MOTOROLA
Land Mobile Products Sector

MICOM-2E ALE
HF-SSB Transceiver

Land Mobile Products Sector
16 Kremenetski Street, Tel Aviv 67899

Service Manual

Printed in Israel, August, 1997

68P0252C55-O

MOTOROLA

MICOM-2E ALE
HF-SSB Transceiver

CONTENTS

Land Mobile Products Sector
1301 E. Algonquin Road, Schaumburg, IL 60196

68P02952C55-O

4. RADIO TUNING PROCEDURE

5. THEORY OF OPERATION

6. TROUBLESHOOTING

SCHEMATIC DIAGRAMS, LAYOUTS AND PARTS LISTS

Appendix A. CONTINUOUS DUTY TRAY (CDT)

PERFORMANCE SPECIFICATIONS for MICOM-2E ALE
Front Mount - MODEL M80AMN0KV5-K
Trunk Mount - MODEL M81AMN0KV5-K

GENERAL

Frequency Range		1.6 MHz Tx, 100 kHz-30 MHz Rx
Number of Channels		200: User programmable; Simplex or Half Duplex
Scanning		5 groups with up to 100 channels per group
Frequency Stability		0.6 PPM, 0.1 PPM optional
Frequency Drift (Aging)		1 PPM per year
Synthesizer Lock Time		10 msec max.
Frequency Resolution		10 Hz
Auto Bandwidths @ -6dB		Voice: 350 to 2700 Hz CW: 650 to 1150 Hz Low speed data: 1450 to 1950 Hz High speed data*: 350 to 3300 Hz
Operating Temperature Range		-30° to +60°C
Humidity		95% @ 50°C
Operating Voltage		13.8 V DC ±20% Neg. Ground
ALE		Per FED-STD 1045 and MIL-STD 188/141A
Current Drain @ 13.8 VDC		
Receive	Squelched	2.2A
	Full Audio	3A
Transmit	Voice	14A
	2 Tone	23A
	1 Tone	28A
Dimensions and Weights		
Front Mount	Height (mm/inch)	92/3.7
	Width (mm/inch)	302/11.9
	Depth (mm/inch)	270/10.7
	Weight (Kg/pounds)	5.7/12.5
Trunk Mount	Height (mm/inch)	92/3.7
	Width (mm/inch)	302/11.9
	Depth (mm/inch)	285/11.3
	Weight (Kg/pounds)	5.9/13
Trunk Mount		
Control Head	Height (mm/inch)	60/2.36
	Width (mm/inch)	187/7.36

* Optional, for authorized users only.

Depth (mm/inch)	70/2.75
Weight (Kg/pounds)	0.32/0.71

TRANSMITTER

Output Power	125W P.E.P. and average
Reduced Power Levels	25W, 62W, 100W (RSS programmable)
Audio Bandwidth Ripple	3 dB
Intermodulation	-31 dB/P.E.P (-35 dB/P.E.P Typical. Note 1)
Harmonic Emissions	-64 dB/P.E.P (-70 dB/P.E.P Typical. Note 1)
Spurious Emissions	-64 dB/P.E.P (-70 dB/P.E.P Typical. Note 1)
Carrier Suppression	-50 dB/P.E.P
Undesired Sideband Suppression	-55 dB/P.E.P
Audio Distortion	2.5%
1/2 Power Mic. Sensitivity	25 to 125 mV (RMS)/600 Ohms
Hum & Ripple	-50 dB
Inband Noise	-60 dB (30 Hz BW)
TX/RX Switching Time	10 msec
Tx Tuning Adjustments	None

RECEIVER

Sensitivity (SINAD) SSB (Voice)	0.5 µV for 10 dB SINAD (0.35 µV Typical. Note 1) 0.1 - 1.6 MHz reduced performance
1/2 Rated Power Sensitivity	1 µV for 2.5W audio @ speaker
Selectivity	-6 dB @ 350 to 2700 Hz -60 dB @ -1 kHz; +4 kHz
Image	-80 dB
IF	-85 dB
Undesired Sideband	-55 dB @ -1 kHz
Spurious	-80 dB
Intermodulation	-80 dB
Cross Modulation	-100 dB @ 100 kHz
Desensitization	-100 dB @ 100 kHz
Reciprocal Mixing	-100 dB @ 100 kHz
Audio Power @ Speaker	5W @ 2.5% distortion
RGC Range	5 µV 1V (2 dB change in output level)
RGC Time Constants	
Voice	Attack time 10 msec Release time 1500 msec
Data	

	Attack time 10 msec Release time 10 msec
Squelch	Constant SINAD (digital)
Clarifier Range	±200 Hz in 10 Hz steps
Receiver Tuning Adjustments	None
Preselector Sections	Sub-octave (1.6 MHz to 30 MHz range)
Maximum Antenna Input	20 kV maximum transient, 100V RMS for 2 minutes

MILITARY & INDUSTRIAL STANDARDS

Vibration	US MIL-STD 810C	Method 514.2
	US MIL-STD 810D	514.3
	US MIL-STD 810E	514.4
Shock	US MIL-STD 810C	Method 516.2
	US MIL-STD 810D	516.3
	US MIL-STD 810E	516.4
Rain	US MIL-STD 810C	Method 506.1
	US MIL-STD 810D	506.2
	US MIL-STD 810E	506.3
Dust	US MIL-STD 810C	Method 510.1
	US MIL-STD 810D	510.2
	US MIL-STD 810E	510.3
Salt Fog	US MIL-STD 810C	Method 509.1
	US MIL-STD 810D	509.2
	US MIL-STD 810E	509.3

FCC INFORMATION

Emissions	J3E, R3E, H3E, J2A, J2B
FCC Applicable Parts of Rules	15, 18, 90
FCC Type Acceptance Number	ABZ9QCC1635
With High Stability Option	ABZ9QCC1634

The MICOM-2E ALE also meets the EIA-RS152B for shock, vibration and applicable test procedures, US FCC and Canadian DOC for channel occupancy, spurious, interference and frequency tolerance. It is manufactured according to the demanding standards of ISO 9000 and EMC (Electromagnetic Compatibility).

Note 1: Values noted as "Typical" are valid over 90% or more of the frequency range.

Specifications subject to change without notice

MICOM-2E ALE MODEL COMPLEMENTS
Front Mount - MODEL M80AMN0KV5-K

FKN4345A	DC Cable
FLN2416A	Low RF Assembly
FHN5781A	Low RF Hardware
FRN5869A	Low RF Enhance Board
FLN2417A	Control Head Assembly
FHN5879A	Control Head Hardware
FLN8693A	Control Head Board
FLN2226B	High Power Assembly
FHN5768A	High Power Hardware
FRN5767B	High Power Board
FMN1615A	Microphone MICOM-2
68P02952C60	MICOM-2E ALE Owner's Manual

OPERATING OPTIONS

S86AD	Add:	Radio Service Software (RSS) for radio programming via PC
G157AA	Add:	ALE software programming via PC
S135AD	Enhanced:	Digital Noise Blanker (recommended for mobile and fixed installations)
G478AB	Enhanced:	High frequency stability option
S809AH	Enhanced:	Interface cable kit for CW key & Headphones (Note 1)
S04AD	Delete:	Delete LSB operation
G158AA	Delete	Delete ALE operation

MOBILE STATION ACCESSORIES

F2265	Automatic Antenna Tuner 1.6-30 MHz, lightweight, compact housing, includes 17 foot (5.2 m) cable and instruction manual
FLN2272	Mobile Mounting Kit (for model M80AMN0KV5-K only)
FSN1600	External Speaker Assembly (for model M80AMN0KV5-K only)

SPARE BOARDS KITS

FEN1657A	Recommended spare boards kit (for model M80AMN0KV5-K)
FEN1658A	Recommended spare boards kit (for model M81AMN0KV5-K)

SERVICE MANUALS

M80AMN0KV5-K or M81AMN0KV5-K	68P02952C55

FIXED STATION OPERATING OPTIONS (Note 2)

S71AF	Delete:	Delete palm microphone
G156AB	Add:	1 Kwatt amplifier interface cable kit radio to 1 Kwatt amplifier unit (Note 1)
G561AB	Add:	Interlink interface cable kit
S987AM	Add:	HF data modem interface cable kit, radio to modem (Note 1)
S308AH	Add:	Phone patch interface cable kit, radio to phone patch (Note 1)
G100AB	Add:	High speed HF data/fax modem interface cable kit, radio to modem (Note 1)
S947AH	Add:	Computer interface - RS232 for radio control only. Radio to computer cable kit, software package, and instruction manual are included. (Note 1)

FIXED STATION ACCESSORIES

FMN1614	Desk microphone
FLN2271	Junction box for connecting up to 4 accessories in addition to CW key and Headphones. (Note 1)
FLN2294	Package kit for continuous duty Data transmission. Includes FLN2271 junction box

FIELD RETROFIT KITS

FLN2515A	Interface Cable kit for CW key & Headphones (Same as S809) (Note 1)
FLN2517A	Interface cable kit for Phone patch unit (same as S308) (Note 1)
FLN2519A	Interface cable kit for High speed HF data/fax modem (Same as G100) (Note 1)
FLN2518A	Interface cable kit for HF data modem (Same as S987) (Note 1)
FLN2516A	Computer interface-RS232 (Same as S947) (Note 1)
FLN2514A	RSS - Radio service software kit (programming via PC) (Same as S86)
FLN2527A	ALE - Software programming via PC (Same as G157)
FLN2520A	Interface cable kit for 1 Kwatt amplifier (same as G156) (Note 1)
FLN2530A	Interface cable kit for Interlink (same as G561) (Note 1)

Note 1: The MICOM-2E ALE includes one accessory port for connecting one accessory device (Phone patch, Deskset, HF data modems, 1 KW amplifier, Computer, CW key & Headphones). If the simultaneous connection of two or more (up to 4 plus CW key & headphones) devices to the accessory port is required, order FLN2271 junction box or FLN2294.

Note 2: For Fixed Station Operation, order S71 (delete palm microphone), FMN1614 desk microphone, and F2369 AC power supply/charger.

MICOM-2E ALE MODEL COMPLEMENTS
Trunk Mount - MODEL M81AMN0KV5-K

FKN4345A	DC Cable
FLN2418A	Control Head Unit
FHN5880A	Control Head Hardware
FLN8695A	Control Head Enhanced Board
HLN6615A	Remote Trunion Mount
FLN2416A	Low RF Assembly
FHN5781A	Low RF Hardware
FRN5869A	Low RF Enhance Board
FLN2419A	Radio Blank Panel
FHN5881A	Blank Panel Hardware
FRN5885A	Interconnection Board
FLN2272A	Mobile Mounting
FLN2502A	High Power Assembly
FRN5767B	High Power Board
FHN5947A	High Power Hardware
HKN6098A	Control Cable
FSN1600A	External Speaker Assembly
FMN1615A	Microphone MICOM-2
68P02952C60	MICOM-2E ALE Owner's Manual

SYSTEM ACCESSORIES

MISCELLANEOUS ACCESSORIES

TRN6273	Headphones
TRN6271	Manual CW key

PHONE PATCH

FDN6065	Phone patch (Note 1)
FDN6066	Phone patch with DTMF control for unattended operation (Note 1)

Note 1: A standard Telephone Set is required for operation with the FDN6065 and FDN6066 Phone Patch. Interface cable option (S308) is required for operation with MICOM-2E ALE.

HF DATA MODEMS

FDN6098	HF data modem
FDN6100	High speed HF data modem
FDN6101	Fax-over-HF upgrade kit for use with FDN6100 High speed modem

MICOM 1000
1 KW Solid State Linear Amplifier

F2340	1000 Watts P.E.P./Average Continuous duty 1.6-30 MHz linear amplifier

AC POWER SUPPLIES

F2369	AC power supply/charger with automatic AC to DC changeover. Uses battery cable supplied with radio. Field programmable for 120 VAC. Wired for 220 VAC.

INTERLINK SSB-FM REPEATER UNIT

F2338	INTERLINK unit

ANTENNA SYSTEM

LONG WIRE ANTENNA
An antenna tuner is required

TAA6030	Long Wire Antenna for use with antenna tuners.

ANTENNAS
BROADBAND ANTENNAS

FAA5510	Broadband Dipole Antenna 300W voice, 150W RTTY, 2-30 MHz
FAA5511	Broadband Dipole Antenna 300W voice, 150W RTTY, 3-30 MHz
FAA5509	Broadband Dipole Antenna 2 KW voice, 1 KW RTTY, 3-30 MHz
FAA5512	Broadband Dipole Antenna 2 KW voice, 1 KW RTTY, 2-30 MHz
FAA5501	Broadband Folded Dipole Antenna 1KW Voice, 1.8-30 MHz
FAA5508	Inverted-V Broadband Antenna 1KW Voice, 400 W RTTY, 2.5-30 MHz

RF CABLES

FKN4613	100 feet (30 meters)
FKN4615	200 feet (60 meters)

MISCELLANEOUS ANTENNA SYSTEM ACCESSORIES

TRN6295	Antenna Ground Plane
TRN6296	Installation kit for dipole and long wire antennas.

MULTIPLE CHANNEL WHIP ANTENNA

For use with Autotuners only

TAA1000	Whip antenna, 8 ft. (2.4 m) stainless steel, spring base, universal flat surface body mount (not recommended for frequencies below 5 MHz)
FAD1400	Whip antenna, 12 ft. (3.5 m) fiberglass, mounting hardware, and 12 ft. nylon cord

RELATED PUBLICATIONS AVAILABLE SEPARATELY

The following documents offer additional information:

68P02952C60	*MICOM-2E ALE HF-SSB Transceiver, Owner's manual*
68P02953C05	*MICOM-2E HF-SSB Transceiver, Radio Service Software, User's Guide*

MOTOROLA

1. INTRODUCTION

1.1 NOTATIONAL CONVENTIONS

Throughout the text in this publication, you will notice the use of warnings, cautions and notes. These notations are used to emphasize that safety hazards exist, and care must be taken and observed.


Warning

The Warning symbol denotes a hazard. It calls attention to a procedure or practice that could result in personal injury if not performed correctly.


Caution

The Caution symbol denotes a hazard. It calls attention to a procedure or practice that could result in damage to or destruction of part or all of the product if not performed correctly.

NOTE

An operational procedure, practice, or condition, etc., which is essential to emphasize.

1.2 SCOPE OF THIS MANUAL

This manual includes model/kit information, specifications, disassembly/reassembly procedures, alignment, troubleshooting, and all theory, schematic diagrams, printed circuit board details and parts lists for all parts in the equipment described.


Caution

This manual is intended for use by experienced technicians who are familiar with similar types of equipment.

1.3 SAFETY STANDARDS

1.3.1 EXPOSURE TO RADIO FREQUENCY ENERGY

In August 1996, the Federal Communications Commission (FCC) adopted updated RF energy exposure guidelines for wireless products regulated by the FCC. Those guidelines are consistent with the safety standards* previously set by both U.S. and international standards bodies. The design of your Motorola two-way radio complies with the FCC guidelines and these standards.

* American National Standards Institute (C95.1 - 1992);
* National Council on Radiation Protection and Measurements (NCRP-1986);
* International Commission on Non-Ionizing Radiation Protection (ICNRP- 1986)

To assure optimal radio performance and to insure that exposure to RF energy is within the guidelines in the above standards, properly install antennas externally on the vehicle, following recommended installation procedures.

Transmit only when people inside or outside the vehicle are 1 to 3 feet away from the properly installed, externally mounted antenna; distance guidelines for the different power levels are summarized in the table below:

Rated power of vehicle-mounted radio	Distance of people from transmitting antenna
15 Watts or less	1 Foot
16 to 50 Watts	2 Feet
More than 50 Watts	3 Feet

1.3.2 POTENTIALLY EXPLOSIVE ATMOSPHERES


Warning

Turn your radio OFF when in any area with a potentially explosive atmosphere, unless it is a type especially qualified for such use (for example, FMRC Approved). Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

Areas with potentially explosive atmospheres are often, but not always, clearly marked. They include fueling areas such as below deck on boats, fuel or chemical transfer or storage facilities; areas where the air contains chemicals or particles, such as grain, dust, or metal powders; and any other area where you would normally be advised to turn off your vehicle engine.

1.3.3 BLASTING CAPS AND AREAS


Warning

To avoid possible interference with blasting operations, turn your radio OFF near electrical blasting caps or in a "blasting area" or in areas posted: "Turn off two-way radio". Obey all signs and instructions.

1.3.4 INSTALLATION SAFETY WARNING

Consider the occupants' safety when you choose a location for the radio. Do not mount the radio overhead or on a side wall unless you take special precautions.

If someone were to remove the radio and does not replace it properly, then a road block could bump the radio loose and the falling radio, could in some circumstances, cause serious injury to the driver or a passenger. In a crash, even when properly installed, the radio could break loose and become a dangerous projectile.

If you have to mount the radio overhead or on a sidewall, give it the added protection of a retaining strap.

1.3.5 OPERATIONAL SAFETY WARNING


Warning

For vehicles equipped with a electronic anti-skid systems, see "ANTI-SKID BRAKING PRECAUTIONS" publications, Motorola No. 68P81109E34.


Warning

It is mandatory that radio installation in vehicles fueled by liquefied petroleum gas conform to the following standard:

National Fire Protection Association standard NFPA 58 applies to radio installations in vehicles fueled by liquefied petroleum (LP) gas with LP gas container in the trunk or other sealed-off space within the interior of the vehicles. The standard requires that:

1. Any space containing radio equipment shall be isolated by a seal from the space in which the LP-gas container and its fittings are located.
2. Remote (outside) fitting connections shall be used.
3. The container space shall be vented to the outside.

When planning the installation of the radio in a vehicle with one or more air bags:


Caution

VEHICLES EQUIPPED WITH AIR BAGS

An air bag inflates with great force. DO NOT place objects, including communication equipment, in the area over the air bag or in the air bag deployment area. If the communication equipment is improperly installed and the air bag inflates, this could cause serious injury.

Installation of the MICOM-2E ALE radio should be performed by a professional installer/technician qualified in the requirements for such installations. An air bag's size, shape and deployment area can vary by vehicle make, model and front compartment configuration (e.g., bench seat vs. bucket seat).

Contact the vehicle manufacturer's corporate headquarters, if necessary, for specific air bag information for the vehicle make, model and front compartment configuration involved in your communication equipment installation.

1.3.6 RESTRICTIONS

Because this radio contains a transmitter, federal law prohibits unauthorized, non-licensed personnel from adjusting or maintaining it. If any operational difficulties should arise while using this product, report them to authorized service personnel as soon as possible.


Warning

Do not attempt any unauthorized modification to the radio.

1.4 SAFE HANDLING OF CMOS DEVICES

Complementary metal-oxide semiconductor (CMOS) devices are used in this family of radios. While the attributes of CMOS are many, their characteristics make them susceptible to damage by electrostatic or high voltage charges. Damage can be latent, resulting in failures occurring weeks or months later. Therefore, special precautions must be taken to prevent device damage during dis-

assembly, troubleshooting, and repair. Handling precautions are mandatory for CMOS circuits and are especially important in low humidity conditions.


Caution

Do not attempt to disassemble the radio without observing the following handling precautions.

1. Eliminate static generators (plastics, Styrofoam, etc. in the work area.

2. Remove nylon or double-knit polyester jackets, roll up long sleeves, and remove or tie back loose hanging neckties.

3. Store and transport all static-sensitive devices in ESD-protective containers.

4. If at all possible, handle CMOS devices by the package and not by the leads. Prior to touching the unit, touch an electrical ground to remove any static charge that you may have accumulated. The package and substrate may be electrically common. If so, the reaction of a discharge to the case would cause the same dame as touching the leads.

5. Disconnect all power from the unit before ESD-sensitive components are removed or inserted unless otherwise noted.

6. Use a static safeguarded workstation, which can be accomplished through the use of an anti-static kit (Motorola part number 0180386A82). This kit includes a writ strap, two ground cords, a static-control table mat and a static-control floor mat. For additional information, refer to Service and Repair Note SRN F1052, "Static Control Equipment for Servicing ESD Sensitive Products", available form Motorola Literature Distribution 2290 Hammond Drive Schaumburg, IL 60173 (708) 576-2826.

   When these items are not readily available, observing the following techniques will minimize chance of damage.

   - If a static-sensitive device is to be temporarily set down, use a conductive surface for placement of the device.
   - Make skin contact with a conductive work surface first and maintain this contact when the device is set down or picked up.

7. Always wear a conductive strip when servicing this equipment. The Motorola part number for a replacement wrist strap that connects to the table mat is 42-80385A58.

8. When straightening CMOS pins, provide ground straps for apparatus used.

9. When soldering, use a grounded soldering iron.

2. TEST EQUIPMENT & SPARE PARTS

2.1 TEST EQUIPMENT

The list in Table 1 includes all standard test equipment required for servicing the MICOM-2E ALE radios.

Table 1. Test Equipment

Model No.	Description	Comments
HP 8568B	Spectrum Analyzer	
HP 8904A	Multi-function Synthesizer	
HP 5316B	Frequency counter	Connected to 0.01 PPM external time base
TEKTRONICS 2252	Oscilloscope	
HP 8903A	Audio Analyzer	
HP 438A	Power Meter	
IBM 486 or higher (or compatible)	Personal Computer	4 Mbytes RAM or more VGA, Super VGA or XGA graphics card

2.2 SPARE PARTS

The lists in Table 2 includes all recommended spare part kits and components.

Table 2. Spare Parts

Motorola Kit/Part Number	Description
FRN5869 (for standard 0.6 PPM frequency stability radio)	Low RF and Digital (LORD) board
FRN5767	High Power board
0102701K52	Harmonic filter module
4808115L07	Pin diode
2409646B25	Coil 100 µHy
4808020K01	Final stage transistor (x2)
4808020K02	Driver transistor (x2)
FRN4345	DC cable
6500020986	Fuse 30A
6500086099	Fuse 7.5A
0102701K51	Flat cable (from control head to LORD board)
0102700K23	Flat cable (from High-Power to LORD board)
0102700K22	Internal coax
0102703K64	Battery assembly
FMN1615	Microphone
Front Mount - MODEL M80AMN0KV5-K	
FLN2417	Control Head
1580596K01	Front panel
7202421H15	LCD glass
7580600K02	Keypad
3608147K01	Volume knob, interior
3605422W02	Volume knob, exterior
5008351Y01	Speaker
3280603K01	Gasket, speaker
0102702K61	Cable, speaker
3204071P02	Gasket, panel
6180602K01	Lens, LCD
FLN8695	Control Head board
2802101U01	Zebra connector for LCD
2802102U01	Zebra connector for LCD

Trunk Mount - MODEL M81AMN0KV5-K	
3005825X01	Remote cable
3286211C01	Gasket, remote panel
FLN2418	Control Head
1580597K01	Front panel
1505702Z01	Back panel
HLN6615	Trunnion
7202421H15	LCD Glass
7580600K02	Keypad
3608147K01	Volume knob, interior
3605422W02	Volume knob, exterior
3286212C01	Gasket, board to panel
6180602K01	Lens, LCD
FLN8695	Control head board
2802101U01	Zebra connector for LCD
2802102U01	Zebra connector for LCD
FRN5885	Interface board
0102705K85	Ground cable
0102701K51	Flat cable

3.1 MICOM-2E ALE FRONT MOUNT DISASSEMBLY

NOTE

The numbers in parentheses refer to the sub-assembly or component number in the exploded view drawings at the end of this manual.

3.1.1 REMOVING THE CONTROL HEAD

1. Insert a small flat blade screw driver, or similar, in the slotted area on the right hand-side panel of the radio.

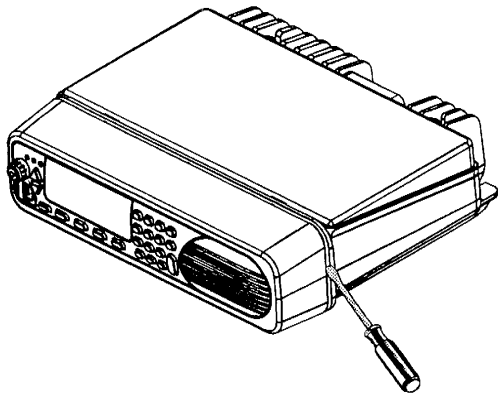


Figure 1. Control Head Removal

1. Press until the side of the control head releases.
2. Gently pull the control head away from the main board.
3. Remove the flat cable from the socket on the radio side.

3.1.2 REMOVING THE COVER (8)

See MICOM-2E ALE Front Mount, exploded view.

1. Remove the 2 screws (15) securing the cover (8) to the chassis (1).
2. Lift the cover over the chassis.
3. Remove the 2 RF coax cables (16) and the 40 pin flat cable (3) from the cover side.

3.1.3 REMOVING THE LOW RF ENHANCE BOARD (13)

See MICOM-2E ALE Front Mount, exploded view.

1. Release the 6 screws (14) of the RF shield (12).
2. Remove the RF shield (12) and upper contacts (11) by gently prying up each corner of the shield.

3.1.4 REMOVING THE HIGH POWER BOARD (4)

See MICOM-2E ALE Front Mount, exploded view.

1. Remove the PA shield (7).
2. Unplug the antenna connector from the PCB.
3. Remove the screws (5) securing the High Power board to the radio chassis.
4. Remove the screws (6) securing the power transistors and the final transformers.
5. Remove the 4 screws securing the 4 regulators.
6. Carefully remove the High Power board (4) by rotating it out of the chassis.

3.1.5 CONTROL HEAD DISASSEMBLY

See Front Mount Control Head, exploded view.

1. Release 3 screws (7) from the PCB and unplug the speaker connector.
2. To pull out the printed circuit board from the control head housing, insert a small blade screw driver in the side groove near the eight protruding tabs. Remove the board together with the keypad (16) and the PCB holder (15), from the control head housing.

3. Remove the keypad from the PCB assembly.
4. Gently bend the 4 snaps to release the PCB holder from the PCB assembly.
5. Remove the 4 screws (7) securing the speaker (6) and its gasket (5).

3.2 MICOM-2E ALE FRONT MOUNT ASSEMBLY

3.2.1 CONTROL HEAD ASSEMBLY

See Front Mount Control Head, exploded view.

1. Place the speaker gasket (5) on the front panel (1) with the rubber side towards the panel wall.
2. Position the speaker (6) on its gasket, and secure it with 4 screws (7) and washers (2). The speaker terminals must be close to the panel center.
3. Combine the volume knob two components (3a) and (3b).
4. Insert the volume knob into the knob opening located on the front panel. Ensure the knob fits and that you are able to rotate it counter-clockwise until it comes to an end.
5. Position the LCD (9) onto the LCD bezel (8). Remove the LCD protective liner.
6. Place the reflector sheet (10) on the frame (11). Remove the reflector sheet protective liner.
7. Position the reflector sheet and frame on the LCD.
8. Insert the elastomeric connectors (12), (13) into the LCD frame, on both sides of the LCD.
9. Insert the LCD bezel on the PCB intended slots, and lock it by bending the locking fingers on the board. The bezel lower side must be next to the PCB edge.


Caution

Bend the locking fingers in the gold pads direction, otherwise the PCB runners may be damaged.

10. Place the PCB holder (15) on the PCB (14), making sure the positioning pins are against the corresponding PCB holes, and secure it with the 4 snaps.
11. Position the keypad (16) on the PCB.
12. Rotate the volume knob to OFF position.
13. Place the PCB assembly on the panel and secure it with the 8 snaps.


Caution

Be careful not to exert pressure on the crystal or any other components.

14. Secure the PCB with 3 screws (7).
15. Remove the protective paper from the backside of the lens.

3.2.2 HIGH POWER BOARD ASSEMBLY

See MICOM-2E ALE Front Mount, exploded view.

1. Ensure the regulator insulators are located on the chassis.
2. Inspect and if necessary, reapply thermal grease to the heatsinking pads on the chassis.
3. Replace the PA insulator (2) on the High Power board.
4. Connect the 40 pin flat cable (3) to the High Power board connector and replace the board on the chassis.
5. Insert the 40 pin flat cable through the opening towards the Control Head.
6. Position the High Power board correctly on the chassis (the 3 pin connector faces its recess in the chassis).
7. Install the power transistor screws (6).
8. Install the regulator screws.


Caution

Make sure the regulators are covered by plastic insulators.

9. Install the transformer screws (5).
10. Install the board screws (5).
11. Insert the antenna connector and plug to the PCB.
12. Replace the PA shield (7).

3.2.3 LORD BOARD ASSEMBLY

See MICOM-2E ALE Front Mount, exploded view.

1. Make sure the cover (8) including the gasket (9) and shield (10) are well positioned.
2. Position the RF shield contacts (11) on the RF shield (12).
3. Replace the PCB (13) with the 25 pin connector facing its recess in the low RF chassis.
4. Place the RF shield on the PCB and secure it with the 6 screws (14).

3.2.4 FRONT MOUNT ASSEMBLY

See MICOM-2E ALE Front Mount, exploded view.

1. Replace the cover (8) on the chassis (1) and secure it with 2 screws (15).
2. Connect the 2 RF coax cables (16), the 24 pin flat cable (17) and the 40 pin flat cable (3) (see Figure 10).
3. Place the front panel gasket (18) on the chassis (1) and insert the 24 pin flat cable and the ground wire through the opening in the gasket.

NOTE Make sure the front panel gasket is lubricated with NYE FLUOROCARBON 865.

4. Position the gasket correctly around the chassis.
5. Lock the 24 pin connector and the ground wire.
6. Gently press the Control Head onto the radio chassis until the protruding taps on the chassis snap into the recesses inside the control housing.

3.3 MICOM-2E ALE TRUNK MOUNT DISASSEMBLY

NOTES

The MICOM-2E ALE Trunk Mount disassembly procedure is similar to the MICOM-2E ALE Front Mount disassembly, except for the following procedures.

The numbers in parentheses refer to the subassembly or component number in the exploded view drawings at the end of this manual.

3.3.1 REMOVING THE CONTROL HEAD

See MICOM-2E ALE Trunk Mount exploded view.

- Release the 4 screws (20) of the front panel (19).

3.3.2 INTERCONNECTION BOARD DISASSEMBLY

See MICOM-2E ALE Trunk Mount Blank Panel, exploded view.

1. Release the 4 screws (4) of the PCB and remove the Interconnect board (2).
2. Disconnect the grounding wire plug.

3.3.3 CONTROL HEAD DISASSEMBLY

See MICOM-2E ALE Trunk Mount Control Head, exploded view.

1. Unplug the Control cable from the back panel (15).
2. Insert a small flat blade screw driver, or similar, in the side locks and press until one side of the back panel is released. Release the other side too and remove the back panel.
3. Insert the screw driver, or similar, in the side grooving, near the eight protruding tabs of the PCB holder (11). Bend these tabs to release the PCB assembly.
4. Remove the keypad.
5. Bend the 4 snaps securing the PCB to the PCB holder, and release the holder.

3.4 MICOM-2E ALE TRUNK MOUNT ASSEMBLY

3.4.1 CONTROL HEAD ASSEMBLY

See Trunk Mount Control Head, exploded view.

1. Combine the volume knob two components (3a) and (3b).
2. Insert the volume knob (9) into the knob opening located on the front panel (1). Ensure the knob fits and that you are able to rotate it counter-clockwise until it comes to an end.
3. Position the LCD (5) onto the LCD bezel (4). Remove the LCD protective liner.
4. Place the reflector sheet (6) on the frame (7). Remove the reflector frame protective liner.
5. Position the reflector sheet and frame on the LCD.
6. Insert the elastomeric connectors (8), (9) into the LCD frame on both sides of the LCD.
7. Insert the LCD bezel on the PCB intended slots, and lock it by bending the locking fingers on the board. The bezel lower side must be next to the PCB edge.


Caution

Bend the locking fingers in the gold pads direction, otherwise the PCB runners may be damaged.

8. Place the PCB holder (11) on the PCB (10), making sure the positioning pins are against the corresponding PCB holes, and secure it with the 4 snaps.
9. Position the keypad (12) on the PCB.
10. Rotate the volume knob to OFF position.
11. Place the PCB assembly on the panel and secure it with the 8 snaps.


Caution

Be careful not to exert pressure on the crystal or any other components.

12. Remove the protective paper from the backside of the lens.
13. Insert the gasket (13) into the panel groove with the polished side towards the panel (15).
14. Place the PCB spacer (14) in the back panel.
15. Assemble the back panel with the front panel. Ensure that the back panel side locks are fastened properly.

The High-Power and LORD boards assembly is identical to the Front Mount model.

4. RADIO TUNING PROCEDURE

4.1 GENERAL

Following service, three calibration procedures are required:

- Transmitter calibration
- Power calibration
- Oscillator calibration

The transmitter calibration is hand-operated, while the power and oscillator calibration are performed via the RSS.

An IBM PC (personal computer) and RSS (Radio Service Software) package, FLN2514, are required to align the radio. Refer to the MICOM-2E RSS manual, Motorola publication number 68P02953C05, for installation and setup procedures for the software.

4.2 TRANSMITTER CALIBRATION

1. Completely rotate clockwise potentiometers R299 (driver bias) and R298 (output bias), on the High-Power board.
2. Ensure that the High-Power board heatsink temperature is 25±5°C and that no audio input is present.
3. Measure Q34 or Q35 transistors base voltage. Adjust R298 until the measured base voltage 0.63±0.01V.
4. Measure Q31 or Q32 drivers base voltage. Adjust 299 until the measured base voltage is 0.76±0.01V.

4.3 POWER CALIBRATION

Perform the power calibration according to the Power Calibration procedure in the MICOM-2E RSS manual.

4.4 OSCILLATOR CALIBRATION

Perform the oscillator calibration according to the Power Calibration procedure in the MICOM-2E RSS manual.

5. THEORY OF OPERATION

5.1 INTRODUCTION

See Figure 4, MICOM-2E ALE Front/Trunk Mount Block Diagram.

This section provides a functional description of the MICOM-2E ALE radio, presented as follows:

- Transmitter
- Receiver
- Synthesizer
- Electronic boards.

5.2 THE TRANSMITTER

Incoming audio signal is fed directly to the DSP processor U6005 after amplification and filtration. The DSP algorithm is translating the incoming audio signal to a stream of I and Q bits (Inphase and Quadrature). This I,Q representation of the audio signal is transferred to the Digital SSB modulator U6000 where a digital quadrature mixing is performed. The digital signal is then transferred to Sigma-Delta D/A which converts the digital signal to an analog form. The result is the "classic" IF SSB signal with a suppressed carrier at 1.05 MHz and "natural" suppression of the unwanted sideband. Since the quadrature mixing is performed digitally, there are no amplitude and phase inaccuracies which may degrade the unwanted carrier and unwanted sideband suppression. The only limiting factor is the performances of the Hilbert transform, performed by the DSP. Since this performance is controllable, the algorithm is designed to achieve unwanted sideband attenuation of at least 60 dB.

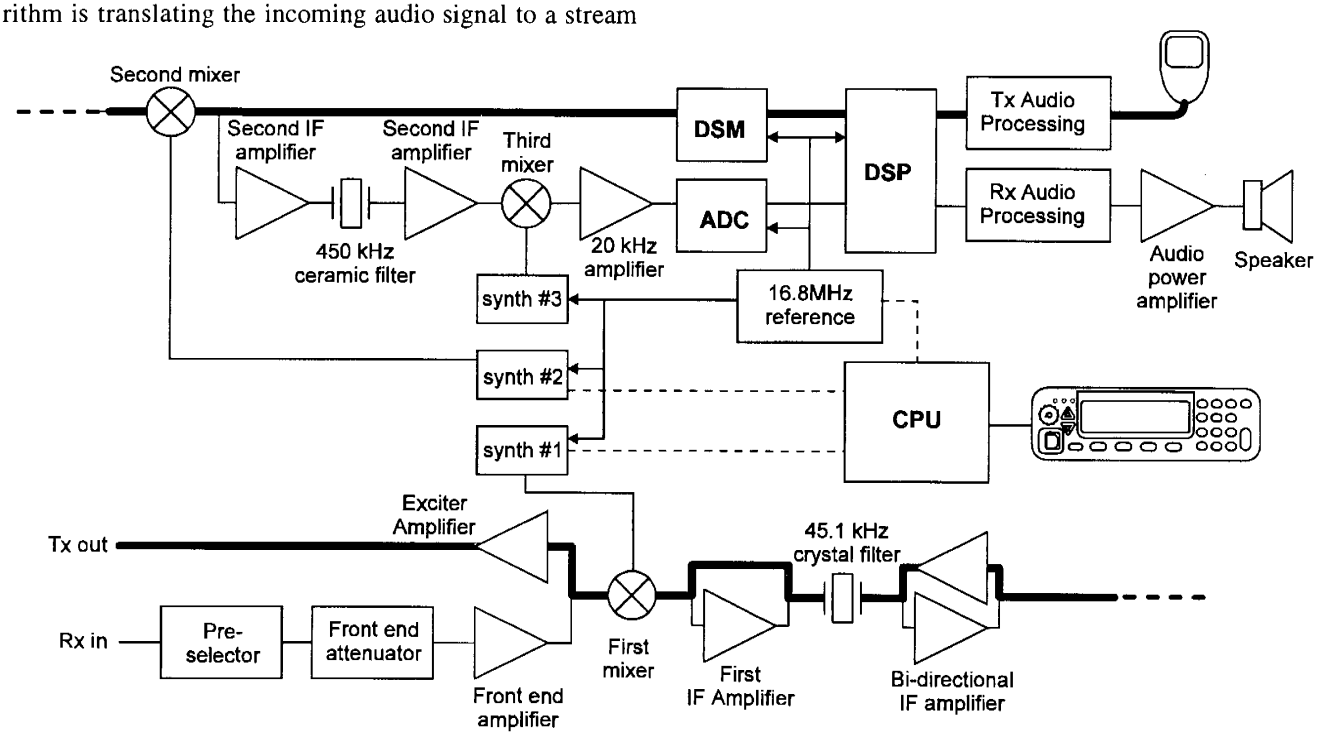


Figure 2. Signal Flow through the Transmitter (LORD Board)

The 1.05 MHz IF signal is converted to 45.1 MHz IF signal at mixer U1108 and then amplified by Q1006. The crystal filter stage cuts out unwanted mixing products and suppresses spurious signals. This unit consists of crystal units FL1 and FL2, centered at 45.1 MHz.

At the last conversion stage of the transmission path, realized by mixer U1000, the signal is converted to the final transmission frequency.

The transmission signal is then amplified by the exciter stage Q1004, Q1005 and then transferred to the High-Power board, where it first passes the ALC attenuator Q39 and is amplified by the pre-driver amplifier, which consists of Q2-Q6.

The Power stage consists of two transistor pairs acting as two cascaded push-pull stages the driver stage (Q32 and Q33) is connected to the final stage (Q34 and Q35) via transformer T5. The output of the power amplifier is transferred to a 50 Ohm impedance by transformer T3.

Maximum output power is 125W PEP (Peak Envelope Power) and average at transmission duty cycle of 1 to 4. Output power can be preprogrammed to one of 4 possible levels: 25W, 50W, 62.5W and 125W. Accurate sensors and the radio software keep the output power within the nominal output power ±7.5%.

The transmitter includes thermal protections. If, for any reason, the transmitter internal temperature exceeds the maximum permitted temperature, the output power is automatically reduced to avoid any fault due to excessive heat.

Mismatch protection is also included. If VSWR (Voltage Standing Wave Ratio) is worse than 2:1, the output power is proportionally reduced to avoid damaging the transmitter.

Seven different multi-section elliptical low-pass filters are inserted between the transmitter's final output stage and the antenna to reject spurious and harmonic frequencies. The seven filters cover seven frequency ranges and are automatically switched by PIN diode switches into the circuit according to the channel selection. The frequency range of each of these filters are: 1.6 to 2.43 MHz, 2.43 to 3.7 MHz, 3.7 to 5.6 MHz, 5.6 to 8.5 MHz, 8.5 to 13 MHz, 13 to 19.8 MHz and 19.8 to 30 MHz.

The radio consists of a closed loop automatic level control (ALC) which keeps the output power within the limits of 125±10 Watts.

The automatic gain control loop begins at the output of the harmonic filter near the antenna output where the output power is sampled (see T6 and its peripheral components in High Power board schematics). A voltage proportional to the output power is fed back to the power amplifier unit and enters a comparison amplifier U6 which compares the sample of the output level with the level determined by the power adjustment word kept in the radio memory and translated to an analog level by D/A U1104 on the LORD board. (For every frequency range, the radio keeps the appropriate power level word. The output of the comparison amplifier is fed to RF attenuator composed of CR54, CR56. Thus attenuator regulates the input power to the RF amplifier, keeping the output level constant.

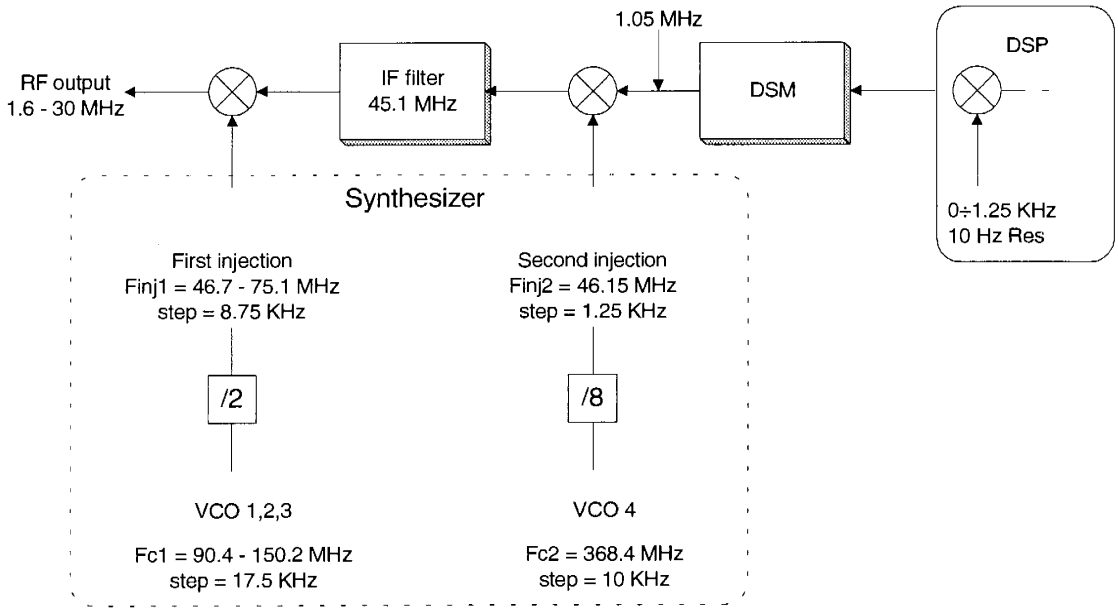


Figure 3. Transmit Path Frequency Conversion Scheme

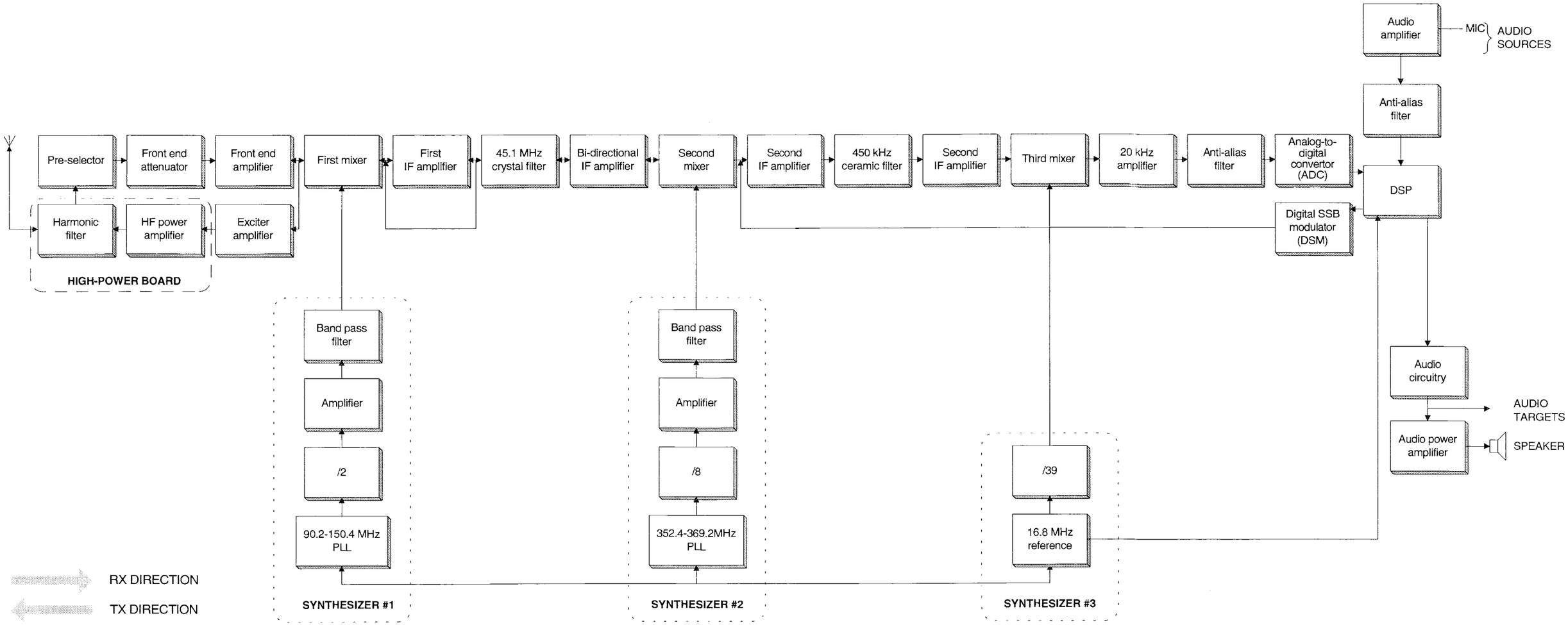


Figure 4. MICOM-2E ALE Front/Trunk Mount Block Diagram

5.3 THE RECEIVER

The receiver chain functions as an SSB demodulator for the HF band. It is based on a triple conversion scheme, which converts a specific 2.7 kHz band of the received spectrum to the input of an ADC (Analog to Digital Converter), centered at 20 kHz.

The conversion chain is based on analog circuitry that was designed to withstand out-of band interference as specified in the manual. The frequency resolution of both the injections is limited to 1.25 kHz, which is insufficient to provide the specified 10 Hz resolution. Therefore, the analog section of the conversion chain provide a coarse tuning only.

After being digitized by the ADC, the received signal is being frequency shifted to the exact frequency by a digital algorithm in the DSP. This fine tuning process complements the course tuning that was performed by the analog section of the receiver. After being fine tuned, the signal is SSB demodulated and filtered according to the radio specifications. The distribution of the overall frequency resolution between the DSP stage (fine tuning) and the analog stages (course tuning) is common to the receive and the transmit chain !

The RGC (Receiver automatic Gain Control) is an impotent segment of the receiver. It is based on analog attenuation stages, distributed along the analog part of the receiver chain, and a digital algorithm within the DSP. The analog attenuation stages are a step-attenuator type. Each stage provides 0 dB attenuation or, when activated, a predefined attenuation. Therefore, the analog section of the receiver can provide only a coarse gain control. The DSP controls the activation of these step-attenuators stages, while adding a smooth continuous gain control by mathematical division after fine tuning and filtering. The overall performance of the RGC provides a 100 dB coverage, starting from -90 dBm .

The DSP processed signal is converted to an analog form, and is amplified to levels up to 5W.

