ANC

CQ

RADIO AMATEURS' JOURNAL

AUGUST
1955
35c



This Issue =

NEW NOVICE DEPARTMENT

NEW RTTY DEPARTMENT

ANTENNAS - MOBILE - VHF

COVER: MARGE, K6HVC

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why is the SX-96 the most wanted receiver on the air?

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Coverage: Standard Broadcast, 538-1580 kc; Three S/W Bands, 1720 kc–34 Mc, Band 1: 538 kc–1580 kc–Band 2; 1720 kc–4.9 Mc–Band 3: 4.6 mc–13 mc–Band 4: 12 mc–34 mc.

Type of Circuit: Double conversion superheterodyne over the entire frequency range.

Type of Signals: AM-CW-SSB.

Features: Precision gear drives are used on both main tuning and band spread dials. Double conversion with selectable crystal controlled second oscillators. Selectable side band reception of both suppressed carrier and full carrier transmissions by front panel switch, delayed AVC, CW operation with AVC on or off. Calibrated bandspread, "S" meter, low drift, double conversion superhet.

Controls: Sensitivity, band selector, volume, tuning, AVC on/off, noise limiter on/off, AM/CW-SSB, Bandspread, selectivity, pitch control, response (pwr on/off, LSB, USB–2 tone pos.), receive-standby.

Intermediate Frequencies: 1650 kc and 50 kc.

Tuning Assembly and Dial Drive Mechanism: Separate 3 section tuning capacitor assemblies for main tuning and bandspread tuning. Circular main tuning dial has 0-100 logging scale. Bandspread dial is calibrated for the 80, 40, 20, 15, and 11-10 meter amateur bands.

Selectivity: Five steps of bandwidth calibration at 6 db points; 5 kc, 3 kc, 2 kc, 1 kc, and .5 kc.

Antenna Input Impedance: Balanced/unbalanced.

Headphone Output Impedance: Nominal 500 ohms.

Audio Output Impedance: 3.2/500 ohms.

Automatic Noise Limiter: Series noise limiter operated by toggle switch on front panel.

Carrier Level Indicator: Calibrated in "S" units from 1 to 9, decibles to 90 db over S9, microvolts from 1 to 1000 k.

External Connections: 3.2/500 ohm speaker terminals, terminals for single wire or doublet antenna, phono jack, AC power cord, socket for DC operation and remote control, audio output terminals, "S" meter electrical adjustment and mounting hole for co-axial cable connector. Phones jack on front panel.

Audio Power Output: 1.5 watts with 10% or less distortion.

Power Supply: 105/125 V, 50/60 cycle AC.

Model SX-96–$249.95

Matching R-46B Speaker–$17.95

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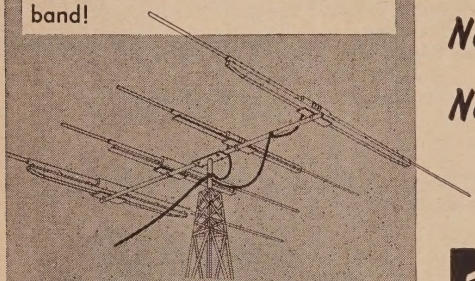
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Cover: Margery Bennett, K6HVC, of Rialto, California. Transmitter is a Heathkit AT-1, VF-1, AC-1 combination with a homemade modulator. Receiver is a Hallicrafters SX-28A. OM Leo, KN6GKM, works for the Santa Fe RR, and monitors K6HVC in the car for occasional messages such as, "Leo, bring home a loaf of bread," etc. Marge is a member of AREC as an Official Weather Station. 8-year-old daughter Teri copies code at 5 wpm, so they may soon be an all-Ham family.



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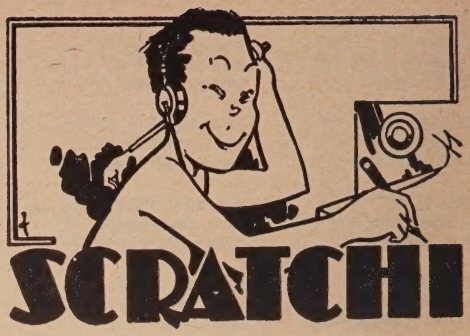
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Feenix, Ariz.

Deer Hon. Ed:

Boy oh boys, what a sityouayshun this having been. Would you buleeving it, but I having here a letter to you I riting to weeks ago, but it not getting in Hon. Uncle Sam's mail. Here are wun part of letter, and I quoting:

"And also, Hon. Ed., plees printing following ad in your Hon. Mag. -- FOR SALE Cumpleet amchoor stayshun. Several reseevers & transmitters. All in 1/c condishun and reel cheep. Contacting Hashafisti Scratchi, Feenix, Ariz."

And how comes you are not getting Hon. Letter? Well, this are what happening. To weeks ago Scratchi are sitting in shack working amchoors in diffrunt parts of country. Ackchewally are trying to talking to amchoors what up north, on acct. is so hot in shack wanting to find out if anybuddies are reely cool. And when I saying it are hot in shack, I not just whistling Heat Wave.

No indeedeys. Are having to using gloves to tooning reseever to keeping nobs from burning fingers. Holding mike with pliers. Also having to standing up, on acct. chair seet being hot seets if sitting down. Mercury in thermometer bubbling away at abouts 130 degrees. Why, even the ten what resistors in the junk box are disipayting nine whats just sitting there. Yessirree Hon. Ed., it are reely h o t.

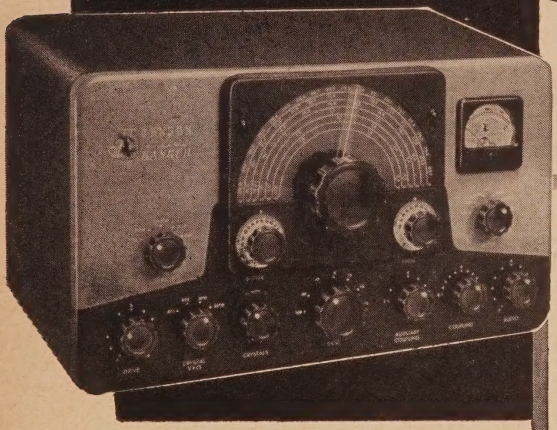
I are just finishing contact when Scratchi's XYL-to-be, Lil Watanabe, are coming in shack. I can seeing from glints in eye she mad at sumthing, so I following her outs into patio. I gessing rite. Lil are mad at me. It seeming that as engaged cupple she expecting me to having more time avaleable to showing her good time. She saying I never going out with her. All I doing is staying in shack and working at amchoor radio.

Lil are saying things likesame this before, only this time she seeming to meening it more. She saying all our friends are talking about what happening to Lil and Scratchi. She also saying that if I not giving ups amchoor radio, she are giving up Scratchi. In addishuns, she telling me I crazy to being in that hot shack. She thinking if I do I getting appleplexy.

As I sitting there in patio, thinking of boilerroom shack I having, and thinking of giving up engagement to Lil, I deciding maybes I better making big step. So, I telling Lil I will

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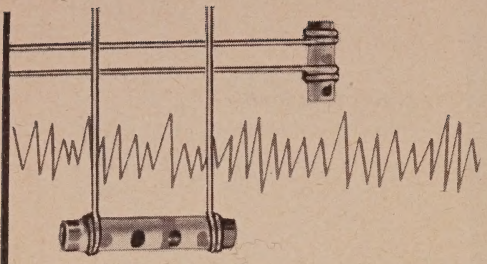
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doing it. I will giving up amchoor radio. Next thing I know she sitting me down and making me riting you letter to selling my ham equipment. After I finish the letter, she taking it and say she going to mail it.

Wunce Scratchi are deciding to giving up radio, I are a diffrunt man. Hon. Ed., it are wunderful. No more worrying about skedyules. No more wundering why having TVI. No more having to buying big toobs to replacing those what burning out. In fackly, Lil and I are getting new hobby. The Mambo. It are reely my idea, on acct. I always wanted to be able to dancing the Mambo, so we taking lessons.

After several lessons Scratchi are being reel cool dancer. Lil not doing to goods, but instrucktor saying I best Mambo dancer she seeing in many weeks. Lil and I are dancing it at nite clubs, but on acct. she not to good, I asking Hon. Lady Instruktor if she not like going out to nite clubs to dancing with Scratchi. She are willing, so boy oh boys, am I dancing the Mambo after that. What a dance −− one, two three, one two three four. . . . Hon. Ed., the waltz are strickly for squares, but that Mambo are cool man, cool.

Next week Scratchi reely living. In daytimes seeing Lil, and we going siteseeing, and horseback riding, and visiting old indian ruins, and climeing mountains and going swimming. In the evening Scratchi are going dancing with lady instruktor. One, two, three, four, one, two, three, four. You can having you amchoor radio, Hon. Ed. The Mambo is for me, and me for the Mambo.

On Sunday afternoon, after Lil and I coming back from swimming, she telling me that maybe she being wrong about my giving up radio. She saying it not rite for me to giving up hobby I liking so much. I are poo-pooing hole idea, and telling her I am not minding at all. Howsumever, she are insisting. She saying she can seeing she are doing wrong in making me giving up radio, and she insisting I go on air again.

So, I telling her I can't doing it, on acct. having ad in your Hon. Mag. to selling my stayshun. At this she are opening her purse and showing me the letter. She not mailing it!! But crafty old geenyus Scratchi having ace up sleeve. I telling her I can't possibly going back on air and work in that hot old shack −− not unless she wanting me to getting appleplexy. So, you know what she doing, Hon. Ed? She telling me that is okeh, on acct. she is buying me l/c air conditioner for shack, and it being installed next day.

So, what am I to doing? I going back on air. First she wants me to giving up radio, then she wants me not to giving up radio. Hon. Ed., I just can't figuring out women, always changing there mind. Why you supposing she wanting me to going on air again?

Respectively yours,
Hashafisti Scratchi

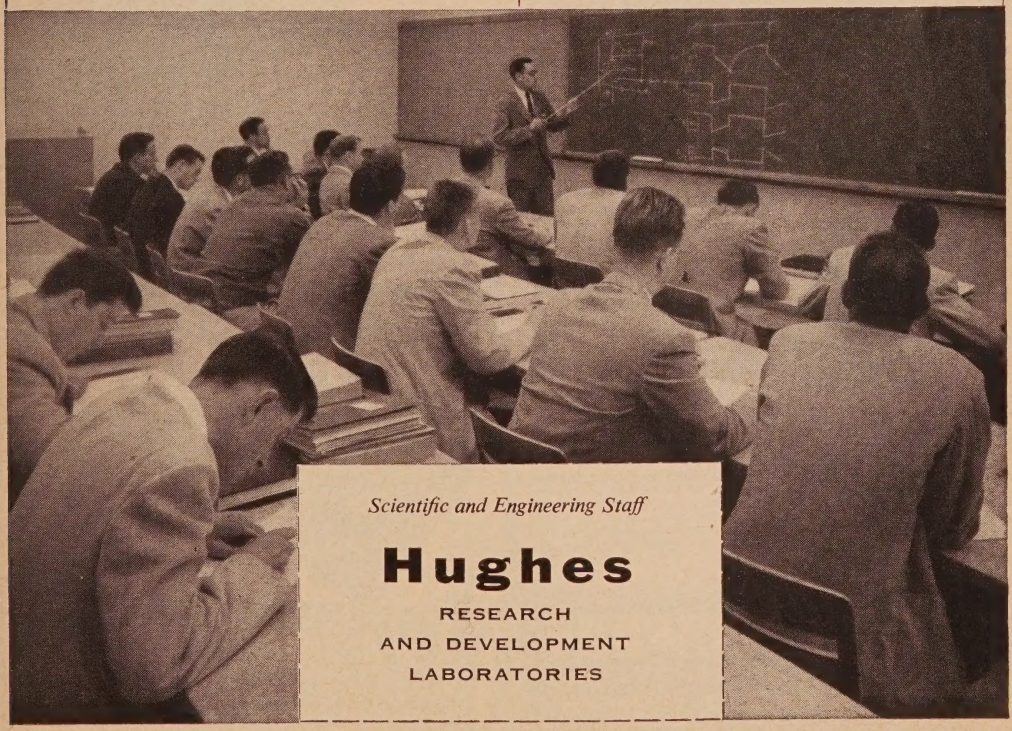
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Shpg. Wt. 120 lbs.

$189.50

Shipped motor freight unless otherwise specified. $50.00 deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts CW.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- Pi network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, ... 125 watts C W. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver I_P Final I_G, I_P, and E_P, and Modulator I_P. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20⅞" W x 13¾" H x 16" D.

Heathkit ANTENNA COUPLER KIT



MODEL AC-1

$14.50 Shpg. Wt. 4 lbs.

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

Heathkit GRID DIP METER KIT



MODEL GD-1B

$19.50 Ship. Wt. 4 lbs.

The invaluable instrument for all Hams. Numerous applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1¼ meter Ham bands. Complete frequency coverage from 2—250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at $3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

Heathkit ANTENNA IMPEDANCE METER KIT



MODEL AM-1

$14.50 Shpg. Wt. 2 lbs.

Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

100 μa. meter employed. Covers the range from 0 to to 600 ohms. Cabinet is only 7" long, 2½" wide, and 3¼" deep. An instrument of many uses for the amateur.

HEATH COMPANY

A SUBSIDIARY OF DAYSTROM, INC.

BENTON HARBOR 12, MICHIGAN

New Heathkit VFO KIT



MODEL VF-1

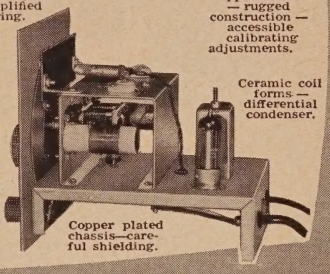
$19.50

Ship. Wt. 7 lbs.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard ½" crystal holder. Construction is simple and wiring is easy.



Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

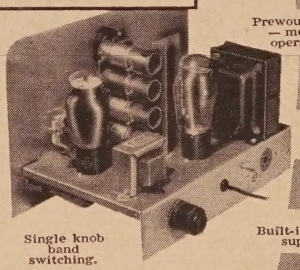
$29.50

Ship. Wt. 16 lbs.

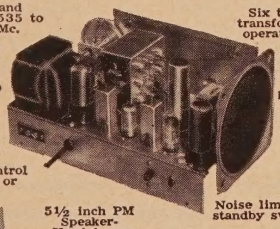
SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.
6AG7 .....Oscillator-multiplier.
6L6 .....Amplifier-doubler
5U4G .....Rectifier.
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8⅛ inch high x 13⅛ inch wide x 7 inch deep.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporaring many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.



Heathkit COMMUNICATIONS RECEIVER KIT



SPECIFICATIONS:

Range.....535 Kc to 35 Mc
12BE6 .....Mixer-oscillator
12BA6 .....I. F. Amplifier
12AV6 Detector—AVC—audio
12BA6 ....B. F. O. oscillator
12A6.....Beam power output
5Y3GT .....Rectifier
105-125 volts A.C. 50-60 cycles, 45 watts.



MODEL AR-2

$25.50

Ship. Wt. 12 lbs.

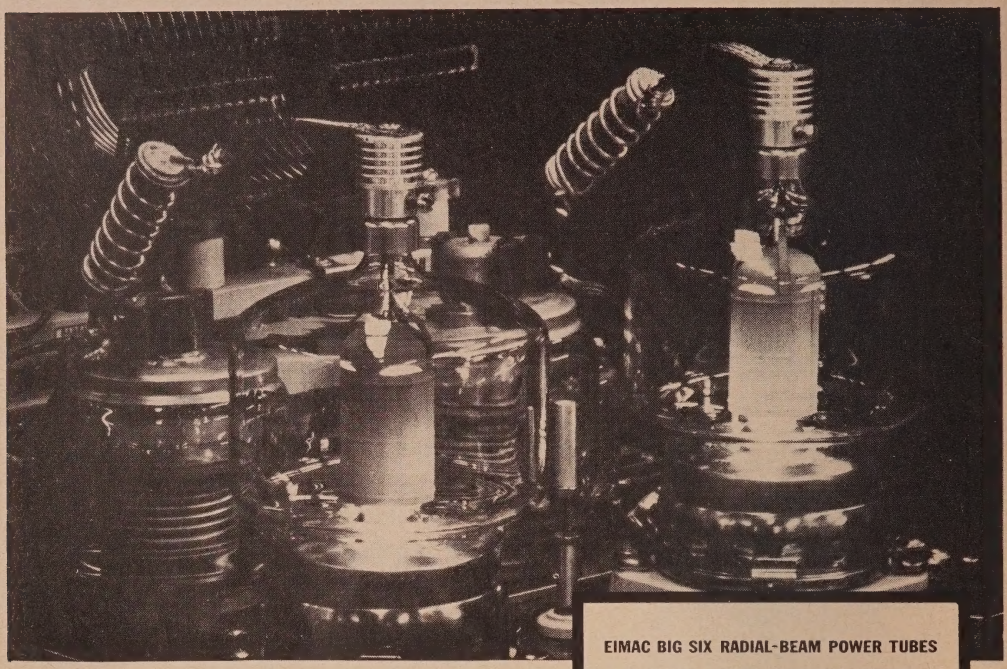
A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

CABINET:

Proxylin impregnated fabric covered plywood cabinet. Shipg. weight 5 lbs. Number 91-10, $4.50.

HEATH COMPANY
BENTON HARBOR 12, MICHIGAN

How to select a tube for single sideband



To realize the advantages of Single Sideband operation, there are two important points to keep in mind when selecting a final amplifier tube. First, since there is no continuously running carrier, high peak powers may be reached when a signal is put on the air. And second, because it is easier to produce an SSB signal at a low power level, it takes more than an ordinary tube to build this valuable low power signal from the modulator to high power in a single amplifier stage. Eimac tubes offer these extras. Their reserve supply of filament emission, lack of internal insulators and widely recognized ability to handle high peak power has been proved over the years. And high power gain is inherent in all Eimac multi-grid tubes. When planning or building an SSB rig, remember these two important points and consider the Big Six of Amateur Radio—Eimac 4-65A, 4-125A, 4-250A, 4-400A and 4X250B radial-beam power tetrodes and the 4E27A radial-beam power pentode.

EIMAC BIG SIX RADIAL-BEAM POWER TUBES

CLASS AB_1 LINEAR AMPLIFIER SERVICE

Typical Two Tone Performance*

	DC Plate Voltage	DC Screen Voltage	Peak Sig RF Grid Driving Voltage	Peak Sig Plate Power Input
4-65A	2000	450	100	160
4-125A	2500	555	100	300
4-250A	3000	600	110	630
4-400A	3500	750	135	980
4X250B	2000	350	50	500
4E27A	2500	600	110	325

*Permitting safe adjustment and conservative operation.

You can be sure of Eimac quality by asking your distributor for Eimac—the mark of excellence in electron-power tubes for over 20 years.

For further information about Eimac tubes and applications write our Amateur Service Bureau.

Eimac

EITEL-McCULLOUGH, INC.

SAN BRUNO • CALIFORNIA

The World's Largest Manufacturer of Transmitting Tubes

. . . de W2NSD

Two big things are starting with this issue of *CQ*. First of all you will find the first installment of an RTTY column by W2JTP. RTTY is a much misunderstood phase of ham radio and there is a great need for more information to be circulated about this fascinating endeavor. It isn't expensive, really, and doesn't take near as much know-how as you think it does. You will find that many of the top brains and the really interesting people have gone in for RTTY. It is a lot like SSB in that way, except that you still have to build your own equipment in order to get on the air. Among those who have helped pioneer RTTY are Herbert Hoover Jr., W6ZH (now Undersecretary of State), Art Collins, WØCXX (Collins Radio), etc. Give the column a tumble.

The new Novice column starts this month with W8ZCV at the controls. This is something we are *real* proud of. Walt has all sorts of interesting things up his sleeve for the future.

Something To Write About

Articles in *CQ* may just seem to happen as far as you are concerned. Each month when the issue comes you flip through and see what there is of interest there, read Scratchi, check through the Classified section and then read one or two of the articles that look good. But consider this next time you go to flip through the magazine: almost all of the articles in there were written by an amateur like you and submitted to *CQ* for publication. This fellow is just like you, except that he sat down and wrote that article. Got a mirror handy? Look in it. I've got a message for you: You could have an article printed in *CQ* too. I seriously doubt if there is one amateur reading this editorial that doesn't have *something* to write about.

What to write about? That is what plagues most of us when we sit down to write. Actually the answer is quite simple: write about something you know. It may be an inside story of your club at Field Day, or how you lost the Sweepstakes, or some new circuit you have been playing with and succeeded. Every good ham club in the country (or out) has activities that should be publicized. I have heard some terrific stories of the hidden transmitter hunts put on by the South Jersey Radio Club, but none have appeared in print yet. Other clubs all around the country are doing the same thing. The CD gang are working themselves into an early grave, but who has taken the time to chronicle their efforts?

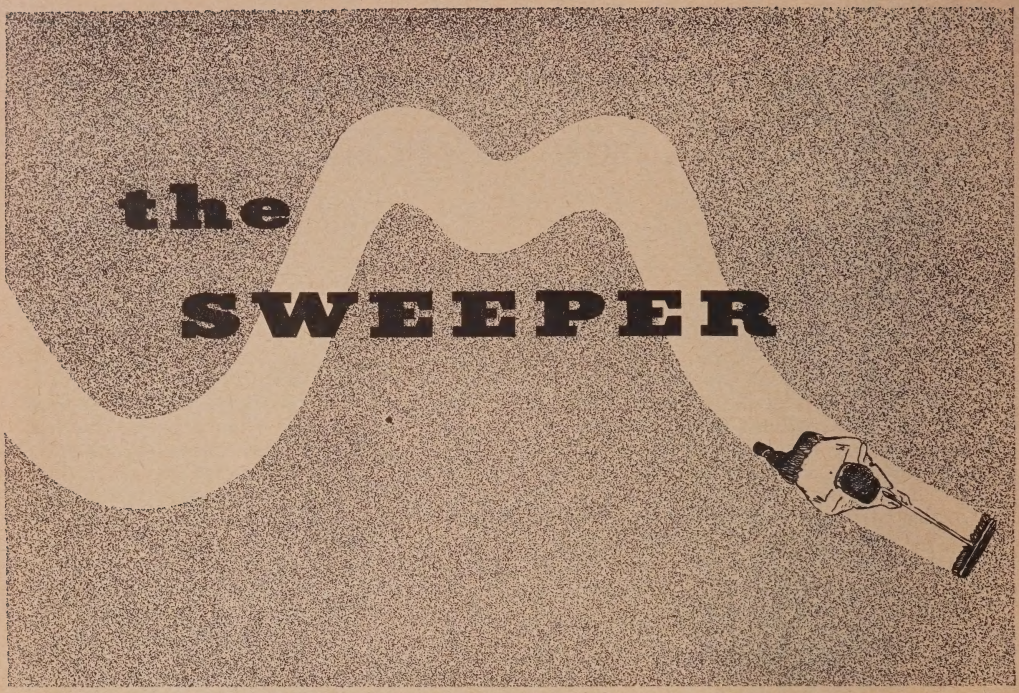
The thing that sells to magazines best is the construction articles. What to make? Ha, even that is easy to answer. Perhaps I shouldn't be quite so candid, but I'll let you in on a little secret: if you look back through your old issues of *CQ, QST, Radio, Radio News,* etc., you will find a lot of familiar circuits. Really new things are few and far between. For example: speech compressors have been appearing for years and yet the July *Radio News* features such a circuit with a 2½ page article. This is not to look down on *RTN* for printing such stuff for I am sure that it would have been run in *CQ* if it had been submitted.

Lest you get the idea that this is a call to plagiarism I will point out that most editors try to keep pretty well informed on what has been printed and give short shrift to an article that does not have some differences or improvements. The thing is that if you are out to make something in order to write an article about it you can probably find a lot of good suggestions in the back issues of magazines. To give you a few more examples: a brief look through some old *Electronics* magazines uncovered an article on Remote Tuning with Reactance Tubes. Now this was mentioned in an article in *CQ* by Bob Weitbrecht in April 1952, but I don't recall seeing much more on the subject since. Here is a wide open field for experimentation and an article or series of articles. There are lots of applications for the remote tuning of a receiver or transmitter VFO by means of a pair of wires with a d-c voltage on them. A receiver could easily be tuned over 100 kc. on 20 meters from a few feet to miles away with this simple circuit.

Another article in *Electronics* caught my eye. It was called "Noise-Free Code Reception." With this relatively simple circuit it is possible to receive perfectly an S-1 signal through an S-9 noise level and yet hear absolutely no noise in the output of the receiver. We certainly would go for a construction article on that device. The circuit is in *Electronics,* hop to it.

What about mobile-marine operation? I have gotten interested in this but have found precious

[*Continued on page 50*]



Harold Isenring, W9BTI
4661 N. Lover's Lane Rd.
Milwaukee 16, Wis.

W9BTI comes up with a fool-proof system of measuring SWR in the VHF antenna system. "The Sweeper" is not difficult to build and the cost should be fairly low. VHF men have been on the lookout for something like this for a long time. So here it is boys, get those beams and antennas doing what they're supposed to.

Any amateur, accustomed to precise and careful measurements of RF in our DX bands, will experience a sense of frustration when he first invades the portion of the spectrum above 50 Mc.

In this domain he finds that the common commodities such as r-f voltage, current, standing-wave-ratio, reactance and resistance do not readily submit to the normal procedures of measurement with which he has been familiar. Since Voodoo is frowned upon in the best amateur circles it is evident that the VHF man needs a new tool to furnish him quantitive data and to aid in evaluating the performance of the apparatus he builds and uses. This is where the SWEEPER enters the picture.

