

PROFESSIONAL DIGITAL TWO-WAY RADIOS

MOTOTRBO™



XiR™ M3188 NUMERIC DISPLAY MOBILE

XiR™ M3688 ALPHANUMERIC DISPLAY MOBILE

DETAILED SERVICE MANUAL



Foreword

This manual covers all XiR™ M3000 Series Mobiles, unless otherwise specified. This manual provides sufficient information to enable qualified service technicians to troubleshoot and repair XiR™ M3000 Series Mobiles to the component level.

For details on radio operation or basic troubleshooting, refer to the applicable manuals available separately.



These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Product Safety and RF Exposure Compliance

ATTENTION!

Before using the mobile two-way product, XiR™ M3000 Series Mobiles, read the RF Energy Exposure and Safety guide that ships with the radio which contains important operating instructions for safe usage and RF energy awareness and control for Compliance with applicable Standards and Regulations.

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Notes

Document History

The following major changes have been implemented in this manual since the previous edition:

Edition	Description	Date
68012008035-A	Initial Release.	June 2013

Notes

Warranty and Service Support

Motorola offers long term support for its products. This support includes full exchange and/or repair of the product during the warranty period, and service/ repair or spare parts support out of warranty.

XiR M3188/XiR M3688 Mobile Radios	Two (2) Years
Product Accessories	One (1) Year

Warranty Period and Return Instructions

The terms and conditions of warranty are defined fully in the Motorola Dealer or Distributor or Reseller contract. These conditions may change from time to time and the following notes are for guidance purposes only. In instances where the product is covered under a "return for replacement" or "return for repair" warranty, a check of the product should be performed prior to shipping the unit back to Motorola. This is to ensure that the product has been correctly programmed or has not been subjected to damage outside the terms of the warranty.

Prior to shipping any radio back to the appropriate Motorola warranty depot, please contact Customer Resources or your Motorola dealer, distributor or reseller. All returns must be accompanied by a Warranty Claim Form, available from your Customer Service representative or Motorola Online Extranet (MOL) or your Motorola dealer, distributor or reseller. Products should be shipped back in the original packaging, or correctly packaged to ensure no damage occurs in transit.

After Warranty Period

After the Warranty period, Motorola continues to support its products in two ways.

1. Motorola's Managed Technical Services (MTS) offers a repair service to both end users and dealers at competitive prices.
2. MTS supplies individual parts and modules that can be purchased by dealers who are technically capable of performing fault analysis and repair.

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XiR™ M3188/XiR™ M3688 Mobile Radios

Detailed Service Manual

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Summary of Printed Circuit Boards and Bands available:

Table below lists all the bands available in this manual and the revision of the Printed Circuit Boards used. For details, please refer to the respective chapters.

Chapter	Description	PC Board Part Number	Board Revision
3	Numeric Display Control Head	84012531002	B
3	Alphanumeric Display Control Head	84012531002	B
5	VHF Low Power 136–174 MHz, 1–25 W	84012504002	B
6	VHF High Power 136–174 MHz, 25–45 W	84012505002	B

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XiRTM M3188/XiRTM M3688

Mobile Radios

Chapter 1

Service Maintainability

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Chapter 1 – Service Maintainability

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Section 1

INTRODUCTION

1.0 Notations Used in This Manual

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

NOTE: An operational procedure, practice, or condition that is essential to emphasize.



Caution

CAUTION indicates a potentially hazardous situation which, if not avoided, **might** result in equipment damage.

2.0 Radio Description

The XiR™ M3000 series mobile radios are available in the following frequency ranges and power levels.

Table 1-1 Radio Frequency Ranges and Power Levels

Freq. Band	Bandwidth	Power Level
VHF	136–174 MHz	1–25 Watts 25–45 Watts
UHF B1	403–470 MHz	1–25 Watts 25–40 Watts

These radios are among the most sophisticated two-way radios available. They have a robust design for radio users who need high performance, quality, and reliability in their daily communications. This architecture provides the capability of supporting a multitude of legacy and advanced features resulting in a more cost-effective two-way radio communications solution.

Notes

Section 2

MAINTENANCE

1.0 Introduction

This chapter provides details about the following:

- Preventive maintenance (inspection and cleaning)
- Safe handling of CMOS and LDMOS devices
- Repair procedures and techniques
- Pre-baking of Integrated Circuits

2.0 Preventive Maintenance

Periodic visual inspection and cleaning is recommended.

2.1 Inspection

Check that the external surfaces of the radio are clean, and that all external controls and switches are functional. It is not recommended to inspect the interior electronic circuitry.

2.2 Cleaning Procedures

The following procedures describe the recommended cleaning agents and the methods to be used when cleaning the external and internal surfaces of the radio. External surfaces include the control head and housing assembly. These surfaces should be cleaned whenever a periodic visual inspection reveals the presence of smudges, grease, and/or grime.

NOTE: Internal surfaces should be cleaned only when the radio is disassembled for service or repair.

The only recommended agent for cleaning the external radio surfaces is a 0.5% solution of a mild dishwashing detergent in water. The only factory recommended liquid for cleaning the printed circuit boards and their components is isopropyl alcohol (100% by volume).



Caution

Use all chemicals as prescribed by the manufacturer. Be sure to follow all safety precautions as defined on the label or material safety data sheet.

The effects of certain chemicals and their vapors can have harmful results on certain plastics. Avoid using aerosol sprays, tuner cleaners and other chemicals.

Cleaning External Plastic Surfaces

Apply the 0.5% detergent-water solution sparingly with a stiff, non-metallic, short-bristled brush to work all loose dirt away from the radio. Use a soft, absorbent, lintless cloth or tissue to remove the solution and dry the radio. Make sure that no water remains entrapped near the connectors, cracks, or crevices.

Cleaning Internal Circuit Boards and Components

Isopropyl alcohol (100%) may be applied with a stiff, non-metallic, short-bristled brush to dislodge embedded or caked materials located in hard-to-reach areas. The brush stroke should direct the dislodged material out and away from the inside of the radio. Make sure that controls or tunable components are not soaked with alcohol. Do not use high-pressure air to hasten the drying process since this could cause the liquid to collect in unwanted places. Once the cleaning process is complete, use a soft, absorbent, lintless cloth to dry the area. Do not brush or apply any isopropyl alcohol to the frame, control head and housing assembly.

NOTE: Always use a fresh supply of alcohol and a clean container to prevent contamination by dissolved material (from previous usage).

3.0 Safe Handling of CMOS and LDMOS Devices

Complementary Metal Oxide Semiconductor (CMOS) and Laterally Diffused Metal Oxide Semiconductor (LDMOS) devices are used in this family of radios, and are 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 disassembly, troubleshooting, and repair.

Handling precautions are mandatory for CMOS/LDMOS circuits and are especially important in low humidity conditions.

DO NOT attempt to disassemble the radio without first referring to the following CAUTION statement.

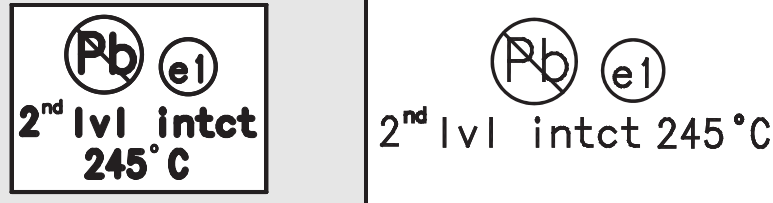
**Caution**

This radio contains static-sensitive devices. Do not open the radio unless you are properly grounded. Take the following precautions when working on this unit:

- Store and transport all CMOS/LDMOS devices in conductive material so that all exposed leads are shorted together. Do not insert CMOS/LDMOS devices into conventional plastic “snow” trays used for storage and transportation of other semiconductor devices.
- Ground the working surface of the service bench to protect the CMOS/LDMOS device. We recommend using a wrist strap, two ground cords, a table mat, a floor mat, ESD shoes, and an ESD chair.
- Wear a conductive wrist strap in series with a 100k resistor to ground. (Replacement wrist straps that connect to the bench top covering are Motorola part number 4280385A59).
- Do not wear nylon clothing while handling CMOS/LDMOS devices.
- Do not insert or remove CMOS/LDMOS devices with power applied. Check all power supplies used for testing CMOS/LDMOS devices to be certain that there are no voltage transients present.
- When straightening CMOS/LDMOS pins, provide ground straps for the apparatus used.
- When soldering, use a grounded soldering iron.
- If at all possible, handle CMOS/LDMOS 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 damage as touching the leads.

4.0 Repair Procedures and Techniques – General

NOTE Environmentally Preferred Products (EPP) (refer to the marking on the printed circuit boards – examples shown below) were developed and assembled using environmentally preferred components and solder assembly techniques to comply with the European Union's Restriction of Hazardous Substances (ROHS 2) Directive 2011/65/EU and Waste Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU. To maintain product compliance and reliability, use only the Motorola specified parts in this manual.



Any rework or repair on Environmentally Preferred Products must be done using the appropriate lead-free solder wire and lead-free solder paste as stated in the following table:

Table 2-1 Lead Free Solder Wire Part Number List

Motorola Part Number	Alloy	Flux Type	Flux Content by Weight	Melting Point	Supplier Part number	Diameter	Weight
1088929Y01	95.5Sn/3.8Ag/0.7Cu	RMA Version	2.7–3.2%	217°C	52171	0.015"	1lb spool

Table 2-2 Lead Free Solder Paste Part Number List

Motorola Part Number	Manufacturer Part Number	Viscosity	Type	Composition & Percent Metal	Liquid Temperature
1085674C03	NC-SMQ230	900–1000KCPs Brookfield (5rpm)	Type 3 (-325/+500)	(95.5%Sn–3.8%Ag–0.7%Cu) 89.3%	217°C

Parts Replacement and Substitution

Check the parts list for the proper Motorola part number and order the part from the nearest Motorola Radio Products and Solutions Organization listed in Appendix A of this manual.

Rigid Circuit Boards

This family of radios uses bonded, multi-layer, printed circuit boards. Since the inner layers are not accessible, some special considerations are required when soldering and unsoldering components. The printed through holes may interconnect multiple layers of the printed circuit. Therefore, exercise care to avoid pulling the plated circuit out of the hole.

When soldering near a connector:

- Avoid accidentally getting solder in the connector
- Be careful not to form solder bridges between the connector pins
- Examine your work closely for shorts due to solder bridges

For soldering components with Hot-Air or infra red solder systems, please check your user guide of the solder system to get information on solder temperature and time for the different housings of the integrated circuits and other components.

5.0 Pre-baking of Integrated Circuits

Electronic components are generally coated with plastic material which has the nature of not being waterproof. If kept unsealed, the components can absorb humidity. When soldered to the board (especially with reflow techniques) a sudden change in temperature can cause fissures or cracks which can result in malfunction or damage. Therefore, service should temper in a Desiccant Cabinet (12 hours at 50 degree Celsius) the radio PCB, before heating up areas around MS components.

To avoid this problem, these Moisture Sensitive (MS) components should be stored and shipped in a sealed wrapping (dry pack). Processing must take place only with dry components when an uninterrupted dry storage can be guaranteed, otherwise the components have to be pre-baked.

If a reflow procedure takes place close to MS components the whole board must be pre-baked.

Please refer to the following table:

Table 2-3 MS Components and Location

Location	Circuit Ref.	Motorola Part No.	MSL
Numeric Display Control Head Alphanumeric Display Control Head	D6005 D6008 D6011 D6013	48012219001	2
Alphanumeric Display Control Head	D6006 D6009 D6012 D6014	48012219001	2
Numeric Display Control Head Alphanumeric Display Control Head	D6004	48012255001	2
Numeric Display Control Head Alphanumeric Display Control Head	D6002	4805729G73	2A
Numeric Display Control Head Alphanumeric Display Control Head	D6001	4805729G74	2A
Numeric Display Control Head Alphanumeric Display Control Head	D6000	4805729G75	2A
Controller R1	U2001M1	51012031001	3
Controller R1	U2001M1	51012058002	3
Controller R1	U3103M1	51012142001	2
Controller R1	U2000M1	51012239002	3
Controller R1	U3200M1	51012469001	2
Controller R1	U1001M1	51012487001	3
Controller R1	U3104M1 U3105M1	5114610F01	2
VHF 25–45 W	Q0702M6	48012022001	3
UHF1 25–40 W	Q0705M6		
VHF 1–25 W	Q0702M5	48012067002	3
UHF1 1–25 W	Q0705M5		
VHF 1–25 W VHF 25–45 W UHF1 1–25 W UHF1 25–40 W	Q0402M4	48012201001	2

Table 2-3 MS Components and Location (Continued)

Location	Circuit Ref.	Motorola Part No.	MSL
VHF 1–25 W VHF 25–45 W UHF1 1–25 W UHF1 25–40 W	VR0201M7 VR0400M4 VR0401M4 VR0402M4 VR0403M4	4805656W87	2
VHF 1–25 W VHF 25–45 W	VR0205M7 VR0210M7 VR0211M7 VR0214M7 VR0215M7		
UHF1 1–25 W UHF1 25–40 W	VR0200M7 VR0202M7 VR0203M7 VR0250M7 VR0251M7 VR0252M7 VR0253M7		
VHF 1–25 W VHF 25–45 W UHF1 1–25 W UHF1 25–40 W	D0401M4 D0402M4	4813974A19	2
VHF 1–25 W UHF1 1–25 W	Q0700M5	4816547H01	2
VHF 25–45 W UHF1 25–40 W	Q0700M6		
VHF 1–25 W	Q0704M5	4816548H01	3
UHF1 1–25 W	Q0702M5		
VHF 25–45 W UHF1 25–40 W	Q0704M6		
VHF 1–25 W VHF 25–45 W UHF1 1–25 W UHF1 25–40 W	U0000M2	51009686002	3
VHF 1–25 W UHF1 1–25 W	U0903M5	5115022H01	3
VHF 25–45 W	U0904M6		
UHF1 25–40 W	U0903M6		
VHF 1–25 W VHF 25–45 W	U200M7	5186310Y39	2
VHF 1–25 W VHF 25–45 W UHF1 1–25 W UHF1 25–40 W	U0401M4 U0402M4		
UHF1 1–25 W UHF1 25–40 W	U0350M7		

5.1 IPC/JEDEC J-STD-020D.1 (March 2008) Chart

Table 2-4 Moisture Sensitivity Levels

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS				
			STANDARD		ACCELERATED EQUIVALENT ¹		
					eV 0.40–0.48	eV 0.30–0.39	CONDITION
	TIME (hours)	CONDITION	TIME (hours)	CONDITION	TIME (hours)	TIME (hours)	
1	Unlimited	≤30 °C/85% RH	168 +5/-0	85 °C/85% RH	NA	NA	NA
2	1 year	≤30 °C/60% RH	168 +5/-0	85 °C/60% RH	NA	NA	NA
2a	4 weeks	≤30 °C/60% RH	696 ² +5/-0	30 °C/60% RH	120 +1/-0	168 +1/-0	60 °C/60% RH
3	168 hours	≤30 °C/60% RH	192 ² +5/-0	30 °C/60% RH	40 +1/-0	52 +1/-0	60 °C/60% RH
4	72 hours	≤30 °C/60% RH	96 ² +2/-0	30 °C/60% RH	20 +5/-0	24 +0.5/-0	60 °C/60% RH
5	48 hours	≤30 °C/60% RH	72 ² +2/-0	30 °C/60% RH	15 +5/-0	20 +0.5/-0	60 °C/60% RH
5a	24 hours	≤30 °C/60% RH	48 ² +2/-0	30 °C/60% RH	10 +0.5/-0	13 +0.5/-0	60 °C/60% RH
6	Time on Label (TOL)	≤30 °C/60% RH	TOL	30 °C/60% RH	NA	NA	NA

Note 1: CAUTION – To use the “accelerated equivalent” soak conditions, correlation of damage response (including electrical, after soak and reflow), should be established with the “standard” soak conditions. Alternatively, if the known activation energy for moisture diffusion of the package materials is in the range of 0.40–0.48 eV or 0.30–0.39 eV, the “accelerated equivalent” may be used. Accelerated soak times may vary due to material properties (e.g. mold compound, encapsulant, etc.). JEDEC document JESD22-A120 provides a method for determining the diffusion coefficient.

Note 2: The standard soak time includes a default value of 24 hours for semiconductor Manufacturer’s Exposure Time (MET) between bake and bag and includes the maximum time allowed out of the bag at the distributor’s facility.

If the actual MET is less than 24 hours, the soak time may be reduced. For soak conditions of 30 °C/60% RH, the soak time is reduced by 1 hour for each hour the MET is less than 24 hours. For soak conditions of 60 °C/60% RH, the soak time is reduced by 1 hour for each 5 hours the MET is less than 24 hours.

If the actual MET is greater than 24 hours the soak time must be increased. If soak conditions are 30 °C/60% RH, the soak time is increased 1 hour for each hour that the actual MET exceeds 24 hours. If soak conditions are 60 °C/60% RH, the soak time is increased 1 hour for each 5 hours that the actual MET exceeds 24 hours.

Note 3: Supplier may extend the soak times at their own risk.

Notes

Section 3

TEST EQUIPMENT AND SERVICE AIDS

1.0 Recommended Test Equipment

The list of equipment contained in Table 3-1 includes most of the standard test equipment required for servicing Motorola mobile radios.

Table 3-1 Recommended Test Equipment

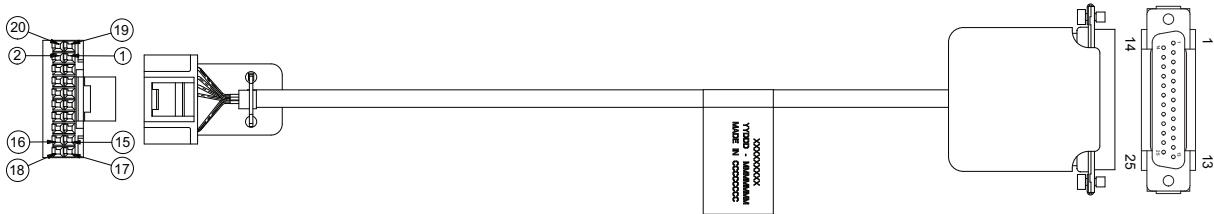
Equipment	Characteristic	Example	Application
Service Monitor	Can be used as a substitute for items marked with an asterisk (*)	Aeroflex 3920, or equivalent	Frequency/deviation meter and signal generator for wide-range troubleshooting and alignment
Digital RMS Multimeter*	100 μ V to 300 V 5 Hz to 1 MHz 10 Meg Ohm Impedance	Fluke 179 or equivalent (www.fluke.com)	AC/DC voltage and current measurements. Audio voltage measurements.
RF Signal Generator*	100 MHz to 1 GHz -130 dBm to +10 dBm FM Modulation 0 kHz to 10 kHz	Agilent N5181 (www.agilent.com) or equivalent	Receiver measurements
Oscilloscope*	2 Channels 50 MHz Bandwidth 5 mV/div to 20 V/div	Tektronix TDS1001b (www.tektronix.com) or equivalent	Waveform measurements
Power Meter and Sensor*	5% Accuracy 100 MHz to 500 MHz 50 Watts	Bird 43 Thruline Watt Meter (www.bird-electronic.com) or equivalent	Transmitter power output measurements
RF Millivolt Meter	100 mV to 3 V RF 10 kHz to 1 GHz	Boonton 92EA (www.boonton.com) or equivalent	RF level measurements
Power Supply	0 V to 32 V 0 A to 20 A	B&K Precision 1790 (www.bkprecision.com) or equivalent	Voltage supply

2.0 Service Aids

Table 3-2 lists the service aids recommended for working on the radio. While all of these items are available from Motorola, most are standard workshop equipment items, and any equivalent item capable of the same performance may be substituted for the item listed.

Table 3-2 Service Aids

Motorola Part Number	Description	Application
RLN4460_	Test Box	Enables connection to audio/accessory jack. Allows switching for radio testing.
PMVN4130_	Customer Programming Software and AirTracer on CD-ROM	CPS allows Dealers/Distributors to program radio parameters. AirTracer allows the capturing of radio traffic into logs for analysis by Motorola.
PMVN4131_	Tuner on CD-ROM	Radio Tuning. Only Motorola Service Centers or Authorized Motorola Service Dealers can perform this function.
PMKN4147_	Front Telco MMP USB Programming Cable	Connects the radio's front connector to a USB port for radio programming and data applications.
PMKN4150_	Back 20 Pin MAP Test Cable	Connects the radio's rear connector for testing. Must use in conjunction with PMKN4147_ (Front Telco MMP USB Programming Cable) for radio programming and alignment.
PMKN4151_	Back 16 Pin MAP Universal Cable	Connects the radio's rear connector to the center 16 pins with unterminated connectors at the user end.
HPN4007_	Power Supply	Provides the radio with power when bench testing.
6686119B01	Control Head Dismantling Tool	Assists in the removal of radio control head.



WIRE DIAGRAM			
20 PIN ACCESSORY PORT CONNECTOR		WIRE COLOUR	DB25P
PIN No.	DESCRIPTION	--	--
1	SPEAKER -	ORANGE	2 & 7
2	EXT MIC	GREY	10 & 15
3	GPI_1 (EXT PTT)	PINK	20
5	FLAT TX	YELLOW	18
7	GROUND	BLACK	16
15	RSSI	BROWN	19
16	SPEAKER +	PURPLE	1 & 5

5.0 Accessory Cable

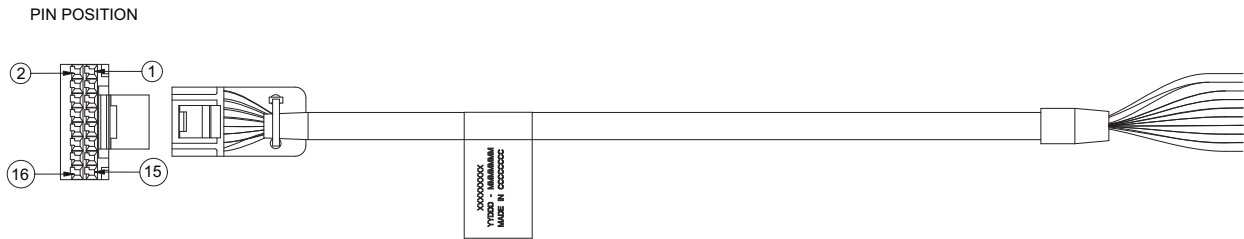


Figure 3-3 Back 16 Pin MAP Universal Cable PMKN4151_

Table 3-4 Wire Diagram for PMKN4151_

WIRE DIAGRAM						
16 PIN CONNECTOR	WIRE COLOUR	WIRE LEAD SIDE		16 PIN CONNECTOR	WIRE COLOUR	WIRE LEAD SIDE
1	BLACK	NC		9	PURPLE	NC
2	WHITE	NC		10	GREY	NC
3	GREEN	NC		11	PINK	NC
4 *	YELLOW / DRAIN WIRE	NC *		12	WHT / BLK	NC
5	ORANGE	NC		13	WHT / BRN	NC
6	BLUE	NC		14	WHT / RED	NC
7	BROWN	NC		15	WHT / ORG	NC
8	RED	NC		16	WHT / GRN	NC

(*) NOTE: CRIMP YELLOW WIRE AND DRAIN WIRE TO TERMINAL ON 26 PIN CONNECTOR.
TIN YELLOW WIRE AND DRAIN WIRE TOGETHER ON WIRE LEAD SIDE.

Section 4

POWER-UP SELF TEST

NOTE: This section is for reference only. If at any time one of the error codes is present, the radio should be returned to a qualified Motorola Service Center.

1.0 Power-Up Error Codes

When the radio is turned on (powered-up), the radio performs cursory tests to determine if its basic electronics and software are in working order. Problems detected during these tests are presented as error codes on the radio's display. The presence of an error should prompt the user that a problem exists and that a service technician should be contacted.

Self-test errors are classified as either fatal or non-fatal. Fatal errors inhibit user operation; non-fatal errors do not. Use the following table to aid in understanding particular power-up error code displays.

Table 4-1 Power-Up Error Codes

Error Code	Description	Error Type	Corrective Action
ERROR 01/02	FLASH ROM Codeplug Checksum	NON-FATAL	Reprogram the codeplug.
ERROR 01/22	Tuning Codeplug Checksum	NON-FATAL	Reprogram the tuning partition/ codeplug. To be done by Motorola Repair Centers .
FAIL 01/82	FLASH ROM Codeplug Checksum	FATAL	Reprogram codeplug. If message reoccurs, send radio to nearest Motorola Repair Centers to replace Service Kit.
FAIL 01/90	General Hardware Error	FATAL	Retest radio by turning it off and turning it on again. If message reoccurs, send radio to nearest Motorola Repair Centers to replace Service Kit.
FAIL 01/92	Security Partition Checksum	FATAL	Reprogram the security partition/ codeplug. If message reoccurs, send radio to nearest Motorola Repair Centers to replace Service Kit.
FAIL 01/93	FlashPORT AUTHENT CODE Failure	FATAL	Send radio to nearest Motorola Repair Centers to replace Service Kit.
FAIL 01/A2	Tuning Codeplug Checksum	FATAL	Reprogram the tuning partition/ codeplug. To be done by Motorola Repair Centers .
FAIL 02/90	RF Hardware Error	FATAL	Send radio to nearest Motorola Repair Centers.

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XiRTM M3188/XiRTM M3688

Mobile Radios

Chapter 2

Mobile Radio Block Diagram

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Chapter 2 – MOTOTRBO XiR M3188/XiR M3688 Mobile Radio Block Diagram

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Section 1

1.0 MOTOTRBO XiR M3188/XiR M3688 Mobile Radio Block Diagram

Figure 1-1: shows the MOTOTRBO XiR M3188/XiR M3688 Mobile Radio Block Diagram. This block diagram should be used for reference for all subsequent chapters.

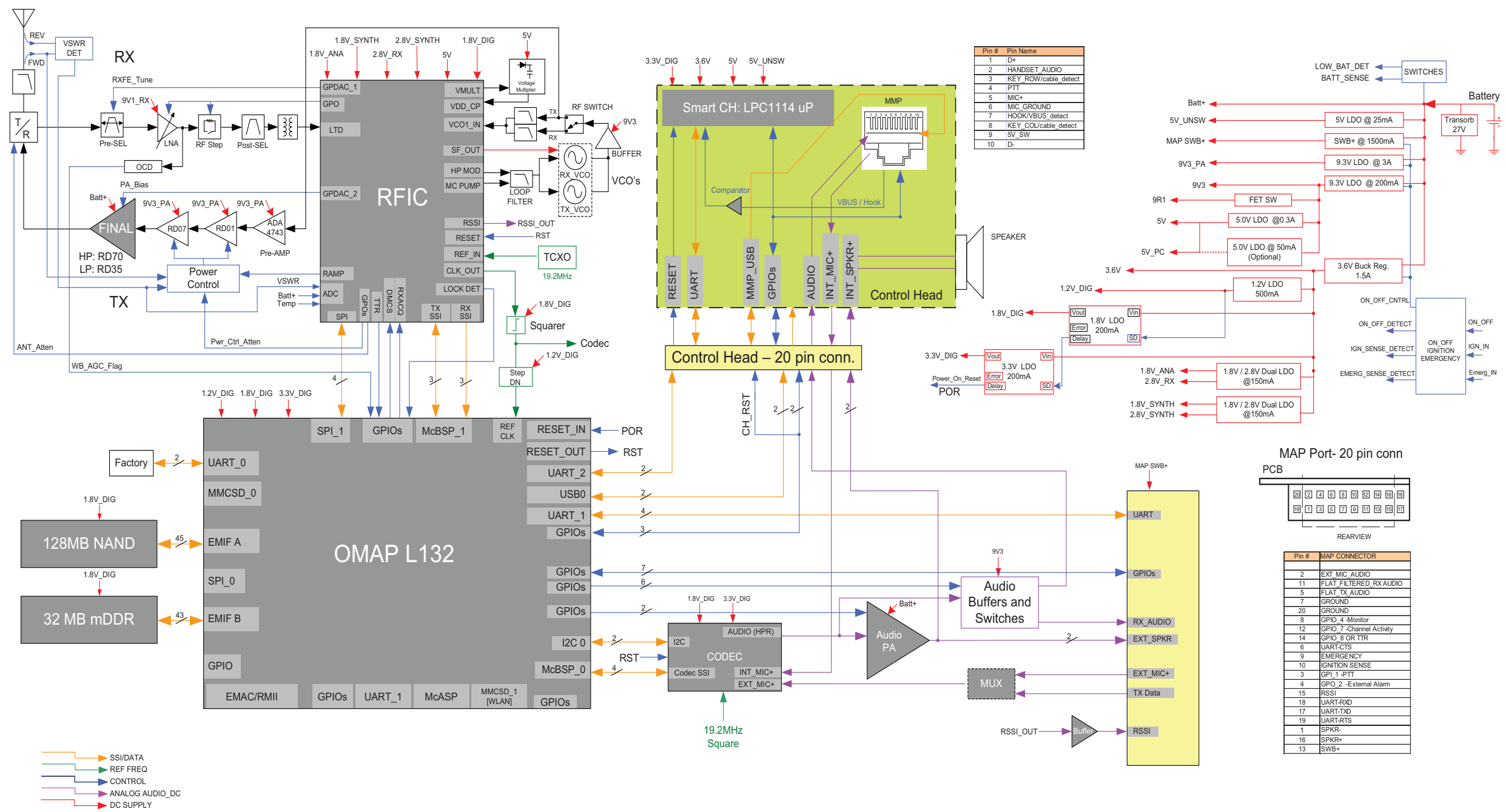


Figure 1-1: Top Level Block Diagram

Notes



XiR™ M3188/XiR™ M3688 Mobile Radios

Chapter 3

Control Head

Service Information

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Chapter 3 – Control Head Service Information

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Notes

Section 1

OVERVIEW

1.0 Numeric Display Model

The Control Head contains the internal speaker, the On/Off button, the Volume Changing Rocker, the Channel Changing Rocker, the accessory connector, several buttons to operate the radio and several indicator Light Emitting Diodes (LED) to inform the user about the radio status and channel. The switches and indicators on the Control Head are indirectly controlled by the processor in the radio.



2.0 Alphanumeric Display Model

The Control Head contains the internal speaker, the On/Off button, the Volume Changing Rocker, the Channel Changing Rocker, the accessory connector, several buttons to operate the radio, several indicator Light Emitting Diodes (LED) to inform the user about the radio status, and a Liquid Crystal Display (LCD) for alphanumeric information e.g., channel number or call address name. The switches, indicators, and LCD on the Control Head are indirectly controlled by the processor in the radio.