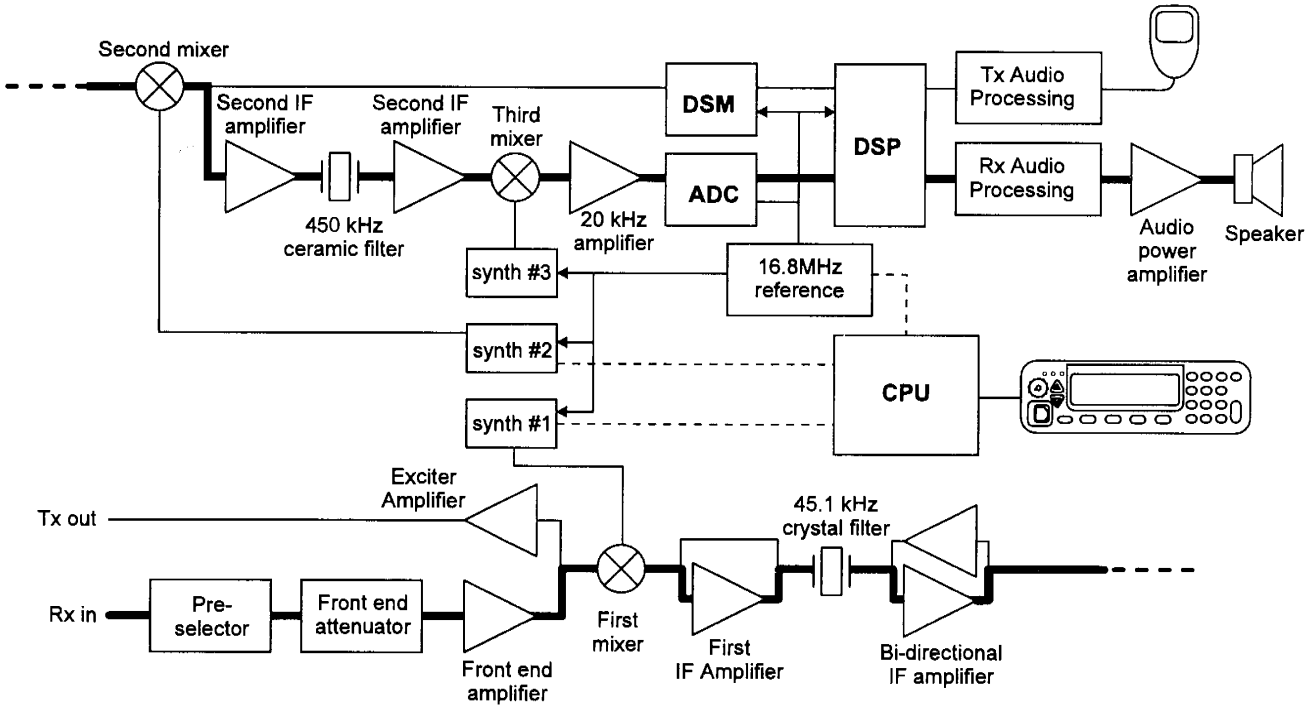


Figure 5. Signal Flow through the Receiver

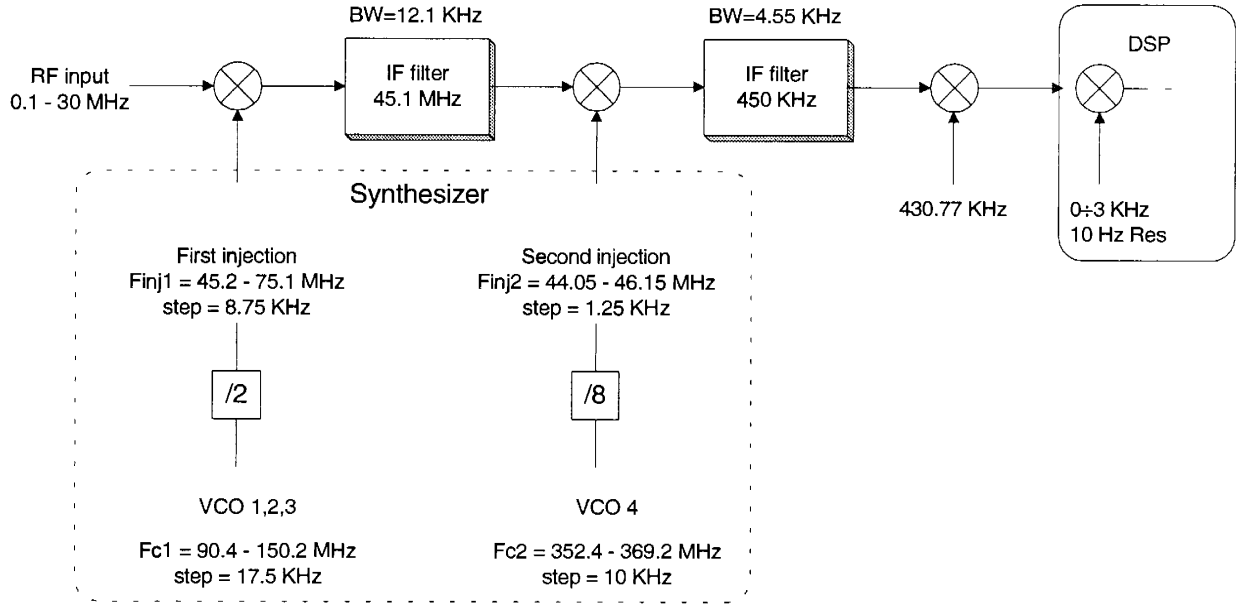


Figure 6. Receive Path Frequency Conversion Scheme

5.4 THE SYNTHESIZER

The synthesizer is designed according the MICOM-2E ALE frequency plan, described in Figure 7.

The conversion principles are as follows:

- In the receive path, the frequency conversion in the analog section is triple; a fourth frequency conversion is done digitally.
- The receive path bandwidth is 10 kHz; determined by a ceramic filter at a 450 kHz frequency.
- In the transmit path, the frequency conversion in the analog section is double; a third frequency conversion is done digitally.
- In the analog part, the conversion resolution is 1.25 kHz only.

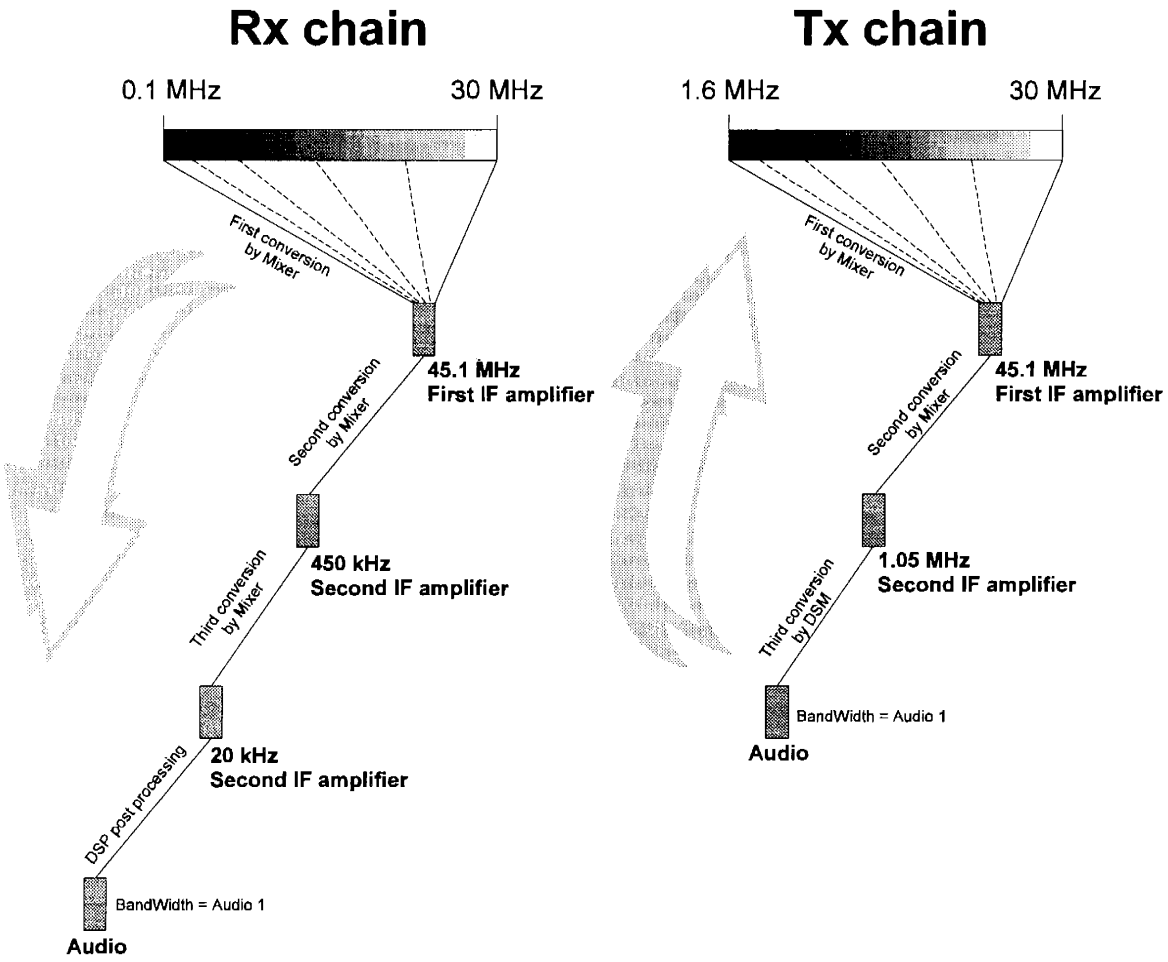


Figure 7. Bandwidths and Frequency Plan Diagram

The synthesizer provides two injections to the transmission and reception paths. The first injection covering 45.2-75.1 MHz is produced by a PLL (Phase locked Loop) IC. To enable wideband covering while maintaining low noise performance, the 45.2-75.1 MHz loop engages three VCOs (U2011, U2012 , U2013) in three sub ranges. The second injection is also a PLL IC covering the 44 - 46 MHz range with one VCO (Voltage Controlled Oscillator).

At both loops the VCOs frequencies are higher than the output frequencies. The first injection employs a division by two (U2002) and the second injection employs a division by eight (U2003). The frequency division decreases spurious level without degrading the lock-in time of the PLL. Frequency division improves frequency resolution, too. Thus, the first injection provides a 8.75 kHz resolution and the second injection provides a 1.25 kHz resolution.

Both loops are derived from a single reference oscillator at 16.8 MHz. As a result, the overall radio's stability and accuracy are determined by the accuracy and stability of this single reference oscillator.

The reference oscillator is a 0.6 PPM DTCXO. An optional 0.1 PPM OCXO can be embedded, for enhanced operation. The OCXO is a hybrid add-on that is thermally isolated. It contains a 16.8 MHz crystal oscillator. The temperature of the oscillator is controlled to 85°C, using a heat dissipating power transistor and a thermistor to monitor the temperature that provides a feedback to a temperature controller circuitry on board.

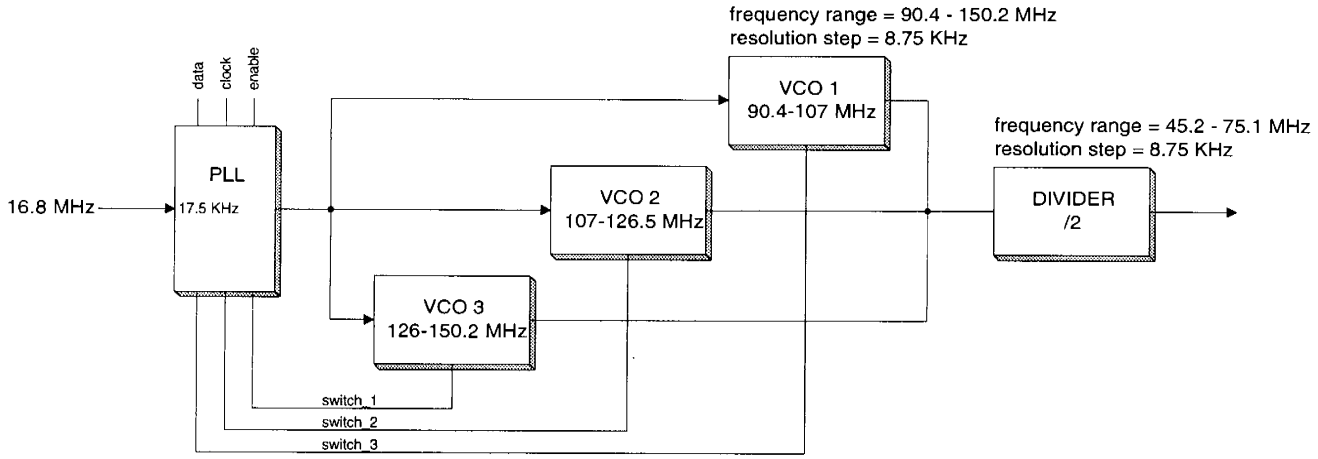


Figure 8. First Injection Block Diagram

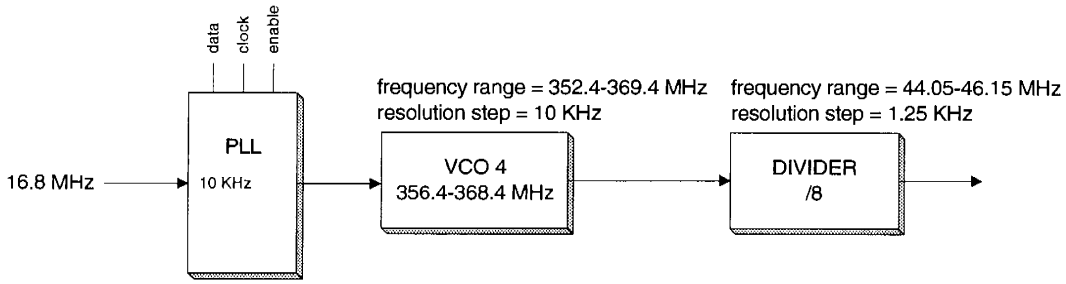


Figure 9. Second Injection Block Diagram

5.5 ELECTRONIC BOARDS

The circuitry of the basic MICOM-2E ALE radio is composed of three functional boards, as follows:

- Low RF and Digital (LORD) board
- High-Power board
- Control Head board

The following illustrations and table indicate the connections and the sub-circuits in the radio system and their specific functions:

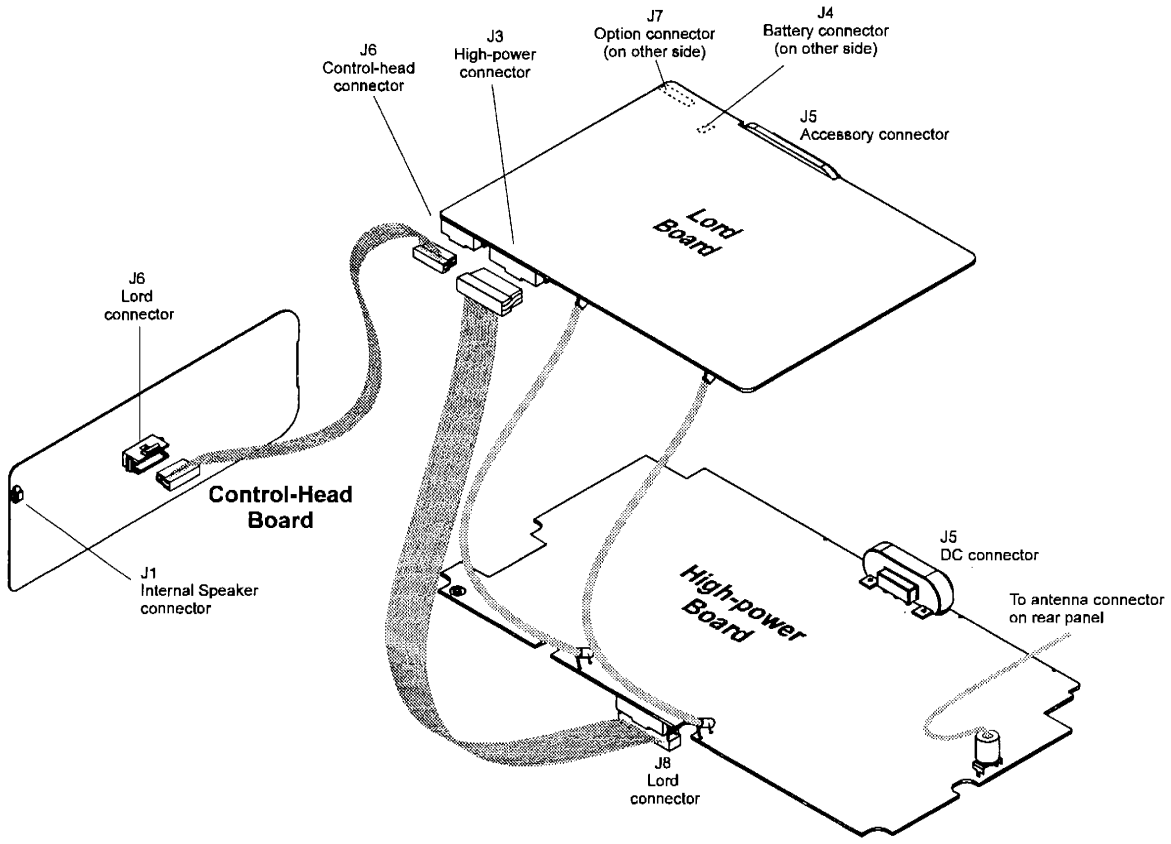


Figure 10. MICOM-2E ALE Front Mount, Connection Diagram

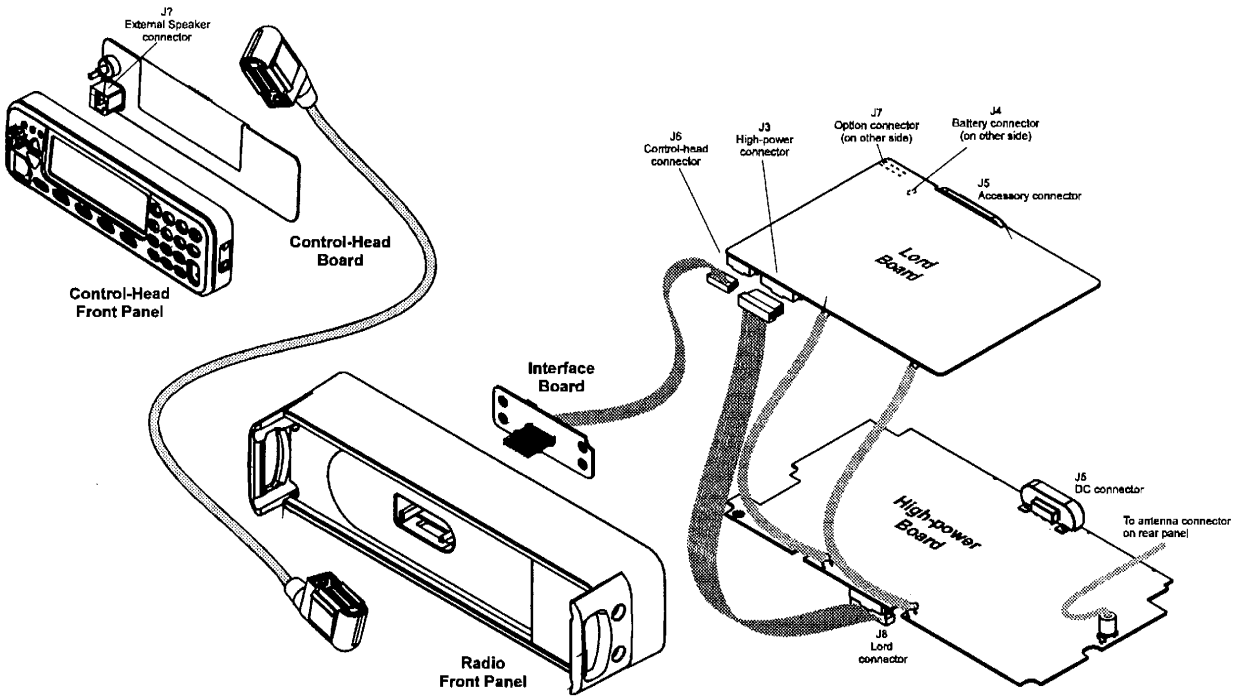


Figure 11. MICOM-2E ALE Trunk Mount, Connection Diagram

Table 3. MICOM-2E ALE Sub-Circuits Function Allocation

Function	High-Power board	LORD board	Control board
Tx/Rx voltage supply	x		
Receive path	x	x	
Excitation		x	
Amplification and HF	x		
DSP		x	
CPU		x	
Audio processing		x	
Loudspeaker and volume			x
Keyboard			x
Activation			x
Interfacing		x	
Frequency referencing		x	
Temperature control	x	x	
Transmit power control	x	x	
Digital voltage supply	x		
Main voltage switching	x		

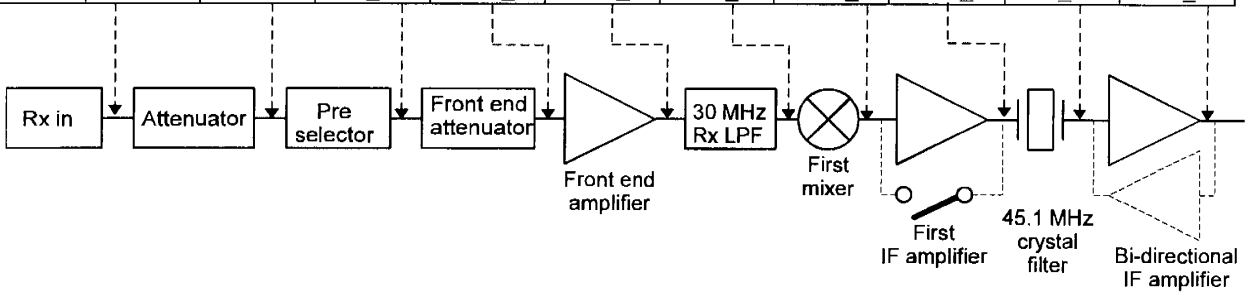
5.5.1 LORD BOARD

The MICOM-2E ALE block diagram describes, with a few exceptions, the LORD board functional structure. The specific block properties and typical signal level and frequency are illustrated in Figure 12.

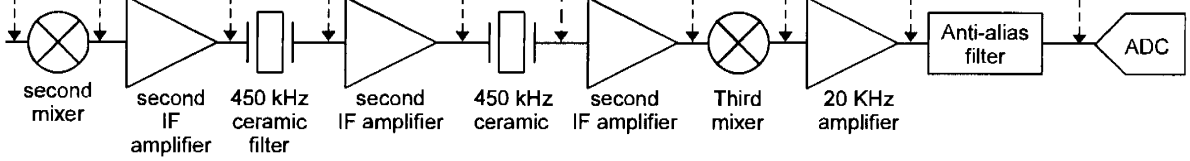
These signals can be measured with the spectrum analyzer, by probing the test points detailed in this figure. An allocation map of all the mentioned test points is illustrated in Figure 13.

NOTE: Provided a -95 dBm signal power is injected.

Gain (dB)	-3	-2.5	0	13	10	-6	12	-4	15	-
P(dBm)	-95	-98	-100	-100	-86	-98	-104	-88±4	-97	-82
F(MHz)	Fin	Fin	Fin	Fin	Fin	Fin	45.1	45.1	45.1	45.1
Name	*1	*2	PS_out	AMP_1	AMP_2	MIX_1	AMP_4	AMP_3	xtal_out	IF2_3



Gain (dB)	-6	22	-1.5	8	-1.5	13	0	28	0	-
P(dBm)	-82	-88	-66	-67.5	-59.5	-61	-48	-48	-20	-20
F(MHz)	45.1	0.45	0.45	0.45	0.45	0.45	0.45	0.02	0.02	0.02
Name	IF2_3	IF3_1	IF3_2	IF3_3	IF3_4	IF3_5	IF3_6	AF_2	AF_3	ADC_in



Gain (dB)	-6	15	-4	0	-6	-6	25	-6	
P(dBm)	-25	-31	-15±4	-21	-27	-33	-6	-6	-12
F(MHz)	1.05	45.1	45.1	45.1	45.1	Fout	Fout	Fout	Fout
Name	DSM_n	IF2_3	xtal_out	AMP_3	AMP_4	MIX_1	ex_amp _lpf	*3	ex_amp_out

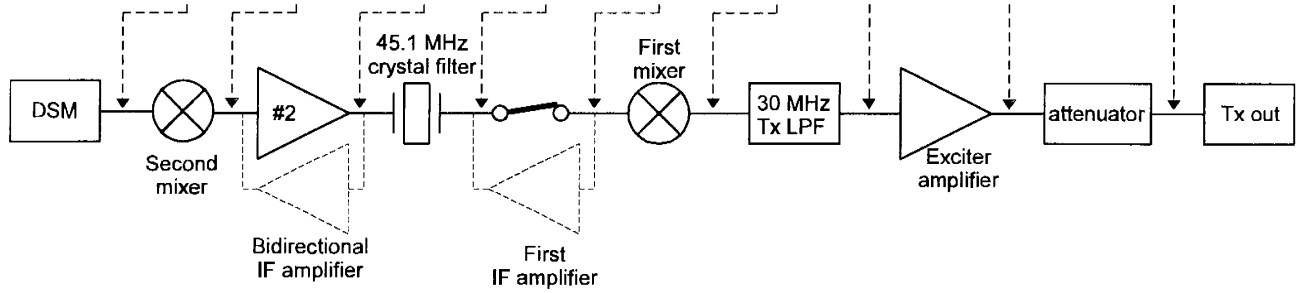


Figure 12. Receive and Transmit Chain Gains

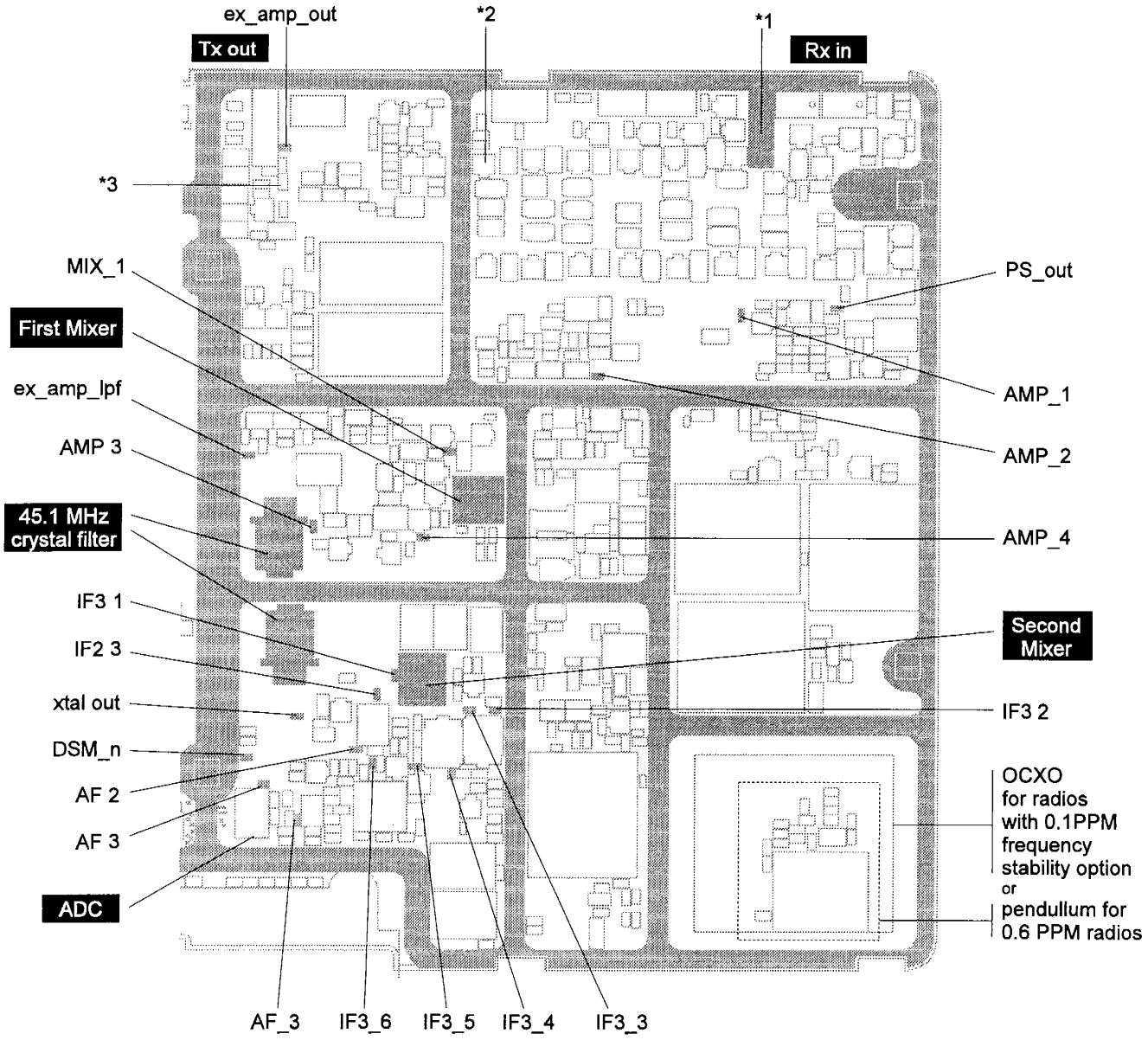


Figure 13. Test Points Allocation Map

5.5.2 HIGH-POWER BOARD

See Figure 14.

The High-Power board comprises the Power Amplifier and the Harmonic Filter circuits.

5.5.2.1 Power Amplifier (PA)

The PA contains the following three RF 1.6 - 30 MHz wide band amplification stages:

- Pre-driver (Q2 - Q6)
- Push-pull driver (Q32, Q33)
- Final push-pull power stage (Q35, Q34)

The PA also includes a control circuit which controls the output power level according to the position of the ALC D/A (controlled by the micro-processor on the LORD board) and the temperature at the final push-pull transistor case. This circuit is implemented by three current operational amplifiers (U6) that receive inputs from the ALC D/A and the VSWR detector (from the harmonic filter circuit). It controls an active attenuator (CR54 and CR56), which regulates the RF input to the amplification stages.

A two-transistor circuit controls the bias of the driver and final amplifier transistors; as heatsink temperature increases, the circuit reduces the bias correspondingly.

5.5.2.2 Harmonic Filter

The harmonic filter is used to attenuate the unwanted harmonics of the transmitted and received signals. During transmission, the Tx/Rx switch is in transmit state, transferring the RF output from the PA to the antenna via the harmonic filter. In the receive mode, the Tx/Rx switch is in the receive state, transferring the received signal from the antenna to the LORD board via the harmonic filter.

The harmonic filter contains:

- Seven selectable low pass filters.
- Seven electronic switches. Only one switch is open at a time, while the others remain closed.
- Tx/Rx electronic switch (includes CR33, CR34, CR35 and CR36).
- Forward/reverse power detector (includes T7, CR4 and CR5).

The filter ranges and switches are listed in the following table:

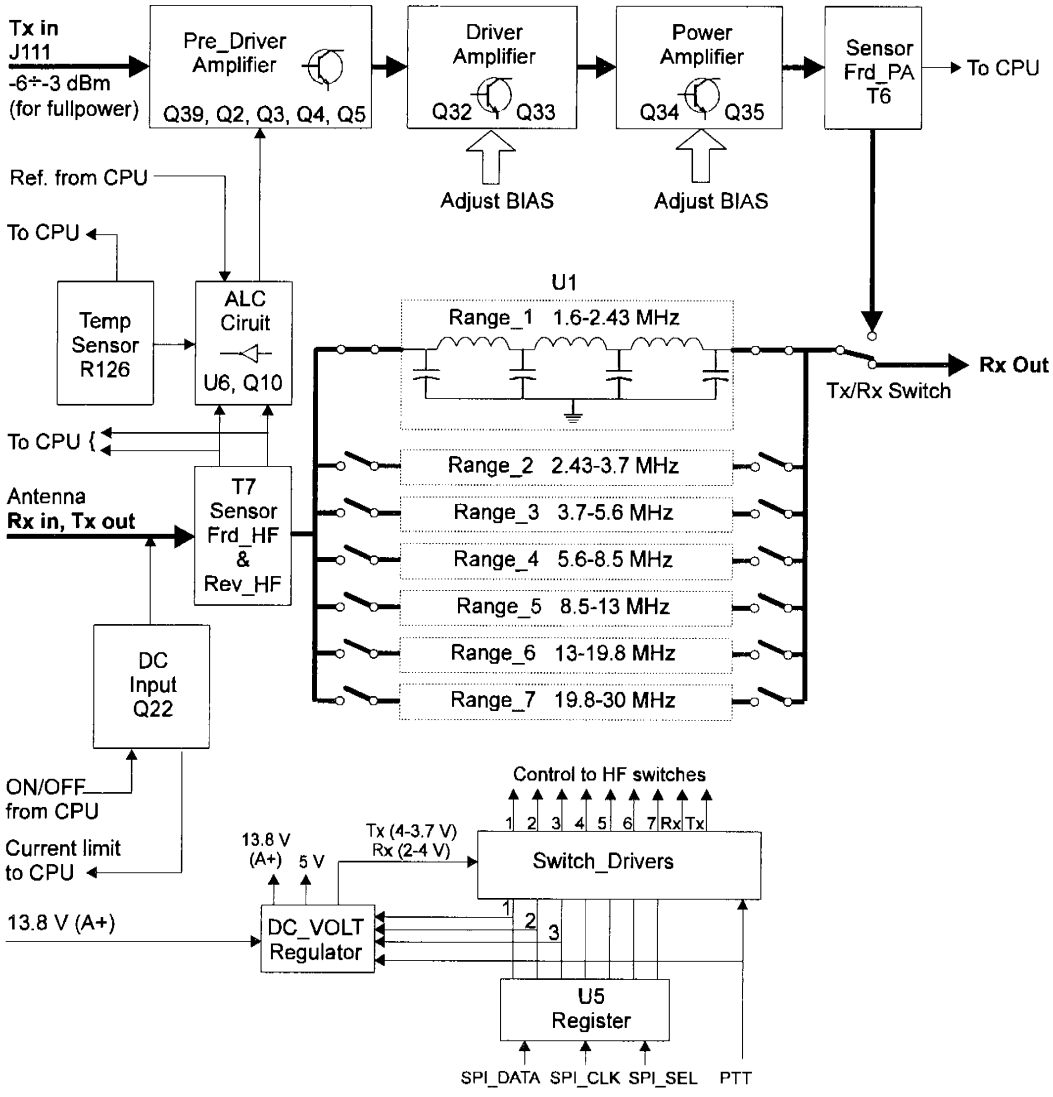


Figure 14. High Power Board

Table 4. Harmonic Filter Bands/Ranges and Switches

Filter	Range (MHz)	Switch
1	1.6 - 2.43	CR40, CR47
2	2.43 - 3.7	CR37, CR44
3	3.7 - 5.6	CR39, CR46
4	5.6 - 8.5	CR42, CR49
5	8.5 - 13	CR41, CR59, CR48, CR59
6	13 - 19.8	CR38, CR45
7	19.8 - 30	CR37, CR44

The harmonic filter contains seven selectable low pass filters, each covering a section of the 1.6 - 30 MHz range. Seven control lines are used to select an appropriate filter according to the operating frequency. When a control line is pulled down, a corresponding PIN diode switch is turned on, selecting and enabling the filter.

A forward-reverse power detector is inserted between the filters and the antenna. During transmission it generates two DC signals. One of these signals is proportional to the forward RF power delivered to the antenna, and the other is proportional to the RF power reflected from the antenna. The signals are sent to both the exciter and the Control board for controlling the level of the power output as a function of the following parameters:

- VSWR value. If the VSWR increases above 2:1, the output power is gradually decreased, to protect the radio from high levels of reflected power.
- Harmonic filter insertion losses. If the harmonic filter insertion losses are too high, the output power level is decreased.

6. TROUBLESHOOTING

6.1 OVERVIEW

In case of malfunctioning, perform the following steps (refer to the Maintenance section in MICOM-2E Owner's manual, Motorola publication number: 68P02952C60):

1. Use BITE
2. Refer to the User Troubleshooting Chart
3. Follow the troubleshooting procedures in this section which provide instructions for isolating faulty boards.

Troubleshooting a board at component level should be performed according to the notes on the relevant schematic diagram.

6.2 TROUBLESHOOTING CHARTS

This section contains two troubleshooting charts for the following MICOM-2E ALE components:

- Receiver
- Transmitter

Refer to the following pages.

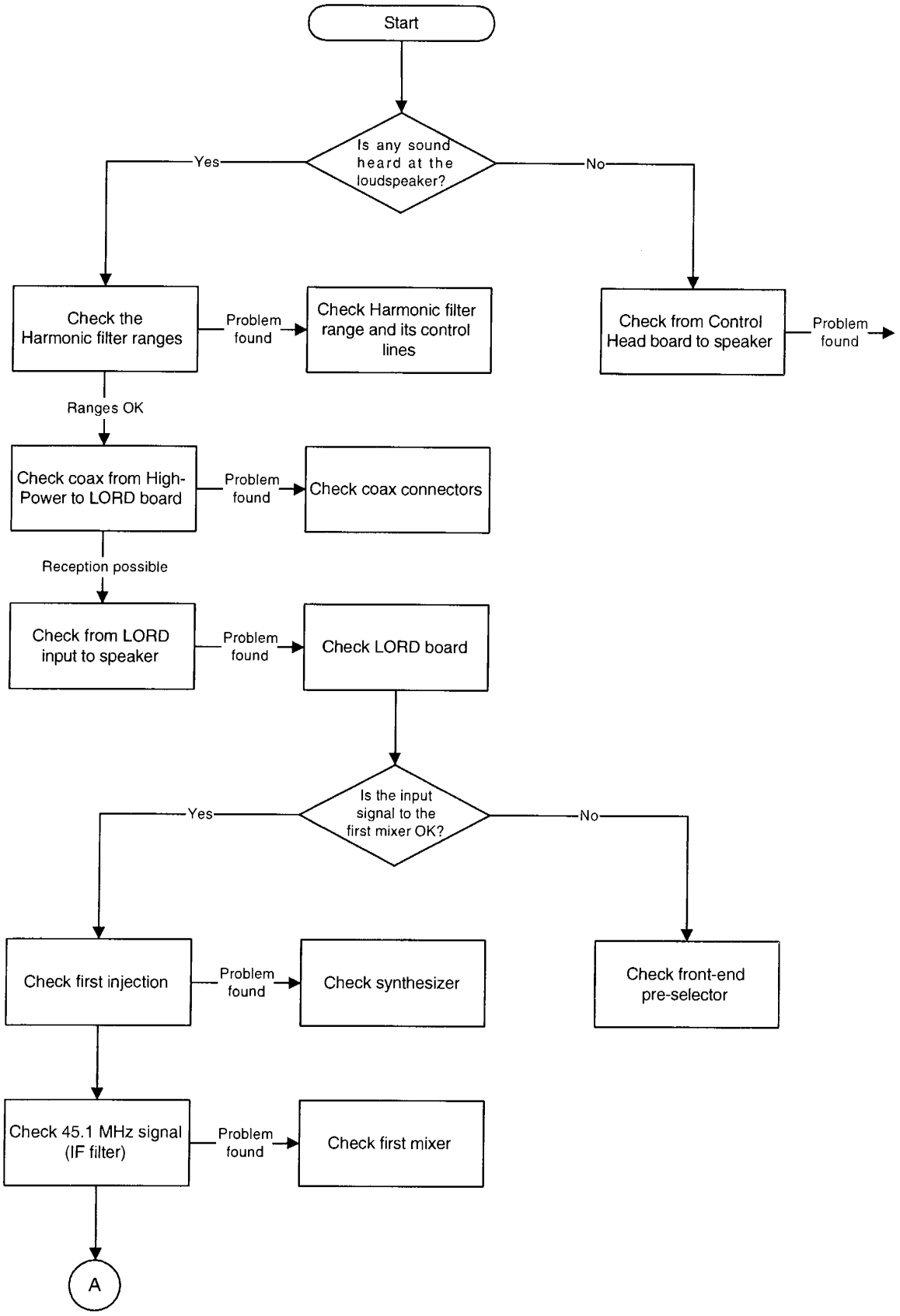


Figure 15. Troubleshooting Flow Chart for Receiver

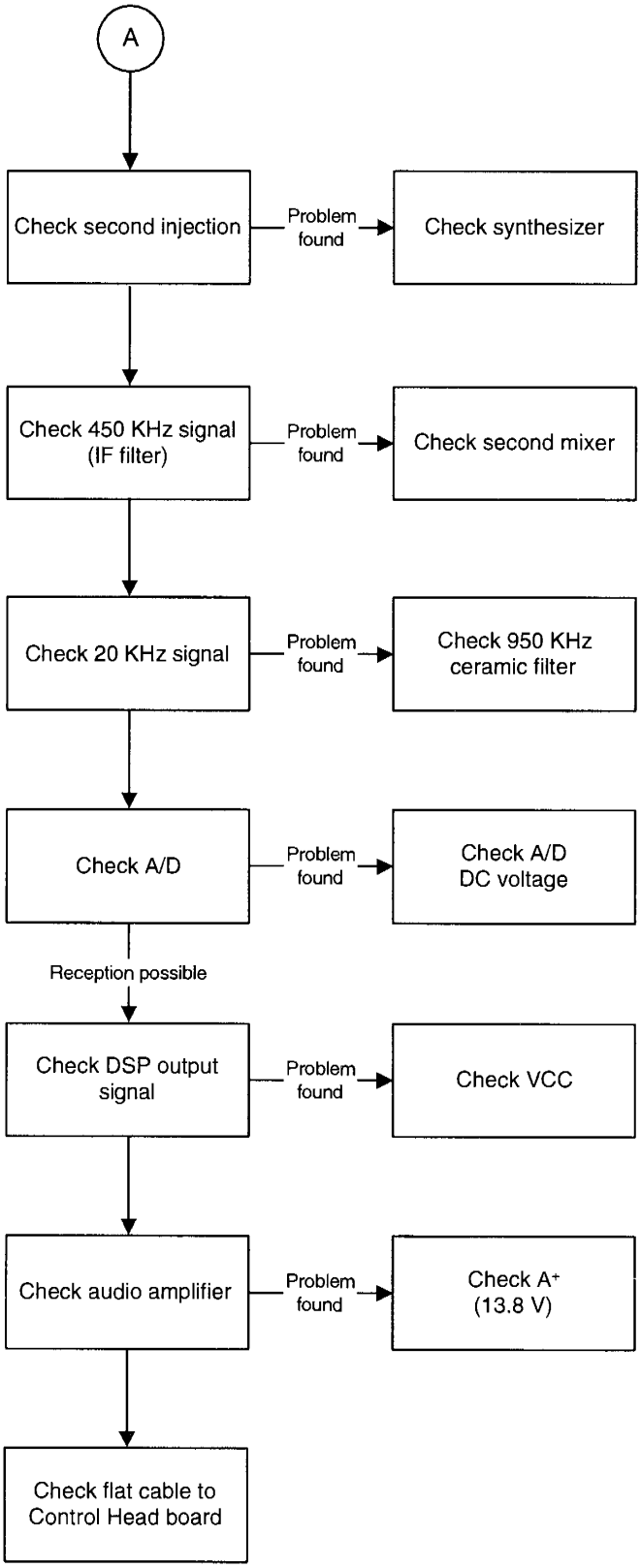


Figure 16. Troubleshooting Flow Chart for Receiver (cont.)

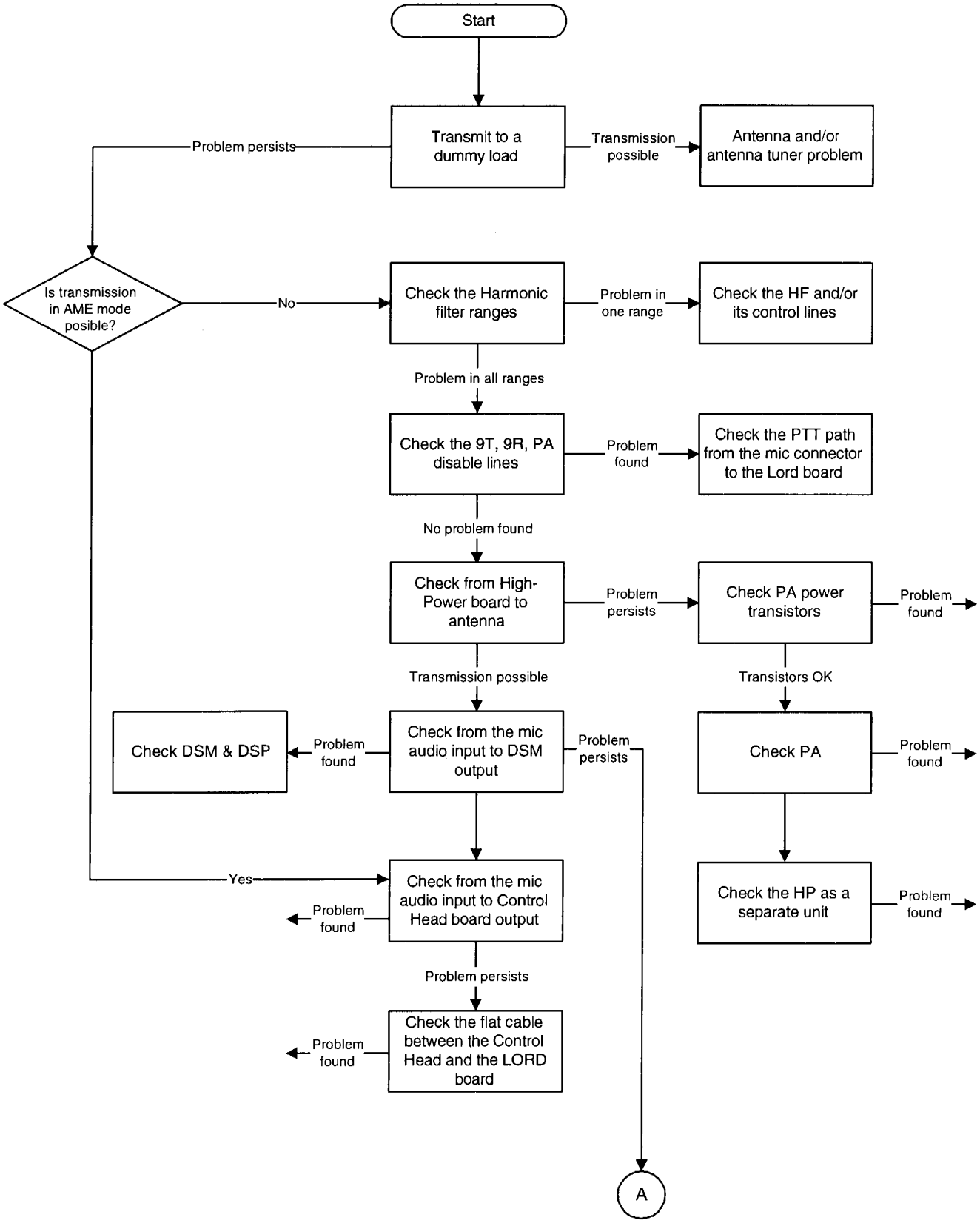


Figure 17. Troubleshooting Flow Chart for Transmitter

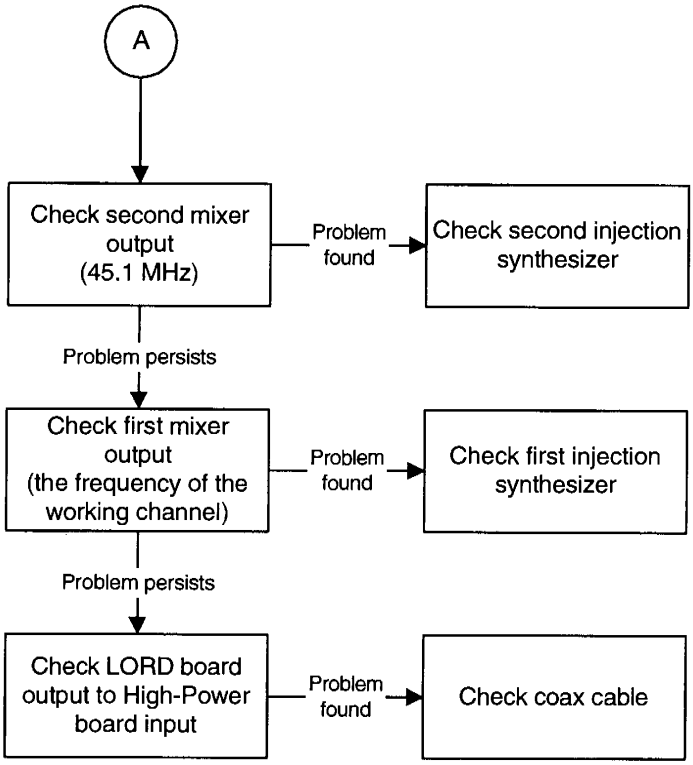


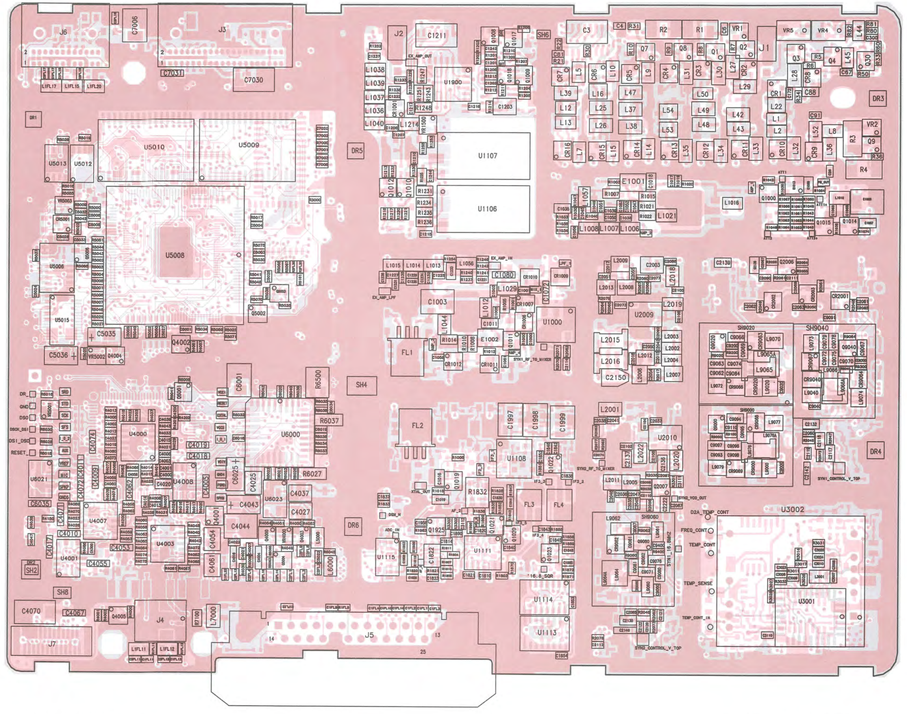
Figure 18. Troubleshooting Flow Chart for Transmitter (cont.)

