

EXECUTIVE MODEL 750-H & 750-HB
BLOCK DIAGRAM

SECTION III

INSTALLATION

RMO 24-H

If the RMO unit is to be used in a mobile installation, fasten the RMO cover to the Mobile Mount as shown in Pictorial #1, then fasten to the bottom section of the dashboard in the vehicle.

The speaker case may be mounted separately with its own mobile mount in the same manner as the RMO or it may be mounted on the bottom of the RMO case. The four rubber feet on the bottom of the RMO case seat in the four holes in the top of the speaker case. The two cases are secured together on the sides with the small aluminum plates packed with the case mobile mounts. The plates are secured in place with the RMO case and Speaker case sheet metal screws.

If the unit is to be used in a base station installation, the RMO and Speaker case are fastened together as described above then the two rubber feet at the front on the bottom of the speaker case may be unscrewed about 3/8" to 1/2" to provide additional clearance for the bottom speaker grill.

The transceiver is usually placed in the trunk compartment of the vehicle.

After the units are mounted it will be necessary to connect the antenna transmission line to the antenna connector on the transceiver.

For 115 VAC operation wire the 18 contact power cable for 115 VAC operation. Interconnect the RMO unit and the transceiver with the multi-conductor cable having a 15 contact connector on each end. One end of this cable connects to SO-2 on the front of the trunk unit and the other end to PL-4 on the back panel of the RMO unit. Wire the jumper plug for 115 VAC operation and insert in socket SO-3 on the RMO back panel. Connect wires from speaker case into green speaker terminals on RMO back panel.

For use on 6 or 12 volt D.C. the 18 contact power cable is wired for the desired operation and jumper plug wired for D.C. operation.

The 18 contact power plug is connected to the connector on the back of the trunk unit and the #12 black wire from this plug is connected to ground.

The jumper plug is inserted in socket SO-3 on RMO back panel. The #14 black wire from the jumper plug is connected to hot D.C. and the units interconnected as previously described.

Due to the size of the power cable, the easiest way to route this cable from the front seat area to the trunk compartment is from the RMO unit to the firewall, down the firewall to the left side of the drive line hump under the floor mat along the edge next to door sill and into the trunk compartment.

RMO 24-HB

The Executive Model 750-HB is designed primarily for base station operation on 115VAC. The interconnection between the RMO and main unit is accomplished in the same manner as the Model 750-H except as follows:

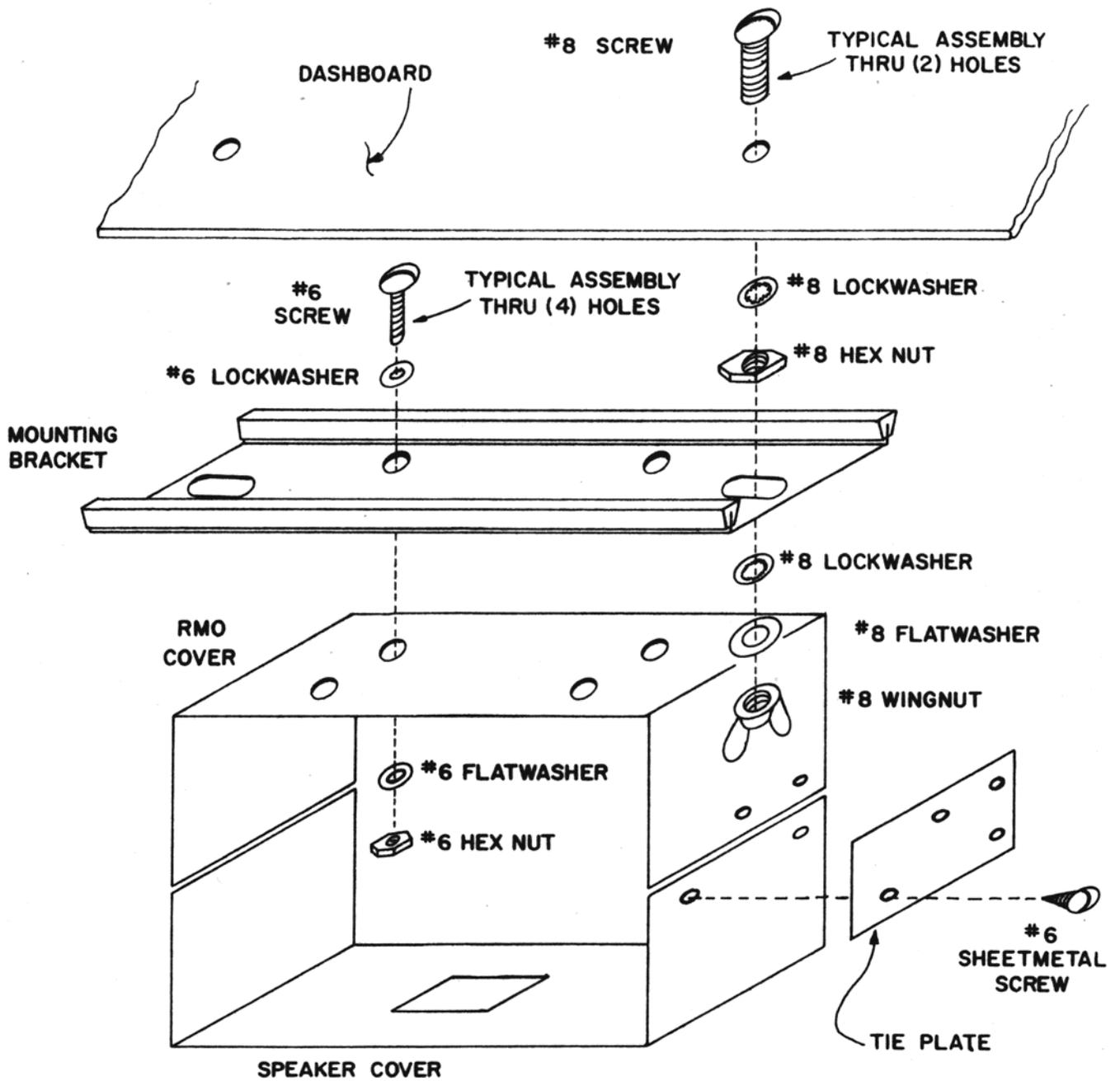
1. No interconnection between the RMO and speaker is necessary as the speaker is contained in the RMO console.
2. Connection between the blue connector on the back of the RMO and PL-10 on the main unit must be made for proper operation of the 'S' meter circuit. An interconnecting wire extends from the cable for this purpose.

