maxon®

Service Manual

SM2500 ENDURO SERIES

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SERVICE MANUAL

This manual is intended for use by qualified technicians and includes information pertaining to the SM2500 circuit design and maintenance.

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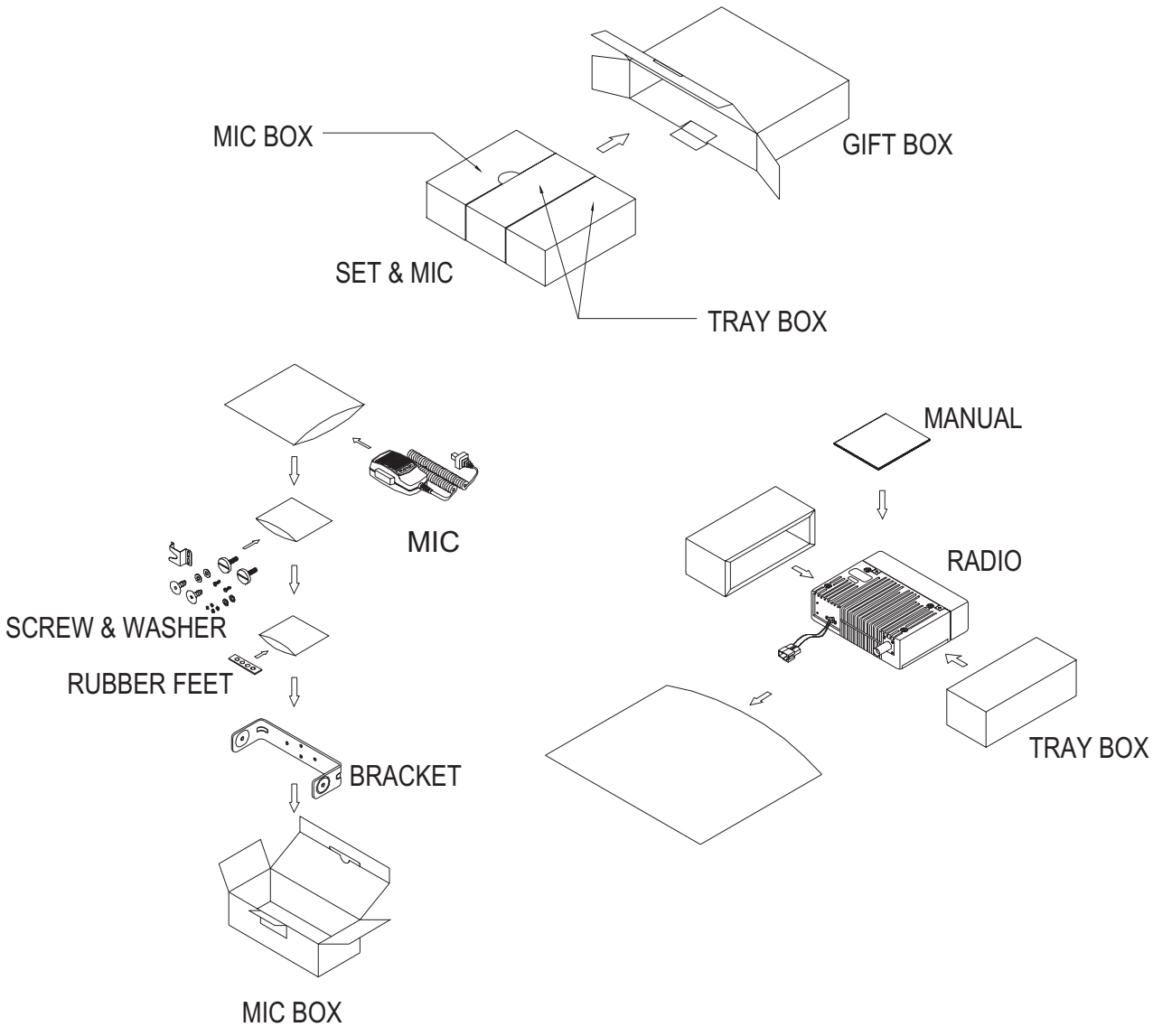
UNPACKING



Unpacking the radio

INTRODUCTION

Advanced state-of-the-art technology is used in the design and manufacturing of the SM2500 Mobile. The Phase Lock Loop (PLL) synthesizer provides more flexibility and capability in the SM2500 Mobile. This scanning mobile has 4 channel capability. It offers CTCSS, DCS, scanning, priority channel, and many other functions. All these functions are controlled by the micro controller. The micro controller reads specific channel information from an Electronically Erasable Programmable Read Only Memory (EEPROM).

FEATURES

The Maxon SM2500 is a rugged two way FM mobile radio which operates from 136-174 MHz (VHF) in two bands & 400-512 MHz (UHF) in five bands. The SM2500 is a synthesized radio utilizing microcomputer technology to provide reliable high quality simplex two-way mobile communications. The SM2500 transmitter output power level is 25 watts over a wide bandwidth, with a receiver operational bandwidth that covers the specified frequency band. The basic radio package includes the following features:

- Microprocessor Control
- Synthesized RF Channel Selection (Frequency Control)
- CTCSS Encode / Decode
- DCS Encode / Decode
- Priority Channel Scan
- 5 PPM Frequency Stability (SM-2150/VHF)
- 2.5 PPM Frequency Stability (SM-2450/UHF)
- Field Programmable with PC
- Internal 4 watt speaker, with Volume Control
- Busy Channel Lockout

LICENSING INFORMATION

FCC Information

The SM2500 Enduro Series radio complies with the Federal Communications Commission (FCC) requirements that regulate the Business Radio Service. The user must know and comply with all applicable parts of the FCC Rules and Regulations. Rules applicable to each service may be ordered from:

Federal Communications Commission
Branch License Division
Gettysburg, PA 17326
Tel: (717) 337-1212 http://www.fcc.gov/

- Note: A valid station license and call sign issued by the FCC is required before operating the transceiver. It is the users's responsibility to apply for and obtain this radio license.

Industry Canada Information

To obtain the Industry Canada license application, contact your nearest field office, or write:

Industry Canada
1241 Clyde Avenue Ottawa
Ontario K2C 1Y3Canada
Tel: (613) 998-5968 http://info.ic.gc.ca/

ABOUT THIS MANUAL

This Maxon Service Manual is a comprehensive guide to the operation, programming, maintenance and field repair of the SM2500 Enduro Series radio. The manual provides service technicians with testing, adjustment, alignment and parts replacement information. It covers all variants of the product and its accessories. Before using this manual or servicing the SM2500 please read this page and the following chapters:

- **"ELECTROSTATIC DISCHARGE & PROTECTION" on page 6**

Please observe the following symbols when servicing the radio:

- This symbol is used to identify a Warning or use of Caution. Use caution when following the outlined procedure.

- This symbol is used to identify a Electrostatic Discharge Sensitive (ESDS) device. Follow ESD protection guidelines when handling such devices.

Production Changes

Production or engineering changes may occur either after this manual is printed and before its next printing or before a Publication Change Notice can be provided. During this interim, technicians should check with Topaz3 if discrepancies are found.

Amendments

Amendments to this service manual will be issued in the form of a Publication Change Notice (PCN). A PCN will be made available at no charge and distributed via regular mail and through the Topaz3 Website: www.topaz3.com. Detailed information is included in the PCN to help incorporate the updates into your existing service manual. Look for the "Binder Icon" on future PCN's.

Safety Information

The Federal Communications Commission (FCC), with its action in General Docket 79-144, March 13, 1985, has adopted a safety standard for human exposure to Radio Frequency (RF) electromagnetic energy emitted by FCC regulated equipment. Maxon subscribes to the same safety standard for the use of its products. Proper operation of this radio will result in user exposure far below the Occupational Safety and Health Act (OSHA) and Federal Communications Commission limits.

WARNING

Do not allow children to operate transmitter - equipped radio equipment.

WARNING

Do not operate a radio transmitter near unshielded electrical blasting caps or in other explosive environments unless it is specifically approved for such use.

CAUTION

Do not key the transmitter or press the PTT button without an appropriate load connected to the antenna connector. Do not allow unauthorized persons to operate any radio transmitting equipment.

ELECTROSTATIC DISCHARGE & PROTECTION

What is Electrostatic Discharge(ESD)?

Whenever static electricity on an object comes into contact with an earth ground object, discharge takes place, most often by way of a spark. This is similar to a miniature lightning strike. Objects sensitive to such Electrostatic discharge are Electrostatic Discharge Sensitive **(ESDS**).
Static electricity is generated by many different products and in many different ways. Handling plastic packaging, walking across a carpet, wearing clothing that retains static charges and working at a workbench that is not earth grounded are only a few ways static electricity is generated.
Your body can generate the largest static charge likely to come in contact with a **ESDS** component, so it is important that all necessary precautions are taken to prevent this contact from occurring.

What is ESD damage?

There are two types of damages or failures: ***upset*** and ***catastrophic***.

Most ESD upset type damage will not normally show immediately. It may only show as a temporary loss of data but the next time everything passes the tests. Often the damage is so small that the damage to the component will not show up for some time, unlike damage caused by a short circuit which may cause a component to smoke, burn or explode. The component may not show any faults; however, at some point in time the component will fail, most likely at the most inconvenient time.

How do I protect against ESD damage?

There are several ways to protect electronic equipment from ESD damage. All of the following should be followed, but even following only one will help.

Prevent charges from forming.

1. Earth ground the workbench. Use an anti-static material on the surface of the workbench and make sure it is grounded. Do not use insulated underlays on the bench. Make sure the ground connections are secured.

2. Use an anti-static floor covering material. Wear anti-static shoes or heel straps. Your chair also must be anti-static.

3. Wear a wrist or heel strap connected to earth ground. Keep clean and tight. If your skin is dry, use lotion under the wrist strap. Check wrist or heel strap daily for proper grounding.

4. Keep non-anti-static plastic packaging and other plastic objects away from work area.

5. Use only anti-static plastic or foam material to protect components and boards. Place component or board **inside** anti-static bag, **not on top of it**.

6. Wear clothing that has been treated with a fabric softener during washing. This will not only reduce the risk of acquiring electrostatic charges but make your clothing more comfortable and stay cleaner longer.

7. Use earth grounded test equipment, soldering irons, etc. and hand tools without insulated handles.

8. Clean your workbench, chair, shoes, etc. with approved detergents and cleaning material only.

9. Observe ESD precautions when the ESDS label is present on components or units and/or in the product manuals.

SPECIFICATIONS

TRANSCEIVER NOMINAL PERFORMANCE

Performance Specifications	FTZ 17TR2049 July 88 TIA/EIA-603 IEC 68 Series EC 529 IP54 MIL STD 810 C,D,E
RF Output Power	25 W
Modulation Type	G3E/F3E (PM/FM)
Audio power	4 W
Intermediate frequencies	45 MHz 455 kHz
Number of Channels	4
Frequency Source	Synthesizer

GENERAL

Power Supply	13.2 VDC nominal CEPT 15.6 VDC maximum (extreme) 10.8 VDC minimum (extreme) 13.8 VDC nominal TIA/EIA-603

Temperature Range

Storage	80°C Maximum; -40°C Minimum (Extreme)
Operating (to spec)	25°C Nominal; 60°C Maximum; -30°C Minimum (Extreme)

Current Consumption

DC Current

Standby (Muted)	< 140 mA

Unmuted

25% Max. AF power	< 350 mA
50% Max. AF power	< 450 mA
100% Max. AF power	< 570 mA

Transmit

1 Watt RF power	1.6 A
3 Watts RF power	2.4 A
25 Watts RF power	6.7 A

Switching range TX and RX (without re-tuning)

VHF Band 2	TX: 148 - 174 RX: 148 - 174
UHF Band 2	TX: 440 - 470 RX: 440 - 470
Channel spacing	25 kHz / 20 kHz / 12.5 kHz programmable (25 kHz - 12.5kHz switch able by CPU control)
Dimensions (in / mm)	2(H) x 7(W) x 6.25(D) 45(H) x 157(W) x 140(D)
Weight	3lbs, 6oz/ 1.6kg (with mic)

TRANSMITTER

- Tests methods are ETS 300 086 Jan. 1991 unless stated

Performance Without Sub audible Modulation

Carrier Power @ nominal conditions

Max. Rated Output Power	25 W +/-10% nominal 25 W +2/-3 dB @ extreme conditions across switching range
Hi Switched by CPU Continuously adjustable	1 - 25 W
Low Switched by CPU Continuously adjustable	1 - 3 W
Frequency stability (SM-2541)	+5.0 ppm (+ 0.00025%)
Frequency stability (SM-2544)	+2.5 ppm (+ 0.00025%)

Peak audio frequency deviation

(across switching range)

Channel Spacing

12.5KHz	± 2.5KHz
25KHz	± 5.0KHz
Audio characteristic	(Method as FTZ 17 TR 2049 July 1988)
MOD Type G3	Within +1/-3 dB of 6 dB/octave pre-emphasis curve: 300 Hz - 2.55 kHz for 12.5 kHz Channel Spacing 300 Hz - 3 kHz for 20, 25 kHz Channel Spacing
MOD Type F3	Within +1/-3 dB of 6 dB/octave pre-emphasis curve: 300 Hz ñ 2.55 kHz for 12.5 kHz Channel Spacing 300 Hz ñ 3 kHz for 20, 25 kHz Channel Spacing

Adjacent channel power

25 kHz	< 70 dBc
12.5 kHz	< 60 dBc

SPECIFICATIONS

TX spurious emissions (conducted)

9 kHz -1 GHz	< -36 dBm
1 - 4.0 GHz	< -30 dBm

TX spurious emissions (radiated)

9 kHz -1 GHz	< -36 dBm
1 - 4.0 GHz	< -30 dBm

TX spurious emissions (radiated)

9 kHz -1 GHz	< -36 dBm
1 - 4.0 GHz	< -30 dBm

Modulation limiting characteristics	Method as FTZ17 TR2049 July 1988 =75% peak deviation
Transmitter audio distortion (without CTCSS)	Method as FTZ17 TR 2049 July 1988
1 kHz modulation input	< 5%
Transmitter audio distortion (with CTCSS)	Method as EIA RS 220A Mar 79
Audio frequency 1 kHz	
Any CTCSS frequency combined	< 8%
Hum & noise (residual modulation)	> 40 dB

TX TONE MODULATION CHARACTERISTICS

Sub audible tones - CTCSS

Tone range	67 - 250 Hz @ 0.3% accuracy
Tone standard	RS-220A EIA Standard
Non-standard tones	50 - 260 Hz @ 0.3% accuracy
Nominal tone deviation	10% peak system deviation

SUB AUDIBLE TONES - DCS

Tone standard	Normal and inverted
Nominal tone deviation	10% peak system deviation

RECEIVER

Performance without sub audible modulation	Method ETS 300-086 JAN 1991 unless stated
Sensitivity 12 dB SINAD	< - 118 dBm
Amplitude characteristic	+ 3 dB

Co-channel rejection

25 kHz	<- 6 dB
12.5 kHz	<- 10 dB

Adjacent channel selectivity

25 kHz	> 70 dB @ nominal conditions
12.5 kHz	> 60 dB @ nominal conditions
Spurious response rejection	> 70 dB (100 kHz - 4 GHz)

Inter modulation response rejection

+ (25 kHz & 50 kHz)	> 65 dB (3 generator method)
+ (50 kHz & 100 kHz)	

Blocking

+ 1 MHz	> 85 dB
+ 5 MHz	> 85 dB
+ 10 MHz	> 85 dB

RX spurious emissions (conducted)

9 kHz - 1 GHz	- 57 dBm
1 GHz -4.0 GHz	- 47 dBm

RX spurious emissions (radiated)

9 kHz - 1 GHz	-57 dBm
1 - 4.0 GHz.	-47 dBm
AF power	5 W maximum @10% Distortion into a 4 ohm load. 4 Watts nominal.
AF frequency response	Method as FTZ 17 TR 2049 July 1988
MOD Type G3	Within +1/-3 dB of 6 dB/octave de-emphasis curve 300 Hz - 2.55 kHz for 12.5 kHz Channel Spacing 300 Hz - 3 kHz for 25 kHz Channel Spacing
MOD Type F3.	Within +1/-3 dB of 6 dB/octave de-emphasis curve 300 Hz - 2.55 kHz for 12.5 kHz Channel Spacing 300 Hz - 3 kHz for 25 kHz Channel Spacing
RX Hum & Noise	> 40 dB

RX TONE DEMODULATION CHARACTERISTICS

Sub audible tones - CTCSS/DCS

CTCSS tone range.	67 Hz to 250 Hz
CTCSS tone standard	RS-220A EIA Standard
CTCSS non-standard tones.	50 - 260 Hz
DCS tone standard	Standard and inverted
Decode Sensitivity	Method: Decrease signal level @ 10% peak deviation
All tone	<= 9 dB SINAD
Environmental	IEC529 level IP54 MIL STD 810F
EMC	EMC Directive 89/336/EEC May 1989 ETS 300.279

RELIABILITY ANALYSIS

	Calculation method
MTBF	15,000 Hr. MIL-HDBK-217F. Ground benign. Parts stress method.
MTTR	30 Min. (Average time to rework any SMD component & reassemble).

OPERATION

Power On - Volume

Rotate the on/off-volume control clockwise to turn the power on. Adjust to the desired volume level. Turn the radio off by rotating the volume control counter-clockwise to detente.

Channel Select

Set the channel selector knob to the desired channel.

Channel Monitor

Federal Communications Commission Rules and Regulations require that you monitor a frequency for activity before transmitting. To monitor the channel for activity before transmitting, press the monitor button.

- NOTE - The TX/RX indicator will glow amber if RF activity is present. It will glow green if the transmission has a CTCSS or DCS tone that matches a tone programmed for receiving. If the LED is not illuminated, a clear channel is present.

Transmit

When the channel is clear, press and hold the P - T - T bar on the side of the microphone. Hold the Microphone 1 or 2 inches from your mouth, and speak clearly and distinctly. The LED will glow red when transmitting and should be on continuously while the P-T-T Bar. Being pressed and the radio is transmitting.

Receive

When the transmission is complete, release the P-T-T bar to receive.

- NOTE - Pressing the monitor button disables any tone coded squelch options, if programmed.

Channel Scan

Pressing the scan button allows you to monitor a number of channels at the same time. A channel scan list can be programmed using the ACC-925 programmer. Any channel, 1 - 4 can be added to the scan list. Once the scan button is pressed, scan is initiated

Normal Scan

Once the scan list is programmed, you can initiate scan. Simply press the scan button, and the radio will start to scan. The TX/RX indicator on the front panel can be programmed to flash green as the radio is scanning.

If a conversation is detected on any of the channels in the scan list, the radio will stop on that channel, and you will be able to hear the conversation. If programmed for nor-

mal scan TX, you will be able to transmit on that active channel during the programmable scan delay time.

The scan delay time is the amount of time the radio will stay on that channel once activity has ceased (dealer programmable, 4 - 7 seconds is typical). The radio will resume scanning once the scan delay time has expired.

Going off-hook while locked on an active channel will stop scan and allow for transmission and reception. The radio will continue to scan when going off-hook and not locked on an active channel. Scanning will continue unless the channel selector knob is changed or the P-T-T bar is pressed.

Priority Channel Scan

A single channel may be programmed as the priority channel. The radio will constantly monitor this channel while scanning and when the radio has stopped on an active channel. If a call is detected on the priority channel, the radio will automatically move to and remain on the priority channel for as long as the priority conversation takes place. Priority channel activity takes precedence over all other conversations.

- NOTE - Priority channel scan and look-back require that the radio leave the active channel for a fraction of a second (at regular intervals) to check the priority channel for a message. Depending upon how the radio is programmed (scan speed, etc.), this may or may not be noticeable as breaks on the active channel for that same fraction of a second.

Scan Channel Delete

On occasion you may wish to temporarily delete a channel from the scan list. To do this, simply press the monitor button while scanning and stopped on the channel to be deleted. This will remove that channel from the scan list until the selector is moved from the scan list channel position or the radio's power is reset. When power is restored or the scan list channel position is again selected, the original dealer programmed scan list will be activated.

Look-Back

Any channel, when not in the scan mode, can be programmed to "lookback" at the priority channel. This feature is ideal for those who do need scan as defined above but want to make sure they never miss a Call on the priority channel if another channel has been selected.Once a look-back channel has been selected, the radio will periodically scan the priority channel.If activity is detected on the priority channel, the radio will move to that channel for as long as it remains active.

CTCSS/DCS Scanning

The SM2541/2544 can be programmed to scan for tone. This will help block out unwanted calls.

Normal Scan TX

A transmission is allowed only after a call is received, depending on the programmed scan delay time After scan resumes and a transmission is made, the radio will sound an alarm (two beeps) and will not allow a transmission.

Priority Scan TX

This allows a transmission after a call is received depending on programmed scan delay time.The Transmission will be made on the channel that the call was received. After the radio resumes scanning, If a transmission is made, the radio will transmit on the programmed priority channel.

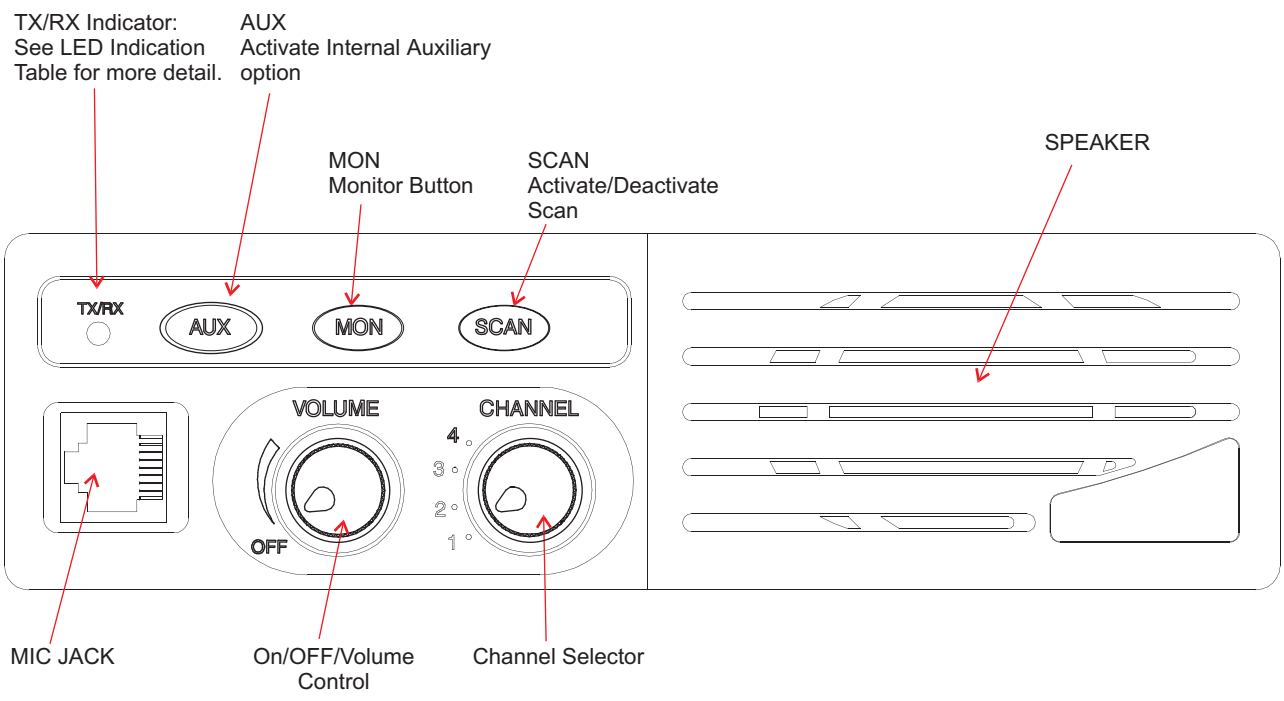
Priority Only TX

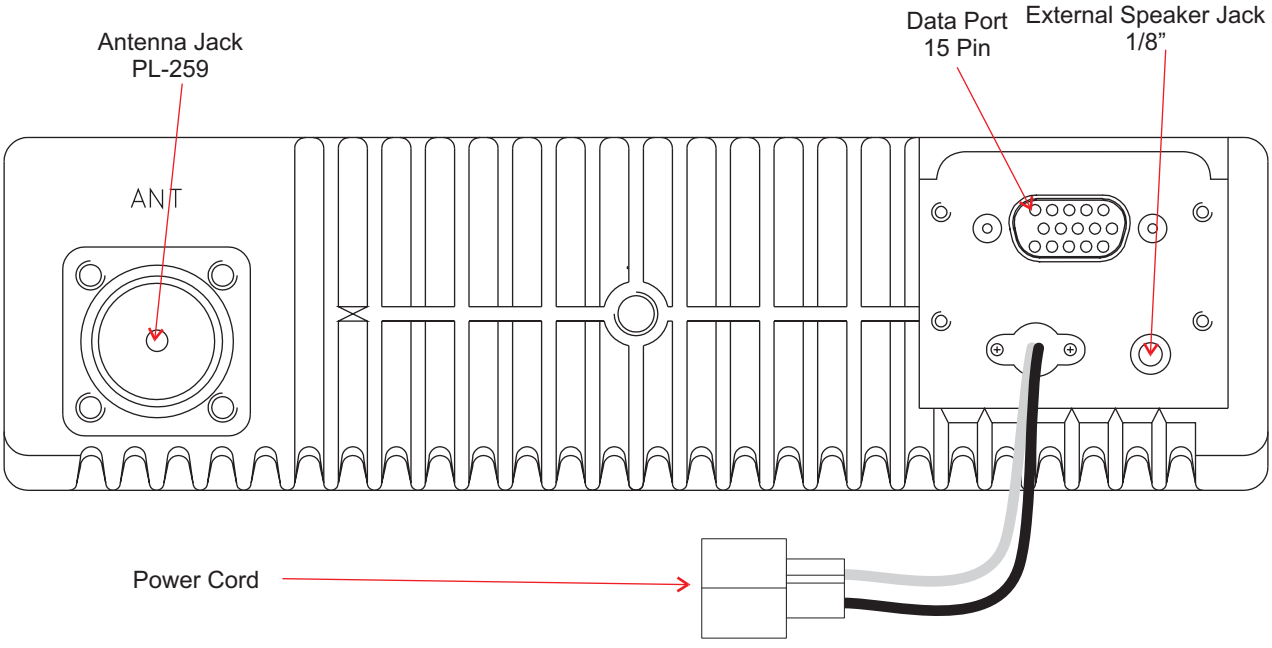
Your radio will transmit on the priority channel when scanning and when not stopped on an active Channel. It can also be programmed to always transmit on the priority channel if scanning or stopped on an active channel.

Receive Only Scan

if a transmission is made at any time, the radio will sound an alarm (two beeps) and will not allow the transmission. Only reception is allowed.

DESCRIPTION OF CONTROLS





Description of Controls

THEORY OF OPERATION

Each of the Scanning Mobile radios, UHF & VHF, include a unique main P.C.B. consisting of RF, Digital and Analog circuitry.

DIGITAL CIRCUITRY

IC 411 and IC412 are digitally-controlled analog switches which internally consist of three single pole, double throw switches. By placing a high (5V) or low (0V) on the control lines which consists of A,B, and C. “A” controls the X ports “B” controls the Y ports and “C” controls the Z ports. Example: A high on control “A” would connect X to X1. A low on control “A” would connect X to X0.

CTCSS/DCS Decode Circuits

Discriminator audio from Pin 9 of IC 109 is fed to IC 406 and associated parts, which are the first 2 poles of a 6th order 250Hz Chebeyshev low pass filter. The output from Pin 1 (IC406A) is fed into IC411 (Pin 2) and output to Pin 15 (IC411). The signal is then fed to Pin 8 (IC407) which is a 6th order low pass Butterworth switched capacitor filter. The output from the Butterworth filter (Pin 3 IC407) is then fed to the remaining 4 poles of the 6th order Chebeyshev, which consist of IC 406C and one of the two operational amplifiers internal to IC407 (MF6-100) along with associated components. Both the Chebeyshev and the Butterworth combines for a 4dB ripple low pass filter when programmed for 250Hz. The output of IC406C(Pin 8) is fed into the remaining operational amplifier internal to IC407 (MF6-100) which forms the squaring circuit for the Decode signal. The signal is output from Pin 2 IC407 (MF6-100) and fed into IC409 (micro) where it is matched with a pre programmed frequency. If successful a Decode occurs, which is shown by a green L.E.D. on the front panel of the mobile and audio is heard. If valid Decode was not seen, the busy L.E.D. (Yellow) would be shown.

