



**Rockwell
International**

instructions

Collins Telecommunications Products Division

523-0767959-102211

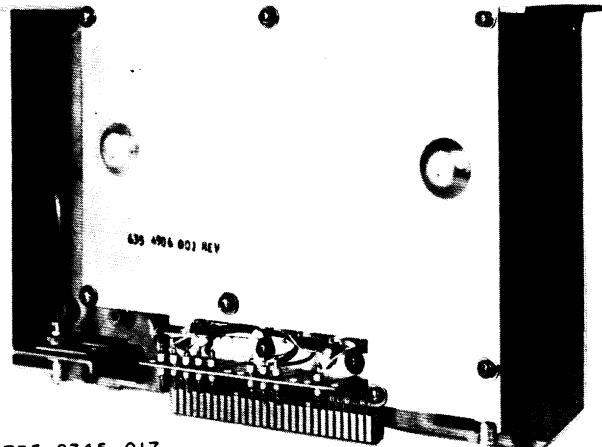
2nd Edition, 1 June 1978

1st Revision, 1 January 1979

RF Translator (637-1767-())

Printed in USA

RF Translator
(637-1767-())



*RF Translator
Figure 1*

1. DESCRIPTION

RF Translator 637-1767-(), shown in figure 1, is a module enclosed in an rf secure compartment (metal box construction). The rf translator module contains a metal box subassembly with internal shielding between various circuit elements and three 2-layer planar cards. It uses a 56-pin edge-on connector (2 layers, 28 pins each) and four subminiature rf connectors for external connections.

The rf translator module consists of two mixers, a receive overload, and rf filter circuits.

The rf translator configuration differences are as follows:

- 637-1767-001, FL14 109.350 00 MHz filter, ± 7.50 kHz at 3-dB points (narrowband filter).
- 637-1767-002, FL14 109.350 00 MHz filter, ± 6.10 kHz at 0.5-dB points (broadband filter).

2. PRINCIPLES OF OPERATION

2.1 General (Refer to figure 2.)

The rf translator converts the 100-kHz (0.100-MHz) to 30.0-MHz receive rf input to a 9.45-MHz receive if frequency.

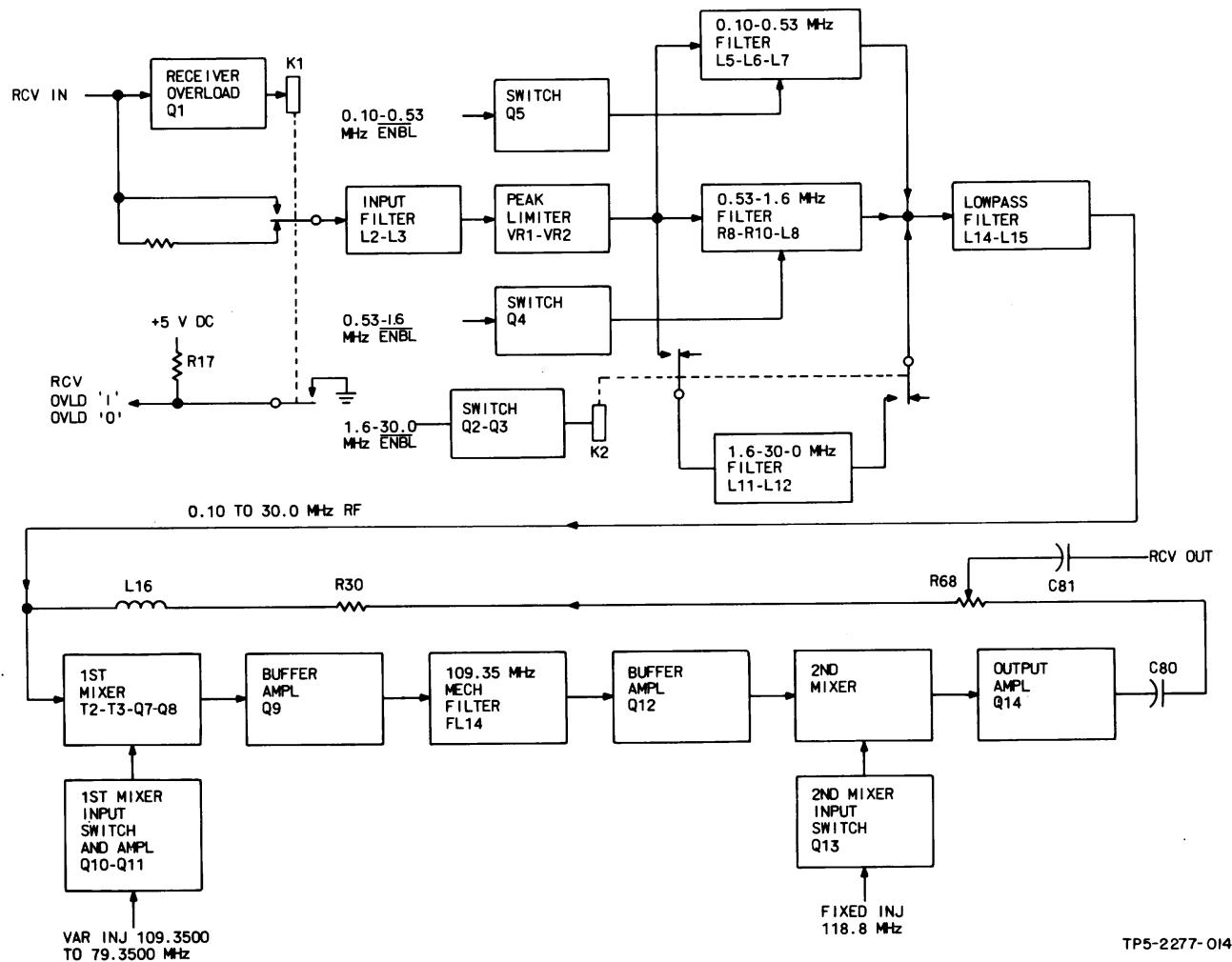
2.2 Receive Function (Refer to figure 2.)

When a receive signal is supplied to the rf translator, it is overload checked and supplied through K1 to the associated bandpass filter. If an overload exists, Q1 causes K1 to deenergize, and the receive rf is loaded through R4 and supplied as receive rf through K1 to the associated bandpass filter.

The bandpass filter is selected by the receiver frequency control. Enable signals from the receiver frequency control enable filter L5-L7 for 100- to 530-kHz (0.10- to 0.53-MHz) operation; enable filter R8-R10-L8 for 530-kHz to 1.6-MHz (0.53- to 1.6-MHz) operation; and energize K2 to enable filter L11-L12 for 1.6- to 30.0-MHz operation.

The signal from K1 is supplied through the selected bandpass filter and through low-pass filter L14-L15 to the grounded gate balanced FET first mixer circuit T1-T2, Q7-Q8.

In the first mixer the 100-kHz to 30.0-MHz signal is mixed with a 109.3500- to 79.3500-MHz variable injection signal to provide a 109.35-MHz if signal. This signal is supplied through source follower FET buffer amplifier Q9, mechanical filter FL14, and a second source follower FET buffer amplifier Q12 to the second mixer circuit.



*Functional Block Diagram
Figure 2*

In the second mixer the 109.35-MHz if signal is mixed with a 118.8-MHz fixed injection signal to provide a 9.45-MHz receive if output signal. The receive if output signal is supplied through output amplifier Q14, receive output switch CR24-CR25, and output control R68, to the rf translator receive if output.

2.3 RF Mixer SRA-1 (Refer to figure 3.)

The SRA-1 is a broadband ring modulator mixer device used in 50-ohm rf/if applications.

