized that he needed a better antenna system. After all, what good is a good radio without an adequate antenna?

Before long the children were asking why Daddy was always in his ham shack saying strange things like, "fine business," "the alligator got you," "you got jammed out," and "who doubled with me?" He bought amps and preamps for the car and the "base station," and still

he wasn't satisfied. Poor Henrietta was in tears as she talked about Fred's next project, that of putting up his own repeater. He was selling their beautiful little home and buying a mountaintop location and a huge tower. She became almost unintelligible as she described how he had lost his job because he had spent so much time in the car talking on the air that his customers had gone with other, more reliable companies. They had been living on their small savings, which was nearly depleted, and Henrietta was now looking for a job.

Needless to say, George was appalled at this tale. He tried to calm Henrietta with some words of wisdom, but could think of none. He simply said he was sorry about all of this and timidly said good-bye.

That night George found Paul and Ben in QSO on 40 c.w. and broke in to relate the story he had heard from Henrietta.

"Amazing!" Ben said. "That is so unlike Fred."

"Indeed," agreed Paul.

"But true," George stated. "Do you know much about 2 meters?"

"Not really," said Ben.

"Neither do I," said Paul.

"Sure is too bad about Fred," said Ben.

"Sure is," agreed Paul.

"Do you think it would be possible to work Fred from here?" George asked. "I wonder what it would take."

"Well," said Ben, "I know there is some DXing on 2 meter sideband, and I think they even link repeaters to cover a pretty good range."

"No kidding?" George responded. "Sounds pretty interesting. I wonder what kind of power you'd need."

And so that QSO continued, with Paul and Ben exchanging shocked reactions to the fate of their friend Fred, while George continued asking probing questions about the mysteries of 2 meters. Before long, as if he had suddenly become preoccupied, George said he had to QRT. He signed out, without even a dit-dit, and was never heard from again.

Paul and Ben still have schedules on 40 meters, but it's just not the same without George and Fred. Lately Ben has been wondering about 2 meter c.w.

"Do you think there is much activity there?" he asked after a pause.

"Well," said Ben, "I guess there is some."

"What do you think you could work on 2 meter c.w.?" he asked after a longer pause.

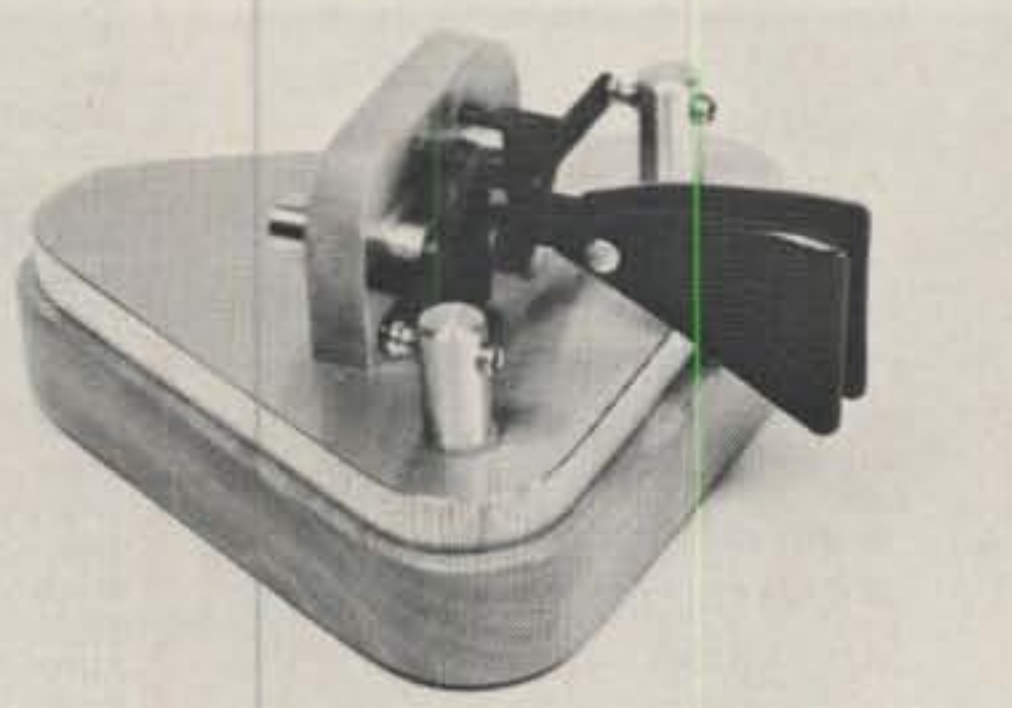
"Gee, I dunno, Ben. By the way, have you heard George on lately? . . . Ben? . . . Do you still copy, Ben? . . . Ben? . . ."

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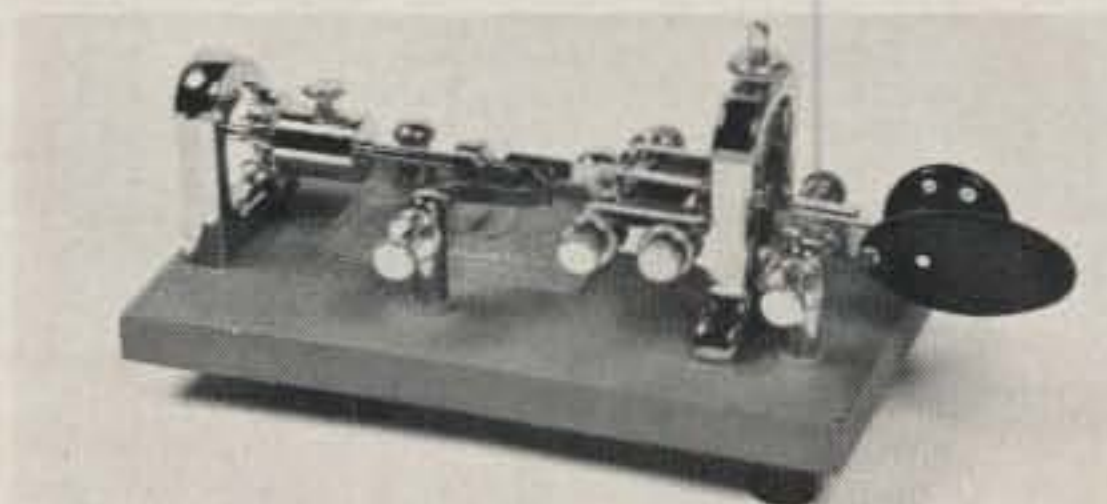
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Automate that J-38? Why not? W0XI gives us another quick program that will help our c.w. operation.

A COMPUTER PROGRAM THAT ACTS AS A STRAIGHT-KEY KEYS

BY PHIL ANDERSON*, W0XI

Have you ever wondered how good your straight-key keying is? I guess we all know that keying by the old straight-key is not always the easiest way to get good code. However, with this program, the Apple (trademark of Apple Computer Co.) corrects for poor duration of dots and dashes and makes sure that a minimum space is inserted between marks—the dots and dashes.

Taking a look at the listing, you will note that it is heavily commented. This follows good practice, and you should comment as you develop a program, not afterward. Statements 10-210 are all comments. The preamble at the beginning tells who wrote the program and when. The next batch of statements defines variables.

Now let's look at the processing portion of the listing. The main body is listed from 300 to 901. Lines 300-415 request a words-per-minute from the operator. Then we process code from 400 through 490.

The algorithm, or plan, is to scan the input key until a mark or closure is sensed. Then we watch to see how long that closure is. If the time is longer than twice a dot, we call the code a dash. If the time is less than twice a dot time, then we call it a dot and print the output accordingly.

The sampling of the input paddle is done in a subroutine, and printing of dots and dashes is also set in subroutines. In this way we can follow the main program very easily, and it is short! Note in the print routines, 2000 and 3000, that we turn off the annunciator output to drive a key. It was turned on as the dot or dash started. Therefore, the code is displayed on the screen and also sent to the gameport. If you want to connect to the port, we suggest that you buffer the output with a transistor. Remember that the port is TTL compatible only.

Try your hand at sending good straight-key code. Let your computer test you and good luck. For other home computer brands, you'll have to change the timing loops and addresses for the gameport. Other than that, it ought to be an easy program to convert.

```

10  REM *****
20  REM ***STRAIGHT KEY KEYS***
30  REM ***PROGRAMS DOT-DASH ***
40  REM ***CORRECTS FOR INPUT***
50  REM ***GENERATES CORRECT ***
60  REM ***DOT-DASH DURATIONS***
70  REM ***FOR GIVEN WPM.....***
80  REM ***ATTACH KEY TO GAME***
90  REM ***PORT. W0XI 11-4-82***
100 REM *****
110 REM
112 REM
115 REM -----
120 REM --      DEINITIONS      --
130 REM --DOT=TWICE DOT TIME--
140 REM --X=1 IF KEY CLOSED --

```

```

150 REM --KEY ATTACHED TO  --
160 REM --PADDLE#1, PIN 3.  --
170 REM --KEY OUT IS TTL AND--
180 REM --IS AN1 OUT, PIN14.--
190 REM -----
200 REM
201 REM
202 REM
210 REM
300 REM ** MAIN PROGRAM BODY**
310 HOME : VTAB (10)
311 INPUT "ENTER WORDS/MIN..";WPM
M
312 PRINT : PRINT
320 IF WPM < 5 OR WPM > 30 THEN
PRINT CHR$ (7): GOTO 310
330 DOT = 50 / WPM:C = 0
400 REM
410 REM ** KEY LOOP SECTION **
415 J = 0
420 GOSUB 1000: REM CHECK FOR KEY
EY
430 IF X = 0 THEN J = J + 1: GOTO
420
440 C = 0: POKE - 16293,0
441 IF J > DOT * 3 THEN PRINT "
"
445 REM TURN ON OUTPUT AN1.
450 GOSUB 1000
455 REM CHECK IF STILL CLOSED
460 IF X = 1 THEN C = C + 1: GOTO
450
470 IF C < DOT THEN GOSUB 2000:
GOTO 400
475 REM THAT IS, PRINT DOT
480 GOSUB 3000: REM C>DOT.
490 GOTO 400: REM START AGAIN.
900 REM
901 REM
1000 REM ...KEY SAMPLE ROUTINE..
1010 Z = PEEK ( - 16286)
1020 IF Z > 127 THEN X = 0: RETURN
1030 X = 1: RETURN
1900 REM
1901 REM
2000 REM ...PRINT DOT ROUTINE ..

```

*3005 W 19th, Lawrence, KS 66044

```

2010 PRINT "S";
2020 POKE - 16294,1
2030 REM TURN OFF OUTPUT.
2040 GOSUB 4000: RETURN
2900 REM
2901 REM
3000 REM ...PRINT DASH ROUTINE..

3010 PRINT "L";
3020 POKE - 16294,1
3030 GOSUB 4000: RETURN
3900 REM
3901 REM
4000 REM ...SPACE DELAY ROUTINE..

4010 FOR I = 1 TO DOT / 2
4020 GOSUB 1000
4030 NEXT I
4040 PRINT "-";: RETURN
5000 REM -----

9000 REM ...MX 80 LIST ROUTINE..

9010 D$ = CHR$ (4): PRINT D$; "PR
#1"
9020 LIST : PRINT D$; "PR#0": END
9030 REM -----

```

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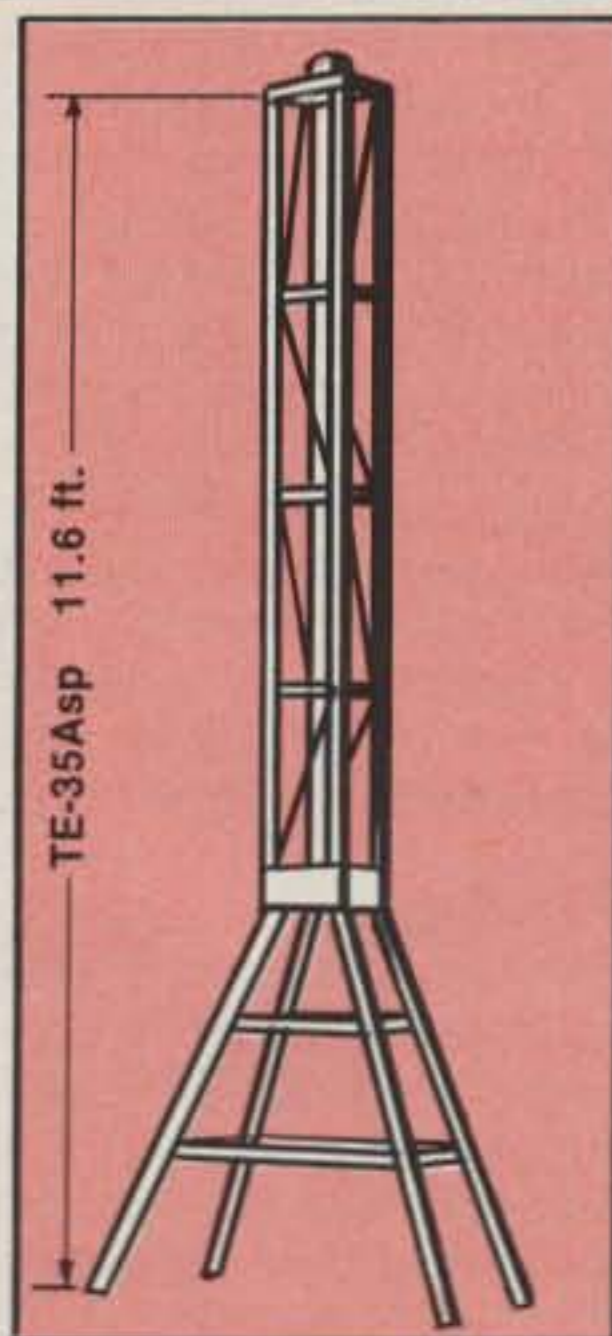
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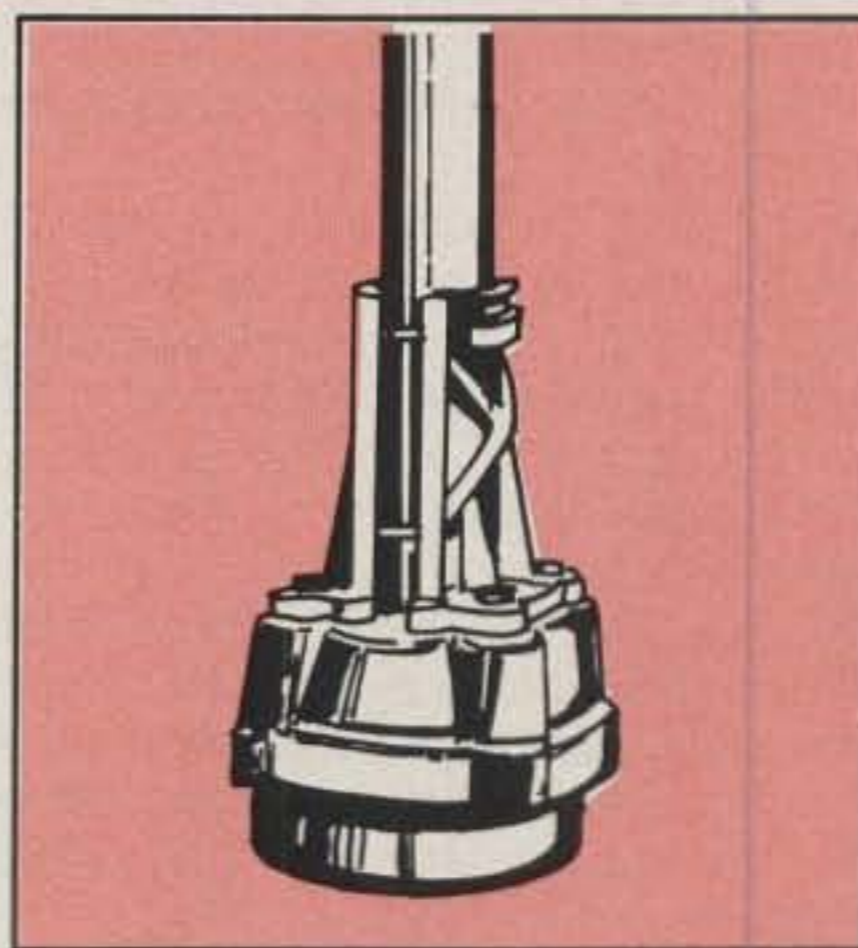
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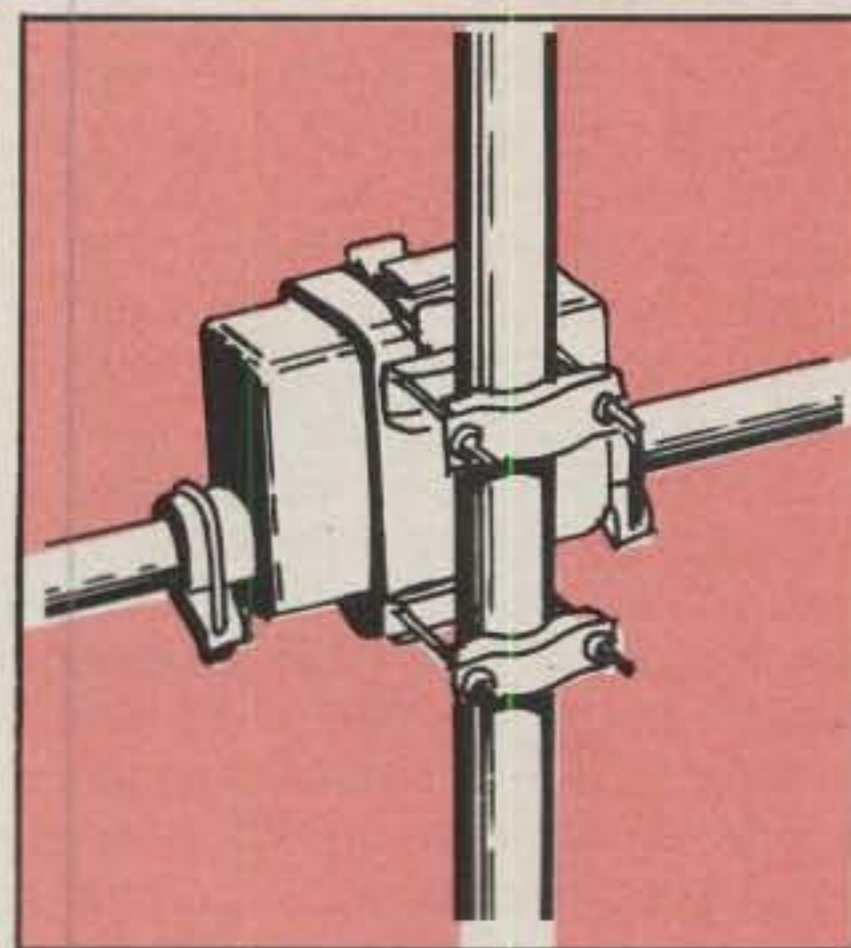
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Antenna Accessories for the Hamshack: Part V

Last month, W8FX continued his multiple-part discussion of r.f. and antenna accessories with a review of r.f. switches and lightning protection devices. In this issue, he goes on to discuss related instruments: the r.f.i. filter and the field strength meter.

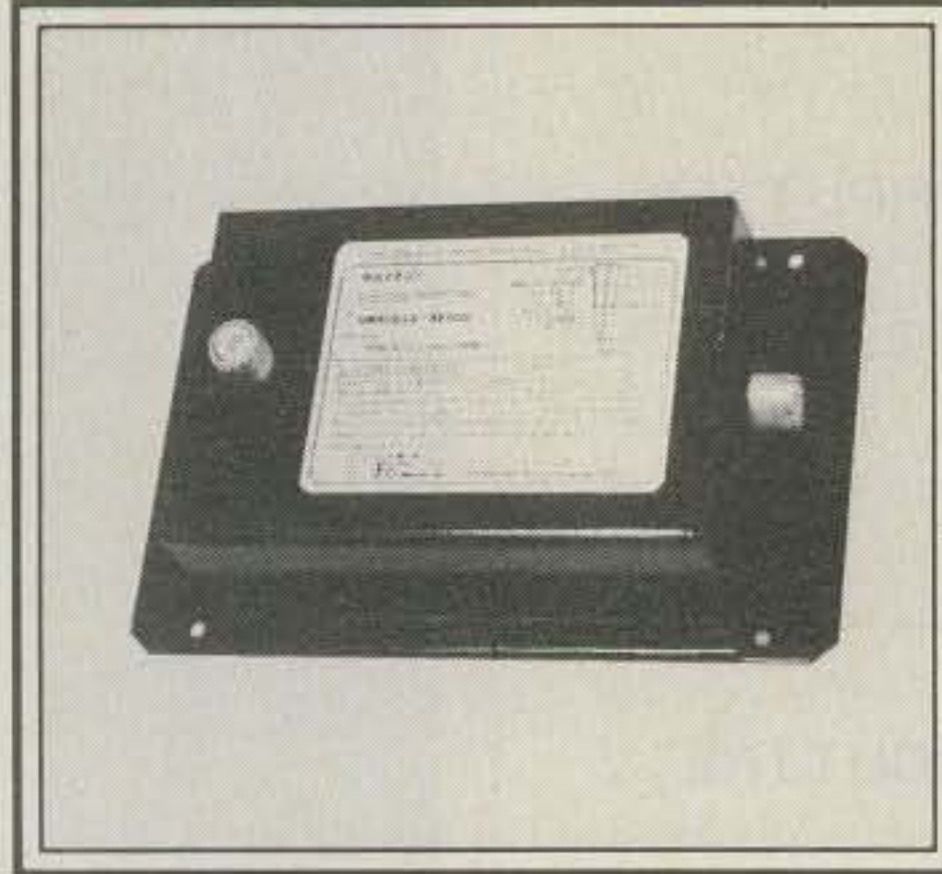
In past months, we've deviated somewhat from our usual discussions of antennas themselves to present a multiple-part series on useful r.f. and antenna accessories. We've covered devices such as the dummy load, r.f. wattmeter, and balun, and many other accessories. Last month, we discussed r.f. switches and lightning protective devices. As we near the conclusion of this series on accessories, and before turning back to antennas, we will focus on the r.f.i. filter and the field strength meter. Let's begin with a look at the r.f.i. (lowpass) filter.

The R.F.I. Filter

The subject of radio frequency interference is a broad one, and we won't attempt to examine it in any detail here, except with respect to some basic r.f.i. prevention steps. Emphasis primarily will be on the transmitter lowpass filter as an inline r.f. accessory.

It's instructive here to incorporate a condensation of helpful transmitter r.f.i. tips included in the booklet "How to Identify and Resolve Radio-TV Interference Problems," which was published by the FCC in 1977. The FCC's booklet is an excellent primer on a wide range of interference problems, especially for amateur radio and citizens band operators, and it contains a number of color photographs illustrating various interference conditions and their origins. The following is adapted from the FCC's publication:¹

Generally, transmitter equipment that is commercially manufactured has precautions built into the set to reduce harmonic radiation. However, you should follow the steps outlined below to ensure that your radio equipment is operating properly—that is, that it does not deviate from technical standards; you have the responsibility to ensure that your opera-



WA2ZOT "Interfilter" is representative of high-attenuation lowpass filters currently available. Unit has a passband of 0-30 MHz with a 0.4 dB loss, while attenuating t.v.i.-inducing harmonics 70 dB. Sealed unit was developed to minimize possibility of dust and moisture invading the interior. (Photo courtesy Unadilla/Reyco)

tion meets legal requirements. (Extremely weak-signal areas may require attention to harmonic suppression beyond the usual limits.)

By installing one or more lowpass filters in the transmitter antenna lead, you will reduce the chances of unnecessary harmonic radiation. A lowpass filter allows frequencies up to 30 or 50 MHz to pass through unattenuated to the antenna while effectively "shorting out" harmonic radiation. The use of a transmatch or antenna tuner can provide enhanced r.f. selectivity, adding several decibels of harmonic suppression to the 60 dB or more offered by most multi-section lowpass filters.

At amateur power levels, corroded metal connections in the area of the transmitting antenna may act like diodes and generate harmonics which may radiate. This type of problem can be found by vibrating suspected offenders such as galvanized downspouts, metal fences, clotheslines, etc., while viewing the affected television set. Sudden changes in the interference pattern which correspond to the vibration should be noted. This test requires an observer at the TV receiver, someone to shake suspicious metal objects in the area, and another person to key the transmitter involved.

If television interference is occurring, note which channels are affected:

1. Lower harmonics of h.f. transmissions generally affect TV channels 2 through 6. Therefore, if one or more of these channels is affected, your transmitter is probably radiating harmonics.

2. If all TV channels are affected, the problem is more likely to be in the TV receiver.

If the interference is caused by harmonics, a spectrum analyzer, calibrated field intensity meter, or frequency selective voltmeter can be used to accurately measure harmonic and spurious radiations from the transmitter. If any lead-in devices, such as standing wave ratio (s.w.r.) meters are used, measurements should be made with the inline device both installed and removed. This may help identify the interference and lead to the source.

An improperly shielded transmitter or transceiver can undo the effects of an otherwise excellent, high-attenuation lowpass filter, since harmonics can propagate on the outer case and around the filter. The cure for this problem lies in proper transmitter shielding, and many transmitters and transceivers—even many of those good-looking, good-performing Japanese imports—are deficient. In fact, many of the so-called "t.v.i.-proof" U.S.-made transmitters of late 50s and 60s manufacture are much better in this regard than their contemporary counterparts.

If you suspect that the transmitter may be radiating harmonic and spurious energy from the cabinet or through the power line, try operating the transmitter into a shielded dummy load. If the interference is still present, then cabinet or power-line radiation is indicated. A power-line filter should be installed; several types are available from a number of manufacturers. Continued interference with the power-line filter installed tends to suggest cabinet radiation.

If it appears that the transmitter is at fault, you should make sure that the chassis of the set is secured to the radio's

¹"How to Identify and Resolve Radio-TV Interference Problems," a booklet prepared by the staff of the Field Operations Bureau, Federal Communications Commission, May 1977. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, First edition, 1977.

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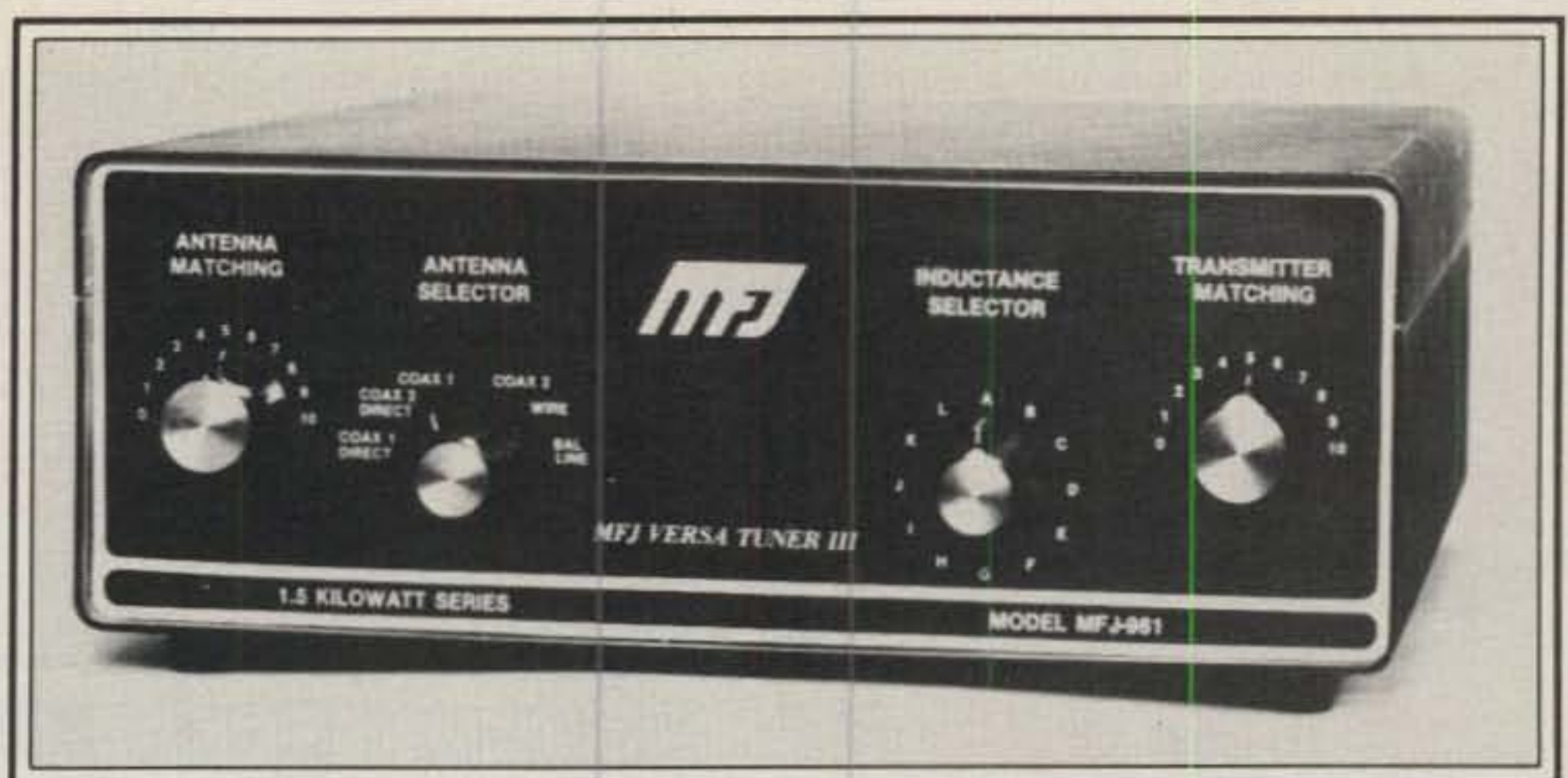
case by tightening the screws holding the chassis and case together. All hamshack equipment—including transmitters, transceivers, receivers, linear amplifiers, and antenna tuners (transmatches)—should be bonded together using solid conductor wire (of at least #10 gauge) or copper ribbon; the same type of heavy-duty conductors should be used as ground leads, and these should be as short as possible.

You should note that using ordinary house wiring and plumbing for r.f. grounding purposes is risky. While equipment should be grounded to these existing systems for shock-prevention considerations, a separate direct ground lead should be run. This should terminate in an outdoor ground rod to avoid the possibility of the ground system, including the building itself, from acting as a "shunted" radiator with highly undesirable harmonic radiation effects a likely occurrence. In any case, the ground lead's length should be kept to less than one-quarter wavelength at the highest h.f. frequency to be used, if possible. Apartment and condominium dwellers may not be able to meet these requirements, so they often must live with a marginal ground and "make do" with what is available.

If you have a linear amplifier in use, consider using two lowpass filters for maximum harmonic suppression. One filter should be installed between the transmitter (exciter) and the input to the linear amplifier; this prevents harmonics generated in the exciter from reaching the linear amplifier. The second filter should be installed at the output of the linear amplifier to reduce harmonic and spurious signal content. As indicated, ensure that the amp is secured to the common ground bus.

We primarily have concerned ourselves here with the h.f. transmitter and the **lowpass** r.f.i. filter. V.h.f. and u.h.f. equipment may require the use of **bandpass** r.f.i. filters to prevent spurious t.v.i.-generating signals from being radiated. Barker and Williamson (B&W), for example, sells a 2 meter v.h.f. bandpass filter, the Model 422-2, which is designed to keep unwanted oscillator, multiplier, and synthesizer frequencies "bottled up" by passing only the 2 meter band and sharply attenuating frequencies above and below the band. Two specialized, sharp-cutoff 6 meter lowpass filters are also available from B&W which have a cutoff frequency near the top of the 6 meter band, at 55 MHz, and which offer 50-70 dB of attenuation; these are the Models 423 and 427. The same firm also markets special low-cutoff filters with cutoff frequencies down to 5.6 MHz.

As the FCC report indicates, there are no hard-and-fast rules or procedures for eliminating r.f. interference; it is a matter of eliminating the most likely sources of interference one step at a time. You may, in fact, need to take several steps before the interference problem is satisfactorily resolved. A key point, however, is to en-



When adjusted properly, the transmatch can provide several dBs additional harmonic suppression, acting much like a bandpass filter for spurious radiation. The transmatch is particularly useful in adding front-end selectivity to an otherwise "wide open" receiver front-end. Representative MFJ Versa Tuner III antenna tuner is shown here. (Photo courtesy MFJ Enterprises, Inc.)

sure that the transmitter and associated equipment are "clean"—that the system is properly operated, is effectively grounded for r.f., and has adequate harmonic and spurious emission suppression. Beyond that, resolving interference problems can be a detective's job and represents a real challenge—one that goes beyond the scope of this article. But the FCC's report, along with the other references cited in the bibliography, should provide a good start toward solving a wide range of r.f.i. problems, whether they involve interference to over-the-air and cable TV, radio, hi-fi gear, telephones, or other electronic equipment. R.f.i. can almost always be corrected, although sometimes with considerable difficulty and expense involved.

If you need help, local television interference (t.v.i.) committees are available in many areas to assist you in resolving interference problems. You can contact the nearest FCC district office or the headquarters of the American Radio Relay League, Newington, Connecticut, for assistance in locating a t.v.i./r.f.i. committee in your area. If local interference problems are severe and a local committee does not exist, you may wish to start your own. This is usually best accomplished under the auspices of a local amateur club or association.