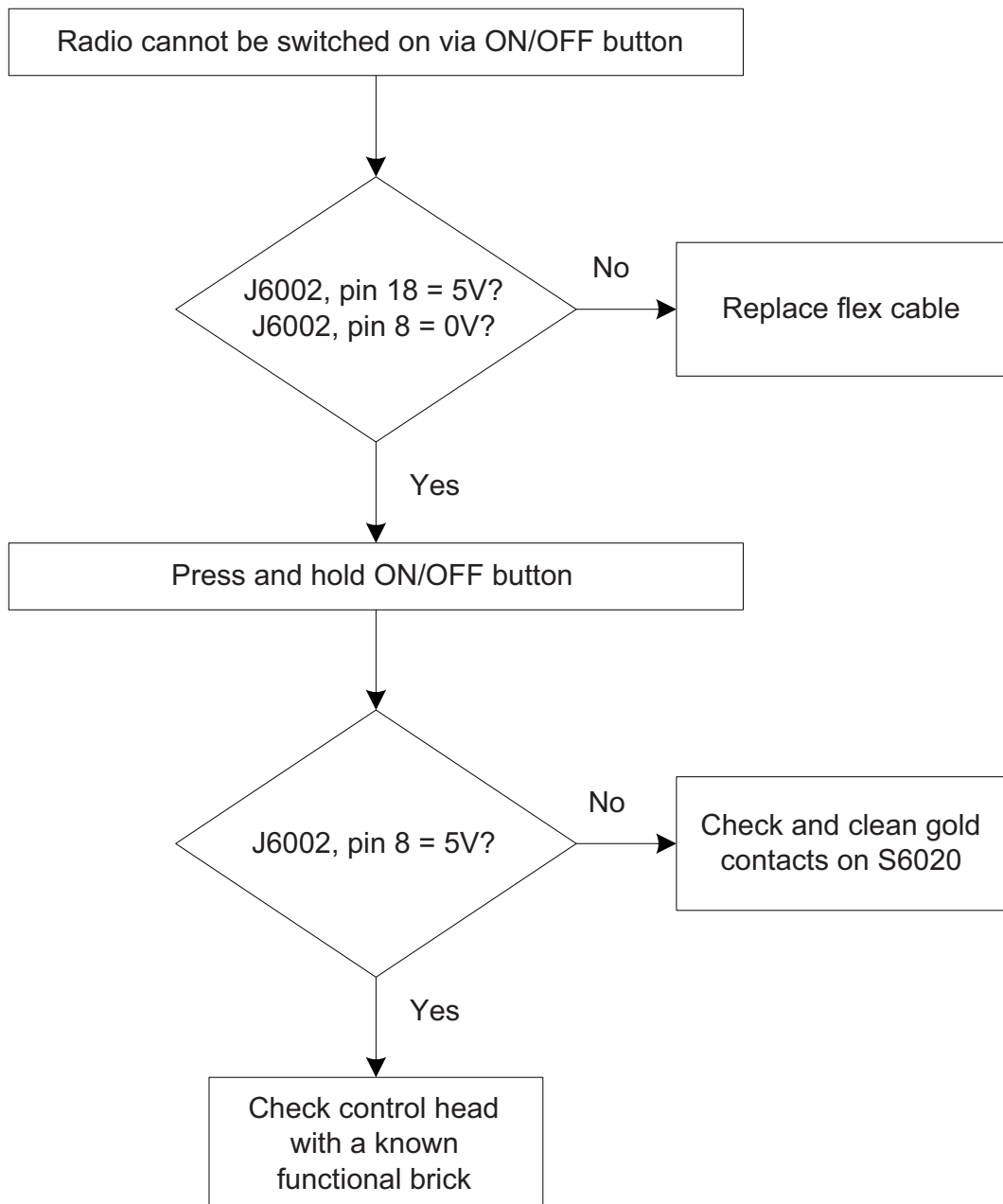


Section 2

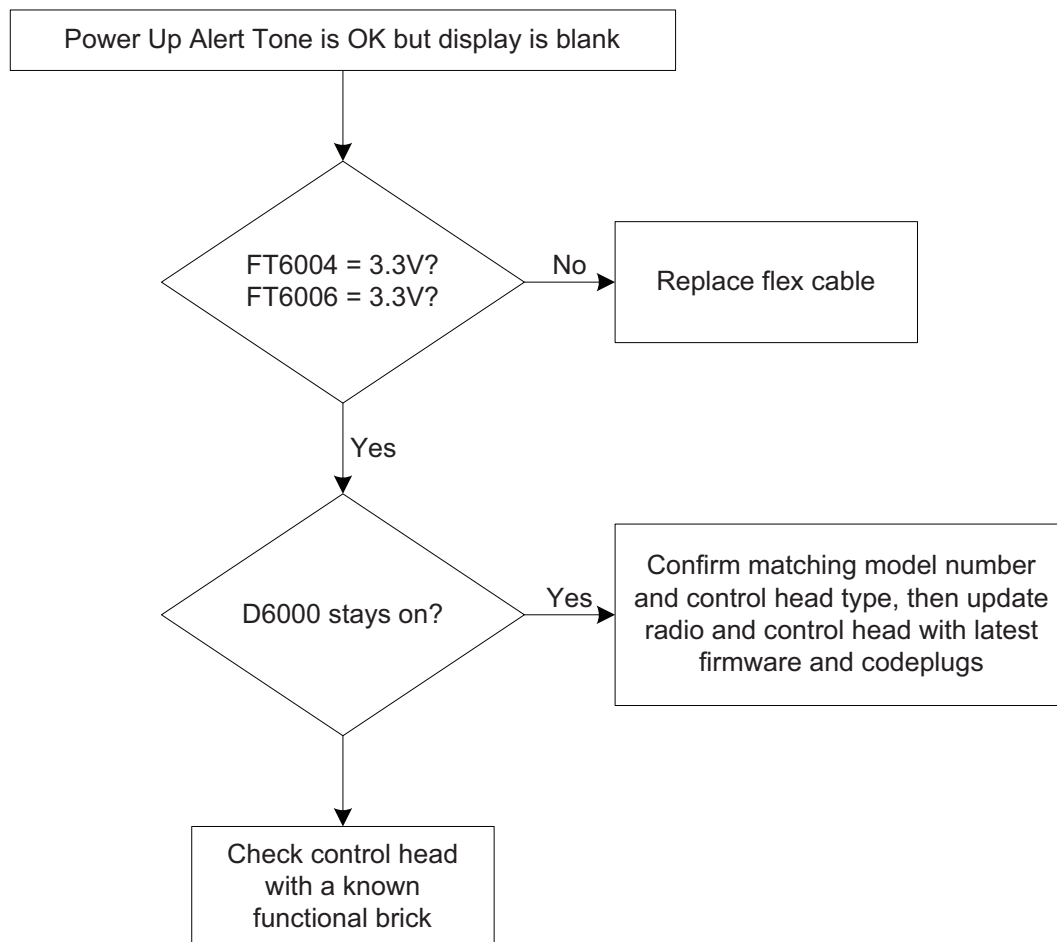
TROUBLESHOOTING CHARTS

1.0 Numeric Display Model Control Head Troubleshooting Flow Chart

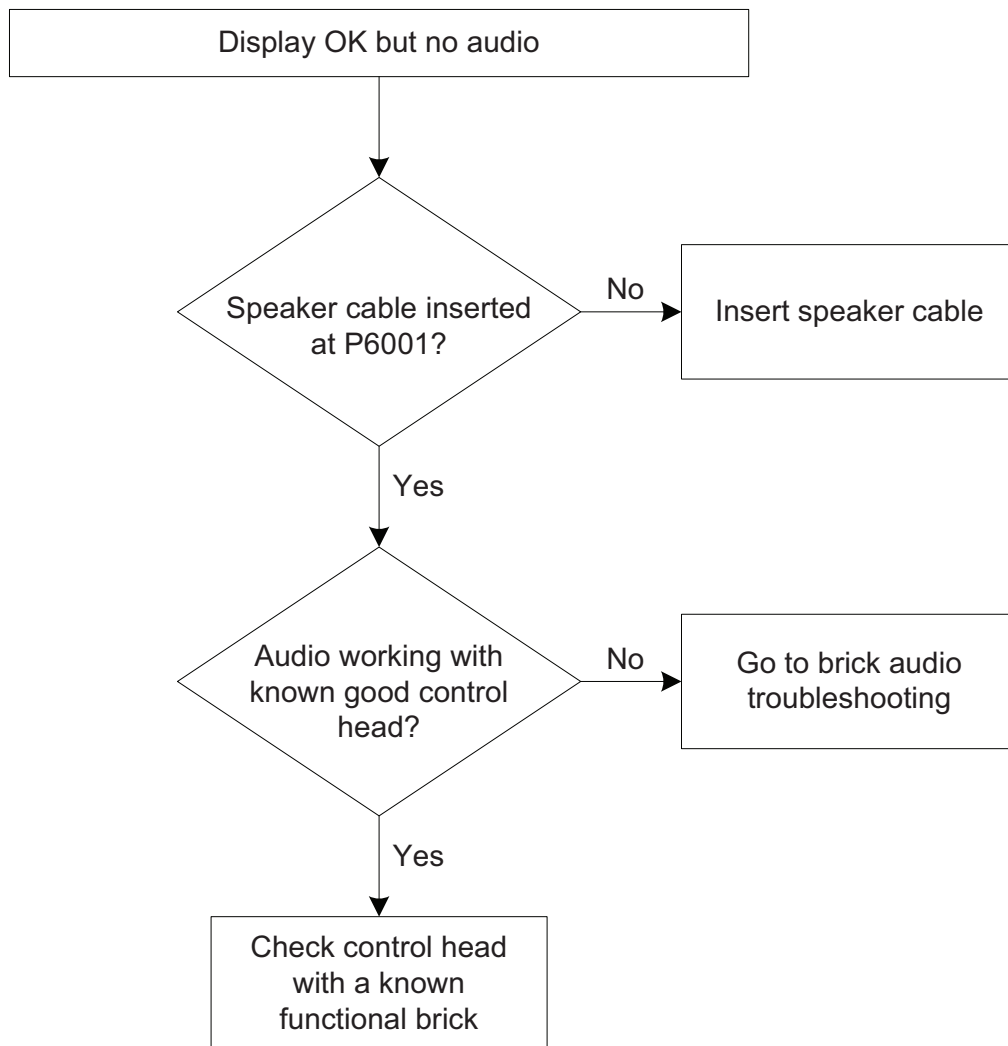
1.1 On/Off



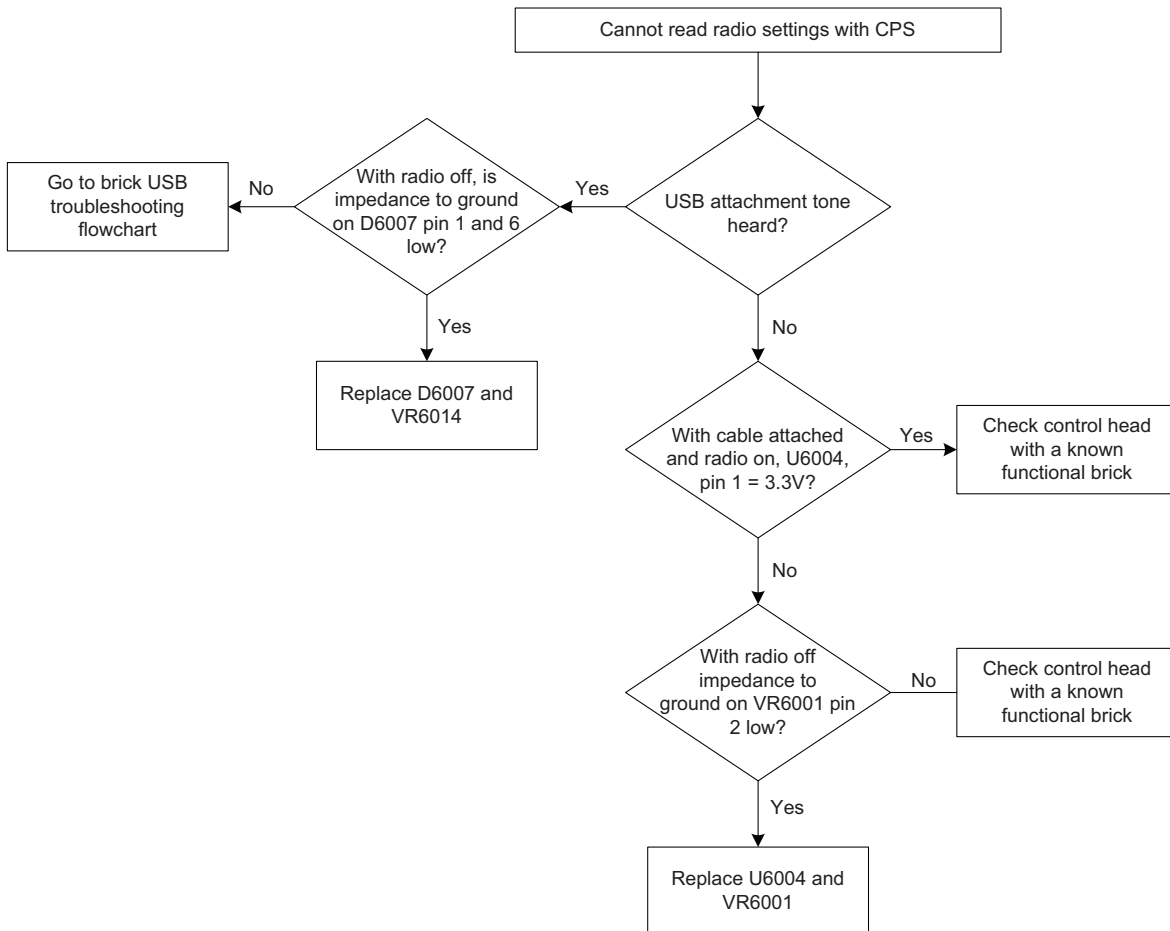
1.2 Numeric Display



1.3 Speaker Audio

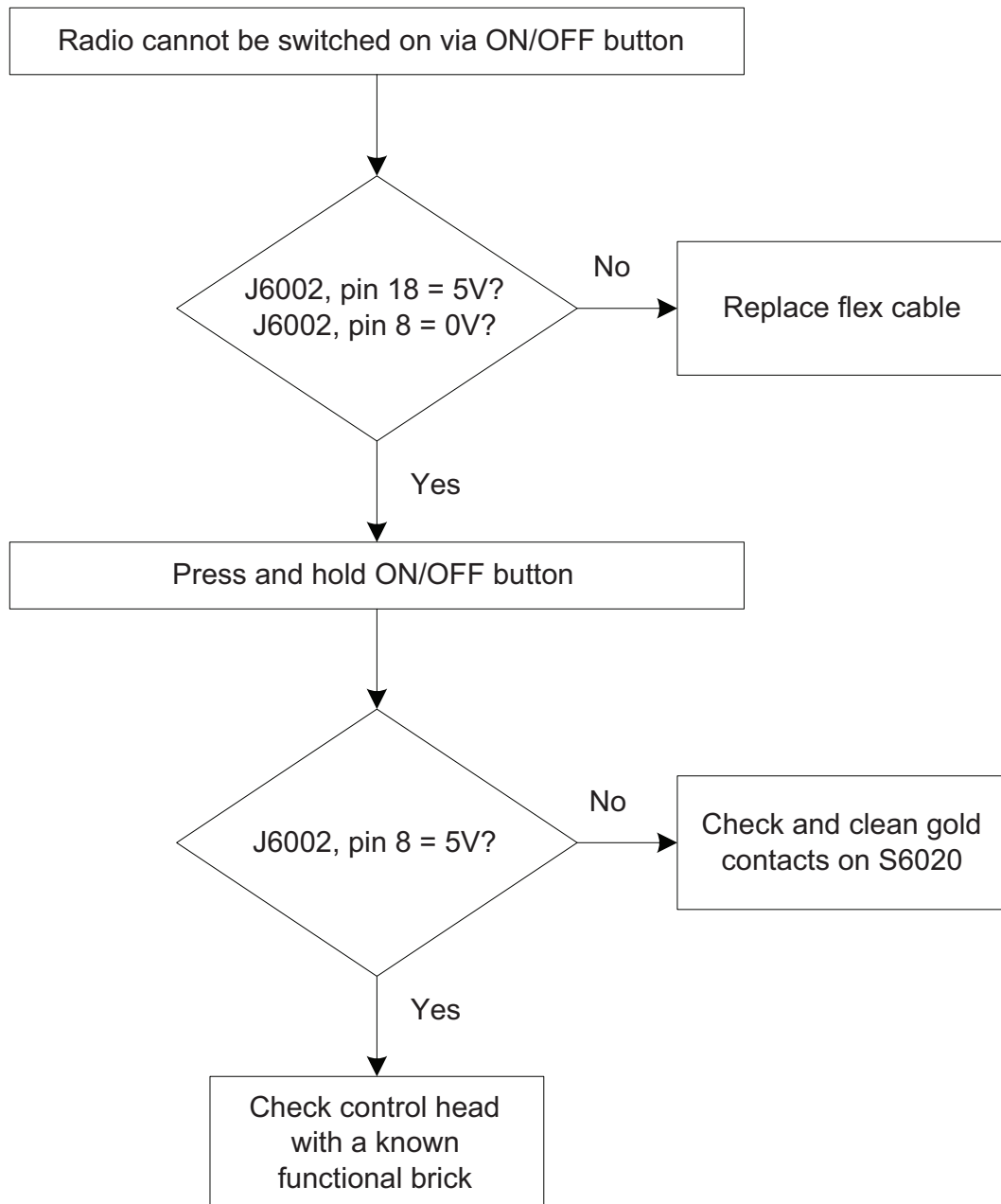


1.4 Front MMP USB

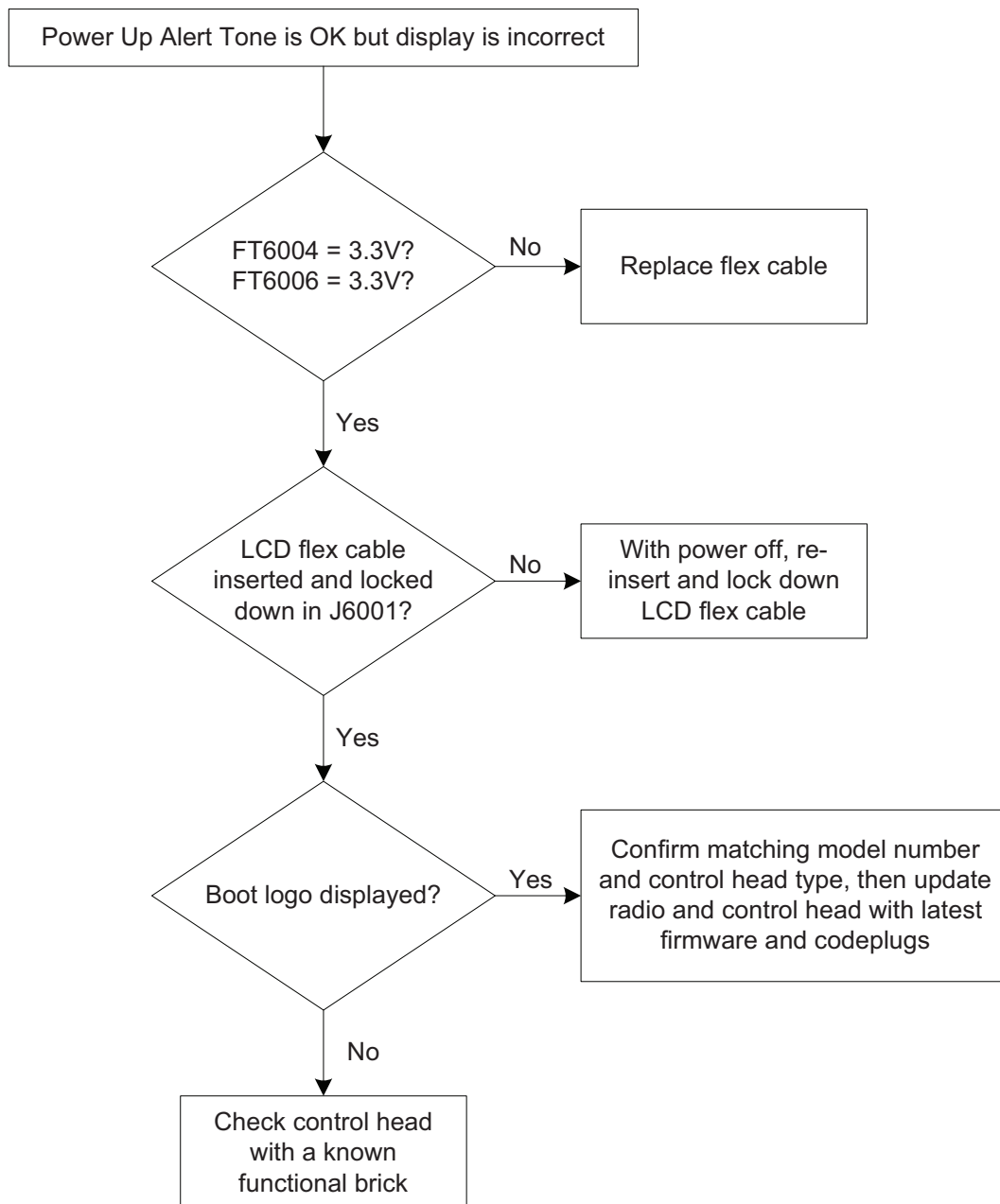


2.0 Alphanumeric Display Model Control Head Troubleshooting Flow Chart

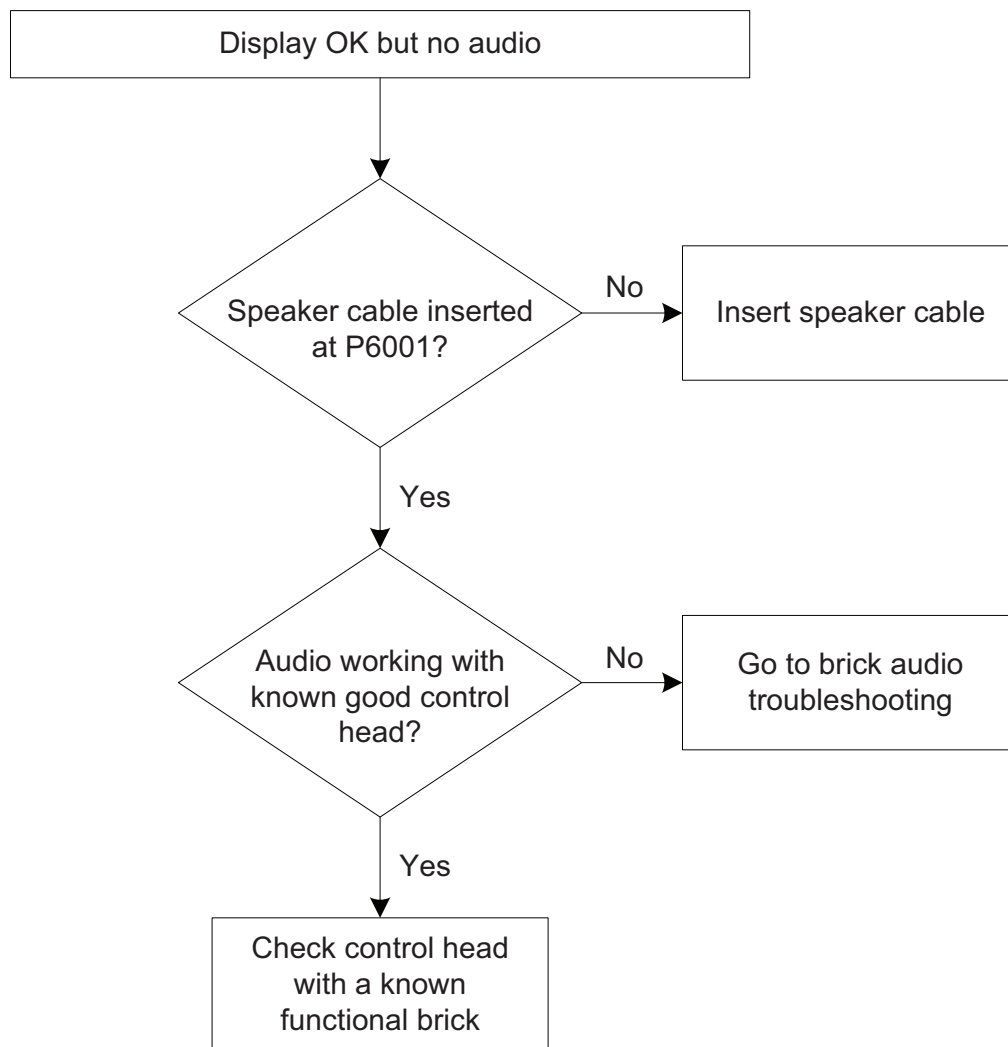
2.1 On/Off



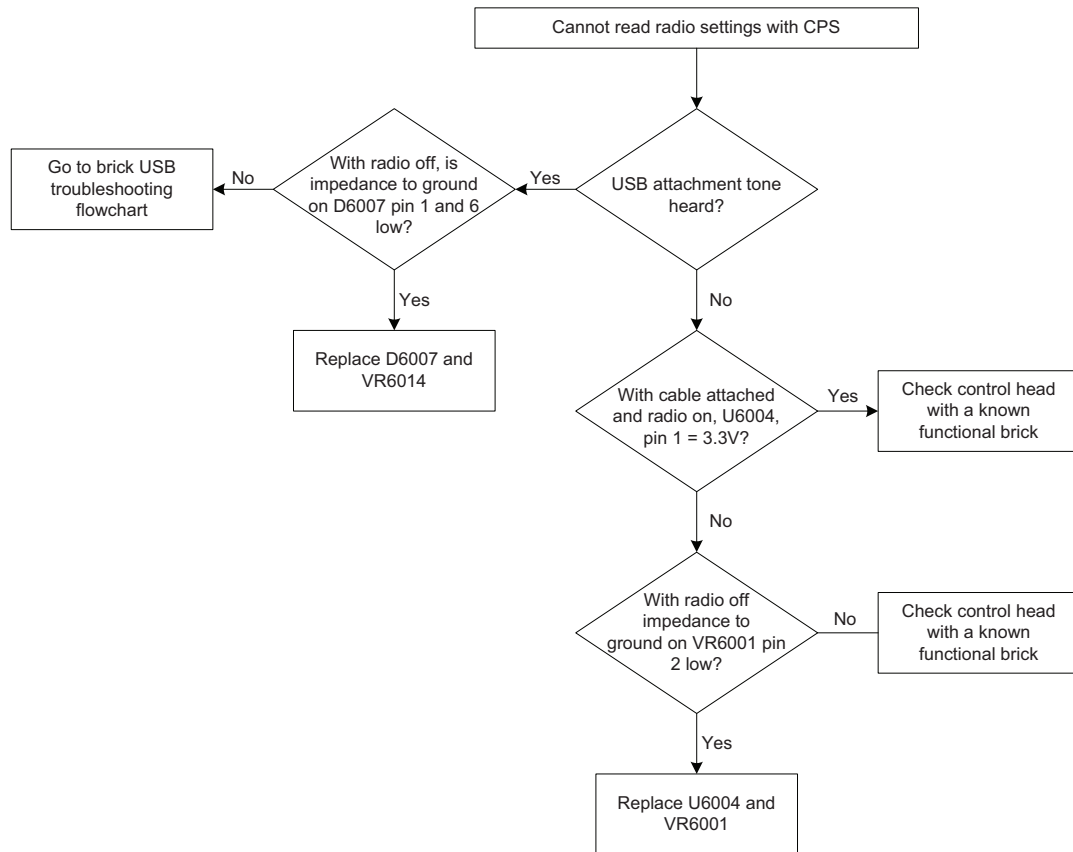
2.2 Alphanumeric Display



2.3 Speaker Audio



2.4 Front MMP USB



Section 3

CONTROL HEAD PCBS/SCHEMATICS/PARTS LISTS

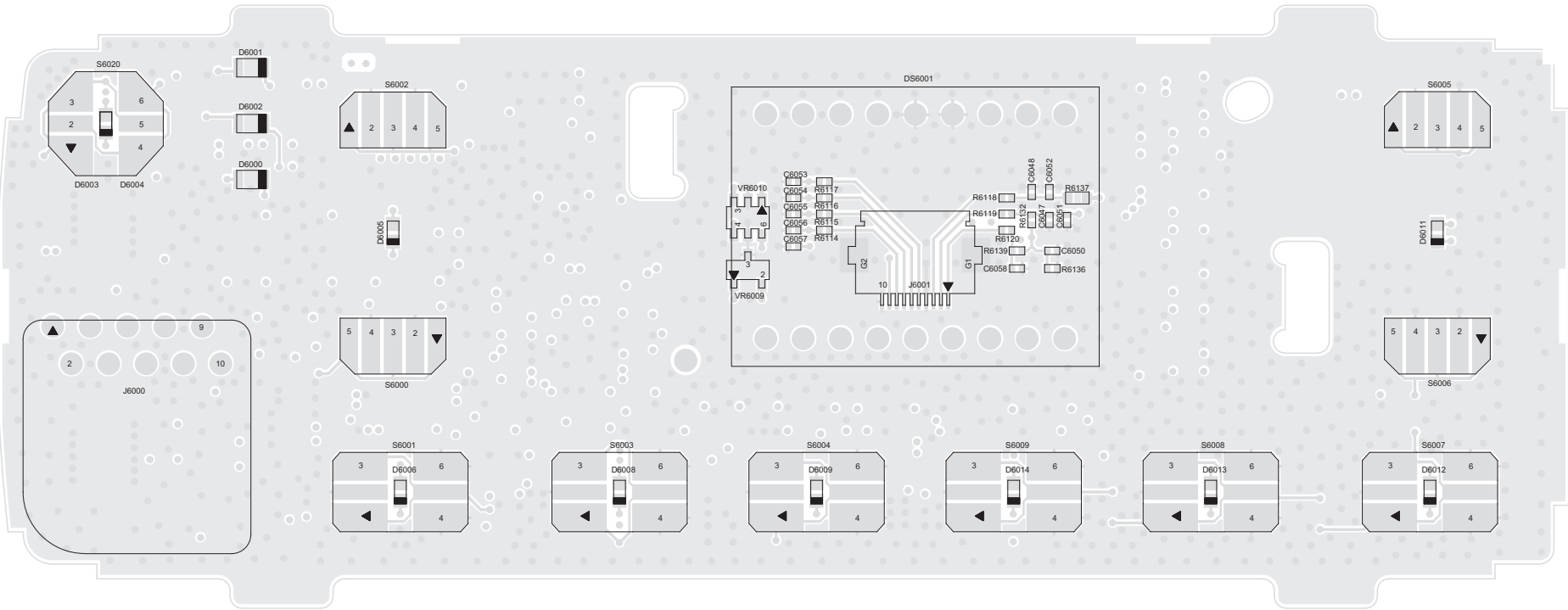
1.0 Allocation of Schematics and Circuit Boards

Table 3-1 Numeric Display and Alphanumeric Display Control Head Schematic Diagrams and Parts Lists

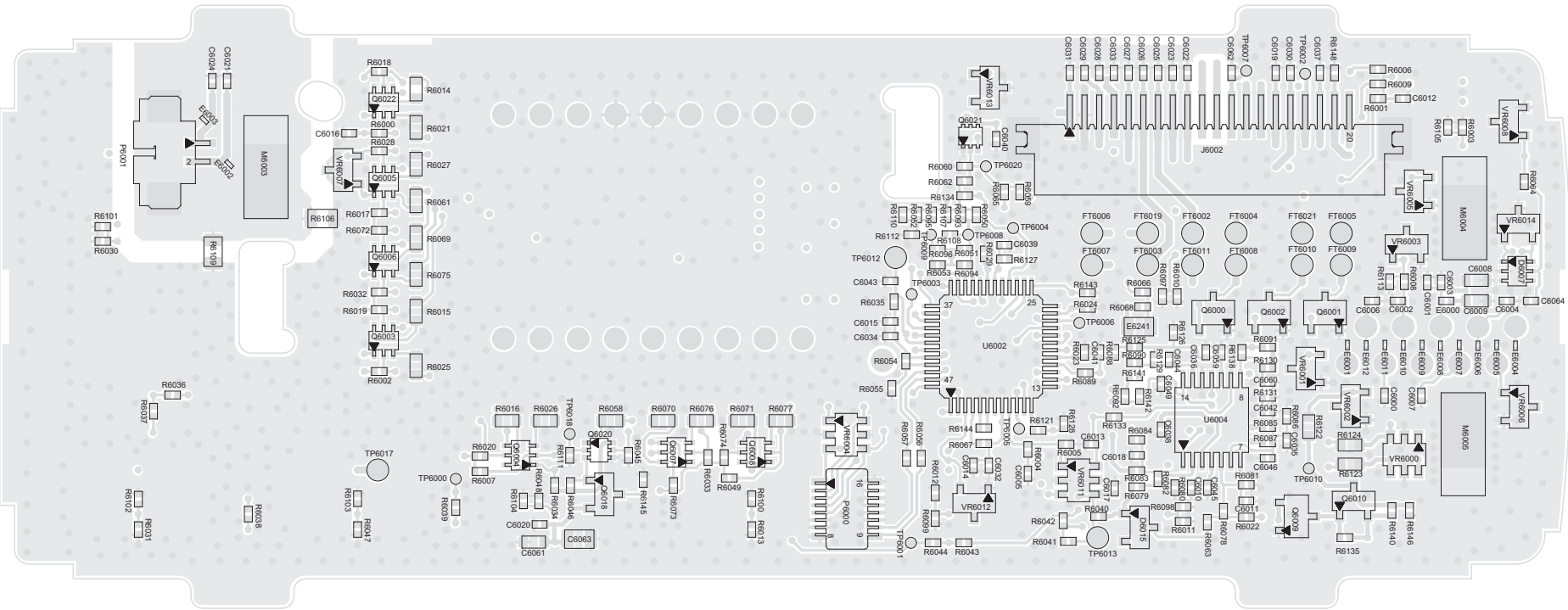
PCB : Numeric and Alphanumeric Display Control Head 84012531002-B Main Board Top Side 84012531002-B Main Board Bottom Side	Page 3-3 Page 3-3
SCHEMATICS Numeric Display Control Head Schematic Diagram	Page 3-4
Parts List 84012531002-B Numeric Display Control Head Parts List	Page 3-5
SCHEMATICS Alphanumeric Display Control Head Schematic Diagram	Page 3-7
Parts List 84012531002-B Alphanumeric Display Control Head	Page 3-8

Notes

2.0 Numeric Display and Alphanumeric Display Control Head – PCB 84012531002-B



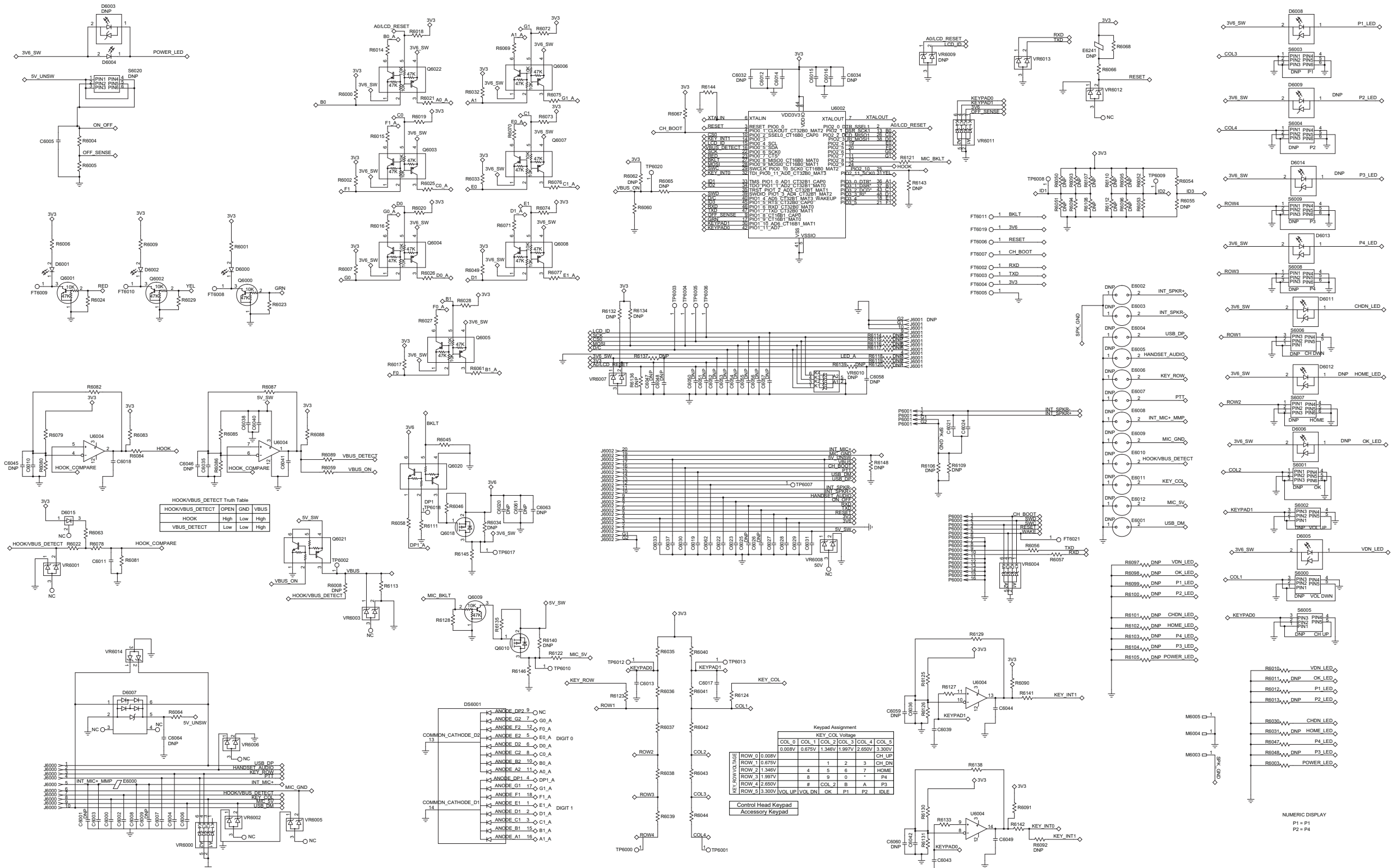
Top Side View



Bottom Side View

Numeric Display and Alphanumeric Display Control Head PCB Diagram – 84012531002-B

3.0 Numeric Display Control Head Schematic



Numeric Display Control Head Schematic Diagram

4.0 Numeric Display Control Head Parts List

Circuit Ref.	Motorola Part No.
C6000	2113945A05
C6001	NOT PLACED
C6002	2113946B04
C6003	21667009166
C6004	2113945A05
C6005	2113945B02
C6006	2113945A05
C6007	2113945A05
C6008	2113945L29
C6009	NOT PLACED
C6010	2113945A05
C6011	2113945A05
C6012	2113946B04
C6013	2113945B02
C6014	2113945B02
C6015	2113946B04
C6016	2113945B02
C6017	2113945B02
C6018	2113945A05
C6019	2113945A05
C6020	NOT PLACED
C6021	2113945A05
C6022	2113945A05
C6023	2113945A05
C6024	2113945A05
C6025	NOT PLACED
C6026	NOT PLACED
C6027	2113945A05
C6028	2113945A05
C6029	2113945A05
C6030	2113945A05
C6031	2113945A05
C6032	NOT PLACED
C6033	2113956A51
C6034	NOT PLACED

Circuit Ref.	Motorola Part No.
C6035	2113945A05
C6036	2113945A05
C6037	2113945A05
C6038	2113945B02
C6039	2113945A05
C6040	2113946B04
C6041	2113945A05
C6042	2113945A05
C6043	2113945A05
C6044	2113945A05
C6045	NOT PLACED
C6046	NOT PLACED
C6047	NOT PLACED
C6048	NOT PLACED
C6049	2113945A05
C6050	NOT PLACED
C6051	NOT PLACED
C6052	NOT PLACED
C6053	NOT PLACED
C6054	NOT PLACED
C6055	NOT PLACED
C6056	NOT PLACED
C6057	NOT PLACED
C6058	NOT PLACED
C6059	NOT PLACED
C6060	NOT PLACED
C6061	NOT PLACED
C6062	2113945A05
C6063	NOT PLACED
C6064	NOT PLACED
D6000	4805729G75
D6001	4805729G74
D6002	4805729G73
D6003	NOT PLACED
D6004	48012255001
D6005	48012219001
D6006	NOT PLACED
D6007	48012049001

Circuit Ref.	Motorola Part No.
D6008	48012219001
D6009	NOT PLACED
D6011	48012219001
D6012	NOT PLACED
D6013	48012219001
D6014	NOT PLACED
D6015	4813978C09
DS6001	72012025001
E6000	7688697V14
E6001	NOT PLACED
E6002	NOT PLACED
E6003	NOT PLACED
E6004	NOT PLACED
E6005	NOT PLACED
E6006	NOT PLACED
E6007	NOT PLACED
E6008	NOT PLACED
E6009	NOT PLACED
E6010	NOT PLACED
E6011	NOT PLACED
E6012	NOT PLACED
E6241	NOT PLACED
J6000	2864287B01
J6001	NOT PLACED
J6002	0915767H01
M6003	39012067001
M6004	39012067001
M6005	39012067001
P6000	NOT PLACED
P6001	2815162H01
Q6000	4815261H01
Q6001	4815261H01
Q6002	4815261H01
Q6003	48012232001
Q6004	48012232001
Q6005	48012232001
Q6006	48012232001
Q6007	48012232001

Circuit Ref.	Motorola Part No.
Q6008	48012232001
Q6009	4815261H01
Q6010	4885065Y01
Q6018	4885065Y01
Q6020	4809939C47
Q6021	4815272H01
Q6022	48012232001
R6000	0613952R01
R6001	0613952Q43
R6002	0613952R01
R6003	0613952Q58
R6004	0613952Q85
R6005	0613952Q93
R6006	0613952Q59
R6007	0613952R01
R6008	NOT PLACED
R6009	0613952Q44
R6010	0613952Q71
R6011	NOT PLACED
R6012	0613952Q71
R6013	NOT PLACED
R6014	0613952H57
R6015	0613952H57
R6016	0613952H57
R6017	0613952R01
R6018	0613952R01
R6019	0613952R01
R6020	0613952R01
R6021	0613952H57
R6022	0613952R66
R6023	0613952R01
R6024	0613952R01
R6025	0613952H57
R6026	0613952H57
R6027	0613952H57
R6028	0613952R01
R6029	0613952R01
R6030	0613952Q71

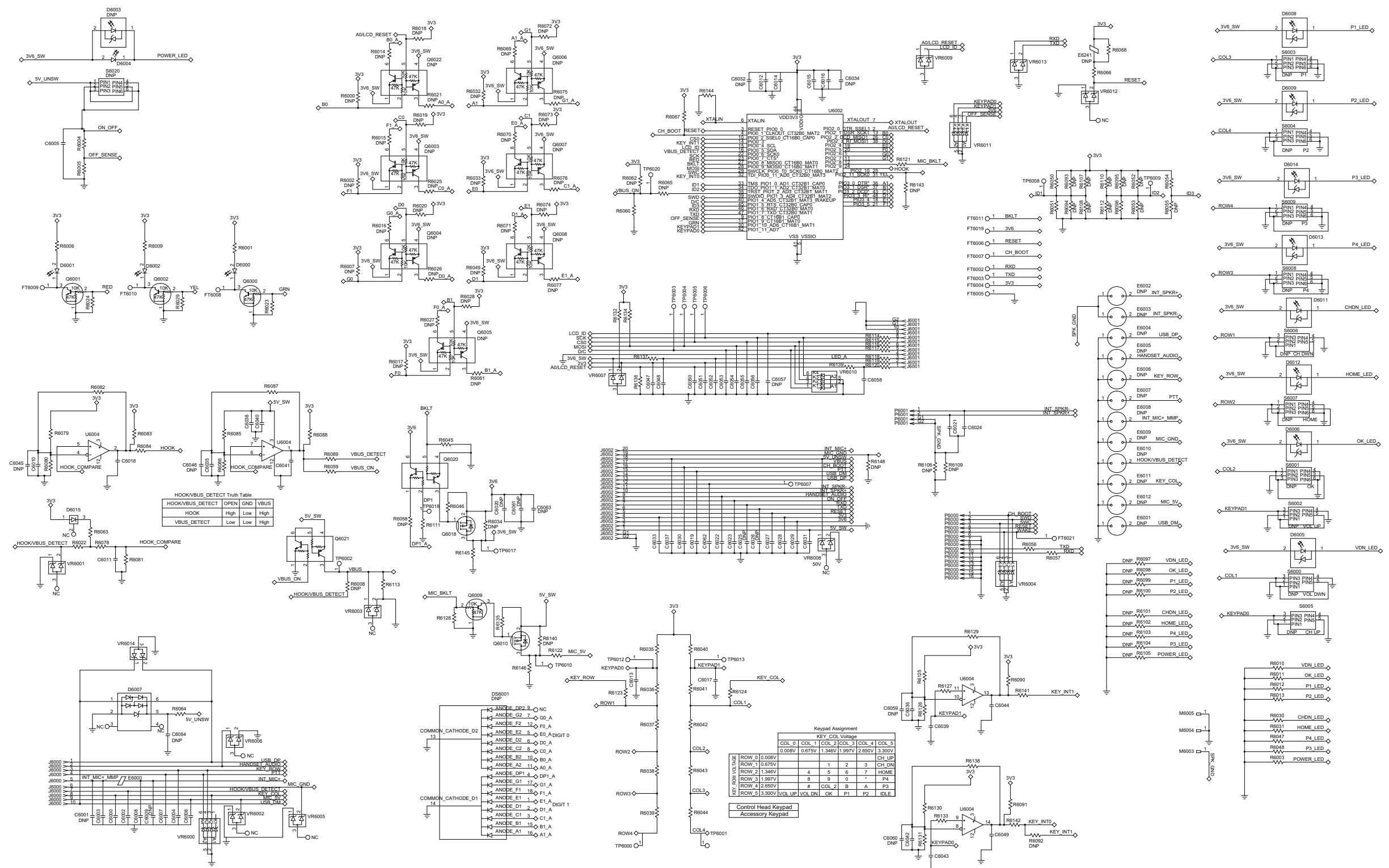
Circuit Ref.	Motorola Part No.
R6031	NOT PLACED
R6032	0613952R01
R6033	0613952R01
R6034	NOT PLACED
R6035	0613952R18
R6036	0613952R04
R6037	0613952R09
R6038	0613952R16
R6039	0613952R28
R6040	0613952R18
R6041	0613952R04
R6042	0613952R09
R6043	0613952R16
R6044	0613952R28
R6045	0613952Q89
R6046	0613952Q89
R6047	0613952Q71
R6048	NOT PLACED
R6049	0613952R01
R6050	NOT PLACED
R6051	NOT PLACED
R6052	0613952N15
R6053	0613952M01
R6054	0613952R66
R6055	NOT PLACED
R6056	0613952R66
R6057	0613952R66
R6058	0613952H63
R6059	0613952R66
R6060	0613952R01
R6061	0613952H57
R6062	NOT PLACED
R6063	0613952Q66
R6064	0613952R01
R6065	NOT PLACED
R6066	0613952Q73
R6067	0613952R17
R6068	0613952R66

Circuit Ref.	Motorola Part No.
R6069	0613952H57
R6070	0613952H57
R6071	0613952H57
R6072	0613952R01
R6073	0613952R01
R6074	0613952R01
R6075	0613952H57
R6076	0613952H57
R6077	0613952H57
R6078	0613952R04
R6079	0613952R33
R6080	0613952R33
R6081	0613952R16
R6082	0613952R49
R6083	0613952Q73
R6084	0613952Q53
R6085	0613952R33
R6086	0613952R35
R6087	0613952R49
R6088	0613952Q73
R6089	0613952Q53
R6090	0613952Q73
R6091	0613952Q73
R6092	NOT PLACED
R6093	NOT PLACED
R6094	0613952R66
R6095	NOT PLACED
R6096	NOT PLACED
R6097	NOT PLACED
R6098	NOT PLACED
R6099	NOT PLACED
R6100	NOT PLACED
R6101	NOT PLACED
R6102	NOT PLACED
R6103	NOT PLACED
R6104	NOT PLACED
R6105	NOT PLACED
R6106	NOT PLACED

Circuit Ref.	Motorola Part No.
R6107	NOT PLACED
R6108	NOT PLACED
R6109	NOT PLACED
R6110	NOT PLACED
R6111	0613952R01
R6112	NOT PLACED
R6113	0613952R17
R6114	NOT PLACED
R6115	NOT PLACED
R6116	NOT PLACED
R6117	NOT PLACED
R6118	NOT PLACED
R6119	NOT PLACED
R6120	NOT PLACED
R6121	0613952R66
R6122	0613952G67
R6123	0613952G67
R6124	0613952G67
R6125	0613952R18
R6126	0613952R43
R6127	0613952R01
R6128	0613952Q89
R6129	0613952R49
R6130	0613952R18
R6131	0613952R43
R6132	NOT PLACED
R6133	0613952R01
R6134	NOT PLACED
R6135	0613952Q89
R6136	NOT PLACED
R6137	NOT PLACED
R6138	0613952R49
R6139	NOT PLACED
R6140	NOT PLACED
R6141	0613952Q53
R6142	0613952Q53
R6143	NOT PLACED
R6144	0613952R66

Circuit Ref.	Motorola Part No.
R6145	0613952R28
R6146	0613952R28
R6148	NOT PLACED
S6000	NOT PLACED
S6001	NOT PLACED
S6002	NOT PLACED
S6003	NOT PLACED
S6004	NOT PLACED
S6005	NOT PLACED
S6006	NOT PLACED
S6007	NOT PLACED
S6008	NOT PLACED
S6009	NOT PLACED
S6020	NOT PLACED
U6002	51012145002
U6004	5188691V50
VR6000	4813979P10
VR6001	4813977A43
VR6002	4813977A43
VR6003	4813977A43
VR6004	4813979P10
VR6005	4813977A43
VR6006	4813977A43
VR6007	4813977A43
VR6008	4813977A43
VR6009	NOT PLACED
VR6010	NOT PLACED
VR6011	4813979P10
VR6012	4813977A43
VR6013	4813977A43
VR6014	48012153001

5.0 Alphanumeric Display Control Head Schematic



Alphanumeric Display Control Head Schematic Diagram

6.0 Alphanumeric Display Control Head Parts List

Circuit Ref.	Motorola Part No.
C6000	2113945A05
C6001	NOT PLACED
C6002	2113946B04
C6003	21667009166
C6004	2113945A05
C6005	2113945B02
C6006	2113945A05
C6007	2113945A05
C6008	2113945L29
C6009	NOT PLACED
C6010	2113945A05
C6011	2113945A05
C6012	2113946B04
C6013	2113945B02
C6014	2113945B02
C6015	2113946B04
C6016	2113945B02
C6017	2113945B02
C6018	2113945A05
C6019	2113945A05
C6020	NOT PLACED
C6021	2113945A05
C6022	2113945A05
C6023	2113945A05
C6024	2113945A05
C6025	NOT PLACED
C6026	NOT PLACED
C6027	2113945A05
C6028	2113945A05
C6029	2113945A05
C6030	2113945A05
C6031	2113945A05
C6032	NOT PLACED
C6033	2113956A51
C6034	NOT PLACED

Circuit Ref.	Motorola Part No.
C6035	2113945A05
C6036	2113945A05
C6037	2113945A05
C6038	2113945B02
C6039	2113945A05
C6040	2113946B04
C6041	2113945A05
C6042	2113945A05
C6043	2113945A05
C6044	2113945A05
C6045	NOT PLACED
C6046	NOT PLACED
C6047	2113946B04
C6048	2113946B04
C6049	2113945A05
C6050	21667009168
C6051	2113945B02
C6052	21667009168
C6053	21667009162
C6054	21667009162
C6055	21667009162
C6056	21667009162
C6057	NOT PLACED
C6058	2113946B04
C6059	NOT PLACED
C6060	NOT PLACED
C6061	NOT PLACED
C6062	2113945A05
C6063	NOT PLACED
C6064	NOT PLACED
D6000	4805729G75
D6001	4805729G74
D6002	4805729G73
D6003	NOT PLACED
D6004	48012255001
D6005	48012219001
D6006	48012219001
D6007	48012049001

Circuit Ref.	Motorola Part No.
D6008	48012219001
D6009	48012219001
D6011	48012219001
D6012	48012219001
D6013	48012219001
D6014	48012219001
D6015	4813978C09
DS6001	NOT PLACED
E6000	7688697V14
E6001	NOT PLACED
E6002	NOT PLACED
E6003	NOT PLACED
E6004	NOT PLACED
E6005	NOT PLACED
E6006	NOT PLACED
E6007	NOT PLACED
E6008	NOT PLACED
E6009	NOT PLACED
E6010	NOT PLACED
E6011	NOT PLACED
E6012	NOT PLACED
E6241	NOT PLACED
J6000	2864287B01
J6001	0916769H01
J6002	0915767H01
M6003	39012067001
M6004	39012067001
M6005	39012067001
P6000	NOT PLACED
P6001	2815162H01
Q6000	4815261H01
Q6001	4815261H01
Q6002	4815261H01
Q6003	NOT PLACED
Q6004	NOT PLACED
Q6005	NOT PLACED
Q6006	NOT PLACED
Q6007	NOT PLACED

Circuit Ref.	Motorola Part No.
Q6008	NOT PLACED
Q6009	4815261H01
Q6010	4885065Y01
Q6018	4885065Y01
Q6020	4809939C47
Q6021	4815272H01
Q6022	NOT PLACED
R6000	NOT PLACED
R6001	0613952Q43
R6002	NOT PLACED
R6003	0613952Q58
R6004	0613952Q85
R6005	0613952Q93
R6006	0613952Q59
R6007	NOT PLACED
R6008	NOT PLACED
R6009	0613952Q44
R6010	0613952Q71
R6011	0613952Q71
R6012	0613952Q71
R6013	0613952Q71
R6014	NOT PLACED
R6015	NOT PLACED
R6016	NOT PLACED
R6017	NOT PLACED
R6018	NOT PLACED
R6019	NOT PLACED
R6020	NOT PLACED
R6021	NOT PLACED
R6022	0613952R66
R6023	0613952R01
R6024	0613952R01
R6025	NOT PLACED
R6026	NOT PLACED
R6027	NOT PLACED
R6028	NOT PLACED
R6029	0613952R01
R6030	0613952Q71

Circuit Ref.	Motorola Part No.
R6031	0613952Q71
R6032	NOT PLACED
R6033	NOT PLACED
R6034	NOT PLACED
R6035	0613952R18
R6036	0613952R04
R6037	0613952R09
R6038	0613952R16
R6039	0613952R28
R6040	0613952R18
R6041	0613952R04
R6042	0613952R09
R6043	0613952R16
R6044	0613952R28
R6045	0613952Q89
R6046	0613952Q89
R6047	0613952Q71
R6048	0613952Q71
R6049	NOT PLACED
R6050	0613952N15
R6051	0613952M01
R6052	NOT PLACED
R6053	NOT PLACED
R6054	0613952R66
R6055	NOT PLACED
R6056	0613952R66
R6057	0613952R66
R6058	NOT PLACED
R6059	0613952R66
R6060	0613952R01
R6061	NOT PLACED
R6062	NOT PLACED
R6063	0613952Q66
R6064	0613952R01
R6065	NOT PLACED
R6066	0613952Q73
R6067	0613952R17
R6068	0613952R66

Circuit Ref.	Motorola Part No.
R6069	NOT PLACED
R6070	NOT PLACED
R6071	NOT PLACED
R6072	NOT PLACED
R6073	NOT PLACED
R6074	NOT PLACED
R6075	NOT PLACED
R6076	NOT PLACED
R6077	NOT PLACED
R6078	0613952R04
R6079	0613952R33
R6080	0613952R33
R6081	0613952R16
R6082	0613952R49
R6083	0613952Q73
R6084	0613952Q53
R6085	0613952R33
R6086	0613952R35
R6087	0613952R49
R6088	0613952Q73
R6089	0613952Q53
R6090	0613952Q73
R6091	0613952Q73
R6092	NOT PLACED
R6093	NOT PLACED
R6094	NOT PLACED
R6095	NOT PLACED
R6096	0613952R66
R6097	NOT PLACED
R6098	NOT PLACED
R6099	NOT PLACED
R6100	NOT PLACED
R6101	NOT PLACED
R6102	NOT PLACED
R6103	NOT PLACED
R6104	NOT PLACED
R6105	NOT PLACED
R6106	NOT PLACED

Circuit Ref.	Motorola Part No.
R6107	NOT PLACED
R6108	NOT PLACED
R6109	NOT PLACED
R6110	NOT PLACED
R6111	0613952R01
R6112	NOT PLACED
R6113	0613952R17
R6114	0613952R66
R6115	0613952R66
R6116	0613952R66
R6117	0613952R66
R6118	0613952R66
R6119	0613952R66
R6120	0613952R66
R6121	0613952R66
R6122	0613952G67
R6123	0613952G67
R6124	0613952G67
R6125	0613952R18
R6126	0613952R43
R6127	0613952R01
R6128	0613952Q89
R6129	0613952R49
R6130	0613952R18
R6131	0613952R43
R6132	0613952R17
R6133	0613952R01
R6134	0613952N01
R6135	0613952Q89
R6136	0613952R28
R6137	0613952H37
R6138	0613952R49
R6139	0613952Q37
R6140	NOT PLACED
R6141	0613952Q53
R6142	0613952Q53
R6143	NOT PLACED
R6144	0613952R66

Circuit Ref.	Motorola Part No.
R6145	0613952R28
R6146	0613952R28
R6148	NOT PLACED
S6000	NOT PLACED
S6001	NOT PLACED
S6002	NOT PLACED
S6003	NOT PLACED
S6004	NOT PLACED
S6005	NOT PLACED
S6006	NOT PLACED
S6007	NOT PLACED
S6008	NOT PLACED
S6009	NOT PLACED
S6020	NOT PLACED
U6002	51012145002
U6004	5188691V50
VR6000	4813979P10
VR6001	4813977A43
VR6002	4813977A43
VR6003	4813977A43
VR6004	4813979P10
VR6005	4813977A43
VR6006	4813977A43
VR6007	4813977A43
VR6008	4813977A43
VR6009	4813977A43
VR6010	4813979P10
VR6011	4813979P10
VR6012	4813977A43
VR6013	4813977A43
VR6014	48012153001

Notes



XiR™ M3188/XiR™ M3688 Mobile Radios

Chapter 4

Controller

Service Information

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Chapter 4 – Controller Service Information

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Section 2 Controller Schematics/Parts Lists

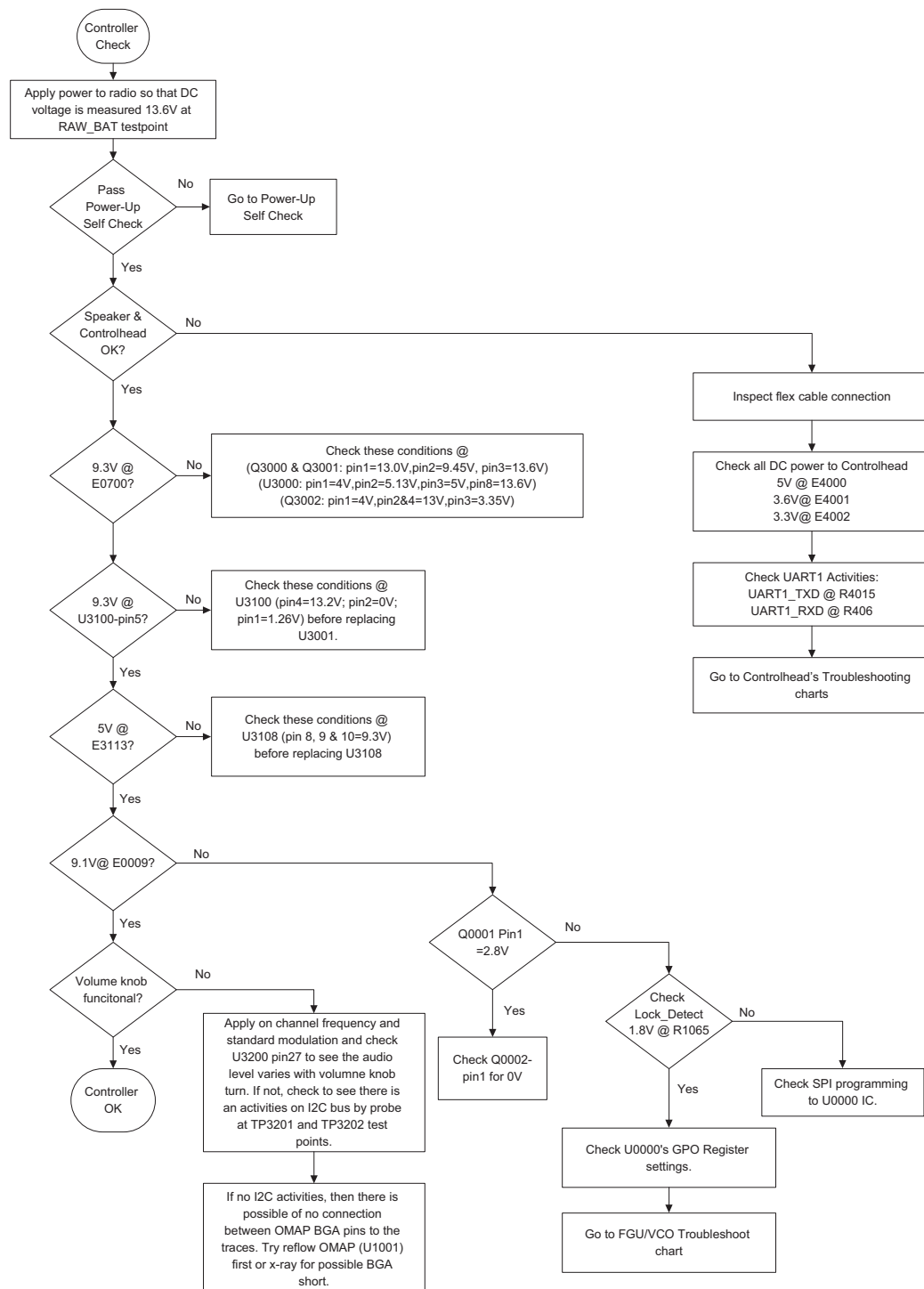
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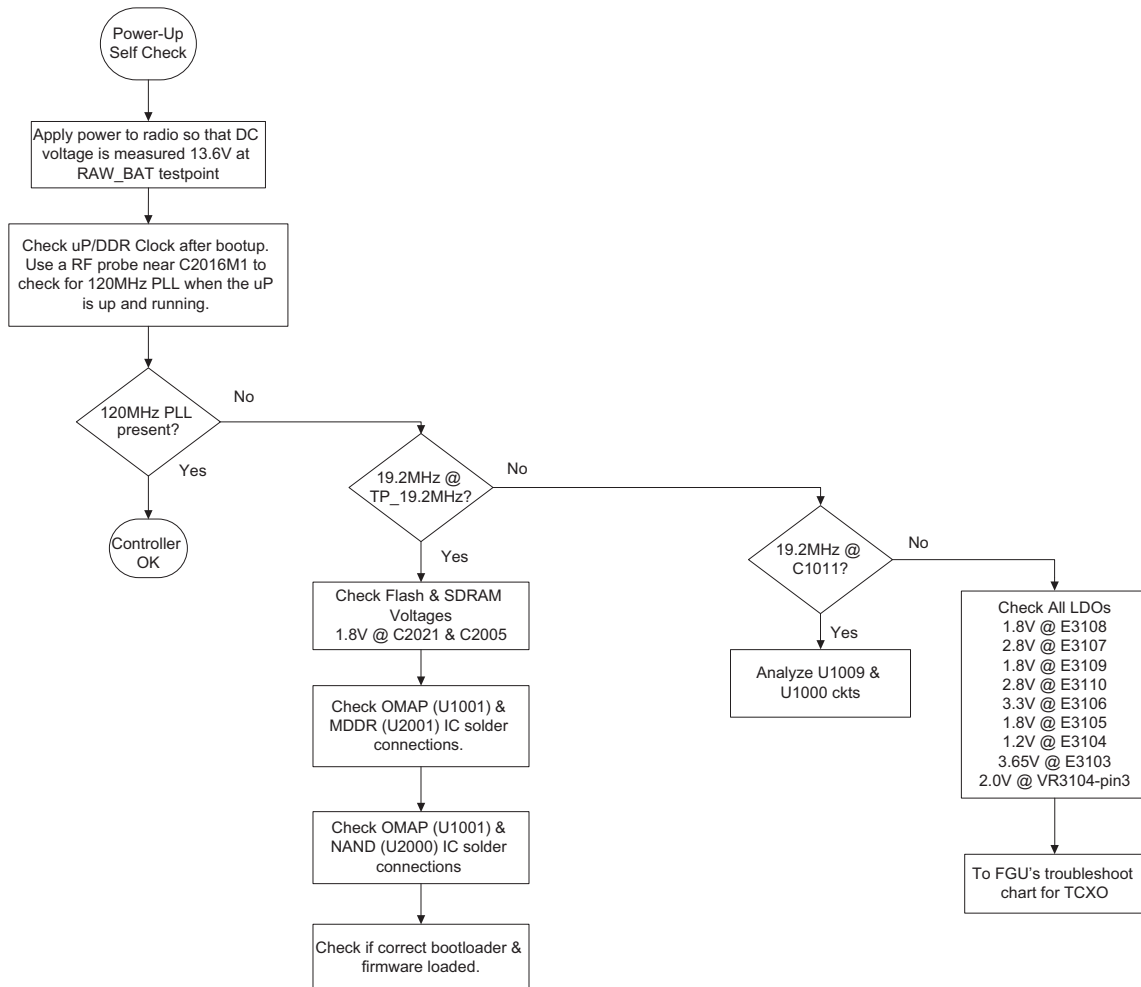
Section 1

TROUBLESHOOTING CHARTS

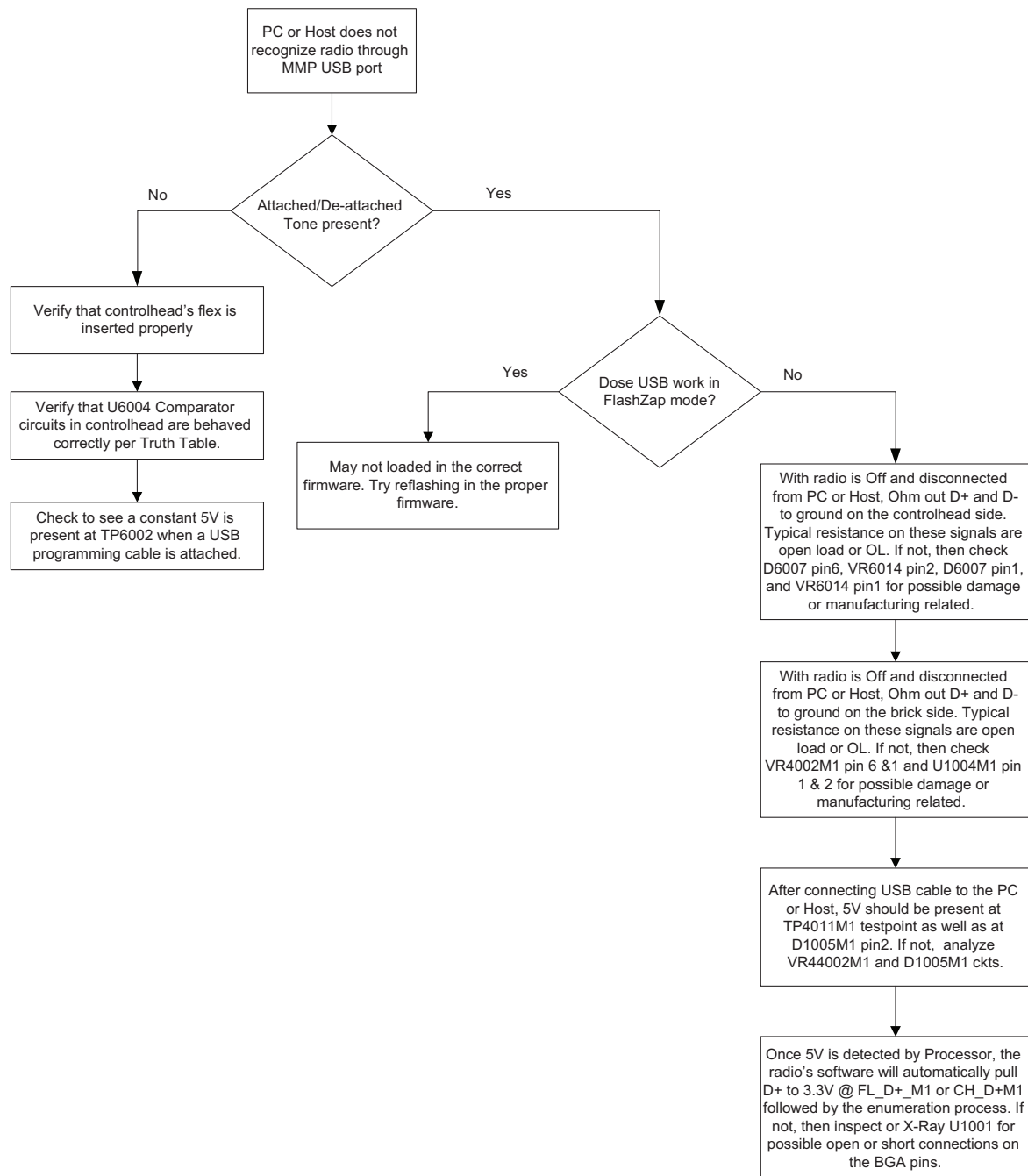
1.0 Controller Troubleshooting Chart



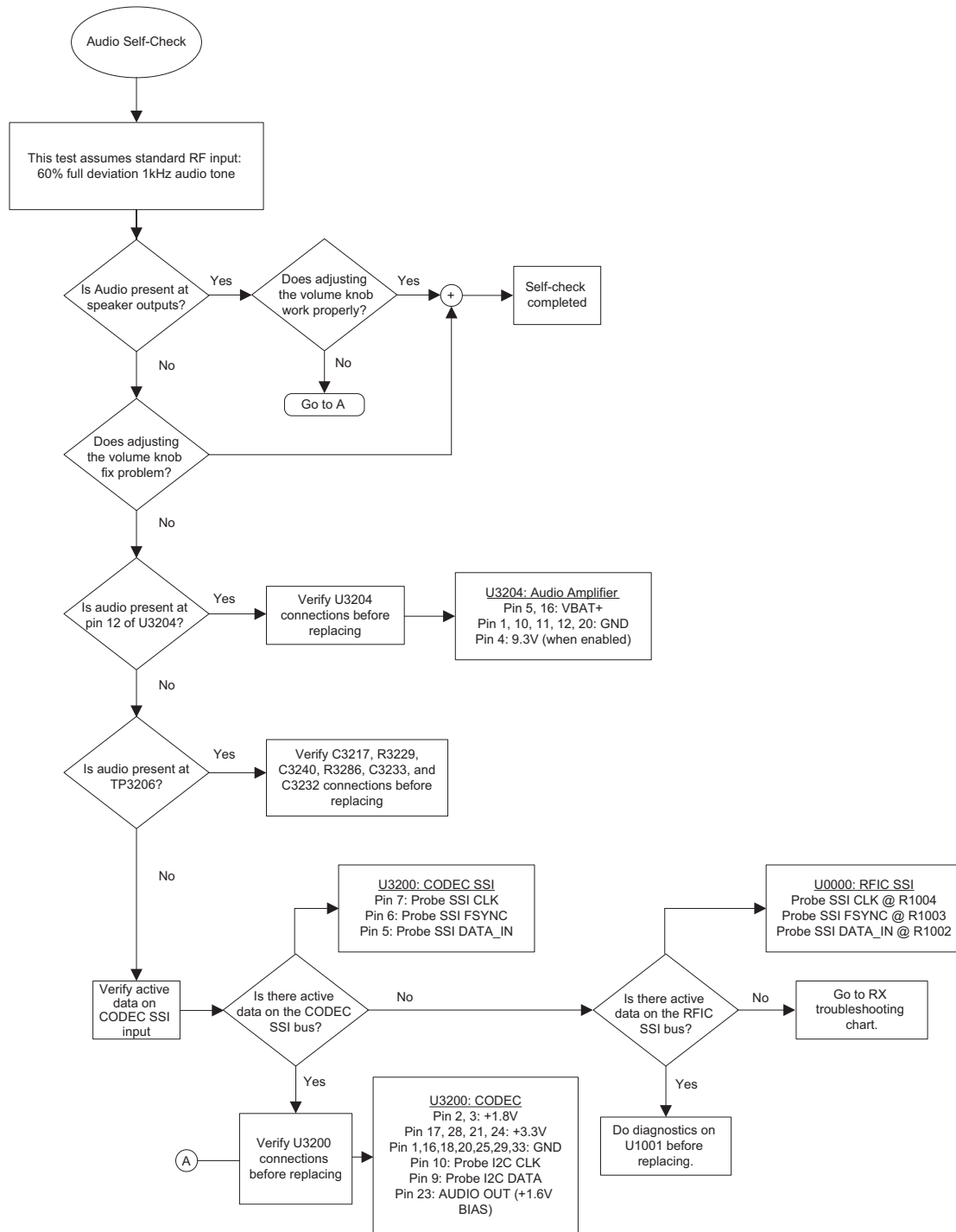
2.0 Power-Up Troubleshooting Chart



3.0 MMP USB (Radio is in Device Mode) Troubleshooting Chart



4.0 Audio Troubleshooting Chart



Section 2

CONTROLLER SCHEMATICS/PARTS LISTS

1.0 Allocation of Schematics and Parts Lists

1.1 Controller Circuits

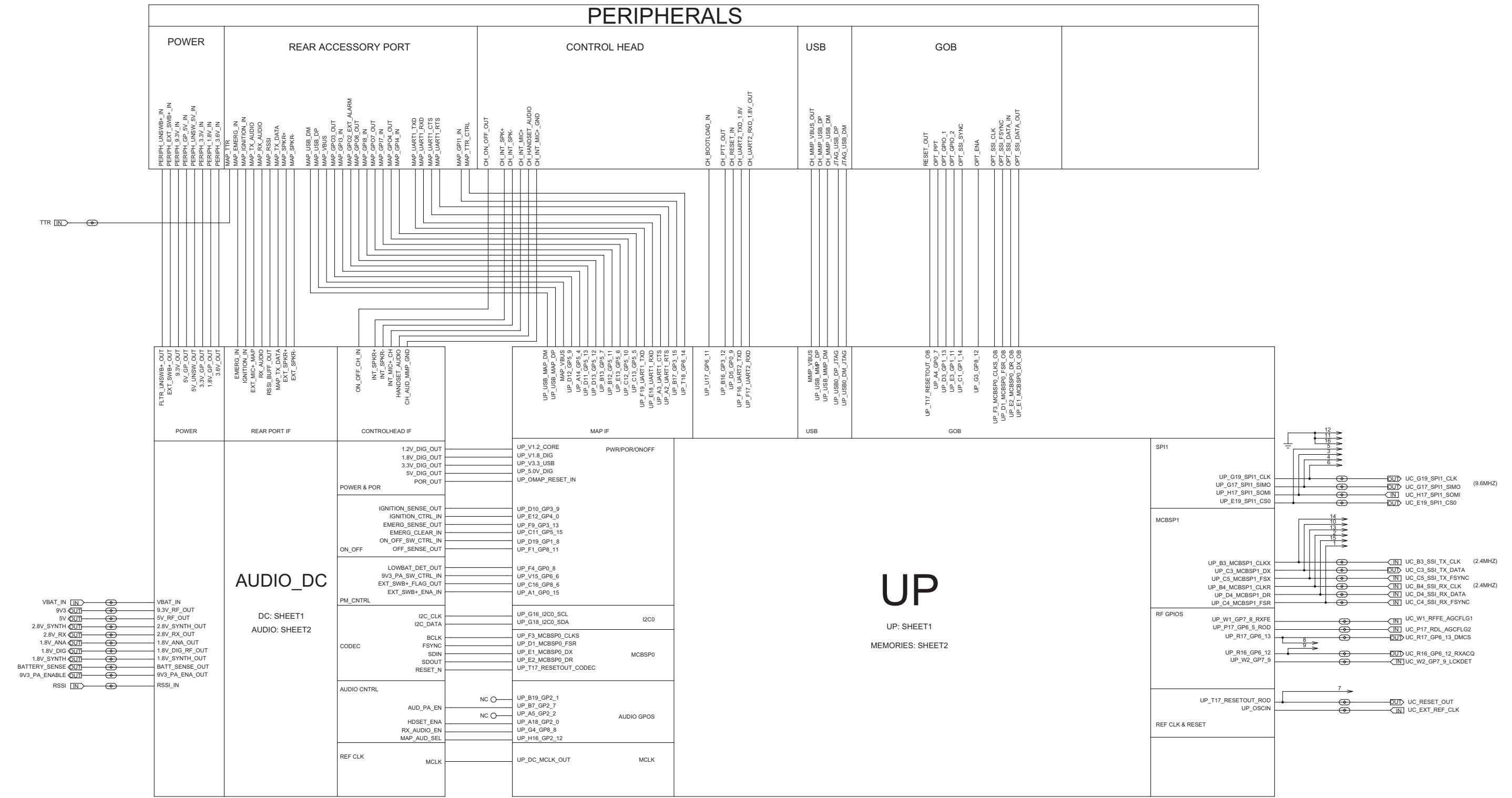
This Chapter shows the Schematics and the Parts List for the Controller circuits.