The Executive Model 750-HB may also be operated from either 6 or 12VDC in the same manner as the Model 750-H.

After the unit is installed and all interconnections are made, turn unit on, switch channel selector to desired channel and set RMO volume control half open. Set volume control on Executive for desired listening level. Peak the antenna coil on the converter board for best signal to noise ratio. This completes installation of RMO unit.

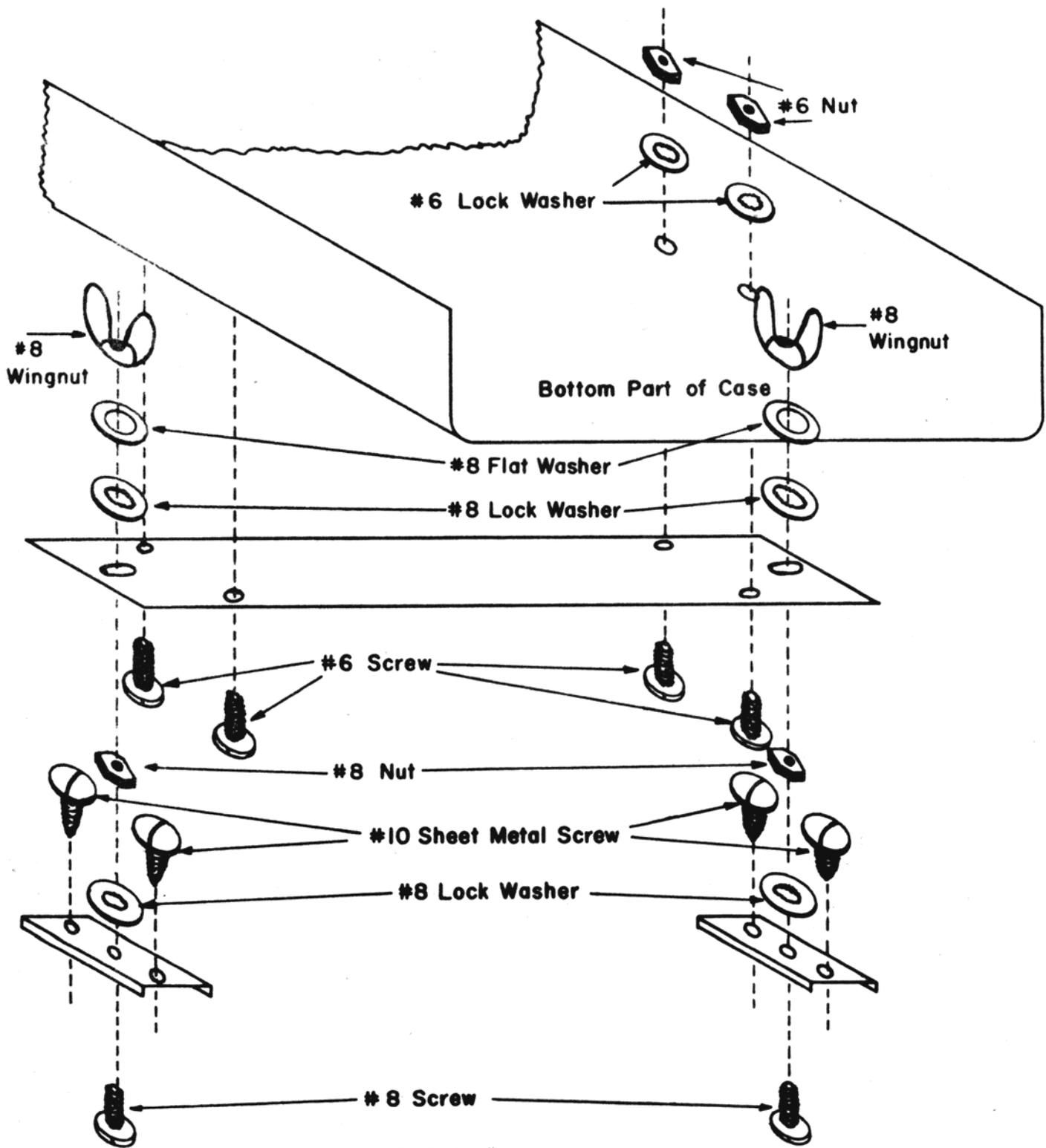
SHORT FORM OPERATING CHART

FUNCTION	CONTROL OR CONNECTOR
Connect antenna	ANT connector on transceiver rear panel
Connect power cord of desired voltage	POWER connector on transceiver rear panel
Connect 15 pin cable	Between RMO and transceiver
Install jumper plug	Between RMO jumper plug and hot DC voltage or use AC jumper plug for AC operation
Connect speaker (750-H only)	To green terminal bushing on RMO back panel
Connect 'S' meter (750-HB)	Between blue terminal bushing PL-7 on RMO back panel and PL-10 on main unit front panel
Turn squelch off	SQUELCH on RMO front panel
Turn set power on and set volume level	VOLUME on RMO front panel
Connect microphone	MIC connector on RMO front panel
Set HI-LO switch to desired range	HI-LO on RMO front panel (LO- 1 thru 12) (HI- 13 thru 23)
Transmit by pushing button on microphone	Push-to-talk button on microphone