The Field Strength Meter

Another useful, passive instrument is the field strength meter (FSM). This device is a relative of the simple crystal set; it senses r.f. fields, but does not require a direct connection to the transmitter, effectively simulating the action of the receiver. The FSM picks up a small amount of the signal radiated by the antenna, rectifies this signal using a diode, and then applies the resultant d.c. to a sensitive meter movement. The amount of current flow depends on the magnitude of the r.f. intercepted by the unit's small whip, and

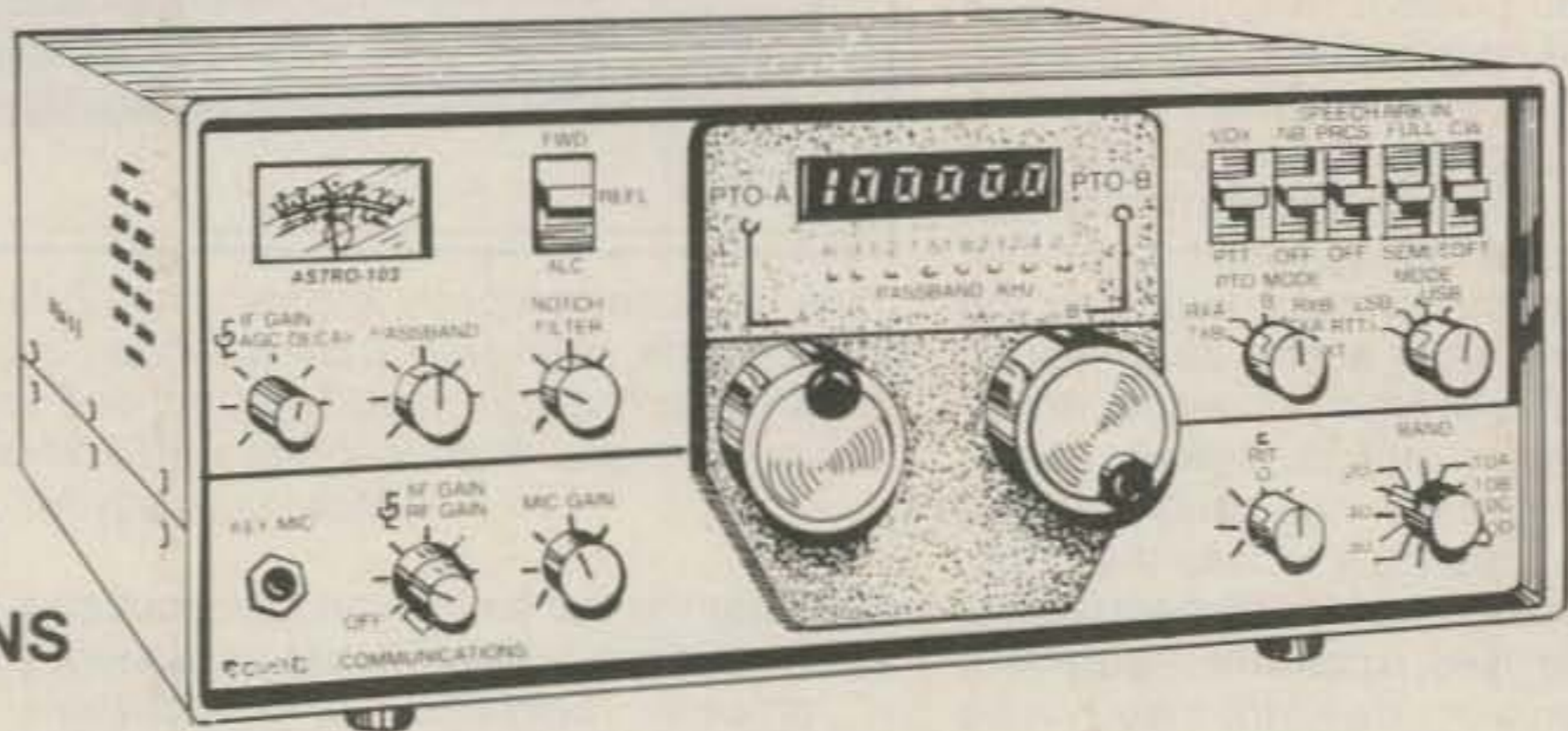
is in turn dependent upon the strength of the r.f. field from the antenna system.

The FSM is a handy, multi-purpose device that is useful for transmitter adjustment, checking relative power output, confirming that your signal is actually radiating, and making various antenna checks and adjustments. Before s.w.r. meters and directional wattmeters came into widespread use (both of which can allow more precise measurement of transmitter and antenna performance characteristics), the FSM was the primary device on which amateurs relied to indicate power transfer to the antenna. While expensive, laboratory-quality devices are normally calibrated in *absolute* units, amateur-market FSMs indicate *relative* field strength. This is normally adequate for making routine transmitter adjustments to indicate maximum power transfer, "pruning" long-wire and other wire antennas, adjusting beam antenna for maximum gain, and assessing fixed and mobile antenna radiation patterns.

Another important use for the FSM lies in the continuous monitoring of station performance: by noting the FSM's normal meter reading, it is possible to detect deterioration of performance in transmitter, transceiver, or antenna. One disadvantage of this instrument is that, located in the hamshack, it is in a location fairly remote from the r.f. field produced by the antenna, and thus may not provide a sufficiently sensitive indication of change in performance. More sensitive, wave-meter-like units generally include a small, self-contained solid-state amplifier circuit and can be tuned—much like the wave meter. These amplified devices have a number of advantages over simpler ones, in that they can be used at a greater distance from the antenna, to enable signal-pattern plotting, and they can be used for tasks such as r.f. troubleshooting as well as locating harmonics and spurious oscillations in transmitters. In the "good old days" of a.m. operation,

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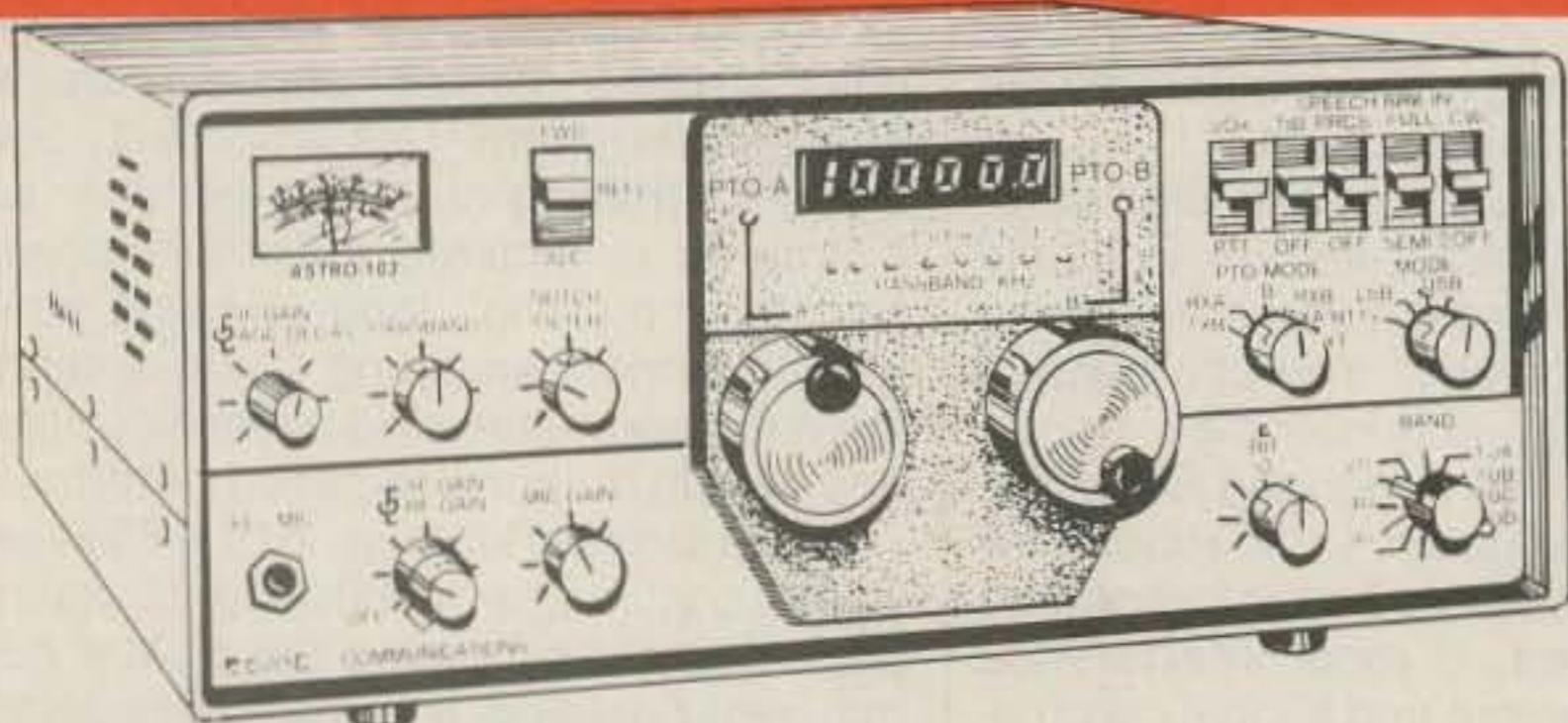
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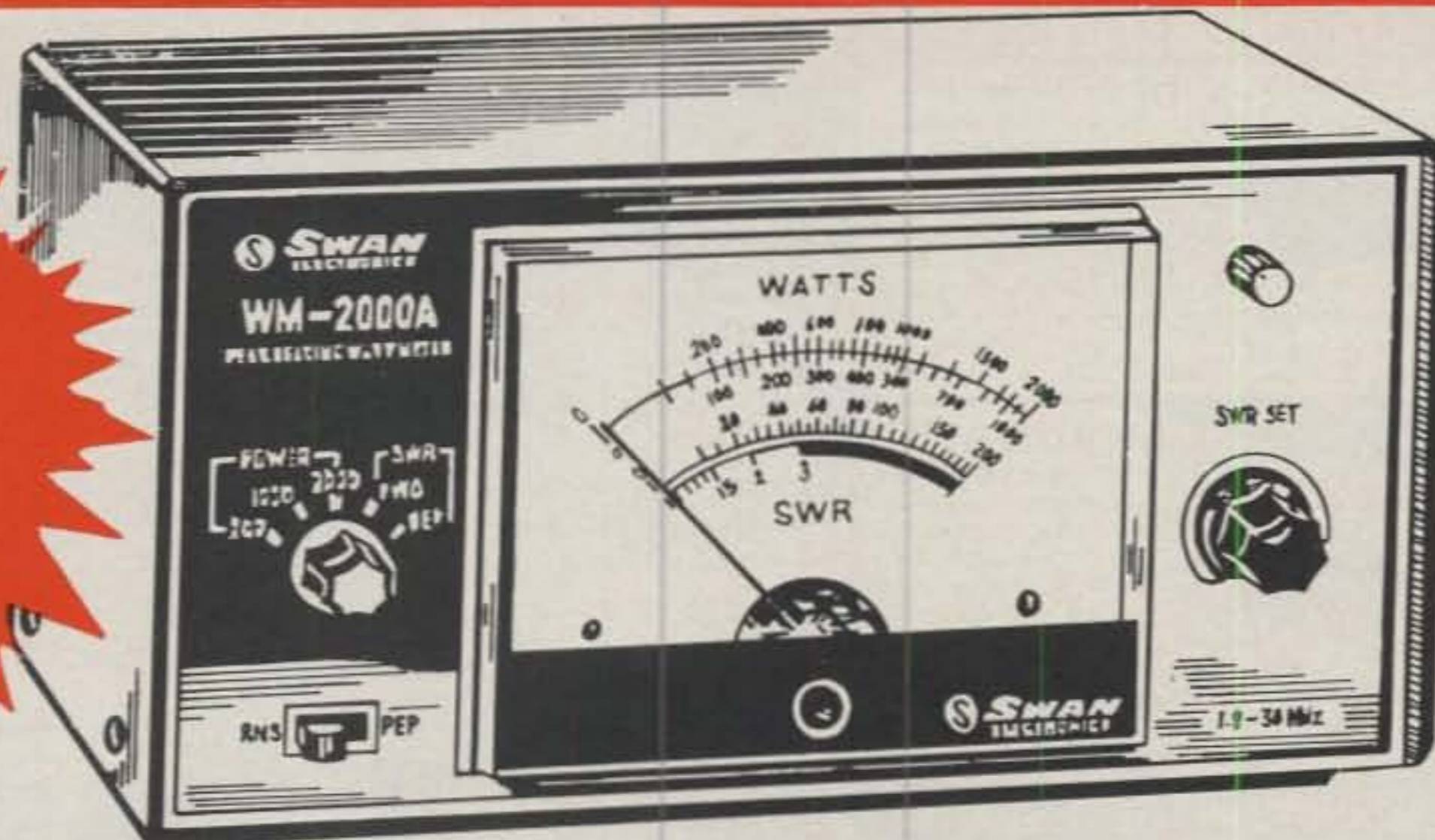
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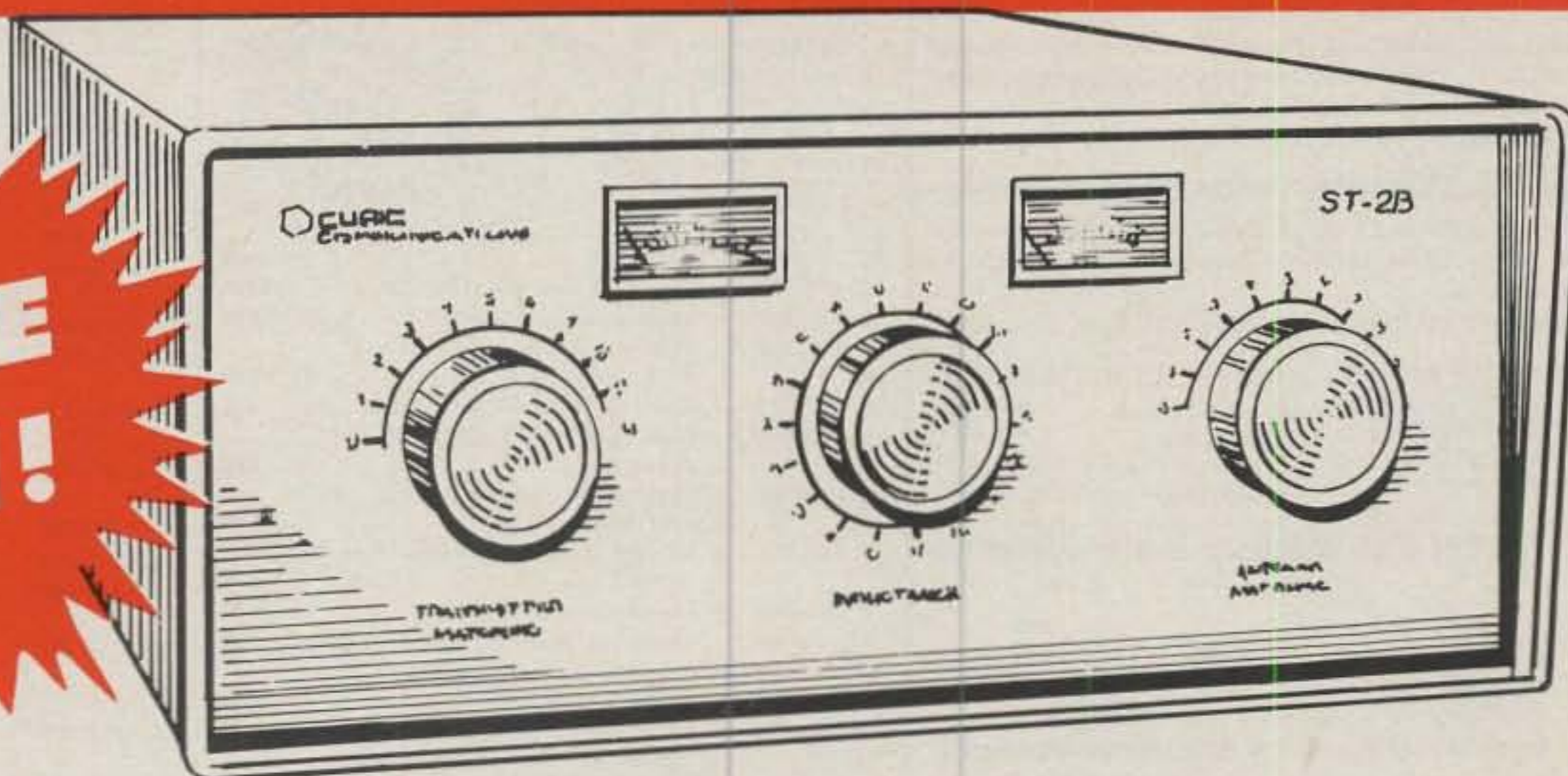
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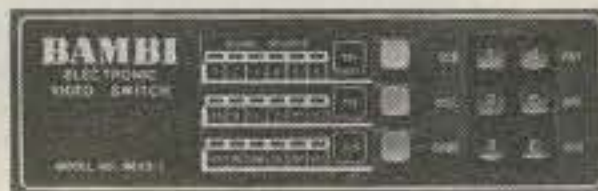
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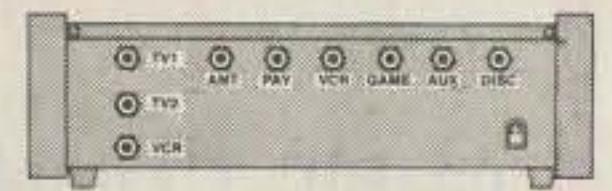
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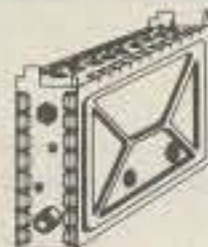


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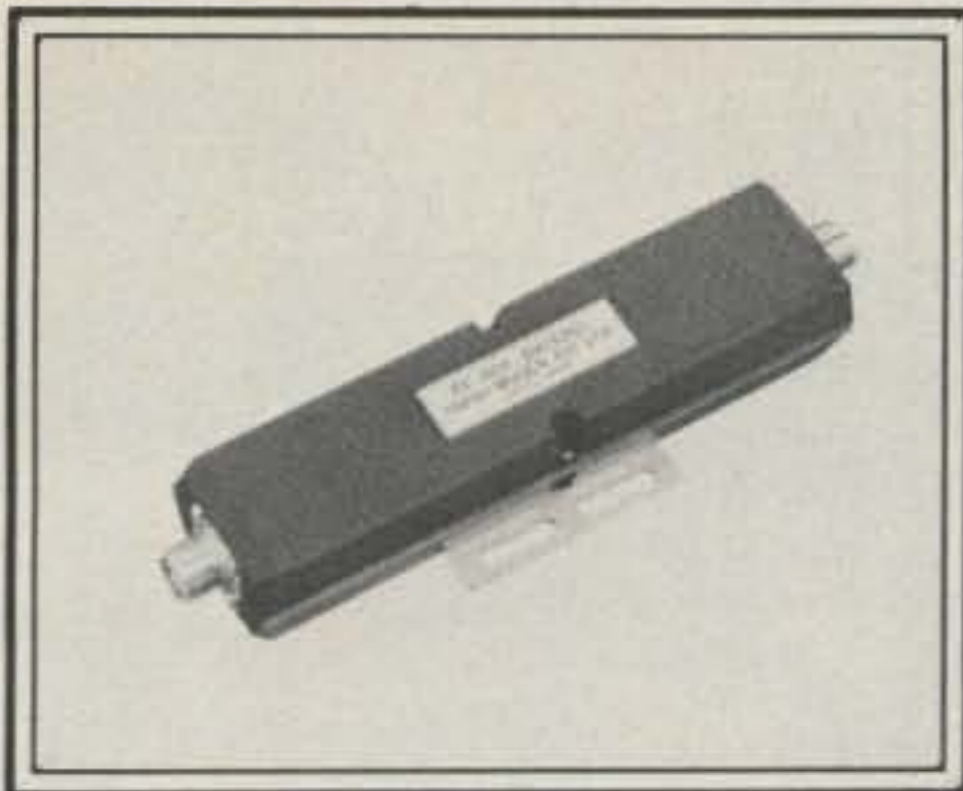
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Multiband antenna systems of all kinds are more prone to harmonic radiation than single-band equivalents due to their inherent nature. For this reason, an antenna tuner or transmatch and a lowpass filter should be used in tandem whenever a multiband antenna is used. Yaesu low-pass shown here provides high harmonic attenuation with negligible insertion loss. (Photo courtesy Yaesu Electronics Corp.)



An extremely handy and useful hamshack accessory is the relative field strength meter. Shown here is the Heathkit HD-1426. Although no longer listed in the Heath catalog, this unit made an excellent beginner's construction project and could perform a variety of chores in antenna and transmitter adjustment. Check local fleamarkets, as they are a good source for this type of equipment.

FSMs could also be used for modulation monitoring if a pair of headphones were substituted for the meter; CBers still make use of this feature.

FSMs represent a class of test equipment that is easily constructed from a few inexpensive components, or FSMs can be purchased for as little as about \$20 from several manufacturers; they are almost always found on hamfest swap tables, as well. The less-expensive untuned meters are relatively insensitive, however, and must be placed quite near the antenna if low power (QRP) is used—thus limiting their use to higher power operations, and making the devices less useful for making antenna pattern observations. Although tuned, amplifying FSMs are few and far between in today's market, many so-called grid-dip oscillators ("dippers") of current manufacture include a usable FSM function, making them versatile instruments indeed. (More on "dippers" next month.)

Despite the limitations of the FSM, this device is nevertheless a simple, nearly indispensable item of test equipment for both fixed station and mobile use, for h.f., v.h.f., and u.h.f. applications. The FSM's small size, convenience, portability, and small size combine to make a very valuable (and usually trouble-free) instrument, one of great value in the typical hamshack.

Wrapping It

In this month's column, we have discussed two additional r.f. accessories: the r.f.i. filter and the field strength meter. Next month, we expect to continue this series on accessories with an examination of the antenna noise bridge and the grid-dip oscillator, as well as other important hamshack accessories in the "r.f. realm." See you then.

The bibliography which follows includes a number of useful reference books and publications. These should be of special interest to those experiencing r.f.i. problems.

73, Karl, W8FX

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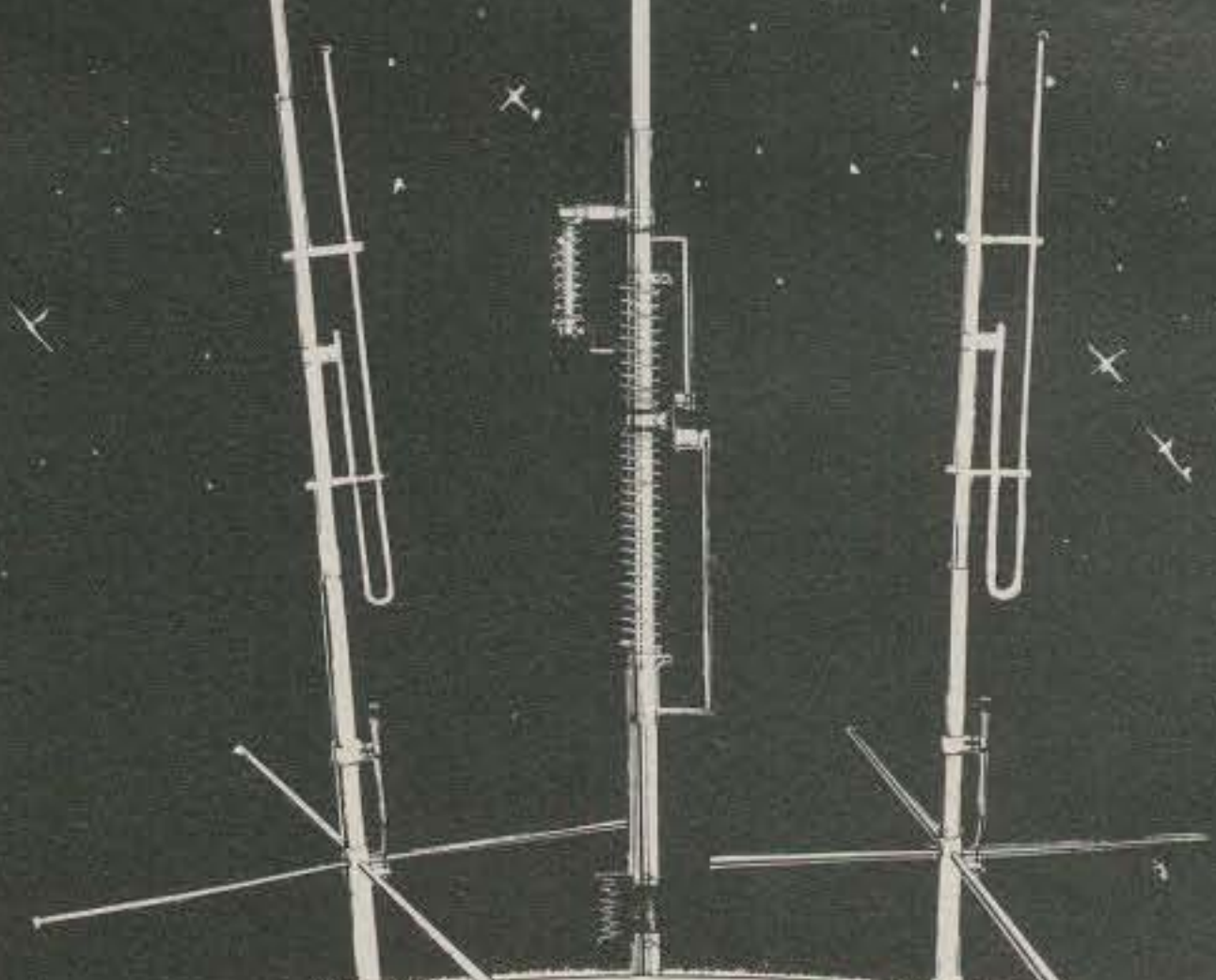
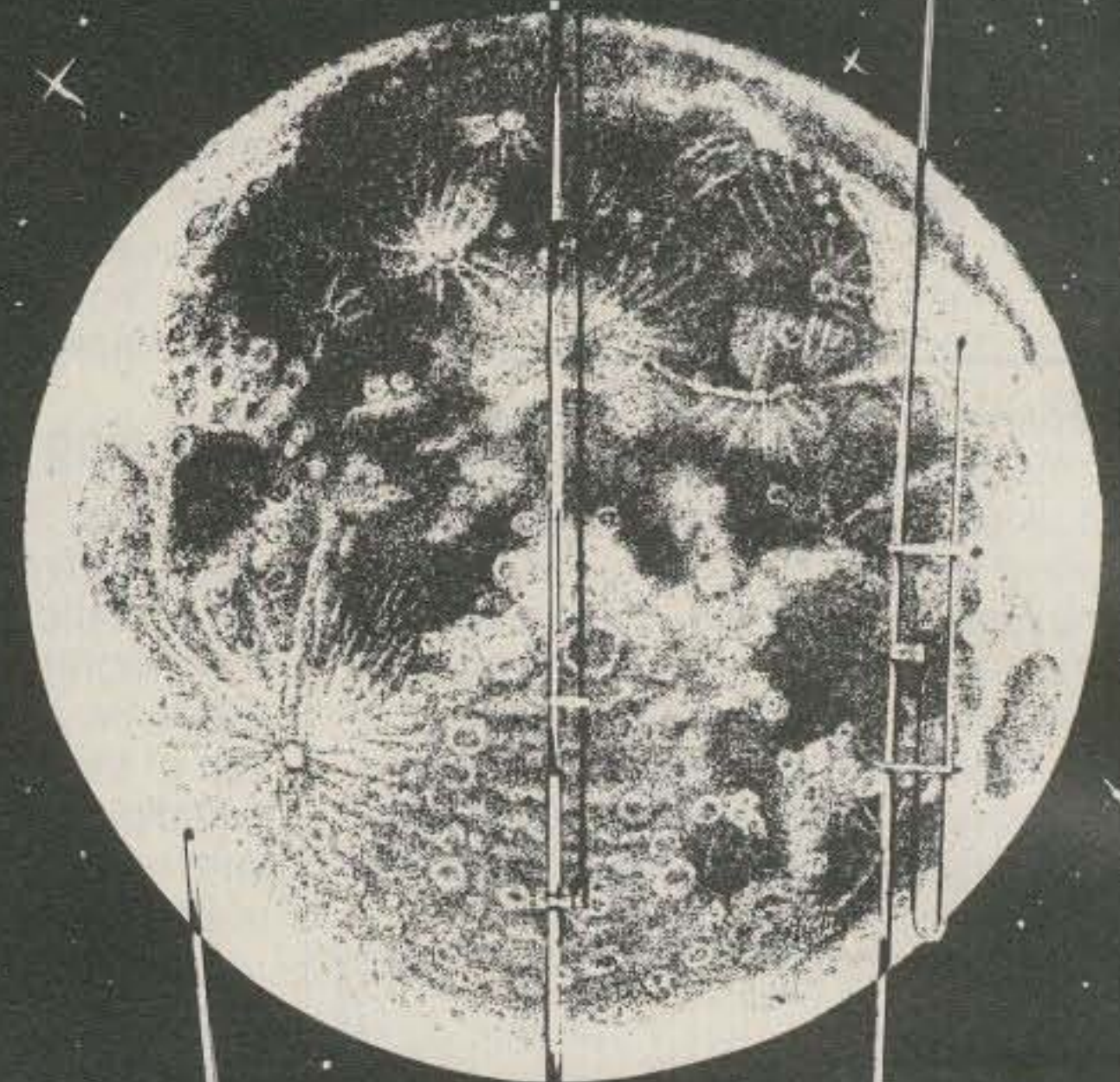
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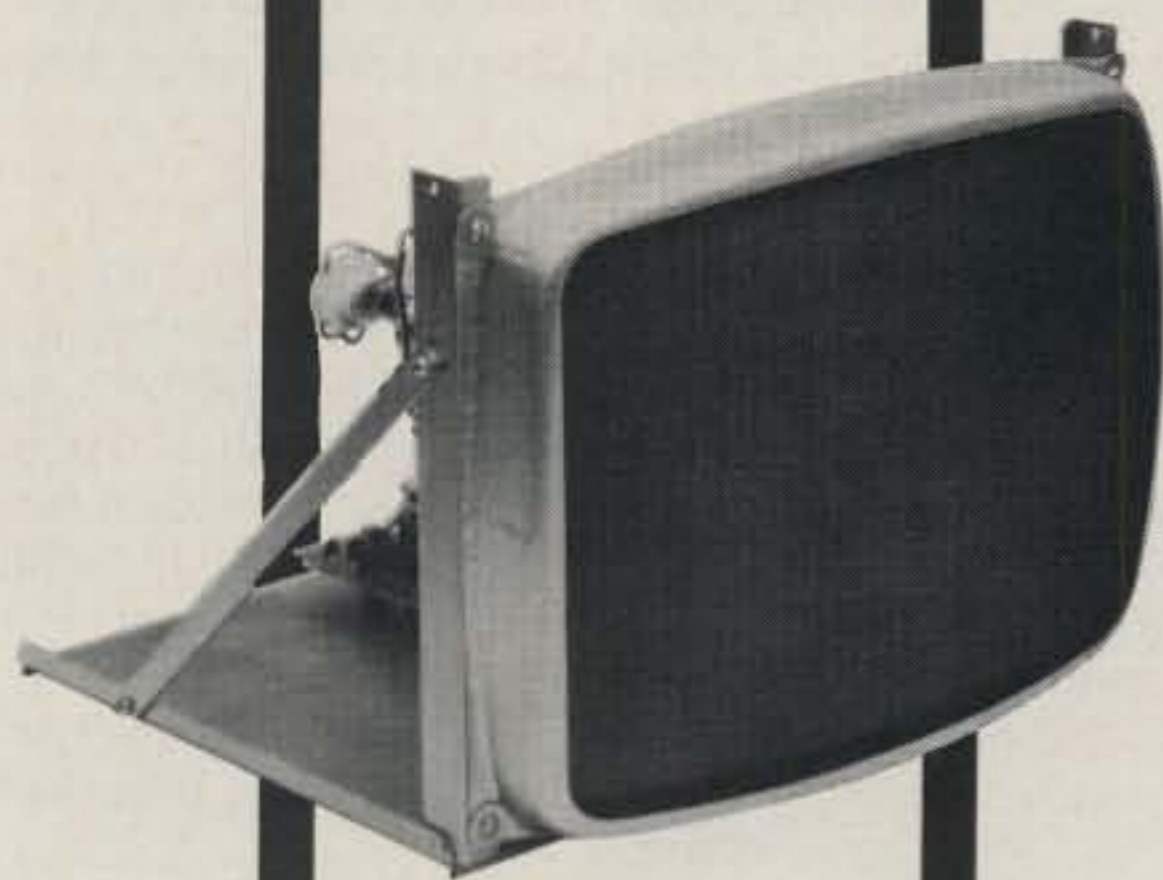
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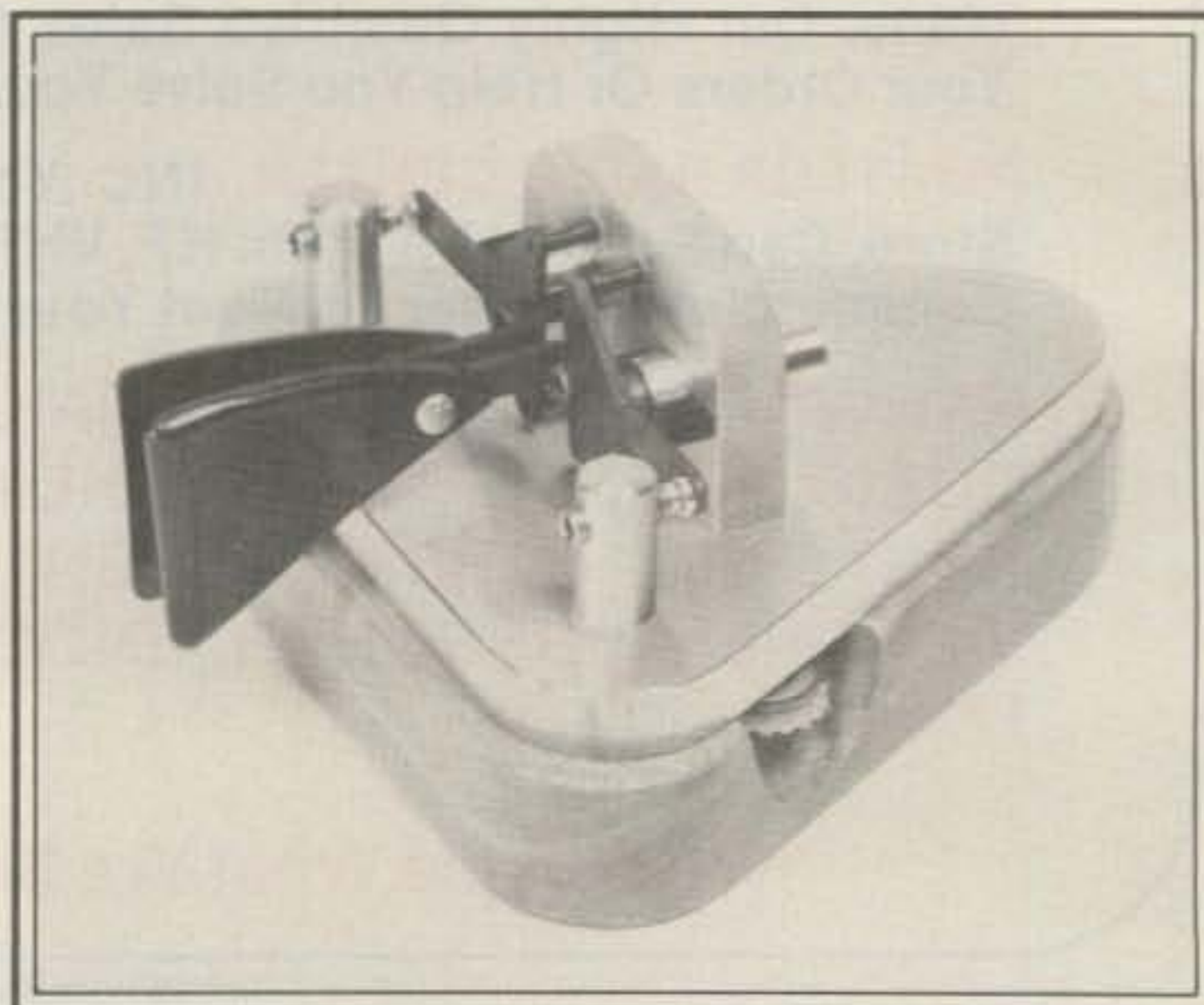
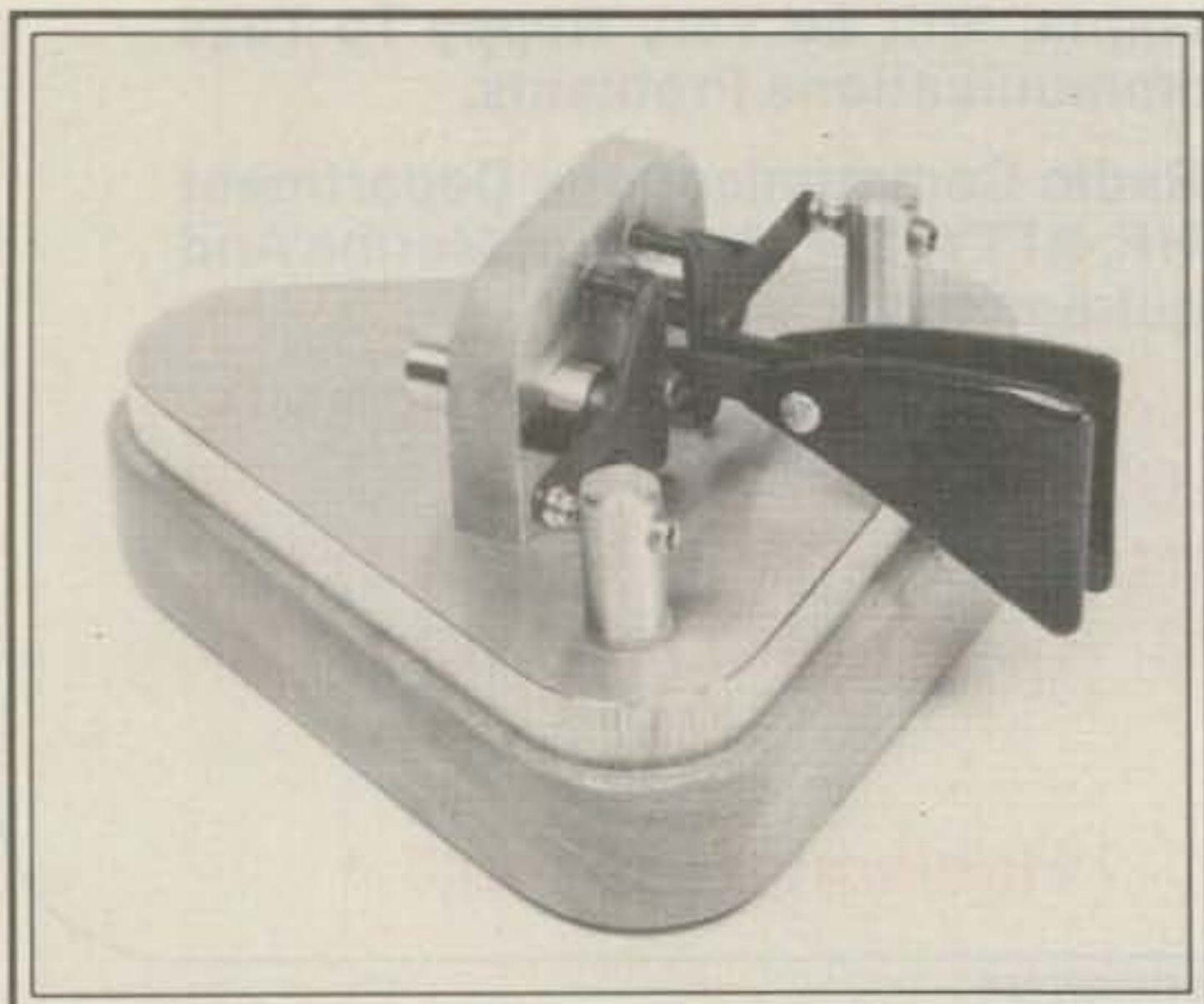
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The Vibroplex Brass Racer Iambic and EK-1 Keyers