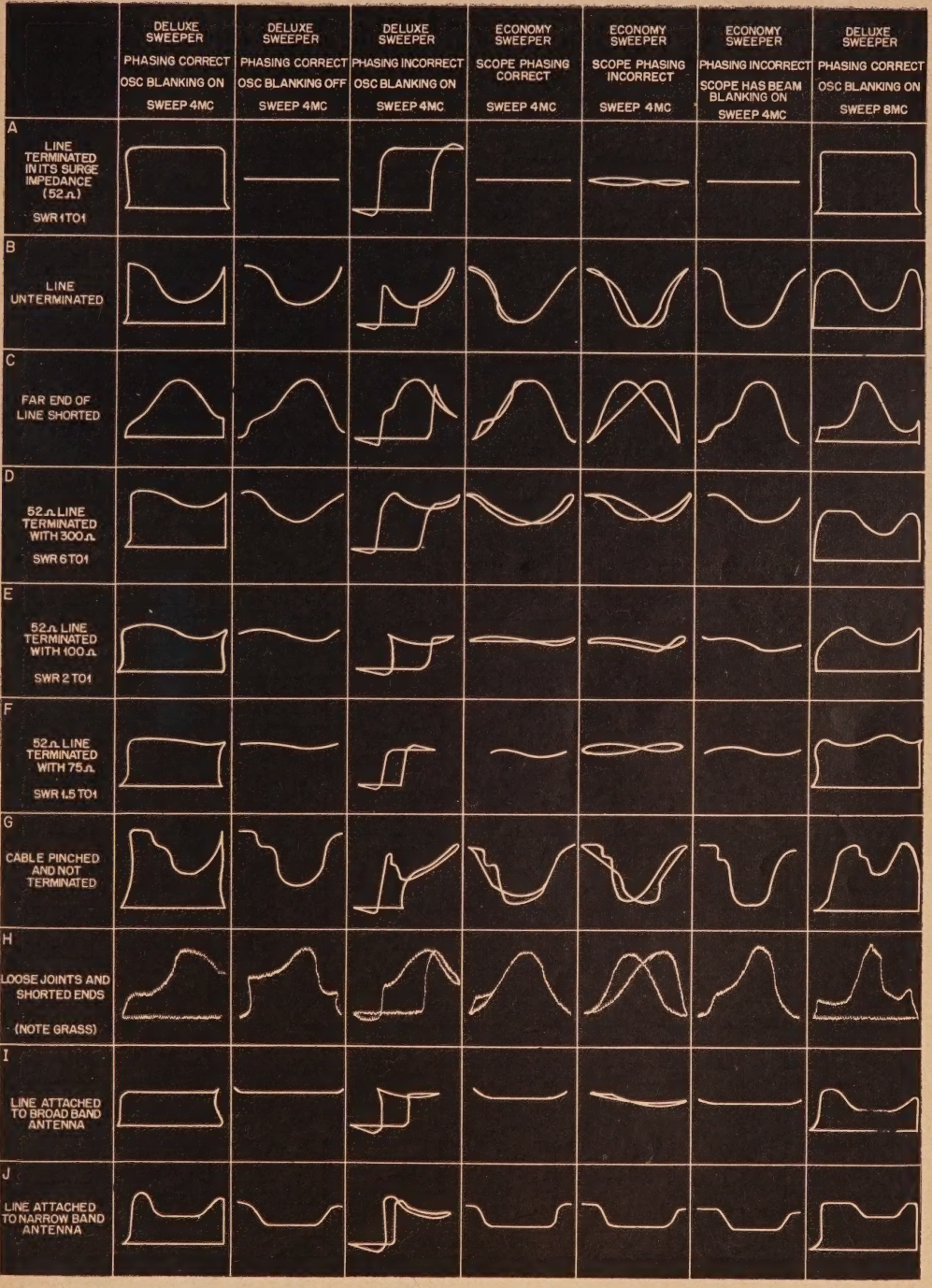
The SWEEPER's effectiveness begins in the vicinity of 50 mc. and improves as the frequency goes higher. The method can be used in all of the VHF bands although the unit to be described was designed particularly for operation in the 144 mc. region. Tuned plate lines are employed whose lengths may be altered for measurements in the 50, 144, 220 or 420 mc. bands. Below 50 Mc. the line lengths become unwieldy.

The adaptability of this instrument for making all sorts of difficult measurements will gradually grow upon you. Some of its uses are:

- **Measuring the input impedance of a receiver**
- **Finding the characteristic impedance of unmarked cables**
- **Finding a kink or defect in a cable**
- **Location of a noisy connection in a line.**
- **Checking dummy loads for transmitters**

Theory of operation

Let us consider the transmission line for a moment. If one end is terminated with a nonreactive resistance equal to the surge impedance of the line, regardless of the frequency the other end will "see" the same impedance. If, on the other hand, the far end of the line is left open, the impedance that the input end "sees" will depend on the length of the line and the input frequency. As an example: a frequency that would make the open line an even number of quarter waves long, would produce a high impedance at the input end. If the frequency were such as to make the line an odd number of quarter waves, the input impedance would be near zero. Shorting the output end would cause the opposite effect in the two examples.



Typical scope patterns for the "Deluxe" and "Economy" SWEEPERS, giving a direct visual indication of impedance variation over a 4-Mc band.

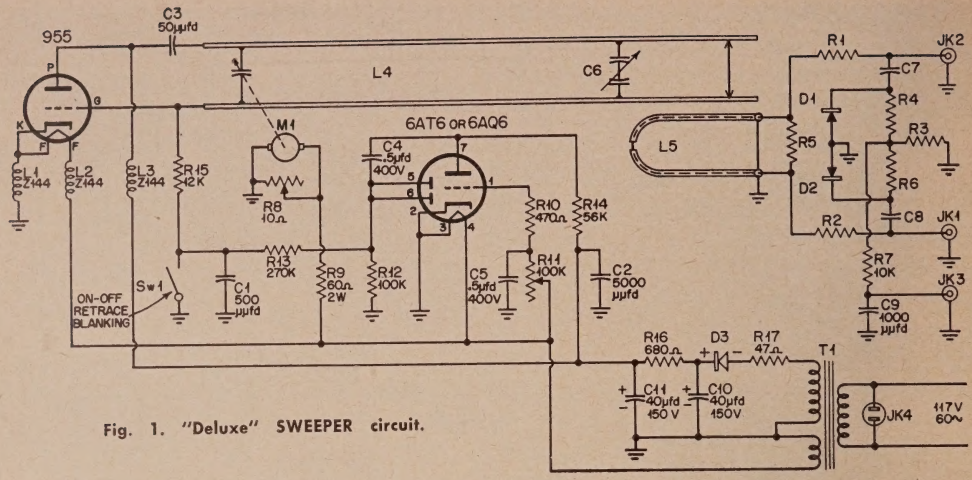


Fig. 1. "Deluxe" SWEEPER circuit.

All resistors ½w. unless otherwise specified.

R1, R2, R5—100 ohm 5%
R3—100K, 10%
R4, R6, R7—10K, 10%
R8—10-ohm wire-wound, 5 watts
R9—60 ohm, 2 watt
R10—470 ohm, 10%
R11—100K potentiometer
R12—100K, 10%
R13—270K, 10%
R14—56K, 10%
R15—12K, 10%
R16—680K, 2 watt, 10%
R17—47 ohm, 10%
L1, L2, L3—Z144 r-f choke
L4, L5—see diagram
C1—500 μμfd. ceramic
C2—5000 μμfd. ceramic
C3—50 μμfd. silver mica button
C4, C5—0.5 μfd. 400V
C6—5-plate Butterfly from SCR522
C7, C8—500 μμfd. silver mica button
C9—1000 μμfd. ceramic
C10, C11—40-40 μfd. 150V electrolytic
D1, D2—IN64 or CK710 diode
D3—35 ma. selenium
J1—SO239 coax panel receptacle
J2—UG-58/U panel receptacle
J3—phono jack
M1—Sweep capacitor-motor assy. from APN-1
T1 — Power transformer, 6.3v. @ 1 amp., 100v. @ 35 ma., primary 117V—TV booster type

Varying the input frequency uniformly from one which makes the input end of the line appear as an even number of quarter waves to one which makes it an odd number of quarter waves would result in the input impedance varying uniformly from extremely high to very nearly zero. We shall take advantage of this phenomenon as the basis for the operation of the SWEEPER.

The Circuit

Basically the SWEEPER consists of a VHF oscillator employing a 955 tube and a set of tuned lines (This ought to be duck soup for those lads tinkering with modulated-oscillator transmitters in pre-WW-II days). The tuned lines are bridged by the sweep motor removed from a surplus APN-1 altimeter. About .25 volts is required by the motor to sweep a 4 Mc. bandwidth. This a-c voltage is furnished by the filament winding of the power supply

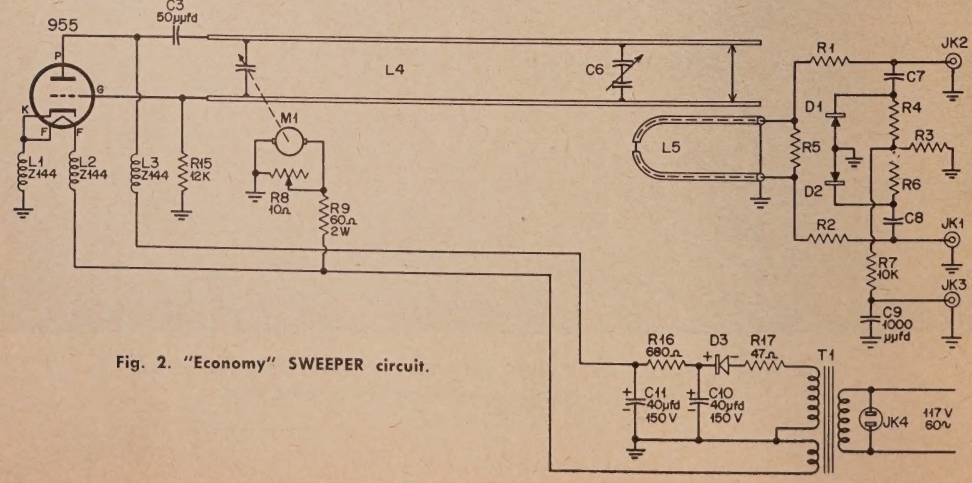
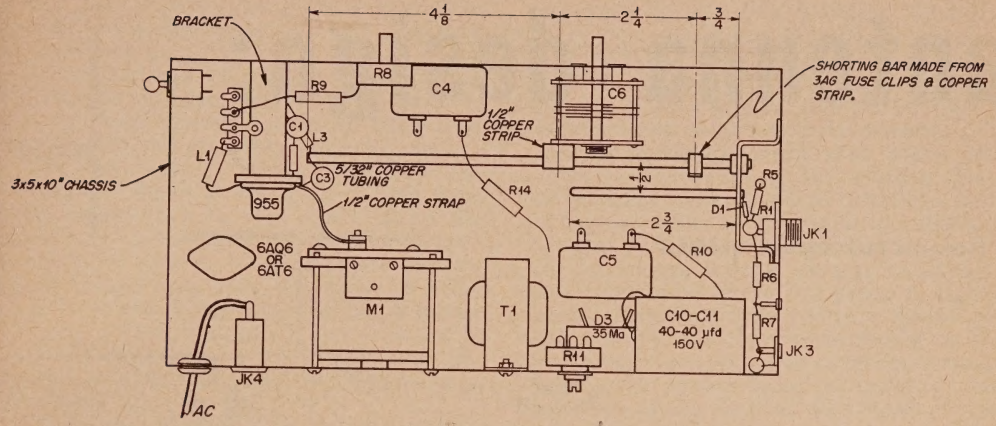


Fig. 2. "Economy" SWEEPER circuit.



Chassis layout of the SWEEPER.

and is regulated by R8, the sweep control. The total range available in this particular configuration is from zero to about 8 Mc. A phase control is in the circuit to start the sweep at any point along the oscilloscope trace, making possible the use of practically any type of 'scope.

Coupled to this variable-frequency oscillator is a shielded link conveying a portion of the picked-up high frequency energy to the output coaxial fittings, into which the circuit or device being measured is connected. Series resistance *R1* and *R2* and shunt resistor *R5* keep the loading on the oscillator relatively constant despite fluctuations in the connected load. A shunt diode system converts the varying r-f voltage to a varying d-c voltage which is presented to the vertical input terminals of the oscilloscope.

The 'scope has its horizontal deflection set to the 60-cycle line frequency so that the spot is swept in unison with the frequency variation of the oscillator. A pure resistance equal to the impedance of the line bridged across the end of the line will present a constant r-f voltage at the detector, giving a straight horizontal line on the 'scope. Any impedance irregularity in the load will appear as a curvature in the horizontal line on the oscilloscope. The table gives an idea of the cathode ray display to be expected from certain types of transmission line conditions. A line mismatch will appear as a sine wave whose amplitude depends on the degree of mismatch.

Two circuit diagrams are shown for the SWEEPER. The Deluxe version includes retrace blanking and a slightly different 'scope presentation although the accuracy is equal in both.

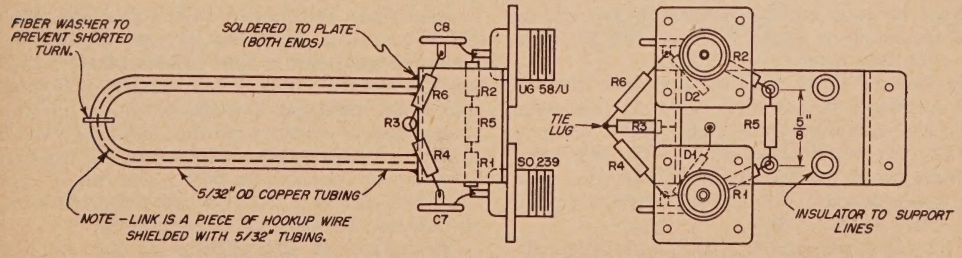
Construction

The SWEEPER can be built into almost any type of box or instrument case, the original being in a utility box measuring 10 x 5 x 3 inches. The only part of the layout that is critical is the oscillator and its output circuit. A reasonable amount of care should be used in this part of the job. Parts placement should be such that short leads result. Short leads should also be used in the assembly of the diode detectors, pickup link and any terminating resistors, also the grounding of the co-ax connectors.

Test and Calibration

After completion, power is applied, and we are ready to calibrate the unit. Set the tuning condenser *C6* in the middle of its range and set the sweep control to zero. With the station

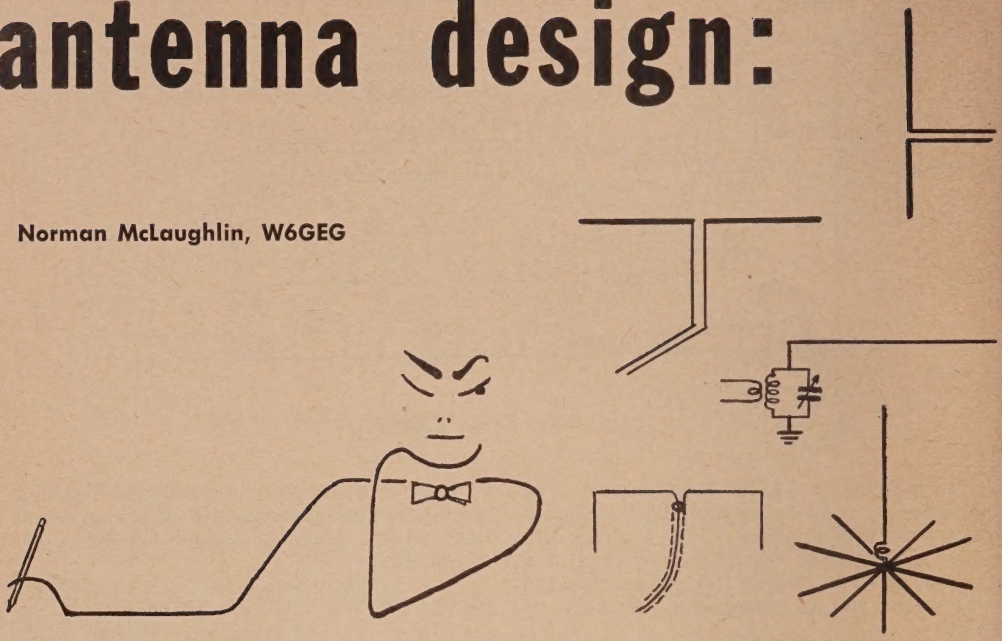
[*Continued on page 56*]



Details of the SWEEPER tank circuit.

antenna design:

Norman McLaughlin, W6GEG



Summer is an excellent time for putting up that "decent antenna" you've always wanted. W6GEG gives us a refreshing view of the practical considerations involved in putting one up that will really "get out" . . .

In designing antennas for amateur use below 30 megacycles, antenna theories are of little help. In fact they tend to confuse and build false hopes for performance that can seldom be realized. As we view the figure eight patterns of dipoles, we are inclined to overlook a most important fact. Those patterns result only when the dipoles are suspended in free space.

Free space is commonly accepted as being many wavelengths above the gound. Getting many wavelengths above the ground is no easy proposition, even on 10 meters. As a result the great majority of amateur antennas are not located in anything even remotely resembling free space. As a matter of fact, few of them are even one quarter wave high.

In view of these facts in should be obvious that anything an antenna might do that even remotely resembles those figure eight patterns is just pure coincidence. Those lobes that were counted on to put signals in wanted directions just can't develop due to the antenna's close proximity to the earth.

Thus, it might appear that the vertical radiator is the solution to the problem. At least no such staggering heights are required for quarter wave verticals. But, laws governing performance of quarter wave vertical radiators are predicated upon an equally impossible condition, a perfect ground. Since the perfect ground would have no ohmic resistance, even approximating it where soil conductivity is optimum is almost an impossibility. As a result, the perfect ground becomes the road block to vertical antennas that the free space height is to the dipole.

Despite such a gloomy outlook the situation is not impossible. Without the aid of free space or a perfect ground it is possible to design an antenna that has reasonable efficiency. Such antennas must be tailor made to fit each QTH. No cure-all antenna exists that will atone for the sins of insufficient real estate or a cliff-dweller QTH. Since most of us are plagued by one "sin" or another considerable thought and planning must go into the antenna if we are to get the most out of it. Results seem to be about proportionate to the time and thought applied to the problem.

Prejudices, ill-founded beliefs and just plain hearsay must be discarded. In their place must be substituted just a few fundementals which will be outlined here. For example, you must accept the fact that it is the center of the antenna that does most of the radiating where dipoles are concerned. It is immaterial whether it be the center 20% or 50%. The center does the work and must be given first consideration in tailoring an antenna to your QTH.

Placement of this section of the antenna might very well make the difference between

a very good or very poor antenna. It must be located in the clearest possible spot regardless of where the ends may be. It must be set up in this choice location without regard to present location of poles, location of the shack or type of feeder system. It must be oriented in the clear without regard to directivity, too.

This may come as a shock to many. Nevertheless, that dipole is not going to have those lobes unless it is in free space. Since the chances are pretty good that nothing approximating free space is going to be achieved we might as well look upon this dipole as being omnidirectional. It has been all along, as honest appraisal of its performance *over a period of time* will reveal. Those lobes were more the product of wishful thinking than a function of the dipole!

Thus Point Number One in good antenna design might be, "Orient the antenna so that the center portion is in the clear without regard to directivity, feeders, shack location etc."

A lot of misconceptions exist regarding feeders. One of the most common is that the place of feed affects antenna directivity. The fact is that a half wave dipole may be fed at any convenient point, center, off-center or end without creating any directivity. Doubtless because of the performance of long wire antennas it is commonly bandied about that end feeding a half wave produces directivity off of the far end. This, of course, is not true.

A great number of misconceptions also exist regarding the relative merit of one type of feed over another. These seem to come and go like women's fashions. At one time the rage was over Zepp feeders and everyone rushed to get up a Zepp antenna. Then came the off-center single-wire feeder and down came the Zepp feeders and up went the newest rage. At one time or other nearly every known feed system has had its day.

For all intents and purposes, below 30 megacycles, one feed system will transfer power as well as another in amateur applications. Few feed systems at amateur antenna installations are of such length that losses become important. Thus it might be said that a properly terminated 50-ohm line will transfer about as much power as a 500-ohm line terminated in its characteristic impedance. Untuned feeders will do just as well as tuned feeders, ad infinitum.

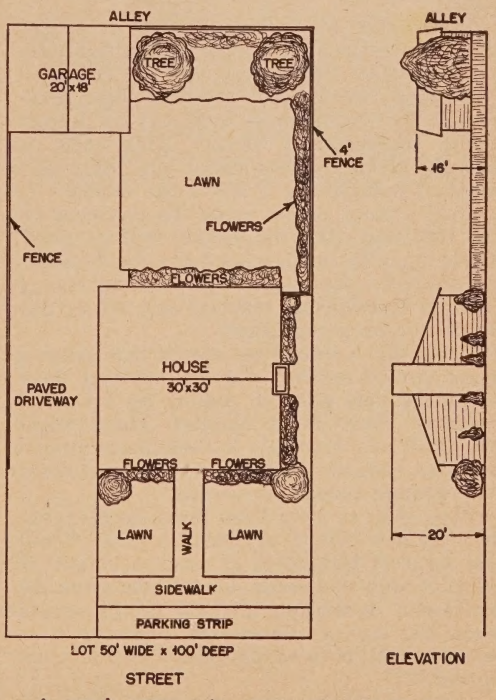
The well tailored antenna is fed with whatever feed system best suits the situation. This might even be end-feeding by bringing the end of the antenna right into the shack to the transmitter. There is nothing wrong with this type of feeding. Except for the high voltages involved it is no more difficult to match an antenna at its high impedance point than it is at a lower impedance. With a proper match the power transfer into the antenna is going to be the same regardless of feed-point impedance.

So, Point Number Two is simply, "Use the type of feed system that best fits the installation." Put another way, design the feed system to suit the antenna and not the antenna to the feed system. Bear in mind that personal preferences transfer no power to the antenna.

Certain conditions might exist where the vertical radiator offers the best solution. Vertical antennas can be made to work very well and have a number of advantages over dipoles. They also have some disadvantages.

In considering vertical antenna installation some modification of the two points in dipole antenna design must be made. It should go without saying that the vertical should be located in the most open spot available. Instead of the center portion doing the radiating, the lower half of the vertical does most of the work. Since vertical antennas are most often fed at the base or current peak no wide selection of feed systems is available. Fifty ohm co-axial cable provides the simplest and most convenient feed method.

Half-wave verticals may be fed with any of the accepted methods of feeding dipoles. After all, the half-wave vertical is nothing more than a dipole standing on end. Half-wave verticals are not as common as quarter-wave verticals. The height problem makes them a little unwieldy particularly at 4 and 7 megacycles. Also, shorter verticals perform so well that little point is seen in doubling the size and



A sample antenna is cut to scale and tried at different locations on your scale-model lot.

quadrupling the construction problems.

Before the importance of ground systems was recognized in amateur circles, vertical radiators were poorly thought of. Some wag once described the vertical as, "An antenna that works equally poor in all directions." Since that slander much more has been learned about vertical antennas. Today, the vertical that fits such a description is usually a poorly-thought-out, designed and installed affair.

The quarter-wave vertical works against ground. The ground, in effect, supplies another quarter wave so that the system is actually a dipole. Since the wire portion of this dipole has negligible ohmic resistance, so should the ground portion. It is when this ground resistance is zero that the perfect ground has been achieved. But, since it has been admitted that achieving this condition is an impossibility we are now confronted with the real problem of vertical radiators.

It should be obvious how far the usual water-pipe ground comes from providing a perfect ground. The Federal Communications Commission requires that broadcast stations install a ground system with a *minimum* of 120 radials spaced each three degrees. The purpose of this minimum requirement is to assure reasonable antenna efficiency. Since the FCC is more interested in the broadcast station's power out, rather than the power input, it set this requirement so the broadcaster would realize the greatest possible signal from his assignment.

In addition to working as sort of a half dipole the ground system has another function. It helps create the vertical angle of radiation. Horizontal radiation, of course, is omnidirectional. The vertical angle is usually 45 degrees for a quarter-wave vertical. This angle is brought about by cancellation and reinforcement of radiation as it leaves the radiator. If a good ground system exists the efficiency of the reflection from the ground will be good. If, on the other hand, a poor or a highly-resistant ground system exists the radiated energy will not be efficiently reflected and will be dissipated in the ground itself.

From this it should be evident that unless a good ground system is to be installed there would be little point in putting up a vertical radiator. Thus, Point Number Three might very well be, "Provide a low-resistance ground for the vertical radiator". Or, more briefly, "No ground system, no vertical".

Now that we have these three simple rules, let's see how best to put them to work. About the simplest method is to make a couple of plots of your real estate. One should show the horizontal dimensions and the profile should show the vertical dimensions. *Figure 1* is an imaginary QTH in which these dimensions are shown.

After sketching your own plots, next cut and "antenna" to scale. A piece of wire, about #20, cut to scale as, say a half wave at the lowest frequency you will want to work will be your principal tool. Now push this "antenna" around the plot. The object is to locate the center of the antenna in the clearest possible spot without regard to where the ends might fall. After the best horizontal location is determined, check that location on the vertical profile.

The profile plot will show you how high the poles will have to be to keep that center section in the clear. It will also show what natural skyhooks might be available in the general area such as trees or buildings.

Now it is time to give some thought to the feed system. Location of the shack will be the major factor, while the economics of the several available systems must be taken into consideration as well. At the same time it might be well to consider what is to be done with the ends of the antenna. Up to now they have been ignored, but since something must be done with them it might be well to start looking for their ultimate destination. Don't overlook the possibility of end feeding the antenna. In any case give considerable thought to placement of antenna ends.

They may be bent in any direction to best fit the real estate. Straight down or off to either side seems to make little difference. It is well, however, to keep the angle of the bend as large as possible, 90 degrees or more.

It could very well be that despite all of this "antenna" pushing around on your real estate plot a satisfactory location cannot be found. Should this be the case, you might consider the possibility of a vertical quarter wave.

In this instance you substitute your "antenna" for your imagination. Study your plot and look for a spot that will provide (a) greatest clearance in the immediate field of the vertical and (b) the most convenient spot from whence to run ground radials.

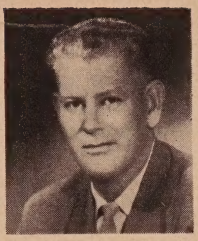
Requirements for (b) entail a little study. Cement driveways or sidewalks should be kept away from. If they are in the immediate vicinity the job of running radials under them might pose some problems. To some, however, this might be no problem.

W6MGN "hydrauliced" four radials 60′ out from the base of his stainless steel vertical, some three feet under the surface. Tom, however, is a man of great patience. Properly inspired he'd think nothing of disassembling the Eiffel Tower with a crescent wrench. (Ed. note: We find that wetting the ground and digging trenches with a hatchet is an excellent method for the lazier man.)

Ground radials need not be put underground. The principle reason they are so put is purely to get them out of the way. They will work just as well lying right on the surface of the earth.

Thus, in placing the vertical, keep an eye

[*Continued on page 49*]



W6FIF, first licensed as 6BCH in 1924, acquired his present call after WW II. Vern holds Amateur Advanced and Radiotelephone First Class licenses. Favorite bands: 80, 40, 40 CW. Favorite activity: Dreaming up the "perfect" ham station. Occupation: Engineer for American Broadcasting Company in San Francisco. Home address: 646 Head St., San Francisco 27, Calif.

the Simplest Calculator

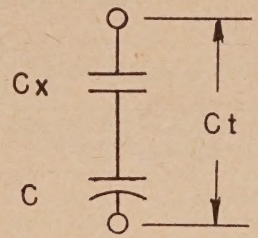
Vernon L. Harvey, W6FIF

W6FIF presents an extremely simple method for lightning calculation of series capacitances or parallel resistances, with practical applications which can save you time and money. . .

