



**751x (VHF)
754x (UHF)
CONVENTIONAL
TWO-WAY RADIO**

**VHF 136-150 and 146-174 MHz
1 and 5 Watts, 9.6 VDC**

**UHF 400-430, 440-470, 470-500, and 490-512 MHz
1 and 4 Watts, 9.6 VDC**

Copyright ©1999 by the E.F. Johnson Company

E.F. Johnson Company, which was founded in 1923, designs, manufactures, and markets radio communication products, systems, and services worldwide. E.F. Johnson produces equipment for land mobile radio and mobiletelephone services which include business, industrial, government, public safety, and personal users.

Viking Head/EFJohnson® logo and Call Guard® are registered trademarks of the E.F. Johnson Company. Smartrunk II™ is a trademark of Smartrunk Systems Inc. All other company and/or product names used in this manual are trademarks and/or registered trademarks of their respective manufacturer.

Information in this manual is subject to change without notice.

TABLE OF CONTENTS

1 GENERAL INFORMATION

1.1	SCOPE OF MANUAL	1-1
1.2	TRANSCEIVER DESCRIPTION	1-1
1.3	PART NUMBER BREAKDOWN	1-1
1.4	TRANSCEIVER IDENTIFICATION	1-1
1.5	ACCESSORIES	1-1
1.6	PRODUCT WARRANTY	1-1
1.7	FACTORY CUSTOMER SERVICE	1-2
1.8	FACTORY RETURNS	1-3
1.9	REPLACEMENT PARTS	1-3
1.10	INTERNET HOME PAGE	1-3
1.11	INSTALLING OPTION UNIT	1-3
1.12	TWO-TONE DECODER SETUP	1-4
	Installation and Programming	1-4
	Setting Tone Frequencies	1-4
1.13	FIVE-TONE ENCODER/DECODER SETUP	1-5
	Installation and Programming	1-5
	Setting 5-Tone Deviation	1-5
1.14	RADIO DISASSEMBLY PROCEDURE	1-6
	Removing Chassis	1-6
	Removing Main Unit From Chassis	1-6
1.15	REVISION SUMMARY	1-7
	General	1-7
	Software Revisions	1-7
	VHF (7510) Hardware Revisions	1-7
	UHF (7540) Hardware Revisions	1-7
	SPECIFICATIONS	1-8

2 TRANSCEIVER OPERATION

2.1	TRANSCEIVER FEATURES	2-1
2.2	CONTROLS AND DISPLAY	2-1
2.3	GETTING STARTED	2-2
	Unpacking	2-2
	Antenna	2-2
	Belt Clip	2-2
	Turning Power On	2-2
	Changing Channel	2-2
	Adjusting Volume	2-3
2.4	BASIC OPERATION	2-3
	Receiving a Call	2-3
	Transmitting a Call	2-3
	Low Battery Indication	2-3
	Time-Out Timer	2-3
	Selective Calling	2-3
2.5	PROGRAMMABLE FUNCTIONS	2-4
	General	2-4
	Keypad Lock	2-4
	Priority Channel	2-4

	Scan	2-4
	Key Beep	2-4
	Monitor	2-4
	Talk-Around	2-5
	DTMF Transmission	2-5
	DTMF Redial	2-5
	High/Low Power Output	2-5
	Emergency Operation	2-5
	Display Lighting	2-5
2.6	BATTERY INFORMATION	2-5
	Battery Pack Replacement	2-5
	Miscellaneous Battery Information	2-6
	Using Battery Case	2-6
	Battery Charging Information	2-6
	Using Desktop Charger	2-7
	Using Multi-unit Charger	2-7
	Using Wall Charger	2-7
	Using Optional Cables	2-8
	Replacement Battery Pack	2-8

3 PROGRAMMING

3.1	GENERAL	3-1
	Programming Setup	3-1
	Programming Cable	3-1
	Programming Software	3-1
	Software Version Required	3-2
3.2	STARTING THE PROGRAM	3-2
3.3	SPECIAL KEYS AND FUNCTIONS	3-2
3.4	MENU FLOW	3-2
	Introduction	3-2
	File Menu	3-2
	Screen Menu	3-3
	Program Menu	3-3
	Print Menu	3-3
	Model Menu	3-4
	Setup menu	3-4
3.5	UNIQUE PMR (EUROPEAN) SCREENS	3-14
	General	3-14
	Unique PMR Screens	3-14
3.6	CLONING (PROGRAMMING ONE TRANSCEIVER WITH ANOTHER)	3-16

4 CIRCUIT DESCRIPTION

4.1	RECEIVER CIRCUIT	4-1
	Antenna Switching Circuit	4-1
	RF Circuit	4-1

TABLE OF CONTENTS (CONT'D)

First Mixer and First IF Circuit	4-1		
Second IF and Demodulator Circuits	4-1		
AF Circuit	4-2		
Squelch Circuit	4-2		
4.2 TRANSMITTER CIRCUITS	4-2		
Microphone Amplifier Circuit	4-2		
Modulation Circuit	4-2		
Drive/Power Amplifier Circuits	4-3		
Current Detector Circuit	4-3		
Power Detector (UHF Only)	4-3		
APC Circuit	4-3		
4.3 PLL CIRCUIT	4-4		
4.4 POWER SUPPLY CIRCUITS	4-4		
4.5 CPU PORT ALLOCATION	4-5		
4.6 OUTPUT EXPANDER IC10 ALLOCATIONS	4-5		
5 ADJUSTMENT PROCEDURE			
5.1 GENERAL	5-1		
Required Test Equipment	5-1		
Test Channels and Power Select	5-2		
Computer-Aided Tuning	5-2		
Reprogramming if EEPROM is Replaced or Error Occurs	5-3		
5.2 PRELIMINARY SETUP	5-3		
		<u>VHF MODELS</u>	
5.3 PLL ADJUSTMENT (VHF MODELS)	5-4		
5.4 TRANSMITTER ADJUSTMENTS (VHF MODELS)	5-4		
Reference Frequency	5-4		
Output Power Adjust	5-5		
FM Deviation Adjust	5-5		
DTCS Waveform Adjust	5-5		
5.5 RECEIVER ADJUSTMENTS (VHF MODELS)	5-5		
Bandpass Filter Adjust	5-5		
Squelch Adjust	5-6		
		<u>UHF MODELS</u>	
5.6 PLL ADJUSTMENT (UHF MODELS)	5-7		
5.7 TRANSMITTER ADJUSTMENTS (UHF MODELS)	5-7		
Reference Frequency	5-7		
Output Power Adjust	5-8		
FM Deviation Adjust	5-8		
DTCS Waveform Adjust	5-8		
5.8 RECEIVER ADJUSTMENTS (UHF MODELS)	5-9		
Bandpass Filter Adjust	5-9		
Squelch Adjust	5-10		
6 PARTS LIST			
VHF Main Unit Parts List	6-1		
UHF Main Unit Parts List	6-9		
VHF/UHF Chassis Parts	6-18		
VHF/UHF Exploded View	6-19		
Transistor and Diode Basing	6-20		
7 SCHEMATIC DIAGRAMS AND COMPONENT LAYOUTS			
7510 (VHF) MAIN UNIT			
Block Diagram	7-1		
Major Component Location Diagrams	7-7		
PC Board Top View	7-3		
PC Board Bottom View	7-4		
Schematic Diagram	7-8/7-9		
7540 (UHF) MAIN UNIT			
Block Diagram	7-2		
Major Component Location Diagrams	7-12		
PC Board Top View	7-5		
PC Board Bottom View	7-6		
Schematic Diagram	7-10/7-11		

TABLE OF CONTENTS (CONT'D)

LIST OF FIGURES

1-1	Option Unit Installation	1-3
1-2	Two-Tone Decoder Adjustment Points	1-4
1-3	Chassis Removal.	1-6
1-4	Main Unit Removal From Chassis	1-6
3-1	Programming Setup	3-1
3-2	Memory Channel Screen (PMR Models)	3-15
4-1	Second IF and Demodulator Circuits	4-2
4-2	APC Circuit.	4-3
4-3	PLL Circuit	4-4
5-1	Test Setup	5-1
5-2	Screen Display Example	5-2
5-3	VHF Adjustment Points	5-4
5-4	UHF PLL Adjustment Points	5-7
5-5	UHF Adjustment Points	5-9
7-1	7510 (VHF) Block Diagram	7-2
7-2	7540 (UHF) Block Diagram	7-3

LIST OF TABLES

1-1	75xx Accessories.	1-2
3-1	Memory Channel Screen Description (LMR Models)	3-4
3-2	Key and Display Assign Screen Description . . .	3-6
3-3	DTMF Autodial Screen Description	3-9
3-4	Continuous Tone Screen Description	3-9
3-5	Scan Function Screen Description	3-10
3-6	2-Tone Code Channel Screen Description	3-11
3-7	Common Screen Description	3-12
3-8	Expert Screen Description.	3-13
5-1	Test Frequencies	5-2
6-1	Transistor Information.	7-1
6-2	Diode Information.	7-1

SECTION 1 GENERAL INFORMATION

1.1 SCOPE OF MANUAL

This service manual contains operation, programming, alignment, and service information for the EFJohnson® 7510 and 7540 Falcon™ transceivers.

1.2 TRANSCEIVER DESCRIPTION

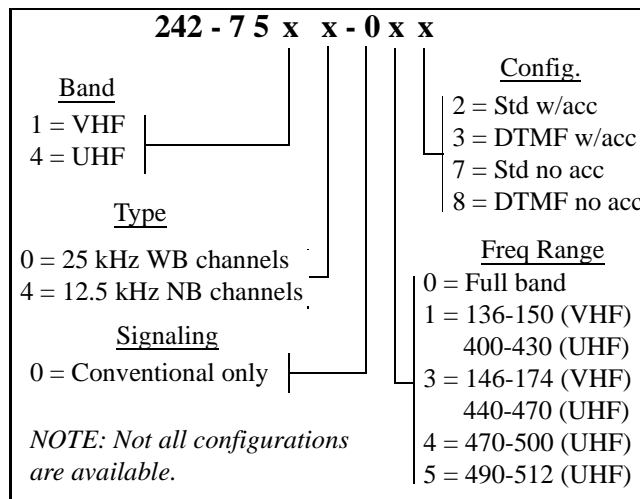
The Falcon™ 7500-series portable transceivers operate on conventional (non-trunked) channels. The 7510 operates in the VHF frequency range of 136-150 or 146-174 MHz, and the 7540 operates in the UHF frequency range of 400-430, 440-470, 470-500, or 490-512 MHz. Up to two banks of 16 channels can be programmed (32 total). Power output is user selectable for low and high levels. The VHF model power output is 1 and 5 watts, and the UHF model power output is 1 and 4 watts.

Standard and DTMF keypad versions of each model are also available. The standard version has 2 channel select keys and 5 programmable keys for a total of 7 keys. The DTMF (telephone) keypad version has 2 channel select keys, 12 DTMF keys, and 10 programmable keys for a total of 24 keys.

These transceivers are digitally synthesized and microprocessor controlled. Transceiver programming is performed using a PC-compatible computer, a special EFJohnson programming cable, and programming software (see Table 1-1). Part of the alignment procedure is also performed using this same hardware setup and special Adjust software included with the programming software (see Section 5).

1.3 PART NUMBER BREAKDOWN

The following is a breakdown of the part number used to identify this transceiver.



1.4 TRANSCEIVER IDENTIFICATION

The transceiver identification number is printed on a label that is attached to the chassis. The following information is contained in the identification number:

Model From P.N.	Revision Letter	Manufacture Date	Plant	Warranty Number
75xx	0 A	43 7	J	12345
8th Digit of P.N.	Week No. of Year	J = Japan Last Digit of Year		

1.5 ACCESSORIES

The accessories available for this transceiver are listed in Table 1-1.

1.6 PRODUCT WARRANTY

The warranty statement for this transceiver is available from your product supplier or from the Warranty Department, E.F. Johnson Company, 299 Johnson Avenue, P.O. Box 1249, Waseca, MN 56093-0514. This information may also be requested from the Warranty Department by phone as described in Section 1.7. The Warranty Department may also be

contacted for Warranty Service Reports, claim forms, or any other questions concerning warranties or warranty service.

1.7 FACTORY CUSTOMER SERVICE

The Customer Service Department of the E.F. Johnson company provides customer assistance on technical problems and the availability of local and factory repair facilities. Regular Customer Service hours are 7:30 a.m. - 5:30 p.m. Central Time, Monday - Friday. The Customer Service Department can be reached using one of the following telephone numbers:

Toll-Free: (800) 328-3911

(From within continental United States only)

International: (507) 835-6911

FAX: (507) 835-6969

E-Mail: First Initial/Last Name@efjohnson.com

(You need to know the name of the person you want to reach. Example: jsmith@efjohnson.com)

NOTE: Emergency 24-hour technical support is also available at the 800 and preceding numbers during off hours, holidays, and weekends.

When your call is answered at the E.F. Johnson Company, you will hear a brief message informing you of numbers that can be entered to reach various departments. This number may be entered during or after the message using a tone-type telephone. When you enter some numbers, another number is requested to further categorize the type of information you need.

You may also contact the Customer Service Department by mail. Please include all information that may be helpful in solving your problem. The mailing address is as follows:

E.F. Johnson Company
 Customer Service Department
 299 Johnson Avenue
 P.O. Box 1249
 Waseca, MN 56093-0514

Table 1-1 75xx Accessories

Accessory	Part No.
Battery pack, 1050 mAH, 9.6V	587-7500-105
Battery case for alkaline batteries	587-7500-120
Leather case w/D-swivel for std model	585-7500-124
Leather case w/D-swivel for DTMF model	585-7500-125
Belt loop w/D-swivel	023-8790-130
Belt clip, std (attaches to battery pack)	585-7500-028
Antenna, flexible	
136-150 MHz (A)	585-7500-051
146-174 MHz (B)	585-7500-053
400-430 MHz (C)	585-7500-041
440-470 MHz (D)	585-7500-043
Antenna jack adapter, to BNC	585-7500-028
Battery Chargers	
Wall charger, 12V/100 mA, 120VAC	585-7500-001
Wall charger, 12V/100 mA, 230VAC	585-7500-002
Desktop charger, single unit complete	
120 VAC	585-7500-011
230 VAC	585-7500-012
Replacement AC adapter for -011/-012 desktop charger	
120 VAC	585-7500-013
230 VAC	585-7500-014
Replacement charger cup for -011/-012 charger (w/adaptor spacer)	585-7500-018
Desktop charger, six unit (w/o pwr sply)	585-7500-005
Power supply for above charger (100-240 VAC, 50-60 Hz)	585-7500-006
Cigarette lighter charging cable	585-7500-027
Speaker/Microphone	589-7500-020
Earphone	589-7500-021
Headset, VOX one-touch PTT	589-7500-022
2-tone decoder kit	585-7500-025
5-tone kit	585-7500-026
Scrambler, Transcrypt® SC-20-4xx	SC20-4xx
Programming Accessories	
Programming software, 3-1/2 disk	585-7500-030
Programming cable, computer-xcvr	585-7500-031
Replication (cloning) cable	585-7500-033

1.8 FACTORY RETURNS

Repair service is normally available through local authorized EFJohnson Land Mobile Radio Service Centers. If local service is not available, the equipment can be returned to the factory for repair. However, it is recommended that you contact the Customer Service Department before returning equipment because a service representative may be able to suggest a solution to the problem so that return of the equipment would not be necessary.

Be sure to fill out a Factory Repair Request Form #271 for each unit to be repaired, whether it is in or out of warranty. These forms are available free of charge by calling Customer Service (see Section 1.7) or by requesting them when you send a unit in for repair. Clearly describe the difficulty experienced in the space provided and also note any prior physical damage to the equipment. Then include a form in the shipping container with each unit. Your telephone number and contact name are important because there are times when the technicians have specific questions that need to be answered in order to completely identify and repair a problem.

When returning equipment for repair, it is also a good idea to use a PO number or some other reference number on your paperwork in case you need to call the repair lab about your unit. These numbers are referenced on the repair order and it makes it easier and faster to locate your unit in the lab.

Return Authorization (RA) numbers are not necessary unless you have been given one by the Field Service Department. RA numbers are required for exchange units or if the Field Service Department wants to be aware of a specific problem. If you have been given an RA number, reference this number on the Factory Repair Request Form sent with the unit. The repair lab will then contact the Field Service Department when the unit arrives.

1.9 REPLACEMENT PARTS

Replacement parts can be ordered directly from the Service Parts Department. To order parts by phone, dial the toll-free number as described in Section 1.7. When ordering, please supply the part number and quantity of each part ordered. EFJohnson

dealers also need to give their account number. If there is uncertainty about the part number, include the designator (C512, for example) and the model number of the equipment the part is from.

You may also send your order by mail or FAX. The mailing address is as follows and the FAX number is shown in Section 1.7.

E.F. Johnson Company
Service Parts Department
299 Johnson Avenue
P.O. Box 1249
Waseca, MN 56093-0514

1.10 INTERNET HOME PAGE

The E.F. Johnson Company has a site on the World Wide Web that can be accessed for information on the company and such things as products, systems, and regulations. The address is <http://www.efjohnson.com>.

1.11 INSTALLING OPTION UNIT

To install options such as the two-tone or 5-tone decoder, refer to Figure 1-1 and proceed as follows:

1. Remove the rubber option cover by lifting it around the edge.
2. Remove and discard the foam block under the rubber cover.
3. Plug the option into J5 and replace the rubber cover.

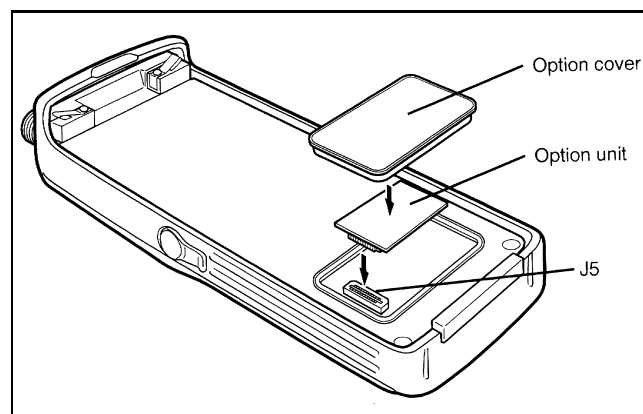


Figure 1-1 Option Unit Installation

TWO-TONE DECODER PART NO. 585-7500-025 SETUP INSTRUCTIONS

1.12 TWO-TONE DECODER SETUP

1.12.1 INSTALLATION AND PROGRAMMING

1. Remove the battery pack from the transceiver and install the decoder in the cavity under the rubber cover as described in Section 1.11.
2. Program the transceiver for operation with a two-tone decoder as described in Section 3. Screens that need to be programmed with two-tone decoder information are as follows. Refer to on-line help for more information on parameters in these screens (press F1 with parameter selected).

Model Menu - "LMR" must be selected (see Section 3.4.6).

Screen Menu - Select "2Tone Code CH" and program the information in the screen (see Table 3-6).

Screen Menu - Select "Memory Channel" and program the information under "2Tone Dec" for each channel on which the decoder will be used (see Table 3-1).

Screen Menu - Select "Key & Display Assign" and program a Monitor switch so that the decoder can be re-activated when the call is complete (see Table 3-2).

1.12.2 SETTING TONE FREQUENCIES

1. Connect an RF signal generator to the antenna jack. Set it to the frequency of a channel programmed for a two-tone decoder. Set the generator output level for 1000 μ V.
2. Set an audio generator to the first tone frequency and modulate the generator with this tone as follows:
 - 25 kHz Channel Spacing - ± 3.5 kHz deviation
 - 12.5 kHz Channel Spacing - ± 1.7 kHz deviation
3. Set the transceiver to the applicable channel and connect an oscilloscope to TP A (bare copper trace) on the two-tone board (see Figure 1-2).
4. Adjust R11 on the two-tone module for a maximum voltage signal on the oscilloscope (greater than 900 mV).
5. Set the audio generator to the second tone frequency and adjust R10 for maximum voltage (greater than 900 mV).
6. Verify proper decoder operation. Replace the rubber option cover.

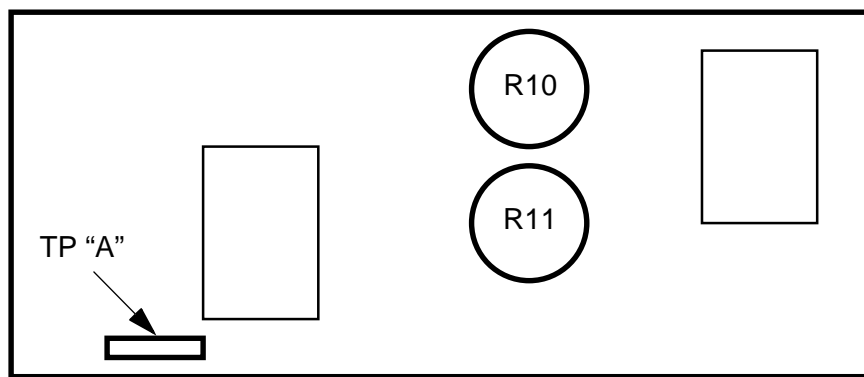


Figure 1-2 Two-Tone Decoder Adjustment Points

FIVE-TONE ENCODER/DECODER PART NO. 585-7500-026 SETUP INSTRUCTIONS

1.13 FIVE-TONE ENCODER/DECODER SETUP

1.13.1 INSTALLATION AND PROGRAMMING

1. Remove the battery pack from the transceiver and install the module in the cavity under the rubber cover as described in Section 1.11.
2. Program the transceiver for operation with a five-tone module as described in Section 3. Screens that need to be programmed with five-tone decoder information are as follows. Refer to on-line help for information on parameters in these screens (press F1 with parameter selected).

Model Menu - "PMR" must be selected (see Section 3.4.6).

Select the following in the Screen Menu:

- "Rx Code CH" and program the information in the screen (see Section 3.5.2).
- "Tx Code CH" and program the information in the screen (see Section 3.5.2).
- "5Tone Format" and program the information in the screen (see Section 3.5.2).
- "Memory CH" and program the parameters in this screen that are related to 5-Tone operation on the channel (see Figure 3-2).

NOTE: If performing the deviation adjustment in the next section, the long tone must be turned on in RPT/STN/ID on the Memory Channel screen.

- "Key & Display Assign" and program Tx Code and Call switches for use in transmitting 5-tone codes.

1.13.2 SETTING 5-TONE DEVIATION

The only adjustment on the 5-tone module is a potentiometer for setting the transmit tone deviation. This control is factory preset and should not require readjustment in the field. However, if adjustment is required, proceed as follows:

1. Monitor the transmit signal with a communications monitor. Set it for HPF = Off, LPF = 20 kHz, De-emphasis = Off, and Level = (P-P)/2.
2. Select a channel near the center of the band and turn a long tone on (see preceding "NOTE") by pressing the appropriate front panel key.
3. Adjust potentiometer R18 (DEV) on the 5-tone module for the following deviation:
 - 25 kHz Channel Spacing - ± 3.5 kHz
 - 20 kHz Channel Spacing - ± 2.8 kHz
 - 12.5 kHz Channel Spacing - ± 1.7 kHz
4. Check channels on each end of the operating band to make sure deviation is within the following limits. If not, repeat preceding adjustment.

- 25 kHz Channel Spacing - ± 3.0 to 5.0 kHz
- 20 kHz Channel Spacing - ± 2.4 to 4.0 kHz
- 12.5 kHz Channel Spacing - ± 1.5 to 2.5 kHz

TRANSCEIVER DISASSEMBLY INSTRUCTIONS

1.14 RADIO DISASSEMBLY PROCEDURE

1.14.1 REMOVING CHASSIS

Refer to Figure 1-3 and proceed as follows:

1. Remove nut "A" (see following note) and knob "B". Then remove two screws "C".

NOTE: A locking compound has been applied to the antenna jack spanner nut. To soften this compound, carefully apply moderate heat to the nut using a soldering iron or similar heat source.

2. Pull the chassis out in direction of arrow.
3. Unplug J6 to separate the chassis from the front panel.

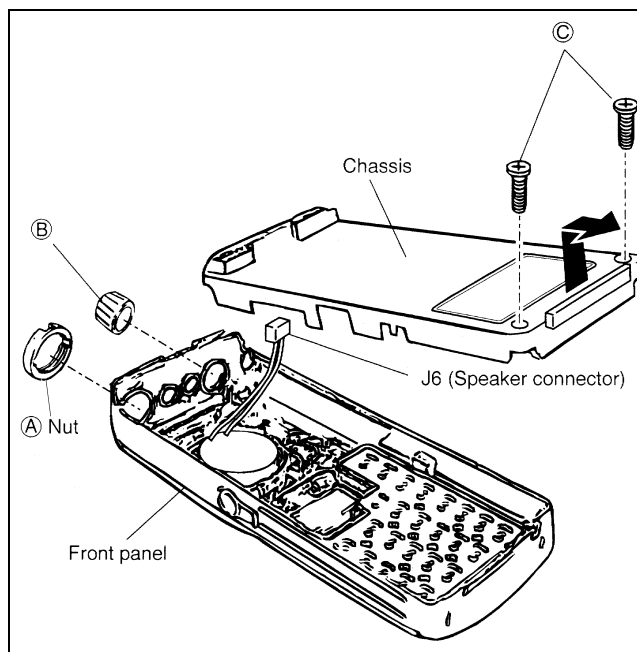


Figure 1-3 Chassis Removal

1.14.2 REMOVING MAIN UNIT FROM CHASSIS

Refer to Figure 1-4 and proceed as follows:

1. Remove the sealing rubber around the main unit.
2. Unsolder tabs located at "D".

3. Unscrew nut "E", two black screws "F", and six silver screws "G".
4. Pull the main unit out of the chassis in the direction indicated by the arrow.

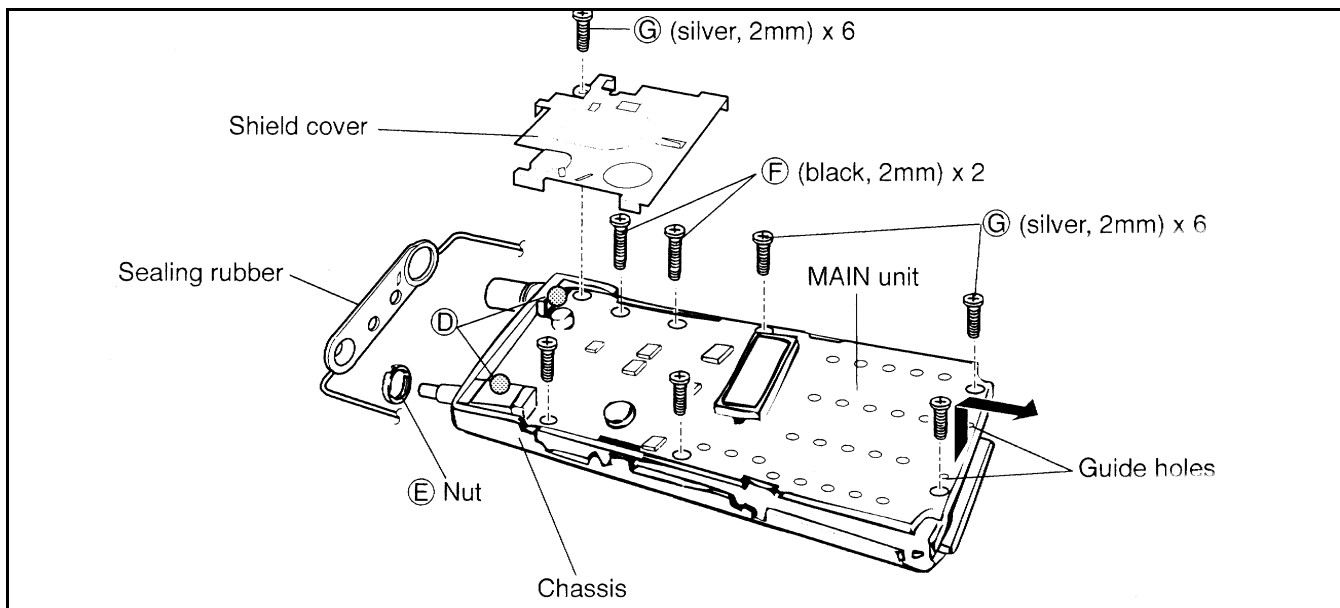


Figure 1-4 Main Unit Removal From Chassis

REVISION SUMMARY

1.15 REVISION SUMMARY

1.15.1 GENERAL

This service manual covers revisions made to the Falcon™ 751x/754x transceivers through July 1999. The following information summarizes these revisions.

1.15.2 SOFTWARE REVISIONS

New Operating Software

Beginning later in 1999, transceivers containing a new release of operating software will begin shipping. Transceivers with this new software can be identified as follows:

- The revision letter in the identification number is “C” or later (see Section 1.4).
- The operating software is Rev 3.1 or higher. This number can be determined by selecting Program > Information using the programming software as described in Section 3.4.4.

New Programming Software

New programming software is required to program transceivers with the new operating software. This new release is Rev 3.1 or later, and the revision number is indicated in the upper left part of the programming screens. Refer to Section 3.1.4 for more information.

This new software is backward compatible which means it can also be used to program earlier “A” and “B” model transceivers.

New Features

- Additional banks can now be programmed. In addition to 2 banks x 16 channels, 4 banks x 8 channels or 2 banks of 20 channels + 12 channels can be programmed.

- The operation of several features has been changed to improve performance.
- Support has been added for an optional scrambler and output port. However, those particular options are not available, so references to them in the programming software can be ignored. If scrambling is desired, use the Transcript® scrambler listed in Table 1-1 instead.

1.15.3 VHF (7510) HARDWARE REVISIONS

C44 (on input of Q32) - With high band (146-174 MHz) models only, changed to 0.0033 μ F.

C284 (near output of IC3D) - With high band (146-174 MHz) models only, changed to 0.001 μ F.

R248 (near output of IC3D) - Changed to R119, a 300k-ohm potentiometer. This control is factory preset and should not require readjustment in the field. Deviation continues to be set electronically as described in Section 5.4.3

R225 (on output of Q38) - Changed to C292, 0.1 μ F.

R258 (100 ohm) - Added in series with pin 22 (AFOUT) of 30-pin output port.

1.15.4 UHF (7540) HARDWARE REVISIONS

R225 (on output of Q38) - Changed to C500, 0.22 μ F.

R471 (100 ohm) - Added in series with pin 22 (AFOUT) of 30-pin output port.

7510 (VHF) AND 7540 (UHF) SPECIFICATIONS

The following are general specifications intended for use in testing and servicing this transceiver. For current advertised specifications, refer to the specification sheet available from your sales representative. Values are typical and are subject to change without notice.

