

SECTION 2 Operation

When listening to strong signals, a reduction in background noise under no signal conditions may be obtained by rotating RF GAIN control (8) counterclockwise, away from the maximum position. As this is done, S-meter (7) static reading will shift up scale. At proper gain control setting, meter will kick about one or two S-units on peaks. For example, if the weakest of the desired signals is peaking at S-9, set gain control so that static meter reading is S-7 to S-8. This retains accurate meter readings. To read frequency, add the dial setting to the BAND switch setting. For example, if the BAND switch is set to 3.8 and the dial is set to 5, the frequency is 3.805 mc. If the BAND switch is set to 3.8 and the dial to 170, the frequency is 3.970 mc. Approximately ten turns of the main tuning knob are required to cover each 200-kc range.

2.3 CW Tuning.

a. Set the controls as shown in paragraph 2.2, except set the MODE switch to USB and the AGC control to SLOW (for normal CW work) or OFF (for break-in operation).

b. Center the desired signal in the receiver passband, and then switch to the CW1 or CW2 mode (depending on the optional filter desired) to reduce interference.

c. Rotate the BFO knob clockwise to energize the tunable bfo, and set the bfo to give the most pleasing beat note. The beat note will be the same in both the USB and CW modes.

d. If the AGC is turned off, decrease the RF GAIN control setting to prevent receiver overloading, and adjust the AF GAIN control to provide the desired audio level. In general, it is best to set the RF GAIN control at a point just below that which causes signals to overload the receiver. This provides optimum sensitivity.

e. Signal hunting is best done in the USB mode, and the sharp CW modes are used for reducing interference once the desired signal is found. The USB mode is also useful for net operation.

2.4 AM Tuning.

a. Set controls as outlined in paragraph 2.2.

b. Set MODE switch to AM.

c. Set AGC switch to FAST.

d. Tune in signal, and adjust AF GAIN for desired audio output level.

If desired, SSB methods may be used for AM reception. Set MODE switch to either USB or LSB position; use tuning procedure for a single-sideband signal. Once the desired signal is tuned in, switching to the opposite sideband may yield a more readable signal. This method of reception is useful under conditions of severe interference or extreme fading.

2.5 RTTY Tuning.

This type of operation requires an external RTTY converter and printer. Tune receiver as follows:

a. Set controls for SSB reception as outlined in paragraph 2.2 with MODE switch in USB position.

b. Turn on tunable bfo by rotating BFO knob (13) clockwise.

c. Set the pointer on the BFO tuning knob at the dot near -1 on the calibrated scale.

d. Tune the receiver for maximum S-meter reading on the desired RTTY signal.

e. Fine adjustment of the BFO tuning knob then will produce 2125-cps and 2975-cps mark and space signals at the receiver audio output. To reverse the mark and space signals, reset the BFO tuning knob to the dot near +4 on the calibrated scale.

2.6 Rejection Tuning.

An interfering heterodyne or CW signal may be reduced in level or eliminated by operation of the REJECTION TUNING knob (6). The off position for this control is at the end of extreme counterclockwise rotation. The on-off switch is provided with a positive stop rather than a detent. Do not force the knob. Clockwise rotation of the knob from the off position moves the rejection notch across the receiver passband. It is recommended that the operator familiarize himself with the operation of this control by tuning the notch across the signal from the crystal calibrator.

When the receiver is initially placed in operation, it may be necessary to touch up the adjustment of R77. Refer to paragraph 4.5.8.

2.7 Use of S-Meter.

The S-meter is intended primarily to indicate relative rather than absolute signal strength. A nominal meter reading of S-9 is obtained with an input signal of 100 microvolts on the antenna. The threshold of agc operation is set at the factory to a nominal value of 2 microvolts. Due to normal tolerances in receiver operation, agc threshold varies slightly from band to band causing correspondingly slight changes in the number of db represented by each S-unit. The db scale is calibrated with 1 microvolt as a reference; therefore, an S-9 signal of 100 microvolts represents a 40-db increase over the reference signal level. Since agc is not applied to very weak signals, S-zero is arbitrarily established at 10 db above 1 microvolt. A figure of 4 db can be taken as an average for one S-unit.