BY DAVE INGRAM*, K4TWJ



Two models of the Vibroplex keyer are available: the Brass Racer Iambic (left, paddle only), and the Brass Racer EK-1 (right, complete keyer). Units are very similar in appearance, except keyer has small side knob for speed adjustment.

There are some items in the amateur radio world that exhibit more performance than appeal, and there are some items that look quite attractive but function in a somewhat compromising manner. Vibroplex, however, truly seems to have brought these two aspects together with their recently introduced Brass Racer Iambic paddles and EK-1 electronic keyers.

The Racer Iambic is a paddle only; it can be used with any electronic keyer proper, and it provides enjoyably smooth operation with a very light and traditional "brass pounder chatter." The Racer EK-1 features a "topside assembly" identical to that of the paddle model, plus a complete electronic keyer is included in its polished wood base. There is a small cutout on the side for thumb adjustment of the speed control, and both units are supplied with a flexible 3 foot cable for connection to associated equipment.

Both keyers are crafted of solid brass and polished hardwood—a striking combination with a very classic appearance.

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In fact, advertisements and photographs simply don't do justice to this combination. Small anti-skid feet are placed on each corner of the hardwood base, keying contacts are solid silver, and paddle handles are black plastic. Both the Iambic paddle and the electronic keyer are heavy enough to stay put on the operating table without "walking" and are rugged enough to take a reasonable amount of abuse.

Although hard to believe, we hear tales that some amateurs set up stations and never operate c.w. Should there be any truth to that ridiculous rumor, we can only suggest adding a key or keyer for tradition sake and letting consequent interest guide actions. The c.w. bands are presently wide open and abound with DX, and high power isn't necessary for joining the fun. I've personally been working all kinds of DX on 20 c.w. Saturday evenings while using QRP (that's right, only 5 watts). Many of these times, I'm one of very few U.S. amateurs on the band. Isn't it interesting how such obvious opportunities may often be overlooked?

All of the Racer's actions are independently adjustable to fit operator preferences. Left to right paddle separations

are varied by travel-limiting set screws, while each paddle's movement to its dot or dash contact is varied by a supplied allen wrench. Rather than using springs, these Vibroplex keys employ magnets for controlling paddle tensions (quite smooth and very effective action). Paddle tensions are adjusted by varying left and right side magnetic forces. The result of these variables is truly pleasant c.w. operation.

Inside Details

The Racer EK-1 paddle and internal keyer uses an ever-popular Curtis 8044 electronic keyer integrated circuit. The chip is socket mounted, along with associated circuitry, on a G-10 fiberglass p.c. board the same shape but slightly smaller than the (brass) paddle section. The board is affixed "upside down" to the paddle with three screws. The wood base then encloses circuitry and secures with two large through-board screws.

The keyer is powered by a small 7.5 volt mercury cell (Duracell T-175, or the equivalent) with an estimated lifespan of approximately 12 months. The cell itself slips into a small clip on one side of the

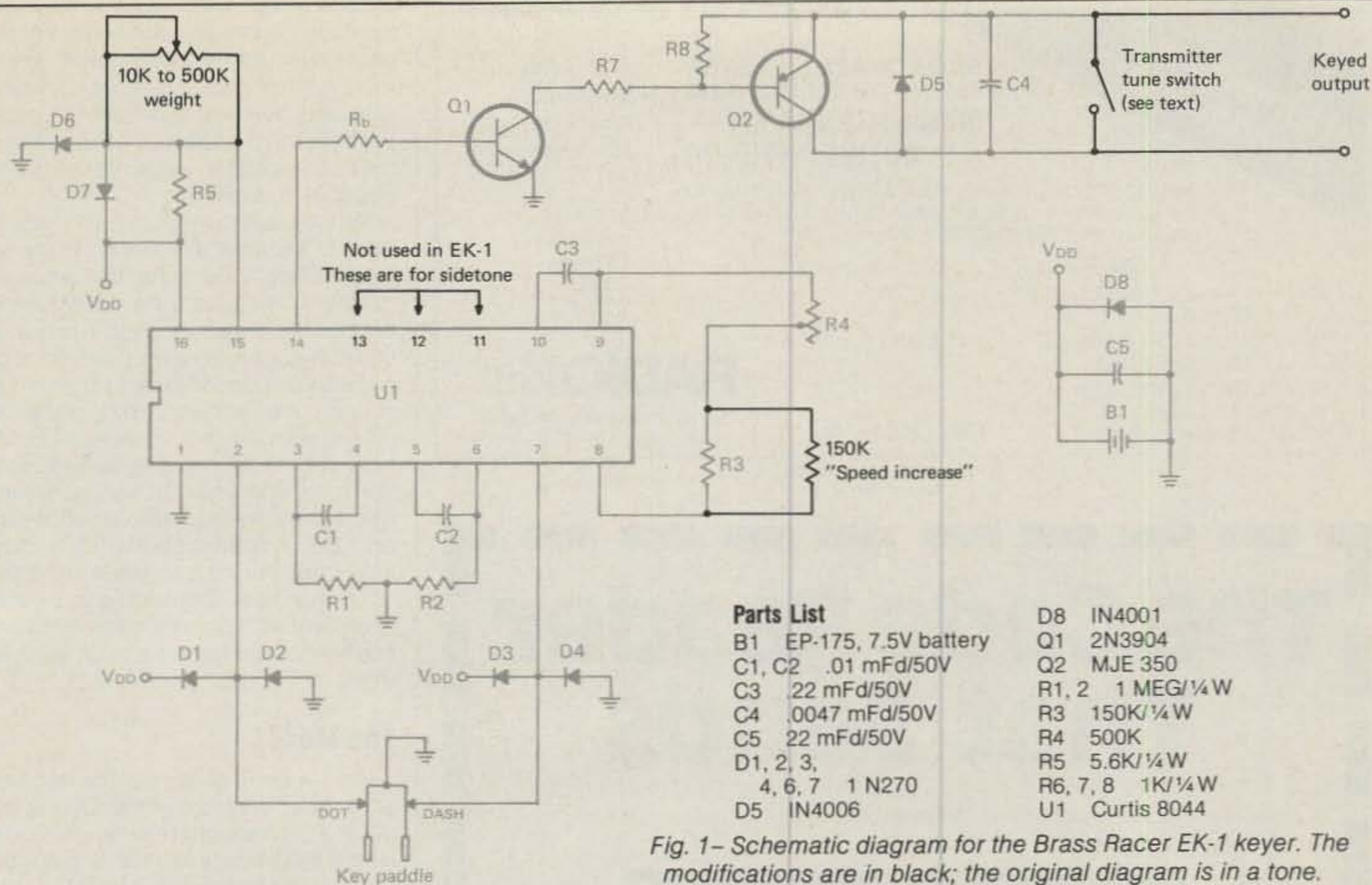


Fig. 1—Schematic diagram for the Brass Racer EK-1 keyer. The modifications are in black; the original diagram is in a tone.

p.c. board. Considering the EK-1 doesn't include a sidetone monitor, with its associated transistors and speaker, this 12-month figure seems relatively accurate.

Vibroplex has the dash-dot ratio fixed at the "standard" 3:1, and a weight control is not included. Since I personally prefer a ratio close to 4:1, I merely added an extra resistor between the 8044's pin 15 and its board connection (which connects to the "top" of R5). This simple modification will be detailed later in the article. The EK-1 also doesn't include a transmitter tune-up switch, which may or may not be of concern to others (many transceivers include "tune" switches, pushbuttons, etc.). Again, I didn't find this a problem; I merely rigged my own miniature s.p.s.t. switch and paralleled it with the keyed output leads. The EK-1 can be used with any transceiver or transmitter which employs either positive or negative keying and has a sidetone monitor (very few modern rigs lack sidetone). An MJE 350 transistor does the keying, and output leads are simply swapped or "turned over" as required for positive or negative voltage—keyed lines.

Using The Keyer

The true enjoyment of this attractive and quality-crafted keyer can only be experienced by fine-adjusting to one's fist and using it on the air. These paddle adjustments are easily accomplished with a small screwdriver and supplied allen wrench. Some amateurs prefer closely

spaced paddles with almost hair-length travels; I personally prefer paddle spacing similar to the Bencher, with slightly more than a few mils travel. Those adjustments took only a few minutes to set. This initial setup, incidentally, was the only time I realized the lack of an internal monitor. No problem, however; I merely switched on the transceiver and used its internal monitor (while leaving VOX off to prevent transmitter activation). I next tried the keyer with three in-shack trans-

ceivers to ensure proper operations and compatibility. All units keyed perfectly, so I soldered wires to the phone plug and hit the c.w. bands in style.

If you've never used an Iambic keyer, you've missed a c.w. treat. This "squeeze key" function operates in the following general manner. Press both the dot and dash paddles at (almost) the same time, giving a slight "time edge" to one paddle. If the dot paddle contacts first, the output sequence will be didahdidahdidah, etc. If

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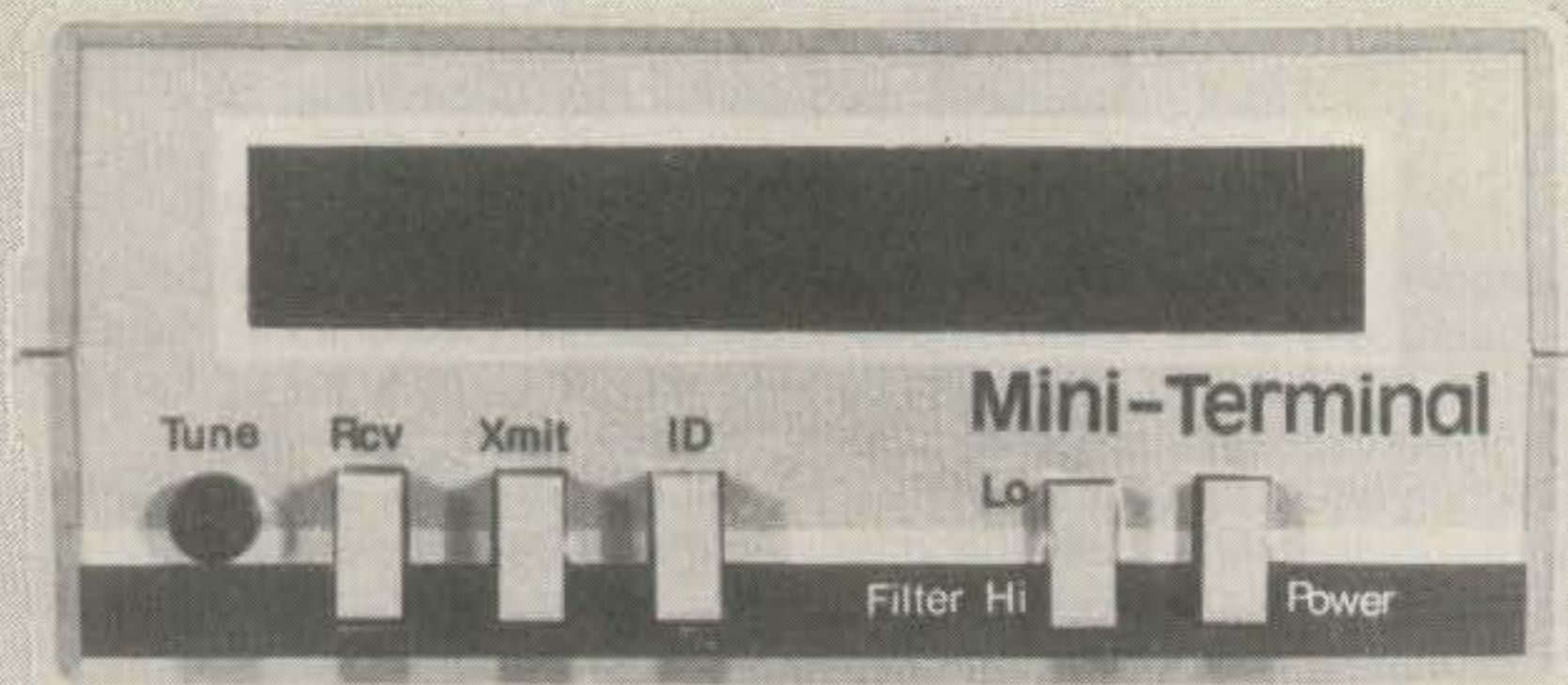
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the dash paddle contacts first, the output sequence will be dahdidahdi, etc. The word "frank," for example, can be sent with only five key squeezes: three starting from the dit side and two starting from the dash side. Conventional keying is also possible, if desired.

As we used the Racer EK-1, two things quickly became apparent: (1) the keyer wouldn't operate quite fast enough for my taste, and (2) a transmitter tune (continuous key) switch wasn't provided. A suitable speed increase (from an approximate maximum of 20 w.p.m. to 40 or 50 w.p.m.) was achieved by paralleling R3 (150K) with another 150K resistor; this is now standard on more current production runs. The tune function, as previously mentioned, was accomplished by placing an s.p.s.t. mini toggle switch beside the keyer and wiring it to short the transmitter's key line. Depending on personal preferences, you may also want to make some of these alterations on your Racer EK-1.

The Mods

As a means of assistance to others, a schematic diagram of the EK-1 is shown in fig. 1. The weight resistance is best selected by temporarily inserting any potentiometer between 10K and 500K, adjusting it as desired, and then measuring resistance and substituting a fixed ¼ watt equivalent. Room is a premium in that area. Pin 15 can be bent straight (missing the socket), and the resistor can be inserted in the socket and soldered to pin 15. The transmitter tune switch is most easily wired to incoming keyer wires on the p.c. board proper. The "speed increase" resistor can simply be soldered (quickly!) in parallel with R3. Through a slight amount of experimenting with "keying time," a transmitter "auto tune" switch can be used to connect/disconnect the previously mentioned "speed increase" resistor to R3. This will provide a 5 or 10 second autokey for tuning with a single dash lever tap. IC pins 11, 12, and 13 are available if you care to rig an out-board sidetone. A standard 8044 circuit is suggested.

Summary

The attractive styling of brass and wood is, in my opinion, a combination that is hard to beat. The mixture in keyer design produces a warm and classic appearance. C.w. operations with either the Brass Racer lambic paddle or the Brass Racer EK-1 keyer is quite enjoyable. Either unit is small enough to slide slightly under the front edge of an upward tilted rig (such as usually provided by tilt-up bails, etc.). This arrangement permits comfortable access to the paddles while occupying miniscule table space.

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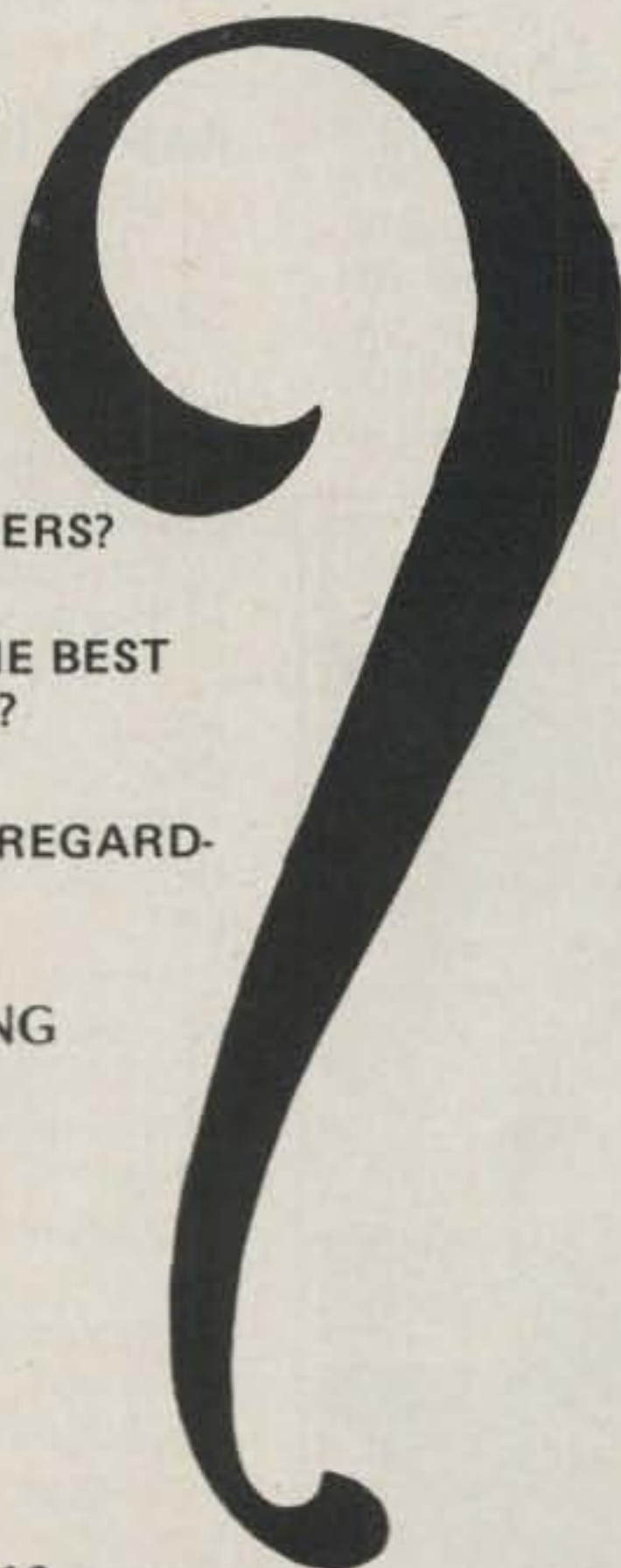
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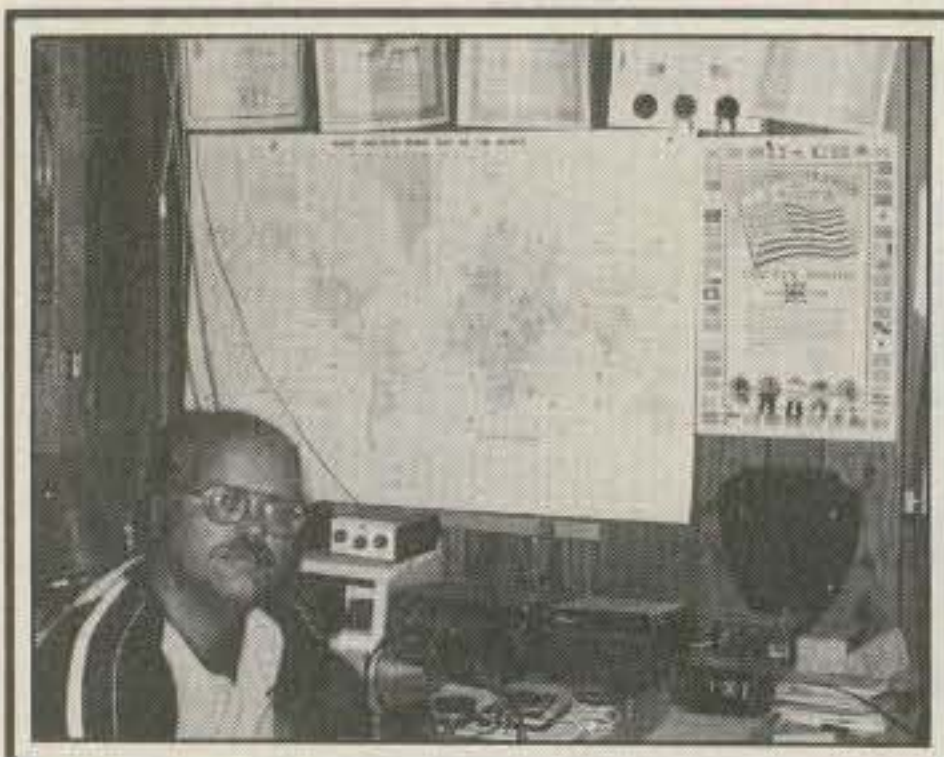


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CIRCLE 65 ON READER SERVICE CARD

NEWS OF CERTIFICATE AND AWARD COLLECTING



Bob Garceau, K1YRP, at the operating position showing some of his equipment and awards.

The Story of the Month for February as told by Bob is:

Robert C. Garceau, K1YRP All Counties #342 9-29-81

"I am 43 years of age. My wife, Merri-lyn, is a teacher in the Headstart program for WACAP. We have 3 children ages 19, 16, and 14. Neither my wife nor the children have an interest in ham radio. I have worked for Pratt & Whitney Aircraft in East Hartford, Connecticut, for 21 years. I'm working on a new Statistical Quality Analysis Program which is turning out some very interesting results. I'm half-way through my fourth term as a local politician. Prior to my work with Pratt & Whitney, I spent four years in the Air Force as a Radio Operator and also operated the MARS station while stationed in France.

"I got interested in amateur radio when I was 12 years old. I used to listen to local hams, using a.m., on an old RCA console all-band radio. I tried to teach myself the code, but with no success. However, when I joined the Air Force and got a perfect score on the code part of the aptitude test, I knew I was going to be a radio operator.

"In 1963, two years after I got out of the service, I started really getting into ham radio. C.w. was not a problem. However, the theory was (Dick Bash did not have his books out then), and it took three attempts to get my General class ticket.

"Between 1963 and 1970 I collected about 350 counties from fixed stations and from state QSO party stations, all c.w. In 1970 I became an inactive ham due to increased family responsibilities. In November of 1977 I got back on the air with a Tempo One and a bunch of dipoles. In December I stumbled onto the 14.336 County Hunters Net and got hooked on

working all USA counties. It took me three and a half years, and most of my activity was during the fall and winter months. During the spring and summer I was active with the Little League as a director and umpire. Shortly after I started County Hunting, I got involved in politics; the day I got my new Tempo One was election day 1977.

"I got elected to the City Council as its President and Deputy Mayor. In the spring of 1978, after 4 years of weekly evening classes, I graduated from Quinebaug Valley Community College with an Associates Degree in Business Management (accounting). In November of 1979 I switched from city to town politics and got elected to the Board of Selectman. We have a city within a town (too complicated to explain). I will be starting my second term in November. If it sounds like I'm over-confident, it is because I'm running unopposed. (This was written in October 1982—Ed.)

"In August of 1980 I upgraded my station. I bought an ICOM-701 and put up an ATB34 on a Wilson tower at 39 feet. I also purchased the Hustler antennas for mobile operation.

"I took up golf this past summer for the first time and play in the low 100's. Merri-lyn is still teaching Headstart children. Our daughter, Roberta, age 19, is going to college during the day and working at a local department store in the evening. Mike, 16, is a junior in high school and is working part time at a local car wash while waiting for the basketball season to start. Our youngest, Jim, age 14, is a



Bob, K1YRP, and Merry in back of the 1977 Cordoba used for mobiling.



Bob, K1YRP, says, "QRZ for a Net Control! I'd like to go swimming."

freshman and likes fishing and playing lots of golf with the OM.

"I've enjoyed County Hunting and like putting out counties from the mobile. I've talked to an awful lot of nice people on the net and wish everyone well as they work towards the USA-CA Award."

Special Honor Roll All Counties

- #401 John B. Sebastian, W8BGF 10-7-82
- #402 Russ Nimocks, N9AUZ 10-7-82
- #403 Joseph H. Reisert, Jr., W1JR 10-19-82

Awards Issued

John Sebastian, W8BGF, added to his fine collection All Counties endorsed All S.S.B.

Russ Nimocks, N9AUZ, waited until he had them All before sending for USA-CA-500 through All Counties endorsed Mixed.

Joe Reisert, W1JR, added All Counties endorsed Mixed to his collection.

Dr. Richard L. Tornatore, KA2K, obtained USA-CA-500 through USA-CA-2500 endorsed Mixed.

Gene Goffriller, OE2EGL, picked up USA-CA-1500 endorsed All S.S.B. (#1 to OE).

Dov Gavish, 4Z4DX, acquired USA-CA-1000 endorsed Mixed (#2 to Israel).

USA-CA-500 Certificates went to:
Katherine Sewell, KA4UEM, endorsed Mixed.

Vladimir Kalina, KN7K, endorsed All A-1.

Alexander Klabnik, OK3YCA, endorsed All A-1.

Leon Bird, N5DWS, endorsed All S.S.B.

George Lee, K5HT, endorsed All S.S.B.

Awards

The Wanganui Award: This award is not sponsored or presented by the New Zealand Amateur Radio Transmitters (NZART),


P.O. Box 73, Rochelle Park, NJ 07662

THE WANGANUI AWARD

Presented By
Branch 48 NZART

Award No.

Date Mode



Awarded to Callsign

Award Custodian

FOR MAKING TWO WAY COMMUNICATION
WITH THE REQUIRED NUMBER OF STATIONS
IN THE BRANCH 48 AREA

The Wanganui Award.

but is presented by the Wanganui Branch of NZART No. 48 by its local members with the purpose of both stimulating interest in amateur radio and promoting the city of Wanganui. Requirements (except for ZL's) are as follows:

1. All stations require three contacts, each of which is worth one point. All contacts must be made with stations who are permanent residents of the city of Wanganui, and they need to be three different stations.

2. Any contact with the club station, ZL2JA, will count as two points.

3. Any contact with a Wanganui-based station, whether they are mobile or portable, also counts as a valid contact point, regardless of its location at the time.

4. All contacts must be made after 1 January 1982. The award is ongoing and there is no time limit. Requirements are the same for s.w.l.'s.

5. No QSL cards required, but the following log data must be supplied: date, time, callsign of station worked, name, frequency, and mode, also full name and callsign and QTH of applicant. All applications are to be countersigned as correct by another licensed amateur or another s.w.l. Cost is 5 IRCs or the equivalent, and free to the disabled. Address all applications to: Award Custodian, P.O. Box 7058, St. Johns Post Office, Wanganui, New Zealand. *(The award is very colorful—Ed.)*

The Kansas DX Association "Buffalo Award": This award is offered to any amateur radio station or s.w.l. in the world (except the 48 U.S. states) to celebrate the achievement of communications with amateur radio stations in the state of Kansas, U.S.A. The rules are as follows:

KANSAS DX ASSOCIATION
BUFFALO AWARD

Presented To



This certificate that the above named applicant has met all of the requirements for this award and is to be congratulated for his operating skills.

The Kansas DX Association Buffalo Award.

1. DX stations shall work 20 Kansas stations plus 5 KDXA members.

2. Contacts shall be made September 1, 1980 or later.

3. Use any amateur band or mode.
4. Applicant shall submit normal log information. QSLs are *not* required.

5. S.w.l. shall submit log information of stations heard.

6. KDXA will supply a current membership list upon receipt of s.a.e. and 1 IRC. (The 1982 membership totalled 80.)

7. Send the application with 4 IRCs or \$1.00 U.S. to: KDXA, Box 454, Salina, Kansas 67401 U.S.A.

Rhinelanders Wisconsin Centennial Award: The Northwoods Amateur Radio Club is helping celebrate the Centennial of the city of Rhinelanders, Wisconsin. Work any NARC station on c.w. or phone. To receive the award send QSL and s.a.s.e. to: Awards Manager, Diane Hamman, KA9BHK, Rt. 5, Box 668, Tomahawk, Wisconsin 54487.

Canadian Provinces Awards Program:

USA-CA Honor Roll

3000		1500		500	
N9AUZ	432	N9AUZ	612	N9AUZ	1780
		OE2EGL	613	KA4UEM	1781
		KA2K	614	KN7K	1782
				KA2K	1783
				OK3YCA	1784
				W5DWS	1785
				K5HT	1786
2500		1000			
N9AUZ	490	N9AUZ	747		
KA2K	491	4Z4DX	748		
		KA2K	749		
2000					
N9AUZ	546				
KA2K	547				

Sponsored by the Niagara Peninsula DX Group, the rules are as follows:

1. These awards are available to licensed amateurs. Contacts after January 1, 1979 are valid.

2. Do not send QSL's. Send a log list showing full details of contacts verified and signed by your local club official or by two licensed amateurs.

3. Certificates will be endorsed for various bands and modes, as requested, when application for awards is made.

4. The fee for each award is \$3.50 or 7 IRCs worldwide.

5. Send application to: Guy V. Cadieux, VE3LVN, 98 Townline Road West, St. Catharines, Ontario, Canada L2T 1P7.

General: There are ten provincial awards, one territories award, and one worked all Canadian counties award. The worked all Canadian counties award is free after you have all other 11 awards.

Class A—for all counties in each province. **Class B**—for half of the counties in each province. Counties: Alberta 20, Newfoundland and Labrador 7, Quebec 75, British Columbia 24, Nova Scotia 19, Saskatchewan 13, Manitoba 13, Ontario 54, North West Territories 4, New Brunswick 15, Prince Edward Island 3, All Canadian Counties 247. A list of all Canadian counties is available from the Awards Manager for \$1.00 or 3 IRCs.

Important Note: When in contact with a station ask for the county of his QTH. This is very important to you.

SECTIONS

73

AWARD

AWARDING BODY: AMERICAN RADIO SOCIETY

REQUIREMENTS: 73 SECTIONS

REMARKS:

73 Sections Award of the Nittany ARC.

NARC Awards Program: Sponsored by the Nittany Amateur Radio Club, Inc. (W3YA and K3HKK), P.O. Box 614, State College, Pennsylvania, 16801 U.S.A. All correspondence c/o Awards Manager. General rules for all awards are:

1. The Nittany Amateur Radio Club will accept as reasonable proof that an applicant has all the QSL cards in his/her possession as may be listed on an applica-

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This extremely useful accessory is designed for direct insertion between your receiver (or transceiver) and the antenna. It is both MORE EFFECTIVE than I.F. type blankers and requires NO MODIFICATIONS to your receiver! The unit operates from a 13 VDC \pm 2 VDC power source at less than 575 mA. (AEA AC wall unit AC-1 will operate the blanker.)

