PR860

Two-Way Portable Radio

MOTOROLA

Detailed
Service Manual

Foreword

The information contained in this manual relates to all models of the Professional Series two-way portable radios, unless otherwise specified. This manual provides sufficient information to enable qualified service shop technicians to troubleshoot and repair portable radios to the component level.

For details on the level 1 or 2 maintenance procedures, refer to the applicable manuals, which are available separately. A list of publications is provided in this manual in the section, "1.3 Related Documents" on page 1-2.

Product Safety and RF Exposure Compliance

Before using this product, read the operating instructions for safe usage contained in the Product Safety and RF Exposure booklet enclosed with your radio.

ATTENTION!

This radio is restricted to occupational use only to satisfy FCC RF energy exposure requirements. Before using this product, read the RF energy awareness information and operating instructions in the Product Safety and RF Exposure booklet enclosed with your radio (Motorola Publication part number 6881095C98) to ensure compliance with RF energy exposure limits.

For a list of Motorola-approved antennas, batteries, and other accessories, visit the following web site which lists approved accessories: http://www.motorola.com/cgiss/index.shtml

Manual Revisions

Changes which occur after this manual is printed are described in FMRs (Florida Manual Revisions). These FMRs provide complete replacement pages for all added, changed, and deleted items, including pertinent parts list data, schematics, and component layout diagrams.

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Document History

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

Edition	Description	Date
6881098C43-O	Original Release	Feb. 2005
6881098C43-P	EPP Conversion: Added Schematics, Parts List for VHF: 8415112H01, U1:8415234H09 and U2:8415235H07	Jul. 2008

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Notes

Chapter 1 Introduction

1.1 Scope of Manual

This manual is intended for use by service technicians familiar with similar types of equipment. It contains service information required for the equipment described and is current as of the printing date. Changes that occur after the printing date are incorporated by a complete manual revision or alternatively, as additions.

1.2 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. Any “return for exchange” or “return for repair” by an authorized Motorola dealer must be accompanied by a warranty claim form. Warranty claim forms are obtained by contacting customer service.

1.2.1 Warranty Period

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.

1.2.2 Return Instructions

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 a Motorola warranty depot, please contact the appropriate customer service for instructions. All returns must be accompanied by a warranty claim form, available from your customer services representative. Products should be shipped back in the original packaging, or correctly packaged to ensure no damage occurs in transit.

1.2.3 After Warranty Period

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

1. Motorola's Radio Parts and Service Group offers repair service to users and dealers at competitive prices.
2. The Motorola Customer Care and Services Division (CCSD) supplies individual parts and modules that can be purchased by dealers who are capable of performing fault analysis and repair.

1.3 Related Documents

The following documents are directly related to the use and maintainability of this product.

Table 1-1. Related Documents

Title	Part Number
PR860 Two-Way Portable Radio Basic Service Manual – English	68P81098C42

1.4 Technical Support

Technical support is available to assist the dealer/distributor and self-maintained customers in resolving any malfunction which may be encountered. Initial contact should be by telephone to customer resources wherever possible. When contacting Motorola technical support, be prepared to provide the product model number and the unit's serial number. The contact locations and telephone numbers are located in the applicable basic service manual listed in Table 1-1 above.

1.4.1 Piece Parts Availability

Some replacement parts, spare parts, and/or product information can be ordered directly. If a complete Motorola part number is assigned to the part, and it is not identified as "Depot ONLY", the part is available from Motorola Customer Care and Services Division. If no part number is assigned, the part is not normally available from Motorola. If the part number is appended with an asterisk, the part is serviceable by a Motorola depot only. If a parts list is not included, this generally means that no user-serviceable parts are available for that kit or assembly.

Parts Order Entry
7:00 A.M. to 7:00 P.M. (Central Standard Time)
Monday through Friday (Chicago, U.S.A.)

To Order Parts in the United States of America:
1-800-422-4210, or 847-538-8023
1-800-826-1913, or 410-712-6200 (U.S. Federal Government)
TELEX: 280127
FAX: 1-847-538-8198
FAX: 1-410-712-4991 (U.S. Federal Government)
(U.S.A.) after hours or weekends:
1-800-925-4357

To Order Parts in Latin America and the Caribbean:
1-847-538-8023

Motorola Parts
(United States and Canada)
Customer Care and Services Division
Attention: Order Processing
1307 E. Algonquian Road
Schaumburg, IL 60196

Customer Care and Services Division
Attention: Latin America and Caribbean

Order Processing
1307 E. Algonquian Road
Schaumburg, IL 60196

Parts Identification
1-800-422-4210, menu 3

1.5 Radio Model Chart and Specifications

The radio model charts and specifications are located in the Basic Service Manual listed under the Related Documents paragraph of this chapter.

1.6 Radio Model Information

The model number and serial number are located on a label attached to the back of your radio. You can determine the RF output power, frequency band, protocols, and physical packages from these numbers. The example in Table 1-2 on page 1-3 shows one portable radio model number and its specific characteristics.

Table 1-2. Radio Model Number (Example: AAH45KDC9AA3AN)

	Type of Unit	Model Series	Freq. Band	Power Level	Physical Packages	Channel Spacing	Protocol	Feature Level	Model Revision	Model Package
AA or LA = Motorola Internal Use → **AA or LA**	**H** = Portable → **H**	**45**	**K** VHF (136–174 MHz)	**D** 4–5W	**C** PR860 (no display)	**9** Program-mable	**AA** Conven-tional	**3** PR860 (non-key-pad)	**A**	**N**
			R UHF1 (403–470 MHz)	**E** 6W						
			S UHF2 (450–527 MHz)							
			B Low Band, R1 (29.7–42.0 MHz)							
			C Low Band, R2 (35.0–50.0 MHz)							

Notes

Chapter 2 Theory of Operation

2.1 Introduction

This chapter provides a detailed theory of operation for the radio components. Schematic diagrams for the circuits described in the following paragraphs are located in Figures 4-1 through 4-56.

2.2 Radio Power Distribution

A block diagram of the DC power distribution throughout the radio board is shown in Figure 2-1. A 7.5V battery supplies the basic radio power (UNSWB) directly to the electronic on/off control, audio power amplifier, 3.5V regulator, power amplifier automatic level control (ALC), and low battery detect circuit. When the radio on/off/volume control is turned on, the switched SWB+ is applied to the various radio power regulators, antenna switch, accessories 20-pin connector, keypad/option board, and transmit LED. The Vdda signal from the 3.3V Vdda regulator supplies the microprocessor with operating power. The Vdd regulator scheme is listed by band in Table 2-1 on page 2-2. Data is then sent to the controller ASFIC to turn on a DAC which takes over the momentary-on path within 12ms. The SWB+ signal supplies power until the radio is turned off. Jumpers for configuring the Vdda and Vddd regulators are shown in Figure 2-1 and described in Table 2-2 on page 2-2.

The radio turns off when either of the two following conditions occur:

- Radio on/off/volume control is turned off.
- Low battery condition is detected.

If a low battery level is detected by the microprocessor through either of the above conditions, the radio personality data is stored to EEPROM prior to turning off.

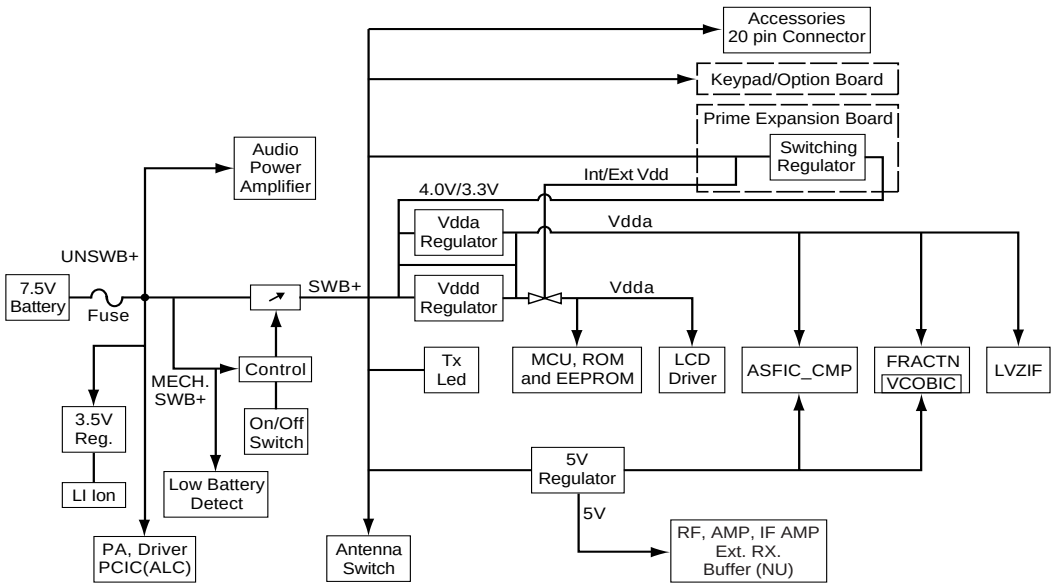


Figure 2-1. DC Power Distribution Block Diagram

Table 2-1. VDD Regulator Scheme by Band

Band	Vdd Regulator Scheme
Low Band	Dual
VHF	Dual
UHF	Dual

Table 2-2. Radio Jumpers

Jumpers	Dual Vdd Regulator Scheme	Single Vdd Regulator Scheme
R401	Y	Y
R402	N	N
R403	N	Y
R404	N	N
R405	Y	N

R = Regulator Jumper

2.3 Controller Board

The controller board is the central interface between the various radio functions. It is separated into MCU digital and audio/signalling functions as shown in Figure 2-2.

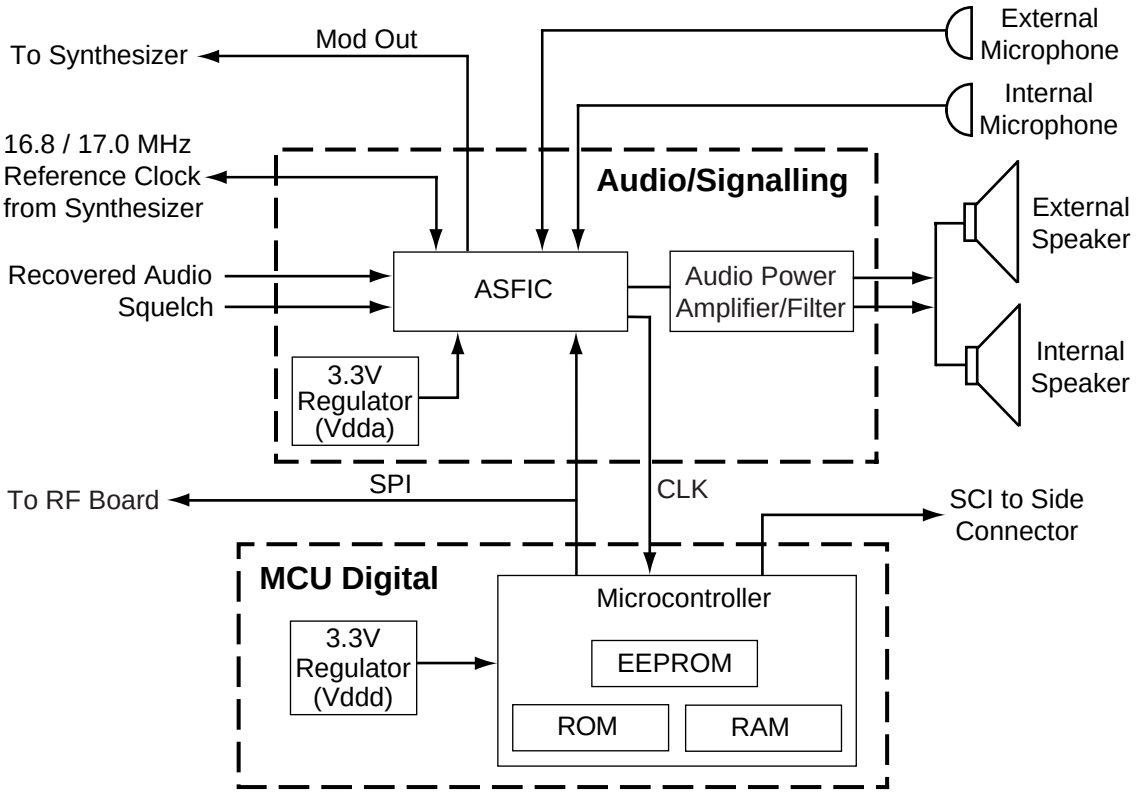


Figure 2-2. Controller Block Diagram

2.3.1 MCU Digital

The digital portion of the controller consists of a microcontroller and associated EEPROM, RAM, and ROM memories. Combinations of different size RAM and ROM are available to support various application software. RAM supports 8KB and 32KB sizes. ROM supports 128KB, 256KB, and 512KB sizes. Table 2-3 lists the ROM, RAM and EEPROM requirements for different radios.

Table 2-3. Radio Memory Requirements

PROTOCOL	FEATURE LEVEL	ROM (KB)	EXT RAM (KB)	EEPROM (KB)
AA,DU	2 or 3	128	–	8
AA,DU	6	128	–	16
CK, GB, GE, FC	–	512	32	16

2.3.2 MODB/VSTBY Supply

The supply to the MODB/VSTBY pin varies depending on the conditions listed in Table 2-4.

Table 2-4. MODB/VSTBY Supply Modes

Condition	Circuit Operation
Radio On	Vddd supply voltage via CR411
Radio Off	• Vddd turned off • Q416 gate pulled low by R462 • Q416 switched on • U410 supplies 3.2V to MODB_VSTBY
Primary battery removed	• Vddd turned off • Q416 gate pulled low by R462 • Q416 switched on • Lithium-ion battery provides 3.2V to MODB_VSTBY

2.3.3 Audio/Signaling

The audio/signalling/filter/companding IC (ASFIC) and the audio power amplifier (Figure 2-2 on page 2-3) form the main components of the audio/signalling section of the controller board. Inputs include a 16.8 MHz clock from the synthesizer, recovered audio and squelch, MCU control signals, and external or internal microphones. Outputs include a microprocessor clock (CLK), modulator output to the synthesizer, and amplified audio signals to an internal or external speaker.

2.4 UHF1 Transmitter

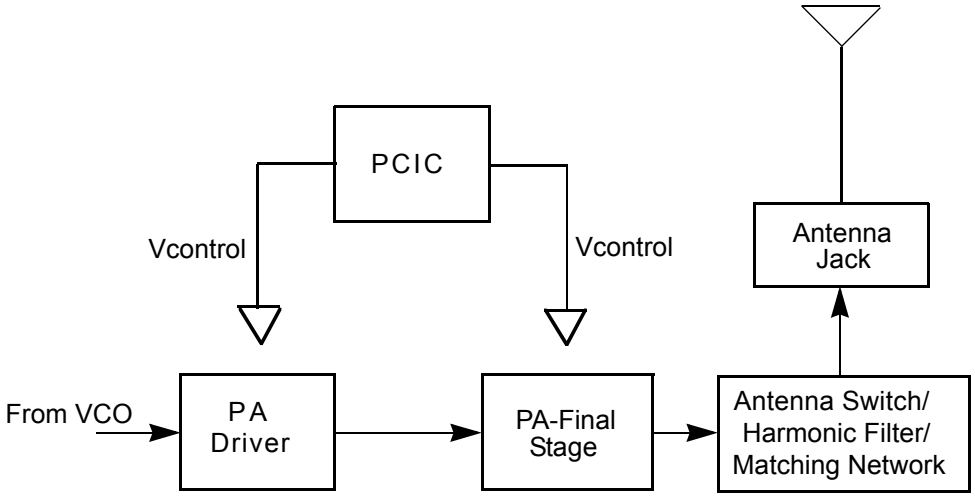


Figure 2-3. Transmitter Block Diagram

The UHF transmitter consists of the following basic circuits as shown in Figure 2-3.

- Power amplifier (PA).
- Antenna switch/harmonic filter.
- Antenna matching network.
- Power control integrated circuit (PCIC).

2.4.1 Power Amplifier (PA)

The PA consists of two LDMOS devices:

- 9Z67 LDMOS driver IC (U101) and
- PRF1507 LDMOS PA (Q110)

The 9Z67 LDMOS driver IC contains a 2 stage amplification with a supply voltage of 7.3V.

This RF power amplifier is capable of supplying an output power of 0.3W (pin 6 and 7) with an input signal of 2mW (3dBm) (pin16). The current drain would typically be 160mA while operating in the frequency range of 403–470MHz.

The PRF1507 LDMOS PA is capable of supplying an output power of 7W with an input signal of 0.3W. The current drain would typically be 1300mA while operating in the frequency range of 403–470MHz. The power output can be varied by changing the biasing voltage.

2.4.2 Antenna Switch

The antenna switch circuit consists of two PIN diodes (CR101 and CR102), a pi network (C107, L104 and C106), and two current limiting resistors (R101, R170). In the transmit mode, B+ at PCIC (U102) pin 23 will go low and turn on Q111 where a B+ bias is applied to the antenna switch circuit to bias the diodes "on". The shunt diode (CR102) shorts out the receiver port, and the pi network, which operates as a quarter wave transmission line, transforms the low impedance of the shunt diode to a high impedance at the input of the harmonic filter. In the receive mode, the diodes are both off, and hence, there exists a low attenuation path between the antenna and receiver ports.

2.4.3 Harmonic Filter

The harmonic filter consists of C104, L102, C103, L101 and C102. The design of the harmonic filter for UHF is that of a modified Zolotarev design. It has been optimized for efficiency of the power module. This type of filter has the advantage that it can give a greater attenuation in the stop-band for a given ripple level. The harmonic filter insertion loss is typically less than 1.2dB.

2.4.4 Antenna Matching Network

A matching network which is made up of L116 is used to match the antenna's impedance to the harmonic filter. This will optimize the performance of the transmitter and receiver into an antenna.

2.4.5 Power Control Integrated Circuit (PCIC)

The transmitter uses the Power Control IC (PCIC), U102 to regulate the power output of the radio. The current to the final stage of the power module is supplied through R101, which provides a voltage proportional to the current drain. This voltage is then fedback to the Automatic Level Control (ALC) within the PCIC to regulate the output power of the transmitter.

The PCIC has internal digital to analog converters (DACs) which provide the reference voltage of the control loop. The reference voltage level is programmable through the SPI line of the PCIC.

There are resistors and integrators within the PCIC, and external capacitors (C133, C134 and C135) in controlling the transmitter rising and falling time. These are necessary in reducing the power splatter into adjacent channels.

CR105 and its associated components are part of the temperature cut back circuitry. It senses the printed circuit board temperature around the transmitter circuits and output a DC voltage to the PCIC. If the DC voltage produced exceeds the set threshold in the PCIC, the transmitter output power will be reduced so as to reduce the transmitter temperature.

2.4.6 Temperature Cut Back Circuit

Diode CR105 and associated components are part of a temperature cutback circuit. This circuit senses the printed circuit board temperature around the transmitter circuits and outputs a DC voltage to the PCIC. If the DC voltage produced exceeds the set threshold of the PCIC, the transmitter output power decreases to reduce the transmitter temperature.

2.5 UHF1 Receiver

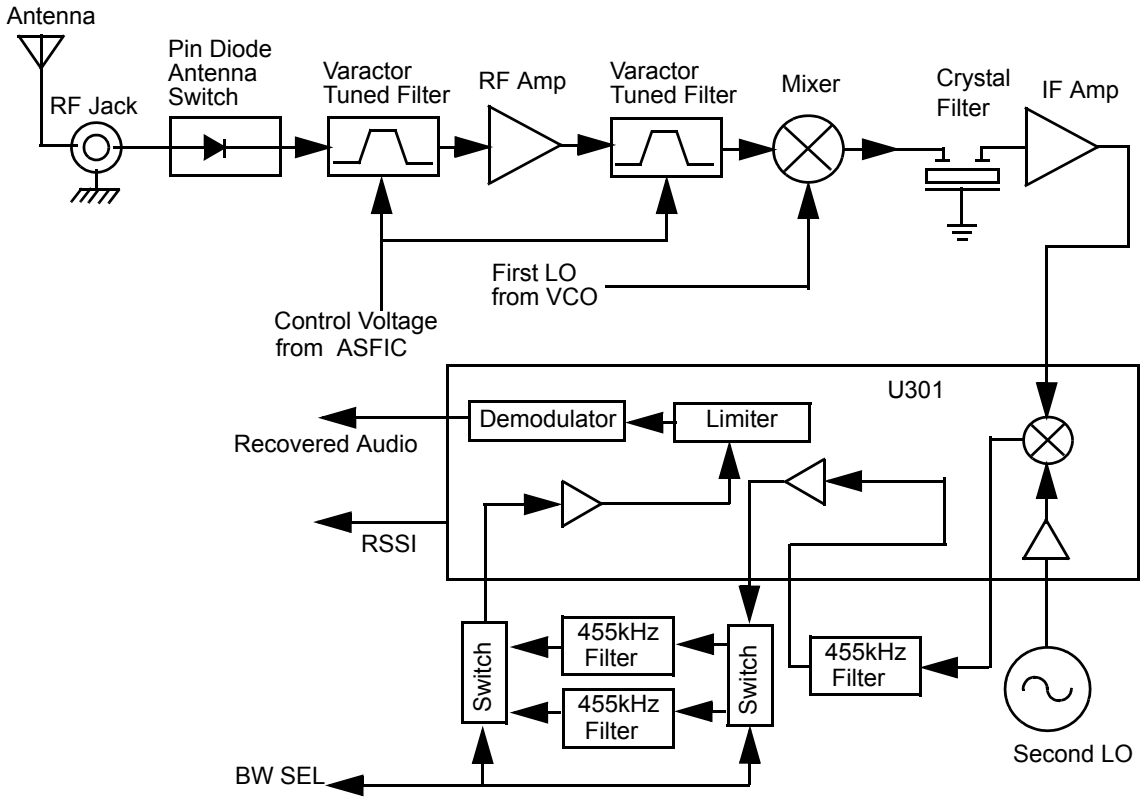


Figure 2-4. UHF Receiver Block Diagram

2.5.1 Receiver Front-End

The RF signal is received by the antenna and applied to a low-pass filter. For UHF, the filter consists of L101, L102, C102, C103, C104. The filtered RF signal is passed through the antenna switch. The antenna switch circuit consists of two PIN diodes (CR101 and CR102) and a pi network (C106, L104 and C107).The signal is then applied to a varactor tuned bandpass filter. The UHF bandpass filter comprises of L301, L302, C302, C303, C304, CR301 and CR302. The bandpass filter is tuned by applying a control voltage to the varactor diodes(CR301 and CR302) in the filter.

The bandpass filter is electronically tuned by the DACRx from IC404 which is controlled by the microprocessor. Depending on the carrier frequency, the DACRx will supply the tuned voltage to the varactor diodes in the filter. Wideband operation of the filter is achieved by shifting the bandpass filter across the band.

The output of the bandpass filter is coupled to the RF amplifier transistor Q301 via C307. After being amplified by the RF amplifier, the RF signal is further filtered by a second varactor tuned bandpass filter, consisting of L306, L307, C313, C317, CR304 and CR305.

Both the pre and post-RF amplifier varactor tuned filters have similar responses. The 3 dB bandwidth of the filter is about 50 MHz. This enables the filters to be electronically controlled by using a single control voltage which is DACRx .

The output of the post-RF amplifier filter which is connected to the passive double balanced mixer consists of T301, T302 and CR306. Matching of the filter to the mixer is provided by C381. After mixing with the first LO signal from the voltage controlled oscillator (VCO) using low side injection, the RF signal is down-converted to the 44.85 MHz IF signal.

The IF signal coming out of the mixer is transfered to the crystal filter (FL301) through a resistor pad and a diplexer (C322 and L310). Matching to the input of the crystal filter is provided by C324 and L311. The crystal filter provides the necessary selectivity and intermodulation protection.

2.5.2 Receiver Back-End

The output of crystal filter FL301 is matched to the input of first IF amplifier transistor Q302 by L330. Voltage supply to the IF amplifier is taken from the receive 5 volts (R5). The IF amplifer provides a gain of about 16dB. The amplified first IF signal is then coupled into U301(pin 1) via C360 and L332 which provides the matching for the first IF amplifier and U301.

Within U301, the first IF 44.85 MHz signal mixes with the 44.395 MHz second local oscillator (2nd LO) to produce the second IF signal at 455 kHz. The 2nd LO signal frequency is determined by crystal Y300. The second IF signal (455 kHz) is then filtered by an external ceramic filter FL302 before being amplified by the second IF amplifier within U301. Again, the signal is filtered by a second external ceramic filter FL303 or FL304 depending on the selected channel spacing. FL303 is used for 20/25 kHz channel spacing whereas FL304, for 12.5 kHz channel spacing. The simple circuit consisting of U302, CR312, CR313 and resistors R345, R360, R321 and R324 divert the second IF signal according to the BW_SEL line. The filtered output of the second IF signal is applied to the limiter input pin of U301.

The IF IC (U301) contains a quadrature detector using a ceramic phase-shift element (Y301) to provide audio detection. Internal amplification provides an audio output level around 120mVrms (@60% deviation) from pin 8 of U301. This demodulated audio is fed to the ASFIC_CMP IC (U404) in the controller section.

The IF IC (U301) also performs several other functions. It provides a received signal-strength indicator (RSSI) with a dynamic range of 70 dB. The RSSI is a dc voltage monitored by the microprocessor, and used as a peak indicator during the bench tuning of the receiver front-end varactor filter.

2.5.3 Frequency Generation Circuit

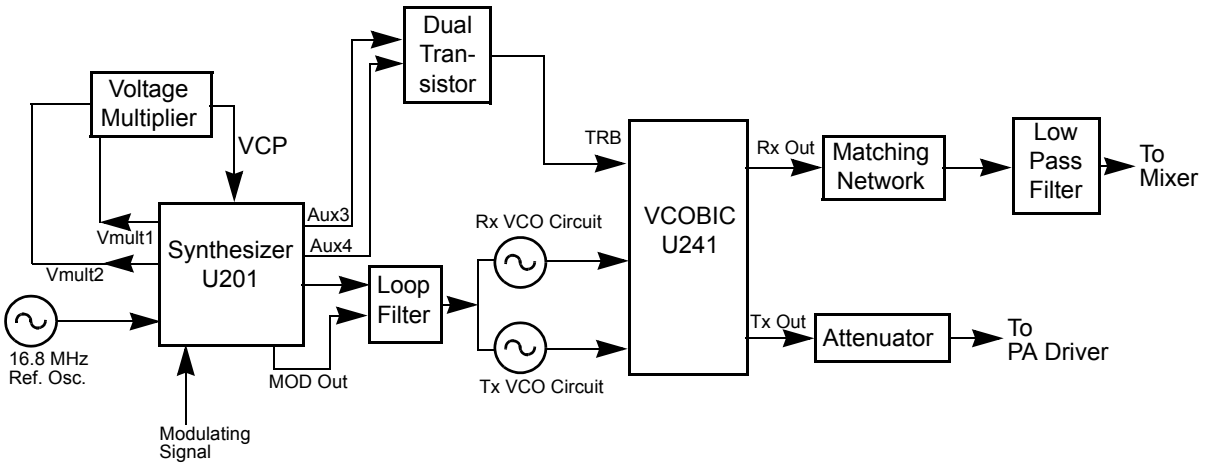


Figure 2-5. Frequency Generation Unit Block Diagram

The Frequency Generation Circuitry is composed of two main ICs, the Fractional-N synthesizer (U201), and the VCO/Buffer IC (U241). Designed in conjunction to maximize compatibility, the two ICs provide many of the functions that normally would require additional circuitry. The synthesizer block diagram illustrates the interconnect and support circuitry used in the region. Refer to the relevant schematics for the reference designators.

The synthesizer is powered by regulated 5V and 3.3V which come from U247 and U248 respectively. The synthesizer in turn generates a superfiltered 4.5V which powers U241.

In addition to the VCO, the synthesizer must interface with the logic and ASFIC circuitry. Programming for the synthesizer is accomplished through the data , clock and chip select lines from the microprocessor. A 3.3V dc signal from synthesizer lock detect line indicates to the microprocessor that the synthesizer is locked.

Transmit modulation from the ASFIC is supplied to pin10 of U201. Internally the audio is digitized by the Fractional-N and applied to the loop divider to provide the low-port modulation. The audio runs through an internal attenuator for modulation balancing purposes before going out to the VCO.

2.6 UHF1 Synthesizer

The Fractional-N Synthesizer uses a 16.8MHz crystal (FL201) to provide a reference for the system. The LVFractN IC (U201) further divides this to 2.1MHz, 2.225MHz, and 2.4MHz as reference frequencies. Together with C206, C207, C208, R204 and CR203 , they build up the reference oscillator which is capable of 2.5ppm stability over temperatures of -30 to 85°C. It also provides 16.8MHz at pin 19 of U201 to be used by ASFIC and LVZIF.

The loop filter which consist of C231, C232, C233, R231, R232 and R233 provides the necessary dc steering voltage for the VCO and determines the amount of noise and spur passing through .

In achieving fast locking for the synthesizer, an internal adapt charge pump provides higher current at pin 45 of U201 to put synthesizer within the lock range. The required frequency is then locked by normal mode charge pump at pin 43 .

Both the normal and adapt charge pumps get their supply from the capacitive voltage multiplier which is made up of C258, C259, C228, triple diode CR201 and level shifters U210 and U211. Two 3.3V square waves (180 deg out of phase) are first shifted to 5V, then along with regulated 5V , put through arrays of diodes and capacitors to build up 13.3V at pin 47 of U201.

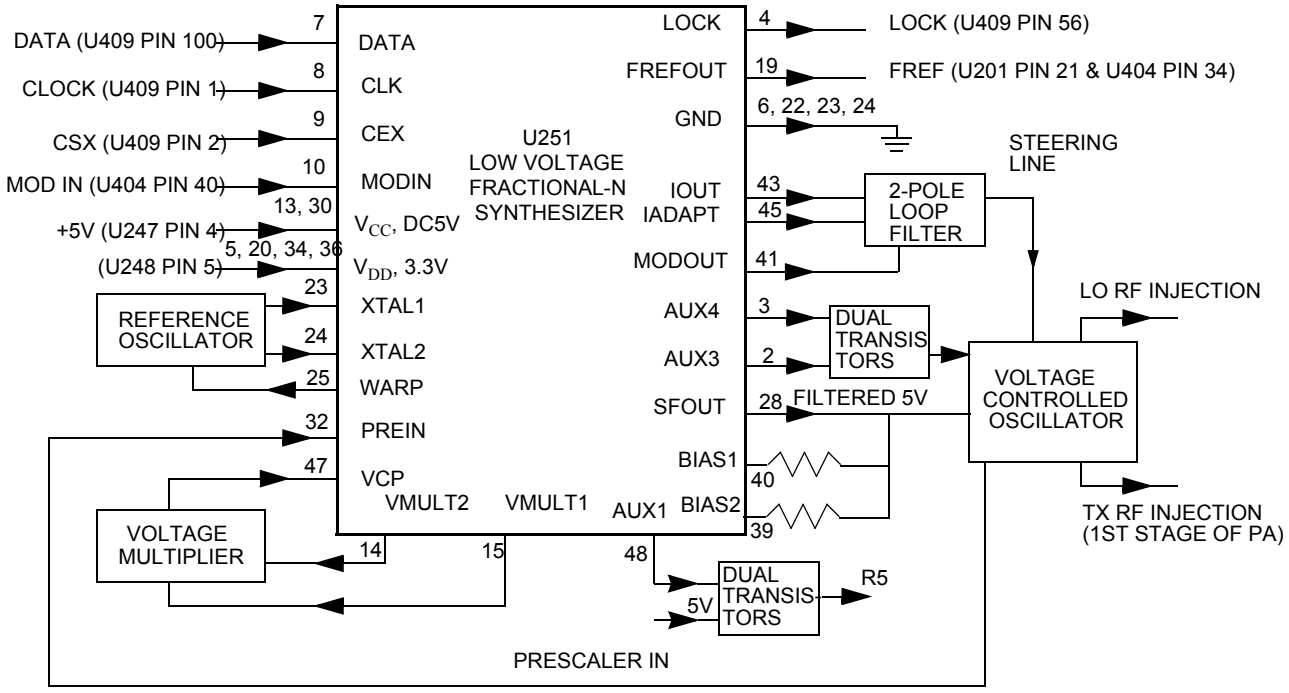


Figure 2-6. UHFSynthesizer Block Diagram

2.7 UHF1 Voltage Control Oscillator (VCO)

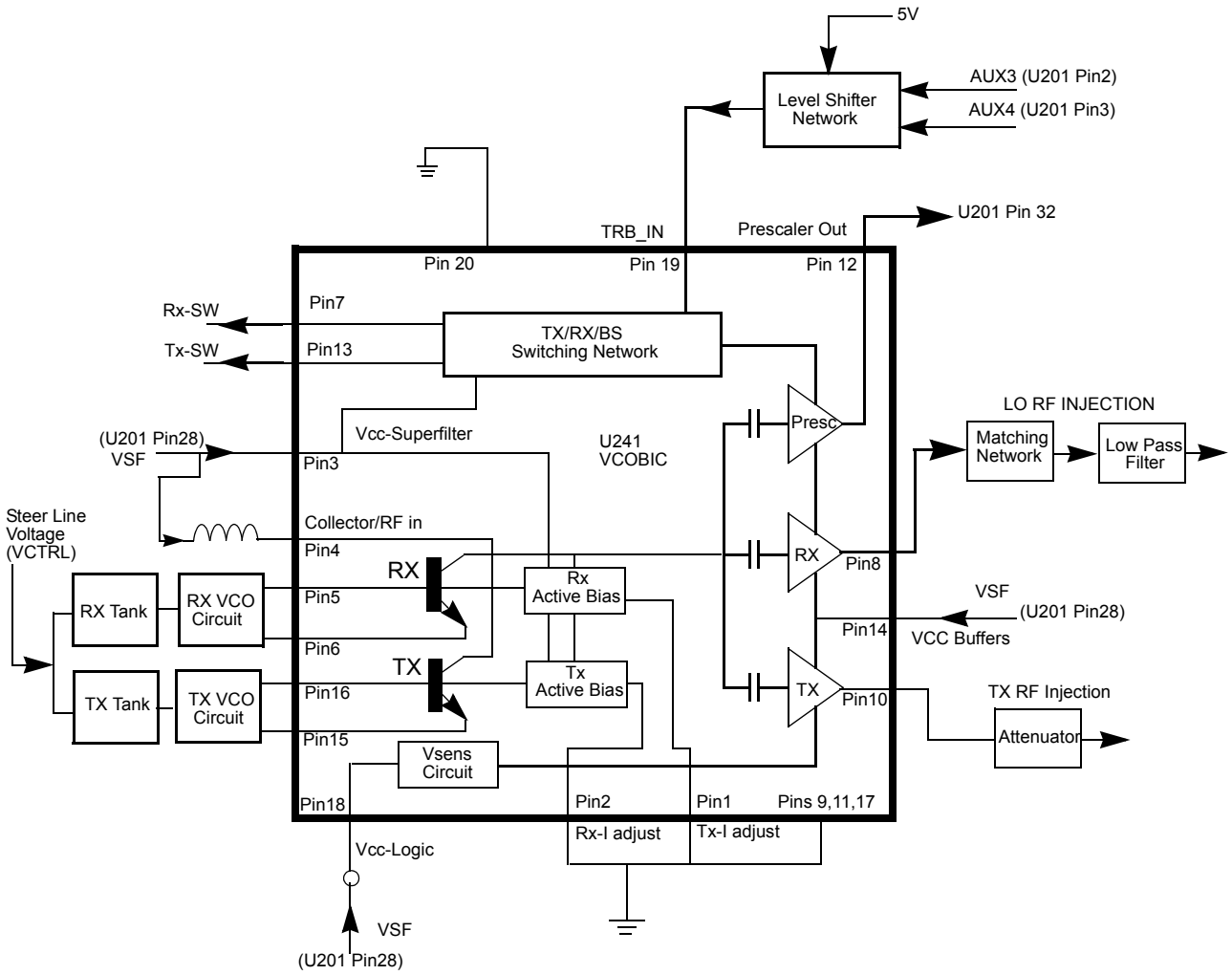


Figure 2-7. UHF VCO Block Diagram

The VCOBIC (U241) in conjunction with the Fractional-N synthesizer (U201) generates RF in both the receive and the transmit modes of operation. The TRB line (U241 pin 19) determines which oscillator and buffer will be enabled. A sample of the RF signal from the enabled oscillator is routed from U241 pin 12, through a low pass filter, to the prescaler input (U201 pin 32). After frequency comparison in the synthesizer, a resultant CONTROL VOLTAGE is received at the VCO. This voltage is a DC voltage between 3.5V and 9.5V when the PLL is locked on frequency.

The VCOBIC (U241) is operated at 4.54 V (VSF) and Fractional-N synthesizer (U201) at 3.3V. This difference in operating voltage requires a level shifter consisting of Q260 and Q261 on the TRB line.

The operation logic is shown in Table 2-5.

Table 2-5. Level Shifter Logic

Desired Mode	AUX 4	AUX 3	TRB
Tx	Low	High (@3.2V)	High (@4.8V)
Rx	High	Low	Low
Battery Saver	Low	Low	Hi-Z/Float (@2.5V)

In the receive mode, U241 pin 19 is low or grounded. This activates the receive VCO by enabling the receive oscillator and the receive buffer of U241. The RF signal at U241 pin 8 is run through a matching network. The resulting RF signal is the LO RF INJECTION and it is applied to the mixer at T302 (refer to UHF (403–470 MHz) Receiver Front End Schematic Diagram on page 4-23).

During the transmit condition, when PTT is depressed, five volts is applied to U241 pin 19. This activates the transmit VCO by enabling the transmit oscillator and the transmit buffer of U241. The RF signal at U241 pin 10 is injected into the input of the PA module (U101 pin16). This RF signal is the TX RF INJECTION. Also in transmit mode, the audio signal to be frequency modulated onto the carrier is received through the U201 pin 41.

When a high impedance is applied to U241 pin19, the VCO is operating in BATTERY SAVER mode. In this case, both the receive and transmit oscillators as well as the receive transmit and prescaler buffer are turned off.

2.8 UHF2 Transmitter

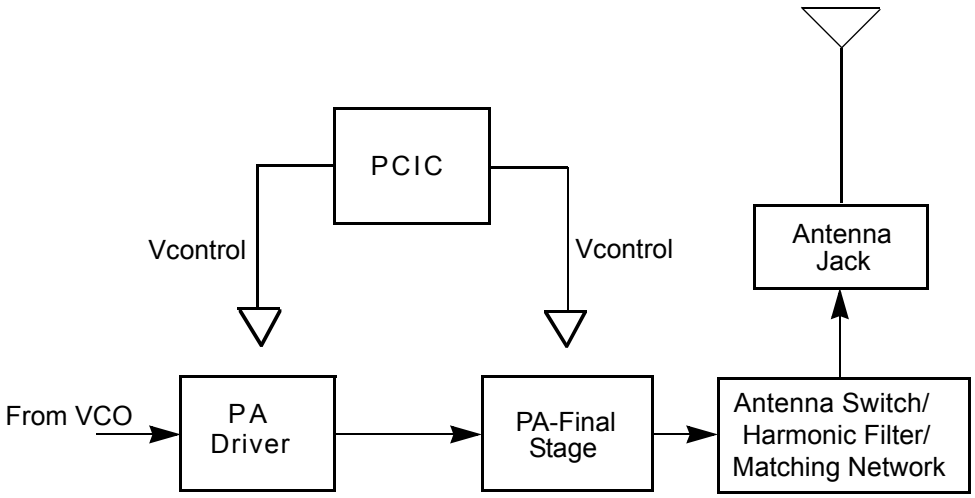


Figure 2-8. Transmitter Block Diagram

The UHF transmitter consists of the following basic circuits as shown in Figure 2-8.

- Power amplifier (PA).
- Antenna switch/harmonic filter.
- Antenna matching network.
- Power control integrated circuit (PCIC).

2.8.1 Power Amplifier (PA)

The PA consists of two LDMOS devices:

- 9Z67 LDMOS driver IC (U101) and
- PRF1507 LDMOS PA (Q110)

The 9Z67 LDMOS driver IC contains a 2 stage amplification with a supply voltage of 7.3V.

This RF power amplifier is capable of supplying an output power of 0.3W (pin 6 and 7) with an input signal of 2mW (3dBm) (pin16). The current drain would typically be 160mA while operating in the frequency range of 450–527MHz.

The PRF1507 LDMOS PA is capable of supplying an output power of 7W with an input signal of 0.3W. The current drain would typically be 1300mA while operating in the frequency range of 450–527MHz. The power output can be varied by changing the biasing voltage.

2.8.2 Antenna Switch

The antenna switch circuit consists of two PIN diodes (CR101 and CR102), a pi network (C107, L104 and C106), and two current limiting resistors (R101, R170). In the transmit mode, B+ at PCIC (U102) pin 23 will go low and turn on Q111 where a B+ bias is applied to the antenna switch circuit to bias the diodes "on". The shunt diode (CR102) shorts out the receiver port, and the pi network, which operates as a quarter wave transmission line, transforms the low impedance of the shunt diode to a high impedance at the input of the harmonic filter. In the receive mode, the diodes are both off, and hence, there exists a low attenuation path between the antenna and receiver ports.

2.8.3 Harmonic Filter

The harmonic filter consists of C104, L102, C103, L101 and C102. The design of the harmonic filter for UHF is that of a modified Zolotarev design. It has been optimized for efficiency of the power module. This type of filter has the advantage that it can give a greater attenuation in the stop-band for a given ripple level. The harmonic filter insertion loss is typically less than 1.2dB.

2.8.4 Antenna Matching Network

A matching network which is made up of L116 is used to match the antenna's impedance to the harmonic filter. This will optimize the performance of the transmitter and receiver into an antenna.

2.8.5 Power Control Integrated Circuit (PCIC)

The transmitter uses the Power Control IC (PCIC), U102 to regulate the power output of the radio. The current to the final stage of the power module is supplied through R101, which provides a voltage proportional to the current drain. This voltage is then fedback to the Automatic Level Control (ALC) within the PCIC to regulate the output power of the transmitter.

The PCIC has internal digital to analog converters (DACs) which provide the reference voltage of the control loop. The reference voltage level is programmable through the SPI line of the PCIC.

There are resistors and integrators within the PCIC, and external capacitors (C133, C134 and C135) in controlling the transmitter rising and falling time. These are necessary in reducing the power splatter into adjacent channels.

CR105 and its associated components are part of the temperature cut back circuitry. It senses the printed circuit board temperature around the transmitter circuits and output a DC voltage to the PCIC. If the DC voltage produced exceeds the set threshold in the PCIC, the transmitter output power will be reduced so as to reduce the transmitter temperature.

2.9 UHF2 Receiver

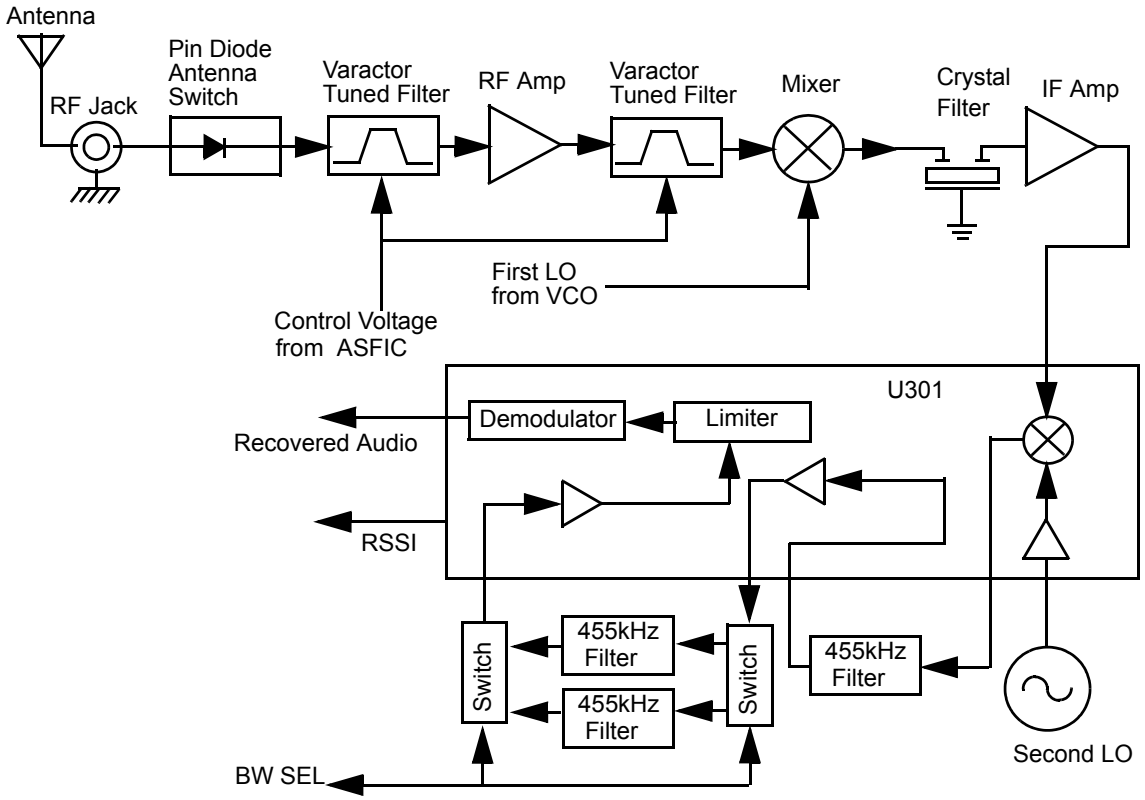


Figure 2-9. UHF Receiver Block Diagram

2.9.1 Receiver Front-End

The RF signal is received by the antenna and applied to a low-pass filter. For UHF, the filter consists of L101, L102, C102, C103, C104. The filtered RF signal is passed through the antenna switch. The antenna switch circuit consists of two PIN diodes(CR101 and CR102) and a pi network (C106, L104 and C107).The signal is then applied to a varactor tuned bandpass filter. The UHF bandpass filter comprises of L301, L302, C302, C303, C304, CR301 and CR302. The bandpass filter is tuned by applying a control voltage to the varactor diodes(CR301 and CR302) in the filter.

The bandpass filter is electronically tuned by the DACRx from IC404 which is controlled by the microprocessor. Depending on the carrier frequency, the DACRx will supply the tuned voltage to the varactor diodes in the filter. Wideband operation of the filter is achieved by shifting the bandpass filter across the band.

The output of the bandpass filter is coupled to the RF amplifier transistor Q301 via C307. After being amplified by the RF amplifier, the RF signal is further filtered by a second varactor tuned bandpass filter, consisting of L306, L307, C313, C317, CR304 and CR305.

Both the pre and post-RF amplifier varactor tuned filters have similar responses. The 3 dB bandwidth of the filter is about 50 MHz. This enables the filters to be electronically controlled by using a single control voltage which is DACRx .

The output of the post-RF amplifier filter which is connected to the passive double balanced mixer consists of T301, T302 and CR306. Matching of the filter to the mixer is provided by C381. After mixing with the first LO signal from the voltage controlled oscillator (VCO) using low side injection, the RF signal is down-converted to the 44.85 MHz IF signal.

The IF signal coming out of the mixer is transfered to the crystal filter (FL301) through a resistor pad and a diplexer (C322 and L310). Matching to the input of the crystal filter is provided by C324 and L311. The crystal filter provides the necessary selectivity and intermodulation protection.

2.9.2 Receiver Back-End

The output of crystal filter FL301 is matched to the input of first IF amplifier transistor Q302 by L330. Voltage supply to the IF amplifier is taken from the receive 5 volts (R5). The IF amplifer provides a gain of about 16dB. The amplified first IF signal is then coupled into U301(pin 1) via C360 and L332 which provides the matching for the first IF amplifier and U301.

Within U301, the first IF 44.85 MHz signal mixes with the 44.395 MHz second local oscillator (2nd LO) to produce the second IF signal at 455 kHz. The 2nd LO signal frequency is determined by crystal Y300. The second IF signal (455 kHz) is then filtered by an external ceramic filter FL302 before being amplified by the second IF amplifier within U301. Again, the signal is filtered by a second external ceramic filter FL303 or FL304 depending on the selected channel spacing. FL303 is used for 20/25 kHz channel spacing whereas FL304, for 12.5 kHz channel spacing. The simple circuit consisting of U302, CR312, CR313 and resistors R345, R360, R321 and R324 divert the second IF signal according to the BW_SEL line. The filtered output of the second IF signal is applied to the limiter input pin of U301.

The IF IC (U301) contains a quadrature detector using a ceramic phase-shift element (Y301) to provide audio detection. Internal amplification provides an audio output level around 120mVrms (@60% deviation) from pin 8 of U301. This demodulated audio is fed to the ASFIC_CMP IC (U404) in the controller section.

The IF IC (U301) also performs several other functions. It provides a received signal-strength indicator (RSSI) with a dynamic range of 70 dB. The RSSI is a dc voltage monitored by the microprocessor, and used as a peak indicator during the bench tuning of the receiver front-end varactor filter.

2.9.3 Frequency Generation Circuit

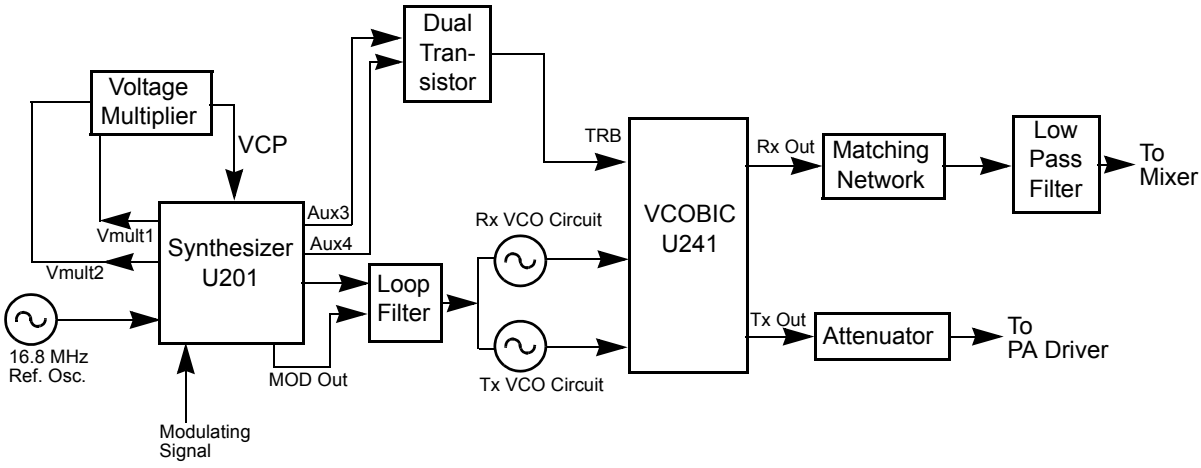


Figure 2-10. Frequency Generation Unit Block Diagram

The Frequency Generation Circuitry is composed of two main ICs, the Fractional-N synthesizer (U201), and the VCO/Buffer IC (U241). Designed in conjunction to maximize compatibility, the two ICs provide many of the functions that normally would require additional circuitry. The synthesizer block diagram illustrates the interconnect and support circuitry used in the region. Refer to the relevant schematics for the reference designators.

The synthesizer is powered by regulated 5V and 3.3V which come from U247 and U248 respectively. The synthesizer in turn generates a superfiltered 4.5V which powers U241.

In addition to the VCO, the synthesizer must interface with the logic and ASFIC circuitry. Programming for the synthesizer is accomplished through the data , clock and chip select lines from the microprocessor. A 3.3V dc signal from synthesizer lock detect line indicates to the microprocessor that the synthesizer is locked.

Transmit modulation from the ASFIC is supplied to pin10 of U201. Internally the audio is digitized by the Fractional-N and applied to the loop divider to provide the low-port modulation. The audio runs through an internal attenuator for modulation balancing purposes before going out to the VCO.

2.10 UHF2 Synthesizer

The Fractional-N Synthesizer uses a 16.8MHz crystal (FL201) to provide a reference for the system. The LVFractN IC (U201) further divides this to 2.1MHz, 2.225MHz, and 2.4MHz as reference frequencies. Together with C206, C207, C208, R204 and CR203 , they build up the reference oscillator which is capable of 2.5ppm stability over temperatures of -30 to 85°C. It also provides 16.8MHz at pin 19 of U201 to be used by ASFIC and LVZIF.

The loop filter which consist of C231, C232, C233, R231, R232 and R233 provides the necessary dc steering voltage for the VCO and determines the amount of noise and spur passing through .

In achieving fast locking for the synthesizer, an internal adapt charge pump provides higher current at pin 45 of U201 to put synthesizer within the lock range. The required frequency is then locked by normal mode charge pump at pin 43.

Both the normal and adapt charge pumps get their supply from the capacitive voltage multiplier which is made up of C258, C259, C228, triple diode CR201 and level shifters U210 and U211. Two 3.3V square waves (180 deg out of phase) are first shifted to 5V, then along with regulated 5V , put through arrays of diodes and capacitors to build up 13.3V at pin 47 of U201.

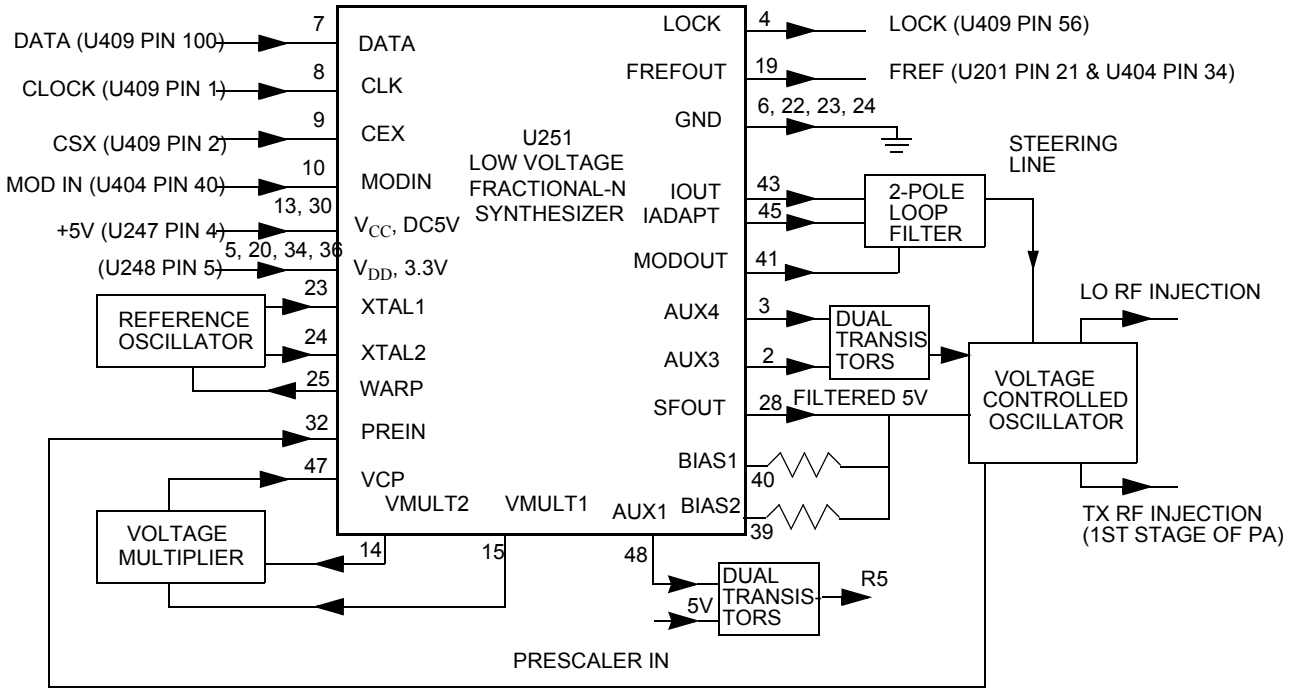


Figure 2-11. Synthesizer Block Diagram

2.11 UHF2 Voltage Controlled Oscillator (VCO)

(Refer to UHF (450–512 MHz) Voltage Controlled Oscillator Schematic Diagram on page 4-51)

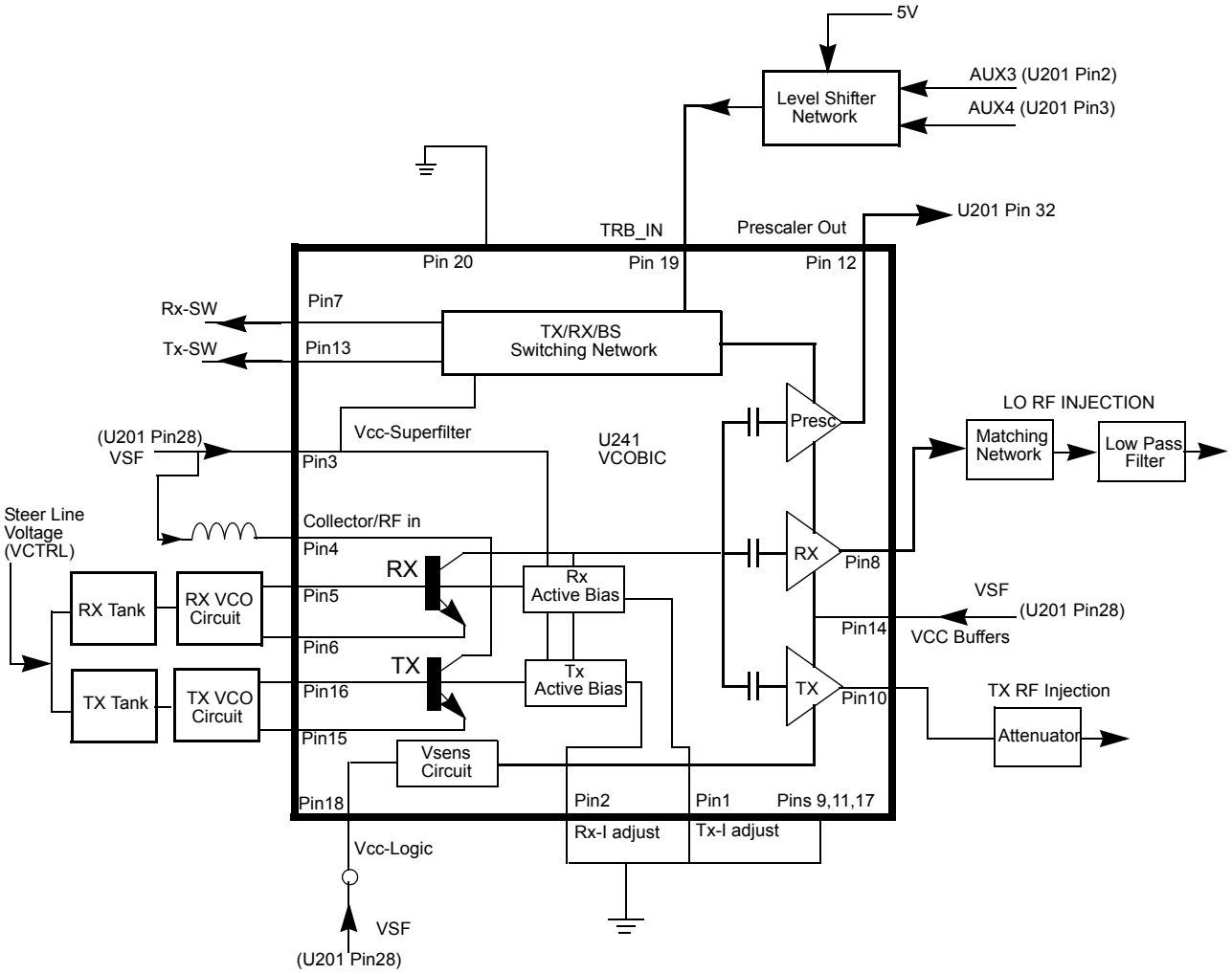


Figure 2-12. VCO Block Diagram

The VCOBIC (U241) in conjunction with the Fractional-N synthesizer (U201) generates RF in both the receive and the transmit modes of operation. The TRB line (U241 pin 19) determines which oscillator and buffer will be enabled. A sample of the RF signal from the enabled oscillator is routed from U241 pin 12, through a low pass filter, to the prescaler input (U201 pin 32). After frequency comparison in the synthesizer, a resultant CONTROL VOLTAGE is received at the VCO. This voltage is a DC voltage between 3.5V and 9.5V when the PLL is locked on frequency.

The VCOBIC(U241) is operated at 4.54 V (VSF) and Fractional-N synthesizer (U201) at 3.3V. This difference in operating voltage requires a level shifter consisting of Q260 and Q261 on the TRB line.

The operation logic is shown in Table 2-6.

Table 2-6. Level Shifter Logic

Desired Mode	AUX 4	AUX 3	TRB
Tx	Low	High (@3.2V)	High (@4.8V)
Rx	High	Low	Low
Battery Saver	Low	Low	Hi-Z/Float (@2.5V)

In the receive mode, U241 pin 19 is low or grounded. This activates the receive VCO by enabling the receive oscillator and the receive buffer of U241. The RF signal at U241 pin 8 is run through a matching network. The resulting RF signal is the LO RF INJECTION and it is applied to the mixer at T302 (refer to UHF (450–512 MHz) Receiver Front End Schematic Diagram on page 4-49).

During the transmit condition, when PTT is depressed, five volts is applied to U241 pin 19. This activates the transmit VCO by enabling the transmit oscillator and the transmit buffer of U241. The RF signal at U241 pin 10 is injected into the input of the PA module (U101 pin16). This RF signal is the TX RF INJECTION. Also in transmit mode, the audio signal to be frequency modulated onto the carrier is received through the U201 pin 41.

When a high impedance is applied to U241 pin19, the VCO is operating in BATTERY SAVER mode. In this case, both the receive and transmit oscillators as well as the receive transmit and prescaler buffer are turned off.

2.12 VHF Transmitter

The VHF transmitter consists of the following basic circuits as shown in Figure 2-13.

- Power amplifier
- Antenna switch/harmonic filter
- Antenna matching network
- Power control integrated circuit (PCIC)

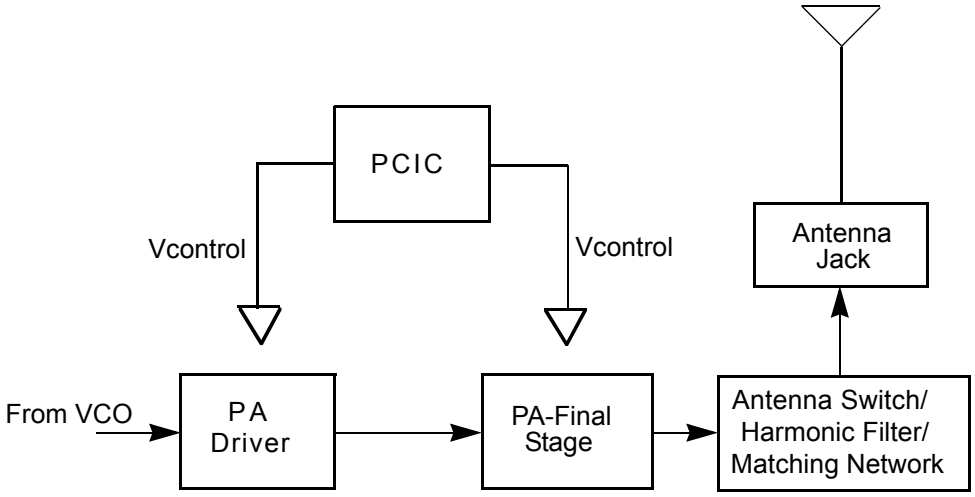


Figure 2-13. Transmitter Block Diagram

2.12.1 Power Amplifier

The power amplifier consists of two devices:

- 9Z67 LDMOS driver IC (U3501)
- PRF1507 LDMOS PA (Q3501)

The 9Z67 LDMOS driver IC contains a 2 stage amplification with a supply voltage of 7.3V.

This RF power amplifier is capable of supplying an output power of 0.3W (pin 6 and 7) with an input signal of 2mW (3dBm) (pin16). The current drain would typically be 130mA while operating in the frequency range of 136–174MHz.

The PRF1507 LDMOS PA is capable of supplying an output power of 7W with an input signal of 0.3W. The current drain would typically be 1800mA while operating in the frequency range of 136–174MHz. The power output can be varied by changing the biasing voltage.

2.12.2 Antenna Switch

The antenna switch circuit consists of two PIN diodes (D3521 and D3551), a pi network (C3531, L3551 and C3550), and two current limiting resistors (R3571, R3572, R3573). In the transmit mode, B+ at PCIC (U3502) pin 23 will go low and turn on Q3561 where a B+ bias is applied to the antenna switch circuit to bias the diodes "on". The shunt diode (D3551) shorts out the receiver port, and the pi network, which operates as a quarter wave transmission line, transforms the low impedance of the shunt diode to a high impedance at the input of the harmonic filter. In the receive mode, the diodes are both off, and hence, there exists a low attenuation path between the antenna and receiver ports.

2.12.3 Harmonic Filter

The harmonic filter consists of C3532 to C3536, L3531 and L3532. This network forms a low-pass filter to attenuate harmonic energy of the transmitter to specifications level. The harmonic filter insertion loss should be less than 1.2dB.

2.12.4 Antenna Matching Network

A matching network which is made up of L3538 and C3537 is used to match the antenna's impedance to the harmonic filter. This will optimize the performance of the transmitter and receiver into an antenna.

2.12.5 Power Control Integrated Circuit (PCIC)

The transmitter uses the Power Control IC (PCIC), U3502 to control the power output of the radio by maintaining the radio current drain. The current to the final stage of the power module is supplied through R3519 (0.1ohms), which provides a voltage proportional to the current drain. This voltage is then fedback to the Automatic Level Control (ALC) within the PCIC to keep the whole loop stable.

The PCIC has internal digital to analog converters (DACs) which provide the reference voltage of the control loop. The voltage level is controlled by the microprocessor through the data line of the PCIC.

There are resistors and integrators within the PCIC, and external capacitors (C3562, C3563 and C3565) in controlling the transmitter rising and falling time. These are necessary in reducing the power splatter into adjacent channels.

U3503 and its associated circuitry acts as a temperature cut back circuitry. This circuitry provides the necessary voltage to the PCIC to cut the transmitter power when the radio temperature gets too high.

2.13 VHF Receiver

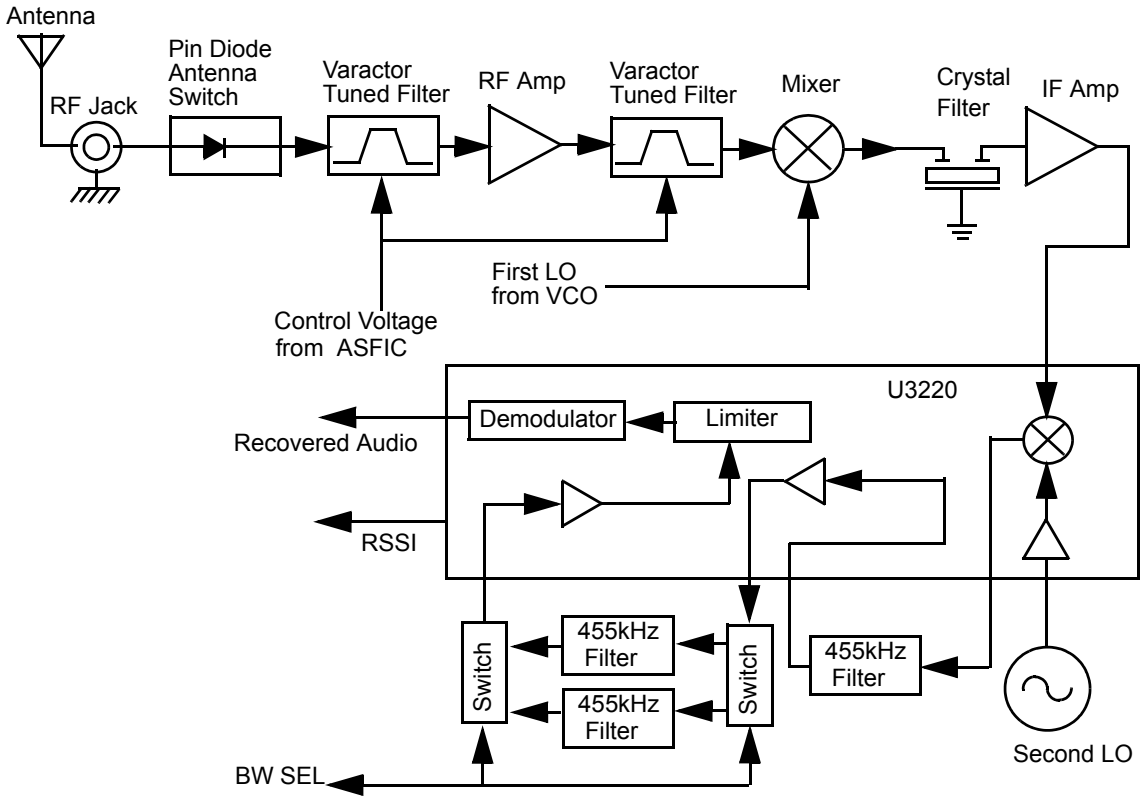


Figure 2-14. VHF Receiver Block Diagram

2.13.1 Receiver Front-End

The RF signal is received by the antenna and applied to a low-pass filter. For VHF, the filter consists of L3531, L3532, C3532 to C3563. The filtered RF signal is passed through the antenna switch. The antenna switch circuit consists of two PIN diodes(D3521 and D3551) and a pi network (C3531, L3551 and C3550).The signal is then applied to a varactor tuned bandpass filter. The VHF bandpass filter comprises of L3301, L3303, C3301 to C3304 and D3301. The bandpass filter is tuned by applying a control voltage to the varactor diode (D3301) in the filter.

The bandpass filter is electronically tuned by the DACRx from IC404 which is controlled by the microprocessor. Depending on the carrier frequency, the DACRx will supply the tuned voltage to the varactor diodes in the filter. Wideband operation of the filter is achieved by shifting the bandpass filter across the band.

The output of the bandpass filter is coupled to the RF amplifier transistor Q3302 via C3306. After being amplified by the RF amplifier, the RF signal is further filtered by a second varactor tuned bandpass filter, consisting of L3305, L3306, C3311 to C3314 and D3302.

Both the pre and post-RF amplifier varactor tuned filters have similar responses. The 3 dB bandwidth of the filter is about 12 MHz. This enables the filters to be electronically controlled by using a single control voltage which is DACRx .

The output of the post-RF amplifier filter is connected to the passive double balanced mixer which consists of T3301, T3302 and CR3301. Matching of the filter to the mixer is provided by C3317, C3318 and L3308. After mixing with the first LO signal from the voltage controlled oscillator (VCO) using high side injection, the RF signal is down-converted to the 44.85 MHz IF signal.

The IF signal coming out of the mixer is transfered to the crystal filter (Y3200) through a resistor pad (R3321 – R3323) and a diplexer (C3320 and L3309). Matching to the input of the crystal filter is provided by C3201 and L3200. The crystal filter provides the necessary selectivity and intermodulation protection.

2.13.2 Receiver Back-End

The output of crystal filter Y3200 is matched to the input of IF amplifier transistor Q3200 by L3203. Voltage supply to the IF amplifier is taken from the receive 5 volts (R5). The IF amplifier Q3200 is actively biased by a collector base feedback provided by R3202 and R3203. The gain controlled IF amplifer provides a maximum gain of about 16dB. A dual hot carrier diode (CR3201) limits the filter output voltage swing to reduce overdrive effects at RF levels above -27dBm. The amplified IF signal is then coupled into U3220 (pin 1) via L3202, C3207, and C3200 which provides the matching for the IF amplifier and U3220.

The IF signal applied to pin 1 of U3220 is amplified, down-converted, filtered, and demodulated, to produce the recovered audio at pin 7 of U3220.

Within U3220, the first IF 44.85 MHz signal mixes with the 44.395 MHz second local oscillator (2nd LO) to produce the second IF signal at 455 kHz. The 2nd LO signal frequency is determined by crystal Y3201. The second IF signal (455 kHz) is then filtered by an external ceramic filter Y3205 before being amplified by the second IF amplifier within U3220. Again, the signal is filtered by a second external ceramic filter Y3203 or Y3204 depending on the selected channel spacing. Y3203 is used for 20/25 kHz channel spacing whereas Y3204, for 12.5 kHz channel spacing. The simple circuit consisting of U3221, CR3202, CR3203 and resistors R3209, R3212, R3211 and R3205 divert the second IF signal according to the BW_SEL line. The filtered output of the second IF signal is applied to the limiter input pin of U3220 (Pin 14).

The IF IC (U3220) contains a quadrature detector using a ceramic phase-shift element (Y3202) to provide audio detection. Internal amplification provides an audio output level around 120mVrms (@60% deviation) from pin 8 of U3220. This demodulated audio is fed to the ASFIC_CMP IC (U404) in the controller section.

The IF IC (U3220) also performs several other functions. It provides a received signal-strength indicator (RSSI) with a dynamic range of 70 dB. The RSSI is a dc voltage monitored by the microprocessor, and used as a peak indicator during the bench tuning of the receiver front-end varactor filter.

2.13.3 Automatic Gain Control (AGC)

The front end automatic gain control circuit provides automatic reduction of gain, of the front end RF amplifier via feedback. This action is necessary to prevent overloading of backend circuits. This is achieved by drawing some of the output power from the RF amplifier output. At high radio frequencies, capacitor C3327 provides the low impedance path to ground for this purpose. CR3302 is a PIN diode used for switching the path on or off. A certain amount of forward biasing current is needed to turn the PIN diode on. Transistor Q3301 provides this current.

Radio signal strength indicator, RSSI, a voltage signal, is used to drive Q3301 to saturation i.e. turned on. RSSI is produced by U3220 and is proportional to the gain of the RF amplifier and the input power to the radio.

Resistors R3304 and R3305 are voltage dividers designed to turn on Q3301 at certain RSSI levels. In order to turn on Q3301 the voltage across R3305 must be greater or equal to the voltage across R3324, plus the base-emitter voltage (Vbe) present at Q3301. Capacitor C3209 is used to dampen any instability while the AGC is turning on. The current flowing into the collector of Q3301, a high current gain NPN transistor, will be drawn through the PIN diode to turn it on. Maximum current flowing through the PIN is limited by the resistors R3316, R3313, R3306 and R3324. C3326 is a feedback capacitor used to provide some stability to this high gain stage.

2.13.4 Frequency Generation Circuit

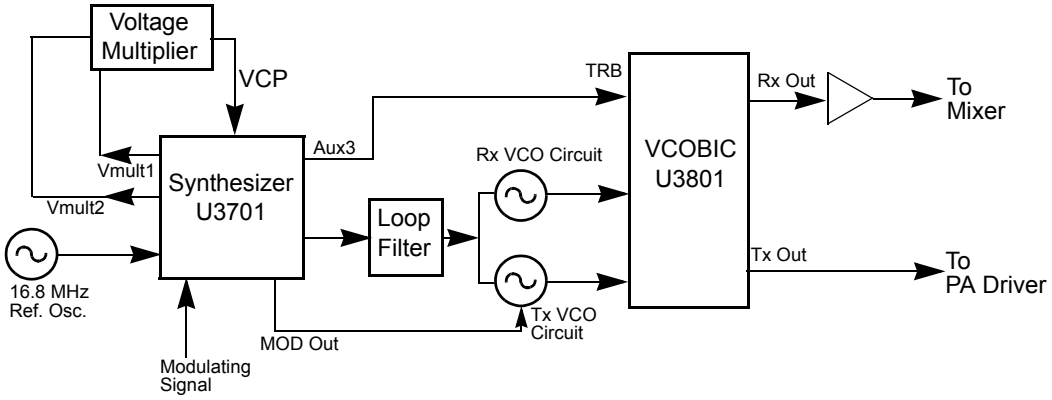


Figure 2-15. Frequency Generation Unit Block Diagram

The Frequency Generation Circuitry is composed of two main ICs, the Fractional-N synthesizer (U3701), and the VCO/Buffer IC (U3801). Designed in conjunction to maximize compatibility, the two ICs provide many of the functions that normally would require additional circuitry. The synthesizer block diagram illustrates the interconnect and support circuitry used in the region. Refer to the relevant schematics for the reference designators.

The synthesizer is powered by regulated 5V and 3.3V which come from U3711 and U3201 respectively. The synthesizer in turn generates a superfiltered 4.5V which powers U3801.

In addition to the VCO, the synthesizer must interface with the logic and ASFIC circuitry. Programming for the synthesizer is accomplished through the data , clock and chip select lines from the microprocessor. A 3.3V dc signal from synthesizer lock detect line indicates to the microprocessor that the synthesizer is locked.

Transmit modulation from the ASFIC is supplied to pin10 of U3701. Internally the audio is digitized by the Fractional-N and applied to the loop divider to provide the low-port modulation. The audio runs through an internal attenuator for modulation balancing purposes before going out to the VCO.

2.14 VHF Synthesizer

The Fractional-N Synthesizer uses a 16.8MHz crystal (Y3761) to provide a reference for the system. The LVFractN IC (U3701) further divides this to 2.1MHz, 2.225MHz, and 2.4MHz as reference frequencies. Together with C3761, C3762, C3763, R3761 and D3761 , they build up the reference oscillator which is capable of 2.5ppm stability over temperatures of -30 to 85°C. It also provides 16.8MHz at pin 19 of U3701 to be used by ASFIC and LVZIF.

The loop filter which consist of C3721, C3722, R3721, R3722 and R3723 provides the necessary dc steering voltage for the VCO and determines the amount of noise and spur passing through .

In achieving fast locking for the synthesizer, an internal adapt charge pump provides higher current at pin 45 of U3701 to put synthesizer within the lock range. The required frequency is then locked by normal mode charge pump at pin 43 .

Both the normal and adapt charge pumps get their supply from the capacitive voltage multiplier which is made up of C3701 to C3704 and triple diodes D3701, D3702. Two 3.3V square waves (180 deg out of phase) are first multiplied by four and then shifted, along with regulated 5V, to build up 13.5V at pin 47 of U3701.

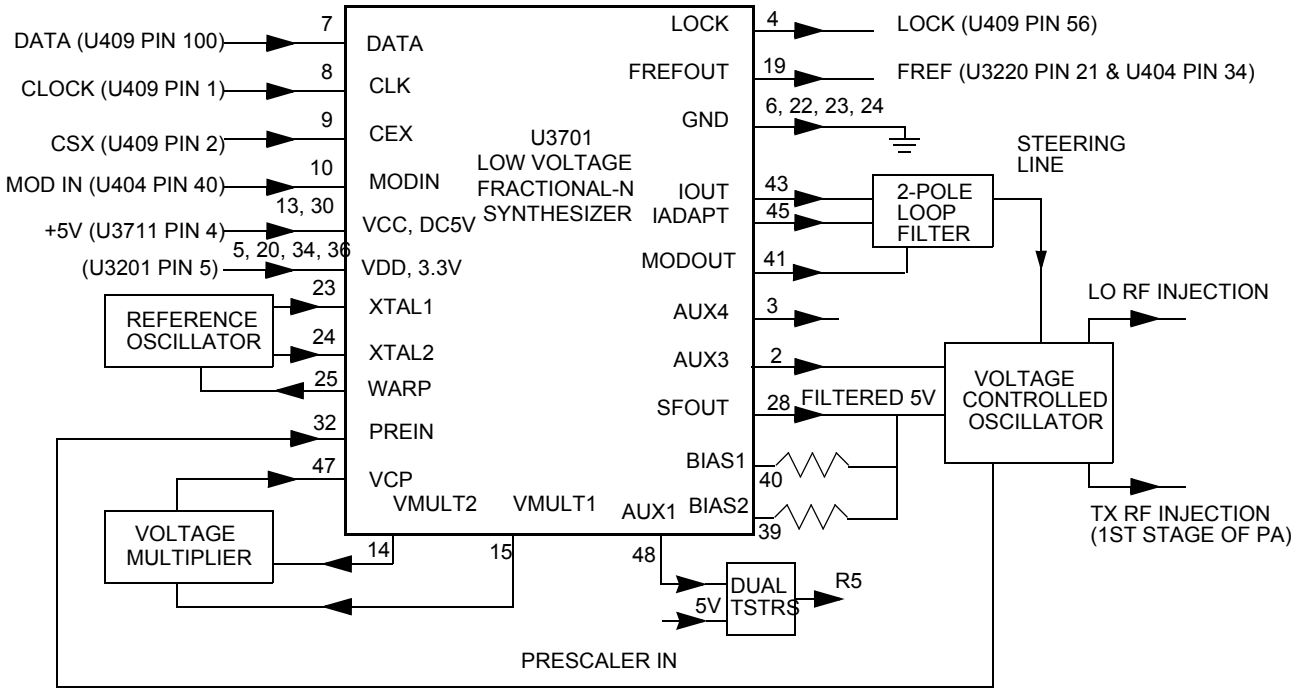


Figure 2-16. Synthesizer Block Diagram

2.15 Voltage Control Oscillator (VCO)

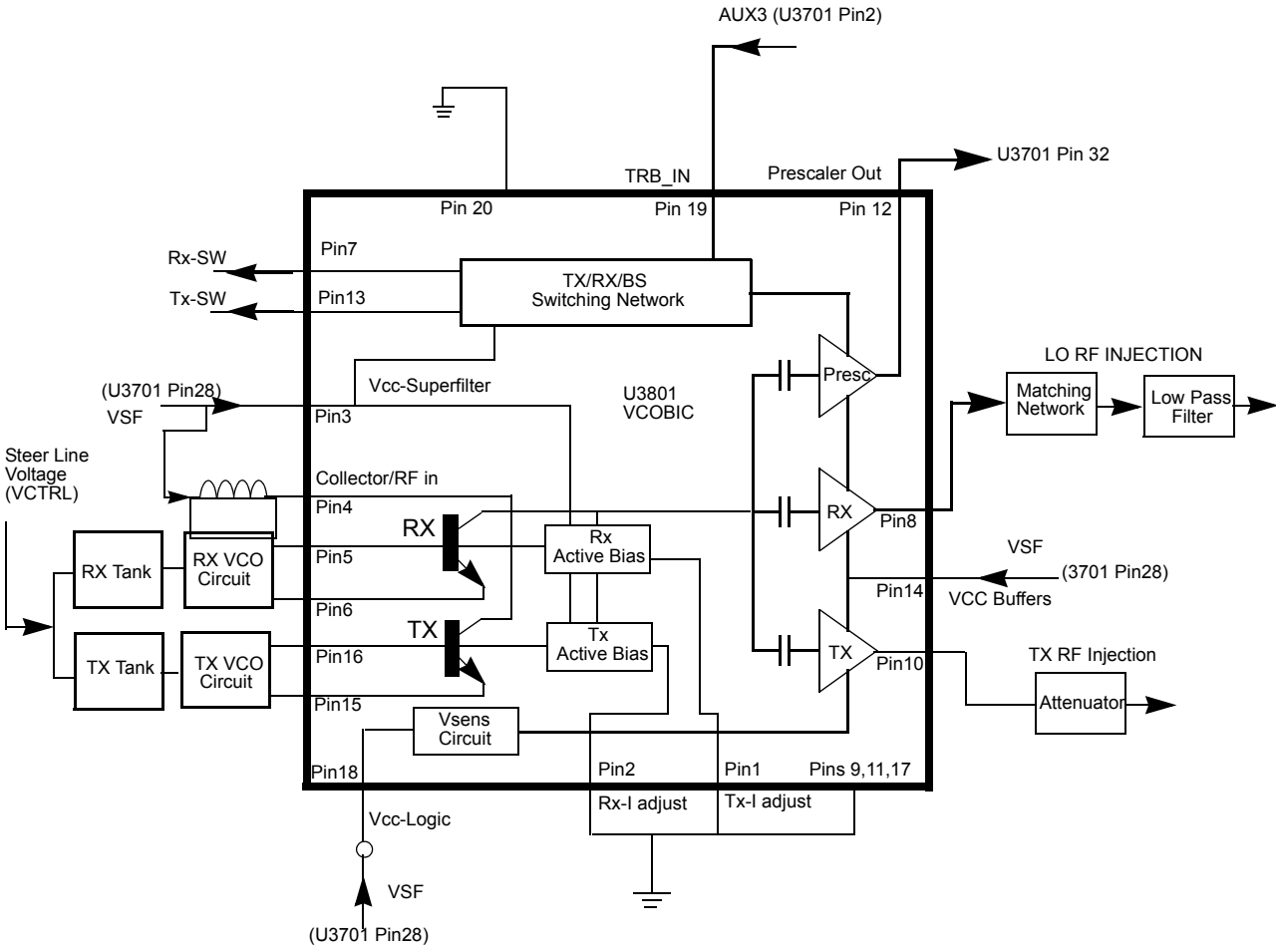


Figure 2-17. VCO Block Diagram

The VCOBIC (U3801) in conjunction with the Fractional-N synthesizer (U3701) generates RF in both the receive and the transmit modes of operation. The TRB line (U3801 pin 19) determines which oscillator and buffer will be enabled. A sample of the RF signal from the enabled oscillator is routed from U3801 pin 12, through a low pass filter, to the prescaler input (U3701 pin 32). After frequency comparison in the synthesizer, a resultant CONTROL VOLTAGE is received at the VCO. This voltage is a DC voltage typically between 3.5V and 9.5V when the PLL is locked on frequency.

The RF section of the VCOBIC(U3801) is operated at 4.54 V (VSF), while the control section of the VCOBIC and Fractional-N synthesizer (U3701) is operated at 3.3V. The operation logic is shown in Table 2-7.

Table 2-7. VCO Control Logic

Desired Mode	AUX 4	AUX 3	TRB
Tx	n.u.	High (@3.2V)	High (@3.2V)
Rx	n.u.	Low	Low
Battery Saver	n.u.	Hi-Z/Float (@1.6V)	Hi-Z/Float (@1.6V)

In the receive mode, U3801 pin 19 is low or grounded. This activates the receive VCO by enabling the receive oscillator and the receive buffer of U3801. The RF signal at U3801 pin 8 is run through a matching network. The resulting RF signal is the LO RF INJECTION and it is applied to the mixer at T3302.

During the transmit condition, when PTT is depressed, 3.2 volts is applied to U3801 pin 19. This activates the transmit VCO by enabling the transmit oscillator and the transmit buffer of U3801. The RF signal at U3801 pin 10 is injected into the input of the PA module (U3501 pin16). This RF signal is the TX RF INJECTION. Also in transmit mode, the audio signal to be frequency modulated onto the carrier is received through U3701 pin 41.

When a high impedance is applied to U3801 pin19, the VCO is operating in BATTERY SAVER mode. In this case, both the receive and transmit oscillators as well as the receive transmit and prescaler buffer are turned off.

2.16 Low Band Transmitter

The low band transmitter consists of the following basic circuits as shown in Figure 2-18.

- Power amplifier (PA).
- Antenna switch/harmonic filter.
- Antenna matching network.
- Power control integrated circuit (PCIC).

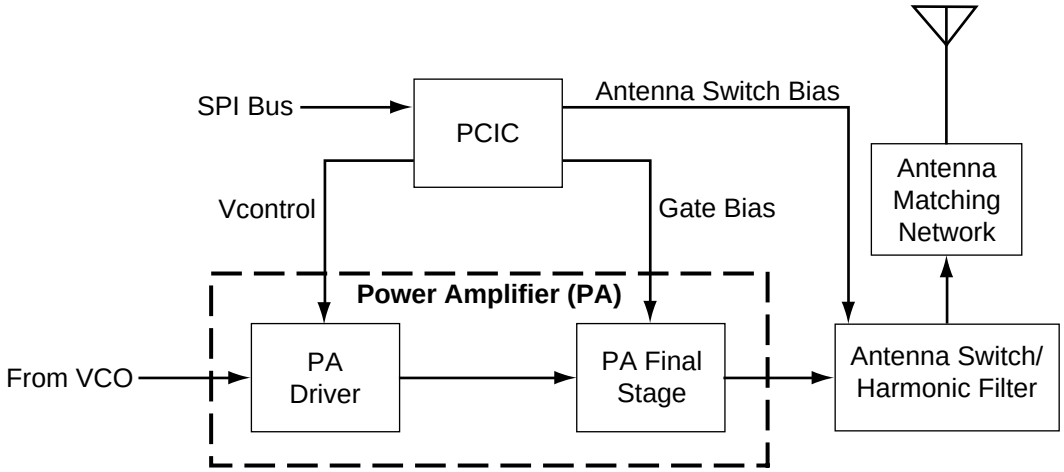


Figure 2-18. Low Band Transmitter Block Diagram

2.16.1 Power Amplifier (PA)

The PA consists of two LDMOS devices:

- PA driver, U101.
- PA final stage, Q100.

The LDMOS driver (U101) provides 2-stage amplification using a supply voltage of 7.3V. The amplifier is capable of supplying an output power of 0.3W (pins 6 and 7) with an input signal of 2mW at (pin16). The current drain is typically 120mA while operating in the frequency range of 29.7 –50 MHz. The power output of this stage is varied by the power control loop which controls the voltage on pin 1.

The LDMOS PA is capable of supplying an output power of 8W with an input signal of 0.3W. The current drain is typically 2000 mA while operating in the frequency range of 29.7– 50 MHz. The final stage gate is bias by a voltage from PCIC, pin 24. This voltage is the output of a programmable DAC inside the PCIC and the output is adjustable with the radio tuner.

2.16.2 Antenna Switch

The antenna switch circuit consists of two pin diodes (D100 and D101), a RF network (C147 and L103), and a DC feed network (L104, C144, and current limiting resistor R101). In the transmit mode, PCIC (U102) pin 32 goes high supplying current via the feed network to bias the diodes “on”. The shunt diode (D101) shorts out the receiver port and L103 is connected from the RF path to ground. L103 and the input capacitance of the lowpass filter form a parallel resonant circuit, effectively disconnecting the receiver port from the antenna while not loading the transmit path. In the receive mode, pin 32 goes low and the diodes are off. D100 looks like a high impedance effectively disconnecting the transmitter from the antenna while L103 and C147 form a series resonant circuit effectively connect the receiver to the antenna.

2.16.3 Harmonic Filter

The harmonic filter consists of components C103, C106, C103, C107,C110, C111, C114, C115 and inductors L100, L101, and L102 which are a part of the SH100 assembly. The harmonic filter for lowband is pole zero design. This feature gives greater attenuation in low frequencies where the harmonic energy of the transmitter is the greatest and less attenuation in high frequencies where there is less harmonic energy. The harmonic filter insertion loss is typically less than 0.8 dB.

2.16.4 Antenna Matching Transformer

The antenna matching transformer (T100) matches the antenna impedance with the harmonic filter to optimize the performance of the transmitter and receiver.

2.16.5 Power Control Integrated Circuit (PCIC)

The transmitter uses the PCIC (U102) to regulate the power output of the radio. To accomplish this, the voltage across R102 is sensed. This voltage drop is directly proportional to the current drawn in the final stage of the transmitter. This voltage is compared to a programmable reference inside the PCIC and the voltage on PCIC pin 4 adjusted. Pin 4 connects to the PA driver IC (U101) pin 1 via resistor R100 and varies RF output power of the driver. This controls the current drain of the final stage and sets the output power.

2.16.6 Temperature Cut Back Circuit

Temperature sensor VR101 and associated components are part of a temperature cut back circuit. This circuit senses the printed circuit board temperature around the transmitter circuits and outputs a DC voltage to the PCIC. If the DC voltage produced exceeds the set threshold of the PCIC, the transmitter output power decreases to reduce the transmitter temperature.

2.16.7 Electrostatic Discharge (ESD) Protection Circuit

The LDMOS PA device (Q100) is very sensitive to static discharge. To protect the device from ESD, a protection circuit consisting of single high-speed Schottky Diode (D104) is connected from the Antenna Nut (J102) to ground. This diode effectively shorts ESD energy to ground, but looks like an open circuit to normal RF energy. The diode turns on when the voltage at the antenna nut exceeds 150V.

2.17 Low Band Receiver

The low band receiver consists of a front end, back end, and automatic gain control circuits. A block diagram of the receiver is shown in Figure 2-19 on page 2-29. Detailed descriptions of these stages are contained in the paragraphs that follow.

