QST

July 1960
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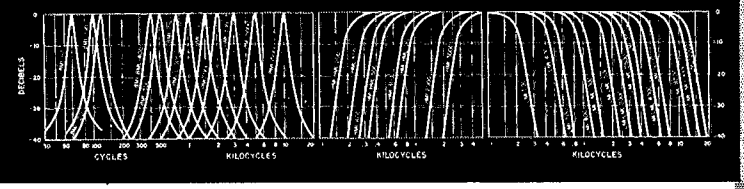
amateur radio

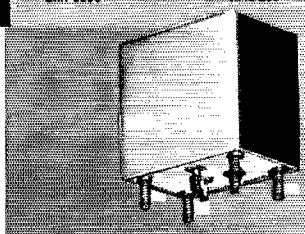
PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

UTC FILTERS FOR ALL APPLICATIONS FROM STOCK



STOCK TYPES
(number in figure is cycles)

BMI-60	BMI-10000	LMI-800	HML-300
BMI-100	BMI-200	LMI-1000	HML-500
BMI-120	BMI-400	LMI-1500	HML-1000
BMI-400	BMI-500	LMI-2000	LML-1000
BMI-500	BMI-800	LMI-2500	LML-1500
BMI-750	BMI-1000	LMI-3000	LML-2000
BMI-1000	BMI-2000	LMI-4000	LML-2500
BMI-1500	BMI-3000	LMI-5000	LML-4000
BMI-2000	LMI-200	LMI-10000	LML-8000
BMI-3000	LMI-400	BML-400	LML-10000
BMI-4000	LMI-500	BML-1000	LML-12000
BMI-5000		HML-200	



This standardized group of filters covers most popular filter applications and frequencies. Units are in compact, drawn, magnetic shielding cases . . . 1 3/16 x 1 1/16 base, 1 5/8 high for BMI, LMI, BML; others 2 1/2 high. There are six basic types:

BMI band pass units are 10K input, output to grid, 2:1 gain. Attenuation is approximately 2 db at 3% from center frequency, then 40 db per octave.

HMI high pass units are 10K in and out. Attenuation is less than 6 db at cut-off frequency and 35 db at .67 cut-off frequency.

LMI low pass units are 10K in and out. Attenuation is less than 6 db at cut-off frequency and 35 db at 1.5 cut-off frequency.

HML high pass filters are same as HMI but 500/600 ohms in and out.

LML low pass filters are same as LMI but 500/600 ohms in and out.

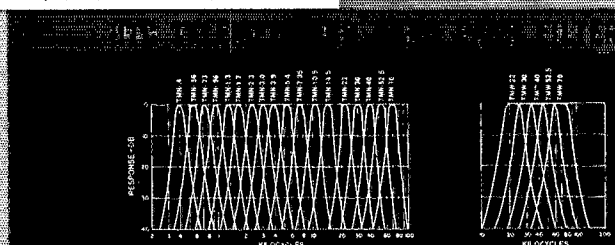
BML band pass units are same as BMI but 500/600 ohms input, output to grid, 9:1 gain.

STOCK TYPES
(number in figure is KC)

TMN-.4	TMN-2.3	TMN-14.5	TMW-22
TMN-.56	TMN-2.8	TMN-22	TMW-30
TMN-.73	TMN-3.8	TMN-30	TMW-40
TMN-.96	TMN-5.4	TMN-40	TMW-52.5
TMN-1.3	TMN-7.35	TMN-52.5	TMW-70
TMN-1.7	TMN-10.5	TMN-70	

TMN-.4 thru TMN-1.7
1/16 x 1 3/16 x 2 inches
Weight ____ 3.5 oz.

TMN-2.3 thru TMW-70
1 3/16 x 1 3/16 x 1 5/16 inches
Weight ____ 1.2 oz.

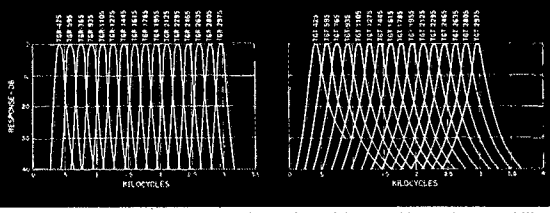


UTC standard telemetering filters provide extreme miniaturization with maximum stability, a complete set of 18 filters taking 19 cubic inches. They are 100K in and out and have an insertion loss of less than 6 db, 4 pin header for small Winchester socket.

TMN units are within 3 db at ± 7.5% of center frequency . . . down more than 18 db at ± 25% . . . more than 40 db beyond 1.75 and .58 center frequency.

TMW are within 3 db at ± 15% of center frequency . . . down more than 20 db at ± 50% . . . more than 40 db beyond 2.5 and .4 center frequency.

TGR-TGT TELEGRAPH-TONE CHANNEL FILTERS



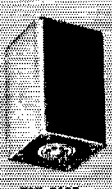
STOCK TYPES
(number in figure is cycles)

RECEIVING

TGR-425	TGR-1785
TGR-595	TGR-1955
TGR-765	TGR-2125
TGR-935	TGR-2295
TGR-1105	TGR-2465
TGR-1275	TGR-2635
TGR-1445	TGR-2805
TGR-1615	TGR-2975

TRANSMITTING

TGT-425	TGT-1785
TGT-595	TGT-1955
TGT-765	TGT-2125
TGT-935	TGT-2295
TGT-1105	TGT-2465
TGT-1275	TGT-2635
TGT-1445	TGT-2805
TGT-1615	TGT-2975



TGT CASE
1 1/2 x 1 1/2 x 2 1/2 in. 8 oz.

TGR CASE
1 1/2 x 1 1/16 x 4 1/4 in. 15 oz.

These band pass filters for multiplex transmitting and receiving provide maximum stability in miniature sizes. Both receiving and transmitting types are 600 ohms in and out, and employ 7 terminal header for sub-miniature 7 pin socket.

TGR receiving filters are within 3 db at ± 42.5 cycles from center frequency . . . down more than 30 db at ± 170 cycles . . . down more than 15 db at adjacent channel cross-over.

TGT transmitting filters are within 3 db at ± 42.5 cycles from center frequency . . . down more than 16 db at ± 170 cycles . . . down more than 7.5 db at adjacent channel cross-over.

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COLLINS

QST

JULY 1960

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—CONTENTS—

W6SAI NOW HEADS EIMAC AMATEUR SERVICES

Here's William I. Orr, W6SAI, new head of Eimac's busy Amateur Service Department. Bill will hold the spot vacated by the retirement of John Reinartz, K6BJ.

If you have a tube application problem or need help, drop Bill a line here at Eimac. He'll be glad to lend a hand with anything from a circuit diagram to expert advice.

And *what* advice! Bill is editor of the internationally distributed "Radio Handbook" and author of the "Beam Antenna Handbook," "All About Quad Antennas," "VHF Handbook" and other publications. He is also a regular contributor to QST and CQ magazines.

Bill was first licensed as W2HCE in 1934 and has been licensed as W6SAI since 1938. He holds DXCC (260 countries), WAZ and other ham awards. Other famous calls held by him are 3A2AF (Monaco), 7B4QF (Andorra) and FP8AC (St. Pierre and Miquelon).

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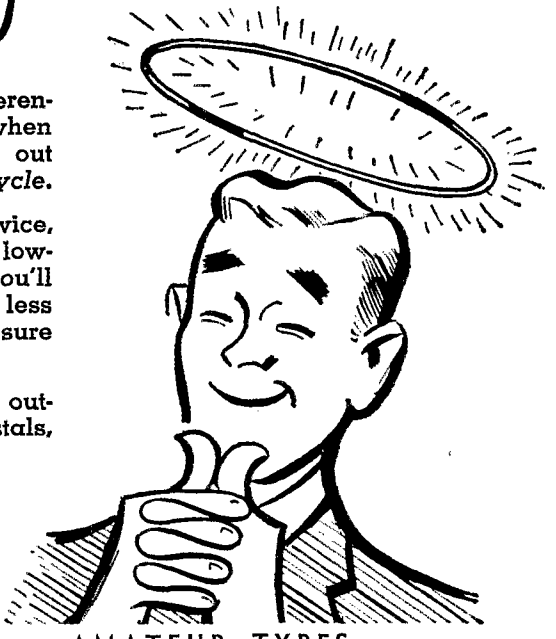

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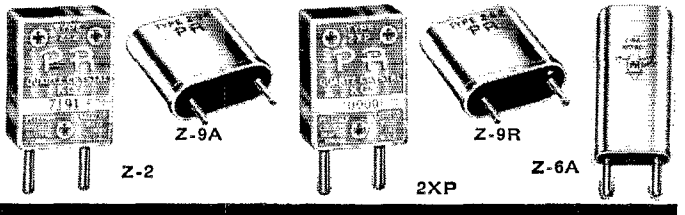

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Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted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

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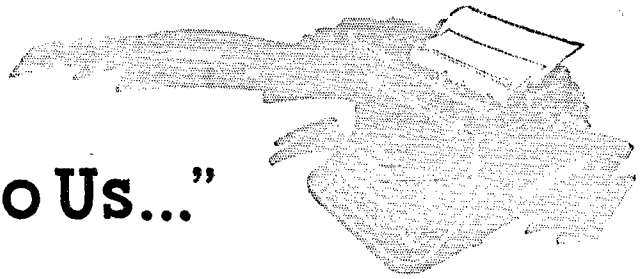
West Gulf Division

GRADY A. PAYNE W5ETA
5103 Linden St., Bellaire, Texas
Vice-Director: Robert D. Reed W5KY
4339 S. Peoria, Tulsa 5, Okla.



"It Seems to Us..."

VOLUNTEER LEADERS . . .

Each year the Board of Directors of the League adopts a resolution of thanks and appreciation to the various volunteer field officials of ARRL for their untiring work and devotion to our affairs. This has been a regular action of the Board for so long that we must take care not to assume it is simply routine. The Board is indeed deeply appreciative of these efforts, because of their inestimable importance in the advancement of organized amateur radio.

The amateur service, like any other radio service, must operate in the "public interest, convenience or necessity" in order to be able to continue justification for our existence and right to use portions of the public domain of the radio frequency spectrum. Perhaps in no other single way is this better accomplished than through group efforts as represented by the League's field organization program.

These volunteer leaders make our machinery run. They accept posts as officers of affiliated clubs, planning programs in technical, operating and other fields to spread knowledge and improve the stature of the individual as well as the club. Others in the club take on special jobs such as with the TVI committee or as public relations officer, adding to the amateur's stature in the community. Still others head up a local Field Day or Simulated Emergency Test exercise to demonstrate amateur radio's capabilities. The huge operating organization of the League is staffed with many volunteers contributing their time to improve amateur radio's ability to perform in the public interest — through traffic systems, section and regional nets, emergency communications, civil defense. SCMs, SECs, and QSL Managers have especially arduous duties, requiring many hours of personal time and all performed for the good of the cause.

A real strength of the League lies in the accomplishments of these volunteer leaders, who are not interested alone in what they can get out of the hobby of amateur radio, but want to contribute something to it.

. . . AND NEWCOMERS

From today's new amateur licensees will eventually come our leaders of the future. Are we assisting them, as we should, to become useful amateur citizens? Are we properly indoctrinating them in the traditions of amateur radio and the spirit of public service?

These questions are especially important today when amateur radio is growing so rapidly in numbers. Years ago, a person became interested through contact with another ham, or the local radio club, or at least through League publications. We had a certain interdependence on each other for information. Local groups especially were more tightly knit, and newcomers were quickly and easily taken under the wing of club leaders and older amateurs for helpful guidance.

Today, nearly every newsstand has one or more "popular" books dealing partially or wholly with amateur radio (in some instances, we regret to say, being little more than a collection of manufacturers pictures and description of gear), and so some of our newcomers enter the game with no concept of what amateur radio really offers, nor its traditions and responsibilities. Many licensees are neither members of the League, nor of affiliated clubs, nor of any organized group or operating activity. This is not to say that they are not, or cannot be, good amateurs. But newcomers, like youngsters, are prone to imitate. Without participation in a group having qualified leaders, they do not necessarily learn from the one who does the right thing, or who does a thing best, and consequently they sometimes imitate a good example, sometimes a bad one. This inevitably means that many of the newer, younger amateurs are indoctrinated first with the more frivolous aspects of the game and are never influenced by the desire to be of service and a sense of dedication so important to maintaining high standards.

Our responsibility to public service doesn't end with the public alone; it should extend also to our own group, to the recruitment of more amateurs in fields of organization. So let's extend a helping hand to guide newcomer activities, so that they will develop the sense of responsibility and team work that goes far deeper than any individual effort. In this way, since newcomers are the leaders of the future, we can help assure that this leadership will be in good hands.

OUR COVER

Our cover this month is the nifty mobile unit built by K0EMK and described in the article starting on page 19 of this issue.

COMING A.R.R.L. CONVENTIONS

July 30–31 — North Dakota State, Minot.
September 2–4 — Pacific Division, San Mateo.
September 10–11 — Central Division, Indianapolis, Indiana.
September 16–17 — Dakota Division, Minneapolis, Minnesota.
September 16–17 — Quebec Province, Montreal.
October 7–8 — Great Lakes Division, Cleveland, Ohio.

NORTH DAKOTA STATE CONVENTION

July 30–31, 1960

The 1960 North Dakota State ARRL Convention, sponsored by the Minot Amateur Radio Association, will be held at the Farmer's Union Auditorium, 215 E. Central Avenue in Minot on July 30–31.

Convention registration begins at 9 A.M., Saturday, July 30. Early birds will enjoy an informal get-together Friday night at the convention site.

Short talks on technical subjects, plus a hidden transmitter hunt, mobile judging, swap table, exhibits, manufacturers displays and an ARRL booth are planned. The convention program ends Sunday at 3 P.M.

Registration fee is $5.00, for all activities, including the banquet; $2.50 for non-hams (activities and banquet), children to 12, $1.50, also including the banquet. Convention registrations or requests for hotel or motel accommodations, should be sent, not later than July 9, to L. E. McFall, W0GNS, Convention Chairman, 1005 Ninth Avenue, N. E., Minot, North Dakota.

(See pages 53 and 55)

Dr. Ed Krieg, W3CAY, was the featured guest on "The Ham's Wide World," presented by *Johns Hopkins File 7* on April 17 to a nationwide television audience. Perry Klein, K3JTE, half of the recent "satellite-bounce" team also appeared and told of his news-making experiments. "The Ham's Wide World" originated at WJZ-TV in Baltimore and was written and produced for *File 7* by Dave Bell, W8GUE. A 16mm film version of the program will be available from the League for group showings.

Strays

W6BSE fell from a 40-foot tower in late May and banged himself up quite badly. K6HIN suggests that friends send get-well cards to W6BSE, Frank Miguel, Eden Hospital, 20103 Lake Chabot Rd., Castro Valley, Calif.

—•••—

The fifth Amateur Television Convention, organized by the British Amateur Television Club, will be held in the Conway Hall, Red Lion Square, London, W.C. 1, on Saturday, Sept. 10, from 1000 to 1900. Amateur-built television cameras will be in action, and other amateur television equipment will be demonstrated. There will be particular emphasis on slow-scan TV techniques.

—•••—

Our article on "Preventive Maintenance" in the March issue of *QST* prompted several of our readers to remind us one and all of the dangers of using carbon tet. This is a highly toxic solvent, and if it *must* be used, should be used only where there is plenty of ventilation. Even a small concentration of the vapors is highly dangerous.

—•••—

K8OWR thinks he has the fastest delivery of a DX QSL on record. He QSOd VP6ZX in Barbados and had the VP6 QSL card 2½ minutes after signing off. K8OWR lives right next to W8SZS who is VP6ZX's QSL Detroit area manager. W8SZS was chatting with VP6SX when K8OWR gave the VP6 a call. After completing the QSO, he trotted 100 feet to his neighbor's shack and collected the DX QSL from W8SZS.

—•••—

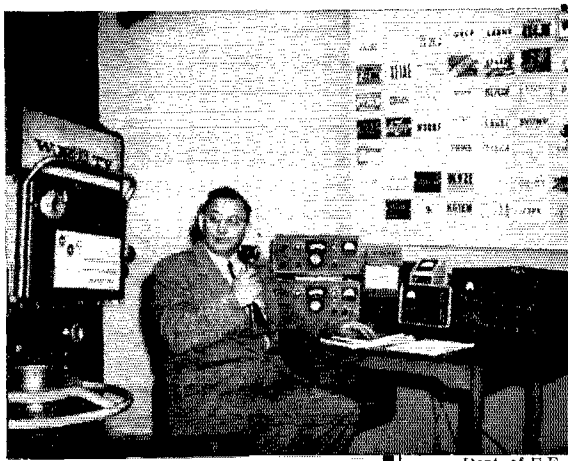
K1LZY says he knows a Novice who has a vertical antenna and is genuinely hesitant to buy a final using a beam power tube — he is searching in vain for one with a vertical power tube.

—•••—

W9HUZ overheard this conversation at a DX club.

Big DX Man (accusingly): "What? You haven't worked ZD7SA yet???"

New Member: "Well, er, no. You see, I haven't got my license yet."



Antenna Patterns from the Sun

Using Solar Noise for Plotting Vertical Patterns of V.H.F. Arrays

BY D. W. BRAY,* K2LMG AND P. H. KIRCHNER,* W2YBP

YOUR v.h.f. antenna is probably aimed at the horizon, but that's not where your signal is going. The radiation in the vertical plane is actually pointed up in the air. This is true whether your antenna is horizontal, vertical or circularly polarized. It occurs because half of the antenna is looking at the ground when it is directed at the horizon. Since the beam strikes the ground, energy bounces off the earth and combines with the energy that is headed skyward.

For a horizontally polarized antenna, which most v.h.f. men use, the reflection is such that the signal is cancelled at the horizon and a sharp beam is formed a few degrees above the horizon. Above this lobe many other weaker and higher-angle lobes are formed. A typical vertical antenna pattern for an antenna a few wavelengths above the ground is illustrated in Fig. 1. A vertically

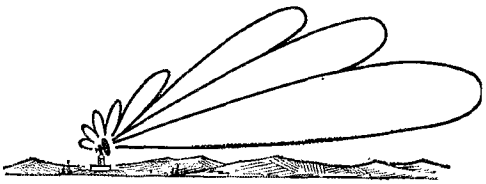


Fig. 1—No antenna ever has a single lobe, aimed precisely at the horizon. As shown in this artist's conception, the main lobe is always at least a few degrees above the horizontal, and other lobes appear above it at higher angles.

polarized antenna would, if the ground were a perfect conductor, add the reflected and direct signal to produce a lobe with its maximum right on the horizon. But the ground isn't a perfect reflector and it causes the same effect as in the horizontal antenna: a lobe structure that is pointing upward.

The only way to beat this is to raise your antenna up as high from the ground as practical to make the first vertical lobe as low as possible. Even though your antenna is as high as you could put it, it still poses the question: is it really high enough; what would another ten feet in elevation buy? Or another question can come to mind as it did at K2LMG. Is that h.f. array, which is below the v.h.f. beam, acting as a ground plane for the latter, causing a high angle of radiation?

The way to answer such questions is to make a vertical antenna pattern plot. That sounds easy but it can't be done as simply as taking a horizontal radiation pattern. To plot a horizontal pattern all you have to do is to have a nearby friend turn on his transmitter, rotate your antenna, and read his signal strength on your S meter.

Although not so easy as the horizontal pattern, the vertical pattern can be plotted by taking a clue from the radio astronomers. Mother Nature has provided a strong and fairly constant source of radio energy a long way off: the sun. In the course of an afternoon the sun sweeps through a range of elevation angles as the earth turns. If you track the sun in azimuth, you can measure the noise level received by your v.h.f. converter as the sun moves down the vertical plane of your antenna. Using the level of the received signal and the calculated position of the sun, the antenna pattern can be plotted.

By this method the question of the h.f. beam at K2LMG was answered. It showed that there was no interaction. If we have excited your curiosity to the point where you would like to run through this experiment for your own antenna, the method is outlined below.

Solar Noise

Since the signal to be received is wide-band noise, the receiver should be opened up to the widest possible bandwidth, so that the greatest amount of noise energy will be collected. But, since this energy is noise a special detector-integrator voltmeter circuit should be used on the output of the receiver in order to smooth out the variations in the noise for more accurate voltage readings. The receiver should be operated with the b.f.o. set for normal c.w. reception. Connect one of the detector-integrators of Fig. 2 to the audio output. One is for use with a volt-ohmmeter, where R = (lowest full scale voltage) × (voltmeter ohms per volt) and $C = \frac{10^6}{R}$ $\mu f.$, with at least a 6-volt rating. The other is for use with a vacuum-tube voltmeter. If the v.o.m. is used the detector must be connected to the high-impedance tap (the higher impedance the better) of the receiver audio output transformer. It doesn't matter which audio output is used for the v.t.v.m. circuit. Even a high-impedance headphone circuit can be used. The received signals will be read on the voltmeter.

Since the gain of even the very best of receivers will change with time, the effects of

* Advanced Electronics Center, General Electric Company, Ithaca, N. Y.

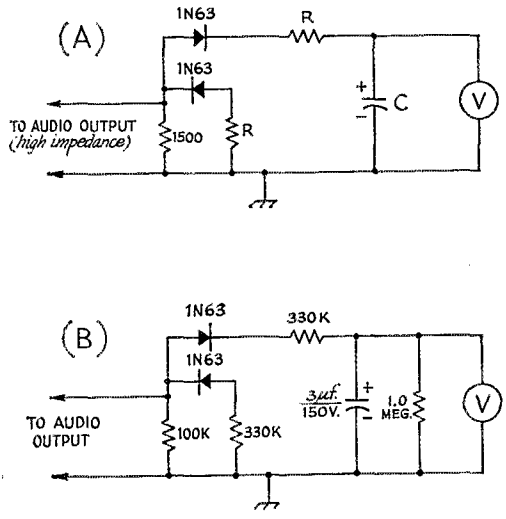


Fig. 2—Detector-integrator circuits for use in taking noise readings. Circuit A is for volt-ohmmeters, B for vacuum-tube voltmeters. See text for information on *R* and *C* values in circuit A.

receiver gain variations can be removed by putting a resistor equal to the impedance of the transmission line on a coax connector and substituting it for the antenna and transmission line at the converter input just before each reading is taken. Noise from the resistor provides a "standard signal."

Taking Data

Data can be taken at either sunset or sunrise. By the method outlined in the following section a graph of the angle to the sun as a function of time should be plotted for the selected day previous to taking data. This graph will then give the beginning and ending times of the test. For a sunset measurement, start at the time of maximum desired elevation angle and continue taking readings until about ten minutes after sunset. For a sunrise measurement you should start about ten minutes before sunrise and continue until the time for the maximum desired elevation is reached.

During the run the horizontal position of the sun will change, so it must be tracked in azimuth. Since your beam is relatively broad in azimuth, probably only a few changes in the horizontal position will have to be made.

The readings should be taken every few minutes, and about once a minute at low elevation angles. Each reading should include the time, the voltage output of the receiver with the resistor substituted for the antenna, and the voltage output with the antenna connected. Set the receiver gain so that the voltmeter is about two-thirds full scale on the most sensitive d.c. scale. At times the sun noise will flare up, or a car will go by the house, so caution should be observed to be sure that the reading of the antenna signal is really a good average value. The reading of the sun won't be much larger than that of the resistor and in fact at times will be lower than the resistor, so don't be alarmed by only small changes of voltage. Since the changes are small, care should be taken to achieve accurate results.

Calculating the Sun's Elevation Angle

The apparent motion of the sun is fairly complicated, and you will have to be prepared to do some work here. If you are interested only in the elevation angles below 15 degrees, and are willing to settle for about 1-degree accuracy, the job isn't too bad. The first step is to find your latitude and longitude from a map, and select a date for making the measurements. From Table I, look up the sun's latitude on the selected date, interpolating between tabulated dates.

Second, find out what time the sun will set (or rise) on the chosen day. If you live in a large city you can simply consult a local newspaper or the TV weatherman. The authors have found that in smaller cities these sources sometimes quote times which actually apply to a larger city nearby, and are not accurate enough for our purposes. The same applies if you live more than 15 miles out in the suburbs. In this case, find the correct time from one of the references listed at the end of this article, following the instructions given with the tables.

Next, calculate the number A from the following formula:

$$A = \sqrt{\cos^2 L - \sin^2 D}$$

where L is your latitude and D (declination) is the sun's latitude.

Now, for any time which is M minutes before sunset (or after sunrise), the sun's elevation angle in degrees is equal to A times M divided by 4, or

$$\theta^\circ = \frac{A}{4} M$$

To extend your pattern to elevation angles higher than 15 degrees you will have to work a little harder. In addition to finding the number A, find another number B from this formula:

$$B = \sin D \sin L$$

where D and L are as before. Remember that

TABLE I
Sun's Latitude Variations

Date	Sun's Latitude	Date	Sun's Latitude
Jan. 1	−23.0	July 4	23.0
9	−22.0	12	22.0
21	−20.0	24	20.0
29	−18.0	Aug. 1	18.0
Feb. 8	−15.0	12	15.0
22	−10.0	27	10.0
Mar. 8	− 5.0	Sept. 10	5.0
20	0.0	23	0.0
Apr. 3	5.0	Oct. 6	− 5.0
16	10.0	20	−10.0
May 1	15.0	Nov. 3	−15.0
12	18.0	14	−18.0
21	20.0	21	−20.0
June 1	22.0	Dec. 2	−22.0
10	23.0	11	−23.0
22	23.4	21	−23.4

when D is negative, sin D is also negative.

For a time M minutes before sunset (or after sunrise) find an angle X degrees by dividing M by 4. That is,

$$X^\circ = \frac{M}{4}$$

Now find the elevation angle ϕ from the equation

$$\sin \phi = A \sin X + B (1 - \cos X)$$

The procedure described above gives the elevation angle of the sun at any time it is above your horizon, to about 1 degree accuracy. To get a better picture of the fine structure of your antenna pattern, especially at the low angles which are most important, better accuracy is needed. About 0.2 degree can be achieved by careful calculation and by applying certain corrections.

Read your latitude and longitude to 0.1 degree or better, and find the sunset (or sunrise) time to the nearest minute. Now adjust this time slightly by $\frac{3.3}{A}$ minutes. Add this to the sunrise time, or subtract it from the sunset time. Use this adjusted time to calculate the elevation angles as described above, and then apply a final correction by adding the amount shown in Fig. 3 to the calculated values. These corrections take

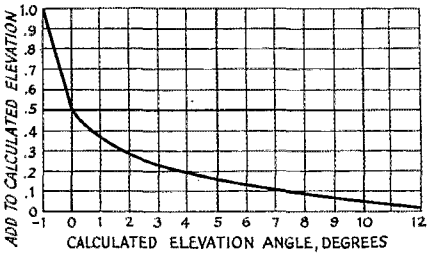


Fig. 3—Chart showing elevation angle corrections to be applied for results of high accuracy.

into account the refraction of the signal (and the light) by the atmosphere, and the difference in size between the radio sun and the visible sun.

Finding the Sun's Azimuth

If you do the job on a sunny day, the simplest way is to have a friend keep the beam pointed toward the sun in azimuth, lining it up by eye. Alternately, calculate the sun's azimuth in advance and rotate the antenna from time to time as required. When readings are taken, the beam should be within about one-fifth of a beamwidth of the sun's azimuth.

Azimuth is found from the formula

$$\cos \Theta = \frac{\sin D - \sin L \sin \phi}{\cos L \cos \phi}$$

ϕ is the elevation angle already calculated. Again, remember that when D is negative, sin D is also negative. The azimuth, Θ, is measured eastward from north in the morning, and westward from north in the afternoon. When cos Θ comes out negative, Θ is larger than 90 degrees and the sun is more south than north.

Plotting the Results

Now that the angle of the sun and the signal-strength readings have been obtained, the antenna pattern can be plotted. Fig. 4 is a curved-earth grid with elevation angles plotted on it. Taking the readings that were made as the sun ran its course, divide the signal voltage from the sun (E_S) by the signal voltage from the resistor (E_R). Do this for each reading taken. Now square each of these values of (E_S/E_R) to obtain the value of $(E_S/E_R)^2$. The next step is to compute the value Y, using the equation

$$Y = \sqrt{\frac{\left(\frac{E_S}{E_R}\right)^2}{\left(\frac{E_S}{E_R}\right)^2_{min}} - 1}$$

where $(E_S/E_R)^2$ is each of the readings that were taken as the sun crossed your antenna and $(E_S/E_R)^2_{min}$ is the value of the reading after the sun is below the zero-degree elevation angle by 5 minutes or more. Then find the greatest value of Y. At this reading, calling it Y_{max}, assign an arbitrary value of slant range — 500 miles. This is then one point on the plot: 500 miles and the angle to the sun at that time. Now take 500 miles and divide it by Y_{max} and multiply all of the other Y values by this amount. Plot on Fig. 4 the angle for each signal-strength reading and distance just found. Drawing the curve, you now have your antenna pattern in the vertical plane.

There is one caution. The sun is not really a point source of radio waves. It can be represented as a ring of about 1-degree angular diameter on the outside and about one-half degree on the inside. Because of this, the nulls in the antenna pattern will not appear to be sharp. For this reason, a sample antenna pattern is shown in order to guide you in your plot. When the curve shows a dip, it probably is a very deep null as indicated by the dotted lines on the same curve, Fig. 5. Because the depth of the nulls cannot be determined, the antenna pattern taken by this method would probably not satisfy an exacting scientist, but in practice the signals that are received on such an antenna, amateur or otherwise, are not from point sources either. Thus the antenna pattern taken by this method is truly an operational pattern.

For those interested in meteor scatter an estimate of optimum range can be made. The meteor trails will be most prevalent at a height of 50 miles. From your antenna pattern note the range at which the elevation angle line through the peak of your lowest lobe intercepts the 50-mile height. Multiplying this number by 2 will yield your approximate optimum meteor scatter range. In the example shown in Fig. 5, this would be about 1000 miles.

Noise Figure and Antenna Gain Check

There is another interesting sidelight to this

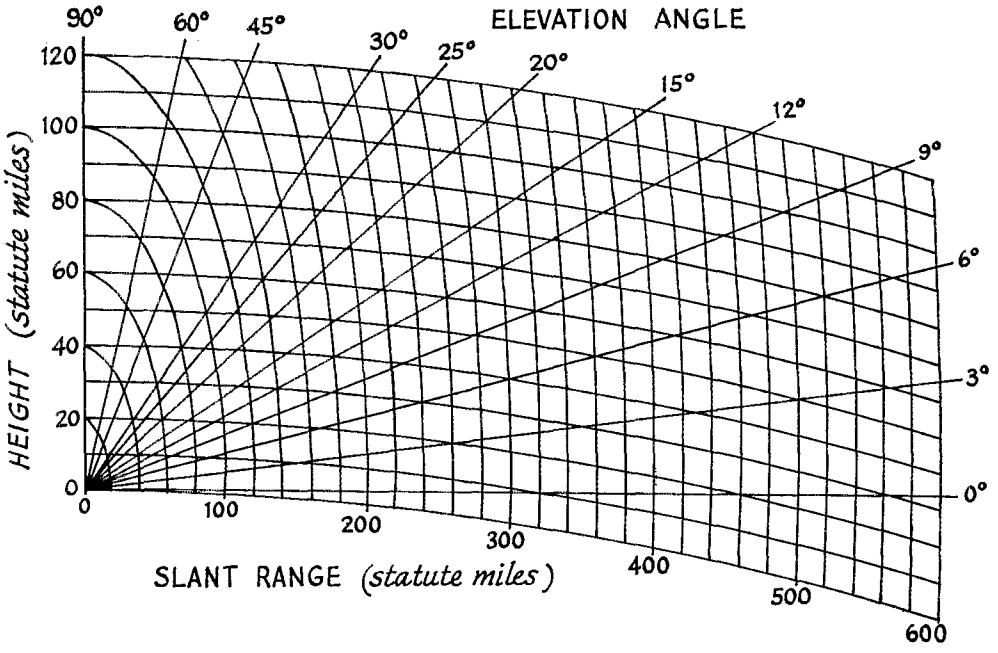


Fig. 4—Curved-earth grid for plotting results obtained from solar noise readings.

subject. The "quiet" sun is a more or less calibrated source of radio energy. Thus by a few simple calculations you can get an idea of your antenna gain or noise figure for actual received signals. Because the amount of energy that is received is a function of both the noise figure and antenna gain, you can start with one of the known values and find the other. The equation which applies is

$$\frac{G_P}{F_P} = 290\,\frac{L_P}{K}\left[\left(\frac{E_S}{E_R}\right)^2_{max} - \left(\frac{E_S}{E_R}\right)^2_{min}\right]$$

where G_P = the power gain on your antenna
F_P = the noise figure expressed as a power ratio
L_P = the transmission line loss for your cable and your length
K = a constant dependent upon the frequency band

and

$$\left(\frac{E_S}{E_R}\right)^2_{max}$$

is the maximum signal ratio from the antenna pattern data taken above. This value will occur at the peak of the first vertical lobe. $(E_S/E_R)^2$ min is the signal ratio at the time the sun was a few minutes below the horizon.

This formula will only apply when the sun is quiet. If the answers are out of line the test should be repeated until a quiet day is found. A quiet sun radiates the lowest amount of energy; all other conditions produce greater received power.

Your antenna gain is probably the least well-known number of your radio system.

TABLE II

Frequency Band	*Value of K*
144 Mc.	2.9
220 Mc.	2.8
432 Mc	2.7
1296 Mc	0.65

To calculate the antenna gain:

1) Estimate the noise figure of your converter by taking the manufacturer's noise figure, or from tube data if it is a home-brew model. This value will probably be expressed in db. Convert the db. noise figure to a power ratio by the common db. formula, F_P = antilog $F/10$ where F is the noise figure in db. from above. This conversion can also be made using the decibel chart in the *ARRL Handbook*.

2) The factor K is listed in Table II for the various amateur bands above 50 Mc. The 6-meter band has been omitted because of the strong background of radio energy in this frequency range in large areas of the sky, which could adversely influence the results. For the higher bands the background radiation is much less. It is possible that one of the bright radio stars could be near the sun when the measurement is being taken, and would therefore influence the readings on the higher frequencies, also, but the chances of this are remote.

3) L is the line loss. This figure is easily estimated by looking up the transmission-line manufacturer's data for your frequency. It is usually expressed in db. loss per hundred feet. Thus, calculate the db. value for your length and convert the db. loss to a power ratio as you did above for the noise figure.

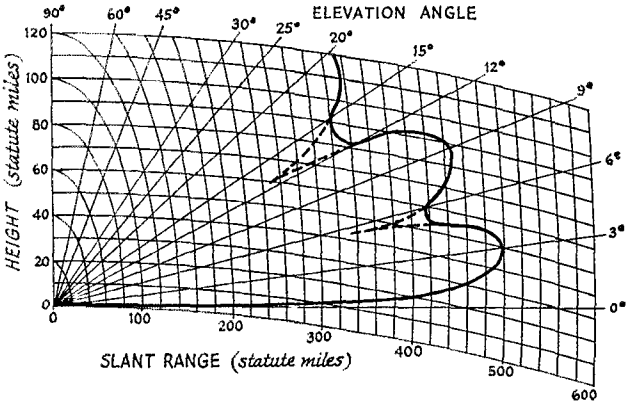


Fig. 5—Representative vertical antenna pattern. Dips in the heavy line represent nulls in the pattern which are actually much deeper than data will indicate. This is due in part to the fact that the sun is not a true point source for radio noise. Antenna pattern may be more like that shown in dotted lines.

Substitution of the values in the formula will yield the power gain G_P of the antenna. This can be converted to db. gain by the common formula

$$G = 10 \log G_P,$$

or by using the *Handbook* table.

What we have really been talking about here is a practical use of radio astronomy. The methods used here also apply to the detection of radio stars. Many interesting experiments can be performed. For those who are interested, take a radio look at Cygnus A or the center of our galaxy in Sagittarius, when they are rising or setting. Both are good strong noise sources, and real DX! QST

References

American Ephemeris and Nautical Almanac, issued yearly by U. S. Naval Observatory. Consult it at library.

Astronomical Phenomena for the Year, published annually. A reprint of selected pages from the above, 25 cents from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

The Telephone Almanac, issued annually. Free from Bell System Telephone Company business offices.

Information Please Almanac, published by Macmillan Company, New York City; sold at newsstands and bookstores

Strays

Voice of America Amateur Radio Program

Every week the Voice of America broadcasts the VOA Amateur Radio Program to all areas of the world at various times throughout the day. The program consists of 15 minutes devoted to the latest gossip on the ham bands, interviews with radio amateurs around the world, propagation forecasts, and discussions of the latest technical news of interest to radio amateurs and shortwave listeners.

The broadcasts, in the *English* language, are written and voiced by Bill Leonard, W2SKE. Gene Kern, W2BAK, produces the program, and propagation forecasts are by Bill Dulin, W4ETT, and George Jacobs, W3ASK.

The distinctive QSL card of the VOA is available for exchange with listeners of the Ham Show, and W2SKE and the gang are looking forward to receiving QSL cards from radio amateurs and shortwave listeners *everywhere*. Listeners may forward their QSL cards to: Either of the following addresses.

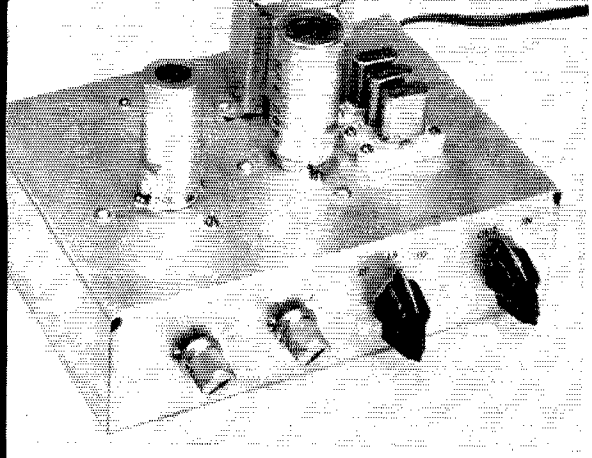
Bill Leonard
Post Office Box #29
Geneva 12, Switzerland

or

Amateur Radio
Box 922
Washington 4, D. C.

The world-wide broadcast schedule for the VOA Amateur Radio Program, effective Sunday, April 3, 1960 is as follows:

TIME (GMT)	*TIME (EST)*	*KC.*	*STATION*	*BEAM*
2115–2130 (Sunday)	4:15–4:30 P.M. (Sunday)	1259	Courier, Rhodes	Middle East
		3980	Munich, Germany	Europe
		6185	Munich, Germany	Europe
		7260	Courier, Rhodes	Middle East
		9520	Salonika	Europe
		9530	Courier, Rhodes	Middle East
		9620	Tangier, Morocco	Europe
		9635	Munich, Germany	Middle East
		11760	Munich, Germany	E. Africa/ Middle East
		15205	WDSI, USA	Europe
		17740	WLWO, USA	West Africa
		21565	WDSI, USA	Europe
		21610	WLWO, USA	West Africa
		7155	Okinawa	East Asia
		9700	Manila	East Asia
		11800	Manila	East Asia
		17770	KCBR, USA	East Asia
		21740	KCBR, USA	East Asia
		25630	KCBR, USA	East Asia
2215–2230 (Sunday)	5:15–5:30 P.M. (Sunday)	173	Munich, Germany	Europe
		1196	Munich, Germany	Europe
		1259	Courier, Rhodes	Middle East
		3980	Munich, Germany	Europe
		6185	Munich, Germany	Europe
		7260	Courier, Rhodes	Middle East
		9520	Salonika	Europe
		9530	Courier, Rhodes	Middle East
		9620	Tangier, Morocco	Europe
		9635	Munich, Germany	Middle East
		11760	Tangier, Morocco	East Africa/ Middle East
		11875	Tangier, Morocco	Europe
		11800	Manila	East Asia
		11890	Philippines	East Asia



The completed converter ready for use, The controls on the chassis front, from the left, are r.f. tuning, mixer tuning, band switch, and on-off switch. On top of the chassis, the 6AK5 is at the left, the 6U8A is in the center, and the crystals are at the right. The power transformer, T_1, is behind the 6U8A.

Improving Performance of Low-Cost Receivers

BY LEWIS G. McCOY,* W1ICP

A Crystal-Controlled Converter for 14 Through 28 Mc.

THE newcomer in ham radio often is more concerned with price than performance when purchasing his first receiver, but it doesn't take him long to discover that although his low-cost receiver does a fair job on 80 and 40 meters, it leaves much to be desired on the higher bands. Such receivers are usually lacking in adequate sensitivity, tuning rate, and bandspread. However, if the receiver is satisfactory on 80 meters this same performance can be obtained on the higher bands by using a crystal-controlled converter.

A converter usually consists of a single stage of r.f. amplification, a mixer and an oscillator. Signals arriving from the antenna are amplified in the r.f. stage, fed to the mixer, converted to another frequency, and then passed on to the receiver. When the converter oscillator is crystal-controlled the receiver operates as a tunable intermediate-frequency amplifier. This may sound like Greek to the newcomer, and if so, it is recommended that the reader study the receiver chapter of *The Radio Amateur's Handbook* for detailed information on how a converter works.

Circuit Details

The circuit of the converter described in this article is shown in Fig. 1. A 6CB6 is used as the r.f. amplifier. To avoid the complexities of band switching, its grid circuit, C_1L_2, is designed for continuous coverage from 14 Mc. to 29.7 Mc. The output of the r.f. stage is fed to the mixer, the pentode section of a 6U8A. The mixer grid circuit, C_2L_4, is similar to the r.f. stage grid circuit in that it covers the three bands by tuning C_2. A double-pole, three-position switch, S_2, is used for band changing in the crystal oscillator, which uses the triode portion of the 6U8A. One section of the switch selects the proper crystal and the other section changes the capacitor across L_5, the tank coil of the oscillator.

A three-pole, two-position switch, S_1, is used for on-off switching. In the "out" position the antenna is connected directly through the converter, from J_1 to J_2. This makes it possible to use the receiver in the normal way, without removing the converter from your receiving setup. When S_1 is set to the "in" position the power transformer is turned on, the antenna is connected to L_1 in the r.f. amplifier, and the plate circuit of the mixer is connected to J_2.

A selenium-rectifier power supply is used to power the converter. However, before building the converter, it would be wise to check the circuit of your receiver as some units provide power take-offs for just such items as converters, and you may not need the power supply. Power requirements are 100 to 200 volts d.c. at about 15 ma. and 6.3 volts a.c. at 0.75 amp.

Construction Details

The converter shown in the photos is built on a 2 × 5 × 7-inch aluminum chassis. Most of the construction is simple, although a few precautions should be taken.

Note in the bottom view how the coils are mounted. All three should be installed with their axes at right angles to each other. L_2 and L_4 are so mounted in order to minimize coupling between the grid and plate circuits of the 6CB6; otherwise the r.f. stage might oscillate. A metal shield, 1¾ by 3½ inches, is installed between these two circuits to further reduce unwanted coupling. The shield should be mounted so that it crosses the 6CB6 socket between Pins 2-3 and 5-6. Solder the metal pillar in the center of the socket to the shield. The object is to shield Pin 1, the grid, from Pin 5, the plate. Flashing copper or any metal that can be soldered can be used for the shield.

Lengths of RG-58/U are used to connect J_1 and J_2 to the terminals on S_{1A} and S_{1B} in order to minimize stray pickup. These cables run along

* Technical Assistant, *QST*.

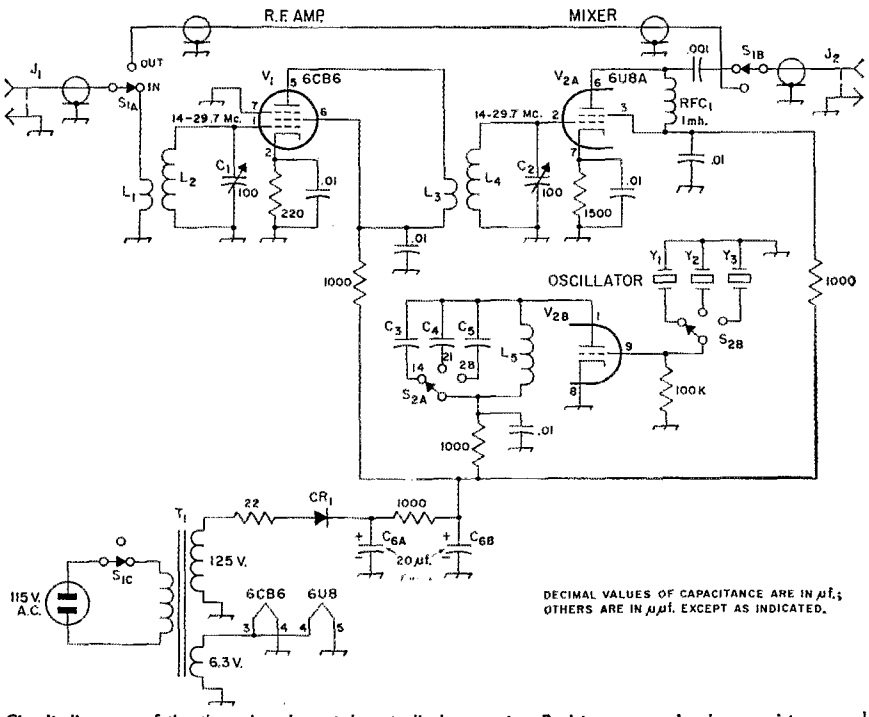


Fig. 1—Circuit diagram of the three-band crystal-controlled converter. Resistances are in ohms; resistors are ½ watt. Capacitors not specified below are disk ceramic.

C_1, C_2—100-μμf. variable capacitor (Hammarlund MAPC-100-B).
C_3—150-μμf. mica (14 Mc.).
C_4—47-μμf. mica (21 Mc.).
C_5—15-μμf. mica (28 Mc.).
C_6—20-20-μf. 250-volt electrolytic.
CR_1—65-ma. 130-volt selenium rectifier (Federal 1002A).
J_1, J_2—Phono jacks.
L_1–L_4, inc,—See Fig. 2.
L_5—9 turns, same coil stock as L_1–L_4.
RFC_1—1 mh. (National R-50, Millen 34300-1000).
S_1—Phenolic rotary, 1 section, 3 poles, 3 positions, two positions used (Centralab PA-1007).
S_2—Phenolic rotary, 1 section, 2 poles, 3 positions, (Centralab 1472).
T_1—Power transformer; minimum ratings: 125 volts, 15 ma.; 6.3 volts, 0.75 amp. (Knight 61G411, Triad R2C).
Y_1, Y_2, Y_3—14 Mc.: 10,500 kc.; 21 Mc.: 17,500 kc.; 28 Mc.: 24,500 kc.; see text (International Crystal Type FA-9).

the front fold of the chassis, as close inspection of the bottom view will show. The outer conductor of the cable should be soldered to the ground lugs on J_1 and J_2, and to grounded soldering lugs installed at S_1.

Making the Coils

Fig. 2 shows the details of the coils. If you are careful in cutting the coils from the original piece of coil stock you'll only need a 3-inch length of stock to make all three coils. One simple method of cutting through the coil support bars is to heat a razor blade and slice through the insulation. If you attempt to cut the bars with a saw you will deform the coil.

The r.f. and mixer coils are mounted on terminal strips as shown in Fig. 2. L_5 is mounted between the pole terminal on S_{2A} and Pin 1 of the 6U8A.

Testing

The first step in testing the converter is to see if the oscillator is working. If you have a general-coverage receiver the simplest method is to turn on the converter and your receiver and listen for the signal from the oscillator while tuning around the crystal frequencies listed in Fig. 1.

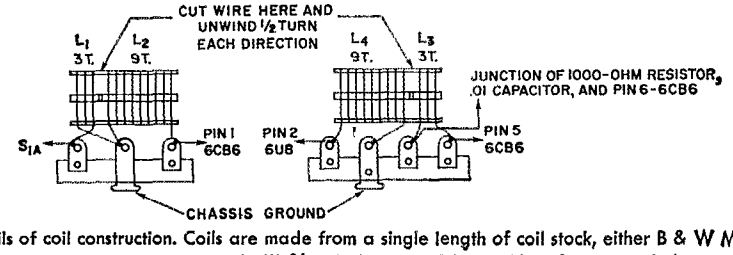
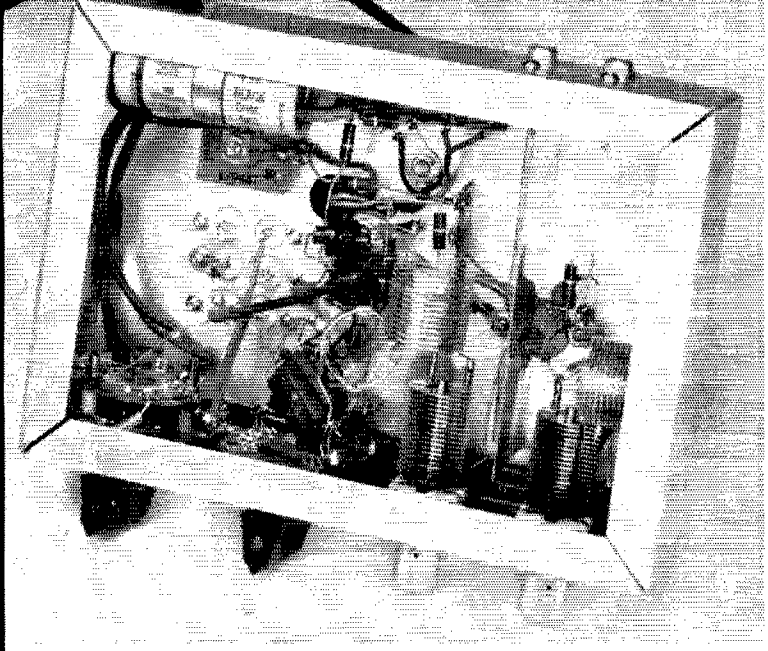


Fig. 2—Details of coil construction. Coils are made from a single length of coil stock, either B & W Miniductor 3011 or Illumitronic Air Dux 616T, ¾-inch diameter, 16 turns No. 20 wire per inch.



This is a bottom view of the "works." The input circuit, L_2C_1, is at the right-hand side in this view. It is separated from the mixer circuit, $L_3L_4C_2$, by the shield partition. The switch at the left front corner is S_1. The power-supply components are mounted along the rear (top) edge of the chassis. J_1 and J_2 are at the upper right on the back wall of the chassis. L_5 is end-on in this view, just below the socket for the 6U8A.

If your receiver doesn't cover the crystal oscillator frequencies a high-resistance d.c. voltmeter can be used for checking. Connect the positive test lead from the voltmeter to chassis ground and the negative lead to the grid, Pin 9, of the 6U8A. Use an r.f. choke, 2.5 mh. or 1 mh., in series with the test lead at the grid. If the oscillator is working the voltmeter will show a reading of a few volts. If you cannot get a reading, check the plate voltage (Pin 1) which should be somewhere near 100 volts. Should you find that the oscillator doesn't work even with plate voltage present, carefully check your wiring for errors. Also, make sure you have the correct value of capacitor across L_5.

Next, connect the converter, from J_2, to your receiver with a length of coax line, either RG-58/U or 59/U. It is important that you use shielded line to connect the converter and receiver together; with unshielded wire you are likely to pick up signals on the 3.5-Mc. band, which will interfere with the signals on the band you want to receive. Connect your antenna to J_1 and you are all set to use the converter.

With the crystal oscillator frequencies listed in Fig. 1, the low-frequency edge of each band will start at 3500 kc. If you don't mind having your receiver tune "backwards" it is possible to use a single crystal for both 21 and 28 Mc. In such a case, the crystal frequency would be the same — 24,500 kc. — as already specified for 28 Mc. With this crystal you can tune your receiver from 3500 to 5200 kc. to cover 28.0 to 29.7 Mc., and from 3500 to 3050 kc. for 21 to 24.5 Mc.

Set your receiver to approximately 3750 kc. and switch the converter for 14-Mc. reception. Set C_1 and C_2 near maximum capacitance — plates about two-thirds meshed — and listen for an amateur signal. You may have to try several settings of C_1 and C_2, because the tuning of these controls is quite sharp. Once you locate a signal, peak the two capacitors for maximum signal strength and make a note of the capacitor settings so you can return to the same point when changing bands. Follow the same procedure for 21 and 28 Mc. C_1 and C_2 will be very near minimum capacitance for 28 Mc. and only slightly more for 21 Mc. Don't be discouraged if you don't get the correct settings at the first try; as we said, the tuning of the two capacitors is quite sharp. That's why it's important to mark the settings. Incidentally, if your receiver has an antenna trimmer on it the trimmer should be peaked for each band.

A single setting of the controls is usually sufficient to cover the c.w. portion, about 200 kc., of any of the three bands. You'll probably have to repeak the controls when going from one end of a band to the other.

If you are just getting started and haven't purchased a receiver as yet, you would be smart to consider the converter described here in conjunction with the BC-454, a surplus receiver.[1] The BC-454 is still available on surplus and is a unit that tunes from approximately 3 to 5 Mc. A companion unit, the BC-455, covers the 7-Mc. band. These two receivers, along with the converter described here, make a receiving combination that is pretty hard to beat for good performance at low cost. QST

[1] McCoy, "Getting Started with the BC-454," *QST*, January, 1959.

MEMBERSHIP CHANGES OF ADDRESS

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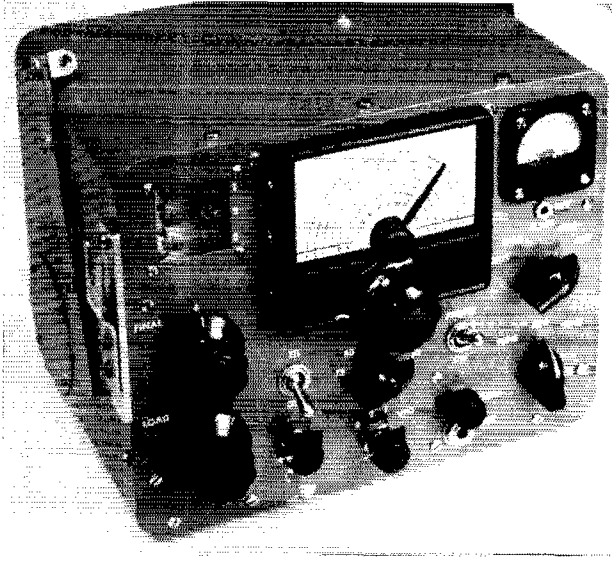


This 50-watt transmitter, including v.f.o. and plate modulator, occupies less space than an 8-inch cube. Controls along the bottom, from left to right, are for output loading, excitation, v.f.o./crystal switch, microphone and audio gain, and the send/receive switch. In the similar row above are the output tank capacitor, filament switch, bandswitch, phone/c.w. switch and meter switch. The key jack is below the 1½-inch meter. The v.f.o. dial is a Millen 10039. Crystals may be plugged into the recessed sockets at the upper left.

Compact Unit
Covering 80-10 Meters

BY GEORGE G. SYMES, JR.,* KØEMK,
ex-W1EFM

50 Watts—Mobile

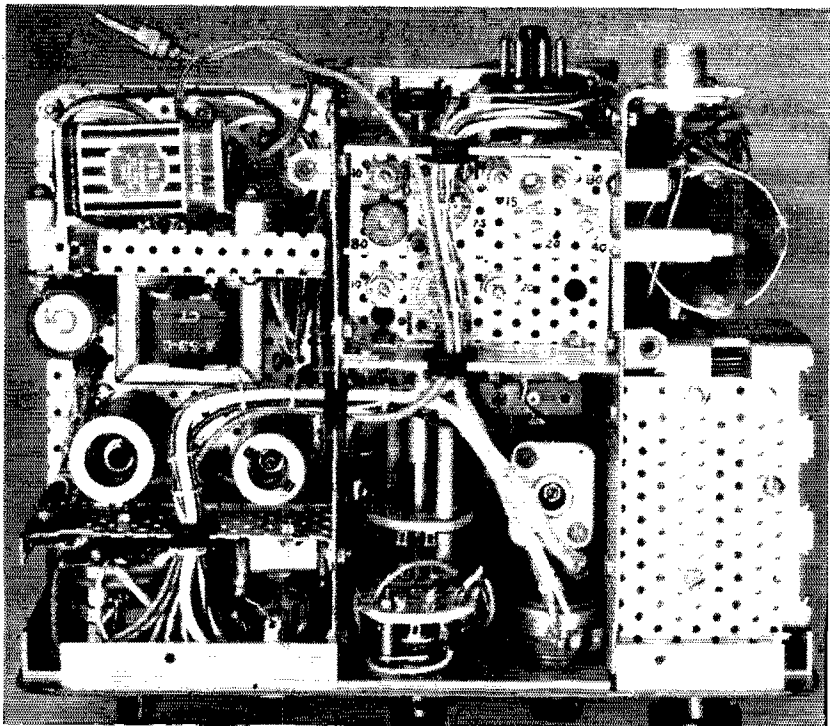
Sectionalized construction eases the pain of assembling this ultracompact mobile unit which may be quickly removed from the car for home-station use. The design includes several features often sacrificed in reducing bulk and weight.

THE transmitter described here was designed as a space-saving replacement for a commercially-made transmitter. The latter's performance was excellent, but it took up just too much room. While getting the size down to 409 cubic inches — smaller than almost any of the comparable manufactured rigs — it has also been possible to include features desired for full flexibility. A summary will show that it is no stripped-down affair:

1) 50 watts, band-switching, 80 through 10 meters, utilizing fully an existing power supply rated at 500 volts, 200 ma. and 250 volts, 100 ma.

2) A self-contained package (except for antenna relay) measuring 7 by 9 by 6½ inches deep that fits nicely between dashboard and transmission hump in a 1957 Chevvy, and which can be removed in a few minutes for use in the home station.

*610 West 58 Terrace, Kansas City 13, Missouri.



Bottom view, showing modulator at the left, exciter center, and final amplifier right. The tubes at the left, below the driver transformer, are the speech amplifiers. The shielded v.f.o. coil is in the lower center compartment to the right of the front portion of the bandswitch, which is partially hidden by the crystal/v.f.o. switch close to the panel. The potentiometer below the v.f.o. coil is the excitation control. Trimmer capacitors and adjusting screws of the slug-tuned coils in the exciter are visible in the upper center section.

July 1960

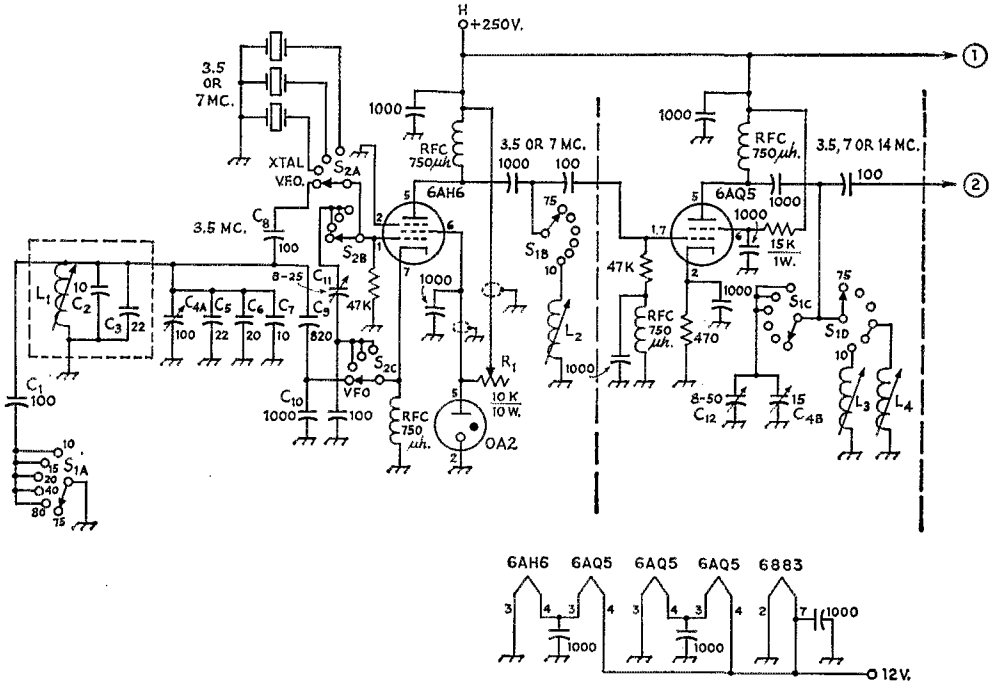


Fig. 1—Circuit of the compact mobile transmitter. Capacitances less than 0.01 μf. are in μμf. and resistances are in ohms Resistors are ½-watt unless indicated otherwise. Unless listed below, fixed capacitors of 100 μμf. are mica; all others are disk ceramic. Lettered terminals connect to the similarly-labeled terminals of Fig. 3.

C_1—Zero-temp. coefficient (Erie TCO-100).
C_2, C_7—Neg.-temp. coefficient N750 (Erie TC7-10).
C_3, C_5—Neg.-temp. coefficient N300 (Erie TC3-22).
C_4—100-μμf. variable (C_{4A}) (Hammarlund MC-100-S ganged with dual 15-μμf. variable (C_{4B}, C_{4C}) (Hammarlund HFD-15-X).
C_6—Neg.-temp. coefficient N750 (Erie TC7-20).
C_8, C_9, C_{10}—Silver mica.
C_{11}—Neg. temp. coeff. ceramic (CRL 823-EN).
C_{12}, C_{13}, C_{14}—Ceramic trimmer.
C_{15}—250-μμf. variable (Hammarlund MC-250-M).
C_{16}—1100-μμf. variable (triple-gang b.c. replacement type, 365 μμf. per section, sections in parallel).
J_1—Miniature closed-circuit jack.
J_2—Phono jack.
J_3—Chassis-mounting coax receptacle (SO-239).
L_1—Approx. 3.5 μh.—20 turns No. 18 on ½-inch ceramic iron-slug form (Burnstein-Appleby Cat. No. 18B120 form or equiv.), or approx. 25 turns on ⅜-inch form (Miller 4400 form).
L_2—(7 Mc.)—Approx. 10 μh.—55 turns No. 26.
L_3—(14 Mc.) Approx. 1.5 μh.—12 turns No. 18.
L_4—(7 Mc.)—Approx. 6 μh.—40 turns No. 26.
L_5—(28 Mc.)—Approx. 0.2 μh.—4 turns No. 18.
L_6—(21 Mc.)—Approx. 0.5 μh.—6 turns No. 18.
L_7—(14 Mc.)—Approx. 1.5 μh.—12 turns No. 18.
L_8—(7 Mc.)—Approx. 6 μh.—40 turns No. 26.
L_9—(3.5 Mc.)—Approx. 10 μh.—60 turns No. 26.
Note: L_2 through L_9 are close-wound with enameled wire on ⅜-inch iron-slug forms (Miller 21A000RB1 form or equiv.).
L_{10}—5 turns No. 14, ¼-inch i.d., ⅜ inch long.
L_{11}—23 turns No. 14 at 12 turns per inch and 8 turns at 6 t.p.i., 1½-inch diam., tapped at 11, 18½, 23 and 26 turns from output end (Airdux 1212D6).
P_1—Phono plug.
R_1—Adjustable-slider type.
R_2—Linear-taper potentiometer (ohmite CU2541).
S_1—7-pole 6-position ceramic rotary switch (6 Centralab PA-3 sections on type 302 index shaft assembly, plus one section pulley-driven, see text, only one of two poles per section used).
S_2—3-pole 4-position ceramic rotary switch (Centralab PA-2007, 4 of 5 positions used).

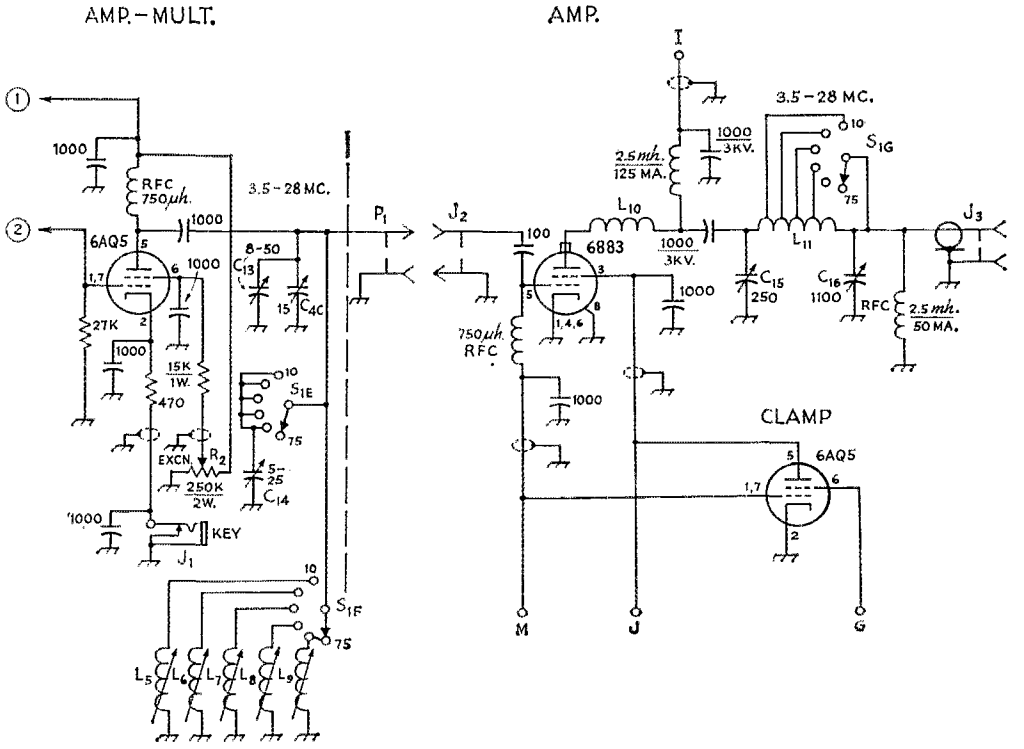
3) A built-in stable v.f.o. (or optional crystal control) is gang-tuned with the exciter stages to maintain constant drive over each band and to minimize the adjustments necessary when changing frequency.

4) Ample modulator power to permit a measure of "Ultra" modulation with means for limiting distortion and splatter.

5) Phone/c.w. switch, excitation control, clamp-tube protection, and r.f. output metering, which are desirable but not generally found in mobile rigs.

The only thing lacking is a panel light for which there was no room, but an outboard light has been rigged.

The size was finally determined by an aluminum case found in a surplus tool store (it was an old refrigerator container), and the project boiled down largely to figuring out how to squeeze the desired circuitry into the space available. It required a good deal of planning and layout work, and departing from the usual flat-chassis construction. The exciter, audio, and final stages were made up as separate units, so as to take



advantage of every bit of space. It is not the most convenient arrangement for servicing, but it does provide complete shielding and, after preliminary adjustment, there has been absolutely no evidence of r.f. or audio instability.

Circuitry

The circuits are quite standard and should be familiar to readers of *QST* and the *Handbook*. As shown in Fig. 1, a 6AH6 is used as a high-C v.f.o. or may be switched by S_2 to any one of three crystals (80- or 40-meter) in a grid-plate cirtuit. Space restrictions dictated a small v.f.o. coil, and so a surplus unit in a shield can having a ceramic ½-inch diameter form with a tuning slug was used. An 0A2 regulator tube keeps a steady 150 volts on the v.f.o. screen, and secure mounting of the frequency-determining components, along with heavy leads, makes it possible to maintain a high degree of stability even while in motion.

The basic v.f.o. range is 3725 to 4000 kc., covered by the 100-$\mu\mu$f. variable, C_{4A}. For operation on 3500 to 3750 kc. and the higher-frequency bands, 100 $\mu\mu$f. of additional fixed capacitance, C_1, is switched across the coil by S_{1A}, a section of the band switch, S_1. This assures good bandspread on the higher-frequency ranges. The v.f.o. output is untuned except for 10-meter operation where a coil resonating at 40 meters is introduced in the circuit by S_{1B}.

The second stage is a 6AQ5 which operates as an untuned buffer for 75-, 80-, and 40-meter operation. For 20-, 15-, and 10-meter output, S_{1C} cuts in the variable capacitor C_{4B} and its trimmer C_{12}, and S_{1D} selects either a 40-meter coil, L_4, for 20- and 15-meter operation, or a 20-meter coil, L_3, for 10-meter operation. Cathode bias is used on this stage.

The driver — another 6AQ5 — is tuned to the output frequency on all bands. C_{4C}, its trimmer C_{13}, and the 75-meter coil L_9 are adjusted to track over the 75-meter band. For 80 meters and the other bands, an additional trimmer, C_{14}, is added to the circuit by S_{1E}. This shifts the basic range, just as in the case of the v.f.o. The trimmer is adjusted to peak the 80-meter output, and the higher-frequency coils are adjusted to give peak drive to the final on their respective bands. Adjusted in this way, the circuits seem to track very accurately. The 250K variable resistor, R_2, in the screen is used as an excitation control, and the cathode connection is taken, via a shielded lead, to a miniature jack on the panel for keying.

The exciter is capacitively coupled to a 6883 (12-volt 6146) which uses a standard pi-network output circuit adjustable to 52 ohms. Protection against excitation failure, or when keying the driver, is provided by a 6AQ5 tetrode-connected clamp tube. Bandswitching in the final is accomplished by driving a separate switch wafer, S_{1G}, in the final-amplifier compartment through a string drive from the shaft of $S_{1A\text{-}F}$.

The modulator circuit of Fig. 2 uses a 12AX7 speech amplifier (circuit connections are shown for a dynamic mike), a 6C4 driver, and a pair of 807Ws in Class AB_1. These tubes are similar to the 807, but considerably smaller and available inexpensively in surplus. Battery bias is used,

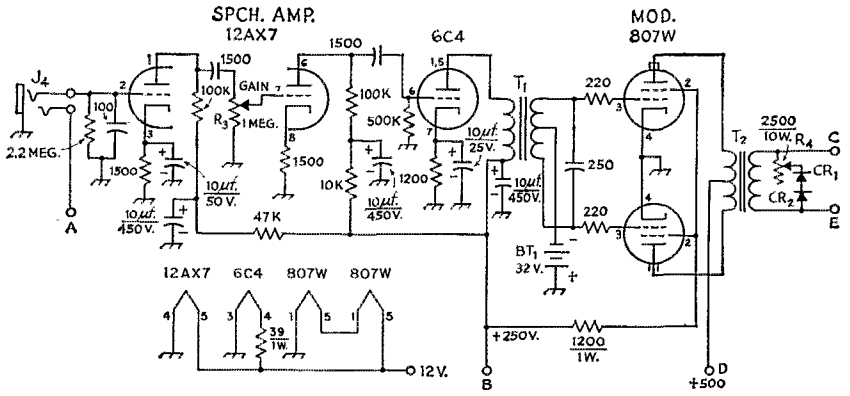


Fig. 2—Circuit of the modulator. Capacitances are in μμf., resistances are in ohms, and resistors are ½-watt composition unless indicated otherwise. Capacitors marked with polarity are electrolytic; others can be paper or ceramic.

CR_1, CR_2—Silicon diode 360 p.i.v., 150 ma. (Sarkes-Tarzian M-150 or 1N1084).
J_4—Double-circuit microphone jack.
R_3—Audio-taper potentiometer.
R_4—Adjustable-slider type.
T_1—Interstage audio transformer, 1:3, single plate to p.p. grids (Stancor A-53-C).
T_2—Modulation transformer, 30 watts, 8200 ohms, c.t., to 5000 ohms (Stancor A-3892).

with a miniature 22.5-volt unit giving shelf life.

The rated output of the modulator is about 40 watts, which is more than required for 100 per-cent modulation at 50 watts input. To take advantage of the reserve audio power, a simplified form of "Ultra modulation" [1] is used. This is accomplished through use of the diode and resistor across the secondary of the modulation transformer. On the negative half of the output audio cycle, the modulator works into a lower-resistance load and therefore the modulator output voltage is less on the negative half of the cycle than it is on the positive half. With the resistor adjusted properly, the positive swing can be increased somewhat beyond the 100-per-cent point without running into cut-off on the negative swing. The resistor is set just below the point where distortion or splatter is detectable.

Control Circuitry

The control wiring, shown in Fig. 3, may appear complex, but it is designed to do a number of things other than just close the power relay. Part of it grew out of the fact that a good six-pole three-position switch was on hand.

In the "receive" position, all +B and control leads are open, so that the transmitter shuts off at once, without the characteristic "hang-over" that often occurs when power is switched off ahead of the filter.

In the "tune" position, +B is fed to the exciter only, with the final plate and screen and speech amplifier not energized. However, the push-to-talk lead is closed, closing the power-supply relay.

In the "send" position, all +B leads are closed, and the antenna change-over relay is also energized. In this position, full push-to-talk control is maintained. For mobile operation, auxiliary contacts on the antenna change-over relay are in series with the +B leads at the points marked "X", so that power to the transmitter is cut with push-to-talk operation. The low-voltage terminal to pin No. 5 is not broken so that low voltage may be applied to the exciter with S_4 in the "tune" position.

Fig. 3 shows alternative low-voltage connections. When low voltage is obtained from a high-voltage supply through a dropping resistor, the connections shown in the detail at the lower left may be used. There is enough difference in the current drawn by the exciter in the "tune" and "transmit" positions to cause a considerable change in voltage if a single value of series resistance is used. This can be compensated for by having two taps on the series resistor as shown, the taps being adjusted to provide a constant voltage in the two switch positions.

Metering

A 0–1-ma. meter is shunted appropriately to read final-plate, final-grid, exciter plate or modulator plate current. The meter switch, S_6 has a fifth position, labeled "Output." With the switch in this position the meter reads the voltage across the transmission line, as developed through a voltage divider and rectifier right at the antenna relay (see Fig. 4). Such an indicator has been used in the fixed and mobile setups in our station for years and it is one indicator that we monitor continuously. It's the one method which leaves no doubt that you're tuned up for peak output. The meter shunts were made from fine wire taken from surplus coils, wound over small 1-megohm resistors. The cut-and-try method of adjustment was used.

Construction

The three units are constructed on separate

[1] Allen, "The Ultra Modulation System," *QST*, October, 1956.

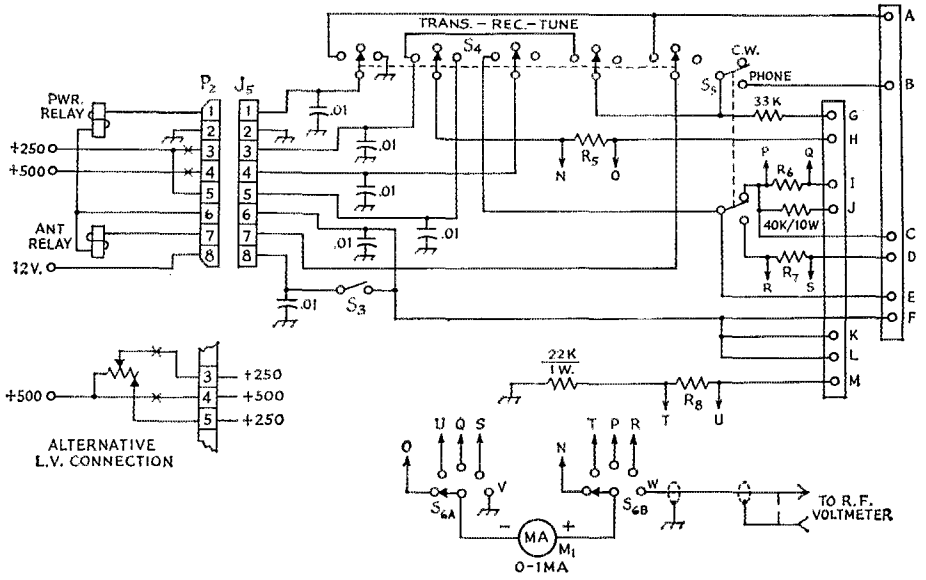


Fig. 3—Control and metering circuits. Resistances are in ohms and resistors ½-watt composition unless otherwise indicated. Capacitances are in μf. and capacitors are ceramic.

J_5—Chassis-mounting male octal connector.

M_1—Miniature 0–1-ma. d.c. meter.

P_2—Female octal plug.

R_5—Meter shunt adjusted to give full-scale reading of 100 ma.

R_6, R_7—Meter shunt adjusted to give full-scale reading of 200 ma.

R_8—Meter shunt adjusted to give full-scale reading of 10 ma.

S_3—Filament switch–s.p.s.t. toggle.

S_4—6-pole 5-position rotary switch, 3 positions used (Centralab PA-2021).

S_5—D.p.d.t. toggle switch.

S_6—2-pole 6-position rotary switch, 5 positions used (Centralab PA-2003).

Terminal identification:

A—P.t.t.
B—+250 v. to speech amplifier.
C, E—Modulator output.
D—+500 v. to modulator.
F—12 v. to modulator filaments.
G—Voltage to clamper screen.
H—+250 v. to exciter.
I—+500 v. to final amp.
J—Screen voltage to final amp.
K—12 v. to exciter filaments.
L—12 volts to final filament.
M—Grid leak to final amp.
N-O—Exciter plate current.
P-Q—Final amp. plate current.
R-S—Modulator plate current.
T-U—Final grid current.
V-W—R.f. output.

foundations and secured to each other and the panel in final assembly. The power leads to r.f. and audio sections go to separate terminal strips behind the front panel, as indicated in Fig. 3, where common connections are made.

The center unit — the exciter — includes the tubes and variable-capacitor gang-mounted on top, and the clamp tube mounts horizontally from a bracket over the doubler-driver tuning capacitors. Underneath, each stage is separated by a shield which also serves as a support for the bandswitch and contributes to the over-all rigidity of the assembly. The front subpanel of the exciter also carries the filament switch, S_3, excitation-control potentiometer, R_2, and the crystal/v.f.o. switch. The v.f.o. coil with its shield is mounted underneath on ceramic pillars to get it away from the tube heat which was so noticeable in top-side mounting.

The 6-inch Centralab band-switch index assembly is long enough to extend through the rear shield, and the end of its shaft carries a small pulley for the string-drive connection to the final-stage switch. The leads to the taps on the final could probably have been extended to a switch wafer on this rear shield, but it was desired to maintain short leads and keep r.f. out of

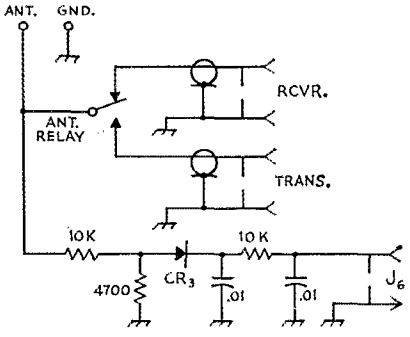


Fig. 4—Diagram showing circuit of the r.f. voltmeter rectifier and its connection to the antenna change-over relay. Resistances are in ohms and resistors ½ watt. Capacitances are in μf. and capacitors are ceramic. CR_3 is a 1N34A diode and J_6 is a phono jack.

the exciter compartment as much as possible. The octal power connector is also mounted on this rear wall, and all leads are bypassed with 0.01-μf. ceramic capacitors at this point.

Components for each stage are mounted right at the tube sockets. The key lead to the jack on the panel is shielded as is the screen lead to the excitation control and also the leads to the dropping resistor for the 0A2 voltage regulator. This resistor is mounted on top of the chassis.

The 6AQ5 coils and trimmer capacitors are mounted on a shelf underneath secured to the interstage shields. The coils are clustered in the space around the band-switch wafers. There is very little space between coils, and between the coils and shield. There is a noticeable drop in final grid current when the end shield is placed in position. That is one reason for selecting 6AQ5s, rather than smaller tubes, as drivers. On 10 and 15, final grid current goes up to a maximum of about 2.5 or 3 ma., whereas the output meter shows that a grid current of 1.8 to 2.0 ma. gives the most output. Beyond this, output begins to fall off. The drive available on the lower-frequency bands is considerably higher.

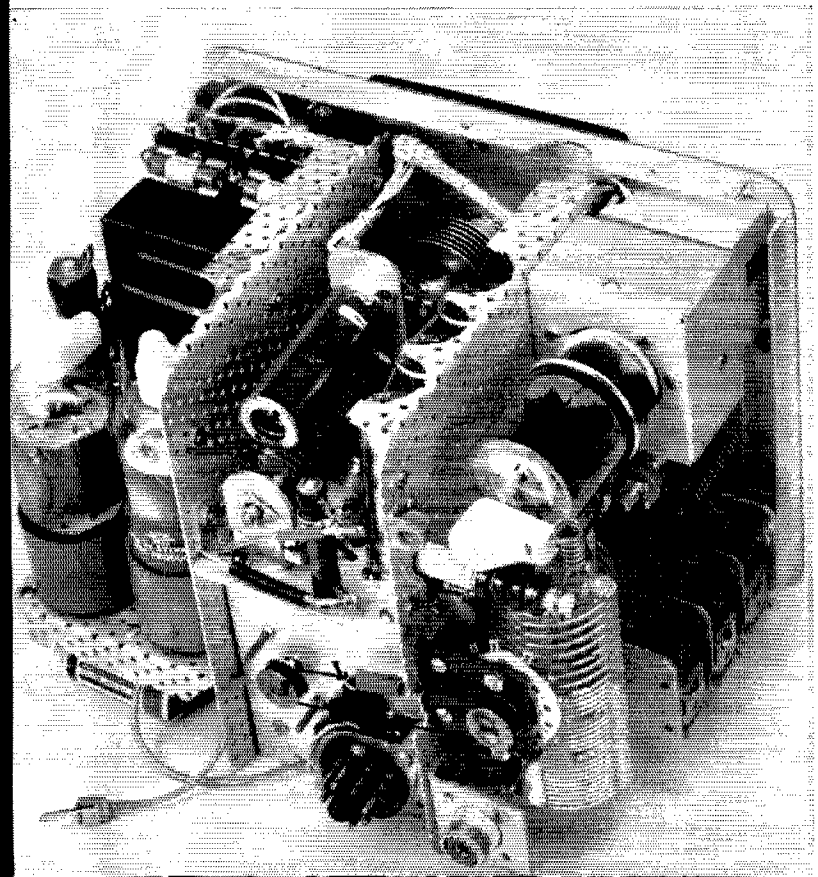
The 6883 stage is mounted on the vertical partition between the exciter and final. The tube socket is mounted in a cut-down Minibox. Power leads are brought out through a grommetted hole, and are made of shielded wire. A phono jack is mounted so r.f. input can be taken from a short coaxial lead from the second 6AQ5. This provides complete shielding of input and output circuits and the 6883 shows no instability at all.

Space limitations and a symmetrical panel layout required mounting the crystal socket on the amplifier section of the panel. A small box was made to shield the crystal socket. Leads go through to the oscillator section and through its chassis to the v.f.o./crystal-selector switch. These leads are quite long, and the reduction in output from some crystals may become apparent, and more careful adjustment of the crystal-oscillator components may be necessary. Aside from this, the mounting of the final-amplifier components should be evident from the photos. The band-switch section is mounted on a bracket with a short drive shaft carrying the mate to the pulley on the main bandswitch shaft.

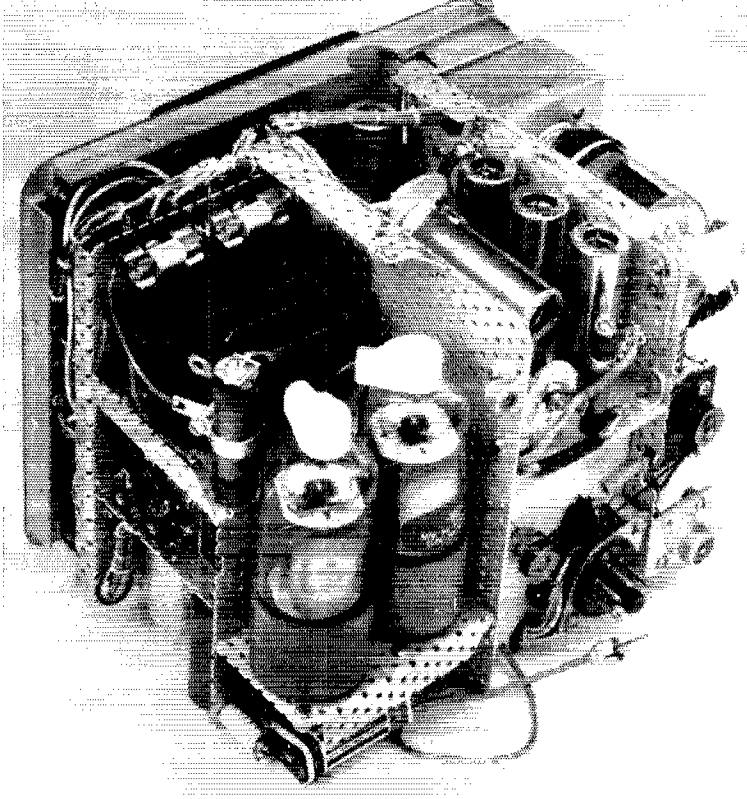
The modulator unit has the speech tubes and driver transformer mounted underneath, and the circuit components are mounted in the middle compartment. Speech-amplifier output comes out of this compartment, through the driver transformer, and then to the modulator grids which are shielded from the rest of the unit. The modulation transformer (origin unknown) is mounted on top, providing short leads to the modulator plates.

The front wall of the modulator unit shields it from the various power leads and switches on the front panel. The gain control is mounted on this panel and its shaft projects through a bushing on the front panel.

The 1½ inches of space between the front panel and modulator unit is just sufficient to accommodate the meter, switches, and wiring, requiring some care in layout to eliminate any interference.



This rear view shows the arrangement of components in the final amplifier. A small box shields the socket of the 6883. The smaller box against the panel encloses the crystal sockets. A portion of the tank capacitor can be seen above the 3-gang loading capacitor below. The amplifier bandswitch is driven by a spring-loaded dial cord from the end of the shaft of the exciter band switch protruding from the center compartment. The tube mounted horizontally above the exciter tuning gang is the clamper tube.



Another rear view showing the modulation transformer and tubes. The negative peak-limiting diodes are mounted above the transformer. This view also shows the exciter tubes with the v.f.o. tube close to the panel, followed by the 0A2 voltage regulator and the two frequency multipliers. The shielded lead terminated in the phono plug goes to the r.f. voltmeter circuit at the antenna relay.

Adjustment

Aside from the initial job of pruning the tuned circuits, there was very little difficulty in getting the rig to operate properly. Those troubles that did show up were corrected as follows:

1) Initially a strong, stable and clean oscillation between the two 6AQ5 stages showed up with excitation removed. This was cured by placing a 27K resistor directly between grid and ground of the second 6AQ5 in place of the 750-μh. choke and 47K grid leak originally used.

2) A 1-mh. 300-ma. r.f. choke was first used in the final plate circuit, but it heated up to the point of frying. A 2.5-mh. 125-ma. choke is used. It runs a little bit warm, but does the job satisfactorily, although a 300-ma. choke of the same inductance might be recommended.

3) Audio feedback was encountered initially and it took some time to find the cause. It was tracked to a floating push-to-talk lead that had been forgotten when using a spare mike. Grounding the open lead at the mike plug cured this.

4) The biggest problem was in stabilizing the v.f.o. A great deal of heat is generated in this small space, causing considerable drift. Heat radiated from the tubes and conducted through the chassis reaches the v.f.o. coil and tuning capacitor. After considerable experimenting, most of the drift was found to originate in the tuning capacitor. Negative-temperature-coefficient compensating capacitors were placed right at the capacitor terminals, and the problem seems to have been pretty well solved. On 10 meters, a slight shift occurs in the first 30 seconds of operation, but anything after that is hardly perceptible. This drift is less than 1 kc. and no one comments on it unless asked to check.

Conclusion

This transmitter has been in operation for several months now and has operated with no troubles at all. It seems to get out well, and numerous reports have commented on the excellent audio. With the exception of the case, most of the components are easily obtainable, either new or as surplus. One hint — the case as purchased had solid walls, and an electric drill was quite a timesaver in making the 3000-odd ventilating holes required! QST

FEEDBACK

If you run into trouble with a parasitic oscillation in the h.f. oscillator of the W9BIY-W9IHT receiver (circuit on page 26, May 1960 *QST*) a half-watt composition resistor of the order of 50 to 100 ohms inserted between the control grid of the 6T4 and all other wiring to the grid should cure it. The resistor should be mounted right at the tube-socket grid prong. W9IHT writes that such a resistor was needed in the original model. It may not be needed in "duplicate" versions, however, depending on the exact layout.

Improved Selectivity for Older Receivers

A Low-Cost Half-Lattice Crystal Filter

BY JOHN M. PALMER,* W1SGN

The author writes, "If you try this filter and do not get improved operation, you have made a mistake somewhere." Less than three dollars' worth of surplus crystals does the trick.

GATHER 'round, sidebanders and a.m. men. Here is the answer to your prayers. An inexpensive (cost me $2.75) band-pass filter with continuously-variable selectivity control. Any of the older Hammarlund receivers can be so equipped without any defacing and a minimum of work. The filter can be easily built from scratch for other receivers. Several of these filters have been built and there have been equally smooth and stable results in every case. The filter has an almost perfect flat top and introduces no ringing whatsoever. The variable selectivity makes possible best results on either a.m. or s.s.b.

Crystals

Here is how it is made. Get surplus crystals with channel numbers 49, 50, 51, 52, 53 and 54. These are suitable for a 465-kc. i.f. strip, such as the one in the Super Pro. For a 450-kc. strip (HQ-129X), use crystals with channel numbers 41, 42, 43, 44, 45 and 46. Buy six small plastic crystal sockets and a 3–12-$\mu\mu$f. ceramic trimmer. Now to work.

* Aza Heishinden 1492–3, Namiyanagi, Hanno-shi, Saitama-Ken, Japan.

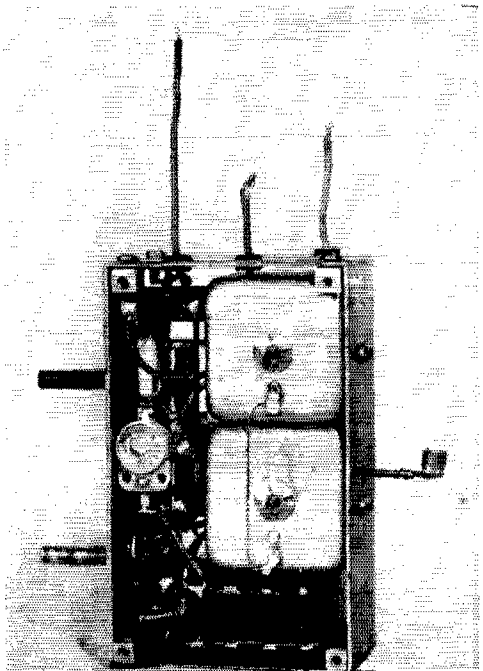
Modification

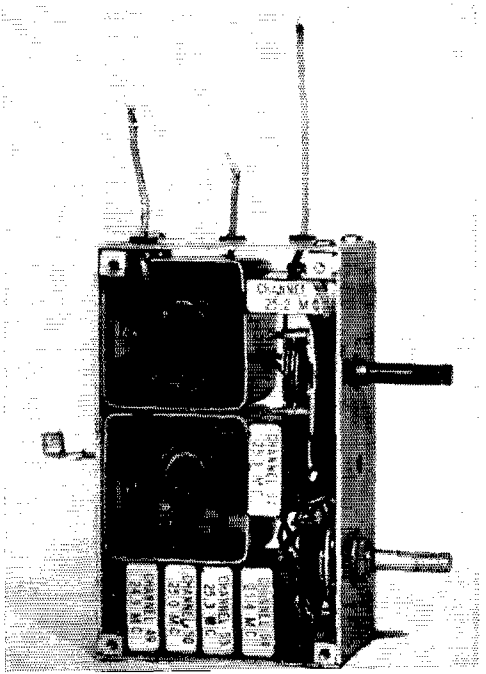
Remove the crystal filter from the receiver. Take off the top and sides. Unsolder and remove the present crystal holder. Remove the mica-compression neutralizing capacitor. With wire cutters clip off the last two of the small resistors on the selectivity switch. These are the 300- and 2000-ohm resistors. Also, remove the wires to the crystal-shorting ("off") part of the switch.

Now take a look at the filter compartment and compare it with the photo of the rebuilt filter. You will notice that the crystals will not fit above the coil can at the top of the filter as shown in the photo. (The unit is inverted in the pictures.) To make room, elongate the mounting holes in the coil cans with a small file and move the coil cans down until the crystals will just fit tightly above. You will find that the remaining two crystals will fit as shown by rearranging the wires. Solder the new resistors (100 and 200 ohms) on the selectivity switch.

Now replace the top of the box. Solder in the new ceramic trimmer as shown in the photo. It is very important that the two series crystals, Y_5 and Y_6, be placed as shown, with the lower-frequency crystal across C_2. If these two crystals are interchanged, the filter will not work!

Side views of the crystal-filter unit. The left-hand view shows the phasing capacitor in the upper right-hand corner. The right-hand view shows the ceramic neutralizing capacitor at mid left. In these views, the unit is inverted in respect to its normal position in the receiver.





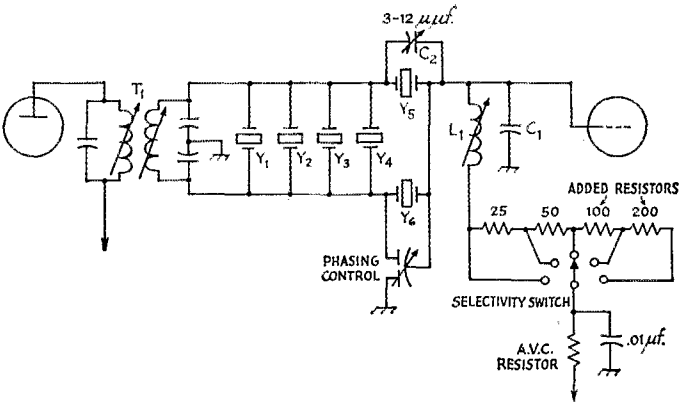


Fig. 1—Circuit of the half-lattice filter replacing the conventional crystal filter found in older-model receivers. The specific application shown is for Hammarlund Super-Pro and HQ-129-X receivers. T_1 and C_1L_1 should be aligned to the midfrequency of filter. Resistances are in ohms, and resistors are ½ watt.

C_1L_1—I.f. circuit following filter (filter output).

C_2—Ceramic trimmer.

T_1—I.f. transformer preceding crystal filter (filter input).

Crystals

	465 kc. I.F.		450 kc. I.F.	
	Freq. (kc.)	Channel No.	Freq. (kc.)	Channel No.
Y_1	461.1	49	446.3	41
Y_2	462.9	50	448.1	42
Y_3	468.5	53	453.7	45
Y_4	470.4	54	455.5	46
Y_5	464.8	51	450.0	43
Y_6	466.7	52	451.8	44

Wire in the crystals as shown in Fig. 1. Check your wiring carefully. While the circuit is simple, the wiring may be very confusing, so double check. To finish up, cement a piece of paper on the inside of the box cover on the crystal-socket side to avoid chance shorting of the socket terminals to the metal case. Now reassemble the box and replace the filter in the receiver.

Alignment

Here is where patience and good work are necessary. Alignment must be perfect. The best way to do the job is with a BC-221 or other very stable generator, using the S meter of the receiver as an indicator. Use an unmodulated generator signal. Let the receiver and generator warm up for a couple of hours. Then roughly align the i.f. transformers following the filter to a frequency midway between the two center crystal frequencies (465.7 kc. for a receiver having a 465-kc. i.f. or 450.9 kc. for a receiver having a 450-kc. i.f. amplifier). If the receiver is a Super-Pro, do not forget to align very carefully the a.v.c. amplifier transformer as you go along — adjust the lower slug (mixer plate) for maximum output.