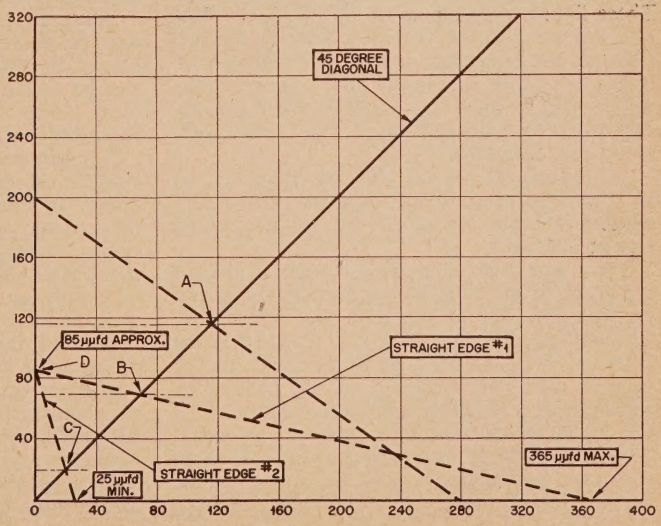
The subject of calculators has long intrigued those who must resort to mathematics to solve problems. In the field of radio and electronics there are many fine calculators available which greatly simplify the solution of complex problems involving capacity, inductance, frequency and the usual Ohms law problems.

The usual problems encountered by the engineer as well as the amateur radio man requires the determination of values of condensers in series, resistors in parallel and inductances in parallel. These can be solved readily by the more common and simpler of the usual formulas.

However, one problem in determining series condenser values involves a quadratic equation type formula. This case arises when we wish to convert a variable condenser of a given capacity range to one of less range by use of a second condenser in series with the given variable element.



As an example, suppose a circuit specified a variable condenser with a capacity range of 50 mmf, i.e., a VARIATION of 50 mmf. Suppose the only condenser on hand was one of 365 mmf maximum capacity and a minimum of 25 mmf; a variation of 340 mmf. Our first thought might be to remove plates until we had the correct range. However, a second condenser of the proper value connected in series will accom-



By simply laying a straight-edge between the two values of capacitances in parallel, the combined value may be read on this chart.

plish the same results and without destruction of our variable condenser.

Here is where the quadratic equation enters. If you are proficient in mathematics and enjoy calculating things, then you will have no trouble with the following formula, where,

C_{v1} = C Minimum
C_{v2} = C Maximum
$C = C_{v2} - C_{v1}$
Ct = Change in terminal capacity
C_x = Fixed capacitor

Then:

$$C_x = C_{v1} + C_{v2} \pm \frac{\sqrt{(C_{v2} + C_{v1})^2 + 4(C_{v1})(C_{v2})\left(\frac{C_{v2} - C_{v1}}{Ct} - 1\right)}}{2\left(\frac{C_{v2} - C_{v1}}{Ct} - 1\right)}$$

Here is how the problem might work out:

$$C_x = 25 + 365 \pm \frac{\sqrt{(365 + 25)^2 + 4(25)(365)\left(\frac{365 - 25}{50} - 1\right)}}{2\left(\frac{365 - 25}{50} - 1\right)}$$

$$= 85.6\ \mu\mu fd.$$

Our variable condenser with a capacity VARIATION of 340 $\mu\mu$fd. will have a VARIATION of 50 $\mu\mu$fd. if a condenser of 85.6 $\mu\mu$fd is connected in series.

The efforts of the writer to find a way to make life easier and less complex resulted in a very simple form of calculator which will quickly solve, within limits, quadratic equation type formulas. It is shown in figure 1.

A piece of cross-section paper, the larger the better, is marked off in arbitrary units of 5. These figures may represent .05, .5, 5, 50, 500, etc., but must be the same for both the vertical side and the horizontal side. A 45 degree diagonal line is drawn from the lower corner to the upper edge of the graph paper. Now a straight edge such as a strip of paper, ruler, etc., completes our calculator.

To familiarize ourself with its operation, let us determine the resultant capacity of two condensers in series, one of 200 $\mu\mu$fd. capacity and one of 280 $\mu\mu$fd.

Place a straight edge on the vertical side of the graph at the 200 point and the lower end of the straight edge at the base line figure 280. This will intersect the 45 degree diagonal at the point A. A line projected horizontally to the vertical side (or vertically to the base line) will indicate a figure of approximately 116.6. If our figure represented $\mu\mu$fd. then our answer is 116.6 $\mu\mu$fd. Or if our capacities had been in μfd. then our answer would be in μfd. These figures might also represent the resulting capacity of a variable 200$\mu\mu$fd. condenser fully meshed in series with a fixed condenser of 280 $\mu\mu$fd.

Now to determine the proper size series element to change our condenser with the 340 $\mu\mu$fd. VARIATION to one of 50$\mu\mu$fd. VARIATION, we need TWO straight edges.

Place one straight edge on the base line at the maximum capacity, 365 $\mu\mu$fd. of the variable. Place the second straight edge on the same base line at the figure 25 representing the minimum capacity of the variable. Intersect the other ends of the two straight edges on the vertical side of the graph and move them up and down, maintaining intersection, until the two points of intersection, B and C on the diagonal indicates a vertical difference of 50 on the vertical side as determined by horizontal lines through these points to a vertical side or vertically to the base line.

Our answer at point D on the vertical side is approximately 85.5 $\mu\mu$fd. which is closer than we can realize with stock fixed capacitors and other undetermined stray capacities in the circuit.

By the use of a single straight edge we may quickly determine the value of two resistors in parallel or find the correct resistor to place in parallel with a given resistor to realize a new resistor of a desired value.

Using our previous figure of 200 and 280 to represent ohms will result in a value of 116.6 OHMS; our resistors of 200 ohms and 280 ohms in parallel. To determine the value resistance to place in parallel with a known resistance to get a desired smaller resistor, simply place one end of the straight edge on either the vertical side or horizontal base at the known resistor value. Select the desired value from the same side and project a horizontal line to the 45 degree diagonal. Then the straight edge through these two points will indicate the correct value at the opposite side.

Since the resultants vary in a logarithmic manner there are practical limitations to the range of capacity or resistance values which can be calculated by the chart. However, for most values normally encountered in practice, the graph is well worth while.

For instance, one may try to convert a given variable condenser to impracticably small variations. In one case, the distributed capacity of the variable condenser was greater than the calculated series condenser needed and as a result the VARIATION of capacity was too great with only one terminal of the condenser connected in the circuit!

Another instance of impractical conversions of capacity would be an attempt to change a condenser variation by only 5 or 10 $\mu\mu$fd. such as a condenser of 340 $\mu\mu$fd. variation to one of 330 $\mu\mu$fd. In this case the series condenser might be on the order of mf rather than mmf. Such a case would have to be calculated from the formula of course.

Since distributed circuit capacity values enter into the problems it is well to limit our conversion attempts to values outside the range of these factors.

In critical applications where it is necessary to have exact values of capacity, it may be advisable to use small semi-fixed variable condensers as the series elements or as trimmers across lumped fixed values simply because few of the calculated capacities are available in stock sizes.

The writer's favorite VFO uses selector switches to connect the correct values of series and parallel condensers into the frequency determining portion of the oscillator circuit which was designed to spread each of five amateur bands over the full range of the dial. Thus when working the edge of the ham bands it is a simple matter to change bands and always be on the band edge, high or low as desired. Additionally, it provides more protection from possible out-of-band operation as well as simplifying band changing.

If cross-section paper is not readily available it is a simple matter to crease a convenient piece of paper into sufficient squares to give a rough graph of quite practical accuracy for simple series condenser or parallel resistor problems, using only the paper creases for the graph squares. Try it.

Unit Construction

John Williams, W2BFD
Technical Editor

If you live long enough, and the radio bug has bitten you hard enough, you will eventually accumulate a considerable amount of electronic gear. This may be scattered around the shack in the form of variously-shaped metal boxes, chassis, cabinets and relay racks.

Sooner or later you are bound to admit openly the notion which has been growing on you bit by bit; you are running out of space and a desire for equipment tidyness has manifested itself.

The author was well past this stage when necessity and desperation induced him to take stock of the situation with regard to packaging of all future apparatus constructed.

With the exception of mobile equipment, which must be engineered for each individual application, and which, perforce, must sacrifice a degree of standardization in the interest of maximum space utilization, most other amateur apparatus may be placed in one of two categories:

(1) Equipment which must be portable within the hamshack. The great bulk of test equipment, experimental power supplies etc., falls in this group.

(2) Equipment which is more or less permanent in location (yet which must be capable of rearrangement and expansion when the station experiences "growing pains"). In this division you would naturally place the transmitters, receivers, frequency standards, phone patches, VFOs, exciters, tone sources for modulation tests, remote control equipment, RTTY adaptors, monitors, SSB receiving adaptors, speakers, jack panels for rapid interconnection of gear around the shack and all those items of test equipment which do not require portability.

Not a great deal can be done for the items in group (1) although an attempt at uniformity in cabinet size will help considerably when it comes to lining them up on a shelf. A number of amateurs have adopted a uniform housing for most test equipment by "standardizing" on the sloping-front cabinets put out by several manufacturers. These cabinets come in uniform height and depth but are available in various widths.

Much economy of space, neatness and accessibility are possible with care in "packaging" items in group (2). While there are exceptions, most amateurs gravitate toward relay-rack and panel construction. This system of mounting great quantities of electrical components in a minimum of floor or table space is the direct result of the expansion of the commercial telegraph and telephone services. It has been completely standardized.

Amateur and commercial needs do not exactly parallel and rack-and-panel construction is not universally adopted by hams because of certain shortcomings. Unlike the Bell System and Western Union, the clutter in the ham shack is caused by a large number of *dissimilar* generally small, units. Many of these consist of a mere handful of parts.

Let's take an example: You want to build a self-powered audio oscillator, using one or two tubes, a couple of transformers and the necessary resistors and capacitors. If you build compactly you will probably be able to restrict the mounting area to about 25 square inches of "chassis" space. What rack-panel will you select? The smallest rack-panel provides a mounting area of not over 1¾″ x 17¼″, which figures to be about 30 square inches.

Let us assume you are willing to waste the 5 square inches. How are you going to mount

your parts? How many small power and audio transformers, etc., can you find, without going into the expensive subminiature field, which can be contained within 1¾″ in one dimension? The next wider panel is 3½″, providing 60 square inches of mounting area, of which we need 25 or less.

Analyze the situation and you are bound to see that rack-panels are fine for large units but yield areas having the wrong length-to-width ratio for small "packages". Any new system developed must be compatible and interchangeable with existing rack-panel standards. The only suitable method that has, thus far, occurred to the writer is the one illustrated. This consists of dividing the usable 17¼″ x 8 11/16″ mounting area of a standard 8¾″ x 19″ panel into six 2⅞″ x 8 11/16″ spaces *with the long dimension vertical.*

Apparatus requiring less than 25 square inches of mounting area can be constructed on a unit-size metal plate and supported in back of the rack-panel with metal pillars. A piece of equipment needing more than this area, but less than 50 square inches, can be mounted on a single plate two units in width (5¾″) and so on, up to providing a single plate 6 units wide, occupying the entire behind-the-panel space.

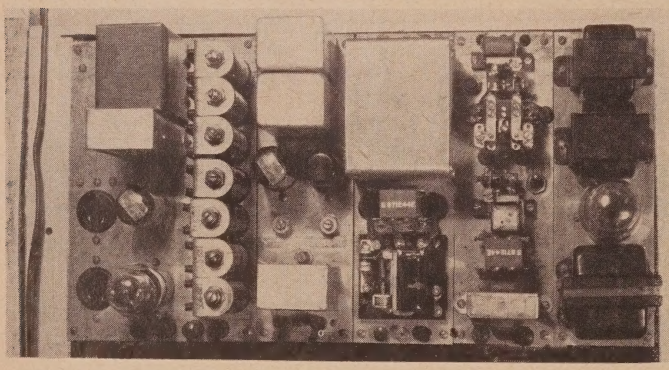
The beauty of this method, which has been employed by the author for nearly ten years (see *CQ*, Nov. 1946, p. 22), is that you can "stash" such a rack-panel, containing all the flotsam of small apparatus now laying around the shack, in between conventional, rack-mounted, larger gear with complete compatibility.

Keep in mind the high mortality of amateur "brainstorms" and you will see where the author's method of building a large number of identical small power supplies on "unit-plates" has paid off handsome dividends. You have eliminated completely the fabrication of a self-contained power supply in the next "brainstorm". If the design turns out badly or the device has outlived its usefulness, you return the unit power supply to "stock" and "demobilize" the rest.

At W2BFD the plan is restricted to all those low-power applications requiring less mounting area than available on a 5¼″ x 19″ standard rack-panel. It has no particular advantages over straight rack-panel methods in the larger sizes. Since it dovetails perfectly with larger panel-mounted gear it fits comfortably into the overall picture. Because a large part of the author's "spare" time is spent on projects requiring many relays and bits of switchgear a number of aids to experimentation have been constructed such as "unit plates" containing several relays, other "unit plates" containing current sources for these relays and so on.

By selection of properly-dimensioned transformers it is possible to construct power supplies delivering 300 volts at 100 milliamperes on single-unit plates. Anything over this requires the 5¾″ width. Small supplies employing selenium rectifiers and 1:1 line-isolating transformers, delivering about 60 to 75 mils at 120 volts for bias or relay operation, can be built two on one plate, which is extremely economical of mounting area. Experimentation with subjects such as single sideband, customarily generated at low-power level, produces chassis with high component-density-per-square-inch. The "unit" system works out ideally here by permitting complete crystal or mechanical filter units to occupy single plates, other plates being occupied by balanced modulators, audio filters, frequency changers and the like. The author has a sizable number of "basic building block" units from which almost any conceivable electronic "goulash" can be concocted.

There is nothing new about unit construction. The author merely claims a comprehensive, overall plan which is integrated to be completely compatible with "normal" construction. It is to be hoped that the present article will stimulate chassis manufacturers to turn out, priced for amateur consumption, prefabricated "basic building block" mountings and pre-drilled rack panels to contain them, also "quick-disconnect" sockets and plugs for making contact with external circuits.



Using the method outlined here, this single rack-panel accommodates six individual units of optimum dimensions.

The plates are cut from 17¼" x 8 11/16" sheets of .091" 24ST Alclad aluminum. Each unit plate is actually narrower than stated unit size by the thickness of the hacksaw cut to allow for stacking irregularities. Pillars are used to support the plates from the main rack-panel. Much of the original unit-style equipment at W2BFD used 1 1/16" long pillars since most of the major components are mounted above deck and the small resistors, condensers and all wiring is beneath. However, there are cases where it is advantageous to use larger parts beneath the plate and, in these cases longer pillars are advisable. All equipment being constructed at present uses 3" pillars cut from ¼" x .065" HARD BRASS tubing, available at most copper and brass supply houses. The .065 hole permits running a 6-32 hand tap into it for threading, without having to drill. With care you can cut this stuff nice and square with a hacksaw but, for a couple of dollars, you can have the local machine shop chop off your brass in the lathe, to make enough supporting pillars to keep you for the next ten years. Be lazy! The 6-32 screws holding the pillars to the rack panel are flatheads, ⅜" long, with roundheads of the same length on the "unit plate" side. Cadmium plated hardware should be used for appearance. The countersinking of the flatheads in the steel rack-panel can be done very neatly in a drill press with a 9/32" drill.

The Alclad aluminum sheet has a pure aluminum finish over a dural base for strength. When all the drilling, for the mounting of parts, has been completed and the burrs removed, the plates can be rubbed lightly, in one direction to give a very beautiful finish, with fine steelwool. Don't overdo it. The aluminum coating is thin.

As this system is a permanent "institution" at W2BFD, an investment was made in a set of *counterbores* for the hole-cutting. A collection of them is now owned in sizes up to 1½". Once you have worked with 24 ST aluminum using counterbores you will never want to return to steel and chassis punches for socket holes.

If you buy more than 25 or 30 pounds of aluminum at a time you can generally persuade the supply house to knock out your unit-plates on the power brake. Get some cut in the two and three-unit sizes while you are about it.

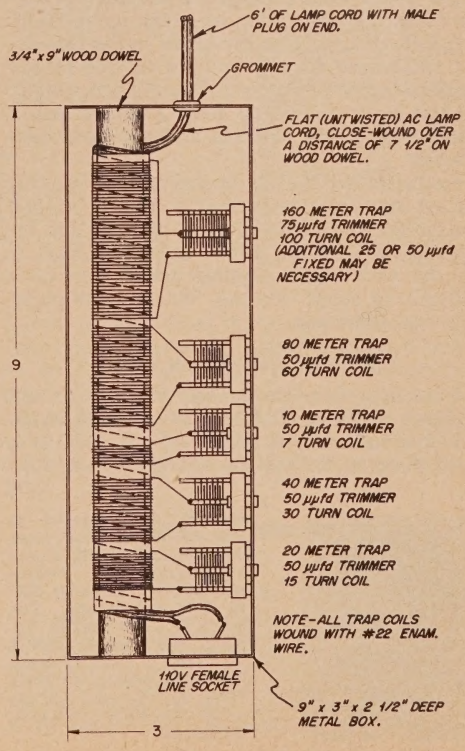
RF on Your Chassis?

Frank Walker, W9KFG

If your antenna setup necessitates juggling some RF in the shack, you may benefit by the experience of W9KFG. Even with a good antenna tuner on the end-fed forty-meter half wave antenna coming into his second-story shack, his transmitter chassis was hot with RF that refused to disappear with the application of numerous grounds and a brute-force a-c line filter. He could still burn out a wavemeter bulb by holding the meter close to the a-c line. Deciding the situation was very ungood, he knitted his brow for a time and came up with this happy solution—an efficient line filter with wave traps tuneable to each band used.

Mounted in a metal box 9x3x3 inches, the filter consists of a single-layer coil of flat lamp-cord wound on a ¾-inch dowel (broomstick) with tightly coupled wave-traps wound as shown in the diagram and coated with polystyrene cement.

With the filter in the circuit, the unit can be tuned by coupling a wavemeter to a loop taken in the cord from the power-line end of the filter. With the transmitter and the wavemeter on the same frequency, the filter for that frequency is tuned for zero or minimum indication of RF on the wavemeter. If no wavemeter is available, tune for minimum RF on the chassis, minimum TVI, etc. If the filters are peaked in the middle of the amateur bands, tuning will be broad enough to eliminate unwanted RF over the entire band.



Simplest is Best

Mobile Feature

Fred Howell, W6MTY

Three years and 80,000 miles with a *Heising* modulated 2E26 have convinced me that simplicity is best—especially in the power-drain department, where the dynamotors of more-complicated rigs gulp as much juice as the engine starter on a frosty morning. If you keep it simple, a mobile rig that will fill pages of log space all the way across the line will work on 300 volts and 100 mils from a vibrator pack that laughs along on only eight amps from the car battery. I'd be using that *Heising* yet, if Frank Jones hadn't suggested something simpler: a mobile adaptation of screen modulation.

A little dreaming on his article in the December 1952 issue of *CQ* brought up the circuit diagram shown in *Figure 1*. *Heising* was simple, but this rig is practically gone! I get by with a grand total of six resistors and six fixed condensers.

Furthermore, the rig conserves "B" power, one of the most important virtues a mobile transmitter can have. Only 4 mils go for incidentals outside the power amplifier! Best of all, the outfit goes together easily and once soldered up keeps working. With so few parts, little can go wrong.

The Circuit and How It Works

Since operation was desired only on 75- and 40-meter phone, the r-f section is conventional. The first half of the 6SN7 tube is used in a tuned-plate crystal-oscillator circuit. Plate voltage is lowered to a safe level by resistor, *R4*, and filtered of modulation products by the electroyltic capacitor, *C5*. For single-band operation, coil *L1* can be fixed. However, with the plate-tuning capacitor shown here, plug-in coils should be used for two-band coverage. Of course, a larger capacitor in the *C7* position would make one coil tune both bands, but this practice is likely to lead to harmonic and overdrive troubles, so it is not recommended.



W6MTY, first licensed in 1936 as W9QAF, has since the war held W4KDV and his present call. Prefers rag-chewing, using 40 CW, 75 SSB and mobile. Formerly OO and SEC in Virginia, and member VFN & VN. Fred is Chief of Space Positioning Branch, Air Force Flight Test Center. Full address: 109 16th St., Edwards, California.

The r-f amplified is capacitively coupled to the oscillator; and a split-stator capacitor with a plug-in balanced coil and center link is used in the plate circuit. The 6L6 tube requires neutralization, which is easily accomplished with this circuit. Other tubes might get by without it—but remember, the 6L6 is simple in price, too.

The modulator circuit is derived from that of *Figure 3* of the previously mentioned article. Using a microphone transformer eliminates one tube section (and removes one more small bit of "B"-power drain). To eliminate vibrator hash and car noises that have a habit of sneaking from the 6-volt system into a microphone circuit, a pair of 1½-volt cells in series are used to supply mike current.

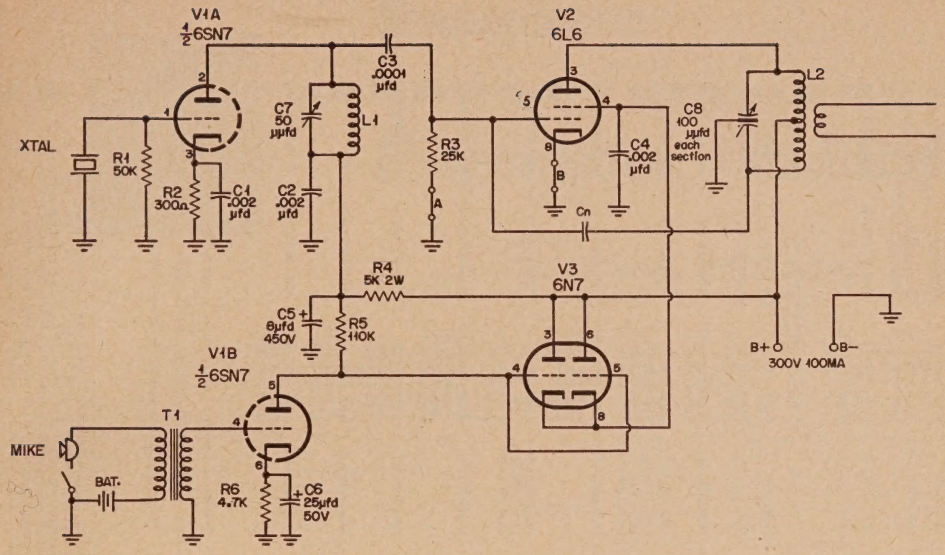
Using the speech-amplifier tube and its load resistor as a voltage divider to supply the cathode-follower grid bias, removed another tube section. Thus, the modulator ends up as a simple voltage amplifier and cathode follower.

This method of biasing the cathode follower does not permit changing the operating point at will, but it is felt that the value of keeping things simple outweighs this disadvantage.

Construction and Operating Hints

The only rigid guide to be followed in the layout is: "Keep the leads short."

Terminals and jumpers are provided in amplifier-plate and grid circuits for metering, although the use of close-circuit jacks (insulating the plate one, of course) would facilitate the



Complete schematic for the W6MTY mobile transmitter.

job. For checking currents, either a multimeter or separate 0-10 and 0-100 milliammeters can be used for grid and plate respectively.

To tune the transmitter, first connect the grid meter and remove the 6N7 modulator. Apply plate voltage and tune the oscillator-plate capacitor for not more than 2 mils of 6L6 grid current. Then tune the 6L6-plate circuit to resonance, as will be indicated by a jump of the grid current. To neutralize the amplifier, adjust the control, *Cn*, for the least grid- current variation as the plate is tuned through resonance.

With the 6L6 tube installed, and its plate circuit adjusted to resonance, as shown by a dip in plate current, the screen voltage should be 150 volts, or one-half the supply voltage. If ncessary, this voltage can be adjusted by changing the value of resistor, *R5* or *R6*. Bias voltage on the 6L6 grid should be set to 50 volts by adjustment of the oscillator-tuning control, as measured with a 20,000 ohms-per-volt meter through an r-f choke clipped onto the "hot" prod. When the oscillator is tuned "on the nose," the amplifier is overdriven, causing downward modulation. This should be checked after the antenna is coupled and the 6L6 tube is drawing its rated operating power.

Several antennas have been used with this rig. A resonant quarter-wave "load" antenna can be fed directly from the output link. The mobile antenna that is being used at present, and which gets good reports at 200-miles range, is a center-loaded *"Master-Mobile"* with the metal covering removed to improve the Q[1]. In fixed locations, as when parked in a picnic ground, a 60-foot length of wire has proved very successful.

C1, C2, C4—2000 µµfd. ceramic disc (Erie 801, Centralab disc Hy-Caps)
C3—100 µµfd. ceramic disc (Erie 811, Centralab disc Hy-Caps)
C5—8 µfd. 450v. tubular electrolytic
C6—25 µfd. 50v. tubular electrolytic
C7—50 µµfd. variable
C8—Dual variable 100 µµfd. per section
Cn—Neutralizing cond—(National NC600V)
R1—50K 1w.
R2—300 ohm 1w.
R3—25K 1w.
R4—5K 2w.
R5—110,000 ohm 1w.
R6—4700 ohms 1w.
Bat—3v. flashlight cells
L1—For 75 meters, 45t. #24 enam. close wound on 1" diam. form. For 40 meters, 22t. #18 close-wound on 1" diam. form
L2—75 meters, B&W 80JVL
40 meters, B&W 40JVL
T1—Single button carbon microphone to grid transformer. (Stancor A-4705, Thordarson T-20A00)
Xtal—Bliley AX2 or PR Z-2 75 meter crystal
RFC—2½ mh. RF Choke
V1a & V1b—6SN7
V2—6L6
V3—6N7—(both sections paralleled)
Mic.—Single button carbon mike with switch

It can be seen from the photos that this rig is larger than necessary, mainly because it was built on the chassis of the old *Heising*-modulated rig, but simplicity was the aim. Anyone starting from scratch could make it much smaller. But regardless of its size, months of operating this rig have proved that simplicity *is* best!

Kansas-Nebraska Hamfest

August 21, at the National Guard Armory in Marysville, Kansas, the Kansas-Nebraska Radio Club will hold its annual Hamfest. More than 200 Hams are expected for this popular yearly affair which will include Hidden Transmitter Hunts, Bingo, Contests, Auction and Prize Drawings. Further info available from WØFDJ or WNØZNP.