3. TESTING/TROUBLESHOOTING PROCEDURES

3.1 Test Equipment and Power Requirements

Test equipment and power sources required to test, troubleshoot, and repair the rf translator module are

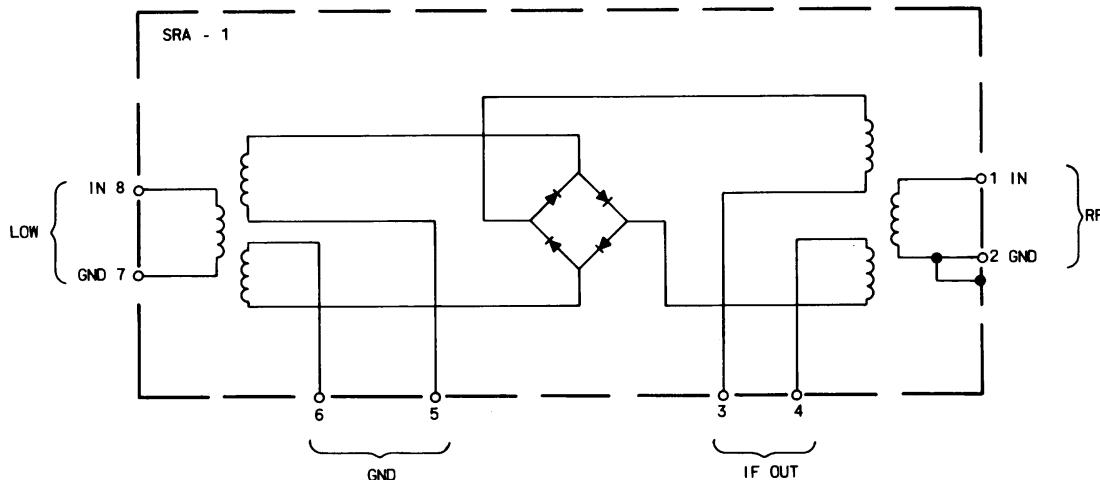
listed in the maintenance section of this instruction book.

3.2 Testing

The test procedures in table 1 check total performance of the rf translator module. These test procedures permit isolation of a fault to a specific component or circuit when the results are used with the schematic to circuit trace the fault.

Note

In emergencies, RF Translator 637-1767-001 can be replaced by RF Translator 635-4903-001. In this type of repair, use the test procedures given in table 1 to test RF Translator 635-4903-001.

CHARACTERISTICS

PEAK INPUT POWER: 50 mW MAX.
 PEAK CURRENT, ANY PORT: 40 mA MAX.
 FREQUENCY RANGE (MHz):
 LOW - 0.5 TO 500
 RF - 0.5 TO 500
 IF - DC TO 500
 CONVERSION LOSS: 6.5 dB TYPICAL,
 8.5 dB MAX. (SIGNAL AT IF PORT,
 OUTPUT AT RF PORT)
 TEST CURRENT WHEN CHECKING
 CONTINUITY MUST NOT EXCEED 20 mA.

ISOLATION (dB):
 LOW BAND EDGE;
 LOW TO RF - 35 dB MIN.
 LOW TO IF - 30 dB MIN.
 MID-RANGE;
 LOW TO RF - 30 dB MIN.
 LOW TO IF - 25 dB MIN.
 UPPER BAND EDGE;
 LOW TO RF - 25 dB MIN.
 LOW TO IF - 20 dB MIN.

TP5-2278-013

RF Mixer SRA-1

Figure 3

Table 1. RF Translator, Testing and Troubleshooting Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
1. Setup	<ol style="list-style-type: none"> Remove top cover of unit containing the rf translator that is to be tested. Remove rf translator. Install rf translator on extender and place it in the unit. Set unit LINE SELECTOR switch to 115 V. Connect unit to 115-V ac power source and set power on. Measure dc voltages between the following pins and ground (P1-1, 28, 29, 56): <ul style="list-style-type: none"> P1-25 +24.0 ±1.0 V dc P1-53 +15.0 ±1.0 V dc P1-23 +5.0 ±0.2 V dc P1-51 -15.0 ±1.0 V dc P1-27 P1-6 		Check associated power supply.

Table 1. RF Translator, Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
2. Receiver SSB sensitivity	<p>a. Set front panel MODE switch to SSB/CW and BANDWIDTH switch to USB.</p> <p>b. Connect an rf signal generator to J1 (RW ANT jack on rear panel).</p> <p>c. Connect an audio vtv to A6TP2 (SSB audio).</p> <p>d. Set the rf signal generator to 250.0 kHz and receiver front panel frequency controls to 249.0 kHz.</p> <p>e. Set the rf signal generator level at 0.00 μV.</p> <p>f. Note noise level on audio vtv.</p> <p>g. Adjust rf signal generator level to 0.30 μV and note signal level on audio vtv.</p> <p>h. Repeat steps e, f, and g with rf signal generator at each of the following frequencies: (receiver front panel frequency controls set 1000 Hz below each frequency given).</p> <ul style="list-style-type: none"> 500 kHz 1.0 MHz 1.6 MHz 5.0 MHz 10.0 MHz 15.0 MHz 20.0 MHz 25.0 MHz 30.0 MHz 	<p>Reference</p> <p>NLT 2 dB above reference</p> <p>Note Signal strength of step g varies with frequency.</p> <p>NLT 3 dB above reference</p> <p>NLT 3 dB above reference</p> <p>NLT 10.5 dB above reference</p>	<p>Check M1, Q14, Q12, FL14, Q9, Q8, Q7, Q5, and associated circuits.</p> <p>Same as step g.</p> <p>Check Q4 and associated circuits.</p> <p>Check Q2, Q3, K2, and associated circuits.</p> <p>Same as 1.6 MHz.</p>
3. Receiver gain (Cont)	<p>a. Connect an rf signal generator to J1 (RCV ANT jack on rear panel).</p> <p>b. Connect an rf vtv (with 50-Ω load) to J3.</p> <p>c. Set the rf signal generator and receiver front panel frequency controls to 1.600 MHz.</p> <p>d. Set the rf signal generator level at -30 dB mW.</p>		

Table 1. RF Translator, Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
3. (Cont)	<p>e. Note the signal level on the rf vtv.</p> <p>f. Repeat steps d and e at each of the following frequencies:</p> <p>5.0 MHz 10.0 MHz 15.0 MHz 20.0 MHz 25.0 MHz 29.9 MHz</p>	<p>NLT -12.0 dB mW</p> <p>NLT -11.5 dB mW NLT -11.5 dB mW NLT -10.1 dB mW NLT -11.5 dB mW NLT -11.5 dB mW NLT -11.1 dB mW</p>	Same as test 2.
4. Receiver overload protection	<p>a. Connect an rf signal generator to J1 (RCV ANT jack on rear panel).</p> <p>b. Connect a dvm to P1-3. Note voltage.</p> <p>c. Set the rf signal generator and the receiver front panel frequency controls to 500 kHz.</p> <p>d. Increase the rf signal generator output level until the receive overload relay just clicks.</p> <p>e. Note rf output level of rf signal generator.</p> <p>f. Note dvm reading.</p> <p>g. Remove rf signal generator.</p>	<p>0 V</p> <p>1.4 to 1.9 V rms</p> <p>NLT +3.0 V dc</p>	<p>Check Q1, K1, and associated circuits.</p> <p>Same as step b.</p> <p>Check K1 and associated output circuit.</p>
5. Receive AGC (Cont)	<p>a. Remove rf translator from extenders and install it in unit.</p> <p>b. Remove channel A if. Install it on extender card and place it in unit.</p> <p>c. Connect an rf signal generator to J1 (RCV ANT jack on rear panel).</p> <p>d. Connect an rf vtv (with high impedance probe) to J3 (A8J1).</p> <p>e. Set front panel AGC switch to OFF.</p> <p>f. Set the rf signal generator and receiver front panel frequency controls to 15.0000 MHz.</p> <p>g. Set the rf signal generator level at -30 dB mW.</p> <p>h. Note the signal level on the rf vtv.</p> <p>i. Set front panel AGC switch to FAST.</p> <p>j. Increase rf signal generator level until reference on rf vtv is reached.</p>	Reference	