Now tune the receiver to background noise on the highest-frequency band. Set the phasing control at "two o'clock," the selectivity switch at the third position, and set the neutralizing capacitor for maximum "crystal" sound (a hollow, muffled sound). Next, switch the receiver to a low-frequency band. Set the selectivity switch at the No. 2 position (third switch position) and tune the signal generator very carefully to the receiver frequency. You will notice two decided peaks on the S meter at the band-pass crystal frequencies. Set the signal generator exactly between these peaks and very carefully align the entire i.f. strip, starting with the bottom filter slug. Do not touch the top (first i.f. grid) slug. Repeat this process until alignment is perfect. Always recheck the generator to make sure it is exactly between peaks. Do not forget the a.v.c. amplifier transformer if the receiver is a Super-Pro.

Final Adjustment

When this is finished you come to the most important adjustment of all — at the top slug on the filter can. This adjustment can best be made by ear with the receiver tuned to background noise on the highest-frequency band. Do not use the signal generator. As you turn the slug adjustment you will come to a point where the noise quickly changes from a "crystal" sound to a natural, higher-frequency sound, and then back again. Set this slug precisely on the least-hollow-sounding peak. This adjustment is the one that removes the double peaks on the flat top. If the adjustment is properly made, the S meter will show no peaks whatever when tuning across a signal. The alignment is now finished.

The phasing control is now the band-width control, with the broadest position at "9 o'clock" and sharpest at "2 o'clock." By varying the neutralizing capacitance, the maximum-selectivity position can be placed at any desired point on the phasing-control dial. Best all-around results are obtained with the selectivity switch on the No. 2 and 3 positions, although some of the s.s.b. men may like the sharper positions. The phasing control can also move the two side notches slightly inside the pass band to remove heterodynes or chatter.

If the filter is properly adjusted the improvement in selectivity will be immediately apparent. It makes a new receiver out of the old HQ-129X. QST

How to Make a Sideswiper

It's been a long time since we've heard about the sideswiper or Cootie key, although there are still several around haunting the ham bands. Thought up originally as an inexpensive substitute for the conventional bug, there are many who believe that some of its features cannot be duplicated by either bug or electronic keyer.

Double-Contact Key for Direct or Electronic Use

BY BARNEY STONES,* KØOSA

Do you know what a sideswiper is? Have you ever heard of a Cootie Key? If the answers are "no," you're one of a large majority because it's been a long time since this type of c.w. key reached its peak of popularity and gradually faded into the dim past. And yet, properly made and handled, the sideswiper (Cootie Key was originally a trade name for a manufactured version of the same thing) can still turn out the distinctive kind of code that prompts many who hear it to ask first what's being used, and then (after a hesitating pause indicating they've never heard of it) how it is made. I've had enough questions asked about mine to believe that interest in it has revived.

* 6227 Stillwell, Pine Lawn 20, Missouri.

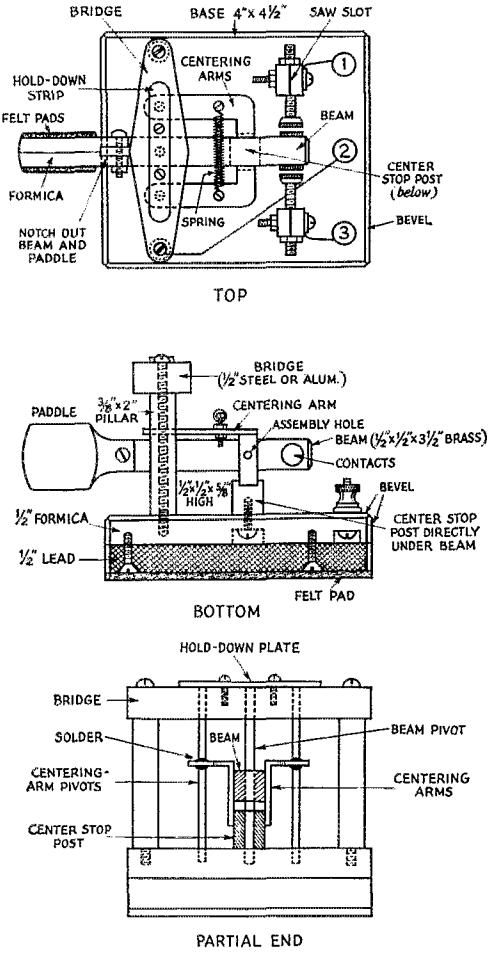


Fig. 1—Top (upper), partial side (center), and partial end (lower) views of the sideswiper. End view is from paddle.

The mechanical design is about the same as you would follow for a switch to control an electronic key. In fact, the sideswiper shown in the sketches can be used for that purpose without alteration. Fig. 1 is drawn approximately to half scale so that dimensions not given can be estimated with accuracy sufficient for the purpose.

Construction

The base is made up of a slab of Formica (canvas-base bakelite) and one of lead of the same dimensions bolted together. A felt pad is cemented to the lead side forming the bottom. The movable contacts are carried on a metal beam turning on a rod pivot riding vertically between a bearing in the base and another in a bridge over the beam. The beam is held central between the two stationary contacts during space intervals of the code by a pair of spring-loaded centering arms also riding on vertical pivots.

Base and Bridge

In constructing the key, lay out and make the base plates first. Screw the lead plate to the Formica plate, and cut both to size at the same time. Remove the lead plate.

Make the bridge top (steel, brass or aluminum)

and drill all holes except those for the centering arms. The two nearest the center hole should be made with a tap drill for 6-32. The end and center holes should be drilled 3/16 inch (+0.010, −0.000). Clamp the bridge to the base plate and, using the bridge plate as a template, spot-drill the center and end holes. Drill the two end holes for a 10-32 tap. The center hole should be drilled ¼ inch deep for easy clearance of the 3/16-inch drill-rod beam pivot shaft. (See Fig. 2A).

Make two pillars of brass or steel tubing that will fit over the 10-32 hold-down screws. These pillars must be square on the ends and of exactly the same length so that the bridge plate will be parallel to the base and not cause the pivot shaft to bind in the bearing holes. The shaft should be perfectly free to move after the spacer screws are tightened. A strip of metal, held down by the two 6-32 screws tapped into the bridge plate, covers the top bearing hole.

Cut the pivot shaft from 3/16-inch drill rod, making it long enough so that it protrudes through the bridge plate while the pivot shaft is sitting in the bottom bearing hole in the base plate. Then file the top end down until it is flush.

Contacts

The beam, stationary-contact posts and center stop post are cut from ½-inch square brass rod. The tongue for the paddle may be cut out with a hacksaw and finished with a file if a milling machine is not available. The paddle pieces are cut from ¼-inch Formica and are faced with pieces of felt cemented on. This makes an enormous difference in the "feel" of the key.

The hole for the pivot rod running through the beam should provide a force fit, or the rod may be soldered in. The beam should be placed on the pivot so that it is midway between the base plate and the bridge plate when the pivot is resting in the lower bearing hole.

The contacts at the end of the beam are soldered on. Large contacts may be obtained cheaply from old motor starters. They may also be fashioned from coin silver.

The center stop post must be accurately centered below the beam. A 10-32 screw tapped into the bottom holds it in place.

Centering Arms

The centering arms are flat angles cut from 1/16-inch brass sheet. The ends of these angles are bent downward so as to bear against the center stop post and the beam simultaneously. These arms are mounted on pivot rods, as shown in the end view of Fig. 1. These rods may be made of any stiff wire of reasonable size, such as coat-hanger wire. To locate the bearing holes accurately in the bridge top plate, use the following procedure.

Using a C clamp, hold the beam, centering arms and center stop post together as illustrated in Fig. 2C. Drill a hole through the beam and the arms as indicated in Fig. 1 (side view). Run a screw temporarily through the hole and fasten it securely with a nut. Now remove the small

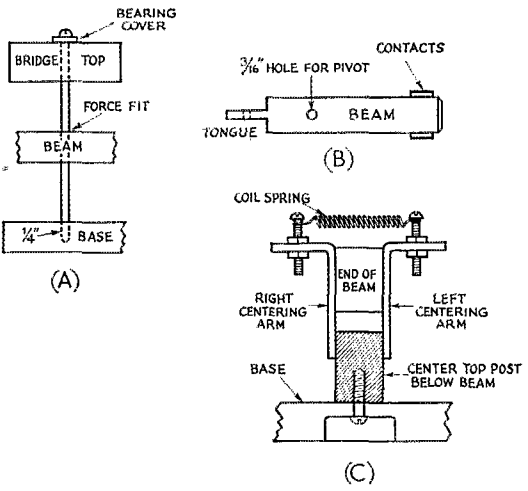


Fig. 2—Sketches showing several details of the sideswiper construction. These drawings are *not* to scale.

plate covering the bearing hole in the bridge plate, and slide the pivot rod upward until the arms are against the bridge plate. The holes in the arms can then be transferred to the bridge plate while keeping the beam at right angles.

The holes should provide a free fit for the pivot rods. After the holes in the bridge plate have been drilled, the bridge should be disassembled while the bridge plate is clamped to the base with previously-drilled holes lined up. Then the centering-arm pivot holes may be transferred to the base, drilling about half-way through the base.

Now reassemble the bridge, and refasten the centering arms to the beam with a screw at the assembly hole. The centering arms can now be soldered to their pivot rods.

Stationary Contacts

The stationary-contact posts are 1¼ inches high. The contact screws are 10-32 flat-head brass, 1¼ inches long. Contacts are soldered onto the heads. The holes for these screws should be accurately spotted to match the contacts on the beam. After the contact-screw holes have been drilled and tapped, the posts should be split down the middle with a fine hacksaw blade for a distance of ⅞ inch from the top. The clamping-screw holes (8-32) should be drilled and tapped at about half the distance between the contact screws and the bottoms of the saw slots. The bottoms of the posts should be drilled and tapped 10-32 for the mounting screws.

The coil spring between the two centering arms should not be stiff. This spring is stretched only ⅛ to 3/16 inch when hooked over the two screw heads in the arms. The weight of a 25-cent piece will stretch it that much. The spring should not be allowed to drag on the beam, of course.

Operation

The terminals are wired as shown in the top view of Fig. 1. To use as a sideswiper, connect

(Continued on page 148)

An Inexpensive One-Man 35-Footer

Lightweight Utility Mast

BY S. E. McCALLUM,* K4URX

Here is a simply-built and easily-erected mast that will put a wire antenna or lightweight beam 35 feet into the air. It requires a single set of guys.

AN OUTSTANDING feature of the 35-foot mast shown in Fig. 1 is that it can be put up by one man. This is largely due to the fact that most of the weight is in the base section. The long 20-foot center section is made of 1 × 2 stock and can easily be held in one hand. True, the mast requires guying. But light-duty guying presents only easy problems — nothing like those associated with the designing, building and raising of a self-supporting mast. And the guys make the task of raising or lowering the mast much easier.

This mast has rendered good service at K4URX for several years. It's handy to put up when trying a new antenna, or a new location for an old antenna. For about a year it supported a 6-meter ground plane, the radials and radiator of which all were made of ⅝-inch thin-wall electrical conduit. In this service the mast was lashed to the side of the house with the top 10 feet and the antenna self-supporting. Here the mast withstood several gusty blows with winds up to 50 or 60 miles per hour. The structure is fairly flexible and gives with the wind. Fitted with wire, stand-off insulators (either commercial or home-brewed of polystyrene strips), and perhaps a whip at the top, the mast can serve for a vertical antenna. In this use it would be self-supporting to a degree because there would be no lateral strain at the top from either the pull of a horizontal wire or the wind resistance of a beam.

* General Electric Company, 316 E. Ninth St., Owensboro, Ky.

Materials

Employing basic "A-frame" construction, the mast consists of a length of 2 × 4 for the base section, a latticed mid-section made of 1 × 2 wood, and a top section of 2 × 2 stock. Actual lengths shown in Fig. 1 can be varied to some extent to suit the builder's requirements. It should be borne in mind, however, that a longer base section will add to the weight and a longer top section will weaken the over-all structure.

Two types of braces spaced 12 inches center-to-center are used on the mid section, all made of 1 × 2 stock. As illustrated at B, the outside cross braces are set at 45 degrees, and alternate in direction and from front to back. The short inside braces fit in between the sides and are graduated in length from slightly less than the width of the 2 × 4 base to slightly more than the width of the 2 × 2 top section. The exact lengths of the cross

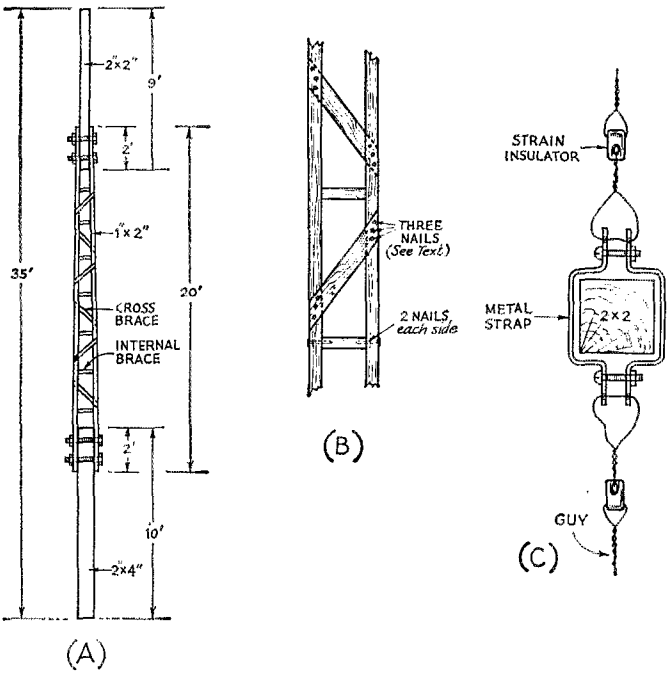


Fig. 1—Sketch of the lightweight 35-foot mast. The detail at B shows the cross bracing. C illustrates a clamp for attaching guy wires at the top of the mast.

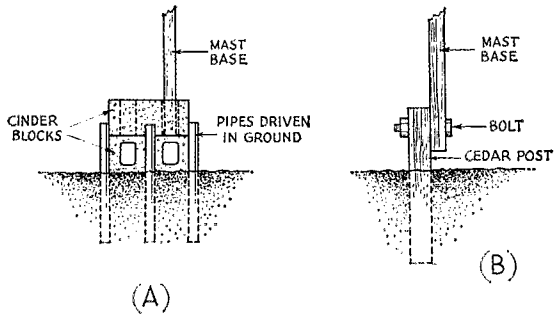


Fig. 2—Methods of anchoring the base. At A, cinder blocks help to prevent deterioration of the base. At B the base of the mast is supported by a cedar post.

braces and internal braces can be determined as the mast is put together.

In the model illustrated, ordinary small finishing nails were used to fasten the braces to the 1 × 2 rails. However, aluminum nails would be preferable. Brass screws probably would be best, but they are expensive and require guide holes and a considerable amount of elbow grease. Cement-coated nails probably would provide stronger construction than noncoated nails, but still would subject the mast to rust damage over a period of time.

The mid section may be fastened to the 2 × 4 base with either nails, lag screws or bolts, the latter being preferable to anticipate future construction changes. The top-section 2 × 2 should be set into the 1 × 2 arms and secured with two ¼-inch bolts. Nails here could split the wood all too easily.

Ideally, all of the wood pieces should be given a prime coat of outside white paint before assembly, and a second coat after construction is completed. However, the operator at K4URX (a lazy, shiftless type) used only one coat of white paint immediately after construction and the mast has suffered no appreciable damage in four years of exposure to the elements.

Assembly

If the lumber yard's 1 × 2 furring stock is composed principally of "knotty spruce," the chances of getting two clear 20-foot lengths are pretty slim and it would be best to have them cut from a 1 × 4 piece that is free of knots. Another point to watch in procuring these strips is their straightness. Crooked 1 × 2 rails will make a crooked mast. This also applies to the 2 × 2 top section and the 2 × 4 base.

Do not precut the braces. Instead, have a supply of 1 × 2 stock ready to use for bracing as you go along.

With all material on hand, lay the four principal pieces out to form the three sections on a surface as flat and hard as you can find. A level driveway serves excellently. Lacking this, the pieces may be laid on the ground, supported at strategic points by bricks or blocks of wood built up so that the entire mast is level and straight.

First, tack the two rails to the base and top sections with light finishing nails to hold the pieces in place. Then measure and cut the internal braces to the various lengths necessary to taper the 1 × 2 rails gradually from the width of the 2 × 4 base down to the width of the 2 × 2 top section. The taper is so gradual that it is not necessary to bevel the ends of these short inside braces. Nail them in place, taking care to keep the entire structure as straight as possible.

Nailing on the cross braces comes next. The trick that prevents the nails from splitting the ends of the cross braces is to use over-length braces — that is, to extend the ends a couple of inches beyond the outer edges of the long 1 × 2 side rails and then saw them off flush *after* they all are in place. If you think this is a waste of wood, just try nailing them on after precutting and see how many ends split. Also, anyone who can precut these angled braces to fit precisely this tapering structure is a minor mathematical genius who is wasting his time with structures like this! Alternate the placing of the cross braces on the rails between the front side and the back side. Use three nails at each end of each brace, aligning the nails diagonally across the side rails to reduce the danger of splitting the rails.

While the three sections are tacked together, drill the bolt holes in their proper places through all pieces at once.

A clamp for top guys and antenna insulator or a pulley can easily be fashioned from two strips of scrap metal as shown in Fig. 1C. Other means can be devised for fastening other types of antennas to the top of the mast although, as previously mentioned, this mast is for light duty. It is possible that a very lightweight rotator and small u.h.f. antenna could be supported. However, no matter how light the rotator, the increased wind-loading surface adds danger; serious u.h.f. work usually demands stacked arrays larger than can be handled by this mast.

Installation

Base anchoring is no problem. Two points should be observed: (1) prevent the base of the mast from moving sideways, and (2) keep the end of the 2 × 4 out of surface water in wet weather. Two methods are illustrated in Fig. 2. The cinder-block mounting of A has been used successfully with the mast described here. Two cinder blocks are used with the bottom one on its side to raise the mast out of the mud, and the top block placed normally with the end of the 2 × 4 slipped into one of the holes in the cinder block. Four stakes driven into the ground around

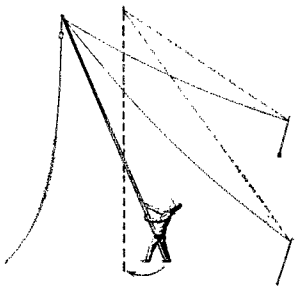


Fig. 3 — Sketch showing how the mast is easily raised by one man. With two guy wires attached to their anchorages, the erector "walks" the base of the mast in the direction of the third guy-wire anchoring point until the mast is nearly vertical.

the cinder blocks prevent lateral movement of the blocks and the base of the mast. Loose construction permits good water drainage, and leaves the mast relatively free for easy removal, even in freezing weather, although you may have some trouble getting a cinder block out of frozen ground. It is feasible, too, to set a 4 × 4 cedar post in the ground and bolt the mast to it as shown in Fig. 2B, although this imposes a degree of permanency on the location. At the time of this writing, the base section of the mast is clamped to the metal vertical member of a yard-arm clothesline support, which itself is set in concrete in the earth.

Metal fence posts, sledged into the earth, make excellent guy anchors because they raise the lower ends of the guys off ground sufficiently to prevent the danger of tripping over them. Alternatively, trees, house corners, clothes poles or iron pipes can be used with confidence with a light-duty mast like this one.

Guys can be almost anything from nylon cord to conventional TV mast wire. Naturally, the heavier the better. Quarter-inch Manila rope serves well and is easy to handle, although it weathers fast. This action can be slowed by soaking the rope in the liquid-type preservative used for wooden fence-posts.[1] To reduce fraying of guy ropes, either standard thimbles or small egg insulators can be used.

Raising or lowering the mast becomes simple if at least two guys first are fastened in approximately their correct positions while the mast is still horizontal on the ground. One simply lifts the base section and pushes against the guys and — presto! — the top end of the mast soars upward as one walks toward the spot where the base will be set. See Fig. 3. However, some caution must be exercised. Don't walk too far if you have only two guys in place or the mast will soar *downward* in the opposite direction — and much faster, too! Set the base down on the ground before the mast reaches the perpendicular. It can be straightened and the guys tightened after the third guy or antenna wire is in place and ready to take some strain. With judicious juggling, neither a side wind nor a tail wind will interfere with this erection process, and it even takes a pretty stiff headwind to cause any trouble. QST

[1] *G-E Ham News*, Sept.-Oct., 1953, page 3.

Strays

Two Hundred Meters and Down, by the late Clinton B. DeSoto, is a 184-page history of early amateur radio (to 1936) which has been out of print for about ten years. The League arranged for reproduction, through a photographic process, of a limited number of copies of this book and has a few still in stock at a price of $2.00, approximately our cost. Address ARRL Hq., West Hartford, Conn.

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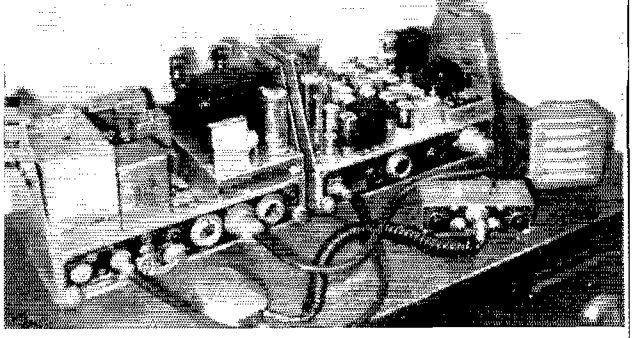
JA9AB advertised in the April 1957 issue of *QST* that he was looking for a copy of *Two Hundred Meters and Down*, which at that time was out of print. I had been looking for a copy myself for a long time, and so I sent him a QSL, wishing him better luck than I had had. Some time later he wrote me saying that a W2 had sent him a copy but that a certain radio shop in New York city had another copy. I wrote to the radio shop for the book, but they replied that they were holding it for a Japanese amateur. After considerable explanation, they released the book to me, and I wrote a letter of appreciation to JA9AB. He certainly exhibited the true ham spirit of friendliness.

I work in New York, yet a ham on the other side of the world had to tell me where to go in NYC to find the book I was looking for! — *W2BOH*

—···—

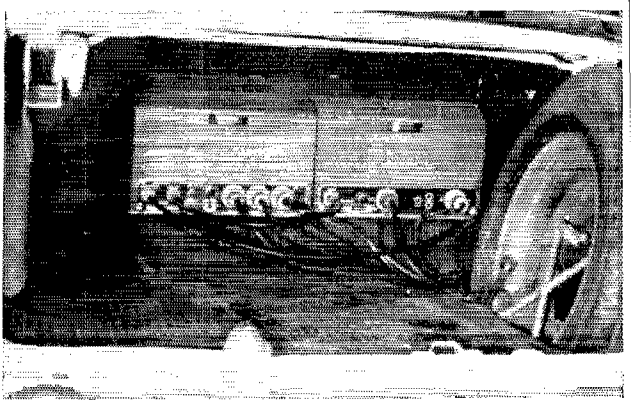
W8CQ made WAC, with a gimmick.



The Motorola "Deluxe" f.m. equipment is the oldest and least expensive of the available units, and there are probably more of these in amateur service than any other model. Originally a 6-volt mobile station, the unit at the left has been converted to 117 volts a.c., and is now in service at K9DDF.

Making Use of Obsolete Commercial Mobile and Fixed-Station Gear

BY JAMES S. AAGAARD,* K9OJV



The rig as it appears in its natural habitat. This car trunk installation is that of W9CWH.

Two-Meter F.M. for Noise-Free Local Communication

THE superiority of wide-band frequency modulation for reliable short-range communications, both point-to-point and fixed-station to mobile, has been recognized for some time by commercial users. Demand for channels has become so great that the Federal Communications Commission recently directed eventual conversion to "split channel" operation. Each of the present channels will be split into two by reduction of the maximum allowable deviation from 15 kc. to 5. The same advantages that make v.h.f. f.m. desirable to a commercial user are also attractive to the amateur. A considerable amount of ham operation of this type on the 2-meter band has developed in certain parts of the country. It is the purpose of this article to "spread the word" and to urge other areas to discover the value of 2-meter f.m.

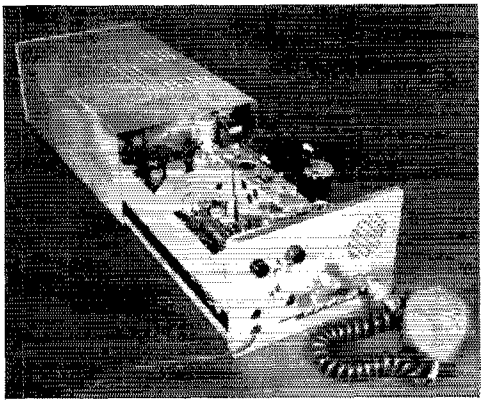
Perhaps the most noticeable characteristic of the f.m. system to the ham who is accustomed to other forms of transmission is the complete lack of noise or hiss once a signal reaches a level of a few microvolts. This is a very sharp contrast to behavior of an a.m. system, where a weak signal tends to increase the noise. With most police-type f.m. receivers a signal of only about one-half to one microvolt will provide 20 decibels reduction in background noise, and a weaker signal than this is still readable. The receivers incorporate a very effective squelch circuit, which permits monitoring with absolutely no sound from the receiver and yet can be adjusted to open on a signal which is not even readable.

It is typical of f.m. systems that a stronger signal will almost completely capture the receiver, so that QRM as most hams know it is nonexistent. Since both transmitter and receiver are crystal controlled, there is never any problem about being on the right frequency. Many hams leave their receivers on whenever they are within earshot, so that in case of an emergency there is almost always someone listening.

For these reasons 2-meter f.m. is ideal for civil defense, emergencies, rag chewing, and short-haul traffic. It seems to attract both newcomers and old-timers, and at least four two-letter calls can be heard regularly in the Chicago area. The Northwest Indiana RACES net numbers about 90 mobile stations and 35 fixed stations among its members, and meets 5 days a week.

Distances over which communication is possible vary considerably, depending principally on the antennas involved. Very few stations, fixed or mobile, feed more than 30 watts into their antennas. Between two mobile units, 5 miles represents about the maximum reliable range, while 10 to 20 miles between a mobile and a fixed station, and up to 40 miles between fixed stations

* Dept. of Electrical Engineering, Northwestern University, Evanston, Illinois.

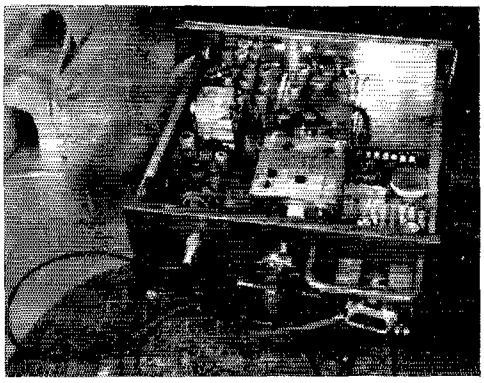


Originally this unit was a 7-watt, 6-volt transmitter and receiver with a separate control head for mobile installation. Basic circuitry is similar to the "Deluxe" units, but miniature tubes and reduced power make possible the much smaller size. An a.c. power supply was fitted on the chassis and controls installed on the front panel to make a compact 10-watt-output fixed station.

can be expected. These, it should be emphasized, are *reliable* ranges. Under favorable conditions stations at much greater distances can be worked.

Sources of Equipment

Equipment for 2-meter f.m. operation is not usually available from the sources which supply other types of amateur equipment. However, the equipment *is* available; the large number of stations now operating in the midwest is sufficient evidence of this fact. You can buy new sets from the manufacturers, such as Motorola, General Electric, RCA, Bendix, and Link, but this tends to be expensive — $400 to $1000 per station. A much better buy for the ham is used 152–174-Mc. equipment taken out of commercial service for one reason or another. This equipment, for the most part, was ruggedly built originally,



This installation by the author has provision for operation on 3 different channels and has 30 watts output. It was a 6-volt unit but the filaments were rewired and the transistorized power supply on the right was constructed to replace the original dynamotor and vibrator. The receiver is on the left and the transmitter in the center.

and probably has been fairly well maintained, so that it has many years of useful life ahead of it in amateur service. A commercial user might find it uneconomical to convert older 6-volt units to 12 volts for new cars, or to modify the units for "split-channel" operation. Many older units cannot be "split," and great quantities are becoming available to the ham.

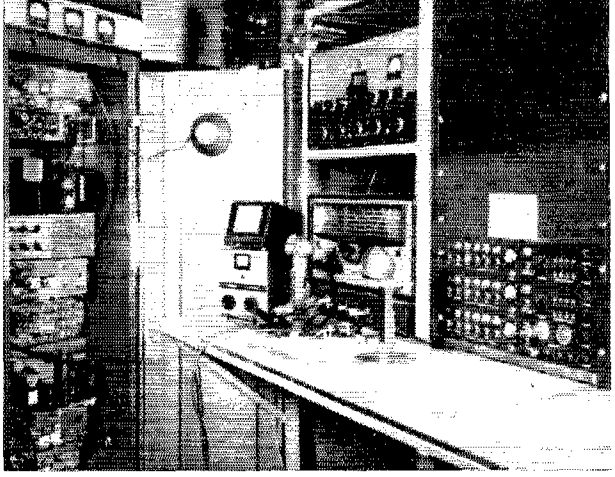
One good place to start your search for equipment is at the shops of local two-way radio servicemen, particularly if they are hams, as many are.[1] They may have units which have been traded in, or know where they can be found. Six-volt mobile equipment which cannot be converted for split-channel operation is the oldest and least desirable commercially, and therefore brings the lowest prices: from $20 to $50. Twelve-volt units are sometimes available at slightly higher prices, while a low-power transmitter (10 watts or less) will bring the price down somewhat. Near the other end of the scale of used gear is the more recent 12-volt unit which could be "split." This is capable of 30 watts output and has provision for two- or three-frequency operation. It is currently available at prices up to $200. Most hams tend to get fixed-station equipment by replacing power supplies in mobile units, but occasionally base stations are available at prices comparable with similar 12-volt equipment.

Large users represent another source, but generally they will not respond to requests for one or two units. Taxi and telephone companies may have as many as 100 units which they intend to sell (or scrap) in one lot. A quantity purchase takes a lot of capital, but sometimes it can be arranged through a local club, AREC or RACES organization. Unit cost is undoubtedly lower this way than any other — as low as $10 or $15 for a 6-volt mobile rig.

The complete cost of getting on the air will depend to a large extent on just what is included with the transmitter and receiver. Control cables and control head are usually included, but microphone, speaker, and antenna may not be. Nearly all units require carbon microphones. Any available p.m. speaker will serve. Antennas may be purchased for $5 to $10 or made very easily. In addition, there will be the cost of crystals and any necessary modifications to the power supply.

There are usually very few modifications to be made to this gear to put it into amateur service. The most common one is the conversion of a 6-volt unit to 117-volt a.c. operation by replacing receiver and transmitter power supplies. Surplus heavy-duty TV power transformers frequently work out just right for the transmitter, and small standard replacement power transformers are satisfactory for the receiver. The conversion of a 6-volt unit to 12 volts is a little more difficult, since it involves filament circuit

[1] Information on equipment currently available may be obtained from Arnold Hatfield, W9IGH, P.O. Box 502, Chesterton, Indiana. See also *QST* Ham-ads.



The rack on the left in this picture of the main operating position at W9BGX contains three complete transmitters and receivers. At the top is a 60-watt-output unit, and the two 30-watt units below it have been modified for 4-frequency operation. The pushbutton control panel at the far right provides for power and frequency control to all units, as well as switching various microphones and an RTTY tone generator.

rewiring. However, 12-volt vibrator power transformers are available as replacement parts for auto broadcast receivers, and 12-volt dynamotors are still on the surplus market. It is worthwhile, though, to pay a little more for a 12-volt unit if it is available, leaving the 6-volt rigs for conversion to a.c.

Control circuits usually require no modification, other than finding a source of 6 volts d.c. for relays in an a.c. conversion. This can usually be obtained from a spare filament winding on the power transformer and a small selenium rectifier.

Since the 2-meter band is slightly below the range in which the units were intended to operate, some padding of tuned circuits may be required. Usually not more than four or five receiver circuits will need small additional capacitors, and most transmitters need no modification at all. The actual tune-up is not at all difficult, and most units are provided with convenient metering connections — decidedly better than the usual amateur transmitter or receiver. Obviously, it is impossible to give here specific instructions for all of the different makes and models of equipment which are useful to the ham. Again I would suggest: See a local ham who services mobile equipment; he knows the alignment procedure and can provide many valuable tips on adjustment and operation. For the ham who is not a tinkerer, the serviceman can make the whole installation at a corresponding increase in cost.

Most hams do not bother with the crystal ovens which are used in commercial service, but to obtain the performance of which the f.m. system is capable it is essential that all stations on the channel be within one or two kilocycles of each other. Provisions are made on all transmitters and receivers for shifting frequency slightly to compensate for slight variations in crystals.

The purchase of inexpensive crystals for this service is definitely not a good idea. Crystals intended for commercial service, and calibrated for the specific type of equipment in which they will be operated, are available from many crystal manufacturers, such as International Crystal Manufacturing Company, for only a few dollars more than the "amateur" crystals. Using these crystals it will be found that crystals for different channels may be interchanged in the equipment with little or no need for any adjustments.

All of the common v.h.f. antennas are in use in this service, and a very inconspicuous installation is possible if necessary. Vertical polarization has become accepted to favor the mobile stations,[2] which may use a whip mounted in the roof. Other antennas are available which can be attached without a hole in the roof, and there are various ways of using the standard broadcast antenna. The most common fixed-station antenna is a ground plane, and some stations use vertically polarized collinear arrays.

Once the basic equipment is operating, there are many refinements which the ingenious ham can add. Many stations are using preamps ahead of the receivers and power amplifiers following the transmitters to extend operating range. The accompanying photographs show some typical installations of this gear.

A word about the frequencies of operation: so far this activity has tended to concentrate in the upper megacycle of the 2-meter band, leaving the lower part clear for a.m. operation. This practice minimizes the amount of padding that must be done to the tuned circuits in the equipment in modifying it for ham use.

It would seem desirable that the same primary channel be used in different parts of the country, since there is little likelihood of mutual interference between stations, and it does make possible some occasional DX. It is also more convenient for the mobile station who is away from his home area, since otherwise he could not operate without a new set of crystals. With these points in mind I would like to recommend 147.3 Mc. as the frequency to be used in establishing new nets. This frequency is now in use by several hundred stations in Indiana and the areas around Chicago, Detroit, Louisville, and St. Louis. It is also a frequency which is included within the RACES authorizations.

Because of the mutual interference which would

(*Continued on page 146*)

[2] With f.m., the reduction in noise obtained through horizontal polarization with a.m. does not enter into the polarization picture. — *Ed.*

High-Frequency Satellite Scatter

BY RAPHAEL SOIFER,* K2QBW

THROUGHOUT the history of amateur radio, hams have been, among other things, first-class propagation specialists. Our accomplishments show it. When experts said, "They can't get out of their back yards with 'below 200' wavelengths," we showed the world. More recently, such ham greats as W2UK/KH6UK, W4HHK, W6NLZ, W4AO, and W4LTU, among others, have pushed the usable DX spectrum up still farther.

What's that you say? These men were all on v.h.f. with great big beams and kilowatts? Well, OM, you've come to the right page. I am going to show how you, Joe Ham, with a single rosy 813 and a dipole which has never been above ten meters in its life can make a significant contribution to a communication project involving the latest techniques which has made front pages all over the country. Hold on, there! I'm not talking about listening to Lunik XVIII or Discoverer IX. That's for SWLs! You're a ham, and you like to talk. How about talking with a fellow ham via a satellite? No, I don't mean 4000 Mc. or even 40 Mc. I mean 15-meter c.w., no beam necessary and only a 250-watt rig — although a kw. is fine, too. Your receiver should be in at least the $250 class. Qualify? Read on. If your receiver is good, but you run QRP, read on, too; we need you as an observer.

You may have read in the papers or heard on TV about the probable "first" QSO made by K2QBW and K3JTE. Many amateurs were frankly shocked when we told them the truth: that we did not use v.h.f. and ran only 300 watts with no beam. If you were one of these, the following should make this more clear.

When Sputnik I was first orbited in 1957, Prof. John D. Kraus noticed that when the satellite passed nearby (a few hundred miles), the received signal strength of WWV at his Ohio laboratory — at night, on 20 Mc. when there was no skip over that path — would increase, accompanied in many cases by a characteristic flutter. As you all know, Kraus is W8JK of antenna fame and the director of the Ohio State University Radio Observatory. He published a paper on this effect,[1] which he named "c.w. reflection." Subsequent work by Kraus and other investigators (including the author) brought out several points:

1) The increase is noted only when skip is out.

2) Most any satellite can be correlated with such disturbances; no special types are needed.

3) The effect drops off sharply as one approaches v.h.f., and is almost unnoticeable at 25 Mc. as compared with 20 Mc. On the low-frequency side atmospheric absorption takes its toll, so 20 Mc. appears to be close to optimum.

4) A receiving antenna with a large capture area is important, to maximize the increase. A beam need not be used.

5) Over the New York-to-Bethesda range (about 200 miles) the increase is sufficient to provide communication, though not reliable, for about a minute or two per pass with amateur power levels. As the power drops below a half gallon, the reliability and the QSO time drop off, reaching zero below 250 watts or so.

There are still many nonbelievers in the ionization-trail theory advanced to explain this type of propagation, but the facts are plain even if the theory is not. Our results, when statistically analyzed, point toward the idea of scatter off the ionized trail built up by the satellite in its high-speed passage through the earth's magnetic field and the ionosphere. We have never obtained useful communication with satellites higher than about 400–500 miles, though WWV does continue to show some effects.

Our experience would indicate that the use of c.w. is mandatory, for reasons of flutter and selective fading. We used a modified version of v.h.f. meteor-scatter procedure, in which the times during which each station transmits are rigidly synchronized at 20 seconds each way, back and forth. To minimize copying difficulty (even though both operators could copy forty cold) we devised a special S code:

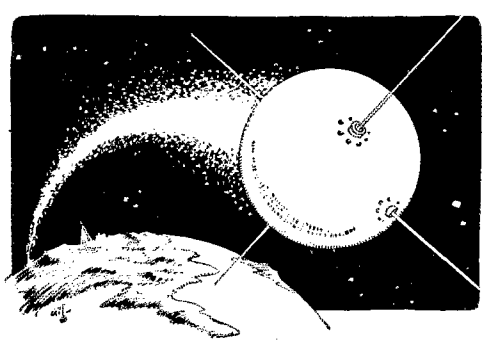
Z = I have not yet heard you — S0.

N = I am copying you or I have copied you and you are or were S1.

M = I am copying you or I have copied you and you are or were S2.

No higher numbers were needed, since signals never got that strong! Clearly, then, if you copy Z from a fellow and you send him N and he copies it, you have made a QSO, since our S code has built-in "rogers." If no "roger," then you send Z. A QSO is defined as two-way exchange or meaningful information, *unknown to the receiving operator beforehand.* If he knew it beforehand,

* P.O. Box 308, Cooper Station, New York 3, N. Y.



[1] Kraus, et al, "The Last Days of Sputnik I," *Proc. IRE*, Vol. 46, No. 3, p. 611 ff.

then there is no need for communication, hence no QSO. By convention, signal reports are used as the information.[2]

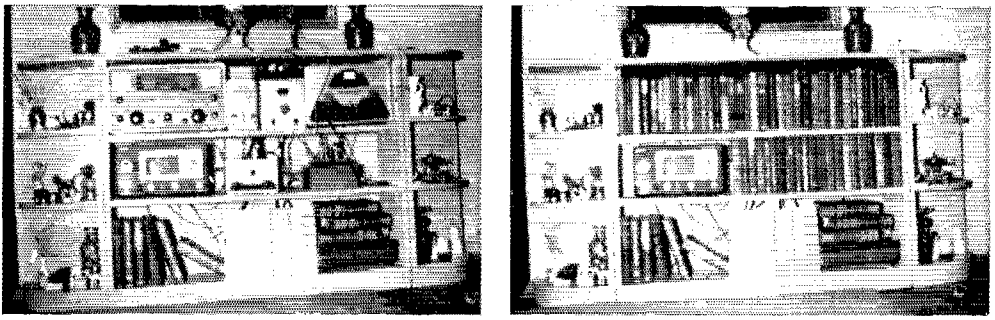
By now you must get the idea that makes this project so fascinating. It is hard work to QSO via satellite. You don't just set up a sked. It may take you dozens of skeds — it took us twenty. Here is the point: It is only by continued QSO attempts by persistent operators that we are going to learn something about this high-frequency satellite-scatter (h.f.s.s.) mode. The sunspot cycle is going down. As more and more satellites are orbited, more QSOs may be made in this way, as more is learned about it. More may not. There is but one way to find out, the same way hams have been using since amateur radio got started.

If you are really interested in this kind of work, have the gear (including access to a tape recorder to record the signals), have the time, and have — above all — the great quantity of persistence needed, why not get in touch with me by letter or QSO? Get set to enjoy fully that wonderful morning at 2 a.m. (you must do it when skip is out) when, after weeks of planning, plotting satellite orbits, listening to signals to get acquainted with the highly individual type of flutter observed in h.f.s.s., and hopefully sending fruitless "Z"s for sked after sked, your partner finally can be heard and, after cross-checking with other forms of propagation, the h.f.s.s. nature is established. The author or any of our project members will be glad to help you out with all the dope you need.

I wish to thank here as many as I can of the people without whose assistance our project would have been impossible. First, our participating staff members, Bob and Don Lokerson, W3EQB-EQD, Art Bickel, K2QHR, and Joel Klein, K3JNG. Some of the amateurs who pitched in to help with the liaison when the 7-Mc. going got rough were W3JWN, W1NJL, W2VDT and K1JAW· thanks, fellows. We are all deeply appreciative of the valuable and many-sided assistance rendered by the Massachusetts Institute of Technology — by George Wood, jr., and Francis E. Wylie in the field of public relations, by Prof. C. L. Searle, by G. H. Pettingill of Millstone Hill and Prof. J. B. Weisner, acting head of the E. E. Department. In any satellite project, you need the best predictions Uncle Sam has to offer. In this case we had them through the efforts of Norton Goodwin of the Volunteer Satellite Tracking Program, who supplied us with up-to-the-minute modified orbital elements from NASA and of Richard M. Adams and Carleton W. Tillinghast of the Smithsonian Astrophysical Observatory, who supplied us with the best that institution's computer had to offer. Norton Goodwin comes in for a round of cheers for the encouragement he gave me and other observers through the years we have been associated with him. Lastly, but most importantly, Perry Klein, K3JTE, the man on the other end of the QSO — that certainly speaks for itself! QST

[2] This definition of a QSO is considerably at variance with the requirements that have been set up for WAS credit in the v.h.f. meteor-scatter work mentioned earlier. There *both* parties have to indicate receipt of the other station's transmission, including actual identification of call signs. However, the method described was adequate for the purposes of this experiment. — *Editor.*

Strays



K2YFM made his XYL happy and hid the clutter of his living-room ham shack by the following clever little scheme. The left-hand photo shows the bookcases and the operating position when the station is ready to operate. In the right photo, K2YFM has hidden the gear by means of two false fronts which are made up of the spines of some old books fastened to boards which fit each shelf.

The wiring in any piece of equipment can easily spell the difference between a professional-looking job and something that looks like a rat's nest. This article shows how to cable leads for better appearance and more reliable operation.

Neater and More Trouble-Free Gear

BY RALPH ROSENBAUM,* W5ECP

Lace That Wiring

How often have you marveled at the excellent paneling and chassis finishes on a piece of electronic equipment only to gasp in engulfing horror at its ugly labyrinth of wiring? Nevertheless, this unfortunate situation is not a hopeless one. Only five cents' worth of lacing cord will improve the aesthetics of this wiring by a thousand per cent! Not only will the lacing increase the resale value of your equipment, but it will also give you the satisfaction of completing a job neatly. Furthermore, a good lacing technique will give strength and rigidity to your small bundles of wire and will virtually eliminate individual wire breakage.

Types of Lacing Cord

You can make no better investment for your ham shack than a roll of lacing cord which meets certain military specifications, MIL-T-713A. This type of lacing cord, usually made from either nylon or flax, is uniformly impregnated with microcrystalline wax; within this wax is a non-mercurial fungicide which renders the lacing material mildew- and fungus-resistant. In addition, any 713A cord must withstand a thirty-pound pull and be neither hygroscopic nor tacky.

Presently, commercial lacing cord is woven into a flat braided cord consisting of six, eight, or twelve plies. These cords are respectively identified as Class 3, Class 2, and Class 1. Class 3 cord, having an average thirty-two pound test, is well suited for amateur work; occasionally, large harnesses might require a Class 2 cord. Lacing cord comes in either black or white, but black is more appropriate since it blends well with other colors and does not show dirt marks. The cost is reasonable — approximately six-tenths of a cent per foot. If your local distributor does not stock 713A cord, I would suggest writing to any of the companies listed at the end of this article.

Preparatory Measures

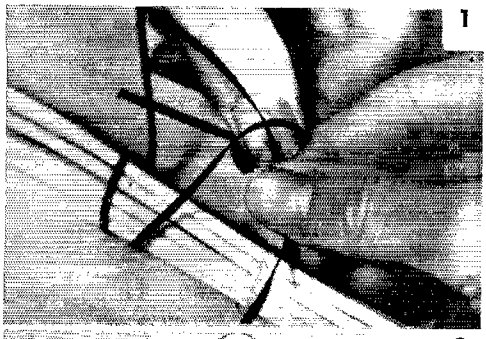
Before you start lacing, here are several helpful suggestions. Since lacing may be executed most rapidly when your hands can be placed in any position relative to the harness, try to mount components either on a Minibox or the bottom plate of a chassis base. While you are soldering wires to components, start training the leads so that they lie parallel in the harness; the less the wires crisscross, the neater the harness will look. Sometimes it is easier to lace small bundles even before they are soldered into the circuit. In other instances the cable leads at one end might first be soldered, the cable next laced, and then the leads soldered at the opposite end.

For a good safety margin, cut the length of your cord three times the length of the wires. Once the running stitch is started, refrain from tightening the knot of the stitch so tight that the insulation on the wires is cut. Often, long-nose pliers or tweezers become a real necessity in crowded places. Use a double-running stitch at all times and space stitches approximately 1¼ inches apart. For a neat appearance always turn the knot of any finished stitch flush with the chassis. Last, isolate r.f., grid-input, and very-high-voltage leads from any harness.

The first eight photographs show the various steps to be followed in lacing cabled wiring. (1) The lacing cord has just been looped twice around a harness to begin the starting knot. The first half of the square knot is now finished by pushing the shorter end over and then under the longer lead. (2) Here the square knot is being completed by running the shorter lead around and under the longer end. (3) A half-hitch knot now completes the starting stitch. (4) A double running stitch is started by swinging the cord around the top and then under the cable. A 300-degree arc has just been completed, and the free end is now ready to be pushed through the loop which has been formed. (5) The free end is now guided through the loop. After this knot has been pulled tight, notice that the cord entering and leaving this stitch always rests against the wires. (6) Here the double running stitch is being completed by executing an identical single running stitch over the one which has just been finished in the preceding photo. Again, the free end should be flush with the wires. (7) The ending stitch is very similar to the double running stitch. The double running stitch has just been finished, and one of the two half-hitch knots is now being made. (8) Here the splice stitch is being completed. The first half of a square knot has just been finished, and now the shorter lead is being swung around and under the longer end. This end can be used to continue the running stitch.

Only a small length of lacing cord has drastically changed the appearance of these identical chassis in the two bottom photographs. Leads from the unlaced chassis, left, are being trained to lie in small harnesses, right, and temporary spot ties have just been made to hold the last three harnesses together.

* 1800 Lafayette Drive N.E., Albuquerque, N. M.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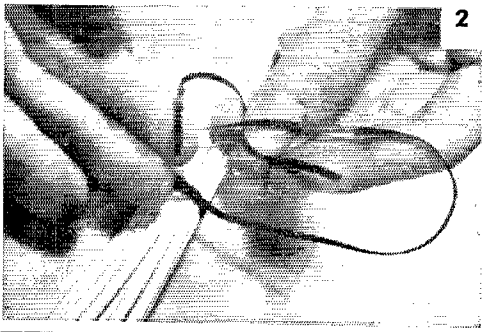
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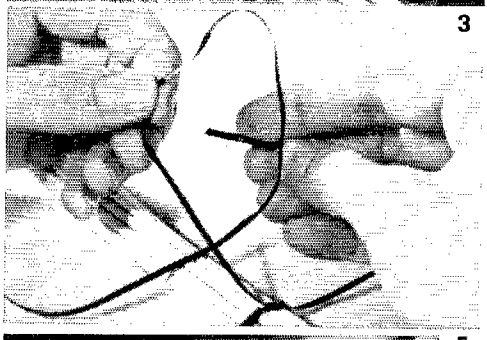
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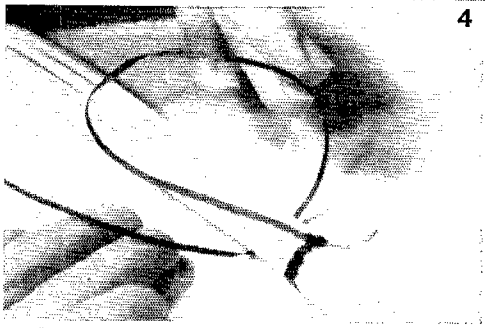
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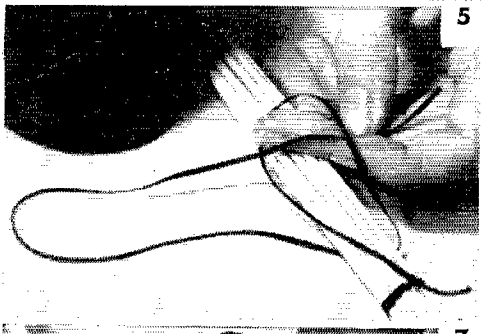
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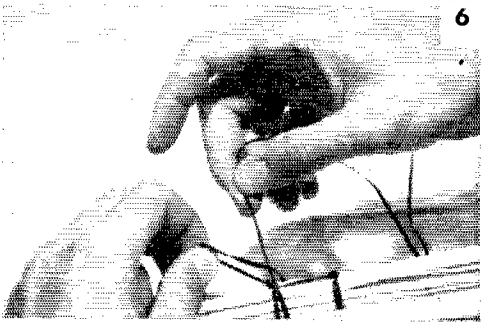
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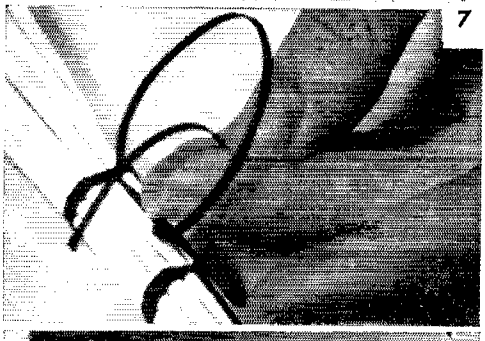
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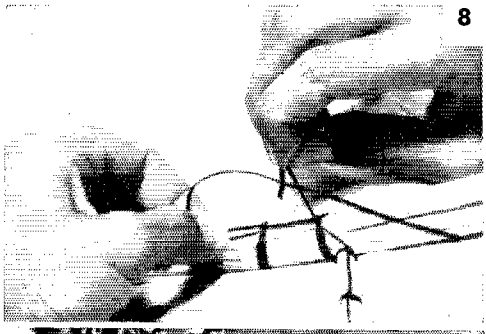
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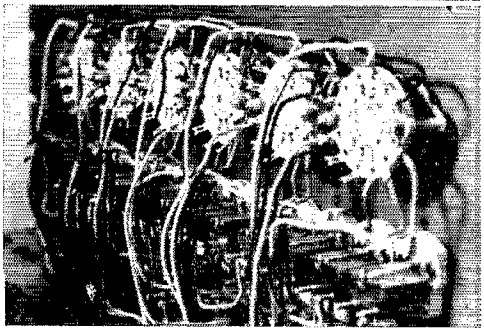
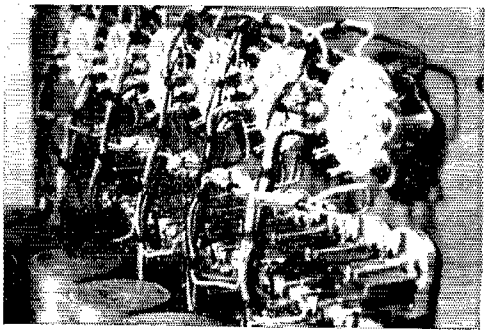




Anchoring the Cord

Let's begin the starting stitch. With the shorter end of the cord in your right hand, loop the cord twice around the wires and then make the first half of a square knot by running the shorter lead under the longer (Photo 1). Pull uniformly on both ends and then, grasping the shorter lead, start the last half of this knot by looping the longer lead around the shorter (Photo 2). With the shorter lead, complete the stitch with a half-hitch knot (Photo 3). After twisting the knot flush with the chassis, prune off any remaining length on the shorter lead.

Lacing Stitch

To begin a double running stitch, hold the free end of the cord close and parallel to the harness. Swing the cord around the top of the harness and proceed to make a 360-degree arc (Photo 4). Now run the free end through the loop which has just been formed (Photo 5). While pulling this single running stitch tight, work the knot under the harness and guide it in line with the starting knot. Repeat this procedure to form another identical single stitch over the original stitch (Photo 6). This completes a double running stitch.

Ending Stitch

The ending stitch is only a slight variation of the double running stitch. Begin this stitch by completing a double running stitch. Then form two half-hitch knots by running the free end of the cord under the lead from the previous running stitch (Photo 7). Pull the knots tight and trim any extra length from the free end.

Branching Cables

Often you may wish either to join a lead from a branch to the main lacing cable or to splice an additional length of cord to the main cable. Execute a double running stitch in the position where you wish to locate the splice. Next, using the free end of the main lacing cord, form the first half of a square knot around the lead; now complete the knot, using this lead, and cut off any extra line from it (Photo 8).

Spot ties, which are identical with the starting stitch, are convenient, too. They are used only on very short branches which require three or less stitches.

A good lacing technique requires a few hours of practice. Why don't you now run through these stitches using some string and a broom handle?

For a climactic finish, paint the starting and ending stitches with a clear plastic glue or glyptal. You'll agree that there isn't a neater piece of gear in town than the piece you have just finished lacing!

Acknowledgments

I am indeed grateful to several persons whose helpful advice and guidance made this article possible. I wish to extend my many thanks to Mr. and Mrs. Vernon Thackeray, W5CSY and W5ZUD, who took the excellent pictures. I am grateful to Mr. Conny Fleissner, W5GEQ, Mr. Jim Hurlbut, and the employees of Crown Engineering in Albuquerque who gave me their excellent assistance and who allowed me to photograph their two chassis. QST

Air-Tex Nylon Lacing Cord — Class 2, No. 17X Flat Braid
Associated Suppliers Company
Los Angeles 65, California

Pure Flax Lacing Cord — Class 3, 32-pound test
Birnbach Radio Co., Inc.
145 Hudson St.
New York, N. Y.

Gudebrod's Gudflace Braided Nylon Lacing Tape — Style 18
Gudebrod Bros. Silk Co., Inc.
12 South 12th St.
Philadelphia 7, Penna.

Nylon Lacing Cord — Class 3
Herman H. Smith, Inc.
2326 Nostrand Ave.
Brooklyn 10
New York, N. Y.

Standard Lacing Cord — Class 3
Walsco Electronic Mfg. Co.
Division of Textron Inc.
100 West Green St.
Rockford, Ill.

Strays

FEEDBACK

Here's what we believe to be a *QST* "first," though we're far from bragging about it: Feedback on Feedback! In May *QST*, page 15, referring to an error in the diagram of the 50-Mc. portable described originally in March *QST*, there was a misprint in regard to the connection of the 1500-ohm resistor in the receiver audio system. It should be returned to the hot side of the switch S_{2B}, in order to eliminate the constant drain on the transistor battery.

Lest anyone think that all Novices are rank beginners in the electronics game, this slip was reported by WV6JLY, the only reader to spot it thus far.

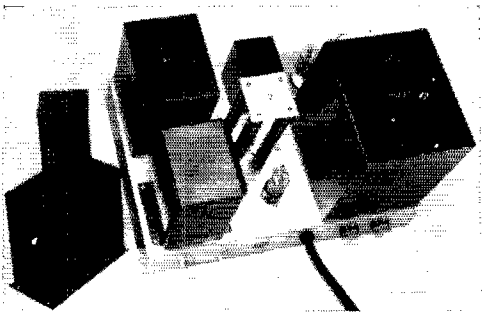
CQ Ghost Ship, by Walker A. Tompkins, published by Macrae Smith Company, Philadelphia 2, Pennsylvania, 192 pages, 5½ by 8¼ inches, cloth cover. Price, $2.95.

Tommy Tompkins, K6ATX, has done it again! The author of *SOS at Midnight* (reviewed in *QST* for April, 1957, page 168) brings back his 17-year-old ham hero, Tommy Rockford, for some more high adventure. In *CQ Ghost Ship*, Tommy heads up the Pacific coast to Willipa Bay, Washington, for what he thinks is to be a vacation with his uncle, only to find himself involved up to the loading coil of K6ATX/mobile with a gang of ultra-modern pirates who use v.h.f. gear to carry out their nefarious schemes. Once again, Tompkins presents a glamourous picture of amateur radio, explaining much about our hobby while spinning a most absorbing tale. Net operation, mobile rigs, hidden-transmitter hunts and a handful of well-known ham calls are artfully worked into the story. Move over, *Tom Swift* and *Rover Boys*, you've got company! — *P.W.*

• Recent Equipment —

The Chippewa Linear Amplifier and Power Supply

HEATH'S "Chippewa" kilowatt linear amplifier comes in two units, the KL-1 being the amplifier itself with the KS-1 the separate 3000-volt, 500-ma. power supply. This method of packaging has, in addition to minimizing crowding of components, the advantage of permitting the builder to put together and test the power supply before he starts on the amplifier. A slight complication in doing this arises because when the two units are used together the KS-1 is controlled from the KL-1 amplifier panel. However, complete information on the control system is given in the instruction manual, and a cheap "control panel" for testing the supply and the control cable without the amplifier can be built from junk-box parts in a few minutes.



The KS-1 power supply is intended for stowing in any convenient out-of-sight spot, so comes without a cabinet. Protective covers for the bleeder and rectifier tubes have been removed for this photo. The small tube on the chassis is the thermal time-delay switch. Fuses, line cord, control socket, ground terminal, and high-voltage output connector are on the near chassis wall.

The KS-1 Power Supply

The KS-1 uses a single-section choke-input filter with an 8- to 30-henry, 500-ma. swinging choke and an 8-microfarad 4000-volt capacitor. The bleeder has four 60,000-ohm, 100-watt resistors in series parallel to give a total resistance of 60,000 ohms at 400 watts, an ample safety factor since the actual power dissipated in the bleeder is about 150 watts. Static regulation is 10 per cent at a 300-ma. load and 15 per cent at 500 ma., with less than 1 per cent ripple, according to the manufacturer's ratings; in typical s.s.b. linear service the regulation is 8 per cent on a current swing from 180 to 600 ma.

The power transformer has two primary windings which may be connected in series for 230-volt supply or in parallel for 115-volt supply, both connections giving 3000-volt d.c. output. The primary windings may also be connected in series across a 115-volt supply line to get 1500-volt d.c. output with the same current rating.

Although the basic circuit of the power supply is the usual, several features of its arrangement are appealing. Not the least of these is the use of ordinary household fuses, easily accessible at the rear of the chassis. Anyone whose rig has been off the air while he hunted frantically in radio stores for the proper cartridge-type replacement will appreciate this. Another example is the method of turning on the plate power. A 60-second delay thermal relay (Amperite 115NO60) assures that plate voltage cannot be applied to the 866 rectifiers until their filaments are properly warmed up. Then, after the Amperite operates, the high-voltage switch on the KL-1 — or whatever control device is used — can be thrown, operating a d.p.s.t. relay which closes the circuit to the plate transformer's primary. The use of the power relay lets the control cable carry only 100 ma. at 115 volts and keeps the 10 amperes at 230 volts (or 20 amperes if the KS-1 is wired for 115-volt operation) off the control switch and inside the power-supply chassis.

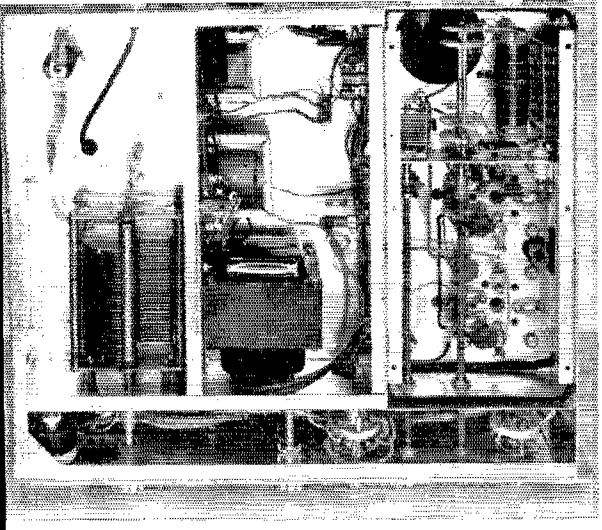
The KS-1 is not furnished in a cabinet but employs a steel chassis with the large components mounted on top and with practically all the wiring underneath. The filament transformer for the 866s, the filter capacitor, the choke and the plate transformer have metal cases, the latter two components being oil filled and hermetically sealed. Protective perforated metal shells cover the bleeders and rectifier tubes.

The back apron of the chassis carries the female high-voltage connector (which takes male Amphenol fitting 82-38), ground connection, female octal socket for the 6-wire control cable, 250-volt 20-ampere three-conductor cord, and two fuse sockets. Dimensions of the chassis are 3 inches high by 17¾ inches wide by 13 inches deep. However, because of the cord and other fixtures on the back of the chassis, room to a depth of about 17 inches should be provided for the KS-1. The greatest height of the supply, from the bottom of the rubber feet to the top of the power transformer, is approximately 11⅞ inches. Weight is 95 pounds.

The kit goes together easily. Three evenings' time with no goofing off to look at Matt and Doc will probably enable you to finish and test the power supply.

The KL-1 Amplifier

The Chippewa amplifier has two 4-400A tetrodes in parallel with a choice of a number of methods of operation. The amplifier can be operated as a linear for s.s.b., a.m. (c.w., too) in Class AB_1, or can be driven in Class C for c.w. work. In AB_1 operation there is a choice of either tuned or untuned input circuits to the grids, the former for driving the tubes from a low-power

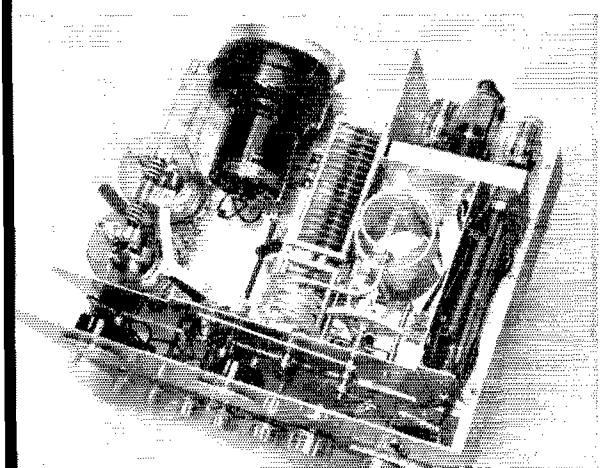


The bottom of the KL-1 chassis is divided into three shielded compartments. The output loading capacitor is at the left. The center compartment contains the filament transformer for the 4-400As, bias-supply components, and control relay. Grid-circuit components are at the upper right, with the 4-400A sockets in the lower-right section. Connectors along the rear (top) of the chassis include the coax output fitting, coax fitting for the monitor pick-up, ground terminal, control-cable connector, female connector for auxiliary controls, high-voltage connector, and input coax fitting.

exciter and the latter for use when ample driving power is available. The possibility of plate-modulated a.m. does not seem to have been provided for since the bypass and blocking capacitors in the plate circuit do not, in general, have high-enough voltage ratings to handle the audio peaks at 100 per cent modulation.

The tuned grid circuit is push-pull so out-of-phase voltage can be obtained for neutralizing the grid-plate capacitance of the amplifier tubes. It is link-coupled to the driving source, with the grid tank a sectional-wound tapped coil tuned by a dual 50-$\mu\mu$f. variable. Five positions on the grid band switch are used for the five bands between 3.5 and 30 Mc., while the sixth position connects the r.f. input from the driver directly to the 4-400A grids, simultaneously shunting a 170-ohm, 80-watt resistance bank from the grids to ground. In this untuned grid-input position the peak-envelope driving power required is 60 watts for full Class AB_1 excitation of the amplifier.

The pi-network output tank is designed to couple the tubes to low-impedance loads. The 28- and 21-Mc. sections of the tank coil are silver-plated copper tubing, the former being oriented so it is not inductively coupled to the remainder of the coil. Two tank capacitors are used, driven by a common shaft; one, a 50-$\mu\mu$f. unit, is used alone on 21 and 28 Mc. The second capacitor, 150 $\mu\mu$f., is paralleled with the first on 14 Mc. and the lower-frequency bands, to provide the additional capacitance needed for optimum tank Q on the lower frequencies. The capacitor



An inside view of the KL-1 amplifier. The vertical tube between the 4-400As directs cooling air against the plate seals. The rear section of the plate tank capacitor is paralleled with the front section when a spring contact on the bakelite arm is forced between the inner ends of the stator mounting rods. Screen resistors, regulator tubes and clamp tubes are mounted on the vertical walls at the right and rear.

switching takes place automatically, when the band switch is operated, through a mechanical linkage and specially fabricated spring-contact arrangement which contacts the capacitor stators. This is visible near the center of the top-view photograph. The output capacitor for loading adjustment is a single-unit variable having a maximum capacitance of 1500 $\mu\mu$f.

A useful addition to the circuit is a pick-up loop mounted near the tank coil and connected to a length of coax cable which runs to a monitor output connector on the rear chassis apron. This permits sampling the r.f. output for oscilloscope or other monitoring of s.s.b. output.

For AB_1 operation screen voltage is obtained from the plate supply through dropping resistors and is regulated at 800 volts by a string of six VR tubes. A 6DQ6A clamp tube takes control of the screen circuit on Class C c.w. In the cw position of the mode switch the TUNE setting of the TUNE-OPERATE switch puts about 150 volts on the screen, allowing the amplifier plate circuit to be resonated without danger of running excessive off-resonance plate current. The TUNE-OPERATE switch has no really vital function in AB_1 (SSB position of the mode switch) operation, but grounds the screens when thrown to TUNE.

Adjustable negative fixed bias for the control grids is furnished by a separate silicon-rectifier supply. This supply has sufficient output voltage to cut off the plate current of the 4-400As, and its full output is applied to the grids through contacts on a control relay (included in the KL-1) during receiving periods in s.s.b. operation. The bias is, of course, returned to the selected value for AB_1 operation while transmitting. In the CW position of the mode switch a second set of contacts on the control relay breaks the 115-volt control line to the plate power supply; the bias-voltage switching arrangement used in the SSB mode is not operative in this case. In Class C operation the same fixed bias is used, with additional bias supplied by the voltage drop from grid current in a grid-leak resistor. The clamp tube holds the screen voltage to a low-enough value without excitation (key up) so that the value of

bias used in AB_1 is enough to cut off the plate current; thus there is no noise from the amplifier when an electronic t.r. switch is used for c.w. break-in. The KL-1 control relay, incidentally, is wired to have its coil actuated by 115-volt a.c. picked up from an external source — specifically, from the TX-1 (Apache) transmitter when the TX-1 is used as an exciter. In such case the plate switch in the TX-1 operates the relay.

A centrifugal blower provides forced air cooling. It draws air into an enclosed sub-chassis through a filter and forces part of it up past the tube bases and part through an air pipe which directs the stream against the plate seals of the amplifier tubes.

There are two panel meters. One measures plate current at all times while the other may be switched to read grid current, screen current or plate voltage.

The filament transformer for the 4-400As is included in the amplifier unit. In addition to a connector for the 6-conductor cable for the primary power control of the KS-1 power supply, there is a separate shielded connector for the high-voltage d.c. and a set of accessory terminals designed to tie in the control circuits with the Heath Apache transmitter and SB-10 Sideband Adapter. There is also a pair of terminals for a 115-volt antenna relay, these being in parallel with the coil of the control relay mentioned above.

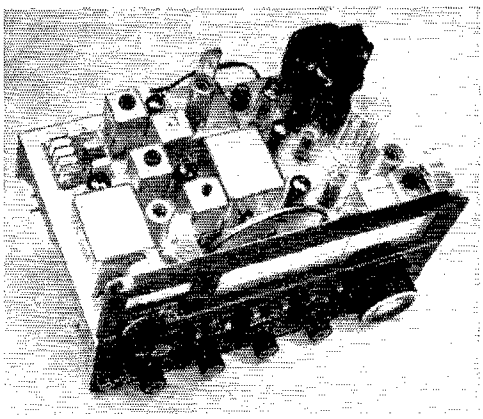
The construction of the KL-1 is such that, once assembled, all cables must be disconnected from the amplifier before the chassis can be slid out of the case. Thus there are no access doors and hence no need for interlocks. The cabinet height is 11 inches, plus another 5/8 inch for the rubber feet. Width is 19½ inches. Depth is 15 inches with another inch for the knobs, but an additional 4 inches or so from the wall should be provided to take care of the cables. Weight of the KL-1 is 61 pounds. *E. L. C.*

The Drake 2-A Receiver

THE small package (12 × 7 × 9 inches) shown in the accompanying photographs is the new Drake Model 2-A receiver, covering up to twelve 600-kc. crystal-controlled segments in the range from 3.5 to 30 Mc. Any of the twelve bands can be selected by a front-panel switch. The receiver comes equipped with crystals for four amateur bands, 80 through 15 meters, plus one 600-kc. range on 10 meters. Band-switch positions are available for the addition of two other 600-kc. ranges in the 10-meter band, plus five positions for frequencies outside the amateur bands, such as those used by MARS and WWV.

The main tuning knob is string coupled to the large calibrated slide-rule dial on the receiver's front panel. The dial is marked in 100-kc. intervals on all amateur bands and also has a similarly divided 0 to 500 kc. scale for use on ranges outside the amateur bands. The dial glass has a scale marked in 10-kc. divisions and the tuning-control knob has a dial marked off in 40 divisions, each representing 1 kc. The positions of both the glass and the dial on the knob are adjustable for calibration alignment.

The block diagram in Fig. 1 shows the tube line-up and the functions of the various stages. A 6BZ6 pentode, V_1, operates as an r.f. amplifier with its grid and plate circuits gang-tuned through a separate panel control labeled PRESELECTOR. The basic range of the preselector circuit is 5.0 to 10 Mc. Other preselector ranges — there are five altogether — are obtained by the seldom-used method of shunting the basic tuned circuits with capacitance or inductance to change the resonant frequency. Capacitive loading is used for the 3.5–5-Mc. range, while progressively smaller coils are paralleled with the main inductances on the three ranges above 10 Mc. Thus the complete 3.5–30-Mc. range of the receiver is covered without any gaps, insofar as the preselector is concerned. The tuning of this part of the receiver is independent of the main tuning control, so the front end must be peaked separately in actual operation.



The Drake Model 2-A receiver is shown out of its cabinet in this view. The cabinet and panel are finished in black as are also the control knobs. The slide switches, arranged along the front panel, are red. From left to right the slide switch functions are: power on-off, Q multiplier on-off, calibrator on-off, standby-receive, fast or slow a.v.c., 2.4- or 4.8-kc. selectivity, diode or product detector, and b.f.o. on-off. Tuning is done with the frequency-control knob at the right of the photograph. Knobs along the bottom of the panel, from the left, are the band-switch control, r.f. gain, sideband tuning, and audio gain. The preselector tuning control is at the top left under the S meter. Crystals for the receiver are plugged into the crystal board at the left rear of the chassis. This view shows the 100-kc. crystal calibrator (an accessory) in place at the rear center.

Signals from the r.f. amplifier are converted to a first i.f. of 3500–4100 kc. in the pentode section of V_{2A}, a 6U8. Injection for the mixer is provided by a crystal-controlled oscillator, V_{2B}, the triode section of the 6U8. (On one tuning

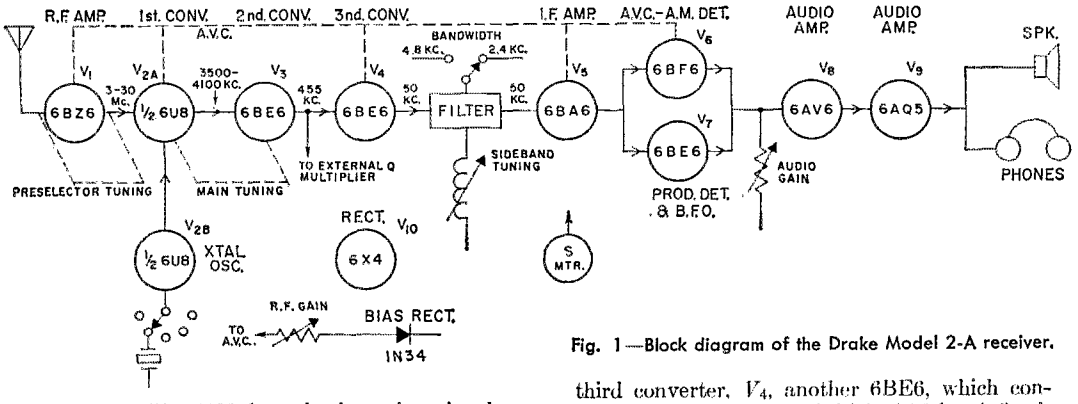
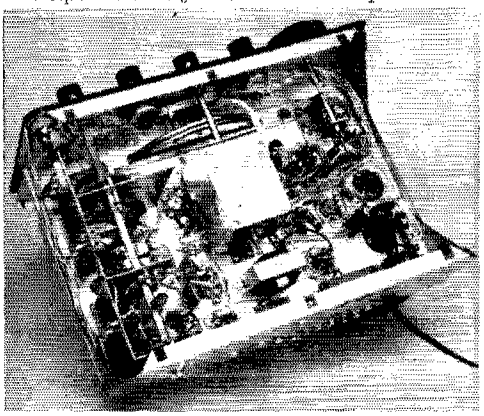


Fig. 1—Block diagram of the Drake Model 2-A receiver.

range, 3500–4100 kc., the incoming signals are already at the intermediate frequency, so on this range V_{2A} simply acts as an additional r.f. amplifier; V_{2B} is inactive in this case.) On crystal frequences between 4 and 20 Mc. a Pierce oscillator configuration is used and the crystals oscillate at the fundamental frequency. An overtone-type circuit and crystals are used when higher crystal frequencies are required.

The second converter, a 6BE6, is tunable over a 600-kc. range, changing signals in the 3500-4100 first i.f. to the fixed second i.f. of 455 kc. The main tuning knob, labeled FREQUENCY, controls the frequency of the v.f.o. section of V_3, and is ganged with a variable capacitor that tunes the 3500–4100-kc. grid circuit of V_3. The tuning range of the v.f.o., 3955–4555 kc., is the same on all bands. The single tuning range together with a ceramic coil form and a double-spaced capacitor in the v.f.o. circuit contribute to good stability; Drake claims a maximum warm-up drift of only 500 cycles.

Output from V_3 at 455 kc. is coupled to the third converter, V_4, another 6BE6, which converts the signal to the third i.f. of 50 kc. A fixed-frequency oscillator, also part of V_4, operating at 405 kc. provides the necessary injection for the conversion. A connection to the 455-kc. i.f. is brought out to a four-prong socket on the chassis rear for use in conjunction with an external Q multiplier. A panel switch marked Q MULTIPLIER controls B-plus to one terminal of this socket.



View underneath the Drake 2-A receiver. The band-switch section is at the left, the sideband filter is in the compartment at the chassis center, and the power-supply components are at the right. Connections on the terminal strip at the chassis rear (in the foreground) include antenna, ground, a.v.c., mute and speaker (4 ohms). A hole is provided in the chassis for a coaxial fitting if this type of antenna connector is desired. The S-meter zero adjustment, a screwdriver control, is at the left on the rear wall of the chassis.

The plate circuit of V_4 contains a tunable sideband filter consisting of four high-Q ganged tuned circuits. This filter has approximately the same characteristics as the one used in the Drake 1-A receiver[1] — 2.4 kc. wide at 6 db. down, 8.5 kc. wide at 60 db. down. However, in the 2-A receiver it is possible to cut out two of the filter's tuned circuits by means of a switch controlled from the front panel, and with these circuits removed the selectivity of the filter is about 4.8 kc. at 6 db. down. The wider band width gives better response for a.m. reception. The filter frequency can be adjusted from the panel, by a control marked SIDEBAND, over a 6-kc. range. This spread is wide enough so that the pass band can be moved from one side to the other of the b.f.o. frequency for sideband selection.

Following the filter is a conventional 50-kc. i.f. amplifier, V_5. The 50-kc. output then goes to two detectors — V_6, an a.m. diode detector, and V_7, a 6BE6 combined product detector and 50-kc. fixed-tuned b.f.o. The output circuit of the product detector includes a low-pass audio filter to suppress audio frequencies above 3 kc. Both detectors run continuously and the desired output can be selected from the panel by a switch marked PROD-DIODE. The b.f.o. may also be turned on or off from the panel.

The d.c. plate circuit of V_5, like that of the r.f. amplifier, V_1, contains the S-meter bridge circuit.

The audio signal, as selected from either detector, is amplified in the triode audio preamplifier, V_8, which in turn is capacitively coupled to the audio power amplifier, V_9. Audio power output is about 1 watt. Good audio circuit design, including negative feedback, accounts for the low harmonic distortion (3 per cent) and intermodulation distortion (0.5 per cent) claimed by the manufacturer.

[1] Recent Equipment, *QST*, November 1957.

As shown in the block diagram, the a.v.c. line is applied to four stages of the receiver. The last i.f. amplifier, V_5, gets its a.v.c. voltage directly from the a.v.c. rectifier (through an i.f. trap), resulting in an attack time constant of only 100 μsec. or so. This fast attack is effective in reducing sudden noise peaks, or "pops," somewhat after the fashion of an i.f. noise silencer. The r.f. amplifier and first and third converters are tied to an a.v.c. line which offers a choice of two time constants, one with a decay time of 0.05 second for a.m. reception and the other, 0.75 second, for s.s.b. reception. Terminals at the rear of the chassis also allow connecting additional capacitance into the a.v.c. circuit so the a.v.c. time constant can be lengthened to suit the individual operator. There is no provision in the receiver for switching the a.v.c. off.

The receiver's r.f. gain is manually controlled through a potentiometer-adjusted negative bias voltage applied to the a.v.c. line. A 1N34 crystal-diode power supply tapped off the power transformer secondary furnishes the negative voltage for the r.f. gain-control circuit.

The STBY-RCV switch on the front panel is arranged to open the a.v.c. system's ground return on STBY, thereby applying the full output of the negative bias supply to the grids of the gain-controlled tubes. The switch is also connected to a MUTE terminal at the rear of the chassis so that a remote relay can be used for send-receive switching. With the switch (or relay contacts) open, the blocking bias is in series with the a.v.c. circuit, which makes the muting rapid since the voltage is not affected by the a.v.c. time constant.

The 2-A's power supply uses a 6X4 (V_{10}) full-wave rectifier with a two-section capacitor-input *RC* filter. It delivers an output voltage of about 150, with lower voltages tapped off the filter resistors. The negative supply delivers about 18 volts for the r.f. gain-control circuit. Power consumption of the receiver is 40 watts at 120 volts, 60 cycles. Low power requirements plus light weight (15 pounds) make this receiver a natural for Field Day. Although there is no voltage regulation in the receiver, the manufacturer claims a maximum drift of only 100 cycles for a 10 per cent line voltage change — another advantage for Field Day!

Accessories available for the Drake 2-A include a crystal calibrator and a *Q* multiplier-speaker combination. — *E. L. C.*

FEEDBACK

HQ-180 Frequency-Conversion System

In discussing the frequency-conversion method used in the HQ-180 receiver (June *QST*, page 42) we misinterpreted the circuit information in the instruction book, with the result that we did some speculating on possible spurious responses which, it turns out, actually would not occur. The 455-kc. gate V_3 and converter tube V_{18} are connected as described, but they do not operate simultaneously as we inferred. A section of the band switch disconnects the screen voltage from the tube not being used; also, the associated tuned grid circuit is short-circuited by another section of the band switch. Thus nothing can get through from V_2, the first mixer, to i.f. amplifier V_4 except over the intended path.

● Technical Correspondence

THAT ICING BIT

75 Holland Lane
East Hartford, Conn.

Technical Editor, *QST*:

The letter from K2DHA in the May *QST* prompted me to get a few additional facts about his ice-melting antenna system. Of prime interest was which side of the coaxial line was connected to the melting half of the dipole, the power involved and the size of the feedline. Mr. Peed was kind enough to reply promptly with the answers to my questions, and I submit the following explanation:

The antennas are fed with RG-59/U, and Cesco Dry-Fit connectors are used at the junctions. Transmitter was about 400 watts a.m. In all cases the melting took place on the dipole halves that were connected to the *inner* conductors of the dipoles. My guess is that the heat generated in the inner wire was readily conducted to its dipole half, while the heat (probably less) in the outer conductor was dissipated through the vinyl covering and the case of the Cesco fitting.

Anyone for open-wire line?

— *Byron Goodman, W1DX*

Box 266
Setauket, N. Y.

Technical Editor, *QST*:

I do not find the results reported in *QST* for May, 1960, pp. 51–52, so very surprising.

If we assume that melting was due primarily to dielectric heating of the ice itself and not I^2R heating of the antenna wire, we expect melting to start first on the side of the antenna with the larger voltage to ground. Almost any antenna, and particularly one fed with coaxial cable, will exhibit some unbalance to ground, and the voltages and currents at corresponding points on the two sides will not be exactly equal. The presence of *any* current on the outside of the coax braid is an indication of this unbalance.

As melting progresses, the unbalance will get worse due to the capacity loading by the unmelted ice, so you can end up with one side clean and the other ice-coated. With higher power or a less efficient antenna you would also get some I^2R heating and the ice would eventually melt on both sides.

Without more details on the antennas, such as which side is connected to the center conductor of the coax, how the lead is dressed with respect to the antenna, what neighboring objects there are to affect capacity to ground, how long the coax is, and what it is connected to at the station end, it is impossible to predict which side of the antenna will have the higher voltage to ground. But I think the important point is that once melting has started the effect will be to exaggerate the unbalance.

— *H. Kuper, K2CU*

1411 Summit Ave.
St. Paul 5, Minn.

Technical Editor, *QST*:

Is it not true that the quarter-wave sections on which the ice did *not* melt were those to which the shield sides of the coax were connected?

If this is true, as I suspect, isn't it possible that the matter revolves around whether or not the coax has the necessary number of quarter waves (electrical) in its over-all length? If so, it would seem to follow that if the coax length is not correct for balancing the r.f. in each half of the antenna, then perhaps that antenna is only radiating half as

much r.f. as it might — or at least concentrating it in one half of its length and getting less efficient radiation than might be possible if it were radiating fully from both halves. . .

— *Jack Morgan, WORA*

— • — •

421 East Christina
Fort William
Ontario, Canada

Technical Editor, *QST:*

I should like to add my humble two-bits worth to K2DHA's "It Beats Us, Too."

It appears that it is the information which was not supplied that is significant. It seems to me that there are two possibilities: either the "dipole" was not really a dipole, due to faulty construction, or — much more likely — it stopped functioning as one under the icing conditions. Is it not easily possible that such heavy icing bridged the supporting system at the end away from the house and provided a conducting path to earth, shorting out one leg of the dipole? Failing that, the icing may have extended the conducting length of one leg along its support (even a rope would coat with ice and become a partial conductor) more than the other, thus upsetting the normally-balanced dipole. . . .

— *George A. Lord, VE3BYG*

184 South Ave.
New Canaan, Conn.

Technical Editor, *QST:*

. . . Isn't the obvious answer his coax drive? A good discussion of the problems of such a drive is given by King, Mimno and Wing in their book, "Transmission Lines, Antennas and Wave Guides," McGraw-Hill, 1945, first edition, page 144 ff. . . . The half of the dipole connected to the coax shield will be nearly at ground potential, so very little, if any, ice melting on that side would result.

By devising a suitable balun for insertion between the coax and the dipole antenna, Mr. Peed could probably increase his transmitting efficiency appreciably, and incidentally melt ice off both sides the next time he tried it.

A balun of coax sections might be rather clumsy, with only the usual 50- or 75-ohm line available. He might, therefore, use a 1:1 transformer, unbalanced to balanced. It would be simple to make and mount. The shunt inductance could be tuned out by a shunt condenser, either calculated or actually adjusted on the ground with a dummy load. This would give some broadbanding of the antenna, too, as a sort of bonus.

— *J. Kelly Johnson*

• Technical Topics

Satellite Ionization

THE article by Ray Soifer, K2QBW, in this issue describes an effect which, at the very least, is subject to a number of explanations. The original report of John D. Kraus — well known to hams as W8JK — in a letter published in the March 1958 *Proceedings of the Institute of Radio Engineers* created quite a stir among scientists specializing in the ionosphere, with considerable doubt being expressed that an object moving at satellite velocity could ionize the atmosphere sufficiently to cause appreciable reflection of radio signals. The interpretation Dr. Kraus placed on his observations also was questioned, since quite similar data were shown to be obobtainable at times when no satellite could have been in the critical region for reflecting signals between two fixed points.[1]

The controversy led to holding a special conference of interested scientists at the Naval Research Laboratory early in 1958.[2] On the basis of existing knowledge of the atmosphere and the data on meteor "bursts" accumulated during years of observation, a mathematical analysis of the conditions necessary for sufficient ionization indicated that the chances of getting reflections from satellite trails were very slim. Added to the possibility of alternative interpretations of the observations, this led to the conclusion that the evidence did not firmly support the reflection theory. Thus it was highly probable that the explanation would have to be sought elsewhere.

So far as we know, that is where the matter still stands, in the minds of the majority of propagation specialists. It is very difficult to establish proof either one way or the other; reliance has to be placed on statistical analysis since reflections from meteor trails, for example, are not only indistinguishable from the satellite reflections that are sought but are also very much more common. No doubt it will take a lot of further observation to establish proof, either way, that will be acceptable all around. In such an effort to settle the question, hams can possibly contribute by giving K2QBW a hand in the program he has planned for further observations this coming Fall.

— *G. G.*

[1] Letter from C. D. Hendricks, jr., G. W. Swenson, jr., and R. A. Schorn, of the University of Illinois, *Proc. I.R.E.*, October, 1958, p. 1763.

[2] The conference proceedings were later published in a special report, "Interaction of Satellites with the Ionosphere."

Color Coding of Semiconductor Diodes and Rectifiers

IF you have used crystal diodes lately you've probably noticed that some are marked with a series of color bands. A standard system of color coding has been adopted by the Electronic Industries Association for identification of semiconductor diodes and rectifiers having type numbers in the "1N —" series.

In the new coding system the "1N" prefix is left out of the color scheme, and the color bands, which are coded in accordance with the tabulation on the next page, indicate the JEDEC[1] type

[1] Joint Electronic Device Engineering Council, an industry committee which has such standardization under its wing.

number that follows the letter "N". Diodes having two-digit numbers are coded with a black band followed by second and third bands having colors indicating the two numbers. If for any reason a suffix letter is required it is indicated by a fourth band. For example, black-orange-yellow-brown indicates a 1N34A.) Diodes with three-digit numbers are coded with the sequence numbers in the first, second and third bands. If a suffix letter is required, it is shown with a fourth color band. On diodes with four-digit numbers the coding is in four bands of the sequence numbers followed by a fifth black band. If a suffix letter is required it is indicated by a colored fifth band which replaces the black band.

A double-width band, which also identifies the cathode-terminal end of the diode, is usually used as the first band. However, an alternative method uses equal band widths with the entire set of bands clearly grouped toward the cathode end. In either case the code is read from the cathode-to-anode end.

Color code for identifying diode and rectifier type numbers.

Number	*Color*	*Suffix Letter*
0	black	—
1	brown	A
2	red	B
3	orange	C
4	yellow	D
5	green	E
6	blue	F
7	violet	—
8	gray	—
9	white	—

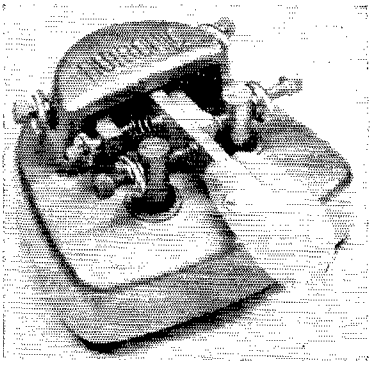
— *E. L. C.*

• New Apparatus

The Autronic Key

THE unusual-looking key in the accompanying photograph was designed specifically for use with an electronic keyer. Although it is small (the base measures only about 3½ inches square) it weighs about 2¼ pounds so there is little tendency for it to "walk." Nonskid rubber feet also insure stable operation. All of the important components of the movement are adjustable. The paddle is made of two plastic pieces of the same size so that the key may be used by both right- or left-handers. The s.p.d.t. switch contacts are of silver alloy. The key is manufactured by the Electrophysics Corp., 2500 West Coast Highway, Newport Beach, California.

— *E. L. C.*



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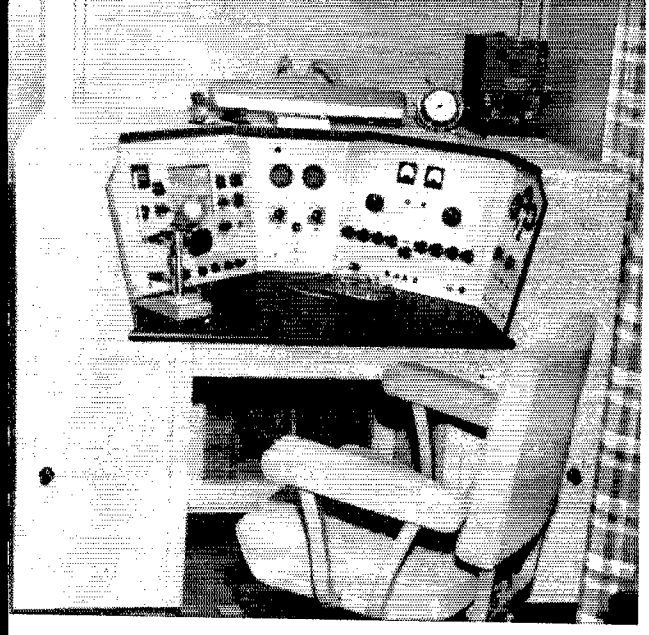
Full size (8 by 10) glossy prints of equipment described in *QST* by staff members (*only*) can be furnished at $1.50 each. Please indicate the *QST* issue, page number, and other necessary identification when ordering, and include full remittance with your order — we do not bill nor ship c.o.d.

July 1935

. . . The League was looking ahead in July, 1935 — to the international radio conference which would be held in Cairo in the winter and spring of 1938. The ARRL was collecting data and arguments to bolster the U. S. delegation against efforts by European governments to cut into the amateur bands. The League was successful in holding amateur frequencies . . . sound familiar?

. . . The issue 25 years ago featured equipment for the portable station and technical articles included W3LW's "Radio Equipment of General Utility," W6EQL's discussion of a genemotor crystal-controlled portable using 6-volt tubes, W9BOE's experimental station on wheels, W3ECP's complete battery-operated portable station — plus a group of articles on non-portable equipment and three pages of hints for the experimenter.

. . . Correspondents were distressed by bootleggers on the higher frequencies.



A Console for the Home Station

BY GEORGE J. ALEXANDER,* VE7XZ

WHEN I decided to build a new rig it was agreed that the station must be more in keeping with the surroundings — a den shared with the XYL.

For special reasons it was decided that the station should occupy a corner space which placed a limit on the physical size of the equipment. It seemed that a console type of construction offered the most compact and cleanest method of housing the various pieces of equipment usually found in a ham station, without having to remove any of the permanent station equipment. The photo indicates what has turned out to be reasonably successful both from an aesthetic viewpoint and in convenience of operation.

Dimensions are not too important for those who may wish to construct a similar console as they will have their own particular space problems but the following external dimensions are given so the reader may get a proportional concept not given by the photographs alone. The console measures 55″ wide, 45″ high overall and 36″ deep. The working space is 34″ wide and 25″ deep at the center and desk high — 30″. The two end pedestals are 16″ wide outside measurement. This dimension was dictated by the size of a standard 14″ × 17″ chassis. The knee-hole does not run through to the back but stops 23″ from the front of the console, the space behind being taken up by a standard 14″ × 17″ chassis. The console is constructed on a wood framework of 2″ × 2″ fir. The members are doweled where necessary and otherwise lap jointed, glued and screwed. The outside covering is ¼″ fir plywood sprayed with Roxatone. The end pedestals are built on 4″ boxes which serve to form a kick space and facilitate the use of a vacuum cleaner.

The end pedestals house the three power supplies and associated circuits. The one on the right is occupied by the high voltage supply at the bottom and on the second deck a screen supply electronically regulated. The high voltage supply is a full bridge type using four 866 rectifiers. The transformer for this supply is not mounted on the chassis but is bolted down to the bottom of the pedestal. The rectifier tubes, filter chokes and filter capacitors, together with the filament transformer are mounted on a 17″ × 14″ × 3″ chassis. This chassis is arranged to slide on angle-iron track and to engage contacts mounted on the inner end carrying the 110 a.c. for filament transformer and the high voltage from the secondary winding of the high voltage transformer as well as the high voltage d.c. for the final plate voltage. This type of construction permits the chassis to be removed by simply pulling it out. There is in series with the primary of the high voltage transformer a voltage regulation transformer which is controlled from the power panel. This control allows altering the high voltage from 1100 volts to 2200 volts in small steps.

The screen supply chassis is carried on similar angle iron slides mounted half way up the pedestal. This chassis carries all the components of a 500-volt electronically regulated supply including the filter chokes and capacitors. The regulating control potentiometer for this supply is brought out to the power control panel and permits control of the screen voltage from 300 volts to 500 if needed.

The pedestal at the left is provided to carry the 1000-volt power supply for the modulator tubes. Both pedestal doors are provided with interlocks.

The space behind the knee-hole is occupied by the speech amplifier and modulator, together with the low power supply for the amplifier. All of these are mounted on 17″ × 14″ × 3″ chassis

*2547 Thompson Avenue, Victoria, B.C.

with plug-in connections at one end to facilitate removal for servicing.

Looking at the panels from the operating position, the narrow panel at the right is the power control panel carrying three round volt meters for the high voltage, the screen voltage, and the modulator plate voltage at the top of the panel. The square meter below measures the modulator plate current. The two knobs control the high voltage variable power supply and the screen voltage variable supply. The three panel lights indicate which circuits are on or off. The four toggle switches at the bottom set up various circuits, while the two push buttons control the a.c. relay for the whole rig, on and off.

