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 for net operation or 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 battery 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, controlled reluctance, 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 on push-to-talk models, 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.

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.

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 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 via tropospheric propagation 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 propagation, nor the design on antennas. Summarizing briefly, the higher the elevation of the site, the greater the tropospheric range, particularly when the height of the antenna above ground is low. Also, the higher the antenna above ground, the greater the range, particularly when the site is not elevated. (Height of the antenna above ground becomes less important when the station is located atop a hill.)

The range also is dependent upon the same factors at the other end of the circuit, as well as the character of the intervening terrain. It also is dependent upon the transmitter power, receiver sensitivity, and antenna gain of the other station. Because some stations employ more transmitter power and many have less receiver sensitivity, it is possible to hear more stations than can be worked. The very high sensitivity of the receiver in the COMMUNICATOR tends to make this condition the more noticeable.

To obtain the best possible performance from the COMMUNICATOR at a given site, a good antenna is important. For general coverage fixed-station work with vertical polarization, a Gonset ground-plane antenna is recommended. A good directional array such as one of the Gonset Yagi arrays will greatly increase the range and reduce QRM problems. These arrays may be oriented for either vertical or horizontal polarization.

The receiver in the 6 meter models tunes down to 49 Mc., to permit watching the 49-50 Mc range for ionospheric "openings". The large number of industrial radio assignments in this frequency range makes it almost certain that stations will be heard at distances from 700 to 1500 miles when the 6 meter band is open to sporadic E layer transmission. Likewise an approaching F2 layer opening will first be noted by the reception of 49-50 Mc. industrial signals