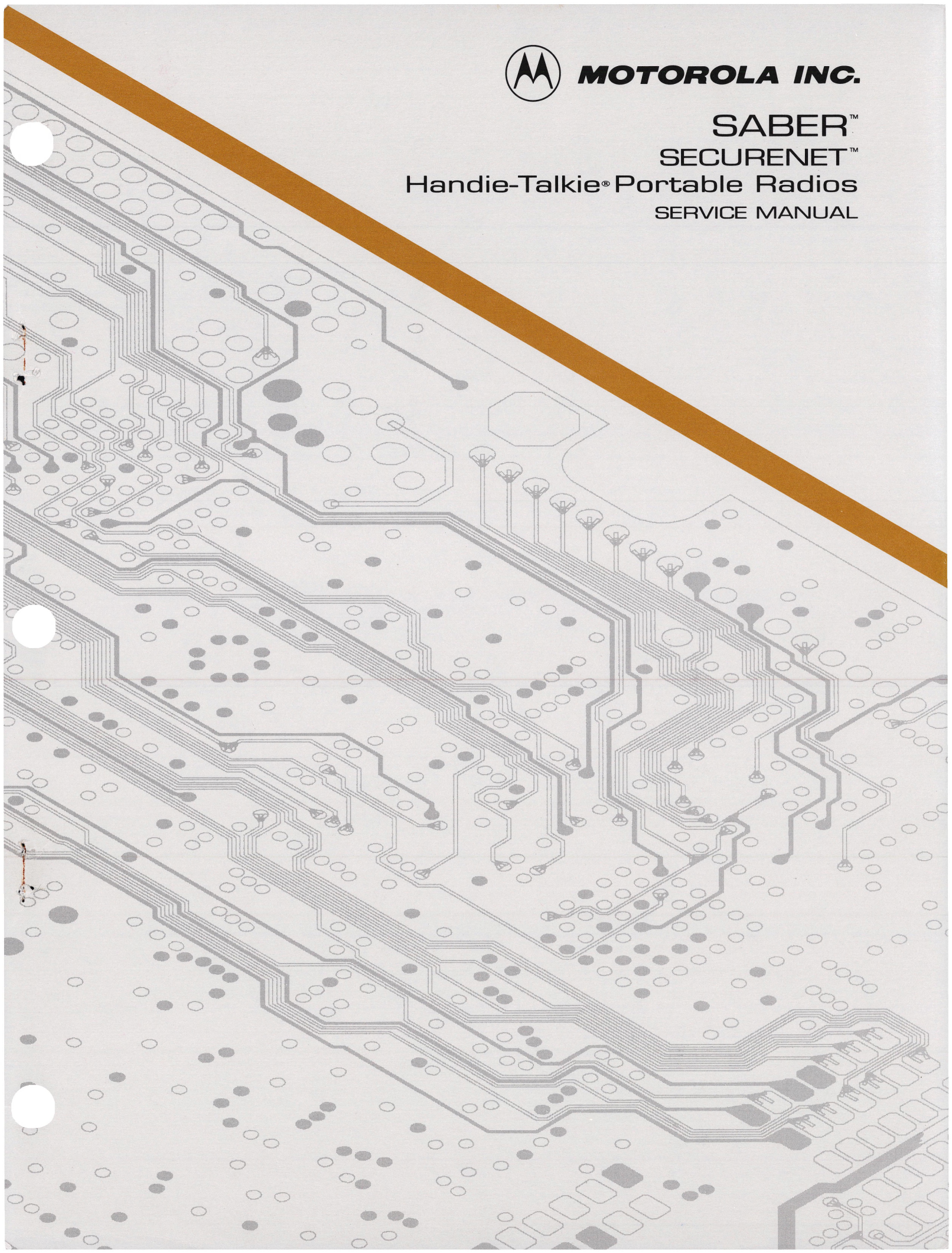




MOTOROLA INC.

**SABER™
SECURENET™
Handie-Talkie® Portable Radios
SERVICE MANUAL**



Manual Scan

I hope this service manual is of use to you. Motorola does not make this available as a PDF and all other available copies are of poor quality.

Each page is captured at 600 DPI, and as 24-bit color, 8-bit grayscale or black and white and at the proper page size, up to 11x34 inches in many cases. OCR has been preformed on the document, even on the large pages. The document is condensed into one single PDF with text overlay. You should be able to print the larger sheets on 11x17 or tile them onto 8.5x11 if needed.

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If something is incorrect here, or unreadable please reach out; I likely have the original lossless compressed images. In the final PDF that's color or grayscale will be JPEG 2000 format with highest quality selected. B&W images will be compressed using CCITT Group 4. This is quite close to the source material, but there may be some artifacts due to lossy compression. If there's a choice between file size and image quality, image quality will win. It's 2021 and storage and bandwidth is cheap.

This was captured on a Canon DR-G2140 scanner which is ~ 7500 USD unit circa 2021. You may note some artifacts and lines in on the scans, these are due to scratches on the sensor glass, and are minor. The replacement glass is about 250 USD if you're feeling generous :-)

If you have a hard to find/out of print manual and would like to make it available please reach out, I may be able to scan and return it to you.

Thank you,

Bryan Fields, W9CR
bryan@bryanfields.net



MOTOROLA INC.

MANUAL REVISION

for
Manuals No. 68P81043C90-O, 68P81043C95-O, 68P81044C45-O,
68P81045C70-O, 68P81045C75-O, and 68P81055C25-O
SABER™, SABER SELECT 5™, and SABER SECURENET™
Portable Radios Service Manuals

This revision outlines changes that have occurred since the printing of your manual. Use this information to supplement your manual. Installation of these changes in earlier equipment is not necessary except as recommended in Motorola Service and Repair Notes (SRN's).

REVISION DETAILS

<u>NO.</u>	<u>CHANGE AFFECTS</u>
1	8405912T01, 8K DISPLAY CIRCUIT BOARD COMPONENT LOCATION DIAGRAMS
2	8405912T01, 8K DISPLAY BOARD SCHEMATIC DIAGRAM
3	8405912T01, 8K DISPLAY BOARD ELECTRICAL PARTS LIST

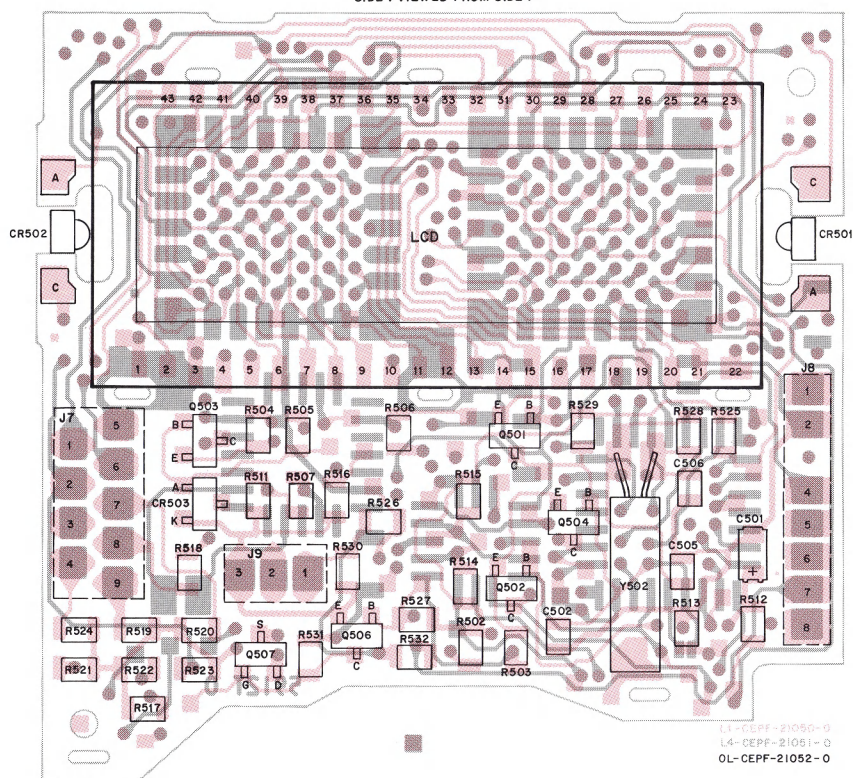
CHANGES

NO.

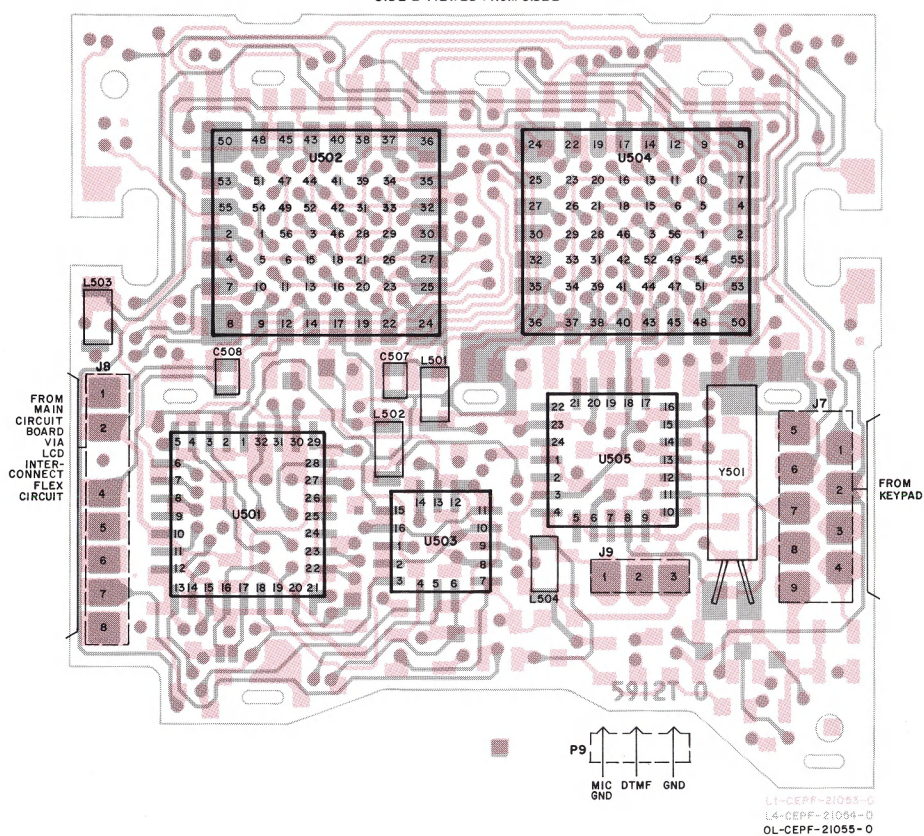
- 1 Add the following Component Location Diagrams for the 8405912T01, 8k Display Circuit Board:

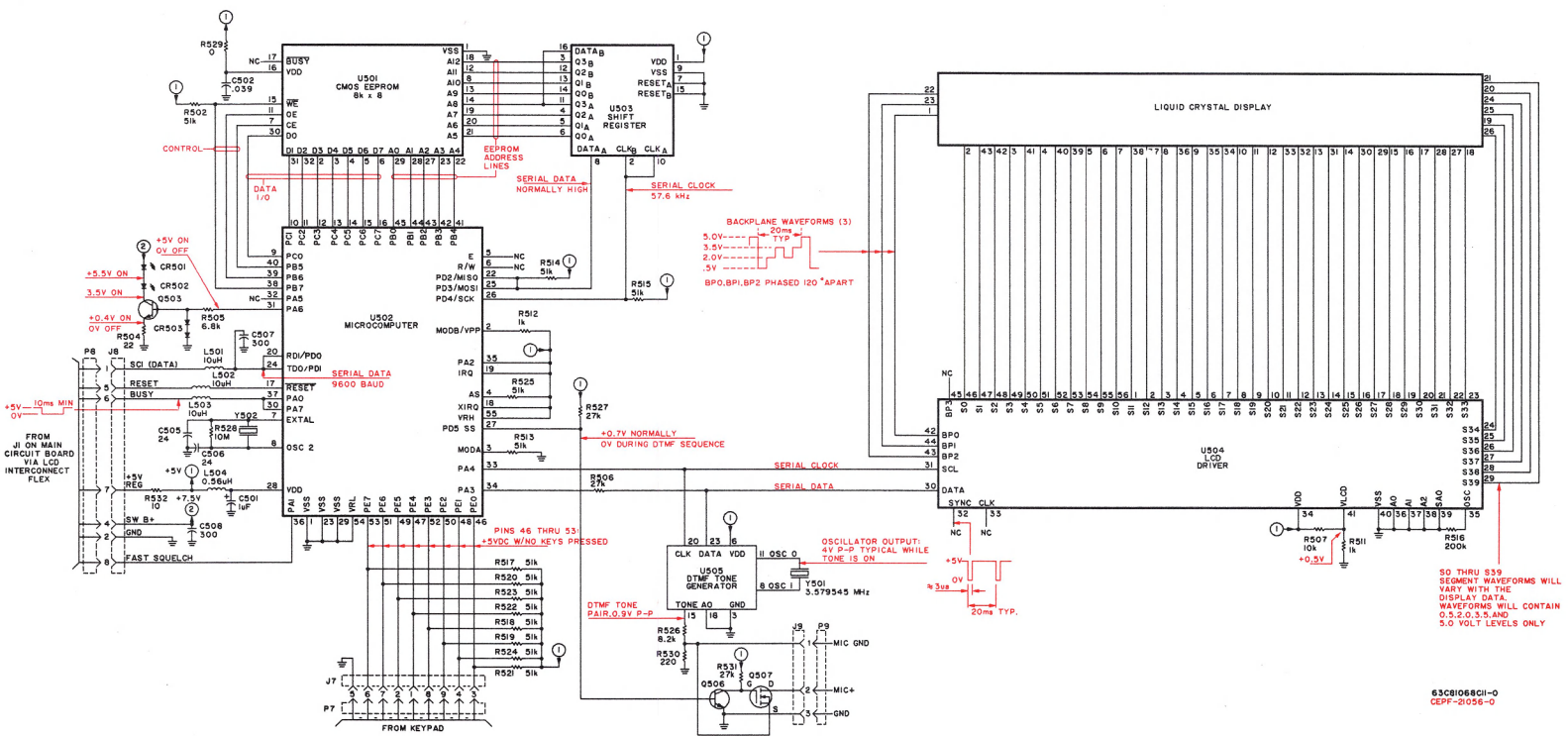
8405912T01 8k DISPLAY CIRCUIT BOARD

SIDE 1 VIEWED FROM SIDE 1



SIDE 2 VIEWED FROM SIDE 2





June 6, 1990

- 3 of 4 -

FMR 1485A-1

3 Add the following Electrical Parts List for the 8405912T01, 8k Display Circuit Board:

8405912T01

SABER 8k Display Circuit Board

Electrical Parts List

TPLF-3935-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C501 C502 C503,504 C505,506 C507,508	2362998B59 2160521C32 ----- 2160520B10 2160520C12	CAPACITOR, Fixed: pF±5%; 50V unless stated 1µF±10%; 20V .039µF±10%; 25V Not Used 24 300
CR501,502 CR503	4805729G27 4805129M06	DIODE: See Note I LED, Yellow SOT-23
J7 J8 J9	0905287C05 0905287C05 0905287C05	JACK: Socket, Printed Circuit (Keypad Switch)(9 req'd) Socket, Printed Circuit (LCD Interconnect)(8 req'd) Socket, Printed Circuit (Speaker/Mic)(3 req'd)
L501 thru 503 L504	2462575A07 2462575A09	COIL, RF: unless stated Choke, 10µH Choke, 0.56µH
Q501,502 Q503 Q504,505 Q506 Q507	----- 4805128M12 ----- 4805128M12 4805218N11	TRANSISTOR: See Note I Not Used NPN; BCW60B (RH) Not Used NPN; BCW60B (RH) TMOS; BST82
R501 R502 R503 R504 R505 R506 R507 R508 thru 510 R511,512 R513 thru 515 R516 R517 thru 525 R526 R527 R528 R529 R530 R531 R532	----- 0660076A90 ----- 0660076A09 0660076A69 0660076A83 0660076A73 ----- 0660076A49 0660076A90 0660076F08 0660076A90 0660076A71 0660076A83 0660076H49 0605021K01 0660076A33 0660076A83 0660076A01	RESISTOR, Fixed: Ω±5%; 1/8W unless stated Not Used 51k Not Used 22 6.8k 27k 10k Not Used 1k 51k 200k±1% 51k 8.2k 27k 10M±10% 0 220 27k 10
U501 U502 U503 U504 U505	0105954S37 0105953N07 0105953N09 0105953N10 0105953N18	CIRCUIT MODULE: See Note I EEPROM, CMOS; 8k x 8 Microcomputer, HCMOS Shift Register; CMOS LCD Driver, CMOS DTMF Tone Generator, CMOS
Y501 Y502	4805664G40 4805664G39	CRYSTAL: 3.579545MHz 3.6864MHz

NOTES:

- For optimum performance, order replacement diodes, transistors, and circuit modules by Motorola part number only.