CTCSS/DCS Encoder Circuit

During TX encode the tone squelch digital signal is produced as a 3-bit parallel word at Pins 15 (A), 16 (B), and 18C of the micro controller (IC409). The 3-bit digital signal is converted to an analog signal by resistors R427, 428, and 430. The analog signal is fed into IC411 Pin 1. The signal is output on Pin 15 (IC411) and fed into Pin 8 of IC407 (6th order Butterworth clock tuned low pass filter). The filtered encode output from Pin 3 (IC407) is fed into Pin 13 (IC411) and output on Pin 14 (IC411). The filtered encode signal is fed to IC405B and RV403 (sub-audible gain control), the output of IC405B is then fed to the audio mixer circuit.

Channel Select Circuit

One of 4 channels may be selected using the channel switch on the front panel. The channel switch SP4T (single pole 4 throw) with output to 4 channel LED’s and to diode’s to be converted to an inverted 4-Bit binary code. The binary code inverted is equal to the channel number. The binary code is decoded by the micro controller enabling the appropriate RX or TX frequency and associated data to be selected from the EEPROM.

EEPROM

RX/TX channels, CTCSS/DCS as well as other data from the programmer are stored in the EEPROM. The data stored is retained without power supplied. This is a non-volatile memory. The EEPROM may have information re-programmed or erased. IC408 is an EEPROM with 2048 (256x 8) bit capacity and data is written and read serially, with the Programming cable through the front panel microphone connector.

High Pass Filter

The high pass filter is an 8-pole.1dB chebeyshev active filter that comprises IC410 and associated components. The de-emphasis is provided by resistor R451 and capacitor C452. Receive audio is passed to IC410 by Pin 4 of IC411 where sub-audible tones below 250Hz are removed. Mic audio is also fed into IC410 via IC411 (Pin 4) where sub-audible voice products below 250Hz are also removed.

Mute (Squelch) Circuit

The mute circuit which is controlled by the output of IC409 (micro) pin 77 (386) is connected to Q409 via R438 which opens analog gate IC401D and mutes the audio path to the AF amplifier, in conjunction with Q137 shorting the input to audio amp IC108.

TX Audio and Filter Circuits

Microphone audio from front panel (via IC412), is fed into IC401A, and into IC404B (Pin 6). The TX audio is output on Pin 7 (IC404B) and into the high pass filter (IC410), where sub-audible voice products are removed. The TX audio output from IC410 is fed into IC404A&B which with associated parts form a pre-emphasis mic amplifier and limiter. The output from Pin 1 IC404A is fed to RV402 (TX Modulation Level Adjust) and fed into IC404C&D with associated parts to form a 3kHz low pass filter. The output of IC404D (Pin 14) is then fed into the Audio Mixer Circuit.

Audio Mixer and Inverter

IC405A is an audio mixer where audio and sub-audible tones are combined. RV403 is used as a level control for the Sub-audible tones. This level is summed with amplified, pre-emphasized, and limited audio and feed to IC405A, which is an inverting amplifier. The output is fed to the VCO and TCXO to provide the necessary modulation signal.

Analog Ground Supply

IC406D supplies analog ground (2.0V) to all operational amplifier circuits except for IC405A and IC405D.

PLL

IC101 (MC1459IF) is a PLL frequency synthesizer with an on-board 1.1 GHZ divide by 64/65 dual modulus prescaler. In addition to the prescaler and frequency counters, the synthesizer IC has a phase detector and a C register (Configuration register) that allows certain functions to be configured as desired.

The synthesizer is serially controlled by three wire input to the IC. Serial data is fed to pin 19 of the IC. Serial data CLK (pin 18) and active low ENABLE (pin 17) are the input pins that allow data transfer into the integrated circuit for control and frequency selection.

Data transfer is byte-oriented and may be shifted in 1, 2 or 3-byte patterns. One byte (8 bits) accesses the C or configuration register, two bytes (16 bits) access the R register and 3 bytes (24 bits) access the A register.

Internally the synthesizer has three counters used as frequency dividers. These counters are the R, A and N counters. The R counter is actually controlled by 3 bits of the R register while the remaining 13 bits determine the divide by R value. The frequency at pin 20 (12.8 MHz) is divided by R to determine the frequency steps of the PLL synthesizer. In programming the radio, 5.0 kHz or 6.250 kHz step sizes can be selected for any channel.

The 24- bit A register controls the N and A (prescaler) counts. Together these counts determine the total synthesizer divide ratio affecting the fin (frequency input) signal from the VCO. A0-A7 are the A counter values. A8-A19 are the N counter values. A21 and A20 must always be set high. A23 and A22 are both set to 0 which controls the function of output A and causes it to be a port. This port, output A, is used to set TX power high or low. A high output on port A sets transmit power low.

The 8-bit C register performs control functions as stated:

C7 sets polarity of the phase detector bits. Logic “0” is normal.

C6 determines the phase detector used. A logic “0” selects theta V and theta R outputs

C5 enables the lock detector when its logic is “1”

C4 when a logic “1”, puts CMOS sections in standby mode.

C3 and C2 set phase detector current at the PD output. Not used in this

application.
C1 is the value present at Output A.
C0 is the value present at Output B.

Transistors Q101 through Q104, along with related resistors and capacitors, connect the dual pin theta V and Theta R outputs into a 2 mA current source that is powered by a 20V DC to DC converter. This allows the tuning voltage to be approximately 3 to 17 VDC.

RF SECTION

Transmitter

The Transmitter is comprised of:
1. Microphone Audio Circuit
2. Transmitter Stage and Harmonic Filter
3. Automatic Power Control
4. Frequency Synthesizer Circuit

Microphone Audio Circuit

Microphone audio is pre-emphasized, limited and mixed with sub-audible tones to provide the modulating signal for the transmitter. This combined modulation is applied to TCXO modulation pin 1 and also to the VCO modulation input via RV101 to effect 2-point modulation. RV101 is a modulation balance control that equalizes modulation sensitivities of the two oscillators.

Transmitter Stage and Harmonic Filter (VHF)

When in the transmit mode of operation the diode D103 is forward biased enabling the RF signal to pass to the pre-driver Q118 by Q116 and Q117. The amplified RF signal is amplified again by Q120. The amplified RF signal passes through the stripline coupler and is fed to the harmonic low pass filter, comprising of L128, L130, L131, and L132, capacitor 271, 273, 275, 277, and 283 and then to the antenna connector (ANT). The stripline coupler provides a sample of the RF signal for the automatic power control. During transmit D107 is forward biased which connects the power amp, D120, to the antenna. D120 is forward biased inhibiting transmit signal power from being fed to the receiver circuitry.

Transmitter Stage and Harmonic Filter (UHF)

Power Amplifier IC103 is an RF Module. In transmit, diode D103 is forward biased allowing the RF signal to pass to the input of IC103 via Q116 and Q117. The amplified RF output passes through the stripline coupler and is fed to the harmonic low pass filter, consisting of spring coils L118, L120, L121 and L125 and capacitors C271, 273, 275, 277 and 280, and then to the antenna connector. The stripline coupler provides a sample of the RF signal for automatic power control. During TX, D108 connects the power amp to the antenna. D120 and D121 are forward biased reducing transmit signal power at the receiver input.

Automatic Power Control (VHF)

The automatic power control contains the stripline coupler, diode D107 and variable resistor VR104, IC104A, and three transistors Q123, Q124, and Q125. IC104A forms a differential amplifier. The RF signal present in the coupler is rectified by D107, to produce a DC voltage proportional to RF power which is applied to Pin 3 of IC104A. TX 8.5V is also applied to the input of IC104A via the potential divider R168, VR104, and R170 at pin 2. The different signal at output of IC104A is passed to Q124 and Q125 to produce a constant power output to the antenna connector (ANT). VR104 is used to adjust the RF high power level. VR105 is used to set the low power setting.

Automatic Power Control (UHF)

The automatic power control contains the stripline coupler, diode D107, and variable resistor RV104, op amp IC104, and two transistors: Q124 and Q125. IC104 acts as a differential amplifier. The RF signal is rectified by D107 to produce a DC voltage, proportional to RF power, that is applied to IC404 pin 3. Voltage divider R168, RV104 and R170 monitors TX 8.5V dc to develop a reference for IC104A pin 2. The difference at the output of (IC104 pin 1) is passed to Q124 and drives the collector of Q125. This

feedback controls the gain of IC103 to maintain a constant RF power output. RV104 is used to adjust the RF high power level. RV105 is used to set the low power setting.

Frequency Synthesizer Circuit

With data received from the EEPROM (IC408) the frequency synthesizer circuit controls and produces the RF carrier frequency for the transmitter during transmit and the local oscillator frequency for the receiver.

The frequency synthesizer circuit is comprised of:
1. RX and TX voltage controlled oscillator module.
2. Loop Filter
3. PLL Frequency Synthesizer

RX & TX Voltage Controlled Oscillator Circuit (VHF)

The circuit contains two VCO's. One for producing carrier frequencies during transmit and one for producing the local oscillator frequency during receive. The circuit also has RX and TX power line filters.

Voltage Controlled Oscillator Circuit (UHF)

The circuit produces carrier frequencies during transmit and local oscillator frequencies during receive. Transistor Q107 is configured as a power supply ripple filter. The VCO utilizes transistor Q108, varactor D101, D102 and trimmer capacitor TC101. These components are configured as a Colpits oscillator. D101 and D102 produce a change in frequency with a change in DC voltage and are controlled by the phase detector. Q110 and Q111 are an amplifier and buffer for the output of the oscillator.

RX & TX Power Line Filters

Transistors Q353 and Q354 are configured as TX5v and RX5v power supply ripple filters respectively.

RX VCO

The RX VCO comprises JFET Q351, coil L356 and varactor D353 and is configured as a Colpits oscillator. D353 produces a change in frequency with a change in DC voltage and is controlled by the phase detector signal present at the anode. The local oscillator signal at the drain of Q351 is applied to RF out of the module when diode D103 is reverse biased and D104 is forward biased. L356 is used for PLL alignment.

TX VCO

The TX VCO comprises JFET Q352 coil L353 and varactor D352 and is configured as a colpits oscillator. The AF signal at MOD port is applied to the cathode of D352. The control voltage from the loop filter is applied to the drain of Q352 and is passed to the power amplifier and harmonic filter via the buffer Q113 and Q114. When diode D103 is forward biased and D104 is reversed biased L353 is used for PLL alignment.

Loop Filter

Transistor Q101 to Q104 and associated components form a loop filter. The phase detector from Pin3 and 4 of IC101 are filtered to remove any reference frequency harmonics and applied to the voltage controlled oscillator.

PLL Frequency Synthesizer

The PLL frequency synthesizer (IC101) contains an oscillator for the reference divider, a programmable divider, a phase/frequency Comparator and an out of lock detector and a Prescaler.

Reference Oscillator

The reference oscillator of IC101 along with a 10.25 or 12.8MHz TCXO, varactor diode D701 and D702, and the thermistors TH701, TH702, and TH703 produce a temperature compensated 10.25 or 12.8MHz reference.

Programmable Dividers

The serial frequency data (DATA) is received by the data programmable divider at Pin 19 of IC101 from Pin 1 of IC409 (Micro controller) out. The internal Prescaler divided input frequency at pin 11 of IC1 is further divided by the programmable divider. The 10.25 or 12.8MHz TCXO frequency at pin 20 is the reference divider to produce a ref-

erence frequency of 5 or 6.25kHz respectively. The internal programmable divided frequency (Fv) and the reference frequency (Fr) are fed to the internal phase detector.

Phase Detector

The phase detector produces negative pulses when Fv < Fr, positive pulses when Fv>Fr. When Fv = Fr and phase is the same, the phase detector presents a high impedance at Pin 4. The signal at Pin 2 is applied to the VCO via the loop filter.

Out of Lock Detector

The out-of-lock detector produces a high logic level when Fr and Fv are in the same phase and frequency, low logic level pulses when the loop is out-of-lock at Pin 2 of IC101. The signals at Pin 2 of IC101 are buffered by Q106 and then integrating by R114 and C122. The product of the integrating circuit is fed to L/D port.

Prescaler

The internal Prescaler of IC101 divides the incoming signal frequency from the VCO via input pin 1 by 64 or 65. The divided VCO frequency is passed to the 6-stage A counter and 12-stage N counter.

Receiver

The receiver uses Dual Conversion Superheterodyning techniques, it is comprised of:

1. RF amplifier
2. First Mixer and First IF Amplifier
3. Second Mixer, Second IF Amplifier and FM Detector
4. Receiver Audio Circuit
5. Mute (squelch) Circuit

RF Amplifier

The signal received via the antenna is routed through the 9th Chebeyshev low-pass filters containing capacitors C273, C275, C277, C280, C283 and coils L128, L130, L131, L132, and is passed through the front-end module (RF amplifier) via pin 1. The front-end module contains L800 to L806 and Q800. The front-end module is configured to enable the RF signal at the operating frequency to pass the first mixer. A bandpass filter consisting of C801-C810 (see band chart for different band values) and L801-L803 is coupled to the base of Q801 (2SC5084) which is the RF amplifier. Diode D801 serves as protection from static and RF overload from nearby transmitters. The output of Q801 is coupled to a second bandpass filter consisting of C812-C824 and L804-L807. The output of the Front End (pin 6) is coupled to the double balanced mixer IC102. The receiver Front End Module is factory pre-tuned and requires no field adjustment. Repair is effected by replacement of the entire (properly banded) module. Frequency bands are listed in the specifications section of this manual.

The receiver Front End module pin-outs are:

1. RF Input
2. Input Ground
3. Ground
4. Receive +5VDC
5. Output Ground
6. RF Output

First Mixer and First IF Amplifier

The VCO local oscillator signal routed through buffer transistor Q113 and Q114 is filtered by C164, C165, C281, C310, and L110, L123. IC102 is a Double Balanced Mixer which provides a 45MHz intermediate frequency output. The filtered frequency from the Front End is coupled to signal input pin3 of the mixer.
The Local Oscillator from the VCO module runs 45MHz lower than the receive frequency and is coupled to IC102 at pin6. The resultant IF output exits at mixer pin2. The 45MHz IF output is matched to the input of the 4 pole monolithic crystal filter by C179, L119, C172 and C173.
The crystal filter provides a bandwidth of + and - 7.5kHz from the operating frequency for the signal providing a high degree of spurious and inter modulation protection.

Additionally, a 90MHz trap is placed at the filter input to provide additional attenuation of the second order IMD (Intermediation Distortion). The output of the filter is impedance matched by T101, C175, and C176 to the base of the post filter IF amplifier Q130 (MMBC1321).

Second Mixer, Second IF and FM Detector

A signal conversion FM receiver integrated chip, IC109 contains the second mixer, second IF and FM detector functions. The second local oscillator frequency is determined by the crystal X101 connected to pin 1 of IC109. The IF signal is received at pin 16 of IC109 via R203 and coupling capacitor C182. The second IF frequency of 455kHz is produced when the different frequency is applied to the mixer via Pin 6. The output of the second mixer via Pin 3 is applied to a 455kHz band-pass filter, CF104 for 25kHz and CF103 for 12.5kHz channel spacing. The output of CF104 is passed to a high gain IF amplifier (limiter) in IC109 via Pin 5. The amplified signal is coupled to the adjustable quadrature detector T103. Any detected signal is produced at Pin 9 of IC109 and applied to the Receiver Audio Circuit and the Mute (Squelch) Circuit.

Receiver Audio Circuit

The receiver audio circuit is comprised of a low pass filter and an audio amplifier on the RF PCB.

Low Pass Filter

The low pass filter is configured from coil L227, capacitor C201 and resistor R206.AF signals from Pin 9 of IC109 are filtered by the low pass filter to remove any components of the 455kHz IF signal. The filtered is passed to the high pass filter.

High Pass Filter

The de-emphasized audio signal from the high pass filter is fed to the audio amplifier (IC108).

Speaker Audio Amplifier

After signal detection and audio filtering, the low level audio is returned to pin 1 of IC108, the Audio PA. IC108, a TDA2003 device, provides sufficient power gain to drive the mobile speaker. Digital transistor Q137 mutes the audio amplifier by grounding R157 when the transistor turns on. When Q137 base is high, the transistor is on and the mobile is muted. Conversely when Q137 is off, the mute is released and audio is heard.

Mute (Squelch) Circuit

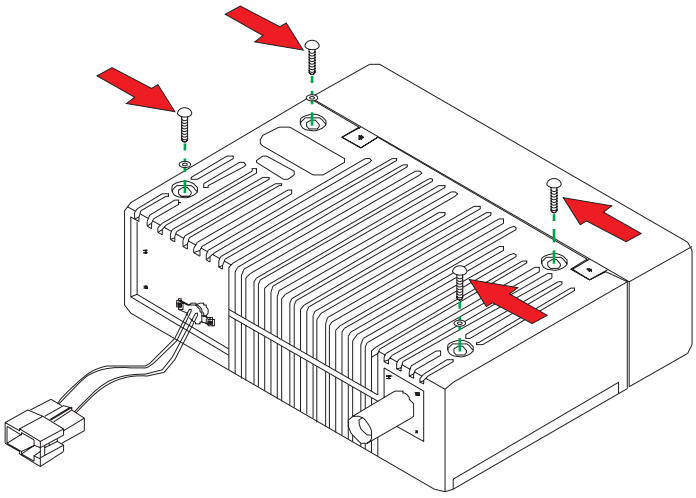
The squelch circuit switches off the audio power amplifier in the absence of audio signal. The squelch circuit comprises a 50kHz pass band filter, squelch control (RV103) and a noise detect circuit. The audio signal from Pin 9 of IC 109 is filtered by the 50kHz bandpass filter formed by L228, L229, C191, C192, and C193. The noise in the IF pass band is accepted, frequencies in the voice frequency band are rejected and noise present at the output of the filter is applied to the noise detect circuit via RV103. RV103 is used to adjust the squelch sensitivity.

Noise Detect Circuit (SQ Board)

The noise detect circuit in conjunction with IC109 consists of transistor Q133 and Q132, thermistor TH101 and diode D125. Any noise signal present is applied to the base of Q133 of the SQ circuit from Pin 11 of IC109. The signal is amplified by Q133 rectified by D11 and then buffered by Q132. The buffered signal output is applied to the squelch trigger of IC109 Pin 12 via resistor R200. The squelch trigger out put (Pin 13 of IC109) is applied to the Micro controller on the Digital circuit. When noise is present, the voltage at Pin 12 of IC109 exceeds 0.7V, the squelch trigger output is 0V (logic0) muting the receiver audio circuit. When no noise is present the voltage at Pin 12 of IC109 is less than 0.7 and Pin 13 of IC109 is at 5V (logic1), unmuting the audio circuit.

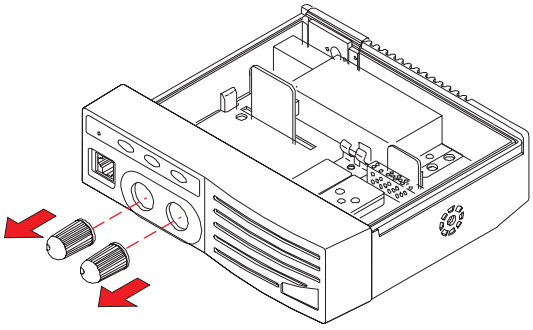
DISASSEMBLY

Removing Top Cover



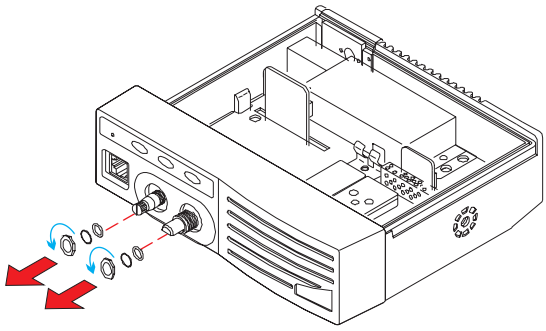
1. Turn unit so bottom of radio is facing up.
2. Remove the four screws on the bottom cover as indicated by the arrows.

Removing the Knobs



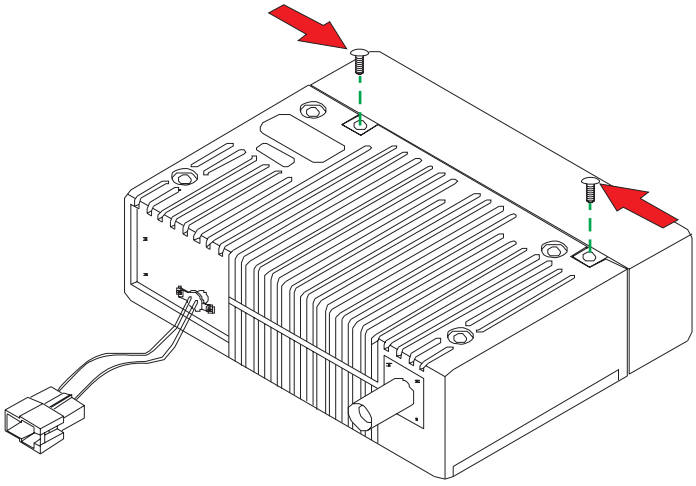
1. Pull the knobs in the direction of the arrows.

Removing Controls



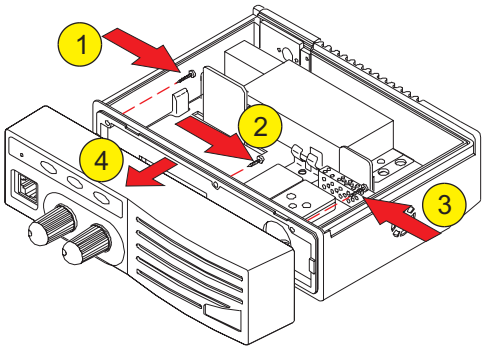
1. Turn Control nuts in a counter-clockwise direction.
2. Remove nuts and washers.

Removing Front Cover



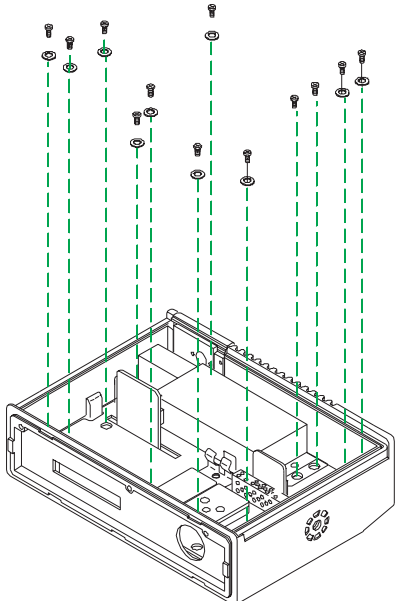
1. Turn unit so bottom of radio is facing up
2. Remove the two screws that hold the front cover on as indicated by the arrows.

Removing Front Cover (Cont.)



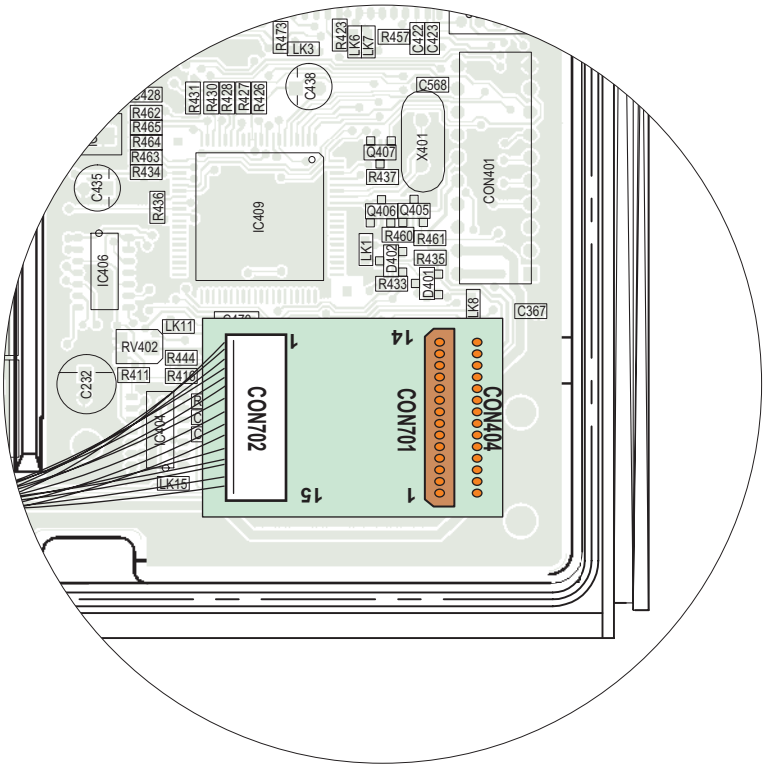
3. Turn unit over so that the radio is right-side-up
4. Remove the three screws that are holding the front cover on as indicated by the arrows (1, 2 and 3)
5. Remove the front cover by pulling the cover in the direction of arrow 4.

Removing the Main PCB

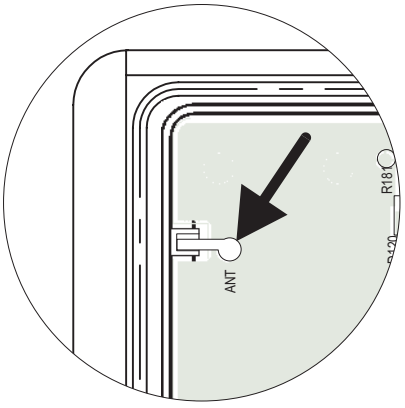


1. Remove the Top Cover (See “Removing Top Cover” on page 21.)
2. Remove the Front Panel (See “Removing Front Cover” on page 22.)
3. Remove the screws that are securing the Main PCB to the frame.
4. Remove the 3 clips that are on Q125, IC107 and IC108.

Removing the Main PCB (Cont.)



5. Remove the Option PCB by disconnecting from CON404.



6. Unsolder the Antenna Connector.
7. Remove the Main PCB from the radio.

COMPONENT REPLACEMENT

Surface Mount Components

Surface mount components should always be replaced using a temperature controlled soldering system. The soldering tools may be either a temperature controlled soldering iron or a temperature controlled hot-air soldering station. A hot-air system is recommended for the removal of components on these boards. With either soldering system, a temperature of 700° F (371° C) should be maintained.
The following procedures outline the removal and replacement of surface mount components. If a hot-air soldering system is employed, see the manufacturer's operating instructions for detailed information on the use of your system.

- CAUTION! Avoid applying heat to the body of any surface mount component using standard soldering methods. Heat should be applied only to the metallized terminals of the components. Hot-air systems do not damage the components since the heat is quickly and evenly distributed to the external surface of the component.

- CAUTION! The CMOS Integrated Circuit devices used in this equipment can be destroyed by static discharges. Before handling one of these devices, service technicians should discharge themselves by touching the case of a bench test instrument that has a 3-prong power cord connected to an outlet with a known good earth ground. When soldering or de soldering a CMOS device, the soldering equipment should have a known good earth ground.

Surface Mount Removal

1. Grip the component with tweezers or small needle nose pliers.
2. Alternately heat the metallized terminal ends of the surface mount component with the soldering iron. If a hot-air system is used, direct the heat to the terminals of the component. Use extreme care with the soldering equipment to prevent damage to the printed circuit board (PCB) and the surrounding components.
3. When the solder on all terminals is liquefied, gently remove the component. Excessive force may cause the PCB pads to separate from the board if all solder is not completely liquefied.
4. It may be necessary to remove excess solder using a vacuum de-soldering tool or Solder wick. Again, use great care when de-soldering or soldering on the printed circuit boards. It may also be necessary to remove the epoxy adhesive that was under the surface mount component and any flux on the printed circuit board.

Surface Mount Component Replacement

1. "Tin" one terminal end of the new component and the corresponding pad of the PCB. Use as little solder as possible.
2. Place the component on the PCB pads, observing proper polarity for capacitors, diodes, transistors, etc.
3. Simultaneously touch the "tinned" terminal end and the "tinned" pad with the soldering iron. Slightly press the component down on the board as the solder liquefies. Solder all terminals, allowing the component time to cool between each application of heat. Do not apply heat for an excessive length of time and do not use excessive solder.