Table 2-1 Controller R1 Schematic Diagrams and Parts List

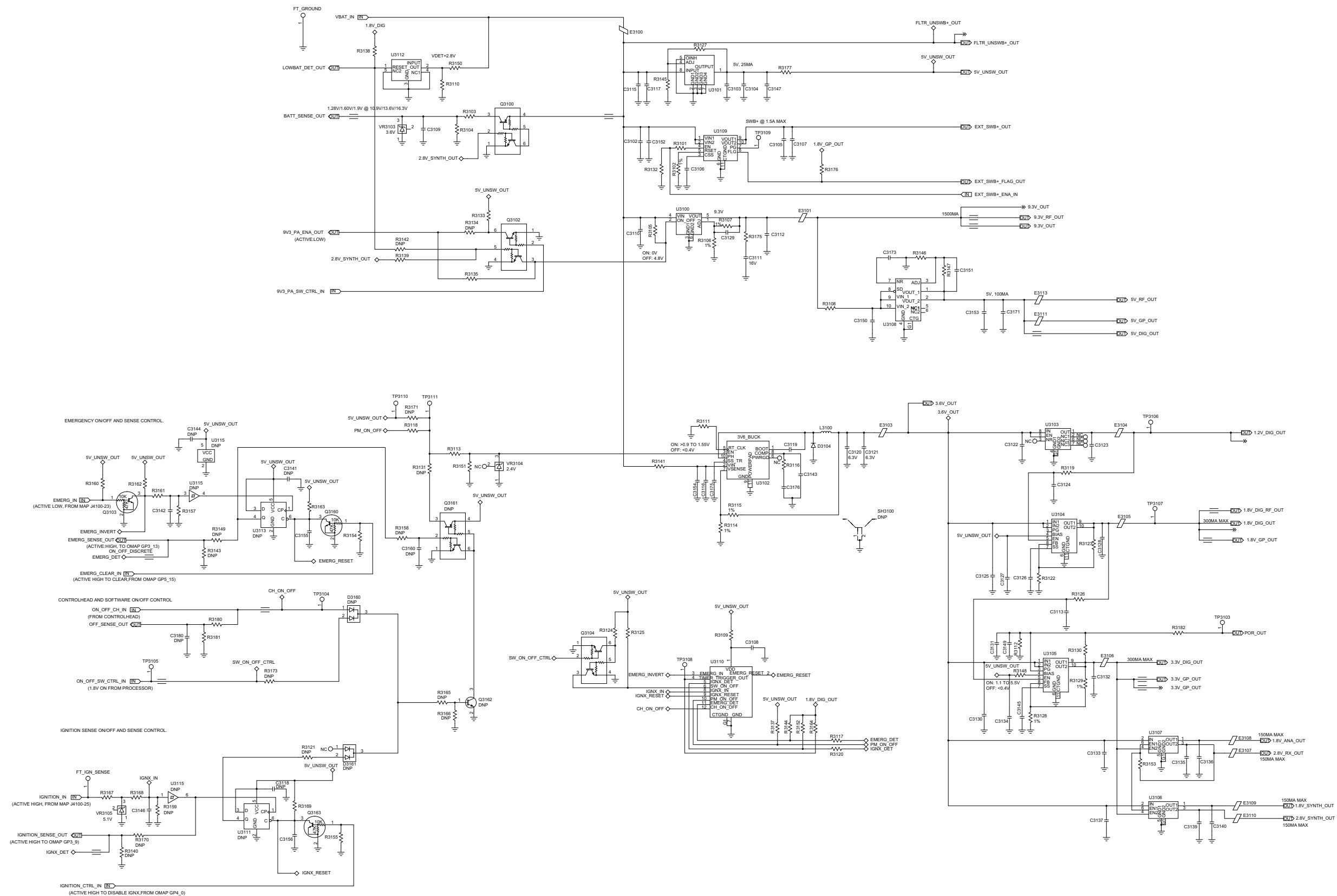
Controller R1 used on PCB: 84012504002_B VHF (136–174 MHz), 1–25 W 84012505002_B VHF (136–174 MHz), 25–45 W 84012591001_A UHF1 (403–470 MHz), 1–25 W 84012592001_A UHF1 (403–470 MHz), 25–40 W	
SCHEMATICS Controller Top Level Controller DC Supply Controller Audio Controller Peripheral (sheet 1 of 2) Controller Peripheral (sheet 2 of 2) Controller Microprocessor Controller Memories	Page 2-3 Page 2-4 Page 2-5 Page 2-6 Page 2-7 Page 2-8 Page 2-9
Parts Lists Controller R1	Page 2-10

Notes

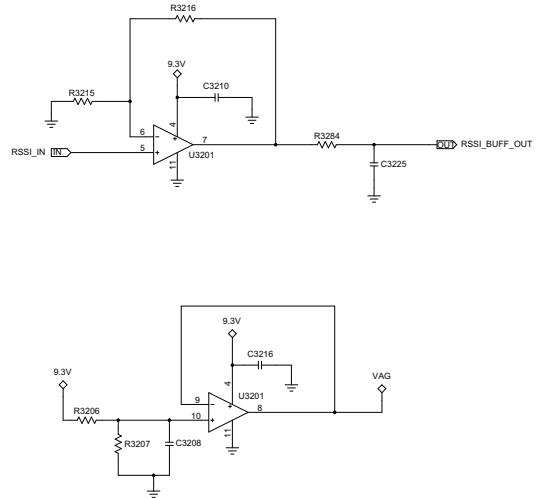
2.0 Controller R1 Schematic Diagrams



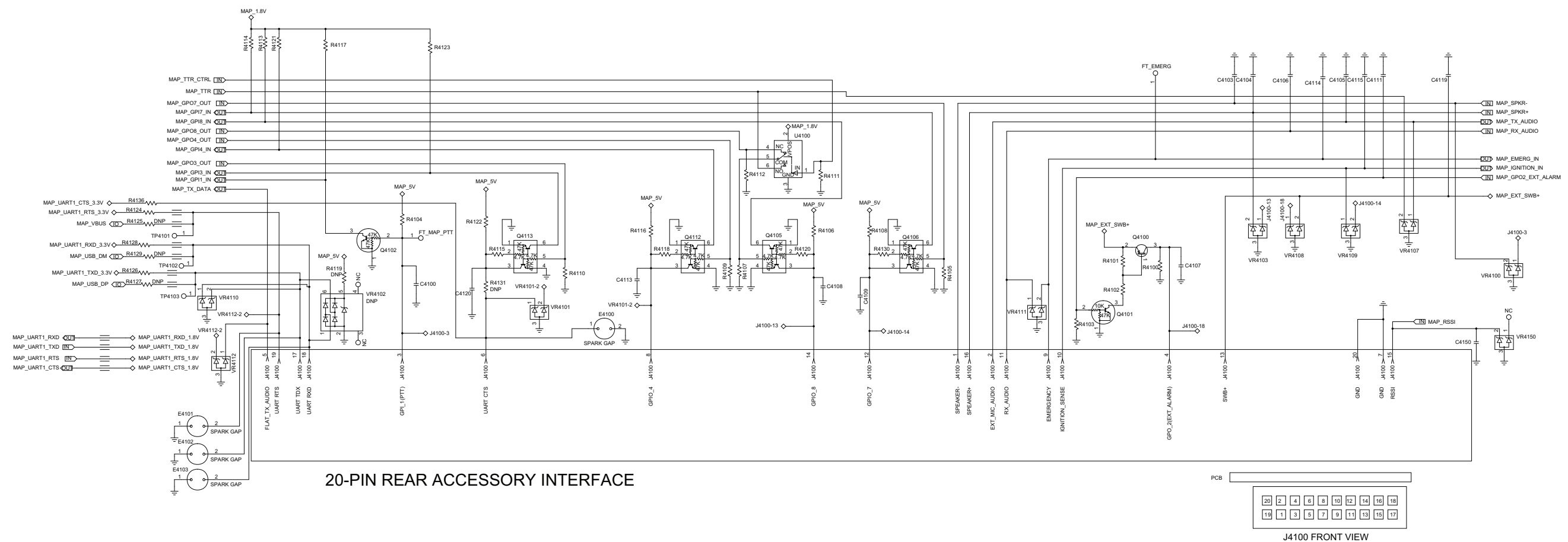
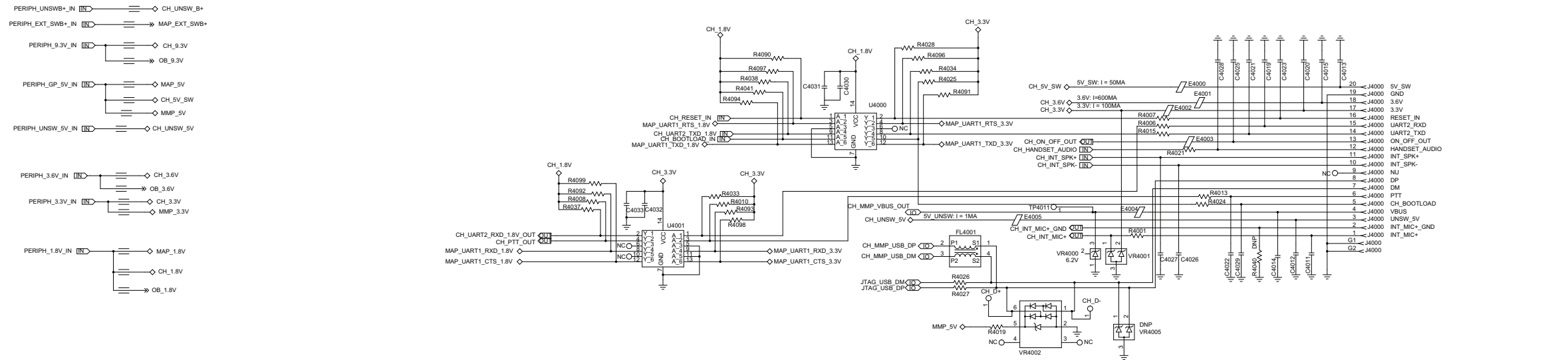
Controller – Top Level Schematic Diagram

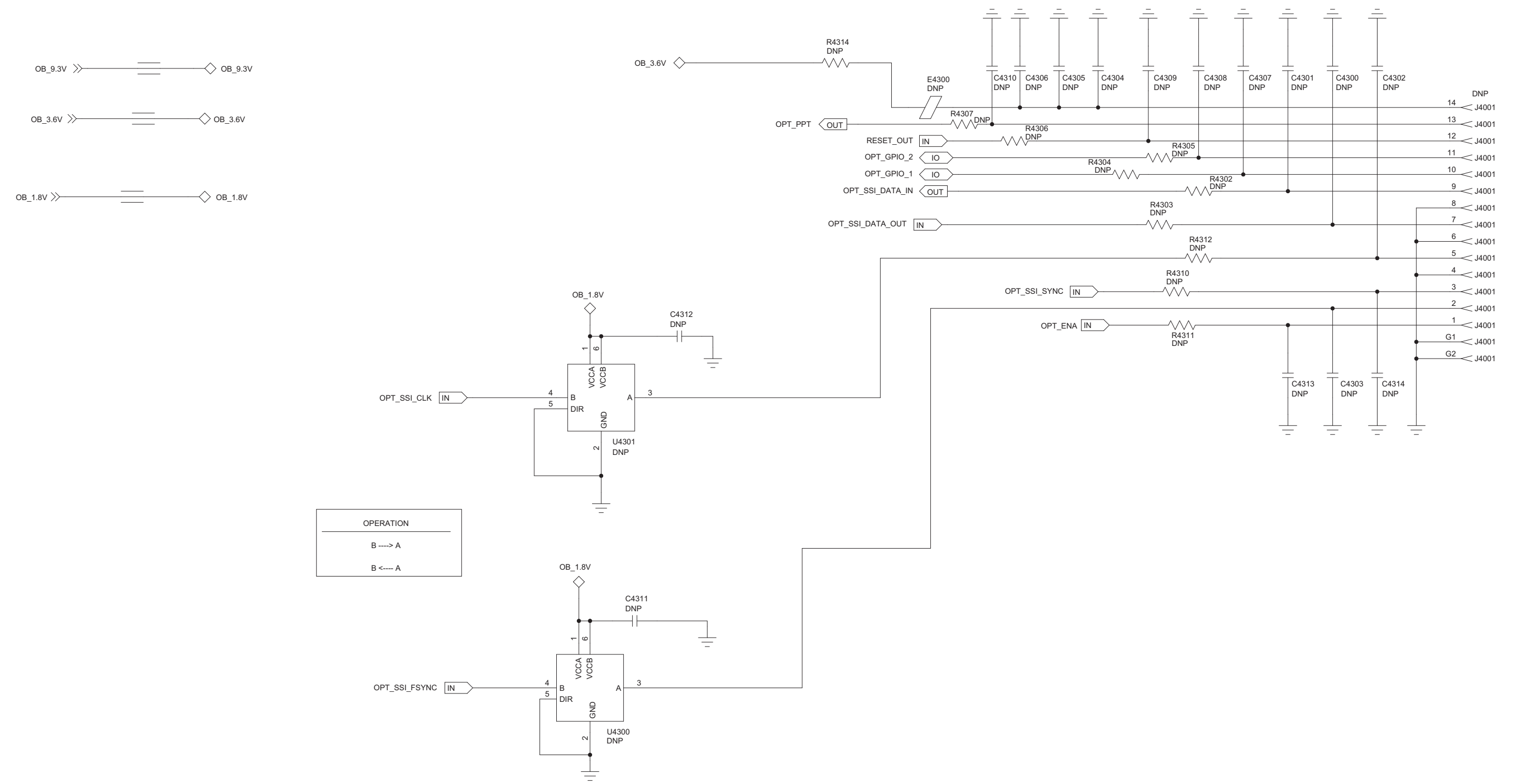


Controller DC Supply Schematic Diagram

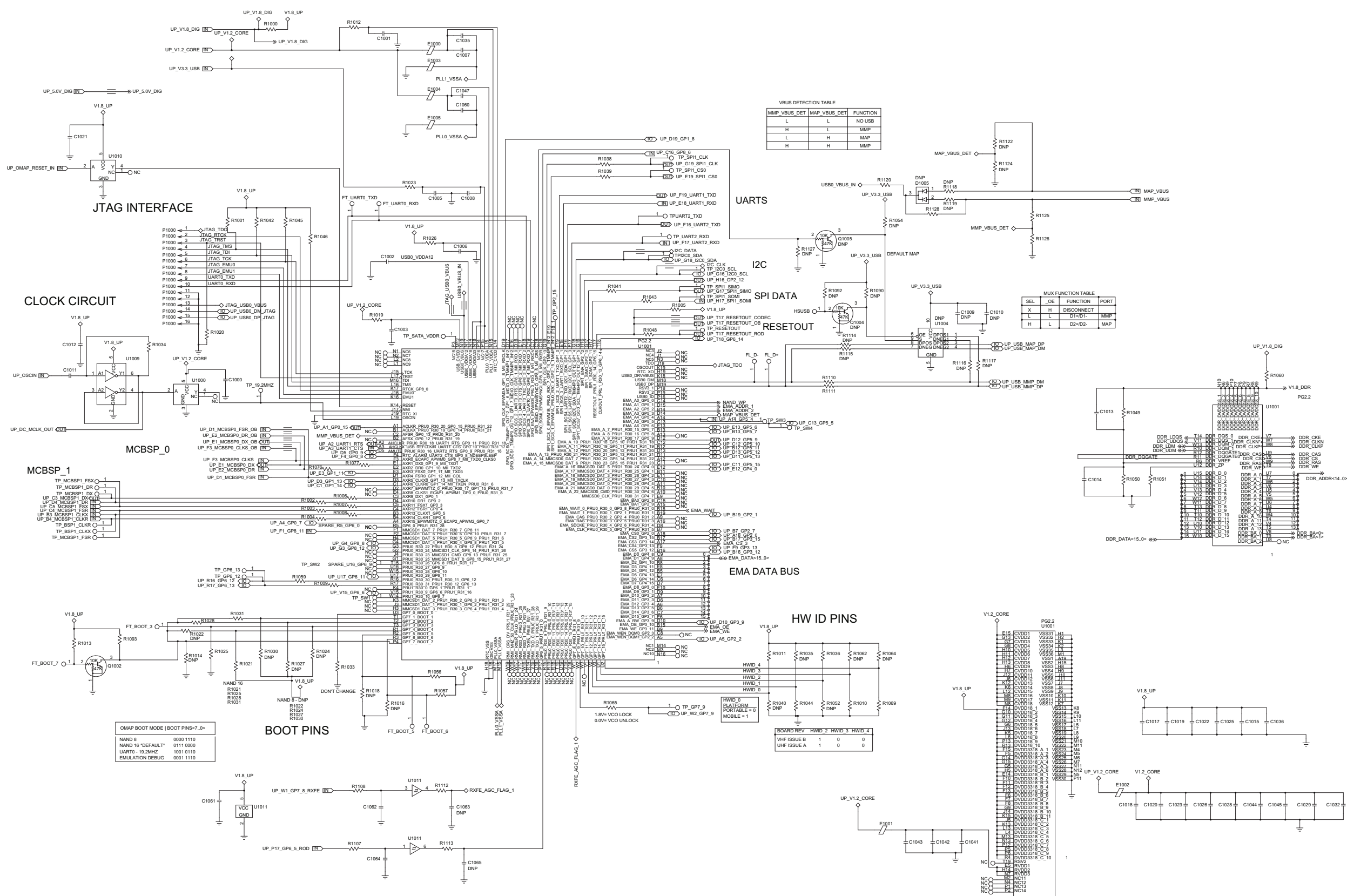


20 PIN CONTROL HEAD INTERFACE



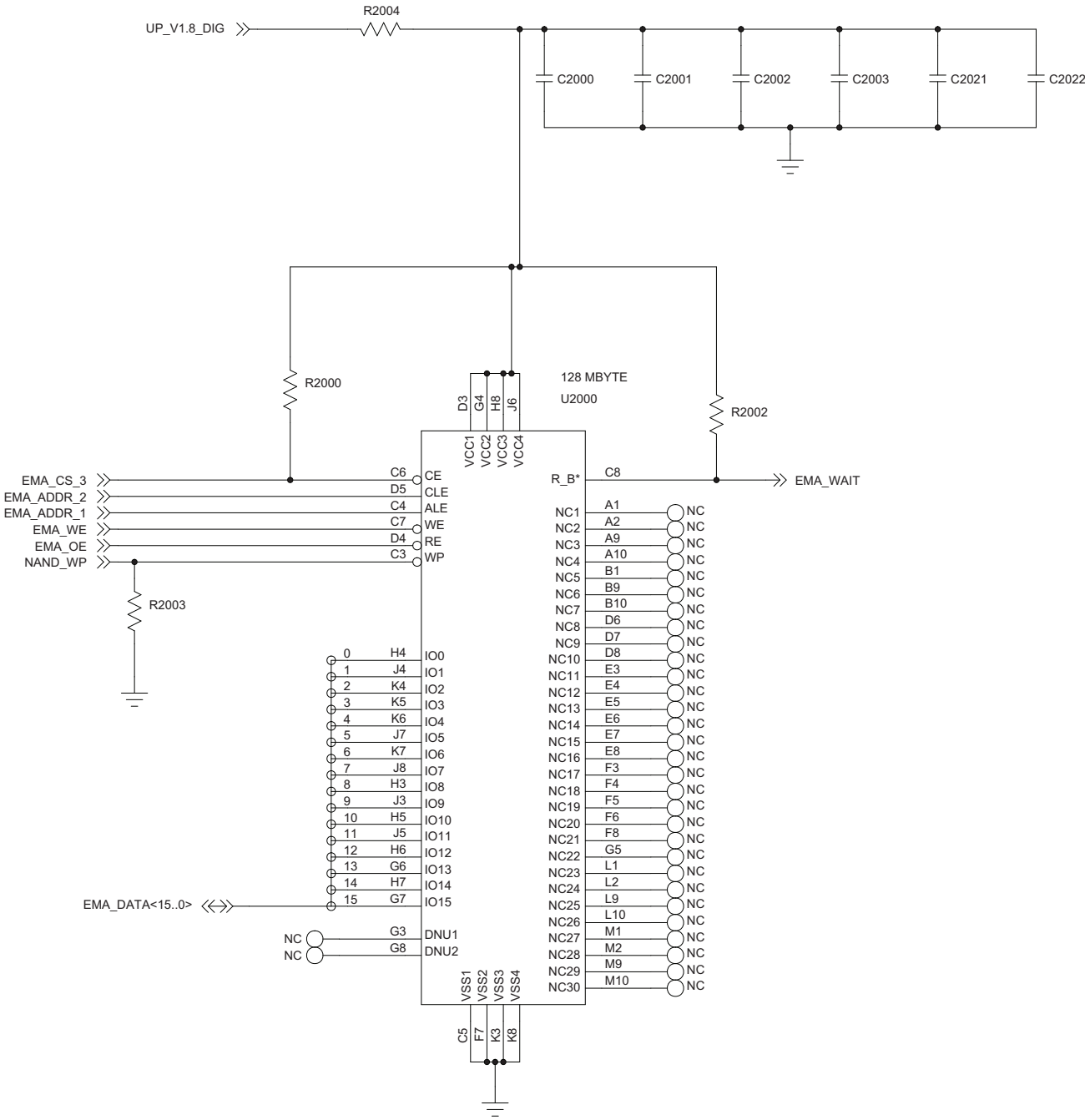


Controller Peripheral Schematic Diagram (sheet 2 of 2)

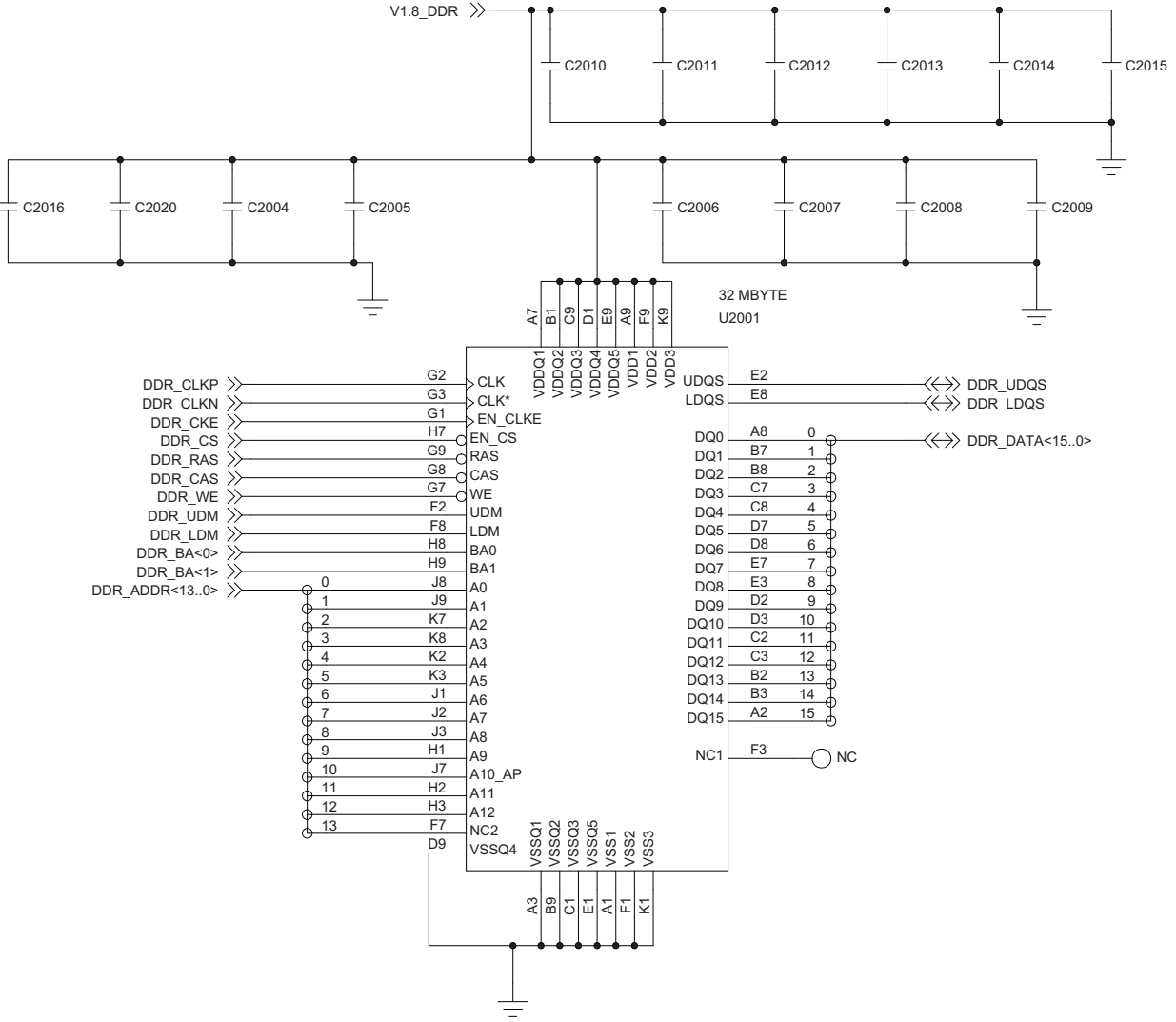


Controller Microprocessor Schematic Diagram

NAND



MDDR



Controller Memories Schematic Diagram

3.0 Controller R1 Parts List

Circuit Ref.	Motorola Part No.
C1000M1	2113945Y02
C1001M1	2113945Y02
C1002M1	2113946K03
C1003M1	2113945Y02
C1005M1	2113945Y02
C1006M1	2113945Y02
C1007M1	2113945Y02
C1008M1	2113946D05
C1009M1	NOT PLACED
C1010M1	NOT PLACED
C1011M1	2113945B02
C1012M1	2113945Y02
C1013M1	2113945Y02
C1014M1	2113945Y02
C1015M1	2113945B02
C1017M1	21667009162
C1018M1	21667009162
C1019M1	21667009162
C1020M1	21667009162
C1021M1	2113945Y02
C1022M1	2113945Y02
C1023M1	2113945Y02
C1025M1	2113945Y02
C1026M1	2113945Y02
C1028M1	2113945Y02
C1029M1	2113956B54
C1032M1	2113956B54
C1035M1	2113945B02

Circuit Ref.	Motorola Part No.
C1036M1	2113946D05
C1041M1	2113945B02
C1042M1	2113945Y02
C1043M1	2113956B54
C1044M1	2113945B02
C1045M1	2113945B02
C1047M1	2113945Y02
C1060M1	2113945B02
C1061M1	2113945Y02
C1062M1	2113945Y02
C1063M1	NOT PLACED
C1064M1	2113945Y02
C1065M1	NOT PLACED
C2000M1	2113945Y02
C2001M1	2113945Y02
C2002M1	2113945B02
C2003M1	21667009162
C2004M1	2113956B54
C2005M1	2113946D05
C2006M1	2113945Y02
C2007M1	2113945Y02
C2008M1	2113945B02
C2009M1	21667009162
C2010M1	2113945Y02
C2011M1	2113945Y02
C2012M1	2113945Y02
C2013M1	2113945Y02
C2014M1	2113945B02
C2015M1	21667009162
C2016M1	2113956B54

Circuit Ref.	Motorola Part No.
C2020M1	2113956B54
C2021M1	2113956D59
C2022M1	2113956D59
C3102M1	21009337414
C3103M1	21667009166
C3104M1	2113946F08
C3105M1	2113956C25
C3106M1	2113946B01
C3107M1	2113944C06
C3108M1	2113945Y02
C3109M1	21667009166
C3110M1	2113944C06
C3111M1	2113946J04
C3112M1	2113945Y02
C3113M1	2113946S35
C3115M1	2113944C06
C3116M1	2113955D13
C3117M1	2113955D13
C3118M1	NOT PLACED
C3119M1	2113945Y02
C3120M1	2113956E60
C3121M1	2113956D58
C3122M1	2113956A51
C3123M1	2113956A51
C3124M1	2113946D07
C3125M1	2113946D05
C3126M1	2113944C06
C3127M1	2113946S35
C3128M1	2113946D05
C3129M1	2113945Y02

Circuit Ref.	Motorola Part No.
C3130M1	2113946D05
C3131M1	2113946A02
C3132M1	2113946D05
C3133M1	2113946D05
C3134M1	2113946S35
C3135M1	2113956A51
C3136M1	21012095001
C3137M1	2113946D05
C3139M1	2113956A51
C3140M1	21012095001
C3141M1	NOT PLACED
C3142M1	21012129001
C3143M1	21667009366
C3144M1	NOT PLACED
C3145M1	2113944C06
C3146M1	21012129001
C3147M1	2113946F08
C3149M1	2113956A51
C3150M1	2113956A51
C3151M1	21667009384
C3152M1	2113944C06
C3153M1	2113956A51
C3154M1	2113955D13
C3155M1	2113945Y02
C3156M1	2113945Y02
C3160M1	NOT PLACED
C3171M1	2113945B02
C3173M1	2113945B02
C3175M1	2113946A01
C3176M1	2113944C48

Circuit Ref.	Motorola Part No.
C3180M1	NOT PLACED
C3200M1	NOT PLACED
C3201M1	NOT PLACED
C3202M1	NOT PLACED
C3203M1	2113955D37
C3204M1	2113955D37
C3205M1	21667009166
C3206M1	2113945L29
C3207M1	NOT PLACED
C3208M1	2113956C37
C3209M1	2113945Y02
C3210M1	2113945Y02
C3211M1	2113945A03
C3212M1	2113955D37
C3213M1	2113945A03
C3214M1	2113955D37
C3215M1	2113956F49
C3216M1	2113945Y02
C3217M1	2113956B91
C3218M1	2113956A51
C3219M1	2113956A51
C3220M1	2113946F05
C3221M1	2113945Y02
C3222M1	2113956A51
C3223M1	2113945Y02
C3224M1	2113946F05
C3225M1	2113945Y02
C3226M1	NOT PLACED
C3227M1	2113956A51
C3228M1	2113945Y02

Circuit Ref.	Motorola Part No.
C3229M1	2113956A51
C3230M1	2113945Y02
C3231M1	2113945Y02
C3232M1	2113945Y02
C3233M1	2113945L49
C3235M1	2113956E39
C3236M1	2113945C31
C3237M1	21009337414
C3238M1	21667009170
C3239M1	21667009170
C3240M1	2113945L49
C3241M1	2113956B91
C3248M1	NOT PLACED
C3249M1	2113956B91
C3250M1	2113956B91
C3251M1	21667009166
C3252M1	21667009166
C3253M1	21667009166
C3254M1	21667009166
C3255M1	2113955D37
C3256M1	2113956B91
C3257M1	2113956B91
C3258M1	2113945L49
C4011M1	21667009166
C4012M1	21667009166
C4013M1	21667009166
C4014M1	21667009166
C4015M1	21667009166
C4019M1	21667009166
C4020M1	21667009166

Circuit Ref.	Motorola Part No.
C4021M1	21667009166
C4022M1	21667009166
C4023M1	21667009166
C4025M1	21667009166
C4026M1	21667009166
C4027M1	21667009166
C4028M1	21667009166
C4029M1	21667009166
C4030M1	21667009166
C4031M1	2113945Y02
C4032M1	21667009166
C4033M1	2113945Y02
C4100M1	21667009166
C4103M1	21667009166
C4104M1	21667009166
C4105M1	21667009166
C4106M1	21667009166
C4107M1	21667009166
C4108M1	21667009166
C4109M1	21667009166
C4111M1	21667009166
C4113M1	21667009166
C4114M1	21667009166
C4115M1	21667009166
C4119M1	21667009166
C4120M1	21667009166
C4150M1	21667009166
C4300M1	NOT PLACED
C4301M1	NOT PLACED
C4302M1	NOT PLACED

Circuit Ref.	Motorola Part No.
C4303M1	NOT PLACED
C4304M1	NOT PLACED
C4305M1	NOT PLACED
C4306M1	NOT PLACED
C4307M1	NOT PLACED
C4308M1	NOT PLACED
C4309M1	NOT PLACED
C4310M1	NOT PLACED
C4311M1	NOT PLACED
C4312M1	NOT PLACED
C4313M1	NOT PLACED
C4314M1	NOT PLACED
D1005M1	NOT PLACED
D3104M1	4885489Y01
D3160M1	NOT PLACED
D3161M1	NOT PLACED
E1000M1	7686949J15
E1001M1	7686949J15
E1002M1	7686949J15
E1003M1	7686949J15
E1004M1	7686949J15
E1005M1	7686949J15
E3100M1	24012102001
E3101M1	2485410Y02
E3103M1	2485410Y02
E3104M1	7686949J22
E3105M1	7686949J22
E3106M1	7686949J22
E3107M1	7686949J22
E3108M1	7686949J22

Circuit Ref.	Motorola Part No.
E3109M1	7686949J22
E3110M1	7686949J22
E3111M1	7686949J22
E3113M1	7686949J22
E3201M1	7688697V14
E3202M1	24012107027
E3203M1	24012102001
E3204M1	24012102001
E4000M1	24012107027
E4001M1	7688697V05
E4002M1	24012107027
E4003M1	24012107027
E4004M1	24012107027
E4005M1	24012107027
E4100M1	NOT PLACED
E4101M1	NOT PLACED
E4102M1	NOT PLACED
E4103M1	NOT PLACED
E4300M1	NOT PLACED
FL4001M1	24012038001
J4000M1	0915767H01
J4001M1	NOT PLACED
J4100M1	0966512A01
L3100M1	24012091002
P1000M1	NOT PLACED
P1001M1	NOT PLACED
Q1002M1	4815261H01
Q1004M1	NOT PLACED
Q1005M1	NOT PLACED
Q3100M1	4815272H01

Circuit Ref.	Motorola Part No.
Q3102M1	4809939C47
Q3103M1	4816134H01
Q3104M1	4809939C47
Q3160M1	4816134H01
Q3161M1	NOT PLACED
Q3162M1	NOT PLACED
Q3163M1	4816134H01
Q3201M1	4815272H01
Q3205M1	4815270H01
Q3206M1	4815270H01
Q3209M1	4815263H01
Q4100M1	4816023H01
Q4101M1	4815261H01
Q4102M1	4815263H01
Q4105M1	48012271001
Q4106M1	48012271001
Q4112M1	48012271001
Q4113M1	48012271001
R1000M1	0613952R66
R1001M1	0613952M66
R1002M1	0613952R66
R1003M1	0613952R66
R1004M1	0613952R66
R1005M1	0613952M66
R1006M1	0613952R66
R1007M1	0613952R66
R1008M1	0613952R66
R1009M1	0613952R66
R1010M1	0613952M66
R1011M1	0613952M66

Circuit Ref.	Motorola Part No.
R1012M1	0613952R66
R1013M1	0613952M66
R1014M1	NOT PLACED
R1016M1	NOT PLACED
R1018M1	NOT PLACED
R1019M1	0613952R66
R1020M1	0613952M66
R1021M1	0613952Q73
R1022M1	NOT PLACED
R1023M1	0613952R66
R1024M1	NOT PLACED
R1025M1	0613952Q73
R1026M1	0613952R66
R1027M1	NOT PLACED
R1028M1	0613952R66
R1030M1	NOT PLACED
R1031M1	0613952R66
R1033M1	0613952Q73
R1034M1	0613952R17
R1035M1	NOT PLACED
R1036M1	0613952M66
R1038M1	0613952R66
R1039M1	0613952R66
R1040M1	NOT PLACED
R1041M1	0613952R66
R1042M1	0613952M66
R1043M1	0613952R66
R1044M1	0613952M66
R1045M1	0613952M66
R1046M1	0613952M66

Circuit Ref.	Motorola Part No.
R1048M1	0613952R66
R1049M1	0613952Q73
R1050M1	0613952Q73
R1051M1	0613952K68
R1052M1	NOT PLACED
R1054M1	NOT PLACED
R1056M1	0613952Q73
R1057M1	0613952Q73
R1059M1	0613952R66
R1060M1	0613952R66
R1062M1	NOT PLACED
R1064M1	NOT PLACED
R1065M1	0613952R66
R1069M1	0613952M66
R1076M1	0613952R66
R1077M1	0613952R66
R1090M1	NOT PLACED
R1092M1	NOT PLACED
R1093M1	0613952Q73
R1107M1	0613952R66
R1108M1	0613952R66
R1110M1	0613952Q25
R1111M1	0613952Q25
R1112M1	0613952R66
R1113M1	0613952R66
R1114M1	NOT PLACED
R1115M1	NOT PLACED
R1116M1	NOT PLACED
R1117M1	NOT PLACED
R1118M1	NOT PLACED

Circuit Ref.	Motorola Part No.
R1119M1	NOT PLACED
R1120M1	0613952Q73
R1122M1	NOT PLACED
R1124M1	NOT PLACED
R1125M1	0613952R01
R1126M1	0613952Q88
R1127M1	NOT PLACED
R1128M1	0613952R66
R2000M1	0613952M66
R2002M1	0613952M66
R2003M1	0613952M30
R2004M1	0613952R66
R3101M1	0613952R66
R3102M1	0613952M58
R3103M1	0613952N62
R3104M1	0613952M30
R3105M1	0613952R01
R3106M1	0613952M09
R3107M1	0613952M85
R3108M1	0613952R66
R3109M1	0613952R66
R3110M1	0613952N55
R3111M1	0613952R32
R3112M1	0613952P12
R3113M1	0613952R17
R3114M1	0613952N01
R3115M1	0613952Z63
R3116M1	0613952E83
R3117M1	0613952R66
R3118M1	0613952R66

Circuit Ref.	Motorola Part No.
R3119M1	0613952Q73
R3120M1	0613952R66
R3121M1	NOT PLACED
R3122M1	0613952M43
R3123M1	0613952M54
R3124M1	0613952R10
R3125M1	0613952Q73
R3126M1	0613952R66
R3127M1	0613952M30
R3128M1	0613952M10
R3129M1	0613952M58
R3130M1	0613952R25
R3131M1	NOT PLACED
R3132M1	0613952M66
R3133M1	0613952R29
R3134M1	NOT PLACED
R3135M1	0613952R66
R3137M1	0613952R01
R3138M1	0613952R17
R3139M1	0613952R66
R3140M1	NOT PLACED
R3141M1	0613959Y13
R3142M1	NOT PLACED
R3143M1	NOT PLACED
R3144M1	0613952R01
R3145M1	0613952H92
R3146M1	0613952Z55
R3147M1	0613952Z63
R3148M1	0613952R66
R3149M1	NOT PLACED

Circuit Ref.	Motorola Part No.
R3150M1	0613952N62
R3151M1	0613952R25
R3152M1	0613952R01
R3153M1	0613952R66
R3154M1	0613952Q89
R3155M1	0613952Q89
R3157M1	0613952R01
R3158M1	NOT PLACED
R3159M1	NOT PLACED
R3160M1	0613952Q89
R3161M1	0613952Q73
R3162M1	0613952Q85
R3163M1	0613952R01
R3164M1	0613952R01
R3165M1	NOT PLACED
R3166M1	NOT PLACED
R3167M1	0613952R01
R3168M1	0613952Q73
R3169M1	0613952R01
R3170M1	NOT PLACED
R3171M1	NOT PLACED
R3173M1	NOT PLACED
R3175M1	0689774Y02
R3176M1	0613952R01
R3177M1	0613952R66
R3180M1	0613952R01
R3181M1	0613952Q91
R3182M1	0613952R66
R3200M1	0613952C44
R3201M1	0613952Q49

Circuit Ref.	Motorola Part No.
R3202M1	0613952C44
R3203M1	0613952Q49
R3204M1	0613952C44
R3205M1	0613952C44
R3206M1	0613952R01
R3207M1	0613952R01
R3208M1	0613952R01
R3209M1	0613952N58
R3210M1	0613952Q49
R3211M1	0613952N30
R3212M1	0613952R03
R3213M1	0613952Q42
R3214M1	0613952J25
R3215M1	0613952R01
R3216M1	0613952R01
R3217M1	0613952Q73
R3218M1	0613952R01
R3219M1	0613952Q73
R3220M1	0613952R01
R3221M1	NOT PLACED
R3222M1	NOT PLACED
R3223M1	0613952R66
R3224M1	NOT PLACED
R3225M1	NOT PLACED
R3226M1	0613952R01
R3229M1	0613952Q67
R3230M1	0613952R10
R3231M1	0613952R10
R3248M1	0613952R66
R3249M1	0613952R66

Circuit Ref.	Motorola Part No.
R3250M1	0613952R66
R3251M1	0613952R66
R3252M1	0613952R66
R3253M1	0613952R66
R3254M1	0613952R66
R3255M1	0613952R66
R3256M1	0613952M66
R3257M1	NOT PLACED
R3261M1	0613952R01
R3262M1	0613952R10
R3263M1	NOT PLACED
R3264M1	0613952R01
R3265M1	0613952M66
R3266M1	0613952R01
R3267M1	NOT PLACED
R3268M1	0613952R01
R3269M1	0613952M66
R3274M1	0613952R10
R3279M1	NOT PLACED
R3280M1	NOT PLACED
R3282M1	0613952R66
R3283M1	0613952R01
R3284M1	0613952R03
R3285M1	0613952R01
R3286M1	0613952Q73
R3287M1	0613952Q63
R3288M1	0613952R01
R3289M1	0613952R01
R3290M1	0613952R66
R3296M1	0613952Q77

Circuit Ref.	Motorola Part No.
R3297M1	0613952Q77
R4001M1	0613952R66
R4006M1	0613952Q37
R4007M1	0613952Q37
R4008M1	0613952Q73
R4010M1	0613952R01
R4013M1	0613952Q42
R4015M1	0613952Q37
R4019M1	0613952R01
R4021M1	0613952R66
R4024M1	0613952R66
R4025M1	0613952Q58
R4026M1	0613952R66
R4027M1	0613952R66
R4028M1	0613952Q58
R4033M1	0613952R01
R4034M1	0613952Q58
R4037M1	0613952Q73
R4038M1	0613952R01
R4040M1	NOT PLACED
R4041M1	0613952R01
R4090M1	0613952R01
R4091M1	0613952Q58
R4092M1	0613952Q73
R4093M1	0613952R01
R4094M1	0613952R01
R4096M1	0613952Q73
R4097M1	0613952R01
R4098M1	0613952R01
R4099M1	0613952Q73

Circuit Ref.	Motorola Part No.
R4100M1	0613952R01
R4101M1	0613952Q77
R4102M1	0613958H83
R4103M1	0613952Q85
R4104M1	0613952Q89
R4105M1	0613952Q85
R4106M1	0613952Q89
R4107M1	0613952Q85
R4108M1	0613952Q89
R4109M1	0613952Q85
R4110M1	0613952Q85
R4111M1	0613952Q85
R4112M1	0613952Q85
R4113M1	0613952R01
R4114M1	0613952R01
R4115M1	0613952N58
R4116M1	0613952Q89
R4117M1	0613952R01
R4118M1	0613952N58
R4119M1	NOT PLACED
R4120M1	0613952N58
R4121M1	0613952R01
R4122M1	0613952Q89
R4123M1	0613952R01
R4124M1	0613952Q37
R4125M1	NOT PLACED
R4126M1	0613952Q37
R4127M1	NOT PLACED
R4128M1	0613952Q37
R4129M1	NOT PLACED

Circuit Ref.	Motorola Part No.
R4130M1	0613952N58
R4131M1	NOT PLACED
R4136M1	0613952Q37
R4302M1	NOT PLACED
R4303M1	NOT PLACED
R4304M1	NOT PLACED
R4305M1	NOT PLACED
R4306M1	NOT PLACED
R4307M1	NOT PLACED
R4310M1	NOT PLACED
R4311M1	NOT PLACED
R4312M1	NOT PLACED
R4314M1	NOT PLACED
SH3100M1	NOT PLACED
U1000M1	5171320H01
U1001M1	51012487001
U1004M1	NOT PLACED
U1009M1	5115001H02
U1010M1	5171320H01
U1011M1	51012283001
U2000M1	51012239002
U2001M1	51012031001
U3100M1	0104039J08
U3101M1	5114014A01
U3102M1	51012069001
U3103M1	51012142001
U3104M1	5114610F01
U3105M1	5114610F01
U3106M1	51012140001
U3107M1	51012140001

Circuit Ref.	Motorola Part No.
U3108M1	5189092V21
U3109M1	51012486002
U3110M1	51007636001
U3111M1	NOT PLACED
U3112M1	5114004A35
U3113M1	NOT PLACED
U3115M1	NOT PLACED
U3200M1	51012469001
U3201M1	5114016A18
U3202M1	5189139P01
U3204M1	51012450001
U4000M1	5115502H01
U4001M1	5115502H01
U4100M1	5189139P01
U4300M1	NOT PLACED
U4301M1	NOT PLACED
VR3103M1	48012095001
VR3104M1	48012095002
VR3105M1	4813977M10
VR3200M1	48012049001
VR3201M1	4813977A48
VR4000M1	4813977M13
VR4001M1	4813977A48
VR4002M1	48012049001
VR4005M1	NOT PLACED
VR4100M1	4813977A48
VR4101M1	4813977A48
VR4102M1	NOT PLACED
VR4103M1	4813977A48
VR4107M1	4813977A48

Circuit Ref.	Motorola Part No.
VR4108M1	4813977A50
VR4109M1	4813977A50
VR4110M1	4813977A43
VR4111M1	4813977A48
VR4112M1	4813977M47
VR4150M1	4813977A48

Note: The suffix “M1”, “M2”, etc. from the Circuit Ref is removed from the schematics and overlays.

