



**Rockwell
International**

Collins instruction book

Collins Government Telecommunications Group

**Collins 75S-3B and 75S-3C
Receivers**

523-0756533-007311
7th Edition, 15 November 1975



**Rockwell
International**

Collins instruction book

**Collins 75S-3B and 75S-3C
Receivers**

**Collins Government
Telecommunications Group
Rockwell International
Cedar Rapids, Iowa 52406**

Printed in the United States of America

table of contents

	<i>Page</i>
Section 1 Installation	1-1
1.1 Unpacking	1-1
1.2 Cabling.....	1-1
1.2.1 External Connections.....	1-1
1.2.2 Cabling With 32S-3 Transmitter.....	1-2
1.2.3 Cabling With KWM-2/2A Transceiver.....	1-2
1.2.4 Cabling With Other Transmitters.....	1-4
1.3 Initial Checks	1-4
Section 2 Operation	2-1
2.1 Calibration.....	2-1
2.2 Single-Sideband Tuning.....	2-1
2.3 CW Tuning	2-2
2.4 AM Tuning	2-2
2.5 RTTY Tuning.....	2-2
2.6 Rejection Tuning	2-2
2.7 Use of S-Meter.....	2-2
2.8 Transceiver Operation With 32S-() Transmitter.....	2-2
2.9 Operation Outside Amateur Bands	2-3
Section 3 Principles of Operation.....	3-1
3.1 Block Diagram.....	3-1
3.2 RF and Mixer Circuits	3-1
3.3 Oscillator Circuits	3-1
3.3.1 Crystal Oscillators	3-1
3.3.2 Variable Oscillators	3-1
3.4 IF. and Detector Circuits.....	3-2
3.5 Q-Multiplier and Notch Filter.....	3-2
3.6 AGC and Control Circuits	3-2
3.7 Audio Circuits	3-2
3.8 Power Supply Circuits.....	3-4
Section 4 Service Instructions	4-1
4.1 General	4-1
4.2 Trouble Analysis.....	4-1
4.3 Voltage and Resistance Measurements	4-1
4.4 Signal Tracing	4-3
4.5 Alignment Procedure	4-3
4.5.1 455-Kilocycle IF. Alignment	4-4
4.5.2 Bandpass IF. Alignment.....	4-5

table of contents (cont)

	<i>Page</i>
4.5.3 RF Circuit Alignment	4-5
4.5.4 VFO Sideband Frequency Shift Adjustment.....	4-5
4.5.5 Crystal Calibrator Adjustment	4-5
4.5.6 VFO Dial Calibration.....	4-5
4.5.7 Tunable BFO Alignment	4-6
4.5.8 Notch Filter Alignment	4-6
4.5.9 IF. Gain Adjustment	4-6
4.5.10 S-Meter Zero Adjustment	4-6
4.5.11 Antenna Trimmers Adjustment	4-6
4.6 Installation of Optional Filters.....	4-6
4.7 Replacement of Dial Lamps	4-8
4.7.1 Dial Lamp Installation.....	4-8
Section 5 Specifications	5-1
5.1 Frequency Coverage	5-1
5.2 Equipment Characteristics.....	5-1
5.3 Tube, Fuse, Lamp, and Semiconductor Complement	5-1
5.4 Available Accessories	5-1
Section 6 Parts List	6-1
6.1 Introduction	6-1
6.2 Group Assembly Parts List	6-6
6.3 Numerical Index	6-31
6.4 Reference Designation Index	6-36
Section 7 Illustrations	7-1
Index	A-1

