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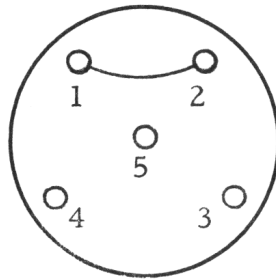
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ACCESSORY RECEPTACLE

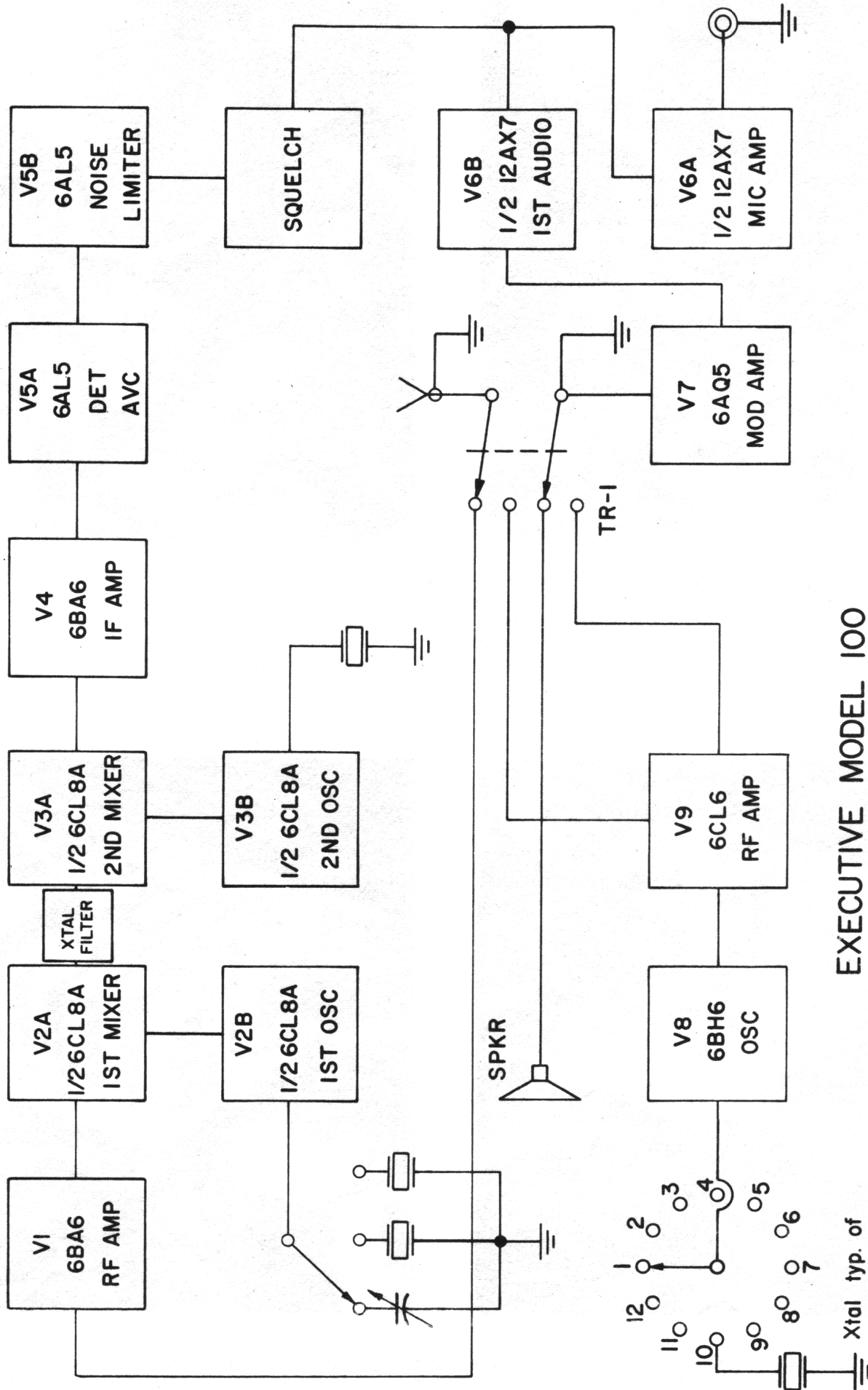
This connector, located on the rear panel of the unit, requires a five prong plug which is furnished with the unit. This plug contains a jumper for internal speaker operation and must be in place for the set to function. For external speaker (4 to 6 ohms) operation, remove the jumper and connect the external speaker between terminals 1 and 5 of the plug.