SCHEMATIC DIAGRAMS, LAYOUTS AND PARTS LISTS

LOW RF ENHANCE BOARD

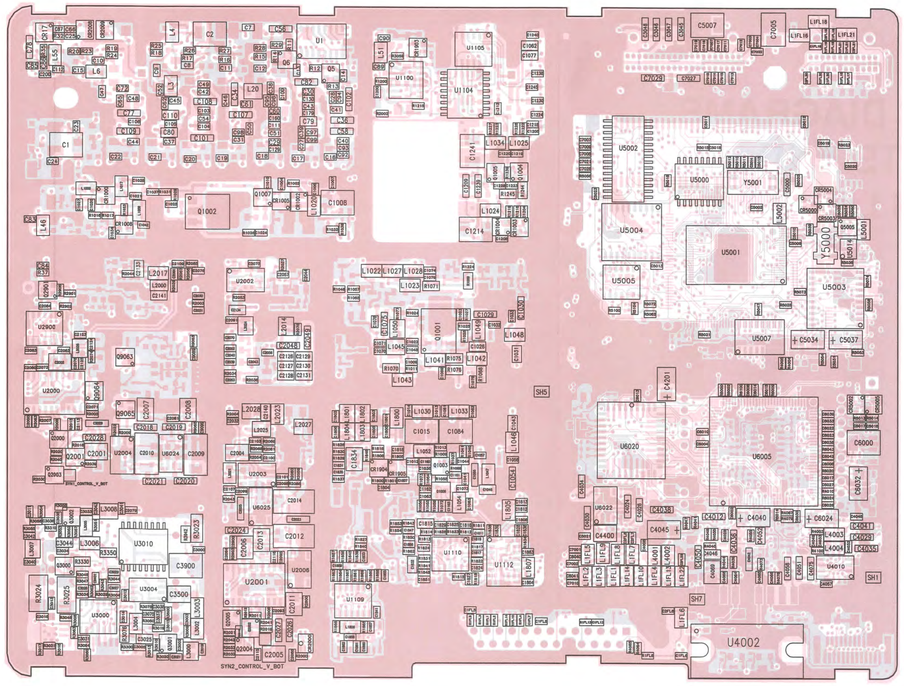
Model FRN5869A

Printed Circuit Board Details



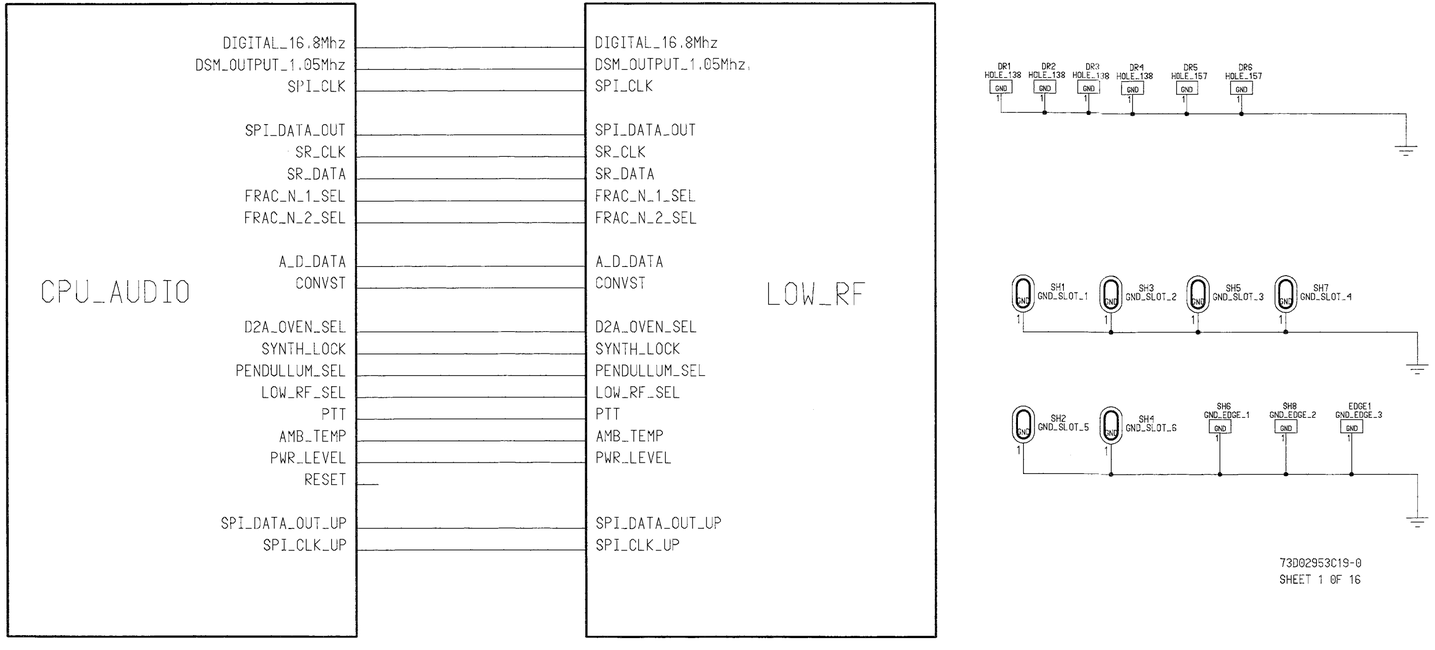
SHOWN FROM COMPONENT SIDE

OVERLAY ● 79B02952C41-O
COMPONENT SIDE 79B02952C43-O
SOLDER SIDE 79B02952C44-O



SHOWN FROM SOLDER SIDE

OVERLAY ● 79B02952C42-O
COMPONENT SIDE 79B02952C43-O
SOLDER SIDE 79B02952C44-O

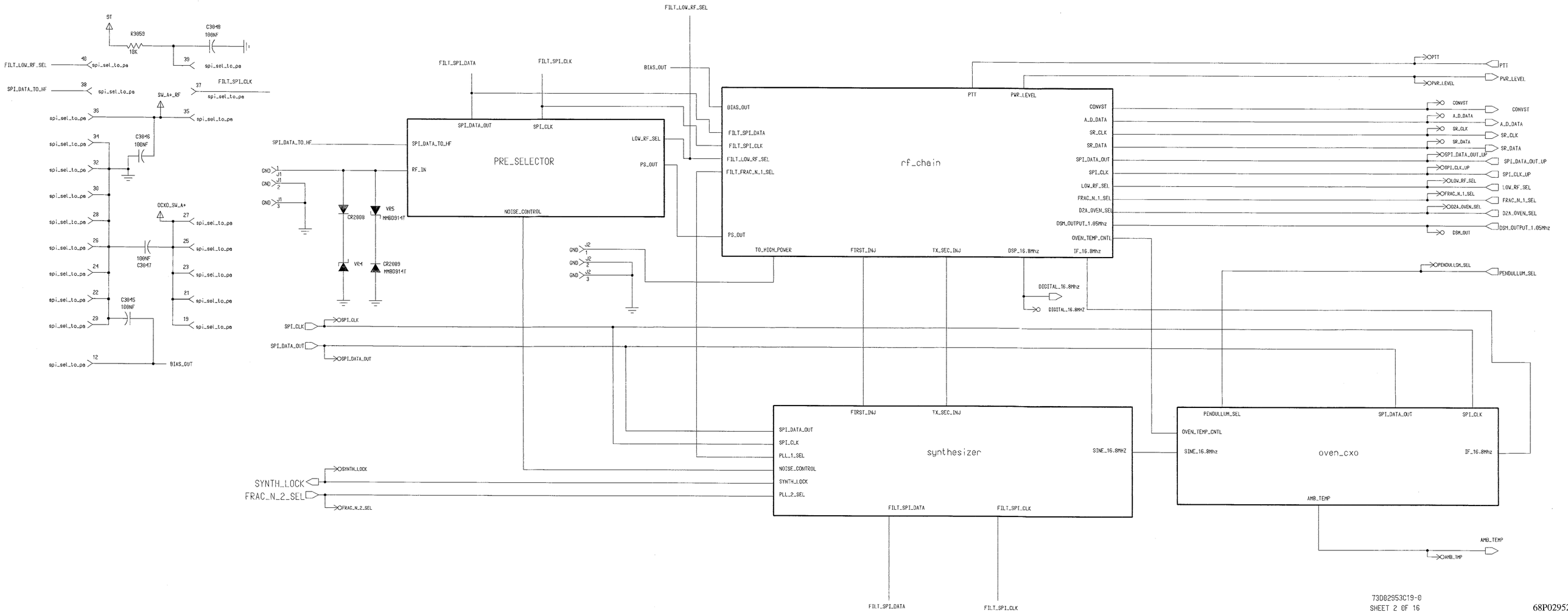


73D02953C19-0
SHEET 1 0F 16

RF ENHANCE BOARD

FRN5869A

ic Diagram - RF Section

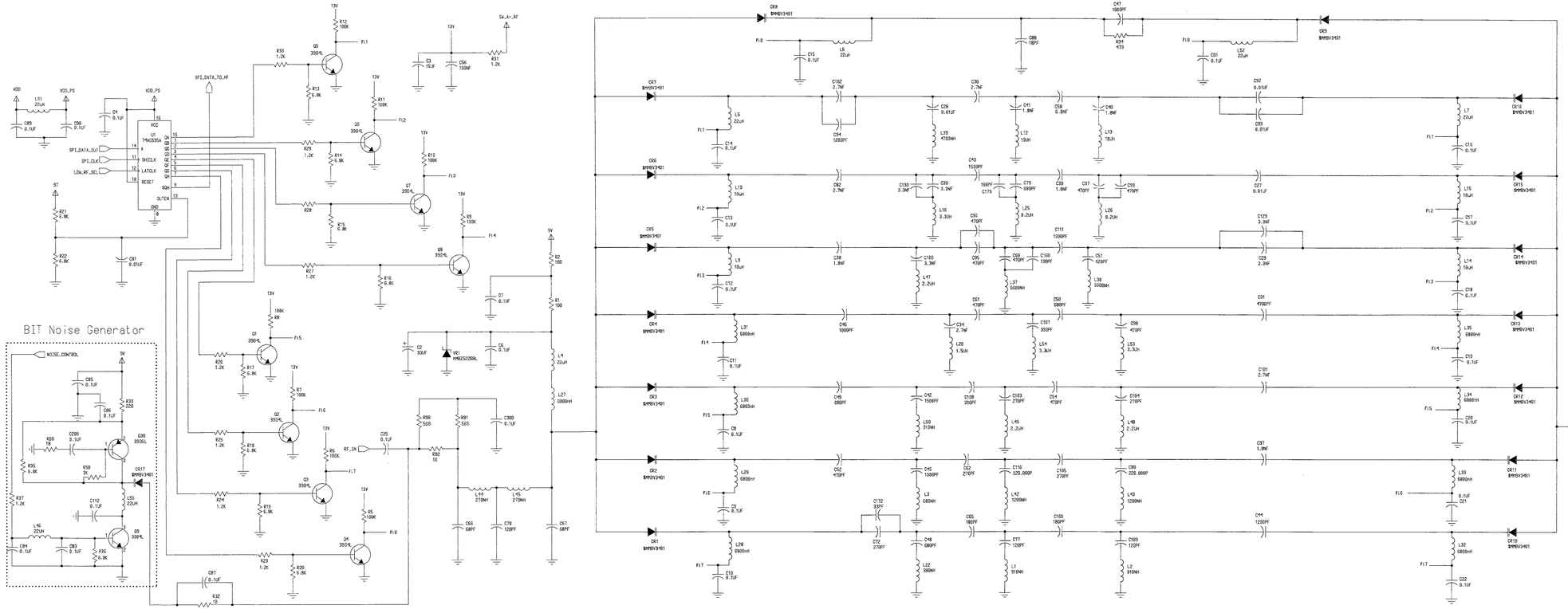


LOW RF ENHANCE BOAR

Model FRN5869

Schematic Diagram - RF Sectio

Pre-Selector Sectio



73D02953C19-0
SHEET 2 OF 16

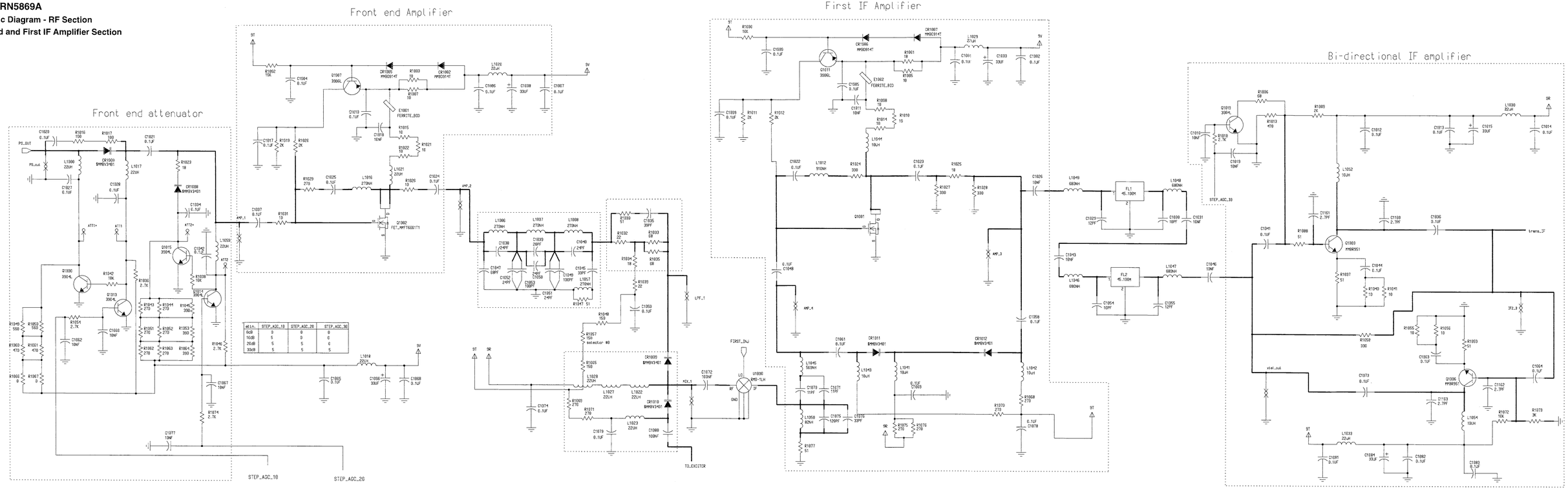
68P02952C55

LOW RF ENHANCE BOARD

Model FRN5869A

Schematic Diagram - RF Section

Front-End and First IF Amplifier Section



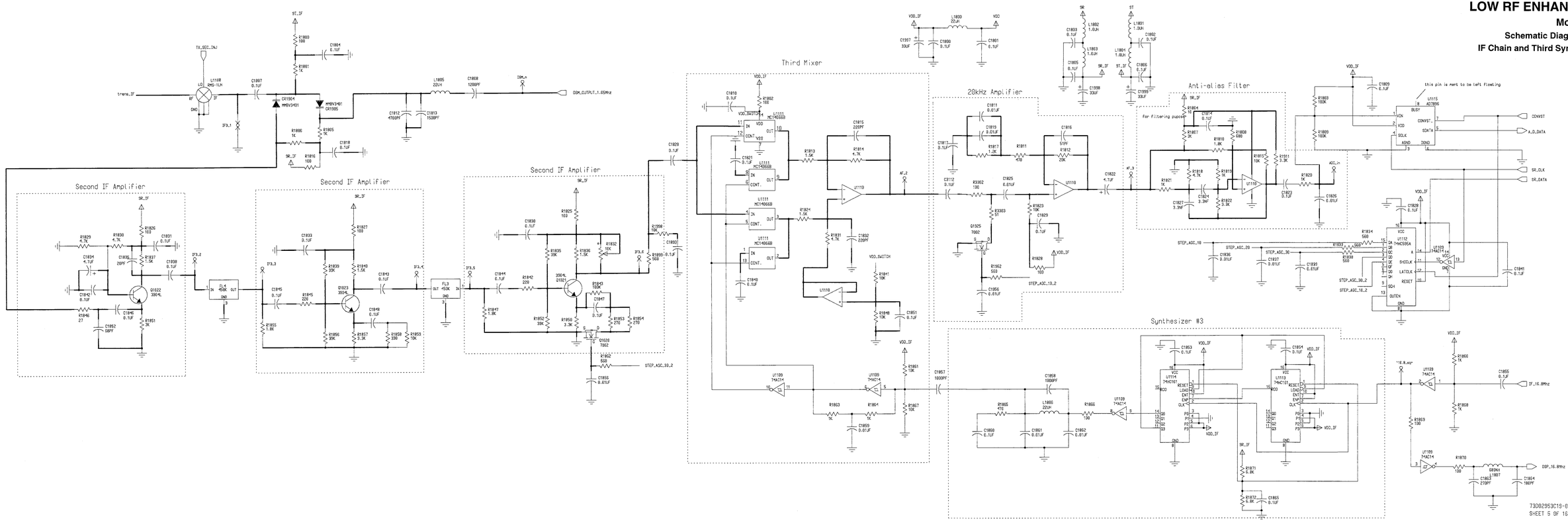
atten.	STEP_AGC_1B	STEP_AGC_2B	STEP_AGC_3B
0dB	0	0	0
10dB	5	0	0
20dB	5	5	0
30dB	5	5	5

LOW RF ENHANCE BOARD

Model FRN5869A

Schematic Diagram - RF Section

IF Chain and Third Synthesizer Section

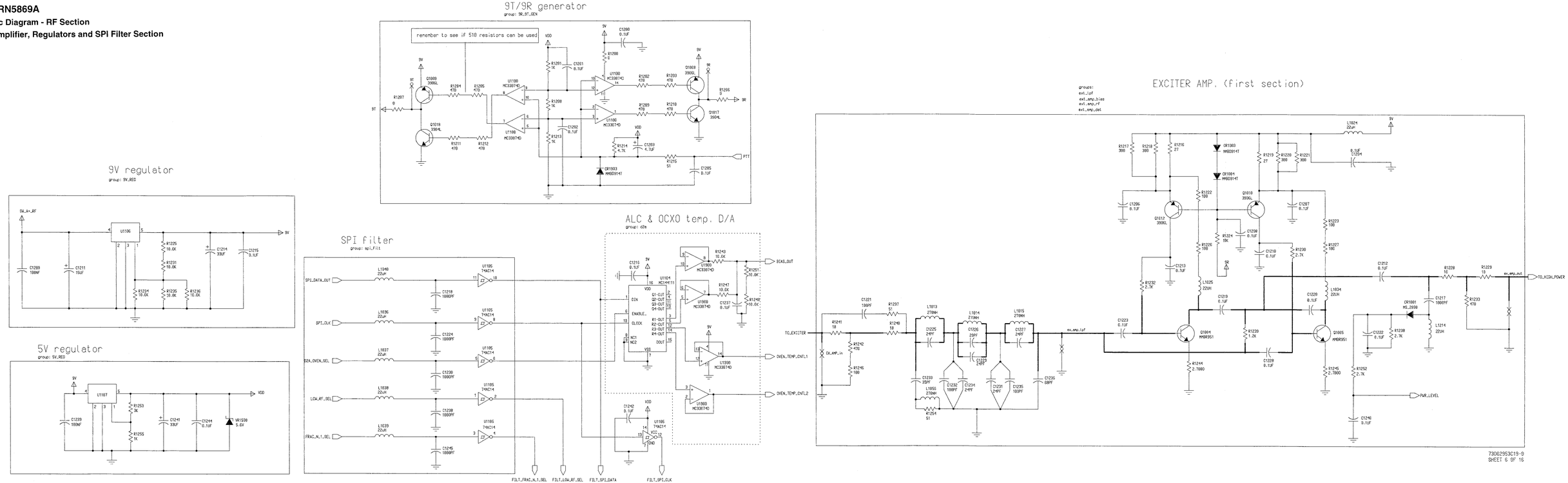


LOW RF ENHANCE BOARD

Model FRN5869A

Schematic Diagram - RF Section

Exciter Amplifier, Regulators and SPI Filter Section



LOW RF ENHANCE BOARD

Model FRN5869A

Schematic Diagram - RF Section

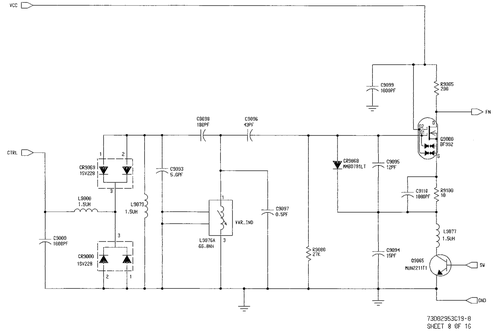
First and Second Synthesizer Section

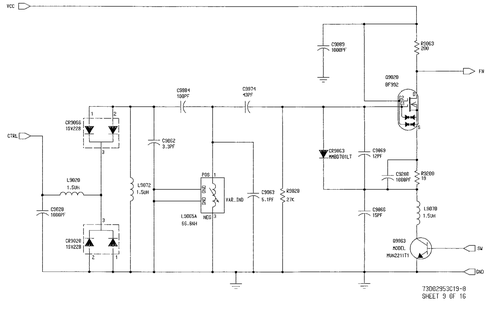
LOW RF ENHANCE BOARD

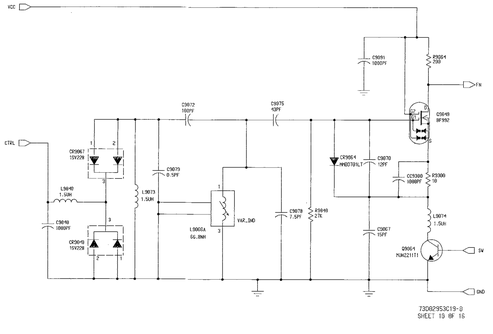
Model FRN5869A

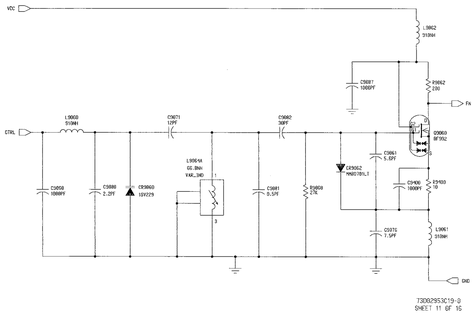
Schematic Diagram - RF Section

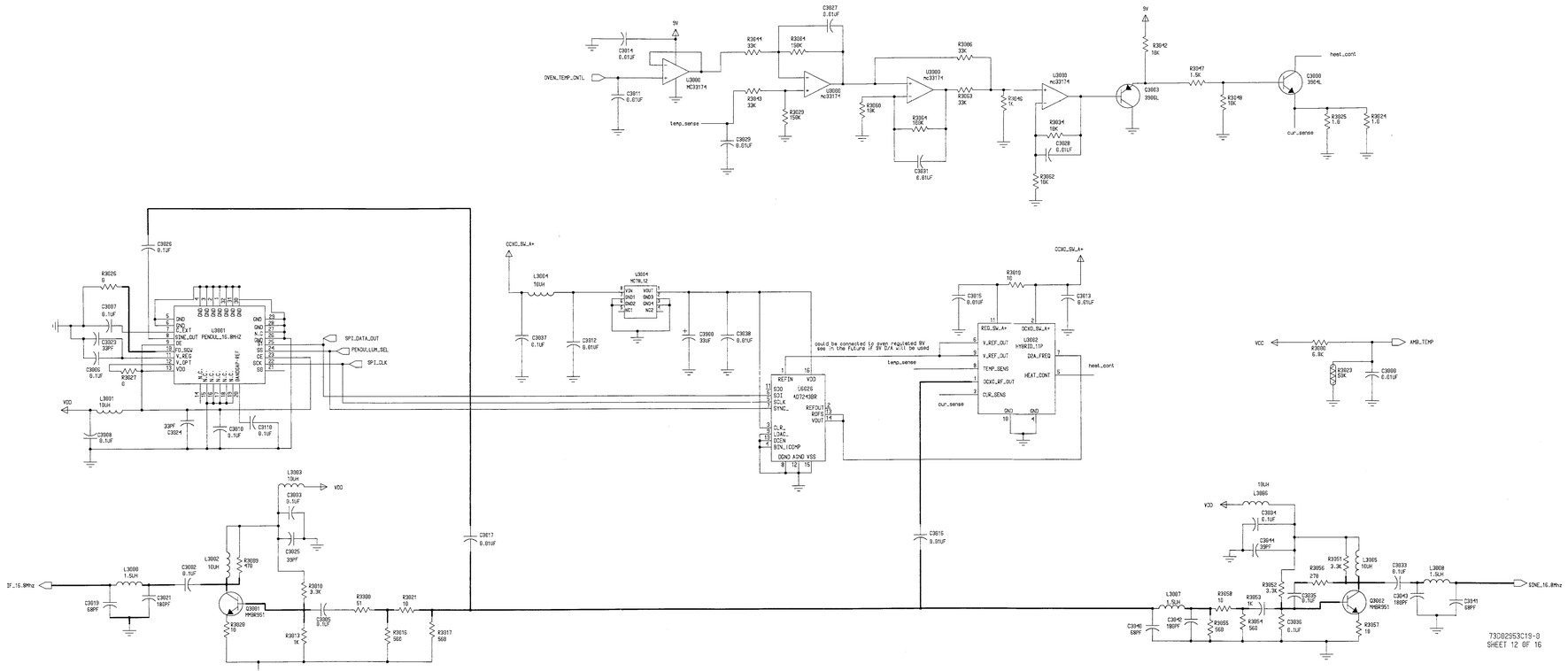
VCO Section







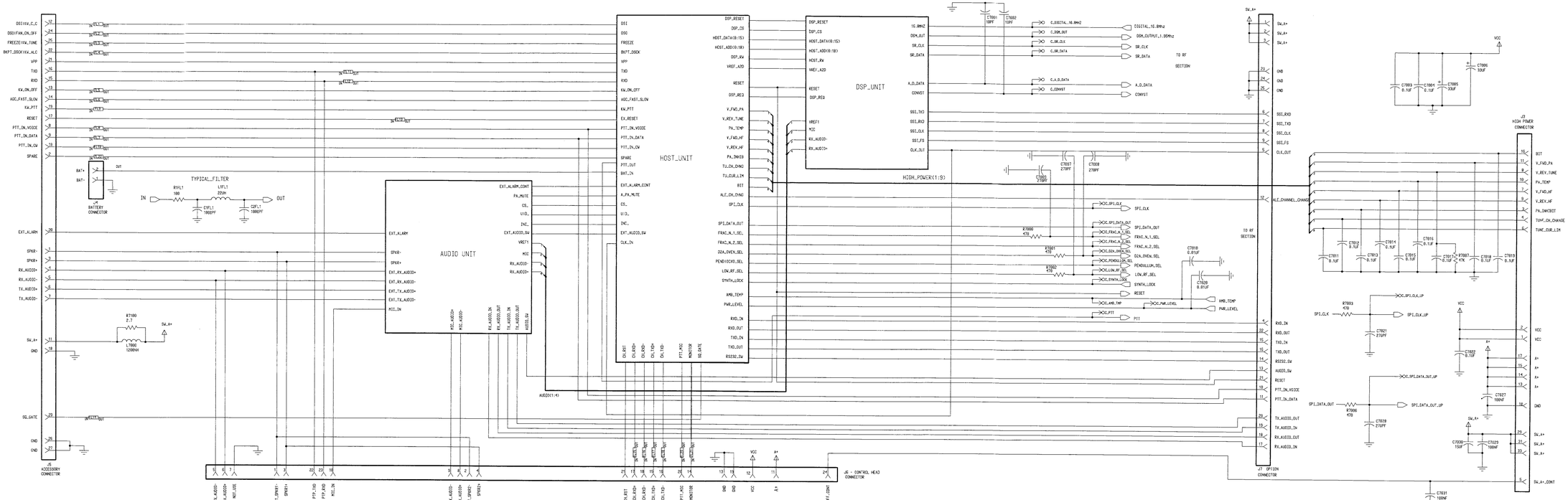



OVEN_TEMP_CNTL
temp_sense
cur_sense
heat_cont
OCXO_SW_A+
SPI_DATA_OUT
PENOUT,LVM_SEL
SPI_CLK
VCC
AMB_TEMP
IF_16.8MHz
SINE_16.8MHz
VDD
could be connected to oven regulated 8V
see in the future if 8V D/A will be used
73D02953C19-O
SHEET 12 OF 16