Notes



XiR™ M3188/XiR™ M3688 Mobile Radios

Chapter 5

VHF (136–174 MHz)

1–25W

Service Information

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Chapter 5 – VHF Low Power Service Information

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Section 2 VHF PCB/Schematics/Parts List

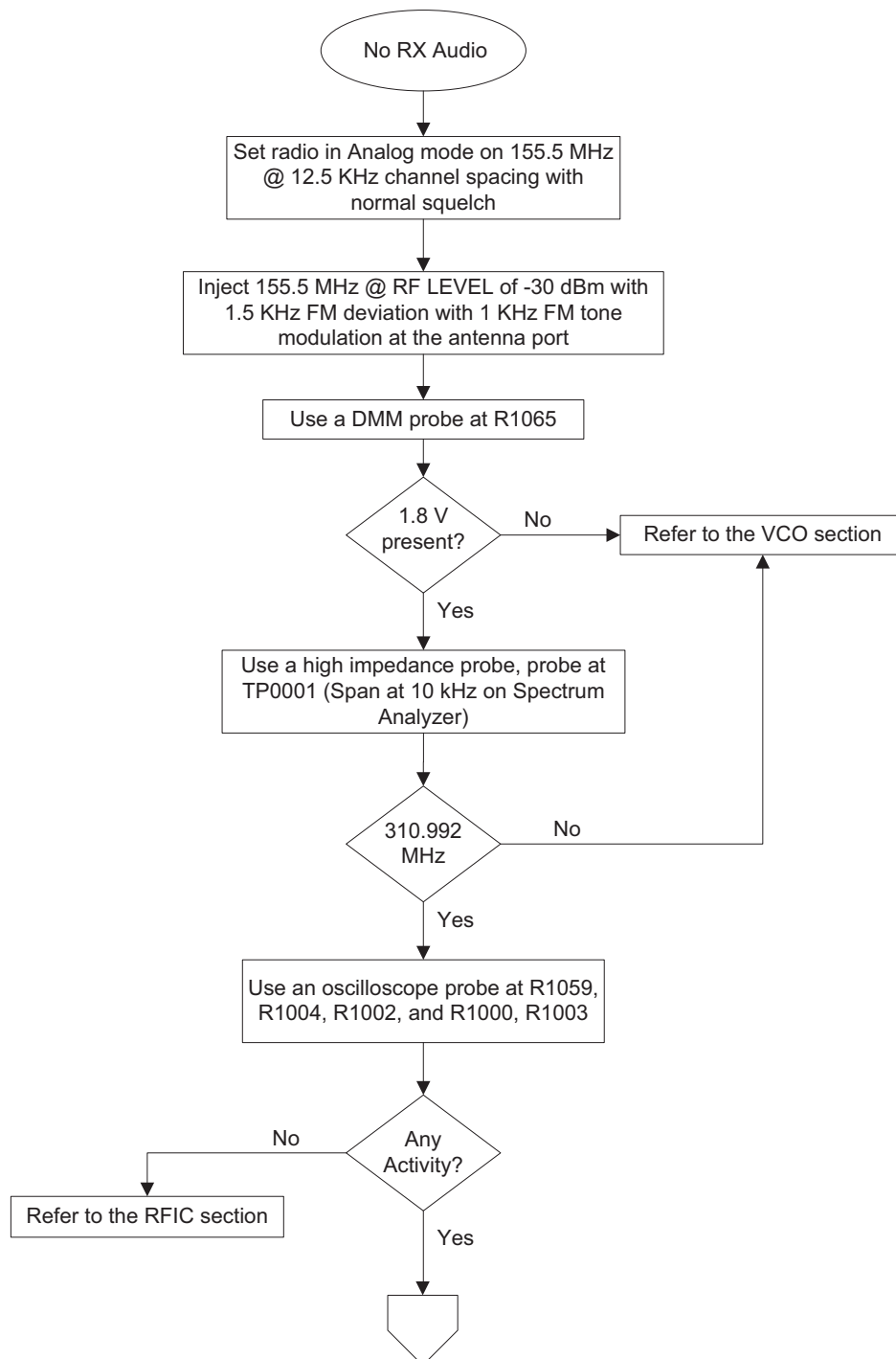
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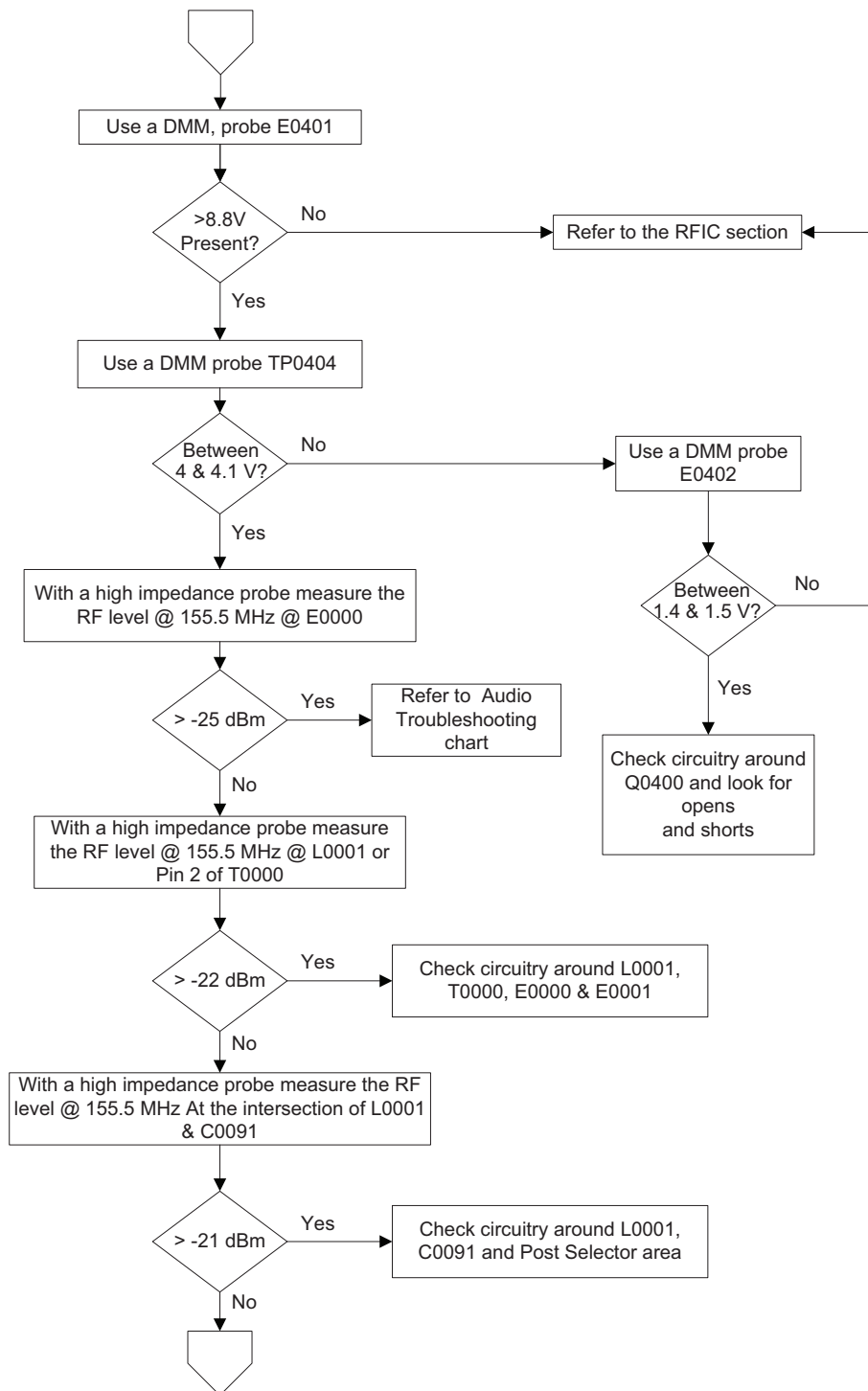
Section 1

TROUBLESHOOTING CHARTS

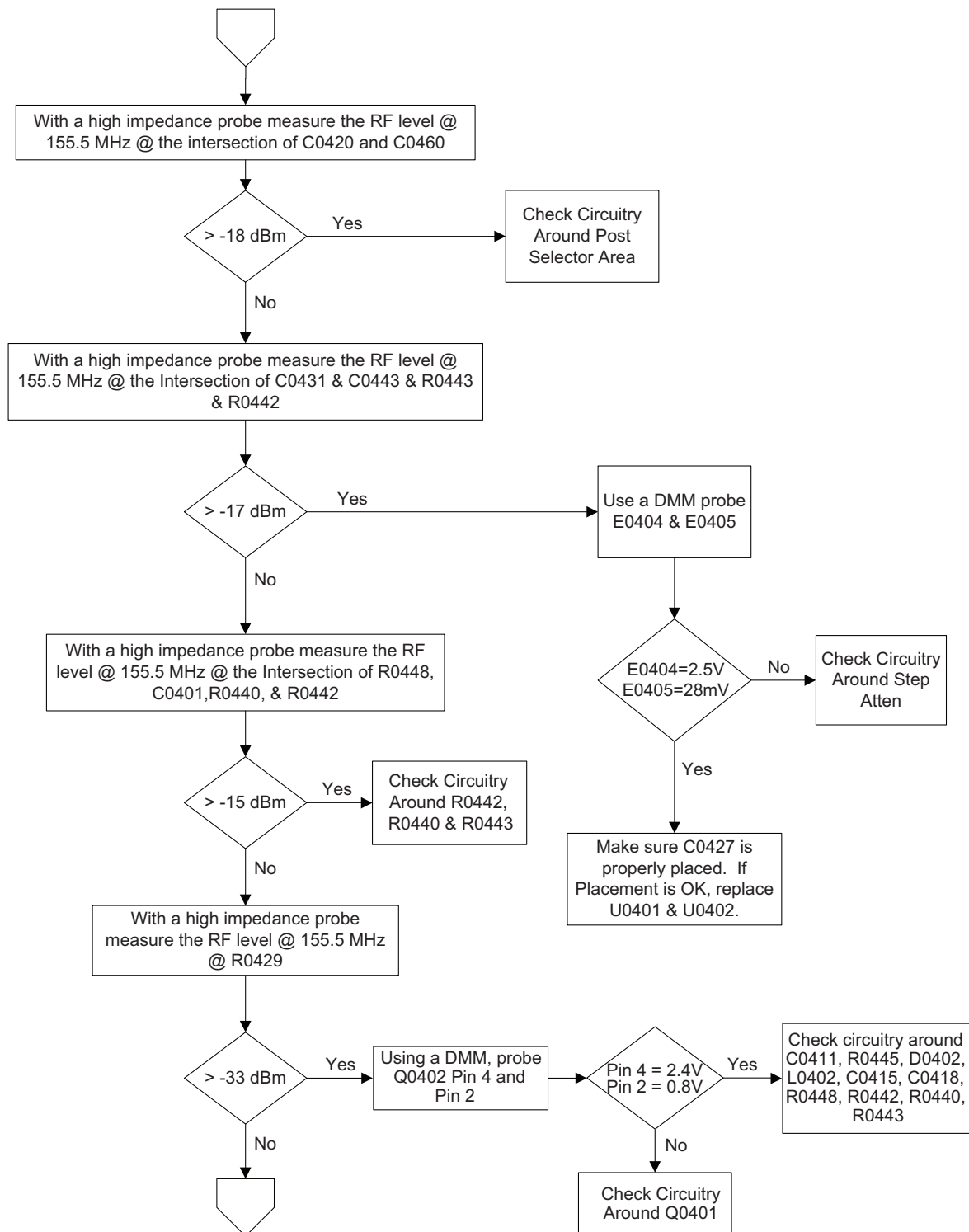
1.0 Troubleshooting Flow Chart for Receiver (Sheet 1 of 4)



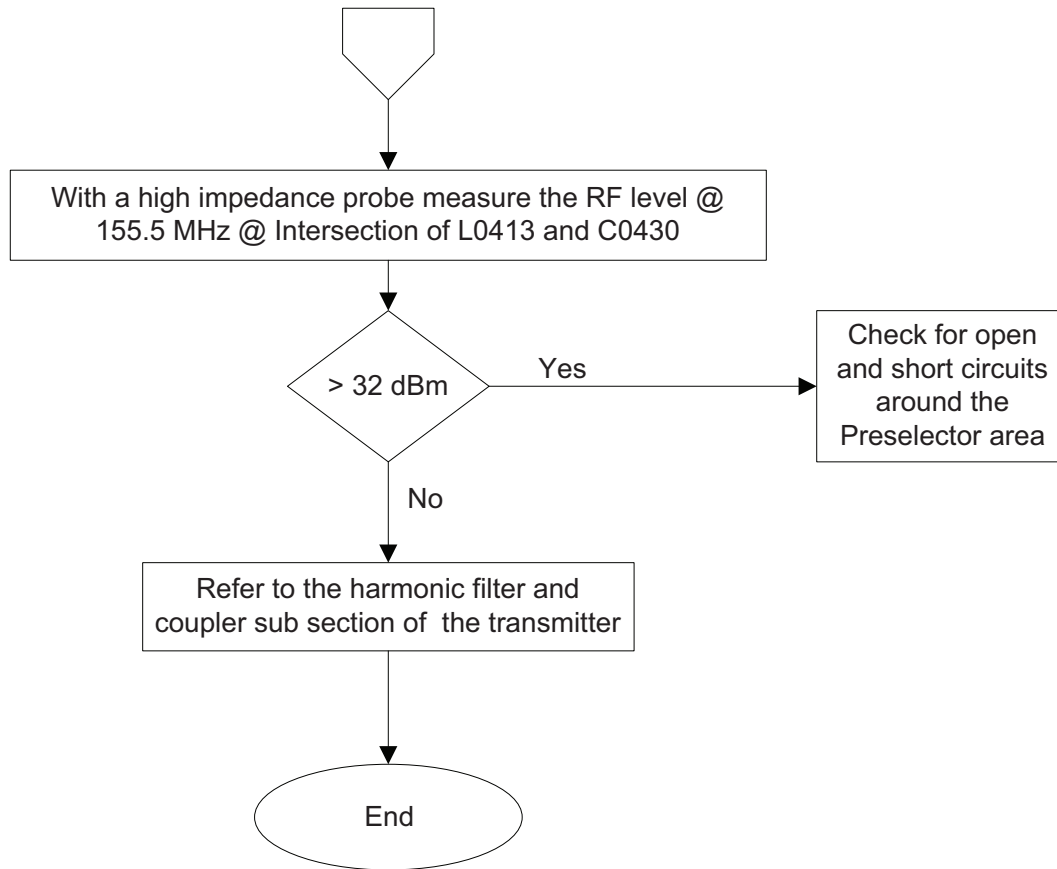
1.1 Troubleshooting Flow Chart for Receiver (Sheet 2 of 4)



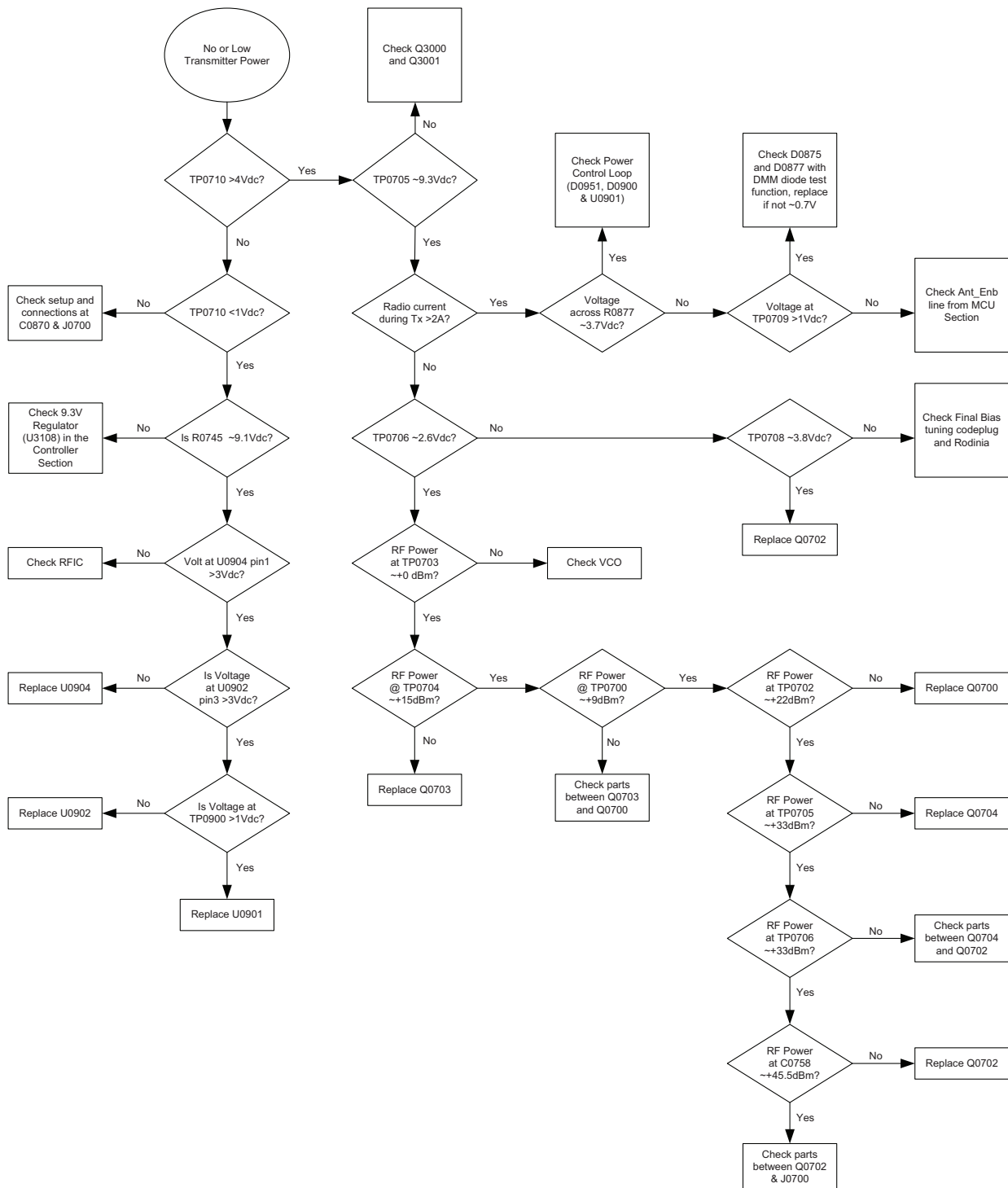
1.2 Troubleshooting Flow Chart for Receiver (Sheet 3 of 4)



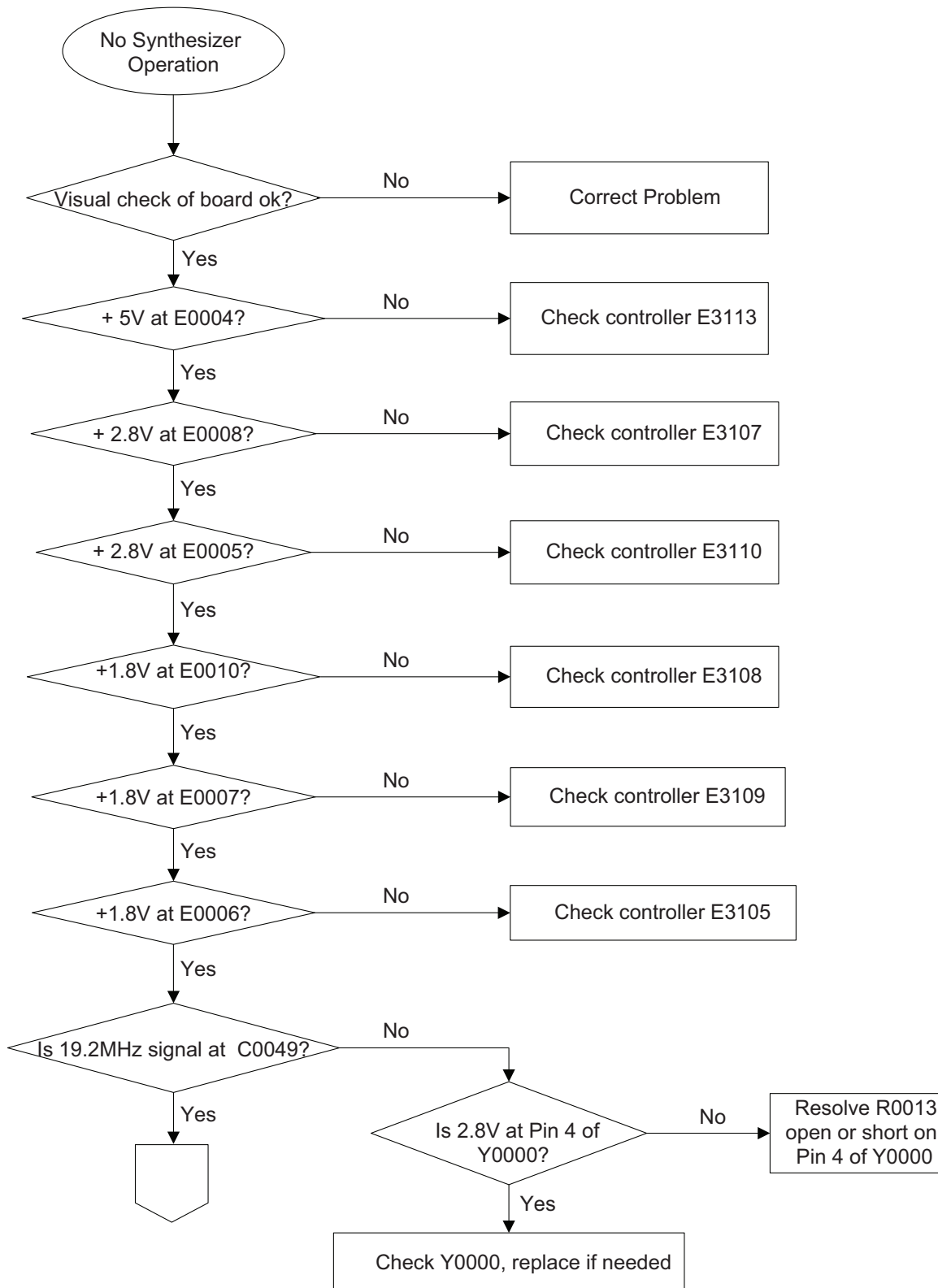
1.3 Troubleshooting Flow Chart for Receiver (Sheet 4 of 4)



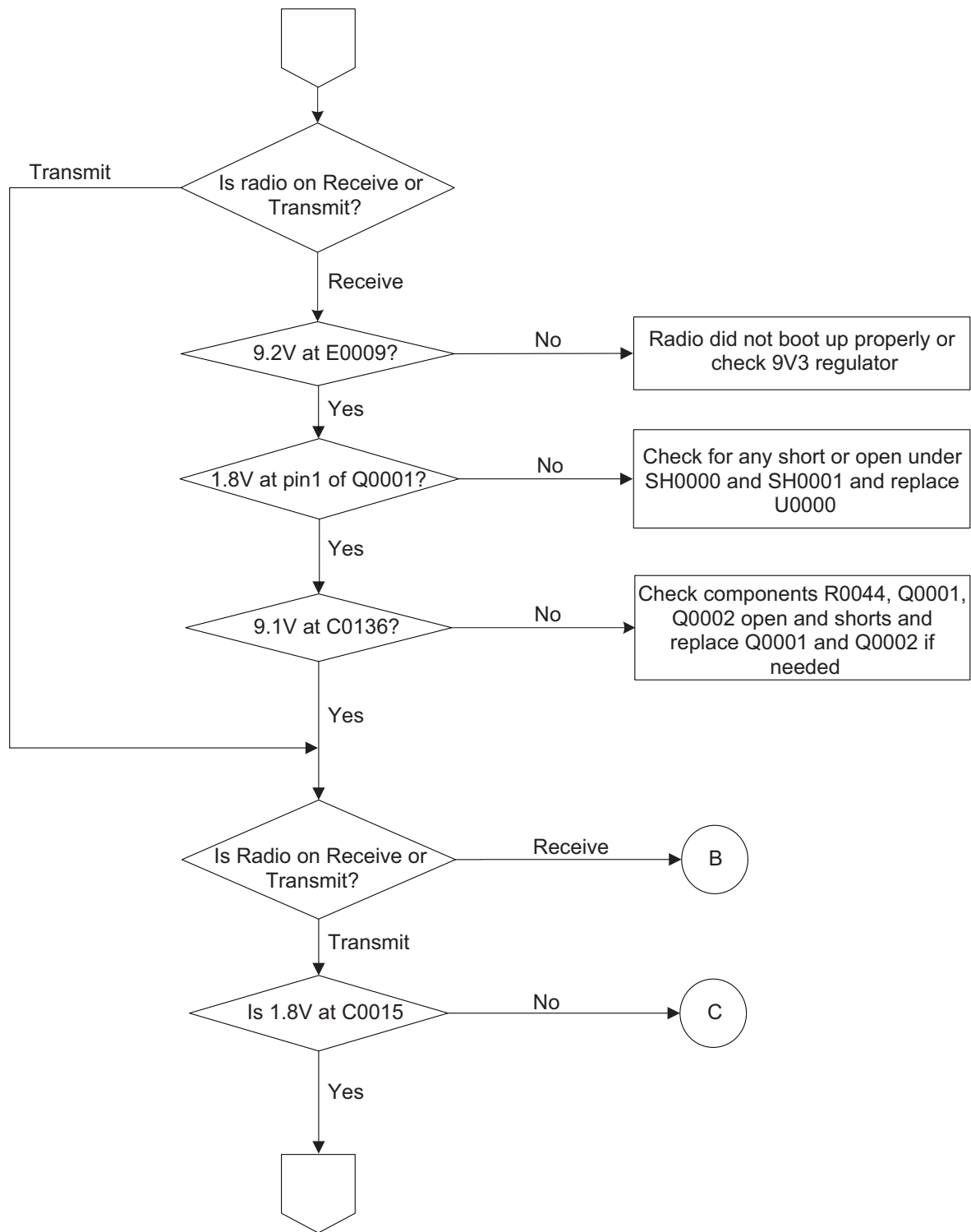
2.0 Troubleshooting Flow Chart for 25W Transmitter



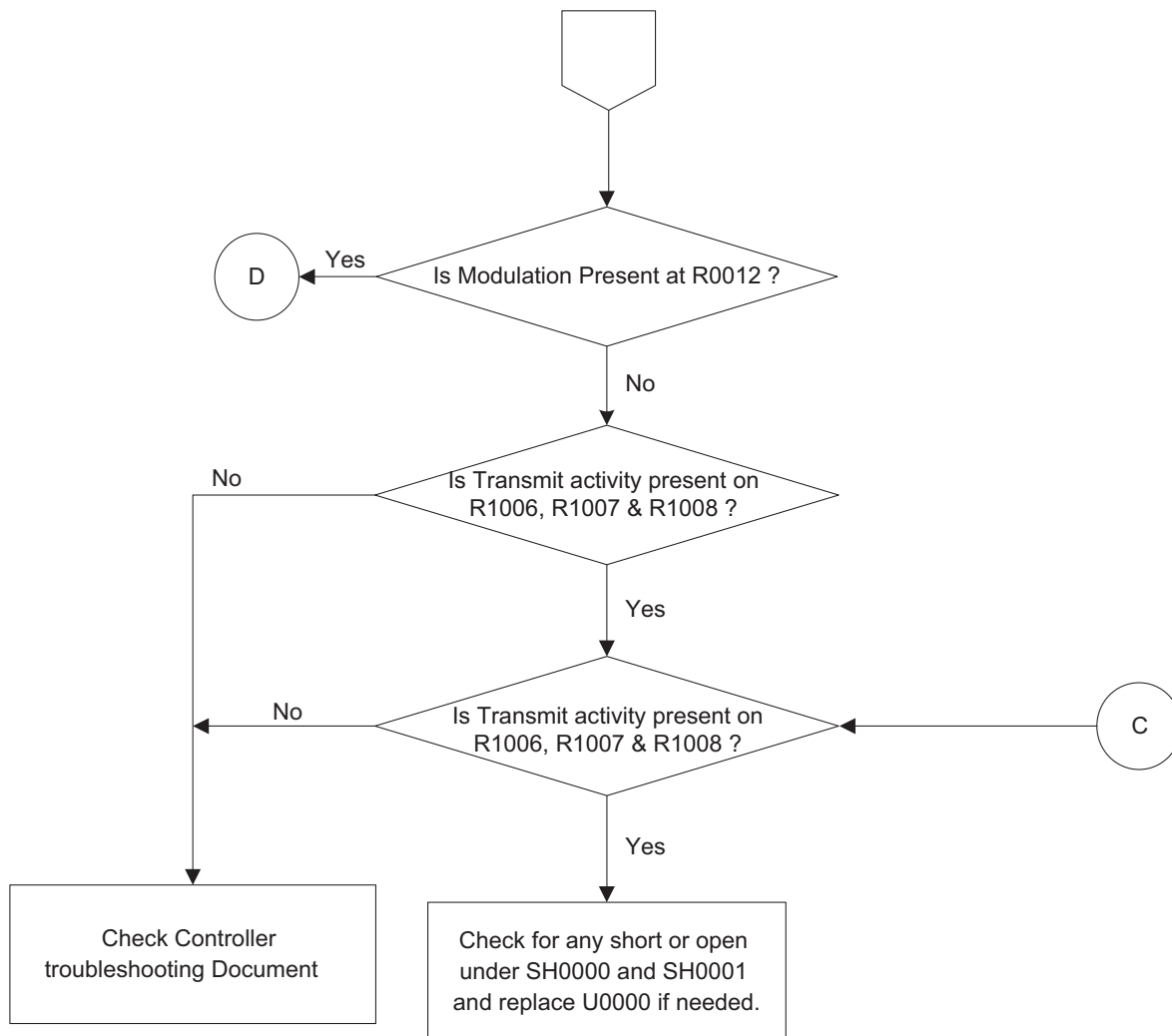
3.0 Troubleshooting Flow Chart for RFIC (Sheet 1 of 5)



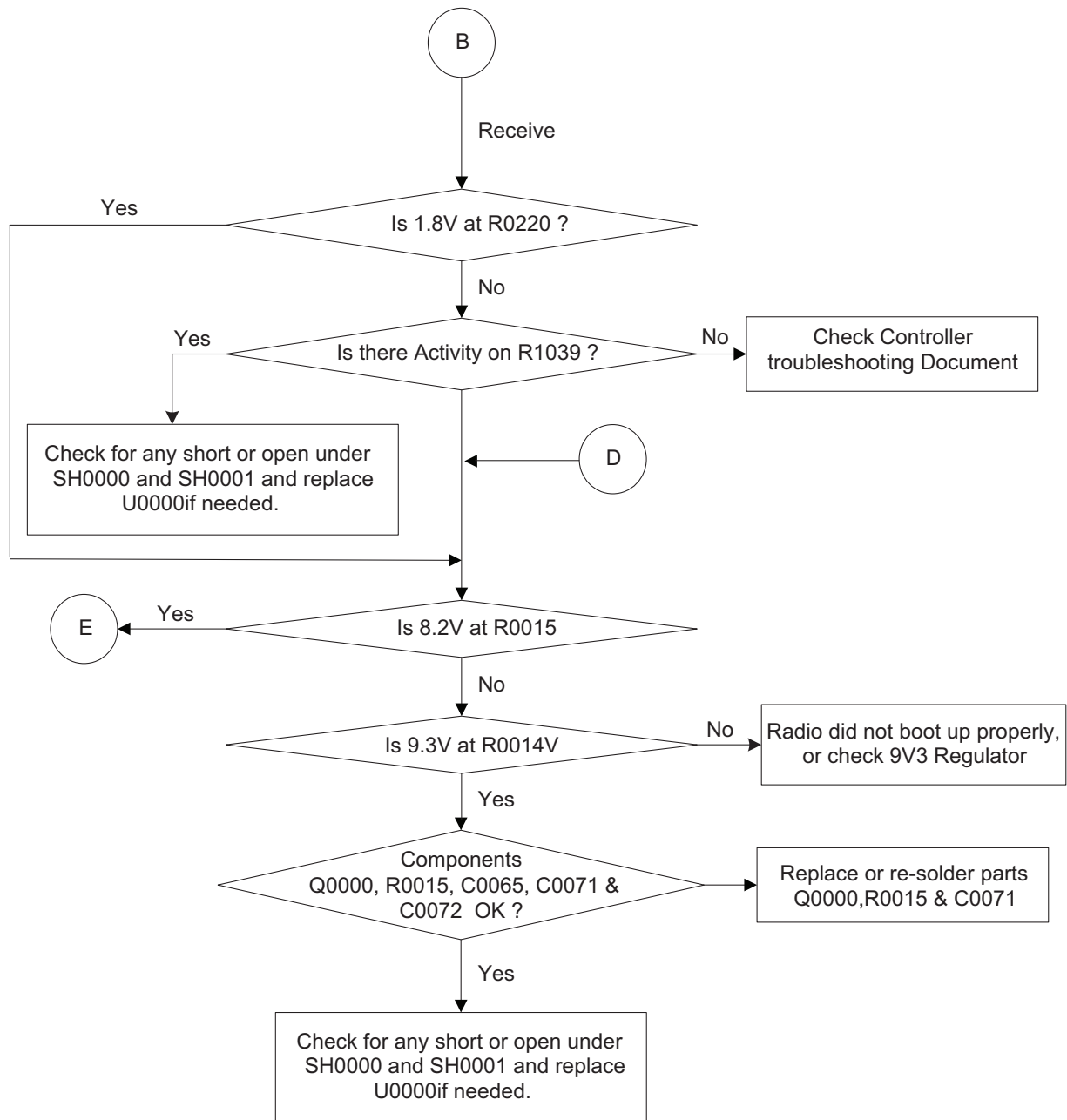
3.1 Troubleshooting Flow Chart for RFIC (Sheet 2 of 5)



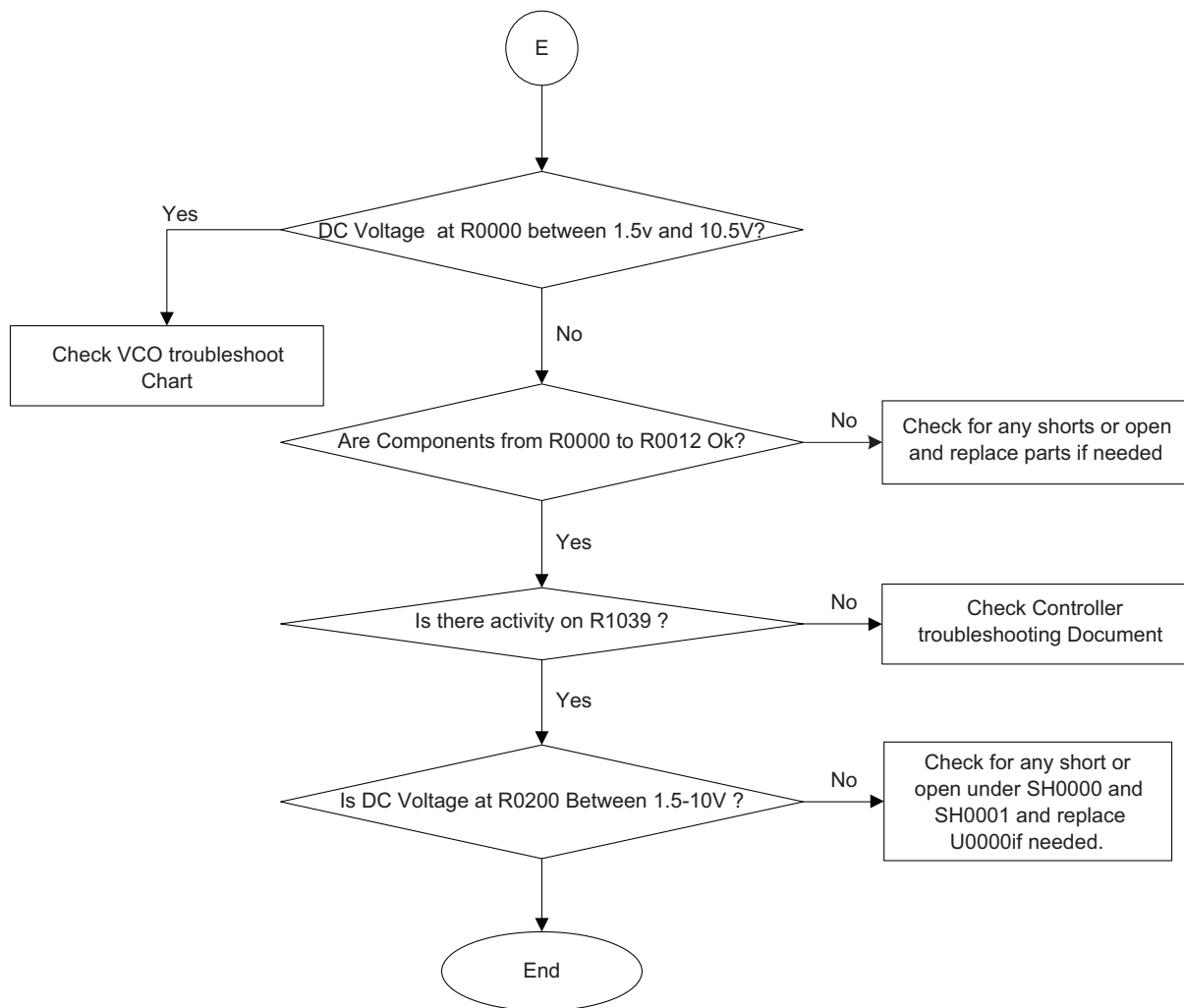
3.2 Troubleshooting Flow Chart for RFIC (Sheet 3 of 5)



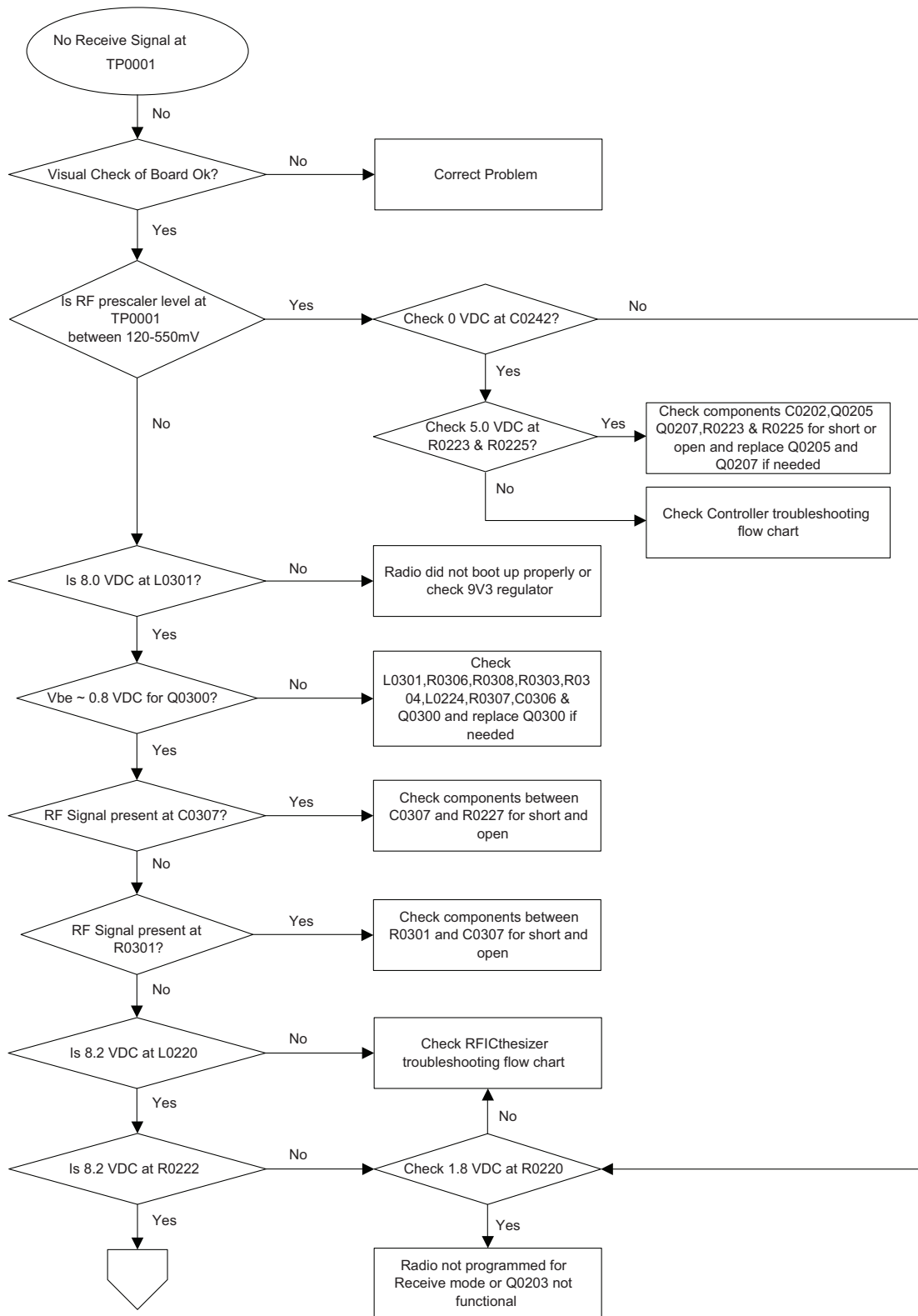
3.3 Troubleshooting Flow Chart for RFIC (Sheet 4 of 5)



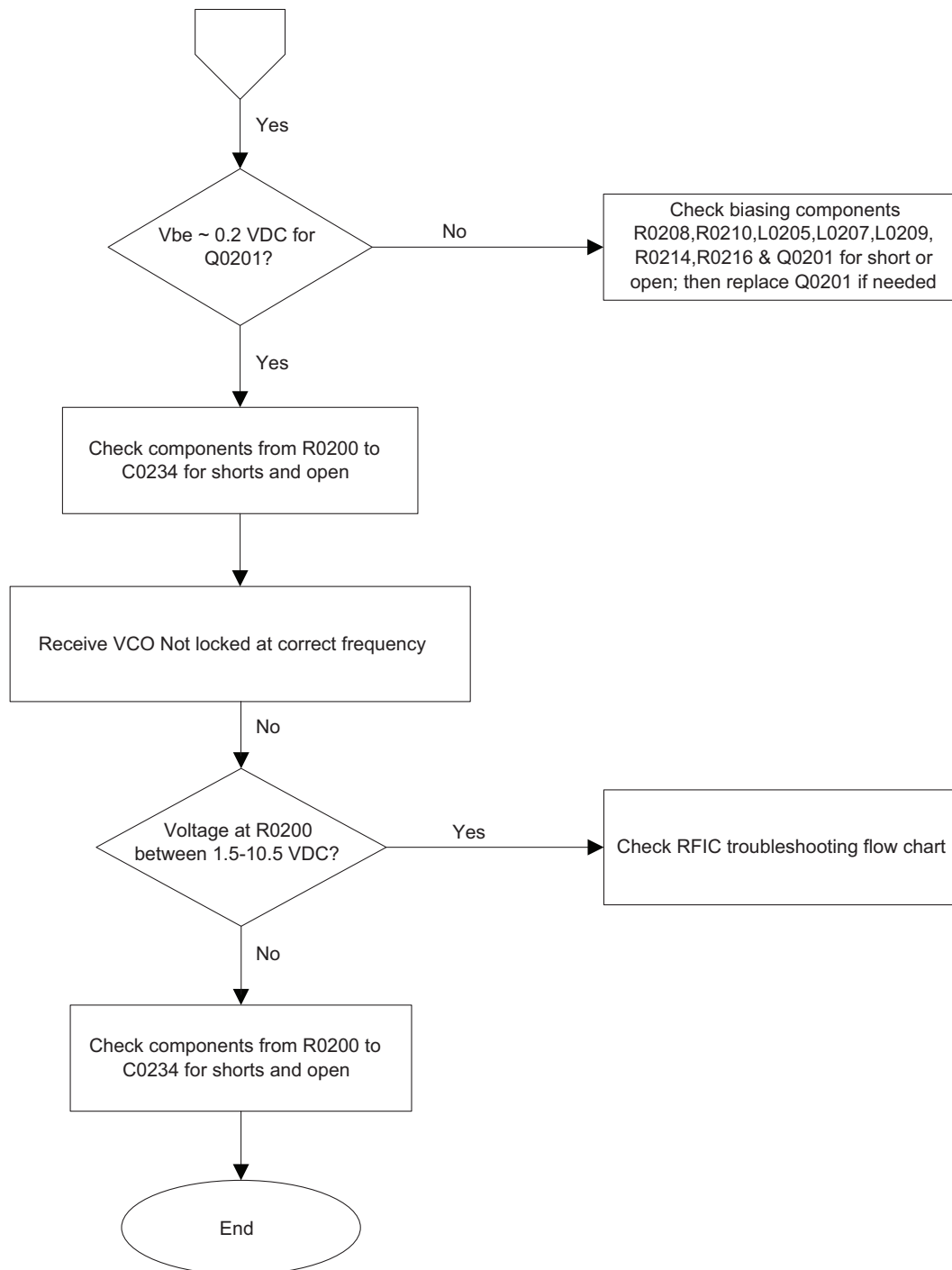
3.4 Troubleshooting Flow Chart for RFIC (Sheet 5 of 5)



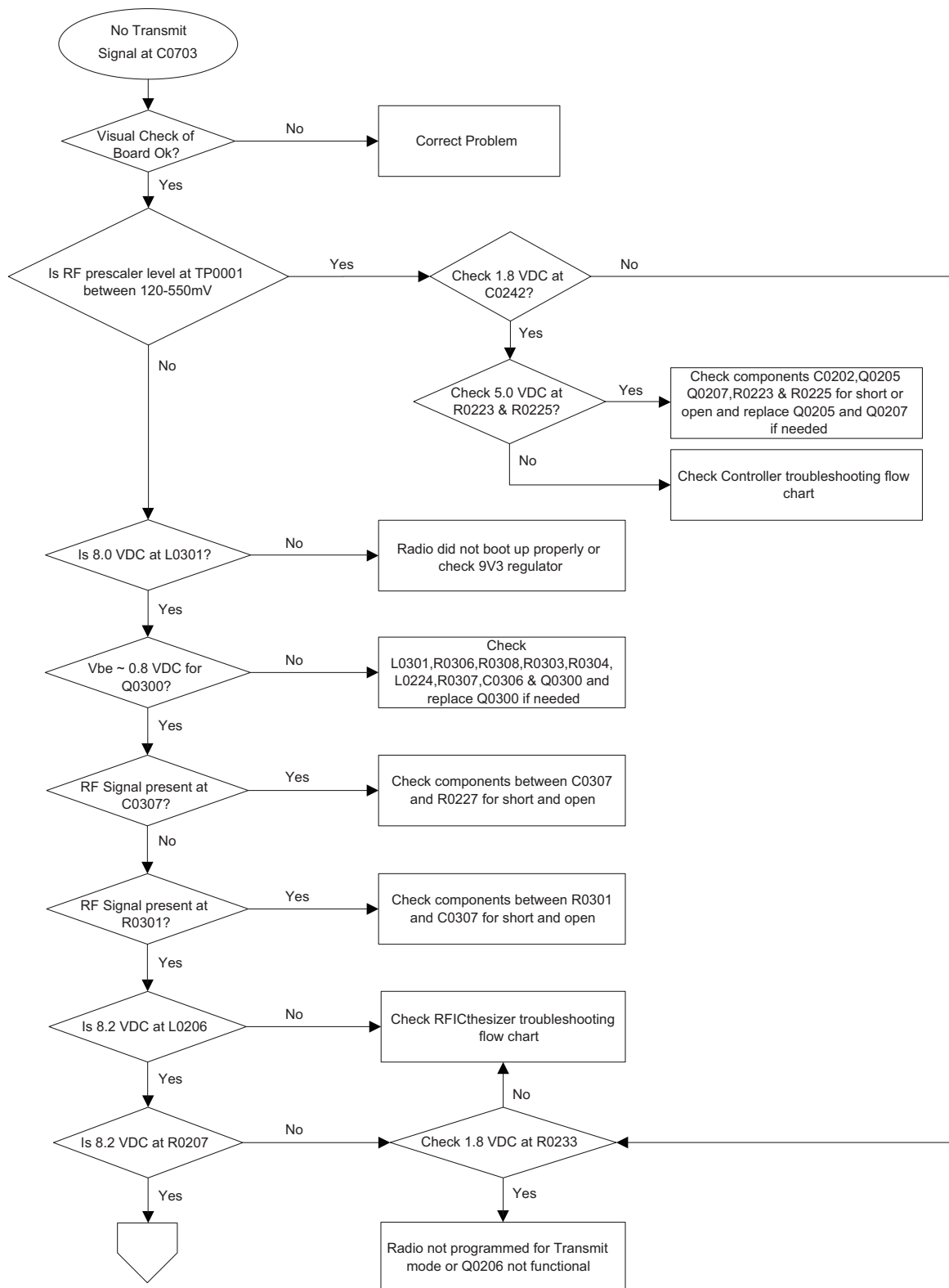
4.0 Troubleshooting Flow Chart for Rx VCO (Sheet 1 of 2)