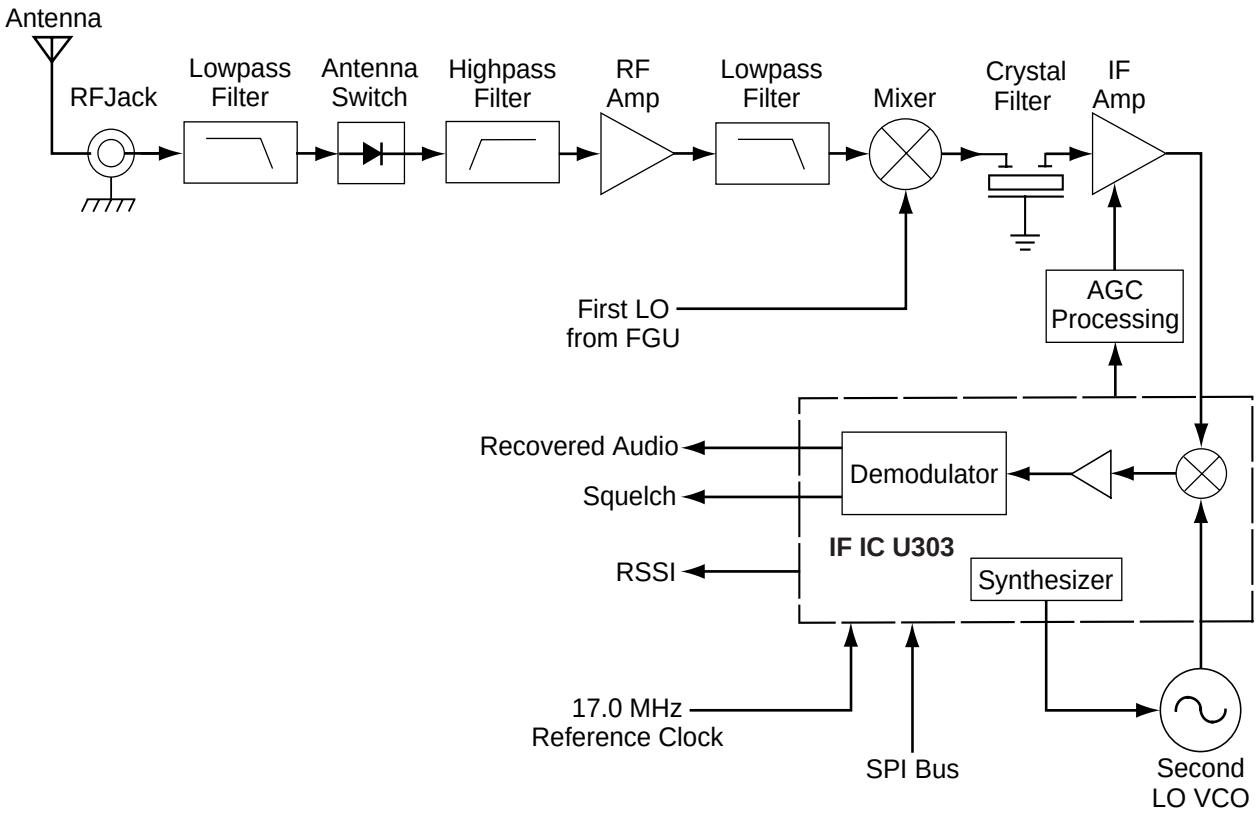


Figure 2-19. Low Band Receiver Block Diagram

2.17.1 Receiver Front-End

The RF signal received by the antenna is routed through the transmitter lowpass filter and antenna switch. These circuits are described in the transmitter section.The signal next passes through a highpass filter consisting of L501, L502, C538, C533 and C504. This filter serves to reject below band signals and has a 3 dB corner frequency of 27 MHz.

The output of the highpass filter is connected to an RF amp consisting of Q509 and associated biasing components. This is a BJT amplifier powered off 5 volts and has 13 dB of gain. The amplifier drives a lowpass filter consisting of L503, L504 L507, C534, C535, C536, C537 and C515. This filter is a pole zero design that filters off harmonic components from the RF amp. The 3 dB corner of this filter is at 56 MHz.

The output of the lowpass filter is connected to the passive double balanced mixer consisting of components T501, T502, and D501. After mixing with the first local oscillator up-converted to a 109.65 MHz IF signal.

The IF signal coming out of the mixer is transferred to the crystal filter (FL301) through a resistor pad (R507, R508 and R509) and a diplexer (C516 and L508). Matching to the input of the crystal filter is provided by L301, L302, C301 and C302. The 3 pole crystal filter provides the necessary selectivity and intermodulation protection.

2.17.2 Receiver Back-End

The output of crystal filter FL301 is connected to the input of IF amplifier transistor U301. Components L303 and C348 and R301 form the termination for the crystal filter and the signal is coupled to one gate of U301 by C303. The IF amplifier is a dual gate MOSFET powered off of the 5 volt supply. The first gate receives the IF signal as indicated previously. The second gate receives a DC voltage from U302 which serves as an AGC control signal. This signal reduces the gain of the IF amplifier to prevent overload of the IF IC, U303. The gain can be varied from a maximum of 13 dB to an attenuation of 55 dB. The output IF signal from U301 is coupled into U303 (pin 3) via C306, R304 and L304 which provides matching for the IF amplifier and U303.

The IF signal applied to pin 3 of U303 is amplified, down-converted, filtered, and demodulated, to produce recovered audio at pin 27 of U303. This IF IC is electronically programmable, and the amount of filtering, which is dependent on the radio channel spacing, is controlled by the microprocessor. Additional filtering, once externally provided by the conventional ceramic filters, is replaced by internal filters in IF IC U303.

The IF IC uses a type of direct conversion process, whereby the externally generated second LO frequency is divided by two in U303 so that it is very close to the first IF frequency. The IF IC (U303) synthesizes the second LO and phase-locks the VCO to track the first IF frequency. The second LO is designed to oscillate at twice the first IF frequency because of the divide-by-two function in the IF IC.

In the absence of an IF signal, the VCO searches for a frequency, or its frequency will vary close to twice the IF frequency. When an IF signal is received, the VCO locks onto the IF signal. The second LO/VCO is a Colpitts oscillator built around transistor Q301. The VCO has a varactor diode, CR301, to adjust the VCO frequency. The control signal for the varactor is derived from a loop filter consisting of components C308, C309, and R310.

The IF IC (U303) also performs several other functions. It provides a received signal-strength indicator (RSSI) and a squelch output. The RSSI voltage is also used to control the automatic gain control (AGC) circuit at the back end.

The demodulated signal on pin 27 of U303 is also used for squelch control. The signal is routed to U404 (ASFIC) where squelch signal shaping and detection takes place. The demodulated audio signal is also routed to U404 for processing before going to the audio amplifier for amplification.

2.17.3 Automatic Gain Control (AGC)

The automatic gain control circuit provides automatic reduction of gain to prevent overloading of backend circuits. This is achieved by lowering the voltage on one gate of U301 which will reduce the drain current in that part and lower its gain.

The Radio Signal Strength Indicator (RSS I) voltage signal for the IF IC (U303) is used to drive the AGC processing circuitry consisting of R306, R307, R308, R309 C307 and U302. As the received signal gets stronger, the RSSI line will rise. When the RSSI line passes a certain threshold, the voltage at the output of U302 will begin to drop. This voltage is connected to one gate of IF amplifier U301 through resistor R305. As this voltage decreases, it will lower the drain current in U301 and reduce the gain of the stage. This will limit the power incident on the IF IC, U303.

2.17.4 Frequency Generation Circuit

The frequency generation circuit, shown in Figure 2-20 on page 2-31, is composed of Low Voltage Fractional-N (LV FracN) synthesizer U205 and discrete RX VCO, TX VCO, and buffers as well as other supporting circuitry. The synthesizer block diagram illustrates the interconnect and support circuitry used in the region. Refer to the schematic for the reference designators.

The synthesizer is powered by regulated 5V and 3.3V. The 5 volt signal to the synthesizer as well as the rest of the radio is provided by U204. The 3.3 v signal is provided by U200 in the controller. The 5V signal goes to pins 13 and 30 while the 3.3V signal goes to pins 5, 20, 34 and 36 of U201. The synthesizer in turn generates a superfiltered 4.3V which powers the VCOs and buffers.

In addition to the VCO, the synthesizer also interfaces with the logic and ASFIC circuitry. Programming for the synthesizer is accomplished through the data, clock and chip select lines (pins 7, 8 and 9) from the microprocessor, U409. A 3.3V dc signal from pin 4 indicates to the microprocessor that the synthesizer is locked.

Transmit modulation from the ASFIC is supplied to pin10 of U205. Internally the audio is digitized by the LV FracN IC and applied to the loop divider to provide the low-port modulation. The audio runs through an internal attenuator for modulation balancing purposes before going out at pin 41 to the VCO.

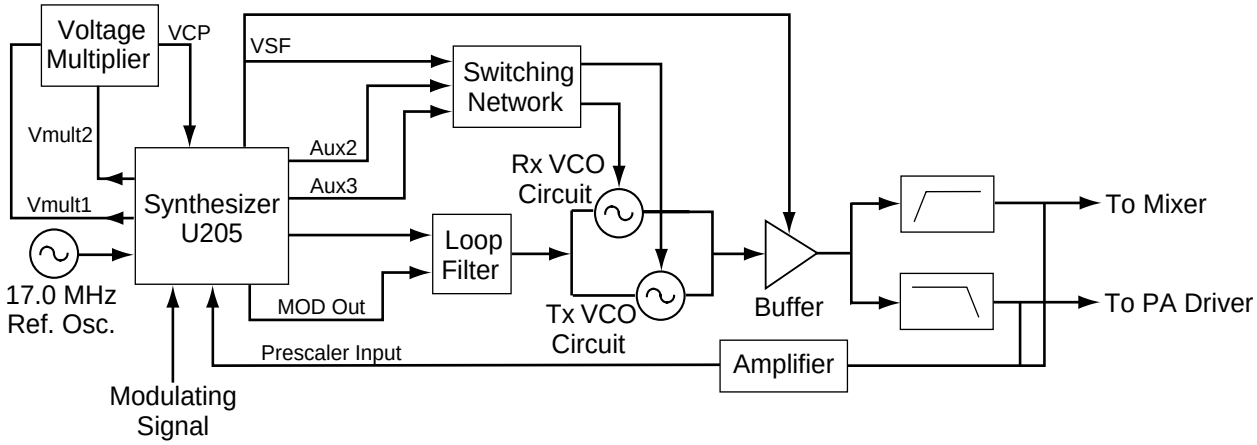


Figure 2-20. Low Band Frequency Generation Unit Block Diagram

2.18 Synthesizer

The Low Voltage Fractional-N (LV FracN) synthesizer, shown in Figure 2-21 on page 2-32, uses a 17.0 MHz crystal (Y201) to provide a reference for the system. Along with being used in the LV FracN synthesizer, the 17.0 MHz signal is provided at pin 19 of U205 for use by the ASFIC and LVZIF.

The LV FracN IC (U205) further divides this by 8 internally to give 2.125 MHz to be used as the reference frequency in the frequency synthesis. While UHF and VHF can use other references, (divide by 7 or divide by 7/8), only the divide by 8 function is valid for lowband.

The internal oscillator device in the LV FracN IC together with C236, C237, C242, R219, CR211and Y201 comprise the reference oscillator. This oscillator is temperature compensated is capable of 2.5 ppm stability over temperatures of -30° to 85°C. There is temperature compensation information that is unique to each crystal contained on Y201 that is programmed into the radio when built.

The loop filter consists of components C256, C257, C259, R224, R225 and R228. This circuit provides the necessary dc steering voltage for the VCO and determines the amount of noise and spur passing through.

To achieve fast locking for the synthesizer, an internal adapt charge pump provides higher current at pin 45 of U205 to put the synthesizer within lock range. The required frequency is then locked by normal mode charge pump at pin 43.

Both the normal and adapt charge pumps get their supply from the capacitive voltage multiplier made up of C247, C283, C284, C285, C286, and triple diodes D210 and D211. This circuit provides 13.3V at U205, pin 47.

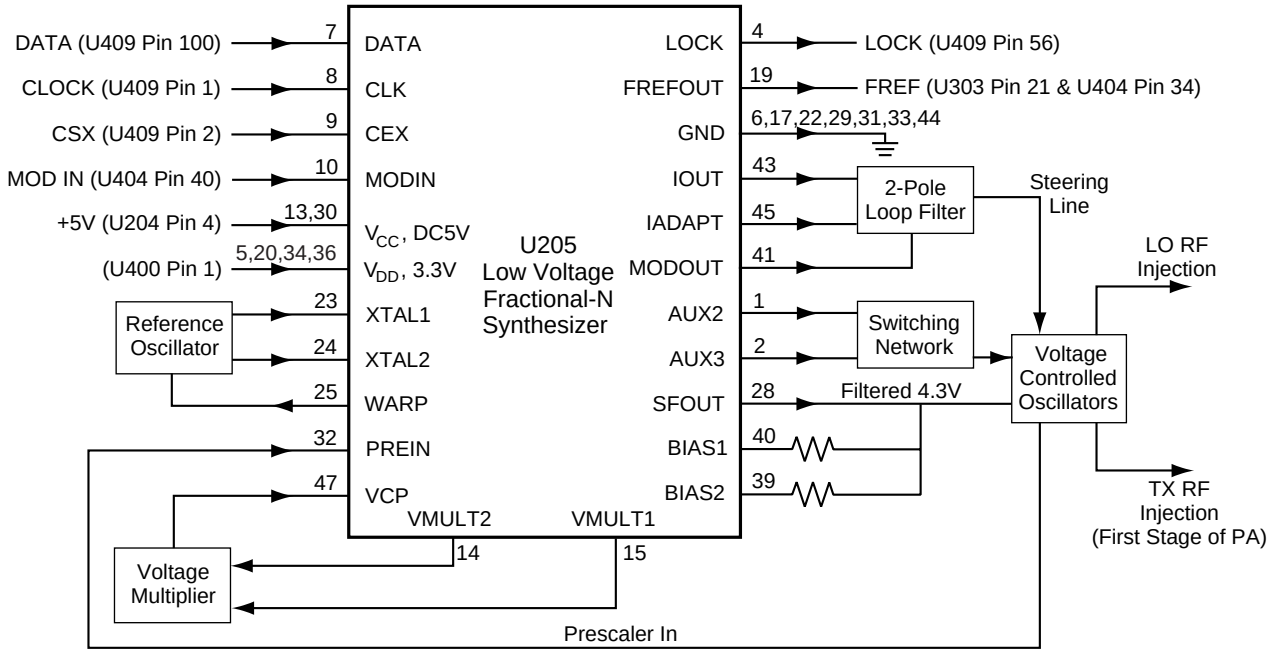


Figure 2-21. Low Band Synthesizer Block Diagram

2.19 Voltage Control Oscillators (VCO)

2.19.1 Receive VCO

The receive VCO is a Colpitts type design and using two active devices in parallel, Q202 and Q204. The oscillator is powered off of the 4.3 volt super filter supply when the AUX3 line goes low. The oscillator operates from 139 to 152 MHz for range 1 and 145 to 160 MHz for range 2. The frequency is tuned by varactor diodes CR201 and CR202.

2.19.2 Transmit VCO

The transmit VCO is a Hartley-type design with active devices Q203. The oscillator is powered off of the 4.3 volt super filter supply when the AUX2 line goes low. The oscillator operates from 29.7 to 42 MHz for Range 1 and 35 to 50 MHz for Range 2. The frequency is tuned by varactor diodes in U203. Note that the values of the inductive tap, L208 and L209, and the capacitor C215 which couples the varactor to the oscillator tank vary between the ranges.

2.19.3 Buffer

Both the receive and transmit VCO are fed to a buffer amplifier Q201. This is a BJT amplifier that boosts the signal levels to +4 dBm and provides reverse isolation to the oscillators. The amplifier is powered off the 4.3 volt super filter supply and the feed network is combined with the transmit filter.

2.19.4 Diplexer/Output Filters

The output of the buffer drives a pair of parallel filters forming a diplexer. One filter is a lowpass filter in the TX pass that passes 29.7–50 MHz signals for the transmitter into the power amplifier while rejecting the receive LO injection signals at 139–160 MHz. This filter is comprised of L204, L211, L212, C230 and C231.

The other filter is a highpass filter which passes 139 –160 MHz signals for the receive LO into the mixer while rejecting the transmit injection signals at 29.7–50 MHz. This filter is comprised of C228, C229, C235 and L215.

2.19.5 Prescalar Feedback

The prescalar input signal for receive and transmit is tapped off of the outputs of each filter by resistors R234 and R238. This signal is routed to the buffer amplifier consisting of components C287, Q288, R287, R288, and R289. The output of this buffer feeds U205, pin 32. After frequency comparison in the synthesizer, current is transferred in the loop filter and a control voltage is generated at the output of the loop filter to adjust the frequency of the VCO. This voltage is a DC voltage between 3.5V and 9.5V when the PLL is locked on frequency.

Notes

Chapter 3 Maintenance

3.1 Introduction

This chapter of the manual describes:

- Preventive maintenance
- Safe handling of CMOS devices
- Repair procedures and techniques

3.2 Preventive Maintenance

The radios do not require a scheduled preventive maintenance program; however, periodic visual inspection and cleaning is recommended.

3.3 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.

3.3.1 Cleaning

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 front cover, housing assembly, and battery case. 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 servicing 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: The effects of certain chemicals and their vapors can have harmful results on certain plastics. Aerosol sprays, tuner cleaners, and other chemicals should be avoided.

1. **Cleaning External Plastic Surfaces**
   The detergent-water solution should be applied sparingly with a stiff, non-metallic, short-bristled brush to work all loose dirt away from the radio. A soft, absorbent, lintless cloth or tissue should be used to remove the solution and dry the radio. Make sure that no water remains entrapped near the connectors, cracks, or crevices.
2. **Cleaning Internal Circuit Boards and Components**
   Isopropyl alcohol 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. Upon completion of the cleaning process, use a soft, absorbent, lintless cloth to dry the area. Do not brush or apply any isopropyl alcohol to the frame, front cover, or back cover.

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

3.4 Safe Handling of CMOS and LDMOS

Complementary metal-oxide semiconductor (CMOS) and lateral diffusion metal oxide semiconductor (LDMOS) devices are used in this family of radios. Their characteristics make them susceptible to damage by electrostatic or high voltage charges. Damage can be latent, resulting in failures occurring weeks or months later. Therefore, special precautions must be taken to prevent device damage during disassembly, troubleshooting, and repair.

Handling precautions are mandatory for the circuits and are especially important in low humidity conditions. DO NOT attempt to disassemble the radio without first referring to the CMOS CAUTION paragraph in the Disassembly and Reassembly section of the basic manual (See Chapter 3).

3.5 General Repair Procedures and Techniques

- **Parts Replacement and Substitution**
  When damaged parts are replaced, identical parts should be used. If the identical replacement component is not locally available, check the parts list for the proper Motorola part number and order the component from the nearest Motorola Communications parts center listed in the “Piece Parts” section of this manual (See Chapter 1).
- **Rigid Circuit Boards**
  The 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, care should be exercised to avoid pulling the plated circuit out of the hole.

  When soldering near the 20-pin and 40-pin connectors:
  - Avoid accidentally getting solder in the connector.
  - Be careful not to form solder bridges between the connector pins.
  - Closely examine your work for shorts due to solder bridges.

- **Flexible Circuits**
  The flexible circuits are made from a different material than the rigid boards and different techniques must be used when soldering. Excessive prolonged heat on the flexible circuit can damage the material. Avoid excessive heat and excessive bending.

  For parts replacement, use the ST-1087 Temperature-Controlled Solder Station with a 600–700 degree tip, and use small diameter solder such as ST-633. The smaller size solder will melt faster and require less heat to be applied to the circuit.

  To replace a component on a flexible circuit:
  1. Grasp the edge of the flexible circuit with seizers (hemostats) near the part to be removed.
  2. Pull gently.
  3. Apply the tip of the soldering iron to the component connections while pulling with the seizers.

  Do not attempt to puddle out components. Prolonged application of heat may damage the flexible circuit.

- **Chip Components**
  Use either the RLN-4062 Hot-Air Repair Station or the Motorola 0180381B45 Repair Station for chip component replacement. When using the 0180381B45 Repair Station, select the TJ-65 mini-thermojet hand piece. On either unit, adjust the temperature control to 700 degrees F. (370 degrees C), and adjust the airflow to a minimum setting. Airflow can vary due to component density.

  To remove a chip component:

  1. Use a hot-air hand piece and position the nozzle of the hand piece approximately 1/8” (0.3 cm) above the component to be removed.
  2. Begin applying the hot air. Once the solder reflows, remove the component using a pair of tweezers.
  3. Using a solder wick and a soldering iron or a power desoldering station, remove the excess solder from the pads.

  To replace a chip component using a soldering iron:

  1. Select the appropriate micro-tipped soldering iron and apply fresh solder to one of the solder pads.
  2. Using a pair of tweezers, position the new chip component in place while heating the fresh solder.
  3. Once solder wicks onto the new component, remove the heat from the solder.
  4. Heat the remaining pad with the soldering iron and apply solder until it wicks to the component. If necessary, touch up the first side. All solder joints should be smooth and shiny.

  To replace a chip component using hot air:

  1. Use the hot-air hand piece and reflow the solder on the solder pads to smooth it.
  2. Apply a drop of solder paste flux to each pad.
  3. Using a pair of tweezers, position the new component in place.
  4. Position the hot-air hand piece approximately 1/8” (0.3 cm) above the component and begin applying heat.
  5. Once the solder wicks to the component, remove the heat and inspect the repair. All joints should be smooth and shiny.

- **Shields**
  Removing and replacing shields will be done with the R-1070 station with the temperature control set to approximately 415°F (215°C) [445°F (230°C) maximum].

  To remove the shield:

  1. Place the circuit board in the R-1070’s holder.
  2. Select the proper heat focus head and attach it to the heater chimney.
  3. Add solder paste flux around the base of the shield.
  4. Position the shield under the heat-focus head.
  5. Lower the vacuum tip and attach it to the shield by turning on the vacuum pump.
  6. Lower the focus head until it is approximately 1/8” (0.3 cm) above the shield.
  7. Turn on the heater and wait until the shield lifts off the circuit board.
  8. Once the shield is off, turn off the heat, grab the part with a pair of tweezers, and turn off the vacuum pump.
  9. Remove the circuit board from the R-1070’s circuit board holder.

To replace the shield:

1. Add solder to the shield if necessary, using a micro-tipped soldering iron.
2. Next, rub the soldering iron tip along the edge of the shield to smooth out any excess solder. Use solder wick and a soldering iron to remove excess solder from the solder pads on the circuit board.
3. Place the circuit board back in the R1070's circuit board holder.
4. Place the shield on the circuit board using a pair of tweezers.
5. Position the heat-focus head over the shield and lower it to approximately 1/8" (0.3 cm) above the shield.
6. Turn on the heater and wait for the solder to reflow.
7. Once complete, turn off the heat, raise the heat-focus head and wait approximately one minute for the part to cool.
8. Remove the circuit board and inspect the repair. No cleaning should be necessary.

3.6 Recommended Test Tools

Table 3-1 lists the recommended tools used for maintaining this family of radios. These tools are also available from Motorola.

Table 3-1. Recommended Test Tools

Motorola Part Number	Description	Application
RSX4043	Torx Driver	Tighten and remove chassis screws.
6680387A70	T-6 Torx Bit	Removable Torx driver bit.
R1453A	Digital readout solder station	Digitally controlled soldering iron.
0180386A78	Illuminated magnifying glass with lens attachment.	
0180386A82 6684253C72 6680384A98 1010041A86 1080303E45	Anti-static grounding kit Straight prober Brush Solder (RMA type), 63/37, 0.5mm diameter 1 lb. spool SMD tool kit (included with R1319A)	Used during all radio assembly and disassembly procedures.
R1319A (110V) or R1321A(220V)	ChipMaster Surface Mount Rework Station	Removal and assembly of surface-mounted integrated circuits and shields includes 5 nozzles.
R1364A	Digital Heated Tweezer System	Chip component removal.
R1427A	Board Preheater	Reduces heatsink on multi level boards.
8880309B53	Rework Equipment Catalog	Contains application notes, procedures and technical rework equipment.

3.7 Replacing the Circuit Board Fuse

In cases where the radio fails to turn on when power is applied, the circuit board fuse should always be checked as a probable cause of the failure. The locations of the fuse for both the UHF and VHF boards are shown in Figure 3-1 on page 3-6. The radio must be disassembled to replace the fuses as described in the Basic Service Manual (see section 1.3 on page 1-2), then the circuit board separated from the radio chassis as described in the paragraphs that follow.

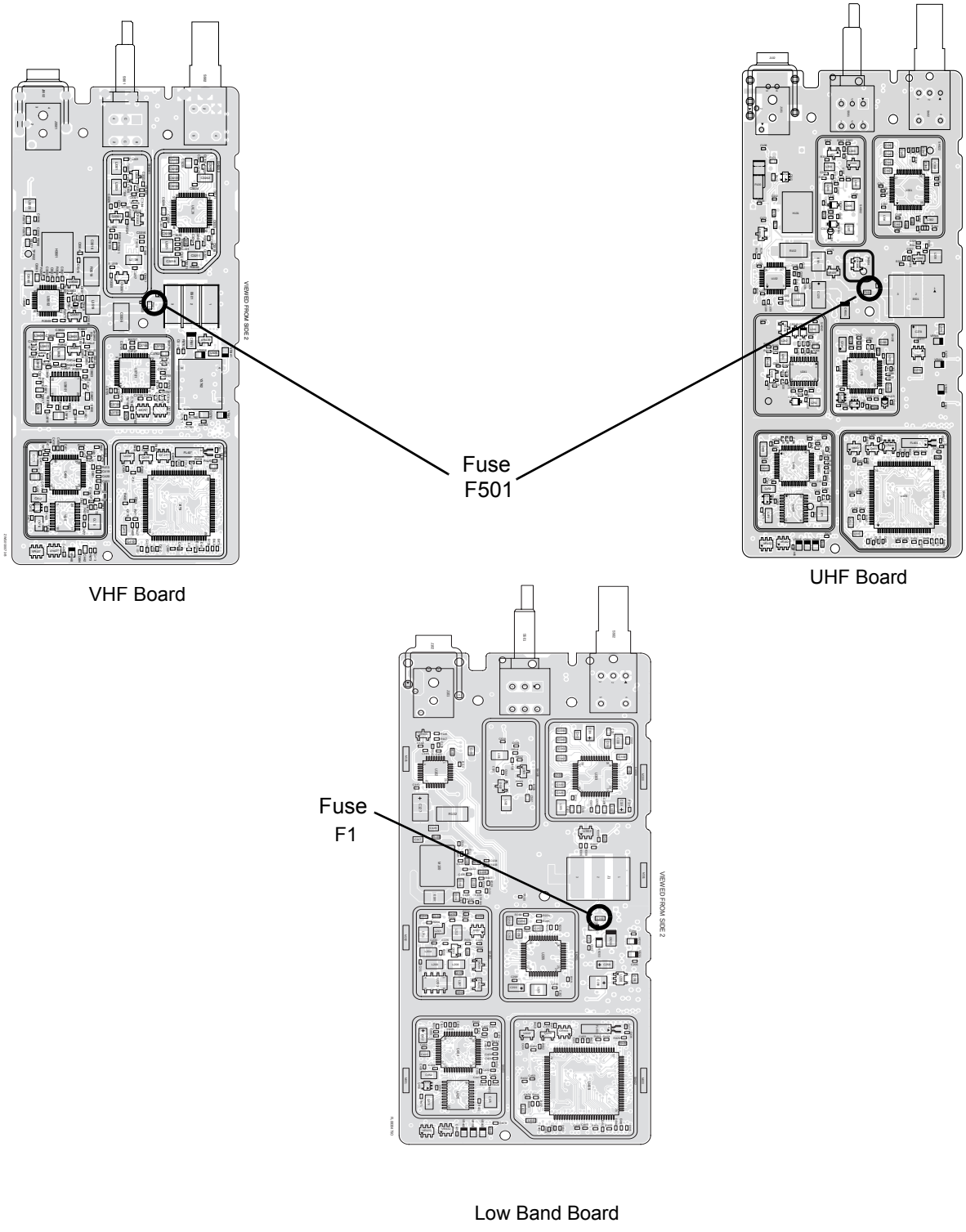


Figure 3-1. UHF/VHF/Low Band Circuit Board Fuse Locations

3.8 Removing and Reinstalling the Circuit Board

Both the UHF and VHF circuit boards are removed from the radio chassis in the following manner:

1. Refer to the Basic Service Manual (see Table 1-1, “Related Documents,” on page 1-2) for radio disassembly, then use a Torx driver and a T-6 bit to remove the four Torx screws shown in Figure 3-2.
2. Lift the circuit board out of the radio chassis, then remove and discard the thermal pad located between the circuit board and chassis.
3. After repairs, replace the thermal pad (Motorola P/N 7580556Z01) then reinstall the circuit board into the radio chassis.
4. Reinstall and tighten the four Torx screws to secure the circuit board to the chassis.
5. Refer to the Basic Service Manual to reassemble the radio.

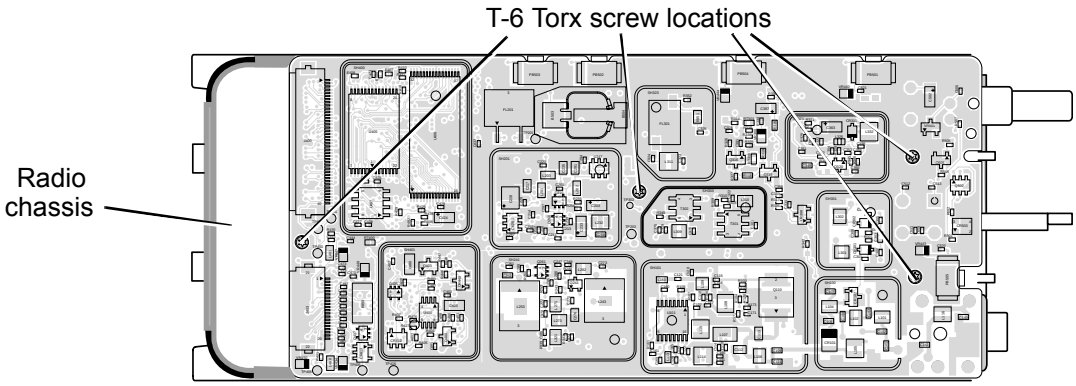


Figure 3-2. Circuit Board Removal and Reinstallation

3.9 Power Up Self-Test Error Codes

Turning on the radio starts a self-test routine that checks the RAM, ROM checksum, EEPROM hardware and EEPROM checksum. If these checks are successful, the radio generates two high-pitched self-test pass tones. If the self-test is not successful, one low-pitched tone is heard. Radios with displays are able to display the error codes. The displayed error codes and related corrections are as follows:

Table 3-2. Power Up Self-Test Error Codes

If the error code displayed is ...	Then, there is a ...	To correct the problem ...
“RAM TST ERROR”	RAM test failure.	retest the radio by turning it off and turning it on again. If message reoccurs, replace RAM (U405).
“ROM CS ERROR”	wrong ROM checksum.	replace ROM (U406).
“EEPRM HW ERROR”	codeplug structure mismatch or non existence of codeplug.	reprogram codeplug with correct version and retest radio. If message reoccurs, replace EEPROM (U407).
“EEPRM CS ERROR”	wrong codeplug checksum.	reprogram codeplug.

Table 3-2. Power Up Self-Test Error Codes (Continued)

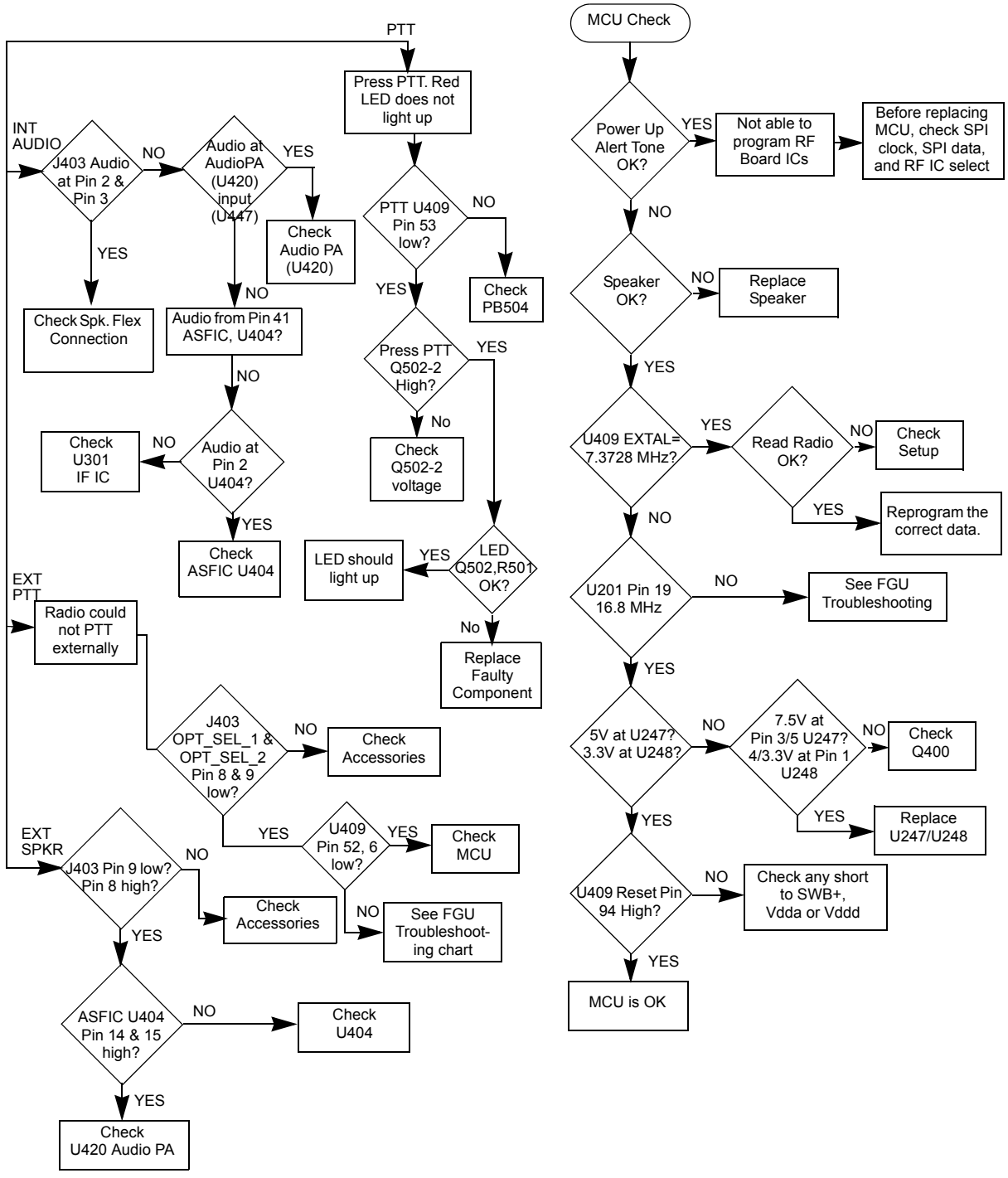
If the error code displayed is ...	Then, there is a ...	To correct the problem ...
No Display	improperly connected display module or damaged display module.	check connection between main board and display module or replace with new display module.

For LTR Models:

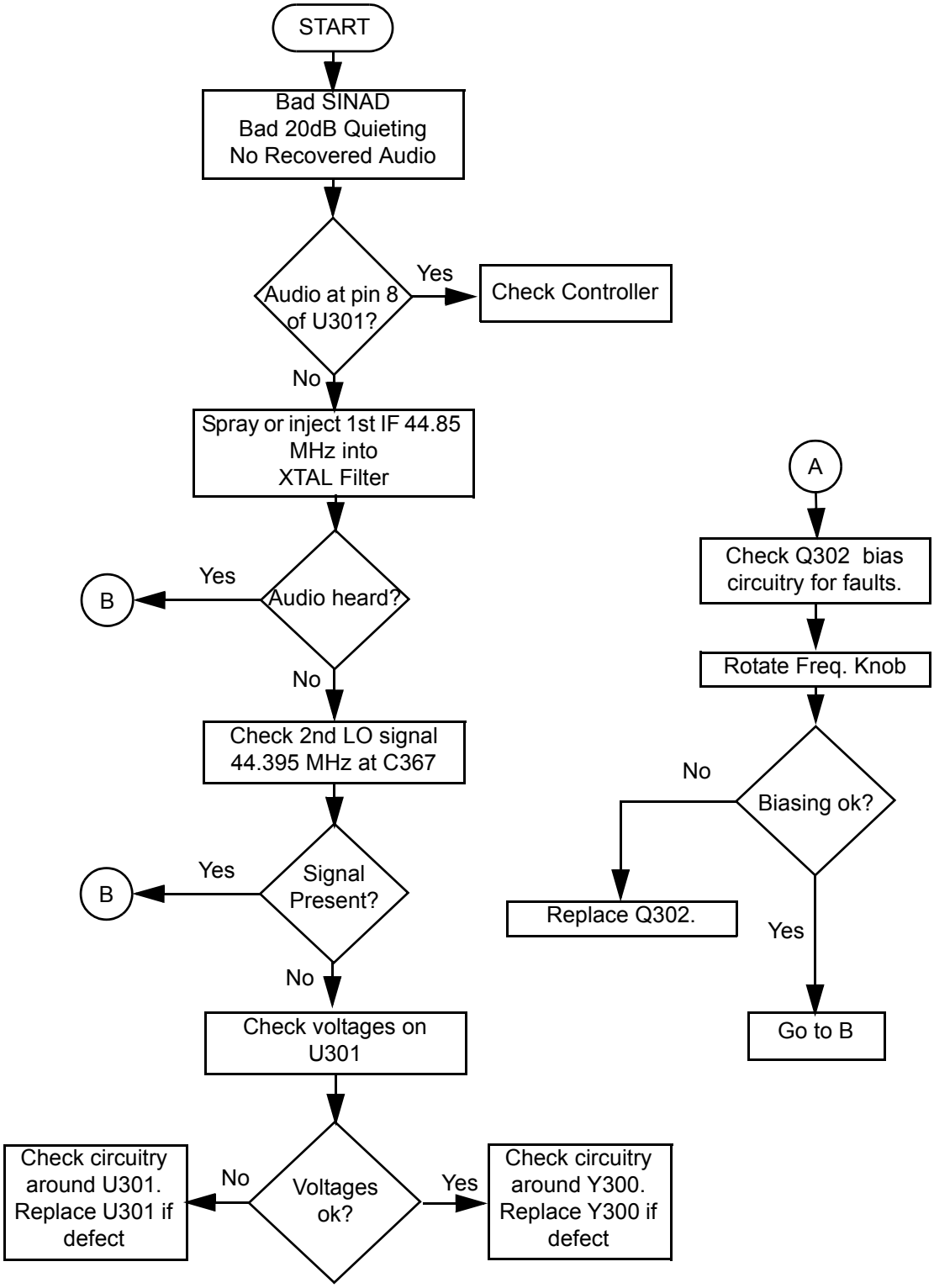
Table 3-3. Power Up Self-Test Error Codes (LTR Models)

If the error code displayed is ...	Then, there is a ...	To correct the problem ...
ESN BAD	defective PTCB	return to factory for PTCB replacement.
AppCode Fail	defective PTCB firmware	reflash PTCB firmware.
EER: Watchdog	firmware failure	restart radio
Unprogrammed	programming error	use CPS to properly program radio and PTCB.
ERROR: NO PTG	no primary talk group	use CPS to program zone with a Primary Talk Group.
Backdoor	---	turn radio off and restart.

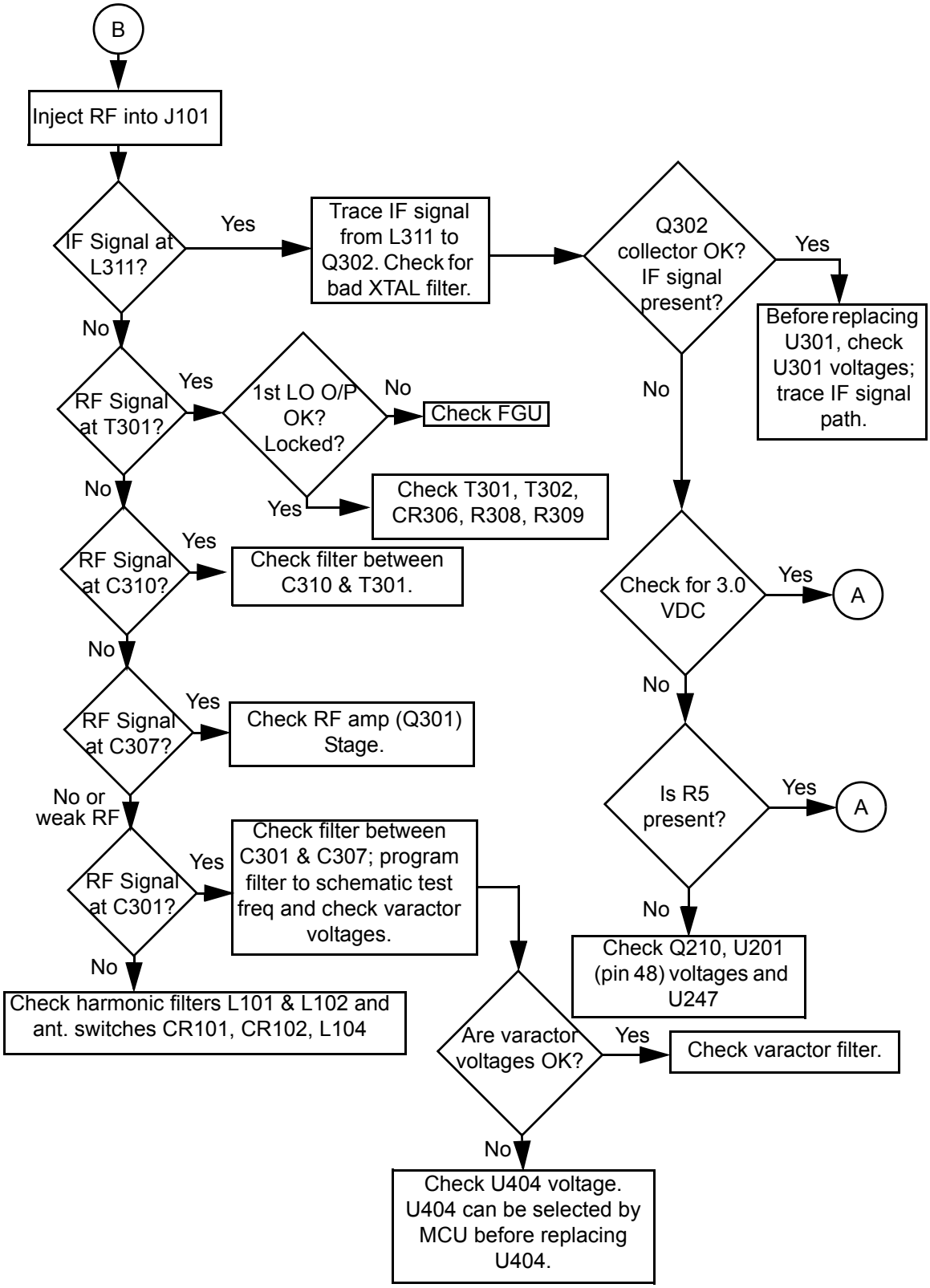
3.10 UHF Troubleshooting Charts



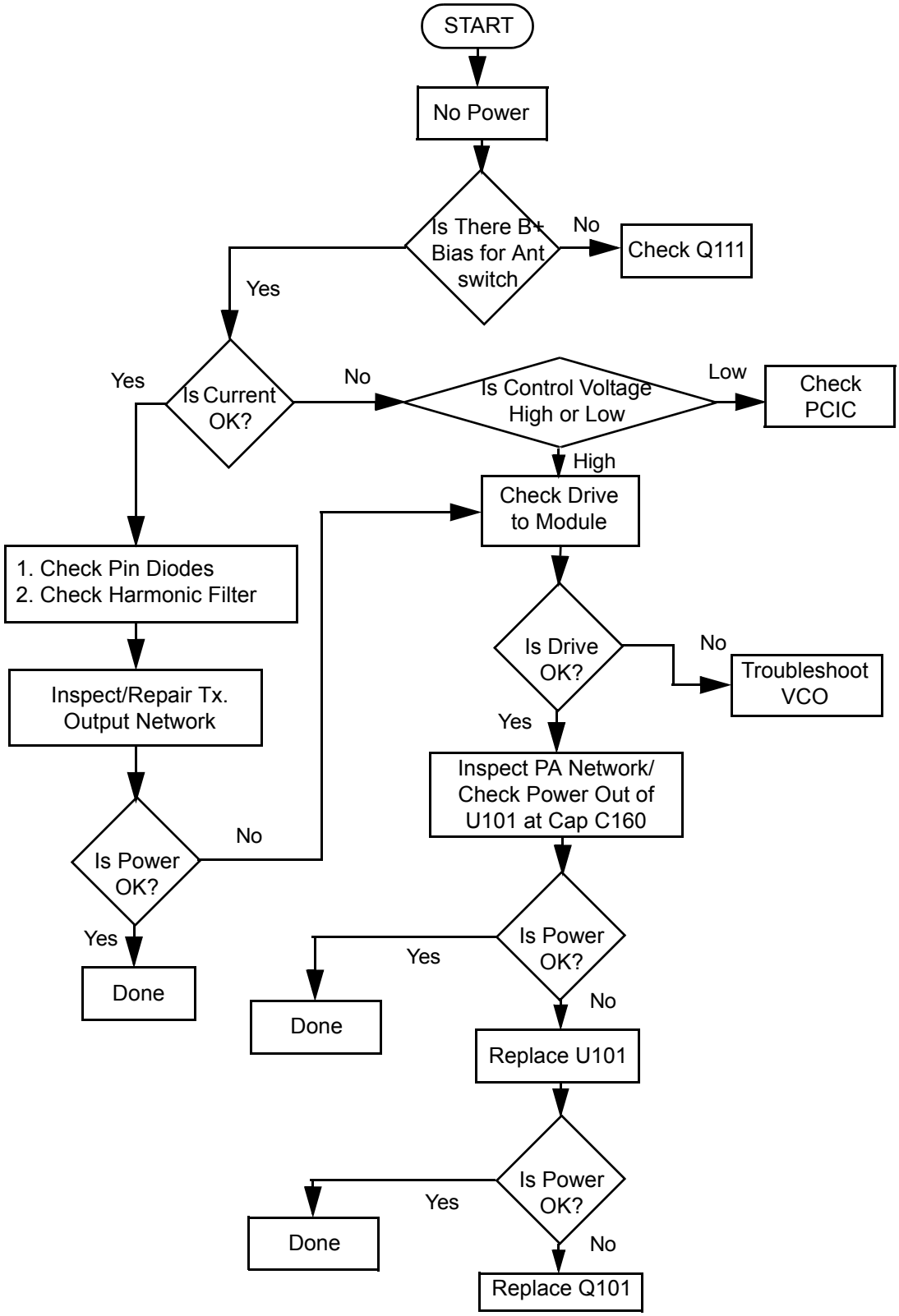
Troubleshooting Flow Chart for Controller



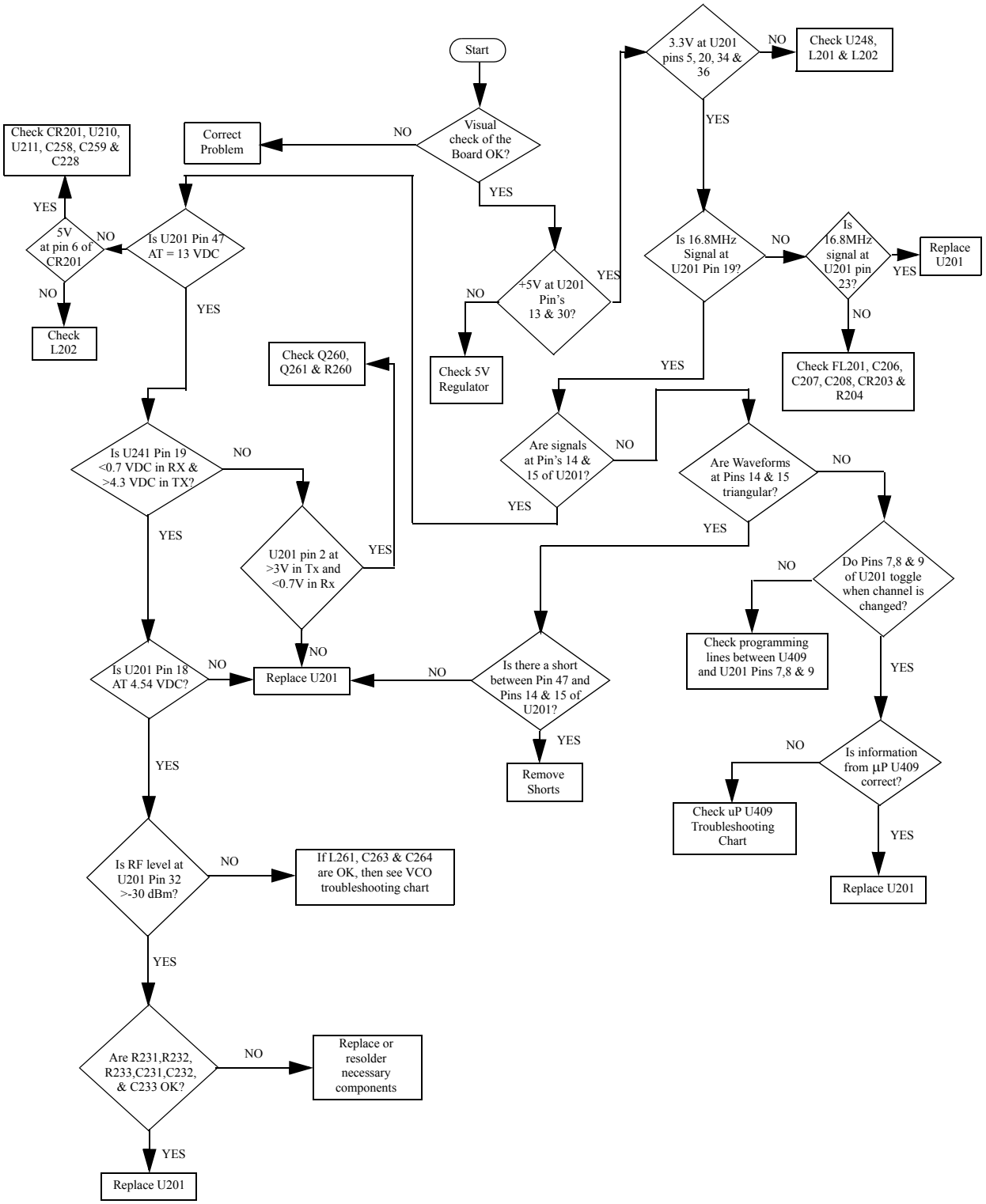
Troubleshooting Flow Chart for Receiver (Sheet 1 of 2)



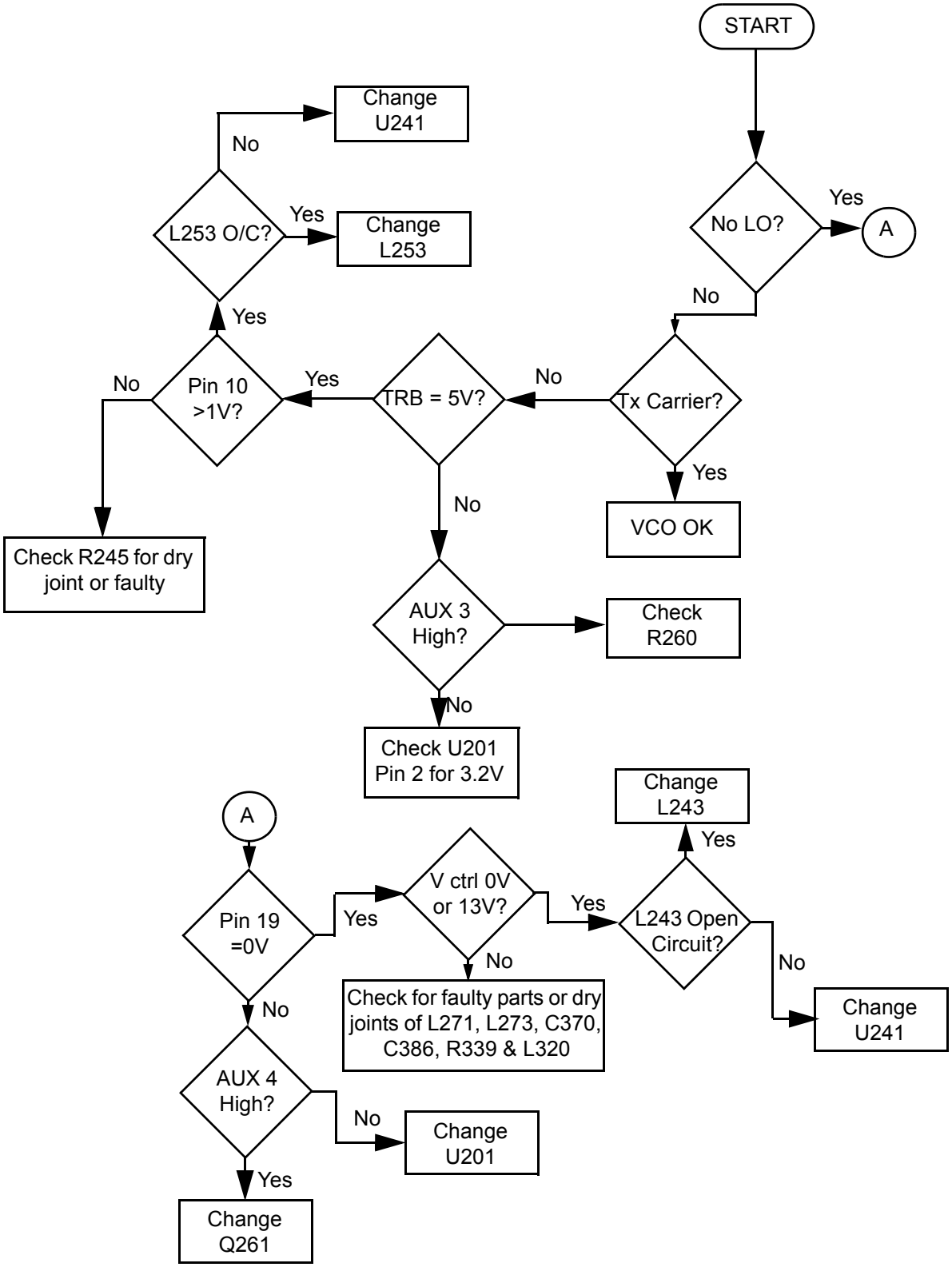
Troubleshooting Flow Chart for Receiver (Sheet 2 of 2)



Troubleshooting Flow Chart for Transmitter

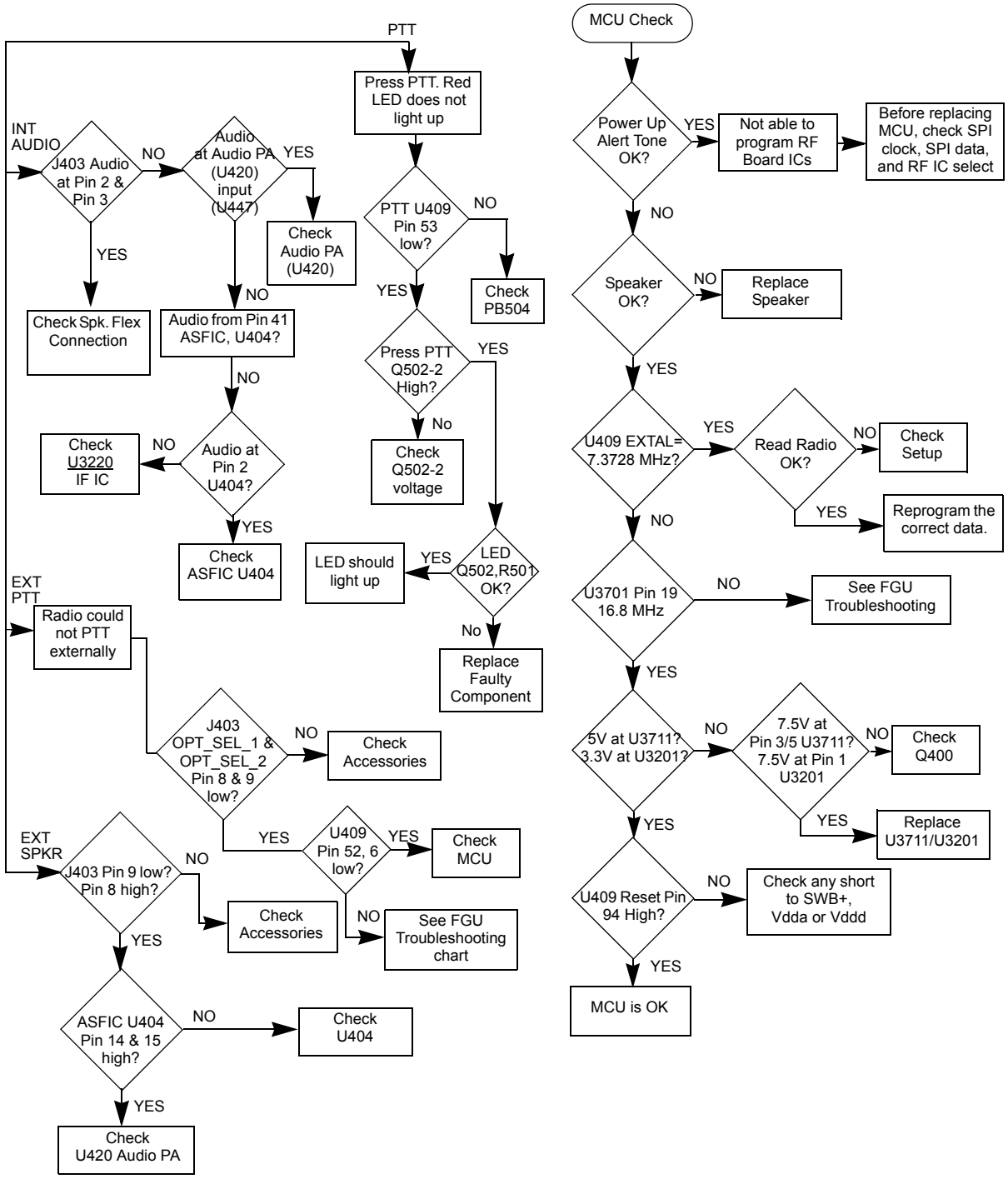


Troubleshooting Flow Chart for Synthesizer

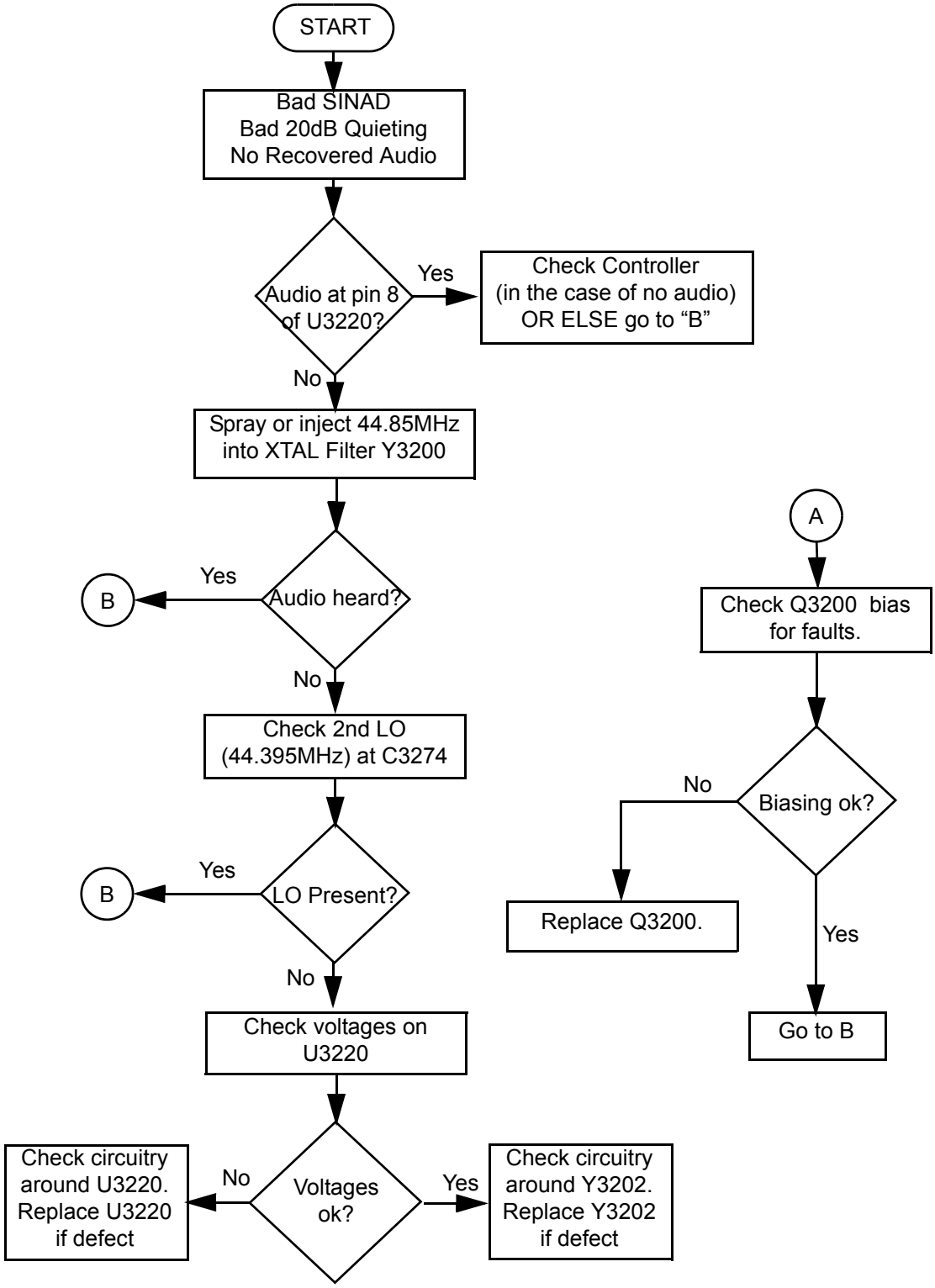


Troubleshooting Flow Chart for VCO

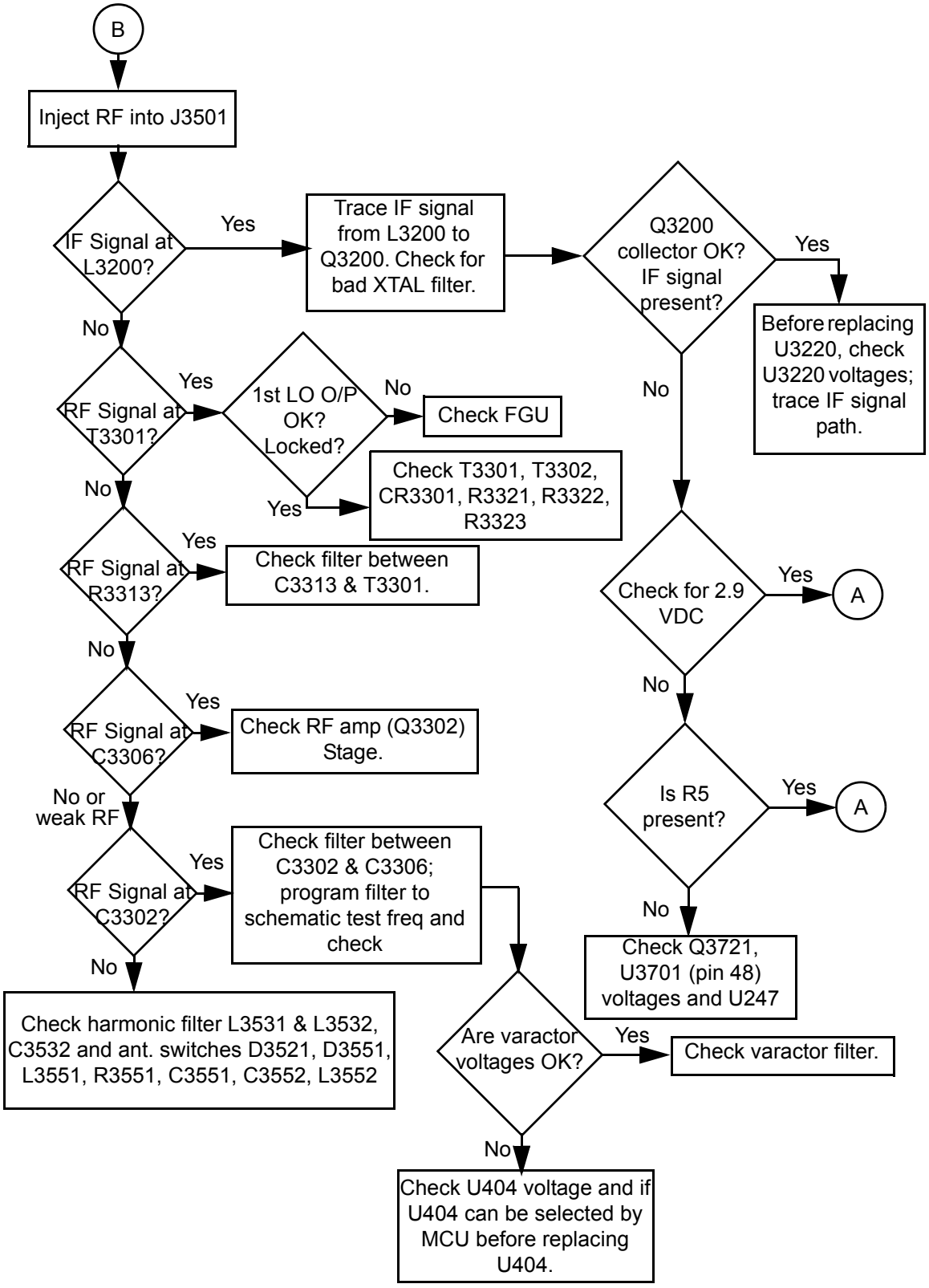
3.11 VHF Troubleshooting Charts



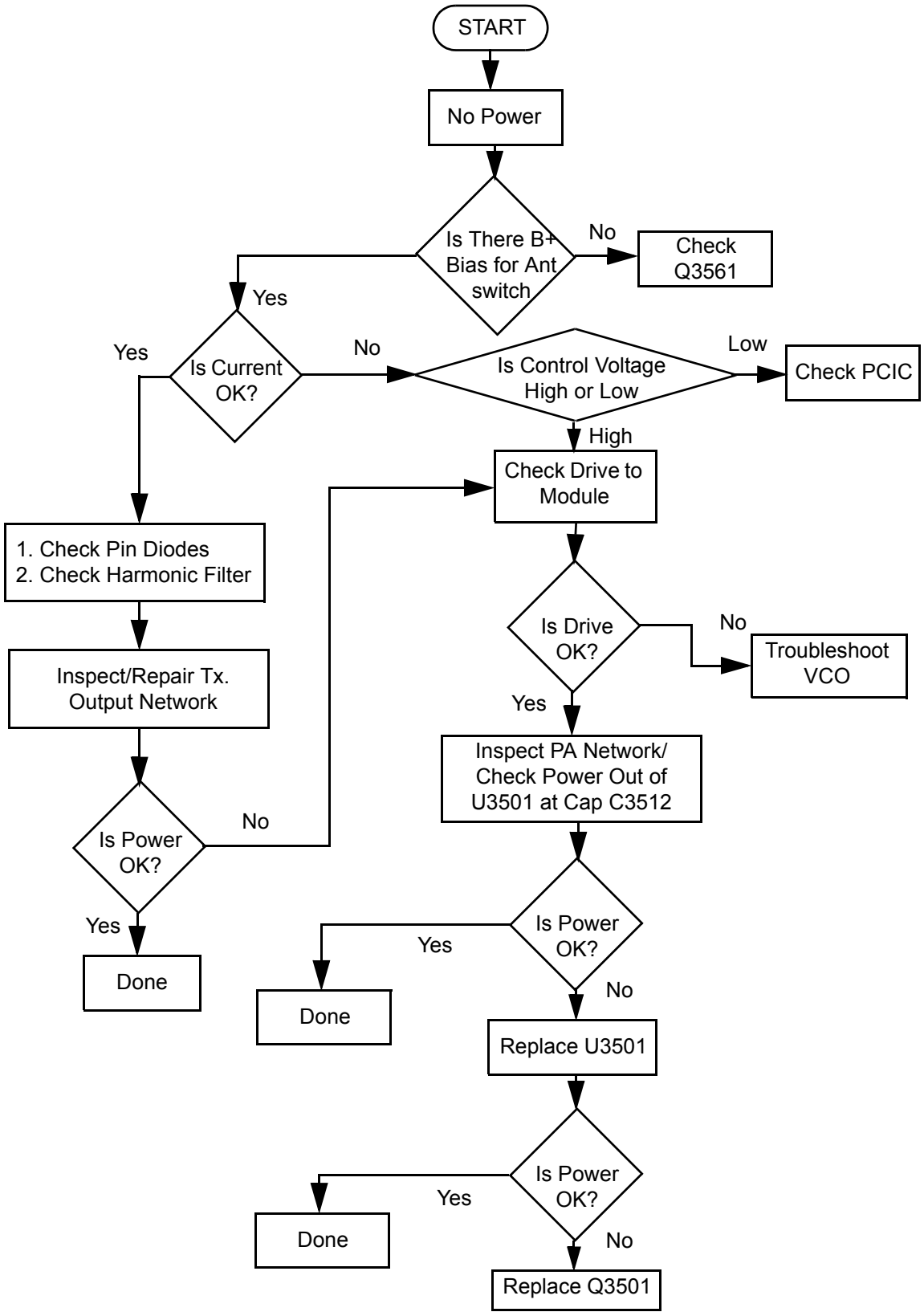
Troubleshooting Flow Chart for Controller



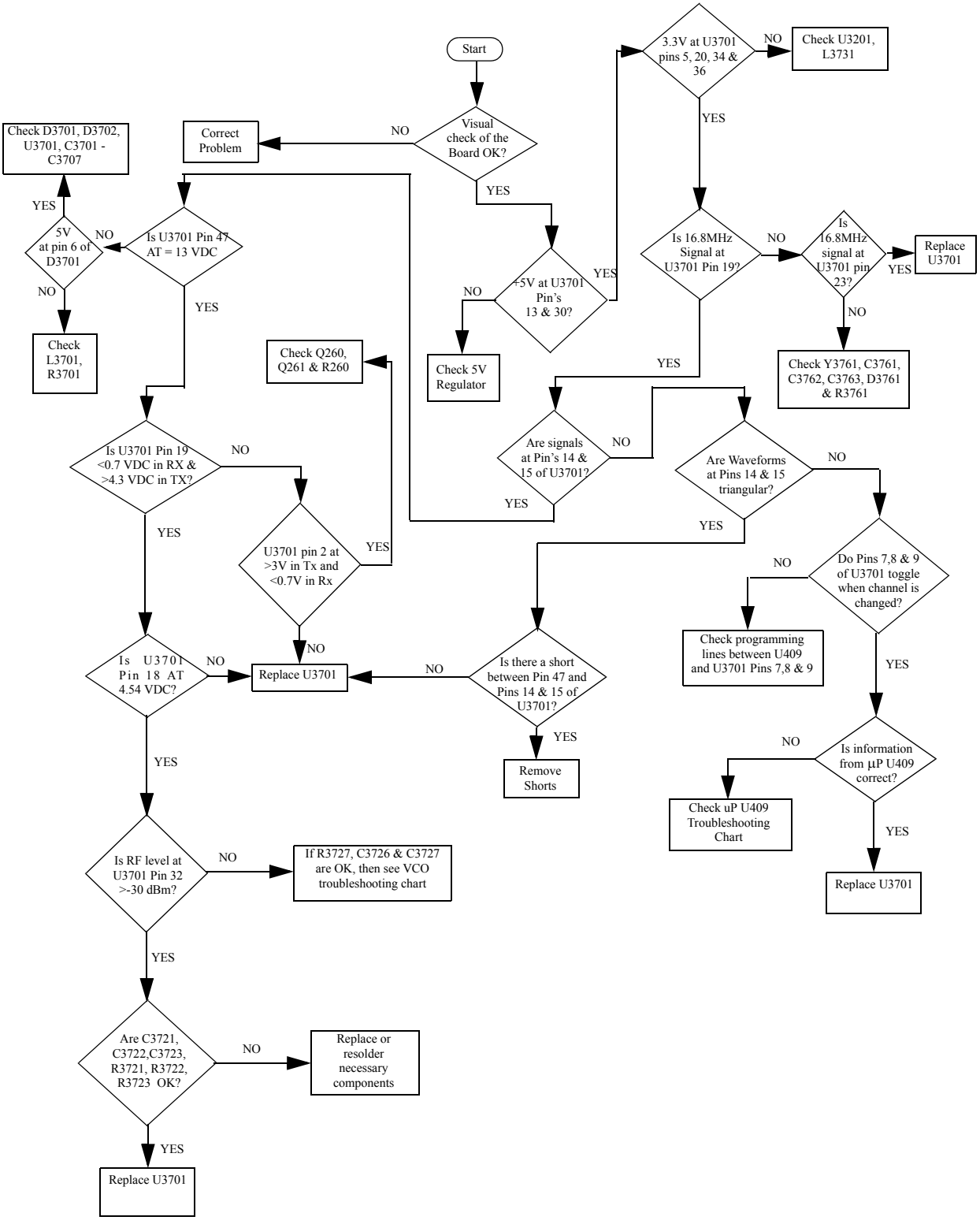
Troubleshooting Flow Chart for Receiver (Sheet 1 of 2)



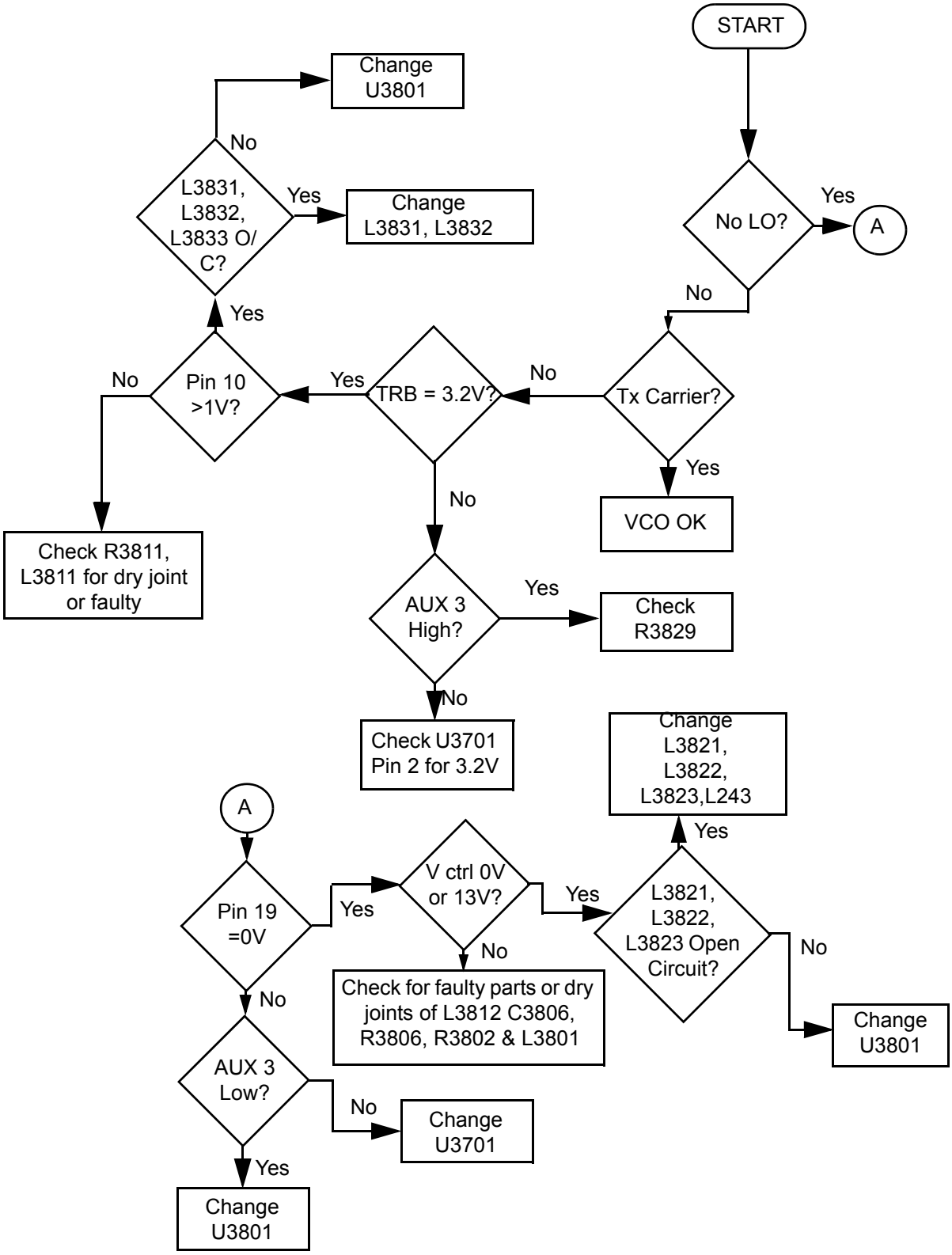
Troubleshooting Flow Chart for Receiver (Sheet 2 of 2)



Troubleshooting Flow Chart for Transmitter

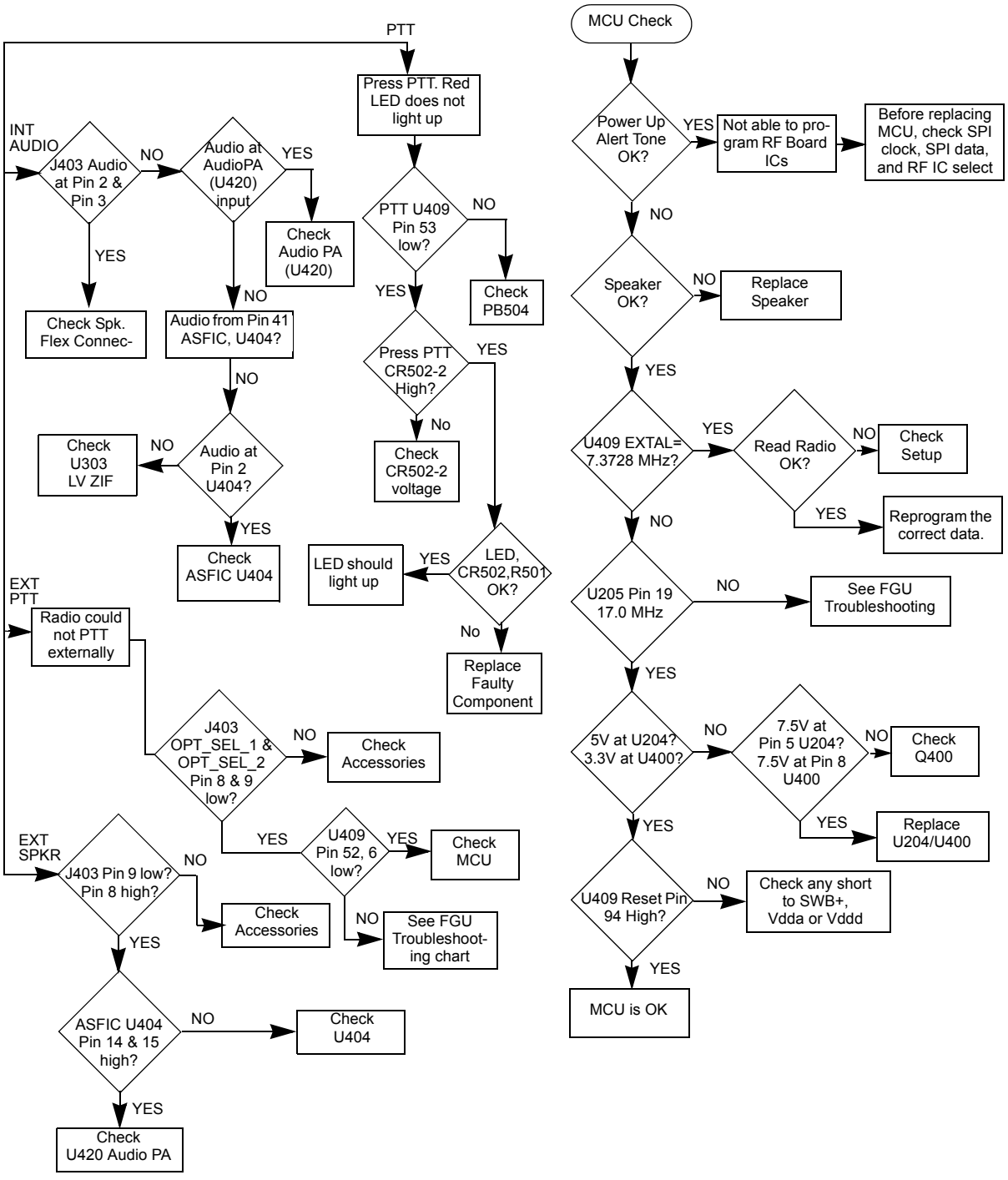


Troubleshooting Flow Chart for Synthesizer

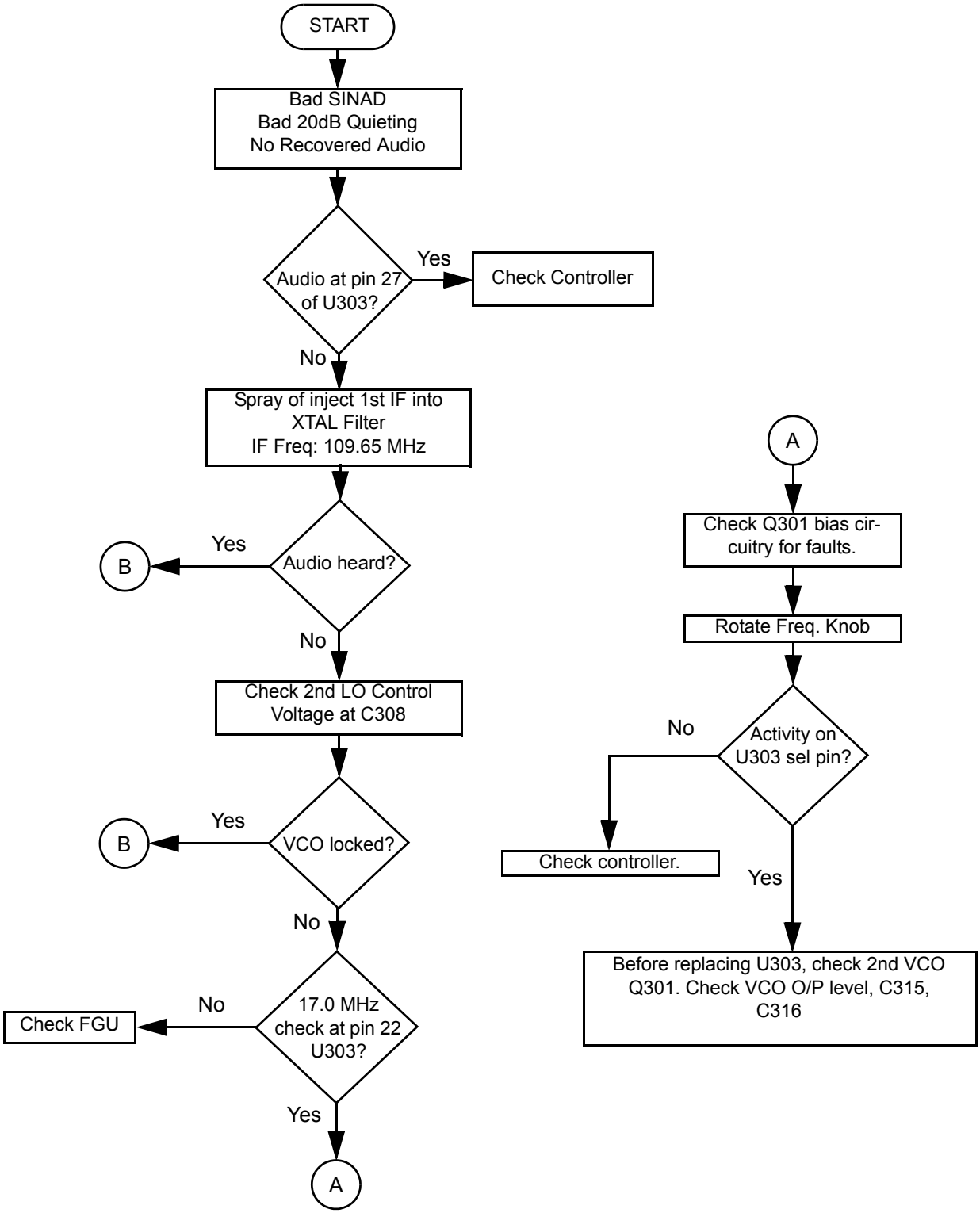


Troubleshooting Flow Chart for VCO

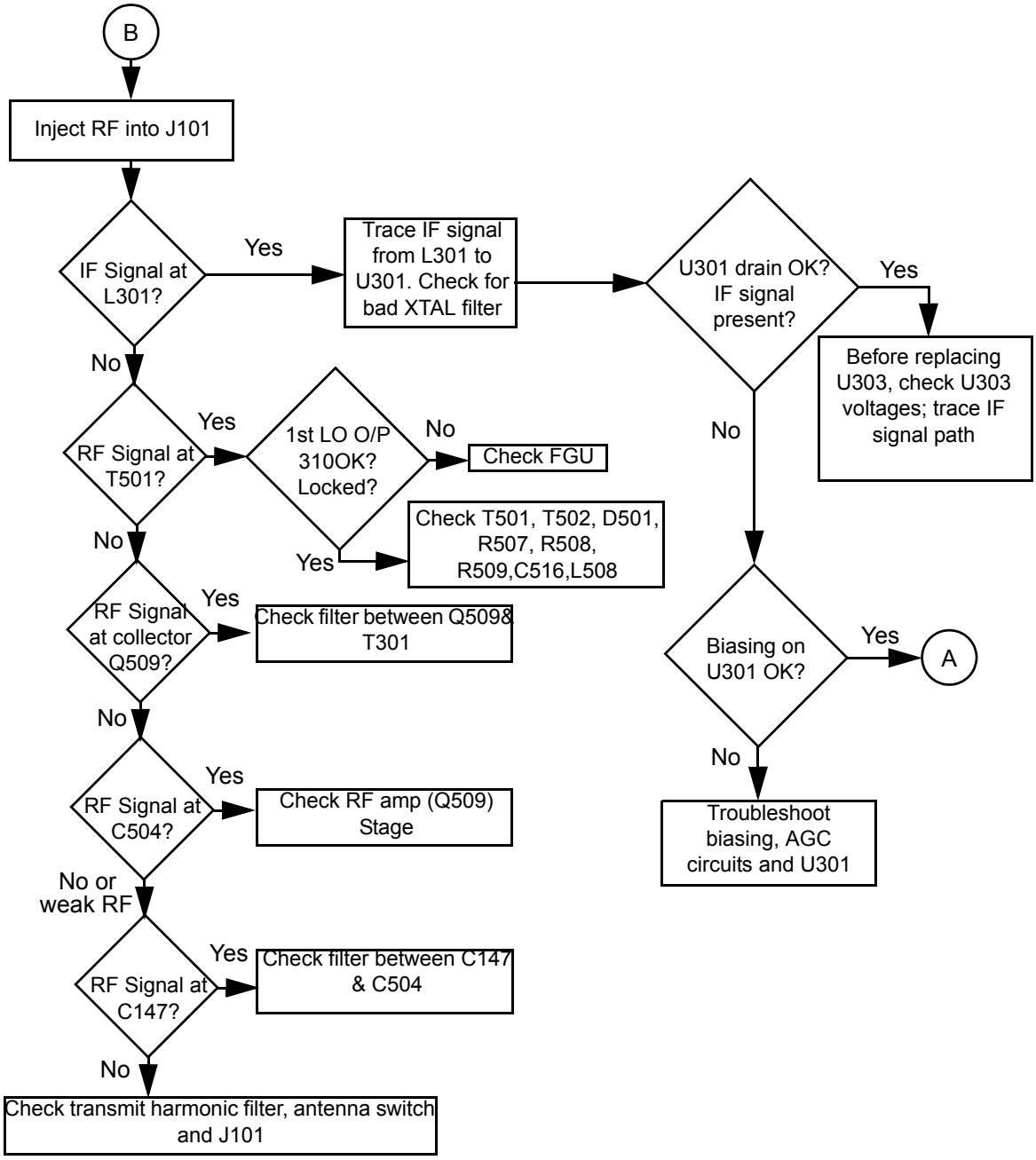
3.12 Low Band Troubleshooting Charts



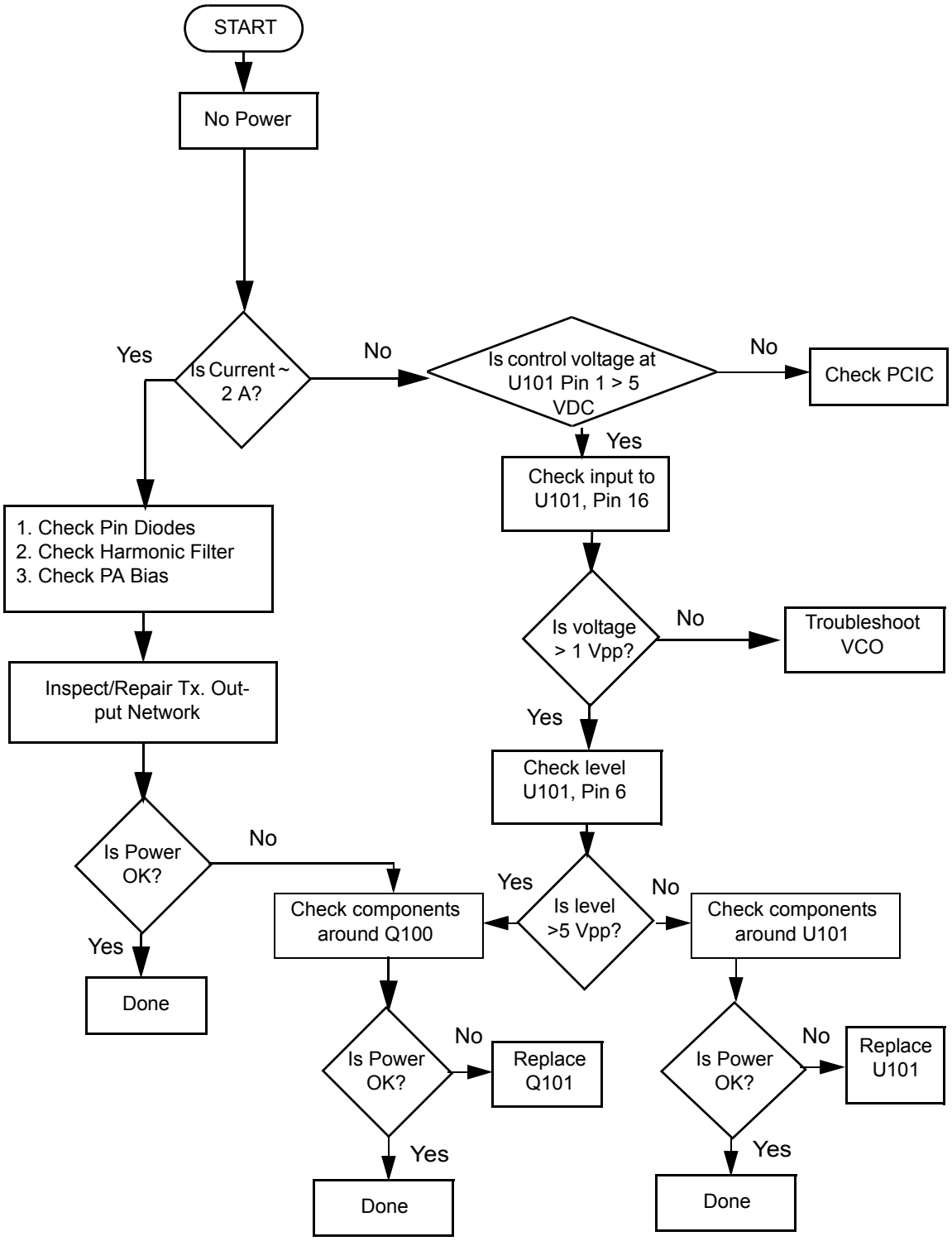
Troubleshooting Flow Chart for Controller



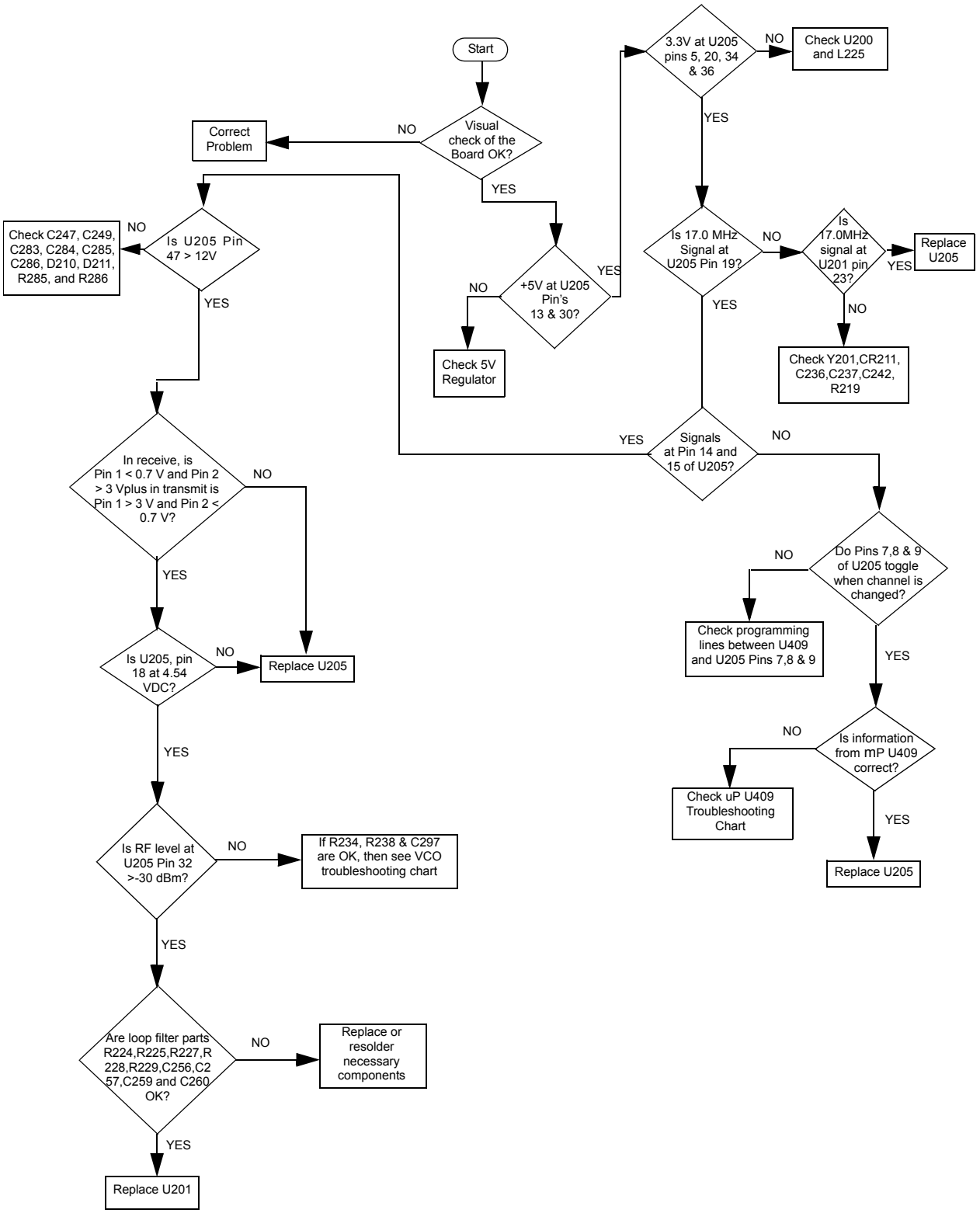
Troubleshooting Flow Chart for Receiver (Sheet 1 of 2)



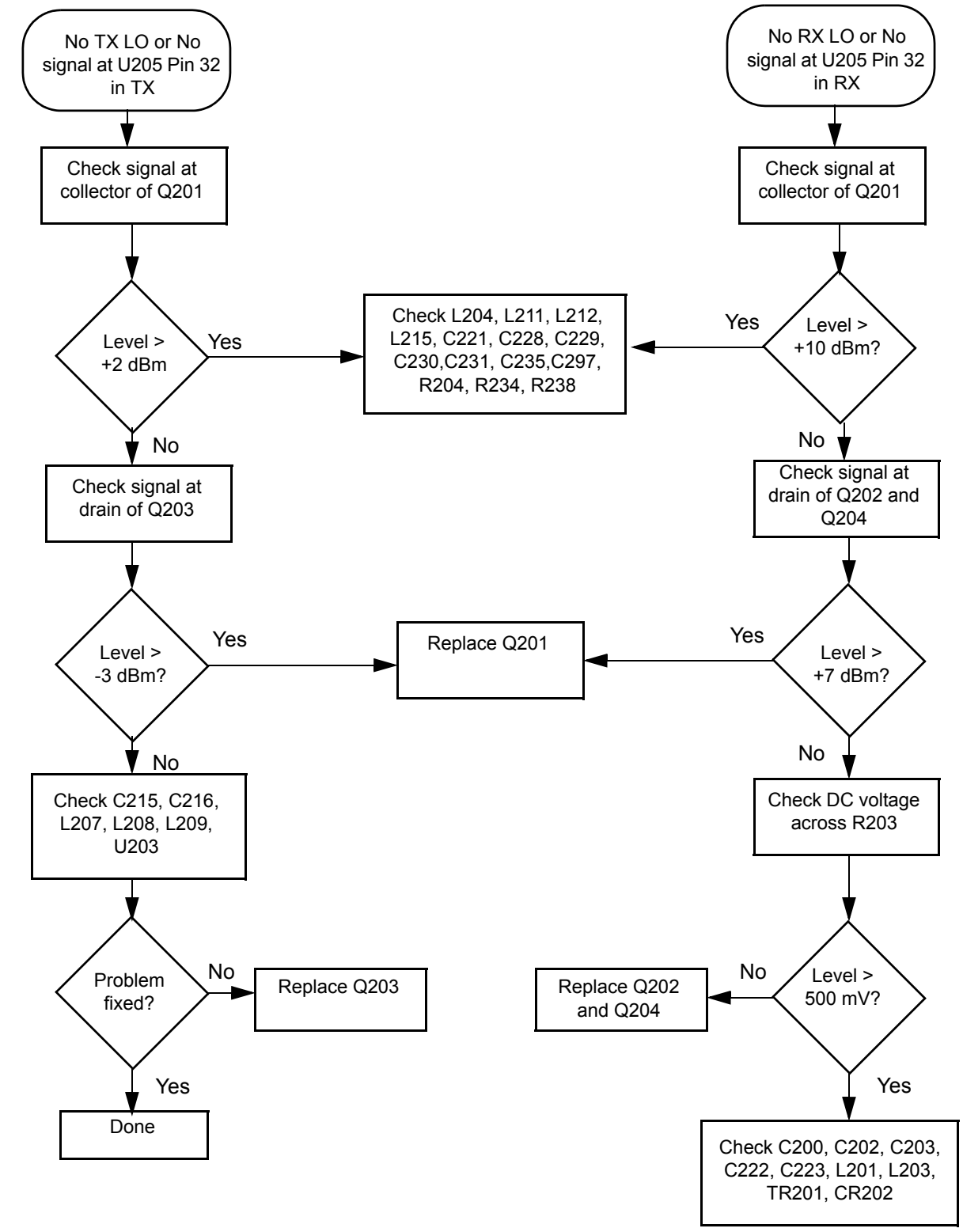
Troubleshooting Flow Chart for Receiver (Sheet 2 of 2)



Troubleshooting Flow Chart for Transmitter



Troubleshooting Flow Chart for Synthesizer



Troubleshooting Flow Chart for VCO

Chapter 4 Schematic Diagrams, Overlays, and Parts Lists

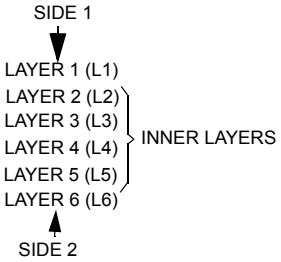
4.1 Introduction

This chapter provides schematic diagrams, overlays, and parts lists for the radio circuit boards and interface connections.