June 6, 1990

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FMR 1485A-1



for
Manual No. 68P81063C30-O
SABER™ SECURENET™ Mid-Band
Portable Radio Service Manual

This revision outlines changes that have occurred since the printing of your manual. Use this information to supplement your manual. Installation of these changes in earlier equipment is not necessary except as recommended in Motorola Service and Repair Notes (SRN's).

REVISION DETAILS

<u>NO.</u>	<u>CHANGE AFFECTS</u>
1	EXISTING MAIN CIRCUIT BOARD COMPONENT LAYOUT DIAGRAMS
2	MAIN BOARD SCHEMATIC DIAGRAM
3	ELECTRICAL PARTS LIST
4	NEW 8405228U01 MAIN CIRCUIT BOARD COMPONENT LAYOUT DIAGRAMS

CHANGES**NO.**

- 1 Add the following above the existing Main Circuit Board Component Layout Diagrams on page 9:

8405404S01 MAIN CIRCUIT BOARD

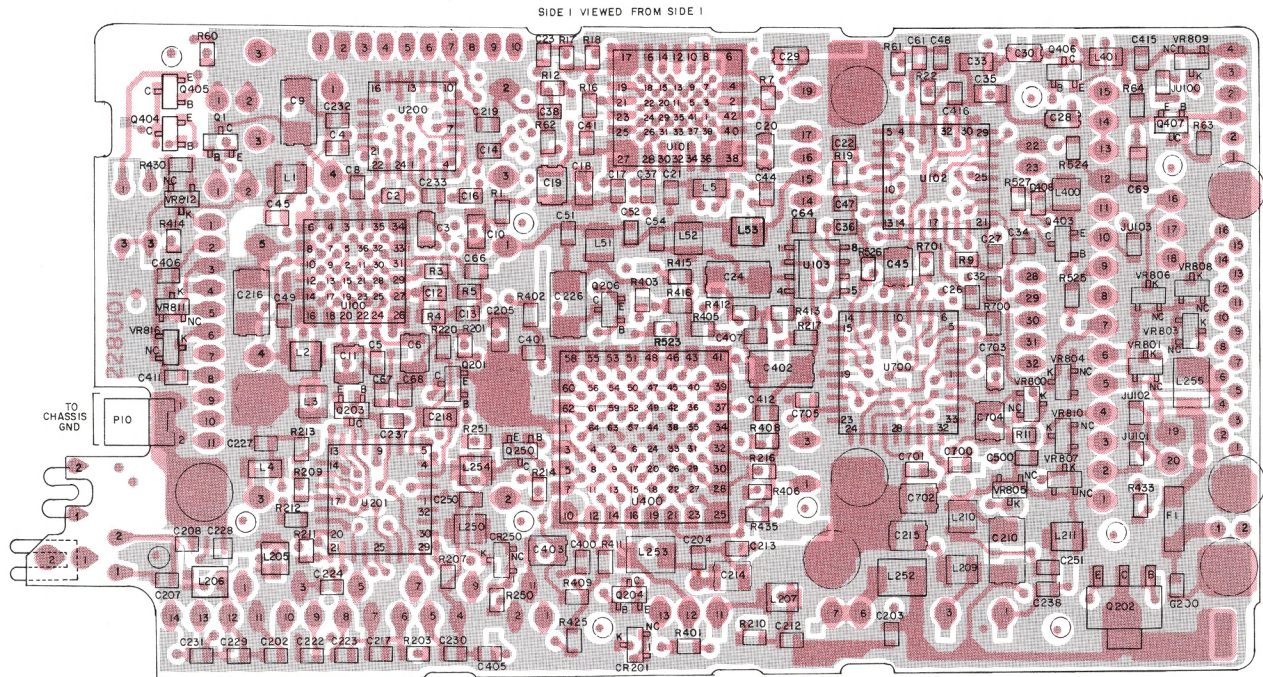
- 2 Make the following changes to the Main Circuit Board Schematic Diagram on page 10:
- Add jumper JU3 between pin 10 of U900 and pin 1 of J2
 - Add 10k Ω resistor R524 between pin 17 of U900 and ground
 - Add .018 μ F capacitor C34 between pin 22 of U102 and ground
 - Add .018 μ F capacitor C416 between pin 32 of U102 and ground
 - Add 100k Ω resistor R523 between pin 18 of U400 and pin 1 of J2
 - Add 390 Ω resistor R527 between the collector of Q403 and the side of L400 that is connected to Y400
 - Delete the line between pin 32 of U201 and pin 10 of P4
 - Delete capacitor C240
 - Change the designator "F900" to read "F900 or F1"

- 3 Add the following to the Electrical Parts List on page 11:

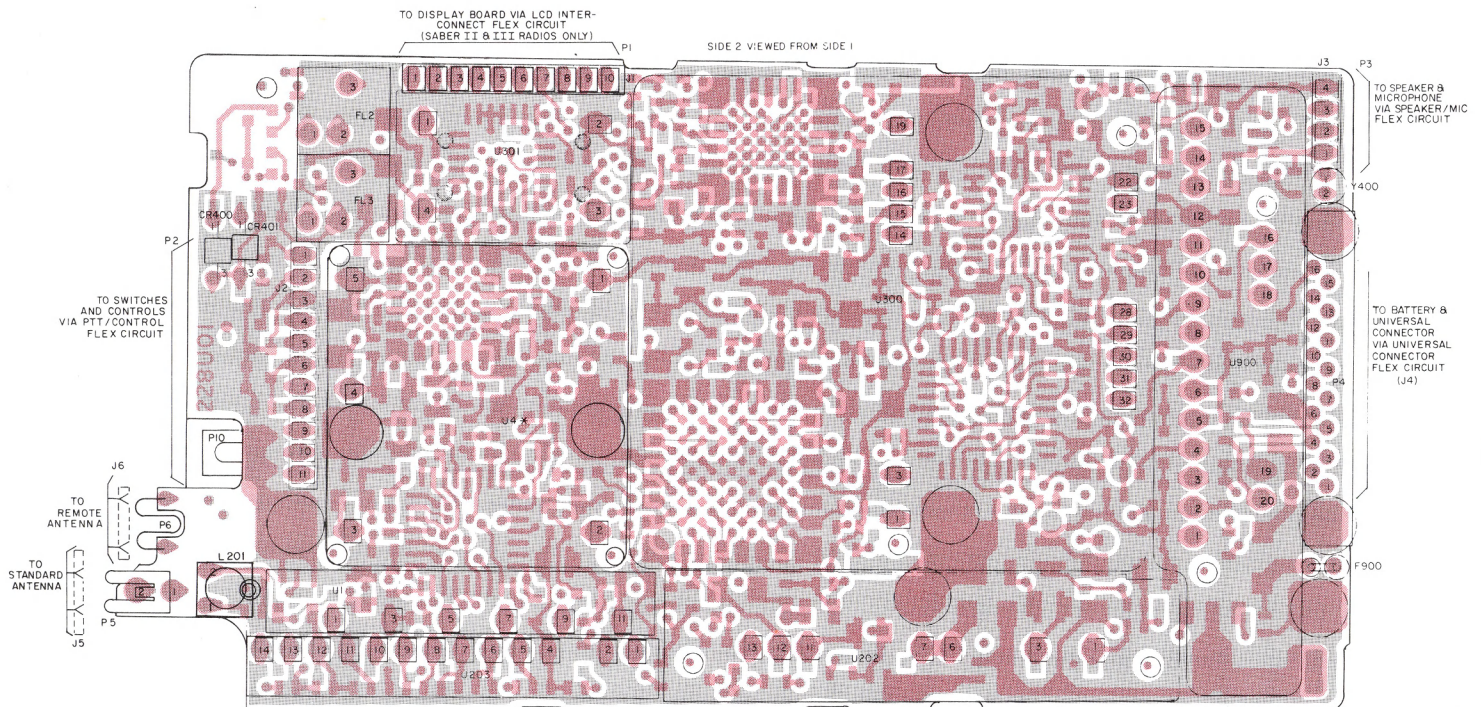
<u>REF. SYM.</u>	<u>ACTION</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
C34	added	2113741A51	Capacitor; .018 μ F \pm 20%; 25V
C240	deleted	2113741A13	Capacitor; 470pF \pm 10%; 25V
C416	added	2113741A51	Capacitor; .018 μ F \pm 20%; 25V
F1	added	6505663R03	Fuse, 5 Amp (8405228U01 board only)
JU103	added	0605021K01	Resistor, 0 Ω \pm 5%; 1/8W
R523	added	0660078L01	Resistor, 100k Ω \pm 1%; 1/8W
R524	added	0660078T01	Resistor, 10k Ω \pm 1%; 1/8W
R527	added	0660076A39	Resistor, 390k Ω \pm 5%; 1/8W

- 4 Add the following new Component Layout Diagrams for the 8405228U01, Main Circuit Board:

8405228U01 MAIN CIRCUIT BOARD



L6-CEPF-21182-0
OL-CEPF-21185-0



* U2 MOUNTED UNDER U4

L6-CEPF-21181-0
L6-CEPF-21182-0
OL-CEPF-21184-0

November 30, 1990

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FMR 1494A-1



MOTOROLA INC.

MANUAL REVISION

for

Service Manual No.68P81063C30-0

SABER™ SECURENET™

Handie-Talkie® Portable Radios

This information outlines changes that have occurred since the printing of your manual. Use this information to supplement your manual.

REVISION DETAILS

NO.	CHANGE AFFECTS
1	Electrical Parts List
2	Exploded View Parts List
3	Exploded View
4	Exploded View Parts Lists
5	Exploded View Parts Lists

CHANGES

NO.

- 1 Change the **Electrical Parts List**, page 11, as follows:

<u>REF. SYM.</u>	<u>ACTION</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
			CAPACITOR, fixed: $\mu\text{F} \pm 20\%$; 25V
C3	Change to	2311049A07	$1 \pm 10\%$; 16V
C6	Change to	2311049J12	4.7; 10V
C19	Change to	2311049J07	$3.3 \pm 10\%$; 16V
C20	Change to	2311049A07	$1 \pm 10\%$; 16V
C24	Change to	2311049J14	4.7; 20V
C28 thru 30	Change to	2311049A07	$1 \pm 10\%$; 16V
C45	Change to	2311049J07	$3.3 \pm 10\%$; 16V
C49	Change to	2113740A20	$3.3 \pm 30\%$
C210	Change to	2311049J14	4.7; 20V
C214, 215	Change to	2311049J07	$3.3 \pm 10\%$; 16V
C403	Change to	2311049J12	4.7; 10V
C408	Delete		
C702	Change to	2311049J07	$3.3 \pm 10\%$; 16V
C703	Change to	2311049A05	$.47 \pm 10\%$
C408	Change to	2311049J12	$.47 \pm 10\%$
			DIODE
F900	Change to	0105955P27	5 Amp
			COIL, RF: unless stated
L2	Changed to	2405452C61	1000nH $\pm 10\%$
L53	Change to	2460578C13	1000nH
			Plug:
P5	change to	REX-4166A	Connector Antenna

- 2 Change the **Exploded View Parts List**, page 13, as follows:

<u>ITEM NO.</u>	<u>ACTION</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
11	changed to	3205082E80	GASKET, O-Ring, (part of item 13)
55	changed to	3205082E68	GASKET, O-Ring, Emergency (2 req'd)

technical publications

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Radio Products Group
8000 W. Sunrise Blvd., Ft Lauderdale, FL 33322

-1 of 2-



FMR1424-6

12-06-91
R.M.G.

- 3 Change the **Exploded View**, page 13, to show an additional Emergency O-Ring gasket (item 55) directly above the existing O-Ring gasket.
- 4 On page 13 and 14, **EXPLODED VIEW DIAGRAMS AND PARTS LISTS**
For SABER II and III only

<u>ITEM NO.</u>	<u>ACTION</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
50	changed to	8405712U01	FLEX CIRCUIT, LCD Interconnect

- 5 On page 12,13, and 14, **SABER I, II, III SECURENET MID-BAND EXPLORED VIEW AND PARTS LIST.**
Change the following.

<u>ITEM NO.</u>	<u>ACTION</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
46	changed to	1405807U01	BOOT, Microphone

SABER™ SECURENET™

Handie-Talkie® Portable Radios

68-88 MHz

SPECIFICATIONS

GENERAL	TRANSMITTER	RECEIVER
FREQUENCY RANGE: 68-84 MHz BANDSPLITS: 68-84 MHz 74-88 MHz POWER SUPPLY: Rechargeable Nickel-Cadmium Battery or Primary Battery BATTERY VOLTAGE Nominal: 7.5Vdc Range: 6 to 9 Vdc TEMPERATURE RANGE Operating: -30°C to +60°C Storage: -40°C to +85°C DIMENSIONS (H X W X D) Less Battery: 4.42" X 2.94" X 1.18" (112.27 X 74.67 X 29.97 mm) With Light-Capacity Battery: 6.68" X 2.94" X 1.18" (169.67 X 74.67 X 29.97 mm) With Medium-Capacity Battery: 7.56" X 2.94" X 1.18" (192.02 X 74.67 X 29.97 mm) With Ultra-High-Capacity Battery: (or Primary Battery) 8.32" X 2.94" X 1.18" (211.33 X 74.67 X 29.97 mm) WEIGHT Non-Keypad Less Battery: 11.94 oz. (338 g) With Light-Capacity Battery: 18.36 oz. (520 g) With Medium-Capacity Battery: 23.62 oz. (669 g) With Ultra-High-Capacity Battery: 25.24 oz. (715 g) Keypad Less Battery: 12.36 oz. (350 g) With Light-Capacity Battery: 18.78 oz. (532 g) With Medium-Capacity Battery: 24.04 oz. (681 g) With Ultra-High-Capacity Battery: 25.66 oz. (727 g)	RF POWER OUTPUT: 1, 6 Watts FREQUENCY STABILITY (-30°C TO +60°C; +25°C REF.): ±.0002% MODULATION: Types 20K0F3E ±5kHz for 20K0F1D 100% modulation 20K0F2D @ 1000Hz) FM HUM AND NOISE (COMPANION RECEIVER): -40dB SPURIOUS EMISSION (CONDUCTED AND RADIATED) ≤1GHz 0.25μW 1 to 4 GHz 1.0μW AUDIO DISTORTION: 3% Maximum AUDIO FREQUENCY RESPONSE: +1, -3dB (6dB/OCTAVE PRE-EMPHASIS; 300 - 3000 Hz) MAXIMUM FREQUENCY SEPARATION: Full Bandsplit (NO DEGRADATION)	SENSITIVITY 20dBQ: 0.45 uV 12dBS: 0.35 uV Squelch (Programmable): 0.30 uV* * Factory set above threshold not to exceed 0.35uV USABLE BANDWIDTH: ±5kHz Minimum SELECTIVITY Adjacent channel: -70dB INTERMODULATION: -70dB FM HUM AND NOISE: -40dB FREQUENCY STABILITY (-30°C TO +60°C; +25°C REF.): ±.0002% AUDIO SPL (AT 30 cm WITH RATED AUDIO): Weighted, 300 - 3000Hz 90dB Nominal (Non-Submersible) 89dB Nominal (-QXK models) RATED AUDIO OUTPUT: 500 mW (At less than 5% distortion) CHANNEL SPACING: 25, 20 kHz MAXIMUM FREQUENCY SEPARATION: Full Bandsplit (NO DEGRADATION)
SECURENET SCRAMBLE TYPE: Digital ENCRYPTION METHOD: Multi-Register, Non-Linear Combiner ENCRYPTION KEY INITIALIZATION: Random ENCRYPTION KEY GENERATION: External, Hand-Held, Microprocessor-Controlled Key loader Volatile Electronic Memory KEY STORAGE: One NUMBER OF KEYS PER RADIO: Continuously-Variable Slope Delta ANALOG-TO-DIGITAL CONVERSION: Modulation (CVSD) 12 Kilobits/Second VOICE SAMPLE RATE:		