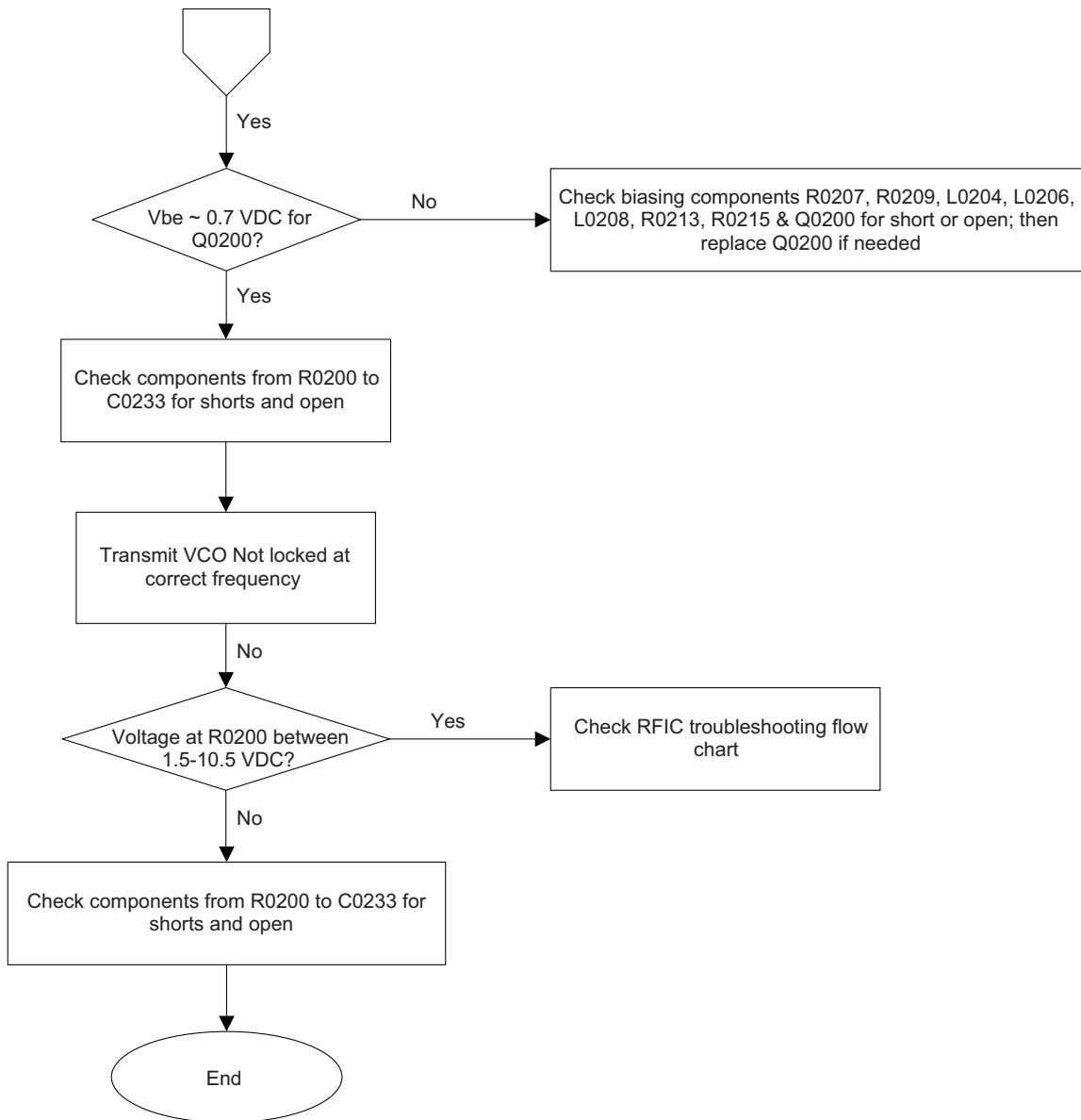
4.1 Troubleshooting Flow Chart for Rx VCO (Sheet 2 of 2)



5.0 Troubleshooting Flow Chart for Tx VCO (Sheet 1 of 2)



5.1 Troubleshooting Flow Chart for Tx VCO (Sheet 2 of 2)



Section 2

VHF PCB/SCHEMATICS/PARTS LIST

1.0 Allocation of Schematics and Circuit Boards

1.1 VHF 25W Circuits

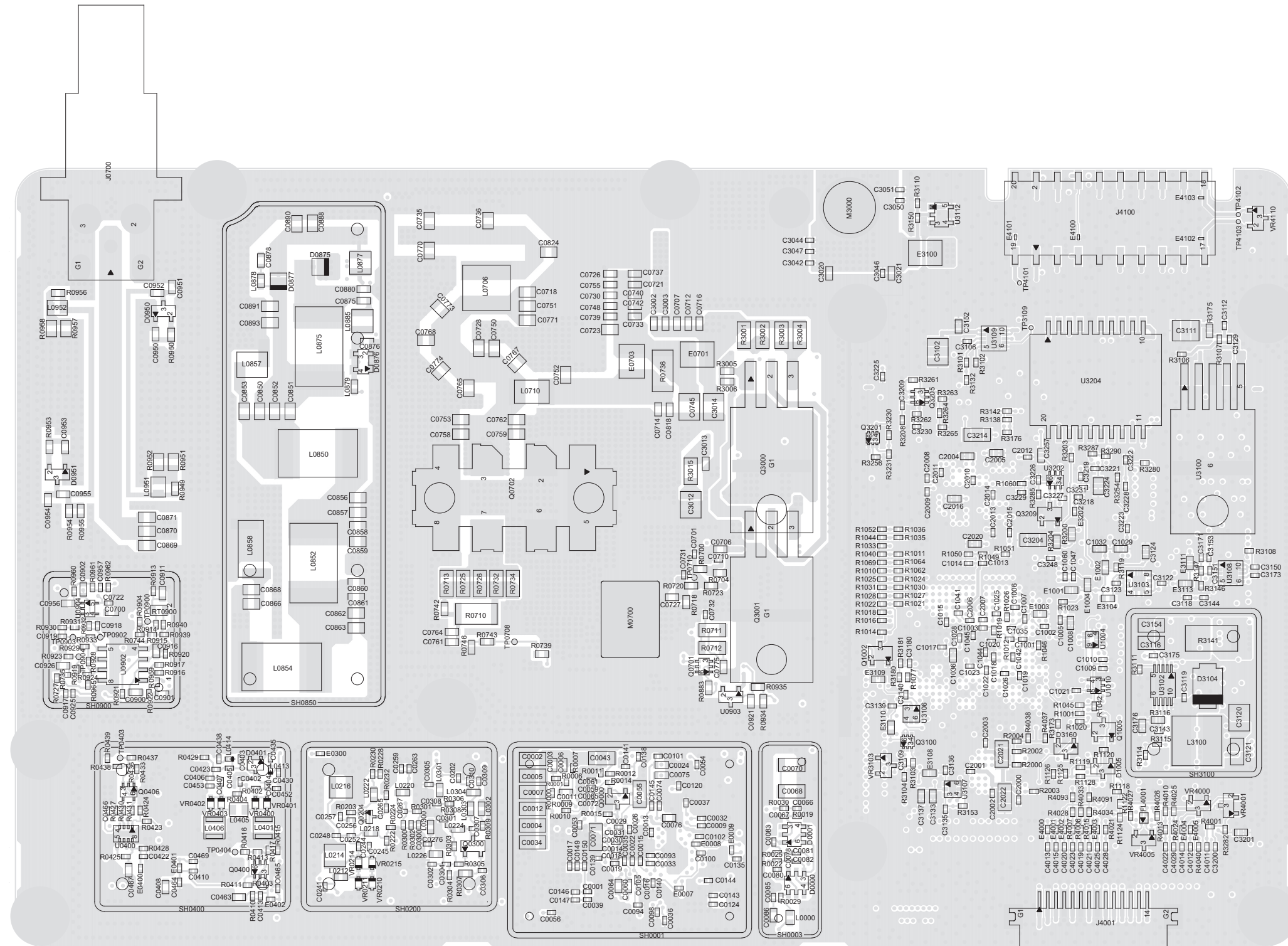
The VHF circuits are contained on the Printed Circuit Board (PCB) which also contains the Controller circuits. This chapter shows the schematics for the VHF 25W circuits only, refer to the Controller section for details of the related Controller circuits. The PCB component layouts and the Parts List in this chapter show both the Controller and VHF 25W circuit components. The VHF 25W schematics and the related PCB and parts list are shown in the table below.

Table 2-1 VHF 1–25W Schematic Diagrams and Parts List

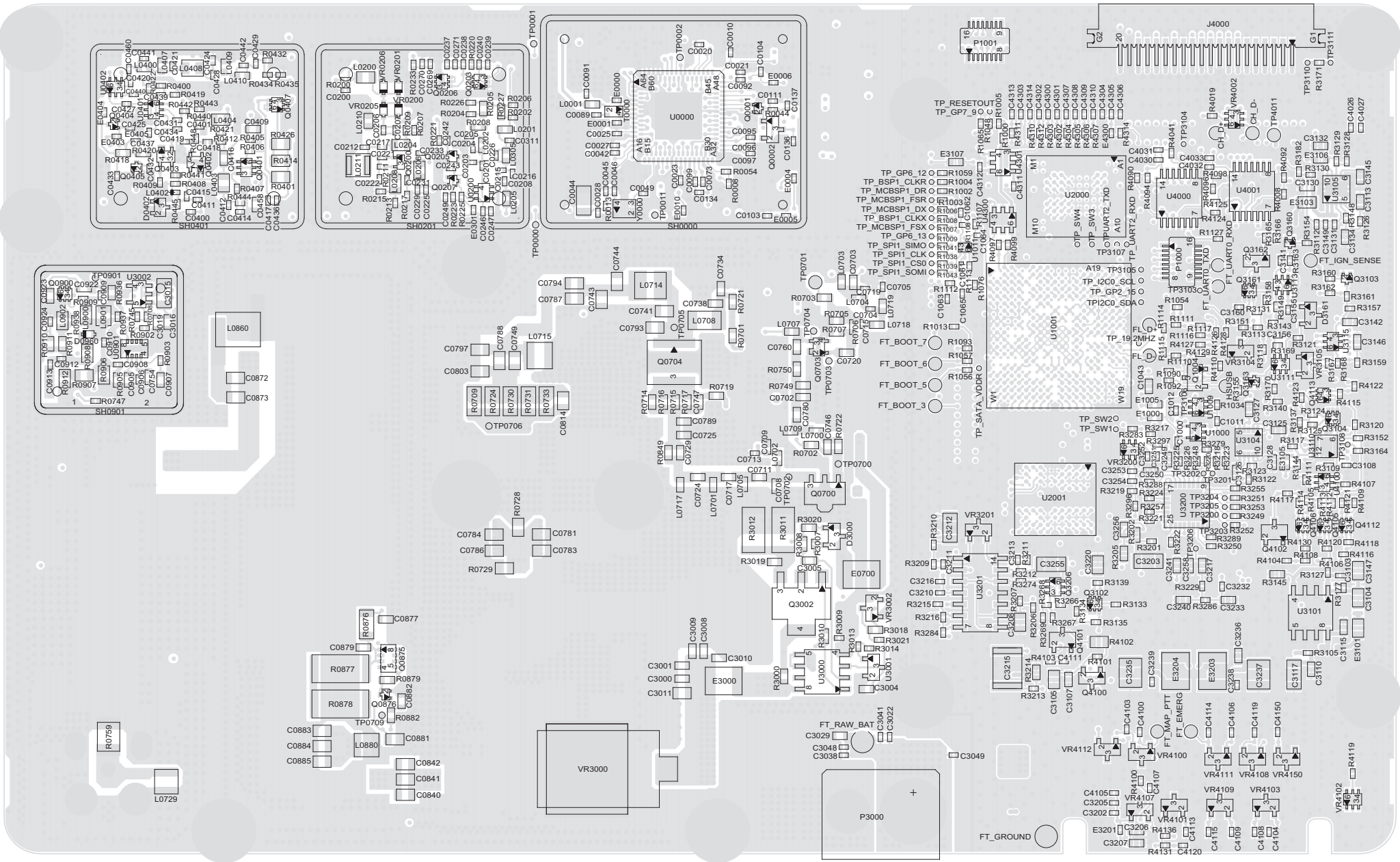
PCB : 84012504002-B Main Board Top Side 84012504002-B Main Board Bottom Side	Page 2-3 Page 2-4
SCHEMATICS Overall Receiver Front- End Transmitter Power Amplifier (sheet 1 of 2) Transmitter Power Amplifier (sheet 2 of 2) Transmit/Receive Switch and Harmonic Filter Power Control Transmitter Power Amplifier DC Distribution RFIC Transmitter VCO Receiver VCO VCO Buffer	Page 2-5 Page 2-6 Page 2-7 Page 2-8 Page 2-9 Page 2-10 Page 2-11 Page 2-12 Page 2-13 Page 2-14 Page 2-15
Parts List 84012504002-B (VHF 25W Only)	Page 2-16

Notes

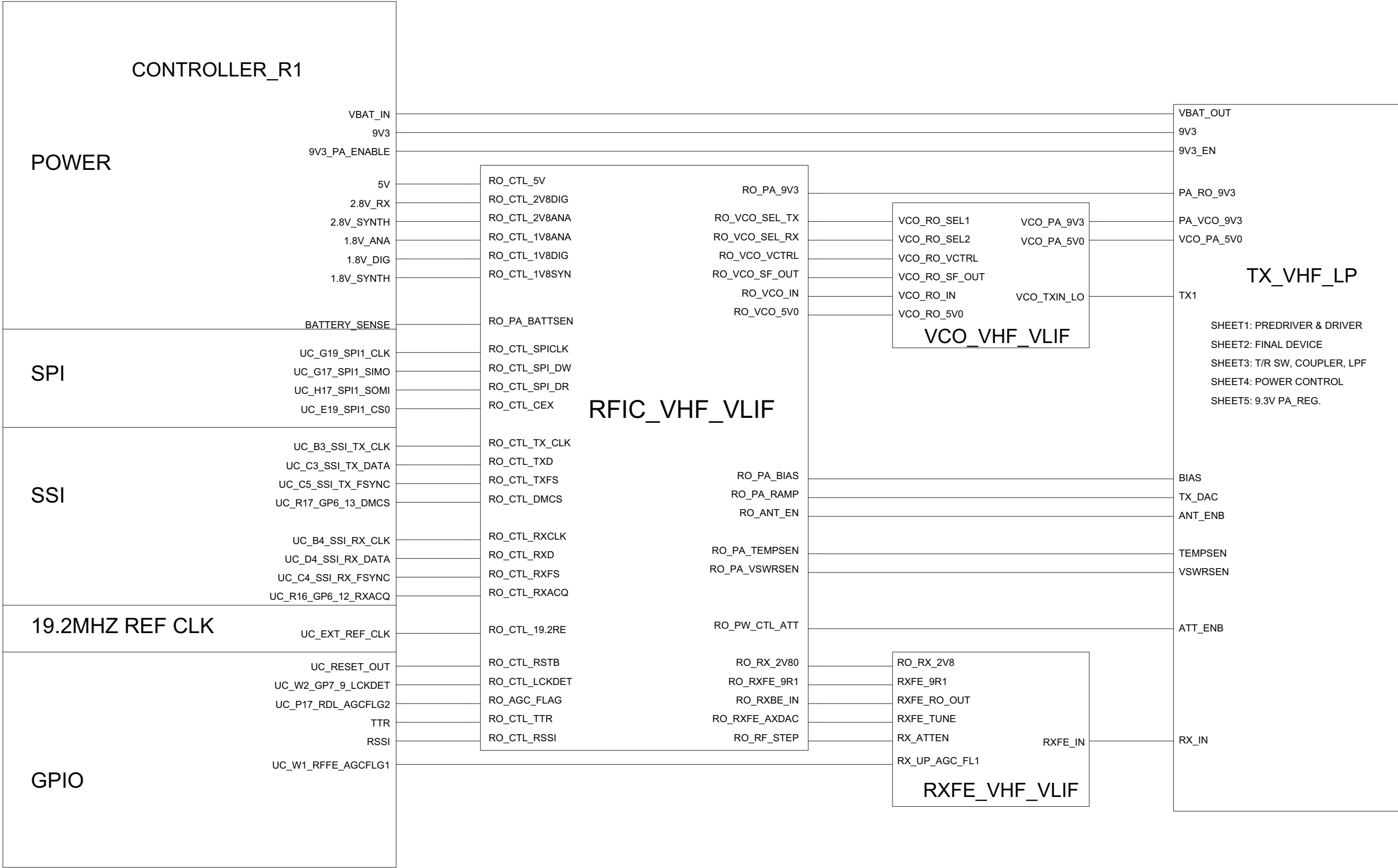
2.0 VHF (136–174 MHz) 1–25W PCB/Schematics/Parts List



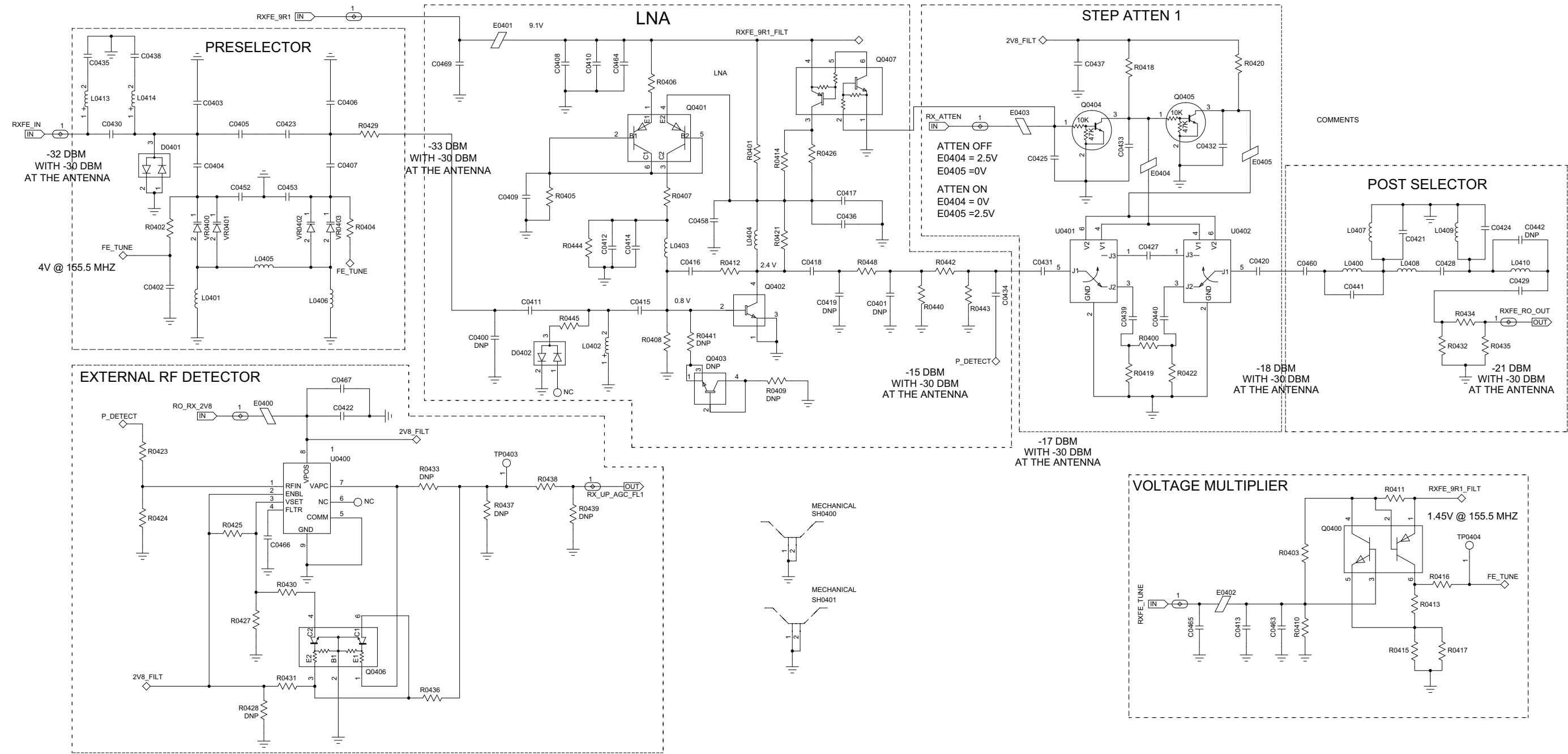
VHF (136–174 MHz) 1–25W 84012504002-B Top Side



VHF (136–174 MHz) 1–25W 84012504002-B Bottom Side

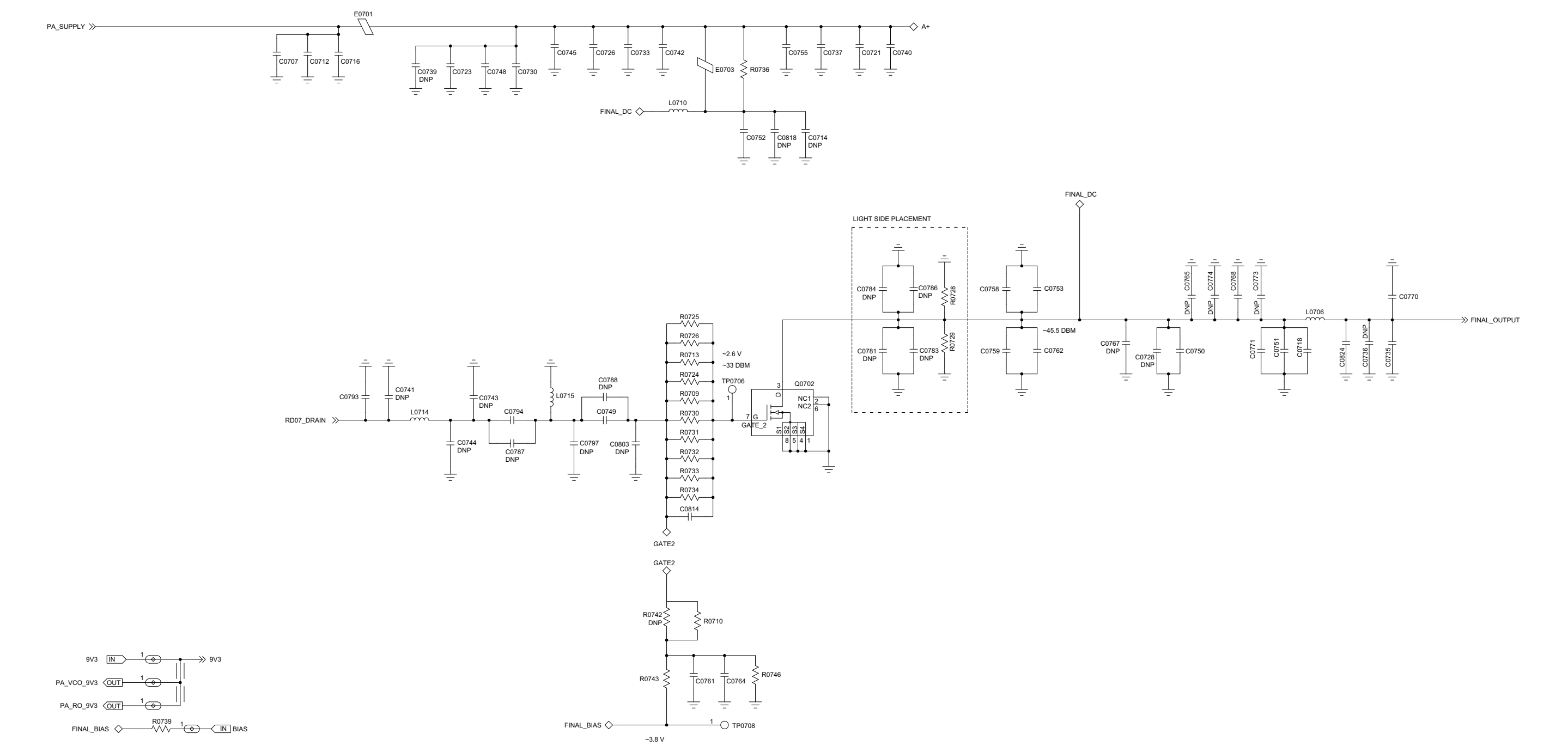


VHF (136–174 MHz) 1–25W Overall Schematic Diagram

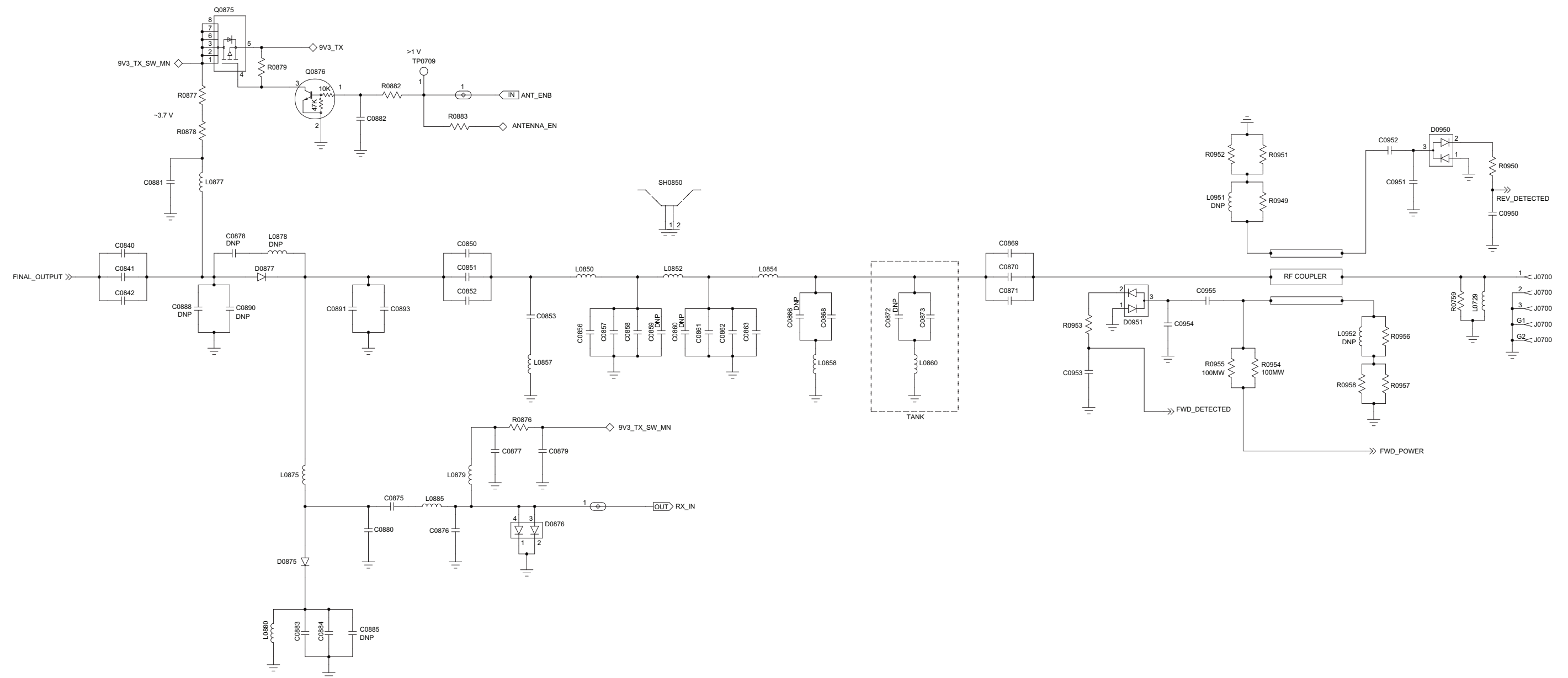


VHF (136–174 MHz) 1–25W Receiver Front-End Schematic Diagram

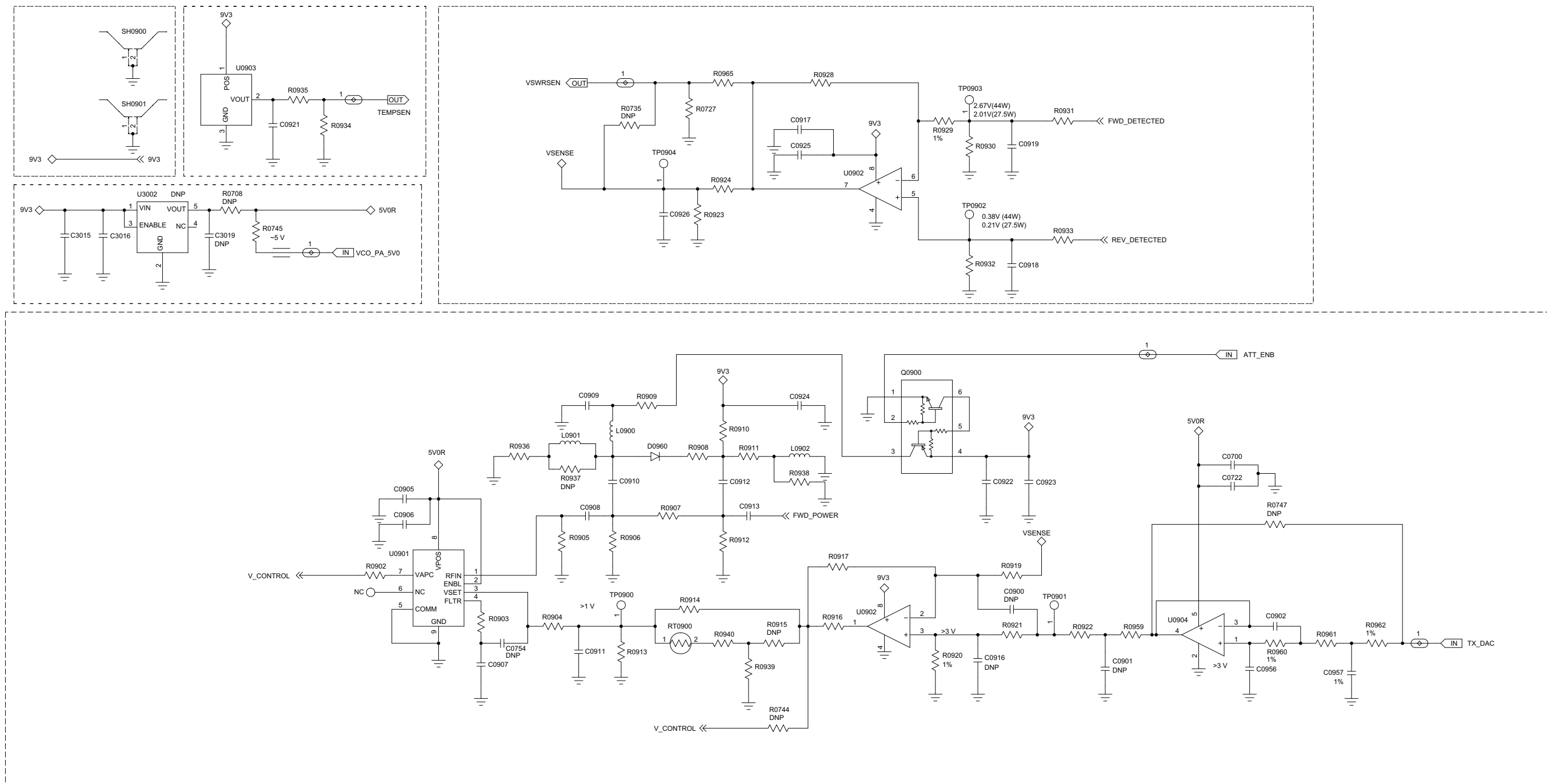




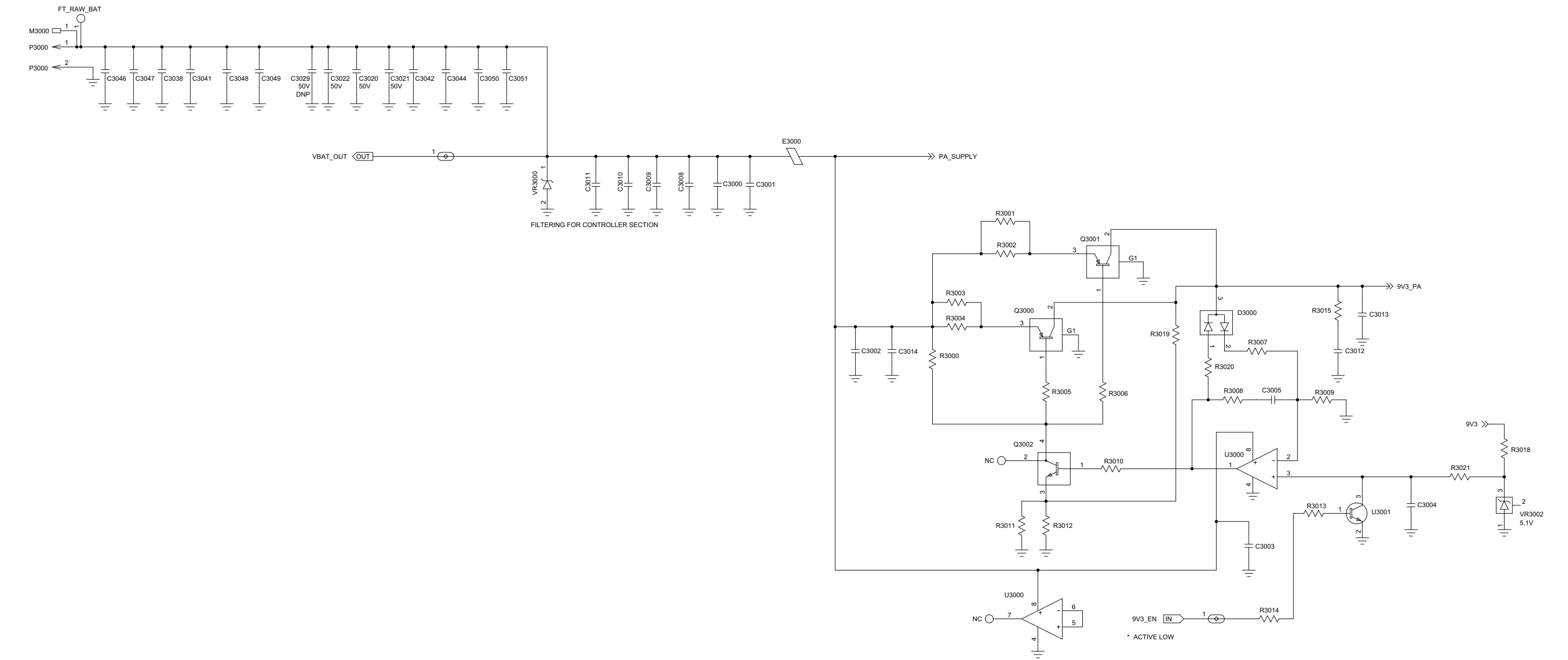
VHF (136–174 MHz) 1–25W Transmitter Power Amplifier Schematic Diagram (sheet 2 of 2)



VHF (136–174 MHz) 1–25W Transmit/Receive Switch and Harmonic Filter Schematic Diagram

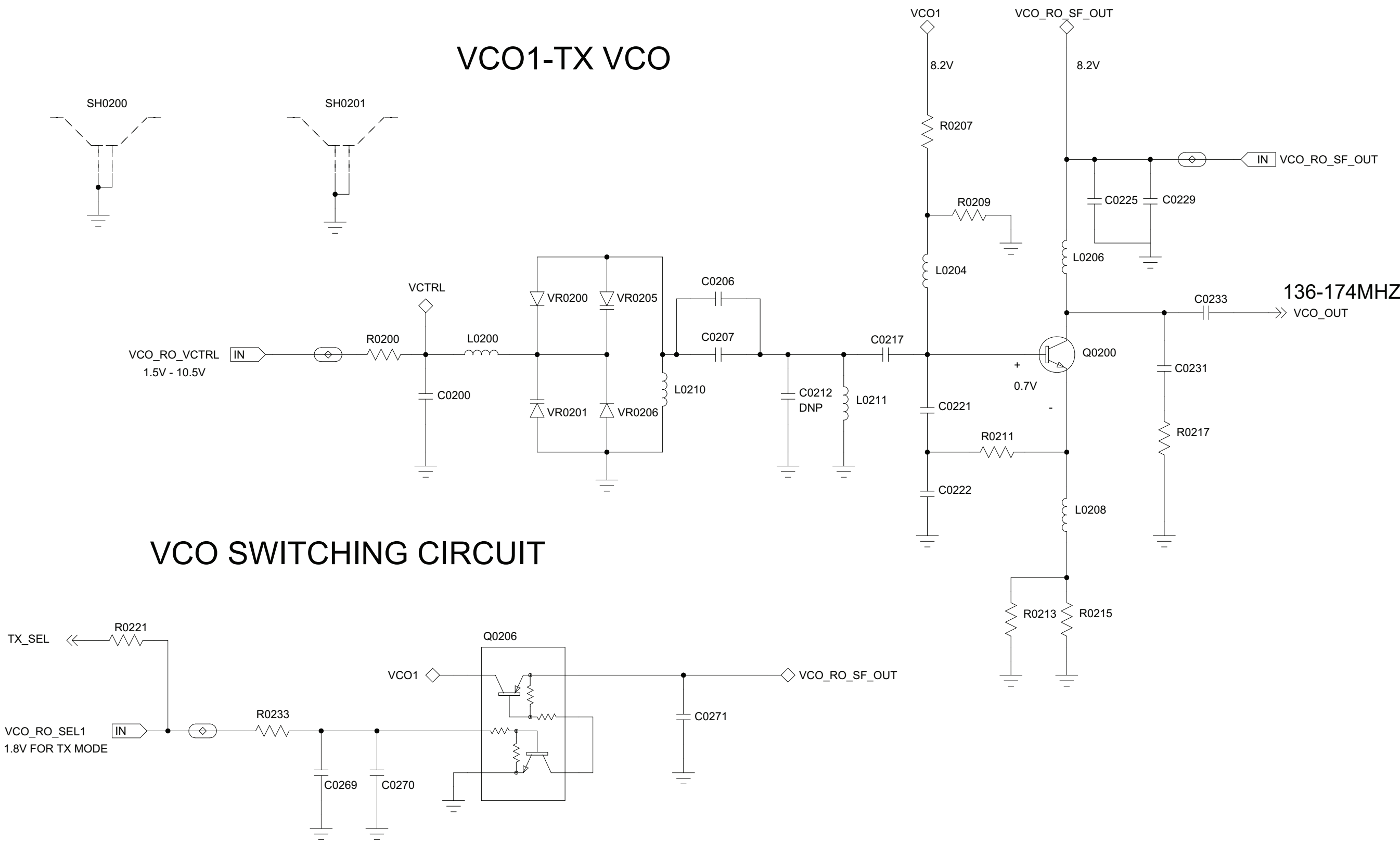


VHF (136–174 MHz) 1–25W Power Control Schematic Diagram



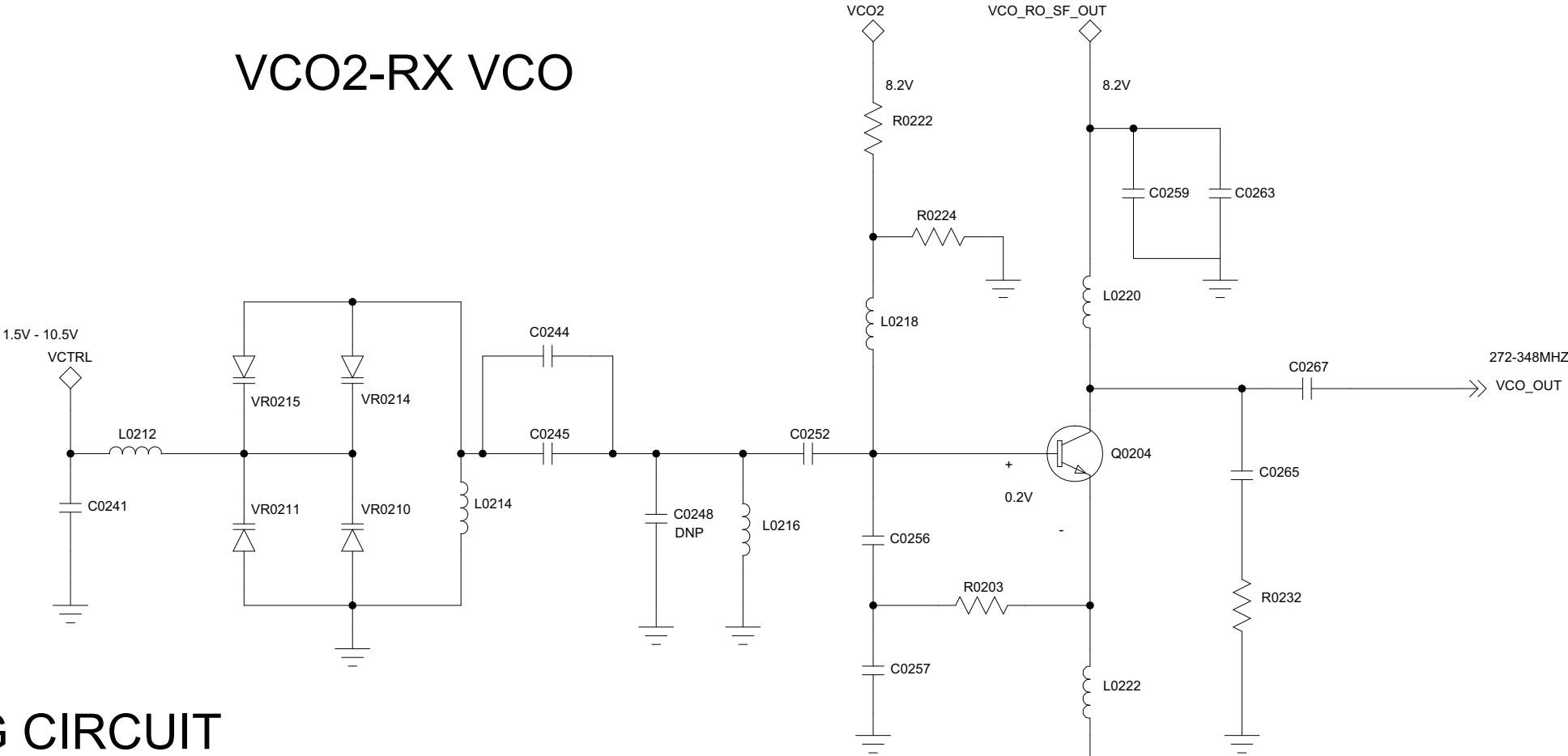
VHF (136–174 MHz) 1–25W Transmitter Power Amplifier DC Distribution Schematic Diagram



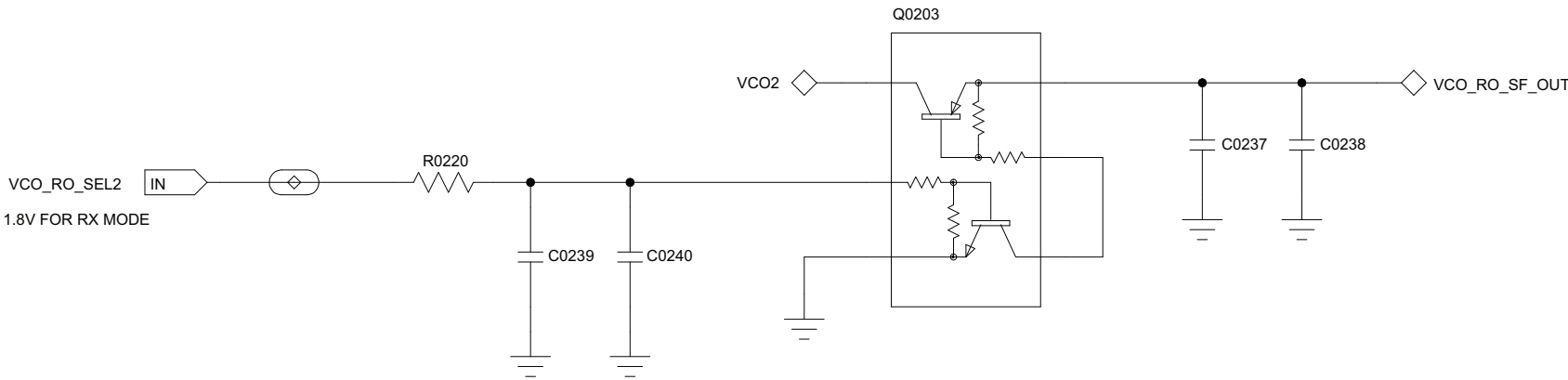


VHF (136–174 MHz) 1–25W Transmitter VCO Schematic Diagram

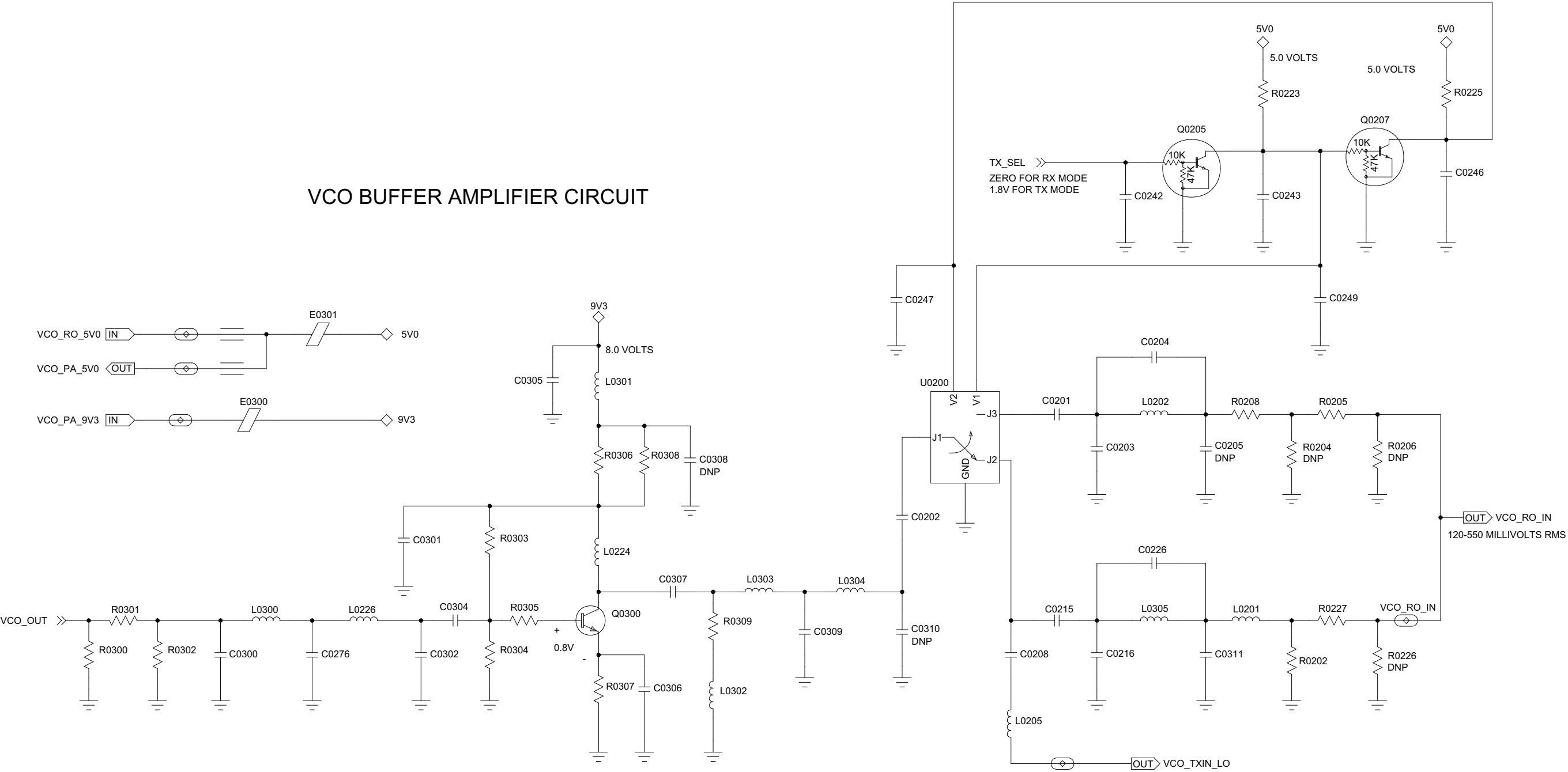
VCO2-RX VCO



VCO SWITCHING CIRCUIT



VHF (136–174 MHz) 1–25W Receiver VCO Schematic Diagram



VHF (136–174 MHz) 1–25W VCO Buffer Schematic Diagram

VHF PCB 84012504002-B
Parts List 1–25W

Circuit Ref.	Motorola Part No.
C0001M2	21667009170
C0002M2	21012044001
C0003M2	NOT PLACED
C0004M2	21012044001
C0005M2	21012044001
C0006M2	2113945C31
C0007M2	21012044001
C0009M2	2113945A10
C0010M2	21667009166
C0011M2	2113945C31
C0012M2	21012044001
C0013M2	2113945Y02
C0014M2	NOT PLACED
C0015M2	21667009166
C0016M2	NOT PLACED
C0017M2	2113945Y02
C0018M2	2113946B01
C0019M2	2113945Y02
C0020M2	21667009166
C0021M2	2113945Y02
C0022M2	NOT PLACED
C0023M2	2113945A03
C0024M2	21012129001
C0025M2	2113945A10
C0026M2	21667009174
C0027M2	2113946B01
C0028M2	2113945Y02
C0029M2	2113946B01
C0030M2	2113946B01
C0031M2	2113946B01
C0032M2	2113945A10
C0033M2	21667009166
C0034M2	21012044001
C0035M2	2113945A10
C0036M2	21667009166
C0037M2	2113945A10
C0039M2	2113945Y02
C0042M2	2113945A03
C0043M2	21012044001
C0044M2	2113955D45
C0045M2	2113945Y02
C0046M2	21667009166
C0049M2	2113945B02
C0053M2	2113945Y02
C0054M2	21667009166
C0055M2	2113955D37
C0056M2	2113945Y02
C0059M2	2113945A10
C0060M2	21012096001