4.1.1 Notes For All Schematics and Circuit Boards

* Component is frequency sensitive. Refer to the Electrical Parts List for value and usage.

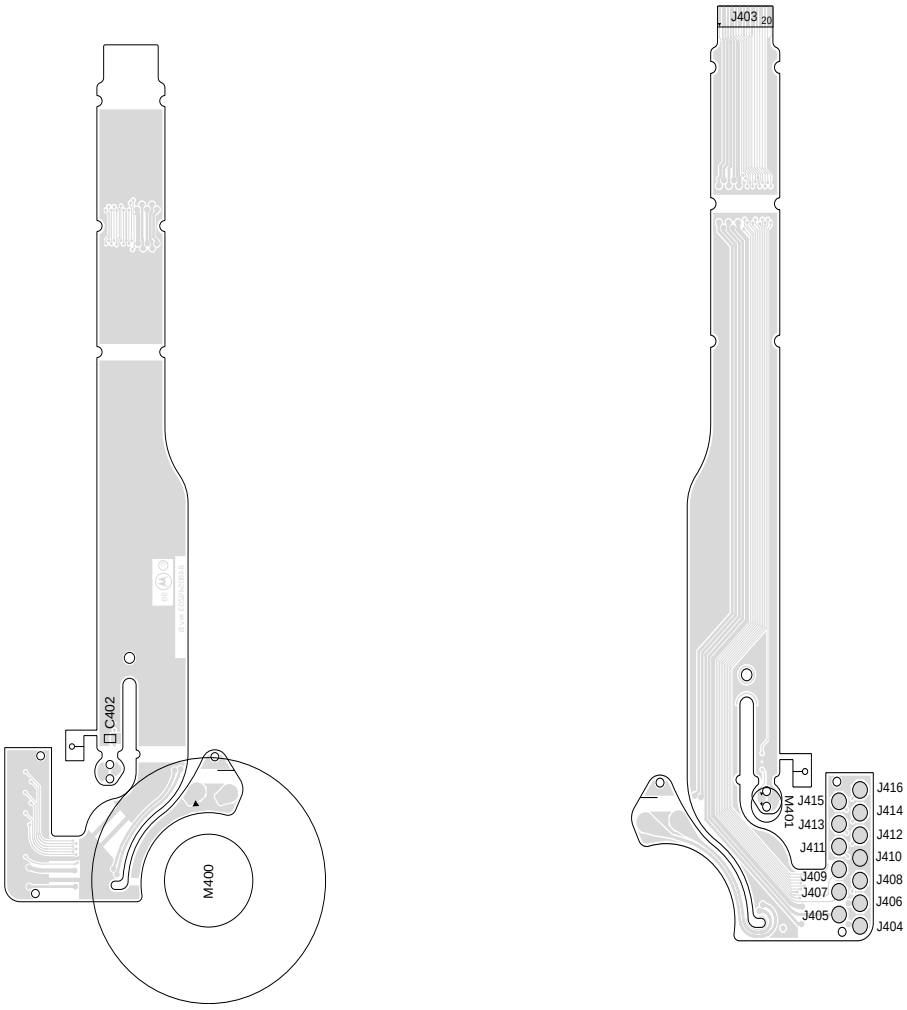
1. Unless otherwise stated, resistances are in Ohms (k = 1000), and capacitances are in picofarads (pF) or microfarads (µF).
2. DC voltages are measured from point indicated to chassis ground using a Motorola DC multimeter or equivalent. Transmitter measurements should be made with a 1.2 µH choke in series with the voltage probe to prevent circuit loading.
3. Reference Designators are assigned in the following manner:
   - 100 Series = Transmitter
   - 200 Series = Frequency Generation
   - 300 Series = Receiver
   - 400/500 Series = Controller and Low-Band Receiver Front End
   - 600 Series = Keypad Board
4. Interconnect Tie Point Legend:
   - UNSWB+ = Unswitched Battery Voltage (7.5 V)
   - SWB+ = Switched Battery Voltage (7.5 V)
   - R5 = Receiver Five Volts
   - CLK = Clock
   - Vdda = Regulated 3.3 Volts (for analog)
   - Vddd = Regulated 3.3 Volts (for digital)
   - CSX = Chip Select Line (not for LVZIF)
   - SYN = Synthesizer
   - DACRX = Digital to Analog Voltage (For Receiver Front End Filter)
   - VSF = Voltage Super Filtered (5 V)
   - VR = Voltage Regulator



6-LAYER CIRCUIT BOARD DETAIL VIEWING COPPER STEPS IN PROPER LAYER SEQUENCE

4.2 Flex Layout

4.2.1 Universal Flex Connector



Front Metal
View From Top Side

Back Metal
View From Top Side

Figure 4-1: Universal Flex Connector

4.2.2 Universal Connector Flex Schematic

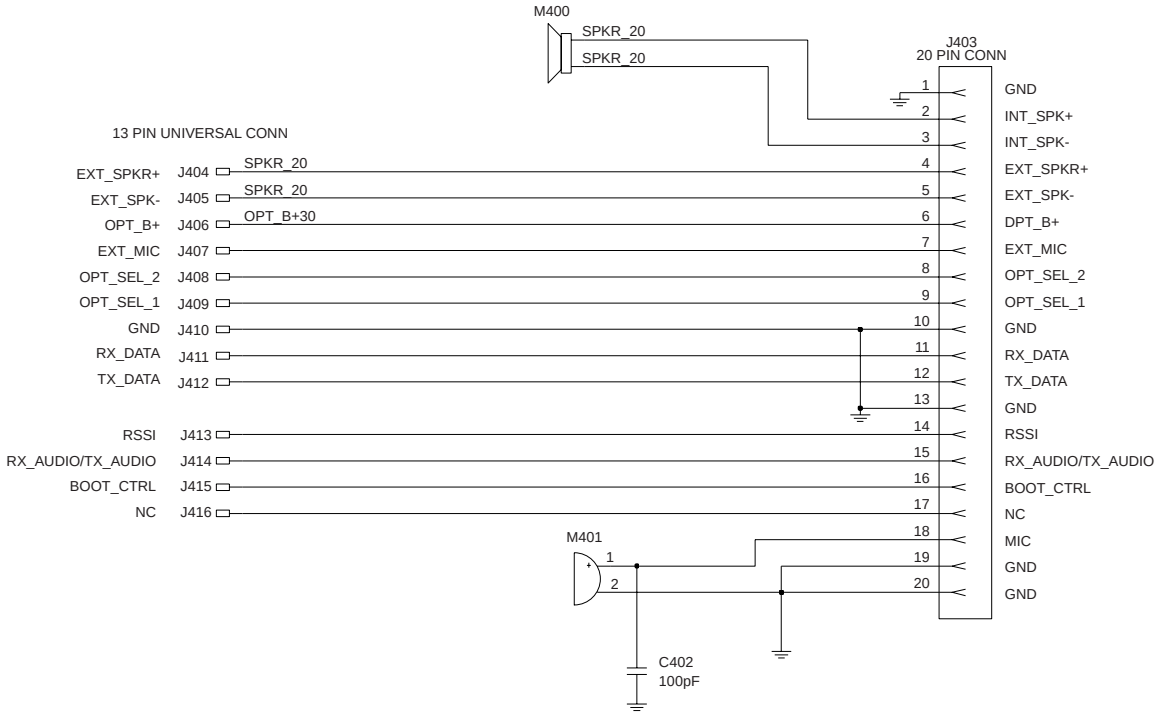


Figure 4-2: Universal Flex Connector Schematic Diagram

4.2.3 Universal Flex Connector Parts List

Reference Symbol	Motorola Part No.	Description
C402	2113740A55	Cap, 100pF
M400	5085962A02	Speaker, 20 ohm
M401	5013920A04	Microphone for 5000 and 7000 Series
M401	5005227J08	Microphone for 9000 Series
	8480549Z01	Flex, Speaker Microphone

Notes

4.3 Controller Section (403–470 MHz: 8486458Z03, 8415234H09, 450–512 MHz: 8486686Z02 & 450–527 MHz: 8415235H07)

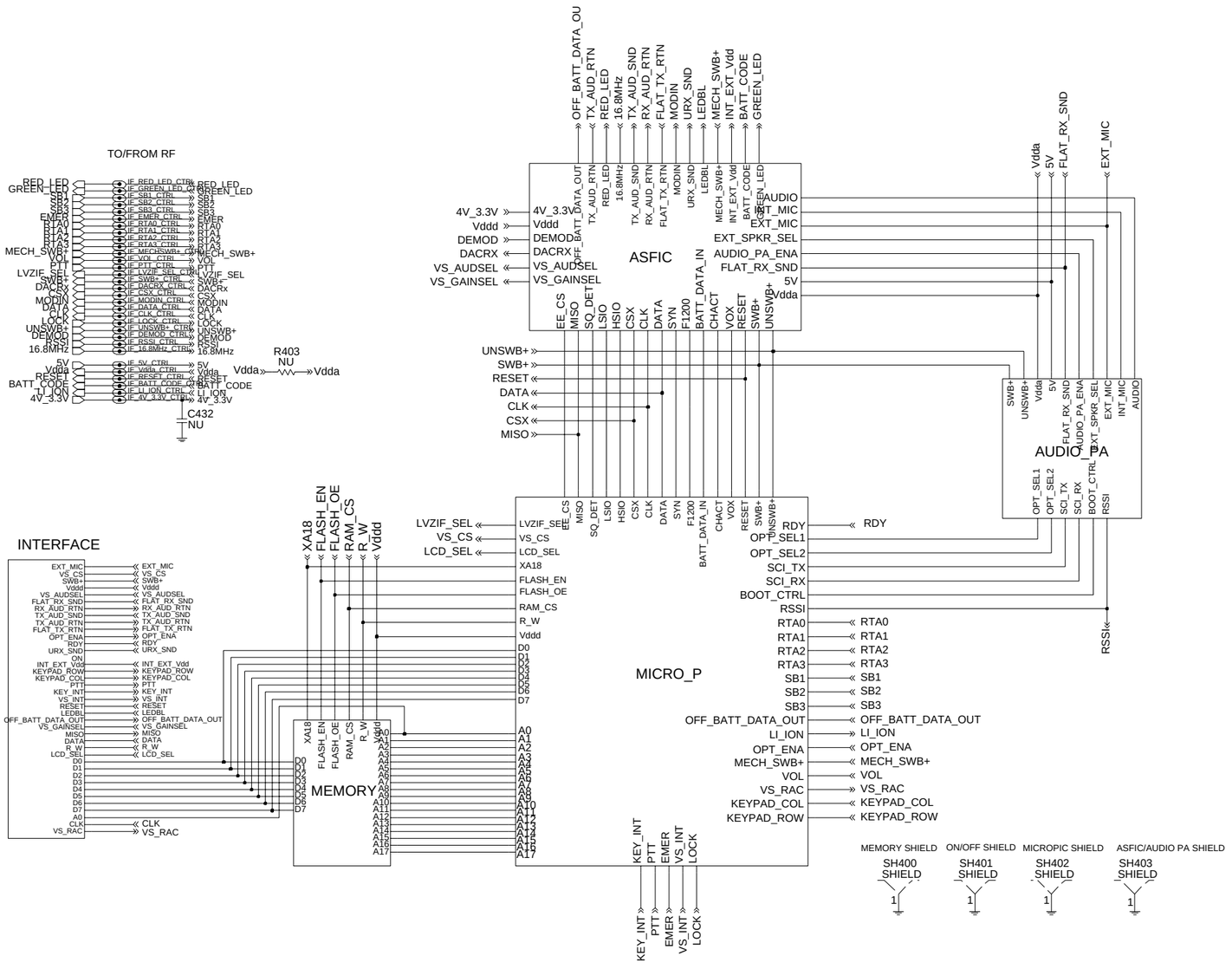


Figure 4-3: UHF Complete Controller Schematic Diagram

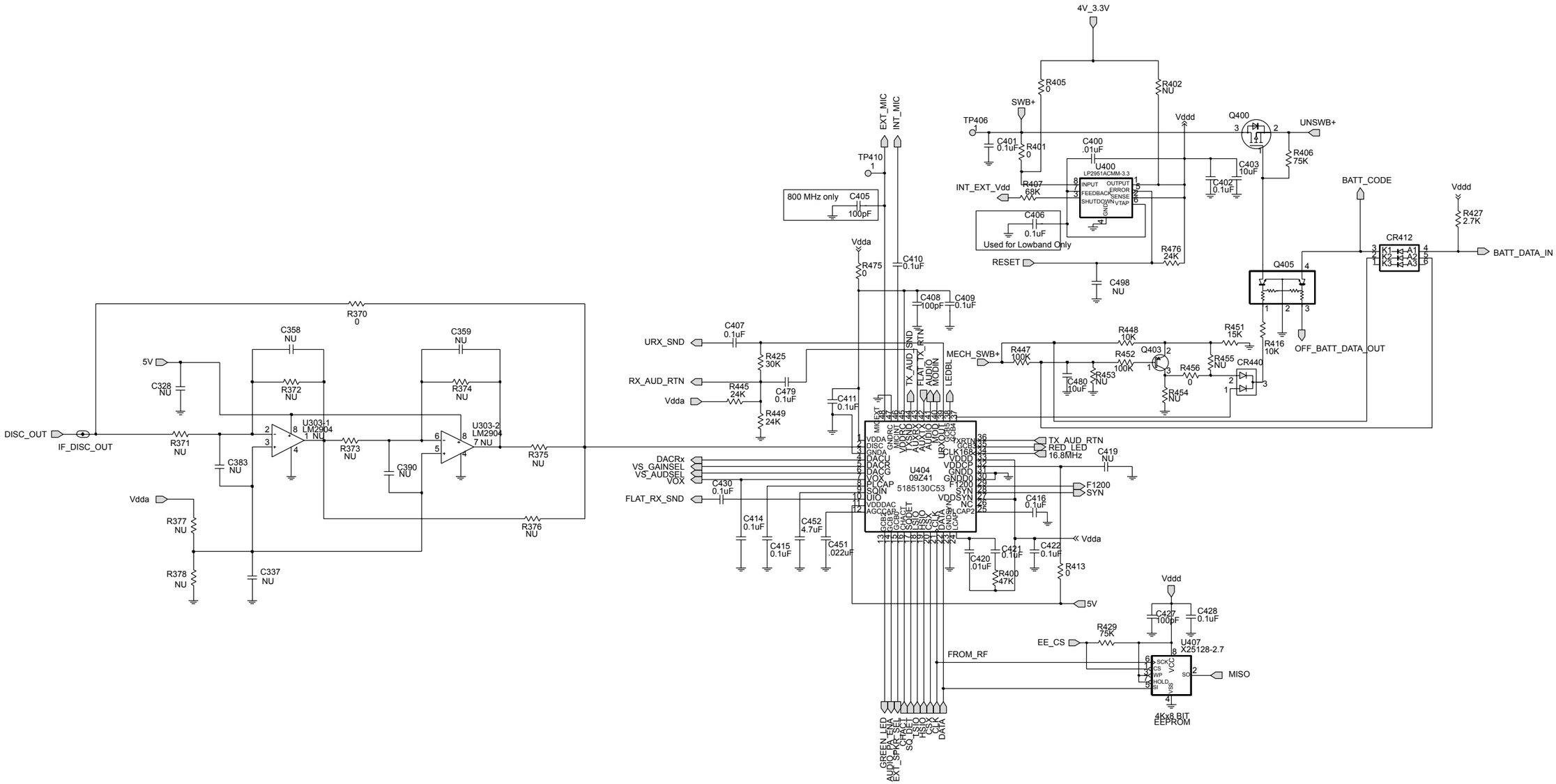


Figure 4-4: UHF Controller ASFIC/ON_OFF Schematic Diagram

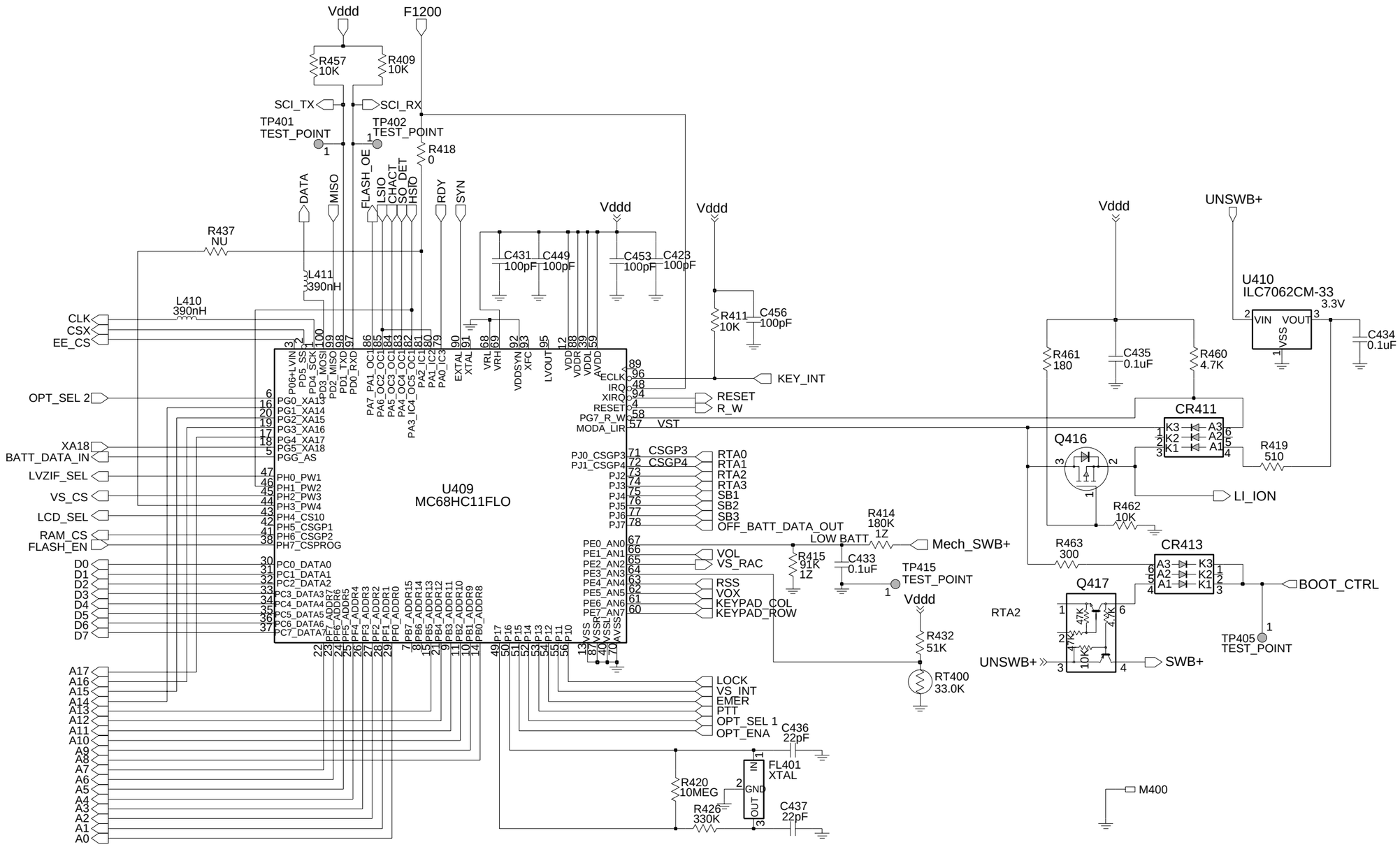


Figure 4-5: Controller Mircoprocessor Schematic Diagram

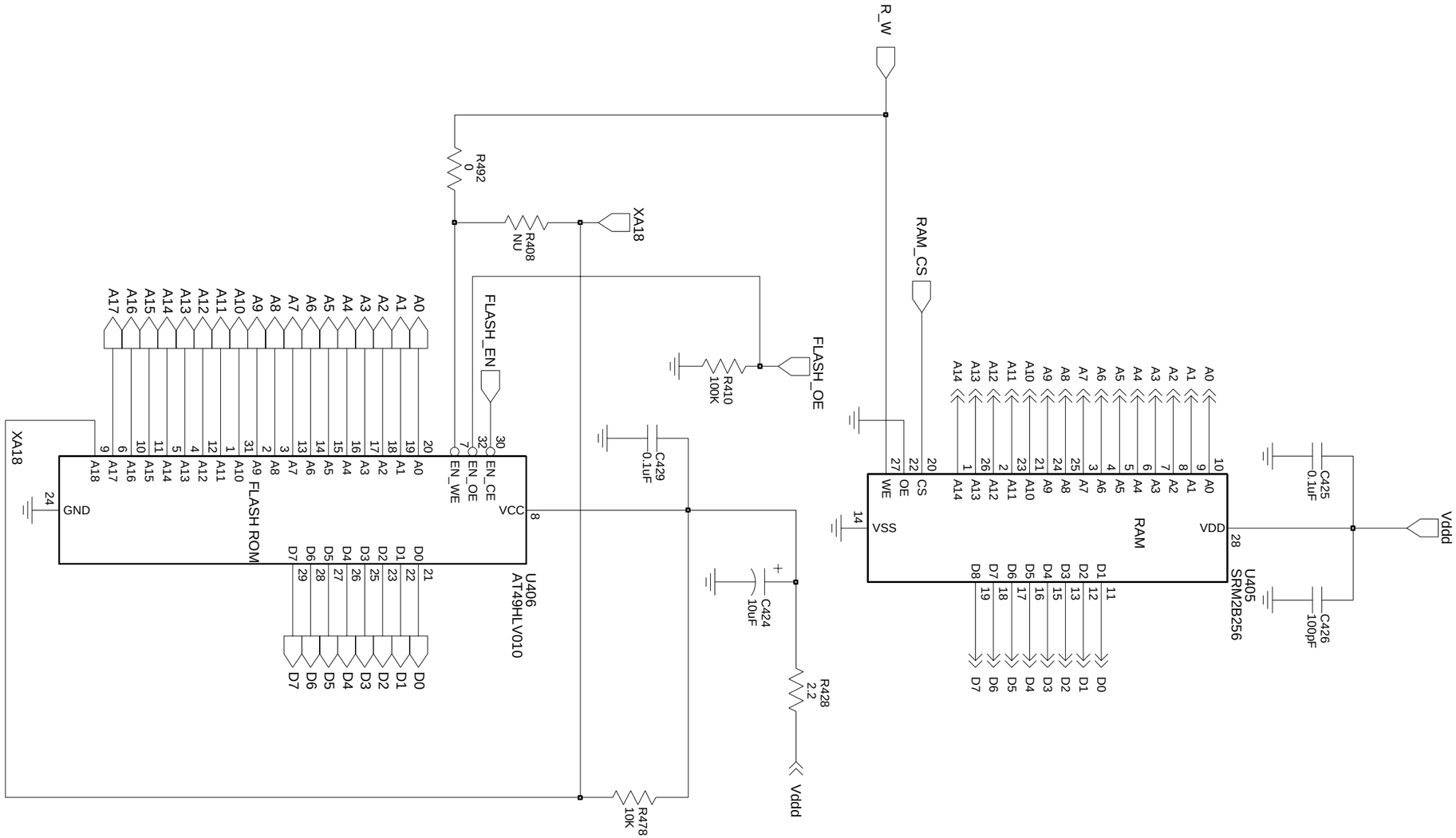


Figure 4-6: UHF Controller Memory Schematic Diagram

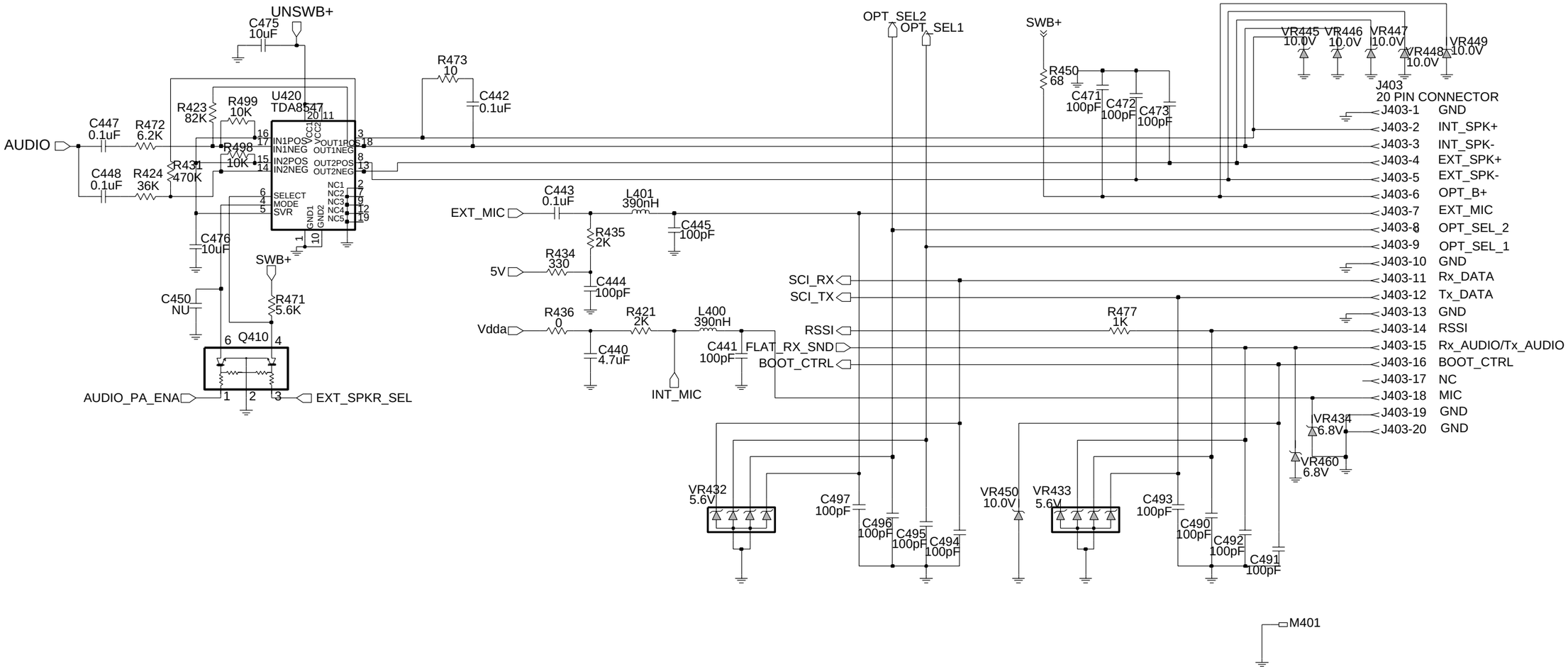


Figure 4-7: UHF Controller Audio PA Schematic Diagram

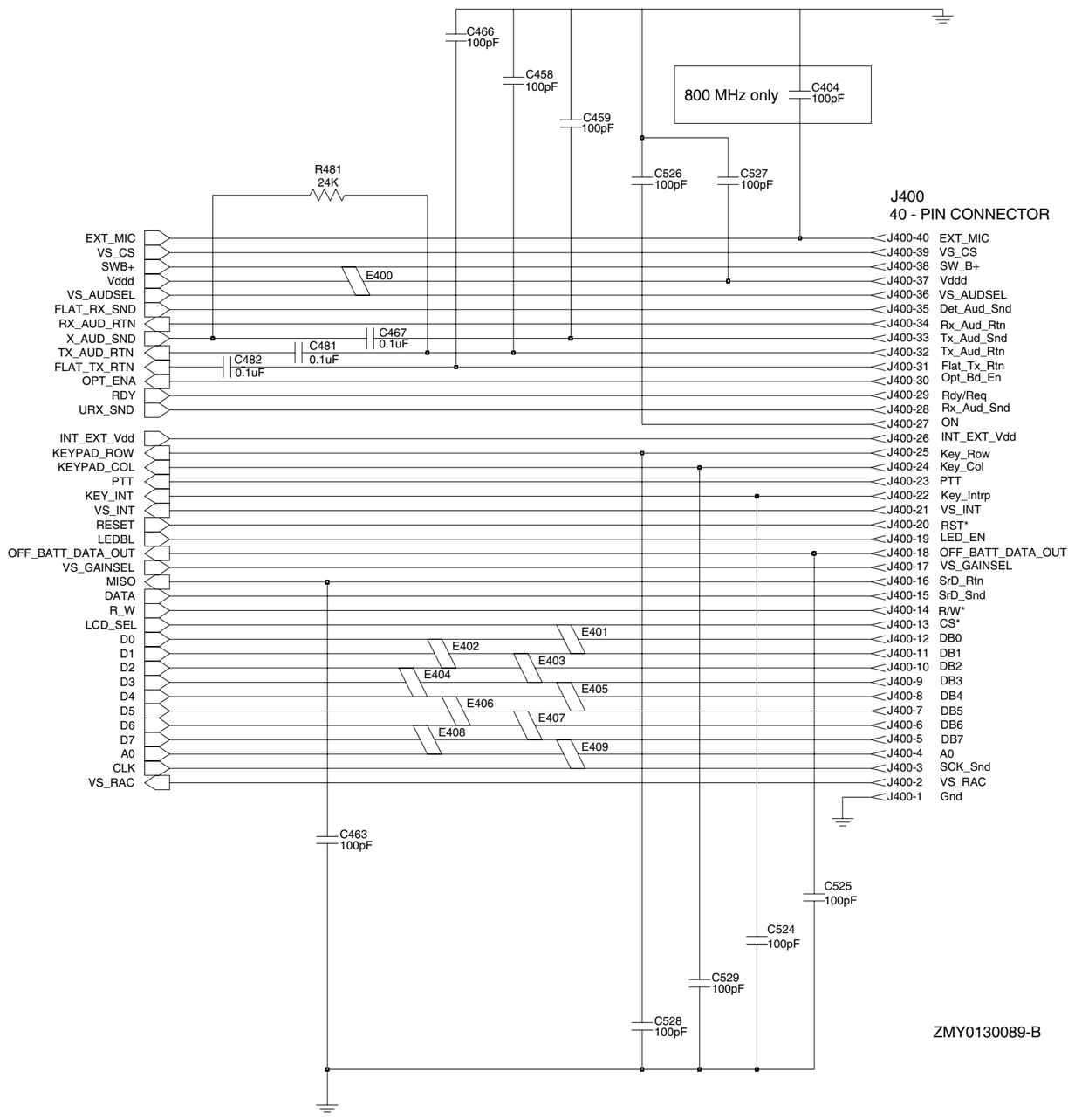


Figure 4-8: UHF Controller Interface Schematic Diagram

4.4 Controller Section (136–174 MHz for 8486473Z04 & 8415112H01)

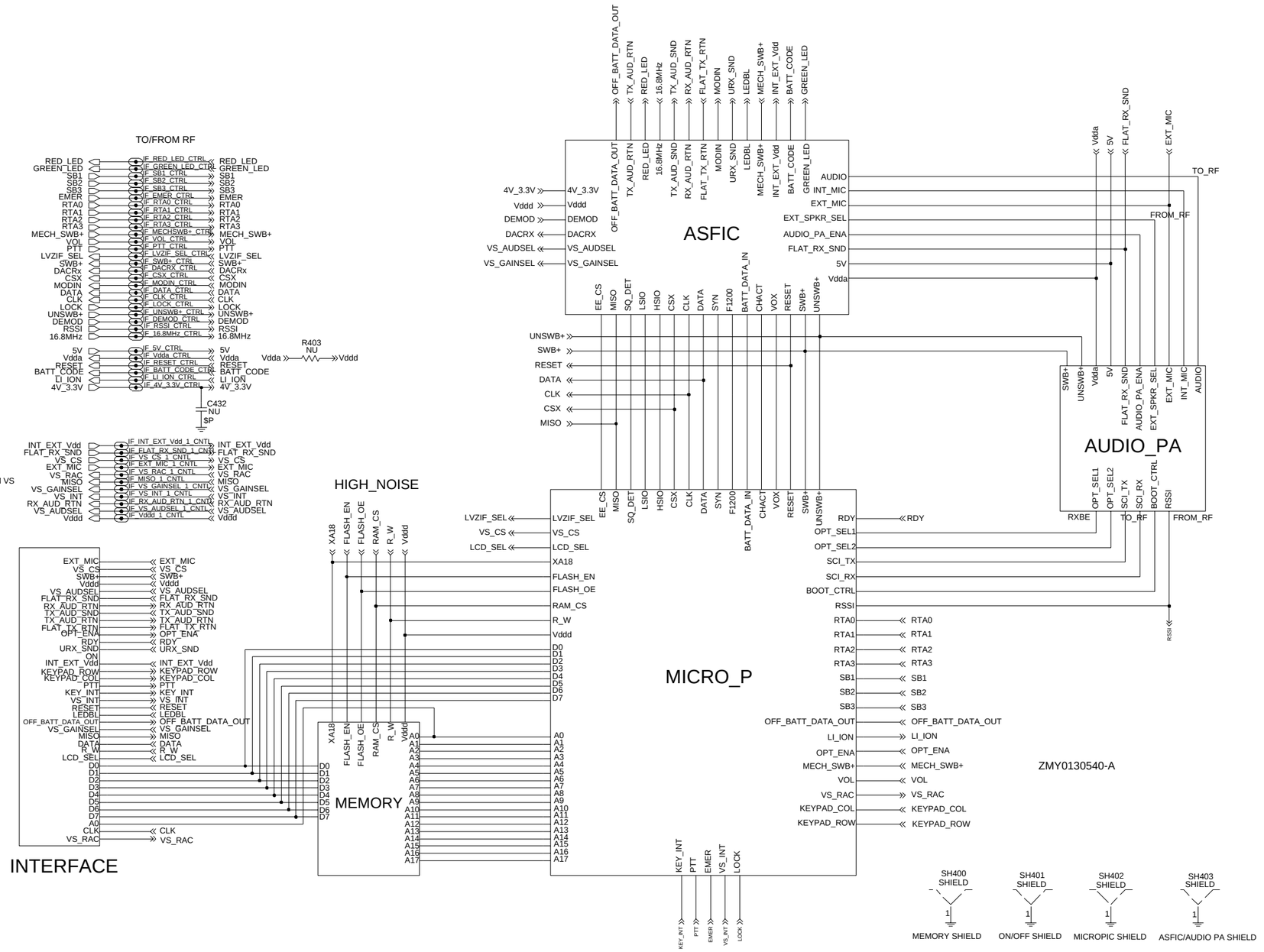


Figure 4-9: VHF Complete Controller Schematic Diagram

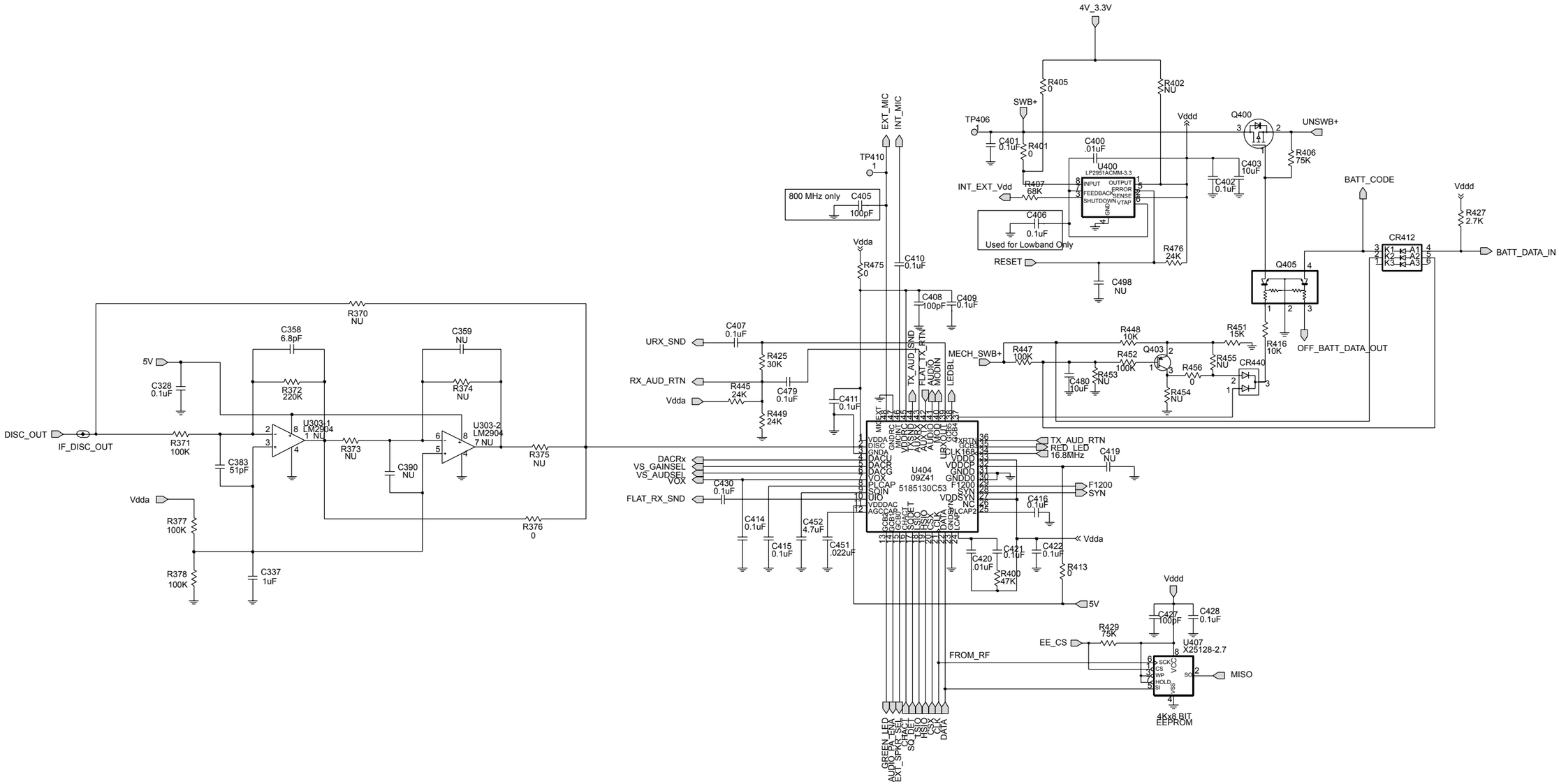


Figure 4-10: VHF Controller ASFIC/ON_OFF Schematic Diagram: PCB No. 8486473Z04

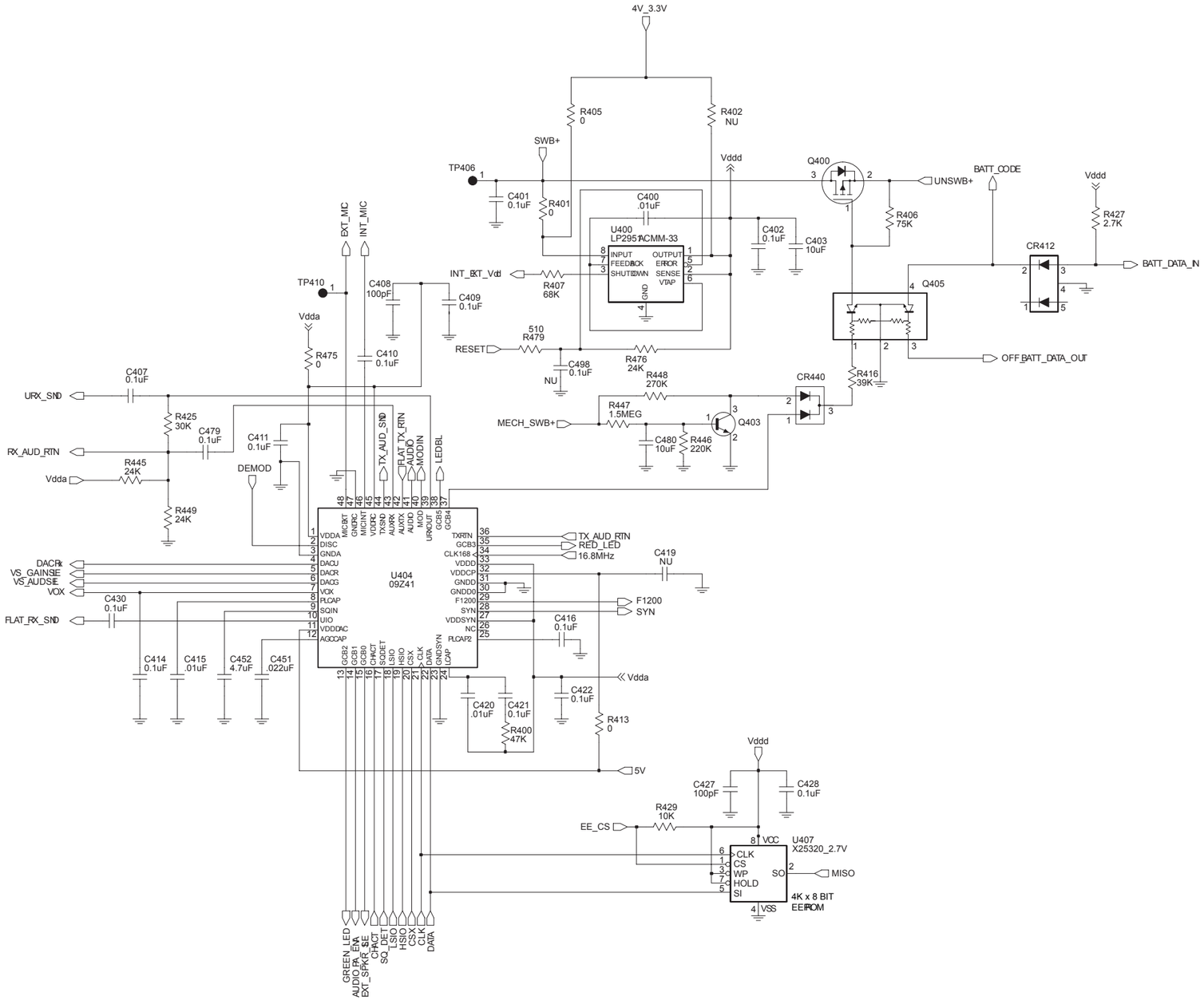


Figure 4-11: VHF Controller ASFIC/ON_OFF Schematic Diagram: PCB No. 8415112H01

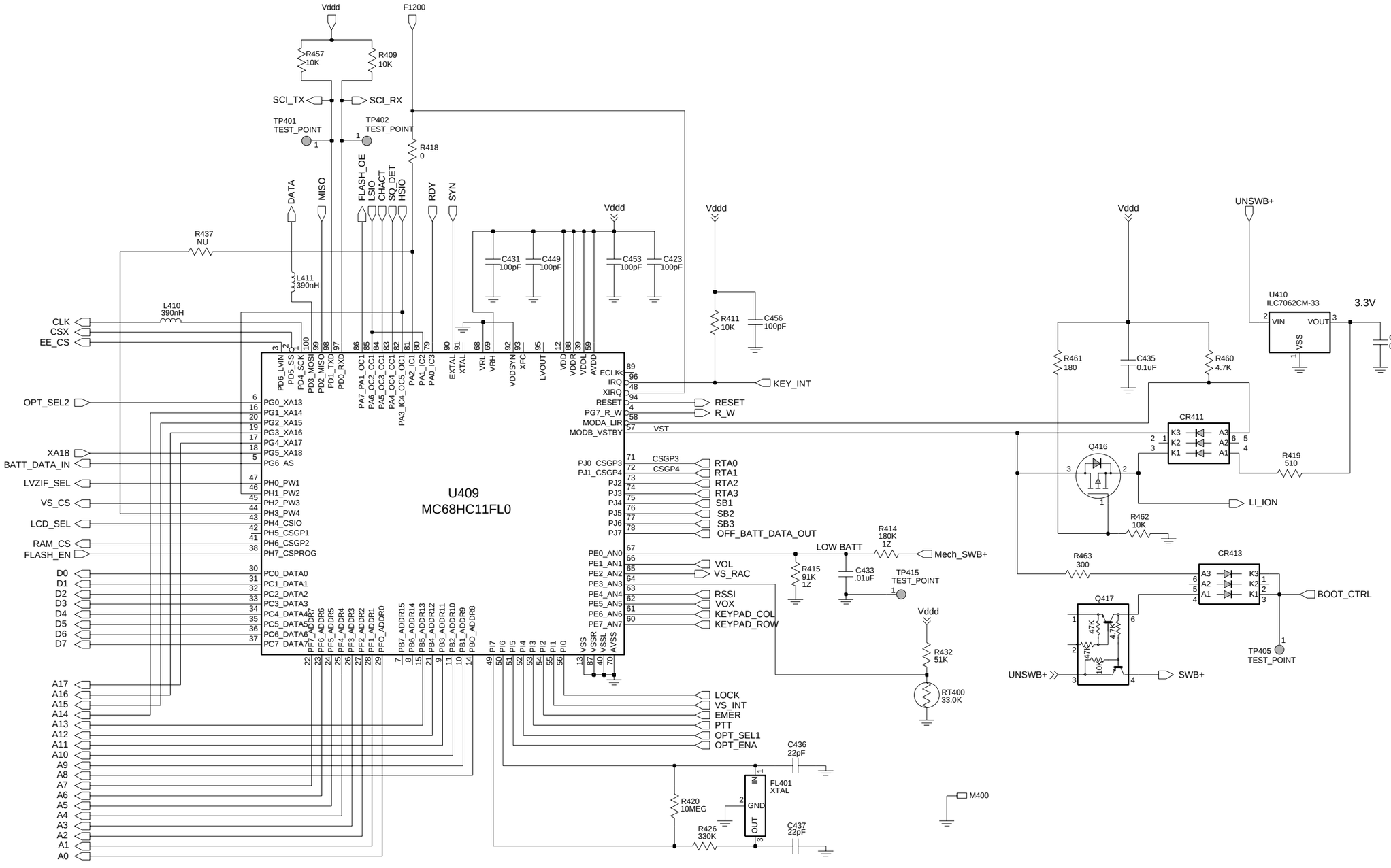


Figure 4-12: VHF Controller Mircoprocessor Schematic Diagram: PCB No. 8486473Z04

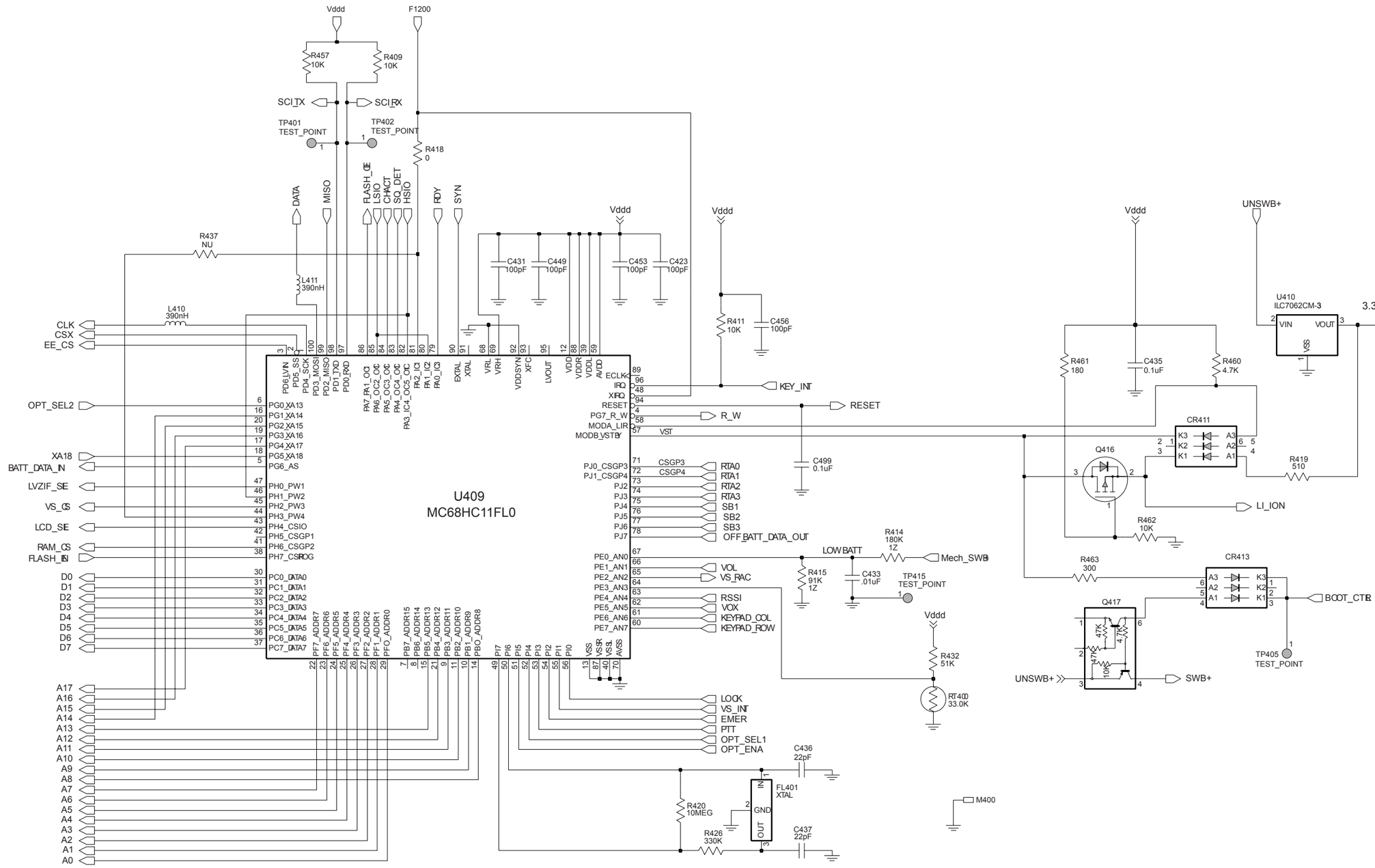


Figure 4-13: VHF Controller Mircoprocessor Schematic Diagram: PCB No. 8415112H01

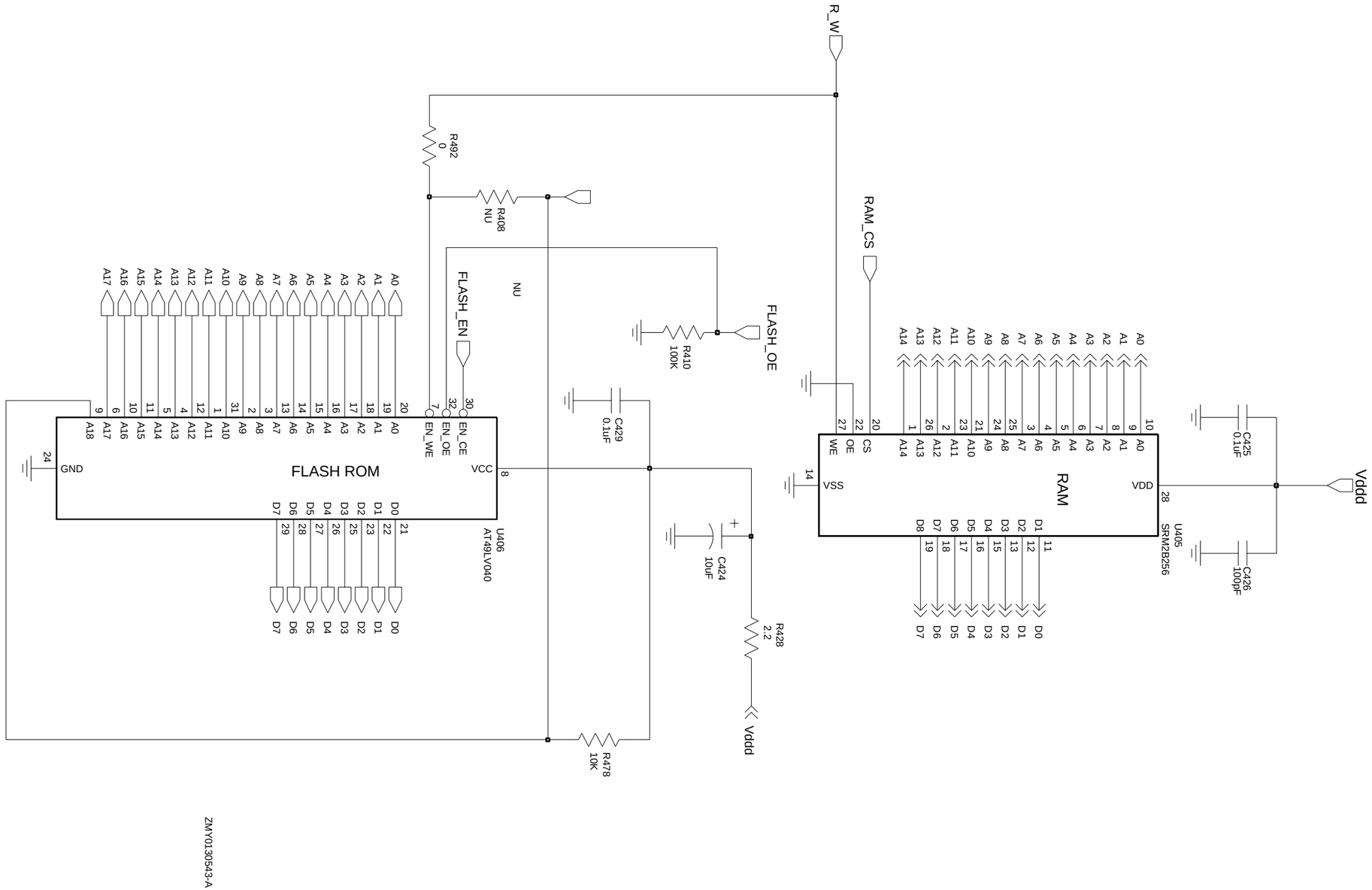


Figure 4-14: VHF Controller Memory Schematic Diagram: PCB No. 8486473Z04

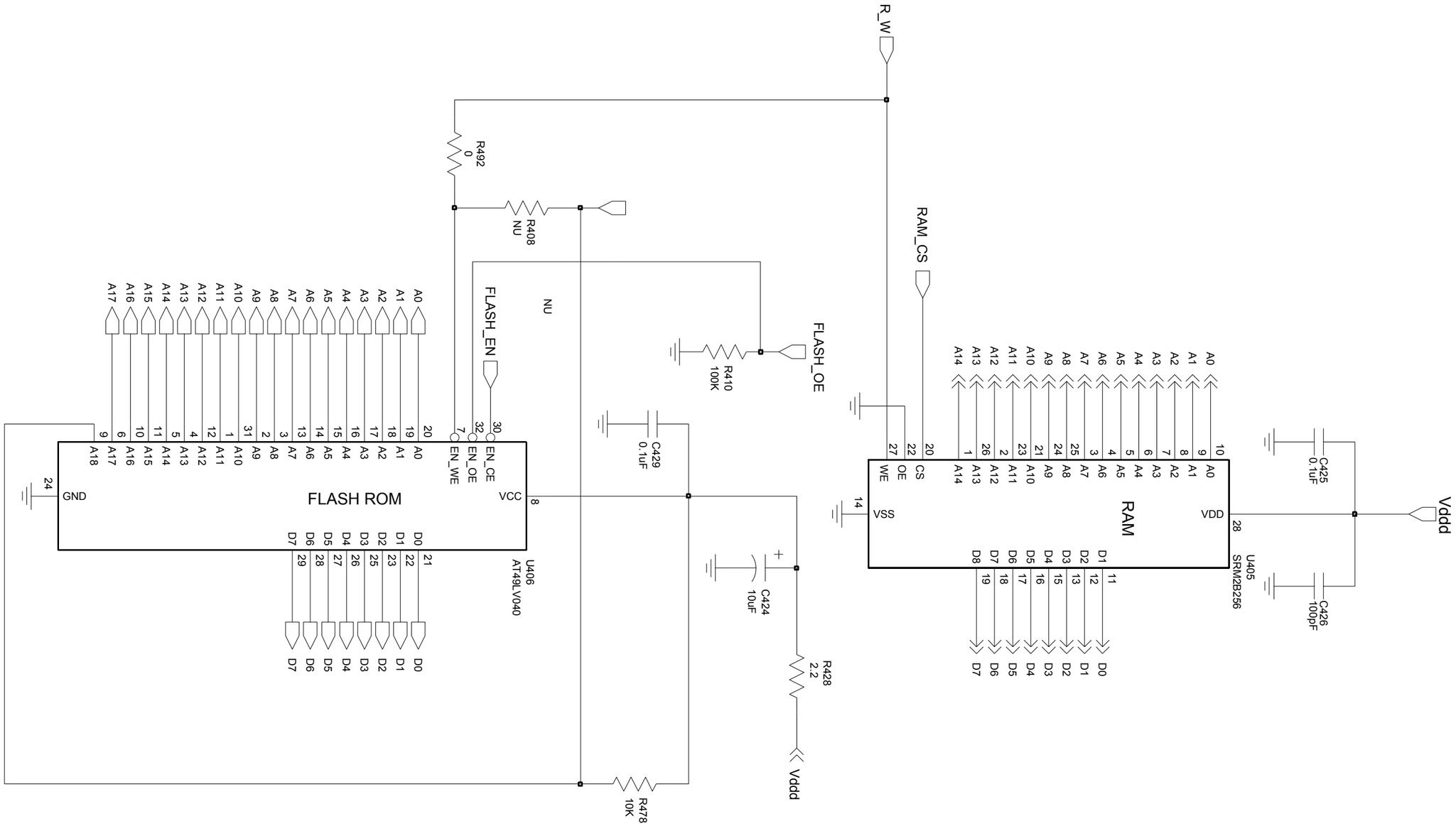


Figure 4-15: VHF Controller Memory Schematic Diagram: PCB No. 8415112H01

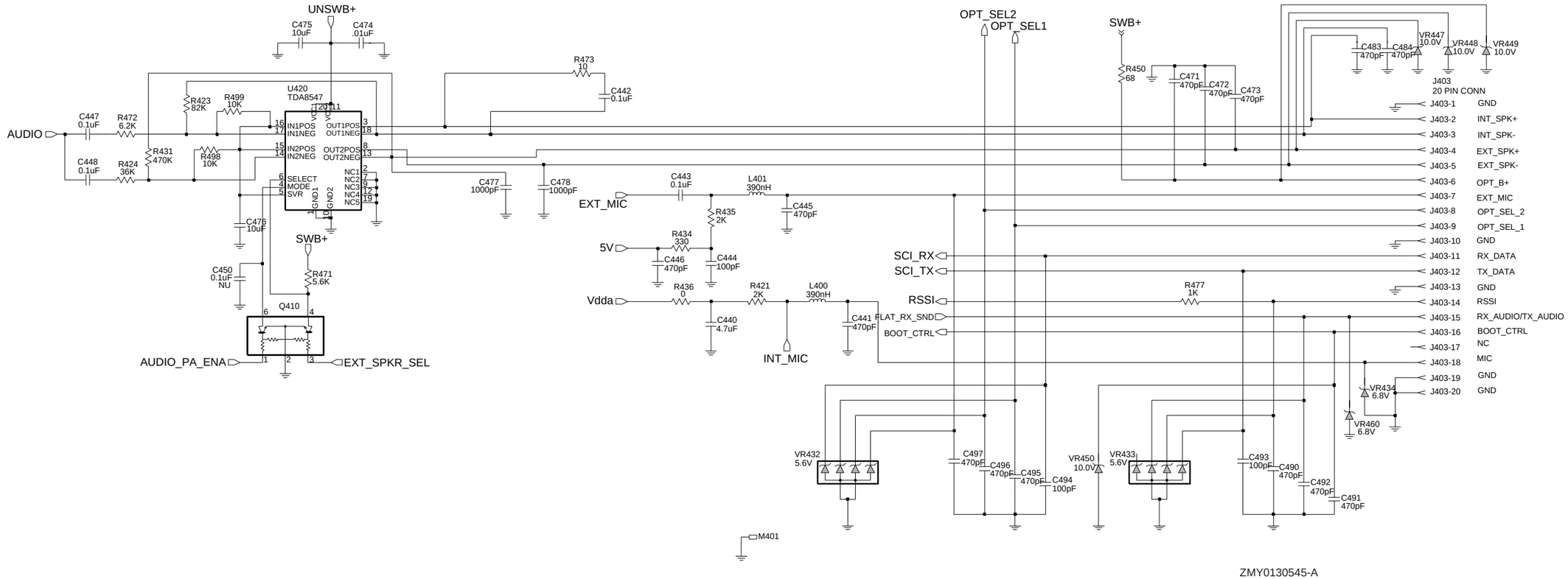


Figure 4-16: VHF Controller Audio PA Schematic Diagram

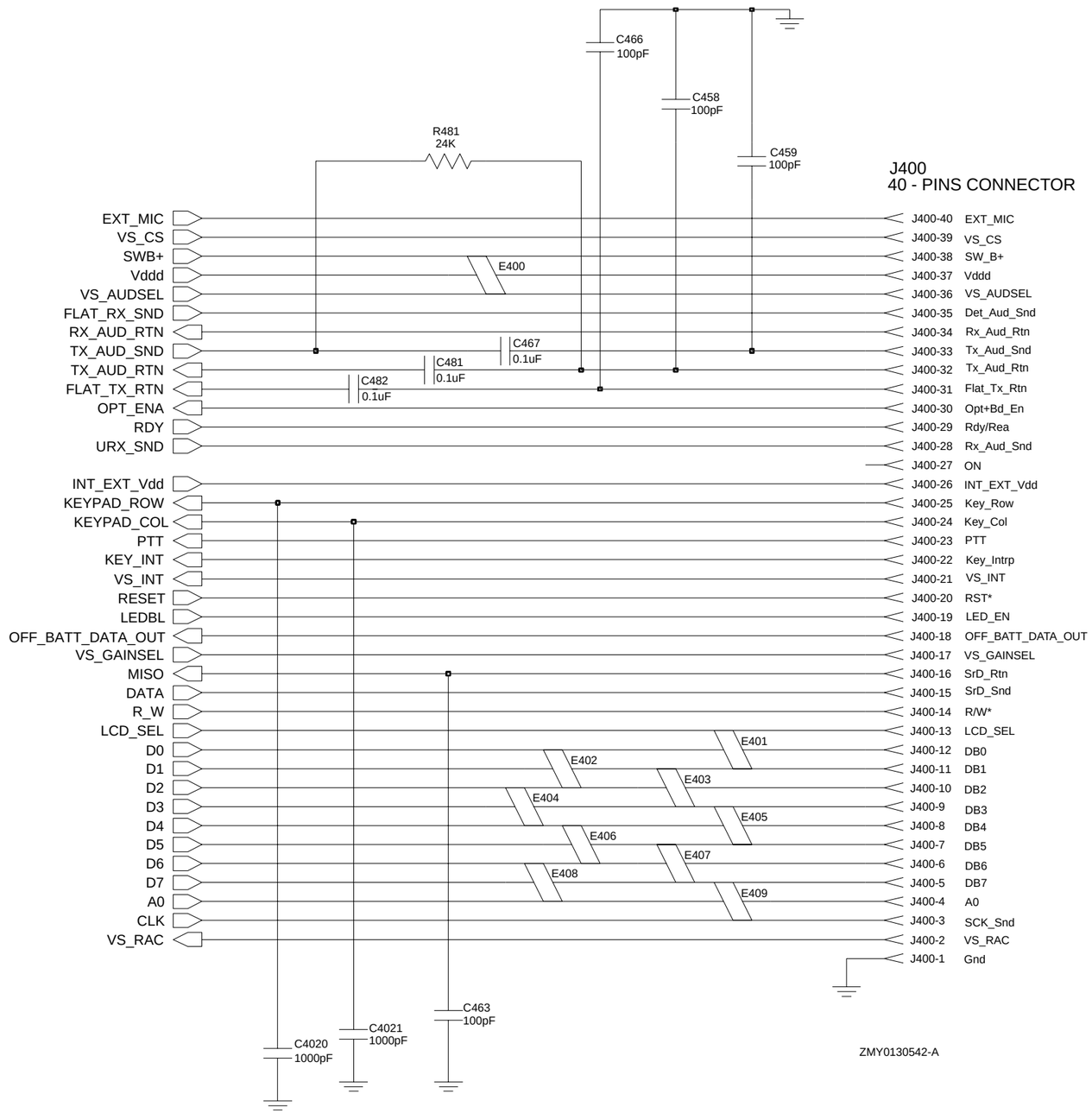


Figure 4-17: VHF Controller Interface Schematic Diagram

4.5 UHF Band 1 Section

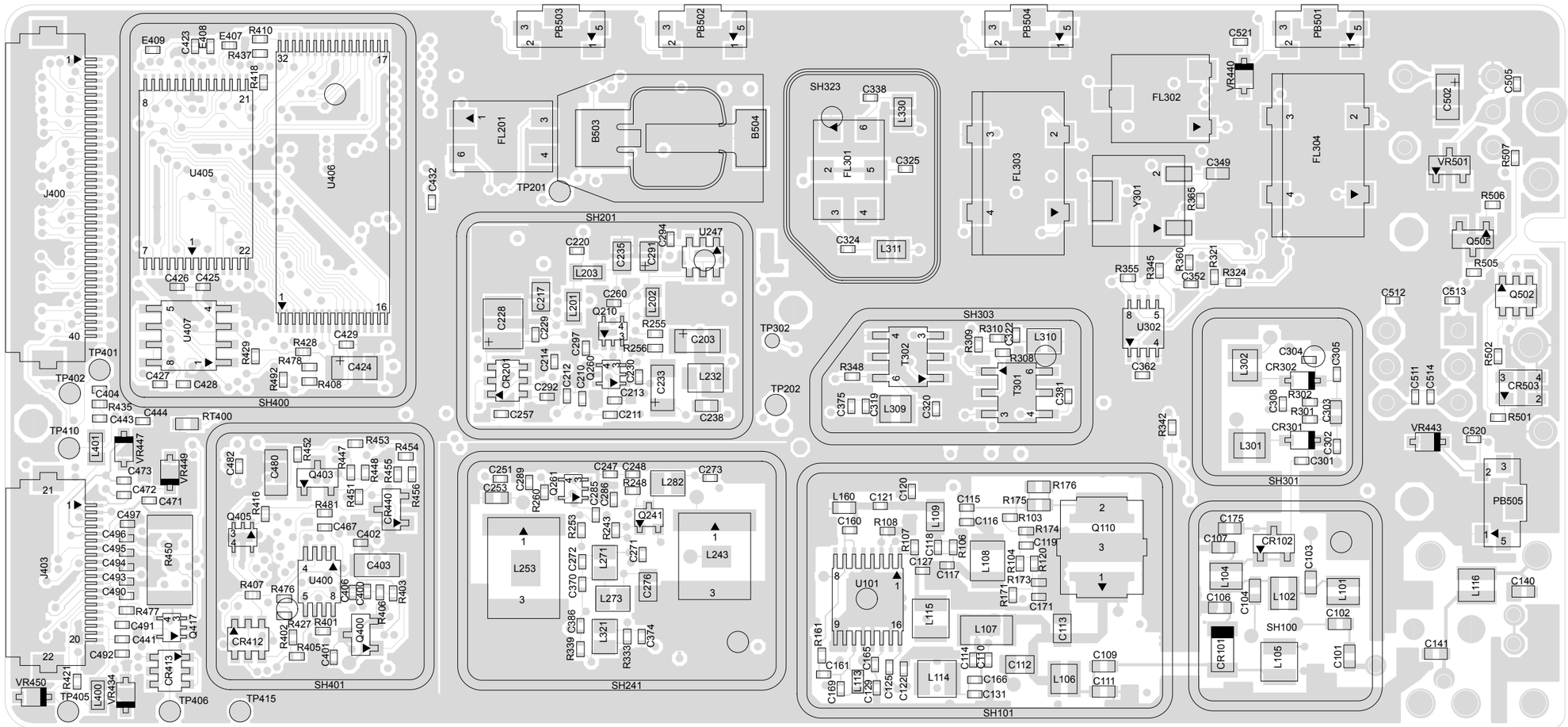


Figure 4-18: UHF (403–470 MHz) Main Board Top Side: PCB 8486458Z03 rev. C

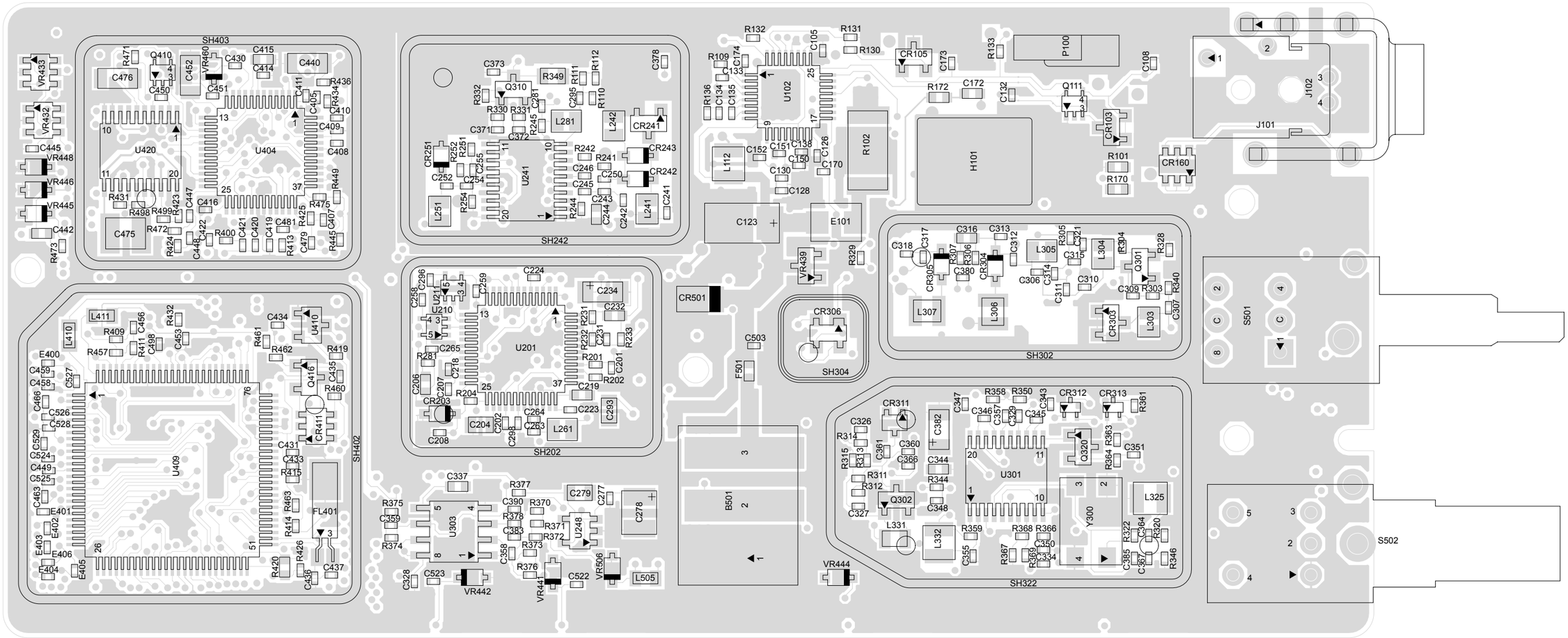


Figure 4-19: UHF (403–470 MHz) Main Board Bottom Side: PCB 8486458Z03 rev. C

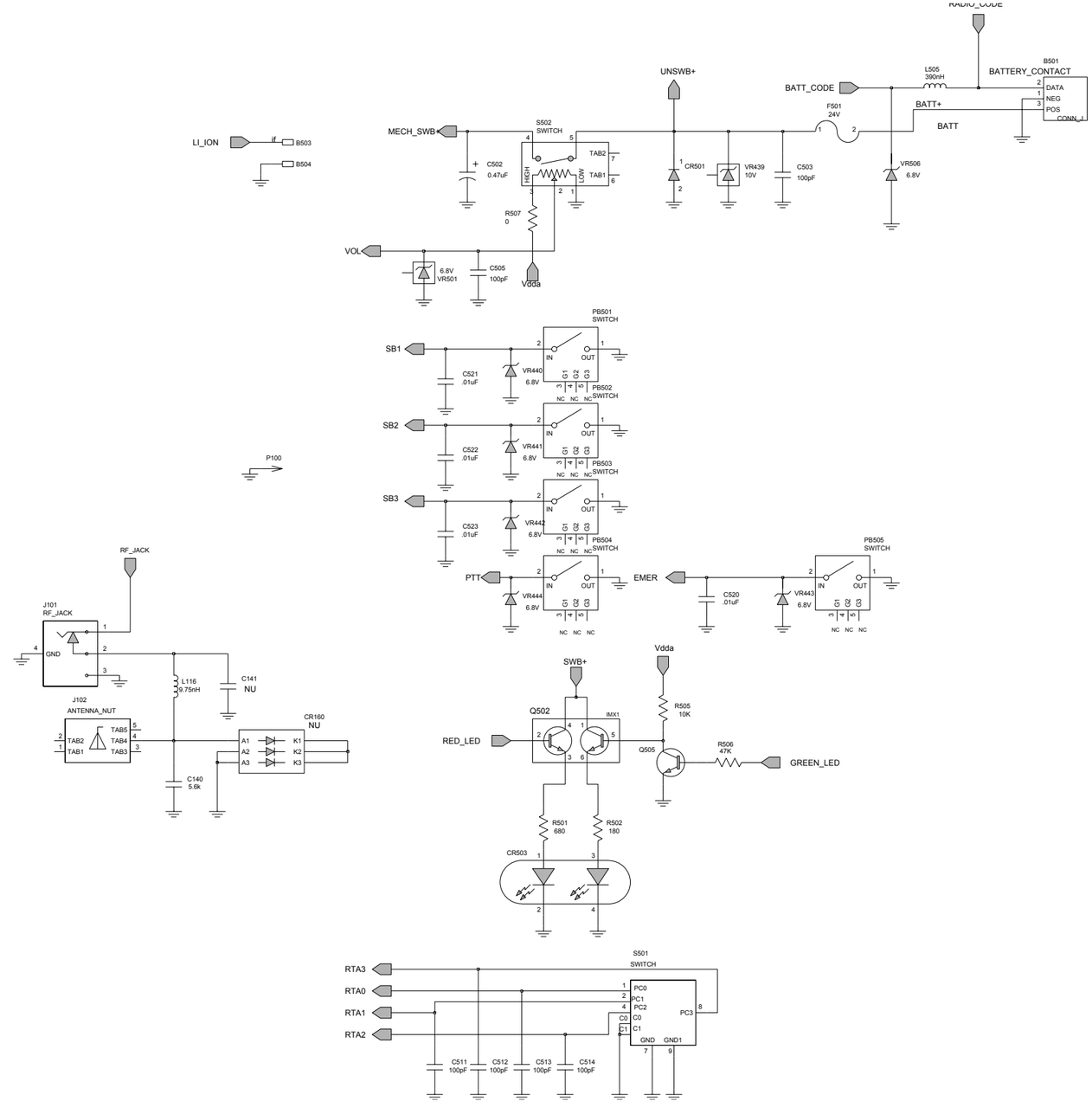


Figure 4-20: UHF (403–470 MHz) Controls and Switches Schematic Diagram

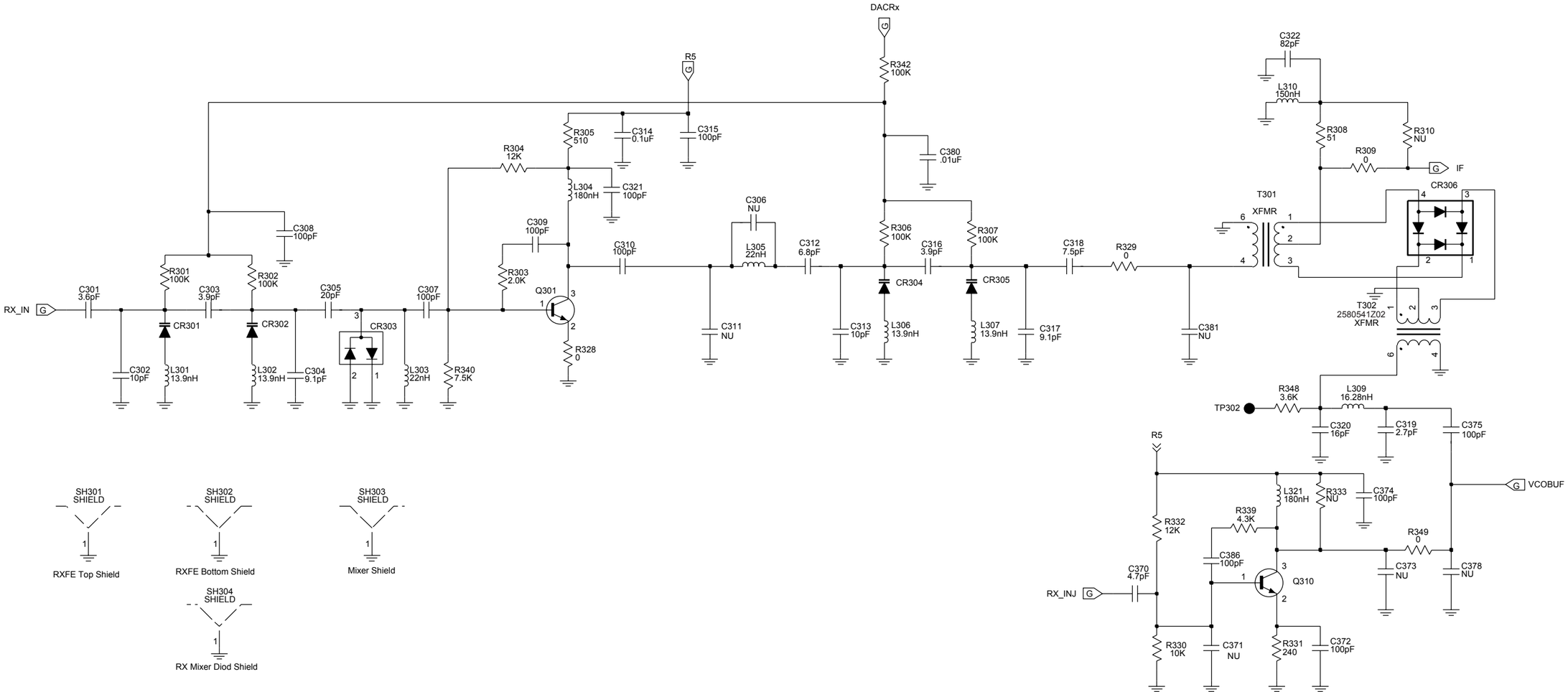


Figure 4-21: UHF (403–470 MHz) Receiver Front End Schematic Diagram

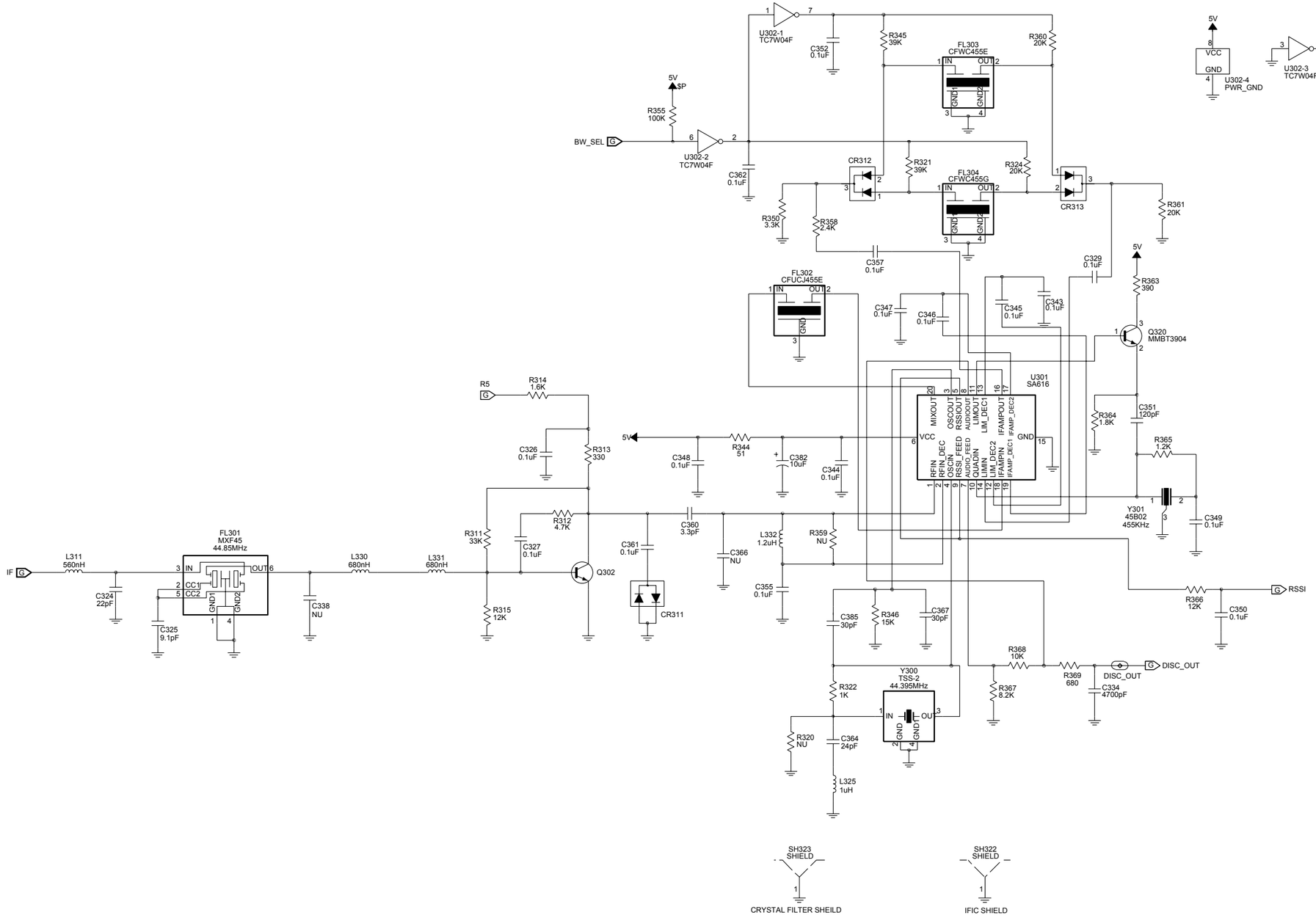


Figure 4-22: UHF (403–470 MHz) Receiver Back End Schematic Diagram

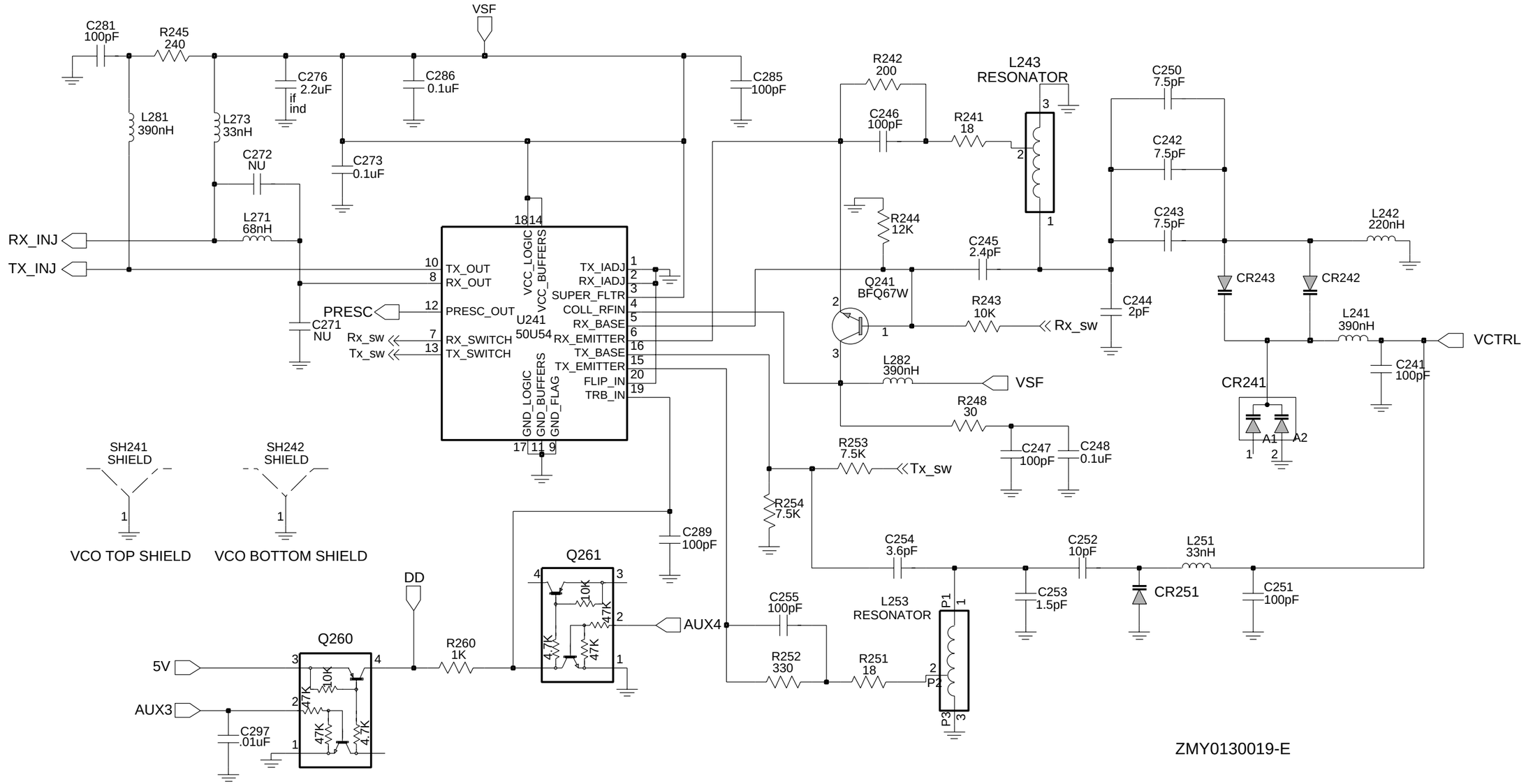


Figure 4-23: UHF (403–470 MHz) Voltage Controlled Oscillator Schematic Diagram

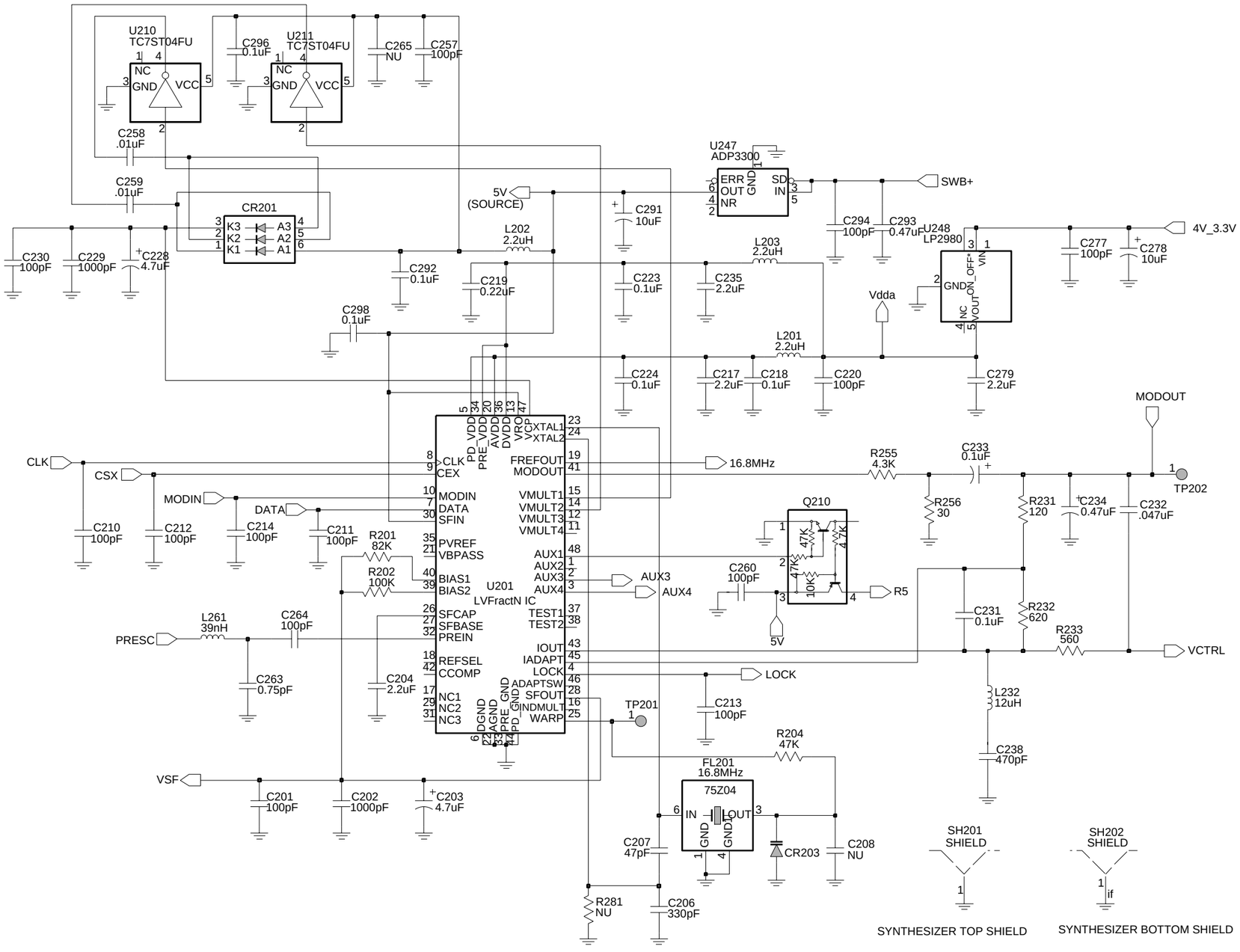
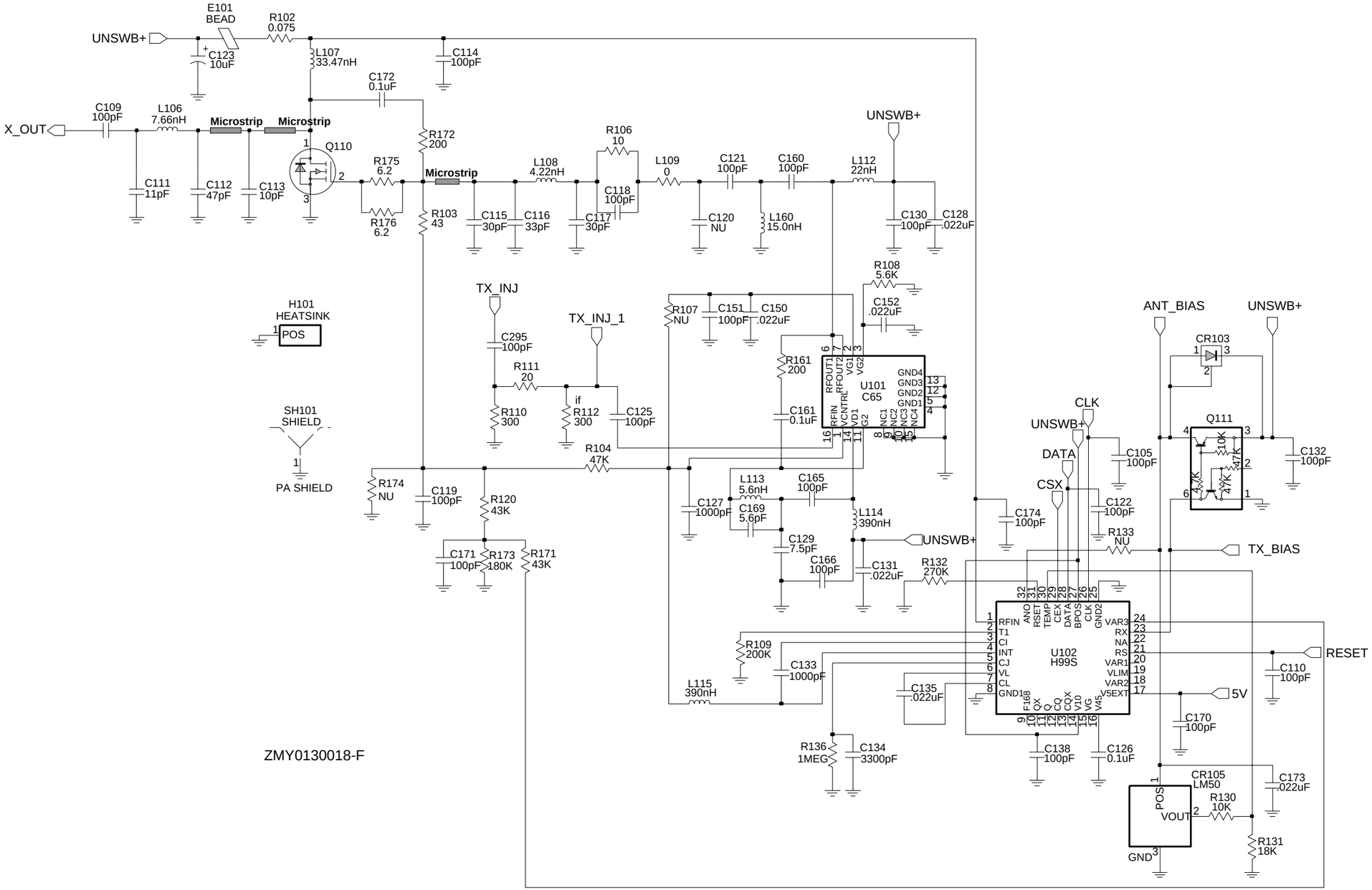