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tion in accordance with all requirements, and that such cards have been sighted as relating to such list by two licensed amateurs or the official of a national level or affiliated radio club, providing further that such official certify to such followed by their full names, calls, and/or titles and full mailing address, and that sponsors have the right to request an applicant to send any card(s) if doubt exists or if the sponsor desires to make a spot check, and such to be at the applicant's expense. Certification by a Notary or other government official legally entitled to notarize will be acceptable in lieu of the above. (This forceably spells out what is generally called the General Certification Rules (GCR)—Ed.)

2. AOMB/M (All One Band or All One Mode or Mixed Modes and Bands) endorsements will be issued as per specific rules, and the 25% rule applies. This means that 25% additional cards will be required in addition to those cards used for AOMB endorsements to obtain a Mixed endorsement.

3. All rules of the Directory of Certificates (KB7SB) and the USA-CA program apply.

4. Send the listing of the stations worked (listed per specific rules) and \$1.00 or 10 IRCs for each certificate. All endorsements at the time of the initial issuance will be made at no extra cost.

73 Sections Award: Issued for working any amateur located in the 73 ARRL Sections as follows:

- Class A—Work all 73 ARRL Sections.
- Class B—Work 65 ARRL Sections.
- Class C—Work 50 ARRL Sections.

The ARRL Sections are those outlined on page 8 of any issue of QST and they should be listed in that order. VE0 counts as Maritime and VE8, Yukon-Northwest Territory may count as any one of the required 73 Sections. AOMB/M endorsements only at the time of issuance of that class of award; AOMB/M endorsements at no extra cost. Initial cost is explained in rule 4; send 10¢ or 1 IRC for higher class endorsement seals. A separate number will be issued for each class imprinted on the endorsement seals pertaining to that lettered class of award.

A copy of the Sections division in the seven states where more than one ARRL Section exists may be obtained by sending an s.a.s.e. or one IRC to the Awards Manager.

Worked All Pennsylvania Counties Award: Issued for working any amateur located in the 67 Pennsylvania counties as follows:

- Class AA: 67 Pennsylvania Counties (available to DX stations including KL and KH but excluding VE stations).
- Class A: 67/60 Pennsylvania Counties.
- Class B: 60/57 Pennsylvania Counties.
- Class C: 45/40 Pennsylvania Counties.
- Class D: 30/25 Pennsylvania Counties.

Note: The last figure is the number of counties required for DX stations; the



Worked Pennsylvania Counties Award of the Nittany ARC.



The NARC Award of the Nittany ARC.

first figure is for VE and U.S. stations.

Please include alphabetical listing of counties and stations with application. Any contacts made after January 1, 1930 will be acceptable, regardless of call or address changes.

NARC Award: Issued for working one of the club stations, W3YA or K3HKK, and/or club members as follows: Center County amateurs work 10 club members, or 7 club members and W3YA or K3HKK. Others work 5 club members or 3 club members and W3YA or K3HKK.

Send alphabetical listing of the stations worked with application. Stations must be members during the calendar year in which worked. All contacts must be made after January 1, 1960 and QSL cards must be received for such contacts. All contacts are acceptable regardless of call or address change.

A list of the qualified club members may be obtained from the Secretary, Nittany Amateur Radio Club, Inc., P.O. Box 614, State College, Pennsylvania, 16801 U.S.A. by sending an s.a.s.e. or 1 IRC. (Thanks to Bud, K2YOF, for all this data; he seems to have received #1 73 Section Award endorsed All 6 Meter S.S.B.—Ed.)

Notes

Sorry to report the loss of Dean Laughlin, K7JWZ, All Counties #89. His story and photo were in CQ, June 1976.

It was also reported by Riley, WA0CEL, that Art, W0KFF, a c.w. County Hunter passed away.

Complaints arriving regarding those questionable (hard to check/prove on normal maps) 3 and 4 County Lines, and it appears that a 2 County line should be the limit!


73, Ed, W2GT



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CIRCLE 128 ON READER SERVICE CARD

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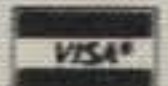
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CIRCLE 144 ON READER SERVICE CARD

“HOW TO” FOR THE NEWCOMER TO AMATEUR RADIO

Terms and Abbreviations

New amateurs are usually confused by the terms and abbreviations heard on the air. This article is intended to clear away some of that mystery, and every reader is urged to pass this information along to prospective and new amateurs.

The November and December 1979 issues of *CQ* include a detailed explanation of the modified Phillips Code used by amateurs. This month's column just lists terms and abbreviations that are unique to amateur radio: work signs, message handling abbreviations, and the most commonly used modified Phillips Code abbreviations. Suggested additions are welcome in writing.

Terms and Abbreviations

AA all after (retransmission request)
 AB all before (retransmission request)
 ABT about
 ADR address (mailing)
 AGN again
 AM amplitude modulation (voice)
 AMSAT Amateur Satellite Corp.
 ANI any
 ANT antenna
 ARES Amateur Radio Emergency Service (ARRL)
 ARRL American Radio Relay League
 ASCII American Standard Code for Information Interchange
 ATV amateur television

 BCI broadcast interference
 BCNU be seeing you
 BFO beat frequency oscillator
 BK back
 BN been, all between (retransmission request)
 BPL Brass Pounders League (ARRL)
 BUG semi-automatic telegraph key
 BURO international QSL forwarding bureau
 B4 before

 C yes, Celsius
 CAC Contest Advisory Committee (ARRL)
 CANS headphones
 CD Civil Defense, Communications Department (ARRL)
 CFM confirm
 CHIEF FUSE operator
 BLOWER operator
 CK check
 CL call, closing station
 CLD called
 CLG calling
 CLR clear
 CNFMD confirmed
 CP code proficiency
 CQ magazine, general call to all stations (work sign)



Twenty-eight-year-old Mark Johnson, N7DYS, and his two-year-old son, Joey, live on a cattle ranch in Fairfield, Idaho. Mark's station includes a Kenwood TS-130-S transceiver powered by an Astron RS-20M power supply, Hy-Gain 18AVT/WB vertical antenna, MFJ 940B antenna tuner, Bearcat 210 scanner, and Realistic DX-302 general-coverage receiver. He has been licensed since May of 1982 and enjoys ragchewing (chatting). Mark has contacted 20 states and he credits CQ with providing a lot of the help he needed to get started in amateur radio. His station is crowded into a closet in his mobile home, but it does the job.

CS callsign
 CUL see you later
 CVTR converter
 CW continuous wave (A0, F0—not code)

 DAT that
 DE the, from (work sign)
 DEC District Emergency Coordinator (ARRL)
 DEM them
 DERE there
 DIS this
 DLVD delivered
 DLVR deliver
 DOSE those
 DP dipole (antenna)
 DR there, dear
 DSB double sideband (voice)
 DX distant station (usually foreign)
 DXAC DX Advisory Committee (ARRL)
 DXCC DX Century Club (award)

 EC Emergency Coordinator (ARRL)
 ECAC Emergency Communications Advisory Committee (ARRL)
 ES and
 ETHER
 SNIFFER receiver

F Fahrenheit
 FAX facsimile (A4, F4)
 FB fine business (excellent)
 FD Field Day (contest) folded dipole (antenna)
 FER for
 FM frequency modulation (voice)
 FOLDED
 DIAPER folded dipole (antenna)
 FREQ frequency

 GA good afternoon, go ahead (transmit)
 GALLON full power (usually 1000 watts, dc)
 GBA give better address (traffic handling)
 GE good evening
 GG going
 GM good morning
 GN good night
 GND ground
 GP ground plane (antenna)
 GUD good

 HANDLE name
 HARMONIC child (if not frequency)
 HEARING
 AID receiver
 HERTZ cycle per second, half-wave antenna
 HI laughter (code)
 HR here, hear, Ham Radio Magazine
 HV have
 HW how
 HW? how do you copy my signal?
 HX hydrographic report

 IARU International Amateur Radio Union
 IRC International Reply Coupon (postage)
 ITU International Telecommunications Union
 IW intruder watch
 K answer (work sign)
 KNW know
 KW kilowatt (1000 watts, dc)

 LID poor operator
 LO league official (ARRL), local oscillator
 LP long path (opposite antenna heading)
 LSB lower sideband (voice)
 LW long wire (antenna)

 MARCONI one-quarter wave antenna
 MIKE microphone
 MILL telegraphy typewriter
 MNI many
 MSG message

 N no (wrong)
 NBFM narrow band frequency modulation (voice)

2814 Empire Ave., Burbank, CA 91504



This photograph of Slaven Galio of Listica, Yugoslavia, shows him at the operating position of YU4ELS, a local amateur radio club I have contacted by code. He operates an Atlas 350-XL transceiver with a W3DZZ antenna.

NBVM	narrow band voice modulation (voice)
NCS	Net Control Station
ND	nothing doing, no dice
NG	no good
NIL	nothing, I have nothing for you
NM	Net Manager
NR	number, Novice Roundup (contest)
NTS	National Traffic System (ARRL)
NW	now, resume transmission
OB	old boy (male amateur)
OBS	Official Bulletin Station (ARRL)
OES	Official Emergency Station (ARRL)
OG	old girl (female operator)
OM	old man (male operator)
ONLI	only
OO	Official Observer (ARRL)
OP	operate, operator
OPR	operator
OSCAR	Orbiting Satellite Carrying Amateur Radio
OT	old timer, old top, offset tuning (receiver)
OTS	Official Traffic Station (ARRL)
OVS	Official VHF Station (ARRL)
PATCH	telephone to amateur station interconnection device
PBL	preamble (message handling)
PRA	Public Relations Assistant (ARRL)
PRAC	Public Relations Advisory Committee (ARRL)
PSE	please
PSHR	Public Service Honor Roll (ARRL)
PX	press report
QST	amateur magazine (ARRL)
QUAD	four sided antenna
R	received okay, are, period (punctuation mark)
RCC	Rag Chewers' Club (award)
RCVD	received okay
RCVR	receiver
RFI	radio frequency interference
RIG	station equipment
RIT	receiver incremental tuning
ROCK CRUSHER	powerful transmitter
RPT	repeat, I repeat (message handling)
RPTR	repeater
RTTY	radioteletype
RX	receiver
SASE	self-addressed, stamped envelope

SCM	Section Communications Manager (ARRL)
SEC	Section Emergency Coordinator (ARRL)
SHACK	radio room
SHUD	should
SIDEWINDER	single-sideband operator
SIG	signal, signature
SKED	schedule
SKYHOOK	antenna
SRI	sorry
SS	Sweepstakes (contest)
SSB	single-sideband (voice)
SSTV	slow-scan television
STICK	pencil
STM	Section Traffic Manager (ARRL)
SVC	service, service message prefix
SWL	shortwave listener
T	zero (numeral)
TA	Technical Advisor (ARRL)
TAD	Ten American Districts (award)
TCC	Transcontinental Corps. (ARRL)
TEMP	temperature
TFC	traffic (messages)
THROW THE BIG SWITCH	close the station
TKS	thanks
TMRW	tomorrow
TNX	thanks
TT	that
TTY	teletype
TU	thank you
TVI	television interference
TX	transmitter, time tick



This is Robby Williams, KA4ZKS, who lives in Rockmart, Georgia. His Mom is WB4PRM and his Dad is AA4WA; consequently, he has a well-equipped station available at his home. The family station includes Drake TR-7A, Kenwood TS-120S, and Kenwood TS-180S Transceivers, plus the Drake C-Line twin receiver and transmitter combination. The antennas are a Hy-Gain TH6-DXX triband Yagi-Uda, 5 element 10 meter Yagi-Uda, 80 meter dipole, and 40 meter dipole. Robby is a 12-year-old seventh grader who also enjoys collecting coins and racing bicycles. He just got started on the air in April 1982, but he has been exposed to amateur radio all of his life. We have a relevant sign posted in my home; it states, "BEWARE—Amateur Radio is highly contagious—there is no known cure."

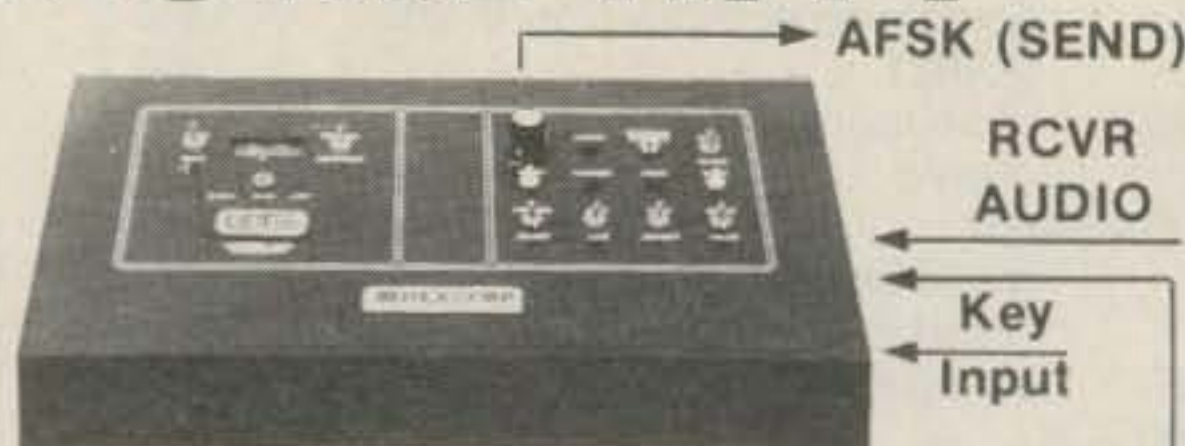
U	you
UR	your
URS	yours
USB	upper sideband (voice)
VERI	very
VFO	variable frequency oscillator
VOX	voice (or sidetone) operated xmit (transmit) control
VRAC	VHF Repeater Advisory Committee (ARRL)
VUAC	VHF/UHF Advisory Committee (ARRL)
VY	very
W	watts
WA	word after (retransmission request)
WAC	Worked All Continents (award)
WAS	Worked All States (award)
WAT	what
WAZ	Worked All Zones (award)
WB	word before (retransmission request)
WID	with
WINDOM	unique half-wave antenna
WKD	worked
WKG	working
WL	will
WPM	words per minute (code speed)
WRD	word/words
WX	weather
XCVR	transceiver
XMIT	transmit
XMSN	transmission
XMTR	transmitter
XTAL	crystal
XVTR	transverter
XYL	wife/married female
YAGI	Yagi-Uda antenna
YF	wife
YL	young lady (female operator)
YRS	years
Z	UTC/Universal Time Coordinated (ex-GMT, Zulu, etc.)
ZB	zero beat (frequency)
2	to
5B DXCC	Five Band DXCC (award)
5B WAC	Five Band Worked All Continents (award)
5B WAS	Five Band Worked All States (award)
5B WAZ	Five Band Worked All Zones (award)
6B WAC	6 Band Worked All Continents (award)
33	fondlest regards (between females)
73	best regards (also an amateur magazine)
88	love and kisses (between male and female)
99	keep out (do not disturb this contact)

FCC Rules and Regulations

It is essential to have a current copy of the Federal Communications Commission (FCC) rules and regulations governing our amateur radio service. A copy of Part 97, plus updating data, can be ordered from the Superintendent of Documents (SUPDOC), U.S. Government Printing Office (GPO), Washington, D.C. 20402.

ASCII MORSE RTTY

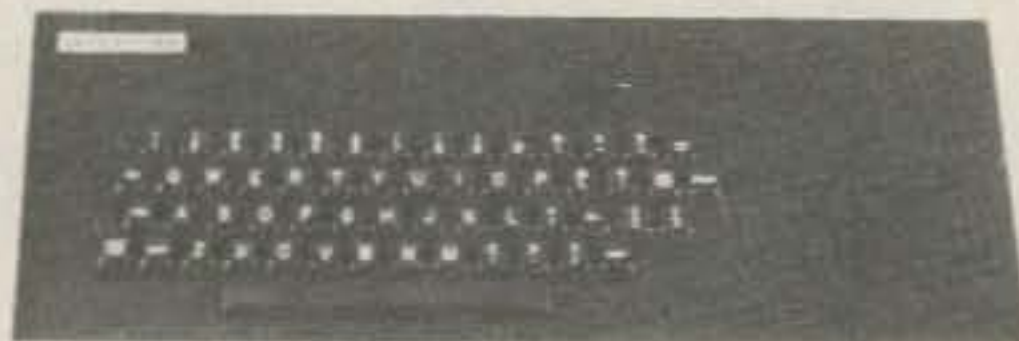
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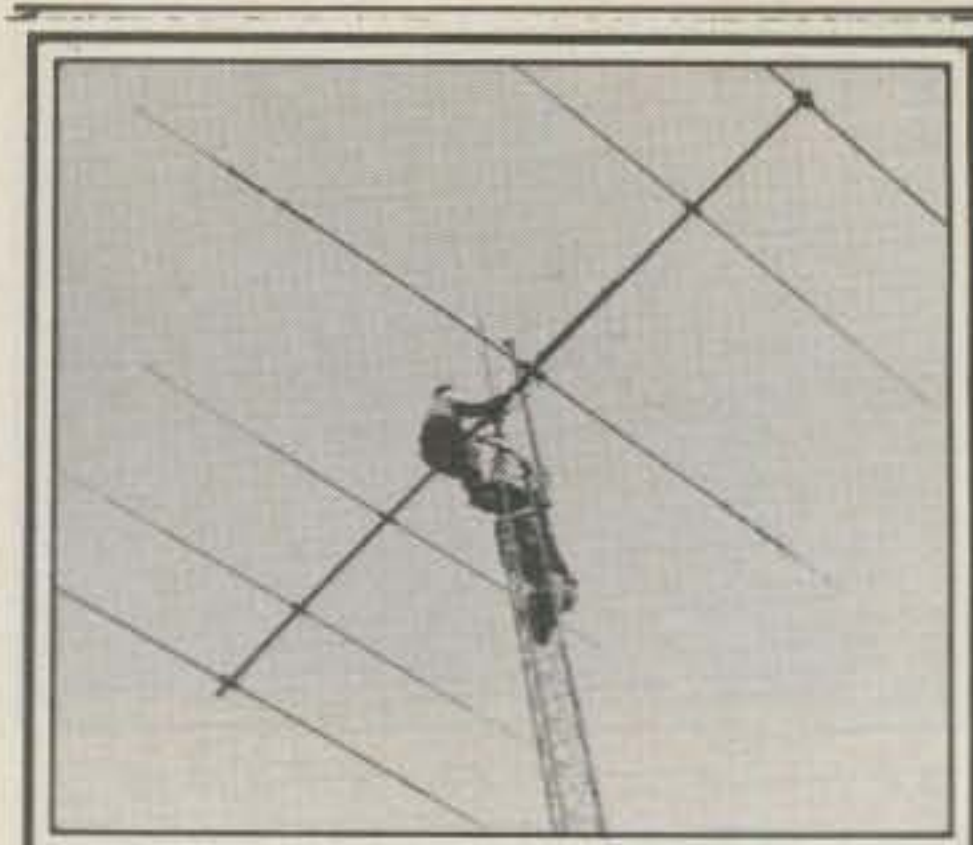
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RTTY - VIDEO - CW

214/840-2072

CIRCLE 34 ON READER SERVICE CARD

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GARLAND, TX 75041



Here is 17-year-old Scott Laurie, KA0IUF, of Cedar Falls, Iowa. CB got him interested in radio, and the Northeast Iowa Radio Amateur Association (W0MG) helped him earn the Novice license. His station includes a Yaesu FT-101 Transceiver, Hy-Gain TH6-DXX beam, dipole, Accu-Memory II keyer, Heath SA-5010 keyer, and a homebrew keyboard. Scott has worked all states on both 10 and 15 meters, plus 94 countries. He is usually on 21,115 kHz from 1910 to 2200 UTC; if you still need an Iowa QSO (contact), try working Scott. He handles traffic in state and sectional code nets. Scott has summer employment on a farm, which was my summer job as a young man. Scott is the fellow in the dark shirt facing the camera in this picture. The amateur helping Scott on the tower is Jim Bohnsack, WB0UFL, a fellow club member at W0MG.

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CIRCLE 132 ON READER SERVICE CARD

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"... Simple installation - excellent instructions..."

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CIRCLE 27 ON READER SERVICE CARD

Part 97 can be obtained by ordering Title 47, Volume 4 (Telecommunication, Part 80 to End, Revised 1 October 1981) of the Code of Federal Regulations (CFR) at \$8.50 per copy.

The monthly updates subscription costs \$10 per year and the updates are called LSA's, which means List of CFR Sections Affected. At the present time, this is the only way to obtain an up-to-date Part 97. If you subscribe to LSA, it is advisable to order all updates that have been issued since October 1981 to bring Part 97 up to date.

Addresses

If you want to expedite receipt of QSL cards from amateurs in certain states and countries, a good way to do it is to send your cards to them with self-addressed and stamped envelopes. However, one needs a mailing address to do this. The Radio Amateur Callbook has provided addresses of domestic (U.S.A.) and foreign (DX) amateurs for more than 60 years. These callbooks are available through most major amateur suppliers. They can also be obtained directly from Radio Amateur Callbook, Inc., 925 Sherwood Drive, Lake Bluff, IL 60044.

A domestic listing is now also available from Jack Speer, N1BIC, 70 Florida Hill Road, Ridgefield, CT 06877. Jack's book is the *Call Directory* and it costs \$15.95, which includes the \$3.00 shipping charge.

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You won't find as much well thought out programming, circuitry, and features anywhere, at any price! The ATR-6800 combines the best of both worlds, an easy to use video system for CW/RTTY/SSTV with automatic station control and a stand-alone computer with expandable memory & full instruction set in Motorola assembly language. Add the BASIC language option package and you'll have the unique combination of an RFI proof computer and ultimate RTTY/CW HAM station. And don't forget "easy to use." All of us at Microlog are RADIO ACTIVE on RTTY, so here's a lot of personal attention to detail and ease of operation. "Stick-on" command listing and video status display will get you on the air quick and sounding like a pro.



There's a certain thrill to using efficient, reliable digital communications equipment on the air. That's the fun of RTTY. Spice up your Amateur Radio operation with the silent video system that does it all, the Microlog ACT-1. Even if you own a home computer and are considering an out-board interface/program, remember, we've put it all in one RFI tight enclosure that's ready to go as soon as you power up. And, with the "Battery-backed" mem-

ory option, you won't even lose your pre-programmed messages if there's a "blink" in the A.C. The ACT-1 has features that the competition doesn't even have on the drawing board! Check for yourself, you could spend a lot more and still come up short.

ATR-6800 vs ACT-1 The most often asked question we hear is "What's the difference between the ATR & the ACT-1?" The ACT-1 is a dedicated system for RTTY/CW/SSTV. It provides all the functions and features you need for a multi-mode station. Along with this superior "ON-the-AIR" performance, the ATR-6800 extends your operation into the realm of automatic station control and computer programming. Plug-in applications modules expand the ATR's memory to add new HAM oriented programs which are enabled by simple keyboard commands. By adding the BASIC option package, you'll have pre-programmed full community mailbox, contest dupe sheet, personal station log, message editor, BASIC computer language and 16k of battery-backed (non-volatile) memory. We also provide a subroutine list so that you can write programs to directly control the ATR-6800 in easy to use BASIC language. The ATR-6800 then is the expandable, "do everything" system where your imagination is the only limit! The ACT-1 is designed for the HAM who needs the essentials of a complete video system for digital communications.

TECHNICAL SPECIFICATIONS ATR-6800 & ACT-1

INPUTS	100mv min. TTL, Keyer, Hand Key ± 12V, 330 Ohm Source	SYNC: Transmits "Blank-Fill" in RTTY and BT in Morse when Text Buffer is empty and unit is in transmit. Keyboard command on/off.	TUNING INDICATORS	800 Hz Keyed Regenerated LED on Mark (Keydown) Tuning ellipse for RTTY
Speaker Audio		UN-SHIFT on Space: Automatically shifts back to "LETTERS" upon receipt or transmission of space. Keyboard command on/off.	PROGRAMMABLE MEMORIES	10-40 character messages (400 total) or *10-80 character messages (800 total) battery backed 15 characters maximum in standard ID and 17 in RTTY ID
Digital		REAL-TIME CLOCK: Keyboard set, always on screen display, hours, minutes, seconds. Can also be inserted in transmit text buffer by keyboard command.	Here is:	Up to 15 characters
RS232		WORD WRAP AROUND: Prevents splitting words at the end of a line. Works in receive as well as transmit.	ID:	ATR — 4 memories, up to 15 characters each. ACT-1 — 2 memories for printer on and printer off
OUTPUT TO TRANSMITTER FOR CW/RTTY/SSTV		CODE PRACTICE: Random 5 char generator sends at any speed you set via the keyboard. Hand-Key input allows use in code practice oscillator that will also read your sending!	**COMPUTER CAPABILITY	Memory
- Voltage Keying	+ 40VDC @ 300ma Max.	STATUS DISPLAY can be called up to show the condition and control commands for 20 programmable parameters, such as AFSK tone freqs, UNOS, printer, etc. Useful as a "HELP" command in case you misplace the manual. There's also a constant "TOP-LINE" display of Time, Mode, Speed, & Code in use.	Language	Standard unit has 4000 bytes of RAM for user program. Basic package adds 16K. Basic or Motorola M6800
- Voltage Keying	-150VDC @ 50ma Max.	DETECTION MODES	Commands	Input: Output; Load; Go with Break Point; or Normal Basic
*Mercury Relay	200VDC or 2 amp (20VA Max.) N.O. & N.C.	Direct	Tape Interface	Stores Programs on Audio Cassette
*Relay Change Over	ATR — Relay ± 30V @ 2 amp N.O. & N.C. ACT-1 — Transistor +12VDC @ 300 ma. GND on XMT	Demodulator	POWER	115 VAC, 60 Hz 60 VA Max, Act-1, 30 VA Max (230 VAC, 50 Hz optional) 12 volt version available External input for charging expanded battery backed memory. 6-15VDC @ 10 ma. max.
FSK Tones, Range	Keyboard Programmable 500 Hz to 3000 Hz	**Terminal	MECHANICAL	
FSK Tones, Level	Mic Compatible 30-50mv Audio	DATA RATES	ATR-6800:	Size
Low Scan	Mic Compatible Audio. Sync 1200 Hz, Black-1500 Hz, White-2300 Hz	Morse	Weight	14 1/4" W x 12 1/4" D x 4" H
MISCELLANEOUS CONNECTIONS		Baudot	ACT-1:	15 lb.
RS 232	± 12VDC, 330 Ohm Source Impedance, Negative Mark	ASCII	Size	17.8 W x 3H x 9.5D
Printer Driver	ATR — • Hi-speed RS-232 upto 2400 Baud • Slo-speed Baudot & ASCII Floating Relay for Current Loop Switching	Slow Scan	Weight	7 lb.
	ACT-1 — • Slo-speed Baudot & ASCII Transistor Switch + 40VDC @ 100 ma. • Optional Hi-speed ASCII RS232 @ 2400 Baud.	OUTPUT OPERATING MODES	ATR-6800 & ACT-1:	Color
Recorder	Mike = 100 mv Audio	Symbol	Material	Beige Top, Black Base AL5052 Aluminum Alloy
"Brag Tape" scope	Speaker = 200 mv Audio	Word		
	Horizontal and Vertical Outputs to Scope for RTTY Tuning Aid	Line		
Slow Speed Tracking	Automatic or Speed Lock	Buffer		
VIDEO OUTPUT				
Volt Peak to Peak, Negative Sync Composite Video (American Standard)				
European standard available upon request.				
VIDEO FORMAT				
Normal	24 lines, 40 characters per line			
Com	12 lines, 20 characters per line			
Black on White or	Keyboard selectable			
White on Black	Any location Line 0 (Off) to Line 20, Keyboard selectable			
Display Split Screen				
SSTV				
	3 lines, 6 characters per line + graphics			
TEST MESSAGES: Quick Brown Fox and RYRY's in Baudot, U*U* in ASCII, VV in Morse.				

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VAN GORDEN Center insulator	\$5.75
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B&W 595 coax switch	\$22.50
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B&W 5KW balun 4:1 or 6:1	\$45.00

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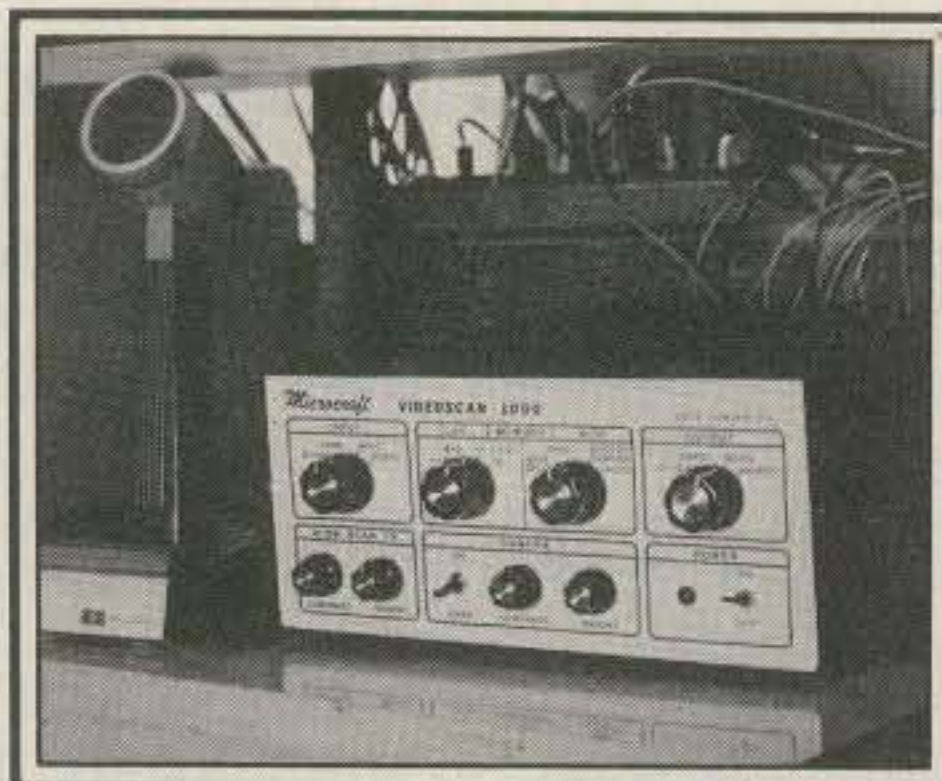
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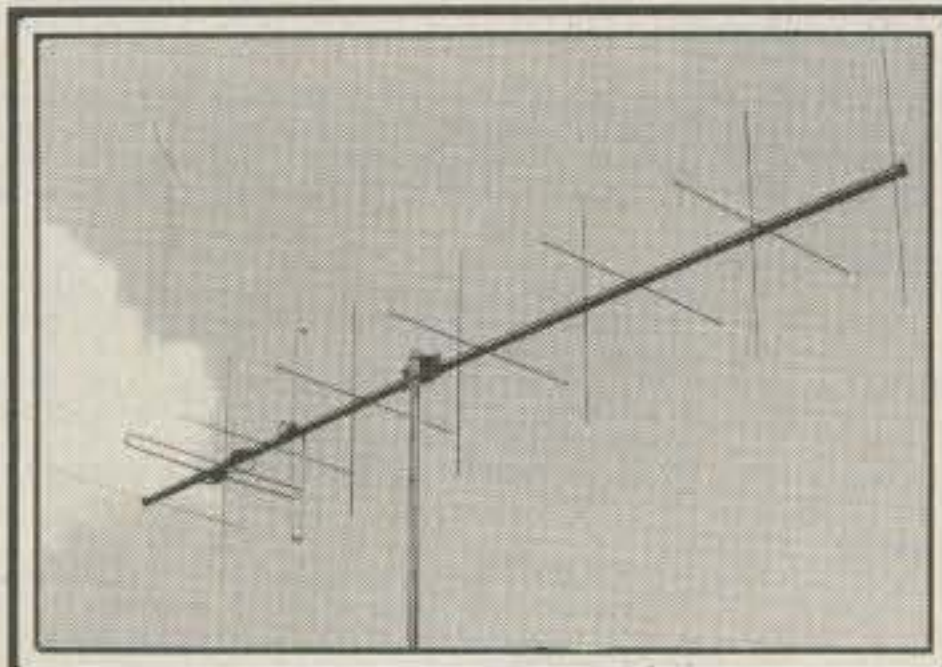
CIRCLE 88 ON READER SERVICE CARD

CQ SHOWCASE

**Microcraft Videoscan 1000**

The Microcraft Videoscan 1000 is completely compatible with amateur-standard SSTV and first generation equipment. That is, Videoscan can convey high-resolution 8 second, 128-line SSTV pictures to first generation scan converters using current standards. However, the unit stands alone with the introduction of two separate high-resolution modes. In these modes the TV picture utilizes the full 256 TV lines and 256 picture elements (pixels) per line. The pixels are quantized to 64 levels of gray. Consequently, no contouring (false edges) is introduced to detract from the picture.

Some noteworthy features of Videoscan are split-mode, stop motion, cursor, gray scale and call sign, and station switching. Microcraft is presently working on a computer input/output port and a color conversion. The Videoscan 1000 is available as a complete kit for \$595 or wired and tested for \$795 plus \$6 for shipping. Shipments are made world-wide. For more information, contact Microcraft Corporation, P.O. Box 513, Thiensville, WI 53092, or circle number 102 on the reader service card.

**KLM Circular Polarized Antenna**

The KLM 143-150-14C Circular Polarized Antenna not only provides optimum re-

ception of OSCAR satellite signals, but can also improve 2 meter terrestrial communication. Reception with the 14C reduces flutter fading and multipath distortion, and often improves S/N ratios. Benefits of circular polarity on transmit are similar, regardless of the polarization of the receiving antenna. The 14C antenna kit includes a feedpoint mounted switcher, keyed by +9 to +15 v.d.c. right from the shack. For single feedline convenience, a special matching harness is included. If desired, the 14C can also function as two separately fed antennas, one vertical and one horizontal. Each set of feedpoints is equipped with a 2 kw balun ready for direct coax feed.

With 7 elements in each plane, the manufacturer claims that the 14C produces 11 dBdC gain at better than 1.5:1 v.s.w.r. Circularity is maintained within 3 dB. Weight is 7½ lbs.; windload is 1.2 square feet. For more information, contact KLM Electronics, Inc., P.O. Box 816, Morgan Hill, CA 95037, or circle number 104 on the reader service card.

