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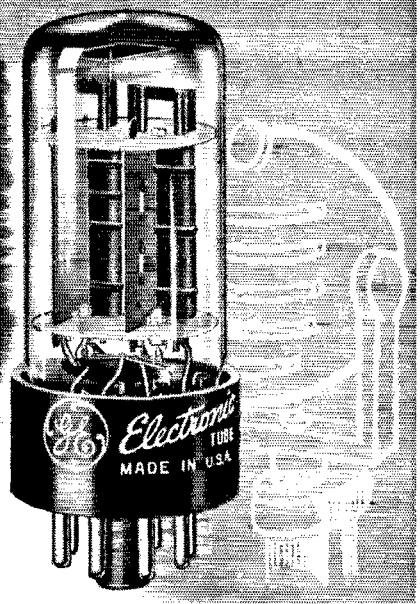

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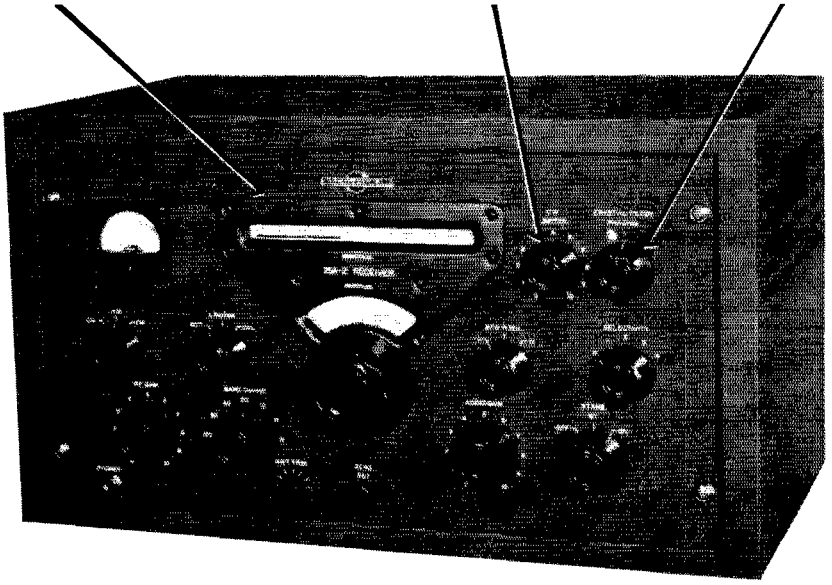

WITH the Collins 75A-2 you'll pick out signals you've never been able to hear before. Two noise limiters, one for cw and one for phone, hold interference to below signal level. Nerve-wearing noise is reduced, and by clipping interference the limiters help you identify and copy otherwise unreadable signals.

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QST

MAY 1952

VOLUME XXXVI • NUMBER 5

PUBLISHED, MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., AT WEST HARTFORD, CONN., U. S. A.; OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION

OFFICES

38 La Salle Road
West Hartford 7, Connecticut

TEL.: 3-6268 TWX: HF 88

Subscription rate in United States and Possessions, $4.00 per year, postpaid; $4.25 in the Dominion of Canada, $5.00 in all other countries. Single copies, 40 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

Entered as second-class matter May 29, 1919, at the post office at Hartford, Connecticut, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1102, Act of October 3, 1917, authorized September 9, 1922. Additional entry at Concord, N. H., authorized February 21, 1929, under the Act of February 28, 1925.

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INDUSTRIAL ARTS INDEX

—CONTENTS—

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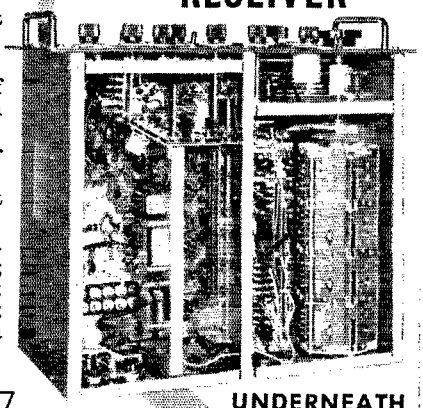

UNDERNEATH VIEW, SX-73

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports are also desired by SCMs for inclusion in *QST*. **All ARRL Field Organization appointments** are now available to League members. These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC, RM, and PAM. *In addition to station and leadership appointments for Members, all amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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* Officials appointed to act temporarily in the absence of a regular official.

THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.

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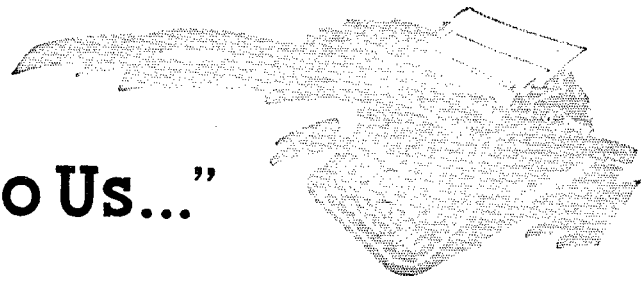


"It Seems to Us..."

21 MC.—A CHEER AND A CAUTION

Yippee!
Hot Dawg!!
Geronimo!!!

These exclamations and a couple of others echoed down the corridor at 38 La Salle Road when FCC via telephone informed Hq. of the proposed opening of the new 21-Mc. band May 1st — the culmination of many months' conference attendance, and government and industry meetings. It is five years to the month since the start of the Atlantic City conference which earmarked 21,000–21,450 kc. for amateur use, and we think those joyful exclamations are not out of order as a climax to five years of playing the role of expectant father pacing the floor in the anteroom.

It's going to be a good band. Despite the unfavorable conditions presently characterizing the higher frequencies, 21 Mc. should provide quite a few openings this summer during a good portion of the day. And, as the sunspot cycle curve starts upward again, the band should improve rapidly and become a world-wide DX channel combining the characteristics of 14 and 28 Mc. and perhaps therefore a more desirable spot than either. Yes, it's going to be a good band.

It's also going to be a bad 'un, in one respect. We mean from the TVI standpoint, in case you hadn't guessed. It's a short, sad story. Several years ago — before TV broadcasting got started but after the U. S. announcement of plans for a 21-Mc. amateur band — television receiver manufacturers were casting about for a standardized intermediate frequency. Despite dire warnings from the American Radio Relay League, the industry chose 21.25–21.9 as the sound-channel i.f. — right smack in the proposed 21-Mc. band. Our protests were to no avail; there was no television broadcasting, only experimental TV receivers — "TVI" was a term yet to be coined, and its prospect then struck no particular fear into the hearts of the manufacturers. There was no 21-Mc. band, and therefore no way to prove our point. So some millions of sets were produced with the 21-Mc. i.f.

Anticipating trouble, in 1948 ARRL worked out with Phil Rand, W1DBM, a series of tests of potential interference from 21-Mc. transmissions; FCC, at our request, provided an experimental license, K2XBH. Exhaustive tests [1] showed conclusively that television receivers using an i.f. of 21.25 Mc. were simply snowed under, even several miles away; those using 21.7 or 21.9 Mc. had very little or no difficulty, even at short distances. The remedy for the millions of existing TV receivers with 21.25-Mc. (or thereabouts) i.f. is, obviously, realigning to 21.9 Mc. (or at least above 21.45 Mc.), and possibly a high-pass filter. Coöperation of RCA and others during the tests showed that this works. Any competent serviceman can do the alignment job.

The bright spots in the picture — and that's no pun — are twofold: One is that in the last couple of years manufacturers, plagued with interference problems from many sources, have pretty well shifted their standard i.f. to the 40-Mc. region, so that current sets shouldn't have any appreciable difficulty. The second, concerning older sets with the 21-Mc. channel, is that for once the position of the amateur station and the TV receiver is reversed — for once the first place to start looking for the gremlin is not the transmitter, but the receiver.

It's our job — yours and mine — to see that this indeed becomes the case. Not in an attitude of "we told you so" — the industry now knows the problem as well as the rest of us; it is, generally, also aware of its responsibility in this particular phase of TVI. We'll be in touch with the companies involved. But it's a long route from the chief engineer or service manager to the individual dealer-serviceman, and although that gap is being gradually closed by a number of steps in process within the industry concerning TVI matters, it all adds up to another task for you in local coöperation. This time your tools are not by-pass condensers and shielding, but public relations and coöperation with local service organizations while *they* make equipment adjustments. And this again underscores the desirability of getting a community interference committee into action as quickly as possible.

[1] Grammer, "TVI from 21 Mc.," *QST*, December, 1948, p. 20.

COMING A.R.R.L. CONVENTIONS

June 14th — New England Division, Springfield, Mass.
June 14th-15th — Rocky Mountain Division, Estes Park, Colo.
June 28th-29th — West Gulf Division, Corpus Christi, Texas.
July 4th-6th — Pacific Division, San Francisco, Calif.

Strays

A current catalog describes a TV antenna that "provides high grain on all channels." W9LQE wonders if he could get one that would discriminate against the prevailing low grade of "corn."

—•••—

DX on 10 'phone can be tricky stuff. W1NOF found a good location for it on a sandy beach. It took W1NER's radio assistance and an AAA tow truck to pull him back into the band.

—•••—

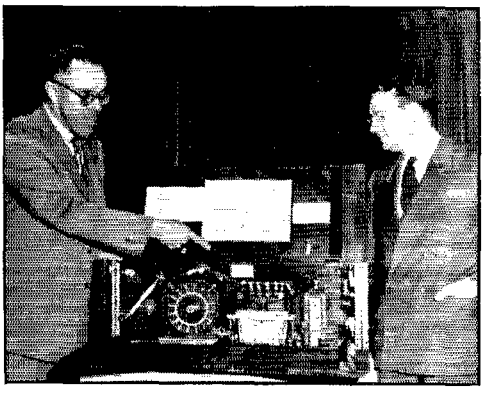
For two days preceding the Memorial Day 500-Mile Auto Race, Indianapolis hams will be on the air to direct incoming mobile hams to any point in the city they may wish to reach. If possible, instructions will also be furnished for reaching hotels or other quarters.

— *Indianapolis Radio Club*

—•••—

Our April "Happenings of the Month" column, reporting on the reëstablishment of RTMA's Amateur Radio Activities Section, erroneously listed the call of Vice-Chairman W. J. Halligan, sr., president of Hallicrafters, as ex-W9WZE. The "ex" was a mistake — Bill has his W9WZE call in active standing.

—•••—



The Henry Ford Museum at Dearborn, Michigan, contains an impressive display — "Words on Wings" — which traces the development of principal systems of communications. A feature of the exhibit is the 1914 spark transmitter of 8FX, one of Detroit's pioneering amateur stations, shown being examined by ARRL Communications Manager F. E. Handy, W1BDI, and Vernon G. Dameron, W8HGA, Director of Education of the Henry Ford Museum and Greenfield Village.

OPENING AT A.R.R.L. HQ.

ARRL has an opening on its Hq. staff for a qualified young amateur to perform junior administrative work, involving things such as membership correspondence on a variety of subjects, some preparation of copy for *QST*, some publicity and promotional work, compilation of statistics, etc., and eventually additional responsibilities such as club contact travel. Essential qualifications: age 20–25; personable; several years active amateur experience; ability to assimilate background data on various aspects of amateur and League affairs; ability to express self well both orally and in correspondence; good typist. Desirable additional qualifications would include: single; club or other local organizational experience; some journalistic background even if only editorship of club newssheet. Starting salary around $3000, substantially higher for outstanding qualifications. If interested and qualified, write to Box A, ARRL, 38 La Salle Road, West Hartford 7, Conn., giving age, education, amateur experience, past and present employment if any, and additional details dealing with aspects mentioned above.

HAMFEST CALENDAR

CALIFORNIA — Sunday, May 25th, at Verdugo Park, Glendale — the third annual picnic of the Los Angeles Council of Radio Clubs, sponsored this year by the San Fernando Valley Radio Club. Special awards, including one for the gals. Also games and prizes for the children. Transmitter hunts on 75, 10 and 2 meters. Bring your own lunch (we furnish the coffee) and come early.

OHIO — Saturday, May 3rd, at Leon's Restaurant, E. Tallmadge Ave. and Brittain Rd., Akron — the 25th anniversary banquet of the Buckeye Short Wave Radio Association. Chicken or steak dinner at $2.50 per plate or $3.00 family style. Make reservations with Bud Ports, W8LBH, 827 Kickapoo Ave., Akron 5.

TEXAS — Friday through Sunday, May 9th–11th, at the Blue Bonnet Hotel in Kerrville — the seventh annual convention of the South Texas Emergency Net. The suppression of TVI will be one of the main topics of discussion, and there will be transmitter hunts and other contests. There will be a banquet on Sunday evening. The registration fee is $2.50. Pre-register with Cedrig Toler, Blue Bonnet Hotel, Kerrville. Hotel or Court reservations may also be arranged.

Quist Quiz

A recently acquired an r.f. ammeter and installed it in the feed line to his antenna. To his chagrin, he finds that maximum output, as indicated by the r.f. ammeter, does not coincide with the plate-tuning dip indicated by the milliammeter in the plate circuit of his 807 output stage. His friend **B** tells him not to worry, that the ammeter is the best indication of proper tuning for maximum output, but **A** feels that something is wrong with his rig, since he always tuned it up on the plate-current dip. Who is right?

(Please turn to page 51 for the answer)

The Truth About the Vertical Antenna

Measured and Calculated Performance Compared with an Ideal Horizontal Antenna

BY B. W. GRIFFITH,* W5CSU

MANY WORDS have been written and spoken on the subject of antennas, yet the utility of the vertical antenna for the lower amateur frequencies still remains a ripe subject for argument. It is not the intent of this article to attempt to settle the controversy, but rather to provide some ammunition. There are presented herein data, both calculated and measured, which have been accumulated during several years of actual operation of a vertical antenna in the amateur bands; it is hoped that the information will be of value to those who are interested in determining the real value of this type of antenna.

The factors which must be considered in studying an amateur antenna system are generally these:

1) Will it produce a usable signal over a large area in competition with QRM?
2) Is its appearance acceptable at your location?
3) Is the cost reasonable?
4) Is it suitable for multiband operation?
5) Is it a good receiving antenna?
6) Will it be disabled mechanically or electrically by wind or ice?
7) What is its effect regarding BCI–TVI?
8) Does it present a personal hazard?
9) Does it present a lightning hazard?
10) Is excessive space required?
11) Is it difficult to construct?
12) Are serious difficulties involved in obtaining correct adjustment?

The application of these questions to the vertical antenna is the purpose of this article. In order that the investigation of the antenna be in sufficient detail to be informative, the present discussion is limited to its performance in the 75-meter band. Some information concerning impedance matching and comments on the performance in other bands are included, but the presentation of actual data on operation in other bands is beyond the scope of this article.

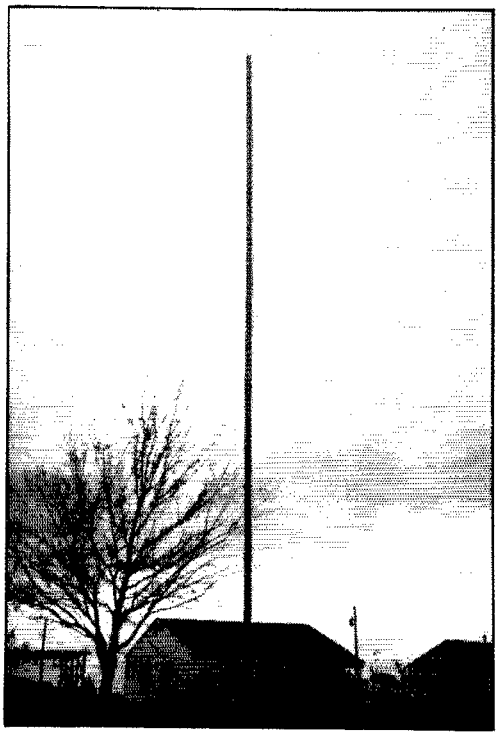
*6502 Wofford Drive, Dallas 17, Texas.

• No one antenna will do all sorts of jobs equally well, and to ask if one system is "better" than another frequently is nothing more than posing a meaningless question. This article compares vertical and horizontal antennas for 75-meter operation and gives facts based on calculations, measurements and observation. Whether the vertical or horizontal best suits your particular objectives is something you will be able to decide after reading it.

Specific Type of Antenna Studied

The antenna considered here is a vertical conductor whose base is at the surface of the earth. The radiator is insulated from the ground at the base, and is series excited. In the particular antenna used at W5CSU, the radiating element consists of 40 feet of 4-inch galvanized iron downspouting, soldered at the joints and guyed at the center and near the top. Guy wires of No. 12 copperweld, insulated at 12-foot intervals and spaced 120°, have successfully held the antenna through five years of violent Texas windstorms and winter ice.

The base of this mast rests on a Pyrex transmission-line insulator, which in turn rests on a sturdily-built copper-covered wooden pedestal about 2 inches above the ground and about 6 inches square.



The vertical antenna at W5CSU, constructed of 4-inch down-spouting, is 40 feet high and is usable on 20, 40 and 80 meters.

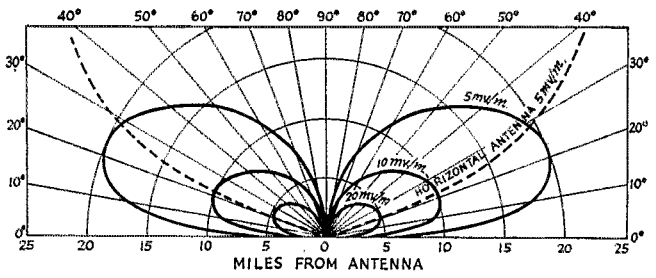


Fig. 1 — Field intensity *vs.* vertical angle for lossless vertical and horizontal antennas over perfectly-conducting earth. Field intensities are calculated for 1-kw. input to Class C final amplifier. The shape of the vertical-plane pattern of the horizontal antenna will depend somewhat on the azimuthal direction, but the variations are not significant at the high angles for which this antenna is most useful at 4 Mc.

The current flowing in the ground near such a vertical antenna will cause considerable power dissipation in the form of heat, unless ground wires are provided to reduce the resistance. These wires must follow the lines of current flow and so must proceed radially from the tower base. A system of wires of this type is known as a "radial ground system.' Broadcast-station antennas are commonly installed with 90 to 120 or more such radials extending ¼ to ⅛ wavelength from the tower. For amateur purposes, however, it is not necessary to go to such lengths to obtain reasonably efficient operation. The antenna at W5CSU is operated with a ground system of 16 radials varying between 25 and 40 feet in length as limited by the dimensions of the lot. It has been operated with only 8 radials with good success. The radials are No. 14 wires buried about two inches below the surface (an axe was found to be the best tool for making the trenches). Either enameled or bare wire may be used. The wires may even be laid on the surface, as their capacitance to ground allows satisfactory operation, but this is not suitable as a permanent installation for obvious reasons. The radial ground wires are soldered to the edge of the copper sheet which covers the antenna pedestal.

Questions now arise: Is a pipe driven into the earth a good ground for a vertical antenna? No, because the earth losses in the absence of the radial wires would be equivalent to a loss resistance in the order of some 50 ohms, and who wants to put a 50-ohm resistor in series with his antenna?

Another question: Does a water pipe make a good ground? Only if it runs radially out from the tower base. Then it will be equivalent to one radial wire.

How good is the system of 16 radials described above? The calculated radiation resistance of this tower at 4 megacycles is 12.0 ohms. Its measured resistance is 19.6 ohms. This is taken to indicate that the ground-system resistance is in the vicinity of 7.6 ohms, so that the radiation efficiency of the antenna at 4 megacycles is about 61 per cent. This means that the radiated signal will be 2 decibels lower than its value with a perfect ground system. It is probable that with the addition of more radial wires the ground resistance could be brought to less than 3 ohms.

The choice of 40 feet for the antenna height was based mainly on the consideration of its being useful in several bands. The height chosen is approximately 0.16 wavelength in the 80-meter band, which is the shortest with which reasonable efficiency can be realized, and 0.58 wavelength in the 20-meter band, which is the longest that can be used without wasting radiation at high vertical angles. This height therefore allows efficient operation in the 80-, 40-, and 20-meter bands. The radiation efficiencies on 40 and 20 are higher than on 80.

Comparison with Horizontal Antenna

The standard to which the vertical is compared is a half-wave horizontal antenna ¼ wavelength above ground. Since a half-wave dipole (some 125 feet long) is a difficult thing to fit into an average city lot, and particularly hard to raise ¼ wavelength (62 feet or so) above ground, the average amateur antenna will not give as good results as the standard selected. The actual antenna is usually a compromise of questionable efficiency. Thus the comparison to follow is more favorable to the horizontal antenna than would be expected in practice.

The field intensity in any given direction from an antenna is proportional to the square root of the applied power. The calculated antenna patterns and coverage discussed are based on the assumption of 1000 watts input to a Class C final amplifier, with appropriate allowance for transmission losses.

Under these conditions, the theoretical vertical-plane patterns of the vertical and horizontal antennas over earth of perfect conductivity are shown in Fig. 1. The values plotted are the field intensity in millivolts per meter at a distance of 1 mile. These values assume 100 per cent efficiency (no losses) in both antennas.

Fig. 1 is not directly usable because the actual antennas are not 100 per cent efficient as radiators and the earth is far from a perfect conductor. However, the theoretical values form a starting point for calculating the actual behavior.

Fig. 1 shows that most of the radiation from the horizontal antenna goes out at very high angles. Only a small portion of the power is dissipated in the earth. With the vertical antenna the preponderance of radiation is at quite low angles. This low-angle radiation, within the first few miles from the antenna, is intimately tied in with and is a part of the surface wave or "ground" wave. As this wave travels over the imperfectly-conducting earth, energy is drained away and dissipated as heat in the earth. Although this

attenuates the surface wave and the radiation at very low angles, the earth cannot remove much energy from that part of the signal which is already at a great height above ground. The vertical pattern at considerable distances from the antenna thus takes on a shape similar to that shown in Fig. 2. Here it may be seen that the maximum effective radiation from the vertical antenna occurs at an angle considerably above the horizon.

The rate at which the surface wave and low-angle radiation diminishes is determined by the characteristics of the soil over which the signal is traveling. The computations involved in the determination of Fig. 2 are not presented here but the method of calculating these factors will be found in an article by K. A. Norton.[1] The values shown were computed for soil conditions existing in the vicinity of Dallas, Texas, and the surface-wave intensity was checked by the field-intensity measurements presented in Fig. 4 and discussed later.

Soil conductivity varies greatly in different parts of the country. A map in the FCC *Standards of Good Engineering Practice for Broadcast Stations* shows the soil conductivity over the United States, and similar maps have also been prepared for Canada and Mexico. Only the soil within about 15 miles of the transmitter affects appreciably the vertical-pattern characteristics of the vertical antenna.

Wet soil is not necessarily indicative of high conductivity. The presence of water, with its high dielectric constant, materially reduces the depth to which currents penetrate in the earth, thereby reducing the cross-sectional area through which current flows. Many dry soils exhibit higher r.f. conductivity than moist soils. Salt water marshes, however, show extremely high conductivity.

Fig. 2 assumes 1000 watts input to the final amplifier, with 61 per cent efficiency for the vertical antenna and 95 per cent efficiency for the horizontal antenna. The contours of equal signal show how the signal shapes up as it departs from the antenna, and we can guess from this its probable final form at great distances.

Take first the horizontal antenna. Its maximum signal is radiated directly overhead, diminishing at lower angles. In the daytime, the signal fired directly up is returned, let us say, by the F_2 layer,[2] arriving back at the local area of the transmitter with a field intensity of about 500 microvolts per meter after having made a 300-mile trip and having passed through the D, E and F_1 layers. Owing to the vertical incidence on these layers, the absorption is small and the intensity therefore almost follows the inverse-distance law. This accounts for the practically constant field intensity observed for a number of miles around the transmitter. Beyond about 30 miles, the signal decreases rapidly because of the increasing distance traveled to the ionosphere and back and because the received radiation is coming from progressively lower angles in the antenna's vertical pattern. A particularly rapid reduction of signal strength with distance is apparent in the daytime because of the rapid increase in signal absorption by the lower ionospheric layers as the angle of incidence deviates from the vertical. At night this absorption disappears, allowing the signal to be transmitted to greater distances. Occasionally at night, especially during sunspot minima, the ionosphere will not reflect 4-Mc. signals at near vertical incidence, thus making it impossible to produce a readable signal at a distance nearer than perhaps 150 miles. This is the "skip-distance" effect which is so disastrous to emergency communications during the night hours.

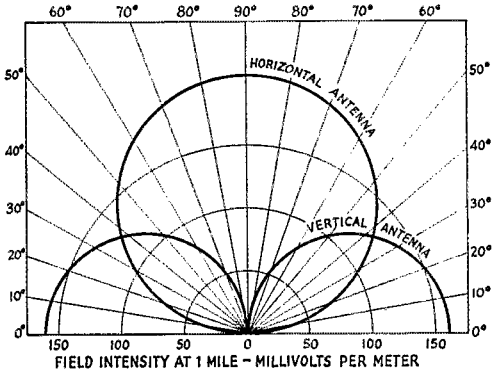


Fig. 2 — **Calculated vertical-radiation contours of the W5CSU antenna, described in the text, in comparison with a half-wave horizontal antenna one-quarter wave high; one-kilowatt input to final amplifier. The curves for the vertical antenna are based on field strengths measured along the ground.**

The expected nighttime signal of the horizontal antenna is shown in Fig. 3, determined by computing the root-sum-square values of signals arriving by one-hop, two-hop, three-hop, etc., transmission, assuming a loss of 3 db. due to absorption and scattering at each ground reflection. This approximates rather well the actual condition of nighttime transmission with the F_2 layer reflecting the signals from a height of about 220 miles.

The propagation from the vertical antenna behaves in a rather different manner. Since there is practically no radiation at angles near the vertical, the coverage within about 30 miles of the station is purely by means of the surface wave. This produces a signal of constant intensity day and night. At about 30 miles the reflected signal from the ionosphere, when applicable, is approximately equal to the ground wave, and exceeds it at greater distances. This is because the attenuation of the ground wave is much greater than that of the nighttime skywave. As

[1] Norton, "The Calculation of Ground-Wave Field Intensity Over a Finitely Conducting Spherical Earth," *Proc. I.R.E.*, December, 1941.

[2] The actual reflection may occur at the E, F_1 or F_2 layer, depending on the ionization, which in turn depends on latitude and the sunspot cycle.

the distance increases, the skywave signal remains fairly constant for some hundreds of miles, since the received signal is coming from progressively lower and therefore stronger parts of the antenna's vertical pattern. Finally, because of the great distance and the shape of the vertical pattern, the signal drops off to unusable values. The calculated performance of the vertical antenna is likewise plotted in Fig. 3.

It is interesting to note that in the absence of the skywave, as in daytime or at times when high-angle radiation is not returned from the ionosphere, the ground wave is thoroughly usable out to a distance of about 100 miles, producing a signal of some 10 microvolts per meter at that distance. This means that the vertical antenna can be relied upon to maintain emergency communications within a 100-mile radius during those late night periods when the horizontal antenna is tragically useless.

An occasional but unreliable transmission of daytime skywave signals over distances of some 1000 miles has been observed from the vertical antenna. This effect is possibly due to reflection from the *E* layer, as the relatively intense radiation at low angles may make this mode of transmission possible.

Fig. 3 shows that for the normal nighttime conditions the signal from the horizontal antenna will exceed that from the vertical out to a distance of some 850 miles, with the exception of the vertical antenna's ground-wave coverage. Beyond 850 miles the vertical antenna's signal is superior. This presentation may be somewhat unfair to the vertical, since it is being compared with a horizontal of 95 per cent efficiency, 62 feet in the air, and in the clear. It is doubtful that many amateur antennas meet these specifications. The signal from an average amateur horizontal antenna would probably be less than shown, and thus would drop below that of the vertical at a considerably shorter distance. The signal for the vertical has been computed from actual field-intensity measurements of the W5CSU antenna, and therefore has been reduced by the actual losses to which the antenna is subject in an average city lot. These measurements, which determine the character of the surface wave, were made along a straight line extending out from the antenna a distance of some 22 miles and are shown in Fig. 4. The instrument used was an RCA type TMV-75-B field-intensity meter. Comparison with the theoretical attenuation shows that about 400 watts is actually radiated. This is in good agreement with the efficiency figures previously given, which were based on impedance measurements of the antenna.

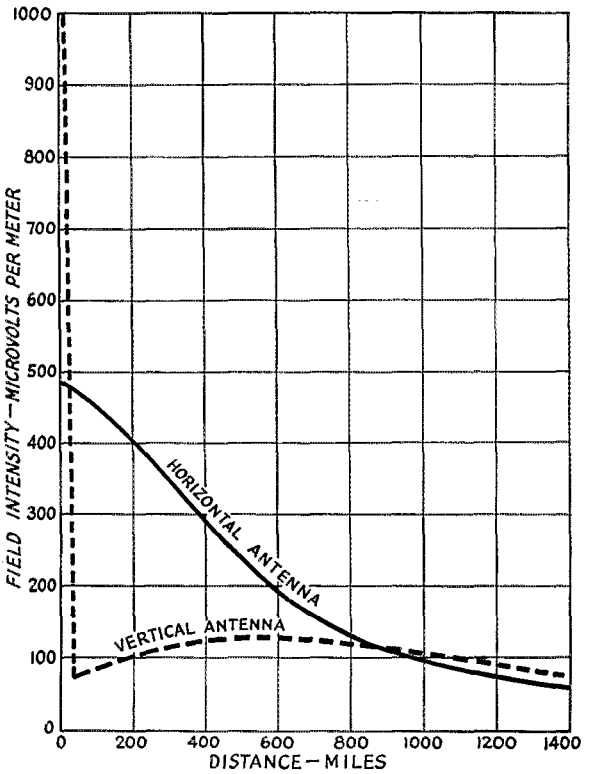


Fig. 3 — Computed field intensities of W5CSU vertical antenna and of ideal horizontal antenna, assuming F_2-layer reflection (nighttime) and 3 db. loss at each earth reflection.

Measurements of the W5CSU signal at Tulsa, Oklahoma, a distance of 236 miles, on two successive nights in June, 1950, showed the median value of the signal to be from 2 to 3 times the computed value for this distance. This probably indicates that most of the signal was arriving via sporadic-*E* reflection, which is common during summer months. As this low layer would propagate signals at this distance with an angle of departure of some 25 degrees, it is seen that the vertical antenna would be favored in this type of transmission.

Impedance Matching

Measurements with a General Radio type 916A r.f. bridge show the impedance at the base of the W5CSU antenna to be as follows:

Frequency in Kc.	*Resistance in Ohms*	*Reactance in Ohms*
1900	9.8	− 460
3500	15.2	− 178
3990	19.6	− 130
7200	113	+ 153
14,400	120	− 64

The recommended connections for matching this antenna to a 52-ohm coaxial line are given in Fig. 5. For operation in the 75-, 40-, and 20-meter bands, the coil *L* should be 8 turns of ¼-inch copper tubing, 6 inches in diameter and 6 inches long, with the taps placed approximately 3 turns from each end. The capacitor *C* for 40-meter

operation should be 200 or 250 $\mu\mu$fd., and should be able to carry 5 amp. r.f. for operation at 1 kilowatt. It is possible, with only a slight compromise in match, to find a single tap position that provides satisfactory coupling for both the 75- and 20-meter bands, thus making it unnecessary to visit the base of the tower in changing frequency between these two bands.

For the lower-frequency part of the 80-meter band the coil should be increased to 9 turns, with the other adjustments unaffected. Provision for either using or not using one or two turns of the coil will, of course, provide the greatest range of frequencies in the 75–80-meter band.

For operation in the 160-meter band the coil should consist of approximately 21 turns of wire, 6 inches in diameter and 7 inches long, or some other inductor having an inductance of about 40 microhenrys, with the center conductor of the coaxial line tapped only one or two turns from the ground end. The coil will have to carry some 8 amperes for 1-kw. operation, so should be wound of No. 8 wire or equivalent.

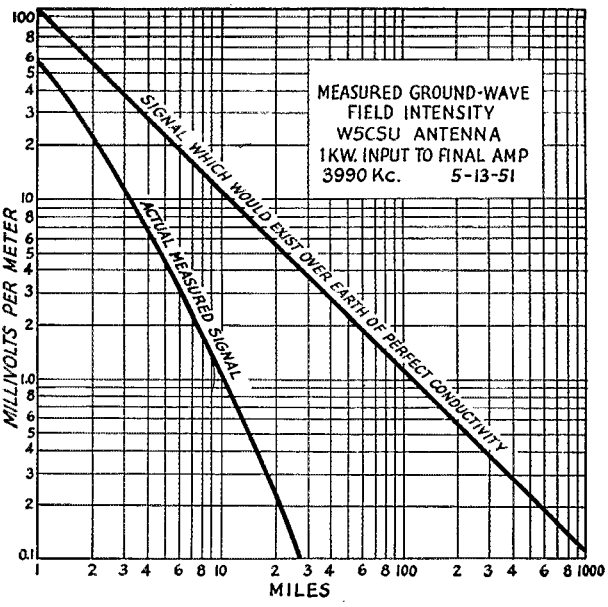


Fig. 4 — Measured ground-wave field intensity of W5CSU antenna with one-kilowatt input to final amplifier, 3990 kc.

Operation in the 40-meter band may be accomplished with the 160-meter coil connected, using the capacitor as before; 20-meter operation is, however, not advisable.

It must be pointed out that the impedance and matching information given here apply only to a cylindrical tower 4 inches in diameter and installed as was previously described. Towers of other dimensions would not be expected to have the same impedance characteristics.

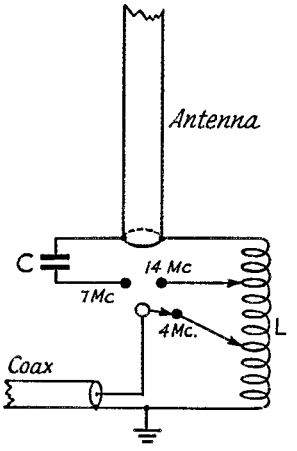


Fig. 5

Method of matching to 52-ohm coax. Circuit constants are discussed in the text.

Utility of the Vertical Antenna

From the standpoint of appearance, the vertical antenna is difficult to surpass. With the transmission line and ground system buried, the complete absence of overhead leads except for the mast and its guy wires provides an exceptionally neat installation. These same characteristics also make this antenna virtually proof against weather hazards. The antenna at W5CSU has withstood high winds and heavy icing without damage and with only negligible change in operating impedance, and previous operation in Minnesota has shown that deep snow does not appreciably affect its operating characteristics.

The question of interference in broadcast and television receivers is always brought up when the vertical antenna is mentioned. The following observations pertain to these effects:

Since the "hot" end of the antenna is high in the air instead of extending near your neighbors' houses, the most intense part of the electric field is usually farther away than with the horizontal antenna. A few cases of blanketing of broadcast receivers have been encountered within 100 yards of the antenna. Since this is principally caused by currents induced in power wires, etc., all these cases have been cured by by-passing the a.c. line to the chassis of the receiver, and occasionally by including a small by-pass condenser from the audio amplifier grid to the chassis. Some interference is caused over a fairly wide area by image response in receivers, due to the strong ground wave, but these images are sharply tunable and usually provide no cause for complaint. In general, BCI has been found no worse than with the horizontal antenna, and is of a type which seems easier to cure.

With regard to television interference, let us first consider the radiation characteristics of a horizontal antenna at the wavelength of harmonics lying in the television bands. The wire is

Coupling network at the base of the antenna. The feed line is coax buried in the ground.

several wavelengths long, and therefore provides considerable gain in certain directions, principally near the direction of the wire; moreover, it radiates a signal which is largely horizontally-polarized. It is easy to see why a near-by television receiving antenna can readily pick up interference of harmonic nature from such a source. The vertical antenna, on the other hand, will concentrate the radiated harmonics into a relatively narrow cone at very high angles; these are moreover vertically-polarized and therefore are at right angles to the receiving antenna polarization. Any high-order harmonic content of the signal delivered to the vertical antenna is thus directed into space at very high angles where it can do no damage.

Out of 14 cases of TVI encountered by this station, not one single case was attributable to harmonic radiation, although the transmitter contains no special filters or other harmonic-suppressive measures other than having been built in a standard metal cabinet and having reasonably selective tank circuits. As the transmission line is buried underground, there is substantially no radiation from this source. All TVI cases were caused by carrier-frequency voltage picked up by the TV lead-in, and each cured by the installation (by the receiver's manufacturer) of a high-pass filter.

Any antenna of appreciable height presents a target for lightning. This vertical antenna, with its base resting near an excellent ground system and being connected to the ground through heavy conductors in the tuning equipment at its base, probably gives less danger from lightning or accidental contact with power wires than other types of antennas. Its presence probably gives some measure of protection to the house by its service as a "lightning rod."

Although there is no d.c. shock hazard from a properly-fed vertical antenna, the operating r.f. potential (which may be several hundred volts on some bands) does cause danger of minor burns. The antenna should therefore be protected in some way from accidental contact with persons.

Among the most important virtues of the vertical antenna is its ability to provide satisfactory operation over several bands. This antenna has been found to operate well in the 20-, 40-, and 80-meter bands, and even in the 160-meter band it has high efficiency compared with that of the short and poorly grounded verticals used in 75-meter mobile operation. However, it is not suitable for operation in the 10-meter band in the form described in this article. The use of this type antenna as a support for another antenna is not in general a recommended practice.

No difficulties have been experienced in using the vertical antenna for receiving. It appears to be somewhat less subject to the disturbances propagated along power lines than is the horizontal antenna, but somewhat more subject to ignition noise in the 20-meter band than is the horizontal. In the 75-meter band the discrimination it provides against the strong signals arriving at high vertical angles from near-by stations relieves in considerable part the problem of intense QRM, making it thereby much less difficult to copy stations at the greater distances.

Conclusions

The results of this study indicate that the vertical antenna is a very practical antenna system for an amateur station. It can be erected in a relatively small space, and can be used successfully on four bands. It is, however, difficult to install, principally because of the requirement of the radial ground system. After being installed, it requires little maintenance because it can be made extremely weatherproof. With the exception of the ground-wave coverage (35 miles or so), the 75-meter nighttime signal within 500 miles is somewhat inferior to that from a good horizontal antenna. Beyond about 800 miles it is definitely superior. Experience has shown that the vertical usually produces an excellent daytime signal within a radius of 300 miles or so, probably by means of *E*-layer reflection. This daytime signal is somewhat better than that from a horizontal antenna.

Strays

While hanging around a railroad station in Tunica, Miss., W5CFL shot out a short Continental code CQ on the idle Morse wire to see what could be raised. Back came ex-W4FDT of the *Commercial Appeal*'s press room in Memphis. The short QSO led to an exchange of QSLs. For "antenna," W5CFL's card read "*longwire.*"

— *W4RJD*

A 50-Mc. Transmitter-Receiver for Civil Defense Use

A Versatile Station Designed Specifically for C.D. Needs

BY CALVIN F. HADLOCK,* W1CTW

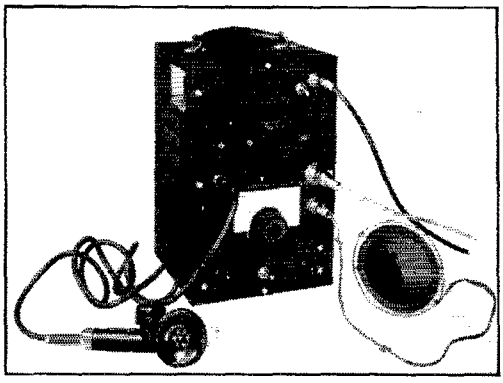
THE equipment to be described was designed as a sample unit to be duplicated by the group of hams comprising the "Amateur Emergency Net for Civil Defense" of Arlington, Mass. At the first meeting of this group the question arose as to whether the primary interest was to get a bunch of stations on the air as an amateur activity or whether the net would be a serious project to provide the best possible service to the community in case of a real emergency such as an enemy attack. The latter aim indicated use of the 6-meter band as giving better coverage than 2, with less QRM than 10 meters. Since only one ham in the town was already on 6, we had to start from scratch and build all equipment.

This is not as much of a hardship as it seems at first. Home stations are of practically no value except to stimulate activity during drills. They are located at the scene of an emergency only by rare coincidence and most of them are out of commission instantly when the commercial power fails. What we needed were interchangeable mobile and portable units designed especially for the job at hand. The local gang turned to with enthusiasm and seem to have gotten as much fun out of building the equipment as they have in operating it. The procedure followed was similar to that of a New Jersey group whose "Civil Defense Club Project" was described in *QST* for October, 1951. Parts lists were made, material collected, and then one night a week was set aside as "construction night" at the home of one of the members, where the boys gathered around the ping-pong table and went to work duplicating the equipment to be described.

It was decided that we would not ask the town to pay for parts for the individual equipments. The town supplied the spot-frequency crystals for 53.4 Mc. and equipment for the control station, but each unit is paid for and belongs to the individual who builds it. For this reason, the cost of parts has been kept to a minimum consistent with good performance.

One advantage of using 50 Mc. is that, in the majority of cars equipped with broadcast receivers, no special antenna need be installed. The broadcast whip on most cars opens up to 55 inches, just about a quarter wavelength long at 6 meters. The rig sits on the front seat and the car antenna is removed from the broadcast set and plugged into a coax extension on the unit.

Current drain is kept down to ten amperes or less and the unit can be taken out of one car and installed in another having a suitable antenna in a few minutes. The vibrator pack, a National 650S, is set on the floor and clipped to the back of the cigarette lighter or ignition system. The unit may be taken into the house, connected to the home antenna, plugged into a National 697 power pack and used as a home-station rig. It contains no relays or audio transformers. Both receiver and transmitter draw about 85 ma. at 250 volts, but will work well with only 150 volts, giving excellent coverage of Arlington with the lower power.



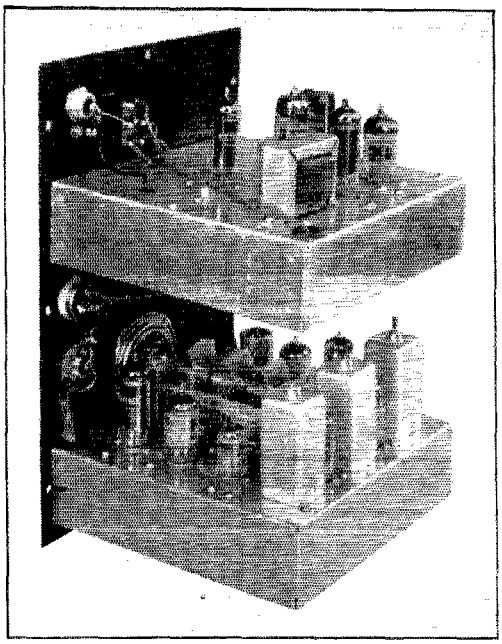
The 50-Mc. transmitter-receiver described by W1CTW. In the upper right corner are the send-receive switch and antenna connections. The three screwdriver adjustments are the crystal oscillator, doubler and final plate tuning. At the right center are the power and 'speaker connections, with the microphone jack at the left. Antenna trimmer and audio gain controls are the two bottom knobs, just below the main tuning dial, with the squelch on-off switch between.

Both the transmitter and receiver are built on 7 by 7 by 2-inch chassis, a standard size available at most radio stores. The cabinet is a 12 by 7 by 7¾-inch standard size, if the 'speaker is not included. A slightly larger cabinet is available if the 'speaker is to be inclosed in the cabinet. This latter practice will require special mounting of the 'speaker to prevent microphonic howling. Connectors are standardized so any unit may be plugged into any power supply.

The Transmitter Portion

The original transmitter was built by Henry Cross, W1OOP, who should receive full credit for its design. Although Henry is not an Arlington ham, he has been of invaluable assistance. He is the type of fellow who, after listening in on a

* c/o The National Company, Malden, Mass.



Interior view of the Arlington civil defense station. In the top deck may be seen, *left to right*, the 6AQ5 final amplifier, the 12AT7 crystal oscillator and doubler, the 6AQ5 modulator, and the 12AT7 speech amplifier and clipper. In the receiver section (lower unit) the tubes at the left are the audio, squelch and second detector. The two i.f. amplifiers are at the back of the chassis, and just visible over the tuning condenser are the r.f. amplifier (shielded) and the mixer-oscillator and voltage-regulator tubes.

discussion of a proposed unit, comes around a few days later and says, "Remember that thing you were talking about the other day? Well, here it is." This transmitter combines exceptional performance with minimum cost. It uses two tube types; namely, two 12AT7s and two 6AQ5s.

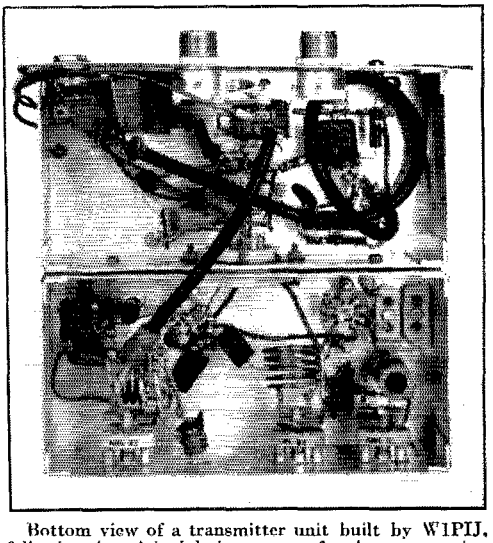
The dual-triode crystal oscillator and doubler follow familiar lines. Regeneration may be used in the oscillator circuit to make ordinary 8-Mc. crystals oscillate on their third overtone, but this was omitted in our units as we are using crystals ground for overtone use. The crystals are provided on a frequency of 26.7 Mc. ± 0.5 kc. by the Valpey Crystal Corporation. This type of crystal is preferred for accurate spot-frequency calibration, as the third-mode frequencies of 8-Mc. crystals may differ somewhat even though the fundamental frequencies are identical.

The final amplifier uses a single Type 6AQ5 tube, neutralized by means of a slug-tuned coil in series with a 0.001-μfd. mica capacitor from screen to ground. Neutralization is checked in the usual manner, adjusting the inductance of the coil for minimum reaction on the grid voltage as the plate tank is tuned through resonance, without plate and screen voltage on the 6AQ5. Practically complete neutralization is obtained, and if it is done at 52 Mc., the amplifier is stable over the entire 6-meter band. A 100,000-ohm resistor in series with a 1-ma. meter is used as a 100-volt meter to indicate grid voltage. The same meter is used to adjust the crystal-oscillator tuning. An antiquated S-meter used by the writer peaks at S7, about 35 volts.

A Type 12AT7 is used for the speech amplifier. The first half is a microphone coupling tube, eliminating the need for a microphone transformer. The second half is a voltage amplifier and clipper. Its action is to produce "square waves," for more effective modulation for the total power drain. This stage is adjusted to clip the positive and negative halves of the sine wave equally. A 33,000-ohm resistor has been added between the plate of this triode and ground. Essentially fixed cathode bias is provided by tapping the cathode resistor of the modulator tube. These two features provide clipping of the sine-wave input at the desired levels. The coupling capacitor between the first-triode plate and second-triode grid is only 0.001 μfd. In conjunction with the 150,000-ohm grid resistor this value produces intentional cutting of the low audio frequencies. As explained by W1OOP,[1] lows should be cut *before* clipping action takes place while the response to lows *after* clipping should be good.

The modulator tube is a Type 6AQ5, with the Heising system of modulation familiar to many old-timers. It fell into disfavor as, unless power was wasted in a dropping resistor, only about 60 to 65 per cent modulation could be obtained with triode tube types. If we look at the load line of a pentode tube, however, it will be noted that it is considerably longer than that of a triode and a modulation percentage of about 87 per cent is possible. The use of the clipper section more than makes up for lack of 100 per cent modulation.

[1] Cross, *QST*, July, 1951, page 61.



Bottom view of a transmitter unit built by W1PIJ, following the original design, except for the construction of the r.f. and audio portions on separate chassis. The r.f. section for 50 Mc. (lower portion) can be removed and a unit for any other band substituted readily. This transmitter also includes a coax relay for antenna switching.

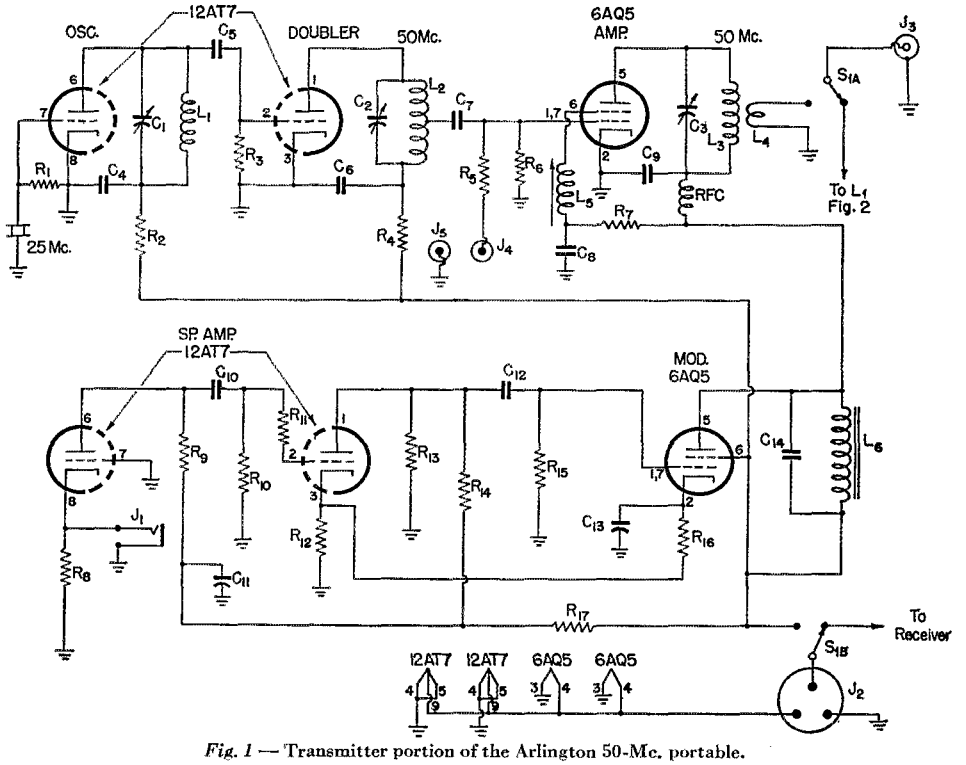


Fig. 1 — Transmitter portion of the Arlington 50-Mc. portable.

C_1, C_2, C_3 — 25-$\mu\mu$fd. trimmer (National PSR-25).
C_4, C_6, C_8, C_9, C_{10} — 0.001-μfd. mica.
C_5 — 50-$\mu\mu$fd. mica.
C_7 — 100-$\mu\mu$fd. mica.
C_{11} — 10-μfd. 400-volt electrolytic.
C_{12}, C_{14} — 0.005-μfd. mica.
C_{13} — 10-μfd. 25-volt electrolytic.
R_1 — 12,000 ohms, ½ watt.
R_2, R_4 — 1000 ohms, ½ watt.
R_3, R_6 — 47,000 ohms, ½ watt.
R_5 — 100,000 ohms, ½ watt.
R_7 — 10,000 ohms, 1 watt.
R_8 — 3300 ohms, ½ watt.
R_9 — 27,000 ohms, 1 watt.
R_{10}, R_{11} — 150,000 ohms, ½ watt.
R_{12} — 33 ohms, ½ watt.
R_{13} — 33,000 ohms, ½ watt.
R_{14} — 68,000 ohms, 2 watts.
R_{15} — 220,000 ohms, ½ watt.
R_{16} — 330 ohms, 1 watt.
R_{17} — 2200 ohms, 1 watt.
L_1 — 11 turns No. 18 enam. on 7/16-inch form (National XR-50 with no slug).
L_2 — 4½ turns No. 14, spaced diam. of wire, ⅞-inch diam., tapped at 2¼ turns.
L_3 — 4 turns similar to L_2, no tap.
L_4 — 2 turns pushback inserted between turns at cold end of L_3.
L_5 — 4 to 7 turns, as needed, No. 22 enam. on ¼-inch slug-tuned form.
L_6 — 100-ma. filter choke.
J_1 — Single-circuit jack.
J_2 — Male power fitting, 3 or more pins.
J_3 — Coaxial antenna fitting, female.
J_4, J_5 — Pin jack.
RFC_1 — 30 to 35 turns No. 28 enam., close wound on high-value 2-watt resistor.

Receiver Details

The writer will take the blame for any troubles that may be encountered with the receiver. This unit, also built on a 7 by 7 by 2-inch chassis, uses seven tubes, not including the 0B2 regulator. It is run from the same supply as the transmitter. A d.p.d.t. toggle switch changes both B + and antenna from one unit to the other, eliminating relays. Considerable argument is possible on various features of the receiver, especially the tube types, but an attempt will be made to justify those used.

For the sake of simplicity, a single-conversion superheterodyne circuit was used. Double conversion would give a better image ratio and sharper selectivity but would be more expensive and harder to build. The intermediate frequency chosen, 1.73 Mc., is a good compromise between bandwidth and image ratio. The image ratio is better than 35 db. A signal to produce an image on the Arlington frequency, 53.4 Mc., would be on 49.94 Mc., outside of the band. Furthermore, no signal in the c.d. assignment on the low end of the band can produce an image in the c.d. assignment at the high end. This is important in our case, as the low segment will be used for inter-town and inter-section communication in the Boston area. The bandwidth of the i.f. amplifier, about 18 kc. at 6-db. points, is quite suitable for spot-frequency use. It is not too critical as to tuning and some variation in transmitter frequencies can be tolerated. It is also desirable when the receiver is set up on the spot frequency and then squelched until one of the local hams comes on looking for a QSO. In the Boston area,

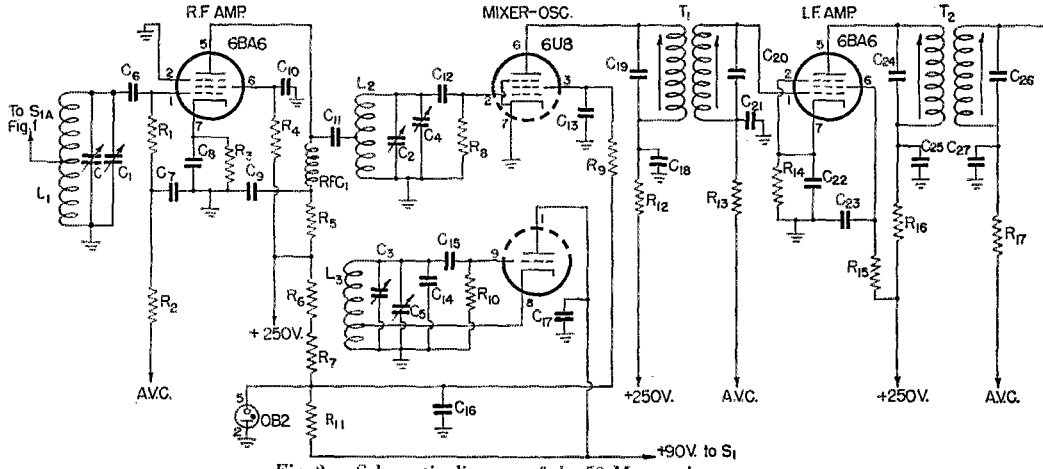


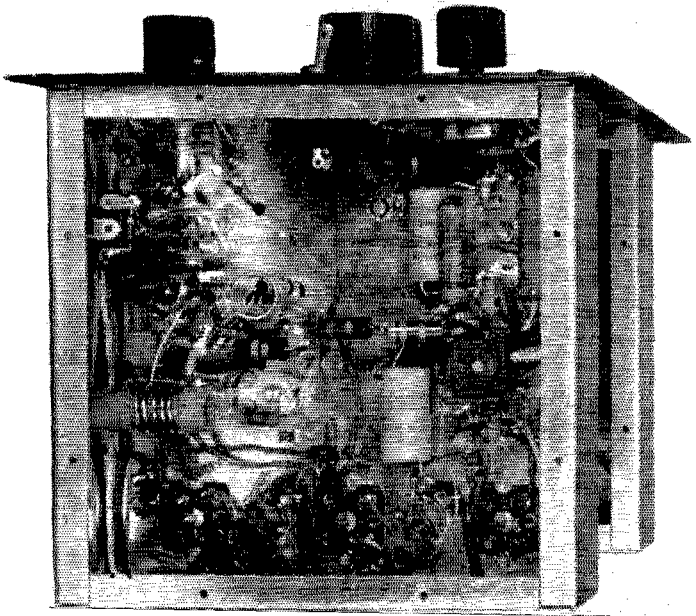
Fig. 2 — Schematic diagram of the 50-Mc. receiver.

C — 15-$\mu\mu$fd. shaft-type trimmer (National PSL-15).
C_1, C_2, C_3 — 3-section f.m. receiver gang condenser, 1 stator and 2 rotor plates per section (1 required).
C_4, C_5 — 1.5 to 6-$\mu\mu$fd. ceramic trimmer.
C_6 — 100-$\mu\mu$fd. ceramic.
C_7, C_9, C_{10}, C_{13}, C_{17}, C_{18}, C_{21}, C_{23}, C_{25}, C_{27}, C_{28}, C_{31} — 0.005-μfd. ceramic.
C_8, C_{16}, C_{22}, C_{29}, C_{33}, C_{35}, C_{36}, C_{39}, C_{41} — 0.01-μfd. ceramic.
C_{11}, C_{12}, C_{15} — 50-$\mu\mu$fd. ceramic.
C_{14} — 5-$\mu\mu$fd., negative 750 coefficient.
C_{19}, C_{20}, C_{24}, C_{26}, C_{30}, C_{32} — 100-$\mu\mu$fd. silver mica (part of i.f. transformer if National type IFS used).
C_{34} — 500-$\mu\mu$fd. mica.
C_{37} — 0.1-μfd. paper tubular.
C_{38}, C_{42} — 25-μfd. 50-volt electrolytic.
C_{40} — 0.0025-μfd. mica.
R_1, R_2, R_{13}, R_{17}, R_{30}, R_{32} — 470,000 ohms, ½ watt.
R_3, R_{18} — 68 ohms, ½ watt.
R_4 — 47,000 ohms, ½ watt.
R_5, R_{12}, R_{16}, R_{20} — 270 ohms, ½ watt.
R_6 — 5600 ohms, 2 watts.
R_7 — 3300 ohms, 2 watts.
R_8, R_{23}, R_{24} — 270,000 ohms, ½ watt.
R_9, R_{21}, R_{22}, R_{26}, R_{27} — 1 megohm, ½ watt.
R_{10} — 22,000 ohms, ½ watt.
R_{11} — 10,000 ohms, 2 watts.

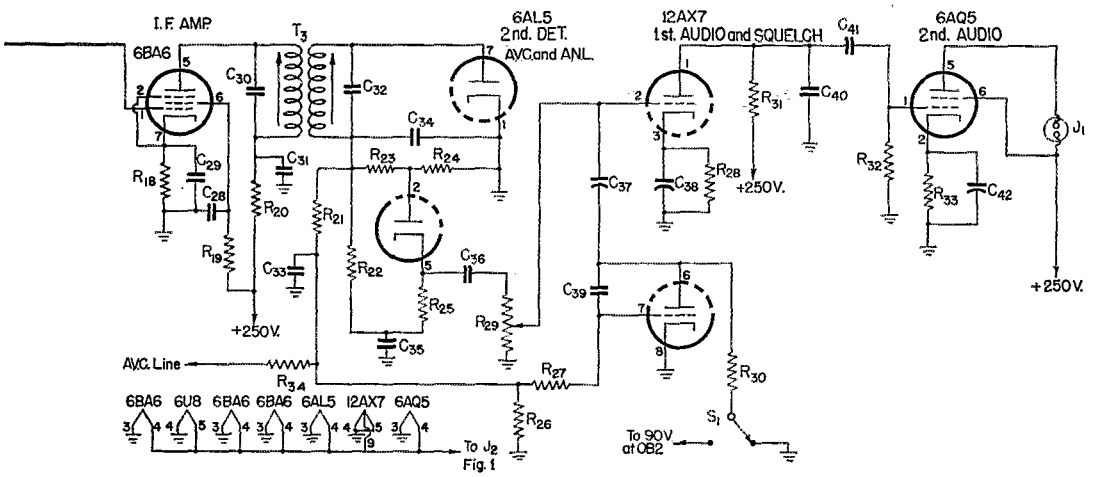
six-meter assignments are 30 kc. apart. At 30 kc. off the center frequency the i.f. attenuation is over 50 db.

Let's start at the loudspeaker and work back toward the antenna. A Type 6AQ5 is used in preference to a 6AK6 as only 180 volts can be used on the 6AK6 without exceeding its rated plate dissipation. Also, a little extra push is desirable when using a cheap, small loudspeaker. One half of a 12AX7 double triode is used for the first audio amplifier, with the other triode as a squelch tube to be described later. A Type 6AL5 combines second detector, a.v.c., and automatic noise limiter, all conventional circuits. The two i.f. amplifiers are 6BA6s, to give good a.v.c. action and high gain.

The mixer-oscillator is one of the new Type 6U8 converter tubes recently developed for television use. A 6X8 was tried, but it has the disadvantage of a common cathode for both sections. The 6U8 has separate cathodes, allowing use of the familiar Hartley oscillator circuit, with the oscillator cathode tapped on the coil. A pentode mixer was considered desirable from the stand-



Bottom view of the receiver portion of the 50-Mc. portable station. The coil on the form at the left is the oscillator. I.f. stages are across the bottom, and the audio portion at the right.



R_{14} — 470 ohms, ½ watt.
R_{15}, R_{19} — 100,000 ohms, ½ watt.
R_{25} — 820,000 ohms, ½ watt.
R_{28} — 2700 ohms, ½ watt.
R_{29} — 500,000-ohm potentiometer.
R_{31} — 220,000 ohms, ½ watt.
R_{33} — 270 ohms, 2 watts.
R_{34} — 100,000 ohms, ½ watt — decoupling resistor — connect between junction of R_{17}, R_{13}, R_2 and a.v.c. line.
L_1 — 5 turns No. 16, ½-inch diam. Space turns for proper tracking. Tap at 1½ turns from cold end.
L_2 — Same as L_1, but tapped at center.
L_3 — 5 turns No. 16, ½-inch diam., 1⅛ inch long, tapped 1 turn from bottom. Wound on National type XR-50 form with slug removed.
J_1 — 2-pin fitting, female.
RFC_1 — 30 to 35 turns No. 28 enam., close-wound on high-value 2-watt resistor.
T_1, T_2, T_3 — 1.73-Mc. i.f. transformer (National type IFS). May be made by removing turns from windings of iron-core 1600-kc. transformers to resonate at 1.73 Mc. with approximately 100 $\mu\mu$fd. across each winding.

point of stability and gain, high over-all gain being needed to make the squelch open on a relatively weak signal.

Although the oscillator and mixer coils were mounted as nearly at right angles as possible, it was found that adequate injection voltage was obtained without any intentional coupling. This should be about one to two volts on the control grid of the pentode when the mixer and oscillator are properly tracked. This can be checked by a high impedance voltmeter such as a 50,000-ohm resistor in series with a 100- or 200-microampere meter. Actually, too much injection voltage was obtained until the oscillator plate voltage was reduced to about 60 volts, by the insertion of a dropping resistor between Pin 1 of the 6U8 and the 90-volt source. The use of a grounded-plate oscillator is desirable; the plate then provides some shielding between the "hot" parts of the triode oscillator and the pentode. A 5-$\mu\mu$fd. capacitor with a 750 negative temperature characteristic is used across the oscillator tuning capacitor for drift compensation.

A 6BA6 pentode is used as the r.f. amplifier tube. Here again there is a chance for argument but the advantage of low-noise amplifiers at this frequency is debatable when the receiver is used near sources of noise, as in a car. The 6BA6 is a tube to which a.v.c. voltage can be applied, and it is desirable to apply a.v.c. to as many tubes as possible. It was found that, even with two stations separated by only a few feet, the receiver does not block or distort.

The oscillator and mixer coils are below the chassis, so the antenna coil is located above the chassis for isolation purposes. Its tuning capacitor is made variable so that it can be adjusted for different antennas. The tuning capacitor is a three-gang double-spaced fugitive from an f.m. receiver, with its sections reduced to one stator and two rotor plates.

The squelch circuit is much simpler than the circuit so commonly used but it is entirely adequate. It lets a small amount of receiver noise leak through so that an operator can tell by listening carefully that the receiver is still operative. The important item is the 0.01-μfd. capacitor which effectively couples the grid to the plate so that electrically they remain at the same potential, virtually making the triode into a diode. The plate impedance becomes very low, of the order of a few hundred ohms, until the grid is cut off by a.v.c. voltage, at which time the plate impedance becomes infinite. This low impedance is connected between the grid of the 12AX7 audio amplifier triode and ground, thereby reducing the voltage input to the grid drastically. Connecting it to the arm of the volume control also makes the squelched noise level relatively constant over most of the range of the control. As the volume control is advanced the shunting effect increases, maintaining a relatively constant squelched noise level which can be heard very weakly a few feet from the 'speaker.

The two chassis are mounted to the front panel of the cabinet on which are also mounted the various connectors.

Adjustments

Getting the unit properly tuned up is not difficult, especially if a grid-dipper is available.

(*Continued on page 118*)

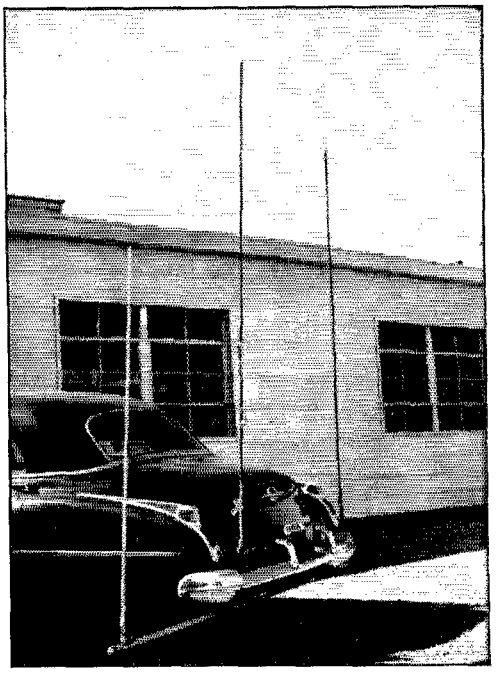
A Car-Mounted 10-Meter Beam

Increased Power for Stationary Operation

BY BERT W. MATTHEWS,* W5OME

• In this article, W5OME describes a set of portable parasitic elements that can be quickly added to the usual 10-meter mobile whip for stationary operation from the car. It should find ready use in set-ups for emergency work as well as other types of activity where operation in motion is not essential.

To many hams like myself, mobile radio is not merely an interesting diversion from home-station activity. For one reason or another, it may be the only opportunity we have to get on the air. Since, even under the best conditions, the mobile ham must compete with home stations under the handicaps of strict limitations on power and antenna dimensions, anything that helps to reduce or offset these disadvantages is of more than casual interest. As is often the case, the idea of a 10-meter beam antenna that could be mounted on a car took form during a casual discussion of something quite remote — the problems involved in the design and adjustment of a directional quarter-wave phased system for a 5-kc. broadcast station! The final result that developed is shown in the photograph and sketch. It is a three-element parasitic beam with *quarter*-wave grounded elements. It is arranged mechanically so that normal mobile operation with the usual single whip antenna is in no way hampered. For stationary operation the parasitic elements can be added easily in a few minutes to provide a gain of 5 db. or better, and they can be dismantled and stored in the trunk just as quickly.



W5OME's 10-meter parasitic array mounted on his car. The director and reflector can be dismantled quickly and stored in the trunk for normal operation in motion.

* % P. O. Box 1470, Haddock Camp No. 3, Las Vegas, Nevada.

Construction

The driven element is the normal quarter-wave whip mounted on the left rear corner of the bumper. The reflector and director are fastened to a length of 1¼-inch pipe slung across the rear of the car, an inch or two below the bumper. The total length of 9 feet is broken up into three 3-foot sections joined by threaded pipe couplings so that the pipe can be quickly dismantled for storage in the trunk. Two ¼-inch steel inverted-L brackets were made and fastened to the frame of the car at the bumper-bracket bolts. The pipe is held in a pair of pipe clamps whose bolts go through holes in the lower ends of these brackets.

The director and reflector elements are telescoping-type window-mount antennas of the sort used for b.c. reception in apartment houses, extending to 120 inches and collapsing to 36 inches. These are fastened, with homemade clamps, to the pipe. The clamps are made so that the bottoms of the elements can be insulated temporarily from the pipe while measurements are being made. The reflector is 0.15 wavelength and the director 0.1 wavelength from the driven element. This brings the reflector about 7 inches beyond the end of the bumper opposite the driven element, while the director is about 3 feet outboard. Obviously, this sytem is not intended for use while the car is in motion, but this is not usually considered a great disadvantage.

Adjustment

Considerable time was spent in adjusting the system before anything like expected results were realized. At first, recommended lengths for a standard three-element horizontal array were cut in half. But, alas, field-strength measurements showed that something was radically wrong. After a lengthy investigation, it was found that while the reflector was behaving quite normally, the director had to be shortened drastically before the array began to produce

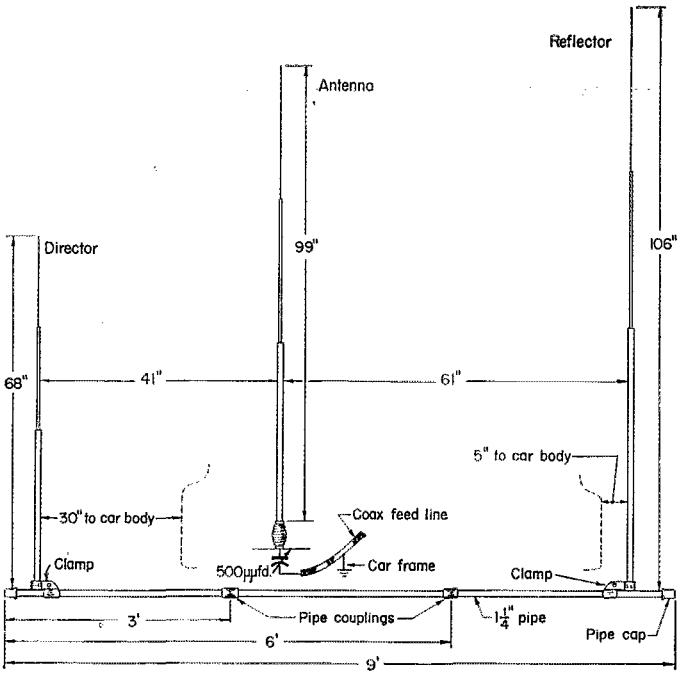


Fig. 1 — Sketch showing the important dimensions of the 10-meter mobile beam antenna. The director resonates at 30.2 Mc., the antenna at 28.8 Mc. and the reflector at 27.4 Mc.

real results. Apparently because the director is not close to the car body, the length of mounting pipe between the director and the car body acts as an extension of the director length. The length of the director whip had to be shortened by about 30 inches for maximum gain. The lengths finally arrived at are shown in Fig. 1. Resonance in each case was checked by removing all but the element to be checked. The parasitic elements were insulated temporarily from the pipe while measurements were being made. Impedance and resonances were checked with a General Radio impedance bridge (a grid-dip meter and variable-resistance bridge [1] could be used instead).

The driven element is a Master all-band job whose length is not adjustable. It was found to have a total length, including the mounting and feed-through, of 0.273 wavelength at the desired center operating frequency of 28.8 Mc. Therefore, a 500-$\mu\mu$fd. variable condenser was placed in series so that the antenna could be tuned to exact resonance. Measurement showed a feed-point impedance of 22 ohms. Although the antenna is fed from the transmitter through a half-wavelength of 70-ohm coaxial cable, loss resulting from the mismatch is negligible. An antenna current of 1.3 amperes with an input of 54 watts shows an over-all efficiency of 69 per cent.

The coax cable was cut to an exact half wavelength as checked on the impedance bridge. This results in a pure resistive load at the transmitter end of the line whenever the antenna is tuned to resonance. It is unnecessary to retune when the parasitic elements are added or removed and a single adjustment of the final will hold over a range of about 500 kc. above or below the exact resonant frequency. The cable I used, incidentally, is a new type produced by Belden. It has a combination of solid and air dielectric and the losses are considerably below those of RG-59/U or RG-8/U. After final adjustments had been made, field-strength measurements showed a minimum gain of 5.5 db. with a minimum front-to-back ratio of 13 db. These checks were made in clear space with no power lines or buildings within at least 10 wavelengths. Checks made at spots not entirely in the clear showed gains as high as 7 db. and front-to-back ratios as great as 20 db.

Cars of various makes and body styles differ in ground-plane characteristics somewhat, so that element length may have to be adjusted experimentally for peak performance. Physical measurements have been made on several types and makes of cars and it seems possible that an arrangement could be provided that could be left mounted permanently on the car. This might be done by placing the driven element on the left rear cowl behind the door, the reflector on the left front cowl in front of the left front door, and the director on the bumper at the left rear side of the car. This would, of course, look like a mobile antenna farm, but those amateur clubs fortunate enough to possess trailer-mounted emergency equipment might find it quite the thing. However, since the array can be put up or taken down in about three minutes and stored conveniently in the trunk, the arrangement shown should find ready application in emergency work.

I want to take this opportunity to thank the many hams who assisted in the testing of this antenna by making comparative S-meter readings, and especially Mr. E. Noel Luddy and Al Reville, W5WB, for their inspiration and helpful suggestions. The results have been more than well worth the effort. On one test, W5OME and W5DCM, the latter station in motion, were in continuous communication for approximately 40 miles on ground wave. The average ground-wave maximum in the area was only about 20 miles before the car-mounted beam was installed.

[1] Scherer, "Building and Using the Antennascope," *CQ*, Sept., 1950.

Happenings of the Month

21 MC. DUE MAY 1ST

On March 17th FCC released two documents, each entitled Notice of Proposed Rule Making, one which would amend our rules to withdraw from amateur use effective April 1st the frequencies 14,350–14,400 kc., and another which would amend our rules to make available for amateur use effective May 1st the entire new band 21,000–21,450 kc. Canada is taking similar action on its amateur assignments.

These actions are among the first to be taken by our Government to put into effect the Atlantic City table of allocations below 27.5 Mc. in accord with the pattern for implementation laid down by the Extraordinary Administrative Radio Conference. They directly result from meetings earlier this year of government and industry communications groups, including participation by ARRL on behalf of amateurs, to work out plans for removing present commercial services from the 21-Mc. band, and to arrange new commercial assignments in the 50 kc. we relinquish at 14 Mc.

Temporarily, the only emission which will be permitted on 21 Mc. is A-1 telegraphy. This results solely from a desire on the part of all concerned to make the proposed changes in the quickest possible time; any discussion and proposed rule-making concerning suballocations would delay the opening of the new band several months. It is the Commission's intention to take up shortly the matter of authorizing additional types of emission.

NOTE: As of press date for this issue, final action to amend our rules had not been taken by FCC — and indeed was not expected until late April. Before firing up on 21 Mc. after May 1st, then, confirm that the band has actually been opened by monitoring W1AW bulletins in late April, or checking with your director, assistant director, SCM, club secretary or other League field official who receives copies of W1AW bulletins or similar material direct from ARRL Headquarters.

BOARD MEETING

A special meeting of the Board of Directors of ARRL has been called for May 9th in Hartford, Conn. At press time we have notice of several proposals which individual directors plan to present. Northwestern's Roberts will ask that copies of Directors' Letters on League affairs be sent to retiring directors for two years following termination of office. Roanoke's Jacobs will ask the deletion of By-Law 12(h) which now makes ineligible for directorship any nominee who is primarily engaged in radio service work; he will also propose an amendment "to prevent the president from succeeding himself in office a second time." Rocky Mountain's Matejka has several motions for the expansion of 'phone allocations: 3750–4000 kc. on 75 meters; a new 7225–7300 kc. band for General Class or higher license (not Conditional); 14,200–14,350 kc. on 20 meters; and 28,250–29,700 kc. on 10 meters.

In addition the Board will most certainly consider the subject of 21-Mc. suballocation. It also will take up the matter of adopting new By-Laws to supplement the Amended Articles of Association put in force last year. There will be reports of committees which will need consideration and possible action. Make certain you or *your club are on record with your director* concerning these matters and any others which may be currently topics of the day.

The May meeting is termed "special" because under the new charter the regular annual meeting is normally scheduled for sometime in the first quarter. Such a meeting was held, as required, but it was no surprise when no directors appeared inasmuch as they had all earlier indicated inability to attend a meeting so early in the year. The minutes follow:

MINUTES OF 1952 ANNUAL MEETING OF THE BOARD OF DIRECTORS
THE AMERICAN RADIO RELAY LEAGUE, INC.

March 14, 1952

1) Pursuant to due notice and the requirements of the Amended Articles of Association, the regular annual meeting of the Board of Directors of The American Radio Relay League, Inc., was called to order at the headquarters office of the League in West Hartford, Connecticut, at 9:32 A.M., EST, March 14, 1952. Present: Vice-President F. E. Handy, occupying the Chair; Secretary and General Manager A. L. Budlong; Treasurer David H. Houghton. In the absence of a quorum the Chair immediately declared the meeting adjourned.

A. L. BUDLONG
Secretary

(Continued on page 120)

BAN ON PJs LIFTED

On page 23 of the February, 1951, issue of *QST* appeared an FCC Public Notice which forbade communication with the amateurs in certain countries. On March 11th of this year FCC announced that this Notice has been modified to permit QSOs with amateur stations in the Netherlands Antilles, since that government now authorizes amateur radio and has so informed the International Telecommunications Union. See "How's DX" in this issue for more dope on PJ affairs.