- Note: With a hot-air system, apply hot air until all "tinned" areas are melted and the component is seated in place. It may be necessary to slightly press the component down on the board. Touch-up the soldered connections with a standard soldering iron if needed. Do not use excessive solder.

- CAUTION! Some chemicals may damage the internal and external plastic parts of the radio.

4. Allow the component and the board to cool and then remove all flux from the area using alcohol or another approved flux remover.

Surface Mounted Integrated Circuit Replacement

Soldering and de-soldering techniques of the surface mounted IC's are similar to the above outlined procedures for the surface mounted chip components. Use extreme care and observe static precautions when removing or replacing the defective (or suspect) IC's. This will prevent any damage to the printed circuit board or the surrounding circuitry.

- Note: The hot-air soldering system is the best method of replacing surface mount IC's. The IC's can easily be removed and installed using the hot-air system. See the manufacturer's instructions for complete details on tip selection and other operating instructions unique to your system. If a hot-air system is not available, the service technician may wish to clip the pins near the body of the defective IC and remove it. The pins can then be removed from the PCB with a standard soldering iron and tweezers, and the new IC installed following the Surface Mount Component Replacement procedures. it may not be necessary to "tin" all (or any) of the IC pins before the installation process.

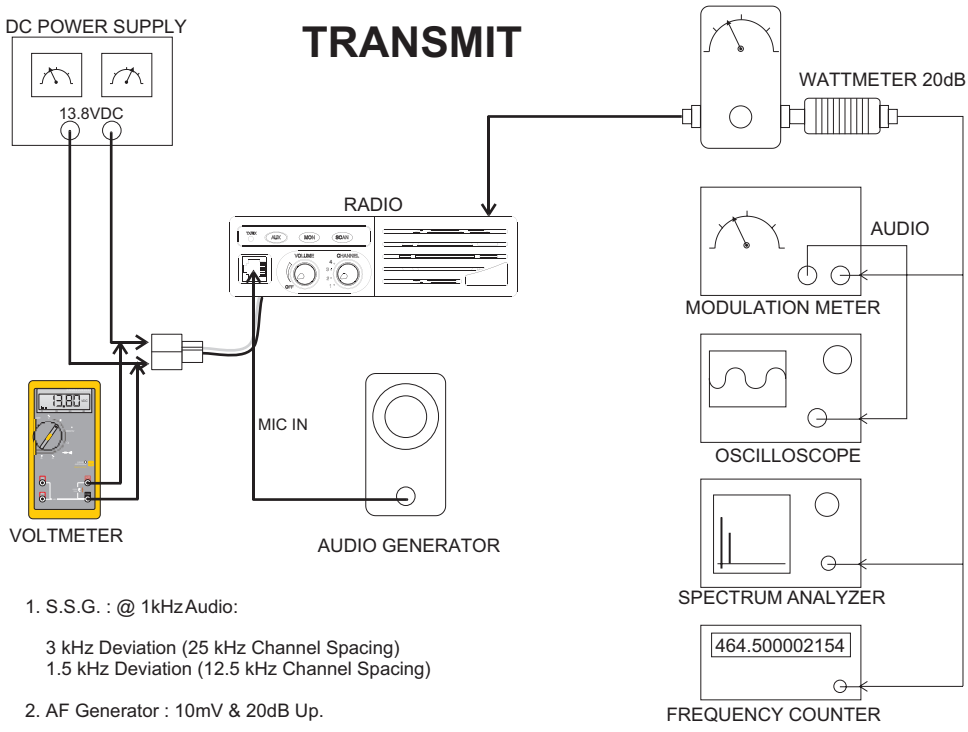
PROGRAMMING

The SM2500 Enduro Series Radio is PC programmable using the ACC-925 software in conjunction with the ACC-2500Programming Cable.

The ACC-925 Software Assembly contains 1 CD-ROM containing the programming software and the programming manual.

- The ACC-925 software is PC compatible with Windows® 95 and newer.

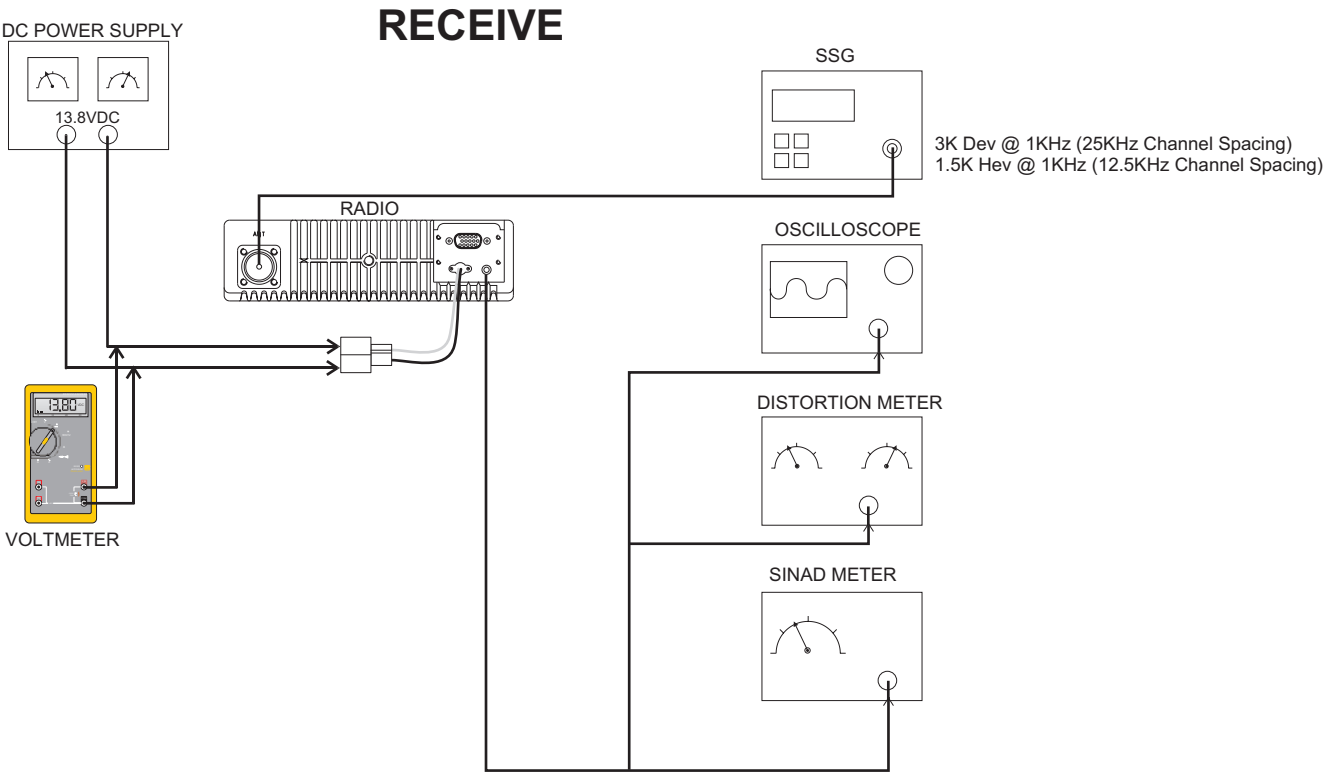
TEST SETUP



1. S.S.G. : @ 1kHz Audio:

   3 kHz Deviation (25 kHz Channel Spacing)
   1.5 kHz Deviation (12.5 kHz Channel Spacing)

2. AF Generator : 10mV & 20dB Up.



Test Setup Diagram

It is important that the TCXO be on the correct frequency before performing a complete alignment of the radio. An incorrect TCXO frequency can impair the performance and even cause mis-alignments.
Normally the transmitter is monitored with a frequency counter or service monitor while the transmitter is keyed at it's highest frequency. The TCXO is adjusted for the least frequency error.

PLL Alignment

- NOTE: If the PLL is out- of- lock, an audible warning will be heard and the front panel red LED will flash.

SM2541

1. Connect an RF power meter to the ANT socket.
2. Using the channel switch, select channel with the lowest transmit frequency.
3. Connect a DC voltmeter to test point 1 (TP1) accessed via the hole in the VCO cover.
4. Set the PTT switch to transmit.

- Note: The transmitter switching band width of this radio is 25MHz. A transmitter frequency range of more than 26MHz may be programmed and used if the voltage specification in step 5 is met.

5. Adjusting L353, set the voltage measured at TP1, measure and check that the voltage is above 2.1 volts. If the voltage is below 2.1 volts the transmitter frequency programmed is too high for the operating bandwidth of the radio.
6. Set the PTT switch to receive.
7. Using the channel switch select channel with the lowest receive frequency.
8. Adjusting L356, set the voltage measured at TP1. Measure and check that the voltage is above 1.5 volts. If the voltage is below 1.5 volts the receive frequency programmed is too high for the operating bandwidth of the radio.

- Note: The receiver switching bandwidth of this radio is 26MHz. A receiver frequency range of more than 26MHz may be programmed and used if the voltage specification in Step 8 is met. There may be some degradation in actual receiver performance, if bandwidth of more than 26MHz is used.

SM2544

1. Connect an RF power meter to the ANT jack.
2. Using the channel switch, select the channel with the highest transmit frequency.
3. Connect a DC voltmeter to test point 1 (TP1), accessed via the hole in the VCO cover.
4. Set the PTT switch to transmit.
5. Adjusting TC101, set the voltage measured at TP1 to 12.0 (+/- 0.05) volts.
6. Release the PTT switch.
7. Using the channel switch, select the channel with the lowest receive frequency.
8. At TP1 measure and check that the voltage is 1.4 volts or more. If the voltage is below 1.4 volts the VCO may not lock because the lowest RX frequency is programmed too far below the TX frequency.

Receiver Alignment RF

- NOTE: The Receiver front end is a pre-aligned module. There are no available field adjustments.

1. Connect an RF signal generator to the ANT socket and a SINAD meter to the external speaker jack (J1) located at the rear panel.
2. Adjust RV103 to the fully open position to hear receiver noise.
3. Adjust the VOLUME control to mid position.

4. Using the channel switch, select the programmed middle receive frequency.
5. Set the RF signal generator to the same receive channel frequency.
6. Set the audio frequency to 1kHz at 3K deviation for wide band (25kHz). Set the audio frequency to 1kHz at 1.5K deviation for narrow band (12.5kHz).
7. Adjust the RF output voltage level of the RF signal generator until the 1kHz signal is heard.

• NOTE: The RF output voltage level and the SINAD reading.

8. Adjust T102 for an improvement in SINAD.
9. Adjust the RF output voltage level of the RF signal generator keeping the SINAD meter readings between 6dB and 12dB.
10. Adjust T101 for an improvement in SINAD.
11. Adjust the RF output voltage level of the RF signal generator keeping the SINAD meter readings between 6dB and 12dB.
12. Check for an RF voltage signal level of 0.31uV and a SINAD meter reading of 12dB or greater.
13. Select the highest receive frequency and check for a SINAD meter reading of 12dB or greater, at 0.42uV. (Sensitivity at the operational band edge).
14. Select the lowest receive frequency and check for a SINAD meter reading of 12dB or greater, at 0.42uV.

Discriminator Tuning

1. Set the RF level to 1.0mV.
2. Adjust T103 for a maximum audio output and on the oscilloscope monitor the sine wave distortion.
3. Adjust T101 and T102 for lowest distortion as observed on a distortion analyzer. This is normally less than 3%.

Squelch Adjustment

1. Select a receiver channel that is programmed for narrow band (12.5 kHz) operation.
2. Set the RF signal generator to the receiver frequency. Set the AF modulation signal to 1 kHz at 1.5k deviation.
3. Adjust the RF output level of the RF signal generator until the 1 kHz signal is heard.
4. Adjust the RF signal to the level desired for squelch sensitivity as you monitor SINAD. This is usually 8dB to 12dB SINAD.
5. On the main board adjust RV103 until the squelch is just unmuted (open)
6. Switch off the RF generator (squelch should close).
7. Switch on the RF generator. Squelch should open at the SINAD point where RV103 was adjusted.
8. This completes the narrow band adjustment.
9. Select a receiver channel that is programmed for wide band operation (25 kHz).
10. Set the RF signal generator to the receiver frequency. Set the AF modulation signal to 1 kHz at 3k deviation.
11. Adjust the RF output level of the RF signal generator until the 1 kHz signal is heard.
12. Adjust the RF signal to the level desired for squelch sensitivity as you monitor SINAD. This is usually 8dB to 12dB SINAD.
13. On the main board adjust RV102 until the squelch is just unmuted (open).
14. Switch off the RF generator (squelch should close).
15. Switch on the RF generator. Squelch should open at the SINAD point where RV102 was adjusted.
16. Disconnect the test equipment.

Automatic Power Adjustment

- **Continuous transmit periods longer than 5 minutes are to be avoided.**

1. Connect the antenna output to a RF power meter or service monitor.
2. Set the PTT switch to the ON position.
3. Adjust the variable resistor RV104 to give the appropriate transmit power. Normally this is 25 watts.
4. Set the PTT switch to the OFF position.
5. Select a channel programmed to low transmit power.
6. Set PTT to ON and adjust RV105 for desired low power.
7. Set PTT to OFF.

CTCSS/DCS Deviation Adjustment

- ***Note: The following adjustment should be preset with factory alignment. If an adjustment must be made the following procedures must be followed:***

1. Program the radio with a 67.0Hz tone on one channel and 250.3Hz on another channel.
2. Connect a power meter and modulation meter to the radio antenna jack.
3. Adjust RV101 to the center of its adjustment.

- ***Note: Release the PTT button when changing channels.***

4. Alternately select the channel with tone 250.3Hz and the channel with tone 67Hz. Key up and note the level for each. If necessary, adjust RV101 until a balance occurs between tone 250.3Hz and tone 67Hz.

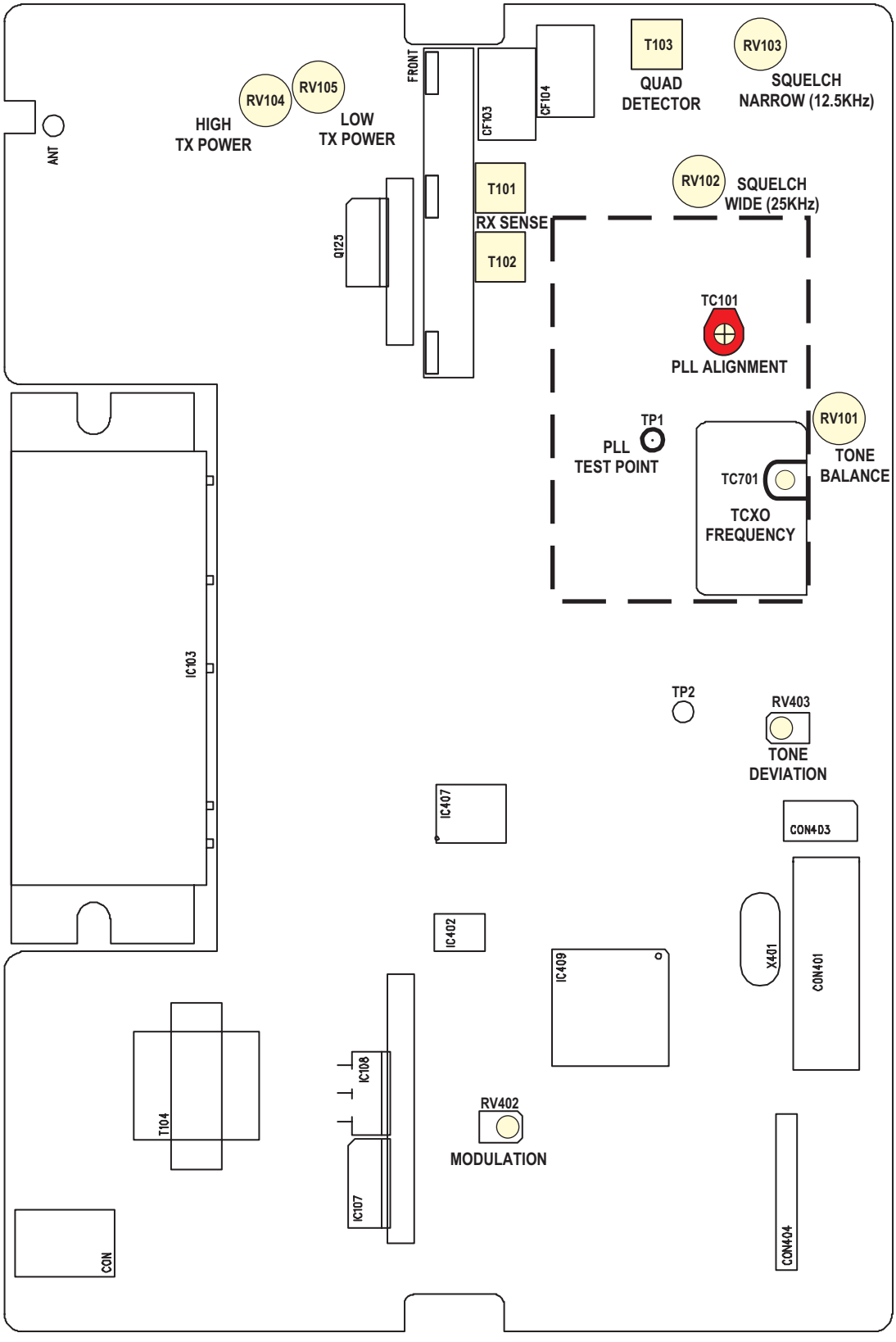
- Note: This adjustment also sets DCS balance even if a DCS tone is not programmed at this time.

5. Select tone 250.3Hz or tone 67Hz and adjust RV403 for the tone level, typically between 500Hz to 1kHz.
6. Release the PTT button.

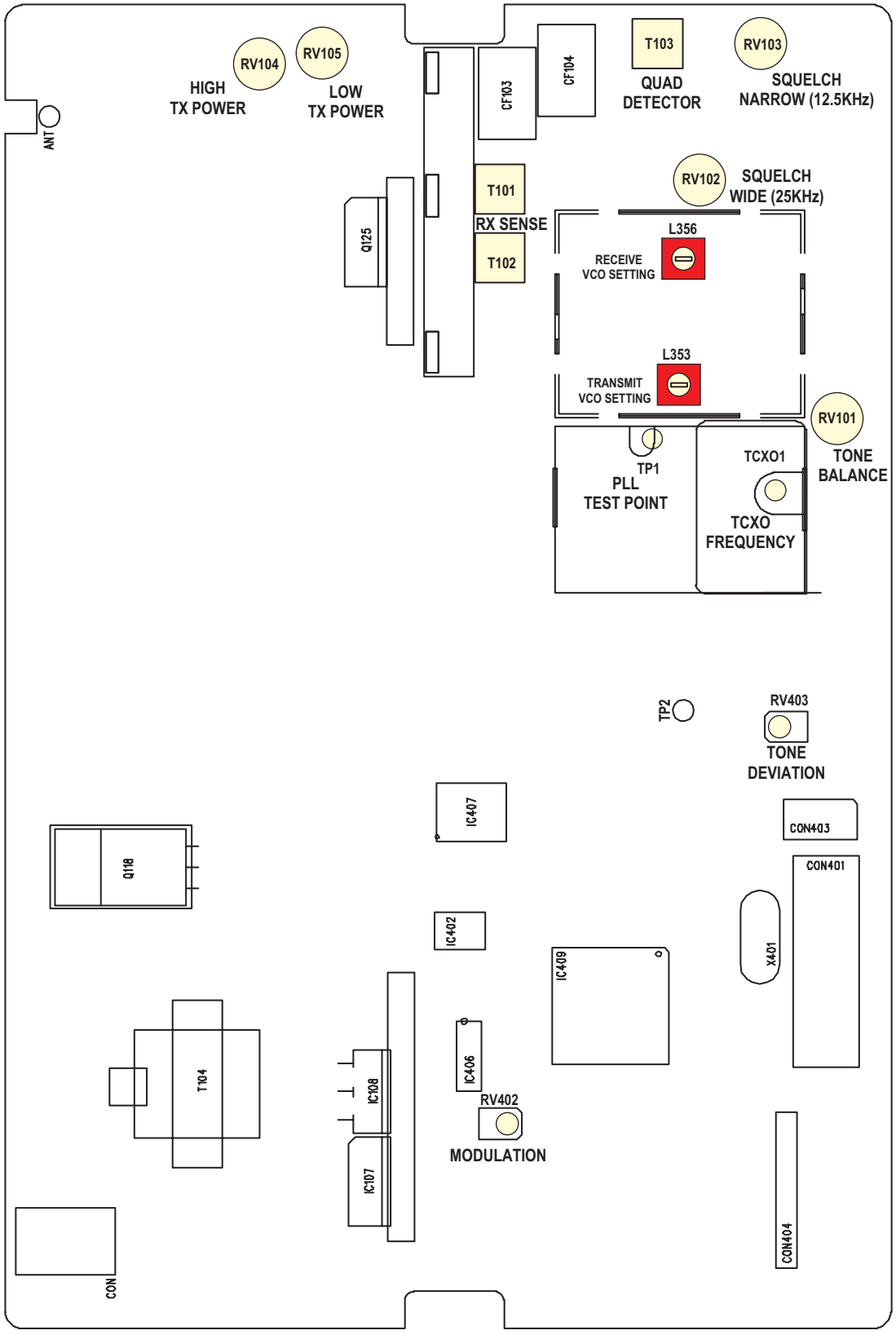
Modulation Deviation Adjustment

1. Connect a power meter and a coupler to the radio.
2. Connect an AF generator to the test box.
3. Set the audio output to 30mV and the audio frequency to 1kHz.
4. Using the channel switch, select the highest transmit channel that does not have CTCSS or DCS programmed.
5. Press and hold the PTT switch.
6. Adjust RV402 for 90% of maximum, system deviation. Adjust RV402 for 2.25kHz for narrow band (12.5kHz). Adjust RV402 for 4.5kHz for wide band (25kHz).
7. Using the channel switch, select the lowest transmit channel that does not have CTCSS or DCS programmed.
8. Press and hold the PTT switch.
9. Measure and check that the deviation is not below 3.8k. If the deviation is below 3.8k, adjust RV402 to 3.8k.
10. Return to highest transmit channel having a sub- audible tone and verify deviation does not exceed 5k.
11. At the channel that highest deviation is found, sweep the audio frequency between 300kHz and 3kHz. Adjust RV402 to ensure deviation is below peak system deviation at all frequencies.
12. Set the PTT switch to the OFF position.

ALIGNMENT POINTS



SM2544 Alignment Points



SM2541 Alignment Points

TROUBLESHOOTING GUIDE

TROUBLESHOOTING GUIDE	
PROBLEM	**SOLUTION**
Unit Does Not Program	1. Defective Programming Lead
	2. Wrong Programming Mode
	3. Defective MIC Connector
	4. Defective IC412
Unit Does Not Work	1. Open DC fuse in Power Cable
	2. Defective Volume Switch
	3. Defective Regulator IC107, 105, 402
	4. Broken DC Cable
No Output from Speaker	1. Defective internal speaker and external jack
	2. Defective IC108
	3. Defective VR801
Squelch Does Not Work	1. Wrong alignment of squelch resistor RV103
	2. Defective IC109
	3. Defective CPU IC409
No Sub Audio Decode CTCSS/DCS	1. Wrong Programming
	2. Defective Switch Filter IC406 (MF-6)
	3. Defective CPU IC409
No TX	1. Defective MIC
	2. Defective CPU IC409
	3. Defective IC412
No TX Power	1. Defective TX enable Q122
	2. Defective APC Control Circuit Q125
	3. Defective TX Power Buffer AMP Q116 and Q117
	4. Defective TX Power Amp Q118,Q120
	5. Defective ANT SW D108 and D120
	6. Defective ANT Connector
Over Power	1. Programming
	2. Q125 Short
	3. Defective D107 and APC Circuit
Low TX Power Output	1. Wrong Programming
	2. Defective TX AMP Q116 , Q117 , Q118, Q120 and D108
	3. Defective Antenna Connector
No Modulation	1. Defective MIC
	2. Defective Analog SW IC412 and IC411
	3. Defective 300Hz HPF IC410
	4. Defective MIC AMP and Splatter Filter IC404
	5. Defective Audio Buffer IC405
	6. Wrong Alignment of RV402
	7. Defective Analog IC401
No Encode of CTCSS/DCS	1. Wrong Programming
	2. Defective CPU IC409
	3. Defective IC407 and IC411
No Sensitivity	1. Defective Antenna Switch D108 , D120 , and D121
	2. Defective front-end Module
	3. Defective DBM IC102
	4. Defective 45MHz IF Filter CF101
	5. Defective IF IC109
Wrong Frequency	1. Wrong Alignment of 12.8MHz TCXO
	2. Wrong Programming

VOLTAGE CHARTS

POWER CONNECTIONS			
	REF	Model(s)	PIN #
5V	IC101	SM2541/SM2544	14
	IC105	SM2541/SM2544	3
	IC402	SM2541/SM2544	3
	TCXO	SM2541/SM2544	4
	Q105	SM2541/SM2544	2
	Q106	SM2544	3
	Q108	SM2544	3
	Q111	SM2544	3
	Q114	SM2541/SM2544	3
	Q139	SM2541	3
	Q360	SM2541	3
8V	IC105	SM2544	1
	Q119	SM2544	2
13.8V	IC103	SM2544	4
	IC107	SM2541/SM2544	1
	Q120	SM2541	3
RX 8V	IC109	SM2541/SM2544	4
	Q122	SM2541/SM2544	3
	Q132	SM2541/SM2544	3
	Q133	SM2541/SM2544	3
	Q601	SM2541/SM2544	3
TX 8V	D168	SM2541/SM2544	1
	IC104	SM2541/SM2544	8
	Q116	SM2541/SM2544	3
	Q117	SM2541/SM2544	3

CON404		
Pin#	Description	Levels
1	VCC - 8V	8VDC
2	GND	0V
3	TX ENABLE - Transmit Enable	Low
4	AUDIO MUTE - Mute	Low
5	MIC/CONTROL - Mic Audio	See LK6, LK7
6	CALL LED - Green LED	High
7	ALERT TONE OUT - Ext Alert	Alert Audio
8	RX AUDIO IN - RX Audio	Audio
9	PTT IN - PTT	Low
10	MONITOR - Monitor Button	See LK8, LK9
11	CALL - Aux/Call Switch	Low
12	BUSY/SQ - Busy	Low
13	TX TONES - Ext Tones	Mic Audio
14	NC/Audio Out - Rx Audio	Audio In

DB 15		
Pin#	Description	Levels
1	NC/Audio Out - Rx Audio	Audio In
2	TX TONES	Mic Audio
3	BUSY/SQ - Busy	Low
4	CALL - Aux/Call Switch	Low
5	MONITOR - Monitor Button	See LK8, LK9
6	PTT IN - PTT	Low
7	RX AUDIO IN - RX Audio	Audio
8	ALERT TONE OUT - Ext Alert	Alert Audio
9	CALL LED - Green LED	High
10	MIC/CONTROL - Mic Audio	See LK6, LK7
11	AUDIO MUTE - Mute	Low
12	TX ENABLE - Transmit Enable	Low
13	GND	0V
14	VCC - 8V	8VDC
15	N/C	

