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CQ RADIO AMATEURS' JOURNAL

JUNE
1954
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W9NZZ DESERVES CONGRATULATIONS

Mr. J. Stan Surber, Peru, Indiana, 46 year old short-wave radio "mailman." Winner of General Electric's 1953 Edison Radio Amateur Award for the outstanding "ham" public service of the year. W9NZZ is the only regular communications link with home for hundreds of servicemen at Arctic weather stations. Last year he transmitted and received over a million and a half words in Morse code to and from such points as T-3, an ice island near the North Pole. His equipment: Collins 75A-3 receiver, 32V-3 transmitter.

Mr. Surber's own account of how he kept on the air 8 hours a day for 353 days *without a miss due to equipment failure*

"During the year 1953, W9NZZ 'worked' the World's most northern stations (Alert and Eureka on Ellesmere Island; Mould Bay on Prince Patrick Island; Isachsen on Ellef Ringnes Island; and, Fletcher's Ice Island floating near the North Pole) in keeping traffic schedules, for a total of 353 days of 365. Of the 12 days missed, 4 of them were due to the necessity of my being out of town. The remaining 8 days missed were due to 'black-out' 20 meter conditions — not one day did equipment failure cause a 'miss.' Practically every day of the year the equipment is turned on at 7:30 a.m. and not turned off until just before I leave for work as a train dispatcher for the Chesapeake and Ohio Railway, or approximately 3:30 p.m. Surely that is dependability!

"The fact that Collins transmitters and/or receivers are used in five of the six most regularly scheduled stations, adds much to this record of consistent communications via 20 meters. It is easy to understand how, with such equipment at both ends, schedules are kept, on frequency and on time.

"To me, the Collins 75A-3 with the 800 cycle mechanical filter, is the last word in CW reception — surely it is the answer to the CW man's prayer."

Naturally we take pride in the fact that Mr. Surber's equipment is *COLLINS.*

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CQ RADIO AMATEURS' JOURNAL

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OUR COVER

Bob Gunderson, W2JIO, Vanguard of sightless radio amateurs is seen here tuning up his transmitter (which he made himself) with the aid of a field strength meter of his own design and construction. The panel meters are dummies, for the benefit of visitors. The July issue of CQ will feature a complete story on the activities or W2JIO and the Braille Technical Press.

FEATURE ARTICLES

Departments

Miscellaneous

Congratulations

F O 8 A J

the CLIPPERTON ISLAND DXpedition

109° 13' W 10° 18' N

RADIO _____ CONFIRMING QSO OF _____ 1954

AT _____ AM/PM _____ ST UR _____ MC. CW/FONE SIGS RST ____

RCVR TWO HALLICRAFTERS SX-88 PSE QSL TNX

XMTR TWO HALLICRAFTERS HT-20 73's

VFO HALLICRAFTERS HT-18

BOB DENNISTON WØNWX LEO OLNEY WØNUC

GENE O'LEARY WØVDQ VERN HEDMAN TOM PARTRIDGE

Clipperton Island was discovered by Captain Clipperton in 1708. Awarded to France in 1930, it is a small, low atoll two miles square in area lying 685 miles west of Acapulco, Mexico and inhabited solely by wild pigs. Our first landing attempt was aboard the "Sea-Rider"—we lost our sextant. Second try aboard the "Barco De Oro II"—lost diesel, sails and food. Landed successfully 1:15 PM Pacific Time, April 23, 1954.

Thousands of amateurs all over the world who worked Clipperton Island will receive QSL cards like this.

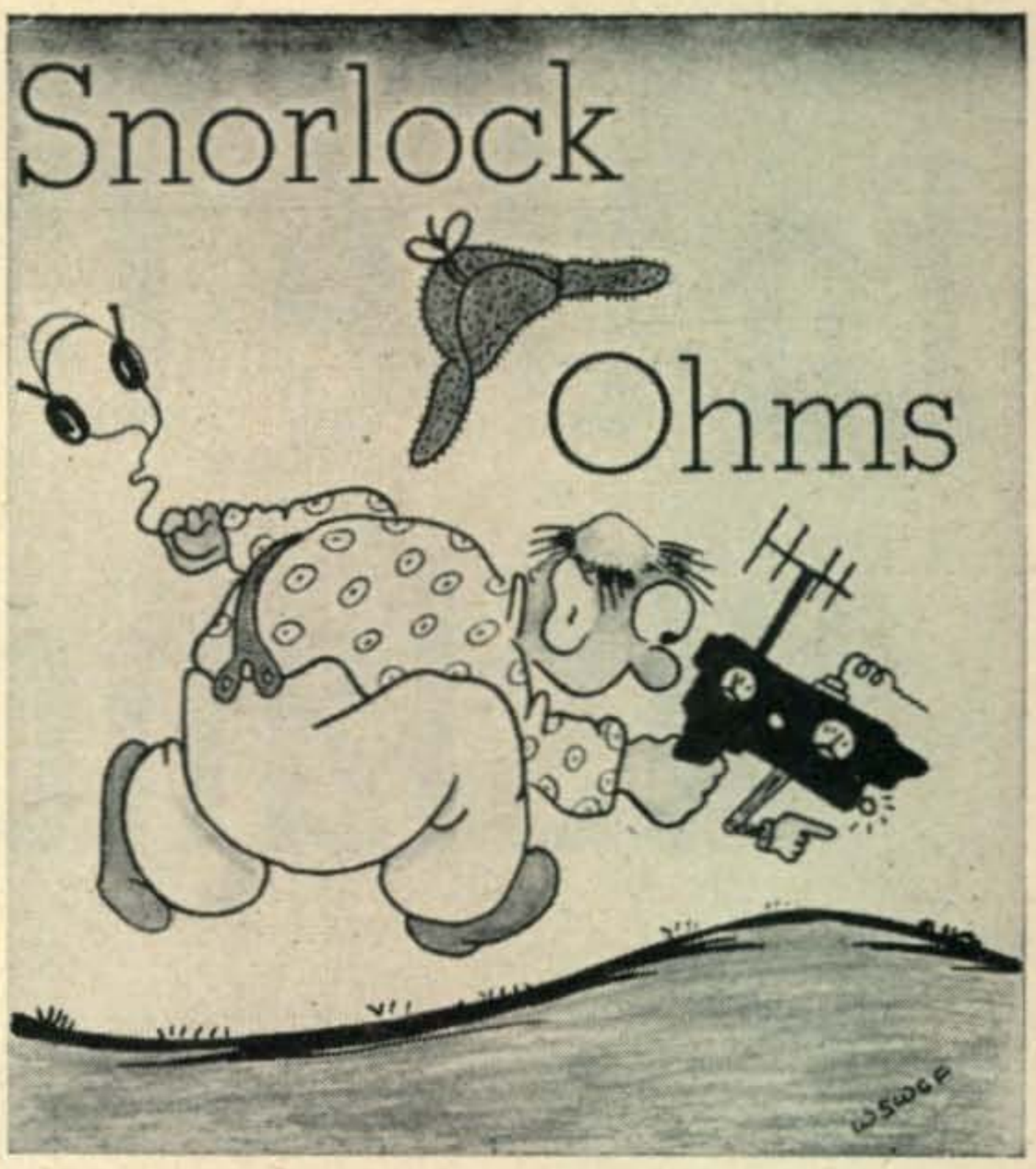
to the Clipperton Island Crew!

Here is adventure in the highest tradition—an exploit that opened the eyes of the world to the tremendous potential and present value of amateur radio! Few incidents in recent history have so caught the public fancy as this hazardous landing on a remote speck of an island in the Pacific. The final success of the project reflects great credit on every member of the amateur fraternity.

Hallicrafters is proud of its part in providing equipment for this worthwhile project. But the real credit, the glory, if you like, goes to the gallant crew that put out a good signal from Clipperton Island.

Hallicrafters SX-88s were the receivers used. This sweetheart of a receiver is an outstanding new design. Two RF stages, double conversion, super-sharp 50 KC second IF, crystal controlled second conversion oscillators and precision gear-drive tuning are a few of the features.

Regular Hallicrafters HT-20 transmitters were used at Clipperton Island. Completely TVI suppressed, this transmitter delivers 100 watts of carrier power with high level (Class AB2) modulation on any band. This compact, efficient design proved itself on Clipperton Island.



The Case of the Corny Ending

Snorlock was having his usual breakfast of buttered puns and synonym rolls when Inspector Louis Coupler stumbled into the sleuth's Ham shack, landing on the 2000-volt power supply.

"Aren't you the electro-cutie!" quipped Snorlock. "Now, kindly get off that power supply. You've cut down my final plate to 300 mils!"

"When are you going to put a safety shield over that Ham Hot Seat?" blared the Inspector.

"What for?" demanded Snorlock, lighting a cigar from the tip of the officer's nose. "I put cheese on the condenser terminals at night. Best mouse-trap I have ever had."

Inspector Coupler shook the volts out of his hair, and said: "I came here to tell you — —"

Snorlock yawned, blew a series of smoke signals that formed two-dot "i's" in the air. He wiped his eyes, and punned: "Smoke gets in my i's."

"Look," sputtered the Inspector, "there's been a murder."

Snorlock yawned, speared a wiener with a stick, inserted it inside the final tank coil. "Nothing like radio-heated wienies in the morning," he said, then mused: "Some day they'll be sending wienies through the air."

"I never *sausage* nonsense!" blared the Inspector. "About this murder — —"

"Ah yes," drawled Snorlock. "Let's see — — the black deed was done at precisely 9:31 p.m. The murderer wore a red hat, is left-handed, has a monkey-shaped mole on the index finger of his right hand, and printed on his chest is the complete circuit diagram of a s.s.b. transmitter."

"How do you know?"

"I don't," Snorlock admitted. "Makes me sound like hot stuff, though, doesn't it?"

Inspector Coupler groaned as Snorlock pressed a button for his robot-valet, Algernon. Algernon came half way, stopped in his tracks. "His battery's run

(Continued on page 8)

(from page 6)

down," explained the sleuth, as he unbolted Algernon's head and connected fresh "A" and "B" batteries. "Bring my greatcoat," he ordered into the voice-operated relay system.

A robin twittered a "CQ" outside. "Wait a minute!" commanded Snorlock. "It looks warmish outside. Bring my not-so-great coat to me."

On the way out, the pair bumped into Dr. Watts Gnu. "Come along," invited Snorlock. "We'll take my motorcycle."

With a deafening roar, Snorlock "dug out," flattening Watts against the back of the sidecar, and leaving the Inspector sitting in the road. "Come come, Inspector," chided Snorlock. "You look awful silly sitting there in the road."

Once again, the Inspector sat on the rear seat, and as the iron steed broadslided around a turn, the officer told what had happened. "It seems," he began, "that our broad-band friend, Q. R. Em, is no longer with us . . . was done in late last night in his Ham shack while working 40-meter CW."

"Good riddance!" exploded Snorlock. "That guy was so broad, he made the Sahara look like Mt. Everest. The skirts of his resonance curve were so wide they called him "Hoop-skirt."

"I recall his democratic attitude toward Ham radio," put in Watts before his mouth was filled with a banana peel discarded from a passing jet plane. "He did not believe in discriminating. All frequencies were his brothers. He was decidedly adverse to crystals and tuned circuits."

"Well," yelled the Inspector at 90 decibels over the straight-pipe exhaust, "he went too far — — QRM'd the local movie house. We suspect the theater manager because old Hoop-skirt was strangled with a reel from an old Pearl White thriller."

"I presume," offered Snorlock, "that our broad-band friend got into the dialog of the movie's sound track, producing some rather disconcerting effects."

"Precisely," agreed the Inspector, as Snorlock jammed on the brakes, catapulting Dr. Watts on to the marquee of the theater.

"I always knew you wanted to be put up in lights," said Snorlock to Watts who was trying to extricate a bulb from his mouth. "Come, come, Watts," chided the sleuth. "You can have your *light* meal later!"

Inside the theater the sounds of crunching pop-corn mingled with the dialog. In one corner of the lobby, some ten customers were obtaining pop-corn from the electronic pop-corn dispenser. The manager was a wizened chap who appeared over-friendly to Snorlock. He chuckled insincerely. "Our local magistrate thinks I dispatched that radio Ham living next door," he said. "Why should I — — the audience loved him!"

"Loved him!" exclaimed Snorlock, unbelieving. "Watts, run over to our departed Ham friend's shack, and call a CQ on 75-meters."

Watts left and the trio took seats near the rear of the theater, far enough from pop-corn chewers who successfully competed with the sound system. A love sequence was being enacted on the screen . . . "Darling," the movie speakers intoned, "there is one thing I must tell you." "And what is that, dear?" the feminine lead returned . . . "CQ, CQ, CQ. This is W— — calling CQ, CQ, CQ, . . ."

(Continued on page 56)

Zero Bias...

Reader Comments

A number of months ago (June 1953) we explored through one of these editorials the question of "reader interest." At that time we placed particular emphasis upon the various monthly departments. Many readers took the time and trouble to let us know their thoughts on this subject. Using those data we feel that *CQ* was better able to serve the reader during this past year.

Once again we would like to call upon our readers to help in laying out editorial plans for the fall and winter months. For your convenience, the problem has been sub-divided and any comments on one or all items would be appreciated.

Mobile: We have a stock of very good manuscripts on this subject. Those on SSB and high power have been held in reserve, should we use them?

SSB: We have three manuscripts on this important field. One is practical, the other two are theory and practice combined. Which should we use first? What particular thing in SSB operation is most desired by the readers?

Antennas: A variety of manuscripts are in reserve. Even one on the T2FD. Which angles would be most appreciated; towers, feedlines, matching systems, or what?

Humor: We are about to surrender on Snorlock—Scratchi is just too lovable! But how about a humorous feature every month—every other month—when?

Informative: Several reserve stories on such items as phone patch legality, newspaper publicity, safety programs, etc. How do these sound—any ideas?

Editorials: Here is a strange one. We know people read them, but the number of comments have gone down and down and down—until they average two letters per week! Is it possible that no one is interested in what is taking place outside of the slanted reporting of our contemporary? Amateur radio is not a little hobby, it is not something so minor that it can be left solely to those with "good intentions." No one on the staff wants the ARRL to be destroyed, but neither do we want to see Ham radio go down the drain to save the prestige of one man. Inept direction under the guise of "saving for the next conference" isn't very comforting. Who's going to trust a "cocktail" behind-the-scenes mishandler?

Departments: We have found reason to drop RTTY, but might replace it with SSB if there is sufficient interest. VHF/UHF is still struggling. DX and NOVICE are booming, while YL and PROPAGATION continue to serve faithfully. Is there anything we're missing?

SWL: We have been asked a number of times to start a separate department for the SWL's. To date we have vetoed the suggestion, how do you feel?

Projects: Currently two members of the staff are engaged in building new equipment based on ideas submitted by readers. Should we concentrate more on this type of endeavor? What projects should we undertake?

Shorts: We have tentatively dropped the "Shack and Workshop" department since much of the material was becoming repetitious In its place we substituted our new "Commentaries." Has this been approved?

How about a letter from you today?

o.p.f.

Panamanian Licenses Not Renewable

In a new decree (April 15, 1954), the Remon administration in Panama has suspended the amateur radio licensing of foreigners, including U.S. citizens. This decision seems to have been motivated by the lack of reciprocal privileges afforded Panama citizens overseas. Licenses now in effect will continue until their expiration dates, but will not be renewed.

10/6 Packset

The second part of this feature (first part in the May issue) has been "dummied" into the July issue. This is the portable unit designed by WØURQ for emergency operation on either 10 or 6 meters.

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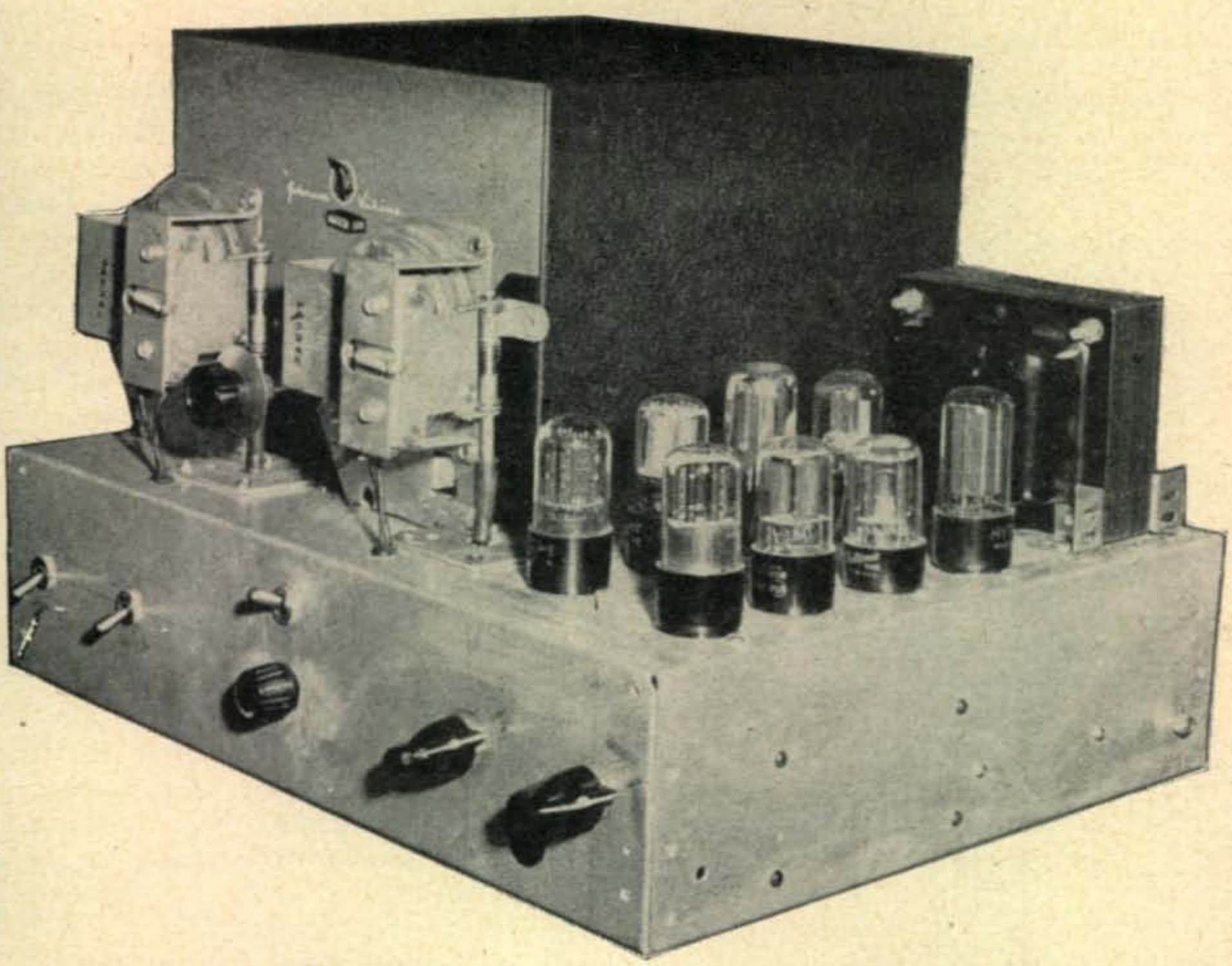


the Automatic

Capt. R. R. Hay, USN, W4LW

414 New Hampshire Ave., Norfolk 8, Va.

The Editors of CQ are Proud to Present This First Fully Automatic Antenna Tuner Utilizing Readily Available Components

As mentioned in the January 1954 issue of *CQ*,[1] the problems of producing an automatic antenna coupler are many. Most of them involve mechanical, rather than electronic difficulties. The automatic coupler described by Virgil True[2] involved a specially designed variable condenser. One produced by the *Collins Co.* uses a special variable inductance. Until the *E. F. Johnson Co.* produced the "Match Box" antenna coupler, there was no coupler readily available to amateurs which could be adapted to automatic control of both phase and magnitude of impedance.

1. Hay, "Problems in Automatic Antenna Tuner Design," CQ, Jan. 1954, p. 33.
2. True, "Automatic Impedance Matcher," ELECTRONICS, Dec. 1951, p. 98.

The feature of the *Match Box* which makes it adaptable for automatic control is the smooth and continuous (within limits) control of both phase and magnitude. There are no limit stops on these controls, and they are both of the variable condenser type so that proper direction of rotation is taken care of without any special provisions. This coupler does have limitations with regard to the characteristics of the antenna with which it is used. The manufacturer lists the output resistance limits as 25 to 1200 ohms for balanced lines, and 25 to 3000 ohms for unbalanced lines and antennas. Although line reactances of several hundred ohms may be compensated for by the coupler at the higher frequencies, it is capable of "somewhat less re-

actance at the lower frequencies." For this reason, the antenna system to be used should be non-reactive in about the center of the amateur band in use.

The *Match Box* is designed for an input of 52 ohms, so it is preferable to use it with a co-axial line of this impedance between the transmitter and the coupler. For automatic operation, it is also desirable to use it with a *True-Matcher*[3, 4] that has been balanced for a 52-ohm load.

Since any one who has a *Match Box* will have a copy of its instruction manual, it is not necessary to dwell on a description of this piece of equipment. However, it is desirable to point

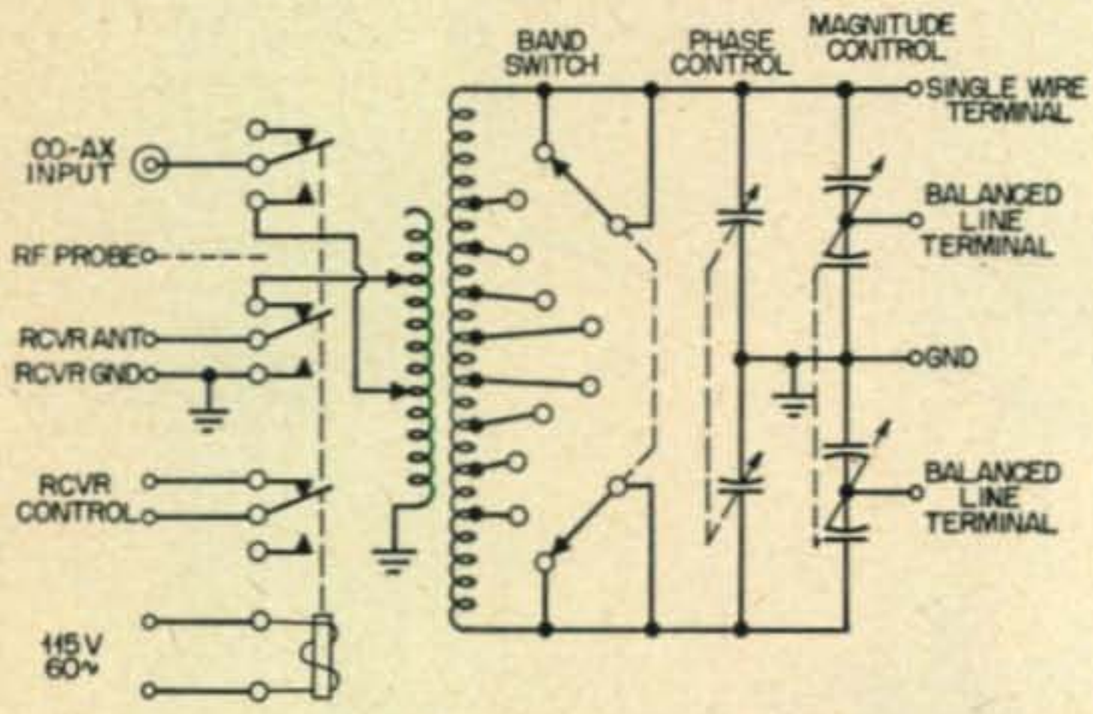


Fig. 1. Schematic diagram of the E. F. Johnson "Match Box" showing use of the existing controls to obtain magnitude and phase corrections.

out that the control of the output impedance is accomplished by a special differential condenser, which provides a variable impedance divider. This condenser is used as the magnitude control (see *Fig. 1*).

Basic Considerations

The use of the *Match Box* with automatic control is similar to that for manual control, except that the match must be more exact. There are three essential conditions which must be satisfied.

(1) The transmitter must be capable of matching the dummy load in the *True-Matcher* and the co-ax line between the *True-Matcher* and the *Match Box*. (A pi-section output is recommended.)
(2) The transmitter must be provided with a means of reducing power during the tuning process.
(3) The antenna system must present a non-reactive load to the *Match Box* in the amateur band to be used, preferably at mid-frequency in the band.

These conditions should be established by manual operations before any attempt is made to convert to automatic operation. Failure to provide the first condition will result in standing waves on the co-ax line to the *Match Box* and will modify the matching capabilities of the *Match Box*. Lack of the second condition will result in excessive plate current in the final r-f stage of the transmitter and possible damage. With regard to the third condition, an improper load presented to the *Match Box* will make it difficult, if not impossible, to obtain a solution with automatic control. "Almost" is not good enough for automatic operation, although it might result in acceptable manual operation. An additional reason for using an antenna system with a small amount of reactance is that tuning of the *Match Box* becomes critical when large amounts of reactance are present in its load.

Obtain a Manual Match First

It must be determined that a match can be obtained in manual operation, otherwise an impossible task may be presented to the automatic system. This determination may be accomplished with an *Antennascope*, a *Johnson SWR Bridge*, or similar device, but a *True-Matcher* will give the most accurate results. The procedure for the *True-Matcher* is as follows: Connect the *True-Matcher* between the transmitter and the *Match Box*, and connect the *Match Box* to the antenna system to be used. Set the band switch of the *Match Box* to the appropriate band. Tune up the transmitter, preferably in low power, to match the dummy load in the *True-Matcher*. Then switch the output of the *True-Matcher* to the *Match Box*. Adjust the "tuning" control for zero reading in phase on the *True-Matcher*, and the "matching" control for zero reading in magnitude. The terms "tuning" and "matching" refer to the titles of the two controls on the *Match Box*. Make this check at each end of the amateur band in question and at one or two check points in the middle of the band. If a perfect match cannot be obtained throughout the band, it will be necessary to alter the antenna, its transmission line or both. The instruction manual for the *Match Box* gives guidance as to these changes. Once satisfactory electrical characteristics have been established, it is possible to proceed with the assembly of the automatic system.

Tying in the "True-Matcher"

The components of the complete automatic system are similar to those shown in CQ[1]:

a. a sensing device for impedance phase and magnitude,
b. d-c amplifiers to operate differential relays in response to the signals produced by the sensing device,
c. reversible motors to operate the tuning controls in the antenna coupler, and
d. an antenna coupler which will provide control of impedance in both phase and magnitude (the *Match Box*).

3. Hay, "The True-Matcher," CQ, Dec. 1952, p. 12.
4. Hay, "Additional Notes on the True-Matcher," CQ, July 1953, p. 30.

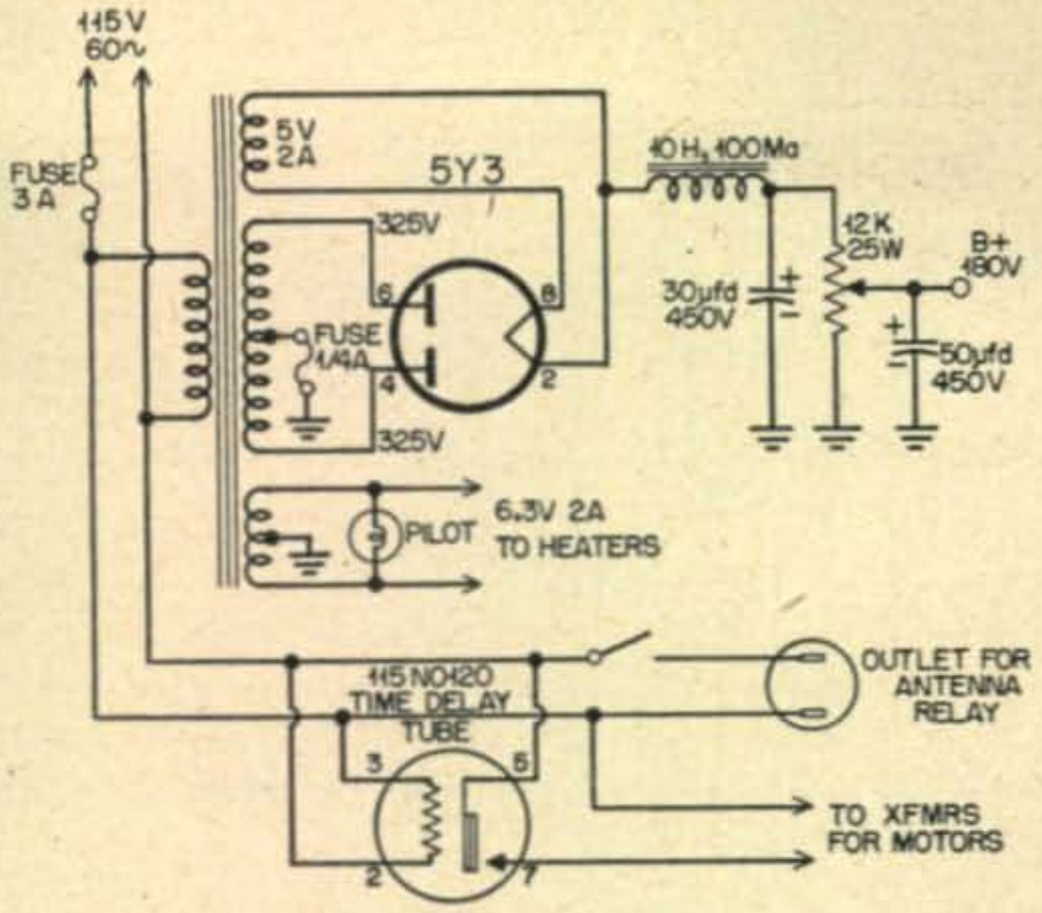


Fig. 2. This power supply is a modified version to be incorporated in the d-c amplifier as shown on page 34 of the January 1954 issue of CQ.

The sensing device is the Ham version of the *True-Matcher*.[4] The remaining components are mounted on a single 17" x 13" x 4" chassis (see view on page 11). The d-c amplifiers and differential relays are the same as those described in the January 1954 issue of *CQ*.[1] The power supply has been altered slightly as shown in *Fig. 2*. A two-minute, time delay tube has been added to give the d-c amplifiers time to settle down before automatic operation is attempted. A switch and a-c outlet have been added to control the antenna change-over relay in the *Match Box*. This latter feature will not be necessary if break-in operation is not used and the transmitter has a built-in source of control for this relay (as in the case of the *Viking II*). The relay may be eliminated altogether, of course, but we made this conversion so as not to injure the *Match Box*. Provision has been made for adjusting the plate voltage supply. The tap of the voltage divider of *Fig. 2* was set for 180 volts after experimentation.

The drive mechanisms used were taken from remote control units made by *ZENITH* and originally designed for use with their model "H" 1951 TV receivers.* These units operate from a power supply of 115 volts, 60 cycles and require 75 watts of power. Each consists of a 110/27 volt step-down transformer, a reversible motor (with condenser), gear train and hand controlled reversing switch. A magnetically operated clutch mechanism permits the driven shaft to be turned manually while the motor is not energized. The output gear is designed to fit over a ¾ round, ¼" diameter shaft. The driven shaft turns at about 4 RPM. This mechanism is designed for intermittent use only, and will overheat if operated continuously for more than five minutes.

In order to adapt this unit for our purposes, the manually operated switch[1] is replaced by a differential relay.* The mechanism was stripped down and the frame cut as shown in *Fig. 3*. It was then assembled with the motor, transformer and condenser below the chassis *(Fig. 4)*,

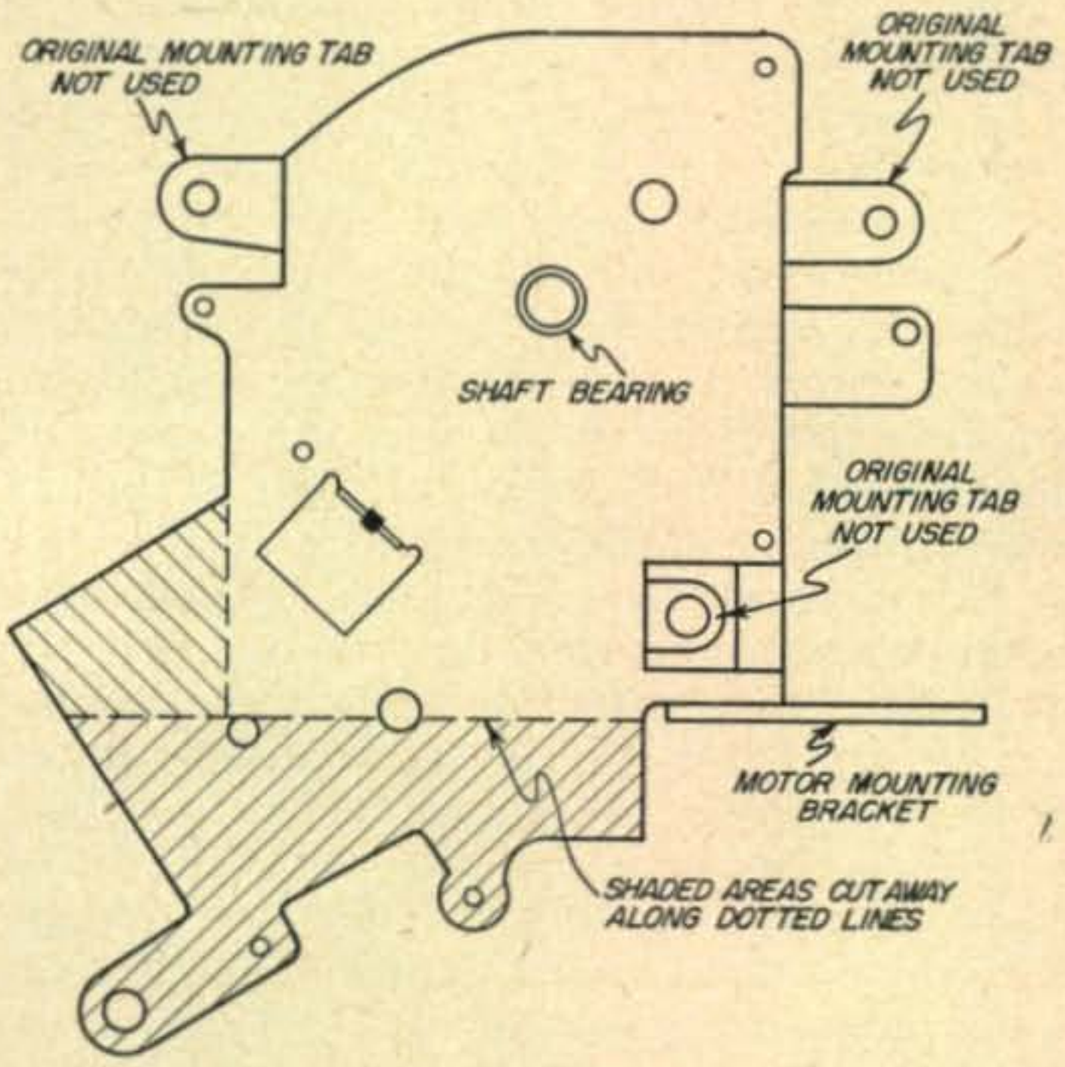


Fig. 3. Mounting plate for the special drive mechanism.

while the gear train and clutch were mounted above the chassis. This resulted in the center of the shaft hole in the gear mechanism being 3/16" above the top of the chassis. This is the same height as the control shafts in the *Match Box* when it is placed on the same chassis.