PICTORIAL #1

EXECUTIVE MODEL 750-H



PICTORIAL #2

EXECUTIVE MODEL 750-H & 750-HB TRUNK MOUNT

ANTENNAE AND THEIR SELECTION

The most common antennae for citizen use are the Ground Plane and Coaxial for base use and the Vertical Whip for mobile use. The Yagi multi-element beam antenna can be used to great advantage where point-to-point communication is required rather than non-directional coverage from the base station. Any antenna with a directional gain will effectively increase the radiated power of the transmitter as well as the received signal applied to the receiver.

It is best to purchase a good commercially built antenna rather than attempt to construct your own. Good commercial antennae have low SWR (standing wave ratio) which is a merit of the radiation efficiency. With home constructed antennae it is sometimes difficult to effect a good match between the antenna and the transmitter causing considerable power to be lost in the system. An antenna should have an SWR of no more than 2:1.

Some power will be lost in the transmission line and therefore long runs should use the larger RG-8U cable. This cable has a lower loss per foot than the smaller RG-58/U. Both types have a characteristic impedance of 53 ohms. Loss per 100 feet at 27 megacycles is 1 db for RG-8/U and 2 db for RG-58/U. For short runs the RG-58/U cable is more easily handled.

Most of the antennae are available in two grades. The lower priced standard grade will not be as mechanically strong as the commercial grade. Electrically both grades are usually about equal. Where ice loads, wind, and salt air are a factor it will be cheaper in the long run to purchase the better antenna.

For extremely short range communication (less than a mile) the base loaded case whip antenna works very well. With two units using case whips, the signals will become quite weak after a block or two and poor squelch operation will be encountered. The outside antenna is by far the best choice and should be mounted as high as practical and still be within F.C.C. regulations. [Paragraph 95.25(c)]. In brief, the F.C.C. limits antenna height to no more than 20 feet above an existing structure or not to extend above the top of the radiating element on an existing tower. Remember the Yagi type antenna is usually mounted in a horizontal position. This type antenna must be used with another antenna mounted in the same plane. If the Yagi is to be used to communicate with mobile units using a whip antenna, the Yagi should be mounted in a vertical plane. A little thought in antenna installation will greatly improve your coverage.

DISTANCE vs ANTENNA

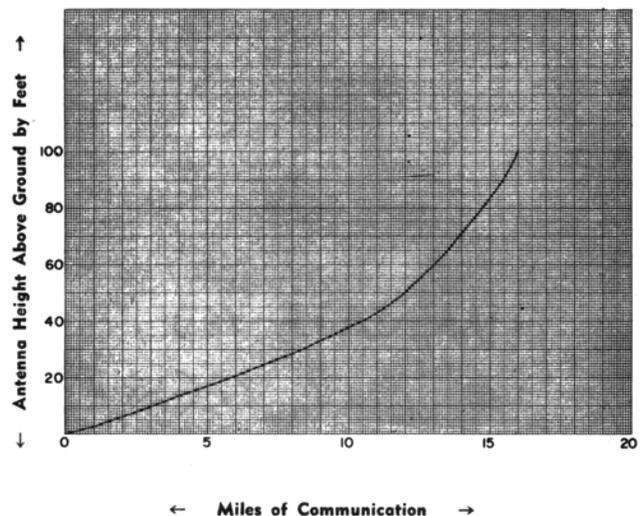
The direct coverage you are able to obtain using Citizen Equipment in the 27 megacycle band will depend a great deal upon the antenna. We shall speak of direct coverage rather than skywave coverage wherein you may communicate 500 to 2000 miles at various times.

The F.C.C. has intended the Citizen use to be for short range communication and all installations should be calculated on this basis. The following charts consider

a base station antenna mounted on a mast with the calculated range to a mobile unit using a standard 108" whip. Remember that the antenna may be mounted on an existing structure or mast [reference F.C.C. 95.24(c)].

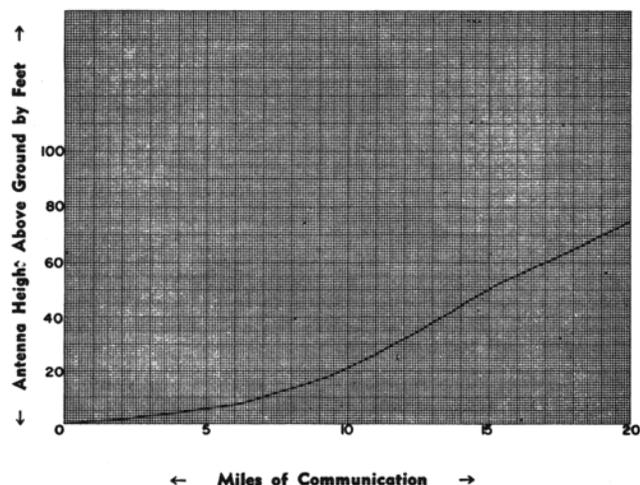
Ground Plane or Coax Antenna For 2 Microvolts at Receiver