The transmitter is the large panel on the right. The meter at the right indicates final plate current. The one on the left is switched for current measurement of the various low current circuits in oscillator, buffer and driver circuits and final screen current. The large dial at left is v.f.o. tuning and the one on the right controls the final tank tuning. The knobs across the bottom control the various circuits. The transmitter is patterned after the 500-watt rig described in recent ARRL *Handbooks*.

The small center panel carries the controls for the antenna coupler which is similar to the "Z" Match described in *QST*. The meter at the top right is the modulation indicator set up with a scope for 100% modulation at full scale. The left meter indicates forward and reflected power on the feeders. The knob at the bottom switches in a dummy antenna for tuning.

Behind the next panel to the left is the NC-240-D Receiver and immediately below are the controls for the monitone and an audio-filter.

The last panel (out of view in the photograph and immediately opposite the first panel described) carries the preselector and the *Q* Multiplier. The power supply for the monitone, audio-filter, preselector and *Q* Multiplier is mounted vertically on a panel in the space behind the last panel at the left just described.

No attempt is made to describe the various circuits as these are mostly covered in the handbooks and magazine articles. Control of the rig, however, is somewhat unusual in that switching the rig from transmit to receive and back to transmit is controlled from the key, while the rig is turned on and off by two push buttons. Depressing the push button at the bottom left hand side of the power panel operates a 110 volt a.c. relay which is wired to hold in on contact. This relay is the main switch and can only operate when the automobile ignition lock shown at the bottom panel under the transmitter, has been turned to "on." Closing the main switch turns on all filaments in transmitter and receiver and auxiliary power supply and energizes the selenium rectifier d.c. power supply serving the various other d.c. relays controlling the rest of the rig. Because mercury vapor rectifiers are used in the main power supplies a time delay relay is used in the a.c. leads to the primaries of these power supply transformers. This relay is set to close 40 seconds after the main switch has been closed. nce this time delay relay has closed, as indicated by a panel light, the rig is in the receive position. A touch on the bug closes a number of relays in the following sequence: opens the center tap of the receiver power transformer disabling the receiver, also closes a relay which grounds the antenna leads to the receiver, actuates the antenna relay from receive to transmit. This antenna relay also has a contact which energizes the relay in series with the a.c. to the primaries of the transmitter power supplies. These relays all hold in until the transmission is finished. When a spring-loaded switch mounted on the side of the bug is depressed this opens the circuit which holds in the control relay and all relays now drop out and the station is again on receive. When the station is on phone the bug is used simply as a control switch, except that another relay controlling the modulator is now in the circuit and the vacuum tube keyer is disabled. A single rotary switch on the transmitter panel changes the mode of operation from c.w. to phone but control of the station is still by *bug*.

All units which are built on standard 17" × 14" × 3" chassis, i.e., power supplies, transmitter, modulator and receiver, are mounted on ½" angle iron slides. The chassis are fitted with suitable plugs and jacks at the rear and handles at the front so that they may be pulled out for servicing. The handles are visible on the transmitter and receiver in the photo.

The rig described has been in operation at this QTH for over four years and has proved most convenient. The author has no hesitation in recommending the console type of construction for housing the station to those hams who still to build their own. QST

Strays

The South Plains Amateur Radio Club of Lubbock, Texas, is sponsoring a project for Boy Scouts to beknown as Region 9 "Jubilee on the Air."

Clubs in the region will set up equipment at area campsites during the national Boy Scout "Jubilee Camporee" July 22–24. Scouts can ragchew and join code practice units during the camporee. A net for the three-state Region 9 area will have a net frequency of 7220 kc. on 40 meters with a national working frequency of 14250 kc. on 20.

The Jubilee will be on the air from 9 A.M. to 2 P.M. and from 5 P.M. to 7 P.M. Saturday, July 23, and from 6 A.M. to 10 A.M. on Sunday, July 24.

K7AWI offers this formula: FCC violations equal the sum of the squares licensed.

Retreading An Old-Timer

BY GEORGE D. SNELL,* K6VTC, EX-6AKM

It can begin very innocently. You just happen to be passing a supply store and you wander in. Everything looks strange and yet somehow familiar. All those smart, streamlined cabinets, square meters with plastic faces, incomprehensible gadgets of all shapes and sizes that you never saw before, and yet all bearing a family resemblance to the old breadboard haywire you once knew so well. They might even be their space-age descendants.

You pause in wonder and look. Then you pick up a *QST* and thumb through it.

"They're still publishing this," you comment rather superfluously, to one of the clerks.

"You bet they are: and it's still the old 'Bible' of ham radio," he replies.

"I can remember when it was my 'Bible' too," you say, thinking back across the hazy years. "I was a ham in the days of Ford spark coils and glass-plate condensers." You remember some of the construction articles in *QST* and how you once tried to wind the secondary of a high-tension transformer.

"Well, you ought to get back in the swim," your friend says. "You'd find it's more fun than ever."

You shake your head. "No, I guess I've forgotten too much. I'd never be able to pass the exams they must give nowadays. All I had to do when I got my ticket back in 1925 was answer in longhand a few simple questions and copy ten words a minute."

He smiles and hands you a copy of *How to Become a Radio Amateur* and *Radio Amateur's License Manual.* Just for the heck of it, you buy them.

That, brother, can be the best dollar investment you ever made in your life, and I am not kidding. That dollar puts you back in circulation, gives you a new interest in life, harnesses your thinking to a hobby that can make your retirement years full of meaning and enjoyment, and maybe even prolong your time on earth because of that.

If you are a "retread ham," as I am, you will know what I am talking about. You'll know, for instance, that a re-submersion in amateur radio, after an absence of, say, thirty or forty years, can be like falling in love again, or finding a little cupful of water from the Fountain of Youth. It will, of course, "take you back" to your younger days (because, as you progress in your new incarnation, you'll find that ham radio *hasn't* changed so very much after all) but this isn't its greatest charm. It's the re-entering of a world at once familiar and strange, of learning again some of the things you once knew, and of learning anew things that sparkle and gleam with interest.

So you take home your ARRL booklets and read them. They ring bells through page after page. They conjure up memories — your first c.w. transmitter, that UV201 whose plate turned bright red if you made a reasonably long dash, that detector-and-one-step Reinartz receiver which was your pride and joy, of the Hertz antenna you clipped to the plate of the 5'er, and the 24-jar chemical rectifier that was so nearly a dead short on the secondary of your transformer that all the lights in the house dimmed when you pressed the key, of the peculiarly pleasant smell of ammonium sulphate as the solution boiled between the lead and aluminum electrodes of that highly inefficient rectifier.

You know for a fact that you haven't forgotten the code any more than you've forgotten how to ride a bicycle or roller skate, even though you haven't done any of these things for over a quarter of a century.

And the beauty of the equipment picture in the booklets! You never have seen anything like this slick gear, so professional-looking you can hardly believe it could have descended from the crude components you used to own. Now, you learn, transmitters not only have outgrown "master oscillators," but even crystals, because there is a mysterious entity known as a v.f.o.! What this may be puzzles you for a while because, search as you will, the ads never give a hint. Finally, if you dig into the *Handbook*, it all becomes clear; and you marvel at this great boon that allows a carrier to be moved at will in the bands.

But it is all so scientific now: you have to know where you are in the spectrum, you have to keep detailed logs, you must monitor for conelrad, and then, there is the ogre of TVI, which you never had to contend with in your time. True, you had to worry about BCI, but that was usually simple to cure with an r.f. choke in your power supply and maybe a trap in the neighbor's

* 1289 Glen Eyrie Ave., San Jose 25, Calif.

antenna circuit. Maybe, you reflect, ham radio 1950's style is too darned scientific for a 1920's type ham — one who can remember when W6AM was 9ZT, and 6CGW and 6AWT were the DX champions of the world.

However, by this time you're too far along in the *License Manual* to take these reflections seriously. A lot of this stuff you actually know! It hasn't *all* changed. In fact, when you cover up the answers, you find you can get maybe ten per cent of them correctly without half trying. You know you couldn't face yourself if you didn't at least make a try at getting that license again. So you try — and wonder of wonders, you succeed!

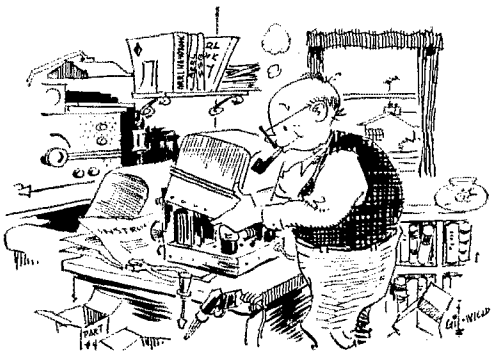
That day, when you walk out of the FCC office *knowing* you've passed, is one you won't forget. And when the little white envelope comes in the mail about six or seven weeks later, and you tear it open to see what your new call will be, then, my friends, you are really living!

With fresh confidence you pore over catalogs, compare power for power, cost for cost, and finally decide you'll buy a kit and build your transmitter. The receiver is a monumental problem because every one looks so unbearably attractive. You examine the specs, point by point, compare, admire, weigh your pocketbook in the balance, and then — presto! select the one you knew you liked best all along.

Your antenna poses a rather more serious problem because you can't shinny up trees the way you used to do, and the XYL won't let you tromp around on the roof, starting leaks. If you have a sympathetic youngster in your house, or in your neighbor's, you corral him, and the all-band trap, the vertical, the folded dipole, or the beam, goes up with much less difficulty (there are so many lovely skywires now — you can smile when you think of your ancient cage and flat-top).

Although your eyes aren't as good as they used to be, you find you can solder wires to these new-fangled miniature parts, and the kit transmitter begins to take form. It's fun to see the thing coming to life in your hands. When you finally plug it in, connect that dummy antenna (60-watt light globe), and at resonance it burns to full brilliance, you know you're back where you belong. You know it even more after that first tremulous handling of the key as you make your first QSO and find you *can* send and copy just about as well as when you left off.

Well, if it all begins so unobtrusively, much as a little spring develops into a trickling stream in the uplands, your re-entrance into ham radio grows like the swift brook, the roaring cataract, and finally the broad and deep river, as you navigate again the mainstreams of our unique hobby, handling traffic (so much more efficiently nowadays with the many traffic networks), pursuing DX (how differently now — with what precision and effectiveness through the use of power, directivity, 17-tube triple-conversion receivers), rag-chewing (here the hobby hasn't changed one whit: the boys on 40 meter c.w. are as loquacious



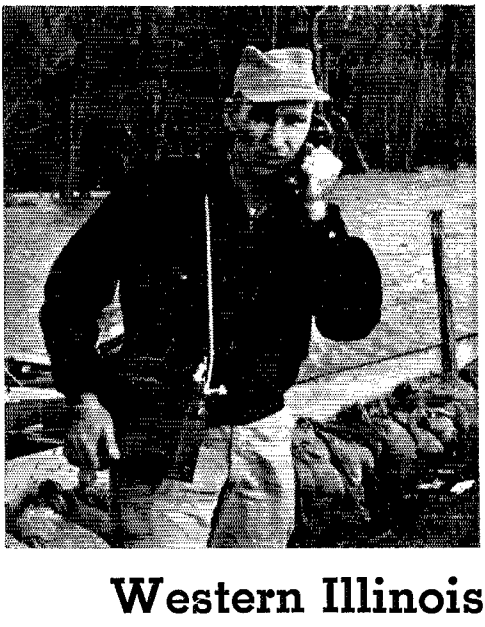
and friendly as they were in 1925), or constructing gear (and what a fantastically expanded field there is here, virtually limitless as electronics increasingly affect our lives in the age ahead).

Retread? Perhaps a better word for it is reborn, back into an interest that will provide a challenge as long as you live. QST

Silent Keys

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

W1CNZ/W1EA, Alexander R. Johnson, Cranston, R. I.
W1UVC, Charles Wax, Boston, Mass.
W2BX, Sid L. Rusack, Vineland, N. J.
WA2ISL, William H. Casswell, Miller Place, N. Y.
W2KLB, Thomas J. Phillips, Atlantic Highlands, N. J.
W2WWK, Franklin L. Kellsey, Scotia, N. Y.
W3TWL, Leon H. Williams, jr., Downingtown, Pa.
W4IJW, Richard G. Smith, Dyersburg, Tenn.
W4SWC, John N. Lesslie, Salisbury, N. C.
W4TPO, Ernest F. Dickson, Nashville, Tenn.
W5AXG, W. Irving Abbott, Dallas, Texas
W5BUS, Harry Deane Loveland, Houston, Texas
W5FCO, John B. Hussey, Shreveport, La.
W5IDK, Jesse M. Hilton, West Monroe, La.
K5IDW, Olin H. Collins, South Norfolk, Va.
K5MDC, Dewey V. Teague, Fort Worth, Texas
W6FYU, Norman L. Olsen, sr., Altadena, Calif.
K6PZJ, Leon A. Chernus, Los Angeles, Calif.
K6ZJN, Lt. Col. Wayne W. Woodward, Hamilton AFB, Calif.
K7IDN, Jack C. Miller, Pendleton, Ore.
W7JWD/W7AMD, Leslie F. Hay, Winlock, Wash.
W7OSC, Gustave A. Piehl, Cottage Grove, Ore.
W7RPY, Eldon G. Montgomery, Ogden, Utah
ex-8ACS, Warren R. Cox, Oberlin, Ohio
K8IIXU, Jesse A. Davy, Piqua, Ohio
W8MZW, Arnold J. Hoyng, Coldwater, Ohio
ex-WN8QWL, Walter A. Ridd, Parkersburg, W. Va.
W9ELU, Robert W. Nelson, Indianapolis, Ind.
KØDQK, Raymond E. Warmbrodt, St. Louis, Mo.
WØGGI, Franklin P. Schoberg, Finland, Minn.
WØICD, Bernard H. Wendt, North Kansas City, Mo.
W0SXI, James T. Penn, Trinidad, Colo.
VE3APS, R. A. R. MacDonald, Toronto, Ontario
VE7ALL, Fred C. Wood, Comox, Bt. Columbia
VK3VA, W. Bert Bridger, Ballarat, Victoria, Australia



K9KCY patrols the sand-bagged levee with a walkie-talkie, with river level plainly visible.

As emergency reports go, this one is fairly routine, and only part of the whole story of the floods in the Mississippi Basin earlier this year. But "a picture is worth a thousand words," and this report was well documented with photos. See "With the AREC" for reports of work done elsewhere in the floods.

A Factual and Pictorial Account of Emergency Communications in the Area around Quincy, Ill.

Western Illinois Amateurs in the Mississippi Flood

ONCE more radio amateurs and their equipment have played an important part in an emergency. During the recent serious flood danger, the Western Illinois Radio Club furnished communications for the National Guard and Levee Commissioners around the Quincy-Meyer, Illinois, area.

On April 3, the amateur group was called to Meyer, Ill., to supply communications between levee work parties and Meyer levee headquarters. The frequency used was 146.9 Mc. f.m. There was also a radio link on 3940 kc., with both c.w. and phone between Meyer and Quincy. The existence of this communications circuit was a major factor in holding back the flood at Meyer.

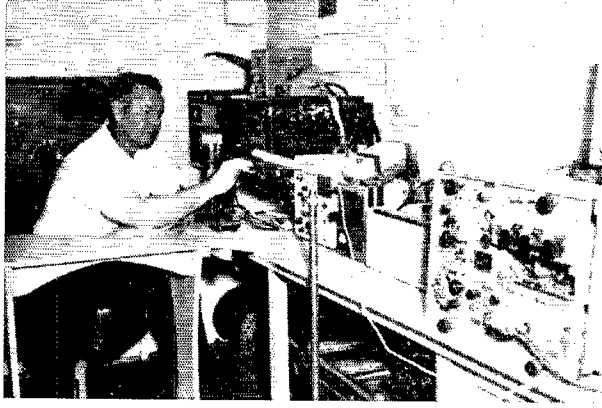
At the same time, another group set up shop in the area south of Quincy; this was organized by W9BIV.

Old Man River kept on rising. On April 5, after fighting all day to hold the levee, it was decided that the situation was hopeless unless a new approach was made. Poor roads and inadequate communications made it impossible to reach trouble points in time. After consulting W9KRC, a new plan was evolved for maximum use of poor back roads and communications procedures, copied after the plan used by W9BIV and his gang south of Quincy, which operated a total of 144 hours solid.

Early in the morning of April 6, members of the Western Illinois Radio Club moved equipment to West Quincy, Mo., and manned it until April 9, a total of 75 hours. During this time, the river reached record heights and many serious conditions developed; but prompt communications enabled men and equipment to reach trouble

Inside the communications bus, K9JFS works at one of the two operating positions. This position contacted walkie-talkies on the levee, who then used megaphones like the one shown at top to communicate with levee workers and supervisors.

Here is the converted school bus used by the Western Illinois Radio Club as a c.d. mobile communications control center. It can be used from any location, stationary or in motion. Note the boards added to the levee (background) to hold back the raging Mississippi.



This neat mobile communications package, left, is owned and operated by WØTBI (in photo) and was used in the area south of Quincy. WØTBI at his operating position inside the mobile van.

spots in record time, and the levees never reached the actual breaking point. At least four times as much work was accomplished after obtaining radio communications than on the days before. Equipment used consisted of base stations, mobiles and hand-carried units, on 2 and 75 meters. Amateur equipment was also installed at the U. S. Corps of Engineers' mobile base at Quincy, thus tying all communications together at one point and placing about 20 miles of levee under continuous radio communications.

Who did this? These are the amateurs: *K9s* KTQ CKV JJD KOJ JFS KCY UUD RLR UUP PCF AAJ RHU GZO MRM, *KN9s* SBM VFF, *W9s* KRC HLW WXK AEX GQK BIV IBR KNH LKG *and* WØTBI. — *Reported by K9JFS.*

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 — North Jersey DX Ass'n, Box 55, Arlington, N. J.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.

W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.

W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.

W6, K6 — San Diego DX Club, Box 16006, San Diego 16, Calif.

W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.

W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.

W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.

VE2 — George C. Goode, VE2YA, 188 Lakeview Avenue, Pointe Claire, Quebec.

VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.

VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 833 10th St., North Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.

VE8 — Earl W. Smith, VE8AT, P.O. Box 534, Whitehorse, Y. T.

VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.

VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.

KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.

KH6 — Andy H. Fuchikami, KH6BA, 2543 Namanu Dr., Honolulu, Hawaii.

KL7 — KL7CP, 310–10th Ave., Anchorage, Alaska.

KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

Hamfest Calendar

Kentucky — The Second Annual Greater Louisville Hamfest will be held on Sunday, July 31, at Monogram Hall, General Electric Appliance Park, Louisville. No further details available at this writing. For further info contact W. J. Johnson, W4HOJ, 3710 Grandview Ave., St. Matthews.

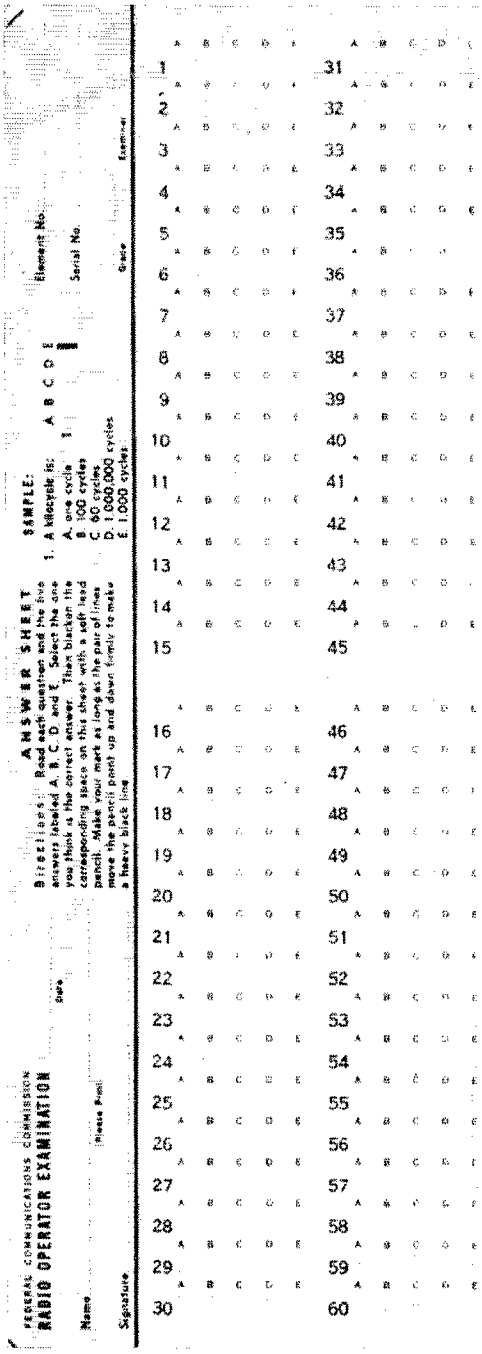
New York — The North Country Radio Club will hold its annual outdoor hamfest on July 17 at the Norfolk Rod and Gun Club in Norfolk. All amateurs and their families are invited. For further information contact Ben F. DeClue, jr., K2SAC, Edwrads, N. Y.

Pennsylvania — The annual hamfest of the South Hills Brass Pounders and Modulators will be held on Sunday, August 7, at the Museum Building, South Park Fairgrounds, South Park, Pittsburgh. Preregistration is $1.50. Swap and shop. For further information contact Anthony P. Trnosky, W3ZQC, 4503 Mollenauer St., Bethel Park.

(*More on page 55*)

FCC Written Exam Procedure Changing

DURING the next few months a new system of answering amateur operator license examination questions will be put into effect by the Federal Communications Commission. The purpose is to reduce the time required for examination grading by the Commission's field office personnel.



In the present system, each question is reproduced with five possible answers, only one of which is correct. The applicant enters the number of his choice on a line below and to the right of the question and answers.

In the new system, the questions and their multiple-choice answers will be prepared on one set of papers, but a separate sheet is provided for the marking of the applicant's choice of the correct answer. See the adjacent illustration showing a portion of an answer sheet. A sample question and the method of marking the correct answer is shown along the left-hand margin. Blanks which the examinee must fill out will also be found in this margin.

The applicant reads a question from his set of papers, determines his choice of the answers (labeled A, B, C, D and E), and then with a soft lead pencil blacks in the appropriate spot on the examination answer sheet. He should make only one mark for each answer. Pencil is preferable so the examinee can erase and change his choice of answer if he realizes — *before the examination has been completed, of course* — that he has made a mistake. In making such corrections, the erroneous marking should be erased completely. As only one answer is correct, and because the grading is done mechanically, the question will be counted wrong if more than one lettered answer space (for a given question) is blacked in, *even if one of them happens to be correct.*

The answer sheet must not be folded or mutilated in any way. This is to permit rapid and accurate handling by field office personnel doing the grading.

Marking of answer spaces prior to the beginning of the written examination or prior to opening the envelope containing the examination questions will constitute disqualification and will subject the examinee — and, in the case of a mail examination, the examination witness — to penalties for participation in a fraudulent examination. *Volunteer examiners take note.*

The answer sheet contains spaces for answers to a total of 150 questions. However, the number of questions for each class of examination will not be changed for the present. Although the questions will be numbered sequentially, the first question may not start with number 1. For example, question numbers of the 20-question Novice examination may be 1 through 20, or 21 through 40, or 41 through 60, etc. Likewise, the 50-question Technician, Conditional and General Class examinations may be numbered 1–50, 51–100 or 101–150.

It is expected that use of the new system may begin at some field offices in July and August. Present plans are that each office will exhaust its

supply of the old style examinations for a given class before beginning use of the new questions and answer sheets. The scope of the questions will be modified only to a minor degree, if any. Instead of requiring the examinee to draw diagrams, multiple choice diagram questions will be provided. For example, the examinee should be prepared to choose: the correct place to connect a neutralizing capacitor in an amplifier; the correct name of an oscillator circuit; the correct descriptive name for a power supply circuit; the correct descriptive name for an r.f. filter circuit, etc. It is planned that the number of diagram type questions will be considerably expanded in the near future. The next edition of the ARRL *License Manual* will be modified accordingly.

The examinee should have little difficulty, if any, in writing the examination if he reads and follows the instructions carefully and thoroughly. This system is already being used for some commercial operator examination elements.

QST

Alabama — The Gulf Coast V.H.F. Picnic will be held at the Gulf Shores State Park, Gulf Shores, on July 17. Fun for all. Bring your family and a picnic lunch. Six meters will be monitored for mobiles. For further information contact Jacob G. Thorn, K5HUW, Rt. 2, Box 161, Pascagoula, Miss.

Alaska — The Arctic Amateur Radio Club of Fairbanks will sponsor the 1960 All-Alaska hamfest on August 12, 13, and 14. Housing is being arranged for out-of-town guests at a nominal cost. For reservations, contact Florence M. Robinson, KL7AZJ, Box 735, College, Alaska.

California — The Ramona Radio Club will hold its annual picnic from 9:30 A.M. to 4 P.M. Sunday, July 31 at Barnes Park on McPherrin and Newmark Avenues in Monterey Park. Tickets are $1.75 from W6IDF.

Idaho — The annual WIMU hamfest will be held in Big Springs, Idaho, on August 5, 6 and 7. There will be events of interest for all. Cabins and good campgrounds are available. For further information, contact Helen M. Maillet, W7GGV, Route 1 South, Pocatello.

Illinois — The 3rd annual picnic of the Six Meter Club of Chicago will be held on Sunday, August 7 at Spring Rock Park, Western Springs. This is located at 47th and the Illinois Tollway. The club station, K9ONA, will be on 50.4 Mc. to guide mobiles. Plenty of parking space, adequate facilities, games, swap table, etc. Registration is $1.00. For further information contact Bowen C. Finfrock, K9PIZ, 1909 W. 67th St., Chicago 36.

Illinois — The Quad-Co. Radio Club will sponsor the third annual hamfest of the Breakfast Club on Sunday, July 31, at Terry Park near Palmyra. The Illinois Emergency Net will hold a meeting, and all other groups are invited to meet at the hamfest, giving prior notice to the hamfest committee. Bring your own basket lunch. Sandwiches and soft drinks available on the grounds. Mobile talk-in on 3.873 and 29.6 Mc., from 0400 to 1100. All sorts of contests and games, including golfing and fishing. Bring your swap gear. Registration is $1.00 in advance, or $1.50 at the gate. For tickets write to Dale Elliott, K9SKJ, Box 134, Loami.

Illinois — The Radio Clubs of Central Illinois are sponsoring the Central Illinois Radio Amateur Picnic (CIRAP) on Sunday, July 17, at the 4H grounds in Allerton Park, near Montecello. No charge. Lunches and refreshments available. For further information contact Roy A. Cartier, W9MUD, 1333 Buena Vista Ave., Decatur.

Illinois — The Shawnee Amateur Radio Association will hold its annual hamfest on July 31 at the DuQuoin State Fairground. A sideband dinner will be held Saturday evening prior to the hamfest. For further information, contact Frances May, K9JJE, 807 South Russell, Marion.

Indiana — The 11th annual v.h.f. picnic sponsored by the Wabash Valley Amateur Radio Association will be held on Sunday, July 31, at Turkey Run State Park, about 40 miles north of Terre Haute, near highway 41. This is an outdoor affair, and if you do not care to bring your own basket lunch, food is available at the Park Hotel and Restaurant. Further information is available from Ken Mier, K9EFO, 2446 Cleveland Ave., Terre Haute.

Kentucky — The 1960 MO-ARK-KY hamfest, sponsored by the Paducah Amateur Radio Club, will be held on Sunday, July 10, at Noble Park Community House, Paducah. This will be an all-day get-together, with a big noon meal. Entertainment for children and non-ham adults. No registration fee. For further information, contact H. G. Dunning, W4NBS, 3716 Alemeda Drive, Paducah.

Maryland — The Maryland Emergency Phone net will hold its annual picnic on Sunday, July 24, at the Gaithersburgh Fair Grounds. Gaithersburg is located on Rt. 240, about four miles northwest of Rockville. Registration will commence at 0900. The fee is $1.00, including parking and free soft drinks. Adequate picnic facilities and refreshments will be available. There will be programs for the wives and children as well as the sale and auction sessions for the OMs. Mobiles will be monitored on 3820 kc. and on 6 and 2 meters. Tickets are available from MEPN members, or may be purchased at the gate. Further information is available from Harrison W. Eppes, K3GZK, 211 Crafton Rd., Bel Air.

Tennessee — The annual hamfest of the Chattanooga Frye Amateur Radio Club will be held on July 30 and 31. Tickets are $1.00, plus $3.25 Saturday steak banquet. There will be a barbecue lunch on Sunday at a small additional cost. For further information, contact Ward Buhrman, W4QT, Box 13, Chattanooga.

Virginia — The fifth annual Graveyard Net picnic will be held on July 9 and 10 at Jamestown. Mobile judging, auctions, QSL judging, a beauty contest, and games for the ladies and children. Facilities are available for camping, fishing, swimming and boating. For further information, contact Norman Reynolds, K4GKN, 36 N. Lawson Rd., Poquoson.

Virginia — The fifth annual hamfest of the Blue Ridge Amateur Radio Society will be held on July 24 at Lakeside Amusement Park, located on Route No. 460, between Roanoke and Salem. Noon lunch will be available on the premises. Registration will start at 0900. For further information, contact Robert E. Anderson, K4UMK, P. O. Box 2002, Roanoke.

West Virginia — The second annual West Virginia state hamfest will be held at Jackson's Mill State 4H Camp near Weston on U. S. Route 19 on July 9 and 10. Registration for the hamfest is $6.00, which includes all hamfest activities plus an evening meal and lodging on Saturday and a breakfast and dinner on Sunday. (Advance registration only.) Special tickets are available at $1.50 for those who do not want lodging or food. The program will include activities for all members of the family. There will be transmitter hunts on 75, 10 and 6, and W8SP/8 will be on 3890 to guide mobiles. For reservations and more information, write West Virginia Hamfest, Box 909, Fairmont, or Box 129, Spring Hill Station, South Charleston.

Wisconsin — The Badger Emergency Network Picnic, sponsored by the Fond du Lac Amateur Radio Club, will be held on July 10 at Lakeside Park in Fond du Lac. Registration is $1.00 per amateur operator. Mobile judging, mobile hunts, etc. Bring your own picnic lunch. For further information, contact Stephen L. Smith, K9GBK, 593 Ledgeview Blvd., Fond du Lac.

Wyoming — The Casper Amateur Radio Club will sponsor the Wyoming hamfest convention on July 16 and 17, at the Pines Lodge in the Big Horn Mountains, 15 miles southwest of Buffalo, Wyoming. Cabins, tent sites, and trailer space is available. There is an excellent fishing stream running through the lodge area. There will be hidden transmitter hunts and other contests, with special activities for the XYLs. Registration is $2.00. For advance registration, contact Rudy Toman, K7IAY, 1615 South Oak St., Casper. For accommodations, write direct to Pines Lodge, Buffalo

13th Event Breaks All Band Occupancy Records

1960 V.H.F. Sweepstakes Summary

THANKS to two tremendous sporadic-*E* skip sessions on 50 Mc. and hundreds of 2-meter newcomers giving it their all, the 1960 V.H.F. Sweepstakes enjoyed record participation. The final tabulation shows 1446 logs, up 28 percent over last year. More on these figures and their significance in the v.h.f. column of this issue. A preliminary report on the contest was made in April *QST*, page 58, so only additional highlights, the club standings and the final score tabulation are given here.

Despite the large increase in two-band activity, there were some fine one-band efforts. Section awards in 22 of the 59 ARRL Sections represented were won by contestants using only one band — 19 on 50 Mc. and 3 on 144. K9HWY, Chicago, with 278 contacts in 22 sections on 50 Mc., led the one-banders. Other outstanding 6-meter efforts were turned in by K5TKR W3FQD W3KMN W4LIP and K1ICM, all with more than 200 contacts each. K2IEJ, Oceanside, N.Y., led the country's 2-meter operators with 164 contacts in 14 sections, for 7872 points. W2QEU K1HJV and K3BHK gave him a good run, all with more than 6000 points on 144 Mc. Leading Novice effort was by WV2GQV/2, who braved the wintry blasts in operating from a mountain location in the Eastern New York Section. He worked 137 stations in 7 sections, for 4658 points.

Reports came from almost everywhere: 43 states, 59 sections, Hawaii, Puerto Rico, Cuba and 3 Canadian provinces. Big scores came from all over, too, which is what we like to see. There were 58 clubs entered, and as always they were a major factor in the big turnout. What some groups won't do for a gavel, especially when they already have about two per member!

The South Jersey Radio Association did it again, making it 5 in a row, and 8 out of 13. SJRA has not finished lower than third since 1949, and their 499,028-point aggregate was an all-time club record. They had no walk-away, however, for their across-the-river rivals, the Mt. Airy V.H.F. Club poured it on as never before, moving up to a close second with 435,086 points. The Six-Meter Club of Chicago, making their first try in 1959, took over third place, dropping ever-trying Dayton Amateur Radio Association back into fourth spot. It is indicative of the growth of club interest that the four leaders all beat the SJRA total for 1959, made under the same scoring system as used this year.

CLUB SCORES

Club	*Aggregate*	*Certificate Winner*
South Jersey Radio Assn.	499,028	W2BLV
Mt. Airy V.H.F. Club (Pa.)	435,086	W3KKN
6 Meter Club of Chicago	360,055	K9KLU
Dayton Amateur Radio Assn.	348,459	K8EXT
Connecticut Mobiliers	131,699	W1RJA
Mobile Sixer's Radio Club (Pa.)	107,075	W3HFY
Waltham Amateur Radio Assn. (Mass.)	94,279	W2BVU/1
Six Meter Mobiliers of Massachusetts	88,378	K1ISR
National Capital V.H.F. Society	75,003	W4LTU
Keystone V.H.F. Club (Pa.)	66,640	K3AAX/3
Hartford County Radio Assn. (Conn.)	57,285	W1LGE
Greater Atlanta V.H.F. Society (Ga.)	48,906	K4YGK
Merrimack Valley Amateur Radio Club (Mass.)	42,947	W1GEF
Central New Jersey V.H.F. Society	34,745	W2GKR
Hampden County Radio Assn. (Mass.)	33,917	W1RFU
6 Meter Club of Dallas	26,546	W5FEG
Quinebaug Valley Radio Club (Mass.)	26,350	K1ICM
51.30 Club (Mass.)	23,870	K1CMU
Maryland V.H.F. Society	23,826	W3DUT
Greater Pittsburgh V.H.F. Society	23,658	W3BWU
Hollywood Amateur Radio Club (Fla.)	22,118	K4PPX
Cowtown 6 Meter DX Club (Texas)	18,581	K5TKR
Syracuse V.H.F. Club	14,765	K2QWD
Dutchess County V.H.F. Society (N.Y.)	14,722	W2LWI
Southern Chester County Amateur Radio Club (Pa.)	14,552	K3ATX
Lake Success Radio Club (N. Y.)	12,616	K2JWT
Delaware 6 Meter Net	12,183	K3AZH
1200 Radio Club (Mass.)	12,008	W1QIB
Air Capital Radio Assn. (Kans.)	11,586	KØGIA
M.I.C. Radio Club (Pa.)	11,362	W3JXT
Copperhead V.H.F. Associates (D. C.)	11,296	W3FSY
Springfield Amateur Radio Club (Ohio)	9486	W8EHW
Framingham Radio Club (Mass.)	8796	W1ZWL/1
El-Ray Radio Club (Mass.)	8716	W1AQE
Butler County V.H.F. Assn. (Ohio)	7921	K8HNM/8
Five Towns Radio Club (N. Y.)	7208	K2VIX
South Bend Amateur Radio Club (Ind.)	6887	K9JKG
Fox River Radio League (Ill.)	6578	K9CFM
Central Michigan Amateur Radio Club	5838	W8CKK
Newington Amateur Radio League (Conn.)	5868	W1TCJ
York Road Radio Club (Pa.)	5834	K3DXC
All Band Amateur Radio Klub (Pa.)	5646	W3RSC
V.H.F. Institute of New York	5626	W2EW
Newport County Radio Club (R. I.)	5611	W1AJR
Northern New Jersey Radio Assn.	5222	W2DZA
State Line Radio Club (N. Y. & N. J.)	4564	K2BPG
Hoosier Amateur Women's Klub	4490	K9SUT
Earbenders Radio Club (N. J.)	4488	WA2FAX
Albany Amateur Radio Assn.	4242	WA2BAH
Clinton Radio Amateur Club (Iowa)	3724	WØRWC
DeVry Technical Institute Amateur Radio Society (Ill.)	3542	K9GIS
Ulster County Mike and Key Club (N. Y.)	3056	K2VYN
Mile High Highbanders (Colo.)	2870	WØNYX
50th State V.H.F. Club (Hawaii)	2168	K6HGP/KH6
Tri-County Radio Club (Ohio)	2024	KN8QFE
Canton Amateur Radio Club (Ohio)	1980	K8BXU
Cumberland Valley Amateur Radio Club (Pa.)	1548	K3BGH
Northeast High School Transmitting Society (Pa.)	538	K3GEQ

SCORES

In the tabulation on the next pages, scores are listed by ARRL division and sections. Unless otherwise noted, the top scorer in each section receives a certificate award. The highest-scoring Novice and Technician also receives a certificate in each section where at least three such licenses submitted valid contest logs; footnotes denote these winners. Columns indicate final score, number of contacts, number of different sections worked, and the bands used. A represents 50 Mc., B 144 Mc., C 220 Mc., D 420 Mc., E 1215 Mc. or higher. Multioperator stations are shown at the end of each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3KKN 26,936-481-18-ABC
W3TYX 26,660-430-21-AB
W3HYJ 23,296-364-22-AB
W3HFY 20,944-374-18-AB
W3CL..19,432-347-18-AB
W3TDF 19,500-375-16-AB
W3CKP 14,352-276-16-AB
W3FSC 14,352-312-13-AB
W3HKZ 12,213-266-13-AB
K3IUV 11,820-296-10-AB
W3JSD..11,550-275-11-AB
K3BPP..11,520-240-14-AB
K3ECF 11,450-229-15-AB
K3AAX/3 11,424-238-14-ABC
W3IBU..11,100-285-10B
K3KMN 10,868-210-16-A
W3FQD 10,428-237-12-A
W3FOZ 10,080-240-11-AB
W3ZYO..9800-196-15-A
K3EOF..9192-192-14-ABD
K3EHP..8960-224-10-A
W3SAO..8928-248-8-AB
K3ESJ...8820-245-8-AB
W3TXO..8748-243-8-AB
K3GOJ...8400-200-11-A
W3CXU..8380-210-10-AB
W3IZU...8334-231-8-AB
K3BEF/3 8160-204-10-A
K3ESL...7704-214-8-AB
K3JFL...7567-166-13-AB
K3ATX..7440-186-10-A
W3SMK..6916-182-9-AB
K3EOD/3 6768-188-8-AB
W3JXT..6394-139-13-AB
K3GOZ..6336-176-8-A
K3BHK..6240-195-6-B
W3NS1...6224-195-6-AB
W3IHT..6205-183-7-ABC
W3HYO..6086-179-7-AB
W3AJF...6018-177-7-AB
W3AMO..5928-156-9-A
W3BRU..5624-143-9-AB
W3GEC..5544-154-8-A
W3BVR..5328-148-8-A
K3EMR..5280-165-6-A
W3ETB..5216-165-6-A
W3CPT..5112-142-8-B
W3GXB..4740-158-5-AB
K3CXV..4712-124-9-AB
K3EH...4320-108-10-AD
W3AYG..4200-150-4-AB
W3KXH..4200-150-4-A
K3GAY..3948-141-4-A
K3IPW/3 3924-111-8-A
W3MVF..3774-111-7-A
K3DXC..3752-134-4-A
K3GFF...3696-132-4-AB
K3HAV..3680-92-10-AB
W3UML..3660-122-5-B
W3PQL...3634-121-5-AB
K3DJO/3 3600-120-5-A
W3HWV..3536-136-3-B
K3EHQ...3444-123-4-AB
K3AIQ...3432-132-3-AB
W3SXD..3420-90-9-AB
W3IXL...3296-103-6-A
W3CLQ..3296-103-6-B
W3WJC..3240-90-8-AB
W3ZOR..3230-85-9-A
K3IUZ...3135-107-5-A
W3GCR..3120-120-3-B
W3QB...2910-97-5-A
K3HNS...2866-111-3-A
K3GVZ..3822-83-7-AB
W3RSC..2784-87-6-B
K3AQH..2769-107-3-A
K3CCR...2688-96-4-A
W3VGN..2640-110-2-AB
W3ZRR...2600-100-3-A
W3OZP...2576-87-6-B
K3CJV...2574-99-3-A
W3JBA...2560-80-6-A
W3QAS...2464-88-4-AB
K3BVZ...2400-80-5-AB
W3HAB..2400-100-2-A
W3WIJ...2340-90-3-A
W3SST...2296-82-4-AB
W3GOB..2262-87-3-A
K3GW...2072-74-4-A
K3HEX..2040-68-5-A
K3BJU...2010-67-5-AB
W3VWF..1984-62-6-A
K3GDI...1950-65-5-AB
K3ATL...1880-47-10-A
K3DGC..1872-72-3-AB
K3BLP...1856-58-6-AB
K3DXS...1800-50-8-A
K3EPB...1764-64-3-A
W3DVL..1755-68-3-A
W3DRC..1703-66-3-AB
K3GWQ..1690-65-3-AB
K3GEC...1680-70-2-A
K3JEZ...1656-69-2-AB
K3BKH..1652-59-4-A
W3DBI²..1632-51-6-A
K3EOD..1599-62-3-AB
W3GEW..1584-66-2-A
W3FLD..1560-52-5-AB
K3CRU..1524-64-2-A
K3DAQ..1508-58-3-A
K3ITD...1508-58-3-A
W3UQJ...1500-50-5-AB
W3CQA..1482-57-3-A
K3JFP...1430-55-3-A
W3BRY..1368-57-2-A
W3BMA..1344-56-2-A
K3AVF..1290-43-5-A
K3DJC...1272-53-2-A
W3QFM..1248-52-2-ABC
W3WZT/3 1248-48-3-AB
K3GZT...1224-51-2-A
K3HWZ..1224-51-2-A
W3CLT...1200-50-2-AB
K3ETV...1200-50-2-A
K3EMA..1104-46-2-B
W3JAY...1064-38-4-A
W3QVI/3 1014-39-3-B
K3JRO....990-45-1-A
W3LRH...984-41-2-A
KN3JGF..960-40-2-B
KN3JYN..960-40-2-B
W3GMB...936-36-3-A
W3WBX/3 902-41-1-A
W3MMV..858-33-3-B
W3EDO...816-34-2-B
W3JHC...792-33-2-A
K3BRJ....780-30-3-B
K3DBY...768-32-2-A
W3NWP...768-32-2-A
K3DGB...756-27-4-AB
W3UKG...754-29-3-A
W3DIR/3..672-28-2-A
K3CFO....600-25-2-A
W3UZF...600-25-2-B
K3DMA...576-24-2-B
K3HIL....576-24-2-A
W3LDA...544-17-6-A
W3UMP...520-20-3-A
K3DXD...504-21-2-B
W3RSC/3 418-17-2-A
K2MBT/3..408-17-2-B
W3JWF...384-16-2-A
K3CIV....374-17-1-A
K3BGT/3..360-15-2-A
K3GEQ....336-14-2-A
W3TJQ....336-14-2-A
W3HIX....312-13-2-B
K3HWZ/3..312-13-2-A
W3VVK....212-13-2-B
W3PEY....308-11-4-CD
W3YQJ/3..231-12-1-A
K3GFR....154-7-1-AB
K3DVL....110-5-1-A
K3BPK/3...48-22-2-A
W3DJW (W3s DJW IWO) 13,200-330-10-AB
W3VXJ (W3VXJ, K3BFP) 12,400-248-15-A
K3ANU/3 (K3s ANU CHF)..7168-225-6-AB
K3CHN (K3s CHN ECB) 6264-174-8-A
K3AIR (2 oprs.) 2716-97-4-ABC
K3HIN (K3s BUB BUC HIN)..2262-87-3-B
K3BFA (K3BFA, W3ICU 1248-52-2-B

Md.-Del.-D.C.

W3MUO..9650-193-15-A
W3ASD...6864-143-14-AB
W3OTC...4515-108-11-A
W3MNE !4500-125-8-AB
K3AZH...4104-114-8-AB
W3CGV...3800-102-9-ABCD
K3DQA...3552-111-6-AB
W3DUT...2924-86-7-A
W3JZY...2730-91-5-B
K3CPJ....2520-90-4-A
K3GJU...2436-87-4-AB
W3LCC...2016-63-6-ABC
W3PGA...2016-72-4-AB
K3IFN....2006-59-7-A
W3MAD..2006-59-7-A
K3KHS...1905-64-5-A
K3KMV...1900-50-9-A
W3JWY...1853-55-7-AB
K3AMG..1820-65-4-A
W3HB....1740-58-5-B
K3HFF...1326-51-3-B
W3TFA...1326-51-3-AB
K3EHS...1300-50-3-A
K3JEY....1204-43-4-AB
W3ILS....1190-35-7-A
W3LMC..1120-40-4-B
KN3ICH..1118-43-3-B
W3BQM..1092-39-4-A
W3IWJ...1080-45-2-AB
W3JQR....980-35-4-A
K3CNI...928-29-6-A
W3CVL...840-35-2-AB
K3AJD....728-26-4-A
K3CLQ....728-26-4-A
W3APY....646-19-7-A
K3CNH...629-19-7-A
K3DEA....527-16-7-A
K3HBF....504-21-2-A
W3NH....494-19-3-B
W3BAY...480-20-1-A
K3EJF....384-16-2-B
K3AVP....374-17-1-A
K3JKQ....360-15-2-A
W3DHN...240-10-2-A
W3HHW...208-8-3-A
K3JYP.....96-4-2-A
K3APS/3....66-3-1-A
W3FSY (W3FSY, K3s DQO GEY) 7486-197-9-AB
K3DGK (K3DGK, K6RCW) 7084-161-12-AB
K3BYD (K3BYD, K8GMZ) 4500-114-10-AB
K3JUK/3 (4 oprs.) 3360-113-5-AB
W3BPD (W3s BPD IWJ) 3268-86-9-B
W3DWU (W3DWU, K4KZH, W4BRM) 3060-90-7-A
K3DLB (K3s DLB, JQR, W3PTW) 2430-81-5-AB
W3COK (W3s COK SQP) 1710-57-5-B

Southern New Jersey

W2BLV 23,188-341-24-ABD
K2TYW¹ 22,916-337-24-AB
W2EIF..19,240-370-16-AB
K2ITP..18,400-400-13-AB
W2PAU 16,575-333-15-AB
W2BV...15,120-280-17-AB
K2HOD 15,012-278-17-AB
W2NSF..14,625-293-15-AB
W2JAV..14,040-270-16-AB
W2TUR 13,620-196-25-A
W2KFC 12,792-246-16-AB
W2LBX 12,581-274-13-AB
W2HTL 11,400-285-10-AB
K2KCI..10,311-247-11-AB
K2BPX...9922-226-12-AB
K2ZZT...9740-224-10-AB
W2ZUL...9588-282-7-AB
WA2GJE..8652-206-11-A
K2TUY...7790-205-9-AB
W2GQO...7650-225-7-AB
W2OQN...7240-181-10-AB
WA2EMB 6800-214-6-AB
W2EWN..6624-207-6-AB
W2ADA...6320-158-10-AB
K2UDA...6240-208-5-AB
K2OYW..6048-168-8-AB
W2NF....5950-175-7-AB
K2EJW...5475-186-5-A
W2ESX...5340-134-10-AB
K2MGZ...5168-152-7-AB
W2CSD...5120-160-6-AB
WA2EHM 4692-102-13-AB
K2BZK...4560-152-5-A
K2KVE...4530-152-5-A
K2YRW..4446-117-9-AB
W2EXB...4200-100-11-A
K2GCD...4120-103-10-AB
WA2AGK 4032-144-4-AB
W2BAY..3978-153-3-AB
K2UFE...3960-132-5-B
K2SMZ...3840-128-5-AB
K2OHM..3720-124-5-A
W2OGZ...3712-116-6-B
K2ZOM..3640-140-3-B
W2MEO..3612-129-4-B
K2HJY...3600-100-8-B
K2SXN...3288-137-2-A
K2UKU...3200-100-6-A
W2GUB...3068-118-3-B
W2ESG...2786-100-4-AB
WA2AXG 2688-112-2-AB
WA2EIY 2600-100-3-A
K2EGH...2490-83-5-A
K2KTS...2472-103-2-AB
W2SDB...2448-102-2-A
W2HVE...2340-90-3-B
WV2HSP2288-88-3-B
W2DMU..2184-78-4-A
K2KMD..2160-60-8-A
K2RRC...2160-90-2-B
W2LY....2041-79-3-AB
K2MKD..2040-85-2-B
K2PTJ...1968-82-2-AB
K2DEI...1920-80-2-AB
W2SDZ..1896-79-2-B
K2SUN..1820-70-3-B
K2MZP..1752-73-2-B
K2QOK..1692-47-8-A
W2VX...1680-60-4-B
K2VPA..1638-63-3-A
W2HBE..1612-62-3-B
W2AKI...1560-65-2-A
W2QDY..1560-65-2-A
K2PRE...1540-55-4-A
K2HDX..1534-59-3-AB
W2SDO..1488-62-2-AB
WV2ECV 1482-57-3-B
W2QBH..1416-59-2-AB
WA2GLL..1400-50-4-B
W2BUI...1296-54-2-A
W3JMG/2 1128-47-2-AB
K2KIQ...1104-46-2-B
K2PZF...1088-32-7-A
K2DFE...1066-41-3-AB
WA2HJI..936-39-2-A
K2YSJ....936-32-4-A
W2LFN...888-37-2-A
K2BG....864-36-2-B
WA2ABF/2 720-30-2-B
W2KFC/2 720-30-2-A
WV2HJI...696-29-2-B
K2UWH...676-26-3-A
W2WKI...672-28-2-B
W2TAV...624-26-2-B
K2GSJ....600-25-2-AB
W2WKI/2 576-24-2-B
K2PWM...552-23-2-A
K2PWQ/2 552-23-2-B
W2PJC...480-20-2-B
WA2BDF..480-20-2-A
K2TZH...480-20-2-A
K2MKD/2 408-17-2-B
W2PAZ...336-14-2-B
K3DTT/2..336-14-2-A
W2FXN...312-13-3-B
K2JVX....240-10-2-A
K2AFJ....216-9-2-B
K2MNZ....168-7-2-B
W2TBD....168-7-2-B
K2SMZ/2..154-7-1-A
K2PPC....120-5-2-AB
W2ZX.....44-2-1-B
WA2BXV...44-2-1-A
K2KIM....44-2-1-A
W2REB (W2REB, K2MPV) 23,112-428-17-AB
K2AA (K2s HDX MIO, WA2DWT 16,224-338-14-AB
K2YIB (K2s, DEI YIB, WA2HJI) 12,768-304-11-AB

Western New York

K2ZBU...6468-155-11-A
K2QWD..4092-93-12-A
W2UTH..4000-100-10-AB
K2GUG..3840-120-6-ABC
W2ORI...3762-99-9-B
K2ERQ¹..3600-100-8-A
K2ZFV....3300-75-12-A
K2LTW..3264-68-14-AB
K2HNQ..3078-81-9-A
W2MTA..2489-66-9-A
WA2EIX..2080-65-6-A
K2DLL...1932-46-11-B
W2ZRG...1764-63-4-AB
K2UXF..1700-50-7-A
WV2GEK 1568-56-4-B
W2YIK...1168-37-6-AB
W2DJL...1104-46-2-A
K2YFY...1100-50-1-A
W2PDW....964-44-1-A
K2TDQ....900-30-5-A
W2EJZ....868-31-4-A
K2HBV....858-39-1-AB
W2PFD....576-24-2-A
K2LMG....559-21-3-B
K2UFZ....481-19-3-A
WA2HEM..418-19-1-B
WA2CUZ..336-14-2-B
K2TXG....330-15-1-A
W2PJO....286-13-1-A
WA2EHS..154-7-1-A
W2BLO....132-6-1-B
K2RRM/2 (5 oprs.) 13,804-238-19-AB
K2VKR (5 oprs) 5428-118-13-AB
K2UZI/2 (K2UZI, W21LQ) 4560-114-10-A
W2RHQ (W2s RHQ WZR, K2ZOJ) 4074-97-11-AB
W2TQF (4 oprs.) 1612-62-3-AB
WA2EQJ (WA2s EQJ GBG)...858-33-3-A

Western Pennsylvania

W3BWU..4928-112-12-A
K3CHC...3705-96-9-A
W3CSJ...3360-78-14-A
K3GQA..2772-77-8-A
K3GCT/3 2688-84-6-AB
W3TFT...2190-72-5-AB
K3AXO...1980-66-5-A
W3RTV...1980-66-5-AB
W3BTT/3 1200-40-5-A
W3MSR/3 910-35-3-B
K3GEG...720-23-6-A
K3BGH...672-24-4-A
W3UMY...512-16-6-A
K3BAD...416-16-3-A
K3AZY...384-16-2-A
W3ZQU...364-14-3-AB
W3TDW...352-16-1-A
K3CTT....330-15-1-A
K3BAK....264-12-1-A
K3AZZ....242-11-1-A
K3IXR....220-10-1-A
W3DJM....22-1-1-A
W3KWH (4 oprs.) 3536-104-7-AB
K3DKO (2 oprs.) 936-39-2-AB

CENTRAL DIVISION

Illinois

K9KLU 17,992-346-16-AB
K9HWY 17,792-278-22-A
W9QXP/9 7760-196-10-AB
W9EQC..6800-200-7-ABC
K9BCJ⁵..6720-210-6-A
W9YVP..6420-214-5-A
K9MLI...6188-182-7-A
W9MCG/9 6052-178-7-A
K9CNN..6016-188-6-AB
K9QXA...5984-176-7-A
K9LTB...5780-171-7-AB
K9JSH/9..5372-158-7-A
W9LWD..5208-186-4-AB
K9DWR..4890-163-5-AB
W9EET...4760-170-4-AB
K9EEC...4740-158-5-B
K9JEQ...4692-138-7-AB
K9QKB...4680-156-5-A
K9UHC...4554-127-8-A
K9BJL...4420-170-3-A
W9OJI...4370-115-9-AB
K9MZV...4128-129-6-A
K9UNI...3990-105-9-A
K9DOC...3920-140-4-AB
K9TFK...3920-140-4-AB
W9ZKQ...3840-120-6-A
K9MYD..3840-120-6-AB
K9QHZ...3750-125-5-A
K9PIZ....3696-132-4-A
K9KGI...3660-122-5-A
K9MFE...3648-114-6-B
K9DOE...3616-113-6-B
K9VEU...3612-129-4-AB
K9POT...3480-116-5-A
K9MEY..3472-124-4-B
W9FVB...3390-113-5-A
W9DJ....3390-113-5-ABC
K9HIJ...3302-127-3-A
K9MLA...3276-117-4-A
K9USX...3276-117-4-AB
K9UHV...3164-118-4-A
K9UHD..3080-103-6-A
K9QLU...3026-89-7-AB
K9GLJ...2968-106-4-A
K9OTS..2884-103-4-A
W9LYA/9 2828-101-4-B
K9LRJ...2800-100-4-AB
K9BLX...2800-100-4-A
K9CSS...2716-97-4-AB
K9CEM..2700-90-5-B
K9MDO..2600-100-3-A
KN9TMG³ 2548-91-4-B
W9DBJ...2448-72-7-A
K9ARA...2436-88-4-A
K9AFB...2418-93-3-AB
KN9SRE..2400-80-5-B
W9NYO..2392-92-3-A
K9GMX..2379-92-3-A
K9MDY..2325-79-5-A
K9APQ...2296-82-4-AB
K9AIA...2268-81-4-A
K9TBA...2160-90-2-A
W9PQR..2158-83-3-AB
K9MXR..2130-71-5-B
K9SAM..2100-75-4-AB
W9YNQ..2100-75-4-A
K9PIM...2100-88-2-A
K9QAM..2100-75-4-AB
W9UCF...2088-58-8-A
K9INV...2040-68-5-A
K9QIY....2002-77-3-A
K9OSR...1992-83-2-A
KN9RVG 1988-71-4-B
K9PBN...1976-76-3-A
W9MYC..1950-65-5-B
K9PRJ....1932-69-4-A
W9JEE...1932-69-4-AB
K9DPV/9 1920-64-5-A
KN9TPP..1911-74-3-B

K9SGY...1890- 68- 4-AB
K9TSQ...1872- 72- 3-A
K9GTS...1872- 78- 2-A
KN9UFT.1820- 70- 3-B
K9OZH...1800- 75- 2-A
K9TMW.1708- 61- 4-A
K9JRQ...1704- 71- 2-A
K9JRM...1680- 56- 5-A
KN9URR.1652- 59- 4-B
W9WJJ...1586- 61- 3-A
K9UNB..1586- 61- 3-A
H9JAK..1586- 61- 3-A
W9NW...1568- 56- 4-B
K9KLJ...1536- 64- 2-A
K9IVB...1536- 64- 2-A
KN9TOK
1534- 59- 3-B
K9TSW..1534- 59- 3-A
W9OEV..1530- 51- 5-B
W9LZG/9
1512- 54- 4-AB
K9KLA/9
1482- 57- 3-AB
K9TSN..1452- 61- 2-A
W9MKW.1440- 60- 2-A
W9RVG..1428- 51- 4-A
W9EXF..1420- 49- 5-B
W9OBW.1400- 50- 4-AB
K9TYI...1400- 50- 4-A
W9VPU..1320- 44- 5-BC
K9AMG..1300- 50- 3-A
W9VCZ..1288- 46- 4-B
K9LTC/9
1254- 57- 1-A
K9QDQ..1248- 52- 2-A
K9PMG..1224- 51- 2-AB
K9GIS...1221- 51- 2-A
K9HZE..1196- 46- 3-A
K9EWY..1196- 46- 3-A
W9IPH..1170- 45- 3-A
K9LYL..1148- 41- 4-B
K9UNX..1128- 47- 2-A
W9ZXA..1122- 51- 1-AB
W9EGI..1104- 46- 2-A
K9TZZ...1092- 42- 3-A
K9KPM.1080- 36- 5-A
K9HLV..1056- 44- 2-AB
K9HWC.1056- 48- 1-
ABC
W9PZP..1008- 42- 2-B
K9JFN...968- 44- 1-A
K9CZA...966- 32- 5-A
K9RTQ...946- 43- 1-A
K9CKM..888- 37- 2-A
K9KGK...884- 34- 3-A
KN9TAV.980- 35- 4-B
K9TVC/9 884- 36- 2-AB
KN9ULO.840- 30- 4-B
K9OZP...836- 38- 1-A
K9IJC...792- 35- 2-A
K9BDJ...770- 55- 4-
ABC
KN9TCE.768- 32- 2-B
W9ADO...720- 30- 2-B
W9BJX...682- 31- 1-A
K9ITS...672- 28- 2-A
W9YIK...638- 29- 1-A
W9UNN..636- 27- 2-B
K9GEJ...624- 26- 2-A
W9PDN..624- 24- 3-AB
K9GHX..600- 25- 2-B
K9RYF...572- 24- 3-B
K9POQ...572- 26- 1-A
KN9UCM.546- 21- 3-B
K9GJO...532- 19- 4-AB
K9UBU...440- 20- 1-A
K9CYL/9..396- 18- 1-A
K9BQW...384- 16- 2-B
K9OMT...360- 15- 2-A
K9IUA...352- 16- 1-AB
W9RPH...308- 14- 1-A
K9CTA...264- 12- 1-A
K9QDY...264- 12- 1-A
W9ACU...240- 10- 2-B
W9RTH...240- 10- 2-AB
W9MAK..144- 6- 2-B
K9KLU/9 110- 5- 1-A
K9BDJ/9...77- 7- 1-A
W9ROS (W9s JCI ROS)
14,554-383- 9-AB
K9OOU (K9s OOU TYC, KN9UKB)
8160-255- 6-AB
W9MGN (2 oprs.)
5040-168- 5-A
W9NZF (K9KZG, W9NZF)...4508-161- 4-AB
K9RCN (K9s JRQ RCN)
2270-109- 5-A
K9RBE (K9s RBE SIA)
3045-102- 5-AB

Indiana

K9SGZ...6490-148-12-AB
K9SGP[1]..6116-139-12-A
K9HYV...3312- 92- 8-AB
K9LZV...3072- 96- 6-A
K9KFL...2940-105- 4-A
K9SUT...2720- 80- 7-A
K9OYD..2268- 81- 4-B
K9JKG...1932- 70- 4-AB
K9IXD..1296- 54- 2-A
K9JJL...1350- 45- 5-AB
KN9QVR.798- 29- 4-B
K9TVQ...702- 27- 3-A

K9OQO/9
572- 22- 3-AB
K9OAE...533- 21- 3-A
K9GCL...448- 16- 4-A
K4CVE/9
416- 16- 3-AB
K9JKC...384- 16- 2-A
W9RTH...264- 11- 2-AB
K9TAW...240- 10- 2-B
W9BUM...144- 6- 2-B
W9QZC...144- 6- 2-AB
K9DLE....44- 2- 1-A
K9MSP/9 (6 oprs.)
8450-169-15-A
K9MMH (K9s MMH FTD)..8244-229- 8-A

Wisconsin

W9JFP...7776-216- 8-
ABC
W9IXF..2254- 81- 4-B
W9JOT..2156- 77- 4-B
W9TQ...1830- 61- 5-B
KN9UIS.1708- 61- 4-B
K9OXY..1649- 49- 7-AB
W9ODI...1200- 40- 5-B
W9HPQ..1040- 40- 3-B
KN9URH
630- 21- 5-B
W9LEE...420- 15- 4-B
K9MWQ..420- 15- 4-B
K9LCK....44- 2- 1-B

DAKOTA DIVISION

South Dakota

K0EIC...198- 9- 1-AB
W0ENC...154- 7- 1-AB
W0FJZ....110- 5- 1-AB
K0UDZ....66- 3- 1-A

Minnesota

K0GIQ...2576- 57-13-AB
K0AKJ...2520- 63-10-AB
K0DTA[1]..1560- 52- 5-AB
K0KAO...1500- 50- 5-A
K0VPR...1280- 42- 6-A
K0OST...598- 24- 3-A

DELTA DIVISION

Arkansas

K5IPL...3068- 58-16-AB
K5AZH..1470- 35-11-A

Louisiana

K5AEY...5700- 74-15-A
W5UQR..2438- 53-13-A
W5LDH...644- 17- 7-A

Mississippi

K5HUW.9680-123-30-A

Tennessee

K4OSF...5376- 96-18-A
W4HHK.3660- 62-20-AB
W4IKK..2850- 57-15-A
K4UXL[1]2576- 58-13-A
K4ZYR/4
2360- 59-10-A
K4PEV...1326- 39- 7-A
K4JWZ...1288- 46- 4-A
K4BSR...1054- 31- 7-A
K4FWD..900- 25- 8-A
K4YZG...794- 28- 4-A

GREAT LAKES DIVISION

Kentucky

W4GSH..3150- 75-11-AB

Michigan

K8DKR..6360-159-10-A
K8BGZ...5616-117-14-AB
W8IYI...5292-126-11-A
W8NOH..4620-110-11-AB
W8UJC...4471-143- 7-A
W8YAN.4200-105-10-A
K8ILO...4140-115- 8-A
K8DZT...3774-111- 7-A
K8HNB..3648-102- 7-A
K8LYY...2565- 86- 5-B
W8VZY...2128- 76- 4-A
K8HNW.2100- 75- 4-B
W8ZSX...1974- 71- 4-B
W8CKK..1760- 55- 6-AB
K8MKC..1260- 42- 5-A
W8LJV...1260- 45- 4-AB
W8VRH..1248- 48- 3-B
K8NGR...936- 36- 3-B
K8LWP...832- 34- 3-B
W8RXY...608- 19- 6-AB
W8BCL....598- 23- 3-B
K8EBX...462- 17- 4-A
K8DHN...432- 18- 2-AB
K8BHZ...432- 18- 2-B
K8LTJ....360- 15- 2-AB
W8BQD...352- 16- 1-A
W8LPK...264- 11- 2-A
K8CEB...264- 12- 1-B
K8MPI....176- 8- 1-B
W8MPD/8
110- 5- 1-B
K8EBY....44- 2- 1-A

K8CJS (K8s CJS EBN KGL)..4488-132- 7-AB

Ohio

W8NRM
15,392-286-16-
ABC
W8IWT..9828-182-17-AB
K8EXJ...8932-203-12-A B
K8KOB[1]..7854-231- 7-AB
K8IIL...7650-213- 8-AB
K8MHJ..7360-184-10-A
K8BSC...6936-204- 7-A
K8BPC...6800-200- 7-AB
W8GHX.6664-196- 7-AB
W8LUZ..6368-199- 6-AB
W8GEN..6080-190- 6-AB
K8IGF...6060-202- 5-AB
K8IYW..5798-223- 3-AB
K8HRD..5792-181- 6-AB
K8BOW..5580-186- 5-AB
W8RKL..5520-184- 5-AB
W8NAF..5460-182- 5-AB
W8AVY..5080-127-10-A
W8NEE..5054-133- 9-AC
K8MYJ..4760-170- 4-AB
W8ZCV..4732-182- 3-
ABC
K8GCT...4590-153- 5-AB
K8MDX.4550-175- 4-AB
W8KQV..4500-150- 5-A
W8BMO.4480-160- 4-
ABC
K8HEF..4394-169- 3-AB
W8TEK..4264-164- 3-AB
K8GCU...4200-140- 5-AB
W8UIV..4170-139- 5-AB
K8OHC..3990-107- 9-A
W8SVI...3990-133- 5-BC
W8EHW.3990-133- 5-
ABC
K8DOQ..3968-124- 6-AB
W8IGI...3960-132- 5-AB
W8WPH.3960-132- 5-AB
W8ENH.3960-165- 2-AB
K8OGG..3892-140- 4-A
W8AVL..3808-136- 4-AB
K8FTT...3744-144- 3-AB
K8GDY..3626-130- 4-A
W8LOF..3556-127- 4-AB
W8ODN.3468-102- 7-AB
W8JRN..3302-127- 3-AB
K8ERE..3288-137- 2-AB
K8QVT..3250-125- 3-A
W8SVW.3136-112- 4-AB
K8MTK.3042-117- 3-AB
W8MOW.2990-115- 3-A
W8SGX..2945- 78- 9-A
K8KAM.2912-112- 3-A
W8TEX..2904-121- 2-AB
K8QVU..2816-128- 1-AB
K8GCS..2808-108- 3-A
K8IYK...2805-115- 7-AB
W8ARC..2750-125- 1-AB
W8ZOF...2664-111- 2-AB
K8AUO..2640-120- 1-AB
K8COA...2640-110- 2-A
W8PQZ..2618-119- 1-AB
K8ECF..2574- 99- 3-A
K8JOD..2544-106- 2-A
K8GDX..2522- 97- 3-A
K8OBQ..2496-104- 2-A
K8KAR..2472-103- 3-A
K8BPB...2400-100- 2-A
K8MGD..2400-100- 2-AB
K8DKW.2400-100- 2-A
K8BLV...2400-100- 2-A
W8BAX..2400- 80- 5-
ABC
W8RKX/8
2328- 97- 2-A
K8AEW...2280- 95- 2-
ABC
W8SFG...2210- 70- 6-B
W8HOH.2210- 85- 3-AB
K8KTX..2190- 73- 5-B
W8IPT...2178- 99- 1-AB
W8RKX.2136- 89- 2-A
W8EDS...2100- 70- 5-B
W8RLW.2090- 95- 1-A
K8EGY..1950- 65- 5-A
W8DWT..1944- 81- 2-B
W8KQX.1936- 88- 1-A
K8HNM/8
1872- 72- 3-AB
W8MCW.1870- 85- 1-B
K8REG...1870- 85- 1-AB
W8GVG..1848- 77- 2-A
W8GVQ...1836- 77- 2-A
W8PHU..1824- 76- 2-AB
K8LQX...1804- 82- 1-B
K8OWB..1804- 82- 1-A
K8DRM.1800- 75- 2-AB
W8LIL...1800- 75- 2-AB
W8JSR...1760- 80- 1-AB
W8KJT...1728- 72- 2-AB
W8ZFO...1704- 71- 2-B
K8DPK...1680- 70- 2-B
W8TSN[6]..1638- 63- 3-A
W8YCP...1632- 68- 2-B
W8STC...1584- 66- 2-A
W8DPW.1584- 72- 1-A
W8RLY..1584- 72- 1-B
W8MBB.1560- 60- 3-AB
W6TVE/8
1540- 70- 1-A
KN8OII[1].1496- 68- 1-B

W8WAU..1488- 62- 2-B
K8RUN...1456- 56- 3-A
K8PEL...1426- 86- 6-A
W8JAR/8
1408- 64- 1-B
W8NGV..1378- 53- 3-A
W8BOL...1368- 57- 2-B
KN8PDO.1364- 62- 1-B
W8KOT...1342- 61- 1-B
K8HNV/8
1300- 50- 3-A
W8WRN.1300- 50- 3-
ABC
K8KZZ...1274- 49- 3-A
W8KSE...1248- 52- 2-A
K8DOT...1232- 56- 1-AB
W8PLQ...1224- 51- 2-AB
W8PEP...1216- 55- 1-AB
W8WUP..1200- 50- 2-B
W8WYU..1188- 54- 1-B
K8HJA...1176- 49- 2-A
W8PYQ...1140- 38- 5-AB
KN8RBX
1134- 41- 4-B
W8WUZ..1100- 50- 1-B
K8GCW.1100- 50- 1-A
W8SJT...1100- 50- 1-A
W8HWD.1100- 50- 1-AB
KN8RAQ.1050- 38- 4-B
K8GCA...1034- 47- 1-A
KN8QFE.1032- 43- 2-B
K8AIW...1020- 43- 2-B
W8TTQ...1014- 39- 3-AB
W8BRU...1012- 46- 1-AB
K8KFY...988- 38- 3-AB
K8RIF....980- 35- 4-A
K8BXU...962- 37- 3-A
W8AL....952- 34- 4-A
K8GKF...880- 40- 1-B
K8CBD...865- 31- 4-AB
W8QDI...814- 37- 1-B
K8HZV...814- 37- 1-A
W8MOH..792- 36- 1-A
W8KKF/8.726- 33- 1-A
K8IHS/8..726- 33- 1-B
K8HNS...696- 29- 2-A
W8KQZ...660- 30- 1-B
K8NDY...650- 25- 3-A
K8LDX...624- 26- 2-B
W8BPZ...600- 25- 2-AB
K8IHS....594- 27- 1-B
W8PGC...552- 23- 2-A
W8MDK...550- 25- 1-B
K8QVU/8.550- 25- 1-A
K8MUO/8.550- 25- 1-A
K8OBV/8.528- 24- 1-A
K8EJI....506- 23- 1-B
K8HEF/8.484- 22- 1-A
K8QHE...468- 20- 2-A
W8FPE...462- 21- 1-B
W8MDS...418- 19- 1-A
KN8PSR..374- 17- 1-A
K8IOW...324- 16- 1-A
KN8PNV.242- 11- 1-B
W8RLB...242- 11- 1-A
W8TEK/8.220- 10- 1-B
W8IUC....220- 10- 1-AB
W8UKQ...176- 8- 1-A
KN8OQM.176- 8- 1-B
K8LEA...121- 6- 1-A
K3HWZ/8..88- 4- 1-A
K8JUB....66- 3- 1-A
K8GFU....22- 1- 1-A
K8DJB/8 (5 oprs.)
11,822-257-13-AB
K8GYK (K8s GYJ GYK)
11,000-250-12-A
K8DOU/8 (6 oprs.)
5184-148- 8-A
W8IED (W8KTM, K8ICN, WA6JFP)
4074-146- 4-AB
W8KKF (W8KKF, K8PNN)
3224-124- 3-AB
W8KPZ (W8KPZ, WA6JFP)
2064- 86- 2-AB
K8DVK (2 oprs.)
1056- 48- 1-A
W8BHI (W8BHI, K8JZF)
816- 34- 2-B

HUDSON DIVISION

Eastern New York

W2LWI 10,410-174-20-AB
K2CBA[1]..7280-130-18-AB
WV2GQV/2[3]
4658-137- 7-B
K2CVG...3984- 83-14-A
K2USW...3002- 80- 9-A
WA2BAH
2400- 80- 5-AB
K2ZEL...2244- 66- 7-A
K2DRV..2152- 62- 8-B
K2GSF...2100- 70- 5-B
K2GCH..1976- 52- 9-AB
K2VYN..1800- 50- 8-AB
W2CTH..1512- 54- 4-AB
W2IP....1224- 36- 7-B
WV2IMG
1215- 41- 5-B
W2HZZ...930- 31- 5-B
K2JYG...840- 28- 5-B
K2OZT...624- 24- 3-AB
W2YPM..418- 19- 1-B

WA2DSS..416- 16- 3-B
WV2FYE.392- 14- 4-B
K2UKE...364- 14- 3-B
W2TMM..330- 15- 1-A
W2SZ (7 oprs.)
7222-157-13-AB
K2LBK/2 (K2LBK, W2TGI, WA2BXK)
588- 25- 2-AB

N.Y.C.-L.I.

W2YHP
11,760-245-14-AB
K2IEJ...7872-164-14-B
K2JWT..7056-168-11-
ABC
K2UTN[1]..4752- 99-14-A
K2VIX...4032- 84-14-A
W2GLU..3434- 101- 7-B
W2BNX/2
2880- 90- 6-B
K2RBW..2704- 85- 6-AB
W2TUK..2460- 82- 5-B
WV2FBA[3]
2176- 70- 6-B
WV2GFH
2144- 67- 6-B
W2IN....2112- 66- 6-B
WV2IDC.2000- 63- 6-B
WV2IMO 1860- 62- 5-B
K2AZT...1792- 64- 4-AB
W2EW...1694- 61- 4-B
W2EZL...1548- 45- 8-A
K2PQY...1440- 40- 8-A
K2GVL...1376- 43- 6-A
K2VBJ...1350- 45- 5-B
WA2BEI 1320- 44- 5-B
K2GZ....1200- 40- 5-B
W2JBQ...910- 35- 3-B
WV2GHP.744- 31- 2-B
K2MBZ...728- 28- 3-B
W2BMQ...704- 22- 6-B
K2OBN...690- 23- 5-A
W2TMN..672- 28- 2-B
K2VNP...440- 20- 1-B
W2AUF...364- 13- 4-B
W2KOL...264- 11- 2-B
W2MFP...220- 10- 1-B
K2QTK....66- 3- 1-B
K2MMX (K2s MMX VPS)..6669- 57- 3-B
W2AEE (5 oprs.)
3195-107- 5-AB
WA2IKL (WA2IKL, K2KDJ) 924- 33- 4-A

Northern New Jersey

K2HHS 14,050-281-15-AB
W2QEU..6600-165-10-B
W2GKR..5560-139-10-A
K2RIH...4680-130- 8-A
W2PWX..4680-117-10-B
W2CBR..4536-108-11-B
K2UYH..4392-123- 8-B
K2DQT..4048- 96-12-AB
K2PRL...3952-104- 9-AB
W2DZA...3306- 87- 9-
ABCD
WA2CCF 3120-104- 5-B
WA2BHE
3040- 77-10-A
K2MYQ..2000- 75-10-B
K2RMD..2888- 76- 9-
ABC
K2OSC...2408- 86- 4-AB
K2UGK...2278- 67- 7-A
K2BPG...2240- 72- 6-AB
K2UQR...2160- 60- 8-AB
K2PTD...2058- 74- 4-AB
WV2HZF[3]
2044- 73- 4-B
W2RDP..2016- 63- 6-A
K2MPD..1980- 55- 8-A
W2ONG..1666- 49- 7-
ABC
K2OPI...1430- 55- 3-AB
W2SHU..1400- 50- 4-AC
K2HU....1368- 38- 8-AB
K2IUK...1280- 32-10-A
WA2FBI[1]222- 47- 3-B
WA2FYL 1170- 39- 5-B
K2RBD...1157- 45- 3-B
W2SMJ...1020- 34- 5-AB
K2VSE....992- 31- 6-A
WA2CLH.930- 31- 5-AB
K2GDR...900- 30- 5-B
W2SMF...868- 31- 4-A
K2KDI...812- 29- 4-A
K2PIZ....700- 25- 4-BC
W2NTY...660- 22- 5-CD
K2RJP....660- 30- 1-AB
K2LVB....572- 22- 3-AB
WA2EBT..572- 22- 3-B
K2DMU...560- 20- 4-B
WA2FAX..552- 23- 2-B
W2MQF...504- 18- 4-B
W2OQV...480- 20- 2-B
W2JDU....480- 20- 2-
ABC
K2LEO....476- 17- 4-A
K2VHF....448- 16- 4-A
WA2FDM 408- 17- 2-A
WV2FAW.384- 16- 2-B
K8HRR/2 360- 12- 5-A
WA2FDM/2
308- 11- 4-AB

WA2HPD..297- 14- 1-A
WV2JMX..242- 11- 1-B
K2JQD...224- 8- 4-A
W2FJC...192- 8- 2-B
K2DIG...176- 8- 1-C
W2BPU...88- 4- 1-AB
WV2GWM..66- 3- 1-B
WA2HWS..44- 2- 1-B
W2AGK...22- 1- 1-C
W2ADE (7 oprs.)
32,016-552-19-ABC
WA2GVT (5 oprs.)
9372-213-12-AB
K2HZN (K2HZN WV2IDJ)
7392-168-12-AB
WA2IOR (6 oprs.)
3200-100- 6-B
K2JRP (2 oprs.)
2232- 62- 8-A
K2YFE/2 (K2s DTV QNC YFE)
2086- 75- 4-B
WA2FGK (multiple operator.....858- 33- 3-B

MIDWEST DIVISION

Iowa

WØRWC..1980- 66- 5-AB
KØKPQ...1624- 58- 4-AB
WØHAJ...546- 21- 3-B
KØGEY...364- 13- 4-B
KØLZP...120- 5- 2-A
WØBTG/Ø..88- 4- 1-A
KØRLA (5 oprs.)
784- 25- 6-A

Kansas

KØITF...8640-160-17-ABCD
KØGIA...1836- 51- 8-AB
KØGIC...1800- 50- 8-AB
KØAQJ...1248- 48- 3-B
KØVQY...1080- 45- 2-B
WØMDK..1014- 39- 3-B
KØSMP...888- 37- 2-B
WØLZJ...864- 36- 2-B
KØATS...840- 35- 2-B
KØSML...792- 33- 2-B
KØJWT...780- 30- 3-AB
KNØWGM
768- 32- 2-B
WØAPG...720- 30- 2-B
KØLMS...624- 26- 2-B
WØSPF...576- 25- 2-B
WØZJY...552- 23- 2-B
WØJFG...550- 25- 1-AB
KØATT...432- 18- 2-B
WØCRN...418- 19- 1-B

Missouri

WØKMV..6720-140-14-AB
KØJNH...3128- 92- 7-AB
KØSIF...3024- 72-11-A
KØSBJ...2520- 70- 8-A
KØCWR..2482- 73- 7-A
WØLFE...1560- 60- 3-B
KØYAP...696- 29- 2-A

Nebraska

WØYZV..3888- 83-14-AB
KØIAN...1184- 37- 6-A
KØOUL...1024- 32- 6-A
WØYOY/Ø.648- 27- 2-AB
W5FFS/Ø..294- 11- 4-A

NEW ENGLAND DIVISION

Connecticut

W1RJA 23,460-391-20-AB
W1HDQ
14,880-241-21-ABC
W1FTX
14,849-241-21-AB
W1QVF 12,600-225-18-AB
W1LGE
12,122-209-19-ABC
W1PHR..8937-166-17-AB
K1HJV...6460-170- 9-B
W1DXE..6000-155-10-B
W1BYX..5198-113-13-B
K1CRN...5148-143- 8-B
W1TCJ...4520-113-10-B
K1GTZ...3852-107- 8-B
K1EEW...3774-111- 7-B
K1JOY...3360-112- 5-B
K1WN...3090-103- 5-B
W1YDS..3090-103- 5-AB
K1CMF..3060- 90- 7-B
K1KUW..2772- 98- 4-B
W1KAC..2700- 75- 8-B
KN1MFQ/1
2640- 88- 5-B
W1AW*..2608- 82- 6-AB
W1SBM...2556- 71- 8-B
KN1JVS/1
2432- 76- 6-B
W1ZPV...2394- 63- 9-B
K1DWL..2324- 83- 4-B
W1JZA...2304- 72- 6-AB
K1IAX/1.2296- 82- 4-B
K1GTK...2268- 81- 4-B
W1YOL...2072- 74- 4-B
K1HLA...2040- 68- 5-B
KN1MGA
1988- 71- 4-B
K1ILQ...1876- 67- 4-B
W1RMZ..1870- 55- 7-B
KN3IYR/1
1859- 72- 3-B
K1AZF...1944- 81- 2-B
W1FVV...1820- 70- 3-AB
K1JGF...1820- 65- 4-B
W1FBD..1800- 65- 5-B
K1MWP..1800- 60- 5-B
K1MEO..1728- 72- 2-B
W1WHL..1710- 57- 5-A
W1VNO..1656- 69- 2-B
KN1MJM
1632- 68- 2-B
KN1MUA
1624- 58- 4-B
K1JYS...1560- 60- 3-B
W1BHP...1456- 52- 4-B
WA2ARO/1
1456- 52- 4-B
W1NGR..1440- 48- 5-B
K1LXD...1280- 40- 6-B
K1GSD...1248- 52- 2-B
K1GQL...1248- 52- 2-B
W1VLS...1230- 41- 5-B
K1IVR...1224- 51- 2-B
W1MEO..1170- 39- 5-AB
W1RFJ...1144- 26- 2-AB
K1HTV/1
1120- 40- 4-B
W1RQ...1110- 37- 5-B
K1DIJ...1088- 32- 7-A
W1WHR..1056- 44- 2-B
W1HAX..1036- 43- 2-B
K1GHK..1024- 32- 6-B
K1AOX...1020- 34- 5-B
W1YCP...888- 37- 2-B
K1DWM..884- 34- 3-B
K1AOY...868- 31- 4-B
W1NLM..858- 33- 3-B
W1CWF...832- 32- 3-B
KN1KJR..780- 30- 3-B
KN1LDP..768- 32- 2-B
W1VMT...750- 25- 5-B
KN1MOH..744- 31- 2-B
W1DZA...650- 25- 3-B
W1ZJJ...624- 26- 2-AB
K1BOI...588- 21- 4-B
W1ILV...572- 26- 1-B
K1DDO...572- 22- 3-B
W1JJV...540- 18- 5-B
W1GFE...504- 21- 2-B
K1BHT...504- 21- 2-B
W1MEK...480- 30- 6-AB
K1ITW...408- 18- 2-B
KN1KKK.390- 13- 5-B
K1GDW...364- 14- 3-B
W1AMJ...308- 14- 1-B
W1OKY...220- 10- 1-B
W1YOL/1 198- 9- 1-A
W1TZH...198- 9- 1-B
K1CDJ...154- 7- 1-B
K1IWY...144- 6- 2-BD
KN1LPR..132- 6- 1-B
W1WEJ....22- 1- 1-B
W1DHT (6 oprs.)
9412-190-16-AB
W1FOM (W1s FOM FOR)...4066-107- 9-AB
K1HMU/1 (K1s ANV HMU W1HAD)
2080- 52-10-AB

Maine

K1CXX...880- 22-10-AB
W1FNT...644- 23- 4-B

Eastern Massachusetts

W1GEP
18,480-280-23-AB
K1AIL...8832-186-14-AB
K1DIT...9396-174-17-A
K1ISR...9000-250- 8-AB
K1DIR...8450-163-16-A
W1QXX..8440-211-10-AB
K1CWE..8220-137-20-A
W1QIB...6800-170-10-AB
W1QMN..6622-152-12-A
W1OOP...6048-144-11-ABCD
W1HOS...5490- 92-20-A
W1LMZ...4864-128- 9-AB
W1WEJ...4840-121-10-A
K1CMU...4590-135- 7-ABC
W1LUW..4580-115-10-AB
K1HRM..4572-127- 8-AB
W1KKB..3888-108- 8-A
W1AQE...3806- 93-11-A
K1KYB...3604-106- 7-A
W1RXJ...3504- 76-14-A
W1UVB..3486- 83-11-AB
K1DNG..3240-108- 5-A
W1YVB...3200- 80-10-AB
W1JSM...3006- 84- 8-AB
W1MFM..3000- 75-10-A
K1MHC..2940-105- 4-B
K1HSI...2884-103- 4-AB
W1HIC...2604- 93- 4-A
W1SOX...2576- 92- 4-B
K1GOF...2560- 80- 6-A
KN1MPJ 2492- 89- 4-B
W1NKA..2430- 81- 5-AB
W1LRV..2408- 86- 4-AB
K1HCW..2184- 78- 4-B
K1DVJ...2166- 57- 9-A
W1UWQ..2144- 67- 6-A
W1JBD...2044- 73- 4-A
W1DDN..2016- 72- 4-B
K1MIM..1950- 65- 5-A
K1CHY...1946- 70- 4-AB
K1ELA...1904- 56- 7-AB
W1EZV...1904- 68- 4-AB
K1BSM...1900- 50- 9-A
W1RCJ...1862- 67- 4-B
K1GXJ...1708- 62- 4-A
K1BKN..1696- 53- 6-AB
K1DZZ...1632- 51- 6-A
W1KCO..1428- 51- 4-A
K1ADB...1404- 54- 3-A
K1MKV..1352- 52- 3-A
K1ITH...1326- 51- 3-A
K1CQX...1222- 47- 3-A
K1AIC...1204- 43- 4-B
K1KCG...1148- 41- 4-A
K1DVX...1120- 35- 6-A
W1JHY...1050- 35- 5-A
W1FNM..1036- 37- 4-A
W1AGN...988- 38- 3-AB
KN1MON 988- 38- 3-B
W1OMN...912- 38- 2-AB
K1ISL....912- 38- 2-A
W1FY....870- 29- 5-A
W1QVK...840- 30- 4-AB
K1AEK...816- 34- 2-A
W1ZEN...806- 31- 3-AB
K1IAG...800- 25- 6-A
K1MAX...784- 28- 4-A
W1EHF...780- 30- 3-B
W1LHF...780- 30- 3-A
K1RSV...676- 26- 3-A
K1DRX...660- 26- 5-A
W1NXY...650- 25- 3-B
K1KVX...650- 25- 3-A
W1JCI....650- 25- 3-B
W1EIQ....572- 22- 3-B
K1ISA....504- 18- 4-AC
K1EES....504- 21- 2-A
K1GHI....480- 20- 2-A
K1EIQ....480- 20- 2-A
K1HLP....468- 18- 3-A
W1HZA...448- 16- 4-B
W1WMK..392- 14- 4-B
K1CKV....364- 14- 3-A
K1MAW..336- 14- 2-A
W1LHM...264- 11- 2-AB
K1LDC...240- 10- 2-A
W1MYD..165- 15- 1-B
W1EHF/1.132- 6- 1-B
K1EEU....132- 6- 1-A
W1LFM....88- 4- 1-A
W1ION....88- 4- 1-A
W1SBP....72- 3- 2-A
W1NJL....66- 3- 1-A
W1NJL....66- 3- 1-A
K1GCU....66- 3- 1-AB
W1DDF/1...22- 1- 1-B
K1JJW....22- 1- 1-A
W1MTT (multiple operator)...10,956-249-12-AB
K1JCU (4 oprs.)
10,584-222-14-AB
W1BVP (W1s BVP AUZ)
4788-133- 8-A
W1DOH (W1s DOH GFX)...1131- 44- 3-A

Western Massachusetts

W1RFU
14,732-254-19-AB
K1ICM
10,854-201-17-A
K1JIR...6080-160- 9-A
W1ZWL..5250-125-11-A
W1ALL/1
4250-126- 7-B
W1FAB..3634- 79-13-AB
K1LWL..2744- 98- 4-ABC
K1HHJ...2622- 69- 9-A
W1QWJ..2546- 67- 9-AB
W1NJW..2240- 70- 6-AB
W1OY....1680- 70- 2-AB
W1HMN..1632- 51- 6-AB
W1JMM..1632- 51- 6-AB
W1FBF...1500- 50- 5-A
W1NMQ..1496- 44- 7-A
K1LMY...1378- 53- 3-B
W1JAD...1258- 37- 7-A
K1CZY....1246- 45- 4-B
W1MQK..1204- 43- 4-B
W1BRF...1152- 36- 6-A
K1RSW...1110- 37- 5-A
KN1MQM
1064- 38- 4-B
W1TXS....744- 31- 2-B
K1JEA....728- 26- 4-A
W1STR....648- 27- 2-B
K1CYG....588- 21- 4-B
K1EZZ....588- 21- 4-B
K1CRK....588- 21- 4-A
K1JNS....520- 15- 4-A
K1JPH....360- 12- 5-A
W1QMN/1
234- 9- 3-B
W1ALL....234- 9- 3-B
W1UCB...192- 8- 2-A
W1UZL/1 (K1IZM, W1UZL)
5382-117-13-AB

New Hampshire

W1MON..4275- 87-15-A
K1JFQ...1904- 68- 4-A
K1GBI...1722- 41-11-A
W1LOO...1400- 50- 4-A
K1JIJ...1152- 36- 6-B
W1UMK/1
960- 32- 5-AB
W1MHL/1 (4 oprs.)
24,621-475-19-AB
W1TNO/1 (W1s TNO YQH)...2520- 63-10-AB

Rhode Island

W2BVU/1
9570-218-12-AB
W1KCS..7936-128-21-AB
W1AJR...3289- 72-13-AB
K1AVL...2006- 59- 7-A
K1DFU...1476- 41- 8-A
KN1KKY
1170- 45- 3-B
K1ELI...1064- 28- 9-A
W1REK...676- 26- 3-AB
W1TXL...448- 16- 4-A
K1GZQ/1 (7 oprs.)
1400- 50- 4-AB
W1JFF (W1JFF, K1JQM)
810- 27- 5-B

Vermont

K1BKK..3360- 70-14-ABC
W1MMN..690- 23- 5-B
W1EXZ...308- 11- 4-A
W1OAK (W1s FTF OAK)
1716- 39-12-A

NORTHWESTERN DIVISION

Oregon

K7BED..1560- 65- 2-B
W7HBH...408- 17- 2-ABE

Washington

W7RT...3892-139- 4-AB
K7ASY...2898-104- 4-ABC
W7PVZ...2132- 82- 3-AB
K7GAF...1339- 52- 3-A
K7GZB...1140- 48- 2-AB
K7CZM...616- 27- 1-A
W7PUA...396- 18- 1-B
K7BBO (K7s BBO DCG
2756-106- 3-AB
W7DK (K7s AYC AYD CYZ)
1056- 48- 1-A

PACIFIC DIVISION

Hawaii

K6HGP/KH6
1026- 45- 8-A
K9KVV/KH6
660- 25- 5-A
W3BJG/KH6
338- 26- 3-A
KH6EE...144- 6- 2-AB

Santa Clara Valley

K6HCP...3510-118- 5-AB
W6ASH...3480-116- 5-ABC
K6TJL/6 (8 oprs.)
11,268-313- 8-AB

East Bay

K6RNQ..4845-128- 8-A
W6MPZ...1456- 52- 4-B
W6SYR...1020- 34- 5-AB
K6TNY/6 (K6s TNY TWM)..6345-214- 5-AB
K6TPO (K6s TPO YXU)
3744-117- 6-AB
W6UPD/6 (7 oprs.)
2490- 83- 5-AB

San Francisco

W6IUK...280- 10- 4-A

Sacramento Valley

W6PIV....1650- 55- 5-ABD
W6GDO...504- 18- 4-B

San Joaquin Valley

W6FZA...1406- 37- 9-AB
K6KYU...1120- 35- 6-AB
K6ROU/6 (K6s AUA ROU, WA6CUZ)
352- 16- 1-AB

ROANOKE DIVISION

North Carolina

W4ULX..1360- 40- 7-AB
W4ACY...1064- 38- 4-AB
W4VHH...224- 8- 4-B
KN3KYB..110- 5- 1-B
W4BUT...88- 4- 1-B
W4ZZ/4 (4 oprs.)
3116- 82- 9-AB

South Carolina

K4YUX..4800- 81-20-AB
W4VIW...2958- 51-19-ABC
W4FAN...1134- 27-11-A
W4DEN...308- 11- 4-A
W4LTC...234- 9- 3-A
ABC

Virginia

W4LTU
13,206-213-21-AB
K4VWH..9456-197-14-AB
K4UKQ..6000-125-14-AC
K4PCN...4326-103-11-A
K4RAY...3330-112- 5-AC
W4KJA...2880- 80- 8-A
W4KNS..2610- 87- 5-B
W4TPX...1650- 55 -5-A
W4MES..1520- 38-10-A
W4SNH..1292- 34- 9-A
K4PUD...1260- 30-11-A
K4RTG...1188- 33- 8-AB
W4KDH (3 oprs.)
3654- 87-11-AB

West Virginia

K8BLR...1071- 32- 7-A
W4DLA/8...22- 1- 1-B

ROCKY MOUNTAIN DIVISION

Colorado

WØWYX..1248- 48- 3-A
KØKWS*..1224- 51- 2-AB
WØTII....984- 41- 2-A
KØYDF...682- 31- 1-A
WØRWD..660- 30- 1-A
KØJSD...638- 29- 1-A
WØJGW...550- 25- 1-A
KØMRY...506- 23- 1-A
WØJJR...440- 20- 1-A
KØMNQ..275- 13- 1-AB
WØMOX..240- 10- 2-B

Utah

W7QDJ...432- 18- 2-AB

New Mexico

K5IQL....944- 30- 6-AB
K5TQP....154- 7- 1-B

Wyoming

K7HKD/7 (K7HKD, W8KNC)
168- 7- 2-AB

SOUTHEASTERN DIVISION

Alabama

K4HPR...462* 21- 1-AB
K4LSQ....308- 11- 4-A

Eastern Florida

W4LIP..15,990-205-29-A
K4CRU*.9968-178-18-AB
W4RMU..9879-136-27-AB
K4ACF...6534-121-17-A
K4PPX...5616-104-17-A
K4FIE...4272- 90-14-A
K8ACC/4
3920- 70-18-A
W4FNR...408- 17- 2-A
K4EYO...165- 15- 1-B

Georgia

W4MDS..9287-126-27-A
K4YGK*.7350-124-20-A
K4YFT...7163-124-19-A
K4DLE..6800-100-24-A
K4KLD...5942- 73-17-A
K4TDU...3402- 63-17-A
W4BGE..3335- 74-13-AB
K4YMC..2860- 56-16-A
K4FNZ...2596- 60-12-A
K4ZFT...2574- 50-16-A
K4HSA...2400- 60-10-A
K4GCG..2376- 54-12-AB
W4VVZ...2058- 49-11-A
W4TST...2052- 57- 8-AB
K4HLD...1650- 39-12-A
W4GIS...1184- 37- 6-AB
K4YMD...986- 29- 7-A
K4TFY/4..962- 37- 3-A
K4EEJ....798- 21- 9-A
K4CER....792- 22- 8-A
K4JAO....672- 28- 2-A
W4UML....644- 23- 4-A
W4GUQ....640- 20- 6-A
K4PKK....616- 22- 4-A

(Continued on page 146)

Hints and Kinks For the Experimenter

SHEET-METAL DRILL

THE sketch in Fig. 1 shows a modified high-speed twist drill that will make clean round holes even in very thin metal stock. This type of drill, which was brought to my attention by Sgt. L. W. Atkins of the RCAF, can be made from discarded, worn-out drills. First, grind a wedge on the tip of the drill as shown in the sketch at the right in Fig. 1. Then rotate the drill 90

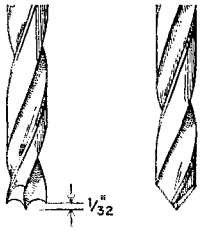


Fig. 1—Sheet-metal drill.

degrees and grind the drill to resemble the sketch to the left in Fig. 1. Grind a small rake on the cutting edge of the drill to insure clean chip removal. Drills down to ¼ inch can be modified this way without much trouble.