Figure 4-24: UHF (403–470 MHz) Synthesizer Schematic Diagram



ZMY0130018-F

Figure 4-25: UHF (403–470 MHz) Transmitter Schematic Diagram

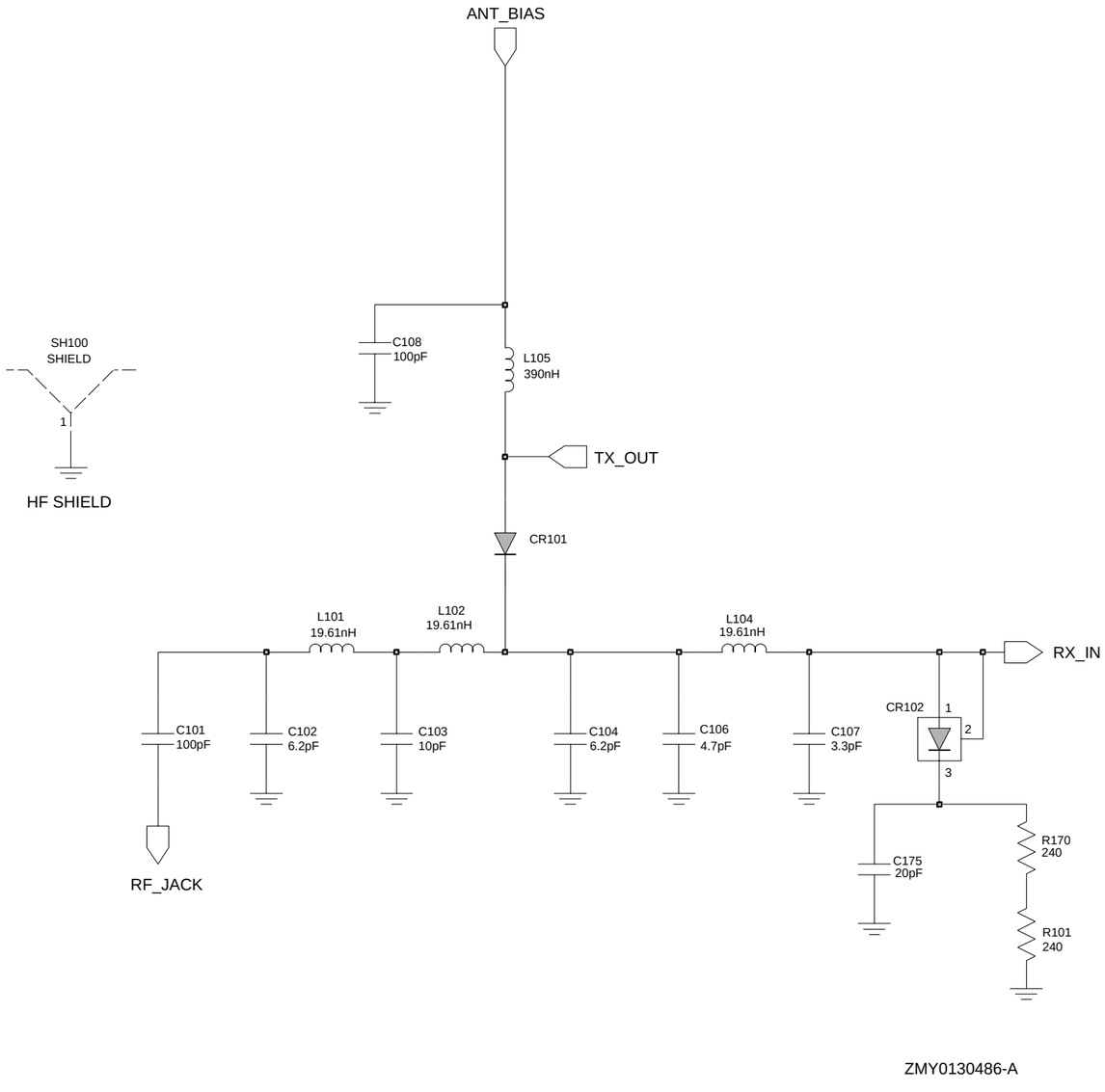


Figure 4-26: UHF (403–470 MHz) Harmonic Filter Schematic Diagram

UHF (403-470 MHz) Radio Parts List (PCB 8486458Z03 rev. C)

Circuit Ref	Motorola Part No.	Description
B501	0986237A02	Battery Contact Module
B503	NOT PLACED	
B504	NOT PLACED	
C101	2113740F51	100pF
C102	2113740F22	6.2pF
C103	2113740F27	10pF
C104	2113740F22	6.2pF
C105	2113743N50	100pF
C106	2113740F19	4.7pF
C107	2113740F15	3.3pF
C108	2113743N50	100pF
C109	2113740F51	100pF
C110	2113743N50	100pF
C111	2113740F31	15pF
C112	2180605Z32	47pF
C113	2180605Z16	10pF
C114	2113743N50	100pF
C115	2113743N35	24pF
C116	2113743N35	24pF
C117	2113743N34	22pF
C118	2113743N50	100pF
C119	2113743N50	100pF
C120	2113743N27	11pF
C121	2113743N50	100pF
C122	2113743N50	100pF
C123	2311049A96	33uF
C125	2113743N50	100pF
C126	2113743M24	100000pF
C127	2113743L17	1000pF
C128	2113743M08	22000pF
C129	2113743N23	7.5pF
C130	2113743N50	100pF
C131	2113743M08	22000pF
C132	2113743N50	100pF
C133	2113743L17	1000pF
C134	2113743L29	3300pF
C135	2113743M08	22000pF
C138	2113743N50	100pF
C140	0662057A67	5600
C141	NOT PLACED	
C150	2113743M08	22000pF
C151	2113743N50	100pF
C152	2113743M08	22000pF
C160	2113743N50	100pF
C161	2113743M24	100000pF
C165	2113743N50	100pF
C166	2113743N50	100pF
C169	2113743N20	5.6pF
C170	2113743N50	100pF
C171	2113743N50	100pF
C172	2113740F51	100pF
C173	2113743M08	22000pF
C174	2113743N50	100pF
C175	2113740F51	100pF
C201	2113743N50	100pF
C202	2113743L17	1000pF
C203	2113928L05	4.7uF
C204	2104993J02	2.2uF
C206	2113740F63	330pF
C207	2113743N42	47pF
C208	NOT PLACED	
C210	2113743N50	100pF
C211	2113743N50	100pF
C212	2113743N50	100pF
C213	2113743N50	100pF
C214	2113743N50	100pF
C217	2104993J02	2.2uF
C218	2113743M24	100000pF
C219	2113743K16	0.22uF
C220	2113743N50	100pF
C223	2113743M24	100000pF
C224	2113743M24	100000pF
C228	2311049J11	4.7uF
C229	2113743L17	1000pF
C230	2113743N50	100pF
C231	2113743M24	100000pF
C232	2113743E12	0.047uF
C233	2311049A01	0.1uF
C234	2311049A05	0.47uF
C235	2104993J02	2.2uF
C238	2113741F17	470pF
C241	2113743N50	100pF
C242	2113743N23	7.5pF
C243	2113743N23	7.5pF
C244	2113740F10	2.0pF
C245	2113743N11	2.4pF
C246	2113743N50	100pF
C247	2113743N50	100pF
C248	2113743M24	100000pF
C250	2113743N23	7.5pF
C251	2113743N50	100pF
C252	2113743N26	10pF
C253	2113740F09	1.8pF
C254	2113743N15	3.6pF
C255	2113743N50	100pF
C257	2113743N50	100pF
C258	2113743L41	10000pF
C259	2113743L41	10000pF
C260	2113743N50	100pF
C263	2113743N02	0.75pF
C264	2113743N50	100pF
C265	NOT PLACED	
C271	NOT PLACED	
C272	NOT PLACED	
C273	2113743M24	100000pF
C276	2104993J02	2.2uF
C277	2113743N50	100pF
C278	2311049A57	10uF
C279	2104993J02	2.2uF
C281	2113743N50	100pF
C285	2113743N50	100pF
C286	2113743M24	100000pF
C289	2113743N50	100pF
C291	2311049A69	10uF
C292	2113743M24	100000pF
C293	2113743A27	0.47uF
C294	2113743N50	100pF
C295	2113743N50	100pF
C296	2113743M24	100000pF
C297	2113743L41	10000pF
C298	2113743M24	100000pF
C301	2113743N15	3.6pF
C302	2113743N26	10pF
C303	2113740L08	3.9pF
C304	2113743N26	10pF
C305	2113743N33	20pF
C306	NOT PLACED	
C307	2113743N50	100pF
C308	2113743N50	100pF
C309	2113743N50	100pF
C310	2113743N50	100pF
C311	NOT PLACED	
C312	2113743N25	9.1pF
C313	2113743N26	10pF
C314	2113743M24	100000pF
C315	2113743N50	100pF
C316	2113740L08	3.9pF
C317	2113743N25	9.1pF
C318	2113743N23	7.5pF
C319	2113743N12	2.7pF
C320	2113743N31	16pF
C321	2113743N50	100pF
C322	2113743N48	82pF
C324	2113743N34	22pF
C325	2109445U26	9.1pF
C326	2113743M24	100000pF
C327	2113743M24	100000pF
C328	2113743M24	100000pF
C329	2113743M24	100000pF
C334	2113743L33	4700pF
C337	NOT PLACED	
C338	NOT PLACED	
C343	2113743M24	100000pF
C344	2113743E20	0.1uF
C345	2113743M24	100000pF
C346	2113743M24	100000pF
C347	2113743M24	100000pF
C348	2113743M24	100000pF
C349	2113743E20	0.1uF
C350	2113743M24	100000pF
C351	2113743N52	120pF
C352	2113743M24	100000pF
C355	2113743M24	100000pF
C357	2113743M24	100000pF
C358	NOT PLACED	
C359	NOT PLACED	
C360	2113743N14	3.3pF
C361	2113743M24	100000pF
C362	2113743M24	100000pF
C364	2113743N35	24pF
C366	NOT PLACED	
C367	2113743N37	30pF
C370	2113743N18	4.7pF
C371	NOT PLACED	
C372	2113743N50	100pF
C373	NOT PLACED	
C374	2113743N50	100pF
C375	2113743N50	100pF
C378	NOT PLACED	
C380	2113743L41	10000pF
C381	NOT PLACED	
C382	2311049A59	10uF
C383	NOT PLACED	
C385	2113743N37	30pF
C386	2113743N50	100pF
C390	NOT PLACED	
C400	2113743L41	10000pF
C401	2113743M24	100000pF
C402	2113743M24	100000pF
C403	2113743G24	2.2uF
C404	NOT PLACED	
C405	2113743N50	100pF
C406	NOT PLACED	
C407	2113928N01	0.1uF
C408	2113743N50	100pF
C409	2113743M24	100000pF
C410	2113928N01	0.1uF
C411	2113743M24	100000pF
C414	2113743M24	100000pF
C415	2185895Z01	0.01uF
C416	2113928N01	0.1uF
C419	NOT PLACED	
C420	2113743L41	10000pF
C421	2113928N01	0.1uF
C422	2113743M24	100000pF
C423	2113743N50	100pF
C424	2311049A59	10uF
C425	2113743M24	100000pF
C426	2113743N50	100pF
C427	2113743N50	100pF
C428	2113743M24	100000pF
C429	2113743M24	100000pF
C430	2113928N01	0.1uF
C431	2113743N50	100pF
C432	NOT PLACED	
C433	2113743L41	10000pF
C434	NOT PLACED	
C435	2113743M24	100000pF
C436	NOT PLACED	
C437	NOT PLACED	
C440	2113743G26	4.7uF
C441	2113743N50	100pF

Circuit Ref	Motorola Part No.	Description
C442	2113743E20	0.1uF
C443	2113928N01	0.1uF
C444	2113743N50	100pF
C445	2113743N50	100pF
C447	2113743M08	22000pF
C448	2113928N01	0.1uF
C449	2113743N50	100pF
C450	NOT PLACED	
C451	2113743M08	22000pF
C452	2113743B29	1uF
C453	2113743N50	100pF
C456	2113743N50	100pF
C458	2113743N50	100pF
C459	2113743N50	100pF
C463	2113743N50	100pF
C466	2113743N50	100pF
C467	2113928N01	0.1uF
C471	2113743N50	100pF
C472	2113743L09	470pF
C473	2113743L09	470pF
C475	2113743H14	10uF
C476	2113928D08	10uF
C479	2113928N01	0.1uF
C480	2113928D08	10uF
C481	2113928N01	0.1uF
C482	2113928N01	0.1uF
C490	2113743N50	100pF
C491	2113743N50	100pF
C492	2113743N50	100pF
C493	2113743N50	100pF
C494	2113743N50	100pF
C495	2113743N50	100pF
C496	2113743N50	100pF
C497	2113743N50	100pF
C498	NOT PLACED	
C502	2311049A05	0.47uF
C503	2113743N50	100pF
C505	2113743N50	100pF
C511	2113743N50	100pF
C512	2113743N50	100pF
C513	2113743N50	100pF
C514	2113743N50	100pF
C520	2113743L41	10000pF
C521	2113743L41	10000pF
C522	2113743L41	10000pF
C523	2113743L41	10000pF
C524	2113743N50	100pF
C525	2113743N50	100pF
C526	2113743N50	100pF
C527	2113743N50	100pF
C528	2113743N50	100pF
C529	2113743N50	100pF
CR101	4880973Z02	Pin Diode
CR102	4802245J41	Pin Diode
CR103	4802245J41	Pin Diode
CR105	5185963A15	Temperature Sensor

Circuit Ref	Motorola Part No.	Description
CR160	NOT PLACED	
CR201	4802233J09	Triple Diode
CR203	4862824C03	Varactor
CR241	4805649Q13	Varactor
CR242	4862824C08	Varactor
CR243	4862824C08	Varactor
CR251	4802245J22	Varactor
CR301	4862824C08	Varactor
CR302	4862824C08	Varactor
CR303	4880154K03	Dual Schottky Diode
CR304	4862824C08	Varactor
CR305	4862824C08	Varactor
CR306	4802245J42	Ring Quad Diode
CR311	4813825A19	Diode Schottky
CR312	4802245J97	Switch Diode
CR313	4802245J97	Switch Diode
CR411	4802245J62	Diode Schottky
CR412	4802245J62	Diode Schottky
CR413	4802245J62	Diode Schottky
CR440	4813833C02	Dual Common Cathode Diode
CR501	4880107R01	Rectifier
CR503	4805729G49	Red/Yellow LED
E101	2484657R01	FERRITE BEAD
E400	2480640Z01	FERRITE BEAD
E401	2480640Z01	FERRITE BEAD
E402	2480640Z01	FERRITE BEAD
E403	2480640Z01	FERRITE BEAD
E404	2480640Z01	FERRITE BEAD
E405	2480640Z01	FERRITE BEAD
E406	2480640Z01	FERRITE BEAD
E407	2480640Z01	FERRITE BEAD
E408	2480640Z01	FERRITE BEAD
E409	2480640Z01	FERRITE BEAD
F501	6580542Z01	Fuse 3A
FL201	4805875Z04	16.8 MHZ Xtal Filter
FL301	9180022M11	Xtal Filter 44.85MHz
FL302	9180468V05	455kHz 4-pole ceramic filter
FL303	9180469V05	455kHz 6-pole ceramic filter
FL304	9180469V03	455kHz 6-pole ceramic filter
FL401	NOT PLACED	
H101	2680499Z01	Heat Spreader
J101	0985613Z01	RF Jack
J102	0280519Z02	Antenna Nut
J400	0905505Y04	40-Pin Connector
J403	0905505Y02	20-Pin Connector
L101	2479990B02	19.61nH
L102	2479990B02	19.61nH
L104	2479990B02	19.61nH
L105	2462587N22	390nH
L106	2479990A02	7.66nH
L107	2479990G01	33.47nH
L108	2479990A01	4.22nH
L109	2479990B01	11.03nH
L112	2462587N45	22nH
L113	2413926H09	5.6nH
L114	2462587N45	22nH

Circuit Ref	Motorola Part No.	Description
L115	2462587N22	390nH
L116	2479990A03	9.75nH
L160	2413926H14	15nH
L201	2462587Q20	2200nH
L202	2462587Q20	2200nH
L203	2462587Q20	2200nH
L232	2462587P25	12000nH
L241	2462587V41	390nH
L242	2462587V38	220nH
L243	2485776Z01	Multi-layered Teflon resonator, Rx
L251	2462587V28	33nH
L253	2460593C02	Multi-layered Teflon resonator, Tx
L261	2462587V29	39nH
L271	2462587V32	68nH
L273	2462587V28	33nH
L281	2462587V41	390nH
L282	2462587V41	390nH
L301	2479990C01	13.9nH
L302	2479990C01	13.9nH
L303	2462587V26	22nH
L304	2462587V37	180nH
L305	2462587V26	22nH
L306	2479990C01	13.9nH
L307	2479990C01	13.9nH
L309	2479990C02	16.28nH
L310	2462587V36	150nH
L311	2413926K32	560nH
L321	2462587V37	180nH
L325	2462587N68	1000nH
L330	0662057C01	0
L331	2413926K33	680nH
L332	2413923A25	1200nH
L400	2462587Q42	390nH
L401	2462587Q42	390nH
L410	2462587Q42	390nH
L411	2462587Q42	390nH
L505	2462587Q42	390nH
P100	3905643V01	Ground Contact Finger
PB501	4086470Z01	Tactile Switch
PB502	4086470Z01	Tactile Switch
PB503	4086470Z01	Tactile Switch
PB504	4086470Z01	Tactile Switch
PB505	4086470Z01	Tactile Switch
Q110	4813828A09	RF PA
Q111	4809939C05	DUAL NPN/PNP Transistor
Q210	4809939C05	DUAL NPN/PNP Transistor
Q241	4805218N63	RF NPN Transistor
Q260	4809939C05	DUAL NPN/PNP Transistor
Q261	4809939C05	DUAL NPN/PNP Transistor
Q301	4802245J44	NPN Transistor
Q302	4802197J95	NPN Transistor
Q310	4802245J44	NPN Transistor
Q320	4813824A10	RF NPN transistor
Q400	4809579E18	MOSFET P-Channel
Q403	4813824A17	PNP Transistor
Q405	4802245J54	Dual NPN Transistor

Circuit Ref	Motorola Part No.	Description
Q410	4802245J54	Dual NPN Transistor
Q416	NOT PLACED	
Q417	4809939C05	DUAL NPN/PNP Transistor
Q502	5180159R01	Dual NPN Transistor
Q505	4880214G02	NPN Transistor
R101	0662057A34	240
R102	0680539Z01	0.1
R103	0662057M41	43
R104	0662057N15	47K
R106	0662057M26	10
R107	NOT PLACED	
R108	0662057M92	5600
R109	0662057N30	200K
R110	0662057M61	300
R111	0662057M33	20
R112	0662057M61	300
R120	0662057N14	43K
R130	0662057M98	10K
R131	0662057N05	18K
R132	0662057N33	270K
R133	NOT PLACED	
R136	NOT PLACED	
R161	0662057M57	200
R170	0662057A34	240
R171	0662057N14	43K
R172	0662057A32	200
R173	0662057N29	180K
R174	0662057N15	47K
R175	0662057B59	3
R176	0662057B59	3
R201	0662057N21	82K
R202	0662057N23	100K
R204	0662057N15	47K
R231	0662057M52	120
R232	0662057M69	620
R233	0662057M68	560
R241	0662057M32	18
R242	0662057M57	200
R243	0662057M98	10K
R244	0662057N01	12K
R245	0662057M59	240
R248	0662057M37	30
R251	0662057M32	18
R252	0662057M62	330
R253	0662057M95	7500
R254	0662057M95	7500
R255	0662057M89	4300
R256	0662057M37	30
R260	0662057M74	1000
R281	NOT PLACED	
R301	0662057N23	100K
R302	0662057N23	100K
R303	0662057M81	2000
R304	0662057N01	12K
R305	0662057M67	510
R306	0662057N23	100K

Circuit Ref	Motorola Part No.	Description
R307	0662057N23	100K
R308	0662057M43	51
R309	0662057M01	0
R310	NOT PLACED	
R311	0662057N11	33K
R312	0662057M90	4700
R313	0662057M62	330
R314	0662057M79	1600
R315	0662057N01	12K
R320	NOT PLACED	
R321	0662057N13	39K
R322	0662057M74	1000
R324	0662057N06	20K
R328	0662057M01	0
R329	0662057M01	0
R330	0662057M98	10K
R331	0662057M57	200
R332	0662057N01	12K
R333	NOT PLACED	
R339	0662057M89	4300
R340	0662057M95	7500
R342	0662057N23	100K
R344	0662057M43	51
R345	0662057N13	39K
R346	0662057N03	15K
R348	0662057M87	3600
R349	0662057C01	0
R350	0662057M86	3300
R355	0662057N23	100K
R358	0662057M83	2400
R359	NOT PLACED	
R360	0662057N06	20K
R361	0662057N06	20K
R363	0662057M64	390
R364	0662057M80	1800
R365	0662057M76	1200
R366	0662057N01	12K
R367	0662057V04	12K
R368	0662057V02	10K
R369	0662057M70	680
R370	0662057M01	0
R371	NOT PLACED	
R372	NOT PLACED	
R373	NOT PLACED	
R374	NOT PLACED	
R375	NOT PLACED	
R376	NOT PLACED	
R377	NOT PLACED	
R378	NOT PLACED	
R400	0662057N15	47K
R401	0662057M01	0
R402	NOT PLACED	
R403	NOT PLACED	
R405	0662057M01	0
R406	0662057N20	75K
R407	0662057N19	68K

Circuit Ref	Motorola Part No.	Description
R408	NOT PLACED	
R409	0662057M98	10K
R410	0662057N23	100K
R411	0662057M98	10K
R413	0662057M01	0
R414	0662057V34	180K
R415	0662057V26	91K
R416	0662057M98	10K
R418	0662057M01	0
R419	0662057M67	510
R420	NOT PLACED	
R421	0662057M81	2000
R423	0662057N39	470K
R424	0662057N12	36K
R425	0662057N10	30K
R426	NOT PLACED	
R427	0662057M84	2700
R428	0662057M10	2.2
R429	0662057N20	75K
R431	0662057N39	470K
R432	0662057N16	51K
R434	0662057M62	330
R435	0662057M81	2000
R436	0662057M01	0
R437	NOT PLACED	
R445	0662057N08	24K
R447	0662057N23	100K
R448	0662057M98	10K
R449	0662057N08	24K
R450	0683962T45	68
R451	0662057N03	15K
R452	0662057N23	100K
R453	NOT PLACED	
R454	NOT PLACED	
R455	NOT PLACED	
R456	0662057M01	0
R457	0662057M98	10K
R460	0662057M90	4700
R461	NOT PLACED	
R462	NOT PLACED	
R463	0662057M61	300
R471	0662057N06	20K
R472	0662057N12	36K
R473	0662057M26	10
R475	0662057M01	0
R476	0662057N35	330K
R477	0662057M74	1000
R478	0662057M98	10K
R481	0662057N08	24K
R492	0662057M01	0
R498	0662057M98	10K
R499	0662057M98	10K
R501	0662057M70	680
R502	0662057M56	180
R505	0662057M98	10K
R506	0662057N15	47K

Circuit Ref	Motorola Part No.	Description
R507	0662057M01	0
RT400	0680590Z01	Thermistor_33K
S501	4080710Z01	Frequency Switch
S502	1880619Z02	Volume / On-off Switch
SH100	2680507Z01	Harmonic Filter Shield
SH101	2680510Z01	PA Shield
SH201	2680511Z01	Synthesizer Top Shield
SH202	2680511Z01	Synthesizer Bottom Shield
SH241	2680513Z01	VCO Resonators Shield
SH242	2680514Z01	VCO Buffer IC Shield
SH301	2686583Z01	Receiver Front-End Shield
SH302	2680555Z01	Receiver Back-End Bottom Shield
SH303	2680509Z01	Mixer Shield
SH304	2680624Z01	Mixer Diode Shield
SH322	2686528Z01	IFIC Shield
SH323	2686527Z01	Crystal Filter Shield
SH400	2680505Z01	Controller Memory Shield
SH401	2680506Z01	Controller On-off Shield
SH402	2680515Z01	Microprocessor Shield
SH403	2680516Z01	Asfic_Cmp, Audio PA Shield
T301	2580541Z02	Balun Transformer
T302	2580541Z02	Balun Transformer
U101	5185130C65	LDMOS PA Driver
U102	5185765B26	PCIC
U201	5185963A27	LVFRACN Synthesizer IC
U210	5102463J61	Inverter
U211	5102463J61	Inverter
U241	5105750U54	VCO Buffer IC
U247	5105739X05	5V Regulator
U248	5102463J58	3.3V Regulator
U301	5186144B01	FM IFIC SA616
U302	5109522E10	LMOS Inverter
U303	NOT PLACED	
U400	5102463J40	3.3V Regulator
U404	5185130C53	ASFIC_CMP IC
U405	5102463J36	Static RAM 32K X 8
U406	5102463J60	Flash ROM 512K X 8
U407	5102495J05	EEPROM 16K X 8
U409	5102226J56	Micro Processor
U410	NOT PLACED	
U420	5102463J44	Audio PA
VR432	4805656W08	5.6V Zener
VR433	4805656W08	5.6V Zener
VR434	4802245J73	Zener Diode 6.8V
VR439	4880140L17	Zener Diode 12V
VR440	4802245J73	Zener Diode 6.8V
VR441	4802245J73	Zener Diode 6.8V
VR442	4802245J73	Zener Diode 6.8V
VR443	4802245J73	Zener Diode 6.8V
VR444	4802245J73	Zener Diode 6.8V
VR445	4802245J74	Zener Diode 10V
VR446	4802245J74	Zener Diode 10V
VR447	4802245J74	Zener Diode 10V
VR448	4802245J74	Zener Diode 10V
VR449	4802245J74	Zener Diode 10V
VR450	4802245J75	Zener Diode 12V

Circuit Ref	Motorola Part No.	Description
VR460	4802245J73	Zener Diode 6.8V
VR501	4813830A18	Diode 6.8V
VR506	4802245J73	Zener Diode 6.8V
Y300	4802245J84	Xtal Oscillator 44.395MHz
Y301	9186145B02	455kHz Ceramic Discriminator
	1485777Z01	Insulator (KAPTON)
	8486458Z03	UHF B1 PC Board

* Motorola Depot Servicing only

4.6 UHF Band 1: Circuit Board/Schematic Diagrams and Parts List (PCB 8415234H09)

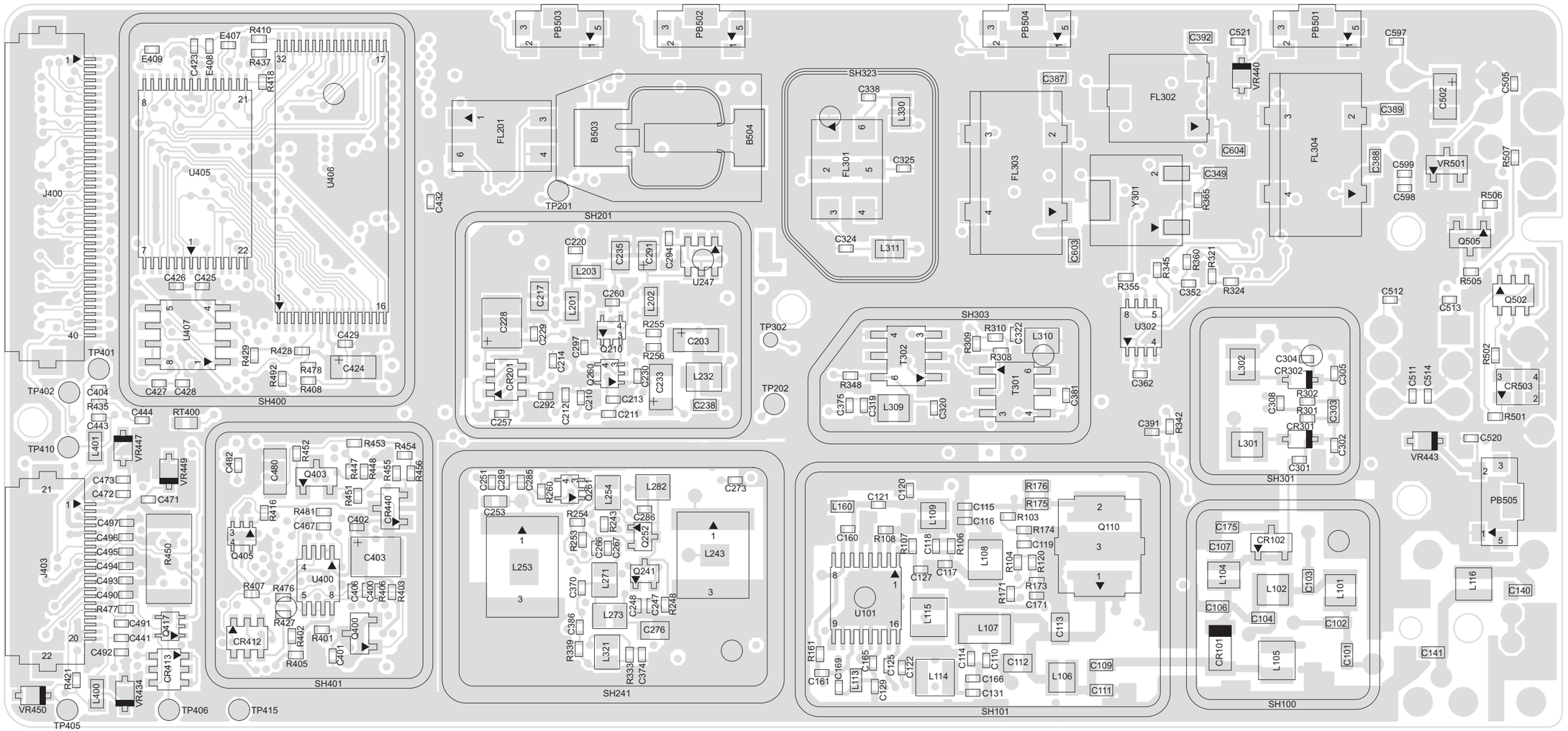


Figure 4-27: UHF (403–470 MHz) Main Board Top Side: PCB No. 8415234H09

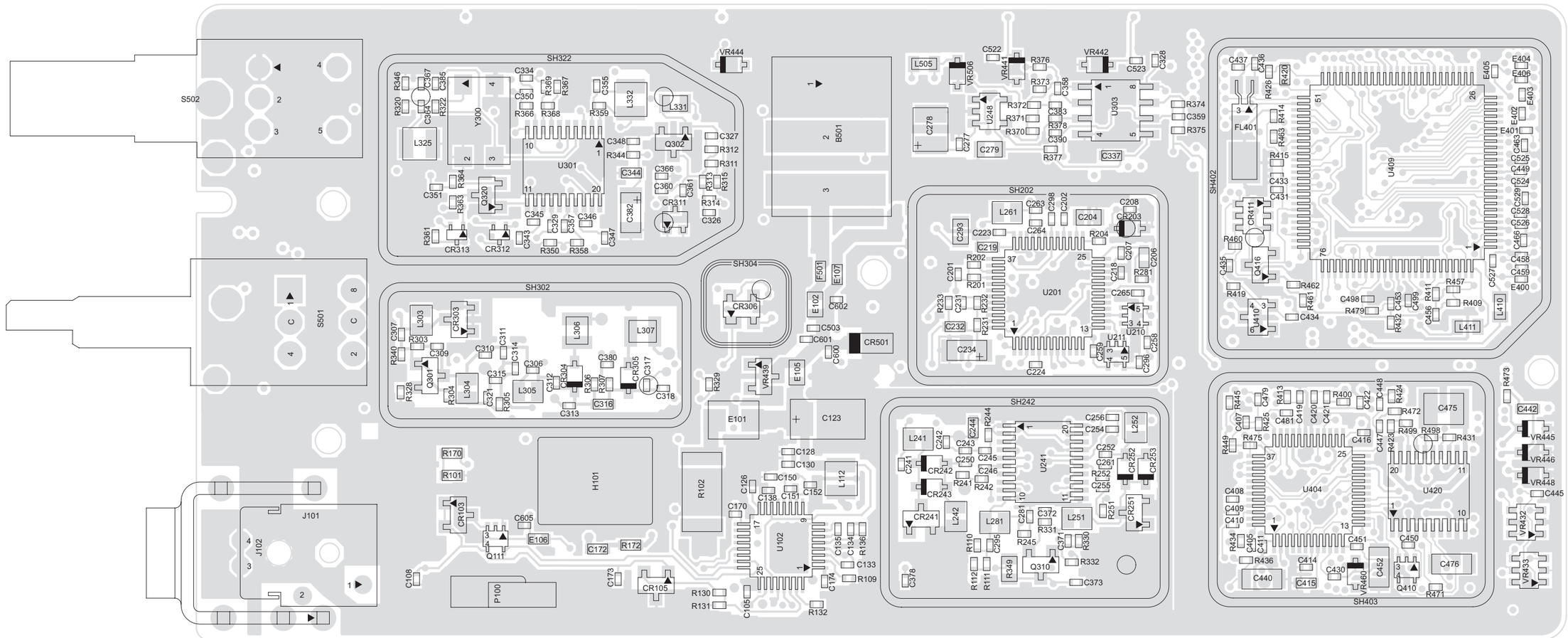


Figure 4-28: UHF (403–470 MHz) Main Board Bottom Side: PCB No. 8415234H09

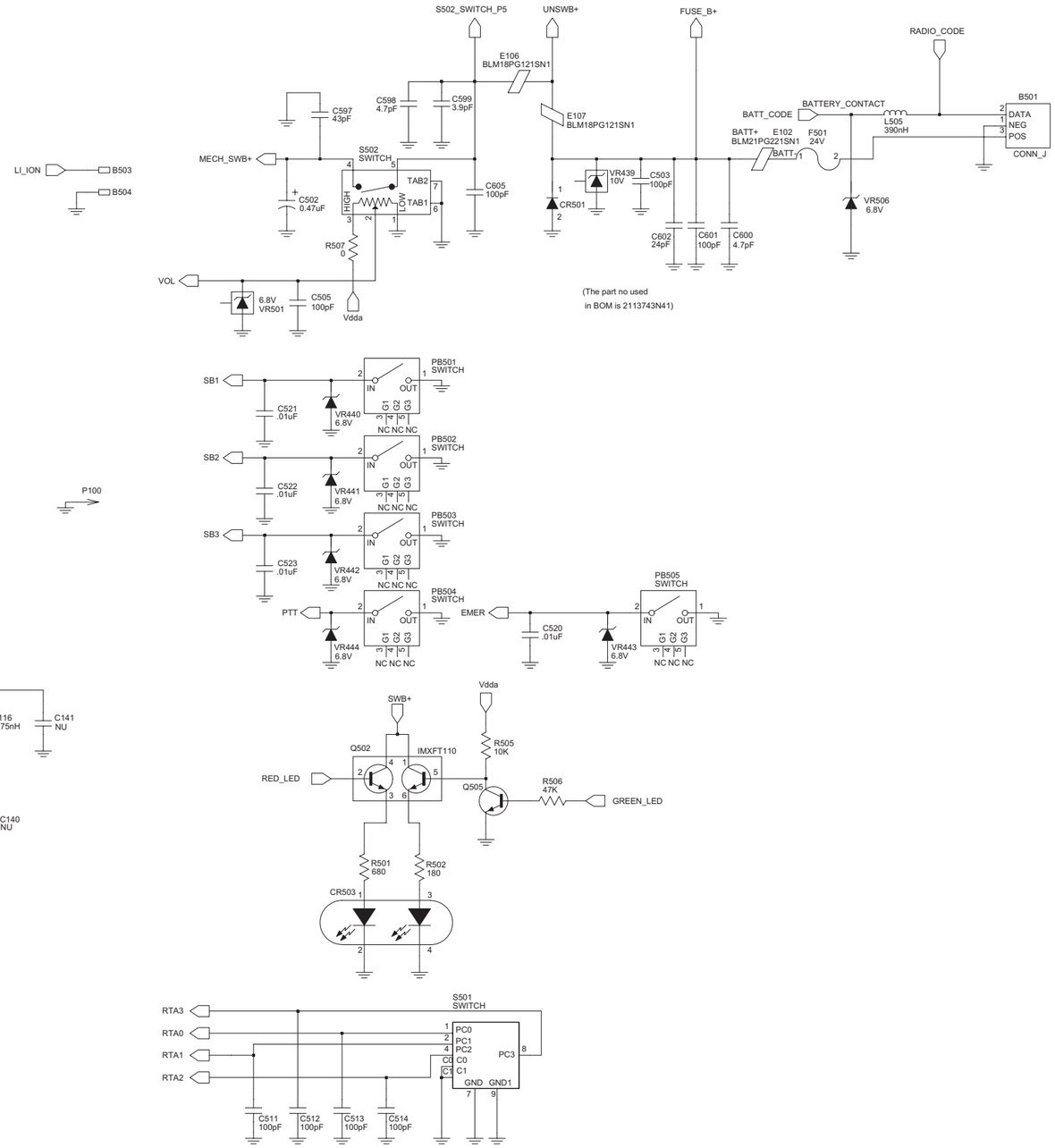


Figure 4-29: UHF Controls And Switches Schematic Diagram: PCB No. 8415234H09

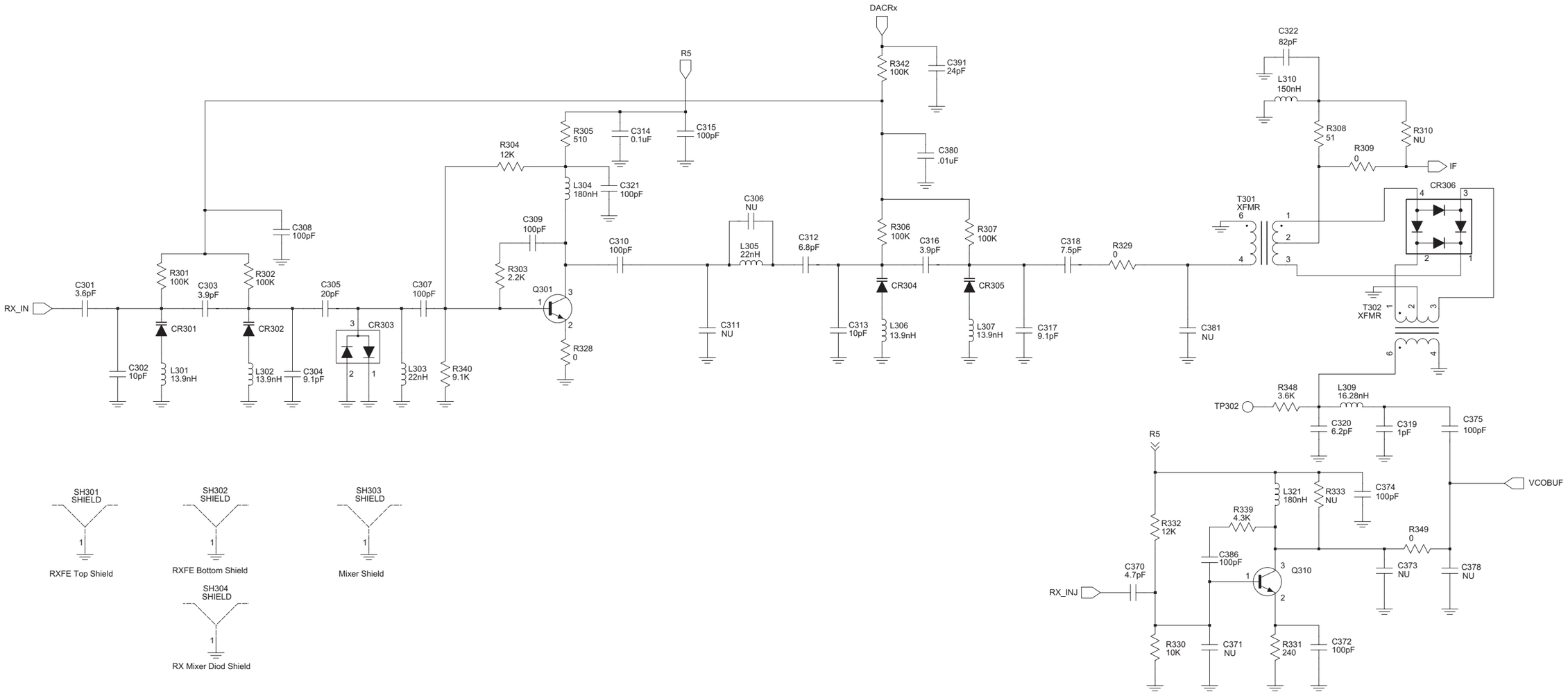


Figure 4-30: UHF Receiver Front End Schematic Diagram: PCB No. 8415234H09

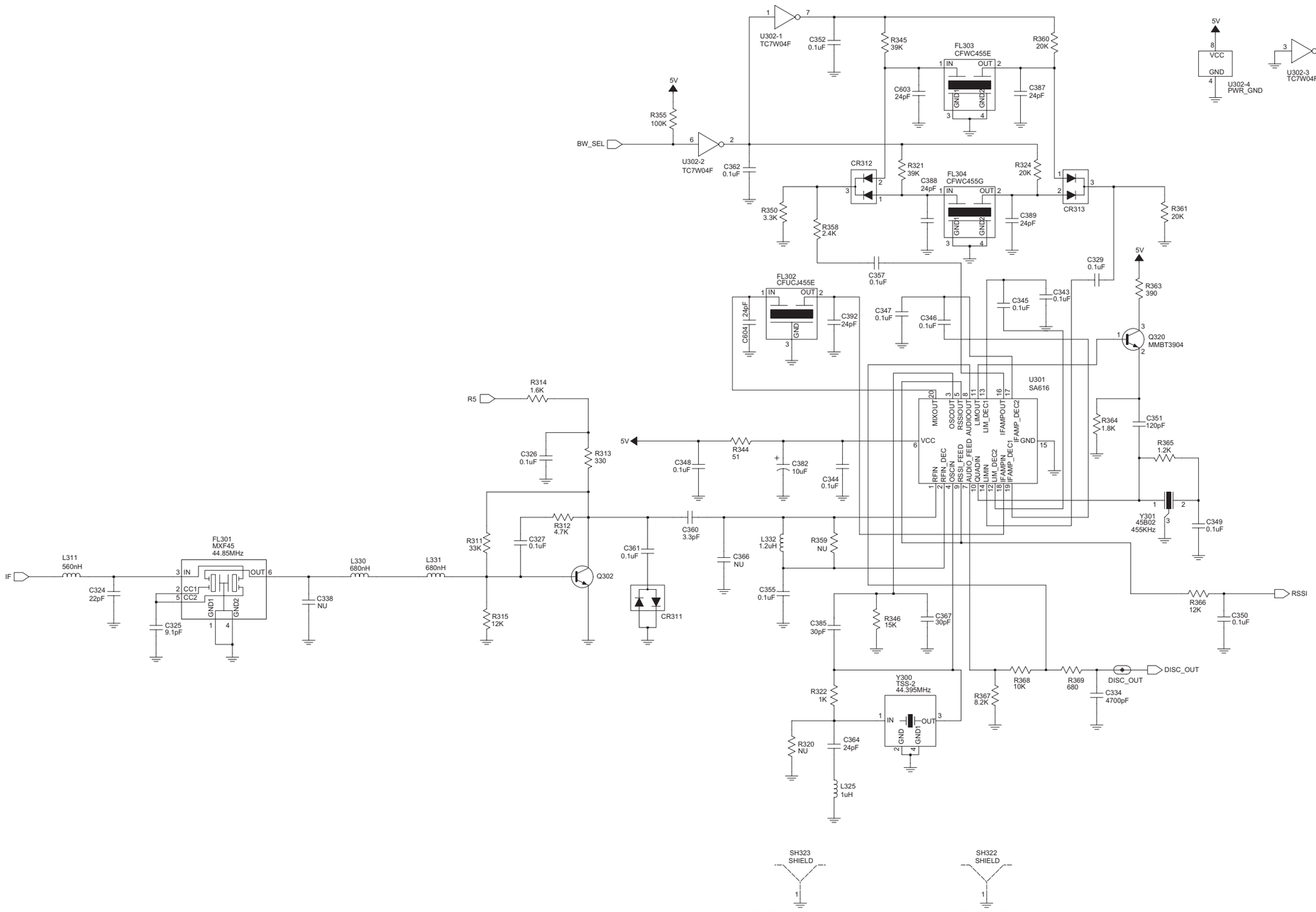


Figure 4-31: UHF Receiver Back End Schematic Diagram: PCB No. 8415234H09

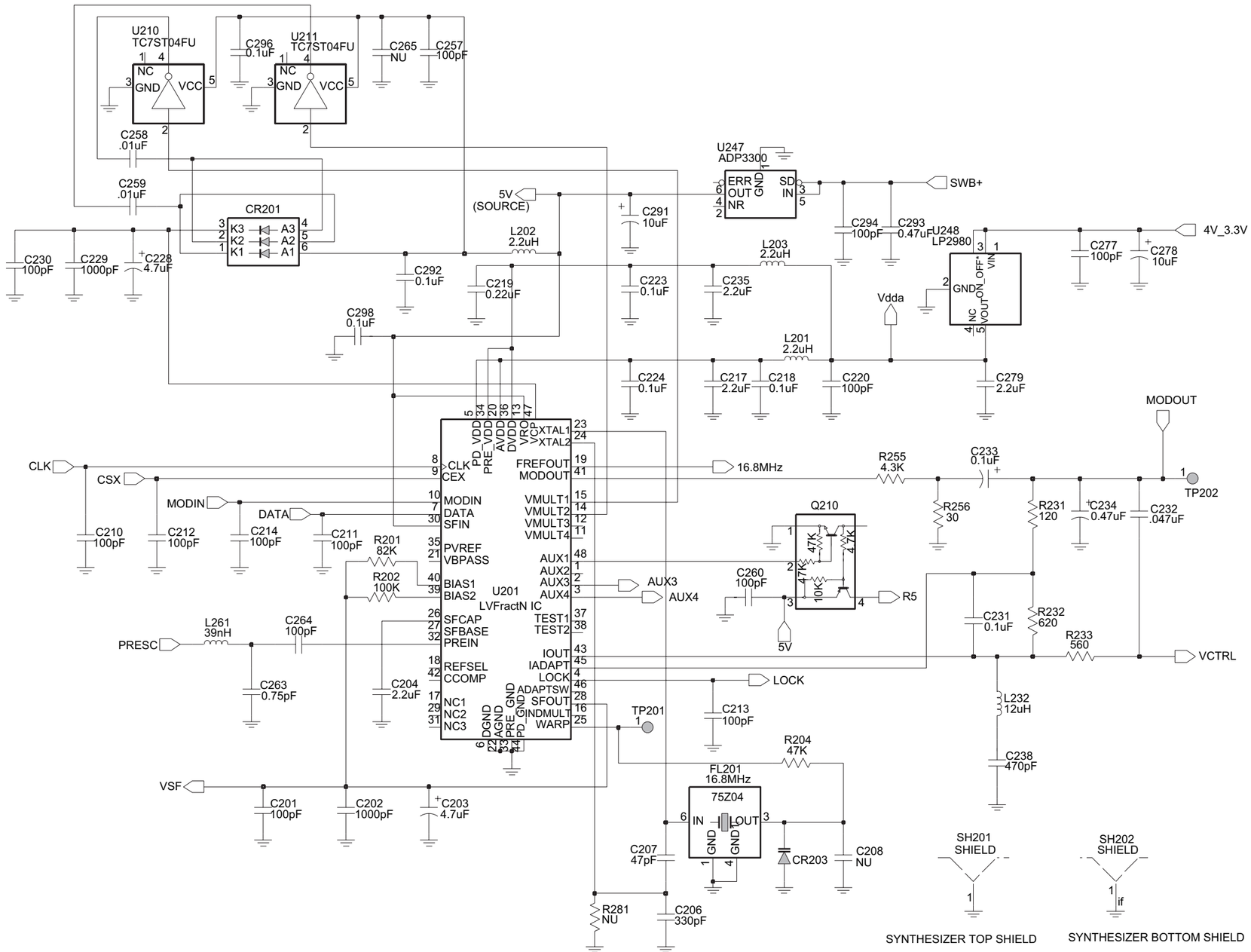


Figure 4-32: UHF Synthesizer Schematic Diagram: PCB No. 8415234H09

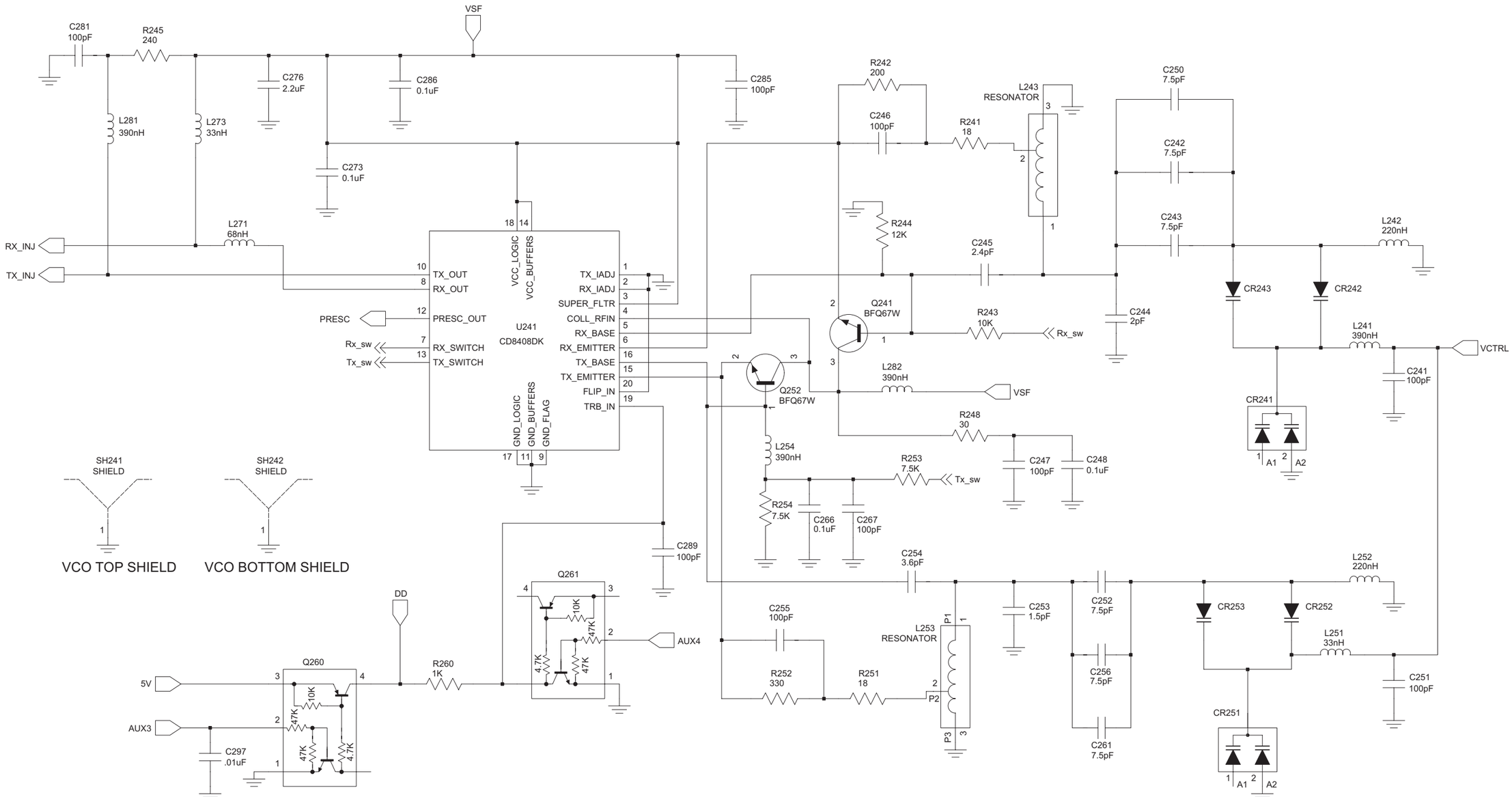


Figure 4-33: UHF Voltage Controlled Oscillator Schematic Diagram: PCB No. 8415234H09

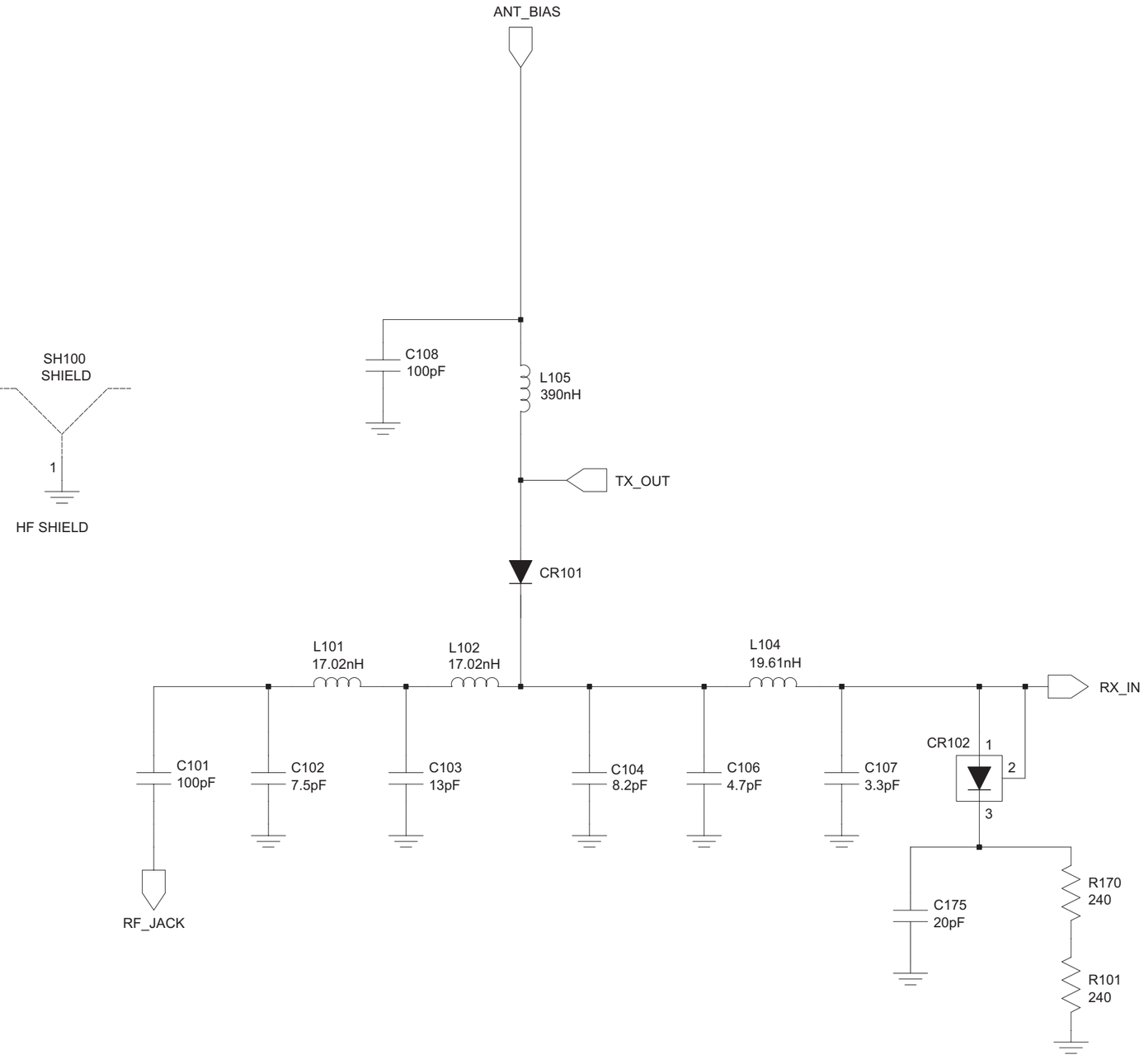


Figure 4-34: UHF Harmonic Filter Schematic Diagram: PCB No. 8415234H09

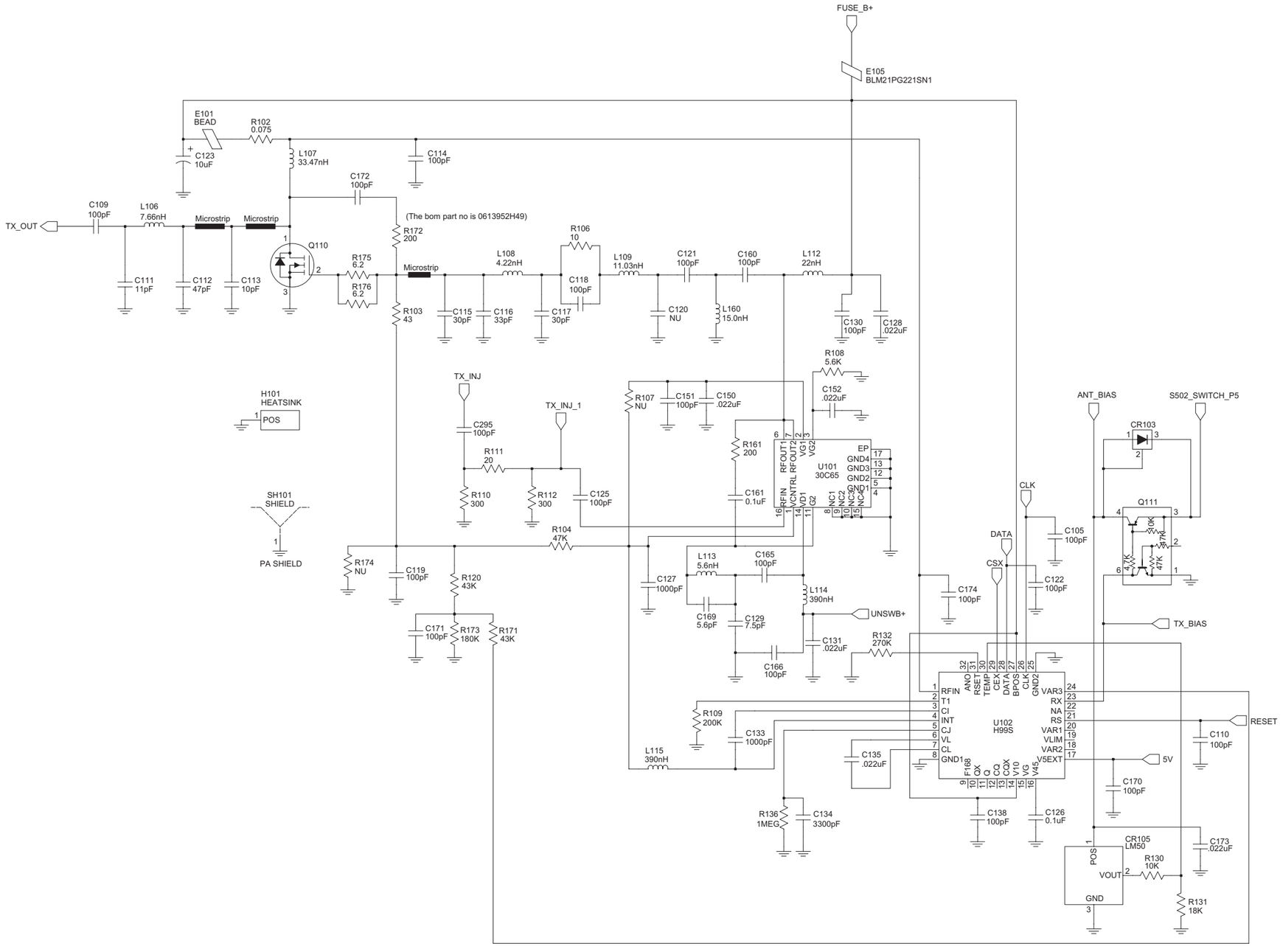


Figure 4-35: UHF Transmitter Schematic Diagram: PCB No. 8415234H09

UHF (403–470 MHz) Radio Parts List (PCB 8415234H09)

Circuit Ref	Motorola Part No.	Description
B501	0986237A02	CONNECTOR (CONTACT BATTERY)
B503	3980502Z01	CONTACT, BACKUP B+
B504	3980501Z01	CONTACT, BACKUP B-
C101	2113944C45	CAP CER CHP 100.0PF 50V 5%
C102	2113944M16	CAP,FXD,8.2PF,.1PF+/-,50V-DC, 0603,C0G,-55DEG CMIN, 125DEG CMAX
C103	2113944M21	CAP,FXD,13PF,+2%,-2%, 50V-DC,0603,C0G,-55DEG CMIN,125DEG CMAX,PB
C104	2113944M15	CAP,FXD,7.5PF,.1PF+/-,50V-DC, 0603,C0G,-55DEG CMIN, 125DEG CMAX
C105	2113944A40	CAP CER CHP 100.0PF 50V 5%
C106	2113944C22	CAP CER CHP 4.7PF 50V +/- 0.25PF
C107	2113944C18	CAP CER CHP 3.3PF 50V +/- 0.25PF
C108	2113944A40	CAP CER CHP 100.0PF 50V 5%
C109	2113944C45	CAP CER CHP 100.0PF 50V 5%
C110	2113944A40	CAP CER CHP 100.0PF 50V 5%
C111	2113944C32	CAP CER CHP 15.0PF 50V 5%
C112	2115937H04	HIGH Q CHIP CAPACITOR, 47PF
C113	2115937H01	HIGH Q CHIP CAPACITOR, 10PF
C114	2113944A40	CAP CER CHP 100.0PF 50V 5%
C115	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,0402,C0G,-55DEG CMIN, 125DEG CMAX,PB
C116	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,0402,C0G,-55DEG CMIN, 125DEG CMAX,PB
C117	2113944A29	CAP CER CHP 22.0PF 50V 5%
C118	2113944A40	CAP CER CHP 100.0PF 50V 5%
C119	2113944A40	CAP CER CHP 100.0PF 50V 5%
C120	2113944A77	CAP,FXD,11PF,+5%,-5%,50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX,PB
C121	2113944A40	CAP CER CHP 100.0PF 50V 5%
C122	2113944A40	CAP CER CHP 100.0PF 50V 5%
C123	2313960F04	CAP,FXD,33UF,+10%,-10%, 16V-DC,SM,-55DEG CMIN, 125DEG CMAX,303MA
C125	2113944A40	CAP CER CHP 100.0PF 50V 5%
C126	2113946K02	CAP CER CHP 0.10UF 16V
C127	2113945A09	CAP CER CHP 1000PF 50V 10%
C128	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-DC,0402,X7R,-55DEG CMIN,125DEG CMA
C129	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5PF
C130	2113944A40	CAP CER CHP 100.0PF 50V 5%
C131	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-DC,0402,X7R,-55DEG CMIN,125DEG CMA
C133	2113945A09	CAP CER CHP 1000PF 50V 10%
C134	2113945A12	CAP CER CHP 3300PF 50V 10%
C135	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-DC,0402,X7R,-55DEG CMIN,125DEG CMA
C138	2113944A40	CAP CER CHP 100.0PF 50V 5%
C140	0613952H91	CER CHIP RES 5600 OHM 5 0603
C141	NOTPLACED	–
C150	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-DC,0402,X7R,-55DEG CMIN,125DEG CMA
C151	2113944A40	CAP CER CHP 100.0PF 50V 5%
C152	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-DC,0402,X7R,-55DEG CMIN,125DEG CMA
C160	2113944A40	CAP CER CHP 100.0PF 50V 5%
C161	2113946K02	CAP CER CHP 0.10UF 16V
C165	2113944A40	CAP CER CHP 100.0PF 50V 5%
C166	2113944A40	CAP CER CHP 100.0PF 50V 5%
C169	2113944A19	CAP CER CHP 5.6PF 50V +/- 0.5PF
C170	2113944A40	CAP CER CHP 100.0PF 50V 5%
C171	2113944A40	CAP CER CHP 100.0PF 50V 5%
C172	2113944C45	CAP CER CHP 100.0PF 50V 5%
C173	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-DC,0402,X7R,-55DEG CMIN,125DEG CMA
C174	2113944A40	CAP CER CHP 100.0PF 50V 5%
C175	2113944C45	CAP CER CHP 100.0PF 50V 5%
C201	2113944A40	CAP CER CHP 100.0PF 50V 5%
C202	2113945A09	CAP CER CHP 1000PF 50V 10%
C203	2113946H01	CAP CER CHP 4.7UF 10V 10%
C204	2113946N03	CAP CER CHP 2.2UF 16V
C206	2113944C04	CAP CER CHP 330.0PF 50V 5%
C207	2113944A33	CAP CER CHP 47.0PF 50V 5%
C208	NOTPLACED	-
C210	2113944A40	CAP CER CHP 100.0PF 50V 5%
C211	2113944A40	CAP CER CHP 100.0PF 50V 5%
C212	2113944A40	CAP CER CHP 100.0PF 50V 5%
C213	2113944A40	CAP CER CHP 100.0PF 50V 5%
C214	2113944A40	CAP CER CHP 100.0PF 50V 5%
C217	2113946N03	CAP CER CHP 2.2UF 16V
C218	2113946K02	CAP CER CHP 0.10UF 16V
C219	2113946L03	CAP CER CHP 0.22UF 16V
C220	2113944A40	CAP CER CHP 100.0PF 50V 5%
C223	2113946K02	CAP CER CHP 0.10UF 16V
C224	2113946K02	CAP CER CHP 0.10UF 16V
C228	2313960D05	CAP,FXD,4.7UF,+10%,-10%,16V-DC,SM,-55DEG CMIN,125DEG CMAX,156MA
C229	2113945A09	CAP CER CHP 1000PF 50V 10%
C230	2113944A40	CAP CER CHP 100.0PF 50V 5%
C231	2113946K02	CAP CER CHP 0.10UF 16V
C232	2113945D02	CAP CER CHP 47,000PF 25V 10%
C233	2313960A26	CAP,FXD,.1UF,+10%,-10%,35V-DC,SM,-55DEG CMIN,125DEG CMAX,61MA,E
C234	2313960A55	CAP,FXD,.47UF,+10%,-10%,25V-DC,SM,-55DEG CMIN,125DEG CMAX,73MA
C235	2113946N03	CAP CER CHP 2.2UF 16V
C238	2113945L17	CAP,FXD,470PF,+5%,-5%,50V-DC,0603,X7R,-55DEG CMIN, 125DEG CMAX,P
C241	2113944A40	CAP CER CHP 100.0PF 50V 5%
C242	2113944A19	CAP CER CHP 5.6PF 50V +/- 0.5PF
C243	2113944A21	CAP CER CHP 6.8PF 50V +/- 0.5PF
C244	2113944C12	CAP CER CHP 1.8PF 50V +/- 0.25PF
C245	2113944A10	CAP CER CHP 2.4PF 50V +/- 0.25PF
C246	2113944A40	CAP CER CHP 100.0PF 50V 5%
C247	2113944A40	CAP CER CHP 100.0PF 50V 5%
C248	2113946K02	CAP CER CHP 0.10UF 16V
C250	2113944A21	CAP CER CHP 6.8PF 50V +/- 0.5PF
C251	2113944A40	CAP CER CHP 100.0PF 50V 5%
C252	2113944A12	CAP CER CHP 3.0PF 50V +/- 0.25PF
C253	2113944C63	CAP,FXD,1PF,.1PF+/-,50V-DC, 0603,C0G,-55DEG CMIN, 125DEG CMAX,PB
C254	2113944A10	CAP CER CHP 2.4PF 50V +/- 0.25PF
C255	2113944A40	CAP CER CHP 100.0PF 50V 5%
C256	2113944A12	CAP CER CHP 3.0PF 50V +/- 0.25PF
C257	2113944A40	CAP CER CHP 100.0PF 50V 5%
C258	2113945B02	CAP CER CHP 10,000PF 25V 10%
C259	2113945B02	CAP CER CHP 10,000PF 25V 10%
C260	2113944A40	CAP CER CHP 100.0PF 50V 5%
C261	2113944A13	CAP CER CHP 3.3PF 50V +/- 0.25PF
C263	2113944A62	CAP,FXD,.75PF,.25PF+/-, 50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX
C264	2113944A40	CAP CER CHP 100.0PF 50V 5%
C265	NOTPLACED	–
C266	2113946K02	CAP CER CHP 0.10UF 16V
C267	2113944A40	CAP CER CHP 100.0PF 50V 5%
C271	NOTPLACED	–
C272	NOTPLACED	–
C273	2113946K02	CAP CER CHP 0.10UF 16V
C276	2113946N03	CAP CER CHP 2.2UF 16V
C277	2113944A40	CAP CER CHP 100.0PF 50V 5%
C278	2313960D07	CAP,FXD,10UF,+10%,-10%, 16V-DC,SM,-55DEG CMIN, 125DEG CMAX,174MA
C279	2113946N03	CAP CER CHP 2.2UF 16V
C281	2113944A40	CAP CER CHP 100.0PF 50V 5%
C285	2113944A40	CAP CER CHP 100.0PF 50V 5%
C286	2113946K02	CAP CER CHP 0.10UF 16V
C289	2113944A40	CAP CER CHP 100.0PF 50V 5%
C291	2313960M51	CAP,FXD,10UF,+10%,-10%, 6.3V-DC,SM,-55DEG CMIN, 125DEG CMAX,96MA
C292	2113946K02	CAP CER CHP 0.10UF 16V
C293	2113945G98	CAP,FXD,.47UF,+10%,-10%, 50V-DC,0805,X7R,-55DEG CMIN,125DEG CMAX
C294	2113944A40	CAP CER CHP 100.0PF 50V 5%
C295	2113944A40	CAP CER CHP 100.0PF 50V 5%
C296	2113946K02	CAP CER CHP 0.10UF 16V
C297	2113945B02	CAP CER CHP 10,000PF 25V 10%
C298	2113946K02	CAP CER CHP 0.10UF 16V
C301	2113944A14	CAP CER CHP 3.6PF 50V +/- 0.25PF
C302	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5PF
C303	2113944C20	CAP CER CHP 3.9PF 50V +/- 0.25PF
C304	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5PF
C305	2113944A80	CAP,FXD,20PF,+5%,-5%,50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX,PB
C306	NOTPLACED	–
C306	NOTPLACED	–
C307	2113944A40	CAP CER CHP 100.0PF 50V 5%
C308	2113944A40	CAP CER CHP 100.0PF 50V 5%
C309	2113944A40	CAP CER CHP 100.0PF 50V 5%
C310	2113944A40	CAP CER CHP 100.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C311	NOTPLACED	–
C312	2113944A24	CAP CER CHP 9.1PF 50V +/- 0.5PF
C313	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5PF
C314	2113946K02	CAP CER CHP 0.10UF 16V
C315	2113944A40	CAP CER CHP 100.0PF 50V 5%
C316	2113944C20	CAP CER CHP 3.9PF 50V +/- 0.25PF
C317	2113944A24	CAP CER CHP 9.1PF 50V +/- 0.5PF
C318	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5PF
C319	2113944A11	CAP CER CHP 2.7PF 50V +/- 0.25PF
C320	2113944A80	CAP,FXD,20PF,+5%,-5%, 50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX,PB
C321	2113944A40	CAP CER CHP 100.0PF 50V 5%
C322	2113944A38	CAP CER CHP 82.0PF 50V 5%
C324	2113944A29	CAP CER CHP 22.0PF 50V 5%
C325	2115153H26	CAP, CERAMIC, COG
C326	2113946K02	CAP CER CHP 0.10UF 16V
C327	2113946K02	CAP CER CHP 0.10UF 16V
C328	2113946K02	CAP CER CHP 0.10UF 16V
C329	2113946K02	CAP CER CHP 0.10UF 16V
C334	2113945A13	CAP CER CHP 4700PF 50V 10%
C337	NOTPLACED	–
C338	NOTPLACED	–
C343	2113946K02	CAP CER CHP 0.10UF 16V
C344	2113945D04	CAP CER CHP 100,000PF 25V 10%
C345	2113946K02	CAP CER CHP 0.10UF 16V
C346	2113946K02	CAP CER CHP 0.10UF 16V
C347	2113946K02	CAP CER CHP 0.10UF 16V
C348	2113946K02	CAP CER CHP 0.10UF 16V
C349	2113945D04	CAP CER CHP 100,000PF 25V 10%
C350	2113946K02	CAP CER CHP 0.10UF 16V
C351	2113944A41	CAP CER CHP 120.0PF 50V 5%
C352	2113946K02	CAP CER CHP 0.10UF 16V
C355	2113946K02	CAP CER CHP 0.10UF 16V
C357	2113946K02	CAP CER CHP 0.10UF 16V
C358	NOTPLACED	–
C359	NOTPLACED	–
C360	2113944A13	CAP CER CHP 3.3PF 50V +/- 0.25PF
C361	2113946K02	CAP CER CHP 0.10UF 16V
C362	2113946K02	CAP CER CHP 0.10UF 16V

Circuit Ref	Motorola Part No.	Description
C364	2113944A81	CAP,FXD,24PF,+5%,-5%, 50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX,PB
C366	NOTPLACED	–
C367	2113944A82	CAP,FXD,30PF,+5%,-5%, 50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX,PB
C370	2113944A17	CAP CER CHP 4.7PF 50V +/- 0.25PF
C371	NOTPLACED	–
C372	2113944A40	CAP CER CHP 100.0PF 50V 5%
C373	NOTPLACED	–
C374	2113944A40	CAP CER CHP 100.0PF 50V 5%
C375	2113944A40	CAP CER CHP 100.0PF 50V 5%
C378	NOTPLACED	–
C380	2113945B02	CAP CER CHP 10,000PF 25V 10%
C381	NOTPLACED	–
C382	2313960B57	CAP,FXD,10UF,+10%,-10%, 6.3V-DC,SM,-55DEG CMIN, 125DEG CMAX,137MA
C383	NOTPLACED	–
C385	2113944A31	CAP CER CHP 33.0PF 50V 5%
C386	2113944A40	CAP CER CHP 100.0PF 50V 5%
C387	2113944C38	CAP CER CHP 56.0PF 50V 5% CAP CER CHP 47.0PF 50V 5%
C388	2113944C81	CAP,FXD,24PF,+5%,-5%, 50V-DC,0603,C0G,-55DEG CMIN,125DEG CMAX,PB
C389	2113944C38	CAP CER CHP 56.0PF 50V 5% CAP CER CHP 47.0PF 50V 5%
C390	NOTPLACED	–
C391	2113944A81	CAP,FXD,24PF,+5%,-5%, 50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX,PB
C392	2113944C38	CAP CER CHP 56.0PF 50V 5%CAP CER CHP 47.0PF 50V 5%
C400	2113944A40	CAP CER CHP 100.0PF 50V 5%
C401	2113946K02	CAP CER CHP 0.10UF 16V
C402	2113946K02	CAP CER CHP 0.10UF 16V
C403	2316410H03	EPP POSCAP
C404	NOTPLACED	–
C405	2113944A40	CAP CER CHP 100.0PF 50V 5%
C406	NOTPLACED	–
C407	2113946B04	CAP CER CHP 0.10UF 10V 10%
C408	2113944A40	CAP CER CHP 100.0PF 50V 5%
C409	2113946K02	CAP CER CHP 0.10UF 16V
C410	2113946B04	CAP CER CHP 0.10UF 10V 10%
C411	2113946K02	CAP CER CHP 0.10UF 16V
C414	2113946K02	CAP CER CHP 0.10UF 16V

Circuit Ref	Motorola Part No.	Description
C415	2185895Z01	CAPACITOR CER LOW DIST .01UF
C416	2113946B04	CAP CER CHP 0.10UF 10V 10%
C419	NOTPLACED	–
C420	2113945B02	CAP CER CHP 10,000PF 25V 10%
C421	2113946B04	CAP CER CHP 0.10UF 10V 10%
C422	2113946K02	CAP CER CHP 0.10UF 16V
C423	2113944A40	CAP CER CHP 100.0PF 50V 5%
C424	NOTPLACED	–
C425	2113946K02	CAP CER CHP 0.10UF 16V
C426	2113944A40	CAP CER CHP 100.0PF 50V 5%
C427	2113944A40	CAP CER CHP 100.0PF 50V 5%
C428	2113946K02	CAP CER CHP 0.10UF 16V
C429	2113946K02	CAP CER CHP 0.10UF 16V
C430	2113946B04	CAP CER CHP 0.10UF 10V 10%
C431	2113944A40	CAP CER CHP 100.0PF 50V 5%
C432	NOTPLACED	–
C433	2113945B02	CAP CER CHP 10,000PF 25V 10%
C434	2113946B04	CAP CER CHP 0.10UF 10V 10%
C435	2113946K02	CAP CER CHP 0.10UF 16V
C436	2113944A29	CAP CER CHP 22.0PF 50V 5%
C437	2113944A29	CAP CER CHP 22.0PF 50V 5%
C440	2113946Q01	CAP CER CHP 4.7UF 16V
C441	2113944A40	CAP CER CHP 100.0PF 50V 5%
C442	2113945D04	CAP CER CHP 100,000PF 25V 10%
C443	2113946B04	CAP CER CHP 0.10UF 10V 10%
C444	2113944A40	CAP CER CHP 100.0PF 50V 5%
C445	2113944A40	CAP CER CHP 100.0PF 50V 5%
C447	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-DC,0402,X7R,-55DEG CMIN,125DEG CMA
C448	2113946B04	CAP CER CHP 0.10UF 10V 10%
C449	2113944A40	CAP CER CHP 100.0PF 50V 5%
C450	NOTPLACED	–
C451	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-DC,0402,X7R,-55DEG CMIN,125DEG CMA
C452	2113955D31	CAP,FXD,1UF,+10%,-10%, 16V-DC,1206,X7R,-55DEG CMIN,125DEG CMAX,P
C453	2113944A40	CAP CER CHP 100.0PF 50V 5%
C456	2113944A40	CAP CER CHP 100.0PF 50V 5%
C458	2113944A40	CAP CER CHP 100.0PF 50V 5%
C459	2113944A40	CAP CER CHP 100.0PF 50V 5%
C463	2113944A40	CAP CER CHP 100.0PF 50V 5%
C466	2113944A40	CAP CER CHP 100.0PF 50V 5%
C467	2113946B04	CAP CER CHP 0.10UF 10V 10%

Circuit Ref	Motorola Part No.	Description
C471	2113944A40	CAP CER CHP 100.0PF 50V 5%
C472	2113945A05	CAP CER CHP 470PF 50V 10%
C473	2113945A05	CAP CER CHP 470PF 50V 10%
C475	2113956E91	CAP,FXD,10UF,+10%,-10%, 16V-DC,1210,X5R,-55DEG CMIN,85DEG CMAX,P
C476	2113946R01	CAP CER CHP 10.0UF 10V
C479	2113946B04	CAP CER CHP 0.10UF 10V 10%
C480	2113946R01	CAP CER CHP 10.0UF 10V
C481	2113946B04	CAP CER CHP 0.10UF 10V 10%
C482	2113946B04	CAP CER CHP 0.10UF 10V 10%
C490	2113944A40	CAP CER CHP 100.0PF 50V 5%
C491	2113944A40	CAP CER CHP 100.0PF 50V 5%
C492	2113944A40	CAP CER CHP 100.0PF 50V 5%
C493	2113944A40	CAP CER CHP 100.0PF 50V 5%
C494	2113944A40	CAP CER CHP 100.0PF 50V 5%
C495	2113944A40	CAP CER CHP 100.0PF 50V 5%
C496	2113944A40	CAP CER CHP 100.0PF 50V 5%
C497	2113944A40	CAP CER CHP 100.0PF 50V 5%
C498	NOTPLACED	–
C498	NOTPLACED	–
C499	2113946B04	CAP CER CHP 0.10UF 10V 10%
C502	2313960A55	CAP,FXD,.47UF,+10%,-10%, 25V-DC,SM,-55DEG CMIN, 125DEG CMAX,73MA
C503	2113944A84	CAP,FXD,43PF,+5%,-5%, 50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX,PB
C505	2113944A40	CAP CER CHP 100.0PF 50V 5%
C511	2113944A40	CAP CER CHP 100.0PF 50V 5%
C512	2113944A40	CAP CER CHP 100.0PF 50V 5%
C513	2113944A40	CAP CER CHP 100.0PF 50V 5%
C514	2113944A40	CAP CER CHP 100.0PF 50V 5%
C520	2113945B02	CAP CER CHP 10,000PF 25V 10%
C521	2113945B02	CAP CER CHP 10,000PF 25V 10%
C522	2113945B02	CAP CER CHP 10,000PF 25V 10%
C523	2113945B02	CAP CER CHP 10,000PF 25V 10%
C524	2113944A40	CAP CER CHP 100.0PF 50V 5%
C525	2113944A40	CAP CER CHP 100.0PF 50V 5%
C526	2113944A40	CAP CER CHP 100.0PF 50V 5%
C527	2113944A40	CAP CER CHP 100.0PF 50V 5%
C528	2113944A40	CAP CER CHP 100.0PF 50V 5%
C529	2113944A40	CAP CER CHP 100.0PF 50V 5%
C597	2113944A84	CAP,FXD,43PF,+5%,-5%, 50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX,PB