ALL TIMES IN EST

EASTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Northern & Central Europe	1430-1800 (1)	0630-1400 (2) 1400-1700 (3-4) 1700-2000 (1-2)	1800-0130 (3-4)	1930-0000 (2-3)
Southern Europe & North Africa	1430-1730 (1-2)	0630-1400 (2) 1400-1800 (3-4) 1800-2000 (1-2)	1830-2300 (3-4) 2300-0100 (2-3)	1930-0000 (2)
Near & Middle East	NIL	0600-1400 (1) 1400-1830 (2-3)	1900-2330 (2)	2000-2300 (1)
Central & South Africa	1500-1800 (0-1)	0600-1200 (1) 1200-1500 (1-2) 1500-2030 (2-3)	1830-0100 (2-3)	1930-0000 (1-2)
South America	1500-1700 (1-2)* 1200-1600 (2-3) 1600-1800 (3-4) 1800-1900 (1-2)	0600-1600 (1-2) 1600-1800 (2-3) 1800-2030 (3-4) 2030-0200 (1-2)	1830-0500 (3) 0500-0730 (2)	1930-0430 (1-2)
South East Asia	NIL	0700-1030 (1)	0300-0600 (0-1)	NIL
Australasia	1900-2200 (0-1)	0700-1000 (0-1) 1600-2000 (1) 2000-2300 (1-2)	0000-0730 (2-3)	0100-0700 (1-2)
Guam & Pacific	NIL	0700-1100 (2) 1500-1900 (0-1) 1900-2130 (2)	2300-0730 (2-3)	0030-0700 (1-2)
Japan & Far East	NIL	0700-1000 (1-2) 1600-2100 (1)	0200-0700 (1)	0300-0530 (0-1)
Greenland	NIL	0700-1300 (2-3) 1300-1830 (3-4) 1830-2030 (1-2)	1700-2000 (2-3) 2000-0500 (3-4) 0500-0900 (2-3)	0200-0500 (2-3)

ALL TIMES IN CST

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Western & Central Europe	NIL	0630-1500 (2) 1500-1700 (2-3) 1700-1900 (1-2)	1900-0030 (2-3)	1930-2330 (1-2)
Southern Europe & North Africa	1430-1630 (0-1)	0600-1400 (2) 1400-1600 (3-4) 1600-1900 (1-2)	1800-0100 (3)	1900-0030 (2)
Central & South Africa	1400-1700 (1-2)	0600-1330 (1) 1330-1530 (2) 1530-1930 (2-3)	1800-0000 (2-3)	1930-2300 (1-2)
Central America & Northern So. America	1500-1730 (0-1)* 1200-1800 (3-4) 1800-1930 (1-2)	0630-1600 (3-4) 1600-2100 (4-5) 2100-0200 (2)	1700-0500 (4-5) 0500-0730 (2-3)	1800-0500 (2-3)
South America	1330-1700 (1)* 1230-1500 (2) 1500-1800 (3) 1800-1900 (1)	0600-1600 (2) 1600-2100 (3-4) 2100-0100 (2)	1800-0430 (3)	1900-0400 (2)
Japan & Far East	NIL	0630-0900 (1-2) 0900-2000 (0-1) 2000-2200 (1-2)	0200-0630 (1-2)	0300-0600 (0-1)
South East Asia	NIL	0730-1000 (1-2) 1000-1930 (0-1) 1930-2130 (1)	0400-0630 (0-1)	NIL

ALL TIMES IN CST

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Hawaii	1800-2100 (1-2)	1000-2000 (2-3) 2000-0200 (3-4)	2130-0300 (4) 0300-0800 (2-3)	2300-0600 (3)
Australasia	1800-2100 (1)	0700-1000 (1) 1500-2000 (1) 2000-2300 (2-3)	2300-0700 (2-3)	0030-0600 (1-2)

ALL TIMES IN PST

WESTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Europe & North Africa	NIL	0700-1300 (1) 1300-1600 (1-2)	1900-2300 (1)	2000-2130 (0-1)
Central & South Africa	1300-1500 (1)	0630-1230 (0-1) 1230-1730 (1-2)	1800-0000 (2)	1900-2230 (1-2)
South America	1500-1700 (0-1)* 1230-1500 (2) 1500-1800 (3) 1800-1900 (1-2)	0600-1400 (2) 1400-1700 (3) 1700-2000 (3-4) 2000-0000 (1-2)	1830-0500 (3)	1930-0330 (2)
Guam & Mariana Islands	1700-2200 (1-2)	0700-0900 (1-2) 1030-2000 (2-3) 2000-2300 (3-4) 2300-0100 (1)	0000-0500 (3-4)	0030-0400 (2-3)
Australasia	1430-2000 (1)* 1400-1800 (2) 1800-2030 (3)	1100-1300 (2) 1300-1900 (1) 1900-2300 (3-4) 2300-0000 (1)	2130-0600 (3)	2200-0500 (2)
Japan, Okinawa & Far East	1300-2200 (1)	0730-1100 (2-3) 1100-1900 (1-2) 1900-0030 (3-4) 0030-0200 (1-2)	0030-0530 (3-4)	0100-0500 (2-3)
Philippine Islands & East Indies	1900-2200 (1)	0700-1000 (2) 1230-2100 (0-1) 2100-0100 (2)	0200-0600 (1)	0330-0430 (0-1)
Malaya & South East Asia	1900-2200 (1)	0700-1030 (1-2) 1030-2200 (0-1) 2200-0100 (2)	0300-0700 (0-1)	NIL
Hong Kong, Macao & Formosa	1600-2300 (0-1)	0700-1100 (2) 1100-2100 (1) 2100-0000 (2-3)	0230-0600 (2-3)	0300-0530 (1-2)

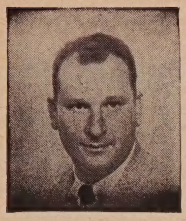
Symbols For Number Of Days Path Forecast To Open:

(0) None (1) 10% (2) 25% (3) 50% (4) 70% (5) 85% or more.

* Indicates time of possible ten-meter openings.

The CQ Propagation Charts are based upon a CW radiated power of 150 watts and are centered on Washington, D. C., St. Louis, Mo., and Sacramento, California. These forecasts are calculated from basic ionospheric data published by the CRPL of the National Bureau of Standards and are valid through September 15th, 1955.

Ionospheric Propagation Conditions



Forecasts by

George Jacobs, W2PAJ/W3ASK

607 Beacon Road, Silver Spring, Md.

Since March I have been including with each month's discussion on general propagation conditions a brief prediction for short-skip paths on the various amateur bands. I have received a considerable number of letters from readers of this column stating that they have found this information very useful and requesting that additional forecasts for short-skip paths be included each month as well as the regular DX forecasts. This month I have devised a *Chart* for presenting forecasts for short-skip conditions. The *Chart* follows the discussion on *General Shortwave Propagation Conditions for August.*

General Propagation Conditions—August

Summer propagation conditions continue through August, being quite similiar to conditions experienced during July. The following is an overall picture of band conditions intended to indicate qualitative changes in each amateur band from month to month. For specific times of band openings on DX circuits or short-skip paths, refer to the *CQ Propagation Charts.*

6 Meters: The occasional short-skip openings as a result of sporadic-E propagation should continue during August, diminishing somewhat during early September.

10 Meters: DX conditions poor with only a slight possibility that circuits will open a small percentage of days to South America. Very frequent short-skip openings between 500 and 1300 miles.

15 Meters: DX conditions improve as fall approaches. Some DX possible during August and late September. Frequent sporadic-E short-skip openings expected.

20 Meters: Good world-wide DX possible from shortly before sunrise to a few hours after sunset, *local standard time.* This will be the best band for DX during the day and early evening hours. Frequent short-skip openings from a few hundred miles to about 1400 miles expected daily.

40 Meters: Conditions are fair to good for DX from shortly before sunset to shortly after sunrise. Static level is higher than during the winter months, but signals should be strong on a good percentage of the nights. This will be the best DX band during the nighttime hours.

80 Meters: Static levels still very high on this band. Fair DX possible to many parts of the world during the nighttime hours.

160 Meters: Daytime propagation limited to less than 50 miles because of severe ionospheric absorption. During the nighttime hours skip possible but high noise levels will limit propagation to less than 1400 miles except if high power is used.

Since there is now considerable amateur activity from Greenland, this month a forecast for the circuit from the East Coast, USA to Greenland is included in the *CQ Propagation Charts* on the opposite page.

Good shortwave propagation are forecast for the entire month except the period August 13-16 which may be somewhat unstable.

Sunspot Cycle

This months forecasts are based upon a predicted smoothed sunspot number of 22 centered on August, 1955. The monthly Zurich sunspot number observed during May

[*Continued on page 49*]

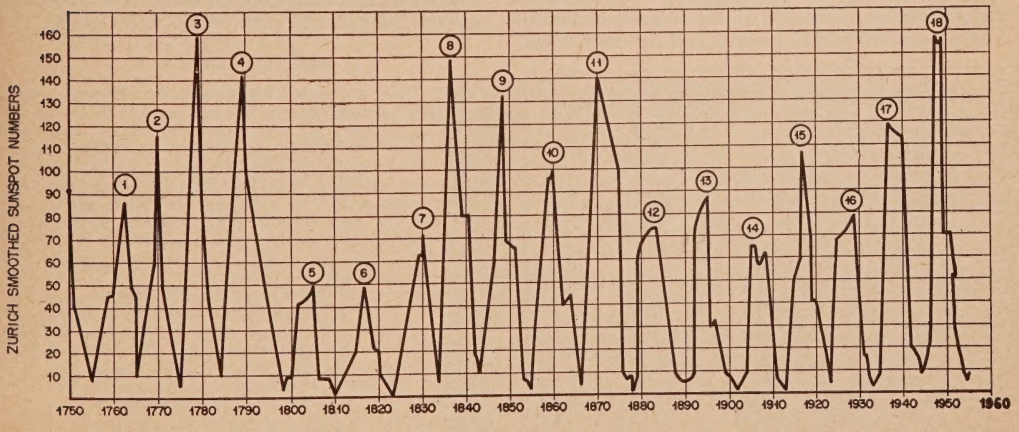


Fig. 2. Sunspot cycles since first observation in 1750 A.D.

RTTY



Reported by **Byron H. Kretzman** **W2JTP**

Not too many moons ago Wayne Green let it be known that he was looking for someone to write a radioteletype column in CQ. Being infected with the TT virus, and consequently a little groggy, I offered to throw something together for him. To try and fill Wayne's shoes (what size are they, anyway?) is a very difficult if not impossible task, so I'll have to stick to the basic purpose of this column: To act as a communication center for information, activity in particular, concerning amateur radioteletype. In this way all of us can keep track of what other fellows are doing, all across the country, even though at times our machines are shut down while we are away in purusit of that all important $—with which we can buy more teletype gear.

"Who the heck is W2JTP? I've never worked him." That, undoubtedly, is the question. Well, the first license came in 1936. From Hempstead, Long Island, W2JTP was on 5 and 2½ meters mostly, "befo de wah," with a little 10 meter mobile and fixed operation. Was an instructor in radioteletype while in the Signal Corps at Fort Monmouth. Wonder how many of you fellows went through the SCRT course there? Since taking the "fatal Step" W2JTP moved westward to Howard Beach and now operates just 2 meters from home and 10 meter mobile. Equipment includes the "Thundering 12" and a Model 21A. In the works is a crystal controlled VHF receiver and a low frequency crystal controlled exciter with rubbery characteristics. These will be the subjects of future CQ articles, when time permits. Activity now seems to be mostly construction.

As soon as the green light for this column came up, I sent out letters to some of the more active fellows across the nation. If any were missed, please forgive me. Time was short. The response to those sent out, however, was terrific. As Wayne once mentioned in an old column, you can always tell who the active radioteletype boys are. They really write you letters. Thanks a million, fellows. Please keep 'em coming.

For the benefit of the newcomer wanting to get on radioteletype, here is how: For information contact the national group, the *Amateur Radioteletype Society,* 163 West 13th Street, New York 11, New York. They publish the *ARTS Bulletin.* The subscription rate is $3.00 per year. Mail checks directly to the Subscription Department, 116-32 132nd Street, South Ozone Park 20, New York. In the east, for equipment communicate with the *V.H.F. Teletype Society,* 38-06 61st Street, Woodside 77, New York. In the west, both information and equipment may be obtained from the *RTTY Society of Southern California,* 3769 East Green Street, Pasadena 10, California. They publish a bulletin called "RTTY." The subscription rate is $2.50 per year. There are other sources of equipment, and if they would like to have it known via this column, drop me a line.

As only a partial list of teletype articles in past issues of CQ, see Nov. '46, Sept. '52, and Dec. '52 for dope on receiving teletype converters. For FSK oscillator information, see April '53 and Oct. '52.

AMATEUR RADIOTELETYPE CHANNELS

National, FSK (mark frequencies; space 850 cycles lower) 3620, 7140, 27,200, 29,160, 52,600 kc.

National, AFSK (2125 cycles mark; 2975 cycles space) 27,200, 147,960 kc. calling & autostart. 144,138 kc. repeater & duplex

California, AFSK 147,850 kc. calling & working

Washington, D.C. AFSK 147,960 kc. calling & autostart. 147,495 kc. working

Chicago, AFSK (FM) 147,700 kc. calling & working

Narrow Shift

Boyd "BeeP" Phelps, W9BP and WØBP says, that from 1919 through 1922 he devoted his life in trying to get hams to listen for him below 220 meters, and several articles in QST were dedicated to that aim. Back in March 1955, however, he sounded out a number of teletype hams regarding tests with him on a narrow shift of 170 cycles, and ". . . everybody wanted to get in the act." W3PYW and W9TCJ went with him to the FCC in Washington where so much encouragement was given that shift "under 900 cycles" was requested for all amateurs via the ARRL directors.

BeeP's letter to the Central Division Director says in part, ". . . We RTTY'ers would like a little change in FCC regulations. We would like to experiment with narrower shift. At present we must use a shift of 850 cycles, accurate to plus or minus 50 cycles, but the tendency for many commercials is to use considerably less than this. With the two carriers closer together in frequency they are more able to fade together than they do now, and we could use a.v.c. to hold the volume level. Few of us can space receiving aerials ten wavelengths



Don Esslinger, W3NQC, uses a Model 26 and is active on 80, 40, and 20 meters with a pair of 812 tubes with about 400 watts input. A two element beam is used on 20. The converter is of the W2JAV type. Best DX so far is the west coast.

apart for diversity like the government and commercial stations do. Narrower bandwidth means greater selectivity can be used in receivers resulting in less interference and less random noise. Thus crystals may again be used in our receivers, or the 800 cycle Collins mechanical filter. In transmitting, while crystal control has advantages for spot net frequencies, few crystals can be made to shift very many hundred cycles. We would like to investigate the advantages of narrower shift to see how far it can be carried. Last, but by no means least, *narrower shift means less QRM* on our crowded ham bands, and this would be material benefit to both RTTY and the CW boys who share the same frequencies. . . . Therefore, narrower shift having many apparent advantages and depriving no one of any privileges, and for better band usage, I request that you introduce a resolution to the Board of Directors of the ARRL requesting that the FCC remove its lower limitation on F-1 frequency shift, that is, instead of the shift being specified as 850 cycles plus or minus 50 cycles, that the wording be changed to specify a shift 'not to exceed 900 cycles' on all frequncies where F-1 is at present authorized."

By now most of you know that George Cooke, the Hudson Division Director, made the motion. The motion passed, but Gil Crossley of the Atlantic Division made a motion for an amendment that the General Manager (Budlong) ". . . investigate the feasibility of acting in this manner, and if found feasible, to so petition the FCC." Now, don't blow your stack, fellows. Remember, the ARRL isn't as well acquainted with radioteletype as we are. We wouldn't want them to take immediate action on just "any idea." Let's be patient. The final outcome is no longer in the lap of the gawds. The responsibility rests squarely on the shoulders of Mr. Budlong. Let's see what happens next.

Across the Nation

Bob Weitbrecht, W9TCJ, writes from Texas, on a temporary assignment. In Fort Worth he visited W5HZF who has a fine a.f.c. system working on his receiver, according to Bob. Back in Williams Bay, Wisconsin, Bob runs 400 watts on 80 and 40 FSK. Receiver is the good old BC-348-Q with Q5-er. (CQ July '53) Machines are Models 14, 26, 12, and a tape transmitter. On the board is a design for a new high stability heterodyne exciter for 80, 40, and 20 meter FSK. Also Bob is getting set for remote control via a UHF link.

Merrill Swan, W6AEE, took time out from his busy preparation for the Pacific Division Convention in Fresno, California, to drop me a few lines. He took his station, including a new 100 watt exciter, but not the KW final—it wouldn't fit in the car. W6AEE at home works all bands with a full gallon, except 2 meters where he runs 50 watts. The h.f. receiver, by the way, is an SX-96. The converter was described in December '52 CQ.

A later report from Merrill says that the Pacific Division Convention on May 21st had twenty-eight radioteletypers in attendance at their meeting. A brief report on the narrow shift motion was given. A talk on terminal units was given by the Robert Dollar Company along with a display of new models. Their 417 terminal unit is being made for CD work and currently is being used in the State of Washington.

Frank White, W3PYW, has equipment ready for 170 cycle shift, and would like to know who else has. Frank is also interested in the possibility of FSK privileges on 160 meters. He says, ". . . You see, the only portions of the ham bands we are permitted to use are those where CW ONLY was authorized. No such portion exists in 160 which has the authorized portions within the band open to both CW and A-3. . . ." W3PYW has found



Howard W. Snyder, W3LMC, has a pair of 26 machines, a Model 12, a 14A reperforator, and a 14AA transmitting distributor for tape. Receiving converters are of the W2BFD type. Autostart is used on 2 meters with a rebuilt 522 receiver. A diode keyer on a Collins 310-B drives a pair of 813 tubes to 800 watts. On 2 meters, a pair of 4-125A tubes run at 600 watts input, feeding a 20 element beam.

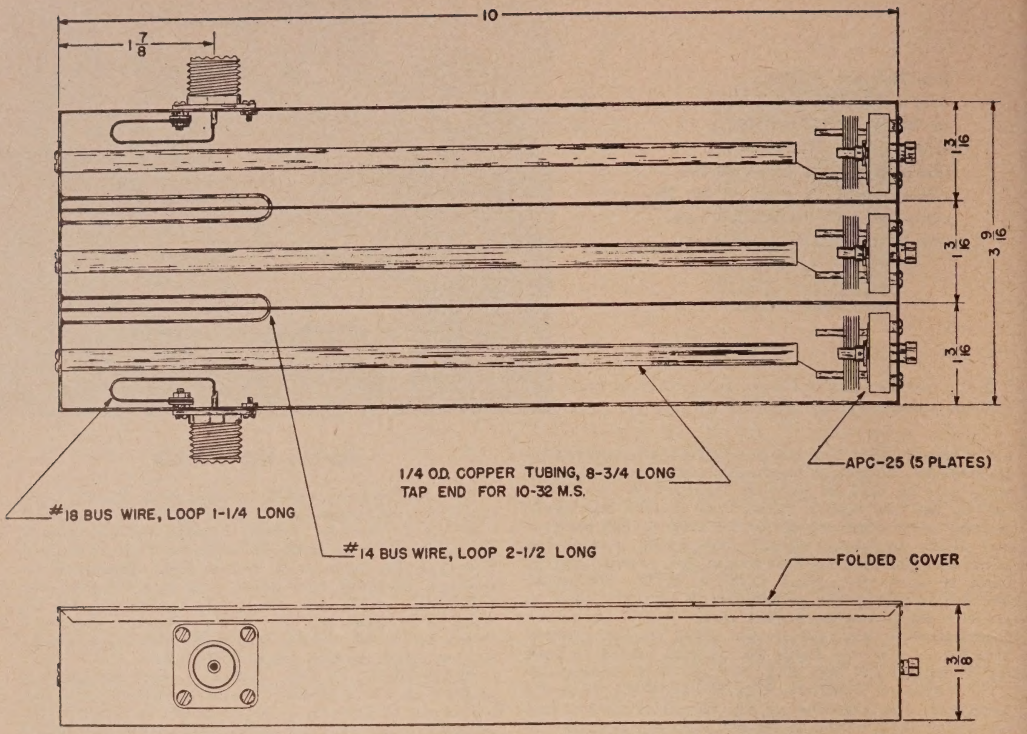


Fig. 1. Simple cavity filter for 2-meter RTTY to prevent receiver blocking during simultaneous CD operations (see text).

20 meters fine for FSK. He works the west coast around 14,144 kc. from noon until the band folds. Speaking of activity, he would like to know where all the New York area fellows are, outside of W2PBG. (Down on 2 meters, Frank.) Frank White is a good source of supply for parts, ". . . until they are gone." and manuals for the Model 26. He will send you a manual for $1.00, postpaid.

Jack Berman, W1BGW, came through with a letter chock full of news. Jack is active on the East Coast Radioteletype Net (3620 kc.) which meets every Wednesday at 7 PM EDT. W1BDI, W1BGW, W1FGL, W1RBF, W2BDI, W2JAV, W2PBG, W2TKO, W2RTW, W3CRO, W3MHD, W3KYR, W3PYW, W3UWM, W4RKD, W9TCJ, W9CNN, W2PAT, and VE2ATC usually report in, Jack says. Net Control station is W3PYW, W2JAV, or W1BGW. Traffic is handled.

Equipment at W1BGW consists of a Model 26, a Model 14 typing reperforator, and a Creed tape transmitter. A Collins 310B1 drives a pair of 813 tubes to a kilowatt. Jack works 80 with a half wave antenna and 20 with a ground plane. Best DX has been DL4RO.

Al Hughes, W1FGL, hopes that the revival of the column will stimulate interest among those who have ". . . not as yet taken a whack at this form of ham communications." Al thinks that many have stayed away because they thought machines were too expensive or the subject too complicated. W1FGL built his first radioteletype transmitter, a pair of 811 tubes, originally for SSB. He now has a pair of 813 tubes to which he can run a kilowatt on 80 and 40. Another part of Al's letter is best quoted directly: "Incidentally, there has been some bad feeling in CW circles that RTTY is causing a lot of interference on the bands. That is not so. We confine our activities almost entirely to 3620, or very close to that, and 7140. Any RTTY you hear anywhere else is almost sure to be commercial—and there are quite a few of them getting into the ham bands, for some reasons. Also, a ham TTy station always signs his call in Morse, and if the station does not sign it is commercial."

Jerry Roberts, W8WJC, moved to Athens, Tennessee, and writes, "Regret to tell you that I sold all radio equipment including teletype a couple of months ago. Purchaser was D. E. Withington, W8IJG, who also bought the location. He may continue with teletype although if he does, it will probably be UHF exclusively. . . . " Hope you get going again from Athens, Jerry.

Baltimore was represented by a nice letter, with pictures, from Howard Snyder, W3LMC. Howard has 800 watts for 80, 40, and 20, plus 600 watts and a double "Brownie" beam for 2 meter AFSK. Machines are two Model 26 and a Model 12. The one 26 is arranged for demonstration purposes as a portable, with a small receiving converter as a companion unit. Locally, W3NQC is on 80, 40, and 20 with 400 watts, a Model 26, and a "Little Nemo" W2JAV converter. Two meter operation is contemplated. Don has been instrumental in obtaining machines as ". . . occasionally a few are released locally. . . ." W3LZZ will soon be on with a Model 26, also.

Roy Weise, W2TKO, is trying to stir up 2 meter activity in the Buffalo area, but to no avail. He tried Toronto, the Lake Erie Shore, and mid-N.Y. State, but no interest. Roy works 80, 40, and 20 with a Model 26, a Model 12A reperforator, and a 1A tape transmitter. He can get on 6 or 2 meters ". . . at the drop of a hat, but gotta have someone to contact!"

Al, W2CFT, hasn't been as active on 2 meters as he has been in the past. Trouble seems to be a boat and SSB. When I visited him in Lake Ronkonkoma he told me that only a few New York City area stations got out that far on Long Island. It appears to me that we need better VHF techniques. The converters and machines are good, but you can't always work 50 to 100 miles with the old 522 and a "J" antenna just above the roof.

Herb, W6ZH/K6EV, one of the early RTTY men on the west coast operates a 12 when at home either at San Marino or Carpentria. He has a Collins KW-1 at Carpentria which was modified for FSK according to the dope in the April 1953 RTTY Bulletin.

New York Area

Clay Cool, W2EBZ, is now editor of the ARTS Bulletin. It is to him that much thanks are due for helping to prepare this column. John Williams, W2BFD, has petitioned the FCC, through official New York City CD channels, for permission to operate an automatic unattended radioteletype 2 meter repeater station in the Municipal Building skyscraper. The altitude would permit solid, commercial quality, CD teletype communication from one end of this vast city to the other, as well as to adjacent suburban CD centers. Operation could be easily interlocked for CONELRAD with WNYC, in the same building. This project is referred to as "BURP Operation" on the local 2 meter AFSK channel.

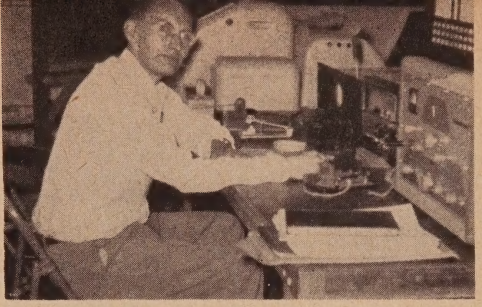
Andy Stavros, W2AKE, has a new Model 100 single magnet machine which is comparatively quiet. Other equipment consists of a Model 14 keyboard perforator and a WU 10A reperforator. He is in the process of setting up for full automatic tape retransmission.

Peter Selmer, W2TLY, expects to move out to Patchogue, Long Island. On his work bench is some tape gear and an electronic distributor. Pete expects, also, to get on 80 meter FSK from out there.

The radioteletype CD test held March 22nd is old news by now, and has been previously reported; however, the statement of James J. Costigan, Acting Director of New York City Civilian Defense Radio Communications in a letter of commendation to all those who participated bears repeating; "The use of radioteletype during the CD exercises on March 22nd was a most impressive demonstration of the potentialities of this medium for emergency communication."

As an interesting sidelight on those 2 meter tests, it was found that it was impossible to operate, at the same time, the other CD 2 meter A-3 channels in the same buildings due to receiver blocking. This is a VHF problem which has been very neatly solved for the Nassau County CD by Everett Gibbs, W2FI, the Radio Officer and EC, and we are greatly indebted to him for permission to pass along the information of how he did it, and to Carroll A. Hamlet, Jr., W2QBR, for the actual mechanical details.

Briefly, each of his receivers has a three section cavity filter between the coax relay and the receiver. Don't let the words "cavity filter" scare you. They are very simple but effective devices, and are not too hard to build. Made from flashing copper, each "cavity" has a more-or-less square cross section of 1-3/16" by 1⅜", and a total length of 10 inches. The center pipe is an 8¾" length of ¼" copper tubing, tapped at the ground end for a 10-32 screw. A five plate "APC" trimmer capacitor at the other end tunes the line. Hairpin coupling loops of #14 wire couple the sections together, and to the input and output coax connectors. Figure 1 shows mechanical details of the assembled filter.



Bob Unsworth, W6MTJ, at the operating position of W6AEE/6 at the Pacific Division ARRL Convention May 21, 1955. That's a DX-100 Heath Kit transmitter, modified for FSK, at the far right end of the operating table. The receiver is an SX-96. The terminal unit is W6AEE, described in December 1952 CQ. Photo is by W6ZNU.