PARTS LIST - MODULES

CONTROL HEAD - ALL MODELS

Part No.	NAME & DESCRIPTION	Ref
134-772-1	CAP,CER,CHIP, 47PF	C801
134-772-1	CAP,CER,CHIP, 47PF	C802
134-772-1	CAP,CER,CHIP, 47PF	C803
134-772-1	CAP,CER,CHIP, 47PF	C804
134-772-1	CAP,CER,CHIP, 47PF	C805
134-772-1	CAP,CER,CHIP, 47PF	C806
134-772-1	CAP,CER,CHIP, 47PF	C807
134-772-1	CAP,CER,CHIP, 47PF	C808
134-772-1	CAP,CER,CHIP, 47PF	C809
134-772-1	CAP,CER,CHIP, 47PF	C810
080-625-5471	CAP,CER,470PF,10%,50V,Y5P,RD,0.1 LS	C815
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C820
140-080-0027	JACK,MDLR,8P	CON801
140-030-0088	CONN,HDR PIN,GDH-20DBCW(23.7MM)	CON802
220-010-0021	DIODE, SW, SDS914	D801
220-010-0021	DIODE, SW, SDS914	D803
220-010-0002	DIODE,SW,KDS184S,SOT-23	D804
220-010-0021	DIODE, SW, SDS914	D805
221-030-0051	DIODE,ZNR,5.1V,BZX84C-5V1,0.3W	D807
221-030-0051	DIODE,ZNR,5.1V,BZX84C-5V1,0.3W	D808
221-030-0051	DIODE,ZNR,5.1V,BZX84C-5V1,0.3W	D810
221-030-0051	DIODE,ZNR,5.1V,BZX84C-5V1,0.3W	D811
240-030-0020	LED LAMP L-319EGW(3& RED/GRN)	LED5
240-030-0015	LED, LAMP,SINGLE,SLR-34 GG3,Grn	LED6
240-030-0015	LED, LAMP,SINGLE,SLR-34 GG3,Grn	LED7
240-030-0015	LED, LAMP,SINGLE,SLR-34 GG3,Grn	LED8
240-030-0015	LED, LAMP,SINGLE,SLR-34 GG3,Grn	LED9
240-030-0015	LED, LAMP,SINGLE,SLR-34 GG3,Grn	LED10
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R823
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R824
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R825
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R826
741-117-2331	RES, TF, 330, 5%, 1/10W, TC250, 0805	R830
741-117-2331	RES, TF, 330, 5%, 1/10W, TC250, 0805	R831
741-117-2331	RES, TF, 330, 5%, 1/10W, TC250, 0805	R832
741-117-2331	RES, TF, 330, 5%, 1/10W, TC250, 0805	R833
741-117-2331	RES, TF, 330, 5%, 1/10W, TC250, 0805	R834
902-001-0203	POT,ROTARY,20K,9MM,H,5P,A	SW2
830-040-0006	SW,PUSH,V,6P,LATCHING	SW3
436-038-8	SW TACT TSA-069501-150	SW4
430-070-5	SW,ROTARY,SRBV14	SW5
436-038-8	SW TACT TSA-069501-150	SW6

FRONT END - V2

Part No.	NAME & DESCRIPTION	Ref
100-621-1561	CAP, CER, 560PF, 5%, 50V, X7R, 0603	C800
100-520-1390	CAP, CER,39pF,5%,50V,COG,0603	C801
100-520-1101	CAP, CER, 100PF, +/-5%, 50V, COG, 0603	C802
100-520-1330	CAP, CER, 33PF, 5%, 50V, COG, 0603	C803
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C805
100-520-1330	CAP, CER, 33PF, 5%, 50V, COG, 0603	C807
100-520-1101	CAP, CER, 100PF, +/-5%, 50V, COG, 0603	C808
100-520-1101	CAP, CER, 100PF, +/-5%, 50V, COG, 0603	C811
100-520-1390	CAP, CER,39pF,5%,50V,COG,0603	C812
100-520-1330	CAP, CER, 33PF, 5%, 50V, COG, 0603	C813
100-520-1330	CAP, CER, 33PF, 5%, 50V, COG, 0603	C814
100-520-1151	CAP, CER, 150PF, 5%, COG, 0603	C815
100-621-1102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0603	C816
100-520-1560	CAP,CER,56PF,5%,50V,COG,0603	C817
100-520-1101	CAP, CER, 100PF, +/-5%, 50V, COG, 0603	C818
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C820
100-520-1271	CAP,CER,270PF,5%,50V,COG,0603	C821
100-520-1390	CAP, CER,39pF,5%,50V,COG,0603	C822
220-010-0005	DIODE, SW, KDS226, SOT-23	D800
350-000-0107	COIL SPRING 1.5X0.45X6T:L	L800
350-000-0107	COIL SPRING 1.5X0.45X6T:L	L801
350-000-0107	COIL SPRING 1.5X0.45X6T:L	L802
350-000-0107	COIL SPRING 1.5X0.45X6T:L	L803
350-000-0107	COIL SPRING 1.5X0.45X6T:L	L804
350-000-0107	COIL SPRING 1.5X0.45X6T:L	L805
350-000-0107	COIL SPRING 1.5X0.45X6T:L	L806
870-200-0026	TRANS,900MHZ,MMBR951LT1	Q800
741-102-1821	RES, TF, 820, 1/16W, 5%, T1608	R800
741-102-1682	RES, TF, 6.8K, 5%, 1/16W, +/-200, 0603	R801
741-102-1332	RES, TF, 3.3K, 5%, 1/16W, +/-200, 0603	R802
741-102-1229	RES, 2.2, 5%, 1/16W, T1608	R803
741-102-1181	RES, TF, 180, 5%, 1/16W, +/-200, 0603	R804
741-102-1471	RES,TF,470,5%,1/16W,+/-200,0603	R804

FRONT END - U2

Part No.	NAME & DESCRIPTION	Ref
100-120-1100	CAP, CER, 10pF, .5%, 50V, COG, 0603	C601
100-520-1110	CAP, CER, 11PF, 5%, 50V, COG, 0603	C602
100-120-1080	CAP, CER, 8.0pF, +/-0.5pF, 50V, COG, 0603	C603
100-520-1200	CAP, CER, 20PF, 50V, 0603	C604
100-120-1070	CAP, CER,7PF, +/- 0.5PF, 50V, COG, 0603	C605
100-120-1070	CAP, CER,7PF, +/- 0.5PF, 50V, COG, 0603	C606
100-520-1200	CAP, CER, 20PF, 50V, 0603	C608
100-520-1200	CAP, CER, 20PF, 50V, 0603	C609
100-621-1102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0603	C610
100-520-1471	CAP, CER, 470PF, 5%, 50V, COG, 0603	C612
100-520-1180	CAP,CER,18PF,5%,50V,COG,0603	C613
100-520-1120	CAP, CER, 12PF, 5%, 50V, COG, 0603	C614
100-520-1150	CAP,CER,15PF,5%,50V,COG,0603	C615
100-120-1070	CAP, CER,7PF, +/- 0.5PF, 50V, COG, 0603	C616
100-520-1180	CAP,CER,18PF,5%,50V,COG,0603	C617
100-120-16R8	CAP, CER, 6.8PF, 0.5PF, 50V, COG, 0603	C618
100-120-16R8	CAP, CER, 6.8PF, 0.5PF, 50V, COG, 0603	C619
100-520-1270	CAP,CER,27PF,5%,50V,COG,0603	C621
100-520-1180	CAP,CER,18PF,5%,50V,COG,0603	C622
100-520-1180	CAP,CER,18PF,5%,50V,COG,0603	C623
100-020-1040	CAP,CER,33PF,5%,50V,COG,0603	C624
220-010-0005	DIODE, SW, KDS226, SOT-23	D601
350-000-0102	COIL, SPRG, 1.0X0.45X4T:L SMD	L601
350-000-0102	COIL, SPRG, 1.0X0.45X4T:L SMD	L602
350-000-0102	COIL, SPRG, 1.0X0.45X4T:L SMD	L603
350-000-0102	COIL, SPRG, 1.0X0.45X4T:L SMD	L604
350-000-0102	COIL, SPRG, 1.0X0.45X4T:L SMD	L605
350-000-0102	COIL, SPRG, 1.0X0.45X4T:L SMD	L606
350-000-0102	COIL, SPRG, 1.0X0.45X4T:L SMD	L607
870-200-0040	TRANS, NPN, KTC5084(0)	Q601
741-102-1563	RES,TF,56K,5%,1/16W,+/-200,0603	R601
741-102-1101	RES, TF,100,5%,1/16W,+/-200,0603	R602

VCO - V2

Part No.	NAME & DESCRIPTION	Ref
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C300
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C301
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C302
100-520-2300	CAP,CER,30PF,5%,50V,COG,0805	C310
100-530-4102	CAP, CER,0.001uF,5%,100V,COG,1210	C311
100-140-3070	CAP,CER,7PF,+-0.5pF,200V,COG,1206	C312
100-540-3181	CAP,CER,180PF,5%,200V,COG,1206	C313
100-540-3181	CAP,CER,180PF,200V,COG,1206	C314
100-550-4150	CAP, CER,15pF,5%,500V,COG,1210	C315
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C351
100-110-2070	CAP, CER, 7pF, 0.5pF, 50V, COG, 0805	C352
100-020-2090	CAP,CER,9PF,+-0.25pF,50V,COG,0805	C353
100-520-2390	CAP, CER,39pF,5%,50V,COG,0805	C354
100-020-31R2	CAP,CER, 1.2PF	C355
100-020-2040	CAP,CER,4PF,0.25PF,50V,COG,0805	C356
100-120-24R7	CAP, CER, 4.7PF, +/-.25PF, 50V, COG, 0805	C357
100-120-24R7	CAP, CER, 4.7PF, +/-.25PF, 50V, COG, 0805	C358
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C359
100-520-2020	CAP,CER,2PF,5%,50V,COG,0805	C360
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C361
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C362
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C363
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C364
100-520-2160	CAP,CER,16PF,5%,50V,COG,0805	C365
100-020-23R3	CAP,CER,3.3PF,0.25PF,50V,COG,0805	C367
100-020-23R3	CAP,CER,3.3PF,0.25PF,50V,COG,0805	C368
100-020-2010	CAP,CER,1PF,0.25PF,50V,COG,0805	C369
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C370
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C371

Part No.	NAME & DESCRIPTION	Ref
102-023-0335	CAP, TA, 3.3uF, 20%, 10V, A	C373
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C374
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C375
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C376
220-030-0004	DIODE,CHIP,BB133	D351
220-030-0004	DIODE,CHIP,BB133	D352
220-030-0004	DIODE,CHIP,BB133	D353
371-017-3102	COIL, CHIP, 1.0UH:NL252018T-1R0J	L351
371-804-3R82	COIL, CHIP, 0.82UH:NL252018T-R82J	L352
353-016-0002	COIL, CORE, CHIP, E558CN-100022	L353
371-804-32R2	COIL, CHIP, 2.2UH:NL252018T-2R2J	L354
353-016-0002	COIL, CORE, CHIP, E558CN-100022	L356
371-804-32R2	COIL, CHIP, 2.2UH:NL252018T-2R2J	L357
371-017-3102	COIL, CHIP, 1.0UH:NL252018T-1R0J	L358
870-050-0001	TRANS, JFET,N-Ch,MMBFJ310LT1,Sot-23,VHF/	Q351
870-050-0001	TRANS, JFET,N-Ch,MMBFJ310LT1,Sot-23,VHF/	Q352
870-020-0005	BRT,NPN,KRC111S,SOT-23,SW,(NM)	Q353
870-020-0003	TRANS, KRC102S	Q354
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q360
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R351
741-117-2331	RES, TF, 330, 5%, 1/10W, TC250, 0805	R352
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R353
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R354
741-117-2331	RES, TF, 330, 5%, 1/10W, TC250, 0805	R355
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R357
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R358

U2 - VCO

Part No.	NAME & DESCRIPTION	Ref
102-033-0105	CAP,TA,1UF,20%,16V,3216	C125
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C126
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C127
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C128
100-520-2104	CAP,0.1UF,25V,0805	C129
132-216-9Z	CAP,CER,CHIP,22PF MCB-30/27KC	C130
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C131
100-120-26R8	CAP,CER,6.8PF, 50V,COG,GRM40	C133
100-110-2070	CAP, CER, 7pF, 0.5pF, 50V, COG, 0805	C134
100-020-2050	CAP,CER,5PF,0.25PF,50V,COG,0805	C135
100-120-2080	CAP,CER,8PF,0.5PF,50V,COG,0805	C136
100-520-2680	CAP, CER,68PF,5%,50V,COG,0805	C137
100-120-22R2	CAP, CER, 2.2PF, +/-.25PF, 50V, COG, 0805	C138
134-772-1	CAP,CER,CHIP, 47PF	C140
100-020-2050	CAP,CER,5PF,0.25PF,50V,COG,0805	C141
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C143
220-050-0002	DIODE, VARI, 1SV229	D101
220-050-0002	DIODE, VARI, 1SV229	D102
371-011-5R68	COIL CHIP 0.68UH:LER015TR68M	L101
371-011-5R68	COIL CHIP 0.68UH:LER015TR68M	L102
371-010-5470	COIL, CHIP, 47NH:LL2012-F47NM	L103
371-010-5270	COIL CHIP 27NH:LL2012-F27NM	L104
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q107
870-260-0002	TRANS, NPN,MRF5711LT1,SOT-143,LN Amp	Q108
870-200-0020	TRANS, NPN, BFR92A, SOT-23, RF AMP,(P2P)	Q110
870-200-0020	TRANS, NPN, BFR92A, SOT-23, RF AMP,(P2P)	Q111
741-117-2101	RES, 100, 5%, 1/10W, T2012	R115
741-117-2220	RES,TF,22,5%,1/10W,TC250,0805	R116
741-117-2562	RES, TF, 5.6K, 5%, 1/10W, TC250, 0805	R117
741-117-2332	RES, TF, 3.3K, 5%, 1/10W, T2012	R118
741-117-2101	RES, 100, 5%, 1/10W, T2012	R119
741-117-2470	RES, TF, 47, 5%, 1/10W, TC250, 0805	R120
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R121
741-117-2151	RES, TF,150,5%,1/10W,TC250,0805	R122
741-117-2682	RES,TF,6.8K,5%,1/10W,TC250,0805	R123
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R124
741-117-2221	RES,TF,220,5%,1/10W,TC250,0805	R125
741-117-2123	RES, TF, 12K, 5%, 1/10W, TC250, 0805	R126
741-117-2392	RES, TF, 3.9K, 5%, 1/10W, T2012	R127
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R128
910-005-0100	VCAP, CER,10pF,ECV-1ZW10X53T	TC101

PARTS LIST - DIGITAL SECTION

Part No.	NAME & DESCRIPTION	Ref
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C401
100-813-2224	CAP,CER,0.22uF,+80 -20%,25V,Y5V,0805	C402
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C403
081-072-3106	CAP,ELE,10UF,50V,20%,5X11,2.5PT	C404
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C405
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C406
081-072-3106	CAP,ELE,10UF,50V,20%,5X11,2.5PT	C407
100-521-2333	CAP, CER,0.033uF,5%,50V,X7R,0805	C408
100-621-2682	CAP, CER,0.0068uF,10%,50V,X7R,0805	C409
134-772-1	CAP,CER,CHIP, 47PF	C410
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C411
100-621-2153	CAP, CER, 0.015UF, 10%, 50V, X7R	C412
134-772-1	CAP,CER,CHIP, 47PF	C413
100-511-2473	CAP,CER,0.047UF,5%,25V,X7R,0805	C414
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C415
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C416
134-719-7Y	CAP, CER, 0.0047UF, 10%, 50V, X7R	C417
100-621-2223	CAP, CER, 0.022UF, 10%, 50V, X7R, 0805	C418
100-621-2182	CAP, CER,0.0018uF,10%,50V,X7R,0805	C419
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C420
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C421
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C422
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C423
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C424
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C425
100-621-2223	CAP, CER, 0.022UF, 10%, 50V, X7R, 0805	C426
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C428
134-772-1	CAP,CER,CHIP, 47PF	C429
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C430
100-621-2332	CAP,CER,0.0033UF,10%,50V,X7R,0805	C431
100-511-2334	CAP,CER,0.33UF,5%,25V,X7R,0805	C432
100-621-2823	CAP,CER,0.082UF,10%,50V,X7R,0805	C433
100-520-2121	CAP,CER,120PF,5%,50V,COG,0805	C434
081-172-3105	CAP,ELE,1UF,50V,20%,5X11,2.5PT	C435
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C436
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C437
081-072-3106	CAP,ELE,10UF,50V,20%,5X11,2.5PT	C438
100-520-2150	CAP, CER, 15pF, 5%, 50V, COG, 0805	C440
100-520-2150	CAP, CER, 15pF, 5%, 50V, COG, 0805	C441
100-511-2473	CAP,CER, 0.047UF, GRM40X7R473J25	C442
100-511-2473	CAP,CER, 0.047UF, GRM40X7R473J25	C443
100-521-2333	CAP, CER,0.033uF,5%,50V,X7R,0805	C445
100-521-2333	CAP, CER,0.033uF,5%,50V,X7R,0805	C446
100-521-2333	CAP, CER,0.033uF,5%,50V,X7R,0805	C447
100-521-2333	CAP, CER,0.033uF,5%,50V,X7R,0805	C448
100-511-2473	CAP,CER, 0.047UF, GRM40X7R473J25	C450
102-033-0105	CAP,TA,1UF,20%,16V,3216	C452
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C453
102-033-0105	CAP,TA,1UF,20%,16V,3216	C454
100-521-2333	CAP, CER,0.033uF,5%,50V,X7R,0805	C455
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C456
100-511-2473	CAP,CER, 0.047UF, GRM40X7R473J25	C457
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C458
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C460
100-521-2333	CAP, CER,0.033uF,5%,50V,X7R,0805	C464
741-127-3000	RES, TF, 0, 5%, 1/ 8W, T3216	RC470
140-020-0032	SOCKET,14P,SIP,STR,LP,52231-1417	CON404
140-080-0043	CONN,BOX SOCKETBCS-110-P-D-HE	CON405
220-010-0002	DIODE,SW,KDS184S,SOT-23	D401
220-010-0004	DIODE,SW,KDS181S,SOT-23	D402
444-050-0001	IC, SW/MUX, MC14066	IC401
401-010-0017	IC, VREG, KIA78L05F, SOT89	IC402
441-030-0002	IC, OP AMP, KIA324F-EL	IC404
441-030-0001	IC, OP AMP, KIA358F, SO-8, DUAL	IC405
441-030-0002	IC, OP AMP, KIA324F-EL	IC406
441-090-0001	IC,FILTER,BLP,MF6CWM-100,SO-14	IC407
442-010-0003	I.C EEPROM CSI93C56SI-TE13	IC408
443-103-0001	IC, CPU,OTP,HD4074818H,FP-80A,4 Bit	IC409
441-030-0002	IC, OP AMP, KIA324F-EL	IC410
440-060-0001	IC, A-MUX/DEMUX, MC14053BD, SO-16, 3PDT	IC411
440-060-0001	IC, A-MUX/DEMUX, MC14053BD, SO-16, 3PDT	IC412
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q401
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q402
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q403
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q404
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q405
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q406
870-100-0019	TRANS,KRA104S PD,SOT-23	Q407
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q409

Part No.	NAME & DESCRIPTION	Ref
741-117-2684	RES, TF, 680K, 5%, 1/10W, T2012	R401
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R402
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R403
741-117-2563	RES,TF,56K,5%,1/10W,TC250,0805	R404
741-117-2752	RES, TF,7.5K,5%,1/10W,TC250,0805	R405
741-117-2183	RES,TF,18K,5%,1/10W,TC250,0805	R406
741-117-2124	RES,TF,120K,5%,1/10W,TC250,0805	R407
741-117-2332	RES, TF, 3.3K, 5%, 1/10W, T2012	R408
741-117-2224	RES, TF, 220K, 5%, 1/10W, T2012	R410
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R411
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R412
741-117-2822	RES,TF,8.2K,5%,1/10W,TC250,0805	R414
741-117-2822	RES,TF,8.2K,5%,1/10W,TC250,0805	R415
741-117-2224	RES, TF, 220K, 5%, 1/10W, T2012	R416
741-117-2822	RES,TF,8.2K,5%,1/10W,TC250,0805	R417
741-117-2822	RES,TF,8.2K,5%,1/10W,TC250,0805	R418
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R419
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R420
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R421
741-117-2433	RES,TF,43K,5%,1/10W,T2012	R422
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R423
741-117-2561	RES, TF, 560, 5%, 1/10W, TC250, 0805	R424
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R425
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R426
741-117-2393	RES,TF,39K,5%,1/10W,TC250,0805	R427
741-117-2203	RES, 20K, 5%, 1/10W, T2012	R428
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R429
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R430
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R431
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R433
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R434
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R435
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R436
741-117-2472	RES,TF,4.7K,5%,1/10W,TC250,0805	R437
741-117-2472	RES,TF,4.7K,5%,1/10W,TC250,0805	R438
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R439
741-117-2105	RES, TF, 1M, 5%, 1/10W, TC250, 0805	R440
741-117-2433	RES,TF,43K,1/10W,5%,T2012	R441
741-117-2333	RES,TF,33K,5%,1/10W,TC250,0805	R442
741-117-2203	RES, 20K, 5%, 1/10W, T2012	R443
741-117-2224	RES, TF, 220K, 5%, 1/10W, T2012	R444
741-117-2124	RES,TF,120K,5%,1/10W,TC250,0805	R445
741-117-2823	RES,TF,82K,5%,1/10W,TC250,0805	R446
741-117-2124	RES,TF,120K,5%,1/10W,TC250,0805	R447
741-117-2224	RES, TF, 220K, 5%, 1/10W, T2012	R448
741-117-2821	RES,TF,820,5%,1/10W,TC250,0805	R449
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R450
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R451
741-117-2302	RES, TF,3K,5%,1/10W,TC250,0805	R453
741-117-2472	RES,TF,4.7K,5%,1/10W,TC250,0805	R454
741-117-2362	RES,TF,3.6K,5%,1/10W,TC250,0805	R455
741-117-2273	RES,TF,27K,5%,1/10W,TC250,0805	R456
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R457
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R458
741-117-2242	Res, TF,2.4K,5%,1/10W,TC250,0805	R459
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R460
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R461
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R462
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R463
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R464
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R465
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R466
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R469
741-117-2303	RES, TF,30K,5%,1/10W,TC250,0805	R470
741-117-2363	Res, TF,36K,5%,1/10W,TC250,0805	R471
741-117-2303	RES, TF,30K,5%,1/10W,TC250,0805	R472
741-117-2472	RES,TF,4.7K,5%,1/10W,TC250,0805	R473
741-117-2364	RES,TF,360K,1/10W,5%,T2012	R474
721-102-0473	RES,MF,47K,5%,1/8W,TC200,AX	R490
901-120-0223	RES,CHIP TRIMMER,22K,RH03E1CJ4X	RV402
901-120-0473	VARIABLE RESISTOR,47K	RV403
162-000-0044	CRYSTAL AT-49 3.579545MHZ	X401

RF SECTION PARTS LIST - SM2541 V2

Part No.	NAME & DESCRIPTION	Ref
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C1
102-023-1106	CAP, TA, 10uF, 20%, 10V, B, 3528	C2
100-723-2684	CAP, CER, 0.68uF, +/-20%, 50V, Y5V, 0805	C9
100-611-1103	CAP, CER, 0.01UF, 10%, 25V, X7R, 0603	C17
100-520-1471	CAP, CER, 470PF, 5%, 50V, COG, 0603	C18
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C19
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C20
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C101
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C102
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C103
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C104
100-020-2050	CAP,CER,5PF,0.25PF,50V,COG,0805	C105
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C106
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C107
100-803-2105	CAP, CER, 1UF, +80/-20%, 16V, Y5V, 0805	C108
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C109
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C110
102-033-0105	CAP,TA,1UF,20%,16V,3216	C113
083-402-1104	MYLAR CAPACITOR 0.1UF 50V 5%	C114
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C115
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C119
083-003-1103	CAP, PE,0.01uF,10%,50V,RD,0.1585 LS	C120
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C121
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C122
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C129
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C139
100-120-2080	CAP,CER,8PF,0.5PF,50V,COG,0805	C144
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C145
081-052-6476	CAP,ELE,47UF,20%,25V,5X11	C147
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C148
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C149
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C150
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C151
081-152-9228	CAP,ELE,2200UF,25V,20%,13X25	C152
100-020-2040	CAP,CER,4PF,0.25PF,50V,COG,0805	C155
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C156
100-520-2150	CAP, CER, 15pF, 5%, 50V, COG, 0805	C157
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C158
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C159
100-520-2240	CAP,CER,24PF,5%,50V,COG,0805	C160
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C161
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C162
100-520-2180	CAP,CER,18PF,5%,50V,COG,0805	C164
100-020-2090	Cap, Cer,9pF,+-0.25pF,50V,COG,0805	C165
100-120-2820	CAP,CER, 82PF	C167
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C168
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C169
100-520-2130	CAP, CER,13pF,5%,50V,COG,0805	C172
100-520-2360	CAP,CER,36PF,5%,50V,COG,0805	C173
100-020-2030	CAP, CER,3pF,0.25pF,50V,COG,0805	C174
100-520-2160	CAP,CER,16PF,5%,50V,COG,0805	C175
100-520-2390	CAP, CER,39pF,5%,50V,COG,0805	C176
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C177
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C178
100-120-2820	CAP,CER, 82PF	C179
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C180
082-033-5106	CAP,TA,10UF,20%,16V,RD,0.1 LS	C181
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C182
134-772-1	CAP,CER,CHIP, 47PF	C183
100-520-2330	CAP,CER,33PF,5%,50V,COG,0805	C184
100-520-2200	CAP, CER,20pF,5%,50V,COG,0805	C185
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C186
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C187
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C188
100-723-2684	CAP, CER, 0.68uF, +/-20%, 50V, Y5V, 0805	C189
100-623-2333	CAP,CER,0.033UF,10%,X7R,0805	C190
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C191
100-623-2333	CAP,CER,0.033UF,10%,50V,X7R,0805	C192
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C193
100-621-2332	CAP,CER,0.0033UF,10%,50V,X7R,0805	C194
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C195
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C196
134-772-1	CAP,CER,CHIP, 47PF	C197
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C198
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C200
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C201
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C202
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C203
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C207
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C209
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C211
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C212
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C214
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C216
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C217
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C219
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C220
082-033-5105	CAP,TA,1.0UF,20%,16V,RD,0.1 LS	C221
082-033-5106	CAP,TA,10UF,20%,16V,RD,0.1 LS	C222
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C223
081-052-7108	CAP,ELE,1000UF,25V,20%,12X16,5.0PT	C224
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C225
081-032-8108	CAP,ELE,1000UF,20%,16V,10X16	C226
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C227
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C228
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C230
081-052-7107	CAP, ELE,100uF,20%,25V,6.3X11	C232
081-052-6227	CAP,ELE,220UF,25V,20%,10X12,5.0PT	C233
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C234
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C235
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C236
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C237
081-152-9228	CAP,ELE,2200UF,25V,20%,13X25	C238
081-072-3106	CAP,ELE,10UF,50V,20%,5X11,2.5PT	C239
100-520-2390	CAP, CER,39pF,5%,50V,COG,0805	C240
100-120-2820	CAP,CER, 82PF	C241
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C244
100-020-2050	CAP,CER,5PF,0.25PF,50V,COG,0805	C245
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C247
100-520-2270	CAP,CER,27PF,5%,50V,COG,0805	C248
100-520-2200	CAP, CER,20pF,5%,50V,COG,0805	C249
081-052-6476	CAP,ELE,47UF,20%,25V,5X11	C250
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C251
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C252
100-520-2750	CAP, CER,75pF,5%,50V,COG,0805	C253
100-540-3330	CAP,CER,33PF,5%,200V,COG,1206	C254
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C255
100-540-3750	CAP, CER,75PF,5%,200V,COG,1206	C256
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C257
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C258
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C259
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C260
100-540-3390	CAP, CER,39PF,5%,200V,COG,1206	C261
104-550-4750	CAP,CER,75PF,5%,500V,COG	C262
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C263
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C264
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C265
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C266
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C267
104-550-4220	CAP,CER,22PF,5%,500V,COG	C268
100-020-2090	Cap, Cer,9pF,+-0.25pF,50V,COG,0805	C269
100-040-3050	CAP, CER,5PF,+-0.25PF,200V,COG,1206	C270
100-530-4102	CAP, CER,0.001uF,5%,100V,COG,1210	C271
100-550-4150	CAP, CER,15pF,5%,500V,COG,1210	C272
100-540-3430	CAP, CER,43PF,5%,200V,COG,1206	C273
100-530-4102	CAP, CER,0.001uF,5%,100V,COG,1210	C274
100-540-3470	CAP,CER,47PF,5%,200V,COG,1206	C275
100-540-3430	CAP, CER,43PF,5%,200V,COG,1206	C277
100-550-4820	CAP, CER,82pF,5%,500V,COG,1210	C278
081-072-3106	CAP,ELE,10UF,50V,20%,5X11,2.5PT	C279
100-040-3240	Cap, Cer,24PF,+-0.25pF,200V,COG,1206	C280
100-520-2360	CAP,CERAMIC,36PF,5%,50V,COG,0805	C281
100-520-2181	CAP, CER,180pF,5%,50V,COG,0805	C282
100-540-3220	CAP, CER,22PF,5%,200V,COG,1206	C283
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C285
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C286
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C287
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C288
100-120-2820	CAP,CER, 82PF	C289
100-511-2473	CAP,CER, 0.047UF, GRM40X7R473J25	C290
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C292
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C295
134-772-1	CAP,CER,CHIP, 47PF	C296
134-772-1	CAP,CER,CHIP, 47PF	C297
132-216-9Z	CAP,CER,CHIP,22PF MCB-30/27KC	C298
134-772-1	CAP,CER,CHIP, 47PF	C299
100-520-2180	CAP,CER,18PF,5%,50V,COG,0805	C550
100-520-2180	CAP,CER,18PF,5%,50V,COG,0805	C551