GENERAL

Frequency Range	VHF: 136-150 or 146-174 MHz UHF: 400-430, 440-470, 470-500, or 490-512/520 MHz
Operating Modes	Conventional (non-trunked), Tone and digital Call Guard®
Channels	32 maximum
Transmit/Receive Separation	Any frequency within the range
Channel Spacing	12.5 kHz (2.5 kHz maximum deviation) or 25 kHz (5 kHz maximum deviation)
Frequency Stability	5.0 PPM from -22° to +140° F (-30° to +60° C)
Dimensions	5.5" x 2.3" x 1.5" (138.5 mm x 58 mm x 37 mm) w/o bat/controls (HxWxD)
Weight	13.8 oz. (390 g) VHF, 14.1 oz. (400 g) UHF (w/ std. bat., antenna, belt clip)
Battery Voltage	9.6 volts DC nominal
Current Drain	60 mA VHF, 65 mA UHF max. (rx standby), 20 mA max. (bat. save mode) 225 mA maximum (receive, 500 mW audio output) 1.0 A maximum (transmit, low power) 2.0 A maximum (transmit, high power)
Battery Life (1050 mAH battery) (TIA 5-5-90)	Low power w/o battery saver - 9.3 hours High power w/ battery saver - 9.6 hours High power w/o battery saver - 7.3 hours
FCC Compliance	Parts 15 and 90

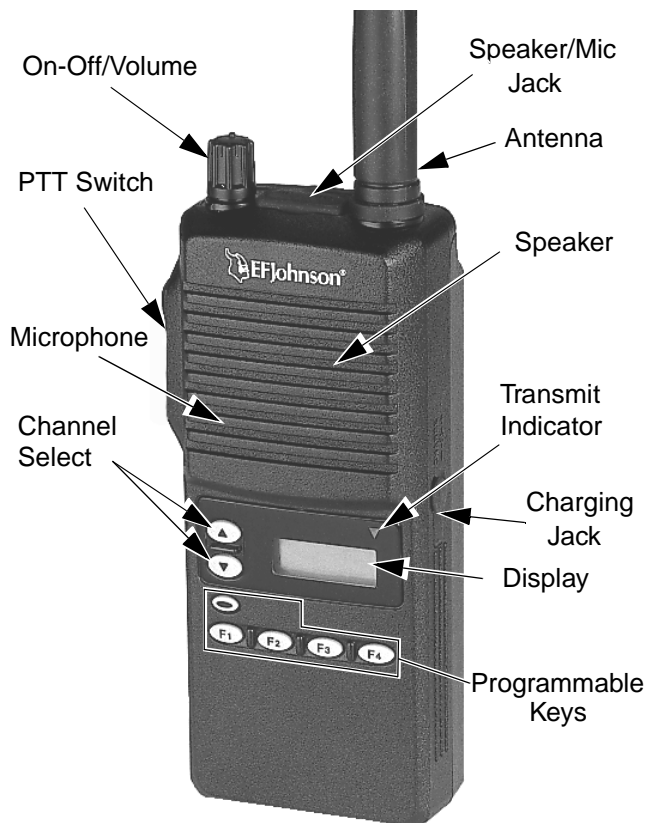
RECEIVER

Sensitivity (12 dB SINAD)	0.25 μ V
Selectivity	70 dB at 25 kHz, 60 dB at 12.5 kHz
Spurious and Image Rejection	70 dB
Intermodulation	65 dB
Hum and Noise	40 dB
Maximum Frequency Spread	Any spread within the range
Audio Power Output	500 mW into 8-ohm load
Audio Distortion	Less than 10% at 1 kHz with 60% deviation
Audio Response	+2, -8 dB at 6 dB per octave de-emphasis per standard TIA
RF Input Impedance	50 ohms

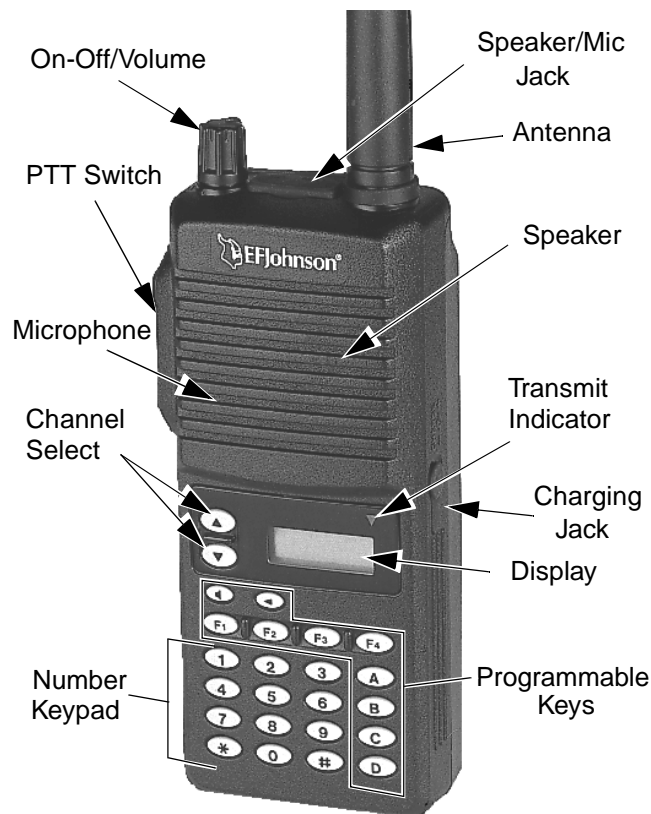
TRANSMITTER

RF Power Output	VHF: 5.0W high power, 1.0W low power UHF: 4.0W high power, 1.0W low power
Spurious and Harmonic Emissions	70 dB
FM Hum and Noise	40 dB at 25 kHz, 34 dB at 12.5 kHz
Audio Modulation	12.5 kHz - 11K0F3E, 25 kHz - 16K0F3E
Audio Distortion	Less than 5% at 1 kHz with 40% modulation
Audio Frequency Response	+2, -8 dB at 6 dB per octave pre-emphasis per standard TIA
Maximum Frequency Spread	Any spread within the band
RF Output Impedance	50 ohms
Duty Cycle (6-6-48 seconds)	10%

SECTION 2 TRANSCEIVER OPERATION



STANDARD MODEL



DTMF KEYPAD MODEL

2.1 TRANSCEIVER FEATURES

- Up to 32 channels programmable
- Multi-tone and/or Multi-code Call Guard or carrier squelch programmable
- DTMF encoder and 2/5 tone capability optional
- VHF and UHF models available
- Up to 5 watts (VHF) or 4 watts (UHF) for greater operating range
- Up to 9.6 hours of battery life with standard 1050 mAH battery pack
- Priority and normal scan to ensure important calls are not missed

2.2 CONTROLS AND DISPLAY

On-Off/Volume Control - Turns power on and off and sets the volume level. To adjust the volume for a comfortable listening level, refer to the preceding description.

PTT (Push-To-Talk) Switch - Push and hold this switch to talk, and release it to listen.

Channel Select Keys (▲ ▼) - Change the selected channel up or down.

Number Keypad - These keys are on DTMF keypad models only, and are used to dial telephone numbers, select channels, and for other functions.

Programmable Switches - The ◀, ▶, ●, F1-F4, and A-D can be programmed for various functions (the

A-D keys are available on DTMF keypad models only). Refer to the descriptions in Section 2.5 for more information.

Display - Indicates the selected channel, operating modes, and error conditions.

Charging Jack - The optional wall charger or cigarette lighter or DC cables can be plugged into this jack to charge the battery (see Sections 2.6.7 and 2.6.8).

Transmit Indicator - Lights when the transmitter is on (PTT switch pressed).

Speaker/Microphone Jack - Connection point for the optional speaker/microphone and programming cables.

2.3 GETTING STARTED

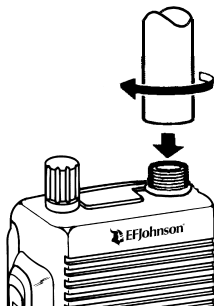
2.3.1 UNPACKING

The following accessories are included with this transceiver:

- Flexible antenna
- Belt clip
- 1050 mAH battery pack (see Section 2.6)

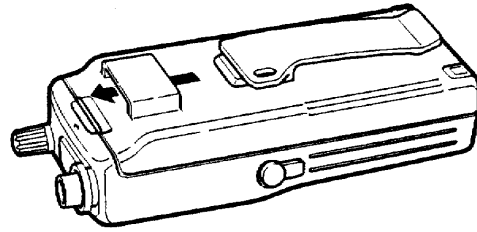
2.3.2 ANTENNA

The included antenna is screwed into the transceiver antenna jack as shown below.

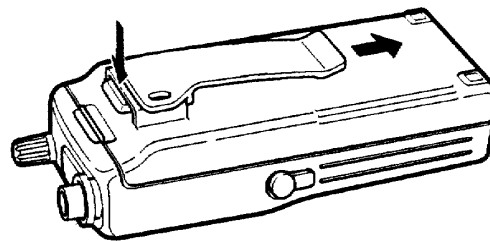


2.3.3 BELT CLIP

The belt clip is attached as shown below.

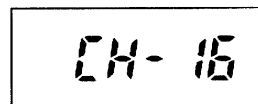


The belt clip is removed as shown below.



2.3.4 TURNING POWER ON

To turn power on, rotate the top panel on-off/volume control clockwise. To turn it off, rotate it counterclockwise to the detent. When power is turned on, a power-up alert tone may sound for about 2 seconds and an opening message may be displayed (depending on programming). The channel is then displayed as an alpha tag or number. The number format is shown below.



NOTE: If nothing is displayed when power is turned on, the battery may be discharged or defective. Turn power off and check the battery. Refer to Section 2.6 for more battery information.

2.3.5 CHANGING CHANNEL

To increase or decrease the selected channel number, press the ▲ or ▼ key. If equipped with a DTMF keypad, you may also be able to select a channel by entering the number.

2.3.6 ADJUSTING VOLUME

To adjust the volume, rotate the on-off/volume control while a message is being received. To adjust while no message is being received, press and hold the Monitor switch (if programmed, see Section 2.5.6). This enables background noise for use as a reference level. Otherwise, note the position of the index on the knob.

2.4 BASIC OPERATION

2.4.1 RECEIVING A CALL

1. Turn power on and set the volume as described in Sections 2.3.4 and 2.3.6.
2. Select the desired channel using the ▲ ▼ switches. The transceiver is now set to receive a message on that channel.

2.4.2 TRANSMITTING A CALL

CAUTION


Do not transmit without an antenna because transceiver damage may result. Antenna attachment is described in Section 2.3.2.


1. Turn power on and set the volume as described in Sections 2.3.4 and 2.3.6.
2. Wait for the channel to become clear to avoid interference (see “MONITOR” description in Section 2.5.6).
3. Push and hold the PTT switch on the side and speak into the microphone at a normal voice level.

NOTE: If a selective calling feature is being used (see Section 2.4.5), it is recommended that you pause for a moment before speaking after pressing the PTT switch. This gives the receiving transceiver time to detect the call which prevents the possible loss of part of your first word.

4. Release the PTT switch as soon as your message is complete so that a response can be received.

2.4.3 LOW BATTERY INDICATION

When a low battery condition is detected,  is displayed continuously. The battery will require recharging soon.

When battery capacity is nearing the minimum level needed to operate the transceiver,  begins flashing.

2.4.4 TIME-OUT TIMER

This function disables the transmitter if it is keyed continuously for longer than the programmed time. This prevents possible transceiver damage caused by transmitting for excessive periods and also a channel from being blocked for an extended period by an accidentally keyed transmitter.

A penalty timer may also be programmed which inhibits the transmitter for a fixed time after the time-out timer is activated.

2.4.5 SELECTIVE CALLING

Introduction

If your transceiver utilizes a selective calling system of some type, it may be necessary to select the particular station to which a call is to be placed or from which a call is to be received. The general procedure is as follows:

1. Select the transmit code channel or 5-tone code (see following).
2. Press the switch programmed for the call function.
3. After transmitting a 5-tone code, the remainder of the call can be carried out in the normal manner.

Transmit Code Channels

Your transceiver may be programmed so that a transmit code channel is selected when using the call function just described. To activate this function, press the switch programmed for transmit code channel selection. Then enter the number of the desired transmit code channel using the number keypad. The call

function previously described then transmits the pre-programmed 5-tone code.

Manual 5-Tone Codes

NOTE: This requires the optional 5-tone unit.



Your transceiver may be programmed to allow 5-tone codes to be sent manually:

1. To activate this function, press the switch programmed for the transmit code function. Then enter the desired transmit code (up to seven digits) using the number keypad.
2. Activate the call function to transmit the 5-tone code. Blinking indicates that the keypad entry is acceptable.

2.5 PROGRAMMABLE FUNCTIONS

2.5.1 GENERAL


The functions described in this section are available only if they have been programmed. When applicable, they are controlled by the programmable switches described in Section 2.2. Therefore, the specific use of each switch varies. The table below can be filled out and used as a reference to identify the functions that are controlled by these switches.

Option Switch Functions			
F1		A	
F2		B	
F3		C	
F4		D	
			

NOTE: Programming determines the availability of the following functions. Therefore, a function is available only if it has been programmed. Refer to Table 3-2 for more information on these switches.

2.5.2 KEYPAD LOCK

This function disables all keypad keys except the one used to control this feature. This prevents keys

from being accidentally pressed. Some channels may be programmed so that this feature is not available. To toggle this function, press for 1 second the switch programmed for the Keypad Lock function. The keypad is locked when the key icon () is displayed.

2.5.3 PRIORITY CHANNEL

This function is used to quickly select a preprogrammed priority channel. When the switch programmed for this function is pressed, "PRIO" is briefly displayed and the priority channel is automatically selected.

2.5.4 SCAN

The scan feature monitors a preprogrammed group of channels. When a signal is detected that the transceiver is programmed to receive, scanning stops and the message is received. Shortly after the message is complete, scanning resumes. To turn scanning on and off, press the switch programmed for Scan. A message may be displayed while scanning.

"Lockout Scan" (preprogrammed list scan) or "Priority Scan" can be preprogrammed. When the "Power-Save" function is activated, the transceiver checks all preprogrammed channels and then returns to the power save mode.

2.5.5 KEY BEEP

The function provides a confirmation tone when keys are pressed. To turn this feature on and off, press the switch programmed for the Beep function for 1 second or longer.

2.5.6 MONITOR

The Monitor function allows the transceiver to be manually unquieted to determine if a channel is busy. Channels may be programmed so that either all messages or only those messages intended for you are received. Therefore, if you hear only your messages, the channel must be monitored before transmitting to make sure someone else is not using it. If you were to transmit while someone else is talking, you would probably disrupt their conversation.

To enable monitoring, press the switch programmed for the Monitor function. If the channel is

programmed so all messages are heard, press and hold the switch to hear all messages. If only messages intended for you are heard, press the switch momentarily to select the audible condition.

2.5.7 TALK-AROUND

Your transmissions may go through a base station (such as a repeater). In this case, if you are out of radio range of the repeater, you will not be able to contact anyone on that channel even though the transceiver you are calling may be only a short distance away.

The talk-around function allows you to contact these transceivers directly without going through a repeater. To activate the talk-around function, press and hold for 1 second the switch programmed for this function. Then to turn it off again, press this switch momentarily.

2.5.8 DTMF TRANSMISSION

This function allows you to transmit a preprogrammed DTMF code to perform actions such as controlling a repeater or opening the squelch of another transceiver. Proceed as follows:

Manual Transmission - Enter the desired digits using the number keypad while pressing the PTT switch. The transceiver may also be programmed so that it is not necessary to press the PTT switch to transmit the digits.

Automatic Preprogrammed Transmission - Press the switch programmed for DTMF transmission. Then press the ▲ ▼ switches to select the desired channel. Then press the DTMF switch again to send the DTMF code.

2.5.9 DTMF REDIAL

This function allows the last-used DTMF code to be retransmitted by simply pressing a key. To activate this feature, press the switch programmed for the DTMF Redial function. If no code has been transmitted since power was turned on, this feature is not available.

2.5.10 HIGH/LOW POWER OUTPUT

This function selects high or low power output on the current channel. To toggle between high and low power, press the switch programmed for High/Low Power. When low power is selected, "LOW" is displayed.

2.5.11 EMERGENCY OPERATION

The emergency function allows you to quickly and easily send your ID in case of emergency. To activate this function, press and hold for 1 second the switch programmed for Emergency.

- A preprogrammed channel is then selected and the emergency code automatically sent.
- The preprogrammed channel remains selected until the control signal is received back or power is turned off.
- The emergency call is repeatedly transmitted at a preprogrammed interval.

2.5.12 DISPLAY LIGHTING

The display backlight has three operating modes:

OFF - No backlight is available

AUTO - When any key is pressed, the backlight turns on for 5 seconds.

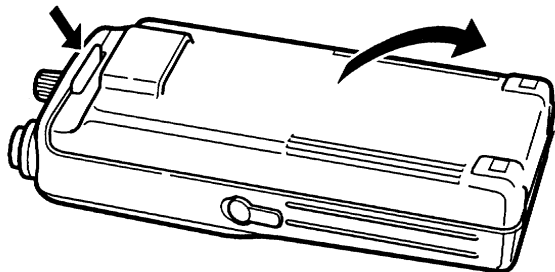
CONTINUOUS - The backlight is on continuously when power is on.

2.6 BATTERY INFORMATION

2.6.1 BATTERY PACK REPLACEMENT

NOTE: Before replacing the battery pack, transceiver power MUST be turned off by the top panel on-off/volume control.

To remove the battery pack, push and hold the release button and then pull the top of the battery pack outwards (see following). To attach the battery pack, place the notched end onto the transceiver and press the top toward the transceiver until it clicks into place.



BATTERY CAUTIONS

NEVER incinerate used battery packs because they may explode.

NEVER immerse the battery pack in water. If the battery pack becomes wet, be sure to wipe it dry **BEFORE** attaching it to the transceiver.

NEVER short the terminals of the battery pack. In addition, do not place a pack where nearby metal objects could touch the contacts. The resulting current flow could cause excessive heat or fire.

2.6.2 MISCELLANEOUS BATTERY INFORMATION

Memory Effect

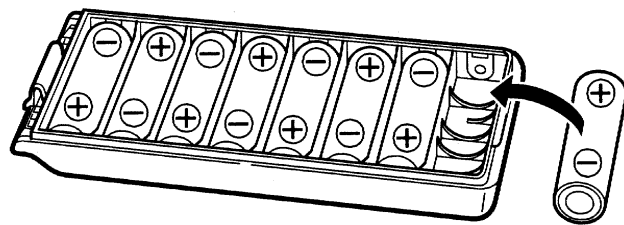
If the battery pack has very little capacity after being charged, completely discharge it by leaving transceiver power on overnight. Then fully recharge the pack again. If it still lacks capacity or does not retain a charge, it must be replaced with a new pack.

Recycling

The rechargeable battery pack used with this transceiver is recyclable. It is usually illegal to dispose of nickel-cadmium batteries in the municipal waste stream. Contact local authorities for information on how to properly dispose of nickel-cadmium battery packs.

2.6.3 USING BATTERY CASE

If using optional Battery Case, Part No. 587-7500-120, install eight AA size alkaline or nickel-cadmium batteries as shown in the following illustration.



BATTERY CASE CAUTIONS

- If using nickel-cadmium batteries, make sure all cells are the same brand, type, and capacity. Never mix old and new cells. Failure to observe these precautions may cause a fire hazard or transceiver damage.
- If using alkaline or other dry cell batteries, **NEVER** connect DC power to the transceiver. This always charges the installed batteries and will damage the transceiver.
- With all types of batteries, **NEVER** incinerate the batteries because an explosion could result. Also, **NEVER** expose a detached battery case to water. If it does get wet, be sure to wipe it dry before using.

2.6.4 BATTERY CHARGING INFORMATION

CAUTION

Be sure to turn the transceiver off while charging or removing the battery pack. Failure to do so may damage the transceiver.

Prior to using the transceiver for the first time, the battery pack must be charged fully in order to provide optimum life and operation. Follow these precautions when charging the battery pack:

- Recommended ambient temperature when recharging is +50° to +104° F (+10° to +40° C).
- Use the supplied charger or one of the optional rapid chargers. **NEVER** use other manufacturers' chargers.
- The optional DC cable or cigarette lighter cable (see Section 2.6.8) may be used as a charger power

source instead of the AC adapter supplied with the desktop charger (see following).

2.6.5 USING DESKTOP CHARGER

The optional desktop charger shown below is available in the following versions. These chargers include all required items including the AC adapter, base, and battery spacer.

120 VAC Model - Part No. 585-7500-011

230 VAC Model - Part No. 585-7500-012

CAUTION

Turn transceiver power off while charging. Failure to do so will result in incorrect charging and may result in reduce battery life. The transceiver cannot be used even if power is turned on.

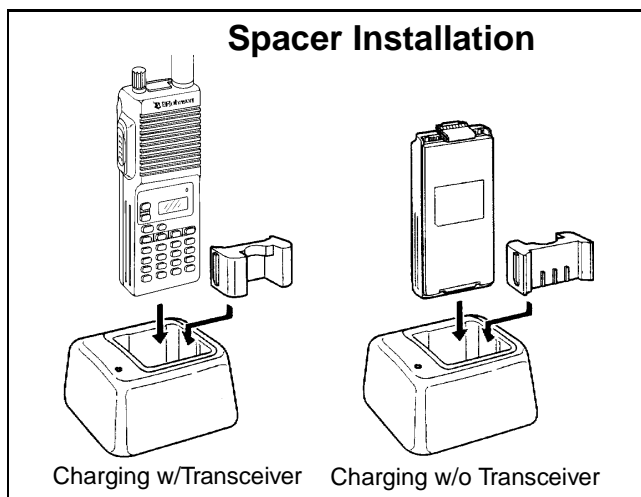
Install the included spacer as shown in the following diagram. Charge time for the 1050 mA battery is approximately 2.0 hours. The charge indicator displays the following conditions:

Steady Orange - Charging is occurring

Steady Green - Charging is complete

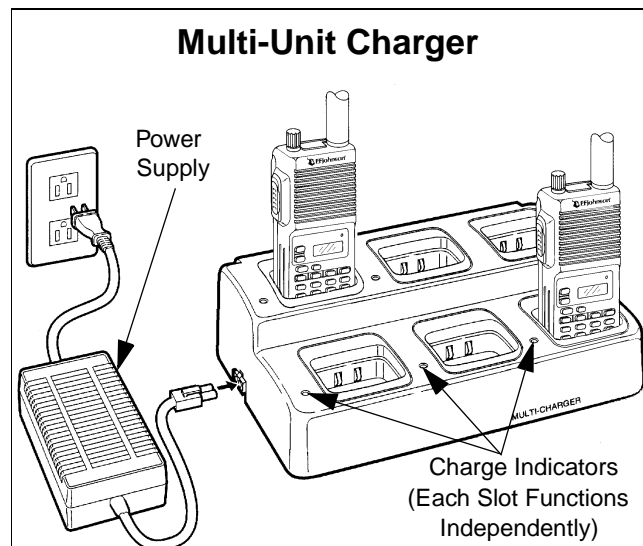
Flashing Orange - Input voltage low. Check power source.

Flashing Red - Problem with battery pack or charger. Reinsert battery or try different pack. If problem persists, the charger may be defective.



2.6.6 USING MULTI-UNIT CHARGER

The multi-unit charger is shown in the following illustration. Each charger slot functions like the desktop charger described in the preceding section. Therefore, the "Caution", charge time, and indicator operation in that section also apply when this charger is used. As indicated in Table 1-1, the power supply is not included with the base and must be ordered separately.



2.6.7 USING WALL CHARGER

The optional wall trickle charger shown in the following illustration is available in the following versions.

120 VAC Model - Part No. 585-7500-001

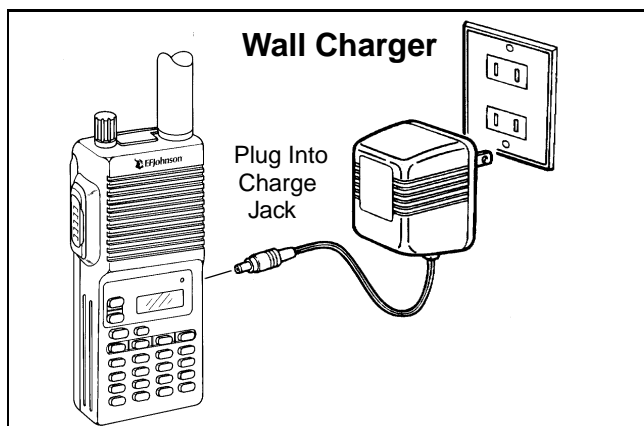
230 VAC Model - Part No. 585-7500-002

This charger plugs directly into the transceiver as shown below. Approximate charge time is 15 hours.

Observe the following precautions when using the wall charger:

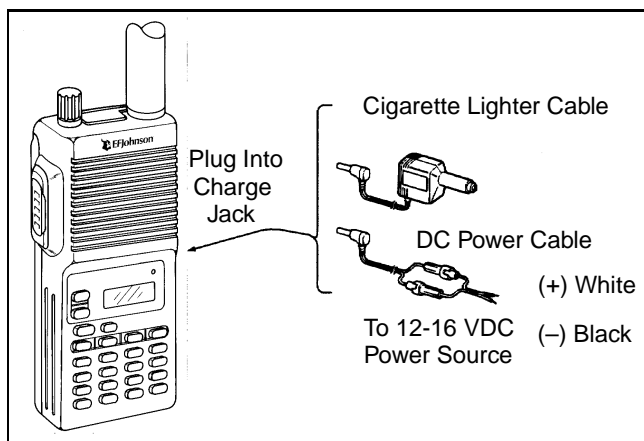
- Charge only nickel-cadmium batteries. NEVER connect this charger to the transceiver when the optional battery case is being used with alkaline or other dry cell batteries installed. Attempting to charge these batteries may damage the transceiver or batteries.

- Do not have transceiver power turned on when this charger is used. The charge current is insufficient to operate the transceiver and charge the battery pack.



2.6.8 USING OPTIONAL CABLES

Optional Cigarette Lighter Cable, Part No. 585-7500-027, or DC Power Cable, Part No. 585-7500-029, can be used to charge the transceiver similar to the wall charger just described. A DC voltage source of 12-16 volts is required when these cables are used. Connect these cables to the charge jack on the side as shown in the following illustration.



Observe the following precautions when using either of these charging cables:

- Charge only nickel-cadmium batteries. NEVER connect this charger to the transceiver when the op-

tional battery case is being used with alkaline or other dry cell batteries installed. Attempting to charge these batteries may damage the transceiver or batteries.

- Even if the power source has enough current capacity, the Charge jack can be used only for charging purposes. Do not attempt to operate the transceiver with a charger connected to this jack if a battery is not attached.
- **Charging continues even after the battery is fully charged. Therefore, do not charge a battery for extended periods because overcharging will result.**

2.6.9 REPLACEMENT BATTERY PACK

Replacement Battery Pack, Part No. 587-7500-105, is the same pack that was included with the transceiver when it was new. It is a nominal 9.6V pack containing rechargeable nickel-cadmium batteries that have a capacity of 1050 mA. Under standard operating conditions (duty cycle of 5% transmit, 5% receive, 90% standby), typical transceiver operating time with a fully charged pack is as follows:

High Tx Power/battery save mode - 9.2 hours
 Low Tx Power - 8.8 hours

Charge a new battery pack before it is used. For maximum battery life, observe the following precautions:

- Avoid overcharging. Do not charge a battery pack for longer than 48 hours.
- Under normal conditions, use a pack only until the low-battery indication appears (see Section 2.4.3). Do not regularly use a pack until the transceiver is totally inoperative.

When the operating time of a fully charged battery becomes extremely short or a pack fails to hold a charge, replace the battery pack with a new one. Refer to Section 2.6.1 for more battery pack information.

SECTION 3 PROGRAMMING

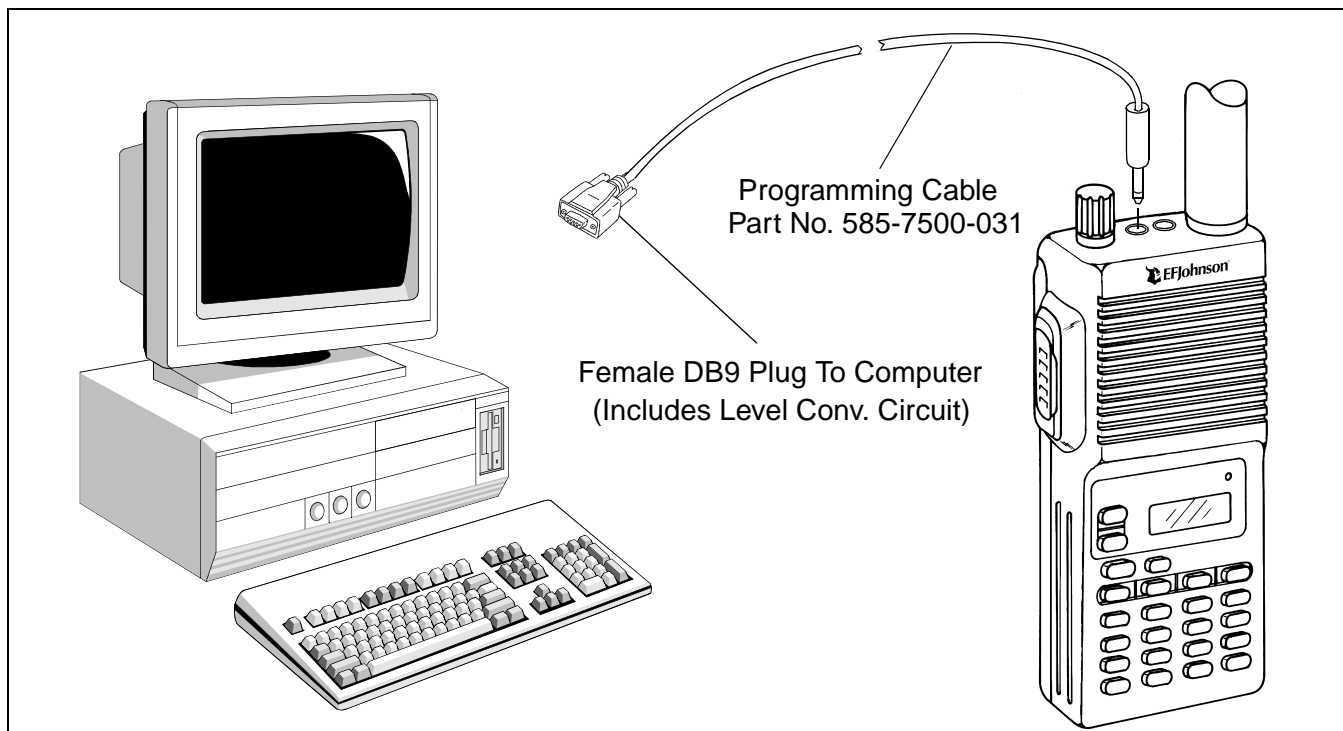


Figure 3-1 Programming Setup

3.1 GENERAL

3.1.1 PROGRAMMING SETUP

The following items are required to program this transceiver. The part numbers of the programming cable and software are shown in Table 1-1. A printer is also recommended for making a hard copy record of the information programmed into the transceiver. The programming setup is shown above.

- IBM® PC AT or PS/2 compatible computer with one available serial port
- MS-DOS® version 5.02 or higher or equivalent
- E.F. Johnson programming cable (includes required level converter circuit)
- E.F. Johnson programming software

3.1.2 PROGRAMMING CABLE

Programming Cable, Part No. 585-7500-031, is required to connect the computer to the transceiver.

