

be run at charging speed during transmissions. Of the two 6-volt wires the *black wire is the ground wire* and the white wire the "hot" 6 volt wire.

Because of the current drawn on transmit (15 amps) it is desirable that heavy wire be used to supply voltage to the COMMICATOR in a vehicular installation. No. 8 B&S gauge is recommended from the battery or starter terminal up to the point where the flexible cable furnished with the COMMUNICATOR is attached. For casual operation in "stray" automobiles simply clip on the ammeter terminal or main "hot" terminal under the dash. Voltage will be adequate when the generator is charging but it may on the shy side when the motor is not running.

### RECEIVER

Receiver operation is self-explanatory. On reception the tuning eye acts as a carrier strength indicator, actuated by the a.v.c.

### TRANSMITTER

The COMMUNICATOR transmitter is designed for intermittent service with a "transmit" time not to exceed 10 minutes during any 20 minute period. If the transmitter "on" time exceeds this duty cycle, or if the COMMUNICATOR is operated for a long period in an unusually high ambient temperature, it is recommended that the back screen be removed (when this can be done safely).

The transmitter employs a crystal multiplication factor of 18, and utilizes crystals in the 8.0 to 8.25 Mc. range in FT-243 type holders.

The output circuit is designed to work either into a quarter wave whip screwed into the coaxial connector on the top, or into 50 or 70 ohm coaxial line having a moderately low standing wave ratio.

The multiplier stages are tuned by removing the snap buttons and starting with the osc-tripler position, closing the eye as far as possible on each indicated position of the tuning eye switch in sequence with the transmit-receive switch in the "transmit" position. The final amplifier is automatically disabled on all positions of the tuning eye switch except the last (tune-load) position. Therefore,

**ALWAYS BE SURE TO RETURN THE SWITCH TO THE "TUNE-LOAD" POSITION BEFORE TRYING TO TRANSMIT.**

When tuning up, either insert a microphone in the mike jack or else throw the microphone selector switch to "carbon"; otherwise feedback may occur. On the "tune-load" position the eye indicates relative r-f voltage across the coax output, and therefore the maximum amount of closure will vary somewhat with the impedance of the load to which the unit is connected.

A very useful feature is the "crystal spotter", which permits one to spot his own transmitter frequency on the receiver dial and thus check receiver calibration or to determine if a received signal is close enough to cause QRM. With the T/R switch in the receive position, the tuning eye switch is thrown to the osc-tripler position. This turns on the exciter at reduced plate voltage. To avoid feedback and get a closer dial reading, the signal should be zeroed in by eye, with the receiver gain turned down. In some cases a second indication may be observed on another portion of the dial, but this will be weaker. Also, it will be far enough removed from the known crystal frequency that there

will be no ambiguity. **BE SURE TO RETURN THE TUNING EYE SWITCH TO "TUNE-LOAD" BEFORE ATTEMPTING TO TRANSMIT.**

With the T/R switch on "Receive" and the "Filaments" switch on "Receiver P-A", the receiver will work normally but the drain will be lower because the transmitter tube heaters will not be lighted. This is a useful feature when operating on 6 volts for long periods and it is not required that the transmitter be in standby condition. The transmitter heaters take approximately 20 to 30 seconds to reach operating temperature.

The microphone input circuit takes either a carbon microphone or a high-impedance high-output type crystal or dynamic (approximately minus 50 db level). In both cases the microphone is connected between shell (ground) and the ring of a PL-68 plug. This is the standard connection for a carbon microphone, except that there is no push-to-talk function. Therefore the push-to-talk switch on a carbon microphone may as well be jumpered if it opens the microphone circuit as well as the separate push-to-talk circuit (which is not used in this case). The "Xtal-Carbon" switch on the rear panel recess should be thrown to the correct position for a particular microphone. The adjacent slotted shaft is the audio gain control for the transmitter and for p-a work. The transmitter speech system is designed for close talking, rather than "studio" type pick up, and ordinarily the gain control will be run full on. The main function of the gain control is to permit reduction of the audio gain if desired when using the COMMUNICATOR as a public address system.

### PUBLIC ADDRESS OPERATION

The small "snap in" coaxial connector (phono type connector) is for connection to the 4 to 8 ohm voice coil of an external speaker for p-a work. A good, trumpet type PM speaker with husky magnet is recommended for best coverage with good efficiency. To use the unit for p-a work, connect the external speaker, turn the "Filaments" switch to "Receiver P-A", and the T/R switch to "Transmit". Adjust the gain control on the rear recess to the desired level.

### OPERATING SUGGESTIONS

For maximum life of the T/R switch the lever should be "flipped" quickly with the tips of the fingers; do NOT grab hold of the lever like a knob and turn it slowly. When used as recommended the switch will give long, trouble-free service. Should replacement ever be required, the switch is available with wiring harness attached in order to facilitate restoring the circuit.

When the power supply switch is turned off, it should not be turned on again for about 1 minute. If this precaution is not observed, the discharged input filter condenser will act for an instant as virtually a dead short on the 6X4 rectifiers, which will still be in condition to pass current due to the fact that nearly a minute is required for the cathodes to cool.

### ANTENNA AND COMMUNICATION RANGE

The communication range of the COMMUNICATOR depends largely upon terrain factors and the antenna employed. At extreme ranges the weather also is a determining factor.

It is not within the scope of this manual to attempt to cover thoroughly the considerations involved in v-h-f