Also available at terminal #3 of this connector is the negative AVC voltage produced by the second detector of the I.F. unit. This voltage may be used to operate an "S" Meter provided the input impedance of the external meter is one megohm or more.

ACCESSORY PLUG WIRING

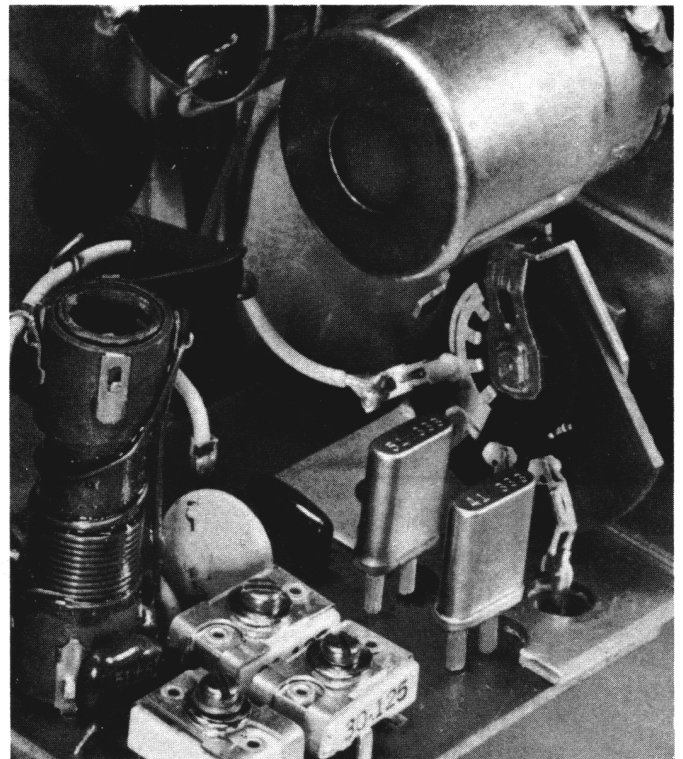
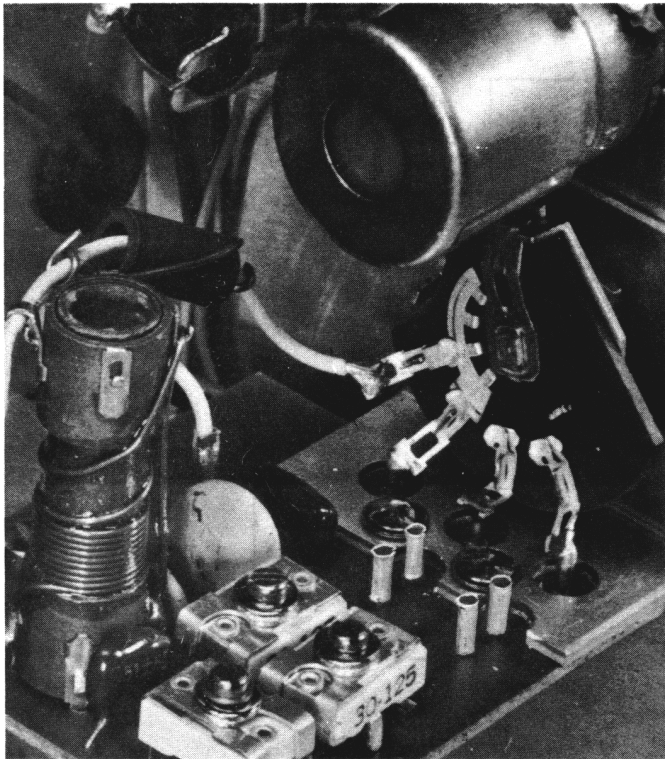