Adjustment is greatly simplified if a VHF signal generator is available, but can be accomplished without it. An "S" meter on the receiver, or a temporary VTVM connection is essential, though. The main idea is tune the filter to pass the desired channel and at the same time attenuate the undesired channel as much as possible. Of course, the farther apart the two channels are, the more effective are the filters. A separation of at least two megacycles is desirable.

The July '54 issue of CQ describes a cavity filter section used for a different purpose, but three of these, connected by ¼ wave cables, would serve the same purpose. Just make sure that they are *not* connected so that the transmitter feeds the antenna through them. They must be in the *receiver* antenna circuit, only.

Another application, more or less obvious, is to permit duplex radioteletype operation, or to permit monitoring a calling channel while operating the working channel, that is, if you are lucky enough to have two machines. Some do, you know.

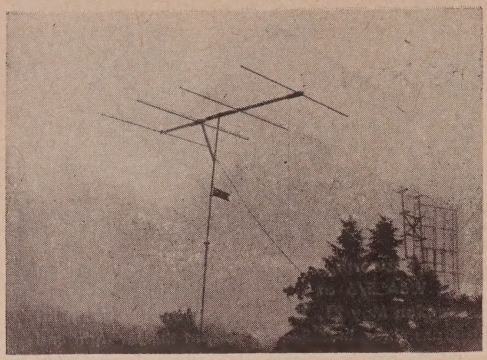
Wal, that's about the size of it. If you like the column, let's hear from you. Here is your chance to let everybody know what you are doing, or thinking of doing, with radioteletype. If you don't like it, let's hear from you anyway, or do I have to start something like: Let's standardize on vertical polarization for VHF teletype; or, why shouldn't we get permission to use AFSK on 160 meters, if they don't like F-1 and since A-3 is already permitted??

DX—Hot off the wire

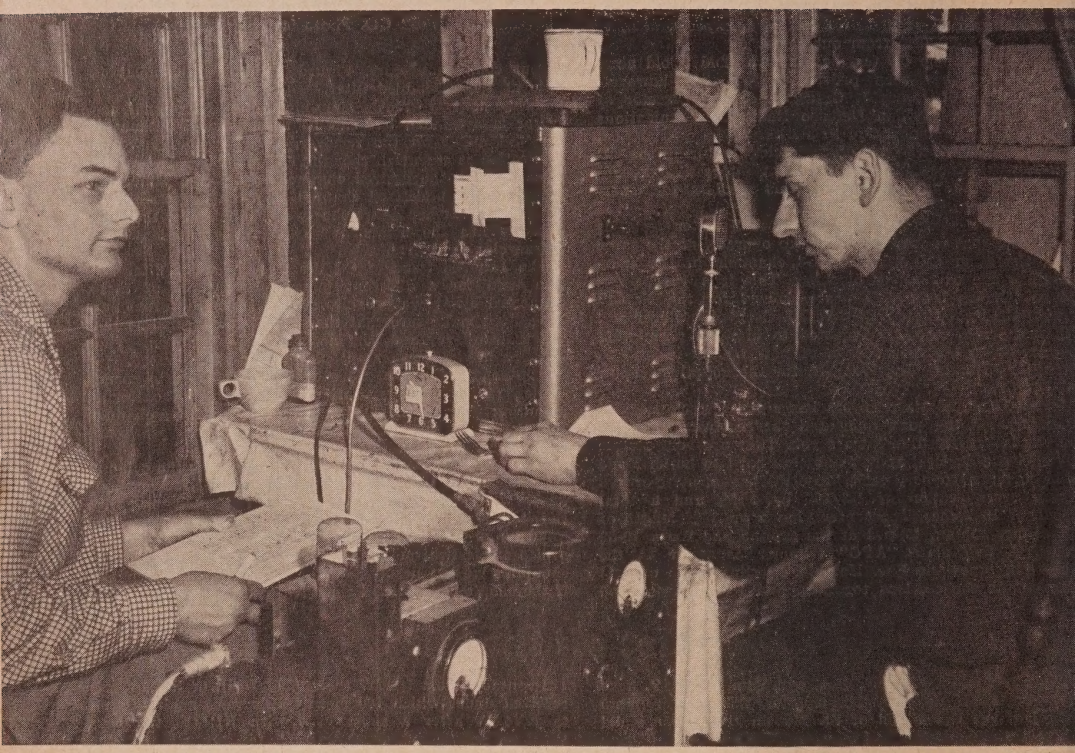
As this is written W6OXS, Bob, and Sam, W6VUP, have just concluded their Caribbean trip. While their main objective was the island of St. Martin their license did not materialize at the last moment. The granting of such licenses necessitates a change of laws by the N.W.I. Government and we are advised by PJ2AA that such a change will be made. Thus, this trip may have accomplished the purpose of making future expeditions to this island a much easier matter. W6OXS and W6VUP operated from HH7W, HHØA, KV4AA and W6OXS/VP2. First contacts from HH7W, on June 17th, were K2JNE, W5WQ, W4CEN, W4YDT and W9FGX. After making 112 contacts from HH7W their official call of HHØA was received under which 100 more QSO's were made. Flying to KV4AA after a short visit with KP4JE, the boys spent a couple of days waiting for an OK on the PJ2M-license but as hopes of this grew dim they accepted the invitation of VP2VA (Tortola, British Virgin Islands) and proceeded to knock off 350 contacts, as W6OXS/VP2, during their two day stay. Field Day QRM limited operation at VP2 somewhat but the familiar line-ups occurred later on. A total of 27 countries were worked in all continents but Asia. First QSO's were: W8WJD, W6AM, TI2PZ, W3QT, W10JR, K2GMO, K2BZT, G4CP, G5DQ, ON4AU, SM5LL, DL3BJ, W4LYV, SM7ANA, F8VB, OK1NC, G3FXB, DL7FW and W8BRA. CW was used throughout with phone reports being given to TI2PZ and W1FH. An ELMAC AF-67 and FMR-6A did the chores from HH while A VIKING I was used at VP2. Sam and Bob left KV4-land for Miami on June 27th for their cross-country drive back to LA . . .

. . . Via W3POE, further news on ZS8 says that ZS1PD will be there from about August 8th to 26th running 70 watts on 7 and 14 Mcs. Probably call: XS1PD/ZS8, or, a regular ZS8 call . . . W6GAL/7 has been deluged with YA6GAL cards and will hang on to them on the outside hope that the guys logs will come through . . . PY2CK reports C8GA, 050, and CRIØAN, 14107. Missing TA3AA cards may be obtained via W6OME . . .

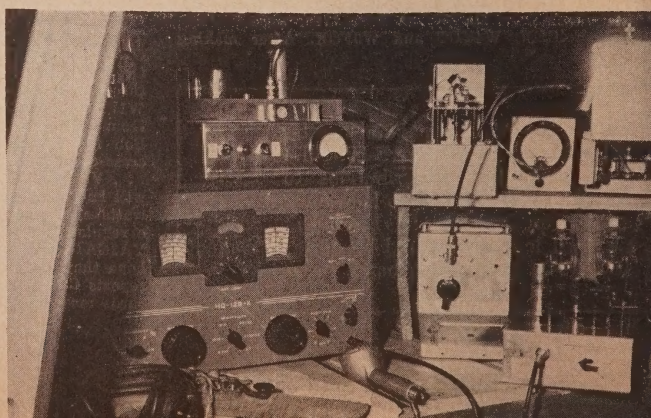
The "YASME" expedition has been fitted out with an ELMAC AF-67, all band 60 watt transmitter. Contributions to defray partial cost of this and to help toward operating expenses for this round-the-world, two-year long, trip would be most welcome at KV4AA. Let's give a hand!



In the foreground the 6 meter beam. The 16 element 220 mc. and the 32 element 430 mc. bedspring can be seen in the background to the right.



Sully (W1DDN) and Paul (W1PYM) at the 2-meter installation in the rangers cabin a'top Pack Manadnock.



220 mc.-430 mc. operating position installed in the back seat of Bob Gubas' Ford.



VHF

Reported by Sam Harris, W1FZJ
P.O. Box 2502, Medfield, Mass.

Well you asked for it, so here we go again. Lots of things happened in the last month. Among other things I got my first taste of two meters in New England. Believe me, for a fellow raised on mid-west v-h-f it's quite a treat. The first night I was able to rotate "Big Bertha" I logged one hundred two meter stations in twelve states. Activity while somewhat heavier on the first megacycle is pretty evenly distributed over the band. You can't just tune the low end and quit because contacts are as likely to be made on the high end as anywhere. This poses quite a problem when your receiver has twenty inches of band spread and five kilocycle skirts. Best solution seems to be less CQ's and more tuning.

Polarization on Two (New England Style)

Of the better than two hundred stations logged to date, about twenty percent are using vertical polarization. Another twenty percent are able to use either vertical or horizontal. The majority of those using vertical are doing so for reasons of convenience or economy. Not much strong feeling about either way. The DX minded use horizontal because that's what the guy on the other end is most likely to be using. The vertical boys have just as many contacts and just as much fun. When the band opens up down the coast everybody works everybody anyway.

Power

Average power runs about twenty to thirty watts. High power one hundred watts, with kilowatts few and far between. Lots of mobile operation. Low power with either vertical or horizontal polarization is bound to give you dozens of contacts anywhere within fifty miles of Boston.

DX

Despite the logging of twelve states, I haven't heard anything that I would dare call DX. After all W4HHK might be listening and what would he say if he heard me calling three hundred miles DX? While we are on the subject of DX, what do you think of a list of schedules and frequencies? F'rinstance as follows:

W9WOK	— 144.15 to	W4HHK	— 144.1	2000 EST
W8IJG	— 220.15 to	W3SUK	— 220.6	1500 EST Sundays
W8YFP	— 50.5 to	W1FZJ	— 50.05	2030 EST
VE1QY	— 144.2 to	W1FZJ	— 144.3	2100 EST
W1FZJ	— 144.3 to	W2NSD	— 144.5	9830 EST Daily

Please get your comments in on this so we can get going. If you are maintaining schedules which you feel would interest others, send us the details.

Correspondence

Received a card from Gil Severns (W6QR) asking what happened to the VHF column. What I'd like to know Gil, is what happened to W3QKI? Or W9SUV? Or W2QED? Seems like if we keep sending you all our good v-h-f men, we ought to be hearing some signals coming back pretty soon. Or at least some news.

Visits: June 11, 1955

Up betimes and off to Waltham where I did join the W.A.R.A. safari bound for New Hampshire and the upper reaches of Pack Manadnock. The object? Bring home the bacon in the June VHF contest. The equipment? Six meters with a four element rotary and thirty watts. Two meters with a twelve element flip-flop and two hundred watts. Two-twenty megacycles with a sixteen element beam and forty watts. Four thirty megacycles with thirty-two driven elements backed up with a screen reflector and fifty watts. The operators? A real bunch of triers. The Results? Nothing short of terrific. Ninety-six contacts and thirteen sections on six, two hundred and forty-three contacts and thirteen sections on two, fifteen contacts and nine sections on two-twenty and ten contacts and eight sections on four-thirty. This, as any v-h-f man can tell you, adds up to a total of 16,727 points. A new high score for W1MHL/1, club station of the Waltham Amateur Radio Association. Made possible in the main by the efforts of such veteran expeditioneers as Bob Guba (W1QMN), in charge of 220-430 installations, Paul Day (W1PYM) two meter entrepreneur, Harold Jenson (W1LUW) and Bill Coburn (W1ELP) six meter triers. Other members of the intrepid crew were Bill Hayden (W1YTL), Dick Metz (W1YVB), Southard (Sully) Lippincott (W1DDN), yours truly and son, Pat. Also contributing greatly to the overall

effort was Roy Finan, New Hampshire State Forestry Department Ranger. The splendid cooperation received from Ranger Finan certainly spelled the difference between success and failure.

I've always considered myself a pretty good contester, but my hat's off to the W.A.R.A., a sterling group of v-h-f men with plenty of organization, lots of spirit and plenty of know how. Or, as the Australians are wont to say "A real bunch of triers."

Expeditions

With vacation time hard upon us, many good men are heading for the hills. We'd like to spread the word among the faithful but we must get the information by the first of the month in order to catch the issue which comes out on the twentieth. We are planning three tries this summer. The first will be from Pack Manadnock in New Hampshire on August 5-6-7. Operation will be on 144.3 Mc., 220.1 Mc., and 432 Mc. The two meter set-up will be operating continuously Friday night until 1000 EST Saturday, July 30th. Operation will recommence Saturday night at Sundown and continue through to midnight Sunday. Power input will be one kilowatt. A 64 element horizontal beam will be doing the squirting. Directional CQ's using CW will be sent on the first five minutes of each hour. The next five minutes will be spent in listening for signals in the specified direction. Remaining time will be spent in contacting all and sundry. Arrangements for 220 Mc. and 430 Mc. skeds will be made via two meters. A monitor receiver will be running continuously tuned to 3.805 megacycles in case anyone wants to contact us the hard way. Tune up your receivers fellows and give a listen. We'll be looking for you. Details on our second go will be in the next issue. As we are restricting our activity to the New England area, you have a choice of Maine, New Hampshire, Vermont, Rhode Island or Connecticut. (If you want Massachusetts you'll have to work W1OOP.) Present plans schedule this effort for September 2-3-4. If you've any "druthers", you'd best let us know before the first of August.

News and Views

Coincidental with the raising of my two meter beam I received the cancellation notice on my old call. I am now addressed as W1FZJ ex-W8UKS. I hope the guy that gets my old call likes it as much as I did.



The new two meter beam is the same array I used in Ohio. Sixty-four elements. Thirty-two driven and thirty-two reflectors. Transmitter uses 4-400 A's at one kilowatt. Receiver uses a pair of WE 416 A's in cascade grounded grid with a crystal mixer. Noise figure using a PRD noise generator is between two and three db.

The six meter beam is still being tuned. It consists of eight halfwaves in phase with eight reflectors. Transmitter is one kilowatt using a pair of 833 A's in the final. Receiver is a pair of 6J4's cascade grounded grid and a crystal mixer. The crystal controlled oscillator in this convertor uses a 2N33 point contact transistor in a circuit designed by Gordon Conley (W8AIN). If anyone's interested in the details on this convertor we'd be glad to supply them on request.

S.S.W. CONTEST

ANNOUNCING the First Annual CQ SSW Contest: A "*States and Stations Worked*" contest for two-meter operators . . .

WHAT

The SSW is a contest designed primarily for two meter operators.

We have long felt that any VHF contest should be scored in such a manner that patience, hard work and continued activity will play as important a part in the final score as good locations, high power and big beams.

Scoring has been set up so that the biggest factor in a high score is activity.

WHO

SSW is open to all licensed amateurs. Provinces in Canada, the District of Columbia and all recognized countries are considered as separate states, and licensed amateurs residing therein are eligible.

WHEN

SSW is scored on a monthly basis. Contest for 1955 begins at 0001 local time July 1. Contest closes at midnight local time on the last day of each month. Certificates will be awarded monthly to each state's first and second place winners.

High scorers for the year in each state will receive special yearly certificates (and prizes?). Yearly contest closes at 2400 local time, December 31, 1955.

HOW

All that is required to enter the SSW is to turn in your monthly score on or before the 10th of the following month. Log sheets may be obtained by addressing the "Log Department, P.O. Box 2502, Medfield, Mass."

SCORING

Stations may be contacted up to five times per month for credit. Two points are counted per contact per station per day up to four contacts a month (total 8 points) and ten points for the fifth contact, making it possible to make 18 points per station per month. Contestants claiming three states or less are allowed an additional five contacts with each station per month, (on separate days) for a maximum of 28 points per station per month.

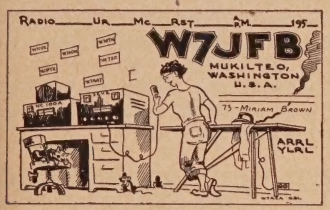
MULTIPLIERS

A multiplier of 10 is used for the first state contacted. A multiplier of 20 is used when two states have been contacted. Add two more to the multiplier for each state additional worked up to ten states (multiplier of 36) and then one more for each state over ten states. Provinces of Canada and the District of Columbia count as states. The states worked multiplier is carried over from month to month. Only one contact per year with each state is required for use as a multiplier.



K5ADQ

NIKKI BOYD
2271 - 34TH
LOS ALAMOS, N. MEX.

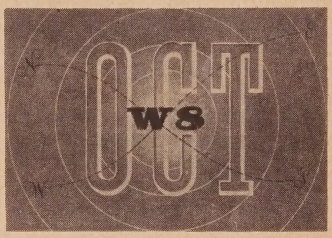


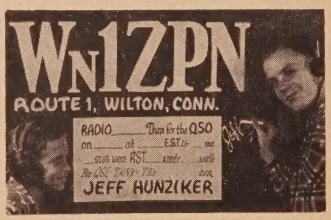


QSL CONTEST WINNERS

Shown above is the August winner in CQ's QSL contest. This classic design takes the prize this month—a two-year subscription to CQ. Scattered about the page are runners-up.

Honorable mention goes to Natalie Hunter, W700K, whose velvet-lined passionate purple perfumed QSL is unfortunately unreproduceable by our printer, since it would require a special run of velvet-lined pages and copious gallons of perfume. Better work her if you want one.





Next Month — September starts the *New Look* in *CQ*, with at least *twice* as many pages of articles . . . on antenna matching, transmitters, test equipment, "I" 's (TVI, GDI, EOI, etc.), SSB, rack and shack layout, economy modulators, a special report on the URSI meetings in Washington, "New Horizons in Radio Communications", plus more on RTTY, VHF, a larger Novice Shack, and a special report on the YLRL convention . . . and miscellaneous items.

TRI-STATE HAMFEST

The Tri-State Amateur Radio Society holds its annual Hamfest Sunday, August 28 at Bowers Grove, 8 miles north of Evansville, Ind., and 2 miles west of Grumpy Pals on highway 41. Large signs will be posted along the highway. Mobiles may check in on 10 & 75. Activities statrt at 10 a.m. with games and contests for all members of the family. Refreshments. Basket dinner at noon. Four big Heathkit prizes: DX-100, VFO, VTVM, & Grid-dip Meter plus smaller prizes. Registration $2.50 per person. Further info from Callie Jones W9UHV.

DX



and Overseas News

Gathered and reported by
R. C. "Dick" Spenceley, KV4AA
Box 403, St. Thomas, Virgin Islands

AFGHANISTAN, YA6GAL: As we write (June 14th) 14 Mc. denizens have been slightly agog over the appearance of this station who has been dispensing many contest type contacts. OK1MB states that beam headings from Prague are in the right direction and Beda was heard calling YA4BBR at one time. The YA6 requested QSL's via W6GAL but he is unknown by W6GAL/7. Should more facts come to light they will appear in the "last minute DX news" of this issue.

ANDORRA, PX1OP: HB9OP advises that he will go to Andorra for an eight to ten day stay about mid-August. He seems confident of receiving the license. An input of 200 watts will be run and tentative schedules for all band operation are given as follows: 3.5 0200 to 0500 GMT, 7 0600 to 1100 GMT, 14 and 21 1100 to 2400 GMT daily.

LAOS, XW8AB: This station has been officially licensed in Laos and runs 50 watts, CW, on the following frequencies: 14,000/012/050/080/100. His name is Marcel Zinck, ex-DL5BS. It should be pointed out that FCC rulings prohibit contacts between USA hams and amateurs in Laos. A letter to the FCC, by the Laos authorities, stating that they have no objection to foreign contacts by Loos hams, would serve to lift this ban.

COMORO ISLAND, FB8: F9RS states that there is a possibility that an FB8 station may appear from this spot around September.

SARAWAK, VS4CT: Pete, VS5CT, appeared on the air from Sarawak around June 5th as confirmed by QSO's with W6DI and W1FH. He may stay there a couple of months and then return to VS5 or go to ZC5-land.

SAN MARINO, M1C: W4CEN reports that I1BDV and I1ZCR plan to be on from San Marino, using the call of M1C, from August 1st to 5th. 200 watts will be used on phone and CW. Operation will be continuous on 7 and 14 Mcs.

FRENCH GUIANA, FY7YF: Possibilities of contact with this spot are greatly enhanced with the arrival of FY7YF on 14 Mcs. His name is Gaby Wong and QSL's may be sent c/o PAA, Cayenne. QRQ op.

AALAND ISLAND, OHØ: The visit of OH1NK, OH1PI and OH1ST to this spot during March 21st and 22nd resulted in 274 contacts. Another trip is planned this Summer. There is a permanent ham on Aaland whose call is OHØNB but he is a newcomer and his activity is confined to 3.5 Mcs. when on.

ASCENSION ISLAND, ZD8AA: W2AH advises that Tom, ZD8AA, will be off the air, for most part, until the middle of October as he is studying for an exam. He also advises that his call is being "pirated" on phone.

UGANDA, VQ5FS: This station has been heard on various frequencies on the 14 Mc. band, CW, T8. He gives his name as "Terry" and QTH as Box 118, Jinja. VQ5FS will be there for two years.

PITCAIRN ISLAND, VR6AC: Via W5MIS we hear that Floyd, VR6AC, will be on 14,143 each Tuesday and Saturday from 0300 to 0500 GMT. A3.

GOUGH ISLAND (TRISTAN DA CUNHA), ZD9AD: G2DPY advises that G3HPM will be on from this QTH for four months this Winter. He will be on all the DX bands including 160 meters if he can get some 160 xtals.

FORMOSA, BV1US (Via West Gulf DX Bulletin): This station has been very active on phone, 14250, and runs 100 watts to a VIKING I. Operating hours are from 0800 GMT, daily, until the band goes dead and all day Saturdays and Sundays. George has held the calls of W3VDC and DL4NV and presently holds the stateside call of W4FFA. He will return to Taipei soon with increased power. Special watch is kept for European contacts on Friday and Saturday nights. His antenna is a cubical quad and receiver an SP600-JX. All QSL's are answered when received.

DX Notes

CT1JS reports that **CR8AB** will fold up soon and return to Portugal. It is possible that another ham will appear from Goa. . . . We have indications that **MP4JO** is located in IRAN. . . . VP2MY is now in Tortola with the call of **VP2VC** and will use phone on 3.5 and 7 Mcs. . . . W4IHN reports **ZA1KAD** who said QSL via I1ZZ. . . . **LB8YB** returns home in September and will QSL to all. . . . **CR1ØAN** was reported on various 14 Mcs. CW frequencies by West Coast and European stations. . . . **VK9OQ**, 14020, is in Papua. . . . Rumors have it that **FW8AB** will soon be on again. . . . **WØELA** reports that

UAØKI and **UAØKAB** were heard QSO'ing W's like mad, 0600 GMT, 14030, and requesting QSL via Box 88, Moscow. . . . We have it that Bob Ford, ex-**AC4RF**, will soon appear as a VS6. . . . SM5ARP recently spent some time on the air as **3A2AW** in Monaco. . . . W4LVV wishes it known that he has never received the logs from **FG7XA** and **FG7XB** so was unable to send out cards as planned. . . . Again on the QSL subject, Gene, **W4BRB**, states that he does not QSL for anyone (PX1AR, 4W1AB etc.) and, should a thing come to pass, we will know in advance. . . . Bud, **VP5DC** (Turks and Caicos), advises that QSL for both him and **VP5BM** should go via W4NMO. They will both be active from this spot for a year or more. . . . **ZP5IT** may be found on 21,350 running 30 watts with a VIKING Mobile rig on CW. See QTH's. . . . W6VUP and W6OXS have left on their Caribbean jaunt and were due to arrive at HH2RM on June 14th. They hope to operate from both sides of St. Martin should licensing problems be resolved. . . . West Gulf DX Bulletin notes as follows: Jim, **ZC2PJ** (Direction Island, Cocos), says: Regret that I am a transient here and will return to Ceylon in August. Hope that my relief will take the rig over so that there will be an active ZC2 here. A QSL received from Otto, **KP6AK**, on Palmyra says that the population on that island is one (him)! **SVØWM** is W6TBJ and is located near the Athens Airport. He runs 30 watts to a Mosley beam. **SU1IC** advises that he is the only officially licensed station at present

Our heartiest congratulation go to the following station upon his achievement of WAZ:

No. 308 SM7QY GUNNAR EKSTROM 40-182

Gunnar completed this when a card was received from AC4NC confirming a 1954 contact. SM7QY is the third SM station to hold this award.

We also welcome the following station as a newcomer to the HONOR ROLL:

W2HSZ 35-159

(He has been heard daily around 0000 GMT near 14078). See QTH's. **ZD6RM** is GM3EAK and will be in Nyasaland for four years. **VQ8CB** is active daily on 14090 at 1200 GMT. Active in Macao are: **CR9AI** (14 Mcs. CW VFO), **CR9AE** (Off and on 14) and **CR9AH**, ex-VS6AG, 21 Mcs. phone and CW. **VS1CZ** skeds both **AC3PT** and **AC5SQ** at 1430 GMT 14 Mcs. daily. . . . **W6BYB**, on Caribbean trip, was heard from FY7-land on May 27th. Since then he has been on from FM7 and is presently (June 16th) in FG7. . . . We hear there will be an active ZS8 on in August. . . . **ZC6AA** seems to be NG as beam reports put him somewhere in the Gulf of Mexico. W6PYH overheard him say "QSL via W5FGE" (?). . . . From DL7AA we hear that **M1H** gave his name as Casalli and QTH, Box 89, San Marino. . . . **DL1CU** is applying for a license to operate from San Marino during September. . . . W6LW noted **KF6CP** on the band giving his name as "Roy" and QTH, Asia. . . . W8OCT suggests that ZL and VK stations listen for **OY7ML** on 14053, 0600 GMT, weekends. No VK's/ZL's have been hooked by OY7ML as yet. . . . W9HUZ reports **VQ4EO**, Paul, ex-**VQ3EO**, is back on the bands around 0400 GMT, 14036. . . . Via CN8MM we hear that **MP4QAI** is on phone daily but operates in the U.S. phone band. There is no FE8, FD8 or FL8 activity at present but Eva hears that **FB8AM** is active from Amsterdam Island. . . .

With the upswing of band conditions and in preparation for the tremendous increase of DX activity which will result we have a couple of procedure suggestions which might save considerable time and headaches for the busy DX, or other, stations.

Two schools of thought may exist regarding the rubber-stamp type of QSO. It cannot be denied, however, that such contacts have their value as a means of greatly increasing the NUMBER of contacts with sought-for DX stations.

It is suggested that the letters "SQ" be added by any station to their CQ or "QRZ?", just before sign-off, to indicate that a short, snappy, contest type QSO is desired consisting ONLY of an RST report. The letters "SQ" may be interpreted to mean "SHORT QSO". Should such a request not be honored by the contacting station (Who might come back:—dr OM vy hpi to QSO you here in Minneapolis, ditty dada ditty, Minneapolis etc.—) the DX station would be justified in "dropping him by the wayside" and going on with the next contact.