Table 1. RF Translator, Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
5. (Cont)	<p>k. Note increase in rf signal generator level.</p> <p>l. Remove channel A if from extenders and install it in unit.</p> <p>m. Remove rf translator. Install it on extender card and place it in unit.</p>	37 to 43 dB	Check CR19, CR20, CR22, CR23, and associated circuits.
6. Filter ripple	<p>a. Connect an rf signal generator to J1 (RCV ANT jack on rear panel).</p> <p>b. Connect an rf vtvm (with 50-Ω load) to J3.</p> <p>c. Set the rf signal generator and receiver front panel frequency controls to 15.0000 MHz.</p> <p>d. Set the rf signal generator level for -10-dB mW rf vtvm reading.</p> <p>e. Adjust the rf signal generator down to 14.9970 MHz and up to 15.0030 MHz while noting the variation in the rf vtvm reading.</p> <p>f. Adjust the rf signal generator down to 14.9940 MHz and up to 15.0060 MHz while noting the variation in the rf vtvm reading.</p>	<p>Reference</p> <p>NMT 0.7-dB variation</p> <p>NMT 5.0-dB variation</p>	<p>Check M1, FL14, and associated circuits. If only slightly out of tolerance, adjustment of L24 and L20 may remedy indication.</p> <p>Same as step e.</p>
7. Receiver intermodulation, 3rd order products	<p>a. Connect two rf signal generators to rf translator as shown in figure 4.</p> <p>b. Set one rf signal generator to 6.1015 MHz.</p> <p>c. Set the second rf signal generator to 9.1015 MHz.</p> <p>d. Using the rf vtvm (with 50-Ω load) connected at the output of the hybrid transformer, independently adjust each rf signal generator for -20-dB mW outputs.</p> <p>e. Connect the two-tone signal to J1 (RCV ANT jack on rear panel).</p> <p>f. Set the receiver front panel frequency controls to 3000.00 kHz.</p> <p>g. Slightly adjust (300 to 2000 Hz) the frequency of the 6.1015-MHz generator for a peak audio output (at A6TP2) as indicated on the audio voltmeter.</p> <p>h. Adjust the variable attenuator for 0-dB reference on the audio voltmeter.</p>	Reference	

(Cont)

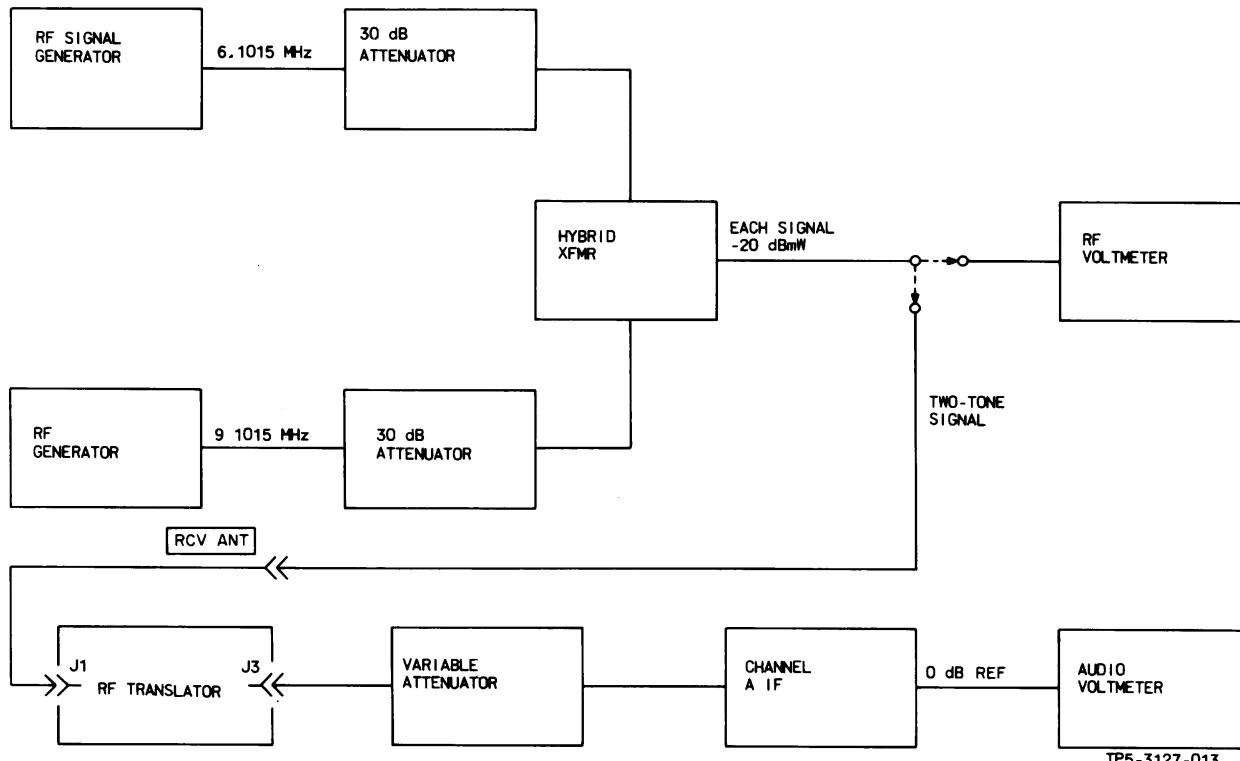
Table 1. RF Translator, Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
7. (Cont)	<p>Note</p> <p>Adjust variable attenuator for a 0-dB reference at point where AGC just begins to affect the audio output.</p> <ul style="list-style-type: none"> i. Note 6.1015-MHz rf signal generator output. j. Set the receiver front panel frequency controls to 6100.00 kHz. k. Slightly adjust the frequency of the 6.1015-MHz generator for a peak audio output as indicated on the audio voltmeter. l. Adjust the output level of the rf signal generator for 0-dB reference in step h on the audio voltmeter. m. Note the decrease in dB of the rf signal generator output from that referenced in step i. n. Repeat steps g through m with the receiver front panel frequency controls at each of the following settings: <p>12100.00 kHz 21300.00 kHz 24300.00 kHz</p>	<p>Reference</p> <p>NLT 83 dB down</p> <p>NLT 83 dB down</p> <p>NLT 83 dB down</p> <p>NLT 83 dB down</p>	<p>To repair, return to factory</p> <p>} Same as step m.</p>
8. Receiver intermodulation, 2nd order products	<ul style="list-style-type: none"> a. Connect two rf signal generators to rf translator as shown in figure 4. b. Set one rf signal generator to 6.1015 MHz. c. Set the second rf signal generator to 9.1015 MHz. d. Using the rf vtv (with $50-\Omega$ load) connected at the output of the hybrid transformer, independently adjust each rf signal generator for -20-dB mW outputs. e. Connect the two-tone signal to J1 (RCV ANT jack on rear panel). f. Set the receiver front panel frequency controls to 3000.00 kHz. g. Slightly adjust (300 to 2000 Hz) the frequency of the 6.1015-MHz generator for a peak audio output (at A6TP2) as indicated on the audio voltmeter. h. Adjust the variable attenuator for 0-dB reference on the audio voltmeter. 	Reference	

(Cont)

Table 1. RF Translator, Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
8. (Cont)	<p>Note</p> <p>Adjust variable attenuator for a 0-dB reference at point where AGC just begins to affect the audio output.</p> <p>i. Note 6.1015-MHz rf signal generator output.</p> <p>j. Set the receiver front panel frequency controls to 6100.00 kHz.</p> <p>k. Slightly adjust the frequency of the 6.1015-MHz generator for a peak audio output as indicated on the audio voltmeter.</p> <p>l. Adjust the output level on the rf signal generator for 0-dB reference in step h on the audio voltmeter.</p> <p>m. Note the decrease in dB of the rf signal generator output from that referenced in step i.</p> <p>n. Repeat steps g through m with the receiver front panel frequency controls at 15 200.00 kHz.</p>	<p>Reference</p> <p>NLT 70 dB down</p> <p>NLT 70 dB down</p>	<p>To repair, return to factory.</p> <p>Same as step m.</p>

Receive Intermodulation Test Setup
Figure 4

4. ALIGNMENT/ADJUSTMENT

4.1 Receiver Alignment (*Adjustment of T3, L24, L26, and L29*)

- a. Connect an rf signal generator through a 6-dB load to J1 (RCV ANT jack on rear panel).
- b. Connect an rf vtvm (with 50- Ω load) to J3.
- c. Set input to J1 at 15.0000 MHz and -30 dB mW.
- d. Set front panel controls for 15 000.0 kHz.
- e. Set R68 (receive gain) at full counterclockwise position.
- f. Adjust T3, L24, L26, and L29 for maximum output, as indicated by vf vtvm.
- g. Perform step f a minimum of three times.