Chart #1

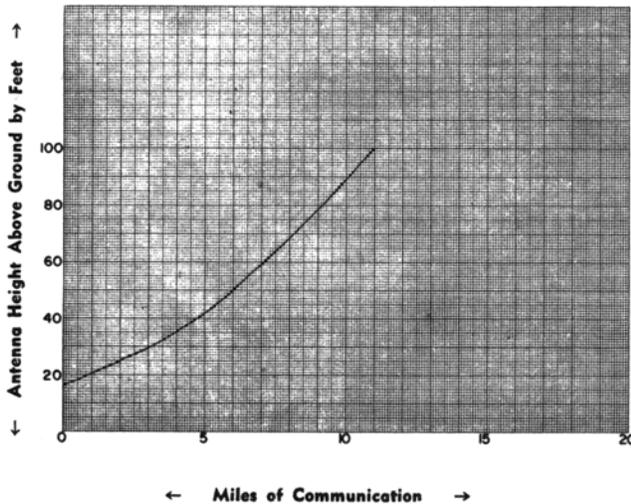


Yagi Antenna Mounted Vertical For 2 Microvolts at Receiver

Chart #2



Ground Plane or Coax Antenna For 15 Microvolts at Receiver
Chart #3



Note how the distance increases with increase height of the antenna for a given installation as in Chart 1. If a direction antenna is used as in Chart 2 you can see how the distance is further increased, however, this reduces the area covered since the Yagi Antenna is quite directional.

Charts 1 and 2 are based on a 2 microvolt signal at the receiver. This signal will not be sufficient for many city areas where high levels of noise exist. Chart 3 considers the coverage for 15 microvolts at the receiver and is more practical for general city use.

When the Citizen frequencies are open to skywave transmission, signals from distant stations will be strong enough to over power weak direct signals. When one is considering communication he should understand that for 100% contact he should base the calculations on 15 microvolts or more.

In mobile communication dead spots will be found at various points as well as locations giving excellent signals. These points should be noted and contacts made from the best possible locations. Vehicle noise and electrical interference will greatly reduce your communicating distance.

ELIMINATE YOUR MOBILE "NOISE GENERATORS"

Now that low cost TWO-WAY radio communication is available to everyone with the opening of the eleven meter band for Citizen use the number of mobile installations will probably exceed the number of base, or control, stations by a factor of 5 to 1 within the near future. It is estimated there are now over 160,000 citizen band mobile installations and approximately 45,000 base, or control, stations in operation. Proper installation and necessary steps towards the elimination of electrical, and mechanical, interference inherent in all motor vehicles is of prime importance if distances of three miles or more are desired to be covered.

For short range coverage the simple installation of a "radio condenser" on the generator and the "interference suppressor" installed in the top of the distributor, or coil, is usually sufficient noise suppression. But when maximum distances of three or more miles must be covered, great pains must be taken and all known means of noise suppression must be used. Different makes and models of vehicles will require different means of noise suppression. Some models only the very simple, others will need the "all out" method.

As there are numerous "generators" of radio interference in every motor vehicle the elimination of one source may not be noticeable as it's noise level may be below one you have not located so the proper way to approach your "noise" problem is by a systematic process of first suppressing all known offenders, namely the generator, voltage regulator, distributor and spark plugs.

We will explain throughout this article what is considered to be the proper vehicle noise suppression methods. The volume of noise you can, or will, tolerate in your receiver will depend upon the amount of suppression applied. Few installations will require the "all out" method and the user must decide when he is satisfied.

The purpose for eliminating your own "noise generators" is the fact that your receiver's automatic volume control (AVC) will react to these random noise pulses as it is the same as though a strong station was tuned-in and will cut the receiver's sensitivity way down which will eliminate the weak stations you normally wish to copy. There's an old saying "if you can't hear them, you can't work them."

Let's start our "noise elimination" with the generator and voltage regulator. The generator is the item that causes the whine as the speed of the motor is increased. It is very easily detected by speeding up the engine and then cutting the ignition off. The instant the switch is turned off ONLY the generator and voltage regulator can cause the noise as all other "noise generators" are eliminated when the switch is off EXCEPT the generator as it is still in operation and is still trying to charge the battery through the voltage regulator. Even though it will operate only a few seconds after the switch is off this is time enough for you to hear the terrific amount of noise it is generating. As the speed of the engine decreases the whine will decrease in unison.

Practically all vehicle manufacturers cable the two leads from the voltage regulator to the generator in a harness with other wires. It is recommended that both of these wires be run in **separate** tinned copper braid. Just disconnect the present wires from the generator and the other end of them at the voltage regulator's "A" and "F" terminals. They can be cut-off where they enter the harness or just taped down out of the way.

A Sprague 48P18 coaxial capacitor, or a similar .5 mfd coaxial capacitor, should be installed directly ON the generator and the lead from the condenser to the battery armature terminal of the generator must be as short as possible. In fact a length of one inch is sometimes too long. A .001 mfd mica capacitor should now be installed from the same battery terminal to the frame of the generator, here again lead length is extremely important and they should be no longer than one-quarter inch. Be sure to remove paint and grease on the generator where the capacitor is bolted as a "good" ground at this point is necessary.

Dress the cable from the coaxial capacitor on the generator against the body of the car. Use speed clips to keep in place or run through presently installed cable clamps. This cable is usually the longest "noise generator" we must suppress and it is preferred to shield this wire in tinned copper braid. The end of the braid must be soldered directly to the coaxial capacitor's body. Be sure to use size #12 copper stranded wire when making-up this new lead. Connect a new cable to the generators' "F" (field) terminal and run this lead in a tinned copper braid shield and dress it along side the battery lead. This new lead may be of size #16 copper stranded wire.