This cable has a female DB9 connector which plugs into the serial port of the computer. In this connector is a level converter circuit which converts the RS-232 levels of the computer to the logic levels required by the transceiver. The other end of the cable plugs into the external speaker jack of the transceiver which also serves as the programming jack. Turn on transceiver power after the cable is connected.

3.1.3 PROGRAMMING SOFTWARE

The programming software is distributed on a 3-1/2" 1.44 M diskette. This diskette includes the main executable program RP7500.EXE and several ancillary files it requires to run. These files total approximately 430k in size. Also included on this disk is the ADJUST program used to tune the transceiver. This program and other files it requires to run total about 180k in size and are located in a separate subdirectory on the disk called ADJ. The use of this program is described in Section 5.

These are DOS programs, so Windows® 3.x, 95, or NT are not required to run them. If the program does not run properly in Windows, run it in the DOS mode.

Before you use the program, the files on the diskette should be copied to your hard disk or a programming disk. Do not use the distribution disk for programming or transceiver tuning because it should be kept as a backup in case something happens to the program on the working disk.

3.1.4 SOFTWARE VERSION REQUIRED

Beginning later in 1999, new versions of both the transceiver and programming software start shipping. The new transceiver has a revision letter of “C” or later (see Section 1.4) and contains Rev 3.1 operating software. To program a new transceiver, the new release of the programming software (Revision 3.0 or later) is required. This software is backward compatible which means that it can also be used to program earlier model 75xx transceivers.

To determine what revision of operating software is in a transceiver, select Program > Information as described in Section 3.4.4. To determine what release of programming software you have, note the information displayed in the upper left part of the main screen.

3.2 STARTING THE PROGRAM

Proceed as follows:

1. Start the computer in the DOS mode. If the program is not installed on a hard drive, insert the programming disk in drive A.
2. Make the directory of the program the current directory. Then start the program by typing RP7500 (Enter).
3. The Memory Channel screen described in Section 3.4.3 is then displayed. Set or modify the data as desired. Make sure to scroll right using the → key so the right-most screen parameters can be programmed.

3.3 SPECIAL KEYS AND FUNCTIONS

- Information on the various parameters is available in the form of help screens. To display information on the currently highlighted function or setting, press F1.
- Pressing ALT or ESC selects the menu on top or returns to the previous screen.
- ↑ ↓ keys or highlighted character keys move the cursor.
- The Space or backspace key toggle the setting.
- Use the File menu to save the data and exit the program.

3.4 MENU FLOW

3.4.1 INTRODUCTION

The menu bar along the top of the screen is used to select the various menus that are used to program this transceiver. Press the ALT or ESC key to enable this menu bar. Then to move horizontally to select a menu, use the arrow (← →) keys or type the highlighted letter in the title. Then to display the menu and highlight the desired item, use the arrow (↓ ↑) keys and then press ENTER to select it. The following describes each of the menus that can be selected.

3.4.2 FILE MENU



Load - Loads data from a previously saved data file. To display the directory, press (Enter) again.

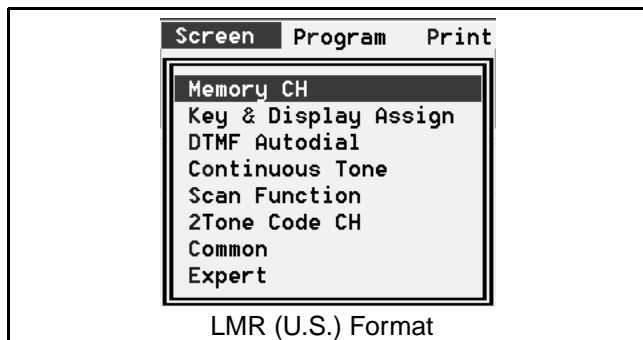
Save - Saves the current data to the specified file. The extension “.ICF” is automatically added to the file name.

Delete - Deletes the current file.

Dos - Allows you to go to the DOS mode to perform a function in DOS such as copying a file. To return to the previous screen, type EXIT.

Exit - Quits the program and exits to DOS.

3.4.3 SCREEN MENU



NOTE: The Screen menu for PMR (European) models is slightly different than the LMR version shown above. Refer to Section 3.5 for more information on PMR models.

Memory Channel - Displays the screen shown in Table 3-1 which is used to program channel parameters such as frequency, Call Guard (CTCSS/DCTS) coding, and power output. The screen in Table 3-1 is for LMR models; refer to Section 3.5 for information on the PMR version.

Key and Display Assign - Displays the screen shown in Table 3-2 which assigns functions to the programmable keys.

DTMF Autodial - Displays the screen shown in Table 3-3 which programs five DTMF code channels (pre-stored telephone or other numbers). Up to 24 characters can be programmed in each location.

Continuous Tone - Displays the screen shown in Table 3-4 which programs nine user selectable Call Guard (CTCSS) tones.

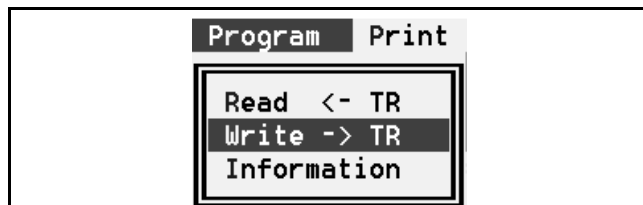
Scan Function - Displays the screen shown in Table 3-5 which programs various scan parameters.

2-Tone Code Channel - Displays the screen shown in Table 3-6 which programs transceiver operation with a 2-tone option. The optional 2-Tone Decoder Kit, Part No. 585-7500-025, is required to use the 2-tone function. This screen is displayed with LMR models only (see Section 3.4.6).

Common - Displays the screen shown in Table 3-7 which programs miscellaneous information.

Expert - Displays the screen shown in Table 3-8 which programs timer and other information. This information was part of the common screen with the earlier Rev. 2.x programming software.

3.4.4 PROGRAM MENU

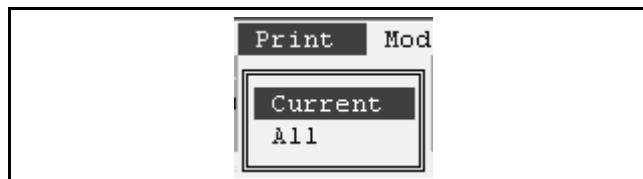


Read ← TR - Reads the data programmed in the connected transceiver.

Write → TR - Programs the connected transceiver with the current data.

Information - Displays information on the connected transceiver such as the model, revision, and the “Program Comment” programmed in the Common screen (see Table 3-7).

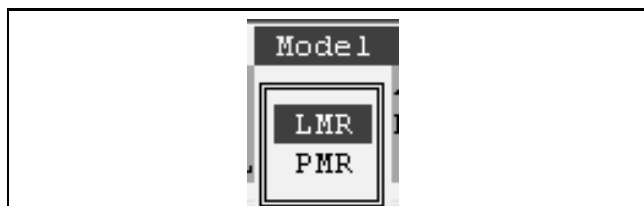
3.4.5 PRINT MENU



Current - Prints the currently displayed data.

All - Prints all data for the selected file.

3.4.6 MODEL MENU

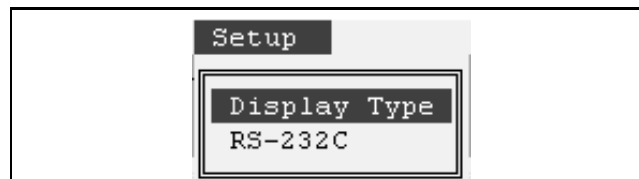


LMR - Selects LMR (U.S.A.) models. Selecting this model displays unique parameters in various screens for programming a 2-tone option. The differences are in the Screen menu (see Section 3.4.3), Memory Channel screen (see Table 3-1), and DTMF Autodial screen (see Table 3-3).

PMR - Selects PMR (European) models. Selecting this model displays unique parameters for programming a 5-tone option. As with the LMR selection,

unique parameters are displayed in the Screen menu and Memory Channel and DTMF Autodial screens. Refer to Section 3.5 for more information on PMR models.

3.4.7 SETUP MENU



Display Type - Select the color or monochrome 1 or 2 display modes.

RS-232C - Selects the computer serial port being used to connect the computer to the transceiver.

Table 3-1 Memory Channel Screen Description (LMR Models)

Bank	CH	Frequency (MHz)	CTCSS/DTCS	Text	PWR TOT	RF Lock	Auto	2Tone	Log	Scrambler
1	Atr	RX TX	RX TX		Save	PWR out	Scan	Reset	Dec	IN/OFF ON/OFF Code
. 1	P	445.75000 450.75000	71.9 <-	WASECA	ON ON	H Busy	(Ena) Tim-B	2	L-IN	1
. 2	E	439.62500 444.62500	118.8 127.3	FARIBLT	ON	H Rpt Tag	(Ena) Tim-A	1	L-OFF	1
. 3		447.00000 452.00000	165.5 <-	CHASKA	ON	L	(Inh) Tim-B			1
. 4										
. 5										
. 6										
. 7										
. 8										
. 9										
.10										
.11										
.12										
.13										
.14										
.15										
.16										

Delete CH F1:Help

NOTE: To display this part of the screen, scroll over using the → arrow key.

Bank Select

Up to 32 channels can be programmed arranged as 1, 2, or 4 banks. To switch between banks when programming these channels, press the PgUp/PgDn keys. To select channels in more than one bank, a Bank Up function switch and the bank configuration must be programmed on the Key and Display Assign 1 and 2 screens (see Table 3-2).

Table 3-1 Memory Channel Screen Description (LMR Models) (Continued)

Parameter	Description
Ch Atr (Channel Attribute)	<p>Press (Enter) to display the menu which selects one of the following choices:</p> <p>Priority Channel - The channel is selected when the Priority key is pressed, and it is monitored during priority scan.</p> <p>Emergency Channel - Transmission occurs on the channel when the Emergency switch is pressed.</p> <p>Emergency Off - Transmission occurs on the currently selected channel when the Emergency switch is pressed.</p> <p>SmarTrunk II™ On/Off - Toggles the SmarTrunk function on and off on the bank. This function is not available with this transceiver.</p> <p>Channel Insert - Inserts a blank channel by pushing the other channel information down one line.</p> <p>Channel Delete - Deletes the programming information on the current line and moves the channel information below it up one line.</p> <p>Return - Exits the menu and returns to the main screen.</p>
Frequency (Rx/Tx)	<p>Enter the desired frequency for the channel. Enter a frequency within the frequency range of the transceiver: VHF = 136-150 or 146-174 MHz, UHF = 400-430 or 440-480 MHz. Channel steps multiples of 5.0, 6.25, or 7.5 kHz only. If no receive frequency is entered, no other data can be programmed on the line. If the transmit frequency is the same as the receive frequency, enter nothing or “=”. The “←” symbol means same as receive frequency. Enter a space for the transmit frequency to disable transmitting on the channel (“Inhibit” is then displayed). F8 and F9 can be used to cut and paste frequencies. Press (Enter) when the desired frequency has been entered.</p>
CTCSS/DTCS (Rx/Tx)	<p>Enters the receive and transmit tone (CTCSS) Call Guard® frequency or digital (DCTS) Call Guard code. Press (Enter) to display the tone selection table. Select a tone by scrolling to it and pressing (Enter). Press the spacebar or backspace key to increase or decrease the entered frequency. The length of the reverse burst can be set by the “CTCSS Reverse Burst” parameter on the Common 1 Screen (see Table 3-7).</p> <p>Digital codes must always be entered directly (there is no table) and tone frequencies can be entered directly. Be sure to enter the tone decimal point or the number is interpreted as a digital code. The N or I after a digital code indicates Normal or Inverted polarity. To toggle the polarity, press the spacebar or backspace key. In addition, the polarity of digital Call Guard signaling for all channels can be set on the Common screen.</p>
Text	<p>Programs the 7-character alpha tag that is displayed when a channel is selected by the channel up/down (▲ ▼) keys. If no text is programmed, the channel number is displayed as CH-xx. Allowable characters are A-Z (uppercase), 0-9, \$, ' () - / < = > @ [\] _ ~.</p>
PWR Save	<p>Programming “On” reduces current drain by deactivating the receiver circuit at preset intervals. Additional power saver information is programmed in the Expert screen (see Table 3-8).</p>
TOT (Time-Out Timer)	<p>Disables the transmitter on that channel if it is keyed continuously for longer than the programmed time. The times for this timer are programmed in the Common 1 Screen (see Table 3-7).</p>
RF PWR	<p>Programs the RF power output for the channel (H = high, L = low). This setting can be temporarily or permanently overridden by the Power function switch if it is programmed. Refer to Table 3-2 for more information. When low power is selected, “LOW” is displayed.</p>
Lockout	<p>Transmit Disable On Busy. The following conditions can be programmed:</p> <p>OFF - No restrictions; the transmitter can be keyed even while receiving a signal.</p> <p>Busy - Transmitting is inhibited if the channel is busy (carrier present).</p> <p>Repeater - Transmission is permitted only when (1) receiving a signal on the programmed Call Guard tone or code (CTCSS/ DCTS) or (2) when no carrier is being detected.</p> <p><i>NOTE: If an attempt is made to transmit in a lockout condition, transmitting is inhibited for the “Lockout Penalty Time” programmed on Common 1 screen (see Table 3-7).</i></p>

Table 3-1 Memory Channel Screen Description (LMR Models) (Continued)

Parameter	Description
Scan	<p>Programs if the channel is scanned (scan list status). Press (Enter) to display the selection screen or select the desired condition by pressing the spacebar or backspace key. The scan list status of the currently selected channel is changed by pressing the Scan function key for 2 seconds. This capability can be inhibited and the default scan list status of the channel programmed as follows:</p> <p>Inh - The channel is not scanned and its scan list status <u>cannot</u> be changed by the Scan key. Ena - The channel is not scanned and its scan list status <u>can</u> be changed by the Scan key. Tag (Inh) - The channel is scanned and its scan list status <u>cannot</u> be changed by the Scan key. Tag (Ena) - The channel is scanned and its scan list status <u>can</u> be changed by the Scan key.</p>
Auto Reset	<p>If PWR ON Scan is enabled in the Scan screen (see Table 3-5), this selects the time delay before scanning resumes after a call is complete (the signal disappears) or a key is pressed. Either Timer A or Timer B can be selected. These timers are programmed in the Common 1 Screen (see Table 3-7). Auto reset can be turned off by setting the timer to "Off" (0).</p>
2-Tone Dec (Decode)	<p>Turns on 2-tone receive mute and specifies the 2-tone code used on the channel. The 2-tone codes are programmed in the 2-Tone Code Ch screen (see Table 3-6). This requires the 2-tone option kit.</p>
Log On/Off	<p>Specifies how the DTMF ID code is transmitted when the PTT switch is pressed and released. The DTMF code is specified on the Log/ID line of the DTMF Autodial screen (Table 3-3). The following conditions can be programmed:</p> <p>OFF (blank) - No ID code is transmitted. Log In - The ID code is transmitted when the PTT switch is pressed. Log Off - The ID code is transmitted when the PTT switch is released. Both - The ID code is transmitted when the PTT switch is pressed and again when it is released. <i>NOTE: Additional DTMF information is programmed in the TOT ID out setting in the Common 1 screen.</i></p>
Scrambler On-Off/Code	<p>This function should be left in the default condition because the particular scrambler it controls is not available with this transceiver.</p>

Table 3-2 Key and Display Assign Screen Description

Key & Display Assign 1		Key & Display Assign 2	
Key Assign (■)	Light	Mic Function	OFF
*(<)	Bank Up	RF PWR(H/L)	Override
NOTE:*(F1)	High/Low	Backlight	Auto
Keypad (F2)	Beep	Opening Text	EFJ #1
type (F3)	Talk Around	LCD Contrast	2:Normal
only (F4)	Scan A	LCD Display	-----
at RX	*(A)	Beep ON/OFF	ON
	*(B)	MR-CH Bank/Free	Bank(16CH*2Bank)
	*(C)		
	*(D)		
only	(Up/Dn) Up/Dn		

KEY AND DISPLAY ASSIGN 1

With the standard (7-key) model, the **■** and F1-F4 keys can be programmed for the following functions. With the DTMF keypad (24-key) model, the **◀**, **▶**, and F1-F4 keys can be programmed with any of these functions, and the A-D keys can be programmed for all functions except DTMF Autodial and Emergency Repeat/Single.

Parameter	Description
Null	No function except it turns the backlight for 5 seconds if the Backlight parameter in screen 2 is set to "AUTO".
Light	Turns the LCD backlight on and off. When turned on, the backlight stays on for 5 seconds or until the switch is pressed again.

Table 3-2 Key and Display Assign Screen Description (Continued)





Parameter	Description
Bank Up	Selects the other bank of sixteen channels if applicable.
Moni	Pressing and holding this key for 2 seconds latches the monitor mode on as indicated by  . This mode deactivates the Call Guard (CTCSS/DTCSS) or 2-tone mute functions. The squelch opens for as long as the key is held, even if the channel is not busy. To re-activate these functions again, press this switch momentarily.
High/Low	Changes the power output from the level set for the channel. The change may be temporary or permanent. See “RF Power (H/L)” in screen 2 which follows for more information.
Scan	<p>Pressing this key toggles scanning on and off. In addition, pressing and holding the key changes the scan list status of the selected channel unless (Inh) is programmed for the “Scan” channel parameter (see Table 3-1). The scan list status programmed in the channel screen then cannot be overridden. When a channel is not in the scan list, “SKIP” is displayed. Turning power off does not change the current scan list. Either the Scan A or Scan B mode, but not both, can be programmed. Operation is as follows:</p> <p style="text-align: center;">Scan A</p> <p>Power-On Scan “Off” (see Table 3-5) - It starts and stops scanning with no auto restart. If the transmitter is keyed during scanning, the scan mode is exited.</p> <p>Power-On Scan “On” - It stops scanning only until the Auto Reset Timer expires (see Table 3-7). If the transmitter is keyed during scanning, scan automatically resumes when the Auto Reset Timer expires.</p> <p style="text-align: center;">Scan B</p> <p>Power-On Scan “Off” or “On” - It starts and stops scanning with no auto restart. If the transmitter is keyed during scanning, scan automatically resumes when the Auto Reset Timer expires.</p>
DTMF Autodial (not assignable to the A-D keys)	<p>Pressing this key enables the DTMF autodial mode. The number to be dialed is selected by the channel up/down keys. Then press the DTMF key again to transmit the number. DTMF codes up to 24 characters can be preprogrammed along with a text message (see Table 3-3). DTMF characters (only) can also be programmed from the keypad as follows. User programming cannot be disabled.</p> <p>DTMF Keypad Models:</p> <ol style="list-style-type: none"> 1. Press the DTMF key and then select the desired location (d1-d5) by pressing the channel up/down keys. 2. Press and hold the DTMF key until the display indicates underscore characters (_ _ _). 3. Enter the desired character using the 0-9, A-D, *, and # keys. Press the DTMF key again to accept the number. <p>Standard (7-key) Models:</p> <ol style="list-style-type: none"> 1. Perform steps 1 and 2 above. 2. Select the desired character for the position using the channel up/down keys. Then press the DTMF key to accept that character and move to the next position (e = *, F=#). Repeat to enter the rest of the characters. 3. When the desired code is entered, exit the mode by pressing and holding the DTMF key.
Re-dial	Retransmits the most recently transmitted DTMF characters. Turning the transceiver off clears the last dialed number from memory, so this feature is then not available.
C. Tone CH Ent	(Continuous Tone Memory Channel) This key selects the continuous tone mode. Press this key and then select the desired tone using the channel up/down ( ) keys. These tones are programmed using the Continuous Tone screen described in Table 3-4.
Keyboard Lock	Pressing and holding this key toggles the keyboard lock function. A locked keyboard is indicated by a key  in the display.
Beep	Pressing this key toggles the key beep. Either “bE OFF” or “bE on” is briefly displayed to indicate the current condition.
Talk Around	Turns the talk-around feature on and off. When the talk-around mode is selected, transmission occurs on the receive frequency to permit mobile-to-mobile communication in some systems. Either “tk OFF” or “tk on” is briefly displayed to indicate the current condition.
Priority CH	Pressing this key selects the channel that has been designated as the priority channel in the channel screen.
Emergency Repeat	Pressing this key transmits an emergency call repeatedly at the interval specified in the Common screen. The emergency channel is specified in the channel screen (CH Atr column). This function cannot be assigned to the A-D keys. A DTMF code is transmitted if it is entered on the “Emergency” line of the DTMF Autodial screen (see Table 3-3).

Table 3-2 Key and Display Assign Screen Description (Continued)

Parameter	Description
Emergency Single	Pressing this key transmits an emergency call for as long as it is pressed. As with the preceding parameter, the emergency channel is specified in the channel screen (CH Atr column), and this function cannot be assigned to the A-D keys. A DTMF code is transmitted if it is entered on the "Emergency" line of the DTMF Autodial screen (see Table 3-3).
Shift	If spurious CPU clock frequencies cause interference with the current receive channel, this key can be pressed to change the clock frequency slightly to minimize this interference.
Trunking Group Switch	Press this switch to select the Trunking Group. This function is currently not available with this transceiver.
Turbo Speedial A/B/C/D	This is a SmarTrunk feature and is therefore currently not available. It automatically places a call by pressing an A-D key (or a F1-F4 key with the standard (non-DTMF) model).
Up/Down Keys	When the conventional mode is selected, these keys are always channel up/down keys. When the SmarTrunk mode is selected (currently not available), programming "Up/Down or */#" assigns the up/down function to the * and # keys.
Scrambler	This function should be left in the default condition because the particular scrambler it controls is not available with this transceiver.
Opt1 Out/Mom Out	This function should be left in the default condition because the optional port it controls is not available with this transceiver.
KEY AND DISPLAY ASSIGN 2	
Mic Function	When "On" is selected, the transceiver PTT can be controlled remotely by an optional external microphone.
RF Power (H/L)	This can be programmed for one of the following configurations: MR CH Individual - The power output selected by the H/L power switch (see preceding description) is only temporary. Power returns to the level programmed for the channel when the channel is changed or transceiver power is cycled. Override - The power output selected by the H/L power switch overrides the channel programming. The selected level is permanent (changing the channel or cycling power does not affect the power output level).
Backlight	Programs backlight control as follows: OFF - The backlight is totally disabled. AUTO - The backlight turns on for 5 seconds when any key except PTT is pressed. Continuous - The backlight is on continuously whenever transceiver power is on.
Opening Text	If text is entered, it is displayed for 2 seconds when power is turned on. If no text is programmed, no message is displayed and the transceiver is usable immediately. The same characters listed in Table 3-1, "TEXT", are programmable.
LCD Contrast	Two levels are selectable: Low contrast or Normal contrast. Press the spacebar or backspace key to select the desired condition or press (Enter) to display the selection menu.
LCD Display	This parameter is not programmable with LMR (U.S.) models. With PMR (European) models, it programs the information that is displayed while a channel is selected. When "Text" is programmed, the text programmed for the channel is displayed (or the channel number if no text is programmed). When "MR Ch + Tx Code Ch" is programmed, the channel number appears briefly and then the Transmit Code Channel is displayed.
Beep On/Off	Turns the confirmation beeps on and off. Some beeps, such as the lockout timer, cannot be turned off.
MR-CH Bank/Free	This parameter selects the type of banks as follows. If a parameter other than "Free" is programmed, a Bank select key must also be programmed (see preceding information). Free - No bank select. Up to 32 channels can be programmed as one block. Bank (16CH*2Bank) - Up to 2 banks with 16 channels each can be programmed. Bank (8CH*4Bank) - Up to 4 banks with 8 channels each can be programmed. Bank (20CH+12CH) - A bank of up to 20 channels and another of up to 12 channels can be programmed. <i>NOTE: The 8CH*2 and 20Ch+12CH parameters are available only with "C" or later models (Section 3.1.4).</i>

Table 3-3 DTMF Autodial Screen Description

DTMF Autodial							
No.	Code Text						
1	15078356222 JOHNSON						
2							
3							
Emergency							
Log / ID							
<table border="1"> <tr> <td>DTMF Timer</td> <td>0.100</td> </tr> <tr> <td>1st Timer</td> <td>0.100</td> </tr> <tr> <td>[*][#] Timer</td> <td>0.100</td> </tr> </table>		DTMF Timer	0.100	1st Timer	0.100	[*][#] Timer	0.100
DTMF Timer	0.100						
1st Timer	0.100						
[*][#] Timer	0.100						

Parameter	Description
<p>This screen is used to program the DTMF autodial codes that can be transmitted by pressing the DTMF key (see Table 3-2). Each location can contain up to 24 characters. Allowable characters are 0-9, A-D, *, and #. In addition, a text message can be programmed which is then displayed in place of the code. Press the INS key to toggle between the insert and overwrite modes. To clear a location, press the spacebar and then (Enter). Press ALT or ESC to cancel the entered codes before input. The code on the “Emergency” line is transmitted when the Emergency key is pressed (see Table 3-2). Likewise, the code on the “Log/ID” line is transmitted when the Log/ID channel parameter is enabled (see Table 3-1) and when the time-out timer expires (see Table 3-7). With PMR models, “4” and “5” are displayed in place of “Emergency” and “Log/ID”.</p>	
DTMF Timer	Sets the time interval in seconds for each code emission and interval.
1st Timer	Sets the tone period in seconds for the first DTMF code corresponding to scanning or power saver function transceivers.
[*] [#] Timer	Sets the tone period in seconds for the * character (same as “E”) and # (same as “F”). These codes can be used for control codes on some systems. <i>NOTE: When these special codes are used for the first code, the “1st Timer” has priority over this setting.</i>

Table 3-4 Continuous Tone Screen Description

Continuous Tone		
No.	RX	TX
Tone 1		
2		
3		
4		
5		
6		
7		
8		
9		

Description	
<p>The continuous tones programmed in this screen are selected by pressing the C.Tone CH Ent function key (see Table 3-2) and then pressing the ▲ ▼ (channel up/down) keys. This allows the user to select the continuous tone being transmitted and received on the current channel. To disable this function, press and hold the function key. To transmit or receive using the codes programmed for the channel in the channel screen (see Table 3-1), select “CT CH-MR” using the ▲ ▼ keys.</p>	

Table 3-5 Scan Function Screen Description

Parameter	Description
Mode	<p>The following conditions are programmable:</p> <p>Scan Off - Scanning is disabled and cannot be enabled by a front panel switch.</p> <p>Mode 1 - Selects normal (non-priority) scanning from the lowest to highest channel.</p> <p>Mode 2 - Selects priority scanning from the lowest to highest channel while checking the priority channel. If scanning is turned off while receiving a message in the scan mode, the transceiver switches to that channel.</p> <p>Mode 3 - Same as Mode 2 except that if scanning is turned off while receiving a message, the priority channel is selected.</p>
Text	<p>Programs the text that is displayed while the scan mode is selected. If no text is programmed, the alpha tag programmed for each channel is displayed as it is scanned. Allowable characters are the same as for "Text" shown in Table 3-1.</p>
PWR Save	<p>Enables or disables the power save mode while in scan. If it is enabled, scanning speed is reduced.</p>
Stop Timer	<p>When Mode 2 or 3 above is programmed (priority scanning), this sets how often in seconds the priority channel is checked while receiving a message on some other channel.</p>
Resume Timer	<p>This sets the scan resume delay in seconds which is the time that elapses before scanning resumes after receiving a message.</p>
PWR ON Scan	<p>If this function is programmed "On", scanning starts automatically when transceiver power is turned on. If scanning halts such as to transmit or receive a message, the timer selected for Auto Reset parameter in the channel screen (see Table 3-1) determines the delay before scanning resumes. See also Scan A/B switch in Key and Display Assign screen (Table 3-2), "Scan" column in 2Tone Code CH screen (Table 3-6), and "Timer A/B" in Common screen (Table 3-7).</p>

Table 3-6 2-Tone Code Channel Screen Description

Parameter	Description																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CH No.</th> <th>Group Call</th> <th>Text</th> <th>2Tone Bell</th> <th>Code ANS</th> <th>CH Beep</th> <th>Stun Scan</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2nd</td> <td>CALL1</td> <td>ON</td> <td></td> <td>PiRo</td> <td></td> </tr> <tr> <td>2</td> <td>2nd</td> <td>CALL2</td> <td>ON</td> <td></td> <td>PiRo</td> <td></td> </tr> <tr> <td>3</td> <td>2nd</td> <td>CALL3</td> <td>ON</td> <td></td> <td>PiRo</td> <td></td> </tr> <tr> <td>G</td> <td>---</td> <td>GROUP</td> <td>Blink</td> <td></td> <td>PiPi</td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 50%; border-collapse: collapse;"> <tbody> <tr> <td>Beep Repeat Timer</td> <td>10.000</td> </tr> <tr> <td>Group Timer</td> <td>3.000</td> </tr> <tr> <td>2nd Tone Length</td> <td>1.000</td> </tr> </tbody> </table>		CH No.	Group Call	Text	2Tone Bell	Code ANS	CH Beep	Stun Scan	1	2nd	CALL1	ON		PiRo		2	2nd	CALL2	ON		PiRo		3	2nd	CALL3	ON		PiRo		G	---	GROUP	Blink		PiPi		Beep Repeat Timer	10.000	Group Timer	3.000	2nd Tone Length	1.000
CH No.	Group Call	Text	2Tone Bell	Code ANS	CH Beep	Stun Scan																																				
1	2nd	CALL1	ON		PiRo																																					
2	2nd	CALL2	ON		PiRo																																					
3	2nd	CALL3	ON		PiRo																																					
G	---	GROUP	Blink		PiPi																																					
Beep Repeat Timer	10.000																																									
Group Timer	3.000																																									
2nd Tone Length	1.000																																									
Group Call	Programs if the 1st or 2nd tone is used for the group code.																																									
Text	Programs the text that is displayed when a matched 2-tone is received. The allowable characters are the same as in "Text" of Table 3-1.																																									
Bell	Selects the bell indicator condition when receiving a matched 2-tone. The following conditions can be programmed: Null - The bell indicator condition is not changed, even when a matched code is received. Off - The bell indicator goes off. On - The bell indicator appears until a key is pressed. Blink - The bell indicator blinks until a key is pressed.																																									
ANS	Turns the Answer Back function on and off. This function transmits a 1 kHz single tone for 2 seconds when receiving a matched 2-tone.																																									
Beep	Emits (or turns off) the following beeps when receiving a matched 2-tone: Null - Beep emission (or non-emission) is retained even when receiving a matched 2-tone. Off - Repeater beep emission is turned off. Pi (Single) - One high beep once PiPi (Single) - Two high beep once. PiRo (Single) - One high and one low beep three times. Pi (Repeat) - One high beep repeated at selected intervals. PiPi (Repeat) - Two high beeps repeated at selected intervals.																																									
Stun	When a matched 2-tone is received, the transceiver is set to the following condition that is programmed: Off - The transceiver can be used continuously. Kill - The transceiver cannot be used. Reprogramming is required to re-activate the transceiver. Stun - "SORRY" is displayed and the transceiver cannot be used. To use the transceiver, turn power off and then on again. The correct password must then be entered. See also "User Password" and "PWR ON Password" in Common screen (Table 3-3). Password entry is required regardless of the PWR ON Password setting.																																									
Scan	When a matched 2-tone is received, scan is set to the following condition that is programmed: Null - Scan condition is not affected. Cancel - Scan is cancelled. Start - Scan is started. See also "Scan" key in Table 3-2 and "Power On Scan" in Table 3-5.																																									
Beep Repeat Timer	When "Repeat" is selected for the above "Beep" parameter, beeps are repeated at this period in seconds.																																									
Group Timer	Programs the 2-tone decoding period in seconds. When the received tone is longer than this setting, the transceiver detects the tone as a group code.																																									
2nd Tone Length	Programs the second tone decode timer. Times of 0-2.55 can be programmed and the default is 1. This parameter is programmable only with "C" or later models (see Section 3.1.4).																																									