LOW RF ENHANCE BOARD

Model FRN5869A

Schematic Diagram - CPU and Audio Section

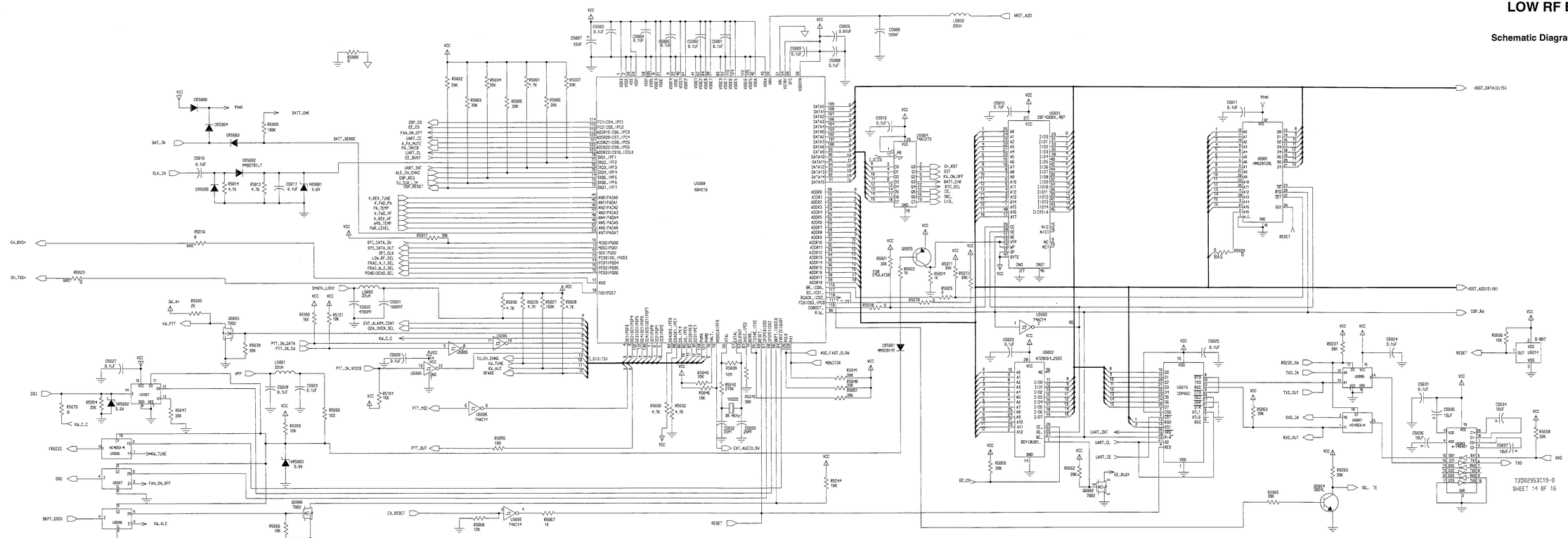


LOW RF ENHANCE BOARD

Model FRN5869A

Schematic Diagram - CPU and Audio Sectio

Host Sectio

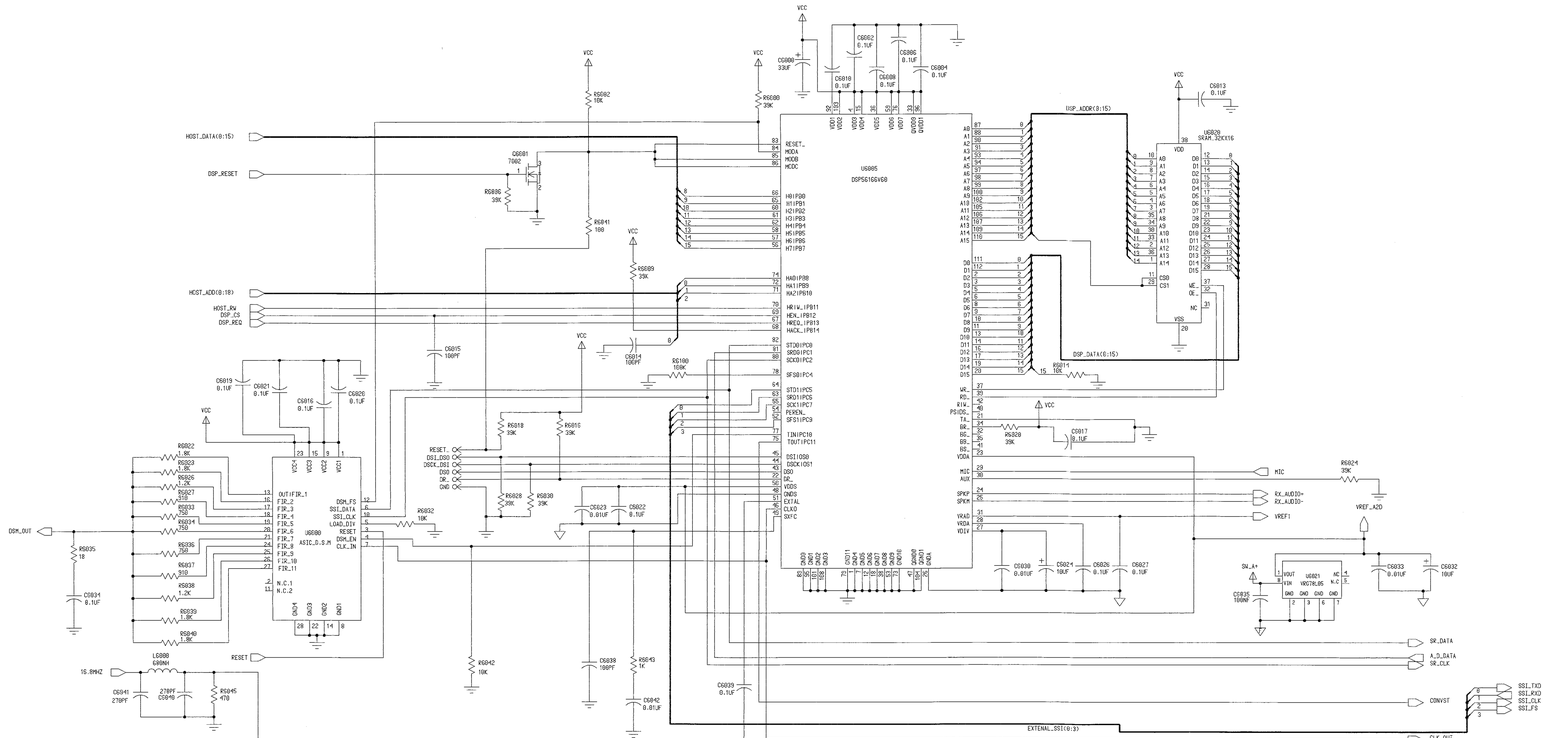


LOW RF ENHANCE BOARD

Model FRN5869A

Schematic Diagram - CPU and Audio Section

DSP Section



73D02953C19-0
SHEET 15 OF 16

LOW RF ENHANCE BOARD

Model FRN5869A

Schematic Diagram - CPU and Audio Section

Audio Section

73D02953C19-0
SHEET 16 OF 16

parts list

FRN5669A Low RF Enhanced Board

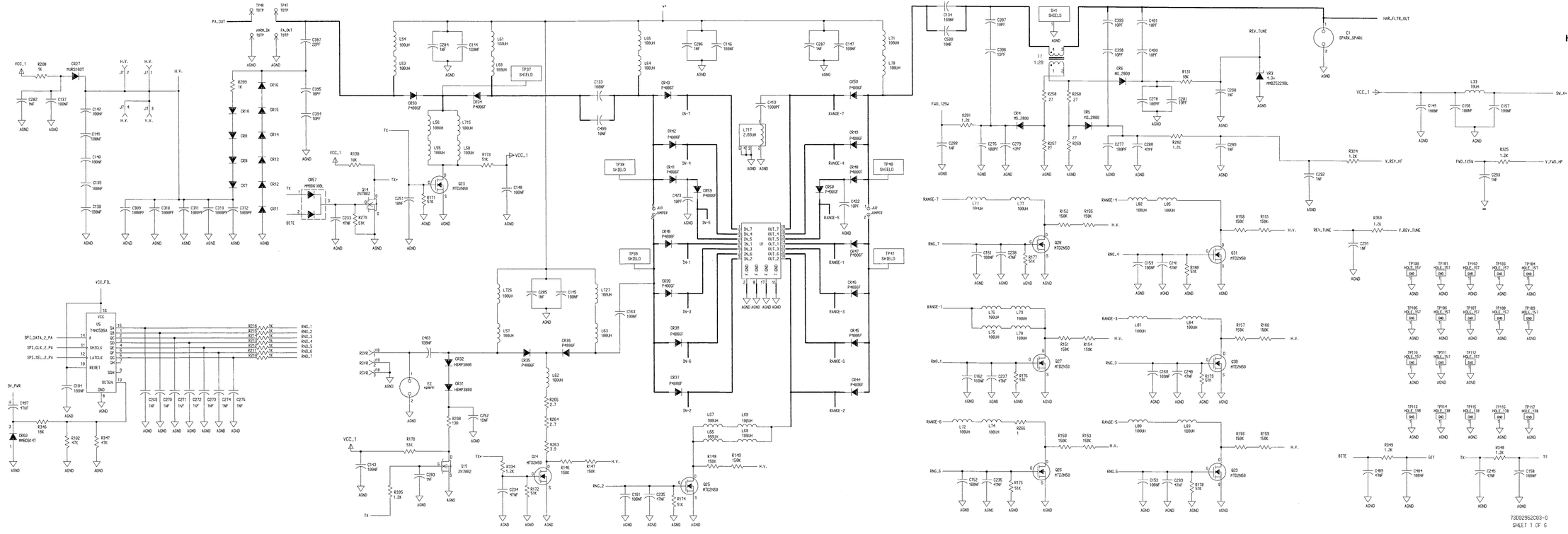
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitors: µF, ±5%, 50V, unless otherwise specified
C1	2311049J39	tantalum 33 10% 16V
C2	2311049J39	tantalum 33 10% 16V
C3	2311049A20	tantalum 15 10% 25V
C4	2113743K15	ceramic .100
C6	2113743K15	ceramic .100
C7	2113743K15	ceramic .100
C8	2113743K15	ceramic .100
C9	2113743K15	ceramic .100
C10	2113743K15	ceramic .100
C11	2113743K15	ceramic .100
C12	2113743K15	ceramic .100
C13	2113743K15	ceramic .100
C14	2113743K15	ceramic .100
C15	2113743K15	ceramic .100
C16	2113743K15	ceramic .100
C17	2113743K15	ceramic .100
C18	2113743K15	ceramic .100
C19	2113743K15	ceramic .100
C20	2113743K15	ceramic .100
C21	2113743K15	ceramic .100
C22	2113743K15	ceramic .100
C23	2113743K15	ceramic .100
C24	2113743K15	ceramic .100
C25	2113743K15	ceramic .100
C26	2113743K15	ceramic .100
C27	2113741F49	10000 pF
C28	2113741F49	10000 pF
C29	2113741F37	3300 pF
C31	2113741F41	4700 pF
C34	2113741B31	2700 pF
C36	2113741B31	2700 pF
C37	2113741F31	1800 pF
C38	2113741F31	1800 pF
C39	2113741F31	1800 pF
C40	2113741F31	1800 pF
C41	2113741F31	1800 pF
C42	2113741F29	1500 pF
C43	2113741F29	1500 pF
C44	2113741F27	1200 pF
C45	2113741F25	1000 pF
C46	2113741F25	1000 pF
C47	2113741F25	1000 pF
C48	2113741F21	680 pF
C49	2113741F21	680 pF
C50	2113741F21	680 pF
C51	2113741F20	620 pF
C52	2113741F17	470 pF
C54	2113741F17	470 pF
C56	2113741B69	100000 pF
C58	2113741B41	6800 pF
C60	2113741F17	470 pF
C61	2113741F17	470 pF
C62	2113740F61	270 pF
C65	2113740F57	180 pF
C66	2113740F47	68 pF
C67	2113740F47	68 pF
C72	2113740F61	270 pF
C77	2113740B51	120 pF
C78	2113740B51	120 pF
C79	2113740A75	680 pF
C80	2113740A63	220 pF
C81	2113741F49	10000 pF
C82	2113741B31	2700
C83	2113743K15	ceramic .100
C84	2113743K15	ceramic .100
C85	2113743K15	ceramic .100
C86	2113743K15	ceramic .100
C87	2113743K15	ceramic .100
C88	2113740A35	18 pF
C89	2113743K15	ceramic .100
C90	2113743K15	ceramic .100
C91	2113743K15	ceramic .100
C92	2113741F49	10000 pF
C93	2113741F49	10000 pF
C94	2113741F27	1200 pF
C95	2113741F17	470 pF
C96	2113741F17	470 pF
C97	2113741F17	470 pF
C98	2113741F17	470 pF
C99	2113741F17	470 pF
C100	2113741F37	3300 pF
C101	2113741B31	2700 pF
C102	2113741B31	2700 pF
C103	2113740F61	270 pF
C104	2113740F61	270 pF
C105	2113740F61	270 pF
C106	2113740F57	180 pF
C107	2113740B63	390 pF
C108	2113740B63	390 pF
C109	2113740B51	120 pF
C110	2113740A63	30 220 pF
C111	2113741F25	1000 pF
C112	2113743K15	ceramic .100
C129	2113741F37	3300 pF
C130	2113741F37	3300 pF
C160	2113740F51	100 pF
C172	2113740F39	33 pF
C179	2113740F51	100 pF
C200	2113743K15	ceramic .100
C300	2113743K15	ceramic .100
C1000	2113743K15	ceramic .100
C1001	2113743K15	ceramic .100
C1002	2113743K15	ceramic .100
C1003	2311049J39	tantalum 33 10% 16V
C1004	2113743K15	ceramic .100
C1005	2113743K15	ceramic .100
C1006	2113743K15	ceramic .100
C1007	2113743K15	ceramic .100
C1008	2311049J39	tantalum 33 10% 16V
C1009	2113743K15	ceramic .100
C1010	2113743K15	ceramic .100
C1011	2113741A45	10000 pF
C1012	2113743K15	ceramic .100
C1013	2113743K15	ceramic .100
C1014	2113743K15	ceramic .100
C1015	2311049J39	tantalum 33 10% 16V
C1016	2113741A45	10000 pF
C1017	2113743K15	ceramic .100
C1018	2113741A45	10000 pF
C1019	2113741A45	10000 pF
C1020	2113743K15	ceramic .100
C1021	2113743K15	ceramic .100
C1022	2113743K15	ceramic .100
C1023	2113743K15	ceramic .100
C1024	2113743K15	ceramic .100
C1025	2113743K15	ceramic .100
C1026	2113741A45	10000 pF
C1027	2113743K15	ceramic .100
C1028	2113743K15	ceramic .100
C1029	2113740B29	15 pF
C1030	2113740B25	10 pF
C1031	2113741A45	10000 pF
C1034	2113743K15	ceramic .100
C1035	2113740A43	39 pF
C1036	2113743K15	ceramic .100
C1037	2113743K15	ceramic .100
C1038	2113740F36	24 pF
C1039	2113740F34	20 pF
C1040	2113740F36	24 pF
C1041	2113743K15	ceramic .100
C1042	2113743K15	ceramic .100
C1043	2113741A45	10000 pF
C1044	2113743K15	ceramic .100
C1045	2113740F39	33 pF
C1046	2113741A45	10000 pF
C1047	2113740F47	68 pF
C1048	2113743K15	ceramic .100
C1049	2113740F51	100 pF
C1050	2113740F36	24 pF
C1051	2113740F36	24 pF
C1052	2113740F36	24 pF
C1053	2113740F51	100 pF
C1054	2113740B27	12 pF
C1055	2113740B29	15 pF
C1058	2113743K15	ceramic .100
C1059	2113743K15	ceramic .100
C1060	2113741A45	10000 pF
C1061	2113743K15	ceramic .100
C1062	2113741A45	10000 pF
C1063	2113743K15	ceramic .100
C1064	2113743K15	ceramic .100
C1065	2113743K15	ceramic .100
C1066	2311049J39	tantalum 33 10% 16V
C1067	2113741A45	10000 pF
C1068	2113743K15	ceramic .100
C1069	2113743K15	ceramic .100
C1070	2113740F28	11 pF
C1071	2113740F28	11 pF
C1072	2113741B69	100000 pF
C1073	2113743K15	ceramic .100
C1074	2113743K15	ceramic .100
C1075	2113740B51	120 pF
C1076	2113740F39	33 pF
C1077	2113741A45	10000 pF
C1078	2113743K15	ceramic .100
C1079	2113743K15	ceramic .100
C1080	2113741B69	100000 pF
C1081	2113743K15	ceramic .100
C1082	2113743K15	ceramic .100
C1083	2113743K15	ceramic .100
C1084	2311049J39	tantalum 33 10% 16V
C1160	2113740F13	2.7 pF
C1161	2113740F13	2.7 pF
C1162	2113740F13	2.7 pF
C1163	2113740F13	2.7 pF
C1200	2113743K15	ceramic .100
C1201	2113743K15	ceramic .100
C1202	2113743K15	ceramic .100
C1203	2311049J11	tantalum 4.7 10% 16V
C1204	2113743K15	ceramic .100
C1205	2113743K15	ceramic .100
C1206	2113743K15	ceramic .100
C1207	2113743K15	ceramic .100
C1208	2113743K15	ceramic .100
C1209	2113741B69	100000 pF
C1210	2113743K15	ceramic .100
C1211	2311049A20	tantalum 15 10% 25V
C1212	2113743K15	ceramic .100
C1213	2113743K15	ceramic .100
C1214	2311049J39	tantalum 33 10% 16V
C1215	2113743K15	ceramic .100
C1216	2113743K15	ceramic .100
C1217	2113741F25	1000 pF
C1218	2113741F25	1000 pF
C1219	2113743K15	ceramic .100
C1220	2113743K15	ceramic .100
C1221	2113740F51	100 pF
C1222	2113743K15	ceramic .100
C1223	2113743K15	ceramic .100
C1224	2113741F25	1000 pF
C1225	2113740F36	24 pF
C1226	2113740F34	20 pF
C1227	2113740F36	24 pF
C1228	2113743K15	ceramic .100
C1229	2113740F47	68 pF
C1230	2113741F25	1000
C1231	2113740F36	24 pF
C1232	2113740F51	100 pF
C1233	2113740A43	39 pF
C1234	2113740F36	24 pF
C1235	2113740F51	100 pF
C1236	2113740B27	12 pF
C1237	2113743K15	ceramic .100
C1238	2113741F25	1000 pF
C1239	2113741B69	100000 pF
C1240	2113743K15	ceramic .100
C1241	2311049J39	tantalum 33 10% 16V
C1242	2113743K15	ceramic .100
C1244	2113743K15	ceramic .100
C1245	2113741F25	1000 pF
C1800	2113743K15	ceramic .100
C1801	2113743K15	ceramic .100
C1802	2113743K15	ceramic .100
C1803	2113743K15	ceramic .100
C1804	2113743K15	ceramic .100
C1805	2113743K15	ceramic .100
C1806	2113743K15	ceramic .100
C1807	2113743K15	ceramic .100
C1808	2113741F27	1200 pF
C1809	2113743K15	ceramic .100
C1810	2113743K15	ceramic .100
C1811	2113741F49	10000 pF
C1812	2113741F41	4700 pF
C1813	2113741F29	1500 pF
C1814	2113743K15	ceramic .100
C1815	2113740A63	220 pF
C1816	2113740F44	51 pF
C1817	2113743K15	ceramic .100
C1818	2113743K15	ceramic .100
C1819	2113741F49	10000 pF
C1820	2113743K15	ceramic .100
C1821	2113743K15	ceramic .100
C1822	2311049J11	tantalum 4.7 10% 16V
C1823	2113743K15	ceramic .100
C1824	2113741F37	3300 pF
C1825	2113741F49	10000 pF
C1826	2113741F49	10000 pF
C1827	2113741F37	3300 pF
C1828	2113743K15	ceramic .100
C1829	2113743K15	ceramic .100
C1830	2113743K15	ceramic .100
C1831	2113743K15	ceramic .100
C1832	2113740A63	220 pF
C1833	2113743K15	ceramic .100
C1834	2311049J11	tantalum 4.7 10% 16V
C1835	2113740F34	20 pF
C1836	2113741F49	10000 pF
C1837	2113741F49	10000 pF
C1838	2113743K15	ceramic .100
C1839	2113741F49	10000 pF
C1840	2113743K15	ceramic .100
C1841	2113743K15	ceramic .100
C1842	2113743K15	ceramic .100
C1843	2113743K15	ceramic .100
C1844	2113743K15	ceramic .100
C1845	2113743K15	ceramic .100
C1846	2113743K15	ceramic .100
C1847	2113743K15	ceramic .100
C1848	2113743K15	ceramic .100
C1851	2113743K15	ceramic .100
C1852	2113740F47	68 pF
C1853	2113743K15	ceramic .100
C1854	2113743K15	ceramic .100
C1855	2113743K15	ceramic .100
C1856	2113741F49	10000 pF
C1857	2113741F25	1000 pF
C1858	2113741F25	1000 pF
C1859	2113741F49	10000 pF
C1860	2113743K15	ceramic .100
C1861	2113741F49	10000 pF
C1862	2113741F49	10000 pF
C1863	2113740F61	270 pF
C1864	2113740F57	180 pF
C1865	2113743K15	ceramic .100
C1890	2113743K15	ceramic .100
C1956	2113741F49	10000 pF
C1997	2311049J39	tantalum 33 10% 16V
C1998	2311049J39	tantalum 33 10% 16V
C1999	2311049J39	tantalum 33 10% 16V
C1FL1	2113741F25	1000 pF
C1FL2	2113741F25	1000 pF
C1FL3	2113741F25	1000 pF
C1FL4	2113741F25	1000 pF
C1FL5	2113741F25	1000 pF
C1FL6	2113741F25	1000 pF
C1FL7	2113741F25	1000 pF
C1FL8	2113741F25	1000 pF
C1FL9	2113741F25	1000 pF
C1FL10	2113741F25	1000 pF
C1FL11	2113741F25	1000 pF
C1FL12	2113741F25	1000 pF
C1FL13	2113741F25	1000 pF
C1FL14	2113741F25	1000 pF
C1FL15	2113741F25	1000 pF
C1FL17	2113741F25	1000 pF
C1FL20	2113741F25	1000 pF
C1FL21	2113741F25	1000 pF
C1FL22	2113741F25	1000 pF
C2000	2113743K15	ceramic .100
C2001	2311049J11	tantalum 4.7 10% 16V
C2002	2311049J11	tantalum 4.7 10% 16V
C2003	2311049J11	tantalum 4.7 10% 16V
C2004	2311049J11	tantalum 4.7 10% 16V
C2005	2311049J11	tantalum 4.7 10% 16V
C2006	2311049J11	tantalum 4.7 10% 16V
C2007	2311049J11	tantalum 4.7 10% 16V
C2008	2311049J11	tantalum 4.7 10% 16V
C2009	2311049A20	tantalum 15 10% 25V
C2010	2311049A20	tantalum 15 10% 25V
C2011	2311049J11	tantalum 4.7 10% 16V
C2012	2311049A20	tantalum 15 10% 25V
C2013	2311049J11	tantalum 4.7 10% 16V
C2014	2311049A20	tantalum 15 10% 25V
C2015	2113740F48	75 pF
C2016	2113740F48	75 pF
C2017	2113740F48	75 pF
C2018	2109720D14	ceramic low dist .1
C2019	2109720D14	ceramic low dist .1
C2020	2109720D14	ceramic low dist .1
C2021	2109720D14	ceramic low dist .1
C2023	2109720D14	ceramic low dist .1
C2024	2109720D14	ceramic low dist .1
C2025	2109720D14	ceramic low dist .1
C2026	2109720D14	ceramic low dist .1
C2027	2109720D14	ceramic low dist .1
C2028	2109720D14	ceramic low dist .1
C2029	2109720D14	ceramic low dist .1
C2030	2113743K15	ceramic .100
C2031	2113743K15	ceramic .100
C2032	2113743K15	ceramic .100
C2035	2113740F29	12 pF
C2036	2113740F18	4.3 pF
C2037	2113740F51	100 pF
C2038	2113740F51	100 pF
C2039	2113740F51	100 pF
C2040	2113740F51	100 pF
C2041	2113740F47	68 pF
C2042	2113740F47	68 pF
C2043	2113740F44	51 pF
C2044	2113740F44	51 pF
C2045	2113740F28	11 pF
C2046	2113740F28	11 pF
C2047	2113740F24	7.5 pF
C2048	2113741B69	100000 pF
C2049	2113741B69	100000 pF
C2050	2113740F39	33 pF
C2051	2113740F39	33 pF
C2052	2113740F34	20 pF
C2053	2113740F34	20 pF
C2054	2113740F34	20 pF
C2055	2113740F34	20 pF
C2056	2113740F31	15 pF
C2057	2113740F31	15 pF
C2060	2113741F25	1000 pF
C2061	2113741F25	1000 pF
C2062	2113741F25	1000 pF
C2063	2113741F25	1000 pF
C2064	2113741F25	1000 pF
C2065	2113741F25	1000 pF
C2067	2113741F25	1000 pF
C2070	2113741F21	680 pF
C2071	2113743K15	ceramic .100
C2072	2113743K15	ceramic .100
C2073	2113743K15	ceramic .100
C2074	2113743K15	ceramic .100
C2075	2113743K15	ceramic .100
C2076	2113743K15	ceramic .100
C2077	2113743K15	ceramic .100
C2078	2113743K15	ceramic .100
C2079	2113743K15	ceramic .100
C2080	2113743K15	ceramic .100
C2081	2113743K15	ceramic .100
C2082	2113743K15	ceramic .100
C2083	2113743K15	ceramic .100
C2084	2113743K15	ceramic .100
C2085	2113743K15	ceramic .100
C2086	2113743K15	ceramic .100
C2087	2113743K15	ceramic .100
C2088	2113743K15	ceramic .100
C2089	2113743K15	ceramic .100
C2090	2113743K15	ceramic .100
C2091	2113743K15	ceramic .100
C2092	2113743K15	ceramic .100
C2093	2113743K15	ceramic .100
C2094	2113743K15	ceramic .100
C2095	2113743K15	ceramic .100
C2096	2113743K15	ceramic .100
C2097	2113743K15	ceramic .100
C2098	2113743K15	ceramic .100
C2099	2113743K15	ceramic .100
C2100	2113743K15	ceramic .100
C2101	2113743K15	ceramic .100
C2102	2113743K15	ceramic .100
C2103	2113743K15	ceramic .100
C2104	2113743K15	ceramic .100
C2105	2113743K15	ceramic .100
C2106	2113743K15	ceramic .100
C2107	2113743K15	ceramic .100
C2108	2113743K15	ceramic .100
C2109	2113743K15	ceramic .100
C2110	2113743K15	ceramic .100
C2111	2113743K15	ceramic .100
C2112	2113743K15	ceramic .100
C2113	2113743K15	ceramic .100
C2114	2113743K15	ceramic .100
C2115	2113743K15	ceramic .100
C2116	2113743K15	ceramic .100
C2117	2113741A45	10000 pF
C2118	2113741A45	10000 pF
C2119	2113741F25	1000 pF
C2120	2113741F25	1000 pF
C2121	2113741F25	1000 pF
C2122	2113741F25	1000 pF
C2123	2113740F28	11 pF
C2124	2113740F21	5.6 pF
C2125	2113740F21	5.6 pF
C2132	2113740A43	39 pF
C2133	2113740A43	39 pF
C2134	2113740A43	39 pF
C2135	2113740A43	39 pF
C2136	2113740A43	39 pF
C2137	2113740A43	39 pF
C2138	2113740A35	18 pF
C2139	2113740A35	18 pF
C2140	2113740A33	15 pF
C2141	2113740A33	15 pF
C2142	2109720D14	ceramic low dist .1
C2146	2113741B61	47000 pF
C2222	2113740A36	20 pF
C2900	2113743K15	ceramic .100
C2FL1	2113741F25	1000 pF
C2FL2	2113741F25	1000 pF
C2FL3	2113741F25	1000 pF
C2FL4	2113741F25	1000 pF
C2FL5	2113741F25	1000 pF
C2FL6	2113741F25	1000 pF
C2FL7	2113741F25	1000 pF
C2FL8	2113741F25	1000 pF
C2FL9	2113741F25	1000 pF
C2FL10	2113741F25	1000 pF
C2FL11	2113741F25	1000 pF
C2FL12	2113741F25	1000 pF
C2FL13	2113741F25	1000 pF
C2FL14	2113741F25	1000 pF
C2FL15	2113741F25	1000 pF
C2FL17	2113741F25	1000 pF
C2FL20	2113741F25	1000 pF
C2FL21	2113741F25	1000 pF
C2FL22	2113741F25	1000 pF
C3000	2113741F49	10000 pF
C3002	2113743K15	ceramic .100
C3003	2113743K15	ceramic .100
C3005	2113743K15	ceramic .100
C3006	2113743K15	ceramic .100
C3007	2113743K15	ceramic .100
C3008	2113743K15	ceramic .100
C3010	2113743K15	ceramic .100
C3011	2113741F49	10000 pF
C3012	2113741F49	10000 pF
C3013	2113741F49	10000 pF
C3014	2113741F49	10000 pF
C3015	2113741F49	10000 pF
C3016	2113741F49	10000 pF
C3017	2113741F49	10000 pF
C3019	2113740F47	68 pF
C3021	2113740F57	180 pF
C3023	2113740F39	33 pF
C3024	2113740F39	33 pF
C3025	2113740A43	39 pF
C3026	2113743K15	ceramic .100
C3027	2113741F49	10000 pF
C3028	2113741F49	10000 pF
C3029	2113741F49	10000 pF
C3031	2113741F49	10000 pF
C3033	2113743K15	ceramic .100
C3034	2113743K15	ceramic .100
C3035	2113743K15	ceramic .100
C3036	2113743K15	ceramic .100
C3037	2113743K15	ceramic .100
C3038	2113741F49	10000 pF
C3040	2113740F47	68 pF
C3041	2113740F47	68 pF
C3042	2113740F57	180 pF
C3043	2113740F57	180 pF
C3044	2113740A43	39 pF
C3045	2113741B69	100000 pF
C3046	2113741B69	100000 pF
C3047	2113741B69	100000 pF
C3048	2113741B69	100000 pF
C3075	2113741F49	10000 pF
C3110	2113743K15	ceramic .100
C3111	2113743K15	ceramic .100
C3112	2113743K15	ceramic .100
C3500	2311049J11	tantalum 4.7 10% 16V
C3900	2311049J39	tantalum 33 10% 16V
C4000	2113741F49	10000 pF
C4001	2113741F49	10000 pF
C4002	2113741F21	680 pF
C4003	2113741F49	10000 pF
C4004	2113743B24	.390 10%
C4005	2113741B69	100000 pF
C4006	2113741F37	3300 pF
C4007	2113741F25	1000 pF
C4008	2113741F25	1000 pF
C4009	2113743B24	.390 10%
C4010	2113743B24	.390 10%
C4011	2113743B24	.390 10%
C4012	2113743B24	.390 10%
C4013	2113741F37	3300 pF
C4014	2113741F21	680 pF
C4015	2113741F29	1500 pF
C4016	2113743B24	.390 10%
C4017	2113743B24	.390 10%
C4018	2113741B69	100000 pF
C4019	2113741B69	100000 pF
C4020	2113740A67	330 pF
C4021	2113741F25	1000 pF
C4022	2113741F25	1000 pF
C4023	2113741F21	680 pF
C4024	2109720D14	ceramic low dist .1
C4025	2311049J11	tantalum 4.7 10% 16V
C4026	2109720D14	ceramic low dist .1
C4027	2311049J11	tantalum 4.7 10% 16V
C4030	2109720D14	ceramic low dist .1
C4034	2109720D14	ceramic low dist .1

HIGH-POWER BOARD

Model FRN5767

Schematic Diagra

Harmonic Filter Drivers Sectio



68P02952C55

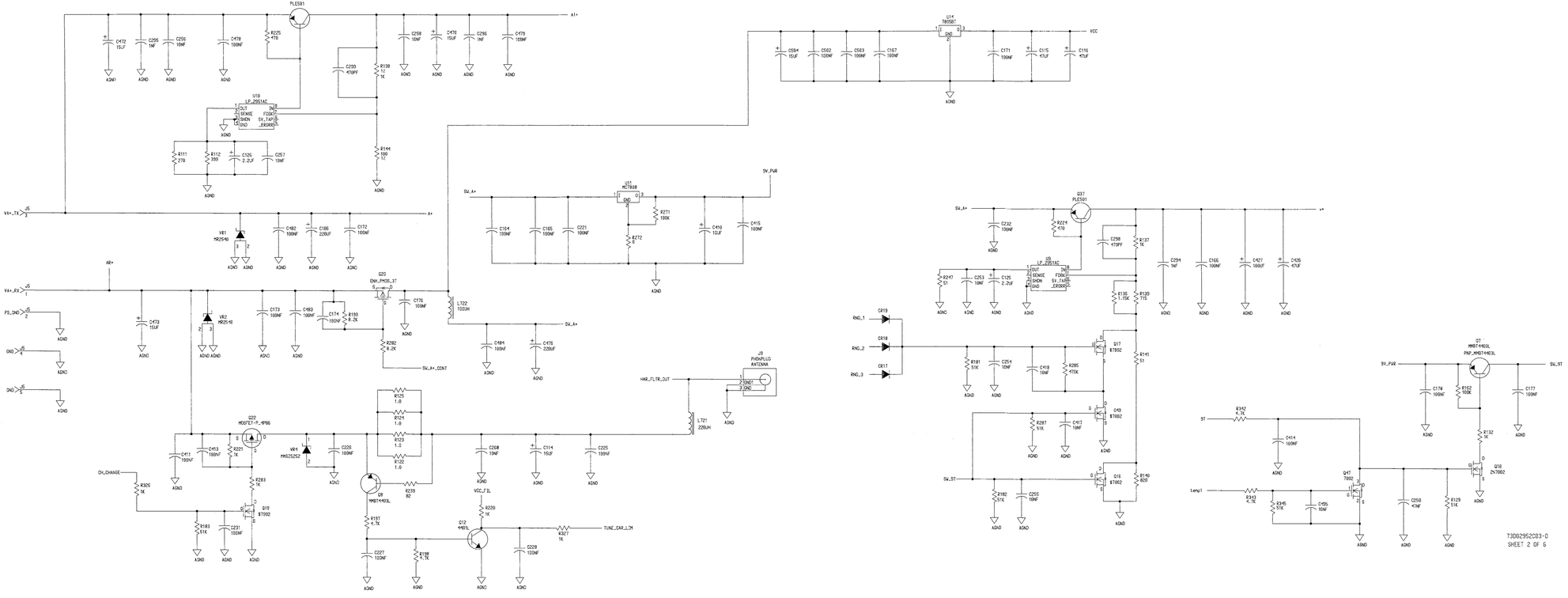
73D02952C03-O
SHEET 1 OF 6

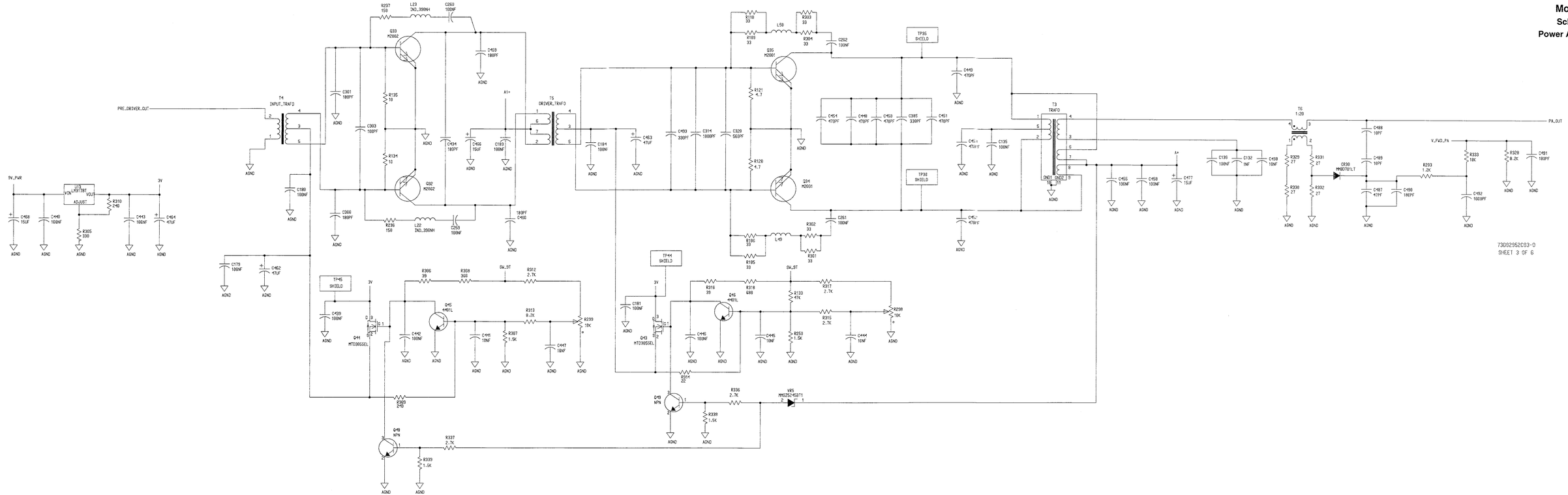
HIGH-POWER BOARD

Model FRN5767B

Schematic Diagram

DC Regulators Section



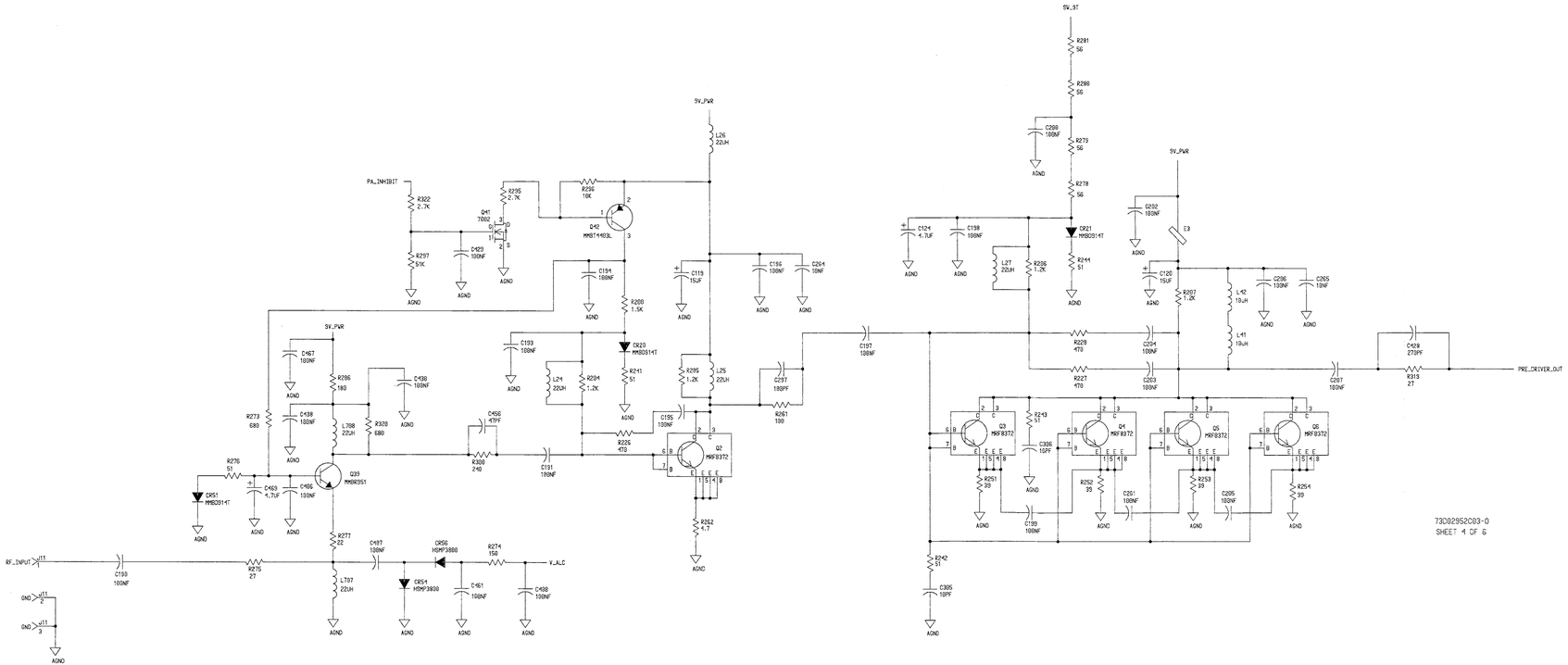

9V_PWR
U13
LM317BT
VIN
ADJUST
VOUT
3V
PRE_DRIVER_OUT
T4
INPUT_TRAFO
T5
DRIVER_TRAFO
A1+
Q33
M2882
Q32
M2882
Q35
M2881
Q34
M2881
L23
IND_39NH
L22
IND_39NH
L59
L49
T3
TRAFO
T6
1:20
PA_OUT
V_FWD_PA
CR30
MMBD701LT
Q45
4401L
Q46
4401L
Q41
MTD3055EL
Q43
MTD3055EL
Q48
NPN
Q49
NPN
VR5
MMBZ5245BT1
TP35
SHIELD
TP36
SHIELD
TP44
SHIELD
TP45
SHIELD
SW_ST
AGND
73D02952C03-O
SHEET 3 OF 6

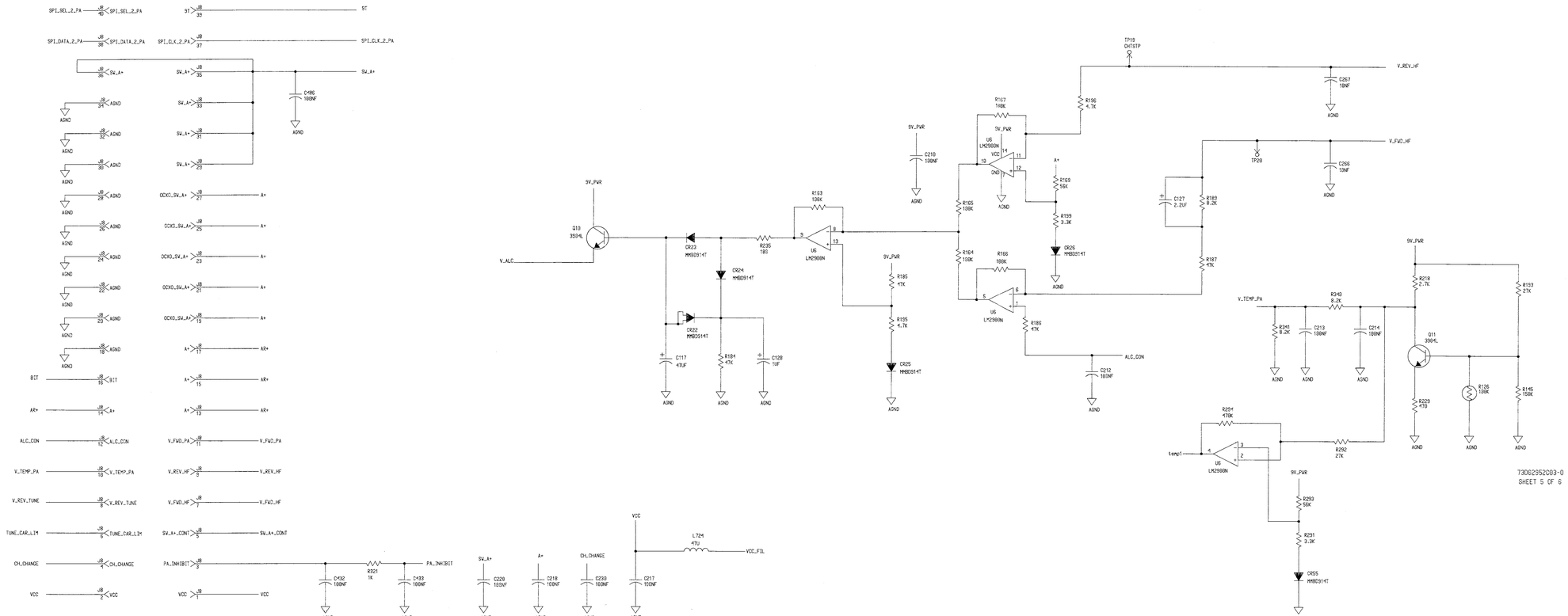
HIGH-POWER BOARD

Model FRN5767B

Schematic Diagram

Drivers Section



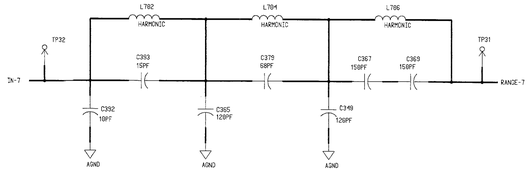

SPI_SEL_2_PA
SPI_DATA_2_PA
SPI_CLK_2_PA
ST
SW_A+
AGND
OCXO_SW_A+
A+
BIT
AR+
ALC_CON
V_TEMP_PA
V_REV_TUNE
TUNE_CAR_LIM
CH_CHANGE
VCC
V_FWD_PA
V_REV_HF
V_FWD_HF
SW_A+_CONT
PA_INHIBIT
C496 100NF
C432 100NF
R321 1K
C433 100NF
C229 100NF
C218 100NF
C230 100NF
C217 100NF
L724 47U
VCC_FIL
TP19 ONTSTP
V_REV_HF
C267 10NF
V_FWD_HF
TP20
C266 10NF
R196 4.7K
R107 100K
U5 LM2900N
R169 56K
R199 3.3K
CR26 MMBD914T
C127 2.2UF
R188 8.2K
R187 47K
R165 100K
R164 100K
R166 100K
R186 47K
C212 100NF
ALC_CON
9V_PWR
C210 100NF
Q10 3904L
V_ALC
CR23 MMBD914T
CR24 MMBD914T
CR22 MMBD914T
R235 10Ω
R183 100K
U6 LM2900N
R195 47K
R155 4.7K
CR25 MMBD914T
C117 47UF
R184 47K
C128 1UF
V_TEMP_PA
R340 8.2K
R341 8.2K
C213 100NF
C214 100NF
R218 2.7K
R153 27K
Q11 3904L
R229 47Ω
R126 100K
R145 150K
R294 470K
R292 27K
temp1
U6 LM2900N
R293 56K
R291 3.3K
CR55 MMBD914T
73D02952C03-0
SHEET 5 OF 6