Circuit Ref	Motorola Part No.	Description
C598	2113944A17	CAP CER CHP 4.7PF 50V +/- 0.25PF
C599	2113944A15	CAP CER CHP 3.9PF 50V +/- 0.25PF
C600	2113944A81	CAP,FXD,24PF,+5%,-5%, 50V-DC,0402,C0G,-55DEG CMIN,125DEG CMAX,PB
C601	2113944A40	CAP CER CHP 100.0PF 50V 5%
C602	2113944A17	CAP CER CHP 4.7PF 50V +/- 0.25PF
C603	2113944C81	CAP,FXD,24PF,+5%,-5%, 50V-DC,0603,C0G,-55DEG CMIN,125DEG CMAX,PB
C604	2113944C81	CAP,FXD,24PF,+5%,-5%, 50V-DC,0603,C0G,-55DEG CMIN,125DEG CMAX,PB
C605	2113944A40	CAP CER CHP 100.0PF 50V 5%
CR101	4880973Z02	PIN DIODE
CR102	4815257H01	SURFACE MOUNT PIN DIODES
CR103	4815257H01	SURFACE MOUNT PIN DIODES
CR105	5115022H01	IC TEMPERATURE SENSOR
CR160	NOTPLACED	–
CR201	4815011H01	DIODE TRIPLE
CR203	4815072H01	DIODE VARACTOR
CR241	4885094Y01	DIODE VARACTOR ISV228 W18
CR242	4815279H01	BBY5503WE6327 FROM INFINEON
CR243	4815279H01	BBY5503WE6327 FROM INFINEON
CR251	4885094Y01	DIODE VARACTOR ISV228 W18
CR252	4815279H01	BBY5503WE6327 FROM INFINEON
CR253	4815279H01	BBY5503WE6327 FROM INFINEON
CR301	4815279H01	BBY5503WE6327 FROM INFINEON
CR302	4815279H01	BBY5503WE6327 FROM INFINEON
CR303	4815048H01	SOT MMBD353 DIODE DUAL SCHT
CR304	4815279H01	BBY5503WE6327 FROM INFINEON
CR305	4815279H01	BBY5503WE6327 FROM INFINEON
CR306	4815923H02	SCHOTTKY DIODE-NEW LEADFREE
CR311	4813974A19	DIODE ARRAY,MXR,SM,SOT-323,7V,.2W,SHTK,2,PB-FREE
CR312	4815047H01	BAND SWITCHIND DIODE,ROHM DAN
CR313	4815047H01	BAND SWITCHIND DIODE,ROHM DAN
CR411	4815067H01	DIODE SCHOTTKY, RB731U
CR412	4815067H01	DIODE SCHOTTKY, RB731U
CR413	4815067H01	DIODE SCHOTTKY, RB731U
CR440	4813978C02	PB FREE, NOT COMPLETELY ENRICHED
CR501	4815155H01	RECTIFIER
CR503	4805729G49	DIODE RED/YEL
E101	2415954H01	INDUCTOR BEAD CHIP
E102	7686949J14	FLTR,FERRITE BEAD, 2A, SM, 0805, CHIP,220OHM
E105	7686949J14	FLTR,FERRITE BEAD,2A,SM,0805,CHIP,220OHM
E106	7686949J15	FLTR,FERR,2A,SM,0603
E107	7686949J15	FLTR,FERR,2A,SM,0603
E400	2480640Z01	SURFACE MOUNT FERRITE BEAD
E401	2480640Z01	SURFACE MOUNT FERRITE BEAD
E402	2480640Z01	SURFACE MOUNT FERRITE BEAD
E403	2480640Z01	SURFACE MOUNT FERRITE BEAD
E404	2480640Z01	SURFACE MOUNT FERRITE BEAD
E405	2480640Z01	SURFACE MOUNT FERRITE BEAD
E406	2480640Z01	SURFACE MOUNT FERRITE BEAD
E407	2480640Z01	SURFACE MOUNT FERRITE BEAD
E408	2480640Z01	SURFACE MOUNT FERRITE BEAD
E409	2480640Z01	SURFACE MOUNT FERRITE BEAD
F501	6515076H01	FUSE CHIP SMT TR/1608FF 3A
FL201	4805875Z04	CRYSTAL 16.8 MHZ
FL301	9180022M11	XTAL FILTER 44.85MHZ
FL302	9180468V04	SMD455KHZ 4 ELEMENT CER FLTR
FL303	9115811H03	SMD455KHZ 6 ELEMENT
FL304	9115811H01	SMD455KHZ 6 ELEMENT
FL401	4870368G02	REFLOWABLE CLOCK OSC XTAL
H101	2680499Z02	HEAT SPREADER
J101	0985613Z01	JACK, RF
J102	0280519Z06	NUT, ANTENNA
J400	0915064H03	CONNECTOR, ZIF (40 PINS)
J403	0915064H02	ZIF (20 PINS)
L101	2460591C40	COIL AIR WOUND INDUC 17.02
L102	2460591C40	COIL AIR WOUND INDUC 17.02
L104	2479990B02	AIR WND COIL/GREEN COLOR 19.61
L105	2414032B22	IDCTR,WW,390NH,10%,620MA, 1.12OHM,CER,30 Q,465MHZ SRF,SM,PB-
L106	2479990A02	AIR WND COIL/GREEN COLOR7.66NH
L107	2479990G01	AIR WND COIL/GREEN COLOR 33.47
L108	2479990A01	AIR WND COIL/GREEN COLOR4.22NH
L109	2479990B01	AIR WND COIL/GREEN COLOR 11.03
L112	2414032B45	IDCTR,WW,22NH,5%,1A,.12OHM,CER,50 Q,2GHZ SRF,SM,PB-FREE
L113	2414017N09	IDCTR,CHIP,5.6NH,600MA,.2OHM,CER,10 Q,3GHZ SRF,SM, 0603, PB-F
L114	2414032B45	IDCTR,WW,22NH,5%,1A,.12OHM,CER,50 Q,2GHZ SRF,SM,PB-FREE
L115	2414032B22	IDCTR,WW,390NH,10%,620MA,1.12OHM,CER,30 Q,465MHZ SRF,SM,PB-
L116	2479990A03	AIR WND COIL/GREEN COLOR9.75NH
L160	2414017N14	IDCTR,CHIP,15NH,5%,600MA, .4OHM,CER,12 Q,1.8GHZ SRF,SM,0603,P
L201	2414017Q20	IDCTR,FXD,2.2UH,20%,30MA, .65 OHM,FERR,45 Q,50MHZ SRF,SM,0805
L202	2414017Q20	IDCTR,FXD,2.2UH,20%,30MA,.65 OHM,FERR,45 Q,50MHZ SRF,SM,0805
L203	2414017Q20	IDCTR,FXD,2.2UH,20%,30MA, .65 OHM,FERR,45 Q,50MHZ SRF,SM,0805
L232	2414032L25	IDCTR,WW,12UH,5%,150MA, 3.8 OHM,FERR,25 Q,23MHZ SRF, SM,PB-FRE
L241	2414032F41	IDCTR,WW,390NH,10%,200MA, 1.5 OHM,CER,40 Q,730MHZ SRF,SM,PB-F
L242	2414032F38	IDCTR,WW,220NH,5%,400MA, .7OHM,CER,30 Q,630MHZ SRF,SM,PB-FRE
L243	2485776Z01	COIL TEFLON RESONATOR (KAPTON)
L251	2414032F41	IDCTR,WW,390NH,10%,200MA, 1.5 OHM,CER,40 Q,730MHZ SRF,SM,PB-F
L252	2414032F26	IDCTR,WW,22NH,5%,500MA, .22 OHM,CER,45 Q,2.2GHZ SRF,SM,PB-FRE
L253	2460593C02	COIL MULT LAYERED TAP TEF RESN
L254	2414032F41	IDCTR,WW,390NH,10%,200MA,1.5OHM,CER,40 Q,730MHZ SRF,SM,PB-F
L261	2414032F29	IDCTR,WW,39NH,5%,500MA,.29 OHM,CER,4
L271	2414032F32	IDCTR,FXD,68NH,5%,500MA,.38 OHM,CER,40 Q,1.2GHZ SRF,SM,0805,P
L273	2414032F28	IDCTR,WW,33NH,5%,500MA,.27 OHM,CER,40 Q,1.8GHZ SRF,SM,PB-FRE
L281	2414032F41	IDCTR,WW,390NH,10%,200MA,1.5OHM,CER,40 Q,730MHZ SRF,SM,PB-F
L282	2414032F41	IDCTR,WW,390NH,10%,200MA,1.5OHM,CER,40 Q,730MHZ SRF,SM,PB-F
L301	2479990C01	AIR WND COIL/GREEN COLOR13.9NH
L302	2479990C01	AIR WND COIL/GREEN COLOR13.9NH
L303	2414032F26	IDCTR,WW,22NH,5%,500MA,.22 OHM,CER,45 Q,2.2GHZ SRF,SM,PB-FRE
L304	2414032F37	IDCTR,WW,180NH,5%,400MA,.64OHM,CER,35 Q,710MHZ SRF,SM,PB-FR
L305	2414032F26	IDCTR,WW,22NH,5%,500MA,.22 OHM,CER,45 Q,2.2GHZ SRF,SM,PB-FRE
L306	2479990C01	AIR WND COIL/GREEN COLOR13.9NH
L307	2479990C01	AIR WND COIL/GREEN COLOR13.9NH
L309	2479990C02	AIR WND COIL/GREEN COLOR 16.28
L310	2414032F36	IDCTR,WW,150NH,5%,400MA,.56OHM,CER,35 Q,780MHZ SRF,SM,PB-FR
L311	2414017K32	IDCTR,CHIP,560NH,5%,50MA,5 OHM,CER,11 Q,150MHZ SRF,SM,0805,PB
L321	2414032F37	IDCTR,WW,180NH,5%,400MA,.64OHM,CER,35 Q,710MHZ SRF,SM,PB-FR
L325	2414032B68	IDCTR,WW,1UH,5%,460MA,1.75 OHM,CER,33 Q,290MHZ SRF,SM,PB-FRE
L330	0613958J74	CER CHIP RES 0.0 OHM JMP 0805
L331	2414017K33	IDCTR,CHIP,680NH,5%,50MA,5.5OHM,CER,11 Q,120MHZ SRF,SM,0805
L332	2414015A25	IDCTR,CHIP,1.2UH,2%,440MA,2 OHM,CER,20Q,200MHZSRF,SM,1008,PB-

Circuit Ref	Motorola Part No.	Description
L400	2414017Q42	IDCTR,FXD,390NH,10%,200MA,.65OHM,FERR,25 Q,135MHZ SRF,SM,080
L401	2414017Q42	IDCTR,FXD,390NH,10%,200MA,.65OHM,FERR,25 Q,135MHZ SRF,SM,080
L410	2414017Q42	IDCTR,FXD,390NH,10%,200MA,.65OHM,FERR,25 Q,135MHZ SRF,SM,080
L411	2414017Q42	IDCTR,FXD,390NH,10%,200MA,.65OHM,FERR,25 Q,135MHZ SRF,SM,080
L505	2414017Q42	IDCTR,FXD,390NH,10%,200MA,.65OHM,FERR,25 Q,135MHZ SRF,SM,080
P100	3905643V01	CONTACT ANT GRD
PASTE	1085674C03	PASTE/NC-SMQ230
PB501	4086470Z01	TACT SWITCH
PB502	4086470Z01	TACT SWITCH
PB503	4086470Z01	TACT SWITCH
PB504	4086470Z01	TACT SWITCH
PB505	4086470Z01	TACT SWITCH
Q110	4813976A03	450MHZ 8W 7.5V PLD-1.5 T&R
Q111	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q210	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q241	4805218N63	RF TRANS SOT 323 BFQ67W
Q252	4805218N63	RF TRANS SOT 323 BFQ67W
Q260	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q261	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q301	4816531H01	NPN SILICON BIPOLAR TRANSISTOR
Q302	4802197J95	RF TRANSISTOR PBR941
Q310	4816531H01	NPN SILICON BIPOLAR TRANSISTOR
Q320	4813973M07	XSTR,BIP GP SS,NPN,T3904,SM,SOT-23,SMT,40V,.225W,200MA,300MHZ
Q400	4815069H02	TSTR MOSFET P-CHAN
Q403	4813973A13	XSTR,BIP GP SS,PNP,T3906,SM,SOT-23,SMT,-40V,.225W,-200MA,250MH
Q405	4815066H01	UMG5N DIGITAL TRANSISTOR
Q410	4815066H01	UMG5N DIGITAL TRANSISTOR
Q416	4815069H02	TSTR MOSFET P-CHAN
Q417	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q502	4815154H01	DUAL TRANS NPN
Q505	4813973M07	XSTR,BIP GP SS,NPN,T3904,SM,SOT-23,SMT,40V,.225W,200MA,300MHZ
R101	0613952H58	CER CHIP RES 240 OHM 5 0603
R102	0615043C01	RES POWER METAL STRIP W18 COMPLIANT
R103	0613952Q40	CER CHIP RES 43.0 OHM 5 0402
R104	0613952R17	CER CHIP RES 47K OHM 5% 0402
R106	0613952Q25	CER CHIP RES 10.0 OHM 5 0402
R107	NOTPLACED	–
R108	0613952Q91	CER CHIP RES 5600 OHM 5 0402
R109	0613952R32	CER CHIP RES 200K OHM 5 0402
R110	0613952Q60	CER CHIP RES 300 OHM 5 0402
R111	0613952Q32	CER CHIP RES 20.0 OHM 5 0402
R112	0613952Q60	CER CHIP RES 300 OHM 5 0402
R120	0613952R16	CER CHIP RES 43K OHM 5 0402
R130	0613952R01	CER CHIP RES 10K OHM 5% 0402
R131	0613952R07	CER CHIP RES 18K OHM 5% 0402
R132	0613952R35	CER CHIP RES 270K OHM 5% 0402
R133	NOTPLACED	–
R136	NOTPLACED	–
R161	0613952Q56	CER CHIP RES 200 OHM 5 0402
R170	0613952H58	CER CHIP RES 240 OHM 5 0603
R171	0613952R16	CER CHIP RES 43K OHM 5 0402
R172	0613952H49	CER CHIP RES 100 OHM 5% 0603
R173	0613952R31	CER CHIP RES 180K OHM 5% 0402
R174	0613952R17	CER CHIP RES 47K OHM 5% 0402
R175	0613952H12	CER CHIP RES 3.0 OHM 5 0603
R176	0613952H12	CER CHIP RES 3.0 OHM 5 0603
R201	0613952R23	CER CHIP RES 82K OHM 5% 0402
R202	0613952R25	CER CHIP RES 100K OHM 5% 0402
R204	0613952R17	CER CHIP RES 47K OHM 5% 0402
R231	0613952Q51	CER CHIP RES 120 OHM 5 0402
R232	0613952Q68	CER CHIP RES 620 OHM 5 0402
R233	0613952Q67	CER CHIP RES 560 OHM 5 0402
R241	0613952Q31	CER CHIP RES 18.0 OHM 5 0402
R242	0613952Q56	CER CHIP RES 200 OHM 5 0402
R243	0613952R01	CER CHIP RES 10K OHM 5% 0402
R244	0613952R03	CER CHIP RES 12K OHM 5% 0402
R245	0613952Q58	CER CHIP RES 240 OHM 5 0402
R248	0613952Q36	CER CHIP RES 30.0 OHM 5 0402
R251	0613952Q31	CER CHIP RES 18.0 OHM 5 0402
R252	0613952Q53	CER CHIP RES 150 OHM 5 0402
R253	0613952Q94	CER CHIP RES 7500 OHM 5 0402
R254	0613952Q94	CER CHIP RES 7500 OHM 5 0402
R255	0613952Q88	CER CHIP RES 4300 OHM 5 0402
R256	0613952Q36	CER CHIP RES 30.0 OHM 5 0402
R260	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R281	NOTPLACED	–
R301	0613952R25	CER CHIP RES 100K OHM 5% 0402
R302	0613952R25	CER CHIP RES 100K OHM 5% 0402
R303	0613952Q80	CER CHIP RES 2000 OHM 5 0402
R304	0613952R03	CER CHIP RES 12K OHM 5% 0402
R305	0613952Q66	CER CHIP RES 510 OHM 5 0402
R306	0613952R25	CER CHIP RES 100K OHM 5% 0402
R307	0613952R25	CER CHIP RES 100K OHM 5% 0402
R308	0613952Q42	CER CHIP RES 51.0 OHM 5 0402
R309	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R310	NOTPLACED	–
R311	0613952R13	CER CHIP RES 33K OHM 5% 0402
R312	0613952Q89	CER CHIP RES 4700 OHM 5 0402
R313	0613952Q61	CER CHIP RES 330 OHM 5 0402
R314	0613952Q78	CER CHIP RES 1600 OHM 5 0402
R315	0613952R03	CER CHIP RES 12K OHM 5% 0402
R320	NOTPLACED	–
R321	0613952R03	CER CHIP RES 12K OHM 5% 0402
R322	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R324	0613952R27	CER CHIP RES 120K OHM 5% 0402
R328	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R329	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R330	0613952R01	CER CHIP RES 10K OHM 5% 0402
R331	0613952Q56	CER CHIP RES 200 OHM 5 0402
R332	0613952R03	CER CHIP RES 12K OHM 5% 0402
R333	NOTPLACED	–
R339	0613952Q88	CER CHIP RES 4300 OHM 5 0402
R340	0613952Q94	CER CHIP RES 7500 OHM 5 0402
R342	0613952R25	CER CHIP RES 100K OHM 5% 0402
R344	0613952Q42	CER CHIP RES 51.0 OHM 5 0402
R345	0613952R15	CER CHIP RES 39K OHM 5% 0402
R346	0613952R05	CER CHIP RES 15K OHM 5% 0402
R348	0613952Q86	CER CHIP RES 3600 OHM 5 0402
R349	0613958J74	CER CHIP RES 0.0 OHM JMP 0805
R350	0613952R01	CER CHIP RES 10K OHM 5% 0402
R355	0613952R25	CER CHIP RES 100K OHM 5% 0402
R358	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R359	NOTPLACED	–
R360	0613952R08	CER CHIP RES 20K OHM 5 0402
R361	0613952R08	CER CHIP RES 20K OHM 5 0402
R363	0613952Q63	CER CHIP RES 390 OHM 5 0402
R364	0613952Q79	CER CHIP RES 1800 OHM 5 0402
R365	0613952Q75	CER CHIP RES 1200 OHM 5 0402
R366	0613952R03	CER CHIP RES 12K OHM 5% 0402
R367	0613952N09	CER CHIP RES 12.1K OHM 1 0402
R368	0613952N01	CER CHIP RES 10.0K OHM 1 0402
R369	0613952Q69	CER CHIP RES 680 OHM 5 0402
R370	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R371	NOTPLACED	–
R372	NOTPLACED	–
R373	NOTPLACED	–
R374	NOTPLACED	–
R375	NOTPLACED	–
R376	NOTPLACED	–
R377	NOTPLACED	–
R378	NOTPLACED	–
R400	0613952R17	CER CHIP RES 47K OHM 5% 0402
R401	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R402	NOTPLACED	–
R403	NOTPLACED	–

Circuit Ref	Motorola Part No.	Description
R405	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R406	0613952R22	CER CHIP RES 75K OHM 5 0402
R407	0613952R21	CER CHIP RES 68K OHM 5% 0402
R408	NOTPLACED	–
R409	0613952R01	CER CHIP RES 10K OHM 5% 0402
R410	0613952R25	CER CHIP RES 100K OHM 5% 0402
R411	0613952R01	CER CHIP RES 10K OHM 5% 0402
R413	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R414	0613952P25	CER CHIP RES 178K OHM 1 0402
R415	0613952N93	CER CHIP RES 90.9K OHM 1 0402
R416	0613952R01	CER CHIP RES 10K OHM 5% 0402
R418	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R419	0613952Q66	CER CHIP RES 510 OHM 5 0402
R420	0613952J73	CER CHIP RES 10.0M OHM 5% 0603
R421	0613952Q80	CER CHIP RES 2000 OHM 5 0402
R423	0613952R41	CER CHIP RES 470K OHM 5% 0402
R424	0613952R14	CER CHIP RES 36K OHM 5 0402
R425	0613952R12	CER CHIP RES 30K OHM 5 0402
R426	0613952R37	CER CHIP RES 330K OHM 5% 0402
R427	0613952Q83	CER CHIP RES 2700 OHM 5 0402
R428	0613952Q09	CER CHIP RES 2.2 OHM 5 0402
R429	0613952R22	CER CHIP RES 75K OHM 5 0402
R431	0613952R41	CER CHIP RES 470K OHM 5% 0402
R432	0613952R18	CER CHIP RES 51K OHM 5 0402
R434	0613952Q61	CER CHIP RES 330 OHM 5 0402
R435	0613952Q80	CER CHIP RES 2000 OHM 5 0402
R436	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R437	NOTPLACED	–
R445	0613952R10	CER CHIP RES 24K OHM 5 0402
R447	0613952R25	CER CHIP RES 100K OHM 5% 0402
R448	0613952R01	CER CHIP RES 10K OHM 5% 0402
R449	0613952R10	CER CHIP RES 24K OHM 5 0402
R450	0613959Y45	CER CHIP RES OHM 5% 2512

Circuit Ref	Motorola Part No.	Description
R451	0613952R05	CER CHIP RES 15K OHM 5% 0402
R452	0613952R25	CER CHIP RES 100K OHM 5% 0402
R453	NOTPLACED	–
R454	NOTPLACED	–
R455	NOTPLACED	–
R456	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R457	0613952R01	CER CHIP RES 10K OHM 5% 0402
R460	0613952Q89	CER CHIP RES 4700 OHM 5 0402
R461	0613952Q55	CER CHIP RES 180 OHM 5 0402
R462	0613952R01	CER CHIP RES 10K OHM 5% 0402
R463	0613952Q60	CER CHIP RES 300 OHM 5 0402
R471	0613952R08	CER CHIP RES 20K OHM 5 0402
R472	0613952R14	CER CHIP RES 36K OHM 5 0402
R473	0613952Q25	CER CHIP RES 10.0 OHM 5 0402
R475	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R476	0613952R37	CER CHIP RES 330K OHM 5% 0402
R477	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R478	0613952R01	CER CHIP RES 10K OHM 5% 0402
R479	0613952Q66	CER CHIP RES 510 OHM 5 0402
R481	0613952R10	CER CHIP RES 24K OHM 5 0402
R492	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R498	0613952R01	CER CHIP RES 10K OHM 5% 0402
R499	0613952R01	CER CHIP RES 10K OHM 5% 0402
R501	0613952Q69	CER CHIP RES 680 OHM 5 0402
R502	0613952Q55	CER CHIP RES 180 OHM 5 0402
R505	0613952R01	CER CHIP RES 10K OHM 5% 0402
R506	0613952R17	CER CHIP RES 47K OHM 5% 0402
R507	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
RT400	0680590Z01	THERMISTOR_33K
S501	4080710Z21	SWITCH, FREQUENCY
S502	1880619Z06	POTENTIOMETER, VOLUME
SH100	2680507Z02	SHIELD, HARMONIC FILTER
SH101	2680510Z02	SHIELD, PA
SH201	2680511Z02	SHIELD, SYNTHESIZER
SH202	2680511Z02	SHIELD, SYNTHESIZER
SH241	2604120G02	AOBA VCO SHIELD

Circuit Ref	Motorola Part No.	Description
SH242	2680514Z02	SHIELD, VCO BOTTOM/LVZIF
SH301	2686583Z02	SHIELD, RECEIVER FRONT END TOP
SH302	2680555Z02	SHIELD, RECEIVER F/END BOTTOM
SH303	2680509Z02	SHIELD, MIXER
SH304	2680624Z02	SHIELD, MIXER DIODE
SH322	2686528Z02	SHIELD, IF SECTION
SH323	2686527Z02	SHIELD, RFI/EMI, CRS, TIN
SH400	2680505Z02	SHIELD, CONTROLLER TOP LEFT
SH401	2680506Z02	SHIELD, CONTROLLER TOP RIGHT
SH402	2680515Z02	SHIELD, CONTROLLER BOTTOM LEFT
SH403	2680516Z02	SHIELD, CONTROLLER BTM RIGHT
T301	2515121H01	BALUN, TRANSFORMER W18 COMP
T302	2515121H01	BALUN, TRANSFORMER W18 COMP
U101	5115678H01	VHF/UHF/800/900 MHZ LDMOS DRIVER IC
U102	5185765B26	IC PWR CTRL IN MOS20
U201	5185177Y01	IC TESTED AT25016 48 PIN W18
U210	5115266H01	INVERTER TC7ST04FU SS0P5-P-A
U211	5115266H01	INVERTER TC7ST04FU SS0P5-P-A
U241	5171121L01	CUSTOM LOW VOLTAGE VCO BUFFER IC
U247	5115026H01	MAX SUPPLY VOL 16V
U248	5115019H01	3.3V REGULATOR IN SOT23-5 PKG
U301	5115281H01	FM IF IC SA616 FROM PHILIPS
U302	5115070H01	IC 3-INV LMOS TC7W04FU
U303	NOTPLACED	–
U400	5115012H01	MAX SUPPLY VOL 30V
U404	5115062H01	IC ASFIC_CMP
U405	NOTPLACED	–
U406	*5115034H01	IC FLASH 4MBIT
U407	5115033H01	16K X 8 SPI SERIAL ROM
U409	5185143E03	HC11FL0 (3V) ASIC MICRO-P
U410	5115044H01	REGULATOR 3.3V,ILC7062CM-33
U420	5115280H01	AUDIO AMPLIFIER TDA8547TS
VR432	4813979P10	DIODE ARRAY,TRNSNT PROT,SM,SOT-457,5.6V,.225W, ZEN,4,PB-FREE
VR433	4813979P10	DIODE ARRAY,TRNSNT PROT,SM,SOT-457,5.6V,.225W, ZEN,4,PB-FREE
VR434	4815038H01	ZENER DIODE-6.8V

Circuit Ref	Motorola Part No.	Description
VR439	4813977M21	DIODE,ZEN,MBZ5242,SM, SOT-23,12V,10MA,.225W, ZEN,PB-FREE
VR440	4815038H01	ZENER DIODE-6.8V
VR441	4815038H01	ZENER DIODE-6.8V
VR442	4815038H01	ZENER DIODE-6.8V
VR443	4815038H01	ZENER DIODE-6.8V
VR444	4815038H01	ZENER DIODE-6.8V
VR445	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,10V,10MA,.2W, ZEN,PB-FREE
VR446	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,10V,10MA,.2W, ZEN,PB-FREE
VR447	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,10V,10MA,.2W, ZEN,PB-FREE
VR448	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,10V,10MA,.2W, ZEN,PB-FREE
VR449	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,10V,10MA,.2W, ZEN,PB-FREE
VR450	4815040H01	ZENER DIODE-12V
VR460	4815038H01	ZENER DIODE-6.8V
VR501	4813977M14	DIODE,ZEN,MBZ5235,SM, SOT-23,6.8V,10MA,.225W, ZEN,PB-FREE
VR506	4815038H01	ZENER DIODE-6.8V
Y300	4802245J84	XTAL 44.395MHZ, 3RD OT, SMD
Y301	9186145B02	CER.DISCR. CDBCA455CX36-TC
	8415234H09	PC BOARD, UHF U1

* Motorola Depot Servicing only

4.7 UHF Band 2 Section

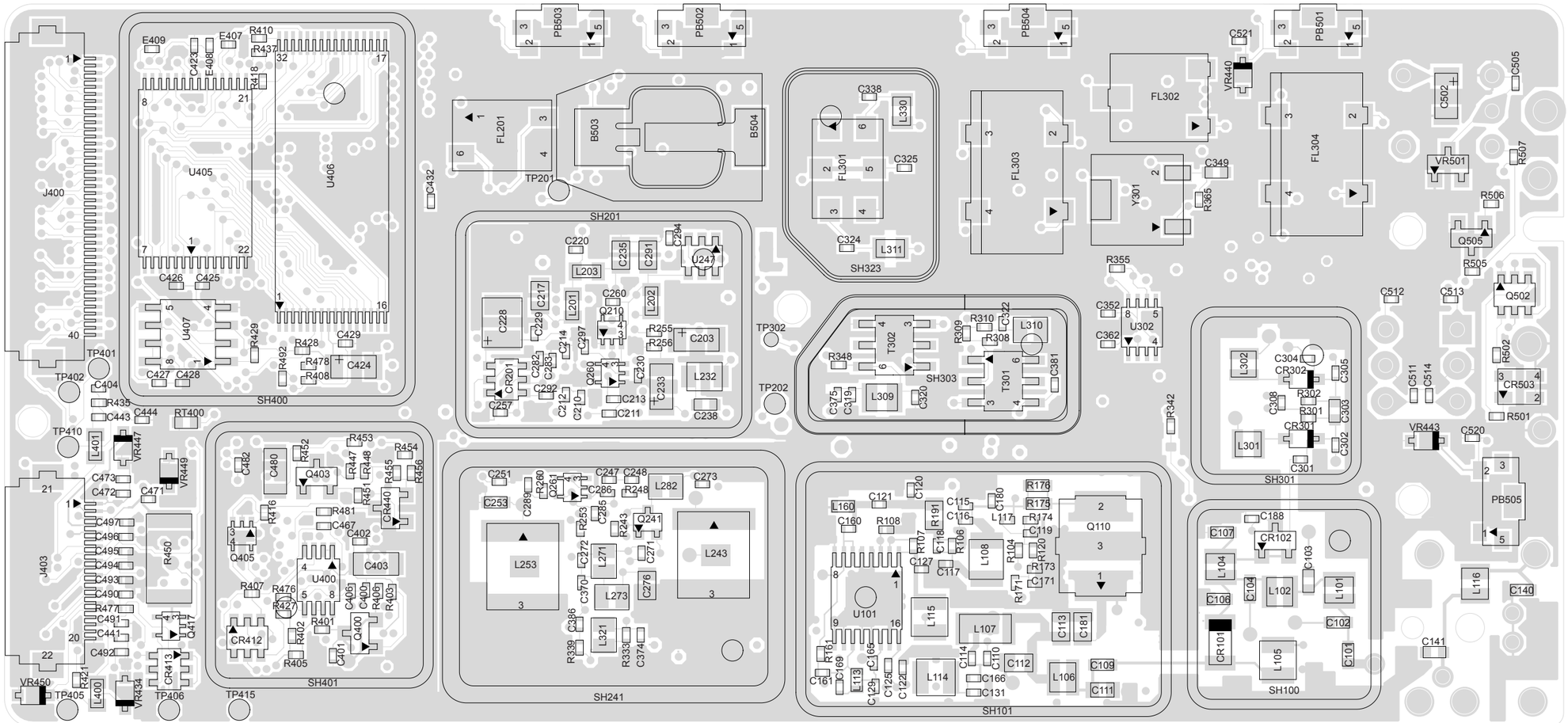


Figure 4-36: UHF (450–512 MHz) Main Board Top Side PCB 8486686Z02 rev. A

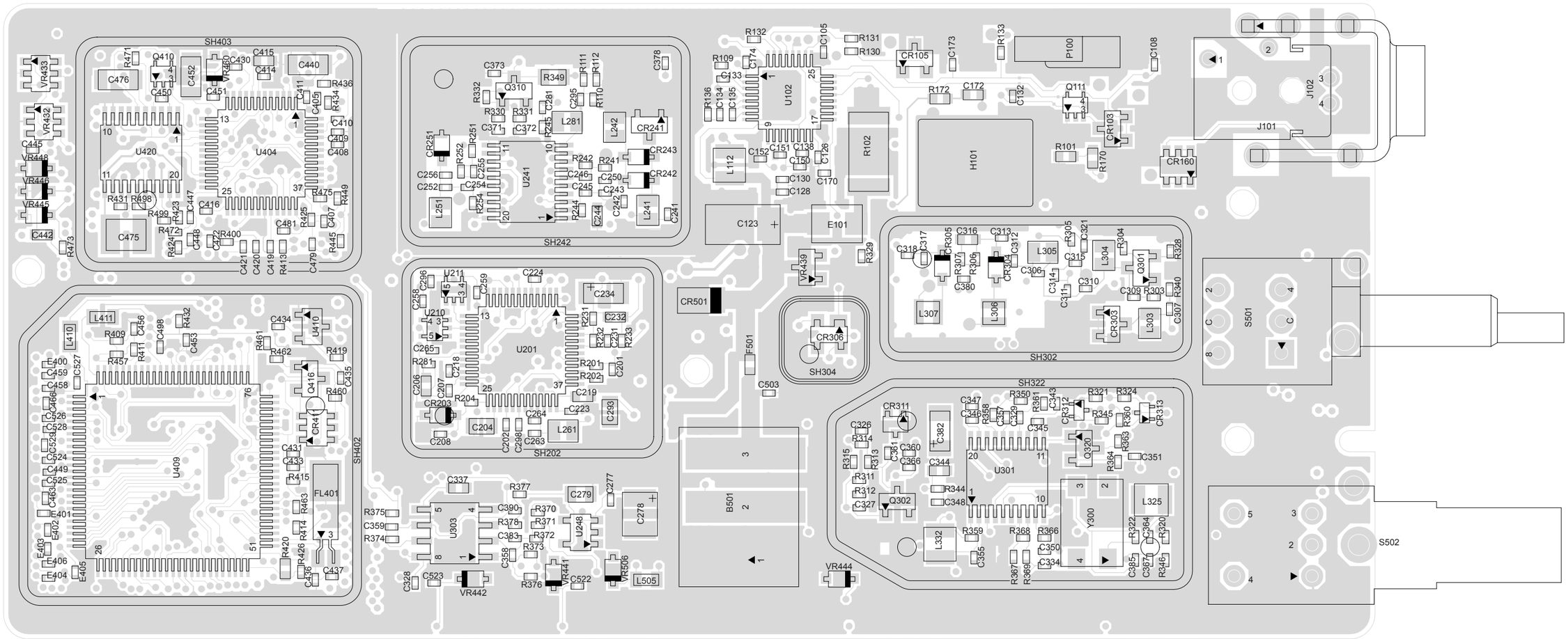


Figure 4-37: UHF (450–512 MHz) Main Board Bottom Side PCB 8486686Z02 rev. A

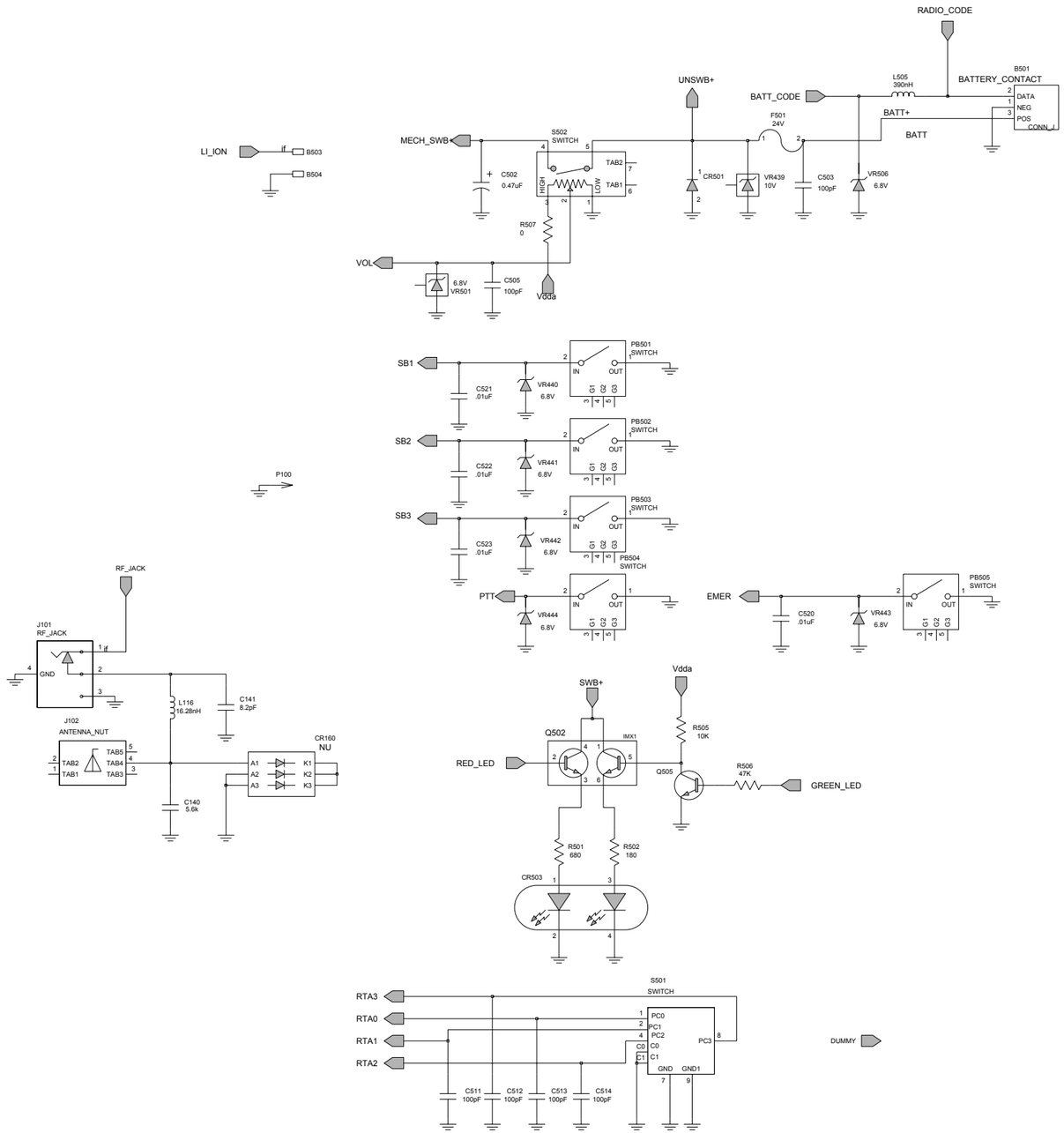
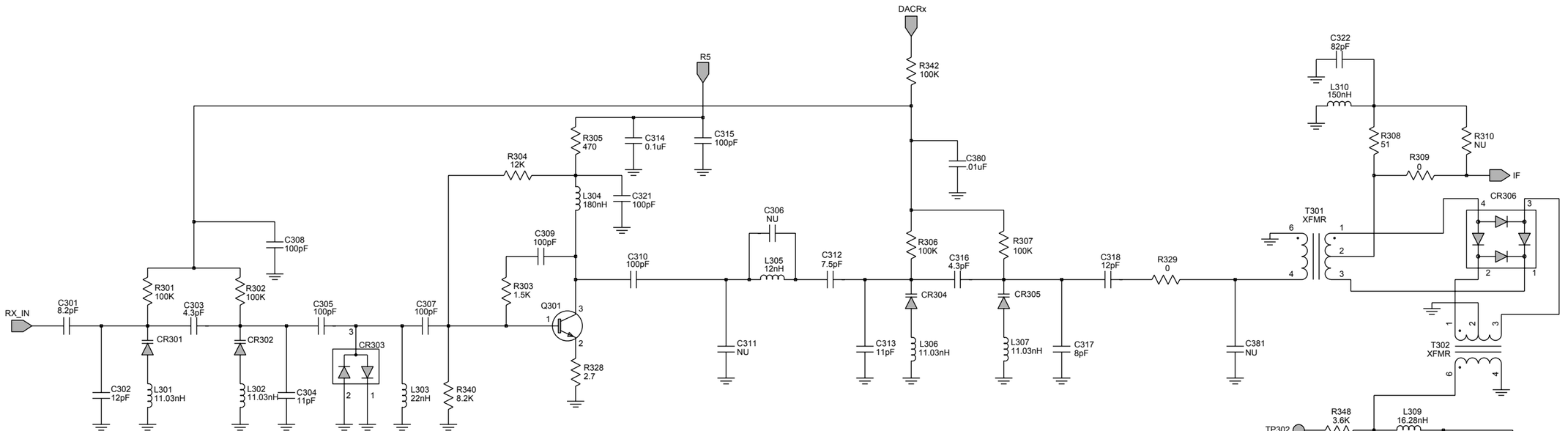
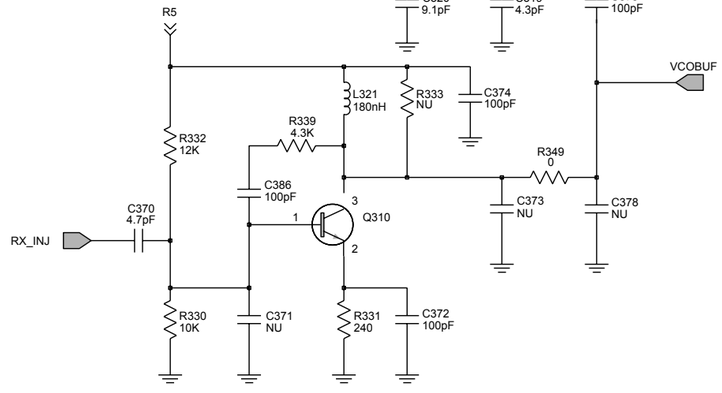


Figure 4-38: UHF (450–512 MHz) Controls and Switches Schematic Diagram





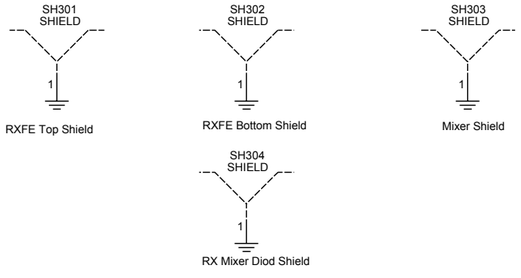


Figure 4-39: UHF (450–512 MHz) Receiver Front End Schematic Diagram

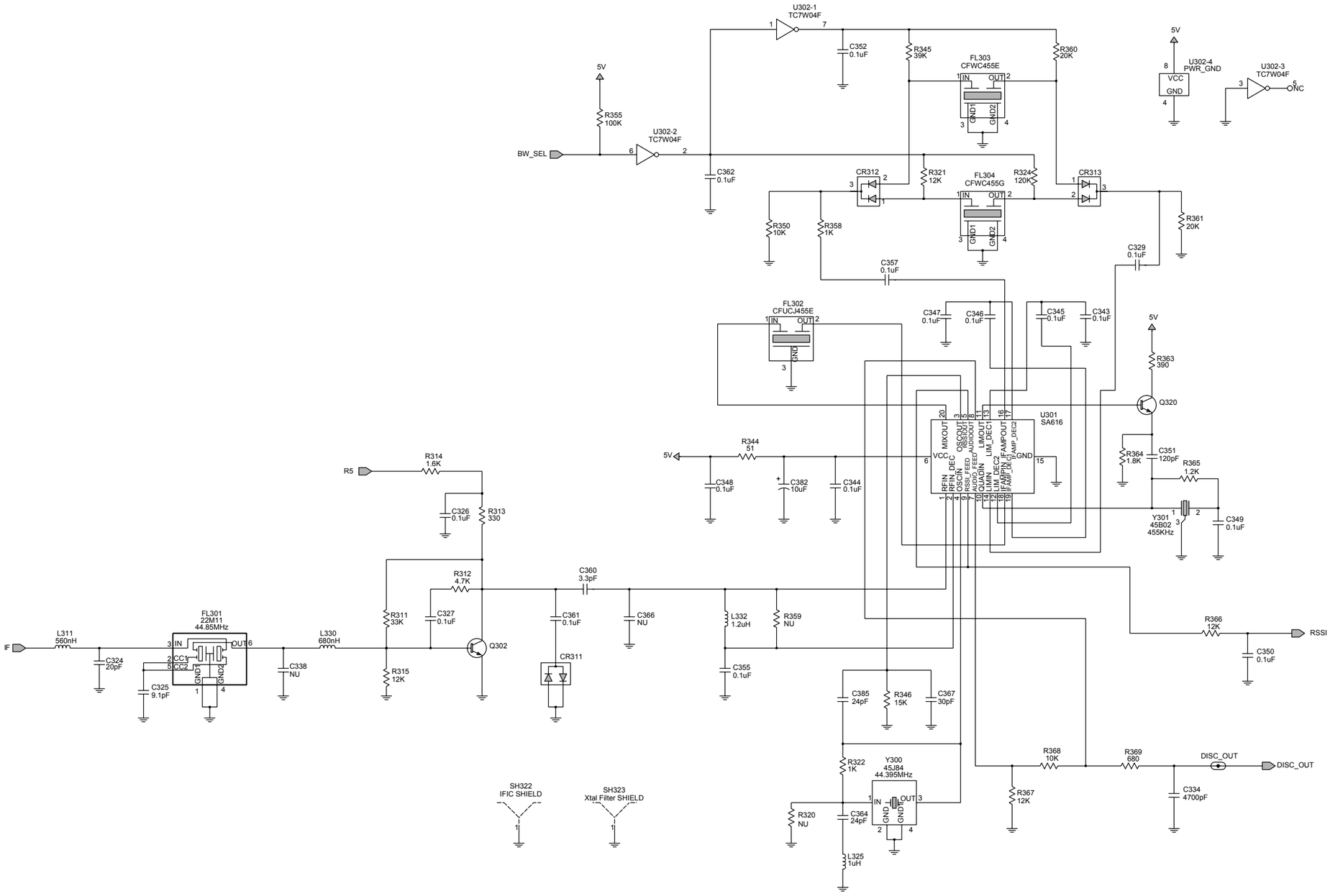


Figure 4-40: UHF (450–512 MHz) Receiver Back End Schematic Diagram

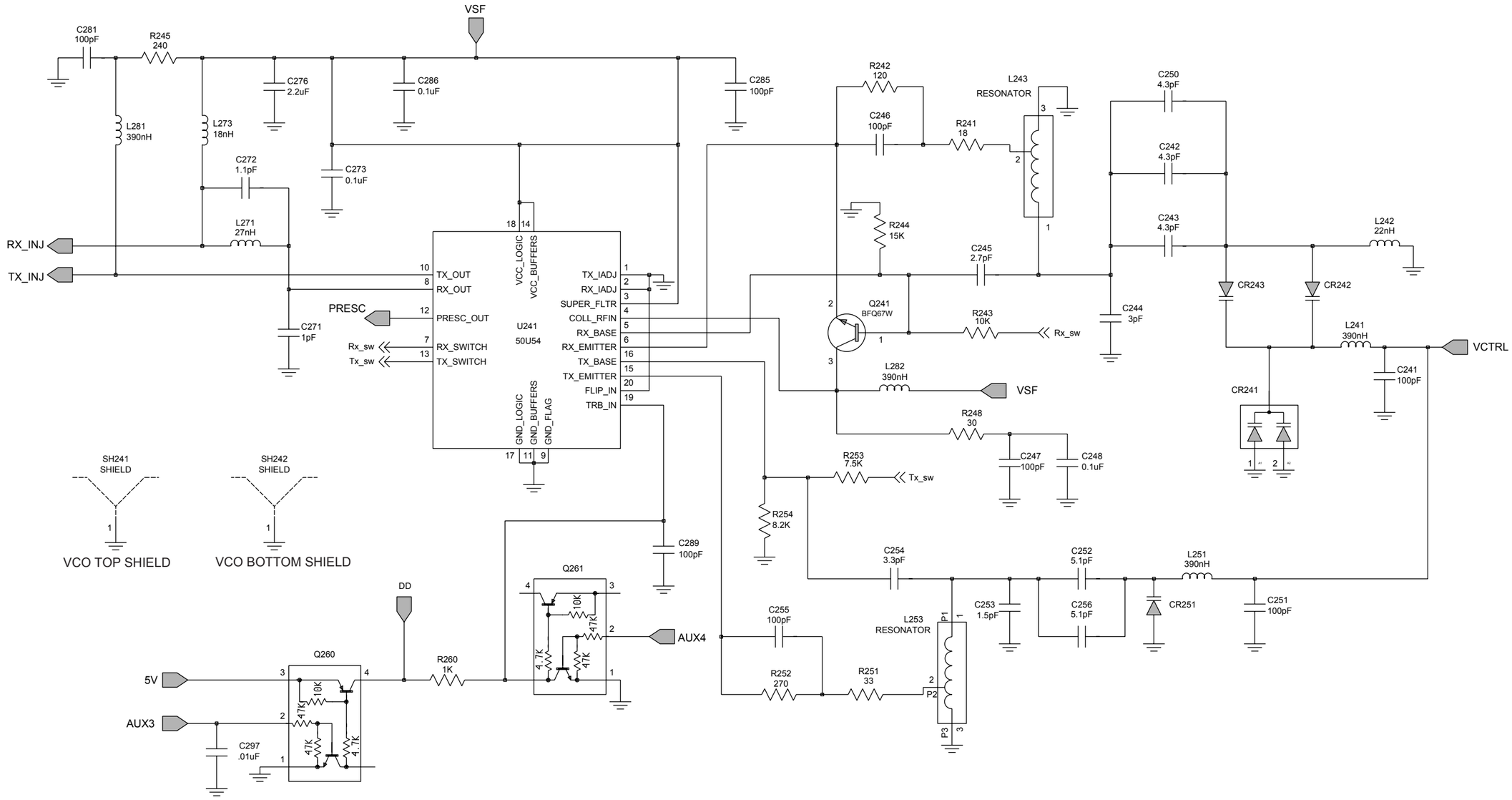


Figure 4-41: UHF (450–512 MHz) Voltage Controlled Oscillator Schematic Diagram

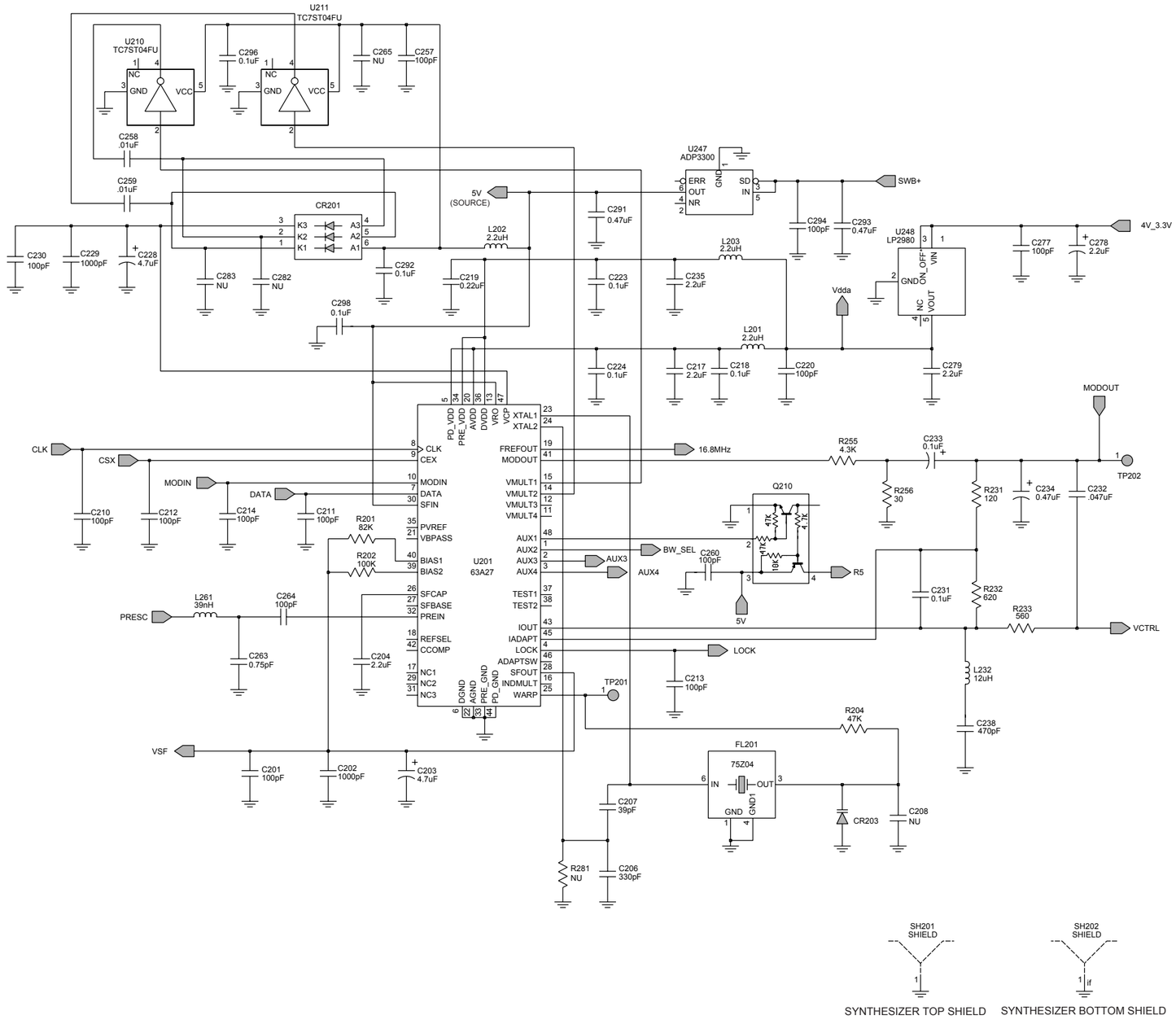


Figure 4-42: UHF (450–512 MHz) Synthesizer Schematic Diagram

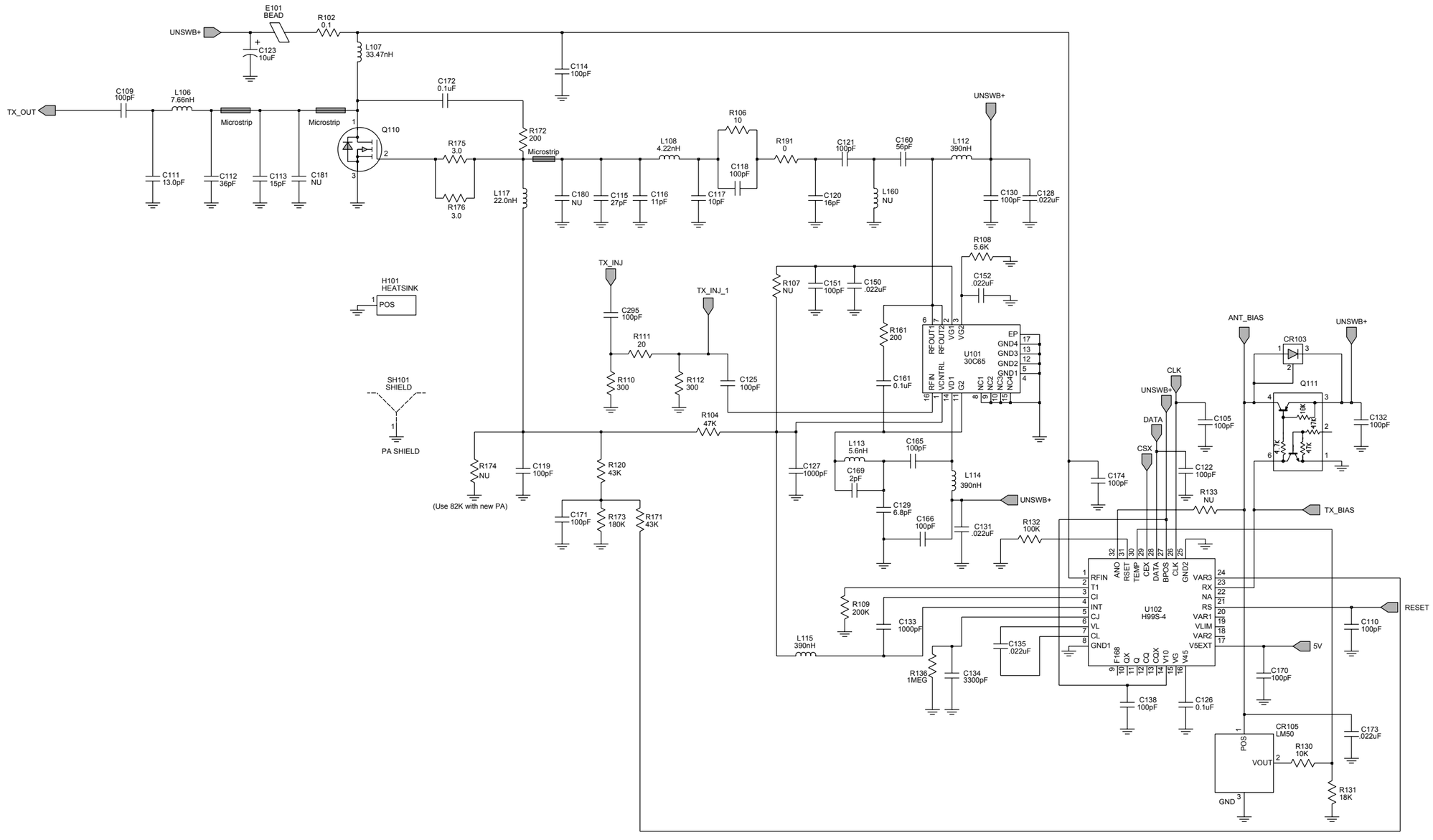


Figure 4-43: UHF (450–512 MHz) Transmitter Schematic Diagram

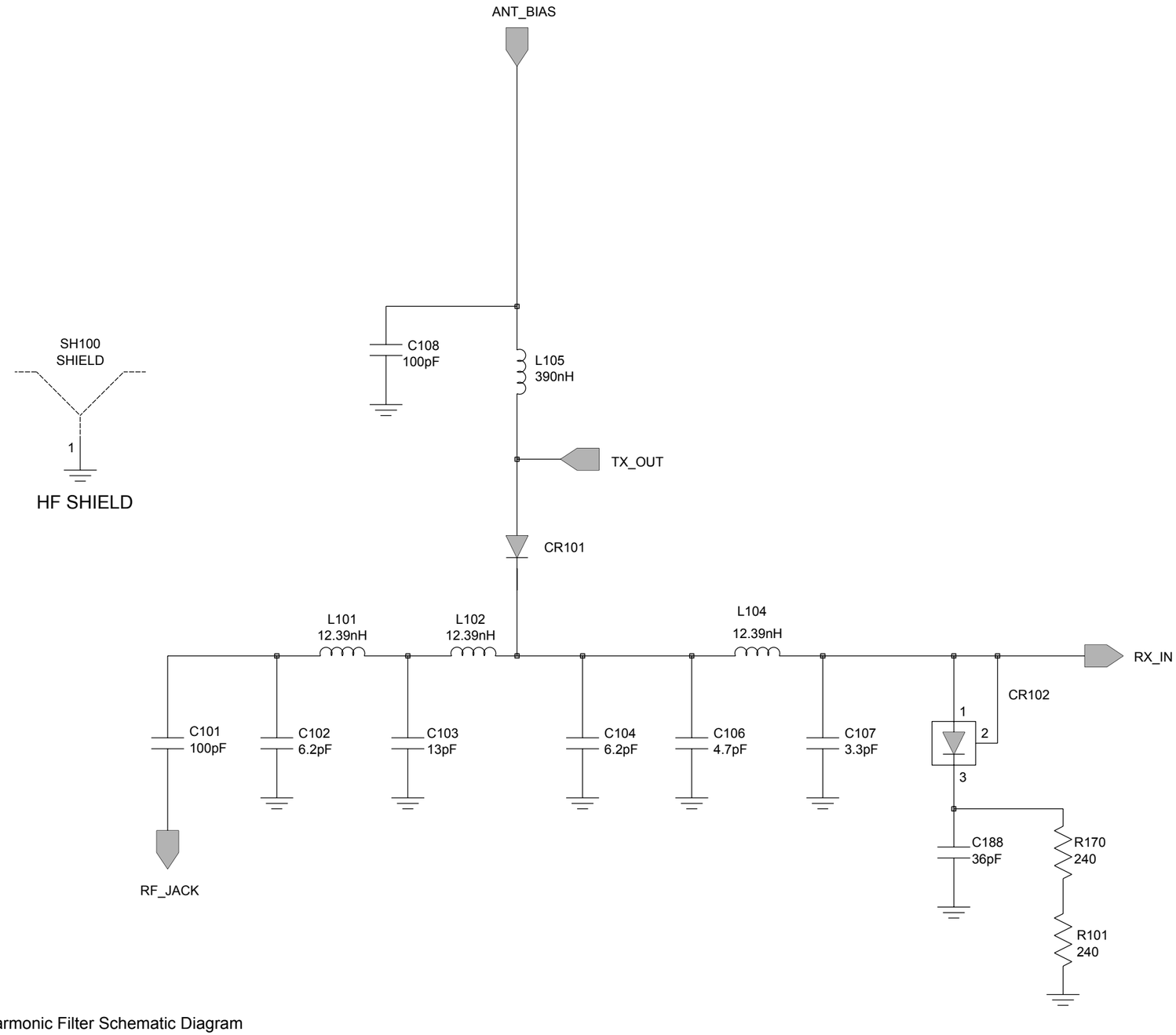


Figure 4-44: UHF (450–512 MHz) Harmonic Filter Schematic Diagram

UHF (450–512 MHz) Radio Parts List (PCB 8486686Z02 rev. A)

Circuit Ref	Motorola Part No.	Description
B501	0986237A02	Battery Contact Module
B503	NOT PLACED	
B504	NOT PLACED	
C101	2113740F51	100pF
C102	2113740F22	6.2pF
C103	2113740F28	11pF
C104	2113740F22	6.2pF
C105	2113743N50	100pF
C106	2113740F19	4.7pF
C107	2113740F15	3.3pF
C108	2113743N50	100pF
C109	2113740F51	100pF
C110	2113743N50	100pF
C111	2103689A22	11pF
C112	2180605Z28	33pF
C113	2180605Z20	15pF
C114	2113743N50	100pF
C115	2113743N31	16pF
C116	2113743N27	11pF
C117	NOT PLACED	
C118	2113743N50	100pF
C119	2113743N50	100pF
C120	2113743N23	7.5pF
C121	2113743N50	100pF
C122	2113743N50	100pF
C123	2311049A96	33uF
C125	2113743N50	100pF
C126	2113743M24	100000pF
C127	2113743L17	1000pF
C128	2113743M08	22000pF
C129	2113743N23	7.5pF
C130	2113743N50	100pF
C131	2113743M08	22000pF
C132	2113743N50	100pF
C133	2113743L17	1000pF
C134	2113743L29	3300pF
C135	2113743M08	22000pF
C138	2113743N50	100pF
C140	0662057A67	5600
C141	2113740F25	8.2pF
C150	2113743M08	22000pF
C151	2113743N50	100pF
C152	2113743M08	22000pF
C160	2113743N44	56pF
C161	2113743M24	100000pF
C165	2113743N44	56pF
C166	2113743N50	100pF
C169	2113743N09	2pF
C170	2113743N50	100pF
C171	2113743N50	100pF
C172	2113743E20	0.1uF
C173	2113743M08	22000pF
C174	2113743N50	100pF
C180	NOT PLACED	
C181	NOT PLACED	
C188	2113743N39	36pF
C201	2113743N50	100pF
C202	2113743L17	1000pF
C203	2311049A56	4.7uF
C204	2104993J02	2.2uF
C206	2113740F63	330pF
C207	2113743N40	39pF
C208	NOT PLACED	
C210	2113743N50	100pF
C211	2113743N50	100pF
C212	2113743N50	100pF
C213	2113743N50	100pF
C214	2113743N50	100pF
C217	2104993J02	2.2uF
C218	2113743M24	100000pF
C219	2113743K16	0.22uF
C220	2113743N50	100pF
C223	2113743M24	100000pF
C224	2113743M24	100000pF
C228	2311049J11	4.7uF
C229	2113743L17	1000pF
C230	2113743N50	100pF
C231	2113743M24	100000pF
C232	2113743E12	0.047uF
C233	2311049A01	0.1uF
C234	2311049A05	0.47uF
C235	2104993J02	2.2uF
C238	2113741F17	470pF
C241	2113743N50	100pF
C242	2113743N17	4.3pF
C243	2113743N17	4.3pF
C244	2113740F14	3pF
C245	2113743N12	2.7pF
C246	2113743N50	100pF
C247	2113743N50	100pF
C248	2113743M24	100000pF
C250	2113743N17	4.3pF
C251	2113743N50	100pF
C252	2113743N19	5.1pF
C253	2113740F09	1.8pF
C254	2113743N26	10pF
C255	2113743N50	100pF
C256	2113743N19	5.1pF
C257	2113743N50	100pF
C258	2113743L41	10000pF
C259	2113743L41	10000pF
C260	2113743N50	100pF
C263	2113743N02	0.75pF
C264	2113743N50	100pF
C265	NOT PLACED	
C271	NOT PLACED	
C272	2109445U01	0.5pF
C273	2113743M24	100000pF
C276	2104993J02	2.2uF
C277	2113743N50	100pF
C278	2311049A57	10uF
C279	2104993J02	2.2uF
C281	2113743N50	100pF
C282	NOT PLACED	
C283	NOT PLACED	
C285	2113743N50	100pF
C286	2113743M24	100000pF
C289	2113743N50	100pF
C291	2311049A69	10uF
C292	2113743M24	100000pF
C293	2113743A27	0.47uF
C294	2113743N50	100pF
C295	2113743N50	100pF
C296	2113743M24	100000pF
C297	2113743L41	10000pF
C298	2113743M24	100000pF
C301	2113743N24	8.2pF
C302	2113743N28	12pF
C303	2113740L09	4.3pF
C304	2113743N27	11pF
C305	2113743N50	100pF
C306	NOT PLACED	
C307	2113743N50	100pF
C308	2113743N50	100pF
C309	2113743N50	100pF
C310	2113743N50	100pF
C311	NOT PLACED	
C312	2113743N23	7.5pF
C313	2113743N27	11pF
C314	2113743M24	100000pF
C315	2113743N50	100pF
C316	2113740L09	4.3pF
C317	2113743N65	8pF
C318	2113743N28	12pF
C319	2113743N17	4.3pF
C320	2113743N25	9.1pF
C321	2113743N50	100pF
C322	2113743N48	82pF
C324	2109445U40	20pF
C325	2109445U26	9.1pF
C326	2113743M24	100000pF
C327	2113743M24	100000pF
C328	2113743M24	100000pF
C329	2113743M24	100000pF
C334	2113743L33	4700pF
C337	NOT PLACED	
C338	NOT PLACED	
C343	2113743M24	100000pF
C344	2113743E20	0.1uF
C345	2113743M24	100000pF
C346	2113743M24	100000pF
C347	2113743M24	100000pF
C348	2113743M24	100000pF
C349	2113743E20	0.1uF
C350	2113743M24	100000pF
C351	2113743N52	120pF
C352	2113743M24	100000pF
C355	2113743M24	100000pF
C357	2113743M24	100000pF
C358	NOT PLACED	
C359	NOT PLACED	
C360	2113743N14	3.3pF
C361	2113743M24	100000pF
C362	2113743M24	100000pF
C364	2113743N35	24pF
C366	NOT PLACED	
C367	2113743N37	30pF
C370	2109445U18	4.3pF
C371	NOT PLACED	
C372	2113743N50	100pF
C373	NOT PLACED	
C374	2113743N50	100pF
C375	2113743N50	100pF
C378	NOT PLACED	
C380	2113743L41	10000pF
C381	NOT PLACED	
C382	2311049A59	10uF
C383	NOT PLACED	
C385	2113743N35	24pF
C386	2113743N50	100pF
C390	NOT PLACED	
C400	2113743L41	10000pF
C401	2113743M24	100000pF
C402	2113743M24	100000pF
C403	2113743G24	2.2uF
C404	NOT PLACED	
C405	2113743N50	100pF
C406	NOT PLACED	
C407	2113928N01	0.1uF
C408	2113743N50	100pF
C409	2113743M24	100000pF
C410	2113928N01	0.1uF
C411	2113743M24	100000pF
C414	2113743M24	100000pF
C415	2185895Z01	0.01uF
C416	2113928N01	0.1uF
C419	NOT PLACED	
C420	2113743L41	10000pF
C421	2113928N01	0.1uF
C422	2113743M24	100000pF
C423	2113743N50	100pF
C424	2311049A59	10uF
C425	2113743M24	100000pF
C426	2113743N50	100pF
C427	2113743N50	100pF
C428	2113743M24	100000pF
C429	2113743M24	100000pF
C430	2113928N01	0.1uF
C431	2113743N50	100pF
C432	NOT PLACED	
C433	2113743L41	10000pF
C434	NOT PLACED	

Circuit Ref	Motorola Part No.	Description
C435	2113743M24	100000pF
C436	NOT PLACED	
C437	NOT PLACED	
C440	2113743G26	4.7uF
C441	2113743N50	100pF
C442	2113743E20	0.1uF
C443	2113928N01	0.1uF
C444	2113743N50	100pF
C445	2113743N50	100pF
C447	2113743M08	22000pF
C448	2113928N01	0.1uF
C449	2113743N50	100pF
C450	NOT PLACED	
C451	2113743M08	22000pF
C452	2113743B29	1uF
C453	2113743N50	100pF
C456	2113743N50	100pF
C458	2113743N50	100pF
C459	2113743N50	100pF
C463	2113743N50	100pF
C466	2113743N50	100pF
C467	2113928N01	0.1uF
C471	2113743N50	100pF
C472	2113743L09	470pF
C473	2113743L09	470pF
C475	2113743H14	10uF
C476	2113928D08	10uF
C479	2113928N01	0.1uF
C480	2113928D08	10uF
C481	2113928N01	0.1uF
C482	2113928N01	0.1uF
C490	2113743N50	100pF
C491	2113743N50	100pF
C492	2113743N50	100pF
C493	2113743N50	100pF
C494	2113743N50	100pF
C495	2113743N50	100pF
C496	2113743N50	100pF
C497	2113743N50	100pF
C498	NOT PLACED	
C502	2311049A05	0.47uF
C503	2113743N50	100pF
C505	2113743N50	100pF
C511	2113743N50	100pF
C512	2113743N50	100pF
C513	2113743N50	100pF
C514	2113743N50	100pF
C520	2113743L41	10000pF
C521	2113743L41	10000pF
C522	2113743L41	10000pF
C523	2113743L41	10000pF
C524	2113743N50	100pF
C525	2113743N50	100pF
C526	2113743N50	100pF
C527	2113743N50	100pF
C528	2113743N50	100pF

Circuit Ref	Motorola Part No.	Description
C529	2113743N50	100pF
CR101	4880973Z02	Pin Diode
CR102	4802245J41	Pin Diode
CR103	4802245J41	Pin Diode
CR105	5185963A15	Temperature Sensor
CR160	NOT PLACED	
CR201	4802233J09	Triple Diode
CR203	4862824C03	Varactor
CR241	4805649Q13	Varactor
CR242	4862824C01	Varactor
CR243	4862824C01	Varactor
CR251	4802245J22	Varactor
CR301	4862824C01	Varactor
CR302	4862824C01	Varactor
CR303	4880154K03	Dual Schottky Diode
CR304	4862824C01	Varactor
CR305	4862824C01	Varactor
CR306	4802245J42	Ring Quad Diode
CR311	4813825A19	Diode Schottky
CR312	4802245J97	Switch Diode
CR313	4802245J97	Switch Diode
CR411	4802245J62	Diode Schottky
CR412	4802245J62	Diode Schottky
CR413	4802245J62	Diode Schottky
CR440	4813833C02	Dual Common Cathode Diode
CR501	4880107R01	Rectifier
CR503	4805729G49	Red/Yellow LED
E101	2484657R01	FERRITE BEAD
E400	2480640Z01	FERRITE BEAD
E401	2480640Z01	FERRITE BEAD
E402	2480640Z01	FERRITE BEAD
E403	2480640Z01	FERRITE BEAD
E404	2480640Z01	FERRITE BEAD
E405	2480640Z01	FERRITE BEAD
E406	2480640Z01	FERRITE BEAD
E407	2480640Z01	FERRITE BEAD
E408	2480640Z01	FERRITE BEAD
E409	2480640Z01	FERRITE BEAD
F501	6580542Z01	Fuse 3A
FL201	4805875Z04	16.8 MHZ Xtal Filter
FL301	9180022M11	Xtal Filter 44.85MHz
FL302	9180468V05	455kHz 4-pole ceramic filter
FL303	9180469V05	455kHz 6-pole ceramic filter
FL304	9180469V03	455kHz 6-pole ceramic filter
FL401	NOT PLACED	
H101	2680499Z01	Heat Spreader
J101	0985613Z01	RF Jack
J102	0280519Z02	Antenna Nut
J400	0905505Y04	40-Pin Connector
J403	0905505Y02	20-Pin Connector
L101	2460591B28	13.37nH
L102	2460591B28	13.37nH
L104	2460591B48	15.22 nH
L105	2462587N22	390nH
L106	2460591A19	8.71nH
L107	2479990G01	33.47nH

Circuit Ref	Motorola Part No.	Description
L108	2479990A01	4.22nH
L112	2462587N42	12nH
L113	2413926H09	5.6nH
L114	2462587N42	12nH
L115	2462587N22	390nH
L116	2479990C02	16.28nH
L117	2409154M17	22nH
L160	2413926H14	15nH
L201	2462587Q20	2200nH
L202	2462587Q20	2200nH
L203	2462587Q20	2200nH
L232	2462587P25	12000nH
L241	2462587V41	390nH
L242	2462587V26	22nH
L243	2485776Z02	Multi-layered Teflon resonator, Rx
L251	2462587V41	390nH
L253	2460593C03	Multi-layered Teflon resonator, Tx
L261	2462587V29	39nH
L271	2462587V27	27nH
L273	2462587V32	68nH
L281	2462587V41	390nH
L282	2462587V41	390nH
L301	2479990B01	11.03nH
L302	2479990B01	11.03nH
L303	2462587V26	22nH
L304	2462587V37	180nH
L305	2462587V23	12nH
L306	2479990B01	11.03nH
L307	2479990B01	11.03nH
L309	2479990C02	16.28nH
L310	2462587V36	150nH
L311	2413926K32	560nH
L321	2462587V37	180nH
L325	2462587N68	1000nH
L330	2413926K33	680nH
L332	2413923A25	1200nH
L400	2462587Q42	390nH
L401	2462587Q42	390nH
L410	2462587Q42	390nH
L411	2462587Q42	390nH
L505	2462587Q42	390nH
P100	3905643V01	Ground Contact Finger
PB501	4086470Z01	Tactile Switch
PB502	4086470Z01	Tactile Switch
PB503	4086470Z01	Tactile Switch
PB504	4086470Z01	Tactile Switch
PB505	4086470Z01	Tactile Switch
Q110	4813828A09	RF PA
Q111	4809939C05	DUAL NPN/PNP Transistor
Q210	4809939C05	DUAL NPN/PNP Transistor
Q241	4805218N63	RF NPN Transistor
Q260	4809939C05	DUAL NPN/PNP Transistor
Q261	4809939C05	DUAL NPN/PNP Transistor
Q301	4802245J44	NPN Transistor
Q302	4802197J95	NPN Transistor
Q310	4802245J44	NPN Transistor

Circuit Ref	Motorola Part No.	Description
Q320	4813824A10	RF NPN transistor
Q400	4809579E18	MOSFET P-Channel
Q403	4813824A17	PNP Transistor
Q405	4802245J54	Dual NPN Transistor
Q410	4802245J54	Dual NPN Transistor
Q416	NOT PLACED	
Q417	4809939C05	DUAL NPN/PNP Transistor
Q502	5180159R01	Dual NPN Transistor
Q505	4880214G02	NPN Transistor
R101	0662057A34	240
R102	0680539Z01	0.1
R104	0662057N15	47K
R106	0662057M26	10
R107	NOT PLACED	
R108	0662057M92	5600
R109	0662057N30	200K
R110	0662057M61	300
R111	0662057M33	20
R112	0662057M61	300
R120	0662057N14	43K
R130	0662057M98	10K
R131	0662057N05	18K
R132	0662057N33	270K
R133	NOT PLACED	
R136	NOT PLACED	
R161	0662057M57	200
R170	0662057A34	240
R171	0662057N14	43K
R172	0662057A32	200
R173	0662057N29	180K
R174	0662057N15	47K
R175	0662057B59	3
R176	0662057B59	3
R191	0662057C01	0
R201	0662057N21	82K
R202	0662057N23	100K
R204	0662057N15	47K
R231	0662057M52	120
R232	0662057M69	620
R233	0662057M68	560
R241	0662057M34	22
R242	0662057M52	120
R243	0662057M98	10K
R244	0662057N03	15K
R245	0662057M59	240
R248	0662057M37	30
R251	0662057M38	33
R252	0662057M60	270
R253	0662057M95	7500
R254	0662057M96	8200
R255	0662057M89	4300
R256	0662057M37	30
R260	0662057M74	1000
R281	NOT PLACED	
R301	0662057N23	100K
R302	0662057N23	100K

Circuit Ref	Motorola Part No.	Description
R303	0662057M78	1500
R304	0662057N01	12K
R305	0662057M66	470
R306	0662057N23	100K
R307	0662057N23	100K
R308	0662057M43	51
R309	0662057M01	0
R310	NOT PLACED	
R311	0662057N11	33K
R312	0662057M90	4700
R313	0662057M62	330
R314	0662057M79	1600
R315	0662057N01	12K
R320	NOT PLACED	
R321	0662057N01	12K
R322	0662057M74	1000
R324	0662057N25	120K
R328	0662057M12	2.7
R329	0662057M01	0
R330	0662057M98	10K
R331	0662057M57	200
R332	0662057N01	12K
R333	NOT PLACED	
R339	0662057M89	4300
R340	0662057M96	8200
R342	0662057N23	100K
R344	0662057M43	51
R345	0662057N13	39K
R346	0662057N03	15K
R348	0662057M87	3600
R349	0662057C01	0
R350	0662057M98	10K
R355	0662057N23	100K
R358	0662057M74	1000
R359	NOT PLACED	
R360	0662057N06	20K
R361	0662057N06	20K
R363	0662057M64	390
R364	0662057M80	1800
R365	0662057M76	1200
R366	0662057N01	12K
R367	0662057V04	12K
R368	0662057V02	10K
R369	0662057M70	680
R370	0662057M01	0
R371	NOT PLACED	
R372	NOT PLACED	
R373	NOT PLACED	
R374	NOT PLACED	
R375	NOT PLACED	
R376	NOT PLACED	
R377	NOT PLACED	
R378	NOT PLACED	
R400	0662057N15	47K
R401	0662057M01	0
R402	NOT PLACED	

Circuit Ref	Motorola Part No.	Description
R403	NOT PLACED	
R405	0662057M01	0
R406	0662057N20	75K
R407	0662057N19	68K
R408	NOT PLACED	
R409	0662057M98	10K
R410	0662057N23	100K
R411	0662057M98	10K
R413	0662057M01	0
R414	0662057V34	180K
R415	0662057V26	91K
R416	0662057M98	10K
R418	0662057M01	0
R419	0662057M67	510
R420	NOT PLACED	
R421	0662057M81	2000
R423	0662057N39	470K
R424	0662057N12	36K
R425	0662057N10	30K
R426	NOT PLACED	
R427	0662057M84	2700
R428	0662057M10	2.2
R429	0662057N20	75K
R431	0662057N39	470K
R432	0662057N16	51K
R434	0662057M62	330
R435	0662057M81	2000
R436	0662057M01	0
R437	NOT PLACED	
R445	0662057N08	24K
R447	0662057N23	100K
R448	0662057M98	10K
R449	0662057N08	24K
R450	0683962T45	68
R451	0662057N03	15K
R452	0662057N23	100K
R453	NOT PLACED	
R454	NOT PLACED	
R455	NOT PLACED	
R456	0662057M01	0
R457	0662057M98	10K
R460	0662057M90	4700
R461	NOT PLACED	
R462	NOT PLACED	
R463	0662057M61	300
R471	0662057N06	20K
R472	0662057N12	36K
R473	0662057M26	10
R475	0662057M01	0
R476	0662057N35	330K
R477	0662057M74	1000
R478	0662057M98	10K
R481	0662057N08	24K
R492	0662057M01	0
R498	0662057M98	10K
R499	0662057M98	10K

Circuit Ref	Motorola Part No.	Description
R501	0662057M70	680
R502	0662057M56	180
R505	0662057M98	10K
R506	0662057N15	47K
R507	0662057M01	0
RT400	0680590Z01	Thermistor_33K
S501	4080710Z01	Frequency Switch
S502	1880619Z02	Volume / On-off Switch
SH100	2680507Z01	Harmonic Filter Shield
SH101	2680510Z01	PA Shield
SH201	2680511Z01	Synthesizer Top Shield
SH202	2680511Z01	Synthesizer Bottom Shield
SH241	2604120G01	VCO Resonators Shield
SH242	2680514Z01	VCO Buffer IC Shield
SH301	2686583Z01	Receiver Front-End Shield
SH302	2680555Z01	Receiver Back-End Bottom Shield
SH303	2680509Z01	Mixer Shield
SH304	2680624Z01	Mixer Diode Shield
SH322	2686528Z01	IFIC Shield
SH323	2686527Z01	Crystal Filter Shield
SH400	2680505Z01	Controller Memory Shield
SH401	2680506Z01	Controller On-off Shield
SH402	2680515Z01	Microprocessor Shield
SH403	2680516Z01	Asfic_Cmp, Audio PA Shield
T301	2580541Z02	Balun Transformer
T302	2580541Z02	Balun Transformer
U101	5185130C65	LDMOS PA Driver
U102	5185765B26	PCIC
U201	5185963A27	LVFRACN Synthesizer IC
U210	5102463J61	Inverter
U211	5102463J61	Inverter
U241	5105750U54	VCO Buffer IC
U247	5105739X05	5V Regulator
U248	5102463J58	3.3V Regulator
U301	5186144B01	FM IFIC SA616
U302	5109522E10	LMOS Inverter
U303	NOT PLACED	
U400	5102463J40	3.3V Regulator
U404	5185130C53	ASFIC_CMP IC
U405	5102463J36	Static RAM 32K X 8
U406	5102463J60	Flash ROM 512K X 8
U407	5102495J05	EEPROM 16K X 8
U409	5102226J56	Micro Processor
U410	NOT PLACED	
U420	5102463J44	Audio PA
VR432	4805656W08	5.6V Zener
VR433	4805656W08	5.6V Zener
VR434	4802245J73	Zener Diode 6.8V
VR439	4880140L17	Zener Diode 12V
VR440	4802245J73	Zener Diode 6.8V
VR441	4802245J73	Zener Diode 6.8V
VR442	4802245J73	Zener Diode 6.8V
VR443	4802245J73	Zener Diode 6.8V
VR444	4802245J73	Zener Diode 6.8V
VR445	4802245J74	Zener Diode 10V
VR446	4802245J74	Zener Diode 10V

Circuit Ref	Motorola Part No.	Description
VR447	4802245J74	Zener Diode 10V
VR448	4802245J74	Zener Diode 10V
VR449	4802245J74	Zener Diode 10V
VR450	4802245J75	Zener Diode 12V
VR460	4802245J73	Zener Diode 6.8V
VR501	4813830A18	Diode 6.8V
VR506	4802245J73	Zener Diode 6.8V
Y300	4802245J84	Xtal Oscillator 44.395MHz
Y301	9186145B02	455kHz Ceramic Discriminator
	1485777Z01	Insulator (KAPTON)
	8486686Z02	UHF B2 PC Board

* Motorola Depot Servicing only

4.8 UHF Band 2 Circuit Board/Schematic Diagrams and Parts List (8415235H07)

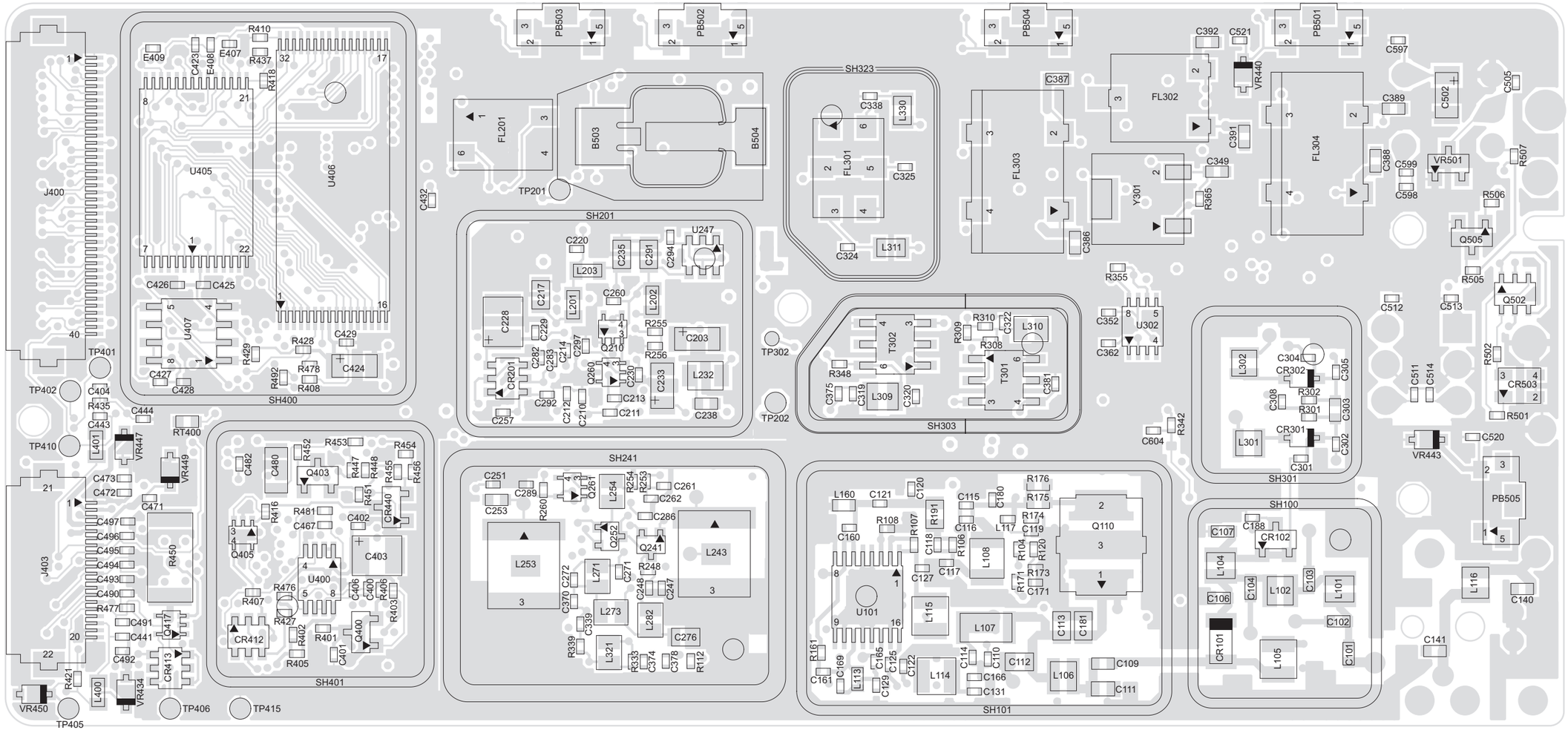


Figure 4-45: UHF Band 2 (450–527 MHz) Main Board Top Side: PCB No. 8415235H07

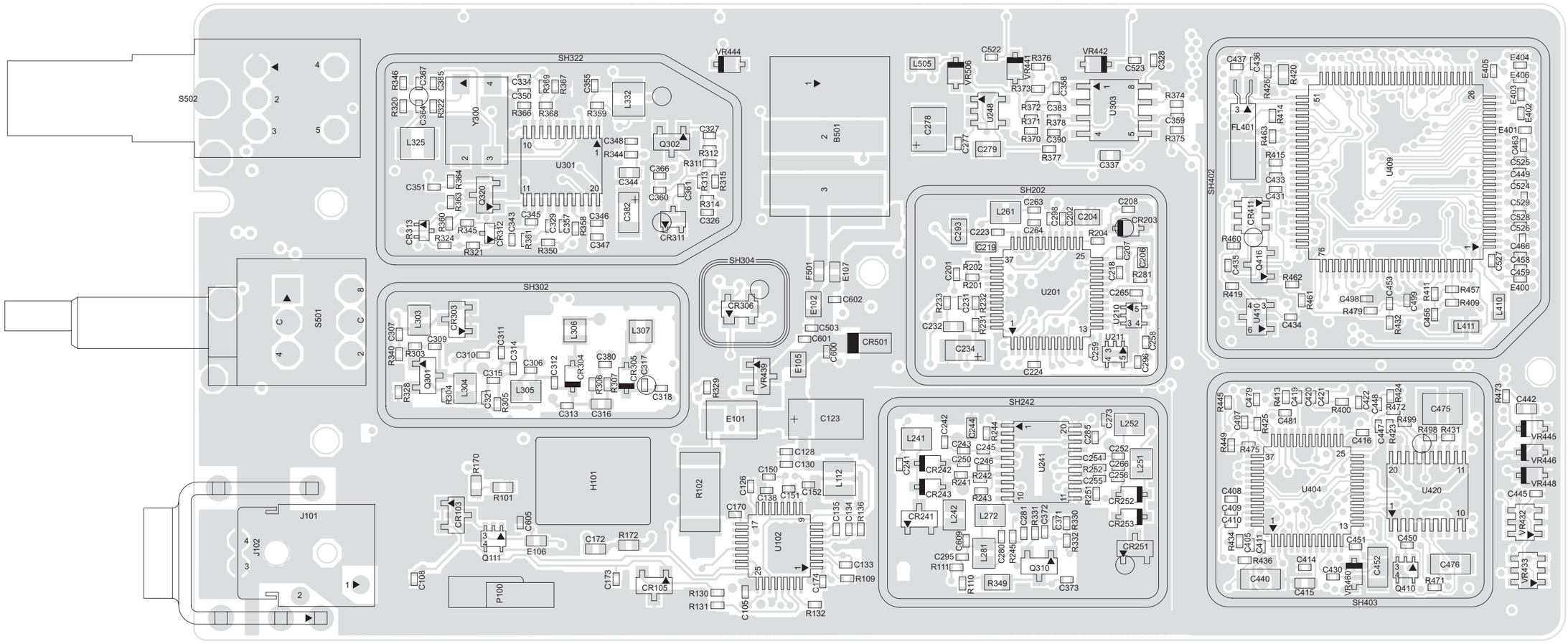


Figure 4-46: UHF Band 2 (450-527 MHz) Main Board Bottom Side: PCB No. 8415235H07

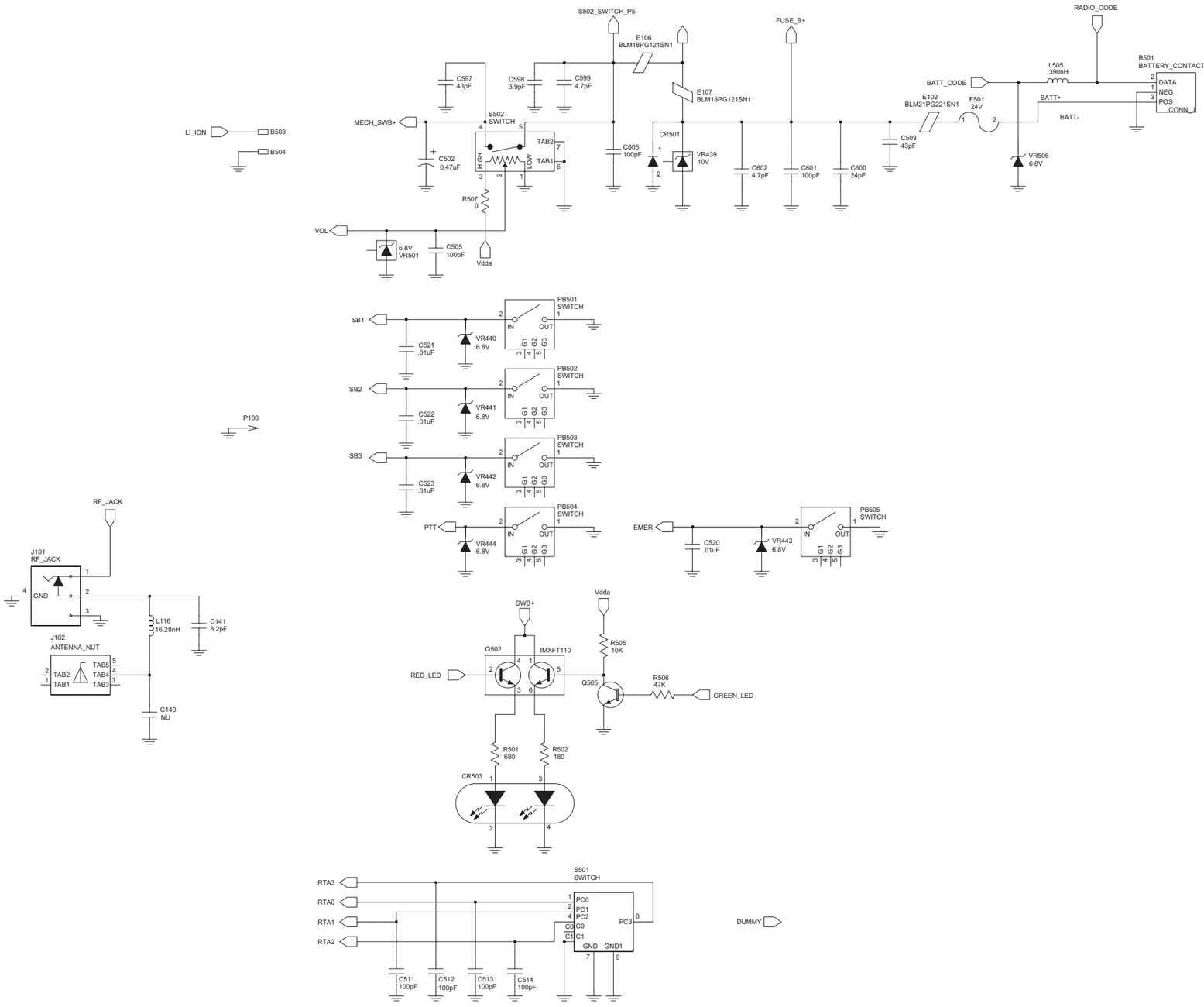


Figure 4-47: UHF Band 2 Controls And Switches Schematic Diagram (PCB No. 8415235H07)

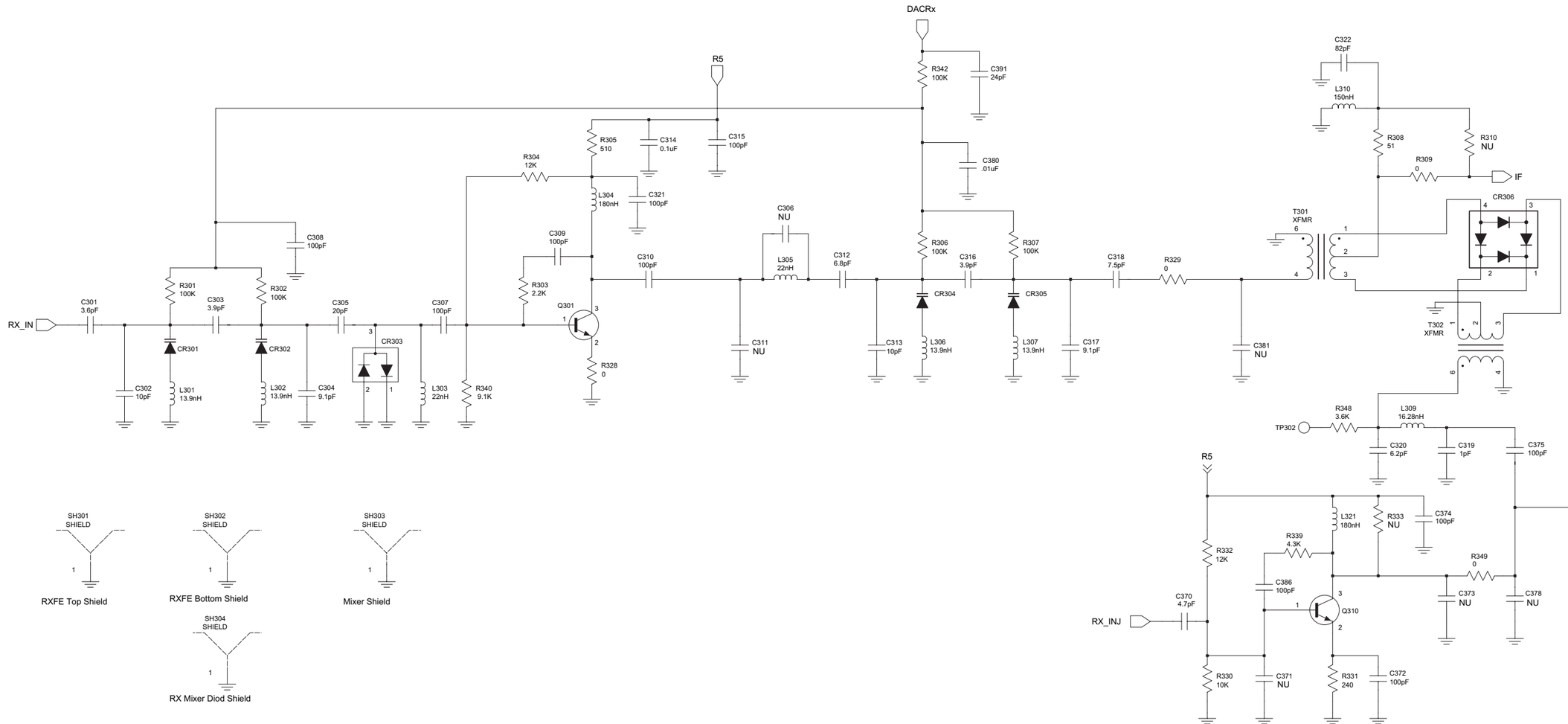


Figure 4-48: UHF Band 2 Receiver Front End Schematic Diagram (PCB No. 8415235H07)