list of illustrations

<i>Figure</i>		<i>Page</i>
1-1	External Connections (C785-01-3).....	1-2
1-2	Station Interconnections (C785-02-5)	1-3
2-1	Operating Controls.....	2-1
2-2	Crystal Socket Locations (C290-09-P)	2-4
2-3	Preselector Calibration Curves (TP0-0691-018).....	2-5
3-1	Block Diagram (C785-17-4)	3-3
4-1	Location of Adjustments.....	4-4
4-2	Optional Filter Installation Diagram (C785-05-3).....	4-7
4-3	Dial Lamp Replacement.....	4-8
6-1	75S-3B/3C Receiver.....	6-6
6-2	Receiver Subassembly	6-9
6-3	Crystal Selection Group	6-26
7-1	75S-3B/3C Receiver, Schematic Diagram.....	7-3
7-2	Chassis Component Location Display (Bottom View)	7-11

list of tables

<i>Table</i>		<i>Page</i>
1-1	Equipment Furnished With 75S-3B/C.....	1-1
2-1	Approximate Limits of Frequency Change Before 32S-() Retuning is Required.....	2-3
2-2	Crystal Frequencies and Operating Bands	2-4
4-1	Voltage and Resistance Measurements Taken With 11-Megohm Input VTVM.....	4-2
4-2	Signal Levels	4-3
5-1	Tubes, Fuses, Lamps, and Semiconductors.....	5-2
5-2	Available Accessories	5-2

SERVICE BULLETIN LIST

SERVICE BULLETIN NO	SUBJECT	MANUAL REVISION NUMBER	MANUAL REVISION DATE
1	Improved Performance	6th Ed	15 Jan 74
2	Second Mixer Plate Circuit Improvement	6th Ed	15 Jan 74
3	Connect 75S-3B to 75S-3C	NA	NA

NOTE

For service information on the 75S-3B and 75S-3C Receivers, write or call Amateur Radio Marketing, Collins Radio Group, Rockwell International, Cedar Rapids, Iowa 52406; 319/395-4507.

75S-3B and 75S-3C Receivers. The power cable plugs into socket J13. The ANT jack is a nominal 50-ohm antenna input. The 4 Ω AUDIO jack is for connection of a speaker.



1.1 Unpacking.

Lift the receiver out of the carton and packing material. Examine for visible damage. If the receiver has been damaged in shipment, save the box and packing material, and notify the transportation company. Complete and mail the equipment guarantee card. Check tubes and crystals for proper seating in sockets. Check tuning controls and switches for freedom of action.

The 75S-3B/C Receiver power transformer can be operated on either 115 or 230 volts ac. Before connecting the receiver to the ac line, see that the transformer connections are correct for the line voltage available. Refer to the receiver schematic, figure 7-1. DO NOT connect the ac power cord to the ac line until power plug P6 has been plugged into J13. To avoid damage to the receiver, make sure the key on P6 is properly aligned with the keyway on J13.

1.2 Cabling.

1.2.1 EXTERNAL CONNECTIONS. Figure 1-1 shows the location of jacks for external connections to the

To connect the receiver for mute operation, a means of supplying a ground while receiving must be applied

TABLE 1-1. EQUIPMENT FURNISHED WITH 75S-3B/C

QUANTITY	DESCRIPTION	FUNCTION	PART NUMBER
2	Phono connectors	External connections	361-0062-00
1	Fuse, 1-ampere slow blow	Spare	264-4280-00
1	Power cord	Ac power	544-3121-00
1	Power plug adapter	Ac power	368-0138-00
1	Instruction book	75S-3B/C instructions	523-0756533
1	Cable marker card	Cable identification	280-2946-00
1	No. 4 Bristol wrench	Accessory tool	024-2900-00
1	No. 6 Bristol wrench	Accessory tool	024-9730-00
1	No. 6 Bristol wrench	Accessory tool	024-0167-00
1	No. 8 Bristol wrench	Accessory tool	024-0019-00
1	No. 10 Bristol wrench	Accessory tool	024-9710-00