2.8 Transceiver Operation with 32S-() Transmitter.

a. Make sure patch cables are connected as outlined in paragraph 1.2.2.

b. Set FREQ CONTROL on 32S-() to REC VFO position.

c. Set OFF-STBY-OPR-CAL switch on 75S-3B/C to STBY position.

d. Set both BAND selectors to the same desired band and both MODE switches to the same position (either USB, LSB, or CW).

e. Tune both receiver and transmitter as in normal operation. Both transmit and receive functions operate from the receiver vfo and the receiver hf crystal oscillator; the transmitter vfo and the transmitter hf crystal oscillator are not used in transceiver operation. Switching the transmitter FREQ CONTROL back to TRANS VFO position will allow separate operation of the two units within the same 200-kc band.

NOTE

Do not attempt operation in transceiver service with any other receiver not having the same frequency mixing scheme.

NOTE

When operating cw in the transceiver mode, the transmitted signal will be approximately 1.3 kc away from the received signal. It is recommended that independent control of the transmitter and the receiver be used when working cw.



When operating a 75S-3B/C with a 32S-() in transceiver service on an amateur band, DO NOT operate the transmitter while the receiver is tuned outside the band limits; the transmitted signal will be outside the amateur band. This is also true for the phone segments of the amateur bands.

There are 14 positions to the BAND switch divided into three A, two B, and three C, D, and E positions. These correspond to 14 crystals in the 75S-3B and to 28 crystals in the 75S-3C. Through the use of an extra switch, 2 crystals are available at each position of the 75S-3C BAND switch.

In transceiver operation, the vfo and the crystal oscillator in the 75S-3B/C determine both the receiver and the transmitter frequency; the 32S-() vfo and crystal oscillator are disabled. However, in order for the tuned circuits of the transmitter to resonate at the desired frequency, the transmitter BAND switch must be set to the same letter as the receiver BAND switch. For example, if the 75S-3B/C is set to band 2D, the 32S-3 can be set to 1D, 2D, or 3D.

If operation on different 200-kc bands is desired (that is, receive on one 200-kc band and transmit on another), remove the transceiver patch cables and operate the units as in normal independent operation.

If transmitted frequency is changed by any great amount, be sure to redip the PA plate current and check the loading. This will be most important on the 80- and 40-meter bands. Refer to table 2-1.

NOTE

When working foreign stations in the 14-mc band with a 75S-3B and a 32S-3 connected for transceive operation, a crystal (8627.500 kc, Collins part number 290-9179-00) permitting operation between 14.1 and 14.3 mc can be used in place of the 14.0- to 14.2-mc or 14.2- to 14.4-mc crystal supplied with the 75S-3B. However, the 32S-3 FREQ CONTROL switch must be set to TRANS VFO. This enables the 32S-3 to be operated between 14.2 and 14.3 mc (between 100 and 200 on the 32S-3 vfo dial).

f. To restore both units to normal operation, remove the two patch cables connecting oscillator signals, replace P1 in J7 on the transmitter slug rack (under top cover), and replace the 100-ohm load plug in the receiver XTAL OSC OUTPUT jack (see figure 4-1).

2.9 Operation Outside Amateur Bands.

Additional 10-meter band coverage or coverage outside the amateur bands may be obtained by plugging an appropriate crystal into the crystal mounting board. Two extra sockets are provided in the mounting board for this purpose. The total 3.4- to 30.0-megacycle coverage available is divided into five segments designated A, B, C, D, and E. The frequency range of

TABLE 2-1. APPROXIMATE LIMITS OF FREQUENCY CHANGE BEFORE 32S-() RETUNING IS REQUIRED

| | BANDS (mc) | | | | |
|---|---------------|-------|---------|---------|--------|
| | 3.4-4 | 7-7.4 | 14-14.4 | 21-21.6 | 28-30 |
| Approximate limits of frequency change before retuning is required. | 15 kc | 30 kc | 50 kc | 75 kc | 100 kc |

SECTION 2
Operation

each of these segments is listed in the total coverage column of table 2-2. The letter portions of the crystal socket locations shown in figure 2-2 indicate which sockets may be used for crystals to cover a 200-kc band within a specific total coverage segment. For example, crystals for extended 10-meter coverage must be plugged into sockets marked E.