Part No.	NAME & DESCRIPTION	Ref
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C552
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C553
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C554
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C555
081-072-3106	CAP,ELE,10UF,50V,20%,5X11,2.5PT	C558
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R	C559
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C608
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C700
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C701
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C702
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C703
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C704
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C705
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C706
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C707
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C708
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C709
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C710
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C711
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C712
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C713
741-127-3000	RES, TF, 0, 5%, 1/ 8W, T3216	RC470
080-968-0102	CAP,FEED THROUGH, 1000PF	CF1
310-030-0013	FILTER,XTAL, 45.3MHz	CF101
310-010-0013	FILTER CERAMIC LT455HT	CF103
310-010-0010	FILTER CERAMIC LT455FW	CF104
220-010-0002	DIODE,SW,KDS184S,SOT-23	D102
220-020-0002	DIODE, PIN, MMBV3401LT1, SOT-23	D103
220-020-0002	DIODE, PIN, MMBV3401LT1, SOT-23	D104
220-010-0003	DIODE, SW, KDS193, SOT-23	D106
220-040-0001	DIODE,SCHOTTKY,MMBD101LT1,SOT-23	D107
200-020-0003	DIODE, PIN, XB15A402A2GB	D108
220-020-0001	DIODE,CHIP,UPP9401 50V	D120
200-030-0008	DIODE, RECT, 1N5404, AX, 14.7x5.5	D124
220-010-0003	DIODE, SW, KDS193, SOT-23	D125
220-010-0004	DIODE,SW,KDS181S,SOT-23	D126
220-010-0022	DIODE,SW,1SS314	D127
220-010-0004	DIODE,SW,KDS181S,SOT-23	D128
220-010-0003	DIODE, SW, KDS193, SOT-23	D129
220-010-0005	DIODE, SW, KDS226, SOT-23	D551
220-010-0005	DIODE, SW, KDS226, SOT-23	D552
440-050-0012	IC, PLL, MC145193F, (SO-20)	IC101
441-031-0001	MIXER,RFMS-1L (SM6) SL70	IC102
441-030-0001	IC, OP AMP, KIA358F, SO-8, DUAL	IC104
401-010-0017	IC, VREG, KIA78L05F, SOT89	IC105
401-010-0016	IC, VREG, KIA7808PI, TO220IS, 70-7026	IC107
401-040-0005	IC, AUDIO AMP,TDA2003V,TO-220-5LEAD	IC108
441-060-0007	IC, VHF RCVR,MC3371D,SO-16,Nwrband	IC109
441-030-0001	IC, OP AMP, KIA358F, SO-8, DUAL	IC106
371-005-3103	COIL, CHIP, 10UH, LER015T100K	L1
371-005-3103	COIL, CHIP, 10UH, LER015T100K	L2
370-017-21R0	COIL,1.0UH,20%,LER015,60MHZ	L107
371-017-3102	COIL, CHIP, 1.0UH:NL252018T-1R0J	L108
371-010-5470	COIL, CHIP, 47NH:LL2012-F47NM	L110
371-011-5R15	COIL CHIP 0.15UH:LER015TR15M	L111
350-000-0147	COIL,SPRG,2X0.35X8.5T:L	L113
350-000-0114	COIL SPRING 2X0.35X16.5T:R	L115
350-000-0029	COIL,SPRG,L,,3.0X0.65X1.5T	L116
350-000-0131	COIL SPRING 4X0.8X1.5T:L	L117
352-000-0R16	COIL,0.16UH,,AX	L118
371-011-5R15	COIL CHIP 0.15UH:LER015TR15M	L119
352-000-0R16	COIL,0.16UH,,AX	L120
350-000-0111	COIL SPRING 4X0.7X0.75T	L121
352-100-0002	COIL ASSY (SM 3010)	L122
371-010-5470	COIL, CHIP, 47NH:LL2012-F47NM	L123
371-011-5R68	COIL CHIP 0.68UH:LER015TR68M	L124
350-000-0131	COIL SPRING 4X0.8X1.5T:L	L125
350-000-0113	COIL SPRING 5.0X0.8X7.5T:R	L126
350-000-0132	COIL SPRING 4.0X0.5X7T:L SMD	L127
350-000-0108	COIL SPRING 2.7X0.7X5T:L SMD	L128
350-000-0055	COIL,SPRG,R,,4.0X0.45X12T	L129
350-000-0108	COIL SPRING 2.7X0.7X5T:L SMD	L130
350-000-0108	COIL SPRING 2.7X0.7X5T:L SMD	L131
350-000-0147	COIL SPRING 2.7X0.8X6T:L SMD	L132
352-100-0002	COIL ASSY (SM 3010)	L134
352-100-0001	COIL ASSY	L135
352-000-00R2	COIL AXIAL	L225
370-017-21R0	COIL,1.0UH,20%,LER015,60MHZ	L226
371-012-3221	COIL CHIP 220UH:NL322522T-221J	L227
352-000-0102	COIL,1MH,10%,AX	L228
352-000-0102	COIL,1MH,10%,AX	L229
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q101
870-100-0004	TRANS,PNP,KTA1504(Y),SOT-23,SW,(ASY)	Q102
870-100-0004	TRANS,PNP,KTA1504(Y),SOT-23,SW,(ASY)	Q103
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q104
870-010-0005	TRANS,PNP,KRA104S,SOT-23,SW,(PD)	Q105
870-200-0008	TRANS,NPN,MMBC1321Q4,SOT-23VHF/RF,(Q4)	Q106
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q108
870-200-0020	TRANS, NPN, BFR92A, SOT-23, RF AMP,(P2P)	Q113
870-200-0020	TRANS, NPN, BFR92A, SOT-23, RF AMP,(P2P)	Q114
870-200-0026	TRANS,900MHZ,MMBR951LT1	Q116
870-260-0007	TRANSISTOR BFG35 SOT-223	Q117
850-250-0005	DNO, **uSE 480-030-0006**	Q118
850-260-0008	TRANS, NPN,MRF1946,0.380 In Flng,VHF Amp	Q120
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q121
870-100-0001	TRANS,PNP,BCX18ITL.SOT-23SW,(T2)	Q122
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q123
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q124
850-150-0003	TRANS, PNP, KTB1367, TO-220IS, GP	Q125
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q127
870-010-0010	TRANS, PNP, KRA110SPK, SOT-23, SW, PK	Q128
870-200-0020	TRANS, NPN, BFR92A, SOT-23, RF AMP,(P2P)	Q130
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q131
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q132
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q133
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q134
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q135
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q137
870-010-0010	TRANS, PNP, KRA110SPK, SOT-23, SW, PK	Q139
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q140
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q219
870-100-0004	TRANS,PNP,KTA1504(Y),SOT-23,SW,(ASY)	Q504
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q550
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q551
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q552
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q553
741-117-2201	RES, TF, 200, 5%, 1/10W, TC250, 0805	R6
741-102-1123	RES, TF, 12K, 5%, 1/16W, +/-200, 0603	R22
741-117-2201	RES, TF, 200, 5%, 1/10W, TC250, 0805	R35
741-102-1472	RES, TF, 4.7K, 5%, 1/16W, +/-200, 0603	R40
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R100
741-117-2182	RES,TF,1.8K,5%,1/10W,TC250,0805	R101
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	R102
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	R103
741-117-2182	RES,TF,1.8K,5%,1/10W,TC250,0805	R104
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R105
741-117-2182	RES,TF,1.8K,5%,1/10W,TC250,0805	R106
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R107
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	R108
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R110
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R111
741-117-2752	RES, TF,7.5K,5%,1/10W,TC250,0805	R112
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R113
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R114
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R116
741-117-2243	CHIP RESISTOR 24K 1/10W 5% T 2012	R117
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R118
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R119
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R130
741-117-2913	RES, TF,91K,5%,1/10W,TC250,0805	R131
741-117-2472	RES,TF,4.7K,5%,1/10W,TC250,0805	R132
741-117-2203	RES, 20K, 5%, 1/10W, T2012	R133
741-117-2682	RES,TF,6.8K,5%,1/10W,TC250,0805	R134
741-117-2390	RES, TF,39,5%,1/10W,TC250,0805	R135
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R136
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R137
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R138
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R139
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R140
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R141
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R142
741-117-2182	RES,TF,1.8K,5%,1/10W,TC250,0805	R143
741-117-2510	Res, TF,51,5%,1/10W,TC250,0805	R144
741-117-2153	RES,TF,15K,5%,1/10W,TC250,0805	R146
741-117-2564	RES, TF,560K,5%,1/10W,TC250,0805	R147
741-117-2153	RES,TF,15K,5%,1/10W,TC250,0805	R148
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R149
741-117-2564	RES, TF,560K,5%,1/10W,TC250,0805	R150
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R151
741-117-2470	RES, TF, 47, 5%, 1/10W, TC250, 0805	R152
741-117-2392	RES, TF, 3.9K, 5%, 1/10W, T2012	R153
741-117-2229	RES, TF, 2.2, 5%, 1/10W, TC250, 0805	R154
741-117-2682	RES,TF,6.8K,5%,1/10W,TC250,0805	R156
741-117-2301	RES, TF,300,5%,1/10W,TC250,0805	R157

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Part No.	NAME & DESCRIPTION	Ref
741-117-2332	RES, TF, 3.3K, 5%, 1/10W, T2012	R158
741-117-24R7	CHIP RESISTOR 4.7 1/10W 5% T 2012	R159
741-117-2220	RES,TF,22,5%,1/10W,TC250,0805	R160
741-117-2182	RES,TF,1.8K,5%,1/10W,TC250,0805	R161
741-117-26R8	CHIP RESISTOR 6.8 1/10W 5% T 2012	R162
741-117-2470	RES, TF, 47, 5%, 1/10W, TC250, 0805	R163
741-117-2151	RES, TF,150,5%,1/10W,TC250,0805	R164
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R168
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R170
741-117-2332	RES, TF, 3.3K, 5%, 1/10W, T2012	R172
741-117-2332	RES, TF, 3.3K, 5%, 1/10W, T2012	R173
723-103-0331	FILM RESISTOR 330 1/ 2W 5% ST MINI	R175
721-122-0121	FILM RESISTOR 120 1/ 2W 5% ST MINI	R176
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R177
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R178
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R180
721-122-0121	FILM RESISTOR 120 1/ 2W 5% ST MINI	R181
741-117-2121	RES, TF,120,5%,1/10W,+/-250,0805	R182
741-117-2474	RES,TF,470K,5%,1/10W,TC250,0805	R183
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R184
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R185
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R186
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R187
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R190
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R191
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R192
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R193
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R194
741-117-2183	RES,TF,18K,5%,1/10W,TC250,0805	R195
741-117-2823	RES,TF,82K,5%,1/10W,TC250,0805	R196
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R197
741-117-2102	RES,TF,1K,5%,1/10W,TC250,0805	R198
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R200
741-117-2334	RES,TF,330K,5%,1/10W,TC250,0805	R201
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R202
741-117-2154	RES,TF,150K,5%,1/10W,TC250,0805	R203
741-117-2102	RES,TF,1K,5%,1/10W,TC250,0805	R204
741-117-2220	RES,TF,22,5%,1/10W,TC250,0805	R205
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R206
741-117-2101	RES, 100, 5%, 1/10W, T2012	R207
741-117-2470	RES, TF, 47, 5%, 1/10W, TC250, 0805	R210
741-117-2683	RES, TF,68K,5%,1/10W,TC250,0805	R211
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R213
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R214
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R215
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R217
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R218
741-117-2393	RES,TF,39K,5%,1/10W,TC250,0805	R219
741-117-2563	RES,TF,56K,5%,1/10W,TC250,0805	R220
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R221
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R222
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R223
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	R224
741-117-2123	RES, TF, 12K, 5%, 1/10W, TC250, 0805	R250
741-117-2202	Res, TF,2K,5%,1/10W,TC250,0805	R251
741-117-2102	RES,TF,1K,5%,1/10W,TC250,0805	R252
741-117-2182	RES,TF,1.8K,5%,1/10W,TC250,0805	R253
741-117-2752	RES, TF,7.5K,5%,1/10W,TC250,0805	R550
741-117-2273	RES,TF,27K,5%,1/10W,TC250,0805	R551
741-117-2273	RES,TF,27K,5%,1/10W,TC250,0805	R552
741-117-2752	RES, TF,7.5K,5%,1/10W,TC250,0805	R553
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R554
741-117-2472	RES,TF,4.7K,5%,1/10W,TC250,0805	R555
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R556
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R559
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	RLK3
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	RLK4
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	RLK5
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	RLK11
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	RLK13
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	RLK14
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	RLK17
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	RLK19
902-002-0223	RES, SEMIFIXED 22K	RV101
901-003-0001	RES,SEMIFIXED,1KB:RH0651C100102	RV102
902-018-0103	RES, SEMIFIXED, 10K	RV103
902-018-0103	RES, SEMIFIXED, 10K	RV104
902-001-0472	POT, ROTARY,SC,4.7K,6mm,V,3P,B	RV105
830-040-0012	SW,PUSH,SKPS-22004	S1
902-001-0203	POT,ROTARY,20K,9MM,H,5P,A	SW2
830-040-0006	SW,PUSH,V,6P,LATCHING	SW3
436-038-8	SW TACT TSA-069501-150	SW4
430-070-5	SW,ROTARY,SRBV14	SW5
436-038-8	SW TACT TSA-069501-150	SW6
353-000-0148	COIL,VARIABLE,A294SN-K5131Z,IFT	T101
353-000-0148	COIL,VARIABLE,A294SN-K5131Z,IFT	T102
353-000-0001	COIL,VARIABLE,455KHZ,180PF	T103
840-020-0001	TRANSFORMER, CHOKE, E1-19MM	T104
910-009-0200	VCAP, CER,Trimmer,Dip,5-20pF	TC701
650-100-0002	TCXO,VCTCXO-3625F5(12.8M) 2.5PM	TCXO1
700-050-0002	THERM, 33K, NTCCS32163SH333KC	TH101
162-000-0056	XTAL,NR2B,44,545M(X1)	X101
169-012-8000	XTAL,HC49T,12.8M -30,10PM,20P,OSC	X701

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Part No.	NAME & DESCRIPTION	Ref
102-023-1106	CAP, TA, 10uF, 20%, 10V, B, 3528	C2
100-723-2684	CAP, CER, 0.68uF, +/-20%, 50V, Y5V, 0805	C9
100-611-1103	CAP, CER, 0.01UF, 10%, 25V, X7R, 0603	C17
100-520-1471	CAP, CER, 470PF, 5%, 50V, COG, 0603	C18
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C19
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C20
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C101
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C102
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C103
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C104
100-020-2050	CAP,CER,5PF,0.25PF,50V,COG,0805	C105
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C106
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C107
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C109
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C110
083-003-1103	CAP, PE,0.01uF,10%,50V,RD,0.1585 LS	C114
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C115
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C117
100-120-24R7	CAP, CER, 4.7PF, +/-.25PF, 50V, COG, 0805	C118
100-520-2150	CAP, CER, 15pF, 5%, 50V, COG, 0805	C119
083-003-1103	CAP, PE,0.01uF,10%,50V,RD,0.1585 LS	C120
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C121
100-520-2104	CAP,0.1UFGRM40 25V GMRS10	C122
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C139
100-520-2120	CAP,CER,12PF,5%,50V,COG,0805	C142
100-020-20R5	CAP,CER,0.5PF,0.25PF,50V,COG,0805	C144
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C145
100-520-2120	CAP,CER,12PF,5%,50V,COG,0805	C146
081-152-4476	CAP, ELE,47uF,20%,25V,RD,0.098 LS	C147
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C148
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C149
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C150
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C151
081-152-9228	CAP,ELE,2200UF,25V,20%,13X25	C152
100-020-20R5	CAP,CER,0.5PF,0.25PF,50V,COG,0805	C155
134-772-1	CAP,CER,CHIP, 47PF	C156
100-020-25R6	Cap, Cer,5.6pF,.25pF,50V,COG,0805	C157
100-020-2050	CAP,CER,5PF,0.25PF,50V,COG,0805	C158
100-120-2060	CAP, CER, 6PF, +/-.5PF, 50V, COG, 0805	C159
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C160
100-520-2020	CAP,CER,2PF,5%,50V,COG,0805	C162
100-120-2060	CAP, CER, 6PF, +/-.5PF, 50V, COG, 0805	C163
100-520-2120	CAP,CER,12PF,5%,50V,COG,0805	C164
100-120-2060	CAP, CER, 6PF, +/-.5PF, 50V, COG, 0805	C165
100-120-2820	CAP,CER, 82PF	C167
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C168
134-772-1	CAP,CER,CHIP, 47PF	C169
100-520-2130	CAP, CER,13pF,5%,50V,COG,0805	C172
100-520-2360	CAP,CER,36PF,5%,50V,COG,0805	C173
100-020-2030	CAP, CER,3pF,0.25pF,50V,COG,0805	C174
100-520-2160	CAP,CER,16PF,5%,50V,COG,0805	C175
100-520-2390	CAP, CER,39pF,5%,50V,COG,0805	C176
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C177
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C178
100-120-2820	CAP,CER, 82PF	C179
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C180
082-033-5106	CAP,TA,10UF,20%,16V,RD,0.1 LS	C181
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C182
134-772-1	CAP,CER,CHIP, 47PF	C183
100-520-2300	CAP,CER,30PF,5%,50V,COG,0805	C184
100-520-2150	CAP, CER, 15pF, 5%, 50V, COG, 0805	C185
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C186
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C187
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C188
100-520-2104	CAP,0.1UF,25V,0805	C189
100-521-2333	CAP, CER,0.033uF,5%,50V,X7R,0805	C190
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C191
100-521-2333	CAP, CER,0.033uF,5%,50V,X7R,0805	C192
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C193
100-621-2332	CAP,CER,0.0033UF,10%,50V,X7R,0805	C194
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C195
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C196
134-772-1	CAP,CER,CHIP, 47PF	C197
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C198
100-520-2120	CAP,CER,12PF,5%,50V,COG,0805	C199
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C200
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C201
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C202
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C203
100-120-2060	CAP, CER, 6PF, +/-.5PF, 50V, COG, 0805	C204
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C207
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C209
083-013-2223	CAP, METAL, POLY, 0.022UF, 63V	C210
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C211
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C212
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C214
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C216
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C217
081-072-3106	CAP,ELE,10UF,50V,20%,5X11,2.5PT	C218
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C219
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C220
082-032-5105	CAP,TA,1.0UF,16V,TAM1C010AMCB	C221
082-033-5106	CAP,TA,10UF,20%,16V,RD,0.1 LS	C222
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C223
081-052-7108	CAP, ELE,1000uF,25V 20% 12x16	C224
100-611-2104	CAP, CER, 0.1UF, 10%, 25V, X7R, 0805	C225
081-032-8108	CAP,ELE,1000UF,20%,16V,10X16	C226
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C227
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C228
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C230
081-052-7107	CAP, ELE,100uF,20%,25V,6.3X11	C232
081-062-7227	CAP,ELE,220UF,20%,35V,8X12	C233
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C234
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C235
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C236
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C237
081-152-9228	CAP,ELE,2200UF,25V,20%,13X25	C238
081-072-3106	CAP,ELE,10UF,50V,20%,5X11,2.5PT	C239
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C240
100-120-2080	CAP,CER,8PF,0.5PF,50V,COG,0805	C242
100-120-24R7	CAP, CER, 4.7PF, +/-.25PF, 50V, COG, 0805	C243
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C247
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C249
081-152-4476	CAP, ELE,47uF,20%,25V,RD,0.098 LS	C250
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C251
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C252
100-520-2330	CAP,CER,33PF,5%,50V,COG,0805	C253
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C255
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C256
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C257
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C258
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C259
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C260
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C261
100-520-2102	CAP, CER, 0.001UF, 10%, 50V, X7R, 0805	C262
100-530-4102	CAP, CER,0.001uF,5%,100V,COG,1210	C263
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C264
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C265
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C266
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C267
100-020-2040	CAP,CER,4PF,0.25PF,50V,COG,0805	C269
100-040-3030	CAP, CER,3pF,+-0.25pF,200V,COG,1206	C270
100-530-4102	CAP, CER,0.001uF,5%,100V,COG,1210	C271
100-040-3050	CAP, CER,5PF,+-0.25PF,200V,COG,1206	C272
100-140-3100	CAP, CER,10pF,+-0.5PF,200V,COG,1206	C273
100-140-3100	CAP, CER,10pF,+-0.5PF,200V,COG,1206	C275
100-140-3080	CAP, CER,8pF,+-0.5pF,200V,COG,1206	C277
081-152-4476	CAP, ELE,47uF,20%,25V,RD,0.098 LS	C279
100-040-3050	CAP, CER,5PF,+-0.25PF,200V,COG,1206	C280
100-110-2070	CAP, CER, 7pF, 0.5pF, 50V, COG, 0805	C281
100-520-2270	CAP,CER,27PF,5%,50V,COG,0805	C282
100-140-3080	CAP, CER,8pF,+-0.5pF,200V,COG,1206	C283
100-520-2300	CAP,CER,30PF,5%,50V,COG,0805	C284
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C285
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C286
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C287
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C288
100-120-2820	CAP,CER, 82PF	C289
100-511-2473	CAP,CER, 0.047UF, GRM40X7R473J25	C290
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C292
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C294
100-521-2103	CAP, CER, 0.01UF, 10%, 50V, X7R, 0805	C295
134-772-1	CAP,CER,CHIP, 47PF	C296
100-520-2120	CAP,CER,12PF,5%,50V,COG,0805	C297
132-216-9Z	CAP,CER,CHIP,22PF MCB-30/27KC	C298
134-772-1	CAP,CER,CHIP, 47PF	C299
100-621-2471	CAP,CER,470PF,10%,50V,X7R,0805	C300
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C301

Part No.	NAME & DESCRIPTION	Ref
100-520-2221	CAP,CER,220PF,5%,50V,COG,0805	C303
100-520-2180	CAP,CER,18PF,5%,50V,COG,0805	C550
100-520-2180	CAP,CER,18PF,5%,50V,COG,0805	C551
081-072-3106	CAP,ELE,10UF,50V,20%,5X11,2.5PT	C558
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C700
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C701
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C702
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C703
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C704
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C705
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C706
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C707
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C708
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C709
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C710
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C711
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C712
100-520-1221	CAP, CER, 220PF, 5%, 50V, COG, 0603	C713
741-127-3000	RES, TF, 0, 5%, 1/ 8W, T3216	RC470
080-968-0102	CAP,FEED THROUGH, 1000PF	CF1
310-030-0013	FILTER,XTAL, 45.3MHz	CF101
310-010-0013	FILTER CERAMIC LT455HT	CF103
310-010-0010	FILTER CERAMIC LT455FW	CF104
220-020-0002	DIODE, PIN, MMBV3401LT1, SOT-23	D103
220-020-0002	DIODE, PIN, MMBV3401LT1, SOT-23	D104
220-010-0002	DIODE,SW,KDS184S,SOT-23	D105
220-010-0021	DIODE, SW, SDS914	D106
220-040-0001	DIODE,SCHOTTKY,MMBD101LT1,SOT-23	D107
200-020-0003	DIODE, PIN, XB15A402A2GB	D108
200-020-0004	DIODE,PIN,XB15A301A2GB	D120
220-020-0002	DIODE, PIN, MMBV3401LT1, SOT-23	D121
200-030-0008	DIODE, RECT, 1N5404, AX, 14.7x5.5	D124
220-010-0021	DIODE, SW, SDS914	D125
220-010-0004	DIODE,SW,KDS181S,SOT-23	D126
220-010-0022	DIODE,SW,1SS314	D127
220-010-0004	DIODE,SW,KDS181S,SOT-23	D128
220-010-0021	DIODE, SW, SDS914	D129
220-010-0005	DIODE, SW, KDS226, SOT-23	D551
220-010-0005	DIODE, SW, KDS226, SOT-23	D552
440-050-0012	IC, PLL, MC145193F, (SO-20)	IC101
441-031-0001	MIXER,RFMS-1L (SM6) SL70	IC102
405-010-0010	POWER AMPLIFIER SM 2450	IC103
441-030-0001	IC, OP AMP, KIA358F, SO-8, DUAL	IC104
401-010-0017	IC, VREG, KIA78L05F, SOT89	IC105
401-010-0016	IC, VREG, KIA7808PI, TO220IS, 70-7026	IC107
401-040-0005	IC, AUDIO AMP,TDA2003V,TO-220-5LEAD	IC108
441-060-0007	IC, VHF RCVR,MC3371D,SO-16,Nwrband	IC109
371-005-3103	COIL, CHIP, 10UH, LER015T100K	L1
371-005-3103	COIL, CHIP, 10UH, LER015T100K	L2
371-010-5270	COIL CHIP 27NH:LL2012-F27NM	L106
350-000-0034	COIL,SPRG,R,0.009UH,13.5X0.5X2.5T	L107
371-010-5180	COIL, CHIP, 18NH, 20%, LL2012-F18NM	L108
371-010-5180	COIL, CHIP, 18NH, 20%, LL2012-F18NM	L110
371-011-5R15	COIL,CHIP,0.15UH:LER015TR15M	L111
350-000-0107	COIL,SPRING,1.5X0.45X6T:L	L113
371-011-5R15	COIL,CHIP,0.15UH:LER015TR15M	L114
350-000-0107	COIL,SPRING,1.5X0.45X6T:L	L115
350-000-0146	COIL,SPRING,2.5X0.5X10T:R	L116
350-000-0149	COIL SPRG,2.5X1.2X3T:L	L118
371-011-5R15	COIL,CHIP,0.15UH:LER015TR15M	L119
350-000-0149	COIL SPRG,2.5X1.2X3T:L	L120
350-000-0149	COIL SPRG,2.5X1.2X3T:L	L121
350-000-0148	COIL SPRG,2.5X0.7X3T:R	L122
371-010-5180	COIL, CHIP, 18NH, 20%, LL2012-F18NM	L123
371-010-5180	COIL, CHIP, 18NH, 20%, LL2012-F18NM	L124
350-000-0149	COIL SPRG,2.5X1.2X3T:L	L125
370-019-0R01	COIL,0.01UH,5%,NL322522,100MHZ,DCR=0.13	L130
352-000-00R2	COIL AXIAL	L225
370-017-21R0	COIL,1.0UH,20%,LER015,60MHZ	L226
371-012-3221	COIL,CHIP,220UH:NL322522T-221J	L227
352-000-0102	COIL,1MH,10%,AX	L228
352-000-0102	COIL,1MH,10%,AX	L229
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	LK17
050-020-0005	MIC,CND,-62DB,4.5V,1K,9.4DIAx6.7H MM	MK1
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	PLK3
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	PLK4
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	PLK5
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	PLK11
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	PLK13
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	PLK14
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q101
870-100-0004	TRANS,PNP,KTA1504(Y),SOT-23,SW,(ASY)	Q102
870-100-0004	TRANS,PNP,KTA1504(Y),SOT-23,SW,(ASY)	Q103
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q104
870-010-0005	TRANS, PNP, KRA104S, SOT-23, SW, PD	Q105
870-200-0008	TRANS,NPN,MMBC1321Q4,SOT-23VHF/RF,(Q4)	Q106
870-200-0020	TRANS, NPN, BFR92A, SOT-23, RF AMP,(P2P)	Q113
870-200-0020	TRANS, NPN, BFR92A, SOT-23, RF AMP,(P2P)	Q114
870-200-0020	TRANS, NPN, BFR92A, SOT-23, RF AMP,(P2P)	Q116
870-260-0007	TRANS,BFG35,SOT-223	Q117
870-010-0010	TRANS, PNP, KRA110SPK, SOT-23, SW, PK	Q119
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q121
870-100-0001	TRANS,PNP,BCX18ITL.SOT-23SW,(T2)	Q122
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q123
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q124
850-150-0003	TRANS, PNP, KTB1367, TO-220IS, GP	Q125
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q127
870-010-0010	TRANS, PNP, KRA110SPK, SOT-23, SW, PK	Q128
870-200-0020	TRANS, NPN, BFR92A, SOT-23, RF AMP,(P2P)	Q130
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q131
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q132
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q133
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q134
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q135
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q137
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q140
870-020-0001	TRANS,NPN,KRC104S,SOT-23,SW,(ND)	Q219
870-100-0004	TRANS,PNP,KTA1504(Y),SOT-23,SW,(ASY)	Q504
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q550
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q551
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q552
870-200-0006	TRANS, NPN, KTC3875(BL), SOT-23, SW, ALL	Q553
741-117-2201	RES, TF, 200, 5%, 1/10W, TC250, 0805	R6
741-102-1123	RES, TF, 12K, 5%, 1/16W, +/-200, 0603	R22
741-117-2201	RES, TF, 200, 5%, 1/10W, TC250, 0805	R35
741-102-1472	RES, TF, 4.7K, 5%, 1/16W, +/-200, 0603	R40
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R100
741-117-2182	RES,TF,1.8K,5%,1/10W,TC250,0805	R101
741-117-2911	RES,TF,910,1/10W,5%,T2012	R104
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R105
741-117-2911	RES,TF,910,1/10W,5%,T2012	R106
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R107
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R109
741-117-2302	RES, TF,3K,5%,1/10W,TC250,0805	R110
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R111
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R112
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R113
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R114
741-117-2274	RES, TF, 270K, 5%, 1/10W, TC250, 0805	R130
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R131
741-117-2752	RES, TF,7.5K,5%,1/10W,TC250,0805	R132
741-117-2123	RES, TF, 12K, 5%, 1/10W, TC250, 0805	R133
741-117-2392	RES, TF, 3.9K, 5%, 1/10W, T2012	R134
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R135
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R136
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R137
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R138
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R139
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R140
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R141
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R142
741-117-2182	RES,TF,1.8K,5%,1/10W,TC250,0805	R143
741-117-2510	Res, TF,51,5%,1/10W,TC250,0805	R144
741-117-2153	RES,TF,15K,5%,1/10W,TC250,0805	R146
741-117-2564	RES, TF,560K,5%,1/10W,TC250,0805	R147
741-117-2153	RES,TF,15K,5%,1/10W,TC250,0805	R148
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R149
741-117-2564	RES, TF,560K,5%,1/10W,TC250,0805	R150
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R151
741-117-2470	RES, TF, 47, 5%, 1/10W, TC250, 0805	R152
741-117-2392	RES, TF, 3.9K, 5%, 1/10W, T2012	R153
741-117-2229	RES, TF, 2.2, 5%, 1/10W, TC250, 0805	R154
741-117-2153	RES,TF,15K,5%,1/10W,TC250,0805	R156
741-117-2301	RES, TF,300,5%,1/10W,TC250,0805	R157
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R158
741-117-2680	RES,TF,68,5%,1/10W,TC250,0805	R159
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R160
741-117-2561	RES, TF, 560, 5%, 1/10W, TC250, 0805	R161
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R162
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R163
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R164
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R165
741-117-2000	RES, TF, 0,5%, 1/10W, +/-250, 0805	R166
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R168