An extension shaft was placed on each of the two *Match Box* tuning controls. One and one-half inch long extensions were sufficient to connect to the drive mechanisms. If it is desired to extend the shafts to a front panel for optional control manually, an additional two inches in

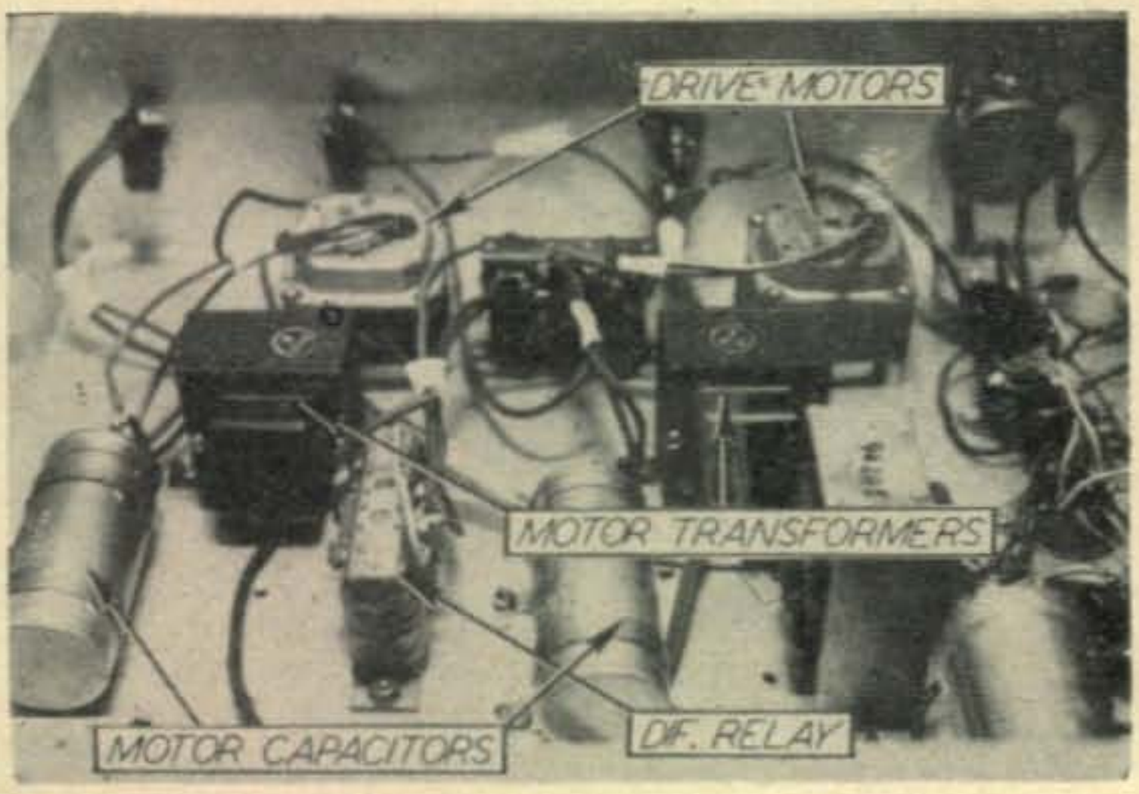


Fig. 4. In this under chassis view the drive motors, transformers for the motor supply, differential relays and motor capacitors are visible.

* The drive mechanisms are obtainable from **Herbach & Rademan, Inc.**, 1204 Arch Street, Philadelphia 7, Pa. They are reasonably priced and at this writing there is a supply in excess of 1000 units available. The transformers and capacitors seen in Fig. 4 are included in this price. The distributor's catalog number is TM-2502; The differential relay catalog number is TM-2333. **Ed.**

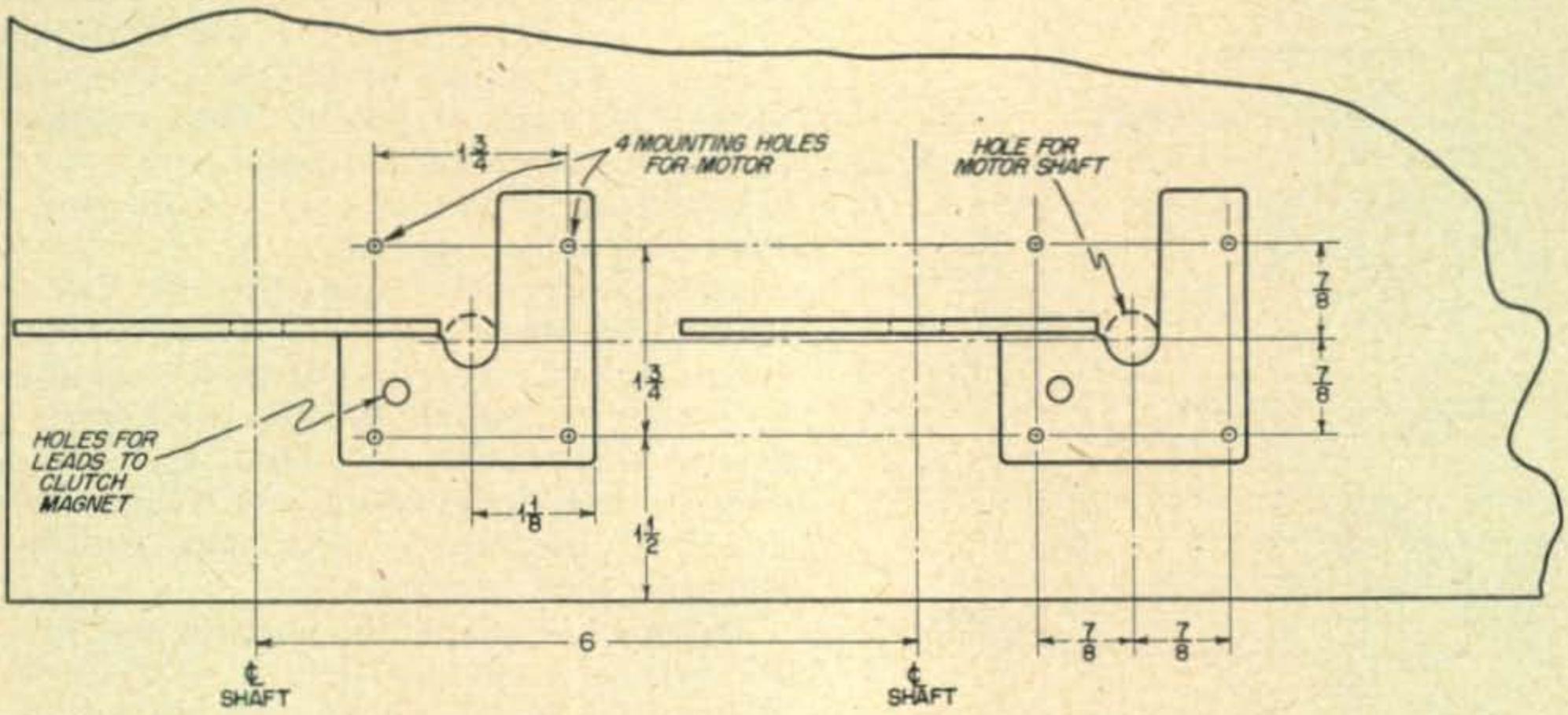


Fig. 5. Partial plan view of the chassis deck showing the position of the mounting plates for the drive mechanisms.

length will be needed. The band switch shaft also should be extended if a panel is used.

The *Match Box* was fastened to the chassis by removing four retaining screws from its base plate and substituting four ½" long *6-32* screws passed through the chassis. The drive mechanisms were then placed by slipping them on the control shaft extensions of the *Match Box*. The position of three motor mounting holes and a hole for the motor shaft were then marked through on the chassis with a scribe (see *Fig. 5* for partial chassis layout). If the drive mechanisms do not line up exactly with the *Match Box* shaft extensions when the mechanisms sit firmly on the chassis, it will be necessary to shim either the *Match Box* or the drive mechanisms. However, in the assembly shown on page 11, no shimming was necessary. Alignment will be made easier if the panel bearing for the "matching" control, in the front of the *Match Box,* is removed. The fourth motor mounting hole may be marked in by measurement from the other three. The motor mounting screws serve to hold the whole drive mechanism in place on the chassis. A hole was provided in the chassis near each drive mechanism to bring two leads from the clutch magnet down through the chassis.

The drive mechanisms were then reassembled above the chassis with the motors below the chassis, and the motor shafts were re-coupled to their worm drive shafts. The 130 μfd. condensers and 27 volt transformers were mounted under the chassis *(Fig. 4)* and the motor control circuits re-wired as shown in *Fig. 6*. The switches in series with the motor circuits permit each motor to be shut off for optional manual operation, or during standby periods.

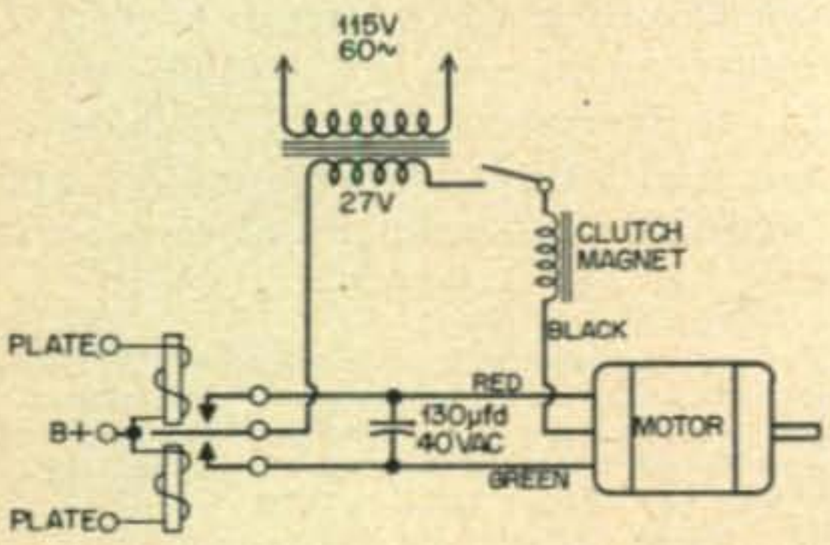


Fig. 6. Motor Control circuit.

The front view of the completed assembly is shown on page 13. This view shows the drive mechanisms assembled on the control shafts of the *Match Box*. The d-c amplifiers and their common power supply are on the right of the chassis. Controls are, left to right, (1) switch for phase control motor, (2) switch for amplitude control motor, (3) switch for antenna relay control (over pilot lamp), (4) balancing control for phase amplifier, (5) balancing control for magnitude amplifier. A 3-way socket (salvaged from one of the *ZENITH* units) between the balancing controls brings in the sensing signals from the *True-Matcher*.

Operating the Automatic "Match Box"

The operating sequence of the complete system is as follows:

(1) Turn power on the *Automatic Match Box* assembly and allow the d-c amplifiers to warm up. The time delay relay tube will require two minutes, but even longer time should be allowed if possible. Leave the motor switches off during the warm-up period.

(2) Balance the d-c amplifiers with no signal input. This may be done most easily by turning the motors on and adjusting the balancing controls until the motors stop.

(3) Set the *Match Box* band switch to the appropriate band and energize the antenna relay.

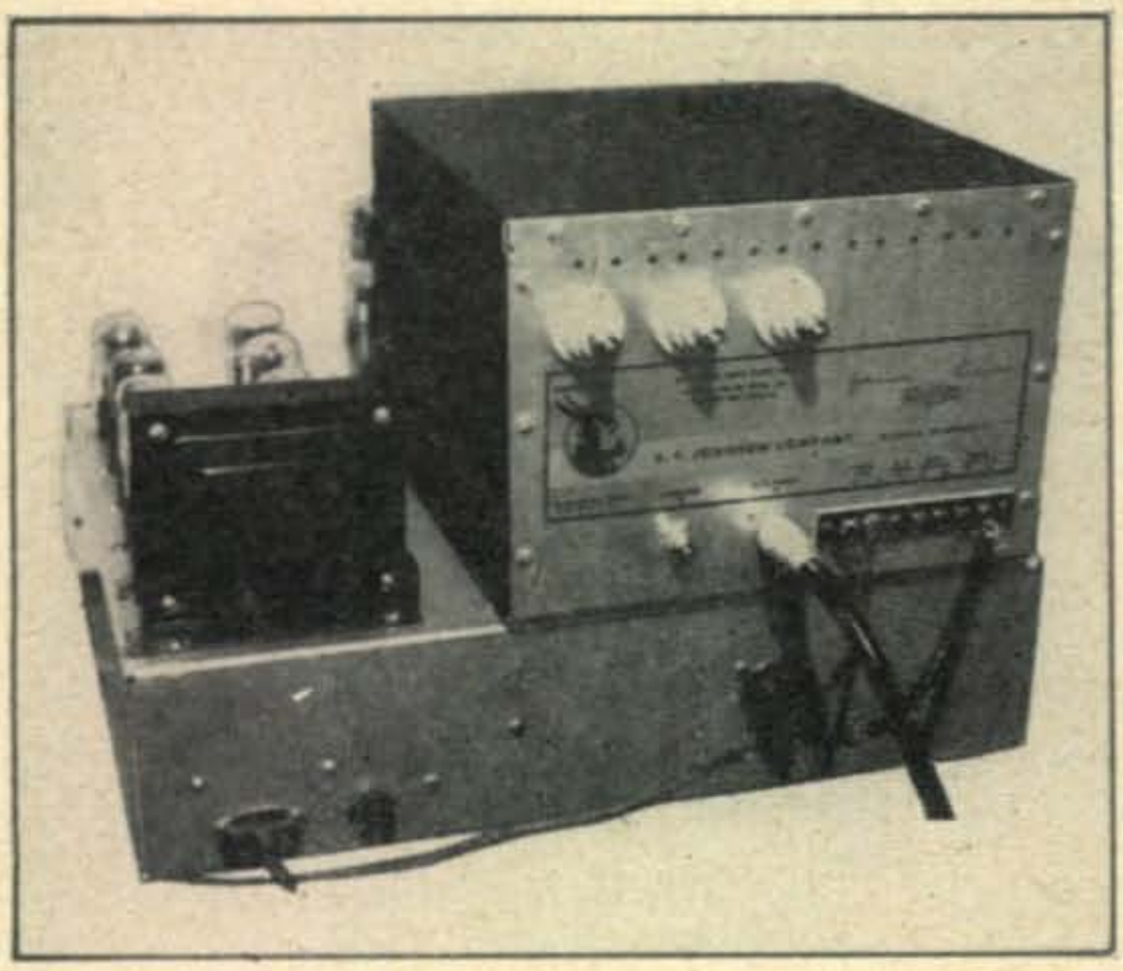
(4) Energize the transmitter in low power and tune it for maximum power transfer into the dummy load of the *True-Matcher*.

(5) Switch the *True-Matcher* output from the dummy load to the *Match Box* and en-

ergize the transmitter until the drive mechanisms on the *Match Box* come to rest.

(6) Increase transmitter power to normal. (This may cause one or both control motors to adjust tuning slightly.)

The drive motors may be left turned on for CW operation, but for some transmitters it may be advisable to turn off one or both motors for phone operation. This is because modulation which causes the plate current to vary (such as controlled carried modulation) will cause sufficient mismatch when this occurs that a signal may be sent to the drive mechanisms. As a result, the motors will drive back and forth during modulation.

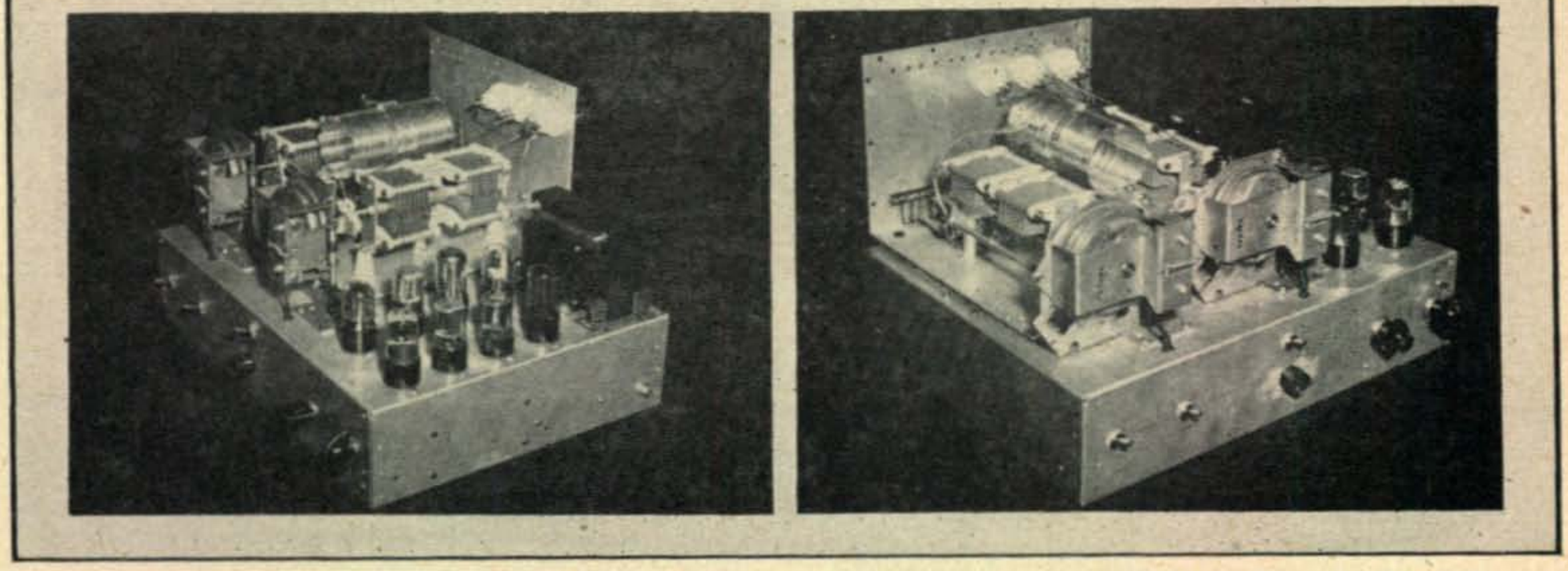


Rear view of the amplifier chassis with the "Match Box" as the antenna tuning unit. Power cables and fuse are at the lower left. Wiring on the terminal strip of the "Match Box" is (left) receiver antenna, ground connection and (right) power to the antenna relay in the "Box." The left-hand feed-thru connection is for single wire antennas, the others for two-wire balanced systems.

The drive mechanisms described above are not the only ones which may be used. *BARCOL Speed Reducers* are suitable for this use. One of these devices tested at W4LW is of 14-watt rating and has a shaft output of 4 RPM. It is simple to mount, quiet in operation and can be run for long periods without overheating. This device operates directly from a 115-volt, 60-cycle supply so that a step-down transformer is not necessary as is the case with the *ZENITH* units. The control circuit does not carry the power current, hence there is no problem of overloading the relay contacts nor of causing radio interference from sparking at these contacts. It has the disadvantage that there is no clutch to permit manual operation.

Operational experience with the *Automatic Match Box* has demonstrated that its greatest value is the short time required to shift frequency. This is not only a great convenience, but insures compliance with FCC regulations. In phone operation, the *Automatic Match Box* tunes itself during the first few seconds of transmission of the call. For CW operation, it will even tune during keying (provided the dashes are reasonably long). Consequently, tuning is completely legal as well as free from annoyance to fellow amateurs. Of course, the remote feature of automatic operation is attractive, particularly in cases where the operating position is at a considerable distance from the location of the antenna coupler.

(The device described by the author must be used with a "True-Matcher" (shown in the July 1953 issue of CQ on page 30) and a d-c amplifier (shown in the January 1954 issue on page 33). Our Circulation Department has made special arrangements to supply copies of these two back issues for a total price of 75c, or 40c apiece if only one issue is necessary to complete your files. Mention "True-Matcher" when requesting these specials.—Editor.)



These two illustrations show the "Match Box" with the dust cover removed. Note how the "Match Box" has been mounted on a chassis with the motor drive shafts at the level of the variable condensers. The d-c amplifier is also made a part of this unit. The "True-Matcher" is similar to that previously described by the author. It is connected to the transmitter output.

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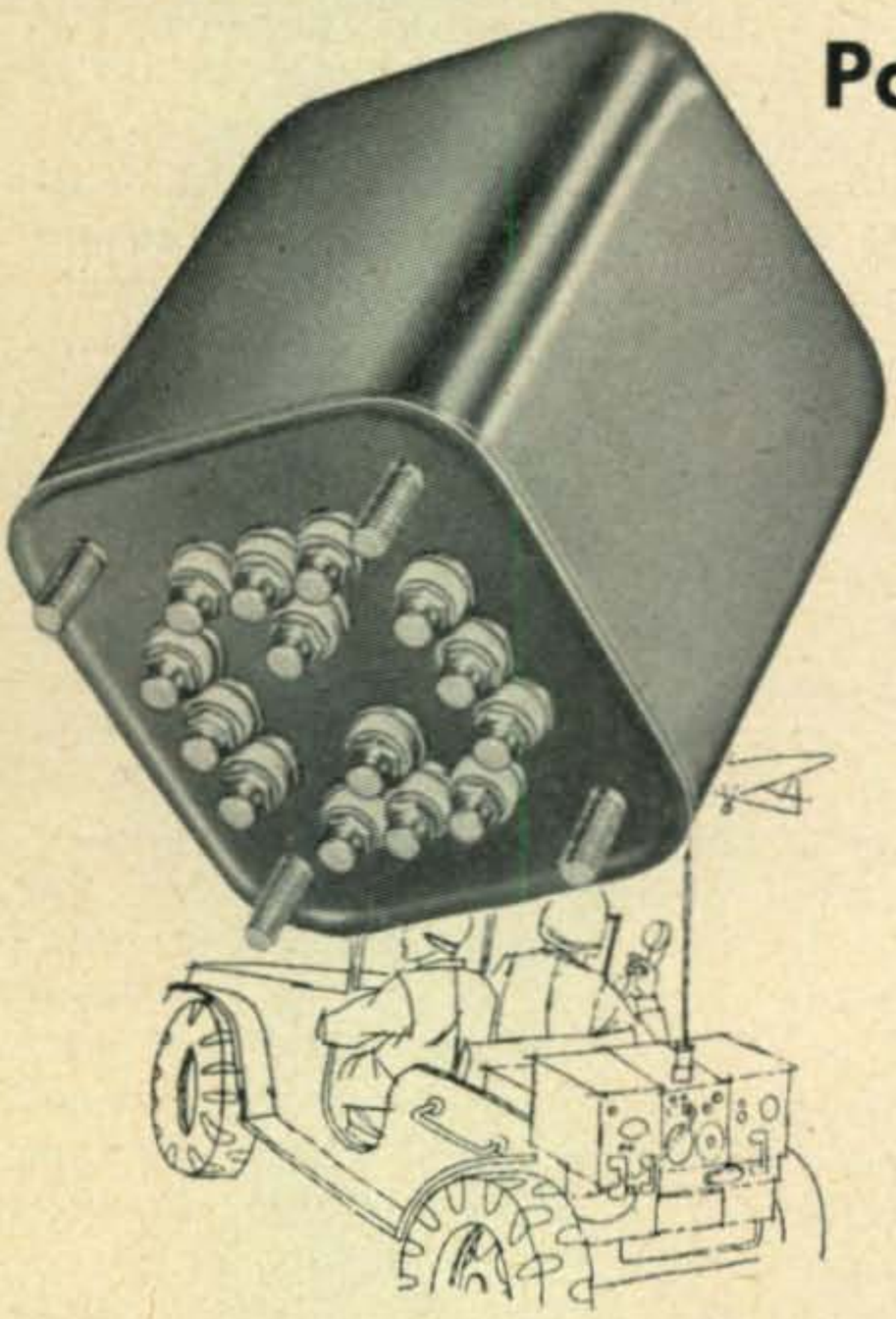

★ *for military communications*

★ *research and development*

★ *pilot runs* ★ *pre-production models*

These CHICAGO transformers meet all specifications of the Military Standard line of transformers developed jointly by the Army Signal Corps, Navy Bureau of Ships and the Air Force working through ASESA (Armed Services Electronic Standards Agency).

The entire CHICAGO MS line has been designed to conform with MIL-T-27, Grade 1 specifications for Class A operation. All units are housed in CHICAGO'S one-piece, drawn-steel cases whose dimensions and mounting centers are within the tolerances of the Military Standard specifications.

POWER TRANSFORMERS—INPUT REACTOR SYSTEMS (PRIMARY—105/115/125 V.—Frequency 54-66 cycles)

CATALOG NUMBER	MIL-T-27 PART NO.	HIGH VOLTAGE A-C Volts	SECONDARY D-C MA.	D-C V OUTPUT	RECT. FIL. Volts	RECT. FIL. Amps.	FIL. NO. 2 Volts	FIL. NO. 2 Amps.	WT. LBS.
PMS-70	MS-90026	200-100-0-100-200	70	385	6.3/5	2	6.3	3	4
PMS-70A	MS-90027	325-0-325	70	260	6.3/5	2	6.3	4	5
PMS-150	MS-90028	325-0-325	150	245	6.3	5	5	3	7¼
PMS-175	MS-90029	400-0-400	175	318	5	3	6.3	8	10
PMS-250	MS-90030	450-0-450	250	345	5	3	6.3	8	13
PMS-350	MS-90031	350-0-350	250	255					7½
PMS-550	MS-90032	550-0-550	250	419					11
PMS-800	MS-90036	800-0-800	250	640					16½

FILAMENT TRANSFORMERS (PRIMARY—105/115/125 V.—Frequency 54-66 cycles)

CATALOG NUMBER	MIL-T-27 PART NO.	SECONDARY Volts	SECONDARY Amps	INSULATION VOLTS RMS	WT. LBS.
FMS-23	MS-90016	2.5	3.0	2500	1½
FMS-210	MS-90017	2.5	10	2500	2½
FMS-53	MS-90018	5.0	3.0	2500	1¾
FMS-510	MS-90019	5.0	10	2500	4
FMS-62	MS-90020	6.3	2.0	2500	1¾
FMS-65	MS-90021	6.3	5.0	2500	2¾
FMS-610	MS-90022	6.3	10	2500	5
FMS-620	MS-90023	6.3	20	2500	8
FMS-210H	MS-90024	2.5	10	10000	4¾
FMS-510H	MS-90025	5.0	10	10000	7

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3501 W. Addison St., Chicago 18, Ill.

A New "Clamper"

WILLIAM I. ORR, W6SAI

Contributing Editor

Take a good look at the photo above. Know what it is? (A tube!—*Ed.*) Yes, that's right, but it also is a 12-henry, 100-milliampere filter choke, as well as an excellent clamper tube! Here is the story of this new development.

The *CBS-Hytron* type 6216 is a beam power tube having a miniature 9 pin base, and a *T6½* bulb. When used in appropriate circuits, it replaces an iron core filter choke 12 henries. The tube has an extremely low internal voltage drop combined with very high plate resistance. This makes it extremely interesting to any amateur using clamper circuits on the newer tubes, such as the 6146. The general characteristics of the 6216 are given in *Fig. 1.* The grid-plate capacity *(0.37 μμfd.)* is comparable to a 5763 *(0.30 μμfd.)*, so no trouble should be encountered in stabilizing the tube. If neutralization should be required, the popular Bruene circuit[1] can be used.

The Electronic Filter Choke

Using a vacuum tube to replace a filter choke is a relatively new idea. The main use of such a brainstorm is in airborne and vehicular electronic equipment, to reduce the weight and space normally required by an iron-core filter choke. The 6216 tube is ruggedized to withstand shocks up to 700 g, and is resistant to vibrations of a high order.

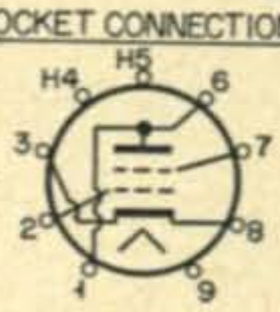
A typical filter reactor circuit is shown in *Fig. 2.* The 6216 tube is placed in series with the negative lead of the power supply and acts as a series resistor of some 300 to 500 ohms. The a-c fluctuations present in the output of the 5Y3 full wave rectifier tube are impressed upon the grid of the 6216 tube through coupling condenser *C4*. The internal resistance of the 6216 tube varies in such a way as to oppose the a-c fluctuations, and to smooth the current flowing through it. Using the circuit of *Fig. 2,* the r.m.s. ripple voltage in the output is only 210 millivolts. Potentiometer *R1* should be adjusted for minimum a-c ripple voltage across the output terminals of the power supply. The action of the 6216 tube, as compared to a standard 12-henry filter choke, may be seen in *Fig. 3.* The voltage drop across the 6216 tube is slightly greater than the drop across the choke, but the ripple voltage is slightly less. The maximum current passed by one 6216 tube in this circuit is 100 milliamperes.

Clamper Tube Operation

The 6216 tube compares in most respects with the 5763 tube for r-f service as a class C amplifier or frequency doubler. The 6216, however, outperforms all other tubes in screen grid clamper service. Any Ham who has ever tried to screen clamp a 6146 tube, using a 6L6, 6V6

6216 CHARACTERISTICS

SOCKET CONNECTIONS

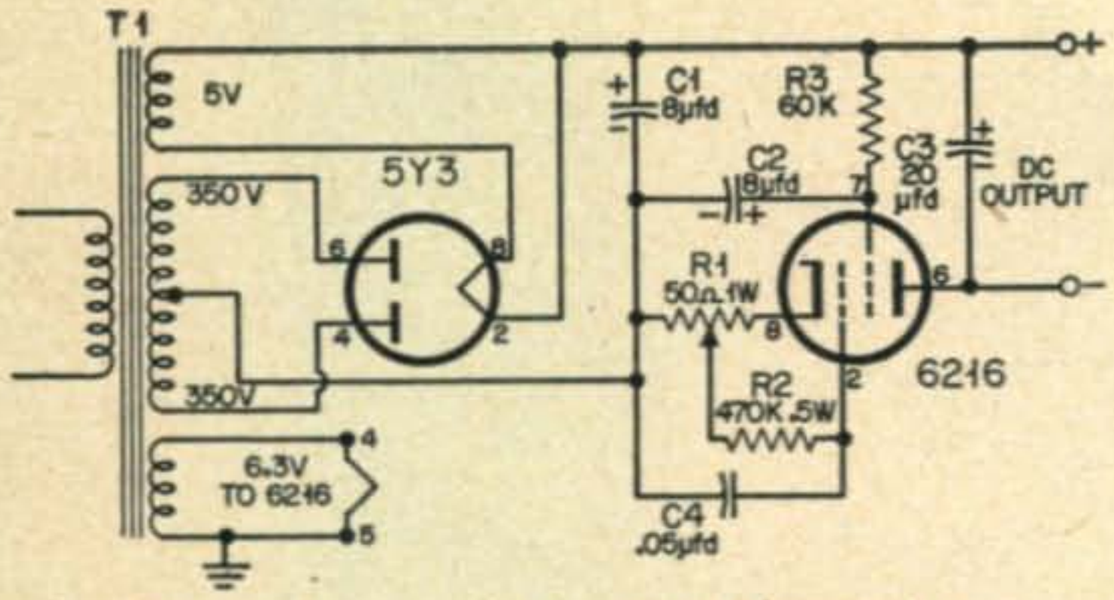


1 PLATE
2 GRID #1
3 CATHODE
4 HEATER
5 HEATER
6 PLATE
7 GRID #2
8 CATHODE
9 NO CONNECTION

CAPACITY-GRID TO PLATE	.37 μμfd
INPUT	12.3μμfd
OUTPUT	6.7μμfd
HEATER –6.3V 1.2AMP	
TYPICAL OPERATION-CLASS C AMP	
DC PLATE VOLTAGE	300V
DC SCREEN VOLTAGE	150V
DC GRID VOLTAGE	–50V
GRID RESISTOR	22,000Ω
DC PLATE CURRENT	63 Ma
DC SCREEN CURRENT	8 Ma
DC GRID CURRENT	2 Ma
DRIVING POWER	.3 WATTS
POWER OUTPUT	8.8 WATTS
TYPICAL OPERATION-FILTER REACTOR	
DC PLATE SUPPLY (FILTER INPUT)	400V
DC SCREEN VOLTAGE	100V
DC GRID VOLTAGE	–4V
DC OUTPUT VOLTAGE	335Vmax
RMS RIPPLE VOLTAGE	210 MV

Fig. 1. 6216 operational data. The power output is that actually measured at 50.0 Mc.

1. Bruene, "How to Neutralize Your Single-Ended Tetrode Final," **CQ**, August 1950, p. 11.



C1,C2	8 μfd	R1	50 OHMS, WIREWOUND, 1 WATT
C3	20μfd	R2	470,000 OHMS, 1/2 WATT
C4	.05μfd	R3	60,000 OHMS, 1 WATT
T1	350-0-350 VOLTS, 100 Ma-CHICAGO TRANSFORMER PV-120, OR PSC-105		

Fig. 2. A 6216 tube used as an electronic filter choke.

or 6AQ5 will appreciate the action of the 6216. When used as a clamper tube, the internal resistance of the 6216 is about 1000 ohms. The internal resistance of the other tubes runs 2000 ohms, or higher.

When the 6216 tube is connected as a triode, the E_p-I_p curves are as shown in *Fig. 4*. Let us assume that we wish to clamp the screen circuit of a 6146 tube—a tube that is notoriously hard to clamp to any degree of success. The clamper circuit to be used is shown in *Fig. 5*. The clamp tube acts as an imperfect "off-on" switch. When excitation is applied to the grid circuit of the 6146 tube, rectified grid voltage appears across grid resistor *R1*. This voltage cuts off the clamper tube, and the tube is "off." When excitation is removed from the grid circuit, the grid voltage of the clamper tube drops to zero, and the tube conducts. It is now "on," after a fashion. The amount it is "on" depends upon the internal resistance of the tube. If this resistance was zero, the screen voltage of the 6146 would be zero, and all would be rosy. Since the clamper tube does have internal resistance, the screen voltage of the 6146 is not zero—it is somewhere between 20 volts and 100 volts, depending upon the choice of the clamper tube. By examining the curves of *Fig. 4* we can find out what the "on" voltage at the plate of the clamper tube may be, and determine whether the tube will perform in an acceptable manner.

The voltages and currents shown in *Fig. 5* are those under actual operating conditions, with the clamper tube "off." The voltage drop across the 28,000-ohm screen resistor *(R2)* is 420 volts, to provide the correct screen voltage of 180 volts at a screen current of 15 milliamperes. Now assume the excitation to the 6146 tube is cut off, and that we are using a 6L6 as a clamper tube. The rectified grid voltage across *R1* drops to zero, and the 6L6 conducts, dropping the screen voltage of the 6146 to some lower value. Referring to *Fig. 4*, a 28,000-ohm load line is drawn *(R2* is considered to be the plate load resistor of the 6L6) from the supply voltage point (600 volts) on the plate family of curves. At the intersection of the zero-bias line with this load line, the value of 6L6 plate voltage is found to be about 55 volts. Thus a 6L6 clamper tube can only drop the screen voltage of a 6146 tube to 55 volts by virtue of its clamping action. Under these circumstances, the 6146 will draw excessive plate current (over 1000 milliamperes) when excitation is removed. The tube will be destroyed in short order with this amount of overload. So it can be seen that the 6L6 is somewhat less than a suitable clamper tube for the 6146. This conclusion also applies to the 6V6 and the 6AQ5 when used in this circuit.

If a 6216 tube is substituted for the 6L6, the operating parameters of the 6146 will, of course, remain the same. The clamping action, however, is different. A 28,000-ohm load line may be drawn on *Fig. 4*, the plate family of curves for the 6216. At the intersection of the zero-bias line with the load line, the value of 6216 plate voltage is about 23 volts. With a screen voltage of 23 volts, and a plate voltage of 600, the 6146 tube will draw a plate current of about 40 milliamperes, which is just within the maximum plate dissipation rating of the 6146 tube.

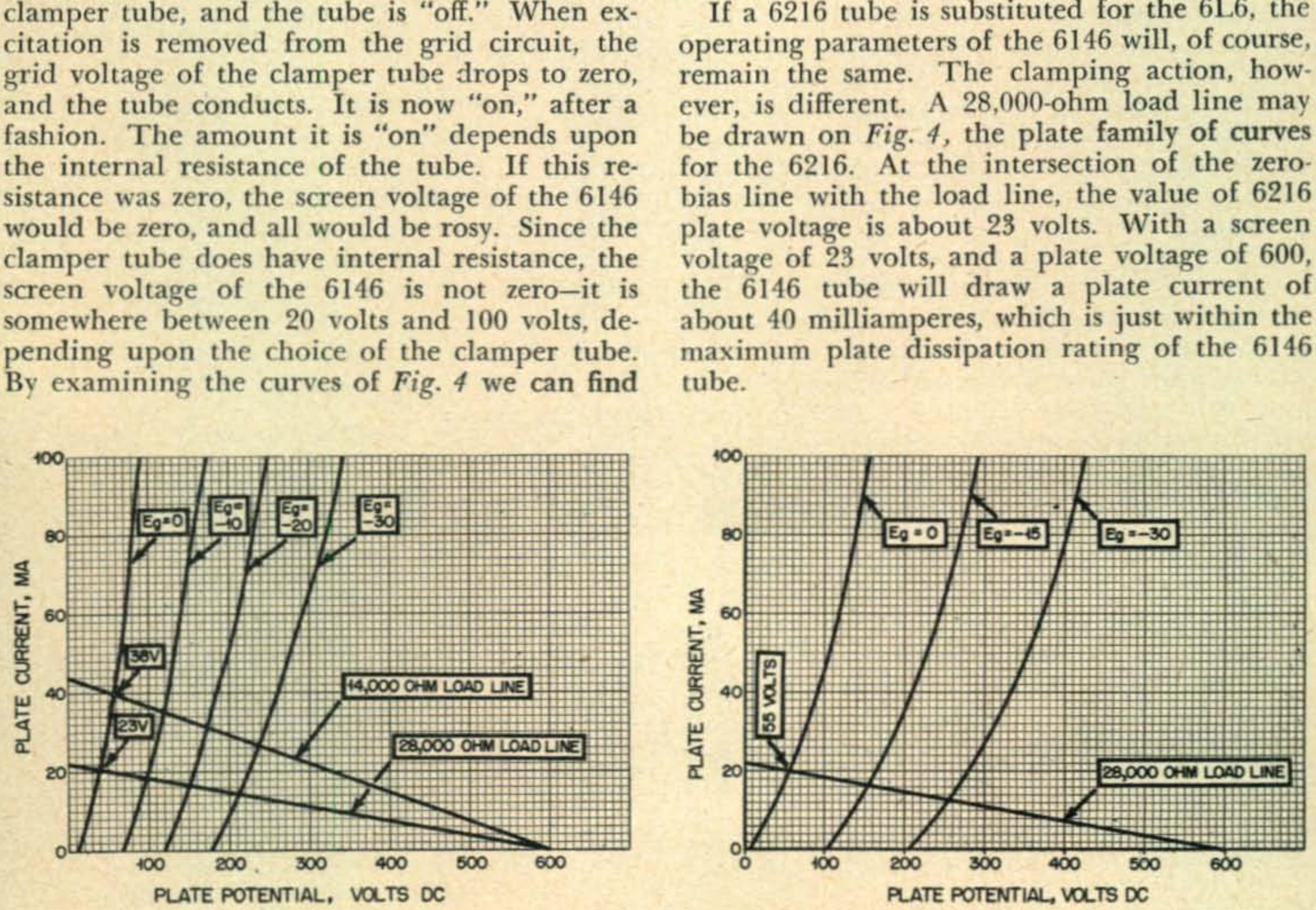


Fig. 4. These E_p-I_p curves when used as described in the text permit the constructor to design his own clamp tube circuit.