SPECIFICATIONS REPRESENT TYPICAL PERFORMANCE AND ARE SUBJECT TO CHANGE WITHOUT NOTICE

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MODEL CONFIGURATION

FACTORY I.D.	POWER LEVEL	FREQ.	SUBMERSIBLE	KEYPAD	DISPLAY
H42QXN7139CN	1W-6W	68-88MHz	No	None	None
H42YXN7139CN	1W-6W	68-88MHz	Yes	None	None
H42QXJ7139CN	1W-6W	68-88MHz	No	3x1	LCD
H42QXK7139CN	1W-6W	68-88MHz	No	3x5	LCD

SPECIALIZED TOOLS AND TEST EQUIPMENT

	SERVICE AIDS
NTN4720A	Securenet Bypass Module
RPX-4665A	Field Modification Kit/RTX-4005A
RSX-4043A	Rotatorq Tool
RTK-4203A	Program/Test Cable
RTL-4224A	Battery Eliminator
REN-4001A	Housing Eliminator
RTX-4005B	Portable Products Test Set
TKN8506A	Keyload Cable
0180370B85 thru B86	Ungar Table Fixtures
0180386A81	Micro-Tip Soldering Iron
0180386A82	Static Protection Kit
6680321B79	Phillips-Head Rotatorq Bit
6680334B48 thru B52	Ungar Service Heads
6680370B88	Frequency and On/Off Switch Spanner Nut Rotatorq Bit
6680370B89	Baseplate Spanner Nut Rotatorq Bit
6680370B90	Antenna Bushing Spanner Nut Rotatorq Bit
6680385A11	Module Extractor
6680387A59	Leadless Component Extractor
6680387A64	Heat Controller With Safety Stand
8407668M01	Display Extender Cable

	TEST EQUIPMENT
R-1053A	Dual-Trace Oscilloscope
R-2045D	Communications Systems Analyzer with Secure Voice Option
S-1339A	RF Millivoltmeter
S-1347D	Power Supply
RTL-4223A	Charger Tester

	FIELD PROGRAMMING EQUIPMENT
RVN-4002E	Field Programmer Software on 5 1/4-inch Disk
RVN-4003E	Field Programmer Software on 3 1/2-inch Disk
0180353A74	Radio Interface Box (RIB)
0180357A57	RIB Wall-Mounted Power Supply
3080369B71	Computer Interface Cable
68P81044C65	SABER Field Programmer User's Guide

CURRENT DRAINS (SEE NOTE)

	SABER I	SABER I AND III
STANDBY	70	73
RECEIVE	215	218
H42 MODELS: 6-WATT	3100	3100
1-WATT	1500	1900

NOTE: Drain specifications are in milliamperes at 7.5Vdc. These current drains apply to test mode, with the radio operating through the external antenna port. Current drains decrease in normal operation due to antenna switch drains and antenna loading.

CLEANING

- Clean all external radio surfaces with a 0.5% solution of a mild dishwashing detergent in water (one teaspoon of detergent per gallon of water).
- Stronger cleaning agents may only be used to remove soldering flux from circuit boards after making repairs.

CAUTION

Never allow any alcohol- or solvent-based product to contact any plastic or rubber radio part.

- Clean internal surfaces with water-activated optical wipes.

RELATED PUBLICATIONS AVAILABLE SEPARATELY

SABER I SECURENET OPERATING INSTRUCTIONS.....	68P81045C60
SABER II SECURENET OPERATING INSTRUCTIONS.....	68P81045C65
SABER III SECURENET OPERATING INSTRUCTIONS.....	68P81048C40
SECURENET SERVICE MANUAL (VHF)	68P81045C70
SECURENET SERVICE MANUAL (UHF)	68P81045C75
SECURENET THEORY/ MAINTENANCE MANUAL.....	68P81045C85
FIELD PROGRAMMER USER'S GUIDE.....	68P81044C65

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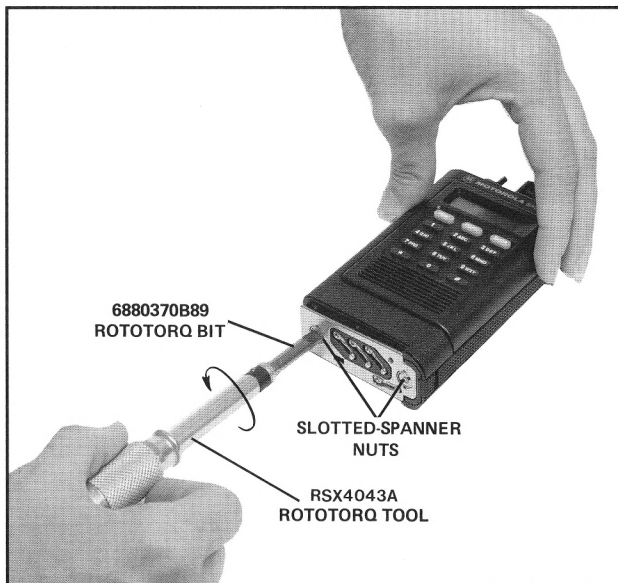
DISASSEMBLY/REASSEMBLY PROCEDURES

1. DISASSEMBLY

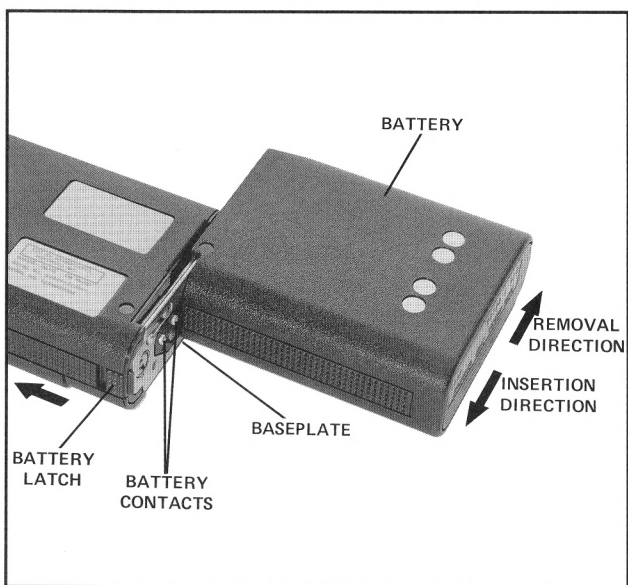
a. **Turn off the radio** by rotating the on/off/volume control knob fully counterclockwise until you hear a click. Remove the universal connector cover or any accessory connected to the radio before beginning disassembly.



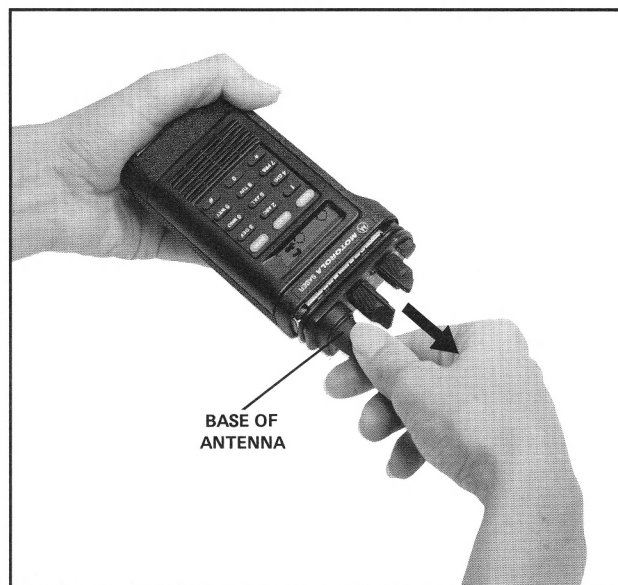
c. **Loosen the two slotted-spanner nuts** on the bottom of the radio using Rotatorq tool bit No. 6680370B89. When loosened, the slotted-spanner nuts are captive and will spin freely without separating from the baseplate.



b. **Remove the battery** from the baseplate on the bottom of the radio housing by pushing the spring-loaded battery latch toward the top of the radio, and sliding the battery away from the latch until it clears the baseplate.



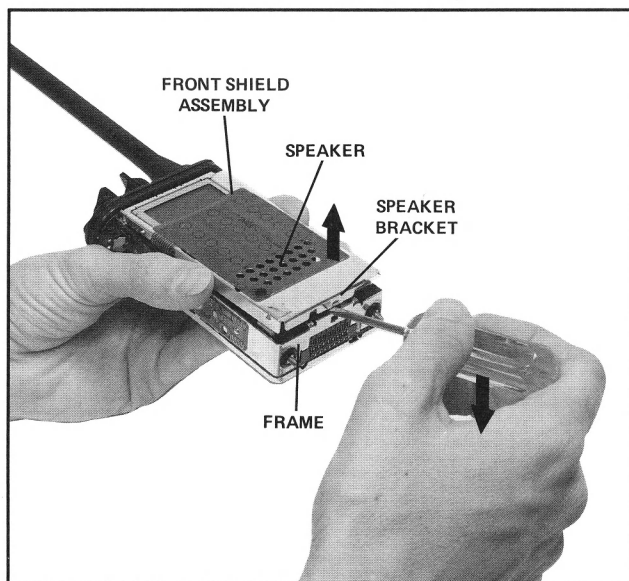
d. **Remove the frame assembly** from the radio housing by grasping the antenna at its base and pulling it gently upward. *Do not depress the PTT switch during removal and do not push on the slotted-spanner nuts to lift the frame assembly.*



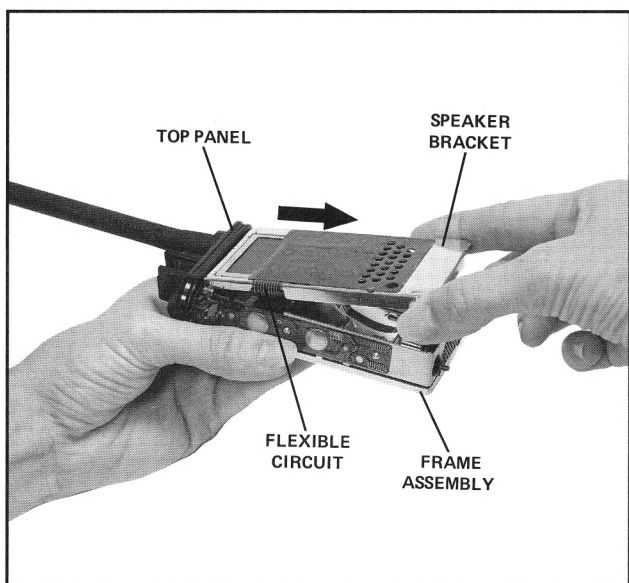
CAUTION

Ensure that all static electricity safeguards are in place.

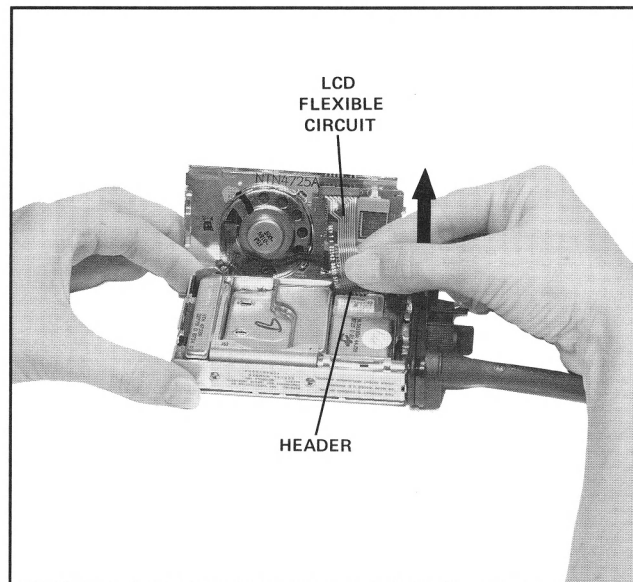
e. With the speaker facing upward, **remove the speaker bracket assembly** by inserting a thin screwdriver blade between the frame and the bottom of the speaker bracket, and prying gently upward on the speaker bracket until it is disengaged from the frame.



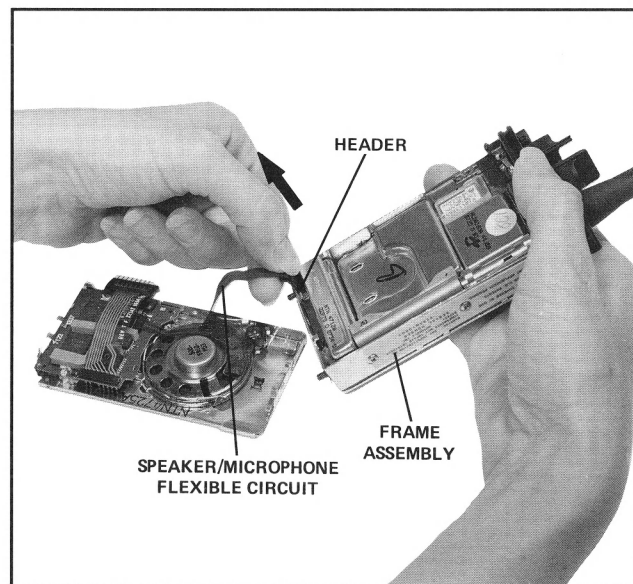
f. **Lift the speaker bracket assembly** away from the bottom of the frame assembly, then pull it out from under the plastic top panel. Be careful not to pull against the flexible circuits connecting the speaker bracket to the frame assembly.



g. *ON SABER II AND SABER III RADIOS ONLY:* **Disconnect the LCD interconnect flexible circuit** from the frame assembly by pulling the header straight out and away from the main printed circuit board.



h. **Disconnect the speaker/microphone flexible circuit** from the frame assembly by pulling the connector straight out and away from the main printed circuit board.



CAUTION

Refer to "SERVICING MAJOR SUBASSEMBLIES" (Section 2) and the appropriate exploded view diagrams at the back of this manual before attempting further disassembly or repair.