- 1 } Jumper
- 2 }
- 3 -AVC Voltage
- 4 12 VAC
- 5 Ground

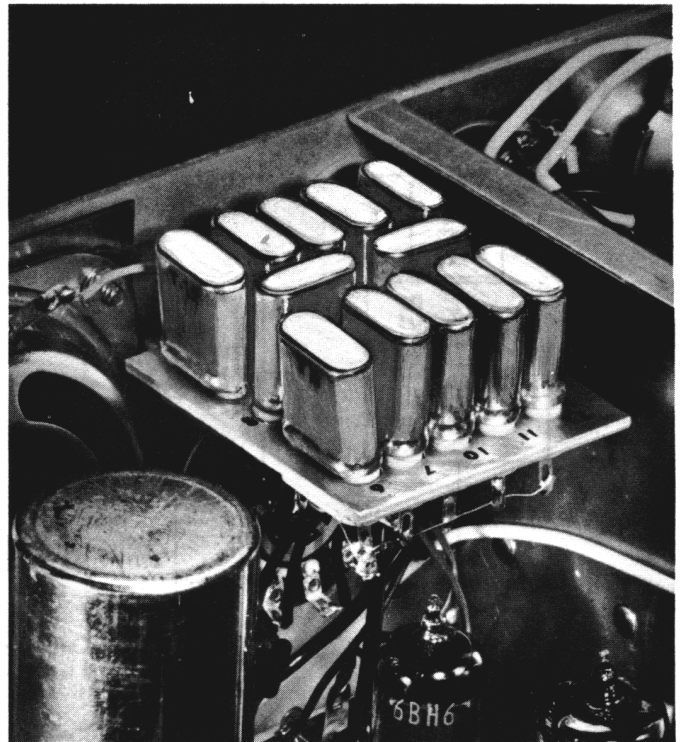
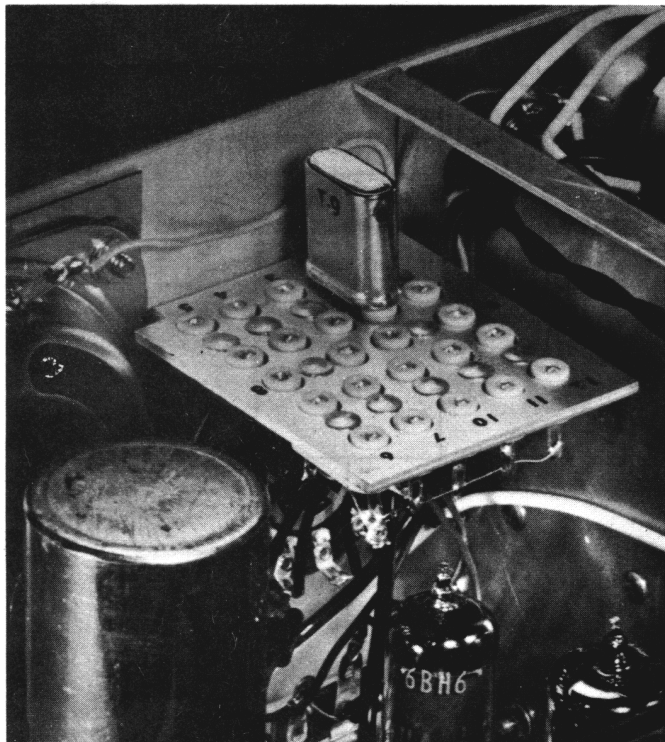


EXECUTIVE MODEL 100
BLOCK DIAGRAM

Xtal typ. of
all 12 positions.



RECEIVER OSCILLATOR. The EXECUTIVE is delivered without receiver oscillator crystals (left photo) and may be operated to tune all 23 channels of the citizens band with the RECEIVE SELECTOR switch in TUNE position. For fixed tuning in either one or two channels install International type "R" miniature crystals for specific channels (right photo). The two crystals from left to right are controlled by positions #2 and #3 respectively on the RECEIVE SELECTOR switch. Type "R" crystals are listed in Section IV of this manual.



TRANSMITTER OSCILLATOR. The EXECUTIVE is equipped with one channel 9 transmit crystal (left photo). Additional crystals may be installed to permit transmission on either one or more channels. From left to right, the twelve crystals are controlled by positions #1, #2, #3, etc. respectively on the TRANSMIT SELECTOR switch. Transmit crystals are listed in section IV of this manual.

SECTION III INSTALLATION

The actual placement of the EXECUTIVE unit makes very little difference, in its performance. In planning an installation the transceiver should be placed where it will save the most steps. For instance, if the unit is installed in a home to provide communications between the wife at home and her husband in the car, the basement would be a poor location. A more desirable location would be at or near the portion of the house where she spends most of her time, such as in the kitchen, den, or possibly the living room.

FIXED LOCATION INSTALLATION

Operation of the EXECUTIVE from any fixed location such as the home or office will always be best with an outside antenna. A full discussion of antenna selection is given at the end of this section.