At a lower plate voltage of 450 volts, using the same circuit parameters, the screen voltage of the 6146 is 18 volts, and the quiescent plate current is 33 milliamperes. So it can be seen that the 6216 clamp tube is satisfactory to use with a 6146 tube operating at plate voltages up to 550 or 600 volts.

High Voltage Operation of the 6146

If it is desired to operate the 6146 at higher plate voltages than 600 volts, it is necessary to cut the quiescent screen voltage of the 6146 to zero to prevent excessive plate dissipation from harming the tube. When this is done, the resting plate current of the 6146 tube is about 20 milliamperes, and a 750-volt plate supply may be employed. In this case an OB2 miniature regulator and a 0.1 megohm resistor must be

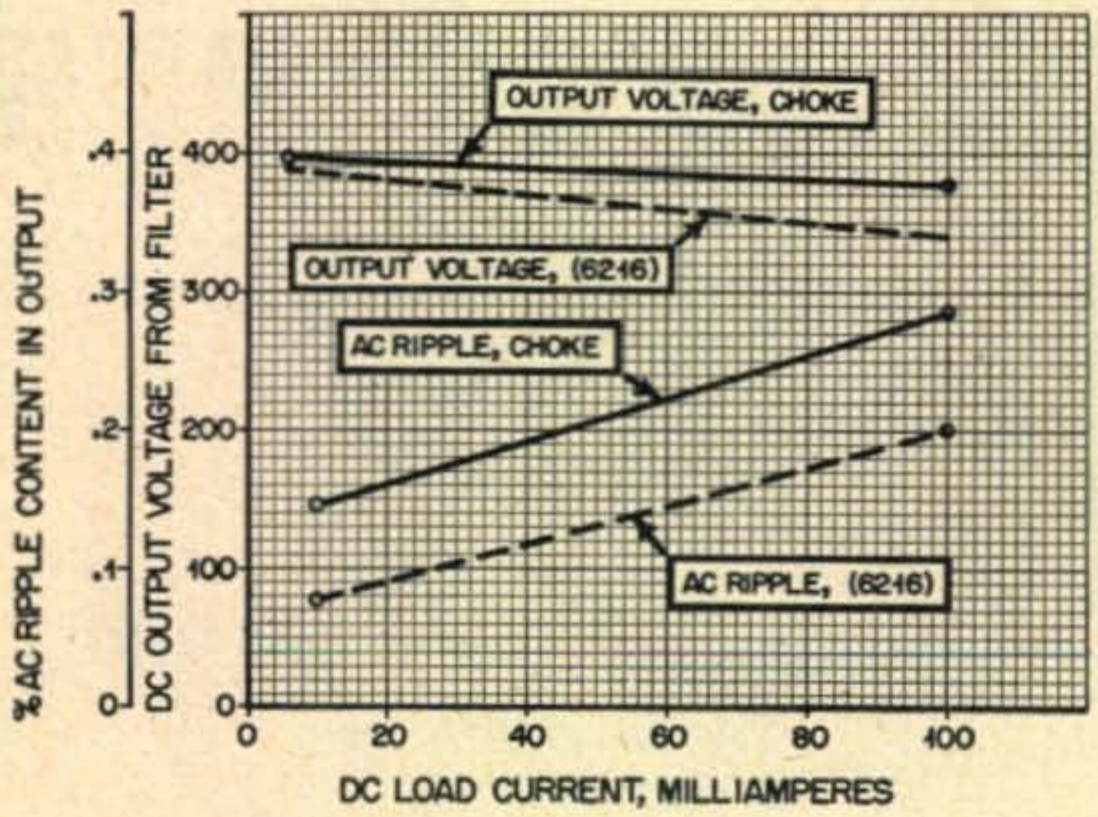


Fig. 3. The 6216 tube vs. a 12-henry iron core choke.

added to the circuit *(Fig. 6)*. When the 6216 clamping action takes place, the OB2 is extinguished, since its anode voltage drops below the minimum firing potential of the tube. This action opens the screen-plate circuit, and the screen is effectively grounded through *R1*. If desired, the OB2 may be used in the screen circuit at lower values of plate voltage. All that is necessary is to decrease the value of the screen resistor so that the plate voltage of the 6216 tube is 105 volts higher than the screen voltage desired on the 6146 tube. The internal resistance of the OB2 will compensate for the extra 105 volts.

Clamping Two 6146 Tubes

If it is desired to clamp two 6146 tubes, the situation changes a bit, but the same solutions apply. Screen current for two tubes is 30 milliamperes. With a plate supply of 600 volts, a screen dropping resistor of 14,000 ohms is required. Drawing a 14,000-ohm line on the 6216 plate family of curves *(Fig. 4)* indicates that at zero grid volts, the plate voltage on the 6216 tube is about 38 volts. This value of voltage on the screen of the 6146 tube is excessive, and would quickly damage the 6146's. Two 6216 tubes in parallel would cut the internal

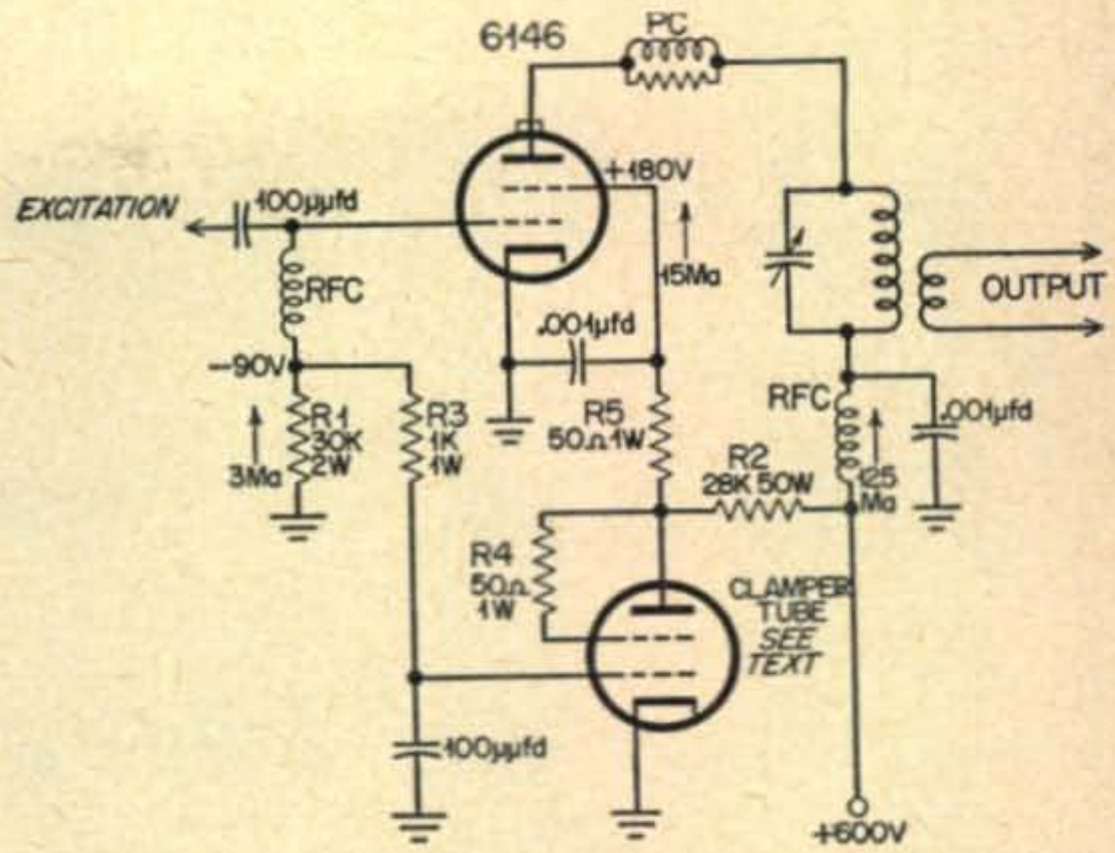


Fig. 5. Basic clamp tube circuit with the 6216.

voltage drop of the clamper tube circuit in half, and drop the screen voltage to about 20 volts. The resting plate current of the two 6146's would then be about 85 milliamperes for the two tubes. This is just within their maximum plate dissipation rating at 600 volts. A 50-ohm, ½-watt carbon resistor should be placed in the grid and plate leads of the paralleled 6216 tubes to prevent spurious oscillations in the clamper circuit.

A better solution would be to use the circuit of *Fig. 6*. The screen resistor would be changed from 32,000 ohms as shown in the drawing to the correct value of 10,000 ohms. (Remember—we have to allow for the voltage drop in the OB2. That is why we now use 10,000 ohms, rather than 14,000 ohms.)

All in all, the 6216 is a pretty spiffy little tube. It will perform as an iron-core choke, work as a class C amplifier, and actually clamp a tricky tube like the 6146. No doubt it will become a very popular tube around the shack of Joseph Q. Ham.

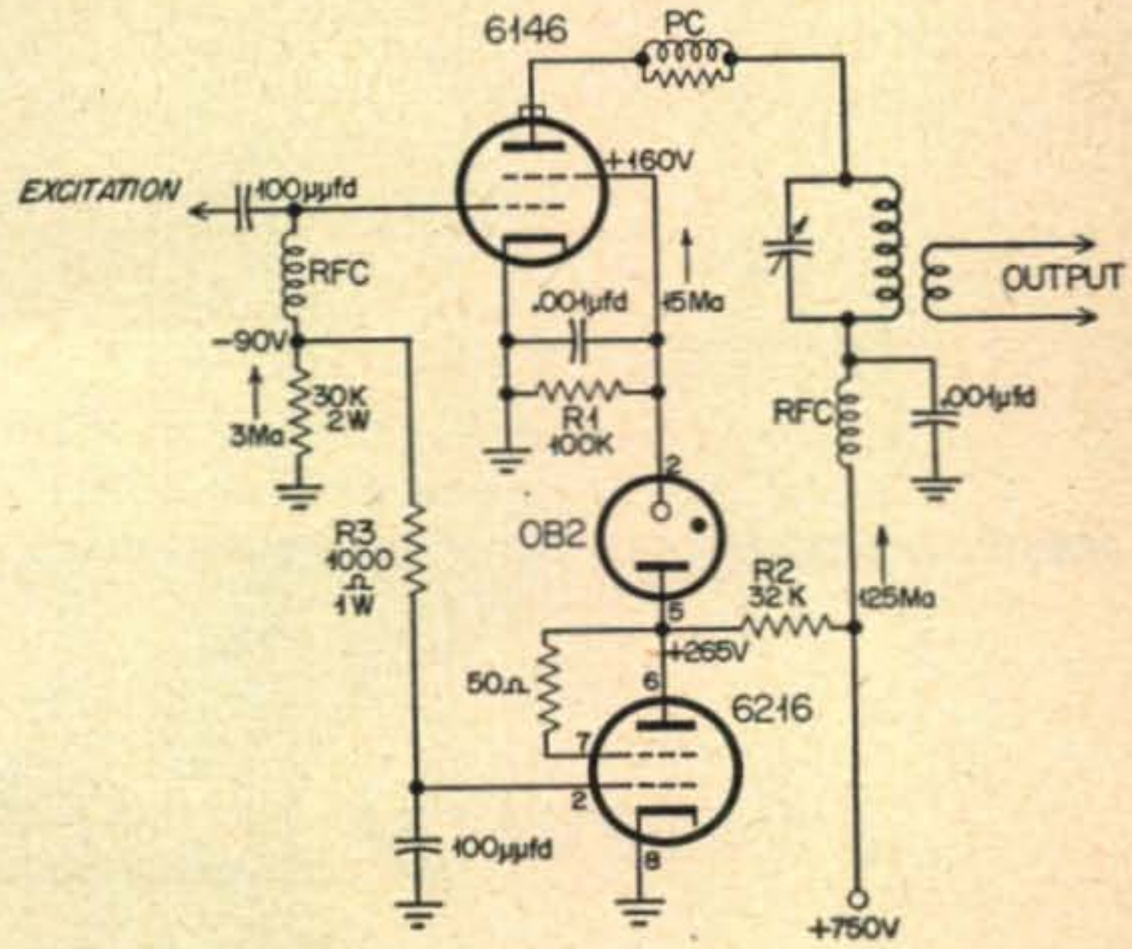
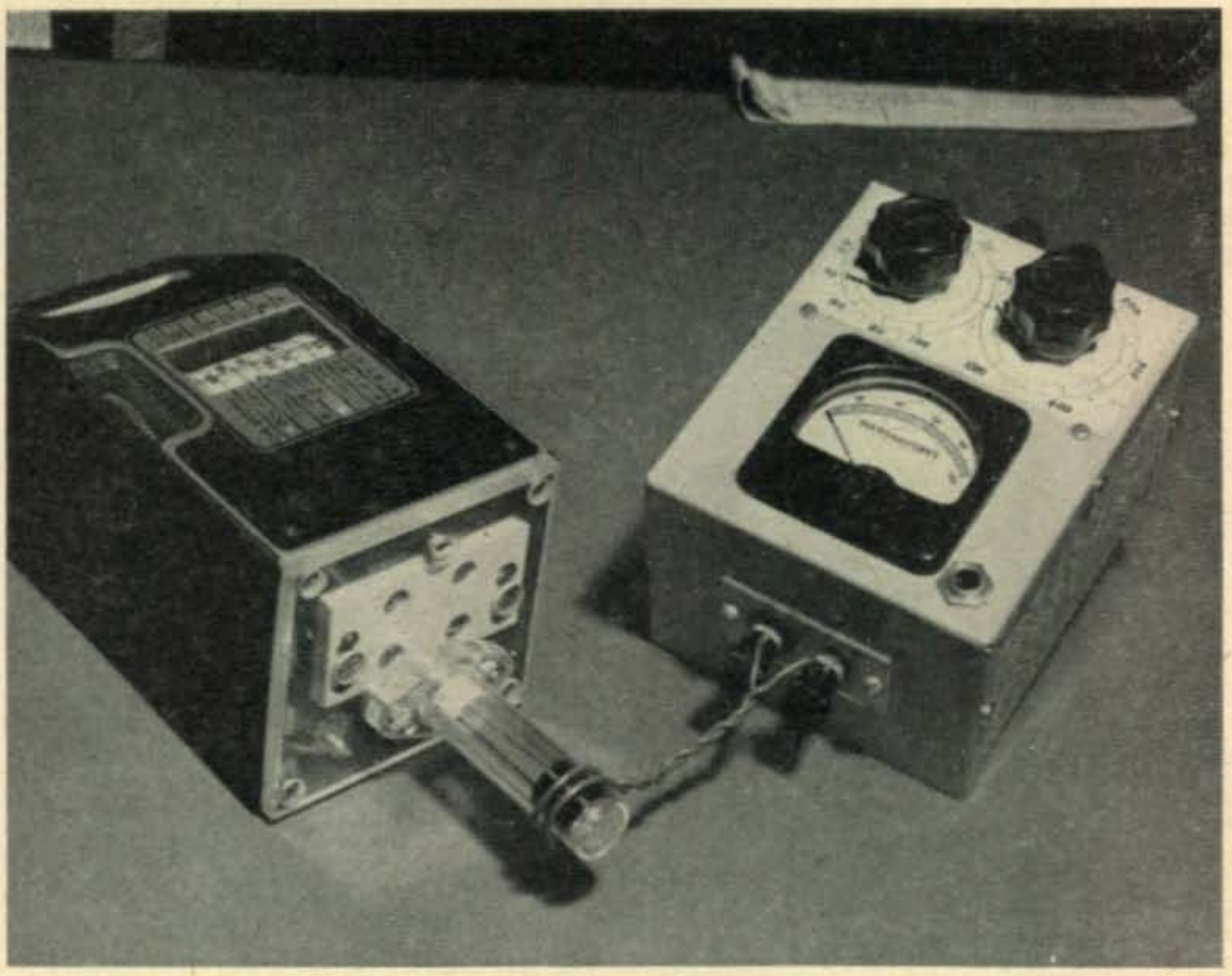


Fig. 6. Improved clamp tube circuit when the final is operated at a higher voltage than shown in Fig. 5, or when two 6146 tubes are employed in parallel.



Antennascope-54

WILFRED M. SCHERER, W2AEF

Contributing Editor

It is the ambition of each magazine editor to be able to look back upon a continuing series of notable contributions to the field of his journal. CQ has been fortunate to include on its staff the Ham that popularized the grid dipper and TNS, while adding the "antennascope" to the family of test instruments. After its introduction in 1950, the "antennascope" quickly became a necessity in many Ham shacks and is currently being manufactured by two equipment companies.

The activation of some 20,000 new amateurs since 1950, has forcefully brought to our attention the fact that to many the "antennascope" is a mysterious device. With the depletion of back issues of CQ containing the original disclosure on the "antennascope" (September, 1950), no further material on its use has appeared in print.

It is also known that the mechanical design of the first "antennascope" left something to be desired. Electrically, although basically a simple design, it had never been up-dated to use the newer crystal detection diodes.

The "Antennascope-54" is a modification of the original instrument. The improved version is the result of several years of study on how and where it is used. We are sure you will find this two-part article of interest.

o.p.f.

Part I of a Two Part Article

The *Antennascope* and *Antennascope-54* are very simple radio frequency bridges for the measurement of antenna impedance and resonance. They may also be used for a wide variety of other measurements and the second part of this article will discuss this subject at great length.

As usual in bridge circuits, the variable element *(R1),* is adjusted until a zero null is obtained on the indicating device *(Detector).* Through the calibration of *R1,* the value of the unknown element, *Rx,* is found. Since the ratio arms, *R1, R2* and *R3* are resistive elements, the unknown *Rx* must also be resistive, or non-reactive, before an accurate balance can be obtained. The configuration of this simple bridge is shown in *Fig. 1.* The schematic of the improved *Antennascope-54* may be seen in *Fig. 2.*

The impedance presented by an antenna is resistive only at resonance. The bridge in the *Antennascope-54* cannot be brought to balance until the r-f generator is at the resonant frequency of the antenna in question. Thus, the *Antennascope-54* also provides a foolproof method of quickly and accurately determining the resonant point of any antenna. It is the

working out of these two problems; i.e, radiation resistance and resonance, wherein the constructor will find the greatest value of the *Antennascope-54*.

The useful range of the *Antennascope-54* is from 10 through 500 ohms. In the original unit this was covered by a single scale which resulted in those readings below 100 ohms being crowded. In this new improved model two scales have been provided. A "high" scale *(R1a)* with readings of good visibility from 50 to 500 ohms. A "low" scale *(R1)* with good readings of from

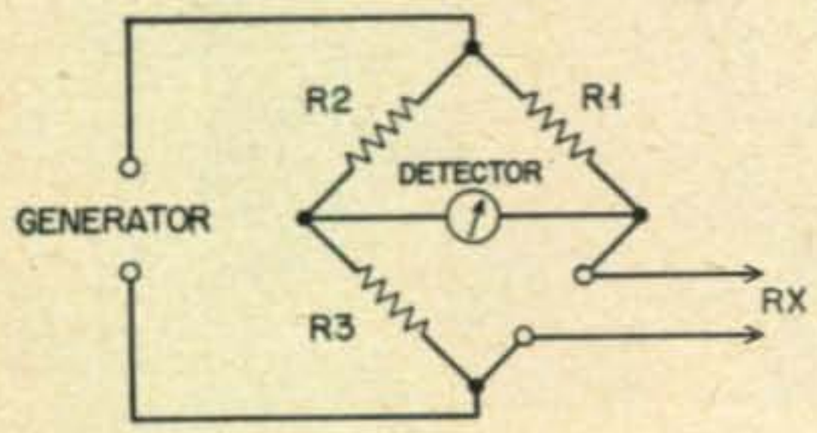


Fig. 1. Fundamental bridge circuit. This is the basic idea of the ANTENNASCOPE-54. Balance of the bridge is indicated by a null, or zero reading on the meter.

10 to 100 ohms. Values between 0 and 10 ohms, and 500 to 1000 ohms may be read through the use of external resistors.

The *Antennascope-54* is designed to be used with a grid dipper as the r-f generating source.

Construction

In the wiring schematic of the *Antennascope-54 (Fig. 2)* the only real critical components are *R1* and *R1a*. Crystal sensitivity is also important and is discussed later on in this text.

From an ideal aspect, *R1* and *R1a* should be perfect non-reactive resistors, thus *any-old-type* potentiometer of the proper value will not work in this spot. Each potentiometer that we have used and measured has had some internal inductance and capacitance. Too much of either of these items will seriously inhibit the use of the *Antennascope-54* on the higher frequencies.

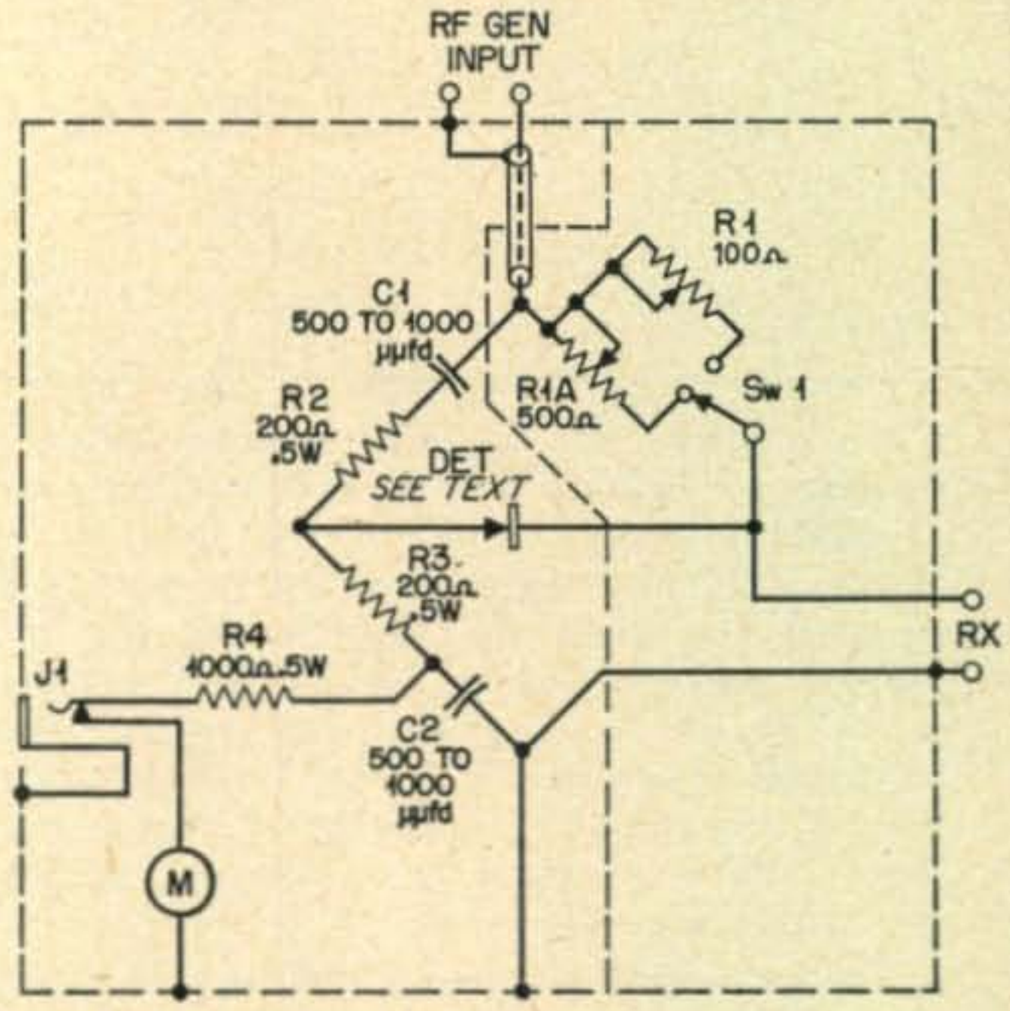
The original model of the *Antennascope* employed a *Centralab Type M* composition potentiometer. Unfortunately, this control is not available on the general amateur market, although some companies have obtained a quantity on special orders. During the development of the *Antennascope-54* we tried dozens of substitutes to find a suitable replacement. The next best thing to the *Centralab* potentiometer is the *Allen-Bradley Type J*, followed rather closely by the *Ohmite Type AB*. Either of these controls may be used for entirely satisfactory results within the useful frequency range of this instrument.

Before a potentiometer is soldered into this circuit it should be checked with an ohmmeter. Temporarily mount it with a scale so that the presence of backlash may be ascertained. Rotate the arm back and forth and note whether or not the identical ohmmeter readings occur at the same scale reading when approached from either clockwise or counter-clockwise rotation. In some controls the carbon contact in the slider arm may be loose. It can be tightened by crimping the mounting clip.

The range switch, *Sw1*, which is a new feature in the *Antennascope-54*, must be of the small slide type. Toggle and wafer switches cannot be used here.

Resistors *R2* and *R3* must be identical values and although shown in *Fig. 2* as having a value of 200 ohms, they can be anything from 50 to 200 ohms—as long as they are identical. Another word of caution: Do not make the mistake of using the wire-wound resistor that physically look like their carbon brothers.

Condensers *C1* and *C2* must also be matched to identical values between 500 and 1000 $\mu\mu$fd. The button type ceramics *(Centralab ZA-751*, for example), are ideal for maintaining low inductance in their corresponding bridge arms. It is possible to use mica, disc or tubular ceramics in the *Antennascope-54* if the instrument will never be used above 30 Mc.

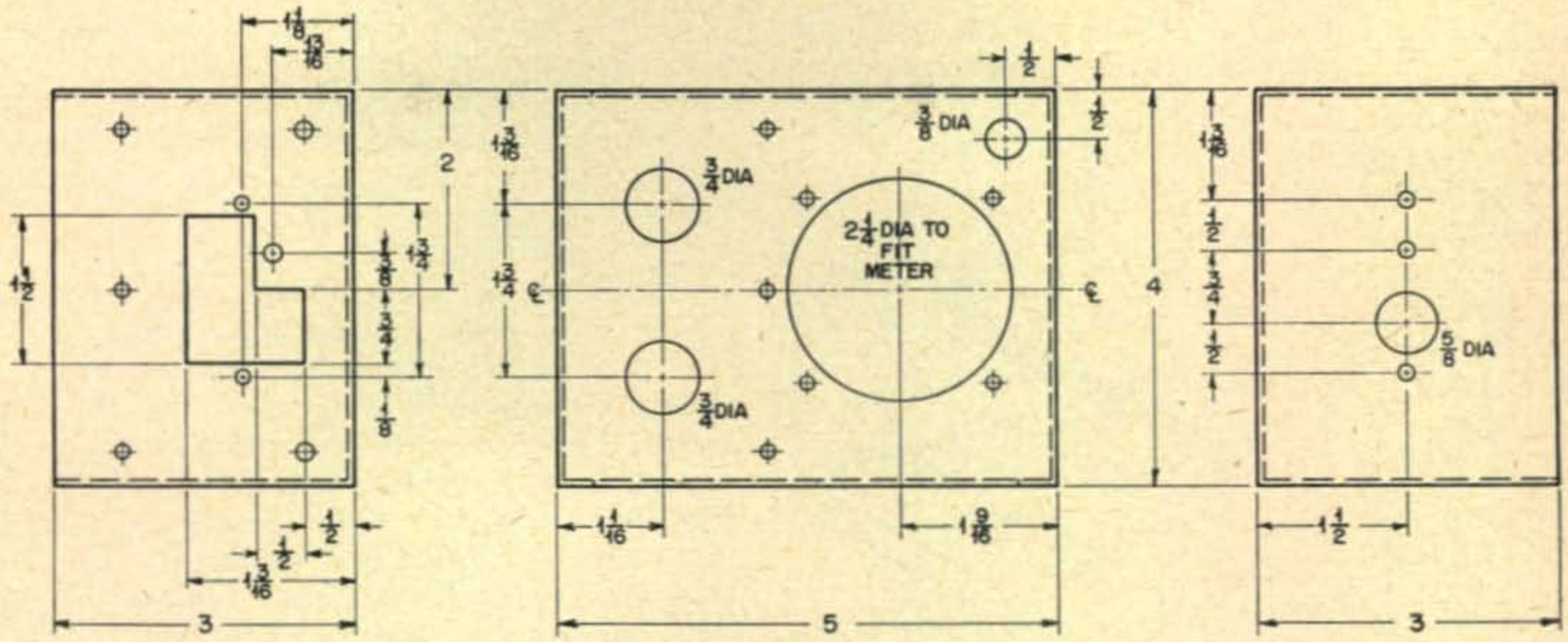


C1, C2—(see text) must be identical values of from 500 to 1000 $\mu\mu$fd. Centralab ZA-751.
J1—close circuit jack.
R1—(see text) 100-ohm potentiometer such as Ohmite AB or Allen-Bradley J.
R1a—same as above, but 500 ohms.
R2, R3—(see text) must be identical values of 50 to 200 ohms, non-inductive.
R4—1000 ohms, ½w.
Det—(see text) may be 1N23B, if mounting clip is constructed, or G7A if wire leads are desired.

Fig. 2. Wiring schematic of the ANTENNASCOPE-54. In this model a range switch, Sw1, has been added. A jack, J1, is placed in series with the meter, although it is essentially unnecessary. Some constructors will find it useful for making readings somewhat removed from the actual position of the instrument.

Crystal Diodes

The design of the original *Antennascope* was predicated on the use of the 1N23A diode.



Since that time, the stability and sensitivity of that diode has been improved (1N23B) and a great number of crystal diodes are now on the market for use on UHF TV. Some of these are cheaper than the 1N23 series and have the additional facility of being easily mounted.

The comparative sensitivities as I have measured them during the development of the *Antennascope-54* are as follows:

1N23B	100%	(Sylvania)
1N23A	95	(Sylvania)
G7A	93	(General Electric)
1N58	65	(Sylvania)
1N34	65	(Sylvania)*
CK710	60	(Raytheon)

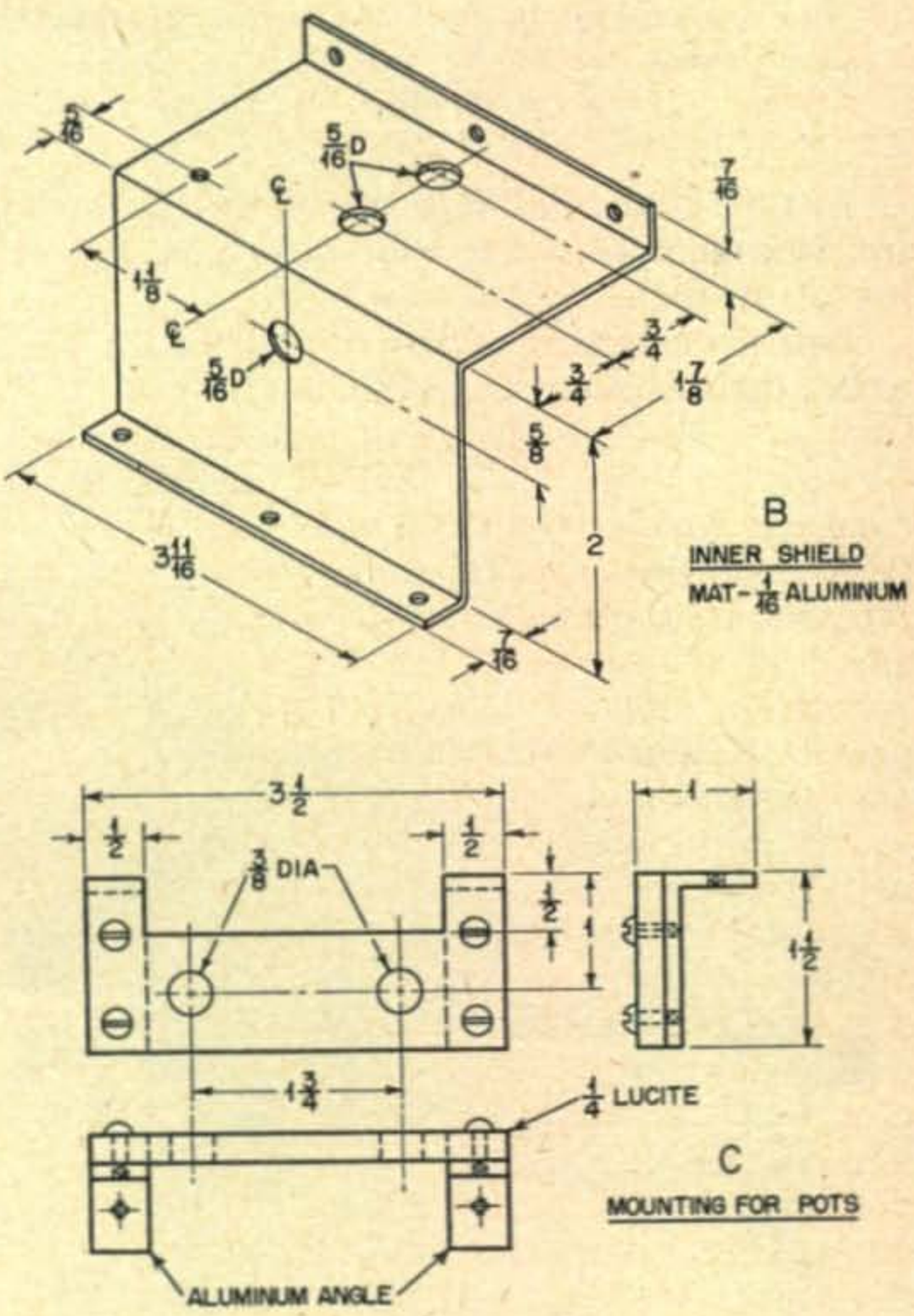
* Very frequency sensitive and poor at the high frequencies.

Since the *Antennascope-54* is to be used with a very low power r-f source (a grid dipper) the eventual sensitivity will also depend upon the meter movement. A full-scale movement of 200 micro-amperes is recommended with an internal resistance of 1000 ohms. The second part of this article will describe the *Antennascope Junior* which is built without a self-contained meter. This will further reduce the overall cost of this instrument by making use of the existing microammeter in your volt-ohmmeter.

Mechanical Details

An "exploded" view of the *Antennascope-54* is seen in *Fig. 3*. The unit is assembled in a *BUD Minibox CU-2105* (3"x4"x5"). An inner shield and shelf *(B)* is folded and drilled out as shown in *Fig. 4*. The *Minibox* is also drilled and cut out as shown in the latter figure. Note particularly the irregular cutout in the left-hand view *(A)* which clears the binding posts *(Rx)* and range switch, *Sw1*.

The terminals for *Rx* are mounted on a piece of lucite (see *part E* of *Fig. 4)* which in turn is mounted over the cutout in the top of the *Minibox*. The range switch, *Sw1,* is also mounted here to reduce any stray capacitance effects between elements of the switch and the box.



