CRYSTAL CONTROLLED
MOBILE CONVERTERS

PART II of the three-part series on high power mobile radio systems by WB8DLD and WB8WFH describes their bandswitching and single band converters, plus conversion suggestions for the BC-453 receivers which function as tunable IF amplifiers. This series started with PART I—Mobile Power Supply Ideas—in the July-August, 1960 issue. PART III—MOBILE LINEAR AMPLIFIER—will appear in the November-December issue.

WB8WFH's bandswitching converter, and the metering panel and power control box, all form a neat under-dash package in the above view. The tuning dial on the converter actually tunes the BC-453 receiver—tucked up on the firewall at the right side of the car—through a flexible shaft.

—Lighthouse Lorry

SEPTEMBER-OCTOBER, 1960

in this issue:

Scanning the Spectrum................page 2
Bandswitching Mobile Converter........page 3
Single Band Mobile Converters........page 7
BC-453 Conversion Suggestions........page 10
1960 Edison Award Announced........page 12

Copyright, 1960, by General Electric Company
MOBILE 558 RECEIPTION . . .

Successful reception of single and double sideband signals in a mobile radio system requires that the receiver have excellent frequency stability, and that it have the ability to select signals at several megacycles. Also, sufficient selectivity to attenuate signals on adjacent channels is highly desirable.

The double conversion superheterodyne receiver circuit, when properly applied, will meet both of these major requirements. It makes possible using crystal control in the high frequency oscillator for the first frequency converter when a band only a few hundred kilocycles wide — such as an amateur band — will be tuned by the receiver.

The tunable portion of the receiver can then be operated much lower in frequency where tunable oscillators for the second converter can easily be built with a stability within a hundred cycles. Some top-performing amateur radio receivers utilize this principle.

The double conversion receiver principle has been applied by W8DLD and W8FH to attain excellent stability and selectivity at low cost by using the BC-453 Quadri or BC-525, covering 300 to 550 kilocycles, as a tunable I.F. amplifier preceded by high-frequency converters with crystal-controlled oscillators. The selectivity and stability of the BC-453 are widely recognized in amateur radio circles.

The tunable oscillator in the BC-453 operates sufficiently low in frequency, and is mechanically rugged, to minimize the effects of temperature and power supply voltage variation, and shock and vibration upon its stability. Of course, the crystal-controlled oscillator in the amateur band converters, have excellent stability too.

Incidentally, here is a more complete listing of crystal frequencies which can be used in the converters described herein than the crystals covered in the roll tables. The listing also shows the harmonic of the crystal oscillator required for injection to the mixer, the signal frequency ranges covered, and the tuning range of the BC-453 receiver for each crystal.

The BC-453 receiver will work fine with 150 volts on the plates. If 300 or more plate volts are applied, bypass capacitors may fall. W8DLD suggests using a VR-105 or 642 regulator tube to hold the plate voltage down to 150 volts. Use a power supply with at least 200 volts output and drop the voltage with a 10-watt adjustable regulator, set so that the VR tube is ignited at all times.

Try the converter/BC-453 receiving combination described in this issue. I'm sure you'll be pleased with its performance.

SUPER POWER RIGS . . .

The one-kilowatt power maximum input of the highest amateur transmitters is dwarfed by General Electric's new 250-kilowatt short wave transmitters being constructed for the Voice of America. They're also many times larger in size — 22 feet long, 10 feet high and 12 feet wide — as compared with most amateur rigs.

Six of the new transmitters, being built for the U.S. Information Agency's VOA East Coast installation near Greenville, N.C., are the largest high frequency transmitters manufactured by General Electric in its 40 years in the communications field.

Each transmitter will include special engineering devices to meet VOA requirements for increasing the intelligibility of reception in foreign lands, where there may be a whole of a signal, again by comparison with amateur radio signal levels.
MOBILE OPERATION on several amateur bands requires that the transmitting and receiving equipment in the installation—as well as the antenna—be constructed to be switched readily to the band on which operation is desired at a particular time. A bandswitching converter with crystal controlled oscillator, designed to work into a receiver covering an established intermediate frequency tuning range, can be constructed in little more space than is needed to house a converter covering only a single band.

The converter used at W8WFL/M, however, also incorporates a remote tuning dial which simply drives a flexible shaft coupled to the receiver, mounted up under the right side of the dash in the car. Other controls for the r.f. receiver—r.f. gain, audio gain, AVC switch, and sideband selector switch—also were built into the converter, although these controls and the dial could easily have been located elsewhere.