2. SERVICING MAJOR SUBASSEMBLIES

a. Baseplate

- All repairs to the baseplate assembly can, and should, be made with the radio chassis inside the radio.
- After the slotted-spanner nuts are loosened, the baseplate is held in place by the power contact screws.
- The retainers holding the slotted-spanner nuts in place are not reusable. Replacement of the retainers requires special insertion procedures; refer to the instruction sheet provided with the slotted-spanner nut kit.
- The "o-ring" portions of the elastomer seal must be fully seated on the threaded bushings before the baseplate is reassembled (the bushings are part of the housing assembly).

b. Housing Assembly

- The housing assembly includes many parts that are not replaceable or repairable.
- The insulator on the universal connector can, and should, be replaced if the old insulator has been torn. When replacing the insulator take care to keep it out of the main seal o-ring's seating area.
- The PTT lever can be replaced by prying out the old part with a soft plastic tool. The plastic housing around the lever may be damaged if a harder tool is used.

c. Control Top Panel

- The control top panel is fastened to the frame by the on/off/volume and frequency switches, and two self-tapping screws; it should be removed from the frame only if absolutely necessary. If repair is required, always start the screws into the control top panel by hand before tightening them with a torque wrench; this will help avoid cross-threading and stripping of the plastic panel.
- The on/off/volume and frequency knobs are 2-part kits; each kit consists of a knob and an insert. Once an insert is removed, it cannot be used again; therefore, remove an insert only if the on/off/volume control or frequency switch must be replaced, or if the control top must be removed from the frame.

- The number of frequency switch positions can be changed by removing the frequency knob and insert, and aligning the top tab on the detent washer with the number on the escutcheon that is equal to the desired number of frequency positions minus three. For example, a 12-position frequency switch would have the top tab aligned with the "9" on the escutcheon. A new frequency knob and insert must be used each time this change is made.

NOTE

There are different detent washers for even or odd numbers of switch positions; see the appropriate exploded view parts list.

d. LCD/Speaker Bracket Assembly

- The LCD assembly can be replaced on SABER II and III radio PC board assemblies, but the instructions on the replacement kit's instruction sheet must be strictly followed.
- The microphone boot must be properly oriented and seated in the speaker bracket **before** the microphone is pressed into place.

e. Backshield Assembly

- Before removing the backshield, ensure that all static electricity safeguards are in place.
- For best results, loosen/tighten all four screws lightly before loosening/tightening any single screw completely.
- The backshield screws are held captive in the shield after being loosened.

f. Circuit Boards and Modules

- All modules plug into sockets on the main circuit board.
- Some modules are fastened to the main board and frame with screws; remove these screws before attempting to unplug a module. **Never** substitute any screw.
- Several of the modules are designed to be removed with a standard DIP extractor tool (OK-1 or equivalent). Always use the extractor tool when removing these modules to avoid damaging their leads.

- Some modules have guide pins to assist in insertion or removal. Pressure may be applied to these guide pins to aid removal of a module if, and only if, it is distributed evenly over all guide pins on the module. *Applying all the force to a single guide pin will cause severe damage to the module.*

- The U900 module is not serviceable.

- Before reinserting any module, always check its leads for damage. Gently straighten any leads that may be bent; replace any modules with severely damaged leads.

- Before reinserting reference oscillator module U301 into the main circuit board, be certain that its squared (pin 1) corner is correctly oriented per the main circuit board component layout diagram.

- When electrically testing and/or probing the main circuit board with the back shield removed, always use the three finger screws on the SABER housing eliminator service aid to provide grounding to VCO synthesizer module U300 (two places), and the rf ground clip (one place).

- When removing the main circuit board from the frame assembly, do the following:

1. Remove the back shield assembly.
2. Unplug the PTT/controls flexible circuit.
3. Remove power amplifier module U202.
4. Remove the two main compression connector screws.
5. Lift the board at the bottom and pull out from under the control top panel.

- The rf and ground contacts at the top of the main circuit board are exposed when the board is removed from the frame. Special care must be taken to avoid accidental damage to these contacts.

g. Frame Assembly

- The tapped tabs on the frame can be stripped if excessive screw tightening torques are used (see Torque Specifications table). The frame is not repairable.

- If you must lift or remove the PTT/controls flex circuit for any reason, do not readhere it to the frame; the flex must be replaced.

h. Dual-Function Switch (S801, 804) and Actuator Assembly

- Before removing the switch, remove the knob by gently separating the two arms of the switch bracket (located between the switch and the main O-ring seal) and pulling upward on the knob.

- Before reinserting the knob, ensure that the slot in the switch is properly aligned with the blade on the knob's shaft.

- When the knob is properly inserted, the arms of the switch bracket will snap into position (approximately 0.2 inches apart), the knob will not be loose in the switch bracket, and the bracket will hold the switch firmly against the inside of the top control panel. If this is not the case, replace the switch bracket.

3. REASSEMBLY

Reassemble the radio in the reverse order of disassembly, referring to "SERVICING MAJOR SUB-ASSEMBLIES" (Section 2) and making certain:

- that the speaker/microphone connector (and the LCD interconnect header on SABER II and III radios) is correctly aligned so that no twisting or pinching of the flexible circuit occurs when the speaker bracket is reattached to the frame assembly.

- that the two extended tabs at the top of the speaker bracket are properly inserted into the slots between the frame and the control top panel.

- to tighten all hardware loosened or removed during disassembly per the torque specifications listed in the Torque Specifications table. Use recommended torque driver (Motorola RSX4043A Rotatorq Tool or equivalent).

- that there is no foreign material on the main O-ring or stud seals.

CAUTION

Inspect the frame stud seals and the top panel O- ring and replace if any damage exists.

- to properly orient the completed frame assembly before inserting it into the radio housing.

- that the PTT switch and monitor button are not depressed while the frame is being inserted into the housing.

TORQUE SPECIFICATIONS

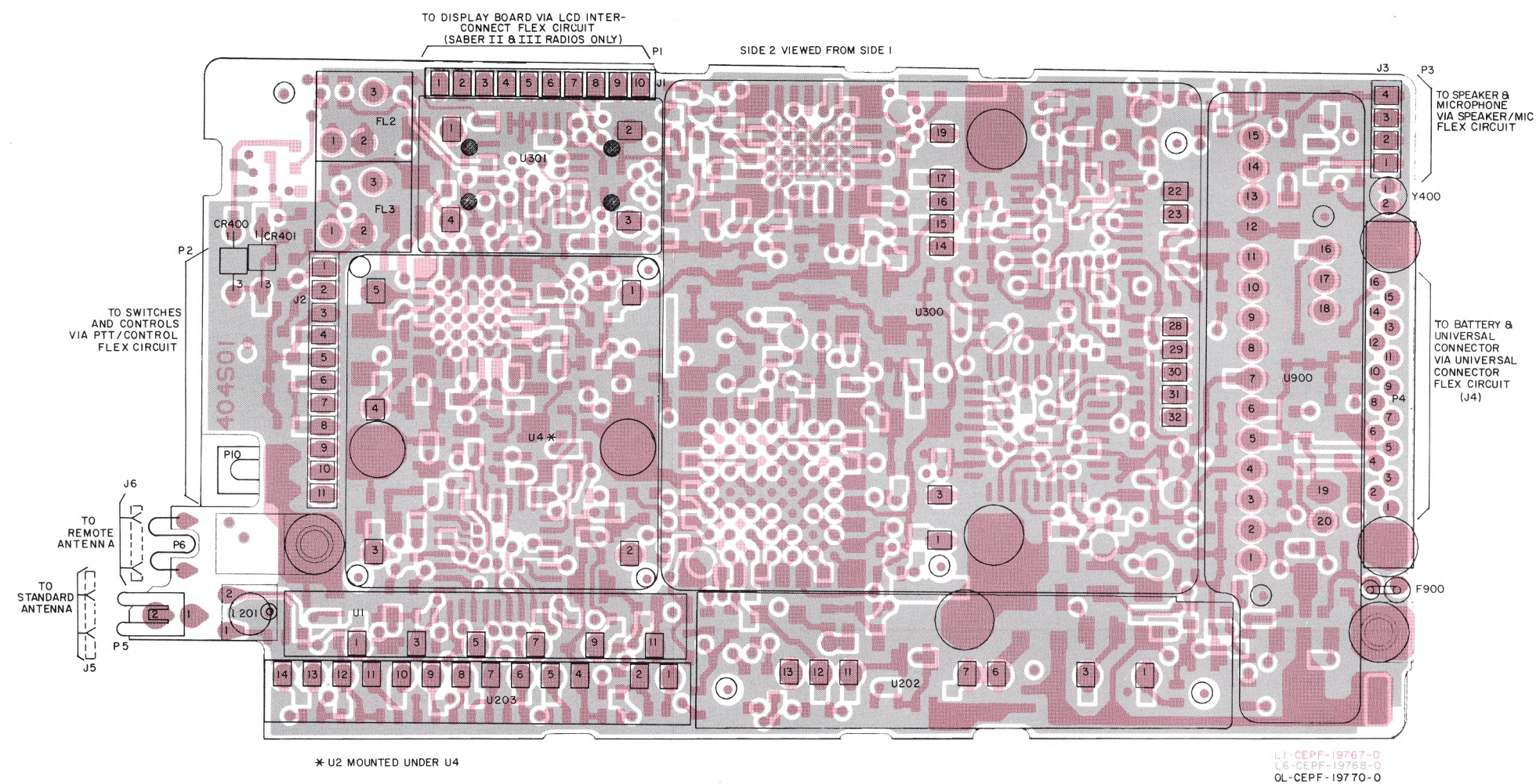
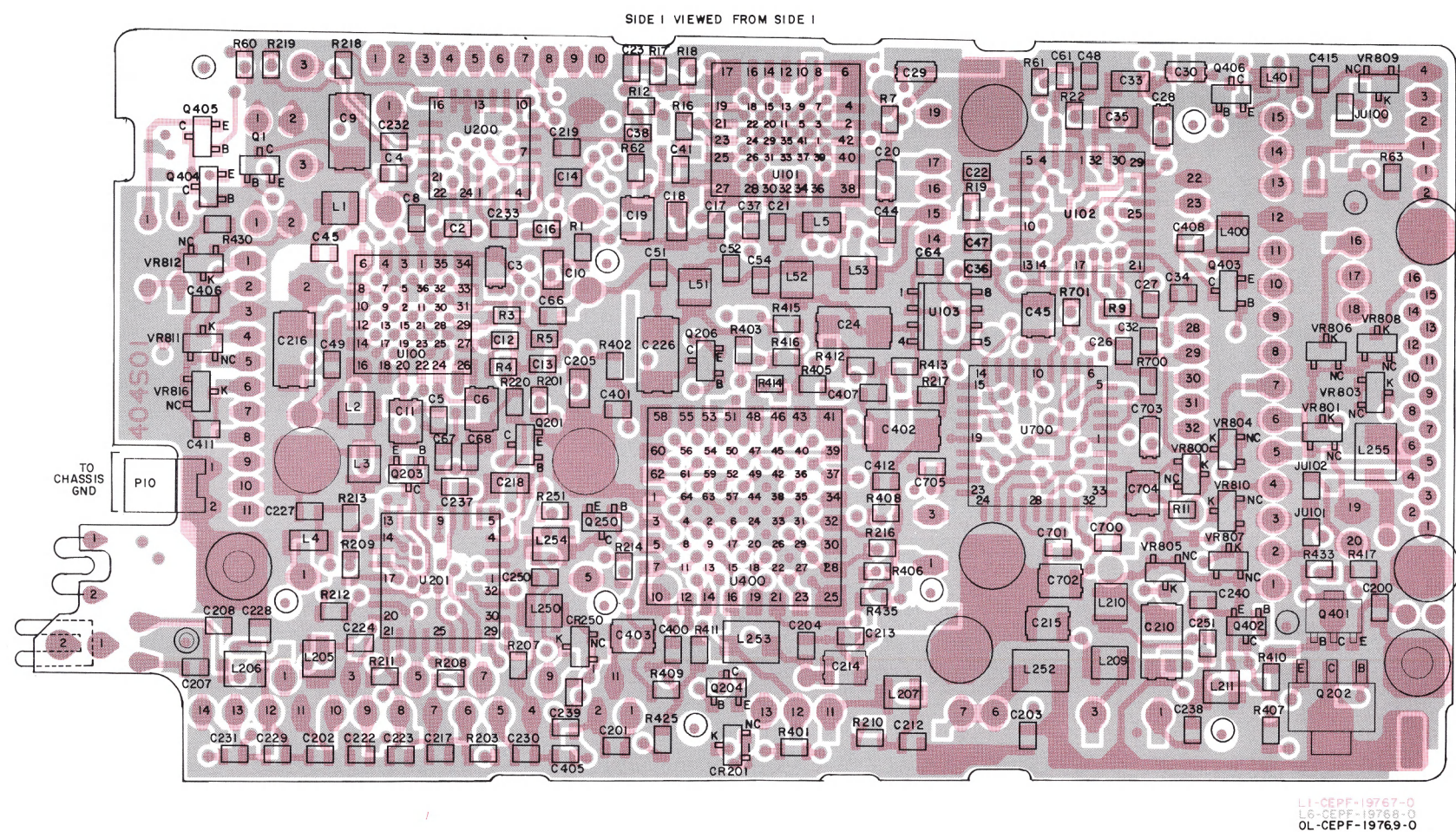
APPLICATION	TORQUE (IN. LBS.)	TORQUE (N·m)	TORQUE BIT NO.
Antenna Bushing Spanner Nut	20	2.27	6680370B90
Back Shield to Frame Screws	2.5	0.28	6680321B79
Bottom Connector to Frame Screws	2.5	0.28	6680321B79
Frequency Switch Spanner Nut	8	0.91	6680370B88
All Module Screws	2.5	0.28	6680321B79
Power Contact Screws	2.5	0.28	6680321B79
Slotted-Spanner Nut (Baseplate)	4	0.45	6680370B89
Top Panel to Frame Screws	2	0.23	6680321B79
Volume Pot Spanner Nut	8	0.91	6680370B88

SECURENET RADIO FUNCTIONAL TESTS (@ 7.5VDC)

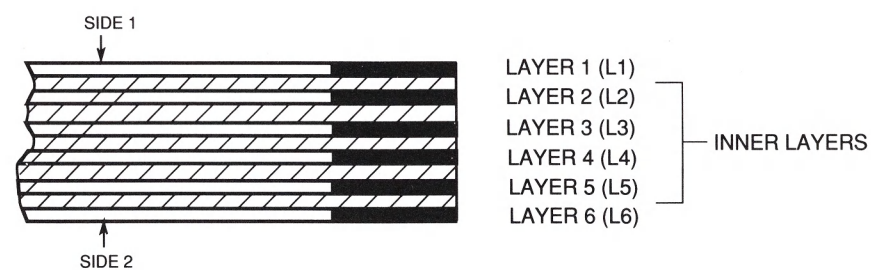
TRANSMITTER PERFORMANCE				
TEST	SERVICE MONITOR	RADIO	TEST BOX	COMMENTS
REFERENCE FREQUENCY	Set to POWER MONITOR, FREQ. ERROR ; frequency to radio transmit frequency; input to RF IN/OUT .	Set to channel corresponding to frequency of test.	PTT Continuous (during performance check).	Frequency error = ≤ 150 Hz (mid-band)
RF POWER OUT	Same as above, except set monitor to measure POWER .	Set to channel corresponding to frequency and power level under test.	PTT Continuous (during performance check).	RF power output \geq published specs for channel under test.*
VOICE MODULATION	Same as above, except set monitor to measure DEVIATION .	Set to channel corresponding to frequency and power level under test.	Input a 1kHz tone @ ≈ 50 mVrms to radio's microphone (through test box). PTT continuous (during performance check).	Listen for 1kHz tone from monitor. Deviation should be ≥ 4.0 kHz and ≤ 5.0 kHz for 25kHz ≥ 3.0 kHz & ≤ 4.0 kHz for 20kHz.
CODED VOICE MODULATION	Load monitor with same key used in radio. Select proper algorithm and DEVIATION test with SECURE COM TEST MENU on screen.	Set to channel corresponding to freq. and power level under test. With key loaded, set radio to coded mode.	Same as above.	Listen for decoded 1kHz tone from monitor. Deviation should be ≥ 3.5 kHz and ≤ 4.5 kHz for 25kHz ≥ 2.5 kHz and ≤ 3.5 kHz for 20kHz.
RECEIVER PERFORMANCE				
RATED AUDIO	Set to GENERATOR ; frequency to radio receive frequency; 1 mV rf output; 1kHz modulation; 3kHz deviation.	Set to open squelch.	Speaker selector on position "A"; switch to load.	Verify that audio is present; adjust radio volume control to read 3.7 to 3.9 Vac on DVM.
12dB SINAD	Same as above, except set monitor to measure SINAD .	Set to open squelch.	Set to speaker load.	Reduce rf level to achieve 12dB SINAD; rf level \leq published specs.
RECEIVE CODED VOICE	Load monitor with same key used in radio; make sure 1kHz level and all other modulation are turned off when switching to GENERATE . Select TEST under SECURE COM MENU .	Set to channel corresponding to freq. and power level under test. Make sure key is loaded into radio.	Speaker selector on position "A."	Increase 1kHz level on monitor and listen for 1kHz tone from test box.