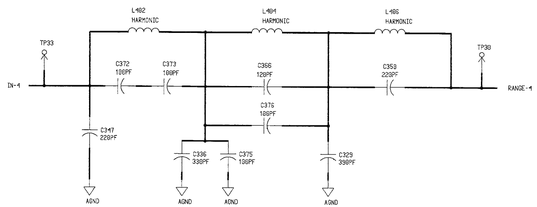
HIGH-POWER BOARD

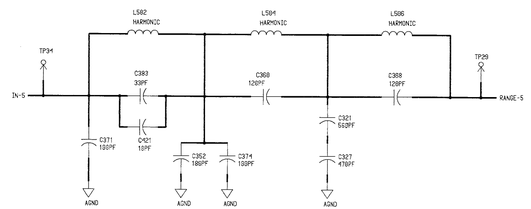
Model FRN5767B

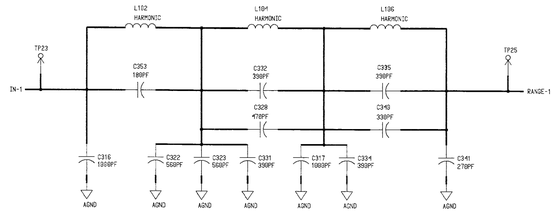
Schematic Diagram

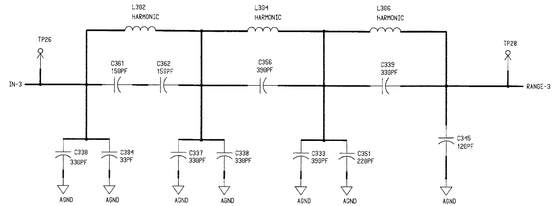
Harmonic Filter Section

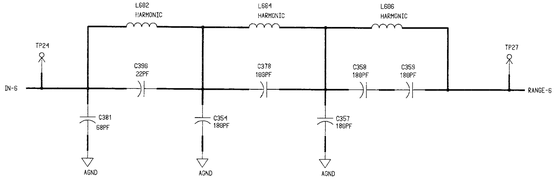


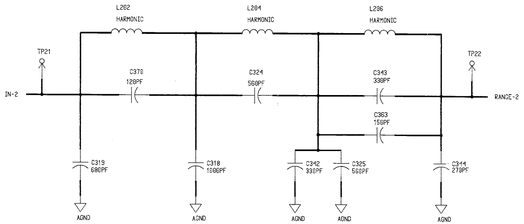




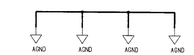


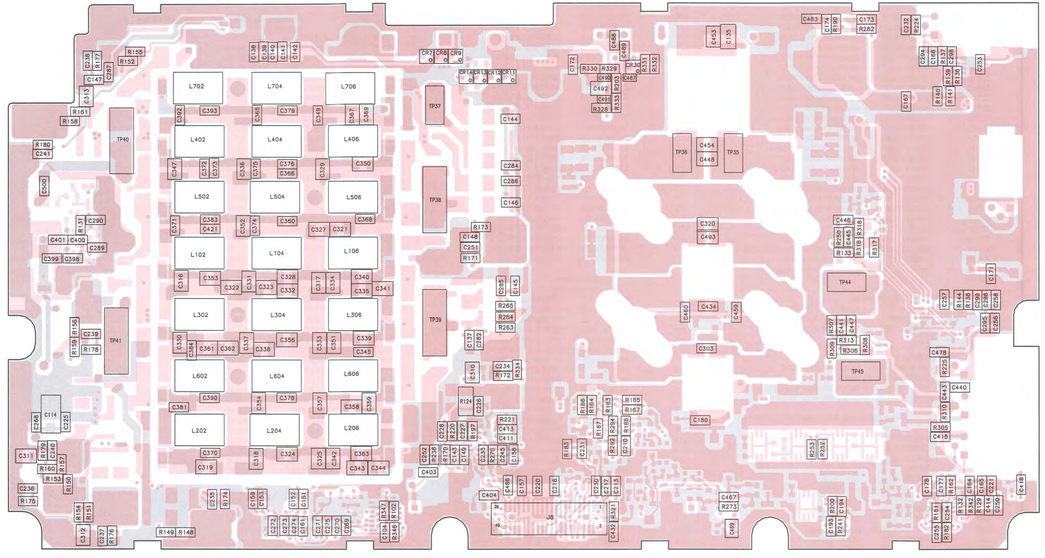






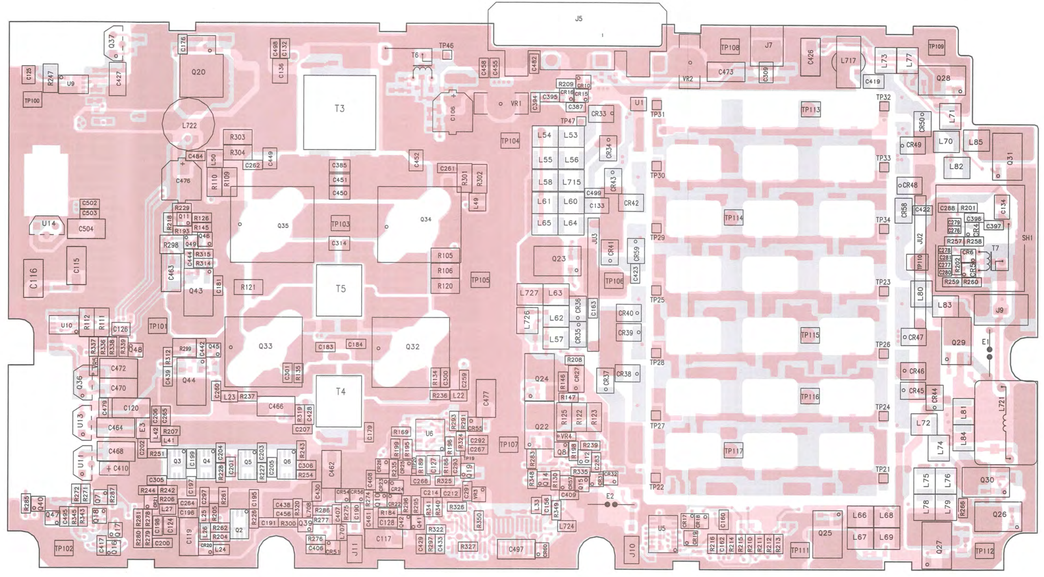
73D02952C03-O
SHEET 6 OF 6





SHOWN FROM SOLDER SIDE

OVERLAY * 79B02953C27-O
COMPONENT SIDE : 79B02953C28-O
SOLDER SIDE : 79B02953C29-O



SHOWN FROM COMPONENT SIDE

OVERLAY * 79B02953C26-O
COMPONENT SIDE : 79B02953C28-O
SOLDER SIDE : 79B02953C29-O

parts list

FRN5767B High Power Board

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitors: µF, ±5%, 50V, unless otherwise specified
C104	2113741B69	100000 pF
C106	2380090M32	ALU 220 20% 35V
C114	2311049A20	tantalum 15 10% 25V
C115	2311049A23	tantalum 47 10% 10V
C116	2311049A23	tantalum 47 10% 10V
C117	2311049A23	tantalum 47 10% 10V
C119	2311049A20	tantalum 15 10% 25V
C120	2311049A20	tantalum 15 10% 25V
C124	2311049A13	tantalum 4.7 10% 10V
C125	2311049A09	tantalum 2.2 10% 20V
C126	2311049A09	tantalum 2.2 10% 20V
C127	2311049A09	tantalum 2.2 10% 20V
C128	2311049A07	tantalum 1 10% 16V
C132	2113740B73	1000 pF
C133	2113741D20	100000 pF
C134	2113741D20	100000 pF
C135	2113741D20	100000 pF
C136	2113741D20	100000 pF
C137	2113741B69	100000 pF
C138	2113741B69	100000 pF
C139	2113741B69	100000 pF
C140	2113741B69	100000 pF
C141	2113741B69	100000 pF
C142	2113741B69	100000 pF
C143	2113741B69	100000 pF
C144	2113741B69	100000 pF
C145	2113741B69	100000 pF
C146	2113741B69	100000 pF
C147	2113741B69	100000 pF
C148	2113741B69	100000 pF
C149	2113741B69	100000 pF
C151	2113741B69	100000 pF
C152	2113741B69	100000 pF
C153	2113741B69	100000 pF
C156	2113741B69	100000 pF
C157	2113741B69	100000 pF
C158	2113741B69	100000 pF
C159	2113741B69	100000 pF
C160	2113741B69	100000 pF
C161	2113741B69	100000 pF
C162	2113741B69	100000 pF
C163	2113741B69	100000 pF
C164	2113741B69	100000 pF
C165	2113741B69	100000 pF
C166	2113741B69	100000 pF
C167	2113741B69	100000 pF
C171	2113741B69	100000 pF
C172	2113741B69	100000 pF
C173	2113741B69	100000 pF
C174	2113741B69	100000 pF
C176	2113741B69	100000 pF
C177	2113741B69	100000 pF
C178	2113741B69	100000 pF
C179	2113741B69	100000 pF
C180	2113741B69	100000 pF
C181	2113741B69	100000 pF
C183	2113741B69	100000 pF
C184	2113741B69	100000 pF
C190	2113741B69	100000 pF
C191	2113741B69	100000 pF
C193	2113741B69	100000 pF
C194	2113741B69	100000 pF
C195	2113741B69	100000 pF
C196	2113741B69	100000 pF
C197	2113741B69	100000 pF
C198	2113741B69	100000 pF
C199	2113741B69	100000 pF
C200	2113741B69	100000 pF
C201	2113741B69	100000 pF
C202	2113741B69	100000 pF
C203	2113741B69	100000 pF
C204	2113741B69	100000 pF
C205	2113741B69	100000 pF
C206	2113741B69	100000 pF
C207	2113741B69	100000 pF
C210	2113741B69	100000 pF
C212	2113741B69	100000 pF
C213	2113741B69	100000 pF
C214	2113741B69	100000 pF
C217	2113741B69	100000 pF
C218	2113741B69	100000 pF
C220	2113741B69	100000 pF
C221	2113741B69	100000 pF
C225	2113741B69	100000 pF
C226	2113741B69	100000 pF
C227	2113741B69	100000 pF
C228	2113741B69	100000 pF
C230	2113741B69	100000 pF
C231	2113741B69	100000 pF
C232	2113741B69	100000 pF
C233	2113741B61	47000 pF
C234	2113741B61	47000 pF
C235	2113741B61	47000 pF
C236	2113741B61	47000 pF
C237	2113741B61	47000 pF
C238	2113741B61	47000 pF
C239	2113741B61	47000 pF
C240	2113741B61	47000 pF
C241	2113741B61	47000 pF
C242	2113741B61	47000 pF
C250	2113741B61	47000 pF
C251	2113741B45	10000 pF
C252	2113741B45	10000 pF
C253	2113741B45	10000 pF
C254	2113741B45	10000 pF
C255	2113741B45	10000 pF
C256	2113741B45	10000 pF
C257	2113741B45	10000 pF
C258	2113741B45	10000 pF
C259	2113741B69	100000 pF
C260	2113741B69	100000 pF
C261	2113741B69	100000 pF
C262	2113741B69	100000 pF
C264	2113741B45	10000 pF
C265	2113741B45	10000 pF
C266	2113741B45	10000 pF
C267	2113741B45	10000 pF
C268	2113741B45	10000 pF
C269	2113741B21	1000 pF
C270	2113741B21	1000 pF
C271	2113741B45	10000 pF
C272	2113741B21	1000 pF
C273	2113741B21	1000 pF
C274	2113741B21	1000 pF
C275	2113741B21	1000 pF
C276	2113740R61	ceramic 180 pF 5% 100V
C277	2113740R61	ceramic 180 pF 5% 100V
C278	2113740R55	ceramic 100 pF 5% 100V
C279	2113740R46	ceramic 47 pF 5% 100V
C280	2113740R46	ceramic 47 pF 5% 100V
C281	2113740R29	ceramic 10 pF 5% 100V
C282	2113740B73	1000 pF
C283	2113740B73	1000 pF
C284	2113740B73	1000 pF
C285	2113740B73	1000 pF
C286	2113740B73	1000 pF
C287	2113740B73	1000 pF
C288	2113740B73	1000 pF
C289	2113740B73	1000 pF
C290	2113740B73	1000 pF
C291	2113740B73	1000 pF
C292	2113740B73	1000 pF
C293	2113740B73	1000 pF
C294	2113740B73	1000 pF
C295	2113740B73	1000 pF
C296	2113740B73	1000 pF
C297	2113739A49	100 pF
C298	2113740B65	470 pF
C299	2113740B65	470 pF
C300	2113740B55	180 pF
C301	2113740B55	180 pF
C303	2113740B49	100 pF
C305	2113740B25	10 pF
C306	2113740B25	10 pF
C309	2102841C20	ceramic 1000 pF 500V NPO
C310	2102841C20	ceramic 1000 pF 500V NPO
C311	2102841C20	ceramic 1000 pF 500V NPO
C312	2102841C20	ceramic 1000 pF 500V NPO
C313	2102841C20	ceramic 1000 pF 500V NPO
C314	2102841C20	ceramic 1000 pF 500V NPO
C316	2102841C20	ceramic 1000 pF 500V NPO
C317	2102841C20	ceramic 1000 pF 500V NPO
C318	2102841C20	ceramic 1000 pF 500V NPO
C319	2102841C19	ceramic 680 pF 500V NPO
C320	2102841C18	ceramic 560 pF 500V NPO
C321	2102841C18	ceramic 560 pF 500V NPO
C322	2102841C18	ceramic 560 pF 500V NPO
C323	2102841C18	ceramic 560 pF 500V NPO
C324	2102841C18	ceramic 560 pF 500V NPO
C325	2102841C18	ceramic 560 pF 500V NPO
C327	2102841C17	ceramic 470 pF 500V NPO
C328	2102841C17	ceramic 470 pF 500V NPO
C329	2102841C16	ceramic 390 pF 500V NPO
C330	2102841C15	ceramic 330 pF 500V NPO
C331	2102841C16	ceramic 390 pF 500V NPO
C332	2102841C16	ceramic 390 pF 500V NPO
C333	2102841C16	ceramic 390 pF 500V NPO
C334	2102841C16	ceramic 390 pF 500V NPO
C335	2102841C16	ceramic 390 pF 500V NPO
C336	2102841C16	ceramic 390 pF 500V NPO
C337	2102841C15	ceramic 330 pF 500V NPO
C338	2102841C15	ceramic 330 pF 500V NPO
C339	2102841C16	ceramic 390 pF 500V NPO
C340	2102841C15	ceramic 330 pF 500V NPO
C341	2102841C14	ceramic 270 pF 500V NPO
C342	2102841C15	ceramic 330 pF 500V NPO
C343	2102841C15	ceramic 330 pF 500V NPO
C344	2102841C14	ceramic 270 pF 500V NPO
C345	2102841C10	ceramic 120 pF 500V NPO
C347	2102841C15	ceramic 220 pF 500V NPO
C349	2102841C10	ceramic 120 pF 500V NPO
C350	2102841C13	ceramic 220 pF 500V NPO
C351	2102841C13	ceramic 220 pF 500V NPO
C352	2102841C12	ceramic 180 pF 500V NPO
C353	2102841C12	ceramic 180 pF 500V NPO
C354	2102841C12	ceramic 180 pF 500V NPO
C356	2102841C16	ceramic 390 pF 500V NPO
C357	2102841C12	ceramic 180 pF 500V NPO
C358	2102841C12	ceramic 180 pF 500V NPO
C359	2102841C12	ceramic 180 pF 500V NPO
C360	2102841C10	ceramic 120 pF 500V NPO
C361	2102841C11	ceramic 150 pF 500V NPO
C362	2102841C11	ceramic 150 pF 500V NPO
C363	2102841C11	ceramic 150 pF 500V NPO
C365	2102841C10	ceramic 120 pF 500V NPO
C366	2102841C10	ceramic 120 pF 500V NPO
C367	2102841C11	ceramic 150 pF 500V NPO
C368	2102841C10	ceramic 120 pF 500V NPO
C369	2102841C11	ceramic 150 pF 500V NPO
C370	2102841C10	ceramic 120 pF 500V NPO
C371	2102841C09	ceramic 100 pF 500V NPO
C372	2102841C09	ceramic 100 pF 500V NPO
C373	2102841C09	ceramic 100 pF 500V NPO
C374	2102841C09	ceramic 100 pF 500V NPO
C375	2102841C09	ceramic 100 pF 500V NPO
C376	2102841C09	ceramic 100 pF 500V NPO
C378	2102841C09	ceramic 100 pF 500V NPO
C379	2102841C08	ceramic 68 pF 500V NPO
C381	2102841C08	ceramic 68 pF 500V NPO
C383	2102841C05	ceramic 33 pF 500V NPO
C384	2102841C05	ceramic 33 pF 500V NPO
C385	2102841C15	ceramic 330 pF 500V NPO
C387	2102841C03	ceramic 22 pF 500V NPO
C390	2102841C03	ceramic 22 pF 500V NPO
C392	2102841C01	ceramic 10 pF 500V NPO
C393	2102841C02	ceramic 15 pF 500V NPO
C394	2102841C01	ceramic 10 pF 500V NPO
C395	2102841C01	ceramic 10 pF 500V NPO
C396	2102841C01	ceramic 10 pF 500V NPO
C397	2102841C01	ceramic 10 pF 500V NPO
C398	2102841C01	ceramic 10 pF 500V NPO
C399	2102841C01	ceramic 10 pF 500V NPO
C400	2102841C01	ceramic 10 pF 500V NPO
C401	2102841C01	ceramic 10 pF 500V NPO
C403	2113741B69	100000 pF
C404	2113741B69	100000 pF
C406	2113741B69	100000 pF
C407	2113741B69	100000 pF
C408	2113741B69	100000 pF
C409	2113741B61	47000 pF
C410	2311049A18	tantalum 10 10% 16V
C411	2113741B69	100000 pF
C413	2113741B69	100000 pF
C414	2113741B69	100000 pF
C415	2113741B69	100000 pF
C417	2113741B45	10000 pF
C418	2113741B45	10000 pF
C419	2102841C20	ceramic 1000 pF 500V NPO
C421	2102841C01	ceramic 10 pF 500V NPO
C422	2102841C01	ceramic 10 pF 500V NPO
C423	2102841C01	ceramic 10 pF 500V NPO
C426	2311049A23	tantalum 47 10% 10V
C427	2305884W01	100 tantalum 10V
C428	2113740B59	270 pF
C429	2113741B69	100000 pF
C430	2113741B69	100000 pF
C432	2113741B69	100000 pF
C433	2113741B69	100000 pF
C434	2113740B55	180 pF
C438	2113741B69	100000 pF
C439	2113741B69	100000 pF
C440	2113741B69	100000 pF
C441	2113741B45	10000 pF
C442	2113741B69	100000 pF
C443	2113741B69	100000 pF
C444	2113741B45	10000 pF
C445	2113741B45	10000 pF
C446	2113741B69	100000 pF
C447	2113741B45	10000 pF
C448	2102841C17	ceramic 470 pF 500V NPO
C449	2102841C17	ceramic 470 pF 500V NPO
C450	2102841C17	ceramic 470 pF 500V NPO
C451	2102841C17	ceramic 470 pF 500V NPO
C452	2102841C17	ceramic 470 pF 500V NPO
C453	2102841C17	ceramic 470 pF 500V NPO
C454	2102841C17	ceramic 470 pF 500V NPO
C455	2113741B69	100000 pF
C456	2113740B41	47 pF
C458	2113741B69	100000 pF
C459	2113740B55	180 pF
C460	2113740B55	180 pF
C461	2113741B69	100000 pF
C462	2311049A23	tantalum 47 10% 10V
C463	2311049A23	tantalum 47 10% 10V
C464	2311049A23	tantalum 47 10% 10V
C466	2311049A20	tantalum 15 10% 25V
C467	2113741B69	100000 pF
C468	2311049A20	tantalum 15 10% 25V
C469	2311049A20	tantalum 15 10% 25V
C470	2311049A20	tantalum 15 10% 25V
C472	2311049A20	tantalum 15 10% 25V
C473	2311049A20	tantalum 15 10% 25V
C476	2380090M32	ALU 220 20% 35V
C477	2311049A20	tantalum 15 10% 25V
C478	2113741B69	100000 pF
C479	2113741B69	100000 pF
C482	2113741B69	100000 pF
C483	2113741B69	100000 pF
C484	2113741B69	100000 pF
C486	2113741B69	100000 pF
C487	2113740A46	47 pF
C488	2102841C01	ceramic 10 pF 500V NPO
C489	2102841C01	ceramic 10 pF 500V NPO
C490	2113740A61	180 pF
C491	2113740A61	180 pF
C492	2102841C20	ceramic 1000 pF 500V NPO
C493	2102841C01	ceramic 10 pF 500V NPO
C495	2113741B45	10000 pF
C497	2311049A23	tantalum 47 10% 10V
C498	2113741B45	10000 pF
C499	2113741B45	10000 pF
C500	2113741B45	10000 pF
C502	2113741B69	100000 pF
C503	2113741B69	100000 pF
C504	2311049A20	tantalum 15 10% 25V
		diodes: (See Note 1)
CR4	4882290T01	SI hot carrier HSMS-2800-31
CR5	4882290T01	SI hot carrier HSMS-2800-31
CR6	4882290T01	SI hot carrier HSMS-2800-31
CR7	4813833C09	.1A 100V 'DX'
CR8	4813833C09	.1A 100V 'DX'
CR9	4813833C09	.1A 100V 'DX'
CR10	4813833C09	.1A 100V 'DX'
CR11	4813833C09	.1A 100V 'DX'
CR12	4813833C09	.1A 100V 'DX'
CR13	4813833C09	.1A 100V 'DX'
CR14	4813833C09	.1A 100V 'DX'
CR15	4813833C09	.1A 100V 'DX'
CR16	4813833C09	.1A 100V 'DX'
CR17	4813833C09	.1A 100V 'DX'
CR18	4813833C09	.1A 100V 'DX'
CR19	4813833C09	.1A 100V 'DX'
CR20	4813833C09	.1A 100V 'DX'
CR21	4813833C09	.1A 100V 'DX'
CR22	4813833C09	.1A 100V 'DX'
CR23	4813833C09	.1A 100V 'DX'
CR24	4813833C09	.1A 100V 'DX'
CR25	4813833C09	.1A 100V 'DX'
CR26	4813833C09	.1A 100V 'DX'
CR27	4813833B06	rect 1A 600V MURS160T3
CR30	4813825A08	70V hot carrier MMBD701L
CR31	4808115L08	pin SMD HSMP3800
CR32	4808115L08	pin SMD HSMP3800
CR33	4808115L07	pin MA4P4006F SMD
CR34	4808115L07	pin MA4P4006F SMD
CR35	4808115L07	pin MA4P4006F SMD
CR36	4808115L07	pin MA4P4006F SMD
CR37	4808115L07	pin MA4P4006F SMD
CR38	4808115L07	pin MA4P4006F SMD
CR39	4808115L07	pin MA4P4006F SMD
CR40	4808115L07	pin MA4P4006F SMD
CR41	4808115L07	pin MA4P4006F SMD
CR42	4808115L07	pin MA4P4006F SMD
CR43	4808115L07	pin MA4P4006F SMD
CR44	4808115L07	pin MA4P4006F SMD
CR45	4808115L07	pin MA4P4006F SMD
CR46	4808115L07	pin MA4P4006F SMD
CR47	4808115L07	pin MA4P4006F SMD
CR48	4808115L07	pin MA4P4006F SMD
CR49	4808115L07	pin MA4P4006F SMD
CR50	4808115L07	pin MA4P4006F SMD
CR51	4813833C09	.1A 100V 'DX'
CR54	4808115L08	pin SMD HSMP3800
CR55	4813833C09	.1A 100V 'DX'
CR56	4808115L08	pin SMD HSMP3800
CR57	4813833C02	dual 70V 'SB' common cathode
CR58	4808115L07	pin MA4P4006F SMD
CR59	4808115L07	pin MA4P4006F SMD
CR60	4813833C09	.1A 100V 'DX'
		spark gaps:
E1	8083029H04	spark gap UZ350B
E2	8083029H03	spark gap U90B
E3	2484657R01	inductor bead chip
		connectors, receptacles:
J5	2802919S02	connector
J8	2804644P01	header 40 pos. 0.050"
J9	0980001F01	jack phono
J10	0980135M01	receptacle coax 002 pins
J11	0980135M01	receptacle coax 002 pins
		inductors: nH, 5%, unless otherwise specified:
L22	2462587T22	chip 390 LOW PRO
L23	2462587T22	chip 390 LOW PRO
L24	2462587T28	chip 22000
L25	2462587T28	chip 22000
L26	2462587P28	chip 22000
L27	2462587P28	chip 22000
L33	2462587P24	chip 10000
L41	2462587P24	chip 10000
L42	2462587P24	chip 10000
L49	2460591P75	coil air wound 72.22
L50	2460591P75	coil air wound 72.22
L53	2409646B25	SMD 100 10% µH
L54	2409646B25	SMD 100 10% µH
L55	2409646B25	SMD 100 10% µH
L56	2409646B25	SMD 100 10% µH
L57	2409646B25	SMD 100 10% µH
L58	2409646B25	SMD 100 10% µH
L60	2409646B25	SMD 100 10% µH
L61	2409646B25	SMD 100 10% µH
L62	2409646B25	SMD 100 10% µH
L63	2409646B25	SMD 100 10% µH
L64	2409646B25	SMD 100 10% µH
L65	2409646B25	SMD 100 10% µH
L66	2409646B25	SMD 100 10% µH
L67	2409646B25	SMD 100 10% µH
L68	2409646B25	SMD 100 10% µH
L69	2409646B25	SMD 100 10% µH
L70	2409646B25	SMD 100 10% µH
L71	2409646B25	SMD 100 10% µH
L72	2409646B25	SMD 100 10% µH
L73	2409646B25	SMD 100 10% µH
L74	2409646B25	SMD 100 10% µH
L75	2409646B25	SMD 100 10% µH
L76	2409646B25	SMD 100 10% µH
L77	2409646B25	SMD 100 10% µH
L78	2409646B25	SMD 100 10% µH
L79	2409646B25	SMD 100 10% µH
L80	2409646B25	SMD 100 10% µH
L81	2409646B25	SMD 100 10% µH
L82	2409646B25	SMD 100 10% µH
L83	2409646B25	SMD 100 10% µH
L84	2409646B25	SMD 100 10% µH
L85	2409646B25	SMD 100 10% µH
L707	2462587P28	chip 22000
L708	2462587P28	chip 22000
L715	2409646B25	SMD 100 10% µH
L717	2408050H15	RF coil 2.03 µH
L721	2404626P01	RF choke 220 µH
L722	2404639P01	coil RF 100 µH 10% radial
L724	2462587L46	chip 47000 10%
L726	2409646B25	SMD 100 10% µH
L727	2409646B25	SMD 100 10% µH
		transistors: (See Note 1)
Q2	4813827A26	NPN sml sig MRF8372 8372
Q3	4813827A26	NPN sml sig MRF8372 8372
Q4	4813827A26	NPN sml sig MRF8372 8372
Q5	4813827A26	NPN sml sig MRF8372 8372
Q6	4813827A26	NPN sml sig MRF8372 8372
Q7	4813824A18	PNP 40V .6A B=100
Q8	4813824A18	PNP 40V .6A B=100
Q10	4813824A10	NPN 40V .2A
Q11	4813824A10	NPN 40V .2A
Q12	4813824A12	NPN 40V .6A B=80
Q14	4813823A07	N-CH TMOS FET 2N7002LT1
Q15	4813823A07	N-CH TMOS FET 2N7002LT1
Q16	4813823A07	N-CH TMOS FET 2N7002LT1
Q17	4813823A07	N-CH TMOS FET 2N7002LT1
Q18	4813823A07	N-CH TMOS FET 2N7002LT1
Q19	4813823A07	N-CH TMOS FET 2N7002LT1
Q20	4813821A23	FET P-CH 30V 50A
Q22	4813821A32	P-CH power FET 60V 5A
Q23	4813821A07	N-CH 500V 2A MTD2N50T4
Q24	4813821A07	N-CH 500V 2A MTD2N50T4
Q25	4813821A07	N-CH 500V 2A MTD2N50T4
Q26	4813821A07	N-CH 500V 2A MTD2N50T4
Q27	4813821A07	N-CH 500V 2A MTD2N50T4
Q28	4813821A07	N-CH 500V 2A MTD2N50T4
Q29	4813821A07	N-CH 500V 2A MTD2N50T4
Q30	4813821A07	N-CH 500V 2A MTD2N50T4
Q31	4813821A07	N-CH 500V 2A MTD2N50T4
Q36	4808698907	M9807
Q37	4808698907	M9807
Q39	4813827A08	NPN sml sig MMBR951LT1 7Z
Q40	4813823A07	N-CH TMOS FET 2N7002LT1
Q41	4813823A07	N-CH TMOS FET 2N7002LT1
Q42	4813824A18	PNP 40V .6A SW B=100
Q43	4813821A36	STAR - CH 60V 12A
Q44	4813821A36	STAR - CH 60V 12A
Q45	4813824A12	NPN 40V .6A B=80
Q46	4813824A12	NPN 40V .6A B=80
Q47	4813823A07	N-CH TMOS FET 2N7002LT1
Q48	4813824A12	NPN 40V .6A B=80
Q49	4813824A12	NPN 40V .6A B=80
		resistors, Ω, ±5%, 1/8W, unless otherwise specified:
R102	0611077B15	chip 47K
R105	0683962T37	chip 33 1W
R106	0683962T37	chip 33 1W
R109	0683962T37	chip 33 1W
R110	0683962T37	chip 33 1W
R111	0683962T59	chip 270 1W
R112	0683962T63	chip 390 1W
R120	0683962T17	chip 4.7 1W
R121	0683962T17	chip 4.7 1W
R122	0683962T01	chip 1.0 1W
R123	0683962T01	chip 1.0 1W
R124	0683962T01	chip 1.0 1W
R125	0683962T01	chip 1.0 1W
R126	0680149M02	thermistor chip 100 kΩ
R129	0611077B16	chip 51K
R130	0611077A98	chip 10K
R131	0611077A98	chip 10K
R132	0611077A74	chip 1000
R133	0611077B15	chip 47K
R134	0611077A26	chip 10
R135	0611077A26	chip 10
R137	0611077E94	chip 1000 1%
R138	0611077E94	chip 1000 1%
R139	0611077A62	chip 330
R140	0611077A72	chip 820
R141	0611077A43	chip 51
R144	0611077D97	chip 100 1%
R145	0611077B27	chip 150K
R146	0611077B27	chip 150K
R147	0611077B27	chip 150K
R148	0611077B27	chip 150K
R149	0611077B27	chip 150K
R150	0611077B27	chip 150K
R151	0611077B27	chip 150K
R152	0611077B27	chip 150K
R153	0611077B27	chip 150K
R154	0611077B27	chip 150K
R155	0611077B27	chip 150K
R156	0611077B27	chip 150K
R157	0611077B27	chip 150K
R158	0611077B27	chip 150K
R159	0611077B27	chip 150K
R160	0611077B27	chip 150K
R161	0611077B27	chip 150K
R162	0611077B23	chip 100K
R163	0611077B23	chip 100K
R164	0611077B23	chip 100K
R165	0611077B23	chip 100K
R166	0611077B23	chip 100K
R167	0611077B23	chip 100K
R169	0611077B17	chip 56K
R170	0611077B16	chip 51K
R171	0611077B16	chip 51K
R172	0611077B16	chip 51K
R173	0611077B16	chip 51K
R174	0611077B16	chip 51K
R175	0611077B16	chip 51K
R176	0611077B16	chip 51K
R177	0611077B16	chip 51K
R178	0611077B16	chip 51K
R179	0611077B16	chip 51K

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R180	0611077B16	chip 51K
R181	0611077B16	chip 51K
R182	0611077B16	chip 51K
R183	0611077B16	chip 51K
R184	0611077B07	chip 22K
R185	0611077B15	chip 47K
R186	0611077B15	chip 47K
R187	0611077B15	chip 47K
R189	0611077A96	chip 8200
R190	0611077A96	chip 8200
R193	0611077B09	chip 27K
R195	0611077A90	chip 4700
R196	0611077A84	chip 2700
R197	0611077A90	chip 4700
R198	0611077A90	chip 4700
R199	0611077A86	chip 3300
R200	0611077A78	chip 1500
R201	0611077A76	chip 1200
R202	0611077A76	chip 1200
R203	0611077A76	chip 1200
R204	0611077A76	chip 1200
R205	0611077A76	chip 1200
R206	0611077A76	chip 1200
R207	0611077A76	chip 1200
R208	0611077A74	chip 1000
R209	0611077A74	chip 1000
R210	0611077A74	chip 1000
R211	0611077A74	chip 1000
R212	0611077A74	chip 1000
R213	0611077A74	chip 1000
R214	0611077A74	chip 1000
R215	0611077A74	chip 1000
R216	0611077A74	chip 1000
R218	0611077A84	chip 2700
R220	0611077A74	chip 1000
R221	0611077A74	chip 1000
R224	0611077A66	chip 470
R225	0611077A66	chip 470
R226	0611077A66	chip 470
R227	0611077A66	chip 470
R228	0611077A66	chip 470
R229	0611077A66	chip 470
R235	0611077A56	chip 180
R236	0611077A54	chip 150
R237	0611077A54	chip 150
R238	0611077A53	chip 130
R239	0611077A48	chip 82
R241	0611077A43	chip 51
R242	0611077A43	chip 51
R243	0611077A43	chip 51
R244	0611077A43	chip 51
R247	0683962T42	chip 51 1W
R250	0611077A78	chip 1500
R251	0611077A40	chip 39
R252	0611077A40	chip 39
R253	0611077A40	chip 39
R254	0611077A40	chip 39
R257	0611077A36	chip 27
R258	0611077A36	chip 27
R259	0611077A36	chip 27
R260	0611077A36	chip 27
R261	0611077A50	chip 100
R262	0611077A18	chip 4.7
R263	0611077A16	chip 3.9
R264	0611077A12	chip 2.7
R265	0611077A12	chip 2.7
R266	0611077A02	chip 1.0
R270	0611077B16	chip 51K
R271	0611077A74	chip 1000

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R272	0611077A44	chip 56
R273	0611077A70	chip 680
R274	0611077A54	chip 150
R275	0611077A36	chip 27
R276	0611077A43	chip 51
R277	0611077A34	chip 22
R278	0611077A44	chip 56
R279	0611077A44	chip 56
R280	0611077A44	chip 56
R281	0611077A44	chip 56
R282	0611077A96	chip 8200
R283	0611077A74	chip 1000
R285	0611077B39	chip 470K
R286	0611077A56	chip 180
R287	0611077B16	chip 51K
R291	0611077A86	chip 3300
R292	0611077B09	chip 27K
R293	0611077B17	chip 56K
R294	0611077B39	chip 470K
R295	0611077A84	chip 2700
R296	0611077A98	chip 10K
R297	0611077B16	chip 51K
R298	1813905A10	potentiometer 10 kΩ 20%
R299	1813905A10	potentiometer 10 kΩ 20%
R300	0611077A59	chip 240
R301	0683962T37	chip 33 1W
R302	0683962T37	chip 33 1W
R303	0683962T37	chip 33 1W
R304	0683962T37	chip 33 1W
R305	0611077A62	chip 330
R306	0611077A40	chip 39
R306	0680149M01	thermistor chip 470
R307	0611077A78	chip 1500
R308	0611077A63	chip 360
R309	0611077A59	chip 240
R310	0611077A59	chip 240
R312	0611077A84	chip 2700
R313	0611077A96	chip 8200
R314	0611077A34	chip 22
R315	0611077A84	chip 2700
R316	0611077A40	chip 39
R316	0680149M01	thermistor chip 470
R317	0611077A84	chip 2700
R318	0611077A70	chip 680
R319	0611077A36	chip 27
R320	0611077A70	chip 680
R321	0611077A74	chip 1000
R322	0611077A84	chip 2700
R324	0611077A76	chip 1200
R325	0611077A76	chip 1200
R326	0611077A74	chip 1000
R327	0611077A74	chip 1000
R328	0611077A96	chip 8200
R329	0611077A36	chip 27
R330	0611077A36	chip 27
R331	0611077A36	chip 27
R332	0611077A36	chip 27
R333	0611077B05	chip 18K
R334	0611077A76	chip 1200
R335	0611077A76	chip 1200
R336	0611077A84	chip 2700
R337	0611077A84	chip 2700
R338	0611077A78	chip 1500
R339	0611077A78	chip 1500
R340	0611077A96	chip 8200
R341	0611077A96	chip 8200
R342	0611077A90	chip 4700
R343	0611077A90	chip 4700
R345	0611077B16	chip 51K

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R346	0611077B05	chip 18K
R347	0611077B15	chip 47K
R348	0611077A76	chip 1200
R349	0611077A76	chip 1200
R350	0611077A76	chip 1200
		shields:
SH1	2683423K03	shield
		transformers:
T3	2504641P01	RF power transformer
T4	2504641P02	RF transformer
T5	2504641P03	RF transformer
T6	2583727K01	coil toroid
T7	2583727K01	coil toroid
		test points:
TP35	2604632P02	heat sink ceramic 10X4.5 mm
TP36	2604632P02	heat sink ceramic 10X4.5 mm
TP37	2604632P02	heat sink ceramic 10X4.5 mm
TP38	2604632P01	heat sink ceramic 17.5X6 mm
TP39	2604632P01	heat sink ceramic 17.5X6 mm
TP40	2604632P01	heat sink ceramic 17.5X6 mm
TP41	2604632P01	heat sink ceramic 17.5X6 mm
TP44	2604632P02	heat sink ceramic 10X4.5 mm
TP45	2604632P02	heat sink ceramic 10X4.5 mm
		integrated circuits: **(See Note 1)**
U5	5113805A75	8 bit ser to par/par HC595
U6	5108858K62	quadruple Norton operational amp
U9	5105469E65	voltage regulator LP2951C
U10	5105469E65	voltage regulator LP2951C
U11	5113816D03	8V positive regulator 1.0A
U13	5113816D11	positive regulator 1.5A LM317BT
U14	5113816D01	5V positive regulator,1.0 A
		Zener diodes: **(See Note 1)**
VR1	4880222R01	reverse polarity Spectra
VR2	4880222R01	reverse polarity Spectra
VR3	4813830A12	4.3V, 225mW, MMBZ5229B_
VR5	4813830C30	17V, 500 mW, MMSZ5247BT1
		non-referenced items:
	8408445Y32	High-Power PCB
	0102702K44	semi harmonic filter
	0102704K59	High Power w/assy
	1483967A03	washer shoulder
	1483967A03	washer shoulder
	1483967A03	washer shoulder
	1483967A03	washer shoulder
	2604044K01	tranlin fence
	2604122P01	plate copper
	3904842P01	diode holder
	3904842P01	diode holder
	4302835E01	spacer for tropical coil

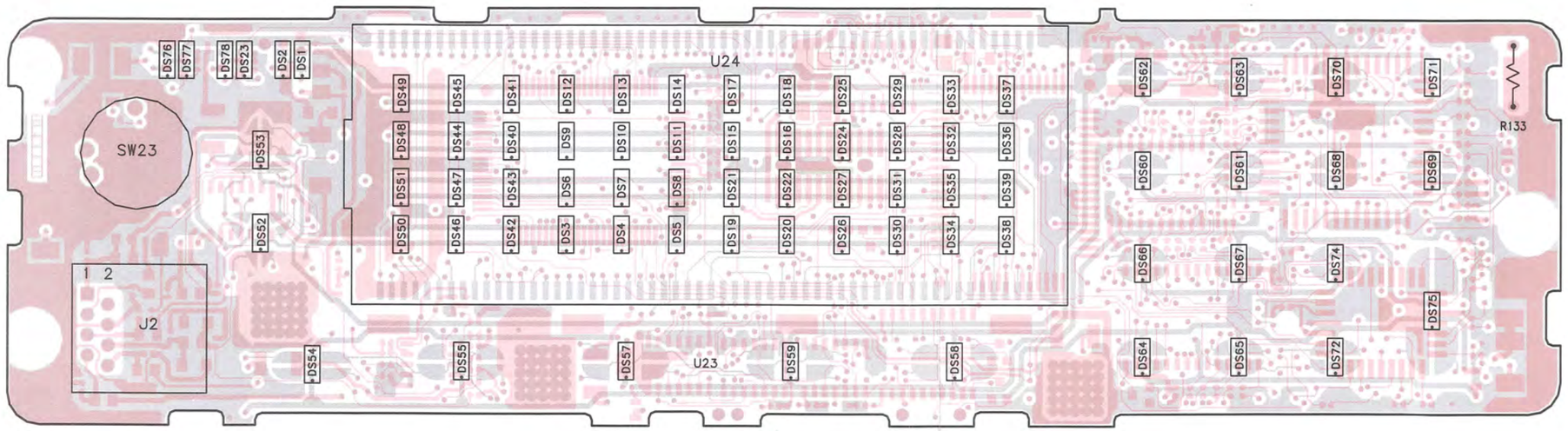
Notes:

1. For optimum performance, diodes, transistors and integrated circuits must be ordered by MOTOROLA part numbers.
2. When ordering quartz crystal units or ceramic resonators, specify carrier frequency, crystal (or resonator) frequency, and crystal (or resonator) type number.

CONTROL HEAD ENHANCE BOARD

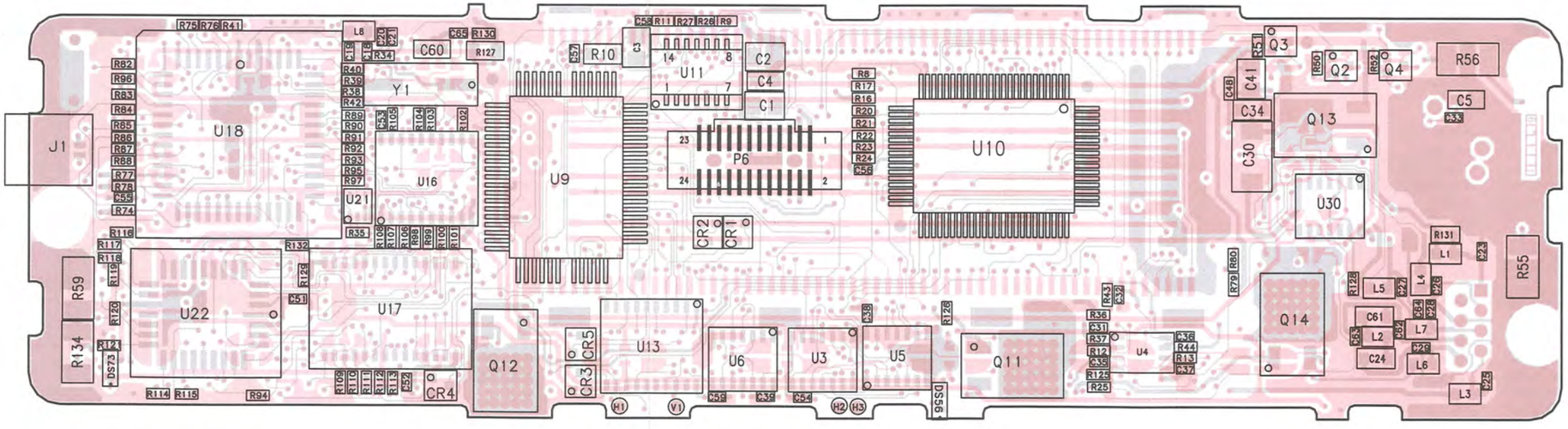
Model FLN8695A (Trunk Mount)

Printed Circuit Board Details



SHOWN FROM COMPONENT SIDE

OVERLAY	79B02951C81-O
COMPONENT SIDE	79B02951C83-O
SOLDER SIDE	79B02951C84-O



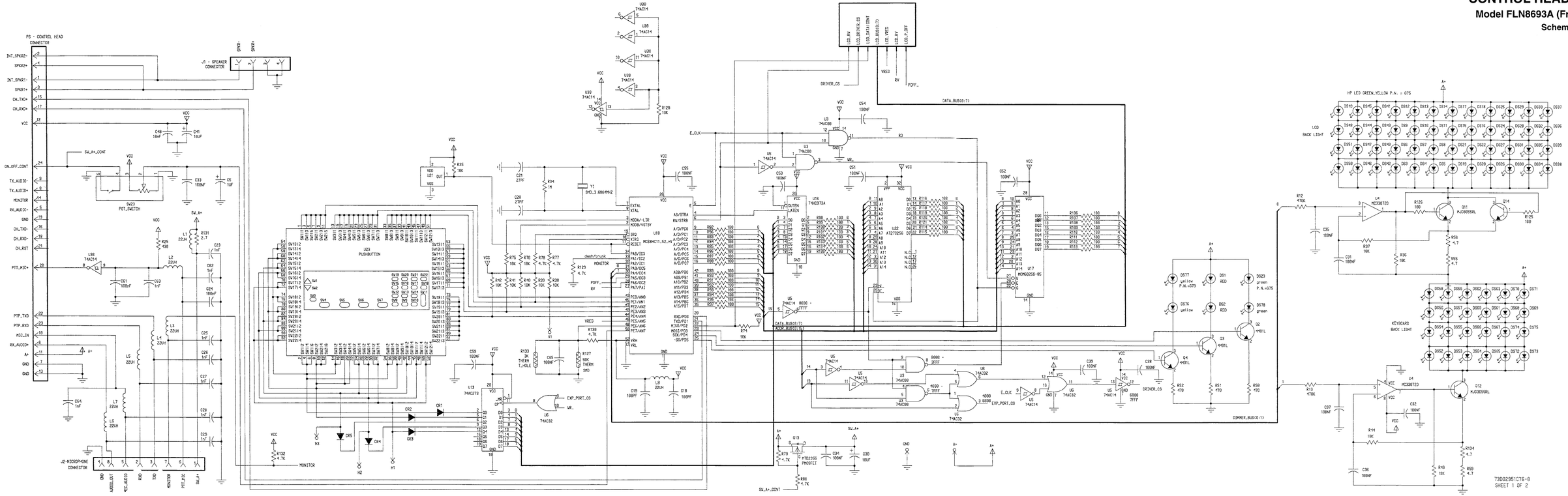
SHOWN FROM SOLDER SIDE

OVERLAY	79B02951C82-O
COMPONENT SIDE	79B02951C83-O
SOLDER SIDE	79B02951C84-O

CONTROL HEAD BOARD

Model FLN8693A (Front Mount)

Schematic Diagram



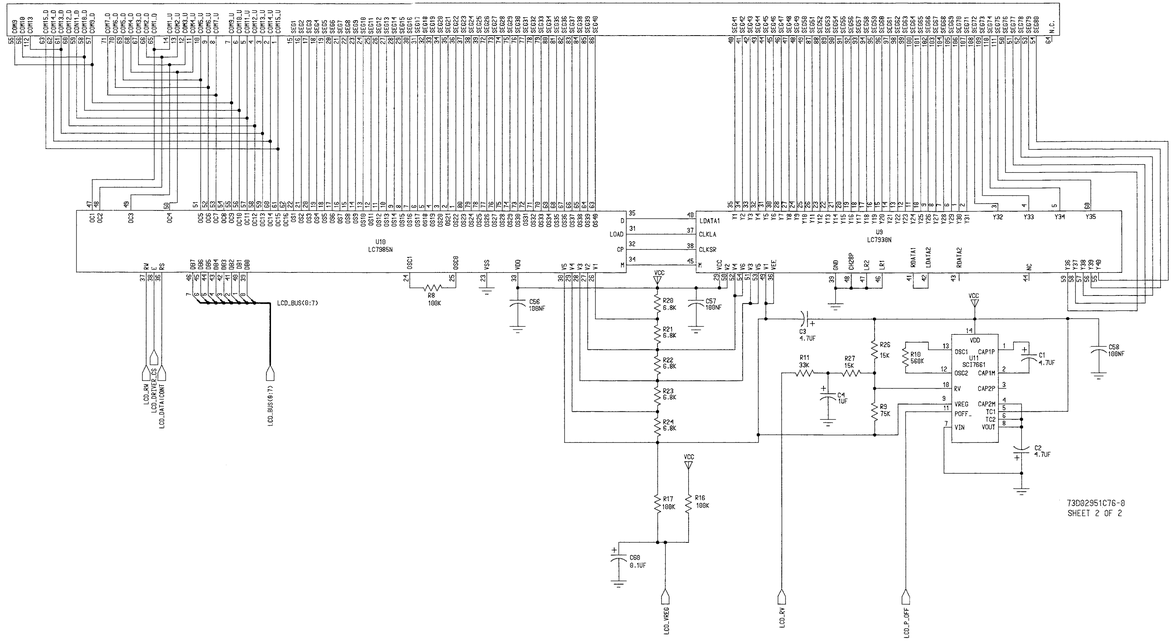
68P02952C55

73002951C76-B
SHEET 1 OF 2

CONTROL HEAD BOARD

Model FLN8693A (Front Mount)

Schematic Diagram and Parts List



parts list

FLN8693A Control Head Board

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitors: µF, ±5%, 50V, unless otherwise specified
C1	2311049J11	tantalum 4.7 10% 16V
C2	2311049J11	tantalum 4.7 10% 16V
C3	2311049J11	tantalum 4.7 10% 16V
C4	2311049A07	tantalum 1 10% 35V
C5	2311049A37	tantalum 1 20% 20V
C18	2113740F51	100 pF
C19	2113740F51	100 pF
C20	2113740F37	27 pF
C21	2113740F37	27 pF
C23	2113741F25	1000 pF
C24	2113741B69	0.1
C25	2113741F25	1000 pF
C26	2113741F25	1000 pF
C27	2113741F25	1000 pF
C28	2113741F25	1000 pF
C29	2113741F25	1000 pF
C30	2311049A19	tantalum 10 10% 25V
C31	2113743E20	.10 10%
C32	2113743E20	.10 10%
C33	2113743E20	.10 10%
C34	2113741B69	0.1
C35	2113743E20	.10 10%
C36	2113743E20	.10 10%
C37	2113743E20	.10 10%
C38	2113743E20	.10 10%
C39	2113743E20	.10 10%
C41	2311049A57	tantalum 10 10% 16V
C48	2113741F49	0.01
C51	2113743E20	.10 10%
C52	2113743E20	.10 10%
C53	2113743E20	.10 10%
C54	2113743E20	.10 10%
C55	2113743E20	.10 10%
C56	2113743E20	.10 10%
C57	2113743E20	.10 10%
C58	2113743E20	.10 10%
C59	2113743E20	.10 10%
C60	2311049A01	tantalum .1 10% 35V
C61	2113741B69	0.1
C62	2113741F25	1000 pF
C63	2113741F25	1000 pF
C64	2113741F25	1000 pF
C65	2113743E20	.10 10%
		diodes: (See Note 1)
CR1	4813825A08	70V hot carrier MMBD701L
CR2	4813825A08	70V hot carrier MMBD701L
CR3	4813825A08	70V hot carrier MMBD701L
CR4	4813825A08	70V hot carrier MMBD701L
CR5	4813825A08	70V hot carrier MMBD701L
		LEDs:
DS1	4805729G74	SMT red
DS2	4805729G74	SMT red
DS3	4805729G75	SMT green
DS4	4805729G75	SMT green
DS5	4805729G75	SMT green
DS6	4805729G75	SMT green
DS7	4805729G75	SMT green
DS8	4805729G75	SMT green
DS9	4805729G75	SMT green
DS10	4805729G75	SMT green
DS11	4805729G75	SMT green
DS12	4805729G75	SMT green
DS13	4805729G75	SMT green
DS14	4805729G75	SMT green
DS15	4805729G75	SMT green
DS16	4805729G75	SMT green
DS17	4805729G73	SMT green
DS18	4805729G75	SMT green
DS19	4805729G75	SMT green
DS20	4805729G75	SMT green
DS21	4805729G75	SMT green
DS22	4805729G75	SMT green
DS23	4805729G75	SMT green
DS24	4805729G75	SMT green
DS25	4805729G75	SMT green
DS26	4805729G75	SMT green
DS27	4805729G75	SMT green
DS28	4805729G75	SMT green
DS29	4805729G75	SMT green
DS30	4805729G75	SMT green
DS31	4805729G75	SMT green
DS32	4805729G75	SMT green
DS33	4805729G75	SMT green
DS34	4805729G75	SMT green
DS35	4805729G75	SMT green
DS36	4805729G75	SMT green
DS37	4805729G75	SMT green
DS38	4805729G75	SMT green
DS39	4805729G75	SMT green
DS40	4805729G75	SMT green
DS41	4805729G75	SMT green
DS42	4805729G75	SMT green
DS43	4805729G75	SMT green
DS44	4805729G75	SMT green
DS45	4805729G75	SMT green
DS46	4805729G75	SMT green
DS47	4805729G75	SMT green
DS48	4805729G75	SMT green
DS49	4805729G75	SMT green
DS50	4805729G75	SMT green
DS51	4805729G75	SMT green
DS52	4805729G75	SMT green
DS53	4805729G75	SMT green
DS54	4805729G75	SMT green
DS55	4805729G75	SMT green
DS56	4805729G75	SMT green
DS57	4805729G75	SMT green
DS58	4805729G75	SMT green
DS59	4805729G75	SMT green
DS60	4805729G75	SMT green
DS61	4805729G75	SMT green
DS62	4805729G75	SMT green
DS63	4805729G75	SMT green
DS64	4805729G75	SMT green
DS65	4805729G75	SMT green
DS66	4805729G75	SMT green
DS67	4805729G75	SMT green
DS68	4805729G75	SMT green
DS69	4805729G75	SMT green
DS70	4805729G75	SMT green
DS71	4805729G75	SMT green
DS72	4805729G75	SMT green
DS73	4805729G75	SMT green
DS74	4805729G75	SMT green
DS75	4805729G75	SMT green
DS76	4805729G73	SMT yellow
DS77	4805729G73	SMT yellow
DS78	4805729G75	SMT green
		connectors, receptacle:
J1	2809926G01	connector 1.25 mm
J2	2805924V01	connector microphone
		inductors: nH, 5%, unless otherwise specified
L1	2462587P28	22000
L2	2462587P28	22000
L3	2462587P28	22000
L4	2462587P28	22000
L5	2462587P28	22000
L6	2462587P28	22000
L7	2462587P28	22000
L8	2462587P28	22000
		plugs:
P6	2802855C04	SMT, header 0.05", 24 pin
		transistors: (See Note 1)
Q2	4813824A12	NPN 40V .6A B=80
Q3	4813824A12	NPN 40V .6A B=80
Q4	4813824A12	NPN 40V .6A B=80
Q11	4813822A02	NPN 60V 10A MJD3055T4
Q12	4813822A02	NPN 60V 10A MJD3055T4
Q13	4813821A09	P-CH 60V 12A _2955_
Q14	4813822A02	NPN 60V 10A MJD3055T4
		resistors, Ω 5% 1/8W, unless otherwise specified:
R8	0662057A97	100K
R9	0662057A94	75K
R10	0611077B41	560K
R11	0662057A85	33K
R12	0662057B14	470K
R13	0662057B14	470K
R16	0660082A97	100K 1% 1/16W
R17	0660082A97	100K 1% 1/16W
R20	0662057A69	6800
R21	0662057A69	6800
R22	0662057A69	6800
R23	0662057A69	6800
R24	0662057A69	6800
R25	0662057A41	470
R26	0662057A77	15K
R27	0662057A77	15K
R34	0662057B22	1.0M
R35	0662057A73	10K
R36	0662057A73	10K
R37	0662057A73	10K
R38	0662057A73	10K
R39	0662057A73	10K
R40	0662057A73	10K
R41	0662057A73	10K
R42	0662057A73	10K
R43	0662057A73	10K
R44	0662057A73	10K
R50	0662057A41	470
R51	0662057A41	470
R52	0662057A41	470
R55	0683962T17	4.7 1W
R56	0683962T17	4.7 1W
R59	0683962T17	4.7 1W
R74	0662057A73	10K
R75	0662057A73	10K
R76	0662057A73	10K
R77	0662057A65	4700
R78	0662057A65	4700
R79	0662057A65	4700
R80	0662057A65	4700
R82	0662057A25	100
R83	0662057A25	100
R84	0662057A25	100
R85	0662057A25	100
R86	0662057A25	100
R87	0662057A25	100
R88	0662057A25	100
R89	0662057A25	100
R90	0662057A25	100
R91	0662057A25	100
R92	0662057A25	100
R93	0662057A25	100
R94	0662057A25	100
R95	0662057A25	100
R96	0662057A25	100
R97	0662057A25	100
R98	0662057A25	100
R99	0662057A25	100
R100	0662057A25	100
R101	0662057A25	100
R102	0662057A25	100
R103	0662057A25	100
R104	0662057A25	100
R105	0662057A25	100
R106	0662057A25	100
R107	0662057A25	100
R108	0662057A25	100
R109	0662057A25	100
R110	0662057A25	100
R111	0662057A25	100
R112	0662057A25	100
R113	0662057A25	100
R114	0662057A25	100
R115	0662057A25	100
R116	0662057A25	100
R117	0662057A25	100
R118	0662057A25	100
R119	0662057A25	100
R120	0662057A25	100
R121	0662057A25	100
R125	0662057A25	100
R126	0662057A25	100
R127	0605621T02	thermistor 50K
R128	0662057A73	10K
R129	0662057A65	4700
R130	0662057A65	4700
R131	0662057C13	2.7
R132	0662057A65	4700
R133	0604149A01	thermistor 3.47K
R134	0683962T17	4.7 1W
		integrated circuits: (See Note 1)
U3	5113808A01	NAND quad 2-input MC74AC00D
U4	5113818A03	high performance single supply
U5	5113808A12	inverter hex Schmitt trigger 74AC14
U6	5113808A14	OR quad 2-input MC74AC32D
U9	5102102U01	LCD driver
U10	5102101U01	LCD controller
U11	5105461G54	DC/DC converter, 14 pin
U13	5113808A42	FF dual D MC74AC273DW
U16	5113805A62	oct 3st n/inv trans lat
U17	5113804A08	32Kx8 CMOS, static RAM, 100 ns
U18	5180960T01	microprocessor trunked Maxtrac
U21	5105625U63	voltage detector
U22	0913900A03	socket 32 positions rectangular SMT
U22	5197032A01	PROM 32Kx8, 200 ns, 32 PLCC

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
U30	5113808A12	inverter hex Schmitt trigger 74AC14
	crystals:	
	(See Note 2)	
Y1	4802582S09	oscillator 3.6864MHZ
	non-referenced items:	
V22	0102705K84	wire & lug black
SW23	1805642V01	potentiometer volume ON/OFF
	8408423Y32	PCB, Control Head

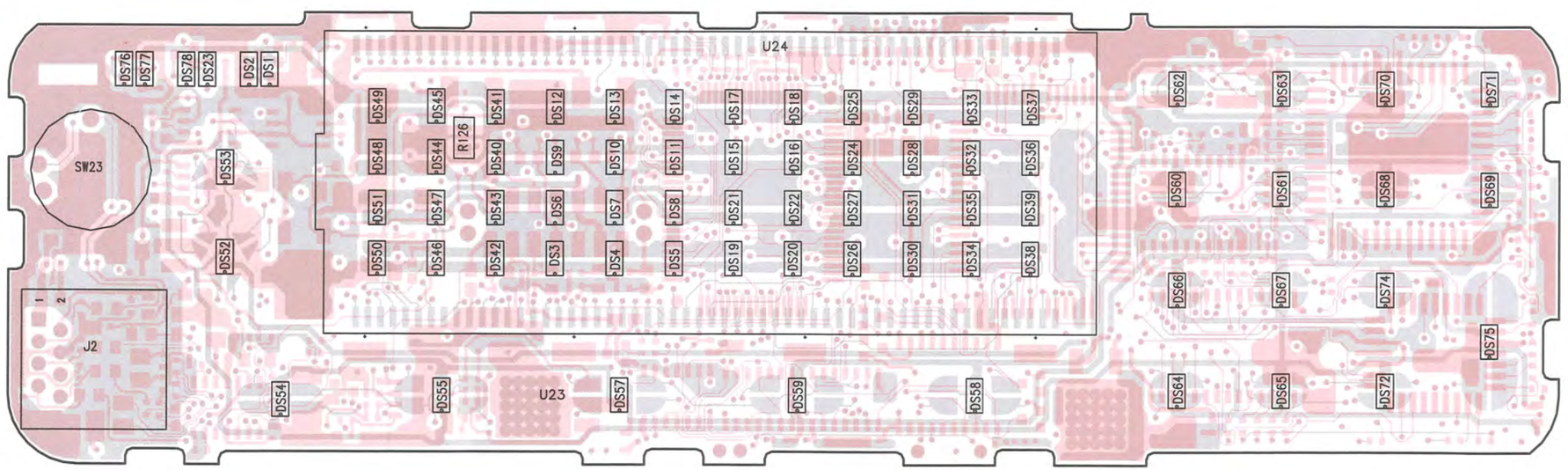
Notes:

1. For optimum performance, diodes, transistors and integrated circuits must be ordered by MOTOROLA part numbers.
2. When ordering quartz crystal units or ceramic resonators, specify carrier frequency, crystal (or resonator) frequency, and crystal (or resonator) type number.