4.2 Mixer Balance (*Adjustment of R31*)

- a. Use a dvm with a 10- μ H choke in series with a test probe to measure voltage readings at T2-2 and T2-5 to ground.
- b. Adjust R31 for equal dc voltage reading at T2-2 and T2-5 to ground.

4.3 Injection Level Adjustment (*Adjustment of T4*)

- a. Connect an rf vtvm (set to 10-V scale) between T2-1 and ground.
- b. Vary input frequency from 2.0 to 29.9 MHz, and note that voltage varies between 3.0 and 7.0 V rms and that the higher voltage readings occur between 27 and 29.9 MHz.
- c. If voltage exceeds the limits of step b or is higher at other than 27 to 29.9 MHz, adjust slug of T4 to achieve the desired levels.

4.4 Translator Gain Adjustment (*Adjustment of R68, T1, and T2*)

- a. Set the rf signal generator for 15.000 00 MHz at -30 dB mW and the front panel frequency controls to 15 000.00 kHz.
- b. Connect an rf vtvm (with 50- Ω load) to J3.
- c. Adjust R68 for -10-dB mW reading on the rf vtvm.
- d. Set the rf signal generator for 29.9000 MHz at -30 dB mW and the front panel frequency controls to 15 000.00 kHz.
- e. Using a pointed plastic tool, carefully adjust the leads and windings of T1 and T2 for maximum reading on the rf vtvm.

Note

The objective is to make the output at 29.900 00 MHz as large as possible with an output difference between 29.900 00 and 15.000 00 MHz of not more than 1.0 dB.

- f. Repeat steps c, d, and e until no improvement is possible.

4.5 Final Noise Balance (*Adjustment of R31*)

- a. Set the front panel frequency controls for 15 000.00 kHz and disconnect the rf signal generator.
- b. Connect an audio voltmeter to the channel A if SSB audio output. Reference the background noise level on the audio voltmeter.
- c. Adjust R31 (20-turn potentiometer) for a minimum noise level. Make this adjustment very slowly to assure a true minimum.

4.6 T1 and T2 Position Fixing

Note

If T1 and T2 require position fixing, it is recommended that the rf translator be returned to the factory. If field repair of T1 and T2 is desired, the following procedures may be used. Do not make these adjustments unless repair has been made to the T1 and/or T2 area of the rf translator.

- a. Set the rf signal generator for 29.900 00 MHz at -24 dB mW and the front panel frequency controls to 15 000.00 kHz.
- b. Connect an rf vtvm (with 50- Ω load) to J3. Reference the rf vtvm reading.
- c. Using a pipe cleaner, carefully apply a very thin coat of Q-Max to the windings of T1 and T2 and the support rods that hold T1 and T2 in position.
- d. After Q-Max is applied, it may be necessary to slightly readjust wires for maximum output. Refer to paragraph 4.4.

5. REPAIR

Repair of the rf translator module is accomplished using standard maintenance and planar card repair procedures. Refer to the maintenance section of this instruction book for planar card repair procedures.

6. PARTS LIST/DIAGRAMS

This paragraph assists in identification, requisition, and issuance of parts and in maintenance of the equipment. A parts location illustration, schematic diagram, parts list tabulation, and modification history are included in the schematic diagram, figure 4. The parts location illustration is a design engineering drawing that shows exact component placement on the circuit cards.

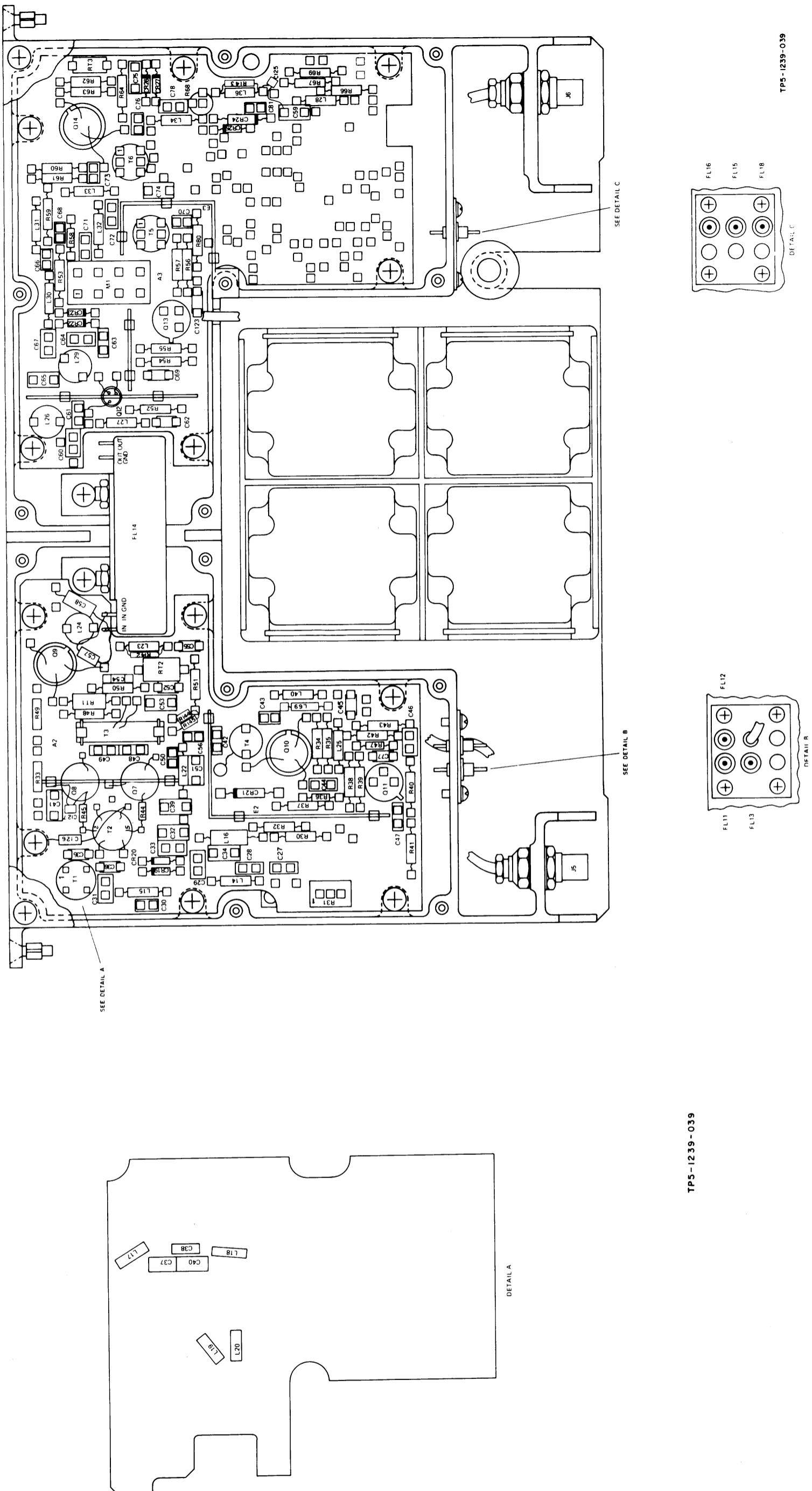
Use the reference designator indicated on schematic and parts location diagram to locate parts in the parts list tabulation. The Collins part number and description are listed for each reference designator.