**LCD Watch/Lighter**

A sporty LCD quartz wrist watch/lighter combination that tells hour, minute, second, day, and date with backlight displays continually. It is operated by one #292 1.5 silver oxide Eveready battery or equivalent. The watch is combined with a built-in lighter, refuelable and replaceable flints, for handy use. Each watch/lighter is equipped with battery and flint—ready to function.

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The Model MT-1RT mobile antenna tunes 3.2 to 30 MHz inclusive. 750 watts CW, 1500 watts PEP for hams, military, MARS, CAP, and commercial service. Center loaded for high efficiency. Enables tuning to exact resonance to wanted frequency. Allows full output from solid state finals. No worry about reduced output from shut down circuits. Output is unaffected by moisture and the elements. Tuned by a control box at the operator's position. Mast section contains a double action hydraulic cylinder driven by two miniature hydraulic pumps and 12 volt DC motors for positive control. No creeping during operation or mobile motion. Can be remotod up to 500 ft. from antenna.

MT-1RT amateur net \$240.00
 MT-1RTR (retro kit for all MT-1's) \$118.00
 MT-1 amateur net 129.95
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 CIRCLE 75 ON READER SERVICE CARD

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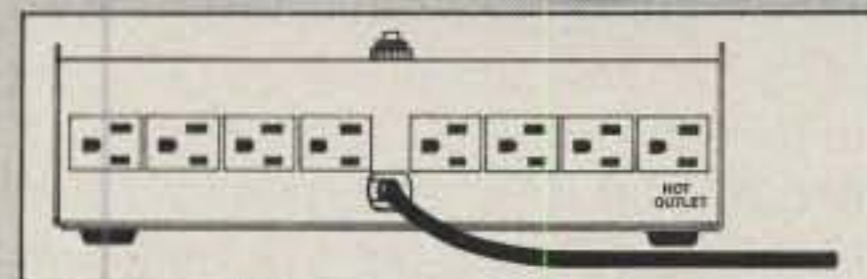
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NEWS OF COMMUNICATIONS AROUND THE WORLD

*I do not hunger for a well-stored mind;
I only wish to live my life, and find
All DX before the rest of mankind . . .*

Often one runs into the premise which leans to the belief that if one person knows something, everyone knows it. This is not necessarily so. Last week one of the QRP types came hippity-hopping up the hill to again remind us that DXing is a continued span of learning. And what has gone before may have to be repeated for those who come later.

"Tell me," this one said, "just how can you tell a DXer at a glance. Someone at the last club meeting was hinting that often it is really no problem. But when I asked for details, he started acting mysterious, or maybe it was something sacred and not to be talked about. What goes?"

Sometimes the feeling comes that frequently one finds in the newer DX types a belief that all one has to do is work a lot of countries and one will know everything about DXing. This extends even to those who may be technically proficient in electronics but who are not DXers. Often they think they should know, but they do not. For it is still one of the Inevitable Truths that only a DXer understands another DXer, and only a DXer understands DX. But we had this QRP type on our hands.

"How to tell a DXer at a glance?" we said, repeating his question. "Actually, it is rather simple. As the zebra is easily recognized by its distinctive stripes and the elephant by its bulk and long nose (usually called a trunk), the endowed DXer has signs easily recognized. Possibly you may have already noted them."

If we had thought that some superficial erudition would impress this one, we were mistaken. "Never mind all the static," he abruptly advised us, "just tell me!" So what could we do but get right to the point.

"Most times when you see a lot of DXers together," we continued, "it is usually at a club meeting. Right?" The Local nodded his head to this. "And they are usually dressed very well, cleaned and polished as most DXers are. Right?"

The QRPer might have been gaining some information, but he was obviously losing patience. "Of course they are," he said, an edge to his voice, "and all the big guns wear badges and show their call-signs. And those with a lot of countries worked have little badges showing their



Goran Ostman, SM4DHF, operated in the Market Reef effort a few months back; actually it was in 1981. This was the group that lacked for brevity in its call. It had to sign SM4DHF/OH0/OJ0. (Photo via SM4CAN)

DXCC country totals. Some even wear an additional one showing that they are on the Honor Roll. Of course I recognize them as DXers. Who could miss them? But what I mean is how do you recognize them elsewhere—out on the street, down at the stores, maybe even at work? This fellow was giving out the idea that he could recognize a DXer almost everywhere. But how? That's what I want to know!"

We had to give a gentle sigh at this. Here we had hoped to savor the moment treasured by those in the know when they divulge a small particle of knowledge, but this one was too impatient. Much too impatient.

"Okay," we said, "you move around with a bunch of DXers at times. On weekends you often see two or three or maybe even more. Sometimes you work putting up towers, discussing antennas, and making the required visit to the local radio stores to see what's new. Right?"

The QRPer was acting as though he wanted to interject a few words, but we held up a hand. We knew he would be in agreement with what we were saying.

"And at these times do they go around all dressed up or, as we might charitably say, are they comfortably casual? What do you say?"

"Of course they are not dressed up. No one works to pour a foundation in good clothes. But what has that to do with it anyhow? Get to the point!"

We were getting there but apparently not fast enough. So we talked maybe even faster. "When a DXer is relaxing, the true spirit usually shows. The nobility, the loftiness of purpose, the concern for his fellow DXer. The DXer." The QRPer held up his hand. "Get to the point!"

So we did. "As the zebra has stripes, the elephant a trunk, the DXer can be often recognized by his attire. For though the dress may be a bit sharper at the club meetings, the casual times show the DXer as he is." We leaned close to the QRPer. "You getting all of this?" we asked, voices low, tones conspiratorial.

The QRPer stood up and his neck muscles tensed. "You can recognize the DX type by the seat of his pants," we quickly said, heading off any possible words from him, "by the sag in the bag, the cut of the cloth, and the reefs in the seat. In short, DXers, when you want to recognize them, can be identified by their tendency to wear pants with the seat cut knee length. Absolutely!"

For a moment we thought we might have a violent argument on our hands, but right in midflight the QRPer paused, leaning forward to check the area down towards his knees. "Well, I'll be . . ." was the muttered comment. We had suspected that it might be just that because long before we even got started in the explanation, we had checked the cut of his clothes. We could hardly lose on this one.

We knew that we might eventually get an argument, but we had run this race before, for it takes but a continuing observance to note that DXers are prone to wear clothes with the comfortable cut in the back, and what could be more comfortable than the deep seat?

"Remember," we continued, "as you see other DXers, check how many lean toward designer jeans with a low rise. Hardly ever you will see a true-blue DXer in designer jeans, though admittedly you may see a DX dilettante so clothed. But check the seat; probably the lower the seat, the higher the DXCC total."

There is always the problem that comes when one has exposed truth to the unknowing. They sometimes have trouble recognizing or accepting it. "Are you serious?" he asked, his voice showing a note of unsureness. "Absolutely!" was our reply.

Some might say that if one believes this, then they will believe anything. But take the time to check the local big guns. When you find the baggy pants with the crotch far down around his knees, approach in all humility, for you are probably close to a real big-gun DXer. You might even find yourself wearing the DX style. A lot of DXers do!

Distant Early Warnings

Writing some months in advance of publication, some DX news often comes at arm's length. But by now some of the following might be a bit closer.

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C.W.: 400 WC4K, 550 WD0AVG, 600 AG5C, 700 VE1ANU, 750 W9NO, 800 KL7AF, HP1AC, 850 W1OPJ, 1250 YU2CBM, 1400 W4BQY, 1450 W4BQY, N2AC, 1500 DL1QT.

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There is a possibility of another Clipperton/FO0 effort in the next month or so. Some have been working on this for some time, this including visits to Tahiti to line up all the necessary permits and licenses. A month or two back things were looking good and the organization was getting to the place where the list of operators was being compiled and the transportation needs arranged.

The last Clipperton effort was in 1978 when the Clipperton DX Club put on a big operation. Sailing on the *MS Philippa*, the crew was there in March of that year and signed FO0-XA/XB/XC/XD/XF/XG and XH. This group was on Clipperton for a week and made over 29K contacts. The cost ran over \$70,000 for direct expenses, the members handling some of their own personal costs for transportation and such. Of the total contacts made by the 1978 effort, over 20,000 were with the elusive W and K stations, 4500 with Europe, and about 4800 with the rest of the world.

Clipperton is named after an alleged English pirate, John Clipperton, the story being that he was marooned on the island by the French in 1705. The island has been claimed by a number of countries. The French claimed it in 1711 and an American claimed it in 1892 to work the phosphate deposits. This was signed over to British interests in 1897, and then Mexico laid claim to the island. With the

island in dispute, the World Court at The Hague in 1931 upheld the French claim to the island.

In a book published on the efforts in 1978, there is mention of a Japanese radio station being established on Clipperton before WW II as a communications link between agents in California and the Japanese mainland.

Also in the planning stage a few months back was a possible LA effort to put Peter I Island on the air. A handful of years back, Willy deRoos made a trip to the vicinity of the island to try putting it on the air, but he decided when close that the effort was not feasible due to ice pack conditions and a number of other factors. Should you want to locate Peter I Island, look for it around 68°47'S and 90°35'W. It is located in the Bellingshausen Sea and almost exactly south of Moline, Illinois, or Yazoo City, Mississippi.

A year or so back one of the Local QRP types was on Peter I Island on a circum-Antarctica cruise. Even though this one was a DX type, it was not possible to raise any great enthusiasm for an operation there. Just trying to keep warm was a major concern.

If these jell, and at this writing either or both are good possibilities, look for them in the next month or so. There is some definite interest in Peter I, there never having been any operation there. Clipperton will draw a lot of needy DX types even though it is but five years since the last operation. Considering who worked the island during the last effort, throughout the world there is a continuing need for this one.

10 MHz

Most should have heard the word by now, but back around Thanksgiving the FCC gave a temporary authority for amateurs in the U.S. to work c.w. or RTTY in the 10.1 MHz to 10.15 MHz area. All 50 kHz will be available to the General, Advanced, and Extra Class licensees, except for the area 10.109-10.115 MHz which is reserved for governmental use. Maximum power allowable in this new amateur frequency is 250 watts input to the final.

This is only a temporary authority, and the FCC made this clear, saying that the authority was given as an interim step while a final study was being completed on the 30 meter band, the new band coming from WARC '79. There may be a number of "temporary" authorizations from the results of WARC, because as yet there has not been a final ratification of this international treaty. However, this should not be cause for instant alarm, but rather an indication as to how things eventually will go.

Gone Forever

Serrana Bank and Baja Nuevo, both HK0's, were stricken from the DXCC

Country List December 1st and were joined by 8Z4—Saudi/Iraqi Neutral Zone—on the long, long trail to the deleted country file.

The HK0's provided a bit of action over the last decade. There really wasn't much to the reefs, but they did provide enough space to put up a station and draw DXers. However, times change, boundaries change, territorial claims change, and DX countries disappear to live only in memory. The 8Z4 area came as a country because Saudi and Iraq could not agree on their common boundary. A few years back they worked out the problem and 8Z4 was on the skids. Now it has gone.

Also a few years back some Saudis operated from the Neutral Zone and did a brisk business. One of the operators came to the states with a film of the effort. He described it as a wild area, often the home of wandering nomads and other things that pass in the night. But what we remember best was the portion of the film showing the new day dawning, a nomadic group passing with a herd of camels, the herders doing the day's work from a Mer-

The WAZ Program

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219	VE2FMI	222	OH4UI
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15 Meter Phone

149 JA8WBW

20 Meter Phone

426 DK5AD 427 EA6DE

40 Meter Phone

22 SM6DHO

10 Meter C.W.

42 DK5AD

15 Meter C.W.

79 W2SGK 80 KA1CY

20 Meter C.W.

180 KA1CY

All Band WAZ

S.S.B.

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2537	JH1UUT	2546	I4IKW
2538	K4RIG	2547	I3AAV
2539	WA6AJP	2548	I7IEH
2540	AD80	2549	VK3NLS
2541	WD5ABG	2550	K8IQB
2542	WB0CIW	2551	N5ACX
2543	WD9DFZ	2552	K0HOW
2544	WB4VQO		

C.W. and Phone

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5455	W5USH	5461	KN7W
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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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cedes-Benz. It was then that we really believed when they said what an unsettled and turbulent place the Neutral Zone was.

Cambridge University Radio Club

Last year this group operated from the Isle of Jersey signing GJ6UW. Late this spring they will be on the Isle of Man signing GD6UW.

There is another matter to note. This is the club that has taken over the task of continuing to publish Geoff Watts' "DX News Sheet." Actually, the bulletin is published by the RSGB, but G3XTT and G3ZAY are doing the necessary editing work. Should you want a QSL for their operations or possibly to learn more about the longest running DX bulletin going, drop a line to the Society at Box 146, Cambridge, England.

Novice DX

In April Russ Russell, N9DLU, will be in St. Croix in the Virgin Islands for a two-week stay and will operate in the Novice bands. Russ will be there from April 5th to the 15th signing N9DLU/KP2 and will run up a wire supported by a kite. He plans only c.w. work in the Novice areas. QSL to his home QTH, 7530 West Lawrence Avenue, Harwood Heights, Illinois 60656.

Work 'Em Now

Back in October, 3C1MM showed on the air announcing that he was in Equatorial Guinea. The station drew a lot of action with his strong 10 meter c.w. signal, but he was soon drawing something else.

Interference and jamming developed on his frequency, mostly out of Europe, with the stations denouncing the operation as phoney. Therefore, the operator gave up and went off the air. Before quitting, he told those working him to QSL to EA1QF. Those who did promptly got back a QSL. So what does that prove? That it is better to work 'em first and worry later.

This is not the first time happenings such as this have been noted. We can recall years back when Andorra was changed from a PX prefix to C3. The unfortunate who first showed with the new prefix was roundly berated for his idiocy. Then we even phoned a local who needed Andorra and the local refused to work the station. No one was going to catch him and make him look less than wise and all-knowing. "There is no such prefix!" he kept repeating. "I checked it out in the country list."

If one were able to read the inner secrets of DXers, a surprising number would have similar incidents etched on their memories. For to try and work a needed country and miss leaves hardly any wound compared to hearing one you did not believe and later finding that it was a good one.

So what do you do? Go not proudly away from a pile-up when you don't recognize the prefix. For as it has been said



Members of the Cambridge Radio University Club, who were sponsors of GJ6UW from Jersey last year and are working for a GD6UW from the Isle of Man this year. From the left: M.J. Ather-ton, G3ZAY; R.N. Herring, G4BNE; G4LVH; M.S. Appleby, G3ZNU; D.I. Field, G3XTT; and G4LUN. G3XTT and G3ZAY are the ones who have picked up and are currently doing the editorial work for the "DX News Sheet."

in years past the memory of some of the oldest DXers, "Work 'em first, worry later!" Do this even when the station is signing UF0OL and says he is on Franz Josef Island. Of course this may bring a bit of skepticism, but work him anyhow.

Abu Ail

Lloyd and Iris Colvin were due at this Red Sea DX Spot in early December signing G5ACI/AA. The Colvins were to be there after finishing up a run in Djibouti where they signed J20DU and ran up over 7K QSOs. The call to be used at Abu Ail was not the prefix one has come to expect, but this call has been listed in the callbooks for years as going to the YASME Foundation and at this stop they will tack on the /AA.

Checking around, this would appear to be the fourth Abu Ail effort, although there may be one we missed. OE6XG/A opened Abu Ail as a new country in May 1979. Then there was J20/A and then J20/Z. Pierre Reissian, J28AZ, who was in on all of these, recounted his experiences in a French amateur publication, and we have extracted some of his words on the April 1982 effort, this being the J20/A effort.

The initial plan was to operate from Djebel-Zugar about two miles west of Abu Ail, but this island belongs to North Yemen and the ARRL advised not to push things, there not being authority from North Yemen to operate. Pierre indicates that this would be difficult to get.

Others on the effort were F6ATQ, F6HFS, and F6GKD, plus one other operators besides J28AZ. This was an all-French effort. The 22 hour run to Abu Ail was made on the trawler *Marilly*, the same vessel used in 1980.

They found the same Italian lightkeeper at the lighthouse on Abu Ail, and he recognized some of the DXers from previous trips. DXers are the bulk of the tourists stopping at Abu Ail.

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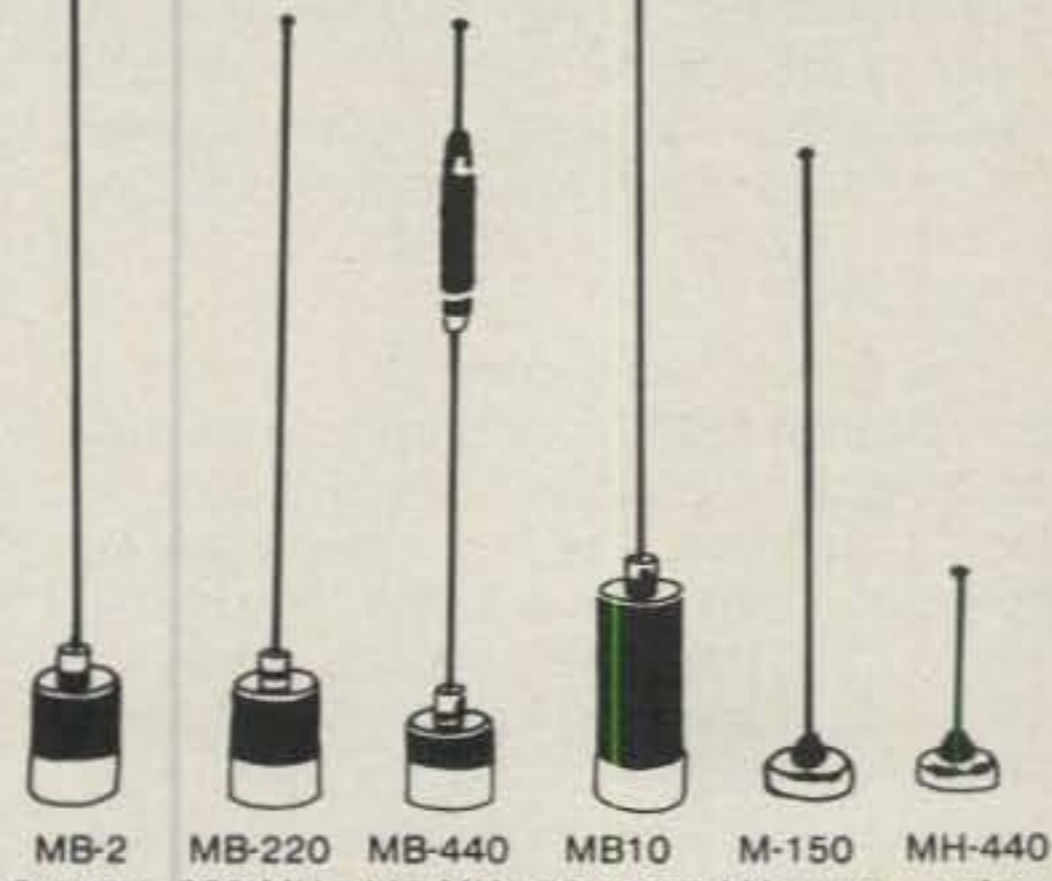
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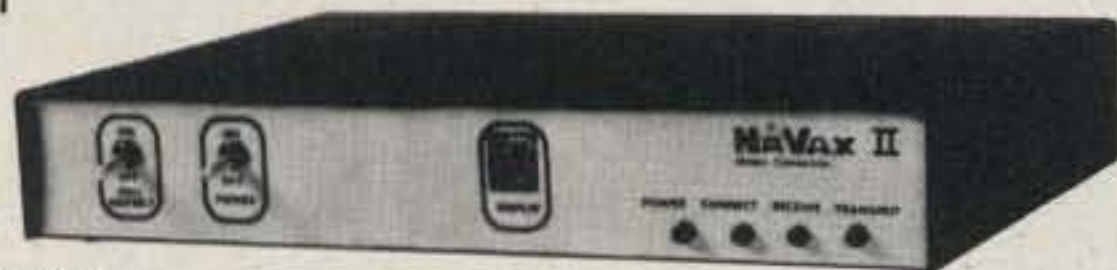
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• 4 digit Access Control	NO	YES
• Toll Restrict	NO	YES
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CIRCLE 91 ON READER SERVICE CARD



Pierre Reissian, J28AZ, who has been on three of the Abu Ail DXpeditions. An active amateur, Pierre has frequently been the mainstay for many operations in Djibouti or to Abu Ail.

This group had a good QSO rate, but propagation faded a bit after sunrise, usually being completely gone by 8:00 a.m. local time. This was the experience all during the stay on the island. The group worked five bands. Pierre notes that on 40 during four days of operating only one F6 was worked even though a watch was being kept for French stations. On some bands lists were compiled for French stations not able to work split frequency.

According to Franz Langer, DJ9ZB, in 1971 the first operation from Abu Ail was by ET3ZU/A who was on Jabal at Tair. Presumably this is the same as Jabal Zuqar. The DXCC country list included this country well back at the start of the 70's, though it was not until the OE6XG/A effort in 1979 that the country started getting in the logs of many deserving DXers. The lighthouse is on Coin Island in the Abu Ail group, and these are located at 14.0°N and 42°45'E. That might help locate them should you head for an atlas. In the OE6XG/A 1979 effort, Franz Langer, DJ9ZB, was one of the operators.

Bermuda

Visitors to Bermuda can get a reciprocal operating permit normally good for three months, if they show up at the Department of Communications office at Hamilton clutching a valid current license in a class equal to or higher than the local variety.

If you are applying by mail, get it off at least 30 days prior to your expected arrival. U.S. amateurs must have a General Class or higher license; Canadians must have an Advanced license. Your approximate arrival and departure dates are also needed.

This might be the best way to go, as customs there will want to see your operating permit before allowing you to bring your gear into the country. There is no charge for the three-month permit. If you plan a longer stay, you can obtain a license which is good until the next June 30th, and there is a \$10 per year charge for the license. Whether you operate under a three-month permit or a yearly li-

cense, you will still be signing your own call plus NP9. If you need more information just phone 5-5151, extension 1120. The mailing address for the Department of Telecommunications is P.O. Box 151, Hamilton 5, Bermuda.

BY8AA

This is another Republic of China station, this one in western, maybe even a bit southwestern, China and in Sichuan (sometimes spelled Szechwan) province. Actually, it is close to the north side of the Himalayas and directly north of Burma. This appears to be another club station, and QSLs go via Box 6106, Beijing, Peoples Republic of China. With all that information, all you have to do is work them, QSL, and wait a couple of weeks for the QSL. Some are getting it back in a week.

The station was on the air in November, being worked by a number of the W's and K's, all of these agreeing that they deserve it. Now if someone would only do something about a legitimate XZ-Burma operation. All the recent ones seem to have foundered before getting by the DXCC desk.

A Lot of Short DX Notes

The Southern California DX Club has replied to the FCC item on phone expansion, saying that the club "... urges the Commission to once, and for all, end the second-class status of U.S. radio amateurs by eliminating the ban on American use of large portions of the internationally accepted voice sub-bands." The SCDXC termed the comments of the ARRL "excellent" in this matter, but differed in two areas, naming what they considered to be a failure to provide for U.S. amateur access to the world-wide voice bands on 7 MHz and the inadequate provisions for U.S. voice operations on 14 MHz.

Just before Christmas D4CBW was reported as claiming to be in the Cape Verde Islands. Supposedly only two legitimate stations are currently licensed in the islands: D44BS and D44BC. Thus, there is a bit of doubt about D4CBW. Also, there is no QSL Bureau for the Cape Verdes Republic. Go direct.

Rick Dorsch, long heard from Ecuador with a variety of callsigns (HC5EE, HC8EE, HC8MD, HC1MD, and HC8VHF), is back in the states. If you still hunger to grasp one of his QSLs, try Box 62, Rochester, Minnesota 48063.

Back in early September some German operators were using calls with an "S1" from an offshore platform in the Thames estuary. Apparently built during WW II for air defense and later abandoned, the thing looks like an offshore oil-drilling rig. Also it seems to be in international waters. "Long Skip" of the Canadian DX Assn. places the platform at 1°28'E, 51°33'N. The operators for the September effort are asking for DXCC country status.

On the Heard Island effort which should

be rolling well when this month's CQ goes into the mails, a bit on the operators might be timely. VK0HI is Dave, also VK3DHF, and a bit back VK9ZD. Dave is a meteorologist. VK0CW is Alan Hamilton, a mechanical engineer who has also signed K8CW, W8DBO, and W5ODJ. VK0MD is Charles, a doctor who is also known as N4BQW. As the end of the last year was coming, the group was on a down-hill pull and action should have started possibly just a bit back.

Bill Poellnitz, K1MM, who was on the last Spratly effort a few years back as well as the recent Cocos-Keeling effort, said in an interview with Rick Barnett, KB0U, of the Kansas City DX Club, that in a big pile-up, he being on the receiving end, he tends to tune the high-end of the pileups and not change frequency unless he has to. Bill feels that when he tunes around he has to adjust to the new tones, possibly only getting partial calls and a different background. Bill likes to get complete calls the first time to avoid repeats or fill-ins. He also feels that on the receiving end recognition of calls heard but not yet worked is built up, this making things a bit faster when contact is made and the QSO entered in the log. Also, he doesn't like to hear calls given more than twice. If he does, it's "arriverderci"! Bill likes a pattern of a station calling once with full call and then listening. Call once and listen.

ZL4OY/A went QRT from Campbell Island just before Christmas, and no activity is known from the island at this time.

CQ DX Awards Program

S.S.B.

1187	K8JHD	1191	IV3PVD
1188	EA9IE	1192	I7IEH
1189	EA3DBU	1193	W1WLW
1190	DL4MBE	1194	K8BUM

C.W.

558	KA2GMT	560	W7CNL
559	OK2JZ	561	W7HZL

S.S.B. Endorsements

310	ZL1AGO/315	200	I7IEH/200
310	IBYRK/315	150	PY2DBU/194
275	W8ILC/QRp/295	150	WB7TFT/174
275	WD8MOV/293	150	DL4MBE/158
275	KB8DB/291	150	WD0DMN/155
275	W6SN/290	3.5/7MHz	EA9IE
275	EA9IE/287	28 MHz	EA9IE
275	N7ASL/276	28 MHz	N8BJO
250	I8SGF/262	28 MHz	I7IEH
250	W1WLW/252	28 MHz	K8BUM
250	WD5HUH/250		

C.W. Endorsements

300	AA6AA/300	275	W7CNL/283
275	W1WLW/292	150	W7HZL/177

The number of active countries is now 318. 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.

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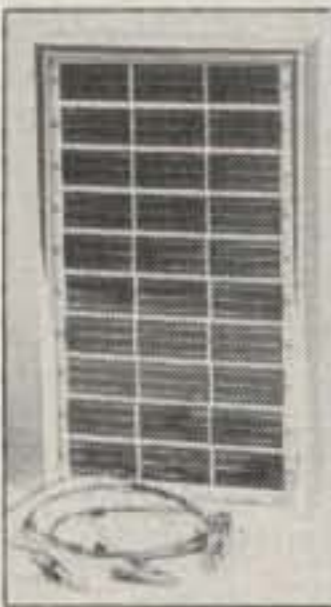
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CIRCLE 17 ON READER SERVICE CARD

No - 83 - 84

VR6KY is now on Pitcairn, this being a YL who married one of the Pitcairn islanders.

Years back, when things were simple, the ITU rules said that amateur calls would be one or two letter prefixes, a number and a suffix not to be more than three letters. Those were the old days for sure, and various combinations have developed in recent years. In the CQ WW S.S.B. Test the Quito Radio Club was signing just the prefix and a zero. It was "HC0" and that was all. After awhile one will learn not to be startled by what one hears; just jump in and work it. And should you have worked HC0, you can QSL to P.O. Box 289, Quito, Ecuador (s.a.s.e. or s.a.e./IRC). If you ran into something you did not understand, they were on 160 through 10 meters.

ZD9BV, often found around 21335 kHz from 1730Z, will be on Tristan for about another year. ZS2MI on Marion Island is frequently found keeping a schedule Saturdays at 1100Z in the area 14150-14200 kHz. When is the ZS2MI station on listening in the U.S. band? Just listen. If he is, you'll know.

Over the years the thought has been expressed a number of times that DX memories are often ephemeral and that those who come late to the feast often have difficulty in finding what went before. The last Clipperton effort found them turning out a booklet of photographs and comments which certainly will make that operation live for a long period. Franz Langner, DJ9ZB, who was in Liechtenstein for the last CQ WW Test, has been on a number of notable DXpeditions and there is a permanent record of the major ones.

There is an informative spiral-bound record of the Abu Ail effort of OE6XG/A in 1979; the latest is the VK9ZR Mellish Reef effort of last spring. Another profusely illustrated book, this one gives the record of that garden spot and will keep the memories alive for that operation.

Those mounting a major effort should give thought to making a record of the effort. The Northern California DX Foundation is willing to accept any archival material for filing, indexing, and eventual availability.

Recently we had a query about RAEM. Some will recognize the call, some will remember the story, but who among those licensed in the last 10 years can tell about Ernst Krenkel and what he did? When the history of an operation is tenuous, the memory will be even more tenuous.

We like what DJ9ZB does. We would wish to see more DXers doing some of the same.

And, to close out this month, there is a report that Andrzej Zielinski, SP2BHZ, and the operator at JW0P on Svalbard has defected. Though his license was issued by Norwegian authorities, some from the home country were noting that amateur radio is currently not allowed in Poland so his operations on Svalbard

might not be legit. The report says that Andy headed west over the hills, but how does one do that on Svalbard?

Also noted is the report that a 1ZO prefix has been adopted in Burma. This may be a bit difficult to figure out, but apparently the "DX News Sheet" reports that the Kaw Thoo Lei administration adopted the 1ZO prefix, and what once might have been XZ5A became 1ZO5.

Recently the Vatican announced the canonization of a Franciscan friar who gave his life in a concentration camp to save another during WW II. This is reported to have been the former SP3RN.

With the ARRL putting out a bi-weekly newsletter, attention should also be drawn to a couple of other newsletters that are proving to have both staying power and a wealth of information. "QRZ DX Hotline" has improved greatly since its initial efforts and currently has clean print and terse information. Published weekly, more information can be obtained by a query to K5FUV, 1310 Paris, Garland, Texas 75040.

The "Westlink Report" has taken over from the original "HR Report" and provides news of the latest developments in amateur radio, some quick and special reports on developing matters, a page of late DX news, and anything else available to keep one abreast of the news. Now running six pages, you can get more information on this bi-weekly paper by querying The Poco Press, 1119 Allegheny St., Sun Valley, Calif. 91352.

And finally, those who seem to long for an FG7AR/FS7 QSL, take heart! Cards do come through and from K8OCL. That's the good news. The bad news is that from the looks of things he is about a year behind in the work—maybe even two years. But they do come!

DX Ten Years Back

In February 1973 XU1AA was being heard from Cambodia. OH2BH was inducted into the DX Hall of Fame at the Fresno International DX Convention. The JA's were reporting that an upcoming trip to CR9-Macao would have one member whose only duty would be to say when needed: "JA's! Please stand by!" VK3JW was aiming to put Mellish Reef on the DXCC Country List. TI9J was scheduled to appear from Cocos Island. CR6GA was planning to operate from Sao Tome in March. YK1OK was active on c.w. The Pandora Net was active in the Pacific area. LA8YB/4W was on from Yemen but being worked only by the East Coast. VP8ME was on from the South Orkneys, and San Felix was scheduled for the first week in April.

5 Band WAZ #28

Bjorn-Hugo Ark, LA5YJ, was the winner of 5 Band WAZ #28, Bjorn being an amateur since 1964. Initially he studied for and was a radio officer in the Norwegian merchant marine. Then he went into

sales in the marine field. When he wanted a change, it was back to sea for a bit, but currently he is back in sales and this time he promotes amateur gear. Bjorn works for Norsk Radio Supply in the Oslo area.