Part No.	NAME & DESCRIPTION	Ref
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R170
741-117-2332	RES, TF, 3.3K, 5%, 1/10W, T2012	R172
741-117-2332	RES, TF, 3.3K, 5%, 1/10W, T2012	R173
723-103-0331	RES,FILM,330,1/ 2W,5%,ST,MINI	R175
721-122-0121	RES,FILM,120,1/ 2W,5%,ST,MINI	R176
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R177
741-117-2122	RES,TF,1.2K,5%,1/10W,TC250,0805	R178
721-122-0121	RES,FILM,120,1/ 2W,5%,ST,MINI	R181
741-117-2221	RES,TF,220,5%,1/10W,TC250,0805	R182
741-117-2474	RES,TF,470K,5%,1/10W,TC250,0805	R183
741-117-2100	RES,TF,10,5%,1/10W,TC250,0805	R184
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R185
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R186
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R187
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R190
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R191
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R192
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R193
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R194
741-117-2183	RES,TF,18K,5%,1/10W,TC250,0805	R195
741-117-2823	RES,TF,82K,5%,1/10W,TC250,0805	R196
741-117-2104	RES,TF,100K,5%,1/10W,TC250,0805	R197
741-117-2102	RES,TF,1K,5%,1/10W,TC250,0805	R198
741-117-2473	RES,TF,47K,5%,1/10W,TC250,0805	R200
741-117-2334	RES,TF,330K,5%,1/10W,TC250,0805	R201
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R202
741-117-2154	RES,TF,150K,5%,1/10W,TC250,0805	R203
741-117-2102	RES,TF,1K,5%,1/10W,TC250,0805	R204
741-117-2220	RES,TF,22,5%,1/10W,TC250,0805	R205
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R206
741-117-2101	RES, 100, 5%, 1/10W, T2012	R207
741-117-2683	RES, TF,68K,5%,1/10W,TC250,0805	R211
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R213
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R214
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R215
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R217
741-117-2103	RES, TF, 10K, 5%, 1/10W, T2012	R218
741-117-2393	RES,TF,39K,5%,1/10W,TC250,0805	R219
741-117-2563	RES,TF,56K,5%,1/10W,TC250,0805	R220
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R221
741-117-2223	RES, TF, 22K, 5%, 1/10W, TC250, 0805	R222
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R223
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R225
741-117-2123	RES, TF, 12K, 5%, 1/10W, TC250, 0805	R250
741-117-2202	Res, TF,2K,5%,1/10W,TC250,0805	R251
741-117-2102	RES,TF,1K,5%,1/10W,TC250,0805	R252
741-117-2182	RES,TF,1.8K,5%,1/10W,TC250,0805	R253
741-117-2752	RES, TF,7.5K,5%,1/10W,TC250,0805	R550
741-117-2273	RES,TF,27K,5%,1/10W,TC250,0805	R551
741-117-2273	RES,TF,27K,5%,1/10W,TC250,0805	R552
741-117-2752	RES, TF,7.5K,5%,1/10W,TC250,0805	R553
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R554
741-117-2472	RES,TF,4.7K,5%,1/10W,TC250,0805	R555
741-117-2222	RES, TF, 2.2K, 5%, 1/10W, T2012	R556
741-117-2471	RES, TF, 470, 5%, 1/10W, TC250, 0805	R559
902-002-0223	RES, SEMIFIXED 22K	RV101
901-003-0001	RES,SEMIFIXED,1KB:RH0651C100102	RV102
902-018-0103	RES, SEMIFIXED, 10K	RV103
902-018-0103	RES, SEMIFIXED, 10K	RV104
902-001-0472	POT, ROTARY,SC,4.7K,6mm,V,3P,B	RV105
901-120-0223	RES.CHIP TRIMMER 22K RH03E1CJ4X	RV402
901-120-0473	VARIABLE RESISTOR,47K	RV403
830-040-0012	SW,PUSH,SKPS-22004	S1
902-001-0203	POT,ROTARY,20K,9MM,H,5P,A	SW2
830-040-0006	SW,PUSH,V,6P,LATCHING	SW3
436-038-8	SW,TACT,TSA-069501-150	SW4
430-070-5	SW,ROTARY,SRBV14	SW5
436-038-8	SW,TACT,TSA-069501-150	SW6
353-000-0148	COIL,VARIABLE,A294SN-K5131Z,IFT	T101
353-000-0148	COIL,VARIABLE,A294SN-K5131Z,IFT	T102
353-000-0001	COIL, IFT, 455KHZ, 180PF	T103
840-020-0001	TRANSFORMER, CHOKE, E1-19MM	T104
910-005-0100	VCAP, CER,10pF,ECV-1ZW10X53T	TC101
650-100-0002	TCXO,VCTCXO-3625F5(12.8M) 2.5PM	TCX01
700-050-0002	THERM, 33K, NTCCS32163SH333KC	TH101
162-000-0056	XTAL,NR2B,44,545M(X1)	X101
169-012-8000	XTAL,HC49T,12.8M -30,10PM,20P,OSC	X701

BAND CHANGES

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RF SECTION

Part No.	NAME & DESCRIPTION	Ref
100-520-2110	CAP,CER,11PF,5%,50V,COG,0805	C155
100-520-2140	Cap, Cer,14pF,5%,50V,COG,0805	C160
100-120-2080	CAP,CER,8PF,0.5PF,50V,COG,0805	C245
100-520-2180	CAP,CER,18PF,5%,50V,COG,0805	C249
100-540-3430	CAP, CER,43PF,5%,200V,COG,1206	C254
100-020-20R5	CAP,CER,0.5PF,0.25PF,50V,COG,0805	C269
100-140-3060	CAP,CER,6PF,+-.5PF,200V,COG,1206	C270
100-540-3510	CAP, CER,51pF,5%,200V,COG,1206	C273
100-540-3560	CAP,CER,56PF,5%,200V,COG,1206	C275
100-540-3470	CAP,CER,47PF,5%,200V,COG,1206	C277
104-550-4750	CAP,CER,75PF,5%,500V,COG	C278
100-540-3200	CAP,CER,20PF,5%,200V,COG,1206	C280
100-520-3270	CAP,CER,27PF,5%,200V,COG,1206	C283
741-117-2151	RES, TF,150,5%,1/10W,TC250,0805	R182

FRONT END

Part No.	NAME & DESCRIPTION	Ref
100-520-1510	CAP,CER,51PF,5%,50V,COG,0603	C801
100-520-1330	CAP, CER, 33PF, 5%, 50V, COG, 0603	C803
100-120-1080	CAP,CER,8.0pF,+/-0.5pF,50V,COG,0603	C804
100-120-1070	CAP, CER,7PF, +/- 0.5PF, 50V, COG, 0603	C805
100-520-1390	CAP, CER,39pF,5%,50V,COG,0603	C807
100-520-1300	CAP, CER, 30PF, 5%, 50V, COG, 0603	C812
100-520-1390	CAP, CER,39pF,5%,50V,COG,0603	C814
100-520-1620	CAP, CER, 62PF, 5%, 50V, COG, 0603	C817
100-520-1121	CAP, CER, 120PF, 5%, 50V, COG, 0603	C818
100-520-1470	CAP,CER,47pF,5%,50V,COG,0603	C822

VCO SECTION

Part No.	NAME & DESCRIPTION	Ref
100-520-2300	CAP,CER,30PF,5%,50V,COG,0805	C354
100-020-25R6	Cap, Cer,5.6pF,.25pF,50V,COG,0805	C357
100-020-25R6	Cap, Cer,5.6pF,.25pF,50V,COG,0805	C358
100-520-2180	CAP,CER,18PF,5%,50V,COG,0805	C365
100-120-24R7	CAP, CER, 4.7PF, +/-.25PF, 50V, COG, 0805	C367
100-120-24R7	CAP, CER, 4.7PF, +/-.25PF, 50V, COG, 0805	C368
373-000-0000	COIL,VARIABLE,SM,96NH,20%,4.5T,Yellow	L353

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RF SECTION

Part No.	NAME & DESCRIPTION	Ref
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C158
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C242
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C243
100-140-3060	CAP,CER,6PF,+-.25PF,200V,COG,1206	C272
100-140-3100	CAP, CER,10pF,+-0.5PF,200V,COG,1206	C273
100-140-3100	CAP, CER,10pF,+-0.5PF,200V,COG,1206	C275
100-140-3100	CAP, CER,10pF,+-0.5PF,200V,COG,1206	C277
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C281
100-140-3070	Cap, Cer,7pF,+-0.5pF,200V,COG,1206	C283
741-117-2472	RES,TF,4.7K,5%,1/10W,TC250,0805	R180
741-117-2221	RES,TF,220,5%,1/10W,TC250,0805	R182

FRONT END

Part No.	NAME & DESCRIPTION	Ref
100-120-1090	CAP, CER, 9PF, +/- 0.5PF, 50V, COG, 0603	C601
100-520-1130	CAP, CER,13PF, 5%, 50V, COG, 0603	C602
100-120-1100	CAP, CER, 10pF,.5%, 50V, COG, 0603	C603
100-520-1330	CAP, CER, 33PF, 5%, 50V, COG, 0603	C604
100-120-1100	CAP, CER, 10pF,.5%, 50V, COG, 0603	C605
100-120-1080	CAP, CER, 8.0pF, +/-0.5pF, 50V, COG, 0603	C606
100-520-1240	CAP, CER, 24PF, 5%, 50V, COG, 0603	C607
100-520-1180	CAP,CER,18PF,5%,50V,COG,0603	C608
100-520-1330	CAP, CER, 33PF, 5%, 50V, COG, 0603	C609
100-520-1330	CAP, CER, 33PF, 5%, 50V, COG, 0603	C610
100-621-1471	CAP,CER,470PF,10%,50V,X7R,0603	C612
100-520-1200	CAP, CER, 20PF, 50V, 0603	C613
100-520-1120	CAP, CER, 12PF, 5%, 50V, COG, 0603	C614
100-520-1160	CAP, CER, 16PF, 50V, 5%, COG, 0603	C615
100-120-1090	CAP, CER, 9PF, +/- 0.5PF, 50V, COG, 0603	C616
100-520-1240	CAP, CER, 24PF, 5%, 50V, COG, 0603	C617
100-120-1090	CAP, CER, 9PF, +/- 0.5PF, 50V, COG, 0603	C618
100-120-1090	CAP, CER, 9PF, +/- 0.5PF, 50V, COG, 0603	C619
100-520-1200	CAP, CER, 20PF, 50V, 0603	C621
100-520-1240	CAP, CER, 24PF, 5%, 50V, COG, 0603	C622
100-520-1200	CAP, CER, 20PF, 50V, 0603	C623
100-020-1040	CAP,CER,33PF,5%,50V,COG,0603	C624
220-010-0005	DIODE, SW, KDS226, SOT-23	D601
350-000-0102	COIL, SPRG, 1.0X0.45X4T:L SMD	L607
870-200-0040	TRANS, NPN, KTC5084(0)	Q601
741-102-1563	RES,TF,56K,5%,1/16W,+/-200,0603	R601
741-102-1101	RES, TF,100,5%,1/16W,+/-200,0603	R602

VCO SECTION

Part No.	NAME & DESCRIPTION	Ref
100-520-2390	CAP, CER,39pF,5%,50V,COG,0805	C130
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C133
100-020-25R6	Cap, Cer,5.6pF,.25pF,50V,COG,0805	C134
100-020-2090	Cap, Cer,9pF,+-0.25pF,50V,COG,0805	C135
100-020-2090	Cap, Cer,9pF,+-0.25pF,50V,COG,0805	C136

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RF SECTION

Part No.	NAME & DESCRIPTION	Ref
100-020-23R3	CAP,CER,3.3PF,0.25PF,50V,COG,0805	C158
100-110-2070	CAP, CER, 7pF, 0.5pF, 50V, COG, 0805	C242
100-020-23R3	CAP,CER,3.3PF,0.25PF,50V,COG,0805	C243
100-040-3040	CAP,CER,4PF,+-.25PF,200V,COG,1206	C272
100-140-3070	Cap, Cer,7pF,+-0.5pF,200V,COG,1206	C273
100-140-3090	CAP, CER,9pF,+-0.5pF,200V,COG,1206	C275
100-140-3100	CAP, CER,10pF,+-0.5PF,200V,COG,1206	C277
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C281
100-040-3050	CAP, CER,5PF,+-0.25PF,200V,COG,1206	C283
741-117-2392	RES, TF, 3.9K, 5%, 1/10W, T2012	R180
741-117-2101	RES, 100, 5%, 1/10W, T2012	R182

FRONT END

Part No.	NAME & DESCRIPTION	Ref
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C601
100-120-1100	CAP, CER, 10pF,.5%, 50V, COG, 0603	C602
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C603
100-520-1150	CAP,CER,15PF,5%,50V,COG,0603	C604
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C605
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C606
100-520-1160	CAP, CER, 16PF, 50V, 5%, COG, 0603	C607
100-520-1180	CAP,CER,18PF,5%,50V,COG,0603	C608
100-520-1160	CAP, CER, 16PF, 50V, 5%, COG, 0603	C609
100-520-1180	CAP,CER,18PF,5%,50V,COG,0603	C610
100-520-1471	CAP, CER, 470PF, 5%, 50V, COG, 0603	C612
100-020-1040	CAP,CER,33PF,5%,50V,COG,0603	C613
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C614
100-120-1080	CAP, CER, 8.0pF, +/-0.5pF, 50V, COG, 0603	C615
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C616
100-120-1100	CAP, CER, 10pF,.5%, 50V, COG, 0603	C617
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C618
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C619
100-520-1220	CAP,CER,22PF,5%,50V,COG,0603	C621
100-520-1160	CAP, CER, 16PF, 50V, 5%, COG, 0603	C622
100-520-1180	CAP,CER,18PF,5%,50V,COG,0603	C623
100-020-13R3	CAP,CER,3.3PF,+/-.25PF,50V,COG,0603	C624
220-010-0005	DIODE, SW, KDS226, SOT-23	D601
350-000-0102	COIL, SPRG, 1.0X0.45X4T:L SMD	L607
870-200-0040	TRANS, NPN, KTC5084(0)	Q601
741-102-1563	RES,TF,56K,5%,1/16W,+/-200,0603	R601
741-102-1101	RES, TF,100,5%,1/16W,+/-200,0603	R602

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VCO SECTION

Part No.	NAME & DESCRIPTION	Ref
100-520-2180	CAP,CER,18PF,5%,50V,COG,0805	C130
100-120-2060	CAP, CER, 6PF, +/-.5PF, 50V, COG, 0805	C133
100-020-23R3	CAP,CER,3.3PF,0.25PF,50V,COG,0805	C134
100-110-2070	CAP, CER, 7pF, 0.5pF, 50V, COG, 0805	C136

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RF SECTION

Part No.	NAME & DESCRIPTION	Ref
100-020-2040	CAP,CER,4PF,0.25PF,50V,COG,0805	C158
100-020-2050	CAP,CER,5PF,0.25PF,50V,COG,0805	C242
100-020-23R3	CAP,CER,3.3PF,0.25PF,50V,COG,0805	C243
100-040-3040	CAP,CER,4PF,+-.25PF,200V,COG,1206	C272
100-140-3070	Cap, Cer,7pF,+-0.5pF,200V,COG,1206	C273
100-140-3090	CAP, CER,9pF,+-0.5pF,200V,COG,1206	C275
100-140-3080	CAP, CER,8pF,+-0.5pF,200V,COG,1206	C277
100-020-2100	CAP, CER, 10PF, +/-.25PF, 50V, COG, 0805	C281
100-040-3040	CAP,CER,4PF,+-.25PF,200V,COG,1206	C283
741-117-2272	RES,TF,2.7K,5%,1/10W,TC250,0805	R180
741-117-2101	RES, 100, 5%, 1/10W, T2012	R182

FRONT END

Part No.	NAME & DESCRIPTION	Ref
100-120-1090	CAP, CER, 9PF, +/- 0.5PF, 50V, COG, 0603	C601
100-120-1090	CAP, CER, 9PF, +/- 0.5PF, 50V, COG, 0603	C602
100-020-15R6	CAP, CER, 5.6PF, +/-.25PF, 50V, COG, 0603	C603
100-020-15R6	CAP, CER, 5.6PF, +/-.25PF, 50V, COG, 0603	C605
100-020-15R6	CAP, CER, 5.6PF, +/-.25PF, 50V, COG, 0603	C606
100-520-1110	CAP, CER, 11PF, 5%, 50V, COG, 0603	C607
100-520-1180	CAP,CER,18PF,5%,50V,COG,0603	C608
100-520-1140	CAP, CER, 14PF, 5%, 50V, COG, 0603	C609
100-520-1300	CAP, CER, 30PF, 5%, 50V, COG, 0603	C610
100-520-1120	CAP, CER, 12PF, 5%, 50V, COG, 0603	C613
100-520-1110	CAP, CER, 11PF, 5%, 50V, COG, 0603	C614
100-520-1140	CAP, CER, 14PF, 5%, 50V, COG, 0603	C615
100-020-1050	CAP, CER, 5PF, +/- 0.25pF, 50V, COG, 0603	C616
100-520-1110	CAP, CER, 11PF, 5%, 50V, COG, 0603	C617
100-020-1050	CAP, CER, 5PF, +/- 0.25pF, 50V, COG, 0603	C618
100-020-1050	CAP, CER, 5PF, +/- 0.25pF, 50V, COG, 0603	C619
100-520-1240	CAP, CER, 24PF, 5%, 50V, COG, 0603	C621
100-520-1160	CAP, CER, 16PF, 50V, 5%, COG, 0603	C622
100-520-1110	CAP, CER, 11PF, 5%, 50V, COG, 0603	C623
100-020-12R7	CAP, CER, 2.7PF, 0.25PF, 50V, COG, 0603	C624

VCO SECTION

Part No.	NAME & DESCRIPTION	Ref
100-520-2240	CAP,CER,24PF,5%,50V,COG,0805	C130
100-020-2040	CAP,CER,4PF,0.25PF,50V,COG,0805	C133
100-020-23R3	CAP,CER,3.3PF,0.25PF,50V,COG,0805	C134

SM2544 U5

RF SECTION

Part No.	NAME & DESCRIPTION	Ref
100-020-2050	CAP,CER,5PF,0.25PF,50V,COG,0805	C158
100-120-2080	CAP,CER,8PF,0.5PF,50V,COG,0805	C242
100-120-24R7	CAP, CER, 4.7PF, +/-.25PF, 50V, COG, 0805	C243
100-040-3050	CAP, CER,5PF,+-0.25PF,200V,COG,1206	C272
100-140-3100	CAP, CER,10pF,+-0.5PF,200V,COG,1206	C273
100-140-3100	CAP, CER,10pF,+-0.5PF,200V,COG,1206	C275
100-140-3100	CAP, CER,10pF,+-0.5PF,200V,COG,1206	C277
100-110-2070	CAP, CER, 7pF, 0.5pF, 50V, COG, 0805	C281
100-140-3060	CAP,CER,6PF,+-.5PF,200V,COG,1206	C283
741-117-2472	RES,TF,4.7K,5%,1/10W,TC250,0805	R180
741-117-2221	RES,TF,220,5%,1/10W,TC250,0805	R182

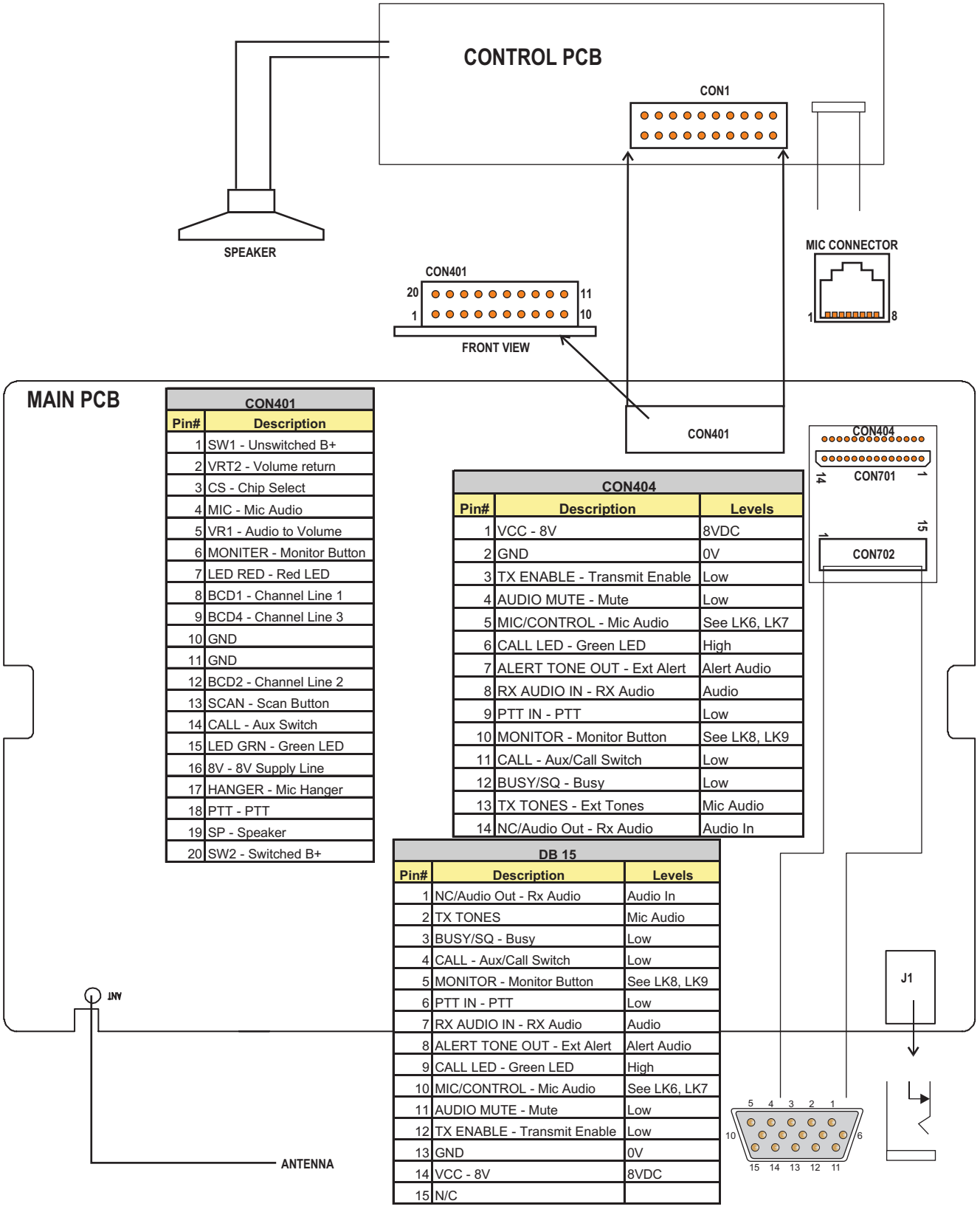
FRONT END

Part No.	NAME & DESCRIPTION	Ref
100-520-1140	CAP, CER, 14PF, 5%, 50V, COG, 0603	C602
100-520-1240	CAP, CER, 24PF, 5%, 50V, COG, 0603	C604
100-120-1080	CAP, CER, 8.0pF, +/-0.5pF, 50V, COG, 0603	C605
100-120-1080	CAP, CER, 8.0pF, +/-0.5pF, 50V, COG, 0603	C606
100-520-1240	CAP, CER, 24PF, 5%, 50V, COG, 0603	C607
100-520-1220	CAP,CER,22PF,5%,50V,COG,0603	C608
100-520-1220	CAP,CER,22PF,5%,50V,COG,0603	C609
100-520-1560	CAP,CER,56PF,5%,50V,COG,0603	C610
100-120-1100	CAP, CER, 10pF,.5%, 50V, COG, 0603	C613
100-520-1160	CAP, CER, 16PF, 50V, 5%, COG, 0603	C615
100-120-1080	CAP, CER, 8.0pF, +/-0.5pF, 50V, COG, 0603	C616
100-520-1240	CAP, CER, 24PF, 5%, 50V, COG, 0603	C617
100-120-1080	CAP, CER, 8.0pF, +/-0.5pF, 50V, COG, 0603	C618
100-120-1080	CAP, CER, 8.0pF, +/-0.5pF, 50V, COG, 0603	C619
100-520-1200	CAP, CER, 20PF, 50V, 0603	C621
100-520-1200	CAP, CER, 20PF, 50V, 0603	C622
100-520-1200	CAP, CER, 20PF, 50V, 0603	C623
100-120-1060	CAP, CER,6PF, +/-0.5pF, 50V, COG, 0603	C624