The voltage regulator is next and the "job" from here on is usually easy compared to the one just completed. Remove the cover from the voltage regulator and clean off any paint that may insulate the cover from the frame. Check the mounting screws and be sure the regulator is being grounded directly to the firewall. If necessary remove and clean away any paint so you may secure a "perfect" ground connection.

Use two 48P3 or 48P5 Sprague coaxial capacitors or similar .1 to .5 mfd coaxial capacitors and install at the "A" and "B" terminals of the regulator. The capacitors metal body must be grounded directly to the firewall. This can be easily accomplished by using a piece of cadmium plated metal about 4" x 4" bent to a 90° angle. Drill two holes for the capacitors and two holes to pass sheet metal screws to bolt to the firewall. Attach the capacitors to the angle with screws and nuts and **also** solder. Locate the assembly so the lead from each capacitor to the "A" and "B" regulator terminals are extremely short. Be sure to clean the paint from the firewall so the bracket will make a good solid ground connection. Attach the cable from the generator's "F" terminal to the voltage regulator's "F" terminal. Connect a .002 mfd capacitor and a 4 ohm resistor, in series, from this point to ground. Again, lead length is important and the overall length of the capacitor-resistor combination must be as short as possible. Attach the lead from the generator's armature terminal to the coaxial capacitor connected to the voltage regulator's "A" terminal. The shielding braid on these leads must be grounded to the capacitor bracket or to the firewall by soldering or with the use of washers and sheet metal screws. Attach the "B" battery lead to the coaxial capacitor connected to the "B" terminal of the voltage regulator. This is the lead coming through the firewall and usually goes direct to the battery charging indicator on the vehicles dash panel.

The next superb "noise generators" of them all are the spark plugs. But here we have available to us years of research for only a few dollars. Just go to your local auto supply store and purchase a complete set of AUTO-LITE RESISTOR spark plugs that are direct replacements for your particular brand and model of vehicle. CAUTION: We own no stock in Auto-Lite, but please accept no "substitute" as some resistor plugs will actually increase your noise problem. Be patient, if your dealer does not stock your size just ask him to get them for you. When installing the new plugs be sure to have the gap properly set.

After **properly** installing the "recommended" suppression to these trouble makers you should be able to drive comfortably and communicate with stations you never heard before with your engine running. However, in most cases this is only the beginning of the job in order for you to say that you have a good mobile installation.

If you have been checking your "noise elimination" progress as you complete each step we know you will be extremely pleased with your work. But from here on each suppression job will not be very noticeable until you hit the one big joker that's causing a lot of trouble. The little "noise generators" will be obscured by this one and wouldn't have showed up until it was eliminated. All-in-all the little ones can really add up and must be taken care of in due time.

Have your distributor checked to see that the capacitor across the breaker points has the proper capacitance and the points are properly set. If the vehicle has been driven 30,000 to 40,000 miles or more it is recommended that the distributor cap and rotor be replaced. This will usually not only reduce the ignition noise, but also improve the overall performance of the engine. At the same time have the timing checked and properly adjusted.

When purchasing your new AUTO-LITE resistor spark plugs also buy enough 4,000 ohm-per-foot ignition cable to make up a new wiring harness from the distributor to the spark plugs. Be sure that the new terminals (ferrules) are installed whereby they make **good** contact with the center conductor of the new cable. It is preferred that the ferrules be soldered rather than crimped on as there is danger of a poor contact causing another "noise generator" to appear.

Check your ignition wiring by shorting out each plug, in turn, while listening to the receiver. Any reduction in the noise level will usually indicate that the ferrules are not making good contact in the distributor head, or the ferrule and center conductor should be soldered.

Install a 10,000 ohm carbon suppressor in the distributor's center terminal and make up a new lead to run to the coil. Here again be sure the ferrules are soldered and are making a "tight" connection inside the coil and distributor. A new lead is recommended here as any breaks what-so-ever in the ignition system's wiring insulation could be a source of "ignition noise." With very short leads connect a .001 mfd disc ceramic capacitor from the coil's battery terminal to the coil's case.

Bonding braid should now be run from the fire wall, coil, and the distributor to the engine. Use as short a piece of braid as possible in each case. If the ground lead of the battery is attached to the fire wall it should be removed and attached to the starter mounting bolt. The power cable ground lead for your transceiver should also be connected at this same point. Usually the hot and ground leads from the battery go direct to the starter's

solenoid which is mounted on the starter and this is a good place to connect the transceiver's power cable. CAUTION: Remove the hot cable from the battery before making connections to the starter as there is danger of the hot battery cable getting loose and shorting out the battery or even starting a fire.

Connect a short piece of bonding braid across each engine hood hinge. NOTE: The hood will act as a shield to help keep the engine noise inside the engine compartment and away from your antenna. Next connect a short length of bonding braid across each trunk lid hinge, front of the engine to the frame, exhaust tail pipes to the frame, and a piece of wire braid from the air cleaner to the fire wall. It is very important that we caution you to be sure that you clean away all paint, grease or insulation material when installing the grounding braid as **good**, low resistance, ground connections must be made.

Noisy tires should be treated with an anti-static powder, brake shoes grounded to the backup plates with bonding braid and static collectors installed inside the front wheel grease retainer cups. Heat and oil indicator sending units on the engine must be by-passed with .1 to .5 mfd capacitors, again using very short leads. All instrument panel gauges and accessories should be by-passed using .5 mfd capacitors. Heater and defroster motors, electric windshield wiper motors and any other accessory motors by-passed with a .25 to .5 mfd capacitor. The gasoline sending unit mounted on the gasoline tank must be by-passed with a .1 to .5 mfd capacitor. An inspection plate is usually provided in the trunk compartment over the tank.