CONTROL HEAD ENHANCE BOARD

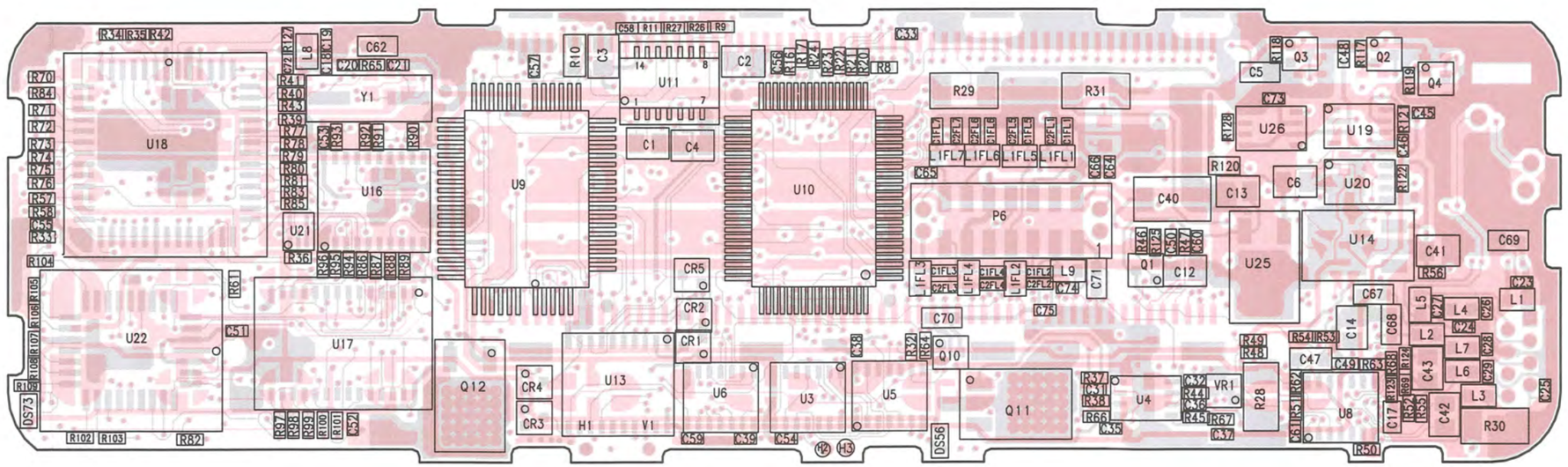
Model FLN8695A (Trunk Mount)

Printed Circuit Board Details



SHOWN FROM COMPONENT SIDE

OVERLAY	•	79B02953C21-0
COMPONENT SIDE		79B02953C23-0
SOLDER SIDE		79B02953C24-0



SHOWN FROM SOLDER SIDE

OVERLAY	•	79B02953C22-0
COMPONENT SIDE		79B02953C23-0
SOLDER SIDE		79B02953C24-0

CONTROL HEAD ENHANCE BOARD

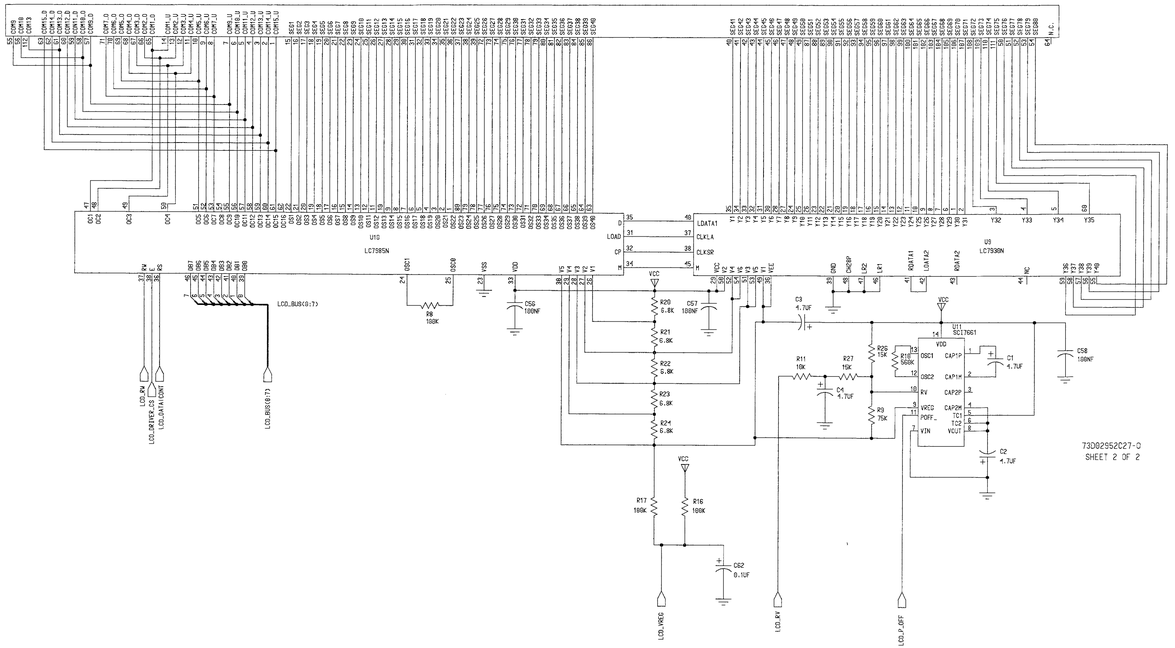
Model FLN8695A (Trunk Mount)

Schematic Diagram

CONTROL HEAD ENHANCE BOARD

Model FLN8695A (Trunk Mount)

Schematic Diagram and Parts List



parts list

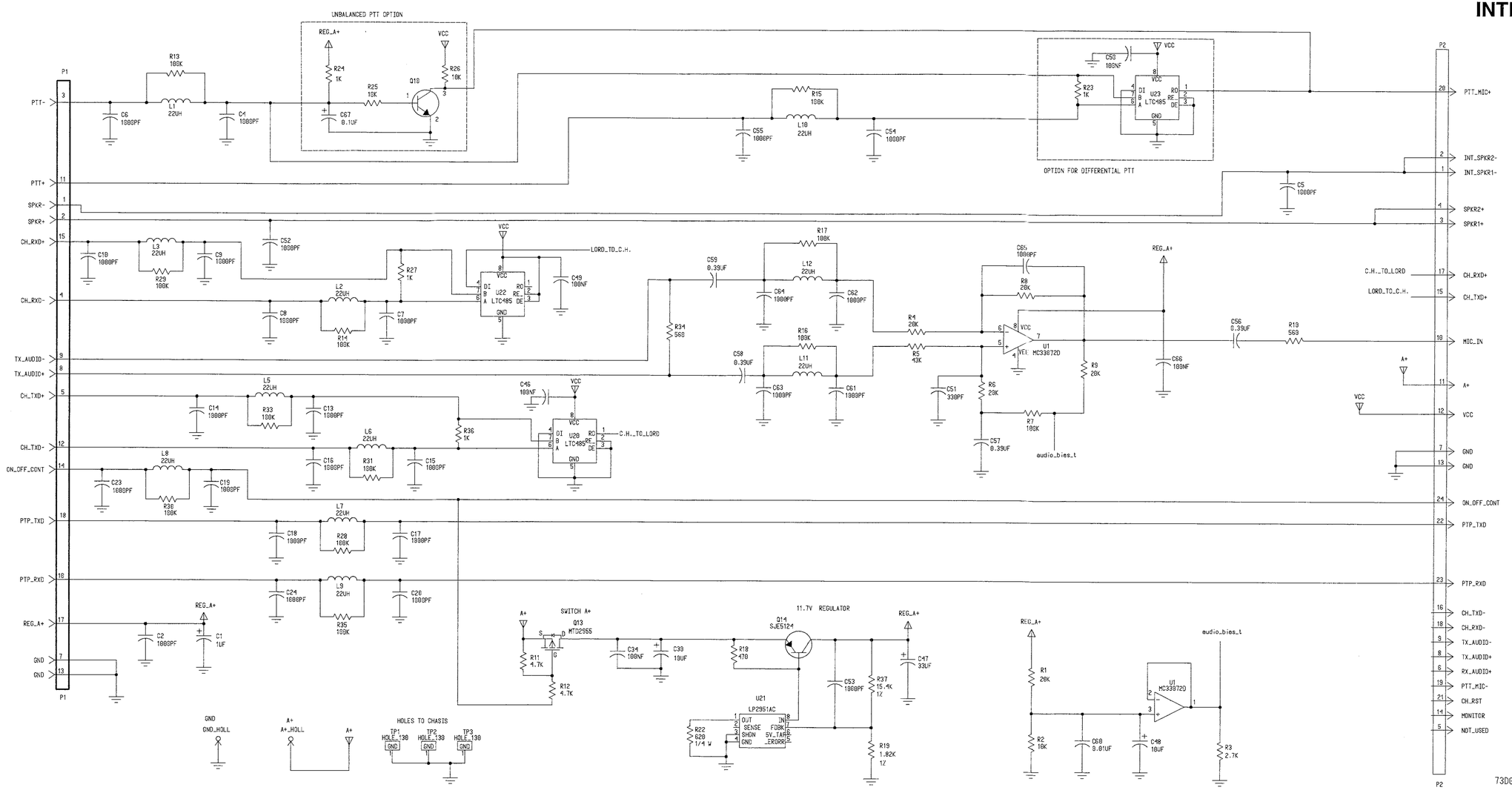
FLN8695A Control Head Enhanced Board

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitors: µF, ±5%, 50V, unless otherwise specified
C1	2311049J11	tantalum 4.7 10% 16V
C2	2311049J11	tantalum 4.7 10% 16V
C3	2311049J11	tantalum 4.7 10% 16V
C4	2311049J11	tantalum 4.7 10% 16%
C5	2311049A37	tantalum 1 20% 20V
C6	2311049J12	tantalum 4.7 20% 16V
C12	2311049A57	tantalum 10 10% 16V
C13	2311049A57	tantalum 10 10% 16V
C14	2311049A57	tantalum 10 10% 16V
C17	2113740A67	330 pF
C18	2113740F51	100 pF
C19	2113740F51	100 pF
C1FL1	2113741F25	1000 pF
C1FL2	2113741F25	1000 pF
C1FL3	2113741F25	1000 pF
C1FL4	2113741F25	1000 pF
C1FL5	2113741F25	1000 pF
C1FL6	2113741F25	1000 pF
C1FL7	2113741F25	1000 pF
C20	2113740F37	27 pF
C21	2113740F37	27 pF
C23	2113741F25	1000 pF
C24	2113741F25	1000 pF
C25	2113741F25	1000 pF
C26	2113741F25	1000 pF
C27	2113741F25	1000 pF
C28	2113741F25	1000 pF
C29	2113741F25	1000 pF
C2FL1	2113741F25	1000 pF
C2FL2	2113741F25	1000 pF
C2FL3	2113741F25	1000 pF
C2FL4	2113741F25	1000 pF
C2FL5	2113741F25	1000 pF
C2FL6	2113741F25	1000 pF
C2FL7	2113741F25	1000 pF
C31	2113743E20	.10 10%
C32	2113743E20	.10 10%
C33	2113743E20	.10 10%
C35	2113743E20	.10 10%
C36	2113743E20	.10 10%
C37	2113743E20	.10 10%
C38	2113743E20	.10 10%
C39	2113743E20	.10 10%
C40	2311049A22	tantalum 33 10% 16V
C41	2311049A57	tantalum 10 10% 16V
C42	2311049J11	tantalum 4.7 10% 16V
C43	2311049J11	tantalum 4.7 10% 16V
C45	2113743E20	.10 10%
C46	2113743E20	.10 10%
C47	2113743B24	.390 10%
C48	2113741F49	0.01
C49	2113741F49	0.01
C50	2113741F25	1000 pF
C51	2113743E20	.10 10%
C52	2113743E20	.10 10%
C53	2113743E20	.10 10%
C54	2113743E20	.10 10%
C55	2113743E20	.10 10%
C56	2113743E20	.10 10%
C57	2113743E20	.10 10%
C58	2113743E20	.10 10%
C59	2113743E20	.10 10%
C60	2113743E20	.10 10%
C61	2113743E20	.10 10%
C62	2311049A01	tantalum.1 10% 35V
C64	2113741F25	1000 pF
C65	2113741F25	1000 pF
C66	2113741F25	1000 pF
C67	2311049A01	tantalum.1 10% 35V
C68	2311049A01	tantalum.1 10% 35V
C69	2311049A01	tantalum.1 10% 35V
C70	2311049A01	tantalum.1 10% 35V
C71	2311049A01	tantalum.1 10% 35V
C72	2113743E20	.10 10%
C73	2113743E20	.10 10%
C74	2113741F25	1000 pF
C75	2113741F25	1000 pF
		diodes: (See Note 1)
CR1	4813825A08	70V hot carrier MMBD701L
CR2	4813825A08	70V hot carrier MMBD701L
CR3	4813825A08	70V hot carrier MMBD701L
CR4	4813825A08	70V hot carrier MMBD701L
CR5	4813825A08	70V hot carrier MMBD701L
		LEDs:
DS1	4805729G74	SMT red
DS2	4805729G74	SMT red
DS3	4805729G75	SMT green
DS4	4805729G75	SMT green
DS5	4805729G75	SMT green
DS6	4805729G75	SMT green
DS7	4805729G75	SMT green
DS8	4805729G75	SMT green
DS9	4805729G75	SMT green
DS10	4805729G75	SMT green
DS11	4805729G75	SMT green
DS12	4805729G75	SMT green
DS13	4805729G75	SMT green
DS14	4805729G75	SMT green
DS15	4805729G75	SMT green
DS16	4805729G75	SMT green
DS17	4805729G75	SMT green
DS18	4805729G75	SMT green
DS19	4805729G75	SMT green
DS20	4805729G75	SMT green
DS21	4805729G75	SMT green
DS22	4805729G75	SMT green
DS23	4805729G75	SMT green
DS24	4805729G75	SMT green
DS25	4805729G75	SMT green
DS26	4805729G75	SMT green
DS27	4805729G75	SMT green
DS28	4805729G75	SMT green
DS29	4805729G75	SMT green
DS30	4805729G75	SMT green
DS31	4805729G75	SMT green
DS32	4805729G75	SMT green
DS33	4805729G75	SMT green
DS34	4805729G75	SMT green
DS35	4805729G75	SMT green
DS36	4805729G75	SMT green
DS37	4805729G75	SMT green
DS38	4805729G75	SMT green
DS39	4805729G75	SMT green
DS40	4805729G75	SMT green
DS41	4805729G75	SMT green
DS42	4805729G75	SMT green
DS43	4805729G75	SMT green
DS44	4805729G75	SMT green
DS45	4805729G75	SMT green
DS46	4805729G75	SMT green
DS47	4805729G75	SMT green
DS48	4805729G75	SMT green
DS49	4805729G75	SMT green
DS50	4805729G75	SMT green
DS51	4805729G75	SMT green
DS52	4805729G75	SMT green
DS53	4805729G75	SMT green
DS54	4805729G75	SMT green
DS55	4805729G75	SMT green
DS56	4805729G75	SMT green
DS57	4805729G75	SMT green
DS58	4805729G75	SMT green
DS59	4805729G75	SMT green
DS60	4805729G75	SMT green
DS61	4805729G75	SMT green
DS62	4805729G75	SMT green
DS63	4805729G75	SMT green
DS64	4805729G75	SMT green
DS65	4805729G75	SMT green
DS66	4805729G75	SMT green
DS67	4805729G75	SMT green
DS68	4805729G75	SMT green
DS69	4805729G75	SMT green
DS70	4805729G75	SMT green
DS71	4805729G75	SMT green
DS72	4805729G75	SMT green
DS73	4805729G75	SMT green
DS74	4805729G75	SMT green
DS75	4805729G75	SMT green
DS76	4805729G73	yellow
DS77	4805729G73	yellow
DS78	4805729G75	SMT green
		connectors, receptacle:
J2	2805924V01	connector microphone
		inductors: nH, 5%, unless otherwise specified:
L1	2462587P28	22000
L1FL1	2462587P28	22000
L1FL2	2462587P28	22000
L1FL3	2462587P28	22000
L1FL4	2462587P28	22000
L1FL5	2462587P28	22000
L1FL6	2462587P28	22000
L1FL7	2462587P28	22000
L2	2462587P28	22000
L3	2462587P28	22000
L4	2462587P28	22000
L5	2462587P28	22000
L6	2462587P28	22000
L7	2462587P28	22000
L8	2462587P28	22000
L9	2462587P28	22000
		plugs:
P6	2805922V01	plug control head vert
		transistors: (See Note 1)
Q1	4813824A12	NPN 40V .6A B=80
Q2	4813824A12	NPN 40V .6A B=80
Q3	4813824A12	NPN 40V .6A B=80
Q4	4813824A12	NPN 40V .6A B=80
Q10	4813824A12	NPN 40V .6A B=80
Q11	4813822A02	NPN 60V 10A MJD3055T4
Q12	4813822A02	NPN 60V 10A MJD3055T4
		resistors, Ω 5% 1/8W, unless otherwise specified:
R8	0662057A97	100K
R9	0662057A94	75K
R10	0611077B41	560K
R11	0662057A73	10K
R16	0660082A97	100K 1% 1/16W
R17	0660082A97	100K 1% 1/16W
R20	0662057A69	6800
R21	0662057A69	6800
R22	0662057A69	6800
R23	0662057A69	6800
R24	0662057A69	6800
R26	0662057A77	15K
R27	0662057A77	15K
R28	0683962T17	4.7 1W
R29	0683962T17	4.7 1W
R30	0683962T17	4.7 1W
R31	0683962T17	4.7 1W
R32	0662057A41	470
R33	0662057A73	10K
R34	0662057A73	10K
R35	0662057A73	10K
R36	0662057A73	10K
R37	0662057A73	10K
R38	0662057A73	10K
R39	0662057A73	10K
R40	0662057A73	10K
R41	0662057A73	10K
R42	0662057A73	10K
R43	0662057A73	10K
R44	0662057A73	10K
R45	0662057A73	10K
R46	0662057A73	10K
R47	0662057A73	10K
R48	0662057A73	10K
R49	0662057A73	10K
R50	0662057A73	10K
R51	0662057A73	10K
R52	0662057A73	10K
R53	0662057A73	10K
R54	0662057A73	10K
R55	0662057A73	10K
R56	0662057A73	10K
R57	0662057A65	4700
R58	0662057A65	4700
R61	0662057A65	4700
R62	0662057A65	4700
R63	0662057A59	2700
R64	0662057A73	10K
R65	0662057B22	1.0 M
R66	0662057B14	470K
R67	0662057B14	470K
R68	0662057A35	270
R69	0662057A35	270
R70	0662057A25	100
R71	0662057A25	100
R72	0662057A25	100
R73	0662057A25	100
R74	0662057A25	100
R75	0662057A25	100
R76	0662057A25	100
R77	0662057A25	100
R78	0662057A25	100
R79	0662057A25	100
R80	0662057A25	100
R81	0662057A25	100
R82	0662057A25	100

INTERCONNECTION B

Model FRN5885A (Trunk

Schematic



73D02952C14-0

2952C55

Reference Number	Motorola Part No.	Description
1	2704597K01	chassis
2	1404860P01	PA insulator
3	0102700K23	HP-Lord, 40 pin flat cable
4	FRN5767B	High Power board
5	0310908A82	screw, M3×0.5×8
6	0310911A11	screw, M3×0.5×8
7	1504002P01	PA shield
8	1504596K01	cover
9	3204012P01	cover gasket
10	3904382P01	lower contacts
11	3904381P01	upper contacts
12	2604072P01	RF shield
13	FRN5869A	Low RF enhance board
14	0310907C25	screw, M3×P0.5×16
15	0308390Y13	screw, M6.0×1.0×40
16	0102700K22	HP-Lord, RF coax
17	0102701K51	control head-Lord, 40 pin flat cable
18	3204071P02	front panel gasket
19	FHN5879A	control head hardware
20	FLN2272	mobile mounting kit

ist

terconnection Board

MOTOROLA PART NO.	DESCRIPTION
	capacitors: pF, ±5%, 50V, unless otherwise specified
2311049A08	tantalum 1µ 10% 35V
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2311049A19	tantalum 10µ 10% 25V
2113741B69	100000
2113743E20	.10 µF 10%
2311049A22	tantalum 33µ 10% 16V
2311049J26	tantalum 10µ 20% 16V
2113743E20	.10 µF 10%
2113743E20	.10 µF 10%
2113740A67	330
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113743B24	.390 µF 10%
2113743B24	.390 µF 10%
2113743B24	.390 µF 10%
2113743B24	.390 µF 10%
2113741F49	10000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741F25	1000
2113741B69	100000
2311049A01	tantalum .1µ 10% 35V
	inductors: nH, 5%, unless otherwise specified:
2462587P28	22000
2462587P28	22000
2462587P28	22000
2462587P28	22000
2462587P28	22000
2462587P28	22000
2462587P28	22000
2462587P28	22000
2462587P28	22000
2462587P28	22000
	plugs:
2805922V01	plug control head vert
2802855C04	smt header 0.05" 24pin

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		transistors: (See Note 1)
Q10	4813824A12	NPN 40V .6A SW B=80
Q13	4813821A09	P-CH 60V 12A _2955_
Q14	4800869807	M9807
		resistors, Ω 5% 1/8W, unless otherwise specified:
R1	0662057A80	20K
R2	0662057A73	10K
R3	0662057A59	2700
R4	0662057A80	20K
R5	0662057A88	43K
R6	0662057A80	20K
R7	0662057A97	100K
R8	0662057A80	20K
R9	0662057A80	20K
R10	0662057A43	560
R11	0662057A65	4700
R12	0662057A65	4700
R13	0662057A97	100K
R14	0662057A97	100K
R15	0662057A97	100K
R16	0662057A97	100K
R17	0662057A97	100K
R18	0662057A41	470
R19	0662057R34	1820-1W 1%
R22	0611072A69	620
R23	0662057A49	1000
R24	0662057A49	1000
R25	0662057A73	10K
R26	0662057A73	10K
R27	0662057A49	1000
R28	0662057A97	100K
R29	0662057A97	100K
R30	0662057A97	100K
R31	0662057A97	100K
R33	0662057A97	100K
R34	0662057A43	560
R35	0662057A97	100K
R36	0662057A49	1000
R37	0662057P72	15.4K 1%
		integrated circuits: (See Note 1)
U1	5113818A03	high performance single supply
U1	8408460Y31	P.C.B
U20	5108100L03	line transceiver LTC485IS8
U21	5105469E65	voltage regulator LP2951C
U22	5108100L03	line transceiver LTC485IS8
U23	5108100L03	line transceiver LTC485IS8
		non-referenced items:
	1480075D01	ins to 220 chassis

Notes:

1. For optimum performance, diodes, transistors and integrated circuits must be ordered by MOTOROLA part numbers.
2. When ordering quartz crystal units or ceramic resonators, specify carrier frequency, crystal (or resonator) frequency, and crystal (or resonator) type number.

parts lists

FRN5865A Continuous Duty Tray (CDT)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	capacitors:	
C1	2311049A04	tantalum .33UF 10% 35V
C2	2311049A04	tantalum .33UF 10% 35V
C3	2311049A04	tantalum .33UF 10% 35V
C4	2311049A04	tantalum .33UF 10% 35V
C5	2311049A04	tantalum .33UF 10% 35V
C6	2311049A04	tantalum .33UF 10% 35V
C7	2311049A04	tantalum .33UF 10% 35V
C8	2311049A04	tantalum .33UF 10% 35V
C9	2311049A09	tantalum 2.2UF 10% 20V
C10	2311049A20	tantalum 15UF 10% 25V
C11	2311049A20	tantalum 15UF 10% 25V
C12	2311049A57	tantalum 10UF 10% 16V
C13	2311049A57	tantalum 10UF 10% 16V
C14	2113740A67	330pF
C15	2113740A67	330pF
C16	2113740A67	330pF
C17	2113740A67	330pF
C18	2113740A67	330pF
C19	2113741F21	680pF
C20	2113741F21	680pF
C21	2113741F21	680pF
C22	2113741F21	680pF
C23	2113741F21	680pF
C24	2113741F21	680pF
C25	2113741F21	680pF
C26	2113741F21	680pF
C27	2113741F21	680pF
C28	2113741F21	680pF
C29	2311049J11	tantalum 4.7UF 10% 16V
C30	2311049J11	tantalum 4.7UF 10% 16V
C31	2311049J11	tantalum 4.7UF 10% 16V
C32	2311049J11	tantalum 4.7UF 10% 16V
C33	2311049J11	tantalum 4.7UF 10% 16V
C34	2311049J11	tantalum 4.7UF 10% 16V
C35	2311049J11	tantalum 4.7UF 10% 16V
C36	2311049J11	tantalum 4.7UF 10% 16V
C37	2311049J11	tantalum 4.7UF 10% 16V
C38	2311049J11	tantalum 4.7UF 10% 16V
C39	2311049J11	tantalum 4.7UF 10% 16V
C44	2311049A09	tantalum 2.2UF 10% 20V
C45	2311049A09	tantalum 2.2UF 10% 20V
C46	2113743B24	.390 UF 10%
C47	2113743B24	.390 UF 10%
C49	2113743B24	.390 UF 10%
C50	2113743B24	.390 UF 10%
C51	2113743B24	.390 UF 10%
C52	2113743B24	.390 UF 10%
C53	2113743B24	.390 UF 10%
C54	2113743B24	.390 UF 10%
C55	2113743F12	.330UF
C56	2113743F12	.330UF
C57	2113743F12	.330UF
C58	2113743F12	.330UF
C59	2113743B24	.390 UF 10%
C60	2113743B24	.390 UF 10%
C61	2113741F49	10000pF
C62	2113741F49	10000pF
C63	2113741F49	10000pF
C64	2113741F49	10000pF
C65	2113741F49	10000pF
C66	2113741F25	1000pF
C67	2113741F25	1000pF
C68	2113741F25	1000pF
C69	2113741F25	1000pF
C70	2113741F25	1000pF
C71	2113741F25	1000pF
C72	2113741F25	1000pF
C73	2113741F25	1000pF
C74	2113741F25	1000pF
C75	2113741F25	1000pF
C76	2113741F25	1000pF
C77	2113741F25	1000pF
C78	2113741F25	1000pF
C79	2113741F25	1000pF
C80	2113741F25	1000pF
C81	2113741F25	1000pF
C82	2113741F25	1000pF
C83	2113741F25	1000pF
C84	2113741F25	1000pF
C85	2113741F25	1000pF
C86	2113741F25	1000pF
C87	2113741F25	1000pF
C88	2113741F25	1000pF
C89	2113741F25	1000pF
C90	2113741F25	1000pF
C91	2113741F25	1000pF
C92	2113741F25	1000pF
C93	2113741F25	1000pF
C94	2113741F25	1000pF
C95	2113741F25	1000pF
C96	2113741F25	1000pF
C97	2113741F25	1000pF
C98	2113741F25	1000pF
C99	2113741F25	1000pF
C100	2113741F25	1000pF
C101	2113741F25	1000pF
C102	2113741F25	1000pF
C103	2113741F25	1000pF
C104	2113741F25	1000pF
C105	2113741F25	1000pF
C106	2113741F25	1000pF
C107	2113741F25	1000pF
C108	2113741F25	1000pF
C109	2113741F25	1000pF
C110	2113741F25	1000pF
C111	2113741F25	1000pF
C112	2113741F25	1000pF
C113	2113741F25	1000pF
C114	2113741F25	1000pF
C115	2113741F25	1000pF
C116	2113741F49	10000pF
C117	2113741F49	10000pF
C118	2113741F49	10000pF
C119	2113741F49	10000pF
C120	2113741F49	10000pF
C121	2113741F49	10000pF
C122	2113741F49	10000pF
C124	2113741F49	10000pF
C125	2113741F17	470pF
C126	2113741F17	470pF
C127	2113743F12	.330UF
C128	2113743F12	.330UF
C129	2113743F12	.330UF
C130	2113743F12	.330UF
C131	2113743F12	.330UF
C132	2113743F12	.330UF
C133	2113743F12	.330UF
C134	2113743F12	.330UF
C135	2113741F49	10000pF
C136	2113741F49	10000pF
C137	2311049A07	tantalum 1UF 10% 16V

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	coils, nH, 5%, unless otherwise specified:	
L1	2462587P28	22000
L2	2462587P28	22000
L3	2462587P28	22000
L4	2462587P28	22000
L5	2462587P28	22000
L6	2462587P28	22000
L7	2462587P28	22000
L8	2462587P28	22000
L9	2462587P28	22000
L10	2462587P28	22000
L11	2462587P28	22000
L12	2462587P28	22000
L13	2462587P28	22000
L14	2462587P28	22000
L15	2462587P28	22000
L16	2462587P28	22000
L17	2462587P28	22000
L18	2462587P28	22000
L19	2462587P28	22000
L20	2462587P28	22000
L21	2462587P28	22000
L22	2462587P28	22000
L23	2462587P28	22000
L24	2462587P28	22000
L25	2462587P28	22000
	connectors, receptacle:	
J1	2808238G10	D-type 25 pos. str pcb
J2	2808238G10	D-type 25 pos. str pcb
J3	2808238G10	D-type 25 pos. str pcb
J4	2808238G10	D-type 25 pos. str pcb
J5	0980463L01	connector
J5	0980255E01	connector power heat sink
J7	2808044H05	plug header 16pin low PRO st
	diodes:	
CR6	4813833C09	diode GEN PURP .1A 100V 'DX'
	integrated circuits:	
U1	5105469E65	voltage regulator LP2951C
U2	5105469E65	voltage regulator LP2951C
U3	5113819A07	low power sing sply MC33174
U4	5113819A07	low power sing sply MC33174
U5	5113819A07	low power sing sply MC33174
U6	5113819A07	low power sing sply MC33174
U7	5113819A07	low power sing sply MC33174
U8	5113816A08	regulator 8V POS 500MA MC78M08BDTRK
U9	5113816A03	regulator 5V POS 100MA MC78L05ABDR2
	jumpers:	
JU1	2880006R02	con PCB header .1 snpb Sr st 2pos
JU2	2880006R02	con PCB header .1 snpb sr st 2pos
JU3	2880006R02	con PCB header .1 snpb sr st 2pos
JU4	2880006R02	con PCB header .1 snpb sr st 2pos
JU5	2880001R03	con PCB header .1 GLD sr st 3 pos
	relays:	
K1	8013917A03	relay SMD 12V 178MM T&R
	resistors, Ω 5% 1/8W, unless otherwise specified:	
R2	0683962T66	RES chip 510 5-1
R4	0662057A73	10K
R5	0662057A73	10K
R6	0662057A73	10K
R7	0662057A73	10K
R8	0662057A73	10K
R9	0662057A73	10K
R20	0683962T66	510 1W
R21	0683962T66	510 1W
R23	0662057A65	4700
R24	0662057A65	4700
R25	0662057A65	4700
R26	0662057A65	4700
R27	0662057A59	2700
R28	0662057A59	2700
R29	0662057A59	2700
R30	0662057A59	2700
R31	0662057A59	2700
R32	0662057A59	2700
R33	0662057A59	2700
R34	0662057A59	2700
R35	0662057A59	2700
R36	0662057A59	2700
R37	0662057A59	2700
R38	0662057A59	2700
R39	0662057A59	2700
R11	0662057A73	10K
R12	0662057A73	10K
R13	0662057A73	10K
R14	0662057A73	10K
R15	0662057A73	10K
R16	0662057A73	10K
R17	0662057A73	10K
R18	0662057A73	10K
R19	0662057A73	10K
R40	0662057A49	1000
R41	0662057A49	1000
R42	0662057A49	1000
R43	0662057A49	1000
R44	0662057A49	1000
R45	0662057A49	1000
R46	0662057A49	1000
R47	0662057A49	1000
R50	0662057A35	270
R51	0662057A35	270
R52	0662057A35	270
R53	0662057A35	270
R54	0662057A35	270
R55	0662057A35	270
R56	0662057A35	270
R57	0662057A35	270
R58	0662057A35	270
R59	0662057A35	270
R60	1802080C16	res variable cermet 25K 10% 0.5W
R61	1802080C16	res variable cermet 25K 10% 0.5W
R62	1802080C16	res variable cermet 25K 10% 0.5W
R63	1802080C16	res variable cermet 25K 10% 0.5W
R64	0662057A87	39K
R65	0662057A87	39K
R66	0662057A87	39K
R67	0662057A87	39K
R68	0662057A87	39K
R69	0662057A87	39K
R70	0662057A87	39K
R71	0662057A87	39K
R72	0662057A87	39K
R73	0662057A87	39K
R74	0662057A87	39K
R75	0662057A87	39K
R76	0662057A87	39K
R77	0662057A87	39K
R78	0662057A87	39K
R79	0662057A87	39K
R80	0662057A87	39K
R81	0662057A87	39K

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R82	0662057A87	39K
R83	0662057A87	39K
R84	0662057A80	20K
R85	0662057A80	20K
R86	0662057A80	20K
R87	0662057A80	20K
R88	0662057A80	20K
R89	0662057A80	20K
R90	0662057A80	20K
R91	0662057A80	20K
R92	0662057A80	20K
R93	0662057A80	20K
R94	0662057A73	10K
R95	0662057A73	10K
R96	0662057A73	10K
R97	0662057A73	10K
R99	0662057A73	10K
R103	0662057A73	10K
R104	0662057A73	10K
R106	0662057A73	10K
R107	0662057A73	10K
R108	0662057A73	10K
R110	0662057A73	10K
R111	0662057A73	10K
R112	0662057A73	10K
R114	0662057A73	10K
R115	0662057A73	10K
R116	0662057A73	10K
R118	0662057A73	10K
R119	0662057A73	10K
R120	0662057A73	10K
R121	0662057A73	10K
R122	0662057A73	10K
R123	0662057A73	10K
R124	0662057A73	10K
R125	0662057A73	10K
R126	0662057A73	10K
R127	0662057A73	10K
R128	0662057A73	10K
R129	0662057A73	10K
R130	0662057A73	10K
R131	0662057A73	10K
R132	0662057A73	10K
R133	0662057A56	2000
R134	0662057A56	2000
R135	0662057A56	2000
R136	0662057A56	2000
R137	0662057A56	2000
R138	0662057A56	2000
R139	0662057A56	2000
R140	0662057A56	2000
R141	0662057A56	2000
R142	0662057A56	2000
R148	0662057A49	1000
R149	0662057A49	1000
R150	0662057A49	1000
R151	0662057A49	1000
R152	0662057A49	1000
R153	0611077E94	1000 1
R154	0611077A76	1200 5
R155	0611077D97	100 1
R156	0611077D97	100 1
R157	0611077A66	470 5
R158	0611077A66	470 5
R159	0662057A73	10K
R165	0662057A59	2700
R168	0662057A80	20K
R169	0662057A80	20K
R170	0662057A80	20K

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R171	0662057A80	20K
R172	0662057A80	20K
R173	0662057B47	0 ±.050
R174	0662057A97	100K
R175	0662057A97	100K
R176	0662057A97	100K
R177	0662057A97	100K
R178	0662057A82	24K
R179	0662057A82	24K
R180	0662057A82	24K
R181	0662057A82	24K
R182	0662057A59	2700
R183	0662057B14	470K
R184	0662057A73	10K
R185	0662057A97	100K
R186	0662057A91	56K
R187	0662057A91	56K
	transistors:	
Q1	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q2	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q3	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q4	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q5	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q6	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q7	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q8	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q9	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q10	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q11	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q12	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q13	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q14	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q15	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q16	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q18	4813821A23	FET P-CH 30V 50A
Q19	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q20	4813824A10	tstr npn 40V .2A GEN PURP
Q21	4813824A10	tstr npn 40V .2A GEN PURP
Q22	4813824A10	tstr npn 40V .2A GEN PURP
Q23	4813822D49	tstr pnp 60V 10A TO220
Q24	4813822D49	tstr pnp 60V 10A TO220
Q25	4813824A10	TSTR NPN 40V .2A GEN PURP
Q26	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Q27	4813823A07	XSTR N-CH TMOS FET 2N7002LT1
Qty	**non-referenced items:**	
	4380643L01	spacer, nut
	4380643L01	spacer, nut
	8408128Y01	PCB

FHN5899A Continuous Duty Tray (CDT) Hardware

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Qty	**Non-referenced items:**	
1	0102705K81	8 pin cable
1	0102705K82	internal cable
2	0200131435	nut 4-40x1/4x3/32 hex stl cad
8	0210971A29	nutCH M4x0.7 hexstlblkox
2	0302214C16	screw for D-type connector
1	0308248G12	screw M8.0 x 1.25 45MM
8	0310907B99	scr machine M4x0.7x38 starpan stl
5	0380477L01	screw for spacer
2	0400008442	washerlock 4 ltspt stl nickle
8	0402439C18	washer
8	0402440C16	washer flat .170x3/8x.032 sstbox
1	0410985A05	washer lock split M8 sstl pas
1	0704566P01	tray lock
4	1308116L01	grill for fan
2	1480075D01	insulator to 220 chassis
1	2780549L01	chassis
2	5980475L01	fan
4	7510606A05	bmpr rubber blk

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C4035	2113743B24	.390 10%
C4037	2311049J11	tantalum 4.7 10% 16V
C4038	2113741B69	100000 pF
C4039	2113741F49	10000 pF
C4040	2311049J26	tantalum 10 20% 16V
C4042	2113741B69	100000 pF
C4043	2311049J26	tantalum 10 20% 16V
C4044	2311049J39	tantalum 33 10% 16V
C4045	2311049J26	tantalum 10 20% 16V
C4047	2113741F25	1000 pF
C4051	2113743B24	.390 10%
C4052	2113740A67	330 pF
C4053	2113743B24	.390 10%
C4054	2311049J11	tantalum 4.7 10% 16V
C4055	2113743B24	.390 10%
C4056	2113741F41	4700 pF
C4057	2113741F49	10000 pF
C4058	2113743B24	.390 10%
C4059	2113741F25	1000 pF
C4060	2113741F25	1000 pF
C4061	2311049J11	tantalum 4.7 10% 16V
C4062	2113743B24	.390 10%
C4064	2113741F25	1000 pF
C4065	2113741F25	1000 pF
C4066	2113741F25	1000 pF
C4067	2113741B69	100000 pF
C4068	2113741F25	1000 pF
C4069	2311049J11	tantalum 4.7 10% 16V
C4070	2311049A20	tantalum 15 10% 25V
C4071	2113743B24	.390 10%
C4072	2113743B24	.390 10%
C4073	2113741F41	4700 pF
C4074	2113743B24	.390 10%
C4075	2113743B24	.390 10%
C4200	2113741F49	10000 pF
C4201	2311049J26	tantalum 10 20% 16V
C4300	2113741F49	10000 pF
C4400	2311049J11	tantalum 4.7 10% 16V
C5000	2113741B69	100000 pF
C5001	2113743K15	ceramic .100
C5002	2113743K15	ceramic .100
C5003	2113743K15	ceramic .100
C5004	2113743K15	ceramic .100
C5005	2113743K15	ceramic .100
C5006	2113741F49	10000 pF
C5007	2311049J39	tantalum 33 10% 16V
C5008	2113743K15	ceramic .100
C5009	2113743K15	ceramic .100
C5010	2113743K15	ceramic .100
C5011	2113743K15	ceramic .100
C5013	2113743K15	ceramic .100
C5016	2113743K15	ceramic .100
C5017	2113743K15	ceramic .100
C5021	2113741F25	1000 pF
C5022	2113741F41	4700 pF
C5023	2113743K15	ceramic .100
C5024	2113743K15	ceramic .100
C5025	2113743K15	ceramic .100
C5026	2113743K15	ceramic .100
C5027	2113743K15	ceramic .100
C5028	2113743K15	ceramic .100
C5029	2113743K15	ceramic .100
C5031	2113743K15	ceramic .100
C5032	2113740F34	20 pF
C5033	2113740F34	20 pF
C5034	2311049J26	tantalum 10 20% 16V
C5035	2311049J26	tantalum 10 20% 16V
C5036	2311049J26	tantalum 10 20% 16V
C5037	2311049J26	tantalum 10 20% 16V

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C6000	2311049J39	tantalum 33 10% 16V
C6002	2113743K15	ceramic .100
C6004	2113743K15	ceramic .100
C6006	2113743K15	ceramic .100
C6008	2113743K15	ceramic .100
C6010	2113743K15	ceramic .100
C6013	2113743K15	ceramic .100
C6014	2113740F51	100 pF
C6015	2113740F51	100 pF
C6016	2113743K15	ceramic .100
C6017	2113743K15	ceramic .100
C6019	2113743K15	ceramic .100
C6020	2113743K15	ceramic .100
C6021	2113743K15	ceramic .100
C6022	2113743K15	ceramic .100
C6023	2113741F49	10000 pF
C6024	2311049J26	tantalum 10 20% 16V
C6026	2113743K15	ceramic .100
C6027	2113743K15	ceramic .100
C6030	2113741F49	10000 pF
C6032	2311049J26	tantalum 10 20% 16V
C6033	2113741F49	10000 pF
C6034	2113743K15	ceramic .100
C6035	2113741B69	100000 pF
C6038	2113740F51	100 pF
C6039	2113743K15	ceramic .100
C6040	2113740F61	270 pF
C6041	2113740F61	270 pF
C6042	2113741F49	10000 pF
C7001	2113740F27	10 pF
C7002	2113740F27	10 pF
C7003	2113743K15	ceramic .100
C7004	2113743K15	ceramic .100
C7005	2311049J39	tantalum 33 10% 16V
C7006	2311049J39	tantalum 33 10% 16V
C7007	2113740F61	270 pF
C7008	2113740F61	270 pF
C7009	2113740F61	270 pF
C7010	2113741F49	10000 pF
C7011	2113743K15	ceramic .100
C7012	2113743K15	ceramic .100
C7013	2113743K15	ceramic .100
C7014	2113743K15	ceramic .100
C7015	2113743K15	ceramic .100
C7016	2113743K15	ceramic .100
C7017	2113743K15	ceramic .100
C7018	2113743K15	ceramic .100
C7019	2113743K15	ceramic .100
C7020	2113741F49	10000 pF
C7021	2113740F61	270 pF
C7022	2113743K15	ceramic .100
C7027	2113741B69	100000 pF
C7028	2113740F61	270 pF
C7029	2113741B69	100000 pF
C7030	2311049A20	tantalum 15 10% 25V
C7031	2113741B69	100000 pF
C9000	2113741F25	1000 pF
C9020	2113741F25	1000 pF
C9040	2113741F25	1000 pF
C9060	2113741F25	1000 pF
C9061	2113740A21	5.6 pF
C9062	2113740A15	3.3 pF
C9063	2113740A20	5.1 pF
C9066	2113740A33	15 pF
C9067	2113740A33	15 pF
C9069	2113740A31	12 pF
C9070	2113740A31	12 pF
C9071	2113740A31	12 pF
C9072	2113740A55	100 pF

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C9074	2113740A44	43 pF
C9075	2113740A44	43 pF
C9076	2113740A25	7.5 pF
C9078	2113740A25	7.5 pF
C9079	2113740A01	.5-870
C9080	2113740A11	2.2 pF
C9081	2113740A01	.5-870
C9082	2113740A40	30 pF
C9084	2113740A55	100 pF
C9087	2113741F25	1000 pF
C9089	2113741F25	1000 pF
C9091	2113741F25	1000 pF
C9093	2113740A21	5.6 pF
C9094	2113740A33	15 pF
C9095	2113740A31	12 pF
C9096	2113740A44	43 pF
C9097	2113740A01	.5-870
C9098	2113740A61	180 pF
C9099	2113741F25	1000 pF
C9110	2113741F25	1000 pF
C9200	2113741F25	1000 pF
C9400	2113741F25	1000 pF
C9401	2113741F49	10000 pF
CC9300	2113741F25	1000 pF
	diodes: (See Note 1)	
CR1	4813825A06	pin diode 35V
CR2	4813825A06	pin diode 35V
CR3	4813825A06	pin diode 35V
CR4	4813825A06	pin diode 35V
CR5	4813825A06	pin diode 35V
CR6	4813825A06	pin diode 35V
CR7	4813825A06	pin diode 35V
CR8	4813825A06	pin diode 35V
CR9	4813825A06	pin diode 35V
CR10	4813825A06	pin diode 35V
CR11	4813825A06	pin diode 35V
CR12	4813825A06	pin diode 35V
CR13	4813825A06	pin diode 35V
CR14	4813825A06	pin diode 35V
CR15	4813825A06	pin diode 35V
CR16	4813825A06	pin diode 35V
CR17	4813825A06	pin diode 35V
CR1000	4813825A06	pin diode 35V
CR1001	4882290T01	SI hot carrier HSMS-2800-31
CR1002	4813833C09	.1A 100V 'DX'
CR1003	4813833C09	.1A 100V 'DX'
CR1004	4813833C09	.1A 100V 'DX'
CR1005	4813833C09	.1A 100V 'DX'
CR1006	4813833C09	.1A 100V 'DX'
CR1007	4813833C09	.1A 100V 'DX'
CR1008	4813825A06	pin diode 35V
CR1009	4813825A06	pin diode 35V
CR1010	4813825A06	pin diode 35V
CR1011	4813825A06	pin diode 35V
CR1012	4813825A06	pin diode 35V
CR1903	4813833C09	.1A 100V 'DX'
CR1904	4813825A06	pin 35V
CR1905	4813825A06	pin 35V
CR2000	4802233J09	triple SOT143-RH
CR2001	4813825A06	pin diode 35V
CR2002	4813825A06	pin diode 35V
CR2003	4813825A06	pin diode 35V
CR2008	4813833C09	.1A 100V 'DX'
CR2009	4813833C09	.1A 100V 'DX'
CR5000	4813825A08	70V hot carrier MMBD701L
CR5001	4813833C09	.1A 100V 'DX'
CR5002	4813825A08	70V hot carrier MMBD701L

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CR5003	4813825A08	70V hot carrier MMBD701L
CR5004	4813825A08	70V hot carrier MMBD701L
CR5005	4813825A08	70V hot carrier MMBD701L
CR9000	4805649Q13	VCTR ISV 228
CR9020	4805649Q13	VCTR ISV 228
CR9040	4805649Q13	VCTR ISV 228
CR9060	4862824C01	varactor
CR9062	4813825A08	70V hot carrier MMBD701L
CR9063	4813825A08	70V hot carrier MMBD701L
CR9064	4813825A08	70V hot carrier MMBD701L
CR9066	4805649Q13	VCTR ISV 228
CR9067	4805649Q13	VCTR ISV 228
CR9068	4813825A08	70V hot carrier MMBD701L
CR9069	4805649Q13	VCTR ISV 228
CS012	2113743K15	ceramic .100
	filters:	
FL1	9102652Y01	crystal filter 45.1 MHz 25kHz 80dB
FL2	9102652Y02	crystal filter 45. 1 MHz 25kHz 60dB
FL3	9182688T03	filter ceramic BP 450 kHz
FL4	9182688T03	filter ceramic BP 450 kHz
	connectors, receptacle:	
J1	0980135M01	receptacle coax 002 pins
J2	0980135M01	receptacle coax 002 pins
J3	2809671B01	header rt 40 pin 104069-C
J4	2809926G01	connector 1.25 mm CTR header
J5	2804635P01	D-type 25 pins right angle
J6	2804935K01	connector header 24 pin right angle
J7	2813916B13	plug smd 25 pos
	inductors:	
E1001	2484657R01	inductor bead chip
E1002	2484657R01	inductor bead chip
	inductors: nH, 5%, unless otherwise specified:	
L1	2462587T29	910NH low PRO
L2	2462587T29	910NH low PRO
L3	2462587P66	680NH low PRO
L4	2462587P28	22000
L5	2462587P28	22000
L6	2462587P28	22000
L7	2462587P28	22000
L8	2462587P28	22000
L9	2462587P24	10000
L10	2462587P24	10000
L12	2462587P24	10000
L13	2462587P24	10000
L14	2462587P24	10000
L15	2462587P24	10000
L16	2462587N74	3300
L20	2462587N70	1500
L22	2413923A11	390 2%
L25	2462587M29	8200
L26	2462587M29	8200
L27	2462587M28	6800
L28	2462587M28	6800
L29	2462587M28	6800
L30	2462587M28	6800
L31	2462587M28	6800
L32	2462587M28	6800
L33	2462587M28	6800
L34	2462587M28	6800
L35	2462587M28	6800
L36	2462587M28	6800
L37	2462587M27	5600
L38	2462587M27	5600
L39	2462587M26	4700

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
L42	2462587M19	1200
L43	2462587M19	1200
L44	2462587T20	270 low PRO
L45	2462587T20	270 low PRO
L46	2462587P28	22000
L47	2462587L30	2200 10%
L48	2462587L30	2200 10%
L49	2462587L30	2200 10%
L50	2462587T29	910 low PRO
L51	2462587P28	22000
L52	2462587P28	22000
L53	2462587N74	3300
L54	2462587N74	3300
L55	2462587P28	22000
L1000	2462587P28	22000
L1006	2462587T20	270 low PRO
L1007	2462587T20	270 low PRO
L1008	2462587T20	270 low PRO
L1012	2462587T29	910 low PRO
L1013	2462587T20	270 low PRO
L1014	2462587T20	270 low PRO
L1015	2462587T20	270 low PRO
L1016	2462587T20	270 low PRO
L1017	2462587P28	22000
L1018	2462587P28	22000
L1020	2462587P28	22000
L1021	2462587P28	22000
L1022	2462587P28	22000
L1023	2462587P28	22000
L1024	2462587P28	22000
L1025	2462587P28	22000
L1027	2462587P28	22000
L1028	2462587P28	22000
L1029	2462587P28	22000
L1030	2462587P28	22000
L1033	2462587P28	22000
L1034	2462587P28	22000
L1036	2462587P28	22000
L1037	2462587P28	22000
L1038	2462587P28	22000
L1039	2462587P28	22000
L1040	2462587P28	22000
L1041	2462587P24	10000
L1042	2462587P24	10000
L1043	2462587P24	10000
L1044	2462587P24	10000
L1045	2462587N62	560
L1046	2462587N64	680
L1047	2462587N64	680
L1048	2462587N64	680
L1049	2462587N64	680
L1050	2462587N52	82
L1052	2462587P24	10000
L1054	2462587P24	10000
L1056	2462587T20	270 low PRO
L1057	2462587T20	270 low PRO
L1059	2462587P28	22000
L1214	2462587P28	22000
L1800	2462587P28	22000
L1801	2462587N68	1000
L1802	2462587N68	1000
L1803	2462587N68	1000
L1804	2462587N68	1000
L1805	2462587P28	22000
L1806	2462587P28	22000
L1807	2462587P66	680 low PRO
L1FL1	2462587P28	22000
L1FL2	2462587P28	22000
L1FL3	2462587P28	22000