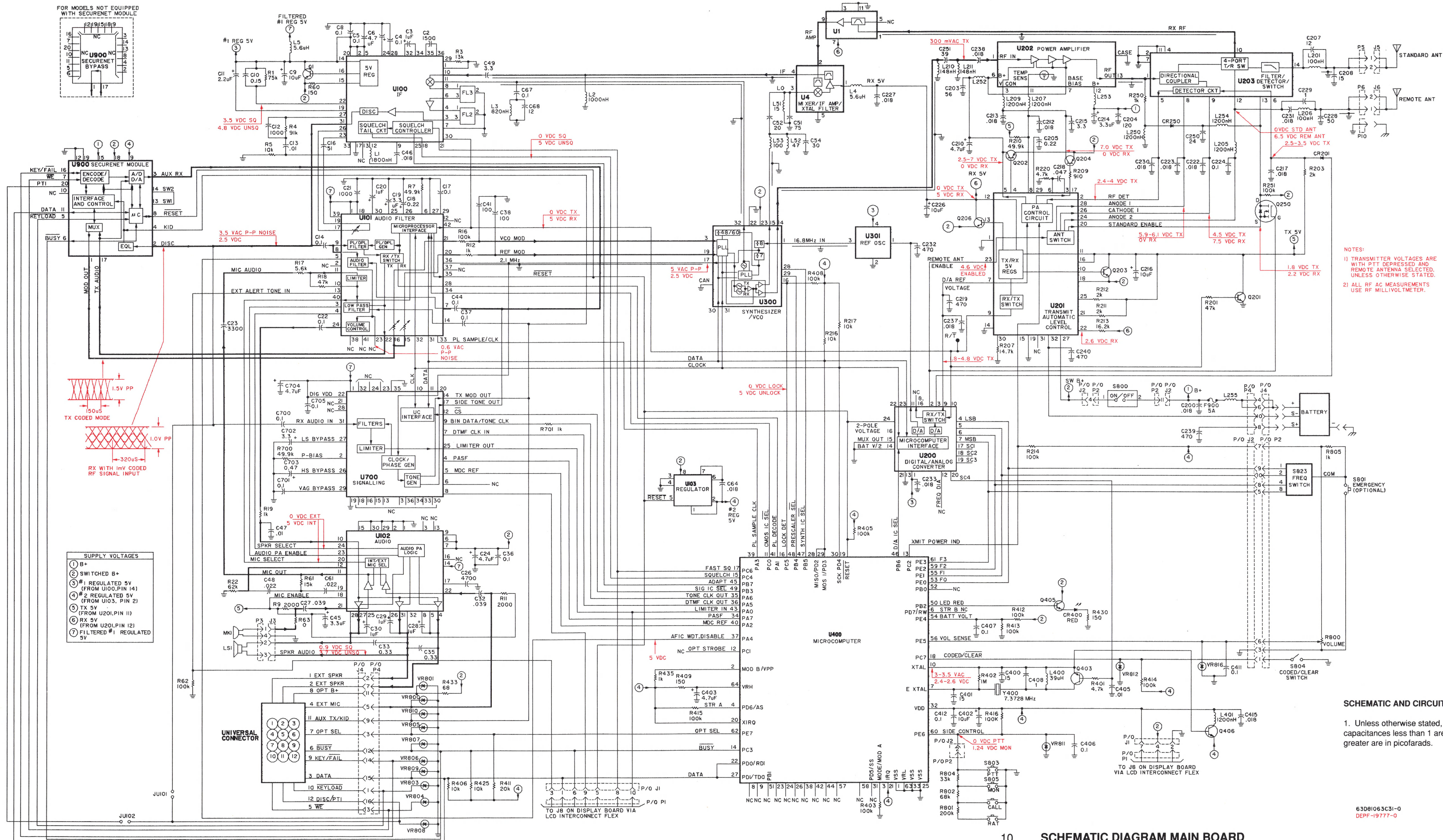
NOTES: Tests should be performed with Test Box RTX-4005B, and associated Test Cable RTK-4203A.

• RF power levels can be different for each individual channel; refer to Radio Information Sheet.



6-LAYER CIRCUIT BOARD COPPER DETAIL VIEWING
COPPER STEPS AT EDGE OF BOARD IN PROPER
LAYER SEQUENCE.





SABER MID-BAND SECURENET
Electrical Parts List

TPLF-3800-0

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITOR, Fixed: uF±20%; 25V unless stated
C1	-----	Not Used
C2	2113741A25	1500pF±5%
C3	2362998B09	1±10%; 16V
C4,5	2160521G37	0.1+80-20%
C6	2362998B68	4.7; 10V
C7	-----	Not Used
C8	2160521G37	0.1+80-20%
C9	2362998B73	10; 16V
C10	2362998D51	0.15±10%; 35V
C11	2362998B64	2.2; 20V
C12	2113741A21	1000pF±5%
C13	2113741A45	.01
C14	2160521G37	0.1+80-20%
C15	-----	Not Used
C16	2113740A48	51pF±30%
C17	2160521G37	0.1+80-20%
C18	2160521H41	.22+80-20%
C19	2362998B16	3.3±10%; 16V
C20	2362998B09	1±10%; 16V
C21	2113741A21	1000pF±5%
C22	2160521G37	0.1+80-20%
C23	2113741A33	3300pF±5%
C24	2362998B69	4.7; 20V
C25	-----	Not Used
C26	2113741A37	4700pF±5%
C27	2113741A59	.039±5%
C28 thru 30	2362998B09	1±10%; 16V
C31	-----	Not Used
C32	2113741A59	.039±5%
C33	2160521H43	.33±25%; 5V
C34	-----	Not Used
C35	2160521H43	.33±25%; 5V
C36,37	2160521G37	0.1+80-20%
C38	2113741A45	.01
C39,40	-----	Not Used
C41	2113740A55	100pF±5% NPO
C42,43	-----	Not Used
C44	2160521G37	0.1+80-20%
C45	2362998B16	3.3±10%; 16V
C46	2113741A51	.018
C47	2113741A45	.01
C48	2113741A53	.022±5%
C49	2113740A15	3.3±30%
C50	-----	Not Used
C51	2113740A52	75±30%
C52	2113740A36	20±30%
C53	-----	Not Used
C54	2113740A40	30±30%
C55 thru 60	-----	Not Used
C61	2113741A53	.022±5%
C62,63	-----	Not Used
C64	2113741A51	.018
C65,66	-----	Not Used
C67	2160521G37	0.1+80-20%
C68	2113740A31	12±30%
C200	2113741A51	.018
C201,202	-----	Not Used
C203,204	2113741A51	.018
C205	2160521H41	0.22+80-20%
C206	-----	Not Used
C207	2113740A31	12±30%
C208	2113740A33	15±30%
C209	-----	Not Used
C210	2362998B69	4.7; 20V
C211	-----	Not Used
C212,213	2113741A51	.018
C214,215	2362998B16	3.3±10%; 16V
C216	2362998B73	10; 16V
C217	2113741A51	.018
C218	2113741B61	.047
C219	2113741A13	470pF±10%
C220,221	-----	Not Used
C222,223	2113741A51	.018
C224	2160521G37	0.1+80-20%

C225	-----	Not Used
C226	2362998B73	10; 16V
C227	2113741A51	.018
C228	2105573Q20	8.2
C229	2113740A03	1.0±30%
C230	2113741A51	.018
C231	2113740A43	39±30%
C232	2113741A13	470pF±10%
C233	2113741A51	.018
C234 thru 236	-----	Not Used
C237,238	2113741A51	.018
C239,240	2113741A13	470pF±10%
C241 thru 249	-----	Not Used
C250	2113740A38	24±30%
C251	2113740A43	39±30%
C400,401	2113740A33	15±30%
C402	2362998B73	10; 16V
C403	2362998B68	4.7; 10V
C404	-----	Not Used
C405	2113741A45	.01
C406,407	2160521G37	0.1+80-20%
C408 thru 410	-----	Not Used
C411,412	2160521G37	0.1+80-20%
C415	2113741A51	.018
C700,701	2160521G37	0.1+80-20%
C702	2362998B16	3.3±10%; 16V
C703	2362998B05	.47±10%
C704	2362998B68	4.7; 10V
C705	2160521G37	0.1+80-20%
		DIODE: See Note I
CR200	-----	Not Used
CR201	4805129M05	SOT-23
CR202 thru 249	-----	Not Used
CR250	4805129M05	SOT-23
CR400	4805729G34	LED, Red
		FUSE:
F900	6505214E02	5 Amp
		FILTER:
FL1	-----	Not Used
FL2,3	9105685Q12	Ceramic; 450kHz; 15kHz BW
		JACK:
J1	0905287C07	Socket, Printed Circuit (LCD Interconnect) (10 req'd)
J2	0905287C07	Socket, Printed Circuit (PTT/Controls Flex) (11 req'd)
J3	0905287C07	Socket, Printed Circuit (Speaker/Mic Connector) (4 req'd)
		COIL, RF: unless stated
L1,2	2462575A04	1000nH±10%
L3	2462575A03	820nH±10%
L4,5	2462575A08	5.6uH±10%
L6 thru 50	-----	Not Used
L51	2405452C19	15uH±10%
L52	2460578C45	47uH±10%
L53	2405452C03	100nH±5%
L200	-----	Not Used
L201	2405855Q03	Air Wound, 100nH
L202 thru 204	-----	Not Used
L205	2462990L15	1200nH±5%
L206	2460578C13	100nH
L207	2462990L15	1200nH±5%
L208	-----	Not Used
L209	2462990L15	1200nH±5%
L210,211	2405452C07	148nH±5%
L212 thru 249	-----	Not Used
L250	2462990L15	1200nH±5%
L251	-----	Not Used
L252,253	2484657R01	MT .160
L254	2462990L15	1200nH±5%
L255	2484657R01	MT .160
L400	2460578C44	39uH±10%
L401	2462990L15	1200nH±5%
		SPEAKER:
LS1	-----	28Ω±1% (part of Speaker/Microphone Flex Assembly)
		MICROPHONE:
MK1	-----	(part of Speaker/Microphone Flex Assembly)

P1 thru 3	-----	PLUG:
P4	2805520Q01	Not Used
P5	3905446Q03	Connector, Bottom
P6	3905445Q03	Connector, Antenna
P7 thru 9	-----	Contact, RF Wireform
P10	3905889R01	Not Used
		Contact, PCB Ground
		TRANSISTOR: See Note I
Q1	4805128M16	PNP; SOT-23; MMBT3906
Q200	-----	Not Used
Q201	4805128M23	NPN; SOT-23
Q202	4805218N45	PNP; BCP69
Q203,204	4805128M16	PNP; SOT-23; MMBT3906
Q205	-----	Not Used
Q206	4805128M16	PNP; SOT-23; MMBT3906
Q207 thru 249	-----	Not Used
Q250	4805218N11	SOTRH; BST82
Q400	-----	Not Used
Q401	4805128M27	PNP; SOT-89
Q402 thru 403	4805128M44	NPN; SOT-23
Q404	-----	Not Used
Q405, 406	4805128M44	NPN; SOT-23
		RESISTOR, Fixed: Ω±5%; 1/8W unless stated
R1	0660076A94	75k±1%
R2	-----	Not Used
R3	0660076E76	13k±1%
R4	0660078T24	91k
R5	0660078T01	10k
R6	-----	Not Used
R7	0660078J80	49.9k±1%
R8	-----	Not Used
R9	0660078G33	2k±1%
R10	-----	Not Used
R11	0660078G33	2k±1%
R12	0660079U73	1k
R13 thru 15	-----	Not Used
R16	0660078L01	100k±1%
R17	0660076A67	5.6k±1%
R18	0660076E89	47k±1%
R19	0660079U73	1k
R20, 21	-----	Not Used
R22	0660076A92	62k±5%
R23 thru 59	-----	Not Used
R60	0660076A29	150
R61	0660076E77	15k±5%
R62	0660078L01	100k±1%
R63	0605021K01	0
R200	-----	Not Used
R201	0660076E89	47k
R202	-----	Not Used
R203	0660078G33	2k±1%
R204 thru 206	-----	Not Used
R207	0660078J18	14.7k±1%
R208	-----	Not Used
R209	0660076A48	910
R210	0660078J80	49.9k±1%
R211,212	0660078G33	2k±1%
R213	0660078J23	16.2k±1%
R214	0660078L01	100k±1%
R215	-----	Not Used
R216,217	0660078T01	10k±1%
R218,219	-----	Not Used
R220	0660076A65	4.7k
R221 thru 249	-----	Not Used
R250	0660079U73	1k
R251	0660078L01	100k±1%
R400	-----	Not Used
R401	0660076A65	4.7k
R402	0660076B25	1M
R403	0660078L01	100k±1%
R404	-----	Not Used
R405	0660078L01	100k±1%
R406	0660078T01	10k±1%
R407,408	0660078L01	100k±1%
R409	0660076A29	150
R410	0660079U73	1k
R411	0660076A80	20k
R412 thru 417	0660078L01	100k±1%
R418 thru 424	-----	Not Used

R425	0660078T01	10k±1%
R426 thru 429	-----	Not Used
R430	0660076A29	150
R431,432	-----	Not Used
R433	0660076A21	68
R434	-----	Not Used
R435	0660079U73	1k
R436 thru 439	-----	Not Used
R700	0660078J80	49.9k±1%
R701	0660079U73	1k
R800	RPX4690A	Kit, Potentiometer, On/Off/Volume (includes S800)
R801	0660076B08	200k
R802	0660076A93	68k
R803	-----	Not Used
		SWITCH:
R804	0660076A85	33k
R805	0660076A49	1k
		Kit, On/Off/Volume (includes R800)
S800	RPX4690A	Dual-Function, Clear/Coded
S801/S804	4005221R01	(S804)(Standard) and Emergency (S801)(Optional)
		Not Used
S802	-----	Kit, Contact Snapdome, PTT
S803	RPX4694A	Kit, Contact Snapdome, Monitor
S805	RPX4694A	Not Used
S806 thru 822	-----	Kit, Frequency
S823	RPX4689A	
		CIRCUIT MODULE: See Note I
U1	NLC6280A	Amplifier, RF (68-84MHz)
	or NLC6382A	Amplifier, RF (74-88MHz)
U2,3	-----	Not Used
U4	NLC6230A	Receiver Front End (68-84MHz)
	or NLC6231A	Receiver Front End (74-88MHz)
U100	5105165R36	IC, I-F
U101	5105165R40	IC, Audio Filter, CMOS
U102	5105165R65	IC, Audio, Bipolar
U103	5105469E65	IC, Regulator
U200	5105226P38	IC, Digital/Analog Converter, CMOS
U201	5105165R53	IC, Transmit Automatic Level Control
U202	NLC6260A	Amplifier, Power (68-84MHz)
	or NLC6261A	Amplifier, Power (74-88MHz)
U203	NLC6250A	Filter/Detector/Switch (68-84MHz)
	or NLC6251A	Filter/Detector/Switch (74-88MHz)
U300	NLC6240A	Synthesizer/VCO (68-84MHz)
	or NLC6241A	Synthesizer/VCO (74-88MHz)
U301	NXN6269A	Oscillator, Reference; 16.8MHz
U400	5105414S18	Microcomputer, MC68HC11; Binary
U700	5105226P67	Signal Filter, Phase 1, CMOS
U900	NTN4720A	SECURENET Bypass Module
	or -----	Optional Encryption Module
		DIODE: See Note I
VR800	4805129M35	Zener, 5.6V
VR801	4805129M49	Zener
VR802	-----	Not Used
VR803 thru 812	4805129M35	Zener, 5.6V
VR813 thru 815	-----	Not Used
VR816	4805129M35	Zener, 5.6V
		CRYSTAL:
Y400	4805664G32	7.3728MHz