He likes DX and especially DXing on the lower bands. His cards on hand qualify him for a number of the higher awards such as 5BDXCC, but apart from gaining the necessary cards to qualify for an award, he seldom wants to take the time to do the paperwork. At this point he

5 Band WAZ

Standings as of November 1, 1982

All 200 zones worked:

1. ON4UN, John Devoldere (Belgium)
2. K4MQG, Gary Dixon (U.S.A.)
3. SM4CAN, Kent Svensson (Sweden)
4. AA6AA, Steve Orland (U.S.A.)
5. W8AH, Albert Hix (U.S.A.)
6. W6KUT, E. A. Andress (U.S.A.)
7. EA8AK, Fernando Fernande (Spain)
8. LA7JO, Stig Lindblom (Norway)
9. EA3SF, Fernando Blenert (Spain)
10. OH1XX, Hannu Nieminen (Finland)
11. EA8OZ, Julio Rosello (Spain)
12. W0SD, Edward Gray (U.S.A.)
13. K0ZZ, Gary Knutson (U.S.A.)
14. ON6OS, P. Michiels (Belgium)
15. OK3TCA, E. Melcer (Czech.)
16. K6SSS, Fred Capossela (U.S.A.)
17. ZL3GQ, Peter W. Watson (New Zealand)
18. OK3CGP, Stefan Melcer (Czech.)
19. SM0AJU, Leif Lundin (Sweden)
20. OZ3PZ, Preben Thomsen (Denmark)
21. I3MAU, Reno Mauri (Italy)
22. I2ZGC, Gianni Zillio (Italy)
23. 4Z4DX, Dov Gavish (Israel)
24. N4KE, Ron Blake (U.S.A.)
25. K5UR, Rick Roderick (U.S.A.)
26. K9AJ, Michael McGirr (U.S.A.)
27. SM3EVR, Tord E. Julander (Sweden)
28. LA5YJ, Bjorn Hugo Ark (Norway)
29. DL3RK, Walter Geyrhalter (W. Germany)
30. N4WJ, Frank McCormick (U.S.A.)
31. G3MCS, W.R. Hawthorne (England)
32. SM5AQD, Hakan "Hawk" Eriksson (Sweden)
33. W0MLY, George McKercher (U.S.A.)
34. I0RIZ, Gianni Rizzi (Italy)
35. ON5NT, Ghislain Penny (Belgium)
36. OH6JW, Antti Kiviuoma (Finland)
37. OK1AWZ, Milan Dlabac (Czech.)
38. IV3PRK, Pierluigi "Luis" Mansutti (Italy)
39. DJ6RX, Klaus Heintzenberg (W. Germany)
40. OH3YI, Ossi Lehvas (Finland)
41. I4RYC, Relli Claudio (Italy)
42. ZL1BIL, Mike Edwards (New Zealand)
43. I4EAT, Fausto Minardi (Italy)
44. ZL1BQD, R.J. Runciman (New Zealand)
45. TG9NX, Francisco Capuano (Guatemala)
46. XE1J, Joe Levy (Mexico)

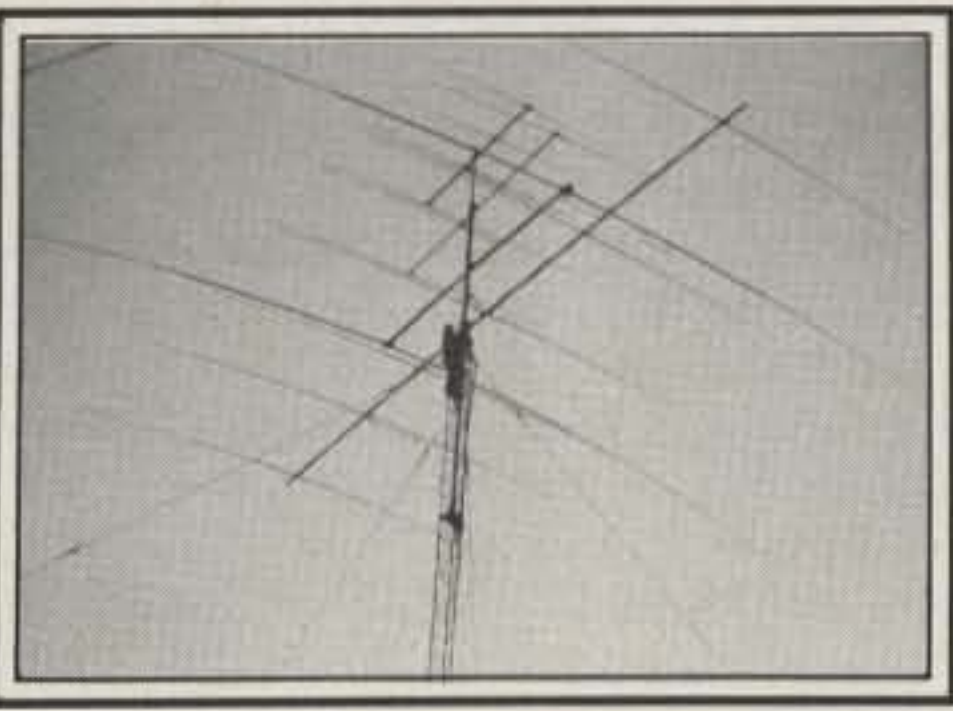
The top contenders for 5 Band WAZ:

- | | |
|----------------|----------------|
| 1. JA3EMU, 199 | 7. EA8QL, 197 |
| 2. F5VU, 199 | 8. K1MEN, 197 |
| 3. CT1FL, 198 | 9. K7UR, 196 |
| 4. W1NG, 198 | 10. W8GT, 195 |
| 5. N4RR, 198 | 11. VE7IG, 195 |
| 6. W8UVZ, 198 | |

179 Stations have attained the 150 zone level



On the left is Bjorn-Hugo Ark, LA5YJ, the winner of 5 Band WAZ #28. On the right is D.B. Duffy, ZL1BOQ, out of Auckland. This was on a spring day in Andebu when ZL1BOQ was checking what makes some LA stations so loud. LA5YJ trained and sailed as a marine radio officer but now is selling amateur gear in the Oslo area.



Bjorn-Hugo Ark, LA5YJ, may appear trapped in an aluminum maze, but he is only working on the antennas. The 75 foot tower holds up 4 on 10, 4 on 15, 6 on 20, 2 full-sized ones on 40 and helps hold up a bevy of others for low frequencies.

thinks 5 Band WAS will be the next effort, with only a few cards needed to round out this one.

Married, there are four boys in the family. Ruth is the XYL and sons are Piet, David, Kurt, and Johan. He is a member of the Horten Group of the NRRL. Bjorn is another who prefers not to catch DX on a net. He does work the DX tests.

The station has a Drake TR7 with a modified linear to keep things at 600 watts to meet Norwegian power regulations. Antennas include 4 elements on 10, 4 on 15, 6 on 20, and 2 full-sized on 40. Eighty has two half-wave slopers oriented NW for the 6/7's and one SE for the same on the long path. Also on 80 is a 130 meter beverage running N/S and a 5/8 vertical with 60 radials. This one comes down

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2113	YU4HA	1584	DJ7CX	1200	W8RSW	879	N4IB	747	G3ZRH
2071	K6JG	1542	N4NO	1198	JH1VRO	865	WB8ZRL	741	N8BJQ
2061	W2NC	1508	SM7TV	1185	K8LJG	854	K08T	727	K7CU
2051	K2VV	1493	W8CNL	1170	SM3EVR	850	KA3A	722	W6OUL
2019	K6XP	1448	YU7AW	1149	YU10BA	826	K2QF	721	W8ILC
1882	VE3GCO	1415	AA4A/8	1145	N6AW	825	G4FAM	703	VE2FOU
1853	YU7BCD	1370	I6SF	1129	W7CB	820	K7AGJ	700	KJ7N
1811	N4MM	1307	W8SFU	1124	DJ2UU	805	YU2CQ	700	KC8JH
1798	W4BQY	1292	K9BG	1056	N6JM	800	W6YMH	700	I1ZQD
1718	W9DWQ	1283	WA1JMP	1051	KL7AF	793	WD9HC	658	K9TI
1707	W7LLC	1282	N6FX	1005	LA7JO	793	DK2BL	630	OE1KJW
1675	PA0SNG	1269	PA2TMS	923	WB8YQX	787	JA9FAI	627	K8HF
1619	K5UR	1262	IN3ANE	921	YU2CBK	768	W0JIE	607	WD8IIA
	N9AF								

S.S.B.

2244	F9RM	1427	K5UR	1107	F2MO	922	TG4NX	750	WB8ZRL
2039	I0ZV	1422	OZ5EV	1062	PY3BXW	920	N2AC	743	PY4OD
1832	K2POA	1410	I0MBX	1060	DJ7CX	901	I2MQP	739	VK6YL
1825	K6XP	1357	W8YDB	1044	W2CC	883	KC8CC	703	W3GXX
1816	K6JG	1336	W9DWQ	1037	OE2EGL	851	I8KCI	700	N4IB
1739	K2VV	1275	I6ZJC	1011	KF2O	850	KL7AF	668	DK4AP
1700	N6CW	1250	N2SS	1005	ZP5RS	833	TG9GI	652	KB2DE
1667	ZL3NS	1201	AA4A/8	1003	CT1UA	828	I0RIZ	650	OE8MOK
1646	N4MM	1201	WD8MGO	993	N6FX	820	WA2FKF	640	I1POR
1583	I8YRK	1190	YU7AW	991	W2NC	809	K9LJG	611	JH5FOO
1551	I4ZSQ	1189	HP1JC	990	KC4OV	809	W8ILC	606	W8RSW
1551	I8KDB	1170	WA4QMO	981	W6YMB	800	AC2J	603	I0SGF
1523	YU7BCD	1134	N4NO	952	WA4OIB	768	W6LQC	602	W0JULU
1462	PA0SNG	1108	W4BOY	949	G4CHP				

C.W.

1901	W8RSW	1495	K6XP	1315	K5UR	1077	K6ZDL	750	KL7AF
1850	W2NC	1416	N2AC	1312	W9FD	1068	LZ1XL	731	AA4A/8
1737	W8KPL	1413	W4BOY	1258	VE1AW	1056	N6FX	690	DJ1YH
1639	WA2HZR	1412	W9DWQ	1225	DJ7CX	965	JE1JKL	689	KA3A
1599	ON4QX	1406	G2GM	1136	YU7AW	930	N4YB	682	JA5MG
1580	K6JG	1344	W3ARK	1127	W1WLW	861	K8LJG	618	G4FAM
1562	N6JV	1330	VK4SS	1122	I6SF	853	DJ3LR	616	W8ILC
1558	K2VV	1324	N4NO	1104	YU3NP	827	I1YRL	605	VE2FOU
1524	YU7BCD	1316	N4MM	1102	VE7CNE	804	KF2O	600	OE1KJW
1514	DL1QT								

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every spring and goes back up every fall when the snow flies. Current plans call to remove the beverage antenna, put up a tower, and see how a bobtailed curtain works on 80.

Bjorn works both c.w. and s.s.b., though at this time he prefers 40 or 80 c.w. Often with the antenna orientation it is possible to raise pile-ups in the states without too much effort. In retrospect, just doing the paperwork for the award was one of the most difficult tasks, taking a week of culling cards and getting things organized. Waiting for a Zone 27 and a DU card the last year kept things on edge. Three more DU's were worked on 80 to finally give the last needed card. Then the initial DU 80 meter contact showed right after the bundle was submitted.

Congratulations to another who has mastered what is undoubtedly the hardest award these days for an amateur to corner.

5 Band WAZ #34

Giambattista Rizzi, IØRIZ, was but the 34th amateur to attain the 5 Band WAZ Award, he believing that this is the hardest award to attain in amateur radio.

A radio amateur since 1962, Gianni is a civil engineer, holding a Masters degree from the Polytechnic Institute in Naples. He works for an Italian construction company doing an international business, and



Gianni Rizzi, IØRIZ, the winner of 5 Band WAZ #34. A mechanical engineer living in Rome, he is often heard in the DX tests.

currently IØRIZ is the manager in charge of a large project in Libya. He lives in Rome and his XYL is named Marisa.

Among other awards Gianni holds the 5BDXCC, DXCC, WAZ, WPX Honor Roll, CW DX Honor Roll, WAS, and a few others. He operates mostly s.s.b. The station has two complete setups. One is a Collins Line with a 30S1 linear. The other is a Drake TR7/R7 with a Henry amplifier. He lives in a condominium and has a tower on the roof: 3 elements on 10, 4 elements on 20, 8 elements on 15, and 2 on 40. On 80 it is the basic dipole. Gianni holds the top Italian license.

Gianni travels a lot, the above coming from a stop in Milan. He belongs to the ARI in Italy, does not check in with the DX Nets, and his awards come from individual effort. He does work in the DX contests, however.

Zones 26 and 31 on 80 meters were the hard ones. Most amateurs will understand Zone 26, but Zone 31 has the Hawaiian Islands and Central Pacific. All this just proves again that DX is a relative thing. Congratulations to another certified DXer!

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4U37UN to W2MZV
K8PYD/4X to K8PYD
VP980 to N1AFC
A920Q to Box 25611, Bahrain
5T5T0 to Jacques Mainguy,
F6BUM, Brouquet, Buzet sur
Baize, F-47160, Damazan,
France

Volunteers! Erik Dean, NI6G, 920 Rockefeller #9A, Sunnyvale, California 94087, is a willing and experienced QSL Manager who is looking for a few more good DXers who need help.

Mary MacKenzie, KA7FEF, 6125 SE 86th Avenue, Portland, Oregon 97266, says she has only been licensed a few years but is steadily upgrading and believes that DX is where the good times are. Mary is also volunteering for QSL Manager duties for some DX stations.

73, Cass, WA6AUD

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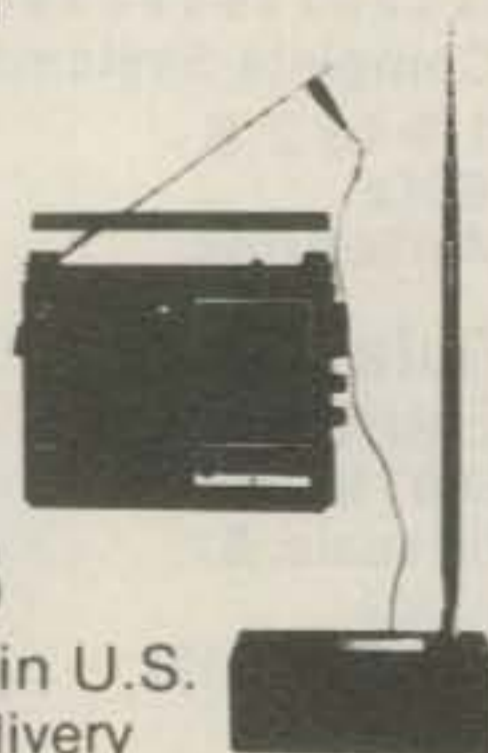
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CIRCLE 139 ON READER SERVICE CARD

Here's a handy gadget to keep around the shack. It's great for Field Day, contest stations, and for utilizing your keyer with a number of rigs.

A Band-Aid For Keyer Polarity

BY ED SOLOV*, K2SE

When I built my keyer, it was intended to be used with my one and only rig—a Heathkit HW-101 with a negative keying line. As such, its output is in the form of a PNP transistor "open collector" as shown in fig. 1.

When Field Day came along, however, I wanted to use it with other rigs, some of which (such as the Kenwood TS-520) have positive keying lines. One solution would have been to rig up a relay output which would be insensitive to polarity. However, there was an easier, cheaper, and quieter way. Into an old Band-Aid box (ugly, but cheap and functional) I built the circuit of fig. 2.

This circuit uses a flashlight battery as a dummy keying line voltage for the keyer. When the keyer output transistor turns on, the battery provides base current to the 2N2222A, which turns it on. If this is connected to a transmitter with a positive keying line, it will provide the proper polarity key closure signal to drive

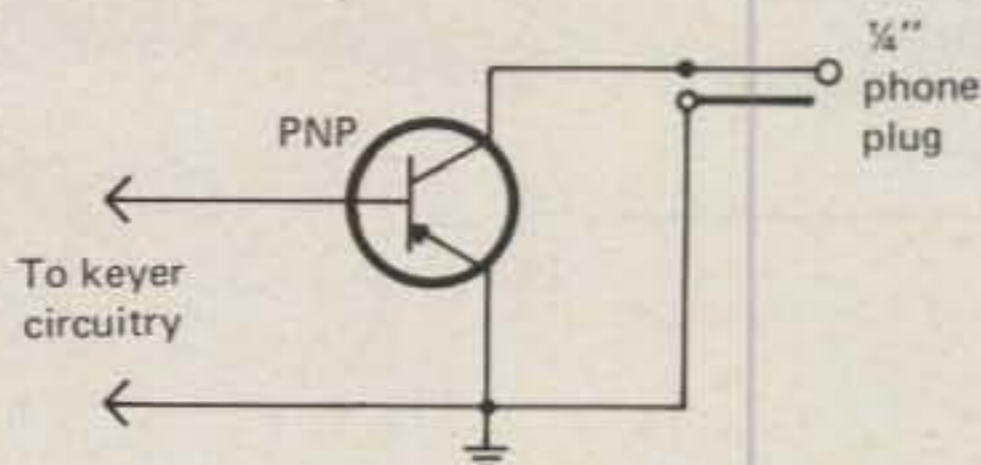


Fig. 1—The existing keyer output circuit for a negative keying line.

the rig. Notice that the keyer ground and the rig ground are tied together with this circuit.

If you have a problem that is the reverse of mine (the keyer is for a positive line and you want to use it on a transmitter with a negative line), just reverse the battery polarity and use a silicon PNP transistor (such as a 2N3906) in place of the 2N2222A. Make sure that the transistor you use has a voltage rating at least equal to the open-circuit voltage on the keying line.

Parts for this gadget, bought new, should cost no more than \$2.00, including all hardware except the Band-Aid box.

*247 Andover Drive, Wayne, NJ 07470

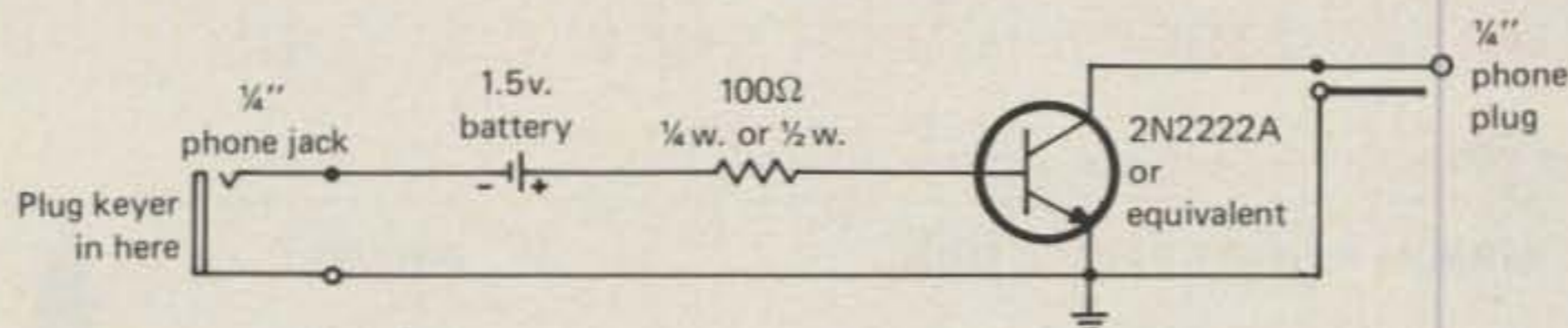
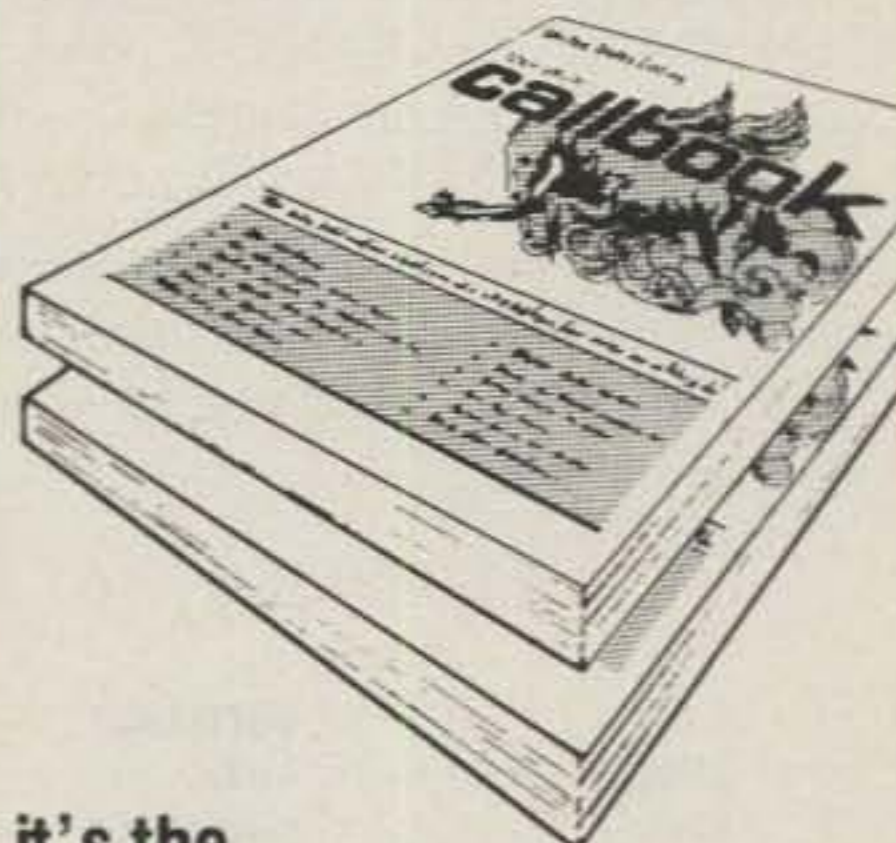


Fig. 2—A polarity reversing circuit.

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THE SCIENCE OF PREDICTING RADIO CONDITIONS

The Royal Observatory of Belgium reports a monthly mean sunspot number of 94.3 centered on October 1982. This results in a 12-month smoothed sunspot number of 124 centered on April 1982. This represents a drop of five numbers over a one month period, as the present cycle continues to decline. A smoothed sunspot number of approximately 100 is now forecast for February 1983.

February Conditions

Beginning about the middle of February and continuing through March and early April, typical *equinoctial* propagation conditions can be expected on the h.f. amateur bands. This usually means a noticeable improvement in conditions between the northern and southern hemispheres—for example, between the United States and South America, Africa, Australasia, Antarctica, and parts of Asia. Equinoctial propagation occurs during the spring and fall months, when the sun is most directly overhead at the equator, producing similar ionospheric characteristics over large areas of the world. It tends to maximize during sunrise and sunset periods and over both short and long path openings.

During the *daylight* hours, optimum DX propagation conditions are expected on 15 meters. The band is forecast to open to all areas of the world sometime during this period, often with exceptionally strong signal levels and little fading or noise. Conditions on 10 meters should run a close second, with openings forecast to most areas of the world during the *daylight* hours. The fewer number of openings expected on this band from North America to Europe and the Far East should be balanced by improved conditions on openings into the southern hemisphere. Excellent worldwide DX openings to most areas of the world are also forecast for 20 meters during the *daylight* hours. Conditions are expected to optimize for an hour or two after *sunrise* and again during the *late afternoon*. With increasing hours of daylight during February, expect the 10, 15, and 20 meter bands to remain open for an hour or so longer into the early evening than during the winter months.

Although the solar cycle is declining, be sure to check the 6 meter band for

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for February 1983

Propagation Index	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 6, 25-26	A	A	B	C
High Normal: 1-2, 5, 7, 22, 24, 27-28	A	B	C	C-D
Low Normal: 3, 8-9, 15-18, 20-21, 23	A-B	B-C	C-D	D-E
Below Normal: 4, 10, 13-14, 19	B-C	C-D	D-E	E
Disturbed: 11-12	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 (B) on Feb. 1st-2nd, good-to-fair (B-C) on the 3rd, fair-to-poor (C-D) on the 4th, good again (B) on the 5th, etc.

For updated information, subscribe to bi-weekly MAIL-A-PROP, David D. Meisel, Editor, 54 Westview Crescent, Geneseo, NY 14454.

possible DX openings, particularly when conditions are High or Above Normal. Openings are expected to be less numerous than in previous years of higher solar activity, but some still may be possible during the hours of *daylight*. The best bet is for openings towards Central and South America, but openings to other areas of the world may also occur. The most probable times for 6 meter openings are shown in the DX Propagation Charts followed by **.

During the *early evening hours* and to as late as *midnight*, five bands should be available for DX openings: 15, 20, 40, 80, and 160 meters! Fifteen meters should hold up for openings towards Central and South America, the Pacific area, Far East, and Asia. Openings to many areas of the world should be possible on 20 meters during this period, but with signals strongest from southerly and westerly directions. Good DX conditions are also forecast for both 40 and 80 meters for openings towards the east and the south. Openings in the same direction, but with higher noise levels and weaker signals,

should also be possible on 160 meters.

Between *midnight* and the *sunrise* period it should be a toss-up between 20 and 40 meters for DX honors. Both bands should open to many areas of the world during this period, with conditions favoring openings towards the south and the west. Expect similar conditions on 80 meters, but with weaker signals and higher noise levels. Be sure also to check 160 meters for some unusual DX openings towards the south and the west during this period. Conditions on all bands (20, 40, 80, and 160 meters) are expected to peak at local sunrise.

V.H.F. Ionospheric Openings

As mentioned previously, be sure to check for 6 meter DX openings during the *daylight* hours. Some short-skip openings over distances of approximately 1200 to 2300 miles may also occur. Best times for such openings are during *afternoon* hours.

Trans-equatorial (TE) scatter propagation tends to increase during the equinoctial period, and some 6 meter openings may be possible between 7 and 10 p.m. local time. The best bet for such openings is between the southern tier states and South America for paths approximately at right angles to the equator. An occasional TE opening may also be possible on 2 meters. Unlike F2-layer or sporadic-E openings on 6 meters, TE openings are characterized by very weak signals with considerable flutter fading.

Auroral displays tend to occur somewhat more frequently during the equinoctial period. Unusual short-skip conditions often occur on the v.h.f. bands during such displays. Openings, generally over distances of several hundred and up to approximately 1300 miles, may take place by means of reflection from the ionized region produced by an auroral display. Auroral-type openings are characterized by flutter fading and multi-path echoes. To take maximum advantage of such openings, rotatable antennas should be beamed towards the auroral display, if it is visible.

Large areas of sporadic-E ionization also accompany most auroral displays. Reflection of v.h.f. signals from these regions can make possible short-skip openings between distances of approximately 750 and 1300 miles. Signals reflected in this manner are usually strong and stable as compared to those reflected directly from an auroral display.

Auroral activity often occurs during periods of radio storminess on the h.f.

11307 Clara St., Silver Spring, MD 20902

HOW TO USE THE DX PROPAGATION CHARTS

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

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

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

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

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

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

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

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

**February 15 - April 15, 1983
Time Zone: EST (24-Hour Time)
EASTERN USA TO:**

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Central Europe & North Africa	08-09 (1) 09-10 (2) 10-12 (3) 12-13 (4) 13-14 (2) 14-15 (1) 09-11 (1)**	06-07 (1) 07-08 (2) 08-11 (3) 11-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	00-03 (1) 03-06 (2) 06-09 (3) 09-11 (2) 11-13 (3) 13-18 (4) 18-22 (3) 22-00 (2)	17-18 (1) 18-19 (2) 19-22 (3) 22-01 (4) 01-02 (3) 02-03 (2) 03-04 (1) 19-21 (1)* 21-00 (2)* 00-02 (1)*
Northern Europe & USSR	08-09 (1) 09-10 (2) 10-11 (3) 11-12 (2) 12-13 (1)	07-08 (1) 08-09 (2) 09-12 (3) 12-13 (2) 13-14 (1)	00-02 (3) 02-03 (2) 03-05 (1) 05-07 (2) 07-09 (3) 09-14 (2) 14-18 (3) 18-21 (2) 21-00 (1)	17-19 (1) 19-22 (2) 22-01 (3) 01-02 (2) 02-03 (1) 20-01 (1)*
Eastern Mediterranean & Middle East	08-09 (1) 09-11 (2) 11-12 (3) 12-13 (1)	07-08 (1) 08-09 (2) 09-10 (3) 10-13 (4) 13-14 (2) 14-15 (1)	04-06 (1) 06-08 (2) 08-12 (1) 12-14 (2) 14-15 (3) 15-17 (4) 17-20 (3) 20-22 (2) 22-02 (3) 02-04 (2)	18-20 (1) 20-23 (2) 23-00 (1) 20-23 (1)*
Western Africa	07-10 (1) 10-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-18 (2) 18-19 (1) 08-12 (1)**	06-09 (1) 09-11 (2) 11-14 (3) 14-17 (4) 17-18 (3) 18-19 (2) 19-21 (1)	02-06 (2) 06-13 (1) 13-15 (2) 15-17 (3) 17-00 (4) 00-02 (3) 22-02 (1)*	18-20 (1) 20-22 (2) 22-00 (3) 00-02 (2) 02-03 (1) 22-02 (1)*
Southern Africa	07-08 (1) 08-10 (2) 10-11 (3) 11-13 (4) 13-14 (2) 14-15 (1) 11-13 (1)**	06-10 (1) 10-12 (2) 12-14 (3) 14-17 (4) 17-18 (2) 18-19 (1)	05-07 (2) 07-14 (1) 14-15 (2) 15-17 (3) 17-20 (4) 20-21 (2) 21-23 (1) 23-02 (3) 02-03 (2) 03-05 (1)	18-20 (1) 20-23 (2) 23-00 (1) 21-23 (1)*
Eastern & Central Africa	09-11 (1) 11-13 (2) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1) 09-11 (1)**	07-09 (1) 09-11 (2) 11-13 (3) 13-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	12-14 (1) 14-16 (2) 16-18 (3) 18-23 (4) 23-02 (3) 02-03 (2) 03-05 (1)	19-23 (1) 23-01 (2) 01-02 (1) 23-01 (1)*

**Time Zones: CST & MST (24-Hour Time)
CENTRAL USA TO:**

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Central Europe & North Africa	08-10 (1) 10-12 (2) 12-13 (1)	07-08 (1) 08-09 (2) 09-11 (3) 11-13 (4) 13-14 (3) 14-15 (2) 15-16 (1)	00-06 (1) 06-09 (2) 09-11 (1) 11-13 (2) 13-15 (3) 15-17 (4) 17-20 (3) 20-00 (2)	17-19 (1) 19-22 (2) 22-00 (3) 00-01 (2) 01-02 (1) 20-22 (1)* 22-00 (2)* 00-01 (1)*
Northern Europe & USSR	08-09 (1) 09-11 (2) 11-12 (1)	07-08 (1) 08-09 (2) 09-12 (3) 12-13 (2) 13-14 (1)	07-10 (2) 10-13 (1) 13-15 (2) 15-18 (3) 18-20 (2) 20-22 (1) 22-02 (2) 02-07 (1)	19-22 (1) 22-00 (2) 00-02 (1) 22-01 (1)*
Eastern Mediterranean & Middle East	09-10 (1) 10-11 (2) 11-12 (1)	07-08 (1) 08-09 (2) 09-12 (3) 12-13 (2) 13-14 (1)	05-06 (1) 06-08 (2) 08-12 (1) 12-14 (2) 14-18 (3) 18-20 (2) 20-23 (3) 23-01 (2) 01-02 (1)	19-22 (1) 20-22 (1)*
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**Time Zone: PST (24-Hour Time)
WESTERN USA TO:**

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western Europe & North Africa	08-09 (1) 09-11 (2) 11-12 (1)	07-08 (1) 08-10 (2) 10-12 (3) 12-13 (2) 13-14 (1) 19-21 (1)	00-06 (1) 06-09 (2) 09-11 (1) 11-14 (2) 14-16 (3) 16-19 (2) 19-22 (1) 22-00 (2)	19-20 (1) 20-22 (2) 22-00 (1) 20-22 (1)*
Central & Northern Europe & USSR	08-09 (1) 09-10 (2) 10-11 (1)	07-08 (1) 08-09 (2) 09-11 (3) 11-12 (1) 19-21 (1)	05-06 (1) 06-09 (2) 09-12 (1) 12-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	19-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*

Central & South Asia	08-11 (1) 19-21 (1)	07-08 (1) 08-09 (2) 09-11 (3) 11-12 (2) 12-13 (1) 19-20 (1) 20-21 (2) 21-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 17-19 (1) 19-21 (3) 21-22 (2) 22-00 (1)	19-22 (1) 04-06 (1)
Southeast Asia	10-13 (1) 18-20 (1)	07-08 (1) 08-10 (2) 10-12 (1) 12-14 (2) 14-18 (1) 18-21 (2) 21-22 (1)	05-07 (1) 07-09 (2) 09-11 (1) 14-17 (1) 19-20 (1) 20-23 (2) 23-01 (1)	05-07 (1)
Far East	09-11 (1) 18-20 (1)	07-08 (1) 08-10 (2) 10-12 (1) 15-16 (1) 16-17 (2) 17-19 (3) 19-21 (2) 21-22 (1)	06-07 (1) 07-09 (3) 09-11 (2) 11-13 (1) 17-19 (1) 19-22 (2) 22-00 (3) 00-02 (2) 02-03 (1)	05-06 (1)
South Pacific & New Zealand	08-12 (1) 12-14 (2) 14-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1) 16-18 (1)**	07-08 (1) 08-10 (2) 10-13 (1) 13-16 (2) 16-19 (3) 19-21 (4) 21-22 (3) 22-23 (2) 23-00 (1)	11-19 (1) 19-21 (2) 21-23 (3) 23-03 (4) 03-05 (3) 07-08 (1) 01-03 (1)* 03-06 (2)* 06-07 (1)*	00-01 (1) 01-02 (2) 02-05 (3) 05-07 (2) 07-08 (1) 01-03 (1)* 03-06 (2)* 06-07 (1)*
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Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	07-08 (1) 08-10 (3) 10-12 (2) 12-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-19 (1) 09-11 (1)** 14-16 (1)**	06-07 (1) 07-10 (2) 10-13 (1) 13-14 (2) 14-16 (3) 16-20 (4) 20-22 (3) 22-00 (2) 00-01 (1)	13-15 (1) 15-16 (2) 16-18 (3) 18-01 (4) 01-03 (3) 03-05 (2) 05-07 (3) 07-08 (2) 08-09 (1)	19-20 (1) 20-00 (2) 00-02 (3) 02-03 (2) 03-04 (1) 21-03 (1)*
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Australasia	11-13 (1) 13-14 (2) 14-16 (3) 16-19 (4) 19-20 (3) 20-21 (1) 16-18 (1)**	06-07 (1) 07-09 (3) 09-11 (2) 11-13 (1) 13-15 (2) 15-17 (1) 17-18 (2) 18-21 (4) 21-22 (2) 22-23 (1)	12-20 (1) 20-22 (2) 22-00 (3) 00-04 (4) 04-06 (3) 06-08 (4) 08-10 (3) 10-12 (2)	00-01 (1) 01-02 (2) 02-06 (3) 06-07 (2) 07-08 (1) 02-04 (1)* 04-06 (2)* 06-07 (1)*
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Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	07-08 (1) 08-09 (3) 09-11 (2) 11-14 (3) 14-17 (4) 17-18 (2) 18-19 (1) 09-11 (1)**	06-07 (1) 07-09 (2) 09-12 (1) 12-14 (2) 14-15 (3) 15-20 (4) 20-23 (3) 23-00 (2) 00-01 (1)	12-14 (1) 14-16 (2) 16-18 (3) 18-01 (4) 01-02 (3) 02-06 (2) 06-08 (1)	19-21 (1) 21-23 (2) 23-01 (3) 01-02 (2) 02-03 (1) 22-02 (1)*
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*Indicates best times to listen for 80 Meter openings. Openings on 160 Meters are also likely to occur during those times when 80 Meter openings are shown with a Propagation Index of (2), or higher.

**Indicates best times to listen for F-2 layer openings on 6 Meters.

bands. Check the Last Minute Forecast for those days expected to be Below Normal or Disturbed during February. These are the days on which v.h.f. auroral-type openings are most likely to occur.

This month's Propagation Charts contain band-opening predictions for major DX paths for the period February 15 through April 15, 1983. A short-skip propagation forecast for February appeared in last month's column.