VCO SECTION

Part No.	NAME & DESCRIPTION	Ref
100-520-2390	CAP, CER,39pF,5%,50V,COG,0805	C130
100-120-2080	CAP,CER,8PF,0.5PF,50V,COG,0805	C133
100-120-24R7	CAP, CER, 4.7PF, +/-.25PF, 50V, COG, 0805	C134
100-120-2080	CAP,CER,8PF,0.5PF,50V,COG,0805	C135

WIRING DIAGRAM



CON401	
Pin#	Description
1	SW1 - Unswitched B+
2	VRT2 - Volume return
3	CS - Chip Select
4	MIC - Mic Audio
5	VR1 - Audio to Volume
6	MONITER - Monitor Button
7	LED RED - Red LED
8	BCD1 - Channel Line 1
9	BCD4 - Channel Line 3
10	GND
11	GND
12	BCD2 - Channel Line 2
13	SCAN - Scan Button
14	CALL - Aux Switch
15	LED GRN - Green LED
16	8V - 8V Supply Line
17	HANGER - Mic Hanger
18	PTT - PTT
19	SP - Speaker
20	SW2 - Switched B+

CON404		
Pin#	Description	Levels
1	VCC - 8V	8VDC
2	GND	0V
3	TX ENABLE - Transmit Enable	Low
4	AUDIO MUTE - Mute	Low
5	MIC/CONTROL - Mic Audio	See LK6, LK7
6	CALL LED - Green LED	High
7	ALERT TONE OUT - Ext Alert	Alert Audio
8	RX AUDIO IN - RX Audio	Audio
9	PTT IN - PTT	Low
10	MONITOR - Monitor Button	See LK8, LK9
11	CALL - Aux/Call Switch	Low
12	BUSY/SQ - Busy	Low
13	TX TONES - Ext Tones	Mic Audio
14	NC/Audio Out - Rx Audio	Audio In

DB 15		
Pin#	Description	Levels
1	NC/Audio Out - Rx Audio	Audio In
2	TX TONES	Mic Audio
3	BUSY/SQ - Busy	Low
4	CALL - Aux/Call Switch	Low
5	MONITOR - Monitor Button	See LK8, LK9
6	PTT IN - PTT	Low
7	RX AUDIO IN - RX Audio	Audio
8	ALERT TONE OUT - Ext Alert	Alert Audio
9	CALL LED - Green LED	High
10	MIC/CONTROL - Mic Audio	See LK6, LK7
11	AUDIO MUTE - Mute	Low
12	TX ENABLE - Transmit Enable	Low
13	GND	0V
14	VCC - 8V	8VDC
15	N/C	

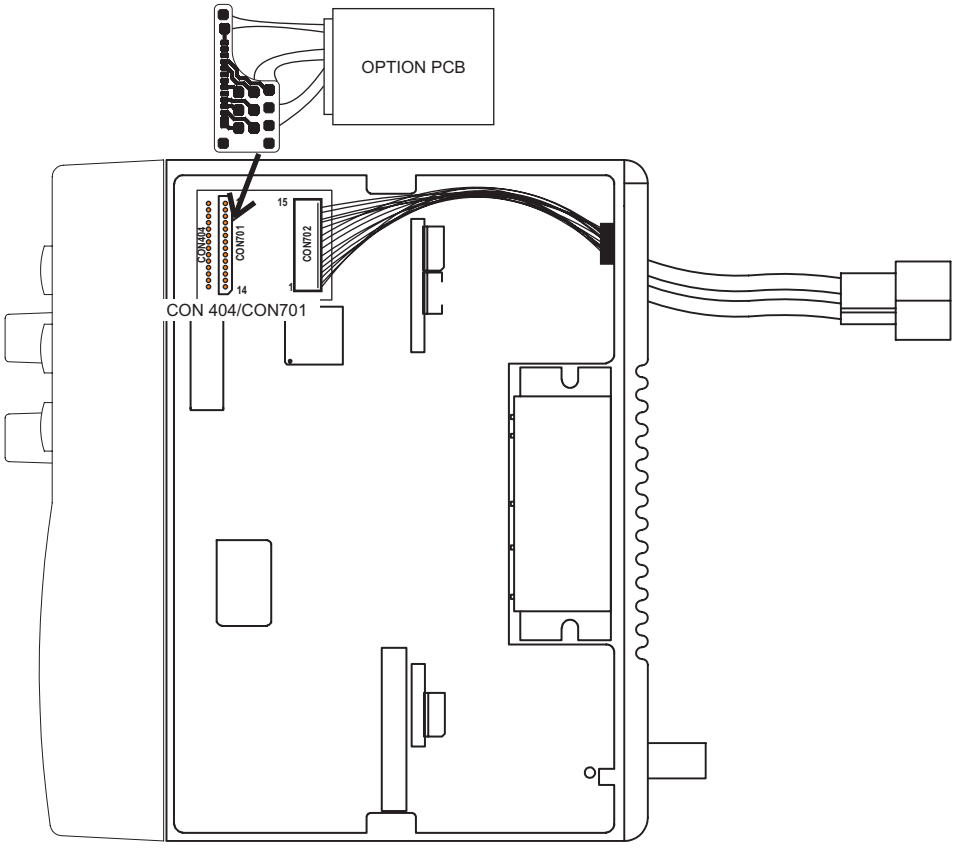
Wiring Diagram

OPTION INSTALLATION

The SM2500 Enduro Series radio is capable of being upgraded through the use of an internal option connector. An adapter PCB can be purchased to make installations easy for non-Maxon accessories. The part number for this PCB is: 650-260-0009 and can be ordered through Topaz3, LLC at 1-800-821-7848 ext 699.

Steps to installing an option board:

1. Follow the manufacturers instructions on setting up the Option PCB.
2. Remove the Top Cover from the radio. (Refer to “DISASSEMBLY” on page 21).
3. Connect the wires to the appropriate locations on the adapter PCB. (Refer to “WIRING DIAGRAM” on page 47).
4. Set the appropriate Links on the SM2500. (Refer to “LINK DESCRIPTIONS” on page 49).
5. Plug the adapter PCB into CON404 of the Main PCB of the radio. (See diagram below).
6. Reassemble the SM2500.



Option Installation

LINK DESCRIPTIONS

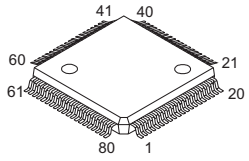
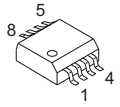
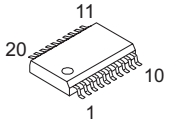
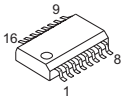
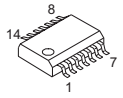
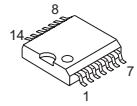
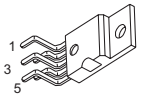
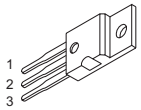
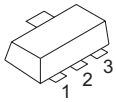
Link 1	Open. If an option that uses green call LED is installed. Closing LK1 will allow PTT and low battery indication to turn the green LED off, so that the tri-color LED is red for PTT or low battery indication. This is done even if installed option is turning green LED on. • Note: Red and Green LED combined equal Yellow.
Link 2	Closed. R429 is a bypassed when link 2 is closed, so that unprocessed receive audio is present at pin 8 of CON404. If LK2 is closed, LK10 must be open. If LK2 is open and LK10 is closed, the micro can mute and receive audio at pin 8 of CON404.
Link 3	Closed. If opened, mic audio must pass though CON404. Input on pin 5, output on pin 13, (IE. Audio Scrambler). Link 6 must be opened with link 7 closed for this to work.
Link 4	Closed. If opened PTT must pass through CON404 with input on pin 9 and output on PIN 3.
Link 5	Closed. If opened, receive audio must pass through option CON404 pin 8 and out pin 14. (IE: Audio de scrambling is one use.)
Link 6	Open. LK6 closed with LK7 opened. The option has the ability to mute the mic path by pulling pin 5 of CON404 low, this is an open drain (collector) type output.
Link 7	Open. LK7 closed allows mic audio connection to option. Link 3 must also be closed. • Note: LK6 and LK7 should not be closed simultaneously.
Link 8	Open. When LK8 is closed, the option can request monitor from the microprocessor on CON404 Pin 10 or for the option board to know that the monitor button has been pressed.
Link 9	Open. Closing LK9 enables the option board to override microprocessor's 386 disable.
Link10	Open. See Link 2.
Link 11	Closed. When Link 11 is closed, connects side tones (IE. DTMF) to the internal speaker.
Link 12	Open. See Link 13.
Link 13	Closed. When Link 13 is Opened and Link 12 is closed both the microprocessor and pin 4 of CON404 are low to enable the Audio Amp. A high at either one disables the audio amp.
Link 14	Closed. When Link 14 is closed and link 11 is opened, the alert tones are connected to the input of the volume control. If used, the option must be able to override the audio amp. (See link 9.)
Link 15	Open. When closed, connects the alert tones to the speaker.
Link 16	Open. Link point for option process of audio frequency through High Pass Filter.
Link 17	Closed. Link point for option process of audio frequency through High Pass Filter.
Link 18	Open. Link point for option process of audio frequency through High Pass Filter.
Link 19	Closed. Link point for option process of audio frequency through High Pass Filter.

PINOUTS - IC's

✱ = SM2541/VHF

Unless otherwise indicated all parts are common to the SM-2000 Series Radio.

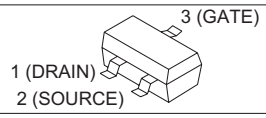
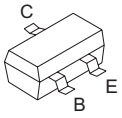
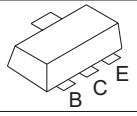
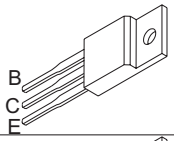
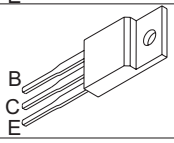
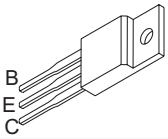
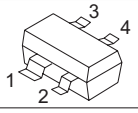
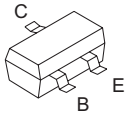
✱✱ = SM2544/UHF

BASE DIAGRAM	MANUFACTURER'S PART NUMBER	REFERENCE NO.	TYPE
	HD4074818	IC409	CPU
	LM358M	IC104, IC105	OP Amp
	AT93C56-10S1	IC408	EEPROM
	MC14519IF	IC101	PLL
	MC14053	IC411,412	Analog SW IC
	MC14066	IC401	Analog SW IC
	MC3371D	IC109	IF IC
	KIA324F	IC404,406,410	OP Amp
	MF6CWM-100	IC407	Switched Cap Filter
	TDA2003V	IC108	Audio AMP
 1:IN 2:GND 3:OUT	KIA7808PI	IC107	Regulator
 1:OUT 2:GND 3:IN	KIA78L05F	IC105,402	Regulator

PINOUTS - TRANSISTORS

✱ = SM2541/VHF

Unless otherwise indicated all parts are common to the SM-2000 Series Radio. ✱✱ = SM2544/UHF

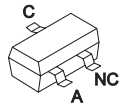
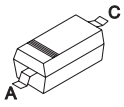
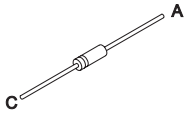
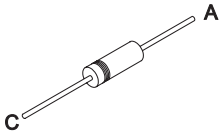
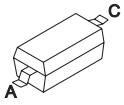
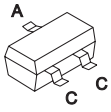
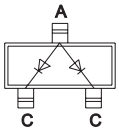
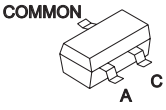
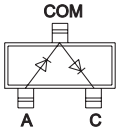
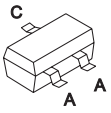
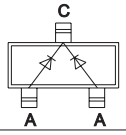
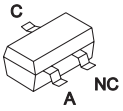
BASE DIAGRAM	MANUFACTURER'S PART NUMBER	REFERENCE NO.
	MMBFJ309LT1	*Q351,*352
	KTA1504S(ASG)	Q102,103,504,821,822
	BCX-18LT1	*Q122
	MMBC1321(Q4)	**Q130
	MMBC1321	*Q106
	KTC3875S(ALG)	Q101,104,360,550-553
	KRA110S(PK)	**Q119,*139,128
	KRC111S	*Q353
	KRA104S	*Q105,*407
	MMBR951	*Q116
	KRC104S(ND)	Q121,123,127,131,134,135 Q137,140,219,401-406,409 *Q108,*Q354, **Q105,**Q407
	BFG35	Q117
	KTB1367	**Q125,135
	KTA1658	*Q125
	C1971	*Q118
	MRF5711	**Q108
	BFR92A	Q113,114, *Q130, **Q110,**Q111,**Q116
	MMBR951	*Q800
	2SC5084	**Q601

PINOUTS - DIODES

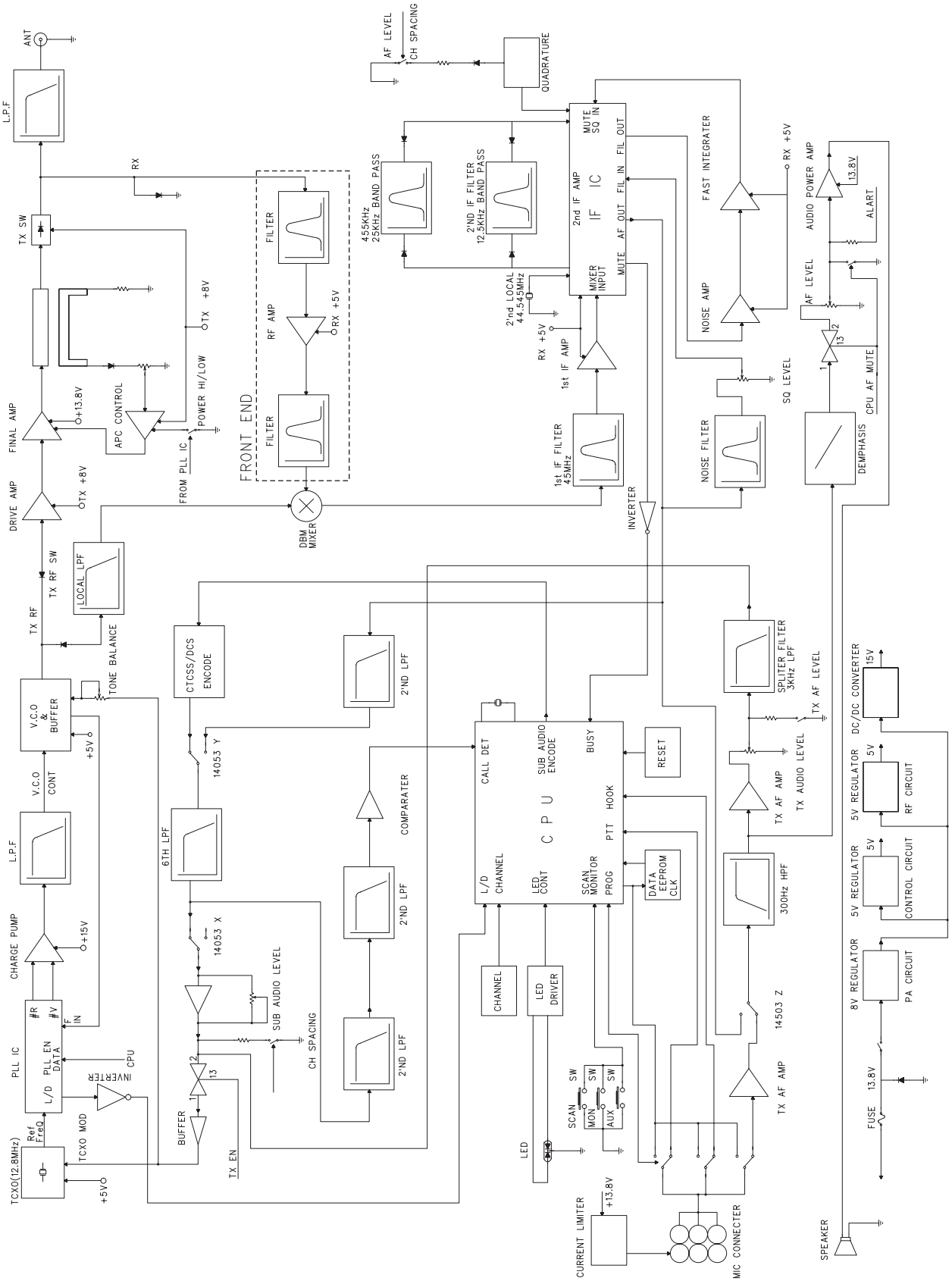
✱ = SM2541/VHF

Unless otherwise indicated all parts are common to the SM-2000 Series Radio.

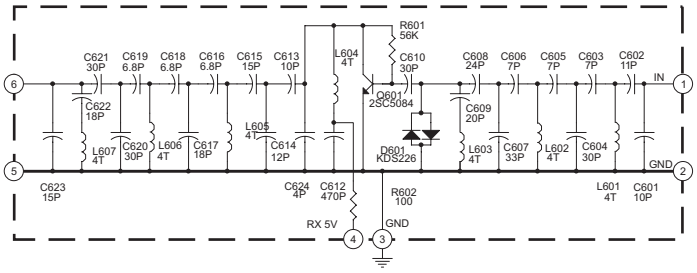
✱✱ = SM2544/UHF

BASE DIAGRAM	MANUFACTURER'S PART NUMBER	REFERENCE NO.	Schematic
	MMBV3401(4D)	D103-105,121	
	KRS193S(F3)	D106,125,129,801,803 D805	
	1SS241(TY)	D127	
	BZX84C-5V	D807,808,810,811	ZENER
	MI402	**D108	
	MI301	**D120	
	IN5404	D124	
	1SV229	D101,102	Varicap Diode
	KDS181(A3)	D402,*126,*128	Diode Switching 
	KDS226(C3)	D551,552 *D800 **D601	
	KDS184S(B3)	D401	
	MMBV105	D701	
	MMBD101	D107	
	MMBD101	D702	

BLOCK DIAGRAM

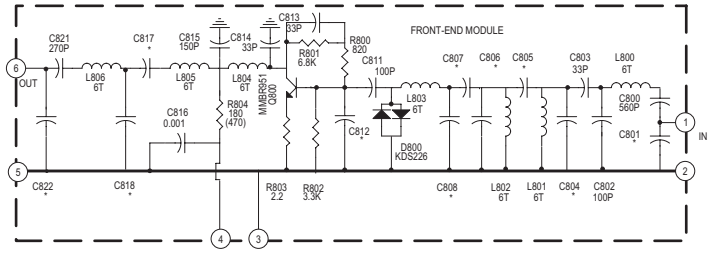


SCHEMATICS - MODULES



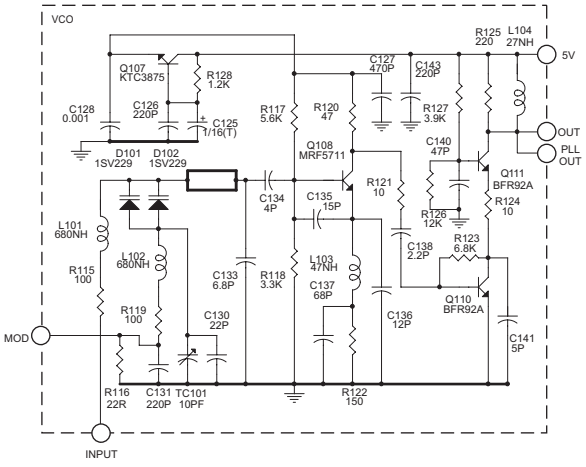
UHF Front End Schematic

(440 - 470MHz)



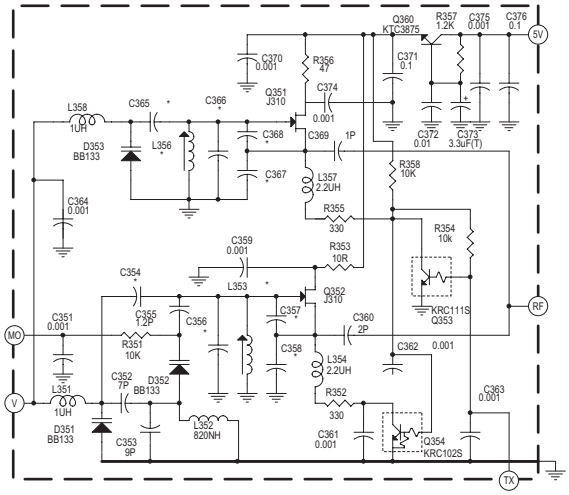
VHF Front End Schematic

(148 - 174MHz)



UHF VCO Schematic

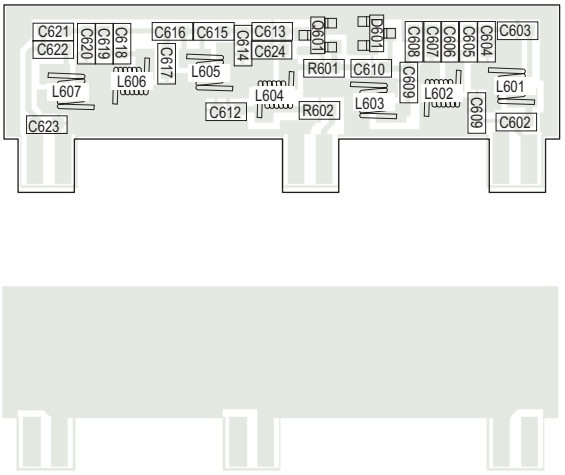
(440 - 470MHz)

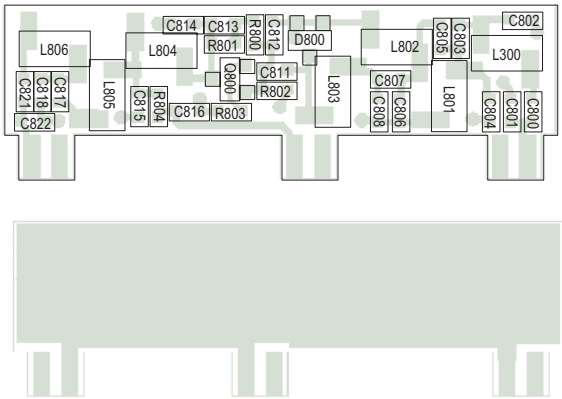


VHF VCO Schematic

(148 - 174MHz)

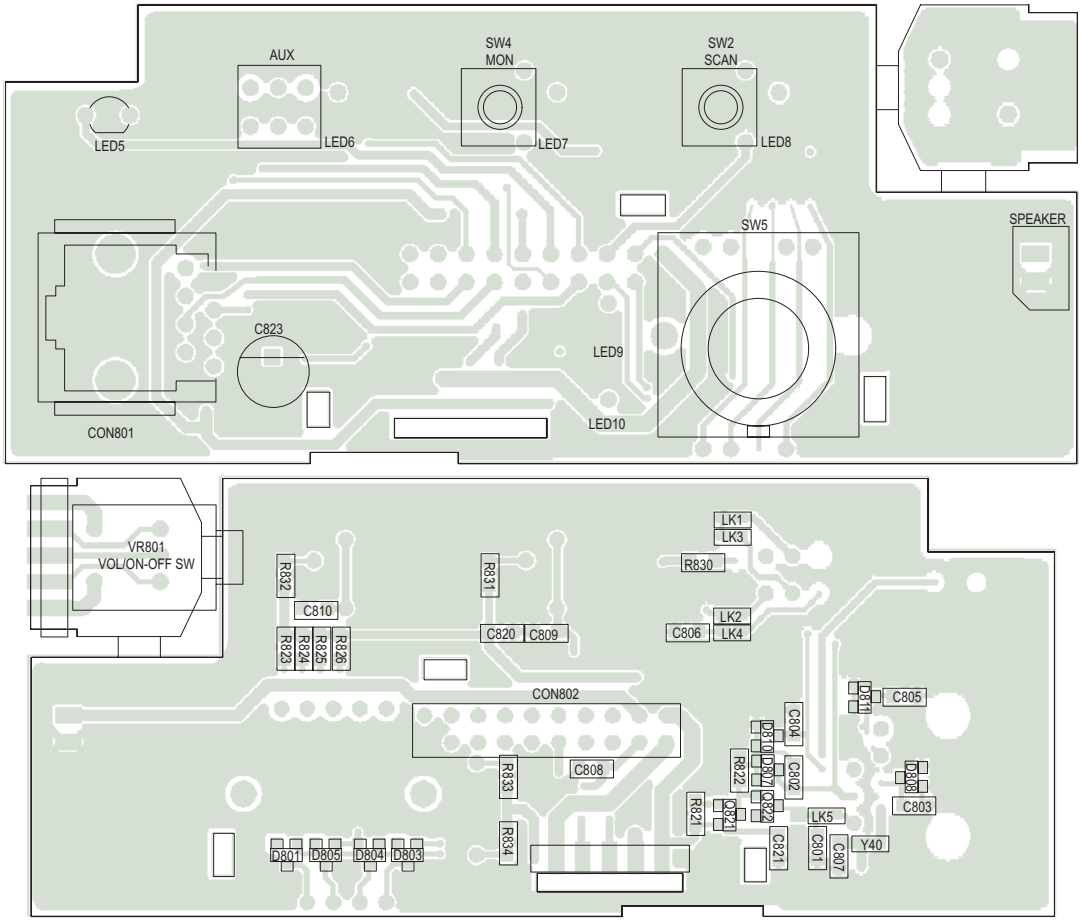
PCB LAYOUT - MODULES





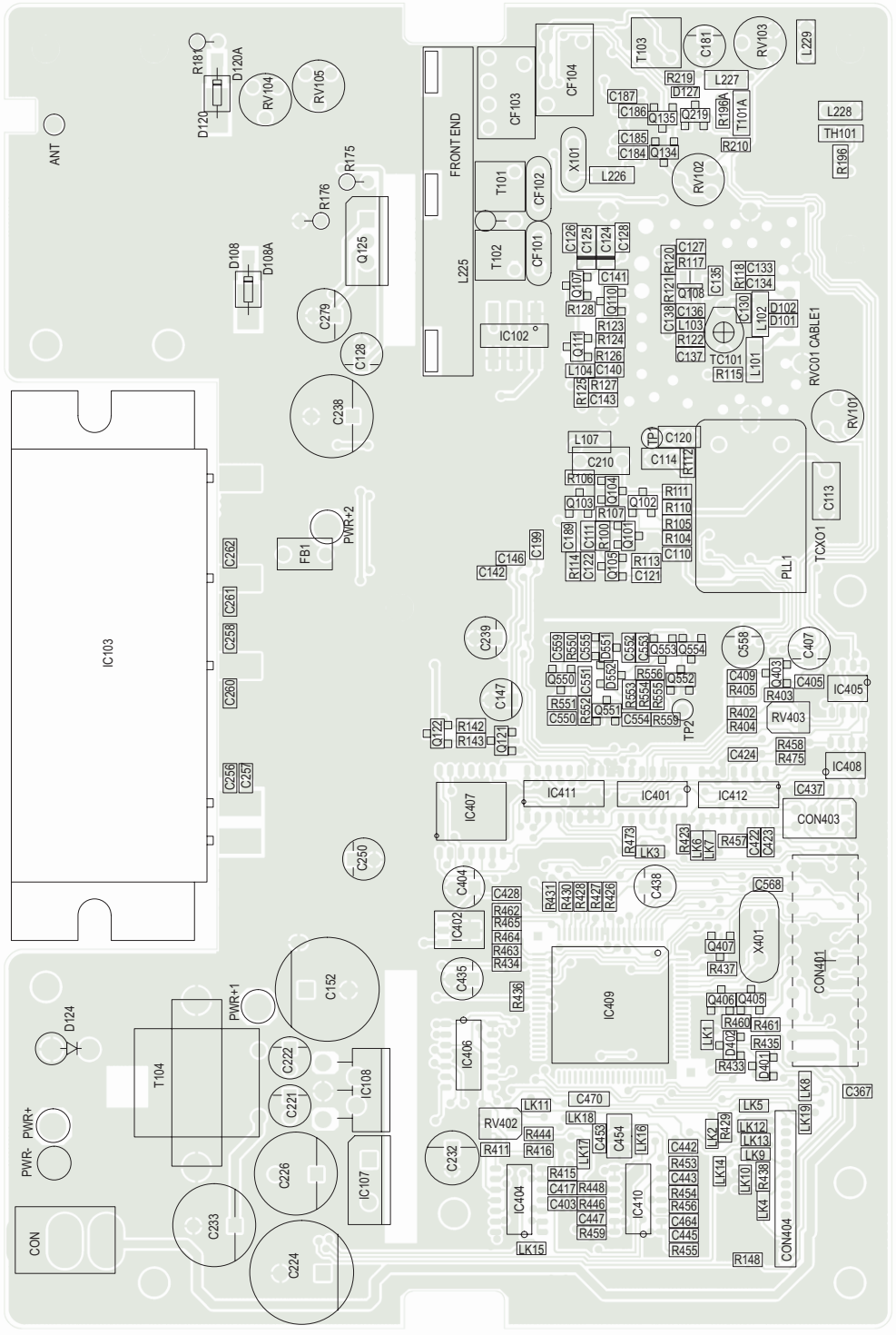
Front End PCB Layout
SM2544 (440 - 470MHz)