COY PRAISES AMATEURS

• Every Government agency must appear before Congressional committees on appropriations to answer any questions that might arise concerning planned expenditures for the coming fiscal year. In February FCC, represented by its then Chairman Wayne Coy, was called before a House subcommittee on appropriations. We reproduce below a verbatim excerpt of the testimony, the questions being asked by Rep. Albert Thomas of Texas, and some mighty powerful answers being furnished by Mr. Coy with able assists from Col. E. L. White, chief of the Safety & Special Radio Services Bureau, which has amateur radio matters under its wing:

Mr. Thomas: Would you save any time by having this other work (license-processing in various services) done in the field?

Mr. Coy: We would not. We could not.

Mr. Thomas: Have you given careful study to that?

Mr. Coy: We have. It is just an impossible problem to have information flowing to the field about available frequencies for assignment to particular applicants with the staff we have and would probably result in a loss of time.

Mr. Thomas: Rather than saving time?

Mr. Coy: Rather than saving time. I am convinced of that myself. I have not asked Colonel White, but I think he would say the same thing, because it is just impossible to keep information flowing to the field fast enough to be of any benefit in granting applications — information about frequency utilization.

Is not that right?

Mr. White: Yes. It is even deeper than that. For example, the amateur applications, which is the biggest part —

Mr. Thomas: What do you mean by "amateur" now?

Mr. White: Amateur stations. We have an average intake of around 5000 applications a month from amateurs all over the country.

Mr. Thomas: In other words, they are not people who are engaged in any particular type of business?

Mr. White: No; but people doing radio research and radio communication as a hobby, mostly. It is one of the older of the services. I think it is the third- or fourth-oldest service, and it is the largest service of any of them. They have 104,000 amateurs right now, and we have 9 people handling those 5000 applications.

Mr. Thomas: Are not you fast reaching the point where industry may require some of the time now allocated for use by amateurs?

Mr. Coy: I should say not. They are worth more than the whole confounded industry.

Mr. Thomas: How do you mean?

Mr. Coy: They have done more of the pioneering work and made possible more commercial developments here than anybody else in this country. I think the amateurs ought to get a Congressional Medal of Honor in the communications field, if we could have one.

Mr. Thomas: But here is a businessman operating a fleet of trucks, and he wants to get a new station or a modification of a station, and here in that particular field his biggest competitor in point of time is the amateur who is playing around with this thing for his own amusement and benefit.

Mr. Coy: Let me put it in several other ways. One, this service is so good that the military want it and have established their own amateur service of their own personnel, directed at their own research kind of problems. The next point in the matter is that this is the greatest emergency resource in communications that this country has.

Mr. Thomas: I understand that, but what I am getting at is are not you reaching the point of saturation where you are going to have to take a look at this in future programs?

Mr. Coy: Not at all. If I were speculating and, say, I would be at the Commission for the next 30 years, which I hope would be an expectancy of mine — I would just like to live that long — I hope I could say to you now that I would never be one who would take the amateurs off the air.

Mr. Thomas: There is no conflict of interest in point of time, saturation, or anything between the amateurs and the legitimate commercial interests?

Mr. Coy: Yes; there is a conflict.

Mr. Thomas: There is a conflict?

Mr. Coy: Surely. A fellow's special interest is always in conflict with the public interest, and the private guy who wants to use something for his special interest as against the general interest is always yapping that the amateur has too much space. At least, we hear that every now and then.

Mr. Thomas: If there is any conflict, then, the business interests are making a sacrifice; are they not?

Mr. Coy: We think we can take care of them in other parts of the spectrum adequately. We think we can take care of every legitimate need of the American businessmen which we believe serves the public interest. We have not denied them: we have set up services for them. We are continually setting up new services. We have ahead of us a pretty dreary outlook of ever getting through with all of them. They pile up faster than we can get through. But when they tell us they can only operate their service by taking away the amateur frequency, we are not for that.

21 Mc. with the Two-Control Bandpass Transmitter

On examining the possibilities of putting the two-control bandpass rig [1] on 21 Mc., it soon becomes obvious that mechanical considerations prevent the addition of a new frequency-multiplier stage. However, by sacrificing the 11-meter band the original 27-Mc. section can be converted into a 21-Mc. tripler. This works out nicely in practice because the actual modification involves nothing more serious than a tube substitution, a change in the values of two components, the addition of one new part and a very small amount of rewiring. The multicircuit tuner in the final amplifier is already capable of being tuned to the new band.

Fig. 1 is a before-and-after wiring diagram of the modified circuits of the transmitter. Section A of the diagram shows the circuits in the original form and Section B shows the changes which permit the doubler to be used as a tripler to drive the 829-B final at 21 Mc. The Type 6N7 tube which served originally in the two high-frequency doubler circuits has been replaced by a Type 6BL7GT double triode, with one triode working as the 21-Mc. tripler and the second as the doubler to 28 Mc. Substituting the huskier 6BL7GT for the 6N7 was necessary in order to insure adequate excitation for the final amplifier at 21 Mc.

As shown by Fig. 1, the revamped set of connections has socket prongs *4*, *5* and *6* wired into the 28-Mc. circuit. The addition of a by-pass capacitor, *C*, and a cathode bias resistor, *R*, are the only major alterations in this stage. Prongs *1*, *2* and *3* of the 6BL7GT socket are used for the 21-Mc. tripler. This circuit no longer connects to S_{1B} as was the case with the 27-Mc. doubler. Instead, the grid of the tube is returned to S_{1C}. It should also be noticed that the compensating capacitor, C_{10}, has been removed from S_{1B} and then reconnected directly to the grid of the tripler tube. The cathode resistor for the 21-Mc. triode (R_7) has been changed to a 1000-ohm 10-watt unit. The plate of the tripler is rewired to the original 27-Mc. coupler, since this coupler can be tuned to 21 Mc.

In the 14-Mc. section of the rig, it is only necessary to rewire S_{1C} so that the old 27-Mc. contact connects directly to the grid of the tripler tube. Then when the bandswitch is set at this position excitation from the 7-Mc. doubler (not shown in Fig. 1) is fed to the 21-Mc. stage alone.

The 21-Mc. bandpass coupler is aligned in the same way as those for other bands. The only new data are the currents and voltages for the 6BL7GT. With no excitation applied to the tube, the drop across the cathode resistors should be approximately 16 volts. D.c. voltage across the grid leaks for the 21- and 28-Mc. sections should measure approximately −115 and −100 volts, respectively, under key-down conditions, and the cathode current for either triode should be somewhat under 50 ma. with 300 volts applied to the plates.

—C. V. C.

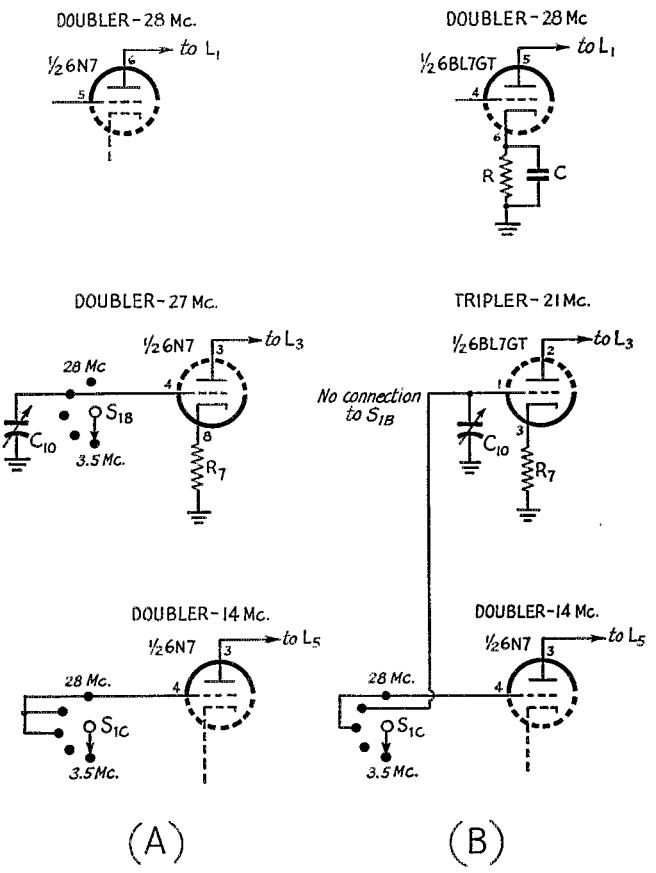


Fig. 1 — Circuits before and after modification for 15 meters. C — 0.001- or 0.01-μfd. disk ceramic. *R*, R_7 — 1000 ohms, 10 watts.

[1] Chambers, "A Two-Control VFO Rig with Bandpass Exciter," *QST* for Aug. and Sept., 1950.

A Midget Fifty-Watter

A Compact C.W. Rig for the Novice or Old-timer

BY RICHARD M. SMITH,* WIFTX

• After you've built a few "breadboard" rigs, you may get the urge to construct something a bit more "commercial" in appearance. Here's a how-to-do-it article describing an inexpensive c.w. transmitter that can be built in a few evenings.

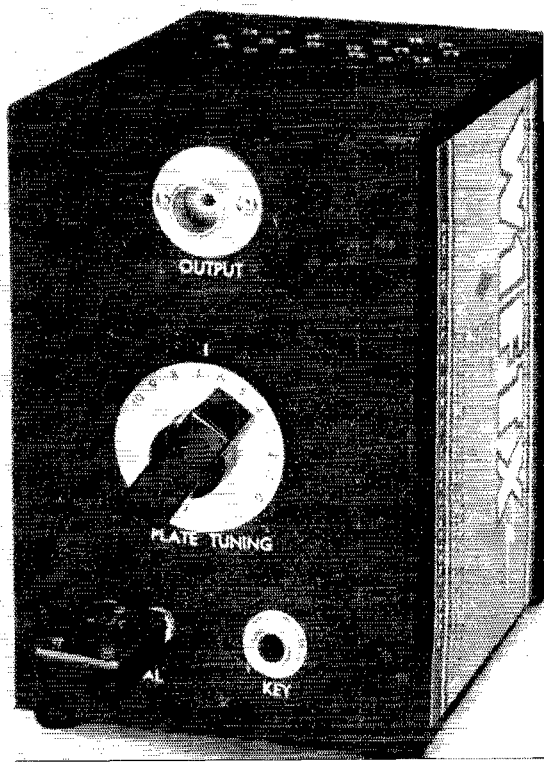
NEARLY fifteen years ago, the late Fred Sutter, W8QBW-W8QDK, created quite a stir in ham radio with a series of Lilliputian transmitters that weren't much bigger than the average QSL card. Apparently his *QST* articles describing these rigs were devoured and remembered, because we still hear nostalgic comments about the "QSL Forty," the "QSL Sixty," and the "Runt Forty" whenever the old gang gets together. These rigs were pint-size powerhouses, and anyone who ever worked Fred knew that they packed a real punch. We decided that the same sort of thing, in modern dress, might make an appealing rig for present-day hams. We started looking around for ideas, realizing that today's requirements are a bit different, but that the basic features of compactness, simplicity, and power are no less appealing today than they were in the '30s when Sutter and the 6L6G were having their heyday. The midget 3.5- and 7-Mc. transmitter shown here is the result.

Circuit Considerations

Packaged in a standard 4 × 5 × 6-inch utility box, this transmitter has many of the features of much larger units. A two-tube oscillator-amplifier circuit is used, as shown in Fig. 1. Years ago we found that it is much simpler to get a clean-keying signal if you avoid trying to make one tube serve the dual purpose of generating the signal and amplifying it, too. A few cracked crystals convinced us that it is cheaper, also, because present-day quartz crystals are built to provide stability rather than power. The operating simplicity of a one-tuber is retained, however, by using an untuned plate circuit in the oscillator stage, so that only the amplifier plate circuit need be adjusted in operation. The 6AG7 was selected as the oscillator tube because it has shown itself to be reliable and easy to adjust, and it is both inexpensive and easy to obtain. For the amplifier, we chose the 6BQ6GT, originally designed as a sweep amplifier for TV receivers, but having ratings similar to the popular 2E26 transmitting tube. It has a good husky cathode that speaks well for its ability to stand up and take it, and its cost is considerably under that of most transmitting tubes, including the 6L6, the 807, and the 2E26. While we didn't have much information on it as an r.f. amplifier, the results have been good enough to justify the gamble we took in selecting it.

Construction

You'll get the general idea of how the rig is built from the photographs. All we'll do here is point out a few of the less obvious points to keep you from going wrong. The "chassis" is nothing more than a small bracket 2⅞ inches wide and 4⅞ inches deep welded to one cover of the utility box (ICA No. 3819). No, you don't have to do the welding; you buy it that way! The tube sockets are mounted in a line across the rear of



* Technical Assistant, *QST*.

♦

The simplicity of this midget 50-watt transmitter is evident from the front view. The only tuning dial is centered on the panel of the 4 × 5 × 6-inch box, with the output jack above it, and the crystal socket and key jack below. Weighing only 3 lbs. 6 oz., the rig is not much larger than the standard-size QSL card pasted on one side of the box. Ventilating holes are drilled in both top and bottom, and the whole unit rests on four rubber feet to avoid marring the operating desk and to permit air circulation.

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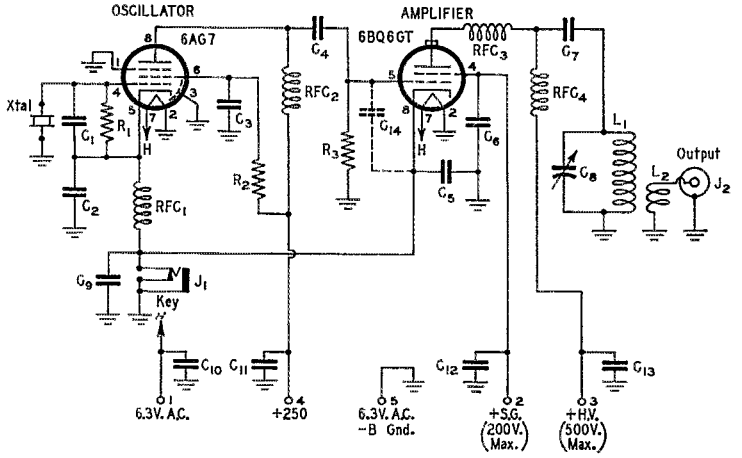


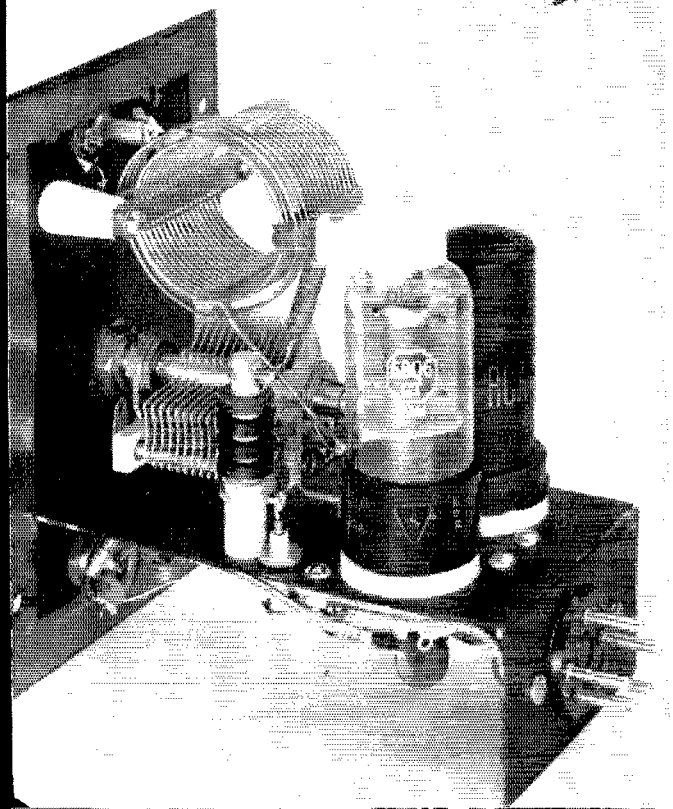
Fig. 1 — Schematic diagram of the midget 50-watt transmitter.

C_1 — 10-$\mu\mu$fd. mica.
C_2, C_4 — 100-$\mu\mu$fd. mica.
C_3, C_6, C_7, C_9–C_{13} — 0.001-μfd. disk ceramic.
C_5 — 0.005-μfd. disk ceramic.
C_8 — 200-$\mu\mu$fd. max. variable (Millen 19200).
C_{14} — 10-$\mu\mu$fd. tubular ceramic. See text.
R_1 — 68,000 ohms, ½ watt.
R_2 — 22,000 ohms, ½ watt.
R_3 — 47,000 ohms, 1 watt.
L_1 — 18 turns No. 18 wire, 1½-inch diam., 1⅜ inches long (B & W 40-JEL modified; see text).
L_2 — 3 turns No. 18 wound around end of L_1.
J_1 — Closed-circuit 'phone jack.
J_2 — Coaxial connector, female (Cinch-Jones S-101-D).
RFC$_1$ — 2.5-mh. r.f. choke, pigtail (National R-50).
RFC$_2$, RFC$_4$ — 2.5-mh. r.f. choke (National R-100S).
RFC$_3$ — 1.8 μh. (Ohmite Z-144).
Xtal — 3.5 or 7 Mc. (see text).

the chassis, centered 1¼ inches from the rear edge. If you use 1¼-inch diameter ceramic sockets, they fit in nicely with about ⅛-inch clearance on each side. The 5-prong male power connector (Amphenol 86-CP5) is centered on the rear apron.

Now, looking at the front, the holes for mounting the crystal socket and the key jack are centered 1 inch above the bottom of the panel so they will clear the lip of the box when the rig is slipped inside. The ⅜-inch diameter hole for the tuning condenser shaft is in the exact center of the panel, and the coaxial output connector, J_2, is centered ¾ inch down from the top. The coil, a cut-down commercial unit, is mounted on ¾-inch ceramic stand-offs placed 2 inches apart on a line 1¼ inches down from the top. If you use a different diameter coil, or a different tuning condenser, check first to make sure that there is enough clearance between the two when the rotor plates are extended.

Now you've got all the so-called "critical" mounting dimensions. Actually, the only critical factor is to make sure that you get all the parts in the box. The r.f.



Everything fits behind the panel without crowding in spite of the size limitation. Here, the amplifier tube is in the foreground, the oscillator to the right, and the amplifier tank circuit next to the panel. A 5-prong power plug is mounted on the rear of the built-in chassis.

leads are bound to be short enough in this rig, no matter how you run them!

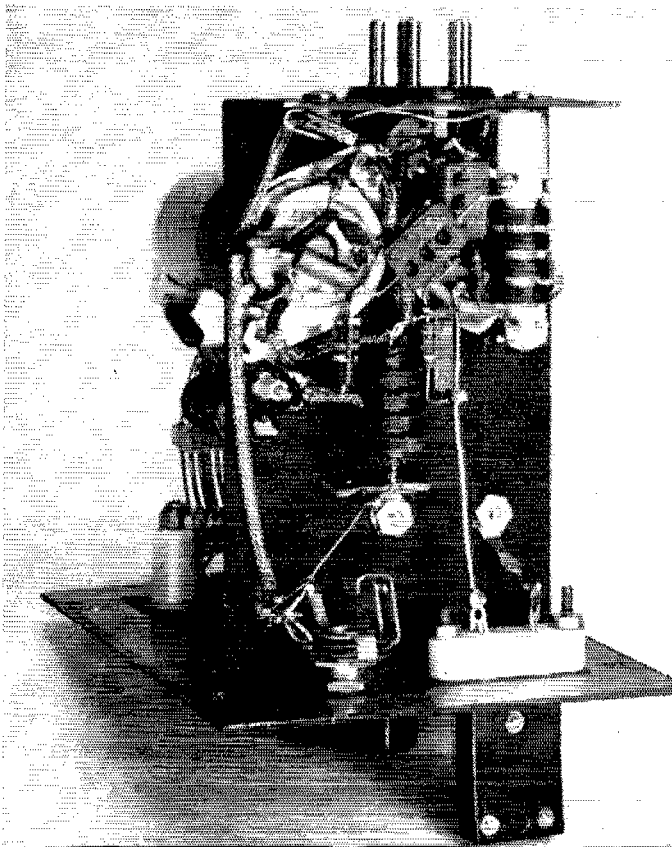
It is a good idea to use a scrap of 2 × 4 lumber as a backing surface when drilling the holes in the chassis to keep the pressure of the drill from bending the light-gauge metal. While you're at it, drill a ¼-inch hole 2½ inches behind the panel and ⅜ inch in from the edge, for a feed-through bushing (Millen 32150) to carry the high-voltage lead to the plate of the tube. Drill a small hole (to pass a 6–32 machine screw) ½ inch nearer the panel to mount the plate r.f. choke, RFC_4. Drill two similar holes 1¼ inches and 2⅜ inches behind the panel on a line through the center of the chassis. The first of these is to secure a tie point below decks, and the second for the rear mounting foot of the tuning condenser.

Don't put the ¼-inch drill away until you have made some holes through the top and bottom of the cabinet to provide ventilation. You can make as many ¼-inch holes as you like without impairing the shielding, but don't use a larger drill unless you are prepared to line the holes with copper screening to keep the harmonics at home.

Before you start mounting parts, clean the paint off the inside of the panel and the lip of the box where they meet. This is to insure good contact, metal-to-metal, so that the shielding will be complete when the rig is "buttoned up." The easiest way to do this is with paint remover, available in almost any hardware store, but if you don't mind spending the time, it can be done with a knife, finishing off with sandpaper. This should be done to the rear cover of the box, too.

Now you are ready to mount the parts prior to wiring. Put the tube sockets in first, with soldering lugs slipped under each nut to serve as ground points. Mount the sockets so that Pin 2 of the amplifier socket and Pin 7 of the oscillator socket are nearest the rear of the chassis. Next mount the crystal socket and the key jack. The latter has one side grounded to the panel, and it is a good idea to scrape a little of the paint off around the inside of the mounting hole to insure good contact. This is a good rule to follow whenever mounting a component that is supposed to be grounded. Put the tuning condenser in next, slipping a ¼-inch spacer under the mounting foot at the rear.

Modification of the B & W type 40-JEL coil is needed before it is mounted. Remove the coil from its plug-in base by clipping the wires off as close to the ceramic base as possible. Then remove the polystyrene bar from the metal mounting feet by drilling through the eyelets that fasten them together and pry them apart. Do this carefully so that you don't damage the bar, which is to support the coil in the transmitter. Remove seven turns from the end opposite the link winding. This should be done a turn at a time, "unwinding" the coil with pliers by pulling on the wire until it breaks loose from the polystyrene supports. Trim off all the excess material on the three small supports, but retain enough of the longer mounting bar to permit it to be drilled to pass 6–32 screws into the stand-off insulators. The total length of the mounting bar after modification is 2¼ inches, and 18 full turns remain. Mount the coil as shown in the photographs, with the link winding at the left (when viewed from the rear). Connect the stator (fixed) plates of the condenser to the right-hand end of the coil (away from the link winding) by



In this bottom view, the amplifier socket is on the left. The oscillator socket is partly obscured from view by the interstage coupling condenser, C_4, and the oscillator plate choke, RFC_2. By-pass condensers are mounted directly on the tube sockets and on the rear of the power connector. Cathode choke RFC_1 is visible in the center, flanked by the amplifier grid leak R_3 and R_1 and C_1 of the oscillator grid circuit. C_{14}, needed only when TVI is a problem, is mounted right across the amplifier tube socket.

breaking away another quarter turn of the coil and dropping it down to the condenser. The other end of the coil must be grounded, along with the rotor plates of the condenser. Make this ground connection at the rear bearing on the condenser, even though it might be easier to ground the coil somewhere on the front panel. Unwind ¾ turn from the end to be grounded and connect it to the rotor lug, forming the wire slightly to avoid contact with the rotor plates as they are turned.

Connect the right-hand end of the link winding to the insulated center terminal of the output jack, and ground the other end. Install parasitic-suppressing choke RFC_3 between the plate cap of the amplifier tube and the top of RFC_4.

The arrangement and wiring of the remaining parts is shown in the bottom view of the transmitter. The heater wiring and the supply leads are made with shielded wire (Belden No. 8885) as a precaution against TVI. Proper use of this wire is described in a recent *QST* article.[1]

By-pass condensers C_{10} through C_{13} are used to filter the supply leads to prevent radiation of TVI-producing harmonics from the leads that connect the transmitter to its power supply. Each should be installed right at the point where the wire passes into the power connector on the rear of the transmitter, with the ground connection being made to the shield braid.[2] The braid itself should be soldered to any convenient grounding lug to insure mechanical rigidity. In addition, wherever shielded wires touch one another they should be soldered together to insure good contact.

After the heater and supply wiring is completed the rest of the small parts can be wired into the circuit. A fairly long lead is required between the crystal socket and Pin 4 of the oscillator socket. Make this of No. 16 bare tinned wire, and it will then be rigid enough to serve as a tie point for one end of C_1 and R_1. One end of RFC_1 is supported by a tie point located about midway between the tube sockets and the key jack. RFC_2 has a tapped ceramic base which is used to mount it on one of the screws that holds the power socket in place. This choke should not be mounted until all of the rest of the wiring has been done around the oscillator socket. Looking at the photograph, the oscillator voltage lead is connected to the bottom of RFC_2, while the top is connected to Pin 8 of the tube socket behind it. Coupling condenser C_4 runs from the top of RFC_2 to Pin 5 of the amplifier socket, and screen resistor R_2 is connected from the other end of the choke to Pin 6 of the oscillator socket.

By-pass condenser C_9 serves as a harmonic filter for the keying lead, and should be installed right at the key jack. Shielded wire is used to connect the jack to the cathode of the amplifier tube, and between the cathodes.

C_{14}, shown in dotted lines in Fig. 1, serves to reduce the amplitude of harmonics generated in the grid circuit of the amplifier, and need be used only when the rig is to be used in TV "fringe" areas. It is connected right across the socket, from Pin 5 to Pin 8.

Adjustment and Operation

After checking the wiring against the diagram, you are ready to apply power to the rig. Note that the diagram calls for 250 volts to be used on the oscillator plate circuit, 200 volts maximum for the amplifier screen grid, and 500 volts maximum for the amplifier plate. The most critical of these is the amplifier screen voltage. Under no circumstances should the screen be operated at more than 200 volts, because it will draw excessive current resulting in possible damage to the tube. We found that the best way to supply the screen voltage is from a well-regulated separate source. The next best alternative is to supply it through a small dropping resistor from the *oscillator* plate supply. With the 6BQ6GT the customary method of using a dropping resistor from the amplifier plate supply is dangerous, because unless the amplifier is loaded fully, screen voltage can rise to excessive value. In addition, it is an uneconomical way to do it, because an unusually high value of resistance is required. Using the system we have suggested is better, because it insures against the screen voltage rising to more than the oscillator plate voltage. It also results in cleaner keying. With a 250-volt supply, a 4700-ohm 1-watt resistor does the job nicely, resulting in about 175 volts applied to the screen under operating conditions. This is a good safe value, and is plenty to permit full output to be obtained. The resistor can be installed in the power supply with greater ease than in the transmitter, which is a bit crowded for space as it is.

Before applying plate and screen voltage to the amplifier tube, try the oscillator to make sure that it is functioning. Plug in the crystal, and then apply power to the oscillator alone, closing the key. Tune a receiver to the crystal frequency and listen for the oscillator signal. Key it to make sure that it does not chirp. If it chirps, check to make sure that you have the right values for C_1 and C_2. If you have accidentally interchanged these condensers, the circuit will not function properly, and may not work at all. Next measure the bias voltage developed across the grid leak of the amplifier stage R_3. To do this, connect an r.f. choke in series with the negative lead of the voltmeter to avoid loading the circuit too heavily, and ground the positive lead to the chassis. If the oscillator is working properly there will be at least −35 or −40 volts of bias indicated when the key is closed. If there is more than this, it is probably because the plate-supply voltage is too high, and it should be reduced somewhat to avoid overdriving the amplifier stage.

Once the oscillator circuit is working, connect a d.c. milliammeter in series with the positive

(*Continued on page 120*)

[1] Goodman, "How To Wire a Transmitter," *QST*, February, 1952.

[2] Grammer, "By-Passing for Harmonic Reduction," *QST*, April, 1951.

Armed Forces Day—May 17th

Receiving Competition and Military-to-Amateur Test

THE Army, Navy and Air Force offer a double-header program for the radio amateur fraternity on Armed Forces Day, Saturday, May 17, 1952.

The three services will cosponsor a receiving competition and a military-to-amateur test, patterned directly after the successful 1951 Armed Forces Day exercises.

Receiving Competition

A message to amateurs from the Secretary of Defense will be broadcast on 15 military frequencies from Army, Navy and Air Force stations. Any listener who can receive and transcribe the International Morse Code message may send his transcribed copy to Armed Forces Day Contest, Room BE1000, The Pentagon, Washington 25, D. C., where representatives of the three services will check it against the original transmission. All who submit a perfect copy will receive a Certificate of Merit, attesting to their code-copying proficiency. Be sure to state the time, frequency and call letters of the station whose transmission you copy.

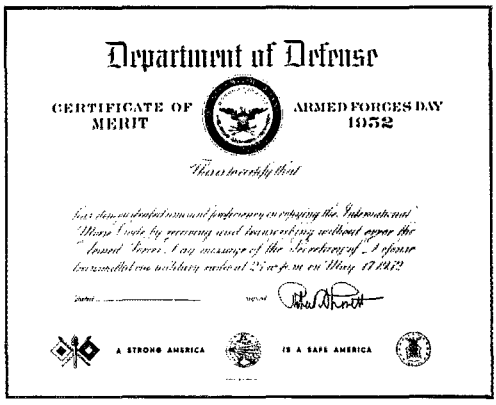
The following times, call letters and frequencies will be employed for the Receiving Competition. (Eastern Standard Time has been used throughout. In converting to local time for your area, remember that EST is five hours earlier than Greenwich time, and is one hour later than Central Standard, two hours later than Mountain Standard, and three hours later than Pacific Standard time.)

Time	*Call Sign*	*Frequencies*
2000 (EST)	*AIR* (Air Force Radio Washington, D. C.)	3497.5, 6997.5, 27,994 kc.
	NSS (Navy Radio Washington, D. C.)	122, 4390, 9425, 12,630, 17,000, 21,960 kc.
	WAR (Army Radio Washington, D. C.)	14,405, 20,994 kc.
2400 (EST)	*AIR* (Air Force Radio Washington, D. C.)	3497.5, 6997.5, 27,994 kc.
	NPG (Navy Radio San Francisco, Calif.)	115, 9255, 12,540, 16,-265 kc.
	WAR (Army Radio Washington, D. C.)	14,405, 20,994 kc.

Each transmission will be preceded by a five-minute CQ call. All transmissions will be at 25 words per minute. Should characters for any reason be transmitted with errors, such errors should appear in your transcription. It is not necessary to copy more than one station, and no extra credit can be given for so doing.

Military-to-Amateur Test

Here is an opportunity for every licensed amateur to work the headquarters stations of the Army, Navy and Air Force direct, and to receive an official QSL acknowledging the contact and showing the RST report of your emission as logged at the military headquarters stations.


Department of Defense

CERTIFICATE OF MERIT

ARMED FORCES DAY 1952

This is to certify that

for demonstrated accuracy and proficiency in copying the International Morse Code by receiving and transcribing without error the "Armed Forces Day message of the Secretary of Defense transmitted on military radio at 2 p.m. e.s.t. on May 17 1952

A STRONG AMERICA IS A SAFE AMERICA

Certificate of Merit to be awarded those making perfect copy of the Secretary of Defense's Armed Forces Day message.

Each of the military headquarters stations will QSL separately, so if you're ambitious you can get three different QSL cards.

AIR, NSS and WAR will be on the air between the hours of 1800 and 2400 (Eastern Standard Time) on May 17, 1952, to contact and exchange QTH, signal-strength and readability information with amateur radio stations. The military stations will work on spot frequencies just outside the 80-, 40-, and 20-meter bands. No traffic handling or message exchange will be permitted. Prompt and courteous operating practices will make it possible for the military stations to contact a larger number of amateur stations during the six hours for which the test is authorized.

A word of caution! In the 1951 exercises, a careless few amateurs operated on the military frequencies rather than in the amateur bands. No authority exists for amateur operation outside the amateur bands in these tests. Similarly, amateurs affiliated with MARS or USNR networks, which drill on military frequencies, are not authorized to use the military frequencies for purposes of these Armed Forces Day exercises. AIR, NSS and WAR will limit contacts to amateur-band stations only.

Here's where to find the military stations:

AIR (Air Force Radio Washington) — 3497.5 (A1), 7635 (A1), 14,405 (A3) kc.

NSS (Navy Radio Washington) — 4015 (A1), 7375 (A1) kc.

WAR (Army Radio Washington) — 4025 (A3), 6997.5 (A1), 13,947.5 (A1) kc.

The Wavelength Factor—II

Propagation, Modulation, and Receivers

BY YARDLEY BEERS,* W2AWH

• **Continuing the survey begun in the February issue, in this article the author takes up the remaining factors that influence the choice of wavelength. The subjects discussed include propagation effects, modulation systems, and receiver techniques.**

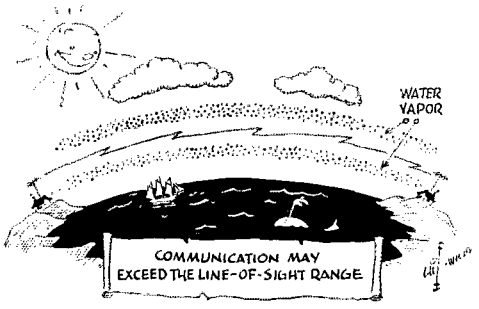
IN the preceding article [1] the discussion was limited to antenna characteristics as related to the operating wavelength. The remaining factors that influence the choice of a band for a particular type of communication may be grouped under three broad headings: propagation phenomena, types of modulation, and receiver characteristics. These factors will now be considered in turn.

PROPAGATION EFFECTS

Atmospheric Effects

Besides ionospheric effects, which are excluded from this discussion, numerous effects are produced in the atmosphere. First, there is regular refraction and also the well-known refraction caused by temperature inversions. The latter may extend the range well beyond the line of sight at times.

One less well-known phenomenon that deserves special mention is superrefraction, "trapping," or "duct" formation. This is due to the formation of a layer containing a gradient of water-vapor density. It is more likely to occur over a large body of water but may also occur over land, especially in evaporation after a rainstorm or during the melting of snow. The existence of such layers is impossible in the presence of strong winds. The general result, normally, is that the rays are bent downward. Then the range of radio communication may exceed several times the line-of-sight range. The necessary conditions are that (1) the height of the duct must be large compared with the wavelength (several hundred feet for a wavelength of one meter) and (2) the transmitting and receiving antennas be *low enough to be contained within the duct.* Since small ducts are more probable than large ones, this phenomenon is more likely to produce an effect at the shorter wavelengths. It is primarily of importance at wavelengths below one meter, but on rare occasions it may influence communication even at 10 meters. Stations with antennas above the duct (for example, on a high cliff overlooking a body of water) will find that the formation of a duct will tend to impair communication and give dead spots in their ordinary coverage. Two or more amateurs separated by an over-water path somewhat longer than line-of-sight range might find it of interest to maintain a schedule at 420 Mc., or preferably higher, to investigate this effect.



At wavelengths above 10 or 20 cm. the atmosphere is essentially transparent to radio waves. Water vapor has a strong absorption band with a peak at 1.3 cm. and extending, for practical purposes, for several tenths of a centimeter on either side of the peak, depending upon the pressure. Oxygen has a strong absorption band centered at 0.5 cm. Therefore the wavelengths between 0.3 cm. and 1.6 cm. are probably undesirable for radio communication although some interesting refraction effects may accompany the absorption. The oxygen absorption is constant, but the water-vapor absorption will depend on the relative humidity. In addition to these true absorptions, raindrops will cause scattering of radio waves which, practically speaking, is the equivalent of absorption. This scattering increases as the wavelength is reduced, and the effect probably is not large at wavelengths greater than 5 or 10 cm.[2]

Non-atmospheric Effects

One of the best-known effects in the propagation of very short radio waves is scattering by opaque objects in the path of the waves. In the

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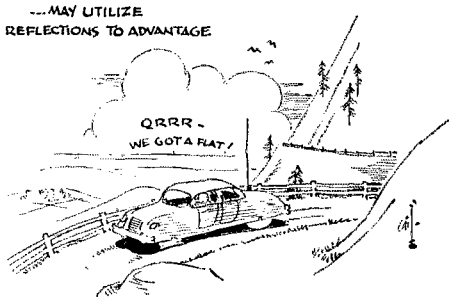
[1] Beers, "The Wavelength Factor," *QST*, February, 1952.

[2] More information concerning ducts and absorption in the atmosphere may be found in Chapter 2 of "Radar System Engineering," Vol. 1 of the Radiation Laboratory Series, McGraw-Hill Book Co. Still more extensive information may be found in Vol. 13 of this series, "Propagation of Short Radio Waves."

For a discussion of other atmospheric effects, see "Over the Hills and Far Away," by R. K. Moore, *QST*, Feb., 1951, p. 13, and "V.H.F. — Why – How – When?" Part II, by E. P. Tilton, p. 46, same issue of *QST*.

case of large regular objects this is more properly termed reflection. Plane surfaces may give either diffused reflection (like the reflection of light from white paper) if the surface is rough, or regular reflection (like a mirror) if the surface is smooth — that is, if the irregularities are small compared with the wavelength. Buildings may be expected to give strong reflections at most of the frequencies we are likely to consider, while smaller objects will have appreciable effects as the wavelength becomes smaller. The strong reflections often present at short wavelengths will cause the signal strength to vary rapidly with a change of a fraction of a wavelength in the position of either the transmitting or receiving antenna. In mobile operation this will give rapid fading, and with fixed stations it may give erratic results. On the other hand, a mobile station may utilize reflections to advantage if it parks in an optimum position. The optimum



position in front of a large wall or cliff may increase the gain and equivalent area of the antenna by as much as 4 times (6 db.).

Another effect of some importance is the Doppler effect, which is the change of apparent frequency when the transmitter and receiver are in relative motion. The reader no doubt has heard the whistle of a locomotive as it passed him, resulting in a sudden lowering of the pitch. A similar effect may occur with radio or light waves. If the transmitter and receiver are approaching, the apparent frequency will be raised by an amount equal to the transmitter frequency multiplied by the ratio of the relative speed of motion to the speed of radio waves (186,000 miles per second). If the two are going apart, the frequency will be lowered. Thus at one-meter wavelength (300 Mc.), a relative speed of 60 miles per hour will give a shift of about 25 cycles, while at 10 cm. the shift will be 250 cycles, and so on. With radar systems this phenomenon may be used to distinguish moving objects from fixed ones. Also it may be used for measuring the speed of projectiles and other bodies. In other applications this effect is a great disadvantage, especially if reflections are present. Rays leaving a moving transmitter in the forward direction may interfere by reflection with others leaving in the backward direction, resulting in an undesirable beat note equal to twice the Doppler shift.

MODULATION

Transmitters employing types of modulation requiring wide frequency channels are usually placed on frequencies higher than 50 Mc. simply because there is no room for them at the lower frequencies. In addition to this very practical reason, there is another one why such systems of modulation should be used at the higher frequencies: frequency instability.

The method of using a very stable oscillator at low frequencies, often crystal-controlled, and then employing a chain of multipliers becomes more impractical as the ultimate frequency is raised, and in the u.h.f. and microwave region is generally not practical except for frequency-standard purposes.[3] The stability of self-controlled oscillators in this region is probably better, on a percentage basis, because resonant cavities may be built with higher Qs than can be obtained with low-frequency LC circuits. Nevertheless, in terms of cycles per second the drifts may be large. In practice it may be desirable to use receivers with i.f. bandwidths of several hundred kilocycles, or even a megacycle or two, to accommodate frequency drift. These wider bandwidths give rise to increased noise. By employing a system of modulation requiring a comparable or larger bandwidth it is possible, in some cases, to overcome some of the loss of signal-to-noise ratio that accompanies wide bandwith.

Wide-Deviation F.M.

The small reflex klystron used normally for local oscillators in microwave receivers, while not very well suited for pulsed operation, has an unusual property which makes it suitable for f.m. The frequency may be varied 10 Mc. or more without a large variation of power by varying the voltage of the repeller by a few volts. Since the repeller is a negative element, it draws no current. Thus effective f.m. can be produced merely by connecting the secondary of a microphone transformer in series. On the other hand, the power supply must be free of hum to a high degree and should be stabilized. The power output of these tubes is generally less than 100 milliwatts, but the high antenna gains practical for point-to-point operation at these frequencies result in ranges of 50 miles or more from suitable locations. Therefore, this type of transmitter offers some possibilities.

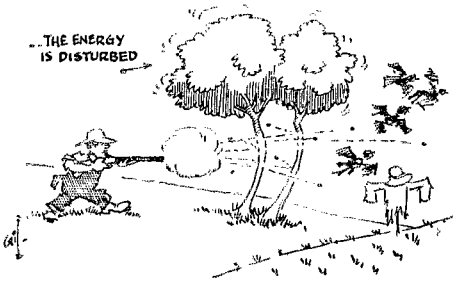
However, in undertaking work with wide-band f.m., one should understand what such a system can and cannot do. As widely publicized, f.m. "discriminates against noise," but this statement is a half truth which may lead to wrong conclusions if not understood. The limiting action of a proper f.m. receiver is such that if two signals

[3] If about 10 watts of r.f. generated by a (quartz) crystal oscillator and frequency multipliers at 90 Mc. is applied to an "S"-band (silicon) crystal holder, harmonics of more than ample strength for frequency-standard work in the 3000-Mc. region are produced.

enter on the same channel, the weaker will be virtually completely suppressed by the stronger. In a similar way, if noise and a *bona fide* signal are present, the signal will cause the noise to be suppressed almost entirely, while if the noise is stronger the signal will be suppressed. If the two are comparable, as is the case at the end of the range, either may predominate.

This latter situation is virtually the equivalent of what takes place with a.m. in similar circumstances. Therefore by substituting f.m. for a.m. and holding the transmitter power and receiver bandwidth constant, the range cannot be increased or decreased to any important extent. However, once the signal is greater than the noise, reception will be much more noise-free with f.m. If the deviation and receiver bandwidth are increased, the effective range will be reduced because the receiver will admit more noise, but once the receiver is well within the limiting range, the noise suppression will be even more complete.

Goldman has given a simple physical explanation of the noise suppression of wide-band systems of modulation.[4] In principle, only a single sideband is required to convey a given amount of information. However, in these special systems the energy is distributed in many sidebands. Thus in effect the information is repeated simultaneously in a number of channels, and if at any



one time one or a few of these channels are disturbed by noise the relative effect on the whole is small. In conventional a.m. only two sidebands are utilized, and if one of these is disturbed the effect will be relatively large. To paraphrase a well-known proverb, in broad-band systems "the eggs are in many baskets," while in conventional a.m. one is putting "all the eggs in two baskets." It follows, of course, that in single-sideband a.m. "all the eggs are in one basket" and noise suppression would not be as favorable as with conventional a.m.

Pulse Modulation

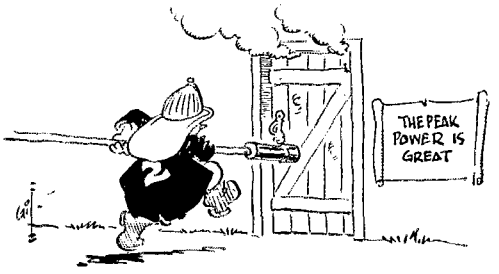
Because of the action of detectors in the presence of signal and noise it is advantageous to replace a continuous-carrier system by a pulsed system when the signal is weak compared with noise and when the receiver bandwidth must be kept moderately large to accommodate frequency instability. It may be shown [5] that when the signal is weak, even so-called "linear" detectors behave in a nonlinear manner, and the noise tends to suppress the signal. Therefore, with constant average transmitter power it is possible, by replacing a continuous-carrier signal with one containing short pulses of higher peak power, to trade a continually-existing signal which is highly suppressed for one which, although existing for only short durations, can rise above noise. On the other hand, as a pulse is made shorter the spectrum of the sidebands becomes wider, and when the reciprocal of the pulse length in seconds becomes larger than the over-all receiver bandwidth expressed in cycles per second, appreciable portions of the signal are lost. This results in distortion of the pulse shape (notably lengthening) and also a deterioration of the ability to detect the signal in the presence of noise. Thus with a bandwidth of 10 kc. pulse lengths greater than 100 microseconds should be used, while if the bandwidth is 1 Mc., pulses as short as 1 microsecond could be used. In the absence of some extraneous reason there would be little or no advantage to increasing the bandwidth and using shorter pulses, because then more noise would be introduced. In radar systems there is such an extraneous reason since the range resolution — the ability to distinguish two targets in the same direction but differing very little in distance — is improved by using shorter pulses. In simple pulsed communications systems there does not appear to be any such extraneous reason for using pulses shorter than can be accommodated in a receiver bandwidth just great enough to take care of frequency instability.

Another advantage of pulsed systems at very high frequencies is that much higher plate voltages may be applied to transmitting tubes than in continuous operation. Therefore, electron transit times are generally much smaller with the result of much higher efficiency. For these reasons tubes may be made to oscillate at higher frequencies under pulsed operation than is possible with continuous operation. Any tube with sufficiently high reserve emission and plate voltage rating may be used for pulsed operation at any frequency at which the tube can be made to oscillate. Since the average power in pulsed operation may be as large as with continuous operation the peak power may be very large indeed. In radar operation the duty cycle (that is, fraction of the total time that the transmitter is oscillating) is usually in the neighborhood of 0.1 per cent, and in pulsed telegraphy systems an approximately similar duty cycle probably would be desirable. In such a case a low-powered transmitter of 10-watt average power would have a peak power of 10 kilowatts, and the plate voltage would probably be several kilovolts! In the u.h.f. and lower-frequency microwave range disk-seal "lighthouse" tubes are very well

[4] S. Goldman, "Some Fundamental Considerations Concerning Noise Reduction and Range in Radar and Communication," *Proc. I.R.E.*, Vol. 36, p. 584 (1948).

[5] See, for example, Section 7.9 of "Microwave Receivers," edited by S. N. Van Voorhis, McGraw-Hill Book Co., New York, 1948.

suited for pulsed operation. For use above 2500 Mc. there is available a special form of magnetron, the so-called traveling-wave integral-cavity magnetron. Most of these magnetrons which can be found in the war-surplus market are designed for use only with very short pulses and may not be used for continuous operation. Their efficiency usually is sixty per cent or better.

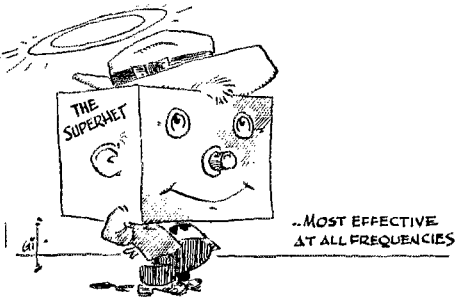


A simple pulsed telegraphy system could employ a keyed pulsed oscillator whose pulse repetition frequency is in the audio-frequency range, and the receiver would be a conventional a.m. receiver of appropriate input frequency. The pulse repetition frequency would be detected and would appear at the output of the receiver. In the case of triode transmitters the pulsing action could be supplied by grid blocking or "squegging," the same phenomenon which gives rise to self-quenched superregenerative detectors. It would be essential to provide adequate fuses to protect the tube in case the pulsing action failed and the tube either went into continuous oscillation or failed to oscillate at all. However, such a system, although very simple, would not give precise control of the pulse shape and repetition frequency. To secure such precise control a vacuum-tube pulsing circuit is required, but this would complicate the apparatus. For use with the microwave magnetrons mentioned above a vacuum-tube pulsing circuit probably is essential.

Telephony may be transmitted by pulsed methods using the audio voltage to modulate any one of the following quantities: pulse amplitude, pulse length, repetition frequency, or the timing of the pulse relative to a marker pulse, the last of these commonly being called "pulse time modulation." In order to permit separation of the audio frequency and the pulse repetition frequency in a filter in the receiver, it is necessary to use a repetition frequency at least three times as large as the highest audio frequency to be transmitted. For the transmission of speech a repetition frequency of at least 15,000 pulses per second is required. In such a situation it would be virtually impossible to use small duty cycles, and therefore it is unlikely that the advantages cited previously in the discussion of pulsed telegraphy could be exploited to any important extent in pulsed telephony. On the other hand, these systems involve the excitation of many sidebands, and therefore in principle a high degree of noise suppression is obtainable when the signal is somewhat larger than the noise just as in the case of wide-deviation f.m. However, the complexity of the circuits required for these types of modulation probably makes them unattractive for amateur communication. For commercial applications pulse time modulation has one important additional advantage. Two or more conversations may be transmitted simultaneously by using one alternate group of pulses for one conversation and another group for a second conversation. In the receiver these may be separated by a properly synchronized "gating" circuit.

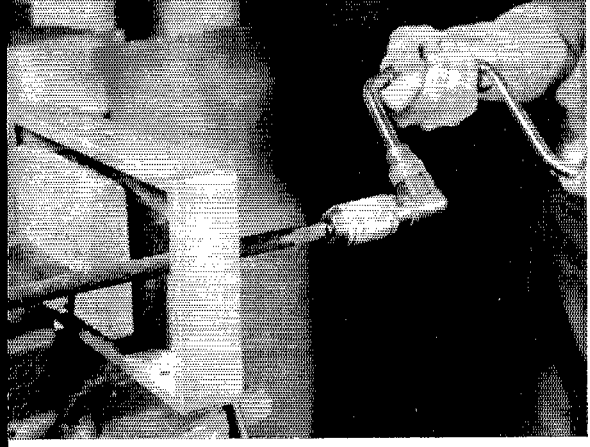
RECEIVER TECHNIQUES

The most effective type of receiver at all frequencies is the superheterodyne. At the lower frequencies it is desirable to use one or more r.f. stages mainly to suppress images and improve the noise figure but also, of minor importance, to help decouple the local oscillator from the antenna to prevent radiation and to improve stability. Although tubes exist that will amplify even at microwaves, the noise figure deteriorates to such an extent that at higher frequencies the over-all noise figure is better without r.f. amplification. Also, at microwaves silicon crystal converters are definitely less noisy than tube converters. In the 1215-Mc. band, with the tubes now available commercially, it would be very difficult to choose between an r.f. amplifier (using a "lighthouse" tube) and a crystal converter for the "front end." In the next lower band (420 Mc.) the choice would favor the r.f. amplifier, at least if carefully designed and adjusted, while in the next higher band (2300 Mc.), the choice would be completely in favor of the crystal. This situation is likely to be changed by the development of new tubes.



Because crystal converters do not amplify, attention must be paid to the noise properties of the i.f. amplifiers used with them. Furthermore, care must be exercised in the choice of the intermediate frequency. Local oscillators generate noise for a considerable range on either side of the frequency of oscillation, and if the i.f. is too low an appreciable amount of this will be in the signal channel and will be converted by the mixer to i.f. noise. (Also, image discrimination will be

(Continued on page 122)



Enlarging a hole is an easy job if you have a cheap carpenter's brace and a large rattail file. Use a block of wood for clamping a chassis in a vise.

Tools and Tricks

Some Old— Some New

BY DONALD H. MIX,* W1TS

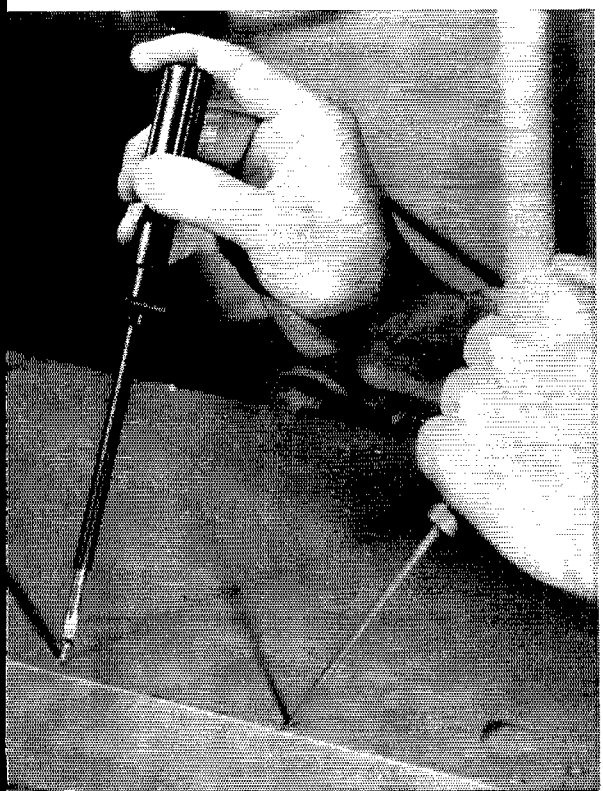
WE'LL WAGER that there aren't many readers of *QST* who can't remember being caught at one time or another in the act of cutting wire with Mom's best shears or using Dad's pet screwdriver to chisel out a hole in a chassis. Such tactics are hard on the implements, to be sure, but they are early evidence of the ability to improvise — the common trait among hams that has proved to be an invaluable asset in the armed services.

While the abuse of tools is not a practice to be universally recommended, there are many small jobs that most hams have learned to make easier by using some tools that weren't necessarily designed for the purpose. For instance, if you have to do all your chassis work with a hand drill that won't take a drill larger than ¼ inch, enlarging holes to ½ inch can be a tedious process. But if you have a dime-store carpenter's brace, you can clamp a rattail file (minus the handle) in the brace and do the job easily. Simply turn the brace in a counterclockwise direction and the file will walk through a chassis as though it were cheese. You can get these files up to ½-inch diameter or more. Don't rotate it in the opposite direction, because the file will lock up in the hole and snap off.

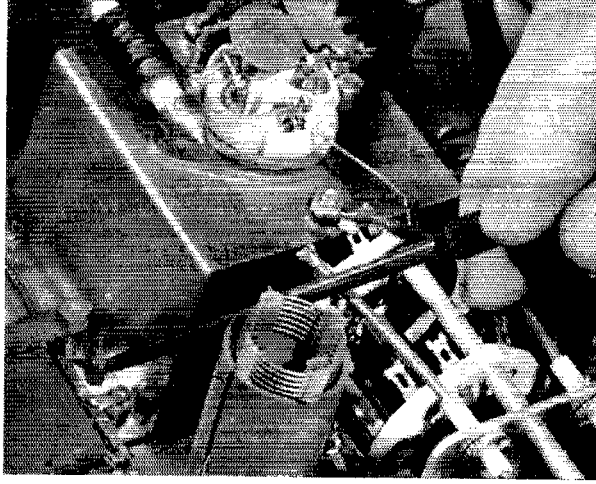
If you have a lot of holes to tap in sheet metal, you can speed up the job of threading by using the tap in the hand-drill chuck. You will have to use a little care to avoid snapping off the tap, but if you put a drop of oil on the tap every hole or two, hold the drill steady and back it up whenever it sticks, you shouldn't have any trouble. A two-speed drill at low speed is ideal for this sort of work.

If you are making a metal box, or putting a bottom plate on a chassis, it is seldom that all of the holes in the pieces to be joined will line up accurately, making it difficult to get the screws in place. After the first screw has been started, you can line up the others by jabbing an ice pick through the two holes and prying them into line. If they won't stay in line long enough to get the screw started, use the ice pick in an adjacent hole, prying in the direction that will bring the desired holes into line. The ice pick, as well as a machinist's scriber, is also an aid in steering a nut onto the end of a screw in a place where you can't reach it with your hand. If the scriber is of the type that has one end bent at right angles, you can use the bent end to rescue the nut if it falls off. As simple an item as a pair of tweezers can save a lot of wear and tear on the nerves.

* Assistant Technical Editor, *QST*.



Lining up holes with an ice pick.



The right-angled scriber can serve many purposes for which it wasn't designed.

In most dime and hardware stores, you can buy very cheaply a cast-iron handle that holds tapered keyhole saw blades. The teeth of the blades are fine enough so that they will cut aluminum quite readily and can be used for cutting out large holes in panels or chassis. If you want to hold the chassis in a vise while you're working on it, place a block of wood a little thicker than the depth of the chassis underneath. The jaws of most vises won't clear the chassis otherwise.

Several manufacturers have recognized the need for special tools of the gadget class in radio-assembly and repairing work. Most hams are familiar with the screw-type socket punches made by Greenlee and also by Pioneer.[1] But perhaps you haven't noticed that they have four marks around the "cup" part that makes it possible to center the punch when the pilot hole is much larger than the screw. Just scribe lines at right angles through the center of the hole and match up the centering marks on the punch with the lines on the chassis. This makes it easy to increase the hole diameter to take a five-prong socket, for instance, where an octal socket originally was mounted. The easy way to use these punches is to clamp the head of the screw in a vise and cut the hole by turning the chassis or panel instead of the screw.

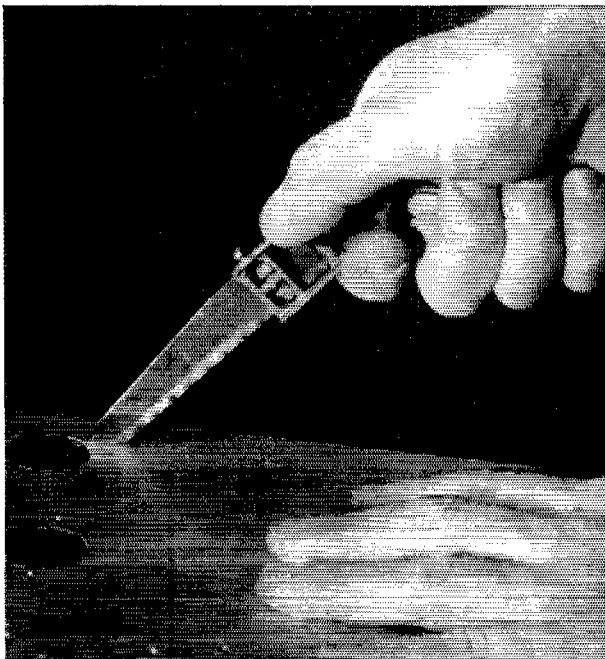
Most hams working with tools know about the automatic center punch that eliminates the need for a hammer when making hole centers in metal. Simply press down in the handle and an internal spring gives the punch a kick that will go through thin aluminum if you aren't careful. The tension is adjustable.

Hytron "Soldering Aids"[2] are fast becoming well known as indispensable tools in radio work. In case you haven't seen one, it's a harmless-looking gadget with a metal insert at either end of a wood handle. One end is forked so that it can be slipped over the end of a wire that is to be unsoldered. By working the fork up close to the connection you're working on, you can wiggle the wire to loosen it up without burning your fingers. It is especially effective in removing wrap-around connections. The metal fork is coated so that it won't get gummed up with solder itself and the mass is small enough so that it doesn't conduct all the heat away from the joint as a pair of pliers often does. The other end of the tool is a tapered spike that can be used to remove old solder from terminal holes. The "Aid" will be found to have many other uses — in restringing dial cords, for instance.

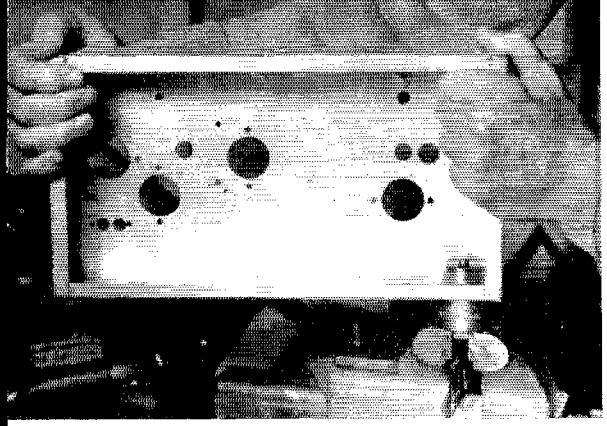
Most radio-parts catalogs carry a small angle-mounted mirror with a long handle that can be used dentist-fashion to get a peek at some hidden

[1] Greenlee Tool Co., 1867 Columbia Ave., Rockford, Ill.; Pioneer Tool Co., 5038 West Jefferson Blvd., Los Angeles, Calif.

[2] Hytron Radio & Electronic Corp., Salem, Mass.

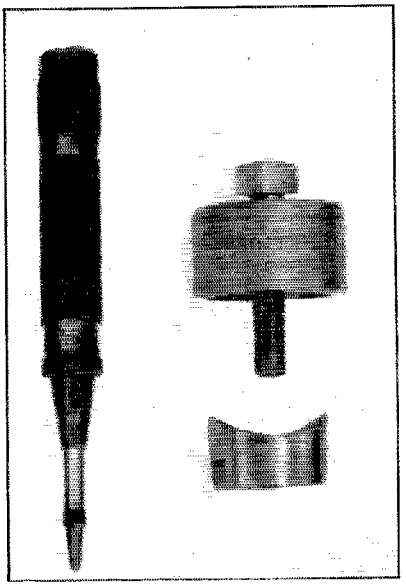


You can use this dime-store keyhole saw for cutting large holes in aluminum.



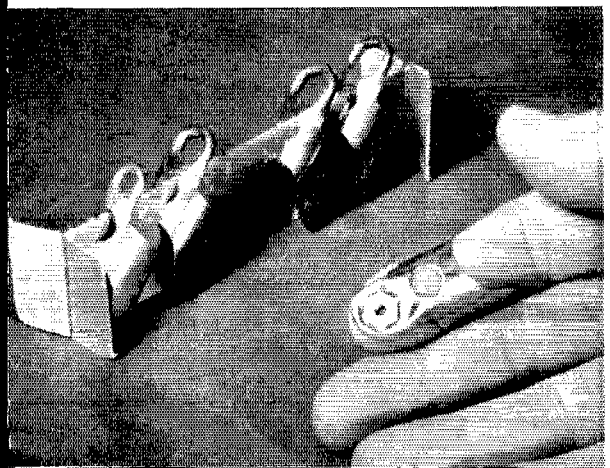
In punching socket holes, turn the chassis instead of the punch bolt.

♦



The automatic center punch (*left*) speeds up layout work. Cutting a socket hole is child's play with the screw-type socket punch at the right.

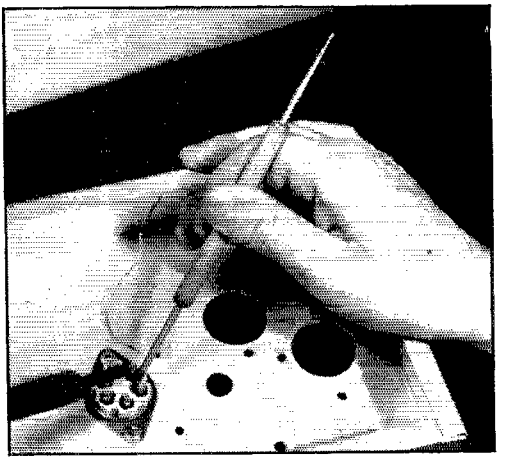
♦



part. Some of these are illuminated with penlight batteries.

One of the best screw-holding screwdrivers we've seen is a new one called the "Quick-Wedge." [3] A simple slider mechanism, which can be worked by the thumb of the hand holding the screwdriver, serves to distort the blade so that it gets a good firm grip on the screw slot. Not only is this tool ideal for inserting or removing screws in tight places, but you will find that it makes the job infinitely easier when you have a large number of short screws to put in place, as in mounting a bottom plate or assembling a shielding enclosure.

Another of the newer tools on the market is a cheap and simple, but very effective, wire stripper and cutter.[4] A simple screw-operated cam sets the stripper for various wire sizes. You can strip the end of the wire with ease in places where



The Hytron "Soldering Aid" is much more of a tool than its name implies.

you couldn't even get near it with most other types of stripper. The cutter is shear type that makes a cleaner cut than most other cutters. The tool is made of high-grade steel, so it should last indefinitely even though it can be replaced at very little cost.

How often have you tried to hold a nut with

(*Continued on page 126*)

[3] Kedman Co., 233 South 5th West, Salt Lake City, Utah.

[4] K. Miller Tool & Mfg. Co., 8 Hess St., Springfield, Mass.

♦

These "Fingertip" socket wrenches save wear and tear on your fingers if you're trying to tighten or loosen a nut.

♦

How To Test and Align a Linear Amplifier

Adjustment Procedure for a S.S.B. Amplifier

BY ROBERT W. EHRLICH,* W2NJR

It can generally be said that a transmitter is no better than its final amplifier, and this statement applies as much to a single-sideband transmitter as to any other kind — perhaps a little more so. If the linear final in an s.s.b. rig is out of adjustment, it not only can cause roughness, splatter and TVI but also will put signals right back in the suppressed-sideband space from which the exciter is working so hard to eliminate them. In other words, it can make the best exciter in the world sound pretty sick. When the linear is properly adjusted, however, the distortion or splatter components will generally represent much less than one thousandth of the total power (30–40 db. down), effectively confining the whole signal to just the passband of the exciter.

In the four years since single-sideband techniques were first described in *QST*, a lot has been learned about the treatment of linear amplifiers — much of which previously had not been of general knowledge to amateurs. Most of these new principles have been gathered together by W3ASW in his recent article,[1] and it should be required reading for the prospective user of a linear. To go a little beyond the general principles that Dick has outlined, this article has been prepared as a guide to the various types of linear-amplifier tests — their procedures, possible oscilloscope patterns, and what to do about them.

One of the more important features of the linear amplifier is that the ordinary plate and grid meters are at best only a poor indicator of what is going on. As the meters bounce back and forth, even a person who is thoroughly familiar with this kind of amplifier would be hard put to sense whether the input power registered is attributable to (a) overdrive and underload, which yield distortion, splatter, TVI, etc., or (b) underdrive and too-heavy loading, resulting in inefficiency and loss of output.

The simplest and best way to get the whole story is to make a linearity test; that is, to send through the amplifier a signal whose amplitude varies from zero up to the peak level in a certain known manner and then observe, by means of an oscilloscope, whether this same waveform comes out of the amplifier at maximum ratings.

Test Equipment

Even the simplest type of cathode-ray oscilloscope can be used for linearity tests, so long as it has the regular internal sweep circuit. If this instrument is not already part of the regular station equipment, it might be well to purchase one of the several inexpensive kits now on the market, so that it will be on hand not only to make initial tests but also as a permanent monitor during all operation. Barring a purchase, it is recommended at least that a 'scope be borrowed to make the line-up checks, whereupon the regular plate and grid meters can serve thereafter to indicate roughly changes in operating conditions.

All linearity tests require that the vertical plates of the 'scope be supplied with r.f. from the amplifier output. To avoid interaction within

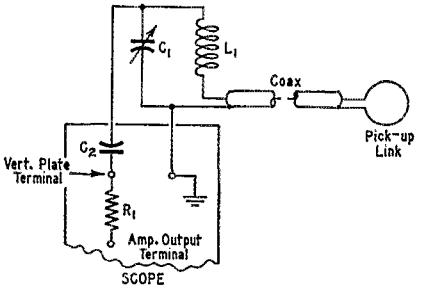


Fig. 1 — The recommended method for sampling r.f. and applying it to the vertical plates of a 'scope. The pattern height can be varied by changing the location of the pick-up loop or by varying C_1.
C_1, L_1 — Resonant to operating frequency.
C_2 — 0.01-μfd. mica or ceramic, 500 volts.
R_1 — 0.47 megohm. Replaces normal direct connection.

the instrument, it is usually best to connect directly to the cathode-ray tube terminals at the back of the cabinet. A pick-up device and its connections to the oscilloscope are shown in Fig. 1. Normally, the pick-up loop should be coupled to the dummy load, antenna tuner, or transmission

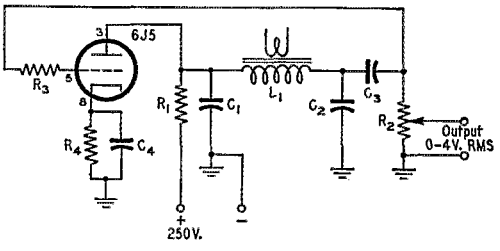


Fig. 2 — Fixed-frequency audio oscillator having good output waveform. The frequency can be varied by changing the values of C_1 and C_2.
C_1, C_2 — 0.02 μfd., 600 volts.
C_3 — 0.01 μfd., 600 volts.
C_4 — 10-μfd. 25-volt electrolytic.
R_1 — 47,000 ohms, 1 watt.
R_2 — 0.5-megohm potentiometer.
R_3 — 2.2 megohms, ½ watt.
R_4 — 1000 ohms, ½ watt.
L_1 — Small 'speaker output transformer, secondary not used.

* 21 Glenview Drive, West Orange, N. J.
[1] Long, "Sugar-Coated Linear Amplifier Theory," *QST*, Oct., 1951.

line — in other words, to a point in the system beyond where any tuning adjustments are to be made.

The only other piece of test equipment will be an audio oscillator. Since only one frequency is needed, the simple circuit of Fig. 2 works quite well. In fact, many stations have a circuit similar to this one built right into the exciter audio system.

Two-Tone Test

The two-tone test involves sending through the amplifier or the system a pair of r.f. signals of equal amplitude and a thousand cycles or so apart in frequency. The combined envelope of two such signals looks like two sine waves folded on one another. If this waveform comes out of the final, well and good; if not, there is work to do. More about that later.

There are two commonly-used ways to generate the two-tone signal, and the choice of which to use depends on the particular exciter. For purposes of this article, the two procedures are designated Method A and Method B, and they are outlined below:

Method A — for Filter or Phasing Exciters:

1) Turn up the carrier insertion until a carrier is obtained at about half the expected output amplitude.

2) Connect an audio oscillator to the microphone input and advance audio gain until (when the carrier and the one sideband are equal) the 'scope pattern takes on the appearance of full modulation; i.e., the cusps just meet at the center line. See Chart I, photo No. 1.

3) To change the drive through the system, increase or decrease the carrier and audio settings together, maintaining equality of the two signals.

Method B — for Phasing Exciters:

1) Disable the audio input to *one* balanced modulator. In the W2UNJ exciter, for example, pull out one 6K6GT; or in the SSB Jr., place a short from plate to B+ on one section of the 12AT7 audio tube.

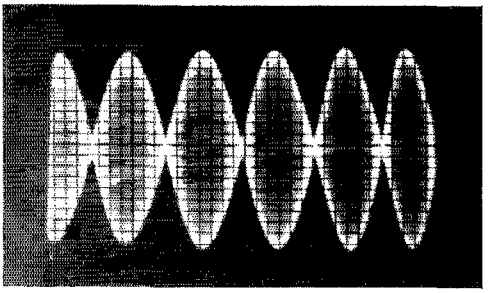
2) Connect the audio oscillator and advance audio gain to get the desired drive. Note that with one balanced modulator cut out, the resultant signal will be double-sideband with no carrier, hence two equal r.f. signals.

Double-Trapezoid Test

When Method B can be used with phasing exciters, it is possible to derive a somewhat more informative pattern by making a connection from the exciter audio system to the horizontal signal input of the oscilloscope and using this audio signal, instead of the regular internal sweep, to cause the horizontal deflection. Those who are familiar with the regular trapezoid test for a.m. transmitters will recognize this set-up as being the same, except that instead of one trapezoid, this test produces two triangles pointing toward each other.

Each individual triangle is subject to the same analysis as the regular trapezoid pattern; i.e., the sloping sides of the pattern should be straight lines for proper operation. Since it is much easier to tell whether a line is straight or not than to judge the correctness of a sine curve, the double trapezoid has the advantage of being somewhat more positive and sensitive to slight departures from linearity than is the regular two-tone pattern.

If the audio can be picked off at the plate of the audio modulator tube that is still working, the input signal need not be a pure sine wave; merely whistling or talking into the microphone



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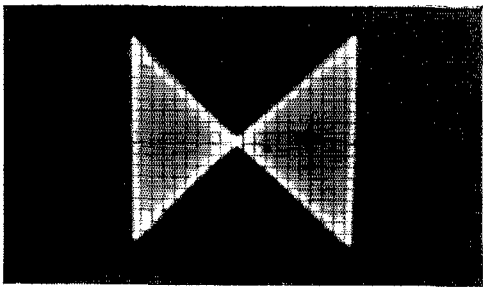

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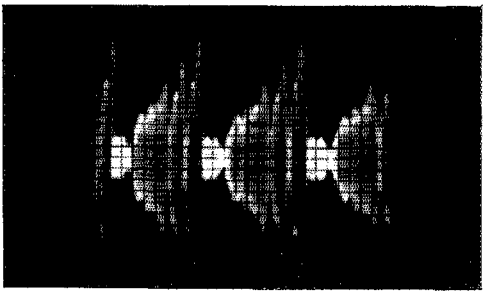

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♦

Chart I — Correct Patterns. 1 — Desired two-tone test pattern. 2 — Desired double-trapezoid test pattern. 3 — Typical voice pattern in a correctly adjusted amplifier, 'scope set for 30-cycle sweep. Note that peaks are clean and sharp.

♦

should produce the appropriate pattern. If, because of the exciter layout, it is necessary to pick

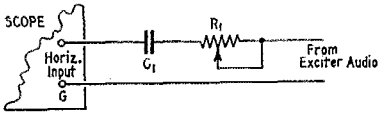


Fig. 3 — "Phaser" circuit for the oscilloscope.
C_1 — 200 $\mu\mu$fd. or as required.
R_1 — 0.5-megohm potentiometer.

up the audio signal ahead of the phase-shift network, it will then be necessary to use a good sine-wave audio oscillator as before. Also, with the latter set-up, the pattern will probably have a loopy appearance at first, and phase correction will be needed to make the figure close up. This can be done either by varying the audio frequency or by putting a phaser in series with the horizontal input to the 'scope, as shown in Fig. 3.

Ratings

Before proceeding with linearity tests, it is well to have in mind the current and power levels to expect. A suppressed-carrier signal is exactly like an audio signal, except for its frequency, so the audio ratings for any tube are perfectly applicable for linear r.f. service where no carrier is involved. On the other hand, the ratings sometimes shown for Class B r.f. telephony are *not* what is wanted, because they are for conventional a.m. transmission with carrier.

Class B, AB or A can be used. Audio ratings are frequently given for two tubes in push-pull but, unlike audio service, a Class B r.f. amplifier works quite well in a single-ended circuit. Therefore, if the amplifier is to be a single-tube stage, one-half the power and current ratings given for two tubes should be used.

If audio ratings are not given for the desired tube type, it will be safe to assume that the maximum-signal input for Class B or AB_2 service is about 10 per cent less than the key-down Class C c.w. conditions. The input will have to be held somewhat lower in Class AB_1 operation because the average efficiency is lower and, also, the tube can draw only a limited amount of current at zero grid voltage.

The maximum-signal conditions determined

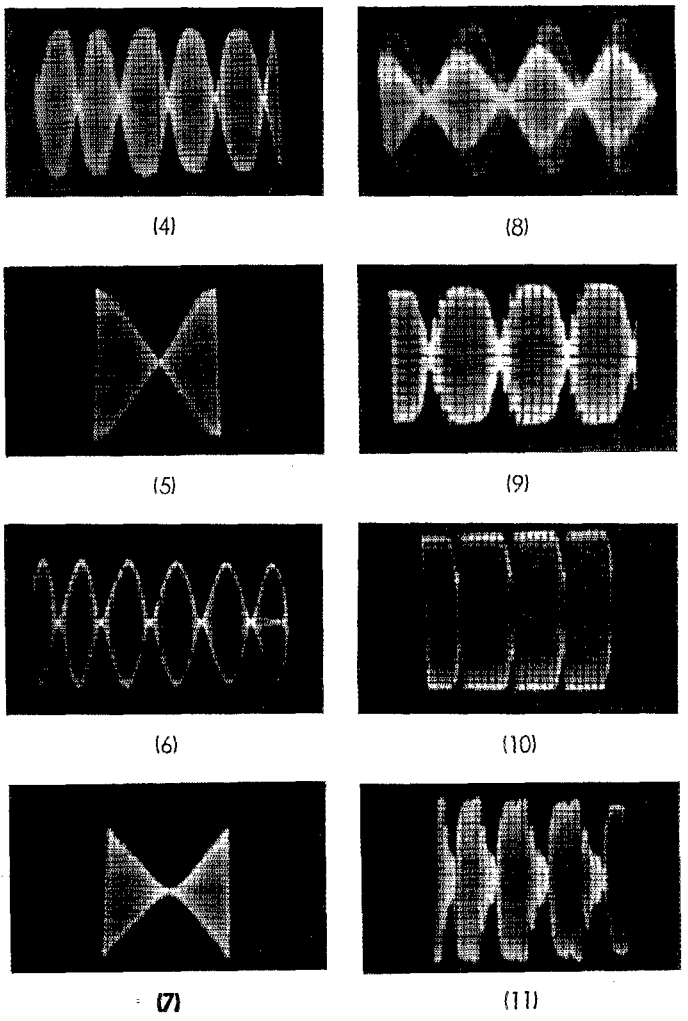


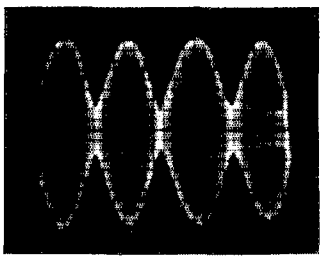
Chart II — Improper Amplifier Operation. 4 — Overdrive, indicated by flattening of peaks. 5 — Same as 4, double-trapezoid test. 6 — Too much bias, causing crossover to become pinched together rather than cutting straight across center line. 7 — Same as 6, double-trapezoid test. 8 — Two-tone test with v.h.f. parasitics. Note fuzzy halo or fringe. In milder cases the fuzziness will appear just at the peaks. 9 — Two-tone test with fundamental frequency parasitics, accompanied by overdrive. 10 — Severe overdrive and parasitics. 11 — Voice pattern showing flattening of peaks due to overdrive. When flattening is apparent on the voice pattern, the case is a severe one.

from tube data correspond in s.s.b. work to the very peak of the r.f. envelope. In a correctly-adjusted amplifier, the rated peak input would register on the meters only if one were to whistle into the microphone, otherwise the meters will always read less. In particular, the average input under two-tone linearity-test conditions is close to 65 per cent of the actual peak input for a Class B amplifier, about 75 per cent for a Class AB_2 stage, and 80 to 90 per cent for Class AB_1. With typical voice operation, the meters will kick up only to a smaller fraction of the same peak input — around 30 to 60 per cent for Class B, 50 to 70 per cent for Class AB_2, and approximately 70 to 80 per cent for Class AB_1.