Conversely stations desiring long contacts could indicate same by the letters "RC", for "Rag-chew", inserted just before sign-off.

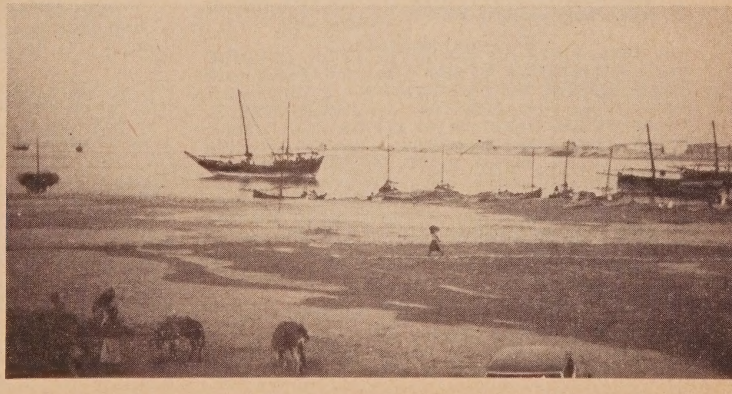
Another suggestion which appears very practical to us comes from G6QB's column. This transmits QSL information in a minimum of time and is applied as follows:

QSLB—Send your card via Bureau.
QSLD—Send your card direct.
QSLA—I will QSL after I receive your card.
(We add) QSLBA—I will QSL via bureau after I receive your card.
QSLDA—I will QSL direct after I receive your card.

Should this system strike your fancy let's go ahead and use it. Through it's use the word should spread quickly.

DX'ploits

Chas, W1FH, reaches 261 with **PJ2MA** and **VS4CT**. . . . ZD3A and **FW8AB** moved Don, W6AM to 256 while Andy, W6ENV, hit 255 thanks to **MP4QAL**. . . . Frank, W6SYG, added PJ2MA and **VR6AC** to reach 254 while namesake Frank, W6AOA, lingers just behind with 253 thanks to **YJ1DL** and **ZD8AA**. . . . Walt, W6MX, jumps to 252 with PJ2MA, FW8AB and YJ1DL as Frank, W6MEK, makes it 252 with MP4QAL. . . . Lindy, W8BHW, is heard from again as he reports addition of ZD8AA for No. 248. . . . Jock, ZL2GX, comes up to date with 18



A very nice catch, radiowise, is Halul Island, Qatar. This spot has recently been ably represented on the Ham bands by Fergus, MP4QAL, and predecessor Tony, MP4QAH. Photo courtesy MP4QAL.

auditions which jumps him from 228 to 246 as George, VE4RO, moves to 242 with PJ2MA. . . . YJ1DL gave Dewey. W6VE, No. 238 while Clyde, WØELA, adds nine to reach 229. . . . John, W6EFM, ups to 224 thanks to VR6AC, YJ1DL and MP4QAL while Bert, G8IG, nailed ZD8AA for 218. . . . Vaughn, W6ID, now rests on 161 with HKØAI, VP5BM and 4X4BX as Glenn, W8KIA, adds ZD8AA for No. 245. . . . Stan, W1CLX, steps to 238 with KC6CG while Howy, W2QHH, reports a'47 French St. Martin QSO with FG8Z for No. 228. . . . Roger, W1JYH, reaches 222 with HKØAI and EA9DF as Joe, W8UAS, is helped to 216 by KC6CG. . . . Carl, W7ZL, keyed with VR3A for No. 212 and Ian, GM3CSM, added LB8YB for 192. . . . Lee, VK3XO, goes to 174 with VQ8CB and VO2EM as Larry, W6CAE, comes up to date with 14 additions, which include KT1UX, ZD6BX, ET3S and VQ3FN to reach 161. . . . Bob, WØQVZ, adds SU1IC for his 39th zone and reaches 161 with VS1CW, LU3ZG, VP8AQ and VQ3CF while Pat, W2GVZ, hits 194 thanks to PJ2MA and VS1GL. . . . Frank, OE1FF, keyed with ET3C, HB7-MX/HE and VK9AU for 158 as John, W4HA, added VS5CT, HB1MX/HE, FB8BZ (new zone), VR6AC, VS2CP and PJ2MA for 194. These plus TF2WAB also moved Johns phone total to 188. . . . Rip, W4EPA, goes to 175 with HKØAI and TI9MHB while a new list from WØANF gives Harry a CW/phone total of 164. . . . A new list plus VS4CT gives Guy, W6DI, an A3 total of 211 as Ernie, W6KQY, miked with VK9RH, VS5CT, PJ2MA and VR6AC for 188 in the phone section. . . . ZD6RM and ZP5AY put Chas., F9RS, on 157 while Ted, TI2BX, idled closer to the century mark when OH1PN, OX3AY and KW6BB gave him 98. . . . K2GMO, recently returned from DL4-land has 117 countries to show for 7 months operation. . . . Hal, VE3IG, reached 105 with HKØAI, 3V8AB, FY7YE and LZ1KSI. . . . WØTGB went to 58 with CP5EP on 21 A3. . . . W8JGU reached 168 with ZD3A, VS1FS and YA6GAL (if good). . . . YO3RF finally nabbed XE1MJ for Zone 6. . . . QSO's were noted between MP4QAL and ZL2AG-YN1AA. . . . DL7AB has 115 on 21 Mcs., 101 phone, latest are 3V8AP, MP4KAC, VP5SC, PZ1RM, CX5AD, JA1CJ and TG9AZ. . . . Lloyd, DL4ZC, pulled a 19 minute WAC on May 16th nabbing VK4YP, LU1AR, JA7AD, DJ1ER, W4PVD and FA3OA. This beats a WAC made by him at JA2KG by 12 minutes! . . . Russ, W3MFW, went to 181 with VQ6LQ, KC6CG, MP4QAL and YA6GAL (?). . . . The VIKING RANGER at K2DSW is two months old and has garnered 51 countries for Bob. Recent addition was 4X4IC which completed WAC.



Operating position of TI9MHB, Cocos Island, is shown above. Johnny Beck's efforts from this spot, last February, resulted in over 2000 contacts. Photo courtesy W6MHB.

European (WAE) DX Contest

This year the German D.A.R.C. is directing the first European (WAE) DX Contest between the radio amateurs of Europe versus the outside world. Special rules will aid WAE Certificate aspirants.

Dates: CW Section, 0000 GMT, September 7th to 2400 GMT, September 18th.

Phone Section, 0000 GMT, September 24th to 2400 GMT, September 25th. Numerical group exchanges will consist of the RST (or RS) report followed by a three digit figure representing the number of the contact.

Each station may be worked once only per band.

Each European call area as per the WAE-country list counts one point towards the multiplier.

The following countries will act as substitutes as follows:

GM Shetland Islands (add "/S") for Franz Josef Land UA1
LA Northern Norway (add "/N") for UB
OH Northern Finland (add "/N") for UC
SM Northern Sweden (add "/N") for UN
GM Orkney/Hebrides Is. (add "/O") for UO
OZ Bornholm Island (add "/B") for UQ
DL7 West Berlin (add "/7") for UR
DM East Germany substitutes for UA1/2/3/6
SM1 Gotland substitutes for UP
IT1 Sicily is separate

The word "northern", in the above, indicates stations above the Arctic circle and the suffixes in parenthesis indicate the way such stations will indentify themselves.

A voluntary QTC feature has been added to this contest whereby scores can be substantially increased. (This is involved, but we will try to explain it.)

A QTC contains the time, call sign and the QSO number ie: 1200 G6ZO 113. This would signify that the non-European station originating the QTC had contacted G6ZO at 1200 GMT and that it was G6ZO's 113th contact during the contest.

After a certain number of initial contest QSO's have been made it may be desired to send a series of QTC's reporting former contacts in the above manner. Say five such reports were sent to your next European contact (The maximum is ten QTC's per station per band). This would be numbered 1/5 which denotes it is your number one series and consists of five QTC's. Your next transmission of messages might be numbered 2/3 with similar meaning ie: 2nd series, 3 QTC's. Each QTC counts for one point. QTC's are only limited by the number of contacts you have made and so are able to report. QTC's already sent cannot be re-sent to a different station. QTC's are sent only by non-European contestants.

Bonus points are also given as follow: 1 point for each station contacted on three bands. 2 points for each station contacted on four bands. 3 points for same on five bands.

Final score will equal the sum of your contacts plus QTC points plus bonus points as multiplied by the sum of



It's always fair weather (in Miami) when old DX'ers get together. Here are (l to r) Ken, K2BU, whose new cubical quad is cutting a swath on 14 Mcs, Jose, TI2PZ, whose fist we envy and host (the one and only) Buck, W4RBQ, whose DX total is in the 200's.

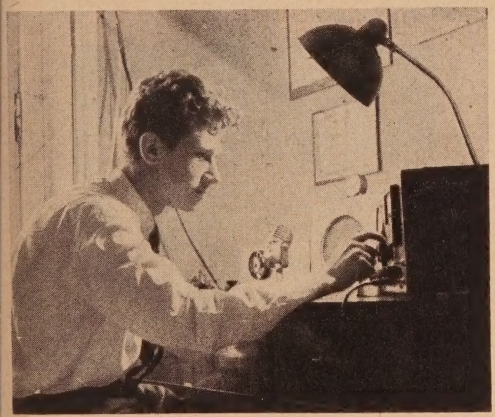
different European countries worked on each band. Times should be in GMT and logs should be postmarked not later than November 20th 1955. Mail to DARC DX Bureau, Fuchsienweg 51, Berlin-Rudow, Germany. (Complete rules may be obtained from this address)

Here and There

Luis, CE3AG/CE3AX, ex-CEØAA should have now completed his trip, with XYL, which resulted in visits with many of his ham friends in the USA, England, France, Belgium, Holland, Denmark, Norway, Sweden, Italy, Germany, Spain and Switzerland. . . . KV4AA logged visits from Brad, KP4TF, Syd, VP2MC, Wes, W4HDN and XYL Liz, Harry, W4PQ and XYL Chris, W4YJD. . . . W8EGB is now out of the army and much in evidence with his KW. . . . Fritz Franke of Hallicrafters visited YV-land. He was kept in touch with home news via W9FKC, YV5EC and KV4AA. . . . Dave, K4BQH and Leo, W4EDE, are willing to go along with any DX'pedition that may be brewing. . . . Officers of the South Calif. DX Club are now: W6YMD, Pres. W6VSS, Vice Pres. and Editor of the Bulletin. W6SWG, Sec'y and W6OYD, Treas. . . . W7ROM/5 may be reached via Box 620, Biloxi, Miss. . . . GM3CIX expects move to foreign country (London) where he may be heard as G3CIX. . . . LU3HR keyed from HC1FG while on way to visit USA. . . . PJ2MA's QSO No. 8 was with Phil, W3SOH, instead of W3HOH as printed.

Indentification of 1955 Argentine Antarctic Stations, Bases and Countries may be determined as follows:

SOUTH ORKNEY ISLANDS, Laurie Island: (Endings are letters A, G and M)
Call blocks: LU1ZA to LU9ZA, LU1ZG to LU9ZG, LU1ZM to LU9ZM.
(5 active stations)



Mario Giganti, I1CWZ, of Milan, Italy, operates on all bands with home-made 50 watt rig. Receiver is a Hallicrafters S-76. Dipole antennas are used on 7, 14 and 21. Mario has worked 94 countries.

SOUTH SHETLAND ISLANDS, Deception Is: (Endings are letters C, I and O)
Call blocks: LU1ZC to LU9ZC, LU1ZI to LU9ZI, LU1ZO to LU9ZO.
(6 active stations)

SOUTH SHETLAND ISLANDS, Moon Bay: (Endings are letters S and T)
Call blocks: LU1ZS to LU9ZS, LU1ZT to LU9ZT.
(6 active stations)

ANTARCTICA, Melchoir Archipelago, Observatory Is. (Endings B, H and N)
Call blocks: LU1ZB to LU9ZB, LU1ZH to LU9ZH, LU1ZN to LU9ZN.
(7 active stations)

ANTARCTICA, Grahamland, Margarite Bay, Gen. S. Martin Base (D, J and P)
Call blocks: LU1ZD to LU9ZD, LU1ZJ to LU9ZJ, LU1ZP to LU9ZP.
(8 active stations)

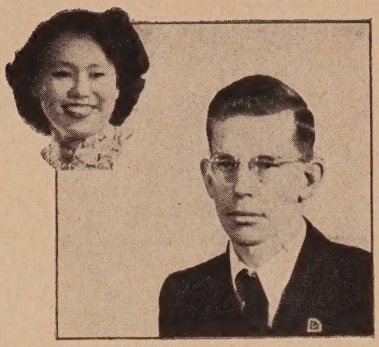
ANTARCTICA, Grahamland, Punta Proa. Admiral Brown Base (E, K and Q)
Call blocks: LU1ZE to LU9ZE, LU1ZK to LU9ZK, LU1ZQ to LU9ZQ.
(4 active stations)

ANTARCTICA, Grahamland, Hope Bay: (Endings are letters F, L and R)
Call blocks: LU1ZF to LU9ZF, LU1ZL to LU9ZL, LU1ZR to LU9ZR.
(11 active stations)

ANTARCTICA, General Belgrano Base (Tierra de Coats) (Endings W)
Call block: LU1ZW to LU9ZW.
(7 active stations)

ANTARCTICA, Mobile stations: LUØZD and LUØZV.

All QSL's go via LU Bureau. (Thanks to LU5AQ)



Op Dave Laing, YJ1DL, of Port Vila, New Hebrides and his XYL, Mabel. YJ1DL operates on CW daily on 7 and 14 between 0130/0230 GMT and 0600/0730 GMT. The rig is home-built, 6AG7-6L6-813, running 50 to 200 watts depending on the line voltage. Receiver is a "veteran" BC-348. Dave operated from ZC3AB, Christmas Island, during 1953-4, and is also VK2DE. A QSL is guaranteed for all YJ1DL contacts by Mabel who chases the cards and collects the stamps. The story behind Dave and Mabel appearing on these islands is interesting—Dave is an Australian but Mabel is Hongkong born of Chinese parents. Altho she has a British passport she is not permitted to reside in Australia, New Zealand or Canada. So Dave and Mabel must keep wandering from place to place seeking a permanent home.

Australian Award

WAVKCA (Worked all VK call areas)

This award is available to any amateur submitting QSL's, to the W.I.A., Box 2611W, Melbourne (GPO) C1, confirming contacts with the following areas as follows:
One QSL from VK Antarctica, Cocos, Heard and Macquerie (VK1)
Three QSL's each from VK2, 3, 4, 5, 6 and 7
One QSL from VK5 Northern Territory
One QSL from Admiralty Is., Bougainville, New Britain, New Guinea, New Ireland, Papua and Norfolk Is. (VK9) Total 21 QSL's.

Applicant must be a member of an affiliated Society of the IARU and sufficient IRC's should be included to cover return postage. QSO's should date from January 1st 1946.

(Courtesy West Gulf DX Bulletin)

[*Continued on page 52*]

the YL's Frequency



Monitored by

Louisa B. Sando, W5RZJ

Jicarilla Apache School, Dulce, New Mexico

New YLRL Officers

Congratulations to these newly elected officers of YLRL: President, W9LOY, Alice (Cris) Bowlin; vice president, W9YBC, Gloria Matuska; secretary-treasurer, WØMMT, Marie Ellis; editor of *YL Harmonics*, W3RXV, Margaret (Peg) Ferber; publicity chairman, W1TRE, Barbara Harrington. Their term started July 1 '55 and, under the revised constitution, they will serve until Dec. 31, 1956, after which officers will undertake their duties on Jan. 1st of each year.

President W9LOY, Cris, has served YLRL as 9th D/C during the past year. She is an active member of LARK (former president) and holds permanent possession of the LARK cup after winning the third consecutive club contest. W9LOY was licensed in 1950. She is active on 40 and 75 phone, checks into the YL nets, and holds YLCC. Her OM is W9RQF and they share a Viking II.



W9LOY, Alice (Cris) Bowlin, newly elected president of YLRL.

Other hobbies include photography, painting in oil and watercolors. They have one boy, aged 6. QTH: 6563 N. Tahoma Ave., Chicago 30, Ill.

W9YBC, Gloria, before taking over as VP had been serving YLRL as publicity chairman. (For photo and write-up see "YL's Frequency," CQ, Sept. '54, p. 30.) Her QTH: 2322 S. 2nd Ave., N. Riverside, Ill.

Secretary-treasurer WØMMT, Marie, has found Ham radio an absorbing and time consuming hobby since her brother first introduced her to it by parking his trailer house next to hers and setting up his rig in the breeze-way between them. She started with a Novice in Dec. '52, and General was received in May '53. Now she is SEC for Colorado, belongs to the Colo. Emergency Phone Net, works in Civil Defense, is an asst. director of the Rocky Mountain Division and is secretary-treasurer of the Trout Route Mike & Key Club. As Marie says, in addition to all this, now she has taken on a real job! In her trailer home WØMMT has been using a Viking I mostly on 75 phone and 80 CW. Now she and her OM (not a Ham) have bought a home and are remodeling it. And one feature Marie expects to enjoy is an 8 x 13 radio room for which WØMZV has built her a 500-watt all-band rig with built-in VFO. Marie has a grown son and daughter and six grandchildren. Her new QTH: 531 Cowan St., Ft. Collins, Colo.

Editor W3RXV, Peg, was re-elected, having served in this post during '54-55. (For write-up about Peg, see "YL's Frequency," CQ, Sept. '54, p. 30.) The arrival of baby Ray, Jr., this spring interfered slightly, but Peg is now back on the job. Her QTH: RFD #2, Slatington, Pa.



W1TRE, Barbara Harrington, publicity chairman of YLRL.

W1TRE, Barbara, who takes over as P/C, has been on the air since 1951, operating 10, 15, 20, 40 and 75, though 20 is her favorite band. She is alternate NC of the 20-meter YLRL phone net, and checks into the 75 YLRL net. She has WAC on phone, and is working hard for DXCC with 81 countries worked and 62 confirmed. Recently she was one of the lucky ones to work YNØYN and is hoping it will count for a new country. She earned highest phone score in Eastern Mass. section during '54 Sweepstakes. W1TRE and OM

W1JEL share a half kw. rig. Her brother is W1UBB and bro-in-law is W1TAO. Barbara is an R. N., and has two daughters aged 5 and 7. QTH: Haverhill Rd., Topsfield, Mass.

YLRL District Chairmen

D/C's elected for the '55-56 term are:

W1——A tie between **W1VYH**, Elizebeth Wood, and **W1RLQ**, Grace Swenson. Run-off vote is in process.
K2IWO, Hilda Andrew, Rt. 2, Box 289, Newburgh, N. Y.
W3TSC, Camille Hedges, 4315 G St., S. E., Washington 19, D. C.
W4BLR, Katherine Anderson, 5210 Raleigh Rd., Richmond 23, Va.
W5SYL, Iva Haley, 1122 Grand Prairie Rd., Grand Prairie, Tex.
W6FEA, Gertie Cassady, 5542 E. Washington Ave., Fresno 2, Calif.
W7——To be appointed.
W8LGY, Ruth Rickett, 570 E. Weber Rd., Columbus 2, Ohio.
W9AQB, Norma Courtney, Elmwood Ave., RR #2, Mishawaka, Ind.
WØKJX, Lydia Johnson, 1258 Van Buren, St. Paul 4, Minn.
Canada——To be appointed.
Canal Zone——**KZ5LM**, Lois Magner, Box 373, Margarita, C. Z.
Hawaii——**KH6AFC**, Hazel Keefer, 3459 Kahawalu Dr., Honolulu 17, T. H.

Each of these YLs will be happy to hear from others within her district, especially new news for *YL Harmonics*. Also, YLRL welcomes new members. Write to your D/C for information, to WØMMT, or to your column editor.

YL Get-Togethers

Twenty-eight licensed YLs attended the Oregon State Convention at Portland on May 7-8. Sat. noon the YLs and XYLs enjoyed a luncheon and each lady registered received a boutonniere of rosebuds made of wood fiber by the Portland girls. Sun. morning a breakfast and style show was the feature attraction, with merchandise certificates as prizes. At the banquet Sun. evening the ladies received many prizes, the main one being a cedar chest filled with all the things that cedar chests are supposed to contain. YLs enjoying the convention included: W7's: ECC, ENU, FKS, FXE, HHH, ITZ, NJS, NTT, SBS, SBX, SJW, SYF, QKU, ZWX, QXH, RAX, RIC, RVM, UEL, UFN, ZKY, ZLS, ZLT, SPC; WN7's: WFO, ZMN, WRA, ZNG. Seventeen of the girls attended the YL operators luncheon, at which a travel iron, donated by W7QKU, QXH and RVM, was won by W7ENU. W7RVM, Helen, was secretary of the Portland clubs that sponsored the convention.

The fifth W9-area YL Get-Together was held May 20-22 at the Allerton Hotel in Chicago with 42 present. W9MLE, Peggy, tells us activities started off with a tour and luncheon at Hallicrafters and then a tour through Allied Radio. Hallicrafters furnished an SSB transmitter and receiver which were set up in one of the hotel rooms and the YLs operated this station on 75 throughout their get-together. Supper was served in the LARK suite. On Sat. the group took a sight-seeing tour around Chicago and then met for luncheon and a business meeting at Younker's Restaurant at which time they voted to hereafter call their annual meetings the Midwest YL Convention. Prize drawing followed and a banquet at 6:30, with many of the OMs present. Convention chairman W9BCA, Helen, supplied this list of the girls attending: W1YVP; W4DEV; W8's: UAP, UAU, UUK, ATB; W9's: WYJ, BCA, IFT, LOY, SPI, AQB, LAS, QMA, IRD, BCB, MYC, MXI, QXI, IWP, KQC, YBC, RUJ, OMZ, MLE, LRT, SJR, YWH, AYX, TMZ, YXK, SYX, LDK, KFC, W9ZXZ; WN9TDC; WØKJZ, and several unlicensed girls. W9MYC, Gladys, tells us the convention next year will be held in St. Paul at the invitation of WØKJZ, Lydia.



YLs enjoying the Midwest YL Convention at Chicago, May 20-22. For calls, see text.

W6FEA, Gertie, was in charge of activities for the YLs at the Pacific Division Convention at Fresno, Calif., May 21-22. A YL meeting was held Sat. afternoon following the luncheon for all YLs and XYLs which featured a fashion show and surprise prizes. Special guest at the YL meeting was W6QPI, Betty Gillies, who spoke on the Powder Puff Derby. Prizes were two $10 gift certificates from Elmar Electronics and other prizes donated by W6FEA, JMS and K6EIA. Sunday a YL breakfast was held at Harts Cafeteria. W6PCN, Peggy, tells us YLs registering were W6's AVF, FEA, FKV, QGZ, JMS, JZA, LFF, PJF, QGX, QMO, QPI, ZTJ; K6's: BJM, CAL, DEN, EHW, EIA, EXQ, LAF; KN6HII.

The New Mexico State Hamfest at Albuquerque on June 4-5 brought together W5's: BZB, RMH, TLI, ZUD, RQK, PKL and RZJ.

With the Clubs

The San Diego (Calif.) YLRL, which was disbanded for a couple of years, became active again in January and has been meeting the second Friday evening of each month at the Red Cross Hq. Bldg. The group numbers fifteen active members, twelve of them licensed YLs, and they are holding classes for theory and code practice. At their installation luncheon held June 11 at Cafe Del Rey Moro in Balboa Park, W6MWU, Mary Poe, succeeded W6OLP, Alice McCleary, as president. Other new officers are K6AWP, Kathleen Kreysler, vice president; K6CAL, Isabel McKenney, secretary; K6EOG, Billie MacDonald, treasurer. K6LDX, Bessie Vernon, is publicity chairman, and K6BPK, Deane Smith, is education chairman.

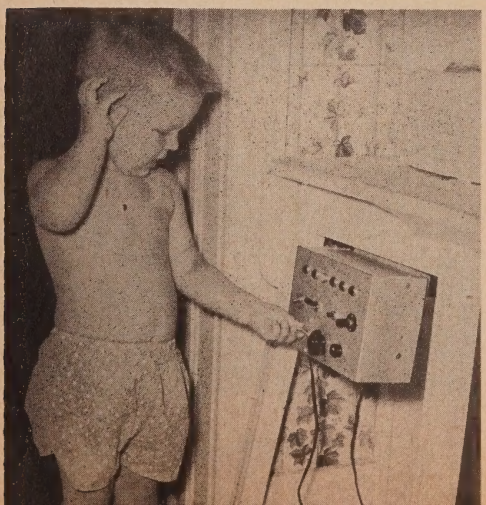
The Los Angeles YLRC also held their installation of officers ceremony on June 11. The new officers are: W6QOG, Helene Leonard, president; W6AKE, Lorraine Freeberg, vice president; K6GMX, Jayne Dynes, recording secretary; K6EXV, Lucille Harmon, corresponding secretary; W6DXI, Gladys Eastman, treasurer. As is now the custom, an engraved gavel was presented to W6PJU, Mildren Griffin, as past president. Under her leadership L.A. YLRC has grown from 35 to 60 members during the last year.

The YLRC/San Francisco also has been carrying on a membership drive which has increased the club roster from 17 to 28 members. During the drive President W6QMO, Jeri, carefully combed the Call Book for what appeared to be YL names. W6PCN, Peggy, tells us they netted a "Romaine," a "Cleo" and a "Claire" who sent their regrets but felt that they wished to continue their OM status!

FLASH

Santa Monica, June 25—The First International YLRL Convention is proving to be a huge success. Nearly 100 YLs have registered, with every U.S. call area, Alaska, Hawaii and Canada represented. Watch for details in next issue.

Jr. op Loren Thompson gets a "rig" of his own to keep him out of the big rig at W5YRT-YTM.





WØMMT, Marie Ellis, secretary-treasurer of YLRL.

LARK of Chicago announces its new list of officers for the coming year: W9BCA, Helen Boddy, president; W9YXK, Rita Von Derhaar, vice president; W9IWP, Mardene Magnus, secretary; W9YWH, Evelyn Tibbits, treasurer; W9SYX, Peg Weigert, publicity chairman; W9LDK, Adeline Weiland, editor of *Pinfeather;* WN9TDC, Blanche Drye, Novice representative. This club is growing rapidly, with more than 30 members at present.

The New York City YLRL reports the following as current officers: W2IQP, Lil Klarfeld, president; W2IGA, Ruth Kalish, vice president; W2MVV, Alma Skeete, secretary; Helen Zuparn, treasurer. They hold meetings at the N.Y. State CD Hq.

The YLs of St. Petersburg, Fla., held their first organizational meeting in January and selected the club name of SPARC-YLs (pronounced Sparkles). Officers are: W4TDK, Naomi Spence, president; W4BIL, Frances Foley, vice president; W4BAV, Catherine Seeds, secretary-treasurer. Other members are W4AVA and W4WPD.