NONREFERENCED ITEMS

	0905287C07	SOCKET, Printed Circuit (for all modules) (69 req'd)
	1405881R01	BOOT, Crystal (for Y400)
	7505934Q01	PAD, Oscillator (for U301)

NOTES:

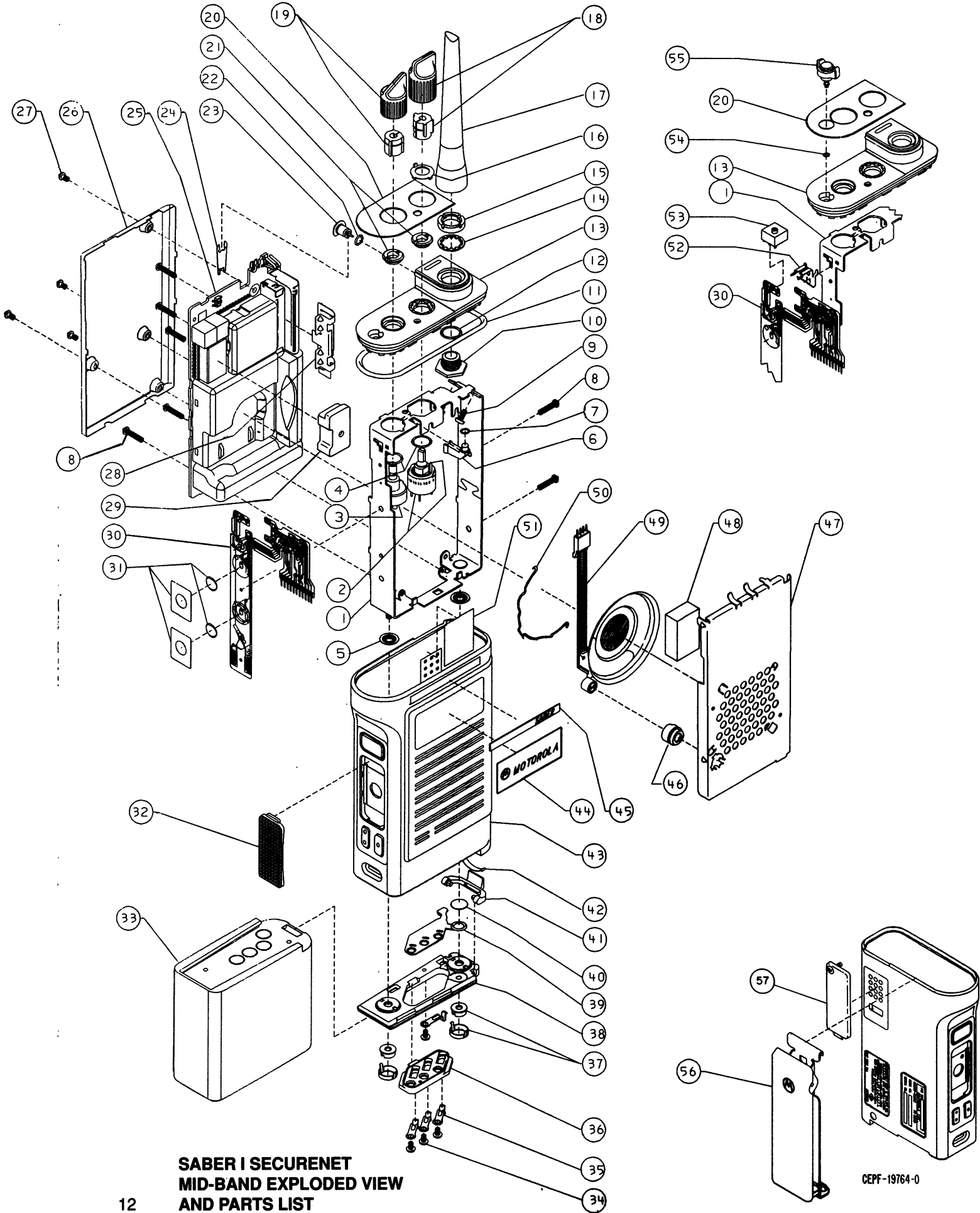
I. For optimum performance, order replacement diodes, transistors, and circuit modules by Motorola part number only.

SABER I SECURENET Mid-Band
Exploded View Parts List

TLPLF-3802-0

ITEM NO.	MOTOROLA PART NO.	DESCRIPTION
1	RPX4720A	ASSEMBLY, Frame Stud (includes item 5)
2	RPX4689A	KIT, Frequency Switch (S823) (includes item 4)
3	RPX4690A	KIT, On/Off Switch (S800)/Volume Control (R800) (includes item 4)
4	3205082E62	GASKET, O-Ring (2 req'd) (part of items 2 and 3)
5	3205422Q01	SEAL, Stud (2 req'd) (part of item 1)
6	6105436Q01	LIGHTPIPE, LED
7	3205082E59	GASKET, O-Ring
8	0300138542	SCREW, Module, Ph Pan Hd; 2-56x3/8" (7 req'd)
9	0305381L02	SCREW, Top Panel; 2-32 (2 req'd)
10	RPX4693A	KIT, Antenna Bushing (includes item 12)
11	3205082E71	GASKET, O-Ring (part of item 13)
12	3205082E58	GASKET, O-Ring (part of item 10)
13	RPX4692A	KIT, Control Top Panel (includes item 11)
14	0400139731	LOCKWASHER, Internal Tooth
15	0205591R01	NUT, Antenna Bushing
16	0405781Q01	WASHER, Detent (even number of switch positions)
	or 0405781Q03	WASHER, Detent (odd number of switch positions)
17	NAC6060A	ANTENNA, MB Helical (68-84 MHz)
	or NAC6052A	ANTENNA, MB Helical (74-88 MHz)
18	RPX4699A	KIT, Frequency Knob
19	RPX4698A	KIT, On/Off/Volume Knob
20	1305622Q09	ESCUTCHEON, SECURENET, No Knob
	or 1305622Q07	ESCUTCHEON, SECURENET, Push-Only
	or 1305622Q03	ESCUTCHEON, SECURENET, Rotate-Only
	or 1305622Q16	ESCUTCHEON, SECURENET, Submersible, No Knob
	or 1305622Q17	ESCUTCHEON, SECURENET, Submersible, Push-Only
	or 1305622Q15	ESCUTCHEON, SECURENET, Submersible, Rotate-Only or Push-and-Rotate
21	0205916P01	NUT, Spanner (2 req'd)
22	3205082E61	GASKET, O-Ring (part of item 23)
23	RPX4691A	KIT, RF Connector (includes items 22,24)
24	4205852N01	CONTACT, Ground, RF (part of item 23)
25	NLC6370A	ASSEMBLY, MB Main PC Board
26	NTN4726A	ASSEMBLY, Back Shield (includes item 27)
27	0305706Q01	SCREW, Captive; 2-56 (4 req'd) (part of item 26)
28	4205577Q01	CLIP, Ground
29	1405343S01	BOOT, Oscillator, SABER I
30	RPX4700A	KIT, PTT/Controls Flex (includes item 31)
	or RPX4723A	KIT, PTT/Controls Flex Assembly (includes items 2,3,31)
31	RPX4694A	KIT, Contact Snapdome (S803, 805) (2 req'd) (part of item 30)
32	4505022P02	LEVER, PTT (part of item 43)
33	NTN4592A	BATTERY, 500 mAh
	or NTN4593A	BATTERY, 900 mAh
	or NTN4595A	BATTERY, 1500 mAh
	or NTN4540A	BATTERY, 3600 mAh Primary
	or NTN4537A	BATTERY, FM, 500 mAh
	or NTN4538A	BATTERY, FM, 900 mAh
	or NTN4596A	BATTERY, FM, 1500 mAh
34	0305706Q02	SCREW, Baseplate Ph Pan Hd;2-56x3/32" (4 req'd) (part of item 43)
35	3905453Q01	CONTACT, Power (4 req'd) (part of item 43)
36	4205437Q01	RETAINER, Baseplate (part of item 43)
37	RPX4696A	KIT, Slotted Spanner Nut (2 req'd) (part of item 43)
38	6405847N03	BASEPLATE (part of item 43)
39	3205701Q01	SEAL, Elastomer (part of item 43)
40	3205472M01	SEAL, Vacuum Port (part of item 43)
41	5505333Q01	LATCH, Battery (part of item 43)
42	4105775Q01	SPRING, Latch (part of item 43)

43	NHN6410A	ASSEMBLY, Housing, SABER I (includes items 32,34 thru 42)
	or NHN6408A	ASSEMBLY, Housing, SABER I Submersible (includes items 32,34 thru 42)
44	3305183R03	LABEL, Bottom Nameplate, SABER I
45	3305183R01	LABEL, Top Nameplate, SABER I
46	1405490Q01	BOOT, Microphone
47	RPX4721A	KIT, Speaker Bracket, SABER I (includes item 48)
48	7505641N03	PAD, Speaker Bracket (part of item 47)
49	0105958M34	ASSEMBLY, Speaker/ Microphone Flex, SABER I
50	4205604Q01	RETAINER, Speaker
51	1405182M03	INSULATOR, Universal Connector
52	0705319R01	BRACKET, Switch
53	4005221R01	SWITCH, Dual-Function (S801, 804)
54	3205082E68	GASKET, O-Ring, Emergency
55	NTN5069A	KIT, Rotate-Only Knob (includes item 54)
	or NTN5068A	KIT, Push-and-Rotate Knob (optional) (includes item 54)
	or NTN5076A	KIT, Push-Only Knob (optional) (includes item 54)
	or 4305607S01	PLUG, Seal (optional)
56	NTN4788A	ASSEMBLY, Belt Clip
57	NTN5025A	Cover, Universal Connector