SECTION 1
Installation

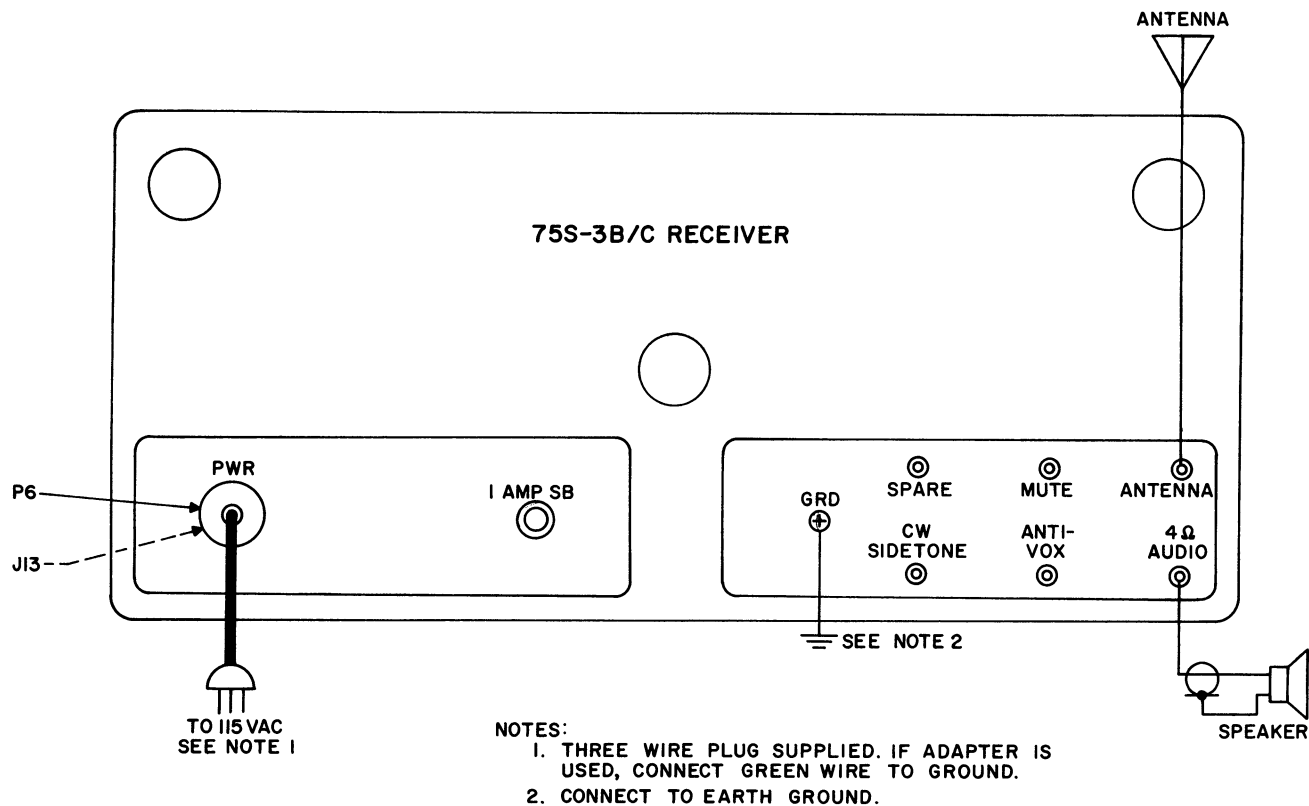


Figure 1-1. External Connections

to the MUTE jack. Opening this circuit mutes the receiver. A set of normally closed contacts on a relay which is keyed with the transmitter may be used for this purpose. To use this circuit, the receiver must be operated in the STBY position.

The CW SIDETONE jack is a high-impedance, low-level audio input (0.2 volt rms, typical) to the receiver. Audio from a sidetone oscillator may be applied to this jack to provide a CW monitoring circuit through the receiver audio system.

The ANTI-VOX jack is a 500-ohm audio output from the receiver. At normal speaker volume levels, 5 to 10 volts rms is provided at this output. This voltage is normally applied to antivox circuits in an associated transmitter.