Table 3-7 Common Screen Description

Common 1		Common 2	
User Password	1234	PWR ON Password	OFF
Prog Comment		Dealer Passcode	159357
		Set Mode Access	Enabled
Auto Reset Timer A	30.000	Transceiver Data Out	Enabled
Timer B	OFF	Scrambler Type	Rolling
Inactive Timer	-----	Scrambler Group Code	1
TOT Timer	30.000	Synchronous Capture	Standard
Penalty Timer	20.000	Tone Start Timing	OFF
ID Out (DTMF)	OFF		
Beep	OFF		
Lockout Penalty Timer	5.000		
CTCSS Reverse Burst	0.400		

Parameter	Description
COMMON 1 PARAMETERS	
User Password	<p>Programs the password that must be entered at power on if the following “PWR ON Password” parameter is “On” or to cancel the “STUN” condition described in Table 3-6. Any four-digit number from 0000-9999 can be programmed. The password is entered on the transceiver as follows:</p> <p>DTMF Keypad Models - Use the DTMF keypad.</p> <p>Standard (Non-Keypad) Models - It is entered using the F1-F4 and ● keys as follows. For example, if 7603 is programmed, it is entered by pressing F3, F2, F1, and F4.</p> <p>F1 - 0 or 5 F2 - 1 or 6 F3 - 2 or 7 F4 - 3 or 8 ● - 4 or 9</p>
Program Comment	<p>Allows a comment to be programmed in the file for use in quickly identifying the contents of a transceiver. When a transceiver is connected to the computer, the comment can be checked without reading all programmed data by selecting “Information” in the Program menu (see Section 3.4.4).</p>
Auto Reset Timer A/B	<p>These timer settings are used by the “Auto Reset” parameter in the channel screen (see Table 3-1). These times set the delay in returning to “Power On Scan” after receiving a message or pressing a key. To disable the Auto Reset function, set one of these timers to OFF (input 0).</p>
Inactive Timer	<p>This feature is available with PMR (European) models only. It sets the time in seconds to return to the “Inaudible” mode after the “Audible” mode is selected. To turn off the inactive timer function, do not assign “Inactive” in the channel screen.</p>
TOT Timer	<p>Programs the time-out timer time in seconds. If the transmitter is keyed continuously for longer than this time, the transmitter is disabled. The time-out timer is enabled or disabled for each channel by the TOT parameter in the channel screen (see Table 3-1).</p>
TOT Penalty Timer	<p>This programs the time in seconds that the transmitter is disabled by the time-out timer. The transmitter cannot be keyed until this time expires.</p>
TOT ID Out	<p>If this parameter is enabled, an ID code (DTMF) is automatically transmitted just before the time-out timer disables the transmitter. This ID code is set on the Log/ID line of the DTMF Autodial screen (see Table 3-3).</p>
TOT Beep	<p>If this parameter is enabled, warning beeps are transmitted 10 seconds before time out occurs.</p>
Lockout Penalty Timer	<p>This is the time that the transmitter is disabled if the user attempts to transmit while in the lockout condition. Transmitting is disabled for the Lockout Penalty Time even if the lockout condition is cleared. A lockout condition exists if the transmitter is disabled by the Transmit Disable On Busy (Lockout) feature programmed on the channel screen (see Table 3-1).</p>

Table 3-7 Common Screen Description (Continued)

Parameter	Description
CTCSS Reverse Burst	If CTCSS tone Call Guard signaling is programmed on the channel, this sets the length of the reverse burst that is transmitted when the PTT switch is released. The reverse burst prevents the “squelch tail” (noise burst) in the transceiver receiving the signal.
COMMON 2 PARAMETERS	
Power On Password	This turns the password function on and off. When it is turned on, “PWoRd” is displayed when power is turned on and a four-digit password must be entered to enable the transceiver. The password is programmed (and described) in “User Password” above. If the STUN function disables the transceiver (see Table 3-6), password input is required even if this parameter is programmed “Off”.
Dealer Passcode	Specifies the six-digit code that must be entered to access the following dealer set mode.
Set Mode Access	This enables/disables the Dealer Set Mode. This mode is not available, so this parameter should always be programmed “Inhibited”.
Transceiver Data Out	Enables or inhibits the downloading of transceiver programming data using the programming software or when programming one transceiver with another (cloning). This prevents the unauthorized duplication of programming data. This does not inhibit overwriting of programming data, so reprogramming is still possible with this enabled.
Scrambler Type	This function can be left in the default condition because the particular scrambler it controls is not available with this transceiver.
Scrambler Group Code	This function can be left in the default condition because the particular scrambler it controls is not available with this transceiver.
Synch Capture	The Synchronous Capture Mode is useful when communicating through a repeater. Because of voice components, the transceiver may not be able to maintain a synchronous mode in rare cases. Normally, it is best to set this parameter to “Standard”. The selectable modes are “Standard” (normal operation) and “Continuous” (repeater operation). This parameter is available only with “C” or later models (see Section 3.1.4).
Tone Start Timing	Tone start timing selects the synchronous tone signal transmit delay time. Set the delay time when the other party’s transceiver is using a power save mode. Selectable values are OFF (default), 0.300, 0.600 and 1.100 sec.

Table 3-8 Expert Screen Description

Expert	
Fast Scan Timer	0.100
Slow Scan Timer	0.500
TX DTCS Inverse	Normal
RX DTCS Inverse	Normal
Emer SW ON Timer	2.000
SW OFF Timer	1.000
Start/Repeat	10.000
PWR Save Start Timer(1st)	5.000
Timer(2nd)	60.000
Low Beep Frequency	500
High Beep Frequency	1000

Parameter	Description
Fast Scan Timer	Sets the period in seconds each channel not programmed for CTCSS/DTCS Call Guard squelch is scanned. <i>NOTE: An appropriate time is set by default and if a time less than the default is programmed, busy channels may not be detected.</i>
Slow Scan Timer	Sets the period in seconds each channel programmed for CTCSS/DTCS Call Guard squelch is scanned. <i>NOTE: An appropriate time is set by default and if a time less than the default is programmed, busy channels may not be detected.</i>

Table 3-8 Expert Screen Description (Continued)

Tx DTCS Inverse	Selects the transmit digital Call Guard (DTCS) code polarity. For this type of signaling to work properly, the polarity of the code in the transmitting and receiving transceivers must be the same. The polarity can also be set for each channel (see Table 3-1).
Rx DTCS Inverse	Selects the receive digital Call Guard (DTCS) code polarity. For this type of signaling to work properly, the polarity of the code in the transmitting and receiving transceivers must be the same. The polarity can also be set for each channel (see Table 3-1).
Emer Sw On Timer	Sets the period in seconds that the Emergency function key must be pressed to activate the emergency function. An emergency call is initiated by pressing the Emergency key for longer than this time.
Emer Sw Off Timer	Sets the period in seconds that the Emergency function switch must be pressed to cancel an emergency call. This must be done before the call is transmitted because once it is transmitted, it cannot be canceled.
Emer Start/Repeat	Programs the delay and interval period in seconds for emergency calls. When the emergency switch is pressed and held, the emergency call is transmitted after this delay period. If the Emergency Repeat function key is programmed (see Table 3-2), the transceiver then transmits repeatedly at this interval until an "Emergency Cancel" code is received.
PWR Save Start Timer	If the power saver function is enabled on the channel in the channel screen (see Table 3-1), this sets the time that no signal must be received before the power saver function activates. Two timers are set: the 1st Timer sets the time that no signal must be received to enable the power saver, and the 2nd Timer sets the time at which the long power saver function is enabled. The 1st Timer must be programmed for a shorter time than the 2nd Timer for the power saver to function. Allowable times are as follows: 1st Timer = 0 - 25.5 seconds, 2nd Timer = 0 - 255 seconds.
Low Beep Frequency	Sets the low beep tone frequency for 400 - 2998 Hz. The nearest available frequency is selected automatically.
High Beep Frequency	Sets the high beep tone frequency for 400 - 2998 Hz. The nearest available frequency is selected automatically.

3.5 UNIQUE PMR (EUROPEAN) SCREENS

3.5.1 GENERAL

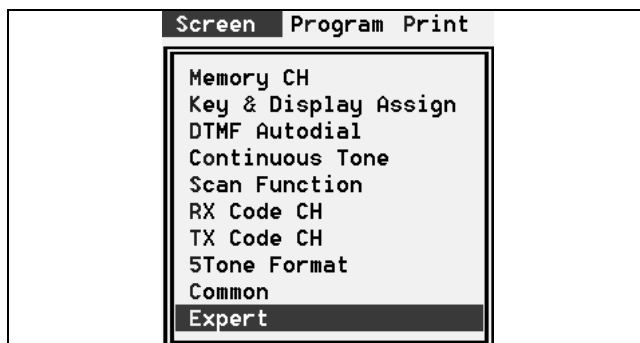
Selecting LMR or PMR in the Model menu (see Section 3.4.6) affects what parameters are displayed in some screens and also what additional screens are displayed. Basically, selecting the LMR (U.S.A.) model displays parameters for the 2-tone option, and selecting PMR (European) displays parameters for the 5-tone option.

NOTE: Optional 5-Tone Kit, Part No. 585-7500-026, is also required to have the 5-tone function.

3.5.2 UNIQUE PMR SCREENS

The following menus and screens are different for LMR and PMR models:

Screen Menu - The LMR menu is described in Section 3.4.3, and the PMR version follows.



Memory Channel Screen - The LMR version of this screen is shown in Table 3-1, and the PMR version is shown in Figure 3-2. Refer to on-line help for information on unique PMR parameters (press F1 with the parameter highlighted).

The following screens selected in the preceding Screen menu are unique to PMR models. Refer to on-line help for information on parameters in these screens.

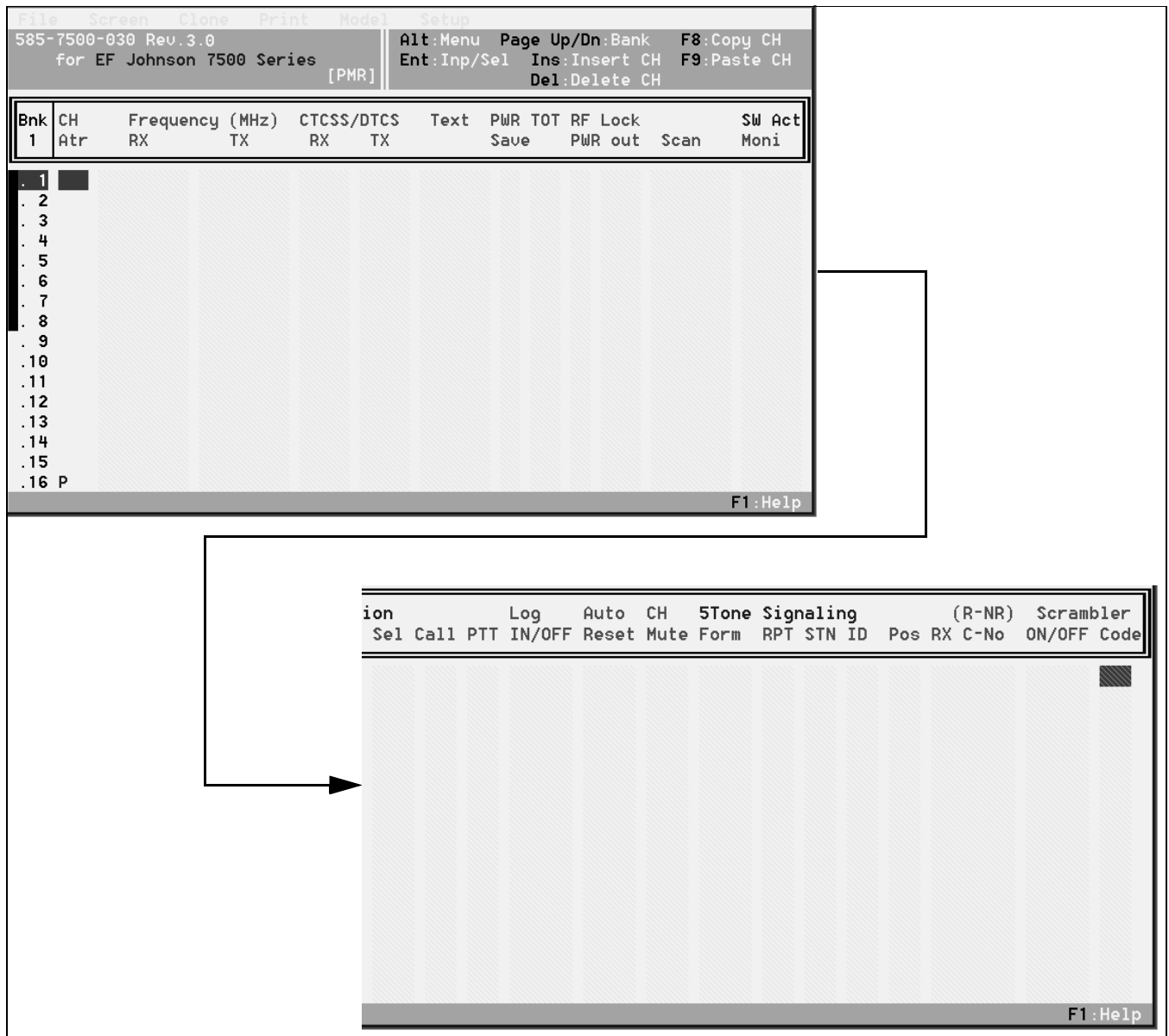


Figure 3-2 Memory Channel Screen (PMR Models)

Rx Code Channel - This screen is shown below and it programs the receive 5-tone code information.

-030 Rev.2.3 EF Johnson 7500 Series		Alt:Menu Ent:Inp/Sel Spc:Inp/Sel +:Status Digit			
PMR					
CH No.	RX Code	Text or ID-Dec	Emer Bell	Cancel ABC Beep	Aud Mode Stun Scan
1	11111	CALL1	ON		PiRo Aud
2	22222	CALL2	ON		PiRo Aud
3	33333	CALL3	ON		PiRo Aud
4	44444	CALL4	ON		PiRo Aud
5	55555	CALL5	ON		PiRo Aud
6	66666	CALL6	ON		PiRo Aud
7	77777	CALL7	ON		PiRo Aud
8	88888	CALL8	ON		PiRo Aud
9	-----	GROUP	Blink	---	PiPi Aud
Link A Timer		0.800			
Compare Digit		12345			
ID Decode Timer		1.600			
Beep Repeat Timer		10.000			

Tx Code Channel - This screen is shown below and it programs the transmit 5-tone code information.

-7500-030 Rev.2.3 for EF Johnson 7500 Series		Alt:Menu Ent:Inp/Sel Spc:Inp/Sel			
PMR					
CH No.	TX Code	Input Digit	Up-Date	ABC Dec	Aud Sel
1	11111	45	ON	ON	
2	22222	45	ON	ON	
3	33333	45	ON	ON	
4	44444	45	ON	ON	
5	55555	45	ON	ON	
6	66666	45	ON	ON	
7	77777	45	ON	ON	
8	88888	45	ON	ON	
9	99999	45	ON	ON	
10	00000	45	ON	ON	
11	00000	45	ON	ON	
12	00000	45	ON	ON	
13	00000	45	ON	ON	
14	00000	45	ON	ON	
15	00000	45	ON	ON	
16	00000	45	ON	ON	

TX Code Common	
Long Tone Timer	0.700
Link R Timer	0.800
Link 1 Timer	0.800
Link 2 Timer	0.800
Lead out Delay Timer	0.200
ABC Decode Timer	1.600
Displayed Digit	12345
Special Tone (Group)	A
(Repeat)	E
(Link2)	F
PTT Call at Inaudible	OFF

5-Tone Format - This screen is shown below and it programs the 5-tone format information.

5Tone Format		
Format	Period	Notone Timer
CCIR	0.100	0.160
ZVEI1	0.070	0.100
ZVEI2	0.070	0.100
DZVEI	0.070	0.100
EEA	0.040	0.060
EEA2	0.040	0.060
DAPL	0.100	0.160
EIA	0.033	0.060

3.6 CLONING (PROGRAMMING ONE TRANSCEIVER WITH ANOTHER)

One transceiver can be used to program another with identical data. Replication Cable, Part No. 585-7500-033, is required to connect the transceivers together (see Table 1-1).

The master (source) transceiver must have the “Transmit Data Out” parameter on the Common screen enabled (see Table 3-7) to download data to another transceiver. If this parameter is not enabled, the transceiver will not go into the clone mode. The programming of this parameter does not affect the ability to receive data. Therefore, it can be in either mode in the slave (target) transceiver. Proceed as follows to program one transceiver with another:

1. Turn on the master transceiver while holding down the Up Arrow (▲) and F4 keys. The display should then indicate “CLonE” and be ready to program another transceiver.
2. Connect the master transceiver to the slave (target) transceiver by plugging the Replication Cable into the external speaker jack (SP) of each. Turn on the slave transceiver (no keys need to be pressed).
3. Press the PTT switch on the master transceiver. The master displays “CL oUt” and the slave displays “CL In” followed by “CL Good” when programming is successful.
4. As with computer programming, turn the slave transceiver off and then on to use the new programming information.
5. To clone another transceiver, connect it to the master in the same manner and press the PTT switch on the master.

SECTION 4 CIRCUIT DESCRIPTION

NOTE: Block diagrams of the VHF and UHF transceivers are located on pages 7-2 and 7-3.

4.1 RECEIVER CIRCUIT

4.1.1 ANTENNA SWITCHING CIRCUIT

Received signals are passed through the low-pass filter (L1-L3, C1-C7 with VHF; L1-L3, C3, C5, C7 with UHF). The filtered signals are applied to the quarter-wave type antenna switching circuit (D8, C52, C76, and L15 with VHF; D406, D8, L15, L401, C76, C448, and C78 with UHF).

The antenna switching circuit functions as a low-pass filter while transmitting. However, its impedance becomes very high while D8 (VHF) or D406 and D8 (UHF) are turned on. Therefore, transmit signals are blocked from entering the receiver circuit. The antenna switching circuit employs a quarter-wave diode switching system. The pass signals are then applied to the RF amplifier circuit.

4.1.2 RF CIRCUIT

The RF circuit amplifies signals within the range of frequency coverage and filter out-of-band signals.

The signals from the antenna switching circuit are amplified by RF amplifier Q12 after passing through a tunable bandpass filter formed by D9, D10, C83, C86, C277, and L17 (VHF) or D10, L413, C79, C457, C86, L17, and C402 (UHF). The amplified signals are applied to first mixer Q13 after out-of-band signals are suppressed by tunable bandpass filter D11, D12, D21, D22, C94, C97, C98, and L19 (VHF), or D11, D12, C94, L89, C406, C96, C98, and L19 (UHF).

Varactor diodes are employed at the bandpass filters that track the filters and are controlled by CPU IC8 via expander IC10 using the T1-T4 signals. These diodes tune the center frequency of the RF passband for wide bandwidth receiving and good image rejection.

4.1.3 FIRST MIXER AND FIRST IF CIRCUIT

The first mixer converts the received signal to a fixed frequency that is the first IF signal. A PLL output frequency is used to perform this function. By changing the PLL frequency, only the desired frequency will be passed through a crystal filter at the next stage of the first mixer.

The signals from the RF circuit are mixed at first mixer Q13 with a first LO signal coming from the VCO circuit to produce a 31.05 MHz (VHF) or 46.35 MHz (UHF) first IF signal.

The first IF signal is applied to a pair of crystal filters (FI1) to suppress out-of-band signals. The filtered first IF signal is applied to the IF amplifier (Q14 with VHF; Q400 with UHF) and then applied to the second mixer (IC2, pin 16).

4.1.4 SECOND IF AND DEMODULATOR CIRCUITS

The second mixer circuit converts the first IF signal to a second IF signal. A double conversion super-heterodyne system (which converts signals twice) improves the image rejection ratio and provides a stable receiver gain.

The first IF signal from the IF amplifier is applied to the second mixer section of FM IF integrated circuit IC2, pin 16, (see Figure 4-1) and mixed with the second LO signal and converted to a 450 kHz second IF signal.

The FM IF integrated circuit contains the second mixer, limiter amplifier, quadrature detector, and active filter circuits. A second LO signal (30.6 MHz with VHF, 45.9 MHz with UHF) is produced at the PLL circuit by dividing its reference frequency.

The second IF signal from second mixer IC2, pin 3, passes through ceramic filter FI2 to remove unwanted heterodyned frequencies. It is then amplified at limiter amplifier IC, pin 5, and applied to quadrature detector IC2, pins 10 and 11, to demodulate the second IF signal into AF signals.

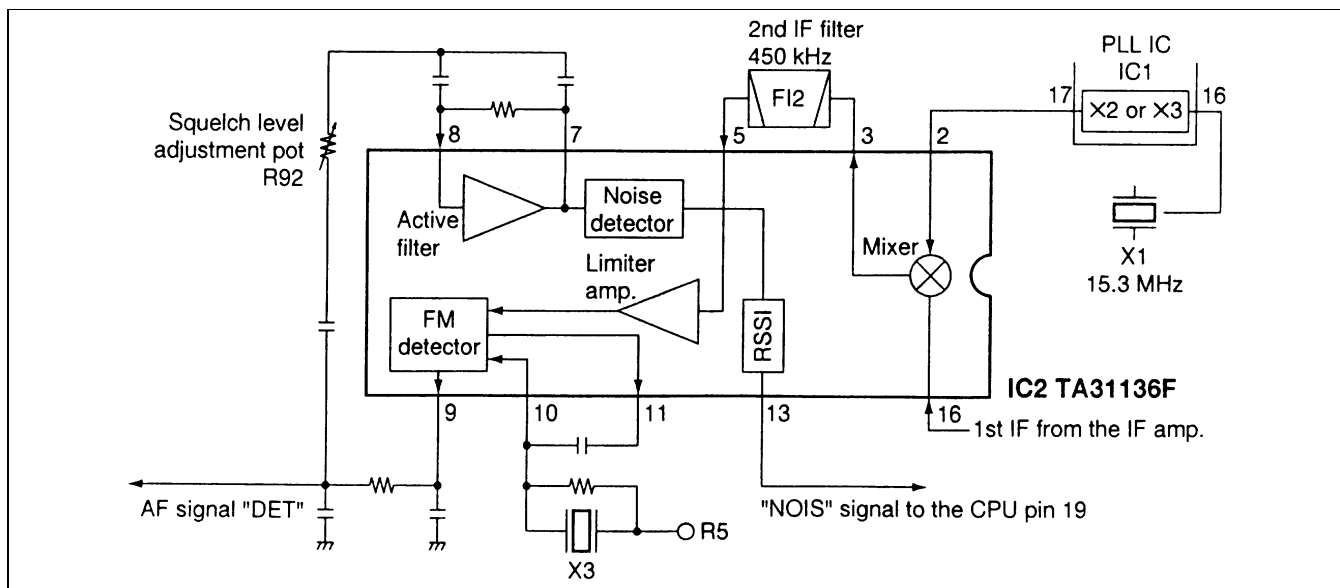


Figure 4-1 Second IF and Demodulator Circuits

4.1.5 AF CIRCUIT

AF signals from FM IF integrated circuit IC2, pin 9, are applied to mute switch IC4, pin 1, via AF filter circuit IC3b, pins 6 and 7. The output signals from pin 11 are applied to AF power amplifier IC5, pin 4, after passing through the volume control on the VR board.

The applied AF signals are amplified by AF power amplifier circuit IC5, pin 4, to obtain the specified audio level. The amplified AF signals, output from pin 10, are applied to internal speaker SP1 via the SP jack when no plug is inserted into the jack.

4.1.6 SQUELCH CIRCUIT

A squelch circuit mutes AF signals when no RF signal is being received. The squelch AF mute switch is controlled by noise that is detected in the AF signal.

A portion of the AF signal from FM IF integrated circuit IC2, pin 9, is applied to the active filter section (pin 8) where noise components are amplified and then detected by an internal noise detector. Squelch level adjustment potentiometer R92 is connected in parallel to the active filter (pin 8) to control the input noise level.

The active filter section amplifies noise components. The filtered signals are rectified by the noise

detector section and converted to pulse-type signals (NOIS) by the noise comparator section. The NOIS signal is applied to CPU IC8 on pin 19.

The CPU detects the receive signal strength from the number of pulses and then outputs an "RM" signal on pin 43. This signal controls mute switch IC4 which turns off the AF signal.

4.2 TRANSMITTER CIRCUITS

4.2.1 MICROPHONE AMPLIFIER CIRCUIT

The microphone amplifier circuit amplifies audio signals with a +6 dB per octave pre-emphasis characteristic to provide the audio level required by the modulation circuit.

The AF signal from the microphone is applied to microphone amplifier IC3C, pin 10. The amplified AF signals are passed through low-pass filter IC3D, pins 13 and 14, via mute switch IC4, pins 2-4. The filtered AF signals are applied to the modulator circuit after being passed through mute switch IC4, pins 8-10 and deviation adjustment potentiometer R119 (UHF only).

4.2.2 MODULATION CIRCUIT

The modulation circuit modulates the VCO signal (RF signal) using the microphone audio signal.

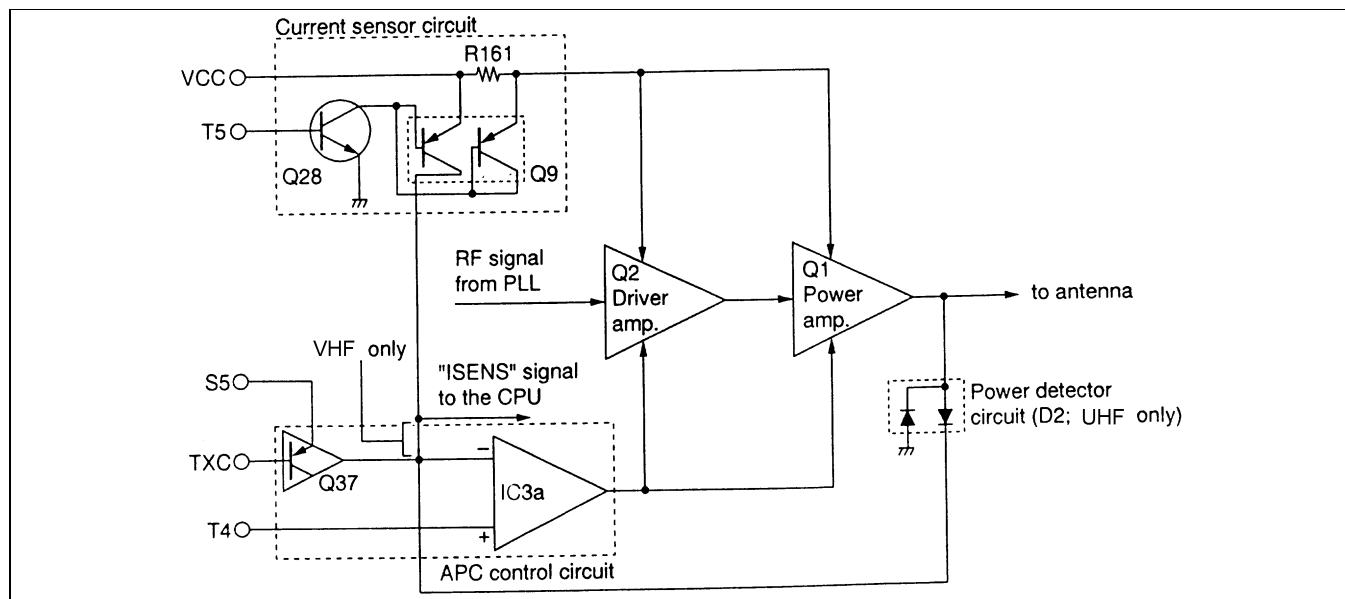


Figure 4-2 APC Circuit

The audio signal changes the reactance of diode D6 (VHF) or D404 (UHF) to modulate the VCO signal at Q7 and Q8. The VCO signal is amplified by buffer-amplifiers Q4 and Q6 and then applied to T/R switching circuit D3 and D4.

4.2.3 DRIVE/POWER AMPLIFIER CIRCUITS

The signal from the VCO circuit passes through T/R switch D3 and is amplified by buffer Q3 (VHF) or buffers Q3 and Q403 (UHF), driver Q2, and power amplifier Q1. Typical output power is 5 watts VHF or 4 watts UHF with a supply voltage of 9.6 volts DC. The amplified signal passes through antenna switch D1 and a low-pass filter and is applied to the antenna jack. The bias current of driver Q2 and power amplifier Q1 is controlled by the APC circuit (see Section 4.2.6).

4.2.4 CURRENT DETECTOR CIRCUIT

The current detector circuit consisting of Q9 and Q28 detects the total current of the driver and power amplifier stages using current sensor R161. Differential amplifier Q9 detects the voltage difference of the current sensor input and output voltages then outputs control voltage to the APC circuit (VHF only) and the CPU (IC8, pin 97).

4.2.5 POWER DETECTOR (UHF ONLY)

Power detector D2 detects the transmit power output level and converts it to a DC voltage. The detected signal is applied to the APC circuit (see following).

4.2.6 APC CIRCUIT

The APC (Automatic Power Control) circuit consisting of IC3A and Q37 protects the driver and power amplifier stages from excessive drive current and selects high and low power output. A diagram of this circuit is shown in Figure 4-2.

The signal output from the current detector circuit (VHF) or the power detector circuit (UHF) is applied to differential amplifier IC3A on pin 2. The "T4" signal from expander IC10 on pin 14 is controlled by CPU IC8 and applied to the other input as a reference.

When driving current increases, input voltage on pin 2 of the differential amplifier also increases. The differential amplifier output voltage on pin 1 then decreases to reduce driving current.