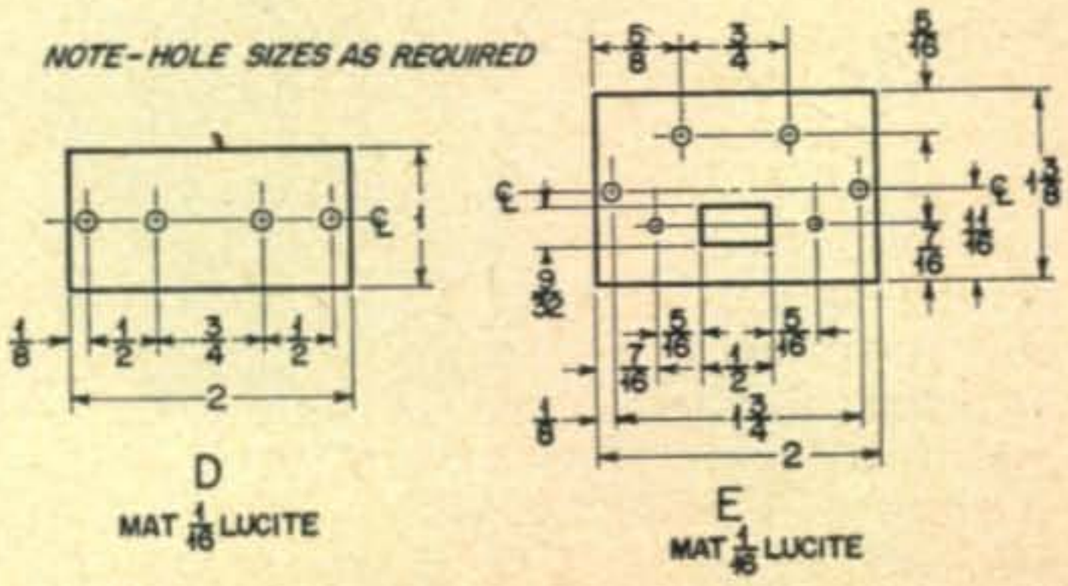


Fig. 4. Minibox, shield and mounting bracket layouts and drilling dimensions.

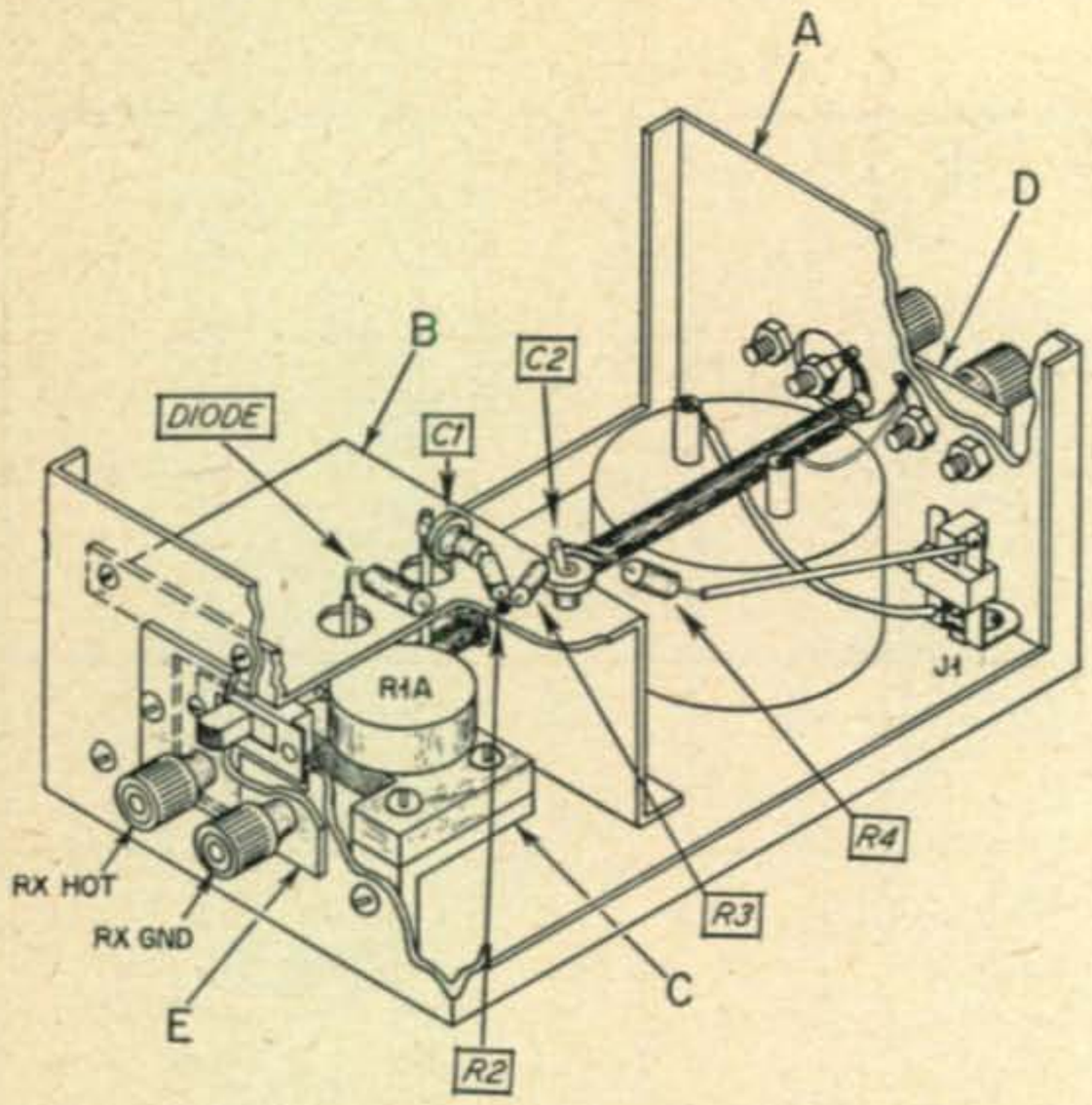


Fig. 3. Wiring view of the Antennascope-54. The layout should be followed as closely as possible.

Controls *R1* and *R1a* are then mounted directly under the *Rx* terminals on a ¼-inch thick piece of lucite. This insulating section is cut and drilled out as shown in *part C* of *Fig. 4*. The constructor must then drill two ¾-inch diameter holes in the front panel of the box to permit the shafts of *R1* and *R1a* to pass through *without* making contact with the box frame. Use extension couplings if the original shafts are not long enough.

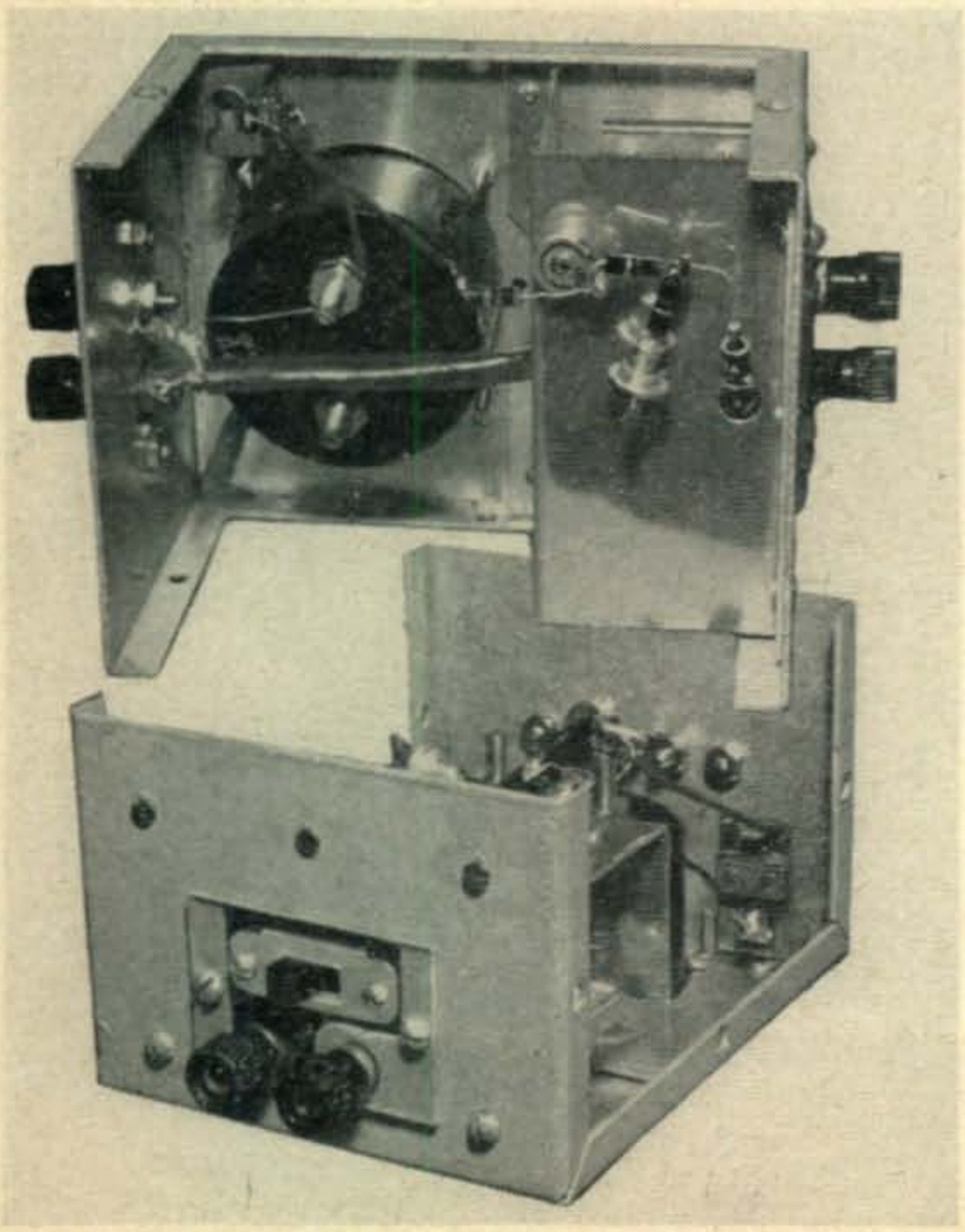
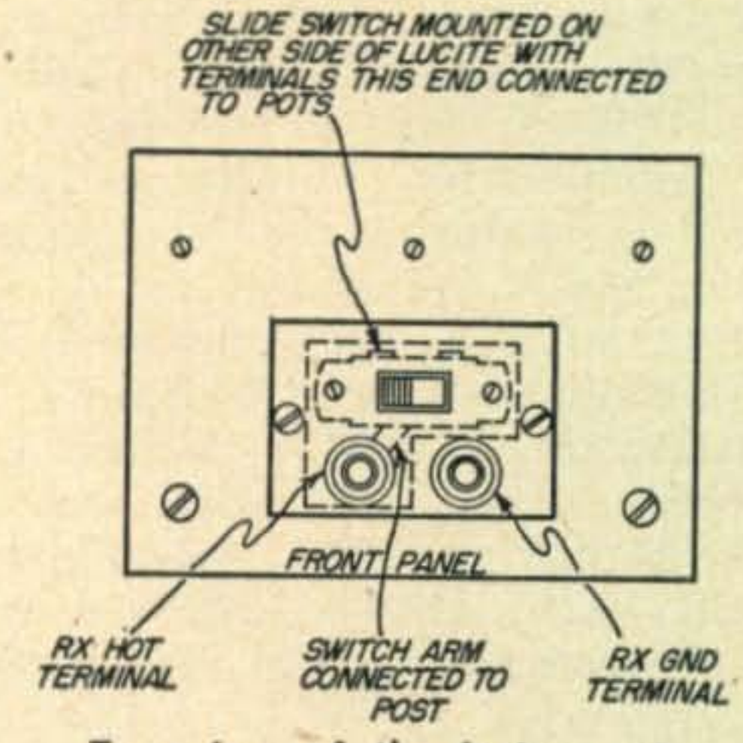


Photo views of the Antennascope-54.

The terminals for the r-f generator input are mounted at the bottom of the box. The "hot" lead is connected to a short length of RG-59/U which passes through the hole in the inner shield. The other end of the coaxial cable goes directly to *R1* and *R1a*.

The connecting leads to the various components in the bridge arms must be made as short as possible to minimize inductance and to prevent stray coupling. Minimum lead length is especially important for the connections between the potentiometers and the range switch, and between the "hot" *Rx* terminal and the switch. For these reasons, *R1* and *R1a* are positioned and mounted so that their terminals may be soldered almost directly to the switch tabs. The tab from the sliding arm of the switch is connected directly to a lug at the bottom of the hot *Rx* terminal.

The crystal diode shown in the unit in these photographs is a *G.E. G7A*. It is mounted in place with its own wire leads.



Top view of the instrument.

The various numbered and unnumbered figures and photographs in this article should clearly illustrate the wiring.

Calibration is Easy

The first step in calibrating the *Antennascope-54* is to attach an accurate ohmmeter between the "hot" *Rx* terminal and the "hot" r-f generator input terminal. Place the range switch to the left to engage *R1* for the 10 to 100-ohm range. Mark out your scale on the face of the base (the design of which I leave to the individual) and divide it into steps of from 2 to 5 ohms.

Now slide the switch to the right to engage the higher range and sub-divide the scale into steps of 25 to 50 ohms. Don't be startled to find that the potentiometers increase their resistances in opposite directions. Remember that *R1*, because of this mechanical layout, must be turned counter-clockwise and *R1a* must be turned in a clockwise direction.

It should now be possible to verify these calibration points through a facsimile of an

(Continued on page 44)

The VHF-UHF News

FURMAN C. COBB

c/o CQ Magazine, 67 West 44th Street, New York 36, N.Y.

As this is being written letters and post cards are in the daily mail telling of changes and further plans in the 144-Mc. trans-continental relay. The attempt was scheduled for Memorial Day. If it was unsuccessful, we can only predict that something totally unforeseen arose at the very last minute. A lot of footwork went into the plans and I personally predicted that the message made it within seven hours (elapsed time). The job of publicizing the relay would have been much easier if "Eddie-come-lately" had worried more about bridging a few bad gaps across the continent and less about his deadlines.

What the Gang is Doing

Al Burson, W8WXV (Shiloh, Ohio), chides us about the remarks in the May column re lack of cooperation on the trans-continental 144 Mc. relay. What I had in mind while writing that column, and before it was drastically edited down in size, was that several conflicting plans and planners were in operation. There seemed to be lack of cooperation between all these planners and things could have been made a lot smoother if a little more concrete info had been passed out to those sincerely working on the project.

In any case, Al very pointedly brings out that the gap from W9WOK/W9EHX through to W2UK is no problem. CW contact has been maintained nightly throughout the past winter and 'phone is a 90% bet from W8WXV to W9WOK. Apparently 300-400 mile gaps can be consistently bridged with good receivers, big antennas and fairly high power. Al wants the boys to think in terms of "effective radiated powers" of the order of 50 kw.!! Naturally, this is within reason and constitutes about the same construction problem as that encountered by the avid 20-meter DX man with a gallon and a 3-element rotary.

Henry Wilson, EI2W (Dublin, Ireland), shows us in the photo on this page the 32-element fixed beam that will be used this month and the next for tests between OH2OK and EI2W. This is a path of about 1600 miles. Henry deserves quite a bit of credit for his efforts in promoting VHF working in Europe and for the 144-Mc. trans-Atlantic tests last summer. By the way, these tests will be repeated in 1955.

EI2W has a very favorable QTH and is some 800 feet above sea-level at Sandyford six miles southeast of Dublin. The usual frequency is 144.1 Mc. and Henry operates from 2100 GMT until midnight GMT most evenings.

Ken Myers, W8WRN (Columbus, Ohio), reports that he was one of the VHF gang that wanted a column in CQ, but somehow managed to let the column slip by without sending in reports to build it up. His two-page letter more than makes up for any forgetfulness.

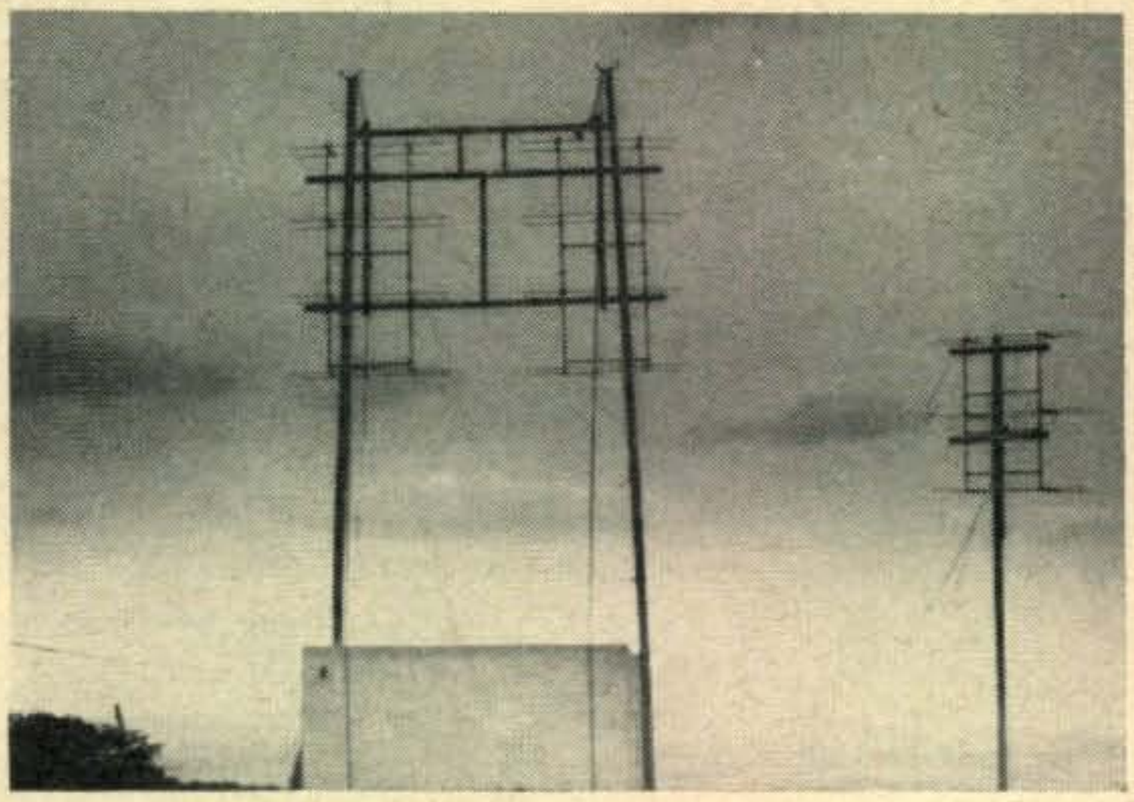
Ken says that activity is very distinctly improving in Ohio. He goes on to cite operations on 50, 144, 220 and 420. I don't think we could cover all of the material, but in general; W8LGI, W8BAX and W8WRN are working 220. W8CPA, W8UZ, W8BAX, W8WPB, W8MSA, WN8QEA, WN8OMV and W8WRN are going strong on 144. Ken worked up a nice sounding pre-amp for 144 using a pair of 6AJ4 tubes and has since modified it for 220. He promises to send us the dope—if interested!! Don't worry—I've already written him for it.

What Next?

I was well aware of the problems that face the column editor when assuming the responsibility for the VHF/UHF column. Because of my other duties, I can obviously only spend a certain limited time in contact with those working in this field. I had been cautioned by the M.E. that a lot of letter writing was necessary—and this I have found to be true. However, I do feel that some plans should be carefully thought out before continuing this column into the fall of 1954.

Exactly what type of text material does the major portion of the VHF gang want to see in this column? W8WXV brought out that he likes the resume type of text with abstracts on ideas that appear in publications not likely to be read by the average VHF worker. I think I tried that some months ago by quoting extensively from the British journals. This brought a very small response. Did someone fail to let us know that this is what is wanted? Is it true that the gang still wants more of "Joe worked John?" Some comments have been heard informally about that—but little or no definite info. How about some short articles within the column on important subjects—similar to the idea used by W2PAU in 1950, etc. Is this a good plan—or just what is lacking?

A card or letter from those that wanted a VHF/UHF column would sure be a big help.



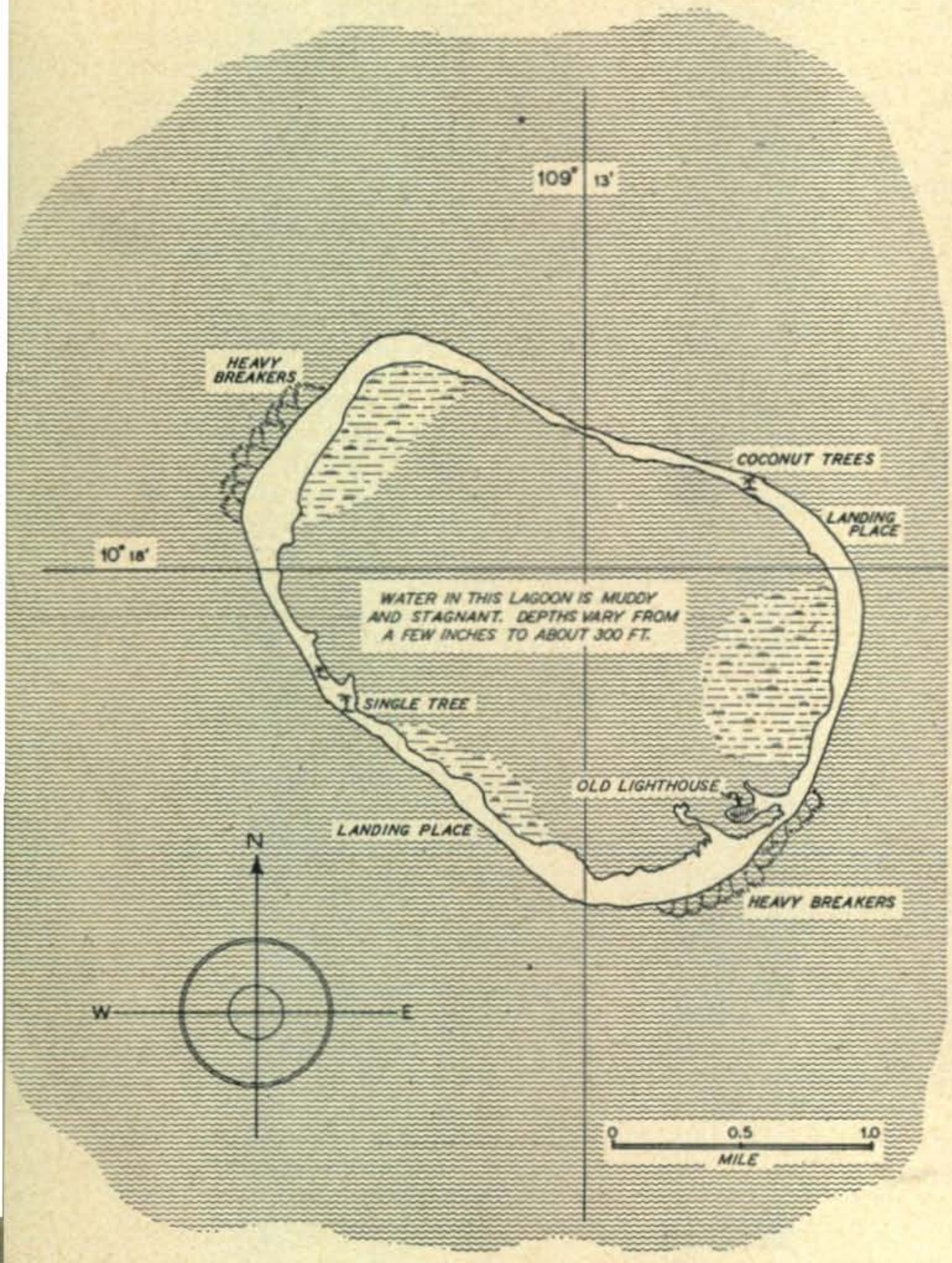
These are the 144-Mc. beams at EI2W, Dublin, Ireland. The 32-element beam at the left is fixed on Scandinavia. The 12-element on the right is for general coverage work.

Clipperton is no PICNIC!

L. N. HIGGINS, W6CAE

1955 Santa Barbara St.,

San Diego, Calif.



A hydrographic chart of Clipperton Atoll. The water in the completely enclosed lagoon is muddy and stagnant, and ranges in depth from a few inches to about 300 feet. The "island" is the top of an inactive volcano, whose sides fall precipitously to a maximum depth of over 3100 feet. This, in addition to the reef-like framework of the atoll, which is surrounded by heavily breaking surf, makes anchorage and landing very difficult.

Several years ago a number of us members of the San Diego DX Club were sitting around at a meeting bragging about the rare ones we'd snagged recently, and wishing we actually could try it from the other end some time and see what it seemed like down at the bottom of the dog-pile instead of just sniffing around the edges. Somebody dragged out a countries-list to see what hadn't been on the air yet and several of us pounced on Clipperton Island which we knew was a good one and yet still somewhere in our vicinity. It turned out that six of us weren't irrevocably tied down with family and business connections and we all thought we might be able to arrange it. One of the fellows knew a man who had been down off the coast of Mexico a number of times in his own large yacht, and thought he could be persuaded to take us to the island.

I contacted the French Consul to see if we could get permission to land and operate a rig. His reply was not at all encouraging, emphasizing what I had already found out—that the island is uninhabited, treacherous of access and too far away from frequented sea lanes in case of distress. He also said that permission would have to come from his home office in France. However, he seemed cordial enough and finally promised to forward our letter for action. A reply was supposed to be forthcoming in a month, but to this date we have never received an answer—Not that it mattered particularly, though, because the Korean affair came up and most of us

CLIPPERTON ISLAND, FO8AJ: (As this is being written the operators of FO8AJ are being towed back to Acapulco, Mexico. We are able to insert this last minute item on the activities of FO8AJ. The following has not been confirmed in its entirety but we believe the facts, as stated, to be substantially correct.)

Following their unsuccessful attempt to reach Clipperton in late March, which forced their return to Acapulco; Bob, WØNWX, Leo, WØNUC, and Gene, WØVDQ, persisting in their efforts, were able to charter the motor schooner "BARCA DE ORO" for their second attempt. This eighty-foot boat left Acapulco on April 10. With the aid of wind and current, rather than with their extremely temperamental diesel engine, which seemed to function only about a quarter of the time, they sighted Clipperton Island with its few palm trees and beached LST at 1800 CST on April 14. At this point, a storm arose during the night and blew them some fifty miles west and north of the island. The next eight days were rugged. All attempts to regain Clipperton, against prevailing winds and current, were fruitless. The diesel finally gave up the ghost and little progress could be made with mainsail and jib. Thanks to the activity of FO8AJ/MM, on board, their situation was well known and steps had been taken to assist them. A Mexican Patrol boat was being dispatched from Matzalan to go to their aid. It was, therefore, a high spot for all concerned when the "G-38," radar equipped, appeared over the horizon at 1600 CST on April 22 and approached them at a 14-knot clip. At this time the "BARCA DE ORO" was 100 miles northwest of Clipperton and losing ground at a rate of two MPH. They were immediately taken in tow and the island was reached the next morning. After the island was circled a landing was made at 1315 CST.

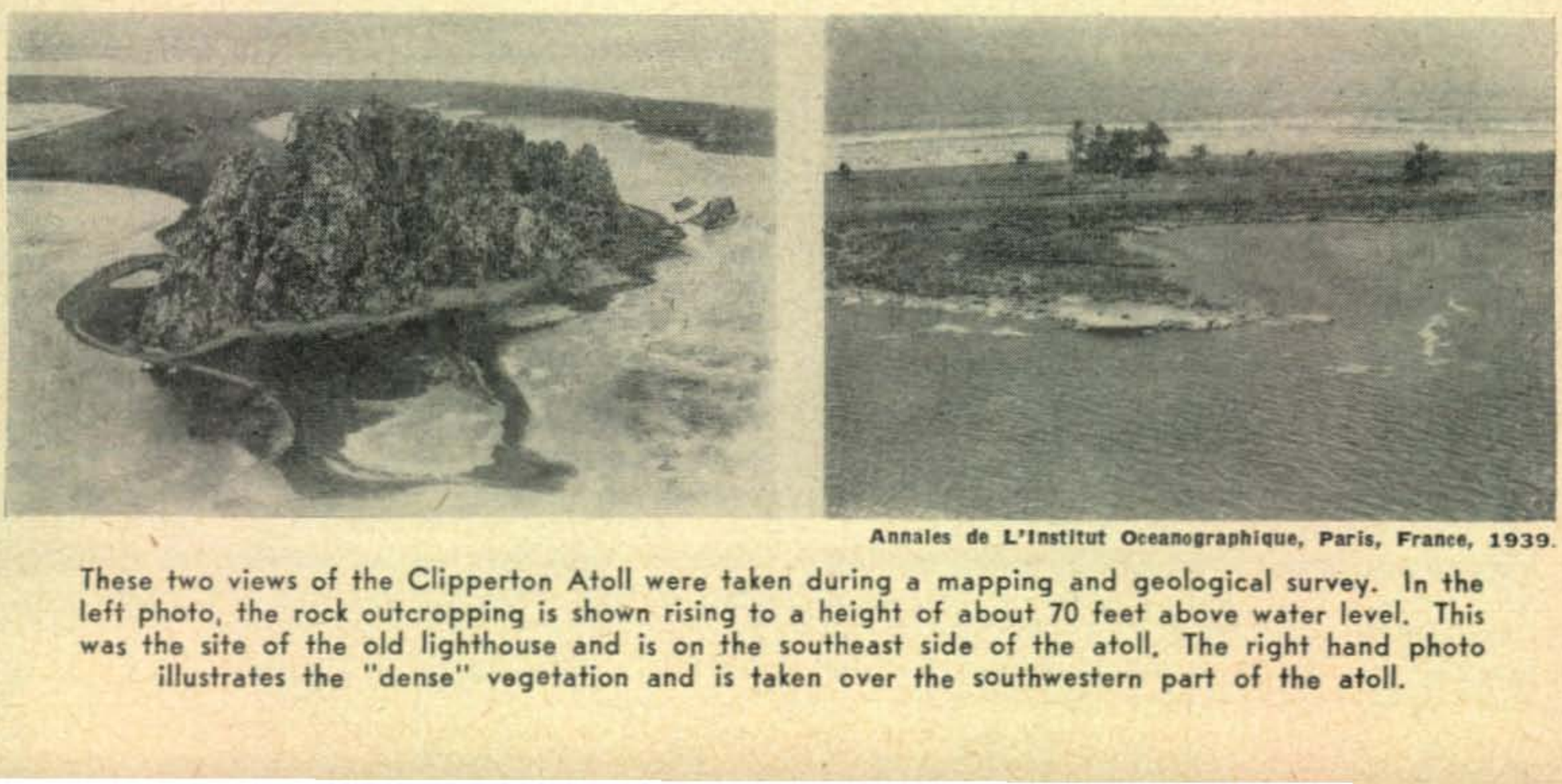
At 1755 CST, April 23, after a preliminary QSO between FO8AJ and FO8AJ/MM the first contact was made with W6DI on 14-Mc. 'phone with Bob, WØNWX, at the mike. This was followed by QSO No. 2 with W6AM with Gene, WØVDQ, at FO8AJ. First CW-to-CW contact as with KV4AA at 1812 PM CST. First 7-Mc. 'phone contact with W6MBD. First 7-Mc. CW QSO W9AND. On 3.5 CW W6VUP was No. 1, followed by W7MZP. On 75 'phone W4TM was first, followed by W6JHB. Due to generator breakdown, 21-Mc. CW operation was limited to one hour with W5VIR being the first contact followed by KV4AA. No 21-Mc. 'phone was used. Generator breakdown kept them off the air from 1500 CST, April 24, until 1600 CST, April 25, at which time they were able to float the generator from FO8AJ/MM to the shore. Orders from the Naval Commander present called for a departure at 1200 CST on the 25. With help from XE1H these orders were revised to enable them to remain active until daylight on the 26 when the big switch was pulled. Approximately 1050 contacts were made during their stay on the island and the success of this expedition was due, in great part, to the splendid assistance given to them by the Mexican Naval Authorities and traffic handling by XE1N, XE1H and W6DI. All the radio equipment was supplied by the Hallicrafters Co.

KV4AA

were tied immediately to our jobs and couldn't make it anyhow. But I still prick up my ears whenever Clipperton is mentioned, and still wish I could go, even though I know now that I'll never make it. It is, of course, of particular interest to me when I see those periodic notices in the DX columns that so-and-so is practically on his way to Clipperton and to keep your gear warmed up for him. But when the ETA comes and goes without a peep, I snicker to myself and realize that some one else has probably read the same articles I finally dug up and now realizes that Clipperton is no picnic. Since the impending expeditions have almost reached epidemic propotions lately, I thought perhaps a few of the facts of life about Clipperton might stifle some of the half-baked proposals or, better yet, get a gang going that would be prepared to accept the challenge that it offers.

The Cold Facts

First of all, there is very little written material about Clipperton—only a few magazine



Annales de L'Institut Oceanographique, Paris, France, 1939.

These two views of the Clipperton Atoll were taken during a mapping and geological survey. In the left photo, the rock outcropping is shown rising to a height of about 70 feet above water level. This was the site of the old lighthouse and is on the southeast side of the atoll. The right hand photo illustrates the "dense" vegetation and is taken over the southwestern part of the atoll.

articles which give a bit of the island's history and details.

To sum these up, the island was first recorded in 1523 by one of Cortez' party. It later got its name from a Lieutenant Clipperton (this is news?) who deserted with his crew and ship from under the command of the famous English buccaneer Dampier. There is no proof that he landed on the island but the legend has it that he used it as a base for his pirating operations and that his ill-gotten gold is buried there.

In 1856, the U.S. laid claim to the island but did nothing about it. Then, two years later, Lieutenant Coet de Kerveguen (that guy was loaded with DX spots) formally discovered the island and raised the French flag on it. Around 1900 Mexico took it over with a small garrison and erected a lighthouse. A contract was then negotiated with a British and U.S. guano company who wanted to collect the fertilizer left by the millions of sea birds that had roosted there over the centuries. The company erected some buildings and a pier, installed machinery for guano concentration and then moved in possibly as many as a hundred people, supplying them with all necessities. Thenceforth a ship arrived periodically, bringing supplies and carrying away the concentrate until about 1914 when the raw material was exhausted. At that time another ship called to take off the survivors of a wreck, and the company people were evacuated along with them, leaving only the Mexican garrison and their families, numbering 30 people.

Left to Die

From that time on the supplies were cut off and the garrison left to its own devices. It is said that Mexico had a revolution at that time and the new president said, "They are of the old regime—let them die." These people had no means of communication and were so far from frequented sea lanes that visual distress signals were virtually useless. Except for a half-dozen cocoanut palms there was no vegetation or fresh water on the island, so they were barely able to exist by eating sea birds and fish and storing up rain water. The hunger and disease they endured was tortuous, but "when the number left alive had been reduced to within the available supply of cocoanuts, the ravages of scurvy were checked." Their only means of getting help was by attempting to travel over 600 miles of open sea in a small boat. When the number of men was reduced to 6, all but one set out to sea to get help, but their boat overturned among the sharks and they were never seen again.

The last man, however, had been left behind because he was supposed to be insane. He soon proclaimed himself "King of Clipperton by cornering all the firearms and forcing the women and children to obey his every command." Finally (on the very day of their rescue), one of the women found a hammer and beat him to a pulp.

In 1917, the "U.S.S. Yorktown" investigated the island as a possible German submarine base. The skipper was Captain H. P. Perrill whose report provides a great deal of our information. I have talked to both the Captain and his wife in their home in San Diego. They remember that, of a possible 30 originally, only 3 women and 8 children survived and they were in a sad state from lack of vegetables, having only one cocoanut per week among them to ward off scurvy. They had been without supplies for two and a half years!

In 1932, after long arbitration between France and Mexico by the King of Italy, the island was returned to French sovereignty, and became, by amateur definition, a much sought-after separate country instead of simply another XE call.

Landlubbers Beware!

Now, as to the island itself, information has been obtained from the Navigation Chart, see page 28, and Sailing Directions for the West Coasts of Mexico and Central America, U.S.N. Hydrographic Office numbers 1680 and 84 respectively. Also, San Diego boasts quite a fishing fleet and a number of fishermen have been contacted who occasionally find the catches good in the vicinity of the island—and some claim to have landed. Additional information has been gleaned from certain scientific expeditions to the vicinity.

Clipperton is roughly 1500 miles south of San Diego and 670 miles southwest of Acapulco, Mexico. It is mainly a narrow O-shaped coral atoll 2 miles in diameter, rising at most only a few yards above the water and completely enclosing a large stagnant lagoon. At the South East end of the ring, however, stands the 70-foot high Clipperton Rock. At one time a passage existed through the coral reef so that at least ships' boats might find safe harbor, but this has since been closed up by the elements.

Since the island is so far out at sea, it bears the full brunt of the elements. The surf is said to be terrific and it "breaks heavily and continuously on its perimeter and at times completely covers the island." Heavy squalls, locally called chibascos, are prevalent and arise without warning particularly during the months of July and August.