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
L1FL4	2462587P28	22000
L1FL5	2462587P28	22000
L1FL6	2462587P28	22000
L1FL7	2462587P28	22000
L1FL8	2462587P28	22000
L1FL9	2462587P28	22000
L1FL10	2462587P28	22000
L1FL11	2462587P28	22000
L1FL12	2462587P28	22000
L1FL13	2462587P28	22000
L1FL14	2462587P28	22000
L1FL15	2462587P28	22000
L1FL17	2462587P28	22000
L1FL20	2462587P28	22000
L1FL21	2462587P28	22000
L1FL22	2462587P28	22000
L2000	2462587V28	33 0805
L2001	2462587M19	1200
L2002	2462587T20	270 low PRO
L2003	2462587T20	270 low PRO
L2004	2462587T20	270 low PRO
L2005	2462587N40	8.2
L2006	2462587N53	100
L2007	2462587N53	100
L2008	2462587N53	100
L2009	2462587N53	100
L2011	2462587N43	15
L2012	2462587E13	68.0 10%
L2013	2462587E13	68.0 10%
L2017	2462587P24	10000
L2018	2462587P24	10000
L2019	2462587P24	10000
L2020	2462587P24	10000
L2021	2462587P24	10000
L2022	2462587P24	10000
L2023	2462587P02	150 10%
L2024	2462587N68	1000
L2025	2462587N68	1000
L2026	2462587N52	82
L2027	2462587E54	120
L2028	2462587E54	120
L3000	2462587N70	1500
L3001	2462587P24	10000
L3002	2462587P24	10000
L3003	2462587P24	10000
L3004	2462587P24	10000
L3005	2462587P24	10000
L3006	2462587P24	10000
L3007	2462587N70	1500
L3008	2462587N70	1500
L4001	2462587P28	22000
L4002	2462587P28	22000
L5000	2462587P28	22000
L5001	2462587P28	22000
L5002	2462587P28	22000
L6000	2462587P66	680 low PRO
L7000	2462587M19	1200
L9000	2462587N70	1500
L9020	2462587N70	1500
L9040	2462587N70	1500
L9060	2462587T29	910 low PRO
L9061	2462587T29	910 low PRO
L9062	2462587T29	910 low PRO
L9064A	2408398Y03	28
L9065A	2408398Y01	53
L9066A	2408398Y02	39
L9070	2462587N70	1500
L9072	2462587N70	1500
L9073	2462587N70	1500

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
L9074	2462587N70	1500
L9076A	2480145S04	coil 4,5 turns, ferrite core
L9077	2462587N70	1500
L9079	2462587N70	1500
		transistors:
		(See Note 1)
Q1	4813824A10	NPN 40V .2A
Q2	4813824A10	NPN 40V .2A
Q3	4813824A10	NPN 40V .2A
Q4	4813824A10	NPN 40V .2A
Q5	4813824A10	NPN 40V .2A
Q6	4813824A10	NPN 40V .2A
Q7	4813824A10	NPN 40V .2A
Q8	4813824A10	NPN 40V .2A
Q9	4813824A10	NPN 40V .2A
Q30	4813824A17	PNP 40V .2A B=100-300
Q1000	4813824A10	NPN 40V .2A
Q1001	4813823B01	N-CH TMOS FET MMFT6661_
Q1002	4813823B01	N-CH TMOS FET MMFT6661_
Q1003	4813827A08	NPN sml sig MMBR951LT1 7Z
Q1004	4813827A08	NPN sml sig MMBR951LT1 7Z
Q1005	4813827A08	NPN sml sig MMBR951LT1 7Z
Q1006	4813827A08	NPN sml sig MMBR951LT1 7Z
Q1007	4813824A17	PNP40V .2A B=100-300
Q1008	4813824A17	PNP40V .2A B=100-300
Q1009	4813824A17	PNP40V .2A B=100-300
Q1010	4813824A17	PNP40V .2A B=100-300
Q1011	4813824A17	PNP40V .2A B=100-300
Q1012	4813824A17	PNP40V .2A B=100-300
Q1013	4813824A10	NPN 40V .2A
Q1014	4813824A10	NPN 40V .2A
Q1015	4813824A10	NPN 40V .2A
Q1017	4813824A10	NPN 40V .2A
Q1018	4813824A10	NPN 40V .2A
Q1019	4813824A10	NPN 40V .2A
Q1020	4813823A07	N-CH TMOS FET 2N7002LT1
Q1021	4813824A10	NPN 40V .2A
Q1022	4813824A10	NPN 40V .2A
Q1023	4813824A10	NPN 40V .2A
Q1925	4813823A07	N-CH TMOS FET 2N7002LT1
Q2000	4813824A10	NPN 40V .2A
Q2001	4813824A17	PNP40V .2A B=100-300
Q2003	4813824A10	NPN 40V .2A
Q2006	4813827A08	NPN sml sig MMBR951LT1 7Z
Q2007	4813827A08	NPN sml sig MMBR951LT1 7Z
Q2901	4813824A17	PNP40V .2A B=100-300
Q3000	4813824A10	NPN 40V .2A
Q3001	4813827A08	NPN sml sig MMBR951LT1 7Z
Q3002	4813827A08	NPN sml sig MMBR951LT1 7Z
Q4000	4813824A10	NPN 40V .2A
Q4001	4813824A10	NPN 40V .2A
Q4002	4813824A10	NPN 40V .2A
Q4003	4813824A10	NPN 40V .2A
Q4004	4813824A10	NPN 40V .2A
Q4005	4813824A10	NPN 40V .2A
Q5002	4813823A07	N-CH TMOS FET 2N7002LT1
Q5003	4813823A07	N-CH TMOS FET 2N7002LT1
Q5004	4813824A10	NPN 40V .2A
Q5005	4813824A17	PNP40V .2A B=100-300
Q5006	4813823A07	N-CH TMOS FET 2N7002LT1
Q6001	4813823A07	N-CH TMOS FET 2N7002LT1
Q9000	4809728C01	FE BF 992
Q9020	4809728C01	FE BF 992
Q9040	4809728C01	FE BF 992
Q9060	4809728C01	FE BF 992
Q9063	4805218N58	w/res bias
Q9064	4805218N58	w/res bias
Q9065	4805218N58	w/res bias

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		resistors, Ω 5% 1/8W, unless otherwise specified:
R1	0683962T49	100 1W
R2	0683962T49	100 1W
R3	0683962T49	100 1W
R4	0683962T49	100 1W
R5	0662057A97	100K
R6	0662057A97	100K
R7	0662057A97	100K
R8	0662057A97	100K
R9	0662057A97	100K
R10	0662057A97	100K
R11	0662057A97	100K
R12	0662057A97	100K
R13	0662057A69	6800
R14	0662057A69	6800
R15	0662057A69	6800
R16	0662057A69	6800
R17	0662057A69	6800
R18	0662057A69	6800
R19	0662057A69	6800
R20	0662057A69	6800
R21	0662057A69	6800
R22	0662057A69	6800
R23	0662057A51	1200
R24	0662057A51	1200
R25	0662057A51	1200
R26	0662057A51	1200
R27	0662057A51	1200
R28	0662057A51	1200
R29	0662057A51	1200
R30	0662057A51	1200
R31	0662057A51	1200
R32	0662057A01	10
R33	0662057A33	220
R34	0662057A41	470
R35	0662057A69	6800
R36	0662057A69	6800
R37	0662057A51	1200
R50	0662057A60	3000
R60	0662057A07	18
R80	0662057A43	560
R81	0662057A43	560
R82	0662057A01	10
R1000	0662057A73	10K
R1001	0662057A07	18
R1002	0662057A73	10K
R1003	0662057A07	18
R1005	0662057C27	10
R1006	0662057A21	68
R1007	0662057C27	10
R1008	0662057C27	10
R1009	0662057A56	2000
R1010	0662057C27	10
R1011	0662057A56	2000
R1012	0662057A56	2000
R1013	0662057A41	470
R1014	0662057C27	10
R1015	0662057C27	10
R1016	0662057A25	100
R1017	0662057A25	100
R1018	0662057A59	2700
R1019	0662057A56	2000
R1020	0662057A56	2000
R1021	0662057C27	10
R1022	0662057C27	10
R1023	0662057A07	18
R1024	0662057A37	330
R1025	0662057A07	18

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R1026	0662057A01	10
R1027	0662057A37	330
R1028	0662057A37	330
R1029	0662057A35	270
R1030	0662057A18	51
R1031	0662057A01	10
R1032	0662057A09	22
R1033	0662057A21	68
R1034	0662057A07	18
R1035	0662057A21	68
R1036	0662057A59	2700
R1037	0662057A18	51
R1038	0662057A73	10K
R1039	0662057A09	22
R1040	0662057A01	10
R1041	0662057A01	10
R1042	0662057A73	10K
R1043	0662057A35	270
R1044	0662057A35	270
R1045	0662057A39	390
R1046	0662057A59	2700
R1047	0662057A18	51
R1048	0662057A29	150
R1049	0662057A43	560
R1050	0662057A43	560
R1051	0662057A35	270
R1052	0662057A35	270
R1053	0662057A39	390
R1054	0662057A59	2700
R1055	0662057A01	10
R1056	0662057A01	10
R1057	0662057A29	150
R1058	0662057A37	330
R1059	0662057A18	51
R1060	0662057A41	470
R1061	0662057A41	470
R1062	0662057A35	270
R1063	0662057A35	270
R1064	0662057A39	390
R1065	0662057A29	150
R1066	0662057B47	0 +-.050
R1067	0662057B47	0 +-.050
R1068	0662057C61	270
R1069	0662057C61	270
R1070	0662057C61	270
R1071	0662057C61	270
R1072	0662057A73	10K
R1073	0662057A60	3000
R1074	0662057A59	2700
R1075	0662057C61	270
R1076	0662057C61	270
R1077	0662057A18	51
R1088	0662057A18	51
R1200	0662057B47	0 +-.050
R1201	0662057A49	1000
R1202	0662057A41	470
R1203	0662057A41	470
R1204	0662057A41	470
R1205	0662057A41	470
R1206	0662057B47	0 +-.050
R1207	0662057B47	0 +-.050
R1208	0662057A49	1000
R1209	0662057A41	470
R1210	0662057A41	470
R1211	0662057A41	470
R1212	0662057A41	470
R1213	0662057A49	1000
R1214	0662057A65	4700
R1215	0662057A18	51
R1216	0662057A11	27
R1217	0662057A36	300
R1218	0662057A36	300
R1219	0662057A11	27
R1220	0662057A36	300
R1221	0662057A36	300
R1222	0662057A25	100
R1223	0662057A25	100
R1224	0662057A73	10K
R1225	0662057R60	10K .1W 1%
R1226	0662057A25	100
R1227	0662057A25	100
R1228	0662057A01	10
R1229	0662057A01	10
R1230	0662057A59	2700
R1231	0662057R60	10K .1W 1%
R1232	0662057A59	2700
R1233	0662057A41	470
R1234	0662057R60	10K .1W 1%
R1235	0662057R60	10K .1W 1%
R1236	0662057R60	10K .1W 1%
R1237	0662057A18	51
R1238	0662057A59	2700
R1239	0662057A51	1200
R1240	0662057A07	18
R1241	0662057A07	18
R1242	0662057A41	470
R1243	0662057R60	10K .1W 1%
R1244	0662057C13	2.7
R1245	0662057C13	2.7
R1246	0662057A25	100
R1247	0662057R60	10K .1W 1%
R1248	0662057R60	10K .1W 1%
R1251	0662057R60	10K .1W 1%
R1252	0662057A59	2700
R1253	0662057A60	3000
R1254	0662057A18	51
R1255	0662057A49	1000
R1800	0662057A25	100
R1801	0662057A49	1000
R1802	0662057A25	100
R1803	0662057A97	100K
R1804	0662057A01	10
R1805	0662057A49	1000
R1806	0662057A49	1000
R1807	0662057A60	3000
R1808	0662057A45	680
R1809	0662057A97	100K
R1810	0662057A55	1800
R1811	0662057A41	470
R1812	0662057A80	20K
R1813	0662057A53	1500
R1814	0662057A65	4700
R1815	0662057A73	10K
R1816	0662057A25	100
R1817	0662057A51	1200
R1818	0662057A65	4700
R1819	0662057A49	1000
R1820	0662057A49	1000
R1821	0662057A49	1000
R1822	0662057A61	3300
R1823	0662057A73	10K
R1824	0662057A53	1500
R1825	0662057A25	100
R1826	0662057A25	100
R1827	0662057A25	100
R1828	0662057A25	100
R1829	0662057A65	4700
R1830	0662057A65	4700

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R1831	0662057A65	4700
R1832	1813905A10	potentiometer 10 kΩ 20%
R1833	0662057A43	560
R1834	0662057A43	560
R1835	0662057A87	39K
R1836	0662057A53	1500
R1837	0662057A53	1500
R1838	0662057A43	560
R1839	0662057A87	39K
R1840	0662057A53	1500
R1841	0662057A73	10K
R1842	0662057A33	220
R1843	0662057A97	100K
R1845	0662057A33	220
R1846	0662057A11	27
R1847	0662057A55	1800
R1848	0662057A73	10K
R1850	0662057A61	3300
R1851	0662057A60	3000
R1852	0662057A87	39K
R1853	0662057A35	270
R1854	0662057A35	270
R1855	0662057A55	1800
R1856	0662057A87	39K
R1857	0662057A61	3300
R1858	0662057A37	330
R1859	0662057A73	10K
R1860	0662057A49	1000
R1861	0662057A73	10K
R1862	0662057A43	560
R1863	0662057A49	1000
R1864	0662057A49	1000
R1865	0662057A41	470
R1866	0662057A25	100
R1867	0662057A73	10K
R1868	0662057A49	1000
R1869	0662057A25	100
R1870	0662057A25	100
R1871	0662057A69	6800
R1872	0662057A69	6800
R1899	0662057A43	560
R1911	0662057A61	3300
R1962	0662057A43	560
R1998	0662057A73	10K
R1FL1	0662057A25	100
R1FL2	0662057A25	100
R1FL3	0662057A25	100
R1FL4	0662057A25	100
R1FL5	0662057A25	100
R1FL6	0662057A25	100
R1FL9	0662057A25	100
R1FL10	0662057A25	100
R1FL11	0662057A25	100
R1FL12	0662057A25	100
R1FL13	0662057A25	100
R1FL14	0662057A25	100
R1FL15	0662057A25	100
R1FL17	0662057A25	100
R1FL20	0662057A25	100
R1FL21	0662057A25	100
R1FL22	0662057A25	100
R2000	0662057A35	270
R2002	0662057B47	0 +-.050
R2003	0662057B47	0 +-.050
R2004	0662057B47	0 +-.050
R2005	0662057A89	47K
R2006	0662057A89	47K
R2007	0662057A65	4700
R2008	0662057A65	4700

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R2009	0662057A90	51K
R2015	0662057A61	3300
R2016	0662057A61	3300
R2017	0662057A01	10
R2019	0662057A01	10
R2020	0662057A47	820
R2022	0662057A71	8200
R2026	0662057A28	130
R2029	0662057A11	27
R2030	0662057A03	12
R2034	0662057A18	51
R2035	0662057A18	51
R2036	0662057A29	150
R2037	0662057A29	150
R2038	0662057A42	510
R2039	0662057A46	750
R2040	0662057A46	750
R2043	0662057A61	3300
R2044	0662057A61	3300
R2045	0662057A42	510
R2046	0662057A60	3000
R2047	0662057A42	510
R2048	0662057A49	1000
R2049	0662057A49	1000
R2050	0662057A49	1000
R2051	0662057A49	1000
R2052	0662057A59	2700
R2053	0662057A49	1000
R2054	0662057A49	1000
R2055	0662057A49	1000
R2056	0662057A49	1000
R2057	0662057A43	560
R2058	0662057A43	560
R2059	0662057A43	560
R2060	0662057A43	560
R2061	0662057A39	390
R2062	0662057A36	300
R2063	0662057A36	300
R2064	0662057A36	300
R2065	0662057A36	300
R2066	0662057A36	300
R2067	0662057A36	300
R2068	0662057A36	300
R2069	0662057A36	300
R2070	0662057A36	300
R2071	0662057A36	300
R2072	0662057A62	3600
R2073	0662057A73	10K
R2074	0662057A33	220
R2077	0662057A07	18
R2078	0662057A07	18
R2079	0662057A07	18
R2080	0662057A07	18
R2081	0662057A07	18
R2082	0662057A07	18
R2083	0662057A07	18
R2084	0662057A01	10
R2085	0662057A01	10
R2086	0662057A01	10
R2800	0662057A65	4700
R2901	0662057A73	10K
R2902	0662057A73	10K
R2903	0662057A07	18
R2906	0662057A97	100K
R3000	0662057A69	6800
R3004	0662057B02	150K
R3006	0662057A85	33K
R3009	0662057A41	470
R3010	0662057A61	3300

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R3013	0662057A49	1000
R3016	0662057A43	560
R3017	0662057A43	560
R3019	0662057A28	130
R3020	0662057A01	10
R3021	0662057A01	10
R3023	0605621T02	thermistor smt
R3024	0683962T01	1.0 1W
R3025	0683962T01	1.0 1W
R3027	0662057B47	0 +-.050
R3029	0662057B02	150K
R3031	0662057B02	150K
R3034	0662057A92	62K
R3043	0662057A85	33K
R3044	0662057A85	33K
R3046	0662057A49	1000
R3047	0662057A25	100
R3048	0662057A73	10K
R3050	0662057B02	150K
R3051	0662057A61	3300
R3052	0662057A61	3300
R3053	0662057A49	1000
R3054	0662057A43	560
R3055	0662057A43	560
R3056	0662057A35	270
R3057	0662057A01	10
R3058	0662057A01	10
R3059	0662057A73	10K
R3060	0662057A73	10K
R3062	0662057A73	10K
R3063	0662057A85	33K
R3064	0662057A97	100K
R3075	0662057B02	150K
R3076	0662057R60	10K .1W 1%
R3300	0662057A18	51
R3301	0662057A01	10
R3302	0662057A25	100
R3303	0662057A18	51
R3310	0662057B46	10.0 M
R3330	0662057R60	10K .1W 1%
R3350	0662057R60	10K .1W 1%
R3600	0662057B46	10.0M
R3942	0662057R60	10K .1W 1%
R3FL20	0662057A65	4700
R4000	0662057A73	10K
R4001	0662057A73	10K
R4002	0662057A80	20K
R4003	0662057A73	10K
R4004	0662057A73	10K
R4005	0662057A80	20K
R4006	0662057A87	39K
R4007	0662057A73	10K
R4008	0662057A60	3000
R4009	0662057A56	2000
R4010	0662057A65	4700
R4011	0662057A80	20K
R4012	0662057A87	39K
R4013	0662057A43	560
R4014	0662057A33	220
R4015	0662057A33	220
R4016	0662057A67	5600
R4017	0662057A69	6800
R4018	0662057A73	10K
R4019	0662057A87	39K
R4020	0662057A60	3000
R4021	0662057B02	150K
R4022	0662057A87	39K
R4023	0662057A97	100K
R4024	0662057A97	100K

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R4025	0662057A80	20K
R4026	0662057A97	100K
R4028	0662057A73	10K
R4029	0662057B02	150K
R4030	0662057A56	2000
R4031	0662057A65	4700
R4033	0662057A80	20K
R4035	0662057A80	20K
R4037	0662057A59	2700
R4041	0662057A73	10K
R4043	0662057A80	20K
R4044	0662057A43	560
R4046	0662057A80	20K
R4047	0662057A73	10K
R4048	0662057A97	100K
R4049	0662057A73	10K
R4050	0662057A69	6800
R4051	0662057A65	4700
R4052	0662057A73	10K
R4053	0662057A97	100K
R4054	0662057A73	10K
R4055	0662057A80	20K
R4056	0662057A73	10K
R4057	0662057A73	10K
R4058	0662057A59	2700
R4059	0662057A97	100K
R4060	0662057A35	270
R4061	0662057A80	20K
R4062	0662057A73	10K
R4063	0662057A73	10K
R4064	0662057A49	1000
R4065	0662057A73	10K
R4066	0662057A69	6800
R4067	0662057A56	2000
R4068	0662057A80	20K
R4069	0662057B02	150K
R4070	0662057B02	150K
R4071	0662057A73	10K
R4072	0662057B02	150K
R4073	0662057A73	10K
R4074	0662057A73	10K
R4075	0662057A35	270
R4076	0662057A73	10K
R4077	0662057A80	20K
R4078	0662057A73	10K
R4079	0662057A56	2000
R4080	0662057A69	6800
R4081	0662057A07	18
R4082	0662057A73	10K
R4083	0662057A80	20K
R4084	0662057A73	10K
R4085	0662057A49	1000
R4086	0662057A69	6800
R4087	0662057A59	2700
R4088	0662057A80	20K
R4100	0662057B02	150K
R4150	0662057A25	100
R4200	0662057A97	100K
R4201	0662057A80	20K
R4202	0662057A80	20K
R4203	0662057A59	2700
R4401	0662057A61	3300
R5000	0662057B47	0 +-.050
R5001	0662057A65	4700
R5002	0662057A87	39K
R5003	0662057A87	39K
R5004	0662057A87	39K
R5005	0662057A87	39K
R5006	0662057A87	39K

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R5007	0662057A87	39K
R5009	0662057A97	100K
R5013	0662057A65	4700
R5014	0662057A65	4700
R5016	0662057B47	0 +-.050
R5017	0662057A87	39K
R5020	0662057B47	0 +-.050
R5021	0662057A87	39K
R5022	0662057A49	1000
R5023	0662057B47	0 +-.050
R5024	0662057A49	1000
R5025	0662057B47	0 +-.050
R5027	0662057B02	150K
R5028	0662057A65	4700
R5029	0662057A65	4700
R5030	0662057A65	4700
R5034	0662057B47	0 +-.050
R5035	0662057A56	2000
R5036	0662057A73	10K
R5037	0662057A87	39K
R5038	0662057A87	39K
R5039	0662057B46	10.0 M
R5040	0662057A87	39K
R5041	0662057A87	39K
R5042	0662057B08	270K
R5043	0662057A87	39K
R5044	0662057A73	10K
R5046	0662057A73	10K
R5047	0662057A87	39K
R5048	0662057A87	39K
R5050	0662057A65	4700
R5051	0662057A87	39K
R5052	0662057A65	4700
R5053	0662057A87	39K
R5054	0662057A87	39K
R5055	0662057A73	10K
R5056	0662057A25	100
R5058	0662057A87	39K
R5059	0662057A87	39K
R5060	0662057A25	100
R5062	0662057A87	39K
R5063	0662057A87	39K
R5065	0662057A87	39K
R5066	0662057A73	10K
R5067	0662057A49	1000
R5068	0662057A73	10K
R5070	0662057B47	0 +-.050
R5071	0662057A87	39K
R5072	0662057A87	39K
R5075	0662057B47	0 +-.050
R5100	0662057A73	10K
R5101	0662057A73	10K
R5104	0662057A73	10K
R6000	0662057A87	39K
R6002	0662057A73	10K
R6006	0662057A87	39K
R6009	0662057A87	39K
R6014	0662057A73	10K
R6016	0662057A87	39K
R6018	0662057A87	39K
R6020	0662057A87	39K
R6022	0662057A55	1800
R6023	0662057A55	1800
R6024	0662057A87	39K
R6026	0662057A51	1200
R6027	0611077A73	910 5 1/8W
R6028	0662057A87	39K
R6030	0662057A87	39K
R6032	0662057A73	10K

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R6033	0662057A46	750
R6034	0662057A46	750
R6035	0662057A07	18
R6036	0662057A46	750
R6037	0611077A73	910 5 1/8W
R6038	0662057A51	1200
R6039	0662057A55	1800
R6040	0662057A55	1800
R6041	0662057A25	100
R6042	0662057A73	10K
R6043	0662057A49	1000
R6045	0662057A41	470
R6100	0662057A97	100K
R6500	1813905A07	potentiometer 1 kΩ 20%
R7000	0662057A41	470
R7001	0662057A41	470
R7002	0662057A41	470
R7003	0662057A41	470
R7006	0662057A41	470
R7007	0662057A89	47K
R7100	0662057C13	2.7
R9000	0662057A83	27K
R9020	0662057A83	27K
R9040	0662057A83	27K
R9060	0662057A83	27K
R9062	0662057A32	200
R9063	0662057A32	200
R9064	0662057A32	200
R9065	0662057A32	200
R9100	0662057A01	10
R9200	0662057A01	10
R9300	0662057A01	10
R9400	0662057A01	10
	integrated circuits: (See Note 1)	
U1	5113805A75	8 bit ser to par/par HC595
U1000	0108106L09	mixer, smd
U1100	5113819A07	low power single supply MC33174
U1104	5113811G02	D/A converter 6bit 4chan w/SPI
U1105	5113808A12	inverter hex Schmitt trigger 74AC14
U1106	5105625U25	9.3V regulator 2941
U1107	5105625U25	9.3V regulator 2941
U1108	0108106L09	mixer, smd
U1109	5113808A12	inverter hex Schmitt trigger 74AC14
U1110	5113819A07	low power single supply MC33174
U1111	5113806A21	MC14066BDR2
U1112	5113805A75	8 bit ser to par/par HC595
U1113	5113805A39	ctr binp async RST 74HC161D
U1114	5113805A39	ctr binp async RST 74HC161D
U1115	5102807C13	A-D converter
U1900	5113819A07	low power single supply MC33174
U2000	5113812A16	PLL frequency synthesizer 1.1 GHz
U2001	5113812A16	PLL frequency synthesizer 1.1 GHz
U2002	5113813A06	prescaler -12093-
U2003	5113813A06	prescaler -12093-
U2004	5113816A01	adj. low dropout pos,100 mA
U2006	5113816A04	regulator 8V pos 100 mA MC78L08ABDR2
U2009	5105625U27	MIMIC
U2010	5105625U27	MIMIC
U2900	5113808A01	NAND quad 2 inputs MC74AC00D
U3000	5113819A07	low power single supply MC33174
U3001	5102845C08	EPOSC 16.8 MHz sine wave SPI
U3004	5105469E65	voltage regulatorLP2951C
U4000	5113819A07	low power single supply MC33174
U4001	1802857C02	potentiometer digital 100 kΩ
U4003	5113819A07	low power simgle supply MC33174
U4007	5113806A21	MC14066BDR2

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
U4008	5113818A03	high performance single supply
U4010	1802857C02	potentiometer 100 kΩ
U5001	5105492X60	256KX16 flash ROM TSOP 48
U5002	5199181A01	EEPROM 8K X 8 28C17
U5003	5113811A11	RS-232-C DVR/RCVR single supply
U5004	5113808A42	FF dual D MC74AC273DW
U5005	5113808A12	inverter hex Schmitt trigger 74AC14
U5006	5113806A20	mux/demux,triple 2-chnl
U5007	5113806A20	mux/demux,triple 2-chnl
U5008	5113802A31	68HC16 w/sci,queud SPI
U5009	5108444S13	CMOS SRAM 62128-8 128K X 8
U5010	5108444S13	CMOS SRAM 62128-8 128K X 8
U5014	5105625U63	voltage detector
U5015	5105625U34	CMOS ACIA SSOP
U6000	5102801C05	ASD.S.M PLCC28
U6005	5113803A14	56166 DSP, 60 MHz clock, 112"
U6021	5113816A03	regulator 5V pos 100 mA MC78L05ABDR2
U6022	5113816A04	regulator 8V pos 100 mA MC78L08ABDR2
U6023	5113816A04	regulator 8V pos 100 mA MC78L08ABDR2
U6024	5113816A03	regulator 5V pos 100mA MC78L05ABDR2
U6025	5113816A03	regulator 5V pos 100mA MC78L05ABDR2
	zener diodes:	
VR1	4813830A09	3.3V 225 mW MMBZ5226B_
VR2	4813830A09	3.3V 225 mW MMBZ5226B_
VR4	4813831A23	10V 37.5 mA 1.5W
VR5	4813831A23	10V 37.5 mA 1.5W
VR1500	4813830A15	5.6V 225 mW MMBZ5232B_
VR4000	4813830A37	27V 225 mW MMBZ5254B_
VR5001	4813830A15	5.6V 225 mW MMBZ5232B_
VR5002	4813830A15	5.6V 225 mW MMBZ5232B_
VR5003	4813830A15	5.6V 225 mW MMBZ5232B_
	crystals: **(See Note 2)**	
Y5000	4813908B01	oscillator 38.4 kHz ±25 PPM
	0102706K68	S RAM
	5109699X01	audio pa TDA1915C
	8408095Y32	LORD B P.C.B"

Notes:

1. For optimum performance, diodes, transistors and integrated circuits must be ordered by MOTOROLA part numbers.
2. When ordering quartz crystal units or ceramic resonators, specify carrier frequency, crystal (or resonator) frequency, and crystal (or resonator) type number.

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R83	0662057A25	100
R84	0662057A25	100
R85	0662057A25	100
R86	0662057A25	100
R87	0662057A25	100
R88	0662057A25	100
R89	0662057A25	100
R90	0662057A25	100
R91	0662057A25	100
R92	0662057A25	100
R93	0662057A25	100
R94	0662057A25	100
R95	0662057A25	100
R96	0662057A25	100
R97	0662057A25	100
R98	0662057A25	100
R99	0662057A25	100
R100	0662057T02	100
R101	0662057A25	100
R102	0662057A25	100
R103	0662057A25	100
R104	0662057A25	100
R105	0662057A25	100
R106	0662057A25	100
R107	0662057A25	100
R108	0662057A25	100
R109	0662057A25	100
R117	0662057A37	330
R118	0662057A37	330
R119	0662057A37	330
R120	0662057C13	2.7
R121	0662057A49	1000
R122	0662057A49	1000
R123	0662057A49	1000
R124	0662057A49	1000
R125	0662057A43	560
R126	0662057T02	thermistor 50K
R127	0662057A94	75K
R128	0662057A49	1K
	potentiometers:	
SW23	1805642V01	potentiometer volume ON/OFF
	integrated circuits: **(See Note 1)**	
U3	5113808A01	NAND quad 2 inputs MC74AC00D
U4	5113818A03	high performance single supply
U5	5113808A12	inverter hex Schmitt trigger 74AC14
U6	5113808A14	OR quad 2 inputs MC74AC32D
U8	5113819A07	low power single supply MC33174
U9	5102102U01	LCD driver
U10	5102101U01	LCD controller
U11	5105461G54	DC/DC converter 14pin sop
U13	5113808A42	FF dual D MC74AC273DW
U14	5113816A07	regulator 5V pos 500 mA MC78M05BDTRK
U16	5113805A62	oct 3st n/inv trans lat
U17	5113804A08	32K*8 CMOS static RAM 100 ns
U18	5113802A01	68HC11 w/sci spi A/D 512
U19	5108100L03	line transceiver LTC485IS8
U20	5108100L03	line transceiver LTC485IS8
U21	5105625U63	voltage detector
U22	5197032A01	PROM 32KX8 200 ns 32 PLCC
U23	7580600K01	push-button switch
U24	7202421H15	LCD
U25	5113816A08	regulator 8V pos 500 mA MC78M08BDTRK
U26	5108100L03	line transceiver LTC485IS8
	diodes: **(See Note 2)**	
VR1	4813830A12	4.3V 5% 225 mW MMBZ5229B_
	crystals: **(See Note 2)**	
Y1	4802582S09	oscillator. 3.6864 MHz smd.
	non-referenced items:	
	8408127Y32	P.C.B

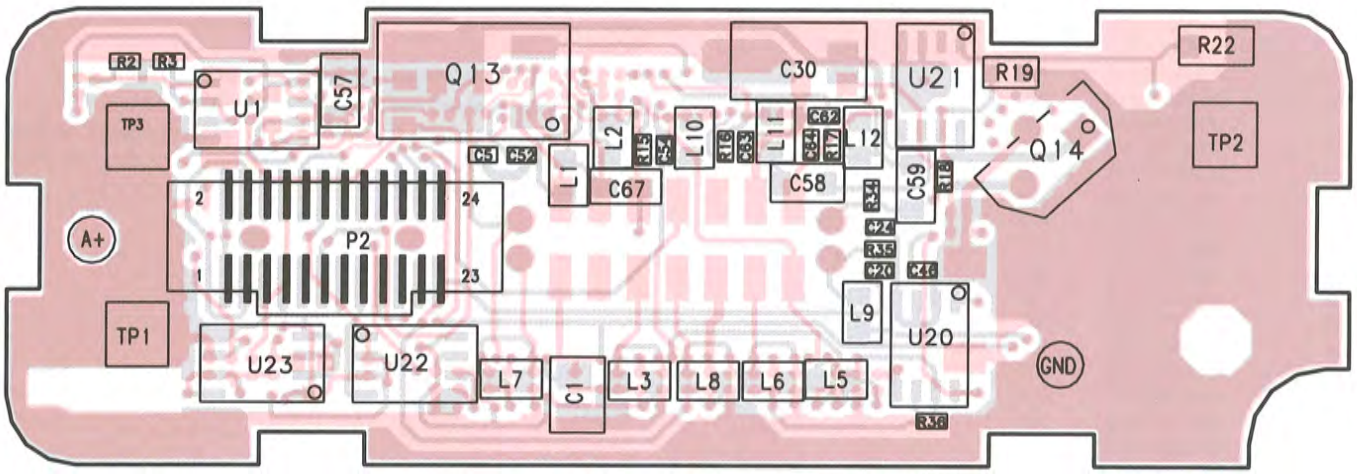
Notes:

1. For optimum performance, diodes, transistors and integrated circuits must be ordered by MOTOROLA part numbers.
2. When ordering quartz crystal units or ceramic resonators, specify carrier frequency, crystal (or resonator) frequency, and crystal (or resonator) type number.

INTERCONNECTION BOARD

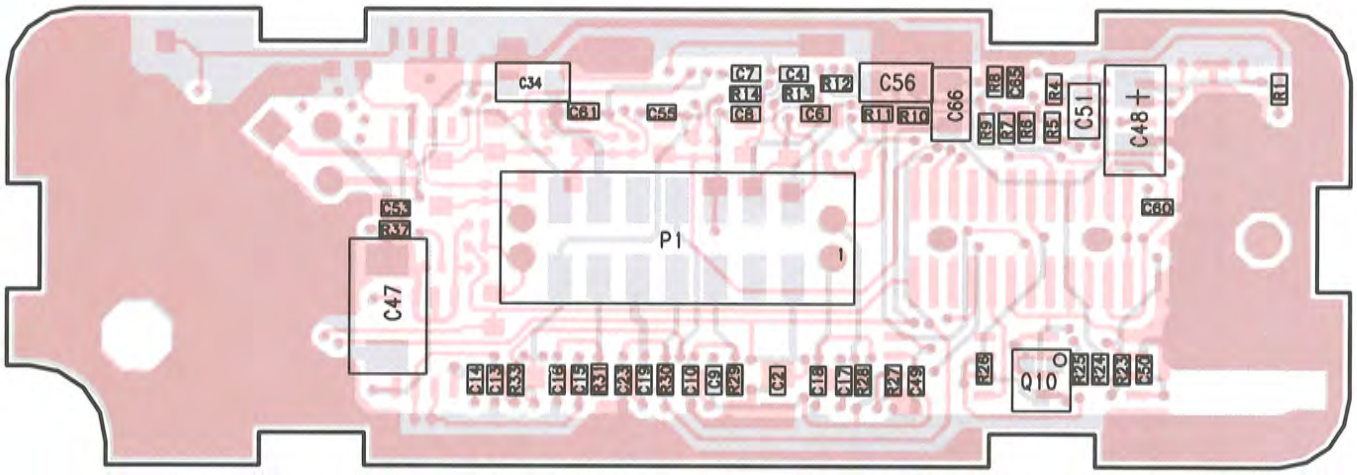
Model FRN5885A (Trunk Mount)

Printed Circuit Board Details



SHOWN FROM COMPONENT SIDE

OVERLAY • 79B02951C91-O
COMPONENT SIDE 79B02951C93-O
SOLDER SIDE 79B02951C94-O

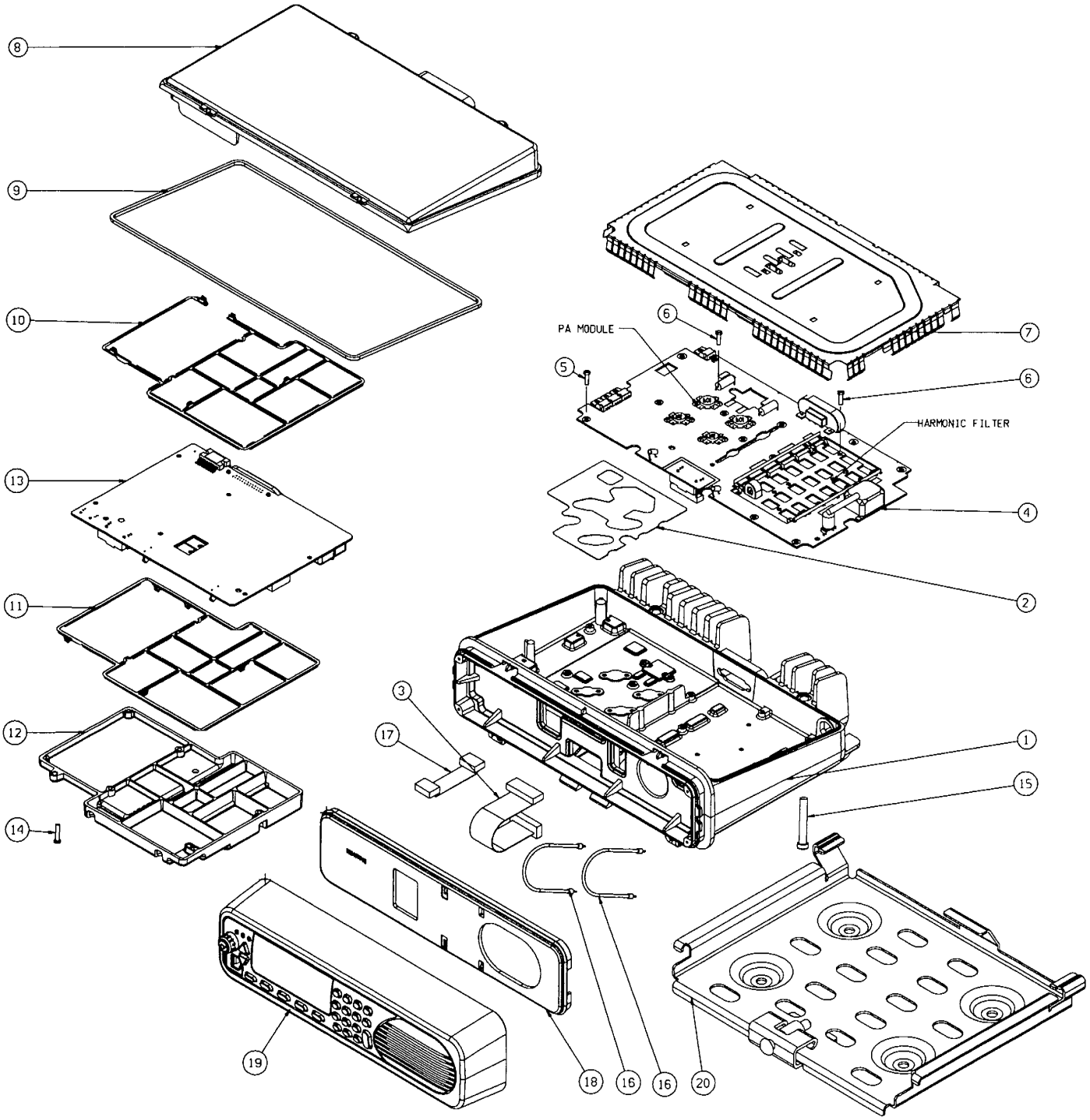


SHOWN FROM SOLDER SIDE

OVERLAY • 79B02951C92-O
COMPONENT SIDE 79B02951C93-O
SOLDER SIDE 79B02951C94-O

MICOM-2E ALE, Front Mount

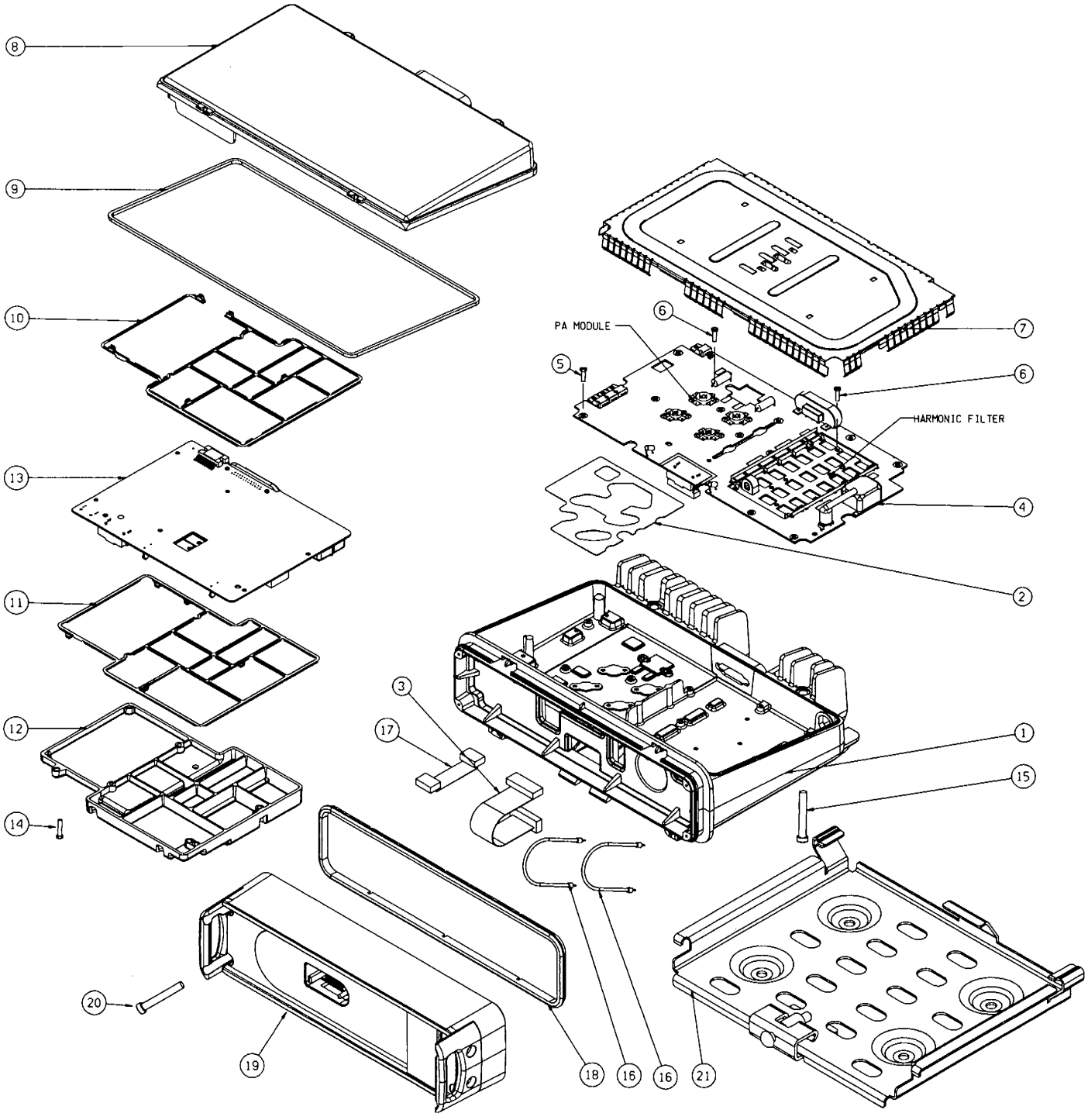
Exploded View



Reference Number	Motorola Part No.	Description
1	2786110F01	chassis
2	1404860P01	PA insulator
3	0102700K23	HP-Lord, 40 pin flat cable
4	FRN5767B	High Power board
5	0310908A82	screw, M3x0.5x8
6	0310911A11	screw, M3x0.5x8
7	1504002P01	PA shield
8	1504596K01	cover
9	3204012P01	cover gasket
10	3904382P01	lower contacts
11	3904381P01	upper contacts
12	2604072P01	RF shield
13	FRN5869A	Low RF enhance board
14	0310907C25	screw, M3xP0.5x16
15	0308390Y13	screw, M6.0x1.0x40
16	0102700K22	HP-Lord, RF coax
17	0102701K51	control head-Lord, 40 pin flat cable
18	3280605K01	front panel gasket
19	FHN5880A	control head hardware
20	0308390Y11	screw, M4x0.7x25, with sealing
21	FLN2272	mobile mounting kit

MICOM-2E ALE, Trunk Mount

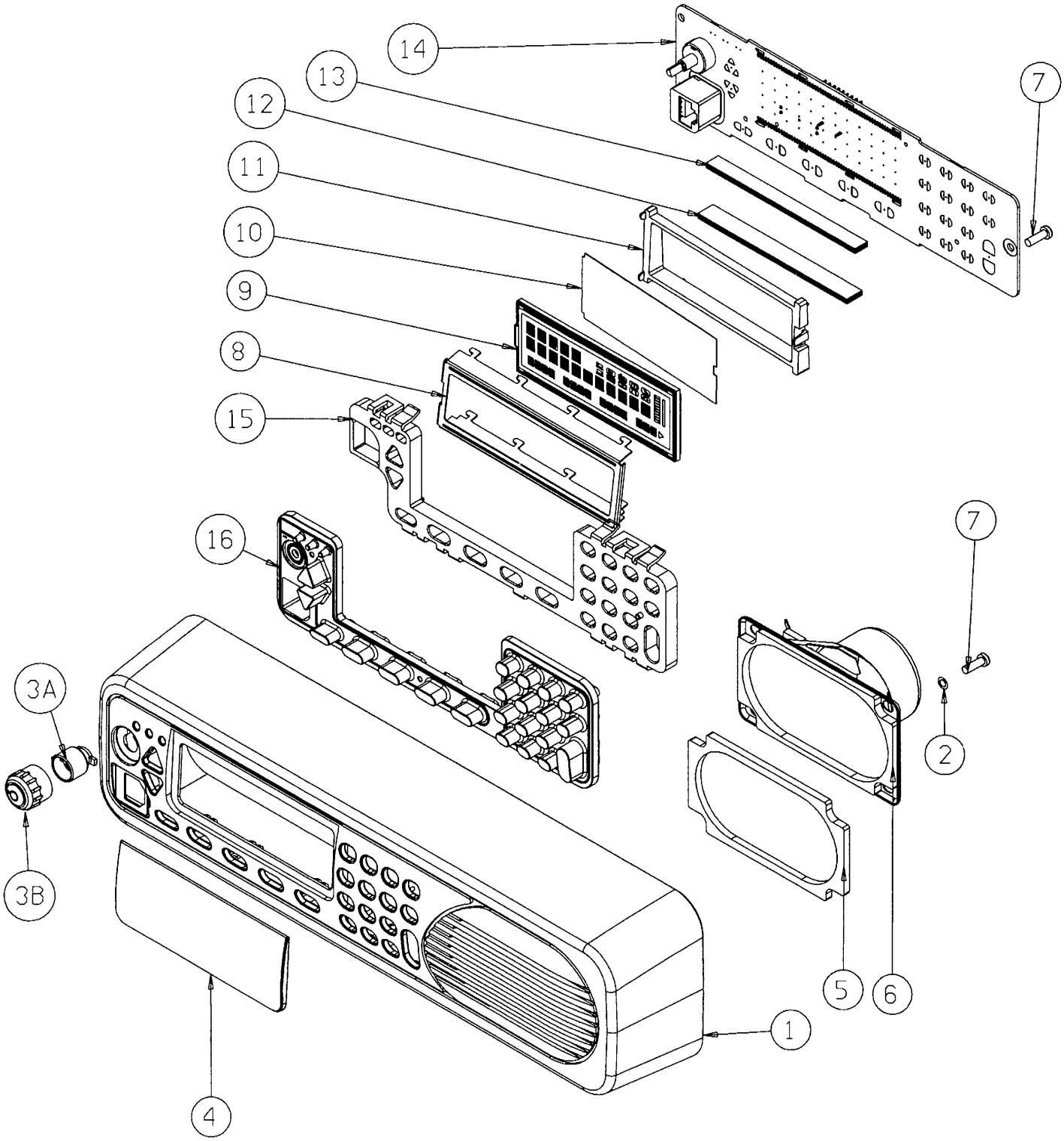
Exploded View



Reference Number	Motorola Part No.	Description
1	1580596K01	front panel
2	0402440C15	washer, flat .140x5/16x.032
3a	3608147K01	knob, volume interior
3b	3605422W02	knob, volume exterior
4	6180602K01	window, LCD
5	3280603K01	gasket, speaker
6	5008351Y01	speaker, 8Ω, 5W
7	0300139776	screw, TPG 5-20x3/8"
8	1302085U01	bezel, LCD
9	7202421H15	glass, LCD
10	9102102U01	reflector sheet
11	0702084U02	frame, LCD
12	2802101U01	connector, zebra pink
13	2802102U01	connector, zebra gray
14	FLN8693A	control head board
15	4380601K01	holder, PCB
16	7580600K02	keypad, front/trunk