Worked All YL Certificate

The South African Women's Radio Club offers a Worked All YL certificate. If you hold QSL cards from different YLs worked in ZS, ZE, CR, VQ and OQ lands, since 1/7/52, you may be entitled to one of the certificates. Amateurs outside the above countries need have only 10 QSLs for confirmation. These should be sent to SAWRC Secretary ZS2FD, Stella Brown, P.O. Lovedale, C.P., South Africa.

From the OMs

OM W2BVS writes that in QSOing DL3VR he learned that his XYL, Kaethe, DJ1AC, spent several months in hospital. Fred suggests that Kaethe might appreciate hearing from some of her DX friends. . . . W3YFW writes to tell of two "firsts" for his XYL. Betty, WN3APT, got her ticket at Christmas time. Her first QSO was on 12/26. A few hours later her second "first" was the arrival of a baby girl. Now Betty is active on 80 and 40 CW and 75 phone.

"Rig" For the Jr. Op

The Owen Thompson family of Tyler, Texas has solved the ever-perplexing problem of what to do with the jr. op while they, Owen, W5YTM, and Maxine, W5YRT, get on the air. At the age of three Loren was so interested in Ham activities that "pop" built Loren a "rig" of his own to keep him out of the RF. WN5FLS reports that the rig has six different colored lights across the top which light up and blink when different combinations of switches are thrown. They can be lit individually or in any color combinations from two to all six. Loren finds it a very interesting device and sets the lights blinking, relays clicking and buzzers buzzing. With Loren occupied and year-old Curtis not yet able to pull switches, Maxine finds time to operate on 75 phone and 40 CW and especially enjoys checking into the Texas YLRL net.

33 till next month—*W5RZJ*



the Novice Shack

Conducted by

Walt Burdine, W8ZCV

RFD 2, Waynesville, Ohio

Born in Kentucky, raised in Indiana, W8ZCV has been a farmer at Waynesville, Ohio for 19 years. In addition to plowing, planting and harvesting, Walt has found time for radio & TV repair work, electronic test equipment assembly for the Air Force, and hamming. Licensed in August 1946, he now holds 10-meter phone WAS, WAVE, WAC, WBE, Radio Onda DX no. 26, RCC, EC, WPR, needs Asia for WAC/YL, needs North and South Dakota for WAS/YL, and has worked 101 countries on phone with a maximum input of less than 100 watts. On 2 meters Walt has 17 states and 8 call areas, not bad for southwestern Ohio. W8ZCV operates 160 meters thru 435 Mc, but is most often found on the 2-meter band, working Novices. Hobbies: "Chasin' wimmen"—ONLY ON THE AIR, flying, and color photography.

Dear Readers of Novice Shack:

It is with mixed emotions of fear, hope, trust and elation that I become the steering wheel for the Novice Shack. I fear that my two predecessors, W9EGQ and the late W2GJV have done the job far too well for me to be able to add any brilliance to the shining lights that have led "THE NOVICE SHACK" to its high following.

My hope is that along the way I may be able to drop a few hints to help those searching for that elusive prize, the General ham license. I trust that all you novices, pre-novices and the technicians will get me your ideas on what technical subjects would best aid your progress in amateur radio. I will try to discuss them in terms that you can understand. My aim is to help you—and to do so, I must have your help. REMEMBER, this is your column, let's make it grow. Again I must say, hats off to the late W2GJV and W9EGQ for a good job.

I sincerely hope that all novices, pre-novices and hams in general read the excellent article about ham radio in the early 1955 issue of PARENTS MAGAZINE. The article, "Ham Radio For The Whole Family," was written by Walker A. Tompkins, K6ATX. If you missed the article you might check with your local library for a copy, as I understand it created quite a furor amongst the would-be ham ranks. That kind of publicity is good for ham radio.

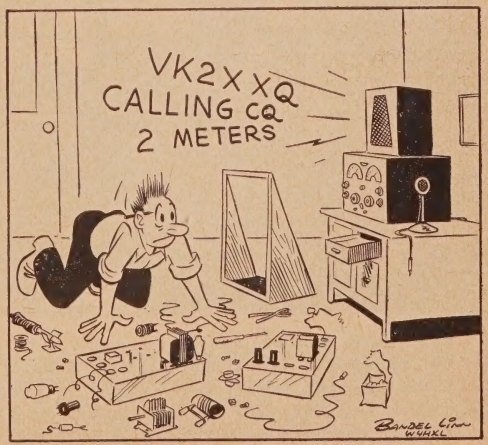
I hope to meet quite a few of you VHF novices and technicians at the VHF Picnic, July 31, at Turkey Run State Park near Terre Haute, Indiana. Bring the family, a basket with too much food and the ham spirit of friendship with you and spend the day. If you are a confirmed low-frequency addict, come and get inoculated with the "VHF Bug." For further information, write: Charles Hoffman, R.F.D. #6 Box 34, Terre Haute, Indiana.

For the technicians in our midst, we quote the following from a letter from our old friend, Bill Mantooth, W4MKJ, Louisville, Ky. "Here is a list of hams in the Louisville area on the 435 mc. band: W4YAL, Dr. Coleman: W4PQU, Steve Dawson: W4PSE, Mell Bullock: W4OXN, Flavil Ford: W4DHL, Herman Logsdon: W4MPV, George Neiderhardt. QTH's in the callbook. If you wish schedule on 435 mc. write W4PSE or W4YAL.

You will be hearing KN8 calls before long because the call, WN8BRK was issued about the middle of May. This is the second time through the already issued W8 calls and the W8- WN8 calls are going fast. I had a visit from Delmer W. Phillips, WN8BRK, 2514 Haines Road, Dayton 10, Ohio. He had never been in an amateur station before and was quite interested in which band and what equipment was needed to start his initial station.

This month the technical portion of NOVICE SHACK will try to explain how to go about getting an amateur license and a few ideas to help the novice and technician newcomer decide how and where to get started.

The bands available for the novice are: A. 3700-3750 kc., B. 7150-7200 kc., C. 21,000-21,250 kc. and D. 145-147 Mc. CW can be used on all these frequencies and phone can be used in the 145-147 mc. band only. The novice license was initiated to help as a training aid to learning the code and I would suggest using CW as much as possible, at



least until you can pass the General license test. The technician license gives you the use of all rights above 50 Mc. except the use of the 144-148 mc. band.

The band to be used by the novice or technician depends on a number of factors. Space limitations, available power, financial conditions, technical ability and location are factors useful in making your decision. We will take up each of these factors in more detail.

SPACE: Good low-frequency antennas require a fairly large amount of space for their proper construction and erection. The length of the antenna proper can be determined by formula, but the height of the antenna is important too. There is no best height but an antenna thirty to forty feet high will give very good results. Special DX antennas should be fifty feet or more. That does not mean that DX can't be worked with an antenna fifteen feet high. I have worked 101 countries with an antenna twelve feet from the ground. A properly designed and fed half-wave antenna can work plenty of DX. The formula for calculating the length of a half-wave antenna is:

$$\text{Length in feet} = \frac{468}{\text{F Mc.}} \text{ or } \frac{468{,}000}{\text{F kc.}}$$

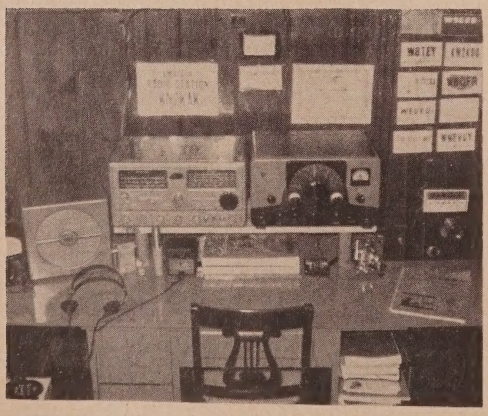
using this formula we come up with a half-wave antenna for the center of each novice band as follows: For 3725 kc. the antenna is 125 feet, 7 inches. For 7180 kc. the antenna is 63 feet, 10 inches. For 21,200 kc. the antenna is 22 feet, 7 inches and for the two meter band the antenna is about 38 inches. If you can put up a half-wave antenna for 3700 kc. you have the space problem licked. Some hams must of necessity operate the high-frequency bands because of the limited space available for antennas. There will be more discussion on these factors next month. I will take up the problem of what bands to use and the cost of building a good ham station and some of the circuits used in their construction.

Kink-of-the-Month Department

I recently built the "Low-Noise 220 Megacycle Converter" from the September-October issue of G-E Ham News and was not completely satisfied with the finished appearance of it. The converter was all right, but there were enough finger-prints on the nice new aluminum chassis to fill a book for the F.B.I. My solution to this unsightly problem is as follows: Before unwrapping the chassis, mark off the placement of all major components such as transformers, tube sockets, condensers and any large coils. Drill chassis and punch out tube sockets and transformer cut-outs. Check placement of parts by temporarily placing the parts in their position. After you are satisfied with placement, remove parts and paper. Spray the clean, punched and drilled chassis with a light coat of Krylon Acrylic Spray number 1302. Allow ten minutes for the chassis to dry. Proceed with the building, confident that the returns in appearance appreciation will repay you for your trouble. This hard coat of clear insulation will not show finger-prints and also it is easier to clean.



W9MAJ, Frank Stout, Clinton, Illinois. He is 15 and has his Conditional license. He is trying to work all Illinois counties. His favorite band is 80 CW.



KN2KAK has been a novice for one month and has passed the General and is waiting for K2KAK. He has worked 120 contacts in 25 states. The antenna is a 136 foot Windom. His name is Alan Fuchs, Forest Hills, New York.

Hints on how to obtain an Amateur License

In answer to Marty Dunsmuir, 3845 Hazel Street, South Burnsley, British Columbia, Roy Kolodny, 112 North Kilkee Drive, Los Angeles, California and Phil Metzger, 375 Krams Ave., Philadelphia, Penna. and others wishing to know how to go about obtaining a license to operate an amateur radio station. In the U.S., the license itself is issued by the Federal Communications Commission, Washington, D.C. There is no charge for the license, just a test of your ability to operate correctly. It is best to check with your postal authority for the place to obtain licenses in countries other than the United States. First, subscribe to CQ magazine for its fine articles on theory, construction and application of radio and electronic circuits. It's a very good idea to get an A.R.R.L. Radio Handbook, price three dollars. Send one dollar and twenty-five cents ($1.25) to: American Radio Relay League, West Hartford, Connecticut.

[*Continued on page 48*]

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Model SSTR-1

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- Transmits or Receives on 10, 11, 15, 20, 40 and 80 meter bands with Panel Bandswitching.
- Transmits or receives full Single Side Band (carrier suppression), AM, CW or Frequency Shift Keyed Signals. External audio oscillators required for Frequency Shift Keying.
- Choice of separate frequencies, within same band for transmission or reception with multi-band dual slide rule dials with 48/1 vernier. Separate tuning for receiver or transmitter.
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- Panel controlled carrier suppression adjustable from 30 DB down to twice normal microphone peak output voltage.
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- Voice control available, with external plug-in chassis, as an accessory.
- Additional accessories available—External AC power supply and 6 or 12 volt Vibrator Supplies.
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EXTRA ACCESSORIES AVAILABLE!

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[from page 46]

for the four booklets: A. How to Become A Radio Amateur. B. The Radio Amateur License Manual. C. Learning The Telegraphic Code. D. Operating An Amateur Radio Station. Join your local radio club and take part in activities of the club if asked. That much done, decide that you want an amateur license enough to put some effort into studying the concepts of radio theory and practice and learning the code. Mastering the radio code is mainly a matter of practice, practice and more practice. Acquiring the art of transmitting and receiving telegraphic code as analyzed by many successful teachers is divided as follows: A. Natural Ability—5%. B. Psychology—10%. C. Study and practice—85%.

It is a very good idea to have a friend help you with your code practice, but this is not necessary. If you know a nearby ham, he will be glad to help you get started. Your local broadcast station will likely be able to give you the names of hams in your neighborhood. Usually the broadcast operators themselves are hams.

The code test for novice, technician and conditional licenses have to be given to you by an amateur, a commercial telegraphic licensee or by some one who has been employed as a United States Radiotelegraphic operator within the last five years. The written test can be given by any citizen twenty-one years of age or older, this can be the same person. The person who gives you the code test does not have to be twenty-one years of age.

After becoming acquainted with the fellow who will give you the code test, satisfy yourself that you can copy the code at five or more words per minute and master the simple theory and operating questions necessary for passing the written part of the test.

Write the Field Engineer-in-Charge of the Federal Communications Commission district in which you live for the packet containing the Novice, Technician or Conditional examination. Note: The Conditional license requires the code test be thirteen words per minute. This packet is not to be opened by you but by the examiner. He will give you the code receiving test and if you pass that he will give the code sending test. If you pass he will so certify on your form 610 in space provided. Next, he or the person you have chosen will give you the written test and stand by while you fill out the required number of questions. He will then put the examination paper, the little white F.C.C. record card and the form 610 in an envelope and send them back to the field office. If you pass the written test, in four to seven weeks you may get the little white card that gives you the privilege of operating an amateur radio station and BROTHER you have just begun to live. Come on . . . Let's get started.

Grand Two Meter Opening

On the night of May 26 the two meter band was wide open. Signals came in from everywhere with surprising signal strength. I worked the novice band on two meters and had a lot of fun. Novices worked here were: WN8WMH, Dayton, who did a wonderful job selling ham radio to the Boy Scouts; WN8ABI, Walt, of Cincinnati; WN8SVU, Lee of Cincinnati, Ohio. Next, brand new General, W8RHL and son Dave, WN8AYD, of Columbus, Ohio. Dave took the test at the Dayton Hamvention two days after his 13th birthday. WN8OUS, Harry, age 15, another Columbus ham was worked and said he was having trouble with his modulator, and at a band opening too. Too bad Harry, get it fixed as I'm sure there will be another opening soon. The FM is too hard to copy on a triple-conversion receiver. Others were: KN2LRN, Liverpool, N.Y. KN2MNB, Westfield, N.Y. WN8USM, Wayne of Batavia, Ohio. KN2JPL, Fredonia, N.Y. and WN8UMF, Dick of North Royalton, Ohio. WN8WMM operating W8SH at Michigan State College, East Lansing was worked and his QSL says the reason he didn't come back was that the oscillator flubbed up and he was out. Sorry, Stu, those things do happen, even here.

Frankly, I was surprised and pleased at the quality of the signals put out by the novices worked that night and the way they waited their turn when there was a pile-up.

Others worked on two meters lately were, WN9RMC, Bryce Jordan of Mays, Indiana. WN8UDE, Dick of Dayton, Ohio and Bud Burke WN8WKQ, USAF, Dayton.

Active Novices and Technicians in the Detroit area are Waymon Grey, W8RFR, Bob Simon, W8QLO, Bill Schwedt, WN8UET, Joan Simon, WN8WPZ, Fred Blinkhorn, WN8TBG and WN8SAN. Bob, W8QLO is trying very hard to spark plug some activity on the 220 Mc band in the Detroit area. Good luck to you Bob, we need all the activity we can get.

A new novice net has been started in Kentucky. The net is on every Sunday afternoon at 3 pm EST on 3735 kc. The net control is W4JHU, Marvin Carver in Russelville, Kentucky. The call used is KYNN as Kentucky Novice Net. Although this net is called the KYNN, the net I am informed is open to all novices in this area and not Kentucky alone. If you plan to operate the nets it is a very good idea to make a study of the Q-signals used in net procedure. Their use speeds the flow of traffic and saves considerable time.

Letters From our readers:

Writes John D. Allyn, age 13, 3711 Prescott Place, Seattle 6, Washington. "I haven't had any good DX but I've worked seven states, Idaho, Washington, Oregon, California, Nevada, Montana, Minnestoa, VE6, VE7 and WL7. I worked Idaho on a three foot wire from the terminal of the Heathkit antenna tuner to the wall. I got a 589 report. My transmitter is a Heathkit AT-1, running 35 watts on 40 and 80 meters. The receiver is a revised SX-23. The antenna is a 57 foot long-wire." Good work, John!

Kenneth E. Mills, WN8RLY, 423 N. Kilmer, Dayton, Ohio just became "General Mills" as a result of a trip to see the R.I. With the membership of Thomas Inman, W8RCA, "veep" of the D.A.R.A. we should have a nice club. When "RCA" and "General Mills" both belong to the same club that's news.

Dave, KN2KHZ writes: "Just a line to let you know that the K2 novices are working DX these days. Last night from 1800-1910 EST, I snagged myself G6RC, G5FA, GW3QN and GW3YR. Tonight I QSO'd LU1DFH in Buenos Aires. Gotta get back on 21.1 mc. now. 73, Dave."

Wayne L. Vearil, WN8USM, Batavia, Ohio, will just have to get that General Class license now because I saw him win a nice Heathkit VFO at the Madison, Indiana Ham picnic, May 15. Let's get that CW speed up, Wayne, and go see the R.I. Work two meter phone two nights and CW two nights and the speed will come up to par.

Sam Guickey (?), KN5BDU, Box 5783, Denton, Texas says in a nice letter: "Being a new novice I thought I could legitimately write you. The helping hand into the ham ranks was furnished for me by W5WGI, W5FEH and W5ETC, all boys my own age. I am 14 years old. The rig here is an Eldico TR75TV and a Hallicrafters S-41G. The antenna is 125 feet of number 14 wire end fed. The frequency is 3717 and|or 3745 kc. Please let the hams know that the KN5 calls are no hoax."

Three new novices in Dayton, Ohio are XYL's. They are Margaret Carrell, WN8VGA, XYL of W8KOM, Betty Hall, WN8AXA, XYL of technician Tom, W8QFA. Tom has code-inspectoritis. I worked Margaret and Betty on two meter phone. Will Betty beat Tom getting a General? (Ed. note:?) Anne P. Thomas, WN8WRV, is not on the air as yet. Get something going Anne so we can work you. Thelma Hawthorn, Ex-WN8RIP of Franklin, Ohio failed to make the General.

Bob Pielage, WN8VHU, age 15, just got on two meters. Bob is very much interested in a television transmitter and has the 5527 tube but we are trying to get him to get the General before too much experimenting on the 435 mc. bands with television transmission. Bob could put a 6L6 on CW. I think he will too.

Nel Armstrong, W8SYE of Barberton, Ohio failed to make it GENERAL at the Dayton Hamvention but son Butch, W8SYD is now the General at their home on 4708 Krantz Avenue. Butch is 13 years old.

The Orange, Virginia Radio Club has graduated nine novices. The Hagers, Arlie, W4HLF and Roy, W4VPO are among the teachers. You didn't send those pictures and names of the new novices as promised, Arlie.

[Continued on page 54]

ANTENNA DESIGN

[*from page 20*]

peeled for nearness of fences. Radials can be tacked along the bottom of fences, behind shrubs etc. Likewise they can be tacked along the foundation of a house, or garage.

Like the antenna ends, they may be bent in all directions. While it is nice to have them running out like spokes of a wheel from the antenna base, it is not always possible to put them in that way. It is better to have many bent radials installed at varying angles than to have only a few straight ones.

Each radial should be terminated with a ground rod. These may be anything from the deluxe rods that are available commercially to ordinary brass welding rod. Bear in mind that the object of the ground rod is to get to wet or damp earth and provide a good d-c path.

Where the water table is high, shorter rods may be used. If the soil remains dry to considerable depth, longer rods will be required. Ordinary galvanized iron pipe is satisfactory but expensive if any great depth is required.

Do not tie the ends of the radials together! They are to be joined at only one point. That is the base of the antenna. The far ends should be tied only to ground rods.

Install these radials with the view to making the ground look as much like it is copperplated as possible. Should copper wire not be available for radials, good galvanized iron wire will provide a good substitute. Let the availability of ground wire and the strength of your back determine how many radials go in!

Regardless of antenna, the time and patience you put into the installation will be the measure of its success. You will find that it will outperform any random piece of wire you may have haphazardly strung around.

PROPAGATION

[*from page 29*]

was 29.6, resulting in a provisional 13-month running smoothed sunspot number of 9.5 centered on November, 1954.

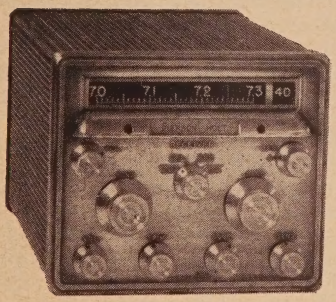
Short-Skip Propagation Forecast Chart, August:

The following forecast for the 10 through 160 meter amateur bands are based upon a radiated power of 75 watts, using a dipole antenna a half wave-length high. The hours of day that propagation conditions will be optimum on a particular band for a certain path distance are given in *Local Standard Time*. The symbols for the number of days that the path is expected to open are the

[*Continued on page 51*]

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PIERSON-HOLT ELECTRONICS

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[*from page 13*]

little information available on what bands work well for such operation, what sort of antennas are best, etc.

Amateur radio has been used for a lot of things that we don't hear about. I know that W6LLP and W6CLW have used it for communication between their cars and expeditions exploring deep caves. I believe that it played an important part last year in the rescue of a fellow who managed to break his leg in a particularly difficult cave and required a lot of help in getting back out. My point is that everywhere you look there are stories just waiting to be written.

Though a story is important it is only half a story without pictures. We want good pictures of everything connected with ham radio. Pictures of your station, mobile installations, CD work, Field Day, special contest setups, expeditions, DXpeditions, visiting notables, interesting antenna installations, etc. Construction articles should come complete with good photos which show all sides and views of the equipment. The better the photos you submit the bigger we will be able to print them in *CQ* (and the more we can pay for the article). Try to provide professional quality 8 x 10 glossy prints, or 5 x 7 if that is all that is available. Equipment shots should have the camera lens stopped down and a long time exposure made with you rapidly moving around the light to fill in all the shadows. This painting with light makes each component stand out clearly. Please use a good camera.

Before letting the subject drop I would like to bring up one pet project of mine which I believe will change the whole aspect of ham radio. As you may know many of the RTTY stations are set up for Auto-Start operation. This means that another station can start up your printer at will and send you a message. When he is through your equipment turns itself off again until someone sends the starting signal again. What a fantastic difference this makes in ham operating! Many is the time when my printer (down in the cellar) would start up and the bell would ring to call me for a QSO or to answer some question. During a break in TV I would go down and read the message left for me and then push the auto-start button to start up the other fellow's printer for my answer to him.

A simple auto-call system could be established for all amateur stations which would make it so you could, in addition to our present haphazard operating, call anyone you want to for a QSO. How many times have you tuned the band looking for someone in particular? How about six meters where something like this is necessary a lot of the time even to have a QSO.

The first person that designs a simple and inexpensive autocall system will not only have the article printed in *CQ* but may well have a few companies after him for the rights to build the equipment commercially.

Just a few more hints on the auto-call: after considerable thought as to how to work such a system I propose that the receiving system consist of two tuned filters and possibly a delay circuit such as the warm-up time of a 117 volt rectifier. A small receiver could be left tuned to some particular channel with its output fed into the filters. When the proper two tones are received they will go through the filters and the combined output of the two filters could operate a relay which would turn on the filaments of a rectifier. When warm it could turn on a light or ring a bell to indicate someone is calling you. The use of two tones and a short delay time should completely eliminate the problem of chance heterodynes triggering off the alarm. On the transmitting end all that would be needed would be a small double audio oscillator which could be set for the two tones desired and fed into the modulator for the short period necessary to set off the auto-call.

There you are! How far can I go to get you inspired? All you have to do is work out some simple circuits, build 'em, prove they work, and send in the article (and pictures). From then on you are famous. Perhaps I shouldn't harp on it, but in addition to this, our budget allows a modest payment for the story.

While on the subject of money perhaps I should take a short swing at people who mention that *CQ* is a commercial publication and is put out to "make money." This is true for *CQ* has been earning about 1% profit. But is this something to be ashamed of? Profits are the basis of our whole economic system in this country and are pretty important. It is true that if we were organized as a non-profit corporation that we would have considerably higher salaries for the staff for this is the usual method of keeping an organization non-profit. We would also pay considerably less taxes and support our government that much less. No, I think that we can serve the amateur much better in our present form. *CQ* exists as a communication medium for amateurs and it can obviously do this best if it is run on a business-like basis.

Apropos to money I have been receiving letters every now and then saying that a rumor has it that *CQ* is folding. This must have sprung from someone with a vivid imagination or else a disgruntled ex-employee. Rather than folding, *CQ* is expanding next month and is getting all sorts of interesting things going. We have a full set of certificates coming available that fill a greatly needed vacuum. We will have lots more good pictures and will feature some darned good technical articles that we just haven't had room to print before.

[*from page 49*]

same as those appearing on the *DX Forecast Chart* on page 28.

Band (Meters)	Distance (Miles) 50-250	250-750	750-1300	1300-2400
10	—	—	1000-2000 (3)	—
15	—	—	0800-2000 (3)	1200-2000 (2)
20	—	1200-1800 (3)	1300-2000 (5)	0700-2000 (4)
			2000-1300 (4)	2000-0200 (2)
40	1300-1900 (4)	0800-2100 (5)	1800-0800 (5)	1800-0800 (4)
80	0700-2200 (5)	1800-0900 (4)	2000-0800 (4)	2000-0600 (3)
160	1900-0600 (5)	2000-0600 (4)	2100-0500 (3)	2100-0500 (1)

Review of Shortwave Propagation Fundamentals (con't)

The daily and seasonal characteristics of the ionosphere have been discussed previously. These effects result from the relative positions between the earth and the sun. Aside from these variations in the ionosphere, there is a long-period variation in the intensity of ultra-violet radiation from the sun. This long-period variation is referred to as the *sunspot cycle.*

The exact nature of sunspots, what they are and what causes them, is still rather obscure; however, science within the past twenty-five years has found that these blemishes on the face of the sun have an effect on short-wave radio transmission. *Figure 1* is an Official *U.S. Navy* photograph of the sun. The sunspots appear as black spots on the photograph. They are believed to be gigantic temporary craters caused by explosions taking place on the sun. Sunspots almost always appear in groups. The groups range in visual size from small specks to large blotches.

Sunspots are known to have been observed by the Chinese as far back as 28 B.C. Long before present day scientists associated these spots with violent disturbances on the sun, they were observed to come and go with a certain degree of regularity. Accurate scientific daily recorded observations of the sun were first undertaken during the 18th Century. Such daily observations are now made at many astronomical observatories throughout the world.

The daily number of observed sunspots is subject to a considerable variation, and except possibly for association with certain types of ionospheric storms, daily sunspot observations have little correlation with general shortwave radio conditions. To obtain a true long-term trend, not colored by short-period fluctuations, monthly averages of the daily observations are reduced to the *smoothed sunspot number.* This value takes into account all the observations made during a one-year period. It is this monthly value of smoothed sunspot numbers that exhibits the trend that develops into the well-known 11-year sunspot cycle.