Modifications are identified by an alphanumeric identifier assigned to each design change. These identifiers are referenced in the DESCRIPTION column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change. Each change relates to the revision identifier (REV) stamped on the circuit card/subassembly and is listed

in the EFFECTIVITY column of the modification history.

Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

<u>CIRCUIT CARD/ SUBASSEMBLY</u>	<u>COLLINS PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Rf translator module	637-1767-001	REV P
Rf translator module	637-1767-002	REV P
Rf filter board A1	635-0780-002	REV H
First mixer board A2	635-0782-002	REV L
Second mixer board A3	635-0784-002	REV J

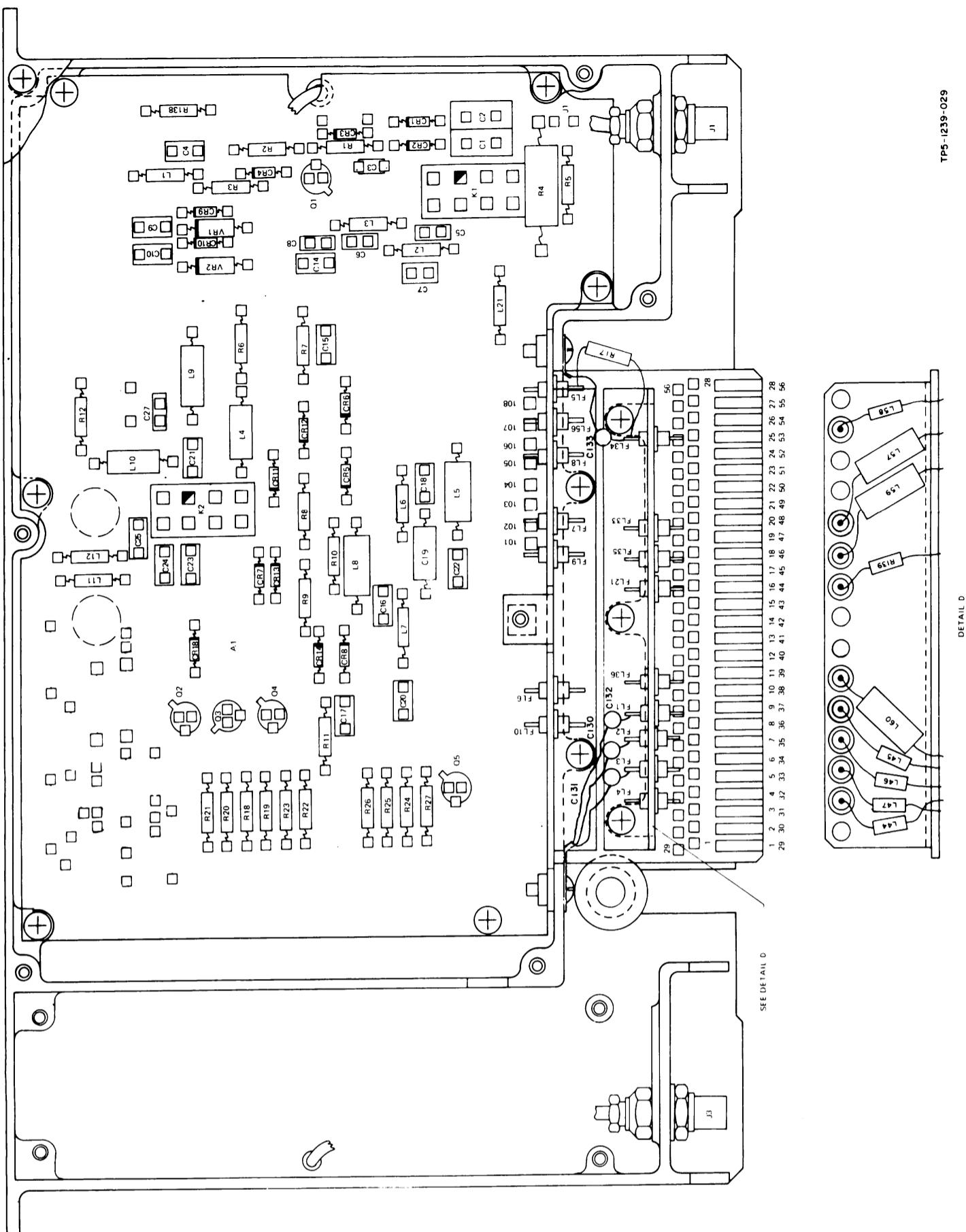


PARTS LIST

REF DES	DESCRIPTION	COLLINS PART NO	USABLE ON CODE
RF TRANSLATOR 637-1767-01			
A1	RF FILTER BOARD	635-0780-002	745-0710-000
A2	FIRST MIXER BOARD	635-0762-002	745-0713-000
A3	SECOND MIXER BOARD	635-0784-002	745-0719-000
C1-C56	NOT USED		
C57	CAPACITOR, FWD, MICA DIEL, 560F, 5%, 50V (B3)	912-441-310	A
C58	CAPACITOR, FWD, MICA DIEL, 680F, 5%, 50V (B3)	912-441-330	A
C59-C125	NOT USED	912-441-280	
C1	CAPACITOR, TEST SELECT		
C126	CAPACITOR, FWD, MICA DIEL, 2pF, ±0.5pF, 300V	912-441-540	
C126	CAPACITOR, FWD, MICA DIEL, 3pF, ±0.5pF, 300V	912-441-070	
C126	CAPACITOR, FWD, MICA DIEL, 4pF, ±0.5pF, 300V	912-441-080	
C126	CAPACITOR, FWD, MICA DIEL, 5pF, ±0.5pF, 300V	912-441-010	
C126	CAPACITOR, FWD, MICA DIEL, 6pF, ±0.5pF, 300V	912-441-090	
C127	CAPACITOR, TEST SELECT		
(A8)	CAPACITOR, FWD, MICA DIEL, 1pF, ±0.5pF, 300V	912-441-060	
C127	CAPACITOR, FWD, MICA DIEL, 2pF, ±0.5pF, 300V	912-441-540	
C127	CAPACITOR, FWD, MICA DIEL, 3pF, ±0.5pF, 300V	912-441-070	
C127	CAPACITOR, FWD, MICA DIEL, 4pF, ±0.5pF, 300V	912-441-080	
C127	CAPACITOR, FWD, MICA DIEL, 5pF, ±0.5pF, 300V	912-441-090	
C127	CAPACITOR, FWD, MICA DIEL, 6pF, ±0.5pF, 300V	912-441-090	
C130-C132	CAPACITOR, FWD, ELCTLT, 2.2μF, 20%, 25V (B1)	184-9102-220	A
C130-C132	CAPACITOR, FWD, ELCTLT, 2.2μF, 20%, 25V	184-9102-220	B
C133	CAPACITOR, FWD, ELCTLT, 22μF, 20%, 25V	184-9102-080	A
C133	CAPACITOR, FWD, ELCTLT, 22μF, 20%, 25V	184-9102-080	B
FL1-FL13	FILTER, RAD INTR, 1750pF	293-222-030	A
FL14	FILTER, BP, 10.9-35 MHZ	293-1330-010	B
FL14	FILTER, BP, 10.9-35 MHZ	241-5006-010	
FL15, FL16	FILTER, RAD INTR, 1750pF	L11-L12	
FL17	NOT USED	L13-L20	
FL18	FILTER, RAD INTR, 1750pF	L21	
FL19, FL20	NOT USED	Q1-Q2	
FL21	FILTER, RAD INTR, 1750pF	Q3-Q5	
FL22-FL32	NOT USED	R1	
FL33-FL36	FILTER, RAD INTR, 1750pF	R2	
FL37-FL55	NOT USED	R3	
FL56	FILTER, RAD INTR, 1750pF	R4	
J1	CONNECTOR, RFCT, ELEC	R4	
J2	NOT USED	R5	
J3	CONNECTOR, RFCT, ELEC	R6	
J4	NOT USED	R7	
J5-J6	CONNECTOR, ROPT, ELEC	R8, R9	
L1-L43	NOT USED	R10	
L44-L47	COIL, RF, 220μH	R11	
L48-L56	NOT USED	R12	
L57	COIL, RF, 12μH	R13-R17	
L58	COIL, RF, 470μH (B1)	240-2711-210	A
L58	COIL, RF, 120μH	240-2715-380	
L59-L60	NOT USED	R20	240-1602-000
Q1-Q8	TRANSISTOR, FET, U322 (TEST SELECT)	637-9117-002	
Q9	TRANSISTOR, FET, U322 (TEST SELECT)	637-9117-002	
Q10	TRANSISTOR, 2N5109	352-0766-010	
Q11-Q13	NOT USED	352-0766-010	
R14	TRANSISTOR, 2N5109	352-0766-010	
R15-R16	NOT USED	352-0766-010	
R17	RESISTOR, FWD, CMPSN, 4.7kΩ, 10%, 1/4W	745-0773-000	
R18-R38	NOT USED	745-0773-000	
R19	RESISTOR, FWD, CMPSN, 180Ω, 10%, 1/4W (A11)	745-0722-000	A
R20	RESISTOR, FWD, CMPSN, 180Ω, 10%, 1/4W (A11)	745-0722-000	A
R21	RESISTOR, FWD, CMPSN, 2.2kΩ, 10%, 1/4W	745-0773-000	
R22	RESISTOR, FWD, CMPSN, 3.3kΩ, 10%, 1/4W	745-0761-000	
R23	RESISTOR, FWD, CMPSN, 4.7kΩ, 10%, 1/4W	745-0773-000	