For the person who desires the "ultimate" in mobile "noise elimination" there are available for some vehicles marine and aviation spark plugs that could be used and the complete ignition system shielded by using these plugs and making metal boxes to enclose the distributor and coil, and shielding all wiring associated with the ignition system. By having the ignition system **completely** shielded most

of the "suppression" can be eliminated and the normal high engine performance will be maintained.

You should set aside a week-end for your "noise elimination" project and have all necessary parts and tools available. You may visit your local two-way radio communications company and secure most of the parts required in kits furnished by some manufacturers of two-way radios. The other parts required are available from radio parts supply and auto parts supply firms.

Lay out your line-of-attack and as each "noise generator" is suppressed it should be noted and checked by listening to the receiver or noting the receiver's "S" meter indication before and after the suppression. This indicates the noise level entering the receiver that is being picked-up by the antenna. To check the noise level entering the receiver by the antenna connecting cable disconnect the cable where it connects to the antenna and short the cable's terminals. If noise is still noticeable it will be necessary to re-route the cable under the vehicle and up through the fire wall to the transceiver. Check the noise level entering the receiver through the power cable by disconnecting the antenna connecting cable at the receiver. All noticeable noise in the receiver is now being picked-up by the power cable and fed to the receiver. This can usually be eliminated by installing a Sprague 48P3 feed-thru coaxial capacitor on the fire wall and the hot battery lead from the transceiver connected through the capacitor to the battery terminal.

We sincerely hope that we have been of some help to you and assure you that when you finish your "noise elimination" project you will consider yourself an "**expert**." But just as a parting reminder, remember that all of those cars along side of you, up front, behind and the ones passing have not been through the "elimination" process and it will be up to your receiver's built-in noise limiter to cut **their** noises down to a listening level that is bearable.

SECTION IV

ACCESSORIES

RMO-24HB

This remote control unit complete with table top mount and interconnecting cables may be purchased as a separate unit for use in connection with any International model 750-H trunk unit. This allows the user to convert his mobile installation to a base station by simply disconnecting and removing the trunk unit and making necessary interconnections (ant. & power) with the RMO-24 HB at the base station location. Stock No. 150-271 \$179.50

ANTENNAS

Without an efficient antenna, operation of your Executive is not as enjoyable as can be experienced with a well designed antenna system. INTERNATIONAL has available antennas for almost any installation. Base Station end fed vertical antenna,

Stock No. 160-116 price \$28.43

Roof Top Mobile Antenna, Stock No. 160-119 price \$15.68

POWER PLUGS

For our customers who have only one unit and wish to use it in several different locations, INTERNATIONAL offers five different power plugs which will allow the Executive unit to be used anywhere.

6 VDC	plug	-gnd	Part No. 150-259	Price ea.	\$7.50
6 VDC	plug	+gnd	Part No. 150-260	Price ea.	\$7.50
12 VDC	plug	-gnd	Part No. 150-261	Price ea.	\$7.50
12 VDC	plug	+gnd	Part No. 150-262	Price ea.	\$7.50
115 VAC	plug		Part No. 150-174	Price ea.	\$7.50
AC or DC	plug kit		Part No. 150-257	Price ea.	\$3.95
AC	jumper plug		Part No. 150-267	Price ea.	\$3.50
DC	jumper plug		Part No. 150-268	Price ea.	\$3.50

'S' METER KIT

Designed for installation in the speaker grill opening of the Executive Model 750-H transceiver, this accessory allows the operator to visually monitor the relative signal strength of received signals.

Stock No. 150-263

Price ea. \$19.95

SECTION V

SERVICE AND MAINTENANCE

GENERAL

As is the case with all types of electronic equipment, the EXECUTIVE should be checked periodically by a qualified technician to insure optimum performance at all times and to correct any condition which might later result in equipment failure due to improper adjustment, tube aging or component failure. Since the EXECUTIVE series receiver differs somewhat in its design from conventional Citizen Band radio sets, no attempt should be made to service this equipment until the technician has become completely familiar with the basic circuitry and has a thorough understanding of the characteristics of dual conversion equipment.

In general, maintenance can be simplified by seeking a definite symptom of a fault and establishing, by reference to the block and schematic diagrams, a condition or series of conditions which might cause the symptom. This will usually help to localize the source of trouble and eliminate those sections of the equipment which are operating properly.

Many technicians tend to overlook the very simple and more obvious sources of trouble in their service work. This may be brought about by a nontechnical operator's description of a particular fault. For example, a Citizen Band operator's complaint of intermittent operation may immediately suggest relay trouble or any number of things to a technician. Yet, upon checking further, the trouble may actually be caused by a defective antenna connector or loose microphone plug or some other condition completely external to the set. For this reason, always quickly check the entire installation for potential trouble before actually removing the set for maintenance work.

DISASSEMBLY OF THE CABINET

Trunk unit- The front and rear panels of the unit are bolted to the chassis. The cabinet is of wrap-around construction divided into two pieces. The perforated top section may be removed for easy access to all tubes without removing the bottom section. Remove the six (three on each side) large sheet metal screws and fibre washers and lift off the top section. To remove the bottom section remove the four sheet metal screws located inside the rubber feet and two additional sheet metal screws one at the back and one at the front on the bottom of the unit.

To re-assemble, simply reverse the procedure outlined above.

RMO-24H

The top cover is secured in place by three sheet metal screws on each side of the case. Remove the sheet metal screws, spring the top cover sides outward and lift off. To re-assemble, simply reverse the procedure.

RMO-24HB

This case is of two piece construction. The main case is secured to the back panel by two snap fasteners on each side of the case. Remove fasteners, swivel bolts and slip unit out of case from the back side.