Figure 2 is a plot of all sunspot cycles since 1750, the year that reliable observations were first made. As seen from the curve, sunspot activity varies from year to year, but does so in a periodic manner to produce alternate minima and maxima at intervals of several years. The

[*Continued on next page*]

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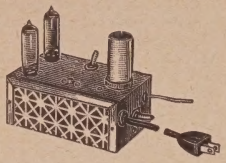
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CQ Magazine

67 West 44 St. — New York 36, N. Y.

[*from preceding page*]

number of years necessary for a complete cycle of activity, from minimum, through maximum, to minimum again, varies somewhat with the different cycles, but has a mean period of approximately 11 years. We have just begun the 19th sunspot cycle observed since 1750. The previous cycle (cycle 18) ended during early May, 1954.

In spite of the fact that sunspots have been regularly observed for over two hundred years, we know very little about what actually causes them. In fact, most of our present knowledge concerning certain effects associated with sunspots, came with the advent of radio. It was not until the late 1920s that sunspot activity was associated



Groups of large sunspots on the face of the sun (U.S. Navy photo).

with the degree of ultra-violet radiation from the sun. During the rise in sunspot activity between 1924 to 1927, it was observed for the first time that there was also a similar rise in measured ultra-violet radiation. After 1929, as the sunspots started to decrease, the measured intensity of ultra-violet radiation also decreased. Although the cause and exact nature of sunspots are still unknown, they nevertheless are an observable indication of the degree of solar activity and associated ultra-violet radiation. Therefore, since ultra-violet radiation varies throughout an eleven-year cycle, we would expect that ionospheric characteristics will also vary in a similar manner.

Next month we will discuss the eleven-year cycle influence upon the ionosphere, and shortwave radio propagation conditions.

DX NEWS

[*from page 41*]

CQ International DX Contest

PHONE SECTION: 0200 GMT, OCTOBER 22nd to 0200 GMT, OCTOBER 24th.
CW SECTION: 0200 GMT, OCTOBER 29th to 0200 GMT, OCTOBER 31st.
LOGS TO: INTERNATIONAL DX CLUB, P.O. BOX 100, BUCHANAN, MICH. POSTMARKED NOT LATER THAN DEC. 15th 1955.

Corn Island

Excerpts from an FCC letter state—Contrary to any previous implication—The Commission does not exercise control over amateur radio operation on Great Corn Island. Amateur radio stations may be operated on islands

on which radio operation is under the control of other agencies of the U.S. Government only with the express permission of, and under operating conditions or regulations imposed by, the agency in control. When there is any question as to the controlling authority, for such areas, the amateur should request guidance from the Commission—.

(From this we gather that the KS4 prefix was unauthorized for use on Great Corn. Future DX'peditions to Corn should approach the proper agency and would, no doubt, be permitted to operate there. Under such conditions it is entirely possible that this group could qualify for separate country status.)

New DX Addresses

FY7YF——Gabriel Wong, c/o PAA, Cayenne, French Guiana.
HA5KBA——W QSO's via W3AXT.
HC1PJ——U.S. Embassy, Quito, Ecuador.
HP1EH——Box 189, Panama City, R.P.
JZØPS——"Kees", Box 52, Hollandia, Dutch New Guinea.
KAØIJ——Bob Clark, Via FEARL, P.O. Box 111, APO 500, PM, San Francisco.
KF3AB——Operator Larry, via W9UTZ.
KC6AI——Loran Stn., Ulithi Atoll, Dick Kohler, Box 3, Navy 926, PM, SF.
KG1JB——Via W4KVM.
KM6AX——Navy 3080, Box 19, FPO, San Francisco, Calif.
ex-KS4AW——"Forrest" Box 26, Opalocka, Fla.
MP4QAI——Palace of Shaikh Ahmed, Doha, Qatar. (Nicolas)
ex-MP4QAJ——Now G3KCE. Roger Rimmer, 29 Kirkless Rd., Southport, Lancs., England.
OY7ML——W QSO's may go via W8PQQ.
SU1IC——Ibrahim M. Charmy, 1 Mohamet Pasha St., El Aguza, Giza, Egypt.
SVØWU——Cal Casale, c/o American Courier, Rhodes.
TG9TU——Anthony Urrutia, P.O. Box 12, Guatemala City, Guatemala.
VQ5FS——Terry, Box 118, Jinja, Uganda.
VR6AC——Via W6SYG (Stamped envelope for return) or Floyd H. McCoy, Pitcairn Island, South Pacific, via Canal Zone.
VQ6LQ——Via W5BNO (W/VE QSO's after May 11th 1955).
VS1EW——Box 158, Singapore.
ZP5IT——Doctor Bailie, Yegros 429, Asuncion, Paraguay.
(Thanks to the West Gulf Bulletin, South Cal. Bulletin, G6ZO, W9VZL, F9RS, FY7YE, W6KQY, W4JII)

Honor Roll Endorsements

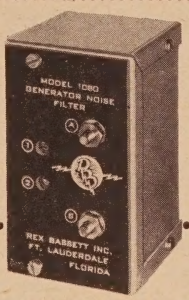
(To June 15th 1955)

CW AND PHONE

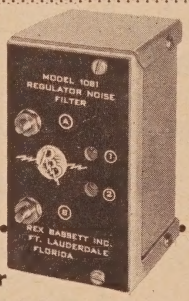
W1FH	40-261	G8IG	40-218	W7HXG	39-136
W6AM	40-256	SM7QY	40-182	W2GVZ	38-194
W6ENV	40-255	W6ID	40-161	OE1FF	38-158
W6SYG	40-254	W8KIA	39-245	W4HA	37-194
W6AOA	40-253	W1CLX	39-238	W4EPA	37-175
W6MX	40-252	W2QHH	39-228	WØANF	36-164
W6MEK	40-252	W1JYH	39-222	W2HSZ	35-159
W8BHW	40-248	W8UAS	39-216		
ZL2GX	40-246	W1ZL	39-212	*PHONE ONLY*	
VE4RO	40-242	GM3CSM	39-192	W6DI	39-211
W6VE	40-238	VK3XO	39-174	W6KQY	38-188
WØELA	40-229	W6CAE	39-161	W6AM	38-185
W6EFM	40-224	WØQVZ	39-161	W4HA	36-188

Last complete HONOR ROLL appeared in the May issue.
Next complete HONOR ROLL will appear in the September issue.
To provide space which may allow entry to the Honor Roll for stations who have worked less than 35 zones and to keep the Honor Roll on a "live" basis all stations who have not reported any change in their totals since September 1953 will be dropped from the listings. This does not apply to holders of WAZ. Any station, so dropped, will be reinstated upon reporting a gain in his totals.

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67 West 44th Street, New York 36, N. Y.

[*from page 48*]

James B. Hostetler, 2006 Malvern Avenue, Dayton, Ohio has held three calls in about eight months, WP4ZZ, WN8TSZ and W8TSZ a General. His dad is Stan, WN8UIT. They plan to move to Geneva, N.Y. this week, so he will have another call shortly. They plan some SSB work for the future.

Help Wanted

James Robson, 309 Market Street, **Harrisburg, Pennsylvania.**

Leonard Bombay (14), 229 Oak Rash Road, **Harrisburg, Penna.**

Jack Roach, 16 Canterbury Street, **Lawrence, Mass.** Telephone: Law. 3-3223. Jack was previously listed with an incomplete address.

Eddie Bosnyak (15), 3425 Baby Street, **Windsor, Ontario.** Phone: CL 2-1778.

Howard Stechel, KN2KUJ, 475 Merrick Road, **Massapequa, New York.** (Howard has 21 states and needs schedules with W6, W7, and WØ.)

Jack Cohen (16), 2626 Monaco Parkway, **Denver, Colorado.** Phone: FR 7-7128. (Jack has been an SWL for some time and has decided that he is on the wrong end of the SWL business.)

Marvin Vernon Crenshaw, 174 Kelburne Ave., **North Tarrytown, New York.** (Marvin needs help in code and theory. All letters will be answered.)

Robert A. Young, 1333 Dade Blvd., **Miami Beach, Florida.** Phone: JE 1-7677. (Needs help in both code and theory.)

Elias Baumgarten (10), KN6IXY, 4023 West 176th Street, **Torrance, California.** (Needs help in theory for the general test.)

Oliver Steiner (11), 1810 Longfellow Ave., **New York, New York.** Telephone: KI 2-0033. (Needs help in code.)

Stephen Wilhelm, 1193 East 9 Street, **Brooklyn 30, New York.** (He needs help in code and theory and wants pen-pals.)

Glenn Hanthorn (14), Post Office Box 285, **Fountain, Colorado.**

Phil Metzger, 375 Krams Ave., **Philadelphia, Penna.** (Will some one please call Phil and explain "Ham Radio" to him.)

Richard Steven Brown (23), 5723 Bellona Avenue, **Baltimore 12, Maryland.** Telephone: Idlewood 3-0412. (Needs help with the code.)

Tom Baustert, W3ZQT, Box 233, R.F.D. #3, **Apollo, Pennsylvania.** (Tom has a Navy CRV-52233 transmitter and is badly in need of a schematic. Can you help Tom out of this dilemma?)

Thomas Green (14), 1223 East 4th Street, **Pueblo, Colorado.** Telephone: 212-4768. (Tom needs help in code and theory.)

Skip Leitzell (15), WN3CHC, 25 East Central Avenue, **S. Williamsport, Pennsylvania.** (Is badly in need of help in getting his VIKING ADVENTURER to work out. Please, some Williamsport ham give Skip a helping hand. Thanks.)

Ronnie B. O'Connell (17), 3401 Fendall Avenue, **Richmond 22, Virginia.** Telephone: 7-6230. (Ronnie needs help in becoming a ham and asks that SWLs who want to become hams write him. Thanks Ronnie for your good wishes. I'll do my best.)

This fellow **really** needs HELP:

WALT BURDINE, W8ZCV, R.F.D. #3, **WAYNESVILLE, OHIO.** (Walt needs letters, pictures, hints and suggestions to improve this space in CQ, The Radio Amateur's Journal. If you wish pictures returned to you, please say so in the letter. I would like to start a collection. Thank you and good luck, gang.

73, Walt.

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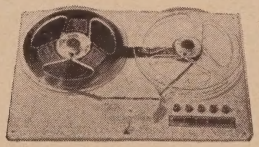
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THE SWEEPER

[*from page 17*]

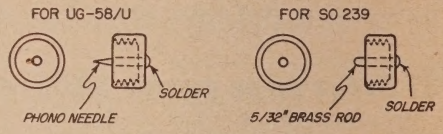
receiver or converter set to 146 Mc. adjust the shorting bars until the output of the oscillator is heard. The main dial on the SWEEPER can now be calibrated against the receiver and should cover considerably more than the two meter band on both sides.

Wherever the dial is set the unit will sweep both sides of this center frequency, the amount of sweep depending on the setting of the sweep control. A sweep of 4 Mc. seems to be best.

Operation

By following the tables you can get an idea just what is taking place in your antenna system. When you think it is set as flat as you can get it, turn the sweep rate to zero and listen for the oscillator signal in a calibrated receiver. The spot indicated on the receiver dial is the center frequency of your antenna system. If it is not where you want it a change can be made in the elements and matching system to bring the center frequency where it should be.

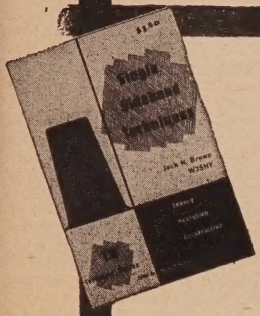
The oscilloscope is coupled to the SWEEPER through a piece of shielded cable to the phono jack provided. Two types of co-ax connectors are provided to give the instrument greater versatility. The unused co-ax conector should always be covered and grounded.



When 300-ohm line is used remove both shorting covers and connect one side of the line to each co-ax connector. Open wire line and 300-ohm ribbon should be kept as far as possible from surrounding objects and excess length may not be coiled up. Excess lengths of co-ax may be coiled up providing no sharp bends are made in the cable. These sharp bends will show up as impedance irregularities in the display.

The 'scope gain should be set so the sine wave, resulting from an impedance mismatch, takes up about two-thirds of the screen height. If the gain is insufficient a larger trace may be had by tighter coupling of the link to the plate lines, by an increase in the value of *R5* or its complete removal. This last is not to be recommended, if it can be avoided. Adjust the horizontal gain until the trace just fills the screen.

With the 'scope and all adjustments on the SWEEPER set, you are ready to proceed with the antenna adjustment. The adjustments will become more familiar after the SWEEPER is around the shack awhile.

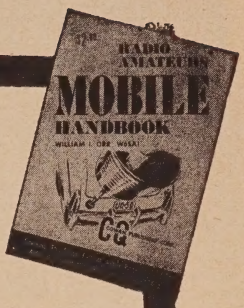


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by Jack N. Brown, W3SHY

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Letters . . . to the editor

Dear OM,

I wish to urge that you consider the problem of the lack of reciprocal licensing agreements between the U.S. and foreign governments regarding amateur radio. The sad lack of such agreements in addition to working hardship on the foreign Ham residing in our land also severely handicaps negotiations for DXpeditions by U.S. Hams to territories under jurisdiction of foreign authorities. Since there are numerous U.S. Hams residing abroad who are accorded operating privileges by foreign governments it seems rather unfair that we, in the U.S., do not reciprocate.

In April QST, page 150, you will find a letter from me on the problem. Since it was published I have received several replies from persons interested in the problem; one from a Mr. Bernard Malandain, F9MH, Visa Dept., French Counsel, N. Y. City, giving background material on this situation in its relation to France. As far as France is concerned the situation is this: there is no provision in French law discriminating against aliens for radio licensing. Therefore, anyone passing the exam is eligible. However, in conformity with standard international practice, applications filed by citizens whose governments deny reciprocity to French citizens are denied. To date a score of countries have made known that they will be glad to license French applicants, so, in this regard, the situation is improving.

Mr. Malandain, having approached the French Minister of Telecommunications on this problem, received an official assurance that, as soon as the F.C.C. changes its stand on the matter, the P.T.T. (French F.C.C.) will be happy to license U.S. Hams immediately.

To show good will and cooperation France has licensed about 75 U.S. Hams who are G.I.s stationed there. No exam was required.

Recently when a U.S. Ham made application for a DXpedition to St. Martin Island, F.W.I. (FG7MA), it was refused and unless there is some improvement in our regulations there will be no more DXpeditions by U.S. Hams in the French Union. (This includes some real rare spots on the DX map!)

Incidentally last year when WØNWX made application for the DXpedition to Clipperton Island it was this Mr. Malandain together with F9AA, Pres. R.E.F. (French Ham Society), who interceded with the Paris authorities on his behalf and provided helpful data and advice. Without this aid the DXpedition never would have been possible.

Malandain said that since he and F9AA realize that this situation does not reflect the desires of the U.S. Hams, both he and F9AA intend to present the matter to the highest authority in our State Dept. However, I believe that if such a movement is to succeed it will require support from A.R.R.L. and/or CQ. I have written A.R.R.L. asking for their stand on the matter and have requested W1DBM, my representative, as New England Division A.R.R.L. Director, to place the problem before the assembly of Directors meeting this month. To date, A.R.R.L. has made no official reply so I'm not able to give you their position.

Whatever the reply of A.R.R.L. should be on this matter, I feel that the U.S. amateur should have the problem presented to him by the amateur press so that the wish of the majority might be solicited in this manner.

Doubtless there will be opposition and the main question seems to be the "bug-a-boo" of "security." However, I believe that this question or problem is one only requiring the proper mechanical means, namely proper screening of applicants, for a workable solution. In this regard I think that we can infer from the article on page 47, March 1954 QST that security checks per se are not looked upon with disfavor by the A.R.R.L. and the U.S. Ham in general.

As for the question of whether this is the right time to bring such a matter forward — we now have Herbert Hoover, Jr., W6ZH, as Under Secretary of State who, as a Ham of long standing, should be helpful toward arriving at some solution. When would there be a better time?

If you should find it possible to bring this problem up in a future issue of CQ, I would be very much obliged and thankful. Much good luck to you and CQ.

John L. Gilleo, W1SSZ

Dear Sirs:

I read with interest the article on "Vertical Additions to Dipoles" appearing in June CQ page 48. Some experimental tests of this type of antenna might be of interest to readers contemplating its use.

A VHF version of the antenna was constructed with the flat top one half wavelength long. Field strength measurements showed the horizontally polarized wave to be maximum perpendicular to the antennas as would be expected. A considerable amount of vertical polarization was present, the vertical polarized wave gave maximum field strength off the end of the flat top.

This antenna should be very good for low frequency bands such as forty and eighty meters. The vertical polarization should provide the low angle radiation necessary for DX, while the horizontal polarization is needed for medium distance work. In addition, the antenna seems to be somewhat more nondirectional than a horizontal half wave.

One fact that might cause trouble to users of this antenna is that the vertical portions cause the resonant frequency of the system to be considerably different from its value before they were added.

Since the antenna was fed with a resonant line, this is not too important, since as long as the antenna is symmetrical and balanced the radiation from the feeder will be low. If one wished to operate 80 meters, and fed the antenna illustrated with coaxial line, the standing wave ratio would be objectionable since the system is far from resonance.

As a guide to readers who might wish to modify their existing 80 and 40 meter antennas to take advantage of both horizontal and vertical polarization, the following

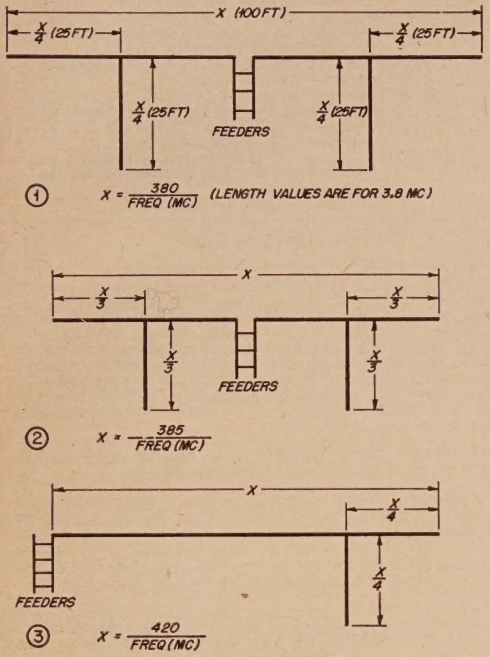
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configurations were set up and tested to determine the proper length for resonance. A horizontal dipole was first checked and the length obtained checked well with the length obtained with the usual formula used. Wire antennas in the six meter band were used to obtain these measurements.



Antennas one and two may be fed with coax for single band operation or open wire line for all band operation. Antenna three must be fed with open wire line.

As with all antenna measurements, precise results are hard to obtain, and some pruning might be necessary to get the antenna resonant, however these lengths should get the antenna a great deal nearer reasonance than those in the article.

It is felt that this combined polarization antenna has a great deal of promise. Almost an infinite number of configurations are possible, and from some of the signals I have heard on 75 meters they really work!

73,

Dick Bremigan, W9RQT

Buckeye S.R.A. Picnic

Annual picnic of the Buckeye Shortwave Radio Association of Akron, Ohio will be held Sunday, August 28, at Happy Days camp in Akron Metropolitan Park, with prize drawings, games for children, and fun for the YL's and XYL's (also OM's, of course). Registrations start at 12 noon, at $2 per family. Mobiles check in on 3860 or 29560 kc. Further info available from W8VQI or W8WAV.

Illinois Airmobile Hamfest

The 21st Annual Picnic and Airmobile Meet of the Hamfesters Radio Club will be held Sunday, August 14 at Mance Park, ¼ mile east of Route 45 and ¼ mile south of Route 66 (Stinson Airport). Planes can home in on WTAQ (1300 kc): 4 190' towers. Planes parked free, but pilots must bring their own tie-downs. Food, ice cream & beverages available, gabes & contests for kiddies and grown-ups. Plenty of tables and free parking. Donations $1 in advance, $1.25 at gate. Tickets available from Jesse P. Markham W9YNV, 37 N. Lotus, Chicago 44, Ill. P.S.: Listen for Hamfesters Club Station on 7272 kc.



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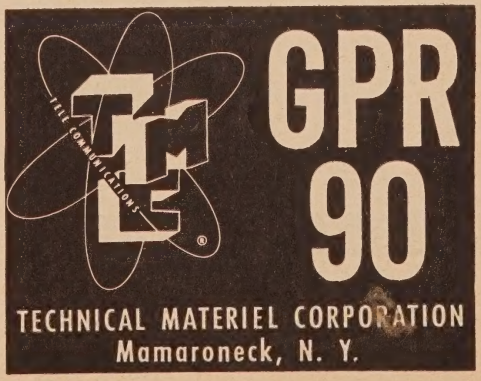
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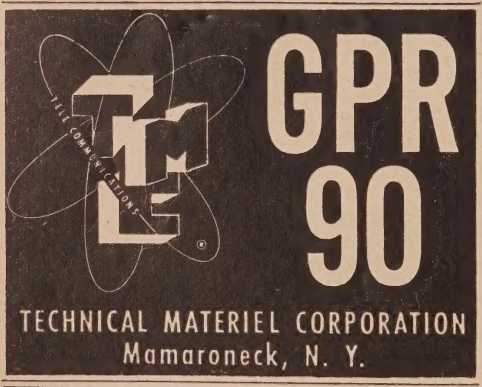
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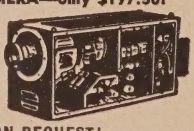
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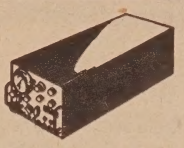
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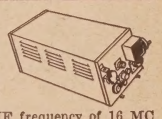
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QSL's! Modern Designs and craftsmanship. Samples, 10¢. Tooker Press, Lakehurst, New Jersey.

QSL's NEW DESIGNS: 2-call and photo cards. Star Printing, 130 S. Glenoaks, Burbank, Calif.

QSL SAMPLES? Bolles, W5OWC, 1521 Koenig Lane, Austin, Texas.

HAMFESTS

PITTSBURGH HAMFEST: Sunday August 7, 1955 at Totem Pole Lodge in South Park. Save 25% by registering in advance. Send check for $1.50 to William E. Guthrie, 4949 Roberta Drive, Pittsburgh 36, Pennsylvania. Tickets are $2 after July 22. Attendance is not required to win valuable prizes. This is the 17th annual Hamfest of the South Hills Brass Pounders and Modulators.

THIS WILL BE the big one! Central Division ARRL Convention. South Bend, Indiana. Oct. 15-16. Advance registration, $3.50. Special prizes for early birds! Write Box 551.

SEE YOU at Hamfesters Radio Club's 21st annual picnic and air mobile meet at Mance Park near Chicago on Sunday, August 14th. Donations: $1.00 in advance, $1.25 at the gate.

BUCKEYE SHORTWAVE Radio Ass'n annual picnic, Sunday, August 28, 1955 at Happy Days Camp, Akron Metropolitan Park, Akron, Ohio. Registrations start at noon, $2 per family. Further information from W8VQI or W8WAV.

18th ANNUAL "Stag Hamfest" biggest bargain hamfest in U.S.A. Over 800 actual amateurs attended last year. Sponsored by the Greater Cincinnati Amateur Radio Association. Sunday, September 11. The location is Kopling Grove on Winton Road two miles south of Greenhills, Ohio. Registration, $2.50 at the gate and here's what you get: hot dogs all day long, donuts & coffee served till noon, beer & pop served all day, full picnic dinner & supper (all you can eat) rain or shine. Lots of prizes, games, radio controlled model aeroplane show, etc. For additional information contact Elmer Schubert, W8ALW, 3965 Harmar Court, Cincinnati 11, Ohio.

WANTED

WE WANT your used gear. Highest trade-in allowance on National, Hallicrafters, RME, Hammarlund, Gonset, Morrow, Johnson, etc. Write or call: C&G Radio Supply Company, 2502-6 Jefferson Avenue, Tacoma 2, Washington. BR, 3181.

AN/APR-4 receivers and tuning units urgently needed! Engineering Associates, 434 Patterson Road, Dayton 9, O.

KILOWATT modulation transformer needed. Prefer multi-match. Box 35W, CQ Magazine, 67 West 44th Street, New York 36, N. Y.

WILL PAY $150.00 for AN1-ARC-1 in good clean condition, 20-channel preferred. Also need BC-610-E xmtrs., BC-614-E speech amplifier. BC-939 OR 729 ant. tuning units; also BC-221 Freq. meters. TCS and others. Amber Co., 393 Greenwich St., New York 13, N. Y.

TECHNICAL MANUALS WANTED: we need Sig. Corps, Navy and Air Force stock catalogs; Maintenance and Instruction TM's for war surplus equipment. Amber Co., 393 Greenwich St., New York 13, N. Y.

WANTED: TUBES—boxed and unboxed transmitting, receiving, and special-purpose industrial types such as Klystrons, etc. Also will buy excess test gear, Hickok tube checkers, Variacs, etc. Will pay cash or swap you for choice equipment and tubes. B. N. Gensler, W2LNI, 330 West 11th Street, New York 14, N. Y.

WANTED: PIERSON-DELANE PR-15 receiver. Please quote price first letter. Griff, Box 4522 University station, Tucson, Arizona.

WANTED: in gud condx NC101x, will pay $65 cash. Prefer N.Y.C. deal, K2KLL, Sid Galitzer, 1514 E. 10 St., Bklyn., N. Y.

WANT: LAMPKIN test gear; Jones MM-252; Bird wattmeter. Cash or extra good trades. Ed Howell, W4SOD, Box 126, Lumberton, N. C.

WANTED: an ELMAC PMR-6A receiver, with or without power supply. Please state type and price expected. A. A. Attaway RMC USN, US Nav. Del. (JBUSMC) APO 676, c/o PM New York, N. Y.

WANTED: BC-610, BC-614, BC-939, APR-5, APR-4, ART-13, ARC-1, ARN-7, BC-221, BC-342, BC-312, BC-348, TDQ. All types receivers, xmitters, radar, test equip., manuals. Cash or trade for new Johnson Viking, Ranger, Hammarlund, Hallicrafters, Gonset, Elmac, Morrow, Fisher Hi-Fi, Pentron, Harvey-Welles, National, etc. Write: Tom, (W1AFN), Alltronics, Box 19, Boston 1, Mass. (Richmond 2-0048).

SWAP OR SELL

BC459-A for SALE or TRADE: Can use cheap 16mm projector. Will sell books by Mortensen. Harold Denny, RR4, Washington, Indiana.

HQ 129X, $125.00; back issues CQ, 10¢ each. FOB. Consider trade. Rev. James E. Baker, Raeford, N. C.



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HOUSE CLEANING time on Mockingbird Hill II. Have big accumulation parts, oscilloscope, geiger counter, test equipment. Sell or trade. Write Rich, W8JS, 3536 Vista Ave., Cincinnati, Ohio.

TRADE: NEW 804's, 211's, 304TL's 833A's, 450TL's, 128A's. Want: NC183D, SX88, KW xmitter, etc. Hodge, Box 3221, Eastchester, Anchorage, Alaska.

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