R24	RESISTOR, FWD, CMPSN, 1.2kΩ, 10%, 1/4W	745-0752-000	
R25	RESISTOR, FWD, CMPSN, 3.3kΩ, 10%, 1/4W	745-0767-000	
R26	RESISTOR, FWD, CMPSN, 4.7kΩ, 10%, 1/4W	745-0773-000	
R27	RESISTOR, FWD, CMPSN, 1.2kΩ, 10%, 1/4W	745-0752-000	
R28	NOT USED	745-0773-000	
R29	RESISTOR, FWD, CMPSN, 4.7kΩ, 10%, 1/4W	745-0773-000	
R30	RESISTOR, FWD, CMPSN, 3.3kΩ, 10%, 1/4W	745-0773-000	
R31	RESISTOR, VAR, 1kΩ, 5%, 3/4W	745-0773-000	
R32	RESISTOR, FWD, FILM, 220Ω, 1%, 1/8W	745-0773-000	
R33	RESISTOR, FWD, FILM, 681Ω, 1%, 1/8W	745-0773-000	
R34	RESISTOR, FWD, CMPSN, 4.7Ω, 5%, 1/4W	745-0773-000	
R35	RESISTOR, FWD, CMPSN, 3.3kΩ, 10%, 1/4W	745-0773-000	
R36	RESISTOR, SEMICOND DEVICE, 1N733A	353-2714-000	

PARTS LIST (Cont)

REF DES	DESCRIPTION	COLLINS PART NO	USABLE ON CODE
RESISTOR, TEST SELECT			
R139	RESISTOR, FWD, CMPSN, 82Ω, 10%, 1/4W	745-0710-000	
R139	RESISTOR, FWD, CMPSN, 100Ω, 10%, 1/4W	745-0713-000	
R139	RESISTOR, FWD, CMPSN, 150Ω, 10%, 1/4W	745-0719-000	
R139	RESISTOR, FWD, CMPSN, 270Ω, 10%, 1/4W	745-0722-000	
C1	CAPACITOR, FWD, MICA DIEL, 27pF, 5%, 50V	745-0728-000	
C2	CAPACITOR, FWD, MICA DIEL, 180pF, 5%, 500V	912-441-140	
C3	CAPACITOR, FWD, MICA DIEL, 330pF, 5%, 500V	912-441-540	
C4	CAPACITOR, FWD, CER DIEL, 0.1μF, 20%, 50V	913-3279-200	
C5	CAPACITOR, FWD, MICA DIEL, 3pF, ±0.5pF, 300V	912-441-070	
C6	CAPACITOR, FWD, MICA DIEL, 18pF, ±0.5pF, 100V	912-441-070	
C7	CAPACITOR, FWD, MICA DIEL, 20pF, 5%, 500V	912-441-070	
C8	CAPACITOR, FWD, MICA DIEL, 51pF, 5%, 50V	912-441-360	
C9, C10	CAPACITOR, FWD, CER DIEL, 0.1μF, 20%, 50V	913-3279-200	
C11-C13	NOT USED	912-441-010	
C14-C17	CAPACITOR, FWD, CER DIEL, 0.1μF, 20%, 50V	912-441-010	
C18	CAPACITOR, FWD, CER DIEL, 0.15μF, 20%, 50V	912-441-010	
C19	CAPACITOR, FWD, PLST CER DIEL, 0.015μF, 10%, 100V	913-3279-200	
C20	CAPACITOR, FWD, CER DIEL, 3300pF, 10%, 100V	913-3279-200	
C21-C22	CAPACITOR, FWD, CER DIEL, 0.1μF, 20%, 50V	913-3279-200	
C23	CAPACITOR, FWD, CER DIEL, 330pF, 20%, 50V	913-3279-200	
C24	CAPACITOR, FWD, CER DIEL, 0.1μF, 20%, 50V	913-3279-200	
C25	CAPACITOR, FWD, CER DIEL, 3300pF, 10%, 100V	913-3279-200	
C26	CAPACITOR, FWD, CER DIEL, NOT USED	913-3279-170	
C27	CAPACITOR, FWD, MICA DIEL, 100pF, 5%, 50V	912-441-050	
K1, K2	RELAY, AMT	912-4065-090	
L1	COIL, RF, 220μH	240-2723-060	
L2, L3	COIL, RF, 0.35μH	240-2745-010	
L4	COIL, RF, 220μH	240-2524-000	
L5	COIL, RF, 1000μH	240-2540-000	
L6, L7	COIL, RF, 27μH	240-2540-000	
L8, L9	COIL, RF, 1000μH	240-2540-000	
L10	COIL, RF, 220μH	240-2524-000	
L11, L12	COIL, RF, 220μH	240-2715-190	
L13-L20	NOT USED	912-441-050	
L21	COIL, RF, 220μH	240-2723-060	
Q1-Q2	TRANSISTOR, 2N2222A	352-0661-020	
Q3-Q5	TRANSISTOR, 2N2907A	352-0551-010	
R1	RESISTOR, FWD, CMPSN, 2.7kΩ, 10%, 1/4W	745-0784-000	
R2	RESISTOR, FWD, CMPSN, 68kΩ, 10%, 1/4W	745-0815-000	
R3	RESISTOR, FWD, CMPSN, 1kΩ, 10%, 1/4W	745-0749-000	
R4	RESISTOR, FWD, CMPSN, 2.2kΩ, 10%, 1W (B2)	745-3366-000	
R5	RESISTOR, FWD, CMPSN, 15kΩ, 10%, 1W	745-3401-000	
R6	RESISTOR, FWD, CMPSN, 47Ω, 10%, 1/4W	745-0701-000	
R7	RESISTOR, FWD, CMPSN, 82Ω, 10%, 1/4W	745-0710-000	
R8, R9	RESISTOR, FWD, CMPSN, 1kΩ, 10%, 1/4W	745-0749-000	
R10	RESISTOR, FWD, CMPSN, 27Ω, 10%, 1/4W	745-0692-000	
R11	RESISTOR, FWD, CMPSN, 68Ω, 10%, 1/4W	745-0707-000	
R12	RESISTOR, FWD, CMPSN, 82Ω, 10%, 1/4W	745-0749-000	
R13	RESISTOR, FWD, CMPSN, 1kΩ, 10%, 1/4W	745-0749-000	
R14	RESISTOR, FWD, CMPSN, 27Ω, 10%, 1/4W	745-0692-000	
R15	RESISTOR, FWD, CMPSN, 68Ω, 10%, 1/4W	745-0707-000	
R16	RESISTOR, FWD, CMPSN, 82Ω, 10%, 1/4W	745-0749-000	
R17	RESISTOR, FWD, CMPSN, 1kΩ, 10%, 1/4W	745-0749-000	
R18			