MOBILE INSTALLATION

It is possible that the EXECUTIVE, when used in a car or other mobile application, may use a short, base loaded whip, mounted on the rear of the unit. It will not however, prove to be very satisfactory. For best results, a whip, mounted outside the vehicle is required. It may be mounted with a bumper mount on the rear bumper, or may be mounted on a rear fender or cowl, using a ball mount.

The EXECUTIVE itself should be mounted under the dash or in some other practical place in the vehicle. A special mobile mount, designed for the EXECUTIVE is available from INTERNATIONAL which allows the unit to be securely mounted to the car, yet be very easily and quickly removed. Information on this mount is given in the ACCESSORIES section of this manual. Various types of antenna mounts and microphones are also available from INTERNATIONAL.

Installations in cars, planes, boats or other locations near gasoline engines present special problems of their own due to noise created by spark plugs, distributor, voltage regulator and generator. A typical mobile installation is shown in Section IV. Measures which help reduce this noise are discussed at the end of this section.

VIBRATOR CARE IS IMPORTANT

With proper care, the vibrator used in the transceiver power supply for operation of the unit from 6 or 12 volts DC can be extended considerably.

When making a mobile installation the automobile voltage regulator must be adjusted for a maximum generator charging rate of 7.3 volts on 6 volt systems and 14.7 volts on 12 volt systems. Equipment installed in vehicles having the regulator out of adjustment where the generator charging voltage exceeds 7.5 VDC on 6 volt systems or 15 VDC on 12 volt systems shall be considered out-of-warranty.