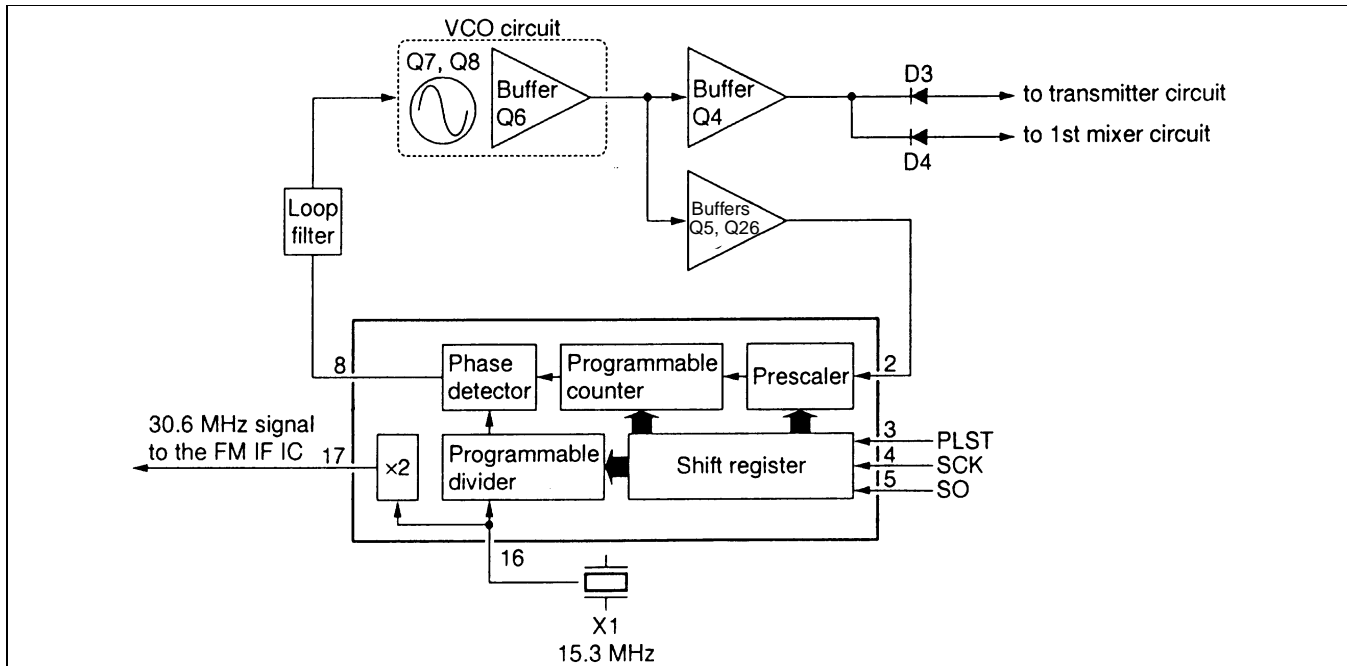


Figure 4-3 PLL Circuit

4.3 PLL CIRCUIT

A PLL circuit shown in Figure 4-3 provides a stable transmit frequency and receive first LO frequency. The PLL output compares the phase of the divided VCO frequency to the reference frequency. The PLL output frequency is controlled by the divided ratio (N-data) of a programmable divider.

The PLL circuit includes VCO Q7 and Q8. The VCO signal is amplified by buffer-amplifiers Q5 and Q6 and then applied to PLL integrated circuit IC1 on pin 2.

The PLL integrated circuit contains a prescaler, programmable counter, phase detector, charge pump, and other circuits. The input signal is divided by the prescaler and programmable counter by the N-data from the CPU. The phase of the divided signal is detected in relation to the reference frequency by the phase detector.

If the VCO frequency begins drifting, the phase changes from that of the reference frequency. The control voltage then changes to compensate for this frequency drift.

Part of the VCO signal is amplified by buffer-amplifier Q4 and applied to the receive first mixer or transmit buffer-amplifier circuit via T/R switching diodes D3 and D4.

4.4 POWER SUPPLY CIRCUITS

Voltage Line	
Line	Description
HV	The voltage of the attached battery pack.
Vcc	The same voltage as HV (battery). It is switched by the power switch.
CPU5	Common 5V converted from the Vcc line by regulator IC6. The output voltage is applied to CPU IC8 and the 5V regulator circuit.
5V	Common 5V supply converted from the Vcc line by 5V regulator circuit Q18 and Q19 using a reference provided by CPU5 regulator IC6.
T5	A 5V supply enabled only in the transmit mode and regulated by Q22.
R5	A 5V supply enabled only in the receive mode and regulated by Q21.
S5	Common 5V supply converted from the 5V line by regulator Q20 for the synthesizer.

4.5 CPU PORT ALLOCATION

Pin No	Port Name	Description
1	CTCIN	Input port for CTCSS/DTCS (Call Guard) signals for decoding.
11	CSIFT	Outputs reference oscillator for the CPU control signal.
12	SCK	Outputs clock signal to PLL IC1, EEPROM IC7, expander IC10, etc.
13	SI	Input port for the data signals from EEPROM IC7, etc.
14	SO	Outputs data signals to PLL IC1, EEPROM IC7, expander IC10, etc.
15	UNLK	Input port for the PLL unlock signal from PLL IC1. Unlock = high signal
18	PLST	Outputs strobe signals to PLL IC1.
19	NOIS	Input port for noise signals (pulse type) from FM IF IC2.
26	CONT	Outputs LCD contrast control signal. High = Normal level selected
36-41	KSO-KS5	Output ports for key matrix.
42	MM	Outputs mic mute signal. Low = DTMF or 2/5 Tone signal is selected
43	RM	Outputs rx mute control signal. Low = Muted
44-47	KR0-KR5	Input ports from key matrix.
48	R5C	Outputs R5 regulator control signal. Low = receive mode
49	S5C	Outputs S5 regulator control signal. Low = Power is on
50	TXC	Outputs T5 regulator control signal. Low = transmit mode

Pin No	Port Name	Description
51	T5C	Outputs T5 regulator control signal. Low = transmit mode
52	LIGHT	Outputs LCD backlight control signal. High = Light on
53	AFON	Outputs the control signal for the AF amplifier control circuit. High = AF enabled
54	DST	Outputs strobe signals to expander IC10.
60-62	CTDA0-CTDA2	Outputs CTCSS and DTCS (Call Guard) encode signals (3-bit D/A type).
63	DUSE	Outputs filter switch control for CTCSS and DTCS (Q38). High = DTCS enabled
90	MTONE	Output port for beep audio while receiving, 2/5 Tone signals while transmitting.
91	DTMF	Output port for DTMF signals while transmitting.

4.6 OUTPUT EXPANDER IC10 ALLOCATIONS

Pin No	Port Name	Description
2	DST	Input port for strobe signals.
3	SCK	Input port for clock signal.
4	SO	Input port for data signal.
11-13	T1-T3	Outputs which control tunable bandpass filter
14	T4	Outputs tunable bandpass filter control signal while receiving, and RF output power control while transmitting.

This page intentionally left blank.

SECTION 5 ADJUSTMENT PROCEDURE

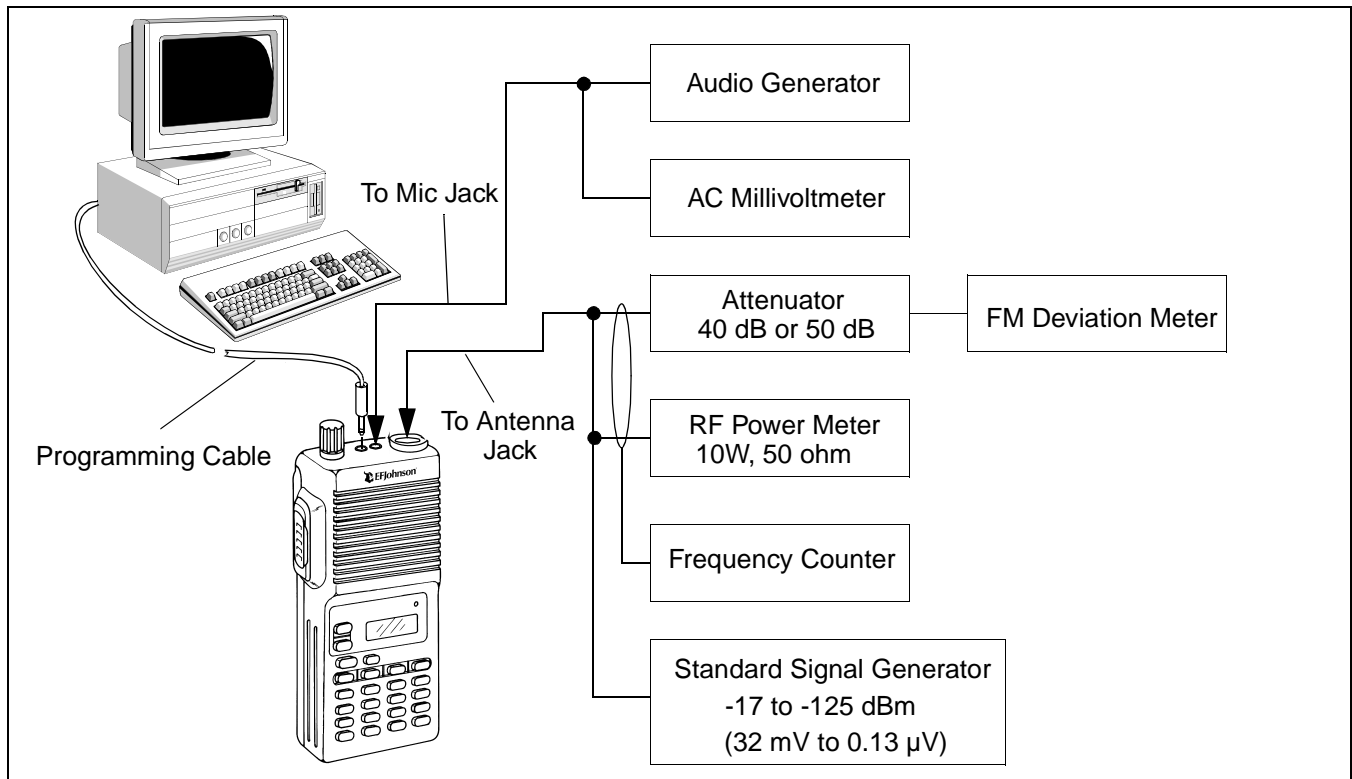


Figure 5-1 Test Setup

5.1 GENERAL

5.1.1 REQUIRED TEST EQUIPMENT

The equipment required to adjust this transceiver is listed in the following table.

Equipment	Grade and Range	
DC power supply	Output voltage	9.6 VDC
	Current capacity	5A or more
RF power meter	Measuring range	1-10 W
	Freq range	120-500 MHz
	Impedance	50 ohms
	SWR	Less than 1.2:1
Frequency counter	Freq range	0.1-500 MHz
	Freq accuracy	±1 ppm or better
	Sensitivity	100 mV or better

Equipment	Grade and Range	
FM deviation meter	Freq range	DC-500 MHz
	Measuring range	0 to ±5 kHz
Digital multimeter	Input impedance	10M/V DC or better
Audio generator	Freq range	300-3000 Hz
	Output level	1-500 mV
Attenuator	Power atten.	40 or 50 dB
	Capacity	10W or more
Standard Signal Generator (SSG)	Freq range	120-500 MHz
	Output level	0.1 μV-32 mV (-127 to -17 dBm)
DC voltmeter	Input impedance	50kΩ/V DC or better
Oscilloscope	Freq range	DC-20 MHz
	Measuring range	0.01-20V
AC millivoltmeter	Measuring range	10 mV - 10V

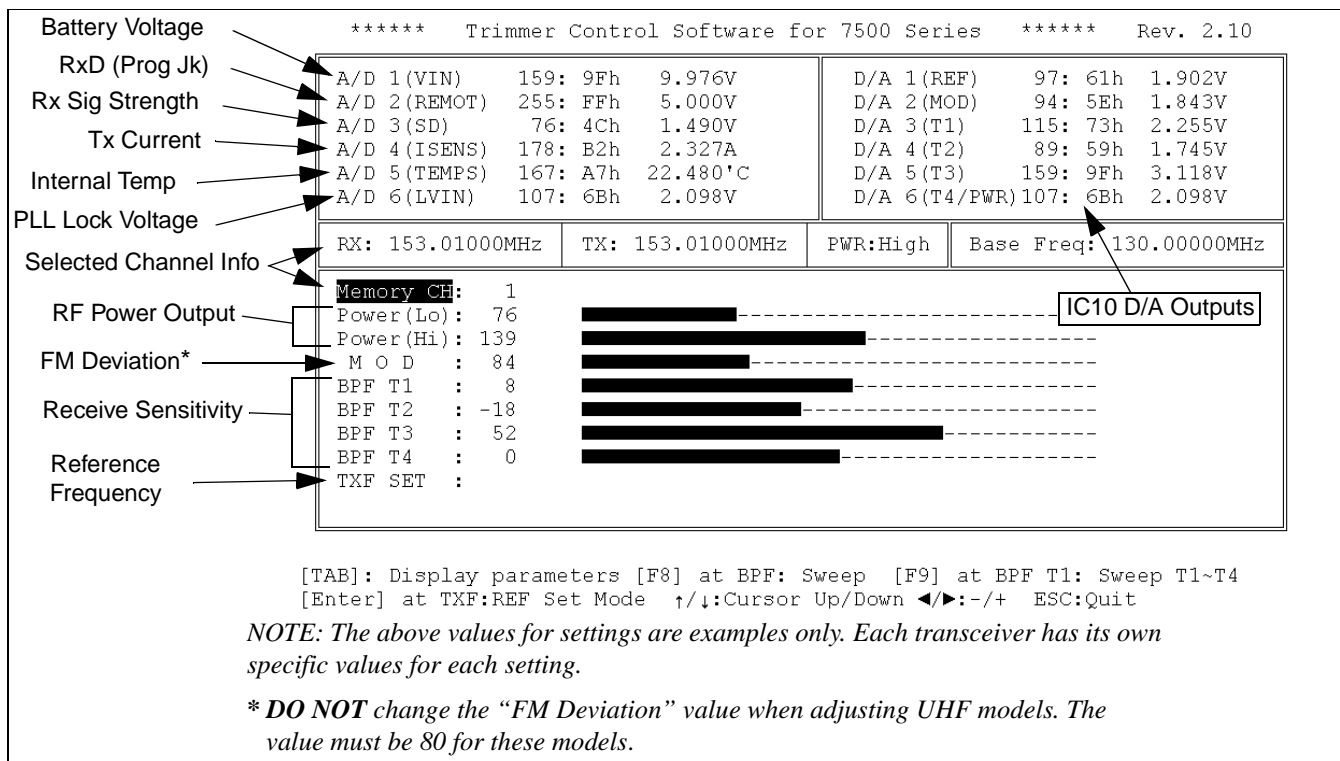


Figure 5-2 Screen Display Example

Table 5-1 Test Frequencies

VHF MODELS		
Channel	136-150 MHz	146-174 MHz
Low	136.000 low power	146.000 low power 146.000 high power
Mid		150.000 low power*
	143.000 low power* 143.000 high power	160.000 low power
High	150.000 low power	174.000 low power
UHF MODELS		
	400-430 MHz	440-470 MHz
Low	400.000 low power	440.000 low power
	400.000 high power	440.000 high power
Mid	415.000 low power*	455.000 low power*
	415.000 high power	455.000 high power
High	430.000 low power	470.000 low power

* These channels must also be programmed with a digital Call Guard (DTCS) code of 007N.

5.1.2 TEST CHANNELS AND POWER SELECT

Test channels at the low, middle, and high ends of the operating band are required to perform the adjustments in this section. These test channels are listed in

Table 5-1, and they must be programmed as regular channels using the programming software described in Section 3. There are no fixed test channels or test modes available with this transceiver.

In addition, the High/Low power switch should be programmed. However, if the PC board is removed from the chassis (see Section 5.2), this switch is not available. Therefore, some frequencies need to have one channel programmed for low power and another for high power so that power can be selected from the computer by changing the channel.

5.1.3 COMPUTER-AIDED TUNING

To make most adjustments described in the following information, the computer setup used for programming (see Section 3) and special Adjust software are required. The Adjust software is included on the disk with the programming software in a separate subdirectory called ADJ. To set up the transceiver for use with this equipment, proceed as follows:

1. Copy the Adjust software to the hard disk or a programming disk as described in Section 3.1.3
2. Turn transceiver power on and connect the computer to the transceiver speaker (SP) jack using the optional programming cable (see Figure 5-1).
3. Start the computer in the DOS mode. Make the current directory the ADJ subdirectory and start the program by typing ADJUST (Enter).
4. The adjustment screen shown in Figure 5-2 is then displayed. The information that is displayed is the adjustment data, frequency, power, and other data for the currently selected channel.
5. To move the cursor between the parameters on the left side of the bar graph, press the \uparrow \downarrow arrow keys. To change a parameter, press the \leftarrow \rightarrow , PgUp/PgDn, backspace, or spacebar keys. Refer to the individual adjustment descriptions which follow for more information on the functions performed using this screen.

5.1.4 REPROGRAMMING IF EEPROM IS REPLACED OR ERROR OCCURS

When EEPROM IC7 is replaced or if the transceiver displays an error message and beeps, the following operation must be performed before making any adjustments.

1. Using the programming software, download the data programmed in an exact same version of the transceiver and save it to a disk file. Refer to Section 3.4.4 for more information on downloading data.
2. Exit the program and copy the saved data file into the "ADJ" directory. To do this from DOS, type A:\Copy (filename).ICF A:\ ADJ (Enter). If using hard drive C:, substitute "C" for "A".
3. Connect the computer to the transceiver that had the EEPROM replaced or is displaying the error (see Figure 5-1).
4. Change the current directory and program the transceiver as follows:

```
A:>CD ADJ Enter)
A:\ADJ\> EEPROM (filename).ICF 1 (Enter)
```

NOTE: If using serial port 2, type "2" instead of "1" after .ICF.

5. When programming is successful, the transceiver displays "CL GOOD".

5.2 PRELIMINARY SETUP

To access the adjustment points in the procedure which follows, remove either the large label covering the back of the chassis or the main unit PC board from the chassis. Proceed as follows:

NOTE: The only component that cannot be accessed by removing the label is C467 which adjusts power peaking in UHF models (see Section 5.7.2). Since this component is located on the front side of the board, the chassis must be removed from the front cover as described in Section 1.12.1 to access it. This component should only rarely require adjustment.

Removing Label - This is the simplest way to access adjustment components. This label covers adjustment holes in the back of the chassis (underneath the battery pack), and measures about 2 x 5 in. (5 x 12 cm). This adhesive-backed label can be removed by inserting a sharp tool under it and carefully peeling it off. It can be reattached after the adjustments are complete. After removing the label, connect a 9.6 VDC power supply to the battery terminals ("-" on left, "+" on right). The PLL adjustment test point (CP1) can be accessed by removing the rubber option cover (see Section 1.11).

Removing Main Board - The procedure for removing this board is described in Section 1.12. The adjustments that can be made without removing the board or label include VHF Transmitter (Sect. 5.4) and VHF/UHF Receive Squelch (Sections 5.5.2 and 5.8.2).

After removing the PC board, do the following:

- Connect a 9.6 VDC power supply to the board as shown in Figure 5-3 (VHF) or Figure 5-4 (UHF). The (+) lead connection point is on the VR board as shown in the detail, and the (-) lead is connected to the ground plane.
- Solder an RF connector to the board in place of the antenna jack that was removed.

VHF ADJUSTMENTS

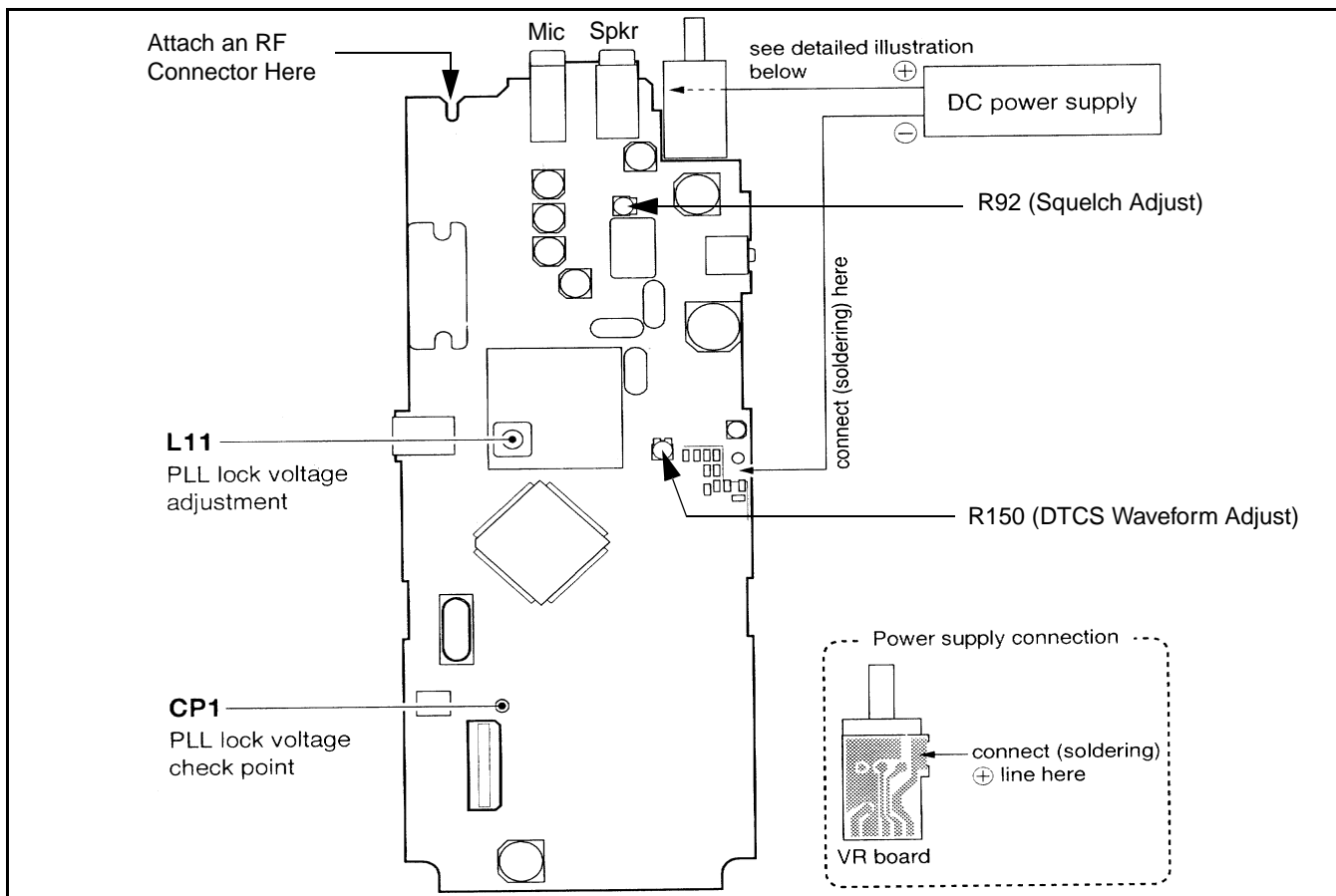


Figure 5-3 VHF Adjustment Points

5.3 PLL ADJUSTMENT (VHF MODELS)

1. Connect a DC voltmeter probe to check point CP1 as shown in Figure 5-3 (access it by removing the rubber option cover if applicable). Select the channel on the high end of the band (150.000 or 174.000 MHz). With the computer setup, this is done by pressing the \uparrow \downarrow arrow keys to highlight "Memory CH" and then pressing the adjust keys (\leftarrow / \rightarrow , PgUp/PgDn, or spacebar/backspace) to select the channel.
2. Key the transmitter and adjust L11 (see Figure 5-3) for a meter reading of 3.0 volt (LB) or 4.3 V (HB).

NOTE: "LB" refers to Low Band 136-150 MHz models, and "HB" refers to High Band 146-174 MHz models.

3. Unkey the transmitter and the meter reading in the receive mode should be 2.2 – 3.2 volts (LB) or 3.1 – 4.1 volts (HB).

5.4 TRANSMITTER ADJUSTMENTS (VHF MODELS)

5.4.1 REFERENCE FREQUENCY

1. Select the channel on the low end of the band (136.000 or 146.000 MHz).
2. Scroll down to "TXF SET" and press (Enter). Monitor the transmit signal with a frequency counter.
3. Key the transmitter and adjust for the displayed frequency by pressing the adjust keys. Unkey the transmitter.

VHF ADJUSTMENTS (CONT'D)

- Press (Enter) again to select the second adjust channel. Key the transmitter and adjust for the displayed frequency (136.001360 or 146.001460 MHz). Unkey the transmitter and press (Enter) again to exit this function.

NOTE: The transmit modulation adjustment in Section 5.4.4 also must be performed if the preceding adjustment is made.

5.4.2 OUTPUT POWER ADJUST

- Select the channel in the middle of the band with LB models (143.000 MHz) or the low end of the band with HB models (146.000 MHz). Select "Power (Lo)" on the screen.
- Connect a power meter to the antenna jack. Select low power by pressing the front panel High/Low power switch or selecting the channel programmed for low power ("LOW" should be displayed).
- Key the transmitter and use the adjust keys to set the power output for 1.0 watt. Unkey the transmitter.
- Select "Power (Hi)" on the screen and select high power by pressing the front panel High/Low power switch or selecting the high power channel ("LOW" should not be displayed).
- Key the transmitter and use the adjust keys to set the power output for 5.0 watts. Unkey the transmitter.

5.4.3 FM DEVIATION ADJUST

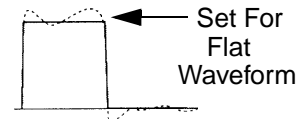
- Select the channel in the middle of the band (143.000 or 160.000 MHz). Then select "MOD" on the screen.
- Connect an audio generator to the microphone jack. Set the output for 1 kHz at a level of 150 mV.
- Monitor the transmit deviation with a communications monitor. Set it as follows: HPF = Off, LPF = 20 kHz, De-Emphasis = Off, Detector = (P-P)/2.
- Key the transmitter and press the adjust keys (←/→, PgUp/PgDn, or spacebar/backspace) to set the following maximum deviation:

Wideband (25 kHz) Models - 4.2 kHz
Narrowband (12.5 kHz) Models - 2.1 kHz

5.4.4 DTCS WAVEFORM ADJUST

NOTE: If the reference frequency adjustment in Section 5.4.1 is made, this adjustment must also be performed.

- Select the 143.000 MHz (low band) or the 150.000 MHz (high band) channel that is programmed with a digital Call Guard (DTCS) code of 007N. Low power should be selected and no audio should be applied to the microphone (MIC) jack.
- Key the transmitter and view the demodulated signal on the CRT of a communications monitor.
- Adjust R150 (see Figure 5-3) for a flat waveform as shown below.



5.5 RECEIVER ADJUSTMENTS (VHF MODELS)

5.5.1 BANDPASS FILTER ADJUST

- Select the channel on the low end of the band (136.000 or 146.000 MHz). Connect a SINAD meter with an 8-ohm load to the speaker (SP) jack.
- Connect an RF signal generator to the antenna jack. Set the output for the channel frequency at a level of 3.2 μ V (-97 dBm), modulated with 1 kHz at the following deviation:

Wideband (25 kHz) Models - 3.5 kHz
Narrowband (12.5 kHz) Models - 1.75 kHz

- Adjust the filters automatically or manually as follows:

Automatic Adjustment Method 1
(Adjusts all filters)

- Select "BPF T1" on the screen and adjust for "0". Repeat for T2 – T4. Reselect "BPF T1".

VHF ADJUSTMENTS (CONT'D)

- b. Press the F9 key and all filters are automatically adjusted for peak levels.

Automatic Adjustment Method 2
(Adjusts only one filter at a time)

- a. Select "BPF T1" and press F8 to automatically adjust it for a peak level.
- b. Repeat for the other three filters.

Manual Adjustment

- a. Select "BPF T1" and press the adjust keys (←/→, PgUp/PgDn, or spacebar/backspace) to obtain minimum distortion.
- b. Repeat for the other three filters.

NOTE: The receive squelch adjustment in the next section must be performed if the preceding adjustment is made.

5.5.2 SQUELCH ADJUST

General

This adjustment can be made with the transceiver completely assembled by removing the small

adhesive-backed label covering the access hole in the chassis. Simply insert a sharp tool under the label and carefully peel it off. A spare label is included with each transceiver.

Adjustment Procedure

1. Select the 143.000 MHz channel with LB models and the 150.000 MHz channel with HB models.
2. Connect a SINAD meter with an 8-ohm load to the speaker (SP) jack.
3. Connect an RF signal generator to the antenna jack. Set it to the channel frequency with an output modulated with 1 kHz at the following deviation:

Wideband (25 kHz) Models - 3.5 kHz
Narrowband (12.5 kHz) Models - 1.75 kHz
4. Preset R92 (see Figure 5-3) counterclockwise to open the squelch. Adjust the generator output level for 12 dB SINAD.
5. Rotate R92 clockwise to close the squelch and then slowly rotate it counterclockwise until the squelch just opens (audio is heard).

UHF ADJUSTMENTS

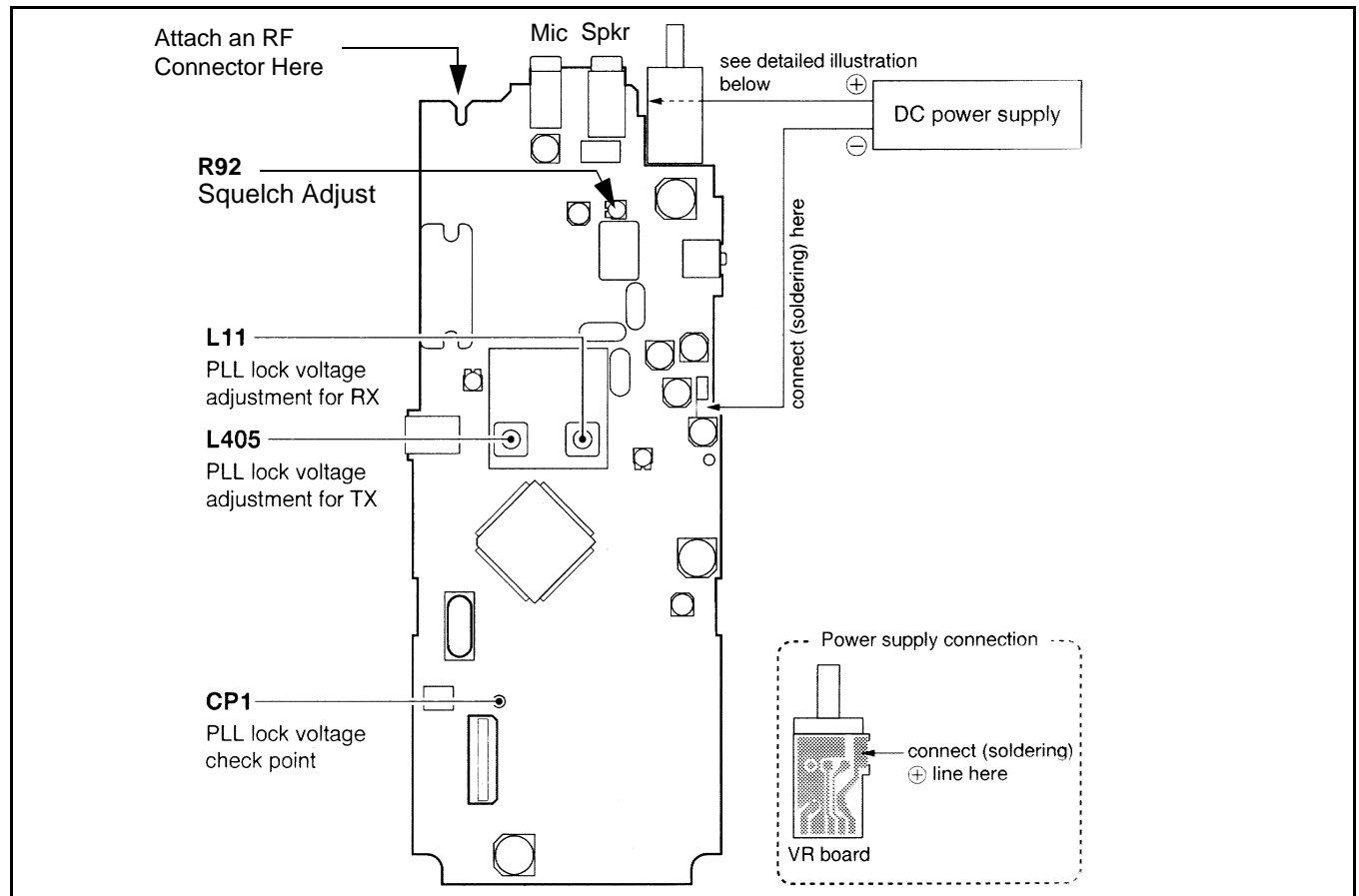


Figure 5-4 UHF PLL Adjustment Points

5.6 PLL ADJUSTMENT (UHF MODELS)

1. Connect a DC voltmeter to check point CP1 as shown in Figure 5-4 (access it by removing the rubber option cover if applicable). Refer to Table 5-1 and select the channel on the low end of the band (400.000 or 440.000 MHz). With the computer setup, this is done by pressing the $\uparrow \downarrow$ arrow keys to highlight "Memory CH" and then pressing the adjust keys (\leftarrow/\rightarrow , PgUp/PgDn, or spacebar/backspace) to select the channel.
2. In the receive mode adjust L11 (see Figure 5-4) for a meter reading of 1.3 volt.
3. Key the transmitter and adjust L405 for a meter reading of 1.3 volt.
4. Select the channel on the high end of the band (430.000 or 470.000 MHz).