From soundings taken long ago, the island evidently is the sharp apex of an underwater volcano rising thousands of feet from the ocean floor. Its sides are so steep that, at the best place, a ship has to approach precariously close to the reef, considering the capricious

(Continued on page 49)

Test Equipment..... ... in the Ham Shack

HOWARD BURGESS, W5WGF

925 Adams Street, S.E., Albuquerque, New Mexico

Signal Tracers

Part V Of This Series

If you have need for a modulation monitor, a microphone tester, low-power modulator, an electronic baby sitter or whether you just want to measure the power consumption of the OW's egg beater, we have found the answer.

In checking over test equipment which will be of interest to Hams we have found one that will do all these things and many more. To the service man this instrument is known as a "signal tracer," and perhaps the designer did not even have the amateur in mind when this piece of gear was developed. We Hams, however, are not slow to borrow anything that fills a need and those who are experimentally inclined will especially appreciate the time such a piece of gear will save.

Because the circuitry of this particular instrument is quite simple, a quick rundown will be sufficient to explain its principle of operation. However, considerable time could be spent detailing its many uses.

The Usual Circuit

Basically, this instrument is a completely a.c. operated, three-stage, high gain amplifier (see *Fig. 1*). An electron ray eye tube permits visual observation of signal levels while a self-contained speaker is used for audio monitoring. There are two inputs, a high level and low level, and a gain control which is common to both. The tube line-up illustrates the high gain which is possible in this unit. The pentode section of a 12C8 tube is used as the input stage. This in turn drives a pentode connected 12SH7 which in turn is coupled to a 12A6 beam power output stage.

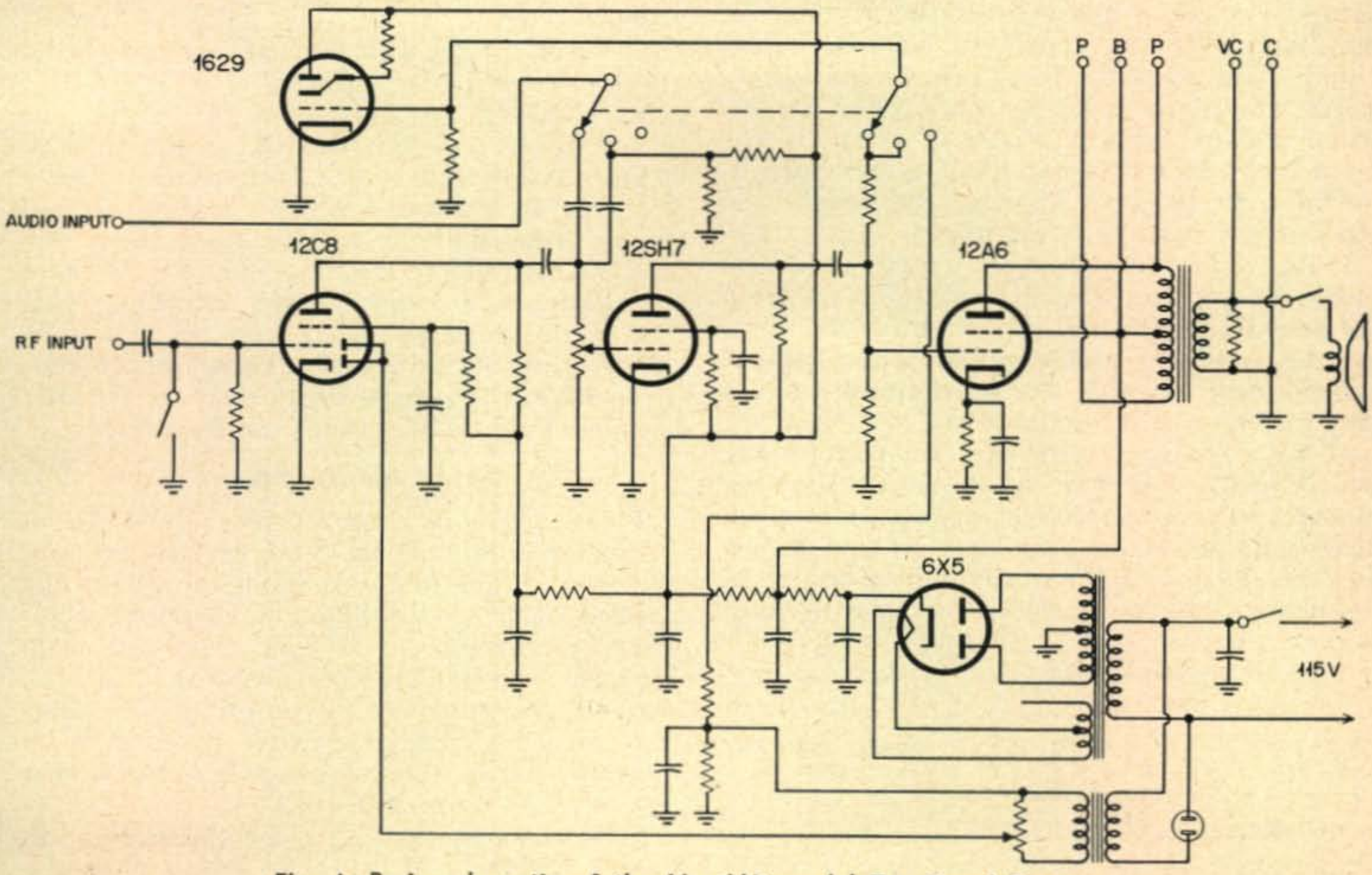


Fig. 1. Basic schematic of the Heathkit model T-3 Signal Tracer.

The Heathkit Signal Tracer model T-3 and Handitester M-1.

The 12A6 output stage is coupled to the permanent magnet dynamic speaker with the usual output transformer, but primary and voice coil windings are brought out on the panel to binding posts. This allows the amplifier to drive another speaker or the speaker in the unit to be used on some other piece of gear independent of the signal tracer. Thus you have a spare or test speaker.

Modulation Checking

For those who are having trouble with distortion in a phone rig this tester should be a natural. A great many times the receiver in the shack is so loaded with r.f. that the signal sounds lousy all of the time; therefore, we don't worry too much until we get a bad report. Then the question is where to start. Is the mike bad? Has the modulator gone sour? Is the hum in the class C stage? Or maybe the other man's receiver is on its way out.

Using a small loop of wire and the crystal probe, we pick up a small amount of r.f. from the feed line. The audio portion of the signal will be amplified and applied to the speaker and eye tube. If hum or distortion are present they can be readily detected.

If trouble is present we can remove the crystal probe and start at the mike, working forward. The tester has enough gain to work directly off the mike, even those of low output such as dynamic and velocity microphones. If the mike is OK we move on to the next stage and so on, reducing the gain and coupling as we go. If the quality is good all through the audio system but bad at the antenna, this would point to trouble in the modulated r-f stage. In making such tests as these it is very important to have the metal case of the analyzer well-grounded to prevent r.f. trouble in the unit itself.*

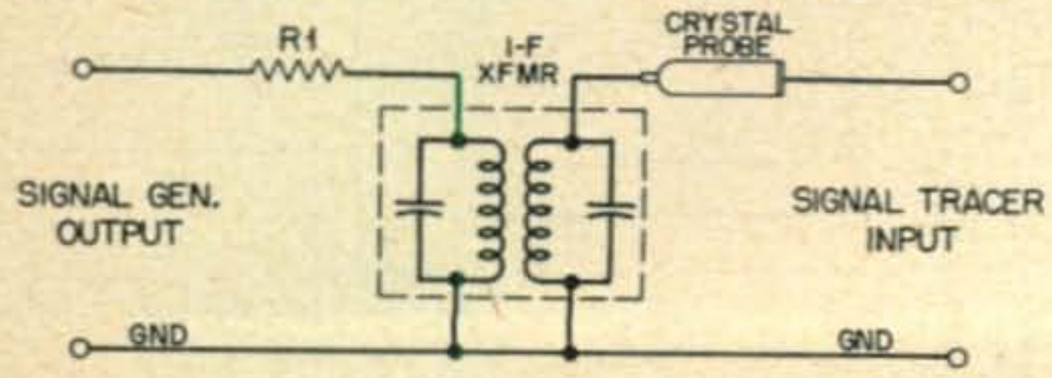


Fig. 2. This circuit is used to check i-f transformer characteristics. The resistance, R1, should be made as large as possible consistent with providing a good signal to the tracer.

In the operation for which this unit was designed, the crystal probe is used in the very high gain or "RF" input. We suggest, though, that if it is to be operated around the transmitter a second crystal probe be constructed with a plug to fit the low gain or "audio" input jack. This will prevent overloading of the first stage in the "tracer."

In checking for hum level in the rig the crystal probe can be coupled to the final as before. A low range a-c voltmeter of the rectifier type is connected across the unused half of the primary of the output transformer. Adjust the gain of the tester so that normal voice modulation will give full scale deflection. Hum and carrier noise will then show up as a residual reading of the meter. These simple tests given here will suggest many more as the user becomes familiar with such an instrument.

V.H.F. Measurements

There is another use which should be of particular interest to the VHF or UHF worker. When we begin to think about measuring the pattern of a special antenna, or looking for standing waves or even making relative field strength measurements the problem of a sensitive instrument arises. R-f amplifiers are sometimes used ahead of a sensitive detector as an indicator but as the frequency becomes higher this becomes more difficult.

A method common to the laboratory although seldom used by Hams is that of modulating the transmitter with a tone during the measurement. The detector can then be very simple, such as a crystal diode, followed by

enough audio amplification to give a good reading on a regular a-c voltmeter. If the modulation is kept at a given level at the transmitter, the readings of the a-c voltmeter will be proportional to the r-f field strength. This method is especially good for work in the higher frequency regions where tone modulation is not objectionable.

To use this system with our particular tester the crystal probe must be adapted for the r-f pickup. In many cases a loop is sufficient and at the higher frequencies a small dipole can be attached to the end of the probe. With this system very weak r-f fields can be detected.

Band-pass Characteristics

When used in conjunction with a signal generator, the crystal probe and signal tracer make an excellent broad-band receiver for the checking of i-f transformers and tuning coils. Although a grid dipper can be used for this purpose, few of them are available for the i-f ranges and even in the high-frequency ranges which they cover it is sometimes difficult to get good coupling to an i-f transformer without dismantling it.

When the i-f coil in question is driven from a signal generator and the crystal probe connected to the output winding (see *Fig. 2*), it is a simple matter to find the resonant frequency of the coil by merely tuning the signal generator until the loudest signal is heard. Due to the high sensitivity of the detector, response is sometimes found at harmonics of the signal generator. To reduce the possibility of error, harmonically related points should be checked above and below any signal heard. For example, if 1000 kc. seems to be the resonant frequency of an i-f transformer, play safe by also checking 500 kc. and 2000 kc. If the 500 kc. is stronger, then move on to 250 kc. just to be sure. In most cases, however, only the second harmonic of the signal generator will give any trouble and its level will be far below that of the fundamental.

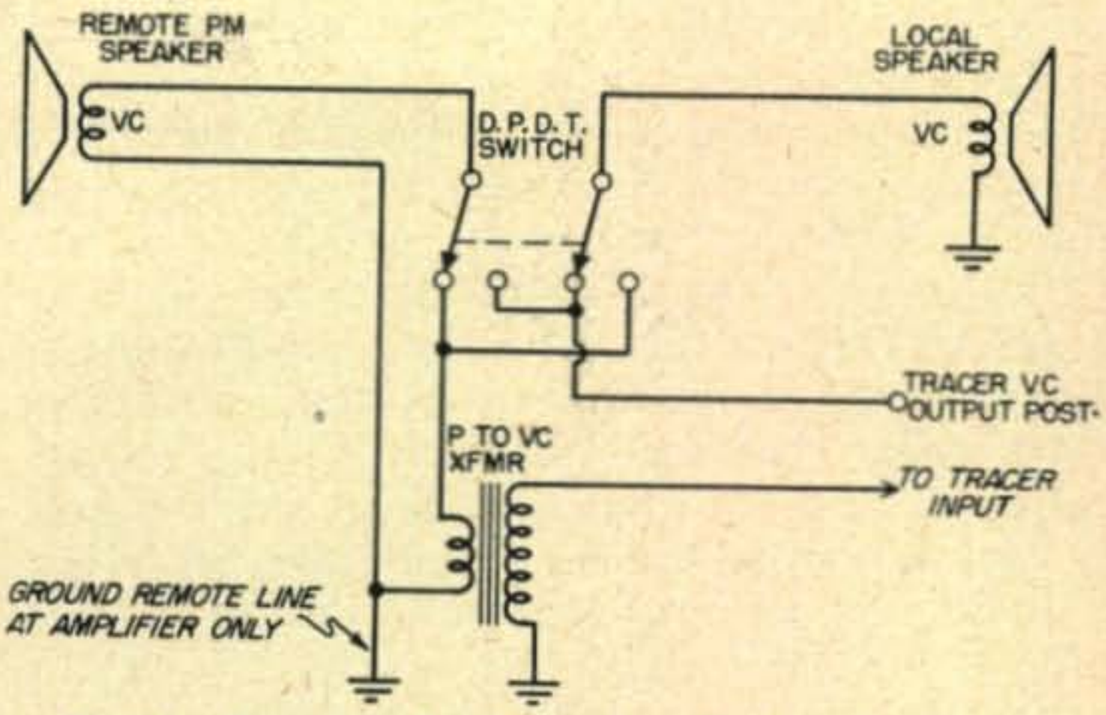
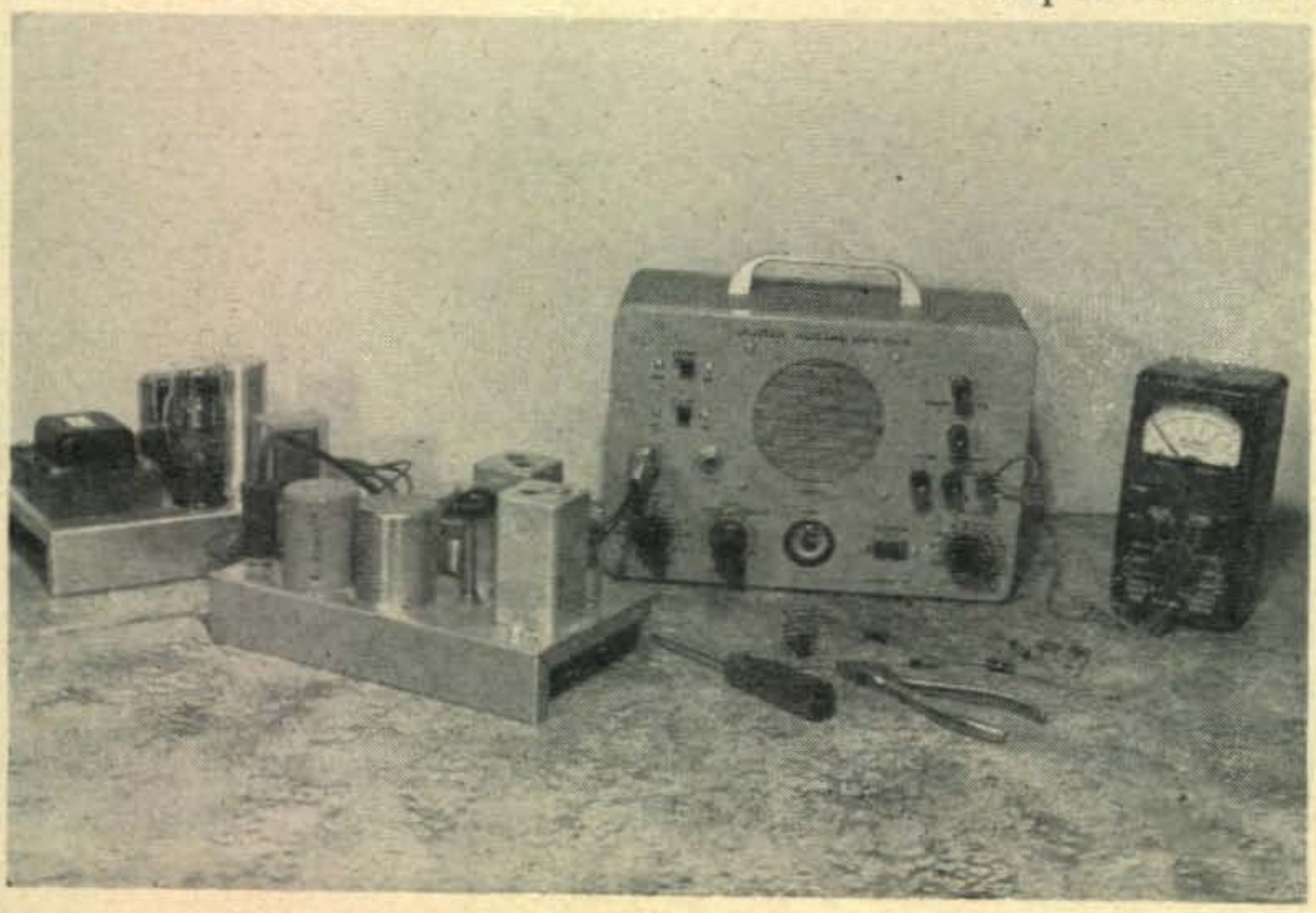


Fig. 3. Suggested wiring to use the tracer as an intercom.

To get a relative check of the band-pass characteristics of an i-f transformer, connect an a-c meter to the output of the signal tracer as mentioned earlier. Find the center frequency of the transformer and tune both windings for maximum readings on the meter. The signal generator is first detuned on the low side until the meter falls to 0.7 of its peak reading. This frequency is noted. Then detune on the high side until the meter falls to 0.7 of the peak value and note this frequency. The difference between the high and low reading is the band-pass between the half power points. In actual use the loading of the tubes will have a tendency to somewhat broaden this frequency span.

There is another use for this very versatile unit, a use for which it was not intended, but which will make it worth its weight in crystals to the Ham with a very young junior operator. Suppose that the OM finds himself baby sitting, and the noise of the receiver and the bang of relays keep Junior awake. The OM, however, being the worrying kind, doesn't feel quite at ease with the little op shut up alone in the other end of the house. The answer is simple. A small speaker hung in the baby's



The experimenter will find many uses for the test equipment described in this article. The author here is using the tracer as an audio amplifier.

room makes a very sensitive mike. Of course, the transmission of sound is in one direction only and operation can proceed as normal with a visual and aural monitor on any radiation that may occur in the nursery. Along these same lines, if the Ham shack is located in the attic, basement, or a small shack at the rear of the lot this unit makes a very good intercom up to several hundred feet. A small reversing switch *(Fig. 3)* is used to alternate the remote and local speaker between input and output for two-way conversation. Naturally, with just a single-pair transmission line to the remote speaker the control of transmissions is at the master station—an advantage many times.

Additional Uses of the Signal Tracer

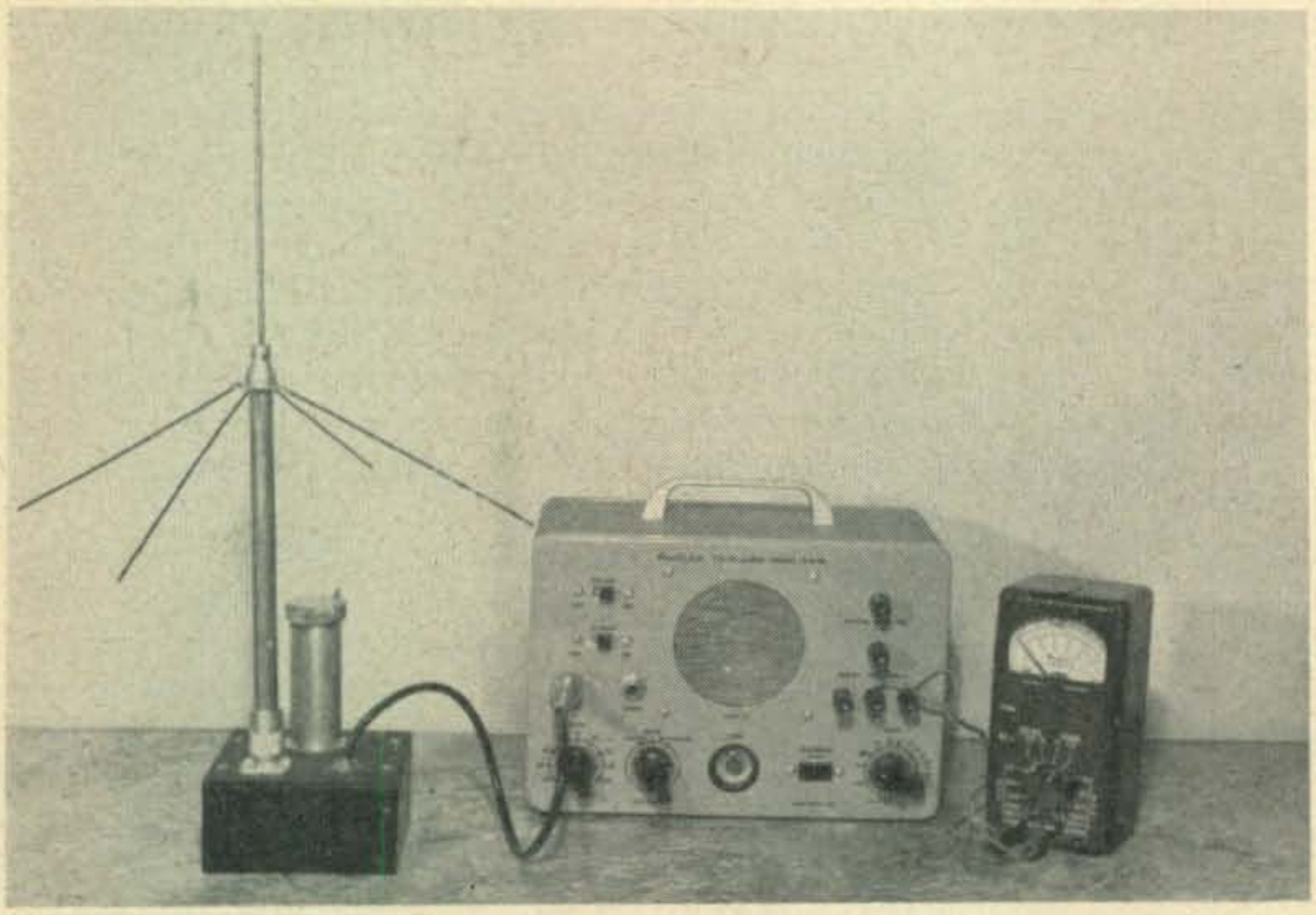
To return to the technical uses of this particular piece of gear, the following are some of the more obvious. Other uses will suggest themselves to the experimenter.

which is supplied with these instruments covers their use as a service instrument so well that little more detail is required here.

Wattmeter Measurements

One useful feature which has not been mentioned is the built-in wattmeter. This operates on 60-cycle power from the line and measures power consumption up to 500 watts. Just plug the signal tracer into the power outlet. The piece of apparatus to be tested is then plugged into an a-c outlet provided on the panel of the tester, and the eye tube is balanced by means of a control which is calibrated in watts.

In this manner the power consumption of small rigs, power supplies and the like can be checked. For the Ham who runs his portable rig from an inverter or motor driven a-c power supply, this feature should be useful. Aside from measuring the normal consumption of power it is no small help in trouble shooting



Using the signal tracer and Handitester with a 420 Mc. ground plane antenna and crystal detector for monitoring purposes.

The unit can be used to provide added gain for a scope channel of low gain or to increase the sensitivity of a vacuum tube voltmeter. In one position of the function switch a d-c voltage of about 200 volts is placed on the input terminals. When this voltage is applied to any doubtful component, such as a condenser or transformer, any leakage will show up as a frying or cracking noise which is amplified and heard through the speaker.

For the experimenter it provides an audio channel for various small receivers which may be constructed without a full audio system, or the system can be used as modulator for small transmitters or signal generators.

Of course, for the Ham who also does some service work there are the uses for which this unit was intended—that of signal tracing receivers and audio systems. The gain of the amplifier is sufficient to start at the antenna using a signal from either a signal generator or from a local broadcast station. The manual units which draw less than 500 watts from the line. Many times trouble can be quickly localized merely by observing the power requirements while tubes are removed one at a time. If you have never played with one of these small power measuring devices before, it is a pretty safe bet that you will have at least one evening's entertainment measuring all of the small gadgets around the house.

In considering the instruments which have been covered in previous issues, there must of necessity be a certain basic similarity between the products of all manufacturers. This is not so with such things as signal tracers, for seldom are two alike.

This signal tracer which comes in kit form is a product of the *Heath Company* and is known as their *Model T-3*. All components including the cabinet and ready-punched chassis are furnished. The instruction book is written in such a manner that a person with

(Continued on page 46)

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ALL TIMES IN E S T

EASTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Western Europe	Nil	0700-1400 (3-4) 1400-1730 (4) 1730-1930 (2)	1900-0100 (3-4)	2000-0000 (3)
Central Europe & Balkans	Nil	0700-1400 (2-3) 1400-1830 (3-4) 1830-2000 (1-2)	1930-0000 (3)	2000-2300 (2)
Southern Europe & North Africa	1530-1800 (0-1)	0600-1500 (3) 1500-1800 (4) 1800-2030 (1-2)	1830-0100 (3-4)	2000-2330 (2-3)
Near & Middle East	Nil	0600-1300 (1) 1300-1500 (2) 1500-1830 (3)	2000-2300 (2-3)	2100-2230 (1)
Central & South Africa	1700-1900 (0-1)	0600-1230 (1) 1300-1600 (2) 1600-2000 (3)	1900-0100 (3)	2000-2330 (1-2)
South America	1300-1830 (3)	0630-1600 (1-2) 1600-2100 (3-4) 2100-0000 (1-2)	1900-0430 (3)	2000-0400 (2)
South East Asia	Nil	0700-1100 (1) 1100-2100 (0-1)	0300-0500 (0-1)	Nil
Australasia	Nil	0630-0900 (1) 1600-1930 (1) 1930-0000 (1-2)	2200-0530 (2) 0530-0800 (3)	0130-0600 (1-2)
Guam & Pacific	Nil	0730-1100 (1-2) 1500-2030 (0-1) 2030-2300 (1-2)	2330-0800 (2-3)	0030-0600 (1-2)
Japan & Far East	Nil	0700-1100 (1-2) 1100-2200 (1)	0200-0600 (1)	0330-0500 (0-1)
West Coast, USA	Sporadic E	0900-1700 (3-4) 1700-2200 (2-3)	2200-0100 (4) 0100-0400 (2) 0700-0900 (2)	2330-0600 (3-4)

ALL TIMES IN C S T

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Western & Central Europe	Nil	0700-1700 (3) 1700-1930 (1-2)	1900-0000 (2-3)	2000-2300 (1-2)
Southern Europe & North Africa	Nil	0600-1400 (2-3) 1400-1730 (3-4) 1730-1930 (1-2)	1830-0100 (3)	1930-0000 (2)
Central & South Africa	1600-1800 (0-1)	0600-0730 (1-2) 0730-1400 (1) 1400-1900 (3)	1830-0000 (3)	1930-2230 (1-2)
Central America & Northern South America	1300-1800 (3-4)	0630-1600 (3-4) 1600-2100 (4-5) 2100-0100 (2)	1800-0500 (4-5) 0500-0700 (2-3)	1830-0400 (3)
South America	1300-1800 (0-1)* 1200-1500 (2) 1500-1900 (3)	0600-1500 (2) 1500-2100 (3-4) 2100-0100 (2-3)	1830-0500 (3-4)	2000-0400 (2)
Japan & Far East	Nil	0700-1000 (1-2) 1900-2300 (2)	0200-0600 (2)	0330-0500 (0-1)

ALL TIMES IN C S T

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
South East Asia	Nil	0800-1200 (1) 2000-2230 (1-2)	0330-0600 (1)	Nil
Hawaii	1930-2200 (0-1)	0900-1630 (2-3) 1630-0000 (3-4)	2230-0500 (4) 0500-0900 (2-3)	0000-0600 (3)
Australasia	1900-2200 (1)	0700-1000 (1) 1500-2000 (1) 2000-0000 (2-3)	2300-0700 (2-3)	0000-0600 (2)

ALL TIMES IN P S T

WESTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Europe & North Africa	Nil	0700-1500 (1) 1500-1700 (1-2)	1900-2300 (1)	2000-2230 (0-1)
Central & South Africa	Nil	0600-1400 (0-1) 1400-1800 (1-2)	1830-0000 (2)	2000-2230 (1-2)
South America	1200-1500 (2) 1500-1830 (3)	1600-1500 (2) 1500-1630 (2-3) 1630-2000 (3-4) 2000-0100 (1-2)	1900-0200 (3-4)	2000-0100 (2-3)
Okinawa	1900-2200 (0-1)	0730-0900 (1-2) 1100-2100 (2) 2100-0200 (3-4)	0130-0500 (3)	0200-0400 (2)
Guam & Mariana Islands	1700-2200 (1-2)	0700-0900 (2) 1030-2000 (2) 2000-0000 (3-4) 0000-0300 (1)	0100-0500 (3-4)	0130-0400 (2-3)
Australasia	1300-1800 (2) 1800-2100 (3)	1100-1800 (1) 1800-2030 (2) 2030-2230 (3-4)	2130-0530 (3-4)	2230-0430 (2)
Japan & Far East	Nil	1030-1900 (2-3) 1900-0200 (3-4)	0030-0500 (3-4)	0200-0430 (2-3)
Philippine Islands & East Indies	1900-2300 (1)	0700-0930 (2) 1300-2130 (1) 2130-0200 (2-3)	0230-0500 (1-2)	0330-0430 (0-1)
Malaya & South East Asia	2030-2300 (1)	0730-1130 (2) 1130-2300 (1) 2300-0130 (2-3)	0400-0600 (0-1)	Nil
Hong Kong, Macao & Formosa	Nil	0700-2200 (1-2) 2200-0200 (3-4)	0230-0530 (2-3)	0300-0500 (1-2)

Symbols For Expected Percentage of Days of Month Path Open:

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

*Indicates time of possible ten-meter openings.

Ionospheric Propagation Conditions

Forecasts by

GEORGE JACOBS, W2PAJ

144-40 72nd Ave.,

Flushing, Long Island, N.Y.

General Propagation Conditions

10 METERS: Sharp increase in short skip openings up to distances of 1200 miles.

15 METERS: Sharp increase in short skip openings and some fair DX expected on long North-South paths.

20 METERS: Band remaining open for DX from shortly after sunrise to shortly after sunset. This will be the best daytime DX band to most areas of the world. Sharp increase in short skip openings.

40 METERS: Good DX to most areas from shortly before sunset to shortly after sunrise, despite considerably higher atmospheric noise levels.

80 METERS: Band seasonably noisy with only fair DX possible during the late nighttime hours. Skip distance at minimum during the summer months and band usable for short distance QSO's almost around the clock.

160 METERS: High atmospheric noise levels and summer absorption will not permit much DX on this band until early Fall. Short skip QSO's possible during dark hours.

This overall picture of band conditions is intended to indicate qualitative changes in each band from month to month. For specific times of band openings for a particular circuit, refer as usual to the *Propagation Charts* on the opposite page.

These *charts* are based upon a radiated cw power of 150 watts, where radiated power is equivalent to the power fed into an antenna multiplied by the gain of the antenna at radiation angles less than thirty degrees.

These forecasts are, for the most part, based upon basic ionospheric data published by the Central Radio Propagation Laboratory of the National Bureau of Standards. The forecasts are intended to be valid until July 15th.

Sunspot Cycle

This month's **Propagation Charts** are based upon a predicted smoothed sunspot number of 6, centered on June, 1954. The observed monthly Zurich sunspot number for March, 1954 was 10.6, resulting in a smoothed sunspot number of 11.3, centered on September, 1953.

Sporadic E

There frequently forms, within the normal E layer of the ionosphere, "clouds" or "patches" of abnormally dense ionization, which are capable of reflecting radio waves of frequencies much higher than those reflected by any of the regular ionospheric layers. These patches usually take the form of thinly ionized areas covering a rather small geographical region. They occur more or less at random and are relatively short lived. For this reason they are usually referred to as **Sporadic E** clouds. Electronic clouds of this nature are capable of reflecting radio waves, at oblique incidence, on frequencies frequently exceeding 30 Mc. and on remote occasions extending up to and above 100 Mc. Long distance propagation does not often occur by way of Sporadic E clouds because of the remote possibility of the clouds being present at the widely separated ionospheric points necessary to effect multi-hop propagation. But single-hop propagation (up to 1400 miles), often occurs by means of Sporadic E, and thus propagation by this means is often referred to as **"short skip"** openings.

The actual cause of this phenomena is not yet known Since it occurs quite frequently at night, it would seem not to be caused by the sun's ultra-violet radiations as are the regular layers of the ionosphere. This does not, however, necessarily mean that it has nothing to do with the sun. While Sporadic E occurrence cannot as yet be accurately predicted, it is known that there is a considerable increase in its occurrence during the summer months. The following are the percentage of times that Sporadic E occurred at Washington, D. C., during 1953, with great enough intensity to permit propagation on frequencies as high as 25 Mc., at a distance of 1000 miles.

JANUARY—3%	JULY—30%
FEBRUARY—1%	AUGUST—15%
MARCH—1%	SEPTEMBER—6%
APRIL—3%	OCTOBER—6%
MAY—11%	NOVEMBER—5%
JUNE—26%	DECEMBER—6%

June and July are the most active months of the entire year for short-skip propagation, with frequent openings expected on 6, 10, 15 and 20 meters.

Here is a tip we gave last year which proved to be a rather good indication for determining the possibility of six-meter openings as a result of Sporadic E propagation. The geometry of propagation is such that as the short-skip distances are observed as **decreasing** on 20, 15 and 10 meters, the frequency that will be reflected by the Sporadic E cloud is **increasing.** When you are hearing stations less than 500 miles away on ten-meters or about 400 miles or less on fifteen-meters, the chances are very good that six-meters will open in the same general direction with the skip greater than 1000 miles. Observations made at Washington, D. C., during the summer of 1953 (by CRPL), indicate that the six-meter amateur band may have opened for a 1000 mile path with Washington as the mid-point, on at least 10 occasions during June and 24 during July.

Solar Eclipse

Last month we mentioned that on June 30, a total eclipse will occur that will be visible over large areas of the United States. We also discussed that the total eclipse of the sun has special significance to radio researchers. During such an event, and only during such an event, it is possible for the ionizing radiation of the sun (which forms the various layers of the ionosphere), to be cut off in the middle of the day. This affords the opportunity to observe the effects upon shortwave radio circuits as rapid changes in ionization take place.

A total eclipse of the sun is one of the greatest spectacles that nature offers. The eclipse of June 30, 1954, will be the last opportunity during the 20th Century to see a total eclipse of the sun over any substantial part of the United States, the only others that will touch this country will be one that will be seen only in Maine in 1963, one that will be seen only in Florida in 1970 and one that will be seen only in the State of Washington in 1979.

Ionospheric conditions are generally quite stable during June. Periods of better than normal propagation conditions are forecast for June 1-3, 7-13, and 21-30. Below normal propagation conditions are forecast for June 4-6, and 17-19.

On Wednesday morning, June 30, 1954, persons living in parts of Nebraska, Iowa, South Dakota and Minnesota, will see an almost black sun rising in the East. The path of this total eclipse begins in Holt County, Nebraska, where the eclipsed sun will rise at 0507 Central Standard Time. It will be seen in Minneapolis and St. Paul as a total eclipse for about 90 seconds, starting at

(Continued on page 57)

Conducted by HERB BRIER, W9EGQ

385 Johnson St., Gary 3, Indiana

The Novice Class license authorizes 'phone operation in the 145 to 147-Mc. Novice band. In addition, many Novices plan to operate 'phone on the low-frequency amateur bands upon obtaining their General Class licenses. This month, therefore, we will discuss 'phone operation.

Proper procedure is just as important in radiophone operation as it is in radiotelegraph operation. For simplicity in the following discussion I will call the one "'phone" and the other "code."