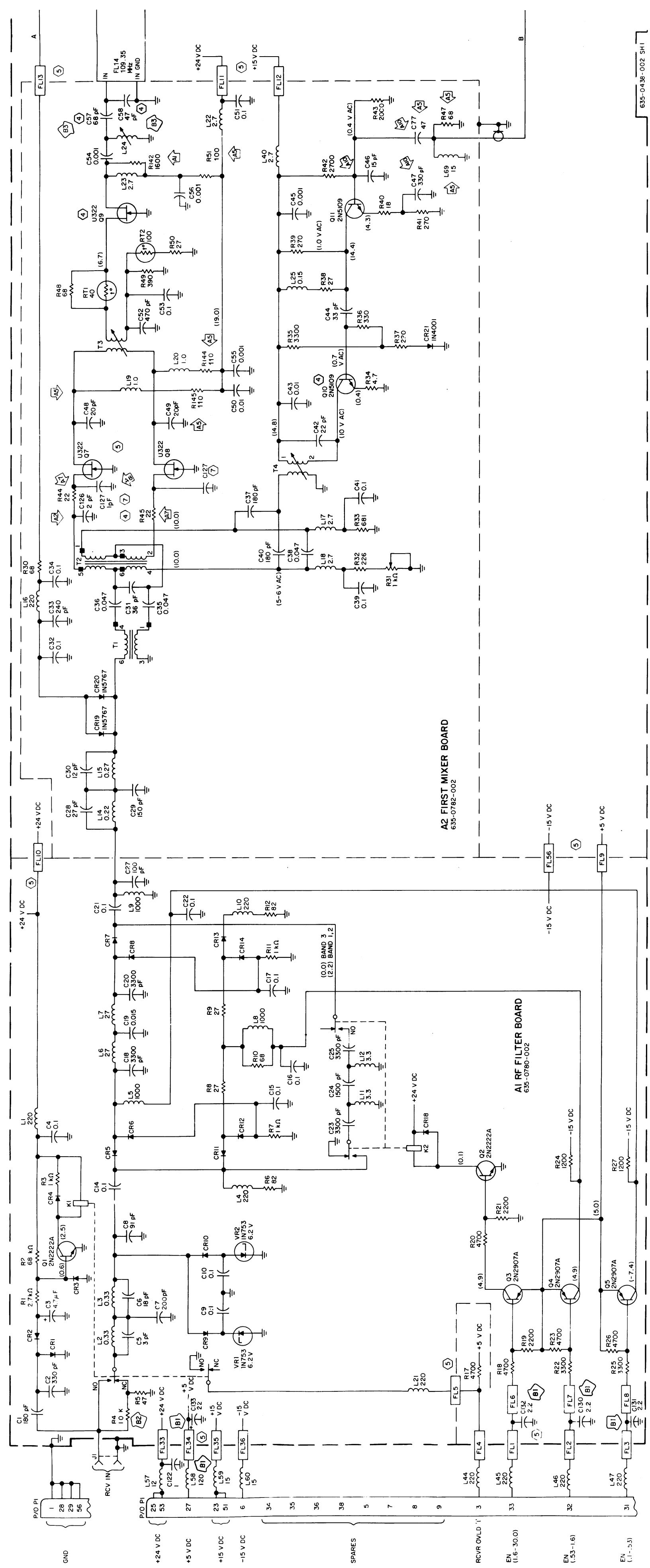
RF Translator, Schematic Diagram
Figure 5 (Sheet 3)

PARTS LIST (Cont)

REF DES	DESCRIPTION	COLLINS PART NO	USABLE ON CODE
R37	RESISTOR, FXD, CMPSN 270Ω, 10%, 1/4W	745-0728-000	242-0439-020
R38	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0692-000	240-2028-000
R39	RESISTOR, FXD, CMPSN, 270Ω, 10%, 1/4W	745-0728-000	240-2040-000
R40	RESISTOR, FXD, CMPSN, 18Ω, 10%, 1/4W	745-0686-000	240-2013-000
R41	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0728-000	240-2017-000
R42	RESISTOR, FXD, CMPSN, 1.5kΩ, 10%, 1/4W	745-0764-000	240-2016-000
R43	RESISTOR, FXD, CMPSN, 18Ω, 10%, 1/4W	745-0755-000	A3C73 from 0.01μF to 0.1μF.
R44, R45	RESISTOR, FXD, CMPSN, 18Ω, 10%, 1/8W (A7)	745-2277-000	A3C73 from 0.39μH to 0.32μH.
R44, R45	RESISTOR, FXD, CMPSN, 22Ω, 5%, 1/8W	745-1663-090	A3R80 from 47Ω to 68Ω.
R46	NOT USED		
R47	RESISTOR, FXD, CMPSN, 82Ω, 10%, 1/8W (A5)	745-2301-000	Added A3C125, 47Ω/0.5F.
R47	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/8W	745-2298-000	Added A3R143, 22Ω.
R48	RESISTOR, FXD, CMPSN, 68Ω, 10%, 1/4W	745-0764-000	Changed:
R49	RESISTOR, FXD, CMPSN, 39Ω, 10%, 1/4W	745-0734-000	A3C61 from 33pF to 27pF.
R50	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0692-000	A3C73 from 0.01μF to 0.1μF.
R51	RESISTOR, FXD, CMPSN, 47Ω, 10%, 1/4W (A5)	745-0713-000	A3C73 from 0.39μH to 0.32μH.
R51	NOT USED		
R52-R141	RESISTOR, FXD, CMPSN, 2.2kΩ, 5%, 1/8W (A1)	745-1663-570	
R142	NOT USED		
R143	RESISTOR, FXD, CMPSN, 110Ω, 5%, 1/8W (A5)	745-1863-280	635-0782-002.
T1	TRANSFORMER, RF	278-0430-190	REV F and above
T2	TRANSFORMER, RF	278-0430-190	REV F and above
T3	TRANSFORMER, RF	278-0431-020	REV F and above
T4	TRANSFORMER, RF	278-0431-010	REV F and above
SECOND MIXER BOARD A3 633-0784-002			
CR1-CR21	NOT USED		
CR22, CR23	SEMICOND DEVICE, 1N5767	922-6119-010	
CR24	SEMICOND DEVICE, 1N4001 (A3)	353-6442-010	
CR25	SEMICOND DEVICE, 1N4454 (A3)	353-3644-010	
CR26, CR27	SEMICOND DEVICE, 1N5767	922-6119-010	
C1-C58	NOT USED		
C59	CAPACITOR, FXD, CER DIEL, 0.1μF, 20%, 50V	913-3279-200	
C60	CAPACITOR, FXD, MICA DIEL, 350pF, 5%, 50V	912-4141-220	
C61	CAPACITOR, FXD, MICA DIEL, 350pF, 5%, 50V	912-4141-180	
C62	CAPACITOR, FXD, CER DIEL, 1000pF, 10%, 200V	912-4141-180	
C63	CAPACITOR, FXD, MICA DIEL, 150pF, ±0.5pF, 300V	912-4141-130	
C64	CAPACITOR, FXD, MICA DIEL, 110pF, 5%, 50V	912-4141-370	
C65	CAPACITOR, FXD, CER DIEL, 1000pF, 10%, 200V	913-4018-000	
(A6)	CAPACITOR, FXD, CER DIEL, 0.01μF, 20%, 50V	912-4141-450	
C66	CAPACITOR, FXD, MICA DIEL, 220pF, 5%, 50V	913-3279-110	
C67	CAPACITOR, FXD, CER DIEL, 1000pF, 10%, 200V	913-3279-110	
C68	CAPACITOR, FXD, CER DIEL, 0.01μF, 20%, 50V	913-4018-000	
C69	CAPACITOR, FXD, CER DIEL, 0.01μF, 20%, 50V	913-3279-110	
C70	CAPACITOR, FXD, CER DIEL, 0.01μF, 20%, 50V	912-4141-320	
C71	CAPACITOR, FXD, MICA DIEL, 150pF, 5%, 50V	912-4141-400	
C72	CAPACITOR, FXD, CER DIEL, 0.01μF, 20%, 50V	913-3279-110	
C73	CAPACITOR, FXD, CER DIEL, 0.1μF, 20%, 50V	913-3279-180	
C74, C75	CAPACITOR, FXD, CER DIEL, 0.1μF, 20%, 50V	913-3279-200	
C76	CAPACITOR, FXD, CER DIEL, 0.01μF, 20%, 50V	913-3279-110	
C77	NOT USED		
C78	CAPACITOR, FXD, CER DIEL, 0.01μF, 20%, 50V	912-4141-160	
C79, C80	NOT USED		
C81	CAPACITOR, FXD, CER DIEL, 0.01μF, 20%, 50V	913-3279-110	
C82-C122	NOT USED		
C123	CAPACITOR, FXD, MICA DIEL, 27pF, 5%, 50V	912-4141-180	
(A4)	CAPACITOR, FXD, CER DIEL, 1000pF, 10%, 200V	913-4018-000	
C123	CAPACITOR, FXD, CER DIEL, 1000pF, 10%, 200V	913-4018-000	
C124	NOT USED		
C125	CAPACITOR, FXD, CER DIEL, 4700pF, 20%, 50V	913-3279-090	
(A4)	CAPACITOR, FXD, CER DIEL, 4700pF, 20%, 50V	913-3279-090	
L1-L25	NOT USED		
L26	COIL, RF, VAR	242-0439-020	
L27	COIL, RF, 2.70μH	240-2028-000	
L28	COIL, RF, 22μH	240-2039-000	