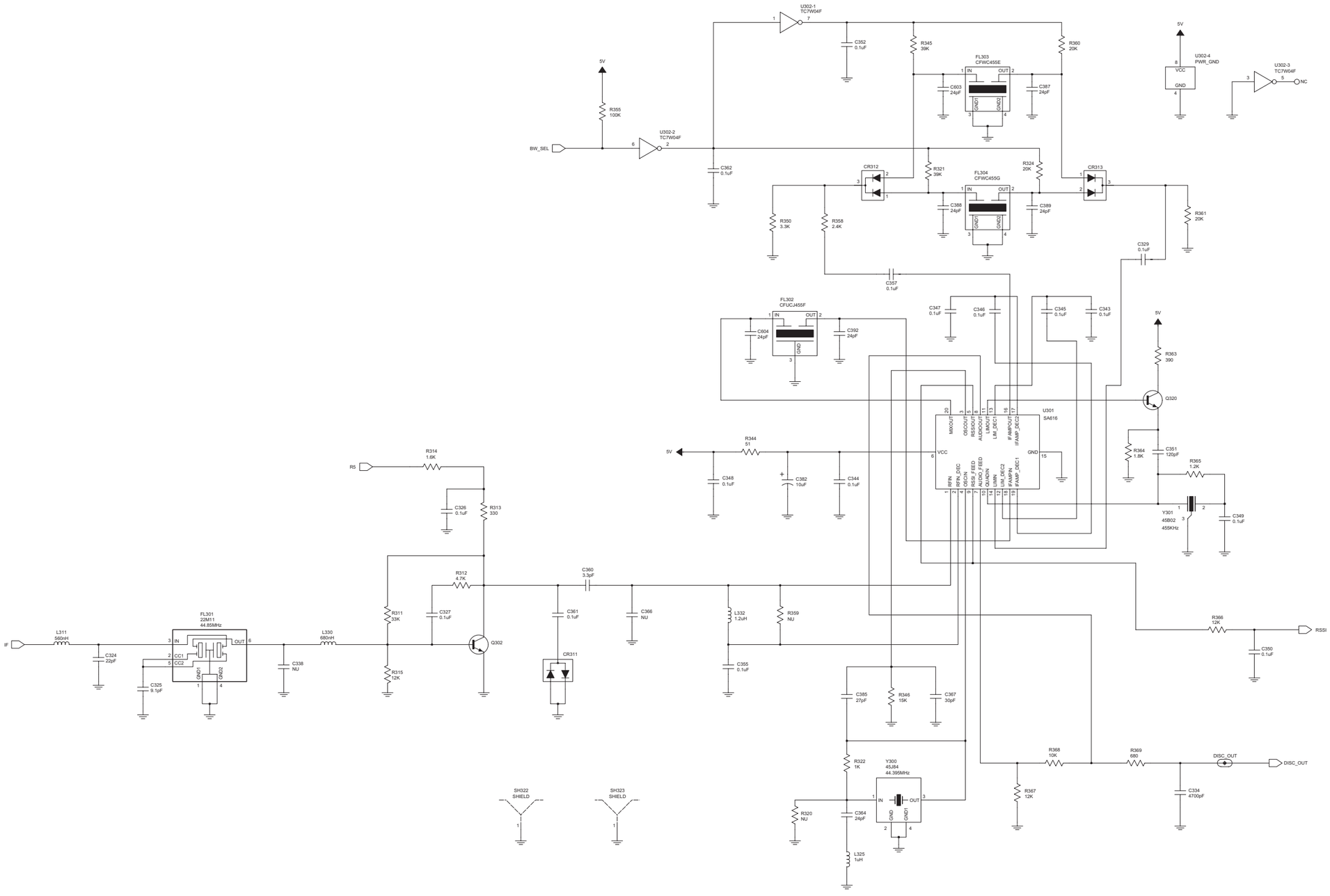


Figure 4-49: UHF Band 2 Receiver Back End Schematic Diagram (PCB No. 8415235H07)

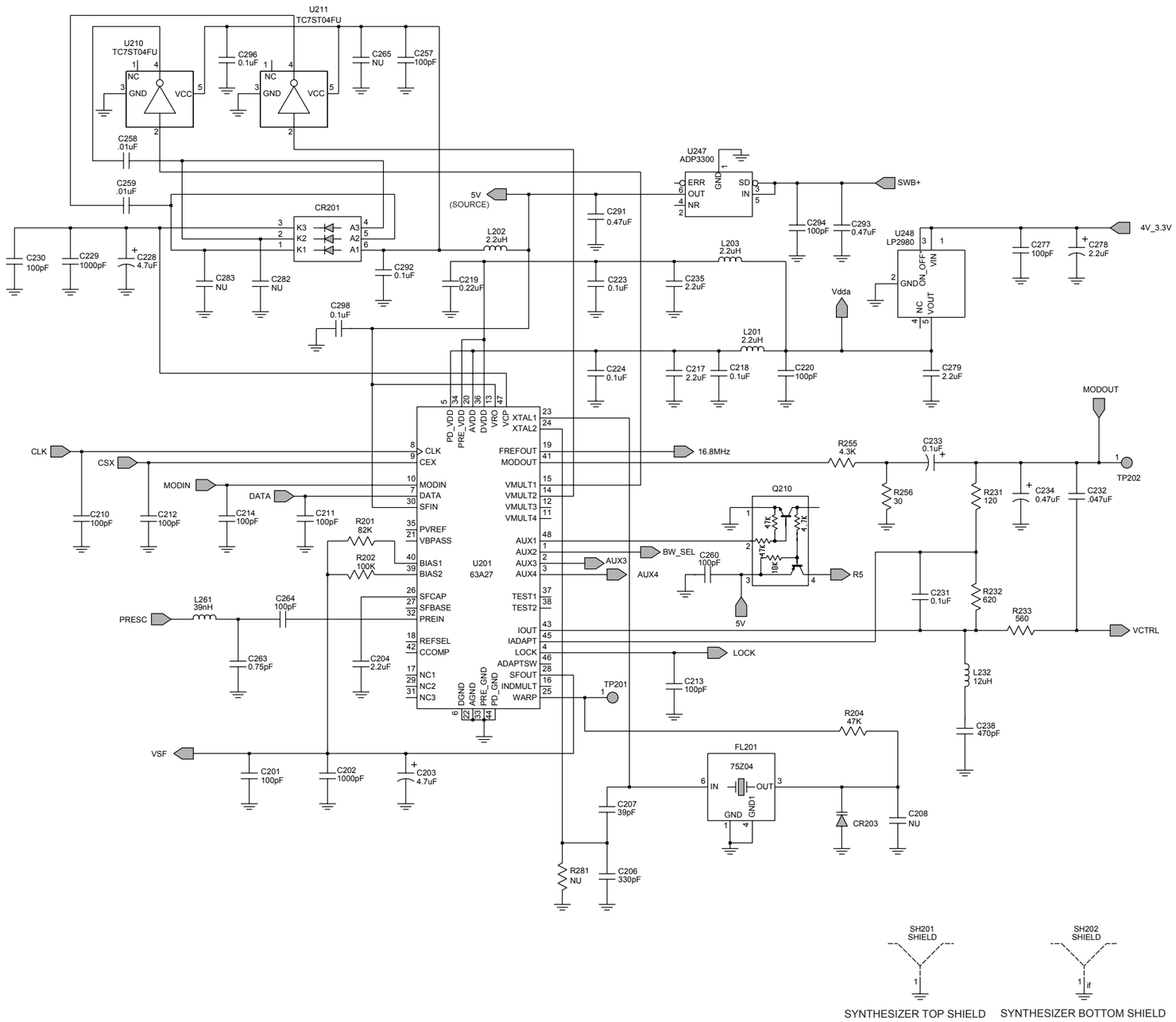


Figure 4-50: UHF Band 2 Synthesizer Schematic Diagram (PCB No. 8415235H07)

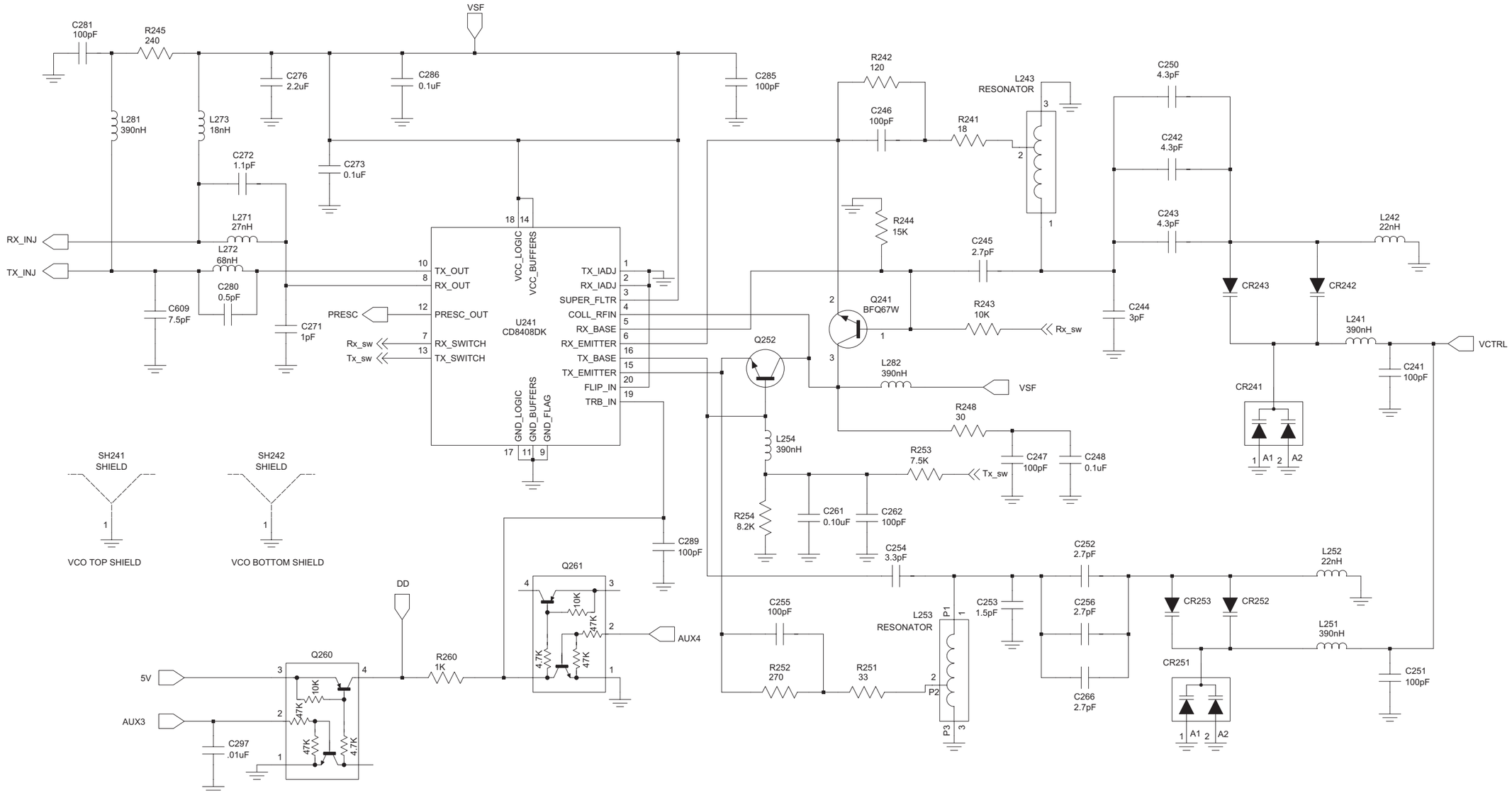


Figure 4-51: UHF Band 2 Voltage Controlled Oscillator Schematic Diagram (PCB No. 8415235H07)

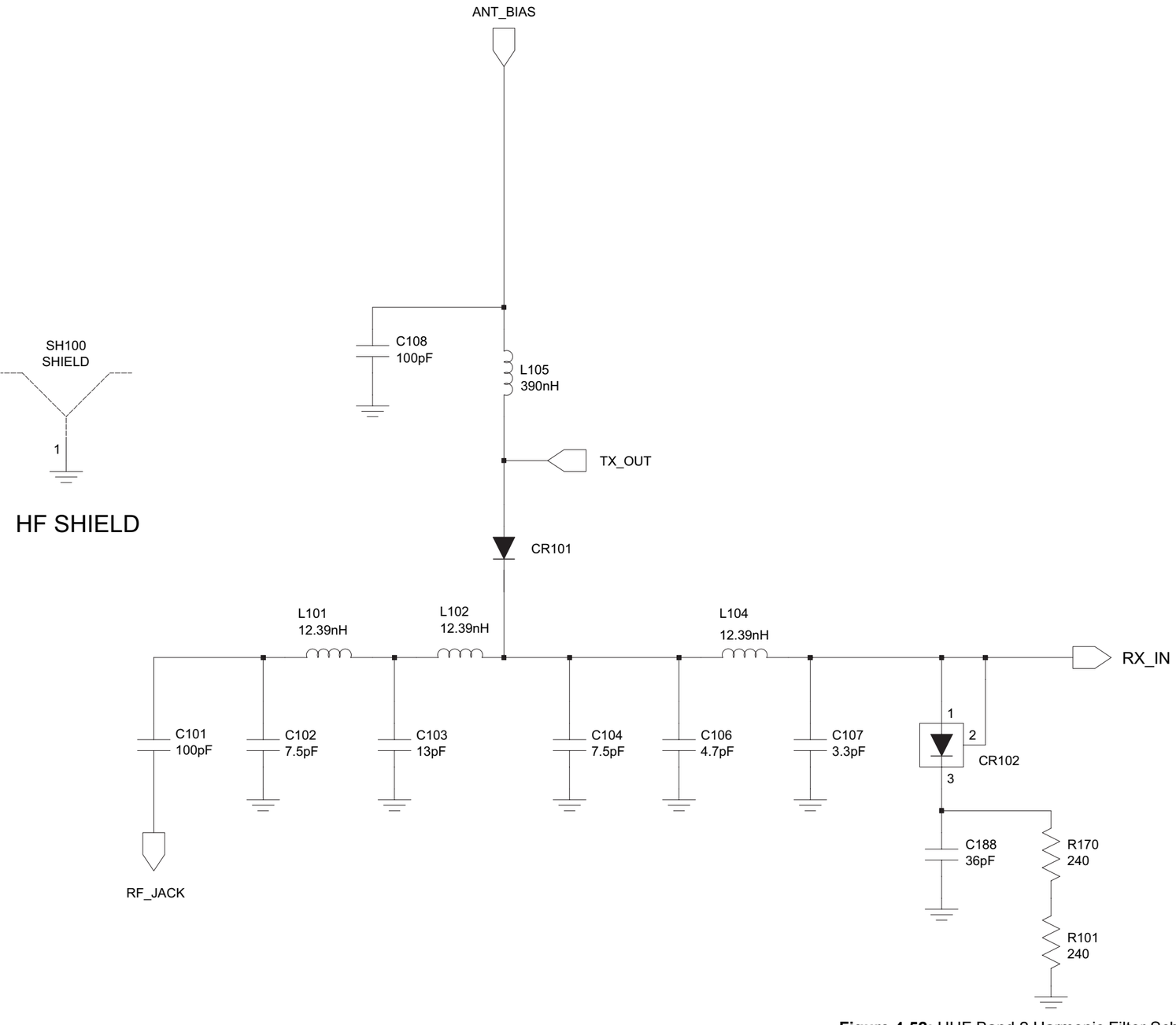


Figure 4-52: UHF Band 2 Harmonic Filter Schematic Diagram (PCB No. 8415235H07)

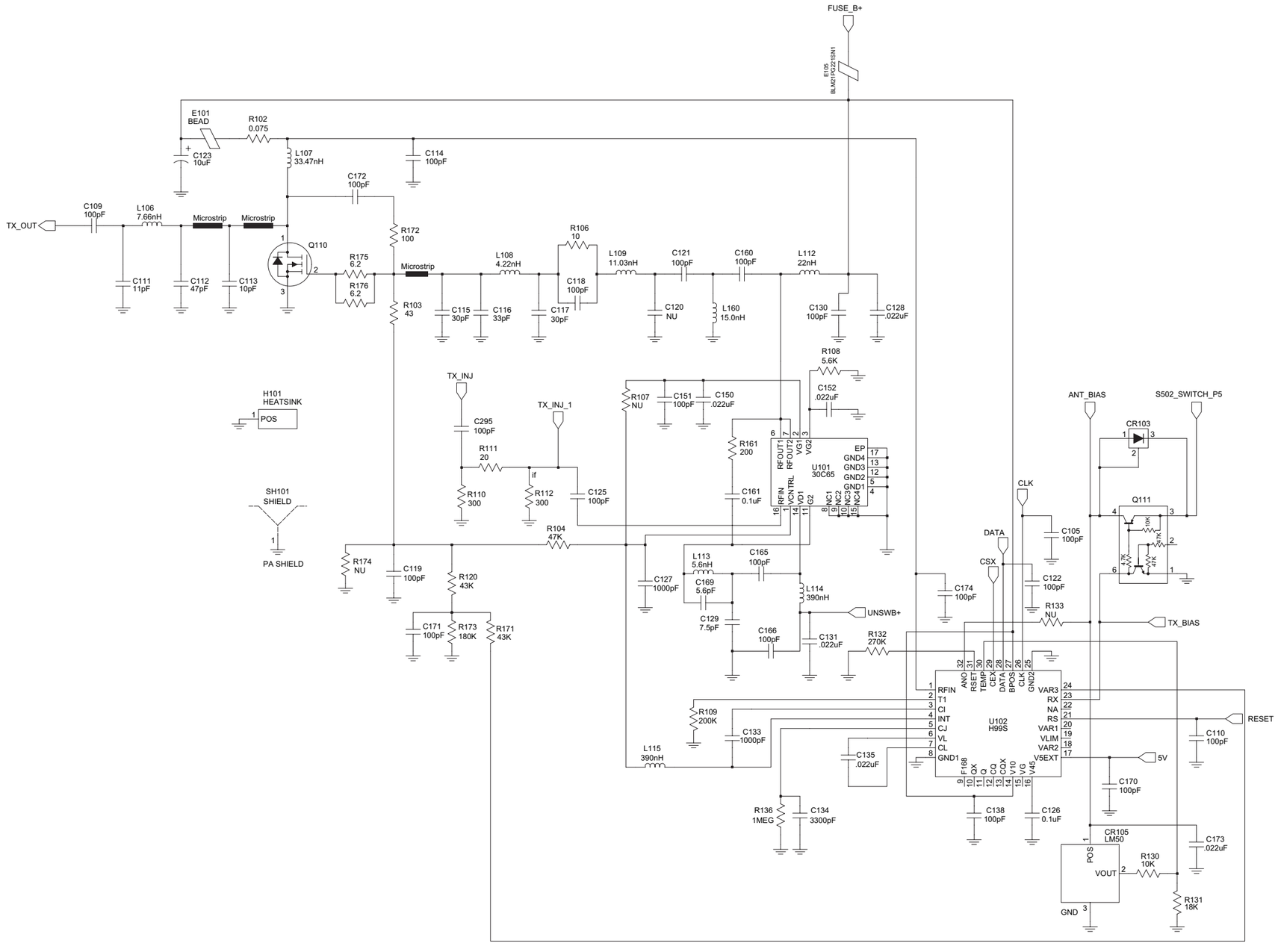


Figure 4-53: UHF Band 2 Transmitter Schematic Diagram (PCB No. 8415235H07)

UHF (450–527 MHz) Radio Parts List (PCB 8415235H07)

Circuit Ref	Motorola Part No.	Description
B501	0986237A02	CONNECTOR (CONTACT BATTERY)
B503	3980502Z01	CONTACT, BACKUP B+
B504	3980501Z01	CONTACT, BACKUP B-
C101	2113944C45	CAP CER CHP 100.0PF 50V 5%
C102	2113944C27	CAP CER CHP 7.5PF 50V +/- 0.5P
C103	2113944C78	CAP,FXD,13PF,+5%,-5%, 50V-DC,06
C104	2113944C27	CAP CER CHP 7.5PF 50V +/- 0.5P
C105	2113944A40	CAP CER CHP 100.0PF 50V 5%
C106	2113944C22	CAP CER CHP 4.7PF 50V +/- 0.25
C107	2113944C18	CAP CER CHP 3.3PF 50V +/- 0.25
C108	2113944A40	CAP CER CHP 100.0PF 50V 5%
C109	2113944C45	CAP CER CHP 100.0PF 50V 5%
C110	2113944A40	CAP CER CHP 100.0PF 50V 5%
C111	2175745M04	CERAMIC CAPACITORS, C0G,100/50
C112	2115937H03	HIGH Q CHIP CAPACITOR, 33PF
C113	2115937H02	HIGH Q CHIP CAPACITOR, 15PF
C114	2113944A40	CAP CER CHP 100.0PF 50V 5%
C115	2113944A79	CAP,FXD,16PF,+5%,-5%, 50V-DC,04
C116	2113944A77	CAP,FXD,11PF,+5%,-5%, 50V-DC,04
C117	NOTPLACED	–
C118	2113944A40	CAP CER CHP 100.0PF 50V 5%
C119	2113944A40	CAP CER CHP 100.0PF 50V 5%
C120	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5P
C121	2113944A40	CAP CER CHP 100.0PF 50V 5%
C122	2113944A40	CAP CER CHP 100.0PF 50V 5%
C123	2313960F04	CAP,FXD,33UF,+10%,-10%,16V-DC,
C125	2113944A40	CAP CER CHP 100.0PF 50V 5%
C126	2113946K02	CAP CER CHP 0.10UF 16V
C127	2113945A09	CAP CER CHP 1000PF 50V 10%
C128	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-D
C129	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5P
C130	2113944A40	CAP CER CHP 100.0PF 50V 5%
C131	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-D
C133	2113945A09	CAP CER CHP 1000PF 50V 10%
C134	2113945A12	CAP CER CHP 3300PF 50V 10%
C135	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-D
C138	2113944A40	CAP CER CHP 100.0PF 50V 5%
C140	0613952H91	CER CHIP RES 5600 OHM 5 0603
C141	2113944C28	CAP CER CHP 8.2PF 50V +/- 0.5P
C150	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-D
C151	2113944A40	CAP CER CHP 100.0PF 50V 5%
C152	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-D
C160	2113944A34	CAP CER CHP 56.0PF 50V 5%
C161	2113946K02	CAP CER CHP 0.10UF 16V
C165	2113944A34	CAP CER CHP 56.0PF 50V 5%
C166	2113944A40	CAP CER CHP 100.0PF 50V 5%
C169	2113944A08	CAP CER CHP 2.0PF 50V +/- 0.25
C170	2113944A40	CAP CER CHP 100.0PF 50V 5%
C171	2113944A40	CAP CER CHP 100.0PF 50V 5%
C172	2113945D04	CAP CER CHP 100,000PF 25V 10%
C173	2113945B04	CAP,FXD,.022UF,+10%,-10%, 25V-D
C174	2113944A40	CAP CER CHP 100.0PF 50V 5%
C180	NOTPLACED	–
C181	NOTPLACED	–
C188	2113944A83	CAP,FXD,36PF,+5%,-5%,50V-DC,04
C201	2113944A40	CAP CER CHP 100.0PF 50V 5%
C202	2113945A09	CAP CER CHP 1000PF 50V 10%
C203	2313960B30	CAP,FXD,4.7UF,+10%,-10%, 10V-DC
C204	2113946N03	CAP CER CHP 2.2UF 16V
C206	2113944C04	CAP CER CHP 330.0PF 50V 5%
C207	2113944A32	CAP CER CHP 39.0PF 50V 5%
C208	NOTPLACED	–
C210	2113944A40	CAP CER CHP 100.0PF 50V 5%
C211	2113944A40	CAP CER CHP 100.0PF 50V 5%
C212	2113944A40	CAP CER CHP 100.0PF 50V 5%
C213	2113944A40	CAP CER CHP 100.0PF 50V 5%
C214	2113944A40	CAP CER CHP 100.0PF 50V 5%
C217	2113946N03	CAP CER CHP 2.2UF 16V
C218	2113946K02	CAP CER CHP 0.10UF 16V
C219	2113946L03	CAP CER CHP 0.22UF 16V
C220	2113944A40	CAP CER CHP 100.0PF 50V 5%
C223	2113946K02	CAP CER CHP 0.10UF 16V
C224	2113946K02	CAP CER CHP 0.10UF 16V
C228	2313960D05	CAP,FXD,4.7UF,+10%,-10%, 16V-DC
C229	2113945A09	CAP CER CHP 1000PF 50V 10%
C230	2113944A40	CAP CER CHP 100.0PF 50V 5%
C231	2113946K02	CAP CER CHP 0.10UF 16V
C232	2113945D02	CAP CER CHP 47,000PF 25V 10%
C233	2313960A26	CAP,FXD,.1UF,+10%,-10%, 35V-DC,
C234	2313960A55	CAP,FXD,.47UF,+10%,-10%, 25V-DC
C235	2113946N03	CAP CER CHP 2.2UF 16V
C238	2113945L17	CAP,FXD,470PF,+5%,-5%, 50V-DC,0
C241	2113944A40	CAP CER CHP 100.0PF 50V 5%
C242	2113944A16	CAP CER CHP 4.3PF 50V +/- 0.25
C243	2113944A13	CAP CER CHP 3.3PF 50V +/- 0.25
C244	2113944C15	CAP CER CHP 2.4PF 50V +/- 0.25
C245	2113944A15	CAP CER CHP 3.9PF 50V +/- 0.25
C246	2113944A82	CAP,FXD,30PF,+5%,-5%, 50V-DC,04
C247	2113944A40	CAP CER CHP 100.0PF 50V 5%
C248	2113946K02	CAP CER CHP 0.10UF 16V
C250	2113944A16	CAP CER CHP 4.3PF 50V +/- 0.25
C251	2113944A40	CAP CER CHP 100.0PF 50V 5%
C252	2113944A12	CAP CER CHP 3.0PF 50V +/- 0.25
C253	NOTPLACED	–
C254	2113944A11	CAP CER CHP 2.7PF 50V +/- 0.25
C255	2113944A40	CAP CER CHP 100.0PF 50V 5%
C256	2113944A19	CAP CER CHP 5.6PF 50V +/- 0.5P
C257	2113944A40	CAP CER CHP 100.0PF 50V 5%
C258	2113945B02	CAP CER CHP 10,000PF 25V 10%
C259	2113945B02	CAP CER CHP 10,000PF 25V 10%
C260	2113944A40	CAP CER CHP 100.0PF 50V 5%
C261	2113946K02	CAP CER CHP 0.10UF 16V
C262	2113944A40	CAP CER CHP 100.0PF 50V 5%
C263	2113944A62	CAP,FXD,.75PF,.25PF+/-, 50V-DC,
C264	2113944A40	CAP CER CHP 100.0PF 50V 5%
C265	NOTPLACED	–
C266	2113944A12	CAP CER CHP 3.0PF 50V +/- 0.25
C271	NOTPLACED	–
C272	2115153H01	CAP, CERAMIC, COG

Circuit Ref	Motorola Part No.	Description
C273	2113946K02	CAP CER CHP 0.10UF 16V
C276	2113946N03	CAP CER CHP 2.2UF 16V
C277	2113944A40	CAP CER CHP 100.0PF 50V 5%
C278	2313960D07	CAP,FXD,10UF,+10%,-10%,16V-DC,
C279	2113946N03	CAP CER CHP 2.2UF 16V
C280	NOTPLACED	–
C281	2113944A40	CAP CER CHP 100.0PF 50V 5%
C282	NOTPLACED	–
C283	NOTPLACED	–
C285	2113944A40	CAP CER CHP 100.0PF 50V 5%
C286	2113946K02	CAP CER CHP 0.10UF 16V
C289	2113944A40	CAP CER CHP 100.0PF 50V 5%
C291	2313960M51	CAP,FXD,10UF,+10%,-10%,6.3V-DC
C292	2113946K02	CAP CER CHP 0.10UF 16V
C293	2113945G98	CAP,FXD,.47UF,+10%,-10%,50V-DC
C294	2113944A40	CAP CER CHP 100.0PF 50V 5%
C295	2113944A40	CAP CER CHP 100.0PF 50V 5%
C296	2113946K02	CAP CER CHP 0.10UF 16V
C297	2113945B02	CAP CER CHP 10,000PF 25V 10%
C298	2113946K02	CAP CER CHP 0.10UF 16V
C301	2113944A23	CAP CER CHP 8.2PF 50V +/-0.5P
C302	2113944A26	CAP CER CHP 12.0PF 50V 5%
C303	2113944C21	CAP CER CHP 4.3PF 50V +/-0.25
C304	2113944A77	CAP,FXD,11PF,+5%,-5%,50V-DC,04
C305	2113944A40	CAP CER CHP 100.0PF 50V 5%
C306	NOTPLACED	–
C307	2113944A40	CAP CER CHP 100.0PF 50V 5%
C308	2113944A40	CAP CER CHP 100.0PF 50V 5%
C309	2113944A40	CAP CER CHP 100.0PF 50V 5%
C310	2113944A40	CAP CER CHP 100.0PF 50V 5%
C311	NOTPLACED	–

Circuit Ref	Motorola Part No.	Description
C312	2113944A22	CAP CER CHP 7.5PF 50V +/-0.5P
C313	2113944A77	CAP,FXD,11PF,+5%,-5%,50V-DC,04
C314	2113946K02	CAP CER CHP 0.10UF 16V
C315	2113944A40	CAP CER CHP 100.0PF 50V 5%
C316	2113944C21	CAP CER CHP 4.3PF 50V +/-0.25
C317	2113944A73	CAP,FXD,8PF,.5PF+/-,50V-DC, 040
C318	2113944A26	CAP CER CHP 12.0PF 50V 5%
C319	2113944A12	CAP CER CHP 3.0PF 50V +/-0.25
C320	2113944A24	CAP CER CHP 9.1PF 50V +/-0.5P
C321	2113944A40	CAP CER CHP 100.0PF 50V 5%
C322	2113944A38	CAP CER CHP 82.0PF 50V 5%
C324	2115153H40	CAP, CERAMIC, COG
C325	2115153H26	CAP, CERAMIC, COG
C326	2113946K02	CAP CER CHP 0.10UF 16V
C327	2113946K02	CAP CER CHP 0.10UF 16V
C328	2113946K02	CAP CER CHP 0.10UF 16V
C329	2113946K02	CAP CER CHP 0.10UF 16V
C334	2113945A13	CAP CER CHP 4700PF 50V 10%
C337	NOTPLACED	–
C338	NOTPLACED	–
C339	2113944A40	CAP CER CHP 100.0PF 50V 5%
C343	2113946K02	CAP CER CHP 0.10UF 16V
C344	2113945D04	CAP CER CHP 100,000PF 25V 10%
C345	2113946K02	CAP CER CHP 0.10UF 16V
C346	2113946K02	CAP CER CHP 0.10UF 16V
C347	2113946K02	CAP CER CHP 0.10UF 16V
C348	2113946K02	CAP CER CHP 0.10UF 16V
C349	2113945D04	CAP CER CHP 100,000PF 25V 10%
C350	2113946K02	CAP CER CHP 0.10UF 16V
C351	2113944A41	CAP CER CHP 120.0PF 50V 5%
C352	2113946K02	CAP CER CHP 0.10UF 16V
C355	2113946K02	CAP CER CHP 0.10UF 16V
C357	2113946K02	CAP CER CHP 0.10UF 16V
C358	NOTPLACED	–

Circuit Ref	Motorola Part No.	Description
C359	NOTPLACED	–
C360	2113944A13	CAP CER CHP 3.3PF 50V +/-0.25
C361	2113946K02	CAP CER CHP 0.10UF 16V
C362	2113946K02	CAP CER CHP 0.10UF 16V
C364	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C366	NOTPLACED	–
C367	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,04
C370	2115153H18	CAP, CERAMIC, COG
C371	NOTPLACED	–
C372	2113944A40	CAP CER CHP 100.0PF 50V 5%
C373	NOTPLACED	–
C374	2113944A40	CAP CER CHP 100.0PF 50V 5%
C375	2113944A40	CAP CER CHP 100.0PF 50V 5%
C378	NOTPLACED	–
C380	2113945B02	CAP CER CHP 10,000PF 25V 10%
C381	NOTPLACED	–
C382	2313960B57	CAP,FXD,10UF,+10%,-10%,6.3V-DC
C383	NOTPLACED	–
C385	2113944A30	CAP CER CHP 27.0PF 50V 5%
C386	2113944C81	CAP,FXD,24PF,+5%,-5%,50V-DC,06
C387	2113944C81	CAP,FXD,24PF,+5%,-5%,50V-DC,06
C388	2113944C81	CAP,FXD,24PF,+5%,-5%,50V-DC,06
C389	2113944C81	CAP,FXD,24PF,+5%,-5%,50V-DC,06
C390	NOTPLACED	–
C391	2113944C81	CAP,FXD,24PF,+5%,-5%,50V-DC,06
C392	2113944C81	CAP,FXD,24PF,+5%,-5%,50V-DC,06
C400	2113944A40	CAP CER CHP 100.0PF 50V 5%
C401	2113946K02	CAP CER CHP 0.10UF 16V
C402	2113946K02	CAP CER CHP 0.10UF 16V
C403	2316410H03	EPP POSCAP
C404	NOTPLACED	–
C405	2113944A40	CAP CER CHP 100.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C406	NOTPLACED	–
C407	2113946B04	CAP CER CHP 0.10UF 10V 10%
C408	2113944A40	CAP CER CHP 100.0PF 50V 5%
C409	2113946K02	CAP CER CHP 0.10UF 16V
C410	2113946B04	CAP CER CHP 0.10UF 10V 10%
C411	2113946K02	CAP CER CHP 0.10UF 16V
C414	2113946K02	CAP CER CHP 0.10UF 16V
C415	2185895Z01	CAPACITOR CER LOW DIST .01UF
C416	2113946B04	CAP CER CHP 0.10UF 10V 10%
C419	NOTPLACED	–
C420	2113945B02	CAP CER CHP 10,000PF 25V 10%
C421	2113946B04	CAP CER CHP 0.10UF 10V 10%
C422	2113946K02	CAP CER CHP 0.10UF 16V
C423	2113944A40	CAP CER CHP 100.0PF 50V 5%
C424	NOTPLACED	–
C425	2113946K02	CAP CER CHP 0.10UF 16V
C426	2113944A40	CAP CER CHP 100.0PF 50V 5%
C427	2113944A40	CAP CER CHP 100.0PF 50V 5%
C428	2113946K02	CAP CER CHP 0.10UF 16V
C429	2113946K02	CAP CER CHP 0.10UF 16V
C430	2113946B04	CAP CER CHP 0.10UF 10V 10%
C431	2113944A40	CAP CER CHP 100.0PF 50V 5%
C432	NOTPLACED	–
C433	2113945B02	CAP CER CHP 10,000PF 25V 10%
C434	2113946B04	CAP CER CHP 0.10UF 10V 10%
C435	2113946K02	CAP CER CHP 0.10UF 16V
C436	2113944A29	CAP CER CHP 22.0PF 50V 5%
C437	2113944A29	CAP CER CHP 22.0PF 50V 5%
C440	2113946Q01	CAP CER CHP 4.7UF 16V
C441	2113944A40	CAP CER CHP 100.0PF 50V 5%
C442	2113945D04	CAP CER CHP 100,000PF 25V 10%

Circuit Ref	Motorola Part No.	Description
C443	2113946B04	CAP CER CHP 0.10UF 10V 10%
C444	2113944A40	CAP CER CHP 100.0PF 50V 5%
C445	2113944A40	CAP CER CHP 100.0PF 50V 5%
C447	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C448	2113946B04	CAP CER CHP 0.10UF 10V 10%
C449	2113944A40	CAP CER CHP 100.0PF 50V 5%
C450	NOTPLACED	–
C451	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C452	2113955D31	CAP,FXD,1UF,+10%,-10%,16V-DC,1
C453	2113944A40	CAP CER CHP 100.0PF 50V 5%
C456	2113944A40	CAP CER CHP 100.0PF 50V 5%
C458	2113944A40	CAP CER CHP 100.0PF 50V 5%
C459	2113944A40	CAP CER CHP 100.0PF 50V 5%
C463	2113944A40	CAP CER CHP 100.0PF 50V 5%
C466	2113944A40	CAP CER CHP 100.0PF 50V 5%
C467	2113946B04	CAP CER CHP 0.10UF 10V 10%
C471	2113944A40	CAP CER CHP 100.0PF 50V 5%
C472	2113945A05	CAP CER CHP 470PF 50V 10%
C473	2113945A05	CAP CER CHP 470PF 50V 10%
C475	2113956E91	CAP,FXD,10UF,+10%,-10%,16V-DC,
C476	2113946R01	CAP CER CHP 10.0UF 10V
C479	2113946B04	CAP CER CHP 0.10UF 10V 10%
C480	2113946R01	CAP CER CHP 10.0UF 10V
C481	2113946B04	CAP CER CHP 0.10UF 10V 10%
C482	2113946B04	CAP CER CHP 0.10UF 10V 10%
C490	2113944A40	CAP CER CHP 100.0PF 50V 5%
C491	2113944A40	CAP CER CHP 100.0PF 50V 5%
C492	2113944A40	CAP CER CHP 100.0PF 50V 5%
C493	2113944A40	CAP CER CHP 100.0PF 50V 5%
C494	2113944A40	CAP CER CHP 100.0PF 50V 5%
C495	2113944A40	CAP CER CHP 100.0PF 50V 5%
C496	2113944A40	CAP CER CHP 100.0PF 50V 5%
C497	2113944A40	CAP CER CHP 100.0PF 50V 5%
C498	NOTPLACED	–
C499	2113946B04	CAP CER CHP 0.10UF 10V 10%
C502	2313960A55	CAP,FXD,.47UF,+10%,-10%,25V-DC
C503	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C505	2113944A40	CAP CER CHP 100.0PF 50V 5%
C511	2113944A40	CAP CER CHP 100.0PF 50V 5%
C512	2113944A40	CAP CER CHP 100.0PF 50V 5%
C513	2113944A40	CAP CER CHP 100.0PF 50V 5%
C514	2113944A40	CAP CER CHP 100.0PF 50V 5%
C520	2113945B02	CAP CER CHP 10,000PF 25V 10%
C521	2113945B02	CAP CER CHP 10,000PF 25V 10%
C522	2113945B02	CAP CER CHP 10,000PF 25V 10%
C523	2113945B02	CAP CER CHP 10,000PF 25V 10%
C524	2113944A40	CAP CER CHP 100.0PF 50V 5%
C525	2113944A40	CAP CER CHP 100.0PF 50V 5%
C526	2113944A40	CAP CER CHP 100.0PF 50V 5%
C527	2113944A40	CAP CER CHP 100.0PF 50V 5%
C528	2113944A40	CAP CER CHP 100.0PF 50V 5%
C529	2113944A40	CAP CER CHP 100.0PF 50V 5%
C597	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C598	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25
C599	2113944A15	CAP CER CHP 3.9PF 50V +/-0.25
C600	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C601	2113944A40	CAP CER CHP 100.0PF 50V 5%
C602	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25
C604	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C605	2113944A40	CAP CER CHP 100.0PF 50V 5%
C609	NOTPLACED	–
CR101	4880973Z02	PIN DIODE
CR102	4815257H01	SURFACE MOUNT PIN DIODES
CR103	4815257H01	SURFACE MOUNT PIN DIODES
CR105	5115022H01	IC TEMPERATURE SENSOR
CR160	NOTPLACED	–
CR201	4815011H01	DIODE TRIPLE
CR203	4815072H01	DIODE VARACTOR
CR241	4885094Y01	DIODE VARACTOR ISV228 W18
CR242	4885055Y01	DIODE VARACTOR PB-FREE
CR243	4885055Y01	DIODE VARACTOR PB-FREE
CR251	4885094Y01	DIODE VARACTOR ISV228 W18
CR252	4815279H01	BBY5503WE6327 FROM INFINEON
CR253	4815279H01	BBY5503WE6327 FROM INFINEON
CR301	4885055Y01	DIODE VARACTOR PB-FREE
CR302	4885055Y01	DIODE VARACTOR PB-FREE
CR303	4815048H01	SOT MMBD353 DIODE DUAL SCHT
CR304	4885055Y01	DIODE VARACTOR PB-FREE
CR305	4885055Y01	DIODE VARACTOR PB-FREE
CR306	4815923H02	SCHOTTKY DIODE-NEW LEADFREE
CR311	4813974A19	DIODE ARRAY,MXR, SM, SOT-323,7V,
CR312	4815047H01	BAND SWITCHIND DIODE,ROHM DAN
CR313	4815047H01	BAND SWITCHIND DIODE,ROHM DAN
CR411	4815067H01	DIODE SCHOTTKY, RB731U
CR412	4815067H01	DIODE SCHOTTKY, RB731U
CR413	4815067H01	DIODE SCHOTTKY, RB731U
CR440	4813978C02	PB FREE, NOT COMPLETELY ENRICH
CR501	4815155H01	RECTIFIER
CR503	4805729G49	DIODE RED/YEL
E101	2415954H01	INDUCTOR BEAD CHIP
E102	7686949J14	FLTR,FERRITE BEAD,2A,SM
E105	7686949J14	FLTR,FERRITE BEAD,2A,SM
E106	7686949J15	FLTR,FERR,2A,,SM,0603
E107	7686949J15	FLTR,FERR,2A,SM,0603
E400	2480640Z01	SURFACE MOUNT FERRITE BEAD
E401	2480640Z01	SURFACE MOUNT FERRITE BEAD
E402	2480640Z01	SURFACE MOUNT FERRITE BEAD
E403	2480640Z01	SURFACE MOUNT FERRITE BEAD
E404	2480640Z01	SURFACE MOUNT FERRITE BEAD
E405	2480640Z01	SURFACE MOUNT FERRITE BEAD
E406	2480640Z01	SURFACE MOUNT FERRITE BEAD
E407	2480640Z01	SURFACE MOUNT FERRITE BEAD
E408	2480640Z01	SURFACE MOUNT FERRITE BEAD
E409	2480640Z01	SURFACE MOUNT FERRITE BEAD
F501	6515076H01	FUSE CHIP SMT TR/1608FF 3A
FL201	4805875Z04	CRYSTAL 16.8 MHZ
FL301	9180022M11	XTAL FILTER 44.85MHZ
FL302	9180468V04	SMD455KHZ 4 ELEMENT CER FLTR
FL303	9115811H03	SMD455KHZ 6 ELEMENT
FL304	9115811H01	SMD455KHZ 6 ELEMENT
FL401	4870368G02	REFLOWABLE CLOCK OSC XTAL
H101	2680499Z02	HEAT SPREADER
J101	0985613Z01	JACK, RF
J102	0280519Z06	NUT, ANTENNA

Circuit Ref	Motorola Part No.	Description
J400	0915064H03	CONNECTOR, ZIF (40 PINS)
J403	0915064H02	ZIF (20 PINS)
L101	2460591B28	COIL AIR WOUND INDUC 13.37
L102	2460591B28	COIL AIR WOUND INDUC 13.37
L104	2460591B48	COIL AIR WOUND INDUC 15.22
L105	2414032B22	IDCTR,WW,390NH,10%,620 MA,1.12O
L106	2460591A19	COIL AIR WOUND INDUC 8.71
L107	2479990G01	AIR WND COIL/GREEN COLOR 33.47
L108	2479990A01	AIR WND COIL/GREEN COLOR4.22NH
L112	2414032B42	IDCTR,WW,12NH,5%,1A, .09OHM,CER
L113	2414017N09	IDCTR,CHIP,5.6NH,600MA, .2OHM,C
L114	2414032B42	IDCTR,WW,12NH,5%,1A,.09 OHM,CER
L115	2414032B22	IDCTR,WW,390NH,10%,620 MA,1.12O
L116	2479990C02	AIR WND COIL/GREEN COLOR 16.28
L117	2414017P17	IDCTR,CHIP,22NH,5%,300M A,.88OH
L160	2414017N14	IDCTR,CHIP,15NH,5%,600M A,.4OHM
L201	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L202	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L203	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L232	2414032L25	IDCTR,WW,12UH,5%,150MA ,3.8OHM,
L241	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L242	2414032F26	IDCTR,WW,22NH,5%,500MA ,.22OHM,
L243	2485776Z02	COIL TEFLON RESONATOR (KAPTON)
L251	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L252	2414032F28	IDCTR,WW,33NH,5%,500MA ,.27OHM,
L253	2460593C03	COIL MULT LAYERED TAP TEF RESN
L254	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L261	2414032F29	IDCTR,WW,39NH,5%,500MA ,.29OHM,
L271	2414032F31	IDCTR,WW,56NH,5%,500MA ,.34OHM,
L272	2414032F27	IDCTR,FXD,27NH,5%,500MA ,.25OHM
L273	2414032F32	IDCTR,FXD,68NH,5%,500MA ,.38OHM
L281	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L282	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L301	2479990B01	AIR WND COIL/GREEN COLOR 11.03
L302	2479990B01	AIR WND COIL/GREEN COLOR 11.03
L303	2414032F26	IDCTR,WW,22NH,5%,500MA ,.22OHM,
L304	2414032F37	IDCTR,WW,180NH,5%,400M A,.64OHM
L305	2414032F23	IDCTR,WW,12NH,5%,600MA ,.15OHM,
L306	2479990B01	AIR WND COIL/GREEN COLOR 11.03
L307	2479990B01	AIR WND COIL/GREEN COLOR 11.03
L309	2479990C02	AIR WND COIL/GREEN COLOR 16.28
L310	2414032F36	IDCTR,WW,150NH,5%,400M A,.56OHM
L311	2414017K32	IDCTR,CHIP,560NH,5%,50M A,5OHM,
L321	2414032F37	IDCTR,WW,180NH,5%,400M A,.64OHM
L325	2414032B68	IDCTR,WW,1UH,5%,460MA, 1.75OHM,
L330	2414017K33	IDCTR,CHIP,680NH,5%,50M A,5.5OH
L332	2414015A25	IDCTR,CHIP,1.2UH,2%,440M A,2OHM
L400	2414017Q42	IDCTR,FXD,390NH,10%,200 MA,.65O
L401	2414017Q42	IDCTR,FXD,390NH,10%,200 MA,.65O
L410	2414017Q42	IDCTR,FXD,390NH,10%,200 MA,.65O
L411	2414017Q42	IDCTR,FXD,390NH,10%,200 MA,.65O
L505	2414017Q42	IDCTR,FXD,390NH,10%,200 MA,.65O
P100	3905643V01	CONTACT ANT GRD
PB501	4086470Z01	TACT SWITCH
PB502	4086470Z01	TACT SWITCH
PB503	4086470Z01	TACT SWITCH
PB504	4086470Z01	TACT SWITCH
PB505	4086470Z01	TACT SWITCH
Q110	4813976A03	450MHZ 8W 7.5V PLD-1.5 T&R
Q111	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q210	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q241	4805218N63	RF TRANS SOT 323 BFQ67W
Q252	4805218N63	RF TRANS SOT 323 BFQ67W
Q260	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q261	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q301	4816531H01	NPN SILICON BIPOLAR TRANSISTOR
Q302	4802197J95	RF TRANSISTOR PBR941
Q310	4816531H01	NPN SILICON BIPOLAR TRANSISTOR
Q320	4813973M07	XSTR,BIP GP SS,NPN,T3904,SM,SO
Q400	4815069H02	TSTR MOSFET P-CHAN
Q403	4813973A13	XSTR,BIP GP SS,PNP,T3906,SM,SO
Q405	4815066H01	UMG5N DIGITAL TRANSISTOR
Q410	4815066H01	UMG5N DIGITAL TRANSISTOR
Q416	4815069H02	TSTR MOSFET P-CHAN
Q417	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q502	4815154H01	DUAL TRANS NPN
Q505	4813973M07	XSTR,BIP GP SS,NPN,T3904,SM,SO
R101	0613952H58	CER CHIP RES 240 OHM 5 0603
R102	0615043C01	RES POWER METAL STRIP W18 COMP
R104	0613952R17	CER CHIP RES 47K OHM 5% 0402
R106	0613952Q25	CER CHIP RES 10.0 OHM 5 0402
R107	NOTPLACED	–
R108	0613952Q91	CER CHIP RES 5600 OHM 5 0402
R109	0613952R32	CER CHIP RES 200K OHM 5 0402
R110	0613952Q60	CER CHIP RES 300 OHM 5 0402
R111	0613952Q32	CER CHIP RES 20.0 OHM 5 0402
R112	0613952Q60	CER CHIP RES 300 OHM 5 0402
R120	0613952R16	CER CHIP RES 43K OHM 5 0402
R130	0613952R01	CER CHIP RES 10K OHM 5% 0402
R131	0613952R07	CER CHIP RES 18K OHM 5% 0402
R132	0613952R35	CER CHIP RES 270K OHM 5% 0402
R133	NOTPLACED	–
R136	NOTPLACED	–
R161	0613952Q56	CER CHIP RES 200 OHM 5 0402
R170	0613952H58	CER CHIP RES 240 OHM 5 0603
R171	0613952R16	CER CHIP RES 43K OHM 5 0402
R172	0613952H49	CER CHIP RES 100 OHM 5% 0603
R173	0613952R31	CER CHIP RES 180K OHM 5% 0402
R174	0613952R17	CER CHIP RES 47K OHM 5% 0402
R175	0613952H12	CER CHIP RES 3.0 OHM 5 0603
R176	0613952H12	CER CHIP RES 3.0 OHM 5 0603
R191	0613958J74	CER CHIP RES 0.0 OHM JMP 0805
R201	0613952R23	CER CHIP RES 82K OHM 5% 0402
R202	0613952R25	CER CHIP RES 100K OHM 5% 0402
R204	0613952R17	CER CHIP RES 47K OHM 5% 0402
R231	0613952Q51	CER CHIP RES 120 OHM 5 0402
R232	0613952Q68	CER CHIP RES 620 OHM 5 0402
R233	0613952Q67	CER CHIP RES 560 OHM 5 0402

Circuit Ref	Motorola Part No.	Description
R241	0613952Q32	CER CHIP RES 20.0 OHM 5 0402
R242	0613952Q45	CER CHIP RES 68.0 OHM 5 0402
R243	0613952R07	CER CHIP RES 18K OHM 5% 0402
R244	0613952R17	CER CHIP RES 47K OHM 5% 0402
R245	0613952Q58	CER CHIP RES 240 OHM 5 0402
R248	0613952Q36	CER CHIP RES 30.0 OHM 5 0402
R251	0613952Q37	CER CHIP RES 33.0 OHM 5 0402
R252	0613952Q53	CER CHIP RES 150 OHM 5 0402
R253	0613952Q91	CER CHIP RES 5600 OHM 5 0402
R254	0613952R08	CER CHIP RES 20K OHM 5 0402
R255	0613952Q86	CER CHIP RES 3600 OHM 5 0402
R256	0613952Q36	CER CHIP RES 30.0 OHM 5 0402
R260	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R281	NOTPLACED	–
R301	0613952R25	CER CHIP RES 100K OHM 5% 0402
R302	0613952R25	CER CHIP RES 100K OHM 5% 0402
R303	0613952Q77	CER CHIP RES 1500 OHM 5 0402
R304	0613952R03	CER CHIP RES 12K OHM 5% 0402
R305	0613952Q65	CER CHIP RES 470 OHM 5 0402
R306	0613952R25	CER CHIP RES 100K OHM 5% 0402
R307	0613952R25	CER CHIP RES 100K OHM 5% 0402
R308	0613952Q42	CER CHIP RES 51.0 OHM 5 0402
R309	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R310	NOTPLACED	–
R311	0613952R13	CER CHIP RES 33K OHM 5% 0402
R312	0613952Q89	CER CHIP RES 4700 OHM 5 0402
R313	0613952Q61	CER CHIP RES 330 OHM 5 0402
R314	0613952Q78	CER CHIP RES 1600 OHM 5 0402
R315	0613952R03	CER CHIP RES 12K OHM 5% 0402
R320	NOTPLACED	–
R321	0613952R03	CER CHIP RES 12K OHM 5% 0402
R322	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R324	0613952R27	CER CHIP RES 120K OHM 5% 0402
R328	0613952Q11	CER CHIP RES 2.7 OHM 5 0402
R329	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R330	0613952R01	CER CHIP RES 10K OHM 5% 0402
R331	0613952Q56	CER CHIP RES 200 OHM 5 0402
R332	0613952R03	CER CHIP RES 12K OHM 5% 0402
R333	NOTPLACED	–
R339	0613952Q88	CER CHIP RES 4300 OHM 5 0402
R340	0613952Q95	CER CHIP RES 8200 OHM 5 0402
R342	0613952R25	CER CHIP RES 100K OHM 5% 0402
R344	0613952Q42	CER CHIP RES 51.0 OHM 5 0402
R345	0613952R15	CER CHIP RES 39K OHM 5% 0402
R346	0613952R05	CER CHIP RES 15K OHM 5% 0402
R348	0613952Q86	CER CHIP RES 3600 OHM 5 0402
R349	0613958J74	CER CHIP RES 0.0 OHM JMP 0805
R350	0613952R01	CER CHIP RES 10K OHM 5% 0402
R355	0613952R25	CER CHIP RES 100K OHM 5% 0402
R358	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R359	NOTPLACED	–
R360	0613952R08	CER CHIP RES 20K OHM 5 0402
R361	0613952R08	CER CHIP RES 20K OHM 5 0402
R363	0613952Q63	CER CHIP RES 390 OHM 5 0402
R364	0613952Q79	CER CHIP RES 1800 OHM 5 0402
R365	0613952Q75	CER CHIP RES 1200 OHM 5 0402
R366	0613952R03	CER CHIP RES 12K OHM 5% 0402
R367	0613952N09	CER CHIP RES 12.1K OHM 1 0402
R368	0613952N01	CER CHIP RES 10.0K OHM 1 0402
R369	0613952Q69	CER CHIP RES 680 OHM 5 0402
R370	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R371	NOTPLACED	–
R372	NOTPLACED	–
R373	NOTPLACED	–
R374	NOTPLACED	–
R375	NOTPLACED	–
R376	NOTPLACED	–
R377	NOTPLACED	–
R378	NOTPLACED	–
R400	0613952R17	CER CHIP RES 47K OHM 5% 0402
R401	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R402	NOTPLACED	–
R403	NOTPLACED	–
R405	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R406	0613952R22	CER CHIP RES 75K OHM 5 0402
R407	0613952R21	CER CHIP RES 68K OHM 5% 0402
R408	NOTPLACED	–
R409	0613952R01	CER CHIP RES 10K OHM 5% 0402
R410	0613952R25	CER CHIP RES 100K OHM 5% 0402
R411	0613952R01	CER CHIP RES 10K OHM 5% 0402
R413	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R414	0613952P25	CER CHIP RES 178K OHM 1 0402
R415	0613952N93	CER CHIP RES 90.9K OHM 1 0402
R416	0613952R01	CER CHIP RES 10K OHM 5% 0402
R418	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R419	0613952Q66	CER CHIP RES 510 OHM 5 0402
R420	0613952J73	CER CHIP RES 10.0M OHM 5% 0603
R421	0613952Q80	CER CHIP RES 2000 OHM 5 0402
R423	0613952R41	CER CHIP RES 470K OHM 5% 0402
R424	0613952R14	CER CHIP RES 36K OHM 5 0402
R425	0613952R12	CER CHIP RES 30K OHM 5 0402
R426	0613952R37	CER CHIP RES 330K OHM 5% 0402
R427	0613952Q83	CER CHIP RES 2700 OHM 5 0402
R428	0613952Q09	CER CHIP RES 2.2 OHM 5 0402
R429	0613952R22	CER CHIP RES 75K OHM 5 0402
R431	0613952R41	CER CHIP RES 470K OHM 5% 0402
R432	0613952R18	CER CHIP RES 51K OHM 5 0402
R434	0613952Q61	CER CHIP RES 330 OHM 5 0402
R435	0613952Q80	CER CHIP RES 2000 OHM 5 0402
R436	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R437	NOTPLACED	–
R445	0613952R10	CER CHIP RES 24K OHM 5 0402
R447	0613952R25	CER CHIP RES 100K OHM 5% 0402
R448	0613952R01	CER CHIP RES 10K OHM 5% 0402
R449	0613952R10	CER CHIP RES 24K OHM 5 0402
R450	0613959Y45	CER CHIP RES OHM 5% 2512
R451	0613952R05	CER CHIP RES 15K OHM 5% 0402
R452	0613952R25	CER CHIP RES 100K OHM 5% 0402
R453	NOTPLACED	–
R454	NOTPLACED	–

Circuit Ref	Motorola Part No.	Description
R455	NOTPLACED	–
R456	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R457	0613952R01	CER CHIP RES 10K OHM 5% 0402
R460	0613952Q89	CER CHIP RES 4700 OHM 5 0402
R461	0613952Q55	CER CHIP RES 180 OHM 5 0402
R462	0613952R01	CER CHIP RES 10K OHM 5% 0402
R463	0613952Q60	CER CHIP RES 300 OHM 5 0402
R471	0613952R08	CER CHIP RES 20K OHM 5 0402
R472	0613952R14	CER CHIP RES 36K OHM 5 0402
R473	0613952Q25	CER CHIP RES 10.0 OHM 5 0402
R475	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R476	0613952R37	CER CHIP RES 330K OHM 5% 0402
R477	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R478	0613952R01	CER CHIP RES 10K OHM 5% 0402
R479	0613952Q66	CER CHIP RES 510 OHM 5 0402
R481	0613952R10	CER CHIP RES 24K OHM 5 0402
R492	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R498	0613952R01	CER CHIP RES 10K OHM 5% 0402
R499	0613952R01	CER CHIP RES 10K OHM 5% 0402
R501	0613952Q69	CER CHIP RES 680 OHM 5 0402
R502	0613952Q55	CER CHIP RES 180 OHM 5 0402
R505	0613952R01	CER CHIP RES 10K OHM 5% 0402
R506	0613952R17	CER CHIP RES 47K OHM 5% 0402
R507	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
RT400	0680590Z01	THERMISTOR_33K
S501	4080710Z21	SWITCH, FREQUENCY
S502	1880619Z06	POTENTIOMETER, VOLUME
SH100	2680507Z02	SHIELD, HARMONIC FILTER
SH101	2680510Z02	SHIELD, PA
SH201	2680511Z02	SHIELD, SYNTHESIZER
SH202	2680511Z02	SHIELD, SYNTHESIZER
SH241	2604120G02	AOBA VCO SHIELD
SH242	2680514Z02	SHIELD, VCO BOTTOM/ LVZIF
SH301	2686583Z02	SHIELD, RECEIVER FRONT END TOP
SH302	2680555Z02	SHIELD, RECEIVER F/END BOTTOM
SH303	2680509Z02	SHIELD, MIXER
SH304	2680624Z02	SHIELD, MIXER DIODE
SH322	2686528Z02	SHIELD, IF SECTION
SH323	2686527Z02	SHIELD, RFI/EMI, CRS, TIN
SH400	2680505Z02	SHIELD, CONTROLLER TOP LEFT
SH401	2680506Z02	SHIELD, CONTROLLER TOP RIGHT
SH402	2680515Z02	SHIELD, CONTROLLER BOTTOM LEFT
SH403	2680516Z02	SHIELD, CONTROLLER BTM RIGHT
T301	2515121H01	BALUN, TRANSFORMER W18 COMP
T302	2515121H01	BALUN, TRANSFORMER W18 COMP
U101	5115678H01	VHF/UHF/800/900 MHZ LDMOS DRIV
U102	5185765B26	IC PWR CTRL IN MOS20
U201	5185177Y01	IC TESTED AT25016 48 PIN W18
U210	5115266H01	INVERTER TC7ST04FU SS0P5-P-A
U211	5115266H01	INVERTER TC7ST04FU SS0P5-P-A
U241	5171121L01	CUSTOM LOW VOLTAGE VCO BUFFER
U247	5115026H01	MAX SUPPLY VOL 16V
U248	5115019H01	3.3V REGULATOR IN SOT23-5 PKG
U301	5115281H01	FM IF IC SA616 FROM PHILIPS
U302	5115070H01	IC 3-INV LMOS TC7W04FU
U303	NOTPLACED	–
U400	5115012H01	MAX SUPPLY VOL 30V
U404	5115062H01	IC ASFIC_CMP
U405	NOTPLACED	–
U406	* 5115034H01	IC FLASH 4MBIT
U407	5115033H01	16K X 8 SPI SERIAL ROM
U409	5.19E+09	HC11FL0 (3V) ASIC MICRO-P
U410	5115044H01	REGULATOR 3.3V,ILC7062CM-33
U420	5115280H01	AUDIO AMPLIFIER TDA8547TS
VR432	4813979P10	DIODE ARRAY,TRNSNT PROT,SM,SOT
VR433	4813979P10	DIODE ARRAY,TRNSNT PROT,SM,SOT
VR434	4815038H01	ZENER DIODE-6.8V
VR439	4813977M21	DIODE,ZEN,MBZ5242,SM,SOT-23,12
VR440	4815038H01	ZENER DIODE-6.8V
VR441	4815038H01	ZENER DIODE-6.8V
VR442	4815038H01	ZENER DIODE-6.8V
VR443	4815038H01	ZENER DIODE-6.8V
VR444	4815038H01	ZENER DIODE-6.8V
VR445	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,1
VR446	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,1
VR447	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,1
VR448	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,1
VR449	4813977A54	DIODE,ZEN,MM3Z10V,SM, SOD-323,1
VR450	4815040H01	ZENER DIODE-12V
VR460	4815038H01	ZENER DIODE-6.8V
VR501	4813977M14	DIODE,ZEN,MBZ5235,SM, SOT-23,6.
VR506	4815038H01	ZENER DIODE-6.8V
Y300	4802245J84	XTAL 44.395MHZ, 3RD OT, SMD
Y301	9186145B02	CER.DISCR. CDBCA455CX36-TC
	8415235H07	PC BOARD, UHF U2

* Motorola Depot Servicing only

4.9 VHF Band Section

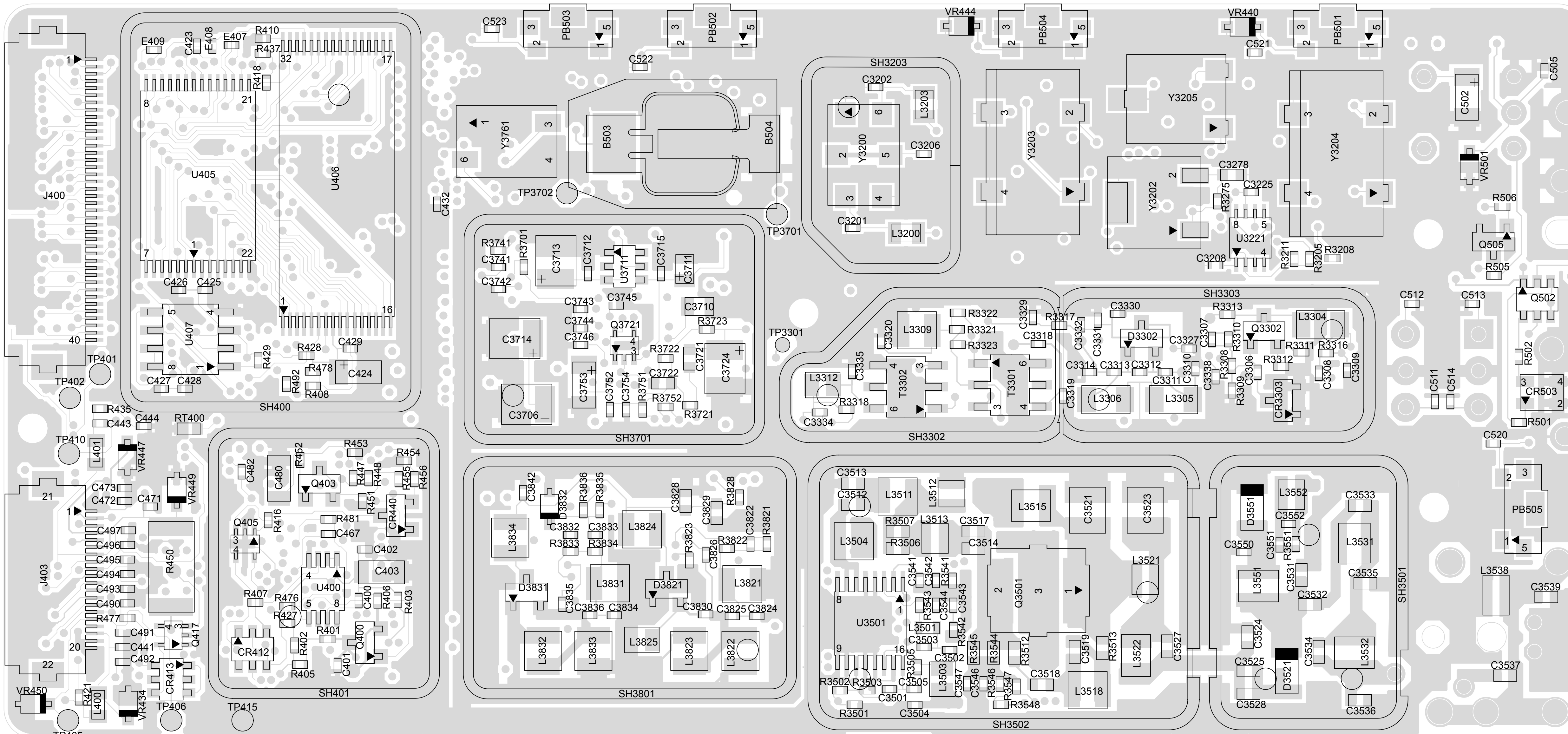


Figure 4-54: VHF (136–174 MHz) Main Board Top Side PCB 8486473Z04 rev. C

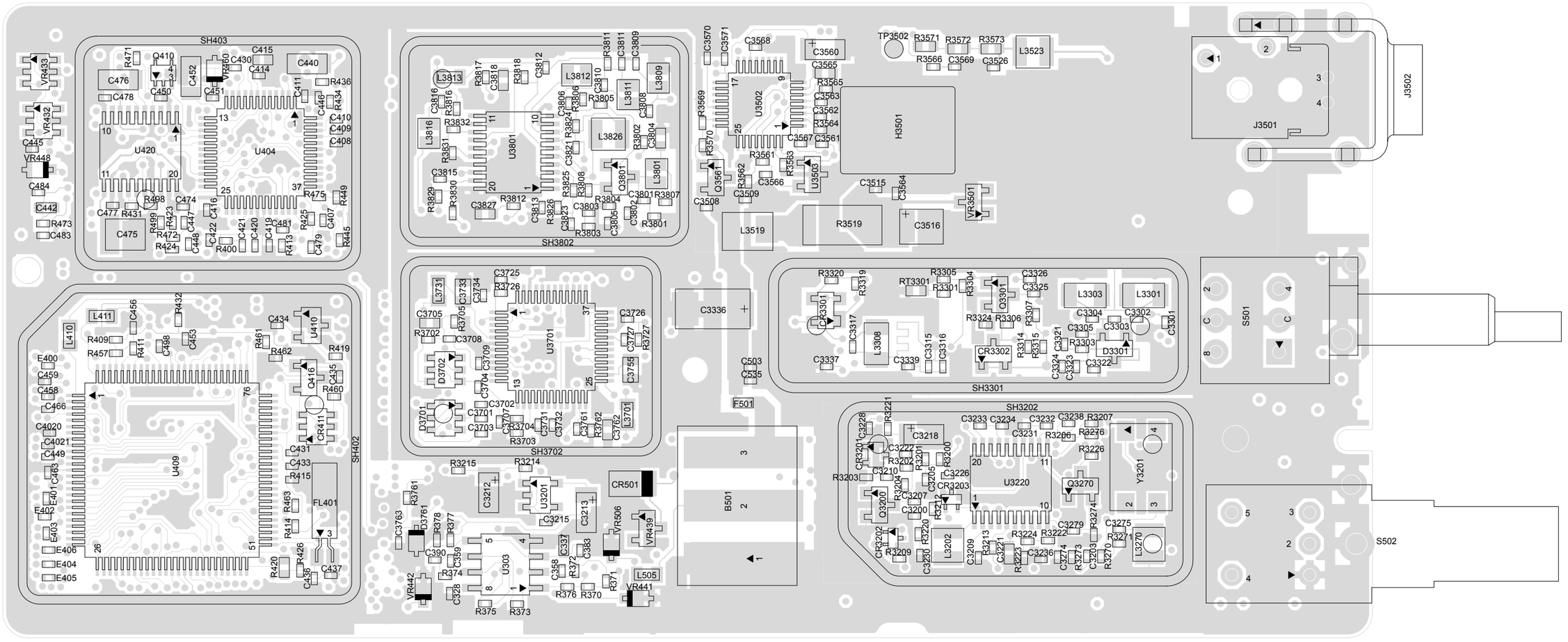


Figure 4-55: VHF (136–174 MHz) Main Board Bottom Side PCB 8486473Z04 rev. C

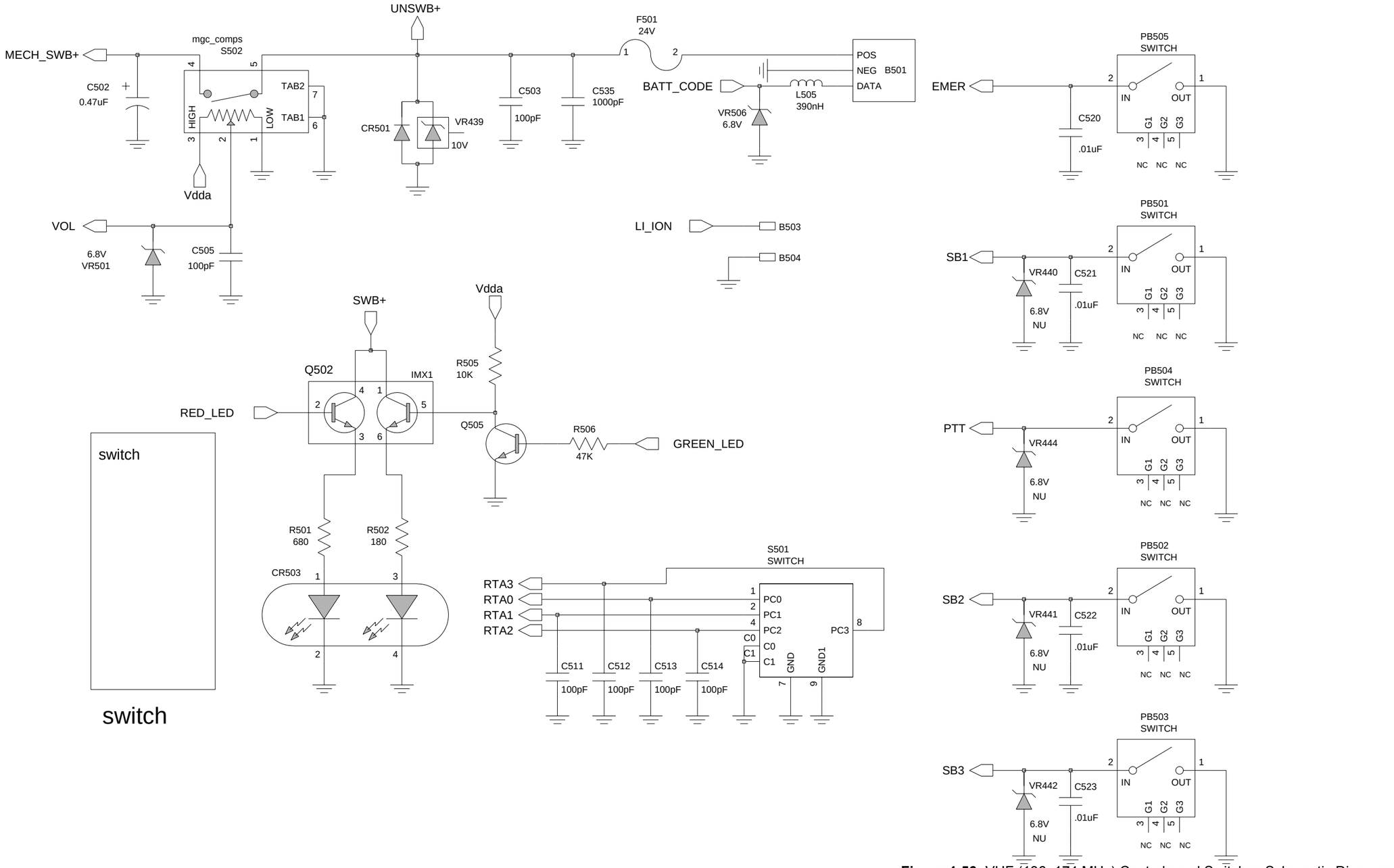


Figure 4-56: VHF (136–174 MHz) Controls and Switches Schematic Diagram

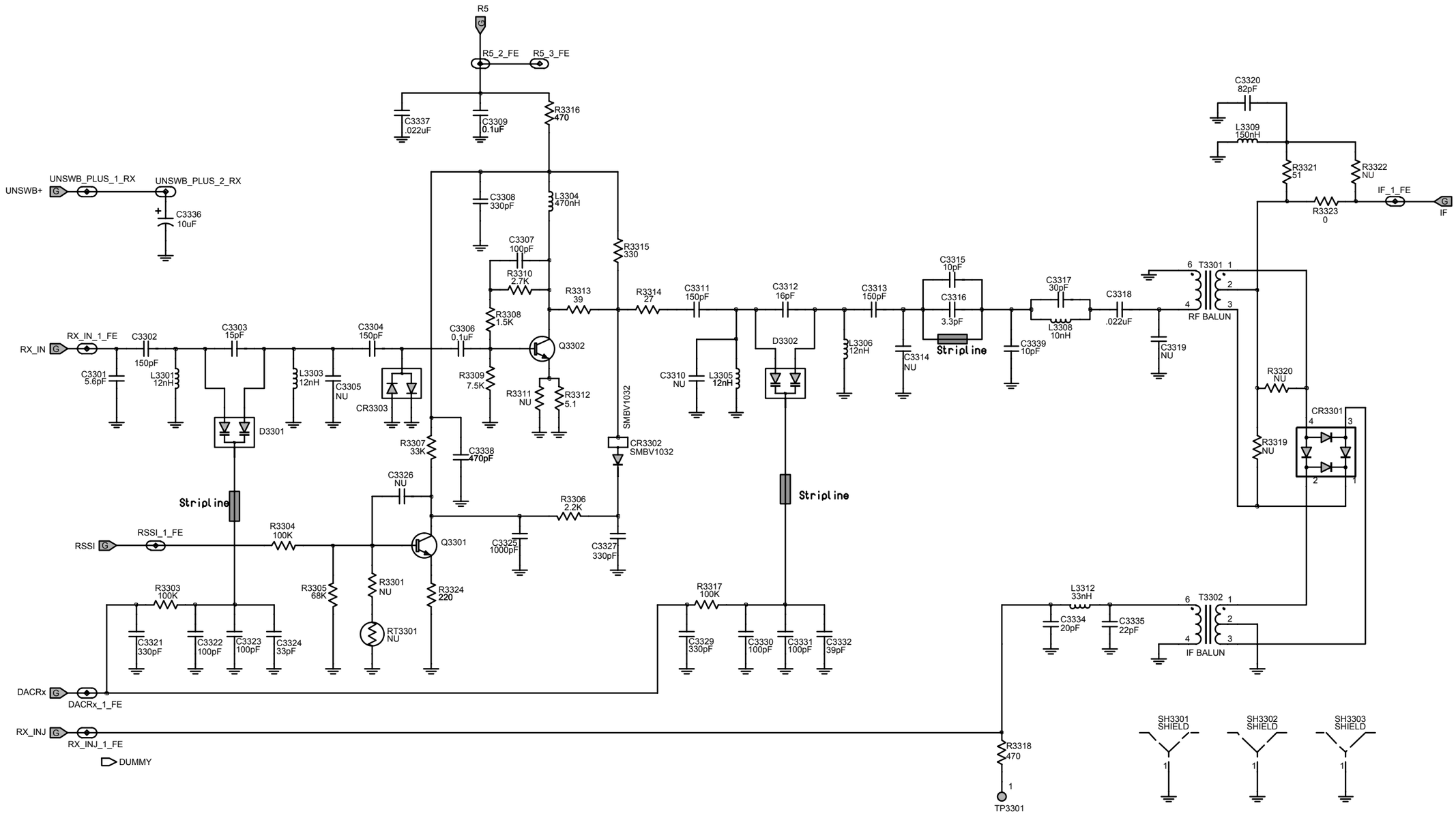


Figure 4-57: VHF (136–174 MHz) Receiver Front End Schematic Diagram

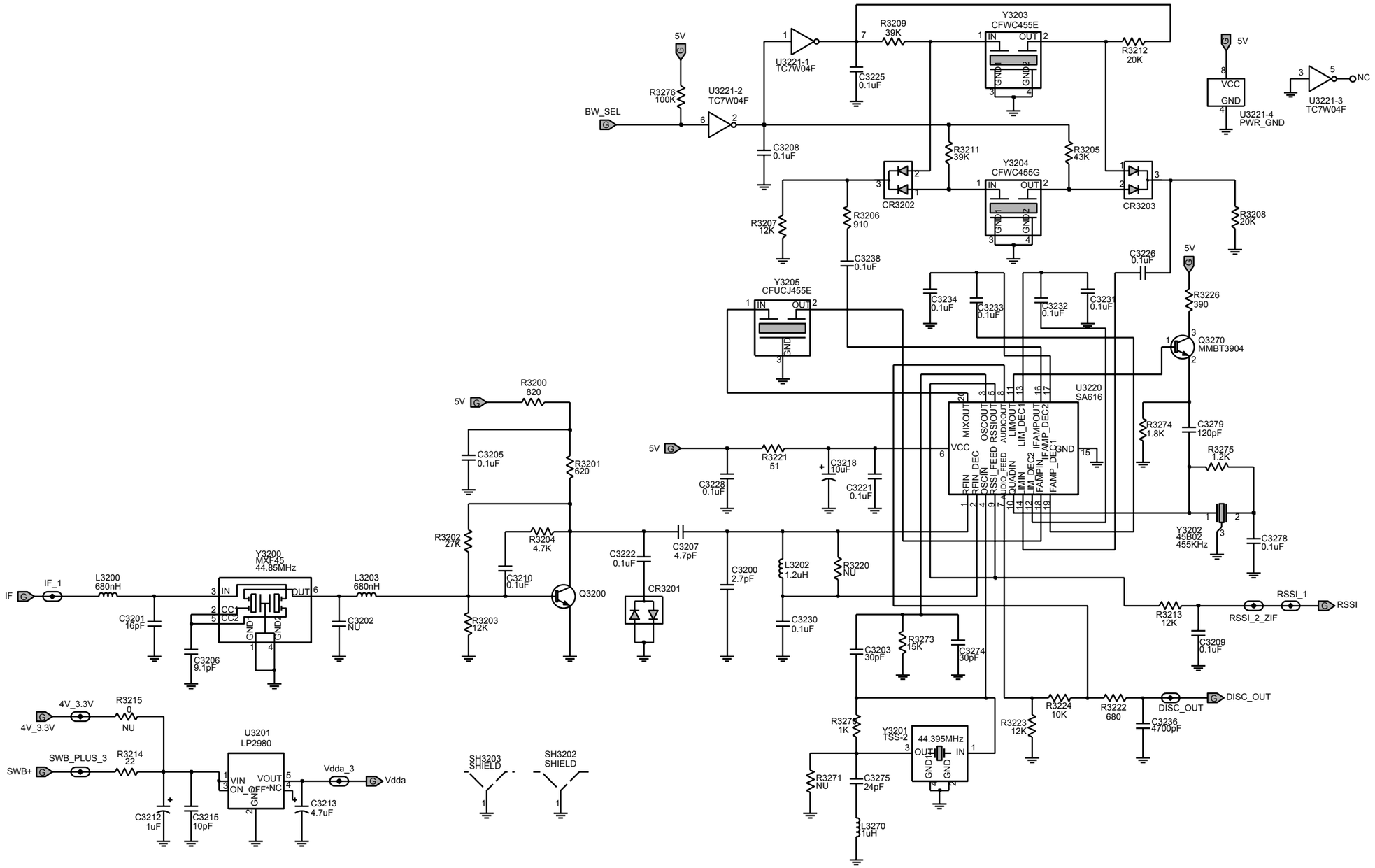


Figure 4-58: VHF (136–174 MHz) Receiver Back End Schematic Diagram

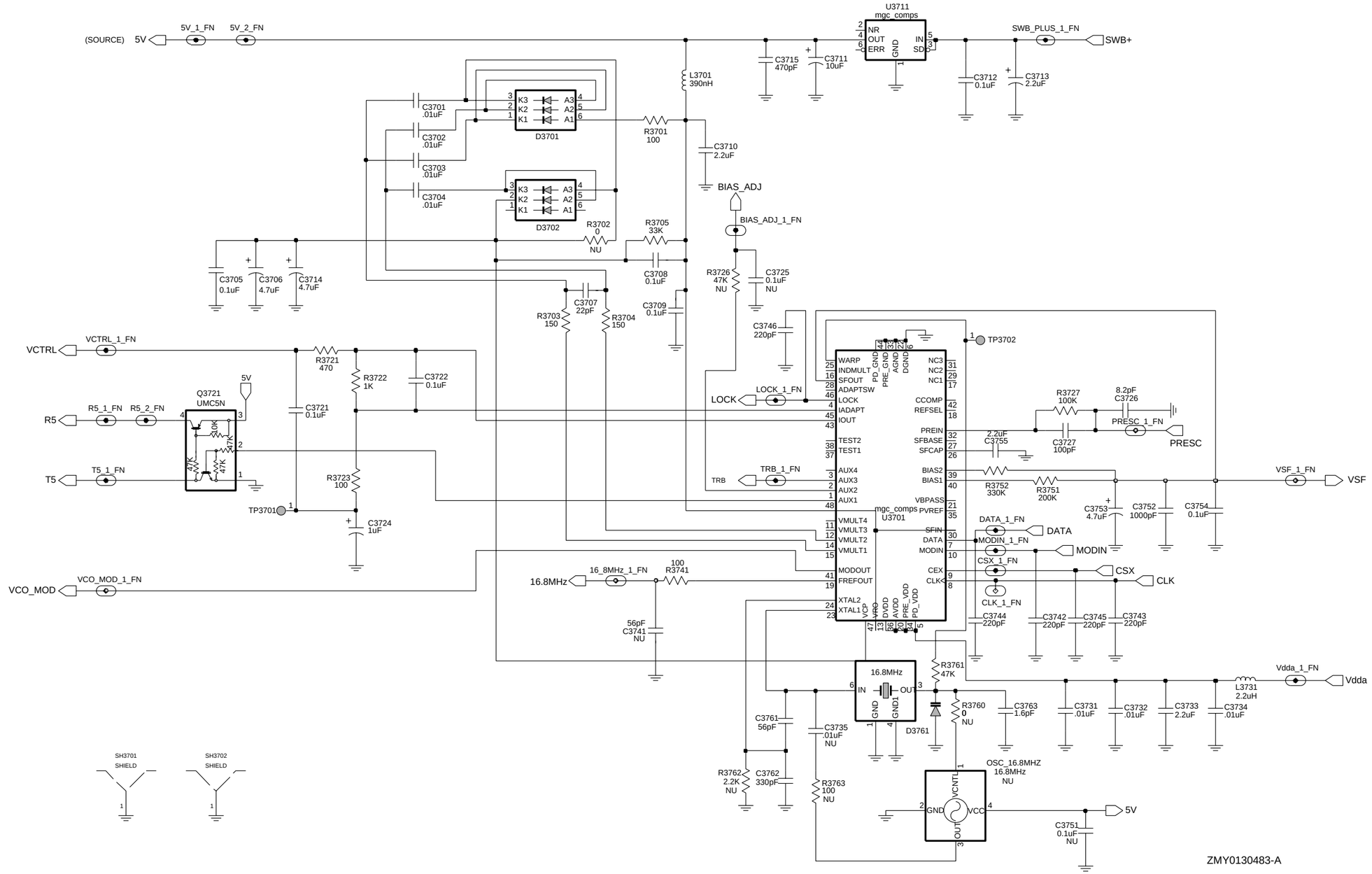


Figure 4-59: VHF (136–174 MHz) Synthesizer Schematic Diagram

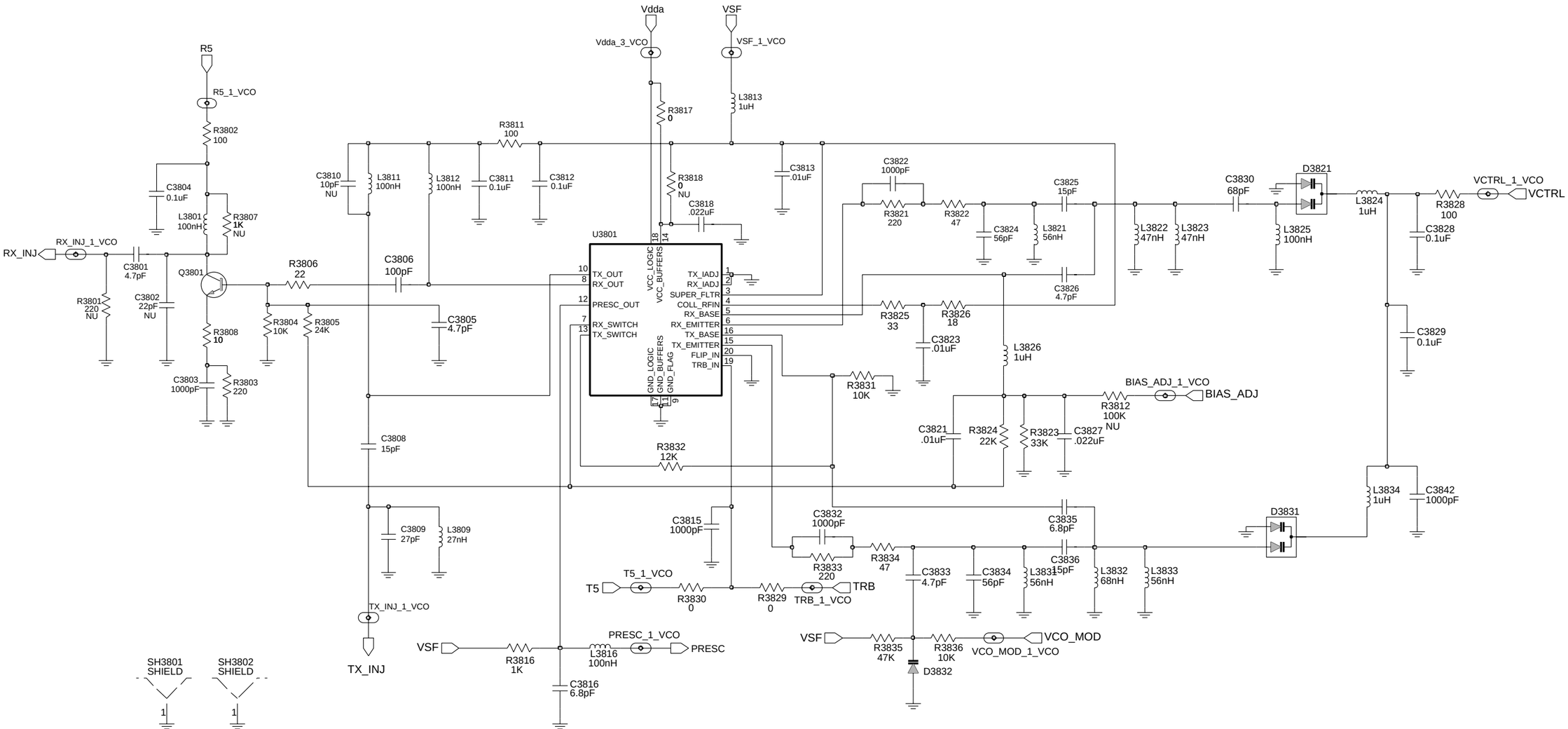


Figure 4-60: VHF (136–174 MHz) Voltage Controlled Oscillator Schematic Diagram

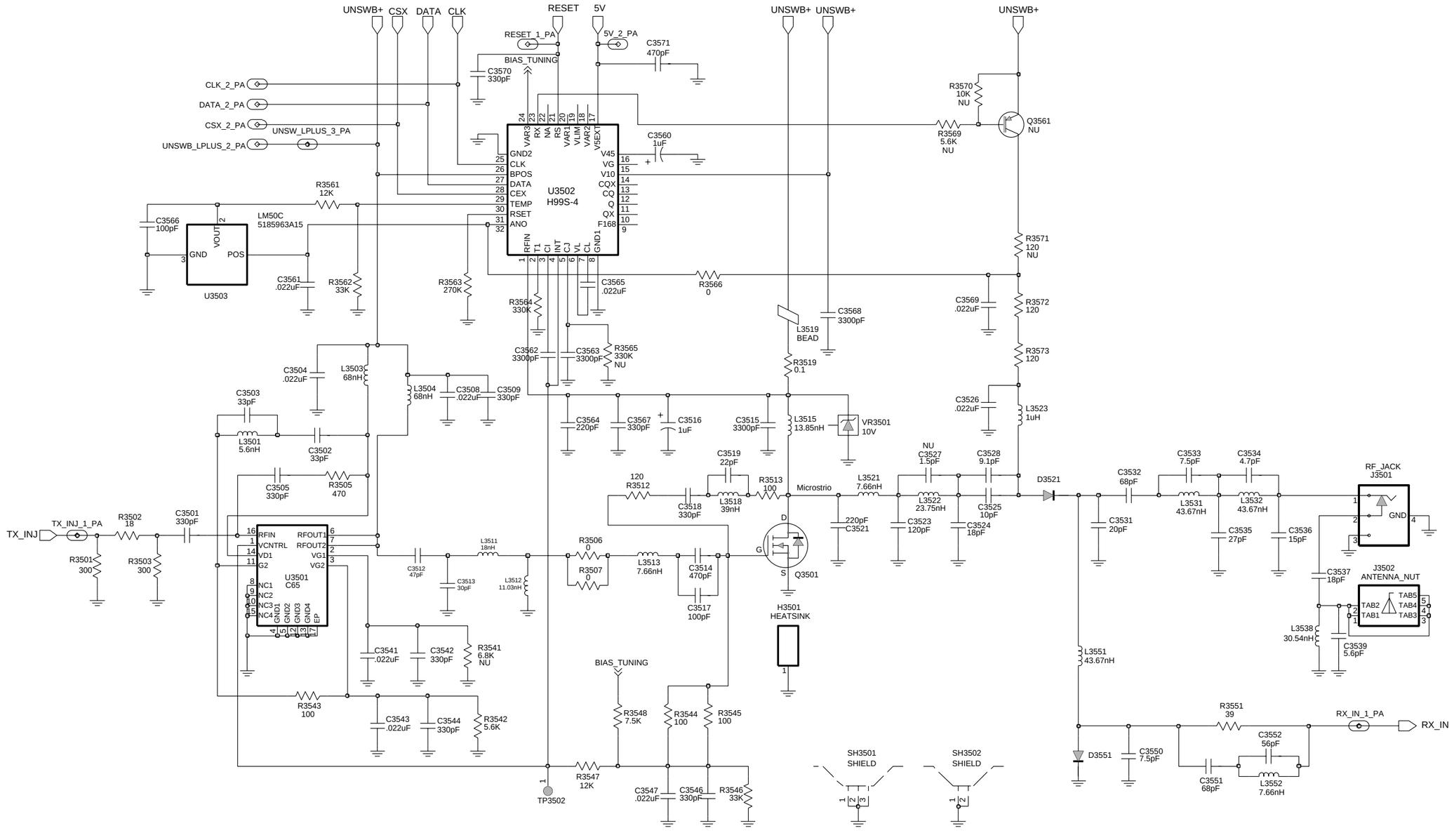


Figure 4-61: VHF (136–174 MHz) Transmitter Schematic Diagram

VHF (136–174 MHz) Radio Parts List (PCB 8486473Z04 rev. C)