SEPARATE COILS were used in each of the r.f. circuits of the converter shown in the schematic diagram, Fig. 1, to cover the five amateur bands from 5.5 to 10 megacycles. A 6DG6 sharp cutoff r.f. pentode functions as the r.f. amplifier, while the pentode section of a 6UR (or 6UR-A) is the mixer. The triode 6UR section is the crystal oscillator.

(continued on page 4)

The BC-453 receiver with which this converter is used. Only one set of coils is shown for L1, L2, L3 and L4. Actually there are five coils in each of these locations, each connected in a separate position on R2, or Su.
The crystal oscillator functions at the crystal fundamental frequencies to cover the 3.65-4.0 and 7.0-7.3 tuning ranges, as shown in TABLE I. Column 2 shows that the second harmonic (13.8 megacycles) of the 6.9-megacycle crystal is the injection frequency, while the fourth harmonic (17.0 megacycles) is used to cover the 21.0-21.45 megacycles. Four harmonic-free coil ranges are used to cover the 7.287 to 8.85 megacycles where most side-band operation occurs on this band. Other crystal combinations are suggested in Fig. 2.

TABLE II - COIL TABLE - BANDSWITCHING CONVERTER

<table>
<thead>
<tr>
<th>AMATEUR BAND ( (MC) )</th>
<th>CRYSTAL FREQ. (MC)</th>
<th>INJECTION FREQ. (MC)</th>
<th>( L_1 )</th>
<th>( L_2 )</th>
<th>( L_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>3.5</td>
<td>4.3</td>
<td>10 of #30 enameled</td>
<td>16.30 * 30* (X2060-5)</td>
<td>61.122 (X2060-7)</td>
</tr>
<tr>
<td>6.8</td>
<td>6.8</td>
<td>7 of #30 enam.</td>
<td>5 of #30 enam.</td>
<td>3.4-7.0 (X2060-3)</td>
<td>16.30-30 (X2060-7)</td>
</tr>
<tr>
<td>6.9</td>
<td>13.8</td>
<td>5 of #30 enam.</td>
<td>3 of #30 enam.</td>
<td>3.4-7.0 * 10&quot; (X2060-2)</td>
<td>61.122 (X2060-7)</td>
</tr>
<tr>
<td>5.25</td>
<td>21.0</td>
<td>2 of #30 enam.</td>
<td>2 of #30 enam.</td>
<td>3.0-3.7 (X2060-1)</td>
<td>28.63 (X2060-5)</td>
</tr>
<tr>
<td>7.075</td>
<td>28.3</td>
<td>2 of #30 enam.</td>
<td>3 turns of #24 enam.</td>
<td>23 turns of #26 enam.</td>
<td>28.3 (X2060-5)</td>
</tr>
</tbody>
</table>

*Small ceramic capacitor across coil where indicated — otherwise only circuit capacitance.

Small ceramic capacitor across coil where indicated — otherwise only circuit capacitance.

FIG. 2. FRONT AND REAR panel drilling diagrams for the bandswitching converter. The slide switch marked "100 KC" applies plate voltage to a 100-kilocycle crystal calibrator which the author included in his converter, but is not shown in the schematic diagram, Fig. 1. All the BC-453 controls could be mounted on a separate panel to reduce crowding in the converter, if desired.
the CRYSTAL FREQUENCY CHART for the converters on page 2 of this issue. Oscillator coils (Lx) tune to the crystal harmonic frequency being used.

A 2.5-millihenry r.f. choke, tapped between the first and second pins from the end to which plate voltage is applied, serves as the converter output circuit and is peaked at the desired frequency in accordance with the location of the tuning range of the BC-453 receiver with Cr. 150-ohm tuned circuit. This circuit, shown in Fig. 2 of the single band converter article on page 8, is also suitable for this converter.

CONSTRUCTION of the model shown in the photos was accomplished in a 4 x 6 x 3-inch home-fabricated box made in two sections. However, the converter can be constructed into a 2 x 5 x 3-inch Minibox (Bud CU-3008) if the remote tuning dial and BC-453 controls are not included in the box. Or, these controls can be included when the converter is constructed in a Minibox 8 x 6 x 3/16 inches (Bud CU-3009) in size.