PARTS LIST (Cont)

REF DES	DESCRIPTION	COLLINS PART NO	USABLE ON CODE
A4	Deleted A3136, 220μH (replaced with A3R143).	242-0439-020	635-0784-002.
R37	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0692-000	REV C and above
R38	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0728-000	Added A3C125, 47Ω/0.5F.
R39	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0686-000	Added A3R143, 22Ω.
R40	RESISTOR, FXD, CMPSN, 18Ω, 10%, 1/4W	745-0728-000	Changed:
R41	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0764-000	A3C61 from 33pF to 27pF.
R42	RESISTOR, FXD, CMPSN, 1.5kΩ, 10%, 1/4W	745-0755-000	A3C73 from 0.01μF to 0.1μF.
R43	RESISTOR, FXD, CMPSN, 1.5kΩ, 10%, 1/4W	745-0755-000	A3C73 from 0.39μH to 0.32μH.
R44, R45	RESISTOR, FXD, CMPSN, 22Ω, 5%, 1/8W	745-1663-090	A3R80 from 47Ω to 68Ω.
R44, R45	RESISTOR, FXD, CMPSN, 22Ω, 5%, 1/8W	745-1663-090	
R46	NOT USED		
R47	RESISTOR, FXD, CMPSN, 82Ω, 10%, 1/8W (A5)	745-2301-000	
R47	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/8W	745-2298-000	
R48	RESISTOR, FXD, CMPSN, 68Ω, 10%, 1/4W	745-0764-000	
R49	RESISTOR, FXD, CMPSN, 39Ω, 10%, 1/4W	745-0734-000	
R50	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0692-000	
R51	RESISTOR, FXD, CMPSN, 47Ω, 10%, 1/4W (A5)	745-0713-000	
R51	NOT USED		
R52-R141	RESISTOR, FXD, CMPSN, 150Ω, 10%, 1/4W	745-1663-570	
R53	RESISTOR, FXD, CMPSN, 68Ω, 10%, 1/4W	745-0734-000	
R54	RESISTOR, FXD, CMPSN, 47Ω, 10%, 1/4W	745-0692-000	
R55	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0764-000	
R56, R57	RESISTOR, FXD, CMPSN, 56Ω, 10%, 1/8W	745-2295-000	
R58	RESISTOR, FXD, CMPSN, 56Ω, 10%, 1/4W	745-0704-000	
R59	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0737-000	
R60, R61	RESISTOR, FXD, CMPSN, 56Ω, 10%, 1/4W	745-0737-000	
R62	RESISTOR, FXD, CMPSN, 150Ω, 10%, 1/4W	745-0764-000	
R63	RESISTOR, FXD, CMPSN, 150Ω, 10%, 1/4W	745-0719-000	
R64	NOT USED		
R65	RESISTOR, FXD, CMPSN, 1kΩ, 10%, 1/4W (A3)	745-0749-000	
R66, R67	RESISTOR, VAR, 100Ω, 30%, 1/2W	382-0008-040	
R68	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0728-000	
R69	NOT USED		
R70-R79	RESISTOR, FXD, CMPSN, 82Ω, 10%, 1/4W (A4)	745-0710-000	
R80	RESISTOR, FXD, CMPSN, 68Ω, 10%, 1/4W	745-0764-000	
R81	RESISTOR, FXD, CMPSN, 27Ω, 10%, 1/4W	745-0764-000	
R82-R142	RESISTOR, FXD, CMPSN, 22Ω, 5%, 100pF	745-0788-000	
T1-T4	NOT USED		
T5	TRANSFORMER, RF	278-0430-170	
T6	TRANSFORMER, RF	278-0430-150	
B1	Added C130, 2.2μF, electrolytic.	635-0784-002,	EFFECTIVITY
B1	Added C131, 2.2μF, electrolytic.	635-0784-002,	
B1	Added C132, 2.2μF, electrolytic.	635-0784-002,	
B1	Added C133, 22μF, electrolytic.	635-0784-002,	
B1	Changed C134 from 0.33μH to 10.27μH.	635-0784-002,	
B1	REV G and above	635-0784-002,	
B1	REV H and above	635-0784-002,	
B1	REV K and above	635-0784-002,	
B1	REV L and above	635-0784-002,	
B2	Changed A1R4 from 220Ω to 120Ω.	635-0780-002	
B2	Changed A1R4 from 220Ω to 15kΩ.	635-0780-002	
B2	REV E and above	635-0780-002	
B3	Changed C57 from 56pF to 68pF.	637-1767-001	
B3	C58 from 56pF to 47pF.	637-1767-001	
B3	REV C and above	637-1767-001	
B3	REV D and above	637-1767-001	
B3	REV E and above	637-1767-001	
B3	REV F and above	637-1767-001	</td



RF Translator, Schematic Diagram
Figure 5 (Sheet 5)