5. Verify that the voltage at CP1 is 3.0 – 4.5 volts in both the receive and transmit modes.

5.7 TRANSMITTER ADJUSTMENTS (UHF MODELS)

5.7.1 REFERENCE FREQUENCY

1. Select the channel on the low end of the band (400.000 or 440.000 MHz).
2. Scroll down to "TXF SET" and press (Enter). Monitor the transmit signal with a frequency counter.
3. Key the transmitter and adjust for the displayed frequency by pressing the adjust keys. Unkey the transmitter.
4. Press (Enter) again to select the second adjust channel. Key the transmitter and adjust for the displayed

UHF ADJUSTMENTS (CONT'D)

frequency (400.00400 or 440.004400 MHz).
Release the PTT switch and press (Enter) again to exit this function.

NOTE: The transmit modulation adjustment in Section 5.7.4 must be performed if the preceding adjustment is made.

5.7.2 OUTPUT POWER ADJUST

1. Select the channel in the middle of the band (415.000 or 455.000 MHz). Then select "Power (Hi)" on the screen.
2. Connect a power meter to the antenna jack. Select high power by pressing the front panel High/Low power switch or selecting the channel programmed for high power ("LOW" should not be displayed).
3. Press the adjust keys (←/→, PgUp/PgDn, or space-bar/backspace) to set the power output for a reading of "80" on the screen.
4. Key the transmitter and adjust C467 located on the other side of the board (see Figure 5-5 and Section 5.2) for maximum power output.
5. Select the channel in the low end of the band (400.000 or 440.000 MHz). Then select "Power (Lo)" on the screen.
6. Select low transceiver power output by pressing the front panel High/Low switch or selecting the low power channel ("LOW" should be displayed).
7. Key the transmitter and press the adjust keys to set the power output for 1.0 watt.
8. Select "Power (Hi)" on the screen and select high power by pressing the front panel High/Low power switch or selecting the high power channel ("LOW" should not be displayed).
9. Key the transmitter and use the adjust keys to set the power output for 4.0 watts. Release the PTT switch.

5.7.3 FM DEVIATION ADJUST

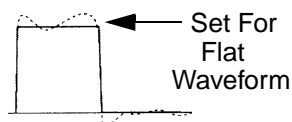
1. Select the channel on the low end of the band (400.000 or 440.000 MHz). The "MOD" parameter on the screen must be "80" for this adjustment. Select and change if required.
2. Connect an audio generator to the microphone jack. Set the output for 1 kHz at a level of 150 mV.
3. Monitor the transmit frequency with a communications monitor. Set it as follows: HPF = Off, LPF = 20 kHz, De-Emphasis = Off, Detector = (P-P)/2.
4. Key the transmitter with the PTT switch and adjust R119 (see Figure 5-5) for the following maximum deviation:

Wideband (25 kHz) Models - ± 4.2 kHz
Narrowband (12.5 kHz) Models - ± 2.1 kHz

NOTE: If the reference frequency adjustment in Section 5.7.1 is made, the following adjustment must also be performed.

5.7.4 DTCS WAVEFORM ADJUST

1. Select the channel in the middle of the band (415.000 or 455.000 MHz) that is programmed with a digital Call Guard (DTCS) code of 007N. Low power should be selected and no audio should be applied to the microphone (MIC) jack.
2. Key the transmitter and view the demodulated signal on the CRT of a communications monitor.
3. Adjust R150 (see Figure 5-5) for a flat waveform as shown below.



UHF ADJUSTMENTS (CONT'D)

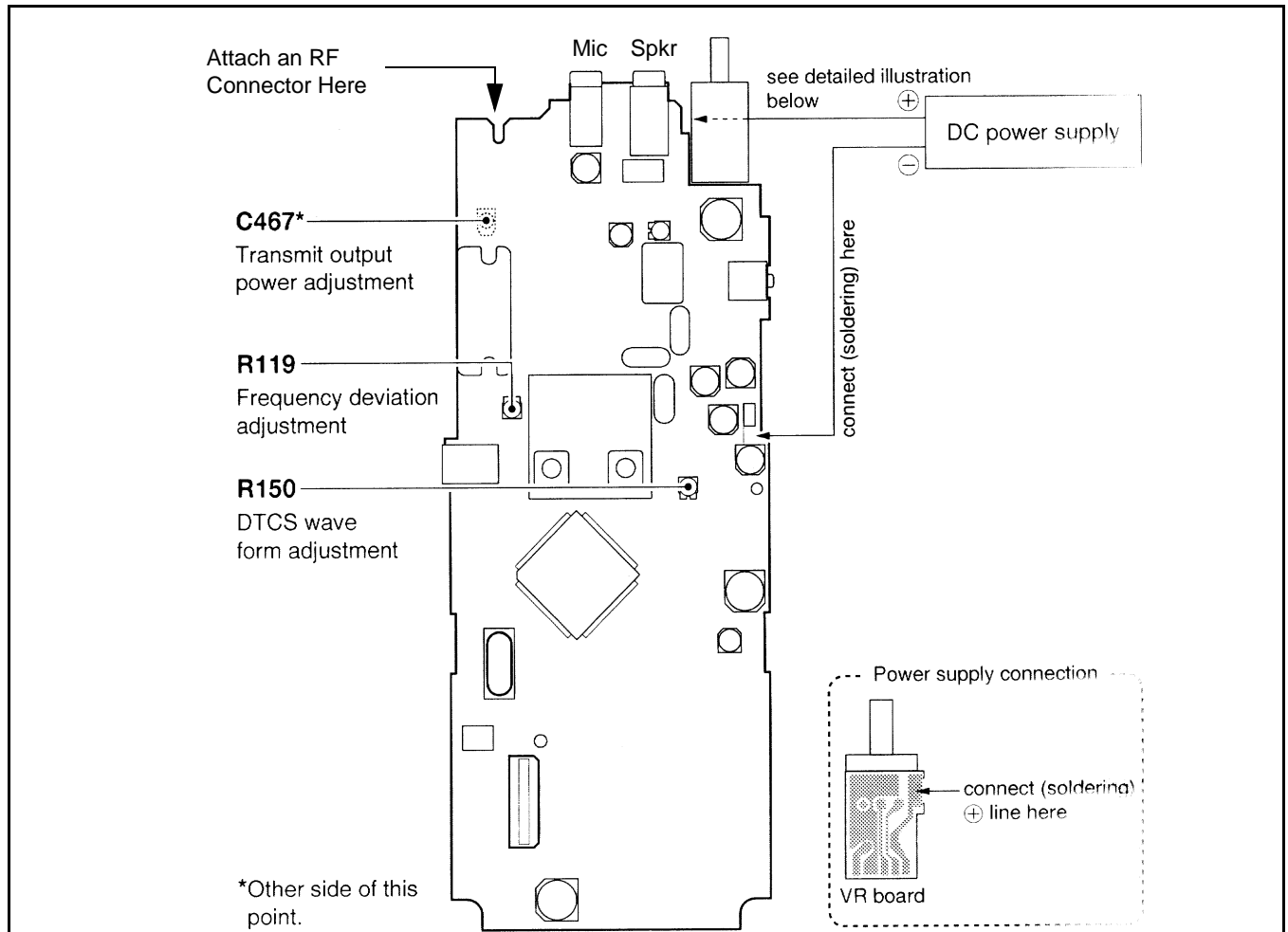


Figure 5-5 UHF Adjustment Points

5.8 RECEIVER ADJUSTMENTS (UHF MODELS)

Automatic Adjustment Method 1
(Adjusts all filters)

5.8.1 BANDPASS FILTER ADJUST

1. Select the channel on the low end of the band (400.000 or 440.000 MHz). Connect a SINAD meter with an 8-ohm load to the speaker (SP) jack.
2. Connect an RF signal generator to the antenna jack. Set the output for the channel frequency at a level of $3.2 \mu\text{V}$ (-97 dBm), modulated with 1 kHz at the following deviation:

Wideband (25 kHz) Models - 3.5 kHz
Narrowband (12.5 kHz) Models - 1.75 kHz

3. Adjust the filters automatically or manually as follows:

- a. Select "BPF T1" on the screen and adjust for "0". Repeat for T2 – T4. Reselect "BPF T1".
- b. Press the F9 key and all filters are automatically adjusted for peak levels.

Automatic Adjustment Method 2
(Adjusts only one filter)

- a. Select "BPF T1" and press F8 to automatically adjust it for a peak level.
- b. Repeat for the other three filters.

UHF ADJUSTMENTS (CONT'D)

Manual Adjustment

- a. Select "BPF T1" and press the adjust keys (←/→, PgUp/PgDn, or spacebar/backspace) for minimum distortion.
- b. Repeat for the other three filters

NOTE: The receive squelch adjustment in the next section must be performed if the preceding adjustment is made.

5.8.2 SQUELCH ADJUST

General

This adjustment can be made with the transceiver completely assembled by removing the small adhesive-backed label covering the access hole in the chassis. Simply insert a sharp tool under the label and carefully peel it off. A spare label is included with each transceiver.

Adjustment Procedure

1. Select the channel in the middle of the band (415.000 or 455.000 MHz).
2. Connect a SINAD meter with an 8-ohm load to the speaker (SP) jack.
3. Connect an RF signal generator to the antenna jack. Set it to the channel frequency with an output modulated with 1 kHz at the following deviation:

Wideband (25 kHz) Models - 3.5 kHz
Narrowband (12.5 kHz) Models - 1.75 kHz
4. Preset R92 (see Figure 5-4) counterclockwise to open the squelch. Adjust the generator output level for 12 dB SINAD.
5. Rotate R92 clockwise to close the squelch and then slowly rotate it counterclockwise until the squelch just opens (audio is heard).

SECTION 6 PARTS LIST

7510 (VHF) Main Unit

Ref No.	Description	Part No.
7510 (VHF) MAIN UNIT PARTS LIST		
C 1	Ceramic C1608 CH 1H 070D-T-A	022-3906-596
C 2	Ceramic C1608 CH 1H 050B-T-A	022-3906-610
C 3	Ceramic C1608 CH 1H 200J-T-A	022-3906-611
C 4	Ceramic C1608 CH 1H 050B-T-A	022-3906-610
C 5	Ceramic C1608 CH 1H 180J-T-A	022-3906-068
C 6	Ceramic C1608 CH 1H 120J-T-A (136-150 MHz)	022-3906-066
	Ceramic C1608 CH 1H 100D-T-A (146-174 MHz)	022-3906-598
C 7	Ceramic C1608 CH 1H 120J-T-A (136-150 MHz)	022-3906-066
	Ceramic C1608 CH 1H 150J-T-A (146-174 MHz)	022-3906-067
C 8	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 9	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 10	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 11	Ceramic C1608 CH 1H 560J-T-A	022-3906-601
C 12	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 13	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 14	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 15	Ceramic C1608 CH 1H 330J-T-A	022-3906-070
C 17	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 18	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 19	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 20	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 21	Electrolytic ECEV1CA330P	022-3906-619
C 22	Ceramic C1608 CH 1H 150J-T-A	022-3906-067
C 23	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 24	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 25	Ceramic C1608 CH 1H 220J-T-A	022-3906-065
C 26	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 27	Ceramic C1608 CH 1H 180J-T-A	022-3906-068
C 28	Ceramic C1608 CH 1H 120J-T-A	022-3906-066
C 29	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 30	Ceramic C1608 CH 1H 220J-T-A	022-3906-065
C 31	Ceramic C1608 CH 1H 050B-T-A	022-3906-610
C 32	Ceramic C1608 JB 1H 102K-T-A	022-3906-060

Ref No.	Description	Part No.
C 33	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 34	Ceramic C1608 CH 1H 0R5B-T-A	022-3906-084
C 35	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 36	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 37	Ceramic C1608 CH 1H 020B-T-A (136-150 MHz)	022-3906-086
	Ceramic C1608 CH 1H 010B-T-A (146-174 MHz)	022-3906-085
C 38	Ceramic C1608 CH 1H 1R5B-T-A	022-3906-087
C 39	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 41	Ceramic C1608 CH 1H 390J-T-A	022-3906-599
C 42	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 44	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 45	Ceramic C1608 CH 1H 331J-T-A (136-150 MHz)	022-3906-092
	Ceramic C1608 CH 1H 101J-T-A (146-174 MHz)	022-3906-072
C 46	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 47	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 48	Tantalum ECST1AY225R	022-3906-626
C 49	Tantalum ECST1CY684R	022-3906-633
C 50	Tantalum ECST0JY106R	022-3906-627
C 51	Ceramic C1608 CH 1H 150J-T-A	022-3906-067
C 52	Ceramic C1608 CH 1H 220J-T-A	022-3906-065
C 53	Ceramic C1608 CH 1H 120J-T-A	022-3906-066
C 54	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 55	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 56	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 57	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 58	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 59	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 60	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 61	Ceramic C1608 CH 1H 180J-T-A (136-150 MHz)	022-3906-068
	Ceramic C1608 CH 1H 090D-T-A (146-174 MHz)	022-3906-348
C 62	Ceramic C1608 CH 1H 180J-T-A (136-150 MHz)	022-3906-068
	Ceramic C1608 CH 1H 090D-T-A (146-174 MHz)	022-3906-348
C 63	Ceramic C1608 CH 1H 560J-T-A	022-3906-601
C 64	Ceramic C1608 CH 1H 120J-T-A	022-3906-066

7510 (VHF) Main Unit

Ref No.	Description	Part No.
C 65	Ceramic C1608 CH 1H 040B-T-A	022-3906-609
C 66	Ceramic C1608 CH 1H 180J-T-A	022-3906-068
C 67	Ceramic C1608 CH 1H 100D-T-A	022-3906-598
C 69	Ceramic C1608 CH 1H 330J-T-A	022-3906-070
C 70	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 71	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 72	Tantalum ECST1CY105R	022-3906-625
C 73	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 75	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 76	Ceramic C1608 CH 1H 200J-T-A (136-150 MHz)	022-3906-611
	Ceramic C1608 CH 1H 180J-T-A (146-174 MHz)	022-3906-068
C 78	Ceramic C1608 CH 1H 100D-T-A	022-3906-598
C 79	Ceramic C1608 CH 1H 040B-T-A	022-3906-609
C 80	Ceramic C1608 CH 1H 050B-T-A (136-150 MHz)	022-3906-610
	Ceramic C1608 CH 1H 3R5B-T-A (146-174 MHz)	022-3906-353
C 81	Ceramic C1608 CH 1H 101J-T-A	022-3906-072
C 82	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 83	Ceramic C1608 CH 1H 010B-T-A	022-3906-085
C 84	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 85	Ceramic C1608 CH 1H 121J-T-A	022-3906-349
C 86	Ceramic C1608 CH 1H 090D-T-A (136-150 MHz)	022-3906-348
	Ceramic C1608 CH 1H 050B-T-A (146-174 MHz)	022-3906-610
C 87	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 88	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 89	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 90	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 91	Ceramic C1608 CH 1H 080D-T-A	022-3906-597
C 92	Ceramic C1608 CH 1H 101J-T-A	022-3906-072
C 93	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 94	Ceramic C1608 CH 1H 020B-T-A	022-3906-086
C 95	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 96	Ceramic C1608 CH 1H 101J-T-A	022-3906-072
C 97	Ceramic C1608 CH 1H 080D-T-A	022-3906-597
C 98	Ceramic C1608 CH 1H 050B-T-A	022-3906-610
C 99	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 100	Ceramic C1608 CH 1H 150J-T-A	022-3906-067
C 101	Ceramic C1608 CH 1H 560J-T-A	022-3906-601
C 102	Ceramic C1608 CH 1H 150J-T-A	022-3906-067
C 104	Ceramic C1608 JB 1H 102K-T-A	022-3906-060

Ref No.	Description	Part No.
C 105	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 106	Ceramic C1608 CH 1H 560J-T-A	022-3906-601
C 107	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 108	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 109	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 110	Ceramic C1608 CH 1H 090D-T-A (Wideband models)	022-3906-348
	Ceramic C1608 CH 1H 110J-T-A (Narrowband models)	022-3906-613
C 111	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 112	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 113	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 114	Ceramic C1608 JB 1C 333K-T-A	022-3906-351
C 115	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 116	Ceramic C1608 CH 1H 820J-T-A (Wideband models)	022-3906-602
	Ceramic C1608 CH 1H 101J-T-A (Narrowband models)	022-3906-072
C 117	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 118	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 119	Ceramic C2012 JF 1C 105Z-T-A	022-3906-078
C 120	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 121	Ceramic C1608 CH 1H 221J-T-A	022-3906-603
C 122	Ceramic C1608 CH 1H 221J-T-A	022-3906-603
C 123	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 124	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 125	Ceramic C1608 JB 1H 222K-T-A	022-3906-061
C 126	Ceramic C1608 JB 1H 272K-T-A	022-3901-393
C 128	Ceramic C2012 JF 1C 105Z-T-A	022-3906-078
C 129	Tantalum ECST0JY156R	022-3906-635
C 131	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 132	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 133	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 134	Ceramic C1608 CH 1H 221J-T-A	022-3906-603
C 135	Ceramic C1608 CH 1H 181J-T-A	022-3906-527
C 136	Ceramic C1608 JB 1H 392K-T-A	022-3906-612
C 137	Ceramic C1608 JB 1C 273K-T-A (Wideband models)	022-3906-608
	Ceramic C1608 JB 1C 333K-T-A (Narrowband models)	022-3906-351
C 138	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 139	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 140	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 141	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 142	Ceramic C1608 JB 1H 102K-T-A	022-3906-060

7510 (VHF) Main Unit

Ref No.	Description	Part No.
C 143	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 144	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 145	Electrolytic ECEV1CA100SR	022-3906-617
C 146	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 147	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 148	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 149	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 150	Tantalum ECST0JY106R	022-3906-627
C 151	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 152	Ceramic C1608 JB 1C 473K-T-A	022-3906-080
C 153	Electrolytic ECEV1AA221P	022-3906-622
C 154	Electrolytic ECEV1CA100SR	022-3906-617
C 155	Electrolytic ECEV1CA100SR	022-3906-617
C 156	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 157	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 158	Electrolytic ECEV0JA101SP	022-3906-621
C 159	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 160	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 161	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 162	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 163	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 164	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 165	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 166	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 167	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 168	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 169	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 170	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 171	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 172	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 173	Electrolytic ECEV1CA470SP	022-3906-618
C 174	Electrolytic ECEV0JA220SR	022-3906-623
C 175	Electrolytic ECEV0JA220SR	022-3906-623
C 176	Electrolytic ECEV0JA220SR	022-3906-623
C 177	Electrolytic ECEV0JA220SR	022-3906-623
C 179	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 180	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 181	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 182	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 183	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 184	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 185	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 186	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 187	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 189	Ceramic C1608 JB 1H 102K-T-A	022-3906-060

Ref No.	Description	Part No.
C 190	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 193	Ceramic C1608 CH 1H 080D-T-A	022-3906-597
C 194	Ceramic C1608 CH 1H 120J-T-A	022-3906-066
C 195	Ceramic C1608 CH 1H 390J-T-A	022-3906-599
C 196	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 197	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 198	Tantalum ECST1AY225R	022-3906-626
C 199	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 200	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 201	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 202	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 203	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 204	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 205	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 209	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 210	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 211	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 212	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 213	Tantalum ECST1AY225R	022-3906-626
C 214	Ceramic C1608 JB 1C 333K-T-A	022-3906-351
C 215	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 217	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 218	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 221	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 222	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 223	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 224	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 225	Ceramic C1608 JB 1C 223K-T-A	022-3906-079
C 226	Ceramic C1608 JB 1C 473K-T-A	022-3906-080
C 227	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 228	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 229	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 230	Tantalum ECST1EY474R	022-3906-624
C 231	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 232	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 233	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 234	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 235	Ceramic C1608 CH 1H R75B-T-A (136-150 MHz only)	022-3906-490
C 237	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 238	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 239	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 240	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 241	Tantalum ECST0JY106R	022-3906-627
C 242	Ceramic C1608 JB 1E 103K-T-A	022-3906-063

PARTS LIST

7510 (VHF) Main Unit

Ref No.	Description	Part No.
C 243	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 244	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 245	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 246	Ceramic C1608 JB 1C 333K-T-A	022-3906-351
C 248	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 249	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 250	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 251	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 252	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 253	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 254	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 257	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 258	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 259	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 260	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 261	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 262	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 263	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 264	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 265	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 266	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 267	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 268	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 269	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 270	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 271	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 272	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 273	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 274	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 275	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 276	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 277	Ceramic C1608 CH 1H 1R5B-T-A	022-3906-087
C 278	Ceramic C1608 CH 1H 120J-T-A (136-150 MHz)	022-3906-066
	Ceramic C1608 CH 1H 100D-T-A (146-174 MHz)	022-3906-598
C 280	Ceramic C1608 CH 1H 240J-T-A	022-3901-411
C 281	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 282	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 283	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 284	Ceramic C1608 JB 1H 332K-T-A	022-3906-077
C 286	Ceramic C1608 JB 1H 222K-T-A	022-3906-061
C 287	Ceramic C1608 CH 1H 150J-T-A (136-150 MHz)	022-3906-067

Ref No.	Description	Part No.
	Ceramic C1608 CH 1H 390J-T-A (146-174 MHz)	022-3906-599
C 288	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 289	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 290	Ceramic C1608 CH 1H 150J-T-A	022-3906-067
C 291	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
D 1	Diode MA77(TW)	022-3906-047
D 3	Diode MA77(TW)	022-3906-047
D 4	Diode MA77(TW)	022-3906-047
D 5	Varicap HVU350TRF	022-3906-578
D 6	Diode MA77(TW)	022-3906-047
D 7	Varicap HVU17TRF	022-3906-580
D 8	Diode MA862(TX)	022-3901-358
D 9	Varicap HVU350TRF	022-3906-578
D 10	Varicap HVU350TRF	022-3906-578
D 11	Varicap HVU350TRF	022-3906-578
D 12	Varicap HVU350TRF	022-3906-578
D 13	Varicap HVU350TRF	022-3906-578
D 15	Diode MA111(TX)	022-3906-585
D 16	Diode MA6S121(TX)	022-3906-583
D 17	Diode MA6S121(TX)	022-3906-583
D 18	Diode MA111(TX)	022-3906-585
D 19	Diode MA111(TX)	022-3906-585
D 21	Varicap HVU350TRF	022-3906-578
D 22	Varicap HVU350TRF	022-3906-578
D 24	Diode DA204U T107	022-3906-582
D 25	Diode SB07-03C-TB	022-3906-332
D 26	Diode DAN202U T107	022-3906-558
D 27	Diode DA204U T107	022-3906-582
D 28	Diode MA77(TW)	022-3906-047
D 29	Zener Ma8030-h(Tx)	022-3906-581
DS1	LCD LM-1462B	022-3906-638
DS2	LED LNJ310M6URA	022-3906-637
DS3	LED LNJ310M6URA	022-3906-637
DS4	LED LNJ808R8ERA	022-3906-639
EP1	PCB B 4929E 2P(#1922-1D)	N/A
EP2	LCD Contact Srcn-1922-sp-n-w	022-3906-735
FI1	Xtal UM-5 31.05 MHz (FI-270) (Narrowband models)	022-3906-588
	Xtal UM-5 31.05 MHz (FI-268) (Wideband models)	022-3906-586

7510 (VHF) Main Unit

Ref No.	Description	Part No.
FI2	Ceramic CFWM450E (Wideband models)	022-3906-590
	Ceramic CFWM450G (Narrow-band models)	022-3906-591
IC1	IC UPD3140GS-E1 (DS8)	022-3906-554
IC2	IC TA31136FN(D,EL)	022-3906-302
IC3	IC NJM2902V-TE1	022-3906-553
IC4	IC BU4066BCFV-E1	022-3906-555
IC5	IC TA7368F(TP1)	022-3906-550
IC6	IC S-81250PG-PD-T1	022-3906-559
IC7	IC 25LC160T-I/SN	022-3906-556
IC8	IC HD6433875A56H	022-3906-557
IC10	IC M62354GP 75EC	022-3906-552
IC11	IC S-80742SL-A6-T1	022-3906-551
J 2	Connector HSJ1122-010010	022-3906-679
J 3	Connector HSJ1456-01-220	022-3906-680
J 4	Connector HEC2711-01-020	022-3906-678
J 5	Connector AXN330C038P	022-3906-681
J 6	Connector PI28A-02M	022-3901-444
J 7	Connector Imsa-9230b-1-05z080-t	022-3906-682
L 1	COIL LA-226	022-3906-643
L 2	COIL LA-225	022-3906-644
L 3	COIL LA-225	022-3906-644
L 4	COIL LQN 1A 17NJ04	022-3906-646
L 5	COIL 33CS-Y655LY-03K=P3	022-3906-670
L 6	COIL LQN 1A 47NJ04	022-3906-650
L 7	COIL ELJRE R10G-F	022-3906-674
L 8	COIL ELJRE R10G-F	022-3906-674
L 9	COIL MLF1608D R15K-T (136-150 MHz)	022-3906-659
	COIL ELJRE R10G-F (146-174 MHz)	022-3906-674
L 10	COIL MLF1608D R15K-T (136-150 MHz)	022-3906-659
	COIL ELJRE R10G-F (146-174 MHz)	022-3906-674
L 11	COIL MC152-E558CN-100024	022-3906-663
L 12	COIL NL 322522T-2R7J-3	022-3906-651
L 13	COIL MLF1608A 1R0K-T	022-3906-656
L 14	COIL ELJRE 47NG-F (136-150 MHz)	022-3906-494

Ref No.	Description	Part No.
	COIL ELJRE 82NG-F (146-174 MHz)	022-3906-675
L 15	COIL LQN 1A 47NJ04	022-3906-650
L 16	COIL LQN1H 54NK04	022-3906-676
L 17	COIL LQN1H 54NK04	022-3906-676
L 18	COIL LQN 1A 33NJ04	022-3906-647
L 19	COIL LQN 1A 33NJ04	022-3906-647
L 20	COIL MLF1608D R47K-T	022-3906-662
L 21	COIL ELJRE 47NG-F	022-3906-494
L 22	COIL LQN 1A 47NJ04	022-3906-650
L 23	COIL LQN 1A 39NJ04 (136-150 MHz)	022-3906-648
	COIL LQN 1A 33NJ04 (146-174 MHz)	022-3906-647
L 24	COIL NL 322522T-2R7J-3	022-3906-651
L 25	COIL MLF1608A 1R0K-T	022-3906-656
L 26	COIL EXCCL3225U1	022-3906-654
L 27	COIL EXCCL3225U1	022-3906-654
L 28	COIL ELJRE 68NG-F	022-3906-671
L 29	COIL ELJRE R10G-F	022-3906-674
L 30	COIL EXCCL4532U1	022-3906-677
MC1	Microphone KUC3523-040245	022-3906-702
MP1	Case 1922 VCO Case-1	022-3906-714
MP2	Cover 1922 VCO Cover-1	022-3906-713
MP3	Holder 1922 LCD Holder	022-3906-729
MP4	Panel 1922 Reflector	022-3906-706
MP5	Heatsink 1922 PA Heatsink	022-3906-712
Q 1	FET 2SK2595AXTB	022-3906-568
Q 2	FET 2SK2596BXTL	022-3906-569
Q 3	Transistor 2SC4226-t2 R25	022-3906-499
Q 4	Transistor 2SC4215-o (Te85r)	022-3906-563
Q 5	Transistor 2SC4215-o (Te85r)	022-3906-563
Q 6	Transistor 2SC4215-o (Te85r)	022-3906-563
Q 7	Transistor 2SC4226-t2 R25	022-3906-499
Q 8	Transistor 2SC4226-t2 R25	022-3906-499
Q 9	Transistor xp6401-(Tx)	022-3906-575
Q 11	Transistor 2SC4081 T107 R	022-3901-343
Q 12	FET 3SK239XR-TL	022-3906-325
Q 13	FET 3SK166-2-T7	022-3906-570
Q 14	Transistor 2SC2714-y (Te85r)	022-3906-562
Q 15	Transistor 2SB1132 T100 R	022-3906-318
Q 16	Transistor XP6501-(Tx).ab	022-3906-573

7510 (VHF) Main Unit

Ref No.	Description	Part No.
Q 17	Transistor UN911H(TX)	022-3906-576
Q 18	Transistor 2SB1132 T100 R	022-3906-318
Q 19	Transistor XP6501-(TX).AB	022-3906-573
Q 20	Transistor 2SA1588-GR (TE85R)	022-3906-561
Q 21	Transistor 2SA1588-GR (TE85R)	022-3906-561
Q 22	Transistor 2SA1588-GR (TE85R)	022-3906-561
Q 23	Transistor 2SC4081 T107 R	022-3901-343
Q 25	Transistor 2SC2712-Y (te85rtem)	022-3901-626
Q 26	Transistor DTC144EU T107	022-3906-038
Q 27	Transistor 2SB1132 T100 R	022-3906-318
Q 28	Transistor 2SC4081 T107 R	022-3901-343
Q 29	Transistor XP1213(Tx)	022-3901-355
Q 31	Transistor DTC144TU T107	022-3906-572
Q 32	Transistor DTC144EU T107	022-3906-038
Q 33	Transistor RXP4601(TX)	022-3906-328
Q 34	FET 2SK880-Y (TE85R)	022-3906-567
Q 35	Transistor 2SC4081 T107 R	022-3901-343
Q 36	Transistor 2SC4081 T107 R	022-3901-343
Q 37	Transistor DTA144EU T107	022-3901-353
Q 38	Transistor DTC144EU T107	022-3906-038
R 1	Variable Rv-312(Rk0971110)	022-3906-696
	Resistor 823 V (82kohm)	022-3906-174
R 2	Resistor Rr0816p-103-d (10kohm)	022-3906-689
R 3	Resistor Rr0816p-102-d (1kohm)	022-3906-690
R 4	Resistor 220 V (22ohm)	022-3906-685
R 5	Resistor 101 V (100ohm)	022-3906-143
R 7	Resistor 101 V (100ohm)	022-3906-143
R 8	Resistor 472 V (4.7Kohm)	022-3906-160
	(136-150 MHz)	
	Resistor 123 V (12kohm)	022-3906-164
	(146-174 MHz)	
R 9	Resistor 270 V (27ohm)	022-3906-686
	(136-150 MHz)	
	Resistor 820 V (82ohm)	022-3906-388
	(146-174 MHz)	
R 10	Resistor 820 V (82ohm)	022-3906-388
R 11	Resistor 122 V (1.2kohm)	022-3906-390
R 12	Resistor 332 V (3.3kohm)	022-3906-159
R 13	Resistor 330 V (33ohm)	022-3906-387
R 14	Resistor 472 V (4.7kohm)	022-3906-160
R 15	Resistor 101 V (100ohm)	022-3906-143
R 16	Resistor 1r0 V (1ohm)	022-3906-688
R 17	Resistor 472 V (4.7kohm)	022-3906-160
R 18	Resistor 393 V (39kohm)	022-3906-170