Circuit Ref	Motorola Part No.	Description
B501	0986237A02	Battery Contact Module
B503	NOT PLACED	
B504	NOT PLACED	
C3200	2113743N12	2.7pF
C3201	2113743N31	16pF
C3202	NOT PLACED	
C3203	2113743N37	30pF
C3205	2113743M24	100000pF
C3206	2109445U26	9.1
C3207	2113743N18	4.7pF
C3208	2113743M24	100000pF
C3209	2113743M24	100000pF
C3210	2113743M24	100000pF
C3212	2311049A07	1uF
C3213	2311049A56	4.7uF
C3215	2113743N26	10pF
C3218	2311049A59	10uF
C3221	2113743E20	0.1uF
C3222	2113743M24	100000pF
C3225	2113743M24	100000pF
C3226	2113743M24	100000pF
C3228	2113743M24	100000pF
C3230	2113743M24	100000pF
C3231	2113743M24	100000pF
C3232	2113743M24	100000pF
C3233	2113743M24	100000pF
C3234	2113743M24	100000pF
C3236	2113743L33	4700pF
C3238	2113743M24	100000pF
C3274	2113743N37	30pF
C3275	2113743N35	24pF
C3278	2113743E20	0.1uF
C3279	2113743N52	120pF
C328	2113743M24	100000pF
C3301	2113743N20	5.6pF
C3302	2113743N54	150pF
C3303	2113743N30	15pF
C3304	2113743N54	150pF
C3305	NOT PLACED	
C3306	2113928N01	0.1uF
C3307	2113743N50	100pF
C3308	2113743L05	330pF
C3309	2113928N01	0.1uF
C3310	NOT PLACED	
C3311	2113743N54	150pF
C3312	2113743N31	16pF
C3313	2113743N54	150pF
C3314	NOT PLACED	
C3315	2113743N26	10pF
C3316	2113743N14	3.3pF
C3317	2113743N37	30pF
C3318	2113743M08	22000pF
C3319	NOT PLACED	
C3320	2113743N48	82pF
C3321	2113743L05	330pF
C3322	2113743N50	100pF
C3323	2113743N50	100pF
C3324	2113743N38	33pF
C3325	2113743L17	1000pF
C3326	NOT PLACED	
C3327	2113743L05	330pF
C3329	2113743L05	330pF
C3330	2113743N50	100pF
C3331	2113743N50	100pF
C3332	2113743N40	39pF
C3334	2113743N33	20pF
C3335	2113743N34	22pF
C3336	2311049A96	33uF
C3337	2113743M08	22000pF
C3338	2113743L09	470pF
C3339	2113743N26	10pF
C337	2113928P04	1uF
C3501	2113743L05	330pF
C3502	2113743N38	33pF
C3503	2113743N38	33pF
C3504	2113743M08	22000pF
C3505	2113743N38	33pF
C3508	2113743M08	22000pF
C3509	2113743L05	330pF
C3512	2113740F43	47pF
C3513	2113740F38	30pF
C3514	2113740F47	68pF
C3515	2113743L29	3300pF
C3516	2311049A08	1uF
C3517	2113740F47	68pF
C3518	NOT PLACED	
C3519	NOT PLACED	
C3521	2111078B51	220pF
C3523	2111078B44	120pF
C3524	2113740F34	20pF
C3525	2113740F27	10pF
C3526	2113743M08	22000pF
C3527	NOT PLACED	
C3528	2113740F27	10pF
C3531	2113740F34	20pF
C3532	2113740F47	68pF
C3533	2113740F24	7.5pF
C3534	2113740F19	4.7pF
C3535	2113740F37	27pF
C3536	2113740F31	15pF
C3537	2113740F33	18pF
C3539	2113740F29	12pF
C3541	2113743M08	22000pF
C3542	2113743L05	330pF
C3543	2113743M08	22000pF
C3544	2113743L05	330pF
C3546	2113743L05	330pF
C3547	2113743M08	22000pF
C3550	2113743N23	7.5pF
C3551	2113743N46	68pF
C3552	2113743N44	56pF
C3560	2311049A07	1uF
C3561	2113743M08	22000pF
C3562	2113743L29	3300pF
C3563	2113743L29	3300pF
C3564	2113743L01	220pF
C3565	2113743E07	0.022uF
C3566	2113743N50	100pF
C3567	2113743L05	330pF
C3568	2113743L29	3300pF
C3569	2113743M08	22000pF
C3570	2113743L05	330pF
C3571	2113743L09	470pF
C358	2113743N22	6.8pF
C359	2113743N31	16pF
C3701	2113743L41	10000pF
C3702	2113743L41	10000pF
C3703	2113743L41	10000pF
C3704	2113743L41	10000pF
C3705	2113743E20	0.1uF
C3706	2311049J11	4.7uF
C3707	2113743N34	22pF
C3708	2113928N01	0.1uF
C3709	2113928N01	0.1uF
C3710	2104993J02	2.2uF
C3711	2311049A69	10uF
C3712	2113928N01	0.1uF
C3713	2311049A09	2.2uF
C3714	2311049J11	4.7uF
C3715	2113743L09	470pF
C3721	2113743E20	0.1uF
C3722	2113743E20	0.1uF
C3724	2311049A08	1uF
C3725	NOT PLACED	
C3726	2113743N24	8.2pF
C3727	2113743N50	100pF
C3731	2113743L41	10000pF
C3732	2113743L41	10000pF
C3733	2104993J02	2.2uF
C3734	2113743L41	10000pF
C3741	NOT PLACED	
C3742	2113743L01	220pF
C3743	2113743L01	220pF
C3744	2113743L01	220pF
C3745	2113743L01	220pF
C3746	2113743L01	220pF
C3752	2113743L17	1000pF
C3753	2311049A56	4.7uF
C3754	2113928N01	0.1uF
C3755	2104993J02	2.2uF
C3761	2113743N42	47pF
C3762	2113740F63	330pF
C3763	NOT PLACED	
C3801	2113743N18	4.7pF
C3802	NOT PLACED	
C3803	2113743L17	1000pF
C3804	2113743E20	0.1uF
C3805	2113743N18	4.7pF
C3806	2113743N50	100pF
C3808	2113743N30	15pF
C3809	2113743N36	27pF
C3810	NOT PLACED	
C3811	2113928N01	0.1uF
C3812	2113928N01	0.1uF
C3813	2113743L41	10000pF
C3815	2113743L17	1000pF
C3816	2113743N22	6.8pF
C3818	2113743E07	0.022uF
C3821	2113743L41	10000pF
C3822	2113743L17	1000pF
C3823	2113743L41	10000pF
C3824	2113743N44	56pF
C3825	2113743N30	15pF
C3826	2113743N18	4.7pF
C3827	2113743E07	0.022uF
C3828	2185895Z01	0.01uF
C3829	2185895Z01	0.01uF
C383	2113743N43	51pF
C3830	2113743N46	68pF
C3832	2113743L17	1000pF
C3833	2113743N18	4.7pF
C3834	2113743N44	56pF
C3835	2113743N22	6.8pF
C3836	2113743N30	15pF
C3842	2113743L17	1000pF
C390	2113743N43	51pF
C400	2113743L41	10000pF
C401	2113928N01	0.1uF
C402	2113928N01	0.1uF
C4020	NOT PLACED	
C4021	NOT PLACED	
C403	2113743G24	2.2uF
C407	2113928N01	0.1uF
C408	2113743N50	100pF
C409	2113928N01	0.1uF
C410	2113928N01	0.1uF
C411	2113928N01	0.1uF
C414	2113928N01	0.1uF
C415	2185895Z01	0.01uF
C416	2113928N01	0.1uF
C419	2113743L41	10000pF
C420	2113743L41	10000pF
C421	2113928N01	0.1uF
C422	2113928N01	0.1uF
C423	2113743N50	100pF
C424	2311049A59	10uF
C425	2113928N01	0.1uF
C426	2113743N50	100pF
C427	2113743N50	100pF
C428	2113928N01	0.1uF
C429	2113928N01	0.1uF
C430	2113928N01	0.1uF

Circuit Ref	Motorola Part No.	Description
C431	2113743N50	100pF
C432	NOT PLACED	
C433	2113743L41	10000pF
C434	NOT PLACED	
C435	2113928N01	0.1uF
C436	NOT PLACED	
C437	NOT PLACED	
C440	2113743G26	4.7uF
C441	2113743L09	470pF
C442	2113743E20	0.1uF
C443	2113928N01	0.1uF
C444	2113743N50	100pF
C445	2113743L09	470pF
C446	2113743L09	470pF
C447	2113928N01	0.1uF
C448	2113928N01	0.1uF
C449	2113743N50	100pF
C450	NOT PLACED	
C451	2113743M08	22000pF
C452	2113743B29	1uF
C453	2113743N50	100pF
C456	2113743N50	100pF
C458	2113743N50	100pF
C459	2113743N50	100pF
C463	2113743N50	100pF
C466	2113743N50	100pF
C467	2113928N01	0.1uF
C471	2113743L09	470pF
C472	2113743L09	470pF
C473	2113743L09	470pF
C474	2113743L41	10000pF
C475	2113743H14	10uF
C476	2113928D08	10uF
C477	2113743L17	1000pF
C478	2113743L17	1000pF
C479	2113928N01	0.1uF
C480	2113928D08	10uF
C481	2113928N01	0.1uF
C482	2113928N01	0.1uF
C483	2113743L09	470pF
C484	2113743L09	470pF
C490	2113743L09	470pF
C491	2113743L09	470pF
C492	2113743L09	470pF
C493	2113743N50	100pF
C494	2113743N50	100pF
C495	2113743L09	470pF
C496	2113743L09	470pF
C497	2113743L09	470pF
C498	NOT PLACED	
C502	2311049A05	0.47uF
C503	2113743N50	100pF
C505	2113743N50	100pF
C511	2113743N50	100pF
C512	2113743N50	100pF
C513	2113743N50	100pF

Circuit Ref	Motorola Part No.	Description
C514	2113743N50	100pF
C520	2113743L41	10000pF
C521	2113743L41	10000pF
C522	2113743L41	10000pF
C523	2113743L41	10000pF
C535	2113743L17	1000pF
CR3201	4813825A19	Schottky Diode
CR3202	4802245J97	Band Switching Diode
CR3203	4802245J97	Band Switching Diode
CR3301	4802245J42	Ring Quad Diode
CR3302	4805129M96	Dual Diode
CR3303	4880154K03	Dual Diode
CR411	4802245J62	Schottkt Diode
CR412	4802245J62	Schottkt Diode
CR413	4802245J62	Schottkt Diode
CR440	4813833C02	Dual Diode
CR501	4880107R01	Rectifier
CR503	4805729G49	Red / Yellow LED
D3301	4802081B58	Dual Diode
D3302	4802081B58	Dual Diode
D3521	4880973Z02	Pin Diode
D3551	4880973Z02	Pin Diode
D3701	4802233J09	Triple Diode
D3702	4802233J09	Triple Diode
D3761	4862824C03	Varactor Diode
D3821	4805649Q13	Varactor Diode
D3831	4805649Q13	Varactor Diode
D3832	4862824C01	Varactor Diode
E400	2480640Z01	Ferrite Bead
E401	2480640Z01	Ferrite Bead
E402	2480640Z01	Ferrite Bead
E403	2480640Z01	Ferrite Bead
E404	2480640Z01	Ferrite Bead
E405	2480640Z01	Ferrite Bead
E406	2480640Z01	Ferrite Bead
E407	2480640Z01	Ferrite Bead
E408	2480640Z01	Ferrite Bead
E409	2480640Z01	Ferrite Bead
F501	6580542Z01	Fuse 3A
FL401	NOT PLACED	
H3501	2680499Z01	Heat Spreader
J3501	0985613Z01	RF Jack
J3502	0280519Z02	Antenna Nut
J400	0905505Y04	40-Pin Connector
J403	0905505Y02	20-Pin Connector
L3200	2413926K33	680nH
L3202	2413923A25	1200nH
L3203	2413926K33	680nH
L3270	2462587N68	1000nH
L3301	2462587T35	12nH
L3303	2462587T35	12nH
L3304	2462587T23	470nH
L3305	2462587T35	12nH
L3306	2462587T35	12nH
L3308	2462587T34	10nH
L3309	2462587N55	150nH

Circuit Ref	Motorola Part No.	Description
L3312	2462587V28	33nH
L3501	2413926H09	5.6nH
L3503	2462587V32	68nH
L3504	2462587N51	68nH
L3511	2462587N44	18nH
L3512	2479990B01	11.03nH
L3513	2479990A02	7.66nH
L3515	2479990C03	1385nH
L3518	NOT PLACED	
L3519	2484657R01	Ferrite Bead
L3521	2479990A02	7.66nH
L3522	2479990E01	23.75nH
L3523	2462587N68	1000nH
L3531	2479990N01	43.67nH
L3532	2479990N01	43.67nH
L3538	2479990M01	30.54nH
L3551	2479990N01	43.67nH
L3552	2479990A02	7.66nH
L3701	2462587Q42	390nH
L3731	2462587Q20	2200nH
L3801	2462587V34	100nH
L3809	2462587V27	27nH
L3811	2462587V34	100nH
L3812	2462587V34	100nH
L3813	2462587Q47	1000nH
L3816	2462587V34	100nH
L3821	2462587N50	56nH
L3822	2462587N49	47nH
L3823	2462587N49	47nH
L3824	2462587N68	1000nH
L3825	2462587V34	100nH
L3826	2462587N68	1000nH
L3831	2462587N50	56nH
L3832	2462587N51	68nH
L3833	2462587N50	56nH
L3834	2462587N68	1000nH
L400	2462587Q42	390nH
L401	2462587Q42	390nH
L410	2462587Q42	390nH
L411	2462587Q42	390nH
L505	2462587Q42	390nH
PB501	4086470Z01	Tactile Switch
PB502	4086470Z01	Tactile Switch
PB503	4086470Z01	Tactile Switch
PB504	4086470Z01	Tactile Switch
PB505	4086470Z01	Tactile Switch
Q3200	4802197J95	NPN Transistor
Q3270	4813824A10	NPN Transistor
Q3301	4880214G02	NPN Transistor
Q3302	4802197J95	NPN Transistor
Q3501	4813828A08	RF Power Amplifier
Q3561	4813824A17	PNP Transistor
Q3721	4809939C05	Dual NPN/PNP Transistor
Q3801	4802197J95	NPN Transistor
Q400	4809579E18	MOSFET P-chan Transistor
Q403	4813824A17	PNP Transistor

Circuit Ref	Motorola Part No.	Description
Q405	4802245J54	Dual NPN Transistor
Q410	4802245J54	Dual NPN Transistor
Q416	NOT PLACED	
Q417	4809939C05	Dual NPN/PNP Transistor
Q502	5180159R01	Dual NPN Transistor
Q505	4880214G02	NPN Transistor
R3200	0662057M72	820
R3201	0662057M69	620
R3202	0662057N09	27K
R3203	0662057N01	12K
R3204	0662057M90	4700
R3205	0662057N06	20K
R3206	0662057M73	910
R3207	0662057N01	12K
R3208	0662057N06	20K
R3209	0662057N13	39K
R3211	0662057N13	39K
R3212	0662057N06	20K
R3213	0662057N01	12K
R3214	0662057M34	22
R3215	0662057M01	0
R3220	NOT PLACED	
R3221	0662057M43	51
R3222	0662057M70	680
R3223	0662057V04	12K
R3224	0662057V02	10K
R3226	0662057M64	390
R3270	0662057M74	1000
R3271	NOT PLACED	
R3273	0662057N03	15K
R3274	0662057M80	1800
R3275	0662057M76	1200
R3276	0662057N23	100K
R3301	NOT PLACED	
R3303	0662057N23	100K
R3304	0662057N23	100K
R3305	0662057N18	62K
R3306	0662057M82	2200
R3307	0662057N11	33K
R3308	0662057M78	1500
R3309	0662057M95	7500
R3310	0662057M84	2700
R3311	NOT PLACED	
R3312	0662057M19	5.1
R3313	0662057M40	39
R3314	0662057M35	24
R3315	0662057M62	330
R3316	0662057M66	470
R3317	0662057N23	100K
R3318	0662057M66	470
R3319	NOT PLACED	
R3320	NOT PLACED	
R3321	0662057M43	51
R3322	NOT PLACED	
R3323	0662057M01	0
R3324	0662057M58	220

Circuit Ref	Motorola Part No.	Description
R3501	0662057M61	300
R3502	0662057M32	18
R3503	0662057M61	300
R3505	0662057M62	330
R3506	0662057B62	3.9
R3507	0662057B62	3.9
R3512	NOT PLACED	
R3513	NOT PLACED	
R3519	0680539Z01	0.1
R3541	0662057N13	39K
R3542	0662057M92	5600
R3543	0662057M50	100
R3544	0662057A25	100
R3545	0662057A25	100
R3546	0662057N01	12K
R3547	0662057N11	33K
R3548	0662057N07	22K
R3551	0662057M40	39
R3561	0662057N01	12K
R3562	0662057N11	33K
R3563	0662057N33	270K
R3564	0662057N35	330K
R3565	NOT PLACED	
R3566	NOT PLACED	
R3569	0662057M92	5600
R3570	0662057M98	10K
R3571	0662057A27	120
R3572	0662057A27	120
R3573	0662057A27	120
R370	NOT PLACED	
R3701	0662057M50	100
R3702	NOT PLACED	
R3703	0662057M54	150
R3704	0662057M54	150
R3705	0662057N11	33K
R371	0662057N23	100K
R372	0662057N28	160K
R3721	0662057M66	470
R3722	0662057M68	560
R3723	0662057M50	100
R3726	NOT PLACED	
R3727	0662057N23	100K
R373	NOT PLACED	
R374	0662057N23	100K
R3741	0662057M50	100
R375	NOT PLACED	
R3751	0662057N30	200K
R3752	0662057N29	180K
R376	0662057M01	0
R3761	0662057N15	47K
R3762	NOT PLACED	
R377	0662057N23	100K
R378	0662057N23	100K
R3801	NOT PLACED	
R3802	0662057M50	100
R3803	0662057M58	220

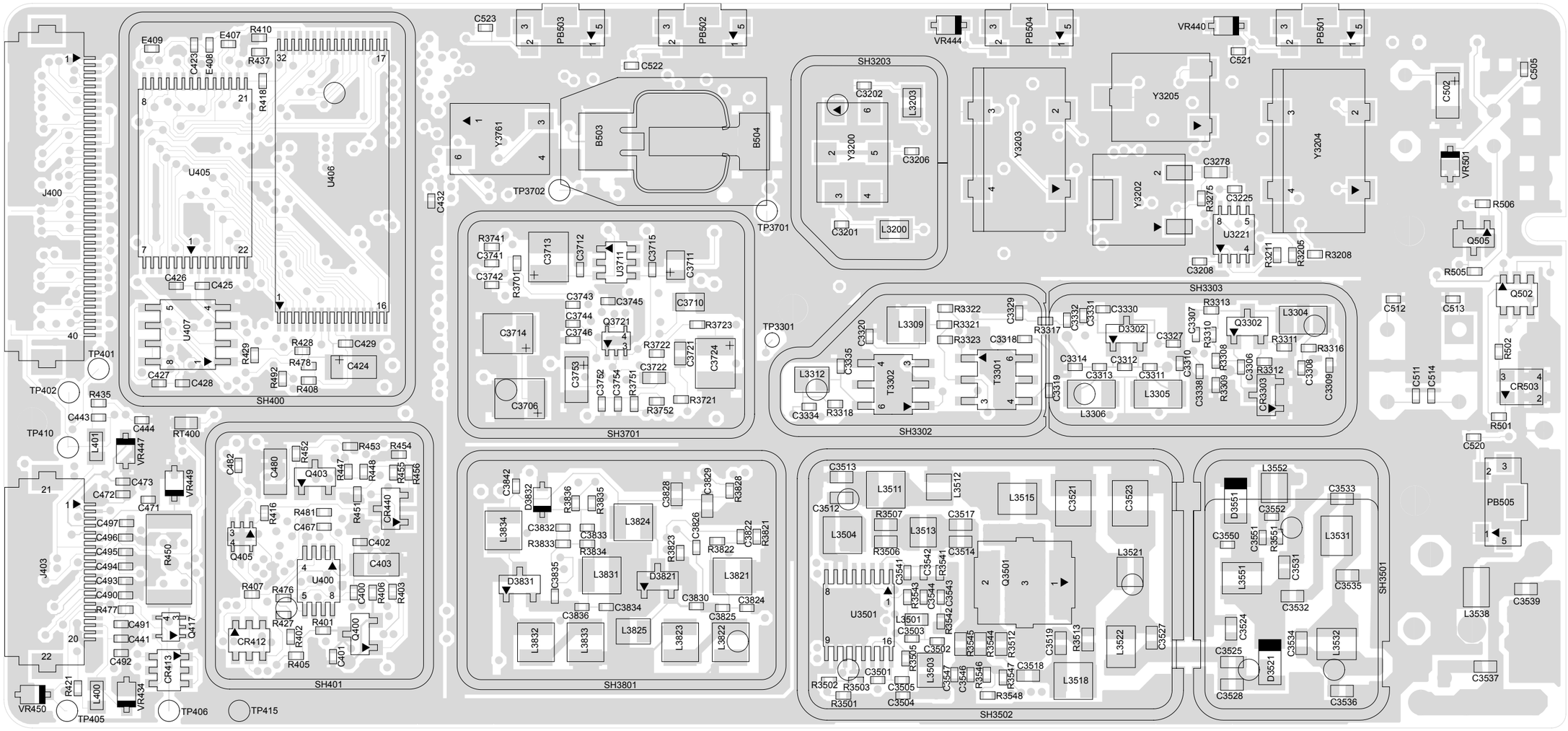
Circuit Ref	Motorola Part No.	Description
R3804	0662057M98	10K
R3805	0662057N08	24K
R3806	0662057M34	22
R3807	NOT PLACED	
R3808	0662057M26	10
R3811	0662057M50	100
R3812	NOT PLACED	
R3816	0662057M74	1000
R3817	0662057M01	0
R3818	NOT PLACED	
R3821	0662057M58	220
R3822	0662057M42	47
R3823	0662057N11	33K
R3824	0662057N07	22K
R3825	0662057M38	33
R3826	0662057M32	18
R3828	0662057M50	100
R3829	0662057M01	0
R3830	NOT PLACED	
R3831	0662057M98	10K
R3832	0662057N01	12K
R3833	0662057M58	220
R3834	0662057M42	47
R3835	0662057N15	47K
R3836	0662057M98	10K
R400	0662057N15	47K
R401	0662057M01	0
R402	NOT PLACED	
R403	NOT PLACED	
R405	0662057M01	0
R406	0662057N20	75K
R407	0662057N19	68K
R408	NOT PLACED	
R409	0662057M98	10K
R410	0662057N23	100K
R411	0662057M98	10K
R413	0662057M01	0
R414	0662057V34	180K
R415	0662057V26	91K
R416	0662057M98	10K
R418	0662057M01	0
R419	NOT PLACED	
R420	NOT PLACED	
R421	0662057M81	2000
R423	0662057N21	82K
R424	0662057N12	36K
R425	0662057N10	30K
R426	NOT PLACED	
R427	0662057M84	2700
R428	0662057M10	2.2
R429	0662057N20	75K
R431	0662057N39	470K
R432	0662057N16	51K
R434	0662057M62	330
R435	0662057M81	2000
R436	0662057M01	0

Circuit Ref	Motorola Part No.	Description
R437	NOT PLACED	
R445	0662057N08	24K
R447	0662057N23	100K
R448	0662057M98	10K
R449	0662057N08	24K
R450	0683962T45	68
R451	0662057N03	15K
R452	0662057N23	100K
R453	NOT PLACED	
R454	NOT PLACED	
R455	NOT PLACED	
R456	0662057M01	0
R457	0662057M98	10K
R460	0662057M90	4700
R461	NOT PLACED	
R462	NOT PLACED	
R463	0662057M61	300
R471	0662057N06	20K
R472	0662057M93	6200
R473	0662057M26	10
R475	0662057M01	0
R476	0662057N35	330K
R477	0662057M74	1000
R478	0662057M98	10K
R481	0662057N08	24K
R492	0662057M01	0
R498	0662057M98	10K
R499	0662057M98	10K
R501	0662057M70	680
R502	0662057M56	180
R505	0662057M98	10K
R506	0662057N15	47K
RT3301	NOT PLACED	
RT400	0680590Z01	Thermistor_33K
S501	4080710Z01	Frequency Switch
S502	1880619Z02	Volume / On-off Switch
SH3202	2686539Z01	IFIC Shield
SH3203	2686527Z01	Crystal Filter Shield
SH3301	2686081B01	Receiver Back-End Bottom Shield
SH3302	2686081B05	Mixer Diode Shield
SH3303	2686081B06	Receiver Front-End Shield
SH3501	2686081B03	Harmonic Filter Shield
SH3502	2686081B04	PA Shield
SH3701	2680511Z01	Synthesizer Top Shield
SH3702	2680511Z01	Synthesizer Bottom Shield
SH3801	2680513Z01	VCO Top Shield
SH3802	2680514Z01	VCO Buffer IC Shield
SH400	2680505Z01	Controller Memory Shield
SH401	2680506Z01	Controller On-off Shield
SH402	2680515Z01	Microprocessor Shield
SH403	2680516Z01	Asfic_Cmp, Audio PA Shield
T3301	2580541Z02	Balun Transformer
T3302	2580541Z02	Balun Transformer
U303	5113818A01	IC Sing Supply
U3201	5102463J58	3.3V Regulator
U3220	5186144B01	IF IC

Circuit Ref	Motorola Part No.	Description
U3221	5109522E10	Inverter IC
U3501	5185130C65	ASFIC CMP IC
U3502	5185765B26	LDMOS Driver IC
U3503	5185963A15	PCIC
U3701	5185963A27	Temperature Sensor
U3711	5105739X05	5V Regulator
U3801	5105750U54	VCO Buffer IC
U400	5102463J40	3.3V Regulator
U404	5185130C53	LV FRAC-N IC
U405	5102463J36	Static RAM 32K X 8
U406	5102463J60	Flash ROM 512K X 8
U407	5102495J05	EEPROM 16K X 8
U409	5102226J56	Microprocessor IC
U410	NOT PLACED	
U420	5102463J44	Audio PA
VR3501	4880140L17	Zener Diode
VR432	4805656W08	Zener Diode
VR433	4805656W08	Zener Diode
VR434	4802245J73	Zener Diode 6.8V
VR439	4880140L17	Zener Diode
VR440	NOT PLACED	
VR441	NOT PLACED	
VR442	NOT PLACED	
VR444	NOT PLACED	
VR447	4802245J74	Zener Diode 10V
VR448	4802245J74	Zener Diode 10V
VR449	4802245J74	Zener Diode 10V
VR450	4802245J75	Zener Diode 12V
VR460	4802245J73	Zener Diode 6.8V
VR501	4802245J73	Zener Diode 6.8V
VR506	4802245J73	Zener Diode 6.8V
Y3200	9180022M11	44.85MHZ Crystal Filter
Y3201	4802245J84	44.395MHz Crystal Oscillator
Y3202	9186145B02	455KHZ Discriminator
Y3203	9180469V05	455KHz 6-Pole Ceramic Filter
Y3204	9180469V03	455KHz 6-Pole Ceramic Filter
Y3205	9180468V05	455KHz 4-Pole Ceramic Filter
Y3761	4805875Z04	16.8 MHZ Crystal Oscillator
	8486473Z04	VHF PC Board

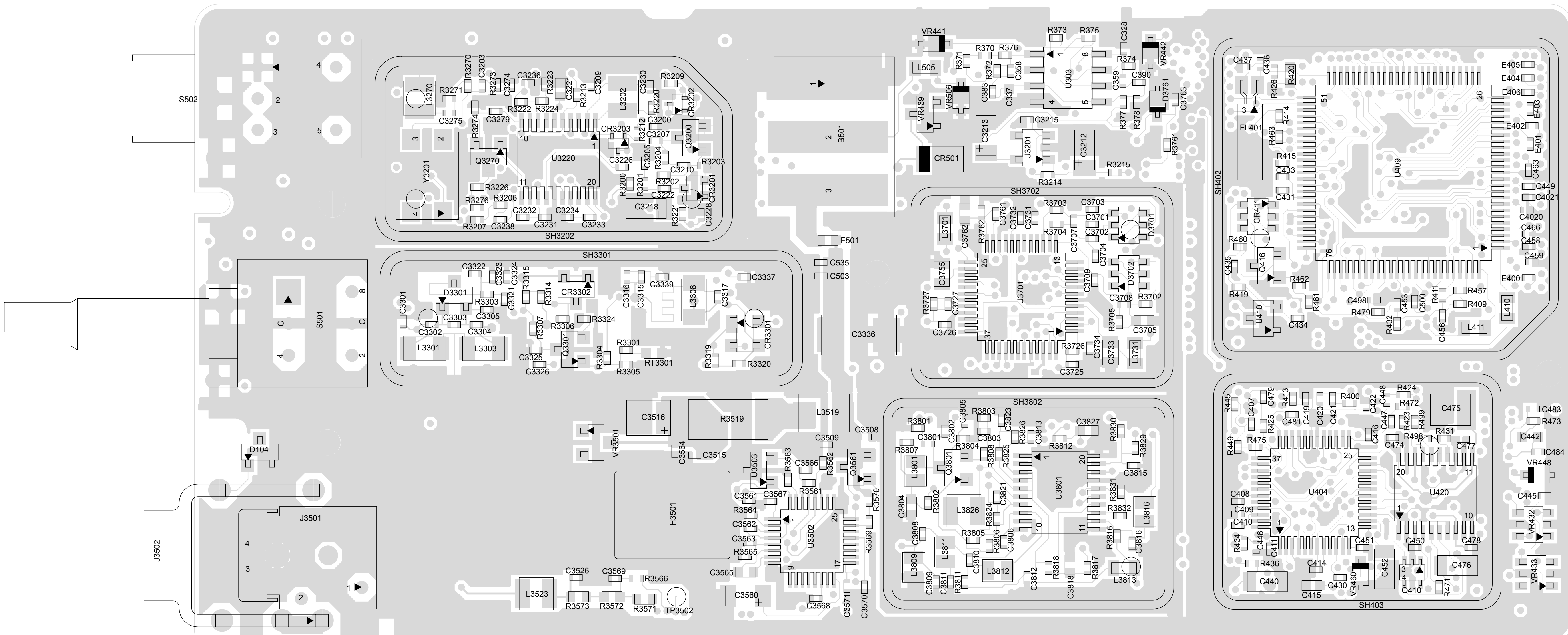
* Motorola Depot Servicing only

4.10 VHF Circuit Board/Schematic Diagrams and Parts List (PCB 8415112H01)



ZMY30008-O

Figure 4-62: VHF (136–174 MHz) Main Board Top Side PCB No. 8415112H01



ZMY30009-O

Figure 4-63: VHF (136–174 MHz) Main Board Bottom Side PCB No. 8415112H01

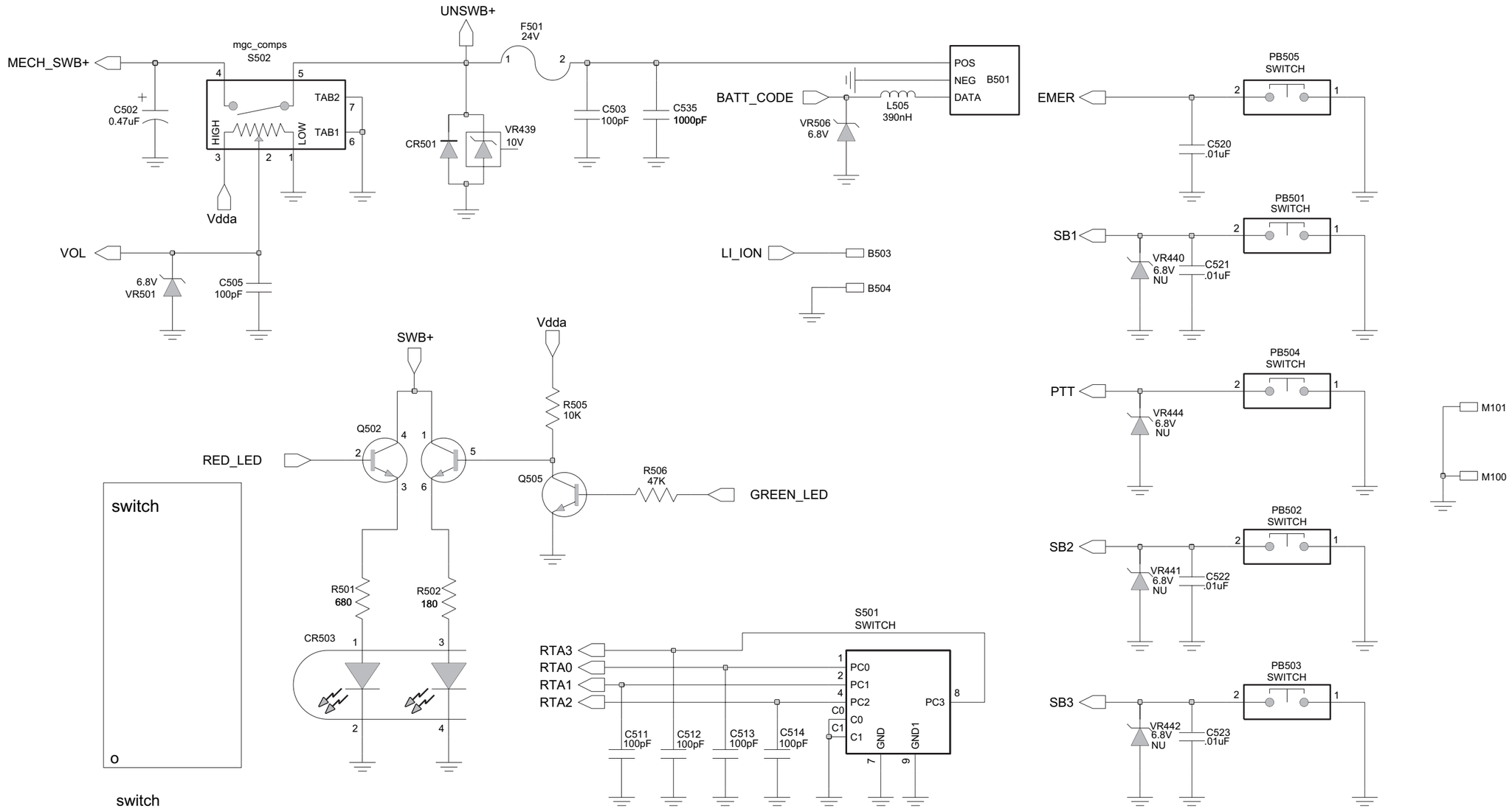


Figure 4-64: VHF Controls And Switches Schematic Diagram

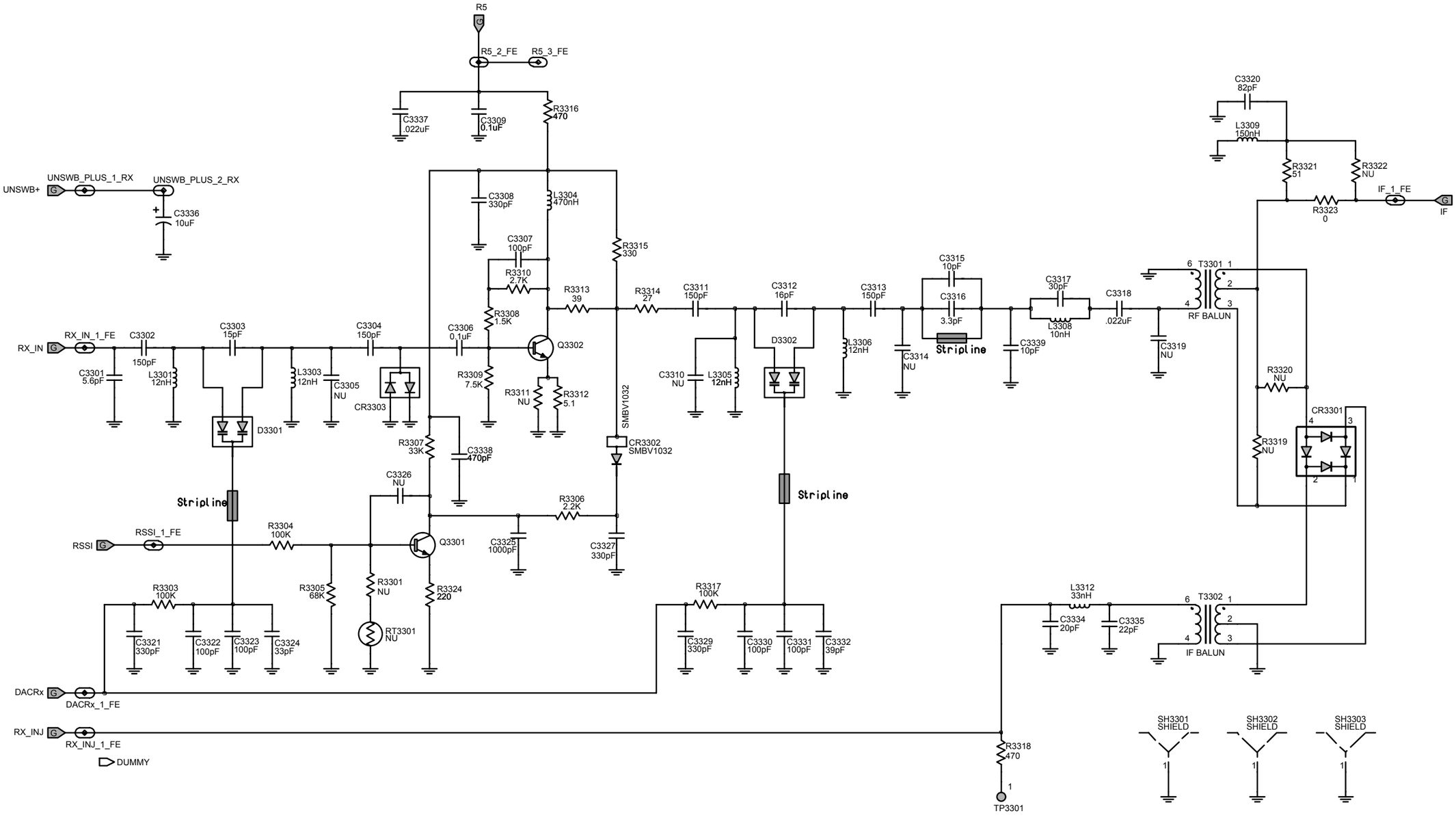


Figure 4-65: VHF Receiver Front End Schematic Diagram

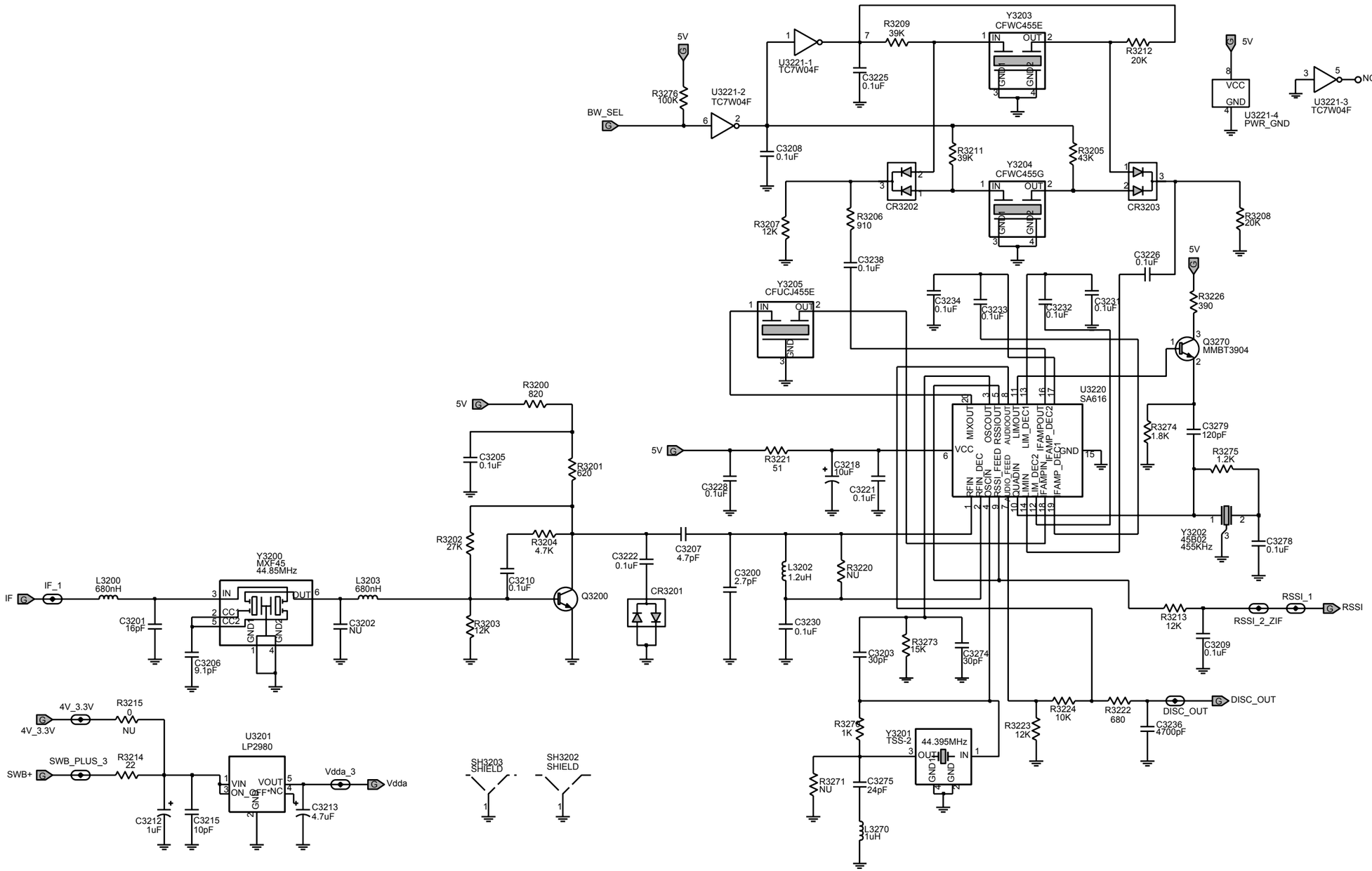


Figure 4-66: VHF Receiver Back End Schematic Diagram

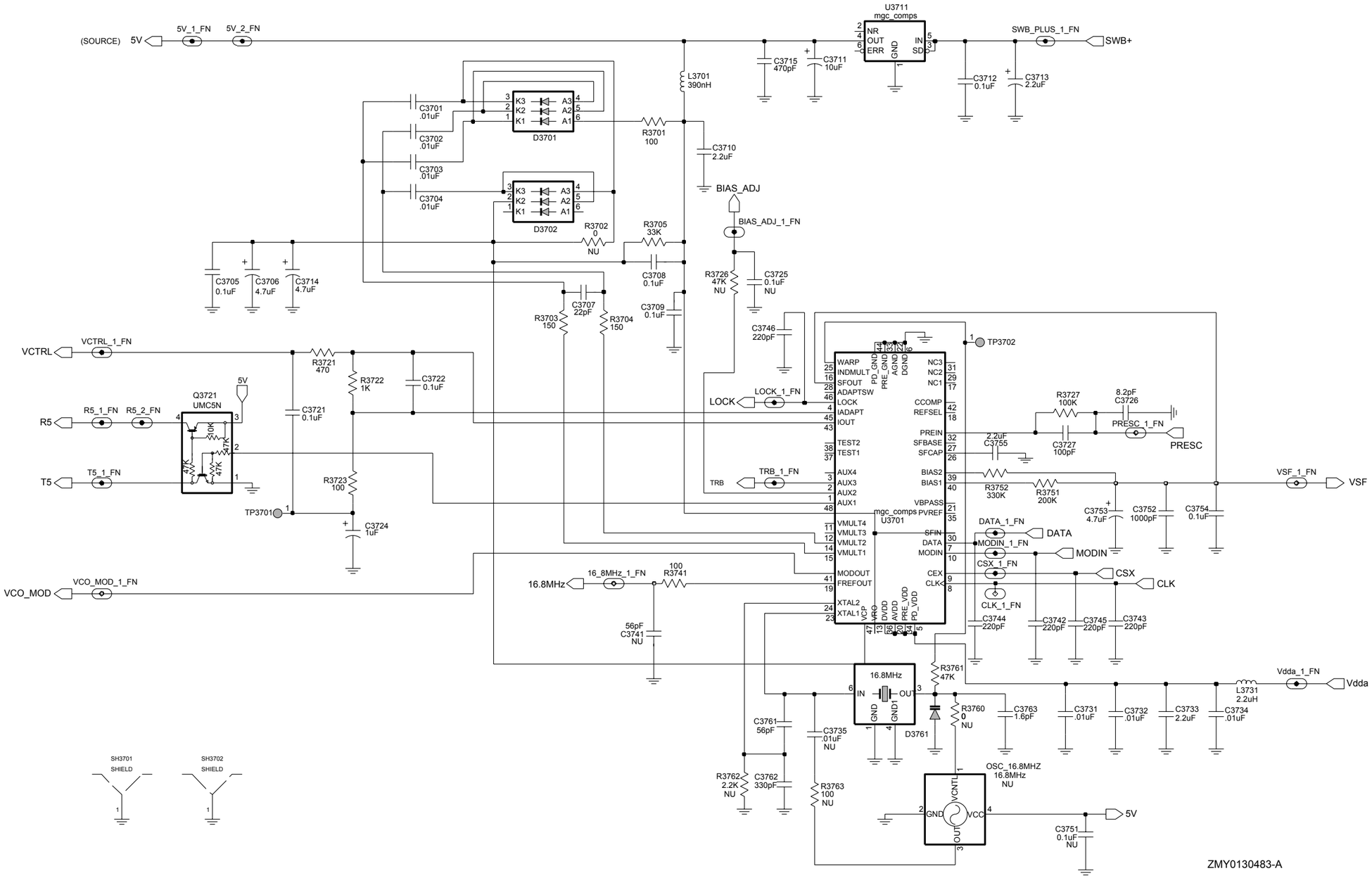


Figure 4-67: VHF Synthesizer Schematic Diagram

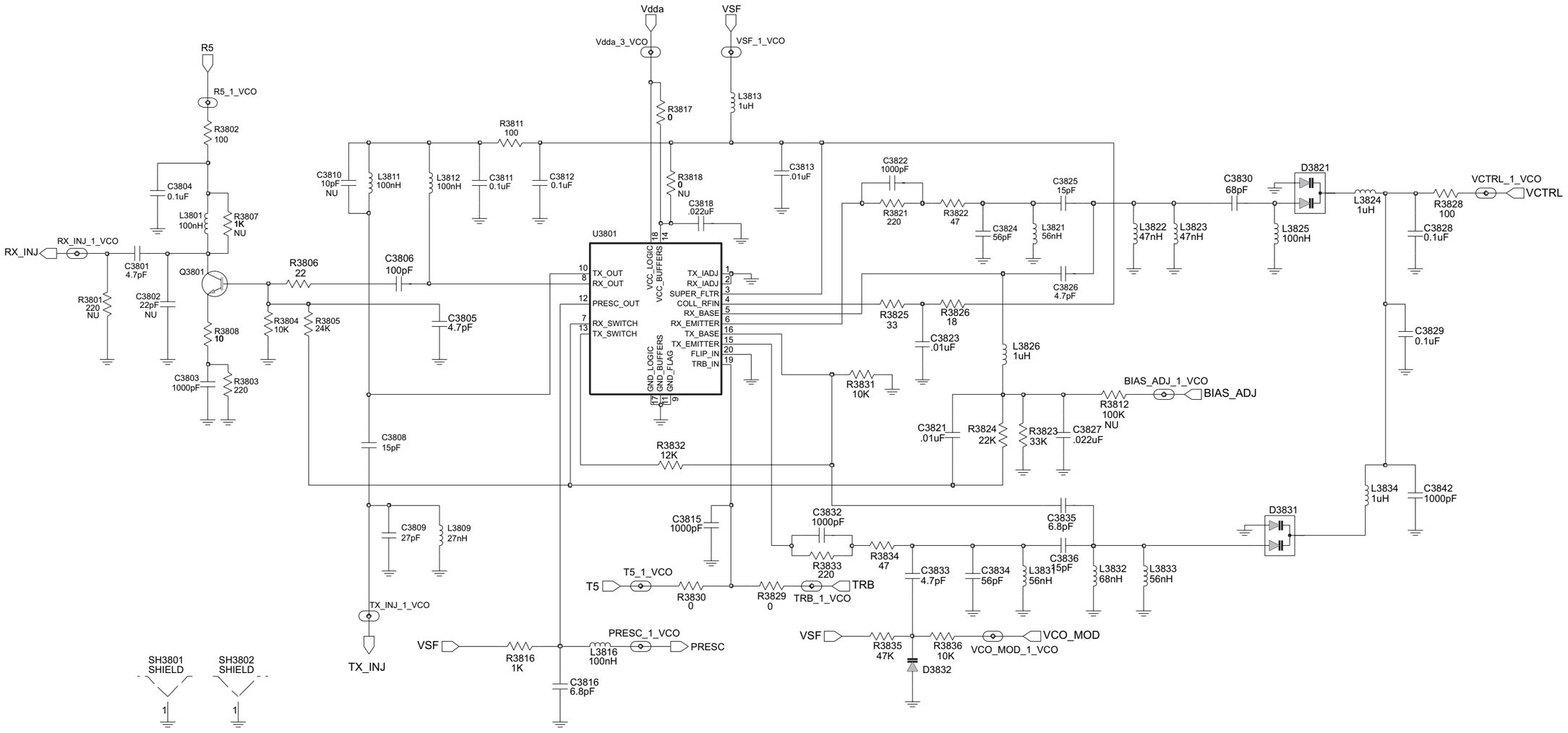


Figure 4-68: VHF Voltage Controlled Oscillator Schematic Diagram

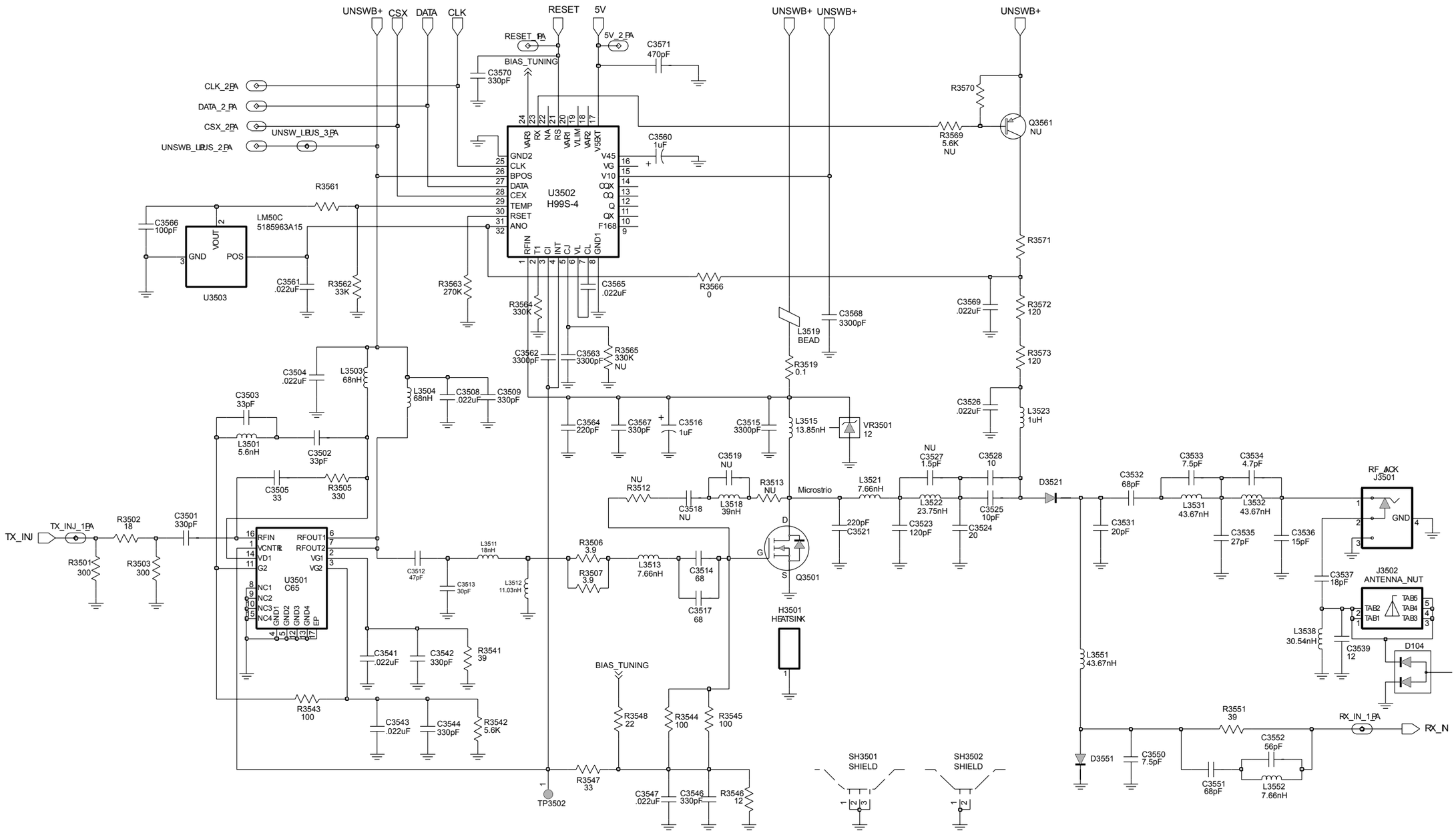


Figure 4-69: VHF Transmitter Schematic Diagram

VHF (136–174 MHz) Radio Parts List (PCB 8415112H01)

Circuit Ref	Motorola Part No.	Description
B501	0986237A02	CONNECTOR (CONTACT BATTERY)
B503	3980502Z01	CONTACT, BACKUP B+
B504	3980501Z01	CONTACT, BACKUP B-
C328	2113946K02	CAP CER CHP 0.10UF 16V
C337	2113946D02	CAP CER CHP 1.0UF 6.3V 10%
C358	2113944A21	CAP CER CHP 6.8PF 50V +/- 0.5PF
C359	2113944A79	CAP,FXD,16PF,+5%,-5%,50V-DC,0402,C
C383	2113944A85	CAP,FXD,51PF,+5%,-5%,50V-DC,0402,C
C390	2113944A85	CAP,FXD,51PF,+5%,-5%,50V-DC,0402,C
C400	2113945B02	CAP CER CHP 10,000PF 25V 10%
C401	2113946B04	CAP CER CHP 0.10UF 10V 10%
C402	2113946B04	CAP CER CHP 0.10UF 10V 10%
C403	2113743G24	CAP CHIP 2.2 UF 16V+80-20%
C407	2113946B04	CAP CER CHP 0.10UF 10V 10%
C408	2113944A40	CAP CER CHP 100.0PF 50V 5%
C409	2113946B04	CAP CER CHP 0.10UF 10V 10%
C410	2113946B04	CAP CER CHP 0.10UF 10V 10%
C411	2113946B04	CAP CER CHP 0.10UF 10V 10%
C414	2113946B04	CAP CER CHP 0.10UF 10V 10%
C415	2185895Z01	CAPACITOR CER LOW DIST .01UF
C416	2113946B04	CAP CER CHP 0.10UF 10V 10%
C419	2113945B02	CAP CER CHP 10,000PF 25V 10%
C420	2113945B02	CAP CER CHP 10,000PF 25V 10%
C421	2113946B04	CAP CER CHP 0.10UF 10V 10%
C422	2113946B04	CAP CER CHP 0.10UF 10V 10%
C423	2113944A40	CAP CER CHP 100.0PF 50V 5%
C424	NOT PLACED	–
C425	2113946B04	CAP CER CHP 0.10UF 10V 10%
C426	2113944A40	CAP CER CHP 100.0PF 50V 5%
C427	2113944A40	CAP CER CHP 100.0PF 50V 5%
C428	2113946B04	CAP CER CHP 0.10UF 10V 10%
C429	2113946B04	CAP CER CHP 0.10UF 10V 10%
C430	2113946B04	CAP CER CHP 0.10UF 10V 10%
C431	2113944A40	CAP CER CHP 100.0PF 50V 5%
C432	NOT PLACED	–
C433	2113945B02	CAP CER CHP 10,000PF 25V 10%
C434	2113946B04	CAP CER CHP 0.10UF 10V 10%
C435	2113946B04	CAP CER CHP 0.10UF 10V 10%
C436	2113944A29	CAP CER CHP 22.0PF 50V 5%
C437	2113944A29	CAP CER CHP 22.0PF 50V 5%
C440	2113946Q01	CAP CER CHP 4.7UF 16V
C441	2113945A05	CAP CER CHP 470PF 50V 10%
C442	2113945D04	CAP CER CHP 100,000PF 25V 10%
C443	2113946B04	CAP CER CHP 0.10UF 10V 10%
C444	2113944A40	CAP CER CHP 100.0PF 50V 5%
C445	2113945A05	CAP CER CHP 470PF 50V 10%
C446	2113945A05	CAP CER CHP 470PF 50V 10%
C447	2113946B04	CAP CER CHP 0.10UF 10V 10%
C448	2113946B04	CAP CER CHP 0.10UF 10V 10%
C449	2113944A40	CAP CER CHP 100.0PF 50V 5%
C450	NOT PLACED	–
C451	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-DC,04
C452	2113743B29	CAP CHIP 1.00 UF 10% 16V
C453	2113944A40	CAP CER CHP 100.0PF 50V 5%
C456	2113944A40	CAP CER CHP 100.0PF 50V 5%
C458	2113944A40	CAP CER CHP 100.0PF 50V 5%
C459	2113944A40	CAP CER CHP 100.0PF 50V 5%
C463	2113944A40	CAP CER CHP 100.0PF 50V 5%
C466	2113944A40	CAP CER CHP 100.0PF 50V 5%
C467	2113946B04	CAP CER CHP 0.10UF 10V 10%
C471	2113945A05	CAP CER CHP 470PF 50V 10%
C472	2113945A05	CAP CER CHP 470PF 50V 10%
C473	2113945A05	CAP CER CHP 470PF 50V 10%
C474	2113945B02	CAP CER CHP 10,000PF 25V 10%
C475	2113743H14	CAP CHIP 10.0 UF 16V +80-20%
C476	2113946R01	CAP CER CHP 10.0UF 10V
C477	2113945A09	CAP CER CHP 1000PF 50V 10%
C478	2113945A09	CAP CER CHP 1000PF 50V 10%
C479	2113946B04	CAP CER CHP 0.10UF 10V 10%
C480	2113946R01	CAP CER CHP 10.0UF 10V
C481	2113946B04	CAP CER CHP 0.10UF 10V 10%
C482	2113946B04	CAP CER CHP 0.10UF 10V 10%
C483	2113945A05	CAP CER CHP 470PF 50V 10%
C484	2113945A05	CAP CER CHP 470PF 50V 10%
C490	2113945A05	CAP CER CHP 470PF 50V 10%
C491	2113945A05	CAP CER CHP 470PF 50V 10%
C492	2113945A05	CAP CER CHP 470PF 50V 10%
C493	2113944A40	CAP CER CHP 100.0PF 50V 5%
C494	2113944A40	CAP CER CHP 100.0PF 50V 5%
C495	2113945A05	CAP CER CHP 470PF 50V 10%
C496	2113945A05	CAP CER CHP 470PF 50V 10%
C497	2113945A05	CAP CER CHP 470PF 50V 10%
C498	NOT PLACED	–
C498	NOT PLACED	–
C500	2113946B04	CAP CER CHP 0.10UF 10V 10%
C502	2313960A55	CAP TANT 0.47 UF 10% 25V 3216-18
C503	2113944A40	CAP CER CHP 100.0PF 50V 5%
C505	2113944A40	CAP CER CHP 100.0PF 50V 5%
C511	2113944A40	CAP CER CHP 100.0PF 50V 5%
C512	2113944A40	CAP CER CHP 100.0PF 50V 5%
C513	2113944A40	CAP CER CHP 100.0PF 50V 5%
C514	2113944A40	CAP CER CHP 100.0PF 50V 5%
C520	2113945B02	CAP CER CHP 10,000PF 25V 10%
C521	2113945B02	CAP CER CHP 10,000PF 25V 10%
C522	2113945B02	CAP CER CHP 10,000PF 25V 10%
C523	2113945B02	CAP CER CHP 10,000PF 25V 10%
C535	2113945A09	CAP CER CHP 1000PF 50V 10%
C610	2113944A40	CAP CER CHP 100.0PF 50V 5%
C611	2113944A40	CAP CER CHP 100.0PF 50V 5%
C612	2113944A40	CAP CER CHP 100.0PF 50V 5%
C613	2113944A40	CAP CER CHP 100.0PF 50V 5%
C615	2113944A40	CAP CER CHP 100.0PF 50V 5%
C616	2113944A40	CAP CER CHP 100.0PF 50V 5%
C618	2113944A40	CAP CER CHP 100.0PF 50V 5%
C619	2113944A40	CAP CER CHP 100.0PF 50V 5%
C620	2113944A40	CAP CER CHP 100.0PF 50V 5%
C621	2113944A40	CAP CER CHP 100.0PF 50V 5%
C622	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3200	2113944A11	CAP CER CHP 2.7PF 50V +/- 0.25PF
C3201	2113944A79	CAP,FXD,16PF,+5%,-5%,50V-DC,0402,C
C3202	NOT PLACED	–
C3203	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,0402,C
C3205	2113946K02	CAP CER CHP 0.10UF 16V
C3206	2115153H26	CAP, CERAMIC, COG
C3207	2113944A17	CAP CER CHP 4.7PF 50V +/- 0.25PF
C3208	2113946K02	CAP CER CHP 0.10UF 16V
C3209	2113946K02	CAP CER CHP 0.10UF 16V
C3210	2113946K02	CAP CER CHP 0.10UF 16V
C3212	2313960B01	CAP TANT 1.0 UF 10% 16V 3216-18
C3213	2313960B30	CAP TANT 4.7 UF 10% 10V 3216-18
C3215	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5PF
C3218	2313960B57	CAP,TANTALUM,10UF,+10%,-10%,4V-DC,S
C3221	2113945D04	CAP CER CHP 100,000PF 25V 10%
C3222	2113946K02	CAP CER CHP 0.10UF 16V
C3225	2113946K02	CAP CER CHP 0.10UF 16V
C3226	2113946K02	CAP CER CHP 0.10UF 16V
C3228	2113946K02	CAP CER CHP 0.10UF 16V
C3230	2113946K02	CAP CER CHP 0.10UF 16V
C3231	2113946K02	CAP CER CHP 0.10UF 16V
C3232	2113946K02	CAP CER CHP 0.10UF 16V
C3233	2113946K02	CAP CER CHP 0.10UF 16V
C3234	2113946K02	CAP CER CHP 0.10UF 16V
C3236	2113945A13	CAP CER CHP 4700PF 50V 10%
C3238	2113946K02	CAP CER CHP 0.10UF 16V
C3274	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,0402,C
C3275	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,0402,C
C3278	2113945D04	CAP CER CHP 100,000PF 25V 10%
C3279	2113944A41	CAP CER CHP 120.0PF 50V 5%
C3301	2113944A19	CAP CER CHP 5.6PF 50V +/- 0.5PF
C3302	2113944A42	CAP CER CHP 150.0PF 50V 5%
C3303	2113944A27	CAP CER CHP 15.0PF 50V 5%
C3304	2113944A42	CAP CER CHP 150.0PF 50V 5%
C3305	NOT PLACED	–
C3306	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3307	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3308	2113945A03	CAP CER CHP 330PF 50V 10%
C3309	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3310	NOT PLACED	–
C3311	2113944A42	CAP CER CHP 150.0PF 50V 5%
C3312	2113944A79	CAP,FXD,16PF,+5%,-5%,50V-DC,0402,C
C3313	2113944A42	CAP CER CHP 150.0PF 50V 5%
C3314	NOT PLACED	–
C3315	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5PF
C3316	2113944A13	CAP CER CHP 3.3PF 50V +/- 0.25PF
C3317	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,0402,C
C3318	2113945B04	CAP,FXD,0.022UF,+10%,-10%,25V-DC,04
C3319	NOT PLACED	–
C3320	2113944A38	CAP CER CHP 82.0PF 50V 5%
C3321	2113945A03	CAP CER CHP 330PF 50V 10%
C3322	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3323	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3324	2113944A31	CAP CER CHP 33.0PF 50V 5%
C3325	2113945A09	CAP CER CHP 1000PF 50V 10%
C3326	NOT PLACED	–
C3327	2113945A03	CAP CER CHP 330PF 50V 10%
C3329	2113945A03	CAP CER CHP 330PF 50V 10%
C3330	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3331	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3332	2113944A32	CAP CER CHP 39.0PF 50V 5%
C3334	2113944A80	CAP,FXD,20PF,+5%,-5%,50V-DC,0402,C
C3335	2113944A29	CAP CER CHP 22.0PF 50V 5%
C3336	2313960F04	CAP TANT 33 UF 10% 16V 6032-28
C3337	2113945B04	CAP,FXD,0.022UF,+10%,-10%,25V-DC,04
C3338	2113945A05	CAP CER CHP 470PF 50V 10%
C3339	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5PF
C3501	2113945A03	CAP CER CHP 330PF 50V 10%
C3502	2113944A31	CAP CER CHP 33.0PF 50V 5%
C3503	2113944A31	CAP CER CHP 33.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C3504	2113945B04	CAP,FXD,0.022UF,+10%,-10%,25V-DC,04
C3505	2113944A31	CAP CER CHP 33.0PF 50V 5%
C3508	2113945B04	CAP,FXD,0.022UF,+10%,-10%,25V-DC,04
C3509	2113945A03	CAP CER CHP 330PF 50V 10%
C3512	2113944C38	CAP CER CHP 47.0PF 50V 5%
C3513	2113944C82	CAP,FXD,30PF,+5%,-5%,50V-DC,0603,C
C3514	2113944C41	CAP CER CHP 68.0PF 50V 5%
C3515	2113945A12	CAP CER CHP 3300PF 50V 10%
C3516	2313960C26	CAP TANT 1.0 UF 10% 35V 3528-21
C3517	2113944C41	CAP CER CHP 68.0PF 50V 5%
C3518	NOT PLACED	–
C3519	NOT PLACED	–
C3521	2111078B51	CAP CHIP RF 220 5 NPO 100V
C3523	2111078B44	CAP CHIP RF 120 5 NPO 100V
C3524	2113944C80	CAP,FXD,20PF,+5%,-5%,50V-DC,0603,C
C3525	2113944C30	CAP CER CHP 10.0PF 50V +/-0.5PF
C3526	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-DC,04
C3527	NOT PLACED	–
C3528	2113944C30	CAP CER CHP 10.0PF 50V +/-0.5PF
C3531	2113944C80	CAP,FXD,20PF,+5%,-5%,50V-DC,0603,C
C3532	2113944C41	CAP CER CHP 68.0PF 50V 5%
C3533	2113944C27	CAP CER CHP 7.5PF 50V +/-0.5PF
C3534	2113944C22	CAP CER CHP 4.7PF 50V +/-0.25PF
C3535	2113944C35	CAP CER CHP 27.0PF 50V 5%
C3536	2113944C32	CAP CER CHP 15.0PF 50V 5%
C3537	2113944C33	CAP CER CHP 18.0PF 50V 5%
C3539	2113944C31	CAP CER CHP 12.0PF 50V 5%
C3541	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-DC,04
C3542	2113945A03	CAP CER CHP 330PF 50V 10%
C3543	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-DC,04
C3544	2113945A03	CAP CER CHP 330PF 50V 10%
C3546	2113945A03	CAP CER CHP 330PF 50V 10%
C3547	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-DC,04
C3550	2113944A22	CAP CER CHP 7.5PF 50V +/-0.5PF
C3551	2113944A36	CAP CER CHP 68.0PF 50V 5%
C3552	2113944A34	CAP CER CHP 56.0PF 50V 5%
C3560	2313960B01	CAP TANT 1.0 UF 10% 16V 3216-18
C3561	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-DC,04
C3562	2113945A12	CAP CER CHP 3300PF 50V 10%
C3563	2113945A12	CAP CER CHP 3300PF 50V 10%
C3564	2113945A01	CAP CER CHP 220PF 50V 10%
C3565	2113945C04	CAP CER CHP 22,000PF 50V 10%
C3566	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3567	2113945A03	CAP CER CHP 330PF 50V 10%
C3568	2113945A12	CAP CER CHP 3300PF 50V 10%
C3569	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-DC,04
C3570	2113945A03	CAP CER CHP 330PF 50V 10%
C3571	2113945A05	CAP CER CHP 470PF 50V 10%
C3701	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3702	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3703	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3704	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3705	2113945D04	CAP CER CHP 100,000PF 25V 10%
C3706	2313960D05	CAP TANT 4.7 UF 10% 16V 3528-21
C3707	2113944A29	CAP CER CHP 22.0PF 50V 5%
C3708	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3709	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3710	2113946N03	CAP CER CHP 2.2UF 16V
C3711	2313960M51	CAP TANT 10 UF 10% 6.3V 2012-12
C3712	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3713	2313960C78	CAP TANT 2.2 UF 10% 20V 3528-21
C3714	2313960D05	CAP TANT 4.7 UF 10% 16V 3528-21
C3715	2113945A05	CAP CER CHP 470PF 50V 10%
C3721	2113945D04	CAP CER CHP 100,000PF 25V 10%
C3722	2113945D04	CAP CER CHP 100,000PF 25V 10%
C3724	2313960C26	CAP TANT 1.0 UF 10% 35V 3528-21
C3725	NOT PLACED	–
C3726	2113944A23	CAP CER CHP 8.2PF 50V +/-0.5PF
C3727	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3731	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3732	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3733	2113946N03	CAP CER CHP 2.2UF 16V
C3734	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3741	NOT PLACED	–
C3742	2113945A01	CAP CER CHP 220PF 50V 10%
C3743	2113945A01	CAP CER CHP 220PF 50V 10%
C3744	2113945A01	CAP CER CHP 220PF 50V 10%
C3745	2113945A01	CAP CER CHP 220PF 50V 10%
C3746	2113945A01	CAP CER CHP 220PF 50V 10%
C3752	2113945A09	CAP CER CHP 1000PF 50V 10%
C3753	2313960B30	CAP TANT 4.7 UF 10% 10V 3216-18
C3754	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3755	2113946N03	CAP CER CHP 2.2UF 16V
C3761	2113944A33	CAP CER CHP 47.0PF 50V 5%
C3762	2113944C04	CAP CER CHP 330.0PF 50V 5%
C3763	NOT PLACED	–
C3801	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25PF
C3802	NOT PLACED	–
C3803	2113945A09	CAP CER CHP 1000PF 50V 10%
C3804	2113945D04	CAP CER CHP 100,000PF 25V 10%
C3805	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25PF
C3806	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3808	2113944A27	CAP CER CHP 15.0PF 50V 5%
C3809	2113944A30	CAP CER CHP 27.0PF 50V 5%
C3810	NOT PLACED	–
C3811	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3812	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3813	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3815	2113945A09	CAP CER CHP 1000PF 50V 10%
C3816	2113944A21	CAP CER CHP 6.8PF 50V +/-0.5PF
C3818	2113945C04	CAP CER CHP 22,000PF 50V 10%
C3821	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3822	2113945A09	CAP CER CHP 1000PF 50V 10%
C3823	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3824	2113944A34	CAP CER CHP 56.0PF 50V 5%
C3825	2113944A27	CAP CER CHP 15.0PF 50V 5%
C3826	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25PF
C3827	2113945C04	CAP CER CHP 22,000PF 50V 10%
C3828	2185895Z01	CAPACITOR CER LOW DIST .01UF
C3829	2185895Z01	CAPACITOR CER LOW DIST .01UF
C3830	2113944A36	CAP CER CHP 68.0PF 50V 5%
C3832	2113945A09	CAP CER CHP 1000PF 50V 10%
C3833	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25PF
C3834	2113944A34	CAP CER CHP 56.0PF 50V 5%
C3835	2113944A21	CAP CER CHP 6.8PF 50V +/-0.5PF
C3836	2113944A27	CAP CER CHP 15.0PF 50V 5%
C3842	2113945A09	CAP CER CHP 1000PF 50V 10%
C4020	NOT PLACED	–
C4021	NOT PLACED	–
CR411	4815067H01	DIODE ARRAY,SWG,RB731UFT108,SMD,1M
CR412	4815067H01	DIODE ARRAY,SWG,RB731UFT108,SMD,1M
CR413	4815067H01	DIODE ARRAY,SWG,RB731UFT108,SMD,1M
CR440	4813978C02	PB FREE, NOT COMPLETELY ENRICHED
CR501	4815155H01	RECTIFIER
CR503	4805729G49	DIODE RED/YEL
CR3201	4813974A19	DIODE SCHOTTKY BARRIER SERIES
CR3202	4815047H01	DIODE,SWG,DAN235EFTL,35V
CR3203	4815047H01	DIODE,SWG,DAN235EFTL,35V
CR3301	4802245J42	RING QUAD DIODE SOT-143 PKG
CR3302	4815129H01	DIODE DUAL BONDS RH
CR3303	4815048H01	DIODE,SHTK,MMBD353LT1,SM,7V
D104	4813978C06	DIODE DUAL 75V A2X MMBD2836LT1
D601	4880479U01	LED
D602	4880479U01	LED
D603	4880479U01	LED
D604	4880479U01	LED
D605	4880479U01	LED
D606	4880479U01	LED
D3301	4815276H01	VARACTOR DIODE FROM INFINEON
D3302	4815276H01	VARACTOR DIODE FROM INFINEON
D3521	4880973Z02	PIN DIODE
D3551	4880973Z02	PIN DIODE
D3701	4815011H01	DIODE,SWG,300MA,80V
D3702	4815011H01	DIODE,SWG,300MA,80V
D3761	4815072H01	DIODE,VCTR,1SV232,30V
D3821	4885094Y01	DIODE VARACTOR ISV228 W18
D3831	4885094Y01	DIODE VARACTOR ISV228 W18
D3832	4885055Y01	DIODE VARACTOR PB-FREE
E400	2480640Z01	SURFACE MOUNT FERRITE BEAD
E401	2480640Z01	SURFACE MOUNT FERRITE BEAD
E402	2480640Z01	SURFACE MOUNT FERRITE BEAD
E403	2480640Z01	SURFACE MOUNT FERRITE BEAD
E404	2480640Z01	SURFACE MOUNT FERRITE BEAD
E405	2480640Z01	SURFACE MOUNT FERRITE BEAD

Circuit Ref	Motorola Part No.	Description
E406	2480640Z01	SURFACE MOUNT FERRITE BEAD
E407	2480640Z01	SURFACE MOUNT FERRITE BEAD
E408	2480640Z01	SURFACE MOUNT FERRITE BEAD
E409	2480640Z01	SURFACE MOUNT FERRITE BEAD
E634	2480640Z01	SURFACE MOUNT FERRITE BEAD
E637	2480640Z01	SURFACE MOUNT FERRITE BEAD
E638	2480640Z01	SURFACE MOUNT FERRITE BEAD
E639	2480640Z01	SURFACE MOUNT FERRITE BEAD
E640	2480640Z01	SURFACE MOUNT FERRITE BEAD
E641	2480640Z01	SURFACE MOUNT FERRITE BEAD
E642	2480640Z01	SURFACE MOUNT FERRITE BEAD
E643	2480640Z01	SURFACE MOUNT FERRITE BEAD
E644	2480640Z01	SURFACE MOUNT FERRITE BEAD
E645	2480640Z01	SURFACE MOUNT FERRITE BEAD
F501	6515076H01	FUSE,FST BLW,3A,24V,FUSE CHIP SMT T
FL401	4870368G02	REFLOWABLE CLOCK OSC XTAL
H3501	2680499Z02	HEAT SPREADER
J400	0915064H03	CONNECTOR, ZIF (40 PINS)
J403	0915064H02	CONN,CONN,F,20CONT,CONNECTOR, ZIF
J601	0980521Z03	CONN, ZIF VERTICAL, 40PINS
J602	0915064H01	CONN,CONN,F,18CONT,CONNECTOR, ZIF
J3501	0985613Z01	JACK,RF
J3502	0280519Z02	NUT, ANTENNA
L400	2462587Q42	IND CHIP 390NH 10%
L401	2462587Q42	IND CHIP 390NH 10%
L410	2462587Q42	IND CHIP 390NH 10%
L411	2462587Q42	IND CHIP 390NH 10%
L505	2462587Q42	IND CHIP 390NH 10%
L3200	2414017K33	IND CER CHIP 680.0 NH 5%
L3202	2414015A25	IDCTR,CHIP,1.2UH,2%,440MA,2 OHM,CER,
L3203	2414017K33	IND CER CHIP 680.0 NH 5%
L3270	2462587N68	CHIP IND 1000 NH 5%
L3301	2415013H02	FIXED INDUCTOR,CHIP,120NH,5%,850 MA,
L3303	2415013H02	FIXED INDUCTOR,CHIP,120NH,5%,850 MA,
L3304	2462587T23	IND CHIP 470NH 5% LOW PRO
L3305	2415013H02	FIXED INDUCTOR,CHIP,120NH,5%,850 MA,
L3306	2415013H02	FIXED INDUCTOR,CHIP,120NH,5%,850 MA,
L3308	2415013H01	FIXED INDUCTOR,CHIP,100NH,5%,850 MA,
L3309	2462587N55	CHIP IND 150 NH 5%
L3312	2415043H02	FIXED INDUCTOR,RF,33NH,5%,S
L3501	2414017H09	IND CHIP 5.6 NH +/- 0.3NH
L3503	2415043H03	FIXED INDUCTOR,RF,68NH,5%,CER
L3504	2415015H02	IDCTR,CHIP,6.8NH,5%,1A,.16OHM,CER
L3511	2415042H01	FIXED INDUCTOR,RF,18NH,5%,CER
L3512	2479990B01	AIR WOUND COIL/GREEN COLOR 11.03NH
L3513	2479990A02	AIR WOUND COIL/GREEN COLOR 7.66NH
L3515	2479990C03	AIR WOUND COIL/GREEN COLOR 13.85NH
L3518	NOT PLACED	–
L3519	2415954H01	INDUCTOR BEAD CHIP
L3521	2479990A02	AIR WOUND COIL/GREEN COLOR 7.66NH
L3522	2.48E+07	COIL AIR WOUND/GREEN COLOR 23.75
L3523	2462587N68	CHIP IND 1000 NH 5%
L3531	2479990N01	AIR WOUND COIL/GREEN COLOR 43.67NH
L3532	2479990N01	AIR WOUND COIL/GREEN COLOR 43.67NH
L3538	2479990M01	AIR WOUND COIL/GREEN COLOR 30.54NH
L3551	2479990N01	AIR WOUND COIL/GREEN COLOR 43.67NH
L3552	2479990A02	AIR WOUND COIL/GREEN COLOR 7.66NH
L3701	2462587Q42	IND CHIP 390NH 10%
L3731	2462587Q20	IND CHIP 2,200NH 20%
L3801	2415043H04	IDCTR,CHIP,100NH,5%,500MA,CER
L3809	2415043H01	FIXED INDUCTOR,RF,27NH,5%,CER
L3811	2415043H04	IDCTR,CHIP,100NH,5%,500MA,CER
L3812	2415043H04	IDCTR,CHIP,100NH,5%,500MA,CER
L3813	2462587Q47	IND CHIP 1000 NH 10%
L3816	2415043H04	IDCTR,CHIP,100NH,5%,500MA,CER
L3821	2415042H02	FIXED INDUCTOR,RF,56NH,CER
L3822	2415015H01	IDCTR,CHIP,47NH,5%,1A,.16OHM,CER
L3823	2415015H01	IDCTR,CHIP,47NH,5%,1A,.16OHM,CER
L3824	2462587N68	CHIP IND 1000 NH 5%
L3825	2415043H04	IDCTR,CHIP,100NH,5%,500MA,CER
L3826	2462587N68	CHIP IND 1000 NH 5%
L3831	2415042H02	FIXED INDUCTOR,RF,56NH,CER
L3832	2415015H02	IDCTR,CHIP,6.8NH,5%,1A,0.16OHM,CER
L3833	2415042H02	FIXED INDUCTOR,RF,56NH,CER
L3834	2462587N68	CHIP IND 1000 NH 5%
PB501	4086470Z01	TACT SWITCH
PB502	4086470Z01	TACT SWITCH
PB503	4086470Z01	TACT SWITCH
PB504	4086470Z01	TACT SWITCH
PB505	4086470Z01	TACT SWITCH
Q400	4815069H02	TSTR MOSFET P-CHAN
Q403	4813973A13	XSTR,BIP GP SS,PNP,TO-236,SOT-23,
Q405	4815066H01	XSTR,OTHR,UMG5NFTR,250MHZ
Q410	4815066H01	XSTR,OTHR,UMG5NFTR,250MHZ
Q416	4815069H02	TSTR MOSFET P-CHAN
Q417	4815055H01	XSTR,GEN PURPOSE SMALL SIG,NPN AND
Q502	4815154H01	DUAL TRANS NPN
Q505	4813973M07	TSTR NPN 40V .2A GEN PURP
Q601	4815125H01	SOT STR RH LOW PROFILE MMBT
Q602	4813973M07	TSTR NPN 40V .2A GEN PURP
Q603	4813973M07	TSTR NPN 40V .2A GEN PURP
Q3200	4802197J95	RF TRANSISTOR PBR941
Q3270	4813973M07	TSTR NPN 40V .2A GEN PURP
Q3301	4813973M07	TSTR NPN 40V .2A GEN PURP
Q3302	4802197J95	RF TRANSISTOR PBR941
Q3501	4813976A01	TSTR, 175 MHZ, 8W, 7.5V, PLD 1.5
Q3561	4813973A13	XSTR,BIP GP SS,PNP,TO-236,SOT-23,
Q3721	4815055H01	XSTR,GEN PURPOSE SMALL SIG,NPN AND
Q3801	4802197J95	RF TRANSISTOR PBR941
R370	NOT PLACED	–
R371	0613952R25	CER CHIP RES 100K OHM 5% 0402
R372	0613952R30	CER CHIP RES 160K OHM 5% 0402
R373	NOT PLACED	–
R374	0613952R25	CER CHIP RES 100K OHM 5% 0402
R375	NOT PLACED	–
R376	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R377	0613952R25	CER CHIP RES 100K OHM 5% 0402
R378	0613952R25	CER CHIP RES 100K OHM 5% 0402
R400	0613952R17	CER CHIP RES 47K OHM 5% 0402
R401	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R402	NOT PLACED	–
R403	NOT PLACED	–
R405	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R406	0613952R22	CER CHIP RES 75K OHM 5% 0402
R407	0613952R21	CER CHIP RES 68K OHM 5% 0402
R408	NOT PLACED	–
R409	0613952R01	CER CHIP RES 10K OHM 5% 0402
R410	0613952R25	CER CHIP RES 100K OHM 5% 0402
R411	0613952R01	CER CHIP RES 10K OHM 5% 0402
R413	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R414	0613952P25	CER CHIP RES 178K OHM 1% 0402
R415	0613952N93	CER CHIP RES 90.9K OHM 1% 0402
R416	0613952R01	CER CHIP RES 10K OHM 5% 0402
R418	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R419	0613952Q66	CER CHIP RES 510 OHM 5% 0402
R420	0613952J73	CER CHIP RES 10.0M OHM 5% 0603
R421	0613952Q80	CER CHIP RES 2000 OHM 5% 0402
R423	0613952R23	CER CHIP RES 82K OHM 5% 0402
R424	0613952R14	CER CHIP RES 36K OHM 5% 0402
R425	0613952R12	CER CHIP RES 30K OHM 5% 0402
R426	0613952R37	CER CHIP RES 330K OHM 5% 0402
R427	0613952Q83	CER CHIP RES 2700 OHM 5% 0402
R428	0613952Q09	CER CHIP RES 2.2 OHM 5% 0402
R429	0613952R22	CER CHIP RES 75K OHM 5% 0402
R431	0613952R41	CER CHIP RES 470K OHM 5% 0402
R432	0613952R18	CER CHIP RES 51K OHM 5% 0402

Circuit Ref	Motorola Part No.	Description
R434	0613952Q61	CER CHIP RES 330 OHM 5% 0402
R435	0613952Q80	CER CHIP RES 2000 OHM 5% 0402
R436	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R437	NOT PLACED	–
R445	0613952R10	CER CHIP RES 24K OHM 5% 0402
R447	0613952R25	CER CHIP RES 100K OHM 5% 0402
R448	0613952R01	CER CHIP RES 10K OHM 5% 0402
R449	0613952R10	CER CHIP RES 24K OHM 5% 0402
R450	0613959Y45	CER CHIP RES 68.0 OHM 5% 2512
R451	0613952R05	CER CHIP RES 15K OHM 5% 0402
R452	0613952R25	CER CHIP RES 100K OHM 5% 0402
R453	NOT PLACED	–
R454	NOT PLACED	–
R455	NOT PLACED	–
R456	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R457	0613952R01	CER CHIP RES 10K OHM 5% 0402
R460	0613952Q89	CER CHIP RES 4700 OHM 5% 0402
R461	0613952Q55	CER CHIP RES 180 OHM 5% 0402
R462	0613952R01	CER CHIP RES 10K OHM 5% 0402
R463	0613952Q60	CER CHIP RES 300 OHM 5% 0402
R471	0613952R08	CER CHIP RES 20K OHM 5% 0402
R472	0613952Q92	CER CHIP RES 6200 OHM 5% 0402
R473	0613952Q25	CER CHIP RES 10.0 OHM 5% 0402
R475	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R476	0613952R37	CER CHIP RES 330K OHM 5% 0402
R477	0613952Q73	CER CHIP RES 1000 OHM 5% 0402
R478	0613952R01	CER CHIP RES 10K OHM 5% 0402
R479	0613952Q66	CER CHIP RES 510 OHM 5% 0402
R481	0613952R10	CER CHIP RES 24K OHM 5% 0402
R492	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R498	0613952R01	CER CHIP RES 10K OHM 5% 0402
R499	0613952R01	CER CHIP RES 10K OHM 5% 0402
R501	0613952Q69	CER CHIP RES 680 OHM 5% 0402
R502	0613952Q55	CER CHIP RES 180 OHM 5% 0402
R505	0613952R01	CER CHIP RES 10K OHM 5% 0402
R506	0613952R17	CER CHIP RES 47K OHM 5% 0402
R601	0613952Z67	RES,MF,51KOHM,1%,.0625W,SM ,0402,200
R602	0613952Z67	RES,MF,51KOHM,1%,.0625W,SM ,0402,200
R603	0613952N12	CER CHIP RES 13.0K OHM 1% 0402
R604	0613952Z58	RES,MF,22KOHM,1%,.0625W,SM ,0402,200
R605	0613952N62	CER CHIP RES 43.2K OHM 1% 0402
R606	0613952P12	CER CHIP RES 130K OHM 1% 0402
R607	0613952N12	CER CHIP RES 13.0K OHM 1% 0402
R608	0613952Z58	RES,MF,22KOHM,1%,.0625W,SM ,0402,200
R609	0613952N62	CER CHIP RES 43.2K OHM 1% 0402
R610	0613952P12	CER CHIP RES 130K OHM 1% 0402
R611	0613952R18	CER CHIP RES 51K OHM 5% 0402
R612	0613952R43	CER CHIP RES 560K OHM 5% 0402
R613	0613952R49	CER CHIP RES 1.0M OHM 5% 0402
R614	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R617	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R618	0613952Q73	CER CHIP RES 1000 OHM 5% 0402
R619	0613952Q73	CER CHIP RES 1000 OHM 5% 0402
R620	0613952Q73	CER CHIP RES 1000 OHM 5% 0402
R621	0613952Q73	CER CHIP RES 1000 OHM 5% 0402
R622	0613952Q73	CER CHIP RES 1000 OHM 5% 0402
R623	0613952Q73	CER CHIP RES 1000 OHM 5% 0402
R626	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R627	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R631	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R632	0613952R25	CER CHIP RES 100K OHM 5% 0402
R633	0613952R25	CER CHIP RES 100K OHM 5% 0402
R646	0613952R25	CER CHIP RES 100K OHM 5% 0402
R647	0613952Q84	CER CHIP RES 3000 OHM 5% 0402
R648	0613952R25	CER CHIP RES 100K OHM 5% 0402
R649	0613952R17	CER CHIP RES 47K OHM 5% 0402
R3200	0613952Q71	CER CHIP RES 820 OHM 5% 0402
R3201	0613952Q68	CER CHIP RES 620 OHM 5% 0402
R3202	0613952R11	CER CHIP RES 27K OHM 5% 0402
R3203	0613952R03	CER CHIP RES 12K OHM 5% 0402
R3204	0613952Q89	CER CHIP RES 4700 OHM 5% 0402
R3205	0613952R08	CER CHIP RES 20K OHM 5% 0402
R3206	0613952Q72	CER CHIP RES 910 OHM 5% 0402
R3207	0613952R03	CER CHIP RES 12K OHM 5% 0402
R3208	0613952R08	CER CHIP RES 20K OHM 5% 0402
R3209	0613952R15	CER CHIP RES 39K OHM 5% 0402
R3211	0613952R15	CER CHIP RES 39K OHM 5% 0402
R3212	0613952R08	CER CHIP RES 20K OHM 5% 0402
R3213	0613952R03	CER CHIP RES 12K OHM 5% 0402
R3214	0613952Q33	CER CHIP RES 22.0 OHM 5% 0402
R3215	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R3220	NOT PLACED	–
R3221	0613952Q42	CER CHIP RES 51.0 OHM 5% 0402
R3222	0613952Q69	CER CHIP RES 680 OHM 5% 0402
R3223	0613952N09	CER CHIP RES 12.1K OHM 1% 0402
R3224	0613952N01	CER CHIP RES 10.0K OHM 1% 0402
R3226	0613952Q63	CER CHIP RES 390 OHM 5% 0402
R3270	0613952Q73	CER CHIP RES 1000 OHM 5% 0402
R3271	NOT PLACED	–
R3273	0613952R05	CER CHIP RES 15K OHM 5% 0402
R3274	0613952Q79	CER CHIP RES 1800 OHM 5% 0402
R3275	0613952Q75	CER CHIP RES 1200 OHM 5% 0402
R3276	0613952R25	CER CHIP RES 100K OHM 5% 0402
R3301	NOT PLACED	–
R3303	0613952R25	CER CHIP RES 100K OHM 5% 0402
R3304	0613952R25	CER CHIP RES 100K OHM 5% 0402
R3305	0613952R17	CER CHIP RES 47K OHM 5% 0402
R3306	0613952Q81	CER CHIP RES 2200 OHM 5% 0402
R3307	0613952R13	CER CHIP RES 33K OHM 5% 0402
R3308	0613952Q77	CER CHIP RES 1500 OHM 5% 0402
R3309	0613952Q94	CER CHIP RES 7500 OHM 5% 0402
R3310	0613952Q83	CER CHIP RES 2700 OHM 5% 0402
R3311	NOT PLACED	–
R3312	0613952Q18	CER CHIP RES 5.1 OHM 5% 0402
R3313	0613952Q39	CER CHIP RES 39.0 OHM 5% 0402
R3314	0613952Q34	CER CHIP RES 24.0 OHM 5% 0402
R3315	0613952Q61	CER CHIP RES 330 OHM 5% 0402
R3316	0613952Q65	CER CHIP RES 470 OHM 5% 0402
R3317	0613952R25	CER CHIP RES 100K OHM 5% 0402
R3318	0613952Q65	CER CHIP RES 470 OHM 5% 0402
R3319	NOT PLACED	–
R3320	NOT PLACED	–
R3321	0613952Q42	CER CHIP RES 51.0 OHM 5% 0402
R3322	NOT PLACED	–
R3323	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R3324	0613952Q57	CER CHIP RES 220 OHM 5% 0402
R3501	0613952Q60	CER CHIP RES 300 OHM 5% 0402
R3502	0613952Q31	CER CHIP RES 18.0 OHM 5% 0402
R3503	0613952Q60	CER CHIP RES 300 OHM 5% 0402
R3505	0613952Q61	CER CHIP RES 330 OHM 5% 0402
R3506	0613952H15	CER CHIP RES 3.9 OHM 5% 0603
R3507	0613952H15	CER CHIP RES 3.9 OHM 5% 0603
R3512	NOT PLACED	–
R3513	NOT PLACED	–