Circuit Ref.	Motorola Part No.
C0061M2	2113945Y02
C0064M2	21012096001
C0065M2	2113945Y02
C0066M2	2113945B02
C0067M2	2113945Y02
C0068M2	2113955D37
C0070M2	2113955D37
C0071M2	2113955D37
C0072M2	2113945A10
C0073M2	21667009166
C0074M2	21667009166
C0075M2	2113946S35
C0076M2	2113946S35
C0078M2	21667009372
C0080M2	2113945B02
C0081M2	2113945B02
C0082M2	2113945B02
C0083M2	2113945B02
C0085M2	21667009166
C0086M2	2113945C31
C0089M2	2113945A10
C0091M2	21667009365
C0092M2	2113945A10
C0093M2	NOT PLACED
C0094M2	2113945Y02
C0095M2	2113945A13
C0096M2	2113945B02
C0097M2	2113945B02
C0098M2	21667009166
C0099M2	2113945Y02
C0100M2	2113945Y02
C0101M2	2113945A10
C0102M2	2113945A10
C0103M2	2113945A10
C0104M2	2113945A10
C0105M2	NOT PLACED
C0111M2	2113945Y02
C0120M2	2113945A10
C0124M2	21667009166
C0134M2	2113945A10
C0135M2	2113945A10
C0136M2	2113945A10
C0137M2	2113945Y02
C0138M2	2113946B01
C0139M2	NOT PLACED
C0140M2	NOT PLACED
C0141M2	2113946B01
C0143M2	2113945Y02
C0144M2	2113945Y02
C0145M2	2113945A10
C0146M2	2113945A10
C0147M2	2113945A10

Circuit Ref.	Motorola Part No.
C0149M2	2113945A10
C0150M2	2113945A10
C0200M7	2113945A10
C0201M7	21667009372
C0202M7	2113945A06
C0203M7	21667009297
C0204M7	21667009366
C0205M7	NOT PLACED
C0206M7	21667009355
C0207M7	21667009355
C0208M7	2113945A10
C0212M7	NOT PLACED
C0215M7	21667009366
C0216M7	21667009315
C0217M7	21667009204
C0221M7	21667009371
C0222M7	21667009374
C0225M7	2113945Y02
C0226M7	21667009372
C0229M7	2113945A10
C0231M7	2113945A10
C0233M7	21667009284
C0237M7	2113945A06
C0238M7	2113945Y02
C0239M7	2113945Y02
C0240M7	2113945A06
C0241M7	2113945A06
C0242M7	2113945A10
C0243M7	2113945A10
C0244M7	21667009339
C0245M7	21667009339
C0246M7	2113945A10
C0247M7	2113945A06
C0248M7	NOT PLACED
C0249M7	2113945A06
C0252M7	21667009294
C0256M7	21667009320
C0257M7	21667009364
C0259M7	2113945Y02
C0263M7	2113945A06
C0265M7	2113945A06
C0267M7	21667009284
C0269M7	2113945A10
C0270M7	2113945Y02
C0271M7	2113945A10
C0276M7	21667009371
C0300M7	21667009315
C0301M7	2113945A06
C0302M7	21667009300
C0304M7	21667009392
C0305M7	2113945Y02
C0306M7	2113945A09

Circuit Ref.	Motorola Part No.
C0307M7	2113945A02
C0308M7	NOT PLACED
C0309M7	21667009368
C0310M7	NOT PLACED
C0311M7	21667009371
C0400M4	NOT PLACED
C0401M4	NOT PLACED
C0402M4	2113945A10
C0403M4	21667009279
C0404M4	21667009375
C0405M4	21667009279
C0406M4	21667009279
C0407M4	21667009375
C0408M4	2113945C31
C0409M4	2113945C31
C0410M4	2113945A10
C0411M4	2113945A10
C0412M4	2113956A51
C0413M4	2113945A10
C0414M4	21667009388
C0415M4	21667009378
C0416M4	2113945C31
C0417M4	21667009388
C0418M4	2113945A10
C0419M4	NOT PLACED
C0420M4	2113945A10
C0421M4	21667009374
C0422M4	2113945A10
C0423M4	21667009279
C0424M4	21667009374
C0425M4	2113945A10
C0427M4	2113945A10
C0428M4	21667009371
C0429M4	21667009386
C0430M4	21667009380
C0431M4	2113945A10
C0432M4	2113945A10
C0433M4	2113945A10
C0434M4	21667009182
C0435M4	21667009370
C0436M4	21667009005
C0437M4	2113945A10
C0438M4	21667009367
C0439M4	2113945A10
C0440M4	2113945A10
C0441M4	21667009367
C0442M4	NOT PLACED
C0452M4	21667009374
C0453M4	21667009374
C0458M4	2113956B54
C0460M4	21667009386
C0463M4	2113945C31

Circuit Ref.	Motorola Part No.
C0464M4	21667009380
C0465M4	21667009393
C0466M4	2113945A10
C0467M4	2113945C31
C0469M4	21667009393
C0700M5	2113945C31
C0701M5	21667009174
C0702M5	2113944C34
C0703M5	2113944C51
C0704M5	21667009125
C0705M5	21667009106
C0706M5	NOT PLACED
C0707M5	2113945C31
C0708M5	21667011030
C0709M5	2113945C04
C0710M5	21667009174
C0711M5	2113944C06
C0712M5	2113945L49
C0713M5	21667009174
C0714M5	NOT PLACED
C0715M5	21667009164
C0716M5	2113944C51
C0717M5	2113944C35
C0718M5	21667007042
C0719M5	21667009373
C0720M5	2113944C51
C0721M5	2113945L37
C0722M5	2113945A09
C0723M5	NOT PLACED
C0724M5	2113944C84
C0725M5	NOT PLACED
C0726M5	2113944C51
C0727M5	NOT PLACED
C0728M5	NOT PLACED
C0729M5	2113944C46
C0730M5	2113945L49
C0731M5	21667009174
C0732M5	2113945A09
C0733M5	2113944C45
C0734M5	2113944C51
C0735M5	21667007030
C0736M5	NOT PLACED
C0737M5	2113944C04
C0738M5	2113944C46
C0739M5	NOT PLACED
C0740M5	2113945C25
C0741M5	NOT PLACED
C0742M5	2113944C30
C0743M5	NOT PLACED
C0744M5	NOT PLACED
C0745M5	21009337414
C0746M5	2113944C06

Circuit Ref.	Motorola Part No.
C0747M5	0613952H42
C0748M5	2113945C31
C0749M5	2113944F05
C0750M5	21667007042
C0751M5	21667007042
C0752M5	21667007066
C0753M5	21667007043
C0754M5	NOT PLACED
C0755M5	2113944C36
C0758M5	21667007043
C0759M5	21667007042
C0760M5	2113944C51
C0761M5	2113944C45
C0762M5	21667007042
C0764M5	2113944C51
C0765M5	NOT PLACED
C0767M5	NOT PLACED
C0768M5	21667007029
C0770M5	21667007030
C0771M5	21667007042
C0773M5	NOT PLACED
C0774M5	NOT PLACED
C0775M5	2113944C06
C0780M5	2113944C06
C0781M5	NOT PLACED
C0783M5	NOT PLACED
C0784M5	NOT PLACED
C0786M5	NOT PLACED
C0787M5	NOT PLACED
C0788M5	NOT PLACED
C0789M5	NOT PLACED
C0793M5	21667007045
C0794M5	21667007047
C0797M5	NOT PLACED
C0803M5	NOT PLACED
C0814M5	2113944F67
C0818M5	NOT PLACED
C0824M5	21667007012
C0840M5	21667007034
C0841M5	21667007034
C0842M5	21667007034
C0850M5	21667007040
C0851M5	21667007040
C0852M5	21667007040
C0853M5	21667007023
C0856M5	21667007030
C0857M5	21667007031
C0858M5	21667007031
C0859M5	NOT PLACED
C0860M5	NOT PLACED
C0861M5	21667007031
C0862M5	21667007031

Circuit Ref.	Motorola Part No.
C0863M5	21667007030
C0866M5	NOT PLACED
C0868M5	21667007023
C0869M5	21667007045
C0870M5	21667007045
C0871M5	21667007045
C0872M5	NOT PLACED
C0873M5	21667007017
C0875M5	2113944C47
C0876M5	2113944C33
C0877M5	2113944C06
C0878M5	NOT PLACED
C0879M5	2113944C06
C0880M5	2113944C36
C0881M5	2113944F05
C0882M5	2113944C51
C0883M5	21667007050
C0884M5	21667007050
C0885M5	NOT PLACED
C0888M5	NOT PLACED
C0890M5	NOT PLACED
C0891M5	21667007029
C0893M5	21667007029
C0900M5	NOT PLACED
C0901M5	NOT PLACED
C0902M5	2113944C51
C0905M5	2113945C31
C0906M5	2113945A10
C0907M5	2113945L41
C0908M5	21667009174
C0909M5	21667009174
C0910M5	21667009174
C0911M5	2113944C02
C0912M5	21667009174
C0913M5	21667009174
C0916M5	NOT PLACED
C0917M5	21667009174
C0918M5	21667009174
C0919M5	21667009174
C0921M5	2113944C51
C0922M5	2113945C31
C0923M5	2113944C02
C0924M5	21667009174
C0925M5	2113946B04
C0926M5	2113944C02
C0950M5	2113944C51
C0951M5	2113944C30
C0952M5	2113944C51
C0953M5	2113944C51
C0954M5	2113944M27
C0955M5	2113944C51
C0956M5	2113944C01

Circuit Ref.	Motorola Part No.
C0957M5	21667009172
C3000M5	2113944C38
C3001M5	2113944C06
C3002M5	2113944C06
C3003M5	2113945C31
C3004M5	2113945C02
C3005M5	2113945C02
C3008M5	2113944C51
C3009M5	2113945C31
C3010M5	2113944C46
C3011M5	2113945G53
C3012M5	2113946J04
C3013M5	2113945C31
C3014M5	21009337414
C3015M5	2113946G01
C3016M5	2113945C31
C3019M5	NOT PLACED
C3020M5	2113945C26
C3021M5	2113944C06
C3022M5	2113945A10
C3029M5	NOT PLACED
C3038M5	21667009169
C3041M5	21667009169
C3042M5	21667009169
C3044M5	21667009169
C3046M5	21667009174
C3047M5	21667009174
C3048M5	21667009174
C3049M5	21667009174
C3050M5	21667009169
C3051M5	21667009174
D0000M2	4815011H01
D0001M2	4815011H01
D0401M4	4813974A19
D0402M4	4813974A19
D0875M5	48012160001
D0876M5	4886622Y06
D0877M5	48012160001
D0950M5	4813974A21
D0951M5	4813974A21
D0960M5	48012181001
D3000M5	4813978P07
E0000M2	24012107027
E0001M2	24012107027
E0004M2	24012107027
E0005M2	24012107027
E0006M2	24012107027
E0007M2	24012107027
E0008M2	24012107027
E0009M2	24012107027
E0010M2	24012107027
E0300M7	24012107027

Circuit Ref.	Motorola Part No.
E0301M7	24012107027
E0400M4	2471132D16
E0401M4	2471132D16
E0402M4	2471132D16
E0403M4	24012107027
E0404M4	2471132D16
E0405M4	2471132D16
E0700M5	24012102001
E0701M5	24012102001
E0703M5	24012102001
E3000M5	24012102001
J0700M5	09009348001
L0000M2	24012161001
L0001M2	24667008014
L0200M7	24667000031
L0201M7	24667008024
L0202M7	24667008013
L0204M7	24667005040
L0205M7	24667008018
L0206M7	24667005040
L0208M7	24667000031
L0210M7	24009342045
L0211M7	2414015C11
L0212M7	24667008032
L0214M7	24009343013
L0216M7	24009343007
L0218M7	24667008032
L0220M7	24667008032
L0222M7	24667008032
L0224M7	24667008032
L0226M7	24667008017
L0300M7	24667008017
L0301M7	24667008032
L0302M7	24667008032
L0303M7	24667008013
L0304M7	24667008019
L0305M7	24667008016
L0400M4	24667008018
L0401M4	2414015C09
L0402M4	2475122C33
L0403M4	24667005043
L0404M4	24667005043
L0405M4	24009344125
L0406M4	2414015C09
L0407M4	24667008025
L0408M4	24009344035
L0409M4	24667008025
L0410M4	24667008018
L0413M4	2475122C42
L0414M4	2475122C42
L0700M5	24667008020
L0701M5	24667008018

Circuit Ref.	Motorola Part No.
L0702M5	24667008028
L0703M5	24667008020
L0704M5	24667008028
L0705M5	24667008025
L0706M5	24012145001
L0707M5	24667008031
L0708M5	2479990G01
L0709M5	24667008022
L0710M5	2460591C53
L0714M5	2460591B73
L0715M5	2460591A77
L0717M5	24667008016
L0718M5	24667008018
L0719M5	24667008025
L0729M5	2414032B60
L0850M5	24012145004
L0852M5	24012145004
L0854M5	24012145004
L0857M5	2415385H02
L0858M5	2415385H07
L0860M5	2416077H16
L0875M5	24012145004
L0877M5	24009343030
L0878M5	NOT PLACED
L0879M5	24667008033
L0880M5	24009343030
L0885M5	2414032B50
L0900M5	24667000031
L0901M5	24009344018
L0902M5	24667000031
L0951M5	NOT PLACED
L0952M5	NOT PLACED
M0700M5	2686201B02
M3000M5	0289511U04
P3000M5	NOT PLACED
Q0000M2	4813973A13
Q0001M2	4816134H01
Q0002M2	4813970A59
Q0200M7	48012195001
Q0203M7	4815272H01
Q0204M7	48012195001
Q0205M7	4816134H01
Q0206M7	4815272H01
Q0207M7	4816134H01
Q0300M7	4802197J95
Q0400M4	4815270H01
Q0401M4	4815267H01
Q0402M4	48012201001
Q0403M4	NOT PLACED
Q0404M4	4816134H01
Q0405M4	4816134H01
Q0406M4	4815066H01

Circuit Ref.	Motorola Part No.
Q0407M4	4815272H01
Q0700M5	4816547H01
Q0701M5	4816013H01
Q0702M5	48012067002
Q0703M5	4802246J29
Q0704M5	4816548H01
Q0875M5	4813970A62
Q0876M5	4816134H01
Q0900M5	4815272H01
Q3000M5	0105959T72
Q3001M5	0105959T72
Q3002M5	4813973B01
R0000M2	0613952R66
R0001M2	0613952R66
R0006M2	0613952Q25
R0007M2	0613952Q46
R0008M2	0613952R01
R0009M2	0613952Q51
R0010M2	0613952R66
R0011M2	0613952Q35
R0012M2	0613952Q81
R0013M2	0613952Q35
R0014M2	0613952R66
R0015M2	0613952R66
R0019M2	0613952R01
R0022M2	0613952R66
R0025M2	0613952R66
R0029M2	0613952Q25
R0030M2	0613952R66
R0044M2	0613952R25
R0054M2	0613952M25
R0200M7	0613952R66
R0202M7	0613952Q42
R0203M7	0613952Q32
R0204M7	NOT PLACED
R0205M7	0613952H37
R0206M7	NOT PLACED
R0207M7	0613952Q86
R0208M7	0613952G67
R0209M7	0613952Q85
R0211M7	0613952Q18
R0213M7	0613952Q67
R0215M7	0613952Q67
R0217M7	0613952Q49
R0220M7	0613952R66
R0221M7	0613952R66
R0222M7	0613952Q78
R0223M7	0613952Q73
R0224M7	0613952Q73
R0225M7	0613952Q73
R0226M7	NOT PLACED
R0227M7	0613952G67

Circuit Ref.	Motorola Part No.
R0228M7	0613952Q67
R0230M7	0613952Q67
R0232M7	0613952Q49
R0233M7	0613952R66
R0300M7	0613952Q66
R0301M7	0613952Q25
R0302M7	0613952Q66
R0303M7	0613952Q94
R0304M7	0613952Q89
R0305M7	0613952Q33
R0306M7	0613952Q49
R0307M7	0613952H46
R0308M7	0613952Q49
R0309M7	0613952Q42
R0400M4	0613952Q38
R0401M4	0613958H68
R0402M4	0613952R25
R0403M4	0613952R01
R0404M4	0613952R25
R0405M4	0613952Q72
R0406M4	0613952Z43
R0407M4	0613952Q73
R0408M4	0613952Q88
R0409M4	NOT PLACED
R0410M4	0613952R01
R0411M4	0613952Q69
R0412M4	0613952Q67
R0413M4	0613952Q75
R0414M4	0613958H69
R0415M4	0613952Q69
R0416M4	0613952R25
R0417M4	0613952Q69
R0418M4	0613952H73
R0419M4	0613952Q53
R0420M4	0613952H73
R0421M4	0613952Q69
R0422M4	0613952Q53
R0423M4	0613952Q77
R0424M4	0613952Q77
R0425M4	0613952N37
R0426M4	0613958H69
R0427M4	0613952N01
R0428M4	NOT PLACED
R0429M4	0613952R66
R0430M4	0613952N46
R0431M4	0613952Z48
R0432M4	0613952Q67
R0433M4	NOT PLACED
R0434M4	0613952Q23
R0435M4	0613952Q67
R0436M4	0613952R66
R0437M4	NOT PLACED

Circuit Ref.	Motorola Part No.
R0438M4	0613952R66
R0439M4	NOT PLACED
R0440M4	0613952L46
R0441M4	NOT PLACED
R0442M4	0613952K25
R0443M4	0613952L46
R0444M4	0613952Q78
R0445M4	0613952Q46
R0448M4	0613952Q35
R0700M5	0613952J01
R0701M5	0613952G67
R0702M5	0613952H49
R0703M5	0613952J01
R0704M5	0613952J01
R0705M5	0613952H50
R0706M5	0613952H44
R0707M5	0613952H50
R0708M5	NOT PLACED
R0709M5	0613958S49
R0710M5	0613959Q42
R0711M5	0613958S44
R0712M5	0613958S44
R0713M5	0613958S49
R0714M5	0613952H42
R0715M5	0613952H42
R0716M5	0613952H42
R0717M5	0613952H42
R0718M5	0613952H96
R0719M5	0613952H89
R0720M5	0613952J01
R0721M5	0613952G67
R0722M5	NOT PLACED
R0723M5	0613952G67
R0724M5	0613958S49
R0725M5	0613958S49
R0726M5	0613958S49
R0727M5	0613952N43
R0728M5	0613958J49
R0729M5	0613958J49
R0730M5	0613958S49
R0731M5	0613958S49
R0732M5	0613958S49
R0733M5	0613958S49
R0734M5	0613958S49
R0735M5	NOT PLACED
R0736M5	0613959Q25
R0739M5	0613952H73
R0742M5	NOT PLACED
R0743M5	0613952J17
R0744M5	NOT PLACED
R0745M5	0613952R66
R0746M5	0613952J25

Circuit Ref.	Motorola Part No.
R0747M5	NOT PLACED
R0749M5	0613952H41
R0750M5	0613952H37
R0759M5	0613959H12
R0849M5	NOT PLACED
R0876M5	0613958S73
R0877M5	0613959Y37
R0878M5	0613959Y37
R0879M5	0613952J25
R0882M5	0613952G67
R0883M5	0613952G67
R0902M5	0613952R66
R0903M5	0613952N01
R0904M5	0613952R66
R0905M5	0613952H42
R0906M5	0613958H49
R0907M5	0613958H56
R0908M5	0613958H32
R0909M5	0613952R66
R0910M5	0613952H91
R0911M5	0613952H85
R0912M5	0613958H49
R0913M5	0613952M51
R0914M5	0613952M71
R0915M5	NOT PLACED
R0916M5	0613952R66
R0917M5	0613952P01
R0919M5	0613952P01
R0920M5	0613952N01
R0921M5	0613952N01
R0922M5	0613952R66
R0923M5	0613952M43
R0924M5	0613952N09
R0928M5	0613952P30
R0929M5	0613952N81
R0930M5	0613952Z61
R0931M5	0613952Z26
R0932M5	0613952N51
R0933M5	0613952M66
R0934M5	0613952J17
R0935M5	0613952H91
R0936M5	0613952H91
R0937M5	NOT PLACED
R0938M5	0613952R66
R0939M5	0613952R66
R0940M5	0613952Z76
R0949M5	0613952G67
R0950M5	0613952G67
R0951M5	0613958H55
R0952M5	0613958H53
R0953M5	0613952G67
R0954M5	0613952H39

Circuit Ref.	Motorola Part No.
R0955M5	0613952H39
R0956M5	0613952G67
R0957M5	0613958H53
R0958M5	0613958H53
R0959M5	0613952R66
R0960M5	0613952N58
R0961M5	0613952N58
R0962M5	0613952N58
R0965M5	0613952P01
R3000M5	0613952H60
R3001M5	0615871H01
R3002M5	0615871H01
R3003M5	0615871H01
R3004M5	0615871H01
R3005M5	0613952H25
R3006M5	0613952H25
R3007M5	0613952M30
R3008M5	0613952G67
R3009M5	0613952M43
R3010M5	0613952G67
R3011M5	0613959Q60
R3012M5	0613959Q60
R3013M5	0613952R01
R3014M5	0613952R01
R3015M5	0615871H01
R3018M5	0613952H73
R3019M5	0613952H60
R3020M5	0613952G67
R3021M5	0613952R25
RT0900M5	0615585H01
SH0000M2	26012095001
SH0001M2	26012095001
SH0003M2	26012094001
SH0200M7	26012231001
SH0201M7	26012231001
SH0400M4	26012231001
SH0401M4	26012231001
SH0850M5	26012100001
SH0900M5	2686425Z02
SH0901M5	2686425Z02
T0000M2	25012016001
U0000M2	51009686002
U0200M7	5186310Y39
U0400M4	5180390L83
U0401M4	5186310Y39
U0402M4	5186310Y39
U0901M5	5180390L83
U0902M5	51012221001
U0903M5	5115022H01
U0904M5	5109731C48
U3000M5	5116525H01
U3001M5	4813973M07

Circuit Ref.	Motorola Part No.
U3002M5	NOT PLACED
VR0200M7	48012260001
VR0201M7	4805656W87
VR0205M7	4805656W87
VR0206M7	48012260001
VR0210M7	4805656W87
VR0211M7	4805656W87
VR0214M7	4805656W87
VR0215M7	4805656W87
VR0400M4	4805656W87
VR0401M4	4805656W87
VR0402M4	4805656W87
VR0403M4	4805656W87
VR3000M5	48012202001
VR3002M5	4813977M10
Y0000M2	4875185M05

Note: The suffix “M1”, “M2”, etc. from the Circuit Ref is removed from the schematic and overlays.



XiRTM M3188/XiRTM M3688

Mobile Radios

Chapter 6

VHF (136–174 MHz)

25–45W

Service Information

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Chapter 6 – VHF High Power Service Information

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Section 2 VHF PCB/Schematics/Parts Lists

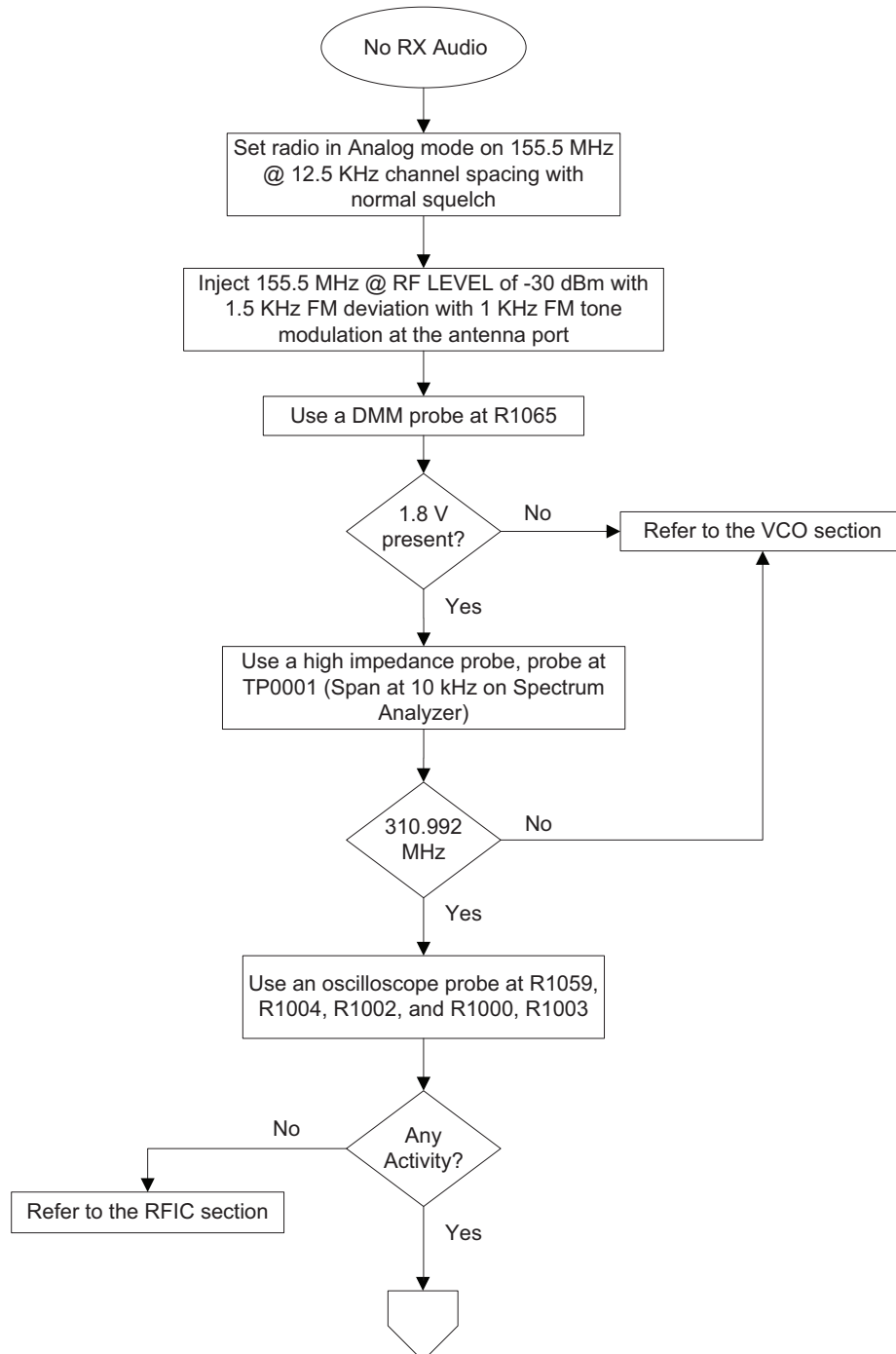
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Notes

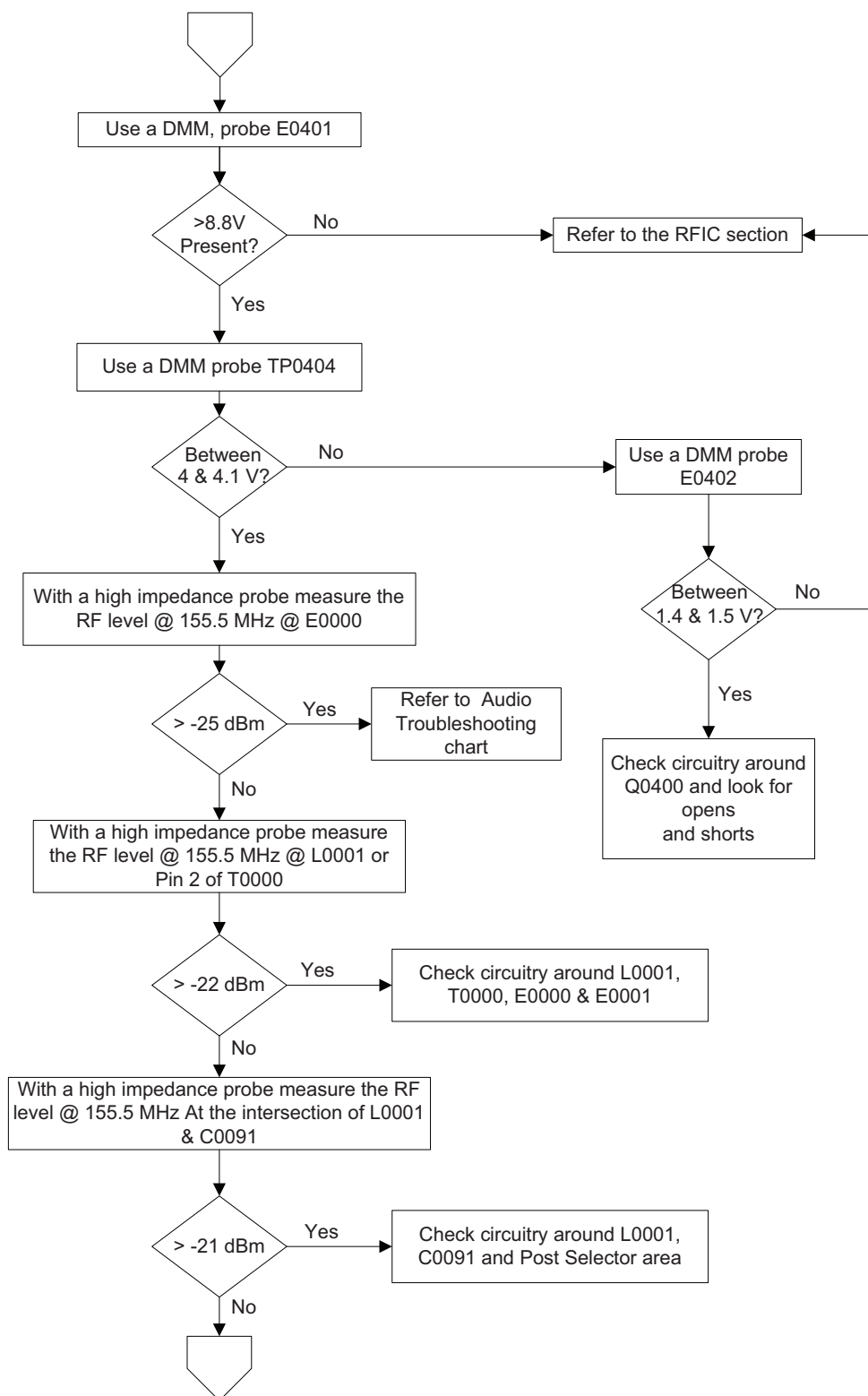
Section 1

TROUBLESHOOTING CHARTS

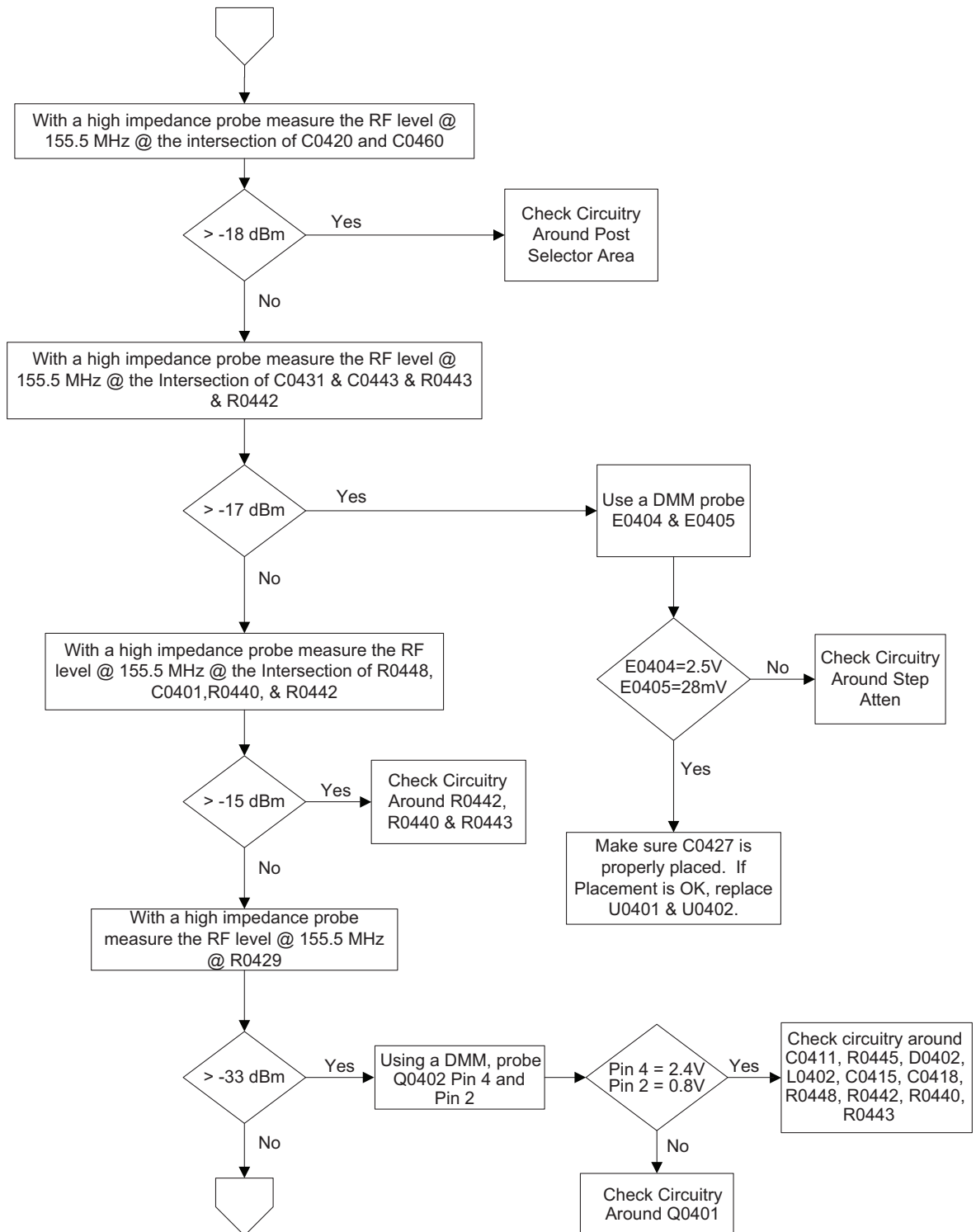
1.0 Troubleshooting Flow Chart for Receiver (Sheet 1 of 4)



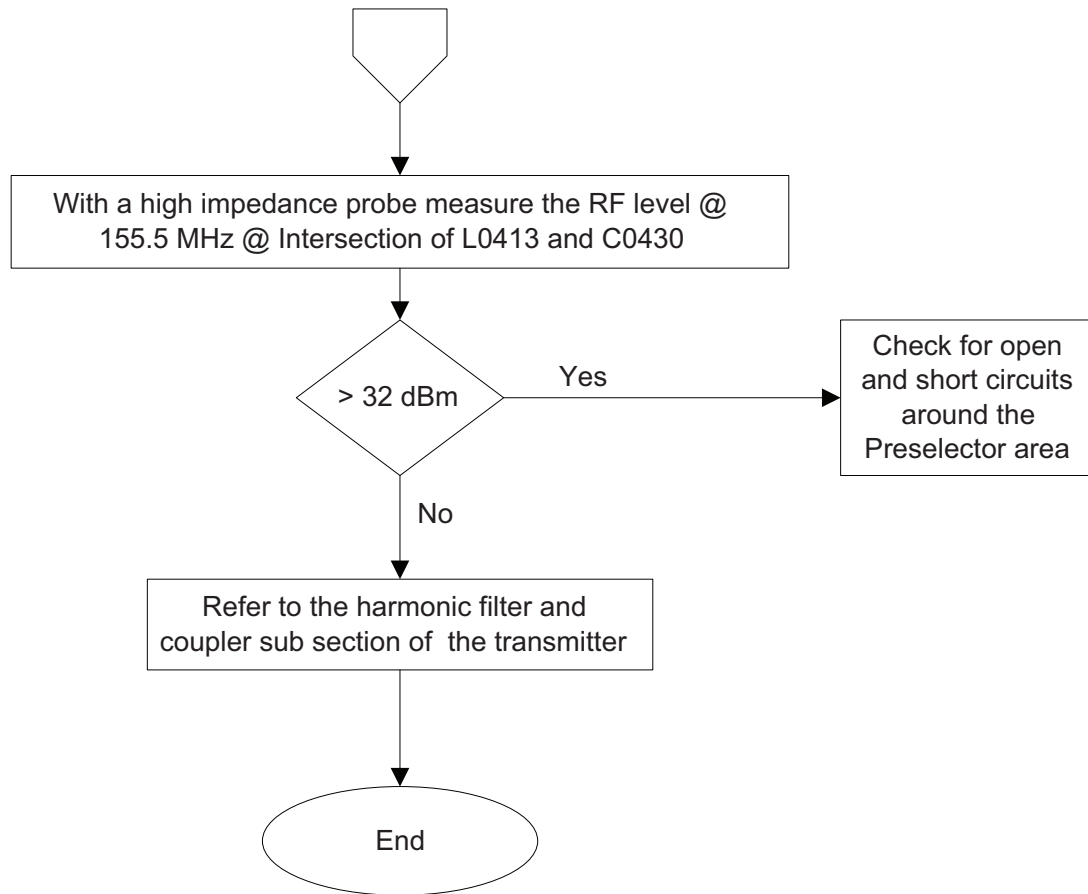
1.1 Troubleshooting Flow Chart for Receiver (Sheet 2 of 4)



1.2 Troubleshooting Flow Chart for Receiver (Sheet 3 of 4)

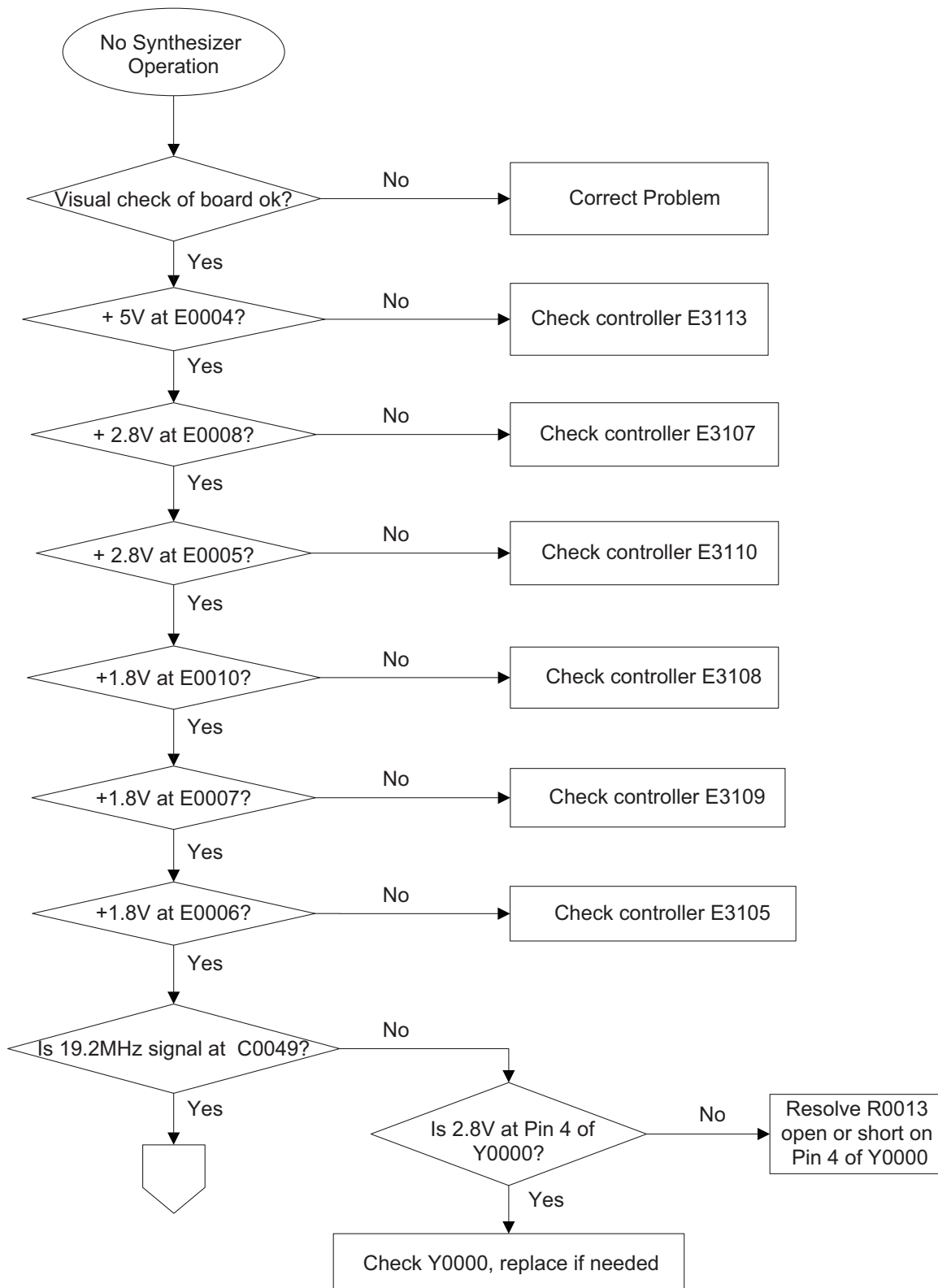


1.3 Troubleshooting Flow Chart for Receiver (Sheet 4 of 4)

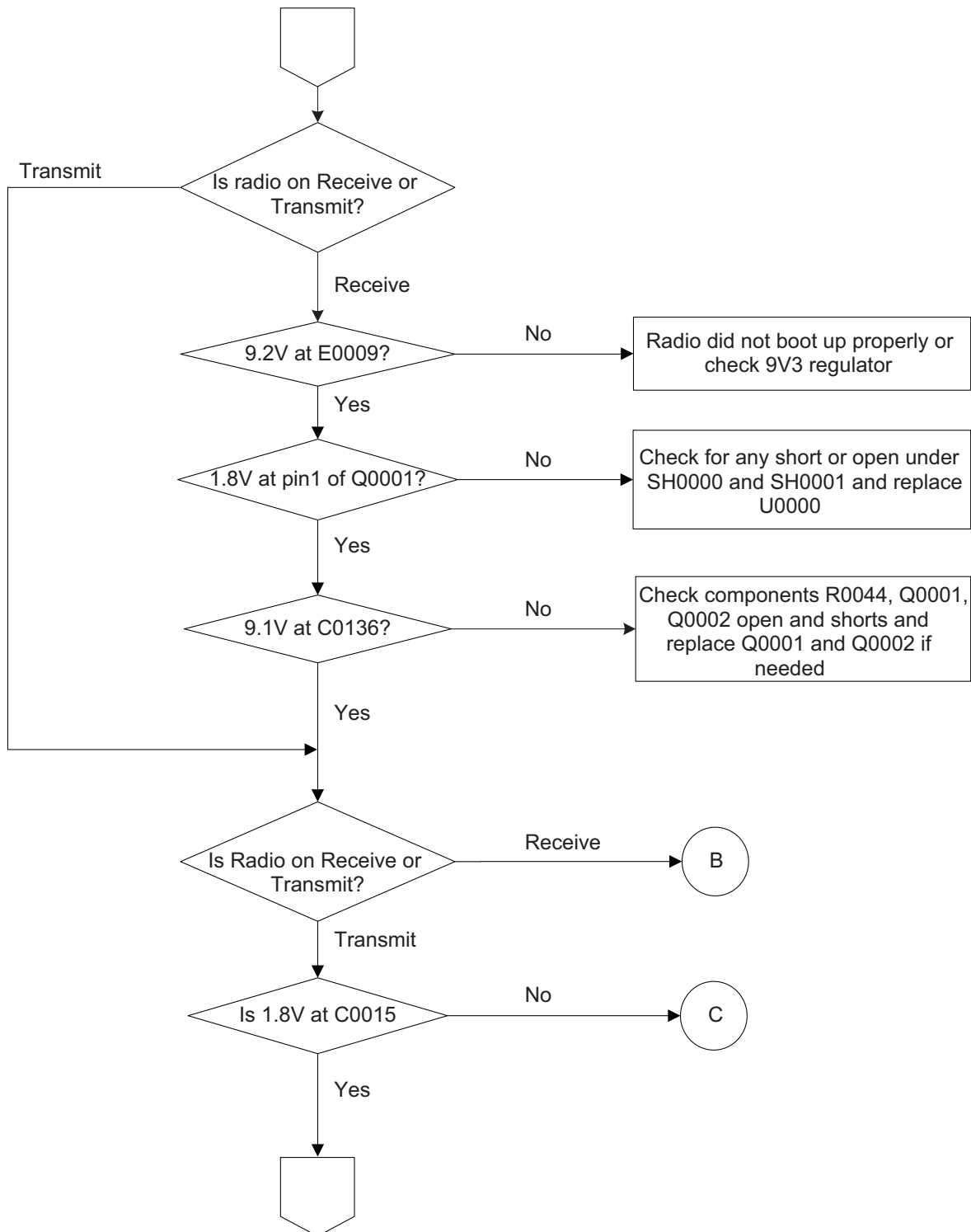




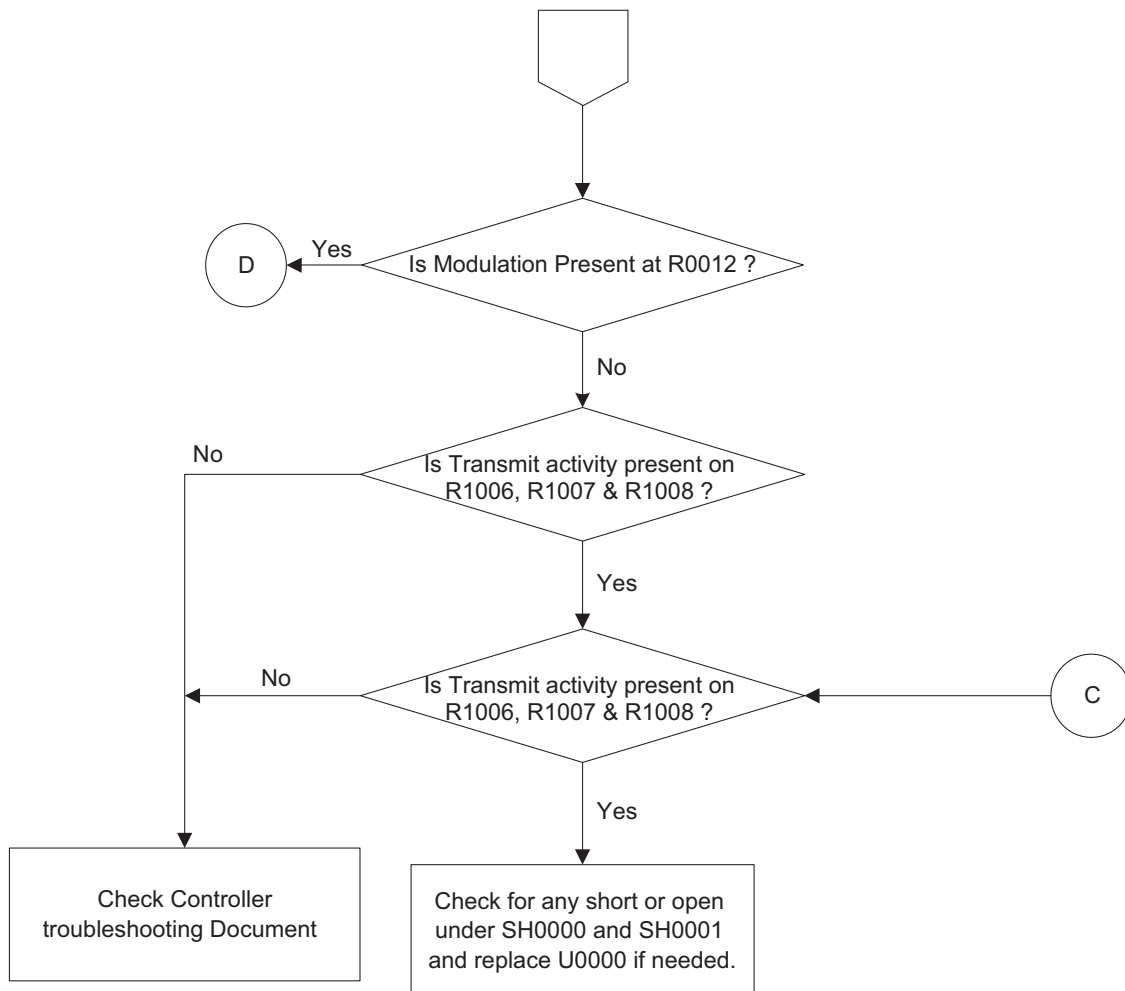
3.0 Troubleshooting Flow Chart for RFIC (Sheet 1 of 5)



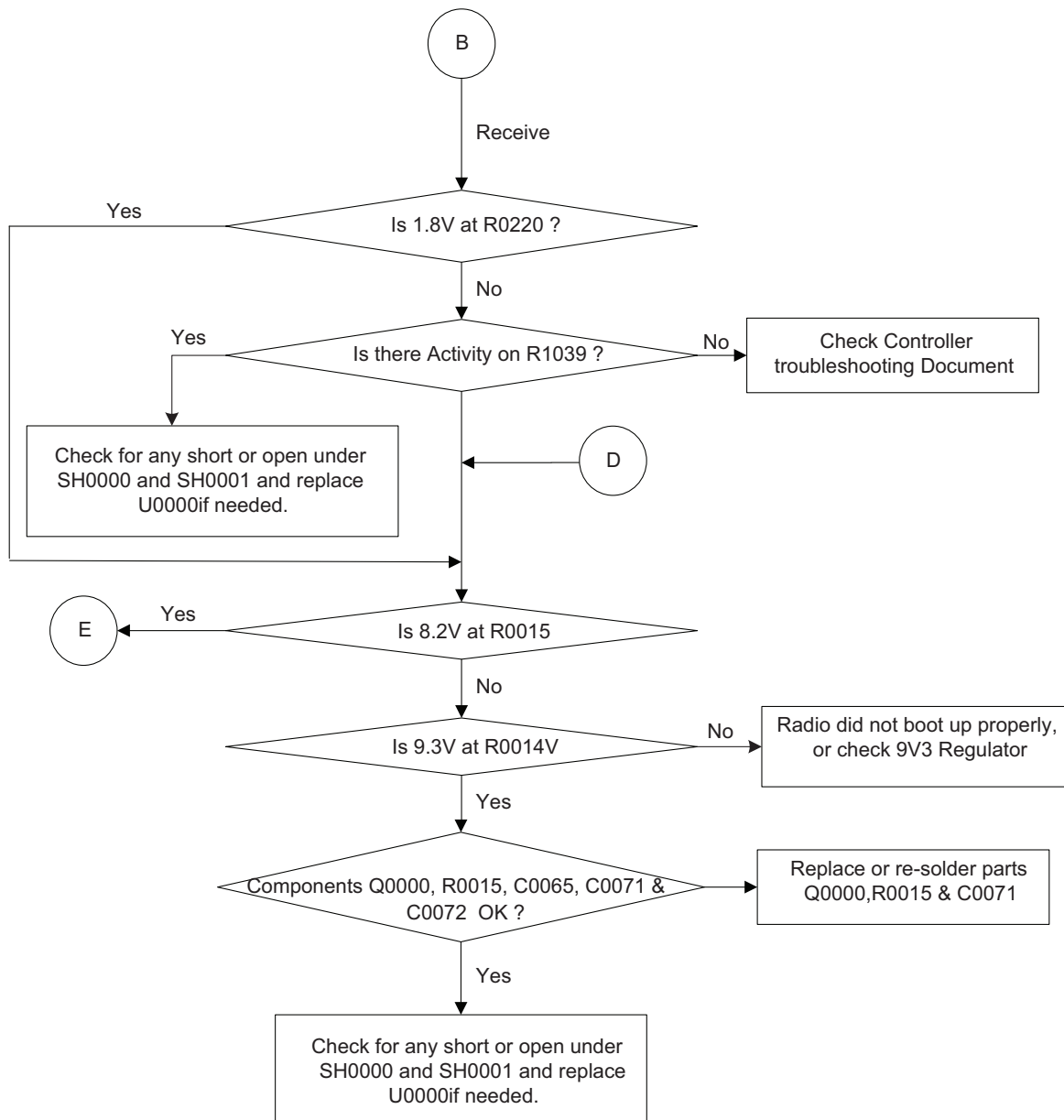
3.1 Troubleshooting Flow Chart for RFIC (Sheet 2 of 5)