Dimensions are given in the panel layout diagram, Fig. 2, the box layout diagram, Fig. 3, and the subchassis layout diagram, Fig. 4, for the 4 x 6 x 2-inch box, but will serve as a guide for the larger standard Miniboxes suggested above. It is best to select the box size to fit the space available in each individual mobile installation.

Major parts were mounted in the locations shown in the above diagrams, and should be kept in the same relative positions in the larger boxes. The subchassis has a 3/8-inch step, as shown in the side view, and was made with narrow flanges along the upper lower and rear edges to facilitate rigid mounting.

Wiring should be handled in the usual manner for high-frequency circuits: shortest possible grid, plate and coil leads; die ceramic bypass capacitors soldered with shortest possible leads; and wire runs kept away from r.f. coils; and short lengths of coaxial cable for antenna input signal and output connections to the BC-453 receiver.

FIG. 3. TOP LAYOUT DRAWING of the converter. The subchassis should be shielded to clear the top flanges on the box.

The TUNEUP PROCEDURE is quite simple, once construction is completed and a check has been made of the heater and plate power circuits to ensure that the correct voltages appear on both tubes. Plate voltages will be the same as the power supply voltage, and screen voltages will range from 100 to 120 volts on both the 6C366 and 6F7 tubes.

The crystal oscillator should be adjusted first. A general coverage receiver is helpful in checking to see that the oscillator works on all bands, and that the plate coils (Lx) are tuned to the correct harmonic frequency. Set S, to the 3.0-megacycle position, tune the receiver to 3.5 megacycles, and tune the 3.5-megacycle Lx for maximum signal in the receiver.

Next, switch S, to 7 megacycles, set the receiver at 6.8 megacycles and tune the 7-megacycle Lx for maximum signal. For 14 (continued on page 6)
megacycles, set $S_1$, tune the receiver to 13.8 megacycles, and tune the 14-megacycle $L_4$ for maximum signal. For 21 and 28 megacycles, calculate the correct harmonic frequency of the crystal being used, set the receiver at that frequency, and peak the proper $L_4$ coils.

**FRONT-END ALIGNMENT** consists simply of peaking the mixer grid coils ($L_3$) first for maximum signal at these frequencies, and then peak the r.f. coils ($L_1$-$L_3$) for each band. Either the signal generator, or external signals close to the specified frequencies, may be used.

The alignment may be completed before the converter is "buttoned up" by installing the top half of the box, since the coils are sufficiently removed from it to have little effect on the inductance values.

Both converter power and remote control connections were made through a 12-pin plug and cable running to the BC-453 receiver. Length of this cable, and the flexible shaft for tuning, will be determined by the space available in the constructor's car, and probably will be from 24 to 36 inches long.
THE SINGLE BAND approach appeals to many mobile amateur radio operators who concentrate their operations mainly on one or two bands because of space limitations, or the nature of local activity. The equipment can be constructed easier because of the absence of a bandswitch and multiple sets of coils. Those amateurs who work two bands can construct plug-in r.f. units for the receiver front end — and transmitter too — and achieve optimum performance on each band.

At WCBD/Mobile, five single-band converters were constructed to cover the amateur bands from 3.5 to 30 megacycles. All units have plug-in connections for easy changing, and follow the same basic circuit. Because of the fairly low frequency chosen for the tunable i.f. range — 200 to 550 kilocycles — four tuned circuits at the signal frequency were included in each converter for maximum rejection of image signals. These image signals will be twice the frequency to which the BC-453 is tuned away from the amateur band signal frequency: An image frequency 400 kilocycles below the signal frequency when the BC-453 is tuned to 200 kilocycles; and an image frequency 1,000 kilocycles below the signal frequency when the BC-453 is tuned to 500 kilocycles.

The triode section of a 6US pentode-triode functions as a grounded-grid r.f. amplifier, as shown in the schematic diagram, Fig. 1. The antenna input circuit is tuned, with only a 2.5-milli henry r.f. choke in the cathode DC return, Coils L1 and L2 form a bandpass coupler which feeds the pentode section of the 614B as a second r.f. amplifier, with an r.f. gain control in its cathode circuit.