TEST EQUIPMENT

A properly equipped Citizen Band service shop will probably have most of the basic test equipment for servicing the INTERNATIONAL EQUIPMENT.

Because of the much closer frequency tolerances used on Citizen Band radio equipment, greater precision is required of all alignment generators and frequency measuring equipment. A good stable HF signal generator will be most helpful when alignment of the receiver is necessary. Hewlett-Packard type 606-A signal generator is a good example of the type and quality of instrument which has the inherent stability and accuracy that is desirable for servicing Citizen Band radio equipment. An accuracy calibrated attenuator with an auxiliary pad to reduce the generator output to 0.25 microvolts or less is very desirable for absolute receiver sensitivity measurements.

For receiver audio recovery measurements, the Heath Model AV-3 Audio Vacuum Tube Voltmeter will provide the necessary accuracy required in this test.

For frequency measurement and modulation percentage checks, the INTERNATIONAL Model C-12B Frequency meter is highly recommended. This versatile instrument specifically designed for use on the Citizen Band Channels, allows the technician to make accurate frequency and modulation checks with the minimum of set up time. The instrument can also be used as an accurate frequency standard for calibration of other equipment on Citizen Band channels.

An adequate source of well filtered low-voltage DC which can be varied over a minimum range of 5 to 15 volts with ample current capacity for good regulation is extremely desirable for service work. Although several automobile batteries can be used with taps at each cell to provide a crude range of adjustment, the upkeep and long range maintenance cost will invariably prove to be more costly than a good battery type of DC supply. One unit of this type is the Heath Model BE-5. Regulation and filtering are adequate for use directly without the need for batteries.

NOTE: Detailed information and prices on the instruments mentioned above may be obtained by contacting the appropriate manufacturer at the address listed below:

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif.
Bird Electronic Corp., 1800 E. 38th St., Cleveland 14, Ohio
International Crystal Manufacturing Co., Inc., 18 N. Lee
Oklahoma City 2, Oklahoma
Heath Company, Benton Harbor, Michigan

PREVENTATIVE MAINTENANCE

Wherever possible, a routine program of preventive maintenance should be set up on all INTERNATIONAL Executive radio installations in order to insure maximum equipment utilization with the least number of interruptions for service work. The following list has been prepared as a guide to indicate items which should be included in a preventive maintenance program. Unusual environmental or installation conditions may make it necessary to expand or alter this list to meet individual requirements in the field.

GENERAL

Check all plugs, connectors, tubes, and fasteners for proper seating. Where equipment is subjected to extremely dusty conditions, occasionally remove the set from its case and dust with a clean, dry brush or with a clean, DRY source of compressed air. Clean the relay contacts only by drawing a small strip of ordinary bond letter paper between the contacts while holding gentle pressure on the relay armature. Do not use a file, sandpaper or any abrassive on relay contacts. The contacts are gold-plated and need only occasional cleaning to remove dust or foreign material. Vacuum or brush out any dust in the case before reinstalling the set.

MOBILE INSTALLATIONS

Check the battery connections. These must be clean and tight at all times. Check the battery at frequent intervals for condition and electrolyte level. Add water, as required, to keep the electrolyte at the proper level.

Inspect the power cable for evidence of physical damage. Check the microphone plug, cable and hanger bracket. Check all plugs and connectors for proper seating and security. Inspect the antenna system carefully. Remove the antenna plug from the set and check for continuity between the center contact of the plug and the actual antenna rod with a low range ohmmeter. Straighten or replace any bent or damaged antenna rods.

Check the voltage regulator for proper operation with the engine running. Adjust the regulator, if necessary, to prevent a voltage in excess of 7.5 volts on 6 volt systems or 14.5 volts on 12 volt systems when the generator is operating at its maximum output.

Inspect the distributor and spark plug wiring. Be sure all terminals are clean, bright and fit securely.

BASE STATION INSTALLATIONS

Check the primary line voltage to make certain it is within its normal limits. If the line voltage is subject to very large fluctuations, install a constant voltage transformer of appropriate capacity.

Inspect the microphone plug, cable and hanger bracket for evidence of excessive wear or damage. Check the antenna system, including the mast or tower, guy wires and coaxial cable. Be sure to inspect the ground wire for the mast or tower. All connections at the tower and ground rod should be clean and tight.

MINIMUM PERFORMANCE

The following routine measurements should be made at periodic intervals. If within the range indicated below, the set can be considered in good operating condition.

1. Check the receiver as follows with no signal input. This can be measured with a VTVM and audio output meter. The Volume control should be wide open, Squelch control OFF, Channel Selector set at Channel 9. The AVC voltage at terminal #30 on the IF unit should be from $-.1$ to $-.3$ and Audio Output across speaker terminals $.5$ VAC or less. Typical meter readings with a 1 uv 400cps 30% modulated signal are $-.9$ or more volts AVC and 1.75 volts AC or better on the audio output meter.
2. Check the transmitter power output with an RF wattmeter. Rated output at standard input voltages of 6.8 , 13.6 and 115 volts should be measured. (Normal 2 to 2.5 watts)
3. If a reflected power meter is available, check the reflected power when transmitting. The reflected power ratio should be 1.5 to 1 or better if the antenna, coax and transmitter are properly matched.
4. Check transmitter output frequency. Frequency should be $.005\%$ or better.

TROUBLE LOCALIZATION

To correct any trouble which may occur in the equipment, first try to isolate the section of the set which causes the trouble. In many instances a good visual inspection of the set will clearly indicate where the defective component is located. Reference to the block diagram of circuit functions and the schematic diagrams on the various sections of the receiver, transmitter and power supply, together with the following list of typical symptoms with probable sources of faults will be helpful in servicing the equipment.