Control Head, Front Mount

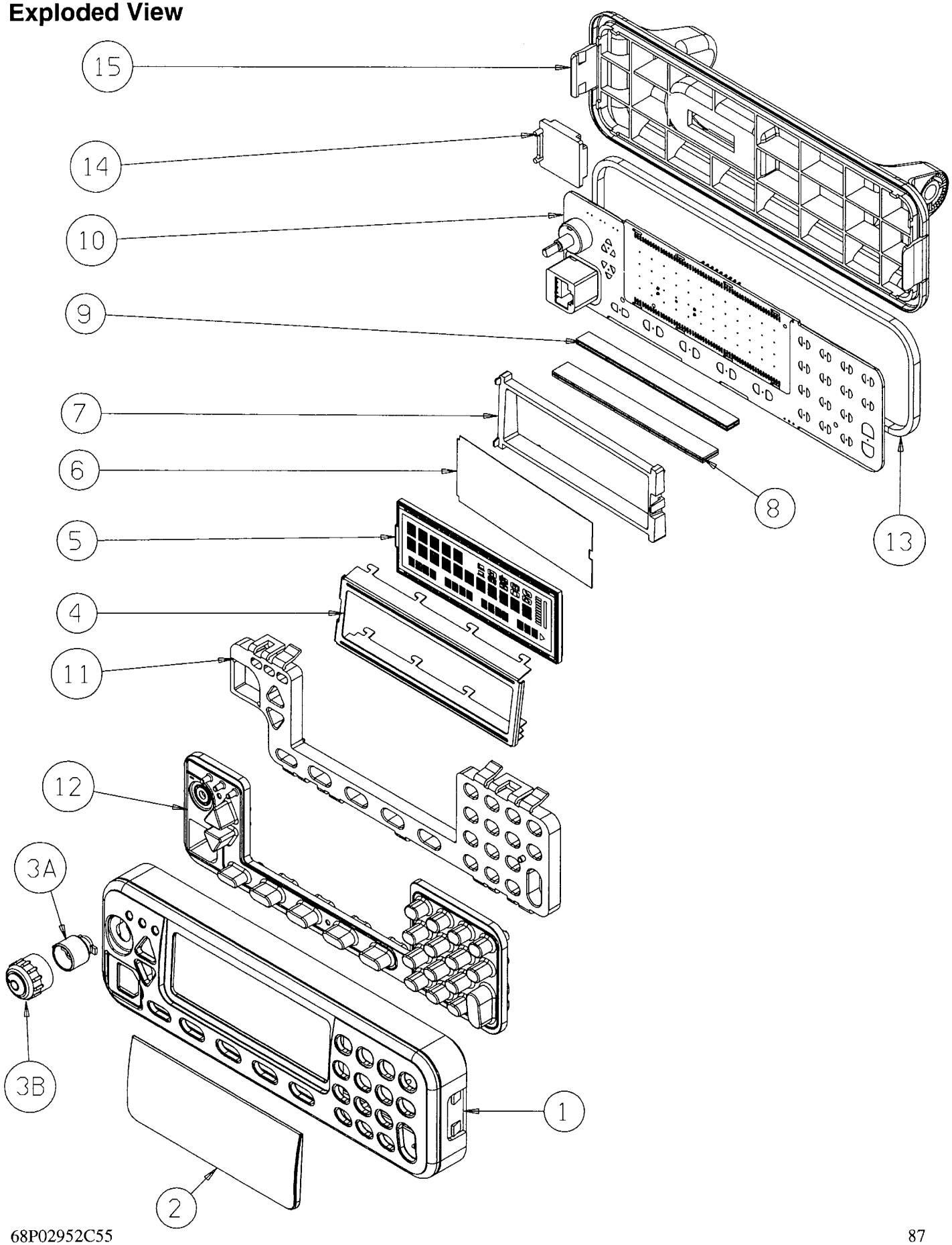
Exploded View



Reference Number	Motorola Part No.	Description
1	1580597K01	front panel, trunk, remote
2	6180602K01	window, LCD
3a	3608147K02	knob, volume interior
3b	3605422W02	knob, volume exterior
4	1302085U01	bezel, LCD
5	7202421H15	glass, LCD
6	9102102U01	reflector sheet
7	0702084U02	frame, LCD
8	2802101U01	connector, zebra pink
9	2802102U01	connector, zebra gray
10	FLN8695A	control head enhanced board
11	4380601K01	holder, PCB
12	7580600K02	keypad, front/trunk
13	3286211C01	gasket, remote panel
14	4386238F01	spacer, PCB remote trunk
15	1505702Z01	back panel, remote

Control Head, Trunk Mount

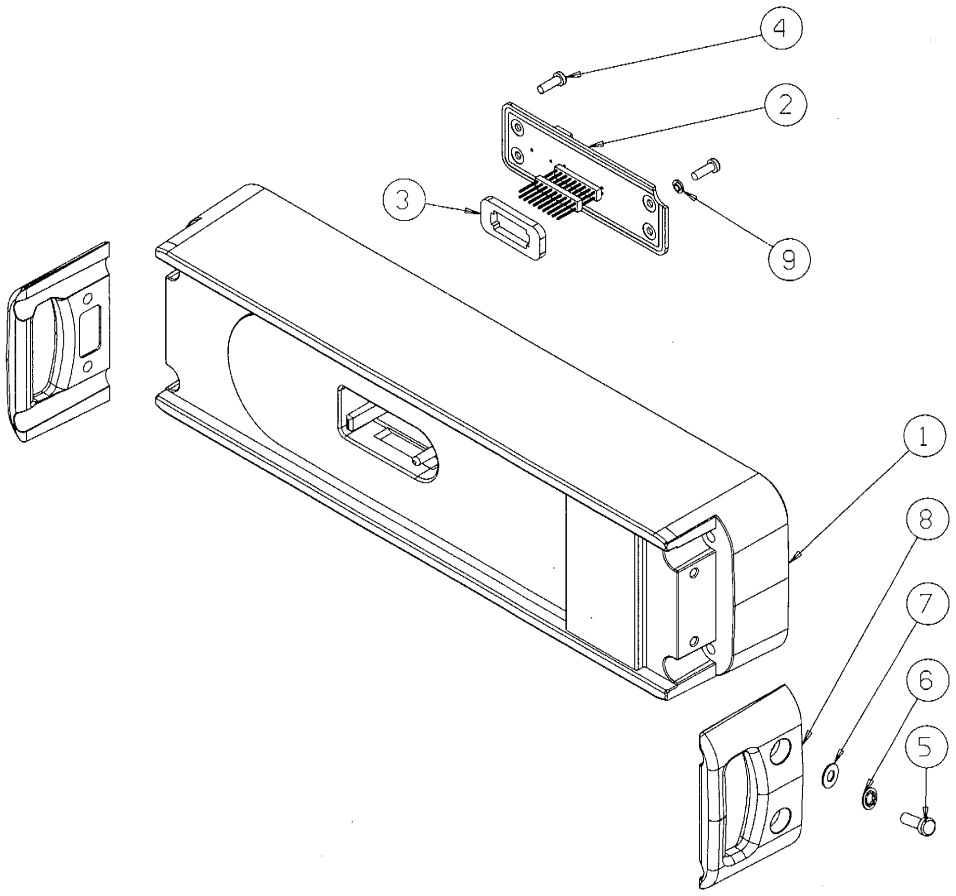
Exploded View



Blank Panel, Trunk Mount

Exploded View

Reference Number	Motorola Part No.	Description
1	1580598K02	front panel, blank
2	FRN5885A	interconnection board
3	3286212C01	gasket, blank panel
4	0310908A82	screw machine M3x0.5x8
5	0308390Y14	screw M4x0.7x10
6	0402439C18	washer, lock
7	0402440C16	washer flat .170X3/8X.032
8	5580604K02	handle
9	0484180C01	washer, shoulder nylon nat



MISCELLANEOUS PARTS LISTS

parts list

FHN5781A Low RF Hardware - Trunk Mount

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Qty	Non-referenced items:	
1	0102701K51	control head-LORD (24 line)
1	0102703K64	battery assembly
1	0102705K85	C.H wire
1	0104760P01	cover assembly
1	0104761P01	RF shield housing assembly
6	0310907C25	screw, machine M3x0.5x16
1	0310908A82	screw, machine M3x0.5x8
2	1480075D01	insulator to 220 chassis
1	4204841P01	battery holder

parts list

FHN5768A High Power Hardware - Front Mount

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Qty	Non-referenced items:	
1	0102700K21	antenna connector
2	0102700K22	RF coax HP-LORD short
1	0102700K23	HP-LORD flat cable 40
1	0102701K52	H.F module
1	0104759P01	chassis assembly
2	0210971A38	nut M4x0.7 hex
2	0308248G11	screw, M6.0x1.0, 40 mm
1	0310907C37	screw, M4x0.7x16
20	0310908A82	screw, M3x0.5x8
12	0310911A11	screw, M3x0.5x8 I
1	0402440C14	washer, flat .125x9/32x.025
2	0402440C15	washer, flat .140x5/16x.032
1	0480083A01	washer stud device
3	0480171J01	washer split lock
4	0484180C01	washer shoulder nylon nat
1	1404860P01	PA insulator
1	1480075D01	insulator to 220 chassis
1	1480543K01	insulator
1	1504002P01	shield PA
2	2204686P01	pin for foot
2	2902231C08	terminal lug ring 22-16 stud-8
2	2904121P01	lead spring
8	2910261A15	lug solder copper HT TN
1	3286025C01	gasket
2	4210219A37	rear E ring
2	4808020K01	transistor NPN power MRF 421
2	4808020K02	RF power transistor NPN
1	5404376E01	label FCC
1	5408577L01	label P.S.front panel 12V DC
1	5480522K01	CE label small
2	5584300B01	handle
2	7504190P01	leg rear
2	7504191P01	leg front

parts list

FHN5947A High Power Hardware - Trunk Mount

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Qty	Non-referenced items:	
1	0102700K21	antenna connector
2	0102700K22	RF coax HP - LORD short
1	0102700K23	HP - LORD flat cable 40
1	0102701K52	HF module
2	0210971A38	nut, machine M4x0.7 hex
2	0308248G11	screw, M6.0x1.0 40 mm
1	0310907C37	screw, machine M4x0.7x16
20	0310908A82	screw, machine M3x0.5x8
12	0310911A11	screw, machine M3x0.5x8
1	0402440C14	washer, flat .125x9/32x.025
2	0402440C15	washer,flat .140x5/16x.032
1	0480083A01	washer stud device
3	0480171J01	washer split lock
4	0484180C01	washer shoulder nylon nat
1	1404860P01	PA insulator
1	1480075D01	insulator to 220 chassis
1	1480543K01	insulator
1	1504002P01	shield PA
2	2204686P01	pin for foot
1	2786110F01	chassis assembly HP
2	2902231C08	terminal lug ring 22-16 stud-8
2	2904121P01	lead spring
8	2910261A15	lug solder copper HT TN
1	3286025C01	gasket
2	4210219A37	retainer E ring
2	4808020K01	transistor NPN power MRF 421
2	4808020K02	RF power transistor NPN
1	5404376E01	label FCC
1	5408577L01	label PS front panel 12V DC
1	5480522K01	CE label small
2	5584300B01	handle
2	7504190P01	leg rear
2	7504191P01	leg front

parts list

FHN5879A Control Head Hardware - Front Mount

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Qty	Non-referenced items:	
1	0102702K61	speaker cable
7	0300139776	screw, TPG 5-20x3/8"
4	0402440C15	washer flat .140x5/16x.032
1	0702084U02	frame LCD
1	1302085U01	bezel LCD
1	1580596K01	front panel dash
1	2802101U01	zebra connector pink
1	2802102U01	zebra connector gray
1	3204071P02	gasket, panel dash/basic
1	3280603K01	gasket, speaker-dash
1	3605422W02	knob, volume exterior
1	3608147K02	knob, volume interior
1	4380601K01	holder PCB
1	5008351Y01	speaker, 8Ω, 5W
1	6180602K01	window LCD
1	7202421H15	LCD glass
1	7580600K02	key pad,dash/trunk
1	9102102U01	reflector sheet j

parts list

FHN5880A Control Head Hardware - Trunk Mount

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Qty	Non-referenced items:	
1	0702084U02	frame LCD
1	1302085U01	bezel LCD
1	1505702Z01	back panel remote
1	1580597K01	panel front-trunk remote
1	2802101U01	zebra connector pink
1	2802102U01	zebra connector gray
1	3280542K01	pad
1	3286211C01	gasket, remote panel
1	3605422W02	knob, volume exterior
1	3608147K02	knob, volume interior
1	4380601K01	holder PCB
1	4386238F01	spacer PCB remote trunk
1	6180602K01	window, LCD
1	7202421H15	LCD glass
1	7580600K02	keypad, dash/trunk
1	9102102U01	reflector sheet j

parts list

FHN5881A Blank Panel Hardware - Trunk Mount

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Qty	Non-referenced items:	
4	0308390Y01	screw M4x10
4	0308390Y02	screw M4x20 blak. O-ring
4	0310908A82	screw mch M3x0.5x8 strslt panstl
4	0402439C18	washer
4	0402440C16	washer flat .170X3/8X.032 sstbox
1	0484180C01	washer shoulder nylon nat
1	1580598K01	front panel blank
1	3280605K01	gasket, rugged panel
1	3286212C01	gasket p.CB blank panel
2	5580604K02	handle

MOTOROLA

Appendix A
Continuous Duty Tray (CDT)

(Package for Continuous Duty Data Transmission)

Model FLN2294

A-1 GENERAL

The Continuous Duty Tray (CDT), FLN2294, is a package (kit) for continuous duty data transmission for the MICOM-2. It also enables the connection of up to four external devices simultaneously, in addition to CW and headphones, to the accessory port of the MICOM-2.

The Continuous Duty Tray consists of two units (see Figure 1): a fan tray and a junction box. The fan tray contains two fans, CW plug and headphone plug. The junction box contains an electrical board (FRN5865) which controls the fans and the connections of the four external devices.

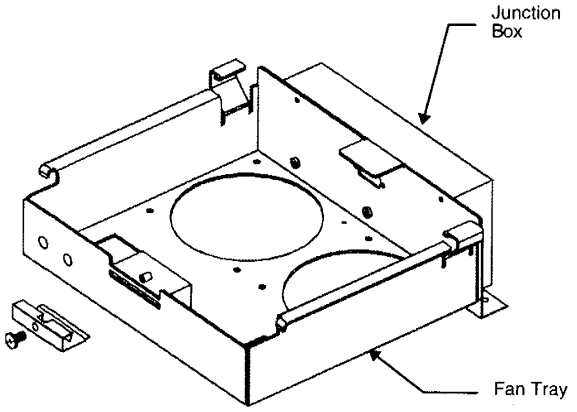


Figure A-1. Continuous Duty Tray (CDT)

A-2 JUMPER SETTINGS

Before installing the CDT, the five jumpers located on the PC board inside the junction box must be set in accordance with the intended system configuration.

Jumpers JU1-JU4 determine whether the audio transmit paths will be controlled by the PTT lines or not (switched audio or continuous flow). Jumper JU5 determines the release decay time of the data PTT line (1 msec or 300 msec).

NOTE

Factory settings are as follows:

- JU1-JU4 (IN) – switched audio mode
- JU5 (IN 1-2) – 1 msec data PTT released time.

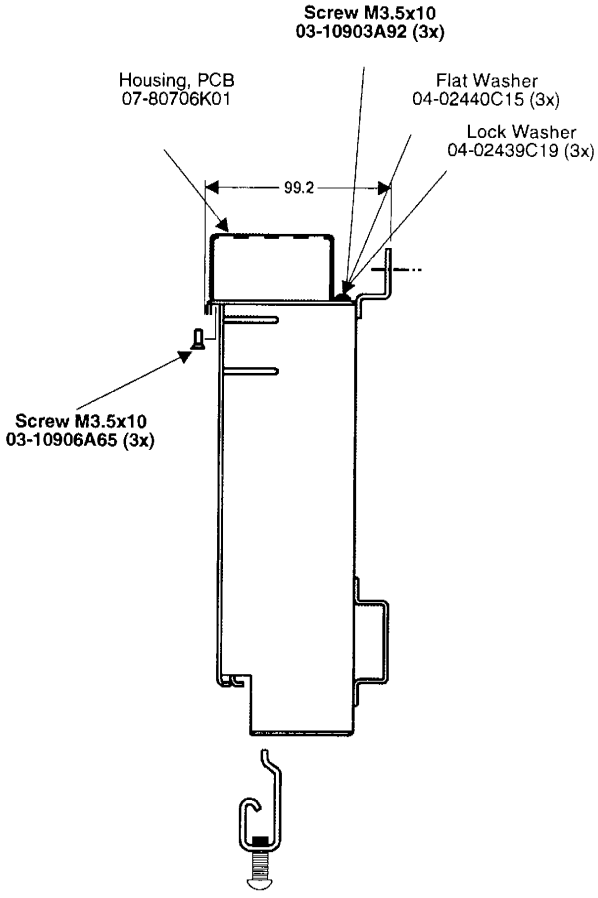


Figure A-2. Junction Box Fastening to the Mounting Tray

In order to set the jumpers proceed as follows:

Step 1. Remove the six screws fastening the junction box to the mounting tray (see Figure 2).

Step 2. Carefully remove the junction box and disconnect the internal cable connected to J7 on the PC board.

Step 3. Set the jumpers according to your intended system configuration, referring to the following table:

No.	OUT (1-2)	IN (1-2)	IN (2-3)
JU1	TX1 Switched Audio	TX1 Continuous Flow	
JU2	TX2 Switched Audio	TX2 Continuous Flow	
JU3	TX3 Switched Audio	TX3 Continuous Flow	
JU4	TX4 Switched Audio	TX4 Continuous Flow	
JU5		Data PTT Released time = 1 msec	Data PTT Release time = 300 msec

Step 4. Reconnect the internal cable to J7 on the PC board and replace the junction box.

A-3 INSTALLATION

A-3.1 GENERAL

This section describes the installation of the CDT in a mobile or fixed station configuration.

NOTE

Before installing the unit, read the entire installation procedure detailed in this section. It is also recommended to read the MICOM-2 installation instructions (MICOM-2 HF-SSB Transceiver Owner's Manual, 68P02941C60).

A-3.2 SELECTING THE MOUNTING LOCATION

Select the mounting location taking into consideration access to electrical connections and maintenance. The mounting location should be clean, dry and well ventilated.

NOTE

Do not mount the unit in close proximity to strong electrical fields produced by brush motors and generators, welders, etc.

A-3.3 MOBILE INSTALLATION

A-3.3.1 Installing the CDT

(Refer to Figure A-3)

Step 1. Place the CDT in the desired location. If holes must be drilled, use the tray bracket as a template to mark drilling points.

Step 2. Use the four supplied screws to fasten the CDT to the mounting surface.

Step 3. Drill an additional hole for the ground bolt.

A-3.4 CONNECTING THE DC POWER

The Continuous Duty Tray is connected to a 12V negative-ground vehicular battery, using HKN6101 power cable. Proceed as follows:

Step 1. Lead the power connector of the DC Power Cable to the DC connector (located on the rear panel of the fan mounting tray) but do not attach it. Then lead the red and black wires to a 12V battery, inserting them through the access holes if necessary.

NOTE

The wires should be as short as possible. Once the tray is installed, cut the wires down to the minimum.

Step 2. Crimp or solder the supplied lugs to the red and black wires.

Step 3. Connect the lug of the red wire to the positive terminal of the battery.

Step 4. Connect the lug of the black wire to the negative terminal of the battery.

Step 5. Connect the power cable to DC connector J6 located on the rear panel of the mounting tray.

A-3.5 FINAL CONNECTIONS

Step 1. Lead the cables of the external devices (up to four devices) to the rear panel of the CDT and connect them to connectors J1-J4 (refer to Figure A-4).

NOTE

Connectors J1-J4 are identical, and external devices can be connected in any order.

Step 2. Install the radio (MICOM-2) according to the instructions in MICOM-2 Owner's Manual (68P02941C60).

Step 3. Use the control cable supplied with the CDT to connect the accessory connection of the MICOM-2 and connector J5 on the junction box.

Step 4. Slide the radio into the tray and fasten the tray bracket with the supplied screw.

A-3.6 FIXED STATION INSTALLATION

In a fixed station installation, an AC power supply is used instead of the 12V battery. A backup battery can be connected to the battery terminals on the power supply.

Installation of the CDT in a base station is identical to mobile installation.

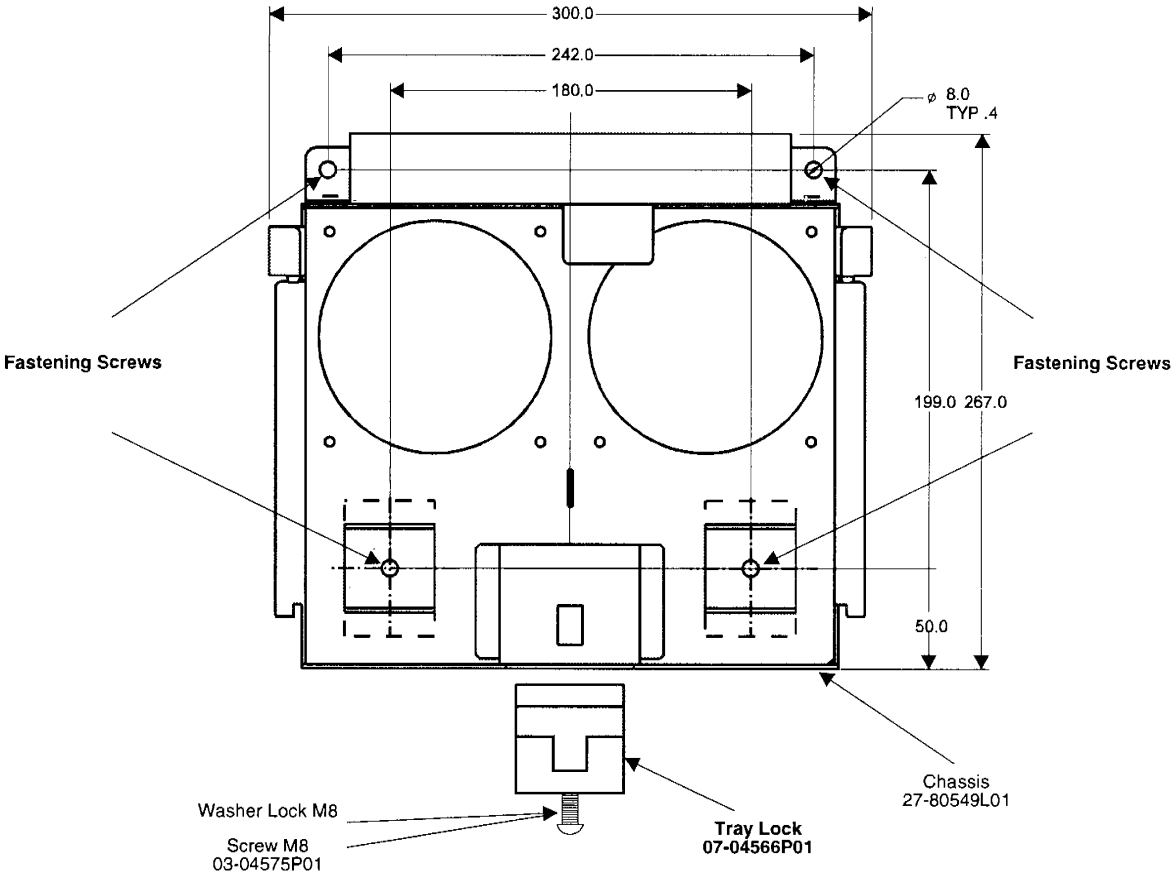


Figure A-3. CDT Installation

A-4 CONNECTIONS AND ADJUSTMENTS

A-4.1 POTENTIOMETERS

Potentiometers are used to adjust the received audio levels (one for each connector). Each potentiometer is associated with a connector as follows:

RX1: J1 – R63

RX2: J2 – R62

RX3: J3 – R61

RX4: J4 – R60

The potentiometers are located on the PC board inside the junction box.

In order to adjust a potentiometer, insert a thin screwdriver through the relevant hole in the front panel of the junction box. The holes are adjacent to the connectors, and are marked RX1, RX2, RX3, RX4 respectively.

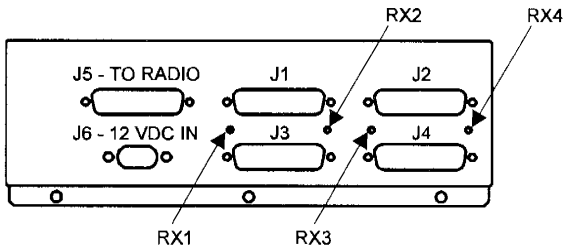


Figure A-4. Location of Potentiometer Adjustment Holes and Connectors

A-4.2 ACCESSORY CONNECTORS J1-J4

The accessory connectors (J1-J4), located on the front panel of the junction box (see Figure 4), are used to connect up to four external devices (e.g. modem, linear amplifier, phone patch). See Table 1 for connector pin assignments.

Table A-1. Pin Assignments of Connectors J1-J4

Pin Number	Pin Name	Function	Input/ Output	Notes
1	SPKR–	Differential output to external speaker	Output	1 Ampere
2	SPARE	Digital I/O	I/O	
3	SPKR+	Differential output to external speaker	Output	1 Ampere
4	RX_AUDIO+	Differential receive audio	Output	0dBm 600 Ohm
5	RX_AUDIO–	Differential receive audio	Output	0dBm 600 Ohm
6	TX_AUDIO+	Differential transmit audio	Input	-9 – 0dBm 600 Ohm
7	TX_AUDIO–	Differential transmit audio	Input	-9 – 0dBm 600 Ohm
8	PTT_IN_VOICE	PTT for transmitting voice	Input	
9	PTT_IN_DATA	PTT for transmitting data	Input	
10	PTT_IN_CW	PTT for MORSE	Input	
11	SW_A+	Power	Output	max 1A each
12	DSI/KW_C_C	BDM – Data Serial In / kw channel change	Output	multiplexed signals
13	KW_ON_OFF	KW power on/of	Output	
14	AGC_FAST_SLOW	AGC fast or slow	Input	
15	RXD	Point to point protocol to HOST/HLC	Input	
16	TXD	Point to point protocol to HOST/HLC	Output	
17	RESET	External RESET (for BDM)	Input	
18	GND	Ground	Output	
19	KW_PTT	kw PTT	Output	
20	EXT_ALARM	External alarm output	Output	
21	VPP	Flash programming voltage, entering to BDM	Input	not connected to J1
22	DSCK/KW_ALC	BDM – Data Serial Clock / kw alc	Input/Ouput	multiplexed signals
23	SQ_GATE	Squelch open or closed	Output	
24	DSO/FAN_ON_OFF	BDM – Data serial out / Fan control	Output	multiplexed signals
25	FREEZE/KW_TU	BDM – Freeze / kw tune	Output	multiplexed signals

A-4.3 CONTROL CONNECTOR J5

Control connector J5, located on the front panel of the junction box, is used to connect the junction box to the accessory connector of the MICOM-2.

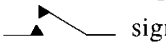
A-4.4 DC CONNECTOR – J6

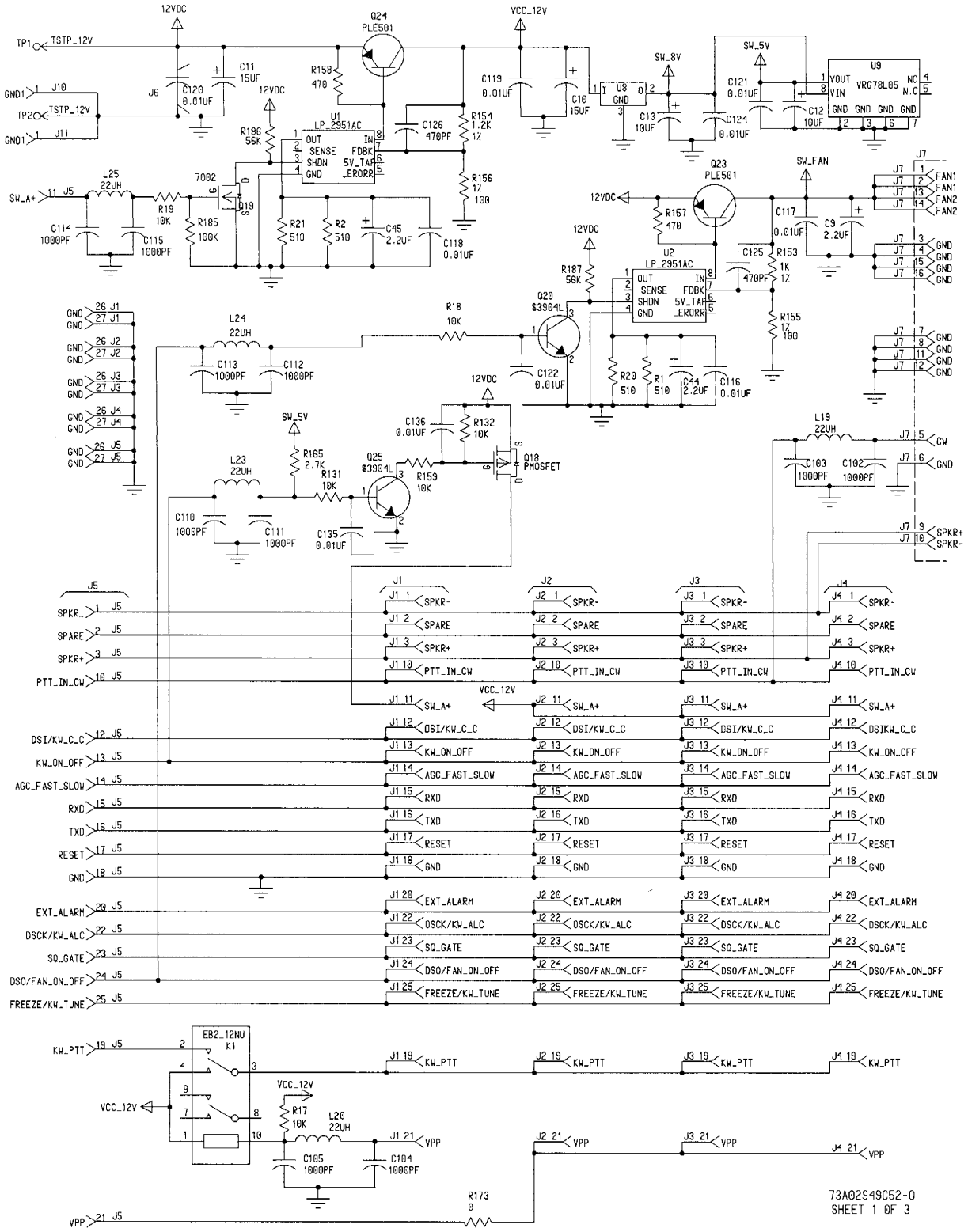
DC connector J6, located on the front panel of the junction box, is used to power the junction box and fans (12 VDC).

A-4.5 HEADPHONE CONNECTOR

The headphone connector is located on the front panel of the fan tray and is marked with the  sign.

A-4.6 CW CONNECTOR

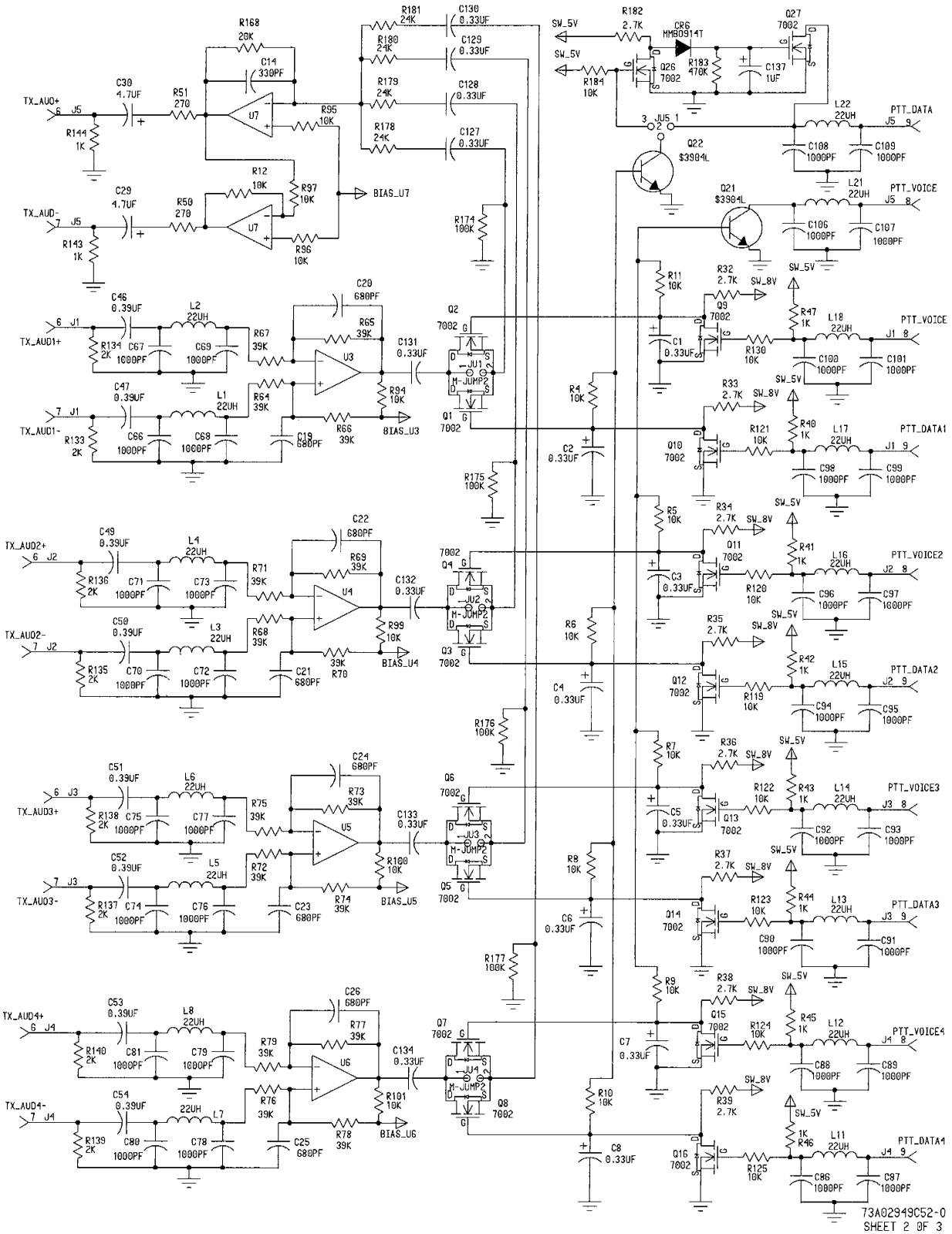
The CW connector is located on the front panel of the fan tray and is marked with the  sign.

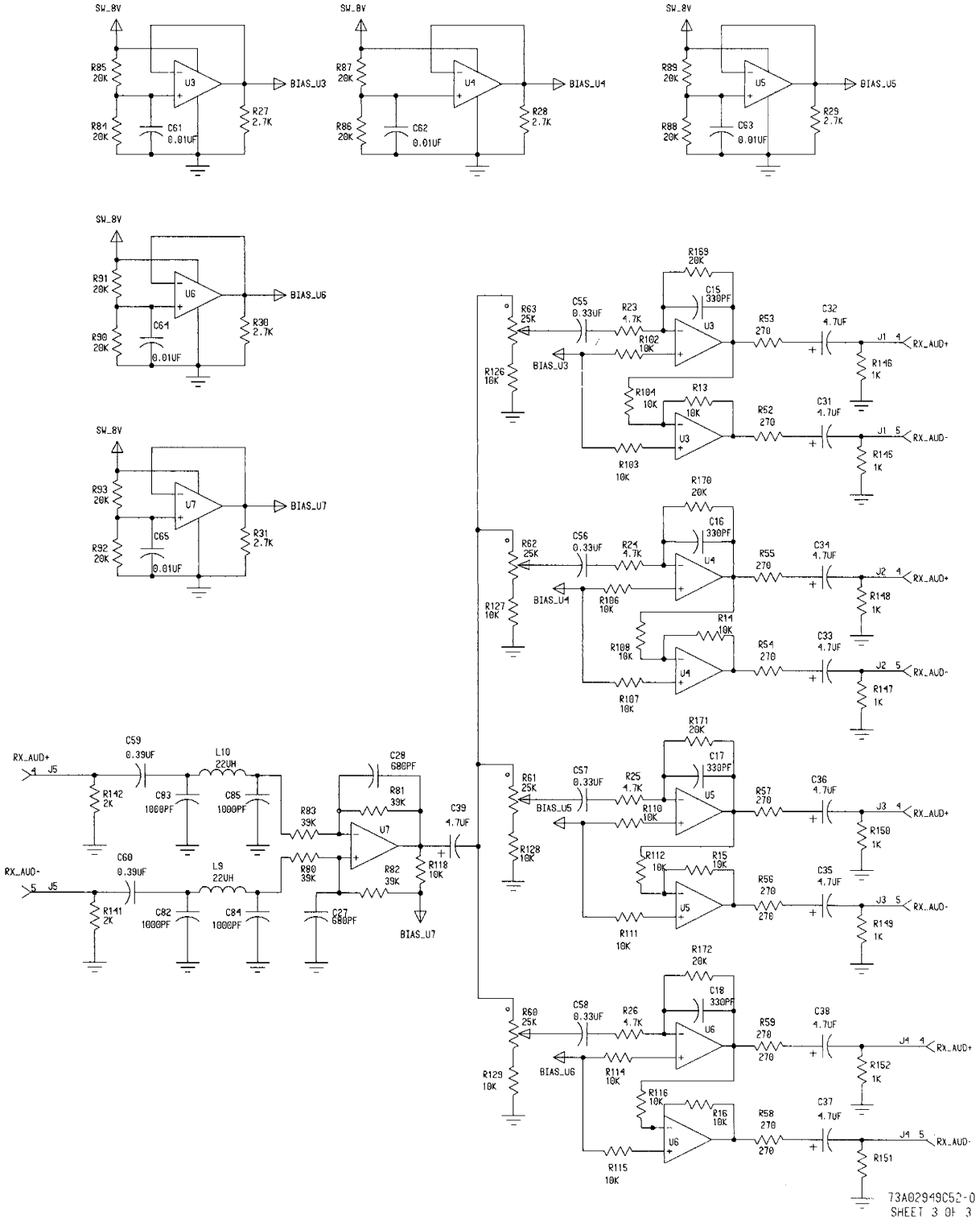

12VDC
VCC_12V
SW_5V
SW_8V
SW_FAN
TSTP_12V
LP_2951AC
PLE501
PMOSFET
EB2_12NU
VRG78L05
SPKR-
SPARE
SPKR+
PTT_IN_CW
SW_A+
DSI/KW_C_C
KW_ON_OFF
AGC_FAST_SLOW
RXD
TXD
RESET
GND
EXT_ALARM
DSCK/KW_ALC
SQ_GATE
DSO/FAN_ON_OFF
FREEZE/KW_TUNE
KW_PTT
VPP
FAN1
FAN2
CW
73A02949C52-O
SHEET 1 OF 3

CDT BOARD

Model FRN5865A

Schematic Diagram

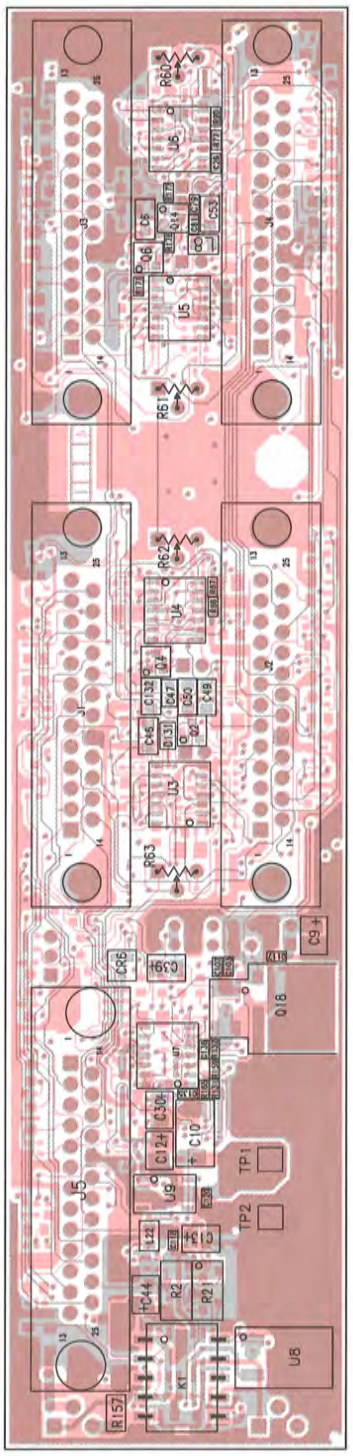



SW_8V
R85 20K
R84 20K
U3
C61 0.01UF
R27 2.7K
BIAS_U3
R87 20K
R86 20K
U4
C62 0.01UF
R28 2.7K
BIAS_U4
R89 20K
R88 20K
U5
C63 0.01UF
R29 2.7K
BIAS_U5
R91 20K
R90 20K
U6
C64 0.01UF
R30 2.7K
BIAS_U6
R93 20K
R92 20K
U7
C65 0.01UF
R31 2.7K
BIAS_U7
R169 20K
C15 330PF
R63 25K
C55 0.33UF
R23 4.7K
R102 10K
R53 270
C32 4.7UF
J1 4
RX_AUD+
R146 1K
R126 10K
BIAS_U3
R104 10K
R13 10K
R52 270
C31 4.7UF
J1 5
RX_AUD-
R145 1K
R103 10K
R170 20K
C16 330PF
R62 25K
C56 0.33UF
R24 4.7K
R55 270
C34 4.7UF
J2 4
RX_AUD+
R148 1K
R127 10K
BIAS_U4
R106 10K
R14 10K
R108 10K
R54 270
C33 4.7UF
J2 5
RX_AUD-
R147 1K
R107 10K
R171 20K
C17 330PF
R61 25K
C57 0.33UF
R25 4.7K
R57 270
C36 4.7UF
J3 4
RX_AUD+
R150 1K
R128 10K
BIAS_U5
R110 10K
R112 10K
R15 10K
R56 270
C35 4.7UF
J3 5
RX_AUD-
R149 1K
R111 10K
R172 20K
C18 330PF
R60 25K
C58 0.33UF
R26 4.7K
R59 270
C38 4.7UF
J4 4
RX_AUD+
R152 1K
R129 10K
BIAS_U6
R114 10K
R116 10K
R16 10K
R58 270
C37 4.7UF
J4 5
RX_AUD-
R151 1K
R115 10K
RX_AUD+
J5
C59 0.39UF
L10 22UH
R142 2K
C83 1000PF
C85 1000PF
C28 680PF
R83 39K
R81 39K
C39 4.7UF
U7
R118 10K
R82 39K
R80 39K
RX_AUD-
J5
C60 0.39UF
L9 22UH
R141 2K
C82 1000PF
C84 1000PF
C27 680PF
BIAS_U7
73A02949C52-O
SHEET 3 OF 3

CDT BOARD

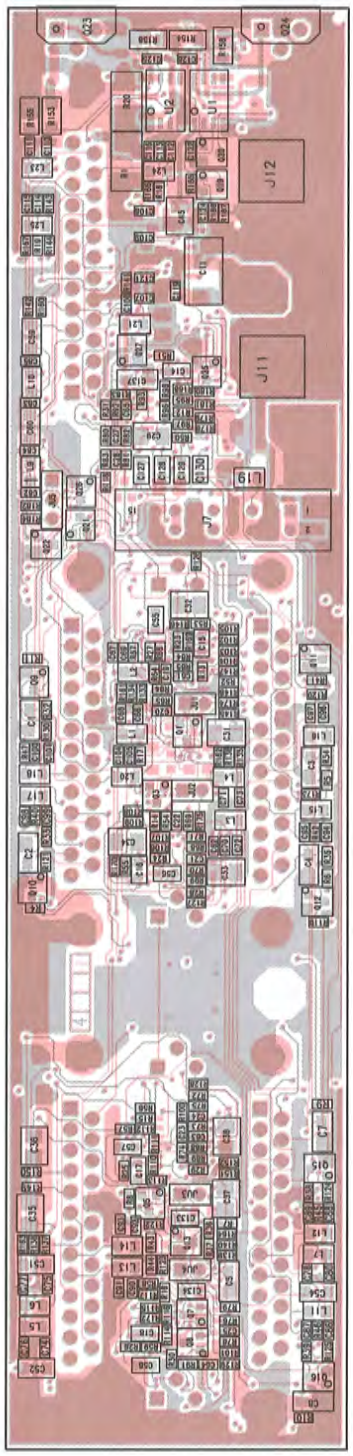
Model FRN5865A

Printed Circuit Board Details



OVERLAY • 79B02948C51-O
COMPONENT SIDE • 79B02948C53-O
SOLDER SIDE • 79B02948C54-O

SHOWN FROM TOP SIDE



OVERLAY • 79B02948C52-O
COMPONENT SIDE • 79B02948C53-O
SOLDER SIDE • 79B02948C54-O

SHOWN FROM BOTTOM SIDE