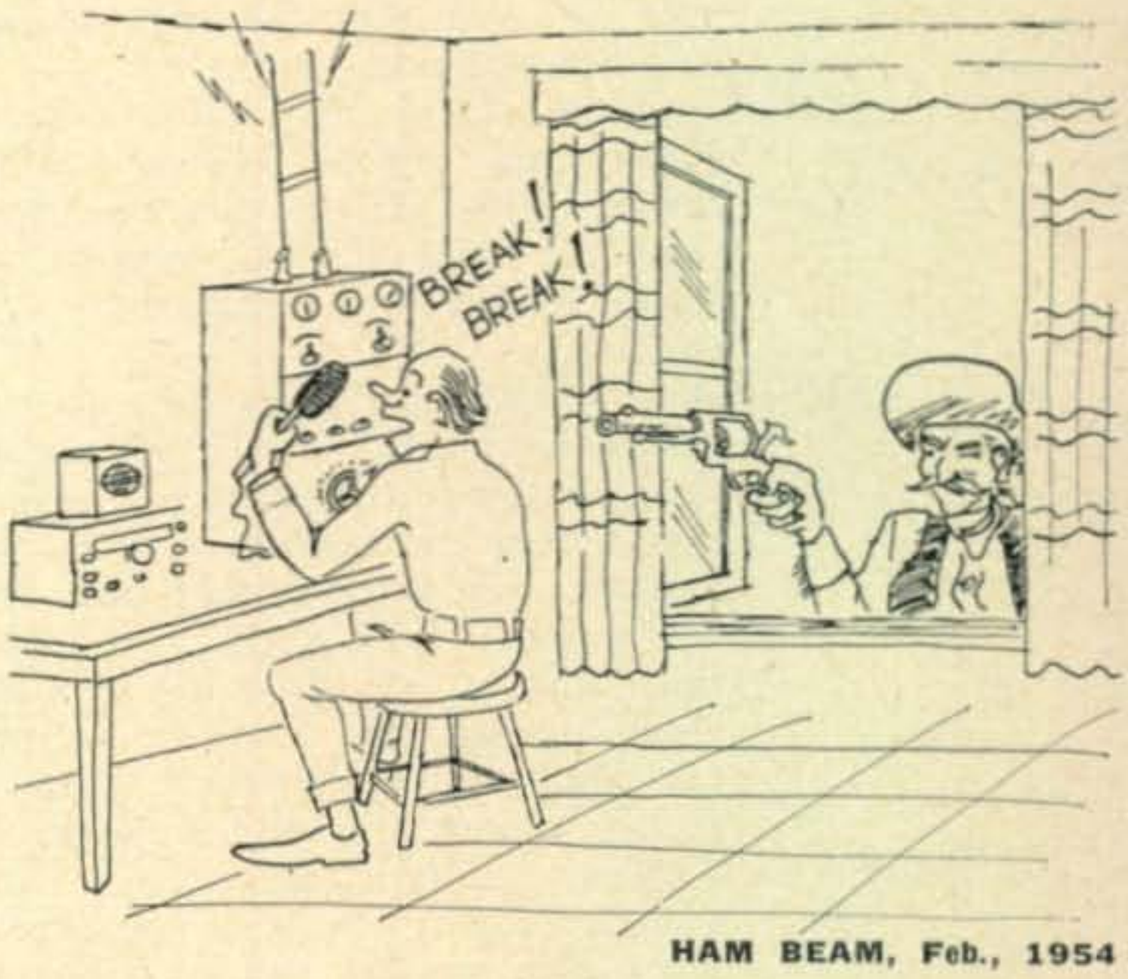
Transmission Of Call Signs

Because they are specified by FCC regulation, we will first investigate the proper procedures for identifying your station and for calling other stations on phone. Compare the following, extracted from FCC amateur regulation Part 12.82, *Transmission of Call Signs:*

"Portable or mobile amateur station operating in the third amateur call sign area calls a fixed amateur station":

Code: "W1ABC W1ABC W1ABC DE W2DEF DN 3 W2DEF DN 3 W2DEF DN 3 AR." The reply: "W2DEF W2DEF W2DEF DE W1ABC K."

Phone: "W1ABC W1ABC W1ABC 'this is' or the word 'from' W2DEF W2DEF W2DEF operating portable (or mobile) three miles north of Bethesda, Md. Over." The reply: "W2DEF W2DEF W2DEF 'this is' or the word 'from' W1ABC."



HAM BEAM, Feb., 1954

The comparison quickly reveals that code procedure signals are replaced by the equivalent word or phrase on phone. Thus "DE" becomes "this is" or "from," and the portable or mobile indicator "DN 3" becomes "operating portable (or mobile) three miles from Bethesda, Md. (not "slant bar 3," or "portable 3") It also reveals that the call sign of the transmitting station *always* comes last.

Further examination reveals that a fixed station is not required to give its location with its call sign (although it may), but a portable or a mobile station is. It is also unnecessary to indicate that a portable or mobile station is being worked.

All this means is that, as long as you operate from the location shown on your license, the basic form, "W1ABC this is (or 'from') W2DEF," will satisfy this section of the FCC regulations.

The regulations regarding the transmission of call signs are quite elemental, nevertheless, they are probably violated by phone stations more often than all other regulations combined. The violations take two forms, and often occur in combination. One is

Kent, WN3WTO, Hagerstown, Md., has set himself the goal of working all states as a Novice. So far he has 30 confirmed.

the omission of part of the calls and the other is the transposition of the calls. Correct: "W1ABC" from W2DEF," or, "WN1ABC this is WN2DEF." Incorrect: "1ABC from 2DEF," or, "W2DEF standing by for W1ABC," and "DEF to ABC"—the FCC does issue citations for observed violations.

When To Transmit Call Signs

The regulations governing the transmission of call signs indicate that they be transmitted at the beginning and end of any single transmission; at the beginning and end of any transmission of three minutes duration or longer; at least once every ten minutes in a long transmission, or in a series of transmissions between stations having established communications in which no single transmission exceeds three minutes in length.

Be careful to identify your station as required by the regulations—but do not overdo it. Once contact has been established, it is seldom necessary to begin or end a transmission with more than a "1 X 1" call. When transmissions are kept short, it is only necessary to announce calls every ten minutes and again at sign off. Unnecessarily long calls will mark you as a beginner or, worse, a poor operator.

Establishing Communication

In replying to a *General Call* (*CQ*), the repetition of the call up should be tailored to fit conditions. In answering one on your own frequency when signals are loud and interference is low, a single, "1 X 1" call is frequently sufficient. Under less favorable conditions, a slightly longer "3 X 3" call may be desirable, to give the receiving operator time to adjust his receiver for best reception.

A slightly longer call is also desirable when attempting to contact a station somewhat off your own frequency, because the overwhelming majority of phone operators listen on their own frequency first when in search of a contact. Even under these circumstances, a series of short calls, interspersed with brief listening periods to determine if you or some one else has raised the station, is better than one long call.

Practically speaking, it is seldom possible to raise a station much over twenty-five kilocycles from the calling frequency on the low-frequency phone bands, unless there are very few stations on the band. Even then, it is sometimes difficult to do. However, on the less-heavily populated bands, like the 144-Mc. band, it is usually possible to raise a station in any part of the band from a single calling frequency.

To CQ Or Not To CQ

At one time, there was much discussion among 'phone operators over whether they should use CQ as a general call. Those in favor argued that, although CQ was originally designed for code use, it is concise and its meaning is well known to all amateurs; therefore, its use by 'phone operators is both convenient and logical. Others argued that what "Calling CQ" actually would mean "Calling any 'phone station"; therefore why not say so

Personally, I hold to the latter view. When I operate phone, I usually solicit contacts by transmitting "Calling any——meter amateur station. This is W9EGQ . . ." However, I am no crusader for this form. Use the one you prefer, but keep the calls short.

Breaking In On Established Contacts

The 'phone bands are the habitat of a strange character almost unknown on the code bands. He is the "break-in station," who makes himself known by his unusual cry of "Break! Break!" on the frequency of the station to which you are talking, indicating that he wishes to join the party.

If you are just chatting of nothing important, you will

Bob Martin, WN9BYH, New Lisbon, Wisc. His transmitter is a Millen running 30 Watts, and his receiver is a BC-454.

probably welcome the breaking station, but if you are discussing something important or personal, you may invite him to join you while praying that his power fails, or you may simply ignore him.

In truth, the propriety of breaking into someone's private conversation deserves more thought than some operators give it. About the best rule regarding it is, "When in doubt, don't!" Listening to the conversation for a few minutes will usually indicate the advisability of a "break." If you decide to do it, wait until one station turns the contact over to the other and say, "Break! Break! This is——," and stand by. If you are heard and are wanted, you will be invited to join the chat. It is extremely rude to "break" constantly while some one is talking, and should not be done except in an actual emergency.

The multi-station "round table" is a child of the break-in technique. The rule in them is—keep transmissions short.

General Operating Techniques

An obvious advantage of phone in comparison to code is that you can say what you wish, without having to grind out each letter in dots and dashes. Consequently, the abbreviations, Q signals, and procedure signals, which are time savers in code work, have little value on phone. Why say QRM when you mean interference?

(Continued on page 51)

Ex-Novice operator "Kit" and his "all band" station, W9TTT, Coal City, Ill. Kit's antenna matches his equipment. It is an end-fed "Zepp" Between 80-foot towers!

Monitored by LOUISA B. SANDO WØSCF

c/o General Delivery, Cortez, Colorado

Seldom do we take space in this column to editorialize, but this is an exception. Sometimes you think about a subject a lot, yet take it more or less for granted—until something brings you up short. For us that something was W1CDX's letter, titled "Appraisal," in March *QST* (page 47). Get out your copy and read it. John's point is that amateur radio should be kept 100% amateur; that we should help other agencies to the best of our ability, but nevertheless remain "free spirits" and not allow ourselves to become a regimented group of operators with a technically perfect plaything. As he says, it has been the free, unbonded spirit of amateur radio which has made it the wonderful source of enjoyment and fraternal brotherhood through the years; that the spirit of Ham radio seeded by *T.O.M.* himself has been the shining glory that has made this fraternal brotherhood great; that if amateur radio is to continue to be the truly great thing it has been, this spirit must never be allowed to fade; that the traditions of amateur radio must be kept alive. Of the many thousands of new amateurs joining the ranks over the last ten years, he wonders how many ever heard of *T.O.M.* or the glorious traditions of amateur radio—the *Wouff Hong, Final Authority, the Rettysnitch, Young Squirts,* etc.

How many of you ever heard of these things, or know any of the history of the struggles and accomplishments of Ham radio in its early days? Surely there are more newcomers among the YLs—bless 'em—but they probably know little of the background of our hobby. Now we have a suggestion. Several YL clubs have written us asking for ideas to apply to club activities. One of the best projects your club groups—or individual YLs—could undertake would be to learn some of the history of Ham radio.

The only written history of Ham radio is contained in the book by C. B. DeSoto, "Two Hundred Meters and Down." It gives a complete history of our hobby from its beginning until before World War II. Unfortunately, it has long been out of print, and to date the ARRL has not seen fit to reprint it, but some Hams and libraries have copies. The book "Calling CQ." by the same author, also contains fascinating reading of the adventures, rescues, explorations and other achievements of Hams. This, too, is out of print, but there are copies available. If you know any old-timers who have a back file of QST, borrow, if you can, some of the old issues from the 1920's and 30's and read some of the articles by T.O.M. and others. During the years we worked at Hq. it was a never-ending source of delight to browse through those old issues.

For the YL clubs, you could allocate a certain portion of each meeting to bringing your members up to date on our history and traditions. Tell the gals to bring their crocheting or knitting, and while the needles fly let one of your members who can read well out loud read to all of you a chapter, an article, or let her condense a section. It's fascinating material. Along with learning of its accomplishments, you may be surprised to find how Ham radio has always had to fight for its very existence—a fight that apparently will never cease. And of special importance, it seems to us that a knowledge of the history of amateur radio is essential in weighing the merits of new proposals presented to us by FCC. Also, the more you know of your hobby, the greater will be your enjoyment from it. Maybe you can even go home and tell the OM a thing or two about Hamming—hi!

Your column editor has available an extra copy of both of the books mentioned. If your YL club can't obtain one locally and if you will request a copy, we'll be glad to lend it for a worthwhile cause.

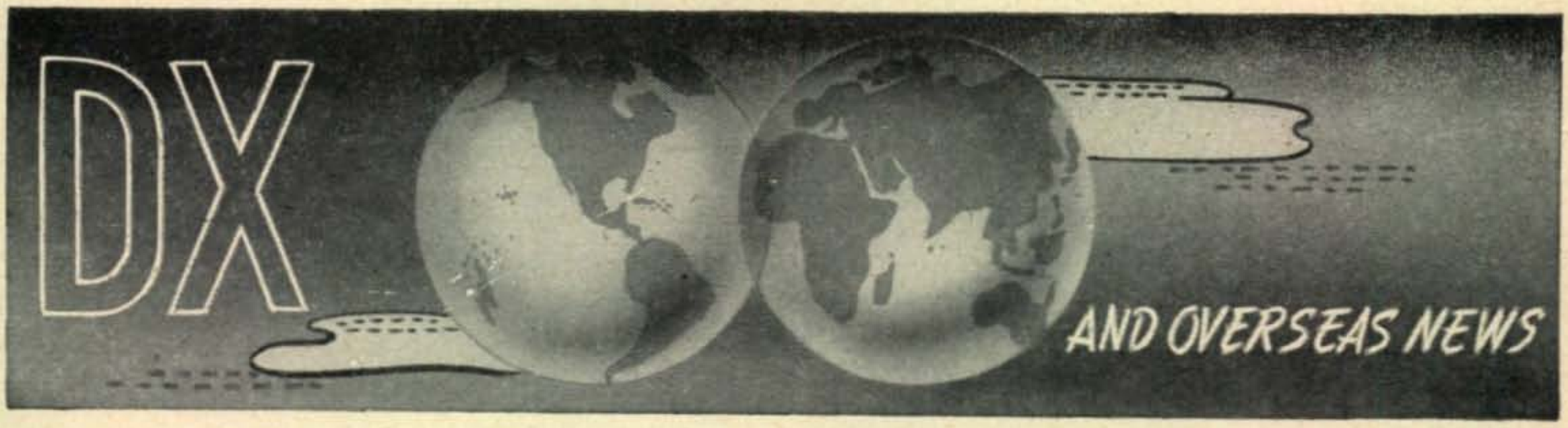
W7QYN, Lois Morrow, an active YL of Washington State. Lois started as a Novice in Jan. '52 and a year later received her General Class. She's been on 75 phone ever since, always ready to handle traffic or rag-chew. She is NCS for the NYLONs, a YL net, and takes over NCS duties on WARTS when she finds time. W7QYN runs about 28 watts, but she and her OM, W7QYO (who operates on 2 meters), are gathering parts for a 500-watt rig. Her receiver is an SX71 and she uses a 136-ft. center-fed antenna. Lois works a 3 to 11:30 p.m. shift at a dairy mart to help along with the home she and her OM have been building themselves on a farm near Sunnyside. And she still finds time for her three daughters, Valerie, 8, Donna, 12 (in the photo), and Jean, 14. Tnx to W7AHQ for this photo from the Yakima Morning Herald, which published an FB write-up about Lois.

YLCC

To date (April) 15 YL Century Certificates and 11 endorsements for working 50 additional YLs have been awarded since YLCC was made available by YLRL in Feb. '53. They are:

No. 1 **W1BFT,** Carl Evans
No. 2 **W2QHH,** H. S. Bradley, plus 3 endorsements
No. 3 **W3JSH,** Dottie Wickenhiser (now K2DYO)
No. 4 **W8HLF.** Arlie Hager, plus 2 endorsements

(Continued on page 58)



Gathered by DICK SPENCELEY, KV4AA

Box 403, St. Thomas, Virgin Islands. USA

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

No. 301 G2LB, TOM MARTIN 40-235

We also welcome the following newcomer to the HONOR ROLL:

W7CNM 38-163

At Time of Writing

RIO DE ORO, EA9DE/EA9DF: A resume of EA2CA's twelve day stay at this QTH, in March, as EA9DE shows that 1450 contacts were made. Some 1075 were on phone and 375 on CW. Conditions to W-land were not the best and only 70 U.S.A. stations were worked on phone and 110 on CW. All bands were used altho 14 and 21 Mc. were the most used. Operation on ten meters produced one contact with LU! The first W on phone was Lou, W1MCW. Juan's hope to attain DXCC during his stay was realized and 102 countries were worked on phone! Total countries, phone/CW, added up to 110. The transmitter used was a British *PANDA PR-120*. The arrival of EA2CA in Rio de Oro coincided with the appointment of Cesar, EA9DF (ex-EA8BI), as Commander of the Aerial Zone of Spanish West Africa (Rio de Oro and Ifni). The latter, an excellent CW operator, will now be active from Rio de Oro on a permanent basis and stands ready to furnish QSO's to all those who missed out on EA9DE and EA9DD. Plans to put "IFNI" on the air again are in the wind and an expedition consisting of EA9DD, EA9DE and EA9DF may do this in September.

TIBET, AC4LM: A report from Bob, KA7RC, advises that AC4LM was contacted on March 31 at 0320 GMT, 14270, on phone. This station is operated by John Yong Lee who gives his QTH as BUPYONG 8, TIBET and says that he is in Government Service there and will be active.

FRENCH SOMALILAND, FL8UU: G6ZO advises that our friend Jim, ST2UU, is on the prowl again and was due to be heard from this QTH again on the weekend of April 17.

SAN ANDRES AND PROVIDENCIA ISLANDS, HKØ: To those of you who heard a flock of HKØ calls during the 72 hours between 1200 GMT May 4 and 1200 GMT May 7 we quote the following as received from TI2TG and HK5EV: "There will be from 50 to 80 HK Hams active on these islands from May 4 to May 7. Each one will use his call letters with the HKØ prefix." This is some sort of a contest but we haven't been informed as to its scope. Activity will take place on 7, 14 and 28 Mc. These two islands are Colombian possessions located some 300 miles north of Panama and there are indications that they have a good chance to obtain a "separate country" status.

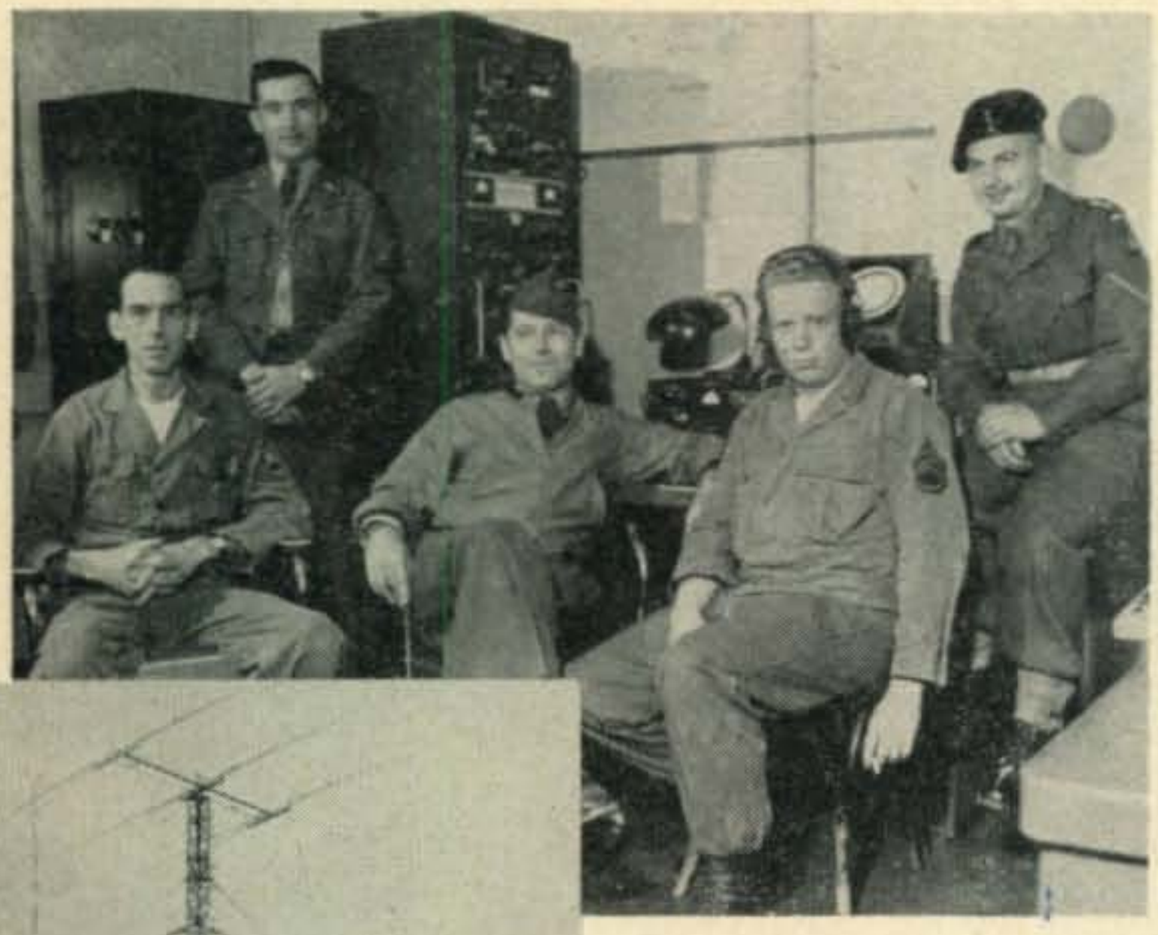
NEPAL, LUØMA: Just to be on the safe side we will give you what we have on this one. An Argentine expedition has been heard, 14090, with the call of LUØMA. Its intention is to climb Mt. Dhaulagiri, a 26,810 ft. peak located near Pokhara in Nepal. While this expedition has apparently gone forth we have no dates as to their arrival in Nepal or whether radio equipment which would put them on the Ham bands will be used on land.

DX Notes

Hal Rowe, **ZL3JA**, advises that his projected trip to the Tokelau Islands, mentioned in our column, seems to be as far away as ever. Transportation is the problem. He could get there OK but it would mean a stay of several months before a boat would be available for his return trip. In the near future a Roman Catholic Priest will be appointed to serve these islands and attempts to sell him on Ham radio will be made. . . . W2GLF advises us that he has received a QSL from **VQ8AR**, Mauritius. Ray is on 14,110 kc. daily, phone, looking for W contacts between 1700 and 1800 GMT. VFO and 807 final are used. W2GLF reports his signals as Q5-S7 with good modulation. See QTH's. . . . **W3MFW** heard G6CJ in QSO with **4W1JK** on Apr. 11. This station claims to be in Taiz, Yemen, and says QSL via RSGB. . . . OH2RY reports **ET3R** active around 1700 GMT on 14054. . . . W4LVV heard **ZA1KAB** on 14050 at 1530 GMT. . . . Seems like **DL4QX** will delay his plans to get on the air from Crete on account of work. His companion on this project, SU1BJ, has been transferred. . . . CE3DZ reports that **CEØAC**, on Easter Island, will be active on phone, 14100, every Saturday afternoon (TI2TG QSO'd CEØAC April 15 on 14107 kc. at 0015 GMT). . . . Mirko, YU1AD, reports a contact with **PX1DL** who gives his name as Louis and QTH as Box 46, Andorra. He runs 50 watts to a plate modulated rig with a ground plane antenna. Speaks good English altho French or Spanish is preferred (14 Mc.) . . . According to W7BD a station signing **CR8AC** has been showing up on 14050 around 2300 GMT.

Leroy, W3CHV, is now home from **SVØWG** and was heard keying from W3AXT. His next post may be in DU-land. Leroy says that operator Paul is still keeping SVØWG on the air, but is A3 only . . . ZL2FA reports QSO with **VK4BL** who is located on Thursday Island some 50 miles off the northern tip of Queensland. No doubt this counts only as a VK4 . . . **FR7ZA** has been coming in on 14020 at 1530 GMT . . . **FM7WP** holds

(Continued on page 43)



Not many of us can be greeted by the new day's sun looking as "chipper" as Stew Perry, W1BB, does after an all night session on 160. That smile—well, why not, many G stations were worked that night and even ZL1WW was hooked after the sun came up!

Above, views of International Amateur Station F7SHP "SHAPE" Headquarters, Paris, France. F7SHP has been active for a year and 125 countries have been worked. All states have been contacted except Utah. 702 W/VE QSO's were made in the recent ARRL Contest. Operators include (left to right) SFC Towsend (Jake), Sgt. Eppel (Walt), CWO Robirtson (Ford), Sgt. Tedford (Ted) and L/C Whitehead (Whitey). The 14 Mc. beam at F7SHP, 100 feet high, really puts the sigs. where wanted. Other antennas are commercial VHF.

Lee Bates, W7HXG, Portland, Ore. is shown here checking his antenna with a grid dipper. Lee runs a KW input to a 450TH, on Phone and CW, driven by a COLLINS 32V2. On 14 and 21 four element beams are used. 184 countries have been worked and a QSL from AC4NC is patiently awaited to complete WAZ. (Photo courtesy Northern Calif. DX Club)

W3EH, Reg Harris, Havertown, Pa. runs 100 watts to a pair of 807's. Reg, on the air since 1932, is Chief Engineer at WIP. (Photo courtesy of W3TBJ/K5FBB)

Thanks to Cesar, EA9DF, and Juan, EA9DE, many were able to add RIO DE ORO to their country lists on Phone and CW. EA9DF (left) remains active from this spot during his tenure as Air Commander for this area. Trips to IFNI are planned by both ops later in the year.

forth on 14038, 2045 GMT . . . **W9OK**, Norfolk Island, will be active three years more. He prefers phone and may be heard around 0500 GMT on 14230/240 (via TI2TG) . . . **VS9AS** and **SU1XZ** plan 160 meter operation . . . **ZD6BX** should be on the air by now. He was well known as ex-VS1BX. 100 watts will be used with operation on 3.5, 7 and 14 Mc. . . . G3HVB is now **VS6CU** and is limited to 25 watts CW for a year. He will be heard on 14 and 21 Mc. . . . **VK9RH**, Norfolk Is., has been heard at 1300 GMT on 7010.

New Caribbean Prefix

The FCC has assigned the amateur call sign prefix KC4 to Navassa Island in the Greater Antilles in the Caribbean Sea. In case any U.S. amateur station is ever established on that island a call sign will be selected from the block KC4AA through KC4AZ.

DX-ploits

Arkie, **W8NBK**, added VR3D for No. 245 jumping over G6RH in the standings . . . Bill, **W6SN**, passed over W6AM and WØYXO when he added EA9DF for No. 244 . . . Geo., **VE4RO**, added VQ9MR, VQ1NZK, and EA9DE to reach 237 and leapfrog six other stations on the list . . . **G2LB** enters WAZ at 235 putting him just ahead of LU6DJX's 234 . . . **PY1AHL** comes up to

160 Statistics

Participants in the 160-meter tests, as recorded by W1BB, represent the largest ever. They were as follows: 24-W1; 27-W2; 14-W3; 14-W4; 1-W5; 2-W6; 2-W7; 18-W8; 12-W9; 9-WØ; 2-VE1; 2-VE2; 7-G2; 29-G3; 1-G4; 6-G5; 8-G6; 3-G8; 2-GD; 3-OK; 1-EI; 1-GW; 4-KV4; 4-HB; 1-HC; 1-GI; 1-OH; 3-ZL; 2-ZC4; 1-HA; 4-KP4; 7-VP6/7/9/4; 1-ZS; 3-GM; 4-GC; 2-LU; 2-HE; 1-VS; 1-CN2; 1-KZ5; 1-YU; 1-VR2 and 2-KH6.

date with 42 additions to jump from 171 to 213 . . . Bob, **W6NGA**, submits 14 additions including HI8W, VR3D, EA9DF and LB8YB which puts him on 192 . . . **DL1DC** sends in a new list jumping him from 145 to 156 . . . **W6ID** adds FK8AO, VK9YY and VP3YG which moves him up nine notches with 149 . . . **W6BIL** moves up six positions on the roll with 144 thanks to VR3D, HI8W, YU6FA and VQ4CF . . . **W9HUZ** adds HC8GI and VR3D for 204 but stays in same position . . . **W3KDP** reaches 199 with FG7XA, EAØAB and EA9DE which passes him over SM5WI, W7PGS, W9MXX and W2EMW . . . **W6LGD** nabbed VR3D for No. 161 which hopped him over W8VLK's 160 . . . Tom, **TI2TG**, added TI9AA and VK9OK, both A3, for 217 but stays in same position heading the 38 zoners . . . **W7CNM** is a newcomer to the roll with 38-163 and enters just below VE2BV who has the same number . . . **W3AYS** comes up to date with ten additions to hit 151 which jumps him over W3MZE's 150.

Ned, **W1RAN**, hooked OD5AX for No. 148 . . . **G8IG** added EA9DE on A3 to reach 187 . . . **W8BF's** new phone list jumped him from 146 to 183 . . . Willard, **W1NWO**, scored twice more with VP8AQ and EA9DE, A3, to hit 205 . . . **TI2TG's** phone total went to 181 with the two additions mentioned above . . . **WØNCG** A3'd with 15RM, CR5SP (Sao Tome), KS4AV and VQ3EO to reach 158 . . . **DL7AA** has reached 154 on 7 Mc. and has a total of 649 countries and 161 zones worked as totals from 3.5 to 28 Mc. . . . Al, **W1MTG** is over the DXCC hurdle with QSL's from LU4ZU, YI2AM, OD5AV, YN4CB and FM7WP . . . We hear that **KH6IJ** worked all W dists. on 160 during recent brawl. FB! . . . **WØRFT's** 160-meter work covers QSO's with XE2OK, ZL1BY, VP7NM, KH6IJ and KH6MG . . . The recent contest gave **W6BYB** such new ones as KT1UX, VP8AJ, VP8AW, YS1O, HH3RC, VP2MD, VR3D and VK1AC putting him on 163 . . . Charlie, **W3VOS**, nabbed 20 countries for his first week's work on 14 Mc. . . . Shely, **W3RGQ**, brought his 160-meter country total to 18 with KG4AT, XE2OK and KH6MG. His rig is a VIKING II . . . **W4AWO's** 18-watter nabbed HH3RC, HP3DA, KG4AO, KS4AV, TI2VJ, CM9AA, VP9BK and YN4CB. All on 7-Mc. phone! . . . Dave, **W3PA**, came through with VP7NM, KZ5DE, GW3ZV, VP4LZ, KV4AA, G5JU and G6GM on 160 from poor low angle QTH. He may move to W4-land (S.C.) soon . . . **YU1AD** went to No. 77 on 3.5 with EA8BF . . . **WØZAM** nabbed EA9DF and VQ4EV to reach 93 . . . New ones at **W8HEV** include EA6AF, ZC4RX, 3V8AN, EA9DF, ZD4BF and KR6AA . . . **W4VDF** has A3'd to 118 with HZ1AB, CT3AN, ZE3JJ, M1B, FO8AD and CR6BX . . . **TI2TG** hit 102 on 21 Mc. with EL2X . . . **W4COK/2** went to 48 on 3.5 with such as EL2X, 4X4BX, TA3AA, ZS2X, ZS3K and FP8AP . . . **WØQGI** thirty-watter nabbed EA9DE and FA9VN to reach 80 . . . **DL3RM** has 111 on 21 while **DL7AP** claims 96 on the same band . . . Gene, **W4BRB**, went to 110 on 3.5 with EA8BH and VP3YG.

Here and There

One of the largest Ham get-togethers occurred in Dayton, Ohio, on April 3 with some 1120 registered guests. Attending were such DX'ers as W8PQQ, W9IOP, W8NBK, W8BHW, W9VW, W9VND, W8CED, W8PUD, W8CXN, W8JBI, W8KIA, W3CAA, W8UKS, W8MPW, W8ZY, W1IKP and W8WZ. W9IOP acted as Master of Ceremonies and Mac, W1IKP, was the ARRL representative. The DX meeting was attended by about 200 Hams and was highlighted by talks by Lindy, W8BHW, on 21 Mc. DX and discussions on the International DX Club led by Larry, W9IOP. The Dayton Amateur Radio Association is to be complimented for sponsoring this FB affair . . . **F7CX**, Bill, may be better known as W8YMJ, ex-W6NVJ/DL4QW/JA5AN . . . **TI2WR** and **TI2BX** have new VIKING rigs . . . Roy, **KH6AAQ/4**, keys from Thomson, Ga. until his return to Oahu in August . . . Dave, **PAØUN**, is staying with K2GXA (an ex-PAØ Ham) until returning to Holland in mid-July . . . **DI9AA**, ex-TI9AA, is stopping in Aruba, PJ2, for engine repairs . . . **W4YHD** has new kilowatt. He ops from Club Station W1MX, at MIT . . . Congrats to Howy, **W2QHH**, upon arrival of Jr. Op . . . **SM5IZ** needs XE QSL to complete WAZ. Any help? . . . **YN1AA** was due to visit Miami Conference May 2.

Ron, **ZL2RC**, winds up his stay in Atlanta, Ga. and heads for west coast where visits will be made at W6VAD and W6AL. Ron is due to sail for N.Z., via Honolulu, on June 11 . . . KV4AA logged visits from **W2APF** (Uncle Dave), **K2CJN**, **KV4BB**, **W2VXH** and **W4GHP** . . . **HR1JM** QRT's in late March and will QSY to Kansas City, Mo. . . . **VP9BJ** left for states April 1 . . . **W3MFW** now has his own QTH and plans a 7-Mc. beam . . . KZ5EM may be heard as **AC5EM** on MARS. Prefix for KP4 and KV4 in MARS is AC4! hm-m-m-m-m . . . Ben, **W5ENE**, was burned out for the ARRL test but did manage to appear on 160 . . . Bill, **W4LPP**, now

T-TI CERTIFICATE

(Worked all Costa Rican Districts)

This Certificate will be awarded to any radio amateur submitting proof of contact, on phone or CW, with seven of the eight following TI districts:

TI2-San Jose	**TI3-Cartago**
TI4-Heredia	**TI5-Alajuela**
TI6-Limon	**TI7-Guanacaste**
TI8-Puntarenas	**TI9-Cocos Island**

QSL's go to the **Radio Club of Costa Rica, P.O. Box 535**, San Jose, C.R.

● ● ●

New Swedish "WAV"

(Worked all Vasteras) Award

This Certificate may be obtained from WAV-Mgr., SM5WI, Emausgatan 45 E, Vasteras, Sweden upon submitting proof of contact with 2 SM5, Vasteras, stations. All QSO's must have taken place AFTER December 31, 1953. Applicants from Europe must submit proof of 10 contacts while applicants in LA, OH, OZ and SM must have 20. Four IRC Coupons must accompany request. There are over 70 SM5 (Vasteras) stations available for QSO.

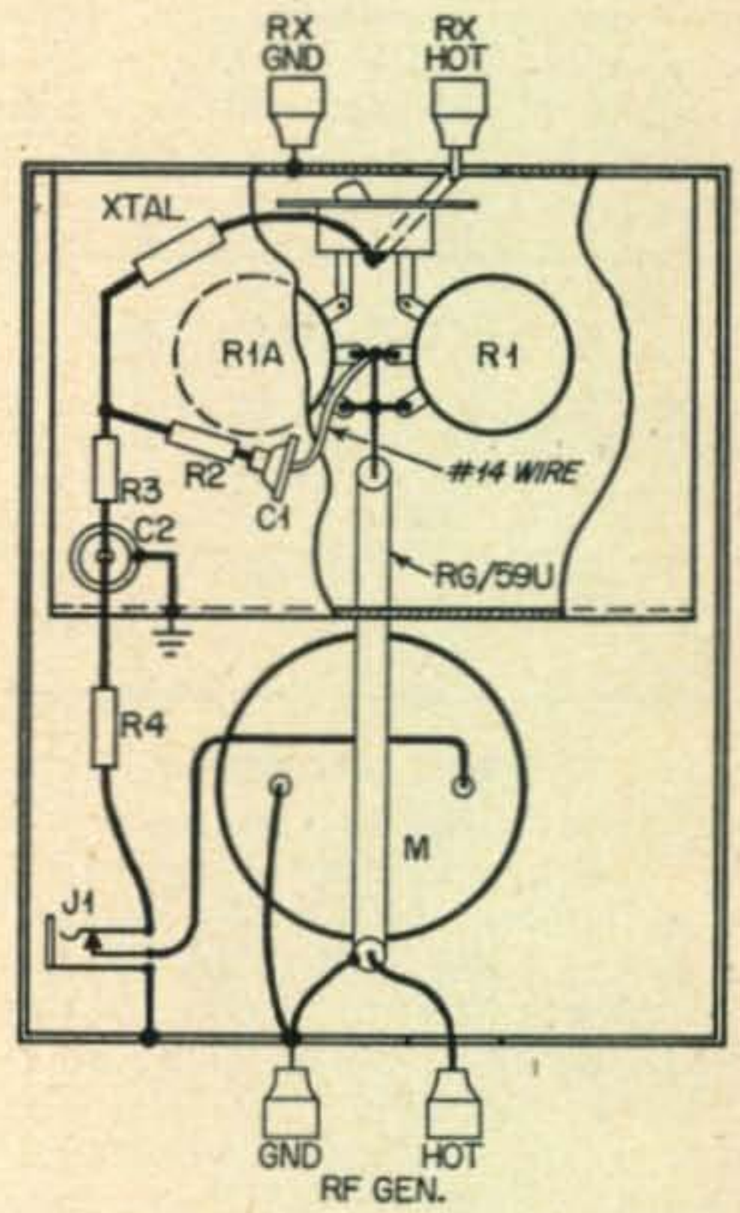
(Continued on page 58)

ANTENNASCOPE-54

(from page 26)

actual r-f measurement. First couple the r-f input of the *Antennascope-54* to your grid dipper coil and put a 50-ohm resistor across *Rx*. See *Fig. 5* for a general idea of how this is done.