When tubes are indicated as being the cause of the trouble, substitute a new tube of the same type for the one suspected of failure. If no improvement is noted, the original may be reinstalled. It should be noted that where tubes are referred to as trouble possibilities, the circuit components immediately associated with that particular tube may also be the source of trouble.

In trouble shooting the equipment, first check the power supply on 6 and 12 volts DC and 115 volts AC. If trouble is not in the power supply, all further checks can be made on 115 volts AC.

Connect a 115 volt power cord to the unit and remove the antenna and connect a dummy load. The dummy load can be made by connecting a #47 pilot lamp across a spare antenna plug and plugging this into the antenna jack of the unit.

VOLTAGE MEASUREMENTS

The voltages measured at pertinent tube socket pins as well as power pin terminals are shown in the table just preceding the sectional schematic diagrams at the back of this manual.

The receiving condition voltages are preceded by the letter 'R'. Transmitting condition voltages are preceded by the letter 'T'. The filament voltages are not marked AC or DC, as this will depend on whether or not the unit is being operated on the AC line or on battery input voltage.

All voltage readings were taken with unit operating from 115 volts AC. Voltages measured when using battery input voltage will differ somewhat from those shown for 115 volt operation.

POSSIBLE TROUBLE CHART

<u>COMPLAINT</u>	<u>POSSIBLE TROUBLE</u>	<u>REMEDY</u>
<u>POWER SUPPLY</u>		
No B+ voltage (AC or DC)	fuse, switch, rectifiers	replace defective parts
No B+ voltage (DC)	fuse, transistors, Q1 & Q2 bad connection on power cable defective transistor transformer 512-118A resistors R66 & R67	replace defective parts repair cable replace defective parts replace defective parts replace defective parts
B+ Low (DC)	battery output low loss in power cable defective transistors Q1 & Q2 resistors R66 & R67	charge battery correct defect in cable replace defective parts replace defective parts
B+ Low (AC or DC)	short in B+ line low resistance B+ line to ground defective rectifiers defective power transformer	remove short remove defective part replace defective parts replace defective parts
<u>TRANSMITTER SECTION</u>		
No RF output	defective V10, V11, V12, or V13 open L14 or RFC-9 open L9, L12, L17, L19 or RFC-6 open C91 open secondary winding of modulation transformer T-6 defective transmitter crystal Y-15 or Y16 poor relay contacts	replace tube/s replace coil/s replace coil/s replace capacitor replace transformer replace crystal/s clean contacts
Low RF output	L10, L12, L17 or L19 im- properly adjusted C89 & C90 improperly tuned weak V8 or V9	re-adjust coils as per recommended procedure re-adjust capacitors replace tube/s
No Modulation	defective V7, V8 or V9 defective modulation trans- former T-6 mike gain control on audio board improperly adjusted clipper control R51 im- properly adjusted	replace tube/s replace transformer re-adjust as per recom- mended procedure re-adjust as per recom- mended procedure
Low Modulation	check as per above Low Grid Drive to V11	check V10 & alignment of coils L10, L12, L17 & L19

COMPLAINT

POSSIBLE TROUBLE

REMEDY

RECEIVER SECTION

Dead (no sound)

defective V1, V2, V3, V4,
V5, V6, V7, V9
open audio filter choke L10
shorted capacitors C64 or C65
defective crystal Y-1 or Y-2
dirty relay contacts

replace tube/s
replace choke
replace capacitor/s
replace crystal/s
clean contacts

Low Volume

defective tube as listed above
receiver requires alignment

replace tube/s
align as required

TRANSMITTER ALIGNMENT

For proper alignment of the Executive model 750-H or 750-HB transmitter, it will be necessary to have the following test equipment.

- (a) RF Wattmeter-Bird Model 43 or equivalent
- (b) Frequency Meter with an accuracy of at least .0025% International Crystal Model C-12B
- (c) Vacuum Tube Voltmeter H.P. 410-B or RCA WV98-B or equivalent
- (d) Audio Oscillator H.P. 650-A or Heath AG-9 or equivalent
- (e) Oscilloscope H.P. 152 or Heath 10-30 or equivalent
- (f) Oscilloscope Converter International Mobilette
- (g) Oscilloscope Converter Attenuator International
- (h) 6 VDC battery for converter. Burgess F4P1 or equivalent

Since the Executive Models 750-H and 750-HB transceivers employ the frequency synthesis method of generating the transmitter output frequency, it is best to first make several preliminary tests to determine whether or not it is necessary to adjust the trimmer capacitors C107, C108 or C111. Normally these capacitors will not have to be adjusted and since such adjustments will require some rather precise frequency measuring, it is best that they be changed only as a last resort.

Using a C-12B Frequency Meter, check the frequency of each channel from 1 thru 23. If they check within ± 800 cps of the channel frequency, no adjustment of these capacitors will be necessary.

If the majority of the channels are out of tolerance, either too high or too low, it will be necessary to adjust capacitor C111 mounted on top of the crystal switch assembly in the RMO as follows:

1. Let us assume that in the initial frequency check we find all channels checking from 900 to 1500 cps high in frequency. This will result in out of tolerance operation on some channels and capacitor C111 should be adjusted to return the channel frequencies to within 800 cps of zero frequency.
2. Switch the CHANNEL selector dial to the channel that was the furthest off frequency.
3. Using a C-12B Frequency Meter as before, set the Frequency Meter to the same channel selected in step two above. Key the transmitter with the LOCAL-REMOTE switch and then key the C-12B. Carefully adjust trimmer C111 in a clockwise direction until the C-12B indicates the transmitter frequency to be within ± 800 cps of zero frequency.