(continued on page 8)

<table>
<thead>
<tr>
<th>TABLE I — PARTS LIST — SINGLE BAND CONVERTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.... 5-mfd silvered mica or ceramic capacitor;</td>
</tr>
<tr>
<td>have values from 1 mfd to 5 mfd for optimum</td>
</tr>
<tr>
<td>oscillator injection without excessive</td>
</tr>
<tr>
<td>output harmonic signal injection.</td>
</tr>
<tr>
<td>L,... 5-140 and 300 microhenry inductor.</td>
</tr>
<tr>
<td>R,... 500 ohm air wound r.f. choke.</td>
</tr>
<tr>
<td>T,... 16 or 30 microhenry pi-wound r.f. choke; see</td>
</tr>
<tr>
<td>TABLE II — COIL TABLE, and test for details.</td>
</tr>
</tbody>
</table>

FIG. 1. SCHEMATIC DIAGRAM for the single band converter designed and constructed by WCBD. All resistors are in ohms, 3% watt rating, and capacitances are in micro-microfarads. If not otherwise marked, the output signal was through pin 2 on the power plug. P. Note that 6 volts DC should be applied to pin 5, and pin 1 grounded, for operation of the converter from 6 volts.
TABLE II — COIL TABLE — SINGLE-BAND CONVERTERS

<table>
<thead>
<tr>
<th>ANODER</th>
<th>COIL TABLE</th>
<th>SINGLE-BAND CONV.</th>
<th>ALTERNATIONS TO BE PERFORMED ON COILS L1 TO L6, INCLUSIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>TV-108</td>
<td>(4.5-MC TV-18)</td>
<td>Remove cores from forms. Replace with single pair (some positions) from 2.5-m. r.f. choke.</td>
</tr>
<tr>
<td>14</td>
<td>FM-251</td>
<td>(10-MC FM-15)</td>
<td>No alterations required in either coils or capacitors.</td>
</tr>
<tr>
<td>21</td>
<td>TV-104</td>
<td>(21-MC TV-20)</td>
<td>Turn slugs nearly all the way out of coils and remove turns from each coil until each circuit turns to 5.3 MC with slug all the way out.</td>
</tr>
<tr>
<td>28</td>
<td>TV-104</td>
<td></td>
<td>Turn slugs nearly all the way out of coils and remove turns from each coil until each circuit turns to 20 MC.</td>
</tr>
</tbody>
</table>

(continued from page 7)

The second pair of coils, Ls and L2, couple the signal into the pentode section of the second 6L8, operating as a mixer. The triode section of this tube is the crystal oscillator, operating either on the fundamental or harmonics of the crystal, as described in the bandswitching converter. Oscillator signal injection is through a small coupling, capacitive. Values from 2 to 6 mmf should be tried, to obtain optimum oscillator injection.

Plate circuit of the mixer is again a 2.5-millihenry r.f. choke (RFC2), with the l.f. output signal tapped off between the first and second jacks. An optional mixer output circuit, using a Miller No. 70-A broadcast receiver antenna coupling coil, is shown in Fig. 2. The antenna winding is used for the output link to the power plug, J1.

THE CHASSIS on which all converters were constructed is a 1/4 x 3 x 21/2-inch Minibox ( Rud CU-3006) and provides plenty of room for the power plug, J1.

FIG. 2. OPTIONAL OUTPUT CIRCUIT for the converter, using a Miller 70A miniature broadcast receiver antenna coil with the primary as the output link coil. This circuit can be substituted for RFC, in either the bandswitching or single-band converter.

FIG. 3. CHASSIS LAYOUT DIAGRAM for the single-band converters. The chassis is 3 1/2 inches on a side. The same parts layout was used for all five of W6OD's converters.

8
for the components specified in TABLE I—
PARTS LIST. The same general parts lay-
out, shown in the drilling diagram, Fig. 3, was used for all converters.

The alterations necessary on coils L, through L, — as described in TABLE II —
COIL TABLE, and the coils checked for proper frequency coverage with a grid-dip
oscillator — should be made before the shield cans are fastened to the chassis.

The usual precautions regarding short r.f.
and bypass capacitor leads apply to all
converters, and especially the 8J and 28-megacycle models. The tube heaters may
be operated from either a 6 or 12-volt supply by making the proper connections when wir-
ing the Jones cable jack which connects to P.

ALIGNMENT of the crystal oscillator stage consists simply of peaking L, for maximum
signal in a receiver tuned to the proper harmonics frequency for the crystal; and band
in use. After coupling the BC-453 receiver to the output, and feeding in a signal of the proper
frequency into L, the signal circuits, L, to L,, may be aligned. Peak coils L, and L, (the top adjustments) about 50 kilo-
cycles inside the high edge of the amateur
band for which the converter is designed (5.25 megacycles on the 4-megacycle converter).