Use a frequency from the grid dipper of about 20 Mc., and while it is oscillating put the range switch on the "low" scale and see if the



Wiring view and layout.

50-ohm value is being read. Move to the "high" scale and repeat to see if 50 ohms is also being read there. Rotate each control several times to find a scale value, and see if backlash is absent—it should be.

The readings should result in pronounced nulls on the meter. If only partial nulls other

Fig. 5. Basic use of the ANTENNASCOPE-54.

than absolute zero are observable, the *Antennascope-54* is not working properly. Check first with a different value of test resistor since the first one might have been reactive. It is important to keep the leads very short during this test and that the resistor be non-reactive —oddly enough some are quite reactive.

(Continued on page 46)

PAN-EL

AMATEUR CRYSTALS

RIGHT OUT OF OUR BIG STOCK

We keep a big supply of amateur crystals on hand, and can usually supply your frequency need the same day your dealer's order reaches us. But if not, give us a few days and we'll produce it for you—without extra charge.

PRICES

P-18A 3500 to 4000; 7000 to 7400; 8000 to 8400 to the nearest integral KC.....$2.75 each

P-23A 14000 to 14350; 28000 to 29700 to the nearest KC ..... 3.75 each

P-23 27255 (.05" pins) Citizen Band..... 3.95 each

All with .09" pins spaced .486" to fit FT243 sockets, except as noted.

For your money in Pan-El Crystals you will get a crystal precisely on frequency stamped on the holder. The electrodes are of gold or silver, bonded directly to the quartz. The crystal, mounted with shock-resistant, jeweller precision, is hermetically sealed in a nitrogen atmosphere—for long-term stability and the utmost in activity.

Since 1942 *Crystals for mobile . . . ship to shore . . . aircraft*

Pan-El

QUANTITY PRODUCERS OF STANDARD AND SPECIAL

Control Crystals

PAN-ELECTRONICS CORPORATION

901 West Peachtree Street, N. E. • Atlanta, Ga.

(from page 44)

Once a null has been found with a given resistor you will find that lead length can upset the balance. The leads of your test resistor must also be very short. Do not parallel connect resistors for testing the *Antennascope-54* —use non-reactive ½-watt single resistors.

Poor nulls can result from stray coupling effects in the *Antennascope-54*, but if the wiring and chassis layout is followed as shown in the figures this trouble should not arise.

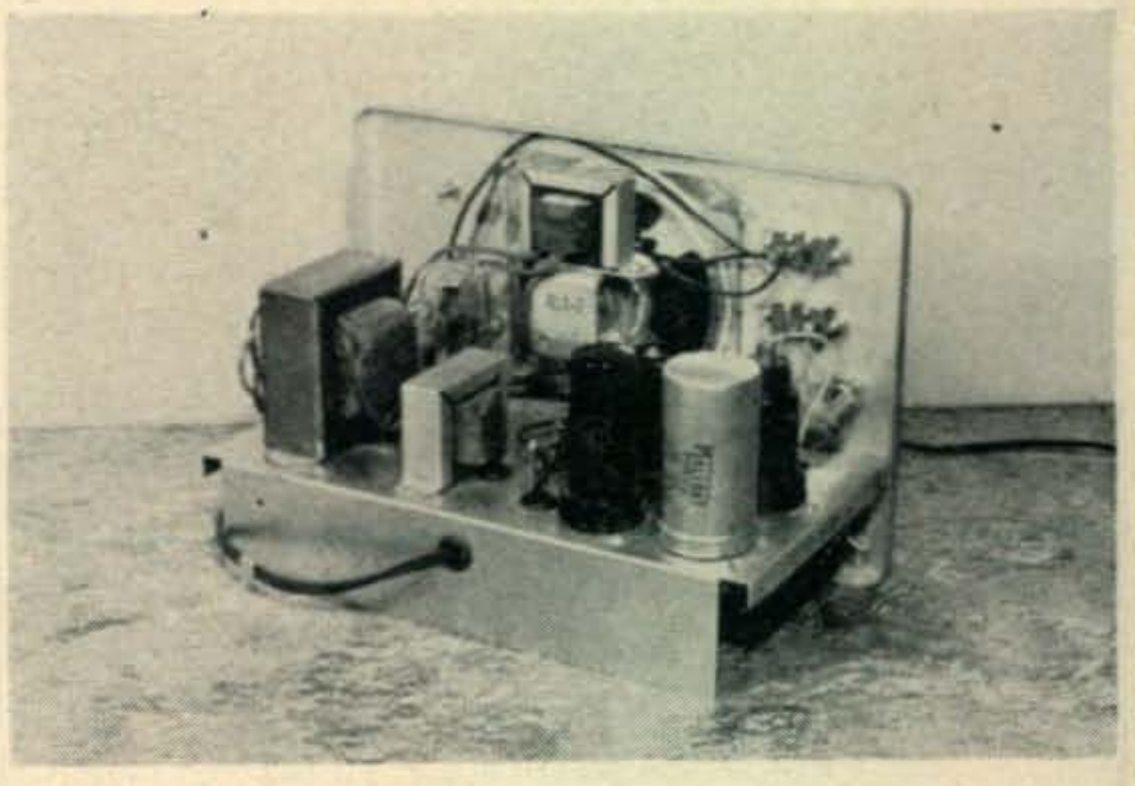
(In Part II of this article, the applications and use of the ANTENNASCOPE-54 will be emphasized. There will also be drawings on ANTENNASCOPE-Junior and the electrostatic loop coupling.)

TEST EQUIPMENT

(from page 34)

no previous radio experience can assemble the unit in several hours.

Only simple tools are required to assemble such a kit as this, but in addition to a couple of screw drivers, soldering iron and side cutters, a volt-ohm-milliammeter is a very handy thing to have. Such an instrument is valuable for continuity and voltage checks when putting a new piece of gear into operation. This same



Rear view of the T-3 signal tracer showing parts placement. This unit may be wired in only a few hours by any experimenter.

company supplies one known as the *Handitester M-1* which can be recommended for the beginner or for the Ham who needs a second meter. One such tester is in use here at our shack, and because of its handy size we've earmarked it for just portable and mobile use. and it remains in the car. It measures 3"x6" x2½" overall.

Although small in size it is designed around

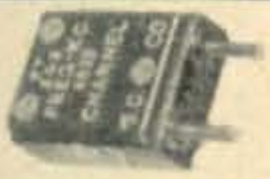
CRYSTALS

Guaranteed to oscillate!

Your choice of frequencies!

Largest selection in the world!

NOTE! EVERY CRYSTAL TESTED FOR ACTIVITY BEFORE SHIPMENT! All numbers listed are FUNDAMENTAL FREQUENCIES IN KOLICYCLES.



FT-243

Lots of 10 or more. Ea. 69c
Lots of 5 or more. Ea. 79c
Individually. Ea. 99c

	2442	2705	2980	3240	6340	7406	7950
1110	2450	2710	2985	3290	6350	7425	7960
1129	2455	2715	2990	3300	6362	7440	7970
1150	2460	2720	2995	3310	6373	7500	7980
1195	2465	2725	3005	3320	6375	7510	7990
1525	2470	2730	3010	3340	6405	7520	8000
1900	2475		3015	3410	6406	7530	8006
1915	2480	2740	3020	3420	6425	7540	8008
1930	2485	2745	3025	3455	6440	7550	8010
1940	2490	2750	3030	3465	6450	7560	8016
1950	2495	2755	3035	3510	6473	7570	8020
1965	2505	2760	3040	3525	6475	7580	8025
1977	2510	2765	3045	3550	6500	7590	8030
1980	2515	2770	3050	3655	6506	7600	8033
1985	2520	2775	3055	3700	6525	7610	8040
2010	2525	2780	3060	3825	6540	7620	8041
2015	2530	2785	3065	3865	6550	7630	8050
2017	2535	2790	3070	3940	6573	7640	8058
2020	2545	2795	3075	3955	6575	7650	8060
2025	2550	2815	3080	3980	6600	7660	8066
2035	2557	2825	3085	3990	6606	7666.7	8070
2040	2560	2830	3090	6000	6625	7670	8073
2055	2565	2835	3095	6006	6640	7680	8075
2060	2570	2840	3100	6025	6650	7690	8083
2065	2575	2845	3105	6040	7000	7700	8100
2090	2580	2850	3110	6042	7006	7710	8108
2105	2585	2855	3115	6050	7025	7720	8110
2125	2590	2860	3120	6073	7040	7730	8116
2130	2595	2865	3125	6075	7050	7740	8125
2135	2600	2870	3130	6100	7073	7750	8130
2140	2603	2875	3135	6106	7075	7760	8133
2145	2605	2880	3140	6125	7100	7770	8140
2155	2610	2885	3145	6140	7106	7780	8141
2165	2615	2890	3150	6142	7125	7783.3	8150
2175	2620	2895	3155	6150	7140	7790	8160
2180	2625	2900	3160	6173	7150	7800	8163.4
2195	2630	2905	3165	6175	7173	7810	8166
2300	2635	2910	3170	6185	7175	7820	8170
2305	2640	2915	3175	6200	7200	7830	8173
2320	2645	2920	3180	6206	7206	7840	8180
2350	2650	2925	3185	6225	7225	7850	8183
2355	2655	2930	3190	6235	7240	7860	8190
2360	2660	2935	3195	6240	7273	7870	8191
2365	2665	2940	3200	6250	7275	7880	8200
2375	2675	2950	3205	6275	7306	7891.7	8208
2370		2945	3202	6273	7300	7890	8206
2390	2680	2955	3210	6300	7325	7900	8220
2415	2685	2960	3220	6306	7340	7910	8225
2430	2690	2965	3225	6315	7350	7920	
2435	2695	2970	3230	6325	7375	7930	
2440	2700	2975	3235	6335	7400	7940	

DC-34 & DC-35

PIN SPACING ¾"

Your Choice. Ea. only — 99c

1690		2422	2745	3155	3630	3890	4130
1705	2155	2435	2764	3161	3650	3895	4135
1720		2446	2775	3190	3655	3905	4150
1738	2175	2466	2776	3201	3665	3920	4155
1746	2195	2467	2807	3270	3680	3925	4175
1770	2202	2478	2816	3279	3695	3935	4177.5
1790	2215	2491	2831	3280	3700	3940	4192.5
1810	2220	2500	2851	3297	3702.5	3950	4210
1830	2235	2510	2853	3311	3705	3960	4215
1850	2240	2514	2894	3317	3710	3965	4235
1870	2255	2527	2895	3365	3730	3985	4240
1890	2258	2540	2899	3385	3745	3995	4255
1910	2275	2559	2925	3390	3750	4012.5	4275
1930	2280	2586	2926	3395	3760	4015	4280
1950	2295	2587	2960	3412.5	3765	4020	4305
1970	2300	2605	2971	3422.5	3770	4030	4310
1990	2315	2625	2980	3462	3775	4035	4325
2010	2326		3000	3480	3790	4050	4335
2030	2335	2643	3010	3485	3792.5	4055	4345
2050	2340	2665	3023	3500	3807.5	4065	4350
2075	2355		3027.5	3520	3825	4080	4370
2082	2360	2685	3055	3540	3830	4085	4380
2090	2375	2710	3077.5	3550	3850	4090	4397.5
2105	2390	2711	3095	3575	3855	4095	4415
2106	2395	2725	3117	3580	3870	4097.5	4435
2131	2415	2732	3149	3610	3885	4115	4440

FT-241 LOW FREQUENCY CRYSTALS

Lots of 10 or more. Ea. 79c
Lots of 5 or more. Ea. 89c
Individually. Ea. 99c

400	440	441	442	444	445	446
447	448	450	451	452	453	454
456	457	458	459	461	462	463
464	465	466	468	469	470	472
473	474	475	476	477	479	480

NOVICE BAND FUNDAMENTAL FREQUENCIES

Individually. Ea. . . **$1.25** Lots of 10 or more. Ea. . . **99c**

AVAILABLE IN EITHER DC-34 OR FT-243 HOLDERS. Specify your needs.
Frequencies in steps of every 1 KC: from **3701 THROUGH 3750.** Examples: 3701, 3702, 3703, etc.
FOR DOUBLING INTO 7 MC BAND, Frequencies in steps of every 1 KC: from **3588 THROUGH 3599.** Ex: 3588, 3589, etc.

NOVICE BAND FUNDAMENTAL FREQUENCIES AVAILABLE IN FT-243 HOLDERS **ONLY.**
Individually. Ea. . . . . **$1.25** Lots of 10 or more. Ea. **99c**
All frequencies from **7175 KC THROUGH 7198 KC** in steps of 1 KC, fractions omitted. Examples: 7175, 7176, 7177, etc.

MISC. & SHIP BAND FREQUENCIES

81.95 KC Octal tube type (Used in SCR-584 & SPM-1)	**$3.99**	2638 KC DC-34	**$2.99**
200 KC FT-241	**1.99**	2638 KC in FT-243 hld.	**2.99**
200 KC Type DC-15 in octal tube holder	**1.99**	2642 KC in FT-243 hld.	**2.99**
327.8 KC No. D-168342. (Used in TS-102/AP	**9.95**	2647 KC in FT-243 hld.	**2.99**
500 KC FT-241	**1.99**	2670 KC in DC-34 hld.	**2.99**
1000 KC FT-241	**2.49**	2738 KC in type 1-C hld.	**2.99**
1000 KC Type DC-9, in octal tube holder	**3.45**	2738 KC in FT-243 hld.	**2.99**
2000 KC FT-243	**1.99**	2738 KC in MC-7 hld.	**2.99**
2142 KC DC-34	**2.99**	3000 KC in FT-243 hld.	**1.99**
2174 KC DC-34	**2.99**	3088 KC in FT-243 hld.	**2.99**
2182 KC FT-243	**2.99**	3093 KC in FT-243 hld.	**2.99**
2500 KC FT-243	**1.99**	3098 KC in FT-243 hld.	**2.99**
2632 KC FT-243	**2.99**	3103 KC in FT-243 hld.	**2.99**
2637 KC FT-243	**2.99**	3188 KC in FT-243 hld	**2.99**
		3193 KC in FT-243 hld.	**2.99**
		3198 KC in FT-243 hld.	**2.99**
		3203 KC in FT-243 hld.	**2.99**
		5000 KC in FT-243 hld.	**1.99**
		10.000 KC Type SR-5	**1.99**

FT-243

Lots of 10 or more. Ea. 34c
Lots of 5 or more. Ea. 39c
Individually. Ea. 49c

4035	4540	5090	5675	5892	6400	6973	7975
4045	4580	5127.5	5687.5	5900	6406.6	6975	8240
4080	4610	5165	5700	5906.7	6425	7450	8250
4095	4620	5180	5706.7	5907.5	6673.3	7473.3	8273
4110	4635	5205	5725	5925	6675	7475	8275
4135	4680	5235	5730	5940	6700	7506.6	8300
4165	4695	5245	5740	5950	6706.6	7525	8306
4175	4710	5285	5750	5955	6725	7573.3	8325
4190	4735	5295	5760	5973.3	6740	7575	8340
4215	4780	5300	5773.3	5975	6750	7606.6	8350
4220	4785	5305	5775	5995	6773.3	7625	8375
4255	4815	5327.5	5780	6206.6	6775	7673.3	8400
4280	4820	5335	5782.5	6225	6800	7675	8425
4295	4840	5385	5800	6240	6806.6	7706.6	8450
4300	4845	5397.5	5806.7	6250	6825	7725	8475
4330	4852.2	5435	5820	6273.3	6840	7773.3	8500
4340	4880	5437.5	5825	6275	6850	7775	8525
4395	4900	5485	5840	6300	6873.3	7806.6	8550
4397.5	4930	5500	5850	6306	6875	7825	8575
4445	4950	5545	5852.5	6325	6900	7873.3	8600
4450	4980	5582.5	5860	6340	6906.6	7875	8625
4490	4995	5587 5	5873.5	6350	6925	7906.6	8650
4495	5030	5645	5875	6373.3	6940	7925	8675
4535	5035	5660	5880	6375	6950	7973.3	8690

FT-171

Lots of 10 or more. Ea. 79c
Lots of 5 or more. Ea. 89c
Individually. Each 99c

1151.8	2150	2415	2911	3510	3807.5	4050	5225
1562.5	2155	2435	2940	3520	3810	4080	5492.5
1738	2191	2442.5	2967	3550	3812.5	4097.5	6000
1746	2220	2467	2990	3562	3825	4110	6210
1940	2258		3010	3569	3870	4112	7165
2010	2260	2500	3010.5	3570	3880	4177.5	7950
2030	2280	2532.5	3175	3580	3945	4245	8000
2040	2282.5	2545	3202.5	3637.5	3950	4255	9200
2045	2290	2550	3205.5	3660	3955	4280	9590
2065	2300	2557	3215	3667.5	3966.5	4310	
2082	2305	2582	3237.5	3682.5	3970	4345	
2105	2320	2630	3250	3695	3975	4350	
2123	2340	2665	3322.5	3700	3980	4360	
2125	2360	2725	3400	3712.5	3995	4400	
2131	2390	2780	3422.5	3760	4012.5	4735	
2145	2405	2835	3500	3790	4037.5	5200	

CRYSTAL GRINDING KIT

With instructions. 10 crystals, grinding equipment and labels.
For 80 METERS **$7.95** For 2 METERS (18th Har.) **$6.95**
For 40 METERS **6.95** For 2 METERS (24th Har.) **6.95**

NOTE! All items subject to prior sale and change of price without notice. MINIMUM ORDER: $2.50. All orders MUST be accompanied by check, cash or M.O. WITH PAYMENT IN FULL. NO C.O.D. CALIFORNIA BUYERS add sales tax. INCLUDE APPROXIMATELY 5c PER CRYSTAL FOR POSTAGE. **DEALERS & JOBBERS: WRITE FOR SPECIAL QUANTITY DISCOUNTS.** Be sure to ask for FREE crystal catalogue giving complete list of frequencies.

U. S. CRYSTALS, INC. DEPT.C
805 S. UNION AVE., LOS ANGELES 17, CAL.

(from page 46)

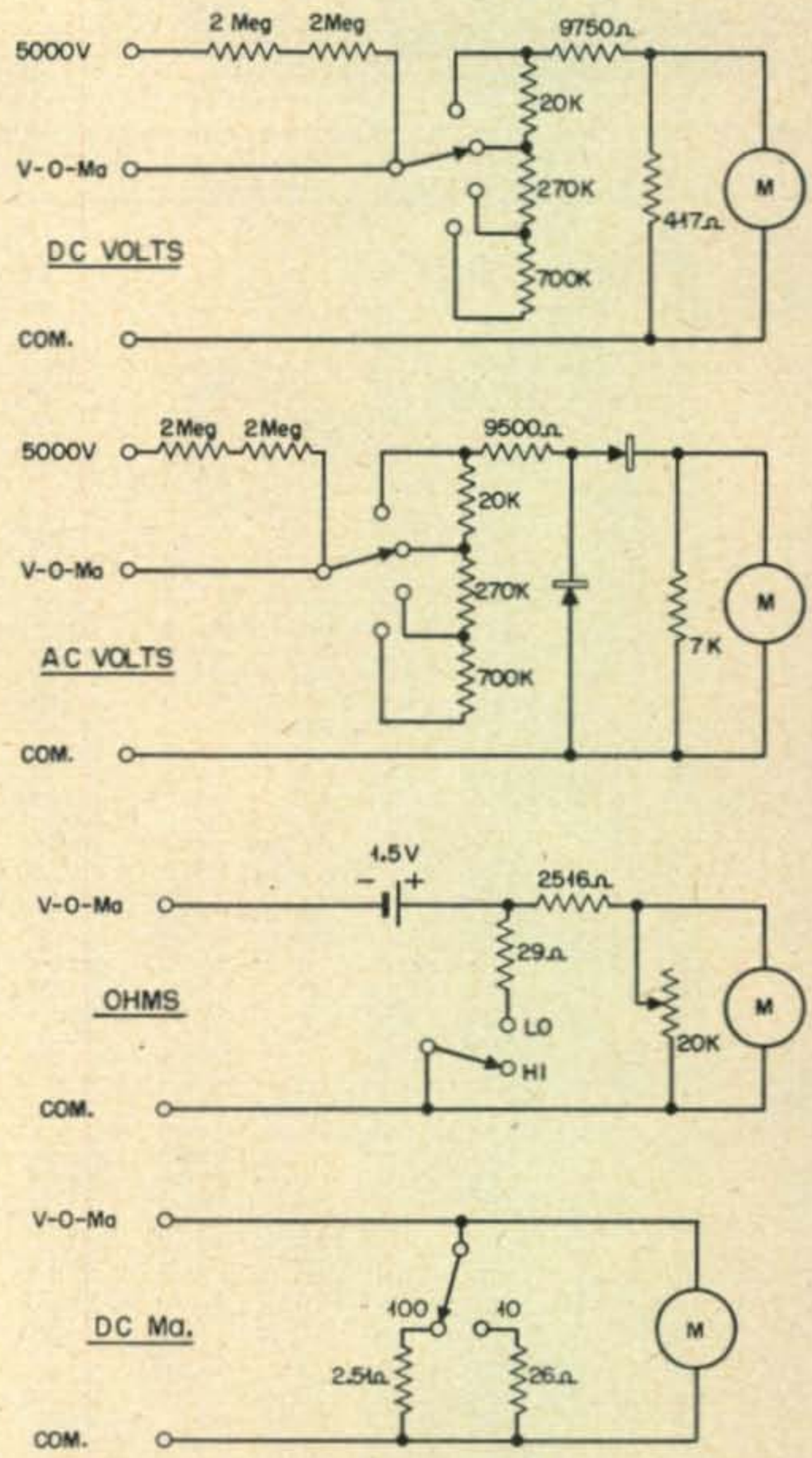


Fig. 4. Basic circuits used in the Heathkit Handitester M-1.

a three-inch meter movement with a sensitivity of 400 microamps. A suitable voltage multiplier and shunt system made up of 1% resistors gives a number of useful ranges. The ranges available are 10-30-300-1000-5000 volts d.c., and the same ranges are available on a.c. The milliampere ranges are 10 and 100, and resistance can be read from 0 to 300,000 ohms in two ranges. This coverage is sufficient for most Ham uses and trouble shooting. This instrument also is very easy to assemble. *Fig. 4* shows the basic circuits which are set up by the range switch in several of its positions.

While looking over the signal tracer and its uses in the radio amateur field, a question came up. How can such a simple instrument have so many interesting uses? Perhaps it is because so few of us have a spare high-gain amplifier, complete with speaker and power supply, to use for any idea which we may dream up. If you've been looking for one of those little extras that add to the pleasure of both operating and experimenting, we think that you'll like this one.

CLIPPERTON

(from page 30)

weather, to find any bottom that can be reached by an anchor. Even in good weather, the island can only be seen from 12 miles away and, from one direction, it is said to look like a ship under sail. Small wonder then that the Hydrographic Office warns that "Clipperton Island is a dangerous place under even the most favorable conditions" and all ships give it a wide margin of safety.

The lighthouse that used to stand on the rock and the pier have long ago corroded away into uselessness. Two or three quonset huts, vestiges of a U.S. World War II weather station are still reported to be standing. Though weather beaten, they probably still offer some shelter. There is one "grove" of cocoanut trees and two "clumps," but these are the only vegetation on the island. The Hydrographic Office reported in 1935 that it was literally covered with nesting birds and it was practically impossible to walk without stepping on millions of land crabs. I think that report must be discounted now as the GI's must have taken care of those crabs, but good! Sharks however, less vulnerable to tender Government-Issue diplomacy, must still swarm there.

The temperature, though the island is only 10 degrees North of the Equator, is reported as warm, not hot. There is simply not enough land to store up the heat against the continually cooling ocean breezes. Naturally, the humidity is high and frequent showers occur.

Are you beginning to get the idea of why it might be that somehow these frequently proposed expeditions never seem to get there? In our case, when we finally contacted the man who was supposed to be willing to sail us there, he replied, "Clipperton? Not on my boat—most anywhere else but I wouldn't go within a hundred miles of that place!"

But seriously though, if you are young and foolish and really willing to risk your neck to get on the bottom of a dog pile, I think it could be done if you can spare the time and make adequate preparations.

First thing I'd do in making up the party would be to include a competent, cautious navigator if you're going to sail your own boat, and for sure a couple men experienced at getting a double-ended surf boat through heavy breakers right side up.

Then I'd apply by letter to the French Consul in your vicinity for authorization, giving full details. He would probably want to be sure that you are a responsible group, that you fully realize what you're getting into, that France would in no way be responsible for

(Continued on next page)

(from preceding page)

your safety, that you are not treasure-hunting and that you otherwise have no designs on France's territory. You would make the application easier to process if you could write it in French. Having given the application a reasonable time to be acted upon, I'd start following it up every week or two so there would be no question of whether you still want to go.

With your plans pretty well established, I'd notify the Coast and Geodetic Survey or Hydrographic Offices. Because it is so seldom visited, they will want you to take lots of photographs of the island and probably a lot of other data too. This won't be any hardship as you probably would want to do so anyway for documentation of any writing you may do when you get back.

When you're all set to go, I think you should fly to Acapulco some time in November or December, when the weather is most favorable for the attempt, and arrange for a boat there. Don't forget prior permission from Mexico to ship radio gear through their country! In both of these deals it would be much easier and cheaper if one of your party were a good bargainer (which is to say, most any Ham), who could speak Spanish.

It has been suggested that it might be possible to land a light sea plane on the lagoon since it is at least a mile long and of reasonable depth mostly. You would, of course, have to case the bottom first for reefs close to the surface. The U.S. forces, however, were supplied by landing craft, and I think I'd prefer to stick to the surface myself.

Critical Phase

In approaching the island, I wouldn't get any closer than 50 miles except during daylight and with good visibility. Having sighted it, I'd approach the landing place on the Northeast side and heave to at a respectful distance. Then I'd take to the surf boat and get a close inspection of how high the breakers are running. Even though the breakers are supposed to be heavy and continual, I've never seen the ocean when it didn't have its ups and downs, so to speak. That is, if the breakers look too high to take a chance on that first day, the odds are good that they may be low enough within a few days (or possibly as much as two weeks) to go ashore.

On the first attempt at landing in the surf boat, I'd leave the Ham gear and an adequate crew on the ship so that it could be pulled away quickly in case of a chibasco. Once ashore, I'd inspect what buildings might be there. If they were not usable or not placed right with reference to antenna sites, I'd make for the Rock and set up a tent on the lee side. According to the chart, the closest palm tree is somewhat more than a mile North of the Rock,

over the lagoon (except for a half-dozen seen right at the base of the rock in 1917). Since an antenna of this span would present quite a mechanical problem, even to a long-wire addict, you'd better bring along a collapsible pole or two to hang the antenna on.

Having gotten the lay of the land, I'd return and try shooting the breakers again, this time with the gear aboard. I'd have all the equipment in reasonably watertight containers because it takes mighty good handling to get through even medium breakers without slopping some water aboard. A really cautious man might also attach marker-buoys with *long* lines–the water is very deep!

There's another possibility for landing. That is to use as a makeshift pier a large landing craft which was sunk near the anchorage during World War II. From recent photographs it is quite possible that it protrudes far enough for such use.

Now you're on shore and I've done all I can to get you there. All you've got to worry about is keeping the gang spread out and away from your frequency and to hope that the sea doesn't get vicious again when you've said your last 73. I sure wish I could have gone with you, but if you'll save me the first QSO, I'll handle the QSL's.

(The above story by W6CAE was, surprisingly enough, received just before the announcement of the FO8AJ expedition. The similarity of the problems predicted by W6CAE and those actually encountered by FO8AJ and FO8AJ/MM is astonishing.—Editor)

NOVICE SHACK

(from page 39)

Or QRX for wait? QSB—B for baker—for fading? Or any number of other terse, colorless substitutes for the real thing that come to mind, such as K for go ahead, or SK for out? Doing this does not save any time. Even worse, it's usually less accurate than using plain English.

To carry the thought a step further, signal reports such as "Your signals are weak but perfectly readable," or "Your signals are very strong but are readable with some difficulty because of heavy interference" are unmistakable in their meanings. On the other hand, a report like "Readability 4, Strength 8" often means just what the sender wants it to mean.

According to the tables in amateur handbooks, a Readability 4 signal is 100 per cent readable with practically no difficulty. To many phone men, however, it is only about 80 per cent readable. And Strength reports are usually exaggerated. Nevertheless, if you give a report in words, keep that RST table handy. The chances are you will be asked "Please give me a report for my log."

If you think this is odd, try to translate a Q(SA) 5 S 9 report into words after looking up the official meaning of QSA. You will discover that it means, literally, "Your very strong signals are extremely strong!"

Phonetics

Phonetic words are sometimes useful in distinguishing individual letters in call signs and in spelling out names: thus, A-Able; B—Baker, etc. Do not get into the habit of using them when conditions do not require them.

There are several phonetic word lists available. Their chief characteristic is that they consist of easily-pronounced, familiar words. The word list used by the Army, Navy, and Air Force now falls down badly on the last point in the absence of special drill.*

(Continued on next page)

* Examples: A—Alpha; F--Fox trot; R—Romeo.

(from preceding page)

High-Capacity Shortened Antenna

In *Fig. 1* is sketched the essential data on an interesting shortened vertical antenna developed by John Reinartz, K6BJ, of *Eitel-McCullough, Inc.* (*Eimac tubes*). Mr. Reinartz reports that only two-thirds of the height of a conventional antenna are required with it to achieve resonance at a given frequency and that it will radiate stronger signals than a simple wire of comparable height. In addition, its construction reduces its *Q;* so that it radiates with equal efficiency over a wide frequency range.

To construct the antenna, obtain a pole of the desired height, such as a bamboo or fiber-glass fishing rod. Fasten the end of a piece of #16 or #12, enamelled wire to the top with rubber tape. Bring the wire down the pole 12" and fasten it. Double the wire back up the pole 6"; then come down for 18". Double back up for 6" and down again for 18". Repeat the process for the length of the pole. Each time the wire is doubled back on itself, it is displaced 120 degrees (1/3 the circumference) around the pole; therefore the wire spirals around it.

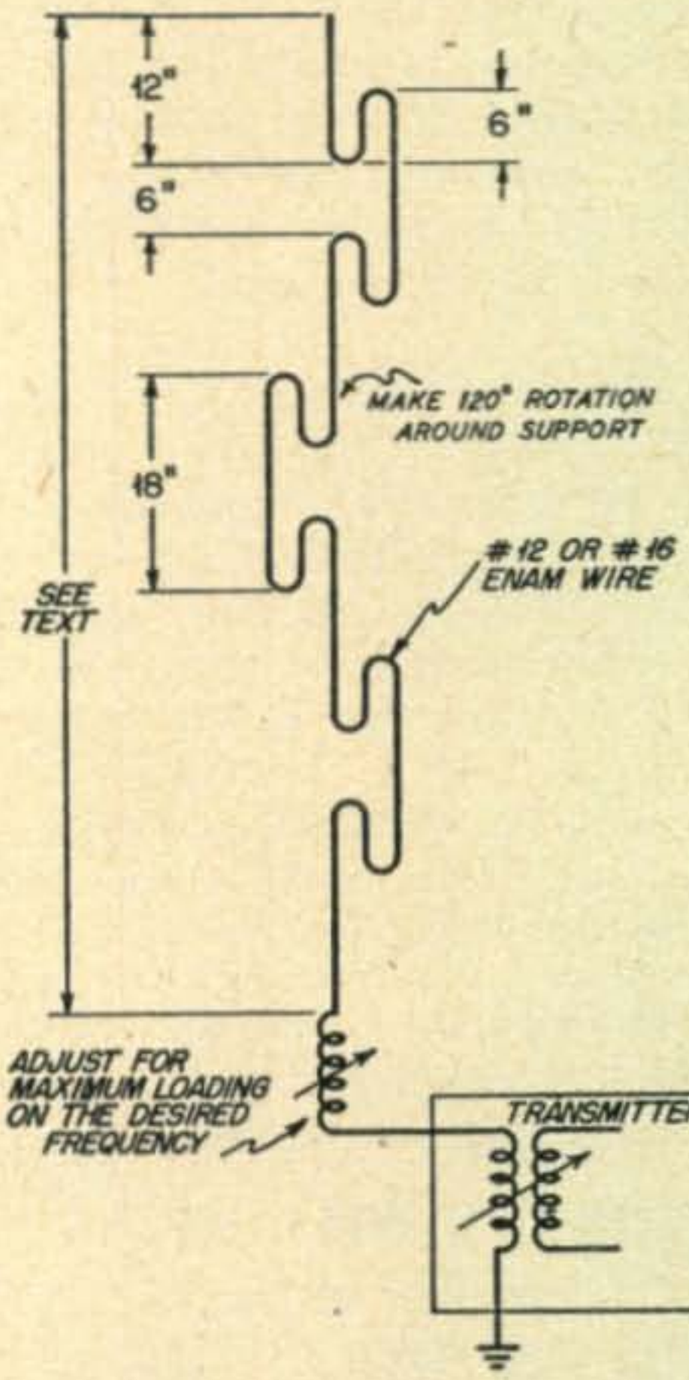


Fig. 1. K6BJ's low-Q, wide-range shortened antenna.

K6BJ's 2638—3995 kc. antenna was approximately fifteen feet long. Of course, the longer the antenna the better, up to a self resonant length. The sketch shows a suitable method of coupling power into the antenna. The shorter it is, the bigger the loading coil must be.

Letters And General News

Brice, W9PNE, has written a very interesting description of Ernest Harper, WN9ZYV, Oakland City, Indiana. "Dear Herb, Ernie had one of the first television receivers in southern Indiana. His tall masts and home-made TV beams were landmarks for years before TV became commonplace. When he got his license last fall, he installed a radial ground system and tuned up the TV mast and antenna as an 80-meter ground plane antenna. The mast was then 70 feet high, but he has now reduced it to 66 feet to be more nearly a ¼-wave long. . . . In one month after getting his license last fall, Ernie had

worked over half the states with thirty watts input. His family sits and watches TV while he is using the TV antenna as a transmitting antenna—with no TVI! . . . Ernie has separate ground-plane antennas for the 7.2-Mc. and 21-Mc. bands. He gets tremendous results on 7.2 Mc. WN9ZYV's present transmitter is home-constructed: 6AG7, 6AG7, parallel 6L6's, running 75-watts input. His receiver is an **NC-183D**. His present record is about 42 states worked, plus a couple of Canadian provinces."

Scott Larson suggests an idea that worked for him and **may** work for others. "Dear Herb, When you take your examination, bring a two-cent postal card addressed to yourself. On it put the following:

Novice: Passed——— Failed———.
Technician: Passed——— Failed———.

"I used this method and got the card back the next day. . . . I am fifteen years old. If anyone in Los Altos, California, would like some help in getting his license, come on over. My address is 425 San Luis, Los Altos." **(This idea may work. At least, I do not see how it can do any harm. You might try including such a card with your examination papers. However, I have a hunch that, if the FCC gets very many of them, they will be ignored—Herb.)**

Miss Anna Shick wants to settle an argument. "Dear Herb, Paul Starky, **WN7UNC**, Skamokawa, Wash., is forty-nine years old. He claims that makes him one of the 'old-men' Novices. I say he is wrong. There are many Novices older than he. Who is right?"

Jim Brown, **WN8OJR**, shades WN7UNC by a few years. He says: "I am fifty-one, and by golly, I figure that I am just about the Daddy of the Novices, Hi. Thought it would be interesting to have a little competition along these lines and find out who is the oldest Novice. . . . I work the 7.2-Mc. band with about thirty watts to a converted 'Command' transmitter. Receiver is an **RME-50**. Antenna is a folded dipole. I have worked 38 states, Canada and Mexico."

Reggie, **WN9ZQA**, says, "I am sixteen years old and a Junior in high school. My station consists of a **Heathkit AT-1** transmitter and an **AR-2** receiver, both of which I put together with no previous radio experience. My antenna coupler is built on a plastic refrigerator box. My antenna is 137 feet long, fed with home-made twin line, and about twenty feet high. It adds a lot of fun to use equipment that you have constructed yourself. . . . I haven't set any DX records, but I've certainly had a lot of fun. All my operating has been in the day time on 3.7 Mc. I have had 230 contacts, and I have received 88 QSL cards."

Dave, **WN7TUV**, Portland, Ore., writes, "Dear Herb, Thought I would let you know there are some Novices in this part of the country, too. I spent several months on 145 Mc. with a '522,' running ten watts, and a ground-plane antenna. Best DX was fifty miles. On 7.2 Mc., I run fifteen watts to a home-brew 6BL7GT transmitter. Best DX is Florida, 2250 miles. I have found that if I get up at 3:00 or 4:00 a.m., my little transmitter really gets out. I have worked twelve states and Canada. . . . Jack, who went with me when I took my examination, finally got jealous of me and got his license. He is WN7UUC. He had to wait only 17 days for his ticket, and I had to wait 12 nerve-wracking weeks!"