To take a typical example, two 811As are rated for a maximum Class B input of 470 watts. If a single 811A is used in the r.f. final amplifier, its maximum signal input should be 235 watts and, to operate up to this rating, it should be lined up with a linearity test to about 150 watts input. Under normal voice operation, the meter will then read up to around 100 watts.

Using the Linearity Tests

The photos accompanying this article have been taken to show many of the typical patterns that may be encountered with either of the test arrangements described previously. They are classified separately as to those representing correct conditions (Chart I), faulty operation of the r.f. amplifier (Chart II), and various other patterns that look irregular but which



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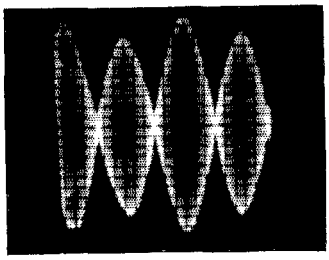

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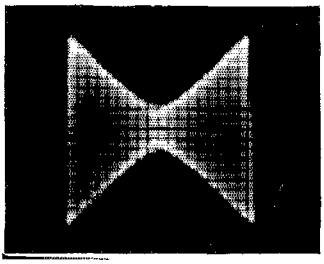

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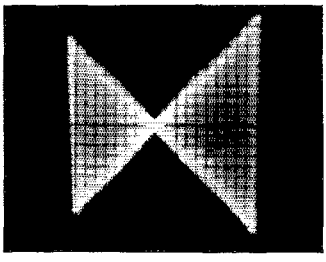

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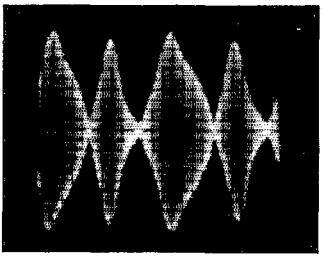

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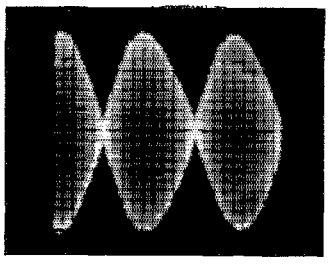

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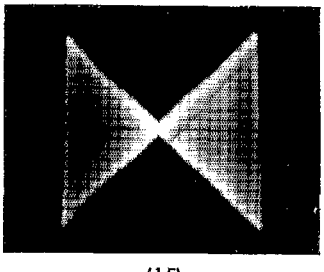

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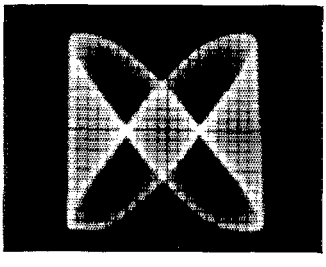

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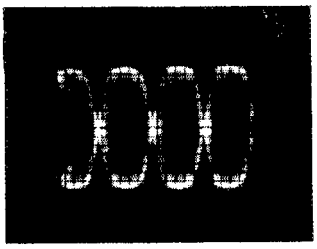
Chart III — Improper Test Set-up. 12 — Two r.f. signals unequal. In method A, caused by improper setting of either carrier or audio control. Method B, either carrier leakage through disabled modulator or unequal sidebands due to selective action of some high-*Q* circuit off resonance. 13 — Same as 12, double-trapezoid test (Method B). 14 — Distorted audio. A clue to this defect is that successive waves are not identical. 15 — Same distortion as 14, but switched to double-trapezoid test pattern. Note that correct pattern prevails regardless of poor audio signal. 16 — Carrier leakage through working modulator (Method B only). 17 — Same as 16, double trapezoid. 18 — (Note tilt to left.) Caused by incomplete suppression of unwanted sideband (Method A) or by r.f. leakage into horizontal circuits of 'scope. 19 — Double trapezoid with audio phase shift in test set-up.



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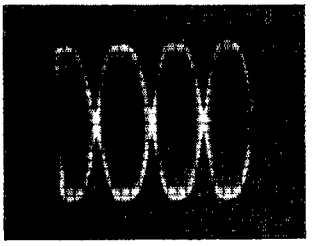

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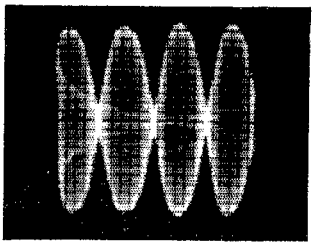

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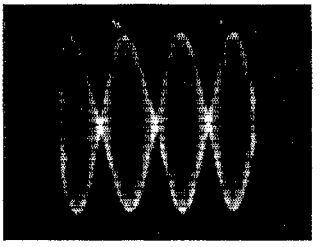
Chart IV — Amplifier Loading Characteristics. Two-tone patterns taken at the output of a Class B linear amplifier with constant drive and successively heavier loading. Measured input power: 20 — 90 watts; 21 — 135 watts; 22 — 250 watts; 23 — 330 watts; 24 — 400 watts.



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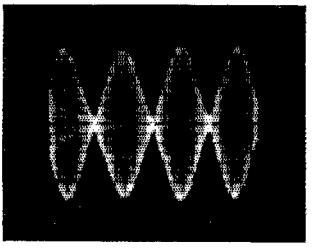


(24)

really represent a peculiarity in the test set-up or the exciter but not in the final (Chart III).

Aside from the problem of parasitics, which may or may not be tough one, it should be possible without much difficulty to achieve the correct linearity pattern by taking action as indicated by the captions on the photos. It can then be assumed that the amplifier is not contributing any distortion to the signal so long as the peak power level indicated by the test is not exceeded. It is entirely possible, however, that good linearity will be obtained only by holding the power down to a level considerably below what is expected, or conversely that there will be signs of excessive plate dissipation at a level that the tubes should handle quite easily. In such cases, some attention should be given to the plate loading, as discussed below.

The several patterns of Chart IV were made to show how loading affects the output and efficiency of a linear amplifier. In the first two, loading is relatively light and limiting takes place in the final plate circuit. Reserve power is still available in the driver, evidenced by the fact that heavier loading on the final allows the peak output to increase up to the optimum level of the third pattern. With still heavier loading the output ceases to increase but in fact drops somewhat; even though the input power goes up all the time, the efficiency goes down rapidly. In the last two patterns, the driver is the limiting element in the system, and the extra power-handling *capability* of the final, due to heavier loading, is wasted by inability of the driver to do it justice. The following conclusions may be taken:

1) For good efficiency, the final itself must be the limiting element in the power-handling capability of the system.

2) If the final is not being driven to its limit, it should be loaded less heavily until such is the case.

3) If the power level obtained above is less than should be expected, more driving power is needed.

There are several ways to tell whether or not the final is being driven to its limit. One way is to advance the drive until peak limiting is apparent in the output, then move the oscilloscope coupling link over to the driver plate tank and see whether or not the same limiting appears there. Another way is to decrease or increase the final loading slightly and note whether the limiting output level increases or decreases correspondingly. If it does not, the final is not controlling the system. Still another but similar method, suggested by Reque,[2] is to detune the final slightly while limiting is apparent, and if proper drive conditions prevail the pattern will improve when the amplifier plate is detuned.

The intermediate and driver stages will follow the same laws, except that the thing called "loading" on a final is often referred to as "impedance matching" when going between tubes. More often than not, an apparent lack of power transfer from a driver to its succeeding stage is due to a poor match. Just as in Class B audio service, a step-down type of coupling is required between power stages, and the person who is accustomed to the conventional plate-to-grid coupling-condenser technique will be surprised to find how effective it is to tap the driven stage down on its tank — or otherwise to decouple the system. For example, an 807 driving a pair of 811s requires a voltage step-down of about 3 or 4 to 1 from plate to each grid.

Dummy Load

For the sake of everyone concerned, linearity tests should be kept off the air as much as possi-

(Continued on page 128)

[2] Reque, "Linear R.F. Amplifiers," *QST*, May, 1949.

So far as we (meaning V.H.F. Editor W1HDQ) know, all of the 50-Mc. s.s.b. work is confined to the W1 call area, with **W1s PNB, CGY** and **SCO** breaking the trail. As you can well imagine, it's a lonely sort of life, since reception is only possible with crystal-controlled converters, and the faster tuning rate of 50-Mc. receivers makes it easier for stations to pass over the carrierless transmissions. However, patience finally paid off for W1CGY, and he established the first long-hop s.s.b. QSO on 50 Mc. by working VE3AET via aurora last March. Conditions were marginal and changing fast, so extensive tests could not be made, but there is some indication that the s.s.b. transmissions would be readable in aurora when double-sideband a.m. is out of the question.

In a nice letter from Hans Alvim, **LA6J**, he tells of his s.s.b. experiences. His first rig was a phasing job running about 150 watts, and during the year it was used his best DX was a VK. His current rig is patterned after "SSB Jr." (*GE Ham News*, Nov.–Dec., 1950) and ends up with a pair of 811-As on all bands, 80 through 10. The receiver consists of crystal-controlled converters ahead of a BC-453 (German version) tuner.

At a dinner held in New York City in March for the s.s.b. gang, about 30 active s.s.b. operators showed up, from W2, W3, W4, W6 and W8. The only complaint about the otherwise wonderful affair was that there wasn't enough time for everyone. Credits for the arrangements and thanks from everyone go to **W2NJR.**

W6GGM at Santa Cruz, Calif., has some interesting dope on s.s.b. out his way. Out there they have been operating a great deal around 3800 kc. They find it to be a good spot, and it has the advantage of being tuned first by the DX stations. Walt worked ZS6DW (3695) in February and ZS6KD (3690) in March, both around 8 P.M. Their carrier could be heard on several different occasions, but their modulation could be heard only on the two nights when contacts took place. Walt is sure that contacts will be more frequent when these ZSs get their s.s.b. rigs going. **W6EDD** and **W7JOK** have also gotten through to ZS.

W6GGM is using a W2UNJ exciter with 2E26s in place of the 6V6s, with a positive bias of about 30 volts on the screens. The idling current is low under these conditions, of course. Zero screen bias has been tried, but the linearity is not as good. Plate voltages up to 1000 have been used, but with 500 volts there is plenty of drive for the p.p. 100THs.

At the recent IRE Convention in New York, Murray Crosby delivered an interesting paper on exalted-carrier reception and mentioned the "product" detector shown in Fig. 1. No values were given, but R_1 and R_2 would be normal grid leaks of 0.5 megohm or so, R_4 would be a normal plate load resistor for V_3 in audio service, and R_5C_1 an audio and r.f. filter. R_3 might require some selection, depending upon the tube types that are used. The circuit is certainly worth a try as a good detector for s.s.b. or c.w. reception.

Ken Stiles, **W2MTJ**, passes along some useful tips to those fellows who have built or are building W1JEO-type exciters (Nov., 1950, *QST*, or current *Handbook*). To quote his letter, "A number of fellows have trouble getting adequate carrier suppression in the W1JEO exciter. The trouble appears to be that the crystal oscillator operates on one mode of crystal resonance and the suppression crystal operates on the other, with a consequent difference in frequencies of 500 cycles or more. A change in the oscillator circuit of the 6K8 triode section will take care of the situation. The arrangement in Fig. 2A, using a Pierce oscillator, works fine at W2MTJ and has been successfully adapted by several others. It results in the oscillator frequency being very close to the frequency of the suppression crystal. By tuning C_1, the oscillator frequency can be set exactly in the slot of the suppression crystal. No changes are required in the remainder of the 6K8 circuit. The oscillator injection voltage obtained is adequate for several volts of audio input. In my exciter I limit the audio input to 1 volt, however, to get the proper level for the two-tone test pattern.

"When the Pierce oscillator was first used like this, the amount of carrier at the output of the carrier-reinsertion amplifier was inadequate, and a slight change was required in the circuit, as shown in Fig. 2B. With this arrangement, sufficient carrier reinsertion is obtained to be equal (at the 6SN7 grids) to the component obtained with 1 volt of audio input to the 6K8.

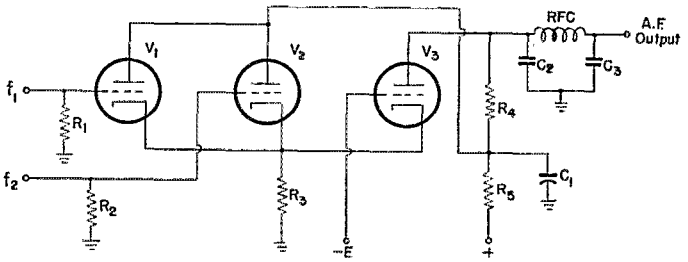
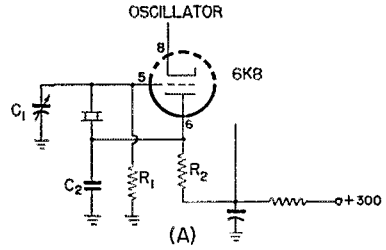
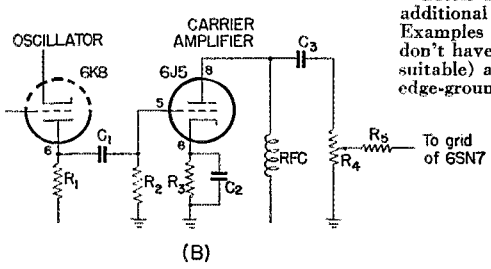


Fig. 1 — The Crosby "product" detector. The two signals, f_1 and f_2, are isolated by cathode followers V_1 and V_2 and mixed in V_3. The bias on V_3, $-E_c$, is adjusted for minimum amplitude detection. The filter C_2, C_3 and *RFC* attenuates f_1 and f_2 and prevents their overloading the audio amplifier.

Here is a station that is about as far from the average as you can find. W4OLL at Herndon, Va., operated by Jack Brown of crystal-lattice fame, is set up for only two modes of communication: single sideband and radioteletype! The transmitter runs a kilowatt to a 304TL — receiving gear is a Super-Pro with provision for crystal stabilization, a 20-kc. selectable-sideband adapter, and a Panadaptor.

QST for





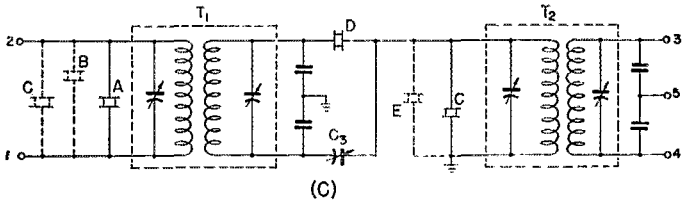


Fig. 2 — Improvements for the W1JEO crystal-filter exciter suggested by W2MTJ.

The revised oscillator circuit at A permits adjustment of the oscillator frequency and consequently better carrier rejection. C_1, 100-$\mu\mu$fd. adjustable; C_2, 470 $\mu\mu$fd.; R_1, 0.1 megohm; R_2, 20,000 ohms.

The revised oscillator circuit does not offer as much voltage available for carrier reinsertion, and the circuit of B gives more amplification. C_1, 47 $\mu\mu$fd.; C_2, 0.01 μfd.; C_3, 0.001 μfd.; R_1 and R_4, 20,000 ohms; R_2, 0.12 megohm; R_3, 1000 ohms; R_5, 0.2 megohm.

Better sideband rejection is obtained by paralleling additional crystals, as shown by the dotted lines in C. Examples of crystal-channel numbers (although these don't have to be used — any adjacent channels will be suitable) are: *A*, 323; *B*, 322; *C*, 321; *D*, 320; *E*, 321, edge-ground to raise frequency several hundred cycles.

"The use of additional crystals in the filter has proven beneficial. These crystals, placed in parallel with the normal suppression crystals, will provide more uniform suppression of the unwanted sideband and can even be used to control the 0-200-cycle portion of the wanted sideband to obtain a more desirable speech-equalization characteristic. The additional crystals can be added either in parallel with the sideband-suppression crystal, *A* of Fig. 2C, or in parallel with the carrier-suppression crystal, *C*. Example crystal-channel numbers are given in the sketch, but any crystals in the range can be used, provided they are for adjacent channels and the same relationship is retained. The use of multiple crystals results in a slight increase in capacity across the transformer winding, and the transformer tuning condenser must be retuned when the crystals are added. It should be noted that crystals of the two-digit series that fall in the desired frequency range may also be used to fill in between the three-digit-series crystals normally used. If these are not available, the crystals at hand can be edge ground to fit them in where a hump is observed in the suppression characteristic of the unwanted sideband. With a little time spent in adding crystals, and retuning C_3 to obtain the best suppression characteristic, it is possible to obtain an average suppression of the unwanted sideband near 30 db. C_3 should be checked for optimum tuning each time a crystal is added or changed."

Arnold King, **W2JJC**, recently worked ZS6KD on 75 s.s.b., and the antenna he used is an interesting one. As shown in Fig. 3, it is a "turnstile" antenna. These antennas are, of course, widely used in v.h.f. work, but this is the first instance we know of their being used on low frequencies. They are practically nondirectional in the horizontal plane.

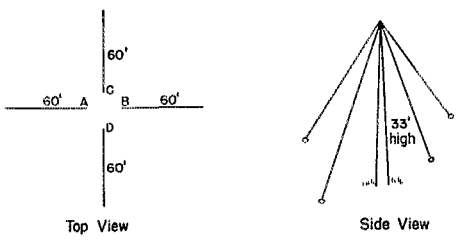


Fig. 3 — The 75-meter "turnstile" antenna used at W2JJC is only 33 feet high at the center and 10 feet high at the corners, but it works out very well. Points *A* and *B* are fed with one length of RG-8/U cable and points *C* and *D* fed with another length a quarter-wavelength (41 feet) longer. The two coaxial lines are then connected in parallel at the transmitter and coupled in the normal way.

The antenna changeover used at W2JJC is also quite interesting, since it permits the use of the same antenna for transmitting and receiving without the big change-over relays usually associated with such practice. As shown in Fig. 4, a quarter-wave stub is shorted out when transmitting,

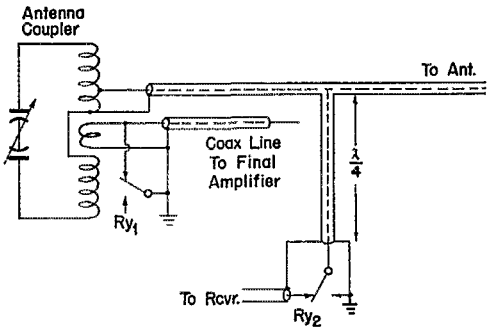


Fig. 4 — The duplexing system at W2JJC uses no antenna relays in the usual sense. The feed line from the antenna runs to an antenna coupler and is tapped across a portion of the coil. A quarter wavelength of coaxial line (41 feet at 3995 kc.) tapped off the main feed line runs to R_{y2} and then to the receiver. On transmit, R_{y2} disconnects the receiver and shorts the end of the quarter-wave line, so that it has no effect on transmission. During receiving periods the link from the transmitter is shorted by R_{y1}.

but during receiving the stub feeds on through to the receiver. In Arny's set-up, R_{y1} is a d.p.d.t. relay in which the second circuit controls screen voltage to his 813s. R_{y2} is also a d.p.d.t. affair; the second arm swings a ground to either exciter or receiver, for control of their respective circuits. Both relays are operated by voice control. The quarter-wave stub must be changed for each band, of course. — *B. G.*

The 6BQ7 on Six and Two

Cascode-Type R.F. Amplifiers for V.H.F. Use

BY C. VERNON CHAMBERS,* WIJEQ

V.H.F. men, always quick to employ new tubes and techniques that will improve reception at the higher frequencies, are now well acquainted with the 6BQ7 low-noise dual triode and the use of the cascode-type amplifier circuit. This combination, the 6BQ7 and the cascode, has already proven its worth while serving in a v.h.f. converter [1] and, as a result, it does not seem necessary to resing the praises of this *hot* front end. Rather, we shall immediately commence the description of a pair of simple r.f. amplifiers that will add considerably to the effectiveness of existing 50- and 144-Mc. receiving equipment that may be deficient in signal-to-noise ratio or gain.

Separate amplifiers were built for the two bands because a good one-band job usually outperforms a multiband unit that requires coil changing. Simplicity of construction and alignment also go hand-in-hand with one-band circuits. Fortunately, this version of the cascode is a conservative user of parts and, as a result, cost need not be the factor that determines how many circuits will be used for the job on hand.

Each of the cascode amplifiers or "direct-coupled driven-grounded-grid" circuits, as they are sometimes called, uses a 6BQ7 tube. The amplifiers are broadband affairs which ordinarily require no retuning after the preliminary alignment has been made. Their gain is approximately 15 and 12 db. at 50 and 144 Mc., respectively. The signal-to-noise ratio compares favorably with that obtained with any good triode amplifier and is superior to that of a pentode amplifier having equivalent gain. An inexpensive power supply is an integral part of the unit.

The Circuits

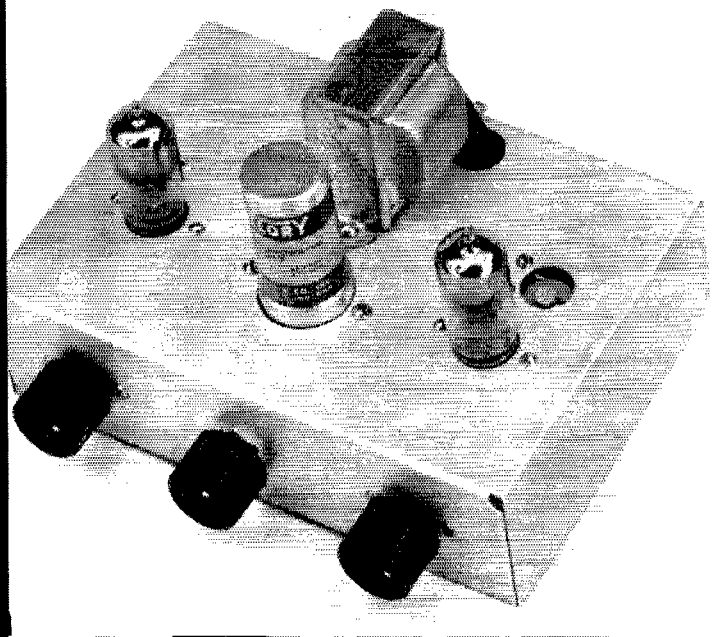
Both of the r.f. amplifiers employ the circuit shown in Fig. 1. The parts list that accompanies the schematic identifies the components having one-band characteristics. In the circuit, C_3 and L_1 form a high-C resonant tuner that is tightly coupled to the input inductor, L_2. The output circuit consists of capacitor C_8, the upper section — the part above the tap — of L_3 and the output link, L_4. A variable padder is used as C_8 at 50 Mc. and a fixed 2-$\mu\mu$fd. ceramic is used as the padder at 144 Mc. If a ceramic trimmer having a sufficiently-low minimum capacitance is available, it may be used as C_8 at the higher frequency. A Centralab type 822 trimmer having a minimum capacitance of 1.5 $\mu\mu$fd. will serve the purpose nicely.

The amplifier circuits are made completely stable by employing shielding — more about this later — and neutralization. The neutralizing circuit has a 1-$\mu\mu$fd. capacitor, C_5, connected between the input grid of the 6BQ7 and the lower end of the plate coil. When used with the power supply to be described, the amplifier tubes operate with low plate voltage and, as a result, the tendency toward self-oscillation is extremely slight. In fact, the circuits will not take off without neutralization under some conditions of loading. However, the noise figure is improved slightly by neutralization.

The power supply for the amplifiers uses a

* Technical Assistant, *QST*.

[1] Tilton and Chambers, "Using the 6BQ7 on 220 and 144 Mc.," *QST*, September, 1951.



The 50- and the 144-Mc. r.f. amplifiers are at the right and the left ends of the chassis, respectively. The power transformer is to the rear of the filter capacitor and the control switch is centered on the front wall of the assembly.

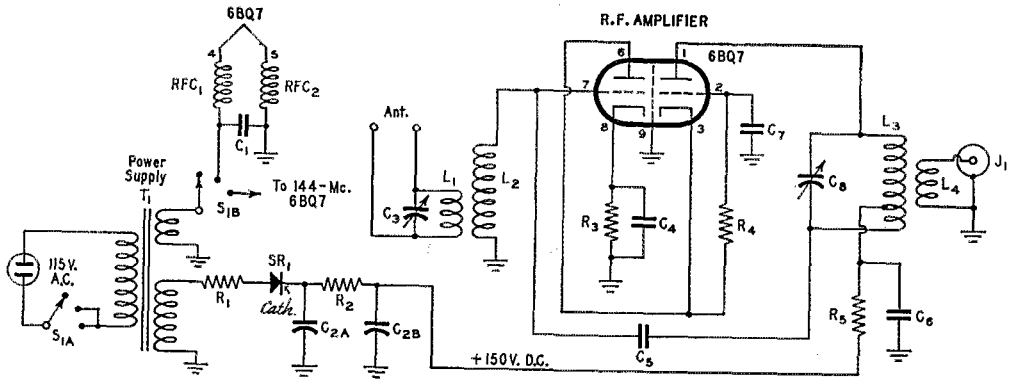


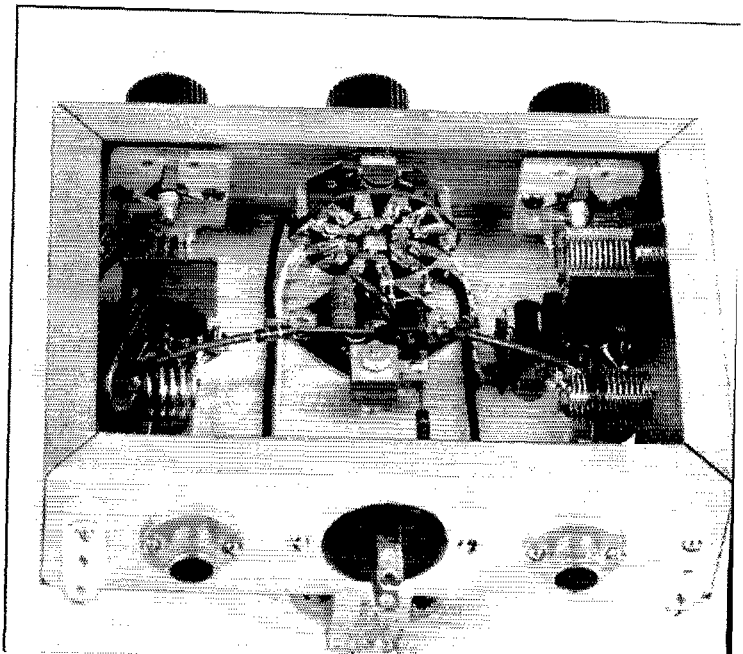
Fig. 1 — Circuit diagram of the 6BQ7 amplifier unit.

C_1, C_4, C_6, C_7 — 0.001-μfd. disk ceramic.
C_{2A}, C_{2B} — Dual 20-μfd. 250-volt-wkg. electrolytic (Mallory FP-217).
C_3 — 15-μμfd. variable (Millen 20015).
C_5 — 1-μμfd. silver mica.
C_8 — 50 Mc.: 4.5–25 μμfd. ceramic trimmer (Centralab 822).
144 Mc.: 2-μμfd. ceramic (Erie Ceramicon).
R_1 — 22 ohms, ½ watt.
R_2 — 3300 ohms, ½ watt.
R_3 — 100 ohms, ½ watt.
R_4 — 0.47 megohm, ½ watt.
R_5 — 1000 ohms, ½ watt.
L_1 — 50 Mc.: 6 turns No. 20 tinned, 5/8-inch diam., 3/8 inch long (B & W Miniductor No. 3007).
144 Mc.: 3 turns No. 16 enam., 3/8-inch diam., turns spaced wire diam.
L_2 — 50 Mc.: 11 turns No. 20 tinned, 5/8-inch diam., 11/16 inch long (B & W Miniductor No. 3007).
144 Mc.: 5 turns No. 16 enam., 3/8-inch diam., ½ inch long.
L_3 — 50 Mc.: 14 turns No. 20 tinned, ½-inch diam., 7/8 inch long, tapped at 3 turns from C_5 end. (B & W Miniductor No. 3003).
144 Mc.: 6 turns No. 14 tinned, 3/8-inch diam., 5 turns spaced diam., last turn adjustable, tapped 1 turn from C_5 end.
L_4 — 50 Mc.: 3 turns No. 22 enam. wound around L_3 just above the tap.
144 Mc.: 2 turns No. 18 enam., 3/8-inch diam., inserted between 4th and 5th turns of L_3.
J_1 — Coaxial cable connector.
RFC_1, RFC_2 — 50 Mc.: 8 turns each No. 18 enam., close-wound (bifilar) on 3/16-inch diam.
144 Mc.: Same as above only 5 turns each.
S_{1A}, S_{1B} — 3-pole 3-position selector switch with one section unused (Centralab 1407).
SR_1 — 20-ma. selenium rectifier (Radio Receptor Corp. 8Y1).
T_1 — Power transformer: 150 volts r.m.s., 25 ma.; 6.3 volts, 0.5 amp. (Merit P-3046).

TV booster-type power transformer, an inexpensive selenium rectifier and a resistance-capacitance filter. This supply delivers approximately 160 volts at the current drawn by a single 6BQ7, furnishes 6.3 volts a.c. for the amplifier-tube heaters, and can be put together for less than five dollars. A.c. input to the power transformer is controlled by S_{1A} and section S_{1B} is a heater switch used to activate either one of the r.f. stages.

Construction

An aluminum chassis measuring 2 by 5 by 7 inches is used as the base for the amplifier assembly. Naturally, a smaller chassis may be used if the constructor is interested in only one of the preamplifiers. Top and bottom views of the unit show how the r.f. circuits are laid out to the right and the left of the supply components. If the 6BQ7 tube sockets are set back two inches from the front wall of the chassis, there is ample



A bottom view of the amplifier unit showing the input and the output connectors mounted on the rear wall of the chassis. Power supply components are centered in the chassis.

room for mounting the input coils between the sockets and the antenna tuning capacitors. The antenna coils, L_1 on the diagram, are mounted directly on the terminals of the panel-supported variable capacitors and the grid inductors, L_2, are soldered between the No. 7 prongs of the sockets and grounded soldering lugs. As seen from the bottom view, the heater r.f. chokes are connected between the sockets and the tie-point strips which are located to the left of the sockets.

The 50-Mc. plate circuit has the inductor mounted on the ceramic trimmer, C_8. In turn, C_8 is supported away from the underside of the chassis by means of metal pillars and 4/40 hardware. A $\frac{5}{8}$-inch hole is cut in the chassis directly above the capacitor, thus making adjustment from the top of the chassis possible. The 144-Mc. plate coil is supported at the plate end by prong No. 1 of the tube socket and at the other end by a tie-point strip, which is in turn mounted to the rear of the socket.

Flashing copper is used as the shielding between the input and the output circuits of the amplifiers. This material can be obtained at most hardware stores and can be easily cut into 1-inch squares with the aid of tin-snips and then soldered to the center posts of the tube sockets by using a soldering iron of ordinary weight.

Testing

The power supply should be tested with the amplifier decoupling resistors, R_5, disconnected from the junction of R_2 and C_{2B}. Under this no-load condition, and with S_1 set to deliver 115 volts a.c. to T_1, the output voltage of the supply should measure approximately 200 volts. If the resistors are now connected in place and the supply again turned on, the output voltage should drop to approximately 160 volts after the 6BQ7 (whichever one happens to be in use) has warmed up. Cathode voltage for the amplifier tube should measure about $\frac{3}{4}$ volt if the circuit is not oscillating. If there is any doubt about the stability of the circuit, it is advisable to insert a 10- or 15-ma. meter in series with R_5 so that plate-current behavior may be examined. If the current does not remain stationary at approximately 6.5 ma. when the grid coil is touched, it is an indication that the neutralization is not complete. Lack of neutralization at 50 Mc. is corrected for by repositioning the tap on L_3 and at 144 Mc. by adjusting the spacing between the last two turns of L_3.

There should be no difficulty in lining up the 50-Mc. amplifier if a test signal is available. It is only necessary to peak the input and the output circuits at the approximate center of the band by means of the variable capacitors. Input and output coupling will be proper if the output link is tightly coupled to L_3 and if the antenna coil is placed as close as possible to the grounded end of L_3.

The 144-Mc. amplifier is a little more difficult to align and, if a grid-dip meter is available, it should be used to check the resonant frequency of L_2 and L_3. These inductors should be made to resonate at the center of the band by either closing or opening the spacing between turns. It is advisable to have the plate-voltage lead disconnected and the heater-voltage line applied during these adjustments.

After the 144-Mc. circuits have been resonated, the over-all frequency response may be flattened by adjusting the coupling to the input and the output circuits.

The gain figures mentioned earlier were made while using the amplifiers ahead of the crystal-controlled converters described at an earlier date. [1], [2] The antennas employed were fed with 300-ohm line and 75-ohm coaxial cable was used between the amplifiers and the converter input circuits. A separate power supply capable of delivering up to 250 volts may be used if desired. The gain of the amplifiers may be slightly higher at the increased voltage.

[2] Tilton and Chambers, "Crystal-Controlled Converters for V.H.F. Use," *QST*, September, 1950. Also *Radio Amateur's Handbook*, 1952 edition.

May, 1927

. . . Government radio regulation is rapidly stabilizing and amateurs are warned to observe the band limits which have now become enforcable law.

. . . "Emergency Transmitters," by Rufus P. Turner, 1AY, stresses the need for such auxiliary apparatus in every truly progressive amateur installation.

. . . A simple low-power transmitter using UX-171 tubes in a self-rectifying Hartley circuit is detailed by Assistant Technical Editor Harold P. Westman.

. . . Commercially-available relays applicable to amateur gear are listed and described by Technical Editor Kruse.

. . . Performance of the UX-852 T-type transmitting tube is thoroughly discussed by Mr. Kruse.

. . . For good results at low cost, S. E. Hall's article on electrolytic rectifiers recommends the use of sodium bicarbonate as the electrolyte.

. . . It's false economy, writes 2PF, to use fifteen-dollar 150–200-meter crystals for harmonic operation in lieu of 80-meter crystals selling for ten dollars more.

. . . A Five-Meter CQ Party is announced, its object to stimulate activity in this range.

. . . Seattle's 7BB has logged the 5-meter test transmissions of 2EB, Jamaica, L. I., N. Y. Oscillating detectors with single stages of audio were used by 9EHT and 9BVC to copy 2EB's signals.

. . . The widely-held belief that 20 meters is strictly a daylight band is being dispelled by numerous reports of DX worked at night.

. . . A letter from Karl E. Zint, radio operator aboard Zane Grey's yacht *Fisherman*, thanks amateurs for outstanding service in the handling of DX traffic.

. . . 1NF and 9DMJ are described and pictured as typical up-to-date amateur stations of the day.

14,350–14,400 KC. WITHDRAWN

Effective April 1st, to conform to the new Atlantic City table of allocations, the amateur 20-meter band was modified by FCC to read 14,000–14,350 kc. The top 50 kc. is withdrawn from amateur use. See "Happenings" in this issue for more details.

Tuning Two Meters on the Car Receiver

A Crystal-Controlled Converter for Civil Defense

BY JAMES H. CREUTZ,* W2PMQ

• By selecting the frequency of 146.25 Mc. for the crystal-controlled oscillator of this little converter, it is possible to tune the two c.d. bands of 145.17 to 145.71 and 146.79 to 147.33 simultaneously by tuning the car b.c. receiver from 540 to 1080 kc. This system not only permits a converter of very small dimensions, but also provides excellent frequency stability and ease of tuning superior to any other system. As the photographs show, the construction of the unit is simplicity itself.

THIS 2-meter mobile converter was designed expressly for operation in the two bands earmarked by the FCC for civil defense communications — 145.17 to 145.71 Mc. and 146.79 to 147.33 Mc. These frequencies are covered completely, merely by tuning the automobile broadcast receiver over the range of 540 kc. to 1080 kc. This makes it quite practicable to enjoy, during 2-meter mobile operation, the ease of tuning and the frequency stability afforded by a broadband crystal-controlled converter. The converter is simple; its three tubes draw only 20 ma. at 150 volts, which even the garden-variety of automobile broadcast receiver can spare. Voltage regulation is not necessary.

Simultaneous Tuning

The trick of tuning two bands, each 540 kc. wide and separated by 1080 kc. on a broadcast receiver having a total coverage of only a little over 1000 kc., is accomplished by simultaneous tuning of both bands. The converter and automobile broadcast receiver constitute a double-superheterodyne receiver in which tuning is accomplished by varying the first intermediate frequency (tuning the broadcast receiver, in other words). Fixing the converter mixer injection frequency at 146.25 Mc. permits the converter to transform all frequencies in one of the desired bands, from 146.79 to 147.33 Mc., into frequencies from 540 kc. to 1080 kc. which the broadcast receiver can select. (In this function the received frequency is *higher* than the injection frequency.) Simultaneously the converter mixer is transforming all frequencies from 144.71 Mc. to 145.17 Mc. into frequencies from 540 kc. to 1080 kc. which the broadcast receiver can select. (In this function the received frequency is *lower* than the injection frequency.)

Normally, one of the two frequencies being received simultaneously would be called the desired frequency and the other the image frequency. The receiver would be described as a superheterodyne in which the image ratio is very poor. But inasmuch as the images are within a desired band of frequency coverage, this is an asset rather than a liability. The first intermediate frequency (in the broadcast band) is so low with respect to the very-high-frequency signal being received that one cannot say which is the desired frequency and which is the image frequency. Both are received with essentially equal strength, considering that the fixed tuned circuits in the r.f. portion of the converter can't discriminate much against signals a few hundred kilocycles apart. The selectivity of the entire system, of course, is most excellent, for the broadcast receiver provides not only the tunable first intermediate frequency but also the selective fixed second intermediate frequency (455 kc. or so) of the double-superheterodyne receiver.

Using this system, of course, one cannot determine which of two frequencies is being received; conceivably a station on 145.17 Mc.

* R.F.D. No. 1, Box 199, Red Bank, N. J.

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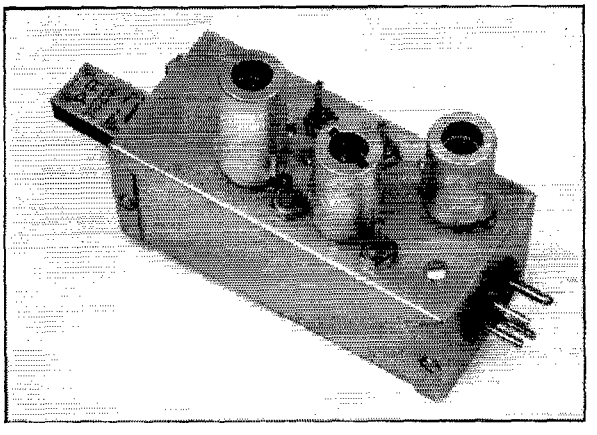

Top view of the two-meter crystal-controlled converter.

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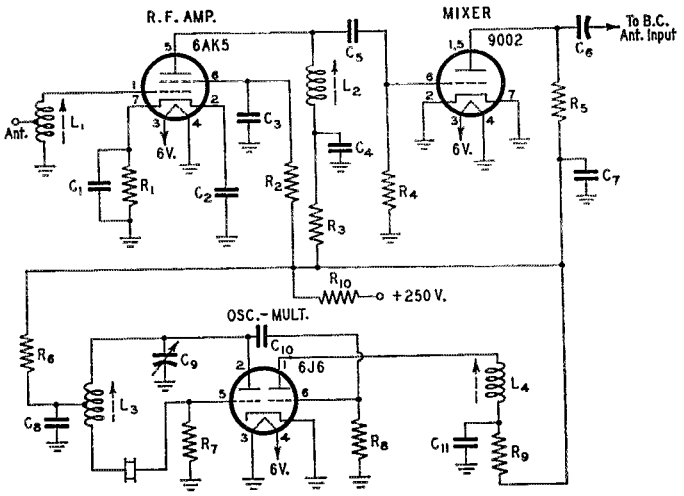


Fig. 1 — Circuit of the 2-meter mobile converter.

C_1, C_2, C_3, C_4, C_7, C_8, C_{11} — 0.005-μfd. disk ceramic.
C_5 — 50-$\mu\mu$fd. ceramic.
C_6 — 0.001-μfd. paper.
C_9 — 50-$\mu\mu$fd. midget variable.
C_{10} — 100-$\mu\mu$fd. ceramic.
R_1 — 270 ohms, ½ watt.
R_2, R_3, R_9 — 1000 ohms, ½ watt.
R_4 — 1 megohm, ½ watt.
R_5 — 0.1 megohm, ½ watt.
R_6 — 3300 ohms, 1 watt.
R_7 — 1000 ohms, ½ watt.
R_8 — 0.22 megohm, ½ watt.
R_{10} — 5000 ohms, 10 watts, wire-wound (in car receiver).
L_1 — 3 turns No. 18, ½-inch diam., tapped 1 turn from ground end.
L_2 — 2 turns No. 18, ½-inch diam.
L_3 — 7 turns No. 22, ½-inch diam., tapped approx. 2 turns from crystal end.
L_4 — 2 turns No. 18, ½-inch diam. All turns spaced approx. diameter of wire. See text regarding iron slug.

could be QRMd by a station on 147.33 Mc. Activity on 2 meters is seldom so great that this will happen.

Circuit

Fig. 1 shows the simple circuit of the converter. A 6AK5 is used as an r.f. amplifier stage, peaked at approximately 146 Mc. and broad enough to give essentially constant amplification over both of the bands. The mixer stage is a 9002, chosen primarily because of its low plate-current drain and quiet mixing characteristics. A 6J6 is used as an overtone oscillator and harmonic amplifier. This circuit may appear tricky to the Novice, but ample data on it have appeared in *QST* and *The Radio Amateur's Handbook*, since the original *QST* articles in October and November 1948, to make it a common tool of the v.h.f. enthusiast. The first section of the 6J6 dual triode is a regenerative oscillator using an overtone crystal; the second section is operated as a frequency multiplier.

The particular crystal used here is a conventional commercial 14,625-kc. crystal. It is a third-overtone oscillator, with a fundamental frequency of 4875 kc., and is intended to oscillate on its third overtone of 14,625 kc. for doubling into the 10-meter band at 29,250 kc. However, it oscillates freely on its fifth overtone, 24,375 kc., in the first section of the 6J6. This frequency is multiplied six times in the second section of the 6J6 stage, giving output at a frequency of 146.25 Mc.

Construction

The converter is constructed in and on an aluminum box measuring 2¼ by 2¼ by 5 inches. Tubes and tuning slugs are mounted on one side, the overtone crystal and controls to vary the inductance and capacitance of the oscillator circuit are mounted on one end, while a five-prong plug is mounted on the other end for both input and output connections. Over-all dimensions are 2¼ by 4¼ by 7¼ inches. The entire unit is plug-in, which proved to be a very handy feature in the early design, test and debugging stages. The converter plugs into a tube socket mounted in a much smaller box to which antenna input and output, 6-volt, and 150-volt leads are run. No trouble was encountered in placing 2-meter antenna input and broadcast-frequency output connections side by side; however, other builders of similar equipment may prefer conventional coaxial connectors for antenna circuits.

The bottom view of the converter shows the layout of parts. Mounted on the end near the crystal socket are C_9 and L_3. The 6J6 socket can be seen near C_9. Nearest coil to L_3 is coil L_4 and adjacent to L_4 is L_2. Sufficient stray coupling exists between L_4 and L_2 to provide oscillator injection without using a separate capacitor.

Coils L_1, L_2 and L_4 are made of stripped No. 18 solid copper tinned hook-up wire. They are air-wound, supported at their ends by either convenient tube-socket terminals or small stand-off insulators. These coils are slug-tuned by separate powdered-iron slugs mounted to the chassis. This method of construction is admittedly a junk-box solution; use of efficient slug-tuned forms is recommended.

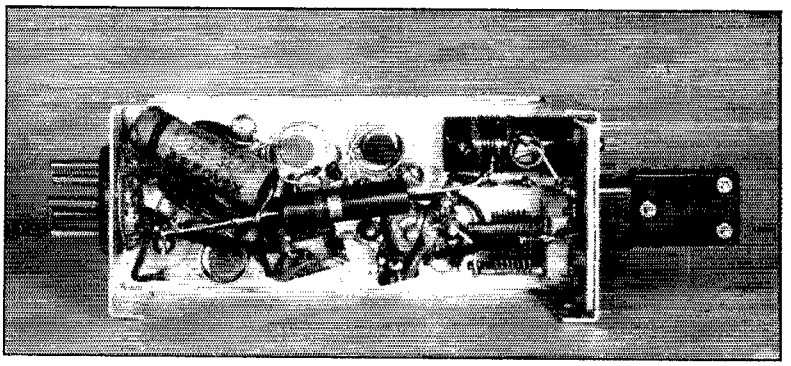
The top view shows the tube location from left to right (crystal end to plug end) as 6J6, 9002, and 6AK5

Resistor R_{10}, not shown, necessary to drop the operating voltage for the converter to approximately 150 volts, is located in the car receiver.

Testing & Alignment

A grid-dip meter, high-frequency receiver, 2-meter receiver, and broadcast receiver are used in testing and aligning the converter. Operating voltages are furnished by the broadcast receiver. The grid-dip meter is not absolutely essential, but the ham who builds his own tuned circuits finds it eliminates many hours of cut-and-try.

Getting the overtone oscillator to work is the



Bottom view of the two-meter converter. All coils are provided with iron-core slugs for adjustment.

first job. The proper L/C ratio in the tuned circuit, L_3C_9, is of extreme importance for proper crystal-overtone operation. Use of the grid-dip meter, pruning of L_3 and adjusting C_9 are necessary until the following conditions are met:

a) The tap on L_3 is approximately one third of the way up from the crystal end of the coil. (A little less than one-third worked best in this particular case; tap two turns up on a 7-turn coil.)

b) L_3 and C_9 tune to 24.375 Mc. with the slug of L_3 in approximately the mid-position of the coil and C_9 approximately half meshed. This permits making necessary variations in both L and C while retaining the same resonant frequency.

The use of the slug-tuned coil for L_3 usually eliminates the need for changing the position of the coil tap. If adjustments do become necessary in the coil turns or tap, keep in mind that only the plate portion of the coil is tuned by C_9 (in series with C_8) and that the crystal portion of the coil is a feed-back winding. Changes in position of the tap will change both the circuit tuning and the amount of regeneration.

Measuring grid current with a milliammeter between the ground end of R_7 and ground is probably the best way to get an indication of proper oscillation. Tune C_9 through its range until a sharp rise is detected in grid current, indicating that the stage is oscillating. Monitoring the oscillator signal on a receiver tuned to 24.375 Mc. is almost essential. The circuit should be adjusted until the stage oscillates at 24.3 Mc. and no other frequency. There should be only one point in the tuning range of C_9 at which any oscillation occurs; if there are more, the crystal is not controlling the oscillations. Tune the receiver back and forth around 24.375 Mc.; if several signals (birdies) are heard, change the setting of the slug in L_3 and try again for one point of oscillation.

When the oscillator is working properly, a clean, strong signal will be received at 24.375 Mc. and at no other frequency. (There should be no output at 4875 kc.; the lowest radio frequency generated is 24.375 Mc.) The crystal will "plop" into oscillation each time voltage is applied. If the stage refuses to oscillate immediately upon application of plate voltage, vary the position of the slug in L_3 slightly and retune C_9 for resonance.

L_4 can be tuned to 146.25 Mc. by setting a 2-meter receiver to that frequency and adjusting the slug for maximum S-meter reading. One caution — it is possible to pick off the wrong harmonic in the multiplier section of the 6J6 and the best insurance against this is to construct L_4 so that it resonates at the proper frequency by using a grid-dip meter.

L_1 and L_2 are tuned for maximum signal response at 145.5 and 147 Mc. respectively; their peaking will be quite broad.

Installation

The converter is installed under the dash of the author's car, adjacent to other receiving equipment for other amateur bands. The usual mobile receiver suggestions apply, with especial reference to filtering out vibrator hash from the car-receiver power supply. A series-type limiter, installed in the car receiver, is helpful.

Operation

The converter has performed satisfactorily in local 2-meter mobile work for a period of several months. In mobile use, the converter and car receiver do not constitute as sensitive a receiving system as a good home receiver, but this is a problem common to all mobile work. When the converter is used in the shack, and fed into a sensitive broadcast receiver, reception is excellent.

Answer to **QUIST QUIZ** *on page 10*

B is right, because the antenna ammeter (or an antenna voltmeter) is the only indication of output. Most tetrode amplifiers that obtain the screen voltage from a dropping resistor will show this effect, since the plate tuning has considerable effect on the screen current and hence the screen voltage. Regeneration in the amplifier will also cause the output to be sensitive to plate tuning. A nonregenerative stage with the screen voltage obtained from a separate supply, or a greater reliance on the antenna ammeter, would keep **A** happy. Without an output indicator, it is possible to overload an amplifier, and actually obtain less than maximum output, without realizing it.

• Technical Topics —

"How's My Modulation?"

If you've tried to work the weak ones on 50 Mc. and higher, you have long since discovered that all too many v.h.f. stations are deficient in the modulation department. On lower frequencies, where signals are peeled off in layers, it has become almost mandatory to keep modulation characteristics in topnotch form. But the v.h.f. man, whose principal enemy is the noise level rather than other stations operating on the same frequency, tends to be satisfied if his nearer neighbors copy him well and report his signal of good quality.

He may sound fine to the fellows who receive him S9, but what happens at the outer edge of his coverage, when the signal is but a few decibels above the noise level? The chances are good that he is one of the many who would be reported as R2 S5, if the truth were always told in giving signal reports. In the Connecticut Valley this sort of speech is known as "Boston Modulation" because of the many seemingly unmodulated carriers that are heard when 6- and 2-meter beams are aimed to the northeast. But insufficient modulation knows no geographical barriers, and the brethren of Beantown are probably no worse or better than any other group of voice operators.

From San Francisco comes a similar complaint, and a simple answer. W6MHF says he hears countless S5 signals on 144 Mc. that are completely unreadable — something that never need happen if some care is taken along the following lines. Deficient modulation can arise from many sources, but it usually narrows down to one or more of these factors:

1) Insufficient modulator power.
2) Careless microphone technique.
3) Improper operation of the r.f. portion of the transmitter.

The first is least likely. Most 'phone men have enough audio — if they would only employ it properly. But as W6MHF points out, just being able to modulate 100 per cent on peaks is no guarantee of good modulation. Even if the equipment is set up carefully with a 'scope, hitting 100 per cent only on occasional peaks may leave you with an *average* modulation level as low as 10 per cent. The peaks are but a small part of the audio power, and unless you do something to bring up the *average* modulation level, you're not going to be readable under adverse conditions.

The way to do this is with some form of clipping that will keep the peaks from rising too high, but hold the modulation valleys in between up to a respectable level. Such devices need not be complicated. W6MHF suggests a clipper that may be installed readily in the popular SCR-522, the war-surplus workhorse that is nearly standard equipment on 144 Mc. It is nothing more than a power-amplifier pentode with low screen voltage, installed in place of the usual 6SS7 driver. Rewire the socket connections according to Fig. 1, using the same bias resistor, by-pass, and plate feed choke as before. A 6J5 speech stage should be added for a carbon microphone, or a 6SJ7 for a crystal microphone. The clipper tube can be either a 6F6 or a 12A6, with suitable heater voltage.

If the plate choke, No. 126, is retained in the clipper plate circuit an *RC* filter is used to prevent high distortion. A 100,000-ohm potentiometer can be substituted for the 50,000-ohm resistor shown, to provide adjustable frequency response, and reduce the tendency to splatter that results from unfiltered clipping.[1] The coupling condenser ahead of the clipper should be small to attenuate lows.

With the extra stage the gain will be increased, and so will the tendency to feed-back. A v.h.f. choke can be inserted in the clipper-tube cathode circuit to cut down r.f. feed-back troubles. The gain should be set so that with close talking there is considerable clipping. Because the signal sounds so much louder than the conventional 522, the

[1] For more on clipping and filtering theory and practice, see *The Radio Amateur's Handbook* chapter on speech amplifiers and modulators. Also, Bruene, "High-Level Clipping and Filtering," Nov., 1951, *QST*, p. 18, and Bruene, "Notes on Speech Clipping and Filtering," Mar., 1952, *QST*, p. 54.

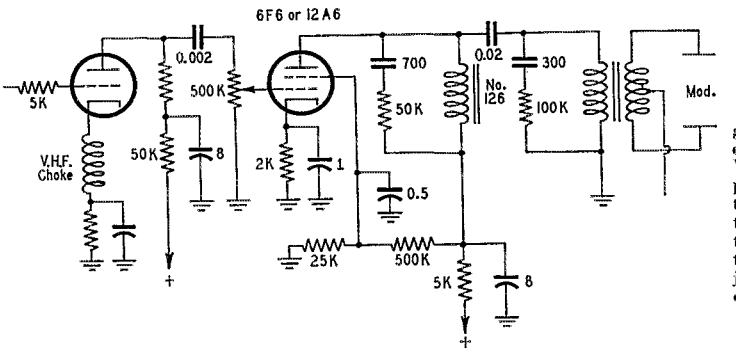


Fig. 1 — Schematic diagram of the W6MHF speech clipper for use in the SCR-522. Where no values are given for parts these should be selected to suit the speech-amplifier tube to be used. Constants in the *RC* filter in the clipper tube plate circuit can be adjusted for the desired frequency response.

user of this clipper method will be accused of overmodulating, but nspection of the actual spectrum of the signal should show no appreciable extra bandwidth or splatter, if the constants in the clipper plate circuit are properly adjusted. The audio level, however, should be equal to or better than that of signals as much as 2 to 3 S-units stronger in carrier level. As Dave points out, it should accomplish the same as increasing power by a factor of 10 to 20 times — the equivalent of running 400 watts to a 522!

So much for modulator power. The best audio system in the world is not going to provide a readable signal if we use it carelessly. Many c.w. operators take great pride in their fists, practicing endlessly to achieve perfection, but how many 'phone men pay any real attention to their microphone technique? Mumbling, careless pronunciation of words, large variations in voice level, distractions in the form of background sounds — all these things lower the readability of a 'phone signal.

Very few ham shacks are treated for acoustic quality. Talking a foot or more from the microphone is fine in a broadcasting studio, but it is out of place in a ham station. The TV set running in the next room, the honking horns of passing cars, or the thousand-and-one family noises that are part of every home have no place in the signal to be transmitted by a good 'phone station. Unless you have a *quiet* shack, acoustically treated, form the habit of talking close to the microphone. Set the gain for proper modulation level when speaking within an inch or so of the microphone — then talk that way, always. Learn to talk at a fairly constant level, and to enunciate clearly. Proper microphone technique pays off in solid communication, and it makes contact with your station a more pleasant experience for the fellow at the other end.

Last but not least, assuming that the points above have been taken into account, we must still be sure that our r.f. amplifier is operating correctly if we are to have good readable modulation. Too many final stages, particularly on the v.h.f. bands where grid drive comes hard, are operated with insufficient excitation, making linear modulation impossible. If the rig is low on grid drive, lightening the load a little may make it possible to modulate fully and correctly.

Make sure that the final-stage tubes are operating according to their 'phone ratings as to grid drive and screen voltage, if any. Be certain that the final is completely neutralized. Beg, buy or borrow an oscilloscope and check the signal with it. Learn what 100 per cent modulation, as indicated on the 'scope, looks like on your meters; then stay as close to that level as you can at all times. Most of us strain to get the last watt out of our rigs and into the antenna; a similar attention to the characteristics of our modulation systems might be a lot more logical.

A 'phone signal should be solidly readable if the carrier is one S unit above the noise level, but probably not more than a third of the signals heard on the v.h.f. bands meet this specification. A fair percentage of them actually have to be four or five S units above the noise before their modulation begins to amount to anything. Which group are you in?— *E. P. T.*

Note on S.W.R. Measurement

In adjusting an antenna coupler to obtain a 1 to 1 standing-wave ratio in a coax link to the transmitter, it sometimes happens that the best possible adjustment does not bring the meter reading down to a null. This could be caused by insufficient matching range in the antenna coupler, or might even be chargeable to a faulty s.w.r. bridge. However, there is a good possibility that the trouble is impure r.f.

One of the first things that should be done after building a resistance-type s.w.r. bridge is to check it with a noninductive resistor of a value equal to the impedance for which the bridge was designed. If a good null is obtained the bridge is OK. In making this kind of check it does not matter if more than one frequency is present in the r.f. applied to the bridge, because the test resistor has little or no frequency consciousness.

An entirely different situation exists when the bridge is used to check a transmission line that feeds an antenna, either directly or through an antenna coupler. The load in this case is definitely selective, and it can be made to look like a desired value of pure resistance only at one frequency or over a small band, in terms of percentage. If the r.f. applied to the bridge contains more than one frequency — for example, harmonics — the s.w.r. at the "off" frequencies usually will be very high, and a relatively small voltage will give a good-sized meter reading. Since adjustments to the coupler or antenna matching system have little effect at any frequency other than the operating frequency, the bridge gives a false indication.

Troubles of this sort are most likely to occur when the output stage in the transmitter is a frequency multiplier, or is a straight amplifier connected to a frequency-multiplier driving stage in such a way that either a submultiple or a harmonic of the output frequency can be amplified and applied to the bridge. A check with a crystal-detector wavemeter at the final tank will show whether a frequency other than the desired one is present in appreciable amplitude. If so, a tuned trap can be inserted in the line between the final stage and the bridge to take it out. The wavemeter check should be made with the amplifier operating at the power level that gives a

(Continued on page 128)

Eighteenth ARRL Sweepstakes Results

Last year it was our unhappy task to report the results of a Sweepstakes that did not follow the old tradition of high scores and shattered section and contact records. Like all previous frays, the 17th SS started out with a bang only to have an unlucky stroke of fate intervene. During the second week-end contest period atmospheric storms descended on many areas and put numerous contestants off the air. The need for providing emergency communications caused countless SSers to forego the pleasure of contest operation. During the 18th SS conditions were much different, and better. Once more we are able to report a snappy contest in the old tradition — complete with both score and contact records that provide a challenge to future participants. More about that later!

Winners

Competition for awards is, under the Sweepstakes rules, among amateurs in each ARRL section. The SS is really 144 contests rolled into one, since that many certificates are offered for the top 'phone and c.w. scores. A total of 1063 entries was received in the Eighteenth SS, 861 from brass-pounders and 202 from the 'phone contingent. In the c.w. category, 72 individual section awards are being made. Among the 'phone entrants, 64 are receiving certificates. The winners are those first-listed in each section tabulation under the heading "Scores." All contestants will certainly join in extending a sincere "well done" to these 18th SS champions for their fine performances!

Sections Worked

All of the League's 72 sections were active in both the 'phone and c.w. portions of this SS. Working all sections always is a notable accomplishment in any contest, and especially in one as fiercely competitive as the Sweepstakes. Deserving of a special place of honor in the SS Hall of Fame for making a clean sweep of all 72 were the following: on 'phone — W1ATE, W3DHM, W6QEU, W8LIO, W8REU, W8UKS, W8VQD and WØPRZ; on c.w. — W3BES, W3GAU, W4KE, W5GEL, W6BJU, W6EPZ, W6MHB, W7FBD and W8IOP.

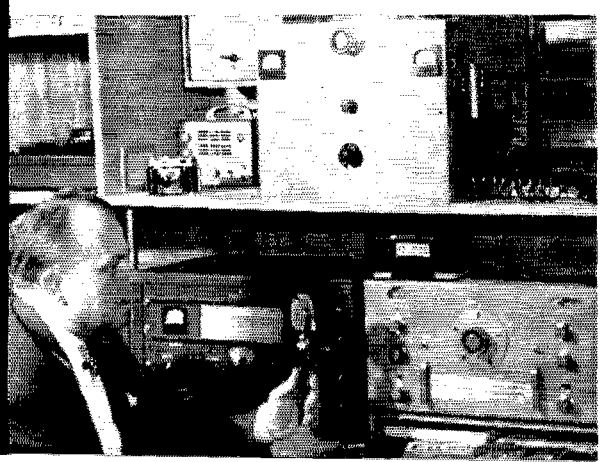
Fourteen contestants missed but one section, and also deserve special mention: on 'phone — W3LTU, W3PWR and W5KC; on c.w. — W3JTK, W3KT, W4BGO, W4KFC, W5CA, W6EAE, W6WIP, W7KEV, WØTKX, KH6IJ and VE3SR.

C.W. Highlights

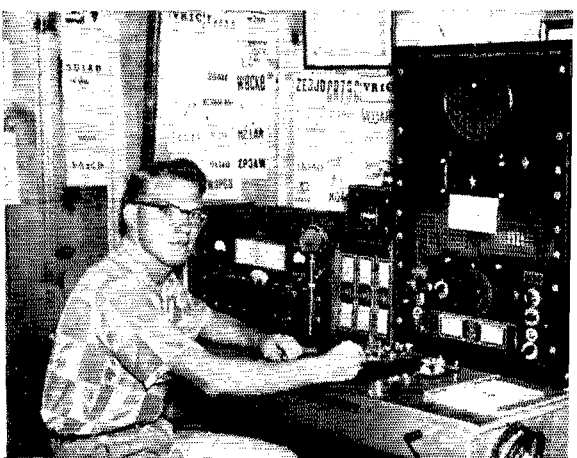
How high is the ceiling on SS scores and contact totals? In the report covering the 1947 fracas we ventured a guess that the saturation point had been closely approached with a score of just over 150,000 points and a contact total just over 900. The following year along came a half dozen contestants to smash the previous score record and two SSers to top the 1000-contact mark! Needless to say, we have long since been cured of any tendency to make predictions about the capabilities of our SS experts. Instead of predicting saturation points, we are now given to wondering who will be the first operator to top the 200,000-point mark. That goal was almost reached in this SS by a West Coast operator, Jim Maxwell, W6CUF, who set a new c.w. score record of 191,250 points, worked all sections and had 1064 contacts while operating W6BJU. Jim is an 18-year-old lad who, it is reported, was participating in his first SS. Hearty congrats, Jim, on a superb operating performance that certainly will give the old-time SS experts something to think about! Here's the equipment line-up used at W6BJU: transmitter, VFO-6V6-parallel 807s; receiver, 75A-2; antennas, 3.5-Mc. long wire, 7-Mc. ground plane, four-element 14-Mc. rotary.

Second highest reported c.w. score was that of contest master Jerry Mathis, W3BES — 181,980 points from 1011 contacts and all sections worked. The SS rig in Jerry's shack consisted of an HT-18 exciter driving either of two amplifiers, an 829

C. E. Smith, W9ZTO, won the Wisconsin section 'phone award and entered the highest 'phone score from the W9 call area.



Eastern Florida entrant Beverley Cavender, W4CKB, chalked up 802 contacts and worked 70 sections to win the c.w. award for his section.



or an 813. The receiving was taken care of by an NC-101X and an HQ-129X.

If you're a regular reader of SS reports, you'll recognize the call W3DGM as that of an SSer who always is in the high score brackets. Mel came through in this shindig right on the heels of W3BES with 181,125 points, 1050 QSOs and 69 sections. His transmitter was an HT-18 driving p.p. 807s and the receiver an NC-100XA with preselector.

Following the three highest scores with totals over 125,000 were W4KFC 172,175, W6WIP 168,359, W8IOP 156,816, W9RQM 155,488, W7PGX 149,975, WØTKX 148,390, W7KEV 147,858, W3ALB 144,550, W3GAU 139,410, WØYCR 138,635, W4CKB 138,425, W9OLU/4 138,173, W5GEL 135,792, W4BGO 132,859, W3JTK 132,770, W9FOI 131,750, W3FQZ 131,100, W8RSP 130,463, W8CEG 129,975, W9WFS 128,188, W4SZY 127,500, W3GHM 126,098, K2USA 125,388.

The following were the high scorers in each licensing area: W1LVQ 105,274, K2USA 125,388, W3BES 181,980, W4KFC 172,175, W5GEL 135,792, W6BJU 191,250, W7PGX 149,975, W8IOP 156,816, W9RQM 155,488, WØTKX 148,390, CO8BL 11,900, KH6IJ 68,160, KL7WC 15,272, KP4LN 62,806, KZ5CW 2280, VE1TR 53,105, VE2IT 41,374, VE3AGX 78,041, VE4RW 35,496, VE5QZ 100,013, VE6EO 62,169, VE7JO 68,475, VE8BK 4200.

Leading all contestants in number of contacts was Larry LeKashman, W8IOP, with a new all-time record of 1100 QSOs. Larry knocked 'em off at the rate of 27.5 per hour, an impressive performance and one that gives the experts a fancy mark to shoot at in the next Sweepstakes! Following, with 800 or more contacts, were W6BJU 1064, W3DGM 1050, W3BES 1011, W4KFC 972, W6WIP 952, W9RQM 893, W7PGX, 873, WØTKX 836, W3ALB 826, WØYCR 825, W4CKB 802, W9OLU/4 802.

'Phone Highlights

For the third time since SS competition was resumed after World War II, Pete Onnigian, W6QEU, tallied the top 'phone score. High man in the 1948 and 1950 contests and holder of the all-time 'phone contact record (854 QSOs in '50), Pete swept through all sections with 807 contacts and a final score of 116,208. He didn't miss any bets, either, and worked 160, 75, 20, 11 and 10 meters in going over the 800-contact mark. His rig ran a kw. input and receiving was done on an S-76. Good going, Pete! Pete's past performances and those of other W6s in the postwar period are worthy of note by SSers in other areas. The top score in each postwar SS has been entered by a Californian!

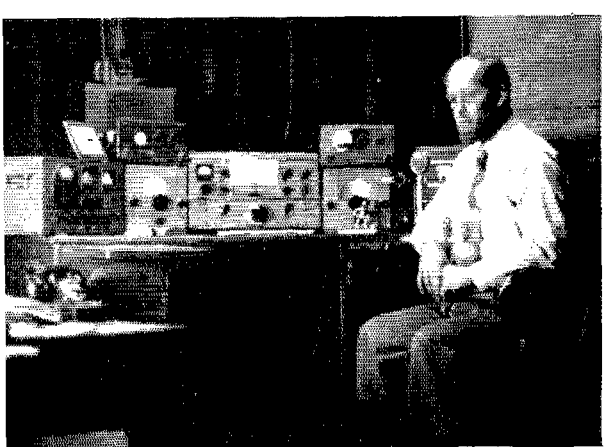
Second highest 'phone score also came from the West. Warner Thomson, jr., W7PUM, talked his way through 569 contacts with 69 sections for a grand total of 98,153 points. Warner used 75, 20 and 10 meters and his SS transmitter was a home-built VFO feeding an HT-9. His score is particularly noteworthy considering the power input — 90 watts.

Don Phillips, W3LTU, was next in line with 82,360 points from 464 contacts and 71 sections. The 75-, 20- and 10-meter bands bore the brunt of SS operation at Don's shack and he even managed to make a few contacts pay off on 6 meters. The rig on the lower-frequency bands was a 6AG7-807-814 job running 90 watts and a pair of 1825s at 30 watts garnered the 6-meter QSOs. Three-element rotaries were used throughout except on 75, where a half-wave doublet 75 feet in the air did the radiating. Following the top three 'phone scores, all with totals over 40,000, were W1ATE 82,080, W8UKS 80,730, W2MNR 73,015, W3DHM 67,824, W8REU 65,592, W4BRB 63,700, W2SKE 62,654, W4PJU 62,445, WØPRZ 59,400, W6CHV 58,123, W8AJW 54,075, W8VQD 51,984, W5RIY 48,100, W7EYD 46,500, W5MYI 45,402, W5KC 44,020, W9ZTO 41,925.

The following were the top scorers in each licensing area: W1ATE 82,080, W2MNR 73,015, W3LTU 82,360, W4BRB 63,700, W5RIY 48,100, W6QEU 116,208, W7PUM 98,153, W8UKS 80,730, W9ZTO 41,925, WØPRZ 59,400, KH6AEX 30,480, KL7NXI 293, VE1OM 683, VE2AHE 2320, VE4JK 3232, VE6TK 11,220, VE7ZT 11,040.

Leading in number of contacts were W6QEU 807, W1ATE 572, W7PUM 569, W3DHM 471, W3LTU 464, W8REU 460, W2SKE 454, W8UKS 451, W2MNR 440, WØPRZ 415.

A total of 80,730 points, 451 contacts and a clean sweep of all sections made F. S. Harris, W8UKS, the fifth highest 'phone scorer and Ohio 'phone winner.



Meet the all-time Sweepstakes champion, Jim Maxwell, W6CUF, of Los Angeles, who set a new c.w. score record while operating W6BJU.

Club Participation

In the competition for the engraved gavel award offered to the club whose members submit the highest aggregate score, 44 groups submitted entries. For the Frankford Radio Club and the Potomac Valley Radio Club, top-scoring groups, it was a spirited race. Until 1948 Frankford had won each of the eight gavels offered. That year, in the 15th Sweepstakes, Potomac took the award by a handsome point margin. In 1949 Frankford countered with a determined effort and, by an equally handsome point margin, won their ninth gavel. Potomac came back strongly in 1950 and qualified for a second gavel. Both groups were primed for an all-out contest this year as the results show. After the smoke of battle had cleared, Potomac emerged the winner of a third gavel by outpointing their rivals 2,947,619 to 2,620,744. The Ohio Valley Radio Association, unheard from since 1949 when they placed third in the contest for the gavel, showed up to take third place honors.

The standings of all clubs that submitted aggregate scores are listed in an accompanying tabulation. Certificates are being awarded to the leading c.w. and 'phone operators in each club that submitted the minimum number of entries required by the rules; the calls of winners are also listed in the club tabulation.

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The Nineteenth Sweepstakes will be held during two week ends in November. Watch the ARRL Calendar of Activities in *QST* for the exact dates, then make your plans to get in on the fun!

C. W. SCORES

Eighteenth Sweepstakes Contest

Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. . . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . . A indicates power up to and including 100 watts (multiplier of 1.25), B indicates over 100 watts (multiplier of 1). . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Example of listings: W3BES 181,980–1011–72–A–40, or, final score 181,980, number of stations 1011, number of sections 72, power factor of 1.25, total operating time 40 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator station listings in each section tabulation; calls of participants at multi-operator stations are listed in parentheses.

ATLANTIC DIVISION

Eastern Pennsylvania

W3BES...181,980–1011–72–A–40
W3DGM..181,125–1050–69–A–40
W3ALB...144,550– 826–70–A–40
W3GHM..126,098– 731–69–A–37
W3KT....111,825– 630–71–A–37
W3LVF...110,831– 643–69–A–35
W3EQA...105,910– 625–68–A–31
W3KEW...97,410– 573–68–A–33
W3CPS....95,265– 560–68–A–38
W3HRD...93,160– 548–68–A–39
W3IXN....72,895– 478–61–A–38
W3BXE....70,125– 425–66–A–33
W3FLH....67,438– 415–65–A–35
W3DVC....64,093– 415–62–A–31
W3EVW...63,750– 375–68–A–26
W3CHH....59,323– 389–61–A–32
W3EAN....58,760– 452–65–B–28
W3ADE....52,390– 338–62–A–28
W3CPV....49,563– 305–65–A–18
W3RFI....46,905– 320–59–A–26
W3ADZ....44,240– 277–65–A–22
W3GHD...42,875– 245–70–A–14
W3CTJ....42,003– 317–53–A–28
W3KGI....41,040– 304–54–A–27
W3MJB....32,725– 238–55–A–24
W3CGS....30,238– 205–59–A–18
W3ENH....29,018– 219–53–A–23
W3BIP.....24,868– 203–49–A–18
W3LTC....16,036– 212–38–B–16
W3QLZ....14,300– 220–26–A–22
W3DYL....12,500– 125–40–A–12
W3SDK....11,040– 139–32–A–17
W3GYV.....9160– 115–32–A–17
W3NHX.....8138– 106–31–A–15
W3ODC.....5468– 81–27–A– 9
W3CLT.....3000– 61–20–A– 7
W3KFK.....2250– 50–18–A– 9
W3PST.....1875– 50–15–A–11
W3PFD.....1698– 50–14–A–17
W3UKI.....960– 24–16–A– 3
W3JLB.....509– 20–11–A– 3
WN3RYT.....165– 16–10–A– 7
W3OVV.....165– 11– 6–A– 1
W4JAA/3(W3ODC)
6278– 93–27–A–15

Md.-Del.-D. C.

W3GAU...139,410– 780–72–A–39
W3JTK...132,770– 748–71–A–40

CLUB SCORES

Club	*Score*	*C.W. Winner*	*'Phone Winner*
Potomac Valley Radio Club	2,947,619	W4KFC	W3PWR
Frankford Radio Club	2,620,744	W3BES	W3LTU
Ohio Valley Radio Assn.	770,767	W8RSP	—
Twin City Contest Club	648,935	WØTKX	—
Wisconsin Valley Radio Assn.	419,282	W9RQM	W9ZTO
Garden State Amateur Radio Assn.	375,744	W2TPJ	W2DME
El-Ray Radio Club	345,461	W1BOD	—
West Park Radiops	312,614	W8BWC	W8AJW
Buckeye Short Wave Radio Assn.	265,120	W8OYI	W8OAC
Queens Radio Amateurs	257,687	W2KPA	—
South Lyme Beer, Chowder and Propagation Society	241,074	W1LVQ	—
Sioux City Amateur Radio Club	232,465	WØFZO	—
Sandia Base Radio Club	228,536	W5FVO	—
Rebel Radio Club	225,250	—	—
Dayton Amateur Radio Assn.	214,856	—	—
Detroit Amateur Radio Assn.	213,583	W8SCW	—
Narragansett Assn of Amateur Radio Operators	194,922	W1KNE	—
West Seattle Amateur Radio Assn.	192,825	W7GUV	—
York Road Radio Club	166,090	W9YFV	—
Dade Radio Club	164,875	W4LVV	—
Syracuse Amateur Radio Club	162,308	W2AW	—
Concord Brasspounders	121,810	—	—
Connecticut Wireless Assn.	107,874	W1FTX	—
Ridgewood Amateur Radio Club	98,590	W2EQ	—
Fredericton Radio Amateurs Club	96,091	VE1VJ	—
Point Radio Amateurs	95,920	W9KXK	—
Albany Amateur Radio Assn.	94,218	—	—
Tri-County Amateur Radio Assn.	92,802	W2JTB	—
Old Pueblo Radio Club	90,196	W7MLL	—
Nortown Amateur Radio Club	87,800	VE3BXF	—
Mid-Island Radio Club	87,365	W2KTF	W2YBT
Tri-State Amateur Radio Society	82,314	W9DGA	—
Lake Success Amateur Radio Club	81,772	W2MHE	—
Denver Radio Club	75,318	—	—
Hamden County Radio Club	61,485	—	—
Case Institute of Technology Radio Club	58,387	—	—
Nassau Radio Club	42,513	W2VL	—
Milwaukee Radio Amateur Club	39,155	—	W9GIL
Greater Cincinnati Amateur Radio Assn.	28,175	—	—
Canton Amateur Radio Club	23,715	—	—
South Philadelphia Radio Amateur Club	15,998	—	—
Tuboro Radio Club	8110	—	—
Eastern Massachusetts Amateur Radio Assn.	6760	—	—
Jamestown Amateur Radio Club	423	—	—

W3FQZ...131,100- 761-69-A-36
W3VES...122,825- 723-68-A-39
W3JTC...122,648- 711-69-A-39
W3GRF...119,700- 685-70-A—
W3FQB...114,713- 665-69-A-40
W3KDP...104,708- 610-69-A-38
W3AEL...103,350- 636-65-A-35
W3DRD..100,568- 583-69-A-37
W3NOE...88,969- 549-65-A-40
W3IYE...77,010- 453-68-A-27
W3WV....76,925- 454-68-A-37
W3LTW...70,525- 455-62-A-29
W3MFJ/3..68,888- 418-66-A-35
W3CDZ...67,238- 408-66-A-33
W3GBB...67,200- 420-64-A-39
W3MCG...62,930- 406-62-A-31
W3FSP...60,638- 384-63-A-36
W3QHP...36,106- 273-53-A-27
W3LVJ....35,235- 243-58-A-22
W3FDJ....33,275- 304-55-B-29
W3RNY...31,006- 226-55-A-27
W3MCD...30,785- 262-47-A-34
W3FYS...25,856- 202-64-B-14
W3HEC...23,465- 187-52-A-36
W3CVA...18,360- 148-51-A-29
W3IL.....15,625- 125-50-A-10
W3MSK...13,965- 149-38-A- 7
W3ILD....11,326- 111-41-A-19
W3IBX....11,070- 108-41-A-17
W3FPQ....10,125- 135-30-A-10
W3OVX....9480- 122-32-A-15
W3JZY....9120- 96-38-A-12
W3QHA....7696- 140-37-B-14
W3QZC....6843- 119-23-A- 8
W3CDG....5760- 72-40-B-11
W3RAH....4686- 84-23-A-20
W3HVM....4188- 67-25-A- 9
W3IBT....3315- 51-26-A—
W3AWS....1700- 34-20-A- 5
W3GKT....1280- 33-16-A- 8
W3JGK....1085- 31-14-A- 4

Southern New Jersey

W2PWP...114,885- 666-69-A-34
W2HEH...106,225- 607-70-A-31
W2ZVW....53,920- 337-64-A-17
W2PNA....20,020- 182-44-A-28
W2BWW....8970- 138-26-A-21

Western New York

W2PJM...106,313- 609-70-A-37
W2BXZ....85,635- 521-66-A-40
W2INH....80,226- 559-67-B-37
W2CCR....62,906- 413-61-A-39
W2AW.....62,400- 390-64-A-23
W2EMW...56,198- 381-59-A-34
W2DOD....47,688- 273-70-A-26
W2COU....43,710- 282-62-A-27
W2KEL....32,116- 259-62-B-25
W2VVJ....24,510- 229-43-A-30
W2FXA....22,185- 174-51-A-31
W2ZRC....19,250- 175-44-A-13
W2VXA....16,170- 133-49-A-25
W2FBA....14,375- 125-46-A- 6
W2GRH....11,393- 150-31-A-33
W2TMI....11,008- 130-34-A-18
W2CIH....10,916- 107-41-A-28
W2BJH....8232- 84-49-B-11
W2RJJ.....5688- 65-35-A- 5
W2VNP....5535- 82-27-A-21
W2ZCZ....5400- 101-27-B—
W2PYC....4547- 68-27-A-17
W2HRL....4441- 73-25-A- 7
W2WZQ....4040- 101-20-B- 5
W2FPW....3025- 62-20-A-11

Western Pennsylvania

W3NRE....63,600- 424-60-A-32
W3ODU....46,665- 306-61-A-33
W3PWN...23,120- 289-32-A-20
W3TFI.....5401- 75-29-A-10
W3LOR.....5226- 67-39-B-13
W2IVS/3....3185- 53-26-A-11
W3QOS.....2350- 47-20-A-15
W3DKL.....1552- 35-18-A- 4
W3NCJ.....113- 15-11-A- 1
W3QPO.....6- 2- 2-B- 2

CENTRAL DIVISION

Illinois

W9FOI....131,750- 776-68-A-28
W9WFS...128,188- 736-70-A-34
W9NII....108,875- 650-67-A-40
W9YFV...102,375- 585-70-A-35
K9AAJ....83,130- 489-68-A-40
W9YTV....69,870- 413-68-A-40
W9OAT....47,885- 314-61-A-22
W9WHF...45,958- 297-62-A-39
W9VOQ....37,990- 262-58-A-15
W9JUO....37,056- 270-55-A-16
W9HXW...31,763- 230-55-A-20
W9ZRG....31,658- 201-63-A-23
W9AGM...31,175- 215-58-A-20
W9EDH....29,736- 252-59-B-32
W9LGC....29,645- 271-44-A-30
W9EET....27,840- 193-58-A-23
W9DOQ....27,610- 251-55-B-23
W9NJZ....24,840- 206-48-A-23
W9KLD....19,975- 173-47-A-28
W9JTM....18,785- 145-52-A-13
W9WID....17,680- 136-52-A-12
W9WYB....12,578- 120-43-A-30
W9KXD...12,363- 115-43-A-16
W9RQT....11,993- 118-41-A-12
W9IFM....10,925- 115-38-A-11
W9MRQ...10,894- 127-35-A-14
W9IVD....10,800- 120-36-A- 3
W9CKC....10,600- 106-40-A-16
W9MWE....9116- 111-33-A-12
W9LUO....8145- 97-36-A-19
W9GNG....6080- 65-38-A-10
W9EBX....3380- 65-26-B- 8
W9PNE/9....1488- 35-17-A- 6
W2CUQ/9....1140- 24-19-A- 4
W9FDY....1068- 31-14-A- 7
W9TAL....1000- 25-16-A- 2
W9TQR....893- 21-17-A- 8
W9ASF....166- 10-19-A- 5
WN9OIN....34- 5- 3-A-15
W9UBW....2- 1- 1-B- 1
K9FAJ (Al Deines, Don Dory, Russell Woodward) 20,577-184-57-B-18

Indiana

W9NZW...72,760- 535-68-B-35
W9NH....72,278- 419-69-A-66
W9BHR[1]...51,678- 454-58-B-36
W9DGA....46,810- 302-62-A-19
W9ERH....46,320- 297-64-A-38
K9NR.....39,528- 324-61-B-28
W9QLW....31,046- 244-51-A-17
W9SFR....27,500- 201-55-A-24
W9UC.....22,940- 186-62-B-20
W9ZBK....16,193- 127-51-A-13
W9YDP....15,651- 170-47-A-17
W9CWH....4013- 54-30-A- 5
W9MWM....2250- 38-24-A- 8
W9GFS....2208- 48-23-B- 8
W9VDG....990- 22-18-A- 3
W9YB (W9s GQM, NVY) 39,005- 270-58-A-39
K9WAA (W9s EBZ, FFR) 19,620- 221-45-B-26
W9CLY (W6IVW, W8CKW, W9LJL)...7078- 75-38-A- 9

Wisconsin

W9RQM..155,488- 893-70-A-40
W9KZZ...103,845- 606-69-A-33
W9GKK...88,910- 523-68-A-30
W9GWK...85,883- 521-66-A-39
W9FXA....85,425- 510-67-A-34
W9RLB....70,380- 414-68-A-31
W9KXK...56,100- 340-66-A-39
W9SBB....55,335- 357-62-A-30
W9ERW...51,109- 326-63-A-39
W9GUR...38,500- 275-56-A-21
W9GKO....36,781- 268-55-A-36

Bob Schoening, WØTKX, scored 148,390 points, worked 836 stations and 71 sections, to lead his call area and win the Minnesota c.w. award.