Shortwave Propagation Handbook

The revised 2nd edition of the popular *Shortwave Propagation Handbook*, by George Jacobs, W3ASK, and Theodore J. Cohen, N4XX, containing up-to-date sun-

spot and solar data, additional prediction charts, and an index, is now available. The book is a definitive work on the fascinating subject of shortwave propagation. It is written in simple, understandable language and is intended to be *read and used* by radio amateurs, shortwave listeners, and all others who make use of the shortwave radio spectrum. The book stresses well-tested do-it-yourself forecasting, and literally contains propagation "road maps" to world-wide shortwave propagation conditions, which eliminates much of the mystery and complexity usually encountered in making such determinations. Now available from CQ's Book Shop. 73, George, W3ASK



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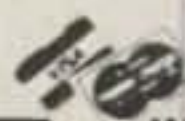
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CQ Presents Exclusive Interview with Under Secretary of State Dr. William Schneider, K2TT

Elsewhere in this issue readers will find a penetrating interview with Dr. William Schneider, K2TT, recently named Under Secretary of State for Security Assistance, Science and Technology. Among his many duties, Dr. Schneider directs the activities of the Office of International Communications Policy. It is this office that is responsible for our country's representation in the International Telecommunications Union (ITU) and for the resolution of telecommunication issues affecting the U.S. and other nations. To see how the Amateur and Amateur-Satellite services are faring today in the international telecommunications community, don't miss CQ's exclusive interview with Dr. William Schneider, K2TT.

FCC Releases 10 MHz Band

On 28 October 1982, the Commission acted to release almost all of the new amateur 10 MHz band for use by holders of General, Advanced, and Extra Class licenses. Under the ruling, the two segments opened were 10.100-10.109 MHz and 10.115-10.150 MHz. The segment 10.109-10.115 MHz is still reserved for use by a government radio service.

Amateurs may use up to 250 watts input on the new band, with emissions restricted to A1, F1, and F2J. That is, you may use c.w. and RTTY; however, no voice communications are permitted.

U.S. operators using the new band are warned that the FCC ruling only provides a temporary, *Secondary* allocation to our service. That is, because the band is allocated to the Fixed service on a *Primary* basis, we may only operate on a non-interference basis. Further, it is vitally important that we not enter the 10.109-10.115 MHz segment lest the government operators using that segment petition the FCC to void our *Secondary* allocation.

Once all of the Fixed service operations in the 10 MHz band have been reaccommodated elsewhere in the spectrum, and once the WARC Treaty is ratified by the Senate (it has not been ratified as this

is written), the 10.100-10.150 MHz band will be allocated to the Amateur service on a *Primary* basis.

FCC Takes Action on Many Items Related to Amateur Service

During October and November 1982, the Commission took action on a number of matters pertaining to the Amateur service. Below is a summary of some of the actions taken.

Notice of Proposed Rulemaking (Docket number unknown at this writing)

In late October, the Commissioners adopted an NPRM in the matter of the process to be used for Novice examinations. As discussed in an earlier column, the proposed process would permit volunteer examiners to write and administer both the code and written examinations. The latter would be based on general subject areas outlined in a syllabus to be provided by the Commission. Following the successful passage of the code and written exams, the examiner would then forward the applicant's Form 610 to Gettysburg, PA, for processing.

Comment deadlines for this item were not available at this writing.

Notice of Proposed Rulemaking (Docket number unknown at this writing)

The Commission approved the release of an inquiry (NPRM) into whether record keeping (logging) should be made optional for amateurs (it would then be necessary to maintain only a record of some technical data on certain types of operations). The Commission believes that logs have not been an important investigation tool, and accordingly, that they should no longer be required.

Comment deadlines for this item were not available at this writing.

Report and Order (Docket No. 81-823): Beacon Operation in the Amateur Radio Service

In its NPRM, the Commission had proposed to classify beacon operation as a form of amateur operation defined in the Rules and to permit automatic control of amateur stations in beacon operation. It was also proposed to limit operation to the amateur bands above 28 MHz and to authorize the use of only A0, A1, F0, and F1 emissions below 450 MHz. A transmitter power input limitation of 100 watts

was also proposed, with identification to be made once each minute during operation.

The Report and Order which resulted from the Commission's inquiry virtually adopted all of these proposals. Of specific interest to our readers may be the bands available for automatically-controlled beacon operations: 28.20-28.30 MHz, 50.06-50.08 MHz, 144.05-144.06 MHz, 220.05-220.06 MHz, 432.07-432.08 MHz. There are no frequency restrictions on beacons being operated under direct control with an operator present. For other details, readers are referred to the Report and Order (Reference FCC 82-455).

Notice of Proposed Rule Making (Docket 82-624): Definition and Measurement of Transmitting Power in the Amateur Radio Service.

The Commission initiated this proceeding because the present rules governing maximum transmitting power in the amateur service are considered archaic and unsuitable. Consideration is therefore being given to a variety of other methods for controlling transmitter power. For example, the Commission is proposing to define and measure amateur transmitter power in terms of output (and, specifically, in terms of peak envelope power output). Comments are due on or before 1 February 1983 with reply comments due on or before 1 March 1983. (Reference: FCC 82-410)

Order: Amendment of Part 97 of the Commission's Rules to provide for full Morse code examination credit for commercial radiotelegraph operators applying for amateur radio operator licenses.

The Commission amended Section 97.25(c) to give an applicant for an amateur radio operator license credit for any amateur telegraphy element if: (1) the applicant holds a commercial radiotelegraph operator license or permit, or (2) the applicant has held such a license within five years of the FCC's receipt of that person's application for an amateur operator license. (Reference: FCC 82-454)

Reports of R.F.I. Remain at High Level

Jeffrey Young, Chief, Enforcement Division, FOB, FCC, reports that during the last quarter of FY82 (July, August, Sep-

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tember 1982), r.f.i. complaints to the Commission totaled 16,805. This is down somewhat from the 19,905 complaints received during the same period last year, but is still high enough to cause concern within the Commission.

Of the 16,805 complaints received, 13,233 involved a television receiver as the victim device. CBers are alleged to have been responsible for 9,035 of the t.v.i. cases reported, while amateurs were cited in 518 of the t.v.i. complaints. In all, complaints involving CBers totaled 10,202, while amateurs were cited 887 times.

Of particular concern to the FOB was the fact that 342 complaints were filed by amateurs who complained of amateur-to-amateur interference. This number of such complaints is the second highest reported (on a percentage basis) for any service, and to some extent represents a breakdown of our service's self-policing policy.

It is interesting to note that of the 16,805 complaints filed during the fourth quarter of FY82, 310 alleged cable TV interference (CATVI). This is one area of r.f.i. that the Commission is watching very closely.

Finally, the total number of r.f.i. complaints reported during FY82 was 75,641, down slightly from the 82,084 complaints filed in FY81. Whether the lower number represents an actual reduction in the number of r.f.i. cases experienced or only an "apparent" reduction brought about by the closing of FOB field offices (and the subsequent loss of contact with the public) is not known. There is no question, however, that the number of actual r.f.i. cases experienced by the public far exceeds those reported. As such, it would be in the best interests of both the Amateur service and the public for the Commission to set susceptibility standards for electronic home-entertainment equipment at the earliest possible date.

Judge Bans Sale of Microwaving Receiving Equipment

A Superior Court judge in Sacramento, CA, has issued a preliminary injunction against the selling of microwave receiving equipment that is in any way capable of receiving signals in the 2150-2156 MHz band. This band is used by the Multipoint Distribution service for the transmission of pay television signals.

Superior Court Judge A. Richard Backus, after 12 days of trial, issued the injunction against Gary Stilwell, KI6T, who operates The Radio Place in Sacramento and whose main retail business is in amateur radio equipment. Despite testimony by an expert witness and three amateurs, and despite two in-court on-the-air demonstrations of amateur equipment for 2300 MHz, Judge Backus ruled that the only practical use for microwave receiving antennas was to receive signals in the MDS band.

The judge did provide that amateur radio operators could purchase microwave equipment provided that they first receive approval from California Satellite Systems, the local MDS operator.

Finally, the judge put the local MDS operator on notice that he would reconsider his decision within the next 12 months by virtue of the operator's ability to scramble or otherwise encode his transmissions.

FCC Puts Teeth Into Its Forfeiture Program

In years past, the chances were good that if you ignored a forfeiture order issued by one of the many bureaus within the Commission, nothing would happen. This is no longer the case.

Now, forfeitures issued by the Field Operations Bureau under delegated authority from all bureaus but the Broadcast Bureau can be collected with the assistance of the local U.S. Attorney. Note that forfeitures can be issued both by the FOB's field offices as well as by the Bureau itself in Washington.

The new procedure for collecting forfeitures was recently demonstrated in the so-called "Lala" case. Here, U.S. marshals seized a vehicle belonging to a man named Lala who had refused to pay a fine imposed by the FCC. Not only did Mr. Lala have to pay his fine (plus accumulated interest) before regaining use of his vehicle, but he also had to pay towing and storage charges for the vehicle while it was in possession of the U.S. government.

In commenting on the Lala case, Richard Smith, Chief, FOB, stated that "while the Commission is deregulating in many areas, it will require adherence to the laws that remain on the books!"

Amateur's License Revoked

FCC Administrative Law Judge Joseph P. Gonzalez has revoked the license for Amateur service station N6BHU licensed to David Hildebrand, Hollywood, CA. Gonzalez also suspended Hildebrand's operator's license.

The case against Hildebrand was begun in March 1981 after the Private Radio Bureau issued an order directing Hildebrand to show cause why his licenses should not be revoked and suspended for violation of FCC rules prohibiting transmission of communications containing obscene, indecent, or profane language.

Although Hildebrand admitted to engaging in the prohibited communications, he argued that the Commission did not show that the words used during his transmissions were patently offensive to listeners in the Los Angeles area. However, Judge Gonzalez found the language used by Hildebrand to be obscene and offensive, noting that a large audience could have been exposed to these transmissions, including individuals under 17 years of age.

The decision was to become effective in December 1982.

Long-Haul Packet Radio Text a Success

According to *AMRAD Newsletter*, journal of the Amateur Radio Research and Development Corporation, a successful long-haul packet radio exchange took place on 16 October 1982 between Maryland and Texas. The operators involved were Bob Diersing, N5AHD, in Corpus Christi, and Tom Clark, W3IWI, near Washington, DC. The exchange, which lasted 15 minutes, took place on the 10 meter band at 28,300 kHz. Both stations were running FSK at a 1200-baud rate and were using the HDLC protocol which is the currently accepted amateur radio standard.

The long-haul tests were specifically designed to investigate the suitability of existing hardware and protocols under weak-signal conditions and under conditions where co-channel interference was present. This work was done in anticipation of the AMSAT (Amateur Satellite Corporation) Phase III B satellite launch scheduled for February 1983. A secondary consideration was the planning of future satellite missions, including the planning of a dedicated packet radio mission within the next few years.

The 10 meter packet radio demonstration took place one week after AMSAT held a landmark meeting to establish and coordinate common packet radio protocols. This meeting, held in the Washington, DC area, was attended by representatives of packet radio groups from New Jersey, St. Louis, San Francisco, Tucson, and Washington, DC. The meeting succeeded in reconciling minor differences in protocols that had evolved during the various R&D activities, and set the stage for the reliable interconnection of local packet-radio networks on a global basis.

For more information on the activities of *AMRAD*, contact Mr. Paul Rinaldo, W4RI, President, *AMRAD*, 1524 Springvale Avenue, McLean, VA 22101. *AMSAT* may be contacted at Box 27, Washington, DC 20044.

Commission Orders Cable Television Operator to Vacate Channel F

In late 1982, William H. Grigsby, Engineer-in-Charge of the FCC's San Diego Field Office, issued a Cease Operations Order to Times Mirror Cable Television serving the city of Escondido, CA. The order directed Times Mirror Cable Television to cease its use of Channel F as a result of harmful interference it was causing to the communications of the California Department of Forestry (CDF).

Mid-band Channel F has a visual carrier of 151.250 MHz, a frequency used for tactical operations in fire trucks of the CDF. As the fire season came upon south-

ern California, the trucks were required to go into various areas of the county to fight fires. It was during these operations that the CDF fire stations observed harmful interference to radio receivers in their trucks.

Because the interference was endangering the functioning of a safety service, the Commission moved quickly to identify and silence the signal source. Further, the Engineer-in-Charge warned Times Mirror to ensure that leakage radiation from its cable system complied with current FCC Rules.

U.S. Threatens to Pull Out of ITU

Late last year, a number of radical Middle-East administrations in the International Telecommunications Union (ITU) threatened to expel Israel from the ITU. The move stemmed from the attack on Lebanon and from Israel's continued refusal to be guided by several UN resolutions pertaining to territories taken in previous wars with its neighboring states. Secretary of State Shultz warned the ITU that the U.S. would end its participation in, and its funding of, any branch of the United Nations—including the General Assembly—that excluded Israel. This threat, coupled with the actions of more moderate states, killed the move to oust Israel.

Up until recent times, the ITU was one of perhaps only a few UN agencies which kept politics out of its deliberations. How-

ever, increasingly successful attempts by Third-World countries to politicize the ITU, coupled with the "one nation, one vote" policy of this agency, is causing officials in the U.S. to question our continued participation in the ITU. This and other issues are sure to crop up more and more frequently during the 1980s as the ITU embarks on a series of Special World Administrative Radio Conferences.

Telephone-to-Telephone Interference Causing Severe and Costly Problems

Complaints of telephone-to-telephone interference from those portable phones which are now so popular with consumers are causing the FCC and the public many headaches. According to Jordan Kaplan, W9QKE (writing in *Circuit Board*, a publication of the York Radio Club, Elmhurst, IL), phone bills of up to several hundred dollars are showing up for calls made on a third-party's portable phone. That is, people are using their portable telephones to make calls on phone units owned by others. Kaplan predicts that the FCC will soon ban the import and sale of portable telephone units operating on 49 MHz, with operation in the 900 MHz band now being considered as an alternative.

Radio Netherlands Broadcasts Feature on Amateur Radio

Radio Netherlands has, for some

months now, been broadcasting a show of interest to amateur operators and computer hobbyists worldwide. The program, according to AMSAT Satellite Report (journal of the Radio Amateur Satellite Corporation), features interviews on a variety of subjects with well-known personalities in the field of amateur radio. Recent guests have included George Jacobs, W3ASK, CQ's Propagation Editor, and Pat Gowen, G3IOR, AMSAT's European Regional Coordinator and one of that corporation's directors.

The feature on amateur radio and computers is hosted by Mr. Jonathan Marks, and it currently begins at 0530 UTC, Fridays. Listen on 6165 kHz or 9598 kHz for this English-language broadcast.


Electronics Firm to Launch Space Mirror

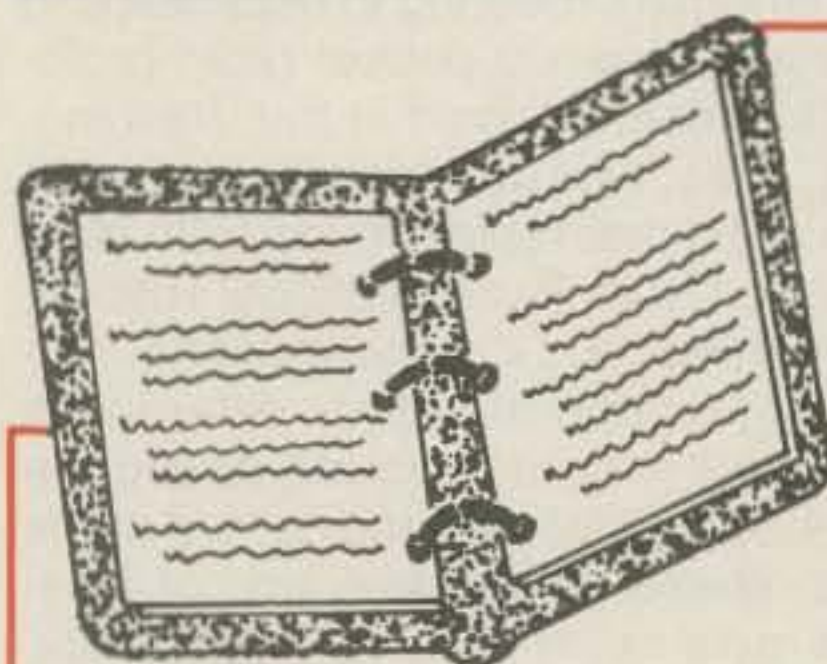
According to the *W5RI Report*, Electronics, Missiles & Communications, Inc., a White Haven, PA, firm, plans to launch something called a "space mirror" to be used for relaying communications to stations up to 1000 miles from the transmitter site. The mirror, which would be designed to hover 100 miles above the Earth, would be a 30-foot dish-shaped reflector made of ultrafine graphite wire mesh. It would be held in orbit by the electromagnetic radiation pressure produced by a ground-based 2 kw transmitter.

The subject of floating mirrors and their use in radio communications was the subject of an alleged April Fool's article published in CQ, April 1980. The question is, who is fooling whom?!—K2EEK

U.S. Creates Telecommunications Training Institute

To further the advance of telecommunications in developing countries, the U.S. Government, in cooperation with a number of major telecommunications corporations in the US, has launched the Telecommunications Training Institute. Based in Washington, DC, and using personnel from companies such as AT&T, COMSAT, GTE, Hughes, IBM, WUI, ITT, Rockwell International, and RCA, the Institute will have the capability of training up to 300 communication specialists in the development and use of advanced ground-based and satellite communication systems. Since the equipment to be used in the training programs is produced by U.S. corporations, an added bonus to be derived from the Institute is that its students will become familiar with, and gain an appreciation for, American-made communication systems.

For more information on the Telecommunications Training Institute, contact Ms. Katherine Boswell, Administrator, Telecommunications Training Institute, 1414 22nd Street NW, Washington, DC 20037, tel.: (202) 862-3857. 



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NEWS/VIEWS OF ON-THE-AIR COMPETITION

Following are a few belated announcements:

The 1.8 MHz WW C.W. Contest Trophy was inadvertently left out of the results reports. The winner of the KP4ES Memorial Award was Fernando Fernandez, EA8AK. The donor is Chip Margelli, K7JA, a long-time friend of the Piza family.

The Radio Club of Panama had a contest on November 27-28. Obviously it is out of the question to participate in that one. However, if you happened to work any HP's during that period, you might make the deadline of January 30th to send your logs to the club at P.O. Box 10745, Panama 4, Rep. of Panama.

The Matanuska ARA of Anchorage, Alaska, is holding a competition on January 29-30. If you contacted their Club station, KL7JFU, or any other KL7's, you can send your log to Kenny Greene, KL7JAI, 3719 W. 80th St., Anchorage, AK 99502.

The American Radio Club of Miami, Florida, also has a QSO competition going on February 15-16, 10-40 meters, both phone and c.w. Contact two or three club members and you qualify for their special awards. Send your QSL's and \$2.00 to: American Radio Club, P.O. Box 3576, Hialeah, FL 33013.

I only have the dates for the A5 UHF ATV Contest on February 18-19. You will have to write to *ATV Magazine*, c/o Mike Stone, WB0QCD, P.O. Box H, Lowden, Iowa 52255 if you want more information.

I continue to receive announcements past my deadline for a given issue, or with insufficient information to include in the column. Sorry, but I can only give you more coverage if you get the information to me on time and spell out what your contest is all about.

Deadline for material for the May issue is February 15th, and March 15th for the June issue. Again, send it to my home address.

73 for this time, Frank, W1WY

CQ WW 160 Meter S.S.B. Contest

2200Z Fri. to 1600Z Sun., Feb. 25-27

We have given our 160 Meter Contest considerable coverage during the past couple of months. Complete rules are in the December issue and a follow-up is in the January column. However, since we have a complete change in the QSO point format, it merits repeating for the benefit of the s.s.b. contesters.

14 Sherwood Road, Stamford, CT 06905

Calendar of Events

* Jan.	28-30	CQ WW 160 M. C.W. Contest
† Jan.	29-30	French CW Contest
* Jan.	29-30	White Rose SWL Contest
* Jan.	30-31	Classic Radio Exchange
Feb.	5-6	RSGB 7 MHz Phone Contest
Feb.	5-6	Vermont QSO Party
Feb.	5-6	New Hampshire QSO Party
Feb.	5-6	South Carolina QSO Party
Feb.	6	North American C.W. Sprint
Feb.	12-13	QCWA C.W. QSO Party
Feb.	12-13	YL-OM Phone Contest
Feb.	12-13	Dutch PACC Contest
Feb.	12-14	Two Land QSO Party
Feb.	13	North American SSB Sprint
Feb.	18-20	A5 UHF ATV QSO Party
Feb.	19-20	ARRL DX C.W. Contest
Feb.	19-20	YL ISSB Phone QSO Party
Feb.	25-27	CQ WW 160 M. S.S.B. Contest
Feb.	26	"73" RTTY Contest
Feb.	26-27	YL-OM C.W. Contest
Feb.	26-27	RSGB 7 MHz C.W. Contest
† Feb.	26-27	French Phone Contest
Mar.	5-6	ARRL DX Phone Contest
Mar.	12-13	QCWA Phone QSO Party
Mar.	12-13	YL ISSB C.W. QSO Party
Mar.	12-14	Virginia QSO Party
Mar.	19-20	Bermuda Contest
Mar.	19-20	G-QRP Activity
Mar.	26-27	CQ WW WPX S.S.B. Contest
Apr.	6-7	DX-YL to N.A.-YL C.W. Party
Apr.	13-14	DX-YL to N.A.-YL Ph. Party
Apr.	9-10	CARF Commonwealth S.S.B.
Apr.	16	Holiday-in-Dixie QSO Party

* Covered last month.

† Not official.

It is no longer necessary to include the QSO number in the Exchange. **Scoring:** Contacts with stations within own country, 2 points. Contacts with stations in other countries but the same continent, 5 points. Contacts with stations in other continents, 10 points. (KH6 and KL7 will be considered countries.) That now makes QSO's between the U.S. and Canada worth 5 points (instead of 2 as in the past). QSO's with stations in the Caribbean and Central America are also worth 5 points (instead of 10).

Overseas stations should benefit from the new format. The few stations in the Carib./C.A. areas will lose part of the big advantage they have enjoyed in the past.

The multiplier remains the same: each U.S. state, VE province, and DX country. (U.S. and Canada are not multipliers for W/K and VE/VO.)

Keep in mind that we now also have a World Trophy in the s.s.b. section: the Charlie O'Brien, W2EQS, Memorial for the World S.S.B. Champion.

It will be interesting to see how the scores will compare with those made under the old system. I also would like to receive comments about whether or not we should extend the "DX Window" to 1835 kHz for the benefit of some of the overseas countries.

Mailing deadline for last month's c.w. entries is Feb. 28th, and this month's s.s.b. entries March 31st. You can send them to: Don McClenon, N4IN, 3075 Florida Ave., Melbourne, FL 32901. They can also go to CQ, 76 N. Broadway, Hicksville, NY 11801. (Please indicate C.W. or S.S.B. on the envelope.)

RSGB 7 MHz Contest

Phone: Feb. 5-6 C.W.: Feb. 26-27
1200Z Saturday to 0900Z Sunday

Rules are practically the same as those used last year. Only single operator entries will be recognized. The following rules are for stations other than the British Isles.

Bands: Phone—7.04 to 7.10 MHz. C.W.—7.00 to 7.03 MHz. (This will require split frequency operation for the U.S. on phone. B.I. stations please note.)

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

Scoring: Stations in Europe score 5 points for each B.I. contact. Those outside Europe score 15 points.

Multiplier: One for each different British Isle country prefix worked (G2, GD4, GI6, GJ8, GM3, GU5, GW8, etc.). Maximum of 42 possible. No credit for GB prefix.

Final Score: Total QSO points times the country prefix multiplier worked.

Awards: In the c.w. contest certificates will be awarded to 1st, 2nd, and 3rd place winners in the British Isles, Europe, and non-European countries. (*What about phone?*)

Include a summary sheet showing the scoring and a list of the country prefixes worked, and the usual signed declaration that all rules and regulations have been observed.

There is also an s.w.l. section with the scoring same as above. Overseas listeners log B.I. stations only. Record the call as well as the serial number sent. The call sign of the station being worked may only repeat once in every 5 contacts logged unless it's a new multiplier.

Unmarked duplicate contacts will be penalized at 10 times the number of points claimed. Logs containing in excess of 5 unmarked duplicates will automatically be disqualified.

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Please send all reader inquiries directly.

Phone entries must be received no later than April 2nd, c.w. April 23rd. They go to: G3KDB, RSGB HF Contest Committee, P.O. Box 73, Lichfield, Staffs., WS13 6UJ England.

Vermont QSO Party

2100Z Sat. to 0700Z Sun., Feb. 5-6
1100Z to 2400Z Sun., Feb. 6

The Central Vermont ARC has gone back to its original format and not combined this year's Party with New Hampshire like it did last year.

The same station may be worked on each band and mode for QSO point credit, but the multiplier is counted once only.

Exchange: QSO no. and QTH. County for VT stations; state, province, or DX country for all others.

Scoring: Each QSO counts 1 point. VT stations multiply total QSO's by sum of states, VE provinces, and DX countries. Others multiply total VT QSO's by VT counties worked (maximum of 14).

Frequencies: S.S.B.—3930, 3960, 7230, 7260, 14280, 14320, 21360, 28570, 50110, 144.2. C.W.—3530, 3730, 7030, 7130, 14080, 21060, 21160, 28070, 144.1. Repeater contacts are not valid.

Awards: Certificates the top scoring stations in each state, province, and DX country, and Novice/Tech. Each VT station submitting a log will also receive a certificate.

The W/VT Award is available to stations working 13 of the 14 Vermont counties.

Log forms and a results sheet are available by sending a large s.a.s.e. for each item. All entries and requests go to: D. Nevin, KK1U, West Hill, Northfield, VT 05663. Mailing deadline is March 1st.

New Hampshire QSO Party

1900Z Sat. to 0700Z Sun., Feb. 5-6
1400Z Sun. to 0200Z Mon., Feb. 6-7

The Concord Brasspounders have also gone back to their original format and are now sponsoring their own QSO Party. However, holding it on the same weekend as the Vermont Party may present a problem, since there are some duplications on times and frequencies.

The same station may be worked on each band and mode for QSO points, but the multiplier is counted once only. N.H. stations may contact each other for QSO and multiplier points.

Exchange: RS(T) and QTH. County for N.H.; ARRL sections or countries for others.

Scoring: N.H. score 1 point per QSO; multiply total by (ARRL sections + countries + N.H. counties) worked.

Others score 5 points per N.H. QSO; multiply total by N.H. counties worked (maximum of 10).

Frequencies: C.W.—1810, 3555, 7055, 14055, 21055, 28130. Phone—1820, 3935, 3975, 7235, 14280, 21380, 28575.

Novice—3730, 7130, 21130, 28130. V.H.F.—50.115, 145.015. F.M. Simplex.

Appropriate awards and the Worked New Hampshire award to qualifying stations in the contest.

Include a large s.a.s.e. with your entry. Mailing deadline is March 12th to: Concord Brasspounders Inc., c/o Norman W. Littlefield, W1VBX, RFD #1 Buck Street, Box 323, Suncook, NH 03275.

South Carolina QSO Party

Starts: 1800Z Saturday, February 5
Ends: 2359Z Sunday, February 6

This one is again being sponsored by the Colleton County Contesters.

The same station may be worked on each band and each mode, S.C. mobiles each county change.

Exchange: RS(T) and QTH. County for S.C. stations, state, province, or country for DX. (Novice and Techs. sign /N or /T.)

Scoring: Two points for s.s.b. contacts, three points for c.w. The multiplier for S.C. stations is the number of states (50), VE provinces, and DX countries worked. Out-of-state stations will use S.C. counties (maximum of 46).

Frequencies: C.W.—3560, 7060, 14060, 21060, 28060. S.S.B.—3895, 7230, 14280, 21365, 28560. Novice/Tech.—3725, 7125, 21125, 28125.

Awards: Certificates to the top scorers in each S.C. county, each state, VE province, and DX country. (Novice and Techs. compete with other N/T.)

Include a summary sheet showing the scoring, your log, and a large s.a.s.e. for a copy of the results.

Mailing deadline is March 5th to: Colleton County Contesters, Att: Elliot Farrell, KE4VP, Rt. 3 Box 658, Walterboro, SC 29488.

YL-OM Contest

Phone: Feb. 12-13 C.W.: Feb. 26-27
Starts: 1800 UTC Saturday
Ends: 1800 UTC Sunday

It's the YL's working the OM's in this annual activity organized by the YLRL. All bands may be used, but cross-band or contacts with stations on Net frequencies do not count. (*I would suggest that a list of frequencies on each band be indicated.*)

Phone and c.w. are separate contests and require separate logs. The same station may be worked once only regardless of band.

Exchange: QSO no., RS(T), and ARRL section or DX country. (See QST for sections list.)

Scoring: Each QSO is worth 1 point. Multiply total by number of ARRL sections and DX countries worked.

There is also a power multiplier of 1.25 for stations running 150 watts or less on c.w., and 300 watts p.e.p. on s.s.b. Multiply your score by the above factor for your final score.

There is a penalty of 3 contacts for each duplicate contact removed from the log by the contest committee.

Awards: First place cups to both YL and OM winners in each contest; 2nd and 3rd place winners will receive certificates. The top scorers in each U.S. and VE call districts and DX countries will also receive certificates.

Logs must be mailed by March 15th and received no later than April 5th to be eligible (*with the cooperation of the Postal Department*). This year they go to the new YLRL V.P., Rose Ellen Bills, N2RE, 17 Craig Place, Pennsville, NJ 08070.

North American "Sprint"

C.W.: Feb. 6 S.S.B.: Feb. 13
Sun. 0100 to 0459 UTC (Sat. night)

The National Contest Journal now sponsors two "Sprints" a year. This is the spring edition. As the name "Sprint" implies, it's a real shorty—only 4 hours.

North Americans will be working other North Americans as well as stations in other countries, single operator only.

Exchange: Call, QSO no., name and QTH (state, VE province, or country).

Scoring: Multiply total QSO's by the sum of states, VE provinces, and other North American countries worked for your final score. (US and VE are not countries; KH6 is not a state.) There are 8 VE provinces: Maritime and VE2-VE8.

Frequencies: Three bands only: 3530-3550, 7030-7050, 14030-14050 kHz on c.w., and 3870-3910, 7210-7240, 14260-14290 kHz on s.s.b.

Awards: A trophy to the highest scoring station on each mode. Certificates to the top station in each U.S.A. call district, Canada, and other countries. The top ten scorers, the winning team, and each member of the winning team will also be rewarded.

Team competition is limited to a maximum of 10 operators as a single unit. Pre-contest registration is required for each team at least 24 hours before the start of the "Sprint." W6OAT is the coordinator.

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

Entries must be received no later than 30 days after the end of each "Sprint." The C.W. go to Rusty Epps, W6OAT, 948-H Kiely Blvd., Santa Clara, CA 95051, and the S.S.B. to Rick Niswander, K7GM, 1914 W. Cortez Cir., Chandler, AZ 85224.

QCWA QSO Party

C.W.: Feb. 12-13 S.S.B.: March 12-13
0001Z Saturday to 2000Z Sunday

The Quarter Century Wireless Association will be holding its 26th annual QSO Party this year. What originally started

out as a party has developed into a contest with new rules each year, leaving little time to renew old acquaintances and meet new members, which was the original theme of this activity.

Only members are eligible to participate. Non-members who have been licensed for 25 or more years can write to QCWA Headquarters, 1409 Copper Drive, Irving, TX 75061 for application information. C.W. and S.S.B. are separate contests and require separate logs.

This year for the first time the same member may be contacted on each band for QSO and multiplier credit.

Exchange: QSO number, your name, chapter I.D. (name or number; if no affiliation use "at large" or AL), and state or DX country.

Points: Score 1 point for each member worked on each band.

Multiplier: One point for each chapter, 1 for each state, and 2 for each DX country worked on each band.

Final Score: Total QSO points from all bands times the sum of multiplier points from each band. (Get out your calculators, fellows.)

Frequencies: C.W.—3545, 7045, 14045, 21055, 28055. S.S.B.—3915, 7245,

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Awards: The usual certificates and plaques to the overall winners in each section. This is an excellent opportunity to build up your totals for the many QCWA awards.

This year it is recommended that you keep a separate log for each band and include a summary sheet showing the scoring and other pertinent information.

Mailing deadline for all entries is March 31st, but it is recommended that you send your c.w. logs by Feb. 28th. This year they go to: Spaceport Chapter #66, Att: Donald McClenon, N4IN, 3075 Florida Ave., Melbourne, FL 32901.

Dutch "PACC" Contest

1400Z Sat. to 1700Z Sun., Feb. 12-13

This year Dutch stations are permitted to use the following special prefixes during the contest: PA4, PA5, PA7, PA8 for PA0, PA1, PA2, and PA3, respectively.

They will also confine their operation to the following band segments: C.W.—3510-3570, 7010-7040, 14025-14070, 21025-21070, 28025-28070. S.S.B.—3600-3650, 3700-3750, 7050-7100, 14150-14250, 21200-21300, 28500-28700.

The same station may be worked on each band but on one mode only for QSO and multiplier credit.

Categories: Single operator, multi-operator, and s.w.l.

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

Scoring: Each QSO with a PA/PB/PI station counts 1 point. DX stations determine their multiplier by the number of provinces worked on each band (maximum of 72).

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

Awards: Certificates to the top scoring station in each category in each country and call area of JA, LU, PY, UA9/0, VE/VO, VK, W/K, ZL, and ZS. Also 2nd and 3rd place awards if returns justify.

S.w.l.'s must log the call of the Dutch station heard and the serial number as well as the station being worked. Scoring same as above. Indicate the multiplier in a separate column in your log only the first time it is worked on each band.

Include a summary sheet showing the scoring, your name and address in block letters, and the usual signed declaration. Mailing deadline is March 31st to: PACC Contest, Att: F. Th. Oosthoek, PA0INA, Fred. Maystraat 36, 4614 EH Bergen op. Zoom, Netherlands.

Two Land QSO Party

2100Z Sat. to 0300Z Mon., Feb. 12-14

This year's party is sponsored by the Gloucester County ARC of New Jersey.

The same station may be worked on each band and mode, mobiles and portables in each county change. NJ and NY may also contact other in-state stations for QSO and multiplier credit.

Single operator stations are limited to 24 hours; multi-operators can operate the full 30 hours.

Exchange: RS(T) and QTH. County and state for Two Landers; state, province, or country for all others.

Scoring: Each s.s.b. contact is worth 2 points; c.w. contacts 3 points.

Two Landers multiply total QSO points by number of (states + provinces + countries + Two Land counties) worked. (NJ, NY, and the U.S. are multipliers.)