NOTE

The second harmonics of the VFO and the variable intermediate frequency both fall in the 5.0- to 6.5-mc range. During reception in this range, these harmonics will cause spurious responses. If the 75S-3B or the 75S-3C is to be used in transceiver operation with a 32S-1 or 32S-3, this frequency range should be avoided. Some of this harmonic energy will pass through the transmitter tuned circuits and become spurious emissions.

The proper crystal for coverage of a specific 200-kc band may be selected as follows:

a. If the lower edge of the desired band is 11.8 mc or less, the required crystal frequency is equal to the lower edge of the desired band plus 3.155 mc. For example, if the desired band is 4.0 to 4.2 mc, the required crystal frequency is 7.155 mc.

b. If the lower edge of the desired band is 12.0 mc or higher, the required crystal frequency is equal to half the sum of the desired lower band edge and 3.155 mc. For example, if the desired band is 14.4 to 14.6

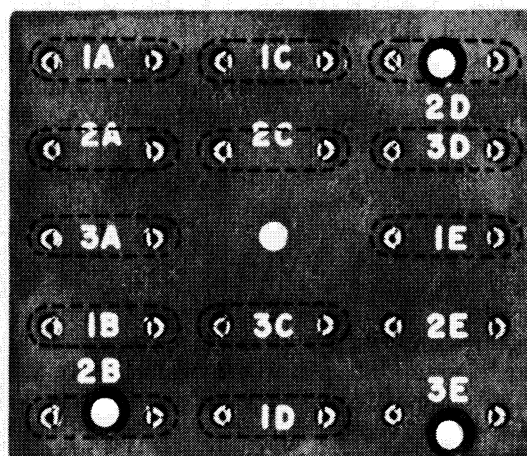


Figure 2-2. Crystal Socket Locations

mc, the required crystal frequency is 8.7775 mc. Extra crystals available are listed in section 6, parts list.

Approximate settings for the PRESELECTOR are shown in figure 2-3. For example, if coverage from 10.0 to 10.2 mc is desired, plug the appropriate crystal into a socket marked C, turn the BAND switch to that position, and set the PRESELECTOR to approximately 3.2 on the logging scale. Peak the PRESELECTOR tuning as in normal operation. The ANT, RF, and OSC trimmer capacitors (those marked C in

TABLE 2-2. CRYSTAL FREQUENCIES AND OPERATING BANDS

| BAND SWITCH POSITION | FREQUENCY BAND | CRYSTAL SUPPLIED | CRYSTAL SOCKET CONNECTED | TOTAL COVERAGE |
|-------------------------------------|--|--|--------------------------|------------------|
| 1A - 3.4 2A - 3.6 3A - 3.8 | 3.4 - 3.6 mc 3.6 - 3.8 mc 3.8 - 4.0 mc | 6.555 mc 6.755 mc 6.955 mc | 1A 2A 3A | A 3.4 - 5.0 mc |
| 1B - 7.0 2B - 7.2 | 7.0 - 7.2 mc 7.2 - 7.4 mc | 10.155 mc 10.355 mc | 1B 2B | B 6.5 - 9.5 mc |
| 1C - 14.0 2C - 14.2 3C - 14.8 | 14.0 - 14.2 mc 14.2 - 14.4 mc 14.8 - 15.0 mc | 8.5775 mc 8.6775 mc 8.9775 mc | 1C 2C 3C | C 9.5 - 15.0 mc |
| 1D - 21.0 2D - 21.2 3D - 21.4 | 21.0 - 21.2 mc 21.2 - 21.4 mc 21.4 - 21.6 mc | 12.0775 mc 12.1775 mc 12.2775 mc | 1D 2D 3D | D 15.0 - 22.0 mc |
| 1E - 28A 2E - 28B 3E - 28C | 28.5 - 28.7 mc As selected As selected | 15.8275 mc Not supplied Not supplied | 1E 2E 3E | E 22.0 - 30.0 mc |