— *R. R. Sopczak, VE3ABL*

COUNTERWEIGHT ANTENNA SUPPORT

AMATEURS having conveniently spaced trees for antenna supports may find the counterweight arrangement that I use interesting. In order to provide sufficient tension on my center-fed antenna, about 20 or 30 pounds of pull is required. In the event of antenna-wire or insulator failure, the prospect of a counterweight of this size dropping to the ground is not pleasant. To hold the counterweight captive and also to attain a 2:1 tension step-up, I use the simple pulley arrangement shown in the sketch, Fig. 2.

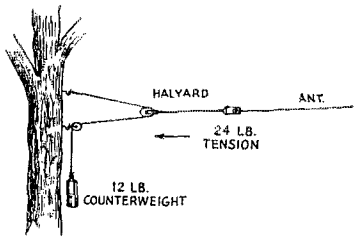


Fig. 2—K2ZZF's counterweight antenna support.

Stainless-steel sheaves with large diameter nylon pulleys used for motorboat steering harnesses are useful in this application and don't require any lubrication. Since the counterweight will move vertically twice the distance that the trees sway horizontally, leave room for sufficient counterweight movement.

— *D. C. Mead, K2ZZF*

BLOWN TRANSISTORS

DON'T throw away burned-out transistors as, in some cases, they can still be used as diodes. Try the emitter-base or base-collector connections as the diode.

— *Pekka Pyykko, OH1NE*

MULTI-ELMAC M1070 POWER-SUPPLY NOTES

THE problem of short vibrator life in the Elmac Model M1070 power supply can be remedied by making a few revisions in the original circuitry. The heavy lines in Fig. 3, below, indicate the parts to be added. The capacitor C_2 originally was 0.0047 μf. and should be changed to a 0.015-μf. 1600-volt unit. One other suggestion: Change the 100-μf. capacitor C_{210} to a 250-μf. 25-volt unit. This will give better action to the antenna changeover relay.

— *Harry Stewart, W8PSV*

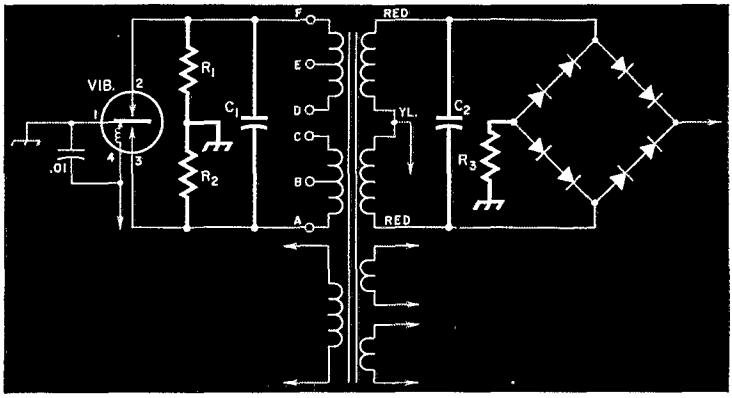


Fig. 3—Changes to the Elmac M1070 power supply.
C_1—0.5 μf., 200 volts.
C_2—0.015 μf., 1600 volts.
P_1, R_2—390 ohms, 2 watt.
R_3—100 ohms, 7 watts.

Happenings of the Month

Examination Schedule

What Bands Available

Board Meeting Minutes

STAFF NOTES

We are pleased to announce the permanent addition to our staff of Mason P. Southworth, W1VLH, as Assistant Technical Editor. No stranger to *QST* readers, Mason spent several summer college vacations, commencing in 1953, in the League's lab, designing and building gear especially for v.h.f. articles. This, together with his own ardent v.h.f. operating activities, made him an ideal choice to head up the 1956–1959 ARRL/Air Force project collecting and analyzing propagation data in connection with the International Geophysical Year. Although already having degrees from Trinity and Rensselaer, he then chose a year of graduate study at Stanford, where somehow he found spare time to supervise another project at the University further analyzing the ARRL/IGY data. While his personal interests still lie largely in frequencies above 50 Mc., his *QST* duties will be concerned with general technical matters.

EXAMINATION SCHEDULE

THE Federal Communications Commission will give Extra and General Class amateur examinations during the second half of 1960 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified from the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: October 8, 11 A.M.
Amarillo, Texas: September 14.
Anchorage, Alaska, 53 Federal Bldg.: By appointment.
Atlanta, Georgia, 718 Atlanta National Building, 50 Whitehall St. S. W.: Tuesday and Friday at 8:30 A.M.
Baltimore, Md., 400 McCawley Bldg., 400 E. Lombard St.: Monday and Friday, between 8:30 A.M. and 10 A.M. and by appointment.
Beaumont, Texas, 301 P. O. Bldg.: By appointment.
Birmingham, Ala.: September 7, December 7.
Boise, Idaho: Sometime in October.
Boston, Mass., 1600 Customhouse: Wednesday through Friday 9:00 A.M. to 10 A.M.
Buffalo, N. Y., 328 P. O. Bldg.: First and third Fridays.
Charleston, W. Va.: Sometime in September and December.
Chicago, Ill., 826 U. S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in August and November.
Cleveland, Ohio: Sometime in September and December.
Columbus, Ohio: Sometime in July and October.
Corpus Christi, Texas: September 8, December 8.
Dallas, Texas, 401 States General Life Ins. Bldg.: Tuesday.
Davenport, Iowa: Sometime in July and October.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.
Des Moines, Iowa: Sometime in September and December.
Detroit, Mich., 1029 Federal Bldg.: Wednesday and Friday.
Fort Wayne, Ind.: Sometime in August and November.
Fresno, Calif.: Sometime in September and December.

The ARRL Board of Directors and League officials during the meeting in Hartford on May 13. Seated, l. to r.: Dakota Director Compton; West Gulf Director Payne; Delta Director De Hart; Southwestern Director Meyers; Pacific Director Engwicht; First Vice-President Groves; Northwestern Director Roberts; Midwest Director Denniston; Vice-President and Communications Manager Handy; Robert A. Marmet of the General Counsel's office; President Dosland; General Manager Budlong; Assistant General Manager Huntoon; Treasurer Houghton; newly-elected Vice President Reid; Roanoke Director Anderson; Hudson Director Kahn; New England Director Chaffee; Rocky Mountain Director Maer; Great Lakes Director Cartwright; Central Director Doyle. Standing, l. to r.: New England Vice-Director Polo; Technical Director Grammer; Southeastern Director Born; Atlantic Vice-Director Van Deusen; Atlantic Director Crossley; new Canadian Director Eaton; Southwestern Vice-Director Talbott; Assistant Secretary Williams.

Grand Rapids, Mich.: Sometime in July and October.
Great Falls, Mont.: Sometime in September.
Hartford, Conn.: September 14.
Hilo, Hawaii: October 11.
Honolulu, Hawaii, 502 Federal Bldg.: Monday through Friday.
Houston, Texas, 326 U. S. Appraisers Bldg.: Tuesday and Friday.
Indianapolis, Ind.: Sometime in August and November.
Jackson, Miss.: December 7.
Jacksonville, Fla.: October 22.
Jamestown, N. D.: October 12, 10 A.M.
Juneau, Alaska, 6 Shattuck Bldg.: By appointment.
Kansas City, Mo., 3100 Federal Office Bldg.: Thursday and Friday, 8:30 A.M. to 1 P.M.
Knoxville, Tenn.: September 21, December 21.
Lihue, Hawaii: October 19.
Little Rock, Ark.: August 3, November 2, 1:00 P.M.
Los Angeles, Calif., 849 So. Broadway: Wednesday, 9 A.M. and 1 P.M.
Louisville, Kentucky: Sometime in August and November.
Memphis, Tenn.: July 14, October 6.
Miami, Fla., 312 Federal Bldg.: Thursday.
Milwaukee, Wisconsin: Sometime in July and October.
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday, by appointment.
Nashville, Tenn.: August 3, November 2.
New Orleans, La., 608 Federal Office Building, 600 South St.: Monday through Wednesday, code tests Monday only at 8:30 A.M.
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Tuesday through Friday.
Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required.
Oklahoma City, Okla.: July 13, October 12.
Omaha, Nebr.: Sometime in July and October.
Philadelphia, Pa., 1005 New U. S. Customhouse: Monday through Wednesday, 8:30 A.M. to 10 A.M.
Phoenix, Ariz.: Sometime in July and October.
Pittsburgh, Pa.: Sometime in August and November.
Portland, Maine: October 11.
Portland, Ore., 201 U. S. Courthouse: Friday, 8:30 A.M.
Roanoke, Va.: October 1.
St. Louis, Mo.: Sometime in August and November.
St. Paul, Minn., 208 Federal Courts Bldg.: Friday, 8:45 A.M.
Salt Lake City, Utah: September 9, December 9, 1 P.M.
San Antonio, Texas: August 4–5, November 3–4.
San Diego, Calif., Fox Theater Bldg.: Wednesday, by appointment.
San Francisco, Calif., 323-A Customhouse: Friday.
San Juan, P. R., 323 Federal Bldg.: Friday.
Savannah, Ga., 214 P. O. Bldg.: By appointment.
Schenectady, N. Y.: September 14–15, December 7–8.
Seattle, Wash., 802 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: September 20, December 20, 10 A.M.
Spokane, Wash.: Sometime in September.
Syracuse, N. Y.: Sometime in July and October.
Tampa, Fla., Rm 201, 221 No. Howard Ave.: By appointment.
Tulsa, Okla.: August 18, November 17.
Tucson, Ariz.: Sometime in October.
Wailuku, Hawaii: October 15.
Washington, D. C., 718 Jackson Place, N.W.: Tuesday and Friday, 8:30 A.M. to 5 P.M. Code test 9:30 A.M. and 1 P.M.
Wichita, Kansas: Sometime in September.
Williamsport, Pa.: Sometime in September and December.
Wilmington, N. C.: December 3.
Winston-Salem, N. C.: August 27, November 5.

NOTE: Only General Class and Amateur Extra Class license examinations are given at FCC offices and examining point listed above. All examinations for Novice, Technician and Conditional Class licenses are conducted by volunteer supervisors.

WHAT BANDS AVAILABLE?

Below is a summary of the U. S. amateur bands on which operation is permitted *as of June 10*. Changes will, as usual, be announced by W1AW bulletins. Figures are megacycles. AØ means an unmodulated carrier; A1 means c.w. telegraphy; A2 is m.c.w.; A3 is a.m. phone (n.f.m. may also be used in such bands); A4 is facsimile; A5 is television; F1 is frequency-shift keying; and f.m. means frequency modulation, phone (including n.f.m.) or telegraphy.

80 meters	3.500–4.000	— A1
	3.500–3.800	— F1
	3.800–4.000	— A3
40 m.	7.000–7.300	— A1
	7.000–7.200	— F1
	7.200–7.300	— A3
20 m.	14.000–14.350	— A1
	14.000–14.200	— F1
	14,200–14.350	— A3
15 m.	21.000–21.450	— A1
	21.000–21.250	— F1
	21.250–21.450	— A3
10 m.	28.000–29.700	— A1
	28.500–29.700	— A3
	29.000–29.700	— f.m.
6 m.	50.0–50.1	— A1
	50.1–54	— A1, A2, A3, A4
	51–54	— AØ
	52.5–54	— f.m.
2 m.	144–147.9	— AØ, A1, A2, A3, A4, f m
	147.9–148	— A1
	220–225	— AØ, A1, A2, A3, A4, f.m.
	420–450[1]	AØ, A1, A2, A3, A4, A5, f.m.
	1,215–1,300	
	2,300– 2,450	AØ, A1, A2, A3, A4, A5, f.m., pulse
	3,500– 3,700	
	5,650– 5,925	
	10,000–10,500[2]	
	21,000–22,000	
	All above 30,000	

[1] Input power must not exceed 50 watts.
[2] No pulse permitted in this band.

NOTE: The bands 220 through 10,500 Mc. are shared with the Government Radio Positioning Service, which has priority.

In addition, A1 and A3 on portions of 1.800–2.000, as follows:

Area	*Band, kc.*	*Power (watts) Day*	*Night*
Minn., Iowa, Wis., Mich., Pa., Md., Del. and states to north	1800–1825	500	200
N. D., S. D., Nebr., Colo., N. Mex., and states west, including Hawaiian Ids.	1975–2000	500*	200*
Okla., Kans., Mo., Ark., Ill., Ind., Ky., Tenn., Ohio, W. Va., Va., N. C., S. C., and Texas (west of 99° W *or* north of 32° N)	1800–1825	200	50

No operation elsewhere.

* Except in state of Washington, 200 watts day, 50 watts night.

Novice licensees may use the following frequencies, transmitters to be crystal-controlled and have a maximum power input of 75 watts.

3.700–3.750	A1	21.100–21.250	A1
7.150–7.200	A1	145–147	A1, A2 A3, f m

Technician licensees are permitted all amateur privileges in 50 Mc., 145–147 Mc. and in the bands 220 Mc. and above.

MINUTES OF 1960 ANNUAL MEETING OF THE BOARD OF DIRECTORS

THE AMERICAN RADIO RELAY LEAGUE, INC. MAY 13, 1960

1) Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc., met in annual session

at the Hotel Statler, Hartford, Connecticut on May 13, 1960. The meeting was called to order at 9:30 A.M. EDST with President Goodwin L. Dosland in the Chair and the following directors present:

P. Lanier Anderson, Roanoke Division
James P. Born, jr., Southeastern Division
Dana E. Cartwright, Great Lakes Division
Milton E. Chaffee, New England Division
Charles G. Compton, Dakota Division
Gilbert L. Crossley, Atlantic Division
Sanford B. DeHart, Delta Division
R. W. Denniston, Midwest Division
John G. Doyle, Central Division
Harry M. Engwicht, Pacific Division
Morton B. Kahn, Hudson Division
Claude M. Maer, jr., Rocky Mountain Division
Raymond E. Meyers, Southwestern Division
Grady A. Payne, West Gulf Division
Alex Reid, Canadian Division
R. Rex Roberts, Northwestern Division

Also in attendance, as members of the Board without vote, were Wayland M. Groves, First Vice-President; F. E. Handy, Vice-President; A. L. Budlong, General Manager. Also in attendance, at the invitation of the Board as non-participating observers, were Canadian Division Vice-Director Noel B. Eaton; Atlantic Division Vice-Director Edwin S. Van Deusen; Southwestern Division Vice-Director Virgil Talbott. There were also present Treasurer David H. Houghton, Technical Director George Grammer, Assistant General Manager John Huntoon, Assistant Secretary Perry F. Williams, and Robert A. Marmet of the General Counsel's office.

2) On motion of Mr. Roberts, unanimously VOTED that the Minutes of the 1959 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

3) On motion of Mr. Born, unanimously VOTED that the Annual Reports of the Officers to the Board of Directors are accepted and the same placed on file.

4) On request of Mr. Chaffee, RULED by the Chair that the report of the Finance Committee is deferred until later on the agenda. Mr. Kahn, as Chairman, read the report of the Planning Committee; whereupon, on motion of Mr. Born, the same was unanimously ACCEPTED. On request of Mr. Born, RULED by the Chair that the report of the Membership & Publications Committee is deferred until later on the agenda. Mr. Anderson, as Chairman, read the report of the Merit & Awards Committee; whereupon, on motion of Mr. Maer, the same was unanimously ACCEPTED. Mr. Chaffee, as Chairman, reported briefly for the Housing Committee and indicated that he would have specific recommendations later in the agenda; whereupon, on motion of Mr. Meyers, the report was unanimously ACCEPTED.

5) On motion of Mr. Born, unanimously VOTED that the Annual Reports of the Directors to the Board of Directors are accepted and the same placed on file.

6) At this point, supplementary oral reports were rendered by the officers of the League. During the course of the above, the Board was in recess from 10:45 A.M. until 11:00 A.M. New England Division Vice-Director Carmine A. Polo joined the meeting at 11:04 A.M.

7) On motion of Mr. Engwicht, after discussion, unanimously VOTED that the Board of Directors approves the holding of an ARRL National Convention in San Jose, California, during 1965, under the sponsorship of the Santa Clara Amateur Radio Association and the West Valley Amateur Radio Association. During the course of the above action, First Vice-President Wayland M. Groves temporarily occupied the Chair.

8) Moved, by Mr. Anderson, that the General Manager be instructed to prepare and publish in *QST* annually, a comprehensive financial statement of the status of the League. After discussion, on motion of Mr. Kahn, unanimously VOTED to amend the motion by striking the text and substituting therefor the following: that the General Manager be instructed to prepare copies of the annual financial statement of the League and make them available to directors and members at no cost. Whereupon, the question being on the motion as amended, the same was unanimously ADOPTED.

9) Moved, by Mr. Anderson, that the General Manager continue the League's efforts to restore operating privileges in the 160-meter band. Moved, by Mr. Crossley, to amend

For the eighth straight year, Ohio has proclaimed and observed an Amateur Radio Week. Again this year it is the week culminating in the ARRL Field Day. Here, behind Governor Michael DiSalle as he signs the proclamation, are Dick DeWitt K8IXY, president of the Columbus Amateur Radio Assn.; Ralph Crammer, W8VHO; and Karl Kanalz, W8THX, secretary of the Ohio Council of Amateur Radio Clubs.

the motion to strike the words "General Manager" and substitute therefor the word "President," in compliance with By-Law 26. After extended discussion, on motion of Mr. Kahn, unanimously VOTED that the matter is laid on the table.

10) The Board recessed for luncheon at 12:14 P.M., reconvening at 1:50 P.M., with all directors and other persons herein-before-mentioned in attendance.

11) On motion of Mr. Maer, unanimously VOTED that the ARRL Board of Directors recommends that the power limit on the 420-Mc. band be raised to 1 kw. input and instructs the General Manager to take the necessary steps to accomplish this change.

12) Moved, by Mr. Meyers, that Article 5 of the Articles of Association be amended to list the names and terms of the current directors in lieu of those now listed. On motion of Mr. Born, unanimously VOTED that the matter is laid on the table.

13) Moved, by Mr. Meyers, that Article 12 of the Articles of Association be amended by adding the word "amateur" in the second sentence so that the pertinent portion would read, ". . . engaged in the manufacture, sale or rental of radio apparatus capable of being used in amateur radio communication, or . . ." After discussion, on motion of Mr. Engwicht, unanimously VOTED that the matter is laid on the table.

14) Moved, by Mr. Meyers, that the Board of Directors hold its next annual meeting at Disneyland, California. After discussion, on motion of Mr. Denniston, unanimously VOTED that the matter is laid on the table.

15) On motion of Mr. Meyers, unanimously VOTED that the Executive Committee is authorized to hold its meetings in various sections of the United States subject to the call of the President, who shall designate the time, place and date of such meetings.

16) On motion of Mr. Meyers, unanimously VOTED that all future publication of Articles of Association and By-Laws call attention to any changes by underlining new additions, corrections and changes.

17) On motion of Mr. Meyers, VOTED that, unless the Secretary is notified to the contrary, the League arrange for and subscribe to the Federal Register in the name of each director in order that each may be kept informed of all official actions taken by FCC as they occur on a day-to-day basis.

18) Moved, by Mr. Meyers, that in the interest of better relations, on the invitation of any director holding a division convention or hamfest, directors of adjacent divisions be authorized to attend such affairs at the expense of the League. Moved, by Mr. Born, to amend the motion by striking the words, "or hamfest." Moved, by Mr. DeHart, to further amend the motion by striking the text and substituting therefor the following: that a director be authorized

to visit an adjacent division at the request of the director of that division; but the motion to amend was REJECTED. The question then being on Mr. Born's amendment, the same was unanimously ADOPTED. Moved, by Mr. Crossley, to amend the motion to include travel to national conventions. Moved, by Mr. Denniston, to further amend the motion to restrict such travel exclusively to national conventions. But, after discussion, on motion of Mr. Meyers unanimously VOTED that the matter is laid on the table.

19) Moved, by Mr. Kahn, that the General Manager be directed to conduct an occupancy survey of the amateur bands between 3.5 and 29.7 Mc. to determine present usage as between various modes of emission. But, after discussion, on motion of Mr. Payne, unanimously VOTED that the matter is laid on the table.

20) On motion of Mr. Crossley, VOTED that the Board establish a committee of elected directors, to be appointed by the President, to be known as the Public Relations Committee; this committee to investigate methods of public relations promotion for the League and recommend to the Board how to execute a vigorous program.

21) Moved, by Mr. Crossley, that Article 5 of the Articles of Association be amended so that the last line would read, ". . . of at least one-half the elected directors of the Board as then constituted." On motion of Mr. Maer, unanimously VOTED that the matter is laid on the table.

22) Moved, by Mr. Crossley, that a committee composed of the elected directors of the Executive Committee be charged by the Board to critically examine the Articles of Association and the By-Laws for seemingly ambiguities, and possible changes and corrections and to report to the Board at the next meeting; the committee chairman shall be designated by the President. On motion of Mr. Maer, unanimously VOTED that the matter is laid on the table.

23) Moved, by Mr. Crossley, that the proper committee of the Board look into the matter of proper publication of the Board minutes and Board committee reports according to Roberts Rules of Order, Sec. 60, last paragraph titled "Minutes to be Published," this committee to examine methods by which this section can be implemented most satisfactorily, then report to the Board at the next meeting, for action; but the motion was REJECTED.

24) On motion of Mr. Doyle, VOTED that it is the sense of the ARRL Board of Directors that applications by qualified groups to conduct national conventions will be considered by the Board upon proper application without regard to time limit.

25) On motion of Mr. Compton, after discussion, unanimously VOTED that the President is instructed to make every effort to bring about reciprocal operating privileges to nationals of foreign governments depending on action of the State Department through diplomatic negotiations.

26) Moved, by Mr. Compton, that the President be instructed to ask the FCC to amend their Rules and Regulations concerning dual identification when using RTTY, so that identification by use of A-1 telegraphy will not be required; but, after discussion, the motion was REJECTED.

27) Moved, by Mr. DeHart, that the Conditional/General Class be offered only to those in the continental United States who are physically incapable of appearing before the FCC examiner, and that those holding the Conditional/General Class at present be called in for examination; but after discussion, with the consent of his second, Mr. DeHart withdrew the motion.

28) Moved, by Mr. DeHart, that the RACES frequencies be assigned outside but adjacent to the amateur bands; but there was no second, so the motion was LOST.

29) On motion of Mr. Cartwright, unanimously VOTED that the League recommend that reports, communications and logs be given in Greenwich Mean Time, and that the League urge the use of GMT by amateurs through publicity in *QST* and schedules of W1AW, and that the Headquarters staff, elected officials and appointees use GMT for the above purposes.

30) The Board was in recess from 4:04 P.M. until 4:20 P.M.

31) On motion of Mr. Kahn, unanimously VOTED that the Board of Directors direct the General Manager to conduct a study of desires of ARRL members as to the mode of usage of the amateur frequencies between 3.5 and 29.7 Mc.

32) On motion of Mr. Meyers, after discussion, unanimously VOTED that ARRL lend all possible support to Project Hope with respect to publicity regarding the amateur radio portion of this venture.

33) Moved, by Mr. Denniston, that Article 5, of the Articles of Association, paragraph 3, sentence 3, be amended to read, "The Board shall meet twice annually at times and places as provided in the By-Laws." After discussion, the yeas and nays being ordered, the question was decided in the negative: whole number of votes cast, 16; necessary for adoption, 12; yeas, 5; nays, 11. All the directors voted opposed except Messrs. Denniston, Doyle, Engwicht, Kahn and Meyers. So the motion was REJECTED.

34) On motion of Mr. Born, unanimously VOTED that the General Manager is hereby authorized to reimburse the division directors for actual expenses incurred by them during the year 1960, in the proper administration of ARRL affairs in their respective divisions, up to amounts as follows:

Canadian Division Director	$1000
Atlantic Division Director	2200
Central Division Director	2100
Dakota Division Director	850
Delta Division Director	2000
Great Lakes Division Director	1100
Hudson Division Director	2000
Midwest Division Director	900
New England Division Director	750
Northwestern Division Director	1200
Pacific Division Director	2000
Roanoke Division Director	750
Rocky Mountain Division Director	800
Southeastern Division Director	2000
Southwestern Division Director	2100
West Gulf Division Director	1500

35) On motion of Mr. Born, unanimously VOTED that the General Manager is hereby authorized to reimburse Director Meyers in the amount of $231.72 as additional expense for the year 1959.

36) On motion of Mr. Meyers, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1960, but not to exceed amounts as follows:

Planning Committee	$1500
Finance Committee	500
Membership & Publications Committee	500
Merit & Awards Committee	200
Housing Committee	2500

37) On motion of Mr. Compton, unanimously VOTED that to continue the Board's policy of reimbursing Section Communications Managers and QSL Managers of the League for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during 1960, a total amount not to exceed $10,800, under terms prescribed by the Communications Manager following the general pattern established by the Board.

38) On motion of Mr. Doyle, unanimously VOTED that QSL Managers be supplied League letterhead memorandum forms for their correspondence.

39) On motion of Mr. Denniston, unanimously VOTED that, to continue the Board's policy of reimbursing Section Emergency Coordinators for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1960 a total amount not to exceed $6,500 under terms prescribed by the Communications Manager following the general pattern established by the Board.

BOARD THANKS VOLUNTEER A.R.R.L. OFFICIALS

In reviewing the work of the League for the past year the ARRL Board of Directors again found that much of our progress is due to the volunteer efforts of elected and appointed officials in the administrative and field organization of our association. By unanimous action the Board has again expressed its sincere thanks to the Vice-Directors, assistant directors, SCMs, SECs and QSL Managers — an action which we know all amateurs will heartily endorse.

40) On motion of Mr. Meyers, unanimously VOTED that the General Manager is hereby authorized to pay, during the period between January 1, 1961 and the 1961 meeting of the Board, expenses against usual authorizations for administrative and committee operations in no greater amounts than 1960 authorized amounts.

41) On request of Mr. Chaffee, RULED by the Chair that consideration of Finance Committee recommendations is deferred until later on the agenda. On request of Mr. Born, RULED by the Chair that consideration of recommendations of the Membership & Publications Committee is deferred until later on the agenda. On motion of Mr. Anderson, the recommendations of the Merit & Awards Committee were unanimously ADOPTED. On request of Mr. Chaffee, RULED by the Chair that consideration of recommendations of the Housing Committee is deferred until later on the agenda.

42) On motion of Mr. Doyle, unanimously VOTED that, pursuant to the terms of the Trust Agreement under the Pension Plan, the following persons are appointed to serve as a Pension Committee from June 2, 1960, to June 2, 1961: Arthur L. Budlong, George Grammer, and David H. Houghton.

43) At this point the Chair notified the Board of the receipt by him of a letter from Percy C. Noble tendering his resignation as a Vice-President of the League and a member of the Executive Committee.

44) The Chair announced the opening of nominations for the election to the Executive Committee of one member of the Board of Directors in accordance with Article 7 of the Articles of Association. Mr. Cartwright nominated Mr. Doyle. On motion of Mr. Denniston, unanimously VOTED that the nominations are closed and the Secretary cast one ballot electing Mr. Doyle to the Executive Committee.

45) On motion of Mr. Born, unanimously VOTED that the Board now proceed to the election of three additional members of the Executive Committee in accordance with Article 7 of the Articles of Association. Mr. Engwicht nominated Mr. Meyers. On motion of Mr. DeHart, unanimously VOTED that the nominations are closed and the Secretary cast one ballot electing Mr. Meyers as a member of the Executive Committee to serve until the next annual meeting of the Board. Mr. Meyers nominated Mr. Kahn. On motion of Mr. DeHart, unanimously VOTED that the nominations are closed and the Secretary cast one ballot electing Mr. Kahn as a member of the Executive Committee to serve until the next annual meeting of the Board. Mr. Born nominated Mr. Chaffee. On motion of Mr. Crossley, unanimously VOTED that the nominations are closed and the Secretary cast one ballot electing Mr. Chaffee as a member of the Executive Committee to serve until the next annual meeting of the Board.

46) The Board recessed for dinner at 5:37 P.M. reconvening at 9:05 P.M., with all directors and other persons herein-before-mentioned in attendance, except New England Division Vice-Director Polo.

47) Mr. Chaffee read the report of the Finance Committee, and on his motion, the same was unanimously ADOPTED.

48) Mr. Born, as Chairman, and Mr. Doyle reported briefly on activities of the Membership & Publications committee.

49) Mr. Chaffee reported on the progress of the Housing Committee as concerns a proposed new building for League Headquarters. Whereupon, on motion of Mr. Crossley, unanimously VOTED that the Housing Committee, with the concurrence of the Executive Committee and the Finance Committee, is authorized to proceed in application for a zoning variance in the town of Newington and, if this is obtained, to proceed with construction of a Headquarters building generally in accordance with the recommendations of the Housing Committee.

50) On motion of Mr. Meyers, unanimously VOTED that the Board express its appreciation to Mr. Chaffee, the Housing Committee and the Headquarters for their efforts in the preparation of a very fine report.

51) On motion of Mr. Doyle, unanimously VOTED that the Board accepts the report of the Planning Committee with great thanks and appreciation, but in view of the need of conserving League funds at this time, the report is now laid on the table.

52) On motion of Mr. Cartwright, affiliation was unanimously GRANTED to the following clubs:

Amateur Radio Technical Society of St. Louis.....St. Louis 10, Mo.
The Willamette Valley DX Club, Inc...Portland, Oregon
The Worthington High Organization of Amateurs.....Worthington, Ohio
The Soft Tube Club.....Smithville, Ohio
Lancaster and Fairfield County Amateur Radio Club.....Lancaster, Ohio
Apple Pie Hill Amateur Radio Club....Tuckerton, N. J.

53) On motion of Mr. Cartwright, unanimously VOTED that the Board expresses its appreciation to Canadian Director Reid for making himself available to attend the Geneva Conference.

54) On motion of Mr. Crossley, unanimously VOTED to take from the table his motion concerning appointment of a committee to examine the Articles of Association and By-Laws. On further motion of Mr. Crossley, unanimously VOTED that the President appoint a special committee of three directors to review Articles of Association and By-Laws of the League and to consider all changes referred to the committee in writing by the directors. The Committee shall report its recommendations for revisions of Articles and By-Laws to the Board at its next annual meeting.

55) On motion of Mr. Anderson, unanimously VOTED to take from the table his motion concerning operating privileges in the 160-meter band. On further motion of Mr. Anderson, unanimously VOTED that the President instruct the General Manager to continue the League's efforts to restore operating privileges in the 160-meter band.

56) On motion of Mr. Born, unanimously VOTED that the Board hereby expresses its sincere thanks and deep appreciation for the untiring work and devotion of the vice-directors, assistant directors, SCMs, SECs and QSL Managers of the League.

OFFICERS' REPORTS AVAILABLE TO MEMBERS

Each year the officers of the League make comprehensive written reports to the directors. The Board has made these reports available to interested members, in a volume which also includes reports of the directors. The cost price is 75 cents per copy, postpaid. A copy of the financial statement only is available without charge. Address the General Manager at West Hartford, Conn.

57) On motion of Mr. Payne, unanimously VOTED that David H. Houghton and F. E. Handy are appointed special members of the Executive Committee to serve until the next annual meeting of the Board.

58) On motion of Mr. Meyers, the following resolution was unanimously ADOPTED:

WHEREAS, the Federal Communications Commission, established by an Act of Congress, cited as "The Communications Act of 1934", signed June 19, 1934, now celebrates its Twenty-fifth, or "Silver" anniversary, and

WHEREAS, the Federal Communications Commission, charged with the regulation of inter-state, and foreign communications, has provided for a service known as the Amateur Radio Service, and

WHEREAS, the Federal Communications Commission has, in its numerous annual reports to Congress, devoted considerable space with respect to matters involving the Amateur Radio Service for its efforts in the development of radio communications, and

WHEREAS, the Federal Communications Commission has been most laudatory for the efforts of the American Radio Relay League, Inc., for our efforts in making the Amateur Radio Service a self-regulatory group dedicated to the promulgation, and observance of the rules affecting the Amateur Radio Service, and

WHEREAS, the Federal Communications Commission, in all its dealings with committees, delega-

(*Continued on page 148*)

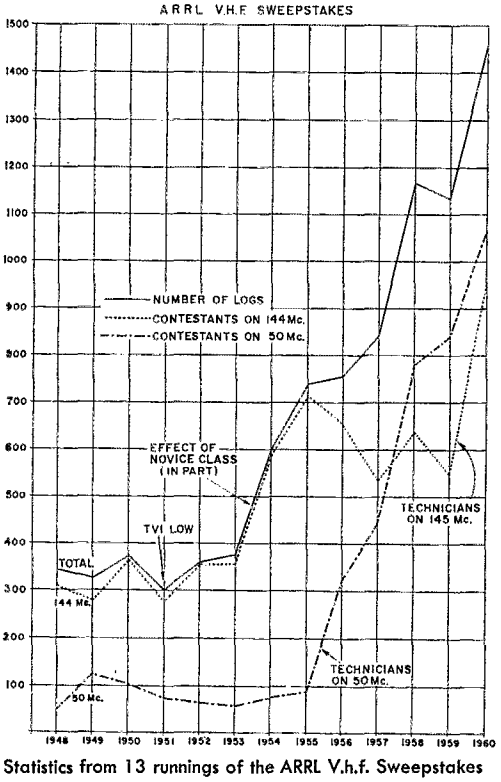
The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

YOU can save us some time and space if you will dig out your July, 1959 issue of *QST* and read over our lead paragraphs of that issue. We showed the record of activity in the ARRL V.H.F. Sweepstakes, and talked a bit about what that record meant, in terms of progress in the world above 50 Mc. Participation in the annual event was shown in graph form, and the graph is reproduced here, with the 1960 totals added. Once again, the graph is worthy of more than passing notice.

The V.H.F. Sweepstakes having run under substantially the same rules since the first one in 1948, it provides perhaps the best means available for sizing up what is happening in our v.h.f. bands. We have no precise way of knowing what percentage of operators submit logs, and admittedly by no means all of the stations that appear in a v.h.f. contest having a club incentive can be considered regular inhabitants of the v.h.f. bands — but as a means of showing the growth of v.h.f. activity over the years the contest will have to do until something better comes along. The shape of the curves drawn from contest records is significant, even if the numbers on them are not.

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



Statistics from 13 runnings of the ARRL V.h.f. Sweepstakes

50 Mc. WAS

1 W0ZJB	19 W3OJU	38 W7ILL	57 W1SUZ
2 W0BJV	20 W6TMI**	39 W0DDX	58 W1AEP*
3 W0CJS	21 K6EDX	40 W0DO	59 W5LFH
4 W5AJG	22 W5SFW*	41 K9DXT	60 W6NLZ**
5 W9ZHL	23 W6ORE	42 W6ABN**	61 W7MAH
6 W9OCA	24 W9ALU	43 W6BAZ	62 W8ESZ
7 W6OB	25 W8CMS*	44 VE3AET	63 W2BYM
8 W0INI	26 W0MVG	45 W9JFP	64 W7ACD
9 W1HDQ	27 W0CNM	46 W0QIN	65 K6PYH*
10 W5MJD	28 W1VNH	47 W0WWN	66 W4HOB
11 W2IDZ	29 W0OLY	48 K9ETD	67 K0JJA
12 W1LLL	30 W7HEA	49 W0FKY	68 K6RNQ**
13 W0DZM	31 K0GOG	50 W8LPD	69 W9QWT*
14 W0HVW	32 W7FFE	51 W0ZTW	70 W6EDC**
15 W0WKB	33 W0PFP	52 W6GCG	71 K6VLM**
16 W0SMJ	34 W6BJI**	53 W2RGV	72 K6GOX**
17 W0OGW	35 W2MEU	54 W1DEI	73 W0EDM
18 W7ERA	36 W1CLS	55 W1HOY	74 W9JCI
	37 W6PUZ	56 W6ANN	75 W0LLU*

* 49 states ** 50 states

VE7CN	45	EI2W	37	LU3DCA	27	SM5CHH	20
KL7AUV	44	CO2XZ	36	LU3EX	27	LA7Y	20
VE1EF	42	ZS8G	32	ZE2JV	26	VQ2PL	18
VE4HS	41	SM6ANR	30	LU9MA	26	JA8AO	18
XE1GE	39	CO2ZX	30	CO2DL	25	JA8BU	17
VE2AOM	38	SM7ZN	29	CT1CO	24	JA1AAT	17
KH6UK	37	PZ1AE	28	CO6WW	21	JA1AUH	16
		SM6BTT	28	LA9T	21	VP5FP	7

The graph for 1960 shows clearly the impact of the changes in operating privileges for Technician Class licensees. The effect of the introduction of the Novice Class ticket is also observable in the middle '50s. Prior to 1954, the contest had consistently brought in 300 to 400 entries. (Though this seems insignificant by today's standards, it was large enough to put the V.H.F. SS in the fourth spot in all ARRL contests, topped only by the Field Day, DX Contest, and the low-frequency Sweepstakes.) With the 1954 version, participation in the V.H.F. SS shot up some 60 per cent, and it has been rising steeply ever since.

Prior to 1955, the growth was almost entirely on 144 Mc., with just a ripple of interest in 220 and 420, not shown on these charts. The rise in 2-meter activity was due in part to the influx of Novices, though it could be argued that the introduction of a certain popular piece of 2-meter gear on the amateur market had a lot to do with it, too. The 50-Mc. band was struggling along with less than 100 participants reporting use of the band, through 1955.

In the 1956 running, when Technicians used the 50-Mc. band for the first time, the 6-meter curve started its steep upward climb with an increase of 360 per cent over the previous year. The 2-meter curve dropped back slightly, a trend that some viewed with alarm. This concern was a factor in the eventual release of part of the band for Technician use, in August, 1960. The move was in prospect last year, when our graph

was first published, and we were wondering at that time whether it would strip the 6-meter band of its hard-earned gains.

At least on the basis of 1960 results, we did not need to worry. The 2-meter logs almost doubled in number, but 6-meter entries increased at a faster rate than in 1959. In other words, except for Novices, who are restricted by their licenses from using the 50-Mc. band, use of both 6 and 2 is becoming an almost universal contest practice, and more people are taking part in the V.H.F. Sweepstakes all the time. The 1960 contest brought in 1446 logs, bringing it up to a level where it begins to challenge the standard SS for third spot in the contest popularity scale.

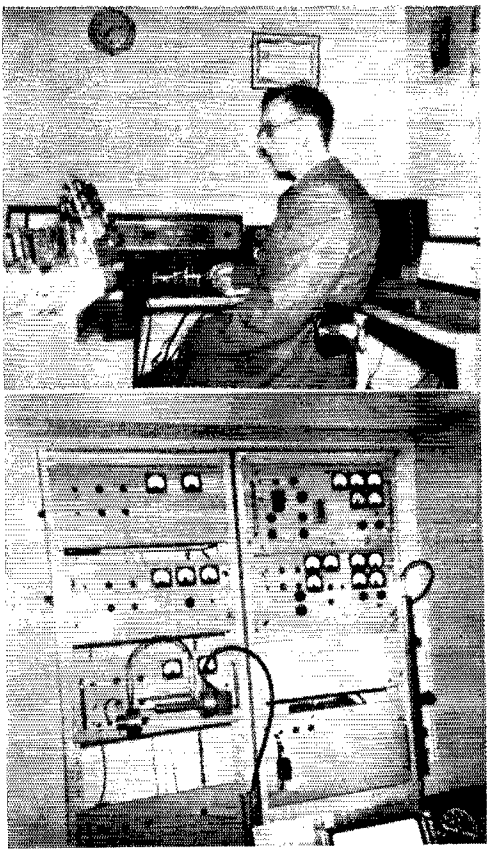
Thus it can be seen that, from the standpoint of numbers at least, the Technician has been the best thing that has happened to the world above 50 Mc. in many a year. But v.h.f. and all of ham radio, for that matter, cannot live by numbers alone. Growth is fine, and we're all for it, but let's not lose sight of our objectives as we count noses. If this growth is made up largely of "video rangers" who devote a major portion of their air time to regaling their captive audience of TV viewers with the details of their exploits in the fields of drag racing or conquest of the fair sex, we will have benefited little from the impressive numbers shown herewith. If these lines also show real growth in the years to come, and the percentage of Technicians who seriously try to do their best with the privileges they now enjoy continues to rise as well, we can point to our numbers with pride. As of now, we can afford to wait.

Here and There on 6 and 2

The southern tier of states enjoyed their best tropospheric propagation of the year on 144 Mc. beginning the night of May 16. W5AJG, Dallas, was hearing stations in 9 states (all Gulf states plus Arkansas, Oklahoma, Tennessee and South Carolina) at one time. W4AIB, nearly 900 miles, was Leroy's first new state worked via tropo in a long time. W4RMU, Jacksonville, working late Monday night, was not able to be on until 0100 May 17, but things were still going strong at that time. Allen worked W5FYZ, Minden, La., and heard W4AIB coming through well. After some sleep W4RMU was back at it again, working W5AJG and W5RCI, for two new states. W4RMU to W5AJG is about 920 miles.

W1AZK, Chichester, N. H., picked up a new one during the Aquarids meteor shower. Don returned from Europe just in time to keep a series of skeds on 144 Mc. with WØBFB, Mitchellville, Iowa. On May 2 he heard only 4 pings during the 1-hour sked beginning at 0630 EST. May 3 brought slightly more frequent and longer bursts, but still not enough for exchange of information. By 0647 the next morning they had exchanged calls, and at 0659 a 30-second burst nearly completed the contact. At 0706 a burst of more than 2 minutes topped off the QSO with what amounted to a ragchew, by m.s. standards. W1AZK wonders if anyone is interested in m.s. work on 220 Mc.

The several days and nights of aurora at the end of March had the buzzboys checking 144 Mc. closely at the end of April for a recurrence. It came, but not with the strength of the March sessions. *QST* deadlines being what they are, we didn't get the results into our report for April. Main items of interest: W7JRG, Billings, Mont., worked K7IDD, Salt Lake City, Utah, K7IHKD, Cheyenne, Wyo., WØIC, Denver, and W7QDJ, Clearfield, Utah, between 1824 and 2025 MST, April 27. W5PZ, Ponca City, Okla., worked WØENC, Rapid City, S. Dak., K9AAJ, Quincy, Ill., and W9OII, Sharon, Wis., and heard WØBFB and WØITF, between 2015 and 2100 CST. W9AAG was heard briefly at 1940 on the 28th. K1AFR, Hampden, Conn.,



Arnold Mynett, G3HBW, and his fine v.h.f. station. Arnold has crystal-controlled transmitters and converters for 144, 432 and 1296 Mc. With more than 400 watts output on 432 Mc., feeding an array of 9 11-element Yagis, he has several times worked more than 600 miles on that band. Transmitter for 144 Mc. has a pair of 4-125As. Rig for 1296 delivers 25 watts output. Photos by W1AZK, who visited G3HBW recently.

says that signals from the more southerly states seemed to have the best of it in this one. John worked W4MKT, Winston-Salem, N. C., and heard excellent signals from W4HJQ W4OKL K4EUS and W8BKI. W9ZIH and W8DX were also good.

Sporadic-*E* skip on 50 Mc. has been good in Cuba, according to CO2DL. Arnaldo worked 95 different stations in 12 days of DX ending with his report of May 10, including 40 U. S. stations in 16 states. This is fine, but it creates something of a QSL problem, for though there are a dozen or more Cuban stations on 6, only a few of the operators speak English. This piles up QSL work and expense for those who work the Ws. CO2DL says that they will gladly QSL direct on receipt of IRCs and self-addressed envelopes. Otherwise, cards are sent to the QSL bureaus. Arnaldo reports formation of a 6-meter net, which operates between 0900 and 1000 EST Sundays, on 50.4 Mc. CO2XZ CO2ZX and CM9BD are on 144 Mc. CM9BD is also working on a 300-watt 432-Mc. rig.

Declining solar activity has not put 50-Mc. DX out of business in Japan as yet. KA2PJ, Secretary of the Far East Amateur Radio League, lists the following members of the American Forces in Japan as active 6-meter men: KA2s LP CW FW AA JG LE EB KC BS and PJ. Though they are limited to 50 watts input, and must operate above 50.35 Mc., they still work into Australia frequently, a distance of some 4000 miles. Signals have also been heard recently from KL7 KH6 KG6 ZL and DU.

U. S. operators are not alone in their lack of confirmations

for their DX work on 6. LU3DCA has worked 30 countries but 4 are not confirmed. He would particularly like to hear from HR2DK VP5FP FF8AP and KZ5CN and KZ5LP. Mike pleads for 6-meter activity in KV4 HP YN YS and the various VPs. The reliability of the *TE* path to the Caribbean, particularly during August to October and February to April, suggests that DXpeditions for 50-Mc. work in these areas would find things highly interesting.

Want to work Liberia on 50 Mc.? EL4A would like to give the band a whirl if he can get the necessary equipment. No donations requested; Ken is willing to pay for the gear. What he'd like is a 6N2 or similar setup, plus a converter having 7-Mc. output. If you know of such equipment for sale at a reasonable price, drop a note, air mail, to Ken Bale, W7VCB/EL4A, Le Tourneau, Robertsfield, Liberia, West Africa. No overseas shipping problems; Ken will make arrangements.

In order to facilitate contacts on 50-Mc. s.s.b., K2PCG is compiling a directory of 6-meter s.s.b. stations. He asks that anyone using the s.s.b. mode on 6 send him the following information: name, address and call, approximate operating frequency, whether crystal or v.f.o. controlled, usual operating times, and details of any regularly-scheduled s.s.b. net operations. Address Phillip Gural, K2PCG, 191 Hillside Ave., Livingston, N. J.

The ARRL Propagation Research Project is now officially concluded, but the need for collection of data on v.h.f. DX continues. This is particularly true of *TE* propagation, as little is known of how this mode ties in with solar activity. Though most other world-wide 50-Mc. DX is pretty well a thing of the past, now that we are more than a year over the peak of Cycle 19, *TE* rolls on in some areas of the world, almost undiminished. Fortunately, key amateurs in these areas assure us that their work and reporting will continue. ZE2JV ZC4WR and G4LX, whose outstanding efforts were reported in some detail in December, 1959, *QST*,[1] are still at it. *TE* interest remains high in several South American countries, and LU3EX and LU3DCA, among others, assure us of continued summaries of their observations.

LU3EX found April a very good month for 50-Mc. DX. The band was open every day but April 1 and 28, and the month provided more contacts than any previous one in Alfredo's long 50-Mc. DX career. Many of these were with U. S. stations, and LU3EX ran his states-worked total from 12 to 27 in a few days' operating.

On April 2 the band was open to this country for 12 to 14 hours, beginning at noon, and 70 stations were worked in California, Arizona, Texas, Florida, and numerous Caribbean and Central and South American countries. On the 5th another session with U. S. A. brought contacts with K5DCG and W5JKB, Texas, beginning at 2230 and continuing to after midnight, *LU* time. K5YRL was worked at 2200 April 11. An early-evening session on the 12th netted K8EXG, Michigan, K4SWT, Florida, K9KGJ and K9TVI, Indiana, K4LEC K4ZWB and W4ETY, Tennessee, and the usual lower-latitude *TE* stations, beginning at 1828. K5DCG was worked at 1800 the 13th, and the band was still open at 2300 when Alfredo closed down. On the 17th the band was open to this country at 1650, and LU3EX bagged K5DCG K5INU K5BYD K5OMW K5GPR K5SLF (on s.s.b.) K5ELD and K5DCG again, leaving the band still jumping at midnight. Things were going again at 1844 on the 18th, with K5YME K7ALF K6GKJ W5TXG K5DCG K7ALE K5LEP K5RAE K5RTR K5GPR K5OOJ K5ENH W7RUX and K5DCG, again the final QST at midnight. This as really two sessions, one from 1844 to 2015 and the other 2200 to midnight.

K5DCG, a regular, was worked again at 2141 April 23. At 2301 the band popped open to W3, and LU3EX worked

220- and 420-Mc. STANDINGS

220 Mc.

W1AZK	9	3	412	W4UMF	11	5	420
W1HDQ	11	5	450	W5RC1	8	5	700
W1OOP	12	4	400	W6NLZ	3	2	2540
W1RFU	15	5	480	K6GTG	2	2	240
W1UHE	11	4	385	W6MMU	2	2	225
W2AOC	13	5	450	K7ICW	1	1	250
K2AXQ	8	3	230	K8AXU	8	5	680
K2CBA	10	4	325	W8IJG	9	5	475
K2DIG	4	3	140	W8LPD	6	4	480
W2DWJ	14	6	740	W8NRM	8	4	390
W2DZA	12	5	410	W8PT	10	5	550
W2LRJ	10	4	250	W8SVI	6	4	520
W2NTY	8	4	200	W9AAG	9	4	600
K2QJQ	10	4	260	W9EQC	11	5	740
W3AHQ	4	3	180	W9JCS	5	2	340
W3FEY	8	4	296	W9JFP	9	4	540
W3LCC	8	5	300	W9OVL	6	3	475
W3LZD	15	5	425	W9UED	4	4	605
W3RUE	6	4	225	W9ZIH	10	5	500
W3UJG	11	5	400	KØDGU	5	3	425
W3ZRF	5	4	112	KØUTF	6	3	515
K4FFU	8	4	400	KH6UK	1	1	2540
W4UBY	7	5	320	VE3AIB	7	4	450

420 Mc.

W1HDQ	8	3	210	W2OTA	6	3	150
W1MFI	4	3	125	K2UUR	6	3	110
W1RFU	7	4	410	K3EOF	6	3	250
W1OOP	9	3	390	W3FEY	5	2	225
W1UHE	6	4	430	W4HHK	3	3	520
W2AOD	6	4	290	W4VVE	6	4	410
W2BLV	11	5	360	W5RCI	5	3	600
W2DWJ	7	4	196	W7LHL	2	1	180
K2CBA	5	3	225	W8HCC	3	2	355
W2DZA	5	3	130	W8NRM	3	2	390
W2NTY	3	2	100	W9GAB	7	4	600

2-METER STANDINGS

Figures are states, U. S. call areas, and mileage to most distant station worked.

W1REZ	32	8	1300	W5UNH	6	3	1200
W1AZK	28	8	1205	W5YYO	5	3	1330
W1KCS	24	7	1150				
W1RFU	23	7	1120	W6WSQ	14	5	1390
W1AJR	23	7	1130	W6NLZ	12	5	2540
W1MMN	21	7	1090	W6DNG	9	5	1040
W1HDQ	21	6	1020	W6AJF	6	3	800
W1LZY	20	7	1180	W6ZL	5	3	1400
K1CRQ	19	6	800	W6MMU	3	2	950
W1AFO	17	6	920				
K1AFR	17	6	675	W7VMP	15	5	1280
W1CLH	17	5	450	W7JRG	13	4	1040
				W7CJM	5	2	670
W2NLY	37	8	1390	W7LHL	4	2	1050
W2CXY	37	8	1360	W7JIP	4	2	900
W2ORI	37	8	1320	W7JU	4	2	353
K2GQI	33	8	1200				
W2AZL	29	8	1050	W8KAY	38	8	1020
K2IEJ	27	8	1060	W8SDJ	35	8	990
W2BLV	27	8	1020	W8PF	34	8	985
W2AMJ	25	6	960	W8IFX	34	8	980
W2DWJ	23	6	860	W8LOF	33	8	1060
K2HOD	23	7	950	W8RMH	32	6	910
W2PAU	23	6	753	W8SVI	30	8	1080
W2SMX	22	6	940	W8SFG	30	8	1000
K2CEH	22	8	910	W8EHW	29	8	860
W2LWI	21	6	700	W8LPD	29	8	850
W2QSX	20	6	750	W8WRN	28	8	680
W2RXG	20	6	700	W8SAX	28	8	960
W2WZR	19	7	1040	W8NOH	26	8	975
W2UTH	19	7	880	W8DX	26	8	720
W2RGV	19	6	720	W8ILC	25	8	800
K2RLG	17	6	980	W8JWV	25	8	940
				K8AXU	24	8	960
W3RUE	30	8	975	W8GFN	23	8	540
W3FDF	29	8	1050	W8LCY	22	7	680
W3GKP	29	8	1020	W8BLN	21	7	610
W3KCA	28	8	1110	W8GTK	17	7	550
W3SGA	27	7	700	W8NRM	17	7	550
W3EPH	22	8	1000				
W3BYF	22	6	660	W9KLR	41	9	1160
W3LNA	21	7	720	W9WOK	40	9	1150
W3NKM	20	7	730	W9GAB	34	9	1075
W3LZD	20	7	650	W9AAG	32	8	1050
				W9REM	31	8	850
W4HJQ	38	8	1150	W9ZIH	30	8	830
W4HHK	36	9	1280	W9LVC	27	8	950
W4ZXI	34	8	950	W9EQC	27	8	820
W4LTU	31	8	1160	W9OJI	26	8	910
W4AO	30	8	1120	W9ZHL	25	8	700
W4MKJ	28	8	850	W9BPV	25	7	1030
W4UMF	28	8	1110	K9AQP	24	7	900
W4VLA	26	8	1000	W9PBP	24	8	820
W4EQM	25	8	1040	W9LF	22	7	825
W4WNH	24	8	850	W9KPS	22	7	690
K4EUS	24	6	765	W9CUX	21	7	800
W4JCJ	23	6	725	W9OEV	20	7	750
W4VVE	21	6	720	W9PMN	19	6	800
W4RMU	20	7	1080	W9ALU	18	7	800
W4TLV	20	7	1000				
W4IKZ	20	6	720	WØBFB	32	9	1180
W4OLK	20	6	720	WØSMJ	29	9	1075
W4AIH	19	7	840	WØIHD	28	8	1030
W4CPZ	18	6	650	WØQDH	24	9	1300
W4RFR	18	7	820	WØRUF	23	7	900
W4MDA	17	6	750	WØINI	21	6	830
K4YUX	16	8	830	WØUOP	21	7	900
W4LNG	15	6	1080	WØTGC	21	7	875
				WØRYG	20	8	925
W5RCI	34	9	1215	WØIC	16	7	1240
W5DFU	28	9	1300	WØIFS	16	6	110
W5AJG	26	8	1360				
W5LPG	25	7	1000				
W5PZ	25	8	1300	VE3DIR	30	8	1330
W5KTD	23	8	1200	VE3AIB	28	8	1340
W5JWL	21	7	1150	VE3BQN	19	7	790
W5FYZ	15	5	1040	VE3DER	17	8	1340
W5ML	12	5	700	VE3AQG	17	7	1300
W5FSC	12	5	1390	VE3HW	15	7	1350
W5HEZ	12	5	1250	VE2AOK	13	5	550
W5CVW	11	5	1180	VE3BPB	14	6	715
W5NDE	11	5	625	VE7FJ	2	1	365
W5VY	10	3	1200				
W5SWV	10	3	600	KH6UK	1	2	2540

W3ZMP W2JYL W3UFR W3LYC and W3IPW, followed by W4SWT K5YAW W4LQS K4GKL and W4MBB, closing down at 0126. The band was hot at noon April 24 to KP4, and WØFKY was worked at 1609, to be followed by K5OOJ K5IHR W5UQR K5WLH K4KVF K5SUG and K4HJB. Stations in Alabama, Tennessee, Illinois, Missouri, Indiana, Oklahoma, Texas and Georgia were worked in great profusion in a 2½-hour workout the 26th, and in just about all southern states again on the 27th. An old friend, W5AGG, Irving, Texas, popped up the night of the 29th. This is Buz, formerly OA4AE, a frequent contact on 6 during the previous sunspot cycle, when the *T'E* mode was still unknown outside of the small band of faithful 6-meter men.

The report of LU3EX carries through to May 9. There was no DX May 1-6, and the respite was almost welcome. A midday opening occurred May 7, to WØ and 5, and 5s were in again May 9. We hear that LUs were worked from W1 during the evening of May 19 and W8CMS reports working LU4DOZ May 7. In this summary we have mentioned only the U. S. openings, but just about every Caribbean Island and Central and South American country where there is 6-meter activity was also on the list, and there were even a few openings out into the Pacific area. Puerto Rico is a pipeline proposition throughout the *TE* season, and LU3EX has worked 31 different KP4s. He now holds the first WPR certificate to be issued for 50-Mc. work. This is in recognition of having worked 25 KP4s, and was issued March 24, 1960. LU3EX has also qualified for the Argentina certificate for working 25 countries on 50 Mc. His total now stands at 28, and he has all continents except Europe, having heard but not worked CT1CO.

Interest in 144 Mc. is on the upgrade in Argentina. LU3EX has a pair of 826s on 144 Mc., and hopes to be on s.s.b. before long. An 829B exciter is presently in operation, and tests are to be conducted with LU9MA, Mendoza, 1000 km., LU2KE, Tucuman, 1150 km., and PY5GK, Curitaba, Brazil. LU2EW is already using s.s.b. on 144 Mc. and doing very well with it.

That old habit of tuning just the low end, and even that carelessly, has cost a good many v.h.f. men some choice DX contacts. W6BJI reports that VE8BY, Yellowknife, N.W.T., heard Channel 2 TV stations almost every night during April, and a couple of WØs were heard in a local ragchew on phone, two different nights. Frequencies were 50.1 and 59.5. They were working break-in, giving calls infrequently, and not clearly, so he was unable to make them out. He has had no luck in raising anyone, possibly because his frequency is 51 Mc. He will be on 50.016 Mc. soon, and will be on whenever TV signals are heard.

Has anyone worked Greenland on 50 Mc.? We recall some third-hand reports of such activity in 1957 or 1958, but we have no actual records. At the Dayton Hamvention K9BSL mentioned that he worked OX3WE crossband, April 1, 1958. Details of any other such contacts, crossband or two-way, would be of interest. Please give full information.

The *TE* circuit between ZE2JV and ZC4WR is still holding up well. ZC4WR says that though there were no strong *F*-type openings, crossband contacts were possible almost every night in April. They missed on April 1, 2, 9, 28 and 30, but only the last was a positive blank. One or the other was unable to be on the other nights when no contact was made. The circuit reliability compares favorably with that of April, 1959, as far as *T'E* is concerned. Chalky listens between 1700 and 1900 GMT for ZE2JV on 50 Mc., and usually picks him up around 1730. On the other hand, the signals of ZS1LA have not been heard at any time.

Running a kilowatt isn't the only way to have fun on a v.h.f. band. W9JFP, Milwaukie, who has the kilowatt, recently completed a flea-power 50-Mc. portable like the one described by your conductor in March *QST*, and finds use of it a fascinating experience. He has worked up to 15 miles with the 21-inch whip, and with the 1/10th watt going into his beam he recently raised a station in Tampa, Fla.

Here is information on signals heard below the band edge from the Pacific area. This is furnished by KG6AJL, Agat, Guam, who has an 829B on 50 Mc. Al has worked 31 stations in all Japanese districts thus far. The signals outside the band are from the Pacific Scatter System, using ionospheric and tropospheric scatter, in a chain from Okinawa to Hawaii. The Hawaii end, beamed west, is on 49.62 Mc. Guam is on 49.56, aimed southeast, and 49.78, aimed southwest. Wake aims east on 49.78, and southwest on 49.86. The Philippines station is on 49.9, aiming southeast. Frequencies between 54 and 54.3 Mc. are also used, with alternate channels in the 34- to 36-Mc. region. Power is 40 kw.

This handsome 16-inch silver cup is offered by the National Capital V.h.f. Society for the first 144-Mc. station to work 48 states.

Clubs and Nets

As announced last month, the National Capital V.H.F. Society has set up a trophy to be awarded to the first amateur to work 48 states on 144 Mc. ARRL WAS rules will apply, except that the work need be with any 48 of the 50 states. The Society will be the sole judge in making the award, and their decision is final. The 16-inch engraved silver trophy is shown in one of our photographs.

The Kansas City V.H.F. Club is sponsoring a summer 50-Mc. contest to promote extended-local communication in the states of Missouri, Iowa, Nebraska, Kansas, Oklahoma, Arkansas, Tennessee, Kentucky and Illinois. Any amateur on 50 Mc. in these states may enter, and log sheets will be furnished free of charge. Only one contact per county can be counted, and communication must be by groundwave or tropospheric propagation. Score 1 point for each contact and multiply by the number of states worked in the contest area. Stations running 25 watts or less multiply by 1.5; those running 25 to 100 watts by 1.25. Contest period: midnight July 1 to midnight Sept. 11. Logs to be postmarked no later than Sept. 23. Prizes: engraved trophy, and gift certificates worth $5.00 and $2.50 at radio store of winner's choice. Station working best DX within the contest area will receive a special certificate award. Further details and forms from Kansas City V.H.F. Club, P. O. Box 973, Kansas City 41, Mo.

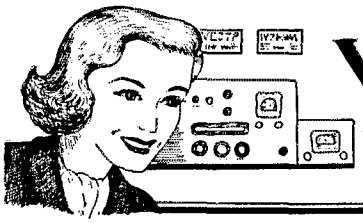
To promote greater band use, 6-meter men of San Antonio have organized an f.m. net on 53.0 Mc. The frequency is monitored 18 hours a day. At present there are 4 fixed stations and 5 mobiles, with more to come. The f.m. is receivable on a.m. receivers, and a strong a.m. signal will come through on the f.m. receivers, so the gang will respond to any kind of call that can be copied. This info from W5VPQ, who says that he monitors 145.2 Mc. in the evening hours also.

K2ZVD, Freedom, N. U., writes that the Southwestern New York High-Frequency Association is holding its annual picnic and field day July 10, at Great Valley, N. Y., with accent on v.h.f. There will be a 50-Mc. transmitter hunt, dinner and activities for the kids. Admission free.

220 and Up

Our request for opinions from 220-Mc. men regarding the desirability of shifting to the middle of the band to avoid

(Continued on page 158)



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

RESULTS: ELEVENTH ANNUAL YL-OM CONTEST

YLRL Vice President and chief log-checker Lillian Beebe, W5EGD/3, estimated that some 1500 OMs and 400 YLs gave contacts in the eleventh YLRL YL-OM contest conducted in February and March.

The top three YL phone winners this year, all from the fifth call area, were also the top three phone winners in last year's contest. For the third consecutive year Dena Morgan, W5DRI, captured first place phone honors.

James Herndon, K6SXA, last year's top OM scorer in the c.w. section repeated the honor this year. Kenneth Keeler, K2EIU, top OM phone scorer also finished as second place OM c.w. winner. John Siringer, W8AJW, second place OM phone winner has been a top YL-OM contest scorer each year since 1952.

Cups went to the YL and OM first place phone and first place c.w. winners. Certificates have been awarded to high place phone and c.w. winners in each district, and country.

Here are the winners. Congratulations to all.

YL

First place c.w.	KØIKL	29,000*
Second place c.w.	KL7ALZ	28,356*
Third place c.w.	K5LIU	23,306*
First place phone	W5DRI	55,387*
Second place phone	W5ERH	48,273*
Third place phone	K5BNQ	47,580*

OM

First place c.w.	K6SXA	3,656*
Second place c.w.	K2EIU	2,960*
Third place c.w.	W9DYG	2,926*
First place phone	K2EIU	5,040*
Second place phone	W8AJW	4,331*
Third place phone	KØSLD	4,162*

YL C.W.

Call	No. of Contacts	Sections Worked	Score
W1RLQ	314	58	22,765*
W3SLS/1	271	45	15,243*
W1YPH	178	48	8,544
K1ADY	115	37	5,318*
K2ZQG	320	50	16,000*
W2EBW	260	38	9,880
K2JYZ	122	41	6,252*
K2UKQ	99	48	5,940*
K2DKL	61	19	1,448*
K2PMR	52	23	1,196*
WV2FYE	35	23	1,006*
K2ZLN	37	13	601*
K3EHZ	240	53	15,900*
W3TSC	226	39	11,018*
W3UTR	157	48	9,420*
W3KZC	137	38	5,206
W3JWM	99	25	3,093*
W3CDQ	106	28	2,968
K3GJE	17	13	276*
K4JYQ	174	55	11,962*
K4TFL	171	43	7,353
W4UF	137	42	5,754
K4VDO	67	25	2,093*
K5LIU	339	55	23,306*
W4KZT/5	200	45	11,250*
K5PFF	202	43	10,857*
K5YIB	167	41	8,558*
K5MXO	150	36	5,400
K5PLC	72	34	3,060*
K6OWQ	187	50	9,350
W6PCA	105	37	4,856*
W6QMO	101	33	4,166*
W6WSV	43	27	1,161
WA6AOE	25	16	500*
K7HSB	163	44	8,965*
W7PUV	147	43	7,901*
W7PTX	161	39	7,848*
K8LPI	199	34	8,457*
K8MKG	137	35	5,868*
W8WRH	132	35	5,775*
W8KLZ	115	32	4,600*
K8MQB	15	9	168*
W9MLE	242	57	17,242*
W9USR	185	42	9,712*
W9PEX	132	38	6,270*
K9TUD	124	39	6,045*
K9HGY	137	34	4,658*
K9QGR	56	24	1,680*
KN9TCM	34	15	637*
W9OMZ	10	7	87*
KØIKL	400	58	29,000*
KØGIC	207	45	11,643*
KH6BTX	166	52	8,632
KL7ALZ	349	65	28,356*
VE3DDA	31	16	620*
VE5DZ	163	42	6,846
VE2AOB	24	16	480*
G3MER	16	9	180*
JA1YL	29	17	616*
JA1AEQ	17	7	148*
OH5RZ	32	18	720*
VK3KS	45	28	1,260

OM C.W.

Call	No. of Contacts	Sections Worked	Score
W1NLM	53	29	1,537
W1OOS	36	23	828
W1GPN	22	12	330*
W1AZW	12	10	150*
K1DCB	8	7	56
K1VOE	1	1	1*
K2EIU	74	32	2,960*
K2DJD	54	28	1,890*
K2GTC	49	24	1,470*
WA2DGG	37	23	1,063*
K2PFC	42	25	1,050
K2YXC	30	20	750*
W2AAU	34	20	680
W2CVW	33	20	660
WA2EJZ	23	16	460*
W2EMW	21	15	393*
K2UUT	15	11	206*
W2IP	16	11	176
W2NIY	10	7	87*
K2OFD	2	2	4
W3FOX	65	31	2,015
W3YVJ	48	25	1,500*
W3QLW	33	22	907*
W3MSR	37	24	888*
W3TSG	32	21	838*
W3KQD	31	17	658*
K3DKE	31	17	658*
W3EIW	29	18	652*
W3EIS	25	18	562*
W3HBA	28	19	532
W3CDG	25	17	531*
K3GQW	20	16	400*
K3ALL	21	21	252
K3KMA	1	1	1*
W4CHK	61	32	2,440*
W4HQN	60	29	2,175*
K4RIN	48	27	1,620*
K4RAD	19	25	1,531*
W4JUJ	34	25	1,156*
K4TEA	37	22	1,017*
K4BVD	30	18	675*
K4EPI	29	16	580*
W4KMS	18	25	562*
K8SVC/4	20	14	350*
K4UJS	15	15	281*
K4DRO	15	11	206*
K4GPH	14	11	192*
W4KPB	9	8	90*
W4ZQK	12	9	35*
W4RXL/4	4	4	30*
W5WZQ	68	28	2,380*
W5DQK	60	29	2,175*
W5VZU	42	25	1,312*
K5UYF	44	23	1,265*
K5LXZ	27	20	675*
W5AWT	20	16	320
K5OCX	17	13	276*
K5LGH	7	6	52*
K6SXA	75	39	3,656*
K6CJF	36	23	1,035*
WA6FKF	28	20	700*
W6JVA	22	17	467*
W6RCV	18	15	270
W6PTF	15	13	195
K6SXX	11	10	110
W7POU	34	19	807*
W7HKT	33	21	693
K7APJ	20	15	375*
K8GWK	54	27	1,823*
W8NAN	50	28	1,750*

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

Call	No. of Contacts	Sections Worked	Score
K8GHG	52	26	1,690*
K8GAB/8	31	18	697*
W8QHW	31	17	658*
W8YGR	21	18	472*
W8DM	24	14	420*
K8KVV	16	15	300*
W8FIN	3	3	11*
W9DYG	71	33	2,928*
W9LNQ	60	30	2,437*
W9BZW	62	28	2,170*
K9ICG	55	27	1,856*
K9DWG	41	27	1,383*
W9GWO	44	25	1,100*
K9ASF	41	24	984
W9CLH	30	23	862*
W9YDQ	30	22	825*
W9NLF	31	19	736*
K9PJN	33	20	660
W9QWM	27	18	607*
K9HRC	21	18	472*
K9OWF	23	13	373*
W9CHD	19	13	308*
K9QFR	11	9	123*
KØPIE	71	30	2,662*
WØVKB	47	25	1,468*
KØAUF	40	21	1,050*
WØKCG	36	19	855*
KØQLY	22	16	440*
KØQWY	20	16	400*
KØDYR	21	16	336

Call	No. of Contacts	Sections Worked	Score
WØMCX	13	12	195*
WØDIB	12	9	108
KØRHE	7	5	43*
VE1EK	13	12	195*
VE2UN	50	27	1,687*
VE2AQO	26	16	520*
VE2IL	35	21	918*
VE3RN	33	18	742*
VE3DDU	22	18	495*
VE3DYJ	26	15	487*
VE4XO	57	28	1,596
DL1YA	3	2	6
F9DW	6	5	37*
FA8CR	5	5	31*
G2WQ	11	11	151*
HB9TT	4	3	15*
IT1AGA	13	11	178*
JA1ACA	4	4	20*
JA1CO	2	2	5*
JA4YC	3	1	3*
JAØIB	1	1	1*
JAØML	1	1	1*
LA6U	3	2	7*
OH2RD	1	1	1*
OH3TY	2	2	5*
OZ3GW	1	1	1*
PAØVB	5	10	62*
PY4AO	6	5	30*
SP6FZ	15	8	120
XE1PJ	8	6	60*

Call	No. of Contacts	Sections Worked	Score
K1KBO	50	27	1,350
W1LQ	36	19	855*
K1CUD	40	17	850*
W1MGP	32	19	760*
W1BAB	34	15	637*
K1DIR	30	15	450
W1NJL	10	8	100*
K1DCB	15	5	75
W1VOE	5	4	25*
K2EIU	92	42	5,040*
K2DJD	54	30	2,025*
W2PEV	51	29	1,818*
W2COB	45	25	1,406
W2NNB	37	22	1,017
W2DVC	33	17	561
W2ASV	21	14	367*
W2MYN	18	12	270*
W2CVW	8	8	64
K2UUT	5	5	31*
W2LGK	10	2	26*
W3BVL	58	29	2,102*
W3QLW	49	28	1,715*
W3EIW	44	28	1,540*
K3GQW	37	23	1,063*
K3HFB	27	14	472
K3ALL	26	17	442
W3MSR	17	13	221
W3CDG	16	11	220*
K3DPD	14	12	210*
W3KQD	2	2	5*
K4DLC	59	37	2,728*
W4DLH	68	38	2,584
K4JIG	58	38	2,537*
W4JUJ	51	33	2,103*
K4STY	60	31	1,860
K5SVC/4	38	23	1,092
K4BQU	22	16	440
K4OVE	22	9	247*
K4EPI	13	12	195*
K4BVD	11	8	110*
K4CVQ	9	4	45*
W4KPB	5	5	31*
K5WXK	70	36	3,150*
K5UYF	66	32	2,640*
K5EJQ	62	32	2,480*
K5USE	54	30	1,620
K5KYD	57	27	1,539
K5OCX	44	24	1,320*
W5ZUQ	44	23	1,265*
K5UTV	33	20	825*
W5OUH	32	19	760*
W5VZU	25	14	437*
W5AWT	13	9	117
W5KNA	9	6	67*
W6FGJ	68	32	2,720*
W6PVD	64	32	2,560*
K6CJF	59	29	2,138*
W6JVA	61	28	2,135

Call	No. of Contacts	Sections Worked	Score
K6GAI	44	24	1,320*
K6MPX	29	17	616*
K6ICS	18	13	292*
W6OIL	15	10	150
W7SFK	92	35	3,220
W7UWT	69	34	2,932*
W7QWE	61	32	2,440*
K7APJ	56	30	2,100*
W7KOI	45	27	1,215
W7CBY	48	25	1,200
W7EVU	34	20	850*
W7WIA	24	17	510*
W7DZB	23	15	431*
W8AJW	99	35	4,331*
W8QHW	60	37	2,775*
W8AYV	57	29	2,066*
K8KVV	12	10	150*
W8NAN	11	8	110*
W9LNQ	58	35	2,537*
K9JIG/9	60	28	2,100*
W9QWM	37	22	1,017*
W9GWO	39	16	624
W9NLF	23	18	517*
K9QEI	23	13	373*
K9KQR	20	7	175*
K9HRC	14	10	175*
K9QFR	12	9	135*
W9TDU	13	5	65
KØSLD	90	37	4,162*
KØPIE	83	39	4,046*
KØLUZ	51	26	1,657*
KØAJR	56	29	1,624*
WØIUB	53	22	1,457*
WØVKB	37	21	971*
KØKYK	33	19	627
WØDIB	30	13	390
KØMQG	20	5	125*
WØAQE/M	7	7	61*
WØWUU	10	6	60
KH6BLX	43	22	946
K2VTX/VE2	61	35	2,668*
VE3RN	23	18	517*
VE6SB	28	18	630*
VE7VJ	50	23	1,437*
VE7CE	41	25	1,025
G3WP	2	2	5*
HH2LD	3	3	11*
HP1AC	16	13	260
I1TC	1	1	1*
I1ZZ	6	6	45*
JA1BLC	6	4	30*
JA1BUN	10	7	87*
JAØFT	1	1	1*
JA1GC	6	4	30*
JAØIB	1	1	1*
PAØDVM	2	2	5*
VP5RH	18	12	270*

YL PHONE

Call	No. of Contacts	Sections Worked	Score
W1RLQ	326	63	25,672*
K1EIR	115	38	5,462*
K1ADY	84	37	3,885*
W1ZEN	104	29	3,770*
W2EWO	285	47	16,685*
K2JYZ	241	43	12,953*
K2ETC	221	46	10,166
W2YTI	215	45	9,675
K2ZQG	106	33	4,372*
K2ZLN	27	14	472*
W2OWL	21	12	315*
W3TNP	183	65	39,243*
W3ICQ	203	42	10,657*
K3ESD	204	36	7,344
W3UTR	119	41	6,098*
K3EHZ	152	28	5,320*
W3GTC	41	13	666*
W4WYR	429	53	28,421
K4CGW	334	52	17,368*
K4UMN	53	27	1,788*
W5DRI	663	70	55,387*
W5ERH	613	63	48,273*
K5BNQ	624	61	47,580*
K5MJW	665	57	37,905
K5YIB	452	59	33,335*
K5JXD	254	45	14,287*
W5ZPD	250	34	10,625*
K5MIZ	104	31	4,030*
K6OQD	259	44	14,245*
WA6HKE	153	38	7,287*
W6WBH	164	32	6,560*
W6JZA	165	30	6,187*
WA6CCR	125	31	3,875
W6QMO	12	1	15*
W7CSQ	217	39	10,578*

Call	No. of Contacts	Sections Worked	Score
K7JQG	186	39	9,067*
K7ADI	155	34	6,587*
W7GGV	136	31	5,270*
K7BII	48	16	960*
W8NDS	362	57	20,634*
W8VRH	125	23	2,875
W8WRH	59	17	1,253*
W8KLZ	31	15	465
W8LGY	35	6	262*
K8MQB	11	8	110*
K9AMD	248	55	17,050*
K9QGR	202	33	8,332*
W9PEX	121	35	5,293*
K9IVG	126	19	2,992*
W9GME	59	16	1,180*
K9MZV	60	1	75*
K9IWR	7	3	21
KØEPE	705	65	45,825
WØSZH	366	56	20,496
WØZWL	286	55	19,662*
KØIKL	337	46	19,377*
KØMMR	255	54	17,212*
KØGRG	180	35	7,875*
KØGIC	188	30	7,050*
WØWDM	132	27	4,455*
KØITP	105	32	4,200*
KØBOF	59	21	1,548*
KH6DLD	597	63	47,013*
VE3DDA	63	27	2,126*
VE4CB	109	38	5,177*
VE6RP	153	27	5,163*
G3MER	41	12	615*
KP4APX	227	42	11,917*
JA1AEQ/Ø	14	3	52*
JA1YL	89	28	3,115*

OM PHONE

Call	No. of Contacts	Sections Worked	Score
K1HTK	83	38	3,942*
K1CCA	90	31	3,487*
K1EFI	81	34	3,442*
W1NEP	77	35	3,368*
K1LST	67	32	2,680*
W1NLM	63	34	2,677*

* denotes low power multiplier used. Twenty-six logs were received for confirmation only.

HEADLINE NEWS

More YLs in local newspaper headlines — all for the good of ham radio! (See May column for gentle push in the direction of more and better publicity for our esteemed hobby.) Employing the theory that one idea begets another, we'll occasionally list the headlines concerning YL amateur activity clipped from community papers that come to our attention. There are some 12,000 newspapers in the original 48 states. Thus, there would seem to be little concern for reaching the saturation point of publicity for ham radio via the newspaper medium.

ONLY WOMAN RADIO HAM OPERATOR HAS CLASS — *Spokesman-Review*, April 10, features K7DPS, Irene O'Neil, Spokane, Washington.

Cora Kitrell, KØOBX, with her OM, KØDOM, (right), and Australian hams VK2EN (left) and VK2VC.

BLIND PATIENT HAS WORLD AT BEDSIDE — Dover, Ohio *Reporter*, March 4, features W8TDB, Polly Thieubaud, Midvale, Ohio.

SHE GOES ALL OVER WORLD VIA HAM RADIO — *Newsday*, April 19, features K2MGE, Dorothy Strauber, Lynbrook, N. Y.

GIRL SCOUTS STUDY TO BECOME HAMS — Long Branch, N. J. *Record*, March 15, features WV2JUR, Kathy Froelich; WV2JUL, Nancy Jorgensen; WV2JUN, Christine Trautvetter; WV2JUO, Susan Fabian; WV2JUP, Nancy Kroner; and WV2JUQ, Joyce Malone, all of Port Monmouth, New Jersey.

SHE GOSSIPS WITH THE WORLD — *Minneapolis Sunday Tribune*, March 27, features K91KL, Joyce Polley, Minneapolis, Minnesota.

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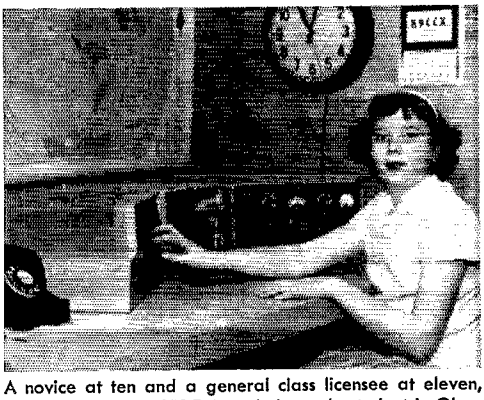
A nice tie-in with this publicity theme is the photo of Cora Kitrell, KØOBX and her OM, KØDOM, with Australian hams VK2EN and VK2VC that was published on the front page of a Lincoln, Neb. newspaper. As the climax of regular QSOs on 20 meters, the VKs recently paid the Kitrells a four day visit. On a Sunday morning while the men were ragchewing on the golf course, the thought occurred to Cora that possibly the visit was a newsworthy item. Upon telephoning the newspaper, Cora relates that a reporter and photographer "couldn't get to our home fast enough." After a two hour interview and several pictures, a creditable story on ham radio by a feature writer appeared in the next morning's paper. The moral of this little story, from a ham's viewpoint, should be obvious.

Licensed in Jan. 1957, KØOBX operates 15 and 20 meters SSB. In addition to QSOs with VK2VC and VK2EN, Cora also skeds her brother stationed on Okinawa daily. For a few months to come she prophesizes that her operating hours will be irregular, for after waiting over nine years, the Kitrells expect their first harmonic on the fourth of July.

The YLRL

With high hopes of soaring over the 1000 mark in membership in 1960, the Young Ladies Radio League has stepped up its recruiting campaign for new members. Midge Rommel, K6BUS, and Alice Geib, W8OTK, Western and Eastern Membership Chairmen, head a drive to attract as many YLs as possible throughout this country and the world to membership in the largest and oldest YL organization. Any licensed woman amateur radio operator is eligible for membership, including novices. The annual dues of $2.00 includes a subscription to *YL Harmonics*, the club's bi-monthly publication. Non-member subscriptions to *Harmonics* are also $2.00 a year. Applications for membership may be obtained from K6BUS, 8508 Trask Ave., Playa del Rey, California, and W8OTK, RFD #1, Van Buren, Ohio.

1960 officers of the YLRL are as follows:



A novice at ten and a general class licensee at eleven, Carol Thompson, K9RDZ, is a sixth grade student in Glenview, Illinois. Carol's dad, K9CCX, claims he had to work hard to keep ahead of her in c.w. practice when they both studied for their tickets together.

President: Gladys Eastman, W6DXI, 735 Glen Ave., Glendale, Calif.

Vice Pres: Lillian Beebe, W5EGD/3, 923 Kent Ave., Baltimore 28, Md.

Secretary: Connie Hauck, K6EXQ, 794 Gleneagles Ave., Pomona, Calif.

Treasurer: Jean Kincheloe, K6OQD, 6625 N. Brightview Drive, Glendora, Calif.

Editor: Wanda Gluck, K6ENK, 7317 Walnut Rd., Fair Oaks, Calif.

Among the most popular of all amateur certificates for both YLs and OMs are the several YLRL awards. Rules for the awards follow.

YL Century Certificate — Proof of contact with 100 different licensed YL operators anywhere in the world is required. All contacts must be made from the same QTH or within a 25 mile radius. One hundred QSL cards, or other written communications from the stations worked confirming the necessary two-way contacts, accompanied by a list of claimed contacts, including the full name of the operator, alphabetically arranged, and the date and time of contact, must be submitted by the applicant directly to the YLCC custodian. Sufficient postage must be sent with the confirmations to finance their return by first class mail. Endorsements are issued for confirmed contacts with each additional 50 different YLs. The applicant is requested to keep a carbon copy of each list sent in and to check the list very carefully before applying for another sticker. Award custodian is Katherine Johnson, W4SGD, Box 666, Fuquay Springs, N. C.

Worked All States/YL — Proof of contact with a licensed YL operator in each of the 50 states is required. This award parallels the ARRL's WAS. QSLs should be sent to Grace Ryden, W9GME, 2054 N. Lincoln Ave., Chicago 14, Ill.

Worked All Continents/YL — Proof of contact with a licensed YL in each of the six continents should be sent to Barbara Houston, K5YIB, Route 2, Box 325, Garland, Texas. IRCs, or equivalent, must be sent with the confirmations to finance their return by first-class mail.

DX-YL — This certificate is issued to any YL who works 25 other licensed women operators outside her own country on or after April 1, 1958. A copy of the log of the 25 contacts should be mailed to Custodian Maxine Willis, W6UHA, 6502 Wynkoop St., Los Angeles 45, Calif.

YLRL Affiliated Club Certificate — In accordance with the new YLRL constitution, effective Jan. 1, 1959, those YL clubs with fifty per cent of their members belonging to YLRL are eligible for national YLRL club affiliation. Interested clubs should apply for certificate to Secretary Connie Hauck, 794 Gleneagles Ave., Pomona, Calif.

Certificate Directories with all rules and regulations regarding certificates offered by the YLRL are available for 25¢ per copy from Jan O'Brien, K6IHHD, 6606 5th St. Rio Linda, Calif.

WAC YL Award Statistics

Custodian of the Worked All Continents YL Award, Barbara Houston, K5YIB, has compiled statistics concerning the award as of April 15, 1960.

Total certificates issued to date — 342, with 180 U. S. and 162 DX. OMs receiving award — 123 U. S. and 142 DX; YLs — 57 U. S. and 20 DX. Interest in the award has been greatest in the U. S. sixth call area. Certificates have been issued to 14 husband and wife ham teams. The first certificate was awarded in 1948 to OM W2QHH. There were no certificates issued for the next seven years until 1955. In 1956 WN8ABM became the first YL to earn the award.

(See YLRL Awards for certificate rules.) QST

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Boo!

Twenty was crummy and fifteen was worse. He couldn't even raise Cicero on the 7090-kc. police ops net, so W9HPJ cooled the filaments and reached for his *Encyclopaedia of Occultism* (Strathmore Press, N. Y.) to while away another fadeout. In that "compendium of information on the occult sciences, occult personalities, psychic science, magic, demonology, spiritism, mysticism and metaphysics" Ero shortly found himself idly thumbing through the G's and H's. And then he found this:

> **Ham** — A Norwegian storm-fiend in the shape of an eagle with black wings, sent by Helgi to engulf Frithjof as he sailed for the island of Yarl Angantyr in the saga of Grettir.

In a swirling midsummer night's dream we can see it all. Overzealous club competition on the medieval DXpeditionary front! Hmmm — what kind of gear did this Frijthof feller have along, and who contracted to handle his QSLs? *Britannica* describes the Icelandic saga of Grettir as a 13th-century "adventurous story of outlawry," indicating that bootlegging may have been an issue here. The boys could have neglected to obtain the proper clearance from the island's P&T. Gee whiz, this doggoned Helgi must have been an A-1 spoilsport to try to mess things up after the lads went through all the grief of preparation and transportation arrangements.

Most interesting of all, what about this Yarl Angantyr pad? It should have a TF or LA/p prefix, but we don't find it on the Countries List. Evidently poor Frithjof didn't quite make it after all, and a perfectly good "new one" is still waiting to be worked. Anyway, let's watch out for those hams with the capital "H". They may well be responsible for lately lousing up propagation on the North Atlantic path and transportation to Malpelo.

What:

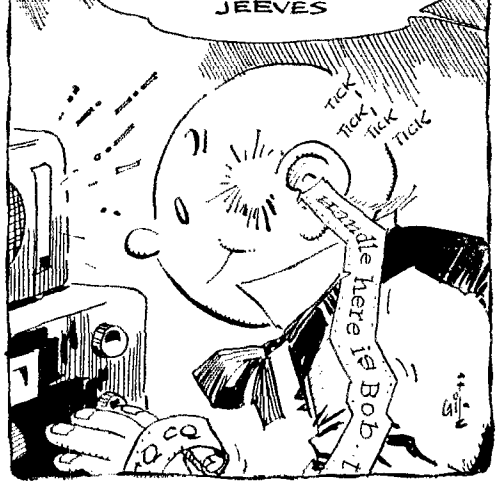
We practiced just as we preached in February's "How's" prologue and consulted junior's two-tube blooper. Sure enough, the bands *were* really dead. Not for long, though. Signals bounced right back for another rally before the next magnetic storm moved in. This cyclical sequence, a sort of sawtooth propagational roller-coaster ride, carries well into the summer and separates many a boy from the DX men.

20 phone is booming, though, so far as W2DY, K2TDI*, W4IUO, K4SXO*, K6LAE, W8PTD, K9MLE*, OQ5RL and observers A. Hovey, W. Johnson and A. Rugg are concerned: **CN8LP**, **CRs** 6CA (14,*108* kc.) *19* hours GMT, **6OU** 7CR, **CT1JH**, **DU1MPH**, **EA6AI**, **EL4A**, **FF8CR** (196), **FG7XF**, **FR7ZD** (180) 11-12, **HH2V** (205), **I5GN**, **IT1ZDA** (179), **JA6AK**, **JZ0HA*** (311) 12, **KAs** 2BB 2QT 7TB, **KC6TM**, **KJ6BV**, **OQs** 5AN 5CF 5HZ 0PD, **PJ3AJ** (196), **SL5CN** of Sweden's military, hit-and-scram **TI9SB*** of little Cocos, **UAs** 1KBB **0KJA**, **UB5VO***, **UI8AK**, **UL7KBK***, **VKs** 9AA of New Guinea, **9NT*** (325) 7, **9RM 0GB**, **VPs** 2KJ* of St. Nevis, **5GH** 7NR (245), **VSs** 1JG 9ANB, **XE0ALP**, **XW8AL**, **YJ1JF** (76) 13 for whom K4-SXO was QSO No. 4, **ZC4MO**, **ZE7JZ**, **4X4s** AS (180), HC HD MB, **9M2s** FX GA and assorted 9N1s, asterisks representing s.s.b. users.

*4822 West Berteau Ave., Chicago 41, Ill.

20 c.w. turns in its usual crop of stoppers for K1s IVT (167/139 worked/confirmed), JTL, W2GVZ (258/-255), K2s UYG YXC, WA2s EFN KMY (76/12), K3CNN, W4IUO, K4s DFT SXO, K5s LGH LLJ (43/23), MHG, W6s JQB KG, K6s CJF LAE (178/168), LEB (145/119), OZL (67/25), W7DJU, W8YGR, K0s OSV OSW WQI, OQ5RL, KP4AOO and A. Rugg: curious **BV3HPT**, **BY1PK** of Red China, **CN2s** AY (74), BK 23, **CO7AI** (53), **CR4AF** (68), **CTs** 1KD 2BO (202) 3AV (60) 23, 3AY (49), CX4CZ (39), **DM2BCO** (35) 16, **DUs** 1VQ 7SV (78), **EA8s** BW (54), CP (60), **EL4A** (15), **FA9UO**, **FB8s** CJ (60) 12, XX (40), ZZ (80) 13-14, **FG7s** XF (78), XG, **FO8s** AC (22), AU (22), transient **FP8AQ**, **FQ8AG**, **FY7s** YF (10) 11, YI (51), **GB3LAS/GD**, **GD3FXN**, **HAs** 1KSA 5KAG (60), **HCs** 1JU 5CR (27) 2, **HK3TH**, **HL9KR**, **HR2FG** 20, **HZ1HZ**, **IS1DKZ** (47), **IT1AGA**, **JAs** 1AB 6PA (24), 7AB, K3IZT/-**KG6**, **KA2s** JM KS, **KC6JB** (75) 16, **KGs** 1BA 1BH 6AAY (35) 7, 6AII, **KM6BI**, **KR6IY**, **KV4s** AA (81) 22, BO, **LUs** 4ZL (33) 4, 0AC (12) 5, **LZ1KSP**, **OE6s** DP KZ (60) 6, **OQ5PS** (64), **OX3NK**, **PI1NTB** of Holland, **PJ2CE** (74), **PZ1AM** 23, **RAEM** of Moscow, **SU1s** IM (48), MS, **SVs** 1AJ 0WI (51), **TI2CMF** (21) 1, **UA9s** CM DB (28), KJK (33), VB (26), **UA0s** BC CI CK (12), FE FF of Sakhalin, JB (30) 12, JD (51), KAE KIA 4, KIB 23, **UB5s** CT (80) 22, IT (72), KCF, **UC2s** AR CI, **UG6AG**, **UH8KAA**, **UI8AK**, **UL7s** HB 0, IG (44), **UO5KAN**, **UP2s** AC KNP, **UQ2s** DO (88) 4, KBA (78), **UR2KCA** (21), VE0NN afloat, **VK9s** CK of Papua, GK (50), GW (58), RO of P.T., **VPs** 2AR (44), 2KD 2VA 3MC 3YG 5BH/mm 5BL 6LN 9BO 9EU, **VR3Z**, **VSs** 1FZ 1KA 1KB 6AE (42), 9APS 9ARF 9OC, WA2EVV/**CN8**, XE1FE, **XZ2s** BB TH, **YOs** 3FD 3KAA (55) 6, 3RI 7WZ, YV3CD, **ZAs** 1BA 2BAK (10, 55) 18-22, **ZC4s** EX (42), PW (64), **ZDs** 1HC (42), 21HP (78) 2, **ZK1s** AK (22), BO (26), **ZL3VB** of the Chathams (10) 12, **ZSs** 3AZ (60), 3DP 7M (83), **3A2CD** (48), **4X4s** FU GY SI (34), **5As** 1TN (47), 5FO (20) 23, 5TA, **7G1A** 0, **9G1BQ**, **9M2s** FS (33) 15-16 and GS.

15 phone is still good enough to suit K1MD, K2UVQ, K4s LRA SXO UWC* (124 on 21-Mc. s.s.b.), K6LGH, K6LAE, WA6CPI, K9MLE*, W0QGI, A. Hovey, KP4AOO and OQ5RL. Why? Well, **CE3AGI**, **CN8s** HQ* JO, **CO8RA**, **CP5s** EL FR, **CRs** 4AS 6AG 8AC (155) 21-22, **CTs** 1KI 3AI, **ELs** 1D 2B 2L 4D*, **FB8s** BZ ZZ, **FF8BF**, **FG7XH**, **FQ8AF** (262) 20, **FM7WS** (220) 4, **GD3GMH***, **HC1JU***, **HH2LD***, **HIs** 7CJY 8GA 8TC*, **HK0AI***, **HZ1AB***, **I5TUF**, **JA3IS**, K1CDZ/VE8, K6CQV/**KS6**, KA8RB, **KCs** 4USB* 4USN* 6AS (372) 6, **KGs** 1FR* 4AV 6AHF, **KJ6BV** (283) 3, **KM6BU**, LX1s, **MP4BCV**, **OA4s** AGI* AQ* GJ*, **OE1ER**, **OD5s** CG LA, **OQ5s** AA DO FD FV FU HF HZ IA JJ KW LJ LK LQ MA OB VB VH WR, **OQ0s** BH PD RL, **PZ1s** AR AX* BE, **SPs** 1KHA, 5XM, **TG9s** FI TI, **TIs** 2GO* 9AM, **UB5FG**, VE6AAE/**SU**,



FB8XX of the Kerguelens is active almost daily on 14,040-kc. c.w., 1630–1845 GMT, and 21,154-kc. phone, 1500–1700, on week ends. On either side of the operating position are Roland (left) and Angelo; below them, left to right, are Robert, Roger, Florent and Bob. *(Photo via FB8BC and W1WPO)*

VKs 6XO on 30 watts to a mobile whip, 9AN or 9IN, VPs 2DF 2ML 3MC 3VN 3WR 3YG 4MM 5RA, VOs 2AB* 2IE 2JS 6GM (230) 21, VR2s BC DF (180) 3, VS9AE, VU2BV, W2AYN/EP (215) 18, XEs 1SN* 3CP, YNs 1TAT* 3BLV 4CB under new management, 6HH, YS1s LA MS*, ZC4s BM FR, ZD2s BRG, JKO, ZEs 2KO 7JK (460) 20, ZP5s JE* LZ, 4X4s FF FV FZ GB HC IM 19, JC JS JU LY, 5As 2CV 2CW 2TQ 3TL 5TA and 9G1BN should give you a clew. (*) for sidebanders.