Peak coils L, and L, from 100 to 200 kilo-
cycles lower in frequency, so that the con-
verter has nearly uniform gain across the
portion of the amateur band most used. Coils
L, and L, are made the top adjustments so
that the converter bandpass can be easily
changed for maximum performance either in
the American phone, or CW assignments of
the amateur bands.

The converters, when completed and
aligned, may be mounted on top of the BC-
453 receiver, as shown in the picture above.

At W8DLD/Mobile, the converters were
mounted on top of the linear amplifier for the
sideband transmitter in the rear of the sta-
tion wagon (as shown in the view on the top
left corner of page 7 in the July-August,
1960 issue). This permits a short connection
to the antenna changeover relay — also on
the linear amplifier — and changing con-
verters when bands are switched in the
amplifier. A coaxial cable feeds the l.f. out-
put signal from the converter to the BC-453
receiver, mounted below the dash (see pic-
ture on page 4 of the July-August, 1960
issue).

Converters of this type have traveled over
120,000 miles in W8DLD's mobile installa-
tions, and the models described incorporate
the lessons learned during this vast amount of "field testing."
CONVERTING THE BC-453 RECEIVER

By A. F. Pascoff, W6DL, and W. C. Louden, W6WPH

CONVERSION DATA for the BC-453 Command Set Receiver has been published. However, here are suggestions for making the basic conversion, plus adding a more powerful audio amplifier, fast-acting AVC and 6-meter circuit, and a sideband selector switch.

HEATER CIRCUIT—
To operate the BC-453 tube heaters from a 6-volt supply, rewire all heater connections to the sockets in parallel. Install 6-volt tubes: three 6AI7, one 6K8, one 6SR7, and one 625 or 626 in the audio (VR), changing no socket connections other than tying pin 7 to pin 1. For 12-volt heater supply operation, either rewire all heaters in parallel and use the original 12-volt tubes (three 12AI7, one 12K8, one 12SR7, and substituting a 12L5 for the 124A), or use the original heater circuit and install 6A11 heater tubes which each draw 0.3 amperes (same 6-volt tubes as shown above).

AUDIO AMPLIFIER—
The original audio amplifier in the BC-453 may be sufficient for hose-station operation under quiet conditions, but more volume is sorely needed to overcome the various noises encountered in mobile operation. A 5-watt amplifier and speaker in the 6 to 8-inch diameter range will provide plenty of sound.

A 3-stage amplifier circuit, shown in the schematic diagram, Fig. 1, was devised, and is easily driven by a 6AS7 or 6325, substituting for the original 12A6 pentode power audio amplifier in the BC-453. One section of a 12AX7 twin triode is a voltage amplifier; the other section functions as a phase inverter, driving the grids of a push-pull output stage with the 12AQ5 at the output (heater supply).

The constants shown provide good frequency response, but the higher audio frequencies will be accentuated if a 0.1-mfd capacitor is wired across the cathode resistor of the 12AX7 audio amplifier. A 0.006-mfd capacitor across the output transformer attenuates higher audio frequencies. The audio amplifier was constructed on a small metal plate about 4 inches square with flanges on all sides for mounting. Wiring should follow the usual practices for audio amplifiers. Note that the audio output signal from the BC-453 was taken from pin 2 of the plug on the rear of the chassis, as shown in the view on page 9.

FAST-ACTING AVC/6-METER CIRCUIT—
The operation of this fast-acting AVC circuit which can be added to the BC-453 receiver must be heard to be appreciated. The 6-meter was designed to work on CW, sideband or amplitude modulated phone signals. The two-tube package, added in a small box to the left side of the receiver in the view on page 9, is well worth its weight in operating convenience. Note in the schematic diagram, Fig. 2, that the 65-kilocycle signal from the BC-453 is picked up of the control grid of the first, i.f. amplifier (V1), so that the AVC amplifier stage, a 12A5/6 pentode, will be completely free of stray BFO voltage. The selectivity of this amplifier must be broader than the signal channel in order to reduce the gain of the receiver when strong adjacent channel splatter is present. The "Q" of L1 should not be too high, or the 65-kilocycle tuned circuit formed by it and the 190-760-mmdf padder will be too sharp. A 0.5-milliwatt iron core r.f. choke (Bud CH-922W, or equivalent) should be used for L1.