W9WJH....25,438- 185-55-A-21
W9RKP....19,800- 180-55-B-22
W9JUV/9...18,620- 133-56-A-13
W9DPN....12,495- 119-42-A-25
W9LSK....11,274- 164-29-A-18
W9BCC....11,200- 128-35-A-15
W9JQP....10,725- 110-39-A-14
W9FPA.....9548- 101-38-A-39
W9SIZ.....8740- 93-38-A- 6
W9CBE.....7920- 96-33-A- 7
W9HDH.....5400- 90-24-A-17
W9DR.....5320- 67-32-A- 8
W9CFL.....4590- 68-27-A-11
W9LXY.....3760- 48-32-A-10
WN9OOD....3023- 51-26-A-22
W9HRX.....1313- 36-15-A- 8
W9TT.....858- 26-14-A-10
W9HHE.....783- 22-14-A- 3
W9ILR.....525- 22-10-A- 1
W9NEM.....499- 30- 7-A- 5
W9OPS.....454- 17-11-A- 5
W9IVQ.....100- 8- 5-A- 7

DAKOTA DIVISION

North Dakota

WØHSM....71,329- 420-69-A-40
WØARB....64,431- 400-65-A-39
WØDBN....28,714- 213-57-A-40
WØLHS....27,600- 185-60-A-10
WØSWC....26,390- 182-58-A-23
WØGSR/Ø..21,910- 158-56-A-29
WØKZL.....313- 13-10-A-10
WØBPO.....40- 4- 4-A- 3

South Dakota

WØPHR...111,789- 648-69-A-34
WØOYB....43,428- 300-58-A-20
WØRRN....15,147- 149-51-B-18
WØGWH....5486- 68-33-A- 8
WØWUU....2400- 50-24-B-11
WØAEN....2160- 37-24-A-14

Minnesota

WØTKX..148,390- 836-71-A-40
WØYCR...138,635- 825-68-A-37
WØAIH...101,325- 579-70-A-36
WØJNC...100,300- 591-68-A-36
WØJPH....76,213- 458-67-A-29
W6WIR/Ø..62,535- 379-66-A-28
WØRTN....41,760- 348-60-B-24
WØDQL....38,506- 255-61-A-33
WØPDN....27,563- 175-63-A-10
WØPIG....13,748- 118-47-A- 9
WØBAT....4255- 75-23-A- 9

DELTA DIVISION

Arkansas

W5STU....27,096- 210-53-A-37
W5QKZ....19,033- 167-46-A-21
W5VN.....4352- 65-34-B- 9

Louisiana

W5KTD..112,988- 659-69-A-39
W5MCT..105,230- 620-68-A-40
W5USN....99,213- 516-70-A-40
W5NDV....37,523- 238-57-A-35
W5TFD....31,694- 239-55-A-35
W5BI.....30,780- 228-54-A-20
W5TFT....20,682- 196-54-B-30
W5JET.....6476- 80-33-A-17
W5CYL.....5- 2- 1-A- 7

Mississippi

W5ZD....112,125- 650-69-A-36
W1SWX/5...6745- 71-38-A- 5
W5LPL.....613- 35-14-A-22
K5FBB (W5PNM, W1SWX) 48,593- 315-62-A-33

Tennessee

W4SON....58,013- 359-65-A-39
W4KH.....57,960- 420-69-B-32
W4VOS....57,769- 361-65-A-36
W4BOR....40,320- 289-56-A-30
W4CVM...39,295- 271-58-A-25
WN4TDZ....316- 15-11-A-13
WN4TIE.....105- 9- 6-A-11

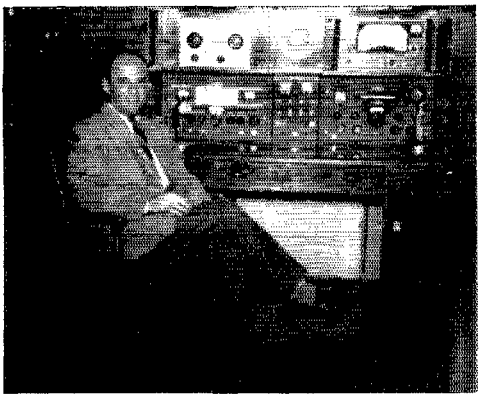
GREAT LAKES DIVISION

Kentucky

W4MDB...32,175- 215-60-A-18
W4NEP[2]...32,072- 317-53-B—
W4OMW...26,460- 206-48-A-17
W4NBS....10,793- 126-43-B-14
W4RRD....6300- 100-28-A-17
W4EII.....4335- 52-34-A- 7
W4SMU....1035- 23-18-A-11
K4WBG (W3OQJ) 89,512- 672-67-B-40

Michigan

W8ICP....156,816-1100-72-B-40
W8BGQ....62,090- 400-62-A-40
W8NOH...40,960- 320-64-B-22
W8SCW...35,880- 276-65-B-22
W8HLG....35,235- 245-58-A-33
W8IWR....33,423- 241-58-A-38
W8FWG...28,808- 277-52-B-28
W8CRD....28,365- 234-61-B-17
W8EXZ....28,350- 210-54-A-14
W8TKW...24,180- 202-48-A-32
W8MGQ...23,256- 204-57-B-17
W8UQR....22,320- 186-48-A-20
W8GP.....21,850- 190-46-A-19
W8DQL....12,013- 155-31-A-19
W8DM.....8798- 104-34-A-14
W8SWA....8415- 102-33-A-18
W8FGB....6885- 84-34-A-11
W8ZZ.....6875- 110-25-A-15
W8GTM....6335- 91-28-A-20



Honors for the sixth highest 'phone score went to N. Y. C.-L. I. award winner, Joseph Michaels, W2MNR.

W8BGY.....5775- 70-33-A- 6
W8QQK.....5625- 75-30-A- 8
W8IBB[3].....6360- 67-32-A—
W8EGI.....5115- 66-31-A- 8
W8GYU.....4650- 60-31-A-12
W8QIX.....2860- 44-26-A- 9
W8FSZ.....2640- 50-22-A-10
W8FLM.....2375- 48-25-B- 4
W8KPL.....1682- 29-29-B- 3
W8GEB.....1365- 39-14-A- 9
W8ENE.....700- 20-14-A-13
W8WBG.....646- 25-11-A- 9
W8MRL (W8NWU)
48,360- 372-65-B-28
W8DLZ (W8IV)
30,660- 257-60-B-30

Ohio

W8RSP...130,463- 750-70-A-38
W8CEG...128,975- 737-70-A-40
W8OYI...107,415- 651-66-A-33
W8SUZ...101,170- 611-67-A-40
W8LQA....96,525- 586-66-A-38
W8BWC....92,225- 527-70-A-38
W8NSS....90,913- 520-70-A-37
W8DQC....90,650- 518-70-A-30
W8ZJM....88,189- 530-67-A-33
W8ZCK....77,095- 455-68-A-39
W8LHV....74,400- 485-62-A-38
W8LPD....69,143- 440-63-A-27
W8NZI....65,406- 403-65-A-39
W8FHJ....63,280- 399-64-A-37
W8PBU....59,148- 401-59-A-25
W8DAD....58,263- 397-59-A-39
W8BOJ....54,245- 325-67-A-20
W8SMC....53,625- 325-66-A-16
W8VQI....51,393- 337-61-A-35
W8AMH....48,300- 345-56-A-34
W8DAE....47,809- 336-57-A-25
W8FRD....37,045- 241-62-A-35
W8PM.....33,000- 220-60-A-19
W8YGR....29,325- 170-69-A-26
W8YCP....27,775- 202-55-A-13
W8GQ.....24,225- 170-57-A-27
W8LOF....23,530- 182-52-A-14
W8GD.....23,333- 153-61-A-21
W8AL.....22,155- 211-42-A-26
W8IB.....16,740- 124-54-A- 8
W8SLB....15,698- 161-39-A-21
W8NMR....14,400- 120-48-A-33
W8MOH....13,400- 134-40-A-18
W8EXI....12,600- 140-36-A-16
W8HFE....11,500- 100-46-A- 5
W8WZ.....11,280- 120-47-B- 3
W8PCS.....7280- 92-32-A- 9
W8DDS.....6820- 88-31-A- 6
W4TLZ/8....6803- 85-32-A-12
W8MXO.....6475- 70-37-A-13
W8CZT.....3375- 45-30-A- 4
W8GBE.....2568- 54-24-B- 7
W8BRA.....2484- 46-27-B- 2
W8FU.....2400- 49-20-A-16
W8RO.....2365- 44-22-A-22
W8EOW.....2310- 44-21-A-13
W8KZT.....2188- 35-25-A- 6
W8GQD.....1620- 36-18-A-10
W8EKL.....1560- 39-16-A-12
W8BUM.....880- 22-16-A- 3
W8OHO.....823- 24-14-A- 4
W8FDC.....645- 23-15-B-18
W8ET.....638- 17-15-A- 3
W8ADE.....385- 14-11-A- 2
W8YNH.....225- 10- 9-A- 3
W8YPT.....120- 8- 6-A- 1
W8OPX.....105- 7- 6-A- 2
W8HIF.....23- 5- 2-A- 4

HUDSON DIVISION

Eastern New York

W2JBQ....89,250- 527-68-A-39
W2WIK....57,150- 381-60-A-30
W2AWF....28,728- 252-57-B-22
W2LDS....28,300- 283-40-A-32
W2BZO....25,908- 241-43-A-18
W2BDB....22,365- 214-42-A-32
W2NCG....16,974- 185-37-A-18
W2CJM....15,278- 147-42-A-30
W2WSS....11,455- 163-29-A-28
W2LBM....10,563- 65-65-A-11
W2KBT.....8715- 125-28-A- 8
W2GTC.....3150- 63-20-A- 8
W2WGE.....1463- 33-18-A- 7
W2ZLL.....1460- 38-16-A- 3

N. Y. C.-L. I.

W2KTF....78,122- 587-67-B-37
W2KPA....61,876- 420-59-A-37
W2LRI....60,900- 422-58-A-38
W2KGN....56,475- 337-60-A-31
W2LPT....55,608- 377-59-A—
W2AOD....54,443- 358-61-A-35
W2MHE....47,368- 382-62-B-24
W2WZ.....47,160- 362-65-B-15
W2GTL....39,528- 324-61-B-25
W2ALJ[4]....29,538- 275-54-B-26
W2GP.....29,025- 270-43-A-22
W2VDT....27,476- 216-51-A-23
W2PZE....24,090- 219-44-A-12
W2OTC....23,500- 200-47-A-12
W2ETT....22,920- 192-48-A-22
W2HAQ....21,728- 194-56-B-22
W2AHC....21,080- 170-62-B-27
W2VL.....20,424- 222-46-B-18
W2OBU....19,014- 186-41-A-13
W2LGS....16,610- 151-44-A-23
W2IAS....15,700- 157-40-A-25
W2ZQW....15,463- 165-47-B-14
W2OPY....15,390- 163-38-A-25
W2BVN....14,835- 140-43-A-19
W2KTU....12,320- 176-35-B-15
W2DBI....11,895- 122-39-A-21
W2VBT....10,620- 119-36-A-11
K2NR[5].....9962- 147-34-B- 9
W2OWO.....9669- 111-35-A-14
K2BH.....9100- 104-35-A—
W2GGN.....8250- 100-33-A-10
W2AWH.....7450- 78-40-A-10
W2YBT.....7130- 92-31-A-10
W2WWC.....4935- 71-35-B- 7
W2DXN.....4500- 101-18-A- 8
W2CXQ.....4420- 72-26-A- 9
W2KHJ.....4356- 100-22-B-16
W2JSV.....3690- 82-18-A-10
W2UXV.....2990- 52-23-A- 5
W2CEA.....2344- 38-25-A-11
W2TUK.....2125- 50-17-A- 2
W2EEY.....2083- 50-17-A- 5
W2SMQ.....1422- 40-18-B—
W2ZMK.....1050- 28-15-A- 6
W2INE.....550- 20-11-A- 6
W2IHE.....434- 16-14-B-11
W2APM.....413- 15-11-A- 4
W2BOT.....220- 11-10-B- 2
WN2KDP.....90- 6- 6-A- 1
W2CB.....84- 7- 6-B- 1
W2UNS.....50- 5- 5-B—
W2ELT.....5- 2- 1-A- 1

Northern New Jersey

K2USA....125,388- 722-70-A-40
W2GFG...118,925- 710-67-A-38
W2TPJ....84,720- 531-64-A-36
W2YLS....80,685- 489-66-A-36
W2EQ.....78,435- 505-63-A-40
W2BTG....76,725- 495-62-A-36
W2GUM....67,500- 450-60-A-30
W2LQP....56,145- 394-57-A-28
W2CWK....55,250- 340-65-A-19
W2MPP....47,575- 346-55-A-36
W2LJR....38,505- 302-51-A-24
W2GBY....34,310- 292-47-A-28
W2JIB....33,325- 310-43-A-21
W2JME....29,824- 233-64-B-23
W2YSE....27,935- 302-37-A-24
W2VJN....23,725- 183-52-A- 9
W2EIK....22,038- 215-41-A-21
W2ZEP....19,380- 205-38-A-16
W2CFW....17,000- 170-40-A-21
W2OM.....15,930- 177-45-B-14
W2CVW....10,650- 416-30-A-26
W2VJM.....9204- 100-37-A- 6
W2BU.....7685- 106-29-A- 8
W2ATE.....6038- 81-30-A- 5
WN2JDX....3651- 68-23-A-19
W2DME....3640- 70-26-B-12
W2ABL....3413- 65-21-A- 5
W2FGW....2200- 45-20-A-17
W2OGY....1320- 33-16-A—

(Continued on page 130)

W2CIP.....1200- 41-12-A-12
W2CGJ.....1102- 29-19-B- 5
K2DN.....618- 19-13-A- 2

MIDWEST DIVISION

Iowa

WØBQT...107,440- 632-68-A-37
WØFZO...104,475- 603-70-A-38
WØCXN....90,780- 534-68-A-35
WØJTF....50,625- 290-60-A-33
WØATA....47,198- 311-62-A-24
WØRTI....35,030- 226-62-A-20
WØNYX...34,580- 247-56-A-19
WØYRN....33,360- 209-64-A-24
WØDDW.....7958- 87-46-B-23
WØBBZ.....3540- 59-24-A- 6
WØAZR.....2180- 50-28-A- 4

Kansas

WØBYV....51,456- 403-64-B-26
WØIUB....35,280- 227-63-A-24
WØMUY...27,203- 202-54-A-18
WØYFE....11,200- 112-40-A-16
WØBIO.....2255- 45-22-A-13
WØAHW (WØs KLS, TXY)
18,498- 153-49-A-18

Missouri

WØCVZ....65,576- 392-67-A-31
WØACK....28,468- 193-59-A-36
WØGUV....24,998- 221-58-B-22
WØBZK....14,893- 133-46-A-16
WØDIC.....7826- 91-43-B-12
WØCAR/Ø...2080- 32-26-A- 8
WØKIK.....560- 16-14-A-13
WØMCX.....264- 12-11-B- 4
WØZLN (WØs BMQ, BYH, GYL)
72,494- 541-67-B-36

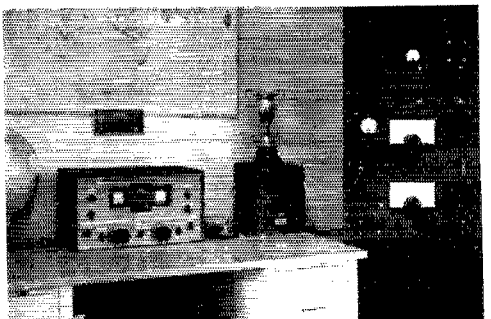
Nebraska

WØMZF.....725- 29-10-A- 4
WØUVI (WØCRJ, Bob McCalla, Bill Fell) .16,501- 156-43-A-38

NEW ENGLAND DIVISION

Connecticut

W1LVQ[6]..105,274- 630-67-A-37
W1TS[6].....86,250- 500-69-A-29
W1DJV[6]....70,630- 506-56-A-29
W1BIH....66,948- 439-61-A-27
W1ODW....55,440- 352-63-A-32
W1LHE....51,625- 350-59-A-33
W1FTX[6]...50,020- 328-61-A-20
W1SVS....35,350- 254-56-A-25
W1DIT....30,177- 240-63-B-21
W1RWS[6]..30,000- 200-60-A-13
W1MTR....28,175- 329-35-A-36
W1VG[6]....25,963- 167-62-A-25
W1DX[6]....24,034- 197-61-B—



The top Canadian score, 100,013 points, was tallied from this neat operating position by Cliff Sawyer, VE5QZ.

YL NEWS and VIEWS

CONDUCTED BY
ELEANOR WILSON,* W1QON

So often we hear, "I'd like to, but I just can't find time to get on the air." In many cases, how would this broad conclusion withstand cross-examination?

Most of us have a vocation, whether it be in business or in the home; and daily we encounter numberless distractions and countless tasks to perform. But these factors notwithstanding, there are not as many YL calls heard as there might be.

Have you noticed, though, that those who are the busiest are those who have time to do even more? YLs who handled hundreds of messages find time to relay a few more. YLs with three or four small children take time out to check into a net or enjoy a bit of rag-chewing. YLs busy teaching code and theory find time to help still another interested person.

The important point is there's so much to be gained by operating more. The more we operate, the better operators we become. The more traffic we handle, the more we help others. And, we YLs who are home during the day have many advantages: we can enjoy uncrowded bands, we have a better chance of working and making friends with DX, we can work in QRM-free nets, we can monitor for band openings, we can do on-the-air testing and experimenting, we can transmit code instruction — to name but some of our opportunities.

Few of us can truthfully say that our planning is so efficient and our day so busy that there just isn't time to get on the air. Let us then "make" time. Surely our amateur licenses are important to us, otherwise we wouldn't have troubled ourselves to get them.

*YL Editor, *QST*. Please send all contributions to W1QON's home QTH: 318 Fisher St., Walpole, Mass.

♦

We are proud to present Frances Hooper, W3SBE (ex-WN3SBE), highest scorer in the ARRL Novice Round-up Contest held January 12th through 27th (see official results, p. 70, this *QST*). "Fran" received her Novice license in August, 1951, her Technician license in December, and her General Class ticket after the Round-up. The XYL of W3BYB and the mother of four young children, she is a member of ARRL and RCC, and holds a Code Proficiency certificate for 15 w.p.m. In the contest Fran used a 6V6-807 rig and a Viking I on the 3.7- and 27-Mc. bands, and a 522 on two meters.

Keeping Up with the Girls

W6PJF is NCS of the YL Rag-Chewing Net which meets Wednesdays at 1300 on 3910 kc. W6s DCL EWV FEA HHD HRO HTS NLM and WRT check in regularly. All interested YLs are invited. . . . W7OVW monitors 29.3 Mc., Tacoma's emergency frequency, from 7:00 A.M. till late evening each day. . . . The list of teen-age YLs is ever increasing. W2KAE and WN4UNO are new additions. . . . W6KNY is a member of C.A.P. and the So. Alameda C.D. Net. Betty handles much traffic for the GIs in the Pacific. . . . W1BCU, W3LSX, and W3MSU took time out from the N. Y. IRE show to rag-chew about matters YL. . . . W2GEZ is in Turkey helping her OM, TA2EFA, with QSL duties. . . . W8GYU is busy building and modifying two-meter converters. . . . And W6FKY is building a modulator for her OM's 80-c.w. rig so she can operate 75 when her Advanced Class license comes through. . . . A recent Vermont contact gave WAS on ten 'phone to KZ5DG. . . . OM W8DSX writes that W2RUF is the only person he has ever worked "who can take 35 w.p.m. of complicated traffic messages any day of the week without asking for lots of fills". . . . WNØHQH and WØAYM were featured in a publicity article in the Lincoln (Nebr.) Sunday *Journal and Star*. . . . W6BDE is "in between antennas." A storm blew one down, and a flu attack has retarded Esther from putting up the new V beam she's been planning. . . . KZ5IM usually operates between 1:00 and 4:00 P.M. EST on 28.6, 28.7, or 28.9 Mc. . . . Always alerted for W YLs, KH6AFL works 10, 20, 40, 75 and 80. Louisa is giving code practice on 40 c.w. three days a week.

. . . WN2BDJ and WN2BDT are mother and daughter in Smithtown, Long Island, and OM WN2BEM makes it another all-ham family. . . . After winning the San Joaquin Valley section of the Dr. Wing Two-Meter Contest for the third time, W6GQZ can now claim permanent possession of the activity trophy. . . . Newly-elected officers of the KH6 YL Club are KH6AFN, president, KH6TI, secretary and publicity director, and KH6AFC, treasurer. . . . W3RXV and W3RXW believe that they were the first married couple to pass the Novice exam in the U. S. . . . W7BKJ predicts an increase in YL activity in W7-land, and Dolly reports new YLs in hard-to-work-for-WAS/YL Utah. . . . W6FEA participates in the American Legion Net, which distributes traffic from overseas. Gertie, the YLRL chairman for the Sixth District, traveled 225 miles to attend the joint luncheon of the L.A. and S.D. YL Clubs. . . . Newly-licensed W5UXW is on 10, W3QPJ and WØCCC are on 10 and 75, and W1SAJ is on 75 and 80. . . . VE8DF has been at Lake Lebarge in the Yukon Ter-

(*Continued on page 140*)

Final Results — 5th Annual ARRL V.H.F. Sweepstakes

WITH 365 reporting contestants, the 1952 V.H.F. Sweepstakes (Jan. 12th–13th) retained its established position as one of the major operating activities on the ARRL calendar, yielding top rating only to the Field Day, fall Sweepstakes, and the DX Contest in numbers of participants. Scores did not quite reach record proportions, as there was little in the way of good propagation to boost multipliers, but activity was the best ever.

Top honors go to W2NLY, Oak Tree, N. J., with 211 different stations worked in 9 sections, for 3780 points. W2BV, Minotola, N. J., was second with 3258 points. It is of interest to note that these two totals were made entirely on 144 Mc., and the large margins by which W2NLY and W2BV hold the two top places is testimony to the effectiveness of their big antenna systems and their intensive operating effort.

As always, club competition was keen. This time the South Jersey Radio Association topped their rivals from across the Delaware, the York Road Radio Club, and thus became the proud possessors of one of the silver-banded gavels, after giving the first-place clubs a close run for several years.

An important factor in the larger 2-meter scores this year was the enthusiastic participation by Novices, 29 of whom appear in the tabulation. A perusal of the complete file shows well over 150 WN calls worked.

In the tabulation to follow, the columns give the total score, the number of contacts made, the section multiplier, and the bands used, A being for 50 Mc., B 144 Mc., C 220 Mc. and D 420 Mc. No contacts were reported for any higher band. The club listing gives the combined club total and the call of the winner of the certificate for the highest individual score in the club. The first call in each section listing is the winner of a certificate award unless otherwise noted.

CLUB SCORES

Club	*Aggregate Score*	*Certificate Winner*
South Jersey Radio Assn	31,526	W2BV
York Road Radio Club	24,192	W3KKN
Hartford County Amateur Radio Assn	4562	W1HDF
Lakeland Amateur Radio Assn	3960	W2RGV
Lake Success Radio Club	3736	W2BNX/2
Old Colony Radio Club	3662	W1MMY
Rochester V.H.F. Group	2707	W2UTH
The DX Club	2192	W3OXQ
San Mateo County Amateur Radio Club	2170	W6TFZ
Providence Radio Assn	1952	W1KCS
Hampden County Radio Club	1448	W1RFU
Philadelphia High Frequency Club	1332	W3WW
Greater Cincinnati Amateur Radio Assn	896	W8LPD
Dayton Amateur Radio Assn	763	W8BVI
Connecticut Wireless Assn	300	W1BDI
Blue Arc Radio Club	277	VE3DHL

ATLANTIC DIVISION

E. Pennsylvania

W3KKN	3040	190	8	A-B
W3IBH	2816	176	8	B
W3UKI	2560	161	8	A-B
W3OXQ	1664	104	8	B
W3NXT	1656	138	6	B
W3MQW	1568	98	8	A-B
W3BWQ	1332	111	6	B
WN3SAO	970	97	5	B
W3OWA	952	68	7	B
W3NKD	912	114	4	B
W3KQQ	804	67	6	A-B
W3IAU	696	87	4	B
W3KIW	696	87	4	A-B
W3JPP	636	80	4	B
W3GRY	600	50	6	A-B
W3NLL	546	91	3	B
W3ALB	504	84	3	B
W3CLT	504	63	4	B
W3BQY	400	40	5	B
W3LVF	396	66	3	A-B
W3QB	384	64	3	B
W3WW	366	61	3	B
W3OWY	354	59	3	B
W3RFI	320	80	2	A-B
W3IMW	306	51	3	B
W3KBB	306	51	3	B
W3SMK	300	75	2	B
W3KDF	282	47	3	A-B
W3AJF	264	66	2	A-B
W3PKJ	264	66	2	B
WN3SOB	256	64	2	B
W3NJS	252	42	3	B
W3FXG	220	55	2	B
W3OZP	212	53	2	B
W3QAS	200	50	2	B
W3AYG	192	48	2	B
W3QVK	192	48	2	B
W3BYB/3	136	34	2	B
W3SSU	120	20	3	B
W3RPK	108	27	2	B
W3RDM	104	26	2	B
W3CYU	100	25	2	B
W3BZQ	56	14	2	B
W2YBL/3	54	9	3	B
W3PNL	48	12	2	B
W3KFK	40	10	2	B

Md.-Del.-D.C.

W3LMC	1116	93	6	B
W3PYW	924	66	7	B
W3CGV	430	43	5	A-B
W3LML	246	41	3	B
W3NH	160	20	4	B
W3VU	128	16	4	B
W3GKP	80	20	2	B
W3RKQ	60	10	3	B
W3NZR	36	6	3	B

S. New Jersey

W2BV	3258	181	9	B
W2UK	2240	140	8	B
W2JAV	2048	128	8	B
W2REB	2016	126	8	B
W2QED	1876	134	7	B-D
W2PAU	1820	130	7	A-B
W2BDI	1442	103	7	B
W2BDL	1274	91	7	B
W2KHW	1140	95	6	B
W2UCV	1050	105	5	B
WN2BLV	952	119	4	B-D
W2JRO	930	93	5	B
W2TJX	888	111	4	B
W2DAJ	808	101	4	B
W2PFQ	688	86	4	B
W2FCV	672	84	4	B
W2SPV	670	67	5	B
W2EH	636	53	6	B-D
W2MEU	630	35	9	A
W2FXT	600	60	5	B
W2DMU	560	70	4	A-B
W2GQO/2	552	69	4	B
W2ASG	534	89	3	B
W2HMP	512	64	4	B
W2GLV	504	63	4	B
W3LTC/2	486	81	3	B
W2ZEA	486	81	3	B
W2EWN	480	80	3	B
W2CNI	474	79	3	B
W2QKO	420	70	3	B
W2ADA	416	52	4	A-B
W2OSV	414	69	3	B
W2YPQ	378	63	3	B
W2TM	340	34	5	B
W2ABQ	318	53	3	B
W2VX	300	50	3	B
W2EGP	220	55	2	B
W2SDO	212	53	2	B
W2EET	200	50	2	A-B
W2OWA	198	50	2	B
W2PEN	176	44	2	B
W2BAY	174	30	3	A-B
W2DGN	144	36	2	B
W2PNA	140	35	2	B
W2OQN	128	32	2	A-B
W2RBF	96	24	2	B
W2APB	84	21	2	B
W2PAU	84	21	2	B
W2PZX	64	16	2	B
W2BGF	52	13	2	B
W2YEP	52	13	2	B
W2RNO	40	10	2	B
WN2AHL	36	9	2	B
W2EEF	20	10	1	B
W2FRJ	14	7	1	B
W2UKV	4	2	1	B

W. New York

W2SPU	792	66	6	B
W2OWQ	728	91	4	B
W2RPO	712	89	4	A-B
W2ORI	704	85	4	B-D
W2TBD	668	84	4	B
W2UTH	560	70	4	B
W2OWF	508	64	4	B
W2CCR	504	63	4	B
W2CDX	430	43	5	B
W2ZHB	300	50	3	B
W2ZYX	267	45	3	A-B
W2SKN	246	41	3	B
W2TKY	243	41	3	B
W2UAD	222	38	3	--
W2UXP	212	53	2	B
WN2EXY	156	38	2	B
W2ZUX	146	37	2	B
W2ELX	130	33	2	B
W2QY	128	32	2	B
W2RUC	92	23	2	B-D
W2VVG	88	22	2	B
W2SJV	84	21	2	B
WN2ALR	80	40	2	B
W2FCG	76	19	2	B
WN2ALL	72	18	2	B
W2DV	66	11	3	B
W2GWY	64	16	2	B
W2UYS	40	20	1	B
W2YUE	40	20	1	B

(Continued on page 142)

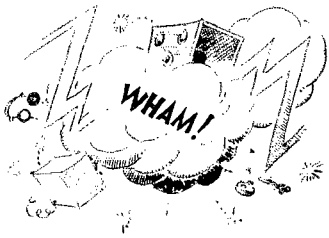
The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

THIS ISSUE of *QST* was to have featured a high-powered driver-amplifier for the 144-Mc. band, but instead, it came very nearly having an obituary for the V.H.F. Editor. It happened like this:

The rig had reached the final testing stage; in fact, it had already been on the air for a few contacts at W1HDQ. In the lab it had survived test runs at 900 watts input, and had delivered a measured output of nearly 500 watts, which is not bad efficiency on 144 Mc. And this while a TV set, running close alongside, brought in a perfect picture on our special weak-signal antenna that we use for TVI checks. Yes, this job looked to be about ready for writing up.

Then, suddenly, a sensation like being close to a blinding flash of light — a feeling of floating through a completely black sky — and the next thing your conductor remembers is picking himself up off the lab floor some six to eight feet away from the transmitter test bench. The new rig lay bottom up on the floor, its big beautiful bottles reduced to scattered bits of broken glass and twisted metal.



The ARRL lab test positions have quite adequate warning devices. There are three big red indicator lights on each power circuit, one close to the switch, one on the meter panel, and a third on the power supply itself. But the writer was taking one of those fatal haste-makes-waste shortcuts. The high-voltage supply at this test position was out of order, so a haywire connection to an adjacent position was being used; its red lights outside the normal line of vision. With fixed bias on the amplifier, and no excitation, there was no constant visual reminder of the high-voltage danger. Omitting the usual test with the grounding stick, he picked the thing up with 1500 volts on the final tank!

If it had been summer, and the writer's hands wet with perspiration instead of dry from March winds — *if* the working area had been a confined space, so that the involuntary leap backward could not have pulled the high-voltage lead off — *if* the Variac had been set for the maximum supply voltage — *if* — *if* — there are plenty of "ifs" that could have given our Editorial Department another obituary job. They all add up to just one thing: *never* skip any safety precautions! And — need we add it — *switch to safety!*

* V.H.F. Editor, *QST*.

Here and There on the V.H.F. Bands

A few 6-meter men have demonstrated that it is possible to live with Channel 2 in some instances, even without work on the TV set, particularly when the TV signal is strong, and the 50-Mc. rig is operated at moderate power levels. There is another kind of TVI, however, that is a problem in the areas where the signal is strongest — interference in the 50-Mc. band from the TV station. This is centered on 50.75 Mc., and if you're not too close to the TV station it causes little trouble except around that relatively unoccupied spot in the band. If you're really close, however, as W5SVB, Bellaire, Texas is, it can eliminate anything except the very strongest signals from 50 up to above 51 Mc. The gang around the New York area say that it was rather bad there when the Channel 2 antenna was moved to the Empire State Building, but that it has since been reduced to relatively harmless proportions. If anyone knows the exact cause of this interference, and a cure for it, W5SVB would like to know about it.

Heard any single-sideband signals on 50 Mc. yet? There are at least two on almost nightly, W1PNB, Bristol, Conn., and W1CGY, East Longmeadow, Mass., are now putting out some real power on 50.3 Mc. Because it requires a narrower passband than does conventional a.m., s.s.b. transmission should be more readable under aurora-reflection conditions, where phase distortion tends to mar readability. Because few of the 50-Mc. fraternity have had s.s.b. receiving experience, and thus do not recognize the signal for what it is when they come across it, our s.s.b. pioneers on 50 Mc. have not had much luck in raising stations outside of locals, to date.

The first s.s.b. 50-Mc. aurora contact came about on the evening of March 9th, when W1CGY raised W2SFK,

RECORDS

Two-Way Work

50 Mc.: CE1AH — J9AAO
10,500 Miles — October 17, 1947

144 Mc.: W6ZL — W5QNL
1400 Miles — June 10, 1951

220 Mc.: W1CTW — VE1QY
275 Miles — June 29, 1949

420 Mc.: W6VIX/6 — W6ZRN/6
262 Miles — July 4, 1949

1215 Mc.: G3QC/P — G8DD/P
75 Miles — Oct. 1, 1950

2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

3300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945

10,000 Mc.: W4HPJ/3 — W6IFE/3
7.65 Miles — July 11, 1947

21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

Glens Falls, N. Y., by calling him on s.s.b. This was Clark's first successful DX call in scores of tries. While this QSO was in progress, VE3AET, Lansing, Ont., ran across the signal and tuned it in successfully. He called W1CGY and established what is, up to now, the 50-Mc. s.s.b. DX record as a result. It is of interest to note that these contacts were made when the band was in extremely poor condition, the aurora being only mild in intensity at the time.

W1CGY and W1PNB have worked long and hard to develop satisfactory 50-Mc. s.s.b. signals. Their efforts have been in the best amateur tradition, and they deserve the coöperation of 50-Mc. men everywhere in their work. When you find the 6-meter band open to W1, look carefully around 50.3 Mc. for these fellows. Tune with the b.f.o. on, and the r.f. (or i.f.) gain turned down. Get the signal "on the nose" and then adjust the b.f.o. carefully for best readability. If you have a crystal-controlled converter you should make out very well, and if your converter is tunable you can still read the signal by retuning carefully to compensate for drift. Watch for these fellows, and let us know how you make out with them.

2-Meter Standings

	Call	States	Areas	Miles
	W1HDQ	16	6	650
	W1IZY	15	6	750
	W1MNF	14	5	600
	W1BCN	14	5	580
	W1DJK	13	5	520
	W1CTW	12	4	500
	W1KLC	12	4	500
	W2BAV	21	7	1175
	W2NLY	18	6	750
	W2PAU	16	6	740
	W2AZL	16	6	—
	W2DFV	13	5	350
	W2CET	12	5	405
	W2DPB	12	5	500
	W2QED	12	5	365
	W2FHJ	12	5	—
	W2QNZ	12	5	—
	W2BVU	12	4	260
	W2UTH	10	5	—
	W2ORI	9	7	620
	W3NKM	19	7	660
	W3RUE	18	7	760
	W3QKI	17	7	820
	W3KWL	15	7	560
	W3LNA	14	7	720
	W3GKP	14	6	650
	W3OWW	13	6	600
	W3KUX	12	5	575
	W3PGV	12	5	—
	W3LMC	11	4	400
	W4MKJ	16	7	665
	W4HHK	15	6	660
	W4JDN	13	6	—
	W4JFV	13	5	830
	W4IKZ	13	5	650
	W4JFU	13	5	720
	W4OXC	13	7	500
	W4CLY	12	5	720
	W4JHC	12	5	720
	W4OLK	12	5	720
	W4FJ	12	5	700
	W4LRR	5	2	900
	W5JTI	14	5	670
	W5QNL	10	5	1400
	W5CVW	10	2	1180
	W5MWW	9	4	570
	W5AJG	9	3	1260
	W5ML	9	3	760
	W5ERD	8	3	570
	W5VX	7	4	—
	W5VY	7	3	1200
	W5FEK	7	2	580
	W5ABN	7	2	450
	W5SWV	7	2	—
	W5FBT	6	2	500
	W5IRP	6	2	410
	W5ONS	5	2	950
	W5FSC	5	2	500
	W5DFU	5	2	275
	W5JLY	4	2	650
	W6ZL	2	2	1400
	W6WSQ	2	2	1390
	W6PJA	2	2	1390
	W6EXH	2	2	193
	W6ZEM/6	1	1	415
	W6GGM	1	1	300
	W6YYG	1	1	300
	W8WJC	21	7	775
	W8BFQ	21	7	775
	W8WRN	19	7	670
	W8WXV	18	8	1200
	W8UKS	18	7	720
	W8EP	17	7	—
	W8WSE	16	7	830
	W8RWW	16	7	500
	W8BAX	15	6	655
	W8FQK	13	7	—
	W8CYE	12	6	—
	W8CPA	12	–	650
	W9FVJ	20	7	790
	W9UCH	20	7	750
	W9SUV	19	7	—
	W9EQC	18	7	820
	W9BOV	15	6	—
	W9WOK	15	5	690
	W9MBI	14	–	—
	W9AFT	14	–	—
	W9NFK	12	7	690
	W9UIA	12	7	540
	W9GTA	11	5	540
	WØIHD	15	6	725
	WØNFM	14	7	660
	WØEMS	13	5	1080
	WØZJB	12	7	1097
	WØWGZ	11	5	760
	WØHXY	8	3	—
	WØJHS	7	3	—
	VE3AIB	12	6	600
	VE1QY	11	4	900
	VE3BOW	8	5	520
	VE3BQN	7	4	540
	VE3TN	7	4	480
	VE3BPB	6	4	525
	VE3AQG	6	4	520
	VE3DER	6	4	450
	VE3EAH	5	4	380

Need VE4 on 50 Mc.? Then look for VE4YW, Brandon, Manitoba, who has 90 watts and a 4-element array on 50.188 Mc. nightly. He makes test transmissions between 1900 and 1905 CST. VE4CT is also on 6, and together these fellows are trying to stir up some more VE4 activity.

There were plenty of aurora bursts during March, but nothing phenomenal has been reported in the way of DX. The carefully recorded observations of several dozen reporters scattered all over the northern half of the country make very interesting reading, however, and the effort these reports represent is deeply appreciated, both by the writer and our friends at Cornell University, to whom the reports are forwarded. If you would like to help in the observation program, just send a card or message, and a supply of reporting forms will be sent to you at once.

We made some mention of the February 23rd session last month. Now that the observations are all in, this one seems to have been the opening of the year. Reports have come from the whole northern portion of the country. Perhaps the most interesting is from W7MBV, Geraldine, Montana, who heard a W2N?? on 145.52 Mc., between 2345 and midnight, EST. Anyone care to step forward and identify himself? W7MBV also heard two other unidentified 2-meter signals, and several 'phones on 50 Mc. And he's in Montana, too! W7BYK, Marysville, Wash., reports four VE7 and W7 contacts on 50 Mc. that night.

To date, March observations have come in for the 3rd, 4th, 5th, 6th, 9th, 10th, 22nd, 23rd and 30th. All but the 5th were of quite short duration, however.

W2UTH, Rochester, N. Y., reports the starting of operations by the Zone IX 2-Meter Net, part of the New York State Civil Defense System. All 2-meter operators in Monroe, Ontario, Wayne, Yates, Steuben, Allegany and Livingston Counties are invited to participate. Any available frequency is used for the present, but allocation of specific channels is planned.

The two WAR nights so far sponsored by the Rochester V.H.F. Group were highly successful, despite rather poor conditions, according to W2ZHB. John says that the WAR certificate award has boosted activity considerably in the Rochester area, and a record-breaking spring and summer season is expected.

W8UZ, Columbus, Ohio, reports activity on 146.34 Mc. each Monday night at 8 P.M., with W8s CPA WRN ABO and WAB joining in.

W9TQ, Milwaukee, has added skeds with W9PK, Downers Grove, Ill., daily except Saturday and Sunday. Contact has been consistent, to date, but on about one out of five days the signal is weak enough to require repeats to exchange useful information. W9DDG joins in this noontime activity when time permits.

W9LEE, Westboro, Wis., says that the signals of WØBBN have improved slightly with the approach of warmer weather, and the regulars around Minneapolis, plus a couple of newcomers, have been worked fairly often.

There is nothing like a daily schedule during the winter months to make one appreciate the coming of spring. Your conductor has kept daily skeds on 144 Mc. with W2QED at 0730 EST throughout the winter, though contacts have been few and far between over this 210-mile path. Beginning about the middle of March, we started swapping reports again quite regularly, and though the signal still runs too weak for voice operation much of the time there is a steady improvement noticed. Before long, we expect to have conditions good enough to start checking on 435 Mc. again.

An effective public-relations service hams can perform is to provide communication facilities for large-scale outdoor sporting events. The Two Meters and Down Club of Los Angeles has been doing this for amateur racing car events, stationing 144-Mc. mobiles at danger points along the track, reporting to a control station at the start and finish point. Accident and race details are thus constantly available to track officials. The success of this work with the Racing Car Association has led to an invitation to serve in a similar capacity for the yacht races to be held in June. Another event on the Club calendar is a V.H.F. Round-up and Picnic to be held in July. Last year's record of 500 in attendance is expected to be surpassed.

With quite a few of its members active on 420 Mc., and interest developing in 220, this organization should be a rallying point for Technician and Novice Class licensees who are starting their ham careers on the v.h.f. and u.h.f. bands. Meetings are held at 8 P.M., the first and third

Wednesdays of each month, at Plummer Park, 7377 Santa Monica Blvd., Hollywood.

Here are more details on the ZL and VK stations that participated in the near-record 2-meter DX across the Tasman Sea. VK2AH, Ryde, N. S. W., is running an 829 amplifier at 100 watts input on c.w., 80 watts 'phone, feeding a 32-element array 40 feet above ground. The receiver is a crystal-controlled cascode converter. ZL3AR, Ashburton, New Zealand (South Island) uses a pair of 826s, a 5-over-5 array 70 feet high, and a much modified 522 receiver. VK2AH had made a crossband contact last year, getting his 2-meter signal across to ZL1ABX for a brief period. He places the distance to ZL3AR at 1340 miles, indicating that the 2-meter record holders in this hemisphere had better watch out!

Here's a 220-Mc. man looking for business. Anyone around the New York area looking for 220-Mc. contacts is requested to get in touch with W2MGQ.

Activity on 420 Mc. has been low during the early spring months, but there has been a lot of preparing going on. W1PBB, Monroe, Conn., has a new 48-element array (he was using an 8-element job when he equalled the record last fall!) and he's been working on his receivers. W1HDF, Elmwood, Conn., recently put on a tripler-amplifier using AX-9903s, and is using a new crystal-controlled converter that will be described soon in *QST*.

W2QED, Seabrook, N. J., modified the front end of an APS-13, adding capacitance across the oscillator to bring the tuning range down to 288 Mc., so that he can tune 432 Mc. by running the mixer output into his 2-meter converter, and tuning with that. A vernier dial is used on the APS-13 oscillator, so that it can also be tuned from 275 to 305 Mc. The 2-meter converter output can be fed into either sharp or broad i.f. systems, to take care of any kind of signal. Two 6J4 r.f. stages (see January *QST*, page 28) are used ahead of this set-up, making a vast improvement over the best that Ken was able to do last summer and fall.

W3AIR and W3RE, near Washington, D. C., are reported to be getting ready for some summer DX, and W3BSV, Salisbury, Md., is all set with improved gear. If more activity (crystal control and selective receivers preferred) can be lined up the length of the Atlantic Seaboard, the DX record should be exceeded by many miles. Any volunteers?

Here is one of the 420-Mc. gang who will be out of business this summer, unfortunately. W3OFK, Yeadon, Pa., suffered serious injuries when a ceiling over which he was running cabling at WCAU-TV collapsed, dropping him some 25 to 30 feet to the floor below. It is expected that he will be hospitalized for at least two months more. Rick has been provided with a small self-contained 2-meter portable rig by W3NXT, and he is on the air nightly from his hospital bed. He may be visited at the Misericordia Hospital, 54th and Cedar Avenues, Philadelphia, Room 209.

More on the 6BQ7

Have you tried the 6BQ7 as an r.f. amplifier on 144 or 220 Mc. yet? Judging by our correspondence, plenty of v.h.f. men have, with results ranging from bad to excellent. It has been pointed out that there is an error in the value of the grid resistor, R_2, in the converter article in September, 1951, *QST*, page 42. This resistor should be approximately 500,000 ohms, rather than 50,000, as stated in the cut label.

W2HNH, Syracuse, N. Y., mentions that he was able to boost the performance slightly by using a smaller value of decoupling resistor (R_3 in the diagram referred to above). Particularly if the power supply voltage tends to be a bit low, dropping this resistor from 1000 to 100 ohms will help a bit. In checking this we came across a slip in the 1952 *Handbook* in connection with the 6BQ7. Obviously, the decoupling resistor in Fig. 16-3 should not be 470,000 ohms, but 100 to 1000 ohms.

W2OWQ, Niagara Falls, N. Y., finds that his 6BQ7 r.f. stage works best with no neutralization. Probably because of variations in layout (very likely multiple ground paths) any feed-back capacitance produces oscillation.

Several users have asked about the best method of coupling to a coax-fed antenna system. Our 6BQ7 circuits have shown an untuned grid coil, with a tuned pick-up winding. This is suitable for Twin-Lead or open-wire transmission-line systems, but for coupling to coax it would be advisable to tune the grid coil and tap the coax directly on it. The position of the tap should be adjusted for best noise figure.

WØZJB	48	W4IUJ	38	W8BFQ	39
WØBJV	48	W4BEN	35	W8LPD	37
WØCJS	48				
W5AJG	48	W5VY	47	W9ZHB	48
W9ZHL	48	W5GNQ	46	W9QUV	48
W9OCA	48	W5JTI	44	W9HGE	47
W6OB	48	W5ONS	44	W9PK	47
WØINI	48	W5ML	44	W9VZP	47
		W5JLY	43	W9RQM	47
W1HDQ	47	W5JME	43	W9ALU	47
W1CLS	46	W5VV	42	W9QKM	46
W1CGY	46	W5FAL	41	W9UIA	45
W1LLL	44	W5NHD	41	W9UNS	45
W1KHL	44	W5FSC	41		
W1HMS	43	W5HLD	40	WØQIN	47
W1LSN	42	W5HEZ	38	WØDZM	47
W1EIO	41			WØNFM	47
		W6WNN	48	WØTKX	47
W2RLV	45	W6UXN	47	WØKYF	47
W2BYM	44	W6TMI	45	WØHVW	45
W2IDZ	43	W6IWS	41	WØJOL	44
W2AMJ	42	W6OVK	40	WØJHS	43
W2MEU	42			WØPKD	43
W2FHJ	41	W7HEA	47	WØMVG	41
W2GYV	40	W7ERA	47	WØIPI	41
W2QVH	38	W7BQX	47		
		W7FDJ	46	VE3ANY	42
W3OJU	45	W7DYD	45	VE3AET	35
W3NKM	41	W7JRG	44	VE1QZ	32
W3MQU	39	W7BOC	42	VE1QY	31
W3JVI	38	W7JPA	42	XE1GE	19
W3RUE	37	W7FIV	41		
		W7CAM	40		
W4FBH	46	W7ACD	40		
W4EQM	44				
W4QN	44	W8NSS	46		
W4FWH	42	W8NQD	45		
W4CPZ	42	W8UZ	43		
W4FLW	42	W8YLS	41		
W4MS	40	W8CMS	41		
W4OXC	40	W8RFW	41		
W4FNR	39	W8LBH	39		

Calls in **boldface** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.

Simple S.W.R. Check

This is antenna weather. If you want an inexpensive standing-wave indicator for those spring antenna workouts, here's a variation on the Twin-Lamp idea that is particularly useful in v.h.f. antenna work. Make two pick-up loops using 2-volt 60-ma. pilot lamps. The loop portion can be a piece of Twin-Lead about an inch long, with the end away from the lamp bridged with wire. Couple one of these loops to the transmission line and adjust the power input to the line so that a fairly bright indication is obtainable with close coupling between the loop and line. Slide the loop along the line until the brightest indication is found, and fasten the loop in that position. A spring-type clothes pin is handy for this purpose.

Now run the other pick-up lamp along the line until the minimum brilliance point is found, and fasten it in place at this point. A good indication of standing-wave ratio is obtained in this way, and you can proceed with adjustments, trying always for the least possible difference in brilliance between the two lamps. When a change in matching is made the nodal points may shift, so the high and low voltage points should be found after each adjustment. If the work is done in the shade, or on a dark day, a glance at the two lamps is all that is needed in trying for minimum s.w.r. If you want approximate figures for the s.w.r., the bulb brilliance can be checked by varying d.c. input to a lamp through a filament rheostat. Such a voltage check will show that a 1.5 to 1 voltage ratio is easily discernible, and quite small steps in either direction can be observed readily.

Strays

This advertisement was clipped from a Chicago newspaper by W9RJM:

> Salesman [wanted] for city salesroom of radio parts distributor. Technical knowledge of radio desirable. Radio amateur license, sheds, grainary, hog hses., etc., incl. preferred. . . .

In these days of high specialization there is still demand for men with diverse qualifications!

—•••—

Ralph Ziegenbein, W8PLP, 920 Clyde Street, Lansing, Mich., has a copy of the 4th edition of *Wireless Handybook*, which lists all amateur calls of 1916. The volume is not for sale or loan, but if anyone wants his 1916 call verified W8PLP will help you out. All he asks is that you send him a stamped envelope or postcard for the return information.

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For more than a year now, ARRL has been working closely with the Boy Scouts of America in the promotion of amateur radio in the scouting movement. With the coöperation of Harry A. Harchar, W2GND, circulation manager of *Boy's Life*, a series of articles on amateur radio has been appearing in the official publication of the Boy Scouts, and from time to time, in *Scouting*, the professional magazine for Scout leaders and officials. The series was worked out in conjunction with League officials and several of the articles which have appeared were prepared by ARRL. All amateurs and club groups are urged to extend a helping hand to Scouts and Scout leaders interested in amateur radio.

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Captain Henrik Kurt Carlsen, W2ZXM, receives the Marconi Memorial Medal of Service from Veteran Wireless Operators Association President William J. McGonigle, W2WNG (ex-W2ASN). The occasion was VWOA's Twenty-Seventh Anniversary Dinner-Cruise at the Hotel Astor, New York City.

Among other organizations recently honoring famed mariner Carlsen were the Garden State Amateur Radio Association of Long Branch, N. J., and the Smithtown, L. I., N. Y., Civil Defense Amateur Radio Association.

Preview — DX Contest High 'Phone Scores

As early as practicable we present a compilation of high *claimed* scores for each annual ARRL DX contest. Despite generally unfavorable propagation conditions, 'phone enthusiasts participating in this year's test — the 18th ARRL International DX Competition — bettered their 1951 efforts in many instances.

The W/VE picture is shaping up as follows: *W1ATE* 161,424, *W4ESK* 149,517, *W6NIG* 102,951, *W3LTU* 86,940, W4KWY 82,620, *W8JIN* 76,819, *W9RBI* 75,558, W6AM 64,428, W4OM 59,556, *W5JUF* 49,975, *W7HIA* 42,846, *WØPRZ* 39,040, W3GHS 39,039, W3PWR 38,520, W4VAN 37,233, *VE3AUJ* 36,018, W5BGP 35,244, *W2APU* 34,452, W6MVQ 34,342, *VE4RO* 31,212, W8NGO 31,008, W8LIO 30,828. Italics represent call-area highs.

Leaders in number of contacts: W1ATE 456, W4ESK 449, W6NIG 370, W3LTU 315, W6AM 276, W8JIN 272, W4KWY 270, W9RBI 256, WØPRZ 246, W4OM 237, W3PWR 214, W5JUF 211, W4VAN 201, W2APU 198, W7HIA 193, W5BGP 180, VE3AUJ 174, WØGKL 171, W3GHS 169, W6MVQ 166, W5ALB 163, W2WZ 162, W9DUB 160, W6YX 156, VE4RO 153. High multiplier totals: W1ATE 118, W4ESK 111, W4KWY 102, W9RBI 98, W6NIG 93, W8JIN 93, W3LTU 92, W4OM 84, WØPRZ 80, W6AM 78, W3GHS 77, W5JUF 75, W7HIA 74, W8LIO 72, W4BGO 69, VE3AUJ 69, W6MVQ 69, VE4RO 68, W5BGP 66, W4VAN 63, W3PWR 60, W2APU 58.

Outside W/VE, these claimed scores have been reported: KH6AEX 135,576, XE1SA 97,713, XE2W 95,403, TG9AD 66,519, XE1QB 29,274, KG4AF 15,050, G2PU 15,000, F8SK 14,841, KT1DD 11,396, CT1SQ 5909, DL4NV 5865, VK4FP 5083, KL7WC 5016. Top contact totals: KH6AEX 807, XE2W 539, XE1SA 535, TG9AD 393, KG4AF 364, KT1DD 277, G2PU 200. High multipliers: XE1SA 63, XE2W 59, TG9AD 57, KH6AEX 56, XE1QB 42, G2PU 25.

Not directly a factor in scoring, but interesting nevertheless, are the numbers of different countries worked by some top U. S. and Canadian entries: W1ATE 74, W4ESK 70, W4OM 62, W4VAN 61, W8JIN 61, W2APU 58, W3PWR 58, W6NIG 57, WØPRZ 56, W3GHS 54, W2WZ 52, VE3AUJ 51, VE4RO 49, W4BGO 49, W5BGP 49, W2DSU 48, W8NGO 47, W6AM 46, W2GNQ 46, W3ALB 45, W8VQD 44, W9UUN 44.

Watch for high claimed c.w. totals in June *QST*.

FEED-BACK

In Fig. 1 of "Using the 6BQ7 on 220 and 144 Mc.," September 1951 *QST*, the value of R_2 should be 500,000 ohms, not 50,000 ohms.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD/1

How:

The rumpus started, as usual, when some obnoxious DXamples of operating tactics were brought forward to be frowned upon. Thrusting their straws deeper into our last remaining Pepsi, our visitors mellowed into the poetic. Paul from St. Louis made an offering of questionable merit, a little ditty not calculated to set well with a crowded stomach:

A DX man lacking in pride
Had a signal nineteen kc. wide;
When he turned on the juice
The darned thing broke loose,
Crawled into the woodwork and died.

Hearing the commotion a mile away, W1RWS called on the landline with his contribution:

A young VQ7 named Spinks
Made ten thousand a year raising minks;
For his card the old pros
Send him new HROs —
So now Spinks thinks raising minks stinks.

Louie from St. Paul ducked a sharp left jab by Jeeves and headed for the window after this one:

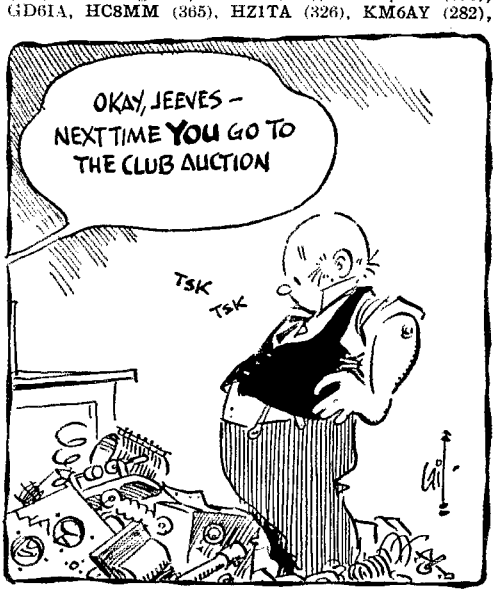
A lardhead was Footfist O'Keye —
He would test with the greatest of glee;
Although thirty years old
He refused to be told
There's a time and a place to V-V.

These gems may be whimsical but we wish the cases in point were greater exaggerations.

What:

Twenty continues to crawl along on its hands and knees. WØVDC overcame a severe attack of raster disaster and is now puffing the peace pipe with his neighbors. Jim's latest trophies: **CRs 5AD** (14,069), **7AX** (090), **CT3AA** (040), **EL7A** (040), **EAØAB** (080), **FF8AG** (065), **FQ8AG** (040), **JA8AB** (060), **KM6AX** (070), **OQ5PE** (020), **OY3IGO** (030), **VQ2GW** (090), **ZS3s K** (010), **P** (060) and **4X4RE** (005) . . . . . KG4AF (015), EA8BF (068), EL2A (057), GC4LI (030), CN8EX (100) and TF3SF (007) were hauled in by W8EXZ's 20-watter and half-waves-in-phase . . . . . WØAIH introduced himself to EA9AP (008), ZD2HAH (060), 5A2TI (038), 9S4AX (001), FQ8AE (084) and YU3AT (093) while W4RNP clobbered TF3AB (040) . . . . . Arkansas's W5ASG knocked off FB8BB (050), CP1BK (075), LZ1KAB (057), TA2EFA (105), VQs 5AU (015), 8CB (101), VK1BS (080), YI3BZL (018) and a ZD2 . . . . . Among W4KE's catches we find OQ5RA, OE13GB and TG9CR . . . . . YL W4TAV's first tangle with 14 Mc. rewarded her with VP7NM; VE3AVS encountered TI8EP who claimed to be fishing off the Nicaraguan coast. VE3AVS cornered the Greenland market, too, with OX3s EL, JJ and HK in the log . . . . . SU1AD has an interesting one worked in YA1AA (102) "in Kabul." He said "QRX for QSL" but SU1AD isn't holding his breath. The latter is still working U.S.S.R. stations but has seen nary a QSL from them . . . . . VO1AN helps put St. John's on the DX map. FF8AC (075), HA4SB (080), FA9UQ (085), OQ5LL (100), YO3RF (078), ZD2FAR (075), ZS3E (104) and 4X4AH (080) are late entries for John . . . . . W8YGR needs a South American gal for WAC/YL and now awaits QSLs from OX3s BI, BQ (120), EL2R (075) and a CT3. Jack wonders if three bouts in one season with the flu bug is any kind of record . . . . . A QSO with CE1DC completed W6ALQ's WACE efforts. Max then added VP8s AE, AU, VP2MD, VU2EJ, ZK2AA, ZP2AC and 4X4RE (016) . . . . . The *DX Bulletin* of the West Gulf Division DX Club reports the following continuous wavers: CP5EZ (070), CR4AC (020), EAs 8BC (070), 8BE (080), 9BC (075), ØAC (100), ØAD (085), EL2B (050), FB8s XX (040), ZZ (047), FD8s AA (048), AB (023), FK8AL (080), FY7YB (020), FQ8s AC (050), AF (041), AK (040), F9QV/FC (052), GC2FZC (040), HZ1AA (040), IS1CNQ (051), JA7EN (014), KS6AA (052), OQ5VN (090), SPs 2KG (025), 9KKA (123), ST2TV (083), SVs 1SMX (074), ØWO (036), one SX7L (074), TF3SG (048), VK9XK (020), VP8s AJ (132), AP (042), VQ5CK (010), YOs 2BC (032), 3GY (032), YU1s AQ (037), BD (075), ZBs 1GKU (040), 2I (050), ZDs 1SD (140), 2GAJ (052), 4BH (030), 5DU (025), 6HN (038), 9AA (146), ZS7D (084) and 5A2TP (073) of an evening; DU1s GT (093), MB (085), EA8s AE (070), FB (095), FM7WF (073), FL8BC (076), FO8AC (058), GD3FBS (005), HA2KQ (017), HE9LAA (045), HZ1AB (028), IS1FIC (038), LX1JW (038), MI3s LK (060), US (070), MP4BBD (108), OE13DC (032), SPs 2GKA (069), 3CM (025), 9EU (036), ST2HL (076), SU1s AD (083), GO (115), PA (017), XZ (094), SVØWP (079), TA3AF (003), UI8KAA (045), VK9DB (078), VQ3BM (060), VS6BA (078), VU2s BC (021), CQ (063), CS (040), CY (035), JG (049), JK (026), MD (083), NB (062), YUs 1AG (081), 1BK (013), 3BB (035), ZB1STC (041), 3V8s AJ (040), AV (050), 4UAJ (082), 4X4DR (080) and 5A2TU (058) in the yawnings.

No great ball of fire is *twenty 'phone*, either. A two-element phased rotary dug up VK9YT (14,325), VP5BP (325) in the Caymans and KT1DD for W4KZF . . . . . ZP4BB (287) answered W5ASG while WØAIH settled for TA2EFA (370) . . . . . ZD9AA bangs through consistently in the late afternoons, says John DeMyer of Lansing, Mich. . . . . W5KUC's West Gulf contingent was breathing on the necks of 'phones CN8EJ (320), CR6AL (164), DU1AP (187), EAs 8AW (392), 9AR (310), EL9A (295), FA8BG (190), FB8BC (340) in Madagascar, FR7ZA (315), F3WV/FF8 (076), GD6IA, HC8MM (365), HZ1TA (326), KM6AY (282),



* Please mail all reports of DX activity to DX Editor Newkirk at ARRL Headquarters, 38 LaSalle Rd., West Hartford 7, Conn.

PY2DV has a business-like installation in Sao Paulo with which he ran a close second to PY2NX in last year's ARRL DX Test. (*Photo courtesy W1EZ*)

MF2AA (350), **MI3NA** (318), **MP4KAC** (290), **OE13GK** (190), **OX3s BD** (348), **BF** (375), **MW** (356), **ST2GL** (250), **TF3SF** (330), **VK1BS** (150), **VQs 3CH** (350), **5AU** (056), **8AD** (304), **VR2s AP** (233), **CG** (280), **CY** (125), **YI3BZL** (215–370), **ZDs 4BF** (130), **4BL** (155), **6RD** (250), **ZK2AA** (180), **ZSs 7B** (330), **7C** (045), **8A** (360), **5A2s TH** (164), **TP** (305), **TS** (177) and **9S4AD** (180) . . . . . W2IEV, scanning the band aboard ship just off ZS3, reported some of the mobile boys ripping through in better shape than many QRO home stations. W2s CEB, MDQ, W3IXJ and W8CDY, all in motion, especially stood out. Vertical fans will seize upon this dope!

Forty hangs on by its toenails and W8EXZ dented it for **4X4XC** (7022), giving him a 30-watt 7-Mc. WAC. Jim also found **KG4AF** (032), **TI2CR** (008) and **DU1AP** (009) . . . . . OH5OS/CR4 tickled VE3AVS. Jeeves suggests OE13XX/CR1Ø for competition . . . . . VK9XK, **KH6QY/KC6** (025), LU9AX and CN8EX came back to W4KE . . . . . It's always good to hear from guys just smitten with the DX bug. W9NSL broke in with XE1TR and CO8MT while W2LJG flagged down two VKs — first DX for both . . . . . W2EEY understands **KH5DH** (009) to be on almost daily . . . . . Ubiquitous PY7WS was W8FRD's fifth 20-watt continent on 40 and W2MVP nailed 5A2TT on the low edge . . . . . Really hot after the stuff now, W8HEV managed **OQ5AE** (006), **OA4BR** (015), **KG6FAA** (041), a bunch of VK/ZLs and **UA1AW** (013), of all people . . . . . **CE7AA** (010), **HK5AR** (015), **FF8AC** (040), **VPs 3WO** (014), **8AP** (015), **ZC4CC** (015), **ZD9AA** (002), **ZS3K** (030), **VQ4HJP** (020) and **VU5AB** (010) are recommended by W5KUC's *DX Bulletin*.

Thunderstorms will be taking over *eighty* for lengthy transmissions but don't give it up too soon. Fragments from W4BRB's 3.5-Mc. coral notebook: W6s AM, SAI and ZAT riddled **VR2CG** (3800) and **ZK2AA** (3505) while VE1ZZ snitched **OX3EL** (3515). **VK9KK** may be on 3525 and **ZB2I** has rocks for 3502 and 3524 kc. **ZE3JP** works 3510 kc. Gene, hisself, captured **EA9AP** (3522), **ZC4XP** (3522) and **VK2AWU** (3508) . . . . . **KG4AF** (3503) and KV4AA were collected by W4KE and W8EXZ . . . . . SU1AD reports a W1BHB as the only U. S. station breaking through to Egypt on this band. (That was most probably W1DHD) . . . . . We hear that WN1TTM worked HC1JW — nice Novice DX for 3.5 Mc . . . . . DL4LQ says 80 is really jumpin' on the Continent; some of those most active are PAØWAD, OK3MR, SL6AL, HB9GQ, DLs 6CW, 9OL and ON4IL . . . . . W8BKP kept the birds off his long highwire by working scrumptious stuff like KH6QY/KC6, SVØWP, LU3EL, ZD4AB, CT3AB, YUs 1AD, 1AFG, 3AGR, PZ1LZ and FA8RJ. George has a nice 55-watt 3.5-Mc. WAC with his BC696.

Seventy-five 'phone did itself proud this season in presenting a variety of countries usually found only on 14 Mc. W5KMZ worked ZL3JO, ZS6KD, TGs 8IH, 9AD, HR1BG, VP5s AR, BP, FR, CM2CT, KP4KE, KZ5PC and some XEs all in the region just below 3800 kc. . . . . W4KZF adds VPs 6SD and 9G . . . . . **CT1BW** (3764), **YN1AA** (3780), **ZL2BE** (3788), **ZS6DW** (3696), **KH6PA/KJ6** (3840), **KH6s MG** (3808), **IJ** (3840), **ABQ** (3840), **AEX** (3830), **VPs 6AL** (3750), **6CJ** (3790), **7NR** (3796) and **7NZ** (3809) were recorded by the West Gulf group's *DX Bulletin*.

As for *ten* — well, let's not kick a band when it's down. We wouldn't totally ignore 28 Mc., though, after a line from KZ5AW. Kim writes that the KZ5s have been working Pitcairn's **VR6AC** (28,054) quite regularly. VR6s AL and AY are supposed to be on the band, too . . . . . W5OBS ran into **CR6BX** (28,400) while W4TAV found KW6AR and KJ6AR . . . . . Anybody perverse enough to be working any 10 c.w. these days? And how about you 11-meter Novices?

W1BB summed up the *one-sixty* season, assessing it as falling considerably below expectations. We think the boys did a bang-up job, notwithstanding. An increase in loran interference was noted; W2EQS reports East Coast loran stations now using megawatt peak power. OH3NY and ZC4XP have reported receiving W1BB's signals regularly during the tests. Stew is planning a more effective receiving set-up for next year's festivities, having been plagued no end by man-made interference.

Where:

Right down to brass tacks we go this time. Good luck with these:

AP4UAK	United Nations Hq., Rawalpindi, Pakistan
CR5UP	(QSL via CT1CL)
DL4IB	Sgt. V. Villanueva, Co. A, 7774 Sig. Bn., APO 403, % Postmaster, New York, N. Y.
F7BB	Chateau Melleray, St. Denis-en-Vel, France
ex-F9LF	Francois Mulet, DT 4/810, Station Radio Air, Tamatave, Madagascar
HP1MS	Victor Salas, P.O. Box 8, Panama City, Panama
LZ1KAB	Box 830, Sofia, Bulgaria
ex-M1D2AM	5A2TH (QSL via 5A2TR)

Like Scrutan, VP6PV's call makes sense backwards. Paul likes c.w. but can screen-modulate his 807 final and has been widely worked on most DX bands. (*Photo by W2AIS*)

MI3NA	Bob Snyder, Radio Marino, Asmara, Eritrea
OE13JE	Sgt. J. W. Edwards, 2nd Radio Sqdn. Mobile, Box 133, APO 175, % Postmaster, New York, N. Y.
OQ5LY	Box 1369, Elizabethville, Belgian Congo
VQ4CB	Box 4030, Nairobi, Kenya
ex-VR2BR	(QSL via NZART)
ex-VR2BX	(QSL to ZL2MH)
VS6CG	13 Yik Yam St., Hong Kong, Asia
VS9AA	Abbott, % Officers Mess, RAF, Khormaksar, Aden
ex-VS9BB	D. Bradley, 37 Old Road, Brampton, Chesterfield, Derbys., England
XU6F	(QSL via VS6CG)
ZC4DT	(QSL via RSGB)
ZD2FFB	F. F. Brewer, SWSS, Enugu, % P&T, Nigeria
ZD2HAH	(QSL via RSGB)
ZD2JAB	Joe Brown, P&T Hq., Lagos, Nigeria
ZP4BB	Pedro Tirado, % U. S. Embassy, Asuncion, Paraguay
ZS3P	Defense Headquarters, Windhoek, South West Africa
3A2AM	Marcel Ardisson, 28 rue Grimaldi, Monaco
5A2TO	C. M. Unfried, Rele USN, Naval Communications Unit #4, APO 231, % Postmaster, New York, N. Y.

Credit is due W1s RWS TSZ, W2s EEY INE TXB, W5ASG, W9CFT, WØAIH, VR2CD, W5KUC (West Gulf Division DX Club *DX Bulletin*), USKA's *Old Man* and REF's *Radio REF* for this assemblage.

Tidbits:

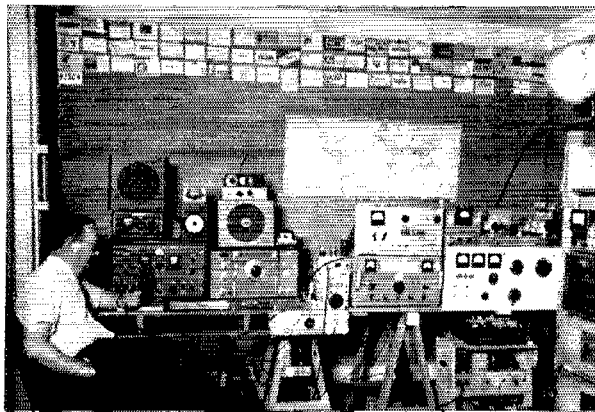
VS9BB left the Maldives for Ceylon and should be back in the U.K. by now. Brad put that rare one on the map with the help of 200 watts to a T-matched dipole on 20 'phone. An HRO aided by a BC-348 did the receiving . . . . . W4LNL is now 5A2TO. He reports the Libya gang very active and enthusiastic QSLers. At last count there were over 20 5A2s licensed, many of whom are ex-MD2/MC2/MT2s . . . . . FN8AD was overheard to be planning a trip by sea to the U.S.A. Gee, he could easily win the "farthest-away-from-home-ham" prize at any U. S. hamfest he might care to attend . . . . . Fiji notes from VR2CD: VR2BX (ZL2MH) and VR2BR are back in New Zealand; VR2CG swapped his 10/20-meter beam for a 6-meter job; VR2AP has staged a comeback on 14-Mc. 'phone. VR2CD worked 41 states on 20 c.w. before rebuilding to 28-Mc. 'phone. Chas adds, "According to the findings of VR2s CD and CG, Fiji has proved disappointing for 20-meter c.w. DX as compared to ZL." Hmmm . . . . . I1KN is griped by rare DX who call directional CQs and then come back to *anybody* while conscientious observant stations QRX properly. Before any "changing their minds" callers of such CQs should "cancel" the directive one. This can be done by a single plain "CQ DE 4W1XX." Why in the world should anyone pay attention to directional CQs if the CQing station doesn't? . . . . . EAØAB slipped in a good plug for amateur radio by furnishing valuable communications assistance to members of a West African Congress meeting at Moka on Fernando Poo island. He provided a convenient and necessary link to Santa Isabel . . . . . F7BB, recently activated, likes 20 'phone primarily but can wiggle a mean bug. Jim has been running 50 watts to a long wire and has plans afoot for Sterba draperies and 8JK beams . . . . . There are now four KX6s active on Kwajalein, those being AB, AH, AL and AO. "Our operating has been confined to 28-Mc. 'phone during local daylight and some 20-meter c.w. during evenings. Our transmitters are BC-610s feeding rotary beams on 10 and 20 meters. It is our intention to be more active this spring on both these bands." KX6AB is aiming for an s.s.b. rig shortly . . . . . OE13JV of Linz, Austria, also holds the call DL4JV . . . . . Farmer-hams may be interested in JA2WR's tests with 14-Mc. terminated sloping Vee beams (*FEARL News*, December-January number). Write him via FEARL QSL bureau . . . . . If still irked by lack of a CR5UP card (and have worked him) try anew via CT1CL . . . . . W1RWS delights in frightening poor c.w. men to death. He heard that EA8AW planned to use 'phone-only during his Ifni and Rio de Oro caper . . . . . TA3AA is one more DX station who gets bleeding-heart QSLs from guys he didn't QSO. He QSLs *contacts* 100 per cent . . . . . The EDR of Denmark will be in charge of proceedings for this year's All-European DX Contest scheduled for December. We'll route you a reminder before then. Experimenting Danish Radioamateurs celebrates its 25th anniversary in August . . . . . John DeMyer heard a PAØ chomping about one YA3MG operating 40 'phone. Only a CR8 on 160 would be more exasperating . . . . . Speaking of his present diggings, KT1WK (CN8EG-W1PWK) gloats, "The whole city is on a big hill. What a DX location this is — wow! 73 es vy best VQ9s to u." Gnats! . . . . . The N.W.I. boys are commencing with system. PJ2A stands for Aruba, B for Bonaire, C Curacao, E St. Eustatius, M St. Maarten and S Saba Island. W1IKE dug this pitch . . . . . The six ops at VP4LZ are competing for the station's first DXCC. Connors has 85 countries worked and Don (W6BVU) 87; the former leads in confirmations. Cards bound for VP4LZ still go via PY1AJ. This Trinidad package furnished the clincher for W1CEG's 3.5-Mc. WAC . . . . . W8BTV would like a lead on the present whereabouts of Jim Buckler, ex-HH2BL. Does anyone have Jim's post-TG9 QTH? . . . . . The government's Air Weather Service, a component of MATS, expresses appreciation of W efforts in the relaying of personal traffic from outpost KL7 stations in the Cold Country . . . . . Merchant mariner W1SDU reports on elegant hospitality received from DLs 1SC and 1UT in Hamburg . . . . . Choice squibs lifted from the West Gulf DX Club's *DX Bulletin* with the permission of Editor W5KUC: When at his rarest, EAØAB had to beat off QSL bribe offers with a figurative baseball bat. . . . Somebody messed around on 80 with ZD9AA's call. . . . ZD1SW is going QRT but ZD3D can still hit 20 c.w. . . . FB8BD is a yummy newly active on Madagascar. . . . KC6DX has a VFO 14-Mc. 'phone cooking on Truk. . . . Some eighteen 3A2 calls already have been assigned. . . . MP4KAC (ex-VT1AD) is digging hard for his DXCC. . . . Commercial Radio Pakistan on 7010 kc. is the subject of vehement RSGB protest. . . . ZD1AN was a spoofer. . . . VP5BP was manned by VE3s CJ and HG. . . . VP8AD is reported en route G-ward. . . . FQ8AC was planning to work 40 but no STs, VQ3s or ZD6s seem interested in the band. FU8AA is, though. . . . Any signal signing XX3BC may be from Macau . . . . . Ex-VS9AC is receiving pasteboards from stations not worked, indicating probable pirating of his call. When he left Aden, VS9s AA, AF and AO were still percolating . . . . . W8FIN reports receipt of an excellent "ham education" while in the services. He was able to visit many JA shacks during his Far East duties . . . . . W6ALQ, who prefers 803s in his final, says the South Orkneys gang at VP8AE could use some literature of any type. Same may be sent to L. A. Wilson, Base H, care of FIDS Office, Port Stanley, Falkland Islands. Warren of 3A2AG/PX1AR fame has been a guest at W6ALQ while awaiting his own W6 call . . . . . We can all get more sleep now because it isn't so —

(*Continued on page 124*)

♦

One of the most elaborately furnished stations in Switzerland is HB9HK. Willie can be worked on frequencies from 3.5 to 460 Mc. and also operates a 50-watter in his "MG" sports car. His profession is dental surgery.