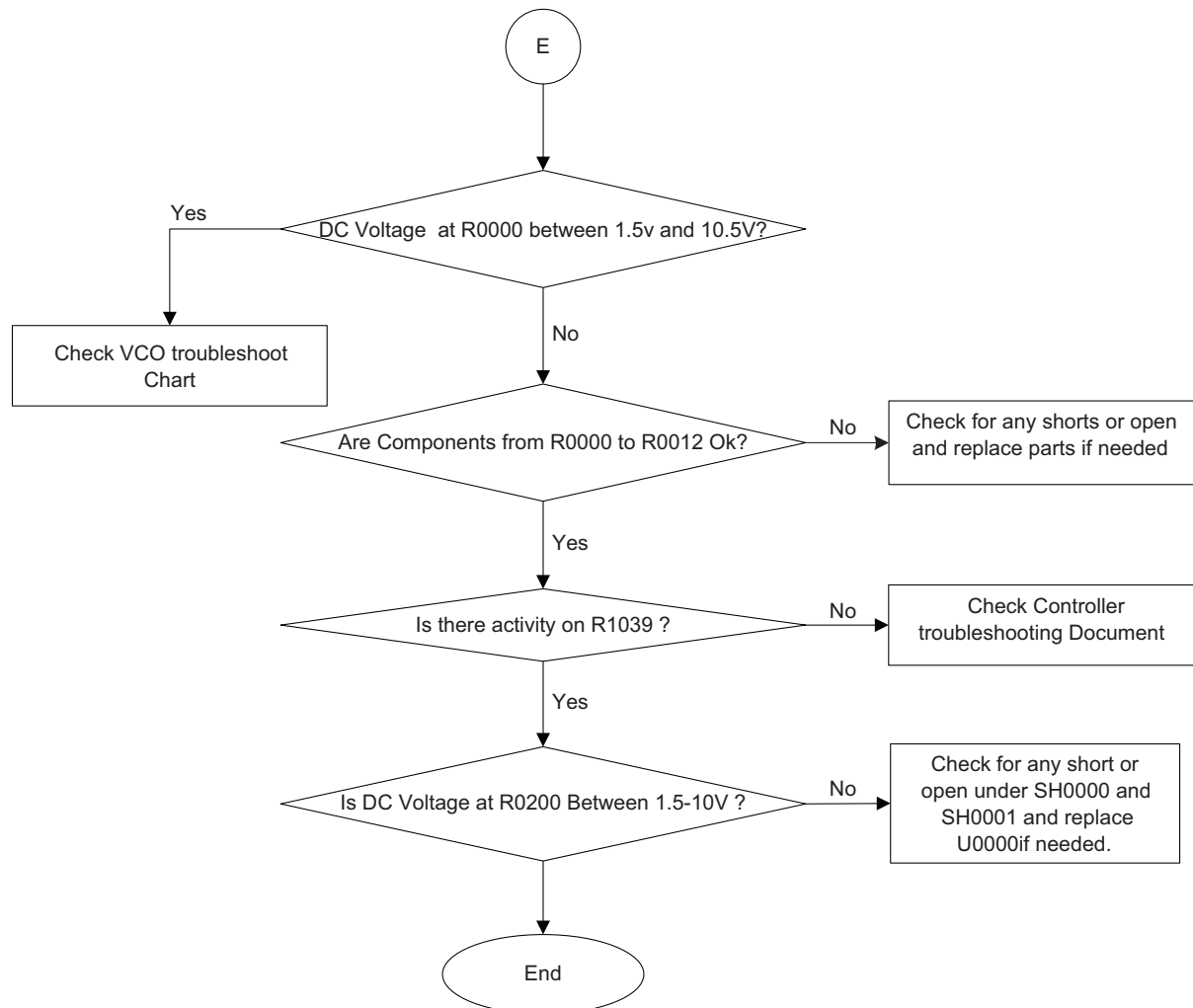
3.2 Troubleshooting Flow Chart for RFIC (Sheet 3 of 5)



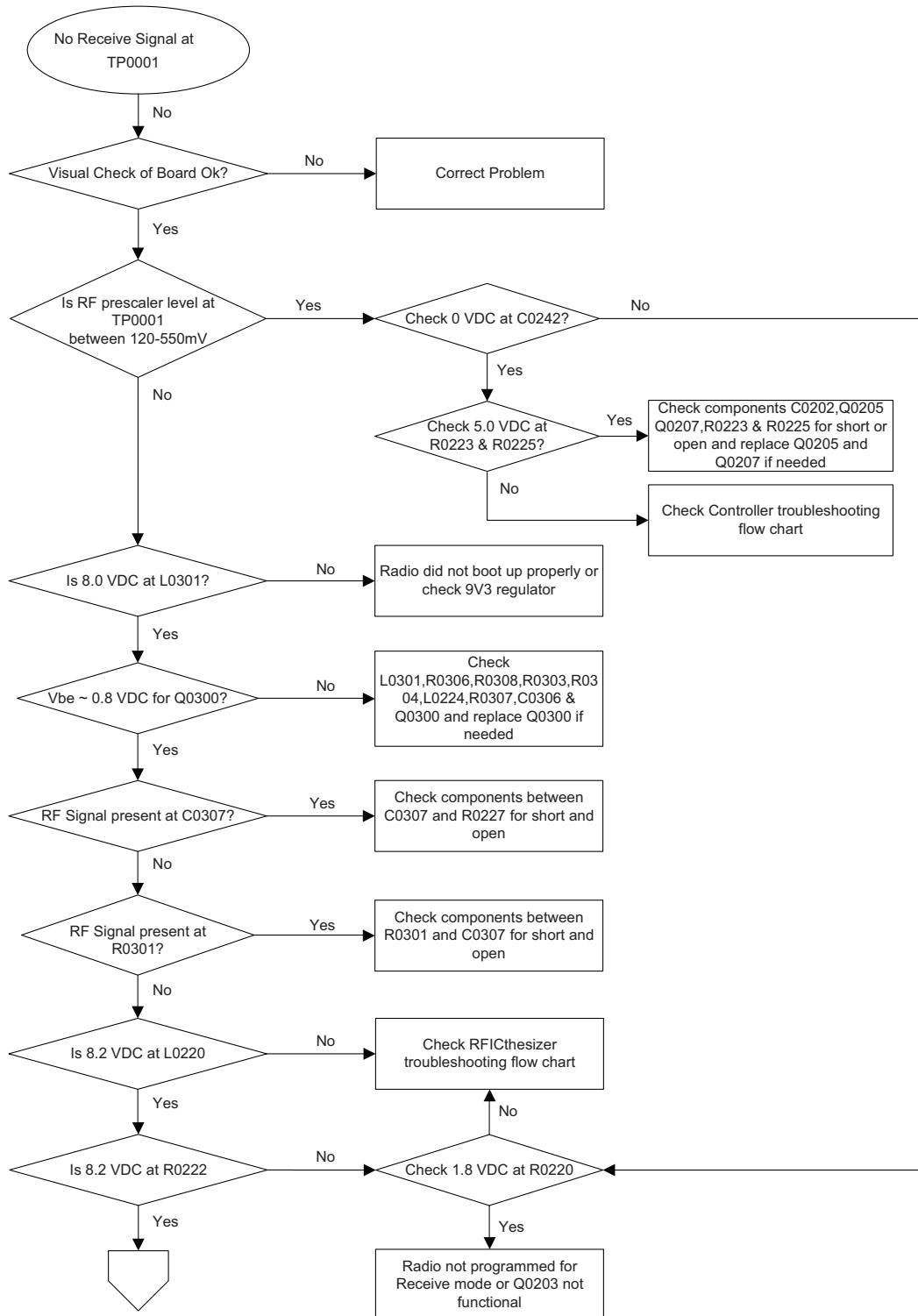
3.3 Troubleshooting Flow Chart for RFIC (Sheet 4 of 5)



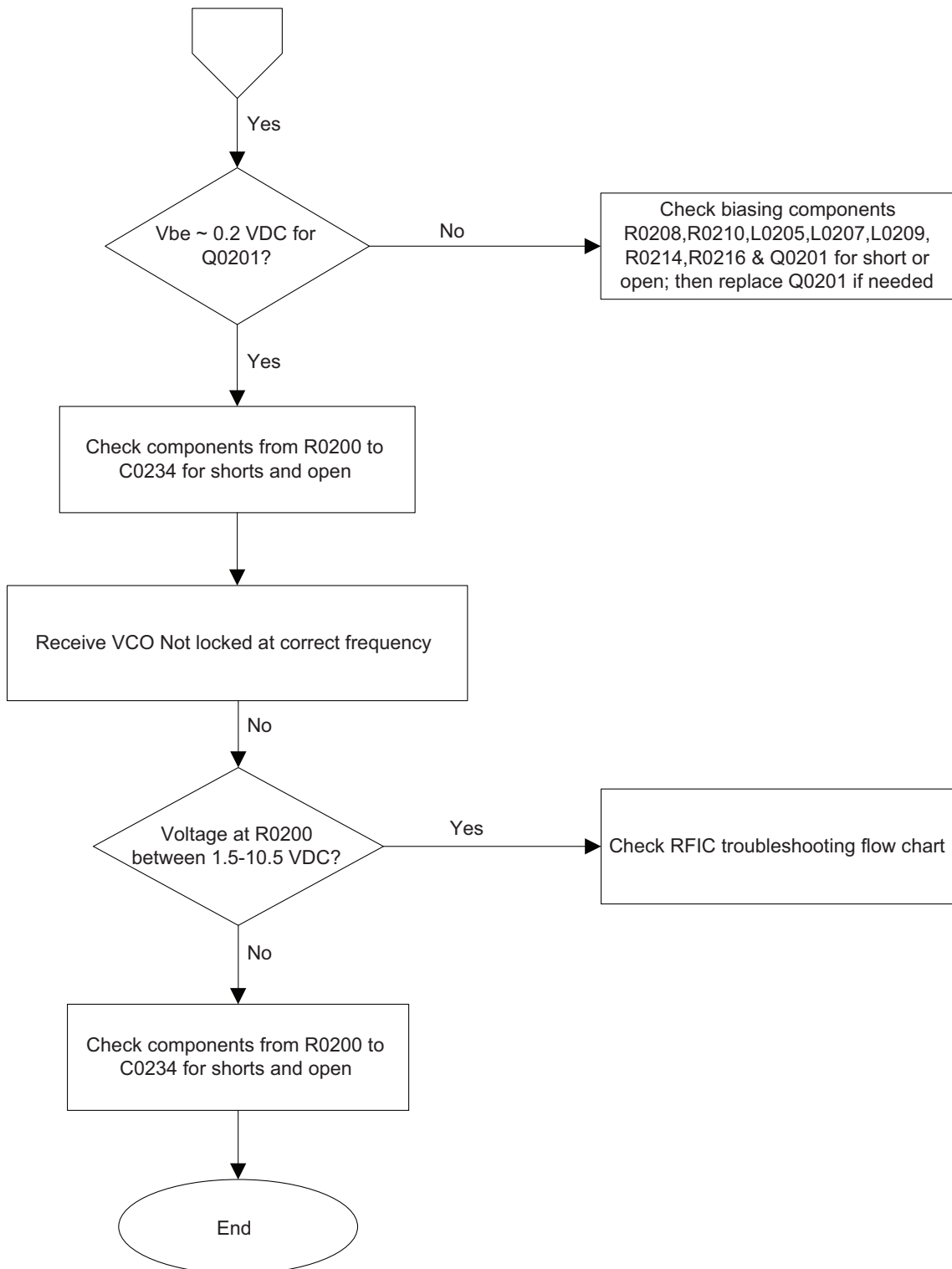
3.4 Troubleshooting Flow Chart for RFIC (Sheet 5 of 5)



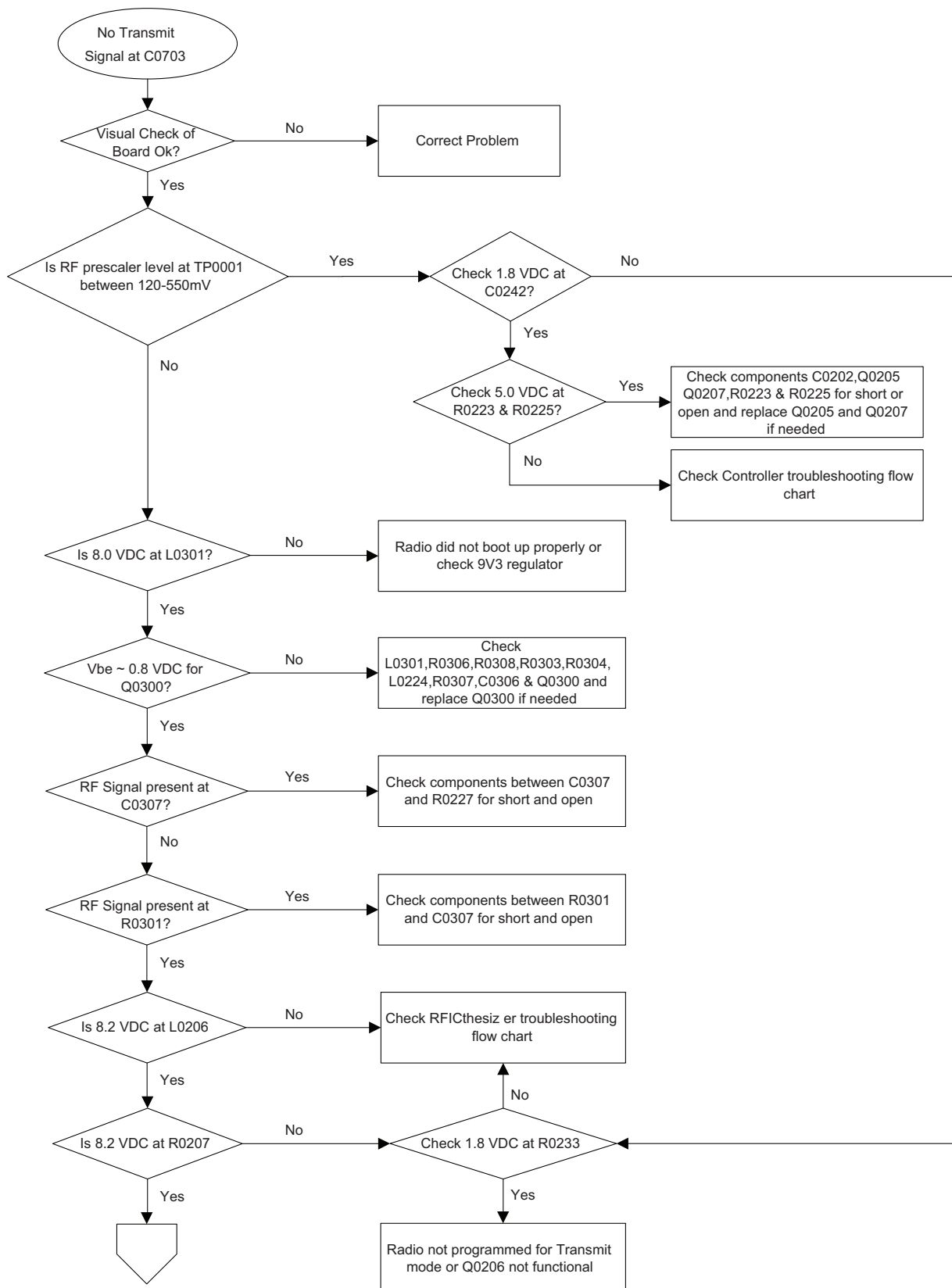
4.0 Troubleshooting Flow Chart for Rx VCO (Sheet 1 of 2)



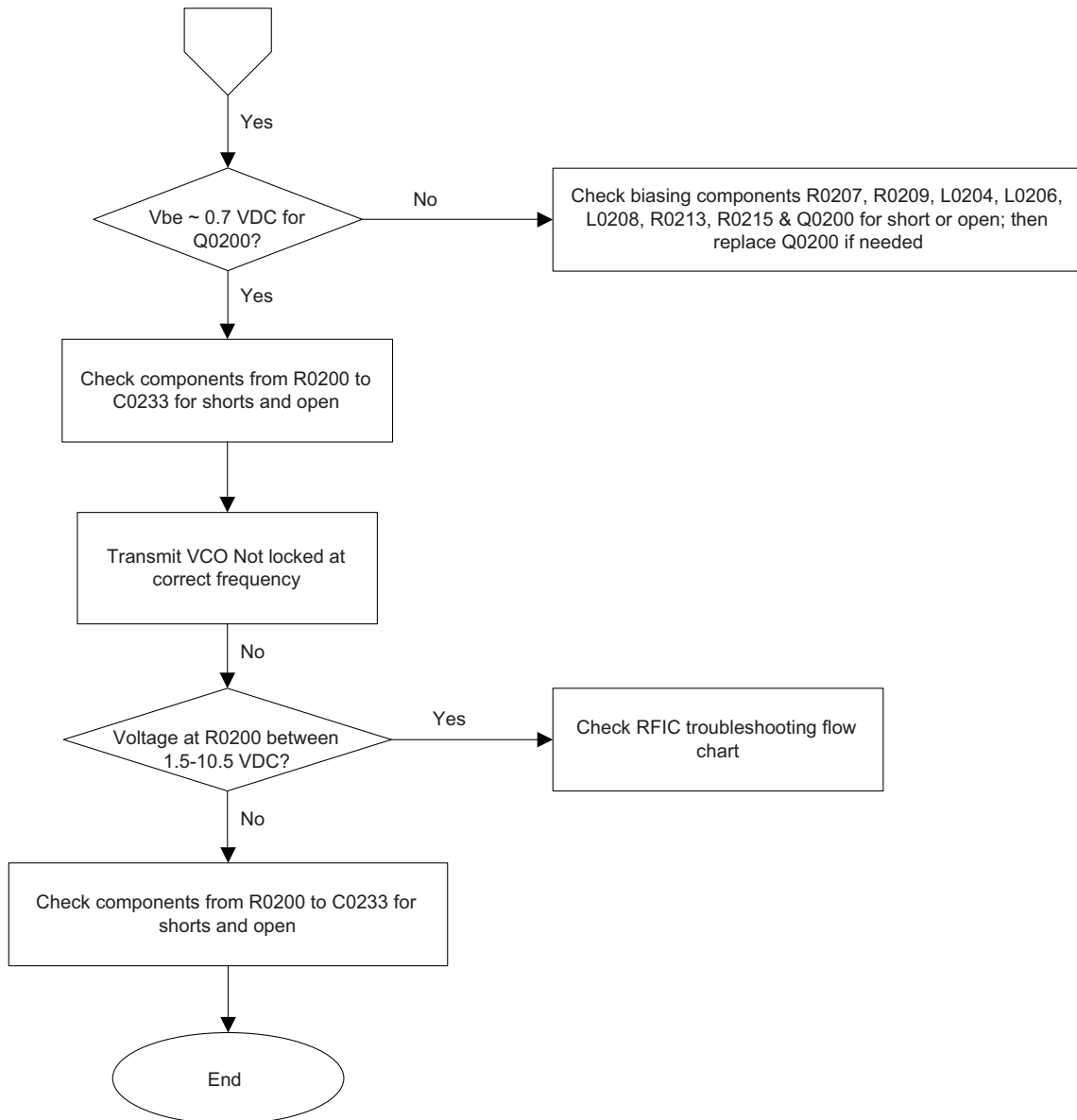
4.1 Troubleshooting Flow Chart for Rx VCO (Sheet 2 of 2)



5.0 Troubleshooting Flow Chart for Tx VCO (Sheet 1 of 2)



5.1 Troubleshooting Flow Chart for Tx VCO (Sheet 2 of 2)



Section 2

VHF PCB/SCHEMATICS/PARTS LISTS

1.0 Allocation of Schematics and Circuit Boards

1.1 VHF 45W Circuits

The VHF circuits are contained on the Printed Circuit Board (PCB) which also contains the Controller circuits. This chapter shows the schematics for the VHF 45W circuits only, refer to the Controller section for details of the related Controller circuits. The PCB component layouts and the Parts List in this chapter show both the Controller and VHF 45W circuit components. The VHF 45W schematics and the related PCB and parts list are shown in the table below.

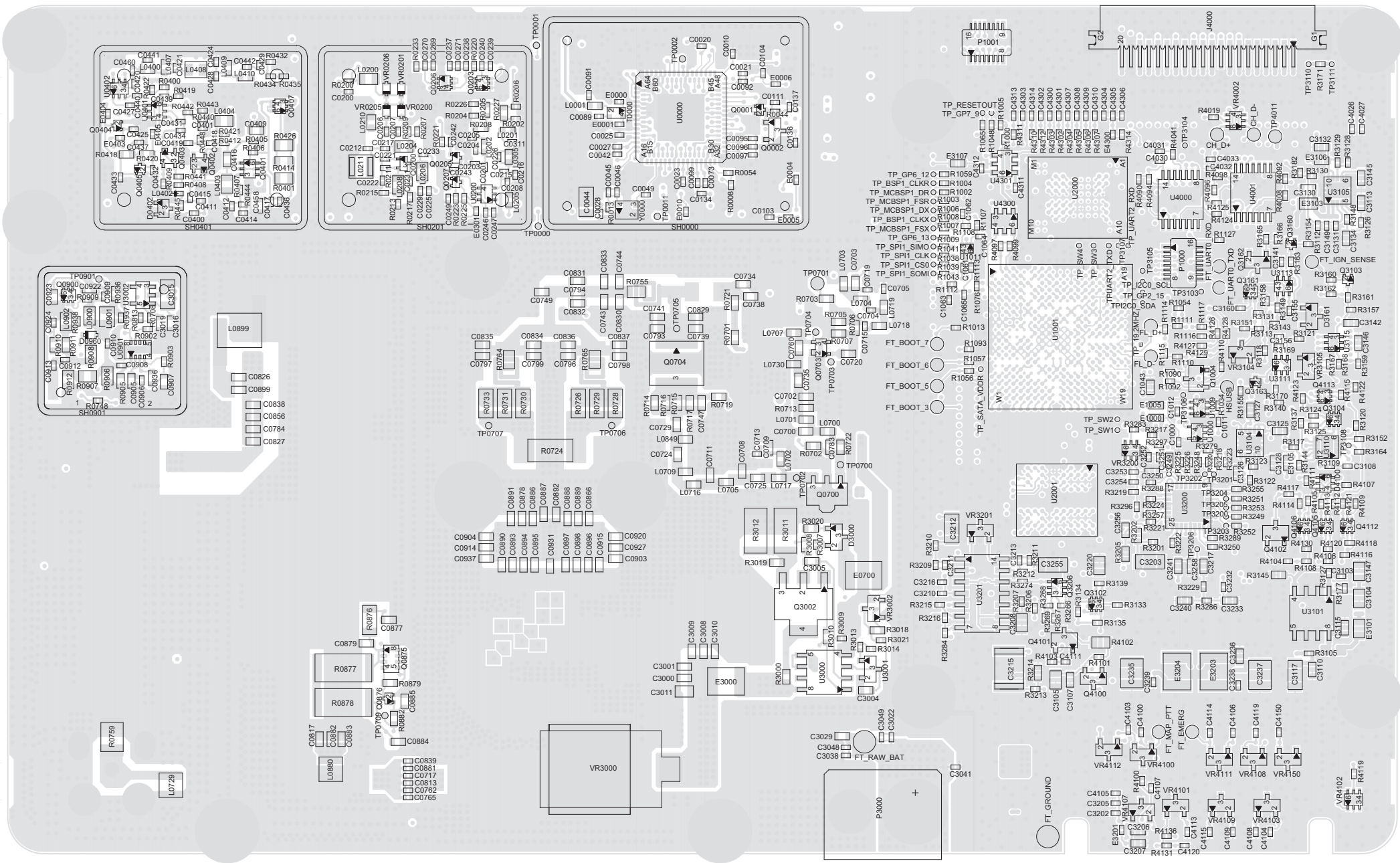
Table 2-1 VHF 25–45W Schematic Diagrams and Parts List

PCB: 84012505002-B Main Board Top Side 84012505002-B Main Board Bottom Side	Page 2-3 Page 2-4
SCHEMATICS Overall Receiver Front-End Transmitter Power Amplifier (sheet 1 of 2) Transmitter Power Amplifier (sheet 2 of 2) Transmit/Receive Switch and Harmonic Filter Power Control Transmitter Power Amplifier DC Distribution RFIC Transmitter VCO Receiver VCO VCO Buffer	Page 2-5 Page 2-6 Page 2-7 Page 2-8 Page 2-9 Page 2-10 Page 2-11 Page 2-12 Page 2-13 Page 2-14 Page 2-15
Parts List 84012505002-B (VHF 45W Only)	Page 2-16

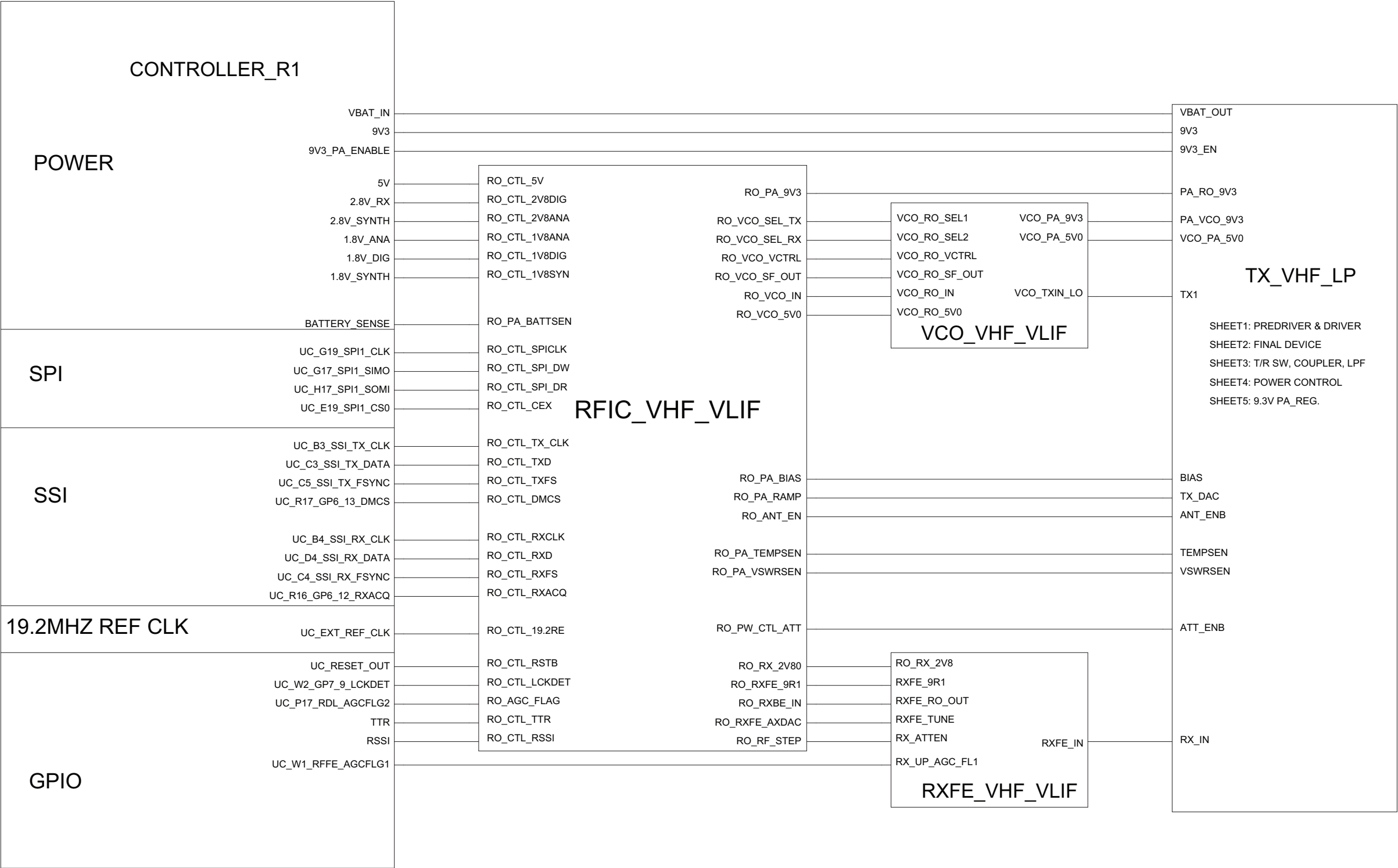
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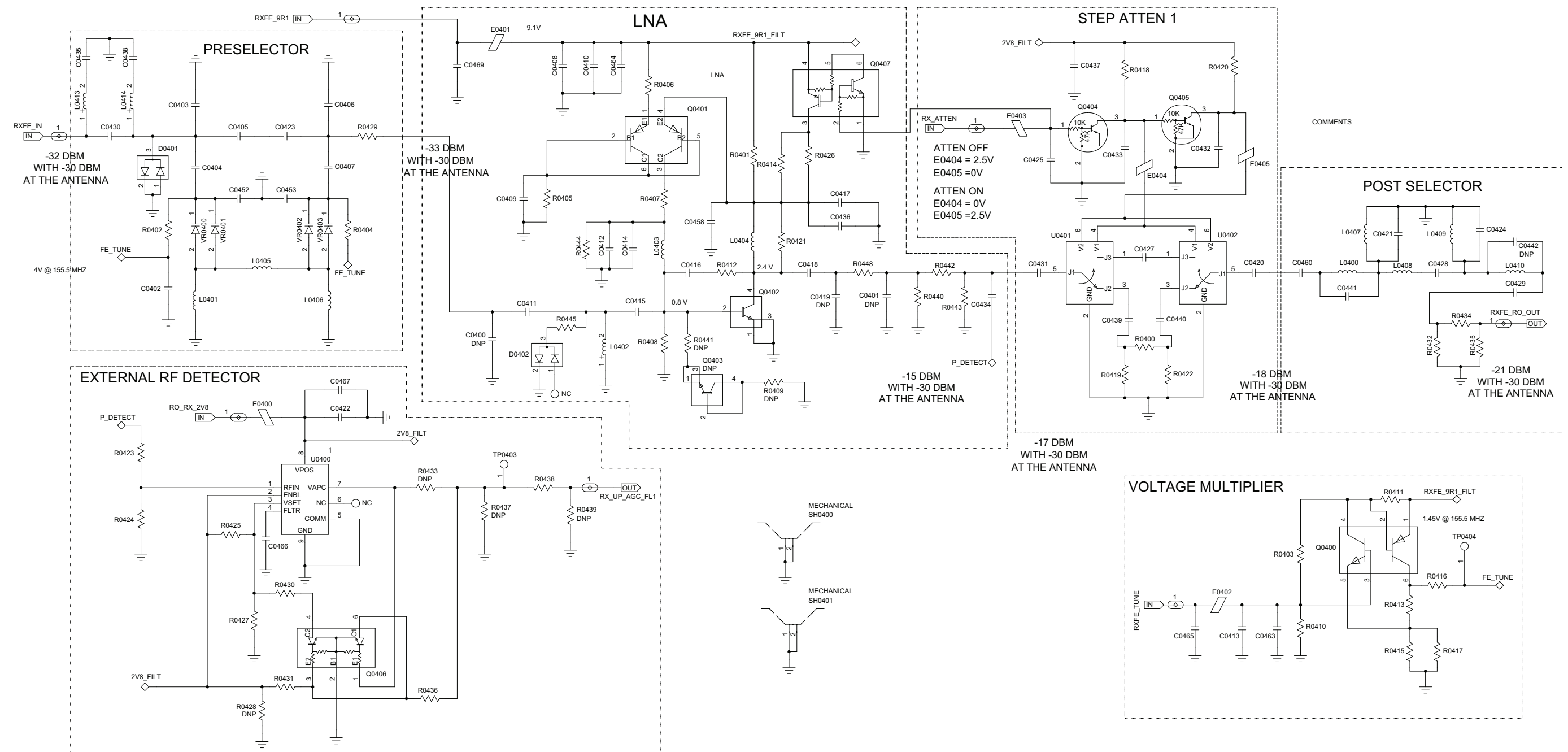
VHF (136–174 MHz) 25–45W 84012505002-B Top Side



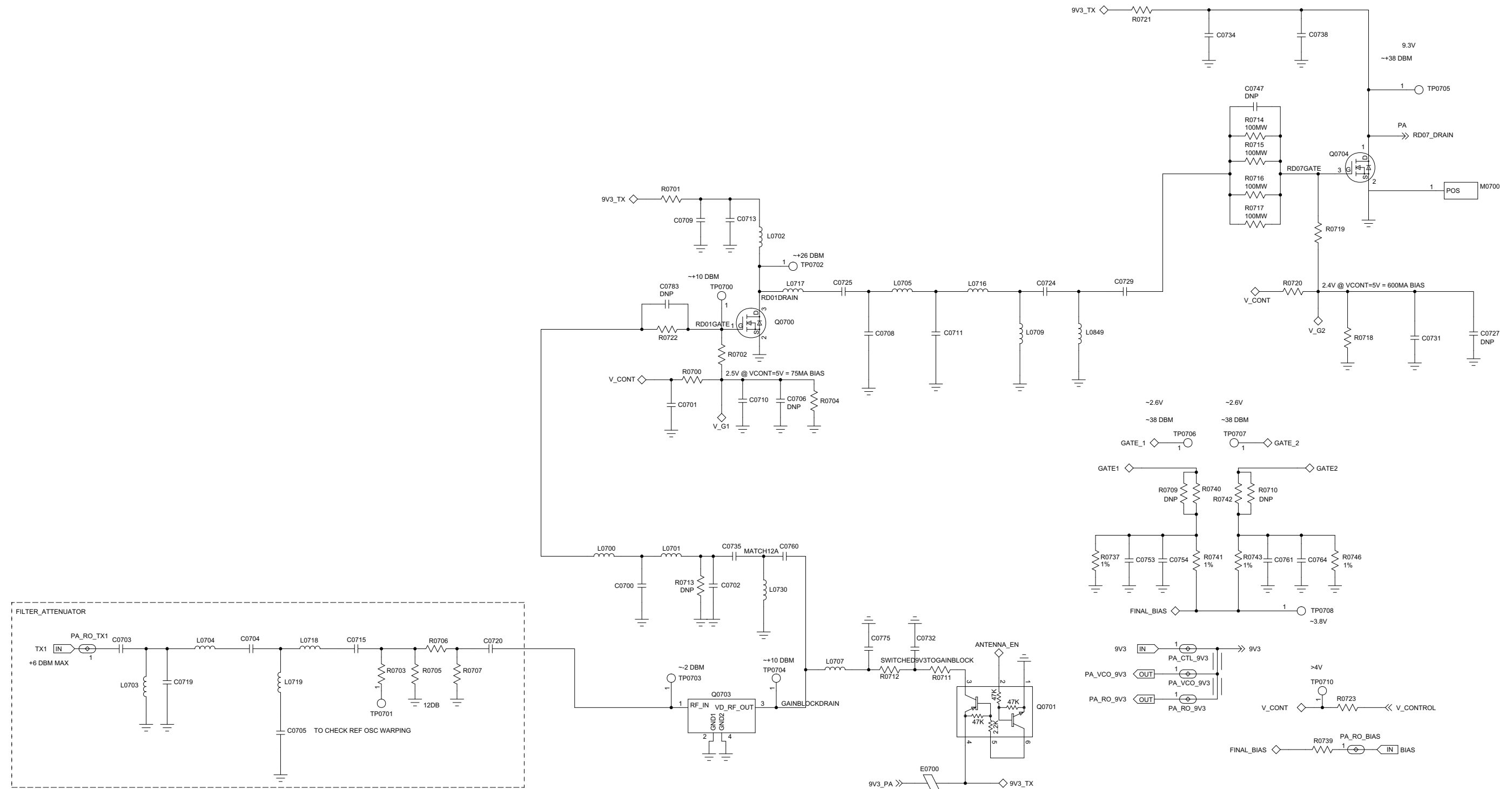
VHF (136–174 MHz) 25–45W 84012505002-B Bottom Side



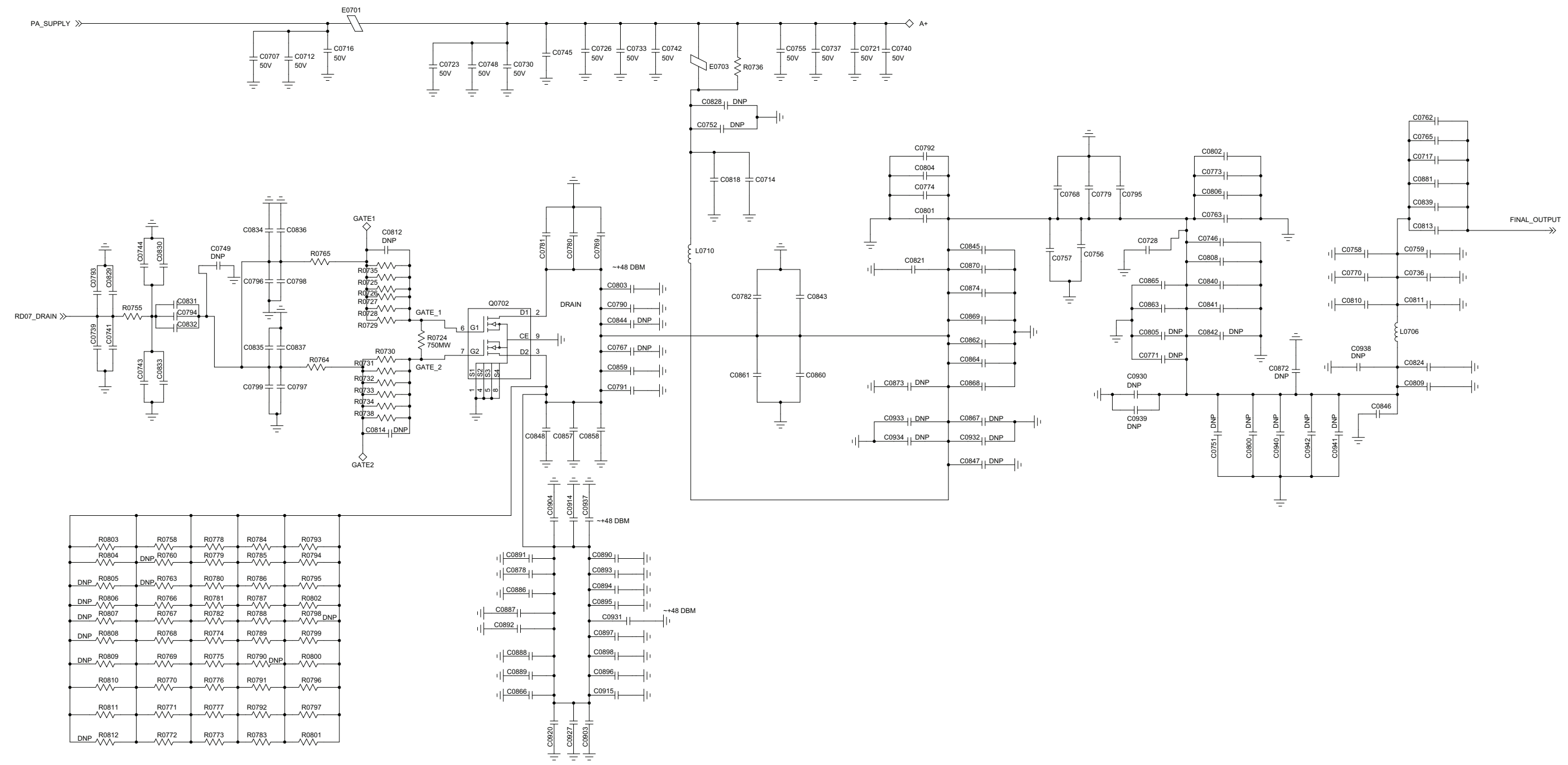
VHF (136–174 MHz) 25–45W Overall Schematic Diagram



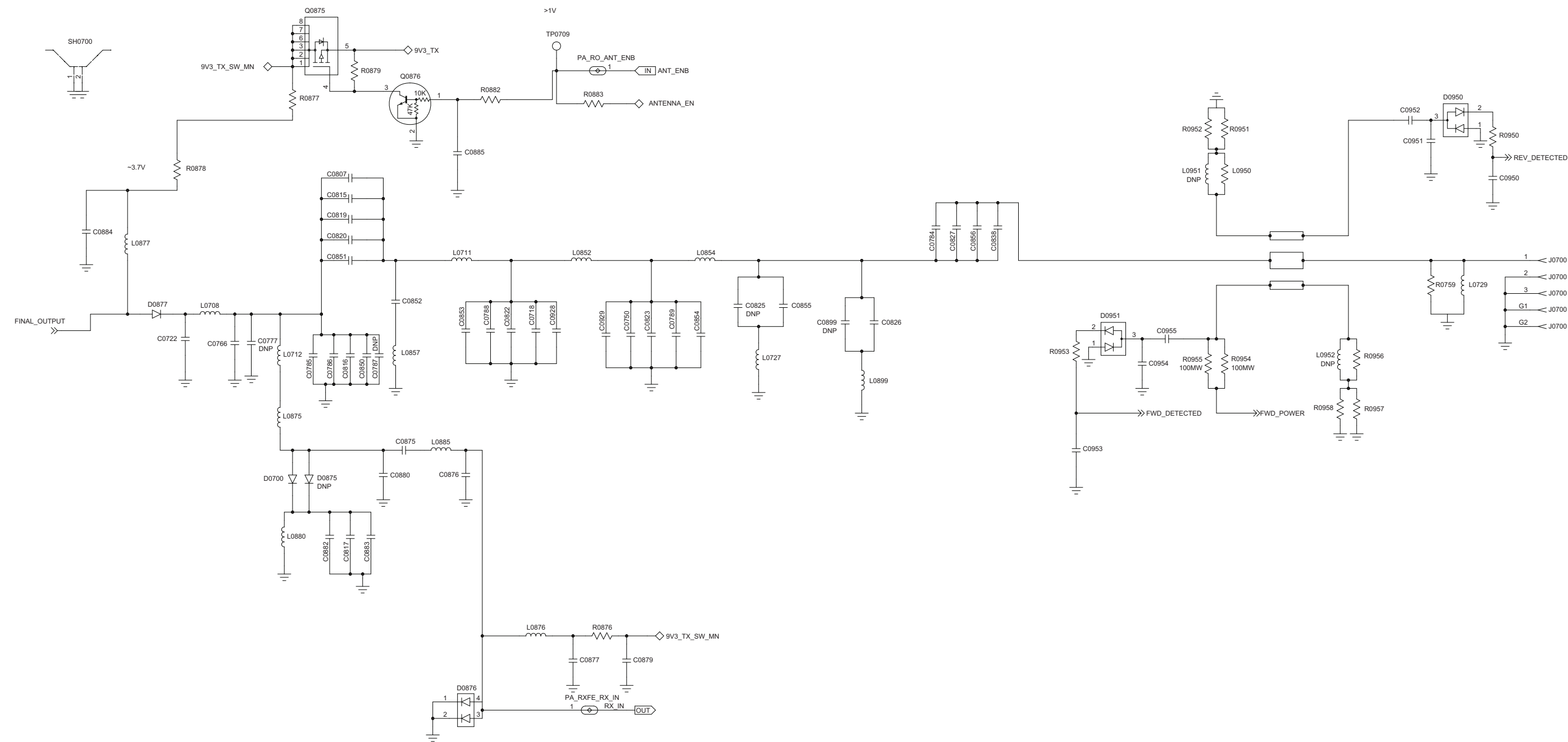
VHF (136–174 MHz) 25–45W Receiver Front-End Schematic Diagram



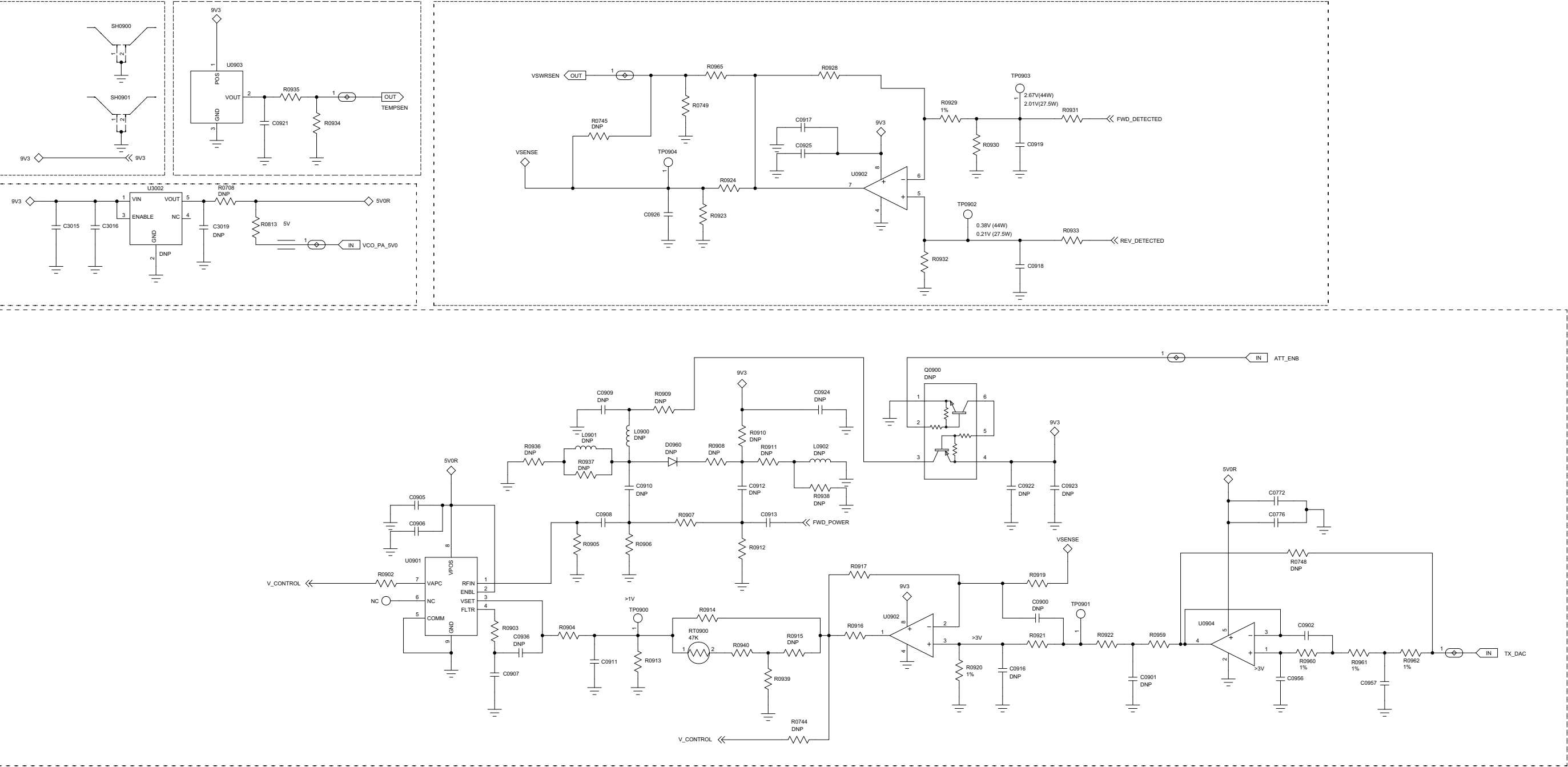
VHF (136–174 MHz) 25–45W Transmitter Power Amplifier Schematic Diagram (sheet 1 of 2)