Ref No.	Description	Part No.
R 19	Resistor 391 V (390ohm)	022-3906-149
R 20	Resistor 683 V (68kohm)	022-3906-173
R 21	Resistor 471 V (470ohm)	022-3906-150
R 22	Resistor 683 V (68kohm)	022-3906-173
R 23	Resistor 681 V (680ohm)	022-3906-152
R 24	Resistor 221 V (220ohm)	022-3906-288
R 25	Resistor 822 V (8.2kohm)	022-3906-256
R 26	Resistor 822 V (8.2kohm)	022-3906-256
R 27	Resistor 471 V (470ohm)	022-3906-150
R 28	Resistor 101 V (100ohm)	022-3906-143
R 29	Resistor 102 V (1kohm)	022-3906-154
R 30	Resistor 472 V (4.7kohm)	022-3906-160
R 31	Resistor 102 V (1kohm)	022-3906-154
R 32	Resistor 561 V (560ohm)	022-3906-151
R 33	Resistor 222 V (2.2kohm)	022-3906-157
R 34	Resistor 100 V (10ohm)	022-3906-138
R 35	Resistor 222 V (2.2kohm)	022-3906-157
R 41	Resistor 470 V (47ohm)	022-3906-141
	(136-150 MHz)	
	Resistor 101 V (100ohm)	022-3906-143
	(146-174 MHz)	
R 42	Array Exb-v8v 102jv	022-3906-700
R 44	Resistor 103 V (10kohm)	022-3906-163
R 45	Resistor 101 V (100ohm)	022-3906-143
R 48	Resistor 103 V (10kohm)	022-3906-163
R 49	Resistor 473 V (47kohm)	022-3906-171
R 50	Resistor 104 V (100kohm)	022-3906-175
R 51	Resistor 474 V (470kohm)	022-3906-181
R 52	Resistor 104 V (100kohm)	022-3906-175
R 53	Resistor 103 V (10kohm)	022-3906-163
R 54	Resistor 184 V (180kohm)	022-3906-177
R 55	Resistor 102 V (1kohm)	022-3906-154
R 57	Resistor 105 V (1mohm)	022-3906-184
R 58	Resistor 104 V (100kohm)	022-3906-175
R 59	Resistor 181 V (180ohm)	022-3906-146
R 61	Resistor 470 V (47ohm)	022-3906-141
R 62	Resistor 105 V (1mohm)	022-3906-184
R 63	Resistor 104 V (100kohm)	022-3906-175
R 64	Resistor 105 V (1mohm)	022-3906-184
R 65	Resistor 104 V (100kohm)	022-3906-175
R 66	Resistor 105 V (1mohm)	022-3906-184
R 67	Resistor 104 V (100kohm)	022-3906-175
R 68	Resistor 472 V (4.7kohm)	022-3906-160
R 69	Resistor 101 V (100ohm)	022-3906-143
R 70	Resistor 104 V (100kohm)	022-3906-175

7510 (VHF) Main Unit

Ref No.	Description	Part No.
R 72	Resistor 103 V (10kohm)	022-3906-163
R 75	Resistor 221 V (220ohm)	022-3906-288
R 77	Resistor 101 V (100ohm)	022-3906-143
R 79	Resistor 561 V (560ohm)	022-3906-151
R 80	Resistor 104 V (100kohm)	022-3906-175
R 81	Resistor 152 V (1.5kohm)	022-3906-155
R 82	Resistor 122 V (1.2kohm) (Wideband models)	022-3906-390
	Resistor 272 V (2.7kohm) (Narrowband models)	022-3906-158
R 83	Resistor 471 V (470ohm)	022-3906-150
R 84	Resistor 391 V (390ohm)	022-3906-149
R 85	Resistor 152 V (1.5kohm)	022-3906-155
R 86	Resistor 104 V (100kohm)	022-3906-175
R 87	Resistor 332 V (3.3kohm)	022-3906-159
R 88	Resistor 124 V (120kohm)	022-3906-176
R 91	Resistor 394 V (390kohm) (Wideband models)	022-3901-500
	Resistor 104 V (100kohm) (Narrowband models)	022-3906-175
R 92	Trimmer Evm-1ysx50 B54 (503)	022-3906-698
R 93	Resistor 273 V (27kohm)	022-3906-168
R 94	Resistor 105 V (1mohm)	022-3906-184
R 95	Resistor 105 V (1mohm)	022-3906-184
R 96	Resistor 473 V (47kohm)	022-3906-171
R 97	Resistor 224 V (220kohm)	022-3906-178
R 98	Resistor 184 V (180kohm)	022-3906-177
R 99	Resistor 123 V (12kohm)	022-3906-164
R 100	Resistor 182 V (1.8kohm)	022-3906-156
R 101	Resistor 105 V (1mohm)	022-3906-184
R 102	Resistor 100 V (10ohm)	022-3906-138
R 103	Resistor 183 V (18kohm)	022-3906-166
R 104	Resistor 104 V (100kohm)	022-3906-175
R 105	Resistor 151 V (150ohm)	022-3906-145
R 106	Array Exb-v8v 102jv	022-3906-700
R 107	Resistor 184 V (180kohm)	022-3906-177
R 108	Resistor 154 V (150kohm)	022-3906-392
R 109	Resistor 103 V (10kohm)	022-3906-163
R 112	Resistor 105 V (1mohm)	022-3906-184
R 113	Resistor 683 V (68kohm)	022-3906-173
R 114	Resistor 223 V (22kohm) (Wideband models)	022-3906-167
	Resistor 333 V (33kohm) (Narrowband models)	022-3906-169
R 115	Resistor 124 V (120kohm)	022-3906-176
R 116	Resistor 102 V (1kohm)	022-3906-154

Ref No.	Description	Part No.
R 117	Resistor 152 V (1.5kohm)	022-3906-155
R 120	Resistor 683 V (68kohm)	022-3906-173
R 121	Resistor 102 V (1kohm)	022-3906-154
R 122	Resistor 272 V (2.7kohm)	022-3906-158
R 123	Resistor 332 V (3.3kohm)	022-3906-159
R 125	Resistor 273 V (27kohm)	022-3906-168
R 126	Resistor 103 V (10kohm)	022-3906-163
R 127	Resistor 330 V (33ohm)	022-3906-387
R 128	Resistor 100 V (10ohm)	022-3906-138
R 130	Resistor 104 V (100kohm)	022-3906-175
R 131	Resistor 471 V (470ohm)	022-3906-150
R 132	Resistor 471 V (470ohm)	022-3906-150
R 133	Resistor 103 V (10kohm)	022-3906-163
R 134	Resistor 222 V (2.2kohm)	022-3906-157
R 135	Resistor 103 V (10kohm)	022-3906-163
R 137	Resistor 472 V (4.7kohm)	022-3906-160
R 139	Resistor 472 V (4.7kohm)	022-3906-160
R 141	Resistor 472 V (4.7kohm)	022-3906-160
R 142	Resistor 101 V (100ohm)	022-3906-143
R 144	Resistor 333 V (33kohm)	022-3906-169
R 145	Resistor 105 V (1mohm)	022-3906-184
R 146	Resistor 104 V (100kohm)	022-3906-175
R 147	Resistor 224 V (220kohm)	022-3906-178
R 148	Resistor 104 V (100kohm)	022-3906-175
R 149	Resistor 103 V (10kohm)	022-3906-163
R 150	Trimmer Evm-1ysx50 B54 (503)	022-3906-698
R 151	Resistor 473 V (47kohm)	022-3906-171
R 153	Resistor 102 V (1kohm)	022-3906-154
R 154	Resistor Rr0816p-682-d (6.8k-)	022-3906-694
R 155	Resistor 101 V (100ohm)	022-3906-143
R 156	Resistor mcr10ezhj 15 ohm (150)	022-3906-683
R 157	Resistor mcr10ezhj 15 ohm (150)	022-3906-683
R 158	Resistor 103 v (10kohm)	022-3906-163
R 159	Resistor 104 V (100kohm)	022-3906-175
R 160	Resistor 151 V (150ohm)	022-3906-145
R 161	Resistor Erj1wrsjr15u (0.15ohm)	022-3906-693
R 162	Resistor 102 V (1kohm)	022-3906-154
R 163	Resistor 153 V (15kohm)	022-3906-165
R 166	Resistor 104 V (100kohm)	022-3906-175
R 167	Resistor 104 V (100kohm)	022-3906-175
R 168	Resistor 103 V (10kohm)	022-3906-163
R 169	Resistor 103 V (10kohm)	022-3906-163
R 170	Resistor 103 V (10kohm)	022-3906-163
R 171	Resistor 473 V (47kohm)	022-3906-171
R 174	Resistor 153 V (15kohm)	022-3906-165
R 175	Resistor 102 V (1kohm)	022-3906-154

7510 (VHF) Main Unit

Ref No.	Description	Part No.
R 176	Resistor 392 V (3.9kohm)	022-3906-391
R 177	Resistor 102 V (1kohm)	022-3906-154
R 178	Resistor 392 V (3.9kohm)	022-3906-391
R 181	Resistor Rr0816r-104-d (100kohm)	022-3906-395
R 182	Thermistor ntccf2012 4ah 473kc-t	022-3906-403
R 183	Resistor 561 V (560ohm)	022-3906-151
R 184	Resistor 103 V (10kohm)	022-3906-163
R 185	Resistor 102 V (1kohm)	022-3906-154
R 186	Resistor 473 V (47kohm)	022-3906-171
R 187	Resistor 104 V (100kohm)	022-3906-175
R 190	Resistor 393 V (39kohm)	022-3906-170
R 191	Resistor 103 V (10kohm)	022-3906-163
R 192	Resistor 103 V (10kohm)	022-3906-163
R 193	Resistor 104 V (100kohm)	022-3906-175
R 194	Resistor 104 V (100kohm)	022-3906-175
R 195	Resistor 104 V (100kohm)	022-3906-175
R 196	Resistor 104 V (100kohm)	022-3906-175
R 197	Resistor 184 V (180kohm)	022-3906-177
R 198	Resistor 102 V (1kohm)	022-3906-154
R 199	Resistor 392 V (3.9kohm)	022-3906-391
R 200	Resistor 102 V (1kohm)	022-3906-154
R 201	Resistor 563 V (56kohm)	022-3906-172
R 202	Resistor 123 V (12kohm)	022-3906-164
R 203	Resistor 123 V (12kohm)	022-3906-164
R 204	Resistor 332 V (3.3kohm)	022-3906-159
R 205	Resistor 152 V (1.5kohm)	022-3906-155
R 207	Resistor 473 V (47kohm)	022-3906-171
R 208	Resistor 103 V (10kohm)	022-3906-163
R 209	Resistor 103 V (10kohm)	022-3906-163
R 210	Resistor 392 V (3.9kohm)	022-3906-391
R 213	Resistor 102 V (1kohm)	022-3906-154
R 214	Resistor 102 V (1kohm)	022-3906-154
R 215	Resistor Rr0816r-334-d (330kohm)	022-3906-691
R 216	Resistor Rr0816r-154-d (150kohm)	022-3906-692
R 217	Resistor 102 V (1kohm)	022-3906-154
R 218	Resistor 124 V (120kohm)	022-3906-176
R 219	Resistor 124 V (120kohm)	022-3906-176
R 220	Resistor 274 V (270kohm)	022-3906-179
R 221	Resistor 334 V (330kohm)	022-3906-180
R 222	Resistor 103 V (10kohm)	022-3906-163
R 224	Resistor 333 V (33kohm)	022-3906-169
R 224	Resistor 393 V (39kohm)	022-3906-170
R 225	Resistor 104 V (100kohm)	022-3906-175
R 226	Array Exb-v8v 102jv	022-3906-700
R 227	Resistor 102 V (1kohm)	022-3906-154

Ref No.	Description	Part No.
R 228	Resistor 104 V (100kohm)	022-3906-175
R 229	Resistor 683 V (68kohm)	022-3906-173
R 230	Resistor 273 V (27kohm)	022-3906-168
R 231	Resistor 103 V (10kohm)	022-3906-163
R 232	Array EXB-V8V 102JV	022-3906-700
R 233	Array EXB-V8V 102JV	022-3906-700
R 234	Resistor 223 V (22kohm)	022-3906-167
R 235	Resistor 684 V (680kohm)	022-3906-183
R 236	Array EXB-V8V 102JV	022-3906-700
R 237	Array EXB-V8V 102JV	022-3906-700
R 238	Resistor 104 V (100kohm)	022-3906-175
R 240	Array EXB-V8V 102JV	022-3906-700
R 241	Resistor 102 V (1kohm)	022-3906-154
R 242	Resistor 102 V (1kohm)	022-3906-154
R 243	Array EXB-V8V 102JV	022-3906-700
R 244	Resistor 104 V (100kohm)	022-3906-175
R 245	Resistor 104 V (100kohm)	022-3906-175
R 248	Resistor 823 V (82Kohm) (136-150 MHz wideband models)	022-3906-174
	Resistor 683 V (68kohm) (146-174 MHz wideband models)	022-3906-173
	Resistor 184 V (180Kohm) (136-150 MHz narrowband mod.)	022-3906-177
	Resistor 154 V (150kohm) (146-174 MHz narrowband mod.)	022-3906-392
R 249	Resistor 473 V (47kohm)	022-3906-171
R 250	Resistor Rr0816p-103-d (10kohm)	022-3906-689
R 251	Resistor 334 V (330kohm)	022-3906-180
R 252	Resistor 104 V (100kohm)	022-3906-175
R 253	Resistor 471 V (470ohm)	022-3906-150
R 255	Resistor 470 V (47ohm)	022-3906-141
R 257	Resistor 105 V (1mohm)	022-3906-184
S 1	Switch JPM1990-2013R	022-3906-338
SP1	Speaker K036na500-26	022-3906-593
W 1	Jumper ERJ3GE JPW V	022-3906-185
W 2	Jumper ERJ3GE JPW V	022-3906-185
W 7	Jumper ERJ3GE JPW V	022-3906-185
WS1	FX2079 P01MA	022-3906-719
X 1	Xtal CR-576 UM-5 15.3 MHz	022-3906-641
X 2	Xtal CR-463 SMD-49 6.8 MHz	022-3906-640
X 3	Discri CDBCA450CX24	022-3906-642

7540 (UHF) Main Unit

Ref No.	Description	Part No.
7540 (UHF) MAIN UNIT PARTS LIST		
C 3	Ceramic C1608 CH 1H 120J-T-A	022-3906-066
C 5	Ceramic C1608 CH 1H 080D-T-A (440-470 MHz)	022-3906-597
	Ceramic C1608 CH 1H 090D-T-A (400-430 MHz)	022-3906-348
C 7	Ceramic C1608 CH 1H 040B-T-A (440-470 MHz)	022-3906-609
	Ceramic C1608 CH 1H 050B-T-A (400-430 MHz)	022-3906-610
C 8	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 9	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 10	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 11	Ceramic C2012 CH 1H 080D-T-A (440-470 MHz)	022-3906-594
	Ceramic C2012 CH 1H 120J-T-A (400-430 MHz)	022-3906-595
C 13	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 14	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 15	Ceramic C1608 CH 1H 270J-T-A (400-430 MHz)	022-3906-069
	Ceramic C1608 CH 1H 200J-T-A (440-470 MHz)	022-3906-611
C 17	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 18	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 19	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 20	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 21	Electrolytic ECEV1CA220SR	022-3906-620
C 22	Ceramic C1608 CH 1H 070D-T-A (400-430 MHz)	022-3906-596
	Ceramic C1608 CH 1H 080D-T-A (440-470 MHz)	022-3906-597
C 24	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 25	Ceramic C1608 CH 1H 040B-T-A	022-3906-609
C 26	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 27	Ceramic C1608 CH 1H 050B-T-A	022-3906-610
C 28	Ceramic C1608 CH 1H 120J-T-A	022-3906-066
C 30	Ceramic C1608 CH 1H 120J-T-A	022-3906-066
C 31	Ceramic C1608 CH 1H 050B-T-A	022-3906-610
C 32	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 33	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 42	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 47	Tantalum ECST1VY104R	022-3906-630

Ref No.	Description	Part No.
C 48	Tantalum ECST1EY105R	022-3906-632
C 51	Ceramic C1608 CH 1H 100D-T-A	022-3906-598
C 52	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 53	Ceramic C1608 CH 1H 050B-T-A	022-3906-610
C 54	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 55	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 56	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 57	Ceramic C1608 CH 1H 220J-T-A	022-3906-065
C 58	Ceramic C1608 CH 1H 101J-T-A	022-3906-072
C 59	Ceramic C1608 CH 1H 101J-T-A	022-3906-072
C 60	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 61	Ceramic C1608 CH 1H 060B-T-A	022-3906-615
C 62	Ceramic C1608 CH 1H 060B-T-A	022-3906-615
C 63	Ceramic C1608 CH 1H 560J-T-A	022-3906-601
C 64	Ceramic C1608 CH 1H 120J-T-A	022-3906-066
C 65	Ceramic C1608 CH 1H 040B-T-A	022-3906-609
C 66	Ceramic C1608 CH 1H 040B-T-A	022-3906-609
C 67	Ceramic C1608 CH 1H 030B-T-A	022-3906-489
C 69	Ceramic C1608 CH 1H 330J-T-A	022-3906-070
C 70	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 71	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 72	Tantalum ECST0JY475R	022-3906-629
C 73	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 75	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 76	Ceramic C1608 CH 1H 070D-T-A (400-430 MHz)	022-3906-596
	Ceramic C1608 CH 1H 040B-T-A (440-470 MHz)	022-3906-609
C 77	Ceramic C1608 CH 1H 560J-T-A	022-3906-601
C 78	Ceramic C1608 CH 1H 070D-T-A	022-3906-596
C 79	Ceramic C1608 CH 1H 2R5B-T-A	022-3906-071
C 84	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 85	Ceramic C1608 CH 1H 100D-T-A (400-430 MHz)	022-3906-598
	Ceramic C1608 CH 1H 060B-T-A (440-470 MHz)	022-3906-615
C 86	Ceramic C1608 CH 1H 050B-T-A (440-470 MHz)	022-3906-610
	Ceramic C1608 CH 1H 060B-T-A (400-430 MHz)	022-3906-615
C 87	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 88	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 89	Ceramic C1608 CH 1H 0R5B-T-A	022-3906-084
C 90	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 91	Ceramic C1608 CH 1H 070D-T-A (440-470 MHz)	022-3906-596

7540 (UHF) Main Unit

Ref No.	Description	Part No.
C 92	Ceramic C1608 CH 1H 090D-T-A (400-430 MHz)	022-3906-348
	Ceramic C1608 CH 1H 070D-T-A (440-470 MHz)	022-3906-596
C 93	Ceramic C1608 CH 1H 090D-T-A (400-430 MHz)	022-3906-348
	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 94	Ceramic C1608 CH 1H 0R5B-T-A	022-3906-084
C 95	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 96	Ceramic C1608 CH 1H 070D-T-A (440-470 MHz)	022-3906-596
	Ceramic C1608 CH 1H 090D-T-A (400-430 MHz)	022-3906-348
C 97	Ceramic C1608 CH 1H 070D-T-A (400-430 MHz)	022-3906-596
	Ceramic C1608 CH 1H 050B-T-A (440-470 MHz)	022-3906-610
C 99	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 105	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 106	Ceramic C1608 CH 1H 100D-T-A (Wideband models)	022-3906-598
	Ceramic C1608 CH 1H 060B-T-A (Narrowband models)	022-3906-615
C 107	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 108	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 109	Ceramic C1608 CH 1H 080D-T-A (Narrowband models)	022-3906-597
	Ceramic C1608 CH 1H 100D-T-A (Wideband models)	022-3906-598
C 112	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 113	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 114	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 115	Ceramic C1608 CH 1H 101J-T-A	022-3906-072
C 116	Ceramic C1608 CH 1H 560J-T-A (Wideband models)	022-3906-601
	Ceramic C1608 CH 1H 101J-T-A (Narrowband models)	022-3906-072
C 117	Tantalum ECST0JY475R	022-3906-629
C 118	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 120	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 121	Ceramic C1608 CH 1H 221J-T-A	022-3906-603
C 122	Ceramic C1608 CH 1H 221J-T-A	022-3906-603
C 123	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 124	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 125	Ceramic C1608 JB 1H 152K-T-A	022-3906-090
C 126	Ceramic C1608 JB 1H 392K-T-A	022-3906-612

Ref No.	Description	Part No.
C 128	Ceramic C2012 JF 1C 105Z-T-A	022-3906-078
C 129	Tantalum ECST0JY156R	022-3906-635
C 131	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 132	Ceramic C1608 JB 1H 472K-T-A	022-3906-062
C 133	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 134	Ceramic C1608 CH 1H 151J-T-A (Wideband models)	022-3906-073
	Ceramic C1608 CH 1H 221J-T-A (Narrowband models)	022-3906-603
C 135	Ceramic C1608 CH 1H 101J-T-A (Wideband models)	022-3906-072
	Ceramic C1608 CH 1H 121J-T-A (Narrowband models)	022-3906-349
C 136	Ceramic C1608 JB 1H 472K-T-A	022-3906-062
C 137	Ceramic C1608 JB 1C 333K-T-A	022-3906-351
C 139	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 140	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 141	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 142	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 143	Ceramic C1608 CH 1H 101J-T-A	022-3906-072
C 144	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 145	Electrolytic ECEV1CA100SR	022-3906-617
C 146	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 147	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 148	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 149	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 150	Tantalum ECST0JY106R	022-3906-627
C 151	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 152	Ceramic C1608 JB 1C 473K-T-A	022-3906-080
C 153	Tantalum ECST1AD107R	022-3906-634
C 154	Tantalum ECST0JY106R	022-3906-627
C 155	Electrolytic ECEV1CA100SR	022-3906-617
C 156	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 157	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 158	Electrolytic ECEV0JA101SP	022-3906-621
C 159	Tantalum ECST0JY475R	022-3906-629
C 160	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 161	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 162	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 163	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 164	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 165	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 166	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 167	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 168	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 169	Ceramic C1608 JB 1H 102K-T-A	022-3906-060

7540 (UHF) Main Unit

Ref No.	Description	Part No.
C 170	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 171	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 172	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 173	Electrolytic ECEV1CA470SP	022-3906-618
C 174	Electrolytic ECEV0JA220SR	022-3906-623
C 175	Electrolytic ECEV0JA220SR	022-3906-623
C 176	Tantalum ECST0JX226R	022-3906-631
C 177	Electrolytic ECEV0JA220SR	022-3906-623
C 179	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 180	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 181	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 182	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 183	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 184	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 185	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 186	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 187	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 189	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 190	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 192	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 193	Ceramic C1608 CH 1H 080D-T-A	022-3906-597
C 194	Ceramic C1608 CH 1H 120J-T-A	022-3906-066
C 195	Ceramic C1608 CH 1H 390J-T-A	022-3906-599
C 196	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 197	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 199	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 200	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 201	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 202	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 204	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 205	Ceramic C1608 CH 1H 180J-T-A	022-3906-068
C 206	Ceramic C1608 CH 1H 0R3B-T-A	022-3906-468
C 207	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 208	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 209	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 210	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 211	Tantalum ECST0JY475R	022-3906-629
C 212	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 213	Tantalum ECST0JY475R	022-3906-629
C 214	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 215	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 216	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 217	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 218	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 221	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 222	Ceramic C1608 JB 1H 562K-T-A	022-3906-607

Ref No.	Description	Part No.
C 223	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 224	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 225	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 226	Ceramic C1608 JB 1H 822K-T-A	022-3901-410
C 227	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 228	Ceramic C1608 JB 1H 821K-T-A	022-3906-083
C 229	Ceramic C1608 JB 1C 104KT-N	022-3906-614
C 230	Tantalum ECST1EY474R	022-3906-624
C 231	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 232	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 233	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 234	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 237	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 238	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 239	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 240	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 241	Tantalum ECST0JY106R	022-3906-627
C 242	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 243	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 244	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 245	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 247	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 248	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 249	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 250	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 251	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 252	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 253	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 254	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 255	Ceramic C1608 CH 1H 220J-T-A	022-3906-065
C 256	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 257	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 400	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 401	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 402	Ceramic C1608 CH 1H 080D-T-A	022-3906-597
C 403	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 404	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 405	Ceramic C1608 CH 1H 070D-T-A (400-430 MHz)	022-3906-596
	Ceramic C1608 CH 1H 060B-T-A (440-470 MHz)	022-3906-615
C 406	Ceramic C1608 CH 1H 080D-T-A (440-470 MHz)	022-3906-597
	Ceramic C1608 CH 1H 100D-T-A (400-430 MHz)	022-3906-598
C 407	Ceramic C1608 CH 1H 470J-T-A	022-3906-600

7540 (UHF) Main Unit

Ref No.	Description	Part No.
C 408	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 410	Ceramic C1608 CH 1H 070D-T-A (440-470 MHz)	022-3906-596
	Ceramic C1608 CH 1H 110J-T-A (400-430 MHz)	022-3906-613
C 411	Ceramic C1608 CH 1H 1R5B-T-A	022-3906-087
	Ceramic C1608 CH 1H 0R3B-T-A	022-3906-468
C 412	Ceramic C1608 UJ 1H 050C-T-A	022-3906-605
C 413	Ceramic C1608 CH 1H 070D-T-A	022-3906-596
C 414	Ceramic C1608 CH 1H 080D-T-A	022-3906-597
C 415	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 416	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 417	Ceramic C1608 CH 1H 0R5B-T-A	022-3906-084
C 418	Ceramic C1608 CH 1H 090D-T-A (440-470 MHz)	022-3906-348
	Ceramic C1608 CH 1H 120J-T-A (400-430 MHz)	022-3906-066
C 419	Ceramic C1608 CH 1H 010B-T-A (400-430 MHz)	022-3906-085
	Ceramic C1608 CH 1H R75B-T-A (440-470 MHz)	022-3906-490
C 421	Ceramic C1608 UJ 1H 040C-T-A (400-430 MHz)	022-3906-604
	Ceramic C1608 UJ 1H 060D-T-A (440-470 MHz)	022-3906-606
C 422	Ceramic C1608 CH 1H 070D-T-A	022-3906-596
C 423	Ceramic C1608 CH 1H 060B-T-A	022-3906-615
C 424	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 426	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 427	Ceramic C1608 CH 1H 0R5B-T-A	022-3906-084
C 428	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 429	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 430	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 431	Tantalum ECST1AY475R	022-3906-628
C 432	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 433	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 434	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 435	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 436	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 438	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 439	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 440	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 441	Ceramic C1608 JF 1C 104Z-T-A	022-3906-076
C 442	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 443	Ceramic C1608 JB 1C 473K-T-A	022-3906-080
C 444	Ceramic C1608 JB 1H 102K-T-A	022-3906-060

Ref No.	Description	Part No.
C 446	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 447	Electrolytic ECEV0JV330SR	022-3906-616
C 448	Ceramic C1608 CH 1H 150J-T-A	022-3906-067
C 449	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 450	Ceramic C1608 CH 1H 010B-T-A (Wideband models)	022-3906-085
	Ceramic C1608 CH 1H 020B-T-A (Narrowband models)	022-3906-086
C 451	Ceramic C1608 CH 1H 080D-T-A (Wideband models)	022-3906-597
	Ceramic C1608 CH 1H 200J-T-A (Narrowband models)	022-3906-611
C 452	Ceramic C1608 CH 1H 030B-T-A	022-3906-489
C 454	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 455	Ceramic C1608 CH 1H 100D-T-A	022-3906-598
C 456	Tantalum ECST0JY106R	022-3906-627
C 457	Ceramic C1608 CH 1H 020B-T-A	022-3906-086
C 458	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 459	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 460	Ceramic C1608 JB 1H 102K-T-A (Narrowband models)	022-3906-060
	Ceramic C1608 JB 1H 182K-T-A (Wideband models)	022-3906-089
C 463	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 464	Ceramic C1608 JB 1H 102K-T-A	022-3906-060
C 465	Ceramic C1608 JB 1H 222K-T-A	022-3906-061
C 466	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 467	Trimmer TZC03R100A110 10P	022-3906-636
C 468	Ceramic C2012 JF 1C 105Z-T-A	022-3906-078
C 469	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 470	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 471	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 472	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 473	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 474	Ceramic C1608 JB 1E 103K-T-A	022-3906-063
C 475	Ceramic C1608 CH 1H 3R5B-T-A (400-430 MHz)	022-3906-353
	Ceramic C1608 CH 1H 1R5B-T-A (440-470 MHz)	022-3906-087
C 476	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 477	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 479	Ceramic C1608 CH 1H 470J-T-A	022-3906-600
C 481	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 482	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 483	Ceramic C1608 JB 1H 471K-T-A	022-3906-059
C 486	Ceramic C1608 CH 1H 050B-T-A	022-3906-610