The PHONES jack on the front panel is connected through a resistive network to a 500-ohm tap on the output transformer. Therefore, best results will be obtained if headphones used are 500 ohms or higher impedance. The speaker is silenced when headphones are plugged in.

1.2.2 CABLING WITH 32S-3 TRANSMITTER. Figure 1-2 shows a complete station interconnection for a 75S-3B/C Receiver, 32S-3 Transmitter, and 312B-4 Station Control. The RG-58C/U cables indicated are

slightly larger in diameter and two inches shorter than the audio and control cables. If the 312B-4 is not used, connect a 4-ohm speaker, such as the 312B-3, to 4 Ω AUDIO jack on receiver. Connect ANTI-VOX jack on receiver directly to ANTI-VOX jack on transmitter. Omit PHONE PATCH and PTT connections.

To connect the 75S-3B/C and the 32S-3 for transceiver operation, use the patch cables furnished with the transmitter, and connect as follows:

a. Connect the 32S-3 and 75S-3B/C as shown in figure 1-2.

b. On the top plate of the 32S-3 slug rack, remove P1 from XMTR XTAL OSC jack J7, and plug it into 32S-3 RCVR XTAL OSC jack J6. Remove the 100-ohm dummy load plug from the 75S-3B/C XTAL OSC OUTPUT jack, and plug it into the XMTR XTAL OSC jack J7 in the 32S-3.

1.2.3 CABLING WITH KWM-2/2A TRANSCEIVER. The 75S-3B/C may be used with a KWM-2/2A to provide separate transmit and receive frequencies. Connect the patch cables as follows:

a. Using an RG-58C/U patch cable, connect REC ANT jack on KWM-2/2A to ANT jack on 75S-3B/C.