♦



Hints and Kinks For the Experimenter

SIMPLE CRYSTAL MARKER OSCILLATOR

MANY present-day communications receivers use two tuning dials, one to set the range, and the other for bandspread tuning. Before the calibration on the bandspread dial is usable, the main tuning dial must be set accurately. A crystal-controlled marker oscillator is about the best way to do this. The circuit shown in Fig. 1 is ideal for this purpose, because it can be built right into most receivers and turned on or off at will by a toggle switch mounted on the front panel.

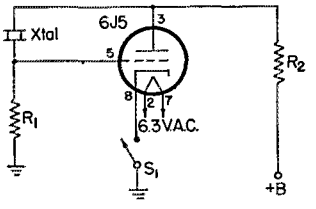


Fig. 1 — A marker oscillator that can be added to any receiver to provide a convenient way to set the main tuning dial to the right spot so that the calibration of the bandspread dial will be accurate. The value of R_1 is 27,000 ohms, R_2 is 0.1 megohm, and S_1 is a s.p.s.t. toggle switch.

The 3.5-Mc. crystal found in some of the SCR-274N transmitters makes a good crystal for use in the circuit, although any 3.5-Mc. unit is usable. The fundamental and harmonics of the oscillator make it usable as a band-edge marker for all bands through 28 Mc. — *Myron C. Pogue, W7FKO*

INEXPENSIVE LOW-LOSS COIL FORMS

IF you are looking for an inexpensive source of small-diameter coil forms, try using some of those short lengths of RG/8U cable that ordinarily are thrown away. Cut the cable as shown in Fig. 2, after removing the black vinyl covering,

Fig. 2 — Cheap coil forms can be made from scrap coaxial cable.

the shield braid, and the center conductor. The polyethylene dielectric is a good low-loss material, and it can be mounted easily as shown.

The simplest way to remove the center conductor is to heat it slightly with the tip of a soldering iron, and then pull it out when the polyethylene starts to melt. — *William B. Desnoes, W2HBC*

EXTENDING WHIP ANTENNAS FOR MOBILE USE

THE arrangement shown in Fig. 3 is a handy way to add precious length to your existing mobile whip antenna. In some instances it is useful to extend ordinary broadcast whips to sufficient length to make them usable with the transmitter.

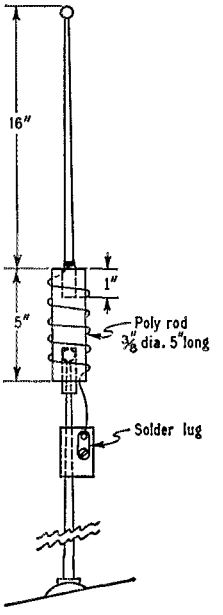


Fig. 3 — Handy method for extending the length of a whip antenna used for mobile work. The dimensions shown may be changed to suit individual applications.

A polystyrene rod is drilled at one end to slip over the top of the whip antenna. The other end of the rod is tapped to take the extension. The length of the rod is then usable as a form for a loading coil. Connection to the whip and to the extension is made as shown in the diagram.

This arrangement has given good results in a 28-Mc. mobile installation, and should be of interest to those who already have b.c. whips mounted on their cars. — *John Jarnefeld, W4MBH/9, ex-W2KFC*

21-MC. OUTPUT FROM THE SINGLE 813 RIG

It is a very simple matter to obtain 21-Mc. output from the single 813 transmitter described in July, 1951, *QST* and in the 1952 edition of *The Radio Amateur's Handbook* (page 185). All that is needed is a new coil for the 6V6 driver plate circuit. We used 4¼ turns of No. 14 enameled wire spaced to occupy 1 inch of a 1½-inch diameter coil form (National XR-5). This coil resonates at the low end of the band with about 20 per cent of the capacity of C_8 in use, and permits the stage to be operated as a tripler from the 7-Mc. output of the 6AG7 oscillator stage.

The 813 stage uses the same coil as that specified for use at 14 Mc. It resonates at 21 Mc. with the main tuning condenser set close to the low-capacity point of its range. — *R. M. Smith, W1FTX*

MODULATION INDICATOR

The simplicity of the modulation indicator shown in Fig. 4 makes it an interesting addition to any 'phone station. The circuit is non-critical, and once set requires no readjustment.

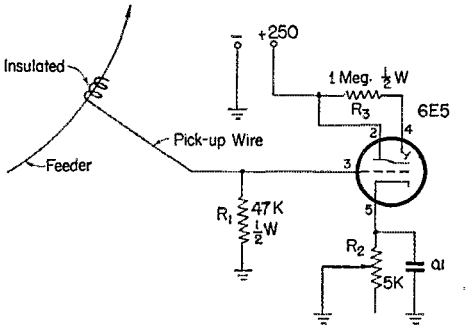


Fig. 4 — A simple modulation indicator using a magic-eye tube.

The circuit makes use of the fact that when a signal is modulated 100 per cent or more in a negative direction, periods of no signal result. With the rig turned off, adjust R_2 until the eye just closes. This becomes the reference point of no signal. Turn the rig on and couple the pick-up wire to the feeders, increasing coupling until the eye opens up to about 90 degrees width. The eye will close as the transmitter is modulated. The higher the percentage of modulation, the more closure of the eye. When it just closes, 100 per cent modulation in the negative direction is reached. Operating just below that point insures against getting tagged for infraction of the regulations. — *Bob S. White, VE7ANR*

EFFECTIVE TVI PROBE

In the course of attempting to eliminate TVI, you sometimes reach a point where the harmonics have been reduced below the point where they can be detected by the usual absorption-type wavemeter, even though link probes and high-sensitivity meters are used. The gadget shown in Fig. 5 can be used from this point on to discover points of harmonic leakage.

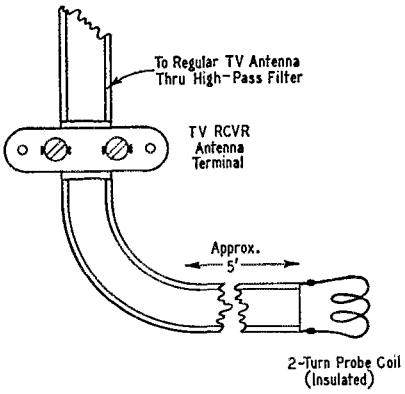


Fig. 5 — Simple probe constructed of 300-ohm Twin-Lead for tracking elusive harmonic leaks. The method of use is described in the text.

Having a TV receiver in the same room as the transmitter is a big help, but if you don't have one, you can use a converter to tune the TV range, as described in earlier *QST* articles. The receiver is turned on, and the end of the probe is connected to the antenna terminals along with the regular TV antenna lead-in. To prevent blanketing by the fundamental transmitter frequency, a high-pass filter should be inserted in the TV lead-in, close to the antenna terminals.

The other end of the probe is then moved around the area of the transmitter. It will produce a marked increase in the interference whenever it comes close to a "leak" in the shielding of the rig. In one instance, I was able to spot a harmonic leaking out from under a metal tube, even though the shell was grounded. — *D. J. Gagne, W2LID*

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1GE, Everett S. Rogers, Portland, Me.
W1TLG, Pasquale A. Antonellis, Winthrop, Mass.
W2OLG, Edgar C. Leicht, Lake George, N. Y.
W2ZJ, Edmund D. Miller, Elmira, N. Y.
W3CZW, Charles C. Smith, Lancaster, Pa.
ex-4AA, Wilbur B. Pope, Athens, Ga.
W4ETK, M. Ross Baird, Coral Gables, Fla.
W6LDZ, Clifford D. Wylie, Santa Maria, Calif.
W7FOA, Clifford F. Bunn, Glendive, Mont.
W7MWW, Frank Zeman, jr., Medford, Ore.
W8BAC, Jerry Trousil, Rocky River, Ohio
W9YQQ, Ed H. Pugh, Independence, Kans.
KP4QZ, Randal J. Carnes, Santurce, P. R.
PY1BG, Aydano de Araujo Salles, Rio de Janeiro, Brazil
VE2JP, Otto E. Curtis, Montreal, Que.
VE4JA, J. A. Argue, Saint James, Man.
VE4ZR, A. E. Roberts, Winnipeg, Man.
VE8TC, Sydney Higham, Goose Bay, Labrador

Results of the Novice Round-up

THE Novice Round-up can best be summed up in the comments of one of the participants, Wayne Nelson, WN4UGT. Wayne writes: "I enjoyed operating the contest and had a rip-roaring good time while getting operating experience and those needed states. It was particularly gratifying to find that many General Class amateurs operated the contest and did not lose patience with us "lids." Vic Clark, W4KFC, one of the old-time contest operators, had this to say: "I certainly enjoyed working the WNs. It was a real pleasure to hear them tell me I was their "best DX," a "new state," "first W4," etc. I'm getting a kick out of the QSLs received as a result of the Round-up. Now have worked WNs in 31 states . . . 29 confirmed . . . hi."

With 92 stations reporting, representing 33 sections, an XYL came up with the best score. Frances P. Hooper, WN3SBE (see photo, page 59), worked 34 sections, 173 contacts for a total score of 6392. West Coast Novice Merit Arnold, WN6NLO, garnered 2nd honors with a total score of 5069, 122 contacts, 37 sections.

The following scores are those of non-Novice stations and they are given by section: *Conn.:* W1AW 3000, W1BDI 2020, W1RWS 322, W1BUD 72, W1NJM 55, W1ICP 50; *N.N.J.:* W2NIY 2232; *S.N.J.:* W2LBX 60; *N.Y.C.-L.I.:* W2OBU 16; *E.Pa.:* W3ADE 1365, W3EAN 90; *W.Pa.:* W3JSH 928; *Va.:* W4KFC 2626, W4TFX 9; *L.A.:* W6WOO 3132.

SCORES

Scores are grouped by Divisions and Sections. The operator of the station first-listed in each section is award winner for that section. Example of listings: WN3SBE 6392–173–34–39, or, final score 6392, number of stations 173, number of sections 34, total operating time 39 hours.

ATLANTIC DIVISION

Eastern Pennsylvania

WN3SBE.....6392-173-34-39
WN3SEB.....4350-130-30-38
WN3SNV.....2136- 72-28-18
WN3RYT.....2090- 85-19-25
WN3SAW..... 870- 58-15-21
WN3SRU..... 39- 3- 3- 2

Md.-Del.-D.C.

WN3RXS.....3762- 99-38-40
WN3RZG..... 203- 14- 7- 8

Southern New Jersey

WN2INI..... 85- 7- 5- 6

Western New York

WN2JML..... 290- 19-10-34
WN2JMF..... 68- 7- 4- 1

Western Pennsylvania

WN3SDV..... 160- 20- 8-20
WN3SFP..... 92- 8- 4- 2

CENTRAL DIVISION

Illinois

WN9QAQ.....1271- 52-19-21
WN9OKI.....1218- 58-16-23
WN9OIN..... 561- 36-11-15
WN9PTT..... 533- 26-13-20

Indiana

WN9PAS..... 816- 36-16-13
WN9PEX..... 207- 13- 9- 3
WN9OWZ..... 76- 9- 4-18

DAKOTA DIVISION

Minnesota

WNØGHX..... 735- 34-15-16

DELTA DIVISION

Tennessee

WN4TIE.....1288- 41-23-34
WN4UIO..... 216- 18-12- 4

GREAT LAKES DIVISION

Kentucky

WN4UNH.....4032-111-32-39
WN4TRY.....1386- 48-22-15
WN4TQC..... 266- 23- 7- 3

Michigan

WN8HKZ.....1020- 51-20-28
WN8IFO..... 588- 39-12-17
WN8IFE..... 494- 28-13-24
WN9OHQ'8... 90- 10- 9- 9
WN8IDM..... 88- 11- 8-14
WN8HFA..... 9- 3- 3- 2

Ohio

WN8HQH.....3000- 85-30-38
WN8HOH..... 315- 48- 5-31
WN8HIF..... 145- 9- 5- 9
WN8HHF..... 45- 5- 5- 1
WN8HSM..... 25- 5- 5--

HUDSON DIVISION

Eastern New York

WN2APH.....2300- 72-25-19
WN2EPM.....1314- 58-18-36
WN2BYI..... 850- 40-17-20

N.Y.C.-L.I.

WN2FTG..... 423- 32- 9-18
WN2KDP..... 350- 35-10--
WN2GBM..... 42- 7- 6-27
WN2EJC..... 9- 3- 3--
WN2BFN..... 4- 2- 2- 2

Northern New Jersey

WN2ILH.....1518- 69-22-13
WN2JCO..... 840- 46-15-19
WN2BAS..... 261- 19- 9- 3

MIDWEST DIVISION

Iowa

WNØEHL..... 95- 9- 5- 6

Kansas

WNØEZI..... 240- 14-10-11
WNØFKO..... 25- 5- 5-20

NEW ENGLAND DIVISION

Connecticut

WN1UFV..... 760- 40-19-35
WN1UCA..... 611- 32-13-15
WN1UPH..... 455- 35-13-15
WN1UFW..... 147- 19-13- 4

Maine

WN1TYG/1... 154- 14-11- 4

Eastern Massachusetts

WN1UBC.....1008- 41-18-23
WN1UOV..... 896- 36-16-15
WN1TVC..... 378- 29-12- 6

Western Massachusetts

WN1UBD.....1116- 52-18-25
WN1TVJ..... 36- 6- 6- 2

New Hampshire

WN1UON.....4466-134-29-34

NORTHWESTERN DIVISION

Montana

WN7PTW..... 221- 17-13-16

Oregon

WN7PQZ..... 70- 10- 7-10

Washington

WN7PRF..... 583- 43-11-26

PACIFIC DIVISION

Nevada

WN7PRM..... 330- 20-11-22
WN7QHH 54- 9- 6- 4

ROANOKE DIVISION

Virginia

WN4TYC..... 99- 11- 9- 1

ROCKY MOUNTAIN DIVISION

Utah

WN7QDJ..... 297- 23- 9-10

SOUTHEASTERN DIVISION

Eastern Florida

WN4UGD.....1890- 70-27-22
WN4UGT.....1809- 67-27-38
WN4TKD.....1156- 53-17-20
WN4TVW..... 616- 29-14- 4

SOUTHWESTERN DIVISION

Los Angeles

WN6ORB.....1534- 59-26-32
WN6NJU..... 610- 61-10-35

Arizona

WN7QJV..... 812- 58-14-34

San Diego

WN6NLO.....5069-122-37-25

WEST GULF DIVISION

Oklahoma

WN5UGO..... 126- 14- 9-16

Strays

It has happened before but it's always a stopper, especially with a Novice license involved. WN4TIK's XYL walked in with his newly-arrived General Class ticket while he was in QSO with W4NTO. TIK signed the transmission "W4TIK" and was thereupon admonished by W4NTO. The latter joined in the chuckle when given an explanation in the next transmission.

—···—

Our April Stray which reported W5TFD, W6NDP, W4TFX, W4TED and W5TFP (then WNs) as filing for the first Novice Class WAS certificates respectively must now be revised. Correspondence verifies that Norma Jean Guile, W1UBM, accomplished and applied for hers considerably earlier than the others. We were unaware that she had performed this feat as a Novice under her former call, WN1UBM, and so far as we now know, Norma Jean rightfully deserves credit for this "first."

Correspondence From Members-

The Publishers of *QST* assume no responsibility for statements made herein by correspondents.

7-MC 'PHONE

302 Shaver Ave.
No. Syracuse, N. Y.

Editor, *QST:*

In February 1952 *QST* in "Happenings of the Month" I noticed some remarks about 7-Mc. band planning which used the incompatible words "'phone" and "40 meters" in the same sentence. I presume this is a typesetter's error because I know anyone who is old enough to refer to the 7-Mc. band as "40 meters" would never say the word "'phone" in the same sentence without first inserting the title of some other amateur band where such depredations are legal even if deplorable. I trust you will never again allow this grevious error to appear in the pages of *QST.*

— *Jared Scott Smith, W2JFX*

817 Gracewood
Memphis 12, Tenn.

Editor, *QST:*

The 'phone boys are restricted to portions of each band, while the c.w. boys have privileges on any frequency in any ham band with exclusive use of 7 Mc. It seems to me the c.w. boys are quite selfish with their frequencies. To be fair to all, half of every band for c.w., the other half for 'phone — that means 7 Mc. too.

— *Howard Benson, W4SBE*

1212 Antonia Way
Bakersfield, Calif.

Editor, *QST:*

Concerning the FCC proposal of allowing 'phone operation on forty meters, I would like to be counted as one who opposes it. If forty-meter 'phone operation were allowed I would be one of the first there. However, I'm convinced that the best interest of the most amateurs would not be served by allowing 'phone operation on forty. All of the foreign 'phones that are at present fairly well scattered throughout the band would move down below the new 'phone band, making it extremely difficult for low-powered c.w. stations to operate.

Many people are of the opinion that American 'phone operation on the high end of the band is advisable on account of all the foreign broadcast stations on the high end. However, I see no reason to believe that these foreign stations would attempt to continue operating in an American 'phone band. They would, no doubt, just move down into the c.w. band.

— *Lloyd R. Zander, W6ITE*

2210 S.W. 27th Lane
Miami, Florida

Editor, *QST:*

The recent letters in the "Correspondence" section have prompted me, after 17 years as a ham, to write my first letter to you.

I have been an active c.w. operator ever since first licensed as W8LVV in 1934. Most of my operation has been on the 40- and 20-meter bands. All my 'phone operation could probably be listed on a half dozen pages of my log.

Traditionally, the 7-Mc. band has been "c.w.," but I would say that tradition is about the only defense that can be offered for keeping it thus. When the average signal on the band was broad and receivers were even more so, there was some reason for dismay when "'phone on 40" was mentioned. Today's equipment makes it feasible. Good receivers and sharp 'phone signals have greatly increased the width, effectively, of our bands. For c.w., the bandwidth has multiplied many times. When the average station had crystal control, two stations in QSO occupied about twice as much space as is the rule now with most stations able to QSY to the called station's frequency. Many of the "old-timers" will remember how half the band would be occupied by one "round table."

Some hams apparently fear the influx of foreign 'phones. They should live in South Florida. Down here, both 40 and 80 are loaded with stations "south of the border." My contention is that after a few preliminary difficulties, the 40-meter band will adjust itself to a situation much like that of the 20-meter band. The official and "unofficial" allocation of frequencies there has proved fairly workable.

— *C. Bolvin, W4LVV*

224 6th Ave., West
Decatur, Alabama

Editor, *QST:*

After reading many different opinions regarding opening of the 40-meter band for 'phone operation, I would like to express my idea. Inasmuch as one 'phone station will occupy more space in a band than four or five "c.w." stations, I am bitterly opposed to opening this band for 'phones. The boys that "can" and like to work c.w. should have at least one band free of 'phone heterodynes.

— *C. E. Uptain, W4BFM*

[EDITOR'S NOTE: This, for a while at least, concludes the "correspondence" on the 7-Mc. 'phone question. The Headquarters has received 34 letters favoring 7-Mc. 'phone, and 51 expressing disapproval.]

SERVICE AS USUAL

Conrad, Montana

Editor, *QST:*

Just a note to let you know that I appreciate your interest and help on my licensing problem. When I wrote in I was more or less just "griping" and it didn't occur to me that you would be able to do anything about it. Hi!

The license was issued Dec. 7th but they didn't mail it until Dec. 19th and I got it Xmas Day!

Again, many thanks for all your trouble and will say that this service alone was worth more to me than the price of a year's membership.

— *Harold Pyle, W7BFW*

ALL DIRECTIONS AT ONCE

South Starr Route
Chadron, Nebraska

Editor, *QST:*

I've been reading your "Correspondence from Members" and am afraid I'm missing out on something. Sounds like some of the 'phone and c.w. boys really get hot under the collar. I want to get in my bit too so this is to let you know that whatever comes up, I'm against it!

— *Charles M. Christian, WØMZG*

THAT TV LETTER

159 Nott Street
Wethersfield 9, Conn.

Editor, *QST:*

I was very happy to hear that the ARRL "called upon all television receiver manufacturers to make construction changes which will eliminate interference with regular broadcasting channels in existing and future sets."

I can appreciate this since I have had more interference trouble with our TV set than with any other set in the neighborhood during my QSOs.

— *William Madigan, jr., WN1UGE*

Annette Island
Alaska

Editor, *QST:*

I got a kick from reading the letters from the TV manufacturers: "Our receivers are so good that they don't have TVI in the first place, but we will coöperate with the

(*Continued on page 146*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
JOHN E. CANN, W1RWS, Asst. Comm. Mgr., C.W.
GEORGE HART, W1NJM, Natl. Emerg. Coördinator

J. A. MOSKEY, W1JMY, Deputy Comm. Mgr.
L. G. McCOY, W1ICP, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, Administrative Aide

Some Traffic Observations. The National Traffic System has again functioned with excellent success through the current (its third) season. High commendation is due those operators in key posts and in the section nets who have contributed to this mechanism that serves all amateur operators. It must be noted that "Old Man Skip" has played hob with operations in some net periods during this season. Shifting the time of net operation has helped a little in some cases. Since that interferes with the dinner hour or cuts into other ham activity it has not been a popular solution. However, with the longer days, conditions are now picking up for net operation.

The National Traffic System provides for a complete exchange of traffic between all net levels in one evening . . . usually section nets operate at 1900 and 2200 Mon. through Fri., with exchanges at regional and time zone levels in between. NTS sets up a plan that will work for amateurs everywhere regardless of some individual absenteeism. NTS was built for the fraternity, permits participation by the casual traffic handler. This ARRL system was designed for the cooperative-minded individual amateur who wants to handle his traffic in an orderly efficient way, preparing himself for the time when his efforts can be used in emergency. "Big wheels" in traffic sometimes like to work as independents, but there's plenty of room for participation of all such in the over-all traffic-exchange networks.

All that our sectional, regional and area nets need is a sufficient degree of individual support and traffic participation to carry on every night. Rotation of NCS by different nights and enough general participation makes for success for all without undue burdens on each participant and networks are always in being even with some members absent. There has to be an NCS (or alternate) guaranteed for each meeting night, on all nets. The National Traffic System provides an automatic means of fast radio contact between *all states*, as contrasted to individual links in smaller chain systems of handling traffic which serve particular points or particular states with high efficiency.

What does the existence of NTS mean to the average amateur? (1) That by reporting on *his* section c.w. or 'phone net (see periods and frequency in ARRL Net Directory) which is or should be a vital part of the system, an amateur radiogram for any point in the U.S.A. can be sent forward with a plan for its successful early relaying to destination, if that section net properly sends a regular representative to its regional net. (2) The operating sessions in most all nets first cover the regulars in turn, noting and standing by any reporters who come in from outside points. Their traffic can be handled as soon as inside the section traffic has been cleared. (3) Any amateur with traffic who calls in will be welcomed, or any amateur residing in the section, but each must of course take his turn to clear traffic. Having a message to originate into the net is the best badge of admission.

Armed Forces Day — May 17th. Try your success in the Armed Forces Day Receiving Competition. See the announcement for Armed Forces Day elsewhere in this issue. Make *perfect* copy if possible of the 25-w.p.m. transmissions to be sent at 2000 and 2400 EST on 15 frequencies! Demonstrate your skill. Send "copy" direct to the Pentagon (Room BE1000), Washington 25, D. C., for checking. Separately from the above, amateurs are on May 17th (6 P.M.–midnight EST) invited to engage in two-way contacts with AIR, NSS, and WAR for friendly QSO and QSL.

Novices, Watch Harmonics. Information has been received that in some cases signals from WN licensees among others are being improperly radiated *at harmonic frequencies*. Novices may take this as a tip to ask fellow amateurs they work to listen for *their* exact harmonic to see if it can be heard at any distance. Better yet, check your transmitter output with a grid-dip or absorption frequency meter such as described in Chapter 21 of the *Handbook*.

Official Observers and Novices themselves are requested to watch the harmonic shadows of the Novice band, especially for 7.4–7.5 Mc. and 11 Mc., and to notify by radio message or postal card any amateurs who can be heard there with improperly strong harmonics. Such action may help a brother ham to avoid an FCC notice.

On Becoming an Official Observer. Would you like to belong to that group of appointees provided with ARRL forms to assist all amateurs in maintaining high signal standards and avoiding FCC notices? General Class licensees experienced in amateur know-how for distinguishing between images and signals themselves, men with tact and stamina who have good receiving equipment and are alert to double-check against the chance of mistake occasioned by receiver overload or propagation conditions, may volunteer to SCMs for Observer work. The ARRL Board has frequently commended OO activity, and on several occasions it has won high FCC praise. Inquiries

about classes of Observer appointment, received by radiogram or letter, will bring our booklet with data on this and other ARRL appointments plus some sample forms. Applicants for OO appointment must reside in one of the field-organization sections (page 6, *QST*) and have stated experience, interest and qualifications.

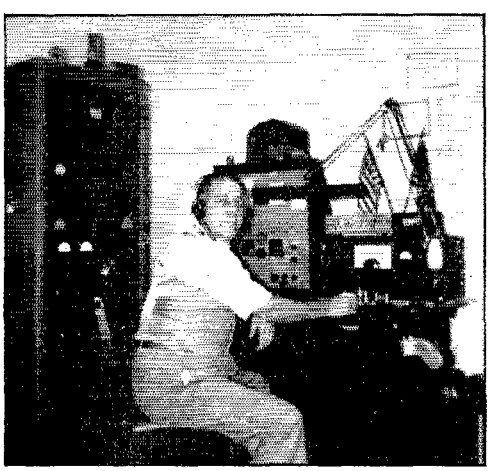
FD Reminder. June 21st–22nd is not many weeks away. Plan to put the finishing touches on any new equipment now being built for emergency-portable and car-mobile work. Plan to test it out and get in the fun *this year* in the largest of all ARRL operating activities. Log forms for report of ARRL Field Day stations are now available gratis on request to ARRL. Affiliated clubs received copies of the FD rules in February. These will be repeated in June *QST*. CU in the FD! — *F. E. H.*

MEET THE SCMs

Virginia's SCM, H. Edgar Lindauer, W4FF, became a licensed amateur as early as 1915, and since that time has also held the calls 3UE, W3GRG, and W4CPS.

He obtained commercial radio experience as operator for the Marconi Wireless Telegraph Co. — Merchants and Miners Transportation and on the Green Star Line, and as installation engineer for RCA. Following a call issued by ARRL during World War I he was one of the first 500 men to enlist as radio operator in the U. S. Army.

Despite his various SCM duties, Lindy still finds time to take part in ARRL Sweepstakes, DX Contests, LO-NITEs, and CD Parties. A charter member and one of the organizers of the Baltimore Radio Club in 1916, he is a present member and former treasurer of the Potomac Valley Radio Club. In addition he holds Official Relay Station appointment, is a member of the Old Timers Club, and has earned a Code Proficiency certificate for 30 w.p.m.



Equipment at W4FF includes a composite transmitter with a pair of 813s in the final so constructed as to permit disassembly for 30-watt Field Day operation or 100-watt Sweepstakes participation, plus flexibility to incorporate these units to drive the 813s at a full gallon if necessary, although 400 watts is generally utilized. Screen-grid modulation to p.p. 813s recently was installed. The receiver is a Super-Pro and antenna is an 80-meter center-fed mounted on two steel poles 70 feet high and 145 feet apart.

Lindy's other hobbies are bowling and, during the summer months, swimming, fishing, and boating at his summer home on Chesapeake Bay. He is employed in the Office of the Secretary of Defense as Chief of the Special Projects Committee.

CODE-PRACTICE STATIONS

W2JZX, Viola Grossman, 18 Phipps Ave., East Rockaway, N. Y., 3805 kc., Mon., Tues., Thurs., 1100 to 1130 EST, and Tues., Wed., 1800 to 1830 EST.

W7MWQ, Dick Wilhelm, P. O. Box 6013, Phoenix, Arizona, 3759 kc., Mon., Wed., Fri., 1930 to 2000 MST.

W6JZ, Ray Cornell, 909 Curtis St., Albany 6, Calif., 3590 kc., Mon., Fri., 5, 7½, 10 w.p.m., Wed., 12, 18, 25, 35, 45 w.p.m., 1845 local time.

W7WJ, Hal C. McCracken, 4603 N.E. 28th Ave., Portland, Ore., 3600 kc., Tues., Thurs., 5, 10, 20 w.p.m., Sat., 18 to 45 w.p.m., 1830 local time.

DXCC NOTES

We are pleased to announce the addition of Singapore, VS1, to the Postwar Countries List. Heretofore, both VS1 and VS2 have counted for Malaya in the Postwar DX Century Club and the ARRL DX Competition. The Crown Colony of Singapore officially came into being on April 1, 1946, so QSL cards from VS1 stations worked on or after that date will be acceptable for Postwar DXCC credit. Cards confirming postwar VS2 contacts will continue to count for Malaya.

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Speaking of countries, a brand-new Postwar Countries List is now available upon request. A number of conveniences not found in the old list have been incorporated in this revised form which has been designed to withstand plenty of rough usage on the operating table.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....246	G2PL.....237	W3KT.....230
W8HGW....241	W6ENV....236	W3JTC....229
W3BES....241	W3CPV....233	W6GRL....229
W6VFR....238	W3GHD....232	W3EVW....228
WØYXO....238	W6AM.....232	G6ZO.....228
	W2BXA....230	

RADIOTELEPHONE

W1FH.....215	W8HGW....198	W2BXA....188
PY2CK....212	W9RBI.....195	W3LTU....187
VQ4ERR....212	W1NWO....193	W6DI.....181
XE1AC....208	W1JCX.....192	

From February 15 to March 15, 1952, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued to the amateurs listed below.

NEW MEMBERS

G6GN.....155	OZ3RO.....106	VP9OO.....101
ON4GU.....149	G5JU.....106	SM3EP.....101
G8DR.....119	EI3R.....105	W6IPH.....101
LU6AX.....115	W6CPL.....105	G8TS.....101
W6BUO.....112	GW3JI.....105	F8PA.....101
DL6HJ.....110	W2RWN....104	OE5LV.....100
W2AOX.....108	W2CC.....102	VE2BK.....100
SM7YO.....107	ZS6VR.....102	GM3EDU...100
	K6CU.....101	

RADIOTELEPHONE

W9HB.....170	G2LS.....100	W8BRA.....100
W2AOX....108	W2KSN.....100	

ENDORSEMENTS

W2AGW.....221	W1WK.....163	G4ZU.....130
ZL2GX.....220	W9HUZ.....162	G6VQ.....126
W1TW.....220	W2PRN.....158	W1JMT.....123
W6AMA.....209	W5CKY.....153	VE1PA.....122
W5KC.....209	W2REF.....152	ZS3K.....121
W6PB.....200	PAØLB.....152	W1BLO.....120
HB9J.....200	W5KUJ.....150	HB9P.....119
W7PGS.....182	I1AMU.....142	W7BDW....111
W4RBQ.....172	KH6PM.....140	F9QU.....111
W2RGV.....167	WØTKX.....140	G5PQ.....110
	ZS2AT.....137	

RADIOTELEPHONE

ZS6BW.....180	I1AMU.....140	PY2JU.....117
ZS6Q.....172	LU4DD.....140	W2MFS.....115
W4EWY.....172	CM9AA.....140	W4GIO.....110
W1ENE.....161	W5KC.....133	

TRAFFIC TOPICS

This is the month when we take cognizance of outstanding individual traffic performance for the previous year. You will be reading this in May, well into the time when traffic experts are again beginning to compete for high honors in the BPL, but it is not until mid-March, when SCMs are reporting February traffic and when copy for May *QST* comes due, that we are able to make a survey of the previous year's BPL records with the assurance that all figures are in.

The BPL survey is made on the basis of "BPL points." These are awarded at the rate of four points for every individually-owned and individually-operated station which makes BPL, plus one additional point for every 100 points in his traffic total each month. Thus, five points are the minimum awarded to any station who makes BPL. These points are totaled from month to month and from year to year for every station whose call appeared in the BPL since World War II. On this basis, the following are the "high ten" for 1951 and for the entire postwar period, with total number of BPL points shown in parentheses:

1951		*Postwar*	
W3CUL	(526)	W3CUL	(927)
W6KYV	(308)	W7CZY	(819)
W4PL	(237)	W4PL	(799)
W7IOQ	(179)	W6CE	(793)
W7CZY	(177)	WØZJO	(453)
WØTQD	(168)	W7CKT	(335)
WØZJO	(157)	W5GZU	(313)
W9ILH	(155)	W6KYV	(308)
W9JUJ	(155)	WØTQD	(302)
W6GYH	(151)	KG6DI	(277)

Let's pause briefly to goggle at the 1951 record of W3CUL. Mac was not only 100% BPL, but her lowest traffic total was in March, when she handled 2643 messages. Her high was in December, when she made 9955. The grand total for the year was 48,537, which is an average of more than 4000 a month! W3CUL was at the head of the BPL every month except May (when Old-Timer W4PL beat her out) and August (when KG6FAA, a multioperator station, was top). We won't say, as we did last year about W6CE, that these records will stand for a long time — but who is going to beat them?

Note that in the postwar list, some of those still in the running are there on the basis of points collected years ago. Last year's champ, W6CE, got started too late to show in the 1951 high ten, but he managed to avoid being outdistanced by the other three of the "big four" on the postwar list.

The W6s were again high in the handling of traffic toward BPL in 1951, placing first both in number of BPLs and number of BPL points, with the W9s and WØs fighting for second place. The total number of stations listed in the BPL in 1951 was 461 compared with 443 in 1949 and 1950, so our traffic fortunes continued to look up. Here is an analysis of 1951 BPL data by call areas:

Call Area	*No. BPLs*	*BPL Points*	*High Three*
W1	15	132	CRW EMG SJO
W2	33	183	RUF BO COU
W3	32	719	CUL NHI NRE
W4	34	413	PL ANK PJU
W5	47	424	PTV LSN GZU
W6	78	1102	KYV GYH BAM
W7	46	517	IOQ CZY FRU
W8	29	231	AUJ RJC ARO
W9	59	604	ILH JUJ JTX
WØ	54	623	TQD ZJO SCA
VE	7	44	3IA 1MK 1AAL
Foreign	27	248	JA3AC KR6AF JA4AI

It is interesting to note that in three different call areas the BPL leader is a member of the feminine sex, and that three others have placed in the high three in their respective call areas. In the W9 area, the high three are all YLs. We OMs had better look to our laurels.

—•••—

National Traffic System. The NTS record for 1951 was summarized in a recent Emergency and Traffic Bulletin, so we will refrain, for space reasons, from going into it here, except to say that we believe NTS is reaching its maturity and receiving more general acceptance among the traffic fraternity. This is not to say that we no longer have any problems; on the contrary, we have bigger ones than ever. The difference is that our efforts now are to gain 100 per cent support instead of just *some* support.

February reports:

Net	*Sessions*	*Traffic*	*High*	*Low*	*Average*	*Most Consisten*
EAN	21	815	76	9	38.8	All
CAN	19	288	39	5	15	RN5
(Jan.)						
1RN	34 *	330	49	0	9.7	E. Mass.
2RN	42	390	26	0	9	JN. NYS
3RN	40	155	18	0	4	E. Pa.
4RN	42	505	48	0	12	S. C.
RN6	28	1010	62	3	36.7	
RN7	50	465	34	0	9	Wyo.
8RN	35	143	22	0	3.8	Mich.
9RN	25	685	65	0	27.4	Ill.
TEN	45	955	62	2	22.2	
TRN	42	99	16	0	4.2	Ont.
QIN	68	1064	54	0	16	
(Ind.)						
TLCN	21	296	29	2	14.1	
(Iowa)						
NYS	25	450	42	4	18	
(N. Y.)						

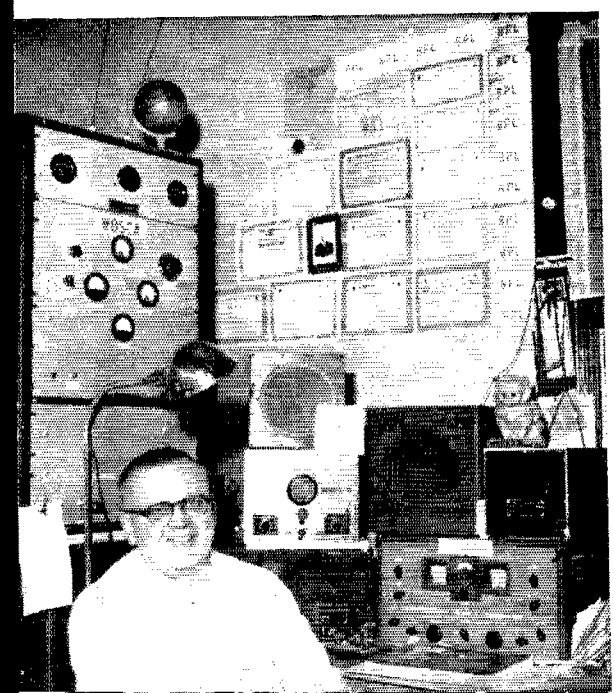
* 42 sessions held.

Eastern Area Net: All regions reported 100 per cent except 4RN and TRN, each of which missed one session. EAN was in session 19 hours and 19 minutes. The monthly EAN bulletin by Manager W8SCW comments on some of the rough spots.

Central Area Net: No one has yet applied for the managership vacancy created by the resignation of W9CBE.

♦

During the past two or three years the call of WØSCA has climbed steadily in traffic and emergency organizational circles. Here is what he and his station look like. When "Doc" was appointed manager of TEN (Tenth Regional Net) in February, 1950, he promised within two weeks to have a net that would come up to any in the country; and then he went to work. Today TEN, primarily as a result of his efforts, is one of the best, and WØSCA has "retired" as manager. Doc is also ORS, RM and EC in his section, holds two ARRL Public Service Certificates and a 30-w.p.m. Code Proficiency Certificate.



Pacific Area Net: Reports have it that PAN is functioning well, but nothing heard from W7HKA.

First Regional Net: Correction to the list of certificate recipients in March *QST* — should be W1s FPS KYQ and LRG instead EPS LYQ and KRG.

Second Regional Net: A 2RN certificate has been issued to W2CGG. The March 2RN bulletin points with pride to the enviable record of 2RN during the present season.

Seventh Regional Net: W7PKX has been appointed Assistant Manager of RN7.

Ninth Regional Net: 9RN certificates have been issued to W4SHJ and W9s BCV CEE ERW HUV KCN MEM and SXL.

Thirteenth Regional Net: VE3BUR says that he is pleased with the teamwork on TRN. VE1OM is to be commended for his untiring enthusiasm in keeping the Maritimes active.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for February traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	249	2644	2215	373	5481
W6KYV	154	1232	258	960	2604
KG6FAA	1055	701	395	265	2416
W9JUJ	24	1090	1065	13	2192
W6GYH	16	868	766	110	1760
W6IAB	76	391	307	884	1658
K6WAR	175	730	628	102	1635
W4IQV	12	673	661	11	1357
W6BAM	68	519	358	156	1101
WØCOZ	4	520	504	8	1036
K9FAE	23	488	491	32	1034
JA2KW	513	208	21	187	929
WØQXO	9	403	370	29	811
KL7AIZ	47	382	358	12	799
W7CZY	4	387	381	6	778
W4AKC	15	383	349	6	753
W4CRA	656	0	0	0	656
W4AGC	7	316	307	5	635
W5MRK	7	304	276	19	606
W2VNJ	30	282	202	71	585
W8RJC	14	274	258	14	560
W8ZGT	10	275	273	2	560
W9ESJ	21	264	211	53	549
WØKHQ	3	3	536	2	544
WØSCA	5	261	256	3	525
W4ANK	79	229	171	44	523
W2DJF	12	257	210	43	522
W7WJ	10	250	204	41	505
W8AUJ	12	260	205	28	505
Late Reports					
KR6AF (Jan.)	300	1440	1232	201	3173
KG6FAA (Jan.)	790	1083	556	439	2868
WØCOZ (Jan.)	8	406	398	8	820
K6FAJ (Jan.)*	256	222	213	9	700
W8DAW (Jan.)	4	318	293	20	635
WØCOZ (Dec.)	6	293	267	26	592
W7II (Dec.)	25	282	245	26	578
K9FAE (Jan.)	12	266	252	15	545

The following made the BPL for 100 or more *originations-plus-deliveries:*

W2ORU	266	W7BA	119	W2RUF	106
W9NZZ	221	W4SHJ	109	W8ARO	102
W4NAD	204	W4JAQ	108	W3LQV	100
W8URM	134	W5PAK	107		

A message total of 500 or more or 100 or more *originations-plus-deliveries* will put *you* in line for a place in the BPL. The Brass Pounders League is open to all operators who qualify for this monthly listing.

* Listed in April *QST* as K6FAT.

SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listing on page 64 of November 1951 *QST* and subsequent supplementary listings in the January and March issues. These corrections and additions were received between January 17 and March 15, 1952. An asterisk (*) indicates correction from one of the previous listings mentioned above. This is the last supplementary listing until a new net list appears in November 1952 *QST*.

Name of Net	*Freq.*	*Time*	*Days*
Barefoot Net	3863	1715 EST	Daily
Bay Area Net (BAN) (Calif.)	3635	2030 PST	Mon.–Fri.
Churn Net (Pa.)	144,138	1930 EST	Mon.
Georgia Novice Net (GNN)	3735	2030 EST	Sat.
Haverford Twp. Emerg. Radio Net (Pa.)	144,800	2100 EST	Mon.
Local Worcester Region #3 CD 'Phone Net (Mass.)	28,720	1900 EST	Mon.
Maryland Emerg. 'Phone Net	3820	1300 EST	Tues., Thurs., Sat., Sun.
		1830 EST	Mon., Wed., Fri.
Mission Trail Net (MTN) *	3680	2000 PST	Daily
Sunrise Net *	3854	1900 PST	Daily
Tennessee 'Phone Net *	3950	1030 EST	Sun.
	3980	0800 CST	Sun.
		1900 CST	Tues., Thurs.

CODE-PROFICIENCY AWARDS

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW will be held on May 14th at 2130 EST. Transmissions will be made simultaneously on 1887, 3555, 7120, 14,100, 28,060, 52,000 and 146,000 kc. The next qualifying run *from W6OWP* only will be transmitted on May 4th at 2100 PST on 3590 and 7248 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. To get sending practice, hook up your own key and buzzer and attempt to send in step with W1AW.

Date	Subject of Practice Text from Mar. *QST*
May 2nd:	*Instantaneous Prediction of Radio Transmission Paths*, p. 11
May 4th:	*Instantaneous Prediction of Radio Transmission Paths*, p. 15
May 8th:	*Pointers on the Installation of Mobile H.F. Converters*, p. 21
May 10th:	*Twenty Watts Mobile . . .* , p. 22
May 16th:	*Getting Ready for 21 Mc.*, p. 28
May 18th:	*A Power Supply for the Novice Transmitter*, p. 32
May 22nd:	*QST Visits "Captain Stay-Put,"* p. 36
May 24th:	*Some Simple Ways of Erecting Temporary and Semi-Permanent Antennas*, p. 40
May 28th:	*50 Watts Output on Ten and Six*, p. 42

A.R.R.L. ACTIVITIES CALENDAR

May 4th: CP Qualifying Run — W6OWP
May 14th: CP Qualifying Run — W1AW
June 6th: CP Qualifying Run — W6OWP
June 7th, 8th: V.H.F. Contest
June 19th: CP Qualifying Run — W1AW
June 21st–22nd: ARRL Field Day
July 12th: CP Qualifying Run — W6OWP
July 18th: CP Qualifying Run — W1AW
July 19th–20th: CD QSO Party (c.w.)
July 26th–27th: CD QSO Party 'phone
Aug. 3rd: CP Qualifying Run — W6OWP
Aug. 18th: CP Qualifying Run — W1AW
Sept. 5th: CP Qualifying Run — W6OWP
Sept. 16th: CP Qualifying Run — W1AW
Sept. 20th–21st: V.H.F. Contest

With the threat of war and the increasing emergency-consciousness on the part of the amateur fraternity in general, many highly organized AREC units are straining at the bit to put their well-trained facilities to work. As a result, we amateurs are getting in on more different kinds of emergencies than ever before, many of them a result of our increasing mobility. In any number of circumstances, mobiles can render a communications service which is needed and which is useful but is not necessarily classed as a "communications emergency." This aids us in figuring more frequently and more prominently in the public press.

Here at Headquarters we are receiving, these days, considerable quantities of clippings describing incidents in which amateurs have participated, some of them in real emergencies, some in minor emergencies, others in mock emergencies and still others simply describing the organizational set-ups and what *can* be done. Reports of all these, and others, come to us for possible use in this column. Unfortunately, space limitations being what they are, it is not possible to use some of them at all, and others have to be "boiled down" to fit into the space available. We hope you will bear with us if your contribution does not appear a month or so after you sent it in, or even if it does not appear at all. We can make only one promise: That due consideration will be given to all and every contribution which reaches us. And here's a tip: send along a photograph. We would like to have a good photo for this page every month, and if yours is a good one it will put your contribution into a higher "priority" classification.

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From mid-December to mid-February, amateurs participated in five known incidents regarding airplane crashes. Let's summarize each one briefly:

Members of the Walla Walla (Wash.) Valley Amateur Radio Club and the Pendleton (Ore.) Amateur Radio Club assisted, on December 20th, in the search for W7QGI of Walla Walla who disappeared in his plane on December 19th. He was accompanied by his young son and daughter. W7PL/7, station of the Pendleton Club, was set up in the hangar of Pendleton Airways, which was designated search headquarters. W7NNP/7 of the WWVARC was installed in Pilot Rock, Ore. Ground parties were dispatched from both places, since the weather prohibited flying. A mobile or a portable accompanied each search party whenever possible. Search operations lasted all day on the 20th and resumed on the 21st, when the wreckage was sighted at about 1000, with no signs of life. The emergency network left the air at 1615 on the 21st after the bodies of the three victims had been brought to Pendleton. Some 37 amateurs from the two clubs and elsewhere in the vicinity assisted in the operation.

The plane that crashed on December 29th near Little Valley, New York, was not located until late in the evening of December 30th. W2ABC and W2GSL in their mobiles attempted in vain to reach the scene of the crash. In the end, communication was supplied with the scene of the crash by portable hand sets provided by the Sheriff's Department, indicating very plainly the utility such units will have in civil defense. The Sheriff of Cattaraugus County praised the amateurs who took part in this emergency.

After the crash on January 19th, at Sandspit, B. C., VE7UG immediately offered his services, since he was the only amateur in the area. Traffic was handled with Seattle through W7LWX and W7HVB. A tape recorder was used to catch any parts of messages missed. About 75 messages were handled, mostly information and directions in salvage operations.

Union County (New Jersey) amateurs were in action at the scene of the air crash near Elizabeth, New Jersey, on January 22nd. W2EUI/M was at the scene of the crash within 20 minutes after it happened, and was joined by W2CCY/M shortly afterward. Communication was maintained with Red Cross Headquarters. Six additional mobiles participated during the course of the activity, with many other local amateurs standing by to assist whenever possible. Ralph Roe, WN2IBH, chairman of the local Red Cross Communications Committee, gave high official praise to the amateurs who participated.

Two jet planes crashed in midair near Boulder City, Nevada, in February. W7LYV, who observed the crash, jumped into his car, turned on his mobile rig and headed for the scene of the accident. Contact was made with W7NCR and telephone connection was made with Nellis Air Force Base. W7LYV/M to W7NCR to the base was the sole means of communication for some two hours. W7KVP also assisted. The value of the prompt establishment of communication was attested by a letter from the Commanding Officer of the base.

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A newspaper clipping sent in by W6DDE tells about an incident in Big Bear City, California, in which a fire was reported by W6HVK who transmitted the information to W6VQU. Big Bear had been cut off from all normal communication by a heavy snowfall. The same snowfall, however, kept firemen from getting to the blaze, and the house burned to the ground. Nice try, fellows.

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In early January, VE1DW received a call from VE1PB located on Sable Island off the coast of Nova Scotia, to the effect that his daughter was ill and needed medical assistance. A doctor was brought to VE1DW and diagnosed the case as pneumonia. After prescribing, the child's case improved. VE1LZ assisted in relaying information during part of this exchange.

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On the morning of January 16th a call was received from a remote radar station near Edwards Air Force Base, California, that one man was killed and one other severely injured in an attempt to return to the home base to avoid being snowbound. W6VRF/M accompanied the rescue convoy to supply communication with the base. Due to snow and icing conditions the ambulance was unable to reach the scene of the accident, and four hours on foot was required, during which portable hand sets on 3885 kc. were used to maintain communication with W6VRF/M. The operation was further complicated by skip conditions on 3885, which frequency was also used by W6VRF/M, who is EC for the Edwards area.

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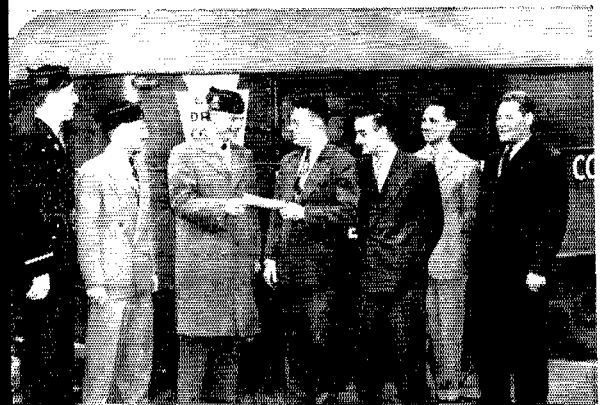
The February 2nd train wreck in Calera, Alabama, alerted three Alabama emergency nets. Our reports from W4GJW and W4RTI indicate first notification at 2210 on February 2nd. By 2215, W4KVY was clearing the AENP frequency on 75 meters while W4GJW alerted AENB on 3680. By midnight, W4RTI was at the scene of the accident in his mobile, reporting ambulances coming out, road con-



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Ham radio gets a big hand in Erie, Pa. The Radio Association of Erie got the local American Legion Post interested in the RAE's "mobile unit" project, resulting in the presentation to officers of RAE of a 21-foot house trailer, at left. Shown receiving title to the trailer are (*l. to r.*) W3ODF, Pres.; Ronald Barker, Treas.; W3QPP, Secy.; W3PIV, Veep. The RAE features an amateur radio column in both Erie Sunday papers.

QST for

ditions, etc. Shortly thereafter, W4NQK appeared on the scene with his 10-meter mobile, making two circuits available. W4RTI says that the call letter license plates served as rapid identification. This, coupled with deputy sheriff commissions, made passage through police lines easy. Among those participating were W4s AUP DAQ DFE ECI FIE FGT FSW GJW HKE KNW KVY NQK NZZ OLG RHO RTI and SDX.

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February was a bad month in the State of Maine. We present herewith paraphrases of reports from SEC W1IGW and EC W1KEZ:

The first indication of trouble was at 0745, February 12th. A wet snow froze on telephone and power lines, causing severe breakage. W1SDW and W1NHT got an antenna up at 1000 to make contact on 3961 kc. Meanwhile, W1MXT dug his antenna out of the snow and made contact at 1115. All this work was done in a blinding snowstorm. At this time W1OLQ in Bangor came on and took traffic from W1MXT and W1NHT. There were telephone connections in the towns but no communications to the outside except by amateur radio.

On return from work, I found my antenna down and finally got on the air again at 1700. At 1730 the Sea Gull Net came on with W1PTL as NCS. From then until 2030 receiving conditions got worse, and it was necessary at one time to relay traffic via W2LBT.

The only real danger occurred the first day when the pumps furnishing water for the Town of East Millinocket failed. I was able to relay the necessary instructions by radio to W1NHT so that eventually they were able to get the water pumps in operation and avert an extremely serious fire hazard.

On February 13th W1NHT and W1MXT came on at 0800 and stayed on most of the day handling traffic between East Millinocket, Millinocket and Bangor. At 1650 I relieved W1NHT and carried on during the evening handling routine traffic.

On February 14th conditions were much improved with one telephone line open. W1SDW monitored the frequency during the day and I took over in the evening. On February 15th I was on from 0730 to 1800 when operation was terminated.

Traffic was handled for the Great Northern Paper Co., Bangor and Aroostook Railroad, U. S. Weather Bureau, local doctors and commercial concerns. Other stations taking part included W1s ALZ AO EBJ LBJ MJR and SCS. — *W1KEZ, EC Millinocket, East Millinocket and Lincoln, Maine.*

On February 18th we awoke to find a howling northeast blizzard had us in its grip. When the skies cleared we had received between 27 and 30 inches of snow. The County Civil Defense Director asked the AREC to stand by. 'Phone lines were so crowded that we set up a circuit between Auburn and Livermore Falls to handle c.d. traffic. W1LRG and W1JTS took care of Livermore and Livermore Falls, while W1SEJ, W1LOZ, W1BHR and W1IGW handled the Auburn end. Livermore was in very bad shape and appealed to Auburn for aid. Amateur radio handled the communications into c.d. headquarters and kept them posted on conditions and progress. — *W1IGW, SEC Maine*

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Eleven SEC reports were received for January, representing 56 communities, 1497 Full Members and 399 Associate Members. We can do better than that, gang.

Ohio River Flood

The following is a boil-down of a report by W8BTV of emergency activities during the Ohio River Flood on January 27th, 28th and 29th:

W8BTV was alerted January 27th when the Red Cross reported that Wheeling would be flooded the following day. Opened up on 3770 kc. at 1345. W8GEP and the Princeton gang lined up contacts in Pittsburgh, Washington, D. C., and Cincinnati, where Ohio SEC W8UPB was on the job. W8DFC operated on 3550, the NEN frequency. W8GCZ was on 3650 to get Washington, D. C., while W8YPR and W8DYP combed the 75-meter band for a Charleston station to join the net on 3770, where W8BTV was QRX. W3KSR in Pittsburgh answered W8BTV on 3770, and got in touch with the Pittsburgh Weather Bureau for river forecasts. W8AUJ, on the Monongahela River, furnished flood reports from there to Pittsburgh and Wheeling, where the information was coördinated. W8UPB furnished information from the River Forecasting Service in Cincinnati. Communication with Charleston was established when W8LII and W8UYR joined the net about 1700. W3AKC lined up K4USA for the Washington contact, and we then had Washington, Charleston, Pittsburgh, Weston (W. Va.) on the Monongahela, Wheeling, and Cincinnati. The net was later joined by W8SFI who had traffic for the Red Cross in Washington. This was routed via W8BTV and K4USA. When skip made impossible contact between W8BTV and K4USA, WØSCA in Lincoln, Iowa, acted as liaison and relayed traffic to K4USA.

On Jan. 28th Red Cross called W8BTV, asking for contact with Washington. The frequency 7100 kc. was used at that time, and finally K4USA was raised with the help of W9JUJ. Emergency traffic was handled and later operations were transferred to 3770.

Operations continued Jan. 29th on 3770 kc. with more Red Cross traffic for Washington, which K4USA handled most ably, getting replies whenever possible. W8SFI also had Red Cross traffic for Washington, which was put through K4USA. W8PTJ joined the net at 1215, thus furnishing contact with Huntington.

The West Virginia Net was held as usual Monday night at 1900, with W4NF in Arlington reporting in for Washington traffic. Schedules were maintained with Charleston (W8UYR), and Washington (K4USA, W4NF), until the Red Cross required no further aid. W8UPB and W8PTJ monitored, with other stations reporting in to offer assistance when possible. Ham radio once again proved its value to the community.

W8BTV received the personal thanks of the City Manager of Wheeling, as well as commendation from the Disaster Committee of the Wheeling-Ohio County Chapter of the American Red Cross, who were very profuse in their thanks. Although the amount of third-party traffic was relatively small in this instance, the facilities were available for dissemination of a large volume of such traffic, as well as official information, which was handled between river cities and the Red Cross in Washington/Arlington.

FEBRUARY FMT RESULTS

In the first 1952 ARRL Frequency Measuring Test, open to both ARRL Official Observers and other amateurs, entries were received from 145 participants who reported 484 measurements; 68 entries were submitted by Observers and 77 by non-OO entrants. Each entrant has received an individual report comparing the accuracy of his measurements of the special W1AW FMT transmissions with those made during the test by a professional frequency-measuring laboratory.

The measurements of Warren K. Hamilton, W2FE, averaged out to an accuracy of 0.2 parts per million, making him the leading entrant in the OO group. Lloyd W. Root, W8HB, a consistently good performer and leader in many previous tests, submitted measurements which averaged 0.3 parts per million and again topped all other non-OO entrants. The standings of other leaders in the test are given below. Since the official readings can only be accredited to 0.4 parts per million, the decimal is shown only to establish listing order. In accordance with the announced rules, no entry consisting of a single measurement was considered eligible in the competition.

Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
W2FE	0.2	W8HB	0.3
W9PFK	0.3	W4HER	0.5
W2OUT	0.5	W3PYW	1.4
W1MUN	0.6	W2IWH	3.2
W8PEN	0.7	W9LZP	3.2
WØOTR	0.8	W4QN	3.8
W4JUI	1.5	W4RVO	4.0
W5BDX	3.0	E. S. Read	5.8
VE6HM	3.2	W1MGN	7.4
W2AIQ	5.3	W6NCP	8.7
W2ATE	7.9	W9PBI	8.8
W8GQ	8.6	W5FMO	9.3
W6CK	9.3	WØDHN	10.4
KZ5GD	10.0	W2DZK	11.7
W2ZT	10.6	WØIQY	13.9

The following ratings are based on a single measurement: OOs — W8GZ 0.6, W4WO 0.8, W4FR 3.3, W8EQ/A8EQ 3.3. Non-OOs — W2YBP 0.6, W1RRA 3.3, W2RJL 3.6, W9MDG 3.6, W4RXO 3.9, W8BMO 10.0, WØFNA 10.9.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, John H. Du Bois, W3BXE — SEC: ISE. RMs: AXA, BIP. E. Pa. Net: 3610 kc. Approximately 300 amateurs, representing a dozen clubs, attended a meeting of the Philadelphia Area Council of Radio Clubs on Feb. 27th at the Cassidy School, 65th and Lansdowne Ave., Philadelphia. Highlights were a talk on TVI by Phil Rand, 1DBM, and an explanation of the FCC's stand regarding amateur interference by Mr. Phelps, the local inspector. Numerous door prizes and also prizes for home-built gear were donated by radio supply houses in the area. TVI committee throughout the section report progress, with QV heading up the Southeastern group. Scranton amateurs are conducting a series of meetings with local appliance sales organizations, but are experiencing difficulties because of fringe area TV signals. The civil defense program is shaping up, with UA covering the system at State level. SM reports 2-meter net active in Lackawanna County. Traffic nets have been very active, this section having placed second high in the country for December. CUL and LQV made BPL this month. More reports from 'phone stations would be welcomed. OOs report an increasing number of violations. The recent F.M.T. was ruined in many areas by foreign broadcasting. EU has the W3BQ memorial station in operation on 3.5 Mc., running 200 watts. NNV is completing teletype set-up. 3QMP/2 is operating at K2FAV, Sampson AFB, N. Y., running 20 watts to a selenium-powered rig on 3970-kc. 'phone, and is on the lookout for Philadelphia contacts. DX-chasers report a dearth of "new ones" during February. Yours truly now is eligible for Old Timers' Club. Speaking of old-timers, how about some reports from Novice Class licensees? Traffic: W3CUL 5481, NHI 415, BIP 242, LQV 182, AD 164, QLZ 65, OML 44, ADE 25, QEW 16, PDJ 12, CAU 5, VR 4, BES 2.

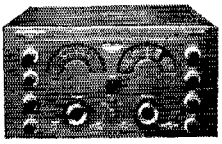
MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, James W. John, W3OMN — Newly-elected officers of the Chesapeake Amateur Radio Club are LZM, pres.; AFM, vice-pres.; PRJ, secy.; SDB, treas. On Feb. 19th 3BYG, of Glenn L. Martin Co., addressed CARC on "R. F. Bridge Techniques." On Mar. 4th NVL covered "Application of a PI Network to Amateur Transmitter Design." The Baltimore Amateur Radio Communications Society, Inc., has shortened its name to Baltimore Amateur Radio Club, Inc. The program for Feb. 18th included "Conversion of a Command Transmitter for Mobile" and on Mar. 3rd "Class C Amplifiers and Factors Affecting its Operation" was presented. The BARC conducts a code and theory class on Thursdays at 8:00 P.M. Interested SWLs and Novices should contact GBB. On Feb. 23rd AM, of NRL, discussed "Antenna Patterns" at the Washington Radio Club meeting and on Mar. 8th PYW explained "Radio-Teletype." The Rock Creek Amateur Radio Club held an auction on Feb. 22nd. MPD is Net Control for the CSRC Net which meets at 9:00 P.M. every Sunday, 29,008 kc. PZ passed the Extra Class exam. LZM is NCS on Fridays for EAN and liaison for EAN to CAN on Wednesdays. Traffic: W3LZM 334, ECP 123, PZW 85, AKB 80, QZC 78, CVE 75, JZY 60, COK 27, MCD 27, ONB 24, BWT 23, QCB 23, FWP 16, CQS 15, NOE 14, WAG 10, NNX 4, TT 3, LSX 2.

SOUTHERN NEW JERSEY — SCM, Lloyd L. Gainey, W2UCV — Pleased to announce the appointment of K2BG as Section Emergency Coördinator for the northern portion of this section. Herb has been very active in emergency net operation and we are sure this section will benefit greatly by his leadership. A very interesting lecture on quartz crystals was presented by OQN at the February meeting of the SJRA. The attendance at this meeting was well over 75, with many new faces. If the increased attendance continues the club soon will be in the market for a larger meeting hall. ASG has taken over as Net Control of the 10-meter mobile group. With warm weather on the way we can expect activity to increase substantially on this band. SDO has installed his Viking transmitter in a new completely shielded metal cabinet and reports TVI eliminated. 80-meter C.D. Net drills are held every Tuesday evening at 7:30 on 3505.5 kc. The Delaware Valley Radio Assn. sponsored its 8th Annual Old Timers Night Round-up and Banquet on April 19th in Trenton. All Novice license holders are reminded of their opportunity to join the various emergency net activities in the section. Traffic: W2RG 189, LTI 147, ASG 23, ZI 10, HAZ 5.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — SEC: UTH. RMs: RUF and COU. PAM: GSS. NYS: 3615 kc., 7 P.M. NYSS: 3595 kc., 8 P.M. NYS: 3980 kc., 6:30 P.M. NYS C.D.: 3509.5 kc., Sun. 9 A.M., Mon., Wed., and Fri., 7:30 P.M. GSS has been appointed PAM for W.N.Y. Your coöperation will be appreciated. Thirty stations checked in for the 5th Anniversary Party of NYS. A QNC from your SCM and Asst. Director started off the Hidden Transmitter Hunt; 42 messages were handled after the party. Prizes were won by ITX, EQD, HUM, and DJF. Many thanks to 1SAL, 4ANK, and 8SCW for their part in making the party a success. At a meeting in Lockport, 21 out of 23 hams in the county signed up for c.d. and AREC. The CCARA has been formed in Addison. It is with regret that we report the passing to Silent Keys of ZJ on Feb. 19th. On Feb. 24th a Memorial Service was conducted by Rev. Evans over the amateur radio facilities of YY on the NYS C.D. North Tonawanda and Lockport have purchased ham gear necessary for c.d. to cover their areas. The XYL of GSS obtained the call WN2MSY. EB spoke on s.s.b. DX at the Rochester DX Assn. meeting. The AREC in Rochester used its new emergency truck in a drill held for c.d. The first real test was an urgent message to WN2AKM calling him to the hospital where his XYL had presented him with a YL jr. operator. QHL and GFD now are 10-meter mobile. The Scintilla Magneto Co. donated a 750-watt generator to Sidney AREC. RTD, FTR, FTO, WUF, and EGO passed the Advanced Class exam. UBR lost 20-, 10-, and 2-meter and TV beams in a storm. New officers of the Sidney Radio Club are YE, pres.; CYV, vice-pres. and treas.; UPT, secy. KBT and RAWNY held auctions and WON spoke on v.h.f receiver design at a KBT meeting. The Niagara Radio Club had a demonstration of Sonar 2-meter gear. Orleans County C.D. Net operates on 29 Mc. Sunday at 9:30 A.M. QNA is back on 2 meters with a 4/4. DEQ returned from a vacation in Florida. TBD is back on the air after a time in the hospital. A new ham in Oneida is Novice GPY. QAA indulges in printing as another hobby. Oswego County c.d. headquarters in Pulaski Court House were wired and tested with emergency power. CKY took a trip to Florida and visited FMH while there. For business reasons FAN was forced to resign as EC for Niagara County and ZOC has been appointed to carry on the c.d. and AREC program, the County having purchased Sonar transmitters and receivers for c.d. use. BTB and ZOL are very active in traffic work. DJF and RUF make BPL. Traffic: (Feb.) W2DJF 522, RUF 468, BTB 390, COU 327, ZOL 203, NAI 164, GSS 64, RUT 59, SJV 51, ZJ 41, QAA 14, RXW 3, ZHU 3. (Jan.) W2PGT 30, QAA 9.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — We take pleasure in welcoming the Bucktail Amateur Radio Club, whose officers are: OGN, pres.; 2FEX/3, vice-pres.; VBL, secy.; RLH, treas.; DNO, sgt. at arms.; RMX, trustee; 2LZY, comm. chief; NMJ, publicity man. The club publication is called the *Bucktail Hamster*. W. Pa. clubs take notice. Write to VBL, secy., 122 E. 2nd St., Emporium, Pa., if interested in club paper exchanges. NDE, KXP, REE, and LGK paid a visit to the Boys' Club of St. Marys. KUN keeps the W. Pa. Net humming when the regular NCS are absent. Up Erie way, KNQ is the lone traffic handler for Erie as far as W. Pa. Net goes. QN sends in his usual fine report on the gang up his way. QPC is building an all-band 300-watt rig. Another new station up Erie way is PJD. LKJ has a TBS-50. The American Legion Post 11 presented the Radio Assn. of Erie with a trailer. We understand the RAE will publish its own club paper. The Western Pennsylvania Radio Club Council, formerly known as PARCC, has been reorganized. We understand MPO has been elected director of the W. Pa. section. The WPRCC held its first official meeting Feb. 29th with 1BDI, Communications Manager of the ARRL, as guest speaker. Included in the group of dignitaries were GEG, Atlantic Division Director; NUG, Route Manager of W. Pa. Traffic Net; and 3UA c.d. director. Your SCM also attended. Among the interested visitors and listeners were NKM, OMY, MPO, UUG, JSH, KWA, GJY, UHN, BSR, and DGL. The Steel City Radio Club paper tells us that new officers of the WPARCC are LPQ, NRQ, MML, and OD. MTP is "debugging his rig." Congrats to JSH and UUG on winning in their respective sections in the YLRL Party. MPO is teach-

(Continued on page 82)



ON the inside cover of *QST* for April, National made the announcement of a new receiver, the NC-183D.

What's "new" about it? To those familiar with National products, this receiver is just about as "new" as any receiver can be and still retain its old cabinet.

The dials have been changed to edge lighted lucite for ease of reading. The markings are light on a dark background. The "S" meter scale is of matching colors.

Let's take a look inside this receiver. Probably the things that catch the eye first are the row of I.F. transformers and the miniature tubes. This new receiver uses 5 double tuned 455 kc. I.F. transformers, a brand new crystal filter and two double tuned 1720 kc. I.F. transformers. All of these circuits are permeability tuned for maximum skirt selectivity. The sharp I.F. system which includes 3 stages of amplification makes the signals "pop in" with push-button suddenness. The selectivity of this I.F. system cuts the QRM to a minimum.

Dual conversion is automatically switched in on the 6, 10, 15, 20, and 40 meter bands. The receiver uses dual conversion from 4.3 mc. through the 6 meter band for greatly improved image rejection. The 1st I.F. frequency is 1720 kc.

You switch in the crystal filter and note the 5 evenly spaced selectivity steps and find the sharp position to be only 80 cycles wide at the 6 db point, adequate for separating most c.w. signals.

A look at the tuning condenser reveals that the bi-metallic temperature compensator is missing. It has now been incorporated in the condenser itself. The tuning condenser mountings have also been improved to reduce mechanical vibration effects.

The new miniature tubes give the chassis a clean uncluttered appearance, even though there are 16 of them. New R.F. coils and miniature tubes combine to give the receiver remarkable sensitivity even in the 6 meter band. The second conversion circuit has been carefully engineered to prevent harmonics of the second conversion oscillator from producing "birdies".

Switching to the broadcast band, you confirm that the fine push-pull audio system has been retained, and also that the receiver can double for your entertainment receiver, complete with phono or FM tuner attachment. The accessory socket will still give you power for those QST gadgets that you like to build from time to time to keep your "hand" in radio.

Now that you have seen as well as heard this new receiver, you realize that here is truly a modern receiver, built in keeping with the finest traditions of National quality and engineering know how. Here is the receiver you have been waiting for!

HARRY PAUL, W1PMS

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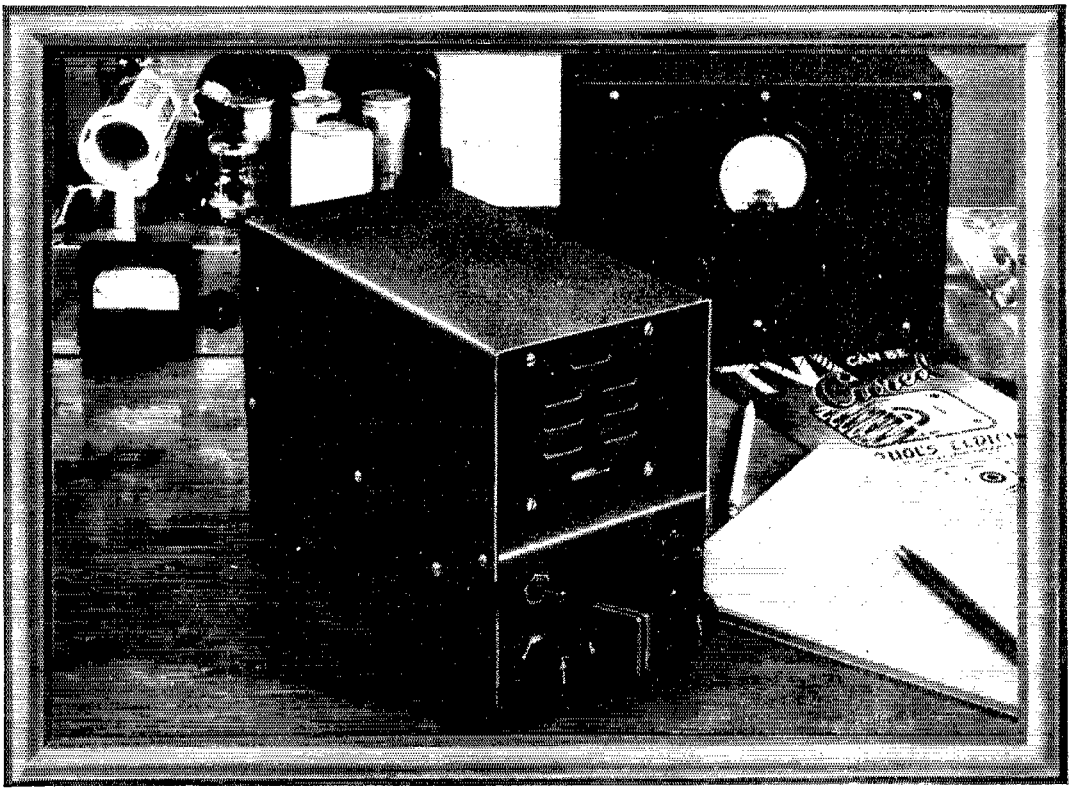


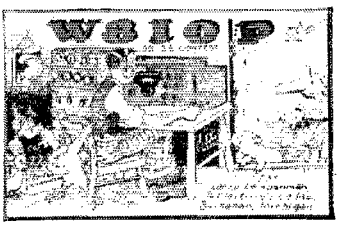
Better QSO's and more of them!
Effortless sending without fatigue!
Perfect sending—the stamp of an A-1 operator!
Controllable speeds from 8 to 50 wpm!

These are just some of the reasons why the modern CW station should have an electronic key . . . whether you buy one or build one.

For plus value, take a look at the features of the Eldico Electronic Key, *the only commercial electronic bug available.*

The Eldico Electronic Bug is a self-completing type of automatic keying device incorporating all the latest improvements in automatic keying known to the art. It features self-completing characters that automatically insure perfectly formed sending; control is provided to give continuous variable speed for any rate of sending from 8 to 50 wpm; there is a separate control for "weight" of characters and ratio of dashes-to-dot length, allowing individual tailoring to your own fist; self-contained with built-in power supply in attractive gray crackle portable case complete with jewel-mounted automatic key mechanism.

At just a little more than the cost of automatic old-fashioned keys you can start using this Eldico Electronic Bug. Performance? Read what one CW man who knows the ropes has to say: "For the amateur who wants to add the finishing touches to his signal, there is nothing that will beat an electronic bug, and believe me distinctive sending made possible by effortless electronic keying makes a difference in results. The good operator always has a definite advantage in making contacts—W8IOP."



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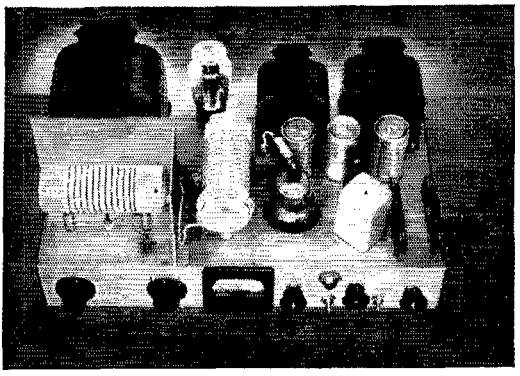

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(Now superseded by the TR-75-TV illustrated above)

In our own "tobacco survey" we discovered that as many as one out of every three transmitters being used by the Novice Hams is an ELDICO TR-75. It is a simple test to run—get on a Novice Band and listen for the good signals—work them and you will probably find the transmitters are TR-75's . . . by working them all, you soon discover that one out of three uses ELDICO. This survey is fun to make . . . get on the Novice Band, call CQWN and give the novice a crack at your call. He likes to work the "old timers" too.

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(*Continued from page 78*)

ing code to the Boy Scouts. OFO now is radio representative on the Westmoreland County c.d. Down Jeannette way, UVD advises that VNE is leaving the Navy. AER says a new case of TVI was found. The length from the TV antenna to the TV set lead-in was the fundamental length of the 14-Mc. band, thus overloading the TV set front end. WN3SXF claims his 2-meter signals are QRMing his neighbor's hearing aid. MOT says the Du Bois Radio Club has been organized and meets at State College. CJF acts as Net Control on the Penn-Ohio 2-meter Net. Traffic: (Feb.) W3KUN 96, NCD 87, AAX 75, NUG 50, UHN 36, JSH 25, AER 14, KWL 13, KNQ 9, MOT 4, LOD 1. (Jan.) W3JSH 72, NUG 59, AAX 25, AER 9.