7540 (UHF) Main Unit

Ref No.	Description	Part No.	Ref No.	Description	Part No.
C 487	Ceramic C1608 CH 1H 470J-T-A	022-3906-600	FI1	Xtal UM-5 46.35MHz (FL-267) (Narrowband models)	022-3906-587
C 488	Ceramic C1608 JB 1H 222K-T-A	022-3906-061		Xtal UM-5 46.35MHz (FL-271) (Wideband models)	022-3906-589
C 489	Ceramic C1608 JB 1C 153K-T-A	022-3901-397	FI2	Ceramic CFWM450E (Wideband models)	022-3906-590
C 490	Ceramic C1608 CH 1H 221J-T-A	022-3906-603		Ceramic CFWM450G (Narrowband models)	022-3906-591
C 491	Tantalum ECST1EY105R	022-3906-632	IC1	IC UPD3140GS-E1 (DS8)	022-3906-554
C 492	Ceramic C1608 CH 1H 100D-T-A	022-3906-598	IC2	IC TA31136FN(D,EL)	022-3906-302
C 493	Ceramic C1608 JB 1C 473K-T-A	022-3906-080	IC3	IC NJM2902V-TE1	022-3906-553
C 496	Ceramic C1608 JB 1H 471K-T-A	022-3906-059	IC4	IC BU4066BCFV-E1	022-3906-555
C 497	Ceramic C1608 CH 1H 470J-T-A	022-3906-600	IC5	IC TA7368F(TP1)	022-3906-550
C 498	Ceramic C1608 CH 1H 560J-T-A	022-3906-601	IC6	IC S-81250PG-PD-T1	022-3906-559
C 499	Ceramic C1608 CH 1H 470J-T-A	022-3906-600	IC7	IC 25LC160T-I/SN	022-3906-556
D 1	Diode MA77(TW)	022-3906-047	IC8	IC HD6433875A56H FX-1922A	022-3906-557
D 2	Diode HSM88AS-TR	022-3906-046	IC10	IC M62354GP 75EC	022-3906-552
D 3	Diode MA77(TW)	022-3906-047	IC11	IC S-80742SL-A6-T1	022-3906-551
D 4	Diode MA77(TW)	022-3906-047	J 2	Connector HSJ1122-010010	022-3906-679
D 5	Varicap HVU350TRF	022-3906-578	J 3	Connector HSJ1456-01-220	022-3906-680
D 7	Varicap HVU17TRF	022-3906-580	J 4	Connector HEC2711-01-020	022-3906-678
D 8	Diode MA77(TW)	022-3906-047	J 5	Connector AXN330C038P	022-3906-681
D 10	Varicap HVU350TRF	022-3906-578	J 6	Connector PI28A-02M	022-3901-444
D 11	Varicap HVU350TRF	022-3906-578	J 7	Connector IMSA-9230B-1-05Z080-T	022-3906-682
D 12	Varicap HVU350TRF	022-3906-578	L 1	Coil 33CS-Y655LY-03K=P3	022-3906-670
D 15	Diode MA111(TX)	022-3906-585	L 2	Coil 33CS-Y655LY-04K=P3	022-3906-669
D 16	Diode MA6S121(TX)	022-3906-583	L 3	Coil 33CS-Y655LY-04K=P3	022-3906-669
D 17	Diode MA6S121(TX)	022-3906-583	L 5	Coil LA-515	022-3906-645
D 24	Diode DA204U T107	022-3906-582	L 6	Coil ELJRE 1N8Z-F (400-430 MHz)	022-3906-673
D 25	Diode SB07-03C-TB	022-3906-332		Coil ELJRE 1N5Z-F (440-470 MHz)	022-3906-672
D 26	Diode DAN202U T107	022-3906-558	L 7	Coil ELJRE 15NG-F (400-430 MHz)	022-3906-668
D 27	Diode DA204U T107	022-3906-582		Coil ELJRE 12NG-F (440-470 MHz)	022-3906-497
D 33	Diode MA111(TX)	022-3906-585	L 8	Coil LL1608-F27NJ	022-3906-665
D 400	Diode 1SS375-TL	022-3906-584	L 9	Coil LL1608-F27NJ	022-3906-665
D 401	Varicap HVU350TRF	022-3906-578	L 11	Coil MC152-E558ANA-100051=P3	022-3906-655
D 402	Diode 1SS375-TL	022-3906-584	L 12	Coil MLF1608A 4R7K-T	022-3906-653
D 403	Varicap HVU350TRF	022-3906-578	L 13	Coil MLF1608A 1R0K-T	022-3906-656
D 404	Varicap 1T365-01-T8A	022-3906-579	L 14	Coil LL2012-F15NK	022-3906-649
D 405	Diode HSU88TRF	022-3906-577	L 15	Coil LQN 1A 17NJ04	022-3906-646
D 406	Diode MA77(TW)	022-3906-047			
DS1	LCD LM-1462B	022-3906-638			
DS2	LED LNJ310M6URA	022-3906-637			
DS3	LED LNJ310M6URA	022-3906-637			
DS4	LED LNJ808R8ERA	022-3906-639			
EP1	PCB B 4923G 2P(#1923-1F)	N/A			
EP2	LCD Contact SRCN-1922-sp-n-w	022-3906-735			

PARTS LIST

7540 (UHF) Main Unit

Ref No.	Description	Part No.
L 17	Coil LQN 1A 8N8J04	022-3906-109
L 18	Coil LQN 1A 8N8J04	022-3906-109
L 19	Coil LQN 1A 8N8J04	022-3906-109
L 20	Coil MLF1608D R82K-T	022-3906-658
L 21	Coil LL1608-F47NJ (440-470 MHz)	022-3906-666
	Coil LL1608-F82NJ (400-430 MHz)	022-3906-667
L 22	Coil MLF1608A 1R8K-T	022-3906-660
L 24	Coil MLF1608D R82K-T	022-3906-658
L 25	Coil MLF1608D R82K-T	022-3906-658
L 26	Coil EXCCL3225U1	022-3906-654
L 27	Coil EXCCL3225U1	022-3906-654
L 400	Coil MLF1608D R22K-T	022-3906-652
L 401	Coil LQN 1A 17NJ04	022-3906-646
L 402	Coil LQN 1A 8N8J04	022-3906-109
L 403	Coil MLF1608A 1R5K-T	022-3906-661
L 404	Coil MLF1608A 1R5K-T	022-3906-661
L 405	Coil MC152-E558ANA-100050	022-3906-657
L 406	Coil MLF1608A 1R5K-T	022-3906-661
L 407	Coil MLF1608A 4R7K-T	022-3906-653
L 409	Coil MLF1608A 4R7K-T	022-3906-653
L 410	Coil MLF1608A 1R0K-T	022-3906-656
L 411	Coil LL1608-F27NJ	022-3906-665
L 412	Coil MLF1608A 1R0K-T	022-3906-656
L 413	Coil LL1608-F15NJ (440-470 MHz)	022-3906-664
	Coil LL1608-F27NJ	022-3906-665
L 414	Coil MLF1608D R22K-T	022-3906-652
L 415	Coil EXCCL4532U1	022-3906-677
L 416	Coil MLF1608D R22K-T	022-3906-652
MC1	Microphone KUC3523-040245	022-3906-702
MP1	Case 1922 VCO CASE-1	022-3906-714
MP2	Holder 1922 LCD HOLDER	022-3906-729
MP3	Panel 1922 REFLECTOR	022-3906-706
MP4	Heatsink 1922 PA HEATSINK	022-3906-712
MP6	Cover 1923 VCO COVER	022-3906-715
MP7	Plate 1923 VCO SHIELD	022-3906-716
Q 1	FET 2SK2595AXTB	022-3906-568
Q 2	FET 2SK2596BXTL	022-3906-569
Q 3	Transistor 2SC3585 R44-T2B	022-3906-564
Q 4	Transistor 2SC5107-O (TE85R)	022-3906-566
Q 5	Transistor 2SC5107-O (TE85R)	022-3906-566

Ref No.	Description	Part No.
Q 6	Transistor 2SC5107-O (TE85R)	022-3906-566
Q 7	Transistor 2SC4226-T2 R25	022-3906-499
Q 8	Transistor 2SC4226-T2 R25	022-3906-499
Q 9	Transistor XP6401-(TX)	022-3906-575
Q 11	Transistor 2SC4081 T107 R	022-3901-343
Q 12	FET 3SK239XR-TL	022-3906-325
Q 13	FET 3SK241-R(TX)	022-3906-571
Q 15	Transistor 2SB1132 T100 R	022-3906-318
Q 16	Transistor XP6501-(TX).AB	022-3906-573
Q 17	Transistor UN911H(TX)	022-3906-576
Q 18	Transistor 2SB1132 T100 R	022-3906-318
Q 19	Transistor XP6501-(TX).AB	022-3906-573
Q 20	Transistor 2SA1362-GR (TE85R)	022-3906-560
Q 21	Transistor 2SA1362-GR (TE85R)	022-3906-560
Q 22	Transistor 2SA1362-GR (TE85R)	022-3906-560
Q 23	Transistor 2SC4081 T107 R	022-3901-343
Q 25	Transistor 2SC2712-Y (TE85RTEM)	022-3901-626
Q 26	Transistor DTC144EU T107	022-3906-038
Q 27	Transistor 2SB1132 T100 R	022-3906-318
Q 28	Transistor 2SC4081 T107 R	022-3901-343
Q 29	Transistor XP1213(TX)	022-3901-355
Q 31	Transistor DTC144TU T107	022-3906-572
Q 33	Transistor XP4601(TX)	022-3906-328
Q 34	FET 2SK880-Y (TE85R)	022-3906-567
Q 35	Transistor 2SC4081 T107 R	022-3901-343
Q 36	Transistor 2SC4081 T107 R	022-3901-343
Q 37	Transistor DTA144EU T107	022-3901-353
Q 38	Transistor DTC144EU T107	022-3906-038
Q 400	Transistor 2SC4215-O (TE85R)	022-3906-563
Q 401	Transistor XP1214(TX)	022-3906-574
Q 402	Transistor DTC144EU T107	022-3906-038
Q 403	Transistor 2SC5107-O (TE85R)	022-3906-566
Q 404	Transistor 2SC4116-BL (TE85R)	022-3906-565
Q 405	Transistor DTC144EU T107	022-3906-038
R 1	Variable RV-312(RK0971110)	022-3906-696
	Resistor 823 V (82Kohm)	022-3906-174
R 2	Resistor 103 V (10Kohm)	022-3906-163
R 3	Resistor 102 V (1Kohm)	022-3906-154
R 5	Resistor MCR10EZHZJ 47 ohm (470)	022-3901-781
R 7	Resistor 101 V (100ohm)	022-3906-143
R 8	Resistor 682 V (6.8Kohm)	022-3906-162
R 9	Resistor 103 V (10Kohm)	022-3906-163
R 12	Resistor 103 V (10Kohm)	022-3906-163

7540 (UHF) Main Unit

Ref No.	Description	Part No.
R 13	Resistor 100 V (10ohm)	022-3906-138
R 14	Resistor 101 V (100ohm)	022-3906-143
R 15	Resistor 103 V (10Kohm)	022-3906-163
R 17	Resistor 472 V (4.7Kohm)	022-3906-160
R 18	Resistor 473 V (47Kohm)	022-3906-171
R 19	Resistor 101 V (100ohm)	022-3906-143
R 20	Resistor 683 V (68Kohm)	022-3906-173
R 21	Resistor 221 V (220ohm)	022-3906-288
R 22	Resistor 683 V (68Kohm)	022-3906-173
R 23	Resistor 221 V (220ohm)	022-3906-288
R 32	Resistor 682 V (6.8Kohm)	022-3906-162
R 33	Resistor 472 V (4.7Kohm)	022-3906-160
R 34	Resistor 102 V (1Kohm)	022-3906-154
R 40	Resistor 684 V (680Kohm)	022-3906-183
R 41	Resistor 560 V (56ohm)	022-3906-142
R 42	Array EXB-V8V 102JV	022-3906-700
R 44	Resistor 122 V (1.2Kohm)	022-3906-390
R 45	Resistor 101 V (100ohm)	022-3906-143
R 46	Resistor 1R0 V (1ohm)	022-3906-688
R 48	Resistor 104 V (100Kohm)	022-3906-175
R 49	Resistor 473 V (47Kohm)	022-3906-171
R 50	Resistor 104 V (100Kohm)	022-3906-175
R 51	Resistor 474 V (470Kohm)	022-3906-181
R 52	Resistor 104 V (100Kohm)	022-3906-175
R 53	Resistor 103 V (10Kohm)	022-3906-163
R 54	Resistor 154 V (150Kohm)	022-3906-392
R 55	Resistor 102 V (1Kohm)	022-3906-154
R 59	Resistor 151 V (150ohm)	022-3906-145
R 62	Resistor 224 V (220Kohm)	022-3906-178
R 63	Resistor 103 V (10Kohm)	022-3906-163
R 64	Resistor 224 V (220Kohm)	022-3906-178
R 65	Resistor 103 V (10Kohm)	022-3906-163
R 66	Resistor 154 V (150Kohm)	022-3906-392
R 67	Resistor 103 V (10Kohm)	022-3906-163
R 68	Resistor 103 V (10Kohm)	022-3906-163
R 69	Resistor 102 V (1Kohm)	022-3906-154
R 70	Resistor 472 V (4.7Kohm)	022-3906-160
R 72	Resistor 473 V (47Kohm)	022-3906-171
R 75	Resistor 271 V (270ohm)	022-3906-147
R 77	Resistor 101 V (100ohm)	022-3906-143
R 82	Resistor 122 V (1.2Kohm) (Wideband models)	022-3906-390
	Resistor 222 V (2.2Kohm) (Narrowband models)	022-3906-157
R 83	Resistor 331 V (330ohm)	022-3906-389
R 84	Resistor 470 V (47ohm)	022-3906-141

Ref No.	Description	Part No.
R 85	Resistor 152 V (1.5Kohm)	022-3906-155
R 86	Resistor 104 V (100Kohm) (Narrowband models)	022-3906-175
	Resistor 124 V (120Kohm) (Wideband models)	022-3906-176
R 87	Resistor 182 V (1.8Kohm) (Wideband models)	022-3906-156
	Resistor 332 V (3.3Kohm) (Narrowband models)	022-3906-159
R 88	Resistor 124 V (120Kohm)	022-3906-176
R 89	Resistor 103 V (10Kohm)	022-3906-163
R 90	Resistor 103 V (10Kohm) (Narrowband models)	022-3906-163
	Resistor 333 V (33Kohm) (Wideband models)	022-3906-169
R 92	Trimmer EVM-1YSX50 B54 (503)	022-3906-698
R 93	Resistor 273 V (27Kohm)	022-3906-168
R 94	Resistor 105 V (1Mohm)	022-3906-184
R 95	Resistor 105 V (1Mohm)	022-3906-184
R 96	Resistor 473 V (47Kohm)	022-3906-171
R 97	Resistor 224 V (220Kohm)	022-3906-178
R 98	Resistor 274 V (270Kohm)	022-3906-179
R 99	Resistor 103 V (10Kohm)	022-3906-163
R 100	Resistor 182 V (1.8Kohm)	022-3906-156
R 101	Resistor 105 V (1Mohm)	022-3906-184
R 102	Resistor 100 V (10ohm)	022-3906-138
R 103	Resistor 183 V (18Kohm)	022-3906-166
R 104	Resistor 104 V (100Kohm)	022-3906-175
R 105	Resistor 271 V (270ohm) (Wideband models)	022-3906-147
	Resistor 471 V (470ohm) (Narrowband models)	022-3906-150
R 107	Resistor 154 V (150Kohm) (Narrowband models)	022-3906-392
	Resistor 334 V (330Kohm) (Wideband models)	022-3906-180
R 108	Resistor 154 V (150Kohm) (Wideband models)	022-3906-392
	Resistor 184 V (180Kohm) (Narrowband models)	022-3906-177
R 109	Resistor 103 V (10Kohm)	022-3906-163
R 112	Resistor 104 V (100Kohm)	022-3906-175
R 113	Resistor 823 V (82Kohm)	022-3906-174
R 114	Resistor 333 V (33Kohm)	022-3906-169
R 115	Resistor 124 V (120Kohm)	022-3906-176
R 116	Resistor 102 V (1Kohm)	022-3906-154

7540 (UHF) Main Unit

Ref No.	Description	Part No.
R 117	Resistor 152 V (1.5Kohm)	022-3906-155
R 118	Resistor 1R0 V (1ohm)	022-3906-688
R 119	Trimmer EVM-1YSX50 B14 (103)	022-3906-697
R 120	Resistor 683 V (68Kohm)	022-3906-173
R 121	Resistor 102 V (1Kohm)	022-3906-154
R 122	Resistor 272 V (2.7Kohm)	022-3906-158
R 123	Resistor 332 V (3.3Kohm)	022-3906-159
R 125	Resistor 273 V (27Kohm)	022-3906-168
R 126	Resistor 103 V (10Kohm)	022-3906-163
R 127	Resistor 100 V (10ohm)	022-3906-138
R 128	Resistor 100 V (10ohm)	022-3906-138
R 130	Resistor 104 V (100Kohm)	022-3906-175
R 131	Resistor 471 V (470ohm)	022-3906-150
R 132	Resistor 471 V (470ohm)	022-3906-150
R 133	Resistor 102 V (1Kohm)	022-3906-154
R 134	Resistor 222 V (2.2Kohm)	022-3906-157
R 135	Resistor 103 V (10Kohm)	022-3906-163
R 137	Resistor 472 V (4.7Kohm)	022-3906-160
R 139	Resistor 472 V (4.7Kohm)	022-3906-160
R 141	Resistor 472 V (4.7Kohm)	022-3906-160
R 142	Resistor 101 V (100ohm)	022-3906-143
R 144	Resistor 333 V (33Kohm)	022-3906-169
R 146	Resistor 104 V (100Kohm)	022-3906-175
R 147	Resistor 224 V (220Kohm)	022-3906-178
R 148	Resistor 104 V (100Kohm)	022-3906-175
R 149	Resistor 103 V (10Kohm)	022-3906-163
R 150	Trimmer EVM-1YSX50 B54 (503)	022-3906-698
R 153	Resistor 102 V (1Kohm)	022-3906-154
R 154	Resistor 682 V (6.8Kohm)	022-3906-162
R 155	Resistor 101 V (100ohm)	022-3906-143
R 156	Resistor MCR10EZHU 15 ohm (150)	022-3906-683
R 157	Resistor MCR10EZHU 15 ohm (150)	022-3906-683
R 158	Resistor 103 V (10Kohm)	022-3906-163
R 159	Resistor 104 V (100Kohm)	022-3906-175
R 160	Resistor 151 V (150ohm)	022-3906-145
R 161	Resistor ERJ1WRSJR15U (0.15ohm)	022-3906-693
R 162	Resistor 102 V (1Kohm)	022-3906-154
R 163	Resistor 333 V (33Kohm)	022-3906-169
R 164	Resistor 272 V (2.7Kohm)	022-3906-158
R 165	Resistor 182 V (1.8Kohm)	022-3906-156
R 166	Resistor 104 V (100Kohm)	022-3906-175
R 167	Resistor 104 V (100Kohm)	022-3906-175
R 168	Resistor 103 V (10Kohm)	022-3906-163
R 169	Resistor 103 V (10Kohm)	022-3906-163
R 170	Resistor 103 V (10Kohm)	022-3906-163
R 171	Resistor 473 V (47Kohm)	022-3906-171

Ref No.	Description	Part No.
R 172	Resistor 105 V (1Mohm)	022-3906-184
R 174	Resistor 153 V (15Kohm)	022-3906-165
R 176	Resistor 392 V (3.9Kohm)	022-3906-391
R 178	Resistor 392 V (3.9Kohm)	022-3906-391
R 181	Resistor 104 V (100Kohm)	022-3906-175
R 182	Therm. NTCCF2012 4AH 473KC-T	022-3906-403
R 183	Resistor 561 V (560ohm)	022-3906-151
R 184	Resistor 103 V (10Kohm)	022-3906-163
R 185	Resistor 102 V (1Kohm)	022-3906-154
R 186	Resistor 473 V (47Kohm)	022-3906-171
R 190	Resistor 223 V (22Kohm)	022-3906-167
R 191	Resistor 223 V (22Kohm)	022-3906-167
R 192	Resistor 563 V (56Kohm)	022-3906-172
R 193	Resistor 104 V (100Kohm)	022-3906-175
R 194	Resistor 104 V (100Kohm)	022-3906-175
R 195	Resistor 104 V (100Kohm)	022-3906-175
R 196	Resistor 104 V (100Kohm)	022-3906-175
R 197	Resistor 184 V (180Kohm)	022-3906-177
R 199	Resistor 102 V (1Kohm)	022-3906-154
R 200	Resistor 221 V (220ohm)	022-3906-288
R 202	Resistor 473 V (47Kohm)	022-3906-171
R 203	Resistor 473 V (47Kohm)	022-3906-171
R 204	Resistor 332 V (3.3Kohm)	022-3906-159
R 205	Resistor 152 V (1.5Kohm)	022-3906-155
R 207	Resistor 473 V (47Kohm)	022-3906-171
R 208	Resistor 104 V (100Kohm)	022-3906-175
R 209	Resistor 104 V (100Kohm)	022-3906-175
R 210	Resistor 222 V (2.2Kohm)	022-3906-157
R 214	Resistor 102 V (1Kohm)	022-3906-154
R 215	Resistor RR0816R-334-D (330Kohm)	022-3906-691
R 216	Resistor RR0816R-154-D (150Kohm)	022-3906-692
R 218	Resistor 823 V (82Kohm)	022-3906-174
R 219	Resistor 104 V (100Kohm)	022-3906-175
R 220	Resistor 274 V (270Kohm)	022-3906-179
R 221	Resistor 334 V (330Kohm)	022-3906-180
R 224	Resistor 273 V (27Kohm)	022-3906-168
	(Wideband models)	
	Resistor 683 V (68Kohm)	022-3906-173
	(Narrowband models)	
R 225	Resistor 223 V (22Kohm)	022-3906-167
R 226	Array EXB-V8V 102JV	022-3906-700
R 227	Resistor 1R0 V (1ohm)	022-3906-688
R 228	Resistor 104 V (100Kohm)	022-3906-175
R 229	Resistor 223 V (22Kohm)	022-3906-167
R 230	Resistor 563 V (56Kohm)	022-3906-172
R 231	Resistor 184 V (180Kohm)	022-3906-177

7540 (UHF) Main Unit

Ref No.	Description	Part No.
R 234	Resistor 223 V (22Kohm)	022-3906-167
R 235	Resistor 684 V (680Kohm)	022-3906-183
R 236	Resistor 102 V (1Kohm)	022-3906-154
R 237	Resistor 104 V (100Kohm)	022-3906-175
R 400	Resistor 472 V (4.7Kohm)	022-3906-160
R 401	Resistor 104 V (100Kohm)	022-3906-175
R 402	Resistor 473 V (47Kohm)	022-3906-171
R 403	Resistor 4R7 V (4.7ohm)	022-3906-687
R 404	Resistor 224 V (220Kohm)	022-3906-178
R 405	Resistor 103 V (10Kohm)	022-3906-163
R 406	Resistor 121 V (120ohm)	022-3906-144
	(Narrowband models)	
	Resistor 391 V (390ohm)	022-3906-149
	(Wideband models)	
R 407	Resistor 124 V (120Kohm)	022-3906-176
R 408	Resistor 102 V (1Kohm)	022-3906-154
R 409	Resistor 100 V (10ohm)	022-3906-138
R 410	Resistor 332 V (3.3Kohm)	022-3906-159
R 411	Resistor 272 V (2.7Kohm)	022-3906-158
R 412	Resistor 1R0 V (1ohm)	022-3906-688
R 413	Resistor 4R7 V (4.7ohm)	022-3906-687
R 414	Resistor 471 V (470ohm)	022-3906-150
R 415	Resistor 100 V (10ohm)	022-3906-138
R 416	Resistor 332 V (3.3Kohm)	022-3906-159
R 417	Resistor 332 V (3.3Kohm)	022-3906-159
R 419	Resistor 4R7 V (4.7ohm)	022-3906-687
R 420	Resistor 271 V (270ohm)	022-3906-147
R 421	Resistor 103 V (10Kohm)	022-3906-163
R 422	Resistor 224 V (220Kohm)	022-3906-178
R 424	Resistor 104 V (100Kohm)	022-3906-175
R 425	Array EXB-V8V 102JV	022-3906-700
R 426	Array EXB-V8V 102JV	022-3906-700
R 427	Array EXB-V4V 102JV (1Kohm)	022-3906-699
R 428	Array EXB-V8V 102JV	022-3906-700
R 429	Array EXB-V8V 102JV	022-3906-700
R 430	Array EXB-V8V 102JV	022-3906-700
R 431	Array EXB-V4V 102JV (1Kohm)	022-3906-699
R 432	Resistor 104 V (100Kohm)	022-3906-175
R 433	Array EXB-V8V 102JV	022-3906-700
R 434	Resistor 103 V (10Kohm)	022-3906-163
R 436	Resistor 182 V (1.8Kohm)	022-3906-156
R 437	Resistor 473 V (47Kohm)	022-3906-171
R 438	Resistor 334 V (330Kohm)	022-3906-180
R 439	Resistor 563 V (56Kohm)	022-3906-172
R 440	Resistor 124 V (120Kohm)	022-3906-176
R 441	Therm. NTCCF2012 3NH 103KC-T	022-3906-701

Ref No.	Description	Part No.
R 442	Resistor 103 V (10Kohm)	022-3906-163
R 443	Resistor 103 V (10Kohm)	022-3906-163
R 444	Resistor 103 V (10Kohm)	022-3906-163
R 445	Resistor 221 V (220ohm)	022-3906-288
R 446	Resistor 563 V (56Kohm)	022-3906-172
R 447	Resistor 471 V (470ohm)	022-3906-150
R 448	Resistor 120 V (12ohm)	022-3906-684
R 449	Resistor 471 V (470ohm)	022-3906-150
R 450	Resistor 222 V (2.2Kohm)	022-3906-157
R 451	Resistor 105 V (1Mohm)	022-3906-184
R 452	Resistor 102 V (1Kohm)	022-3906-154
R 453	Resistor 473 V (47Kohm)	022-3906-171
	(Wideband models)	
	Resistor 563 V (56Kohm)	022-3906-172
	(Narrowband models)	
R 454	Resistor 105 V (1Mohm)	022-3906-184
R 455	Resistor 683 V (68Kohm)	022-3906-173
R 455	Resistor 104 V (100Kohm)	022-3906-175
R 456	Resistor 152 V (1.5Kohm)	022-3906-155
R 457	Resistor 183 V (18Kohm)	022-3906-166
R 458	Resistor 273 V (27Kohm)	022-3906-168
R 459	Resistor 103 V (10Kohm)	022-3906-163
R 460	Resistor 221 V (220ohm)	022-3906-288
R 461	Resistor 473 V (47Kohm)	022-3906-171
R 464	Resistor 102 V (1Kohm)	022-3906-154
R 465	Resistor 220 V (22ohm)	022-3906-685
R 466	Resistor 223 V (22Kohm)	022-3906-167
R 468	Resistor 123 V (12Kohm)	022-3906-164
R 469	Resistor 272 V (2.7Kohm)	022-3906-158
S 1	Switch EVQ-PJ705K	022-3906-592
SP1	Speaker K036NA500-26	022-3906-593
W 1	Jumper ERJ3GE JPW V	022-3906-185
W 2	Jumper ERJ3GE JPW V	022-3906-185
W 6	Jumper MJP-0.4-T	022-3906-695
W 8	Jumper ERJ3GE JPW V	022-3906-185
WS1	FX2080 P01MA	022-3906-718
X 1	Xtal CR-576 UM-5 15.3 MHz	022-3906-641
X 2	Xtal CR-463 SMD-49 6.8 MHz	022-3906-640
X 3	Discri CDBCA450CX24	022-3906-642

PARTS LIST

Ref No.	Description	Part No.
7510 (VHF) CHASSIS PARTS		
MP1	Chassis 1922 Chassis-1	022-3906-703
MP2	Panel 2079 T-front panel assy	022-3906-708
	Panel 2079 S-front panel assy	022-3906-707
MP4	Panel 1922 Contact Base	022-3906-705
MP5	Knob N261 **	022-3906-720
MP6	Key 2079 10-key	022-3906-741
MP6	Key 2079 7-key	022-3906-742
MP7	Cap 1922 mic cap	022-3906-730
MP9	Seal 1922 main seal	022-3906-727
MP10	Cover 1922 opt cover	022-3906-704
MP11	Cap 1922 DC cap	022-3906-728
MP12	Terminal 1922 plus terminal	022-3906-732
MP13	Terminal 1922 minus terminal	022-3906-731
MP14	M.connector ant connector-101 Fx1922	022-3906-748
MP17	Plate 2079 Window plate w/tape	022-3906-711
MP19	Sheet 1922 rear sheet (Y)	022-3906-747
	Sheet 1922 rear sheet (E)	022-3906-736
	Sheet 1922 rear sheet (M)	022-3906-744
MP21	Sheet 1922 mic sheet	022-3906-733
MP22	Sheet 1922 Opt Sheet	022-3906-734
MP24	Ant Connector-101 Nut	022-3906-725
MP25	Screw Hex Nut(A)	022-3906-724
MP26	Screw P.H M2 X 4 BLK	022-3906-721
MP27	Screw P.H BT M2 X 4 NI-ZU	022-3906-722
MP28	Screw P.H BT M2 X 4 NI-ZU	022-3906-722
MP29	Screw P.H BT M2 X 4 NI-ZU	022-3906-722
MP30	Screw P.H BT M2 X 6 ZK	022-3906-723
MP31	Screw P.H BT M2 X 6 ZK	022-3906-723
MP34	Sheet 1922 A-rear sheet	022-3906-737
MP35	Seal 1923 mic seal	022-3906-739
MP36	Sponge (Fh)	022-3906-740
MP37	Plate 1989 ant rug	022-3906-726
MP39	Sheet 2079 window sheet	022-3906-743
MP40	Sheet insulator board Ez	022-3906-738

Ref No.	Description	Part No.
7540 (UHF) CHASSIS PARTS		
MP1	Chassis 1922 Chassis-1	022-3906-703
MP2	Panel 2079 S-Front Panel (A) Assy	022-3906-709
	Panel 2079 T-Front Panel (A) Assy	022-3906-710
MP4	Panel 1922 Contact Base	022-3906-705
MP5	Knob N261	022-3906-720
MP6	Key 2079 10-Key	022-3906-741
	Key 2079 7-Key	022-3906-742
MP7	Cap 1922 mic cap	022-3906-730
MP9	Seal 1922 main seal	022-3906-727
MP10	Cover 1922 Opt Cover	022-3906-704
MP11	Cap 1922 DC cap	022-3906-728
MP12	Terminal 1922 plus terminal	022-3906-732
MP13	Terminal 1922 minus terminal	022-3906-731
MP14	M.connector ant connector-101 FX1922	022-3906-748
MP17	Plate 2079 window plate w/tape	022-3906-711
MP19	Sheet 1922 rear sheet (T)	022-3906-745
MP19	Sheet 1922 rear sheet (X)	022-3906-746
MP21	Sheet 1922 mic sheet	022-3906-733
MP22	Sheet 1922 opt sheet	022-3906-734
MP24	Ant Connector-101 Nut	022-3906-725
MP25	Screw hex nut(A)	022-3906-724
MP26	Screw P.H M2 X 4 BLK	022-3906-721
MP27	Screw P.H BT M2 X 4 NI-ZU	022-3906-722
MP28	Screw P.H BT M2 X 4 NI-ZU	022-3906-722
MP29	Screw P.H BT M2 X 4 NI-ZU	022-3906-722
MP30	Screw P.H BT M2 X 6 ZK	022-3906-723
MP31	Screw P.H BT M2 X 6 ZK	022-3906-723
MP34	Sheet 1922 A-Rear Sheet	022-3906-737
MP36	M.connector Ant Connector-101 FX1922	022-3906-748
MP37	Cover 1923 shield cover	022-3906-717
MP38	Seal 1923 mic seal	022-3906-739
MP39	Sponge (FH)	022-3906-740
MP40	Sheet insulator board EZ	022-3906-738
MP40	Sheet 2079 window sheet	022-3906-743
MP41	Sheet 2079 window sheet	022-3906-743