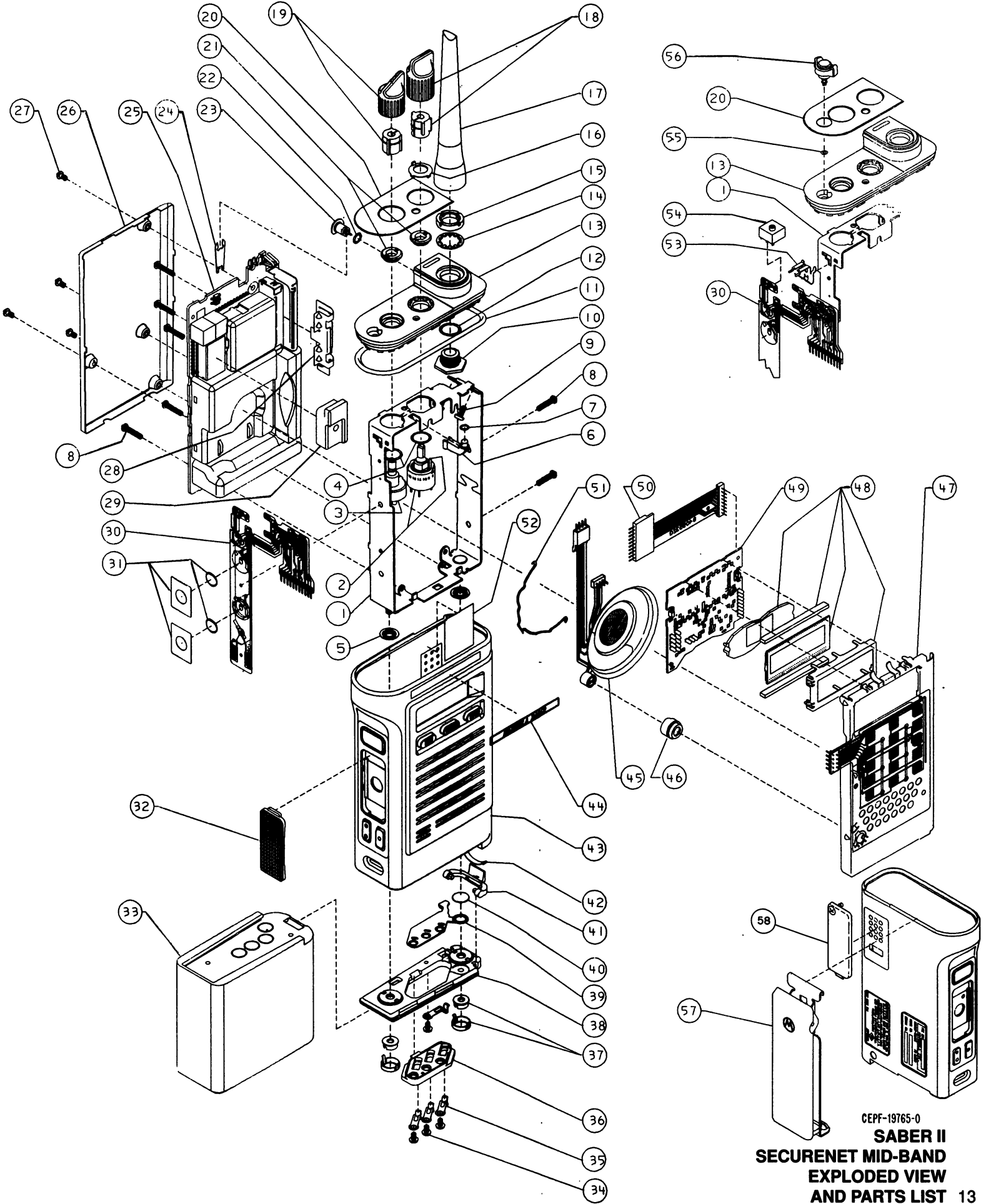


SABER II SECURENET Mid-Band
Exploded View Parts List

TPLF-3803-O

ITEM NO.	MOTOROLA PART NO.	DESCRIPTION
1	RPX4720A	ASSEMBLY, Frame Stud (includes item 5)
2	RPX4689A	KIT, Frequency Switch (S823) (includes item 4)
3	RPX4690A	KIT, On/Off Switch (S800)/Volume Control (R800)(includes item 4)
4	3205082E62	GASKET, O-Ring (2 req'd) (part of items 2 and 3)
5	3205422Q01	SEAL, Stud (2 req'd) (part of item 1)
6	6105436Q01	LIGHTPIPE, LED
7	3205082E59	GASKET, O-Ring
8	0300138542	SCREW, Module, Ph Pan Hd; 2-56x3/8" (7 req'd)
9	0305381L02	SCREW, Top Panel; 2-32 (2 req'd)
10	RPX4693A	KIT, Antenna Bushing (includes item 12)
11	3205082E71	GASKET, O-Ring (part of item 13)
12	3205082E58	GASKET, O-Ring (part of item 10)
13	RPX4692A	KIT, Control Top Panel (includes item 11)
14	0400139731	LOCKWASHER, Internal Tooth
15	0205591R01	NUT, Antenna Bushing
16	0405781Q01	WASHER, Detent (even number of switch positions)
	or 0405781Q03	WASHER, Detent (odd number of switch positions)
17	NAC6060A	ANTENNA, MB Helical (68-84 MHz)
or	NAC6052A	ANTENNA, MB Helical (74-88 MHz)
18	RPX4699A	KIT, Frequency Knob
19	RPX4698A	KIT, On/Off/Volume Knob
20	1305622Q09	ESCUTCHEON, SECURENET, No Knob
	or 1305622Q07	ESCUTCHEON, SECURENET, Push-Only
	or 1305622Q03	ESCUTCHEON, SECURENET, Rotate-Only or Push-and-Rotate
21	0205916P01	NUT, Spanner (2 req'd)
22	3205082E61	GASKET, O-Ring (part of item 23)
23	RPX4691A	KIT, RF Connector (includes items 22,24)
24	4205852N01	CONTACT, Ground, RF (part of item 23)
25	NLC6370A	ASSEMBLY, MB Main PC Board
26	NTN4726A	ASSEMBLY, Back Shield (includes item 27)
27	0305706Q01	SCREW, Captive; 2-56 (4 req'd) (part of item 26)
28	4205577Q01	CLIP, Ground
29	1405387R01	BOOT, Oscillator, SABER II/III
30	RPX4700A	KIT, PTT/Controls Flex (includes item 31)
	or RPX4723A	KIT, PTT/Controls Flex Assembly (includes items 2,3,31)
31	RPX4694A	KIT, Contact Snapdome (S803, 805) (2 req'd) (part of item 30)
32	4505022P02	LEVER, PTT (part of item 43)
33	NTN4592A	BATTERY, 500 mAh
	or NTN4593A	BATTERY, 900 mAh
	or NTN4595A	BATTERY, 1500 mAh
	or NTN4540A	BATTERY, 3600 mAh Primary
	or NTN4537A	BATTERY, FM, 500 mAh
	or NTN4538A	BATTERY, FM, 900 mAh
	or NTN4596A	BATTERY, FM, 1500 mAh
34	0305706Q02	SCREW, Baseplate, Ph Pan Hd; 2-56x3/32" (4 req'd) (part of item 43)
35	3905453Q01	CONTACT, Power (4 req'd) (part of item 43)
36	4205437Q01	RETAINER, Baseplate (part of item 43)
37	RPX4696A	KIT, Slotted Spanner Nut (2 req'd) (part of item 43)
38	6405847N03	BASEPLATE (part of item 43)
39	3205701Q01	SEAL, Elastomer (part of item 43)
40	3205472M01	SEAL, Vacuum Port (part of item 43)
41	5505333Q01	LATCH, Battery (part of item 43)
42	4105775Q01	SPRING, Latch (part of item 43)
43	NHN6440A	ASSEMBLY, Housing, SABER II (includes items 32, 34 thru 42)
44	3305183R02	LABEL, Nameplate, SABER II
45	0105958M24	ASSEMBLY, Speaker/Microphone Flex, SABER II (8k Display)
	or 0105958M34	ASSEMBLY, Speaker/Microphone Flex, SABER II (2k Display)
46	1405490Q01	BOOT, Microphone
47	RPX4722A	ASSEMBLY, LCD/Speaker Bracket
48	RPX4703A	KIT, LCD Assembly (part of item 49)

49	8460999A71	ASSEMBLY, 8k Display PC Board, MB SABER II (includes item 48)
50	8405532Q01	FLEX CIRCUIT, LCD Interconnect
51	4205604Q01	RETAINER, Speaker
52	1405182M03	INSULATOR, Universal Connector
53	0705319R01	BRACKET, Switch
54	4005221R01	SWITCH, Dual-Function (S801, 804)
55	3205082E68	GASKET, O-Ring, Emergency
56	NTN5069A	KIT, Rotate-Only Knob (includes item 54)
	or NTN5068A	KIT, Push-and-Rotate Knob (optional) (includes item 54)
	or NTN5076A	KIT, Push-Only Knob (optional) (includes item 54)
	or 4305607S01	PLUG, Seal (optional)
57	NTN4788A	ASSEMBLY, Belt Clip
58	NTN5025A	Cover, Universal Connector

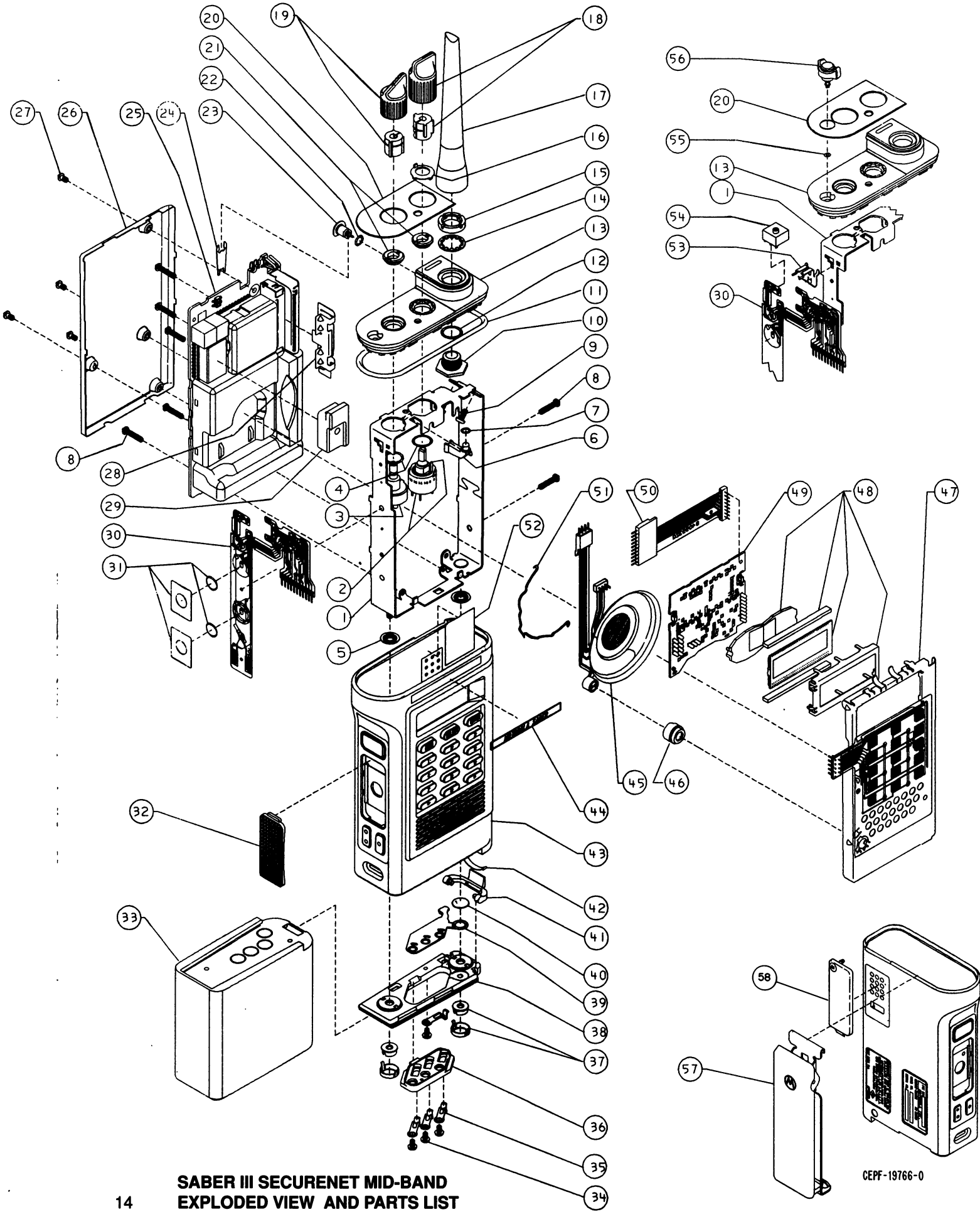


SABER III SECURENET Mid-Band
Exploded View Parts List

TPLF-3804-O

ITEM NO.	MOTOROLA PART NO.	DESCRIPTION
1	RPX4720A	ASSEMBLY, Frame Stud (includes item 5)
2	RPX4689A	KIT, Frequency Switch (S823) (includes item 4)
3	RPX4690A	KIT, On/Off Switch (S800)/Volume Control (R800)(includes item 4)
4	3205082E62	GASKET, O-Ring (2 req'd) (part of items 2 and 3)
5	3205422Q01	SEAL, Stud (2 req'd) (part of item 1)
6	6105436Q01	LIGHTPIPE, LED
7	3205082E59	GASKET, O-Ring
8	0300138542	SCREW, Module, Ph Pan Hd; 2-56x3/8" (7 req'd)
9	0305381L02	SCREW, Top Panel; 2-32 (2 req'd)
10	RPX4693A	KIT, Antenna Bushing (includes item 12)
11	3205082E71	GASKET, O-Ring (part of item 13)
12	3205082E58	GASKET, O-Ring (part of item 10)
13	RPX4692A	KIT, Control Top Panel (includes item 11)
14	0400139731	LOCKWASHER, Internal Tooth
15	0205591R01	NUT, Antenna Bushing
16	0405781Q01	WASHER, Detent (even number of switch positions)
	or 0405781Q03	WASHER, Detent (odd number of switch positions)
17	NAC6060A	ANTENNA, MB Helical (68-84 MHz)
	or NAC6052A	ANTENNA, MB Helical (74-88 MHz)
18	RPX4699A	KIT, Frequency Knob
19	RPX4698A	KIT, On/Off/Volume Knob
20	1305622Q09	ESCUTCHEON, SECURENET, No Knob
	or 1305622Q07	ESCUTCHEON, SECURENET, Push-Only
	or 1305622Q03	ESCUTCHEON, SECURENET, Rotate-Only or Push-and-Rotate
21	0205916P01	NUT, Spanner (2 req'd)
22	3205082E61	GASKET, O-Ring (part of item 23)
23	RPX4691A	KIT, RF Connector (includes items 22,24)
24	4205852N01	CONTACT, Ground, RF (part of item 23)
25	NLC6370A	ASSEMBLY, MB Main PC Board
26	NTN4726A	ASSEMBLY, Back Shield (includes item 27)
27	0305706Q01	SCREW, Captive; 2-56 (4 req'd) (part of item 26)
28	4205577Q01	CLIP, Ground
29	1405387R01	BOOT, Oscillator, SABER II/III
30	RPX4700A	KIT, PTT/Controls Flex (includes item 31)
	or RPX4723A	KIT, PTT/Controls Flex Assembly (includes items 2,3,31)
31	RPX4694A	KIT, Contact Snapdome (S803, 805) (2 req'd) (part of item 30)
32	4505022P02	LEVER, PTT (part of item 43)
33	NTN4592A	BATTERY, 500 mAh
	or NTN4593A	BATTERY, 900 mAh
	or NTN4595A	BATTERY, 1500 mAh
	or NTN4540A	BATTERY, 3600 mAh Primary
	or NTN4537A	BATTERY, FM, 500 mAh
	or NTN4538A	BATTERY, FM, 900 mAh
	or NTN4596A	BATTERY, FM, 1500mAh
34	0305706Q02	SCREW, Baseplate, Ph Pan Hd; 2-56x3/32" (4 req'd) (part of item 43)
35	3905453Q01	CONTACT, Power (4 req'd) (part of item 43)
36	4205437Q01	RETAINER, Baseplate (part of item 43)
37	RPX4696A	KIT, Slotted Spanner Nut (2 req'd) (part of item 43)
38	6405847N03	BASEPLATE (part of item 43)
39	3205701Q01	SEAL, Elastomer (part of item 43)
40	3205472M01	SEAL, Vacuum Port (part of item 43)
41	5505333Q01	LATCH, Battery (part of item 43)
42	4105775Q01	SPRING, Latch (part of item 43)
43	NHN6412A	ASSEMBLY, Housing, SABER III (includes items 32, 34 thru 42)
44	3305183R02	LABEL, Nameplate, SABER III
45	0105958M24	ASSEMBLY, Speaker/Microphone Flex, SABER III
46	1405490Q01	BOOT, Microphone
47	RPX4722A	ASSEMBLY, LCD/Speaker Bracket
48	RPX4703A	KIT, LCD Assembly (part of item 49)

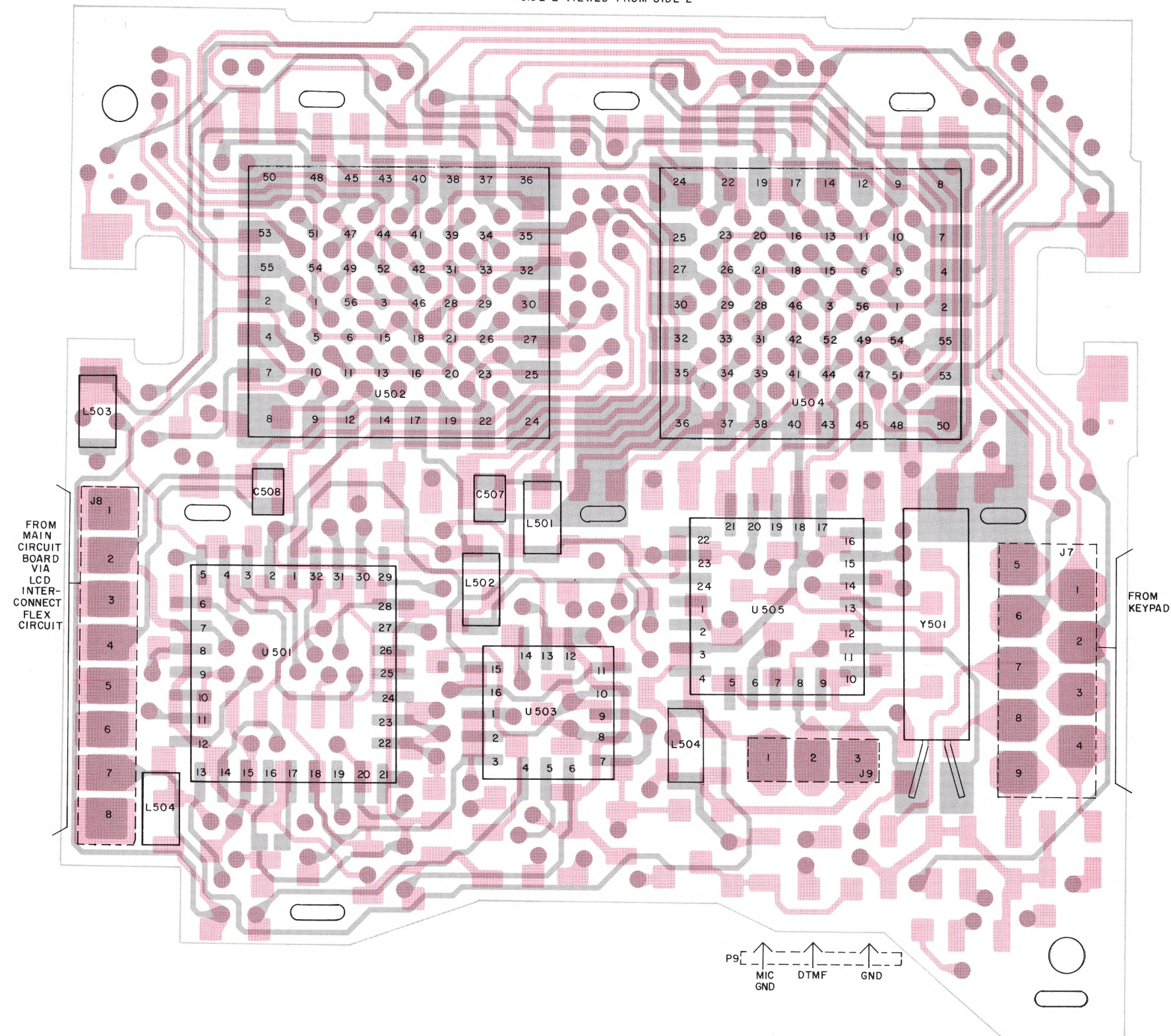
49	8460999A71	ASSEMBLY, Display PC Board, MB SABER III (includes item 48)
50	8405532Q01	FLEX CIRCUIT, LCD Interconnect
51	4205604Q01	RETAINER, Speaker
52	1405182M03	INSULATOR, Universal Connector
53	0705319R01	BRACKET, Switch
54	4005221R01	SWITCH, Dual-Function (S801, 804)
55	3205082E68	GASKET, O-Ring, Emergency
56	NTN5069A	KIT, Rotate-Only Knob (includes item 54)
	or NTN5068A	KIT, Push-and-Rotate Knob (optional) (includes item 54)
	or NTN5076A	KIT, Push-Only Knob (optional) (includes item 54)
57	or 4305607S01	PLUG, Seal (optional)
58	NTN4788A	ASSEMBLY, Belt Clip
	NTN5025A	Cover, Universal Connector