CENTRAL DIVISION

ILLINOIS — SCM, H. F. Lund, W9KQL — Section Nets: IEN, 3940 kc.; ILN, 3515 kc. SEC: QLZ. Asst. SEC: HPG. RM: BUK. PAM: UQT. LIY is QRL building TV antennas. WN9PLD is planning an m.o.p.a. rig. WN9QLR has a new 75A-1 receiver. MAR is fighting TVI from his T-55 final. PHE returned from the hospital in time for the DX Contest. MUN popped his plate transformer in trying to go to 144 Mc. The New Trier High School Club, sponsored by QFI, has 36 licensed hams. They recently held a very successful joint meeting with the North Suburban Club. JZN spent a couple of weeks in Florida. GXA now has a kw. on 14-Mc. c.w. WYO is back in the 9th District. ØTPK now signs the call 9PYT. ECP is building a 144-Mc. mobile rig. KRH uses a BC-459 VFO ahead of his Viking I. DUA was active in traffic during the Tennessee tornado the latter part of February. IAY has a new electronic keyer under construction. Springfield was well represented at St. Louis Feb. 7th with ten applicants taking examinations. LZS now holds Advanced Class ticket. The Tri-Town Club has organized a c.w. net. It meets every Saturday at 2130 CST on 3525 kc. JMG is NCS. MEI received his Advanced Class license and is new communications manager of DUA. KA has worked 60 countries with 36 watts input and an indoor dipole. Attention a W6: EBX is looking for one of you fellows who can work through the skip, as a West Coast outlet is needed for TXN. CFV has the Bloomington Area 'phone net going swell on 1810 kc. YQP has returned to the air. MMH moved to new QTH. CRD has a miniature version of the "Additive Freq. Meter" per *QST;* it is small and doesn't get in the way like most of those things do. QQO is a new Novice in Crystal Lake. IFA now is OES and works 144 Mc. after spending the day as engineer of a b.c. station. According to NN the bands sound like they need some more OO work. Hamfesters Club officers for '52: WOL, pres.; AVH, vice-pres.; EET, treas.; GVO, rec. secy.; FWV, fin. secy.; HOV, committee chairman of the picnic which will be held Aug. 10th. Now is a good time to find out how the political candidates feel toward an amateur call letter license plate for your car. Although they are 100 miles from the nearest TV station the Decatur Club has organized a TVI committee to aid them in their battle with irate TViewers who blame them for all kinds of TVI. UQT got his son a TV set. It seems that Doc baby-sits once a week with his grandchildren — the TV helps him entertain the youngsters. BEN is using a vertical antenna. Asst. EC certificates require annual endorsement; see your EC right away, he needs your help. Traffic: (Feb.) K9FAE 1034, W9EBX 213, MEM 206, YIX 160, SXL 156, CEE 143, CSW 106, BUK 104, YTV 88, EHS 50, STZ 38, LXJ 37, KQL 28, AOV 26, MRQ 21, DUA 20, KRH 12, DOR 7, MUN 7, LIN 3. (Jan.) K9FAE 545, W9CEE 80, OR 21, MEI 12, NN 8, KRH 2.

INDIANA — SCM, Clifford C. McGuyer, W9DGA — DLI is on 80-meter c.w. NZZ spends 4 to 5 hours daily handling Arctic traffic. IFR worked KH6UL on 4-Mc. 'phone. RZO works single sideband. RE has new HRO. MAM has a new transmitter and no TVI. YME has new three-band mobile rig. MYI is recovering from a broken leg. VDD is back from the Marines. IXG is back from school. The Michiana Radio Club had 135 amateurs at its annual banquet. New officers are PDF, pres.; BYY, vice-pres.; SIQ, secy.; and FIW, treas. WWT is a new RM. KTX is NCS on the MARS nets. New OPS appointees are ZIB, WBA, FSA, HIW, FYM, and YVS. GUX is on 144 Mc. UNT has rebuilt his SCR-522 for 144 Mc. and has new Yagi antenna. GNR is back on 14-Mc. c.w. ORZ is new OES appointee. BFW is on 7-Mc. c.w. BKJ reports total IFN traffic was 129, with 64 members covering 42 cities. UMS is working 4-Mc. 'phone. TT reports RFN has 53 members, and is building new 150-watt final amplifier. JUJ received 25-w.p.m. CP award. DARA gave an emergency drill for the c.d. officials at Muncie. WBA is a member of the Great Lakes Net. FWH is on 4-Mc. 'phone with clamp-tube modulation. JPF is back on the air after an absence of three years. IZC is a member of the Overseas Net. JUJ reports QIN traffic was 1064. The Fort Wayne Radio Club had 85 persons at its annual banquet, with Alt. Dir. MVZ as the main speaker. FMJ was M.C. BFW worked portable from Florida, and schedules 4SMZ on 7 Mc. The Lake County ARC is incorporating. UDD likes cascode preamplifiers for 144 Mc. ARRL Communications Manager Handy, 1BDI, met with the FWRC Feb. 25th. HVT moved to Texas. YUR and MBL are getting their AREC program rolling. HC moved to Kentucky. FJI has TCI, Taxi Cab Interference. New hams in South Bend are CUP and 4SZL. TARS held a Valentine Party. HQF has 109 countries confirmed. WBA is a photographer for Studebaker at South Bend. MWM worked 2UYI/5 8000 feet above Texas in a C-46 on 7 Mc. YVS is a locomotive engineer for the B. & O. Railroad. Traffic: (Feb.) W9JUJ 2192, TT 449, TG 332, NZZ 320, LZI 198, JTX 137, DHJ 120, IZC 119, HUV 115, BKJ 103, DGA 89, DOK 60, QLW 50, IFR 22, WBA 20, CVN 18, BDP 13, FSA 12, MWM 2. (Jan.) W9YME 12, IFR 1.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: ESJ. RMs: CBE, IQW. C.W. Net (WIN) 3625 kc., 7 P.M. daily; slow speed at 6:30 P.M. 'Phone Net (BEN) 3950 kc., 6 P.M. daily. Net certificates were issued as follows: (WIN) — CXY, ERW, IBQ, KXK, IFS; (BEN) —FPE, FBU, EDF, IZE, GCT, OOL. IZE has a new 30-watt mobile on 10-and 75-meter 'phone. New faces on WIN are ONV, LFP, FDX, PKB, JHI, NFX, IFX, LSK, LUE, MYU, NLH, and LSF. ERW has turned to traffic-handling and is doing an FB job. JQP added two new ones in KW6AR and VP5BP (Caymenes). KXK is new ORS, and can be found on WIN when not chasing DX. The TV Indians have been after IXA. LSK received Advanced Class ticket. EFR, GJK, JM, LIK, NLH, and OVO are all mobile in Door and Kewaunee Counties, with VVU, VMZ, and NKZ soon to join the mobile ranks. With NUW as control station, WVRA Emergency Corps conducted a 5-hour test for the Red Cross, dispatching the 10 mobiles on 85 different missions. NEV, the BARC station, has a ½-kw. rig furnished by KBT. The Racine Megacycle Club has an aggressive TVI program with BVG, RM, and LXY on the committee. WN9PWJ is on 80 and 11 meters from St. Lawrence College with a TBS-50D and an SX-71. On 144 Mc.: LEE worked LEF (Ind.) and GPV (Ill.) as new DX. EYN is on with an 829-B. DSP gave a demonstration to the NWRC on 144 Mc. FAN worked 9LF (Ill.) and 8DX (Mich.) for new DX. TQ and DDG continue with 144-Mc. RTTY work. The Dells Region Club has 10 mobile units and its own emergency power unit. The BARC has alternate meetings at Beloit and Janesville. The DCARC will be hosts at the BEN picnic in August at Sturgeon Bay. IQW reports that the WIN has had a total of 61 different stations reporting this season. LIK is new EC for Door and Kewaunee Counties. Traffic: W9ESJ 549, IQW 179, SFL 114, FXA 102, ERW 98, KXK 84, ANM 62, IFS 57, DR 56, CBE 40, SDK 35, NEV 20, RQM 18, IXA 16, LSK 10, AFT 8 CFT 8, SGG 6, OVO 5, OOD 3.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Everett E. Hill, WØVKP — LHS is back with us after two months on active duty with the Army as a maneuver umpire. JVP is back on the air with a swell rig. Fred is Fargo's fire chief and civil defense director. We will miss UNU, now a Silent Key, who was always on and ready for a chat. JNP is on his way overseas. He is a radio repairman for the Army. SWC is the new secretary of the Jamestown Club. Club secretaries and all appointees are urged to submit a monthly activities report for this column. I have to depend on you fellows for most of the information. So, send in those reports promptly on the first of each month. According to records, our State is below normal in activities. With a little work on the part of each of us we can be on the top. More hams are urged to originate messages and check into the nets. The new QTH of your SCM is 1527 Fifth Ave. So., Fargo. Traffic: WØLHB 90, EXO 35, KZL 12.

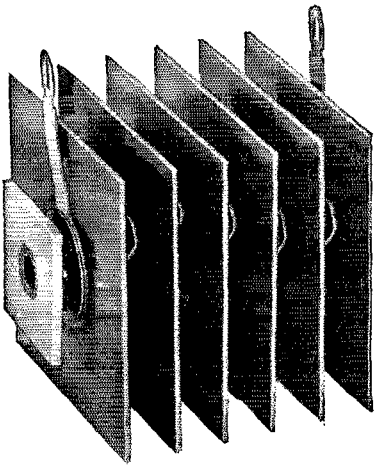
SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — RM: OLB. GCP has returned from vacation and taken over as SEC for Eastern South Dakota. Handle AREC activities for that section through him. New Novices in Hot Springs: WNØHOH, HOI, HOJ, and HGZ. VIW, formerly of Hot Springs, now is with Western Union at Grand Island, Nebr. The Sioux Falls Club is conducting a WAS Contest with a 5-watt power limit. BJV and CJS maintain twice-weekly skeds on 50 Mc., with MZJ and TI joining frequently. TI, BJV, and ORE hold a daily round table on 2 meters at 1900 CST, with DID, KQO, and DB signing in. Newly-elected officers of the Howlin' Wind RC, Watertown, are QLK, pres.; DYM, vice-pres.; and Clyde Blizzard, secy.-treas. Ex-HDO now is 7RBU. Please send clippings of any publicity on ham radio to me. Some activities reports still are getting here too late. They must be in by the sixth of each month. UWO has a new Viking in operation, and is moving to Cedar Rapids with a Collins radio. Traffic: (Feb.) WØOLB 114, EHO 74, PHR 37, CSB 25, RRN 19, AEN 7. (Jan.) WØUVL 72.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM, Jean Walter, ØKYE. SEC: BOL. RM: RPT. LDI now is in Honolulu with the call KH6AMG. Marv is using 250 watts on 14-Mc. c.w. and 'phone. If you hear him, give him a call. Here is good news. We are going to have a Mid-American Convention in Minneapolis at the Nicollet Hotel on September 5-6-7. TLE is chairman, RTE is secretary, and DBC is treas. DQL now has a new Lysco 600S on c.w. ANY now is stationed in Japan and on the air at JA7HJ, EN, and TB. HNS is mobile on 75-meter 'phone. ATD is going high power on 144 Mc. GGQ has a new HRO receiver. UCV now is Extra Class. CCX is vacationing in Phoenix, Ariz. ANU is back on the air on 75 meters after

(*Continued on page 84*)

MALLORY HAM BULLETIN

It Will Pay You To Try MALLORY Selenium Rectifiers



It is believed that only a comparatively few amateurs have taken full advantage of the economy, efficiency, convenience, and reliability Selenium Rectifiers can offer when employed in amateur transmitters, receivers, and test equipment.

Yet, very definite economies can be effected in certain amateur power supply circuits when conventional vacuum tube rectifiers are replaced with inexpensive Mallory Dry Disc Selenium Rectifiers. Selenium Rectifiers require no filament voltage, thus the power transformer may be eliminated entirely in many cases, or reduced in size substantially, in others. In addition, no rectifier tube socket is needed, and interconnecting wiring is reduced to an irreducible minimum.

Circuit efficiency can be improved considerably, too. The voltage drop across a Selenium Rectifier stack averages only about 5 volts as compared to 15 to 80 volts in tube rectifiers. Rectifying action is practically instantaneous in a Selenium Rectifier, since no filament "warm-up" period is necessary. As a result, a Selenium Rectifier is ideal for bias supply rectification where important bias voltages must be made available prior to application of anode potentials.

Mallory Selenium Rectifiers are convenient for the amateur to install. No socket-hole punch or other special tool is needed. A single clearance hole for a No. 8 machine screw or stud is all that is required to mount the rectifier in practically any position above or below a chassis.

The name Mallory on a Selenium Rectifier is your assurance of unconditional reliability, for the average life of a Mallory Selenium Rectifier is equal to or better than almost any other component in your equipment. Tested at an elevated stack temperature of 100° C. (15° C. above recommended operation), Mallory Selenium Rectifiers had an average life expectancy of more than 7000 hours with less than 4% loss of efficiency.

NOTE: This amazing record was compiled with standard Mallory 85° C. FP and TC Electrolytic Capacitors in the input of the load test circuit. Since the average life of any Selenium Rectifier depends greatly on the quality of the electrolytic capacitor used with it, extreme care should be exercised in selecting a capacitor for this important job. Standard Mallory FP or TC Electrolytic Capacitors, obtainable from your Mallory Distributor, will assure you of the kind of operation you want when using Selenium Rectifiers in your own equipment.

Your Mallory Distributor can supply you with 11 values of Mallory Selenium Rectifiers ranging from 35 to 450 milliamperes and operating at an RMS voltage of 130.

See him today, for that unbeatable combination of Mallory Selenium Rectifiers and Mallory FP or TC Electrolytics, as well as for all those other fine Mallory parts, including resistors, ham band switches, controls, rheostats, potentiometers, pads, tubular capacitors, transmitting capacitors, vibrators, and vibrator power supplies—practically everything you need to keep your equipment in good operating condition.

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(*Continued from page 82*)

being gone about a year. Fran also has a new Viking transmitter. NJQ, from Brookings, was a visitor in the Twin Cities and worked a lot of the boys from his mobile rig. WNØHQB, HFU, and HPX, with WØHTX and HFY are new hams. BRA now is Official Observer. The St. Paul Radio Club, Inc., has purchased a 3-kw. gas-powered generator for emergency and Field Day work. PDN, HKF, and SMT now have auto-calls with their receivers set to 29,640 kc. The call 1-2-3-4 will set them off. Net Control Station UCV had a high of 35 members checking into the noon net on 75 meters. ZDU has installed a 10-meter rig in his car and now is mobile. GYH is building a modulator for the Minneapolis Radio Club's kw. It won't be long before it will be on 3960 kc. checking into the MSN. We would like to see everyone join the Emergency Corps. Do it now! Write your SEC, Bob Prehm, BOL, at 1130 Delaware, St. Paul, Minn., for application blanks. Traffic: WØITQ 459, KFF 220, HEO 124, UCV 112, AA 67, KNR 38, GYH 30, MXC 29, CWB 28, DQL 28, BRA 18, GGQ 17, TJA 16, BUO 15, TKX 15, FTJ 8, ATD 5. KØWAW 4.

DELTA DIVISION

ARKANSAS — SCM, Dr. John L. Stockton, W5DRW — The University of Arkansas and John Brown University have both reformed their amateur radio clubs. Good luck to both. TJH is on 3.5 and 7 Mc. with BC-457. QIP is on 75-meter 'phone. UEB is building a new rig with a pair of 807s. ANR has been QRL between the job and the MARS C.W. Net. EA reports 100 per cent attendance on MARS for two months. DRW has a new radio room and new 40-meter vertical ground-plane antenna. Traffic: W5RWJ 61, EA 30, UEB 1.

MISSISSIPPI — SCM, Norman B. Feehan, W5JHS — LPL, new SEC, reports a simulated emergency test was held in the Jackson Area in January, with 7 mobile and 3 fixed stations participating and supervised by EC FFF. The total Jackson membership consists of 12 full, 2 supporting, and 10 mobile members. New ECs are ZD, LBY, QKX, and RLP. New Asst. EC is WN5THC. The Keesler Club elected the following new officers: PNM, pres.; 1RLA/5, vice-pres.; TBI, secy.; TUO, treas.; KL7AEG/5, act. mgr. K5FBB is on 144 Mc. and checks the band each evening after the Hurricane Net, which meets at 6:15 P.M. SCE has Collins 32V and works 10-, 20-, and 75-meter 'phone. SNR, NYV, 4UZB/5, and JHS attended the hamfest and fish fry at Ft. Walton, Fla. RIM and JHS have a sked on 3935 kc. daily at noon. All traffic is welcome. 9OSO/5 and 5OKO/5 are operating in Columbus now. Traffic: W5RIM 154, WZ 152, JHS 139, KYC 53, LPL 12.

TENNESSEE — SCM, D. G. Stewart, W4AFI — Tennessee amateurs came through again with excellent emergency service during the recent tornado that struck Fayetteville. Complete account and recognition of those participating will appear in AREC News. IKG is due a round of thanks for his efforts in obtaining our embossed call-letter license plates. Do not forget to send him a dime to cover the cost. AEE set up two fixed frequency receivers on 29.6 Mc. for monitoring Davidson County Ten-Meter Net. PFP is owner of a new Elmac 54 for mobile operation. AGC made BPL again and reports interest and traffic picking up on the C.W. Net. This Net now meets Monday through Saturday at 1900 CST on 3635 kc. FHP is back in the swing. APC reported a nice total and is NCS for CAN. PFP now is NCS for Tennessee on TCPN, furnishing an excellent outlet for both Stateside and overseas traffic. MRU has a new YL jr. operator. BAQ, BOR, DYY, GQQ, HHK, IBG, IIY, KGQ, LVG, LVJ, LVW, ORF, PKI, PKZ, ROS, SBE, STI, 5SGK, and Novices UDI and UDQ furnished communication for the recent "Mothers March Polio Drive" in the Memphis Area. Traffic: (Feb.) W4AGC 635, APC 374, PFP 149, IIB 70, AEE 26, SZI 25, RMJ 18, RHO 13, FHP 10, FLW 5, PMR 5. (Jan.) W4AGC 203, SZI 4.

GREAT LAKES DIVISION

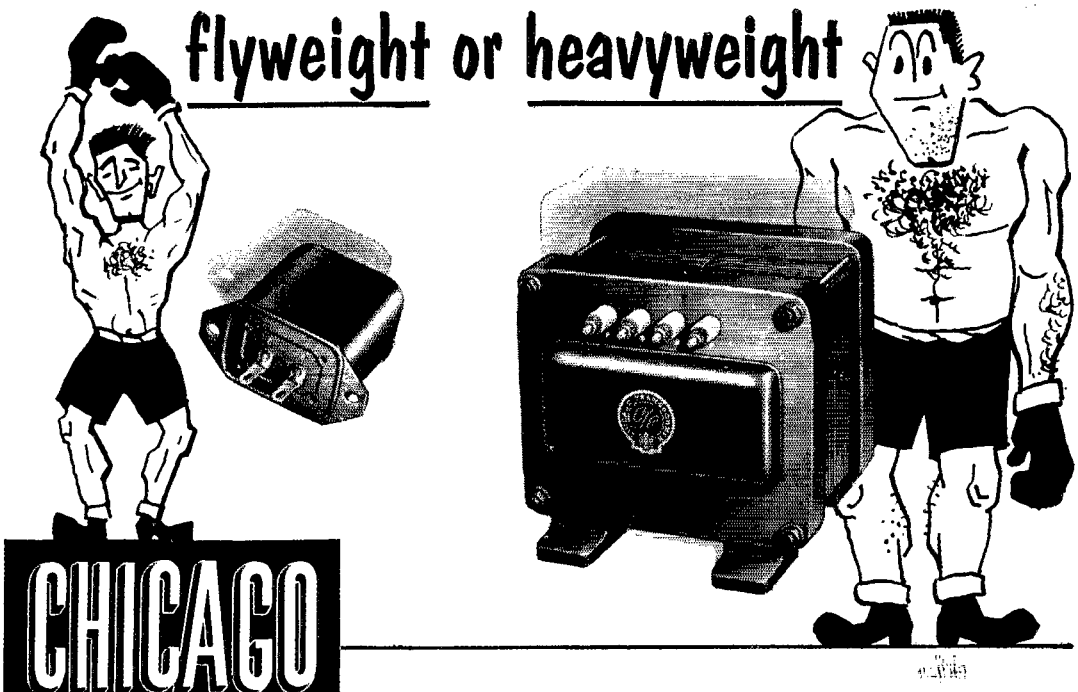
KENTUCKY — SCM, I. W. Lyle, jr., W4KKG — The House and Senate both passed the amateur license plate bill unanimously. We hope by the time you read this the Governor has signed the bill and you are about to receive your plates! Kentucky amateurs owe some great big thanks to TFK, TUT, and others who helped on this bill. New PAM is NBY. MRF soon will be on with new 500-watt rig. VP is working everything he hears with 35 watts s.s.b. RPZ now has two operators, TRY and 3PWH. BNW has a nice signal on KYB with 25 watts. SZL is working on new all-band rig. BAZ is building a super-duper for MARS and CAP work. MGT again hits a high with a big traffic total. MWX, Kentucky RM, is QRL work but runs up a nice total. KZF did very well in the 'phone section of the DX Contest. QDI, a YL, soon will be an XYL! RRN, also a YL, now is Class A and will be on the 75-meter YL Net. NUQ is back from a month's rest in Florida and reports that JQV is just back from Hawaii. JXF is doing an FB job as ARTS prexy. The Ky. QSO Party was lots of fun for the sixty stations participating. KMX has recovered from chicken pox! The Louisville 2-meter gang is looking for QSOs every Sunday at 2 and 7 P.M. CST. FU is a new ORS and works in the Overseas Net. WBG, at Fort Knox, says things are humming there and they are about ready to start 2-meter operation also. Traffic: W4MGT 407, WBG 148, MWX 105, BAZ 79, KKG 63, PRT 36, RPZ 14, VP 14, BXU 12, CDA 8, KZF 2.

MICHIGAN — SCM, Norman C. MacPhail, W8DLZ — Asst. SCM, (c.w.) J. R. Beljan, 8SCW. Asst. SCM ('phone): R. B. Cooper, 8AQA. SEC: GJH. RMs: ELW, UKV, YKC. PAM: UTH. New appointments: OPS to GJB, EC (Livingston County) to SVM, EC (Presque Isle County) to PVB. Officers of the new Calumet High Radio Club are FWG, pres.; IQA, vice-pres.; IRB, secy.-treas. The Grand Rapids gang scored another Michigan "first" with a Faye-Emerson-type telecast of the emergency net in operation. KBI, IV, YDJ, BJD, EXO, VV, and GEH performed the honors and did the work. The show was telecast over WOOD/TV and a more professional job hasn't been seen around these parts in a month of blue Tuesdays. The Muskegon Radio Club is conducting a series of code and theory classes every Tuesday night with EKU, MRL, NWU, and WAK acting as instructors. More than 20 prospective amateurs are attending. Ed Handy won a year's subscription to *CQ Magazine* at the Grand Rapids Midwinter Hamfest. It was NOT a frameup! A total of 372 attended to hear Ed's general discussion of the future of amateur radio. The officers of the GRARA are due a hearty pat on their respective backs for an outstanding job. EGI is running 10 watts on 75- and 20-meter 'phone with good success. FX is starting work on some Field Day rigs for the Detroit Club. TIC is rebuilding (again) his new mobile rig. SPF is home from a 2-week cruise, courtesy of the USN in Florida. BVY reports the Midland gang is conducting a series of TVI tests in conjunction with newspapers. This is the kind of coöperation we all strive for. DAW has a daily sked with Japan — and has had for THREE YEARS! EOS has a new 8-lb jr. operator — a boy! Traffic: (Feb.) W8RJC 560, ZGT 560, URM 473, SCW 210, QBO 166, ZLK 130, JYJ 119, DAP 86, ILP 70, IV 62, NZZ 53, IKX 50, COW 46, ZWM 46, DLZ 45, WXO 34, TQP 29, QIX 28, AQA 25, WVL 22, LR 20, CYX 19, EGI 18, DOI 17, QPO 14, KBI 12, FX 11, ENX 10, GJH 10, SWF 8, DWB 7, GJB 7, HSE 7, LLD 6, TZD 6, EEF 5, DQL 4, TIC 2. (Jan.) W8DAW 635, RTN 89, IKX 67, NOH 62, DOI 36, YWF 36, SPF 23, EOS 21, DWB 19, UGD 12, CYX 8, ENX 7, IHN 7, ZDF 7, LLD 5, FFG 4, NQ 4, MGQ 2, YMO 1. (Dec.) W8ZWM 32, DQL 14.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN, and J. Erickson, 8DAE. SEC: UPB. PAM: PUN. RMs: DAE and PMJ. New appointments are: CSU, CZR, ID, and UWA as EC; YGR as ORS; DAD as OO Class IV. ARO is back on the BPL list. Our SEC sent in the following: "A statewide coördinated plan for the Disaster Communications Service is being drafted, to include State Highway Patrol, police, amateurs and other services. As soon as the plan has been approved by FCC, notice will be given in this column, so any interested persons may take due notice and make application for special licenses." BYT and PS made Advanced Class. MVARC had a station set up in conjunction with the Alert America Convoy. GAV is NCS of 1st AF MARS Net, Fridays on 3307.5 kc. WN8JAN is new operator at Van Buren. Our condolences to DAE, who recently lost his mother. We regret to report the loss of Jerry Trousil, BAC, who passed away on March 5th. YGR was gunning for the gals in the YL/OM Contest. PMJ now is active on 144 Mc. ET, licensed in 1915, has applied for Extra Class license. Emery Lee, FCC Divisional Engineer, visited the headquarters station of the CCAREC on Feb. 18th during the county-wide test. LYD, EC, reports that more than 100 stations participated. On Feb. 19th Mr. Lee addressed the CACARC, his subject being, you guessed it, TVI. On March 23rd, Phil Rand, 1DBM, appeared in Cleveland at the WHK Auditorium; subject — TVI! HOM received his General Class ticket. Case Tech's club station, URD, is back on the air. Speakers at the Dayton Hamvention held March 22nd were 1DBM, 8LK, 8IOP, 1DX, 8HB, and ex-D4BER. On Feb. 26th the Lima Area group entertained 1BDI, 8UPB, and your SCM. They are a very active and hospitable group. On the 27th Mr. Handy, 1BDI, addressed the Mansfield group and spoke the following night in Canton. *Toledo Shack Gossip* tells us that SMN is a pappy for the second time; OXK and BN have new 75A-2 receivers; COC, RQI, and YKF have been removed from the mothballs; and that raisin cupcakes can be made in about 47 minutes. According to the *Dayton RF Carrier*, their technical committee is composed of HB, ORI, ACE, and ENH; and that during the Polio Porch Parade their mobiles had gendarmes as passengers and drove about the hamlet to see that the female collectors were not molested. Springfield's *Q-5* states that Dr. Paul Rothemund of Antioch College and OSU was a speaker at a recent meeting; and that CSA won the first quarter of the club contest. Columbus' *Carascope* informs us that FYV has a new Viking transmitter; HHM is taking a crack at 420 Mc.; and that the Tuesday drills on 29,640 kc. are well attended. Congratulations to the gang in getting those reports in on time. Traffic: (Feb.) W8FYO 359, ARO 308, DAE 157, DMJ 77, AL 53, IZQ 42, WE 36, QIE 30, ZAU 28, RN 27, YCP 27, YGR 24, GZ 22, PMJ 21, EQN 20, BEW 19, AJW 17, DZO 3, FJX 3, DXO 3, AQ 2, ET 2, LBH 2, BUM 1. (Jan.) W8GAV 10.

(*Continued on page 86*)

flyweight or heavyweight



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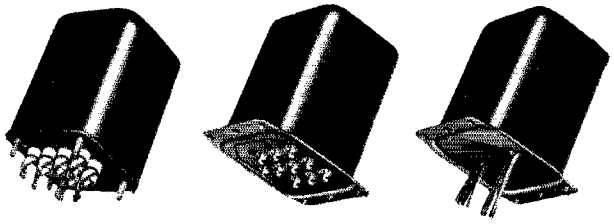

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(Continued from page 84)

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — RMs: TYC, KBT. PAMs: IJG, JQI, NIV. TYC, our very active RM, reports that the 5th anniversary party of NYS was a big success. E.N.Y. charter members present were EQD, ITX, and LRW. Twenty regular members were QNI, and a hidden station hunt was conducted. EQD and ITX tied for first prize. HUM received the second, and DJF, of W.N.Y., won the third prize. Hidden stations were 1SAL, 4ANK, and 8SCW. Special net certificates were issued to all concerned, along with our best wishes. NYS meets on 3615 kc. at 7 P.M. daily, NYSS on 3625 kc. at 8 P.M. daily. PHO broke his consecutive run of QNIs into DON at 200; QRL from now on will be irregular. FVP is the new announcer at WHUC. FQL, EC for Greene County, has a new gas-powered generator plus two mobiles operating on 144 Mc. New Novice is KYF; Marie is the XYL of CYW. APF was honored with a life membership in AARA. This was the second such award since the Club's existence. Plans for a Section Novice Net are under way. For information, please contact the SCM now. FW wants more activity on 160 meters, especially in the Tri-City Area. The lack of station activity reports is very discouraging. Let us make this column more interesting. I solicit your coöperation. Traffickers attention: Much traffic is handled but little is reported and our total is the lowest in the division. If all traffic was reported, this section would be on top. Let's all pitch in, and don't forget your report must reach me by the fifth of the month. Endorsements: VH, CTM, NOY, CYW, LDS, OZH, and ILI as EC; IJG as PAM; GTC as ORS. Traffic: (Feb.) W2TYC 197, EFU 53, PHO 47, ILI 38, GTC 24, VP 20, FQL 2. (Jan.) W2PHO 179, LRW 145.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, jr., W2OBU — Asst. SCM: 2TUK. SEC: SYW. RM: TUK. PAM: YBT. The Long Island section of the YLRL dinner was a huge success with 1QON and 1OLP as guests. About 70 hams attended and sure enjoyed a fine dinner and enlivened talks on the female side of our hobby. Officers were installed for the year and many plans were formulated. New officers of the Staten Island Radio Club are VKF, chairman; GGJ, treas.; EDR, rec. secy. Officers were installed at the annual steak dinner supervised by PFL. In the N.Y.C.-L.I. 75-Meter 'Phone Net, YBT as PAM, QOW, EIJ, and CLG have upped power and the Net now is holding its own after a trying time with QRM. The Net now boasts of 20 to 25 members reporting in at 1000 Sundays on 3910 kc. and plans are being made to create close coöperation with W.N.Y. and E.N.Y. section nets and to participate in a state-wide emergency set-up. WN2LWJ, formerly operating at Kodiak, Alaska, now is stationed at Coast Guard radio station at East Moriches and went mobile to work into the Suffolk County AREC Net. The Nassau Radio Club is in a dither. Its star c.w. man on 80 meters, TUK, also RM for the NLI Traffic Net, is forsaking the role of bachelor the week end before Field Day and the Club members wonder whether they can snare first place without the services of Harry. LPJ hit 100 per cent attendance in the NLI Net and sparked many nights as NCS. The Net handled 230 messages during the month and seeks more stations in the eastern part of the section. JDN enjoyed a fine Florida vacation, and GCE contemplates a trip to South America. Both are members of the Mid-Island Club. STG is the newest member of the MIRC and the Club is planning a bang-up Field Day and promises lots of competition to the Nassau and Lake Success Clubs. A Novice net has been formed in Brooklyn, with EZJ as NCS, and meets Sundays at 0930 on 3745 kc. for all Brooklyn hams desiring aid. EEY has been an OO for eighth months and now has received OBS appointment. Our ex-SCM, KDC, in addition to holding an OPS appointment, has been appointed Official Observer, Classes III and IV. DIC has been appointed OES and reports the TVI Organization of N.Y. will accept requests by mail for its bulletin on high- and low-pass filters which will be distributed free. Write or contact DIC and aid in the program to get the boys back on the air. JZX is conducting code instructions at 1100 to 1130 Mondays, Tuesdays, and Thursdays on 3805 kc. and announces W1AW bulletins at that time. PF has returned from a visit to W6-Land where he visited many hams. His son now is IVA, General Class. OJX received 35-w.p.m. CP certificate on initial trial and asks that an outlet for the DON Net be secured in 2RN/NYS/NLI Areas. Volunteers, step forward and contact the SCM in your section. RWQ applied for Extra Class license under the "grandpappy" clause. Tuesdays at 2030 is the time to meet PAA, PTC, CEP, and GNB on 420 Mc. and get in on a good round table. Much has been done on 420 Mc. and activity is stirring. Get in on the fun. LGK says he is doing much better with 12 watts a.m. on 10 meters than with 28 watts f.m. How come? The Westchester Amateur Radio Assn. furnished communications for the Sports Car Hill-climb near Mahopac. Those taking part were mobiles FAR and JAM and portables NUE, JPX, and DRH. 2, 6, and

(Continued on page 88)

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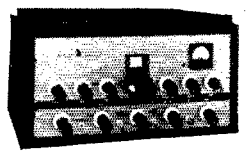

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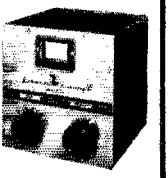

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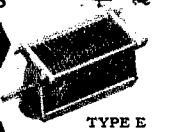

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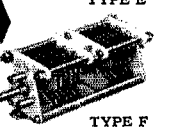
TYPE C & D. Unusually economical for quality condensers. .051" thick rounded aluminum plates. Large laminated rotor brushes. Air gap .080" to .250" (Type D) and .125" to .500" (Type C). Type D panel space, 4¼" W x 4" H; Type C, 5½" W x 5⅜" H.



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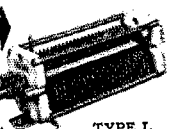

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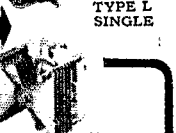

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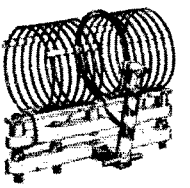

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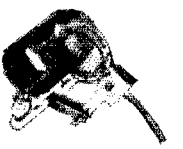

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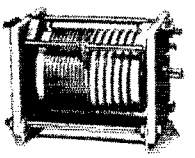

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10 meters were used. Traffic: W2VNJ 585, BO 366, OBU 365, LPJ 244, OJX 133, EC 132, GP 108, DZK 71, MQB 50, JZX 42, TUK 28, ZKJ 24, LRI 20, PF 18, BQP 17, WN2KFV 17, W2QOW 9, YBT 9, BQM 4, IVX 4, DXN 3, EEY 2.

NORTHERN NEW JERSEY — SCM, Thomas J. Ryan, jr., W2NKD — IHF and TPJ are new OO appointees. JKH's XYL presented him with a jr. operator. KON, engineer at Bendix-Teterboro, is the latest WN to be reported. OUS reports the Monmouth County Emergency Net meets on Monday at 2100 on 147.15 Mc., covering from the Amboys to Manasquan. ENM is Net Manager. Hudson County is forming a radio club under the chairmanship of KPC, assisted by LSH, FVD, and NUI. LRO, ex-3QMA, now in Metuchen, is on 3.5-, 7-, and 14-Mc. c.w. GUZ joined the Raritan Valley RC. UK will head the Club's Field Day activities. New members of NNJRA, which meets in Englewood Red Cross the 2nd and 4th Mondays, are AGA, EJW, ND, JEK, and WN2IVE. UOU resigned as president because of a serious heart illness and JUC is new president. K2CR resigned as vice-president because of his XYL's illness and KBH took over the office. The station call LUL was issued to ESW for c.w. work in Hawthorne, and LOR to ZBY for the same work in Hackensack. Area 1 (Bergen and Passaic Counties) 28-Mc. C.D. Net now has 126 members; average attendance each Wednesday on 29.510 Mc. is 60 stations. Ex-2YOB now is 1UYX in Longmeadow, Mass. Ex-2BFP now is ØDLR in Ames, Iowa. DXU was discharged by the Marine Corps and is pounding brass on 7 Mc. DJT is using new ground-plane on 14 Mc. Teaneck c.d. station is JJS, recently assigned. NIY, LPL, GLB, AHC, and LQB are all in the same office of A.T.&T. in New York City. FGA reports the following stations active in c.d. work in Orange: YQ, JBN, TZG, YWJ, and PFE. All drill on 28 Mc. at 1030 Sundays with headquarters in the basement of the Orange Fire Dept. ZXM, Capt. Kurt Carlsen, spoke to the Monmouth County 2-Meter Net from the QTH of OUS. He was given honorary membership in the Garden State ARA. At the same meeting ZK addressed the group on the subject, "The Radio Amateur in Case of an Atomic Attack." More than 100 attended the YL-OM Party given by the GSARA. Livingston ARA completed its converter project. The Somerset Hills Club now meets at ZKT's. Only 14 report cards were received on February activities, plus approximately ten letters. Now, if the other 140 appointees would report, we might have something resembling a column of Northern New Jersey activities!!! Traffic: W2CUI 285, CCS 225, WCL 173, LMB 117, EAS 94, ANG 47, ZK 39, DRV 34, IIN 31, CFB 5, OUS 5, CJX 4, NIY 2, COT 1.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — DIB now has added a contact with a PBY, in flight, to his list. VRB is the new SEC for Iowa starting with a 95 per cent renewal of ECs. HDX is new EC for Cedar Rapids Area. The new officers of the Cedar Rapids Club are NSN, pres.; JTF, vice-pres.; UWF, treas.; UCU, secy. Cedar Rapids, Waterloo, and Ames report new interest by the hams in c.d. work. SEF now reports in to the Colorado slow-speed net; he also is a member of the CAP communications net. QVA is enjoying TV. FTF is building a new ham shack. TLCN met 21 times during the month. FYN now is working at the new Sylvania plant. A new Novice in Burlington is WNØGGW. DRV is the proud possessor of a new 75A-2. PP received his Extra Class license. YTA is working on SUPER-exciter. New president of the Waterloo Club is AEB. PZO is having BCI trouble. SEF is enjoying his job as OBS. YNP put Braille markings on a Viking dial for BDR, who finds it very FB. BXR, the Davenport Club station, has a new antenna. The Club elected PCQ, pres.; BXO, vice-pres.; CUV, 2nd vice-pres.; FME, secy.; DST, treas. Ex-ØAQL now signs 6LYK from Long Beach. YKN is back on the air after a siege in the hospital. TWX is in the hospital. Check your appointments and if they need renewal send certificates to the SCM for endorsement. 1952 looks like an outstanding year for Iowa ham activities. Traffic: (Feb.) WØSCA 525, YTA 162, QVA 121, NYX 57, DFD 40, PZO 29, DIB 20, NWF 16, SEF 16, ATA 10, FTF 1. (Jan.) WØBDR 153, NYX 37.

KANSAS — SCM, Earl N. Johnston, WØLCV — Thanks to you Novices who are reporting your activities. WNØEZT of Reserve, a new ARRL member, reports he has worked 32 states so far with his 6V6 oscillator with 8 watts input. His neighbor, WNØHAW, of Hamlin, has worked only 3 states so far but has been on only a month. He also is using a 6V6 oscillator with about 7 watts input and has a 125-foot center-fed 50 feet high. FZZ and EOT, of Chanute, are trying out 160 meters. 7NMZ/Ø has a new Viking. GHR, of Leavenworth, reports that the Missouri Valley Net still is reporting in 100 per cent with 28 traffic reports for the month. FYX is a new AREC member at Beloit. SSB is a new mobile in Topeka working 3.8, 14, and 28 Mc. with a Millen exciter p.p. 6V6 modulators. He has a.c. power supply as well as Dynamotor in cabinet. KRZ, of Topeka, is mobile again with Motorola 69–20A working all bands. 6WWD/Ø and ØAAZ, both mobile, have new Harvey-Wells rigs in their cars. LIX advises of the passing of Ed H. Pugh, YQQ.

(*Continued on page 90*)

"Eimac 4-65A fits exacting requirements"

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Traffic: WØNIY 176, BLI 83, FDJ 42, BET 32, KXL 16, PB 8, LIX 5, BNU 2.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — The Tri-State Radio Society has elected the following officers: JEJ, pres.; FKM, vice-pres.; PKI, secy.; GLY, treas.; and BUL, sgt. at arms. Club meetings are held the tenth and twenty-fifth of each month at the CAP Building at the airport. The Columbia Club has just started on a TVI program in coöperation with TV owners in an attempt to solve the TVI problem. FIR has a new jr. operator. New ORS appointments went to PME/Ø and CFL. HUI now is an MARS member. PME/Ø is keeping four daily traffic schedules. CFL has been QRL with the Navy and business. OOT has his mobile rig installed and operating in the used hearse he owns. OUD's OM, DE, got the car license tag with OUD's call. MRD now is 9RCK at Belleville, Ill. New hams in Springfield: HLL, HGD, WNØs GXZ, FXK, FOJ, FWT, and GIL. QXO makes BPL again and is taking a two-week vacation trip to Florida. Most clubs and organizations in Missouri sent representatives to the divisional conference called by OZN, our new Director, which was held March 9th at Kansas City. Novices are invited to join the SAN (Springfield Area Emergency Net) which meets at 8:00 A.M. the first and third Sundays of each month on 3720 kc. under the net direction of EBE. This is a slow-speed net to aid in training Novices in emergency net operating. A number of Missouri stations are operating in an unofficial net on 7160 kc. at 4:00 P.M. daily. Your SCM would appreciate more reports from the various clubs in this section. Traffic: WØQXO 811, GAR 260, CFL 80, BVL 71, GBJ 61, PME/Ø 47, EBE 38, HUI 35, OUD 25, GCL 4, JEJ 4, QMF 4.

NEBRASKA — SCM, Guy R. Bailey, WØKJP — BXJ is doing a swell job as OO. He reports FVE and FVF, brother and sister at Avoca, now are Class B. FVR, of Greenwood, is in the Air Force. KON reports the c.w. net is doing fine; the SCM extends congratulations to LOD and KDW on a perfect attendance. AUH is keeping regular sked with 7LTD in Portland, Ore. The SENRC gave a farewell party for BDF, who was leaving to enter the services. Among those present were MYT and XYL AYM, LPU, KAL, and XYLs, IGK, BWK, GJM, FVE, FVF, and SUS. New Novices are Alvin, HQN; son Hienie, age 12, HQL; daughter Carol, age 15, HQH; also FWI and FTR in Lincoln. VBJ now is living in Lincoln. FLF is back on the air with 150 watts and also is mobile on 75 meters. ASE is building a rig for his plane. EKP has a 60-watt portable for his summer cabin. LTE also is mobile in Lincoln. JDJ says NSS still is functioning but QRM is heavy. The SENRC is making big plans for Field Day and the committee met at the home of PHW in Omaha to plan Field Day for the Ak-Sar-Ben Radio Club. The Club also delegated PHW and QXR to attend the Midwest Division conference at Kansas City. JDJ says he has been fighting the flu as well as the QRM. Your SCM wishes to thank everyone for the FB reports this month. Traffic: WØKON 154, FQB 83, JDJ 75, LJO 70, KDW 39, WBF 36, KCK 24, BXJ 17, DHO 16, SAI 15, CBH 12, YNA 11, AUH 10, BZC 10, HQQ 8, HWM 7, YHN 4, YMU 4, EGQ 2, FOW 2, LRF 2, RAM 2.

NEW ENGLAND DIVISION

CONNECTICUT — Acting SCM, Roger C. Amundsen, W1HYF — SEC: LKF. PAM: STU. CN, 3640 kc.; CPN, 3880 kc. ODW offers to help with the bulletin, which is the best news of the month. 2VMX/1 warns of Novice second harmonics 7.4 to 7.5 Mc. He suspects Pi-Net tuners and half-wave antennas combine to give trouble. Let's listen there and help out our newcomers. CUH is c.d. radio officer in Groton. About twenty attended the CPN meeting at GB on Feb. 24th. EMF is playing with 75-meter conical. DHO is on with 40-meter ground plane and 20-meter beam. HUM has been traveling. RBT reports the Univ. of Conn. station, LXV, is active again. The V.H.F. Radio Club had 75 at its shindig in Hartford on Feb. 23rd. PCZ heads the Stamford Club, with NOF, NER, PXS, NOA, and OUG other brass. They have an FB c.d. set-up. WN1UHU and his dad, UJS, along with WN1TUC, are new members. KLI and NOA are teaching code. THX, at Fairfield U., with WN1USF as secretary, received the gift of an 150-B. KYQ-26, AYC-21, and RRE-20 lead CN. JSC, new EC for Trumbull, drills Mondays at 9 P.M. on 147.2 Mc. MNG, chairman of the program committee of the New England Division Convention to be held in Springfield, Mass., on June 14th, promises space for a Connecticut section meeting. See you there. It's to be held at the Eastern States Exposition. LV, AM, PCH, KYF, and HYF all have new Extra Class licenses and WN1VGL/W1VGL is new Novice/Technician in Danbury. DBM presented the 2nd edition TVI book and a talk at Norwalk on Feb. 20th. Traffic: (Feb.) W1AYC 322, SJO 252, HYF 190, LV 117, KYQ 105, AW 103, EMF 100, NJM 70, STU 56, HUM 50, BDI 48, LIG 42, GVK 35, CUH 28, NBP 25, RFJ 21, RRE 18. (Jan.) W1LIG 33, DHO 5.

MAINE — SCM, Orestes R. Brackett, W1PTL — SEC: 1GW. RM: LKP. Net frequencies and time: Pine Tree Net, 3596 kc., at 1900 Mon. through Fri. Sea Gull Net, 3960 kc., at 1730 Mon. through Fri. It is with much sorrow that we report the passing of Everett S. Rogers, 1GE, who

(*Continued on page 92*)

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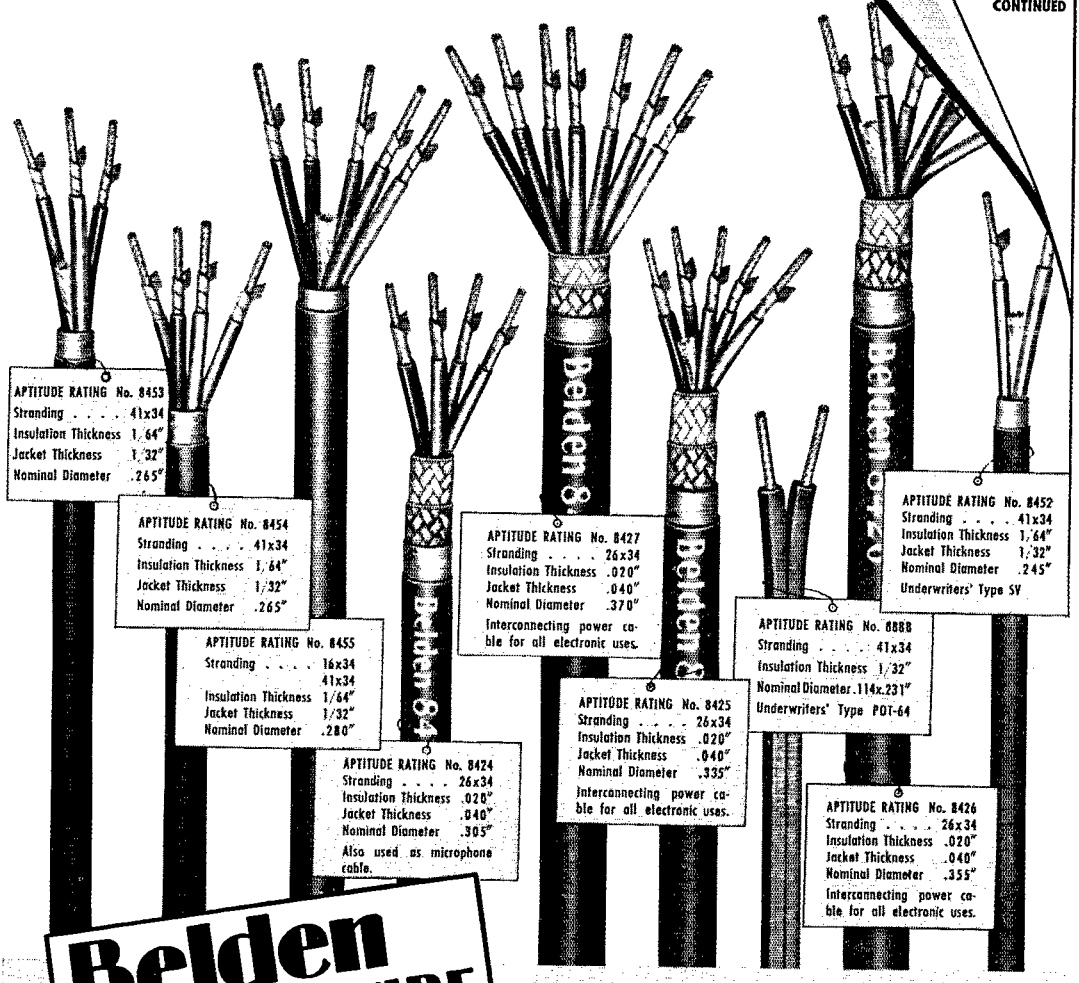

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EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: SCS as OPS, TVZ as ORS, SXM as OO. Appointments endorsed: KBN, AGX, PU, IH, SAI, SS, and WI as ORS; IIM, HIL, SAI, and SS as OPS; SAI, IH, and CTR as OBS; SS as EC for Lincoln; AWA as EC for North Reading; BGH as OO. SZV is in MARS and his call is AD3AM. Activity on 144 Mc.: UZB, KMW, WN1UWO, and TGA in Dorchester; WN1UZZ, Wakefield; WN1UIO and WN1VDE in Rockland; WN1TZZ at Squantum Naval Base. VBC is the call of the Brookline Amateur Radio Society. 4TSI, ex-1QPY, is on 3.9 Mc. SAD has Advanced Class license. UVF has General Class license. SS is chairman of TCPN. UE is working on amplifiers for his 3 b.c. rigs. LM says 7 Mc. has been dead in the mornings. VCH is ex-5SKI. RSE has been reporting into 6 nets on 3.9 and 144 Mc. TTS and UHD are on 28 Mc. TBL/MM is on a tanker. OGK and JZV gave JFS a TV set. TIN is working at WESX. DRV is on 28 Mc. SCS, the only YL in Natick c.d., is active in nets. BB, Winthrop EC, has 12 emergency-powered rigs on 144 Mc. with the following hams active: BDU, DJ, OIR, TLG, TQN, TTH, BJM, CMW, NMX, QEC, MSH, TQT, HFJ, GGP, DJI, VOC LVA, QUX, SBT, PBX, KJB, MQB, DPI, and AGB. The T-9 Radio Club held a meeting at HBG's QTH. The South Shore Club had Messrs. Hall and Terrel, from Workshop Associates, speak at its meeting. The Braintree Amateur Radio Club held a meeting with a talk by AJA on operating a Johnson Viking. The Eastern Mass. Club had an auction with AKY doing his job again; Jack Babkes, of Sonar Co., gave a talk. QVP has a new Viking transmitter. The Quannapowitt Radio Assn. had a talk by PIM of Hytron on a "Hot 2-meter Converter." WN1ULW passed General Class exam. PYT has PE103 parts on 144-Mc. receiver. BGW went to a meeting of Massachusetts DXCC members in Cambridge. E. J. Mason, of Malden, reports TYA is in the Army at Camp Gordon, Ga. WI is working on new rigs. The Hingham Amateur Radio Club has been formed and will meet monthly in c.d. headquarters in the Town Office Bldg. Officers are MD, pres.; DRL, vice-pres.; ONV, secy.-treas. Other members are AYG, BIY, BW, DMS, GNG, JWC, and TXX. WN1VAW is Hingham's first YL operator. AGX is on 28 and 144 Mc. Helen Wright, WN1UPZ in Brookline, is working on a Novice net on 3.5 Mc. All interested Novices, please get in touch with her; she will be on 3725 kc. QJ, now in Brockton, is handling some traffic. TVZ, in Hopkinton, is on 7 Mc. JJY is on 3.9 kc. some and also in MARS. RSE, Whitman EC, has as assistants AYN, IZB, SCA, REG, LEM, and WN1UBF. CPE is manager of New England 75-meter 'Phone Net which meets Sundays at 9 A.M. on 3870 kc. SUR, Mansfield EC, reports a demonstration held in the Grange Hall with ODQ/1, TQF, TPZ, WN1UAL, and SUR/mobile taking part. SE is active on 144 Mc. The Old Colony Net meets on 144.14 Mc. each Mon. at 7:30 P.M. The Gypsy Radio Club of Haverhill has a net on 28 Mc. Tues. at 6:45 P.M. The Club now meets the first Thurs. of each month at 8 P.M. John George and Ed Fisk passed Novice Class exam. Doc and Mrs. King passed Technician Class exam. His call is UIB. New Novices in Wellesley: VAB, VAO, TEK, and TFC. UU's son is WN9OYN. NWO is a new member of the DXCC 'Phone Roll. BGW is in Federal Civil Defense Alliance Net on 3.5 Mc. MBQ, Vineyard Haven EC, sent his certificate in for endorsement. WN1UBC, Chelmsford, passed his General Class exam. RYQ is working at Matawan, N. J. UFJ, secretary of the Norfolk County Radio Assn., has his General Class license. DHX, Fall River EC, has the following mobiles on 3.9 Mc.: QFN, GDJ, MYF, RVP, SFX, portable SXM, and TUI. FZU has a 3-kw. a.c. generator and is on 144 and 3.9 Mc. DP has a 600-watt a.c. generator and a Tempco transmitter. Traffic: W1EMG 291, SS 205, UE 123, TY 104, LM 100, JCK 88, NUP 75, DMS 68, MME 30, BY 26, RSE 22, JFS 18, SCS 18, JJY 10, WU 8, BB 6, BGW 6, CTR 5, HWE 2.

WESTERN MASSACHUSETTS — SCM, Victor W. Paounoff, W1EOB — SEC: JYH. PAM: RDR. RM: BVR. WMN meets at 7 P.M. Monday through Friday on 3725

(*Continued on page 94*)

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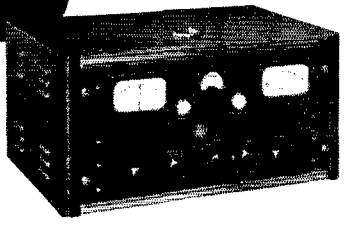

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kc. This Net operates slow speed. A new ham in Agawam is UUR. New OPS is SWJ in Westfield. BDV has completed his gadget, which works FB. Details later. Region 3 and Worcester c.d. nets are going well under the guidance of RO and SPF. Club meetings are interesting and well attended at Worcester. COI is busy tracking down the source of his TVI. VQ3RJB, Reverend Bonifaci, was guest speaker at Region 9 Amateur Radio Club recently. JYH is busy preparing and sending out 8-page report on AREC progress over the past year. The Hampden County Radio Club received a very enlightening and easy-to-listen-to talk on the whys and wherefores of the oscilloscope from JOU. There are not many more days left to get in your advance reservation for the coming ARRL New England Division Convention. Do it now! Traffic: W1RHU 64, BVR 61, GVJ 18, EOB 6.

NEW HAMPSHIRE — SCM, Norman A. Chapman, W1JNC — RM: CRW. The following appointments have been renewed: EC for Hillsborough County: GDE. ORS: BFT, CRW, PFU, POK, and PVF. OPS: CRW. Please forward your certificates for endorsement. TDI has been newly appointed as Emergency Coördinator for Carroll County. SAL, with the able assistance of RVG, handled traffic from their station operating from Soldier's Home during the Civil Defense Alert at Tilton. TNO/1 is standing by for Dartmouth College traffic. Look for him on 7160 kc. SJS reports that he likes traffic-handling and is active on the Eastern Shuttle Net, 7120 kc. AIJ, TDJ, and LCD discovered during a rag-chew on the TVI Net that their birthdays fell on the same date. Result: A big birthday cake and "fixin's" at TDJ's shack. SAL says he will be using n.f.m. on 75-meter 'phone very shortly. AO is plenty proud of his new Extra Class license. Bill got his first ticket in 1916. I would like to hear from all other Extra Class ticket holders in this section WN1VAU is a new Novice in Gossville. Don't forget, it is not too soon to start preparations for Field Day. Applications for OES appointment are invited. Traffic: (Feb.) W1JNC 42, SJS 15, QJX 14, POK 7, TNO 7, GMH 5. (Jan.) W1SAL 109, QJX 13.

VERMONT — SCM, Raymond N. Flood, W1FPS — Howdy, folks. Looks like everybody is rebuilding lately, possibly because of a combination of poor conditions and TVI. OAK's Vermont Slow Speed Net on 3740 kc. Mon. through Fri. is progressing but needs more Novices to report in. AVP says three more have passed the Novice Class exams in Rutland. KJG has an eight-element Yagi beam on 144 Mc. LYD is doing FB on 160 meters with a Viking I. KRV has 2E26 at 25 watts on 50 Mc. and will add 250-watt final soon. BJP reports visits from PYO, 4EEP/1KUY, and XYL ex-1LJZ. WN1UHL, of Brattleboro, passed the Gen. Class exam. AZV is active again after an illness of more than 4 months. AXN is busy on a new house. TXY says he's going to invent Rube Goldberg to cut off that extra dash. Hi. Traffic: W1RNA 166, OAK 106, AVP 47, FPS 39, IT 28, AXN 16, BJP 8, TXY 6, ELJ 5, KRV 4.

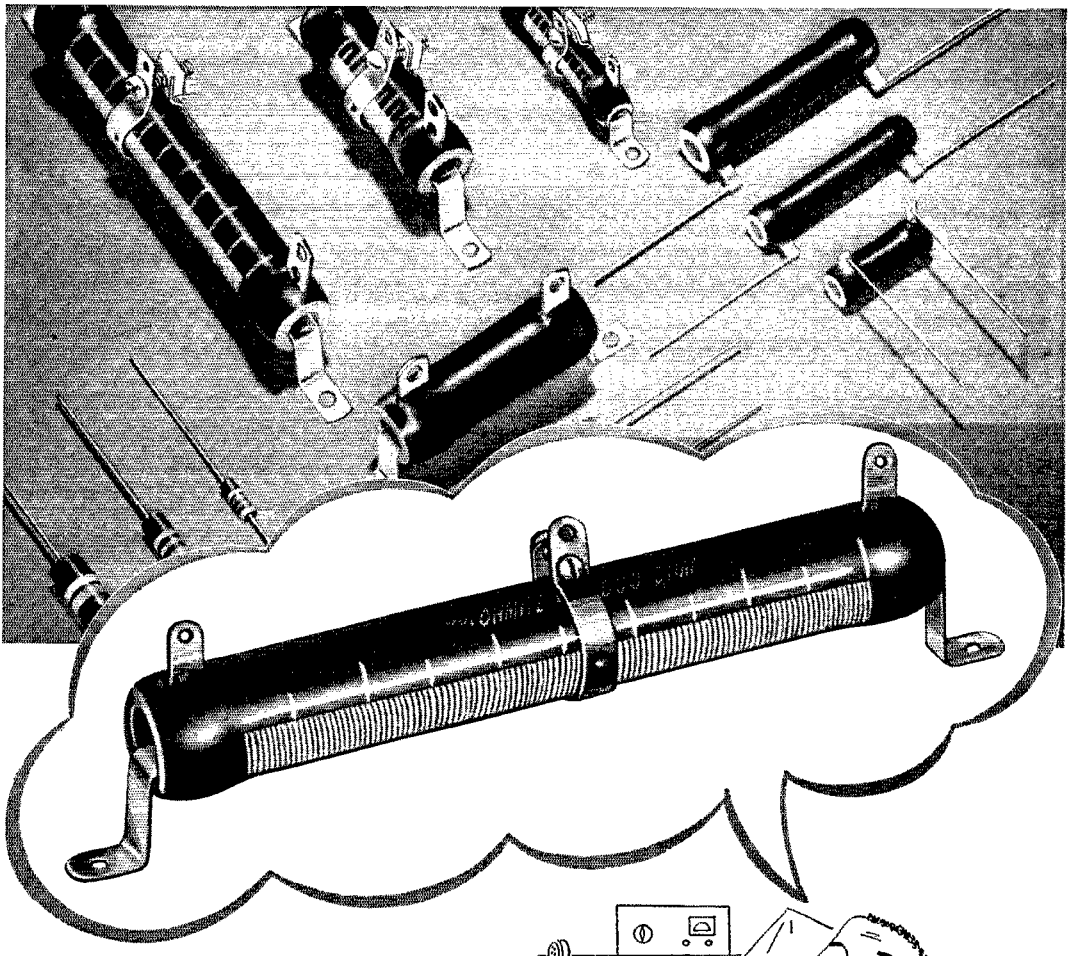
NORTHWESTERN DIVISION

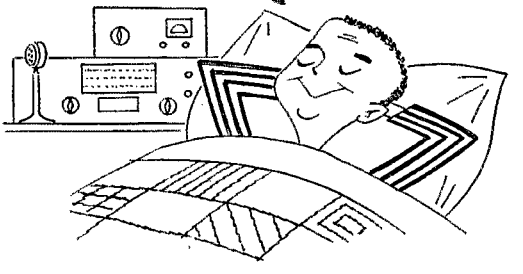
ALASKA — Acting SCM, Jack M. Walden, KL7BK — NT is the new SCM, and expects to return from a business trip Stateside about May 1st to take over his duties. The Anchorage Club set up AA in an amateur c.d. radio booth at the Fur Rendezvous, made lots of contacts, and aroused considerable interest in the public. WL7AMS has joined the ranks of active Novices with his powerful little 20-watter. ZM has returned to the air, and is heard mostly on 3.5-Mc. c.w. 75-meter mobile activity is at an all-time winter high with AN, AGU, AHX, BK, FN, and RZ working regularly from the rolling QTHs. FN made what he thinks is the first out-of-town-with-a-mobile QSO from Homer when he worked AA at the Fur Rendezvous. ADX, at Healy, is on frequently, and is a valuable relay from Anchorage to Fairbanks. NR, AIZ, AID, and several others are heard constantly moving traffic in a mighty business-like way. How about some reports? Or maybe even traffic counts? Traffic: KL7AIZ 799, YG 236, AN 25, UM 17, FN 5, ADX 4.

IDAHO — SCM, Alan K. Ross, W7IWU — Lewiston: FRM, EC for Lewiston, reports 18 AREC members. IDZ is applying for OPS appointment. IFG, Assistant EC, is airborne mobile in his Cessna 140, operating 75-meter 'phone. Coeur d'Alene: FIS, EC, reports BAA still driving school bus. EHZ has '50 Chevvie and is planning mobile job. ISF is rebuilding around a Collins VFO. ILD, long silent, plans to get on, rumor has it. ELJ is active on 20-meter mobile. OTD is on 3.5, 7, and 28 Mc. EGK is too busy on the acreage to do much hamming. Meridian: MKS, of the FARM Net, has applied for an Official Observer appointment. Nampa: PIT's daughter is WN7RCW. ETU is president of the club. Boise: New hams are WN7RCE and WN7QHM and W7RFD, an ex-W9. A Sunday 10-meter hunt turned out OCF, PIT, NPO, ORJ, PKA, DOH, FOF, AHS, and OCR with IWU "hiding." Sun Valley: WN7REI, of the UPRR now is on with a Meck 60. Traffic: (Feb.) W7NH 225, GHT 54, FIS 25, IWU 5. (Jan.) W7FOF 35, MKS 14.

MONTANA — SCM, Edward G. Brown, W7KGJ — CPY returned home the latter part of March from Arizona, where he has spent the winter. BNU returned home March 17th after vacationing in the South. Deck had tough luck on the icy roads in Idaho and smashed up his new car slightly.

(Continued on page 96)





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Luckily no one was hurt. CT was in Denver for several weeks studying radiotelephone communication for the Telephone Co. JDZ has new HRO-50-T1 and is working on 'phone patch. ODK has Viking transmitter. NWB plans high-power final. ED, FGB, and JDZ are active in the FARM Net. FC has a TBS-50 mobile on 3.8 and 14 Mc. and ED plans the same set-up in the future. GLT has HRO-50. SAW is making changes, but not in his rig, Dick has a new little YL. LCM is planning locations for his three-element 10- and 20-meter beams at his new home. FIN was active in the DX Contest. Butte has eight or ten stations active on 2 meters, operating on 145.350 Mc. The gang has established communication with Anaconda. Keep your activities reports coming. Traffic: (Feb.) W7JDZ 241, KGJ 69, LER 13. (Jan.) W7JDZ 68.

OREGON — SCM, J. E. Roden, W7MQ — MEZ is new EC for LaGrande Area and is eager to get that section more AREC-minded. AXJ reports that he finally has gotten his radioteletype going, and is working on 11 meters with LU, VS, and IHI. HDN, the Oregon SEC, reports that both of his rigs are out of commission for the time being. PHM is busy completely rebuilding the Pendleton Amateur Radio Club station. JPM has just returned from Japan, where he has been visiting the past two years, and soon will be back on the air. JVO received his 35 w.p.m. Code Proficiency certificate. CNA is helping to reorganize the OEN 3600-kc. Net and is very consistent as NC on this Net. WJ makes BPL this month with a total of 505. New officers of the Grants Pass Radio Club are as follows: FTA, pres.; MEV, vice-pres.; ITZ, secy.; AHP, treas. JOP promises to be back on the air soon. II has been in the hospital undergoing an operation. Traffic: (Feb.) W7WJ 505, II 328, MLJ 313, APF 171, MQ 67, GNJ 53, AWI 41, FY 20, GWE 18, HJU 17, IEJ 12, LVN 10, DZT 7, KTG 7, ADX 6, KYO 6, EUG 5. (Dec.) W7II 578.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — SEC: BTV. RM: FIX. PAM: NRB. ERH is captain and KCU is chief observer for aircraft warning in Colfax. HFL has come to anchor in Seattle and says he is going to keep his feet on dry land for awhile. PGY rebuilt his 10-meter beam, installed new Elmac mobile, put up a ground-plane antenna, and put 813 tube in the final of home rig. OEX is reorganizing the Totem Net. NJ reports the following stations taking part in the "Yellow Alert" which the c.d. called: OEX, QZF, PGY, NJ, WOG, BA, KO, OZG, PJQ, PWO, KYQ, OYO, HRC, IVY, FKL, NLB, EOP, LOZ, AVC, CV, GNY, OFB, and KPC. QZF and PGY joined MARS. PDB has a new audio system. BA is experimenting with a stacked 10-meter beam. KZP is chairman of the North Seattle Club Field Day committee. OVW has receiver set on 29.3 Mc. 24 hours a day. JWE is using a pair of 814s with clamp-tube modulation on 3.5 and 14 Mc. LFA now is with the Government — Army private, that is. GJU and PFZ still are in the thick of the early morning DX. JRH let his ticket lapse and is awaiting word from FCC. LEC finally has 10-meter rig on the air, also mobile rig working. OGP is doing fine from Kodiak (KL7NR) with kw. and "V" beam. JJK is on maneuvers in Texas. NDO is on 7 and 14 Mc. with 459A. PHP has ARC-5 on 3.5 Mc., also TVI. EHJ, LEC, HMQ, OIH, OEB, GJU, MTX, MPH, and GWK took part in EC drill for the Puyallup Area. Officers of the Puyallup Radio Club are OIH, pres.; OEB, vice-pres.; GJU, secy.; NDO, treas.; and Don Baber, trustee. MCU is going to Coast Guard School in Connecticut. WN7QGB and WN7PQX keep Puyallup on the map Novice-wise. FIX has a new rig with 813 in the final. AWG works on WSN, RN7, and PAN Nets. LVB built new e.c.o. to go ahead of his 813. EQN is busy teaching prospective Novices. FWD has new four-section TVI low-pass filter built. ETO checks into Inland Empire Emergency Net on 160 meters. AIB acts as NCS on WSN one night a week. EVW is on 450 Mc. ZU commutes between Seattle and the East Coast. BYK finished new mobile rig, bandswitching 75, 10, and 6 meters. The Clif Cavanaugh Award trophy, which each year goes to the outstanding c.w. station, was won by FWD. This Trophy, which is a Vibroplex key, is awarded each year by the SCM in the Washington section in memory of the late Clif Cavanaugh, ACF. FWD rebroadcasts W1AW bulletins each evening, sends code practice for Novice and beginners, assists in the 7th district QSL Bureau, and missed only 11 sessions on the Section Net during 1951. Traffic: W7CZY 778, BA 350, HKA 302, LEV 240, EVI 213, TH 164, FIX 112, AWG 105, LVB 67, EHH 62, KCU 56, PGY 37, FWD 35, ETO 34, AIB 22, KTL 8, OEB 7, CZX 6, AVM 4, EVW 4, NRB 4, ZU 4, NTU 2.

PACIFIC DIVISION

HAWAII — SCM, John R. Sanders, KH6RU — A YLRL Hawaii Chapter has been organized and meets the last Thurs. of each month for lunch at The Willows in Honolulu. Temporary officers are AFN, pres.; AFL, vice-pres.; TI, secy. and publicity; AFC, treas. All interested YLs, whether licensed, hope-to-be, or just "radio widows," are invited to join the group. The Honolulu Mobile Club held another transmitter hunt. The Club boasts 50 members now. The HARC meets the third Mon. at 7:30 P.M., Hawaiian Electric Building, Ward St., Honolulu. All hams and aspirants on or visiting Oahu are invited to attend. More than 100 attended

(*Continued on page 98*)

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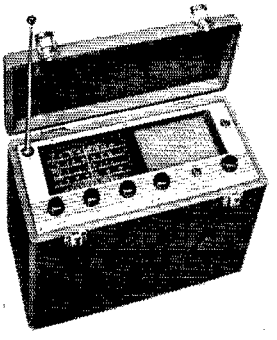
THE HIGHLIGHTS: Frequency range, 540 kc to 54 mc in 6 continuous bands. Six crystal controlled channels in frequency range from 1.5 to 29.7 mc. Single superhet from 540 kc to 7.0 mc and dual conversion from 7.0 to 54.0 mc. IF's, 455 kc and 6 mc. For reception of AM, CW, MCW, ICW, and Carrier Shift Tele-typewriter. Six-position band change turret, with readily interchangeable coils. Dial calibration and precision gear train eliminate need for separate electrical bandspread; for example, from 350-550° of bandspread are provided on ham bands from 80 to 10 meters. Has extreme frequency stability and amazing resetability. Calibration accuracy, within ±0.2% or less at all frequencies.

Sensitivity is 2 mv or less for 10 db signal-to-noise ratio. Six steps of selectivity available. Audio fidelity, ±1.5 db from 200 to 4000 cps. AGC, ±6 db from 2 mv to 1 volt input. Image rejection, not less than 80 db at any frequency; IF rejection not less than 100 db. IF output, at 70 ohm socket, 200 millivolts (455 kc) with 2 mv antenna input. Carrier level indicators calibrated −30 to +70 db; zero db = 50 mv. Panel controls: RF gain, AC on/off; bfo pitch; audio gain; crystal phasing; selectivity; VFO/Crystal; crystal vernier; band selector; frequency; receive/send; CW/modulation; AGC/manual; ANL/off; antenna adjust. All components are built to JAN specs. Complete with 17 tubes, plus rectifier, voltage regulator and current regulator. Panel for standard relay pack is 10½" x 19"; depth behind panel, 16¾". Shpg. wt., 75 lbs.

97-553. Hallicrafters SX-73 Receiver. *Net*. **$975.00**
$146.25 down, $73.21 monthly for 12 months.

97-787. R-46 Speaker for above receiver. *Net*. **$19.95**



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97-505. S-72 Portable. *Only*.....**$109.95**

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Model S-72L. As above, but with 175-400 kc band in place of 12-31 mc band. Ideal for marine and aviation service.

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97-508.	S-38B Receiver.....	**49.50**
97-529.	S-81 Receiver.....	**49.50**
97-528.	S-82 Receiver.....	**49.50**

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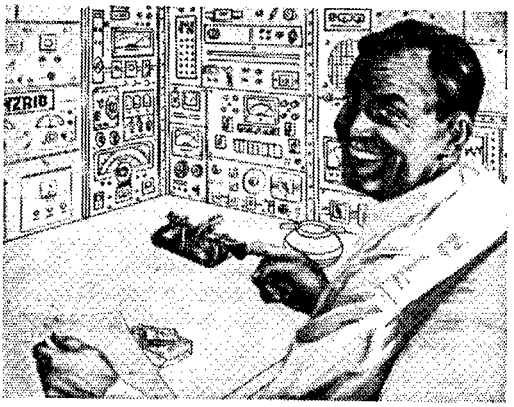

the last meeting. At Hilo AFS, AEI, AFQ, AFR, and IN are conducting code and theory classes for a group interested in taking the FCC spring exams. The Pearl Harbor MSTS office is full of hams: ADY, ALI, AKV, PA, and YZ with two more coming up. ADY has departed for duty at Earle, N. J. RU went to Hilo to rehabilitate burned-out KILA, hence no report last month. Traffic: (Feb.) KG6FAA 2416, JA2KW 929. (Jan.) KR6AF 3173, KG6FAA 2868, JA2KW 977, KR6EM 112, KH6ADY 29, TS 16.

NEVADA — SCM, Carroll W. Short, jr., W7BVZ — SEC: JU. ECs: HJ, JLM, JVW, KIO, KOA, MBQ, TJY, VO, and ZT. RM: PST. OPS: JUO. OO: LGS. Nevada State frequencies are 3660, 7225, and 29,360 kc. The So. Nevada Amateur Radio Club renewed its ARRL affiliation. PRM turned in his Novice and Technician Class licenses for a Conditional ticket. OXX qualified for Extra Class license under the "grandpappy" clause! He is co-chairman of Clark County c.d. and has Collins receiver and transmitter and 2-kw. generator in the station wagon. JUO finally received a QSL for his 100th country. In the SS he worked 86 stations in 41 countries on 3 bands for more than 10,000 points. KIO also was in the 'phone section of the SS. SXD and MWF are on 28-Mc. 'phone. TKV moved to Boulder City and has 10 hams as close neighbors! He received certificate No. 11 for working 25 Nevada stations. K2CJ, who was in Nevada, now is in W4-Land. Your SCM continues to watch 7225 kc. daytimes and skeds MRN, NWU, and VO.

SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6LZL — Along with c.d. and TVI activities we have the ARRL Tri-Section Hamfest coming up in the first part of July, and preparations are under way for the coming Field Day to be held the latter part of June. All these activities require a lot of effort on the part of committees and club members so let's all lend a helping hand and be assured of success in all these undertakings. The Monterey Bay Radio Club had Mr. R. E. Barrington of the Pac. Tel. & Tel. Co. as its guest speaker. The subject was "Micro-wave Systems." The SCCARA had Mr. Roache of the FCC as its guest speaker. The subject was "Setting up a TVI Committee." The NPEC held its two meetings this month consisting of discussions on TVI, Field Day, and the club transmitter. AEV, our SEC, reports there is increased activity in the Palo Alto Area. More drills are being held with great success. JWD is the new EC for the Palo Alto Area and is doing a good job already. NW still is poking his head in on the nets and helping out with the code classes the SCCARA is holding. HC is so busy with outside work he had to lay off net duties for awhile. New calls in the area are WN6 MXB, MIV, MFN, and JES. NBD is active on 144 Mc. these days. K6DM is active on 80-meter c.w. and 75-meter 'phone. DPE is back on the air and active on 160-meter 'phone and 80-meter c.w. VWF sends regrets that business keeps him on the road a great deal of the time so he will have to give up his OBS appointment for awhile. YUG is new OBS appointee. LZL has a new jr. operator. Traffic: W6BPT 278, NW 31, MMG 27, HC 25.

EAST BAY — SCM, Ray H. Cornell, W6JZ — Section activity centered around the formation of TVI committees and the implementation of the FCC Plan. RLB, JZ, and CX, together with ATO and CIS, represented the amateurs at an FCC Conference held at the Custom House in San Francisco. All groups pledged coöperation to eliminate TVI in the Area. The East Bay Committee cleared up its first two complaints to the satisfaction of all concerned. NDU, VPI, NQJ, CHI, and ATM participated in RADEF Tests at Vallejo recently. NBARA maintains a club station, HTB, in the Red Cross Bldg., Vallejo. VVZ, MSS, HFM, and EJA are instructors in the code and theory class given by the Richmond Radio Club every Mon. and Wed. from 7 to 9 P.M. HFM reports that the City of Richmond is providing headquarters for c.d. work in the Hall of Justice. EJA rebuilt for bandswitching for the DX Contest. YDI has a new 75A-2. IPW reports EBSN handled 32 messages in 18 sessions; BAN handled 74 messages in 20 sessions. The designation EBSN was dropped in favor of BAN. JOH is high man on BAN. JOH, HOR, and IPW received 43, 30, and 25 BRAT points, respectively. IPW says that maybe BAN will end up as a 160-meter 'phone net. CX is taking a rig along on his 7-week vacation in Hawaii. NGC reports plenty of grief with the rig as well as with everything else. LMZ renewed his ORS certificate. He has worked 157 countries with 135 confirmed. 7WJ alternates with 6JZ in sending code practice. JZ is on Mon., Wed., and Fri. on 3590 kc. at 1845 PST; WJ is on Tues., Thurs., and Sat. on 3600 kc. at 1845 PST. Speeds are 5, 7½, and 10 w.p.m. on Mon., Tues., Thurs., and Fri., and 12, 18, 25, 35, and 45 Wed. and Sat. Anyone who can spend one or two nights a month to assist the East Bay TVI Elimination Committee is urged to volunteer his services. Write P O. Box 71, Berkeley HOR received Class A license and a 35-w.p.m. code sticker on the same day. RLB is building a 6-meter rig for c.d. use. He built a Heathkit 'scope and enjoyed every wire of it. UHM is in Hawaii after his marriage on March 1st. NTU recommends loop antennas to beat local noise sources. The Oakland Radio Club had a bean feed March 6th with about 40 members, YLs, and XYLs present. US is looking for a new rig to replace the BC-610 he sold. ZKX has moved down the Peninsula. MXQ finds a quarter-wave open-end stud on the TV receiver is the way to cure 2-meter TVI caused by re-

(Continued on page 100)

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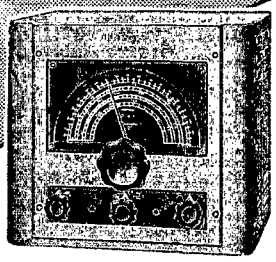

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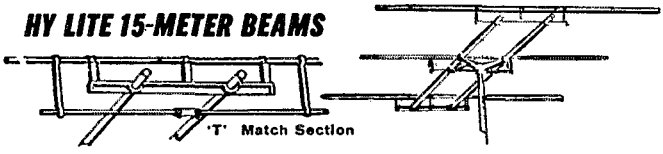

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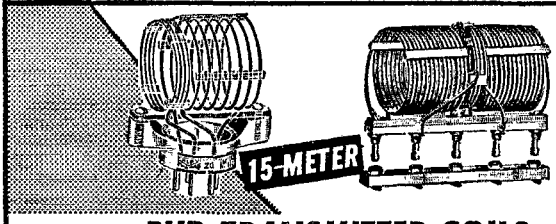
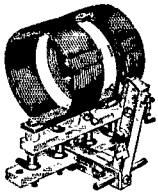


BUD TRANSMITTER COILS

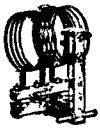
Type	Watts	Description	Net
OEL-15	75	Fixed end link	$1.80
OCL-15	75	Fixed center link	1.80
OLS-15	75	Adjustable center link	1.80
OES-15	75	Adjustable end link	1.80
RCL-15	150	Adjustable center link	3.33
RES-15	150	Adjustable end link	3.33
VCL-15	500	Adjustable center link	3.96
VES-15	500	Adjustable end link	3.96
MCL-15	1000	Adjustable center link	7.35
MES-15	1000	Adjustable end link	7.35
RLS-15	150	Variable link coil	2.67
VLS-15	500	Variable link coil	2.96
MLS-15	1000	Variable link coil	5.85

B & W 15-METER COILS



Type	Watts	Description	Net
MEL	25	End link	$1.26
MCL	25	Center link	1.26
JEL	75	End link	1.65
JCL	75	Center link	1.65
JVL	75	Variable link	1.65
B	150	No link CT	1.74
BEL	150	End link	2.97
BCL	150	Center link CT	2.97
BVL	150	Variable link CT	2.40
T	500	No link CT	1.92
TCL	500	Center link CT	3.57
TVL	500	Variable link CT	2.73
TVH	500	8-plug jack bar	4.71
HD	1000	No link CT	4.50
HDCL	1000	Center link CT	7.83
HDVL	1000	Variable link CT	6.21

JOHNSON 15-METER COILS



Swinging Link No.	Net	Semi-Fixed Link No.	Net
150H/LCS14	$1.95	150H/LCF14	$1.86
500H/LCS14	2.10	500H/LCF14	2.01
1000H/LCS14	4.80	1000H/LCF14	4.59

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ceiver overloading. PWR is active again with low power on 75 meters. NZG built an antennascope. EHS likes his new Winchester 270. Traffic: W6IPW 211, JOH 134, HOR 115, CX 66, JZ 24, YDI 10, EJA 8.

SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — Phone JU 7-5561. SEC. NL. Phone PL 5-6457. The amateur TVI committee for the S.F. Area is in full swing. Many thanks to the volunteer committee, which includes DZN, SFW, ZLQ, GCV, VYC, ATO, EFP, ATY, LNT, VPC, GBA, WN6s NCK, JAA, GAM, and OXL, as well as HB9KM, now in San Francisco. The committee still has room for three or four more interested members, who may have either technical skill or, equally important, a friendly and interesting personality, with the ability to listen to complainants without bias. If YOU have TVI, and the complainants have not yet sent complaints to the FCC, and you have been unable to cure the trouble or to convince the complainants as to responsibility for the TVI, PHONE JU 7-5561 and state the facts. UNDER NO CIRCUMSTANCES SHOULD YOU allow the case to get to the state of a neighborhood feud. BE DIPLOMATIC ALWAYS with the complainant — AND CALL THE COMMITTEE. The committee will gladly help ANY amateur who needs help and is willing to work to help himself as the facts determine, regardless of his membership or non-membership in ANY amateur organization. TVI committees also are being formed in the Marin and Sonoma County Areas, and will work after the same pattern. The factory representatives of a number of manufacturers of TV sets have promised their assistance in installing FREE high-pass filters to cure fundamental blocking in sets of their manufacture. CALL YOUR TVI committee — either to report your trouble, or to volunteer to do your part on the committee. LOU has been elected Club EC of the Sonoma County Radio Amateurs, and has been appointed ARRL EC for Sonoma County. His address is 937 Pacific Ave., Santa Rosa, and all amateurs interested in emergency radio work are urged to contact him if in Sonoma County. IEN has taken over the duties of secretary of SCRA. In the San Francisco Area, BYS, EC, and NL, SEC, have finally received financial assistance for the Emergency Corps of S.F. from the c.d. funds, and now are engaged in rebuilding and activating many 2-meter rigs. Regular EC drills continue, with the great emphasis on mobile operation, also in Marin County, Humboldt County, and in the Tamalpais Radio Club, under ECs KNZ, SLX, and ZUB, respectively. News is solicited for this column from all the many WN6 operators anywhere in the S.F. section. The Pacific Division ARRL Convention is scheduled for July 4, 5, and 6 in San Francisco, with many of the Bay County clubs participating in the work and financial arrangements. The chairman is CTH. SFRC meets the 4th Fri., 1641 Tarval St., S.F. HAMS meets the 2nd Fri., 1625 Van Ness Ave., S.F. Marin RAC meets the 2nd Fri., American Legion Hall, Larkspur. Tamalpais RC meets the 3rd Fri., OZC, Vistazo near Centro East, Tiburon. Sonoma Co. RA meets the 1st Wed., Grace Bros. Brewery, 2nd St. west of the Freeway, Santa Rosa. Humboldt ARC meets the 2nd and 4th Fri., YMCA rooms, Mun. Aud., "E" St., Eureka. When this news is read my term as SCM of the San Francisco section will have come to an end — and a very short two years it has seemed. My thanks to all the amateurs of the section, and the best of luck. Traffic: (Feb.) W6ATO 5, KAH 4. (Jan.) W6SWP 60, KAH 2.

SACRAMENTO VALLEY — Acting SCM, Willie van de Kamp, W6CKV — AF is building a combination f.s. meter, monitor, and frequency meter. The SV Net on 28.8 Mc. was discontinued as of Feb. 29th. Mobiles GHP, SUP, UNT, and WN6OUB helped locate lost boys. Husband WN6EWW and wife ALL visited in the Chico Area. The Roseville gang has monthly c.d. drills in coöperation with the police. HVD and KTF are active on 160 meters. MON is mobile on 1920 kc. from a bicycle. GERC is concentrating on flea-power portable gear using 1½-volt tubes. FDT was a visitor in Chico. RFB now is located in Live Oak. Traffic: W6KRX 25, GDO 21.

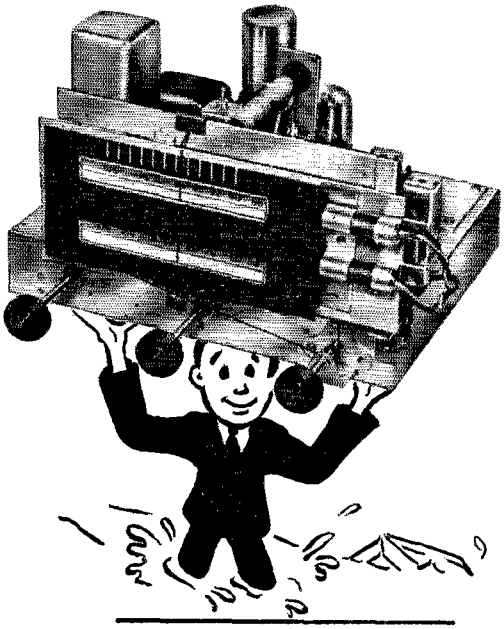
SAN JOAQUIN VALLEY — SCM, E. Howard Hale, W6FYM — SEC: FYM. RM: EXH. ECs: BCL, CQI, EHN, FIP, GCS, GKX, HZE, JPU, and VRF. ORS: EXH, GIW, JQB, LRQ, and QUE. OPS: IAZ. OBS: EXH, GRA, GS, GWQ, and OHT. OES: FYM, RJE, and UWY. OOs: FKL, HZE, and JQB. PSQ has moved back to Fresno. Officers of the Fresno Club are PDD, pres.; SUV, vice-pres.; OWL, secy.; and NTK, treas. A new call in Fresno is COU on 75-meter phone. JPU is getting good reports with 5 watts s.s.b. on 75 meters. WN6KOL, in Fresno, is a new one. FEA, Gertie, garnered 1265 points in the YL-OM Contest. EHN, at Bakersfield, has new 80-foot pole in the front yard. IAZ, at Stockton, is a new OPS appointee. The State Civil Defense Agency has been requested by Governor Warren to contact amateurs along the Sierra Mountain counties to report snow and water run-off and possible flood conditions. The request has come down from KME, SEC for the Sacramento section. Details have been mailed to the ECs. Activity in SJVN on 3525 kc. is growing larger each month. Check in some night, Mon. through Fri. at 1900. ERE has a new Viking I. Major Phil Smith, LOH, stationed at Castle AFB, is active on 75-meter 'phone and has joined the Mission Trail. GYN is a new call in Denair near Turlock. ZZC

(*Continued on page 102*)

We're swamped

Swamped with orders for the Pilot $89.95 FM-AM hi-fi tuner we're selling for

$42.95



BUT: IMMEDIATE DELIVERIES WILL CONTINUE TO BE MADE 'TIL THE LAST ONE IS SOLD!

THESE ARE THE FACTS: From Maine to California bargain-hunters have air-mailed, phoned and wired orders. Our shipping department looks as if a cyclone had struck it. Nevertheless, Radio Shack is shipping these great SPECIAL-PURCHASE Pilot Tuners on the SAME DAY we receive the order. How long can this go on? Not long, because the end of our stock is in sight. Then there will be NO more. So once again we urge you music-lovers and custom-builders to H-U-R-R-Y.

THESE ARE THE SPECS: 10 tubes, AC operation, 20-15,000 cycle output to any amplifier, radio or TV set. Separate 3-gang tuning condensers for FM and AM; separate built-in FM and AM antennas plus terminal strip for attaching external antenna if needed; separate pilot lights for FM and AM; tuned RF stage on FM and AM; separate inputs for phono (crystal) and TV-Audio (or magnetic cart. or recorder). Four-position selector switch: FM/AM/PH/TV. Modern superhet AM circuit; ratio detector FM with 225 kc wide linear response. Complete with tubes, dual-filtered AC supply, escutcheon, knobs, brackets, 12-page instruction book. Compact 11½" W, 6" H, 9½" D. Ship. wt. 8½ lbs.

SEE YOU IN SPRINGFIELD ON JUNE 14

On June 14, the Hampden County Radio Club of Springfield, Mass. is sponsoring the New England Division ARRL Convention and Hamfest. We'll be there with bells on, and hope to see you and yours, too. Meanwhile, when you think of Collins, Gonset, National, Harvey-Wells et al., remember our "Play as you Pay" plan: 15% down, 1 year to pay, no interest if paid within 60 days!

RECORD LOW PRICE FOR A CRYSTAL MIKE

$3.35

3 for $9.95.

Go mobile, go tape, wire or Frankie Sinatra with this brand new (special purchase) crystal microphone! Element is exact replacement for a $10 unit this company makes. Response 100-6000 cycles. 6½ ft. cable. Streamlined black-crackle finished metal case. Last count showed we have exactly 150 of these mikes left, so it's first-come first-served. Only $3.35 each, or 3 for $9.95.

RADIO SHACK
CORPORATION
167 Washington St., Boston 8, Mass.

and his XYL, aided by WMU and his XYL, hosted a grand party for the Mission Trail Net members at Wasco. Traffic: W6GRO 164, JQB 157, IAZ 126, K6FAJ 110, W6EXH 101, FEA 57, GIW 24, FYM 6, WJF 2.

ROANOKE DIVISION

NORTH CAROLINA — SCM, J. C. Geaslen, W4DLX — This section is picking up, gang. The SCM received 18 traffic reports this month. That's a record. Thanks to all of you, and let's keep it up. From Wilmington, VW is new president of the Cape Fear Radio Club; BBZ is secretary-treasurer. EC is active on 3.5 Mc. and is reconditioning his /MM yacht. MVP and SXK are high-tower-rotary men and SWR a "V"-Beamer on 28 Mc. With all that activity down there, how about supplying a 75-meter 'phone man on the Tar Heel Net? LWU reports from Goldsboro that the club there is building nicely and is affiliated with ARRL. ONM, Burlington, NCS of the Tar Heel Net, says the roster is getting so big we might have to run a double-header. AKC has resigned as RM so the SCM is looking for an active c.w. traffic man to fill this post. The Mecklenburg Amateur Radio Society, of Charlotte, staged a Red Cross Emergency Drill. The Club station, BFB, was used at the R. C. Headquarters and mobiles were FUA, OQQ, and DLX. Rumors from all over the State have indicated at least a dozen new Novices. How about hearing from some of you Novices on your activities? Notice to all station appointees: Please report your traffic and activities each month DIRECTLY to the SCM and *not* via the RM. This is your responsibility, not the RM's. Your report is necessary to hold your appointment. ARRL furnishes cards for this purpose. AKC really tops the traffic list this time. Congrats, Joe. Traffic: W4AKC 753, IMH 227, PIC 80, RRH 77, ONM 37, RAZ 24, REZ 18, BAW 16, DLX 15, CGL 12, CVQ 12, LWU 8, MVP 8, BBZ 4, SGD 4, PIX 2.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — THR and CHD are regular members of 4RN. WN4TWX is Net Control for the S. C. Novice Net, frequency 3740 kc., and all S. C. WNs are invited to contact WN4TWX for details. A limited number of crystals are available for loan while they last. BR is building final with a pair of 814s. DBT has 6 watts on 75 and 80 meters. 1IIB has been transferred to Charleston. The Charleston Shipyard Radio Club meets on the first and third Tuesdays of the month and hams connected with the Navy are invited to attend. Traffic: W4ANK 523, THR 209, CHD 98, DCE 4.

SECOND ANNUAL VIRGINIA QSO PARTY... MAY 4TH

A QSO party, open to all Virginia hams will be held between the hours of 1:00 P.M. and 9:00 P.M. EST, Sunday, May 4, 1952. Every licensed amateur in Virginia is urged to participate, if only for a few QSOs, in this affair!

Bands: 3.5 Mc., 7 Mc., 28 Mc. No power limit, or mode restrictions in this get-together. Objective will be to contact as many fellow Virginians in as many different Virginia counties as possible during the eight-hour period, exchanging certain information with each station worked. Stations may be worked only once on each band (regardless of mode used) but they may be worked again on a different amateur band.

Contest call is "CQ Virginia" on 'phone, "CQ Va" on c.w.

Information to be exchanged in each QSO is to consist of the following items: 1. Number of QSO (in the party). 2. Your call. 3. Your RS or RST report to station worked. 4. Your county. 5. Your name or nickname. For example . . . W4FF might send the following message on his third QSO in the party: "Nr 3 W4FF 589X FAIRFAX LINDY."

SCORING: Each message sent counts 1 point and each one received, 1 point. Two points, therefore, are possible from each QSO. Multiply total number of QSO points by number of different Virginia counties contacted in course of party for final score.

The following frequencies are suggested as rallying points during this affair: 3550-3600 kc.; vicinity 3680 kc. (VN frequency); vicinity 3835 kc. (VFN frequency); 3900-3950 kc.; 7050-7100 kc.; 28,800 to 29,000 kc. (c.w. and 'phone). Use the v.h.f.s, too!!!

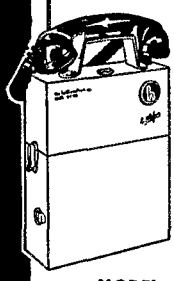
There will be prizes for winners. Get on and meet your neighbors, neighbor! All Virginia hams, except SCM, and members of the contest committee on awards are eligible for awards. All logs should be mailed to SCM before June 1. Send in your log whether you have one QSO or a dozen! Scores will be announced in the Virginia Net bulletin (a copy to each participant submitting a log) and the winners in *QST*.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — SEC: NAD. RMs: MWH, PXA, SDK, SHJ, and FV. Highlight of activities of this section during the month was the successful campaign for auto license plates with designated call letters. Virginia joins with 14 other states in a far-

(Continued on page 104)

NOW! TERMINAL offers 2-WAY FM COMMUNICATION • COMMERCIAL QUALITY AT LOW COST

FOR: Disaster control . . . Construction . . . Ranching . . . Forestry . . . Exploration . . . Telephone . . Pipe-line inspection . . . Railroading, etc.



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- Up to TWO WATTS antenna output.
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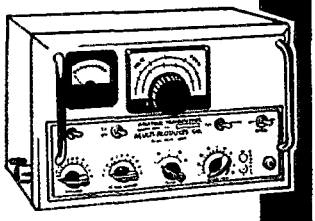
- Dry or wet rechargeable batteries.
- Built-in squelch circuit.
- Frequency within operating range to your specification.
- No extras to buy . . . price includes: push-to-talk handset; receiver and transmitter crystals; all tubes; plug-in antenna, and applicable vibrator power supply with wet-battery models.

MODEL	FREQUENCY	POWER OUTPUT	POWER SUPPLY	PRICE
HT-21-LDS	25-50 Mc.	¾ Watt	Dry Battery	$324.95*
HT-21-LWS	25-50 Mc.	¾ Watt	Wet Battery	349.95*
HT-21-HWS	25-50 Mc.	2 Watts	Wet Battery	399.95*
HT-22-LDS	150-174 Mc.	½ Watt	Dry Battery	324.95*
HT-22-LWS	150-174 Mc.	½ Watt	Wet Battery	349.95*
HT-22-HWS	150-174 Mc.	1 Watt	Wet Battery	399.95*
S-81 115V AC/DC	152 to 174 Mc. FM receiver			$49.50
S-82 115V AC/DC	30 to 50 Mc. FM receiver			49.50

*Plus Federal Excise Tax

ELMAC 50 Watt XMTR

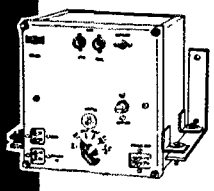


Fills a long-felt need for a moderately priced mobile transmitter with a real SOCK — or for a low-power regular or stand-by fixed station transmitter. 10, 11, 20 or 75 meter with crystal or with direct-reading VFO on all bands. 50 Watts input, hi-level plate modulation, built-in Pi antenna Network, compact measuring only 7½" x 7½" x 12", complete with tubes.

A-54 for carbon mike . . .	$139.00	6 VDC dynamotor supply . . .	$87.50
A-54H for hi-Imp. mike . .	149.00	Electro-voice 210 carbon mike .	16.50
110 VAC power supply . . .	39.50	Electro-voice 600D dynamic mike	23.10

TERMINAL for: MOUNTS, WHIPS, LOADING COILS, etc.

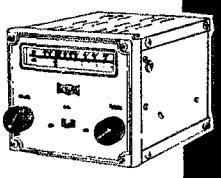
MOBILE TRANSMITTERS MB-26



2, 6 or 10 meter models, 6 watts, power filter network, low power consumption. Crystal controlled output. 6 tubes, built-in relay, compact. **72.45**

SONAR Radio

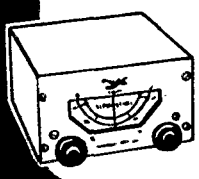
MOBILE RECEIVERS SR-9



9-tube super-het, not a converter. Self-contained, with noise limiter, voltage-reg. oscillator; better than .5 mcv sensitivity. 2, 6 or 10 meter models. **72.45**

For Fixed-Station use: Power Supply (117V-60 cycle, AC, 325V at 190 Ma, 6.3V at 6A) complete with tubes, stand-by switch and auxilliary outlet. PS-117, $30

(SONAR transmitters and receivers also available for VHF, commercial and aircraft frequencies. Write stating your requirements.)



mallard MOBILE CONVERTER

10, 20, or 75 meter models. Features: "slug-tuned" coils, high sensitivity, stability. Very popular. **39.95**

LOOK! JOHNSON "VIKING" TRANSMITTER

No. 240-101 Now available for optional use of 829 B or RAYTHEON RK 4D22/32!

Both with the RAYTHEON output tube

- Complete Kit (less tubes) . . $209.50
- Complete Kit with tubes . . 244.92
- Completely wired with tubes and air tested . . . 298.50

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sighted approach toward recognition of the necessity for emergency radio communications on an organized level rather than a haphazard catch-as-catch-can should a need for such help become necessary. Much credit goes to the license plate committee (JAQ, NV, AKN, JRX, and NAD) which, with the aid of the Hon. Paul Crockett, York County Delegate, steered the bill (House Bill 728) through preliminary committees and subsequently the House of Delegates and the Senate without encountering a dissenting vote. Members of Virginia's Assembly are commended for their open-minded approach and recognition of this organized group who offer equipment and personal services without remuneration of any kind. Hats off to those other fellows in the section who helped rally the gang which made the end result possible. Sunday, May 4th, is the day for the start of Virginia's Third Annual QSO Party. BPL received a wallop from NAD, SHJ, and JAQ, all by reason of originations and deliveries exceeding 100. The loss of IA through transfer to Japan (JA2KW) is a real blow to this section. His sterling guidance and interest will be missed by all of us, particularly your SCM. LW joined Arlington County Civil Defense Emergency Group. SHJ is a new RM. RDJ has been appointed EC of Waynesboro. SDK is organizing a Novice group to study for the General Class license. Traffic: (Feb.) W4NAD 417, SHJ 344, FV 332, JAQ 182, MWH 163, FF 83, SUC 82, KFC 44, PWX 38, IA 34, OGG 32, KSW 31, PXA 30, KX 21, LK 18, IYI 14, OKN 7, LW 4, TFX 2. (Jan.) W4OKN 8.

WEST VIRGINIA — SCM, John T. Steele, W8MCR — To JM, retiring SCM, thanks for a job well done. To Arlie, the XYL of VPO, apologies for a mistake. She was reported as having the call WN8HLF; it should have been W8HLF. The Tri-City Club reports new officers are UYR, pres.; DHX, vice-pres.; N. D. Casdorph, secy.-treas., IRN, act. mgr. LGB is EC for the Tri-City Area, with UYR as Asst. EC. A successful emergency test was held by the Club on Feb. 10th. DRF is working on a full gallon. Stations reporting in to WVN during February were AUJ, DFC, GCZ, GEP, BTV, YPR, BWK, GGC, EPK, PZT, HZH, CNF, HUG, GFV, PTJ, and HXG. A total of 137 messages was handled. The Charleston Amateur Radio Club sponsored a get-together meeting Feb. 29th to meet the new SCM. To Bera, EVR, congrats on a good job of organizing. The meeting was well enjoyed, as were the refreshments served by the YLs and XYLs. New appointments: EVR as PAM, BWD as OPS, DRF as OO, VPO, FYD, and WHR are doing a good job as NCS on the 'phone net. Traffic: W8AUJ 505, BTV 131, BWK 96, DFC 43, EVR 30, GCZ 15, FUS 13, GGC 7, GEP 3.

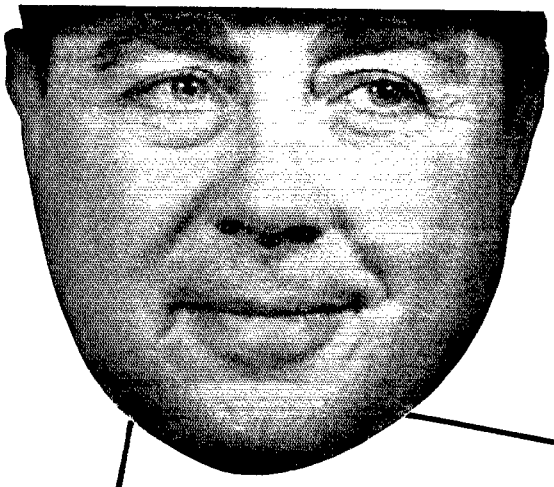
ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, WØIQZ — SEC-PAM: KHQ. Asst. SEC: PGX. RMs: LZY and ZJO. THE ROCKY MOUNTAIN DIVISION CONVENTION WILL BE HELD AT ESTES PARK, COLORADO, ON JUNE 14TH AND 15TH. It will be sponsored by the Denver Radio Club. Write Walt Reed, WRO, for details. We have two in the BPL this month, KHQ and COZ. COZ has made it for the past three months and it looks like he may be a close contender for the honor of most consistent BPLer, held at present by ZJO. BXM sends in a nice news letter of the Colorado Springs Club. Ent AFB has three new calls, HKD, HKE, and HKO. JMB is giving 10-meter 'phone a whirl and is doing OK. ANX has junked his f.m. and now has a.m. LZY has taken a leave of absence from the Colorado Springs Club because of working hours QRM. ZKM has a new mobile. COB now has a kw. on the air. COF has his rig all debugged. KMS has new 40-foot tower which holds up 10- and 2-meter beams. NWQ and BXM are planning a 2-meter jaunt on Pikes Peak June 14th and 15th. They will have a transmitter on 2 meters and one on 6 meters with two receivers on each band, and hope to set a new record for these bands. Only one letter and two traffic report cards were received this month. Yours truly tore down the mobile transmitter after running into self-oscillation troubles. See you at the Rocky Mountain Division Convention on June 14th and 15th. Traffic: (Feb.) WØCOZ 1036, KHQ 544, KØFAM 147. (Jan.) WØCOZ 820. (Dec.) WØCOZ 592.

UTAH — SCM, Leonard F. Zimmerman, W7SP — This will be the last report for yours truly. UTM will take over as SCM of Utah. Let's give Floyd our support, especially in reporting activities. If the regular report cards are too much bother for you, send him a message via one of the local nets. ØTW informs us that the Denver Club is sponsoring a Rocky Mountain Convention at Estes Park, Colo. June 14–15. Details may be obtained from WØWRO. The Ogden Club is getting its c.d. and emergency organization whipped into shape. The trend up there seems to be toward high-power mobile on the lower frequencies. NHL is conducting a Novice class sponsored by the Ogden Club. Anyone interested may obtain details from him or any member of the Ogden Club. MFU is on a mission in Norway and says that he is looking for Utah contacts on 14 Mc. from various LA stations. He also would like to buy an S-38, S-20R, or S-40. If interested you may obtain the address from us. Traffic: (Feb.) W7UTM 102, (Jan.) W7UTM 60.

WYOMING — SCM, A. D. Gaddis, W7HNI — PKX,

(Continued on page 106)



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RM, still is doing FB traffic work with LVU on RN7, New Mex. Net, and TLAP. GZG is back on 80 meters with new antenna. An OO application was received from PJU, at Dwyer. LVU is working with Major at Casper AFFC on using our facilities for the tracing of enemy planes. Plans for the Rocky Mountain Convention to be held at Estes Park June 14th and 15th, sponsored by the Denver Radio Club, are going ahead rapidly. It will be worth going to, gang, so mark it on the calendar. Traffic: W7PKX 371, LVU 17.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — JKU, MEM, and KF are planning 144-Mc. operation. CYL soon will sport a new mobile rig. PVG can be found on 7 Mc. MVM will be on 3.5 Mc. from new Birmingham QTH. SUF earned ORS appointment for his consistent traffic work on 3.5 Mc., meeting AENB and RN5. OAO meets AENB, RN4, RN5, and FN. The Birmingham Club TVI Committee has a functioning TVI program. Many new members were enrolled in the current membership contest. VBZ is new in Trussville. A highly successful AREC meeting held in Birmingham was attended by ISD, RTI, EBD, and GJW, and the results already are being seen. ECI skeds his son RRW/7 in Spokane on 7100 kc. RTI has a new car with under-the-dash Elmar transmitter. Traffic: W4SUF 67, OAO 41, MVM 9, GJW8.

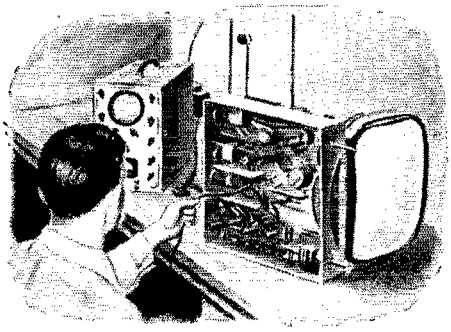
EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — Frequency change: Palmetto Net (FN) from 3675 to 3765 kc. for a tryout. Dope on Tampa Fair: 2427 messages. Operators at DUG: ALP, BIF, BIN, DIN, GMJ, HAD, LKC, OVE, PPL, RME, SSV, and TOA; plus operations from individual stations CRA, DIN, and KKY. Skeds were through DRD, OZC, ANK, OMN, AKC, FTX, IQV, THR, FWZ, K5FCH, W5DRJ, 8URM, 8BIZ/4, and 2VNJ. Dade City: SAS wants a sociable net on 7 Mc. Daytona Beach: WN3SOQ is operating portable. WN4TNR had to run his power up to wedge in. Ft. Lauderdale: JVF and MLS are IM's Assistant ECs. Visiting mobiles there included KP4KR, K2BV, and W8WFA. AREC will be set up at R. C. Headquarters on 5 bands from 144 Mc. to 3.85 kc. Gainesville: It's nice to have DGW back after another year at sea. Jacksonville: Field Day committee is composed of EOE, UHY, and ATM. FBL wants Jacksonville Novices to come in with him on some 144-Mc. activity. COW now is located here. QCJ has British "Commander" bring-'em-inner. Lake City: IQV made BPL while recuperating from an operation! Lakeland: A club has been formed with 23 members. NAK finished code school, resulting in six new hams. Miami: SAT worked 43 countries in the DX Contest; he still needs Utah for WAS! Montbrook: PMN and one of his brothers, 2BZU, visited DGW. All three went to Bradenton to visit TAS. PMN and TAS operate bedridden (arthritis) on 7 Mc. New Port Richey: WN4UMJ is the first Novice to report in the MARS Net. (WN4UMJ is *not* WN4UOJ as reported last month.) KJ filed for "granddaddy" FCC license for the old, old-timers. St. Petersburg: The Club (W4GAC) set up at the County Fair with a real layout for traffic. Tavares: WN4VDY, ex-WN8HON, reports WN8IDC/4 at Marathon. Reid has worked VP7NZ and some KZs. Umatilla: WN4TKD has a Hammarlund 129X. Traffic: (Feb.) W4IQV 1357, CRA 656, PJU 384, OMN 344, PZT 193, LMT 151, WS 102, DIN 100, KJ 83, ALP 57, FWZ 55, ART 18, RWM 16, DDW 15, NRT 8, RT 8, WN4TYE 6, W4IM 4, NAK 3, SAS 2, WN4TKD 2. (Jan.) W4IM 6.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS — SEC: PQW. ECs: PLE, FOX. GQM has an FB Q5-er going. The hamfest at ROM's was a complete success. JYK works 14 Mc. KJV is in JA-Land. KWM is rebuilding modulator. MDO has a code machine for EARC members. MFY is building new antenna. PLE is building new modulator. POT is on the lookout for a heavy-duty rotor. RKH is the proud owner of new v.t.v.m. SIW and SQO are in the Hair Net. SMM is working on a mobile rig. RGY is leaving the area. SWF is building EARC Club station modulator. 8HCX is another XYL ham. UCB is 2-meter mobile. UOO has 2-meter receiver going. SYP meets the Hair Net fast. 8BIZ handles MARS. NOX is working 28 Mc. PTK took down the 10-meter beam. TTM is marking time until she can go up for Class A license. HJA has been on 28 Mc. DAO also is on 28 Mc. UCY continues to work DX. WN4UTB and WN4VCB keep 3.7 Mc. busy. WN4UYS is all ready to go. ART meets the Magnolia Net. UIT is low power on 28 Mc. SZH has an FB mobile rig. PQW works all bands from 2 meters up. RZV has deserted 28 for 3.8 Mc. AXP has come to life again. EQZ is perking up again. NJB has an FB all-band converter in the car. OKB is heckling the gang again. JPA is going mobile. VR still handles traffic on 7 Mc. NYZ is interested in 144 Mc. MS has 2-meter transmitter going. HIZ meets the CAA Net. AOK is on HB9-Land. QX is building a new rig. QK is getting ready for 75 meters. FHQ is ready for 2-meter work. RBC is almost 100 per cent mobile. Traffic: W4ART 44, NOX 30, AXP 16, GQM 4, MS 2.

GEORGIA — SCM, James P. Born, jr., W4ZD — The Atlanta Radio Club's Hamfest will be held June 8th at Robinson's Tropical Gardens on Paces Ferry Road on the

(Continued on page 108)

Here's your Opportunity



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banks of the Chattahoochee River. A National HRO-50-T receiver will be given to some lucky attendant. K4WAR lost his 14-Mc. beam during the DX Contest because of high winds which cut his score down considerably. POI is active in traffic-handling and c.d. work. The hams in Macon are using 144-Mc. 'phone for local contacts and to get away from TVI. GEO has returned to 3.85-Mc. 'phone after an absence of four years. IPL now has his Advanced Class license and is active on 3.85-Mc. 'phone. PUM is the new Net Control Station for the Atlanta Ten 'Phone Net. RKK has a new 400B Globe King transmitter and is moving to St. Petersburg, Fla. BIW is sending code practice on 3790 kc. every Friday from 1930 to 1955 EST at a speed of 7, 10, and 16 w.p.m. KOR, UR, ARW, MCM, GVU, and OOA have their Extra Class tickets. UQI has a new harmonic — it's a girl. PYM, North Georgia College Radio Club, held open house and field day at its new shack near the college called "Radar Ridge." PYM is interested in making schedules with stations interested in v.h.f. and u.h.f. work. Members of any net in Georgia are eligible for membership in the Georgia Cracker Radio Club. Any net member interested, please contact the club secretary, NS, 129 No. Candler Street, Decatur, Ga. Traffic: K4WAR 1635, W4RKK 104, ACH 63, ZD 49, POI 43, NS 34, FVY 28, OSE 24, MTS 11, HKA 10.

WEST INDIES — SCM, William Werner, KP4DJ — SEC: ES. GP and CO have been reappointed EC for Arecibo and Mayaguez, respectively. W4GEL, now KP4RH, applied for AREC membership. KD is up to 194 countries. We are sorry to hear that QZ passed away from a heart attack Feb. 24th. VP6SD is lining up VP6s AL, CJ, and WR, Barbados, in the AREC to report to P.R. Amateur Emergency Net on 3925 kc. RD, Asst. EC Arecibo District, has a new Meissner 150B. DJ transmits ARRL bulletins Mondays 8 P.M. on 3559 kc. HZ reports into the net with new 75-meter mobile. DV, now in the merchant marine, is planning maritime mobile. W4CG is operating mobile from KV4, St. Croix. KV4AU joins the AREC 3559-kc. Net. CQ was heard operating mobile on 3925 kc. BI has station RB on Muertos Island. W2DIN became KP4RH. GO donated four 805 tubes to PRARC station KP4ID. NO is another newcomer to 75 meters. W2JXH and his XYL are visiting KP4s. MS is building kw. final to use 32V-1 as a driver. GP also is building a kw. HN is anxious to set up v.h.f. RTTY circuit from San Juan to Ramey AFB. FS has 522 on 144 Mc. The Red Cross is sending all KP4s a request to join its Disaster Communications Service via ARRL AREC. DJ was appointed to Red Cross Disaster Committee to line up all communications. Civil defense communications will be supplied by Red Cross/AREC Nets. How about the 10-meter gang joining in? Let's use 3925 kc. as a calling frequency only, shifting to another when contact is established. Long-winded ragchews by high-powered stations on 3925 kc. is discouraging mobile operators who can't get in. Traffic: KP4DJ 9.

CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — Major H. J. Parry, KZ5JQ, is our new USARCARIB MARS officer, with AZ doing most of the operating at AC5AA/KZ5AA. ST went to Washington, assigned as radio operator on the presidential train. AC is president of the new C.Z. YL Club; with LM, vice-pres.; DG, secy.; and ML, act. chairman. LF, harmonic of FL and LM, passed his exams, making another all-ham family of KZ5s — pop, mom, and junior. RM's XYL passed her exam and is signing with KA. Several years ago W6CJE sent a receiver to the McCoys on Pitcairn Island. It went dead and recently, via a steamer from New Zealand, it arrived in the Canal Zone. The shipping agent turned it over to HG and PC for repairs. Now it's on the way back to VR6-Land, a trip of more than 4000 miles from the Canal Zone, with all new condensers, and hotter than a firecracker, according to the repairmen. Miggs, of W4PNA/5, collected the first 100 CZ QSO certificate.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Samuel A. Greenlee, W6ESR — SEC: KSX. PAM: PIB. RMs: CE, FYW. Section Traffic Nets: Mon. through Fri. . . . c.w., So. Calif. Net (SCN) 3600 kc. at 2030 (1st session outgoing traffic 1915) El Capitan Net (ECN) 3655 kc at 1930. Both these nets are tied in with RN6 and NTS. BPL this month was made by KYV and GYH. At this time we make a brief report on activities in the section. These are the results of YOUR interest, YOUR efforts in behalf of ham radio. According to an "Activity Summary by Sections" compiled by ARRL, the L.A. section has, in the space of one year, risen from eighth place — in total traffic handled — 3423 messages Dec. '50 to FIRST place in Dec. '51 with 11,304 messages. The number of stations reporting to SCM is almost double and increasing monthly. AREC, under KSX, is near the 700 mark in membership (and only active members are counted). Your SCM welcomes reports from any and all amateurs in the section. We are on top now — let's stay there! FYW (RM) says the El Capitan Net now is on 3655 kc. Want to move traffic at medium speed? "Break" ECN. DCB now is on 75 meters, as is KER. WWU, and FHE. WOO is kept busy with OO work and traffic. OHX reports 4LDM and XYL, KZT, now are in Morro Bay. HLZ re-

(Continued on page 110)

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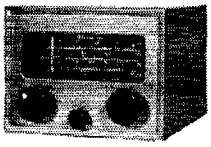

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1 Microvolt signal produces 0.5 Watt audio output. A.N.L. and B.F.O. are push-button operated.

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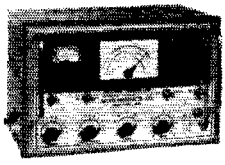

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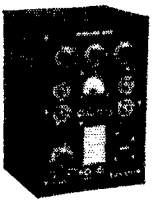

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NOTE: In view of the rapidly changing market conditions, all prices shown are subject to change without notice and

ceived "Ham of the Year" award by the Mission Trail Net. CMN still is battling the dentists. PIB (PAM) reports: American Legion Net (3975 kc.) handled 696 messages in February. PMS reports from the hospital and is getting well fast. CE is experimenting with twin carburators in new high-powered transmitter. MJ reports: The Two Meter & Down Club has fine speakers at all meetings. The V.H.F. Net operates Mondays on 146.8 Mc. Solved: The Flying Saucer mystery — they are NCP's beams in a high wind. (Sure hope he never gets together with DTY, the guided missile expert.) GJP, Net Mgr., announces new SCN frequency, 3600 kc. BLY (Asst. SEC) reports: YUY has a snazzy 144-Mc. mobile and is high brass in Montebello c.d.; FMQ is back from the A.F.; WGL visited JAs 2MB and 4MC; NCP has his beams up again (have you checked lately, Ira?); ZPB QSOed the gang while portable rowboat at Parker Dam; and LVQ is now Class A. GYH really works his skeds with that new transmitter. KYV skeds Pacific on 14 and 7 Mc. MVF is completing his "ultimate" rig (how many kws. izzat?). AM went all out in the DX Contest with ADP, BXL, and KPC as coöps. GEB is coaching 3 prospective WNs during lunch hour. Nice to hear IOX back on 80 meters. COZ says he is rebuilding the shack; GAE has a new operating console; BXP has 807 final; KPD has a new beam; and LQR is on 80 and 160 meters. CFL has designed an accurate frequency meter, for 2400 Mc. ! ! ! CK (OO) suggests WNs contact OOs to ascertain if their signal is clean before operating; a good idea for all of us. If in doubt contact CIX, CK, EBK, OKL, or WOO (OOs) for a check. Orchids to FE for arranging a 'phone patch with a G.I. in Guam and his wife in L.A. within minutes after being called by the wife. And, it was entirely unscheduled! Let's each contact the family of a G.I. and handle some messages for them — we need public good will now, and this is the way to get it. Rebuilding: EPL and ESR. WN6NJU is gunning for 144-Mc. DX. AREC notes per KSX (SEC): The So. Bay Net has been absorbed into the Centinella Valley Net to streamline the organization; OI (EC) is Area Commander in c.d. He especially commends BLY and FPD (ECs) for their fine work in AREC organization. Thanks also to BHG, BUK, CIX, FMG, IZO, KQS, and MU for their reports. Traffic: W6KYV 2604, GYH 1760, GJP 243, NCP 153, FMG 135, HLZ 56, CE 52, BLY 48, FE 47, PMS 41, BHG 36, CK 34, IZO 32, CMN 30, EBK 14, MJA 14, FYW 11, OHX 10, AM 8, ESR 8, WOO 8, GEB 7, DCB 2, WN6NJU 2.

SAN DIEGO — SCM, Mrs. Ellen White, W6YYM — Asst. SCMs: Shelley E. Trotter, 6BAM; Richard E. Huddleston, 6DLN; Thomas H. Wells, 6EWU. SEC: NBJ. RM: IZG. ECs: DEY and IOK. New Novices on the air in El Centro are WN6MUL and WN6KJB. DLN is handling heavy Japan traffic in the Valley. KNL is operating the IVARA station, GG, on the Mission Trail Net. LVN is working out with a new ground-plane vertical for 7 Mc. A new full-fledged member of the League's Old Timers Club is EWU, who is very active on 75 meters. TET is checking into SSN regularly and is up for appointment as ORS. NSK is hurrying to get a mobile rig in his new Chevvie Power-glide. OCY has received the word from Uncle Sam. ODB and OCY recently finished a pre-Field Day special, two twin-five arrays stacked one wavelength apart. New officers of the Orange County Amateur Radio Club are QZQ, prexy; LQX, vice-pres.; DHP, secy.-treas. GTB and JAN, act. chairmen. WN6PJU, XYL of ZE, is Acting Net Control on the OCEN 2-meter net. Others of Orange County on 2 meters are BVA, CYR, DEY, QZQ, TAZ, and ZE. The S.D. AREC did a bang-up job in furnishing communications for the recent Glider Meet. After a long absence, a welcome call is heard back on 75-meter 'phone these days — BKZ is on the air! Another active YL on the air in San Diego is EYF. San Diego windstorms are taking their toll of both TV and amateur antennas. BAM's FB February total puts him into the BPL for 12 consecutive months! Appointments in the section as OBS and OPS are currently available. If interested, contact your SCM. Traffic: (Feb.) W6IAB 1658, BAM 1101, ELQ 322, IZG 251, GTC 93, BSD 68, TET 52. (Jan.) W6ELQ 246.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, William A. Green, W5BKH — Asst. SCM, Joe G. Buch, 5CDU. SEC: JQD. RM: QHI. PAM: IWQ. Appointments were made to SQW as ORS and PYQ, QOV, and NCD as EC. JQD now has 66 active ECs but needs 100, so if your area is not represented here is your chance. The Novice Traffic Net now has the following members: SQW, TBT, TES, TFB, TFN, TFX, TKB, TXA, TXB, TYU, UFP, ULX, and UMA. Lamesa ARC elected MHM, UIJ, and SPP as president, vice-president, and secretary, respectively. RGU, of that Club, is conducting code classes on 28 Mc. Their ten-meter net meets Fridays at 2000. ROH, with the Big Spring ARC, is starting a new code class. At Sherman, POG is teaching theory and code to Sea Scouts. The Bonham Club announces a new Adv. Cl. licensee, RYI. Lubbock ARC has a new club ham shack located at City Air Port. BAM hears DX on all bands. DRV, PST, and POG are on 3825-kc. mobile with revamped equipment with DRV working 160-meter mobile. TLW makes RN5 with a new 807 rig. Con-

(Continued on page 112)

gratulations to KRZ, who got a write-up in his local paper for services rendered via ham radio. LUQ has a fine beam on 20 meters that makes his 175 watts sound like a kw. in JA-Land. Ex-5AUL now is 9AUL and is keeping skeds with BKH on 3680 kc. It soon will be time to elect an SCM. Your SCM believes that one term is enough and that the office should be passed around, so give some thought to nominating a suitable candidate. Traffic: (Feb.) W5PAK 260, BKH 164, JOG 144, TMB 80, QMF 73, SQW 69, HBD 64, ARK 58, LEZ 52, EBW 45, GZU 37, TLW 35, RHP 32, CWE 30, WN5UFP 19, W5GZH 18, RRM 17, KPB 16, SRG 16, RJM 13, SGR 11, BAM 8.

OKLAHOMA — SCM, Jesse M. Langford, W5GVV — SEC: AGM. RM: OQD. PAMs: GZK and ATJ. The Oklahoma City AREC group is to be congratulated on the fine dinner meeting held Feb. 24th. The principal speakers were Legislator Robert Sherman and Dave Middleton, CA, West Gulf Division Director. SNL reports for the Ardmore Area that PNG surprised the local mobilcs with license tags bearing their call letters. JP, OWG, SCX, BLW, TFP, and SNM attended the Lawton Hamfest. OWG has a new MARS exciter. 144-Mc. activity has been renewed in the Ardmore Area. SCX is building a new 75-meter mobile converter. BLW has a fluorescent ridge roll. The Canton Radio Club is conducting classes in radio, many attending from the surrounding towns. Even the town marshall is working on a license. SWJ, Tulsa, schedules 9QXO, Columbia, daily. EHC reports WN5NEY is a new CAA amateur. TMY is organizing 1.9-Mc. emergency net. All Novice stations are welcome to participate in the Oklahoma Novice Net on 3735 kc., 7 to 8 P.M., Tues. and Thurs. HXL, TXR, EYG, and CXE are reopening on 144 Mc. in Oklahoma City. The Bartlesville Club gave a farewell party for Frank Fisher Mar. 9th at Osage Park. GVS will be back on the air with a new Viking. OLZ, 3682.5 kc., invites all to bring their traffic to the net. Traffic: W5MRK 606, GZK 347, ROZ 247, OQD 145, MQI 94, SWJ 85, MFX 82, JHA 80, FOM 77, GVV 26, NVO 23, GPD 18, EHC 16, FKL 13, KY 11, ESB 10, CKQ 8, HFN 4.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — 4RZU/5 reports conditions on 7 Mc. have been bad. WN5TOL has worked 34 states and has 33 confirmed. NPX is active on STX. PTV still is spearheading So. Tex. Traffic Net. OUG now is a member of Houston c.d. as a zone control station. LHD is at Randolph AFB. BHO is building a new 2-meter beam and is active in STEN and MARS. NHA is starting a Novice emergency net for Southern Texas in coöperation with the Texas State Guard. Crystals will be furnished. All interested, contact him at 2006 Yale St., Corpus Christi, Tex. TPP and KFY have a code and theory class at their home. NHA reports a Novice Emergency Net on 3726 kc. doing nicely with quite a few members. FXN has been helping VV build a new 50-Mc. rig and reports. TIK received his Class B ticket. SCZ has a new 807 rig. POL is chairman of AARC TVI Committee. NZE is club president. NFC is chairman of the License Plate Committee. TFY has a new QTH. QEM is replacing 809s with an 813, all bands 400 watts, also TVI proofing. ACL has 32V-1 working again. WN5TNJ recently passed away. He was active on 144 Mc. and CERN. RSA signed up in the AREC. MN is working H. & B. Morning Net. Let's plan on the ARRL Convention to be held in Corpus Christi, Tex., the last week end in June. HQR is chairman and IBT is program chairman. HMO is a new ham in Alice and works for CAA. WN5UUE and UBD are newly licensed. NPX is going to A. & I. OJU now is safely married. Traffic: W5MN 421, 4RZU/5 151, W5QEM 60, BHO 18, FXN 5, TFY 2.

NEW MEXICO — SCM, Robert W. Freyman, W5NXE — SEC: PLK. PAM: BIW. RM: NKG. PAM v.h.f.: FAG. Nets: C.w., 3633 kc., 7:00 P.M., Mon. through Fri., 'phone, 3838 kc., 7:30 A.M., Sun., 6:00 P.M., Tues. and Thurs. A set of code records and all necessary equipment for its use has been donated to the New Mexico Boys' Ranch by Eldico and the amateurs in New Mexico. The state picnic will be held Sun., June 1st, at Cabrillo Peak (13 miles north of Mountainair to Manzano, then west 4 miles). The Sandia Club will have mobiles on 2916 kc. at the peak and at the Manzano turnoff. Sixteen stations called in on the first meeting of the 160-meter net. VDV and VDY are on the air from Los Alamos with Vikings. RCJ has his Viking and HRO installed in a housetrailer for a move to KL7. QHB is running 300 watts to his s.s.b. rig as a linear amplifier on 75-meter net. JXO broke press with two more radio articles. PSV is moving to Denver. CTG has a new home and 10 watts on 75 meters. DAH has been on 80 and 75 meters with 60 watts. UZI now is at Los Alamos with 4-250A on all bands. BIW has all-band mobile. KWP has 829 on 50 Mc. MYI has home-grown all-band VFO. Traffic: W5NKG 106, NXE 83, IGO 81, ZU 28, JZT 2.

(Continued on page 114)

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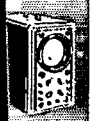




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CANADA
MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ, EC: EK. RM: OM. YV again leads in traffic this month. The following paragraph appeared in the *Civil Defense Bulletin* issued by the Coördinator's Office at Ottawa: "EMERGENCY COMMUNICATIONS — The first message transmitted over the emergency civil defense facilities in Nova Scotia was sent to Hon. A. B. DeWolfe at his home in Halifax from his Communications Committee Chairman, Mr. E. S. Campbell, on December 13. Two-way voice communication was carried on between radio transmitters in provincial headquarters and Halifax target area, control center. Radio contact was made also with amateur stations in the Province, and out of the Province to St. Anthony, Nfld., giving an indication of the signal strength of the headquarters transmitters. Among those present at Provincial Emergency Headquarters for the test were Arthur Crowell, SCM Maritime, ARRL, and Sqdn. Leader Barrett, Director RCAF amateur radio network, both of whom are members of the provincial communications committee." There now are about 40 civic and municipal emergency committees set up in Nova Scotia. If you've not already offered your assistance, contact your EC now. Traffic: VE1YV 223, FQ 186, MK 110, AAK 79, AL 71, OM 70, TO 39, ABJ 33, PZ 23, HT 15, ZO 11, AAL 10, JD 10, KG 10, XA 9, DB 7, JA 7, ZB 7, AB 6, ZM 6, AAN 3, ABR 3, PS 3, FR 2.

ONTARIO DIVISION

ONTARIO — SCM, G. Eric Farquhar, VE3IA — Despite being off the air for two weeks because of illness, ATR heads the traffic list for this section. GI is active on 50 Mc., and also is Net Manager of the Ontario section net. Regular reporters into OSN are AFK, ATR, BBM, BIU, BL, BME, BMG, BNC, BOZ, BUR, BVR, DGA, DU, EAU, EAM, GI, HP, OD, SG, TM, and WY. VD is busy TVling the rig. Recent visitors to Florida were DND and VZ. BPB solicits 2-meter contacts Saturdays and Sundays at 0930 EST. BUR includes two new masts in his rebuilding program. The Ottawa Amateur Radio Club combined meeting and spring auction. One for the book is the report from a "TV viewer" in Carleton Heights that the call signal of the amateur station giving him trouble was "CQ 75." Ottawa-Smithfalls traffic is very capably handled by CAU and MP. The Mohawk Radio Club enjoyed a talk on weather forecasts and how they serve industry given by Mr. McCormack of Dominion Weather Office. Hamilton ARC members were given a treat when RCAF instructors of radar and communication school gave demonstrations and theory lectures on the oscilloscope. Toronto and Hamilton Emergency Corps held simulated tests on 28 Mc. Taking part in Toronto were AHA, AJA, AMB, ARF, BQR, BRI, BYZ, DHG, DMC, KW, NO, and RU. DGZ was in charge of the Hamilton test. Manning headquarters were BHS, BKM, WE, Keith Bernard, and Alex Skelton. Mobile units were provided by BIK, BV, DND, JU, QT, and VZ. CY and HC, as VP5BP in the Caymen Islands, had many W/VE contacts and gave the gang a new country. Fine skeds with home were provided by DGZ. BL delivered one of his fine talks and demonstrations on "Micro-Wave Transmission" to the Kitchener-Waterloo Radio Club. Traffic: (Feb.) VE3ATR 176, BUR 123, GI 97, WY 89, TX 83, IA 77, EAM 58, BJV 41, DU 36, AYW 33, EAU 17 SG 16, DFE 5, VD 2. (Jan.) VE3GI 52, TO 16, DFF 3.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GL — SEC: BR. BK, having completed his term as president of MARC, now finds more time for ham activity, and now is ORS. AQE and AQT are new hams in Lachine. FX is heard on 14 and 28 Mc. after a long lay-off. EC maintains skeds with AEM, AGP, ZG, and VE, and reports AM, ZG, TR, PV, and others with their calls on license plates in his area. AGG skeds AFARS regularly and is bearing down on getting the new rig with 813 final completed. CA reports just routine operating, traffic dropping off, and DX most difficult to work. AAO took part in the Frequency Measuring Test on Feb. 8th and has a new recorder with which to record his observations of modulation, etc. FG has a new all-band rig, VFO-controlled with 813 in the final. PQN continues active, but with traffic light LO, AKJ, CD, AMB, and XR are the most regular attenders. FT has gone n.f.m. on 14 Mc. to get away from BCI. When this appears it will be time to be getting the portable gear polished up ready for Field Day. Those who have participated in the past are looking forward to this year's event, and those who have not participated are urged to get some gear together and form a group or join an active group. More reports of activity are needed. Let's have them. Traffic: VE2CD 80, AMB 54, CA 46, EC 13, GL 7, AKJ 6, AO 6, LO 3, BK 2.

VANALTA DIVISION

ALBERTA — SCM, Sydney T. Jones, VE6MJ — AO is reported to be organizer of the AFARS Net. EO visited Calgary recently in connection with his duties as city elec-

(*Continued on page 116*)

trician. DZ has returned to 3.8-Mc. 'phone with higher power. The camera bug seems to have bitten HK. HL says he is QRL working for a living but has started his final for 7 Mc. PV wishes each day was twenty-four hours longer to enable him to get all the jobs done. KO has resigned as EC for Lethbridge. JJ is organizing the 6-meter gang in Medicine Hat. FF was heard in Edmonton operating mobile while en route to Wetaskiwin. JP and MJ attended two-day lodge reunion. EM is in Edmonton attending the sitting of the Provincial Legislature. HM has been appointed a member of the Provincial Civil Defense Coördination Committee. EH has been experimenting with top-loaded antenna on his mobile. One turn makes quite a difference, Teddy. I have received confirmation of my reëlection as your SCM for a third term. Thanks, gang, I shall do my best to warrant your confidence. Please send in your reports regularly and let's make this column really interesting. Traffic: VE6HM 142, YM 33, MJ 5, HL 3.

BRITISH COLUMBIA — SCM, Wilf Moorhouse, VE7US — Reports were received with thanks from AC, AIO, AMJ, QC, TT, DD, and DH. The BCARA Cup was awarded to XW. Mobile gatherings have been replanned for the summer; we need an active Asst. EC for this job. The fraternity lost an old friend, Mrs. JF, whose passing is felt by all hams. The BCARA president this year is FB, succeeding KC. The 5 P.M. Net still is active, as is the 6 P.M. AREC Net. C.d., Red Cross, and RCMP have registrations of active AREC personnel. Your SCM and SEC worked on this project and many hours were spent in organizational detail. All amateurs are invited to join AREC (c.d.) and get on the lists. The OOs were busy during the Contest covering unethical operation. ACC, AHF, AQS, ASB, AQB, GP, DH, LP/7, PN, and SH were covered in the report from the Nanaimo Area. AGE, AEP, FP, SO, AQG, YE, AO, OQ, QC, ALJ, YI, QZ, JG, TT, SF, PO, CB, ACM, AAZ, KA, MT, TT, JG, XV, and LP were all visited by the SCM last month. This is not work, though; it's always a pleasure! Many 20-meter stalwarts are heard on 75 meters. 10, 20, and 40 meters are spotty. We expect to have picnic-meetings for the AREC boys in three locations during the summer, one in each section which can become an "open-forum" AREC discussion. The Regional ECs would M.C. these picnics. Traffic: VE7AA 34, QC 24, DH 21, DD 15, AC 14, AIO 2, TT 2.

PRAIRIE DIVISION

MANITOBA — SCM, A. W. Morley, VE4AM — It is with regret we report the passing of two Winnipeg amateurs, ZR and JA. Our deepest sympathy to both their families. AY is a new call at Haskett and RT is new in Winnipeg. JY and OS are new 'phones on 75 meters, with the former promptly joining the 'phone net. RX has joined brother, ex-TX, in California. HL has gone commercial with a TBS-50, a Viking and an HQ-129X. MARC has applied for affiliation with ARRL. DU reports regularly and is rebuilding the final. Thanks to BARC for the following: BD, Deloraine, and HT, of Hartney, along with EA, who had his call 6 hours, visited the BARC meeting. EF has p.p. 813s VFO on 80 and 75 meters. 5CW now is in Winnipeg. 50 Mc. is being pushed, with YW and CT active. YW runs transmissions on this band nightly at 1900 for experimental purposes. Ex-AW is back in the section and is signing EW. A new appointment is that of RB as OO. This is a much-needed appointment and Doc is to be congratulated on taking on the job. Traffic: (Feb.) VE4AM 92, HG 84, HP 80, DJ 22, DQ 22, CI 16, CE 14, ER 11, QD 6, DU 4, JM 4, GQ 3, HL 2. (Jan.) VE4AM 82, QD 16, GQ 4.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — The change of time to 1830 hours for the 'phone net has been proving advantageous and will remain at that time until conditions are more stable on 75 meters. Two organizational meetings were held during February by your SCM. At Tisdale the various phases of amateur radio were discussed. The need for that district being organized in the AREC was brought forth. As a result FS has been appointed Tisdale Area EC and your help and coöperation is needed. It was suggested that all stations having their own power should be known by the SEC and a drill of these stations held. Advise BZ if you are in this category. At Regina, the chief subject was the coming hamfest to be held there June 30th and July 1st. Civil defense, AREC, and ways to improve the 'phone net and the organization of a c.w. net were discussed. LY has been appointed Yorkton Area EC and will need the assistance of hams in that section. BV is installing 10-watt mobile rig for 75 meters. TE puts out a nice signal with his new rig. BJ has new Eddystone receiver. PR is new on 'phone from Lac La Ronge. EE, JF, JK, and CO held Sunday skeds on 50 and 144 Mc. but still are hoping for their first contact. They invite heard reports: Traffic: VE5BV 27, TE 25, HR 19, PJ 18, DD 2, FG 1.

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442	5 x 6 x 4		1.33
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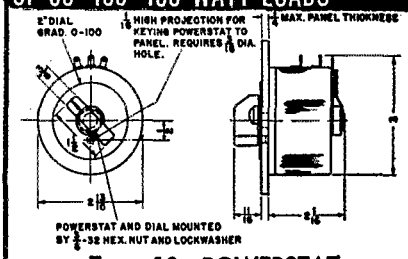

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P-2942	5 c.t.	12	2500	3 1/16	2 15/16	2⅜	4.06
P-2943	5 c.t.	30	2500	3¾	3⅛	3	6.47
P-2944	6.3 c.t.	1	2500	1⅝	2 13/16	1½	1.65
★P-3074	6.3	1.2	5000	2	3¼	2	2.12
P-2945	6.3 c.t.	2	2500	2	3¼	1⅝	2.12
P-2946	6.3 c.t.	3	2500	2	3¼	1⅞	2.50
P-2947	6.3 c.t.	6	2500	3	3⅝	2¼	3.24
P-2948	6.3 c.t.	10	2500	3 1/16	2 13/16	2⅞	4.41
P-2960	7.5 c.t.	4	2500	2⅝	3¼	1⅞	2.94
P-2961	6.3 c.t.	3	2500	3	3⅝	2¼	4.06
	6.3 c.t.	3					
P-3041	5 c.t.	3	2500	2½	4	2⅛	4.06
	6.3 c.t.	3.6					
P-3143	7.5 c.t.	8	2500	3½	2 15/16	3¼	5.00
P-3145	10 c.t.	5	2500	3½	2 15/16	3	5.00
P-3146	10 c.t.	10	3000	3⅞	3⅝	3⅝	5.88
P-2959	12.6 c.t.	2	2500	2	3¼	1⅞	2.65
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COrtlandt 7-3440

Dept. QS 5
New York City 7

A 50-Mc. Transmitter-Receiver

(Continued from page 21)

The three r.f. coils of the transmitter section were checked by the grid-dipper to determine if they would cover the 6-meter band with leeway. Initial adjustment of the three r.f. coils of the receiver was also done approximately with the grid-dipper, after which they were tracked in the conventional manner.

The oscillator is on the high side of the signal frequency and the mixer and antenna circuits are tracked to it by coil squeezing and plate bending. The transmitter, in practice, does not use a plate current meter. In some units a single-turn loop in series with a dial light bulb is coupled permanently to the output tank. Maximum brilliance indicates resonance. The antenna coil is coupled up until the bulb becomes very dim, keeping the plate tuning capacitor adjusted for maximum brightness, of course. A somewhat better scheme is to place the bulb in series with the antenna coil, tuning for maximum brilliance. If the bulb is too bright at full output, it can be shunted by a capacitor of such a value as to give the desired brightness.

In the writer's unit, maximum output is determined by means of a field-strength meter, both tuning and antenna coupling being adjusted for maximum reading. This field-strength meter is a germanium crystal across which a 1-ma. meter is connected through two r.f. chokes. A 2-foot wire is connected to one side of the crystal, and the other end of this wire is looped around the base of the broadcast whip. The meter, which is mounted with the crystal in a small case, is set on the motor hood. If you use this method, don't forget to remove the meter before you drive off!

When changing frequency, a new crystal is plugged into the unit through the hole in the side of the cabinet. In some units this hole is omitted and a double crystal socket and a switch are used. The S-meter is plugged into the tip jacks and the oscillator tuning capacitor adjusted until a slight deflection is noted on the meter. The doubler plate tank is then peaked for maximum S-meter reading and the amplifier tank for maximum bulb reading or field strength. Then, the oscillator tank is tuned past the point of maximum S-meter reading until the meter reading suddenly drops to zero. The capacitor is then turned back until the S-meter again suddenly reads and should be left tuned slightly below this maximum. This insures prompt starting of the crystal when the B + switch is turned off and on. If the above procedure is not followed, parasitic oscillation may occur and the parasitic seems to prefer TV Channel 4!

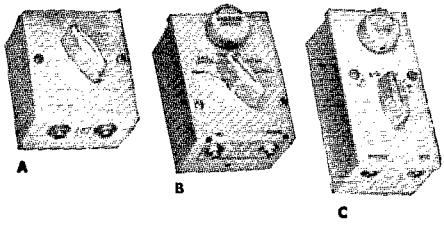
Extensive use in several ham shacks and a demonstration at one of the local radio clubs have shown this design to be substantially TVI-free in the Boston area, where Channels 4 and 7 are in use. There is a possibility of 4th-harmonic trouble in the top three channels, and

(Continued on page 120)

LOOK STEINBERGS LOOK

SUPER SPECIALS

JACK BOXES



(A) BC-345. 3½" x 3" x 1⅞" aluminum, 2 standard open-circuit jacks, 3-position switch, 6-contact banana plugs and jacks.
(B) BC-1366. 4¼" x 3" x 2¼" aluminum, 1 standard open-circuit jack, 1 3-circuit mike jack, 150,000 ohm volume control, 5-position switch, 11-contact banana plugs and jacks.
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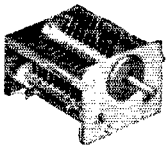

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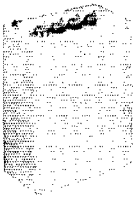

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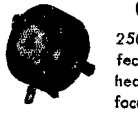

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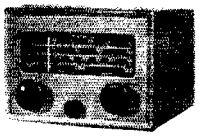

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adjacent-channel interference in Channel 2, but the low power of the rig and the shielding afforded by the metal cabinet should make treatment of any TVI that might arise a relatively simple matter.

This same unit can be duplicated for 10-meter operation and this has been done with very satisfactory results. The only change necessary in the transmitter is to increase the size of the three tank coils and the neutralizing coil. In the receiver, the three r.f. coil sizes will be increased. It is recommended, however, that the intermediate frequency be changed from 1.73 to about 900 kc. as the best compromise between image ratio and bandwidth. This can be done by replacing the 100-$\mu\mu$fd. silver mica capacitors of the present i.f. transformers with 360 $\mu\mu$fd.

Happenings

(Continued from page 24)

F.C.C. NOTES

In February Wayne Coy, who had served as FCC's chairman since late 1947, resigned the post to enter private industry. Paul A. Walker, who has been a commissioner since FCC's inception, was named the new chairman by President Truman and promptly confirmed. To fill the vacancy the President named Robert T. Bartley, former administrative assistant to Speaker of the House Sam Rayburn, and a former Telegraph Division Director of FCC.

A new district office, No. 24, has been established by FCC with headquarters at the Briggs Building, Washington, D. C., and covering metropolitan Washington — specifically, the boundaries of the District of Columbia extended 10 miles in all directions.

Midget 50-Watter

(Continued from page 80)

high-voltage lead. The meter should be capable of reading at least 200 ma., and should be connected so that its positive terminal goes to the supply, with the other lead going to the high-voltage input terminal of the transmitter. Apply plate and screen voltage to both stages, close the key, and resonate the amplifier tank circuit by turning C_8 until the meter reading dips sharply. If a 3.5-Mc. crystal is used, the dip will be near the maximum-capacity point on the condenser (plates fully meshed). With 7-Mc. crystals, the dip will be near minimum capacity. Current at the dip should be no more than 5 or 10 ma. Don't allow the transmitter to operate this way for more than a few seconds, because the screen-grid current in the amplifier is excessive under no-load conditions. In this rig, it is not advisable to use 3.5-Mc. crystals when 7-Mc. output is desired, because the grid drive available from the untuned oscillator plate circuit is insufficient to

(Continued on page 122)

permit efficient frequency doubling in the final.

The best way to couple power out of the transmitter and into the antenna is through an antenna coupler. The circuits of several suitable units are described in recent editions of *The Radio Amateur's Handbook*, along with suggestions for various antennas. In selecting a coupler for this rig, be sure that it has provisions for variable coupling through either a swinging link or a variable coupling condenser, because the output link in the transmitter is fixed.

Adjust the coupler so that the amplifier stage is loaded to 100 ma. maximum. Recheck the tuning of C_8 to be sure that the circuit is still resonant. The dip at resonance will be much less pronounced when the load is coupled to the stage but it should still be possible to notice a dip of a few milliamperes. If it is necessary to tune C_8 more than a few dial divisions away from its no-load setting to restore resonance, decrease the coupling between the rig and the coupler slightly and try again. In some instances it may even be necessary to change the method of connecting the antenna to the coupler to get satisfactory operation. This you can tell by experimenting along the lines suggested in the *Handbook*.

When the rig is put into actual operation, metering can be done by connecting the meter in series with the key leads once you've determined the proper settings to obtain full loading of the amplifier stage. When connected this way, the meter reads the total of all grid, screen, and plate currents flowing in the transmitter, so the reading will be considerably over 100 milliamperes. The oscillator plate and screen currents total about 25 ma., the amplifier screen current runs about 5 to 8 ma., and the amplifier plate current about 100 milliamperes. Grid currents in both stages total only a milliampere or so, and can be disregarded insofar as their contribution to the total meter reading is concerned.

Wavelength Factor

(Continued from page 86)

poor if the i.f. is too low.) There do exist, however, special balanced circuits employing two crystals for the suppression of local-oscillator noise. On the other hand, if the i.f. is too high, the noise originating in the i.f. amplifier itself may be excessive. At a carrier frequency of 3000 Mc. the optimum i.f. is about 30 Mc. By careful design the natural trend of deterioration of noise figure with the increase of frequency may be confined to surprisingly small limits. Even throughout most of the useful microwave range noise figures of 100 (20 db.) or less may be obtained.

It is frequently desirable to sacrifice the high performance of the superheterodyne for simplicity or compactness. At the low frequencies, the regenerative detector, preferably preceded by an r.f. amplifier, is probably the best "second

(Continued on page 124)

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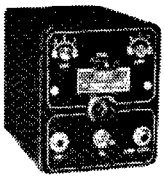
DUNCAN SCOTT W2LAL



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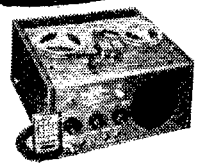

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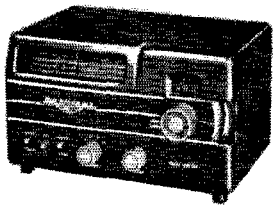

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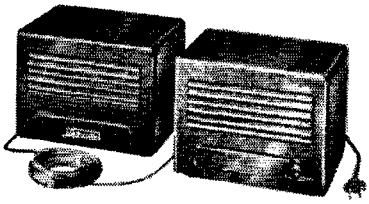
Lafayette TWO-WAY INTERCOM



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choice." At somewhat higher frequencies the regenerative detector is replaced by the superregenerative detector. In the u.h.f. and microwave range the crystal detector followed by an audio (or video) amplifier using common receiving tubes would probably be the best "second" choice since it avoids the noise of high-frequency tubes and also the complication of the elaborate power supply required by them.

[*In the third article of this series, to appear in an early issue, the information contained in this and the first article will be utilized in reaching conclusions as to the optimum bands for both general amateur activities and civil defense work.* — ED.]

How's DX?

(*Continued from page 67*)

there ain't no such animal as F7S5P. This Paris SHAPE Hq. station's call really was F7*SHP* and it is no more. F3HK hastens to point out that French calls are under no circumstances three-lettered . _ . _ . _ Giving our practically non-existent French a terrific workout, FF8AC writes of his removal to France. He shipped out over 2000 QSLs via bureaus. After six months at home he'll head for another juicy DX spot. Yvon was D5AT for a period just after the war . _ . _ . _ PK4DA informs us of his travel itinerary in outline and this is how it stands: April 16th to May 10th, the West Coast and San Francisco (% W6UZX); May 10th to May 31st, en route New York City via Portland and Detroit; June 1st to June 15th, New York City; June 15th to July 15th, New England and vicinity. Arie's XYL will accompany him on this trek. PK4DA (ex-PA0UM) intends to remain in the U.S.A. and is without doubt one of the best-known overseas amateurs to visit our shores. We know the W/VE gang will roll out the carpet for him in traditional ham fashion! . _ . _ . _ "I'm convinced this is the country's worst DX QTH . . . used to be W2ECW in N. J. and with 50 to 60 watts worked more DX than I've worked in the State of Washington in five years with 200 to 400 watts." This lament from W7KIL in eastern Washington is no sour grape; we find in the files only one postwar Montana DXCC (W7KVU) and *none* in Idaho. About 90 per cent of W7 DXCCs were made from locations along the coast, these being postwar data.

—...—

Jeeves wanted to close this effort with a limerick of his own but we held him off. We have him looking for that word to rhyme with "orange."

BRAZIL'S 21-MC. CONTEST

Brazilian radio amateurs are sponsoring a special 21-Mc. contest during July to "warm" the band and to provide a test of propagation conditions. The 'phone section of the contest will start at 0301 GCT on July 5th and 19th and will end at 0300 GCT on July 7th and 21st. The c.w. section will start and end at the same hours on July 12th-14th and 26-28th. The transmitting contest is for PY stations, but amateurs of other countries may participate by logging PY stations called or calling and recording the date/time and series of figures sent by the calling station. The same PY station may be logged more than once, provided there is an elapsed time of at least two hours between each entry of that station. Listeners may claim 2 points for each correct logging. There will be special awards for winners.

Logs should be sent to LABRE, P. O. Box 2353, Rio de Janeiro D. F., Brazil, and should arrive there prior to October 31, 1952.

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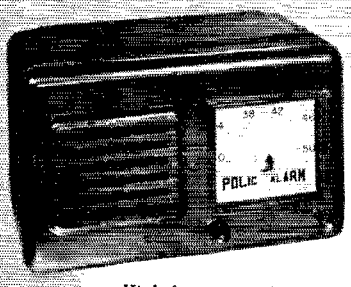


POLICALARM MODELS PR-8 AND PR-31

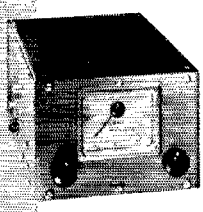
Cover Police, Fire, Truck, Taxicab, Transportation, Emergency Calls, Hospitals and Similar Services

High-frequency FM receivers covering 152-162 mc and 30-50 mc. Superhet circuits use ratio detector for quiet operation under "no signal" conditions. Sensitivity better than 10 microvolts for 50 milliwatts output. Selectivity, 100 kc. Drift compensated. Use 12AT7, 6BJ6, 19T8, 35B5, 35W4 rectifier. Include 5" PM speaker. In walnut plastic cabinets, 11x6x6". For 110-120 volts, AC or DC. Low power consumption—only 30 watts. Antenna impedance, 72 ohms.

98F100. Model PR-8. Covers 152-162 mc. For taxicab calls and similar services. With vertically mounted 16" stub antenna. Complete with all tubes. Shpg. wt., 8 lbs.

98F101. Model PR-31. Covers 30-50 mc. For police, fire, and emergency calls. Requires 6 to 8-ft. vertical wire antenna. Complete with all tubes. Shpg. wt., 8 lbs.

NET EACH.....$44.95



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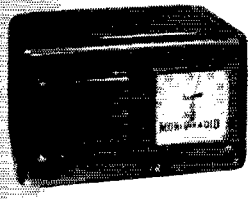
98F102. M-101. 152-162 mc. **NET**
98F103. M-51. 30-50 mc. **EACH.....$72.50**



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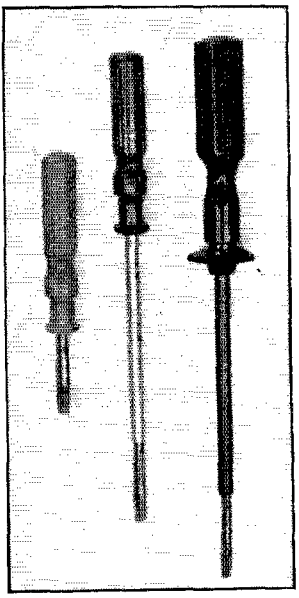
Tools and Tricks

(Continued from page 38)



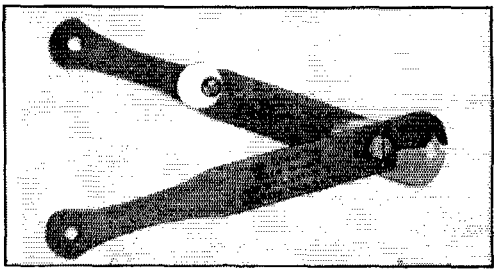
"Quick-Wedge" screw-holding screwdrivers save time and patience in assembly work.

your fingers while you tighten or loosen it with a screwdriver? For 49 cents RCA [5] puts out a set of "Fingertip" socket wrenches. A wrench slips over the end of the most appropriate finger and not only will keep the nut from turning, but it will hold the nut in place while you're trying to get the screw started.

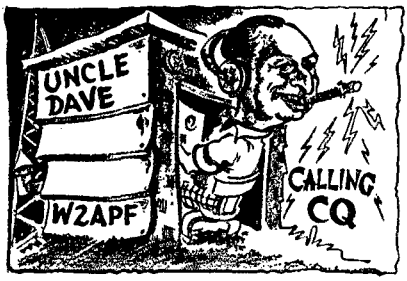
Most of these tools are inexpensive items and are of the sort that can take the cussing out of otherwise awkward jobs. They are well worth adding to the ham's workshop equipment. If you can't find them at your local dealer's, you can use the address in the footnotes.

From your own experience, you will probably recognize that these few tricks with tools by no means exhaust the possibilities. They merely serve to suggest a host of other ways in which construction can be made a pleasant diversion, rather than a chore.

[5] Radio Corp. of America, Harrison, N. J.



A simple but very effective combination wire cutter and stripper.