15 c.w. stays with us reluctantly, and K1JTL, K2s UVQ YXC, WA2s BLP KMY, K3CNN, K4s DFT LRA, K5s LGH MHG UMC, K6CJF, WA6CPI, W7DJU, W8YGR, K8NHC, KØs OSV OSW, OQ5RL and A. Rugg have the goods on CE3AG, CM8RM, CN8CJ, CP3CN, CR8AC, CX2BT, DM2ADE, FQ8HI, FR7ZD, HCs 1LE 2IU, HH3RH, HL9KR, HZ1AB, JAs 1BAL 5FQ 5JS 7AD, KG6AGL/mm, KV4AQ, MP4BCV, OA3D (45) 2, OY2Z, SP8HR, ST2AR, SVØs WI WT/Crete, TI2s CMF LA, UAs 9JR 9OM 9VB ØBC of Dickson Isle, ØKZA ØLA, UB5s FG KAB, UI8AD, VPs 1JH 2SL 5ME 7BK 8EH, VS1s GC GZ, VU2XG, XE1PJ, YOs 2BU 3IF, YVs 4CI 5ACM 5AEZ 5GO, ZB1NR (60) 20, ZD8SC, ZE8JY, ZP6AY, 4X4IM, 5As 2CW 5TA and steady 7G1A (50) 19 — just about par for this time of year.

15 Novice sportsmen are there to take advantage of every mercurial 21-Mc. opening, led by KNs 1LOM 3KLM (18/10), 3KLN 4MPR (now N-less), 5ZCL 8QXB 9SRR 9VLQ 9UIY and WV2HUJ (25/2). In addition to the usual (but becoming more unusual) DJ/DL G HB9 OH ON4 OZ PAØ and SM stand-bys, the lads capture trophies like CE4EC, CN8JF, CO7LG, CP3CN, CR6CA, DM3XED, EAs 1EH 3NC 9AP, Fs 2LB 2PO 8DO, FG7XF, GI3s MUS NSM, GMs 3NZI 8FM, GW3INV, HA8CF, K4DCZ/VE8, KA9MF, KG4AH, KN4PNM/KL7, LA8P, LUs 1AD 1DQK 2FOB 2GBK 8FBH, OA3D, OQ5s IG PS, PYs 2BTB 2BTJ 2BYR 3AAS 3ZU 4GA 5TH, SPs 8HR 9KAS, TI2VA, UA1QK, VKs 2ALQ 3AWS 5JT, WH6s DMU DOG, WP4s ARZ ATX ATY AUL AUT AVF AVI AVU, YU1EH, YVs 4AT 5ABF 5AKQ, ZB1NR, ZL2PM and ZP6AY.

10 phone DX will be worked so long as such hawks as K1IMD, W2JAJ/m, K2UYG, W5ERY, K5s LGH MHG, K6CJF, WA6CPI, A. Hovey, A. Rugg, EL4A, KP4AOO, OQ5-ØRL and GC2RS lurk ready to pounce on CE3GI, CN8JF, CRs 4AV 6BD 6BJ, CXs 3AA 5BR, EA8CK, EL4A, HI8JSM, HKs 3LZ (400), ØAI, I5TUF, JA1s CON HQ, KG4AK (600), KJ6BV (998), KW6CQ, OA4s IGY (850), JC, OE1CS, OQ5FM, PZ1AR, TI2OE, UB5KEF, UN1AT, VPs 2DAQ 2DX 6TR, VQ2JS, XE1CD (410), ZG4FR, ZE3JU, ZL1LY, ZS7L and those new-style Russians, RB5KFM, RC2AFA, RI8BN, RP2KCK and RQ2KDD. Sure, the band sounds dead at times — too many guys just listenin'. Don't just *sit* there; call some CQs (especially you non-W/Ks!)

10 c.w., still a week-end favorite for DX diversion, entertains K2UYG, WA2EFN, K3CUI, K5LGH, K6s CJF OZL, WA6CPI, K7CAD and EL4A with GX2BT, DMs 2AHD 3BE 3WTM, FG7XF (160) 15, IS1FIC, JAs 1CE (100), 1YL, KV4BO, KG6FAE, OQ5s IG KJ, RB5YP, SP6AAT, TI2LA, UC2BB, VE8RX, VPs 3YG 5ME 6YB 7NT 9EC, VQ2GP, YV5GO, ZE8JJ and ZP9AY. Wonder if this 28-Mc. code paragraph will survive the summer.

40 phone takes some of the pressure off 20 but it's quite a challenge. K1IVT, W3PHL (109 countries on 7-Mc. phone), WA6CPI, W. Johnson, OQ5RL and ISWL DXcavators turn up such items as CO8BS, DJs 1BZ 2XC, DL1FI, EAs 3JE 8CF 8CU, Gs 2PU 3HVY 3IVG 3JUL 3KLK 3KPV 3LGA 3NBP 3NUG 5DQ 8TK GB2SM, GM2BUD, HI7CJY, HKs 2GO ØAI of San Andres, HCCO, JAØSX, KG6NAA*, KP4-AEV, KV4BA, LAs, IMB 6VC, LZ1UF, OD5LX, ON4s LX OC, OQ5s EX IA JL MP, PAØHBO, PY8SB, PZ1AX, SM7KQ, TG5HC, TIs 2CMF 2OE 8ORO, VKs 2AKF, 2ATN, VPs 1JH 3IG 3YG 7NT, VS6EE, XEs ILA (285) 7, 2SH ØRDD, YN4CB, YS1IM, ZB2N nad ZL3ID. Tough going but it *can* be done.

40 c.w., on the other hand, necessitates no rock-crushers, as a rule, and we find WA2BPL, K5s JVF MHG, K6s CJF KDS, WA6s CPI CRX, W7s DJU LZF, K7CAD, EL4A, A. Rugg and ISWL trading beeps or hearing 'em from CM2s UZ 6, WS (19) 4, CN2s AO BK (15) 6, COs 2IP 7, 7AA, CX2TF (13) 9, DM2s ABE ABL, EI9J, EL4A, HA5KAG, HCs 1LE 2IU (13) 6, HKs 5CR 7MM (2) 2, HR1MF (4) 3, IT1AGA, dozens of JA1s JAs 2BP 2OE 3ALY 3BCC 3CB 3CIS 3EA 3FV 4JX 4VR (7) 12, 5CP 5MM 7XF 8AAA 8FC 8KV 8LN 9MI ØRC, KG4AD, KR6MD, KX6CA, LUs 1XI (10) 10, 5ZI 6DBQ 7WG 9XO 8-10, OA3D 4, OX3AY, PYs in all call areas but the 6th and 9th, ST2AR, UA9s AA DU EF KYB YP, UAØs KCO KDA KID 4, KZA, UB5s in quantity, UG6KAA, UI8AD, UL7IF, UM8KAA, UN1AA, UO5AB, UP2s CB KNP, UQ2KAA, UR2DZ, UT5BK of the Ukraine, VE9NN, VKs 2AQF 5TC, VPs 1JH 4LE 4TR 5BL 6AG 9AK 9DL 9EP 9G 9WB 4–8, VQs 3CF 4FK 4GQ, VRs 2DK 3Z, W2AIS/KV4 (5) 0, XEs 2SON (6) 6–7, 3BL, YN4AB, YU1DGH, YV5ACP, ZLs 1RI 3CS 8 and 4X4WF . . . . . Forty-meter Novices are catching the fever, too. KNs 1LOM and 8QXB captured KH6CXY, KZ5MQN, VK3XB and WH6DIG up around midband.

80 c.w. deserves some attention even in the summer doldrums, so K4TDN, K7CAD Andy Rugg and ISWL account for DJs 1VC 5FS, HP1AP, ON4HC, OKs 1KEI 1KNG 2KET, PJ2AE, PY1ADA, TI2CMF, UA9CM (8), VPs 1JH 3YG 5FP 5ME 7NT, ZLs 3GQ 3JT and 4NX . . . . Voicewise, W8HCP recently pulled ZL1ACG* out of the 75-meter DX hat. And if you still need Asia on 3.8-Mc. phone, ZC4JB* is ready and willing with s.s.b. around 3780 kc.

So does another sultry season engulf our DX realm in northern latitudes. Percy Bysshe Shelley would have been an eager DX man, we think, and in that case he wou'd have put his immortal line this way: "If Summer comes, can Fall be far behind?"

Where:

Africa — "Please take note that, with effect from the 1st of May, 1960, the QSL bureau for Ghana, handling incoming and outgoing cards, is located at the following address: H. Suess, 9G1CW, P.O. Box 1945, Kumasi, Ghana." This from 9G1CW himself, now secretary-treasurer of the newly formed Ghana Amateur Radio Society . . . . . "We have been receiving many QSLs for ZS7RT," communicates SARL (South Africa), "but as far as we can find out there is no such call in any ZS area. The postmaster general of Swaziland informs us that no two-letter suffixes have been issued." . . . . . KØDQI reminds us he does QSL chores for ex-FQ8AP and ZE1JV, self-addressed stamped envelopes required from W/Ks . . . . . WGDXC's *DX Bulletin* learns that "ZS5JY's ZS7–8–9 expedition cards had to be printed three times before they were right. He traveled 3000 miles and made over 1800 QSOs although not a DXer himself." . . . . . From ZS7P: "I QSL all cards received 100 per cent, either direct or via QSL bureaus. In each case of request for QSL by air it would be appreciated if postage be covered by currency and not by IRCs." . . . . . K2UYG hears from W8KMI that FR7ZD is knee-deep in incoming cards. Reply-paid postals may help stave off the backlog.

Asia — "We try to QSL 100 per cent," declares W9QPI of the HL9KT staff. "However, we have been receiving some cards for contacts made as far back as 1958, and our logs for that year are no longer available for checking. International Reply Coupons are appreciated." Via Ws 6GQY and 9IMN, Don reports that all cards for HL9KT QSOs dating since late '58 have now gone forward through bureaus . . . . . "Ex-VS9AT, now GI3MUS, writes he is more than glad to send QSLs still due," says W4PDP. "I'm sure

CR7CO obviously prefers to relax and enjoy the game while others sweat and strain in frantic DX pile-ups and pursuits. But, then, being a CR7 is one thing, being a W/K quite another.

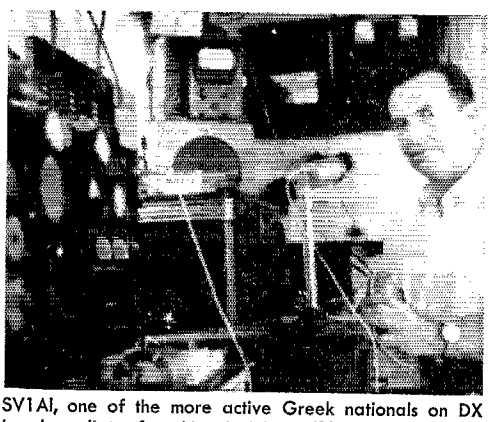
IRCs and s.a.e. will be appreciated." The recommended G13MUS address fellows . . . . W6JNX's cards to HLs 1BX 2AC and ØKC ricocheted vigorously . . . . W9KOK tells W1WPO he holds the logs for the late AC4YN-VU2DR records dating back to 1929. Mitch will gladly consult with anyone whose bona-fide QSO(s) with Reg so far have gone unconfirmed. "By the way," adds W8KOK "it is interesting to note the number of times AC4YN called CQ with no reply." . . . . The Amateur Radio Society of India supplied QSLs for January's VU2ANI Andamans DXtravaganza. VU2JG writes W1WPO, "Cards . . . are being routed through the ARSI QSL Bureau, with Bureau stamps on each card, to W8PQQ who will distribute them to different hams. Cards which do not bear ARSI QSL Bureau stamps may be treated as not genuine. QSLs received direct with sufficient stamp coverage will be QSLd direct. Any ham who may not be in receipt of QSL from VU2ANI within, say, three months may contact ARSI who will issue a duplicate card." . . . . KA2JM's present direct address follows, and he can also be reached via 2019 Argyle St., Kalamazoo, Mich. (K5LPG/8). Pappy started ham life as W9FPY (1927–'42) and also signed DL4MT in 1949–'52 . . . . K6BX points out that about 140 of the nearly 200 licensed VU stations are on the air. ARSI QSL manager VU2JG handled about 30,000 cards in 1959.

Oceania — "I have a note from W6ZVJ in which he says he has logs and QSLs for his operation as KM6AH (1947–'50) and KB6AY (1950–'54)," advises W6ERS. Deserving parties, to your pens . . . . "This is to inform you that I am the world-wide QSL manager for VK9s DH and TK. Note that my QTH appears only beginning with the spring 1960 *Call Book*." That from goodfellow WA6HOH . . . . Via friend K2QXG, VK9VM suggests the new Rabaul Amateur Radio Club, P.O. Box 170, Rabaul, T.N.G., for bureau action on QSLs to New Guinea VK9s. K2QXG continues to assist with VK9VM confirmatory labors . . . . W3GJY carries on as QSL manager for FO8AU and ZK1AK . . . . Regarding ZL3VH/3's recent Chathams action, W4PDP affirms that "Pye doesn't want money from the boys for his QSLs. He says, in fact, that if one goes to the Bank of New Zealand to convert it, awkward situations can arise; they question where it came from and why." *Good* questions . . . . More WGDXC QSL observations: VK2APX/lh is not interested in collecting QSLs from the VK2 bureau; try him direct. . . . ZL2GX reports ZL5AA cards sent to all requiring them and that he is still working on the ZL5AC QSL situation. . . . ZL2GX is ZL4JF's QSL manager; there is no regular mail service to the Campbells. Jock also will handle the QSL angle for VR1D who is former ZL1ABZ of the Kermedecs . . . . "As soon as I get my cards I'll QSL 100 per cent." assures VK9HC of rare Cocos-Keeling.

Europe — In addition to U8CGC *Courier*, WAGR-410, FPO, New York, N. Y., Japan DX Radio Club suggests P.O. Box 172, Rhodes, Greece, as a QSL address for SVØWV/Rhodes . . . . VERON's *DXpress* understands that W6UOU's sister recently operated EA6AR on sideband. QSOs with a ladylike voice might be verifiable through W6UOU, therefore . . . . ZB1FA joins the expansive QSL bureau of W2CTN, s.a.s.e. required from W/K patrons. A rundown of W2CTN's vast clientele appears in the May 1960 "How's" . . . . Quick, Watson, the beam readings. G4GB says G3LAF never operates 10, 15 and 20 meters contrary to evidence to the contrary, and OY7ML alerts us to recent unauthorized employment of his call. "In the future, only OY7ML QSLs signed by myself and distributed by W6NJU are valid," asserts Martin . . . . SVØWI/W4EWO writes from the Continent: "I had been QSLing 100 per cent but I've been getting such low returns that I now QSL only on receipt unless it's a new country for me." That's par these days . . . . G5RH finds his QSLs for previous GM5RH operation in lively demand. "I've always made a point of sending a card direct to each station at the time of QSO but, if anyone has not got, and still wants, a GM5RH QSL for a genuine QSO he should send a card direct to [the address following]." . . . . OZ7FG wants a tracer on operator Chuck of KAØIJ, confirmation desired for a 21-Mc. phone contact in late 1958. Any help?

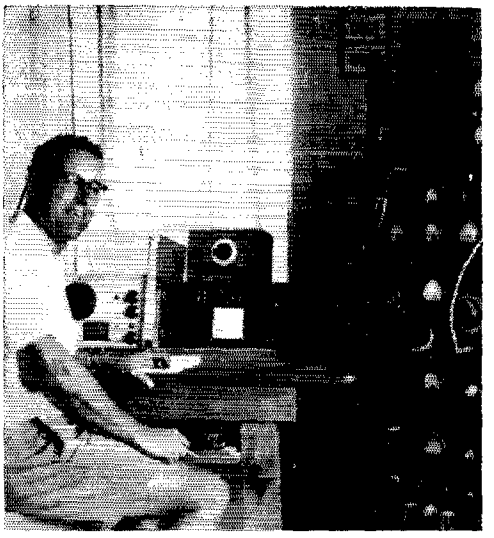
Hereabouts — VP3YG, who handles incoming British Guiana QSLs, tells K2UYG that VP3s AD EFG ER FM HAG MC RW VN and YG are quite active and legit, VP3s CW TY and WO are operationally dormant, however . . . . K5JVF finds that 7-Mc. specialists LU9XO and PY2BIS like their cards sent direct, but CM2WS and PY4AYO prefer the bureaus route. Dave could use a postal pinpointing on LU1XI . . . . "Remind the gang I handle QSLs for TI2s PZ and WR," urges KØDQI, stressing s.a.s.e. requirements . . . . W3KVQ continues QSL efforts in behalf of CT3AV, VP2AR, VU2RM, ZD1AW and 4S7WP — s.a.s.e., natch . . . . W2WK and WA2BLH personally visited FM7WQ, discovering that Pierre does not work c.w. "Someone is apparently using his call illegally. FM7WQ is on a.m. at present and plans s.s.b. soon." . . . . W8YIN has it that K2TDI and W8BKO volunteer QSL aid to deserving overseas brethren . . . . "I am handling QSL chores for TG5HC," affirms K5GOT. "All that is necessary is a self-addressed stamped envelope." *And* the QSO data, of course . . . . As of early May, K6BX had succeeded in disseminating more than 350 not-too-ancient-vintage *Call Books* to active overseas DXers. *Good* work — see p. 63. February 1960 *QST* . . . . Regarding KS4AZ action by Ws 3KA 4KFC and 4JNE in February, "QSLs are not solicited but U. S. cards received with self-addressed stamped envelopes, and Canadian and overseas QSLs with IRCs or U. S. stamps and self-addressed envelopes, will be answered direct. All other cards will be answered via QSL bureaus at a later date. The time on QSLs must be listed in GMT. Time does not permit searching out a QSO entry when only local time and date are supplied." The boys also make a point not widely appreciated: "DX stations should use other than U. S.-issued IRCs. Coupons returned to the country of issue are good only for domestic postage." . . . . "I'm handling all QSLs for VP2KD," apprises K4LRA. "The usual s.a.s.e., of course, and please emphasize the necessity for GMT." . . . . And now we thank W1s UED WPO, K1s IMD IVT JTL, W2s DY JBL, K2s UVQ UYG, WA2KMY, W3LMA, KN3IJP/KA2, W4PDP, K4SXO, W6KG, K6s CJF LEB, W7s LZF NRB, W8FTD, K8NHC, W9QQG, W9QGI, KØs OSV OSW WQI, VE2YA, OQ5RL, FEARL(M) of Japan, Hamfesters Radio Club, International Short Wave League, Japan DX Radio Club, Newark News Radio Club, Ohio Valley Amateur Radio Association, Universal Radio DX Club, VERON of Holland, West Gulf DX Club and Willamette Valley DX Club for the individual recommendations that follow:

AP5B, E. Elington, P.O. Box 496, Lahore, W. Pakistan
BV3HPT, Box 11, Shin-ti'en, Taiwan
BY1PK, Box 427, Peking, China
CN8HQ, P.O. Box 41, Putnam, Ill.
CO2IP, J. Chatelus, Calle 9, Parcelacion, Moderna Calvario, Havana, Cuba



SV1AI, one of the more active Greek nationals on DX bands, radiates from historic Athens. *(Photo via W1FZ)*

CO2LE, 19 Laguna St., Havana, Cuba
CO8JK, Dr. F. Roca, P.O. Box 587, Santiago, Cuba
CP3CN, C. Fiorilo, P.O. Box 474, Oruro, Bolivia
CR8XG, Box 122, Cunc, Goa
CT3AV (via W3KVQ)
EI9G (via W7VEU)
FB8CJ (via W6BAF)
FG7XG (via W3GJY)
ex-FQ8AP (via KØDQI)
FQ8HI, P. Stamm, B.P. 235, Ft. Lamy, Tchad, Fr. Eq. Afr.
GB2LS, Liverpool District Amateur Radio Society, Gladstone Hall, Queens Dr., Liverpool 13, England
ex-GM5RH, D. Aldridge, G5RH, c/o International Marine Radio Company, Ltd., 49 Oxford St., Southampton, Hants., England
HC2IU, P.O. Box 5200, Guayaquil, Ecuador
HK3LZ (via LCRA)
HKØTU/mm (via K9DVF)
IIAB, Alfredo Bella, via Boezo 10, Milan, Italy
JA1DCY, K. Hirota, 757 Kyodo-cho, Setagaya-ku, Tokyo, Japan
JA6AK, I. Shinohara, P.O. Box 36, Miyazaki, Japan
JZ0PO (via RSGB)
K4SRA/mm, Lt. Cmdr. L. Francis, USS *Shangri-La* (CVA-38), FPO, New York, N. Y.
K5TJG/KH6, H. Boswell, 45-718b Kam Highway, Kaneohe, Hawaii
KA2JM, AI/Sgt J. Mitchell (K5LPG), 2875th GEEIA Sqdn., Box 13, APO 323, San Francisco, Calif.
KA5MC, J. Mullins, c/o VMR 253, FPO, San Francisco, Calif.
KC6AS, H. Hirata, c/o USAF Weather Bureau, Ponape, E. Carolines
KG1BA, APO 23, New York, N. Y.
KG6IG, APO 815, San Francisco, Calif.
KG6s NAA NAB, Box 153, Navy 926, FPO, San Francisco, Calif.
KH6IJ/1, K. Nose, 9 Belmont Ave., Concord, Mass.
KZ5VV, T. J. Herrman, KØWVI, 434 Thomas Ave. So., Minneapolis 5, Minn.
LU4ZL (via Argentine bureau)
LUs 7WG 9XO (via Argentine bureau)
MP4BCV, P.O. RAF, Bahrein, Arabian Gulf
ex-MP4TAF-SU1SS-MD5DL-DL2BJ (to VS9ADL)
OQ5MA, Box 219, Stanleyville, Belgian Congo
OQ5PL, Box 2312, Leopoldville, Belgian Congo
OY2Z, J. Ziska, Box 239, Torshavn, Faeroes Islands
PJ2MG (via PJ2CE)
PZ1AM, A. Meubelman, Box 12, Coronie, Surinam
RP2NCH, V. Vytautas, 90-6, Red Army St., Kaunas, Lithuanian S.S.R.
SV0WI, A. Evans, USASG, APO 223, New York, N. Y.
TG5HC (via K5GOT)
TI2s PZ WR (via KØDQI)
TI9AM (via TI2PI)
TI9SB (via TI2HP)
VK9s DH TK (via WA6HOH)
VK9HC, J. Collister, c/o Cable Stn., Cocos Islands, Indian Ocean
VP2AE (via K1EFI)
VP2KD (via K4LRA)
ex-VP4TY (to VP3YG)
VP5VB (via KV4AA)
VP6BS, W. Dowrich, Whitehall Rd., St. Michael, Barbados, W. I.
ex-VP6US-ZB1USA, B. Wheeler, K3KWN, 3127 S. 20th St., Philadelphia, Penna.
VP7BK, Raytheon, PAA/GBI, Patrick AFB, Fla.
VQ1SSB, J. Roberts (VQ3GX), Box 30163, Nairobi, Kenya
VQ2AB (via W6BAF)
ex-VQ5FS (see EI9G)
VQ9HB, Harvey Brain, Mahe, Seychelles
VR1D (ex-ZL1ABZ; via ZL2GX)
ex-VS9AT, W. Bell (*GI3MUS*), 78 Orangefield Ave., Belfast, No. Ireland
W2AYN/EP, F. Borsody, Khiban Separd 46, Tehran, Iran
WA2EVV/CN8, Lt. Cmdr. D. Minton, Navy 214, Box 16, FPO, New York, N. Y.
XE2R, A. Patron, P.O. Box 156, Mazatlan, Sinaloa, Mexico
XE2SO, A. Flores, No. 12P, Hermosillo, Sonora, Mexico
XEØCOL, R. Levine, WA2COL/4, 1212 N. Park Rd., Hollywood, Fla.
YV5AFJ, I. A. Jaar, P.O. Box 2224, Caracas, Venezuela
ZD1RO, R. Oxley, P.O. Box 54, Freetown, Sierra Leone
ZD2BRG, Box 11, Kano, Nigeria
ZE7JZ (via K6MHO)
ZL3VH, W/O-1 J. Pye-Smith, S. D. Signal Troop, P.O. Box 9015, Addington, N. Z.
ZS3AZ, Box 1100, Windhoek, Southwest Africa
3A2CN, P. Andergalt, 49 rue Grimaldi, Monaco
ex-5A5TO, F. Vitringa, Banstraat 2, The Hague, Netherlands
ex-9G1CP (to ZD1RO)
9N1s CJ GW, G. Ward, ISOM, APO 143, Box Kat, San Francisco, Calif.
9N1MD, M. Bannis, USOM, Katmandu, Nepal
9N1MM, Moran, P. O. Box 50, Katmandu, Nepal



ZL1AH is well known for his superior c.w. performances in the annual VK/ZL DX Contest, also for outstanding 160-meter transoceanic work. Those G6GM QSLs confirm the first New Zealand-England two-ways on Top Band.

9N1TB, c/o U. S. Embassy, Katmandu, Nepal

NOTE: Data preceding are neither necessarily accurate nor "official" — good luck! (You may need it.)

Whence:

Asia — *Say*, JARL (Japan) is sponsoring an operating affair fraught with promise. It's the All-Asia DX Test, August 27th-28th, wherein Asian amateurs will strive to contact as many non-Asians as possible, and vice versa, a code-only affair. Detailed participation particulars next *month* . . . . Via W1WPO of the ARRL DXCC Desk: W2AYN's historic permit to bring Iran back into international ham radio reads that he "is hereby granted permission to operate his amateur radio station . . . in Iran for a temporary period of two years, starting [March 30, 1960]. Operation will be in accordance with ITU Region III rules, under the radio call sign W2AYN/EP. Communication with other-country amateurs is authorized." Frank had been in Iran three years as a communications advisor to the government before W3ZA came along to talk him into DX fun . . . . In addition to HL9s KR KS KT KU and TA, W1HEG of HL9KS points out that "several HL2s again are active, though these are experimental stations permitted to contact only other HL9s and HL2s. HL2s AC AE and AO can be heard on 20 phone and c.w., but they cannot work outside the Republic of Korea. At HL9KS we've been working mostly 14,060 and 14,210 kc." HL9KT operators W9QPI, K4YJF and Fred write from Seoul: "We can usually be found on 14,015-kc. c.w. or 14,150-kc. phone at 2330-0100, 0300-0500, 0700-0900, 1100-1300, 1500-1700 GMT daily, and all day Sunday. We also have rocks for 21,022.5 and 21,225 kc. but we seldom use 15. QRM and QRN are really bad here in our peculiar valley QTH. We have a BC-610 at 400 watts and a receiver similar to the 75A-4." . . . . "I plan to go to East Pakistan and Sikkim a little later on," writes 9N1GW to W3LMA. "Tell the boys to be patient." . . . . HS1B tells of AP2CR's recent portable operation from the Khyber Pass, an historic *battleground, where the local populace grew quite restive* over his noisy little black box. Colin also aims for early East Pakistan DX sport . . . . K6CJF has confirmed QSOs with 84 JAs in sixty cities and awaits cards from another 126 . . . . W8YGR reports the passing of ex-C9AL, VE3AL, in Toronto . . . . WA6BKQ and ex-KN3IJP experiment with a four-band quad in Japan . . . . Asian addenda courtesy FEARL(M), ISWL, *VERON* and WGDXC informants: CR8s AC and XG claim to represent Goa on 21,240 and 14,100 kc., respectively. . . . TA4AF *is another Turkey teaser*, 14,190-kc. a.m. . . . OK7HZ leaves the Middle East in favor of VU regions. . . . UL7KBK says he's the No. 1 Kazakh s.s.b. entry. . . . DU1GF visited personally with JA-KA friends. . . . 9N1TB gets along quite well with 30 a.m. watts and a simple dipole.

Africa — "VQ9TED/mm, worked on sideband, said he will be on from the Seychelles beginning next month until March, 1961," advises W2SUC. "During this period he also intends to operate from the Aldabras, Mauritius, Chagos

and other areas in the northwest Indian Ocean with a KWM-1, 75A-4 and Eddystone receiver." . . . . W8YIN learns that roving 9G1CX (ex-VQ4EO) hopes to ham in FD8 FF4 ZD1 ZD2 ZD3 and 7G1 territory beginning any time now with a KWM-1 on 14, 21 and 28 Mc. . . . . W9ERU dropped in on SU1IC in March for a pleasant personal QSO. Gene finds it difficult to obtain ham gear in Egypt and just as difficult to gain amateur status there . . . . . "Here's a new one for the boys to try," suggests EL4A (W7VCB). "I now have QSOs with about fifty countries recorded on tape. Through this means it will be nice to relive these good old EL4A days when I'm back in the States. Who'll make the first DXCC with a completely taped record? Our new Liberia net meets Sundays at 1700 GMT on 7025 kc., phone and/or c.w. The CN8 boys did a fine emergency job at Agadir, and ham radio also recently saved some lives in this area in scattered flying incidents." . . . . . K1IVT has it that ZE8JJ will be QRT for two months while rigging new quarters . . . . . OQ5RL-OQ0RL (W8PTD-ON4RA) continues to roam central Africa with portable gear, visiting and operating from such shacks as those of CR6CA, OQ5s CJ FV RS, OQ0s DM PD RS, VQ2s JS SB TV and others . . . . . VQ8AM tells W3LMA that the devastation of this year's second Mauritius cyclone lingers on. It was the worst blow there since 1892 and a third of the island's half-million inhabitants lost their homes. . . . . Ghana Amateur Radio Society, franchised this April, now is going strong. Secretary-treasurer 9G1CW remarks, "We hope to be able to have closer cooperation between the scattered amateurs in this country, those in Accra, Kumasi, Sekondi/Takoradi, Tarkwa, etc." . . . . . "My station comprises a GSB-100 transmitter, NC-300 receiver, and I believe I'm the first resident ZS7 on single-sideband," declares ZS7P . . . . . Commentary from ZD2JKO via K6BX: "Since January 12th I have had over 2000 QSOs with the States and I am still amazed at how many W/Ks have not worked Nigeria. Of course, with 200,000 U. S. amateurs and only a handful of ZD2s I suppose it's not surprising. ZD2s AMS BRG IHP JKO and RJO now are active here; ZD2s DCP and FNX return shortly from leave." . . . . . ISWL, VERON and WGDXC understand that W9ZQF leaves ETE3CE this month, hoping others will keep the station workable. The clubs also hear that VQ8BB may reactivate Carajos Cargados later this year, and that W0AIW intends an Indian Ocean encore come autumn.

Oceania — "FO8AU started operation from the island of Rurutu in the Australes group which lies approximately 240 miles south of Tahiti," W3GJY tells W1WPO. "He plans to stay there for the next three years." . . . . . After a 13-year DX career and QSOs with 185 countries, ZL4AV seemed quite excited to catch Rhode Islander K1JTL for his final WAS-clinching state . . . . . W6KG notes that KG6AAY operator Bill heads for a spell of hamming at less DXotic KH6UL . . . . . W4GXB affirms, "ZL3VH of Chathams fame feels there's a trip to the Tokelaus brewing for him. This will not be a DXpedition *per se* but he will be in a military party as the only wireless operator." . . . . . W8YIN hears that VK9RO showed up from Port Moresby and worked W6GT on sideband with just two watts . . . . . VERON and WGDXC offer this Pacific patter: Former ZL1ABZ of Kermedecs renown intends DXtensive 14-Mc.

VS6DJ was recently visited by K6LAE who forwards this resultant snapshot. Dr. Tan hooks his 75A and DX-100 to dipoles on 10, 15 and 20 meters.

a.m. work from Funafuti as VR1D. . . . ZL4JF of the Campbells commenced a 20-meter phone offensive in late April. . . . Chathams islander ZL3VB often tries his 14,010-kc. luck on Sundays, 0430-0530 GMT. . . . VK2FR may forsake Lord Howe isle this fall, and ZL2AXU anticipates a return to his VR2BZ dials next year.

Europe — F9IL, DUF awards manager of REF (France), files "DXCC?" No. 28 (see p. 59, July 1959 "How's") . . . . . "I'm most active on 14 Mc. but I work 7, 21 and 28 Mc. at times," remarks SVØWI (W4EWO). "I've been on since October of '59 and usually operate from 1900 to 2300 or 0600-0700 GMT. If you know of KH6s or ZLs looking for an SV (Greece) contact I'd be glad to oblige." . . . . . According to K1JTL, Jesy of YU3DK qualifies for your world-wide YL DX collection . . . . . YL W6VWL managed a few West Coast contacts and quite a batch of European QSOs on 14-Mc. sideband from EA6AR in May, says W8YIN . . . . . WACC — Worked All California Counties — is the goal of OK1CG. K6OZL contributed rare Kings county to Jin's cause, a project that nears completion after ten years of W6/K6/WA6 QSOs . . . . . WA2KMY worked K3HOR/mm's Comanche and Cheyenne aboard SS *Petroseaul* near Crete . . . . . Yes, you never can tell what you'll be in for when you fire up the rig on DX bands. W1ELL finds himself presented with a specially inscribed plaque as the 1000th United States QSO for G2DF . . . . . Spain MARS op K1BVI returns Stateside to Plattsburgh AFB, N. Y., colleague K5QKV goes back to Amarillo AFB, and W7UUW heads for reassignment in Presque Isle, Maine. All three have just completed 36-month stints in EA-land — *ole!* W7HNT, also stationed in Spain, tells

HL9KS is staffed by personnel of the U. S. Korean Military Advisory Group at Seoul, W1HEG custodian. The station operates on assigned frequencies in the 10-, 15- and 20-meter bands between 0800 and midnight local time with a maximum input of 500 watts.

K6LAE obtained these interesting views of 9M2FX (left and center) and 9M2DW (right) for your album on a recent tour of the Far East. The gear at 'FX includes a Marconi receiver, homemade 829B 50-watter, Temco 150-watter and homespun s.s.b. exciter. That's the OM himself lurking in the web of his comical quad, as he puts it. At 9M2DW we note a BC-610 surplus item driven by a BC-221 v.f.o., and an HRO-5 inhaler.

W1UED that rules of the SARA Sevilla award (p. 160, May 1960 *QST*) have been revised. Check with Spanish-American Radio Amateurs, P.O. Box 7107, 3973rd Combat Support Gp., APO 282, New York, N. Y., for the latest . . . . . 11AB changed QTH from Rome to Milan and enjoys his new homebuilt s.s.b. outfit . . . . . WA5M and WA5M-II inquiries now should be directed to SSA Diploma Manager, Stockholm 4, Sweden, not to SM6ID . . . . . GB2LS, an exhibition station at Liverpool, will seek DX contacts on 1.9 through 28 Mc. the 14th–16th of this month. Special commemorative QSLs are in the works . . . . . Ex-GM5RH intends much DX work as G5RH with his 32S-1. "So far as I know I was the only GM5 active on DX bands in recent years and, judging by the reaction when I went on the air, I was in considerable demand." . . . . . Continental canvassings by ISWL, NNRC, OVARA and VERON: Who's this TF8AA — Yarl Angantyr? . . . IT1AGA nears eligibility for the Ohio Valley Award already won by Ws 40MW 8IBX and 5AWT in that ord . . . . Club station UB5KAB, all homebuilt, has 240 countries worked, 101 on s.s.b. . . . ZA2BAK lays claim to being the first "official" Albanian licensee.

Hereabouts — *Wow* — KS4AZ operators W3KA, W4s KFC and JNE tally up their February 14th-23rd Swan Islands DXpedition results at 4590 QSOs with every state and 64 countries. "FCC allowed two hours operation on 160 meters during the ARRL DX Test which netted 45 contacts with 17 states and five countries on Top Band . . . . . Transmitting equipment consisted of a TCS-12 using parallel 1625s at 50 watts on 160 meters, 75 watts on 80 and 40 meters. A Meissner Signal Shifter drove parallel 813s at 500 watts on 20 meters, and an 807 tripler was used on 15. KS4AZ did not operate 10 meters . . . . . KS4AZ1mm was active en route to and from the islands. The trip from Tampa to Swan required three and a half days on a converted LCI. Nearly 200 contacts were made from the ship using a 15-watt RS-6 transmitter on 20-meter c.w." These data come from a concise communiqué issued by the trio upon their return . . . . . High seas turned back HKØTU/mm in a May bid to activate Malpelo isle, but VP2VB/mm of *Yasme III* may give it a try later on. Danny warmed up with a Maytime hot time as VP5VB . . . . . TGØOA tries a Kon-Tiki-type raft voyage from Guatemala to Peru, hamming frequencies unspecified . . . . . Atlanta's Southeastern DX Club will certify your contacts with any ten of its members worked since the first day of 1958. Check with W4FID for details . . . . . From J. Guilonard near Paramaribo: "There is no radio league in Surinam. The director of government telephone, telegraph and radio grants operators licenses after being satisfied with the skill and knowledge of applicants. In the future every amateur can be called upon to pass an examination." . . . . . K2UYG suggests U. S. Government Printing Office Cat. No. C42.2:EL2/959 (25 cents) for would-be DXpeditioners. Its title: *Electric Current Abroad* . . . . . W2EQS expects to put FP8AS back on the air for a week early next month, mostly c.w. on 10 through 160 meters . . . . . KZ5VV is gratified to see his parents, KZ5s TJ and WW, now Generalized and working 10 and 15 . . . . . "I've been KP4AOO for about two years now and the count is 159/130, 91/50 on phone." Roger does it with a Ranger, HQ-110 and TA-33JR spinner . . . . . "VP2KD has an Adventurer on 10, 15 and 20, phone and c.w.," says QSL manager K4LRA. "He still needs QSOs with Ariz., Ark., Alaska, Nebr., Nev., N. Dak. and Hawaii, and QSLs from La., Md., Mont. and Vt." . . . . . KØWQI commends W1ELL's 95-country performance with only 15 watts and a simple long-wire. FB, OM! . . . . . OVARA reports W4KVX making a strong DX comeback after fire devastation . . . . . NNRC advises certificate hounds to check with W3KQD regarding the Horseshoe Radio Club sheepskin, with W3BQA concerning the Keystone award, and with W1TWR for specs on the Maine 15 X 15 certification.

Ten Years Ago in "How's DX?" — The July 1950 preface treats on excessive use of "CQ DX," pointing out that foolish competitors are less troublesome than shrewd rivals who use their equipment more intelligently . . . . . Twenty-c.w. correspondents report success with ACs 8SQ 4NC 4RF 4YN, AP5B, C8DD, CRs 5AJ 10AA, FD3RG, FK8AL, FN8AD, MD7GR, PKs 1HH 1TM 2ZZ 4OO, VK1YM, VR1s A B C, VSs 5CA 7KR and ZS8MK, while 14-Mc. phone dispatches deal with action by AP2N, CR5UP, EK1MD, HE1JJ, KG6GD/KC6, MB9BL, MD2s AC MD, OE13EG, PKs 1MF 4DA 5HL 6CS, VRs 3C 5GA, W2EJV/PK1 and 3V8BB . . . . . Only MD7WE, TA3-GVU and VU2CL disturb summer 7-Mc. tranquillity . . . . . Ten phone simmers down to EK1s BC RW WX, KG6IE/Iwo, MP4BAO, PZ1Z, SV5UN and ZD4AU . . . . . TI2ES threatens Cocos (TI9) activity, W6LRU writes of the newly organized San Diego DX Club, W3BXE prepares for an FP8AB encore, and Cocos (ZC2) QSOs appear likely . . . . . There are photos of DX-minded OHs and well-known W6-W7-VE7 DXers, and Jeeves plays truant among voluptuous summer static on the beach. QST

Strays

A 12-year-old novice from East Meadow, N. Y. receives perfectly, has antenna and transmitter working fine, and has had several experienced men check his station without finding a flaw . . . but he can't make a QSO on his own. His call is WA2HEX!

—···—

K3CDA noticed a fellow ham driving in Punxsutawney, Pa., tapped a CQ on his horn . . . and was picked up a few minutes later and fined for disturbing the peace!

—···—

A group of Maine hams, the Spud Pickers Amateur Radio Klub, is offering a unique certificate . . . at 3:37 A.M., July 4, the first 50-star U. S. flag to see the sun will be raised at Mars Hill, Maine. SPARK is setting up rigs under the flag and will operate all bands, 80 through 10, until noon, EST. Certificates will go only to the first 50 stations contacted.

Correspondence From Members-

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

T9?

¶ I am confused — Is my log book as old and as ancient as I feel? Has ARRL deleted the RST system on the inside front cover or what?

I am referring to the consistency with which I hear T9 reports given to stations who may be anything from T2 to T9 on the T scale. I repeat, has this item been discontinued in the log books? (The ones I have in stock still carry it.) Or doesn't the present species of ham read it and use it?

Recently I had the occasion to give a T8 report to a couple of K stations on the same day. You know what they said? "What is wrong with my signal, OM?." To me T8 indicates "good DC, just a trace of ripple" but to them it must have been terrible.

I work many European stations and report them from T6 to T9 and hear someone else work them right behind me and have yet to hear a T6 tone reported as T6 by anyone else. (Postwar that is.)

Isn't a bit of publicity and education regarding signal reports, particularly the tone portion, in order? False reporting only adds to the confusion already existing on the bands, at times, by not letting the fellow on the other end know that his signal is not the best. A correct report many times makes that person aware of something he did not realize about his signal.

Please, let's give the other fellow a break by reporting his signal per the RST system. It's worth it and it pays off. — *Walter L. King, W7ETK, Seattle, Washington.*

¶ A hearty endorsement of your request for honest signal reporting (Operating News, April *QST*) — Amen! — *Tom Kirwin, K5LZX, New Orleans, Louisiana.*

GOOD GOING, GIL!

¶ Compared to some of the other readers, I am a Johnny-come-lately, but I would like to give cartoonist "Gil" a 21-gun salute! He can pack more humor into one panel than most others can put in volumes . . . — *John P. Stowe, W3JQE, Philadelphia, Pennsylvania.*

LITTLE BIT OF LARSEN E.

¶ By now you must have many pieces of correspondence on the subject of page 51, the April issue, especially in reference to the fine print which says, in part:

> "Here you will find exciting authentic reproductions of the rarest QSL cards in the world, many at fairly reasonable prices. Included in the purchase price will be your call and signal report filled in by our patient penman in an exact duplicate of the original handwriting and ink. These QSL cards are rapidly becoming very popular for decorative and other uses. . . ."

Now I am sure ARRL will continue to uphold its high standards for DXCC, but I can see you flooded with a bunch of these phonies — evidently the "other purposes" referred to. Seems if you have the money you can buy yourself a pretty good counterfeit QSL collection and imitate the genuine ham who gets 'em the hard way. Ye Gods, *QST*, how could you endorse such a thing?

I hope this was an April Fool joke! — *Norman W. Pinney, jr., W4EMP/KR6PN, Kadena, Air Base, Okinawa.*

¶ Upon receipt of April *QST*, I along with several thousand others eagerly looked for Larsen E. Rapp's usual April article. It was there along with a note at the bottom of the page "NOT A ADVERTISEMENT." In years past, the May and June issues carried letters to the editor which were anything but dull. Why spoil the effect by telling the newcomers that it is a gag? . . . — *R. Bruce Abernethy, Fort Monmouth, New Jersey.*

(*Editor's note*: We hated to spoil the effect, too, but postal regulations required that we identify the thing as not a legitimate advertisement. Nevertheless, we have already had two phone calls from fellows who drove up and down Route 128 vainly searching for Larsen E. Enterprises).

CONTESTS AND PUBLIC SERVICE

¶ I have been following the feud that W2SF touched off with his letter condemning the ARRL contest calendar, and in general all contest operators.

The point most of us miss, is that Amateur Radio is provided for as a PUBLIC SERVICE and not solely for the enjoyment of its members. Just as commercial stations give of their time for the public service, so should we give of our time to greater improve our operating skill. I personally know of no better way to improve this skill than to take part in a contest.

It is these skills that enable amateurs to dispatch traffic efficiently and accurately in the face of real emergencies. This is our part as public servants.

I challenge those who subscribe to W2SF's philosophy to take part in the next ARRL Sweepstakes, or DX test. If they take part in it earnestly, they will have earned a "Well done" in acquiring the skill necessary that they may be good public servants through ham radio. — *Art Ekblad, WØJWL, Minot, North Dakota.*

¶ I enjoy reading *QST* and especially correspondence from the readers. However, it seems to me that in almost every recent issue, someone is complaining about contests.

Contests do serve some useful purposes in their own right. DX contests enable amateurs to work new countries, and the Sweepstakes, new states. CD and LO parties enable the ARRL officials and appointees to get together. Contests also give the amateur who likes competition a chance to compete with other hams and to see how good an operator he is.

I will agree that in the midst of a contest, the band sounds like mass bedlam, but only to those who do not enjoy working contests. Certainly no one could hope to carry on an ordinary rag chew or a traffic net in the middle of the SS or a CD party.

However, this concentrated activity usually is centered around the lowest 100 kc. or each band during the SS, or about the lowest 50 kc. during a CD party. If some of the hams who have complained about lack of space to operate, would tune up above their usual operating frequencies, they would find that contest activity almost ceases. But to have the ARRL make a ruling that only so much of the spectrum could be used during contests would be unwise and unfair. This would unduly handicap some amateurs who are rock-bound, have antennas favoring certain portions, or limited receiver/transmitter coverage.

So let's keep the contests the way they are. If the amateurs who are not participating stay well clear of the contest activity, all the less space will be taken up by the contests. — *Dick Minnick, K8KCO, Dearborn, Michigan.*

¶ . . . A couple of years ago, a ham friend of mine tried very hard, and without success to make one simple contact during one of your contests. The poor guy was stranded and couldn't get help. He had been flying in Pennsylvania and had motor trouble. He was on six meters, and couldn't raise anyone, until, by some sheer accident, a W2 (who was on 50.55 Mc.) finally dropped off the air for a minute to get a cup of coffee or something, and I picked up my friend and got help to him as soon as he could land (which he did do on a highway near Harrisburg). He told me he had been calling just about every minute for a half hour. He had called "CQ-Emergency", "MayDay", and others, but everyone was interested in making more contacts than the other fellow and didn't care about anyone else.

I'd say keep the National Emergency Frequencies clear, especially during contests, and constantly monitored, or it's senseless to have them. — *Walter J. Barry, W3CTY, Darby, Pennsylvania.*

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C. W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

OFFICIAL OBSERVER HONOR ROLL

Follows those amateurs who contributed *most substantially* to fellow amateurs through the medium of careful observation and the sending of helpful advisory notices during the year 1959.

W1JNV*	K2ZSQ	W4PK	K8DHJ
K1IMP	K2CUQ	K4GAG	W8BWS
W1GR	W2LRO	W5LEF*	K8EEB
K1GCV	K2DEM	W6WLI*	K8KPP
W1NF	K2YBN	K6PLW	K9GDF*
W1WAJ	K2CPR	W6ADB	W9GFF
W2BLP*	W3AHQ*	K6DDO	K9MDK
W2BKC	W3MSR	W7OEB*	W9RKP
W2BVE	W3MFW	W8EMD*	W9JJN
W2QQ	K4BUB*	W8GFE	W0PME*
W2JCA	W4AWS	W8OUU	

* Call Area Leaders.

Credit to Observers. Some 335 Official Observers reported sending 18,009 advisory (and assisting) OO notices in the year 1959. A special commendation is due all those listed in the Honor Roll. W2BLP, W1JNV, W3AHQ and W6WLI respectively sent and reported some 1395, 796, 701, and 643 friendly reports, leading in the volume of work accomplished in the name of ARRL during the year.

Many Observers accumulate quite a volume of thank-you mail from amateurs receiving the notices. There's no telling how many FCC notices were beaten to the punch by an OO report. We *know* the effort helps. We appreciate having the special file of Observer results which we are proud to show off or refer to as indicative of what OOs are accomplishing. Thanks on behalf of the fraternity to Official Observers for their continued careful surveillance and friendly card-sending.

Personnel Aims in the ARRL Observer Corps. Since March, SCMs have started a program of review of the Observer staff in their respective Sections. A quota of seven consistently active Observers per Section, and thus *500 actives* for the entire Field Organization is the ultimate aim. Observers that are inactive, that is not sending and reporting-through-SCM monthly on their observing activity, have to be dropped under the appointment rules. Section Managers carefully limit the posts to active amateurs of some years' experience, best qualified by demonstrated equipment know-how; tact must also be employed. Applicants must have an experience background which assures that no reports will be sent which are based on image reception or receiver overload. Through the ARRL OO program our Amateur Service can continue to be known as a self-regulated facility which together with our traffic work in our notable and dedicated nets and consistent participation in AREC and RACES emergency setups (also public service), give us a public appreciation and respect for amateur radio.—*F. E. H.*

Members of the Mt. Soledad Amateur Radio Club of San Diego, Calif., and RACES operators totalling 31 participated in the Cancer Crusade fund drive on April 29. Mobiles on 2, 6 and 10 meters made pickups, reported to the headquarters control station above. From back to front are W6LYF (San Diego SEC), WA6CLP (on telephone) and K6HQJ, club president.

A.R.R.L. ACTIVITIES CALENDAR

June 25–26: Field Day
July 7: CP Qualifying Run — W6OWP
July 16–17: CD Party (c.w.)
July 18: CP Qualifying Run — W1AW
July 23–24: CD Party (phone)
Aug. 3: CP Qualifying Run — W6OWP
Aug. 16: CP Qualifying Run — W1AW
Sept. 1: CP Qualifying Run — W6OWP
Sept. 16: Frequency Measuring Test
Sept. 17–18: V.H.F. QSO Party
Sept. 21: CP Qualifying Run — W1AW
Nov. 12–13, 19–20: Sweepstakes Contest

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Aug. 27–28: First All Asian DX Contest, Japan Amateur Radio League (next month).

Aug. 27–28: First New Jersey QSO Party, Garden State Amateur Radio Assn. (next month).

RESULTS, APRIL CD PARTIES

For the sake of variety, let's start our brief back-glance of the January CD Parties on phone. It was there that W8NOH finally was able to beat out the East Coasters to lead the garbling gang. Lou has always been up there with the top scorers, but unable to take the top slot because Midwest stations just could not match East coast stations in number of QSOs. But this Party found a near washout of 75 meters both evenings in the East, therefore holding down the QSO totals. That's where W8NOH's big section multiplier of 45 took command and put him on top. Lou, who is usually our "leader" in scaring up 20 meter contacts, milked that band for many contacts and sections to score a round 27,000. W1YNP was tops in QSOs with 136 to score second high with 24,310, and W2REH was the third of the triumphant three with 18,135. Twenty meters was definitely the band in the phone Party with openings on 15 and 10 in the West and Midwest. But 10 meter openings coast to coast did not materialize. The band was nearly dead on the East coast. The usefulness of these two bands is rapidly coming to a close.

C.w. was another colorful story with W4DQS moving into the top notch. Climbing steadily in the last three Parties, Eastern Florida's W4DQS registered 720 contacts in 67 sections for 243,545. Connecticut's SCM W1TYQ was second with 225,540. Walt, W3GYP, has always been able to make the high claimed scores consistently with 50 watts and dipoles. Well, this time, W3GYP garnered together a little power and showed what he could do to the tune of 219,240 points. Other bug twirlers over 200K: W1RAN, W3GQF, and W3KLA.

The following are the high claimed scores. Figures show score claimed, number of QSOs, and number of different sections worked. Final and complete standings will appear in the July *CD Bulletin*. — *W1DGL*

C.W.

W4DQS	243,545-720-67
W1TYQ	225,540-709-63
W3GYP	219,240-691-63
W3MSR	212,625-668-63
W1RAN	212,550-648-65
W3GQF[1]	204,425-623-65
W3KLA	203,490-646-63
K4BAI	199,680-617-64
K6SXA	195,270-560-69
K5DGI	183,360-568-64
K5BSZ	175,455-552-63
W9LNQ	169,880-543-62
W1EOB	169,600-523-64
K1IFB	159,960-492-65
W2REH	155,620-500-62
W2OIB	155,170-526-59
W9NYU	152,700-502-60
K0OBF	150,040-181-62
W1CMH	144,000-474-60
K4PUZ	138,300-461-60
W4DVT	133,200-437-60
W4PRO	126,600-422-60
K5ZBS	123,830-414-58
W8SCW[2]	123,540-426-58
WA2BMB	121,200-400-60
W4BZE	120,475-390-61
W1WEF	118,260-431-54
W4PK	117,800-375-62
W4THM	117,450-405-58
K4IXG	117,410-393-59
K7CHH	117,180-373-62
K2SSX	116,850-405-57
W3NF	116,050-415-55
W1JYH	110,670-350-62
K2MFF	108,300-355-60
K4CAX	107,640-407-52
W1AQE	106,430-367-58
K4EJI	104,775-375-55
K8HGT	103,600-366-56
K4BVD	103,545-346-59
W4KFC	103,530-350-58
K0QCQ	102,950-350-58
K8KCO	102,555-380-53
K4RIN	101,495-380-53

PHONE

W8NOH	27,000-115-45
W1YNP	24,310-136-34
W2REH	18,135-115-31
W1DXS	17,205-111-31
WA2EKE	13,950- 86-31
W4BGP	12,960- 81-32
K2PHF/1	12,320- 70-32
W1GKJ	10,800- 75-27
K2THC	10,320- 82-24
W9NLJ	8910- 60-27
K4IXG	8910- 61-27
W1DGL/1	8710- 62-26
K2JTU	8500- 65-25
K2VTX/VE2	8320- 60-26
W9YT[3]	8040- 61-24
W4JUJ	8000- 57-25
W3EAN	7670- 54-26
K4IFB	7150- 55-26
W2EEN	6720- 60-21
K4EJI	5760- 42-24
W3MSR	5415- 50-19
K4DRO	5160- 36-24
W3GQF[4]	17,670-114-31

[1] W3WZL, opr.; [2] K2SIL, opr.; [3] W9SZR, opr.; [4] Multiple operator.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

Now and again we receive correspondence from an amateur with a "Great Idea." Why don't we have common calling and emergency frequencies, like the commercials do, inside the amateur bands?

We have always reacted favorably to such an idea. We first started reacting favorably back around 1947 and have been reacting that way, off and on, ever since. In fact, we've been publishing a list of National Calling and Emergency Frequencies in these pages of *QST* almost every month for lo these many years, and from time to time have importuned amateurs to use them.

Now comes W6RIL with the disturbing thought that perhaps these NCE frequencies are not receiving general use (and how can we deny this?) because they are not properly located in the bands, that their random and arbitrary selection was not adequately thought out in advance. Although we are a little weary of having amateurs tell us that instead of the NCE frequency or frequencies chosen we should choose a different frequency which *they* use (also chosen at random), we have to admit that Vern's proposal is food for thought. If it's food for us, it's food for you, so here in brief outline is what he suggests:

Two things are needed to make an emergency frequency usable and effective — we must be able to find it, and it must be monitored. Regarding the first, there are two frequencies in every amateur band that 99% of the amateurs can find, and they are the band edges. Thus, the most logical place for NCE frequencies is just inside the band edges. Regarding the second, it is difficult to monitor a frequency and use it at the same time, but in some sections of the country (W6RIL thinks only on the west coast, but we know better, don't we, fellows?) this is accomplished by the "pause"

technique, by which stations in contact simply pause a few seconds before replying to each other in order to allow weak stations, if any, to break in. High-powered stations would not use the designated band-edge frequencies without making use of the "pause" in their operation, and mostly the frequencies would be reserved for mobile operation.

Vern points out further that on a mid-band frequency you get sidebands from both sides, while on the band edge you get them only from one side; modern receivers are pretty good at slicing off one entire side of a signal these days. Also, since the frequency in each band should be one available to all possible modes of emission, the band-edge frequency should be in the "phone" band, not the c.w. band.

We could and will point out a number of disadvantages to these proposals, but we'd like to give you a crack at them first. What think? Shall we change our NCE frequencies to 3995, 7295, 14,345, 21,445, 29,695, 53,995 and 147,995 (or, in the case of 6 and 2 meters we could use the low band edge, if preferred) and employ the "pause" technique? We can't take a vote on this, we have only your opinions, our own judgment and the dictates of logic to go on. If you feel strongly about it, one way or another, better let us hear from you before we commit any overt act. If we don't hear from you, we'll assume that (1) you couldn't care less, or (2) you don't read this column.

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Amateurs were of material assistance in the Tennessee-Georgia-Alabama area on Mar. 3-4-5-6 when heavy snowfall isolated many towns and created emergency communications conditions, evacuation problems and power failures. Most of the homes in this area are heated by electricity, so evacuation became mandatory. The AREC was activated on Mar. 3 at 1900 and was on constant duty until 2030, Mar. 6. Reports and clippings sent in by W4TDZ and EC W4JVM reveal some of the situations met.

On Mar. 3, Cedartown, Ga., was without telephones and some power lines were down. The Central of Georgia Railroad, whose trains were not running because of the storm, contacted K4IMQ, who established communication with W4DLK in Chatttanooga. Through this link it was possible to restore operation of the railroad.

On Mar. 4 the National Guard was called out but was without communications. K4TSC set up at the Signal Mountain Fire Hall and Police Station and six mobiles were dispatched to handle communications between the road blocks, patrols and headquarters. A control station and mobiles were also used on Lookout Mountain in the same manner, with K4HXD and KN4LGS operating the control station. Mobiles included *W4s* DIJ ARI JVM TDZ ZJV and K4ICH. K4HXD worked for over an hour in below-freezing temperatures to install a mobile for W4DIJ.

K4KMT provided Fort Payne, Ala., with a link to Chattanooga all day Mar. 4 through a station set up at the Fort Payne city hall, the only communications link out of Fort Payne. Traffic concerned deaths, illness, weather and private business. A farmer near Fort Payne was left with 5,000 baby chicks about to freeze to death through lack of power. He contacted K4TNZ at Greenville who relayed the message to K4HVF in Chattanooga and returned an answer giving instructions as to where to find the nearest shelter, food and heat for the chicks; the entire transaction took less than 45 minutes.

In addition to supplying communications, the amateurs in many cases were also able to help out with their emergency generators for churches (used for shelters) and the Red Cross. All in all, the amateurs under the direction of W4JVM, EC for Hamilton County, Tenn., acquitted themselves in admirable fashion in this serious emergency. W4JVM gives us the following additional list of amateurs known to have been active: *K4s* AWL CMY HDF IXN KTC MDA MOC MQA TND VYR VZV, *W4s* ADW BBW HOI HTS KPR OVG PL VUV.

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Heavy icing on electric and telephone wires isolated a number of ranchers in Western Nebraska on March 8. KØCYN relayed the word of the failure to WØRJA in Alliance, who contacted authorities and a crew was sent out to restore power. Considerable hardship would have been experienced had this contact not taken place. — *WØRJA.*

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Western North Carolina amateurs furnished communications for folks in the mountain area during the heavy accumulation of snow that started late in February and lasted until mid-March. Operations commenced on March 10, when K4MZZ and W4EKS, with their equipment accompanied a rescue squad from Elkin to West Jefferson. One transmitter was set up at the Electric Company and another at a heliport outside of town. From this beginning, amateurs began setting up circuits with Winston-Salem, Elkin, Banner Elk, Morganton, Shelby and other strategic points. Upon arrival of the rescue squad from Shelby, some two-meter circuits were set up, and on March 11 MARS went into action, also K4GPA operating from Fort Bragg. On the same date the Winston-Salem RACES group went into action arriving in West Jefferson at 2300, with three operators and their communications bus, using the club call W4NC/4; this setup relieved K4MZZ and W4EKS, who had been on duty for 36 hours. Cooperation between all services concerned, communications and otherwise, was excellent. As an example, K4MZZ asked W4RRH to determine if a landing strip for helicopters was prepared at Boone. The nearest amateur contact was W4WID at Lenoir. W4RRH asked the local Sheriff's Department to contact Asheville State Highway Patrol, they in turn contacted Boone and the message that the strip was ready was returned via the same route.

The Tar Heel Emergency Net frequency of 3865 was used both for c.d. and net purposes during the emergency. Several different modes of communication were used. Over 500 messages were handled at West Jefferson. At the close of the operation, State Civil Defense Director Griffin sent a message over the amateur circuits which was high in its praise of the "highly professional service" rendered. The following amateurs, not already mentioned above, were outstanding in the services they performed: *K4s* BYX CWH GHH GQO JIP KUT OGP YJG, *W4s* AAS BOH CPI DNE PZII ROE RRH RXH YJG YSB ZWF. — *W4RRH, SCM, North Carolina.*

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On April 10, K5RJI/mobile came upon an accident at a busy suburban intersection near Tulsa, Okla. K5RJI/mobile was in contact with K5TLB/mobile, K5ZGV/mobile, K5YBC and K5VIT. A call for police assistance was immediately made through K5YBC. After investigation, it was ascertained that no one was seriously injured. The police arrived on the scene shortly thereafter. — *K5RJI.*

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The AREC-C.D. group of Concord, Mass., was alerted at 1800 on Mar. 3 in order to set up communications facilities for the Fire Department, which feared fire outbreaks they would be unable to reach because of the 22-inch snowfall. An auxiliary station on 2 meters was set up at the Highway Department and transceivers were placed in four of the largest snowplowing trucks. The base station at Central Fire Station activated a 2-meter net and kept in constant touch with the road commissioner and town manager, receiving and relaying a constant stream of reports from the plows. By 0200 on Mar. 4 the storm had abated to the point where the plows had gained the upper hand and all vital roads were passable and the net was secured. Mobiles were dispatched to pick up the operators and equipment on the plows. The operation was under the direction of EC-RO W1WNP. Others taking part: *K1s* BRO GLM KEC, *W1s* KYC LMZ NKA WXC.

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While driving in Western Florida, K4SWQ was involved in a traffic accident on March 13 when another car suddenly pulled out in front of him. He called for assistance on his mobile rig and was immediately heard by W4RKH in Fort Walton, who was monitoring the 29,560 frequency, as usual. W4RKH notified the sheriff's office and Highway Patrol. Meanwhile W4IQK, who was mobile near the scene of the accident and heard the communication, hastened to the location given and drove K4SWQ's wife and daughter to the hospital for a check up. Fortunately, none of the passengers was seriously injured. Also fortunate was the fact that the mobile rig continued to function even though the car was severely damaged.

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During the period from March 2 through March 6, the Rome, Ga., area was completely cut off by ice damage to power and communications lines and roads. EC W4YRL set up temporary antennas at the city garage and got on the air with emergency power on the morning of March 3. Later the operation was moved to the home location of W4BPW, assistant EC, from which point it continued operations through Sunday night, Mar. 6. Over 120 official

K4YRL, EC for Floyd and Barton Counties, Ga. (at mike) and W4BPW, Asst. EC for Floyd County, hard at work handling emergency communications during the ice storm which isolated Rome, Ga., in March.
(Atlanta Constitution Staff Photo.)

emergency messages were handled, plus a number of personal emergency messages. Cooperation of other amateurs in the area was excellent, with due credit to the Georgia Cracker Net.

W4GJZ, assistant EC for Bartow County, with nine AREC members, did outstanding work in that area. He and K4CLQ in Rockmart spent many hours dispatching trains for the N.C. & St. L. and Seaboard railroads, which had no communications. Many AREC members were off the air because of power failure. — *K4YRL, EC Rome, Ga.*

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Now about those midwestern floods in late March and early April. The area affected was a large one, and we have reports from Iowa, Nebraska, and South Dakota. As usual, the amateurs did a tremendous job in communications. Where to begin?

Let's start with a summary of the account in "Statie," the bulletin of the Sioux City Amateur Radio Assn. First word of the impending flood in that area came on Mar. 28, when all amateurs were asked to report to the city auditorium as soon as possible by KØBXO, Woodbury County EC. Followed the business of setting up a control station (WØERG, at the auditorium) and dispatching mobiles (about 10 of them) to various points along the Floyd River to assist evacuation procedures and report river stages. Conditions not being too good, WØMHC in Leed was called on to relay from the mobiles to the control station. This went on all night and into the next day. On March 29, while mobiles were cruising up and down the river to report stages and ice jam conditions, KØEMH was set up at the Riverside Red Cross headquarters. Mobiles were being kept busy reporting results of attempts to break the ice jams in the river. In the evening QRM became bad and the aid of WØDJU was enlisted as a relay for the mobiles to the auditorium. Many mobiles worked all night. On Mar. 30 the ice jam was broken and the river holding its own, so most stations were on standby until 1600, after which patrol activity resumed. WØDJU again served as relay. On Mar. 31 an attempt was made to establish communication on 6 meters to avoid the QRM previously experienced, but this was unsuccessful. At 1800 on April 1, all amateurs were asked to report to the auditorium because of a flood threat on Perry Creek. Mobiles were dispatched, but it soon appeared that the Big Sioux River was the greater threat. Evacuation and river stages again became the problems. KØAUU and KØMMS went to the boat club to take hourly readings from a foot bridge. Readings were taken and relayed by KØLFA to the NCS throughout the night. By the morning of April 2, the Floyd river was backing up into storm sewers and flooding basements. In the afternoon, WØERG was moved to the Red Cross building and it became necessary to set up another station (KØLSU) at Army Reserve Headquarters, where evacuees were being taken. The three control stations, with WØDJU doing relay work, operated all night. By Sunday morning (April 3), flood waters had covered large areas north of Sioux City and activity was at its highest until midnight, when WØERG and mobile stations went off until Monday morning. By that time flood waters had receded and evacuees were being moved back into their homes. Amateurs were needed to assist this activity, also, which continued until Wednesday evening, April 6, when Red Cross informed the amateurs they were no longer needed. KØMMS, who wrote the account, mentioned the following additional calls: *WØs* VSR EQN OSO, *KØs* KGS KAR SIC.

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KØDYR, EC for Minnehaha County, S. Dak., reports that the Sioux Falls Flood Control Center requested the aid of the Sioux Falls Amateur Radio Club at noon on Mar. 29. A truck was readied, equipped with amateur gear and moved to Dell Rapids, from which point hourly river readings were relayed to the control center, KØLXF to KØDIY. This operation continued until March 30 at 1615. Reports were also received from W0QDU at Flandreau. Manning the truck were *WØs* HON RWE SMV, *KØs* QPK SZJ and DKV. Receiving reports at Sioux Falls were *WØs* DIY RRN and KØDYR. WØOOZ/mobile was also active in the operation assisting in evacuation procedures. On April 1 the amateurs again assisted for the same purpose, with some of the same crew doing the job, plus WØPHR. Band conditions were very bad, but no reports were missed.

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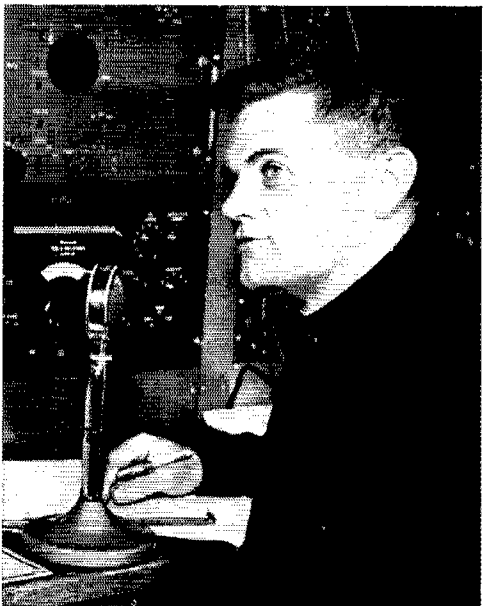
Amateurs in the Burlington, Iowa, area were also active during the flood conditions in early April. EC/RO KØAFW was alerted by the Des Moines County C.D. on April 2 to supply communications at Wever, where the Skunk River was flooding. Two mobiles provided traffic direction on highway 61, which was covered with water. This highway was closed at 1730 and the next morning was under three feet of water. At 1800 three mobiles were put into operation at points along the levee, on two-meter f.m. One served as a link between the walkie-talkie network on the levee and flood control headquarters, with the link back to Burlington on 75 meters. Ten walkie-talkies were so operating, handling information as to the condition of the levee at various points and emergency requests for men and supplies at trouble spots. At 1400 a 6-meter net was established. At 1800 the link to Burlington was changed to 10 meters to avoid QRM.

On April 3 a request was sent to Burlington for batteries, but none was available. They were obtained from Des Moines National Guard Headquarters and sent by plane. K9IDW helped out with this transaction. Four mobiles



Rev. Thomas Haller, KØLDO, handled a significant amount of emergency traffic during the flood emergency in Northeastern Nebraska in late March.
(Photo by KNØZLV.)

were in operation most of this day.

On April 4, the river level began to fall and traffic became routine, so equipment was pulled out and operators returned to Burlington; however, all operator personnel remained on standby until midnight. KØAFW lists 17 operators who put in 290 man hours during this emergency. Those listed as having participated (hours in parentheses): *KØs* IWA (12) URL (14) EXT (5) AAH (32) ZMIU (23) VFW (10) UVE (40) AFN (42) *WØs* UTG (15) QVA (23) TQG (6) DVP (4) ENM (4) MDU (15) K9IDW (24) K9UWA (3).

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On April 15 at 1735 CST a tornado struck Louisburg, Kans. With only one telephone line open, commercial news sources required assistance in getting details of the damage. WØOCK drove to the scene and set up communications on 29.1 Mc. with WØTOD, using the facilities of WØZCL. Traffic began to flow immediately, consisting of storm damage reports, casualties and incidents. Without the amateur circuit, the receipt of this information by radio and TV stations would have been greatly delayed. — *WØTOD.*

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The month of March brought reports from 27 SECs, all of them already on the record for 1960. A total of 9394 AREC members were represented. Even though this is down somewhat from last month, it is still better than the same month last year, which was better than March 1958. So things continue to look up for the AREC. Sections reporting March activities: Ga., S. Texas, N. Y. C.-L. I., N. Mex., Mich., Ala., E. Pa., Santa Clara Valley, Va., Colo., Ore., Okla., E. Bay, Maine, Utah, Minn., Wash., N. Tex., S. Dak., E. Fla., Wyo., San Joaquin Valley, Ind., Nevada, Vt., Ont., E. Mass.

RACES News

The Dane County (Wis.) RACES group conducted a test of its facilities on March 29, in cooperation with the Red Cross. Twenty mobiles were assigned patrols in the area. The control station was set up at the Red Cross building, with an alternate control station at a local radio station transmitter site. K9KVA, radio officer, operated the control station, assisted by W9RBI; emergency power was used throughout. Additional fixed stations took turns as acting net control. Some of the mobile units were able to assist motorists stuck in ditches because of the heavy rainstorm, and police were summoned in these cases, all in stride. — *W9RBI.*

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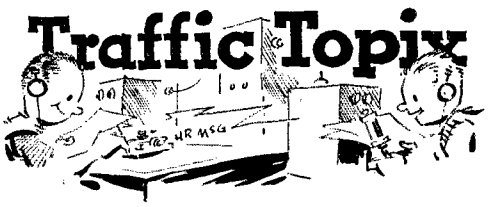
On Mar. 27, a RACES test was held in Portland, Ore., using two meter equipment exclusively. The main transmitter at c.d. headquarters controlled the activities of seven mobiles on 144.17 Mc., all fixed frequency f.m. The test was very successful. — *W7JDX, SCM Ore.*

This control station, part of the Dade County, Fla., RACES setup, is located in the city auditorium in Hialeah, Fla., and is equipped to operate on all bands. At left is K4AHW, radio officer for Zone 3. Seated is W4ZYK, alternate radio officer and assistant EC for Dade County. *(Photo by W4IYT.)*

Traffic Topix



Remember our proposal in December, 1959, *QST* for some new QN signals? You don't? Well, dig out your copy and take a gander. Then hear this:

We received a comment from *one* amateur. We won't name him, because we don't want him to feel conspicuous. (Incidentally, he only partially agreed with us.) This doesn't exactly take on the aspect of a mandate from the membership, and we would be justified in doing nothing. Anyway, that's one way of looking at it. The other way is that "silence gives consent," and if nobody particularly cares one way or another, as long as we still think it's a good idea we might as well go ahead and put it into effect.

So, what to do? Decisions, decisions . . . Well, the matter came to a head when the assistant circulation manager came in waving a copy of the Operating Booklet and saying that we were almost out of copies and had to make a new printing, so if we had some changes to make, now would be the time to make them. The decision had to be made, and fast; the assistant circulation manager isn't a man to be fooled with. Throwing all caution to the winds, we took our blue pencil in hand and with a few bold strokes and a little marginal scribbling we changed three of the QN signals, to wit:

QNQ no longer has anything to do with QNC. It now means: "Move frequency to . . . and wait for . . . to finish handling traffic. Then send him traffic for. . . ." This is for NCS in QNY procedure.

QNV no longer has anything to do with QSV. It now means: "Establish contact with . . . on this frequency. If successful, move to . . . kc. and send him traffic for. . . ." Also for NCS use.

QNZ can now be used by any station instead of just the NCS. It now means: "Zero beat your signal with mine."

These changes now appear in the new printing of the Operating booklet. Operating Aid No. 9 has also been changed. See December *QST* for details on how the first two of the above signals will be used by NCS.

Now, you NCS's, the purpose of the changes will be defeated if you use these new signals unnecessarily. If you are reasonably sure that the two stations concerned can copy each other, the thing to do is *avoid* their use — otherwise you are wasting more time than you make up for by using them when necessary.

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While we're on the subject of QN signals, this seems a propitious time to point out something else that doesn't seem generally understood: You *never* use a question mark with a QN signal. It isn't necessary. Either the signal is a question or it isn't, depending on which signal you are using or how, when or by whom it is being used.

And while we're on the subject of Q signals in general, it seems a good time to point out that QRX no longer means "stand by." There is no Q signal that means this any more; why not just say AS? The nearest thing to it is QTX which, in question form, means: "Will you keep your station open for further communication?" Without the question, it means the same thing affirmatively. This is also a useful signal in network operation and has been included in the new Operating Booklet list of Q signals.

You phone traffic men: pardon us for leaving you out of the above discussion. It doesn't apply to you. You just *say* what you mean, in as few words as possible — but you use *words*, not abbreviations.

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This month's quote is from *Kentucky Ether Clippings*, the bulletin of the Kentucky Nets: "Slow down enough to get it right. Review those Q and QN signals in order to learn their true meanings. Be deliberate, think ahead, make good, clear, distinct signals. Don't haul off and start into a word like honorificificatudinatimous unless you know you can spell it in one breath! If you hesitate one split instant on a long word, the receiving operator gets it as two words."

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for April traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	351	2996	2747	463	6557
K2UTV	217	3033	2955	70	6275
KØFCT	2701	625	538	87	3951
WØLGG	801	651	600	48	2100
WØSCA	26	995	963	0	1984
WØLCX	26	960	901	59	1946
K1FDP	182	847	706	131	1866
W6YDK	1355	207	151	40	1753
W5FDB	0	823	724	73	1620
W7BA	7	802	751	51	1611
K6MCA	196	689	600	45	1530
W8UPH	20	696	616	68	1400
K1MMQ	462	506	388	22	1378
W9DYG	14	657	574	78	1323
KØONK	152	584	550	34	1320
K2YZI	34	622	611	18	1285
K9AIR	209	417	23	603	1252
W9OHJ	1	622	611	11	1245
K4QLG	735	221	102	119	1177
W4PL	27	573	526	30	1156
WØBDR	17	619	498	9	1143
W7DZX	4	514	479	32	1029
WA2CIG	100	465	456	6	1027
W9DO	19	454	36	437	946
W6EOT	17	453	421	21	912
K6YBV	41	453	398	16	908
W6RSY	36	485	279	99	899
W6GYH	102	397	376	13	888
W1PEX	20	398	377	13	808
K5USA	292	250	235	23	800
K6BPI	72	359	301	64	796
WØSCT	10	381	372	5	768
K6LVR	9	363	345	9	726
W6GQY	303	61	321	26	711
W1AWA	15	364	321	7	707
K2THC	22	344	334	5	705
K1CIF	204	274	208	10	696
K1CAU	18	336	316	24	694
W3VR	49	329	304	10	692
K4SJH	153	281	217	36	687
KØQEK	64	308	252	56	680
K6EA	159	275	204	23	661
W9CXY	3	311	301	10	625
K5OJD	2	309	298	10	619
K6ZCR	42	309	209	58	618
W7HUT	60	271	251	18	600
W9JOZ	20	292	278	2	592
W9TT	26	277	104	181	588
WØKJZ	59	267	139	98	563
WØTUS	76	272	193	21	562
KØCLS/6	36	267	233	25	561
W7BDU	4	274	273	0	551
K4QIX	7	284	244	10	545
W9MM	8	261	255	6	530
W5QMJ	8	260	249	10	527
W8DAE	38	254	141	92	525
VE2WT	114	206	203	0	523
WØWAL	61	230	187	43	521
W9IDA	6	256	252	4	518
W1BMU	32	258	219	8	517
W5OOF	88	216	192	19	515
W6QMO	38	257	151	68	514
W9IMN	61	226	44	179	510
K4EJI	45	235	209	20	509
W4PNM	19	236	201	51	507
Late Reports:					
KØFCC(Mar.)	14	331	334	12	691
W5CEZ(Mar.)	38	264	177	30	509

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	113	1138	1059	79	2389
W4LEV	271	524	488	33	1316
W6ZJB	466	368	281	63	1178
K6WAH	79	482	215	267	1043

BPL for 100 or more *originations-plus-deliveries*

W5LTB 390	W5ZHN 129	WA6EEO 103
K4SLR 200	W6DEF 124	K1IWP 102
K1NR 193	K5REH 120	W3KUN 102
KØLTJ 176	K4MXF 118	K6SXX 102
W9GJS 160	K9PLF 118	WA2CCF 101
K3WBJ 159	K6YLS 110	WA2CNS/VE8 100
W6BHG 147	K2DEI 109	K4OUI 100
K7BKH 147	W3TN 109	Late Reports:
W9DGA 138	W2VDT 108	W4SRK (Mar.) 150
K4BQP 137	WØQDL 108	WA2CNS/VE8 (Mar.) 133
W4QDY 130	K4KWQ 104	KØHSW (Mar.) 114
W4SHJ 129	W2EW 103	

More-Than-One-Operator Stations

W5AC 166 W0YQ 122

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W3HNK, K5MXO, W9GJS, W9IMN, KØDTK.

The BPL is open to all amateurs in the United States, Canada, Cuba and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

April Net Reports:

Net	Sessions	Check-ins	Traffic
Early Bird Transcon	..	....	601
Eastern States	30	371	470
20 Meter SSB	21	522	2134
Transcontinental Phone	..	....	2291
Interstate Phone	27	406	721
Mike Farad E & T	42	454	849
7290 Traffic	42	1305	774
Interstate SSB	30	1317	315
Hudson Traffic	30	418	316

National Traffic System.

April reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
1RN	57	771	.449	13.5	74.7
2RN	60	692	.496	11.5	94.0
3RN	60	603	.372	10.0	98.3
4RN	60	1017	.402	16.9	92.5
RN5	56	1361	.627	24.3	91.7
RN6	59	1174	.344	19.9	86.3
RN7	60	773	.323	12.9	44.4
8RN	53	348	.206	6.6	84.3
9RN	54	1256	.682	23.3	66.7
TEN	60	1132	.578	18.8	68.3
ECN	13	33	.153	2.5	69.2[1]
TWN	50	549	.334	11.0	66.8
EAN	30	1510	.930	50.3	98.3
CAN	30	1387	.854	46.2	97.8
PAN	30	1689	.759	56.3	100.0
Sections[2]	1311	10571		8.1	
TCC Eastern	100[3]	299			
TCC Central	60[3]	1286			
TCC Pacific	106[3]	1329			
Summary	2043	27780	EAN	12.2	PAN
Record	1720	19949	1.057	17.8	100.0
Late report:					
PAN (Mar.)	31	1914	.816	61.7	100.0

[1] Region net representation based on one session per night. Others are based on two or more sessions per night.

[2] Section nets reporting: WSSN & WIN (Wis.); SCN (Calif.); Mich. SSB; BUN (Utah); MDDS (Md.-Del.-D. C.); NHN (N. H.); SDN, S. Dak. 75 Phone & S. Dak. 40 Phone; SCN (S. C.); WVN (W. Va.); RIN (R. I.); QDN, FMTN, FPTN, GSSN, GN (Fla.); TN (Tenn.); AENT, AENB, AENP Morn, AENP (Ala.); QMN (2 Mich.); NEB (Nebr.); MSN, MJN, MSPN/Noon (Minn.); VN & VFN (Va.); NMBP (N. Mex.); Iowa 75; CPN & CN (Conn.); TLCN (Iowa); GSN (Ga.); KYN, MKPN (Ky.); EM2N & EMN (Mass.); BCEN (B. C.); Colo. HNN & CCN (Colo.); QIN (Ind.).

[3] TCC functions reported, not counted as net sessions.

Another month of 100% reporting on the part of region and area nets and the TCC, topping considerably our previous records in number of sessions and traffic total, despite generally bad conditions during the month. Nothing, but *nothing*, stops the NTS!

Section net reporting continues to grow heavier, but at the same time, it seems, sloppier. Section net managers and managers of other nets operating at section level are cautioned to be sure their reports (preferably on a form CD-125 or facsimile) indicate *how* they make liaison with their NTS region net, either direct or through another NTS net. Frequently this is not done and we are left in the dark as to the NTS status of the net reporting — in which case it is almost invariably omitted. Our space in the above summary is very limited. Only summary data on NTS section nets can be included. Data on other nets at section level and comments concerning them should be submitted to the SCM for consideration for his monthly column.

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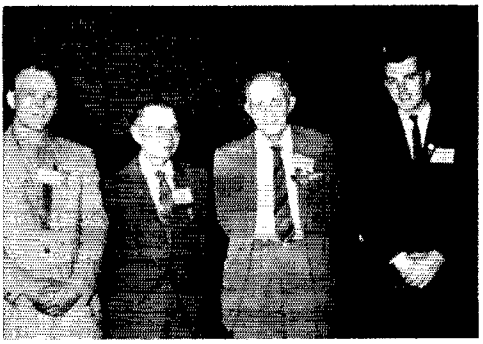
W2PHX reports that 2RN certificates have been awarded to W2EBG, W2TLO and K2UFT. W3UE makes a very encouraging report on conditions in his region, mentioning excellent prospects in all three sections and rapid, efficient operation of 3RN. W5GY has awarded RN5 certificates to W4DLM/5, K4GBS, *K5s* RDN BSZ, *W5s* OOF QMJ. W6RSY makes his first RN6 report, and it's a dandy; the net has changed operating time to 2000 and 2200 PDT (whatever that is). RN7 certificate has been awarded to W7GYF; first session starting time has been changed from 1945 to 1930 PST because PAN changed to 2000 PST.



These traffic notables were photographed at the Northwestern Division ARRL Convention in Portland, Ore., April 30–May 1. Left to right are W7DPW, W7ZB, W7FIX (publisher of Pacific Area Net News) and K7CLL.

Fellows, let's all go to GMT and stop this messing around, eh? W9ZYK has issued 9RN certificates to K4AVX, K9HNM and W9QQG. VE3AUU says several ECN sessions could not operate because "no signals." Conditions, you know. TWN now operates both sessions on 7060 kc. for the summer; KØEDH says she is skeptical, but participants wanted to try it. W9DO submits his last CAN report and promises to stay in there; W9DYG takes over as CAN Manager. W6PLG also sends in his last PAN report, as KØEDK, new PAN manager, takes over; Clem hates to give it up, but the business of making a living has to come first.

Transcontinental Corps. TCC schedules are going well, although "daylight saving" time has done the usual job of messing things up pretty badly. April magnetic storms played havoc, but the traffic total didn't seem to suffer. Note that more schedules were unsuccessful, however; this is not through lack of trying. The turnover continues, as the three TCC Directors strive to keep all vacancies filled.

We're sorry to report that Russ, WØBDR, had a tough time in the midwestern floods and a bout with the flu, but all seems about back to normal now.

April reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern.....	100	84.0	1407	299
Central.....	60	98.7	2572	1286
Pacific.....	106	88.7	2620	1329
Summary....	266	88.7	6599	2914

The TCC roster: Eastern Area (W1SMU, Dir.) — *W1s* AW NJM OBR SMU WEF, *K2s* SSX UTV, W2FEB, WA2APY, *K4s* KNP QES, W8PGW, *W9s* CXY DO DYG, VE2AZI/W1. Central Area (WØBDR, Dir.) — *WØs* LCX SCA BDR. Pacific Area (W6EOT, Dir.) — W5ZHN, *K6s* LVR YLS GID, *W6s* EOT QMO ELQ HC, WA6ATB, *W7s* GMC ZB BDU DZX, *KØs* DTK EDH EDK CLS/6, *WØs* ANA KQD.

HIGH SPEED CODE TEST RESULTS

The third semi-annual high speed code test, sponsored by the Connecticut Wireless Assn., Inc., was transmitted on Mar. 13, 1960, simultaneously by five stations on four different bands: W1BDI on 21,050; W1NJM on 3637 and 7120; W1TX on 14,095; K6EWY on 3550; W6OZ on 7001. Forty certified copies of the test were received. W1NJM, in charge of the program, now announces the following winners of high speed code proficiency certificates: At 60 w.p.m., W5JPC and W9YZO. At 55 w.p.m., W4DLA. At 50 w.p.m., K2BZ, W3GAU, K6VYJ, W9EDO/MIO. At 45 w.p.m., K1BPJ, W1WPR, W2CVW, W2LYH, W5OXO, W6RIL, W8APL, W9LHM, KH6IJ/1. At 40 w.p.m., W2JCA, W2MZB, W2TPV, W6INH, W9PNE, K9PTL, WØTDH, VE3IA.

The following get an E for effort, but failed, often by very narrow margins, to qualify at the speed for which they were trying (shown in parentheses). An asterisk indicates operators who already hold a CWA certificate for a lower speed. W2CKQ (40), K2SSX (40), K2UTV (40), W2ZVW* (50), W3MSR (50), W4AGV (40), W5FRZ (40), K6SMY (40), W7BHH (40), W9BRD* (60), K9DJM* (50), K9DJN* (50), W9NPC (40), W9QGL (40), KØILM* (60).

High speed practice continues once per week, on Sundays at 2030 EST (Monday at 0130 GMT), speeds ranging from 15–55 w.p.m. and 25–65 w.p.m. in that order or the reverse order. Primary frequency is approximately 7120 kc., other frequencies as announced during the call-up starting at 0115 GMT and during identification breaks. Next code test is scheduled for Sept. 11, 1960.

RESULTS, FEBRUARY FREQUENCY MEASURING TEST

The February 9, 1960 FMT, open to all amateurs, brought entries from 347 participants who made a total of 1372 measurements. Of these, 169 ARRL Official Observers submitted 734, and 178 non-OOs made 638 readings. All taking part have received individual reports of their readings. The standings accredited to the more precise in each group appear below; all listed show ability of the highest order in Frequency Measurement. September *QST* will announce details of the next ARRL FMT.

Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
W8CUJ.....	0.0	W1MUN/8.....	0.0
W8GBF.....	0.0	W8GQ.....	0.1
W5NKH.....	0.1	W1PLJ.....	0.2
W8YCP.....	0.2	WA8YHX.....	0.5
W2LS.....	0.6	W2VCX.....	0.6
W4CVO.....	0.7	W1HZZ.....	0.7
WØOTR.....	0.8	K2USA.....	0.7
W3UZB.....	1.0	W8LFI.....	0.7
K6RTD.....	1.1	W5YM.....	1.1
W2FE.....	1.4	K6DHQ.....	1.3
W6CK.....	1.9	W4SHL.....	1.6
W9TZN.....	2.9	W4AWY.....	2.1
W7LKQ.....	3.2	K6STZ.....	2.1
W6GQA.....	4.6	K5IBZ.....	2.1
W1OGU.....	4.6	K6HI.....	2.3
W2ADE.....	5.1	L. S. Fisher.....	2.3

W1AW OPERATING SCHEDULE

(All times are in Greenwich Mean Time — GMT)*

Operating-Visiting Hours:

Monday thru Friday: 1700–0500 (following day).

Saturday: 2300–0630 (Sunday); Sunday: 1900–0230 (Mon.).

Exception: W1AW will be closed from 0230 July 4 to 1700 July 5 in observance of Independence Day.

A map showing how to get from main highways (or from Hq. office) to W1AW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules.

Frequencies (kc.):

C.w.: 1820, 3555, 14,100, 21,075, 28,080, 50,900, 145,800.

Phone: 1820, 3945, 7255, 14,280,** 21,330, 29,000, 50,900, 145,800.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibration purposes.

Times:

Monday thru Saturday: 0000 by c.w.; 0100 by phone.

Tuesday thru Sunday: 0330 by phone; 0400 by c.w.

General Operation: Use the chart on page 101, May 1960 *QST*, for times and frequencies for W1AW general contact with any amateur. Note that since this chart is organized in EDST, the operation shown between 0000 and 0100 each day will fall in the evening of the previous day in some time zones.

Code Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Tuesday, Thursday and Saturday, and at 5, 7½, 10 and 13 w.p.m. on Monday, Wednesday, Friday and Sunday are made on the above-listed frequencies (except 1820 kc.). Code practice starts at 0130 each day. Approximately 10 minutes of practice is given at each speed. On July 19 and Aug. 17, instead of the regular code practice, W1AW will transmit certificate qualifying runs.

* W1AW schedule is shown in GMT per recommendation of ARRL Board of Directors that use of GMT for amateur communications be encouraged. For ADST, subtract three

hours; for AST or EDST, subtract four hours; for EST or CDST, subtract five hours; for CST or MDST, subtract six hours; for MST or PDST, subtract seven hours; for PST subtract eight hours; for Alaska time (central part) and Hawaii subtract ten hours. Don't forget to change the *day* (to previous day) when subtracting takes you through 0000.

** Single sideband.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made July 18 at 2130 Eastern Daylight Time (0130 GMT, July 19). Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted July 7 at 2100 PDST (0400 GMT, July 8) on 3590 and 7129 kc.