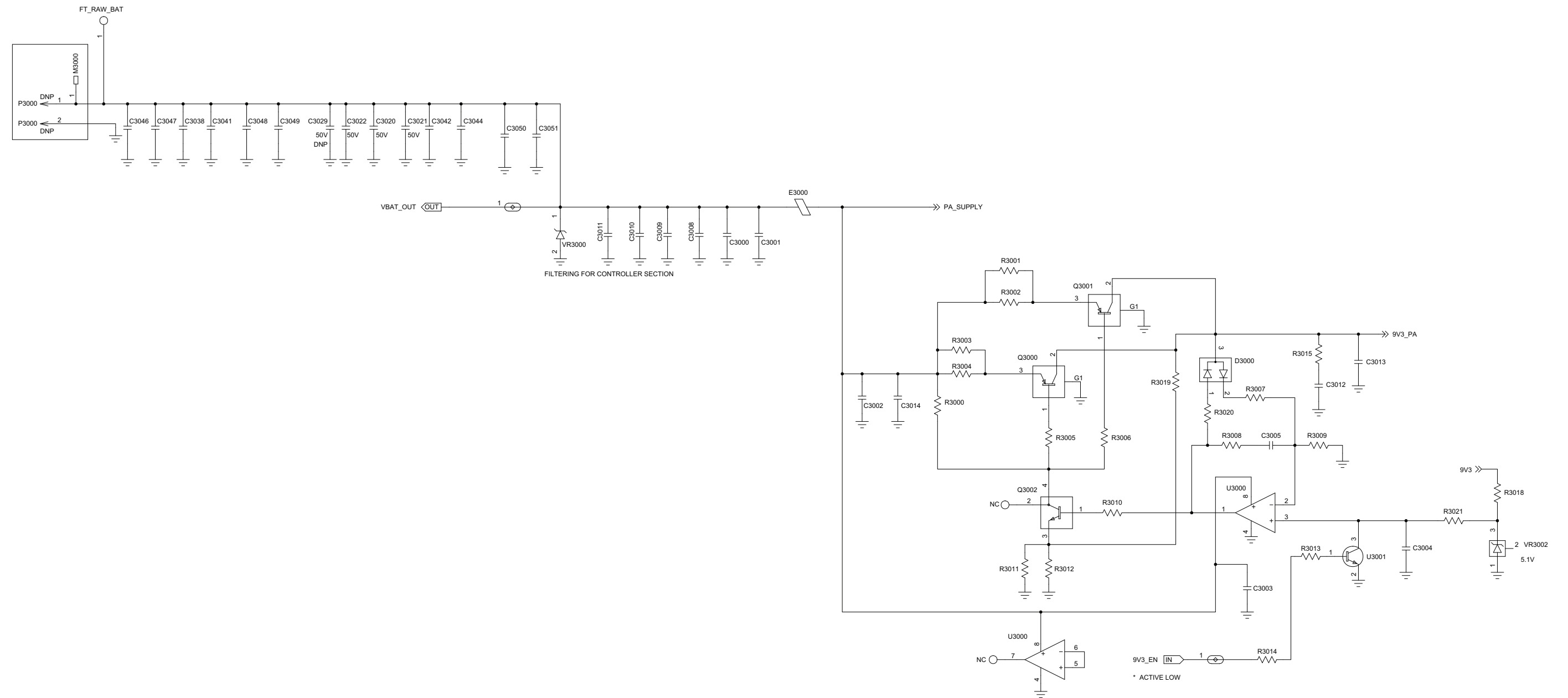
VHF (136–174 MHz) 25–45W Transmitter Power Amplifier Schematic Diagram (sheet 2 of 2)



VHF (136–174 MHz) 25–45W Transmit/Receive Switch and Harmonic Filter Schematic Diagram

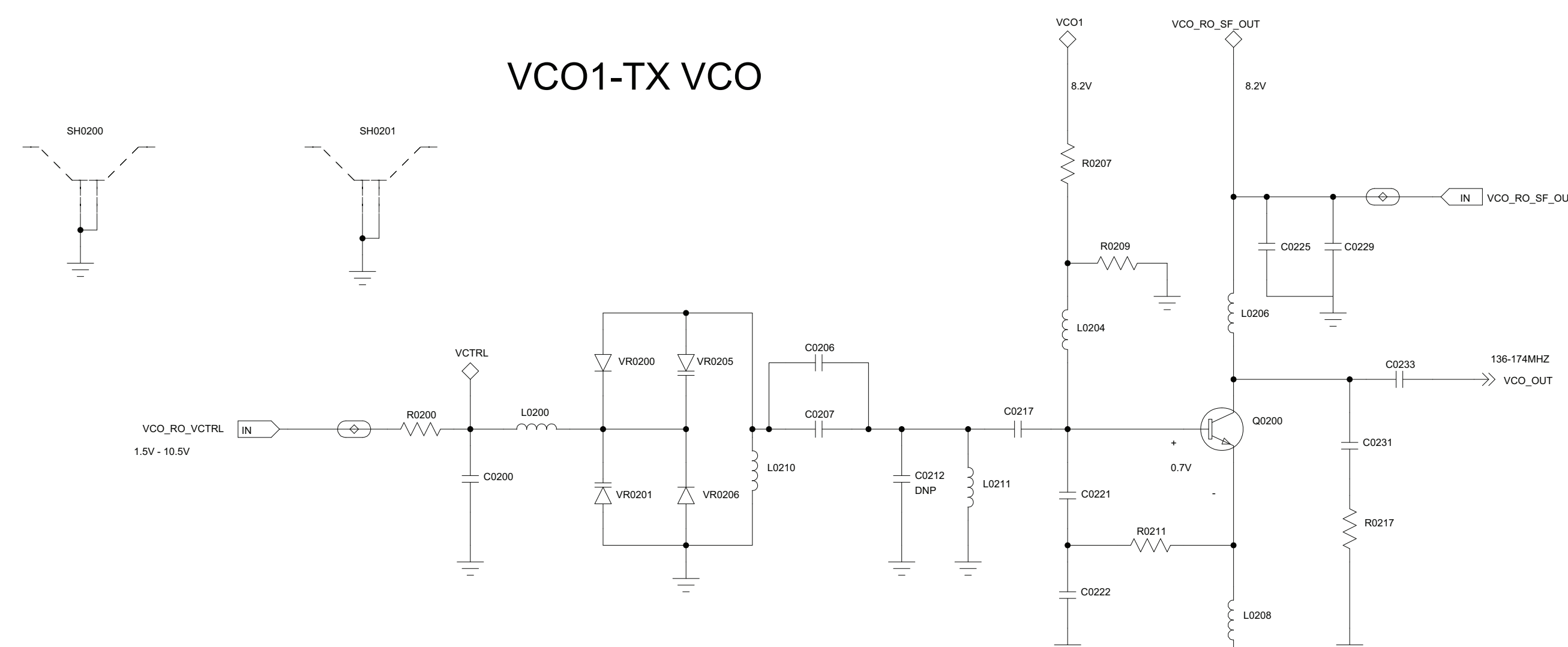


VHF (136–174 MHz) 25–45W Power Control Schematic Diagram

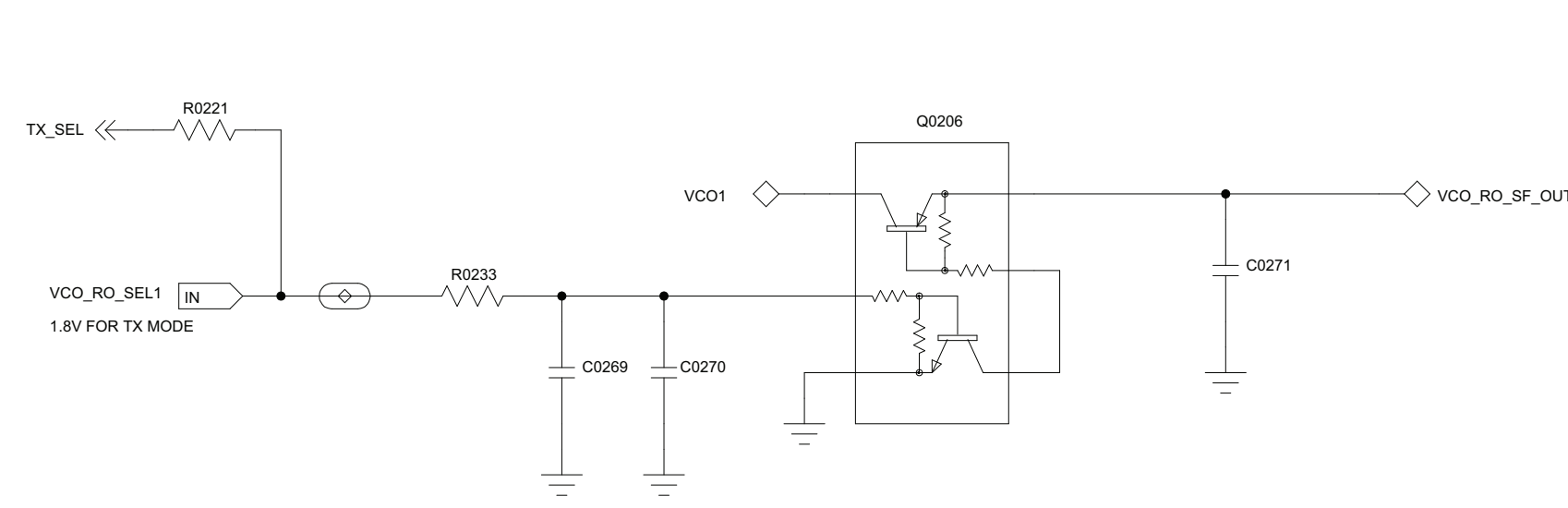


VHF (136–174 MHz) 25–45W Transmitter Power Amplifier DC Distribution Schematic Diagram



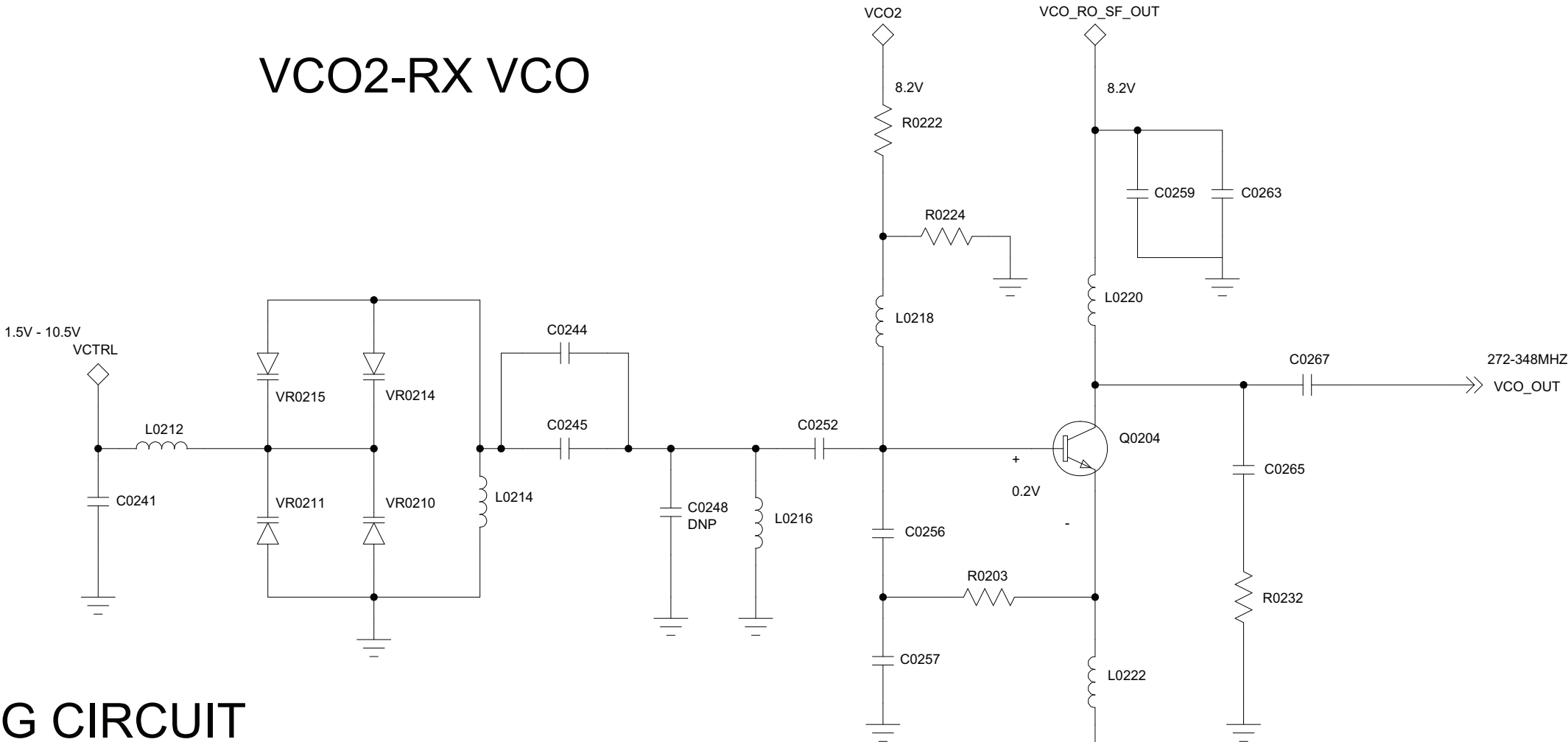


VCO SWITCHING CIRCUIT

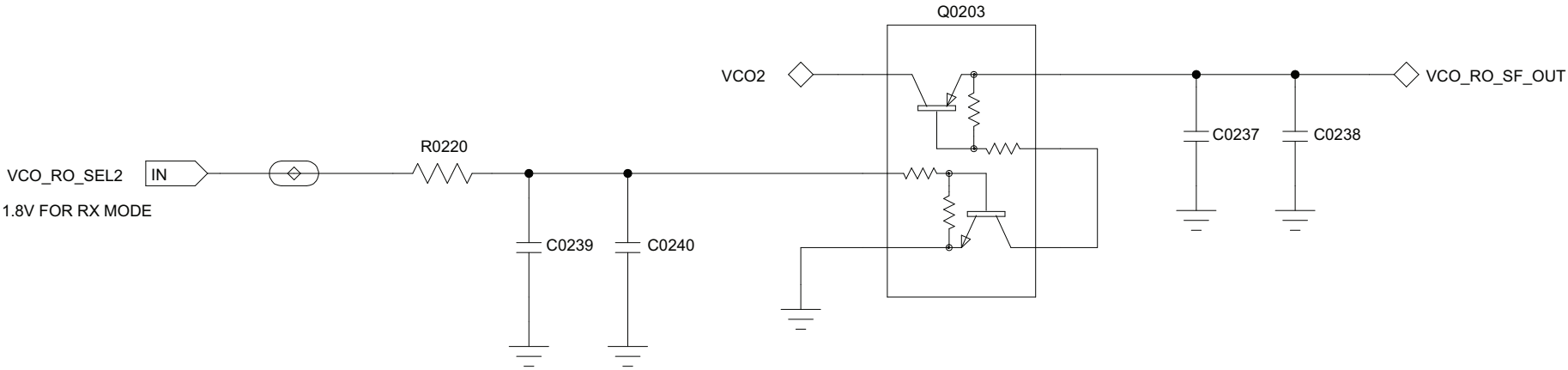


VHF (136–174 MHz) 25–45W Transmitter VCO Schematic Diagram

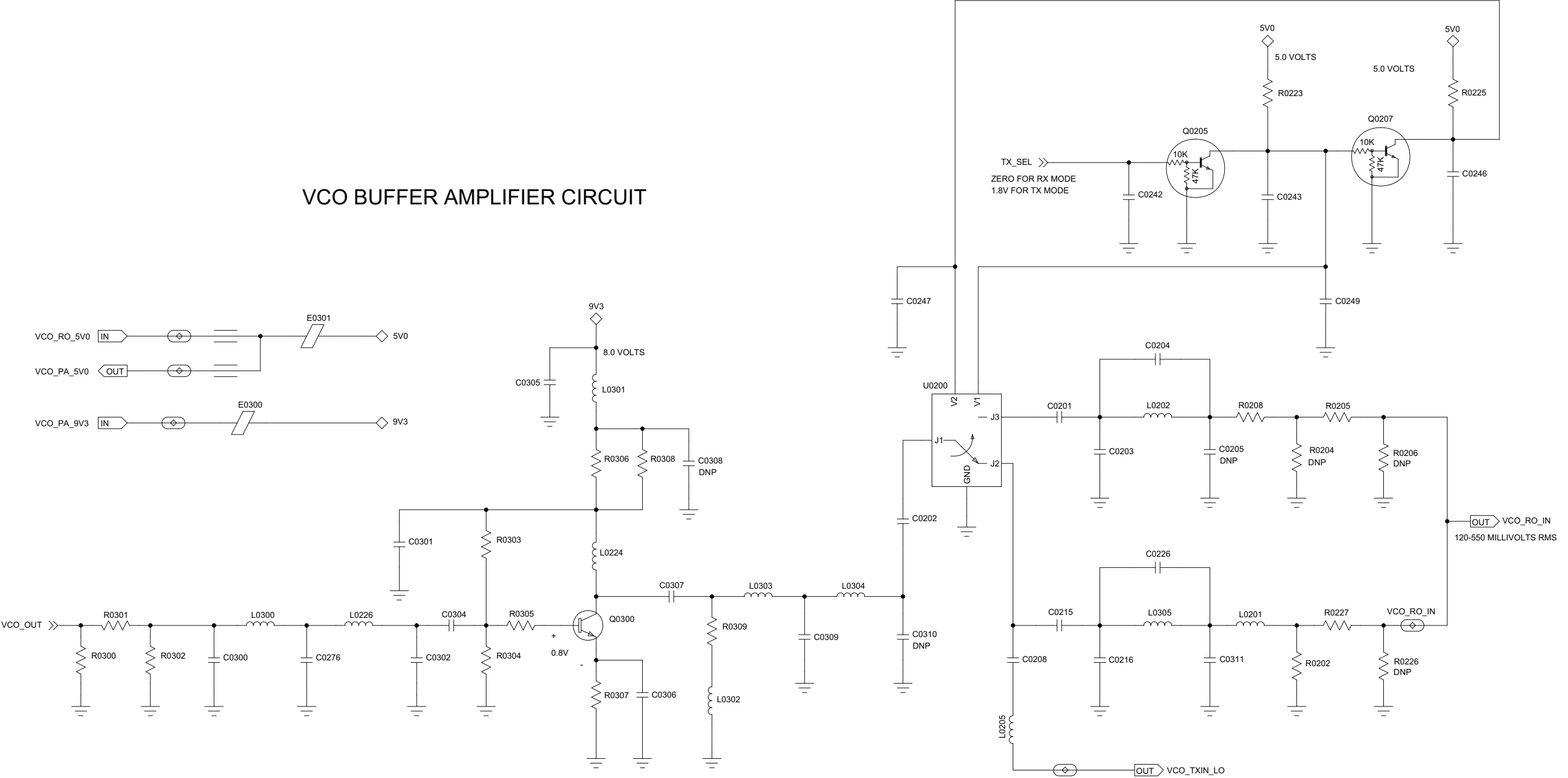
VCO2-RX VCO



VCO SWITCHING CIRCUIT



VHF (136–174 MHz) 25–45W Receiver VCO Schematic Diagram



VHF (136–174 MHz) 25–45W VCO Buffer Schematic Diagram

VHF PCB 84012505002-B
Parts List 25–45W

Circuit Ref.	Motorola Part No.
C0001M2	21667009170
C0002M2	21012044001
C0003M2	NOT PLACED
C0004M2	21012044001
C0005M2	21012044001
C0006M2	2113945C31
C0007M2	21012044001
C0009M2	2113945A10
C0010M2	21667009166
C0011M2	2113945C31
C0012M2	21012044001
C0013M2	2113945Y02
C0014M2	NOT PLACED
C0015M2	21667009166
C0016M2	NOT PLACED
C0017M2	2113945Y02
C0018M2	2113946B01
C0019M2	2113945Y02
C0020M2	21667009166
C0021M2	2113945Y02
C0022M2	NOT PLACED
C0023M2	2113945A03
C0024M2	21012129001
C0025M2	2113945A10
C0026M2	21667009174
C0027M2	2113946B01
C0028M2	2113945Y02
C0029M2	2113946B01
C0030M2	2113946B01
C0031M2	2113946B01
C0032M2	2113945A10
C0033M2	21667009166
C0034M2	21012044001
C0035M2	2113945A10
C0036M2	21667009166
C0037M2	2113945A10
C0039M2	2113945Y02
C0042M2	2113945A03
C0043M2	21012044001
C0044M2	2113955D45
C0045M2	2113945Y02
C0046M2	21667009166
C0049M2	2113945B02
C0053M2	2113945Y02
C0054M2	21667009166
C0055M2	2113955D37
C0056M2	2113945Y02
C0059M2	2113945A10
C0060M2	21012096001

Circuit Ref.	Motorola Part No.
C0061M2	2113945Y02
C0064M2	21012096001
C0065M2	2113945Y02
C0066M2	2113945B02
C0067M2	2113945Y02
C0068M2	2113955D37
C0070M2	2113955D37
C0071M2	2113955D37
C0072M2	2113945A10
C0073M2	21667009166
C0074M2	21667009166
C0075M2	2113946S35
C0076M2	2113946S35
C0078M2	21667009372
C0080M2	2113945B02
C0081M2	2113945B02
C0082M2	2113945B02
C0083M2	2113945B02
C0085M2	21667009166
C0086M2	2113945C31
C0089M2	2113945A10
C0091M2	21667009365
C0092M2	2113945A10
C0093M2	NOT PLACED
C0094M2	2113945Y02
C0095M2	2113945A13
C0096M2	2113945B02
C0097M2	2113945B02
C0098M2	21667009166
C0099M2	2113945Y02
C0100M2	2113945Y02
C0101M2	2113945A10
C0102M2	2113945A10
C0103M2	2113945A10
C0104M2	2113945A10
C0105M2	NOT PLACED
C0111M2	2113945Y02
C0120M2	2113945A10
C0124M2	21667009166
C0134M2	2113945A10
C0135M2	2113945A10
C0136M2	2113945A10
C0137M2	2113945Y02
C0138M2	2113946B01
C0139M2	NOT PLACED
C0140M2	NOT PLACED
C0141M2	2113946B01
C0143M2	2113945Y02
C0144M2	2113945Y02
C0145M2	2113945A10
C0146M2	2113945A10

Circuit Ref.	Motorola Part No.
C0147M2	2113945A10
C0149M2	2113945A10
C0150M2	2113945A10
C0200M7	2113945A10
C0201M7	21667009372
C0202M7	2113945A06
C0203M7	21667009297
C0204M7	21667009366
C0205M7	NOT PLACED
C0206M7	21667009355
C0207M7	21667009355
C0208M7	2113945A10
C0212M7	NOT PLACED
C0215M7	21667009366
C0216M7	21667009315
C0217M7	21667009204
C0221M7	21667009371
C0222M7	21667009374
C0225M7	2113945Y02
C0226M7	21667009372
C0229M7	2113945A10
C0231M7	2113945A10
C0233M7	21667009284
C0237M7	2113945A06
C0238M7	2113945Y02
C0239M7	2113945Y02
C0240M7	2113945A06
C0241M7	2113945A06
C0242M7	2113945A10
C0243M7	2113945A10
C0244M7	21667009339
C0245M7	21667009339
C0246M7	2113945A10
C0247M7	2113945A06
C0248M7	NOT PLACED
C0249M7	2113945A06
C0252M7	21667009294
C0256M7	21667009320
C0257M7	21667009364
C0259M7	2113945Y02
C0263M7	2113945A06
C0265M7	2113945A06
C0267M7	21667009284
C0269M7	2113945A10
C0270M7	2113945Y02
C0271M7	2113945A10
C0276M7	21667009371
C0300M7	21667009315
C0301M7	2113945A06
C0302M7	21667009300
C0304M7	21667009392

Circuit Ref.	Motorola Part No.
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C0307M7	2113945A02
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C0310M7	NOT PLACED
C0311M7	21667009371
C0400M4	NOT PLACED
C0401M4	NOT PLACED
C0402M4	2113945A10
C0403M4	21667009279
C0404M4	21667009375
C0405M4	21667009279
C0406M4	21667009279
C0407M4	21667009375
C0408M4	2113945C31
C0409M4	2113945C31
C0410M4	2113945A10
C0411M4	2113945A10
C0412M4	2113956A51
C0413M4	2113945A10
C0414M4	21667009388
C0415M4	21667009378
C0416M4	2113945C31
C0417M4	21667009388
C0418M4	2113945A10
C0419M4	NOT PLACED
C0420M4	2113945A10
C0421M4	21667009374
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C0435M4	21667009370
C0436M4	21667009005
C0437M4	2113945A10
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C0439M4	2113945A10
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C0441M4	21667009367
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Circuit Ref.	Motorola Part No.
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C0460M4	21667009386
C0463M4	2113945C31
C0464M4	21667009380
C0465M4	21667009393
C0466M4	2113945A10
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C0469M4	21667009393
C0700M6	2113944C85
C0701M6	21667009174
C0702M6	2113944C83
C0703M6	2113944C51
C0704M6	21667009125
C0705M6	21667009106
C0706M6	NOT PLACED
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C0708M6	2113944C82
C0709M6	2113945C04
C0710M6	21667009174
C0711M6	2113944C85
C0712M6	2113945L49
C0713M6	21667009174
C0714M6	2113944C02
C0715M6	21667009164
C0716M6	2113944C51
C0717M6	21012152001
C0718M6	21012094041
C0719M6	21667009373
C0720M6	2113944C51
C0721M6	2113945L37
C0722M6	21012152005
C0723M6	2171741Y01
C0724M6	2113944C46
C0725M6	2113944C51
C0726M6	2113944C51
C0727M6	NOT PLACED
C0728M6	21012094043
C0729M6	2113944C51
C0730M6	2113945L49
C0731M6	21667009174
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C0733M6	2113944C45
C0734M6	2113944C51
C0735M6	2113944C33
C0736M6	21012152001
C0737M6	2113944C04
C0738M6	2113944C46
C0739M6	2113944C84
C0740M6	2113945C25
C0741M6	2113944C84
C0742M6	2113944C30

Circuit Ref.	Motorola Part No.
C0743M6	2113944C40
C0744M6	2113944C42
C0745M6	21009337414
C0746M6	21012094044
C0747M6	NOT PLACED
C0748M6	2113945C31
C0749M6	NOT PLACED
C0750M6	21012094041
C0751M6	NOT PLACED
C0752M6	NOT PLACED
C0753M6	2113944C51
C0754M6	2113944C45
C0755M6	2113944C36
C0756M6	21012094042
C0757M6	21012094039
C0758M6	21012152001
C0759M6	21012152001
C0760M6	2113944C79
C0761M6	2113944C45
C0762M6	21012152001
C0763M6	21012094043
C0764M6	2113944C51
C0765M6	21012152001
C0766M6	21012152005
C0767M6	NOT PLACED
C0768M6	21012094057
C0769M6	21012094046
C0770M6	21012152001
C0771M6	NOT PLACED
C0772M6	2113945C31
C0773M6	21012094043
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C0775M6	2113944C06
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C0791M6	21012094046
C0792M6	21012094047
C0793M6	2113944C84
C0794M6	2113944C02

Circuit Ref.	Motorola Part No.
C0795M6	21012094057
C0796M6	2113944C31
C0797M6	2113944C31
C0798M6	2113944C31
C0799M6	2113944C31
C0800M6	NOT PLACED
C0801M6	21012094047
C0802M6	21012094057
C0803M6	21012094046
C0804M6	21012094047
C0805M6	NOT PLACED
C0806M6	21012094043
C0807M6	21012094057
C0808M6	21012094044
C0809M6	21012152005
C0810M6	21012152001
C0811M6	21012152001
C0812M6	NOT PLACED
C0813M6	21012152001
C0814M6	NOT PLACED
C0815M6	21012094057
C0816M6	21012152001
C0817M6	21012094052
C0818M6	2113944C02
C0819M6	21012094057
C0820M6	21012094057
C0821M6	21012094045
C0822M6	21012094041
C0823M6	21012094041
C0824M6	21012152001
C0825M6	NOT PLACED
C0826M6	21012094033
C0827M6	21012094061
C0828M6	NOT PLACED
C0829M6	2113944C84
C0830M6	2113944C42
C0831M6	2113944C02
C0832M6	2113944C02
C0833M6	2113944C40
C0834M6	2113944C31
C0835M6	2113944C31
C0836M6	2113944C31
C0837M6	2113944C31
C0838M6	21012094061
C0839M6	21012152001
C0840M6	21012094044
C0841M6	21012094041
C0842M6	NOT PLACED
C0843M6	21012094043
C0844M6	NOT PLACED
C0845M6	21012152001

Circuit Ref.	Motorola Part No.
C0846M6	21012152005
C0847M6	NOT PLACED
C0848M6	21012094046
C0850M6	21012152001
C0851M6	21012094057
C0852M6	21012094039
C0853M6	21012094041
C0854M6	21012094039
C0855M6	21012094039
C0856M6	21012094061
C0857M6	21012094046
C0858M6	21012094046
C0859M6	21012094046
C0860M6	21012094045
C0861M6	21012094045
C0862M6	21012094056
C0863M6	21012094056
C0864M6	21012094056
C0865M6	21012094056
C0866M6	21012094046
C0867M6	NOT PLACED
C0868M6	21012094056
C0869M6	21012094056
C0870M6	21012094043
C0872M6	NOT PLACED
C0873M6	NOT PLACED
C0874M6	21012094056
C0875M6	2113944C06
C0876M6	2113944C31
C0877M6	2113944C06
C0878M6	21012094046
C0879M6	2113944C06
C0880M6	2113944C35
C0881M6	21012152001
C0882M6	21012094052
C0883M6	21012094052
C0884M6	2113944C06
C0885M6	2113944C51
C0886M6	21012094046
C0887M6	21012094046
C0888M6	21012094046
C0889M6	21012094046
C0890M6	21012094056
C0891M6	21012094046
C0892M6	21012094046
C0893M6	21012094056
C0894M6	21012094056
C0895M6	21012094056
C0896M6	21012094056
C0897M6	21012094056
C0898M6	21012094056

Circuit Ref.	Motorola Part No.
C0899M6	NOT PLACED
C0900M6	NOT PLACED
C0901M6	NOT PLACED
C0902M6	2113944C51
C0903M6	21012094056
C0904M6	21012094056
C0905M6	2113945C31
C0906M6	2113945A10
C0907M6	2113945L41
C0908M6	21667009174
C0909M6	NOT PLACED
C0910M6	NOT PLACED
C0911M6	2113944C02
C0912M6	NOT PLACED
C0913M6	21667009174
C0914M6	21012094056
C0915M6	21012094056
C0916M6	NOT PLACED
C0917M6	21667009174
C0918M6	21667009174
C0919M6	21667009174
C0920M6	21012094056
C0921M6	2113944C51
C0922M6	NOT PLACED
C0923M6	NOT PLACED
C0924M6	NOT PLACED
C0925M6	2113946B04
C0926M6	2113944C02
C0927M6	21012094056
C0928M6	21012094041
C0929M6	21012094041
C0930M6	NOT PLACED
C0931M6	21012094056
C0932M6	NOT PLACED
C0933M6	NOT PLACED
C0934M6	NOT PLACED
C0936M6	NOT PLACED
C0937M6	21012094056
C0938M6	NOT PLACED
C0939M6	NOT PLACED
C0940M6	NOT PLACED
C0941M6	NOT PLACED
C0942M6	NOT PLACED
C0950M6	2113944C51
C0951M6	2113944C30
C0952M6	2113944C51
C0953M6	2113944C51
C0954M6	2113944C81
C0955M6	2113944C51
C0956M6	2113944C01
C0957M6	21667009172

Circuit Ref.	Motorola Part No.
C3000M6	2113944C38
C3001M6	2113944C06
C3002M6	2113944C06
C3003M6	2113945C31
C3004M6	2113945C02
C3005M6	2113945C02
C3008M6	2113944C51
C3009M6	2113945C31
C3010M6	2113944C46
C3011M6	2113945G53
C3012M6	2113946J04
C3013M6	2113945C31
C3014M6	21009337414
C3015M6	2113946G01
C3016M6	2113945C31
C3019M6	NOT PLACED
C3020M6	2113945C26
C3021M6	2113944C06
C3022M6	2113945A10
C3029M6	NOT PLACED
C3038M6	21667009169
C3041M6	21667009169
C3042M6	21667009169
C3044M6	21667009169
C3046M6	21667009174
C3047M6	21667009174
C3048M6	21667009174
C3049M6	21667009174
C3050M6	21667009169
C3051M6	21667009174
D0000M2	4815011H01
D0001M2	4815011H01
D0401M4	4813974A19
D0402M4	4813974A19
D0700M6	48012160001
D0875M6	NOT PLACED
D0876M6	4886622Y06
D0877M6	48012160001
D0950M6	4813974A21
D0951M6	4813974A21
D0960M6	NOT PLACED
D3000M6	4813978P07
E0000M2	24012107027
E0001M2	24012107027
E0004M2	24012107027
E0005M2	24012107027
E0006M2	24012107027
E0007M2	24012107027
E0008M2	24012107027
E0009M2	24012107027
E0010M2	24012107027

Circuit Ref.	Motorola Part No.
E0300M7	24012107027
E0301M7	24012107027
E0400M4	2471132D16
E0401M4	2471132D16
E0402M4	2471132D16
E0403M4	24012107027
E0404M4	2471132D16
E0405M4	2471132D16
E0700M6	24012102001
E0701M6	24012102001
E0703M6	24012102001
E3000M6	24012102001
J0700M6	09009348001
L0000M2	24012161001
L0001M2	24667008014
L0200M7	24667000031
L0201M7	24667008024
L0202M7	24667008013
L0204M7	24667005040
L0205M7	24667008018
L0206M7	24667005040
L0208M7	24667000031
L0210M7	24009342045
L0211M7	2414015C11
L0212M7	24667008032
L0214M7	24009343013
L0216M7	24009343007
L0218M7	24667008032
L0220M7	24667008032
L0222M7	24667008032
L0224M7	24667008032
L0226M7	24667008017
L0300M7	24667008017
L0301M7	24667008032
L0302M7	24667008032
L0303M7	24667008013
L0304M7	24667008019
L0305M7	24667008016
L0400M4	24667008018
L0401M4	2414015C09
L0402M4	2475122C33
L0403M4	24667005043
L0404M4	24667005043
L0405M4	24009344125
L0406M4	2414015C09
L0407M4	24667008025
L0408M4	24009344035
L0409M4	24667008025
L0410M4	24667008018
L0413M4	2475122C42
L0414M4	2475122C42

Circuit Ref.	Motorola Part No.
L0700M6	24667008024
L0701M6	24667008020
L0702M6	24667008028
L0703M6	24667008020
L0704M6	24667008028
L0705M6	24667008020
L0706M6	24012145001
L0707M6	24667008031
L0708M6	2460591A01
L0709M6	24667008019
L0710M6	2460591C53
L0711M6	24012145004
L0712M6	2460591A77
L0716M6	24667008016
L0717M6	24667008016
L0718M6	24667008018
L0719M6	24667008025
L0727M6	2415385H07
L0729M6	2414032B60
L0730M6	24667008021
L0849M6	24667008014
L0852M6	24012145004
L0854M6	24012145004
L0857M6	2415385H02
L0875M6	24012145004
L0876M6	24667008031
L0877M6	24009343030
L0880M6	24009343030
L0885M6	2414032B49
L0899M6	2416077H16
L0900M6	NOT PLACED
L0901M6	NOT PLACED
L0902M6	NOT PLACED
L0950M6	0613952G67
L0951M6	NOT PLACED
L0952M6	NOT PLACED
M0700M6	2686201B02
M3000M6	0289511U04
P3000M6	NOT PLACED
Q0000M2	4813973A13
Q0001M2	4816134H01
Q0002M2	4813970A59
Q0200M7	48012195001
Q0203M7	4815272H01
Q0204M7	48012195001
Q0205M7	4816134H01
Q0206M7	4815272H01
Q0207M7	4816134H01
Q0300M7	4802197J95
Q0400M4	4815270H01
Q0401M4	4815267H01

Circuit Ref.	Motorola Part No.
Q0402M4	48012201001
Q0403M4	NOT PLACED
Q0404M4	4816134H01
Q0405M4	4816134H01
Q0406M4	4815066H01
Q0407M4	4815272H01
Q0700M6	4816547H01
Q0701M6	4816013H01
Q0702M6	48012022001
Q0703M6	4802246J29
Q0704M6	4816548H01
Q0875M6	4813970A62
Q0876M6	4816134H01
Q0900M6	NOT PLACED
Q3000M6	0105959T72
Q3001M6	0105959T72
Q3002M6	4813973B01
R0000M2	0613952R66
R0001M2	0613952R66
R0006M2	0613952Q25
R0007M2	0613952Q46
R0008M2	0613952R01
R0009M2	0613952Q51
R0010M2	0613952R66
R0011M2	0613952Q35
R0012M2	0613952Q81
R0013M2	0613952Q35
R0014M2	0613952R66
R0015M2	0613952R66
R0019M2	0613952R01
R0022M2	0613952R66
R0025M2	0613952R66
R0029M2	0613952Q25
R0030M2	0613952R66
R0044M2	0613952R25
R0054M2	0613952M25
R0200M7	0613952R66
R0202M7	0613952Q42
R0203M7	0613952Q32
R0204M7	NOT PLACED
R0205M7	0613952H37
R0206M7	NOT PLACED
R0207M7	0613952Q86
R0208M7	0613952G67
R0209M7	0613952Q85
R0211M7	0613952Q18
R0213M7	0613952Q67
R0215M7	0613952Q67
R0217M7	0613952Q49
R0220M7	0613952R66
R0221M7	0613952R66

Circuit Ref.	Motorola Part No.
R0222M7	0613952Q78
R0223M7	0613952Q73
R0224M7	0613952Q73
R0225M7	0613952Q73
R0226M7	NOT PLACED
R0227M7	0613952G67
R0228M7	0613952Q67
R0230M7	0613952Q67
R0232M7	0613952Q49
R0233M7	0613952R66
R0300M7	0613952Q66
R0301M7	0613952Q25
R0302M7	0613952Q66
R0303M7	0613952Q94
R0304M7	0613952Q89
R0305M7	0613952Q33
R0306M7	0613952Q49
R0307M7	0613952H46
R0308M7	0613952Q49
R0309M7	0613952Q42
R0400M4	0613952Q38
R0401M4	0613958H68
R0402M4	0613952R25
R0403M4	0613952R01
R0404M4	0613952R25
R0405M4	0613952Q72
R0406M4	0613952Z43
R0407M4	0613952Q73
R0408M4	0613952Q88
R0409M4	NOT PLACED
R0410M4	0613952R01
R0411M4	0613952Q69
R0412M4	0613952Q67
R0413M4	0613952Q75
R0414M4	0613958H69
R0415M4	0613952Q69
R0416M4	0613952R25
R0417M4	0613952Q69
R0418M4	0613952H73
R0419M4	0613952Q53
R0420M4	0613952H73
R0421M4	0613952Q69
R0422M4	0613952Q53
R0423M4	0613952Q77
R0424M4	0613952Q77
R0425M4	0613952N37
R0426M4	0613958H69
R0427M4	0613952N01
R0428M4	NOT PLACED
R0429M4	0613952R66
R0430M4	0613952N46

Circuit Ref.	Motorola Part No.
R0431M4	0613952Z48
R0432M4	0613952Q67
R0433M4	NOT PLACED
R0434M4	0613952Q23
R0435M4	0613952Q67
R0436M4	0613952R66
R0437M4	NOT PLACED
R0438M4	0613952R66
R0439M4	NOT PLACED
R0440M4	0613952L46
R0441M4	NOT PLACED
R0442M4	0613952K25
R0443M4	0613952L46
R0444M4	0613952Q78
R0445M4	0613952Q46
R0448M4	0613952Q35
R0700M6	0613952J01
R0701M6	0613952G67
R0702M6	0613952H49
R0703M6	0613952J01
R0704M6	0613952J01
R0705M6	0613952H48
R0706M6	0613952H47
R0707M6	0613952H48
R0708M6	NOT PLACED
R0709M6	NOT PLACED
R0710M6	NOT PLACED
R0711M6	0613958S44
R0712M6	0613958S44
R0713M6	NOT PLACED
R0714M6	0613952H35
R0715M6	0613952H35
R0716M6	0613952H35
R0717M6	0613952H35
R0718M6	0613952H96
R0719M6	0613952H89
R0720M6	0613952J01
R0721M6	0613952G67
R0722M6	0613952H25
R0723M6	0613952G67
R0724M6	0613959Q53
R0725M6	0613958S29
R0726M6	0613958S29
R0727M6	0613958S29
R0728M6	0613958S29
R0729M6	0613958S29
R0730M6	0613958S29
R0731M6	0613958S29
R0732M6	0613958S29
R0733M6	0613958S29
R0734M6	0613958S29

Circuit Ref.	Motorola Part No.
R0735M6	0613958S29
R0736M6	0613959Q25
R0737M6	0613952F01
R0738M6	0613958S29
R0739M6	0613952H73
R0740M6	0613952H73
R0741M6	0613952E66
R0742M6	0613952H73
R0743M6	0613952E66
R0744M6	NOT PLACED
R0745M6	NOT PLACED
R0746M6	0613952F01
R0748M6	NOT PLACED
R0749M6	0613952N43
R0755M6	0613958J74
R0758M6	0613952R01
R0759M6	0613959H12
R0760M6	NOT PLACED
R0763M6	NOT PLACED
R0764M6	0613958J74
R0765M6	0613958J74
R0766M6	0613952R01
R0767M6	0613952R01
R0768M6	0613952R01
R0769M6	0613952R01
R0770M6	0613952R01
R0771M6	0613952R01
R0772M6	0613952R01
R0773M6	0613952R01
R0774M6	0613952R01
R0775M6	0613952R01
R0776M6	0613952R01
R0777M6	0613952R01
R0778M6	0613952R01
R0779M6	0613952R01
R0780M6	0613952R01
R0781M6	0613952R01
R0782M6	0613952R01
R0783M6	0613952R01
R0784M6	0613952R01
R0785M6	0613952R01
R0786M6	0613952R01
R0787M6	0613952R01
R0788M6	0613952R01
R0789M6	0613952R01
R0790M6	0613952R01
R0791M6	NOT PLACED
R0792M6	0613952R01
R0793M6	0613952R01
R0794M6	0613952R01
R0795M6	0613952R01

Circuit Ref.	Motorola Part No.
R0796M6	0613952R01
R0797M6	0613952R01
R0798M6	NOT PLACED
R0799M6	0613952R01
R0800M6	0613952R01
R0801M6	0613952R01
R0802M6	0613952R01
R0803M6	0613952R01
R0804M6	0613952R01
R0805M6	NOT PLACED
R0806M6	NOT PLACED
R0807M6	NOT PLACED
R0808M6	NOT PLACED
R0809M6	NOT PLACED
R0810M6	0613952R01
R0811M6	0613952R01
R0812M6	NOT PLACED
R0813M6	0613952R66
R0876M6	0613958S73
R0877M6	0613959Y37
R0878M6	0613959Y37
R0879M6	0613952J25
R0882M6	0613952G67
R0883M6	0613952G67
R0902M6	0613952R66
R0903M6	0613952N01
R0904M6	0613952R66
R0905M6	0613952H42
R0906M6	0613958H46
R0907M6	0613958H55
R0908M6	NOT PLACED
R0909M6	NOT PLACED
R0910M6	NOT PLACED
R0911M6	NOT PLACED
R0912M6	0613958H46
R0913M6	0613952M51
R0914M6	0613952M71
R0915M6	NOT PLACED
R0916M6	0613952R66
R0917M6	0613952P01
R0919M6	0613952P01
R0920M6	0613952N01
R0921M6	0613952N01
R0922M6	0613952R66
R0923M6	0613952M43
R0924M6	0613952N09
R0928M6	0613952P30
R0929M6	0613952N81
R0930M6	0613952N51
R0931M6	0613952Z26
R0932M6	0613952Z60

Circuit Ref.	Motorola Part No.
R0933M6	0613952Z50
R0934M6	0613952J17
R0935M6	0613952H91
R0936M6	NOT PLACED
R0937M6	NOT PLACED
R0938M6	NOT PLACED
R0939M6	0613952R66
R0940M6	0613952Z76
R0950M6	0613952G67
R0951M6	0613958H55
R0952M6	0613958H53
R0953M6	0613952G67
R0954M6	0613952H39
R0955M6	0613952H39
R0956M6	0613952G67
R0957M6	0613958H53
R0958M6	0613958H53
R0959M6	0613952R66
R0960M6	0613952N58
R0961M6	0613952N58
R0962M6	0613952N58
R0965M6	0613952P01
R3000M6	0613952H60
R3001M6	0615871H01
R3002M6	0615871H01
R3003M6	0615871H01
R3004M6	0615871H01
R3005M6	0613952H25
R3006M6	0613952H25
R3007M6	0613952M30
R3008M6	0613952G67
R3009M6	0613952M43
R3010M6	0613952G67
R3011M6	0613959Q60
R3012M6	0613959Q60
R3013M6	0613952R01
R3014M6	0613952R01
R3015M6	0615871H01
R3018M6	0613952H73
R3019M6	0613952H60
R3020M6	0613952G67
R3021M6	0613952R25
RT0900M6	0615585H01
SH0000M2	26012095001
SH0001M2	26012095001
SH0003M2	26012094001
SH0200M7	26012231001
SH0201M7	26012231001
SH0400M4	26012231001
SH0401M4	26012231001
SH0700M6	26012100001

Circuit Ref.	Motorola Part No.
SH0900M6	2686425Z02
SH0901M6	2686425Z02
T0000M2	25012016001
U0000M2	51009686002
U0200M7	5186310Y39
U0400M4	5180390L83
U0401M4	5186310Y39
U0402M4	5186310Y39
U0901M6	5180390L83
U0902M6	51012221001
U0903M6	5115022H01
U0904M6	5109731C48
U3000M6	5116525H01
U3001M6	4813973M07
U3002M6	NOT PLACED
VR0200M7	48012260001
VR0201M7	4805656W87
VR0205M7	4805656W87
VR0206M7	48012260001
VR0210M7	4805656W87
VR0211M7	4805656W87
VR0214M7	4805656W87
VR0215M7	4805656W87
VR0400M4	4805656W87
VR0401M4	4805656W87
VR0402M4	4805656W87
VR0403M4	4805656W87
VR3000M6	48012202001
VR3002M6	4813977M10
Y0000M2	4875185M05

Note: The suffix “M1”, “M2”, etc. from the Circuit Ref is removed from the schematic and overlays.

Notes

Appendix A Replacement Parts and Kits

A.1 Level 1 and 2 Maintenance

This manual covers Level 1 and 2 Maintenance:

Level 1 maintenance is the assessment and/or repair of fault in terms of faulty accessory or physical aspect of product; not including opening of the unit. Limited to replacement of antenna, battery, handset, external microphones, external knobs, all related frequency programming to customers' and in some cases alignment/tuning, by Customer Programming software (CPS).

Level 2 maintenance includes all Level 1 activities plus: Assessment that require opening the Subscriber Product and rectifying a fault by replacement of a board or module, or replacement of major mechanical parts (like Front Housing Kit or Control Head Board), followed by alignment/tuning to ensure the replacement of board/module/major mechanical parts are within Subscriber Product's specifications as per the service manual. It does not incorporate discrete component replacement.

A.1.1 Replacement Parts Ordering

Some replacement parts, spare parts, and/or product information can be ordered directly. While parts may be assigned with a Motorola part number, this does not guarantee that they are available from Motorola Radio Products and Solutions Organization (RPSO). If no Motorola part number is assigned, the part is normally not available from Motorola, or is not a user-serviceable part. Part numbers appended with an asterisk are serviceable by Motorola Depot only.

Orders for replacement parts, kits, and assemblies should be placed directly on Motorola's local distribution organization or via Motorola Online. For Level 2 maintenance, only Motorola Service Centers or Authorized Motorola Service Dealers can perform these functions. Any tampering by non-authorized Motorola Service Centers voids the warranty of your radio. To find out more about Motorola Service Centers, please visit <http://www.motorolasolutions.com>

A.2 Level 3 Maintenance

The Level 3 Maintenance can only be done at the Motorola Service Center/Depot since it can deeply affect the performance of the radio. To find out more about Motorola Service Center, please visit <http://www.motorolasolutions.com>

Notes

Glossary

This glossary contains an alphabetical listing of terms and their definitions that are applicable to portable and mobile subscriber radio products. All terms do not necessarily apply to all radios, and some terms are merely generic in nature.

Term	Definition
Analogue	Refers to a continuously variable signal or a circuit or device designed to handle such signals.
Band	Frequencies allowed for a specific purpose.
CMOS	Complementary Metal Oxide Semiconductor.
CPS	Customer Programming Software: Software with a graphical user interface containing the feature set of a radio.
Default	A pre-defined set of parameters.
Digital	Refers to data that is stored or transmitted as a sequence of discrete symbols from a finite set; most commonly this means binary data represented using electronic or electromagnetic signals.
DPL	Digital Private-Line: A type of digital communications that utilizes privacy call, as well as memory channel and busy channel lock out to enhance communication efficiency.
FCC	Federal Communications Commission.
Frequency	Number of times a complete electromagnetic-wave cycle occurs in a fixed unit of time (usually one second).
GPIO	General-Purpose Input/Output.
GPS	Global Positioning System.
IC	Integrated Circuit: An assembly of interconnected components on a small semiconductor chip, usually made of silicon. One chip can contain millions of microscopic components and perform many functions.
IF	Intermediate Frequency.
kHz	kilohertz: One thousand cycles per second. Used especially as a radio frequency unit.
LCD	Liquid-Crystal Display: An LCD uses two sheets of polarizing material with a liquid-crystal solution between them. An electric current passed through the liquid causes the crystals to align so that light cannot pass through them.
LDMOS	Laterally Diffused Metal Oxide Semiconductor.
LED	Light Emitting Diode: An electronic device that lights up when electricity is passed through it.
MDC	Motorola Digital Communications.

Term	Definition
MHz	Megahertz: One million cycles per second. Used especially as a radio frequency unit.
Paging	One-way communication that alerts the receiver to retrieve a message.
PC Board	Printed Circuit Board. Also referred to as a PCB.
PL	Private-Line Tone Squelch: A continuous sub-audible tone that is transmitted along with the carrier.
Programming Cable	A cable that allows the CPS to communicate directly with the radio using USB.
Receiver	Electronic device that amplifies RF signals. A receiver separates the audio signal from the RF carrier, amplifies it, and converts it back to the original sound waves.
Repeater	Remote transmit/receive facility that re-transmits received signals in order to improve communications range and coverage (conventional operation).
RF	Radio Frequency: The portion of the electromagnetic spectrum between audio sound and infrared light (approximately 10 kHz to 10 GHz).
RX	Receive.
Signal	An electrically transmitted electromagnetic wave.
Spectrum	Frequency range within which radiation has specific characteristics.
Squelch	Muting of audio circuits when received signal levels fall below a pre-determined value. With carrier squelch, all channel activity that exceeds the radio's preset squelch level can be heard.
TOT	Time-out Timer: A timer that limits the length of a transmission.
TPL	Tone Private Line.
Transceiver	Transmitter-receiver. A device that both transmits and receives analogue or digital signals. Also abbreviated as XCVR.
Transmitter	Electronic equipment that generates and amplifies an RF carrier signal, modulates the signal, and then radiates it into space.
TX	Transmit.
UHF	Ultra-High Frequency.
USB	Universal Serial Bus: An external bus standard that supports data transfer rates of 12 Mbps.
VHF	Very High Frequency.
VIP	Vehicle Interface Port.
XiR	Refers to Digital Professional Radio model names in the MOTOTRBO Professional Digital Two-Way Radio System.



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June 2013.

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