The AVC voltage is rectified by the IN34 diode and applied through a decoupling network back into the BC-453 receiver at the lower end of L1. The selectivity of the interstage i.f. transformer which drives the second i.f. amplifier stage (V2). The AVC voltage is also applied to one control grid of a 12AT7 twin triode in a vacuum tube voltmeter type 6-meter circuit. An SPDT switch provides for full AVC readings for higher "DX" 8-meter readings, or lower AVC for "Local" S-meter readings from strong signals.

FIG. 1. SCHEMATIC DIAGRAM of a 5-watt audio amplifier for the BC-453 receiver. Audio output from the receiver is when taken from the push-pull output transformer through the terminals on the rear of the receiver chassis. Capacitors are in microfarads, and resistances are in ohms. 1/2-watt values marked.
Note that a phone jack connection to the plate of the 12AX7 AVC amplifier provides a place to feed the i.f. signal to the vertical planes of an oscilloscope. By setting the horizontal sweep on the scope at 30 to 60 cycles, both incoming signals, and your own transmitter, may be checked for linearity.

The AVC/S-meter unit was constructed in a 4 x 2 ½ x 3-inch Minibox (Bud CL3015) and mounted on the left side of the BC-453. Extension shafts run from the controls to knobs, with the shafts supported on a small bracket. Exact arrangement of the AVC and S-meter circuit components will depend on the space available on each side of the BC-453 receiver in each mobile installation.

**SIDEBAND SELECTOR SWITCH**

When properly aligned, the 8-kilocycle i.f. amplifier in the BC-453 has a bandwidth of about 2.5 kilocycles. This makes possible good SSB reception with considerable rejection of the unwanted sideband when the BFO signal is injected at either the upper or lower edge of the i.f. amplifier passband.

It is necessary only to install an SPST switch to add a 30-mmf capacitor across the BFO tuned circuit to change the frequency of the BFO so that it will provide the proper exalted carrier signal for reception of either upper or lower sideband signals. This addition, shown in the schematic diagram, Fig. 3, also includes increasing the plate voltage on the 12AT7 BFO tube by about 50 volts. This greatly increases the BFO injection for improved operation of the detector on SSB signals.

With the SPST switch open, adjust Cm in the BFO and L12 so that upper sideband signals are properly received (BFO will be at upper edge of i.f. amplifier passband). Then, close the sidetube selector switch and tune in a signal transmitting lower sideband, which also should sound normal.

When a station transmitting, say, lower sideband is properly tuned in, and the station shifts to upper sideband, the SPST switch should then be opened, and the BC-453 receiver dial be tuned 3 kilocycles higher in frequency to properly receive the upper sideband. A bit of practice in changing sidebands will allow this to be made in a matter of seconds.

The combination of the amateur band converter and BC-453 receiver modified as described herein is capable of providing excellent amateur radio mobile reception.

---

**FIG. 2. FAST-ACTING AVC and 5-meter circuit for the BC-453 receiver.** Area inside dashed line at lower left corner of diagram shows points in the BC-453 circuit from which the i.f. signal is taken at pin 4 of the 12SK7 first i.f. amplifier, and connection to the lower end of L1, into which AVC voltages from the AVC circuit is fed into the BC-453.

**FIG. 3. SIDEBAND SELECTOR switch is added to BFO in BC-453 by adding a 30-mmf capacitor across BFO coil to shift BFO frequency. Locate switch and capacitor as close as possible to BFO tube to prevent radiation of signal from wiring.**

11
NOMINATIONS for the 1960 Edison Radio Amateur Award are now open. All radio amateurs and others who know of a worthy public service which has been performed during 1960 by a duly licensed radio amateur while pursuing his hobby within the limits of the United States, are urged to nominate that person. Simply state the candidate's name, call letters, full address, and a description of the service performed, in a letter to the Edison Award Council, General Electric Company, Electronic Components Division, Owensboro, Kentucky.

Full details of the Edison Award are given in the full-page announcement (at right) which appears in the October issues of amateur radio magazines. The award is sponsored annually by General Electric.

You will help increase the stature of all radio amateurs by naming a suitable candidate for the acclaim, distinctive Edison Award trophy, and $500 gift that the recipient is presented at a public ceremony in Washington, D.C.

Nominating letters must be postmarked not later than January 2, 1961. Compile the public service record during 1960 of your candidate now and mail it before the deadline approaches!