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Model 3005 Triband	47.60
Model 3006 Steering Post Bracket	3.90
Model 3008 2 meter	44.50
Millen 90651 Grid Dipper	61.50
Eldico GDO Grid Dipper Kit. Complete	29.95
Wired and Tested	49.95
Lysco D11 Grid Dipper. Complete	39.95

FOLLOWING TRANSFORMERS DISCONTINUED BY MANUFACTURER—ALL NEW

UTC LS6L1 PP6L6 self bias AB1 9000 ohm plate to plate Sec. 500, 333, 250, 200, 125, 50, 30, 20, 15, 10, 7.5, 5, 2.5, 1.2 30 watt	$ 21.00
UTC LS181 Pri. 100, 110, 120, 220, 230, 240 Sec. 1500, 1250, 01250, 1500, 1250-1000 after filter 200 ma	33.50
UTC LS6L3 same as 6L1 sec. is; 30, 20, 15, 10, 7.5, 5, 2.5, 1.2 30 watt	14.00
UTC LS7 driver trans. 30000 plate to plate. 45 pri. imp. turn ratio 1.5; 1 Pri. to Sec.	15.50
Stancor P5012 115 VAC Ser. 2.5 @ 10 amp—5 V @ 3 amp 10000 V insulation	5.30
Thordarson T15C37 input choke 300 ma 5-25HY 78 ohm	5.00
UTC PA51AX Varimatch Driver Trans; all single tubes like: 6C5, 30, 49, 53, 79, 89, 6A6, 45, 46, 2A3 to 19, 30, 19, 78, 79, 89, 2A3, 45, 46, 6L6, 42, 59	5.25
UTC PA53AX Driver from PP tubes like 45, 49, 2A3, 6B5, 6L6 to: 46, 4-46, 841, 210, 801, 800, 203A, 838, 805, 50T, 830B	6.25
UTC PA512 50, 200, 500 line to 2-250TH, 2-450TH, 2-HF200, 2-HF300, 2-204A or 2-849	15.00
UTC PA135 input to grid-line to 2 grids, 50, 200, 500 Sec. 150000 overall	$ 6.75
UTC PA15 output trans. pri. 3000/500; Sec. 500, 200, 50, 16, 8, 5, 3, 1.5 ohm	5.50
UTC PA4L6 output trans. 33000/3800 Sec. Same as PA15	15.00
UTC LVM10 15 Watt varimatch line autoformer	4.50
UTC LVM11 30 Watt varimatch line autoformer	7.00
UTC LVM2 40 Watt line to univ. voice coil 500 ohm to .2 to 75 ohm	7.50
UTC PVM3 Varimatch output 300 audio watt will match any tubes to 500, 200, 50, 15, 8, 3, 1.5 ohm	12.50
UTC R10 850V ct @ 200 ma 5V3A 6.3V CT 5A or 2.505A 6.3VCT3A or 2.5 12 amp	7.00
UTC R5 385-0385 180 ma 5V 4 amp 6.3 V CT 4 amp or 2.5 6 amp, 6.3 V CT 5 amp	6.50
UTC R1 325-0-325 40 ma 5V 2A. 6.3 VCT 2a. or 2.5V CT4A	3.05
UTC R2 350-0-350-70 ma 5V 3 amp 6.3 V CT 2.5A or 2.5 V CT 8A	3.70
UTC R13 425-0425 200 ma 5V3A 6.3 5 amp or 2.5 5 amp 6.3 3 amp or 2.5 12 amp	7.00

USED EQUIPMENT

Hallicrafters SX-28A with speaker	$210.00
Hallicrafters SX-42 with speaker and til base	245.00
National HRO5 with power supply, speaker ABCDEF coils, also equipped with a 100 kc calibrator and NBFM adaptor	225.00
National NXT-30 transmitter complete with tubes and coils for 10-20-40-80-160 meter bands, also has built in NTE exciter and N5A speech amplifier 30 watt	125.00
Meissner 150-B transmitter with full set of coils including buffer doubler and exciter for 10 meter	325.00
Hallicrafters HT-9 transmitter with tubes and coils for 10-20-40-80-160 meter bands	350.00
Bud VFO-21 variable frequency oscillator	42.00
Millen 90881 RF power amplifier with 40 meter coil less tubes	55.00

BARGAIN SPECIALS

GE oil condensers 23F11 2 mfd. 1000 V	$ 3.95
GE oil condensers 23F44 4 mfd. 3000 V	9.95
GE plate circuit relay 8000 ohm DPDT contacts close at 8MA	1.95
Clarostat 50 watt rheostats 250 ohm. Each	1.35
Lots of 10. Each	1.20
DeJur 50 watt 50 ohm rheostats. Each	1.25
Lots of 10. Each	.99
72 ohm line 1 KW rating polyethylene insulation. Per ft	.09
Per 100 ft	5.00
J38 hand keys. Each	.79
7" Pyrex Insulators. Each	1.40
National 697 AB power supply	15.00
National NFM 73 adaptor	16.95
National HRO-7 "G"	13.00

Hand Carbon

MICROPHONES

Hand carbon microphones with "press-to-talk" switch (similar to T17B) . . . made in England . . . . . $3.95 each

FORT ORANGE *Radio Distributing Co. INC.*

904 BROADWAY, ALBANY 4, N. Y., U. S. A.

AMATEUR HEADQUARTERS

Long Distance Phone: ALBANY 5-1594 . . . *Cable Address:* "UNCLE DAVE"

Linear Amplifier

(*Continued from page 43*)

ble. They make quite a racket and spurious signals are plentiful in earlier stages of misadjustment. Ordinary lamp bulbs make a fine dummy load so long as it is recognized that their impedance is not exactly the same as the antenna and that this impedance changes somewhat as the bulbs light up. These factors can be taken into account by making careful note of plate and grid currents after the transmitter has been adjusted and is operating with a linearity test signal at maximum linear output into the lamp load. Then, having reconnected the regular antenna, the same loading conditions for the final will be reproduced by adjusting its tuning and loading until the identical combination of plate and grid currents can be obtained. This process will require only a few moments of on-the-air operation.

Conclusion

When the final on-the-air checks are made, it will be convenient to make a few reference marks on the oscilloscope screen to indicate the peak height of the pattern. The 'scope will then serve as a permanent output monitor for all operations. For best results the sweep should be set for about 30 cycles, in which case the voice patterns will stand out clearly and can easily be kept just within the reference lines. Incidentally, the pattern is really fascinating to watch.

One final plea — don't be a "meter bender." Input power isn't everything. If you have to cut your input in half to avoid overload, the fellow at the other end will hardly notice the difference in level. At the same time, your neighbors, both those on the ham band and those next door trying to watch TV, will appreciate the difference right away.

The writer wishes to acknowledge with thanks the kind assistance and suggestions offered by C. B. Grady, W2SNQ, in making the photos for this article.

Technical Topics

(*Continued from page 53*)

full-scale reading on the bridge.

Resistance bridges take so little power that it is sometimes a problem to cut it down enough. However, with a tetrode final there is a simple solution — disconnect the screen voltage, ground the screen, detune the plate circuit, and reduce the excitation by detuning somewhere in the exciter chain if no other means is available. Then when the bridge is connected the full-scale initial setting can be approached by retuning the plate circuit toward resonance and, if necessary, increasing the excitation. This method usually gives ample control over the output without requiring a reduction in the amplifier plate voltage, since the plate input will be small with the screen at zero d.c. voltage. — *G. G.*

Sweepstakes Results

(Continued from page 58)

W1IKE[6]...14,438- 175-33-A-10
W1NJM[6]...14,960- 136-44-A- 8
W1BDI[6]...11,844- 126-47-B-11
W1RFJ....10,725- 130-33-A-27
W1AJO.....5772- 78-37-B-12
W1RPQ.....5772- 78-37-B- 7
W1HYF.....4928- 74-27-A- 8
W1TOM.....4400- 95-20-A-20
W1FWH[6]....3875- 63-25-A- 6
W1RFC.....3040- 64-19-A-23
W1RY.....1283- 27-19-A- 4
W1CEG[6].....990- 22-18-A- 2
W1RUR.....770- 22-14-A- 4
W1BUD[6].....495- 18-11-A—
W1RMU.....106- 12- 5-A- 4
W1AW (W1QIS, W2VMX)
55,705- 430-65- B-19
W1YU (W1TUR, W2BMF,
W4KFM) 32,784- 354-48-B—

Maine

W1NXX...95,165- 601-66-A-40
W1CV.....72,000- 460-64-A-40
W1GKJ....26,040- 217-48-A-19
WN1TVB....1958- 45-18-A-34
W1CRP.....1438- 25-23-A-10

Eastern Massachusetts

W1BOD....80,190- 448-66-A-40
W1AQE....79,706- 491-65-A-40
W1OMI[7]...76,923- 616-63-B-38
W1IAP.... 41,990- 324-65-B-24
W1ONP....37,549- 295-51-A-34
W1CMU...27,628- 258-43-A-36
W1PEG....19,240- 189-52-B—
W1EIQ.....16,095- 175-37-A-27
W1PLJ.....14,063- 125-45-A-33
W1FTH....12,765- 139-37-A-20
W1SAD....12,615- 174-29-A-23
W1LNT.....9488- 115-33-A-26
W1ONV.....8729- 102-43-B-38
W1SSZ.....7632- 89-37-A-29
W1RSR.....4500- 73-25-A-10
W1QDR.....3881- 67-23-A-12
W1QIB.....2613- 55-19-A 14
W1NXY.....2365- 43-22-A- 3
W1BDF.....1800- 40-18-A- 5
W1SXE.....1553- 35-18-A-10
W1PAW.....536- 17-13-A-10
W1SXV.....300- 12-10-A- 2
W1EMG.....208- 13- 8-B- 1

Western Massachusetts

W1JYH....58,960- 440-67-B-17
W1FKI....34,104- 294-58-B-26
W1SOZ....28,249- 267-53-B-31
W1ASU....10,664- 124-43-B-10
W1YK (W1's RAN, RCS)
33,150- 259-52-A—

New Hampshire

W1BFT....85,090- 509-67-A-29
W1NHJ....80,500- 460-70-A-35
W1CRW...73,950- 435-68-A-27
W1FZ.....10,140- 100-52-B-21
W1QGU.....7673- 99-31-A-12

Rhode Island

W1KNE....73,200- 489-60-A-30
W1CJH....72,553- 467-63-A-37
W1AWE...27,120- 226-60-B-36
W1PXI....16,425- 146-45-A-23
W1TFX....13,395- 148-38-A-28
W1TAT....11,378- 111-41-A—
W1TKX.....6175- 96-26-A-17
W1RFQ.....6110- 94-26-A-21

Vermont

W1RWP...34,800- 300-58-B-40
W1BVP....13,545- 129-42-A-14
W1FPS.....8024- 122-34-B-15
W1OAK.....750- 21-15-A- 4

NORTHWESTERN DIVISION

Alaska

KL7WC....15,272- 168-46-B-25
KL7NXI.....5000- 80-25-A-19
KL7MF.....3060- 72-17-A-15
KL7AIO.....2090- 44-19-A- 8
KI7IR.....60- 6- 5-B- 4

Idaho

W7FBD...108,990- 614-72-A-39
W7PCZ....35,319- 296-61-B-38

Montana

W7FLB....52,404- 402-66-B-36
W7BSU....51,750- 378-69-B-39
W7NZJ....25,163- 184-55-A-22
W7KGJ....16,988- 151-45-A-16
W7EWR.....8460- 95-36-A-11

Oregon

W7GEB....98,350- 566-70-A-37
W7YG[8]....89,700- 520-69-A-39
W7NLI....69,428- 513-68-B-33
W7ENW...62,142- 373-67-A-35
W7AXJ....51,360- 321-64-A-39
W7DIL....22,790- 215-53-B-25
W7JLU....20,655- 153-54-A-15
W7LNG....17,450- 175-50-B-18
W7NRJ.....4858- 67-29-A-11

Washington

W7GUV....76,500- 451-68-A-38
W7KWC...70,140- 501-70-B-34
W7AJS....64,101- 468-69-B-39
W7LEV....52,930- 319-67-A-31
W7OEB....34,200- 231-60-A-26
W7PQE....24,354- 226-54-B-17
W7AIB.....20,948- 148-57-A-21
W7EYQ....20,400- 173-48-A-23
W7EAU....11,174- 151-37-B—
W7CWN.....7656- 88-35-A-14
W7GVG.....5810- 85-28-A-17
W7LPN.....5088- 80-32-B-13
W7DXF.....4620- 66-28-A-12
W7ZU.....3673- 57-26-A-10
W7NM.....2470- 38-26-A- 7
W7ETO.....2400- 50-24-B-12
W7MTY.....2323- 51-23-B—
W7LCS/7.....900- 36-10-A- 6
W7BCS.....444- 19-12-B- 4
WN7PQP.....406- 38- 5-A-31
W7HDM.....40- 4- 4-A- 2

PACIFIC DIVISION

Hawaii

KH6IJ.....68,160- 480-71-B-40
KH6ADY.....90- 9- 4-A- 1

Nevada

W7KEV...147,858- 839-71-A-40
W7BKS....28,815- 226-51-A-39

Santa Clara Valley

W6EAE....85,626- 605-71-B-40
W6YHM...61,710- 375-66-A-29
W6NHA....32,860- 249-53-A-23
W6IUV....22,631- 178-51-A-25
W6CIS.....17,516- 151-58-B-10
W6ZZ.....13,197- 127-53-B-23
W6MMG....6765- 82-33-A- 9
W6WMM....5760- 72-40-B- 9
W6BTJ.....3996- 75-27-B-13
W6WUJ.....3672- 51-36-B- 1
W6UYG.....336- 14-12-B- 2

East Bay

W6MHB..100,260- 558-72-A-38
W6NGC....39,900- 280-57-A-25

(Continued on page 138)

W6IPH....24,738- 217-57-B-20
W6JOH....16,390- 149-44-A—
W6LJQ....14,688- 125-47-A-15
W6HHX....10,675- 122-35-A-21
W6KEK....10,032- 132-38-B- 7

San Francisco

W6BIP....50,680- 362-70-B-26
K6DL.....15,652- 151-52-B-26
W6HPM....14,299- 146-41-A-34
W6KGQ.....6475- 75-35-A-15
K6USN (K6DM, W6VWF) 26,904- 236-57-B-24

Sacramento Valley

W6OKK....53,788- 334-65-A-35
W6DBP.....3400- 50-34-B- 5

San Joaquin Valley

W6GUR....32,408- 223-58-A-27
W6QXF....19,063- 125-61-A-31
W6EGX....15,290- 139-44-A-23
W6JQB....13,904- 158-44-B-13
W6GRR....10,545- 115-38-A-10
W6NDP.....1103- 25-18-A-14
W6EFW (W6s ARI, BRP, BVM, BYH, EFV, HT, IDZ, WNX) 82,950- 477-70-A-35

ROANOKE DIVISION

North Carolina

W4AKC....90,701- 542-67-A-38
W4KE.....87,840- 610-72-B-39
W4LYV....42,411- 318-67-B-33
W4FDV....32,448- 312-52-B-24
W4BDU....20,783- 165-51-A-24
W4PRL....14,453- 141-41-A-15
W4EFV.....4275- 57-30-A- 7

South Carolina

W4OGG....48,735- 342-57-A-22
W4DCE....46,620- 334-70-B-33
W4FNS....25,550- 185-56-A-16

Virginia

W4KFC...172,175- 972-71-A-40
W9OLU/4.138,173- 802-69-A-36
W4SZY...127,500- 750-68-A-40
W4IA.....112,470- 654-69-A-40
W4KFT...107,100- 630-68-A-33
W4PNK....92,460- 539-69-A-39
W4FF.....85,965- 521-66-A-40
W4NH.....81,413- 501-65-A-36
W4KVM...80,603- 489-66-A-35
W4SEB....69,840- 441-64-A-36
W4ESK....53,400- 368-60-A-33
W4EMJ....48,980- 319-62-A-35
W4CC.....46,818- 307-61-A-17
W4HQN....44,100- 351-63-A—
W4ABY....40,433- 300-54-A-19
W4JUQ....36,636- 281-53-A-20
W4SR.....28,405- 247-46-A-24
W4JUJ....27,510- 199-56-A-21
W4VE.....25,920- 216-60-B—
W4LK.....20,815- 181-46-A-14
W4LIM[9]...18,600- 155-48-A-20
W4NQV.....770- 22-14-A- 1
W4SHU/4 (WN4TEK) 4421- 70-27-A-10

West Virginia

W8DIE....50,600- 395-64-B-37
W8UMR...28,710- 198-58-A-19
W8EUJ....14,250- 115-50-A-23
W8VCT (W8VMP) 28,073- 197-57-A-22

ROCKY MOUNTAIN DIVISION

Colorado

W0IC.....74,705- 446-67-A-26
W0ANW...37,725- 255-60-A-29
W0SGG....30,459- 210-59-A-23
W0EWH...22,373- 160-57-A-24
W0CDP.....7470- 83-36-A- 8
W0JPI/0.....6600- 81-33-A- 6
W0ACM.....2503- 39-26-A- 7
W0BWJ.....871- 24-17-A-17
W0FZI.....613- 20-15-A- 2

Utah

W7BSE.....1140- 24-19-A- 5

Wyoming

W7PKX....70,875- 405-70-A-40
W7HRM...69,010- 515-67-B-31
W7NDV...35,008- 275-64-B-34

SOUTHEASTERN DIVISION

Alabama

W5ONL/4....5775- 83-28-A-10

Eastern Florida

W4CKB...138,425- 802-70-A-37
W4LVV....78,623- 480-66-A-36
W4SAT....57,724- 367-63-A-39
W4AZK....27,580- 197-56-A-17
W4RTX....23,125- 185-50-A-16
W4TJU....20,151- 172-47-A-22
W4EOE....14,153- 159-37-A-17
W4OGI....10,830- 114-38-A-11
W4SAS.....2719- 45-25-A-20
W4QLC.....760- 19-16-A- 6
WN4TKD....368- 27- 7-A-14
W4TRA.....188- 13- 6-A-22
W4IYT (W4WTF) 3600- 50-36-A- 8

Western Florida

W4BGO...132,859- 752-71-A-40
W4NN.....61,945- 478-65-B-36

Georgia

W4BHG....16,445- 127-52-A-20
W4GGD....7920- 110-36-B-12

West Indies

KP4LN....62,806- 401-65-A—
CO8DL....11,900- 229-20-A-37
CO2BC.....1020- 25-17-A- 5
KP4PK.....816- 24-17-B- 2
KP4OE (W4JBC, KP4s OD, PN) 57,970- 480-62-B-39

Canal Zone

KZ5CW.....2280- 38-24-A- 2
KZ5RG.....855- 19-18-A—

SOUTHWESTERN DIVISION

Los Angeles

W6BJU[10]..191,250-1064-72-A-40
W6WIP....168,359- 952-71-A-33
W6EPZ...122,580- 681-72-A-36
W6GEB....73,500- 423-70-A-25
W6WOO...40,610- 267-62-A-24
W6LIT/6...30,940- 238-52-A-31
W6YLZ....29,000- 200-58-A-19
W6QOZ.....6670- 92-29-A-30
W6OHX.....6308- 90-28-A-12
W6KUC.....3868- 60-26-A-12
W6WEG.....1276- 29-22-B—
WN6NJU.....475- 41- 5-A-17
W6KNE.....463- 19-10-A- 5
WN6NWJ.....58- 12- 2-A—

Arizona

W7PGX...149,975- 873-70-A-40
W7RZQ....69,888- 426-66-A-34
W7MLI....38,003- 314-61-B-33
W4COB/7..28,652- 254-58-B-32
W7QEK....27,875- 225-50-A-23
W7JGZ....27,019- 198-55-A-23
W7ENA....25,025- 183-55-A-21
W7NSJ....13,300- 133-40-A-18

(Continued on page 134)

W7PKU	9240-	114-42-B-20	
W7SX	2019-	44-19-A- 7	
W7PMD	1219-	34-15-A-13	

San Diego

K6AM	39,498-	265-61-A-20	
W6BSD	36,224-	285-64-B—	
W6NEC	32,280-	274-60-B-29	
W6GTC	16,245-	174-38-A-40	
W6ZOM	4375-	70-25-A-15	

WEST GULF DIVISION

Northern Texas

W5RJP	74,705-	446-67-A-40	
W5PXT	14,532-	127-42-B-11	
W5OVU	6800-	101-34-B-18	
W5QJH	3465-	50-28-A-14	
W5SRQ	2074-	40-21-A-18	
W5IHM	1364-	31-22-B- 4	
W5STI	1063-	25-17-A- 9	
W5LIU	105-	8- 7-B- 1	
W5ONQ	50-	5- 5-B- 2	

Oklahoma

W5OWG	60,388-	487-62-A-38	
W5HFN	59,200-	370-64-A-40	
W5EGO	47,784-	362-66-B-40	
W5RB	45,045-	286-63-A-33	
K5NRJ [11]	22,754-	186-62-B-15	
W5DLM	19,825-	153-52-A-20	
W5KYY	18,144-	165-56-B-16	
W5DY	4548-	56-34-A-19	
W5RTM	3645-	54-27-A- 6	
W5SVS	2179-	44-21-A- 6	

Southern Texas

W5GEL	135,792-	947-72-B-39	
W5FNA	81,725-	467-70-A-31	
W5AQE	44,220-	335-66-B-22	
W5EMA	42,470-	274-62-A-23	
W5NPX	38,586-	335-59-B-27	
W5EUK	22,490-	174-52-A-30	
W5HOM/5	4329-	59-37-B-11	
W5RVI	2220-	38-24-A-20	
W5TBQ	75-	6- 5-A- 4	

New Mexico

W5FVO	92,138-	538-70-A-37	
W5PXN	76,935-	451-69-A-35	
W5CA	59,463-	336-71-A-25	
W5KWP	40,125-	270-60-A-29	
W5TOU	33,530-	250-56-A-29	
W4SRP/5	1220-	31-16-A—	

CANADA

Maritime

VE1TR	53,105-	418-52-A-40	
VE1VJ	37,940-	271-56-A-32	
VE1MV	28,160-	256-44-A-29	
VE1CU	27,675-	207-54-A-29	
VE1KM	25,636-	250-52-B-25	
VE1WB	25,013-	219-46-A-32	
VE1ACU	17,050-	159-44-A-40	
VE1TF	13,140-	212-36-B-34	
VE1GJ	8500-	100-34-A—	
VE1DB	6408-	89-36-B-12	
VE1CD	4318-	79-22-A-12	
VE1PV	3915-	68-29-A- 9	
VE1BK	2080-	52-20-B- 3	
VE1AAV	475-	19-10-A- 3	
VE1OM	248-	11- 9-A- 2	
VE1AM	13-	5- 1-A- 3	
VE1ZK (VE1CM)	24,150-	212-46-A-30	

Ontario

VE3AGX	78,041-	497-63-A-40	
VE3BBR	74,630-	442-68-A-38	
VE3AR	60,705-	431-57-A-28	
VE3ACB	54,605-	326-67-A-33	
VE3BL	46,131-	304-61-A-32	
VE3DBP	44,324-	301-59-A-24	
VE3ASD	37,233-	281-53-A-27	
VE3EAN	37,166-	281-53-A-31	
VE3BXF	33,150-	261-51-A-36	
VE3SR	31,808-	233-71-A-25	
VE3YV	23,856-	174-55-A-26	
VE3DKF	22,813-	183-50-A-23	
VE3AYE	18,604-	183-41-A-40	
VE3AUU	15,531-	183-35-A-29	
VE3EAU	13,728-	149-38-A-24	
VE3ARL	7828-	102-31-A-12	
VE3AHM	7395-	90-34-A-16	
VE3AMK	7276-	109-34-B-15	
VE3BLY	7215-	111-26-A-22	
VE3BJV	6330-	109-24-A-19	
VE3DME	6090-	89-28-A-29	
VE3GI	4992-	64-39-B- 7	
VE3BSW	4860-	82-24-A-12	
VE3API	3240-	54-30-B- 9	
VE3DN	2043-	43-19-A-33	
VE3AXS	1848-	39-24-B- 8	
VE3DNK	1770-	61-12-A-12	
VE3PB	1225-	35-14-A- 9	
VE3DER (VE2PP, VE3s AYG, AON, BIU, DGE, ONI, DDV, VE4GY)	31,537-	257-61-B—	

Quebec

VE2IT	41,374-	281-59-A-27	
VE2OL	29,879-	226-53-A-17	
VE2MU	12,416-	116-43-A-14	
VE2SD	9938-	136-30-A-22	
VE2GF	5300-	140-16-A-38	
VE2WZ	1472-	31-19-A-11	

Alberta

VE6EO	62,169-	457-69-B-39	
VE6BU	38,552-	317-61-B—	
VE6MA	34,965-	261-54-A-37	
VE6UB	15,006-	123-49-A—	
VE6DU	5310-	118-18-A- 5	

British Columbia

VE7JO	68,475-	415-66-A-38	
VE7EH	45,342-	344-66-B-27	
VE7YR	32,625-	218-60-A-34	
VE7AC	19,400-	194-50-B-22	
VE7HQ	9453-	100-38-A-18	
VE7ABQ	1088-	29-15-A- 5	
VE7GG (VE7s ALE, ALS, EP, HD)	27,300-	195-56-A-13	
VE7FB (VE7AFN)	1064-	30-19-B—	

Yukon

VE8BK	4200-	70-30-B-11	

Manitoba

VE4RW	35,496-	261-68-B-27	
VE4HS	6745-	71-38-A-12	
VE4NS	4750-	63-38-B- 9	
VE4GB	1800-	38-24-B-10	
VE4DU	360-	12-12-A- 3	

Saskatchewan

VE5QZ	100,013-	572-70-A-38	
VE5CO	46,080-	292-64-A-38	
VE5MS	7718-	74-42-A-12	

[1] W3OWR, opr.
[2] W4TAV, opr.
[3] W4FQQ, opr.
[4] W2DLP, opr.
[5] W1QJM, opr.
[6] Hq. staff, not eligible for award.
[7] W1RMF, opr.
[8] W8IIS, opr.
[9] W3RJS, opr.
[10] W6CUF, opr.
[11] W5PCL, opr.

(Continued on page 136)

'PHONE SCORES

ATLANTIC DIVISION

Eastern Pennsylvania

W3LTU...82,360-464-71-A-38
W3DHM..67,824-471-72-B-37
W3NGB...18,418-139-53-A-27
W3BET...16,500-154-55-B—
W3MQC.....952- 34-14-B- 3
W3EAN.....84- 7- 6-B- 1
W3KEW.....3- 1- 1-A- 1

Md.-Del.-D. C.

W3PWR..35,642-251-71-B-12
W3ZQ.....4158- 63-33-B-11

Western New York

W2ICE....15,892-137-58-B-21
W2GSS...11,250-100-45-A-16
W2PDB....9328- 91-41-A-34
W2PJM.....780- 26-15-B- 1
W2FZJ.....40- 5- 4-B—
W2FXA.....3- 1- 1-A- 1

Western Pennsylvania

W3LXE...11,050- 85-52-A-16

CENTRAL DIVISION

Illinois

W9NDA..20,633-131-63-A-18
W9DOR...11,750-100-47-A-34
W9IFA...11,000-100-44-A-15
W9YMZ....2106- 39-27-B-19
W9LMC.....40- 4- 4-A- 5

Indiana

W9RZS...12,814-101-51-A-25
W9MUR....8385- 98-43-B-11
W9EGQ....8151-105-39-B- 5
W9BKJ.....7566-100-39-B—

Wisconsin

W9ZTO...41,925-258-65-A-28
W9JBF...18,525-132-57-A-18
W9GIL.....9180- 85-54-B—
W9LXY....8750- 87-40-A-13
W9QJB.....5382- 59-39-B- 9
W9FTY....4725- 54-35-A-12
W9FZC.....2550- 43-30-B—
W9VWX.....810- 27-12-A-10
W9VHA.....660- 22-12-A- 6
W9ONY.....50- 5- 4-A- 2

DAKOTA DIVISION

North Dakota

WØBPO.....383- 19- 9-A- 7

South Dakota

WØPRZ...59,400-415-72-B-29
WØIWE...10,860- 91-48-A-14

Minnesota

WØVIP...23,700-158-60-A-19
W5RPP/Ø...4043- 49-33-A- 7
WØSCZ.....112- 8- 7-B- 3

DELTA DIVISION

Louisiana

W5KC....44,020-310-71-B-39
W5BZR.....5226- 67-39-B—

Mississippi

W5IHP.....6970- 85-41-B- 8
W5WZ..... 884- 26-17-B- 4

Tennessee

W4PKM..13,524-138-49-B-12

GREAT LAKES DIVISION

Kentucky

W4KZF...35,400-240-59-A-31
W4CDO....8366- 89-47-B-19

Michigan

W8REU...65,592-460-72-B-35
W8VQD...51,984-361-72-B-40
W8BGY....5460- 70-39-B-10
W8FGB....3380- 53-26-A- 9
W8ZPU.....1093- 23-19-A-12
W8VVD.....416- 16-13-B- 1
W8FLM.....160- 10- 8-B- 1

Ohio

W8UKS...80,730-451-72-A-37
W8AJW...54,075-308-70-A-27
W8LIO...35,784-251-72-B-25
W8LAX...35,604-260-69-B-39
W8FTX...27,040-169-64-A-20
W8OAC...12,054-147-41-B-21
W8JIN....10,504-101-52-B- 5
W8BFH....7898- 81-39-A-23
W8VRK....5200- 65-32-A-18
W8AGA....3335- 46-29-A-16
W8FNX....3300- 55-30-B- 6
W8NFD....2150- 43-25-B- 7
W8BNC....2040- 34-24-A- 4
W8ET.....1073- 39-11-A- 5
W8FPC.....1020- 27-16-A-12
W8RVM.....728- 26-14-B—
W8PNJ.....680- 20-17-B—
W8DNJ.....546- 21-13-B- 3
W8CGG.....360- 16- 9-A- 7
W8YPE.....352- 16-11-B- 3
W8BUS.....220- 11-10-B—
W8NSS.....150- 10- 6-A- 1
W8BSR.....24- 4- 3-B- 2
W8URD.....4- 2- 1-B- 1

HUDSON DIVISION

Eastern New York

W2SZ.....16,121-174-47-B-24
W2ILI.....8190-117-35-B-10
W2WIK.....105- 7- 6-A- 1

N.Y.C.-L.I.

W2MNR..73,015-440-68-A-36
W2SKE...62,654-454-69-B-40
W8NSD/2.22,412-216-52-B-19
W2MQB..10,291-126-41-B-16
W2JZX.....4526- 73-31-B- 9
W2SKK....3537- 66-27-B- 3
W2YBT....600- 24-10-A- 5
W2NNH.....411- 25- 7-A-11
W2VL.....288- 16- 9-B- 2
W2KZE.....48- 6- 4-B- 4
W2DXN.....40- 4- 4-A- 1
W2SMQ.....28- 7- 2-B—
W2ELT.....8- 3- 1-A- 1

Northern New Jersey

W2JKH...34,540-223-62-A-37
W2JJI....18,709-179-53-B-35
W2ATE....9849-101-49-B-11
W2DME....1900- 40-19-A- 3
W2LMB.....960- 30-16-B- 3
W2BAT.....672- 21-15-B- 1
K2BX.....144- 9- 8-B- 1

MIDWEST DIVISION

Iowa

WØSQN.....570- 19-12-A- 3

Kansas

WØQQT.....4416- 69-32-B- 8

(Continued on page 138)

Missouri

WØBCF/Ø..28,764-214-68-B-28
WØMGX..25,984-203-64-B-34
WØWCM...1071- 32-17-B- 4

Nebraska

WØMGV..30,940-230-68-B-16

NEW ENGLAND DIVISION

Connecticut

W1ATE...82,080-572-72-B-33
W1ICP[1].....588- 21-14-B- 3
W1LVQ[1]....240- 12-10-B- 1
W1NJM[1].....60- 6- 5-B- 1

Maine

W1GKJ...12,023-117-42-A-17

Eastern Massachusetts

W1JEL...36,698-316-59-B-39
W1BDF....4960- 64-31-A-17
W1JNX.....3120- 52-30-B-12
W1SBD.....1585- 41-19-B- 6
W1ORZ.....980- 28-14-A- 4
W1QON.....132- 11- 6-B- 3
W1OLP.....70- 7- 5-B- 2
W1MGP.....3- 1- 1-A- 1

Western Massachusetts

W1JR.....6983- 70-42-A- 7
W1CJK.....2525- 51-25-B- 9

New Hampshire

W1BFT...36,720-230-64-A-22
W1HRI...23,450-190-62-A—
W1JNC....9052-146-31-B-28

Rhode Island

W1BFB...31,616-247-64-B—
W1TRX....6600-100-33-B-12
W1JMT....4464- 72-31-B- 9

Vermont

W1RNA...16,674-199-42-B-30
W1AXN....1638- 39-21-B- 9

NORTHWESTERN DIVISION

Alaska

KL7NXI.....293- 13- 9-A- 4

Idaho

W7DMZ..21,600-180-60-B-26

Oregon

W7MLJ...19,200-160-60-B-31

Washington

W7EYD...46,500-302-62-A-30
W7HAD..39,525-255-62-A-33
W7IYK...20,405-193-53-B-38
W7QGN...17,690-153-58-B-21
W7EKA...11,308-131-44-B-10
W7NRB....6950- 86-33-A-13
W7AQA.....1260- 30-21-B—

PACIFIC DIVISION

Hawaii

KH6AEX.30,480-256-60-B-21
KH6IJ....20,608-224-46-B-11
KH6WU..20,460-191-55-B-24

Nevada

W7JUO...27,456-215-64-B-24

Santa Clara Valley

W6WMM...3072- 48-32-B- 6

San Francisco

W6YGQ....4865- 70-28-A-27
W6ATO.....1541- 34-23-B- 2

Sacramento Valley

W6VBI...15,451-133-47-A-31
W6TXL....3400- 50-34-B- 5
W6BIL..... 840- 21-20-B- 4

San Joaquin Valley

W6QEU..116,208-807-72-B-35
W6WJF.....646- 19-17-B- 6

ROANOKE DIVISION

North Carolina

W4GXB....3813- 62-31-B- 9

Virginia

W4FV....27,132-238-57-B-35
W4NTZ..20,769-179-58-B-40
W4KMS..13,818-141-49-B-23
W4LIM.....8774-113-41-B-21
W4ESK.....1350- 27-25-B- 1
W4KVM.....510- 17-12-A- 1

West Virginia

W8QHG...20,295-173-59-B-18
W8UYR...18,850-163-58-B-19
W8FGL.....9635-103-47-B-19

ROCKY MOUNTAIN DIVISION

Colorado

WØYMP....2220- 56-16-A-14

Utah

W7SSY...20,520-147-57-A-23

Wyoming

W7GBY...15,953-151-53-B-17

SOUTHEASTERN DIVISION

Alabama

W4HA.....1140- 30-19-B- 2

Eastern Florida

W4BRB...63,700-367-70-A-39
W4PJU...62,445-362-69-A-37
W4AYX...10,320-120-43-B-24

Western Florida

W4AGB...22,572-212-54-B-25

Georgia

W4NLY/4 12,780-110-48-A-21
W4SCU (WN4TVF)
349- 16- 9-A- 5

SOUTHWESTERN DIVISION

Los Angeles

W6KJK...38,760-287-68-B-39
W6UQQ...17,280-128-54-A-17
W6BUK....3472- 63-28-B-11
WN6NJU.....43- 10- 2-A- 3

Arizona

W7PUM..98,153-569-69-A-38
W7PEF.....2250- 46-20-A- 8
W7PKU.....384- 16-12-B- 3

San Diego

W6CHV...58,123-347-67-A-39
W6WSS.....7995- 85-39-A-19

(Continued on page 140)

WEST GULF DIVISION

Northern Texas

W5RIY...48,100-300-65-A-36
W5VIM...39,325-242-65-A-35
W5PXT....1364- 31-22-B- 3

Oklahoma

W5FAB...27,714-225-62-B-23
W5IWL.....9800-100-40-A-21
W5MCF....1950- 33-24-A- 6
W5SVS.....216- 15- 8-B- 4

Southern Texas

W5HQR...25,600-200-64-B-23
W5JWM....7030- 76-37-A-12
W5JPC....4373- 53-33-A-10

New Mexico

W5MYI...45,402-332-69-B-39
W5SBU...10,695- 96-46-A-10
W5MYM...3781- 61-25-A-14

CANADA

Maritime

VE1OM.....683- 22-14-A- 4

Quebec

VE2AHE..23,220-215-54-B-37
VE2ID....17,732-172-52-B-33
VE2IZ....12,084-115-53-B-40

Alberta

VE6TK...11,220-110-51-B-17

British Columbia

VE7VT...11,010- 92-48-A-29

Manitoba

VE4JK....3232- 51-32-B- 9

[1]Hq. staff, not eligible for award.

YL News and Views

(Continued from page 59)

ritory for almost seven years. Mary writes that the bands this year have been poor from her vantage point, and she *hopes for better conditions soon, particularly on 40 c.w.* . . . The Dallas *Morning News* reported that W5SPV and W5NRE were to be married on the "Bride and Groom" program in New York. . . . W6EHA and her OM, W6EHB, are operating portable-five from their house trailer (complete with three-element 10-meter beam) in Las Cruces, New Mexico. . . . On a recent trip to California, VE3DTW enjoyed meeting many of the W6 YLs. . . . W8GEN has over 125 DX pen pals (all amateurs). YLs interested in having a DX correspondent may write Carol for names and addresses. . . . On March 7th at Hempstead, Long Island, the L. I. Unit of the YLRL had its first installation of officers and dinner party. W1QON installed W2JZX, president, WN2KDP, vice-president, W2KEB, secretary-treasurer, and WN2BXT and WN2IZI as board members. . . . *W9 YLs:* Don't forget the Chicago YL Gathering, May 23rd-25th. See Hamfest Calendar, page 10, April *QST*.

YLs Set Traffic Records

YLs can well be proud of their traffic record for 1951. In three call areas the BPL leader is a YL, and W3CUL led all other individual stations in the amount of traffic handled for the year and for the entire postwar period! A detailed account of outstanding YL traffic activity may be found under "Traffic Topics" in this issue.

Strays

W6HQF traded some TVI for a little local QRM and is happy with the swap. Neighbor Frank Parker dropped in at Ray's Sacramento shack to register a TVI complaint, accepted an invitation to listen on ten meters and left with a *License Manual* and *Handbook*. He recently took his FCC exam!

V.H.F. Sweepstakes

(Continued from page 60)

W2VBH..... 36- 18-1-B
W2TEX..... 32- 16-1-B
W2RHQ..... 30- 15-1-A-B
W2BCL..... 26- 13-1-B
W2VMS..... 16- 8-1-B

W. Pennsylvania

W3QKI..... 700- 70-5-B
W3KWL..... 288- 36-4-B
W3LNA..... 280- 35-4-B
W3KXI..... 126- 21-3-B
W3KWH[2]..... 42- 14-3-A-B

CENTRAL DIVISION

Illinois

W9PK..... 530- 53-5-B
W9DRN..... 408- 51-4-B
W9JGA..... 258- 43-3-B
W9KCW..... 156- 26-3-B
WN9PUW.... 80- 20-2-B
W9ADO..... 56- 14-2-B
WN9PYV..... 34- 17-1-B
W9LWQ..... 6- 3-1-B

Indiana

W9HKQ..... 360- 36-5-B
W9NSF..... 232- 29-4-A-B
W9GLW..... 80- 10-4-B
WN9OVL..... 76- 19-2-B
W9JUJ..... 44- 11-2-B
W9BUM..... 40- 10-2-B

Wisconsin

W9BTI..... 216- 27-4-B
W9AFT..... 200- 25-4-B
W9UJM..... 168- 21-4-B
W9TQ..... 104- 13-4-B
W9FAN..... 54- 10-3-B
W9NVK..... 40- 10-2-B
W9DSP..... 24- 6-2-B
W9LEE..... 24- 6-2-B

GREAT LAKES DIVISION

Kentucky

W4JDN..... 138- 23-3-B
W4KZF..... 52- 13-2-B
W4SMU..... 40- 10-2-B

Michigan

W8NNF..... 612- 51-6-B
W8RMH..... 520- 52-5-B
W8DX..... 440- 44-5-B
W8RWW..... 340- 34-5-B
W8DIV..... 216- 27-4-B
W8GYU..... 192- 24-4-B
W8BGY..... 176- 22-4-B
W8DDO..... 90- 15-3-B
W8MRK..... 40- 10-2-B
W8KKB..... 24- 6-2-B

Ohio

W8VOZ.....1000- 62-8-A-B
W8LPD..... 660- 63-5-A-B
W8HUX..... 435- 44-5-B
W9UOF/8.... 416- 52-4-B
WN8HOH.... 294- 49-3-B
W8BVI..... 285- 48-3-B
W8BMO..... 258- 43-3-B
W8WRN..... 240- 30-4-B
W8PTF..... 222- 37-3-B
W8FKC..... 189- 32-3-B-C
WN8HQK.... 174- 29-3-B
W8ZCV..... 124- 31-2-B
W8MGA..... 114- 19-3-B
W8EHW..... 110- 28-2-B
W8ZPH..... 108- 18-3-B
W8QBJ..... 96- 24-2-B
W8BOI..... 48- 12-2-B
W8MGP..... 48- 12-2-B
W8MFV..... 36- 9-2-B
WN8INQ..... 24- 11-1-B
W8LOF..... 12- 6-1-B

HUDSON DIVISION

E. New York

W2BVU..... 714- 51-7-B
W2PCQ..... 588- 42-7-B
W2ZQA..... 312- 39-4-B
W2UDC..... 118- 28-2-B
W2GPH..... 100- 25-2-B

N.Y.C.-L.I.

W2PRB.....2034-170-6-B
W2CET.....1344- 84-8-B
W2GMT.....1212-101-6-B
W2GLU..... 870- 87-5-B
W2BNX/2.... 850- 85-5-B
W2DLO..... 846- 72-6-B
W2QAN..... 750- 75-5-B
WN2AOC..... 650- 65-5-B
W2QHZ..... 476- 34-7-B
W2AOD..... 370- 37-5-B
W2KU..... 370- 37-5-B
WN5KFV..... 328- 41-4-B
W2MHE..... 320- 40-4-B
W2ODB..... 296- 37-4-B
WN2KAC..... 290- 29-5-B
W2KMH..... 256- 32-4-B
W2IFM..... 234- 39-3-B
W2IN..... 208- 26-4-B
W2LXL..... 208- 26-4-B
WN2IVN..... 126- 21-3-B
W2YSL..... 114- 19-3-B
WN2BNS..... 96- 16-3-B
W2JCI..... 84- 14-3-B
W2DID..... 78- 13-3-B
W2LGK..... 32- 16-2-B

N. New Jersey

W2NLY.....3780-211-9-B
W2MM.....1264- 79-8-B
W2RGV.....1068- 89-6-B
W2DFV..... 954- 80-6-B
W2QQF..... 852- 71-6-B
W2PEV..... 840- 60-7-B
W2YKX..... 670- 67-5-B
WN2FBZ[3].... 528- 68-4-B
WN2AZP..... 504- 63-4-B
W2RQI..... 480- 60-4-B
W2IDZ..... 432- 27-8-A-B
WN2JZV..... 432- 54-4-B
W2CIP..... 376- 47-4-B
W2DZA..... 310- 30-5-A-B
WN2LHS[3].... 198- 33-3-B
W2HCD..... 156- 26-3-B
W2GDN..... 66- 11-3-B
WN2HWC.... 44- 11-2-B
W2MPP..... 36- 9-2-B
W2AJD..... 28- 7-2-B

(Continued on page 144)

NEW ENGLAND DIVISION

Connecticut

W1HDQ[3] 2112-97-11-A-B-C-D
W1OS..... 942- 79-6-B
W1TIA..... 720- 45-8-A-B
W1HDF 656-33-8-A-B-C-D
W1SPX..... 528- 36-6-A-B
W1OLG..... 330- 33-5-B
W1QAS..... 250- 25-5-B
W1PHR..... 228- 29-4-B
W1BDI[2]..... 156- 26-8-A-B
W1KHM..... 150- 25-3-A-B
W1AW[3]..... 116- 29-2-A-B
W1RWS[3]..... 108- 18-3-A
W1RMU..... 80- 20-2-B
W1HAX..... 76- 19-2-B
W1HXD..... 48- 12-2-A
W1CEG[3]..... 36- 6-3-A
W1TXM..... 24- 6-2-B
WN1USF..... 22- 12-2-B
W1DJV[3]..... 20- 5-2-A
W1LIH..... 16- 4-2-A

E. Massachusetts

W1CTW 1080-108-5-A-B-C
W1FBJ..... 940- 94-5-B
W1BJN..... 930- 93-5-B
W1MMY..... 860- 86-5-A-B
W1AQE..... 680- 85-4-B
W1PLX..... 605- 61-5-B
W1SUR..... 544- 68-4-B
W1MCR..... 480- 60-4-B
W1TPZ..... 408- 68-3-B
W1ODQ..... 372- 62-3-B
WN1UIQ..... 372- 62-3-B
W1RUU..... 300- 50-3-B
W1CPB..... 276- 46-3-B
W1TQF..... 276- 46-3-B
W1RPM..... 204- 34-3-B
W1IZY..... 200- 25-4-B
W1LAO..... 198- 33-3-B
W1LKM..... 174- 29-3-B
WN1UAL..... 144- 24-3-B
W1TTY..... 140- 35-2-B
W1CTR..... 112- 28-2-B
W1HPV..... 108- 27-2-B
W1QFO..... 66- 33-1-B
W1FGT..... 52- 13-2-B
W1PLR..... 52- 13-2-B
W1ALP..... 44- 22-1-B
W1SQE..... 40- 10-2-B
W1LSR..... 30- 15-1-B
W3OTC/1..... 12- 6-1-A

W. Massachusetts

W1RFU.....1080- 60-9-A-B
W1CCH..... 174- 29-3-B
W1OBQ..... 150- 25-3-B
W1TSF..... 100- 25-2-B
WN1UBD..... 96- 16-3-B
W1RRX..... 22- 11-1-B
W1PHU..... 16- 8-1-B

New Hampshire

W1FZ..... 48- 12-2-A-B

Rhode Island

W1KCS.....1162- 81-7-A-B
W1SGA..... 790- 80-5-A-B
WN1TTG..... 282- 47-3-B
W1RXJ..... 132- 22-3-B
W1AOP..... 80- 20-2-B
W1INM..... 10- 5-1-B
W1MIJ..... 10- 5-1-B
W1AEI..... 8- 4-1-B

Vermont

W1MEP..... 60- 12-3-B

NORTHWESTERN DIVISION

Washington

W7EVO..... 50- 23-1-A-B
W7FIM..... 20- 10-1-A-B
W7BYK..... 12- 6-1-A-B

PACIFIC DIVISION

Santa Clara Valley

W6LOZ/6....1060-106-5-B
W6TFZ.....1030-103-5-B
W6ZBS..... 720- 72-5-A-B
W6BHR..... 264- 44-3-A-B
W6INN..... 156- 26-3-B
WN6PBC..... 144- 24-3-B
W6YHL..... 138- 24-3-B
W6UYG..... 132- 22-3-B
W6GCG..... 34- 34-5-B

East Bay

W6AJF 790-79-5-A-B-D
W6NJJ[1]..... 360- 60-3-B

San Francisco

W6MHF..... 504- 63-4-A-B
W6HMA[1]..... 147- 25-3-B

San Joaquin Valley

W6GQZ..... 320- 32-5-B

ROANOKE DIVISION

North Carolina

W4CVQ..... 36- 6-3-B

Virginia

W4HBD..... 348- 29-6-B

West Virginia

W3PZK/8[1].... 128- 16-4-B

SOUTHWESTERN DIVISION

Los Angeles

W6HZ.....342-57-3-A-B-D
WN6NJU..... 22- 11-1-B

WEST GULF DIVISION

Northern Texas

W5IRP..... 36- 6-5-B

Southern Texas

W5FSC..... 204- 34-3-A-B
W5FEK..... 192- 32-3-B
W5NHB..... 104- 26-2-B
W5GOZ..... 30- 15-1-B
W5LLT..... 18- 9-1-B

CANADA

Ontario

VE3AIB..... 728- 91-4-A-B
VE3DIR..... 712- 90-4-B
VE3AQE..... 472- 59-4-B
VE3ANY..... 420- 70-3-A-B
VE3UT..... 240- 40-3-A-B
VE3BPB..... 170- 17-5-B
VE3DER..... 150- 25-3-A-B
VE3DHL..... 148- 37-2-A
VE3BHQ..... 100- 25-2-B
VE3DAV..... 51- 26-1-A
VE3AKO..... 40- 20-1-A
VE3DAT..... 38- 19-1-A
VE3OJ..... 12- 6-1-A-B
VE3BBW..... 10- 5-1-A-B

[1] Multioperator station, not eligible for award.
[2] Steel City Amateur Radio Club station, W3RXT operator.
[3] Headquarters staff, not eligible for award.

Correspondence

(*Continued from page 71*)

ARRL in keeping ham TVI out of our future receivers." Bah! I have a rig that will TVI any receiver!

Note the QTH. Best darn cure for TVI yet. I haven't worked anyone since I was W7OCH in Portland, because I was putting up my rhombic antenna here on the Island and ran out of space, fell into the water and drowned.

— *John E. Fick, KL7AJX*

EXTEND A HELPING HAND

Hennessey, Oklahoma

Editor, *QST:*

I was called on a few days ago to investigate some TV interference and after checking the neighborhood, I found an xmitter built on a breadboard without any shielding, by-pass or other precautions. This rig was in a position whereby any small child or adult could come in contact with high voltages.

Now those newcomers are the finest fellows in this country and they need help. (We were all in that same class years ago.) I suggest that it is up to the ARRL and us old-timers to work more with those fellows and help them over the hump. Some of them are discouraged because they do not understand their rigs and how to operate them. This can be corrected if an older, more advanced operator will pay them a visit and do a little coaching.

May I suggest that every Novice who intends to try for the higher ticket read *QST* and work with the ARRL, tune in on the code lessons, and make use of other things that ARRL has to offer.

— *W. P. Waggoner, W5UCT*

NOVICES ON ELEVEN?

4622 N. Kelso
Chicago, Illinois

Editor, *QST:*

Was just wondering if any Novices are using 11 meters at any time. So far I haven't heard one sig.

We're planning to operate on a frequency of 27.1 Mc. soon and to start the ball rolling, we will listen for some sign of life every night from about 7 to 8 CST. Also, whenever we see that 10 meters is hot, we will be operating on 11 simultaneously.

— *John Elaherty, WN9QVT*

24-HOUR QRM

528 South Wood St.
Fremont, Ohio

Editor, *QST:*

Needless to say, I, like 95% of the ham fraternity, think that the Novice ticket is the greatest boost ham radio has ever had. It is a much needed shot-in-the-arm that is not likely to peter out. But something that anyone who never listens to 80 c.w. or works the band doesn't know is that the Novice has actually brought this band back to life. They tell me that before the war it used to be a good band for a QSO at any time, but except for the period immediately following the opening up a few years ago 80 has been deader than yesterday's ginger ale during daylight except for an occasional spurt of activity on a Sunday. Not so any more — the Novice has taken over — AND HOW! Good ol' 80 now sounds like 40 on a Saturday or Sunday and there is at least some activity on the band every day in the daytime. Just hearing those Novices on there has caused a lot of the old-timers to get in on it too. Due to the Novice 80 is again justifying its existence during the daylight hours for the c.w. man. More power to the Novice. 73.

— *Ray Grob, jr., W8YFJ*

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) **A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him, takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSL Cards? SWLS? Large variety. Samples, 25¢. Sakkers QSLS, W8DED, Holland, Michigan.

MOTOROLA used communication equipment bought and sold, W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

QSL's by Glenn Print (W3FSW, Griffeth). On vacation.

SUBSCRIPTIONS. Radio publications a specialty. Latest Call Books, $2.50. Earl Mead, Huntley, Montana. W7LCM.

QSL's-SWL's Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

5-Element 2-meter beams. Riverside Tool Co., Box 87, Riverside, Ill.

WANTED: Your surplus radio receivers, transmitters, ARC-1, ARC-3, ART-13. We buy anything. What have you? Tom Allen, 159 Carlton Ave., Brooklyn 17, N. Y.

QSLS! Taprint, Little Rock, Mississippi.

QSLS, SWLS. America's Finest! Samples, 10¢. C. Fritz, 1213 Briargate, Joliet, Ill.

WANTED: TG-29 telegraph repeater. I-193-A relay test set. Also wanted: Teletype 1/40th HP synchronous motor. W6ITH, Moraga, Calif.

ELIMINATE TVI. Shield your rig. 26 gauge heavy plated bright steel. Perforated 75 .453 holes per in. Easily cut forms and soldered. Sheets 29" x 23", 2 for $3.50; five for $6.50 postpaid. Sample dime in stamps. Republic Television, Inc., Dumont, N. J.

DON'T fail! Check yourself with a time-tested Surecheck Test similar to FCC tests. Novice, $1.50; Conditional and General, $1.75; Advanced, $2.00. Amateur Radio Supply, 1013 Seventh Ave., Worthington, Minnesota.

QSLS: Fluorescent QSLs radiant and glowing with quality-control. QSLs Kromekote three colors and up. Rainbow maps, DX QSLS. Samples rushed, 10¢. Uncle Fred, Box 86, Lynn, Pa.

QSL and SWL cards. Samples. W1SQF, Minner, Candia, N. H.

PHONE patch schematics, practical discussion, $1.00. Nichols, W1MRK.

WANTED: Top prices paid Navy selsyns 1F, 1G, 1CT, 5F, 5G, 5CT and BC-348; BC-221, AN/ART-13, AN/ARC-1, AN/ARC-3, RTA-1B. Lectronic Research, 719 Arch St., Philadelphia.

FOR Sale: RG-8U Coax in 29 ft. lengths with fittings, $2.00 plus postage. C. F. Moretti, W2AIH.

ANNOUNCING ARRL New England Division Convention and Hamfest, sponsored by Hampden County Radio Club, at Eastern States Exposition Grounds, West Springfield, Mass., Saturday, June 14, 1952. Registration and banquet, $5.00. Registration only, $2.00. Send checks to Albert Jackson, W1OBQ, Treasurer, P.O. Box 221, Springfield, Mass.

QSL's. Brownie, W3CJI. (Richard Brown again in business) 433 Chestnut St., Emmaus, Penna.

SX-62 WANTED. Must be in perfect condition. Will sell S-47 less than one year old. Guaranteed perfect condition. E. E. George, 5108 Stonewall Road, Little Rock, Arkansas.

WANTED: Motorola mobile equipment. Box 382, Newark, N. J.

WANTED: Harvey-Wells, Viking, 310B exciter, NC-57, NC-240D, Leica G, will sell A1 SX 28A, spkr, $175.00; Navy PCA 300 Panadaptor good condx, $75; VHF 152A, unused, $65; command xmitter 2.1 to 3 Mc. $17.50; BC221 and pwr., $50; PE-103, original crate, $25; 522 and pwr supply, $39.50; BC654, PE103, PE104 and cable, $65; 4–65A, $11.00; 810, $6.00; 304TL, $5; 829B, $8; 60 amp 5 V Fil. xformers, $10; new Zeiss 2¼ x 2¼ f. 4/5, case, $33; new $66.00 Argoflex, $40. Argus A2, $20.00. Sell, Swap, buy. W5OWG, 125 Main, Ardmore, Okla.

QSL CARDS? Modernistic? Cartoons? Rainbow-map? State-map? QSL samples 25¢. Sakkers, W8DED, Ham Print Shop, 53 East 7th St., Holland, Michigan.

WANTED: Aircraft radio technicians. Experienced installation and maintenance all types aircraft electronic, communication and navigation equipment. Write, stating education, experience and starting salary desired. Atlantic Aviation Service, Box 1709, Wilmington, Del.

QSLS: 100, $1.95 up. Samples, 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

LATEST Call Books, $2.50. Earl Mead, W7LCM, Huntley, Mont.

CRYSTALS: Low drift, mounted units. Exact frequency, $1.50 each, ± 5 kilocycles, $1.00. Postage extra. Breon Laboratories, Williamsport, Penna.

SELL: ARR7 Hallicrafters surplus receiver, used 1-year. Make offer. Bob Garnett, Monte Vista, Colorado.

WANTED: Motorola mobile transmitter. TVI proof home rig. Box 382, Newark 1, N. J.

ATTRACTIVE QSL cards. Atlantic Press, P.O. Box 346, Clifton, N. J.

WOULD like help from local operator on code and theory. R. Cro, 20 Orchard, Wellesley, Mass.

SELLING BC454-B, BC455-B, 80 and 40 meter receivers. Completely converted. Each has power supply. Like new. $20 each. Jack Wittmack, WN6EKG, 266 S. Lime St., Orange, Calif.

SELL: Drake TVI filter TV-52-40LP. Reasonable. WØFQQ, 2224 E. Willamette, Colorado Springs, Colorado.

BEST Offer, any or all: Super Pro 400X, Signal key, QST, Nov. 1929 through December 1951. Handbooks, 1929, 1932, 1940. WØVOV, L. Ingalls, Tracy, Minn.

SACRIFICE Collins 32RA transmitter, 120 watts phone, $90 or best offer. QST's 1926–1948 inclusive. Best offer. Parts, request list. Lt. Col. Felstead, W6CU, Camp San Luis Obispo, Calif.

FOR Sale: Stancor ST-202A, 125 watts; HT-17, S-40-B, Triplett 3413, crystal controlled ARC-5 as per QST Nov. issue. Also Novice xtals. Wan: VHF-152A, Millen 90811. Jackman, W1UAD, 749 Wood Ave., Bridgeport, Conn.

WANTED: Dynamotors DY-17, DY-12, PE-103A, transmitters ART-13, ATC, TCS, BC-610, Collins, receivers BC-348, BC-312, BC-342, Collins, National, Hand generators, any type; Vibrator power supplies PE-237, PE-104A, Rectifiers, RA-34, RA-62, RA-20. Technical manuals, tubes, war surplus test equipment. Arrow Appliance, 25 Harrison Ct., Lynn, Mass.

TEN Meter Sylvan crystal-controlled converter, complete with A.C. power supply: $19.50. W5ALA, 4531 Fairway, Moore, Dallas 19, Texas. NC-173 receiver, excellent condx, $150; May QST Novice transmitter, $15. Douglas Phelps, Sidney, N. Y.

FOR Sale: One hundred feet Andrew type S450 air-filled fifty ohm copper coax, complete with dry air pump; one end terminal with pressure gauge and inlet valve other end terminal with pressure valve, also two adapters for RG-8U cable. All brand new, $182.50. F.o.b. Erie. R. T. Schlaudecker, W3NOJ, 1824 West 32nd St., Erie, Penna.

THORd. transformer 1750 and 1500 volts DC, 300 mils. Never used. $23. W8ARO.

WILL swap: Speedgraphic, Contax, Leica, extra lenses, other photo equipment, excellent condx, for 32V2 and ham gear. B. Clouse, 1970 Riverside Dr., Columbus 12, Ohio.

SX-32 recvr with National speaker, similar to SX-28, asking $90. Kenyon multimatch, 40W modulation xformer, $5. ARC-5, 3-6MC, 7–9MC recvrs, $10 each, 190–550KC, $15. Mallory Vibrapack 6V DC to 300V, 100 Ma. $10.00. Prices F.o.b. Alan Saeger, W2FGK, 26 Alpine Lane, Hicksville, L. I., N. Y. HI 3–5663.

10-METER rig, plug-in coils, VFO, output 40 meters, NBFM, 250, 500 or 900 watts. Mounted in blonde cabinet, final 813's, and buyer must call for it. $125.00. Jensen, 1946 Thurston Ave., Racine, Wisconsin.

HALLICRAFTERS S-36 wanted. W2ADD.

COLLINS 32V-2 for sale. Never used. WØOUC, 8311 Webster St., Omaha, Nebraska.

WANTED: SX42 and R42 spkr for $175. W. H. Oldendorf, Lt (jg), MC USNR, Naval Hospital, Newport, R. I.

HAMFEST time: come to Camp Ki-Shau-Wau where the Starved Rock Radio Club will again hold their annual Hamfest June 8th. Follow "Hamfest" signs south from Junction of Illinois Routes 178 and 71 or East on blacktop road from Tonica, Illinois. One dollar advance registration or one-fifty at the gate. For addtl., info, write W9MKS, George E. Keith, Box 22-A, Utica, Ill.

CUSTOM-Made 80–10 150 W. deluxe transmitter in chromium plate relay rack with 2 National MB150 tuners and one MB40 tuner. See Handbook 1951, p. 211 for circuit. Pair of 807's modulators, p. 264 Handbook for circuit, $250. Write: S. S. Friedland, Storrs, Conn.

SELENIUM Rectifier and transformer kit O-16VDC/12 Amp, $23.98. Snooperscope, Infrared, Sees-in-dark-tube, data, $4.98. IN34 prepaid USA, 7 for $4.65. Sell your surplus tubes and equipment. Free Tabogram. "TAB" 109 Liberty St., N. Y. C.

FOR Sale: SX-28, rack model, matching speaker, $100. Express collect. Mildred Drobnick, 145 Main St., Franklin Boro, Conemaugh, Penna.

ESTATE of late Donald Harring, W2OQT disposing of all equipment. Meissner 150B xmittr, VHF receivers, etc. Send for list or call W2VTO, 32 Rock Lane, Levittown, Hicksville, L. I., N. Y. HI 5–6031-W.

WEBSTER 180 wire recorder, like new, with 14 half-hour, 3 hour spools of wire; extra take-up drums. First $99.50. W1SYV, Milton Academy, Milton, Mass.

QSLs by W2HAZ. Petty, 17 Southard, Trenton, N. J.

AM in process of forming boys' radio club (9). Need low-cost used equipment, parts, tools and above all, corresponding help for securing our tickets. H. Hoffman, Naples, Florida.

WANTED: "Kytoon" for antenna tests. W1BB.

NEW crystals for all commercial services at economical prices; also regrinding or replacement crystals for broadcast, Link, Motorola, G-E and other commercial types. Over 16 years of satisfaction and fast service. Eidson Electronic Co., Phone 3-3901, 1802 North Third, Temple, Texas.

TRADE Remington portable and case, excell. condx, on receiver or TBS50D and pwr supp., pay cash difference. Sell Lettine 240, coils 80–40–20 slightly used, $70. Portable S72 new condx, $80. Blum, 2661 Dibblee Ave., Columbus 4, Ohio.

FOR Sale: Meissner 150-B complete. Write or phone: Darrell D. Kimball, W1TXX, 184 Hersey St., Hingham, Mass. HIN. 6-0917-R. Will deliver within 200 miles of Boston. What am I offered?

WANTED: S40B or equivalent receiver. WØVQC.

FOR Sale: Gon-Set Tri-band with nine tube fixed tuned; Philco receiver, built-in clipper, 1st class condx. First $65.00 takes. F. Mosser, W8ZAI, 6894 State Park Blvd, RFD #5, Pontiac, Mich.

WANT: SCR-694, BC-1306, PE-237, DY-12, DY-17, GN-58, ART-13, ATC, Tech manuals, war surplus test equipment, radar equipment. Sell: 1 h.p. 3 phase motor, $35. T. Clark Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass.

FOR Sale: Hallicrafters HT9 transmitter 10–80 meters, 100 w. fone 125 w. cw complete; Meissner EX signal shifter with NBFM and power supply; VHF 152A, converter for 2–6–10 meters (brand new). No fair offer refused. Need the cash. Arnold Jones, E43rd St. 11th Ave., Bldg. #4, Paterson, N. J.

SELL: HT9 transmitter, 125 watts, coils 80 to 10, extra 814 and crystals, $250. BC459 and 696 VFO's with power supply and relays, $50.00. HRO 5TA1, $175. All in excellent condition. No delivery. Paul Barrabee, W1EZG, 53 Morseland Ave., Newton Centre, Mass.

FOR Sale: New Hi-power Thordarson transformers, chokes, filter condensers, new meters, new pair of Eimac 4-250A's, new Bud 48" enclosed rack, chassis, etc. QST and CQ 1946–7–8–0; Handbooks, etc. Send for list. A. Martinka, 1253 Grace St., Chicago 13, Ill.

FOR Sale: Millen 90700 Variarm, $20; JBT Model 30F frequency meter, 48–62 cycles 100–150 volts, new, $15; BC454B, new, $8; BC458A, new, converted, $6; BC906D frequency meter 14.5–23.5 Mc. new condx, $25; Eicor Dynamotor, volts input 14 volts, output 1000–.350 amp. New $14. Prop pitch motor. Converted, $16.00. Cannot ship last two items. K. Blamey, 24 Conestoga Drive, Pittsburgh 34, Penna.

SELL: Crystal 14,099 kc., $2; 810 tubes, $8 each; power transformer, UTC S-47 1500–1250–1000 v. each side center tap, $18; Coil, B&W 40-meter JCL, $1.50; condensers, National neutralizing STN 18, $2.00 each. James L. Poteracke, W8ZZK, 939 W. Drive, Indianapolis.

FOR Sale: Meissner Model EX signal shifter in excellent condx. Complete, with FMX modulator: $65.00. R. Werner, WØSOV, 727 6th Ave. West, Grand Rapids, Minnesota.

WANTED: In like-new condx, Workshop 20-meter beam for Johnson rotator HRO50-T-1. Description and price to W7BA Peek, Seattle, Wash.

WANTED: 32V2 Collins transmitter. State best price in first letter. All correspondence will be answered promptly. P.O. Box 1931, Abilene, Texas.

FOR Sale: Lettine 240 and NC-46. Both in excellent shape. Best offer. Write to Jerry Williamson, Filer, Idaho.

THREE K-7 gun mounts for sale. Perfect beam rotators: $10 each. Perfect condition. Described in surplus conversion manual, second edition. Harry Harris, W6FRM, 2616 Castle Heights Ave., Los Angeles 34, Calif.

FOR Sale: 2-meter receiver built from article in November 1951 QST, highest offer takes it or will trade for 10 or 10 and 20 meter beam antenna. William Madigan, jr., 159 Nott St., Wethersfield, Conn.

TIME payments are available on any and all items under what we consider to be the most flexible plan available today. Write for details, and request our latest list of used communication equipment at the same time. We also accept trade-ins, so ask us for a quotation. Write Carl, W1BFT, Evans Radio, Concord, N. H.

SELL: Low-priced receiver. Suitable for Novice. TV booster cheap. Edgar Stanley, R. 3, Waverly, Ohio.

OLD QSTs, other mags still needed: June, Dec. 1916 (have 1916 issues to trade); Pacific Radio News, 1917–23; Wireless Age, 1920–25. Break down, men, and gladden this old antiquarian's heart! Write now Uncle Vern, W6ERS, 700 Rolph St., San Francisco 24, Calif.

BC-610E wanted: Also BC614, may be less tubes and in repairable condition. Please state condition and price. W2FMB, 98 Holland Road, South Orange, New Jersey.

WANTED: Marconi, Electro Importing, Wireless Specialty, DeForest apparatus; Electrical Experimenter, Wireless Age: 1913–14–15–16 YearBook of Wireless Telegraph and Telephony; Collins "Wireless Telegraphy"; Murdock,2 slide tuning coil; early crystal detectors; early hand keys. Any amateur apparatus manufactured before 1921. Describe all items fully and price wanted. L. Rizoli, W1AAT, 100 Bay View Ave., Salem, Mass.

WANTED: Your attendance at the Mid-American and Dakota Division ARRL Convention, September 5, 6 and 7, 1952. Nicollet Hotel, Minneapolis, Minn.

FOR Sale: Hallicrafters SX42, 3 speed automatic record-changer, Lane accoustically lined Lowboy baffle containing two 15" Jensen coaxial speakers with matching network, $350; Electronic designs VTVM, $35; Sylvania tube tester, portable, in steel case, $35; new Harvey-Wells TBS50D, xtal mike, PE-103, xtals, $150; Abbott TR-4, 6V dc-110Vac, 300 V at 100 Ma., mike tubes, plywood case. Free delivery within 100 mile radius; beautiful audio system. Harry E. Noyes, W1PTB, 120 Forest St., Rutland, Vermont.

SELL or trade: SCR522, 2-meter beam. Douglas W. Ryan, 58–23 185th St., Flushing, L. I., N. Y.

WANTED: Rotator for 20-meter beam. WØVQC.

SWAP: Hy-Lite 10–20 3-el. beam with T-matches for 8 mm movie equipment. W3RPG, Box 144, Thompsontown, Penna.

WANTED: AN/APR-4, APR-5A, ARC-1, ARC-3, ART-13; TS-12 and other "TS-", particularly microwave equipment, even salvage; quantities of 723A/B, 3C22, etc. tubes; any laboratory equipment. Top cash or SS swap; rush! Engineering Associates, 434 Patterson Road, Dayton 9, Ohio.

SELL: VHF-152A used five hours: $50 plus express. Lew Wallace, Gowanda, N. Y.

FOR Sale: transmitter 150-watts 10–160 meters fone-c.w. complete with antenna tuner, C.W. monitor, overmodulation indicator, control panel with 6 relays and all tubes. Mounted in 6 ft. rack. Best offer over $200. W2FZJ, Jordan Road, New Hartford, New York.

WILL trade for good ham gear: high power rifles, like new, 8 mm Mauser Sportsman, Mauser automatics, 30–40 Craig, Winchester 73 what have you? R. M. Mills, jr., W5SNR, Box 224, Gulfport, Miss.

TRANSFORMER, 600 v.d.c. at 600 Ma (Harrison had it). Microphone, Turner 9D 500-ohm dynamic, 50 micro-amp. meter, G.E. Type DO, 41, 3-in. round. All unused, excellent condx. Other small parts, stamp for list. Want cash. R. M. Smith, W1FTX, RFD #1, Granby, Conn.

BARGAIN: HQ-129X receiver with matching speaker, $130. Temco 75GA transmitter. Fone or c.w., xtal or VFO. 100 watts fone. 125 c.w. new bias batteries. Only $220. I purchased this equipment new and it has had good care. I will deliver by car free to any place within 100 miles of Dallas. Contact Don Tressler, W5KJV, 916 Graham, Dallas, Texas. Telephone TR-7685.

LOOKING for QST 1916–1919 U. S. Gov. Printing Office Call Books Commercial Stations 1922, 25, 26; Amateur Stations 1925, 26. Year Book Wireless Telegraph; Electrical Experimenter June 1913. Wireless catalogs such as Duck, Rasco, Mesco, E-I, etc. anything early. Radio Service Bulletin, National Amateur Wireless Assn bulletins. Early ARRL wall maps. Early Wireless School booklets. ARRL List of Member Stations. Marconi, US Navy or any early Call Books, or lists of calls or stations. Marconigraph, Collins Wireless Bulletin, ancient gear such as Omnigraph, Keys, leyden jars, Helix, spark gap, Marconi receiver, loudspeaker, phones. Robert L. Willits, W1PN, Box 26, Hyannis, Mass.

FOR Sale: Two RCA 8000's with sockets with about 20 hrs. service. $18.00 the pair. Stancor P3898, 300 watt class "B" multitap transformer like new, $20. Meissner Model EX deluxe signal shifter, in excellent condition, $20. W8FSA, 411 So. Jefferson, Ithaca, Mich.

WANT: Leece-Neville mobile alternator system. Cash or swap ¾ H.P. Century motor, 115/230 V.A.C. W4KTZ, 2412 Brighton Drive, Louisville, Kentucky.

BC610E with speech amplifier, coils 10 through 40, $450. HT-9, coils 10 through 80, $190. Both complete and in good operating condition. Plate power transformer and modulation transformer for BC610. Will take 250 watt Class B modulator and good receiver as part trade. All inquiries answered. Charles Strunk, W5JZP, Route 3, Box 351, Yuma, Ariz.

SELL: IRE Proceedings 1946–1951, in binders. In excellent condition, $20. Eldico Hi-Voltage power supply kit, 1500 V. Never used, $25.00. Bob Abernethy, W2PQY, 120 Frederick Ave., Babylon, L. I., N. Y.

ALL parts and one coil for 600 watt final includes 250TL as removed from BC610 $45; 20-watt plate modulator for command xmittr w/pwr supply, input for xtal mike, $20; BC458A, new condx, $6. SX28 and speaker, excellent condx, $140. W9DSV, Box 261, Webster, Wisc.

SELL or trade: Globe King (coils for 160 and 10) on air. New 522, S40 receiver. Mobile trans. with PE-103, 50 watts input. Morrow 2BC converter 10 and 75. Want: BC-610, Collins, SX42, HRO. What have you? Don Clark, W7OHG, 105 N.W. Main, Blackfoot, Idaho.

20 KV vacuum condensers, 40, 50 and 150 $\mu\mu$fd, only six of each will sell for $6.00 each. W6IRT, Norman Lefcourt, 1406 Venice Blvd., Los Angeles 6, Calif.

FOR Sale: Hallicrafters HT-9 transmitter, coils for 80, 40, 20, 10. Electro-Voice model 1000 speech clipper. Prewar Meissner signal shifter, coils for 80, 40, 20, 10. Collins Navy TCS transmitter and receiver with 12 volt dynamotor power supply and loading coil. Receiver has Navy noise limiter kit installed. 110 volt A.C. supply for TCS, built of mostly Collins parts on Collins chassis. Collins Navy MBF transmitter-receiver converted to 10 meters, receiver has single dial tuning, with tuning meter, hand-set, and balun unit in accessory case. Sonar 10-meter NBFM mobile transmitter. Morecroft, W6LFT, 2637 Pickens, Montrose, Calif.

BARGAINS: New and reconditioned Hallicrafters, Collins, National, Hammarlund, Harvey-Wells, Gonset, RME, Millen, Meissner, Lysco, Elmac, Morrow, others. Reconditioned S38, $29.00; S40A, $69.00; SX43, $119.00; SX71, $149.00; SX42, $199.00; SX62, $199.00; SW54, $35.00, NC57, $69.00; NC173, $139.00; HQ129X, $139.00; SX25, S72, HFS, NC183, HRO7, HRO50, HRO50-1, SP400X, HF-10-20, VHF152A, RME45, Collins 75A1, Harvey-Wells, Bandmaster transmitters, Signal Shifters, etc. Shipped on trial. Terms. List free. Henry Radio, Butler, Missouri.

BARGAINS: Extra Special: Motorola P-69-13 Mobile receivers, $29.50; Globe-King, $315.00; HT-9, $199.00; HRO-50, $275.00; Lysco 600, $109.00; SP-400X, $249.00; HRO-7, $199.00; Collins 75A1, $275.00; HRO-5T, $175.00; SX-71, $159.00; HRO Senior, $119.50; RME 2-11, $99.50; RME-45, $99.00; Meissner EX shifter, $59.50; S-40A or SX-16, $69.50; VHF-152A, $69.00; HF-10-20, $59.00; SX-24, $69.00; Globe Trotter, $79.50; Meissner Signal Calibrators, $24.95; MB611 mobile transmitter, $29.00; 90800 exciter, $29.50; RCA chanalyst, $79.50; XE-10, $14.95 and many others. Large stock of trade-ins. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Laboratories, 740–42–44 W. B'way, Council Bluffs, Iowa.

SELL: Complete KW AM/CW ham station. Best offer over $250. Write or wire: WN8JGD, Tom Clements, Choate School, Wallingford, Conn.

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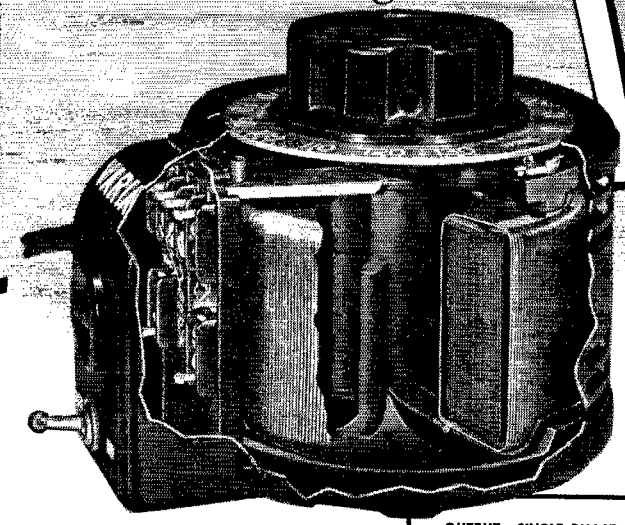

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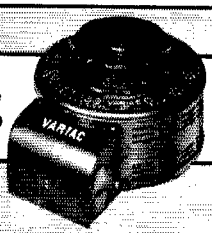
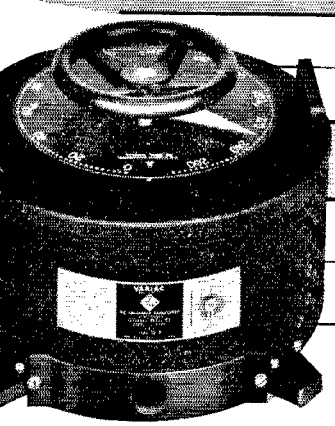
Input Voltage	OUTPUT—SINGLE PHASE DATA KVA	Output Voltage	Rated Amperes	Maximum Amperes	Type of* Mounting	Type	Price	
115	0.17	0–115 0–135	1	1.5 1.0	I	200-B	$12.50	 Type 200-B
115	0.86	0–115 0–135	5	7.5 5.0	I II III	V-5 V-5M V-5MT	18.50 20.50 25.00	Type V-5
230	0.60	0–230 0–270	2	2.6 2.0	I II III	V-5H V-5HM V-5HMT	21.00 23.00 27.50	
115	1.5	0–115 0–135	10	13.0 10.0	I II III	V-10 V-10M V-10MT	33.00 35.50 40.00	 Type V-10
230	1.2	0–230 0–270	4	5.2 4.0	I II III	V-10H V-10HM V-10HMT	34.00 36.50 41.00	
115	3.	0–115 0–135	20	26.0 20.0	IV	V-20M	55.00	Type V-20
230	2.4	0–230 0–270	8	10.4 8.0	IV	V-20HM	55.00	
115	5. 10.	0–115 0–115	40 80	45.0 90.0	IV V	50-A 50-AG2	140.00 310.00	Type 50
230	7. 14.	0–230 0–230	20 40	31.0 62.0	IV V	50-B 50-BG2	140.00 310.00	

* I Unmounted model.
II Protective Case around windings.
III Protective Case, terminal cover, line switch, convenience outlet and line cord.
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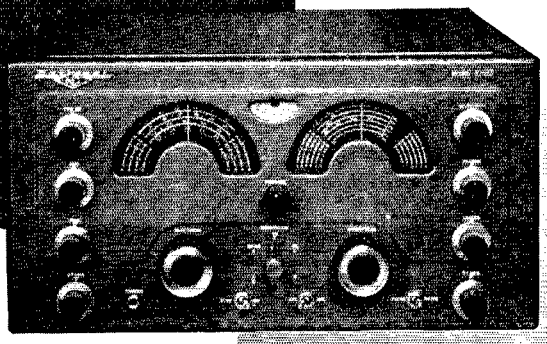

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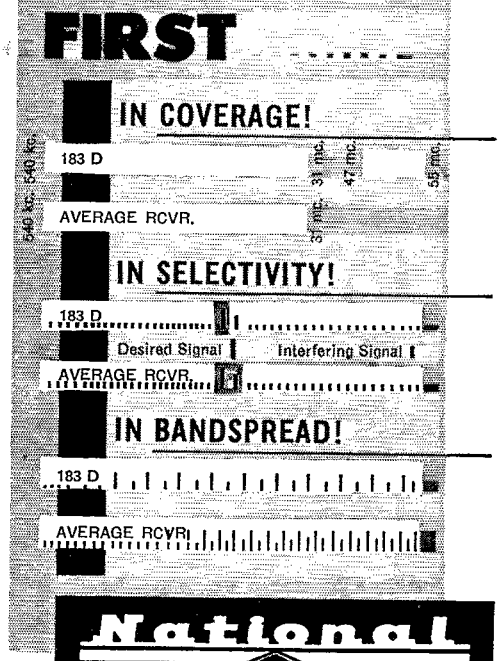

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