Alvin, **W7UAD**, and his wife Maxine, **WN7UAC**, write,

(Continued on next page)

(from page 53)

"Dear Herb, We got our Novice licenses last July. Since then, Alvin has obtained his General. Maxine expects to get hers in May. . . . Our transmitter is an **NT-200**, running twenty-five watts. Antennas are a long wire and a fishpole type. Receiver is an **S-22R.**"

Gary, **WNØQDP**, says, "In 6½ months as a Novice I have had the time of my life, working 42 states with my little ten watter and a borrowed 70-watt transmitter. I have now traded in my **S-38C** on an **SX-71**, but that **S-38** was really a hot little number. . . . I hope to continue to contact more Novices and making friends among them while still finding time to study for my General Class license. If any one needs Minnesota, he can write to me, and we will arrange a schedule. My address is: 4095 Ninth St., Winona, Minn."

Help Wanted

The following requests for help in obtaining an amateur license this month:

Dick Berg, Jr. (16), 509 Scott St., *LaPorte, Ind.* Phone 44461 (after 6:00 p.m.) Also wants a foreign pen pal interested in radio.

Eugene L. Prayner (32), 14300 Corridon Ave., *Maple Heights, Ohio.*

Dennis Paranzino (12), 3344 Merchantville Ave., *Pennsauken, N. J.*

Jack Layton, W. Red Banks Barlow Ave., *Woodbury, N.J.* (Wants to start SWL Club.)

Lee Gillette, 19156 Wells Dr., *Tarzana, Calif.*

Dean Rogers, 405 W. Marietta, *Peoria Heights, Ill.*

Horace E. Wetzel (14), University School, *Shaker Heights, Ohio.*

George J. Varatta (WW II veteran), 37 Ferncliff Ave., Centerdale 11, *North Providence, R. I.*

Charles Bostian, 5600 Purdue Ave., *Baltimore 12, Md.*

Walt Cantillon (14), 1624 Lincoln Ave., *Dubuque, Iowa.*

Al Holbach (33), 3114 W. 42nd St., *Kansas City Kans.* Tel: JU-8477.

Dean Walsh (14), 4200 Mission Road, *Kansas City, Kans.* Tel: JU-9639.

Billy Marshall, 1625 West 7th, *Texarkana, Texas.* (Wants to start SWL club.)

Sam Sussman (13½), 6084 Jeanne Mance, *Montreal Que., Canada,* Tel: TA 6945.

Carl M. Mitchell (14), 56 Sparhawk Street, *Amesbury, Mass.*

David W. Ronk, (WW II veteran), P.O. Box 1183, *Pinecrest, Calif.*

Max Lee, 2623 Parkview Ave., *Kalamazoo, Mich.* (Max is football and baseball coach and science instructor at a Kalamazoo high school. He and the entire science class have been bitten by the bug!)

William Bauman (20), 389 Church St., *Hasbrouck Heights, N.J.*

Paul J. Markowitz (13), 389 Seventeenth Ave., *Patterson 4, N.J.*

Howard Gomes, 95 Main St., *Pawtucket, R. I.*

(Continued on page 56)

(from page 54)

Terry Champion (16), c/o New Brunswick International Paper Co., *Dalhousie, N. B., Canada.*

David Conner (14), 180 West Hartsdale Ave., *Hartsdale, N.Y.* Tel: WH 9-1718.

More Letters And News

Bob Kenny, ex-G3AAU/GM3AAU, 2nd operator at **VE3BWY,** calls attention to **The World Friendship Society of Radio Amateurs,** which was founded in 1935 by Duane McGill, W9DQD. Its name describes its aims. I shall quote from the information Bob supplied. . . . "The society has, as one of its major activities, the **Bedfast Club.** This exists in an endeavor to lighten the load of our fellow Hams who find themselves confined to bed. . . . It is the object of the **Bedfast Club** to send to these good people reading matter of all kinds, both radio and general. Also, to help them with gear and useful items of equipment, to get them started on the air. Everyone's help is needed in this respect. . . . We have a Junior section, which is open to all young radio-minded boys and girls at high schools, colleges. . . . and any other Youth organization that cares to participate. . . . the Novice is especially welcome. . . . Dues are $0.75 a year for those under twenty; $1.00 a year for others. Donations of books and magazines are solicited for use in the **Bedfast Club."** . . . More information on the **WFSRA** may be obtained from Gary Ripton, 47 Lake St., LeRoy, N.Y., U.S.A., and Bob Kenny, c/o Mark Northcott, R.R. 2, King, Ontario, Canada.

Another club of interest to Novices and SWL's is the Short Wave **International Listeners' Club,** 10091 Brecksville Road, Brecksville, Ohio. Western Headquarters; P.O. Box 152, Kahuka, Oahu, Hawaii. Dues are $1.00 a year.

From **Eric Trebilcock,** BERS195, Victoria, Australia, probably the world's most famous shortwave listener; "Dear Herb: I have now been listening to 7-Mc. American Novices for a year. I have logged 76 different ones, all of which have been mailed a card. So far, I have received 40 cards in return. This is not a bad percentage, considering that many of my reports have been mailed in care of other amateurs, as I do not always have the latest Call Book available. . . . It is quite obvious from the wording on QSL's to hand that my reports of reception of their signals here in VK3 land comes as a surprise to most Novices. To be heard in Australia is beyond their wildest dream. I am glad I reported to the ops concerned. It gives them heart and assures them that their efforts have not been in vain. . . . As for me, I have been in radio commercially and as a hobby for nearly thirty years, although only a Ham 'SWL.' I have long been known around the world. I use but a **Hallicrafter S-38** and a long-wire antenna."

Tuck, **W1ZFM,** reports, "Dear Herb: I got my Novice license in September and spent nearly two fruitless months on the 80-meter 'Cave of the Winds' Novice band with a 35-watt rig. Then I went on '40,' feeding thirty-five watts to a ½-wave vertical **(66 feet—Herb)** and things started popping. I had QSO after QSO, found better operators, DX galore and YL's! By February 17, when my General arrived, I had over 500 QSO's in 35 states, Canada, Puerto Rico, and the Canal Zone."

Until Next month. 73, Herb, W9EGQ.

SNORLOCK OHMS

(from page 8)

The audience burst out laughing. "You see!" said the manager. "They're nuts about it!"

The movie dialog went on . . . "You thrill me, darling. In fact . . ." "Old Man, you're pinning my dial. You're coming in like a ton of bricks . . ."

Again laughter. Snorlock rose with difficulty from his seat. A dab of bubble gum pulled off part of his trousers. The Inspector and the manager followed the sleuth to the lobby where Snorlock telephoned Watts. "Switch over to 40-meter CW," he ordered—and noticed a slight tremor in the manager's face.

"What'll that prove?" Inspector Coupler wanted to know. "I'm beginning to think he's innocent."

"Of course I am," broke in the theater man. "Why, that interference in my sound track brought more laughs than the cartoon."

Snorlock watched the electronic pop-corn dispenser. Suddenly its neon lights glowed on and off in accordance with the keyed CQ sent by Watts. Simultaneously kids at the machine screamed, attracting more children.

A strange sight greeted the Inspector's popped eyes. Pop-corn cartons were popping out of the machine as fast as Watts could key. And kids were picking them up without bothering to put money in the slot.

Soon the dispenser was empty. And all that could be heard was the humming of the relays, doing a sort of musical CQ. Snorlock faced the manager. The latter's face was livid. His whole frame shivered.

"This is your man, all right," said Snorlock. "You see, he was right to a certain degree. He didn't mind the voice in the sound track. But he *did* mind Hoopskirt's *brass pounding*.

"And, you can see why — — the keyed impulses triggered the relays of the electronic pop-corn dispenser, permitting the ejection of free cartons of pop-corn. Our theater friend didn't so much mind what was happening on the screen. But he did mind what was happening to his pop-corn machine. That *really* hurt!"

"All right!" screamed the manager. "I did it, I did it! But a man's gotta live. That pop-corn machine was a gold mine, until — —" the man slumped to the floor.

"You know something," mused Snorlock, as Inspector Coupler snapped the bracelets on the cinema operator, "this case has a *corny* ending!"

PROPAGATION

(from page 37)

0508 CST. The path of totality will race Eastward across Lake Superior, over Akimiski Island in Hudson Bay, over Frederikshaab, Greenland, just missing Iceland, sweeping across the Faeroe Islands, Southern Norway and Sweden, across the Ukraine and the Caspian Sea and ending just beyond the Khyber Pass in Pakistan. The total eclipse will have covered a path of nearly 9000 miles in two and three quarters hours. Taking into account the different time zones, it will span all the terrestrial daylight hours, for example, it will be seen as a total eclipse first in Nebraska at 0507 local standard time, in the Faeroe Islands at Noon, local standard time, and in Pakistan at sunset. The eclipse will not be seen at all in the Western States of the United States but will be seen as a partial or total eclipse in most other states. New York City will see it as an eclipse of about 75% totality at about 0630. EST. The eclipse will also be seen in London, England with about 75% totality shortly after noon, local standard time. Regardless of whether you are in a position to see the total eclipse or not, its effects should be noticed on shortwave radio circuits all over the world, especially on those circuits where reflection from the ionosphere takes place at a point along the path of the total eclipse. The period that such effects should be most noticeable is between the hours of 1100-1400 GMT. Based on observations made during previous eclipses, it appears that the major effect noticed is a rapid **decrease** in signal strength on the higher frequencies (12-30 Mc.), or a rapid **increase** on the lower frequencies (3-12 Mc.), as the path of the eclipse passes near the ionospheric reflection point. I would be very interested in hearing from readers who may notice such effects during the total eclipse of June 30.

Next month, this column will discuss the latest progress in propagation research as reported at the joint meeting of the International Scientific Radio Union (URSI), and the Institute of Radio Engineers held recently at Washington, D. C.

DX NEWS

(from page 43)

keys from K5FEO in No. Texas . . . **PJ2AA** wants it known that many QSL's have been received for PJ QSO's other than PJ2A- and PJ2C- calls. These are unknown and will be destroyed . . . New officers in the Ohio Valley Club are: Pres. W4KVX, Vice Pres. W8UOD, Sec'y W4EPA, Treas. W8RSW, Activities Mgr. W8PBU . . . Phil, **WØSO,** is tied for first place in chess tournament in Kansas City. His opponent is named Frankenstein. We wish him luck in the playoffs. (KV4AA played chess with WØSO over the air some time back. The result—? Let's skip it!) . . . Newly married life has kept Egon, **4X4RE,** off the air for the past six months . . . W1TTA now keys from **K1FCM** . . . YU3AE is now **YU2AE** . . . TI2TG had visits from **YN4CB, CX2CG** and **CX2CL.**

Electro-Voice has put out a tabulator known as "W9IOP's SECOND OP." This is an extremely handy gadget to have around the shack and may be purchased for the sum of $1.00 from Electro-Voice, Buchanan, Mich., or from their distributors. It furnishes the following information: All prefixes throughout the world, local beam headings, time differential, date, postage rates, continent, DX zone, country, country QSO record, country QSL record and world QSL bureaus.

4S7XG, Pete, sails from Colombo on July 27 and will arrive in London about Aug. 10 . . . Bob, **W9NN,** was scheduled to visit Fla. in last part of April. W4RBQ and W4NN will be visited . . . G3HYJ advises that **ZD4BN** is now in ZS1-land and will shortly move to Rhodesia . . .

Honor Roll Endorsements

(To April 15, 1954)

W8NBK	40-245	W6ID	40-149	PHONE	ONLY
W6SN	40-244	W6BIL	40-144	W1RAN	35-148
VE4RO	40-237	W9HUZ	39-204	G8IG	39-187
G2LB	40-235	W3KDP	39-199	W8BF	37-183
PY1AHL	40-213	W6LGD	39-161	W1NWO	36-205
W6NGA	40-192	TI2TG	38-217	TI2TG	36-181
DL1DC	40-156	W7CNM	38-163	WØNCG	35-158
		W3AYS	36-151		

Last complete HONOR ROLL appeared in the May issue.
Next complete HONOR ROLL appears in the September issue.

NEW ADDRESSES

CE5CT—San Martin 229, Concepcion, Chile.
DM2 QSL Bureau—Box 666, Halle, Germany.
DM2ABK—Karl Rothammel, Sonneberg, Bloch Huette, Germany.
EA9DF—Lt. Col. Cesar Gonzalez Yague, Villa Bens, Cabo Juby, Rio de Oro, Spanish Sahara.
FM7WP—Andre Leandre, Rte des Religieuses, Fort-de-France, Martinique.
OD5AV and OD5AX—Box 235, Tripoli, Lebanon.
PY2AJ—Joao Ramos Baccarat, Rua Guaibe, 103, Santos, Brazil.
VQ8AR—Raymond Raffray, Floreal, Mauritius.
W8FGX—Jake Schott, 3110 Costello Ave., Cincinnati 11, Ohio.
ZL3JA—Hal Rowe, c/o Inland Revenue Dept, Taxes Div. Christchurch, N.Z.
Thanks to W2GLF and W3WDC

YL's FREQUENCY

(from page 40)

No. 5 **W4SGD,** Katherine Johnson, plus 2 endorsements
No. 6 **W4CKB,** Beverley Cavender
No. 7 **W3OQF,** Barbie Houston
No. 8 **W7HHH,** Bea Austin, plus 2 endorsements
No. 9 **W8ATB,** Esther Stuewe
No. 10 **W8HWX,** Lillian Richardson, plus 1 endorsement
No. 11 **W4ARR,** Bob Crane, plus 1 endorsement

No. 12 **W8HUX**, Marvel Sines
No. 13 **W3OP**, E. J. Knoll, Jr.
No. 14 **W9CMC**, Rodney Starkweather
No. 15 **W4KYI**, Frances Krepp

Note that twice as many YLs have received the award as OMs. Guess it's true with most YLs—we just naturally like to QSO another gal. YLCC custodian **W7GLK**, Dot Dickey, says applicants have been wonderful about sending postage for return of their cards, but she wishes Hams would follow the instructions published in this column in the March '53 issue of **CQ**, especially paragraph 6. The rules also appeared in Feb. '53 **QST**, so please check them in either magazine before mailing your cards and save Dot lots of work going through the QSL pack to get data. Dot also gives a tip on how to get needed confirmations, if that's what you're lacking. She says **W2QHH**, Howie, worked it slick by sending ordinary post cards to those who neglected to send QSLs or who didn't have them printed yet. Self-addressed and all made out for the signatures and data, it was little trouble for the YLs to finish the job.

With the Clubs

Here is a brand new YL club. According to W6PCN, Peggy, the gals have organized the **YLRC of San Francisco.** They started in January with a general get-together to see how much interest there would be. Fifteen turned up—four licensed YLs and eleven hopefuls. For the time being **W6QMO**, Jeri, is president, and Peggy is doing the secretary-treasurer-publicity stint, because it was voted that all interested would be accepted as conditional members but only licensed YLs could hold office. Jeri has been holding code classes twice a week to help the girls get their tickets and several have passed the Novice exam. The club will meet the third Tuesday of each month and each member will take a turn as hostess, the meetings to be purely social. The girls will be glad to hear from others in the area interested in joining the club. Licensed YLs in the club now are **W6QMO, PCN** and **KN6's CUT, CUV, EEE,** and **EEV.** KN6EEE, Vi, who has been nicknamed the "dit girl," is the XYL of W6JLV and the mother of W6FVK, making it another all-Ham family. As it turns out, the group contains as many mothers of Hams as XYLs.

MYL?

W6PCN, Peggy, wonders if there is any Ham abbreviation for the mother of a Ham. We've never heard of one, but how about MYL? This was suggested a long time ago to replace the term XYL, but as far as we know it has never caught on—XYL has been in use so long it is a permanent part of our Ham language. But MYL for Mother YL—why not? Should it be used for all mothers of Hams, or **licensed** mother YLs only? So far, we have used just the term YL for all licensed YL operators, married or not. Well, we'd be happy to have your thoughts on the subject, and any other suggestions you may have.

Results 5th Annual YL-OM Contest

It has taken a few years to build up, but judged by the increased participation this contest certainly rates high with both the OMs and YLs. Winner for the OMs this year was **W4ARR** with a total of 62 contacts and score of 1,826.25. YL winner was **W4KYI** with 434 contacts and score of 27,993.

YLRL Veep W2OWL found it quite a task checking all the logs, but is happy to report these additional high scorers:

TOP PHONE AWARDS

	CALL	PHONE SCORE	CW SCORE	TOTAL
1st OM	W1BFT	1,207.5	510.	1,717.5
2nd OM	W8AJW	1,039.5		
3rd OM	W9CMC	882.	165.	1,047.
1st YL	W8HLF	20,992.5	580	21,572.5
2nd YL	W1SCS	17,220.		
3rd YL	W4STH	13,066.5		

TOP CW AWARDS

1st OM	W2SAW		552.5	
2nd OM	W9VBZ		531.25	
3rd OM	W8SDD	135.	517.5	652.5
1st YL	W1FTJ		12,220.	
2nd YL	W9JUJ		11,497.5	
3rd YL	VE3AJR		9,386.	

Here are the rest of the scores, in order by district and call:

YL ENTRIES

STATION	PHONE	CW	TOTAL
W1QON	232.5		
W1RLQ	783	552.2	1,325.5

(Continued on next page)

(from preceding page)

W1UKR	5,082.		
W1YYM	2,346.	4,060.	
	(Also worked phone to CW 240.)		6,646.
W2EBW		1,755.	
W2EEO	646		
W2IQP	675		
W2JZX	1,008.		
W2RUF		253.	
K2DYO		918.75	
W3MDJ	5,152.		
W3RXV	3,024.	5.	3,029.
W3UTR	202.5	1,200.	1,402.5
W4BLR		3,437.5	
W4SGD	7,605.		
W4TIE		680.	
W4VJX	5,985.	2,025.	8,010.
W4VTO	2,079.		
W4ZDA	84.	255.	339.
W5SPV	6,440.		
W5WUX	3,723.		
W6GQZ	1,428.		
W6JZA	5,760.		
W6QGX	13,000.		
W6QMO	225.	288.75	513.75
W7OOY	3,480.		
W7TGG	924.		
W8ATB	270.		
W8HWX	7,177.5	37.5	7,215.
W8KLZ		212.5	
W8MBI	1,080.		
W8NNH	1,504.5		
W8SJF		2,352.	
W9AQB	2,262.		
W9LOY	364.5	225.	589.5
W9WZL		1,403.	
W9YBC	945.	30.	975.
KZ5DG	1,350.		
VE1ABT		4,374.	

These YLs submitted logs for cross-checking only, or had a score of less than 100 points: W1OAK, VOS, K2AHG, W3CDQ, NNS, W6EHA, W7HHH, WØZWL.

OM ENTRIES

STATION	PHONE	CW	TOTAL
W1JYH	202.5	146.25	348.75
W1LQ		101.25	
K2BWP	378.		
K2CYS/2		125.	
W2JML	255.		
W2NTY		225.	
W2NOC	280.5	255.	535.5
W2OLT	105.	75.	180.
W2VL	229.5	90.	319.5
W3JSJ		101.25	
W3KUN	88.	198.	286.
W3QLW	280.5	37.5	318.
W3RVG	165.	4.	169.
W3SIJ		255.	
W3STV		123.75	
W4GMY	273.		
W4IA		100.	
W4JUJ	135.	260.	395.
W4KL		280.	
W4NTT	210.	260.	470.
W4OMW	214.5	195.	409.5
W4TFD		125.	
W4TFX		297.5	
W4WRH	247.5		
W4WTY	144.	123.75	267.75
W6MES	112.		
W7SFK	105.		
W8FRD		315.	
W8RO	6.	125.	131.
W8YGR		240.	
W9KA		195.	
W9OMM	450.		
W9RKP		125.	
WØHFP	612.		
WØIUB		130.	

These OMs submitted logs for cross-checking only, or had a score of less than 100 points: W1APA, AW, FPS, MGG, VOV, WTG, YDC, K2ACM, K2BBT, W2BT, CYK, K2DZG, W2GVV, HAK, KYS, TYC, UAP, WUQ, W3CDG, LMM, NRE, RYV, VSS, YA, W4JLK, ZDB, W5EGX/5, W5ZWR/5, W6KJJ/M, W8DAE, EDJ, JWG, JWX, KYY, MBA, NND, ORY, W9CGB, NLJ, VNP, WØGAX, VE1DB, VE2APC, VE4PK.

Of course, there were many comments from the OMs, ranging from "too few YLs" to "fine operating ability." One of interest was, "This year's contest has inspired me to try for WAS/YL or YLCC."

Here and There

Ex-W9FZO, Helen, at West Palm Beach, Fla., now has the call **W4DEV**, for which she uses these "chamber of commerce" phonetics—**D**elightfully **E**nchanting **V**acationland. Helen has been having a fine time on 20 phone since Jan. and gets very nice reports with her Viking I . . . **W2PZA**, Jean, is off for a vacation trip to Italy and France. . . . **W2RUF**, Clara, took a winter motor trip to Mexico and liked it so much she plans to go again next year. . . . **W6NZP**, Evelyn, and her OM are back in the States after many months of traveling. They were guests of W2JZX, Vi, and the Long Island YLRL. . . . Congratulations to **W2SUR**, Esther, on the arrival of her second daughter, born Jan. 13.

CUL ES 33—WØSCF.

Classified Ads

Advertising in this section pertains to amateur radio activities. The publishers of CQ do not guarantee any product or service advertised in this section. Please print or typewrite copy. Remittance in full must accompany copy.

RATES: 25c per word per insertion for commercial business organizations.
5c per word per insertion for idividuals on a non-commercial basis.
CLOSING DATE: June 25, for the August issue.
WRITE: CQ Magazine, 67 West 44th St., N. Y. 36, N.Y. Attention, Jeanne C. Gillespie.

For Sale:

BARGAINS: Stock up with these assortments. 12 rotary switches; 40 ceramic condensers, 20 wire wound resistors; 40 mica condensers; 20 toggle switches; 10 volume controls. Your choice of assortments $1.49; any 3 assortments $3.99. Also giant 20-pound assortment of parts $2.49. Aviation Accessories, Inc., Box 4178, Fort Worth, Texas.

FOR SALE: Meissner EX Signal Shifter $44.50; Lysco "600" 40 w. VFO $89.50; Temco 75GA 125 w. transmitter, complete, fone & CW VFO 10 thru 80 M $225; 40 w. all band RF amp. $19.50. All guaranteed A-1 condition. Want SS equipment, DB preselector. W6SRF, 3519 Andy St., Bellflower, California.

SALE LOCALLY: S40B receiver $65. Used very little. George Linehan, 53 Hano St., Allston, Massachusetts.

SELL: Collins 30-J 600 w. input phone and CW transmitter $275. Boehme automatic keyer and McElroy 3-key perforated tape puncher for Morse code $145. AR-88-D $250. #241 Dumont scope $245. 12,000-ohm 110 volts dc. relays $1.75. Teletype printers. Want BC342, BC312, 75A, 32V, 310 exciter, technical manuals. Will trade. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. (RIchmond 2-0048, 2-0916)

SELL: BC453, Q5er, complete. With power supply. Excellent condition. Best offer. Bob Kotowski, 7850 Cressett Drive, Elmwood Park 35, Illinois.

25 WATTS $19.95. Complete transmitter kit includes tubes, Novice crystal. Details free. Hart Industries, 467 Park, Birmingham, Michigan.

75A2 and SPEAKER, like new, $345; HRO-50T1 jam up, 8 coils, speaker, crystal calib., NBFM $325; Collins 32V2 transmitters, excellent with extra new 4D32 $475; one, like brand new $500. Bob Sturman, W4SOV, 512 Rankin Street, N.E., Atlanta, Georgia.

XYL or HAM STATION GOES! 75A2 deTVI'd Viking I, Viking VFO and Matchbox, crystal mike. All A-1 condition. $495 plus shipping. W6RQM.

SELL: S-53A, new in February. Best offer. Selling because I need money for 4-400A. WØEHF, 2558 Ida Street, Omaha, Nebraska.

MODEL ATD transmitter, 100-watt phone & CW, VFO 1500-9050 kc. complete with power supply. Harry J. Hoffman, 366 Canterbury Road, Bay Village, Ohio.

SURPLUS SPECIALS! RG-8/U cable 100 ft. $5.95; 250 ft. $13.25; 500 ft. $25.00. Coaxial connectors—PL-259 5 for $2.25, SO-239 5 for $2.00. New tubes—807 $1.65, 811A $4.25, 812A $3.50, 813 $10.50, 866A $1.48 304TH $8.75, 872A $3.95, 24G $1.85. Postage extra. Request free bulletin and visit our new store for thousands of bargains. Want to buy or swap Selsyns, Synchros, Servo Motors, Amplidynes, RTA-1B Aircraft Radio. Lectronic Research, 717 Arch Street, Philadelphia 6, Pa.

FOR SALE: RME-MC-55 five band converter $38. Sonar XE10 FM exciter $15. J. McKee, 45-22 39 Place, Long Island City 4, New York.

TRANSMITTER HUNTERS: We have a complete line of transmitter hunting equipment which is the product of many years experience of hunting and finding 10 meter hidden transmitters. Postcard brings information. W5NFC-W5QZZ, 2024 Ford St., Austin, Texas.

FOR SALE: Collins 32V-2 in perfect operating condition, including new Astatic T-3 Crystal Microphone and stand. This transmitter is absolutely clean and spotless. Best offer over $400. Mark 19 with most accessories. Brand new complete with dynamotor. This set was never used. Comes with full instructions and maintenance manual. $20. Volume No. I Riders TV Manual, used once. Offer over $5.00 takes it. Roy T. Merkel, W3HPP/2, 107 Cross St., Little Silver, New Jersey.

SNOOPER: Panoramic-type display unit described in August 1952 issue of CQ. 7 Mc. input for VHF-152 or RME 2-11. Excellent for VHF monitoring. Special price this model $140. Box GF, c/o CQ Magazine.

FOR SALE: 10-meter phone transmitter and receiver plus all the extras. Reasonable. W2DQE, Mt. Vernon, New York. Phone MO 7-7509.

Hamfest Announcements:

17th Annual OARA Convention will be held in Klamath Falls, OREGON, JUNE 26 and 27, 1954. Prizes and entertainment for all. Write: W7GLF.

Hamfest. Calgary, ALBERTA. JULY 3 and 4. Advance registration $4.00. Calgary Stampede starts July 5. Near Banff and Lake Louise. Write: Calgary Amateur Radio Assoc., Box 196.

ARRL Pacific Division Convention, San Jose, CALIFORNIA. JULY 3, 4, and 5. Technical talks; Novice roundup; group meetings on traffic, emergency, TVI, VHF, SSB, RTTY, mobile. Women's program with entertainment, fashion show, bus trip and theater party. Steak barbecue, $2000 prizes, Wouff Hong initiation, transmitter hunts, code contests, pre-registration prize. Registration fee $6.00. Write SCCARA, P.O. Box 6, San Jose, Calif.

Annual WYOMING Hamfest, JULY 24 and 25 in beautiful Big Horn Mountains. Camping or cabins in the area. Contact a Wyoming Ham or write W7QPP for information.

Remember Blossomland Amateur Radio Association's Hamfest Picnic, JULY 25 at Warren Dunes State Park, 15 miles south of St. Joseph, MICHIGAN on U.S. 12. Ten-meter transmitter hunt. Bring gear for swap & shop. Registration fee $1.00 in advance or $1.25 at park. Advance registration through Al Carpenter, WN8ORM, Secy-Treas., St. Joseph, Mich.

Instruction:

PORT ARTHUR COLLEGE, Port Arthur, Texas, provides training in radio, radar & television necessary to pass FCC exams for phone and tel. licenses. 12-14 months. Start any level, low tuition with board & room at cost in dorm. Advanced students on-the-job KPAC (500-watt station) training. Approved for Veterans. Write "Registrar" for catalog and info. New courses start every 5 weeks.

Wanted:

WE NEED used receivers and transmitters of all models. We will give you the highest trade-in allowance or pay you cash. Don't trade or sell until you get our offer. Henry Radio, Butler, Missouri.

WANTED: Millen 90810 transmitter and 90281 power supply. Other 2-meter gear acceptable. No. 552's. James S. Hightshoe, 732 Kinderkamack Rd., River Edge, N. J.

WANTED: BC-464 radio control target plane receivers. Any condition if audio chokes intact. F. Schwartz, W4KFK, 204 6th Ave. No., Nashville 3, Tennessee.

NEED R5A/ARN-7 Bendix Compass receiver and BC788 altimeter. Advise at once price, condition. Also Buyer of all surplus aircraft electronics. Write James S. Spivey Inc., 1406 G St. N.W., Washington 5, D.C.

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 Co., 2502-6 Jefferson Ave., (BR-3181) Tacomo 2, Wash.

WANTED: Your surplus electronic equipment. Cash or trade for new Viking, Hammarlund, National, Gonset, Elmac, Hallicrafters, Telerex, etc. Especially want ART-13, DY-17, DY-12, APN-9, BC342, BC312, BC348, TCS, BC610, BC614, BC939, BC729, ARC-1, ARC-3, BC221, BC611, 32V, 75A, any Collins equipment, 301, AR-88, test equipment, manuals, RTA-1B, Teletype, Keyboard tape, perforators, Boehme equipment. Alltronics, Box 19, Boston 1, Mass. RIchmond 2-0048, 2-0916.

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

WE NEED used receivers. We give highest allowances for S-20R; S-40A, B; NC-57; NC-100; NC-125; SX-24; SX-25; HQ129X; and similar receivers. World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

WANTED: RCA KW Mod. transformer ARK-13 Mod. transformer with S.W., H.V. supply for 1 kw. pair 813's or 2500 V 500 ma. transformer. State price and condition. "Judge" Glanzer, WØLMB, Bridgewater, South Dakota.

WANTED: Magazines—"Radio" and "Radio World"—odd copies or series. (Write to Bob Briody—140 W. 57th Street, N.Y.C.)

WANT: QST—1946, 1947, 1948. CQ 1946 thru 1949. Must be reasonable. C. Storch, 5 Winfield Terrace, Great Neck, L.I.N.Y.

WANTED: Synchros Size 3, will pay $40 each; Size 1, $20 each, subject to inspection. Also need other types Synchros and Amplidynes. Electro, 58 Eastern Avenue, Boston 13, Mass.

For Sale:

FOR SALE: Viking II and VFO $335, W6BLZ, 528 Colima Street, La Jolla, California.

FREE BARGAIN LIST. 10 μfd/600 WV oil capacitors 98c. Sacrificing 15-tons hot electronic items. Mark Electronics, 1888 Randall, Bronx, Sew York.

FOR SALE: Brand new 75A2 Collins receiver. Also brand new RCA tape recorder. Will sell at sacrifice. W9LQI, Ashton, Illinois.

GO MARITIME MOBILE—26' steel-hull cabin cruiser, sleeps four, 120 HP Chrysler Crown marine engine, fully equipped. Complete with Harvey-Wells Bandmaster, receiver, antenna $2500. Sullivan, W2LTE, 3051 Edwin Avenue, Fort Lee, New Jersey.

WE ARE NOW in our new ultra modern building with fresh stocks to serve you. Bargains, with new guarantee: S-72 $69.50; S-40A $75; RME-45 $99; HRO Senior $99; Lysco 600 $99; S-27 $109; SX-43 $129; S-76 $149; SX-71 $169; SX-42 $189; HRO-50 $275; 75A1 $275; HT-17 $32.50; EX Shifter $69; Globe Trotter $59.50; Harvey Wells Sr. $79; Deluxe $99; Viking I $199; Elmac A-54 $99; HT-9 $199; Globe King $295. Free trial. Terms financed by Leo, WØGRQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

GOING MOBILE? Dynamotor, brand new, 6VDC input, 425 VDC 375 Ma. output, $19.50. Cleaning house, free list. W6ODD, Box 776, Camarillo, California.

SALE: S-40B $80. Perfect condition, WN8OBL, RFD 1, Kawkawlin, Michigan.

FOR SALE: VHF152A with "Piggy-Back" on 2 meters $40. Eldico MT-2 transmitter $30. Gonset 2-meter converter $13. All excellent condition. Lysco noise limiter never used, $2.00. W4EZM, 331 N. Krome Ave., Homestead, Florida.

FREE AUTOMOBILE with purchase of Collins 75A-3 and 32V-3. Selectronic Supplies, Inc., 1320 Madison Ave., Toledo, Ohio. Phone FU 3361.

MUST SELL 300-watt composite transmitter. Less than half price for the parts. Write for list. Jim Hairgrove, W5MXK, 516 Morton St., Richmond, Texas.

REAL BARGAINS: New and reconditioned Collins, National, Hallicrafters, Johnson, Elmac, Gonset, Babcock, Morrow, RME, Millen, Lysco, others. Reconditioned S38 $29, S53A $59, S40A $69, S76 $129; NC125 $129, NC183 $199, HRO50T1 $299, HRO60 $399, NC57 $69, NC88 $89, HQ129X $169, SP400X $249, VHF-152A $39, Gonset Triband $29, S40B, SX71, SX42, SX62, HFS, HRO5, HRO7, NC183D, SX28A, Collins 75A1, 75A2, 75A3, 32V1, 32V2, 32V3, Viking II, many others. Shipped on trial. Easy terms. Write for free list. Satisfaction guaranteed. Henry Radio, Butler, Missouri.

TG34A New $22. Tapes $2.75 each. Set of 15 new $35. New 837, 836, GL559, 724B $1.00. Chester Choszik, 6028 Larkins, Detroit 10, Michigan.

REMINGTON MODEL 17 typewriter, Radio Keyboard, serial JC 540310, excellent condition. For sale to highest bidder, FOB San Francisco, California. M. Kuhn, 30 Seventh Avenue. San Francisco 18, Calif.

COLLINS KW-1 and Collins 75A-3 receiver with 3kc and 6kc mechanical filters. All in "factory new" condition. Transmitter $3000, receiver $525. W6AGZ, 6513 Blucher Ave., Van Nuys, California.

VIBRATOR POWER SUPPLY. 6 volt input 300 volt 100 mil. output, filtered. Aluminum cabinet. Perfect condition. $12. W2LFJ, 101 White Road, North Syracuse, New York.

JOHNSON VIKING Ranger, the new completely self-contained exciter-transmitter with built-in VFO is now available in kit form. Write for prices on wired and tested units. This does not replace or supersede the Viking II transmitters. Trade-ins accepted: time payments available. Write W1BFT, Evans Radio, Concord, New Hampshire.

SELL one new PE-103 dynamotor (original carton unopened) $30. W5LCA, Route 1, Donaldsonville, Louisiana.

SELL: HRO-50T1, perfect including 21Mc. coils. First M.O. $230. KW, BC221 VDO, bandswitch exciter, PP 813 final, TVI filter, antenna tuner, cannot pack or ship, $250. W5QLY.

FOR SALE: Leece-Neville Alternator 6 v. 80 amp. Complete with rectifier, meter, voltage regulator, one year old, $135.00 G. M. Golden, W1OZ, 125 York Terrace, Brookline, Mass.

PR31 30-50 Mc. receiver $35.00. Howard Potts, 5562 Cherry St., Portsmouth, Ohio.

75A3 with NFM adapter and matching speaker $495. Johnson Matchbox $42. All in absolutely perfect condition. W8ZBD, 511 N. Warner, Bay City, Michigan.

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Trading Corner:

STAMP COLLECTION WANTED: Have large assortment Ham gear—tubes, meters, transformers, cabinets, filter, relays, variables, other parts for kw rig. Swap for stamps, preferably U.S. or British Colonies. W2RWP, 215 Carlton Rd., Syracuse 4, N.Y.

SWAP: BC221, calibration perfect, cabinet slightly scratched for Hallicrafters S-72 portable. W5QLY.

TRADE OR SELL: 250-watt enclosed rack and panel 10-20-AM phone transmitter. W.E. 28A mobile transmitter complete. Want good Ham receiver. H. K. MacLeod, William St., Seaford, New York.

NC-57 EXCELLENT Condition. Best offer. Trade Retina 1B Xevar F3.5, synch flash, chrome for Novice equipment, table TV. Gursh, 1481 Shakespeare, New York 52, N.Y.

Have nearly new CLASSICAL RECORD COLLECTION 33 rpm and Webster 27 changer to swap for mobile gear, reflex type camera, good TV set, or good tape recorder. Please write Radioman SS Mormacstar, Pier 32, North River, New York City, N.Y.

TRADE OR SELL: Model 12 teletype with synchronous motor, table, cover, stand and polar relay. Tape perforator, distributor, and tape transmitter with three polar relays. All converted, wired, and ready for operation. Excellent condition. W4EBH, 328 West Whitlock Ave., Winchester, Virginia.

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