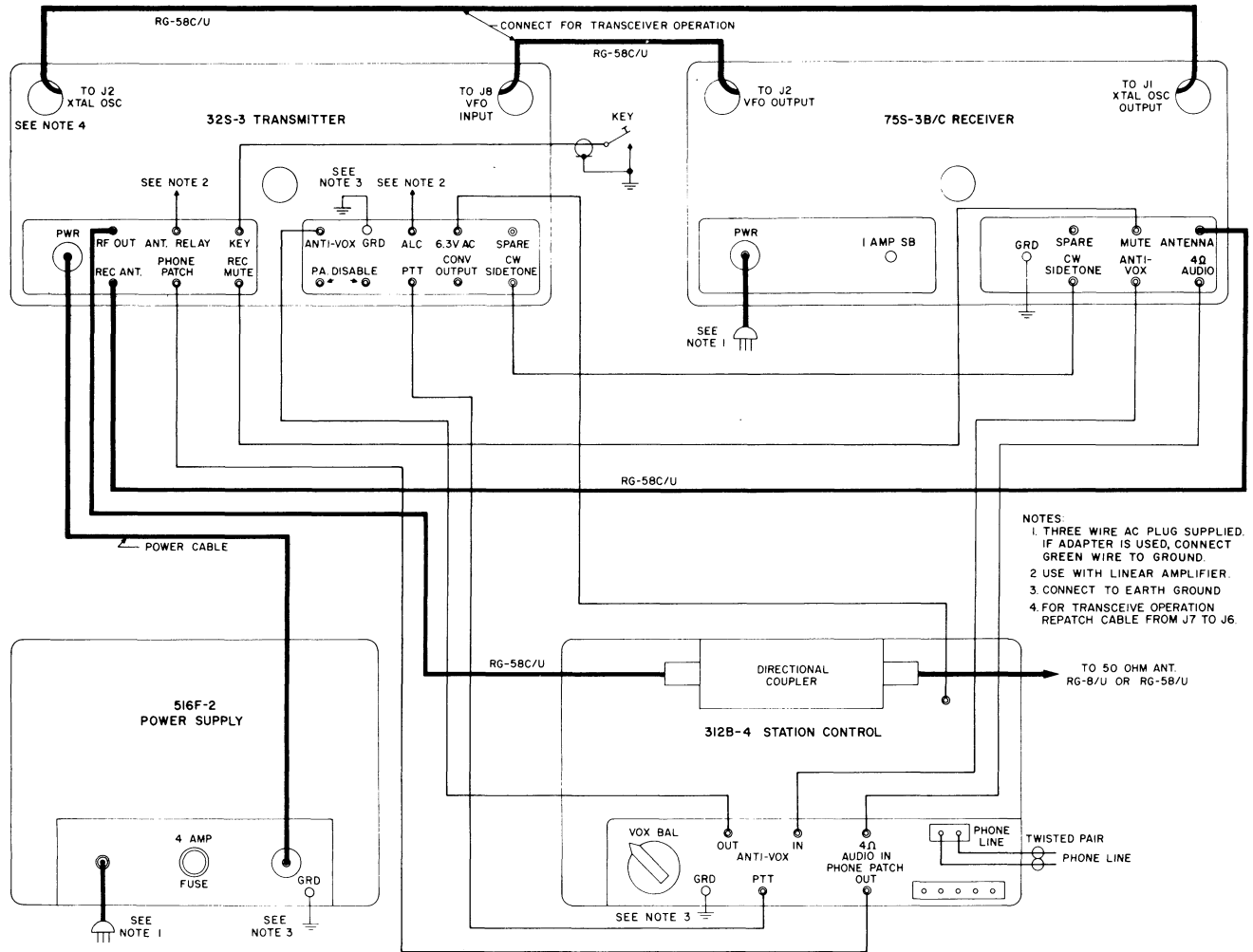


Figure 1-2. Station Interconnections

SECTION 1 Installation

b. Connect the 500 Ω jack on the KWM-2/2A to the ANTI-VOX jack on the 75S-3B/C. If a 312B-4 or 312B-5 is used, connect the KWM-2/2A 500 Ω jack to ANTI-VOX IN and the 75S-3B/C ANTI-VOX jack to ANTI-VOX OUT on the 312B-4/5.

c. Connect the REC MUTE jack J20 on the KWM-2/2A to the MUTE jack on the 75S-3B/C.

The station speaker may be plugged into either the 4 Ω jack on the KWM-2/2A or the 4 Ω AUDIO jack on the 75S-3B/C. For normal mute operation, set the 75S-3B/C function switch to STBY. Receiver output from the KWM-2/2A is turned off by setting AF GAIN to zero. For transmit and receive operation on the same frequency, reduce the 75S-3B/C AF GAIN to zero, and operate the KWM-2/2A in a normal manner.

1.2.4 CABLING WITH OTHER TRANSMITTERS.

a. To provide receiver muting when using 75S-3B/C with a KWS-1, connect a cable from pins 5, 6 on J102

(receiver disable) in the transmitter to MUTE jack on the receiver. Connect a cable from receiver ANTI-VOX jack to pin 7 on J102 (500-ohm audio) in the KWS-1. Connect cable shield to ground.

b. To use the 75S-3B/C with the 32V-3, connect a cable from the receiver MUTE jack to receiver disabling pins 24 and 25 on the transmitter.

c. To use the 75S-3B/C with other makes of transmitters, connect muting, CW sidetone, and antivox provisions in the receiver as applicable. The requirements for use are outlined in paragraph 1.2.1.

1.3 Initial Checks.

Lift the top cover, and make sure the dummy load (see figure 4-1) is plugged into the XTALOSC OUTPUT jack unless the receiver is connected for transceiver operation. Recheck the interconnections to make sure the patch cables are plugged into the appropriate jacks. Be sure that RG-58C/U cables, rather than the audio and control cables, have been used for all rf applications.