Any person can 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 six 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 EDST (0130 GMT). Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date	Subject of Practice Text from May *QST*
July 1:	*A Vacuum-Tube Voltmeter* . . . , p. 22
July 7:	*Harmonics, Harmonics* . . . , p. 16
July 12:	*Simple Is Best*, p. 18
July 15:	*Some New Ideas* . . . , p. 25
July 21:	*The World Above 50 Mc.*, p. 78
July 26:	*Andaman Island Expedition*, p. 86
July 29:	*Der Loudenboomer*, p. 37

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....298	W1ME.....294	W1GKK....292
ZL2GX.....298	W3JNN....294	W9NDA....291
W6AM.....298	W6ENV....293	W6DZZ....291
W3GHD....297	W5ASG....293	W6ADP....291
W8HGW....296	W7GUV....293	CE3AG....291
KV4AA.....295	W9YFV....293	W8DMD....291
W2HUQ....295	W3KT.....293	W8UAS....290
W8JIN.....295	W9RBI....293	W2BXA....290
W2AGW....295	G3AAM....292	W6TT.....290
W6SYG....295	W4DQH....292	ZS6BW....290
W8BRA....295	W7GBW....292	W3BES....290
PY2CK.....295	W7AMX....292	W5ADZ....289
W4BPD....295	W8BKP....292	W4TM.....289
W6EBG....294	G2PL.....292	G4CP.....289
W6CUQ....294	ZL1HY....292	W8KIA....289

Radiotelephone

PY2CK....295	W8BF.....287	W6AM.....283
VQ4ERR....291	W9RBI....287	W8KML....283
ZS6BW....290	W3JNN....286	4X4DK....283
W8GZ.....289	W8HGW....285	ZL1HY....282
W1FH.....287	W6YY.....285	CX2CO....281
	W8PQQ....285	

From April 1, to May 1, 1960 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

W2CTN....241	G3LKJ.....106	K5MIW....101
W3DWY....201	W6QQW....105	W5UVR....101
LA8RB.....138	W0VHQ....105	K0RAL....101
DL6BP.....130	SM7BAU....105	ON4RN....101
OH2RL.....124	WA2GWF...104	ZL1ARY....101
K6LEB.....119	K4ASU.....104	W1AOL....100
KA2DE.....113	CR7DQ.....104	K1IFJ.....100
SM5ATK....111	ZB1CH.....104	W2HDW....100
K1IJG.....110	K4PUZ.....103	K2ZYR....100
W2JTJ.....110	UA3AF.....103	W3AFM....100
W2REH....110	W1HPZ.....102	K4KJN....100
W9MPN....110	VE3UOT....102	W6WSV....100
VE3BMO...109	I1APS.....102	W7AIB....100
UN1AB.....108	K1DXW....101	GZ2NU....100
W1WSN....106	K1IGO.....101	PA9MRN...100
W7DIB.....106	K2DJD.....101	G3KRC....100
G3AWA....106		SM5BBC...100

Radiotelephone

K2ZFH.....130	OQ5CJ.....108	K0RDO....103
W2YBO....127	OZ5JT.....108	K2GKU....102
ZL2AHZ....125	OH2RL.....106	K9KKR....101
EA8BC.....121	W6VUW....105	DL3BK....101
W8BXO....120	VQ3PBD...105	KA2DE....101
W1OKG....118	K4PFS.....104	9G1CW....101
WA6EYP...116	PY5GA.....104	K4ICW....100
VE2AFC....110	W8TTZ.....103	W8ACT....100

ENDORSEMENTS

W3KDP....271	W6ULS.....250	W2DGW....223
W0QDF....271	W8GLK.....250	SM5CCE....223
W4HA.....270	W2FXN.....244	W0AJU.....221
W6EFR.....270	W6DBP.....242	W1EQ.....220
W2IWC.....264	PY4AO.....241	W1ODW....220
W7HIA.....262	W1CBZ.....239	K5BGB....220
W3OP.....261	KV4BB.....235	K9AGB....220
W7HKT.....260	W2HO.....234	W9GFF....220
W2NUT....252	YS1O.....233	W4IEH....215
W2ESO.....251	W6KUT....230	W4JAT....215
W3ALB.....251	K6LGF.....230	W2FAR....211
W2AEB.....250	CE3HL.....229	W6KG.....211
W6YK.....250	VE3DKY...226	W2PZI.....210
W5DML....210	K2UVU.....174	W4FNS.....140
W8JSU.....210	W1HWH....171	W8VVD....140
W2ROM....208	W2KIR.....171	K9PPX.....140
JA1DM.....208	W6MVL....171	VE1WL....140
W6SRU....204	K7GIE.....171	DL9KP.....140
W8ILG.....203	W7WDM....171	SP6FZ.....140
W2NOY....201	W3MSR....170	K2HVN....133
W4JBQ.....201	K5JZY.....170	K4YCW....132
W4DKP....200	W5PSB.....170	HH2LD....131
EA2CB.....200	DJ2KU.....169	W1UQP....130
W1WLW....199	W1YNP....163	W2IP.....130
W9INN.....199	W4PZO.....163	W2MOF....130
WA6EYP...193	W2BHU....162	W3HZQ....130
DL3BK.....192	W4IKI.....162	W6WLO....130
DJ3JZ.....192	W7CMO....161	W9TKD....130
W2FZY.....191	W9IJU.....161	W9TMU....130
W6HYG....191	ZL4CK.....161	SM5VN....130
W0FNN....191	W5AUJ.....160	SP1JV.....129
W2TP.....190	W5CK.....160	SM5BFE....124
W8IBX.....190	W0OBW....157	OE6FD.....122
W9NN.....190	K1JDN.....155	W3PN.....121
W0MCX....187	W2EHN....155	W5CYE....121
W1JSS.....185	G2AFQ.....155	W4MCM....120
G2BVN.....183	K4OMR....153	W5NXF....120
OH3TH.....182	W7YEY.....152	W6MDK....120
K2QHL.....181	W6PHF.....150	W7IAM....120
W4RNP....181	W0VIP.....150	W0DVZ....120
K4CLT.....180	VE3CIO....150	KP4AOO....114
DJ3KR.....180	I1IZ.....150	K4BUJ.....113
DU7SV.....180	VP7NS.....149	K9HOL.....113
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• 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, Allen R. Breiner, W3ZRQ—SEC: DUI. RM: AXA. PAM: IVS. The EPA C.W. Net meets nightly on 3610 kc. at 1830 EST. The Pennsylvania Phone Net meets Mon. through Fri. on 3850 kc. at 1800 EDST. The AREC EPA Net meets nightly on 3610 kc. at 1800 EDST. As of June 1 IVS has been appointed as the new PAM. Our heartfelt thanks and gratitude goes to TEJ for holding this appointment for the past five years. The Delaware-Lehigh ARC code and theory class ended with a net result of four General Class operators. The Temple University ARC is having a good turnout for its code classes. The Haverford Township RC held a 2-meter transmitter hunt Apr. 30. IVK and MYP did the hiding with 19 members doing the hunting. EAN was proclaimed hound-dog No. 1. The Delaware Valley Teenage Net is recruiting members. It meets Fri. at 1900 EDST on 29.250 kc. K3HYQ is now working with IBM. EU is the new manager of the West Branch of the Admiral Corp. YLL is looking for a new sky hook. The water tower, the former haven for his antenna, has been torn down. New equipment department: To K3HXC, another 80-meter antenna for his traffic work load. DJV completed a Viking Valiant. K3DQH traded a shootin' iron for an Apache. EML put the finishing touches to a new high-voltage supply. K3IPA and IPK joined the EPA Net. Try twisting that one around when you're NCS. The West Philadelphia Radio Assn. members were guests of the Philmont Mobile Club at the first meeting in its new club house. WNC is club president. The Southern Chester County ARC and the Chester County Emergency Net Club will merger as one. *VOX*, the publication of the Lehigh Valley ARC is edited by GCN. The Mt. Airy V.H.F. RC noted its 4th anniversary. We welcome K2RZD to the section; he is now located at Dalton. By the time this appears in print Field Day 1960 will be history. Those attempting it for the first time will have gained unforgettable experience. Old-timers at the game will be figuring on how to better next year's score. I hope everyone's set-up was successful. Traffic: W3CUL 6557, VR 692, MFW 296, HNK 262, AXA 176, KMD 168, K3IPK 108, IPA 102, ANU 91, DCB 86, DZB 82, HEX 75, W3ZRQ 53, ZLP 44, FKE 41, NNL 41, BFF 30, EML 27, BUR 25, K3BHU 22, W3OY 18, K3IPX 14, W3ADE 10, K3CRU 10, W3ITI 9, K3ANS 6, HXC 6, ALD 5, CAH 5, W3DUI 4, BNR 3.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—SEC: PKC. MDD Traffic Net meets on 3650 kc. Mon. through Sat. at 1915 EST; the MEPN (phone) on 3820 kc. Mon., Wed. and Fri. at 1800 and Sat. and Sun. at 1300 EST; MDDS and MSN (slow speed) Nets on 3650 kc. at 1845 and 2030 EST. New appointments: K3HJD and K3LNH as OES; 1WJ as OBS. The MEPN will hold its annual picnic and hamfest at Gaithersburg Fairgrounds July 24 and a big time may be expected by all! OO AHQ won the ARRL award as the leading Observer in the 3rd call letter area for 1959. Russ receives a year's subscription to the *Call Book* for his efforts in sending 701 advisory forms! K3ADS/3 keeps 6-meter c.w. skeds with Pa. K3AMC has his 20A-600L combination going well on 20-meter s.s.b. BUD has turned the MDDS Slow-Speed Net over to ZNW for the summer. K3BYB would like to see a Md. v.h.f. traffic net. K3BYD worked many 8s and 9s on 6-meter c.w. during the April aurora opening. CDQ continues her activity on 40 meters. CPM checks in as OO. CVE reports 17 Prince George AREC stations checked in for the May 4 test. K3DCP has the antenna up at his new QTH. ENU is the new vice-pres. of the Free State ARC. The club is active in many public demonstrations. EAX, at the U. of Md., has a new antenna. EKO is active in MDD and the Delaware Net. EOV is installing a PMR7. The Baltimore ARC meets the 1st and 3rd Mon. at the Red Cross Bldg. K3GBV reports plenty of 6-meter DX. K3GZK is trying a new antenna on 20 meters. HCE is rebuilding for RTTY. K3HDU checks in from Indian Head. K3HPG did real well in the '59 Novice Roundup. 1WJ is active in CD nets. K3IZM is starting out well as OES. The B & O RR ARC held a family dinner Apr. 23. JWN has a temporary job in N.C. and will be missed on MDD. KA is settling down to OO work after his recent Caribbean DX-pedition. KHA, WZL and UGE operated GQF/3 from Sussex Co., Del., during the recent Delaware Contest. LZZ took the Chesapeake ARC through the WBAL-TV studios. K3LNH likes working 6-meter DX and is active in OES activity. NNM and K3IYT provided contacts from a plane on Armed Forces Day. KØPIV/3 is helping MDD with a hefty signal. PRC is helping GZK on MSN. RNY has temporary overseas duty. TN keeps up his usual good activity and again makes BPL! TSG is an MDD regular. UE reports that K5OEA/3 is moving to R. I. K3WBJ turns in a good traffic report from Walter Reed Hospital. WG wants more volunteers for TCC. ZAQ likes OO work. UTR had an active station on the air at the meeting of the President's Committee for the Physically Handicapped. Nice work! Traffic: (Apr.) W3TSG 202, K3WBJ 197, W3TN 184, UE 176, AHQ 87, JWN 74, NNM 62, K3BYB 45, W3ZNW 35, K3AMC 30, W3BKE 30, K3GBV 30, W3EOV 19, K3GZK 18, W3IWJ 17, KØPIV/3 15, W3KA 14, BUD 11, EKO 4, HCE 4, K3LNH 4, DCP 2, HDU 2. (Mar.) K3BYB 56, GBV 39, W3EAX 3.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2BZJ, W2HDW and W2ZI. The Jersey Phone and Traffic Net totals for April are: Sessions 30, attendance 430 and traffic 105. During "Opal '60" the following were on duty at the State Control Center: W2BZJ, W2ISZ, W2VQR, W2OSC, K2AAR, W3BCJ, K2BPA and W2ZI. K2JJC, Pitman, is breaking in a new receiver. W2BAY, Haddonfield, is setting up equipment for satellite tracking. W2RHB has installed a new tower with the help of W2SDO. W2BLV, W2KDB and K2EW. W2ESX, W2PAU and W2BLV have been making the most of recent Aurora openings. The Burlington County Radio Club, K2KED, has a new tower and new antennas at its headquarters in Moorestown. Installation was made under the direction of W2GOK. W2UA, Moorestown, has returned from a European vacation. W2WKI, Burlington County Radio Officer, reports excellent participation in "Opal '60." Headquarters operators included WA2HJI, K2HOD, K2ECY, K2HJY, W2DEE and K2IJC. The Levittown (N. J.) Radio Club reports that 12 trainees have received their Novice licenses. WA2IVJ, Levittown, is presently located in Greenland. W2BV, Minotola, is breaking in a new rig on 50 Mc. W2ZX, the SJRA's DX chairman, reports a marked increase in the club's DX activity and scoring in the recent contest. The SJRA's membership chairman, K2UDA, and his able assistants, K2SHJ, WA2BLV, K2ODZ, K2MKD, W2HVE and K2DCI, are doing a very fine job. K2MKD was elected a director of the SJRA. No reports were received from clubs in Mercer, Atlantic, Gloucester or Cumberland Counties this month. A report of your activities is solicited. Traffic: K2DEI 184, W2RG 148, W2TLO 94, W2ZI 52, W2SXV 37, K2JJC 21, K2SNK 14, W2BZJ 12, K2SOX 7, W2IU 4.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. Rms: W2RUF and W2ZRC. PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900, ESS on 3590 kc. at 1800, NYSTPEN on 3925 kc. at 1800, NYS C.D. on 3510.5 and 3993 kc. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, IPN on 3980 kc. at 1600. Congrats to WA2CIG on a fine BPL total. Much fine work was accomplished by W.N.Y. hams in the Civil Defense Alert. I have received many reports of RACES drills conducted on an almost routine basis, with no confusion. This is the type of service the public has learned to expect from amateurs. Did you participate? 1HDQ gave a fine talk to the RAWNY on his way home from Dayton. K2DNN, EC for Chemung Co., has organized an AREC group. AWA has produced a slide-tape show on "Marconi First Amateur." W2QY headed the project. The RARA reports that 25 out of 39 passed their General Class exams at a club-arranged affair. From all reports the RAGS Spring Party went

(*Continued on page 100*)

CHARLES SEWELL, K1DXY/5—Raytheon field engineer—inspects Raytheon radar equipment aboard a B-58 Hustler supersonic bomber.

FIELD ENGINEERING WITH A FUTURE

Deep in the heart of K5-land

Checking the "eyes" of an Air Force B-58 Hustler bomber – its Raytheon navigational and bombing radars – has proved to be both an interesting and *rewarding* assignment for Raytheon field engineer Charles Sewell, K1DXY/5. Formerly a Marine air communications Maintenance Chief, Sewell is now Senior Engineer in charge of Hustler radar systems for the entire Fort Worth-Dallas area, where Hustlers are built.

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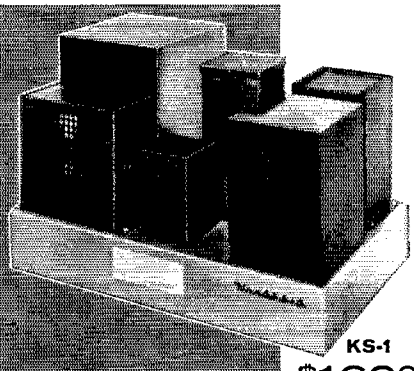

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$17.00 dn.,
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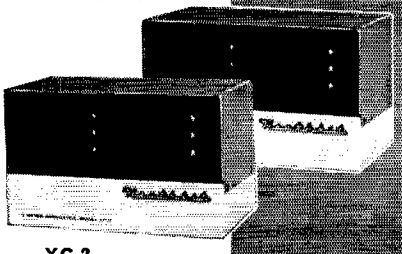

XC-2

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6-METER CONVERTER KIT (XC-6)

Extends frequency coverage of the Heathkit "Mohawk" and most other general coverage receivers into the 6 meter band. Converts 50-54 mc signals to 22-26 mc. 3-tube circuit provides two RF stages and low-noise triode mixer. Calibration accuracy assured by .005% overtone crystal supplied. Provision for external RF gain control. 6 lbs.

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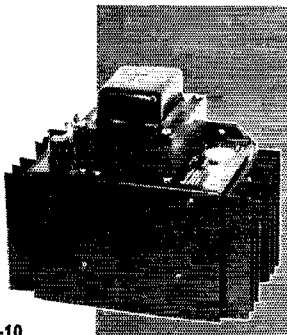
$39.95 each



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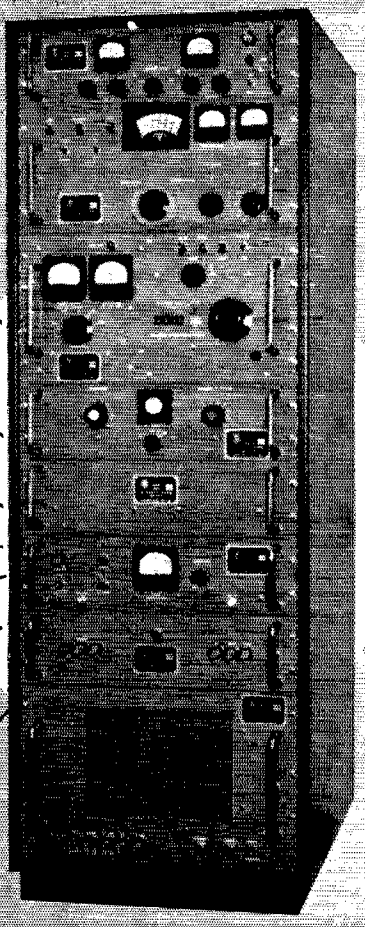

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All frequency determining elements in the SBG-1 are derived from a 1 mc source which has a phasing control for correction to an external standard. Also, the unit may be connected to an external standard of greater stability without degeneration to the standard. When the sideband exciter unit is bypassed, the Model SBG-1 may be used as an ultra stable R.F. frequency source.

Housed in a standard relay rack with 60 inches of panel space, the control portion requires only 29½ inches of rack space. The other components may be housed separately in the event this makes for a more convenient installation.

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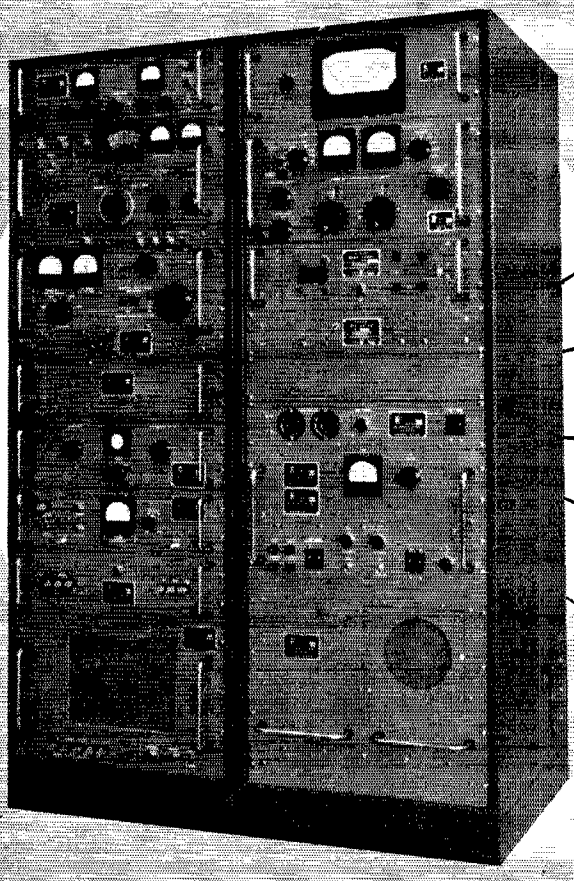

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It is a combination of the well known TMC 1000 watt transmitter and the new TMC synthesizer Model SBG-1 (described on left hand page). The unit features both a single sideband exciter and an FS exciter; a standing wave ratio indicator or an antenna tuning unit which also indicates SWR. Each model is supplied with a coaxial antenna changeover relay and a directional coupler.

Signal/distortion ratio is 40 db down from full PEP output. Second harmonic suppression is down at least 40 from full PEP output. Carrier insertion is from —55 db to full output.

Power Input: 115/230 volts, 50-60 cps, single phase.

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15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

☐ Std. 2-El Gamma match	19.95	☐ T match	22.95
☐ Deluxe 2-El Gamma match	29.95	☐ T match	32.95
☐ Std. 3-El Gamma match	26.95	☐ T match	29.95
☐ Deluxe 3-El Gamma match	36.95	☐ T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

☐ Std. 2-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 2-El Gamma match	31.95	☐ T match	34.95
☐ Std. 3-El Gamma match	34.95	☐ T match	37.95
☐ Deluxe 3-El Gamma match	46.95	☐ T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

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ON THE GOTHAM
V-80 VERTICAL ANTENNA

- If K6INI can do it, so can you.
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- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph windstorms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. ONLY $16.95.

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☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

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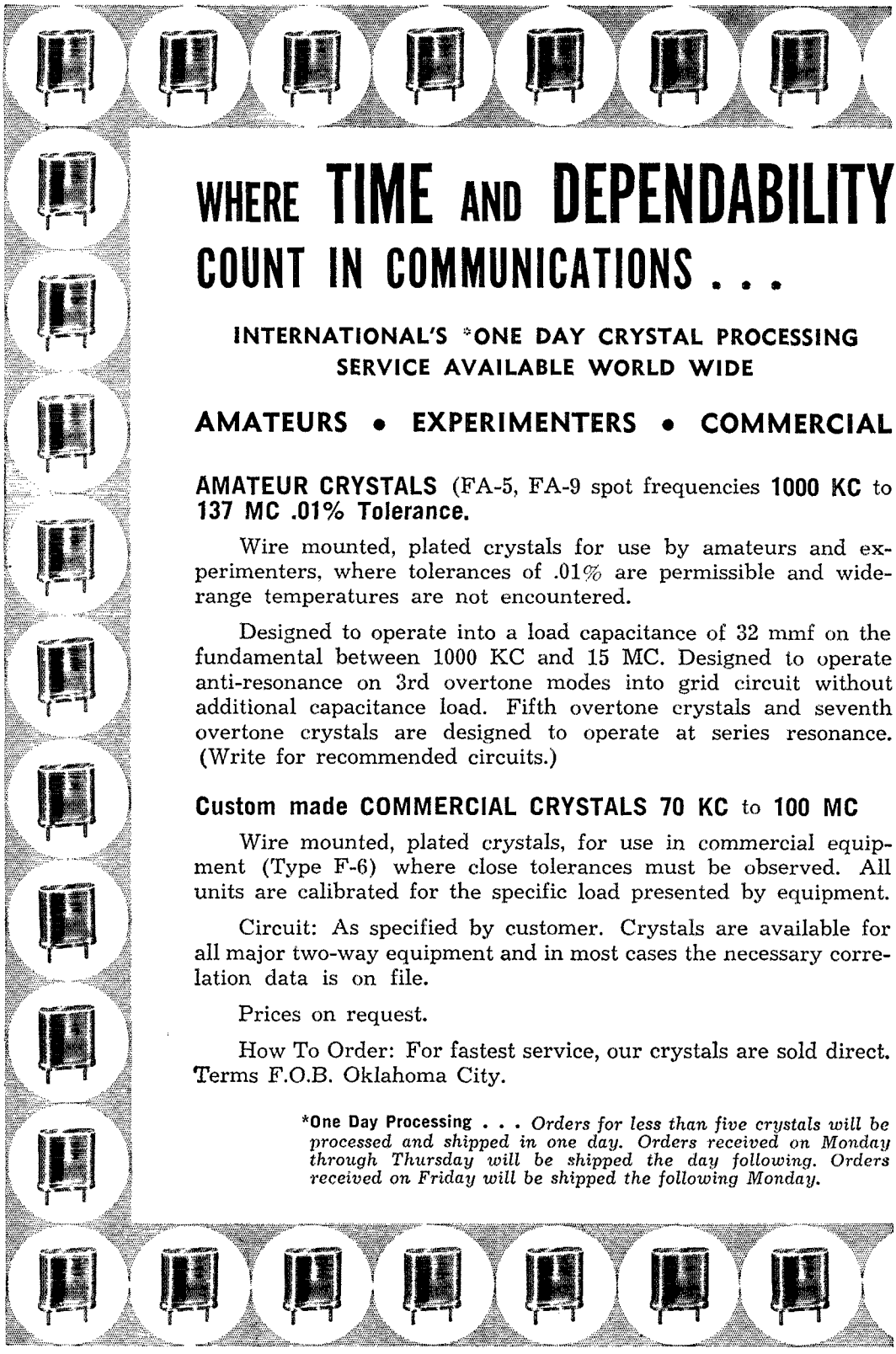

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Wire mounted, plated crystals for use by amateurs and experimenters, where tolerances of .01% are permissible and wide-range temperatures are not encountered.

Designed to operate into a load capacitance of 32 mmf on the fundamental between 1000 KC and 15 MC. Designed to operate anti-resonance on 3rd overtone modes into grid circuit without additional capacitance load. Fifth overtone crystals and seventh overtone crystals are designed to operate at series resonance. (Write for recommended circuits.)

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Wire mounted, plated crystals, for use in commercial equipment (Type F-6) where close tolerances must be observed. All units are calibrated for the specific load presented by equipment.

Circuit: As specified by customer. Crystals are available for all major two-way equipment and in most cases the necessary correlation data is on file.

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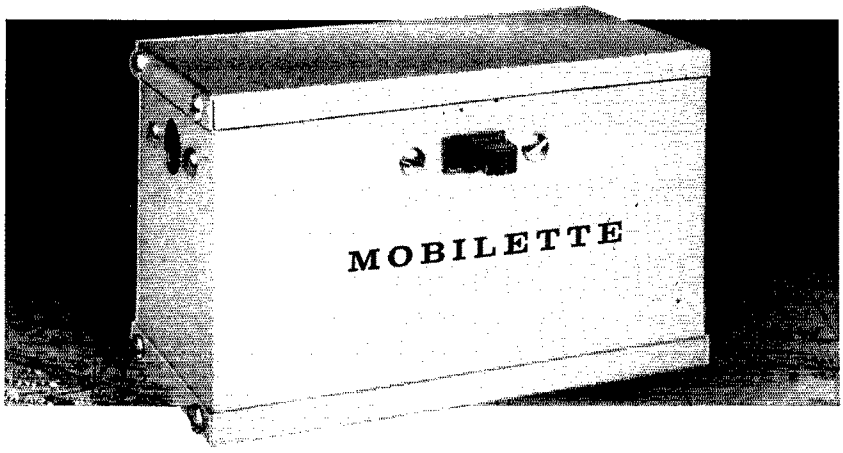

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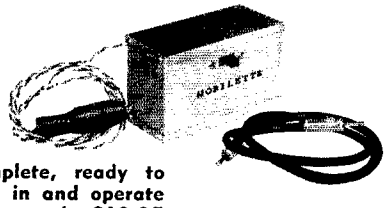

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(*Continued from page 88*

over with a big bang. More than 250 attended the hamfest and indications are that this could turn into the largest annual event in the section. The Northern Chautauqua ARC Banquet was a big success. K2HUK was speaker. Congratulations to W2BLP, the top OO in the nation for 1959! The Greene ARC reports a successful hamfest. WA2KVD, WA2INY and K2QKB are new 6-meter mobiles. The Buffalo Area is alive with mobile activity on 20-meter s.s.b. The gang includes K2VAW, W2WYC, K2KYA, W2RNK, W2LXE and K2HUK. The OARC published its first bulletin. A fine job! K2JPM reports QRP contact on 80 meters of 700 miles; his circuit has one watt output. WV2LDZ and WA2FDJ have 7 harmonics. W2TPV and K2UZJ tied for first place in the code contest at the RAGS Party, 40 w.p.m. plus. W2RUF conducted the test and each won a certificate, trophy and Mosely V 4-2 antenna. W2EUP has constructed a remarkable transistorized electronic bug with no "bugs." W2CXM now has its kw. on the air. K2KQC got married and she's temporarily off the air. K2KIJ is a real cartoonist—his pictures liven up each issue of CARA's *QRM* (in four colors yet!). WA2GCH does a fine job as editor of CVARC's *Ham Bulletin*. Traffic: (Apr.) WA2CIG 1027, W2EZB 474, K2SSX 290, W2RUF 255, K2RTN 132, WA2DSC 118, K2IYP 109, K2UZJ 108, K2AOQ 88, WA2CRH 80, W2OE 79, K2GWN 71, K2IMK 69, W2TPV 58, K2RWV 50, K2QDT 43, K2IMK 37, K2OFV 36, W2PVI 36, W2CXM 32, WA2EYJ 32, K2BBJ 30, W2FEB 26, K2JXF 26, W2PGA 24, W2BKC 15, K2EQB 8, K2OQO 8, K2RTQ 8, W2ZDL 8, W2QCI 7, W2EMW 2, WA2FML 2, K2HUK 2. (Mar.) W2EZB 411, W2TPV 58, K2IMJ 37, WA2DSC 28, K2EE 18, W2CQY 14, K2OQO 7.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: KUN, NUG and GEG. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The PFN meets Mon. through Fri. at 1800 EST on 3850 kc. KUN makes BPL again. K3HHB left for the Air Force. WRE now has her antique key collection in a private room in the shack. Congratulations to the Butler Senior High School ARC on becoming affiliated with the League. A new YL Novice is KN3LBO. BWU worked LU4DFN and LU2FAO on 6 meters for his eleventh country. UGV built a W9TO electronic keyer. The Nittany ARC (K3HKK) members are going all out on 2-meter projects. The Mon Valley ARC reports via *Parasitic Press:* K3DMF is on s.s.b., the club is offering a handsome certificate for working the club station ZHV and ten members. The Greater Pittsburgh V.H.F. Society reports the following: GXI/9 was a recent visitor in Pittsburgh, UFR worked LU3EX on 6 meters, K3KGC worked CX9AJ on 6 meters. RTV is sporting a six-element Telrex 55 ft. high. PGV won the POOS Contest. The Etna RC reports via *Oscillator:* Field Day was held at SFA's farm; KN3LKP is a new Novice in Munhall; PIE won the station award for contacting 5 club members. ZCS is taking legal action against the Borough of Wilkinsburg to erect a radio tower. SFX is recuperating from an operation. The Horseshoe RC reports via *Hamateur News:* LIV took first place in the Altoona QSO Party. K3CZK put together a 6-meter transceiver. JYM is building an HBR-16. JHG received his HRC Award. QKE has a Johnson 500. Reports from the Huntingdon County ARC: K3IGF recently received his ticket. K3JMR is joining the USAF. K3HXV is on 10-meter mobile. K3CKY received his WAS certificate. The Centre County 6-Meter Net has moved to Sat. at 2100. RBC has made a unique cartop 2-meter antenna. Traffic: (Apr.) W3KUN 308, WRE 284, K3GHH 162, W3MFB 84, LSS 63, K3HWL 50, W3UGV 23, UHN 16, K3COT 5, W3BWU 3. (Mar.) W3UGV 46.

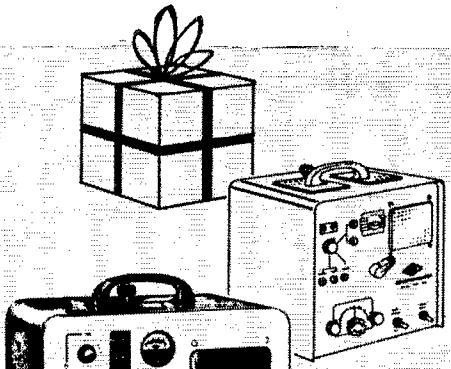
CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP. RM: USR. PAM: RYU. EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. Quite a large gang turned out to honor HPG, vice-director of this division, for his contribution to ham radio in Chicago. Among those in attendance were League Officials GPI, ILVQ and PRN. The McLean County Club has turned out a new bunch of Novice licensees. YMZ is back on the nets after recovering from a serious operation. Traffic count for the nets reporting this month: The ILN handled 330 messages in 18 sessions, the No Name Net a count of 82 and the North Central Phone Net completed 214 pieces of traffic. The Rockford amateurs cooperated with the local c.d. and other emergency groups when the recent flood stages reached that area. K9IVG received her A-1 Operator certificate. VBV is working DX with his new Valiant and has received his WAC award. MAK is burning up the c.w. nets with a W9TO keyer which is home-brewed. K9BHD has received 180 verified countries on his DXCC award. K9BJM is the proud possessor of a new WAC certificate. The RACES gang helped out with a booth at the Mississippi Valley Sports Show and the Boy Scouts Scout-O-Rama at Rock Island. K9KZB is the new Assistant EC of that area. KN9WLR is a new call in Ashley. QLZ reports that attendance at the Starved Rock Radio Club Hamfest was the largest and the venture was very successful. K9DCF won first in a trombone solo contest in the state-wide competition. K9BTE has hooked a new 20A to his Globe Champion and really claims he works the s.s.b. boys FB. K9JMA has completed a 6146 rig for 60 Mc. K9RAS advises that the Calumet Area Emergency Net discontinued operation on Sat. and Sun. as of May 1 and will resume week-end operation Oct. 1. RHV made the highest score during his club's SS Contest. JJN is back on the local nets after working mobile during his vacation in Arizona. K9MDK finally received his WAS award. Mr. and Mrs. Carl Mosley, of Mosley Electronics, were guests at the Montgomery County AREC Ham Scramble held in Litchfield. LZE and his XYL are the proud parents of a jr. YL harmonic. K9AMD is mobiling with a Communicator on 6 meters. K9WUA is a new call in the Montgomery County Area. 4IYR/9 has returned to this section after spending three months in Puerto Rico. The Hamfesters (Chicago) is busy getting ready for its annual hamfest. Arangements have been completed for the Central Division Convention to be held in Indianapolis Sept. 10 and 11. ARV has a new Gonset GSB-100 s.s.b. exciter and Drake 1-A receiver and has been spending a lot of time on 15 meters. K9QMJ's new rig is an HT-32 and he is working DX FB on s.s.b. The Joliet amateurs cooperated with the local Cancer Drive by volunteering to help in the collection of door-to-door solicitations. Traffic: (Apr.) K9AIR 1252, W9DO 946, IDA 518, IMN 510, USR 396, QQG 273, K9PLF 251, W9MAK 101, JXV 86, K9HNM 84, IVG 80, W9SXL 60, FAW 56, K9RAS 56, JMA 39, BTE 33, OAD 29, QYY 25, LXG 24, QYW 19, MDK 16, OEW 11, W9VBV 8, LGH 6, K9BIV 5, W9PRN 5, K9TAW 4, TKY 4, OCU 2, QPJ 2, W9YMZ 2, K9GDQ 1. (Mar.) K9CIL 48.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur Evans, 9TQC. SEC: SNQ. PAMs: BKJ, MEK, RVM and UKX. RMs: DGA, JOZ, TT and VAY. Net skeds: IFN, 0800 daily and 1800 M-F on 3910 kc.; ISN (s.s.b.), on 1900 daily on 3920 kc.; QIN, 1900 daily and RFN 0700 Sun. on 3656 kc.; QIN (training), 1800 M-W-F on 3745 kc.; CAEN daily at 1900 on 1805 kc. New appointments: FWH as EC of Madison County, BVR for Marion County and 4CTU/4 for Steuben County. K9RFW is OBS. New officers of the Winslow ARS are K9ULK, KN9UOI, KN9UQC and KN9SXE. Twenty-three clubs were represented at the spring Indiana Radio Club Council meeting. An amendment to the by-laws provides that each affiliated club must send a delegation to one out of three meetings to remain in good standing. QYQ is making like a chipmunk on s.s.b. New officers of the Columbus ARC are K9UVO, KN9SNH and K9PWU. The Hoosier Hills Ham Club entertained 75 at a dinner meeting and ladies' night. ZEB was guest speaker. Newly-elected officers of the Montgomery ARC are K9LVZ, PHJ and RNC. The Duneland ARA entertained 150 at its 3rd annual banquet. MEK has resigned as PAM for the ISN after a very fine job. K9AOM succeeds him. The Kokomo ARC has a new club bulletin, *Big Bull Bulletin*, edited by club members. The QIN is issuing an FB certificate to net members who check into the net 15 times or more each month for 5 months in any 6-month period. The QIN Honor Roll certificate is in recognition of steady members, rather than large traffic-handlers. ACW shares his shack with son K9QHL. KN9VWO is on 2 meters. *Amateur radio exists as a hobby because of the service it renders.* Apr. reports: UXK reports CAEN traffic at 59; IFN traffic, reported by RVM, was 259; ISN traffic, reported by MEK, was 224; VAY reports QIN at 468; JOZ reports QIN (training) totaled 62. Those making BPL: TT, JOZ, MM, GJS and DGA. Traffic: (Apr.) W9JOZ 592, TT 588, MM 530, ZYK 451, GJS 365, DGA 190, VAY 168, K9AYI 148, KN9TCG 101, W9RVM 74, K9MAN 63, ORZ 63, W9SWD 61, BKJ 58, FJR 51, MEK 51, BDG 49, K9YRU 41, W9CLY 39, RTH 38, K9LZJ 36, RMQ 26, W9ZPP 26, QYQ 22, YYX 21, K9GBB 20, W9DOK 19, K9IXD 19, ILK 18, W9EGV 17, FWH 16, K9LBD 14, W9DZC 13, K9UAN 13, W9BDP 12, K9BSU 12, GSV 11, HMC 10, W9VNV 10, BUQ 9, EJW 9, OCC 7, SNQ 6, TQC 6, YVS 5, K9IIJ 4. (Mar.) K9PDE 27, GSV 13, UPM 6, W9GUX 2, SFU 1.

(*Continued on page 102*)

A dozen years ago . . Gonset wrapped VHF into a tidy "package" and "Communicator"—the most widely used, *commercially*-produced 2-way equipment in amateur VHF history—came into being.



Down through the years, in step with VHF technology advances, Gonset has continued to set the pace with other, improved Communicators—Model II . . . Model III and now . . . again **"packaged"** for fullest operating flexibility and convenience . . .

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New . . . brilliantly new . . . throughout. Handsome, industrial-designer styling provides finger-tip operating convenience—an outer housing with desirable "form factor" which facilitates carrying . . . lends itself to horizontal or vertical mounting. Now . . . **for a new decade, an even finer VHF "package", Communicator IV!**

ADVANCED DESIGN FEATURES . . .
For the receiver . . . latest, frame-grid VHF tubes in front-end for excellent noise figure . . . triple conversion with crystal controlled first conversion—ANL—Squelch.

For the transmitter: 20 watts input . . . broad banded RF driver stages minimize tuning controls. P-P 6BQ5 modulators delivering more than 10 watts of audio, P-t-t-operation . . . high quality ceramic microphone supplied.

For the power supply: 12V DC/117V AC merely by changing cables. Transistorized DC supply eliminates vibrators.

Highlights: Frequency range, 143.7 to 148.3 mc. **Receiver noise figure,** 4 to 5 db. **Sensitivity,** *0.4 μv 10 db S+N/N. Noise figure 4 to 5 db.* **Receiver tubes:** 6ER5 RF 6ER5 1st mix. 6J6 xtl osc. and multiplier. 6AV6 2nd mix. 6C4 tunable osc. 6BE6 3rd conv. 6BA6 1st I-F, 6BA6 2nd I-F, 6AV6 det.—AVC rect, 1st aud amp. 6AL5, ANL, squelch, OB-2 volt. reg.

Transmitter tubes: 6360 fin. amp. 12BY7A xtl osc—tripler. 12BY7A, tripler, 12BY7A doub-driver. 7059 speech amp.-phase inv. 2—6BQ5's P-P modulators.

Dimensions: 5"H, 9½"W, 13"D. 21.8#.

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WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH. PAMs: NRP, GFL and K9IQO. RMs: SAA, VHP, VIK and K9ELT. New appointees: K9GSC as OES, K9UTN as OPS, VIK and VHP as RMs, the latter two taking over the managership of WSSN and WIN, respectively. K9RBG received his BEN certificate. K9PDJ has become a member of MARS. CXY, the outstanding NTS operator, is active again and received a BPL certificate along with DYG, the latter becoming new manager of the Central Area Net. K9GDF will receive four issues of the *Call Book* for being top OO in the ninth call area during 1959. Richard sent out 531 notices, making him fifth in the nation of 534 OOs. NOR received his 1st-class radiotelephone operator license. IKY has joined MARS. EC ONI, another MARS operator, is giving WIN its much-needed northern traffic outlet. K9JQA reports that the Four Lakes Club of Madison handled communications for the annual Scout-O-Rama. From the Oshkosh Club bulletin, *QRMer:* Ten 2-meter mobile transmitters are now available for c.d. work. K9RDI now is in Indonesia at the American Embassy. VBZ is active as head of the MRAC TVI committee. Traffic night at the MRAC was well presented by DYG and K9DTK. The picnic date of the club is set at July 17. EC AJU reports c.d. activity is on the increase in the Ashland-Bayfield Area. K9PTL finds his WIN operations were just what was needed during his recuperation. Out La Crosse way, as reported by BGB: KN9WEA is a new Novice. K9RJB dropped the "N" from his call, HJV is on RTTY. FZC now is permanently in Madison with the State Traffic Patrol. OMs, YLs and XYLs: If you're not making this column it's because your news isn't reaching here or is not of the right type necessary to be included. Your cooperation is appreciated. Traffic: W9DYG 1323, CXY 625, K9DAC 412, PDJ 211, ELT 123, GDF 101, JQA 80, W9KQB 79, LFK 41, NRP 37, VHP 34, CBE 28, K9DOL 27, W9MWQ 22, K9GSC 18, W9ONI 18, VIK 18, WJH 17, IKY 11, K9ALP 10, W9SIZ 8, K9UBC 7, LWV 6, IQO 4 LCA 2 NLE 1.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: KØKBV. PAM: KØKJR. RM: KTZ. KØMHC won second prize at the State Science Fair, held in Bismarck Apr. 9, with his model of a satellite. KØPVH entered a transistorized transmitter. KØRHE is building a converter for a BC-348 following the articles in *QST*. KØTPK will be off the air after receiving his General Class license because of a hitch in the Navy. AIU moved to Fargo, leaving the Jamestown Radio Club without a secy.-treas. and KØGRM now holds that position. PQW is the North Dakota State Radio Officer for RACES. While in Valley City on Apr. 18, HVA visited at the home of KØPVH. Traffic: WØBHT 49, KØGRM 41, GGI 15, DWW 14, WIM 14, CLD 11, WØBHF 10, KØMPH 8, WØYCL 8, IHM 5, KØITP 5, KBV 5, WØPHC 5, KØATK 4, WØOMA 4, TUP 2, KØPVH 1, TVM 1.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: SCT. The SFARC emergency truck operated during the floods in Southeastern South Dakota the first week in April, transmitting river stages to the Weather Bureau and flood control center. KØDYR has been appointed communications chief for Minnehaha County. KNØYUD is a new call in Sioux Falls. KNØZLK is on the air from Colman. KØHJB was severely burned during a chemical experiment at school. KØTAM is EC for Deuel County. KØRWY, formerly of Clark, has moved to Huron. The Signal Hill ARC demonstrated amateur radio at a booth at Deadwood and handled several hundred messages. MZJ, Brookings, has acquired a Ranger and a 6N2. KØEWJ, Beresford, has a new HT-37. Officers of the Mitchell ARC are GWW, pres.; GCP, vice-pres.; KØTKY, treas.; KØQMM, secy.; and WCN, act. mgr. The amateur club of the School of Mines was presented a trophy by Sigma Tau fraternity for having the highest scholastic rating on the campus for 1958-59. The club has a kw. home-made station, KØVYY, on the air. Traffic: (Apr.) WØSCT 768, WØDVB 462, BMQ 221, ZWL 159, KØDUR 31, AIE 17, WØFJZ 16, CTZ 15, DIY 14, KØACJ 11, TKN 11, WØNNX 7, OFP 7, RRN 6, KØLXH 5, WØRWM 5, VQC 5, KØSEJ 4, KLR 3, DYR 3, WØYVF 2. (Mar.) WØDVB 185, KØHSW 114, WØUAJ 95.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Rollin O. Hall, ØLST. SEC: TUS. PAMs: KØEPT and OPX. RMs: RIQ and KØIZD. URQ/KJZ had the honor and pleasure of spending an evening with 1BDI, who was on his way to the West Coast. The MRC Picnic will be held Aug. 7 at Lake Nokomis Park, Minneapolis. MARC's new officers are KØEWC, pres.; KØICG, vice-pres.; OGP, secy.-treas.; and KØKLY, on the Board of Directors. IRJ is back in Cromwell. QVQ and VYL have planted their gardens.

(*Continued on page 104*)

. . . the DB23 secret weapon of Big Gun DXer's

As DX becomes more competitive and condition less ideal, the sales curve of the DB23 is rising. Try a DB23 Preselector to *hear* for yourself why many leading DX men consider it essential. Top-engineered receivers, perfectly aligned and properly matched into your antenna should give optimum performance. But few hams have the facilities, the patience, the skill or the time to keep a receiver in perfect shape. The RME DB23 is a low-noise r-f amplifier which can be used to compensate for circuit detuning inherent in the best receivers. The RME DB23 will substantially improve the performance of almost all receivers on the amateur bands from 3.5 to 30 mc.

The DB23 consists of one tuned input circuit, which matches input impedances of 50 to 75-ohms unbalanced or 300-ohms balanced, followed by two stages of low-noise, neutralized, broad-band push-pull 6J6 amplifiers. Finally, a push-pull 6J6 impedance matching stage delivers the amplified signal to the receiver with output impedance of 150-ohms unbalanced or 300-ohms balanced. Power supply is built-in.

The voltage gain which can be expected from the DB23 varies somewhat with the band in use and the output impedance selected (balanced output gives 6 more gain). Minimum gain, using a balanced output connection, will be about 26db; while maximum gain, using the same output circuit, will be around 35 db. The tuned circuit in the DB23 adds selectivity to the receiving system.

Because the DB23 is a low-noise device, an improvement in signal plus noise-to-noise ratio (or usable gain) is experienced. This feature is quite pronounced with the less sensitive receivers, but even the better receivers will benefit. An improvement of 7.5 db in signal plus noise-to-noise ratio is not unusual. One control selects the desired band, another peaks the input. Continuous tuning is not necessary.

Most DX men will go through acrobatics to improve their competitive edge. Here is one way of doing it with nothing more than a screwdriver, two minutes of your time, and the modest investment of $49.50.

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WMA earned his sticker for DXCC 120 via phone. Director BUO and his XYL, KMP, spent a week in Chicago. KØSBB instructs a code class Sat. evenings in Rochester. GBG and his XYL returned for the summer from Arizona. University student ISJ received his Extra Class license. EC KØCPW designated COS, TJA, 1QW, and KØEVW as Asst. ECs. KØCAE, RSJ and GTT furnished mobile communications for the Mobilgas Economy Run. YUZ is stationed at Ft. Campbell, Ky. Novices UAZ and UBA are a father-son team on 40 meters. BQV is the radio technician for Eire Mining Co. BHA and KØMNY are new MARS members. EBX uses a rhombic on 10, 15 and 20 meters. JVX is building an s.s.b. final with a pair of 4X150s at 800 watts. 4PXX visited KJZ. RTN is chief engr. at WHLB. DOB's son, KNØUJF, has a DX-40 on 40 and 15 meters. KØs RDA and UKU are new MJN members. ARRL President TSN and his XYL, KØWKS, will be guest speakers at the Central Division Convention in Indianapolis. The Minn. RTTY "Rats Nest Net" meets Thurs. at 2000 CST on 3620 kc. PET renewed OPS and received ORS appointment, along with MSN members ISJ, KØs SNC and SNG. KØOQT is EC for Wadena Co. Class III-IV OO appointment was issued to KØJYJ. A special word of praise and thanks go to two "oletimers," GTX and TJA, for their many years of faithful participation in AREC as ECs in their respective counties. We are sorry that added duties in their businesses brought about the EC resignations. Traffic: (Apr.) KØQEK 680, WØKJZ 563, TUS 562, PET 237, QDL 185, KØSNC 124, IZD 96, WØHEN 85, NYM 85, KLG 83, KØQBI 81, WØKYG 71, RIQ 71, OPX 68, KØORK 68, LWK 62, WØISJ 61, UMX 55, LST 49, KØKYK 42, PML 42, IKU 37, WØTHY 34, KØRHN 28, WØVPO 25, KØJCF 24, MNY 23, ICG 22, UKU 22, KIN 21, WØBUO 20, KØOBP 19, SSB 19, WØDQL 15, KØJYJ 15, MAH 15, DHH 14, SNG 14, UXT 14, OQT 12, QYY 11, MGT 10, WØWVT 7, KØVXW 5, WØFGP 4, OET 4, KØIDV 2, KNØWYV 2. (Mar.) WØKFN 38, WVT 8, RA 5.

DELTA DIVISION

ARKANSAS—SCM, Ulman M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. RM: K5TYW. We were very glad to see so many of you at the hamfest in Eureka Springs. It was nice having our Delta Division Director with us. I feel sure we all profited by his fine talk and the information he gave us on AREC. Dee travelled a long distance to be with us and we are all grateful to him for coming. K5KMK has a new HT-32 rig and is putting out a nice signal on 75 meters again. W5DAG is back at his home QTH after being away for many months. GWB is back on the air after a long absence. GUE has joined the U. S. Air Force. We notice a growing interest in RTTY in this section of late. Miss. County now has two complete emergency stations set up for RACES and AREC, one in Blytheville and the other in Osceola. How about some news for this column boys? Traffic: W5SZJ 101, K5JXD 39, W5RYM 13, K5THF 11, CIR 8, W5WZN 8, K5ABE 6, PYD 5, KIX 4, TYW 4, W4OGY/5 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Section Emergency Coordinator MXQ made the trip to the Hamfest at Monroe, spoke to the gathering on the AREC and had a lot of eyeball QSOs. 4LDM/5, who has been operating in the Bossier City Area, has been awarded an RN5 Net Certificate. He operates regularly in RN5, LAN, UTL and TNX nets and is an Official Relay Station. JYD, who has been galavanting around the country, sent in a message through W4LDM/G that she was having a grand time and says hello to the MARS members. It looks like the Lake Charles Radio Club will not have a hamfest this year. K5CZV has a new Seneca transmitter on 6 and 2 meters and would like some reports. CEZ didn't make BPL in April, having missed a lot of early P.M. skeds because of pre-Easter activities and a couple of trips out of town. Carter has installed a BC-1306 in his car for mobile use. K5AGJ, the Jeffersonian Brass Pounder and Sidebander, has been reappointed ORS and OPS for another year. UQR, Official Experimental Station active on 50, 144 and 220 Mc., reports DX activity on 50 Mc. for 15 different days during April. NUH/K5SMR has been appointed OPS. With this report I start my fourth term as Section Communications Manager for Louisiana. I want to thank all who sent in messages of good will, especially 4RRN, Delta Division Director. I am looking forward to renewed efforts by all Communications Department appointees in the State and an influx of new blood toward a bigger and better organization in Louisiana. Traffic: (Apr.) W5CEZ 393, MXQ 177, K5AGJ 108, W4LDM/5 91, K5CZV 19, W5EA 2. (Mar.) W5CEZ 509.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—I recently visited the Tombigbee Club at Columbus. A fine meeting was held and many interesting topics were covered, such as Field Day, emergency activity, future

(*Continued on page 106*)

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meetings, etc. Thanks for inviting me, fellows. You have a fine club. K5IKB and W5SRU are interested in starting a post office net in Mississippi. Please contact them. K4LET has moved to Natchez. K5TKK has a new 15-meter beam. LWS has a new Drake s.s.b. receiver. I'm looking forward to seeing you at the hamfests this summer. Let me hear from you regarding a visit to your club. Traffic: W5JHS 24, RIM 18, K5MDX 12.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4EJN. RM: FX. PAMs: PAH and UOT. The Mid-South Club in Memphis reports participation in a fund-raising drive for the American Cancer Society and in the Cotton Carnival Regatta; also that a free radio school is being started. UVP reports that the Johnson City Club has a new generator. K4OUK describes how the OREN tracked down an unlicensed transmitter. TZG likes his new Hornet Triband beam. TZD has moved his OBS sked 5 minutes earlier on Mon. and Fri. mornings and is overhauling his 6-meter equipment and frequency standards. WBK is on 6 meters with a Heath HW-29. Thanks for the following reports: Net—UOT, FX and PAH; OES—K4KYL; OO—K4RIN and TZD. The Oak Ridge Club honored Director RRV with a dinner dance Apr. 30. Traffic: W4PL 1156, VJ 133, EIN 105, FX 105, OGG 99, K4AMC 80, W4FCU 55, K4JNK 55, W4PQP 49, UIO 35, UVP 26, K4OUK 25, W4TZG 15, DFR 14, UVL 14, PAH 11, K4LPW 9, W4JVM 6, SGI 6, K4ZQZ/4 6, FNR 3, KYL 2, W4TDZ 2.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: W. C. Alcock, 4CDA. SEC: BAZ. RM: K4CSH. PAMs: SZB and K4HCK. V.H.F. PAM: K4LOA. How many Kentucky traffic men read "Traffic Topix" regularly in *QST*? You can improve your ARRL procedure, expedite traffic, and have smoother operating nets by so doing. The old-timers will benefit as well as newcomers. SEC and State C.D. Radio Officer BAZ had a well-planned "Operation Alert 1960." A new OBS is K4LRX, a new ORS K4KWQ, a new OO K4ZRA. OO reports were received from K4BUB, ZRA, DFO, SZL and EJA. New on KYN are K4MPR and DWR. The v.h.f. meeting at K4ZQR had a good attendance in Louisville. A Heath HW-29 "Sixer" was demonstrated. DFZ is going mobile with a BC-1335. CDA is putting a c.d. station together in Danville. KKG reports conditions on 10 meters and skeds went to pot. The amateur radio station at the Scout Show in Danville won a blue ribbon. Traffic: K4KWQ 246, W4BAZ 207, SUD 135, K4AVX 114, W4ZDB 110, K4HOE 65, CC 58, KWE 53, HCK 48, W4CDA 34, K4VDO 25, VDN 24, W4SZB 22, K4JLX 21, KIS 20, W4UVH 20, NUQ 19, K4QHZ 17, ZBA 17, SBZ 14, DFZ 12, W4KJP 12, ADH 9, K4DFO 8 W4KKG 8, K4ZQR 5, IFB 3, W4SZL 3, WVU 3, K4LOA 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: YAN. RMs: SCW, OCC, QQO and FWQ. PAMs: AQA, K8CKD, K8JUG, ATB and NOH. (v.h.f.). V.H.F. PAM appointment went to PT: EC to CTY, PDP, QQO and RIW; ORS to HKT, PXA, YAN and K8KVV; OPS to CQU, QPO, VQN, YAN, K8CWG, K8LNV and K8LZF; OO to QQO and K8LOS. EMD (OO) turned in 200 violations for April, then while K8GXZ was helping to put up a steel mast it fell on Maury's leg, causing a double fracture and also fracturing an ankle! High voltage is not the only thing hams must be careful of. New officers of the Mt. Pleasant ARC are K8HSG, pres.; JRA, vice-pres.; VDI, secy.; K8JOC, treas. New officers of the Ford ARL are PEF, pres.; K8JXV, vice-pres.; K8LWP, secy.; K8GSA, treas.; PCR and K8LIB, act. mgrs.; K8KCO, editor. The FARL has a club station on the air and has an FARL Net which meets each Sun. on 28,800 kc. at 2100 EST. In the Flint Area IQS, QLR, DEA, QLX and QBO all have new 100V transmitters. Ham radio was demonstrated before the Hazelton School PTA. The St. Clair Valley ARC reports two petitions are circulating —one for the extension of phone sub-bands and one against! VPC agrees that OOs should check between 7.4 and 7.5 Mc. for harmonics. K8QLL is now General Class. From OES reports: NOH says S.W. Michigan is well covered on 144 Mc. K8BGZ notes that 144 Mc. is getting better in ths 60-mile area. BFF reports lots of openings. PYQ worked PT on 220 Mc., 85 miles airline. K8HNQ says that RHD worked Alabama, Arkansas and Oklahoma on 50 Mc. Oak Park ARC officers are TZU pres.; K8GZI, vice-pres.; K8KCJ, secy.; SMX treas.; K8GUM, bulletin editor. Officers of the Central Michigan ARC (Lansing) are OCK, pres.; FEV, secy. K8GJD decided to ground the antenna during a storm—result, one bad shock! K8EXE put grid-block keying in the DX-100. K8JUG has a new 40-ft. tower. CQU reports from U.P. for the first time. PXA now is on RTTY. K8EWI got a "Special Award" for the computer. EGI

(*Continued on page 108*)

NEW for Mobile...

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A five band mobile antenna with excellent radiating efficiency that changes bands without switches . . . that's the new Autowhip TM-5 by Mosley! Fully automatic electronic switching by means of simple series and parallel resonant trap circuits. These precision made, series-tuned traps improve SWR on the 10-15-20, and 40 meter bands and a parallel network achieves near unity SWR on 80 meters.

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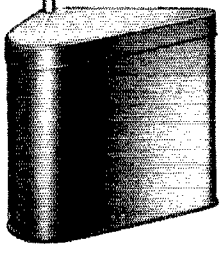

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is rebuilding the SX-11. IXJ replaced the HQ-120 with an HQ-180. The Central Michigan (Lansing) Picnic will be held at Grand Woods Park, Aug. 28. Traffic: (Apr.) K8OTJ 307, W8PGW 304, OCC 270, K8GJD 171, W8FWQ 134, JKX 127, K8KMQ 110, W8NOH 97, ILP 96, K8EXE 72, W8FX 65, JTQ 60. K8JUG 59, W8RTN 57, ELW 48, K8NAW 38, W8ACW 35, K8DJQ 33, W8YAN 30, TIJ 29, TBP 24, K8LPV 22, W8TQP 21, CQU 16, DSE 16, EU 15, NUL 15, K8AEM 14, JED 13, W8HKT 12, PXA 12, SCW 12, K8EWI 9, W8FDO 8, QIX 8, K8KCO 7, W8AUD 6, ALG 5, IBB 5, QPO 4, EGI 1. (Mar.) K8EXE 51, W8ACW 50, IBB 40, K8KVV 35, W8SCW 17, K8CKD 9, W8IXJ 6, K8KVM 4.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: HNP. RMs: DAE and VTP. PAMs: HZJ and WYS. CBN, of Dennison U., gave his famous antenna demonstrations and lecture before the Seneca RC. The Ohio Council of Amateur Radio Club's 1960 officers are GDQ chairman; GJS vice-chairman; THX, secy.; and AL, treas. Cleveland had a tornado warning and the Cuyahoga County AREC went into action with AEU, ADV, BAH, BHR, BPY, BVN, CFD, CTZ, EIL, EPM, GRY, IDM, INW, JDR, JFE, LHX, LKO, LVM, MHW, NLX, NNC, NRI, NZI, OIS, OZD, PVC PVQ, PYR, QXR, SLS, SQU, SUS, SZF, UNB, UNI, VQT, WLM, ZEP, K8s AAG, BVI, BWH, CDA, CFH, DBF, DBJ, DPA, DXV, EJH, EQN, ETF, GBH, GDF, GJW, GZQ, HNA, HVH, IEE, IJZ, IPI, IZL, IZM, JDQ, JGH, JHZ, JIZ, JSE, KAQ, KGP, KNJ, KRN, KTG, LHX, LMY, LXE, MBV, MBW, MLW, MXN, NHK, NHO, NHR, NHU, NLW, ONV, PCR, PIY, PXR, PXS, QNK, QXA, QXF, RFX and SBZ taking part. These 93 stations, which formed a weather net, were able to furnish information which the Weather Bureau requested of them. K8TOX is a new Technician in Canton with an HQ-170, Viking 6 and 2 and Finco A6-2 beam and, when he gets his General Class ticket, a Valiant and Gonset five-element Tribander. K8TBQ received his General Class license. Toledo's *Ham Shack Gossip* selected NWC as its "Ham of the Month." Through his untiring efforts the St. Lawrence Seaway 2-Meter Net has grown tremendously in the short time it's been on the air. "Ham Shack Gossip" also tells us that K8KDT is not feeling well, the Toledo Mobile RC showed for inspection the club project, a 2-meter transceiver, at its meeting along with movies and refreshments; FPU, HSW, NBD, TSD, K8s EUC and IUA are working DX on 160 meters; the stork brought FPU a baby daughter; the Teen Hams of Toledo's 1960 officers are K8KFP, pres.; K8NIW, vice-pres.; K8HVN, secy.; and K8NCS, treas. April appointments were FAN/8 as OES; ERW, LFJ, K8s BNL and LGA as ECs. K8SNG and KN8SVM are new hams. Your SCM attended the North East Ohio 50-Mc. Group banquet in Barberton along with 153 other hams and their wives. A talk and demonstration of amateur radio was given to Boy Scout Explorers Post No. 135 by AEU, TFW, UNB, and K8JHZ, members of the Cuyahoga County AREC. K8HTI is now on 6 meters, as are K8HZN and K8TOY, the latter being a new ham in Canton. The Columbus ARA's *Carascope* reports the club held an exhibition of small gizmos and gadgets and home-brew equipment. BYV has a new Globe King. K8DHJ is on 10 meters using a dipole. Joe Kramer, with National Lead Co., showed some of the measuring equipment used in his company's business to the Fort Hamilton ARA. *The Static*, edited by K8CHE, tells us the Soft Tube Club awards outstanding v.h.f. amateurs with a plaque on which a soft tube is mounted; and the stork brought K8AOG twins (a boy and a girl). CXM received his WAS. NP is in the hospital. VYU took unto himself a wife. K8QHJ received his General Class license. K8HXU joined Silent Keys. The Toledo Mobile RA and Lucas County AREC together collected forty-two thousand dollars during the Cancer Drive, with ADI, HDY, NKG, OFG, RZM, RZQ, UKX, VKR, WIT, K8s CWS, DPC, GIJ, HNI, JDS, KAS, LCW, LVR, NBQ and OFW assisting. The Geauga County amateurs again helped the sheriff during the Annual Maple Festival. April BPLers are UPH and DAE. Traffic: (Apr.) W8UPH 1400, DAE 525, SZU 250, BZX 145, K8DHJ 140, ONQ 53, W8YGR 36, AL 30, K8MTK 24, W8LZE 22, CXM 17, AEB 16, K8MYG 15, W8WE 15, K8GCV 13, BNL 12, BSR 10, W8CTZ 9, WSY 9, PMJ 8, LT 7, K8LTA 7, W8IBX 6, LMB 4, CL 2, HZJ 2, K8MFY 1. (Mar.) K8GWK 147, W8PMJ 46, FNI/8 12, K8MYG 12, MFY 10.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; SRPN on 3980 kc. at 1600; ESS on 3590 kc. at 1800; ENY (emerg.) on 29.490 (Thurs.) and 145.35 Mc. (Fri.) at 2100; MHT (Novice)

(Continued on page 110)

on 3716 kc. Sat. at 1300. Endorsement: K2CXO as EC. Congratulations to our two BPLers, K2UTV and K2YZI. Operation Alert was successful at all RACES levels. W2SZ, with a staff of operators and three rigs, kept traffic moving at a fast pace from State Control to Area Four. Local traffic also moved briskly on the v.h.f. nets and there appeared to be more AREC participation in ENY than in previous years. The Schenectady Club celebrated its 30th anniversary with an antique wireless exhibit and a special salute to the old-timers. WA2BMB scored 121,200 points in his first CD Party. A total of 39 states on 6 meters is reported by K2CVG. WA2AUI is operating on 1200 Mc. K2RRZ is on 6 meters with the Tecraft rig and converter. Two new Generals in Cohoes are K2TFH and K2TTG; in Albany, WA2AWY, WA2EBO and WA2JWM. K2UTC did well in the Feb. F.M.T. W2LWI reported three aurora openings on 2 meters in April. Bob worked North Carolina, Virginia and Ohio. K2LKI is very pleased with his new tri-band beam. W2VEF is on s.s.b. with a new HT-37. The Schenectady Co. 6-Meter Emergency Net held a simulated disaster drill for its mobiles. This net operates simultaneously with a sister net on 75 meters each Sun. Traffic: K2UTV 6275, K2YZI 1285, K2AYB/2 215, K2MBU 144, K2VCZ 137, W2PHX 123, K2LKI 93, K2RKY 79, K2LZW 58, W2ATA 53, W2EFU 46, W2SZ 46, K2BIO 27, K2OZT 27, W2CEV 12, WA2BMB 7, K2RTE 7, W2PKY 6, K2HNW 5, K2TTG 5, W2TYC 4, WA2EKE 2.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2VDT. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. nightly at 1930 EDT and Sat. and Sun. at 1915 EDT. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EDT. NYC-LI AREC, 3908 kc. Sun. at 1730 EDT. V.H.F. Traffic Net, 145.8 Mc. Tue., Wed. and Thurs. at 2000 EDT. BPL cards were earned by W2EW and W2VDT, both on originations plus deliveries. K2IRS is sporting a new eight-element 2-meter beam and Communicator III. A new 120-foot antenna at K2YQK has improved Dom's 80-meter signal. WA2BWC passed the General Class exam and is assisting newcomers in their quest for Novice Class tickets. Recent band openings on 2 and 6 meters have made many v.h.f. enthusiasts happy. K2MEM has a Heath HW-29 on 50 Mc. A new low n.f. 144-Mc. converter per Dec. *QST* is under construction at W2MDM. Six-meter hams who helped out in the Loyalty Day Parade in Brooklyn and received police compliments were W2MUB, K2DZA, K2LPU, K2RMA, K2TXA and WA2FKQ. While home for the Easter vacation K2UYG added two new countries for a DXCC total of 130. K2ZUX, daughter of K2JYM and K2JYZ, passed the General Class exam. Mom, Dad and daughter are now using an SX-101. W2OTA worked his sixth state on 432 Mc. New officers of the Polytechnic Institute of Brooklyn RC, W2BXK, are W2BWZ, pres.; K2SFZ, vice-pres.; K2RDP, secy.; K2VOL, treas.; and K2DBM, MARS coordinator. W2SEU/1, in Westover AFB, Mass., writes that he soon will be on 80 and 40 meters from W1-Land and v.h.f. from the home QTH. WA2GPT earned a V.H.F. Traffic Net certificate for her excellent attendance, missing only two net sessions in five months. W2ZJJ returned to the air with a Millen exciter. WV2JTC installed a 15-meter beam. K2RKL moved to Rockville Centre with his new XYL. New officers of the Federation of Long Island Radio Clubs are K2MQW, pres.; K2AZT, vice-pres.; K2EEK, secy.; and K2LCQ, treas. K2RQE is on the air with a Highbander, a v.f.o., an SX-99 and a Johnson 6N2 converter. Your SCM's brother, W4JQG/2, joined the married ranks. Please check your appointments for renewal. You will save me time and the mailing cost of reminders if you remember your own renewal date. Mobileers are urged to drive with caution during these crowded months on our highways. Traffic: (Apr.) W2VDT 270, W2EW 239, K2UFT 217, W2WFL 77, WA2GPT 73, W2DSC 55, K2SFS 46, W2GP 34, K2YQK 28, WA2BWC 24, K2LHA 17, W2DUS 16, K2QBW 15, K2THY 15, K2RHG 13, K2SJP 13, K2BH 10, W2EC 10, WA2DXH 8, K2IUT 8, WA2BST 7, WV2IMO 7, W2OKU 6, W2PF 6, K2AZT 5, W2JGY 5, K2CMJ 4, K2MEM 4, WA2EUL 3, K2KVL 2, K2MFQ 2, W2MDM 2, W2ZRA 2, WA2FDY 1, K2GB 1, WV2KAK 1, W9PVD/1 1. (Mar.) W2IN 2.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW—SEC: WA2APY. RM: W2RXL. PAMs: K2SLG and K2KVR. K2ZSQ and W2BVE made the OO Honor Roll. WA2KM's report was received on time —by ten minutes. W2NIY is spending most of his time observing instead of operating. K2LWQ and K2THC now are taking some 2RN assignments from NJN. WA2CCF made BPL for the third time on originations plus deliveries. K2VVL now has a 2 and 6 converter and a Gonset III. K2AGJ is chasing DX and working 2 meters. K2PVH worked E. Fla. on 75 meters in the recent CD Party for his best 75-meter DX. W2FSL

(*Continued on page 112*)

Introducing the NEW Globe Electronics Mobiline Six...

6 METER MOBILE OR FIXED STATION TRANSCEIVER CRYSTAL OR VFO CONTROLLED WITH 20 WATTS INPUT

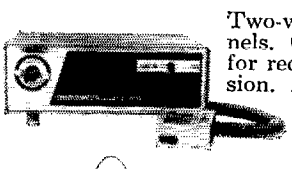
The smartly styled new Mobiline Six is a compact transmitter and receiver combination for equal 6 meter adaptability to a fixed or mobile installation, operating from 115v AC, 12v DC or 6v DC, all with the power supply provided. It weighs only 20 pounds. Sized only 5" x 12", the unit takes little space in either home or car.

The receiver portion utilizes 7 tubes, including an RF stage delivering better than 1 μv sensitivity. A squelch control is also provided in the Mobiline Six.

In the transmitter section, the internal VFO is voltage regulated and shock mounted to provide the utmost stability under adverse mounting conditions. The 2E26 amplifier stage is conservatively operated to handle 20 watts input power.

VFO or XTAL control; "S" meter, tuning meter, slide rule dials, VFO spotting and Class B modulation are a few of the other feature highlights. Available August, 1960. $229.95.

...and the NEW Citizens Band CB-200 Deluxe and Pocketphone



CB-200 DELUXE

Two-way radio. Five channels. One tunable channel for receiving. Dual conversion. Pi net. $179.95.

POCKETPHONE

Transistorized two-way radio 1⅝" x 2⅜" x 6¼". 13 ounces. No license required. Range ½-1 mile. Rechargeable battery. $125.00.

GLOBE ELECTRONICS

A DIVISION OF TEXTRON ELECTRONICS, INC.
22-30 SOUTH 34TH ST. COUNCIL BLUFFS, IA.

spent most of April in the Navy Reserve. W2NKD is using a BC-221 for a v.f.o. on 80 and 40 meters. K2EQP is *not* on RTTY—just trying to get on. NJN had 30 sessions, 603 attendance and handled 403 messages. W2RXL has a new Heath 6-meter transceiver. K2GIF is active on RTTY. W2CFB continues to get good results in the FMT. NJ 6 and 2 reports 10 sessions, 133 attendance and 11 messages. WA2GUI has a new 70-ft. tower. K2RVH and K2KJI are both on 432 Mc. W2VMQ had trouble with the beam in a windstorm but it works better the way the wind left it. K2YBC has a new Apache. K2UCY was busy counting noses for the Census Bureau. Now a father and son team reports, WV2GQZ and WA2GQI. Father, WV2GQZ, can't get at the rig enough to get his General Class license because son, WA2GQI, won't let him. Mgr. W2ZI reports the NJPN held 30 sessions, handled 105 messages and 430 stations reported in. WA2FGP has trouble with the receiver and the v.f.o., but then, we all have. K2UKQ has signed on for the AREC. K2PTI received a 25-w.p.m. certificate. K2UWN passed the General Class exam. W2TKZ reports his dad has been assigned the call W2NQ. He is ex-W1NQ. W2VAV is on s.s.b. with an HT-32A, mostly on 40 meters. K2KVR has been busy as all get out, but hopes to have a little free time this summer. Your SCM normally does not include reports in this column unless sent in by the person interested. All are welcome to send reports and as many as possible will be included. Traffic counts only if sent or received by radio, and counts as delivered only if delivered to the addressee. Traffic: (Apr.) K2THC 705, K2UCY 442, WA2COO 282, W2RXL 141, K2VVL 138, K2MFF 111, WA2CCF 110, K2VNL 96, WA2APY 91, W2CQB 83, W2EBG 62, WA2GUI 57, K2GIF 50, WA2IAT 46, K2QGD 36, W5FKL/2 31, K2LWQ 30, WA2FGP 21, W2BSC 20, K2PVH 20, W2ZVW 20, K2LXL 17, W2DRV 16, K2EQP 16, W2BVE 15, K5JTU 15, WV2GQZ 9, W2RON 8, K2BWQ 6, W2CFB 6, WA2AKM 5, K2AGJ 4, W2CJX 4, W2CVW 4, W2EWZ 4, K2QYT 4, K2UKQ 4, W2NIY 2, W2NKD 2, K2PTI 1. (Mar.) W2CQB 116, WA2FGP 38, W2FJC 5, WA2GVV 4, W2VMX 2.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—Officers of the 75-Meter Phone Net are KØBSZ, net control; OFK, 1st alternate; WØMEL, 2nd; KJN, 3rd; KØKAQ, 4th; GOT, director 1st district; BTX, 2nd; JPJ, 3rd; KØCBC, 4th; WØVWF, 5th; FMX, 6th; WLY, secy.-treas. The 75-Meter Phone Net report for April is 1250 QNI with 141 QTC. The new Hawkeye 75-Meter Net meets on 3930 kc. at 0830 CST Sun. Directors are NTB, CZ and KØSEW; secy.-treas. is QKF; net control is LSF, with NTB and KØSEW as alternates. The newest TLCN member is DUA. KØLUZ received an OO appointment. VWF returned from an extended vacation in Florida. BTD moved to Cedar Rapids from Nebraska. KØAFN, Radio Officer of the Des Moines County C.D., reports on the emergency communications set up at Wever, in Lee County, during the recent flood. A total of 10 walkie-talkie units and 3 mobiles patrolled 6 miles of the Skunk River levee. Flood control headquarters was set up in a lumber yard with 75 and 10 meters being used to communicate with c.d. headquarters in Burlington. The following amateurs participated: KØIWA, URL, EXT, AAH, ZMU, VFW, UVE, AFN, WØUTG, QVA, TQG, DVP, ENM, MDU, K9IDW and UWA. They worked a total of 290 man hours to help save the levee. Traffic: (Apr.) WØLGG 2100, SCA 1984, LCX 1946, BDR 1143, IFX 119, NTB 73, KØHBD 55, WØDUA 50, BLH 47, KØMMZ 39, WØNYX 38, QVA 29, FMZ 19, KØGXP 17, KAQ 17, WØYDV 17, JPJ 14, KØEAA 12, WØVWF 12, KØSEW 11, GOT 8, IHC 5, JGM 5, QKF 4, WØFDM 3, KØKTP 3, EXN 2, LUZ 2, OFK 1. (Mar.) KØQKF 5.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: VZM. Asst. SEC: LOW. RM: QGG. PAM: UTO. V.H.F. PAM: HAJ. As of May 1 VZM has been our new SEC and UTO our PAM. We wish to thank IFR for his excellent work as SEC and dislike to see him resign. ILB has been appointed Area 2 RACES Officer and LHN Saline County Radio Officer. KØJWD and LNZ paid a visit to the Salina Club. 5RDP/Ø and others have been taking the MARS portable outfit around the State for visits. KØEKN, of *Ham Monitor*, and ETX are working a distance of 20 miles mobile on 2 meters. ETX is using a 6AQ6 in the final and doubling. KØJMF advises that the KVRC's station is now set up in the old National Guard Armory. Most of the clubs in Topeka, Wichita, McPherson, Kansas City and Salina have gone to 2 meters with their storm-weather nets. KØGIC caught a band opening on 6 meters Apr. 13 and 21. Three new stations reporting into the ACARA Net are BVK, KNØZLR and JAW. JFG is moving to California. KØEVD and KØLGS are moving to Alabama. Rolla fast-talked KØCJW into taking over as phone director and treasurer of the net. One thought, let us all coop-

(*Continued on page 118*)

Viking Amateur Equipment

your best buy...and here's why!

Excellent dollar value . . . high trade-in value . . . solid communication power . . . dozens of operating and convenience features—just a few of the many good reasons why Viking transmitters are "1st choice among the nation's amateurs." Visit your authorized Johnson distributor and compare—you'll soon see why dollar-for-dollar a Viking transmitter is your best buy!

VIKING "KILOWATT" AMPLIFIER —(Below)—The only transmitter that provides maximum legal power in all modes—SSB, CW, and plate modulated AM. Class C final amplifier operation provides plate circuit efficiencies in excess of 70% with unequalled broadcast-type high level amplitude modulation. Two 4-400A tubes in Class AB_2 easily deliver 2000 watts P.E.P.* in SSB mode—provides 1000 watts input AM with two push-pull 810 tubes in Class B modulator service. 1000 watts input Class C CW. High efficiency pi-network output circuit will match 50 to 500 ohm antenna loads.

Pedestal contains complete unit. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB. With tubes.

Cat. No. 240-1000..Wired and tested.....**Amateur Net $1595.00**

Matching accessory desk top, black and three-drawer pedestal.

Cat. No. 251-101-1.....**FOB Corry, Pa. $132.00**

*The F.C.C. permits a maximum one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of two times average or more, depending upon individual voice characteristics.

BE SURE TO SEE . . . the new Viking filter-type sideband transmitter with 60 db sideband suppression—and the new Viking "10-Meter Messenger." For detailed specifications on the new sideband transmitter . . . see your distributor—for information on the "10-Meter Messenger" . . . write for Specification Sheet 737.

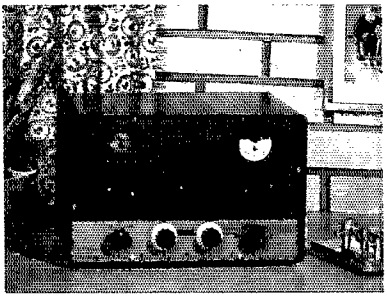
FIRST CHOICE AMONG THE NATION'S AMATEURS

Viking

E. F. JOHNSON COMPANY • WASECA, MINNESOTA

Viking

amateur equipment



"6N2" TRANSMITTER

Rated at 150 watts CW and 100 watts phone, this compact VHF transmitter offers instant bandswitching coverage of both 6 and 2 meters! Completely shielded and TVI suppressed—may be used with the Viking I, II, "Ranger", "Valiant" or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 mc. output. Silver-plated balanced tank circuit—series capacitive reactance compensation provides maximum coupling flexibility. With tubes, less crystals, key and microphone.

Cat. No.		Amateur Net
240-201-1	Kit	$129.50
240-201-2	Wired and tested	$169.50

"ADVENTURER" TRANSMITTER—Self-contained . . . 50 watts CW input . . . rugged 807 transmitting tube . . . instant bandswitching 80 through 10 meters. Crystal or external VFO control—wide range pi-network output—timed sequence keying. With tubes, less crystals.

Cat. No. 240-181-1 . . Kit . . . . . Amateur Net $54.95

SPEECH AMPLIFIER/SCREEN MODULATOR—For "Adventurer" phone operation. High gain—use with crystal or dynamic microphones. With tubes.

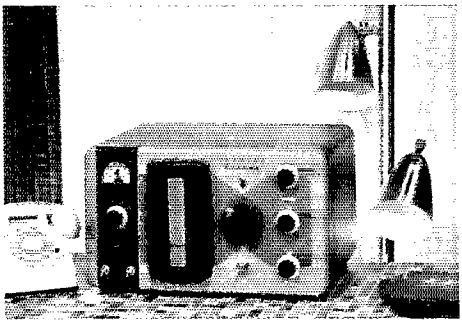
Cat. No. 250-40 . . Kit . . . . . Amateur Net $12.25

"CHALLENGER" TRANSMITTER—70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW on 6 meters. Two 6DQ6A final amplifier tubes. Crystal or external VFO control—TVI suppressed—wide range pi-network output. With tubes, less crystals.

Cat. No. 240-182-1 . . Kit . . . . . Amateur Net $114.75
Cat. No. 240-182-2 . . Wired . . . . . Amateur Net $154.75

"NAVIGATOR" TRANSMITTER/EXCITER—40 watts CW input . . . also serves as a flexible VFO Exciter. 6146 final amplifier tube—bandswitching 160 through 10 meters. Built-in VFO or crystal control. With tubes, less crystals.

Cat. No. 240-126-1 . . Kit . . . . . Amateur Net $149.50
Cat. No. 240-126-2 . . Wired . . . . . Amateur Net $199.50

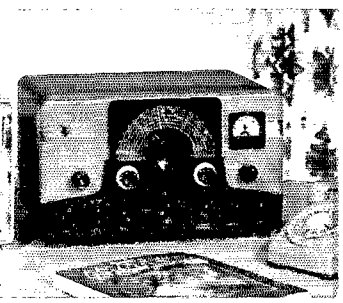


"COURIER" AMPLIFIER

Rated a solid 500 watts P.E.P. input with auxiliary SSB exciter as a Class B linear amplifier; 500 watts CW or 200 watts AM linear. Self-contained desktop package—may be driven by the Viking "Navigator", "Ranger" or other unit of comparable output. Continuous coverage 3.5 to 30 mcs. Drive requirements: 5 to 35 watts depending upon mode and frequency desired. Employs two 811A triodes in parallel. Pi-network output will match 40 to 600 ohm loads. TVI suppressed. With tubes and built-in power supply.

Cat. No. 240-352-1 . . Kit . . . . . Amateur Net $244.50
Cat. No. 240-352-2 . . Wired and tested . . . . . Amateur Net $289.50

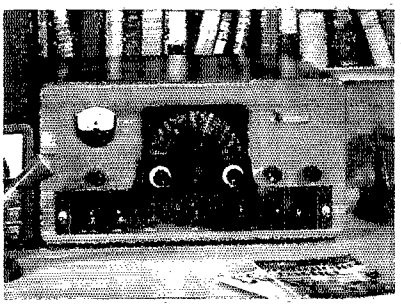
4 *feature-packed transmitters...*



"RANGER" TRANSMITTER/EXCITER

This popular 75 watt CW or 65 watt phone transmitter will also serve as an RF/audio exciter for high power equipment. Completely self-contained—instant bandswitching 160 through 10 meters! Operates by extremely stable built-in VFO or crystal control. High gain audio—timed sequence keying—effectively TVI suppressed. Pi-network antenna load matching from 50 to 500 ohms. Final amplifier tube is a 6146. Complete with tubes, less crystals, key and microphone.

Cat. No.	Amateur Net
240-161-1 . . Kit	$229.50
240-161-2 . . Wired and tested	$329.50



"VALIANT" TRANSMITTER

Here's power to slice through terrific QRM! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) 200 watts phone. Instant bandswitching 160 through 10 meters—operates by built-in VFO or crystal control. Pi-network output matches antenna loads from 50 to 600 ohms . . . final amplifier utilizes three 6146 tubes in parallel. TVI suppressed—timed sequence keying—low level audio clipping—built-in low pass audio filter—self-contained power supplies. With tubes, less crystals, key and microphone.

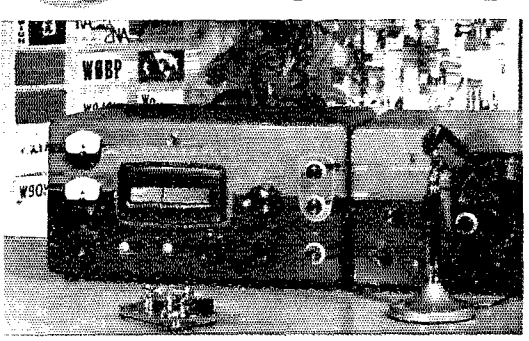
Cat. No.	Amateur Net
240-104-1 . . Kit	$349.50
240-104-2 . . Wired and tested	$439.50

"FIVE HUNDRED" TRANSMITTER

Rated a full 600 watts CW—500 watts phone and SSB. (P.E.P. with auxiliary SSB exciter.) Compact RF unit designed for desk-top operation —power supply-modulator unit may be placed anywhere. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system—low level audio clipping. Final amplifier uses a 4-400A tetrode. Wide range pi-network output. With tubes, less crystals, key and microphone.

Cat. No.	Amateur Net
240-500-1 . . Kit	$749.50
240-500-2 . . Wired and tested	$949.50

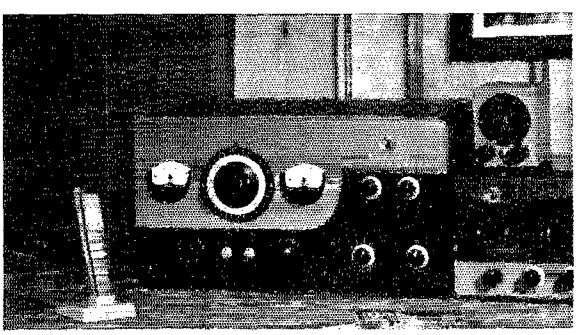
3 *exciting desk-top linear amplifiers...*



"THUNDERBOLT" AMPLIFIER

The hottest linear amplifier on the market—maximum "talk-power" to smash through QRM! 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear; in a self-contained desk-top package. Delivers a dominant signal on all amateur bands—continuous coverage 3.5 to 30 mcs—instant bandswitching. May be driven by the Viking "Navigator", "Ranger" or other unit of comparable output. Drive requirements: approx. 10 watts Class AB_2 linear, 20 watts Class C continuous wave. Final amplifier employs two 4-400A tetrodes in parallel, bridge neutralized. With tubes and built-in power supply.

Cat. No. 240-353-1 . . Kit . . . . . **Amateur Net $524.50**
Cat. No. 240-353-2 . . Wired and tested . **Amateur Net $589.50**



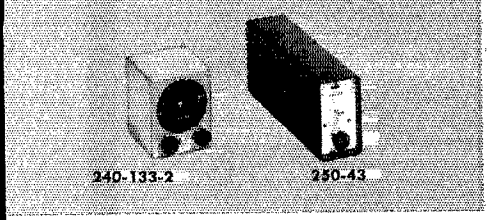
"6N2 THUNDERBOLT" AMPLIFIER

This new feature-packed power amplifier is rated at 1200 watts P.E.P.* input SSB and DSB, Class AB_1; 1000 watts CW, Class C; and 700 watts input AM linear. Continuous bandswitched coverage on 6 and 2 meters—effectively TVI suppressed—wide range pi-network output. Unique silver-plated Hi-Q coaxial line; silver-plated anode and other external portions of 7034 tubes; silver-plated inductors, capacitors and switch provide outstanding efficiency—losses on 2 meters held to approximately 5%. Drive requirements: approx. 5 watts Class AB_1 linear, 6 watts Class C continuous wave. With tubes and built-in power supply.

Cat. No. 240-362-1 . . Kit . . . . . **Amateur Net $524.50**
Cat. No. 240-362-2 . . Wired and tested . **Amateur Net $589.50**

*The F.C.C. permits a maximum one kilowatt average power input for the amateur service. In SSB operation under normal con-

FOR 6 AND 2 METERS . . .



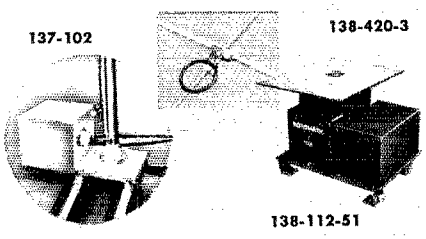
"6N2" VFO—Replaces 8 to 9 mc. crystals in frequency multiplying 6 and 2 meter transmitters. Exceptionally stable. Output range: 7.995 to 9.010 mc. Requires 6.3 VAC at .3 amps and 250 to 300 VDC at 10 ma. With tubes and power cable.

Cat. No. 240-133-1..Kit.....**Amateur Net $34.95**
Cat. No. 240-133-2..Wired and tested.....**Amateur Net $54.95**

"6N2" CONVERTER—Instant front panel switching from normal receiver operation to 6 or 2 meters. Excellent image and I. F. rejection. Available in following ranges: 26 to 30 mcs., 28 to 30 mcs., 14 to 18 mcs., or 30.5 to 24.5 mcs. With tubes. Specify range desired.

Cat. No. 250-43..Kits.....**Amateur Net $59.95**
Cat. No. 250-43..Wired.....**Amateur Net $89.95**

ANTENNAS, BEAMS AND ROTATORS . . .



PRE-TUNED BEAMS—Rugged, semi-wide spaced with balun matching sections. High gain—low SWR—excellent front-to-back ratio. 3 elements, boom and balun.

Cat. No. 138-420-3..20 Meters.....**Amateur Net $139.50**
Cat. No. 138-415-3..15 Meters.....**Amateur Net $110.00**
Cat. No. 138-410-3..10 Meters.....**Amateur Net $ 79.50**

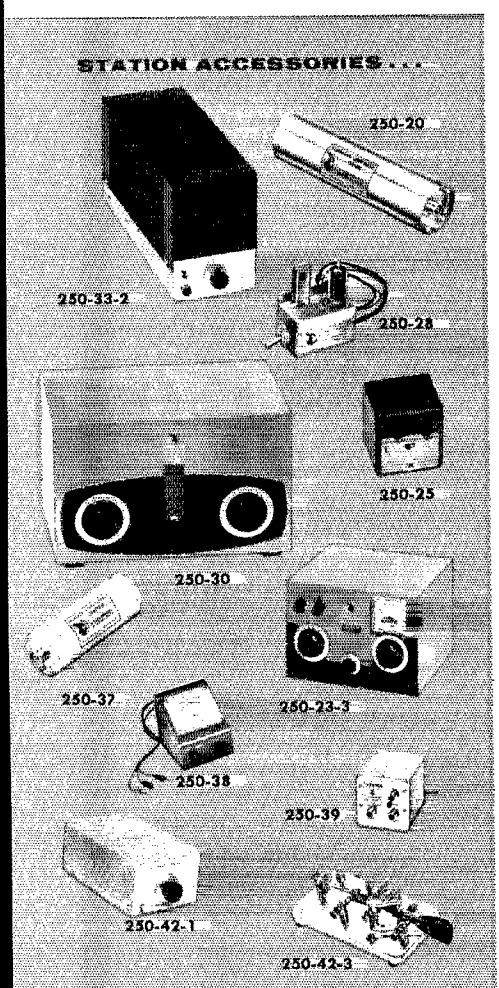
"ROTOMATIC" ROTATOR—Supports beam antennas weighing up to 175 pounds. Rotates 1 RPM. Cast aluminum housing—5/16" steel rotating table tilts 90°. With desk-top control box. For coaxial line.

Cat. No. 138-112-51 With limit switches for 370° rotation **Amateur Net $354.00**

"MATCHSTICK"—Fully automatic, pre-tuned multi-band vertical antenna system. Bandswitching 80 through 10 meters. Remotely motor driven from operating position. Low SWR (less than 2 to 1) all bands. Impedance: 52 ohms. Complete, with 35' mast.

Cat. No. 137-102..Pre-tuned.....**Amateur Net $129.50**

STATION ACCESSORIES . . .



VIKING AUDIO AMPLIFIER—Self-contained 10 watt speech amplifier, with power supply and tubes. Speech clipping and filtering improves performance of your AM transmitter.

Cat. No. 250-33-1..Kit.....**Amateur Net $73.50**
Cat. No. 250-33-2..Wired and tested.....**Amateur Net $99.50**

LOW PASS FILTER—Handles more than 1000 watts RF. 75 db or more attenuation above 54 mc. Wired and pre-tuned.

Cat. No. 250-20..52 Ohms Impedance.....**Amateur Net $14.95**
Cat. No. 250-35..72 Ohms Impedance.....**Amateur Net $14.95**

CRYSTAL CALIBRATOR—Provides accurate 100 kc check points to 55 mc. Requires 6.3 volts at .15 amps and 150-300 volts at 2 ma. With tube and crystal.

Cat. No. 250-28..Wired and tested.....**Amateur Net $17.95**

"SIGNAL SENTRY"—Monitors CW or phone signals up to 50 mc., powered by receiver. With tubes.

Cat. No. 250-25..Wired and tested.....**Amateur Net $22.00**

"MATCHBOXES"—Completely integrated antenna matching and switching systems for kilowatt or 275-watt transmitters. Bandswitching 80 through 10 meters. Tunes out large amounts of reactance. No "plug-in" coils or "load-tapping," necessary.

Cat. No.	Amateur Net
250-23-3..275 Watts, wired with directional coupler and indicator.....	**$86.50**
250-23..275 Watts, wired less directional coupler and indicator.....	**$54.95**
250-30-3..Kilowatt, wired with directional coupler and indicator.....	**$149.50**
250-30..Kilowatt, wired less directional coupler and indicator.....	**$124.50**

DIRECTIONAL COUPLER AND INDICATOR—Provides continuous reading of SWR and relative power in transmission line. Coupler may be permanently installed in 52 ohm coaxial line—handles maximum legal power specified by F. C. C. Indicator is a 0-100 microammeter calibrated in SWR and relative power.

Cat. No. 250-37..Coupler.....**Amateur Net $11.75**
Cat. No. 250-38..Indicator.....**Amateur Net $25.00**

T-R SWITCH—Instantaneous break-in on SSB, DSB, CW or AM. Excellent receiver isolation. Gain: 2 db at 30 mcs.; 6 db at 3.5 mcs. Rated 4000 watts peak power. With tube, power supply and provision for RF probe.

Cat. No. 250-39..Wired.....**Amateur Net $27.75**

ATTENUATORS—Provide 6 db attenuation with required power dissipation to enable various units to serve as exciters for Viking "Thunderbolt" linear amplifier.

Cat. No. 250-42-1..For Viking "Ranger" or similar.....**Amateur Net $21.50**
Cat. No. 250-42-3..For use with HT-32 or similar unit.....**Amateur Net $21.50**

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Communication Products Company, Inc.

MARLBORO NEW JERSEY

Station Activities

(Continued from page 112)

erate more in our c.d. alerts. The AREC and RACES are brothers under the skin. Traffic: (Apr.) WØOHJ 1245, BLI 395, KØHGI 222, WØTOL 188, ABJ 177, QGG 117, FNS 92, SYZ 81, SAF 72, UTO 58, KØBXF 56, WØVZM 51, KØJVX 39, W5RDP/Ø 34, WØRJF 31, KØIZM 20, HVG 18, TNW 14, UAX 13, WØGJG 12, KØQKS 12, WØFHT 8, KØEFL 7, WØIFR 7, KØQOB 5, JID 3, GIG 1. (Mar.) WØBBO 6, KØLHF 5.

MISSOURI—SCM, C. O. Gosch, WØBUL—Net reports: (Mar.) MON (3580 kc. 1900 CST M-S) 27 sessions; QNI 204; QTC 165; NCS OUD 16, KØQCQ 3, KØONK 2, KØBLJ, OJC, PME 1. SMN (3580 kc. 1600 CST Su.) 3 sessions; QNI 9; QTC 0; NCS OUD. HBN (7280 kc. 1205 CST M-F) 22 sessions; QNI 756; QTC 437; NCS KØLTJ 5, KØJTW 4, KØFCT, WAL 3, KØBFH and QJU 2, KØMMR, K5JXD and KØONK 1. (Apr.) MEN (3885 kc. 1800 CST MWF) 13 sessions; QNI 441; QTC 125; NCS OHC 5, OVV 4, DFK and KØOLW 2. MON (3850 kc. 1900 CST M-S) 26 sessions; QNI 165; QTC 124; NCS OUD 14, KØQCQ 6, ONK 4, OJC and PME 1. HBN (7280 kc. 1205 CST M-F) 20 sessions; QNI 793; QTC 501; NCS K5JXD 6, QJU, KØLTJ, KØJTW and KØFCT 3, KØLTP and WAL 1. The SCM wishes to apologize to the members of MON and HBN for having misplaced their March reports. Sorry they're late. The SWMARC, Inc., Picnic will be held Aug. 28 in the Shrine Mosque at Springfield. The Hambutcher's Net Picnic will be held in Phelps Grove, Springfield, July 31. The April meeting of the HARC (Kansas City) had as guest speaker KØONK, who demonstrated how a handicapped person becomes a proficient c.w. and phone traffic-handler. She has many BPL certificates to prove it. She has been appointed NCS of a newly-formed slow-speed c.w. net whose purpose is to acquaint and instruct Novice and other new operators in the art of traffic-handling and to assist them in increasing their code speed. PME led the WØ call area in the number of OO notices sent in 1959. We regret to record the passing of ICD and KØDQK. Traffic: (Apr.) KØFCT 3951, ONK 1320, WØWAL 521, KØLTJ 446, WØOMM 236, KØSGJ 123, BCK 117, VXU 96, WØOUD 81, ZBR 81, KØOVV 58, WØBUL 48, RTW 43, KIK 41, TPK 41, BVL 38, KNØVTX 30, WØWAP 29, KØMMR 26, WØYHT 19, MKJ 16, EPI 14, PXE 14, KØOEP 8, WØARO 3, GBJ 3, KØRXD 3. (Mar.) KØRXD 17.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Western Nebraska Phone Net, on 3850 kc. daily at 0700 MST, NIK as NC, reports QNI 679, QTC 146. The 75-Meter Morning Phone Net, on 3980 kc. daily at 0800 CST, KØDGW as NC, reports QNI 770, QTC 245. For the Nebraska Section Net C.W. NYU reports 28 sessions, QNI 229, QTC 160. KØUES, of Gering, passed away recently. KNØVIC and KNØUWQ both passed the General Class exams. Congratulations. New appointees are KØKUA as ORS and OPS, KØQFK as ORS, KØRUA as ORS and NYU as RM of the Nebraska C.W. Net. Traffic: (Apr.) WØNYU 280, KØLJW 179, QFK 164, DGW 147, RRL 130, KUA 102, WØZJF 80, NIK 62, GGP 61, KØSCM 42, VIA 38, WØVEA 34, BOQ 30, KØDFO 30, KJP 28, SPB 20, CDG 19, UQN 18, WØOCU 17, KØULQ 17, WØKDW 15, HTA 14, VZJ 14, KØDVW 13, WØRJA 11, LJO 9, KØROP 9, UWK 9, WØUWK 9, KØTUH 8, KTZ 6, MSS 6, WØYFR 5, HOP 4, RMS 4, WKP 4, KØVTD 3, MZV 2. (Mar.) WØRDN 173, KØBRS 87, WØRSM 28.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—QJM spent the latter part of April on Naval Reserve training duty. K1BEN built the Heath 10-meter transceiver and reports it works fine for AREC and RACES. NJM enjoyed the CN-CPN-CVN dinner. BDI attended the Oregon Northwestern Division Convention in Portland. CHR is repairing the squeaks and groans in his rig. WHL advised the Conn.-6 Meter Net handled 28 messages during 4 sessions with an average of 10 stations per session. High QNI were K1GQO, EQD, WHL, 4; K1CRD, K1MNE, IGG, K5LBP/1, 3. K1MOT is leaving for the Navy. Twenty-eight CQ Radio Club members attended the Swampscott Convention, with K1EJS, K1GEH, JJL and MBY winning prizes. New members on CVN are K1NQJ, K1NMO and K1KEA, who now has his General Class license. RMV, a retired Navy man, is active with a GSB-100 and a 4-400A to a three-element beam on 15 and a "V" beam on 20 meters. STT is rebuilding his shack. EGS is active on 75 meters with an HT-9. LLH has a new HQ-170. K1IFJ and K1IJG made DXCC. The Stamford ARC is running code classes at 1930 the 2nd and 4th Fri. of each month. K1DIJ reports 6-meter c.w. is rather lonely. KN1MJM

(Continued on page 120)

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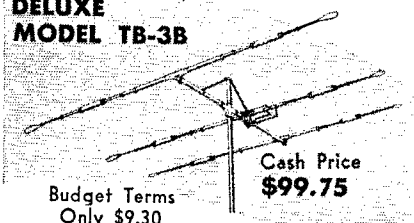

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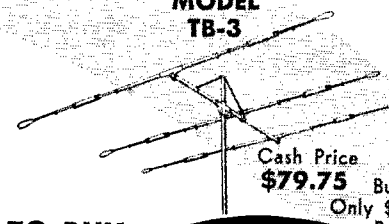

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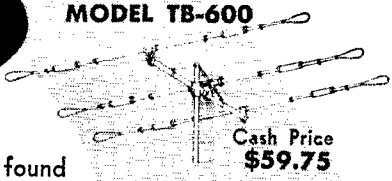

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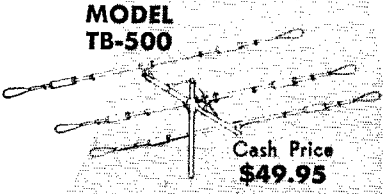

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has dropped the "N" and is active in AREC and RACES. The CQ RC had a booth at the Better Homes Show in Torrington. KYQ advises the first session of CN handled 342 messages during 28 sessions with an average attendance of 13.5 stations. The second session handled 87 messages during 28 sessions and had a 3.5 attendance record. High QNI goes to K1GGG, K1JAD and K1HAN. K1AOX has a new Rohn 60-ft. tower and Cushcraft 44-element Quad Yagi on 2 meters. OBR vacationed in Puerto Rico. K1LFS uses a DX-40 and an SX-101A. K1GUD is active on 20-meter c.w. KN1LOM worked a DJ on 15 meters and a VK on 40. K1LAW, FUW, LIG, PHT, QPD and TCJ took part in the February FMT. HCZ is back after several months in Alabama. K1CWQ, K1CWR, K1DGB, EQD, JKL and WHL are all using the Heath HW-29 on 6 meters. YBH reports CPN met 29 times in April, handled 394 messages, and had an average daily attendance of 29 stations. High QNI goes to K1AAE, K1BSB, YBH, 29; K1AQE, DAV, FHP, IHG, 28; TVU, VQH, 27; MWB, 26; K1CAK, K1CBV, 23. New stations on CPN are K1IWW, K1GOX and KGF. Section Net certificates were awarded to K1BSB and K1CAK. EC WHR reports Cheshire runs 2 drills a month on 146.88 Mc. ZZK won the Southington ARA Bermuda Contest. GTH is giving radio operating instructions to the auxiliary police. ZTQ was elected president of the Southington Moose Club. New appointments: K1GUD, K1IVT, K1LFS and K1-MBA as OOs; BNB and K1GGG as ORSs; VIY as OPS; FHP as OBS. Appointments renewed: EOR as SEC; YBH as PAM; KYQ as RM; AW, BDI CHR and KYQ as ORSs; FHP and WHR as EC; AW as OBS and OPS; BDI as OES. Reports received: OES from K1AOX and FVV; OO from K1IFJ, K1IVR, EQV, QPD, NWE and TYQ. Traffic: (Apr.) W1YBH 295, AW 272, KYQ 265, K1AAE 240, W1EFW 237, OBR 174, K1HAN 111, JAD 111, W1ROX 100, FHP 79, TYQ 69, K1GGG 65, W1CHR 61, K1CAK 44, CBV 41, AQE 40, W1TYU 38, K1BSB 35, W1VTY 31, K1DGK 30, HWF 30, W1RFJ 29, ZLC 27, WAZ 14, CUH 13, K1ANV 12, CRD 10, W1WHL 10, BDI 9, K1IWW 7, W1HJG 5, K1GQO 4, W1NTH 4, K1MOT 3, BDO 2, BJI 2, W1-BNB 2, K5LBP/1 2, W1QJM 1. (Mar.) W1QJM 6. (Feb.) W1QJM 148.