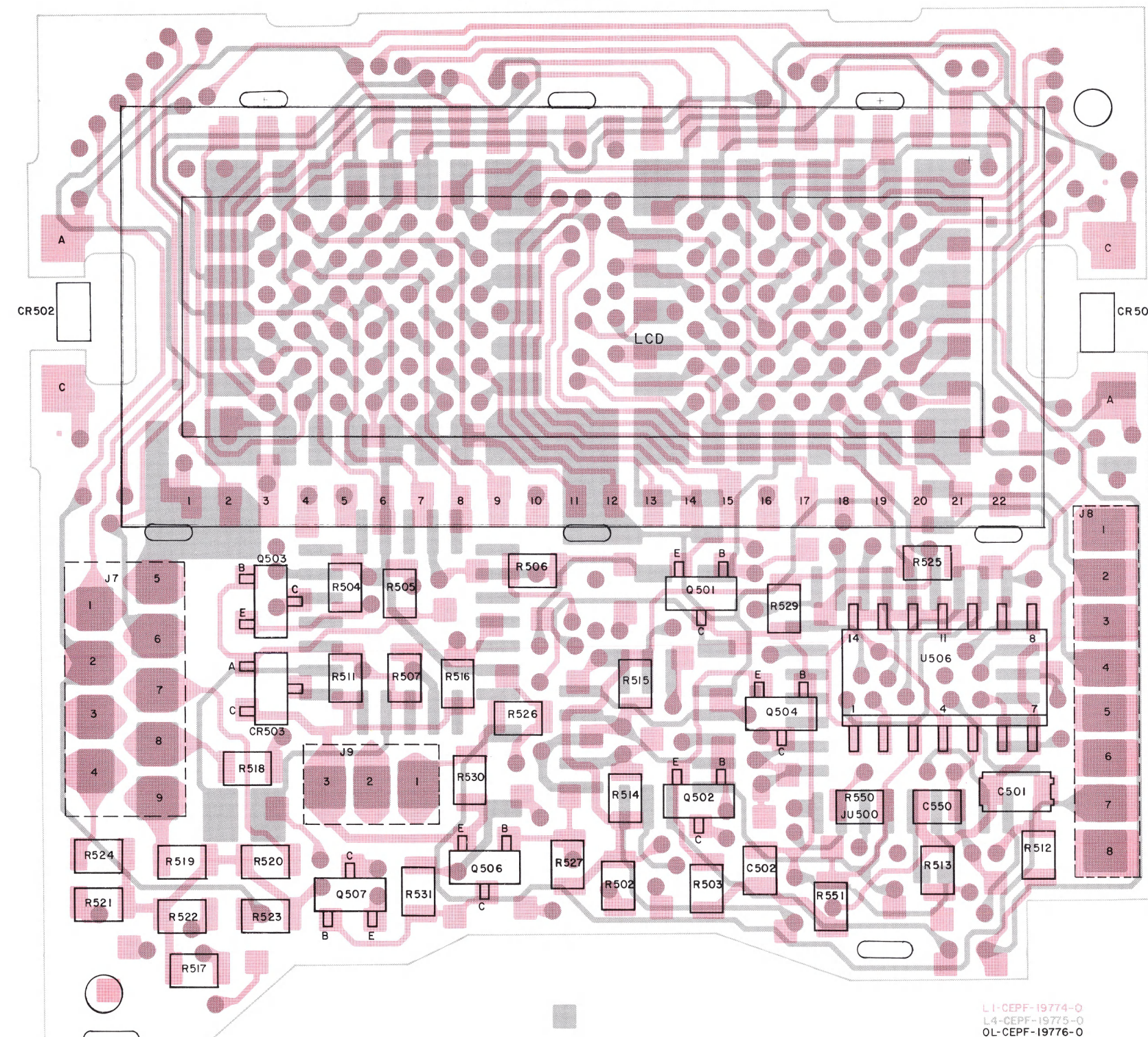
14 SABER III SECURENET MID-BAND
EXPLODED VIEW AND PARTS LIST

CEPF-19766-0

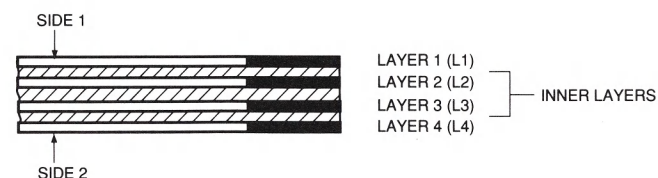
SIDE 2 VIEWED FROM SIDE 2

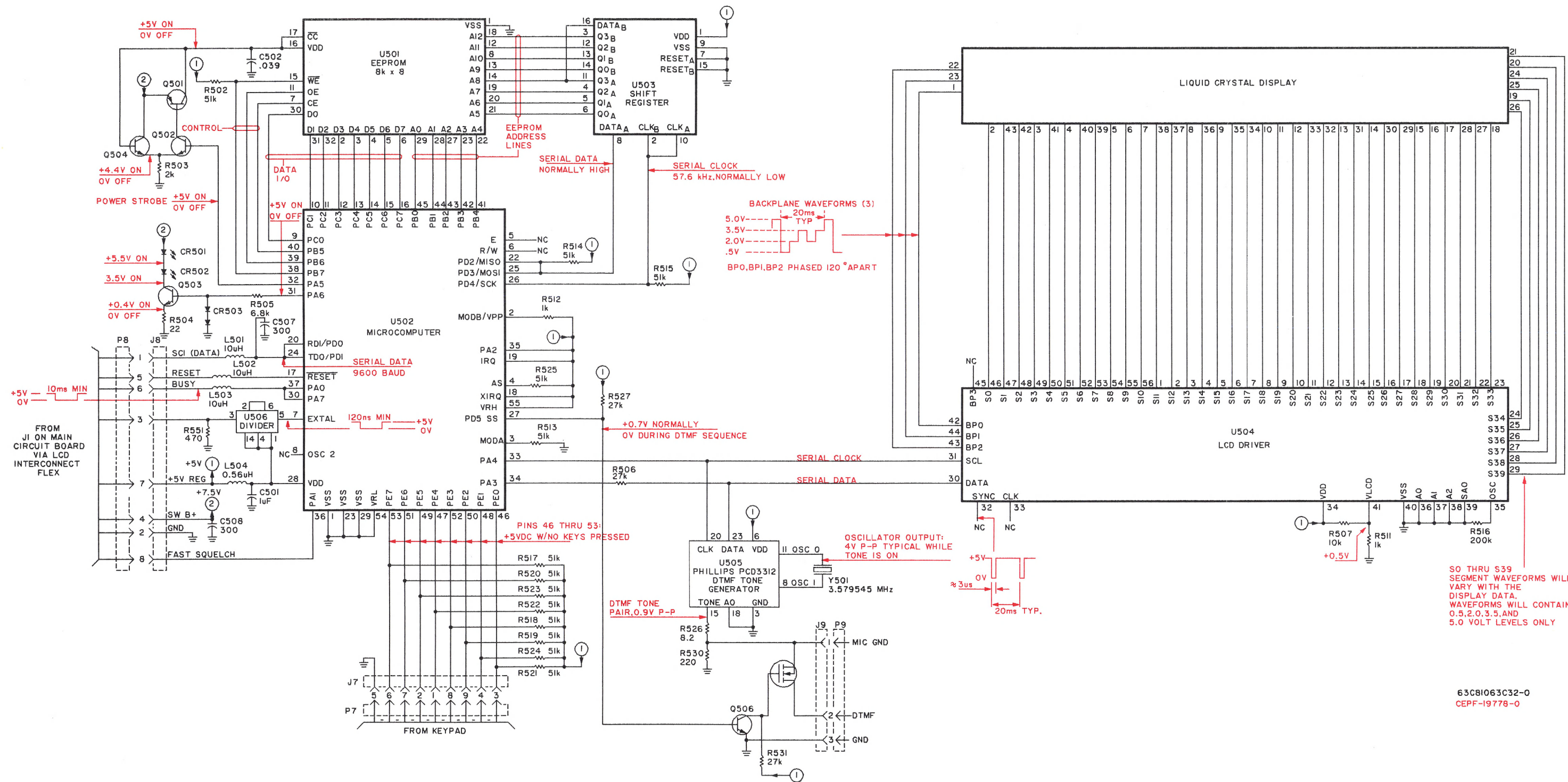


SIDE 1 VIEWED FROM SIDE 1



4-LAYER CIRCUIT BOARD COPPER DETAIL VIEWING
COPPER STEPS AT EDGE OF BOARD IN PROPER
LAYER SEQUENCE.





SCHEMATIC AND CIRCUIT NOTES

1. Unless otherwise stated, resistances are in ohms ($k = 1000$), capacitances less than 1 are in microfarads, and capacitances 1 or greater are in picofarads.

TEPF-17445-O

SABER Display Electrical Parts List

TPLF-3801-0

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C500	-----	CAPACITOR, Fixed: $pF \pm 5\%$; 50V unless stated Not Used
C501	2362998B59	$1\mu F \pm 10\%$; 20V
C502	2160521C32	$.039\mu F \pm 10\%$; 25V
C503 thru 506	-----	Not Used
C507, 508	2160520C12	300
CR500	-----	DIODE: See Note 1 Not Used
CR501, 502	4805729G27	LED, Yellow
CR503	4805129M06	Dual; SOT-23
J1 thru 6	-----	JACK: Not Used
J7	0905287C05	Socket, Printed Circuit (Keypad Switch)(9 req'd)
J8	0905287C05	Socket, Printed Circuit (LCD Interconnect)(8 req'd)
J9	0905287C05	Socket, Printed Circuit (Speaker/Mic)(3 req'd)
L500	-----	COIL, RF: unless stated Not Used
L501 thru 503	2462575A07	Choke, $10\mu H$
L504	2462575A09	Choke, $0.56\mu H$
Q500	-----	TRANSISTOR: See Note 1 Not Used
Q501	4805128M29	PNP; BCX18 (LH)
Q502 thru 504	4805128M12	NPN; BCW60B (RH)
Q505	-----	Not Used
Q506	4805128M12	NPN; BCW60B (RH)
Q507	4805218N11	SOT (RH); BST82
R500,501	-----	RESISTOR, Fixed: $\Omega \pm 5\%$; 1/8W unless stated Not Used
R502	0660076A90	51k
R503	0660076A56	2k
R504	0660076A09	22
R505	0660076A69	6.8k
R506	0660076A83	27k
R507	0660076A73	10k
R508 thru 510	-----	Not Used
R511, 512	0660076A49	1k
R513 thru 515	0660076A90	51k
R516	0660076F08	$200k \pm 1\%$
R517 thru 525	0660076A90	51k
R526	0660076A71	8.2k
R527	0660076A83	27k
R528,529	-----	Not Used
R530	0660076A33	220
R531	0660076A83	27k
R532 thru 550	-----	Not Used
R551	0660076A41	470
U500	-----	CIRCUIT MODULE: See Note 1 Not Used
U501	0105953N12	EEPROM; 8k x 8
U502	0105953N07	Microcomputer, HCMOS
U503	0105953N09	Shift Register, CMOS
U504	0105953N10	LCD Driver
U505	0105953N18	Tone Encoder
U506	5180177M01	D Flip-Flop
Y500	-----	CRYSTAL: Not Used
Y501	4805664G40	3.579545MHz

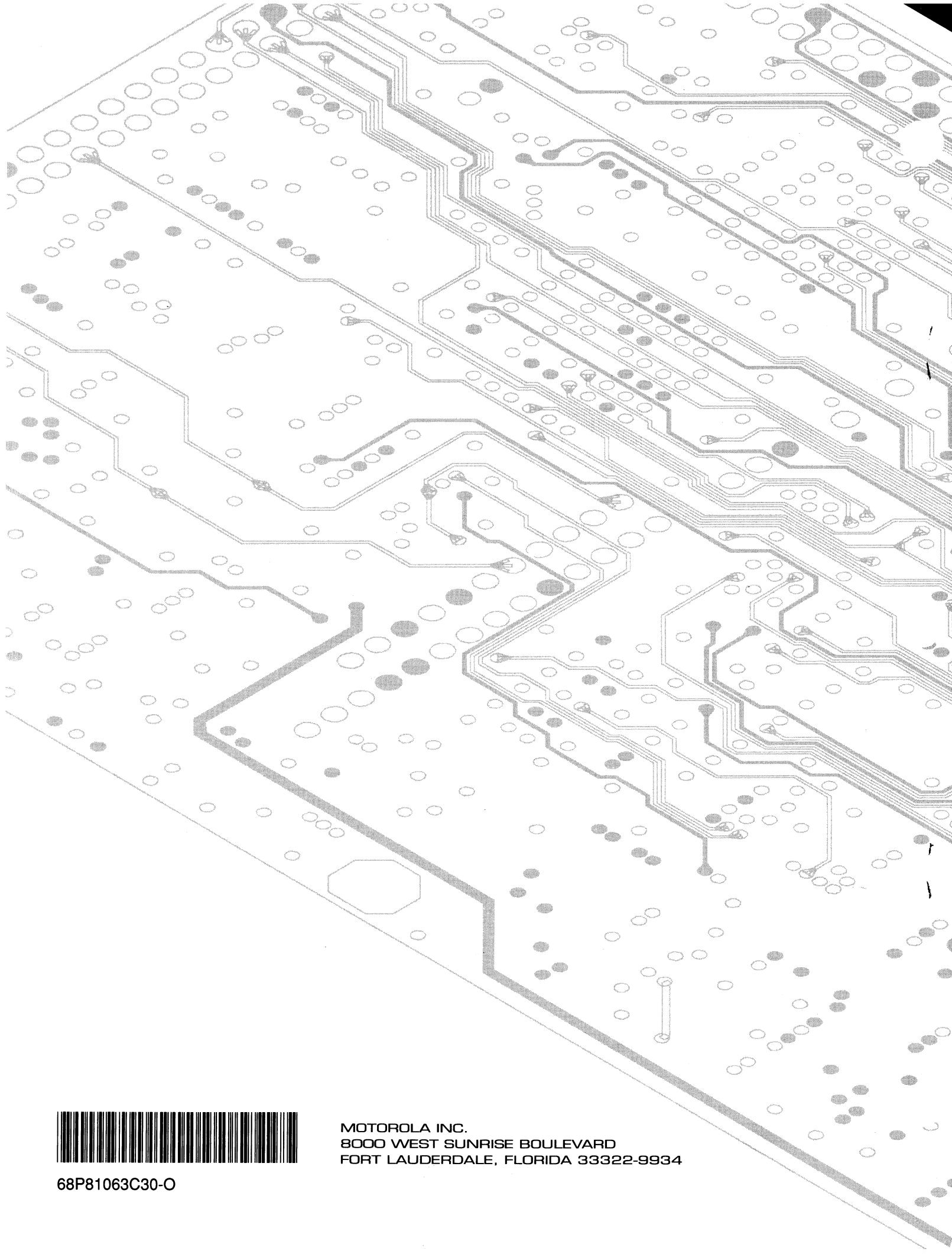
NONREFERENCED ITEMS

7505440S01	PAD, Display Board
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NOTES:

- For optimum performance, order replacement diodes, transistors, and circuit modules by Motorola part number only.

SABER 8K DISPLAY BOARD SCHEMATIC AND PARTS LIST



68P81063C30-O

MOTOROLA INC.
8000 WEST SUNRISE BOULEVARD
FORT LAUDERDALE, FLORIDA 33322-9934