Circuit Ref	Motorola Part No.	Description
R3519	0680539Z01	POWER METAL STRIP RESISTORS
R3541	0613952R15	CER CHIP RES 39K OHM 5% 0402
R3542	0613952Q91	CER CHIP RES 5600 OHM 5% 0402
R3543	0613952Q49	CER CHIP RES 100 OHM 5% 0402
R3544	0613952H49	CER CHIP RES 100 OHM 5% 0603
R3545	0613952H49	CER CHIP RES 100 OHM 5% 0603
R3546	0613952R03	CER CHIP RES 12K OHM 5% 0402
R3547	0613952R13	CER CHIP RES 33K OHM 5% 0402
R3548	0613952R09	CER CHIP RES 22K OHM 5% 0402
R3551	0613952Q39	CER CHIP RES 39.0 OHM 5% 0402
R3561	0613952R03	CER CHIP RES 12K OHM 5% 0402
R3562	0613952R13	CER CHIP RES 33K OHM 5% 0402
R3563	0613952R35	CER CHIP RES 270K OHM 5% 0402
R3564	0613952R37	CER CHIP RES 330K OHM 5% 0402
R3565	NOT PLACED	–
R3566	NOT PLACED	–
R3569	0613952Q91	CER CHIP RES 5600 OHM 5% 0402
R3570	0613952R01	CER CHIP RES 10K OHM 5% 0402
R3571	0613952H51	CER CHIP RES 120 OHM 5% 0603
R3572	0613952H51	CER CHIP RES 120 OHM 5% 0603
R3573	0613952H51	CER CHIP RES 120 OHM 5% 0603
R3701	0613952Q49	CER CHIP RES 100 OHM 5% 0402
R3702	NOT PLACED	–
R3703	0613952Q53	CER CHIP RES 150 OHM 5% 0402
R3704	0613952Q53	CER CHIP RES 150 OHM 5% 0402
R3705	0613952R13	CER CHIP RES 33K OHM 5% 0402
R3721	0613952Q65	CER CHIP RES 470 OHM 5% 0402
R3722	0613952Q67	CER CHIP RES 560 OHM 5% 0402
R3723	0613952Q49	CER CHIP RES 100 OHM 5% 0402
R3726	NOT PLACED	–
R3727	0613952R25	CER CHIP RES 100K OHM 5% 0402
R3741	0613952Q49	CER CHIP RES 100 OHM 5% 0402
R3751	0613952R32	CER CHIP RES 200K OHM 5% 0402
R3752	0613952R31	CER CHIP RES 180K OHM 5% 0402
R3761	0613952R17	CER CHIP RES 47K OHM 5% 0402
R3762	NOT PLACED	–
R3801	NOT PLACED	–
R3802	0613952Q49	CER CHIP RES 100 OHM 5% 0402
R3803	0613952Q57	CER CHIP RES 220 OHM 5% 0402
R3804	0613952R01	CER CHIP RES 10K OHM 5% 0402
R3805	0613952R10	CER CHIP RES 24K OHM 5% 0402
R3806	0613952Q33	CER CHIP RES 22.0 OHM 5% 0402
R3807	NOT PLACED	–
R3808	0613952Q25	CER CHIP RES 10.0 OHM 5% 0402
R3811	0613952Q49	CER CHIP RES 100 OHM 5% 0402
R3812	NOT PLACED	–
R3816	0613952Q73	CER CHIP RES 1000 OHM 5% 0402
R3817	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R3818	NOT PLACED	–
R3821	0613952Q57	CER CHIP RES 220 OHM 5% 0402
R3822	0613952Q41	CER CHIP RES 47.0 OHM 5% 0402
R3823	0613952R13	CER CHIP RES 33K OHM 5% 0402
R3824	0613952R09	CER CHIP RES 22K OHM 5% 0402
R3825	0613952Q37	CER CHIP RES 33.0 OHM 5% 0402
R3826	0613952Q31	CER CHIP RES 18.0 OHM 5% 0402
R3828	0613952Q49	CER CHIP RES 100 OHM 5% 0402
R3829	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R3830	NOT PLACED	–
R3831	0613952R01	CER CHIP RES 10K OHM 5% 0402
R3832	0613952R03	CER CHIP RES 12K OHM 5% 0402
R3833	0613952Q57	CER CHIP RES 220 OHM 5% 0402
R3834	0613952Q41	CER CHIP RES 47.0 OHM 5% 0402
R3835	0613952R17	CER CHIP RES 47K OHM 5% 0402
R3836	0613952R01	CER CHIP RES 10K OHM 5% 0402
RT400	0680590Z01	THERMISTOR_33K
RT3301	NOT PLACED	–
S501	4080710Z19	SWITCH, FREQUENCY
S502	1880619Z04	VOL POTENTIOMETER with hi temp cam
SH400	2680505Z02	SHIELD, CONTROLLER TOP LEFT
SH401	2680506Z02	SHIELD, CONTROLLER TOP RIGHT
SH402	2680515Z02	SHIELD, CONTROLLER BOTTOM LEFT
SH403	2680516Z02	SHIELD, CONTROLLER BTM RIGHT
SH3202	2686539Z02	IF SECTION SHIELD
SH3203	2686527Z02	SHIELD, RFI/EMI, CRS, TIN
SH3301	2615144H01	SHIELD FOR GSM PLACEMENT
SH3302	2615144H05	SHIELD FOR GSM PLACEMENT
SH3303	2615144H06	SHIELD FOR GSM PLACEMENT
SH3501	2615144H03	SHIELD FOR GSM PLACEMENT
SH3502	2615144H04	SHIELD FOR GSM PLACEMENT
SH3701	2680511Z02	SHIELD, SYNTHESIZER
SH3702	2680511Z02	SHIELD, SYNTHESIZER
SH3801	2680513Z02	SHIELD, VCO TOP
SH3802	2680514Z02	SHIELD, VCO BOTTOM/LVZIF
T3301	2515121H01	BALUN, TRANSFORMER
T3302	2515121H01	BALUN, TRANSFORMER
U303	5114005A01	IC LOW COST SING SPLY LM2904DR
U400	5115012H01	IC,ADJ LOW DROPOUT,SM,POS P
U404	5115062H01	IC,CUST,TQFP48
U405	5115020H01	IC,SRAM,32K X 8,SOIC,3.6V
U406	* 5115286H01	IC 4M FLASH ROM- NON SHRINK+EPP
U407	* 5115033H01	IC,EEPROM,16K X 8,SM
U409	5185143E03	IC,MICROP,QFP,QFP100,3.7MHZ
U410	5115044H01	IC,LOW DROPOUT,SM,3.3V POS
U420	5115280H01	AUDIO AMPLIFIER TDA8547TS
U602	5115014H01	IC,COMPTR,SM,SOT-23/5
U3201	5115019H01	IC,LOW DROPOUT,SOT-23,SOT-23
U3220	5115281H01	FM IF IC SA616 FROM PHILIPS
U3221	5115070H01	IC,INVTR,TC7W04FU,SSOP
U3501	5115678H01	VHF/UHF/800/900 MHZ LDMOS DRIVER IC
U3502	5185765B26	IC PWR CTRL IN MOS20
U3503	5115022H01	IC,TEMP SENS,LM50C,SM,SOT-23
U3701	5115060H01	IC,FREQ SYN,AT24701-OT4X
U3711	5115026H01	IC,LOW DROPOUT,SM,SOT-23/6,P
U3801	5105750U56	IC PKG DIE VCO BUFFER
VR432	4813979P10	TRANS SUP 5.6V QUAD
VR433	4813979P10	TRANS SUP 5.6V QUAD
VR434	4815038H01	DIODE ARRAY,ZEN,SM,SOD-323,6.93V
VR439	4813977M21	DIODE 12V ZENER _5242_
VR440	NOT PLACED	–
VR441	NOT PLACED	–
VR442	NOT PLACED	–
VR444	NOT PLACED	–
VR447	4813977A54	DIODE ZENER 0.2W SOD-323 10V
VR448	4813977A54	DIODE ZENER 0.2W SOD-323 10V
VR449	4813977A54	DIODE ZENER 0.2W SOD-323 10V
VR450	4815040H01	DIODE ARRAY ,ZEN,MM3Z12VT1G,SM,12
VR460	4815038H01	DIODE ARRAY,ZEN,SM,SOD-323,6.93V,
VR501	4815038H01	DIODE ARRAY,ZEN,SM,SOD-323,6.93V,
VR506	4815038H01	DIODE ARRAY,ZEN,SM,SOD-323,6.93V,
VR3501	4813977M21	DIODE 12V ZENER _5242_
Y3200	9180022M11	XTAL FILTER 44.85MHZ
Y3201	4802245J84	XTAL 44.395MHz, 3RD OT, SMD
Y3202	9186145B02	CER.DISCR. CDBCA455CX36-TC
Y3203	9115811H03	SMD455KHZ 6 ELEMENT
Y3204	9115811H01	SMD455KHZ 6 ELEMENT
Y3205	9180468V05	SMD455KHZ 4 ELEMENT CER FLTR
Y3761	4805875Z04	CRYSTAL 16.8 MHZ

* Motorola Depot Servicing only

4.11 Low Band Section

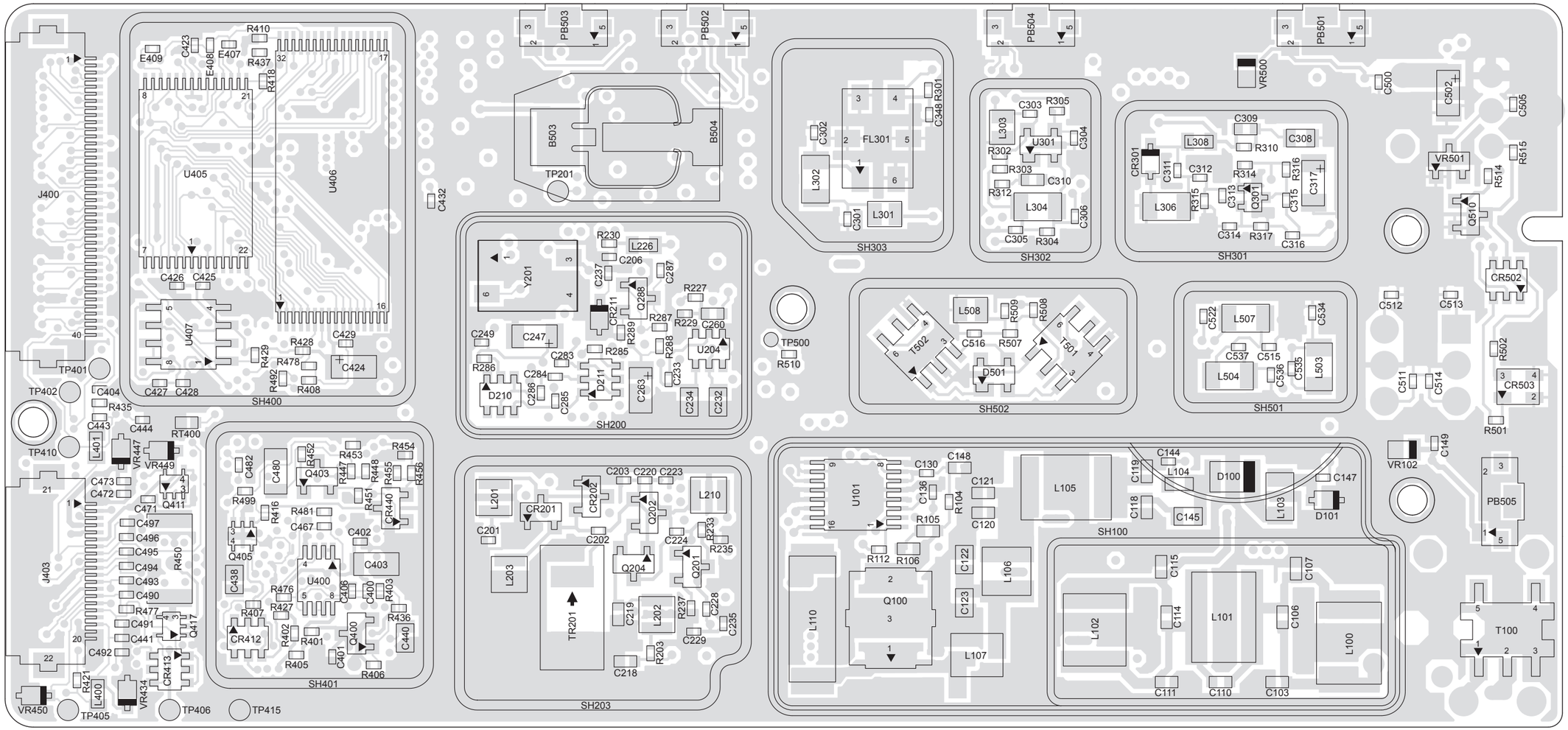
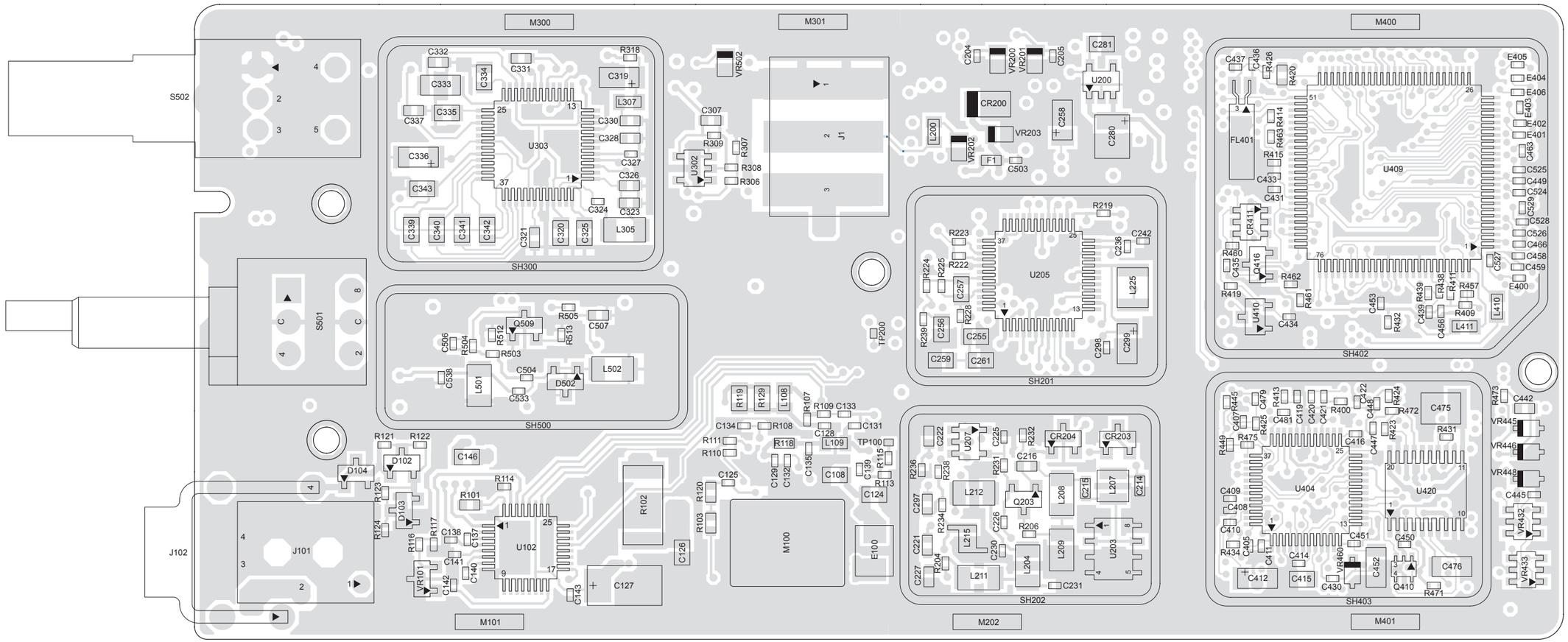
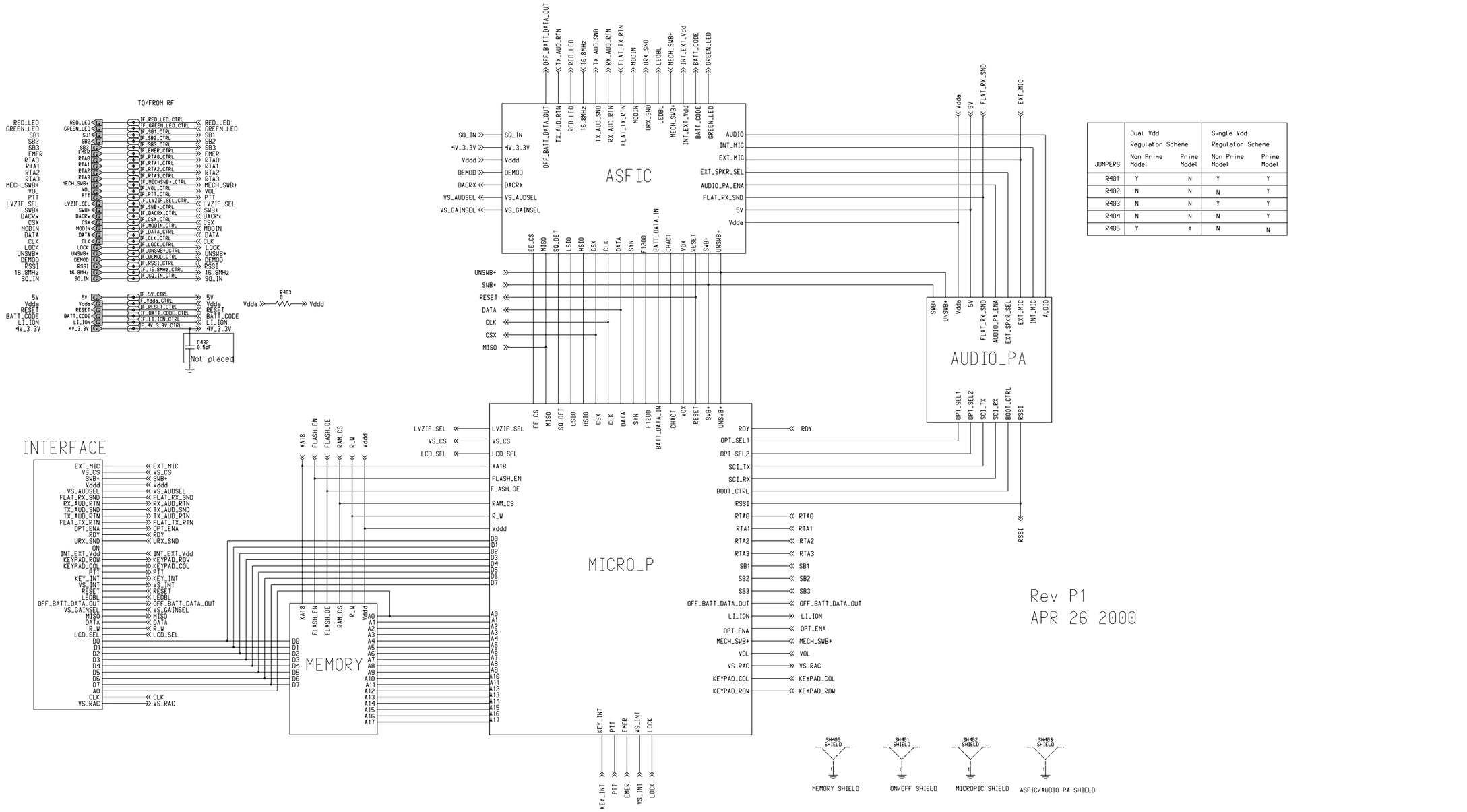


Figure 4-70: Low Band (29.7–42/35–50 MHz) Main Board Top Side PCB (8485658Z05 rev. D)



MAEPF-28216-O

Figure 4-71: Low Band (29.7–42/35–50 MHz) Main Board Bottom Side PCB (8485658Z05 rev. D)



JUMPERS	Dual Vdd Regulator Scheme		Single Vdd Regulator Scheme	
	Non Prime Model	Prime Model	Non Prime Model	Prime Model
R401	Y	N	Y	Y
R402	N	N	N	Y
R403	N	N	Y	Y
R404	N	N	N	Y
R405	Y	Y	N	N

Figure 4-72: Low Band (30–50 MHz) Controller Overall Schematic Diagram

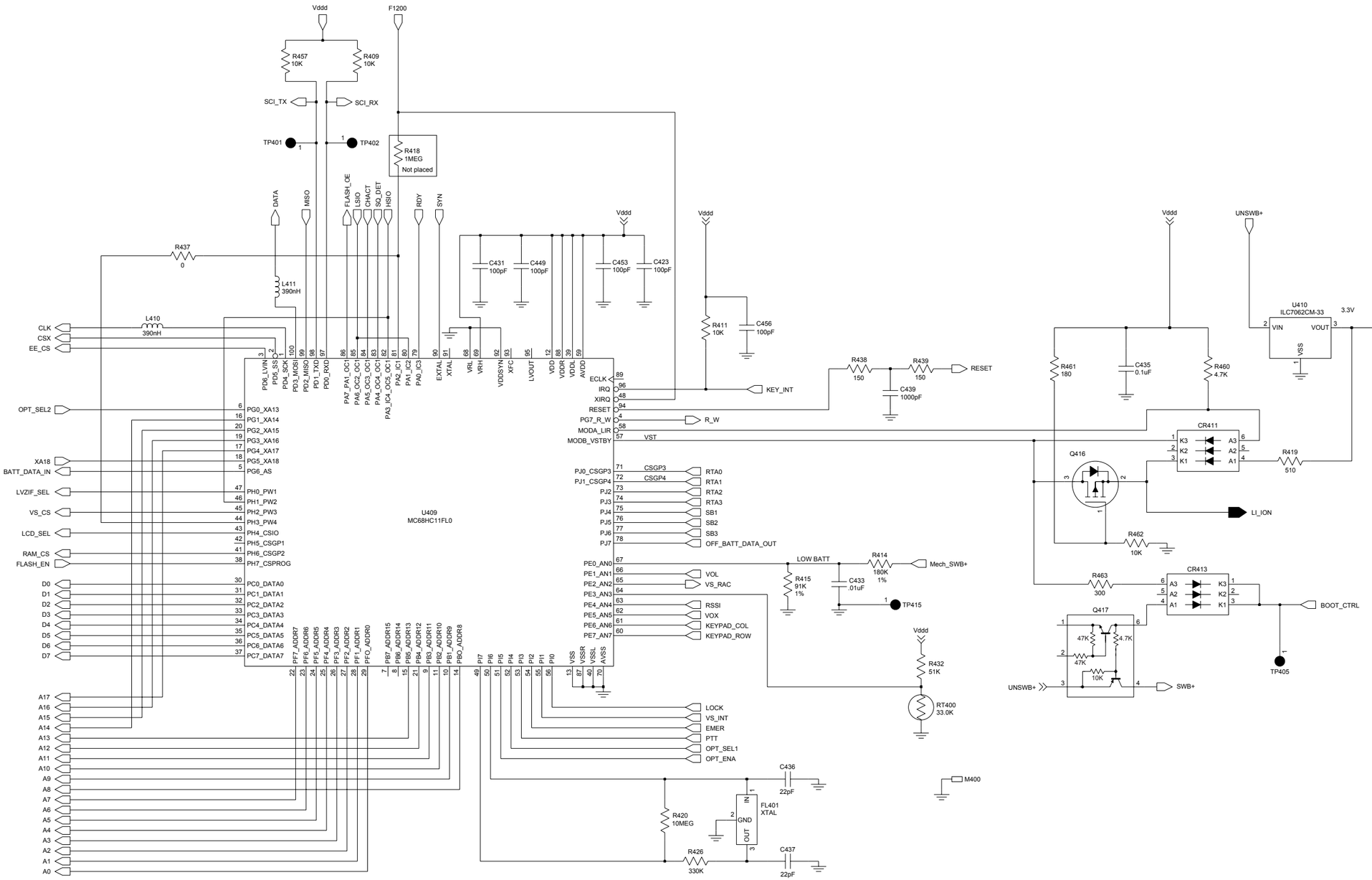


Figure 4-73: Low Band (29.7–42/35–50 MHz) Controller Microprocessor Schematic Diagram

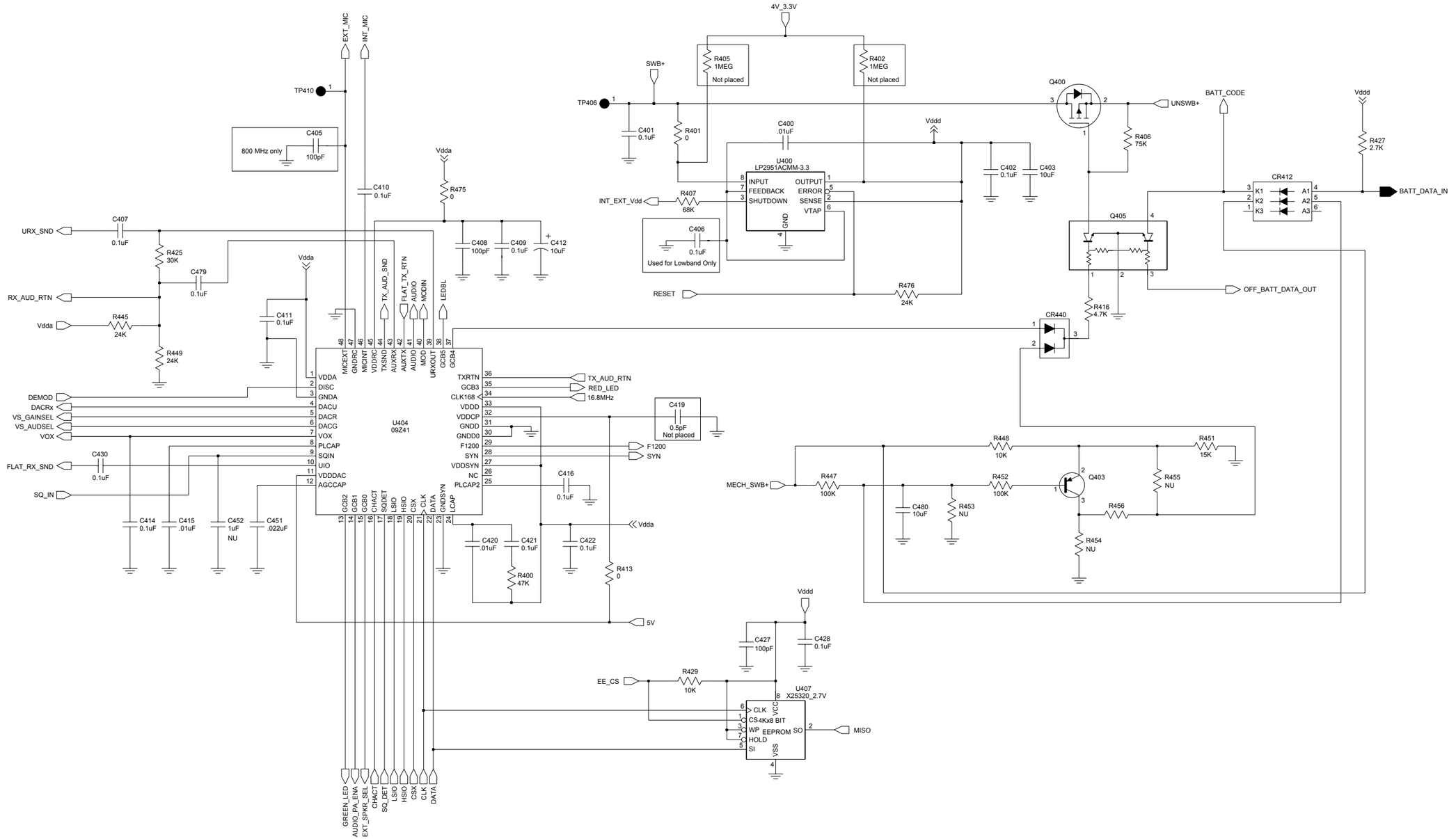


Figure 4-74: Low Band (29.7–42/35–50 MHz) Controller ASFIC Schematic Diagram

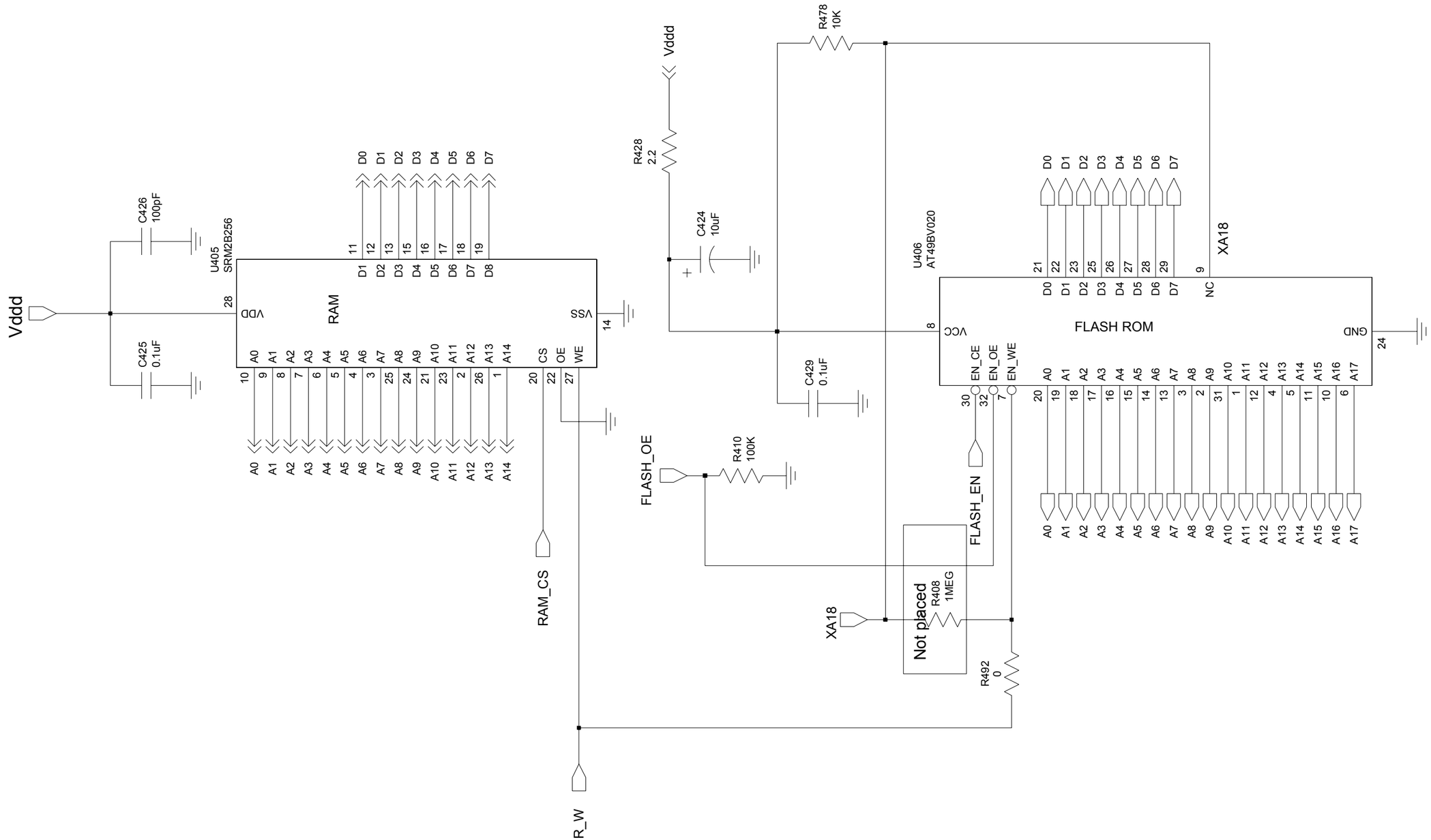


Figure 4-75: Low Band (29.7–42/35–50 MHz) Controller Memory Schematic Diagram

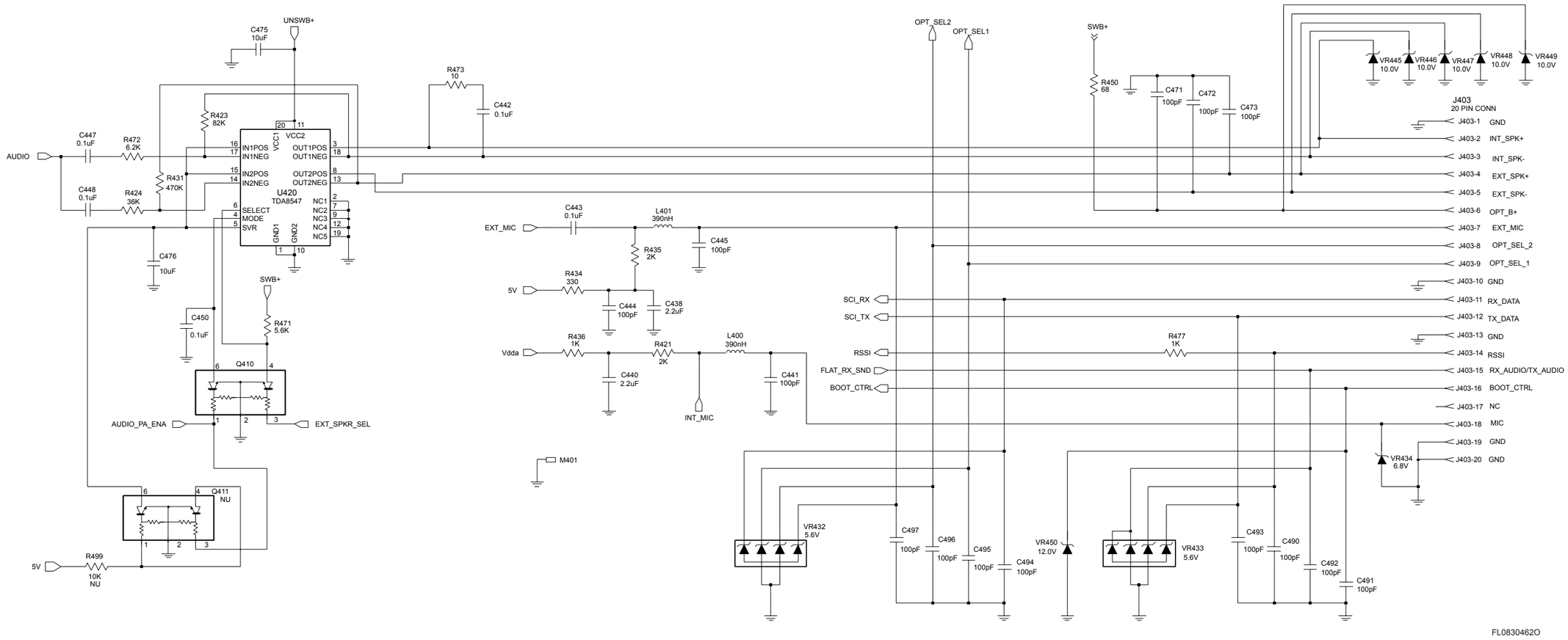


Figure 4-76: Low Band (29.7–42/35–50 MHz) Controller Audio PA Schematic Diagram

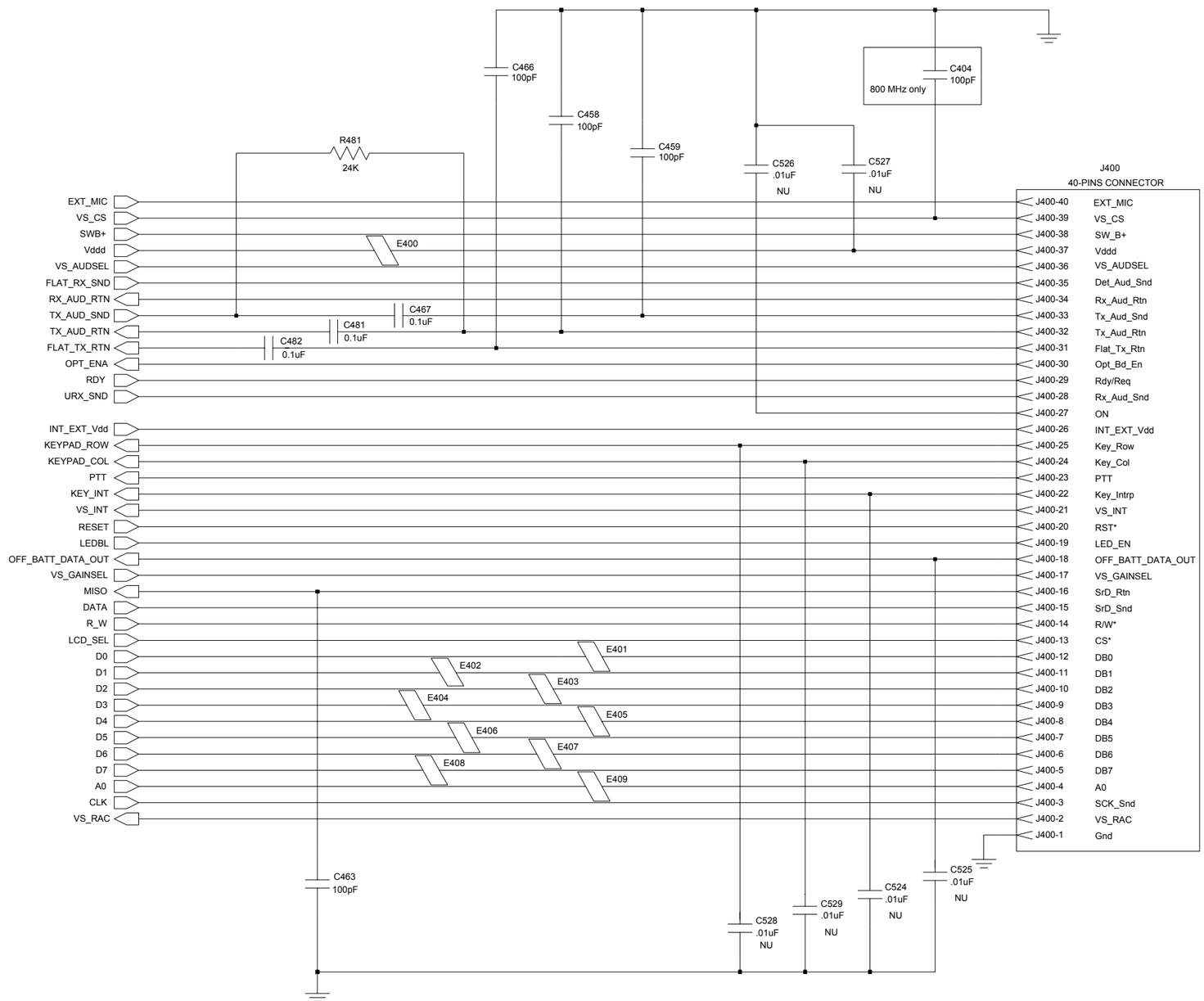
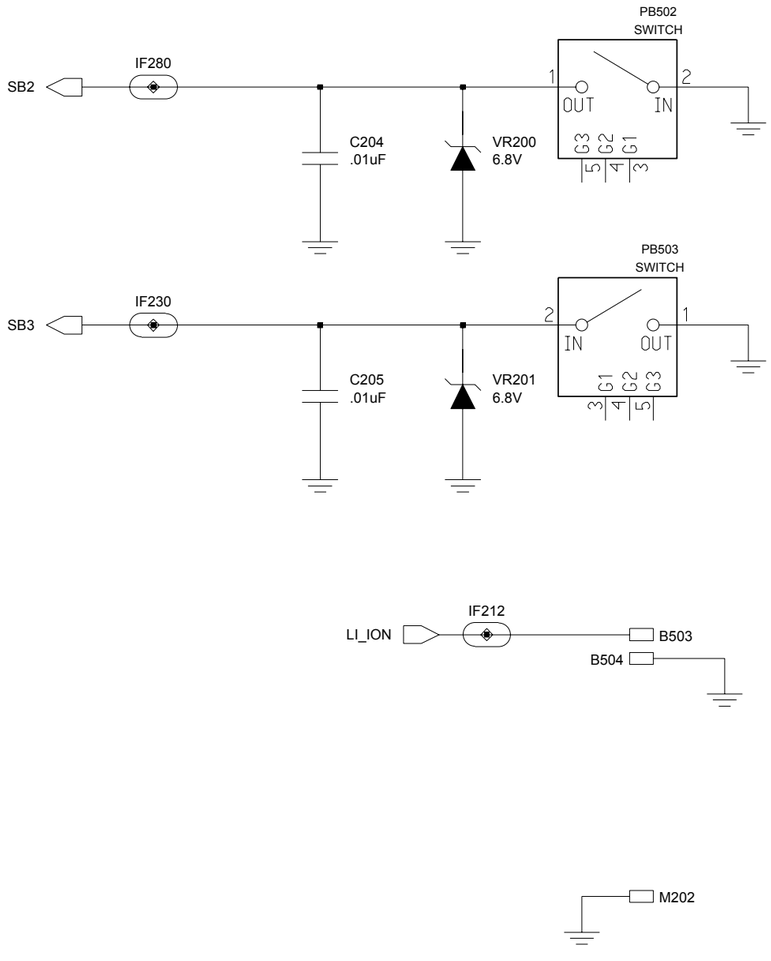
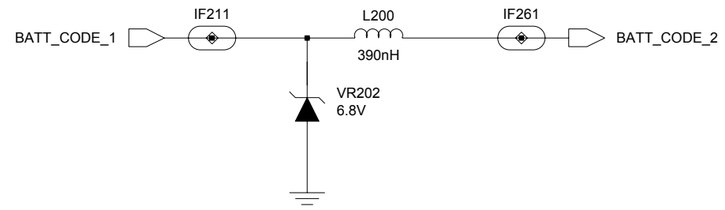
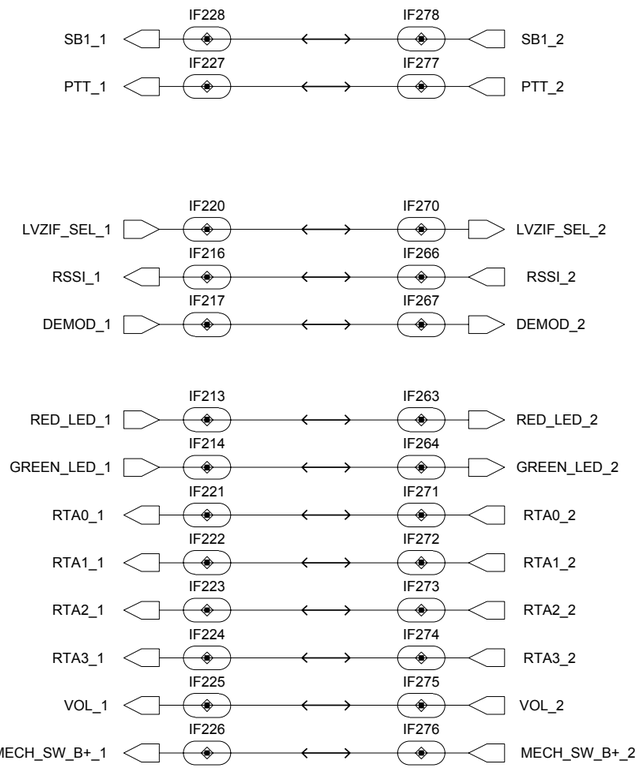


Figure 4-77: Low Band (29.7–42/35–50 MHz) Interface Diagram







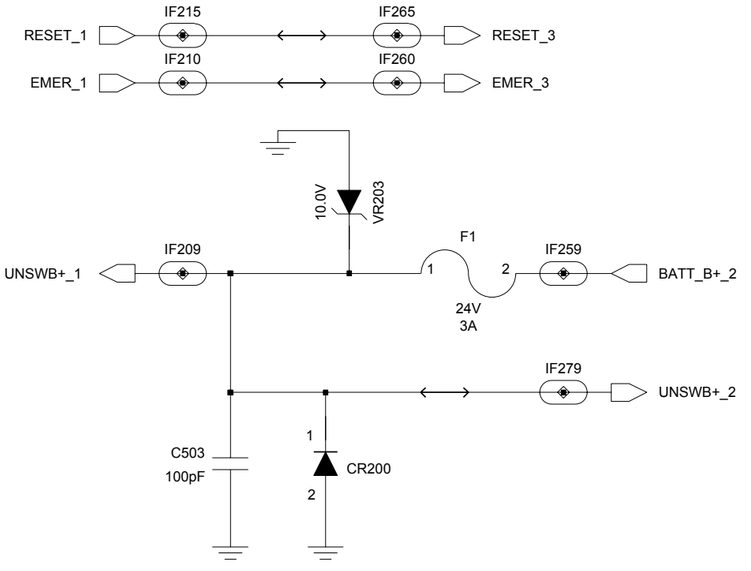


Figure 4-78: Low Band (29.7–42/35–50 MHz) Controls and Switches Diagram

Software Package	S501 - Freq. switch
Conventional/MDC	4080710Z01 - 16 position
5 Tone	4080710Z02 - continous

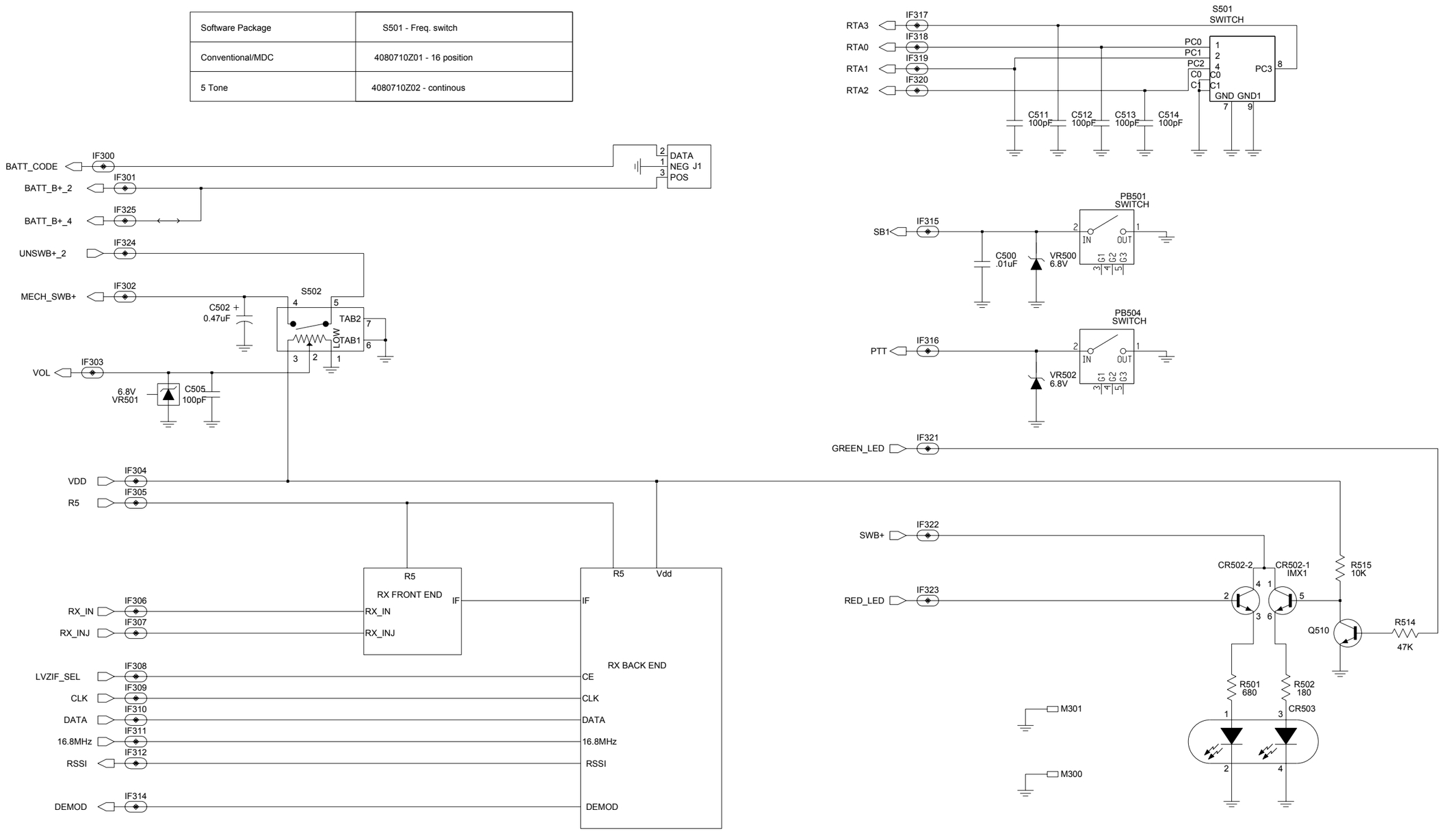
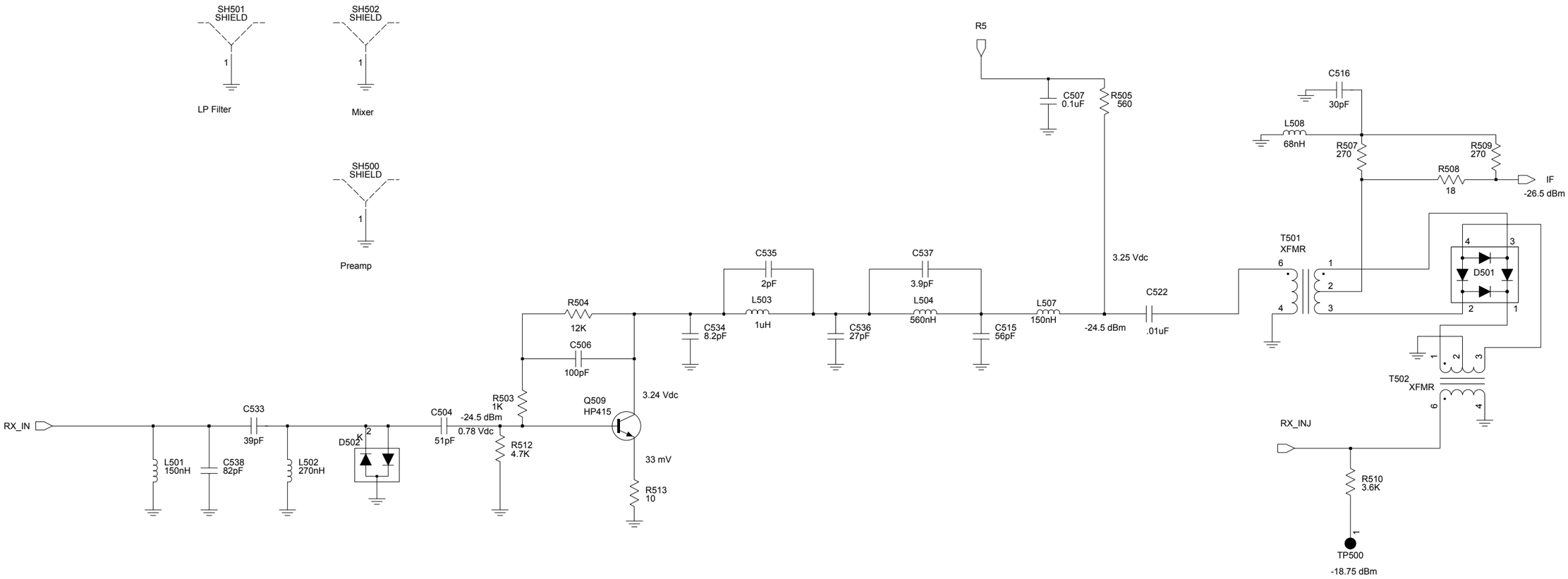


Figure 4-79: Low Band (29.7–42/35–50 MHz) Receiver Main Diagram



Receive -47 dBm signal @ 35.04 MHz with 1K tone

RF measurements made with Boonton 92 millivoltmeter

Figure 4-80: Low Band (29.7–42/35–50 MHz) Receiver Front End Schematic Diagram

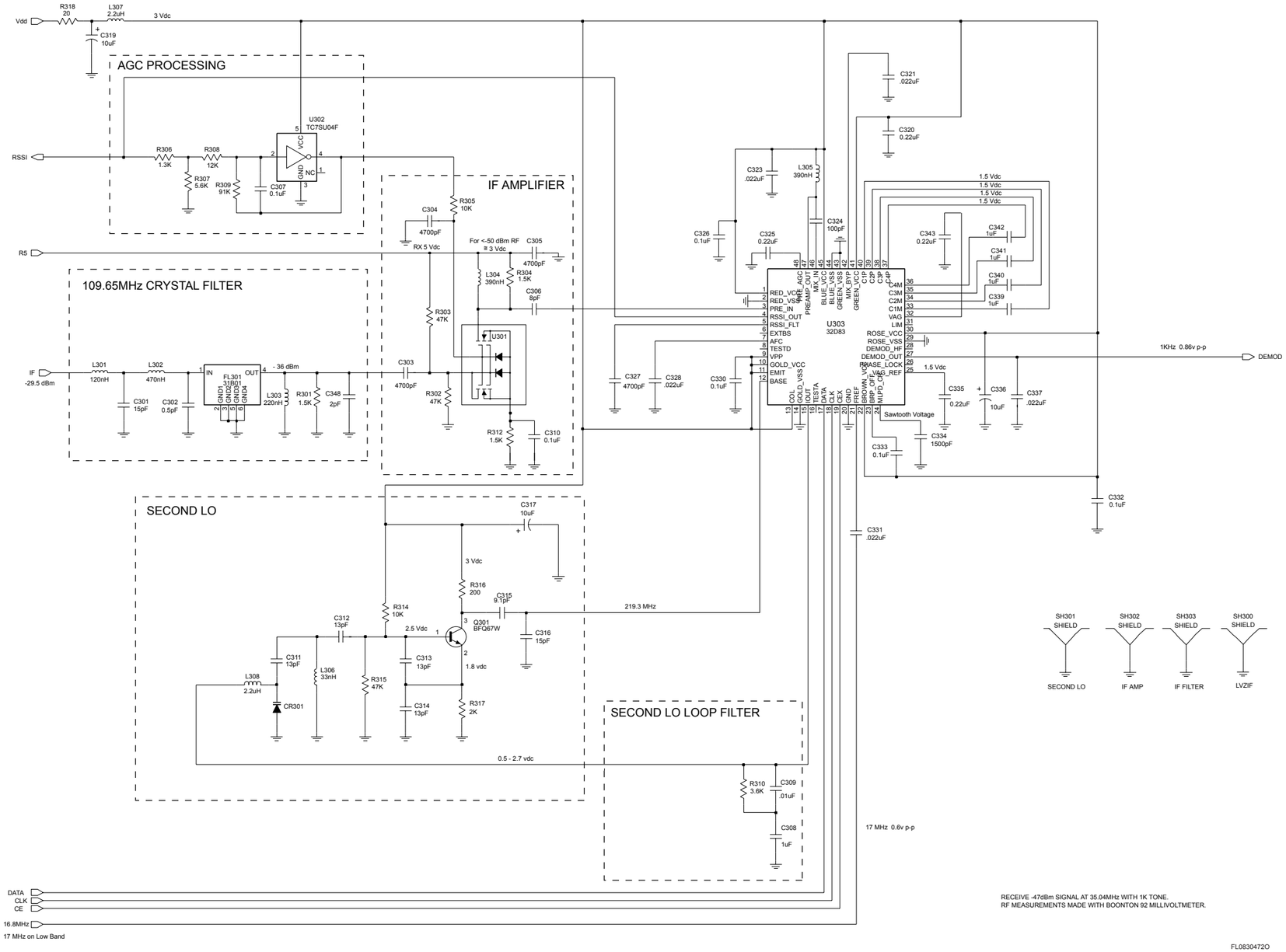
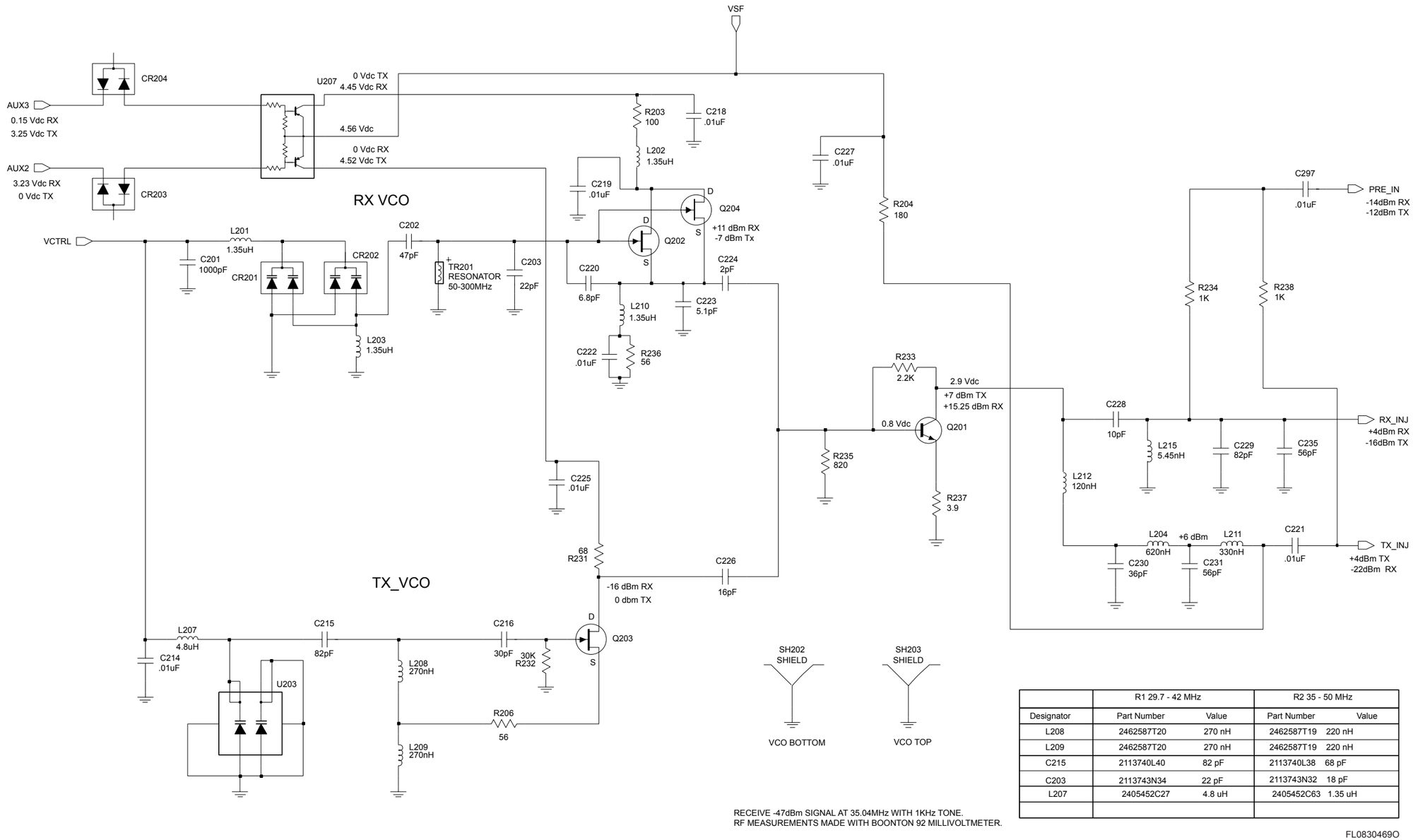


Figure 4-81: Low Band (29.7–42/35–50 MHz) Receiver Back End Schematic Diagram



RECEIVE -47dBm SIGNAL AT 35.04MHz WITH 1KHz TONE.
RF MEASUREMENTS MADE WITH BOONTON 92 MILLIVOLTMETER.

	R1 29.7 - 42 MHz		R2 35 - 50 MHz	
Designator	Part Number	Value	Part Number	Value
L208	2462587T20	270 nH	2462587T19	220 nH
L209	2462587T20	270 nH	2462587T19	220 nH
C215	2113740L40	82 pF	2113740L38	68 pF
C203	2113743N34	22 pF	2113743N32	18 pF
L207	2405452C27	4.8 uH	2405452C63	1.35 uH

FL0830469O

Figure 4-82: Low Band (29.7–42/35–50 MHz) Frequency Generation Unit VCO Diagram

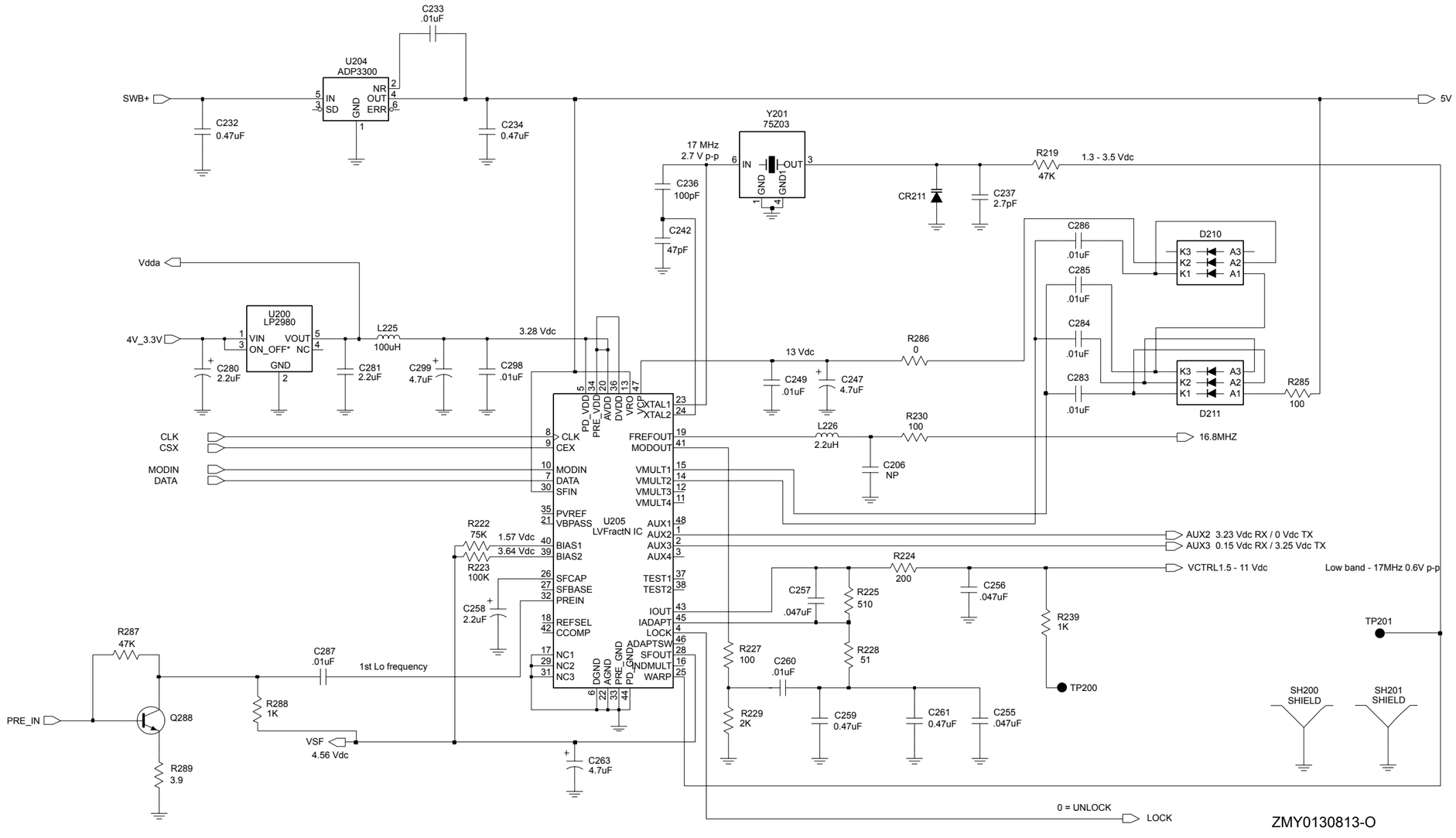


Figure 4-83: Low Band (29.7–42/35–50 MHz) Frequency Generation Unit Synthesizer Diagram

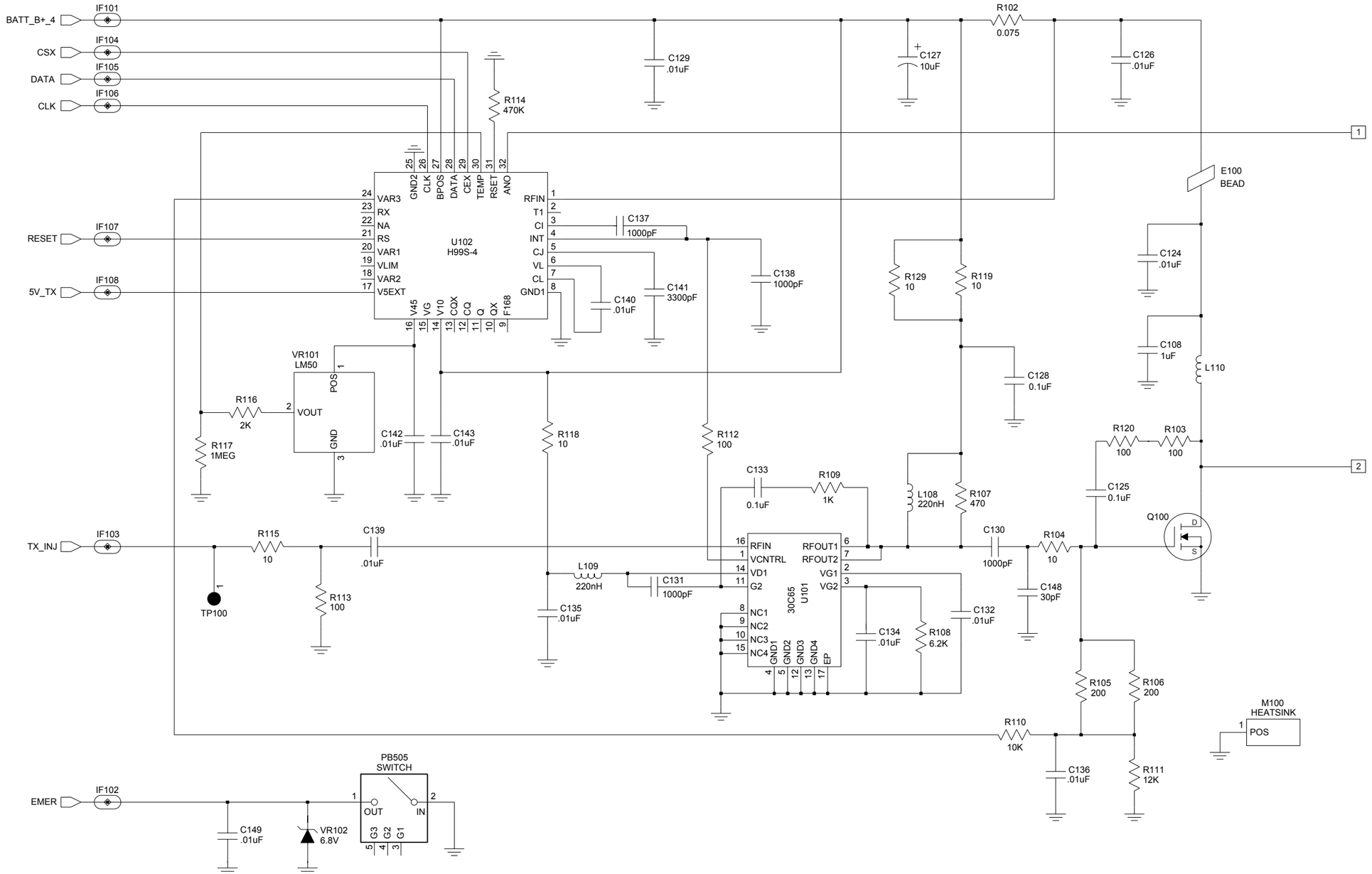


Figure 4-84: Low Band (29.7–42/35–50 MHz) Transmitter Diagram (Sheet 1 of 2)

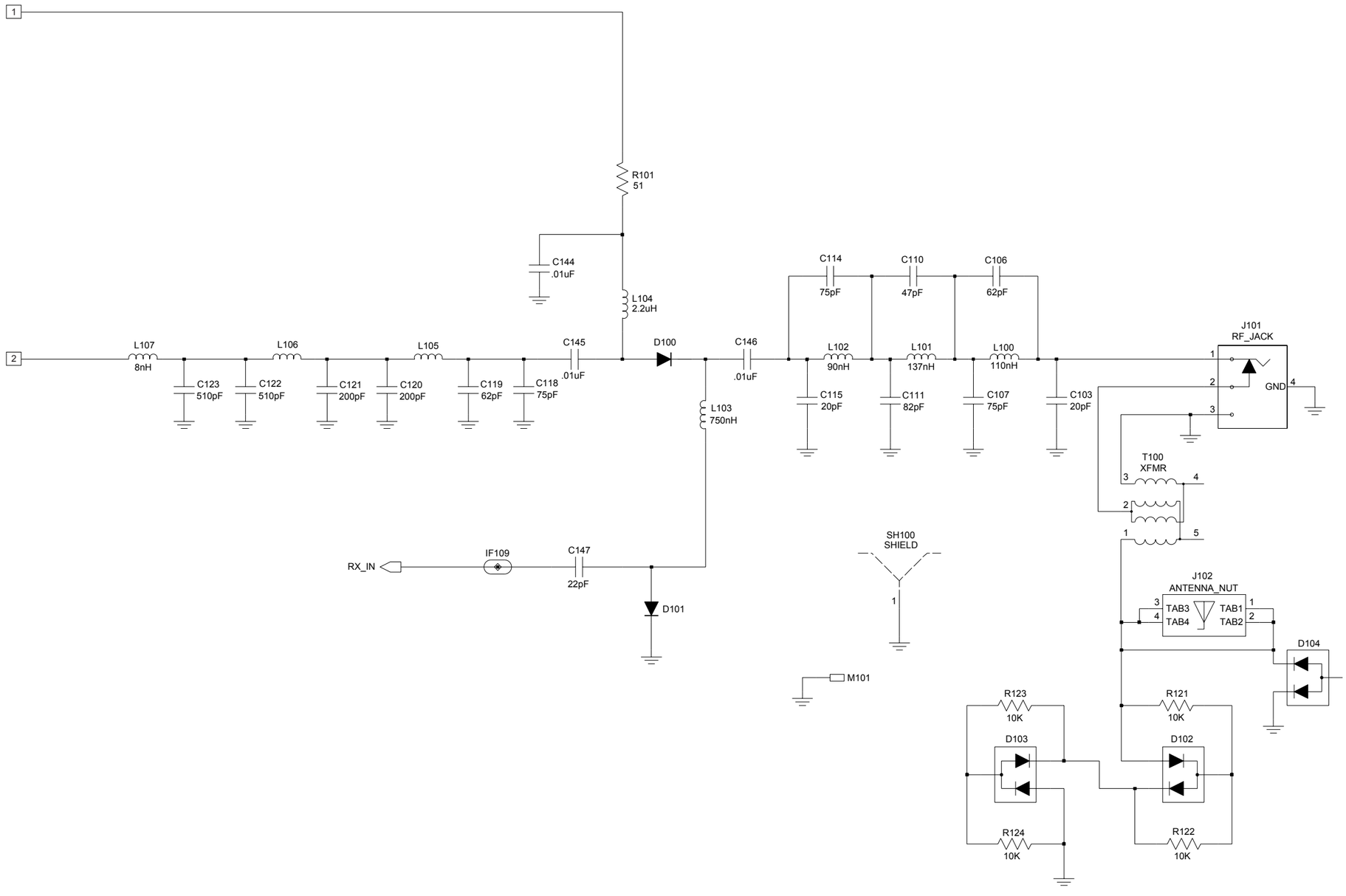


Figure 4-85: Low Band (29.7–42/35–50 MHz) Transmitter Diagram (Sheet 2 of 2)

Low Band (29.7–42/35–50 MHz) Radio Parts List

Circuit Ref	Motorola Part No.	Description
C103	2113740L25	20pF
C103**	2113740L24	18pF
C106	2113740L37	62pF
C106**	2113740L35	51pF
C107	2113740L39	75pF
C107**	2113740L36	56pF
C108	2113743F16	1.0uF
C110	2113740L34	47pF
C110**	2113740L33	43pF
C111	2113740L40	82pF
C111**	2113740L38	68pF
C114	2113740L39	75pF
C114**	2113740L37	62pF
C115	2113740L25	20pF
C115**	2113740L24	18pF
C118	2113740F48	75pF
C118**	2113740F49	82pF
C119	2113740F46	62pF
C119**	2113740F39	33pF
C120	2113740F58	200pF
C121	2113740F58	200pF
C121**	2113740F59	220pF
C122	2113740A72	510pF
C123	2113740A72	510pF
C124	2113741A45	0.01uF
C125	2113743M24	0.1uF
C126	2113741A45	0.01uF
C127	2311049A96	33uF
C128	2113743M24	0.1uF
C129	2113743L41	0.01uF
C130	2113743L17	1000pF
C131	2113743L17	1000pF
C132	2113743L41	0.01uF
C133	2113743M24	0.1uF
C134	2113743L41	0.01uF
C135	2113743L41	0.01uF
C136	2113743L41	0.01uF
C137	2113743L17	1000pF
C138	2113743L17	1000pF
C139	2113743L41	0.01uF
C140	2113743L41	0.01uF
C141	2113743L29	3300pF
C142	2113743L41	0.01uF
C143	2113743L41	0.01uF
C144	2113743L41	0.01uF
C145	2113741A45	0.01uF
C146	2113741A45	0.01uF
C147	2113743N34	22pF
C148	2113740F38	30pF
C149	2113743L41	0.01uF
C201	2113743L17	1000pF
C202	2113743N42	47pF
C203	2113743N34	22pF
C204	2113743L41	0.01uF
C205	2113743L41	0.01uF
C206	2113743N42	47pF
C214	2113741F49	0.01uF
C215	2113740L40	82pF
C216	2113740F38	30pF
C218	2113741F49	0.01uF
C219	2113741F49	0.01uF
C220	2113743N22	6.8pF
C221	2113741F49	0.01uF
C222	2113741F49	0.01uF
C223	2113743N19	5.1pF
C224	2113743N09	2pF
C225	2113743L41	0.01uF
C226	2113743N31	16pF
C227	2113741F49	0.01uF
C228	2113743N26	10pF
C229	2113743N48	82pF
C230	2113743N39	36pF
C231	2113743N44	56pF
C232	2113743A27	0.47uF
C233	Not Placed	
C234	2113743A27	0.47uF
C235	2113932N44	56pF
C236	2113743N50	100pF
C237	2113743N12	2.7pF
C242	2113743N42	47pF
C247	2311049A56	4.7uF
C249	2113743L41	0.01uF
C255	2113741A61	0.047uF
C256	2113741A61	0.047uF
C257	2113741A61	0.047uF
C258	2311049F16	2.2uF
C259	2113743A27	0.47uF
C260	2113743F49	0.01uF
C261	2113741A27	0.47uF
C263	2311049A56	4.7uF
C280	2311049A57	10uF
C281	2104993J02	2.2uF
C283	2113743L41	0.01uF
C284	2113743L41	0.01uF
C285	2113743L41	0.01uF
C286	2113743L41	0.01uF
C287	2113743L41	0.01uF
C297	2113741F49	0.01uF
C298	2113743L41	0.01uF
C299	2311049A56	4.7uF
C301	2113743N30	15pF
C302	2113743N01	0.5pF
C303	2113743R33	4700pF
C304	2113743R33	4700pF
C305	2113743R33	4700pF
C306	2113743N65	8pF
C307	2113743E20	0.1uF
C308	2180478Z20	1uF
C309	2113741F49	0.01uF
C310	2113743E20	0.1uF
C311	2113743N29	13pF
C312	2113743N29	13pF
C313	2113743N29	13pF
C314	2113743N29	13pF
C315	2113743N25	9.1pF
C316	2113743N30	15pF
C317	2311049A59	10uF
C319	2311049A59	10uF
C320	2113743A23	0.22uF
C321	2113743E07	0.022uF
C323	2113743E07	0.022uF
C324	2113743N50	100pF
C325	2113743A23	0.22uF
C326	2113743E20	0.1uF
C327	2113743R33	4700pF
C328	2113743E07	0.022uF
C330	2113743E20	0.1uF
C331	2113743E07	0.022uF
C332	2113743E20	0.1uF
C333	2109720D14	0.1uF
C334	2113740A82	1500pF
C335	2113743A23	0.22uF
C336	2311049A59	10uF
C337	2113743E07	0.022uF
C339	2113743F16	1uF
C340	2113743F16	1uF
C341	2113743F16	1uF
C342	2113743F16	1uF
C343	2113743A23	0.22uF
C348	2113743N09	2pF
C400	2113743L41	0.01uF
C401	2113743M24	0.1uF
C402	2113743M24	0.1uF
C403	2113743G24	2.2uF
C404	Not Placed	
C405	Not Placed	
C406	Not Placed	
C407	2113928N01	0.1uF
C408	2113743N50	100pF
C409	2113743M24	0.1uF
C410	2113928N01	0.1uF
C411	2113743M24	0.1uF
C412	2311049A59	10uF
C414	2113743M24	0.1uF
C415	2185895Z01	0.01uF
C416	213928N01	0.1uF
C419	Not Placed	
C420	2113743L41	0.01uF
C421	2113928N01	0.1uF
C422	2113743M24	0.1uF
C423	2113743N50	100pF
C424	2311049A59	10uF
C425	2113743M24	0.1uF
C426	2113743N50	100pF
C427	2113743N50	100pF
C428	2113743M24	0.1uF
C429	2113743M24	0.1uF
C430	2113928N01	0.1uF
C431	2113743N50	100pF
C432	Not Placed	
C433	2113743L41	0.01uF
C434	Not Placed	
C435	2113743M24	0.1uF
C436	Not Placed	
C438	2113743F18	2.2pF
C439	2113743L17	1000pF
C440	2113743F18	2.2pF
C441	2113743N50	100pF
C442	2113743E20	0.1uF
C443	2113928N01	0.1uF
C444	2113743N50	100pF
C445	2113743N50	100pF
C447	2113928N01	0.1uF
C448	2113928N01	0.1uF
C449	2113743N50	100pF
C450	Not Placed	
C451	2113743M08	0.022uF
C452	2113743B29	1uF
C453	2113743N50	100pF
C456	2113743N50	100pF
C458	2113743N50	100pF
C459	2113743N50	100pF
C463	2113743N50	100pF
C466	2113743N50	100pF
C467	2113928N01	0.1uF
C471	2113743L41	0.01pF
C472	2113743L41	0.01pF
C473	2113743L41	0.01pF
C475	2113743H14	10uF
C476	2113928D08	10uF
C479	2113928N01	0.1uF
C480	2113928D08	10uF
C481	2113928N01	0.1uF
C482	2113928N01	0.1uF
C490	2113743N50	100pF
C491	2113743N50	100pF
C492	2113743N50	100pF
C493	2113743N50	100pF
C494	2113743N50	100pF
C495	2113743N50	100pF
C496	2113743N50	100pF
C497	2113743N50	100pF
C500	2113743L41	0.01uF
C502	2311049A05	0.47uF
C503	2113743N50	100pF
C504	2113743N43	51pF
C505	2113743N50	100pF
C506	2113743N50	100pF
C507	2113743K15	0.1uF
C511	2113743N50	100pF
C512	2113743N50	100pF
C513	2113743N50	100pF

Circuit Ref	Motorola Part No.	Description
C514	2113743N50	100pF
C515	2113743N44	56pF
C516	2113928N37	30pF
C522	2113743L41	0.01uF
C524	Not Placed	
C525	Not Placed	
C526	Not Placed	
C527	Not Placed	
C528	Not Placed	
C529	Not Placed	
C533	2113743N40	39pF
C534	2113743N24	8.2pF
C535	2113743N09	2pF
C536	2113743N36	27pF
C537	2113743N16	3.9pF
C538	2113743N48	82pF
CR200	4880107R01	Rectifier
CR201	4805649Q13	Varactor Diode
CR202	4805649Q13	Varactor Diode
CR203	4813833C07	Dual Diode
CR204	4813833C07	Diode Dual
CR211	4862824C03	Varactor Diode
CR301	4862824C01	Varactor Diode
CR411	4802245J62	Diode Schottky
CR412	4802245J62	Diode Schottky
CR413	4802245J62	Diode Schottky
CR440	4813833C02	Dual Diode Common Cathode
CR502	5180159R01	Dual Trans NPNs
CR503	4805729G49	Diode Red/Yellow
D100	4802482J02	Pin Diode SMD
D101	4809948D23	Pin Diode
D102	Not Placed	
D103	Not Placed	
D104	4813833C06	Dual Diode
D210	4802233J09	Triple Diode
D211	4802233J09	Triple Diode
D501	4802245J42	Ring Quad Diode
D502	4805129M06	Diode
E100	2480640R01	Inductor Bead Chip
E400	2480640Z01	Ferrite Bead
E401	2480640Z01	Ferrite Bead
E402	2480640Z01	Ferrite Bead
E403	2480640Z01	Ferrite Bead
E404	2480640Z01	Ferrite Bead
E405	2480640Z01	Ferrite Bead
E406	2480640Z01	Ferrite Bead
E407	2480640Z01	Ferrite Bead
E408	2480640Z01	Ferrite Bead
E409	2480640Z01	Ferrite Bead
F1	6580542Z01	Fuse 3A
FL301	4885631B01	109.65MHz Crystal Filter
J1	0986237A02	Connector
J101	0985613Z01	RF Jack
J102	0280519Z01	Antenna Nut
J400	0905505Y04	40-pins Connector
J403	0905505Y02	20-pins Connector

Circuit Ref	Motorola Part No.	Description
L100	2460591X13	120nH
L100**	2460591X12	100nH
L101	2460591X08	140nH
L101**	2460591X14	137nH
L102	2460591X12	100nH
L102**	2460591X16	89nH
L103	2462587T27	750nH
L104	2462587Q20	2.2uH
L105	2460591X13	120nH
L106	2460591X10	50nH
L106**	2460591X15	46nH
L107	2484562T03	8nH
L107**	2484562T20	5nH
L108	2462587Q08	220nH
L109	2462587Q08	220nH
L110	2460591X11	80nH
L200	2462587Q42	390nH
L201	2405452C63	1.35uH
L202	2405452C63	1.35uH
L203	2405452C63	1.35uH
L204	2462587T25	620nH
L207	2405452C27	4.7uH
L207**	2405452C63	1.35uH
L208	2462587T20	270nH
L208**	2462587T19	220nH
L209	2462587T20	270nH
L209**	2462587T19	220nH
L210	2405452C63	1.35uH
L211	2462587T21	330nH
L212	2462587T16	120nH
L215	2409348J04	5.45nH
L225	2462587L50	100uH
L226	2462587Q20	2.2uH
L301	2462587V35	120nH
L302	2462587T23	470nH
L303	2462587V38	220nH
L304	2462587T22	390nH
L305	2462587T22	390nH
L306	2462587T44	33nH
L307	2462587Q20	2.2uH
L308	2462587Q20	2.2uH
L400	2462587Q42	390nH
L401	2462587Q42	390nH
L410	2462587Q42	390nH
L411	2462587Q42	390nH
L501	2462587T17	150nH
L502	2462587T20	270nH
L503	2462587T30	1uH
L504	2462587T24	560nH
L507	2462587T17	150nH
L508	2462587V32	68nH
PB501	4086470Z01	Tactile Switch
PB502	4086470Z01	Tactile Switch
PB503	4086470Z01	Tactile Switch
PB504	4086470Z01	Tactile Switch
PB505	4086470Z01	Tactile Switch

Circuit Ref	Motorola Part No.	Description
Q100	4813828A08	FET
Q201	4802245J44	NPN
Q202	4805218N82	FET
Q203	4805218N82	FET
Q204	4805218N82	FET
Q288	4802245J44	NPN
Q301	4805218N63	NPN
Q400	4809579E18	MOSFET P-Channel
Q403	4805128M67	PNP
Q405	4802245J54	NPN
Q410	4802245J54	NPN
Q411	Not Placed	
Q417	4809939C05	Dual NPN/PNP
Q509	4802245J44	NPN
Q510	4880214G02	NPN
R101	0662057A18	51
R102	0680735Z01	0.075
R103	0662057A21	68
R104	0662057M26	10
R105	0662057A32	200
R106	0662057A32	200
R107	0662057M66	470
R108	0662057M93	6.2K
R109	0662057M60	270
R110	0662057M98	10K
R111	0662057N01	12K
R112	0662057M50	100
R113	0662057M50	100
R114	0662057N39	470K
R115	0662057M26	10
R116	0662057M81	2K
R117	0662057N47	1M
R118	0662057A01	10
R119	0662057C35	22
R120	0662057A21	68
R122	Not Placed	
R123	Not Placed	
R124	Not Placed	
R129	0662057C35	22
R203	0662057M50	100
R204	0662057M56	180
R206	0662057U45	56
R219	0662057N15	47K
R222	0662057N20	75K
R223	0662057N23	100K
R224	0662057M57	200
R225	0662057M67	510
R227	0662057M50	100
R228	0662057M43	51
R229	0662057M81	2K
R230	0662057M50	100
R231	0662057M46	68
R232	0662057N10	30K
R233	0662057M82	2.2K
R234	0662057M74	1K
R235	0662057M72	820

Circuit Ref	Motorola Part No.	Description
R236	0662057M44	56
R237	0662057M16	3.9
R238	0662057M74	1K
R239	0662057M74	1K
R285	0662057M50	100
R286	0662057M01	0
R287	0662057N15	47K
R288	0662057M74	1K
R289	0662057M16	3.9
R301	0662057M78	1.5K
R302	0662057N15	47K
R303	0662057N15	47K
R304	0662057M78	1.5K
R305	0662057M98	10K
R306	0662057M77	1.3K
R307	0662057M92	5.6K
R308	0662057N01	12K
R309	0662057N22	91K
R310	0662057M87	3.6K
R312	0662057M78	1.5K
R314	0662057M98	10K
R315	0662057N15	47K
R316	0662057M57	200
R317	0662057M81	2K
R318	0662057M33	20
R400	0662057N15	47K
R401	0662057M01	0
R402	Not Placed	
R403	Not Placed	
R405	0662057M01	0
R406	0662057N20	75K
R407	0662057N19	68K
R408	Not Placed	
R409	0662057M98	10K
R410	0662057N23	100K
R411	0662057M98	10K
R413	0662057M01	0
R414	0662057V34	180K
R415	0662057V26	91K
R416	0662057N13	39K
R418	Not Placed	
R421	0662057M81	2K
R423	0662057N21	82K
R424	0662057N12	36K
R425	0662057N10	30K
R427	0662057M84	2.7K
R428	0662057M10	2.2
R429	0662057N20	75K
R431	0662057N39	470K
R432	0662057N16	51K
R434	0662057M62	330K
R435	0662057N81	2K
R436	0662057M74	1K
R437	0662057M01	0
R438	0662057M54	150
R439	0662057M54	150

Circuit Ref	Motorola Part No.	Description
R445	0662057N08	24K
R446	Not Placed	
R447	0662057N23	100K
R448	0662057M98	10K
R449	0662057N08	24K
R450	0662057T45	68
R451	0662057N03	15K
R452	0662057N23	100K
R453	Not Placed	
R454	Not Placed	
R455	Not Placed	
R456	0662057M01	0
R457	0662057M98	10K
R460	0662057M90	4.7K
R463	0662057M61	300
R471	0662057N06	20K
R472	0662057M93	6.2K
R473	0662057M26	10
R475	0662057M01	0
R476	0662057N35	330K
R477	0662057M74	1K
R478	0662057M98	10K
R481	0662057N08	24K
R492	0662057M01	0
R499	Not Placed	
R501	0662057M70	680
R502	0662057M56	180
R503	0662057M74	1K
R504	0662057N01	12K
R505	0662057M68	560
R507	0662057M60	270
R508	0662057M32	18
R509	0662057M60	270
R510	0662057M87	3.6K
R512	0662057M90	4.7K
R513	0662057M26	10
R514	0662057N15	47K
R515	0662057M98	10K
RT400	0680590Z01	Thermistor 33K
S501	4080710Z01	Channel Switch
S502	1880619Z02	Volume Switch
SH100	2686076A01	Shield
SH200	2685709B02	Shield
SH201	2680511Z01	Shield
SH202	2680511Z01	Shield
SH203	2686079A01	Shield
SH300	2680516Z01	Shield
SH301	2680508Z01	Shield
SH302	2680697Z01	Shield
SH303	2680553Z01	Shield
SH400	2680505Z01	Shield
SH401	2680506Z01	Shield
SH402	2680515Z01	Shield
SH403	2680516Z01	Shield
SH500	2680555Z01	Shield
SH501	2680697Z01	Shield
SH502	2680696Z01	Shield
T100	2505515V03	Transformer Coil
T501	2580541Z02	Transformer Coil
T502	2580541Z02	Transformer Coil
TR201	2460593D01	Resonator, 50–300MHz
U101	5185130C65	LDMOS Driver
U102	5185765B26	Power Control
U200	5102463J58	3.3V Regulator
U203	4805649Q14	Varactor Diode
U204	5105739X05	Linear Regulator
U205	5185963A27	LV Fractional N Synthesizer
U207	4805921T06	Dual PNP
U301	5102464J01	LVZIF - TRAY
U301	4885622B01	Dual Gate MOSFET
U302	5185623B01	Inverter
U303	5109632D83	LVZIF
U400	5102463J40	3.3V Regulator
U404	5185130C53	ASFIC
U406	5102463J59	Flash ROM 128K x 8
U407	5102464J04	EEPROM 8K x 8
U409	5102226J56	Microcontroller
U420	5102463J44	Audio PA
VR101	5185963A15	Temperature Sense
VR102	4802245J51	6.8V Zener
VR200	4802245J51	6.8V Zener
VR201	4802245J51	6.8V Zener
VR202	4802245J51	6.8V Zener
VR203	4802245J53	6.8V Zener
VR432	4805656W08	5.6V Zener
VR433	4805656W08	5.6V Zener
VR434	4802245J73	6.8V Zener
VR445	4802245J74	10V Zener
VR446	4802245J74	10V Zener
VR447	4802245J74	10V Zener
VR448	4802245J74	10V Zener
VR449	4802245J74	10V Zener
VR450	4802245J75	12V Zener
VR460	4802245J73	6.8V Zener
VR500	4800245J51	6.8V Zener
VR501	4813830A18	6.8V Zener
VR502	4802245J51	6.8V Zener
Y201	4805875Z03	Crystal Oscillator
	8485658Z05	Low Band PCB

** Motorola depot servicing only

* Range 2 only

Notes

Appendix A Replacement Parts Ordering

A.1 Basic Ordering Information

When ordering replacement parts or equipment information, the complete identification number should be included. This applies to all components, kits, and chassis. If the component part number is not known, the order should include the number of the chassis or kit of which it is a part, and sufficient description of the desired component to identify it.

Crystal orders should specify the crystal type number, crystal and carrier frequency, and the model number in which the part is used.

A.2 Transceiver Board and VOCON Board Ordering Information

When ordering a replacement Transceiver Board or VOCON Board, refer to the applicable Model Chart in the front of this manual, read the Transceiver Board or VOCON Board note, and include the proper information with your order.

A.3 Motorola Online

Motorola Online users can access our online catalog at

https://www.motorola.com/businessonline

To register for online access, please call 1-800-814-0601.

A.4 Mail Orders

Send written orders to the following addresses:

Replacement Parts/ Test Equipment/Manuals/ Crystal Service Items (United States and Canada)**:**

Motorola Inc.
Customer Care and Services Division*
Attention: Order Processing
1307 E. Algonquin Road
Schaumburg, IL 60196
U.S.A.

Federal Government Orders:

Motorola Inc.
U.S. Federal Government Markets Division
Attention: Order Processing
7230 Parkway Drive
Landover, MD 21076

International Orders:

Motorola Inc.
Customer Care and Services Division*
Attention: Order Processing
1307 E. Algonquin Road
Schaumburg, IL 60196
U.S.A.

A.5 Telephone Orders

Customer Care and Services Division*
(United States and Canada)
7:00 AM to 7:00 PM (Central Standard Time)
Monday through Friday (Chicago, U.S.A.)
1-800-422-4210
(International Orders)
1-847-538-8023

U.S. Federal Government Markets Division (USFGMD)
1-800-826-1913 Federal Government Parts - Credit Cards Only
8:30 AM to 5:00 PM (Eastern Standard Time)

A.6 Fax Orders

Customer Care and Services Division*
(United States and Canada)
1-800-622-6210
(International)
847-576-3023

USFGMD
(Federal Government Orders)
1-800-526-8641 (For Parts and Equipment Purchase Orders)

A.7 Parts Identification

Customer Care and Services Division*
(United States and Canada)
1-800-422-4210, menu 3

A.8 Product Customer Service

Customer Response Center
(Non-technical Issues)
1-800-247-2346
FAX:1-800-247-2347

* Customer Care and Services Division (CCSD) was formerly known as Accessories and Aftermarket Division (AAD).

Motorola, Inc.
1301, E. Algonquin Rd.
Schaumburg, IL 60196-1078, U.S.A.

6881098C43-P