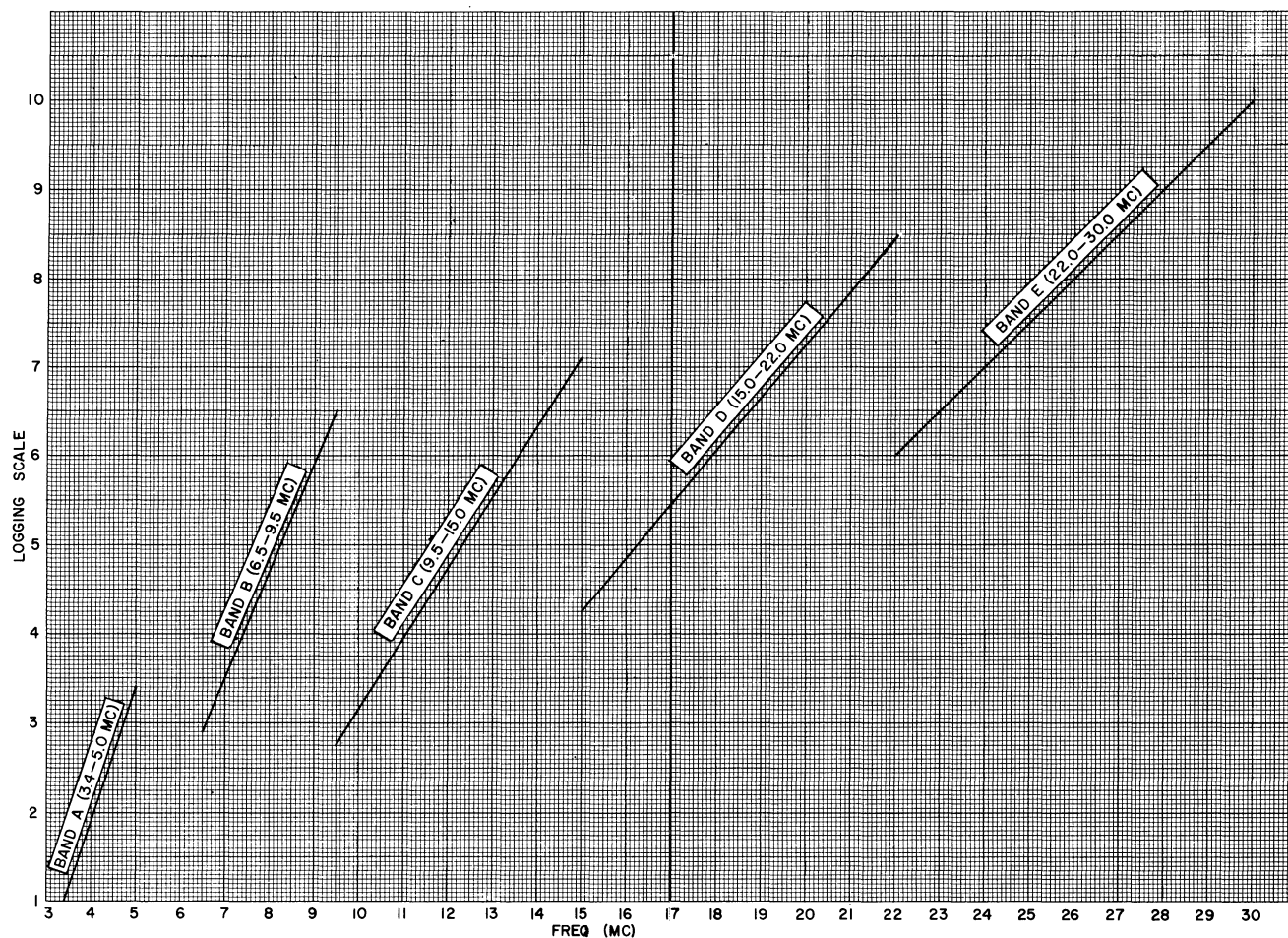


Figure 2-3. Preselector Calibration Curves

the example above) may also be peaked if optimum performance is desired at frequencies outside the amateur bands. On some bands it is possible to peak the PRESELECTOR tuning at an image frequency or at a different order of output frequency from the crystal oscillator; however, there is only one correct setting for coverage within a given 200-kc band.

The above information also applies to the 75S-3C, except that two crystal mounting boards are provided in this receiver. The amateur-band board is located

under the chassis. To obtain access, refer to paragraph 4.1. When the crystal board selector (located directly above the BAND switch) is switched to the alternate coverage position, the above-chassis board is switched into the circuit. This provides 14 additional 200-kc bands within the 3.4- to 30-mc range of the receiver. The crystal socket locations are the same for both boards. Space is provided in the window adjacent to the BAND switch to record band information. A pencil may be used to allow erasure if changes are to be made.