All others multiply total QSO points by number of Two Land counties worked per band, 10 through 160, a possible maximum of 83 per band.

Frequencies: C.W.—1805, 3560, 7060, 14060, 21060, 28060. S.S.B.—1815, 3900, 7230, 14280, 21355, 28600. Novice—3725, 7125, 21125, 28125.

Awards: Certificates to the top scorers in each Two Land county, each state, VE province, and DX country. Also top mobile, portable, Novice, and multi-operator station. An additional award to the top single operator station in Two Land.

Indicate each new multiplier in a separate column as worked. A summary sheet and the usual signed declaration are also requested. A large s.a.s.e. will get you a copy of the results.

Mailing deadline for all entries is March 20th to: Gloucester County ARC, c/o Dennis Sandole, WB2GES, 814 West Kings Highway, Mt. Ephraim, NJ 08059.

ARRL International DX Contest

C.W.: Feb. 19-20 Phone: March 5-6
0000Z Saturday to 2400Z Sunday

Rules are essentially the same as last year with one major change in the multi-operator category. I strongly recommend you study the rules in December QST for a detailed explanation, and also send a large s.a.s.e. (2 IRC's for DX) for sample log and entry forms.

Use all six bands, 1.8 through 28 MHz, excluding the new 10 MHz band. Aeronautical and maritime mobile stations may not be worked by W/VE for contest credit. Following is a brief outline.

Categories: Single operator, both single and all band; multi-operator, one transmitter and two transmitters; and multi-operator, multi-transmitters. Also QRP, all band only, 10 watts or less input.

Multi one and two transmitter stations must remain on a band at least 10 min-

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utes once a contact is made. The second transmitter in a two transmitter station is not limited to working new multipliers only as in the past. Multi-transmitter stations, no limit, but only one signal per band. (Better study the multi category thoroughly.)

Exchange: RS(T) and state or province for W/VE; RS(T) and power input for DX stations (3 digit number).

QSO points: W/VE stations earn 3 points for each DX contact; DX stations get 3 points for each W/VE contact.

Multiplier: Each DXCC country worked on each band for W/VE's. DX stations use U.S. states (48) and VE districts VE1-8, VO for their multiplier (maximum of 57 per band).

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

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

Disqualification regulations will be strictly enforced and are listed in the official rules.

Mailing deadline for all entries is April 5th and they go to: ARRL DX Contest, 225 Main Street, Newington, CT 06111.

YL ISSBers QSO Party

Phone: Feb. 19-20 C.W.: March 12-13
0001Z Saturday to 2359Z Sunday

Rules are quite lengthy, and therefore I suggest you send an s.a.s.e. to KØRDJ for details. The party is open to all, but the emphasis is on membership participation.

The same station may be contacted on each band for QSO points, but counts once only as a multiplier. You are required to take two rest periods of 6 hours each during the 48-hour contest period.

Exchange: Name, RS(T), S.S.B.ers number, U.S. state, VE province, country, and DX/WK partner. (Non-members send no number.)

Categories: Single operator, DX/WK partners, and OM/YL teams.

Points: Three points for each member contacted on own continent, 6 points if on a different continent. Non-member QSO's only 1 point.

Multiplier: Only member stations count as a multiplier. One for each of the following: both DX/WK partners worked, each OM/YL team worked, each U.S. state, VE province, and DX country worked. And two when DX/WK partners work each other, and two if your d.c. power input is 250 watts or less. (Should add up to quite a sizable score.—ed.)

Frequencies: Use the General Class portions of the U.S. bands for both phone and c.w. On 20 avoid the Net frequencies on 14313, 14332, and 14336. Check 40 and 80 meters on the hour. V.h.f. and u.h.f. may also be used, but Simplex only.

Awards: Special certificates to the overall winners in each category. Regular certificates to the winners in each U.S. state, VE province, and DX country.

Logs should be set up as outlined in the Exchange.

All entries must be received by June 1st. This year they go to: Rick and Minnie Connolly, KØRDJ and KAØALX, Star Rt. #1, Crocker, MO 65452.

"73" RTTY Contest

0000Z to 2400Z Sunday, February 26

This is the 2nd annual RTTY contest sponsored by 73 Magazine and the RTTY Journal.

The same station may be worked once on each band. Single operator stations are limited to 18 hours of operation. Multi-operators may operate the full 48 hours. Off times must be at least 30 minutes each and must be indicated in your log.

Categories: Single and multi-operator, single and all band, 10-80 meters.

Exchange: RST and state or province for the U.S. and Canada. All others RST and a consecutive QSO number.

Scoring: One point per contact, and one multiplier point for each U.S. state (48), VE province and territory, and DX country worked on each band.

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

Awards: Awards will be issued in each category to the winners in each U.S. call area, VE province, and DX country (minimum of 5 hours and 25 QSO's).

Disqualification: Taking credit for duplicate contacts in excess of 2% of the total and other discrepancies will be deemed grounds for disqualification.

Use a separate log for each band, a dupe and summary sheet, and a multiplier check sheet. Indicate equipment used. Contestants are requested to send a large s.a.s.e. for official forms and the final results.

Mailing deadline is March 26th to: RTTY World Contest, c/o The RTTY Journal, P.O. Box RY, Cardiff, CA 92007.

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CIRCLE 3 ON READER SERVICE CARD

A LOOK AT THE WORLD AROUND US

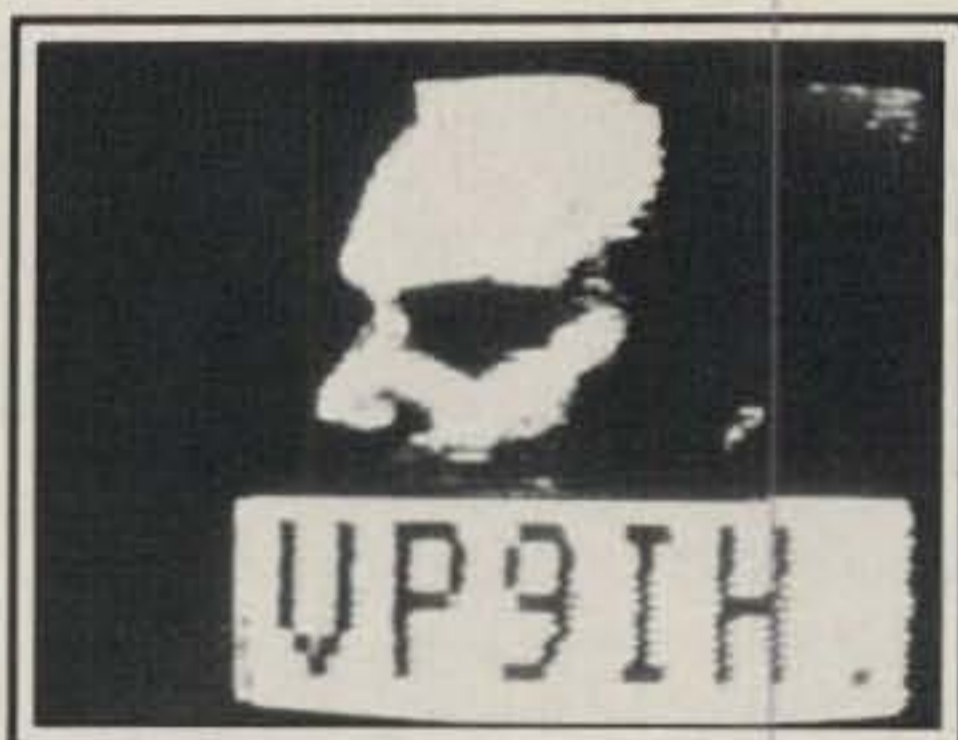
Joining SSTV Activity

As evidenced by on-the-air activity and our numerous requests for basic getting-started information, interest in Slow Scan TV is once again on the rise. Pursuing your inquiries accordingly, we will discuss some additional considerations for new or prospective SSTVers in this month's column.

The capabilities that a prospective Slow Scanner should look for in equipment basically will be determined by available funds and technical know-how. One can get started in this exciting mode for as little as \$40 or \$50 by assembling a simple oscilloscope viewing adapter as described in the 1976 ARRL Handbook (check your local library for copies). This easy-to-construct unit is used in conjunction with an oscilloscope which can be obtained at quite a reasonable price at hamfest bargain tables. The oscilloscope's CRT is exchanged for a long persistence P-7 equivalent to permit viewing SSTV pictures. The displays provided by this system are quite acceptable considering the cost, and the unit will provide many hours of enjoyable viewing. Another Slow Scanner can provide assistance in turning your photographs into cassette tapes for later transmission, and you're set to enjoy long-distance video action.

Older model SSTV gear, such as the Robot 70 monitor and 80 camera, SEEC or Venus units, etc., often appear in magazine ads and/or hamfest swap circles at very reasonable prices (\$100 to \$200, depending on model and condition). While the pictures displayed on any and all P-7 units are not as bright and long lasting as those produced by digital scan converters, overall weak signal performance and picture quality are very good. Many old-time Slow Scanners own both a digital scan converter and a P-7 unit, the latter still being respected for its high-resolution displays.

Used digital scan converters are relatively hard to find, and prices usually are not substantially less than their new counterparts. If you find a used scan converter in good working condition, it will probably not remain available very long. Any digital scan converter requires a complimenting Fast Scan camera and monitor for operation. We've found the Panasonic TR930 monitor and WV-1400 camera to be good performers at a rea-



SSTV DX continues to create plenty of excitement on the 20, 15, and 10 meter bands, as exemplified by this recent view from VP9IH on Bermuda Island.



The Cokin® special-effects filter holder fits onto the front of the camera lens via an adapter ring. Filters are then inserted into holders.

sonable price. Alternately, an optional modulated oscillator can be used to interface the scan converter with a regular home TV set for displaying SSTV pictures. Screen sizes between 4 and 9 inches are suggested if the monitor is placed within arm's length of the operating position, and screen sizes of 9 to 12 inches are suggested for across the room viewing. Close viewing of large screen-displayed SSTV pictures tends to accentuate undesirable picture element contouring.

If you presently own an Apple II or TRS-80C home computer, getting operational on SSTV is simply a matter of adding Commsoft's packages for the Apple or K6AEP's packages for the TRS-80C. We do not know of any SSTV packages for the TRS-80 model 1, 2, or 3, however.

Don't try skimping on camera flood-light illumination. Using slightly more than minimum lighting will permit stopping-down the camera's lens and will provide a greater depth of field. Calibrate your monitor by on-the-air views from others, and then set your camera to produce

comparable results without readjusting the monitor. Results will be almost ideal.

SSTV operations are a mixture of audio and video; try to avoid calling CQ via SSTV for long periods without identifying by voice. The FCC requires such audio ID's for SSTV transmissions, and it's also an optimum way to avoid unnecessary QRM. One or two frames of each SSTV picture are sufficient for getting views across without becoming boring during QSO's, and frequent breaks to ensure that other stations are copying are highly desirable. Large SSTV "roundtables" can be a real blast of enjoyment. The increased viewing-to-televising ratio lets one move in, out, and around the shack in a relaxed and unconfined manner.

Antennas for SSTV?

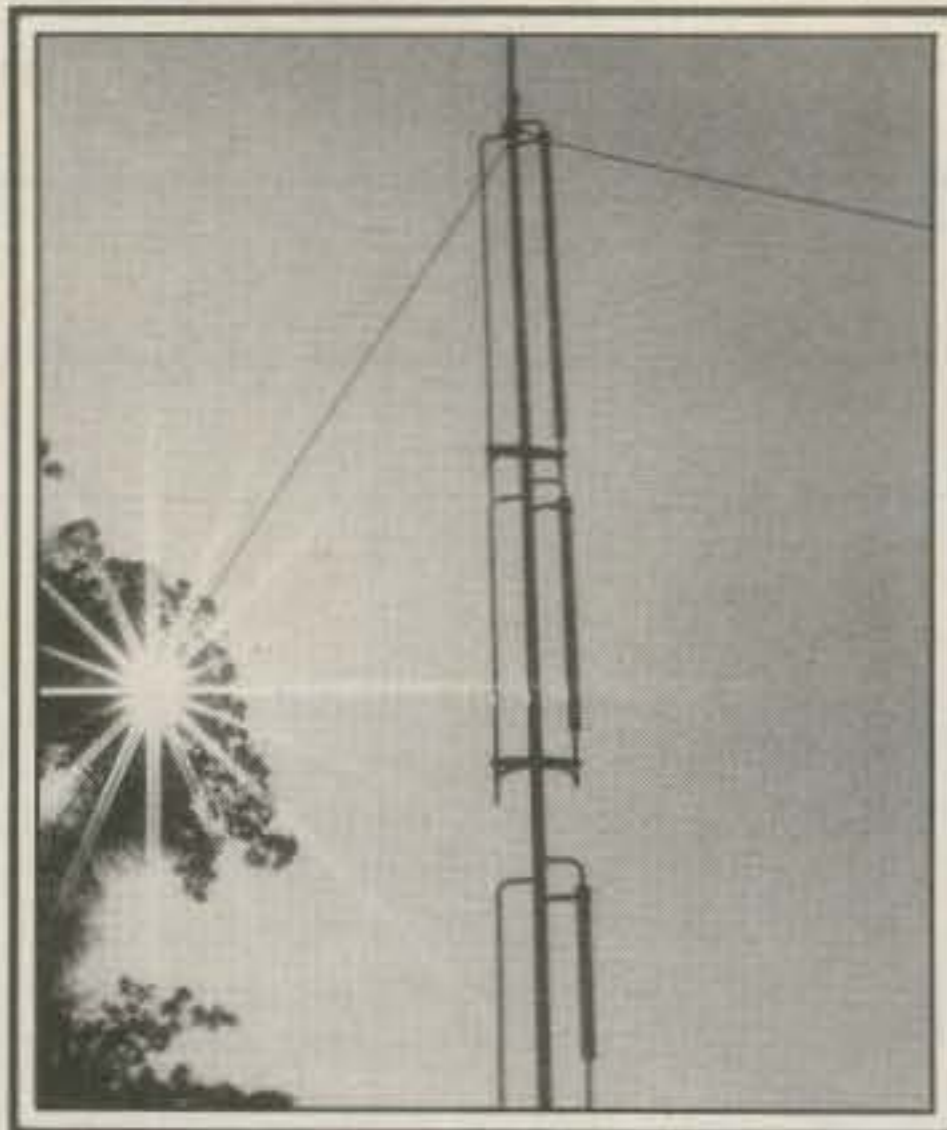
Although a paramount subject in Fast Scan TV circles, only a few Slow Scanners give consideration to this important final link in a communications setup. As we find ourselves in contact with others in various areas, however, we're continuously faced with who's "off the beam's back" and which way our signal should favor. The technique I've found quite beneficial in this situation is simply using a vertical.

A good vertical with an efficient ground system gives doggone good results in all directions and eliminates beam rotations during otherwise enjoyable (yet busy!) activities. There are enough in-shack movements with camera, switching, lighting, monitor, etc., and anything that reduces fumbles is worthwhile. We have personally used vertical antennas for a number of years, and find their operation quite acceptable and enjoyable. Give them a try. The results are admirable.

VK Satellite TV Interest Rising

Word from "down under" indicates a number of individuals are gearing up to try their hand at home reception of satellite TV signals. There are several Intelsat spacecrafts within "view" of that area, but reception is somewhat more of a challenge and/or more expensive than United States operations. Thus far, the minimum acceptable system consists of a 100 degree LNA and 16 foot dish. Since freight charges of shipping the dish from the U.S. tally almost as much as the dish itself, individuals are constructing their own units from fine screening, wire mesh on wooden/fiberglass forms, etc. Since

*Eastwood Village No. 1201 So., Rt. 11, Box 499, Birmingham, AL 35210



The KLM 40-10V antenna with sunset captured by special-effects "starburst" filter discussed in text and shown on TV camera elsewhere in this column. When used with at least $4\frac{1}{4}$ wavelength radials, this vertical is outstanding.

Australian TV systems employ "CCIR standards" (625 scanning lines, 50 Hz and 15,625 Hz sweep rates, 7 MHz video bandwidth, etc.), interfacing U.S. receivers with their "NTSC standards" (525 scanning lines, 60 Hz and 15,750 Hz sweep rates, 6 MHz video bandwidth, etc.) may call for some receiver modifications, which usually voids warranties. It is difficult to say at this time whether the ac-

tivity will be worth the effort, but the challenge and excitement are supreme!

Dayton '83

Both Fast Scan and Slow Scan TV enthusiasts are once again preparing for the yearly "big one" which will be happening during the last weekend in April. A Slow Scan get-together has been scheduled for Friday evening, and an ATV get-together is slated for Saturday evening. Ron Flynn, KB8LU, has been named ATV/SSTV program chairman, so you may contact him directly concerning room reservations, forum planning, etc. This convention usually books solid, so establishing reservations early is suggested. Check out Robot's booth for a look at their new color SSTV scan converter.

Using SSTV Capabilities

While writing this column, I found myself thinking of the enjoyment of SSTV during past years and considering its plight in the future. Are we truly using this visual asset to its fullest capability, or are we becoming a slave to our own equipment? Have we used our gear to expand worldwide friendships, or have we become self-indulged in technical innovations? In this respect, I think that SSTV might be related to computer operators. Lacking proper programming, the medium is basically useless.

If our returns are to be long lasting, we must all strive for greater friendships and applications of the mode proper. Rather than permitting video contacts to fall into "technical" and "mugshot" categories, let's use this medium for sharing appealing aspects of each other's lifestyles and interests. Let's see more on-the-air friendliness, and more of those "personalized views" we've always expected to be the mainstay of SSTV. Seek out your particular form of self-expression and use SSTV to fulfill that area. If one visual QSO is worth many audio-only QSOs, let's prove it!

These are the basics of international friendships and good will and the destiny-controlling force for which all amateur radio is known. What appealing sites does your area boast? Can you explain your professional work in a way to help others via SSTV? Consider the kind of views you would like to see from others, then while remembering video communications are "two-way streets," begin setting up your own SSTV programs accordingly. Ultimately, everyone will reap maximum benefits from these efforts.

Special-Effects Filters

If you would like to have some fun with special video effects during this holiday season, check out the line of Cokin® filters *et al* at a nearby camera store. These relatively inexpensive items screw onto the front of a photographic or TV camera lens, then various filters slide into the

holder (be sure to carry your lens for matching threads). The Cokin® starburst filter is great for viewing lights, tubes, etc.; it makes plain streetlamps look like a million dollars. Other slide-in items include close-up, multiple image, graded, and variable waves. The possibilities are endless. If you use a color camera, the full package of gelatin filters will open new horizons. You can enhance colors, compensate for discoloring effects, or "roll your own" for enhancing clouds while leaving other picture areas normal. There's room in the screw-on holder for combining several filters. An ideas book is supplied with the basic filter holder, and the whole works can also be used with several different cameras.

New Directions

During the last 13 months, this column has provided information and how-to details on one of amateur radio's many unique areas of operation and enjoyment. We've discussed getting started and operating Slow Scan and Fast Scan TV, setting up an effective station, new equipment, and technological advancements in video. If you've kept these articles on file, you now have an up-to-date "helping hand" for present and future video-related activities. It's now time to move in new directions and consider yet more areas of excitement, challenge, and downright fun. This doesn't mean we're dropping video completely; we're expanding to give you more insight into more areas so you can ultimately reap yet greater enjoyment from our boundless amateur radio world.

It has been said that a true leader cannot be confined or defined, and we feel all radio amateurs reflect this description. We talk with others using at least two modes of communication, and usually more. We assemble and operate items beyond the grasp of many people. Yet there are a number of areas or directions amateurs haven't investigated merely because understandable descriptions and bottom-line straight facts haven't been readily available. We had to almost become wizards in such already developed areas to join the fun. This new column hopefully will fill that void and provide "exactly what is it and how can I use it" information in almost every new direction of amateur radio today and tomorrow!

Areas slated for coverage in the column include, but are not limited to, OSCAR satellites, computer-related RTTY setups, RTTY listening, clandestine and shortwave listening, 10 meter f.m., casual and serious DXing, QRP, microwaves, SSTV, antennas, and all types of new equipment. This "magazine within a magazine" will be reader directed, with your requested areas of coverage determining directions. Each subject will cover 2 or 3 months discussion. Now let's hear your requests as we all move forward in new directions!

73, Dave, K4TWJ

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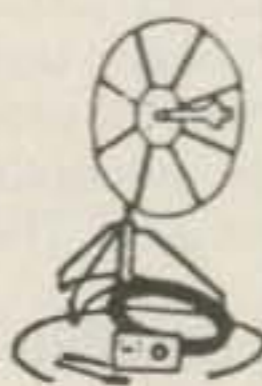


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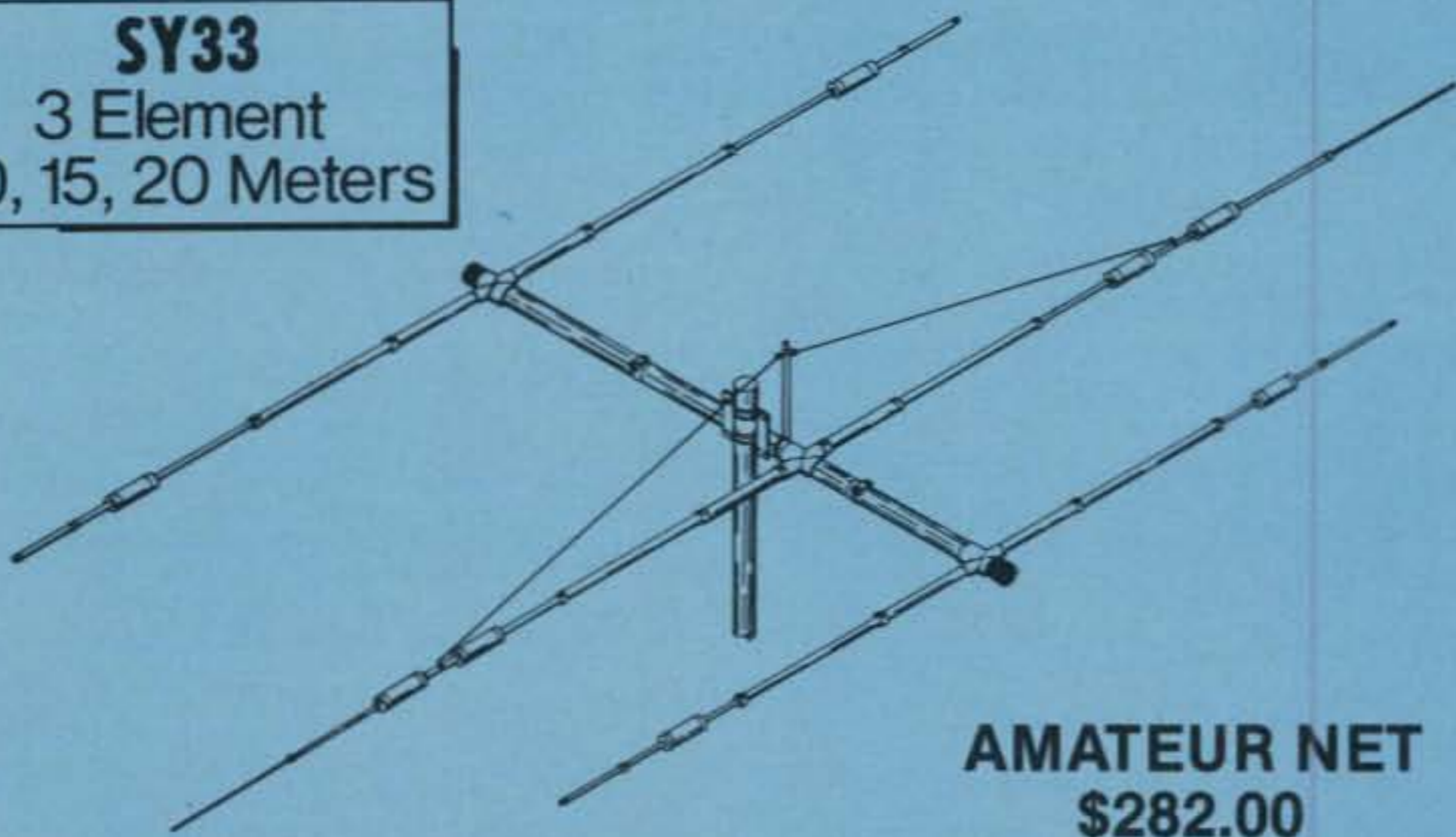
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Easily assembled, the WV-1A is supplied with a base mount bracket to attach to vent pipe or to a mast driven in the ground.

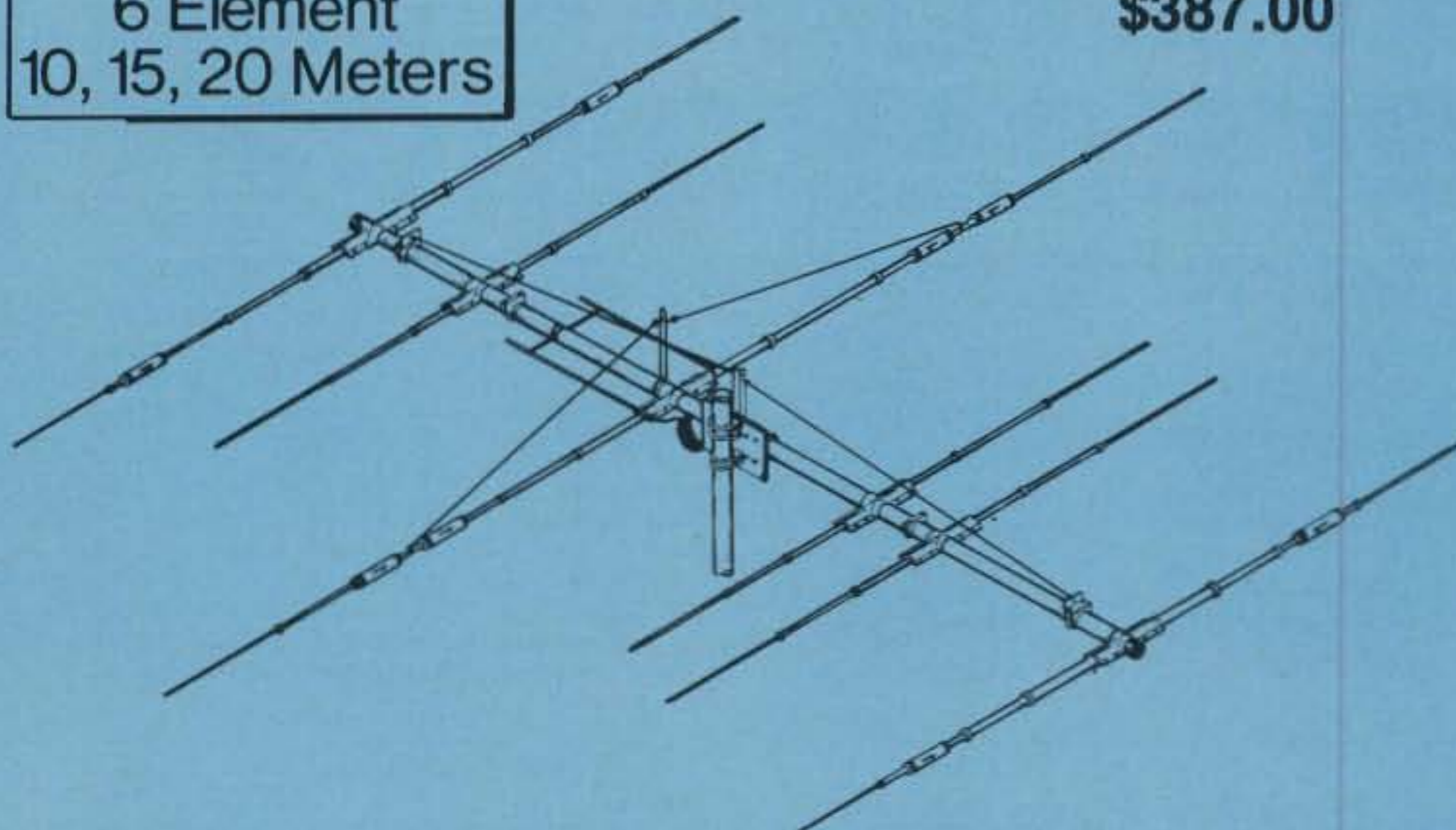
SPECIFICATIONS

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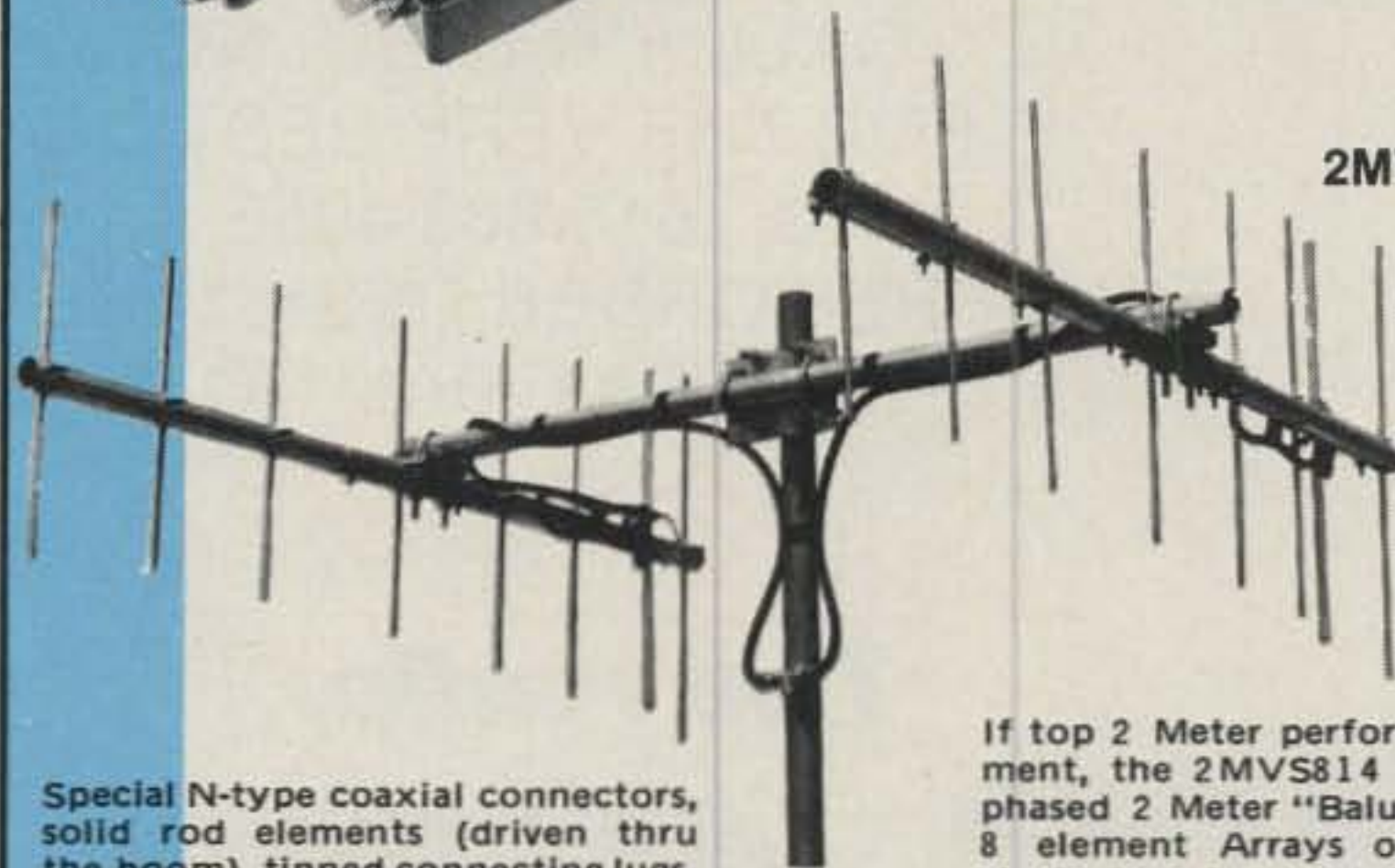
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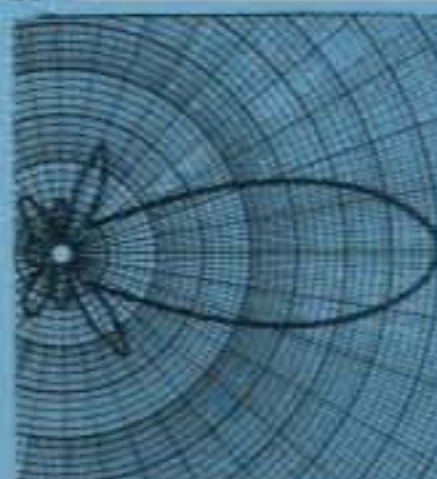


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Upper and Lower Case The ACE 1000 has true upper and lower case capabilities. The 72-key keyboard also includes an alpha lock key, a numeric pad and keys with special designations such as period, plus, minus, greater than (go to) and asterisk (multiply) that are frequently used with VisiCalc. Other features of the Franklin ACE 1000 include a joystick/game paddle connector, a speaker and eight peripheral connectors.

And Plenty of Power Franklin has eliminated the power and overheating problems that sometimes trouble competing units. A built-in fan and a 50-watt power supply permit all eight peripheral connectors to be used simultaneously without concern about overloading.

Franklin ACE 10 Disk Drives Franklin ACE 10 disk drives (sold separately) are ideal companions to the Franklin ACE computer. They read and write any Apple II-compatible diskette. Based on the proven technology of the Shugart SA 400 Series, ACE 10 drives are available with a controller to provide a complete subsystem. The controller, which accommodates two drives, plugs into a peripheral connector in the ACE 1000 computer. It may be used with both DOS 3.2 and DOS 3.3 and includes a built-in disk drive exerciser.

Franklin ACE Features

- Apple II Compatible
- Upper and lower case
- 12-key numeric pad
- VisiCalc keys
- Built-in fan
- 64K of RAM
- Typewriter-style keyboard
- Alpha lock key
- 50-watt power supply

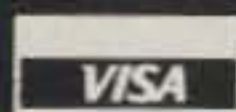
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WANTED: Accessories for Galaxy 5 mk 2, AC35 ps., VFO, amplifiers, etc. KA9JAW, 1520 Cerro, Dubuque, IA 52001.

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SELL: Johnson Messenger 1 XCVR 10 Meters. Original owner, all manuals, good condx. \$20 PPD. Sever, 7267 Tara Drive N., Mobile, AL 36619.

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