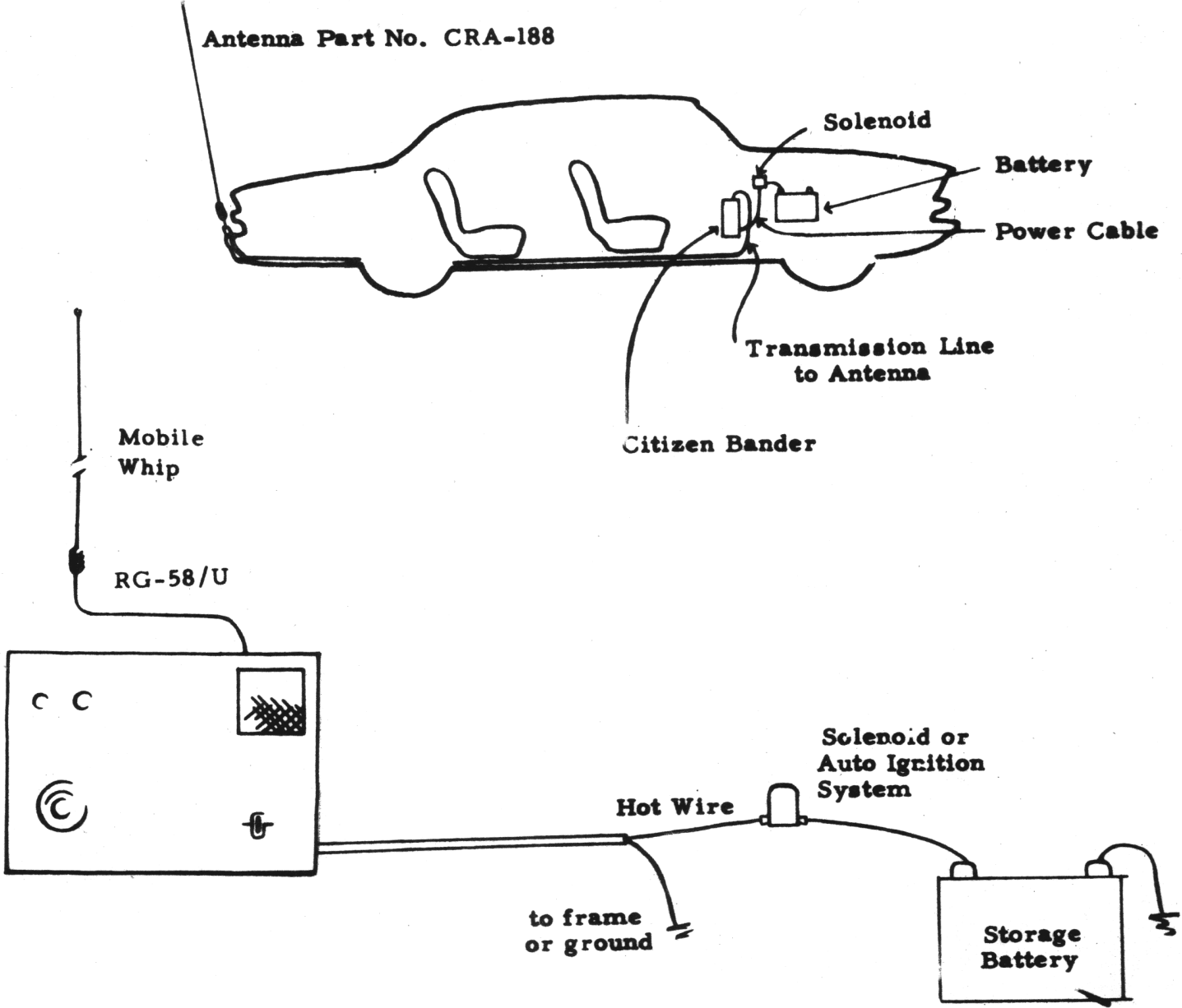
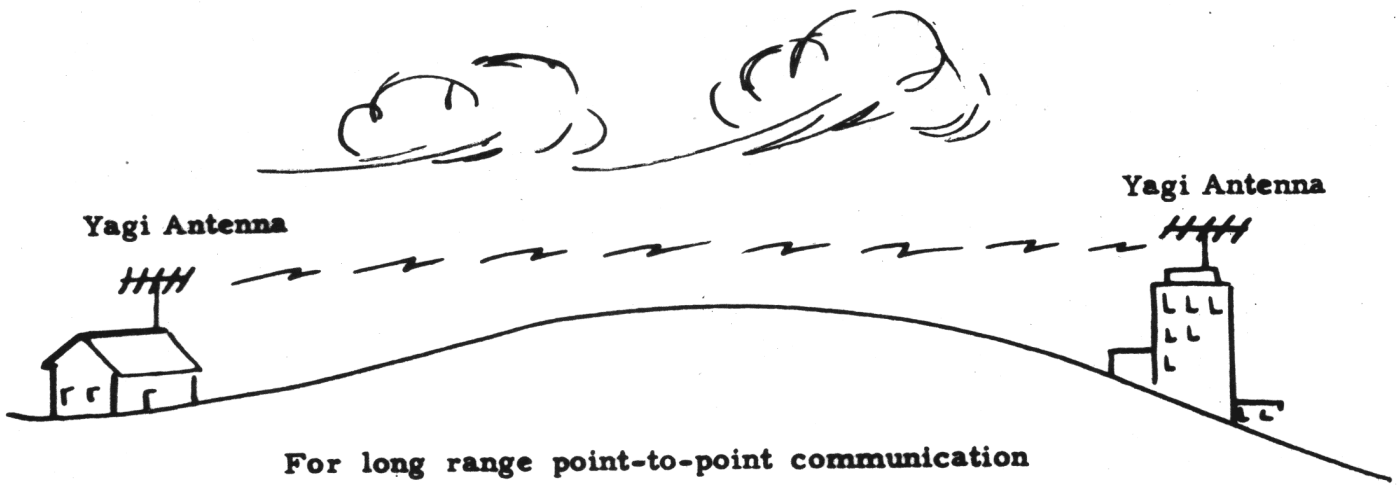
Excessive voltage causes vibrator contact arcing and eventually the contacts will fuse together. When this happens the fuse blows. The replacement of the fuse and vibrator will only be a temporary cure as eventually the same thing will occur again. As an extra safety factor, when the EXECUTIVE is used on 12 VDC the 15 amp fuse should be replaced with a 7.5 amp fuse.

Voltage should be checked at the unit with the engine at fast idle. If it seems as though the battery is fully charged the lights should be turned on for several minutes without the engine running and immediately upon starting the engine the voltage should be noted. If it is excessive the voltage regulator should be adjusted before the equipment is permanently installed. In all cases the voltage must be checked when the generator is charging at maximum.

Vibrators have a thirty (30) day warranty, but if you check the voltage properly you will receive many months of trouble-free operation before needing vibrator replacements.

Also of interest is the fact that vibrator contacts will "stick" under a low voltage condition and all users should be advised that under no circumstances should the vehicle be started when the unit is on. Since a tremendous amount of current is drawn from the battery, voltage in some cases will drop to 50% of its normal value during the starting period which is sufficient time for vibrator failure to occur.

INTERNATIONAL will have available soon a test adaptor for use in making these voltage checks and suggest you watch for the announcement. In the meantime use your regular VOM or VTVM for this test. REMEMBER... check the voltage AT THE EQUIPMENT since poor connections or long cable leads will be the cause of a low voltage condition.