MAINE—SCM, Jeffrey I. Weinstein. W1JMN—SEC: JMN. PAM: BXI. RM: EFR. The Sea Gull Net meets Mon. through Sat. at 1700 on 3940 kc. The Pine Tree Net meets Mon. through Fri. at 1930 on 3596 kc. The Maine Slo-Speed Net meets Tue., Thurs. and Sat. on 3726 kc. at 1730. New appointments: LHE and KAK as OPSs. Official appointee applications are available from your SCM. The 200th Anniversary Celebration of Cumberland County includes in its itinerary the issuance of commemorative certificates and QSLs to amateurs who contact a specified number of Cumberland County stations during the Celebration (June 19 to Aug. 27.). Details concerning the event can be obtained from any Cumberland County station. K1JMB is operating portable from the Maine State YMCA Camp at Winthrop. LHE is now on 75 meters. I'm pleased to say that AREC in Maine is coming along exceptionally well, as are other activity projects. If you're not registered in the AREC plan for your area, you're not doing your part in PICON by supplementing the emergency preparedness program of amateur radio. I hope everyone realizes the importance of AREC organizational activities and drills. When the need for amateur emergency communications arises, our pre-planning and regular drill proceedings will be given the acid test. Think it over for a while. What would *you* do during an emergency? Traffic: (Apr.) K1GVQ 196, W1ISO 52, K1BDQ 49, W1EFR 49, AHM 40, K1BZD 35, MJN 33, KSG 27, KN1MBM 22, W1JMN 16, K1CJK 14, JMB 13, DYG 12, JNN 9, W1OTQ 9, K1MES 8. (Mar.) W1ISO 38, KN1-MZB 37, K1LCD 34, DPM 18.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—SEC: AOG. New appointments: K1DSA as OO, K1s MEM, GNR and JCC as OPSs, APB as RO and EC for Walpole. The committee that put on the New England Division Convention at Swampscott is to be congratulated on a fine affair. UVC is a Silent Key. I met DPI, of Winthrop, and he asked for all of the old gang. MME is the new c.d. director for Hull. ZOP is net manager for the New England Phone Net, which meets Sun. at 0900 on 3870 kc. The East Mass. 2-Meter Net gang had a very nice time at GNR's QTH on the day of the convention. Heard on 75 meters: RLO, KYR and K1HEZ. Heard on 2 meters: KLZ, FRR, QT, DPV, K1s MIF, HBV, ATY, HDY, MZE, KTK and KN1NGI, his XYL. The T-9 Radio Club elected JPS pres.; CVM, vice-pres.; ISX, treas.; MNK, secy., and held its Annual Hog Rassle and Ladies Night. New officers of the Harvard Wireless Club, AF, are 8JMY, pres.; 9ARB, vice-pres. and sfn. mgr.; ETH, secy.-treas. DL4AAE visited WU. AKN is feeling fine again. K1JYU has a new QTH in Beverly. K1MQQ and

(*Continued on page 122*)

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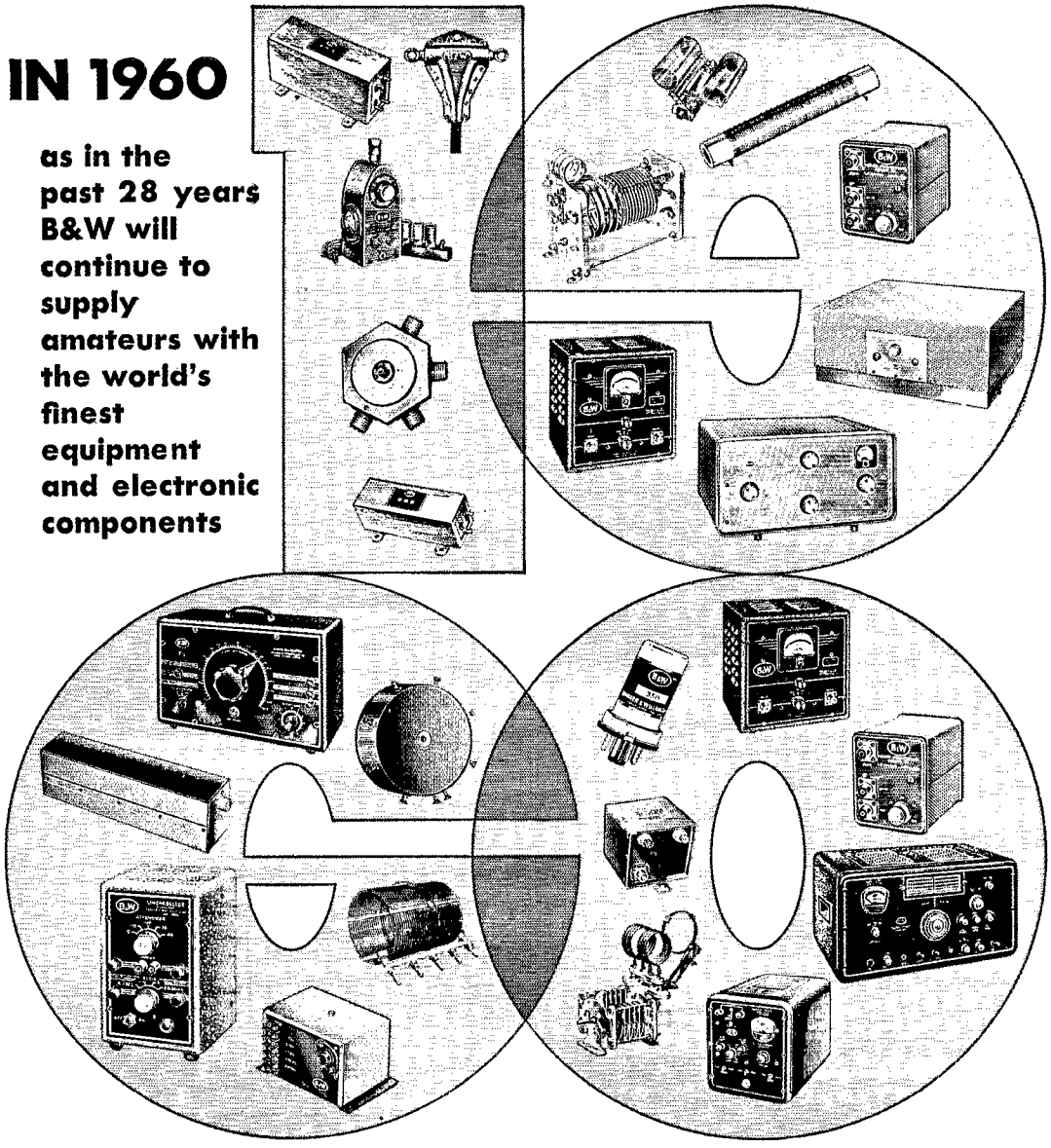

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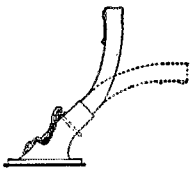
KN1LYN are active. K1IWP is on the 6-Meter Crossband Net. YRW and K1ODR are Asst. ECs to YYI. K1KOO has a Gonset set on 2 meters. K1JKA has a Valiant. IHC is going on active duty for 6 months. K1JAW has 48 states. K1JIU has a WAS certificate. The Pochantas Radio Club held Field Day in Maine. K1-DTJ will be on at Hull as K1CUI for the summer. AUQ is working in Andover. K1DIO is remodeling. K1BYV is building a beam for 15 meters. K1JBL is going 6-meter mobile to Tampa, Fla. ZSD is helping BYL with the code. KBN is rebuilding the 6-meter rig. FJJ has a new QTH. K1LJK built the "Mickey Match" and is on 160 meters. KN1NVE will be on 2 meters soon. K1AII has General Class and will have 1 kw. on 6 meters. The El-Ray Radio Club held a meeting with Raytheon's "Bright Tube Display" by Neil MacGregor. SFD says Lawrence has Gonsets on 2 and 6 meters for c.d. work. K1KUY is on 6 meters with an SR-34 and a 6N2. WA6EFX is on 2 meters in Marblehead. K1KZV is on 6. KN1NSN, Concord, is on 2. K1KEC has an 829B on 2. NKA has a Heathkit on 6. K1GLM is working c.w. K1JML is active on 6 meters. SIV and K1GTX are Asst. ECs to OFK. On 2 and in our net: K1KOO, KTX, ICJ and W1TWN. QFO is on again. OFK, ZSS and N1CCE put DOM's beam up for him. K1MPB has General Class. VSV now is in Winthrop. TZ, LJS, ALP, BCN, CKW and K1GAZ attended the meeting held at Area 2 Hq. PIM spoke at the QRA meeting on "Transistorized Power Supplies." The Framingham Club held a meeting with a talk on "Lighting" by Mr. Wolf; K1LWL spoke on facsimile operation. JNY is the leading OO for W1-Land and second highest in the nation. The Braintree Club held an election. The Eastern Mass. Novice Net had 15 sessions, 43 QNIs, traffic 7. The Hudson Traffic Net had 30 sessions, 418 QNIs, traffic 316. The Eastern Mass. 2-Meter Net had 30 sessions, 485 QNIs, traffic 430. K1MCH has an HQ-129X Viking Challenger. Appointments endorsed: ENS Arlington, COL Cambridge, ZNG Wakefield, YYI Carlisle, KT Georgetown, AKN Sandwich, AR Belmont, DWY Beverly as ECs; FHJ as OBS; AR as OPS; RCQ as ORS: LJS is active on 10 meters. MCX had an eye operation, KH6IJ spoke at the Yankee Club. EM2N had 79 per cent attendance at the convention. There were 7 visitors from Connecticut, 2 from Western Mass. and 4 from Eastern Mass. The Mass. Phone Net had 30 sessions, 492 QNIs, 312 traffic. On 6 meters: K1s BNH, BVB, DNG, GIR, GIK, GXJ, HHH, HWC, IDD, IDU, ICK, IXO, JDD/m, JDF, JFQ, MPT, W1s NWS, ORV, STW, VEX, FWQ, LLY, BAQ, MLK, QXX, LXR, THO, WJR, JBD, MCG and TVC. WAJ met with the new c.d. director, Mr. Dempsey, once "1AC," to go over things in c.d. VPT has been moved to the Town Hall. Traffic: (Apr.) K1MMQ 1378, W1PEX 808, AWA 707, EMG 282, K1GNR 245, W1EAE 230, OFK 208, ZSS 174, K1-JAW 138, IWP 103, W1DOM 102, K1DGI 87, BGK 85, JCC 75, JIU 70, LLX 62, W1HGO 56, K1DTJ/C1U 55, W1AUQ 43, SIV 42, K1DIO 34, W1RQL 34, K1BYV 33, GYM 30, HMC 26, JBL 22, W1VYS 20, AOG 18, ZSD 15, K1CMS 10, KTK 10, W1KBN 8, AAR 6, FJJ 6, K1LJK 5, LCQ 4, W1ALP 2, KN1NGI 2, NVE 1. (Mar.) W1EMG 329, K1BYL 227, JCC 33, AII 4.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble. W1BVR—SEC: BYH. RM: DVW. PAM: DXS. WMN meets on 3560 kc. at 7 P.M. Mon. through Sat. MPN meets on 3870 kc. at 6 P.M. daily. The new Novice net, WMNN, meets Mon, Wed and Fri on 3744 kc at 6:30 P.M. BYH reports 145 full members and 21 supporting members of the AREC in this section (61 of whom have mobile units). The Massachusetts Phone Net handled 312 messages during the month with an average of 10.75 messages per session. West. Mass. had a large delegation at the N.E. Division Convention at Swampscott. KN1MEB, KN1MGK, KN1MFS, KN1-LNC, and KN1MZW have been active in the new WMNN. DVW and K1IJV were tops in attendance on WMN. BVR had charge of the 1RN meeting at the convention with an excellent turnout of 1RN members. The Worcester Tech. ham station, YK, now is active on both WMN and MPN with K1AII as chief operator. K1GCV has just finished a K2POO automatic key and VT keyer. OAZ reports lots of 6-meter activity in the Fitchburg Area. OOY and K1KBS have new SX-101 receivers. COI has made DXCC. Congrats! FKN is on 2 meters with a Gonset. QCC has 50 watts on 6 meters. VBG (sightless) demonstrated to the members of the Hampden County Radio Association how he tunes up his rig with the aid of his "tuning Oscar." RM DVW and Asst. RM K1IJV are putting on the pressure to get new members for WMN and WMNN. Congrats to both! Traffic: K1CAU 694, W1DXS 241, LDE 187, BVR 147, WEF 134, DVW 107, K1IJV 75, LBB 54, W1ZPB 41, AGM 14, OSK 10, K2PHF/1 8, K1GCV 5, W1YK 3.

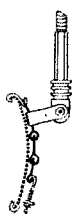
NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—RMs: K1BCS and K1IIK. PAM: HQ.

(*Continued on page 124*)



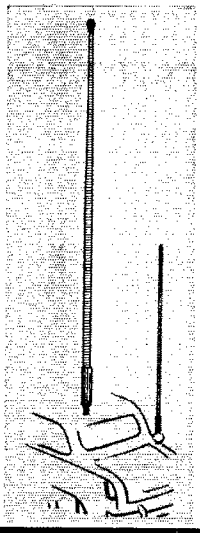
Marine Mount

Self-supporting fold-down mount for use with Style 72-0 antenna. Chrome plated. Includes neoprene gasket and hardware. STYLE 99 — $27.30



Bumper Mount

Adjustable link bumper mount with low-loss insulator. Metal parts cadmium plated. STYLE 97 – $7.50



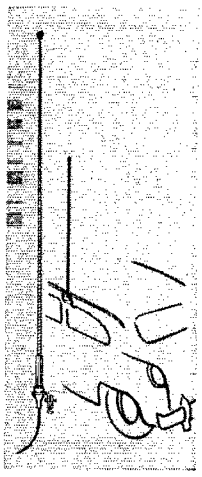
Rain Gutter Mounted Antenna

The convenient, detachable installation with all exceptional benefits of lightweight fiberglass. – Includes 9' RG 58/U transmission cable. –STYLE 74-0 – $14.40

Normal Mode Helical Antenna

Distributed-load antenna eliminates additional loading coils. 4' length permits choice of mounting positions. –STYLE 62-0 Deluxe model, in white – $15.90

– STYLE 73-0 Std. model, metallic gray – $11.25

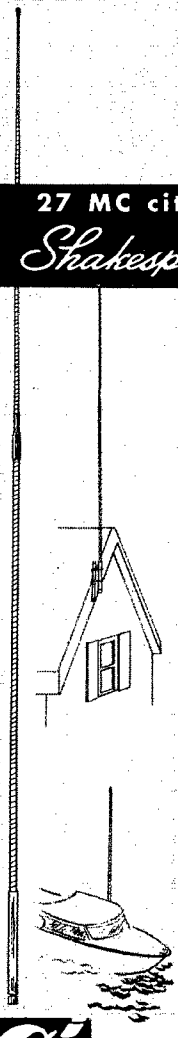


the quality line of antennas — the company that sets the standard in the field of fishing equipment now sets the standard in quality antennas

27 MC citizens band

Shakespeare WONDERODS

FIBERGLASS

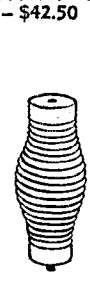


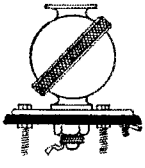
Standard 96" Whip Antenna

Light weight . . . high flexural and impact strength . . . corrosion resistant. Whip – STYLE 10-3 – $6.95

Loaded Coaxial Sleeve Antenna

Ideal for both marine and base station application. Antenna terminated with UHF connector. – STYLE 72-0 – $42.50



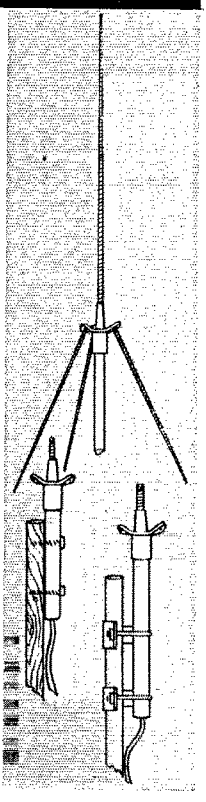


Aluminum Ball Mount

–Has low-loss molded fiberglass insulator plate, neoprene gasket, unique locking band. – STYLE 70-1 – $7.95

Barrel Spring Cadmium plated

–STYLE 71-1 – $4.50



Ground Plane Antenna

High strength fiberglass radiating elements. Supplied to fit 1½" pipe thread. Antenna terminated with UHF connector. –STYLE 61-0 – $41.60

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V.H.F. PAM: TA. The GSPN meets at 1900 Mon. through Sat., and at 0930 Sun., on 3842 kc. The NHN (c.w.) meets nightly at 1830 on 3685 kc. New officers of the Contoocook Valley Radio Club are K1BGI, pres.; K1JYI, vice-pres.; K1MID, secy.; KJS, treas.; MAS, act. mgr. Welcome to the following new hams: KN1s NLN and NVW at Pease AFB, and KN1s NXU, OGW and OJA in the Concord Area. The SEC appointment for the State is still open; also several EC appointments at the county level are available to those qualified and interested. I would like very much to see these vacancies filled. Your SCM attended the New England Division Convention at Swampscott and was pleased to see many of the New Hampshire gang present. I hope all hams in the section remember that the SCM is your elected representative to the ARRL and is here to serve your interests and help with your problems. Don't hesitate to contact me any time if I can be of service. Traffic: K1FDP 1866, CIF 696, IIK 188, W1TA 67, K1JDN 31, W1BCO 11, CUE 8, K1MID 3, NBN 2.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ. RM: SMU. PAM: TXL. New appointments: TXL as PAM. ORS endorsements: BIS and CPV. Reports received: OO from GR and K1LPL; OES from LRR and HZN. LPL and HMO received their General Class tickets. KN1NSY recently received his Novice Class ticket. CMH passed the exam for his 1st- and 2nd-class radiotelegraph tickets. WED and her OM, NFD, are operating mobile on 6 meters. The AQ Club in Rumford issued WRI certificate No. 7 to K1AQE and announced that the Field Day Committee consisted of CZD, WAC and JZI. EI has joined the mobiles with his new HW-29. K1LSM has left the R. I. Area for W4-Land, Johnny, who is with the U.S. Navy, will be missed by the boys on the RIN. The RIN held 21 sessions and handled 111 pieces of traffic during April with TGD having 100 per cent QNI. As of June 1 the net meets on Mon., Wed. and Fri. only for the summer. Traffic: (Apr.) W1SMU 517, JXD 324, K1NR 197, W1TXL 120, K1LSM 106, BBK 68, AAV 27, W1CMH 18, WED 12, K1ZHN 6. (Feb.) W1CMH 4.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—DPD is Butte County C.D. Director. The Shoshone County Amateur Radio Club is taking up publication of an Idaho Call Book. Idaho Radio Amateurs, Inc., enjoyed a ham breakfast in the park. The Magic Valley Amateur Radio Club had a dinner dance at Kimberly Town House. 1BDI, Communications Manager, and CPY, Northwestern Division Director, met with Pocatello hams. DWE and K7ANZ gave the Novice exam to 18 high school boys. RKI, changed cars and has to change the mobile to a 12-volt system. NTQ teaches the Carnegie course to salesmen. BNS is teaching the principles of s.s.b. to his ham club. K7GJY has a new Apache. K7JEP moved to Sandpoint. K7HUR got his Conditional Class ticket. YBA now is on the swing shift and building a 2-meter transceiver. Easter visitors to Pocatello were SKP, Reno and WA6IOU and his XYL, W7CUM, of Livermore, Calif. FARM Net Traffic: 98. Traffic: W7VQC 44, K7BWV 40, W7LIQ 27, GGV 20, EEQ 13, DWE 8, DHL 3.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI—SEC: KUH. PAM: YHS. RM: K7AEZ. K7ABV had the high Montana score in the c.w. section of the SS Contest. He also earned DXCC and the United Nations Award on c.w. K7BKH made her 10th BPL. A meeting with 1BDI, of ARRL Hq., was held in Butte. JRG worked his 13th state on 2 meters. K7BKH, YQZ, IDK, K7IHA, K7BYC, FL, NPV, JFR, TPE and TGM earned Section Net Honor Roll certificates for attendance on MPN. K7BYC earned one on MSN. New calls: KN7LPF in Lewistown; KN7LUA in Bozeman; KN7LUC in Harlowton; KN7LUE in Kalispell; KN7s LTU, LTV, LTW, LTX, LUB, LUG, LUH, LUI and LUL in Miles City. K7ECF is in the VA Hospital at Long Beach, Calif. FLT and HYD moved from Ismay to Billings. CNP moved to Anaconda from Washington. OOY and NPV have a new baby girl. A new radio club is the Anaconda Amateur Radio Club in Anaconda. Officers are EQP, pres.; TQC, vice-pres.; KN7JOI, secy.-treas.; and K7HJM, act. mgr. YHS has a new 100V. Traffic: K7EWZ 414, BKH 280, DCI 169, BYC 33, GWA 6, CTI 5, DNV 5, W7IDK 5, K7DVZ 4, W7YQZ 4, FIS 2.

OREGON—SCM, Hubert R. McNally, W7JDX—The 1960 Portland Conventiin is now history but I am sure everyone had an enjoyable time. The Portland gang is to be congratulated on a swell affair. Your SCM is tied up with some bursitis in both shoulders but guess I'll survive. Hi. CPV has been appointed district chairman for the YLRL. DEM is getting ready for the

(Continued on page 126)

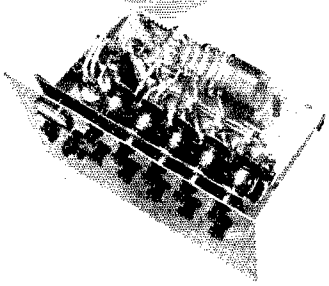
"HIGH POWER IN SMALL PACKAGES"

NEW LINEAR AMPLIFIERS from YUBA-DALMOTOR

NEW

NEW

In constant search for more favorable size and weight ratios, the imaginative engineering at Yuba-Dalmotor has developed two new compact linear amplifiers.



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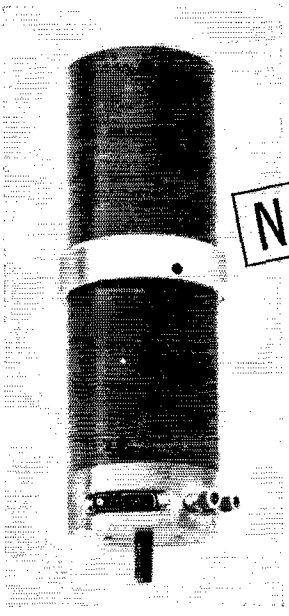
Complete and Instantaneous Band Switching

For the first time complete and instantaneous band switching with either local or remote control, from 2 to 30 MC, 2 to 5 bands. Unit is capable of 3000 * watts PEP input on SSB, also suitable for AM, CW, FM and FSK. Highly efficient and compact through use of Jennings vacuum components, and 3 water-cooled Eimac high power tetrodes in a grounded grid configuration. High degree of linearity attained through use of screen clamping. Adaptable for amateur or commercial service – for portable, fixed station, or portable-mobile use. Available in cabinet or rack mounting.



NEW

**The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of two times average or more, depending upon individual voice characteristics.*

MODEL DM 1000
Specifically for mobile SSB Operation

A completely new design concept in mobile communications – developed for SSB operation. Designed for bumper mounting, this unit puts the RF power directly into a conventional whip antenna. High power Eimac tetrode is used in highly efficient circuit, cooled by small amount of recirculating water. Rated at 1000 watts PEP input with minimum grid drive. Easily interchangeable plug-in units give multi-band operation.

Two new portable packages to power communications equipment now available from Yuba-Dalmotor: (a) A complete, field power unit with 3-phase, 400 cycle alternator, coupled gasoline engine, coolant and heat exchange components, (b) DC to DC inverter—to provide one KW continuous output from either 12 volt (DMP 1012) or 24 volt (DMP 1024) input.

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big "Boatnik" to be held on the Rogue River. MTW is NCS on OSN Wed. nights. K7CLL is slowing down on traffic-handling but his XYL, K7IWU, seems to be taking up the slack without any trouble. BDU made BPL again on OSN, but ZB slipped a little. New OO stations in Oregon are YG and GUH. GWC reports 3 mobile drills on 3825 kc. in April and UQI has a fine report showing a nice increase in activity on the AREC Net. RACES and AREC members in the Portland Area participated in OPAL'60, as did AREC members in several counties. We regret to announce the passing of K7IDN, of Pendleton. Not so much news came in for this report. Guess it is a case of too much convention. Sure was swell to meet all of you there. Traffic: W7BDU 551, ZB 271, K7AXF 234, CLI. 140, W7ZFH 58, K7IWU 46, W7DIC 38, MTW 36, DEM 25, LT 25, AJN 20, CPV 17, K7BRY 15, CNZ 12, W7GUH 7.

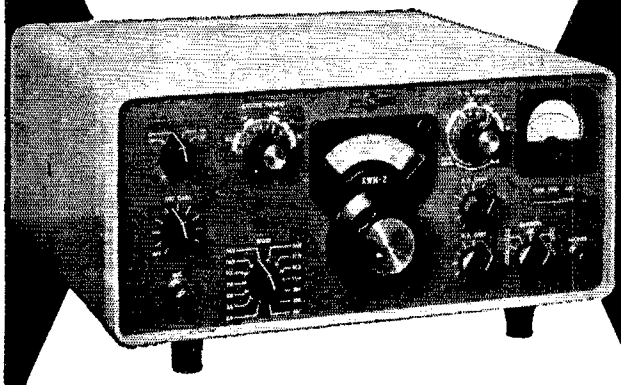
WASHINGTON—SCM, Robert B. Thurston, W7PGY —The Skagit Club Banquet was attended by some 130 amateurs in the A.O.U.W. Hall in Mount Vernon. K7BWV is the new net manager for the Slow-Speed Net. K7CWO and AKA are going to attend radio school in California in August. The Clark County AREC held an on-the-air meeting on 3920 kc. and had a total of 22 participants. New officers of the Clark County Amateur Radio Club are AZN, pres.; NFR, vice-pres.; K7DQH, secy.; SAP, treas. K7CHH made a good score in the CD Party. VPW has a new home-brew electronic keyer. AIB has a Navy type TCM transmitter and made DXCC. K7KYG is QRL building the Johnson Valiant transmitter. K7KRZ made several contacts with Okinawa and Japan last month. K7GMT has a new five-element beam for 6 meters. MPD is going to Sault Saint Marie, Mich. in July for nine months with Boeing Aircraft Co. ZBU is building a 6-meter moble rig. WVU is running 100 watts on 2 meters. WTG is planning on transistorized power supply for mobile operation. The following amateurs supplied communications for the sports car races at Shelton: W7s BWZ, TSO, IPJ, SEM, TBF, BTG, ERW, WTG, K7s, CHG, SZI, ALV, KOB and HIL. The FCC turned down the BEARS request for the station call of W7BAC. K7ELH worked a VE2 with 8 watts. OEB is visiting Puyallup. The VARC went all out for Field Day. The SCM and SEC made trips to various clubs gathering in April and procured four new ECs for the AREC program. CWN attended the ORA at Portland. About forty-seven amateurs attended the Handy/Roberts meeting in the P.I. Auditorium on Apr. 28. IST is building 220-Mc transmitter and converter. OIV is back on the air with a big rig. K7DYL has a new Ranger. ASY is working for the N.P. Railway. MCU is due back from the Philippines on May 20 after 15 months overseas. TIQ is QRL wiring the new Apache. K7GUX vacationed in KH6-Land. KN7HXH is sweating out General Class. EBU is a new OPS in Morten. New OESs are ZVY and K7GGT. AIB and IEU renewed their ORS appointments. K7HTZ is working on a new 500-watt rig. K7EQX has a new HT-32. Traffic: W7BA 1611, DZX 1029, HUT 600, QLH 453, APS 147, GYF 126, AMC 108, GIP 104, IST 104, JHS 66, AIB 53, VPW 43, ZDQ 34, USO 26, BTB 19, OMO 17, K7AJT 8, W7SYE 8, DDQ 4, W7FYO 4, TIQ 2.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—The NARA has a 2-meter repeater on Slide Mt. okayed by the FCC with 220-Mc. control with input frequency of 144.320 Mc. and output frequency of 147.240 Mc. and is looking for sked. K7HRW has a 6-meter beam up to 70 feet. CX is back on 6 and 2 meters with his Seneca. The Wildcat Amateur Radio Club of Las Vegas High School is a new ARRL affiliate. Welcome, fellows. VIU has the final back on now with parallel 4-400As. VIU, VJR and K7GQD participated in OPAL '60. The Boulder City group was active in OPAL '60. Tech. K7BFM relayed c.d. traffic to IWT via the land line for OPAL '60. Not many reports were received from you fellows this month. Let's keep your SCM informed of what's going on.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—SEC: W6ZRJ. PAM: W6ZLO. RMs: W6PLG and W6RSY. The Palo Alto ARA was in Burgess Park, Menlo Park, under the chairmanship of W6ABZ on Field Day and had a public demonstration of emergency operation. The Monterey Bay RC was at the Fair Grounds in Watsonville under the leadership of W6OEF and offers a trophy to its best operators. Plans for the Pacific Division Convention to be held in San Mateo Sept. 2, 3 and 4 are well under way by the CCRC. K6DEY is the program chairman. W6HC has acquired a 5-kw. gasoline generator. W6ASH has 80 watts to a 2-meter Yagi in the top of an 80-ft. pine tree. W6OKK plans to move to Cupertino and it is merely coincidental that it's a better ham QTH for him. WA6HRS

(*Continued on page 128*)



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THE NEW COLLINS KWM-2 TRANSCEIVER

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Featuring operation on all bands between 3.4 mc and 30 mc on either voice or CW, the KWM-2 has the quality and performance of the time-proven KWM-1 and famous Collins S/Line.

Filter type SSB generation and crystal-controlled double conversion also are features of the KWM-2, in addition to VOX and speaker anti-trip circuits. ALC keeps the signal adjusted to its rated PEP resulting in an increased average talk power.

The KWM-2 is easily moved between mobile and fixed station installations. For mobile use, the transceiver slides into the mount and the power, antenna, selector and car radio speaker plugs connect automatically. These same four connectors are used in a fixed station installation.

The KWM-2 mobile transceiver transmits on SSB or CW with a nominal output of 100 watts for complete coverage on all amateur bands. Any of fourteen 200 kc segments of the 3.4-30.0 mc frequency range may be utilized except the 5.0-6.5 mc range on transmitting. Other frequencies (such as MARS) outside the amateur bands may be obtained by inserting the proper crystals.

PRICE — **$1095.00**

Type/Description		Net Price
516E-1	DC Power Supply	$262.00
351D-2	Mobile Mount	$110.00
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516F-2	AC Power Supply	$115.00
312-B5	Speaker Console	$333.00
30S-1	Linear Amplifier	$1556.00
136B-2	Noise Blanker	$120.00

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now is operating 50 watts mobile on 75 meters. WA6CLT has a 6-meter mobile converter ready for his trip East. We are sorry that Jim is leaving the section but happy that he made his WAS No. 3 while here. W6GGQ and WA6BWT, father and son, also are leaving the section for the Midwest. K6LQY has a new beam on a 60-ft. tower. W6RLP has a new HT-37 SSB. W6RSY has his hands full with RN6 managership and needs help. Summer conditions on the nets separate the men from the boys. How about pitching in and proving you're a man? New official appointments: K6MPX as EC, W6CTH as EC and W6WX as ORS. Traffic: W6RSY 899, K6ZCR 618, K6DYX 332, W6AIT 154, W6DEF 135, W6FON 72, K6VQK 58, W6YHM 46, W6ZRJ 44, W6HC 25, W6ASH 22, W6OII 21, K6GZ 18, W6ZLO 18, W6RFF 16, K6YKG 7, W6YBV 4, W6ZXS 2.

EAST BAY—SCM, B. W. Southwell, W6OJW—W6WLI won the OO award for W6. W6JOH is keying at W6OT. W6NBX is the mainstay on NCN, and received a Section Net certificate. K6GK is working on 2-meter gear. W6WLI worked in the C.W. CD Party. The 1960 Western S.S.B. Convention will be held in Santa Barbara Oct. 1. K6OSO is QSL Manager for the Richmond Radio Club. KG6AGF was an East Bay visitor and is looking for the gang on 14.275 upper sideband between 2300 and 0300 PDST. K6YKT is going mobile. RRC had a good turnout at the mobile transmitter hunt. K6EPC and W6HBF operated K6EPC/m during Field Day. K6TYF has a two-element beam fixed on KG6. K6TGA has a new vertical. K6QDV is going high power and has a new electronic keyer. K6ESZ has his AT-1 on 160 and 6 meters. WV6HNT is awaiting his General Class ticket. The MDARC toured KTVU, Channel 2. W6IDC has QSYed to Riverside in the Los Angeles section. K6TFC made WAC, but is sweating out a card from Africa. New members of the HARC are W3WAU, WA6DJD, WV6-JYB, K6IKX and K6IFU. WA6HGO has a new skyhook. WA6AHF, got a TVI notice from the FCC. K6TKL is working out bugs. That's it for this time, gang. Traffic: W6NBX 455, K6GK 120, W6OT 60.

SAN FRANCISCO—SCM, Leonard R. Geraldi, K6-ANP—Asst. SCM: Jeri Bey, W6QMO. RM: W6GQY. PAM: W6PZE. ECs: K6EKC, W6OPL and W6JWF. OOs: W6GQA Class 1, K6OHJ, W6OKR and W6PHS. OBSs: W6GGC and W6MXJ. ORSs: W6GGC, W6QMO, W6OPL, W6BIP, W6GQY and K6QJB. OPSs: W6PZE, W6GGC and W6FEA. W6HC, Pacific Division Director, was guest speaker at the April meeting of the San Francisco Radio Club. His subject was the ARRL. Slides of Squaw Valley were shown and much enjoyed. The CCRC held its dinner-meeting Apr. 6 with 56 guests attending. Plans for the Pacific Division Convention to be held Sept. 2 3 and 4 are shaping up nicely and this looks like it will be a very FB affair. The BAYLARC had a surprise guest at its April meeting in the person of Wanda Gluck, K6ENK, of Sacramento, who showed slides of the recent California YL get-together held in March. W6OPL assisted in putting up an amateur radio station for a local Boy Scout troop in the recent Scout-O-Rama held in San Francisco. The boys contacted various troops scattered throughout the country. W6PZE reports that K6YBV is now the new secretary of the NCTN. We are sorry to announce the passing of Lt. Col. Wayne Woodward, MARS director of the Fourth Air Force. W6JWF and W6GGC attended the memorial services at Hamilton AFB. W6QMO has taken over the manager's spot on NCN. W6OKR reports that WA6ELC has moved from Larkspur to Santa Rosa and that K6YYL has moved to Livermore. W6OKR worked LU4DFM, LU3EX and LU2FCD on 6 meters. K6LRN is now a member of the ALN. W6JWF and W6GGC attended the testimonial dinner for W6WGO in San Jose. Traffic: W6GQY 711, W6QMO 514, W6GGC 100, W6PZE 22, W6FEA 20.

SACRAMENTO VALLEY—SCM, Jon J. O'Brien, W6GDO—Asst. SCM: William van de Kamp, W6CKV. SEC: K6IKV. RM: W6CMA. PAMs: W6ESZ and W6PIV. The North Hills Radio Club reports that officers for the fiscal year '60-'61 are K6TWE, pres.; W6ISX, vice-pres.; and K6IS, secy-treas. The Mt. Shasta ARC has a new president, WA6FGO. Ex-W6SXI is now KØZFR in St. Louis, Mo. A new Novice in Chico is WV6KUM. WA6BVI has moved nearer to Elk Grove and is planning an antenna farm. W6JDN and W6ZZA are going mobile once again, as are W6DYF, WA6EBI, WA6FJP, WA6GIT and many others. It must be the beautiful weather that makes everyone want to go mobiling. MARS Around the World was the theme for the 1960 MARSfest held May 20. May 21 found several Sacramento Area hams participating in "Operation Sacto-Able," a full-scale civil defense exercise. Traffic: K6YBV 908, K6SXX 401, K6YLS 248.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan,

(Continued on page 130)

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F455Q-05 Mechanical Filter	50.00
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W6JPU—The new officers of the Kern County Radio Club are K6JAG, pres.; W6QWB, vice-pres.; WA6BDT, secy.; W6LRQ, treas.; W6QQW act. mgr. The new officers of the KARS are K6RGZ, pres.; K6OZL, vice-pres.; K6DOC, treas.; W6NKJ, act. mgr. W6GUZ is heard on 75 meters. K6CZO is on 75-meter mobile with 60 watts. K6ROU has a Tribander and is chasing DX. K6GOX is back on 6 meters again. W6OUX is running 3-807s in the final on 75-meter mobile. W6JPS got a ticket for operating on 20 and listening on 40 meters. W6PXP got his ART-13 mounted in his El Camino and is working out well. W6SMS is on s.s.b. with 4-811s in the final. W6HKV is on s.s.b. on 75 meters with a GSB-100. W6FXV is plate-modulating his BC-1306. W6HYG is chasing DX on 20 meters. K6ZCD is running 60 watts on 75-meter mobile. W6UBK has a new SX-101A. W6KUT has 230 countries confirmed. W6YIM has a new HT-37 on s.s.b. W6FXV has a new 100V. W6ERE is s.s.b. on 75 meters. K6TKF has a 10B on s.s.b. on 75 meters. The SJVN had 26 sessions, 568 check-ins and a traffic total of 69. W6VVU is moving to Mariposa. W6EPB has a pair of 811s on s.s.b. W6LOS has an Eldico receiving adapter for his HRO. K6IFL is heard on s.s.b. with a Heath SSB exciter. The Fresno Amateur Radio Club boasts 105 members. Traffic: K6EJT 26, W6FXV 1, K6ROU 1.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: ORC, V.H.F. PAM; ACY. K4IEX reports from the Charlotte Area: K4MWB received the DXCC Award. K4IEX has received the following awards: WAC, 20-K, YLCC, R6K, WPX DUF 3 and WASM. New hams in Charlotte: NIT and K4ENH. K4PZL, secy.-treas. of the Rutherfordton County Amateur Radio Club, reports that K4PBG is the new president and TMY, vice-president. The club has 25 members and meets each 2nd Thurs. at 7:30 P.M. K4LTJ and IUI hold code and theory classes twice per week. The club's Annual Hamfest will be held June 19. K4HGK, OES, reports interesting activity on 6 meters. During the "Aurora" he worked 10 states, four of which are new. K4CQH worked CO2DL on 6 meters Apr. 19. A mobile net on 6 meters is being formed in the Lexington Area. ASY, V.H.F. PAM, reports that activity is picking up on the 6-Meter Net with an average of 18 checking in each session. K4GMP has been appointed OBS for the 6-meter group. ZXI and K4GZT are making plans for microwave work this summer. Burke County and surrounding counties ave a 6-meter c.d. mobile net with 17 members located in Caldwell, Burke, Avery and Iredell Counties. HUW, State RACES Radio Officer, monitors 3993 kc. daily from 0830 to 1630 Mon. through Fri. C. E. Blalock announces plans are being made for c.d. training in the near future and also for RTT circuit to Headquarters. Traffic: W4LEV 1316, PNM 507.

SOUTH CAROLINA—SCM, DR. J. O. Dunlap, W4GQV—SEC: K4PJE. RM: K4AVU. PAM: K4IIE. ZRH has resigned as State RACES Radio Officer and K4AII has been appointed to succeed him. New members of the Mike and Key Club of Greenville are K4EOX and EOS. The Spartanburg ARC's XYL appreciation banquet was a great success. K4LNO presided and short talks were given by AKC and GQV. The Greenville Area Net was active Mar. 25 handling traffic for a train wreck. Active members were DZC, WVK, VOS, JOY, CHD, K4HKN, BLF mobile and PJW. At the S.S.B. Net meeting and supper held at Greenville Apr. 30, FFH was elected net manager, K4QMZ, traffic manager, DHW, secy.-treas. UDG is back in Greenville from North Carolina. The May 1 Greenville Hamfest was well attended and the prizes were excellent because of the efforts of Presidents K4DNT and QDV, of the Greer and Blue Ridge Clubs. MYJ was M.C., GQV guest speaker. July 1 is the absolute deadline for applying for special license tags. The address of SCARAB is Box 90, Rock Hill, S. C. Traffic: K4HDX 172, GAT 112, W4KNI 96, K4AVU 89, VVE 84, W4FFH 67, DAW 66, K4ZHV 63, W4AKC 49, K4WCZ 48, LNJ 44, W4PED 18, VIW 9, TLC 4.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—SEC: K4MJZ. RMs: SHJ, K4JKK, K4QER, K4KNP and K4EZL. PAM: W4BGP. VSN activity has so increased that Ann, K4QER, had to move up the starting time to get all the work done! K4JKK, our VN Mgr., reports 62 sessions, traffic 620, QNI 682. Incidentally the number of stations reporting activity is up to 90 percent over the same time last year! Our PAM, W4BGP, reports 30 sessions, traffic 329, QNI 1150 (average 38.3 per session), 1950 traffic 1666. Our SEC is working hard to build up the section AREC. How about much more support and reports? Have *you* enrolled in the emergency program? The Buena Vista Amateur Radio Club

(*Continued on page 132*)

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has been formally organized and officers elected. The club is sparking a 6-meter net as part of the club activity and plans to cooperate with the new EC, K4CHA, in the AREC. The Shenandoah Valley Amateur Radio Club elected K4OYK, pres.; TCK, vice-pres.; ACC, secy.; Fred Bame, treas.; K4ZJJ act. mgr. The club will hold its hamfest Aug. 6 and 7 at Winchester. Carol, K4AJL, working as census-taker found it lots of fun and a terrific experience. PNK reports he will be in a new QTH by the time this appears. OWV says that K4IIX has a new mobile with 50 watts after having "feet in the air" for 2 weeks. K4AVW is "loud and clear" on the neighbor's stereo. SNH reports an unusual relay: CXQ-4 to BZE (80 meters)-BZE on phone through K4ROI (50.1 Mc.) to SNH. CXQ and K4LHB report activity from two locations each. JUJ still is collecting wallpaper by adding Gaylark, Laborador and Maine QSO Party Awards. K4TFL is sporting WAS and WWCNY. K4LPR acquired a Collins 51J3. Traffic: (Apr.) K4QIX 545, M1FX 351, W4QDY 343, K4KNP 319, W4DVT 284, SHJ 276, K4SGQ 187, OUI 150, W4BZE 89, K4FSS 89, W4ATQ 87, CXQ/4 82, OOL 60, K4JKK 44, W4BGP 40, K4IIP 38, VWK 32, AL 28, W4ZMH 28, K4BAV 22, AJL 21, W4PNK 19, OWV 14, GOF 13, SNH 13, CXQ 12, JUJ 10, K4ZHA 9, W4PVA 8, UHG 8, KX 7, K4TFL 7, W4LK 5, K4ARO 4, GKX 4, LHB 4, W4VMC 3, K4IKF 2, LHB/4 2, LPR 2. (Mar.) K4SSA 17, TFL 2.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—This is the last announcement of the 2nd Annual West Virginia State Hamfest, to be held in Jackson's Mill, July 9 and 10. UMR and K8QYB, father and son, are active on 75 through 10 meters. Officers of the Mountain State Transmitters ARC are K8AXU, pres.; K8CHW, vice-pres.; K8AGA, secy.-treas.; GIU, act. mgr. Present members are UHK, K8QOH, TGT, SWL (a real call), UHB, NIV, K8HXD K8LUR, EUJ, K8NVM, K8QOI and TGF. K8GMG increased traffic by checking 8RN. VMP lost his antenna and tree in a recent storm. IXG and FGL have arranged an excellent program for the West Va. Hamfest. VMP, HTU, K8BIT, K8DZU, K8MQT and JZO are handling publicity and prizes for the hamfest. West Va. now has 15 active radio clubs in the state. K8QYG and JUE are active from the Eastern Panhandle. New NCSs on the WVN-CW are K8LGX and K8JPV. GQE has a new QTH and an antenna and is DXing on s.s.b. DPT has a brand-new jr. operator. VOI completed the 813 rig for 75-meter phone. K8AEN has a new Drake 2A. K8JSX reports that 6-meter activity is high in the Kanawha Valley. Traffic: K8JPV 192, CNB 155, JLF 142, HID 110, BIT 62, W8NYH 32, K8MQB 29, GMG 28, W8ELX 26, FNI 24, K8HTS 15, W8SNP 5, K8AEN 2.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, WØBWJ—Asst. SCM: Howard Eldridge, KØDCW. SEC: NIT. RMs: EDK and WME. PAMs: CXW and IJR. OBSs: KQD and DCC. A new e.d. Radio Officer for Colorado was appointed Apr. 15. He is KØDNW from Boulder. KØEDK has been nominated as net manager on PAN. Colorado was saddened to learn that two well-known and quite active hams, Carolyn Owen, KØBCQ, of Denver and James Penn, SXI, of Trinidad had joined the list of Silent Keys. During the three-day C.D. Drill May 3, 4 and 5 it was very gratifying to hear operation from Colorado State C.D. Hq. in Boulder. This is the first time in quite awhile that regular operation from the State has occurred. A vote of thanks to KØDNW and his able assistants, IUF and KØDNP. Also thanks to all the ROs who helped maintain communications under adverse conditions. Congratulations to the CWXN for maintaining a 100 per cent record even though the band was dead. URH's phone bill may be high but the WX got through. A quote from a Montrose club paper: "Can you justify an investment of several hundred dollars in equipment by doing little or nothing? Enjoy your investment more by operating more." KØFCC made BPL in March YQ, in April. Traffic: (Apr.) KØDTK 497, EDH 361, EDK 357, RTI 314, WØYQ 288, ANA 240, MYB 132, KØDCW 128, YOK 74, EVG 52, WØCBI 42, KØQGO 35, WØIA 21, KØLCZ 15. (Mar.) KØFCC 691, YOK 58.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, W7OCX. The AREC net in Salt Lake County has been named SCAN. Utah AREC now has 88 members. QWH has been acting as SEC and is looking for someone to fill the post. K7CFL has moved to New Mexico. His activity in Utah will be greatly missed. MWR is back on the air after a long absence and is heard ragchewing with locals almost daily. LQC, in Ogden, has been checking into BUN with a real potent signal. DQW is now heard regularly on 40 meters. BUN did quite well for a month of poor conditions. K7BLR has been doing a top-notch job as NCS on SCAN. PAN has moved to 7120 kc. at 2100

(*Continued on page 134*)

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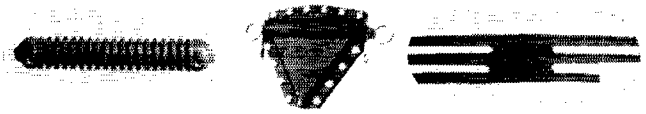
Through the use of a unique and exclusive new patented process, a multiplicity of doublet wires are extruded in a perforated, low loss polyethylene ribbon. ELIMINATING TRAPS, the Hy-Line doublets maintain efficiency, full size performance on all bands with an SWR of less than 2:1. May be fed directly with 52 or 72 ohm coaxial cable. No matching sections, baluns, or antenna tuners required. All doublets handle maximum legal power. Competely factory pretuned, ready to unroll and install in a matter of minutes. Each doublet includes new molded unbreakable center and end insulator assemblies.



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6, 10, 15, 20, 40 and 80 Meters

At last a highly efficient all-band doublet that operates as well on the high frequencies as it does on 40 and 80 meters. Overall length 130'. Net weight only 5 pounds. Complete with new molded plastic center and end insulators.

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For the ham who doesn't have space for the 80 meter section, 6 through 40 meter coverage in an overall length of 64'. Complete with new molded plastic center and end insulators. Net weight only 3½ pounds.

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Only 32' long! Installs almost anywhere • rooftops, attics, etc. Excellent for portable or temporary operation. Rolls up into a small package for easy handling and transportation. Complete with new molded plastic center and end insulators. Net weight only 2¾ pounds.

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Center Insulator

Supplied in all Hy-Line Doublets, the new center insulator is also available separately. Molded of high impact cycolac plastic with all hardware iridite treated in accordance with military specifications. Furnished with silicone grease for weather proofing. Accepts either ¼" or ⅜" diameter coaxial cables. Weight only 6 oz.

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Supplied in all Hy-Line Doublets, the new 7" end insulator is molded of high impact cycolac plastic with aluminum bushings. Heavy serrations increase leakage path to approximately 12". Weight only 2½ ounces.

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MST for the summer. Traffic: (Apr.) W7OCX 353, K7WHE 53, W7QWH 22, K7HIO 21. (Mar.) K7HIO 25.

NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl W. Franz, 5ZHN. SEC: CIN. PAM: ZU. 10-Meter PAM: LQM. V.H.F. PAM: FPB. The Breakfast Club meets Mon. through Sat. at 0630 MST on 3838 kc.; NMEPN on Sun. at 0700, Tue. and Thurs. at 1800; NMBP on Mon., Wed. and Fri. at 1900 MST on 3570 kc.; The Sandia Base Radio Club is trustee of a memorial fund in honor of KF. Mrs. McKesson donated $500 to start the fund, which is to be used to help deserving young hams. LEF won the accolade (and a year's subscription to the *Call Book*) for his diligent work as OO. The Totah ARC's plans for July 4 celebration include an excursion on the "Silverton," America's last narrow-gauge railroad. SGC is the new prexy of the Totah ARC and K5WTQ is vice-pres. Traffic: W5ZHN 476, K5LMJ 156, GOJ 115, IPK 45, W5UBW 22, GB 14, VC 6, BZB 2, CIN 2, K5LWN 2.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: CQL. The Pony Express Net meets Sun. at 0830 MST on 3920 kc.; the Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net on Mon. and Wed. through Fri. at 1830 MST on 3610 kc. BHH's vertical antenna blew down but is back up now. VTB has been appointed OES. GDW moved to California. K7KLE went along but came back. K7AUI, district radio man for civil defense, did a nice job on the c.d. drills, which were well attended by Wyoming hams. LKQ handled District Number Two fine. There will be quite a few nice prizes given out at Wyoming Hamfest on July 16 and 17. Traffic: W7DXV 107, BHH 95, K7KLE 24, W7NMW 13, LKQ 12, AMU 7, K7IAY 3, LIL 3, W7BKI 2, DTD 2, GIL 2, K7GMD 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ—Asst. SCM: O. K. Gibbs, K4BTO. SEC: JDA. RMs: RLG and OCV. PAMs: PHH, BTO and JJX. New appointments: 5RYG/4, K4AJF, PKA and K4AUP as ECs; K4ZNI as OPS; K4MLF as OES; K4EII as OO. Congrats to new Generals K4DSO, EII and KBW. HON is in Texas with the Air Force. Congrats to RNX and OLG, who received Citizenship Awards at the Birmingham Hamfest. Congrats to K4SAV, winner of a mike in the recent AENT contest. New NCSs of the AENP morning session are K4RIL, Thurs., K4ZBX Wed. Welcome to AENB, K4UGS and KQX. Alabama was 100 per cent on RN5 in March. Highest QNI on the AENB in April were SAV and RJM. YRO is on a new location in Autaugaville. ZKU moved to Washington, D. C. K4SAV is new liaison captain on the AENP. PVG is on RTTY. K4RJM made DXCC. PTR has a new 43-ft. told-over tower. New Jasper hams are KN4QMH, KN4-PRE and KN4TRJ. MLU is on s.s.b. with 100-watt home-brew. K4CZK has a three-element Hi-Gain beam. K4HVN is sporting a new HQ-180. USM is on the air with a new HT-37. SLM has a new Hornet beam. FDZ is retired. K4CZK worked I1THR with 20 watts on 10 meters. A new ham in Piedmont is KN4-UWZ. K4KJD is enjoying s.s.b. with a new SB-10. Congrats to K4ZBX and his XYL on their new baby boy. *Six-meter news:* K4OCV will announce a v.h.f. c.w. net soon. JSP worked LU3EX. RIL reports the Muscle Shoals ARC is planning a 6-meter program. CIN worked HC1FS, Ecuador,, and LU3DCA and calls CQ on 145.170 Mc. at approximately 10 P.M. every night. JJX reports the AENX is active conducting procedure classes. A 6-meter emergency net is needed in the Montgomery Area. Contact JJX. K4JSP has been reappointed Asst. EC V.H.F. in Jefferson County. ASW did excellent work punching the chassis for the Birmingham ARC 6-meter project. OZK lost his 125-ft. tower and six-element beam in the March ice storm. K4EFM has a new 60-ft. tower and eight-element beam. WHW is mgr. of the FB 6-meter emergency net in Mobile. Traffic: (Apr.) K4PFM 184, W4RLG 176, PTR 90, KIX 85, K4SAV 85, JDA 67, W4PVG 52, MI 45, K4PHH 38, ZXX 32, W4ZRQ 31, K4BTO 29, RJM 29, W4EVU 22, K4AOZ 19, HVN 18, W4WHW 18, K4CZK 14, W4CIU 13, K4KQN 12, RSB 12, HFX 10, JSP 9, HJM 7, W4RTQ 6, K4RIL 5, HAL 4, ISZ 4, W4USM 4, K4ZBX 4, ZNI 4, W4AYU 3, K4ISZ 2, TDJ 2. (Mar.) K4PFM 134, RJM 27, HAL 20, CZK 12, W4EVU 12, KAC 12, K4ZNI 8, RSB 7, SPP 6, KJD 5, ZBX 4, OCV 3, W4CIN 2, K4YGS 2, W4JJX 1. (Feb.) K4YGS 24, RSB 17.

EASTERN FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT. RM: K4SJH. PAM: TAS. V.H.F. PAM: RMU. New officers of the Lakeland ARS are K4VQB, pres.; K4LTX, vice-pres.; K4FWO, treas.; and Herman Coile, secy. The club station of the Daytona Beach ARA, BV, was a success at the Hobby

(*Continued on page 136*)

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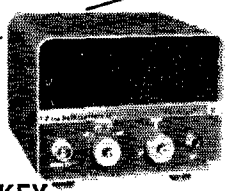

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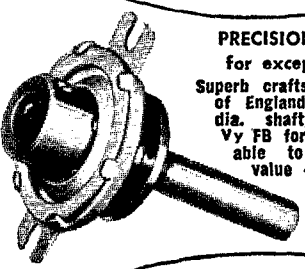

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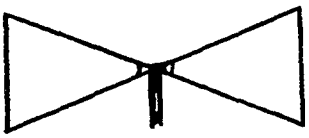

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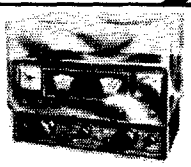

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Show. The Suncoast V.H.F. Club's new officers are K4LYS, pres.; K4IKK, vice-pres.; K4EAC, secy.-treas. Eastern Fla. ranked high in the 1959 SET. Dade County, under SJZ, Albury EC, ranked third in the nation with 754 points. Our hats are off to all the loyal ECs who sent in reports. New Novices in Ft. Myers are KN4-UVZ and VGN. The Orlando Radio Club did a swell job during the local floods. The club members operated the c.d. bus in the area and relayed information back to the Red Cross and C.D. Hq. The Broward ARC participated in the Ft. Lauderdale Hobby Show. A total of 294 messages were handled, not two thousand as reported last month. Good work anyway, fellows. The Sunshine Wireless League (Pompano Beach) meets the 1st and 3rd Thurs. Contact K4GHX for further information. K4GLI received his General Class license. Pick one of our section nets and join in the fun. On Apr. 7 DPD worked 24 Texas and 2 Louisiana stations on 2 meters. K4MTP has a new Valiant. KN4VRS, 11 years old, is a new ham in Dade City. Is he the youngest in E. Fla.? NDJ now is on with an NC-183 and a TX-1. K4ILB can send and receive simo 75 through 10 meters and also can put 6 and 2 meters to work if needed. Dan is equipped with emergency power and is the new EC for Manatee County. Let's keep those monthly reports coming in, fellows. We ranked 6th in the nation for 1959. Traffic: (Apr.) K4QLG 1177, SJH 687, W4SDR 435, K4KDN 260, SLR 256, W4LMT 220, K4LCF 111, W4GJI 94, K4AX 90, W4IYT 81, K4BLM 77, BY 66, ILB 65, GBS 62, RNS 60, TDT 58, W4CNZ 57, BKC 48, NDJ 39, K4BOO 32, JJZ 26, W4SGY 24, K4FXG 23, W4JTA 22, LDF 19, SMK 16, FE 15, K4MTP 12, W4MRC 10, DPD 8, K4GLI 6, AHW 5, IWT 5, OSQ 5, W4GOG 4, K4LDF 2. (Mar.) W4FFF 108, K4GBS 104, W4JTA 30, K4BZ 16.

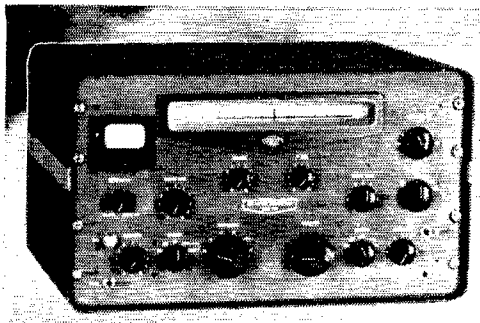
WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: HKK. PAM: K4RZF. RMs: AXP and UBR. Tallahassee: New officers of the TARC are K4OHR, pres.; K4HQC, vice-pres.; and K4MZT, secy.-treas. The 10-Meter Net has grown to 10 members. HXH is the NCS, operated by K4MZT. MLE has renewed his ORS appointment and is active on QFN with a DX-100 and an HQ-110C. UEU, GAA, YUU and K4OHR, along with KQP from Perry, attended the Orlando Hamfest. Ft. Walton/Eglin AFB: K4UBR put out another FB Fla. c.w. net bulletin. A 2-meter MARS net is being formed, using 143.95 Mc. There was a fine turnout for Operation Alert 1960 in Okaloosa County. Eighteen operators manned 7 fixed stations, in addition to 12 mobiles, during the 2-day effort. Seagrove Beach: K4QVL was host for a picnic for W. Fla. Phone Net members. Pensacola: MS raised his DX total to 170. K4FTI is active on 2 meters. K4QAC and K4RMO are meeting MARS Nets. W4MLH has moved to Pensacola after retiring from the Navy. Milton: K4BSS has moved here from Pensacola, and has been appointed ORS. K4HOX is active on 75 meters and in WFPN. Traffic: (Apr.) W4SRK 162, K4BBS 100, RMO 7. (Mar.) W4SRK 231, K4BSS 184.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: PMJ. PAMs: LXE and ACH. RM: DDY. The GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. 0800 on Sun.; the GSN Mon. through Sun. at 1900 EST on 3595 kc., DDY as NC; the GTAN Sat. at 1000 EST on 7290 kc.; the 75-Meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc., K4JTC as NC; the Atl. Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc., KWC as NC.; the GPYL Net each Thurs. on 7260 kc. at 0900 EST, K4DNL as NC. K4LIU is a new Peach member. K4FGW and K4KIH also are new members of the Peach Net. K4DNL has a new transmitter and a 65-ft. tower constructed by chief engineer DOC. YEK now is operating high-power mobile with an AF-67. TJS assisted in construction of the installation. K4EJI made BPL again. We're sure sorry to lose ZKU to Washington, D. C. He started to work with the ACF May 2. K4BQP made BPL and also earned a medallion. The AREC program is growing by leaps and bounds in Clark County. K4BQP is EC. K4BAI is doing an FB job as net control of the GCEN Sun. K4ZZS and K4QJH also are doing excellent jobs as Net Control during the week. KTS is a new ham in Marietta, Ga. K4VHC is going s.s.b. YE is keeping skeds with sons K4CAX and YZC. LNG ran some unsuccessful meteor scatter skeds with 8PT. FWH transmits bulletins on 2 and 6 meters regularly. K4LEM has been inactive because of school. The Teenage Radio Club as a Viking Valiant and an HQ-160 receiver. The club call is IOF. The Albany Amateur Radio Club elected K4ICW, pres.; POJ, vice-pres.; Charles Royal, secy.-treas.; K4TOZ, act. chairman; K4ZMT and K4MGF co-chairman. The club meets the 3rd Thurs. of each month. Traffic: K4EZI 509, W4ZKU 321, K4BQP 249, BAI 153, W4DDY 147, K4UJS 53, VTH 48, LVE 28, VHC 28, W4MKN 21, K4BVD 17, W4JWO 16, K4PHA 12, W4YE 12, K4MIH 8, YSB 8.

WEST INDIES—SCM, William Werner, KP4DJ—

(*Continued on page 138*)

RADIO SHACK SUMMER SIZZLER



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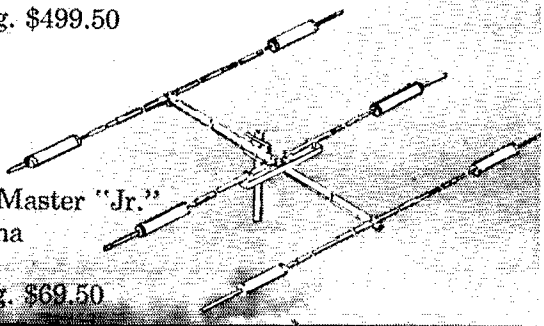

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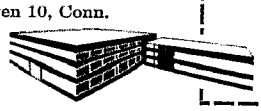

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SEC: AAA. KP4s participated in an unannounced and unexpected traffic-handling test as part of Civil Defense Operation Alert on May 3. Two stations were set up at C.D. Headquarters by Asst. ECs ABN and MC without the knowledge of any other amateurs and when the test came they were able to contact and transmit c.d. traffic to the following stations on 7245 kc.: ES, AKB, Ponce, WT Mayaguez, ALS Aguadilla, OA Caguas, AQQ Hato Rey, AQT Guayama and KV4AA St. Thomas, V.I. On 51 Mc. the following reported: UL, AHX, Bayamon, AVB Santurce, ES Ponce, AJK Guanica, AHQ Vega Baja, CK Villa Caparra, ATZ Caparra Terrace, ACH Puerto Nuevo. ALY, AOD Rio Piedras. The call of the P.R. Amateur Radio Club, KP4ID, was used at c.d. headquarters. Three official messages were filled to Region One Hq., K1ISU at Harvard, Mass., via ES on 14 Mc. A total of 34 messages was handled by ID at c.d. headquarters. AOD also sent page-long messages to c.d. headquarters on the following two-day test on 15-meter phone! AZ copied W2APF's "World Peace" message, which was tape-recorded by ALY, who gave to AOD, who transmitted it to thirteen Stateside stations. AVB surprises everyone on 50 Mc. with his one-watt Heath transceiver and Telrex Spiralray beam. The one watt gets through to So. America and Stateside too. RM has a new 50-Mc. converter. AMG traded his HRO-50 for a 75A-2. ADY moved from Yauco to San Juan, leaving his four-watter at Yauco. He now uses an HRO-50 and an Elmac 67A from San Juan. BZ acquired a 20A and will be on 14-Mc. s.s.b. CX is building s.s.b. for 14 Mc. DV is getting back on with a Viking 500 and a TA33 Tribander. API and brother WP4AVL will be /1 this summer. API has worked 16 countries and made WAC on 14-Mc. s.s.b. WT is active on the Antilles Emergency and Weather Net, 7245 kc. at 7 A.M. daily, and the 40-Meter MARS Net at 6 P.M. Traffic: KP4WT 53.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—The Crossroads Amateur Radio Club opened its new home to the public Apr. 16. KZ5MM made the opening speech and KZ5CD unveiled the new sign. Most of the Atlantic Side amateurs and their families attended the opening as well as Mr. William O'Brien, who is the assistant director of civil defense for the Atlantic Area. Several hams from the Pacific Area attended. Plans for installing more equipment is in progress. SW has been in the hospital, but has now returned to duty. KZ5GH has returned from a well-earned Stateside vacation. FB bought BU's KWM-1 and is now on s.s.b. SW also is on s.s.b. UJ, CJ, JL, QQ, GW and others whose calls we do not have at this moment are leaving the Canal Zone and we will soon be hearing most of them from various parts of the U.S.A. Our best regards go to all of them and we hope that they enjoy their new stations as well as they have the present one. New hams: UQ, RB, OS. Novices: KZ5LEN and KZ5TPN. Traffic: KZ5KQ 137, AD 53, VR 50, TJ 20, RA 18, CD 13.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: W6BUK and W6ORS. The following stations earned BPL for the month: K6MCA, W6ZJB, K6WAH, W6GYH, K6LVR, K6EA, KØCLS/6, W6BHG and WA6EEO. Congrats, fellows! W6OZ is transmitting code practice for Novices. K6GKX reports a new net, the Intra-State Net, meeting at 1100 PDST on 145.08 Mc. W6ZJB has a new SX-101 and break-in on all bands. KØCLS/6 received TCC and Public Service Certificates. Congrats, Jerry! W6SRE made a report from Idaho! WA6FXJ is building a 180-watt rig. K6OZJ is on with RTTY. WA6CKR had a nice trip to Arizona and into Mexico. K6LJY built a new v.f.o. for his DX-100 on 80 meters. W6ORS is QRL with the Little League and Cub Scouts. WA6AYF made WAS by getting Nevada! W6FB, W6CK and K6OCH made excellent accuracies in the recent FMT! The Riverside County Amateur Radio Assn. supplied communications for the Grand Prix. New officers of the Monterey Park Amateur Radio Club are K6GIP, pres.; W6TLO, vice-pres.; K6VVN, secy.; WA6BGM, treas. K6UMM worked a batch of LUs on 6 meters. New officers of the SoCal 6 Net are K6PZM, net mgr.; K6JQB, asst. mgr.; WA6ARM, operations mgr.; WA6JOX, secy.-treas. K6PZM received a Public Service Award. Congrats, Joe! Support your section nets: On c.w., the Southern California Net which meets on 3600 kc. at 1900 PDST; on phone, the SoCal 6 Net which meets on 50.4 and 51.0 Mc. at 1900 PDST daily. Traffic: (Apr.) K6MCA 1530, W6ZJB 1178, K6WAH 1043, W6GYH 888, K6LVR 726, K6EA 661, KØCLS/6 561, W6BHG 402, K6OZJ 389, W6WPF 367, WA6EEO 195, K6JSD 175, WA6CKR 168, WA6DJB 149, K6PSP 146, WA6JOX 128, K6GOK 95, WA6BGI 72, K6LJY 69, K6HLR 45, WA6DWP 36, K6SIX 34, W6USY 34, K6GKX 26, W6CK 22, WA6AYF 16, K6CDW 10,

(*Continued on page 140*)

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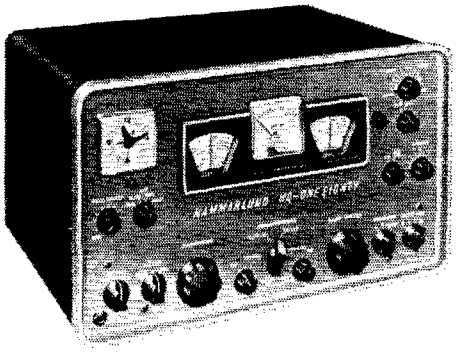

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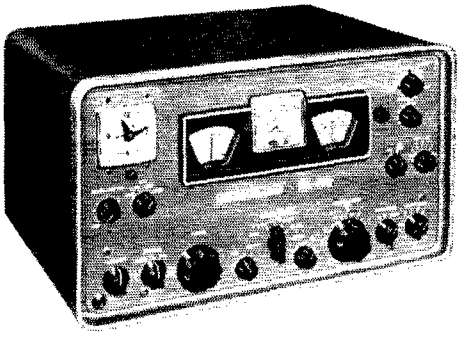

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W6SRE 8, WA6DHM 6, WA6AWD 5, W6BUK 4, K6MSL 2. (Mar.) K6JSD 120, K6TPL 23, K6PZM 7, W6NKR 6, W6SRE 2.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—SEC: CAF. The Copper State Net meets at 1930 MST Mon. through Fri.: the Grand Canyon Net Sun. at 0800 on 7210 kc.; the Catalina Emergency Net Wed. at 2000 on 29.627 and 145.8 Mc.; the Tucson AREC Net Wed. at 1900 on 3880 kc. Congratulations are in order for the Catalina Radio Club, Tucson. Their newsletter, titled *Zero Beat*, should be of interest to all Arizona amateurs. For more information, contact Dale A. Adams, 931 South Eli Drive, Tucson, Ariz. A new call is K7-LKV, issued to Phil Meade, Chief of Pima County Civil Defense, Search and Rescue. A new amateur club has been formed by the hams of Motorola, Inc., Phoenix, Ariz. Traffic: W7AMM, 76, K7CET 14.

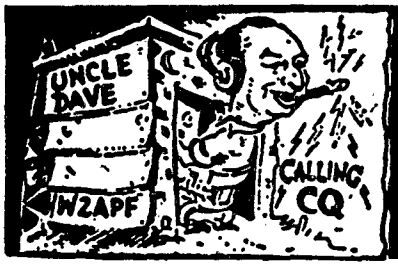
SAN DIEGO—SCM, Don Stansifer, W6LRU—WV6KXS is a new Novice in San Marcos. W6IAC, the Escondido High School Club, held Field Day on Mt. Palomar. K6IQ, in Santa Ana, now has emergency power, and is active on 2 through 160 meters. W6IEY, OES in La Mesa, sent in a good report for April. K6TFT, OO in South Bay, sent in a good report and states he is now on 6- and 2-meter mobile. W6IMT, in Anaheim, is president of the ARA in Long Beach. The Newport Club swapped colored Field Day slides with the Northern New Jersey Radio Association. The Field Day site this year was the 93,000-acre Irvine Ranch in Orange County, with W6WPN as chairman, and the club call of K6CQS. W6OME lost his tower and antenna in a recent wind. W6BZE is now active from a new QTH on Mt. Helix with a potent signal. W6SYA is home after a trip under the polar ice cap with the Navy. Your SCM again enjoyed the Newport Amateur Radio Society at a May meeting, talking on "The ARRL on a Yearly Basis." The May San Diego DX Meeting was held at the home of W6NIF in Del Mar. The W/K6 QSL Bureau reminds all who work and expect any foreign cards to keep one legal-size stamped addressed envelope on file with the QSL Bureau, P.O. Box 16,006, San Diego 16, Calif. K6BTO, OES, reports a new vertically-polarized antenna on 220 Mc. Traffic: W6IAB 2389, W6YDK 1753, W6EOT 912, K6BPI 796, WA6ATB 391, K6LKD 391, WA6DJS 88, WA6CDD 75, K61Q 24, K6TFT 23.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—SEC: K5AEX. PAM: BOO. I am happy to announce that LR has accepted the appointment of Route Manager. I hope you will give him your full support in this job. I had the pleasure of attending a banquet in Mineral Wells where ETA presented the club with its Charter of Affiliation with ARRL. Col. Meeks, manager of the Chamber of Commerce, gave a very interesting talk on communications. About 40 were present for a very fine dinner on the roof of the Crazy Hotel. The *Mineral Wells Index*, local newspaper, gave the meeting an FB write-up. GY reports several RN5 net certificates were awarded during April but none in the Northern Texas section. What is wrong—have you forgotten your c.w.? K5EKH expects to get out of the Navy and will be back in Ft. Worth soon. K5MIBB is the proud owner of a new HT-37. NFO reports several alerts in the West Texas Area but none of the storms were too serious. Many amateurs were standing by if needed. Congratulations to IKI on being able to convince his XYL on the importance of becoming a ham. KN5BJV is her call. K5PXV has a new home-brew 6146 transmitter. I still like to hear of the "Old School Amateur" who builds his own. I made an enemy of an old friend once by saying "a man is not a ham until he has been on the air with his own home-built equipment." I hope to see you all in Dallas, June 17-18-19, at the West Gulf Division Convention. Traffic: W5SMK 453, BKH 246, GY 168, LGI 67, K5JSN 11.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—Our hearty thanks to VVQ for the work he has done with the c.w. nets. Ed's work no longer will permit him to act in the capacity of RM. His resignation is regretfully accepted. K5JGZ will be the new No. 1 RM for Oklahoma. CZB is getting quite a workout as NCS of the Storm Net. HHG, AZO, KY and others are working as liaison with the Weather Bureau. K5USA, W5QMJ, OJD, OOF, LTB and REH made BPL in April. K5DUJ is on a.m. with a Viking. K5BBA worked FO8AG and CR6CF. YKB was awarded the Scout's President Award for outstanding service as counsellor. K5PHP is the new publicity chairman of the Bartlesville Club. The Muskogee Club is now an ARRL affiliated Club. K5CBA has a new DX-100. New ECs are K5MND, WSX, ZOM and K5YJP. K5GQW is doing well on the highbands with a

(*Continued on page 142*)



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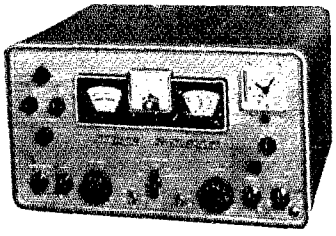

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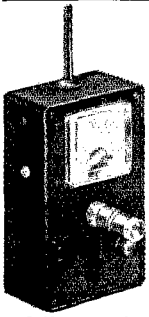

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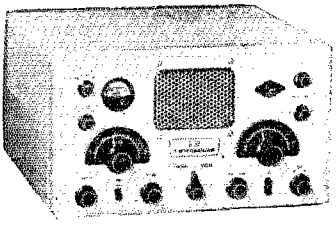
Hammarlund HQ-140X	195.00



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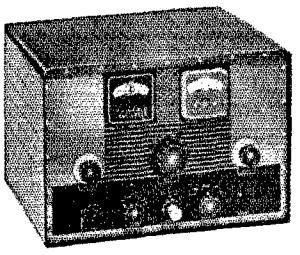

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18 Months to pay, life insurance at no extra cost

24 HR. SERVICE on stock items

true "do-it-yourself" beam. TMY now is running 500 watts with a BC-460. EHC worked JZØHA. K5VYU finally erased the "N" from his call. Traffic: K5USA 800, OJD 619, W5QMJ 527, OOF 515, LTB 400, K5CAY 198, W5DRZ 193, K5JGZ 190, DLP 171, W5VYQ 141, K5REH 133, AUX 120, BAY 94, FLG 49, W5KY 40, K5IBZ 32, OVR 31, DUJ 29, OVT 27, W5ESB 26, CCK 25, K5QEE 25, QEF 24, OTM 18, W5MQI 16, K5MTX 15, OOV 14, W5EHC 13, K5BBA 12, JOA 12, INC 11, LYM 11, W5VLW 11, WDD 10, BBA 9, K5CBA 7, W5GIQ 6, WAF 6, WAX 6, K5EZM 3.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. PAM: ZPD. RM: K5BSZ. The members of the Corpus Christi Amateur Radio Club handled communications for the assembly and during the Buccaneer Parade. The Parade had 163 units and the route was 5 miles long, with control points each 2 blocks and First Aid stations manned by members of the Red Cross. The 7290 Traffic Net had 42 sessions with 1305 stations and 774 messages handled. Our sympathy to ADZ on the loss of his father. ZPD and K5RGT are new OPS appointees. The C.W. Traffic Net badly needs outlets in Brownsville, Corpus Christi, Beaumont and the El Paso Area. If interested, contact K5BSZ at 1900 on 3770 kc. K5BSZ lost his tower and 20-meter beam in a windstorm. The Texas Union Amateur Radio Society is a new radio club formed on the Campus of the University of Texas. Officers are K5DKA, pres.; YPQ, vice-pres.; the technical committee consists of HFG and K5s AIL, RNW, JQG and TVL. During Round-UP Week they operated from a 2-booth display and handled 299 messages. Nice going, fellows. There has been some 6-meter DX operating in Southern Texas. Traffic: W5FDB 1620, K5DKA 330, W5AC 186, K5MXO 158, W5ZPD 145.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, VE1OC and H. C. Hillyard, VO1CZ. SEC: BL. There is a gathering of the old-timers in the section at 0800 on 3750 kc. every Sun. morning. RT acts as chairman and all amateurs who have held an amateur license for twenty years or more are invited to call in. S.s.b. addicts are on the increase with BC, CL, and LT having joined the ranks. LT is now settled in his new QTH. Congratulations go to Alex, VE2BE, now Vice-President of ARRL. Our Canadian Vice-Director, VE3CJ, now advances to the post of Canadian Director. Field Day 1960 has now been written into history. Why not place a written summary in your club's records for reference and use by future Field Day committees. News is scarce this month because of poor conditions and a lack of activity reports. The NBARA Annual Meeting will be held during the latter part of July in the St. Stephen Area. Keep tuned to 75 meters for details. Traffic: VE1OM 22, AEB 10.

ONTARIO—SCM, Richard W. Roberts, VE3NG—Three new hams got their tickets at Belleville. The North Bay gang will not hold its usual hamfest this year. CYE is recovering from an operation. DDL, W8JBG and K8BDJ were seen at the ARRL Convention in Saginaw. DQX does a fine job on a club bulletin containing news on the local clubs in Toronto. Would all of you who hold A-1 Operator Club certificates please drop me a card or radiogram. There seems to be a lack of interest in this fine award and possibly some publicity might assist this worthwhile work. The Ottawa gang had an FB smörgasboard near Aylmer. The gang wishes to remind you that if you are intending to operate mobile in the U.S.A. you should get FCC permission first. Write FCC, Washington D. C., for application. RR has a new Triband antenna. BEE is to become a private fly-boy at Picton. GO was seen at the s.s.b. dinner at Oakville. CAB had an excellent article on the past officers of the Quinte Radio Club in its April issue. The boys at the Sault held a successful banquet and also are holding a club QSL card contest. DCX still is hot on traffic-handling. AXH is back on 75 meters. DLC teaches c.w. to Army cadets. DGW teaches c.w. to Scouts. OE is RTTY, as is TL. DFA has a vertical antenna. CFR has three watts mobile for local work. EAC is recovering from an operation. VE8-DW is home at London. AML ran a civil defense test in Sarnia recently. DYB is on 2 meters. CXL is working rare DX. The Hamilton ARC visited Nortown in Toronto and paid a return visit in May to Hamilton. Traffic: (Apr.) VE3BUR 183, DCX 144, DPO 122, NG 100, BZB 93, NO 82, RN 75, CFR 53, AOE 39, AUU 39, KM 36, DH 26, EHL 26, DUU 25, DTO 22, AIL 21, DZA 15, DWN 14, DXZ 12, DLC 10, VD 2 (Mar.) VE3AOE 39.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—It's nice to hear LU back on the air after a lengthy illness.

(*Continued on page 144*)

A group of McGill students are headed for Ellesmere Island. BDG and BCL converted to s.s.b. and now are firm boosters. Recent severe ionospheric storms may have played havoc with lower frequency skeds but created a heyday for v.h.f. enthusiasts. ABE reports having a "ball" on 2 meters. AIO reports similar experiences on 50 Mc. Incidentally 50 Mc. receives very scant support from VE2s. Only AIO and AOM are active. AOL was elected president of the St. Maurice Valley group. AUH still skeds VK3AMN Sat. mornings. AJD is doing well traffic-wise. Results of an election at St. John's: AIP, pres.; BCB, vice-pres.; and ASL, secy. AIL received the "Worked all Goose" certificate. SG is planning to install mobile in the new car. ADE at Valleyfield, runs a Comanche and a Cheyenne. EF is the new operator at Iberville. The Annual Fall Outing of IC and 3ARF at Mazinaw Lake (Ont.) will take place Sept. 10. AWQ is an enthusiastic newcomer on 40 meters. MD was 5PW, 2OX and 7AJY; c.w. operator SI, ex-12ZP, 3BIM, 4UB. He uses a DX-40 and likes s.s.b. AYM, St. Eustache, is doing well on 10-meter phone. AFZ, at Sutton, is a fine c.w. operator on 40 meters. YB on m/m (ice breaker *Earnest Lapointe*) supplied lots of the gang with assorted ice cubes. MH is going to the States and expects to return in July. VE2 mobiles met the VE3 mobiles at Cornwall. Finally, IC demands a retraction that he is the inventor of the "gidget", as stated in this column in May *QST*. The "author" is TY. Traffic: (Apr.) VE2WT 523, WA2CNS/VE8 152, VE2DR 79, AGN 26, EC 26, AJD 6, JZ 5. (Mar.) WA2CNS/VE8 202.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—Last month's report was missing because ten days after the mailing date "my friend" told me he had not mailed the letter I had given him as he left my QTH. The BCEN is struggling because of Daylight Saving Time and summer static conditions. JQ is associate manager of the BCEN. Activity reports are picking up with nine received this month plus the gleanings of "Zero Beat" from Victoria. For once in many moons nothing was received from Nanaimo. The editor of the sheet must be building his house under the eagle eye of his XYL. I was present at the ARRL Convention in Portland and was amazed at the interest in mobile and mobile hunts. Victoria has an active group on mobile and Vancouver used to have, with many hidden transmitter hunts, etc., but for the last two or three years interest has waned. Anyone any suggestions? Hope you all answered the form sent to you by the D.O.T. re frequency allocations. If anyone heard strange signals emanating from various locations throughout B.C. during May or June, AC could be found at the other end. Oh yes, he also was doing some fishing and gold-panning. Hope you all have pleasant vacations. Traffic: VE7AML 153, AAF 150, JQ 119, AOT 70, AQD 66, ALZ 28, AV 19, BAZ 13, AEC 5.

MANITOBA—SCM, M. S. Watson, VE4JY. Acting SCM, Jim Elliott, VE4IF—Your SCM JY is spending three months in France. CK is operating 75-meter mobile. JP, our most conscientious 75-meter participant, is now indulging in single sideband interests. The president of ARLM, Inc., TJ, has been on vacation in Florida. SX is building a 6-meter rig for mobile. DN is leaving Manitoba for England. Among those heard in the May 3 civil defense exercise were AN, HC, HT, KG, OS, JW and AY. BG and family are moving to Ottawa. At last KB has a signal on the air, thanks to LO and NH. Jack and Gord spent several evenings working on Gary's equipment. KK has moved from Rivers to Neepawa and is active on 75 meters. IF has moved his old rig (304-TL) out to his summer cottage. NO and MO have been heard on 75 meters lately. LJ has a new linear running, and is working some DX on 20 meters. HW has a Quad beam up and working FB. SA has been busy working DX. PH has been handling traffic. KP has been busy building a boat. The rig at the QTH of IF, GE and PE has been off the air because of a short in the antenna. IW has a very FB phone signal on 75 meters. Traffic: VE4SL 55, CB 16, RR 8, AN 6, PA 6, PE 6, EF 3, JP 2, RB 2.

SASKATCHEWAN—SCM, H. R. Horn, VE5HR—Congrats to JV upon reaching double DXCC for VE5 leader. Congrats also to DZ for the high VE5 score in the SS. NI was a visitor, taking an educational exam with other provincial winners. FC has a new Mohawk. OB was awarded a Certificate of Merit by radio station CFQC for his work in handling Sunday church broadcasts for 20 years, not missing one service at the various churches. Our congratulations, Carl. AR, ex-VE2AHW, now in Saskatoon, is active on the bands and is now s.s.b. HQ is mobile on 75 meters. JO still is improving after his accident but makes frequent stays at the hospital for further treatment. QC has a new HT-37. LM is s.s.b. with an SB-10, 6-meter activity is on the increase in the district. ARRL appointments are open in various fields such as EC, OPS, ORS

(*Continued on page 146*)

and OES. If interested, please contact me for further particulars. TH has beat his modulator trouble and puts out an FB mobile signal now. YF and FY are doing an FB job with civil defense communications in the Saskatoon Area. YF is chief instructor and FY is communications officer. Traffic: VE3TJ 42, DC 33, DZ 32, DS 22, LM 14, EQ 7, HQ 5, HF 4, CR 3, HX 2, PD 2, QL 2, TM 2. QST

V.H.F. Sweepstakes

(Continued from page 00)

K4VSW...572- 26- 1-A
W4ZUC...552- 23- 2-A
W4KWA/4 552- 23- 2-AB
K4ZSX/4..540- 23- 2-A
K4BQK...459- 14- 7-A
K4PZS....308- 11- 4-A
W4BSJ....297- 14- 1-B
K4YXQ...286- 13- 1-A
K4TQU...204- 9- 2-A
W4EGX...176- 8- 1-B
K4LLQ/4..176- 8- 1-A
K4LRZ/4..132- 6- 1-A
K4DKS....72- 3- 2-A

West Indies

KP4AHQ 1288- 46- 4-AB
CO2DL...256- 16- 6-A

SOUTHWESTERN DIVISION

Los Angeles

K6OJV...4628-178- 3-AB
WA6CEF[1] 2184- 91- 2-B
W6NLZ..2140- 54-10-ABCD
K6QPH..1440- 60- 2-A
W6SDW/6[9] 780- 30- 3-A
WV6HTM 616- 28- 1-B
WA6BCH..528- 24- 1-A
WA6DHH 408- 17- 2-B
WA6DHM 408- 17- 2-B
W6PFE...396- 18- 1-AB
W6NTC....66- 1- 3-B
W6VHF (9 oprs.) 15,024-470- 6-ABC
W6UFJ/6 (WA6s FCY FNJ, W6UFJ) 858- 39- 1-B

San Diego

K6RCK...600- 25- 2-A

Santa Barbara

K6VDW...66- 3- 1-B

WEST GULF DIVISION

Northern Texas

K5TKR 13,640-220-21-A
K5LIW..9802-190-16-A
W5FEG..4378-100-12-AB
K5TIQ...3875- 78-15-A
K5KVE..2660- 70- 9-A
W5AQS..2464- 57-12-AB
W5YQZ..2432- 64- 9-A
K5UJM..2040- 60- 7-A
K5KWB..1598- 47- 7-A
K5MLM..1328- 45- 6-A
K5SXU...1088- 34- 6-A
K5MTK..1066- 41- 3-A
K5GHR..1056- 33- 6-AB
K5RJU...972- 41- 1-A
K5WUY..864- 26- 7-A
K5SMU...806- 31- 3-A
K5OCS....588- 21- 4-AB
K5BDL...588- 21- 4-A
K5VCG...576- 24- 2-A
K5VQK...550- 25- 1-A
K5YST...418- 19- 1-A
K5PCN...374- 17- 1-A
K5PDD...352- 16- 1-A
K5YSW...330- 15- 1-A
K5TXX/5..88- 4- 1-A

Oklahoma

W5JSB...7680-120-22-A
W5PZ.....924- 33- 4-B
K5CBA...392- 14- 4-A
K5ZGV/5 (4 oprs.) 1235- 48- 3-AB

Southern Texas

W5GBH..2856- 63-14-A
W5SVB...1328- 42- 6-A
K5KNR..1102- 29- 9-A
K5PKX...396- 11- 8-A

CANADIAN DIVISION

Quebec

VE2AQA/2 885- 30- 5-B
VE2CD...403- 16- 3-B
K2VTX/VE2 364- 14- 3-B
VE2TT (VE2s AXY TT) 1394- 42- 7-AB
VE2BBP (VE2s AME BBP BBS)...198- 9- 1-B

Ontario

VE3AIB..2394- 86- 4-B
VE3BPR..2020- 51-10-AB
VE3CIT..1898- 73- 3-B
VE3NW..1020- 30- 7-AB
VE3DWQ..552- 23- 2-B
VE3DLS...286- 13- 1-
VE3ESS/3 (VE3s DWW MR) 1848- 66- 4-B

British Columbia

VE7AFB..360- 15- 2-AB
VE7ACQ..144- 6- 2-B

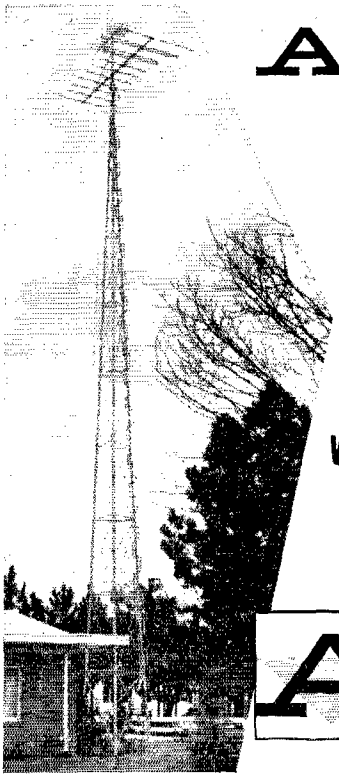
[1] Technician Award Winner. [2] W2DBN opr. [3] Novice Award Winner. [4] W2YLM opr. [5] K9LTC opr. [6] K8JIA opr. [7] Hq. Staff, not eligible for award. [8] W1WPR opr. [9] W8NWD opr.
Non-competing: W1LUG, W2LRJ, W4KJL, VE3CIL.

Two-Meter F.M.

(Continued from page 85)

exist between stations in northern Indiana and Chicago, most Chicago stations operate on 147.5 Mc., although many stations in both areas have provision for use of both channels. However, 147.5 Mc. is outside of the RACES authorizations, which makes it somewhat less desirable. It would seem that until such congestion arises, and it is likely to do so only in the most heavily populated metropolitan areas, it would be best to start with 147.3 Mc.

(Continued on page 148)

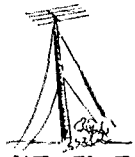


AERMOTOR

Always Stands Tall!

3-Post

Self-Supporting Steel Antenna Towers



WON'T TIP! WON'T TILT! WON'T TOPPLE!

Fine radio equipment deserves a fine antenna tower! Aermotor towers need no guy wires. They're self-supporting, will sustain a load of 1500 lbs. and will withstand winds up to 85 miles per hour. Available in 20, 33, 47, 60, 73, 87 and 100 foot heights. Type MI-98 with 2-inch pipe top is shown at left. Other styles available. For more information, write direct to:

140

AERMOTOR

DIVISION OF MOTOR PRODUCTS CORPORATION

2500 WEST ROOSEVELT ROAD • CHICAGO 8, ILLINOIS

PREMAX

ANTENNA EQUIPMENT

Proven For Performance and Value

	Amateur Net each
MOBILE	
Type CA Bumper Mounting, Chain Style	$6.60
Type R-200 Universal Ball Mounting — Coax type	6.90
Type R-300 Universal Ball Mounting — Standard	6.90
Type SA-2 Heavy Duty Stainless Spring Adaptor	7.50
Type RS-300 Comb. Ball and Spring Mounting — Standard Type	13.50
Style BXS — Center loaded Antenna for standard frequencies — 72" S. S. Whip	9.00
Style BSS — Same as BXS with SA-2 Spring	15.00
TS-896 — 96" one piece Stainless Whip — taper ground	4.50
TS-884 — 84" Same description as above	4.50
TS-872 — 72" Same description as above	4.20
BASE STATION	
GP-430 — Light weight Aluminum Ground Plane Antenna fully adjustable from 40-60 MCS	30.00
GP-450 — Same as above — adjustable from 20-40 MCS	24.00
GP-312 — Civil Defense VHF Ground Plane Antenna — Efficient and inexpensive — 108-120 MCS	4.80
GP-314 — Same as above — 144 MCS	4.80
GP-315 — Same as above — 152-162 MCS	4.80

Types M, AL and SS Telescoping Vertical Antennas are available in Steel, Aluminum and Stainless ranging from 12' to 35' in height.

Safeguard your Base Station Equipment with a Premax Ground Rod, ⅜" to ⅝" diameters, up to 8' in length.

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PREMAX PRODUCTS

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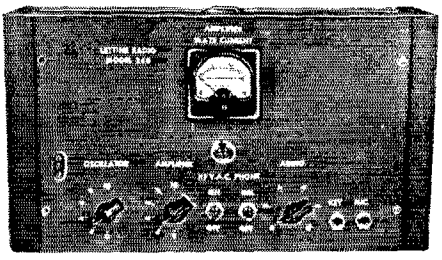
6020 HIGHLAND AVE. • NIAGARA FALLS, N. Y.

XMTRS FOR 160 TO 2 METERS

TECHNICIAN – NOVICE – GENERAL

or Special Freq. 500 KC. to 160 MC.



MOD. 240 WITH MOBILE CONNECTIONS & AC SUPPLY 1.6 to 30 mc. with plug-in coils. For Phone & CW, Novice, General, CAP, Industrial. Complete with 8 x 14 x 8 cabinet, tubes, 40 meter coils & crystal. Wt. 30 lbs. $79.95
80, 20, 10 meter coils $2.91 per band. 160 meter coils $3.60.

MODEL 242 FOR 6 METERS OR 2 METERS — 45 to 50 watts input — 6146 final. Complete with mobile connections, A.C. power supply, tubes, xtal. Xtal mike input. Uses 8 mc. xtals or Lettine VFO. Swinging link matches 52 — 300 ohm antennas. Same cab. as 240 .....$89.95

NOW! MODEL 262 — 2 and 6 meters on one chassis with separate RF sections, tubes and output; making use of the outstanding RF and audio sections of the 242 with high efficiency RF output and 100% push-pull plate modulation. Wt. 32 lbs., 8" x 17" x 8" cabinet. Price with 11 tubes and 2 xtals $137.50

VFO $49.95

Send full amount or $25 with order — balance C.O.D.

LETTINE RADIO MFG. CO.

62 Berkeley St. Valley Stream, N. Y.

There are actually a number of other channels in use in the Chicago area, such as 147.24, 147.7, 147.06, and 146.94. With the exception of 147.7, which is used for RTTY, these are used mainly for c.d. operation and by hams who desire alternate channels. From an equipment viewpoint it is desirable to restrict the channels in any one rig to a range of about 500 kc. to avoid the necessity for retuning when changing channels.

Many hams in this area say that they have received more pleasure per dollar from their 2-meter f.m. gear than from any other equipment they own. Admittedly, those of us with mobile rigs have a selfish interest in seeing this activity spread to other areas, but we feel that hams in those areas will enjoy it as much as we do, once the initial inertia is overcome and a few stations get on the air. QST

Sideswiper

(*Continued from page 29*)

Terminals 1 and 3 together for one wire, and put the other wire on Terminal 2. For use with an electronic key, connect the common wire to Terminal 2, the dash side to Terminal 3 and the dot side to Terminal 1.

If the lead plate is omitted, it will be necessary to screw the key to the operating table because any key that moves on the table the slightest bit will not make good dots.

The sideswiper needs a contact spacing of only about 0.020 inch. It takes several times this distance to throw the weight of a bug far enough to make good dots. So, you can run the speed of the sideswiper up to the point where most bugs will not operate reliably. At the same time, you can instantly slow down to 2 w.p.m. or less. Since there is no guess as to how long it is going to take to make the desired number of dots, one never makes 6 dots for an H and 9 dots for a 5 like half of the bug keys you hear on the air.

Either dots or dashes are made by moving away from the side where you happen to be, so there is no lost motion or time as with a bug or straight key. Also, the stroke of the sideswiper is so short and so light that it never tires your fingers or wrist. Many operators with glass arms can use this type of key and never feel any strain. Try one and prove it to yourself. QST

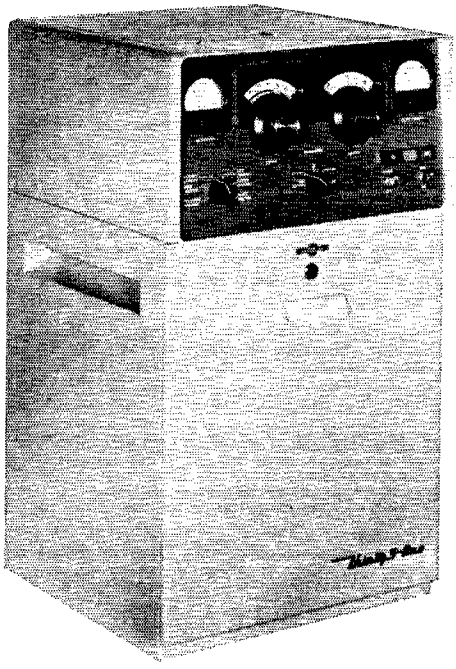
Happenings

(*Continued from page 65*)

tions, groups, or individuals interested in, or charged with, the allocation, or use, of radio frequencies, has carefully given due consideration to the Amateur Radio Service as a result of our efforts in self-regulation, and

WHEREAS, the Federal Communications Commission, hampered somewhat by budget limitations, which in turn handicaps its employment of Civil Service field personnel, has made every effort to carry out the many details and functions in connection with the huge task of monitoring the frequency

(*Continued on page 150*)



Collins 30S-1 Linear Amplifier

ELECTRONIC SELECTED SHORT SUBJECTS

■ The 30S-1 Linear Amplifier rounds out the Collins S/Line to make a complete, high powered, amateur SSB station. The 30S-1 may be loaded into an antenna without exceeding the legal dc input of 1 kw during tune-up. Correct tuning and loading are indicated by a meter reading, while the PA tuning control is operated in the usual manner to obtain minimum plate current. At any power level, any deviation of the loading indicator from zero provides immediate warning of misadjustment or malfunction.

■ Tom Jacobs, W8MG, Wyandotte, Michigan says: *"Man, this is the you-have-arrived type of amplifier. I did not know it was possible to pack so many worthwhile features into one amplifier."*

73 Dale . . . W8DGE

spectrum, and

WHEREAS, the Federal Communications Commission, in its Twenty-fifth Annual Report to Congress specifically acknowledges the efforts of some five hundred and twenty-five Television Interference Committees which are sponsored by the self-regulatory Amateur Radio Service.

BE IT THEREFORE RESOLVED, that the following citation be forwarded to the Secretary, Federal Communications Commission, Washington 25, D. C.: The Board of Directors of The American Radio Relay League Inc., meeting on this 13th day of May, 1960, at Hartford, Connecticut, unanimously salutes the Federal Communications Commission on its Twenty-fifth anniversary, and deeply appreciates the assistance it has given the Amateur Radio Service by permitting and encouraging amateur imagination, ingenuity, and self-regulation, which in turn has made possible the phenomenal progress in the art of telecommunications during the past quarter century, and

BE IT FURTHER RESOLVED, that the Board of Directors of The American Radio Relay League, Inc., unanimously go on record to assure the Federal Communications Commission of the desire of our membership to continue in our efforts of self-regulation, by promoting an interest in the suppression of all forms of interference, good operating practices, sound engineering techniques, and observance of rules regulating the Amateur Radio Services as may be now in effect, or promulgated by the Federal Communications Commission.

59) On motion of Mr. Meyers, unanimously VOTED that the Secretary is instructed to forward to the Federal Communications Commission a suitably framed copy of the citation contained in the resolution just acted upon, and that an appropriate facsimile be forwarded to each Commissioner, each Bureau and Division Chief, each Engineer-in-Charge of the various field offices and to the Chief, Amateur and Disaster Services, along with a copy of the resolution in its entirety.

60) On motion of Mr. Meyers, unanimously VOTED to take from the table his motion concerning the location of the 1961 meeting of the Board at Disneyland. Moved, by Mr. Meyers, that the Board of Directors hold its next annual meeting at the Disneyland Hotel, Anaheim, California. The yeas and nays being ordered upon request, the question was decided in the affirmative: whole number of votes cast, 16; necessary for adoption, 9; yeas, 12; nays, 4. All the directors voted in favor of the motion except Messrs. Anderson, Maer, Payne and Roberts, who voted opposed. So the motion was ADOPTED.

61) Moved, by Mr. Engwicht, that By-Law 3 be amended by adding a new sentence to read: "Members in arrears shall be carried on the League records for 30 days but if they have not renewed their membership by that date they shall be dropped." But, on a point of order raised by Mr. Maer, RULED, by the Chair, that the motion is out of order because of the previous action of the Board in establishing a special committee to examine the Articles of Association and By-Laws.

62) Moved, by Mr. Engwicht, that the League explore the following matter with the FCC — the 15-meter band be reallocated to include Novice amateur radio operation in the portion 21,100 to 21,200 kc. only, leaving the portion 21,200 to 21,250 kc. open only to holders of General Class licenses or higher. On motion of Mr. Maer, VOTED that the matter is laid on the table.

63) Moved, by Mr. Roberts, to amend By-Law 25 deleting the words, "The Territory of" preceding "Alaska", by changing "state" to "states" preceding "of Nevada", and by deleting the words "the Territory of" preceding "Hawaii." The yeas and nays being ordered, the question was decided in the affirmative: whole number of votes cast, 15; necessary for adoption, 12; yeas, 15; nays, 0. All the directors voted in favor except Mr. Reid, who abstained. So the By-Law was AMENDED.

64) The Chair announced the opening of nominations for President. Mr. Doyle nominated Mr. Dosland. On motion of Mr. Meyers, unanimously VOTED that the nominations are closed, and that the Secretary cast one ballot electing Mr. Dosland as President for the new term.

65) The Chair announced the opening of nominations for First Vice-President. Mr. Anderson nominated Mr.

(Continued on page 152)

Groves. Mr. Reid nominated Mr. Meyers, but Mr. Meyers withdrew his name. On motion of Mr. Meyers, unanimously VOTED that the nominations are closed and that the Secretary cast one ballot electing Mr. Groves as First Vice-President for the new term.

66) The Chair announced the opening of nominations for an additional Vice-President. Mr. Meyers nominated Mr. Reid. On motion of Mr. Kahn, unanimously VOTED that the nominations are closed and that the Secretary cast one ballot electing Mr. Reid as a Vice-President for the new term.

67) On motion of Mr. Maer, unanimously VOTED that Noel B. Eaton be seated as the new director of the Canadian Division.

68) The Chair announced the opening of nominations for an additional Vice-President. Mr. Compton nominated Mr. Handy. On motion of Mr. Engwicht, unanimously VOTED that the nominations are closed and the Secretary cast one ballot electing Mr. Handy as a Vice-President for the new term.

69) The Chair announced the opening of nominations for Secretary. Mr. Meyers nominated Mr. Budlong. On motion of Mr. Engwicht, unanimously VOTED that the nominations are closed and the Secretary cast one ballot electing Mr. Budlong as Secretary for the new term.

70) The Chair announced the opening of nominations for Treasurer. Mr. Chaffee nominated Mr. Houghton. On motion of Mr. Denniston, unanimously VOTED that the nominations are closed and the Secretary cast one ballot electing Mr. Houghton as Treasurer for the new term.

71) At this point, President Dosland read a letter from Mr. Arthur L. Budlong resigning as Secretary and General Manager of the League effective December 31, 1960. On motion of Mr. Kahn, the following Resolution was unanimously ADOPTED:

BE IT RESOLVED, that the Board of Directors accepts with deep regret the resignation of A L. Budlong as Secretary and as General Manager of The American Radio Relay League, Inc., effective at the close of business on December 31, 1960, after thirty-seven years of service to the League, and that the Board of Directors hereby ratifies and approves the Agreement made by the Officers of the League with A. L. Budlong this date respecting retirement benefits.

BE IT FURTHER RESOLVED, that the League, acting through its Board of Directors, hereby confers upon A. L. Budlong the title of "Secretary and General Manager Emeritus," as of January 1, 1961.

72) On motion of Mr. Maer, unanimously VOTED that John Huntoon is elected as Secretary and appointed General Manager of the League, effective January 1, 1961, at a salary of $15,000 per year.

73) On motion of Mr. Meyers, unanimously VOTED that the Board give a rising VOTE of thanks to Arthur L. Budlong. (Applause.)

74) On motion of Mr. Compton, unanimously VOTED that the Board expresses its appreciation to Arthur L. Budlong, John Huntoon and Goodwin L. Dosland for their splendid work on behalf of amateur radio at the Geneva Radio Conference in 1959.

75) At this point, the Chair announced the following committee appointments for the coming year:

Finance Committee:	Mr. Chaffee, *Chairman*
	Mr. Maer
	Mr. Payne
Planning Committee:	Mr. Kahn, *Chairman*
	Mr. Crossley
	Mr. DeHart
Membership & Publications Committee:	Mr. Meyers, *Chairman*
	Mr. Doyle
	Mr. Compton
Merit & Awards Committee:	Mr. Denniston, *Chairman*
	Mr. Anderson
	Mr. Engwicht
Housing Committee:	Mr. Chaffee, *Chairman*
	Mr. Anderson
	Mr. Roberts
	Mr. Kahn
	Mr. Budlong
Public Relations Committee:	Mr. Crossley, *Chairman*
	Mr. Doyle
	Mr. Cartwright

(*Continued on page 154*)

Committee to Consider Revision of the Articles of Association and By-Laws:

Mr. Maer, *Chairman*
Mr. Doyle
Mr. Anderson
Mr. Marmet (ex-officio)

76) On motion of Mr. Crossley, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1960, but not to exceed amounts as follows:

Public Relations Committee.....$2000
Committee to Consider Revision of the Articles of Association and By-Laws..... 2000

77) On motion of Mr. Doyle, unanimously RESOLVED that the Board of Directors extends to J. Stan Surber, W9NZZ, its sincere good wishes for a speedy and complete recovery from his illness.

78) On motion of Mr. Roberts, unanimously RESOLVED that the Board of Directors extends its sincere thanks and appreciation to Percy C. Noble, W1BVR, for his many years of service to the League as Director of the New England Division, ARRL Vice President, and member of the Executive Committee.

79) Whereupon, on motion of Mr. Meyers, the Board adjourned *sine die* at 10:45 P.M. EDST.

80) (Time in session 7 hours, 40 minutes; total authorizations; $49,981.72.)

A. L. BUDLONG
Secretary

REPORT OF THE FINANCE COMMITTEE TO THE BOARD OF DIRECTORS OF THE AMERICAN RADIO RELAY LEAGUE

Your Committee has reviewed the financial position of the League with the Treasurer and has studied his report as distributed to the Board. The Committee has also had the benefit of monthly reports of the cash position throughout the year. These reports appear to adequately present the financial statistics and demonstrate the continued sound management of this important phase of the corporate structure.

Your Committee is happy to note the profitable investment of funds temporarily not needed in the conduct of the League's business in U. S. Treasury Bills, particularly the $50,000 maturing January 15, 1961 at 5.2% yield. At the suggestion of the Committee, an additional investment of $50,000 in U. S. Treasury Bills was made by the General Manager within the past two weeks, although the same rate of return was not available. This reduces the current cash to a level considered prudent by the Committee, while maintaining these supplemental funds in readily available form. It should be noted that the volume of checks and similar items passing through the League bank accounts would normally cause bank charges unless a compensating balance is maintained. In this connection, the League's relationship with Connecticut Bank & Trust Company appears to be excellent.

In view of the possibility of a substantial cash outlay in the event a new headquarters building is authorized by this Board, the Committee feels that no long term investments should be considered at this time. However, the Committee feels that because no decrease in membership seems evident as a consequence of the increase in dues, an improved cash flow may be expected. It is therefore important, that this situation be reviewed from time to time in keeping with Committee responsibilities.

Respectfully submitted,

MILTON E. CHAFFEE, W1EIW
Chairman, Finance Committee

(Continued on page 156)

REPORT OF THE PLANNING COMMITTEE TO THE BOARD OF DIRECTORS OF THE AMERICAN RADIO RELAY LEAGUE

At the 1959 Board meeting the Planning Committee was directed to make a study of the possibility of presenting a story covering amateur radio in such fashion as to make it appealing and interesting to the general public, this program to take the form of a moving picture suitable for presentation on local and national television stations, as well as for distribution throughout the world to interested groups, organizations, etc.

At the time this undertaking was given to the Committee, Mr. John Brabb was Committee chairman. However, the undersigned offered to take the initiative in investigating the subject's preliminary phases, inasmuch as the television networks and national advertising agencies are located in New York City. It was the Committee's unanimous feeling that the history of amateur radio could support many interesting, true stories written in such fashion as to warrant prime television time, with excellent chance of commercial sponsorship. Such a procedure would necessitate the use of professional writers, and advertising agencies who were qualified to present such stories to interested sponsors.

This matter was initially discussed with Mr. Bill Leonard of the Columbia Broadcasting System. Mr. Leonard, W2SKE, is well-known for his news and commentary broadcasts and it was felt his advice would prove very helpful. It was further believed that this matter should be brought to the attention of Mr. Ernest Lehman, K6DXK. Mr. Lehman is one of the better known moving picture writers, his latest picture being "North by Northwest." This matter was also discussed with him and he indicated a desire to be a part of any such undertaking.

The Planning Committee held a meeting at the Central-Midwest Convention held in St. Louis in August, 1959, at which time the above facts were transmitted to the Committee as a whole. Mr. John Doyle and Mr. Dosland were also present at the Committee's meeting, and Mr. Doyle indicated that, through his familiarity with several large advertising agencies in the Chicago area, he would be glad to lend his services to ascertain whether such a projected program would find interest as a possible sponsored television program.

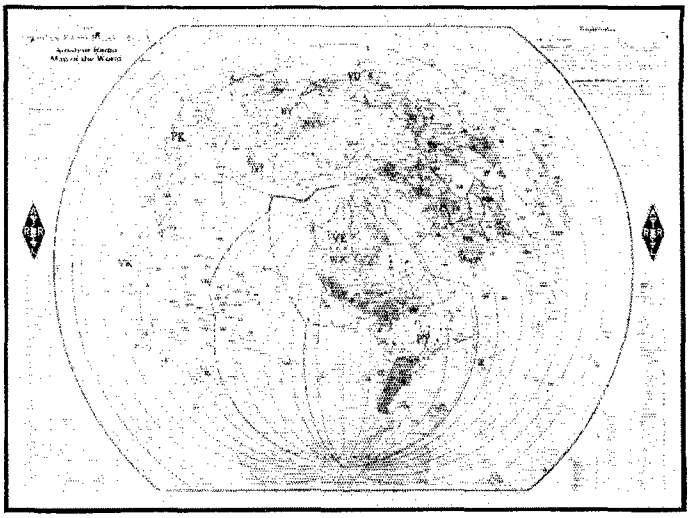
Subsequent discussions with Mr. Leonard were very difficult to arrange inasmuch as he was busily engaged in preparing a TV program for CBS depicting the political situation in the Dominican Republic. This preparation caused him to be out of town for many months during the latter part of 1959, and Mr. Leonard could not contribute a great deal during this period. Mr. Lehman was in New York City for several weeks in connection with a moving picture that was being filmed but was unable to devote any of his time to the subject of amateur radio although he continued to express a sincere desire to participate in this project when he was free.

At the time of this report's preparation, it is obvious to the Committee that it is difficult to obtain services of qualified personnel to act in advisory capacity until such time as this project is more fully developed. It is also apparent, as time goes by, that this undertaking will cost considerable money, which might eventually be underwritten by a sponsor, but until a story line is developed it could not be presented for sponsorship. The Committee hesitates to recommend at this time any expenditure be made until a firm story outline is agreed upon.

In view of what was recently presented over the ABC television network on April 17th, entitled "The Ham's Wide World", on the program JOHN HOPKINS FILE 7, the Board may desire to further evaluate this project. This program was presented in a most professional manner but was purely documentary and had no dramatic impact as

(Continued on page 158)

1960 Model!



A brand-new edition of the ARRL World Map is now available. Latest amateur data by League Hq. Brilliantly executed by expert map-makers Rand McNally. Order this 1960 showpiece for your shack now!

No active amateur can afford to be without one of these popular and useful adjuncts to good operating. Here is why the ARRL World Map is such a favorite:

As soon as you hear a DX station you can see exactly where he is—the country prefixes are not just listed in the marginal index; they're printed *on the countries, themselves. You can tell his* direction from you, and his distance. There's no question about which continent he's in—boundaries of the six continents are plainly marked.

The time zones are plainly marked, too. Call areas of thirteen countries are shown. Principal cities are designated. There's a scale of miles, another of *kilometers. Printed on heavy map paper measuring* 40" wide x 30" high, in 8 colors that really stand out, this new ARRL World Map is easily read from your operating position.

40" x 30" 8-Color Map, $2.00, *postpaid anywhere in the world*

AMERICAN RADIO RELAY LEAGUE, INC. 38 LA SALLE ROAD WEST HARTFORD 7, CONN.

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FACTORY AUTHORIZED SERVICE

ON RECEIVERS AND TRANSMITTERS

REPAIRS, modernization, calibration and alignment by competent engineers using factory standard instruments. Collins, Globe, Hallicrafters, Hammarlund, Harvey-Wells, National Co. Service representative for Hickok and RCA Test Equipment. Factory parts. All work guaranteed. Our twenty-fourth year.

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NEW 100V TRANSMITTER

Output: 100w SSB, PEP; CW; 40w AM
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600L LINEAR AMPLIFIER — *Powerful, Silky Smooth No Tuning* — Pat'd Broadband Input & Output ckts. As good as a separate amplifier on every band.

MM2 'scope with adapter — tells all about your and the other fellow's signals. Kits or W&T

- 10B, 20A Exciters, VFO's, Slicers, Kits or W&T
- **RME Receivers, CDR ROTATORS, Tri-Ex, Spaulding, Aermotor Towers, Telrex—the best in Beams**

SAVE MONEY BY MAIL: Write for Bulletin "Getting Started" and "Stepping Up" in SSB. Give call letters.

Order from W9ADN at

ORGANS & ELECTRONICS Box 117, Lockport, Ill.

Grice **has the** *Mosley*

TRAP "MOBILE"

MODEL MA-3 FOR 10-15-20

No band switching
No mechanical devices or relays
New lightweight traps
Low SWR over full width of each band
Stainless steel construction

$19.95 **Amateur Net**

Grice ELECTRONICS, INC.

Send for price list of our complete line of used amateur radio equipment.

300 E. Wright Street
PENSACOLA, FLORIDA

such. However, its result provided a most satisfactory form of publicity for amateur radio in general. Undoubtedly, this program was very inexpensive to present and what expense was incurred was probably underwritten by the sponsor.

The Committee believes that before further work is authorized, the Board should decide whether it wants to underwrite the initial expense of such a program's preparation, or whether it prefers additional types of programs of the type presented on April 17th. The preparatory cost estimate of all work prior to submitting same to a sponsor could run between $5,000.00 and $25,000.00, depending upon the number of programs desired, the time segment of each program, and whether it will be in dramatic or documentary form.

The Committee believes that the most saleable type of program to be a series of dramatic stories based on amateur radio incidents that could be presented in one-half hour time segments for both local and national television coverage. These stories would be filmed for such presentation and would also be available for separate distribution for other media.

Without commercial sponsorship, the Committee believes the costs of this undertaking would be prohibitive to the ARRL but believes that, if suitable sponsorship can be obtained, it would be highly desirable to have such a series presented to the public.

The Committee will await the Board's decision and instructions.

Respectfully submitted,

MORTON B. KAHN,
Chairman, Planning Committee

World Above

(Continued from page 69)

trouble from TV receiver oscillator radiation (May *QST*, page 81) has brought only 6 replies to date. Two say, "OK to change, but not this summer. Wait 'til next winter." One suggests 223 Mc. or higher. The rest say that any frequency is OK, provided everyone agrees on it, *and moves there*. Let's hear from more of you, before we recommend any change.

W3LCC, Kensington, Md., is on 432 with a 4X250B tripler (as in W1VLH article, Feb., 1957, *QST*) and has been working W3UJG, Rockville, Md. Both are ready to put the Washington area on the 432-Mc. map when conditions are good. Both worked K2CBA, Troy, N. Y., on 220 Mc. during the aurora of April 30. They also heard W1AZK, Chichester, N. H.

There is 220-Mc. activity around Greenville, S. C., though W4TLC says that the TV oscillators of receivers on Channel 7 give some trouble, mostly around 220.8 Mc. He presently runs a 6360 on 220.2 Mc., and will shortly have a 4X250B amplifier going. He is on regularly Monday, Wednesday and Friday evenings, and can be on any time during the day.

W2LRJ, Bellport, L. I., has a parametric amplifier working on 220, resulting in about 24-db. gain. This, says Charlie, really makes those TV birdies stand out! He is one who would move up in frequency after the DX season is over, if everyone agrees.

There are quite a few stations around the Chicago area running 10 watts or less, says W9OVL, Hammond, Ind. Some of the operators are disappointed when they find that the reliable local range with such gear is short. Ben points out that for a given amount of power *in the antenna*, and for a given *area* of antenna (not number of elements) 220 will do just about the same as 144, but no better. It is slightly more responsive to tropospheric effects, but the difference is not marked. Expect no miracles from 220, says Ben. A fair amount of power, the biggest array you can manage, and the best possible receiver performance are musts for the fellow who would work out on 220, probably even more than on 144. QST

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. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.
(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.
(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**
(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.
(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** 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, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ 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 copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**
(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 except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

2ufd 4000v DC capacitors, $5.00 each, or 2 for $9.00. F. G. Dawson, 5740 Woodrow Ave., Detroit 10, Mich.

COAXIAL Cable. New surplus RB-54A/U, 58 ohms impedance —30 ft. prepaid, $1.00. Radio magazines, buy, sell, trade. R. Farmer, 3009 No. Columbia, Plainview, Texas.

ALL types of transmitting and receiving tubes wanted. Also aircraft or ground receivers and transmitters. Hamgear or test equipment. For immediate action for cash write or phone Ted Dames, W2KUW, 308 Hickory St., Arlington, N. J.

MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N. Y.

S.S.B. xfrmrs, exact set of 3 (hermetically sealed) for W2EWL Special, brand new, $3.00 postpaid. New compact G-E 100-watt modulation xfrmr, multi-impedance (10 lbs.), $6.25; new Eimac vacuum condenser, 12ufd at 32 kilovolts, $5.50. G-E Pyranols, 4 ufd at 1000 v.d.c. (330 vac) min. 4 for $3.50. Please include postage, no c.o.d.'s Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, N Y.

WANTED: Commercially built Single Sideband transmitting and receiving equipment like Collins or equivalent. Al T. O'Neil, Lake City, Minn.

ANTENNA 80-40-20-15-10, $21.95. Patented. W4JRW, Lattin, Box 44, Owensboro, Ky.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

CASH for your gear. We buy, trade or sell. We stock Hammarlund, Hallicrafters, National, Johnson, Gonset, Globe, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H. & H Electronic Supply, Inc., 506-510 Kishwaukee St., Rockford, Ill.

SSBERS! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA. Dues $3.00 yearly. Write for membership application, sample "Sidebander", to SSBARA, 12 Elm St., Lynbrook, N. Y.

"PIG-IN-A-POKE"? Not if you visit Ham Headquarters, USA and see and choose from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-in Center. More for your money, because tremendous turnover makes lower overhead! Terms, trades. Send postcard for mouth-watering photograph and price list Q-6. For the best in all new and used equipment, it pays to come to "Ham Headquarters, USA"! BCNU, 73, Bil Harrison, W2AVA, 225 Greenwich St., New York City, N. Y.

KWM1 and a few high plate dissination tubes wanted. 304T1/TH 4-1000A, 4PR60A, etc. Ted Dames, W2KUW, 64 Grand Place, Arlington, N. J.

QLS? State-maps, Rainbows? Deluxe? Citizens? Religious? Samples 25¢ (refunds). Calbooks (summer) $5.00, "Rus" Sakkers, W8DED, Box 218, Holland, Michigan.

QSL-SWLS. Reasonable. Samples 10¢. Glenn Print., 1103 Pine Heights Ave., Baltimore 29, Md.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalogue, 25¢.

QSLS-SWLS, Samples 10¢. Malgo Press, 1937 Glensdale Ave., Toledo 14, Ohio.

QSL'S New design, lower prices, fast delivery. Catalog 25¢ (coin only), refundable. Dick Crawford, K6GJM, Box 607, Whittier, Calif.

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN6ZMT, Creative Printing, P. O. Box 1064-C, Atascadero, Calif.

QSLS-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

QSLS Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS. Taprint, Union, Miss.

SUPERIOR QSLS, samples 10¢. Ham Specialties, Box 3023, Bellaire, Texas.

QSLS. 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., New Brunswick, N. J.

QSLS WAT, Box 1, Brecksville, Ohio.

QSL's-SWL's: That are different, colored, embossed card stock, and "Kromekote." Samples 10¢. Turner, K8AIA Box 953, Hamilton, Ohio.

QSLS. Quality and economy complete samples dime. QSL Printing, Box 12351, Houston 17, Texas.

QSLS, $1.00. Riesland, Del Mar, Calif.

QSLS, Lapel pins, samples dime. Kephart W2SPV, 4309 Willis, Merchantville, N. J.

QSLS, SWLs, XYL-OMs (sample assortment approximately 9¾¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 737 Lincoln Ave., St. Paul 5, Minn.

C. FRITZ Quality QSLS, new location: P.O. Box 1684, Scottsdale, Ariz. Samples 25¢ deductible. Get our card-of-the-month deal, a 30-day special from Arizona.

GLOSSY QSLS, 100, 4 colors, $3.50. Others less, Samples 10¢. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Michigan.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSL'S SWL'S Nicholas & Son Printery, P.O. Box 11184, Phoenix, Arizona.

QSLS-SWLS, 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS: Send 25¢ (refundable) for samples. W6CMN, Schuch, 6707 Beck Ave., North Hollywood, Calif.

QSLS-SWLS. Free Samples. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS, Glossy 2 and 3 colors, attractive, different, 48-hour service. Samples 10¢. Free ball point pen with order. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSLS. 100 for $3.00. Glossy. Distinctive design. Samples free. R. A. Larson Press, 32 Midland Ave., Stamford, Conn.

QSLS. $1.75 per 100 postpaid U.S. only. Glossy, red and green. All orders mailed within 10 days. Free sample. Hobby Print Shop, Umatilla, Fla.

QSLS: Cartoons, colors, samples 25¢. Chris, W9PPA, 365 Terra Cotta Ave., Crystal Lake, Ill.

DON'T Buy QSLs until you see my free samples. Bolles, 7701 Tisdale, Austin 5, Texas.

ATTRACTIVE QSLS. Pearce, 192 Osborne, Danbury, Conn.

QSLS 10 useable samples, 10¢. Back issues QST, CQ, 75¢. Coop Box 5938, K. C. 11, Mo.

QSLS. Samples, dime, Printer, Corwith, Iowa.

RUBBER Stamps for hams, sample impressions, W9UNY, C. W. Hamm, 542 North 93, Milwaukee, Wisconsin.

QUALITY QSLS, QSO file cards, personalized "Ham-ized", stationery. Distinctive, attractive. Sample 10¢. Jerry, K7DKO, Everson, Wash.

QSLS. Stamp brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS. Fine quality. Choose your own combination of 7 styles, 10 card stocks, 8 ink colors, photos. $2.50 up. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

QSLS. Large variety of multi-color samples, 10¢. Don, K5OWT, Box 332, Ada, Okla.

QSLS. Reasonable, nice designs, samples dime, W2DJH Press, Warrensburg, N. Y.

COLORFUL QSLS. Dime. Filmcrafters. Box 304, Martins Ferry, Ohio.

QUALITY QSLS. Samples and prices, 10¢. Savory Press, 172 Roosevelt Road, Weymouth, Mass.

CHESS By Ground Wave, Los Angeles. Join the Chess-Nuts-Net. Poplar 3-4924.

SELL Johnson Courier, $220.00; Jennings Vacuum capacitor UCS 10-375 $\mu\mu$fd, 100,000v, $35.00; Prop pitch motor selsyns indicator, $35; 4-125as, $2.00. W7PSO, 3740 Alpine, Casper, Wyoming.

WANTED: 6 to 12 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N. C.

SELL: KWS-1 extra good condition. Hy-Gain Triband beam with 100 feet RG8U. Heathkit QF-1 built, never used. Heathkit AM2. New 4D32. Virgil Schaffer, 3165 Grove Court, Cedar Rapids, Iowa.

FREE Bargain list, Box 575, New York 8, N. Y.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Authorized factory service station for Collins, Hallicrafters, Hammarlund, National, Harvey-Wells. Our twenty-fourth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, $1.50; General, $1.75; Extra, $2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

LOWEST Prices: Latest amateur equipment. Factory fresh sealed cartons. Self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 919 High Ridge Rd., Stamford, Conn.

GREAT surplus values!! BC-603 Receiver New $17.00—R-26/ARC5 Rec 3-6 mc New $12.95, used exc $7.95—R-27/ARC5 Rec 6-9 mc New $12.95, used exc $7.95—BC-659 Transceiver with PE-120 $19.95—T-47/ART-13 Transmitters 34/AP $49.00—Sound-Powered Dynamic Phones Pr. $4.75—Rec. Microwave R-111/APR-5 $39.00—Collins CF1 82-Q for Q-5'er compl. w/tubes & instructions $5.95—Collins Mod. Xformer 100 watt 811-PP to 813 final $3.95—RA-62-C Power Supply A-C for SCR-522 VHF 110/60 cyc. New $59.50—Kits only for above, $17.00—Ground-plane VHF antennas 30-200 MC New $9.95—Hi-Mu Electronics—131 Hamilton St., New Haven, Conn. Store hours 10—5. Sat. 9—12.

HAM-SWAP. Need a new piece of gear? Need to trade or sell the old? Then you need the new Ham-Swap! Published twice monthly. National circulation. $1 ad free with $1 year's subscription. Send your $1 now to Ham-Swap, Inc., 35-A East Wacker, Chicago 1, Ill.

BOOK Matches with your call. 50 for $2.50. A & B Services, Box 147C, Kittery, Maine.

TOROIDS: Unused 88 mhy like new. Dollar each. Five, $4.00. pp. DaPaul, 101 Starview, San Francisco, Calif.

AMATEUR Paradise Vacation. Livingstone Lodge and cabins, Mascoma Lake, Enfield, N. H. Couples, families, 100 acres, bathing, boats, sports, Dartmouth golf course nearby, Tennis, Churches, fishing, etc. 31st year. Amateur rig available. Light housekeeping. $20.00 PPPW, Children half. Literature. A1 Q. Livingstone, W2QPN.

SELL: Collins 32S1 with AC power supply, $560; Eldico Kw linear, $325, Telrex 15m, 3-el. full size, still crated, $65.00. F.o.b. HQ100, gud condx, $100.00. W3VDE, 1219 Yardley Rd., Morrisville, Penna.

200 Watt amplifier for 220 Mc. Completely shielded 4X250M with blower. 110 watts output for $39.00. WA6LEN, 3974 Riviera Dr., San Diego, Calif.

COLLINS 12 D.C. power supply, mounting rack and cables, for KWM-1, like new condx. Rex Bassett, W4QS.

BREAKFAST Club Hamfest, July 31st, Terry Park, Palmyra, Illinois. This hamfest is sponsored by Quad-Co Amateur Radio Club, Inc. Dale Elliott, Secretary. Write Box 134, Loami, Ill.

FOR Sale, all in gud condx, T.W. Masters TV antenna, $20; Hornet Tribander 10,15,20 meter beam, complete w/coaxial cable, $80.00; V.O.M. Precision model to 60 megohm scale, $10; Tube tester Precision model #180 for $25.00; Super Pro receiver range 1250-50 Mcs., complete w/power supply and 5 ft. rack with fuse box, $140; Measurements Corp. #80 signal generator up to 50 Mcs., $80; Motorola 2-way radio 30 to 55 Mcs. 12V converted for 60 watts output, $100 or will trade for what have you? Bill, K8MQQ/2, 440 Battery Ave., Apt. 3-C, Brooklyn 9, N. Y.

WANTED: High serial numbered Collins KWS-1 and 75A4. KW Matchbox. MicroMatch. Hallicrafters S-27B. W4SHZ, Box 1638, Brookley AFB, Alabama.

SIXTH Annual Syracuse VHF Roundup, October 8, 1960.

SAVE On Electronic, Radio and Communications components and equipment for Hams and Commercial use. See thousands of parts in stock. Many more coming in daily, all at unusual savings. If you live in or near Philadelphia, visit our new warehouse at 31st & Grays Ferry, or send for free catalog. Selectronics, 1206 South Napa St., Philadelphia 46, Penna., or phone HOward 8-4645.

RECEIVER: Knight kit, factory aligned: $75. NYC area only. John, K2OFD, Tel. KI 6-0063.

WANTED: Receiver, the best $100 will buy. What have you? W. R. Goodman, 4 Stones Throw Road, Wilmington 3, Del.

KWM-1 with AC, DC pwr. supplies, Mobile Mount heliwhip ant., mike, cables, etc. $950 firm; HT-33, $390; 32V3, $375; shipping is extra. Bill Tinsley, W9BPW, Western Springs, Ill., 4836 Woodland Ave., Phone CH 6-0048.

"MALE" Ham operator complete knowledge in teaching of children and setting up proper equipment at a summer camp in the Pocono Mountains of Northeast Pennsylvania. Must supply own equipment. Please write explaining full qualifications to Pocono Highland Camps, N.W. Corner Castor & Gilham Sts., Philadelphia 49, Penna.

LIKE New, Jackson 49 tube tester with 49-S unit and 60 new tubes, $45; Precision E-400 signal generator with dummy antenna and coaxial set, $25.00; Supreme Multimeter, $5.00. Witmer, 109 3rd, Lemoyne, Penna.

HAVE 10 top brand 6146. Will sell 2.50 each. K4LRX.

FOR Sale: Regency CD-2 Conelrad, $15. Harvey-Wells Z-match coupler, $50; Johnson 250-39 TR switch, $15.00; B&W 600 grid dip, $30; Precision 202 signal tracer and probe, $30; RCA WR-49B signal generator, $50.00; Simpson 466 "Handi-scope", $115; Eico 950-K Bridge, $18. All of above are new, unused except coupler just back from factory. Bob, K5THF, Box 3236, Arsenal, Arkansas.

LEECE-NEVILLE 50 amp. rectifier, $5.00; new, 20 amp, 36 V, AC, full wave, $4.00; 2 KW isolation trans, G-E, $12.00; 110V selsyns, $3.00. B. J. Kucera, 10615 So. Highland Ave., Garfield Heights 25, Ohio.

FOR Sale: ARC-5, R-28 rcvr., converted for 108 Mc., satellite frequency according to June 1957 CQ, with power supply and several crystals. $20.00 plus shipping charges. R. Plunkett, K5DRX, 106 Hancock, University of Virginia, Charlottesville, Va.

SPARKLING new Apache xmtr, unused, including $100 professional assembly job, all for $245 F.o.b. Want: Collins F455J-05-6, K6CTV, 1780 American, Pomona, Calif.

BEST Offer takes Collins KW-1, slightly used. Given factory modernization and shipped direct from Collins in factory cartons. WØHBG/3, 5311 Worthington Drive, Washington 16, D. C.

WANTED: 105B Lampkin, state lowest cash price, condition, etc., M. L. Stone, Box 202, Fulton, Miss.

FOR Sale: NC-300, like new condition. Will deliver within 150 mile radius. Send offer to Fred Kent, 221 West Filmore, Winterset, Iowa.

SELL: Viking II and VFO, both in exc. condx. $175; Hammarlund HQ-129X and spkr, gud, $100; Gonset Super 6, exc., $40; PE-103 and base, $10. Martin Zimmerman, W9PYV, 2909 Farwell, Chicago, Ill.

SELL GPR-90, price $285, in gud condx. Sell to anyone in near vicinity. Make an offer. Frank Rodio, WA2GKA, 450-51st St. Brooklyn, N. Y.

HAMFESTERS Radio Club announces its 26th annual picnic on Sunday, August 14, 1960, at Santa Fe Park near Chicago. See July Hamfest Calendar or write K9EEC.

LOCAL Cash Sale: Johnson SWR Bridge, $10; NC-173, $90; Gonset Super 6 Converter, $35; RME VHF-152, $45; Viking II, $190; VM tape recorder, $85. Norman Friedman, K1CNK, 76 Kaye Rd., W. Haven, Conn.

VIKING II, factory-wired, sequence keying, and Viking VFO, $200; Monkey, excellent condx, $25. Want SSB exciter, linear, HC10, EE3 or T.O. keyer. J. M. Hoffer, K1CQO, 24 Cherry Rd., Framingham, Mass.

SX-99, in exc. condx, matching speaker, $100. K6PXJ, 26667 Silver Spring Drive, Rolling Hills, Calif. FR 8-2904.

KWM-1, power supply, spare tubes, mike. Used very little. $600. Joe Laviero, KN1LVD, 103 Jacobs St., Bristol, Conn. Tel. LU 3-0128.

DX-40, excellent modulation, top condx, $65, SX-28, superior condx, rack mounting case, $75. Ten meter 3 el. beam, wide spaced, 20 ft. boom, $17. VF-1, stable, accurate, excellent condx, $20. F.o.b. Gene Wengert, W3MMQ, 4416 Tonquil St., Beltsville, Md.

ELMAC A-54 mobile xmtr for sale; similar to later model AF-67; 6146 final provides 67 watts phone! W/manual, $78 or, w/pwr supply, $90.00. K1EHQ, P.O. Box 733, New Canaan, Conn.

COMPLETE 1959 CQ and 1958 QST runs, most of 1957 QST, some 1956. 20¢ per issue plus postage. W1JBL.

SELL: 32V3 transmitter, perfect operating condx, looks new, complete extra tubes, $435. Buyer pays shipping. W3QLW, 1328 Hillside Ave., Honesdale, Penna.

FOR Sale: Globe Chief 90A, factory-wired and UM-1 modulator, in excellent condition. Both $50. W4BIR, 3611 Wimberly Lane, East Ridge 11, Tenn.

FOR Sale: DX-100, $200; S53A, $60; Globe Chief 90, $45. Will ship F.o.b. K9OSH, Bob Braun, 602 Lucky St., Reedsburg, Wis.

600 W. 304TL linear; 20 & 40 meter KW coils, Variac bias. Enclosed cabinet, w/pwr supply. Sry, will not ship. $50.00. K6PQC.

FOR Sale: Complete issues QST 1934-1940; 1942-1950; CQ 1947-1955. Write: Mrs. J. J. Korzdorfer, R.F.D. #1, Montrose, Penna.

INSTRUCTOGRAPH Machine in good condx, with 12 tapes on code and Signa-Tone with key to practicing code on instruction book to study from. $40. Cubical quad antenna complete with bamboo and wires and rotor AR22 indicator C.D.R. $75. S. Bedell, 260 Autumn Ave., Brooklyn 8, N. Y.

SX-101, R-47 spkr, spotless, $250. Will deliver N.E., NYC. Unused AR-22 rotator, $25.00. Dow-Key DKC-TRM relay, $9.00. Kearney, 4 Arlington St., Cambridge 40, Mass.

M359 coax elbow connectors, 2 for $1.00 postpaid in U.S.A. (Cash with order only). Bushland, Box 307, Chippewa Falls, Wis.

POLITICAL Campaign buttons wanted, ribbons, badges, posters, handbills, songs, etc. Anything from Presidential election campaigns. Swap for ham gear, parts, hemostate, cash. Dr. Alan York, K2TMJ, East Hampton, N. Y.

BC-342 with 2 Kc xtal lattice filter plus plug-in Gonset 3-30 converter makes hot, selective all-band 110 volt receiver; first $70.00. Tecraft 2-meter converter, 14-18 Mc. i.f., like new, $20. Stancor 203-A mobile 10-meter xmtr, wired for 12 volts, gud, $20 Robert N. Lewin, 28 Fenimore Drive, Harrison, N. Y.

HQ-160 with matching speaker, like new. Viking II with Johnson Monitor and 122 VFO. Sonar low pass filter. Dow-Key coax relay. All w.g. connecting cables, manuals, $525. complete. K2ABY, J. McHugh, 73 Cherry Ave., Bethpage, L. I., N. Y.

WANTED: Motorola, Link, or RCA mobile equipment 30-50 Mc. FM. Units must be complete. State condition and price. B. Riley Fowler, Box 143, Morganton, N. C.

DX-LOGAMATIC, records states, countries and zones worked and confirmed. GMT time chart included. $1.00 postpaid in United States. Milburn, Burlington, Kentucky.

HAMMARLUND HQ-129X with crystal cal., and acces. socket, $140; Heathkit DX-35 and VFO (assembled) mike and Johnson bug, $80. The whole kaboodle for $210. Will ship collect or deliver within reasonable distance. Kertesz, K2VTD, 306 Lafayette Ave., Geneva, N. Y.

SELL: HQ-140X and 6" speaker, $150; BC-221, $60; RCA voltohmyst, $40, German FM tuner, $12; misc. transformers, meters, etc. Irv. Seidman, W2GNZ, 1535 Longfellow Ave., Bronx 60, N. Y.

FOR Sale: HT-32A. Only a few months old; $500.00. Nathan Freund, 48-53 44 Str. Woodside, N. Y. ST 6-4565.

WANTED: 11th Edition of Editors & Engineers, Radio Handbook. State price and condition, or will trade for 12th Edition. E. Patrick Harrigan, W0GTM, 1701 Wellesley Ave., St. Paul 5, Minn.

SELL: DX-20, $30.00 and an AR-3, $22.00 or your best offer. Danny Hilson, KN9SMC, Colfax, Wis.

HQ-160 Receiver, in brand new condition. Will ship collect in original carton. $280. W2ODH, Jules Pyryt, 192 Norman Way, Paramus, N. J.

KITS Wired. Licensed radio technicians with complete test facilities 25% purchase price plus postage, or buy fully wired, tested kits. Sales and Service Division, Robert S. Schoenfeld Corporation, 2079 Wallace, N.Y.C. 62.

TOWER 58 ft., 13 in. triangular Trylon steel. Telrex 3 el. full 20 m. beam, rotator. Take it away. First $150. W1CPI.

THREE DM 45 dnv. 12v. 1030-500v. @ $5.00 each; D-104 with push-to-talk stand, $10; Bud cab'net for 14" panel, with panel, $10;; two filament trans. 10v @ 10 amp. low cap. SSB type @ $5.00 each, home-built scope. 5" $15.00. Charles Clarke, K5HRJ, Box 535, Knox City, Texas.

HELP Young Americans stay off street corners! Contribute radio equipment to the new Scotch Plains High School Radio Club, so it can create QRM instead. Larry Graham, K2UYF, c/o Scotch Plains, Fanwood High School, Scotch Plains, N. J.

FINEST assortment Radio and Experimental parts. Send $5.00. We prepay in U.S.A. money-back guarantee. Radio Center, 3008 Gervais St., Columbia, S. C.

SELL: SX-99 receiver less speaker, $85 plus shipping charges. W3LGK, 324 Chestnut, St. Marys, Penna.

NEW small shielded 50 ohm 50 watt dummy loads, $6.00. K7KOK, 917 West Vista Ave., Phoenix, Ariz.

FOR Sale: BC348Q receiver, excellent condx, AC power supply. Art Rauch, W2DID, 30 East Smith, Central Islip, N. Y. Tel. CE 4-8544.

SALE: Gonset G-77, Regency ATC-1 converter, 505 mike, $300. K0IYD. 642 University Village, Minneapolis 14, Minn.

RME 4350 receiver with speaker, excellent condition, sacrifice at $170. Bob Aaronson, W4PBH, 415 Blair Road, Falls Church, Virginia. CL 6-3547.

HALLICRAFTERS Equipment in excellent electronic and physical condition HT-32, $495. SX-101, Mk III, $295. B. E. Walther W9QAH, Rte 3, Box 160, Stevens Point, Wis.

HQ-170C, mint condx, $275. Prefer local deal. W1RGX, 483 Charles St., Malden, Mass. Tel. DA 4-1779.

GLOBE KING 500A, 500 watts AM, 450 watts SS, $425; HQ-120, $85. Both for $495. W3LXY, Joe Yutz, Pottsville, Penna.

GOING VHF, must sell xtra FB DX-40, $60; VF-1, $15; SX 25 with speaker, $60; QF-1, $7.50. Richard Denton, 3617 Talahi Drive, Knoxville, Tenn.

FOR Sale: Elmac AF67, $95; 6 meter Communicator II with VFO, $175; 6 meter Gonset linear, $95; NC-200, $110; Viking II, $195. Tom White, K5AON, 867 Berkinshire, Dallas 18, Texas. Davis 7-2200.

TRADE: Perfectly new, TA-F-6 Geiger Counter, Never used. For RME Preselector. K7IUF, Moneta, Wyoming.

WANTED: American Mod. R331 ribbon-velocity microphone. K1DVO, Glenbrook, Conn.

CAPACITORS: Sell or trade 120 mfd. 3000 volts, oil-filled, $50.00 or sporting equipment. Ralph Hall, 2452 Glenside Blvd., Muskegon, Mich.

FOR Sale: Hallicrafters HT-32 in excellent condx. $495. Prefer local pick-up. W3HPI., Mickleys Gardens, Allentown, Penna.

FOR Sale: Collins KW-1, 4-250A tubes, 2 new, 3 used, 810, 872A, Millen grid dip, BC221 AK, pwr. W8RWZ.

WANTED: 74A4 (late serial number). Sell: SX-100, $190; DX-40, VFO, $75. Jim Dittrich, K2OIN, Meadow Lane, Vestal, N. Y. Away on vacation until July 10.

JOHNSON Kilowatt with desk (Latest model) used 2 months. Cost $1725. Will sacrifice for $1285. KWM-1, $575; AC supply, $75; 34ID-1 Mobile Mount with cables for DC power supply, $38; C.E. sideband slicer "B" with API adaptor, $65; B&W 51SB, $155; BC221AK, $40; APR4 38 to 1000 Mc rcvr, $110; Bell stereo amplifier, $65. Sidney Gogel, 1096 Laux Place, No. Bellmore, N. Y. Tel. SUnset 5-6876.

CRYSTALS, 80-2 meters, 25¢ each. Send for frequency list. Stancor power transformer, 1200 V.C.T. at 200 Ma. with filament windings, $4.75 each. W6IMC, White, 210 Alden Road, Hayward, Calif.

FOR Sale! DX100, modified keying, break-in, fan, JT-30 mike, $180; NC-98, spkr, audio limiter, $110; Globe Chief, key, 4 xtals, $50. For miscellaneous equipment, send stamp. Bob Riseman, K1DEY, 145 Pond Brook Rd., Chestnut Hill 67, Mass. Tel. DE 2-9470.

WANTED: SX-28 or comparable receiver. VK3AYR, Box 39, Richmond FI. Victoria, Australia.

GELOSO Italian amateur rcvr. In perf. condx. $250. K0TGW, Wichita, Kansas.

GONSET G28 10M., $170; Mosley TA33 3 el. 3bnd. Beam, $70. W1YYE. Box 49, Wollaston 70, Mass.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system $50; 12 volt 60 amp system, $60; 12 volt 100 amp syst., $100. Guaranteed no ex-police car units. Herb A. Zimmerman, Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Tel. ULster 2-3472 or JAckson 2-2857.

TWO Technical Material Corp. frequency shift exciters, Model XFK, complete manuals. $350.00 each. In exc. condx. Will be willing to deliver in New York State. W. Taylor, Box 93, Alfred, N. Y.

FOR Sale: Morrow MBR5 rcvr and MB560A xmtr; Shure 505K mike, spkr, 6-12v 120w. vibr supply, and all cables, $320.00 or Viking Ranger xmtr, NC98 rcvr, Viking Matchbox, xtal mike, spkr, $290. Will keep one, sell one. Your choice of which. J. R. Hall, WA6JBM, 4824 Hill Street, La Canada, Calif.

WANTED: BC-454, 3.0-6.0 Mc. Allen J. Fehl, RFD #4, Brookville, Ind.

KWM-1 wanted. You must beat dealer prices W0ZHJ, 2444 D. Lincoln, Nebr.

EIMAC 4-1000A tube in good condx, tests OK. Used with low dissipation for several hundred hours, $30 plus express charge. W4AAW, 1817 Beechwood Ave., Nashville, Tenn.

WANTED: 800 cycle F4558 filter for 75A3. W2MES.

SELL: Slightly used 4-400. $22.50; Heathkit OM-3, 'scope, $37.50 in perf. condx; WRL 755 VFO, vy gud condx, $39.50. Globe King factory-converted to 500A, vy gud condx, operates perfectly on all bands, $395. J. Artioli, K1EBZ, 1070 Parker St., Springfield, Mass.

HAM Magazine subscription: Write Tatum, W6LKJ, 1451 Raymond Avenue, Glendale, Calif.

6 meter xmtr and converter, $15.00. W6RET, 8831 Sovereign Rd., San Diego 11, Calif.

SELL: Johnson Viking KW RH desk Ranger, Match box spare 250A, all $1250.00; Collins 30K1, 500 watts c.w. 375 phone 80 thru 10, instrux book, 319B VFO spare tubes, $550; National NS-183R, $275. All in perfect order. T. S. Valpey, W1ATP, Box 87, Holliston, Mass.

COMMUNICATOR II (2 meter transmitter-receiver) with mike, antenna, crystal, excellent condition; $165 in cash or money order only. Roy Goshorn, W3TEF, Bellwood, Pennsylvania.

GE Used two-way radios, ham gear bought, sold, swapped. Louis McCann, W3YYL, Oley, Penna.

FOR Sale: A complete line of new and used ham gear, including Hallicrafters, Hammarlund, Collins, National, Johnson, Barker & Williams, Central Electronics and many others. We are also headquarters for VHF gear of all brands, trades ins and time payments. Write, call or telegraph Ronnie Durham, W5ATB, or Jerry Reed, K5ZGV at Radio, Inc., 1000 South Main, Tulsa, Oklahoma.

OA2, OB2-.65; OC3, OD3-.50; 2E26-2.50; 3E29-6.95; 4E27A-35.00; 4X150A-8.50; 6D4-1.50; 5R4GY-1.00; 565-1.00; 5670-.85; 5727-1.50; 5814A-1.25; 5894-12.00. We sell tubes exclusively. Top cash paid for unused 304TH, 304TL, 750TL, 4PR50A. Maritime, K2RQC, Garry Shapiro, Box 516, Hempstead, N. Y.

"GALLUPS ISLAND", United States Maritime Radio School, would like schedule from any one who attended. Write: R. Taylor R. 32 (Fairmount Avenue), Lincoln, R. I. W1QCO.

FOR Sale: Hallicrafters SX-99 receiver, in excellent condx, $110. Norman Jordan, KØSEJ, Corsica, South Dakota.

ALUMINUM for every ham need, Write to Dick's, 62 Cherry Ave., Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

KWM2 wanted. L. Wecker, #18 Secatogue Lane E., West Islap, L. I., N. Y.

GONSET G-66 receiver with Universal Power supply and G-77A transmitter with 115 VAC/12 VDC power supply. Excellent condition, with manuals. Settle for $325.00. Howard Enstrom, W9QIU, Rt. 2, Edgerton, Wisconsin.

SX-99, QF-1, $120; Challenger, Heath VF-1, $120. K5JZZ, 503 Julia, New Iberia, La.

FOR Sale: Shure equipment 535 mike, $35.00; 55S mike, $38.00 A86A impedance matching transformer, $5.00. Also Telex Monoset, $5.00; mike shock mount, $5.00 or all for $80.00. Richard Ellinwood, RD #2, Norwich, N. Y.

LATEST Out: Directory listing over 350 Award Certificates; includes quarterly Revision Service. Write Clif Evans, K6BX.

WANTED: Midwest receiver chassis about 1945 or later. Condition must be good. EX/5CB, 222 Merchants Bank, Ft. Smith, Ark.

FOR Sale: Factory reconditioned KWS-1, $1050; 75A4 with speaker, $500.00; both for $1450. Serial numbers under 1000. Spare set, new, 4X250B for $50.00. Srv, no shipping, but delivered within 100 mile radius. Glenn M. Munro, 835 Tulip Lane, Naperville, Ill.

MOBILE Package Heathkit MT-1 xmtr, MR-1 rcvr MP-1 transistor power supply, in exc. condx, $197.00 plus shipping. J. Mozzochi, W1LYQ, Room 13, Hurley Hall, Storrs, Conn.

CAMERA, Fairchild F-56 Aircraft 20" lens, Roll film and 5 x 7 cut film magazines. Complete with trunk (new). To trade for 2 or 6 meter xmtr or tubes. 4-125A4, 250A4, 400A4, 1000As, K8TII, G. W. Roper, 2937 Barth St., Flint 4, Mich. Tel. CEdar 9-0581.

SELL: Hallicrafters S-85 receiver, like new condx, $75.00. WA2DES, Robert Corvalan, 1105 Jerome Ave., Bronx, N. Y.

SPRING SALE: Bargains, 100-Vs, old price $695; new 32S-1 xmtrs, old price $590; used 75S-1, like new, $375; HQ-170C perfect, $269; KWM-2 used only 4 hrs, $875; Gonset GSB-100, $345 and new Gonset Linear GSB-101, $369; new 75A-4 factory warranty, $675. Cash, no trades! Collins 30S-1 linear, used 9 hours, still in warranty, $1195; HT-37, perfect, $369.00; KWM-1 perfect with Mobile Mount, $495; Johnson 2 kw. Thunderbolt brand new in sealed carton, $479.00. No trades, please! Guaranteed. Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas. Phone WHitney 6-2820.

GONSET 500W linear power amplifier; in perfect condition, $170. National Select-O-Ject. in exc. condx, $15.00; new boxed 5.3-7.0 Mc. ARC-5 for SSB; $9.00. New crated PE-103A, $17.00; new crated P-38 propeller pitch motor, $30.00; pair of brand new 4X150As, $15.00; National HRO-60TS spkr, new, $10. W9ODS/7, 6634 W. Orange Dr., Glendale, Arizona.

KWS-1 excellent condition, $900; 75S-2 receiver with CW filter and xtal, practically new, $460. Both units have latest mods, installed at factory. W4VCC, 6307 Bowie Drive, Springfield, Va. FLeetwood 4-9692.

SELL: Small prop pitch, xfrmer, mast coupler, limit switches, $50.00; 1000/1250 volt, 300 Ma. supply, $45.00; speech, TZ40 modulators, 200 w. audio $50.00. F.o.b. W60KK, 1525 Newhall, Santa Clara, Calif.

SELL: Two complete 10-meter BC-1335 transceivers, new, $70. Bill Rosenberger, New Market, Va.

RECEIVER Month!! Reconditioned! Terms! Full Guarantee! Collins 75A1 $265.00; 75A2 $325.00; 75A3 $399.00; 75A4 $549.00 up; Elmac PMR6-6V $79.00; PMR6-12V $79.00; Hallicrafter S40A $69.50; SX71 $155.00; SX88 $399.50; SX96 $175.00; SX99 $119.00; SX100 $219.00; SX101 MIII $299.50; SX110 $129.00; Hammarlund HQ-100 $139.00; HQ-110 $205.00; HQ-160 $299.00; SP-600 JX $549.00; Harvey Wells R-9 $99.50; Heath MR-1 Commanche $139.00; RX-1 Mohawk $249.00; Knight Deluxe $99.95; National SW-54 $39.95; NC-57 $69.00; HRO-60T w/coils $375.00; NC-66 $69.00; NC-98 $109.00; NC-125 $125.00; NC-173 $135.00; NC-183 $169.00; NC-183D $269.00; NC-188 $125.00; NC-300 $249.50; RME-84 $65.00; GPR-90 (late) $395.00. Leo, W0GFQ, Box 919, Council Bluffs, Iowa—World Radio Laboratories.

HRO-60T, Standard & BC coils, one owner, guar. perfect, $425. 50 ft. self-support mast, prop rotator, indicator, ladder, Gonset 20M ant., $150. Don Parrott, 426 NW 48th, Oklahoma City, Okla.

TCS-14 xmtr, $40; Jackson TVG-2 sweep generator, $100; famous Labgear wide band multiplier, $20; Signal Shifter, $30; HRO $50, all items with manuals. K3LBW, Traver, 825 Harrison City Rd., Greensburg, Penna.

SELL: DX40 with built-in antenna relay, $55.00; VF-1, $15; 32 ft. Rohn guyless tower, two element Hy-gain Tribander, powerful homebrew rotator, 25 ft. of mast, 60 ft. RG8U, selsyns, $150. Several 304TL tubes. All inquiries answered. Rex Pike, K1ODL. Box 126, Medfield, Mass.

FOR Sale: Amateur equipment estate of the late W1CNZ: NC-300, $250; BW5100B, $375; BC221AH, $60; HRO-W with coils 1.7-30 Mc., $25.00. Many other parts. Write W1GR.

TRADE: Am leaving country and desire general coverage rcvr comparable to SX-101A, which I will trade. Prefer SX-88. No Hammarlund. K3IQS/O. 602 N. 19th St., Grand Forks, N. D.

FOR Sale: 20A F/W. QT-1, P&H amplifier, Model 400B F/W, and BC458 VFO-500 watts SSB, all like new, $340.00, or best offer. K5MWU, QTRS. 1831B, Blytheville AFB, Ark.

CAPUCHIN-Franciscans seek used parts and equipment to build amateur station for training future missioners in amateur radio and to communicate with their priests in the Mariana and Ryukyu Islands. Frater Joques Chiocco, O.F.M. Cap., KINGR. St. Anthony Friary, Hudson, N. H.

TELREX TBS-416 for sale, 3 el. trap Triband beams, $50 and my sympathy. Mechanically it's perfect but sold "as is" and including all factory correspondence. My price too high? I paid $150 but talk to me. I might unload it cheaper. E. H. Buckley, Hartselle, Ala.

URGENT Need! Stevens Arnold type 172 millisec relay. Reply by hamgram. W5GY.

COLLINS, recent 32S-1, 75S-1, 516F-2, spkr; Heath: SB-10, Mohawk, spkr; highest agreeable offer. Arthur Andersen, W8DEA, 1328 West Home Ave., Flint 5, Mich.

SELL Johnson KW and desk and Ranger with all connecting cables, ready for operation: $975. Also NC-303, matching spkr, and XCU303 deluxe calib, 3 mos. old, $400. Will take receiver on trade. K9LIX. 104 S. Weinbach, Evansville 14, Ind. Tel. GR 6-2035.

SELL: Morrow MBR5, MB560A, RVP250, RAP250, RTS600, James C1450, remote antenna tuber, microphone, heliwhip, cables, mounting brackets, etc. Send offer for complete package. Jerry Herdan, WA6LLS, 1435-167 Ave., San Leandro, Calif.

GONSET GSB-100, like new. Original carton. Used very few hours. First check for $395 buys. Claude Goodman, Jr., W5KWC, 1803 South Marsalis, Dallas, Texas.

HEWLETT-PACKARD 200C audio oscillator, $50; Remington noiseless mill, $15; approved A-800 audio preamplifier, $15; Mallory 6RS10, 6VDC battery-charger/power supply, $12. V. R. Hein, 418 Gregory, Rockford, Ill.

SELL: Viking Kilowatt with knotty pine desk, extra screen and grid volt Ma. meters, $1000; new Johnson audio amplifier, $50.00; Ranger PTT, $150; 39 ft. Vesto Tower, prop pitch, three Telrex beams, extra heavy masting, indicator and cables, help take down. $300; 522 xmtr, Tecraft converter, Gonset twin six beam, CDR rotator, $75; new Heath 0-11 'scope, $50; new BC696, $12; New BC457, $8; new PE-103, $10; converted prop pitch, $20; QSTs 1949 thru 1959, $25; CQs, 1948 thru 1959, $20. Offers considered. No shipping, sry. George Mack, 71 Tuttle Rd., Briarcliffe Manor, N. Y.

HARVEY-WELLS Bandmaster Deluxe TBS50D in exc. condx. All bands 2 thru 80. Complete TVI suppressed. Includes 5 xtals, mike, gud pwr supply. Manual included. $95. W7EBG, 6840 E. Windsor Ave., Scottsdale, Ariz.

GLOBE CHIEF, mod. 90 wid modulator, Heath VFO (VF-1) and Ameco low-pass filter. Complete, $90. F.o.b. New York, Baynon, 21 Return Lane, Levittown, N. Y.

RANGER For sale, like new condx, $180. Also have NC-183, $120. Dennis E. Royal, 852 E. Aurora, Des Moines, Iowa.

FOR Sale: S-40 with built-in Heath Q-mul and spkr, $50; Johnson Signal Sentry, 15. P. Leahy, W9GYV, 4453 Cortez, CA 7-6516, Chicago 51, Ill.

WANTED: BC-454, 3.0-6.0 Mc. Allen Fehl, RFD #4, Brookville, Ind.

CROSLEY "Pup" and Howe xtal set wanted. Trade Radiola III or cash. SW54, new, $35. Jack Walker, 11149 Densmore Ave., Granada Hills, Calif.

COLLINS 75A-4, matching speaker, mint condx, #2628, used less than 60 hrs. 2.1 and 6 Kc filters. Will ship prepaid, in orig. carton, anywhere in U.S.A. upon receipt certified check $585.00. W5WEF, 21 Shannon Drive, Little Rock, Ark.

S-85, $70. K3BTM, 448 Market St., South Williamsport, Penna.

CRYSTALS Airmailed: SSB, MARS, Marine, Net, Novice, Commercial, etc. Custom finished FT-243 .01% any kilocycle 3500 to 8600 $1.49 (10 or more 99¢), all novice 99¢, 1700 to 30,000 $1.95. All frequencies 60¢ additional for HC-6/u hermetic holders. Builders crystal packages: November QST "Phasing Sidebander" $9.95; June 1958 QST "SSB Package", 5 mixer FT-243 $9.95, hermetics $12.95, 7 matched filter $6.90 set. All types, if you don't see it be specific, write. Airmailing 9¢ per crystal. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

WORLD'S Finest reconditioned equipment at lower prices. On trial. Trades. Terms financed by us. S-38, $29.00; S-53A, $59; SX-99, $119.00; SX-100, $199.00; SC-101, $279.00; HT-32, $429.00; HQ-100, $129.00; NC-300, $249.00; Viking II, $179.00; KWM-1, $545.00. Hundreds of other items. Write for list. Henry Radio, Butler, Missouri.

QUICK sale: All guaranteed. National HR060T, calibrator, speaker, excellent, $295; Complete unit station, AM/CW transmitter, PP813s, 750 Watts, 2KVA variac controlled, phone patch, spare tubes, standard components, rack mounted Super Pro BC794B receiver, typewriter well, file cabinet, linoleum top section, airport type enclosed cabinet, tvied suppressed, fully metered, boom mike, Transmitter $390; Receiver $145; Complete station $515; Complete ART-13, 250W input, heavy duty supplies, $110; Speech Amplifier modulator, BC274N chassis, PP807s, $25; 6V, Carter compact dynamometer, 600 V, 220 Ma., $10; Eico 5 in. scope, like new, three probes, $40; Consider swapping for HT33, Thunderbolt, etc. LeRoy Judge, W2GIC, 96 Scudder Place, Northport, L. I., N. Y.

WANTED: Your buy or sell list. State price, condition. Small buyer fee. W3LMS Exchange, D'Amico, 319 Maryland St., Buffalo 1, N. Y.

SELL: HR060T, Standard coils plus BC band and Hy-Gain 10 M. and 15 M. coils, NBFM adaptor, xtal, calibrator, 60SC-2 comb, spkr and coil storage rack, Rcg. amateur net, $860; gud, as new, $475. Hammarlund C-10 excellent SSB adaptor, perfect condx, $99.00. W9ADN, Box 117, Lockport, Ill.

HEATHKIT TV alignment generator TS-4A, wired, with xtal, with all cables, perfect, $49.00. F.o.b. Geneva. C. H. Daykin, W2AFE. 19 Oxford Pl., Geneva, N. Y.

NATIONAL NC-60 receiver. In excellent condx, $40.00, F.o.b. Boston, Mass. Edward Gramer, 100 Landseer St., West Roxbury 32, Mass.

SELL: Phasemaster II with BC-458 VFO, $180.00; Viking Ranger, $165.00; NC-300 with xtal cal, $250.00. K2SYA.

COLLINS Wanted: 30S1, 312B-4, 51J4. Sell BC348, $55.00; 5" Heath oscilloscope in mint condx, $50.00; Eico 221 VTVM, new, excellent, wired, $25.00; selling out, many dirt-cheap bargains. Request list! W7GPP, 1308F, The Dalles, Oregon.

HT32, $350. In exc. condx. First cashier's check or money-order takes it F.o.b. F. Price, 4620 Magnolia, Chicago 40, Ill.

SELL: Closed circuit TV (Commercial), suitable for hospital, school, prison, etc. RCA PT-100A, Twin units, pedestal rack mounted. Never used. Descriptive letter on request. P. Kantz WA2LQT, 1602 S. 2nd St., Phila., Penna. Tel. HO 2-9628.

SELL: SX-99, QF-1, Viking Adventurer, Knight VFO, mike, 50 watt modulator, Knight transmitter, Vibroplex "Original" Bug, 15 meter 1-el beam, $265.00, best offer or separately. David DuPuy, 116 North Blue Ridge Rd., Black Mountain, N. C.

SELL: DX-100 with Apache pi network, $150.00. K2 UMH, 53 Louise St., Delmar, N. Y.

SELL: Globe Chief new, $50; VF-1 and pwr supply, $20; Globe ant. tuner, $11.00; code and theory course (Ameco), $7.00; also have assortment of tubes and miscellaneous all gud, write for list. K1LNM, 1295 Bay St., Springfield, Mass.

VALIANT Transmitter, received from factory 2 months ago for updating and aligning, never used since. Factory wired; HQ140X with spkr, clean gear, $475 for both or separate prices. Replies answered L. Meadows, 2645 Clydesdale Ct., Oceanside, N. Y. Tel. RO 4-0598. K2HPW.

ENGRAVED Call and name on bakelite with white lettering. Lapel pin or identify equipment. $1.00 including California tax. Address Harvey, Box 451, Grover City, California.

SELL For cash: National NC-98 receiver with spkr, perfect condx, $110. Write Gelnn Krueger, W9TXU, 8240 Emerald Ave., Chicago 20, Ill.

SALE: Johnson KW, with desk, $900 F.o.b. T/Sgt. Charles A. Griggs, 725th AC & W Sqdn, Walnut Ridge AFS, Ark.

THE Annual Peoria Hamfest will be held at Exposition Gardens, Youth Building Sept. 18, 1960. Advance registration $1.00; at the gate, $1.50. Contact Larry Pearsall, W9FDY, 2224 Herold, Peoria, Ill.

SELL: Collins 75A1 and spkr, D-104 mike, Heath SWR bridge, coax relay, 100 Kc xtal calib., 50 ft. steel tower, 15 meter beam and rotor. Dick Harper, W6VEK, HI 6-8418, 50 La Sierra Dr., Arcadia, Calif.

ALL Amateurs are welcome by Bill Mains, K8LKA, Manager, Radio Amateur Division. Contact Bill for all your needs. Low prices on all used equipment. Trades accepted. Visit, write or phone M. N. Duffy Co., Ham Headquarters, 2040 Grand River, Detroit 26, Michigan, Woodward 3-2270. Specials: Johnson Pacemaker New Floor Model $395.00, Special Trade on New NC400, Hallicrafters SR34 Universal Complete $389.00, B&W 5100B Like New $319.00. Hallicrafters HT33 Little use $439.00. EE2 Electronic Key $39.00. Globe Champion 300A Mint $295.00. DX100B $169.00. DX100 $149.00. Hallicratters SX88 $395.00. Viking II $179.00. Above subject to prior sale. 73, Bill Mains.

MOBILE Rig, nice performer; AF-67, Super Six, pwr., supp., cables, relays, mounts, fiberglass antenna, VC-8010B helium coil, mike, TNS, the complete installation ready to use with 12 volt system for push to talk operation 10 through 80 meters. First check for $237 takes. W4ZPZ, Sheffield, 1518 Oriole Place, Greensboro, N. C.

75A4 Ser. #5375, $575; 32S1, ser. #985 and pwr. supply, $525; both like new condx, factory cartons; E-Z Way GPRBX 40 ft. heavy-duty crank-up, tilt-over tower; Tennalab Triband beam, ham rotor, 300 ft. 8AU cable and fittings, with antenna switch, $525; 6 mos. old Jones MicroMatch, $25; Eico grid dip new, 25. K9LLO, 377 Westgate, Park Forest, Ill. Tel. Pilgrim 8-4236.

SALE Xmtrs, mobile rigs, dynamotors, tubes (813, 4E27, 805 and more); FM gear. Send stamp for list. Bruce, KØGVW, 3312 France Ave., Minneapolis, Minn.

AMATEURS, Hi-Fi, electronic fans, expert kit construction, reasonable rates, our work guaranteed. Write for complete details. Bailey, K5VTI, Krebs, Oklahoma.

WANTED: KW generator, 115V-GON; Sell new (5) 832A, 3JP1, 829B, $5.00 each; 24G, 316A, $1.00 each; used (2) 4-125A, $7.00 each; 250TH, 450T, 35TG, 833A, $3.00 each; Eico 5" PP scope, $30; Leece-Neville 6V 100 Amp., generator, rectifier, regulator, $25.00. W90BW, 133 South Rohlwing, Palatine, Ill.

WANTED: Mosley TA33 beam, gud condx, quote price. Bob MacIntyre, VE4ZX, 522 Burrin Ave., Winnipeg, Man. P., Canada.

WANTED: *Clean Hallicrafters SR-34 or 6m Communicator.* Have 6V-6M Transcon mobile xmtr-converter, Viking factory wired 2M VFO, 6V-2m Communicator as part payments or sell separately to your best offer. Rich, WA2CSE, 216 DeMott Ave., Rockville Centre, N. Y. Tel. RO 6-2395.

SELL New Hallicrafters HT-37, SX-111 and R-48 spkr. All for $595.00. Won at a Hamfest. Never unpacked. First certified check gets them. You pay freight. Write for prices on separate sales. *Rubley, K4CNA, 3508 Oakwood Blvd., Sheffield, Ala.*

SELL: Viking II, VFO, SX-100, Mosley 15-10 beam, lo-pass filter, co-ax relay; $500.00 for package. W2ZWT, 2 Miller Rd., Hicksville, N. Y.

KWS-1, excellent, $1150.00. 100V sealed carton, $675.00. May trade. W8WGA.

JOHNSON Thunderbolt. Low bands, factory wired, exc. condx, used less than ten hours, $455. Hallicrafters SR 34, 6 and 2 meter transmitter rcvr, 6, 12, 110 volts, $385; Telrex 20 meter, 3-el. "Supermini" beam, $35. K2YJX, Steve Marshall, 21 Woodland, Tarrytown, N. Y. Tel. ME 1-5596.

GF-12 Navy transmitter, RU-16 remote tuning receiver, BC-696A xmtr, Technicians delight, 50 Mc. transceiver, Carter 500V 200 Ma. 6V dynamotor supply, Vibrator supply 300V 100 Ma 12V, PE-103C dynamotor, 300V 100 Ma; Heathkit CT1 Capacitester, BD-86D dynamotor supply, 600V 300 Ma., Varistat 1500BQ adjustavolt, power supply 300V 125 Ma 110V., 1957 Olds receiver, 100 xtals 3604-10250, Delco 6V HD generator, emergency 425V-6.5V-1.6V hand generator. No trades. Make cash offer. W5EJA, P.O. Box 191, Biloxi, Miss.

COMPLETE Ham sell out, Fixed and mobile: transmitters, receivers, power supplies, instruments, miscellaneous. Send for list. Al Booth, W1TUX, Beechwood Dr., Sandy Hook, Newtown, Conn. or to Dan Johnston, W2CMI, Viewmont Terrace, Little Falls, N. J.

WANTED: Hammarlund Super Pro or HQ140. Must be in exc. condx with no alterations. Robert Steinberg, 20582 Lorain Rd., Cleveland 26, Ohio.

SSB Deluxe homebrew rig; exciter, linear, monitoring 'scope, 3 ft. rack. Write for full info. Tim Rand, K8GTI, 740 No. Highland, Dearborn, Mich.

HQ-140X, excellent condx with spkr, $180.00. Shipping costs will be paid within 300 miles. W9TGZ, Box 151, Bloomfield, Ind.

FOR Sale: Astatic T-3 mike with push-to-talk stand, $18.00. Cost me $35.00. Johnson Matchstick vertical all-band, $55.00. Ed Schofield, Box 14, Jarrettown, Penna.

FOR Sale: Johnson Viking I, latest modifications push-to-talk relays included, $149; Johnson VFO $29.50; Johnson Matchbox, $29.50; Elenco Power Gainer speech compressor, $29.50; Bud calibrator FCC 90B, $12.50; Johnson SWR bridge, $6.00; Hallicrafters SX-43 matching Hi-Fi spkr, $89.50; Johnson Viking II push-to-talk circuit included, $179.50; HQ-40X with Central Q Multiplier, $179.50. Want two Pacemakers, two HQ-170, Thunderbolt, power divider. W5DUA, 1306 West 8th St., Plainview, Texas.

SELL: G-77A and G-66B w/3 way p/s and spkr, M/M antenna with all band center loading coil; extra heavy body mount with bumper bracket; Electro-Voice 600D mike, all cables and brackets for complete mobile installation. Potsage paid in U.S. First check for $425.00 takes all. Joe Burkholder, KØGMN/7, 1637 Harmony Rd., Winnemucca, Nev.

SELL: SX-101 Mark III, in like new condx, $275. E. H. Kirk, W9OET, 6315 S. Harrison St., Ft. Wayne, Ind.

B&W 5100 B and B&W 51SB-B. Late run 2 with all manuals. Robert A. Smith, W1LLF, 320 Bushy Hill Road, Simsbury, Conn.

GONSET 12v "Slim-Pac" power supply for G-66-B receiver. Used 10 hours. $20.00. W3YAV, 7410 Birch Ave., Washington 12, D. C.

SAN FRANCISCO and Vicinity: Communications receivers repaired and realigned. Guaranteed work. Factory methods. Special problems invited any equipment. Commercial two-way equipment. Factory service Leece-Neville and Delco alternators. Associated Electronics, 58 South P St., Livermore, Calif. W6KF, Skipper.

FOR SALE: HQ-110, $196.50; HQ-110C, $203.50; Viking Mobile xmtr., $65.00; Millen SSB Rec. Adapter, $30.00; Meissner Signal Shifter, $26.50; RME 4350 with Spkr., $185.00; LA-400 Linear, $145.00; Globe Scout 680A, $85.00; Gonset 6 meter Linear, $122.50; Viking Challenger, $113.50; Viking "500", $675.00; Viking Valiant, $325.00; DX-100, $169.50; Collins 310B-3, $149.50; Alpha 6 xmtr., $64.50; Alpha AC pwr. sup., $24.50; P & H 600A with pwr., $65.00; Viking II, $175.00; Matchbox, $45.00; Gonset G-66B with 3 way pwr., $175.00; Gonset G-77, $175.00; Elmac AF-67, $127.50; SX-101 Mark III, $275.00; 20A with QT-1 and 458 VFO, $235.00. Write Art Brown, W9IHZ, Brown Electronics Inc., 1032 Broadway, Fort Wayne, Ind.

SELL: Dumont #241 Oscilloscope, $50; Eico #315 wired signal generator, $18.00; Frequency meters, BC221L, $50; BC221AK, $75. Thermoelectric Devices, Inc., 302 Mass. Ave., Cambridge, Mass.

SELL: Viking Valiant, factory-wired with relays and Johnson Signal Sentry CW and 'phone monitor for total of $300. K5MIJ, 703 Charles Pl., N.W., Albuquerque, New Mexico.

COLLINS KWM-1 with mobile mount, AC supply, DC supply, DC cables, Shure mike, 15 and 20 antennas. Cash only. $750. Delivered in Atlanta, W4HZF, 2690 Hayden Dr., East Point, Ga.

WANTED: Defective or inoperative commercial SSB exciter. Please state condition in detail. K2OYN, 449 Hill St., Boonton, N. J.

TELETYPE Printer #15KSR. Send and receive. Complete, ready for RTTY. $150. Winfred Winkler, 2199 Mark Trail, Decatur, Ga.

FOR Sale: SX-100, exc. condx, $200; DX-35, $40; 350 watt GG 811As with built-in power supply, $55. Jonathan Wachtel, K2UDM, 36-42, 206 Street, Bayside 61, N. Y. BA 4-8626.

SELL: Viking Ranger, factory-wired, $200. SX-99, $100; HQ-100 W/BFO, $150. All in excellent condx. Leon Steinberger, W2EVV, 55 Lenox Rd., Brooklyn, N. Y. Tel BU 2-4737.

GLOBE CHIEF 90, in exc. condx, $35.00. Merritt Dallinger, KNØYCO, Yale, Iowa.

GOING Mobile! 75A1, $265; Model B slicer, $55; perfect condx, together, $300. Also single 813 Handbook VFO xmtr, modulator, relay rack, power supply; Commercial quality. Make offer on xmtr. Will crate. Durland, W1YWP, 27 Edgerton St., Darien, Conn.

WANTED: B&W 850A, Cardwell condensers P8060 and P8013. W2MHL, 147 Farview, Paramus, N. J.

BC221AK frequency meter. Bought new with original calibration book. Has modulation. Never used. $65. R. Yeager, 1455 Wilson, Chicago 40, Ill.

SELL: Like new Hallicrafters SX-101 Mark IIIA with spkr, $300; NC-183D with spkr, $275. No shipping. Frank Walker, *10015 Yale Ave., Chicago 28, Ill.*

SX 110, used 6 months, $120. Liebman, 517-B, 136 St. Belle Harbor 94, N. Y. GR 4-3353.

RANGER for sale, PTT, grid block keying, $175. F.o.b. Cupertino. Dick Trevisan, 11282 Bubb, Cupertino, Calif.

SALE: Gonset six-meter Communicator III, like new. $220 or best offer. Jerry Clark, K9UHU, 106 South Lake, Syracuse, Indiana.

QST, June 1924 to date solid run, perfect condition, 433 books, best offer. M. Rieger, 216 Rutledge Ct., North Plainfield, N. J.

32V3 with set spare tubes, $495; NC-183D with matching spkr, $315, clean, exc. condx, manuals, orig. cartons, $775 takes both. Johnson Matchbox 250-23, $30. F.o.b. Railway Express collect with 3 day examination privilege. Have gone SSB. Rev. Gene Lafleur, W5WZR, 900 N. Union, Opelousas, La.

WILL Ship prepaid within the 50 states my clean, excellent, DX-getter Collins 75A-4 for $530. Dan Marien, 1014 Federal Reserve Bldg., Cincinnati, Ohio.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halsted St., Chicago Heights, Ill. Tel. SKyline 5-4056.

SWAP, Sell: Corona portable mill, exc. condx; complete mobile installation commercially made. Want: BC-221, receiver, test equipment, etc. Brewer, WØAG, 2208 11th Ave., Greeley, Colo.

COLLINS Receivers reconditioned: 51J-2, $495; 51J-3, $675; 75A-1, $269; 75A-2, $295; PMO oscillator, $245; HQ-145X, $149; HQ 110, $149; R-390A Gonset 111 2M., $209; HRO-7R, $99; Valiant, $319; Ranger, $199; BC-103 1 Panadaptor, $89; Model #14, #15, #19, #26, #28 teletype printers Telewriter Converters. Write Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. (Tel. Richmond 2-0048).

WANTED: Johnson Matchbox and xtal calibrator for Collins 75A2. W3ZPP.

SX-101A, used 20 hours, $295; Globe Scout 680A, factory-wired, like new condx, $75; new power transformer 220 volt multitap primary 4000 to 5000 volts centertapped, secondary, $35; copper clad steel wire approx. 1400 ft. 3/16" dia. Make offer. Stan Rosenberg, 1385 Richmond Court, East Meadow, N. Y.

SELL: Viking Adventurer, Hallicrafters S-40B with Heath Q-multiplier, Eldico AM-40 modulator. K5BTF, Rt. 3, Box 178-A, Pine Bluff, Arkansas.

SELL: Antenna, Hornet Triband TB-500, new, in carton, never unwrapped. Must sell due to relocation, $45.00. Will be willing to ship. Also, Transmitter, Viking Ranger, in exc. condx, factory-wired. Also must go due to relocation and will be willing to ship, $160.00. S. Alexander, 2430 25th Ave., S. F., *Calif.*

FOR Sale: Unusual and special ham items. Old books, Ignitrons, General Radio audio freq. meter and Decade Box, UTC audio filters, Heathkit SB-10, etc. Send stamped envelope for complete list. W8BBT, RFD #1, Box 520, Oberlin, Ohio.

SELL: Elmac A54H mobile xmttr w/12 volt Dynamotor and 115 volt AC supply. Wired for 12 volt filaments: $85.00. K2DN, 738 Marcellus Drive, Westfield, N. J.

SELL Apache, $235.00; SX-100 with R-46B spkr, $210; AM-2, $12; QF-1, $7; Dow-Key DKC GEE relay with connector, $10. All equipment is in excellent condition. KIGUX, 143 Sproat, Middleboro, Mass.

WANTED: "A"-band (14-30 Mcs. G.C.) coil sets for HRO-50T1 rcvr. *Richard L. Smith, W8BFP, 1400 St. Paris Pike,* Springfield, Ohio.

SELL: Morrow mobile receiver MBR5; xmtr, MB560A; RTS600 AC power supp. with enclosed spkr; carbon push-to-talk mic; all cables and manuals with Morrow armchair enclosure, ready-to-go, *like nu condx:* $350.00 Louis Kipp, 8268 168th St., Jamaica 32, L. I., N. Y.

COLLINS 32V3. One of the cleanest and best-working units in existence. Kept in factory-fresh condx. A real buy at $450. Will ship. Have gone SSB. W2PVK, 416 Barry Rd., Rochester, N. Y.

FOR Sale: BC-348, $45; S-53A, $55. Jim Highsmith, 2315 Wensley Dr., Charlotte, N. C.

FOR Sale: Collins KWM1, AC supply, DC supply, mobile track, cables and xtal mike, $850; Elmac AF67, 300V supply and PE103, $130; Hammarlund Pro 310 and spkr, $280.00; BC221T, AC and book, $50.00; Vibroplex bug and case, $20.00. Keith Nyfeler, W8IJP, 6530 Adams Ave., Cincinnati 43, Ohio. Phone LOcust 1-5097.

APACHE and NC-300 with calibrator and Dow-Key TR switch. New condition. $500.00. 26 teletype, make offer. K2POE, 1152 Park Ave., Vineland, N. J.

KWS-1 with spare final tubes. First $1200 gets this versatile beauty. Bob, K8DZQ, 5566 West Outer Drive, Detroit 35, Mich.

HQ180, clock, speaker, brand new, only 5 hrs use, in original carton, manual, unmailed guarantee, received from dealer in lieu of professional fee. First check $375 takes both. Will ship collect. Dr. Frederick Doob, 124 West 79th St., New York 24, N.Y.

SELL: Tape recorder, Silvertone portable model 7074, two 3.2 ohm spkrs, five tubes, meter indicator, $60.00 F.o.b. K5IPK, 2224 47th, Los Alamos, New Mexico.

FREE List. Cleaning shack. Surplus and amateur gear BC-348Q, APA-38, APA-10, all converted to 60 cyc., $60; $30; $75. F.o.b. More, K6AHX, P.O. Box 273a, Del Mar, Calif.

SELL: NC-300 rcvr and featherweight phones. Excellent condx. in orig. carton. $275 C.o.d. Gary Tighe, 2909 W. Oak St., Sioux Falls, S.D.

SELL: Globe Linear, LA-1, $85; SX-71, w/spkr, in fair condx, $110; C.E. 10B, w/458VFO and all coils, in vy gud condx, $150. W4UFQ, Dale S. Harridge, Box 332, Madison, Ga.

COLLEGE Bound. Must sell Globe Chief 90-A. $45.00; Knight VFO, $15; Knight R-100 receiver with speaker and S-meter, $95. $145.00 takes all! K5LEH, College Heights, 814 Faculty Row, Arkansas.

SELL: Collins S/Line, 32S1, $500; 516F-2, $90; 75S1, $395; excellent condx. Frank Layton, W7IQS, 731 West Dana, Mesa, Ariz.

WANTED Millen or B&W grid meter. Millen antenna bridge and CDR Ham rotator. W4SK, Box 554, Eau Gallie, Fla.

SALE Or Swap: SX-101 Mark III and matching spkr, best offer. Want: Apache and Matchbox. K4DPX, 1801 Windsor Ave., S.W., Roanoke, Va.

PACKED and delivered F.o.b. Washington, D.C.: Collins KWS-1 transmitter, $1200; Collins 75A-4 receiver with speaker, $575; Tel-Rex heavy duty rotator, $125 with control; Tel-Rex medium duty rotator, $80 with control. R. E. Macomber, W3CZE, P.O. Box 68, North Beach, Md.

SELL: Collins 75A1 recvr, $225.00; Collins 310B3 exciter, factory mounted, in matching 75A1 cabinet, $125.00. Like new condx. Sell together or separately. Local deal only. A. DeSalvo, 2890 E. 97th St., Bronx, N.Y. Tel. TA 9-3070.

CASH for used short-wave ham receivers, transmitters and accessories. Treger, W9IVJ, 2023 N. Harlem Ave., Chicago 35, Ill. Tuxedo 9-6429.

PIERSON KE-93 receiver with 6-12 DC and 110 AC power supplies: brand new, never installed, late serial #3462. Save over $50.00. Complete, $295.00. Gilbert de la Laing, W6BJI, 1260 W. San Ramon, Fresno, Calif.

RANGER Push to talk, $150; BC610 with desk speech control amplifier, no changes either piece, $250.00; special commercial built mobile lab trailer, heavy duty wiring, extra door, reinforced floor, picture window, complete with Ranger and 610, $1000. Will deliver 300 miles. WØMBH, Box 728, Lima, Ohio.

SX100, neat, clean, stable: $190; set Miller McLaughlin 50 Kc. IF xfrmrs and 50 Kc filter, $12.00; set 10 4860 Kc. xtals; FT243 holders for filter, $5.00; RCA 8005 new $3.50. Will sell brand new 4E27A, $15 or swap for pair 813s. Neill A. Jennings, P.O. Box 7152, Greensboro, N.C.

HT32 $400 L1000A with LPA-MU-2, $300. Both in excellent condx. Going mobile. Priced for quick sale. Cash only. J. Power, 21 Holt Circle, Trenton, N.J.

HAVE Extra receiver for sale: An SX-101 Mark III-A new, in original carton, first $299.00 takes it F.o.b. ARC-5/T-23 xmttr 100-150 Mc., brand new, $17.50. Sil Thompson, 192-50B 71st Crescent, Apt 3B, Fresh Meadows 65, N.Y. Phone JAmaica 3-5808.

FOR Sale: Presentation model bug, like new, $15.00 prepaid in U.S.A. Donald Roberts, Hotel Netherlands, Holland, Mich.

FOR Sale: Viking Valiant, reluctant to part with. Best offer over $250.00. Joe Fuhr, W3FHZ, 33 Hilltop Rd., Levittown, Penna.

SELL: Viking Valiant, in exc. condx. Factory-wired. $300 plus shipping charges. W9IJO.

MORROW Twins, rcvr, xmtr, 50 watts, mobile & home; 2 power supplies included. Cost new over $500. Will sacrifice at $300. M. Levy, K1KIT, 136 Main St., Stoneham, Mass.

DX-100, VFO not calibrated; 14AV antenna with radials; Drake filter; JT30 microphone. Best offer over $200. W1VEM, 6 Hancock Rd., Barrington, R. I.

SELL: Motorola radio-telephone, 152-162 Mc., 30 watt, mobile, xmttr-rcvr, cables, mic, antenna, controls, xtals, manuals, pwr supplies, exc. condx. Will ship, $100. Jack Plane, K1JVJ, Niantic, Conn.

FOR Sale: Complete ham station, HQ-120, DX-40, VF-1, 40 m. dipole, all auxiliary equipment; wired for single switch operation. Complete inventory sent on request. Will sell complete or in units. Barry, W2ROH, 91 Morris Dr., East Meadow, N.Y.

New RME 4350A with speaker, highest bid over $235. K5JMY, 2846 Lucas Drive, Dallas 19, Texas.

MOVING to KL7 Land in August. Selling out. Stamp for list. W3CTY.

SELL: Mobile rig, AF67, Gonset Super Six, Elmac pwr., Webster ant., Shure mike, chain bumper mount. Complete, $200.00. K4BEE, Charlotte, N.C. Tel. JAckson 3-5813.

FOR Sale: HQ-160 with spkr, $275; Heath Apache with SSB adapter, $290; Heath OM-3 oscilloscope, $30; Heath SWR bridge, $10; B&W T-R switch, $15; Electro-Voice 951 mike, $20. All perfect, like new. Must sell. Going to college. Take it all for $600. Steve Johnson, K9LAM, 165 Spring Lane, Winnetka, Ill.

MINT Condition Collins station as single unit only 30S1 amplifier 32S1 with supply. 75S1 has 500 cycle filter with 8 FO xtal 312B4 station control firm. $2200. 32V2, $250.00. W2BBV, 49 Frum Ave., Yonkers, N.Y.

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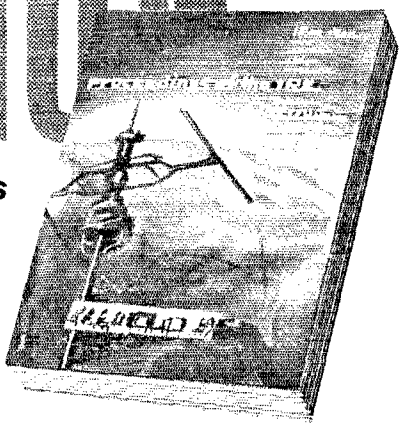

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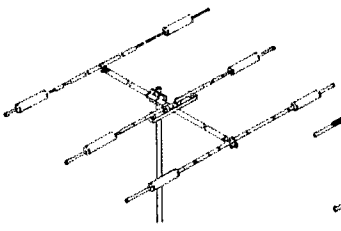

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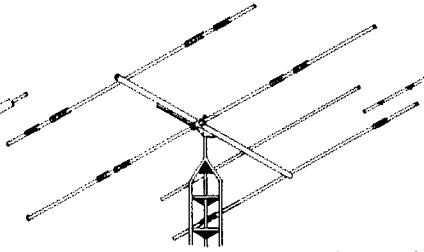

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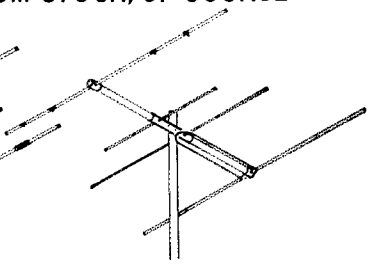

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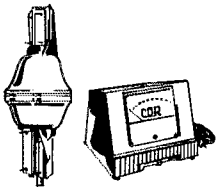

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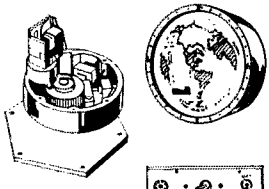

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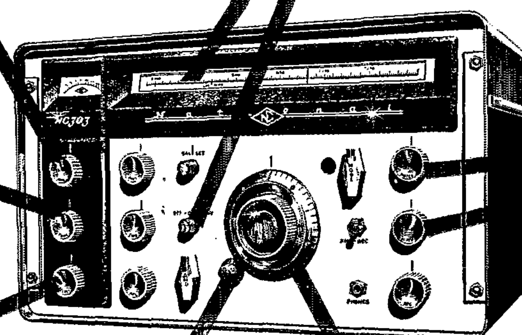

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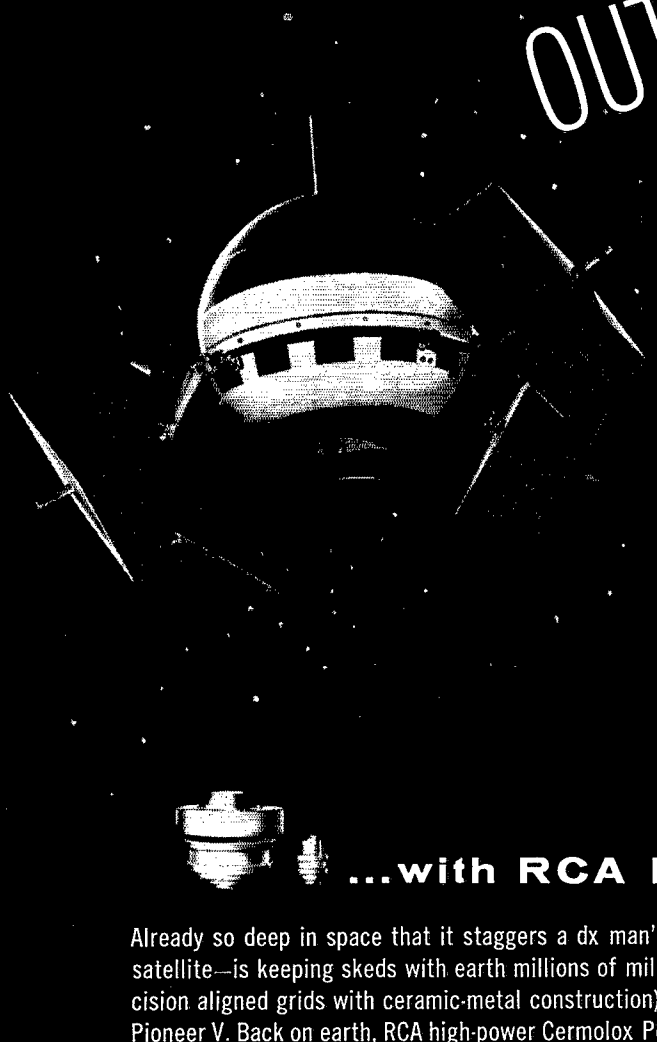

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