Typical Mobile Installation

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 19.25(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

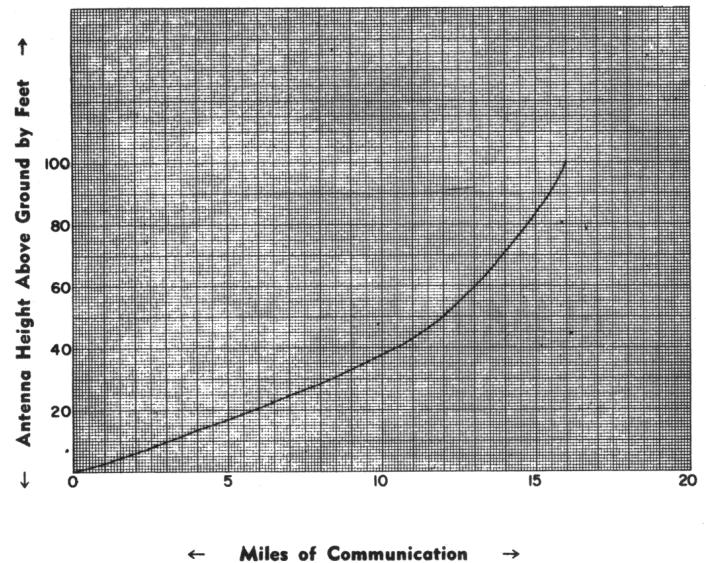
The direct coverage you are able to obtain using Citizen Equipment in the 27 megacycle band will depend a great deal upon the antenna. We shall speak of direct coverage rather than skywave coverage wherein you may communicate 500 to 2000 miles at various times.

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. 19.24(c)].

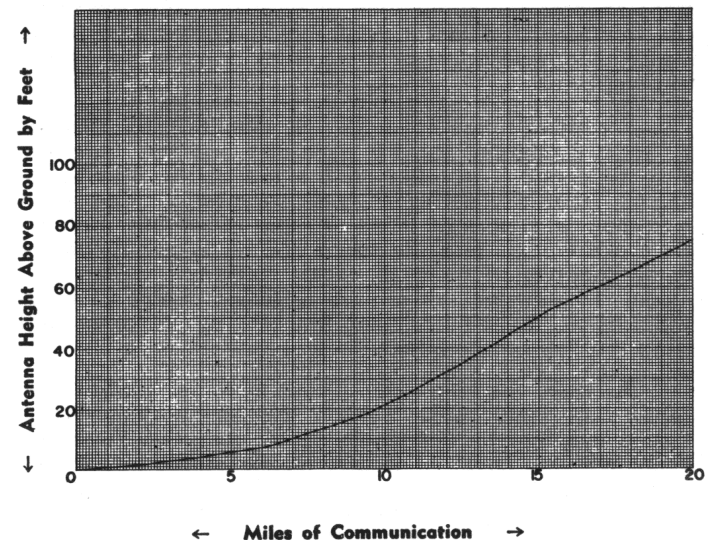
Ground Plane or Coax Antenna For 2 Microvolts at Receiver

Chart #1



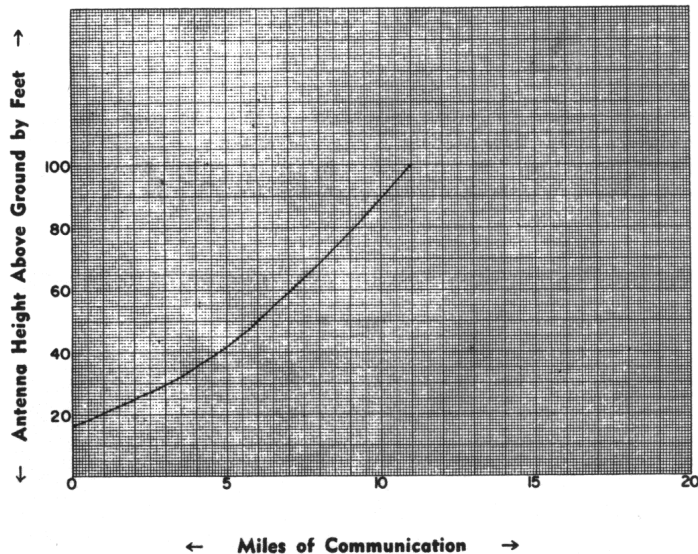
Yagi Antenna Mounted Vertical For 2 Microvolts at Receiver

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 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.