Front End PCB Layout
SM2541 (148 - 174MHz)

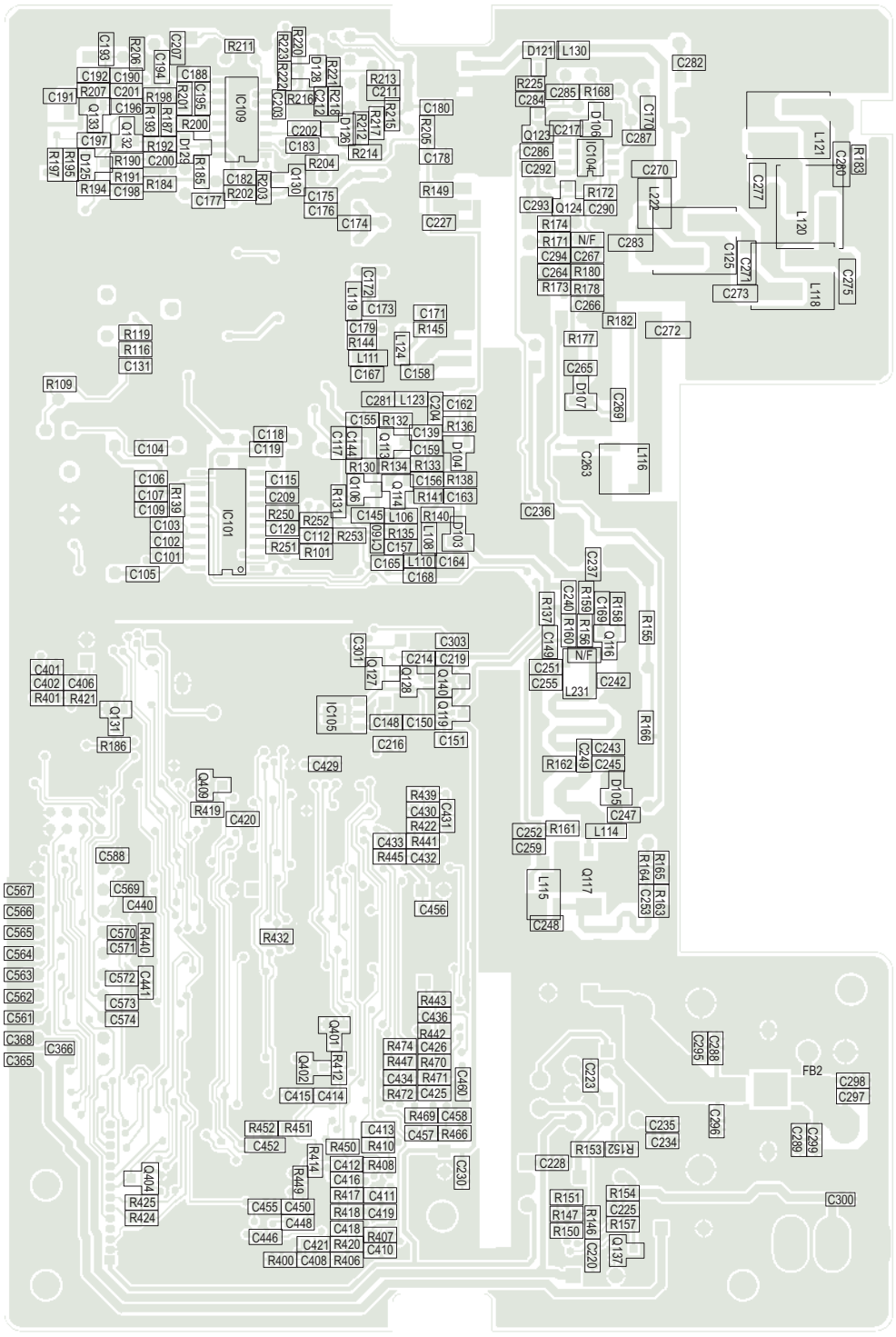


Control Head PCB Layout

MAIN PCB LAYOUT - UHF

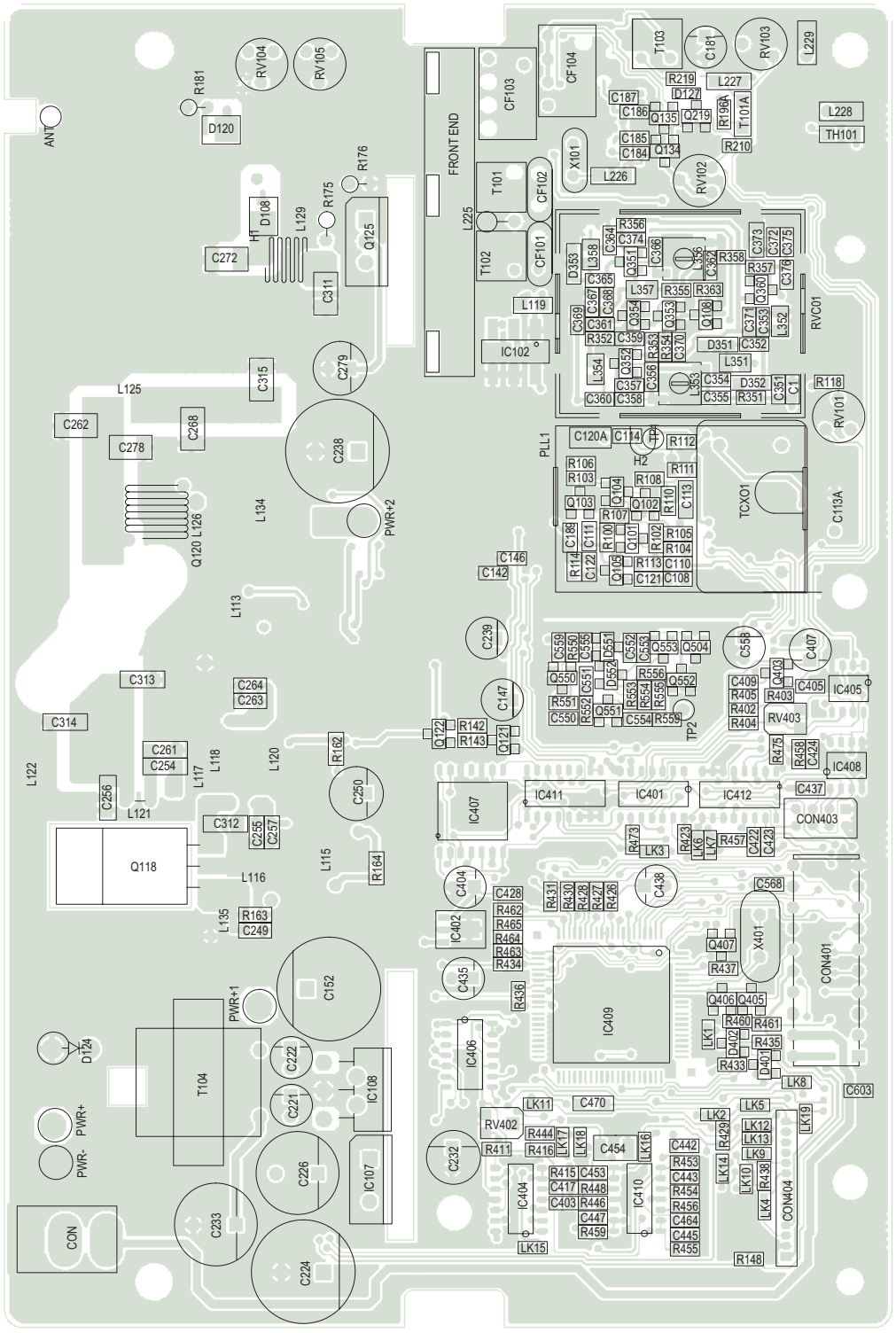


SM2544 Main PCB Layout - Top

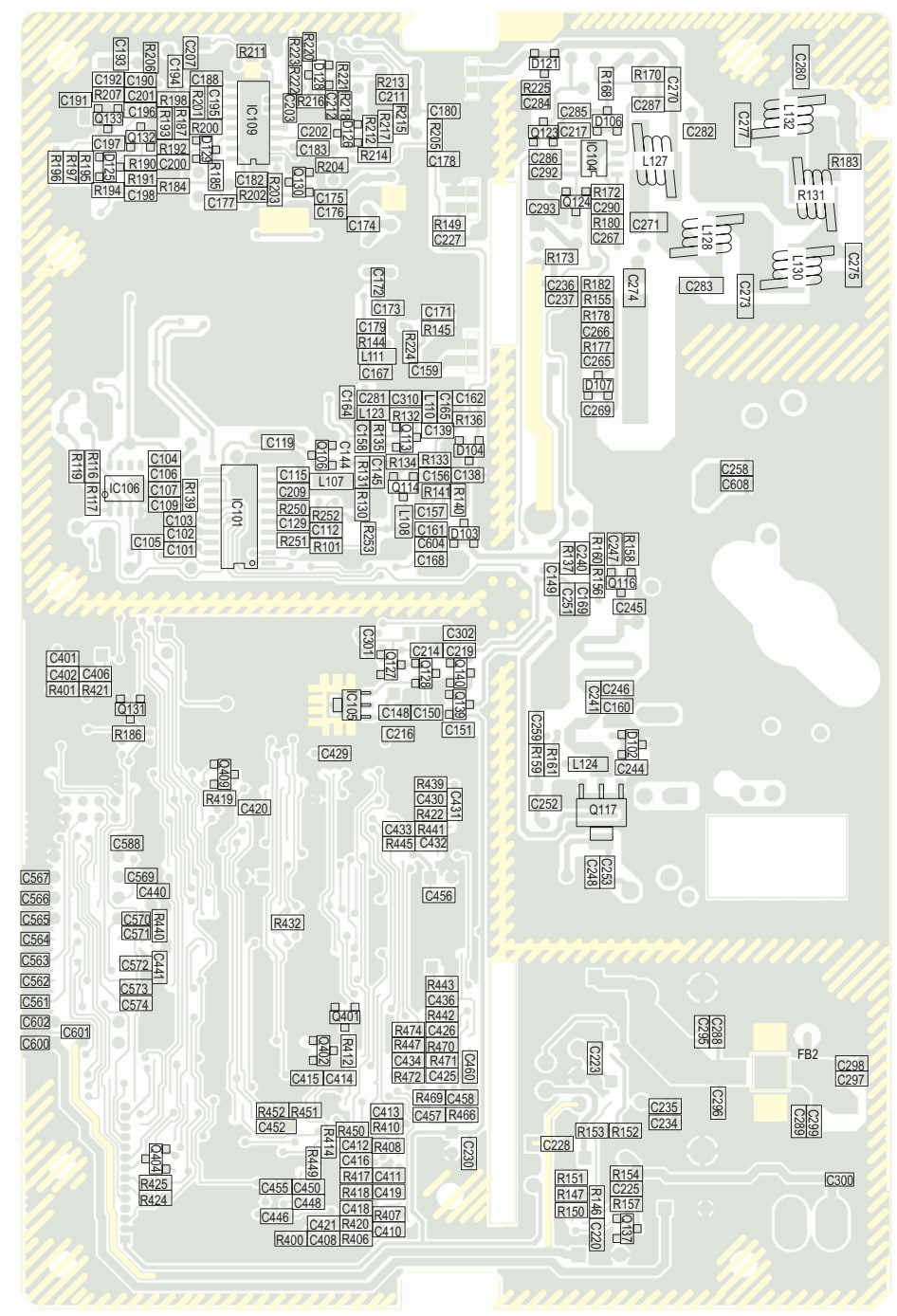


SM2544 Main PCB Layout - Bottom

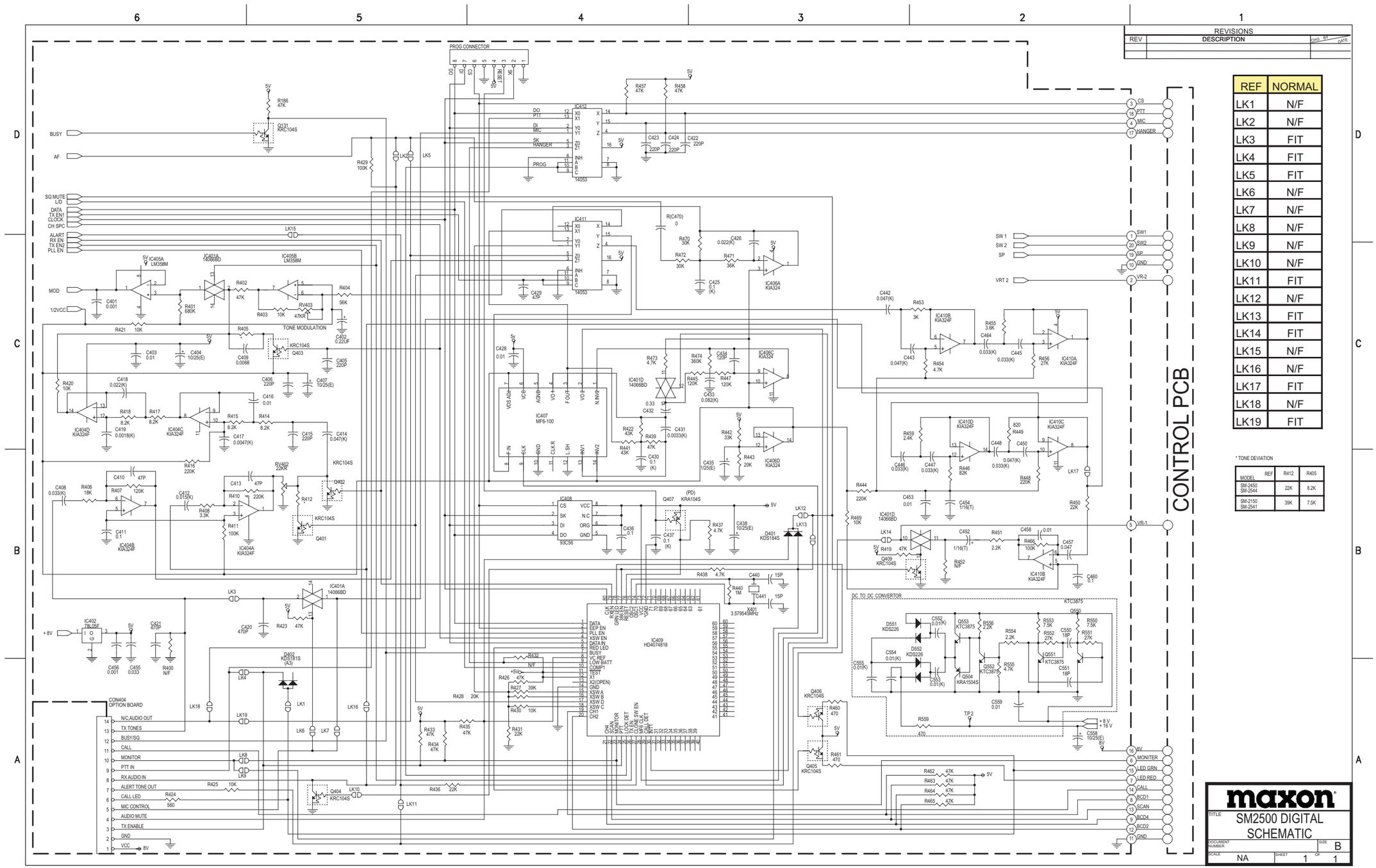
MAIN PCB LAYOUT - VHF



SM2541 Main PCB Layout - Top



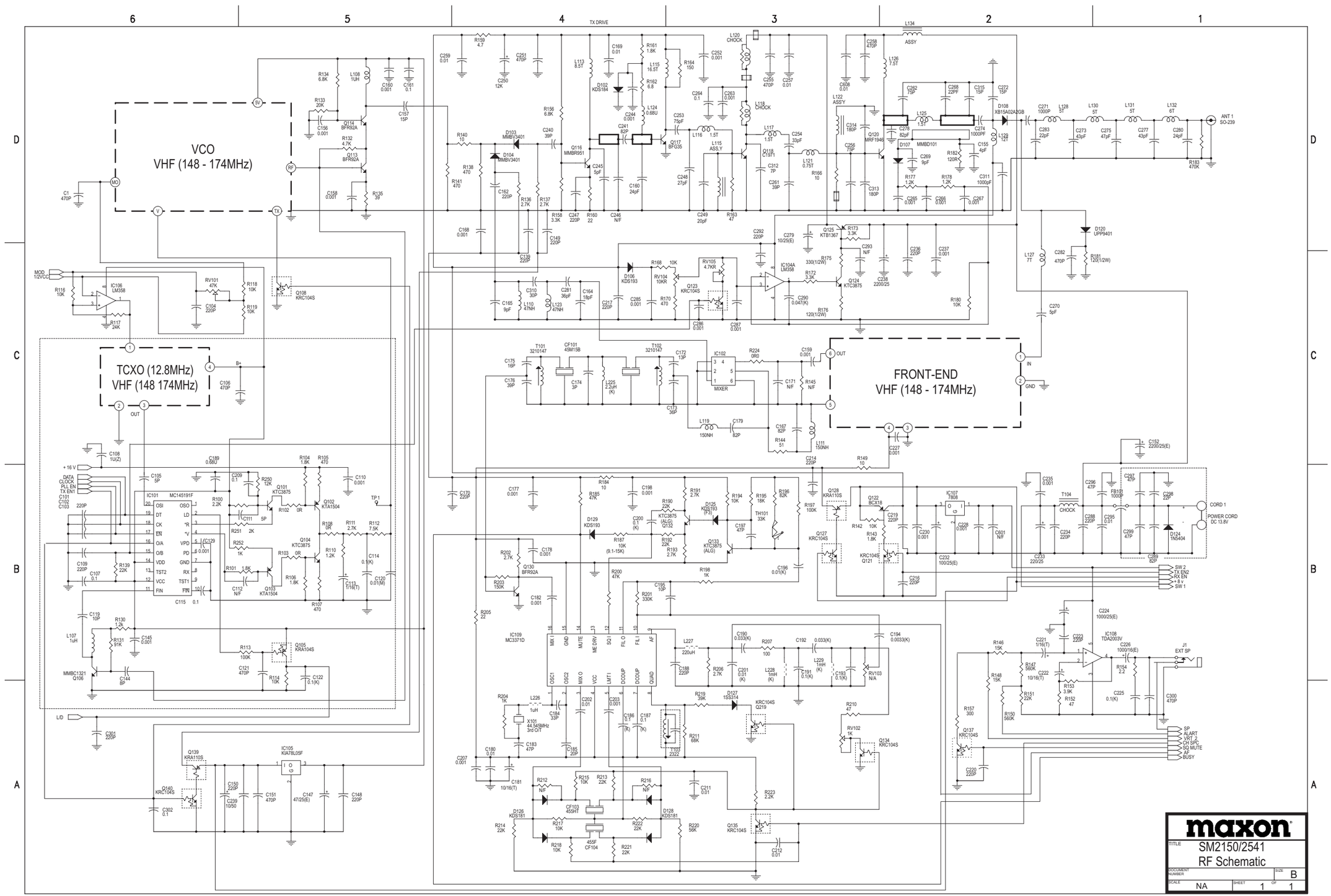
SM2541 Main PCB Layout - Bottom



REF	NORMAL
LK1	N/F
LK2	N/F
LK3	FIT
LK4	FIT
LK5	FIT
LK6	N/F
LK7	N/F
LK8	N/F
LK9	N/F
LK10	N/F
LK11	FIT
LK12	N/F
LK13	FIT
LK14	FIT
LK15	N/F
LK16	N/F
LK17	FIT
LK18	N/F
LK19	FIT

* TONE DEVIATION

MODEL / REF	R412	R405
SM-2450 SM-2544	22K	8.2K
SM-2150 SM-2541	39K	7.5K


VCO
VHF (148 - 174MHz)
TCXO (12.8MHz)
VHF (148 174MHz)
FRONT-END
VHF (148 - 174MHz)
TX DRIVE
MIXER
IC101 MC145191F
IC102
IC104A LM358
IC105 KIA78L05F
IC106 LM358
IC107 7808
IC108 TDA2003V
IC109 MC3371D
Q101 KTC3875
Q102 KTA1504
Q103 KTA1504
Q104 KTC3875
Q105 KRA104S
Q106 KRC104S
Q108 KRC104S
Q113 BFR92A
Q114 BFR92A
Q116 MMBR951
Q117 BFG35
Q118 C1971
Q120 MRF1946
Q122 BCX18
Q123 KRC104S
Q124 KTC3875
Q125 KTB1367
Q127 KRC104S
Q128 KRA110S
Q130 BFR92A
Q133 KTC3875 (ALG)
Q134 KRC104S
Q135 KRC104S
Q137 KRC104S
Q139 KRA110S
Q140 KRC104S
D102 KDS184
D103 MMBV3401
D104 MMBV3401
D106 KDS193
D107 MMBD101
D108 XB15A02AGB
D120 UPP9401
D124 1N5404
D125 KDS193 (F3)
D126 KDS181
D127 1SS314
D128 KDS181
D129 KDS193
T101 3210147
T102 3210147
T103 2322
T104 CHOCK
CF101 45M15B
CF103 45SHT
455F CF104
X101 44.545MHz 3rd O/T
L134 ASSY
L122 ASSY
ANT 1 SO-239
CORD 1
POWER CORD DC 13.8V
MOD
B+
+ 16 V
DATA
CLOCK
PLL EN
TX EN1
L/D
SW 2
TX EN2
RX EN
+ 8 v
SW 1
SP
ALART
VRT 2
CH SPC
SQ MUTE
AF
BUSY
IN
OUT
GND
maxon
SM2150/2541
RF Schematic
B
1
1

TX DRIVE

P/A
57729

VCO
UHF (440-470MHz)

TCXO (12.8MHz)
UHF (440-470MHz)

FRONT-END
UHF (440-470MHz)

maxon	
TITLE	SM2450/SM2544 RF Schematic
DOCUMENT NUMBER	SIZE B
SCALE NA	SHEET 1 OF 1

CONTROL HEAD SCHEMATIC

REVISIONS

REV	DESCRIPTION	CHG BY	DATE

SW-1
SW-2
SP
GND1
VRT2

C815 47pF
SP1 4 OHM 4W

CURRENT LIMITER
Q821 N/F
R822 N/F
C821 N/F
R821 N/F
Q822 N/F
C823 N/F
C808 47pF

VR801 SW POWER

LK5
CON801 MIC
13.8V
8V
PTT
MIC
HANGER
CS
GND

CS
PTT
MIC
HANGER

VRT1
8V
LEDGRN
LEDRED
CALL
SCAN
MONITER
BCD1
BCD4
BCD2
GND

LK1
SW3 AUX
SW2 SCAN
SW4 MONITER
LED5
LK2
LK3
LK4
C806 47pF
C810 47pF
C809 47pF

D807 5.1V
D808 5.1V
D810 5.1V
D811 5.1V
C801 47pF
C802 47pF
C803 47pF
C804 47pF
C805 47pF
C807 47pF

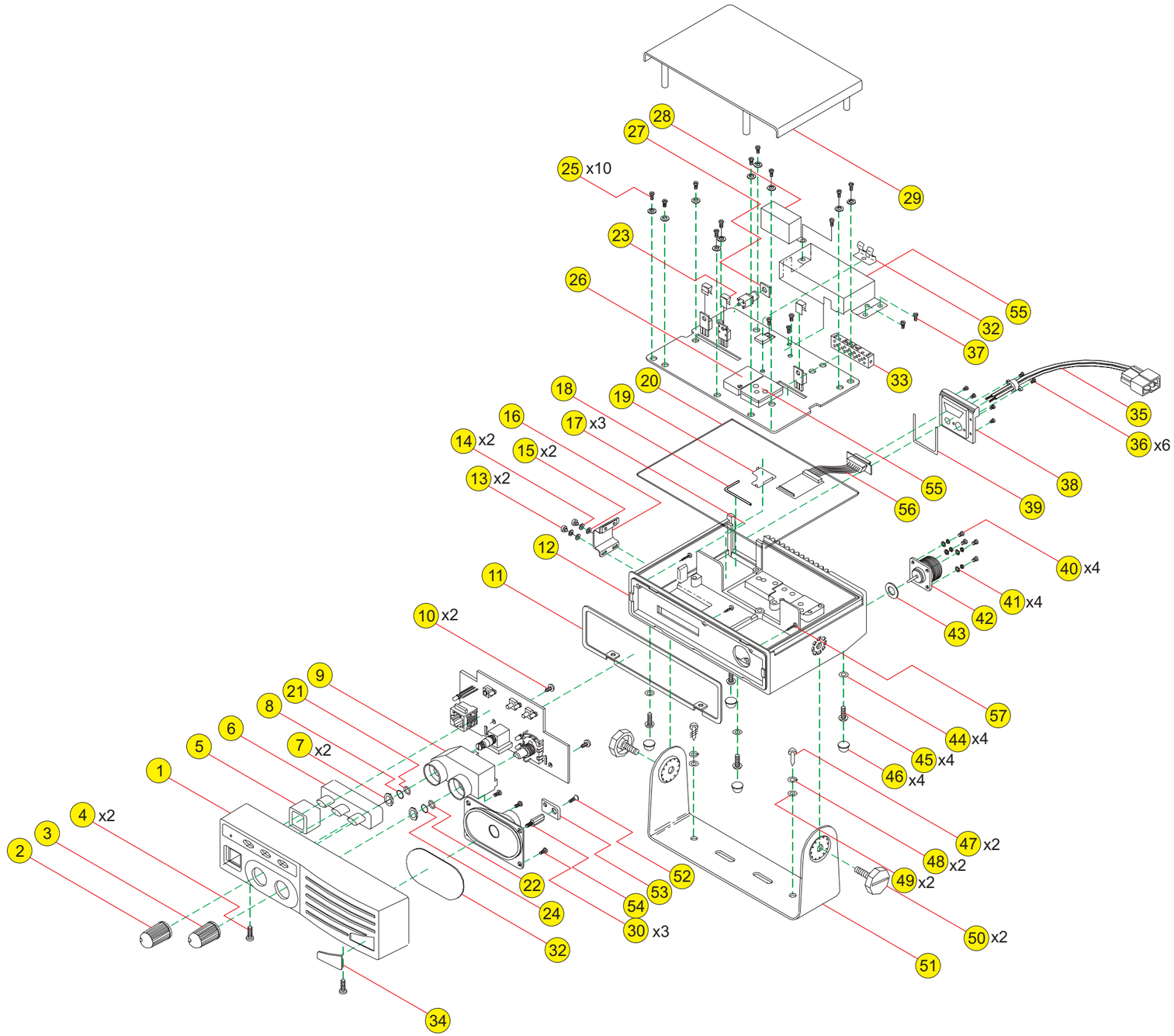
C820 0.1uF
R823 100K
R824 100K
R825 100K
R826 100K
R830 330R
R831 330R
R832 330R
R833 330R
R834 330R
LED6
LED7
LED8
LED9
LED10

LK1	LK2	LK3	LK4
N/F	N/F	FIT	FIT

D801 KDS193
D804 KDS184
D803 KDS193
D805 KDS193

SW5 CHSW

maxon
TITLE: SM-2541/2544 CONTROL HEAD SCHEMATIC
DOCUMENT NUMBER
SIZE: B
SCALE: NA
SHEET 1 OF 1



NO	PART NO.	PART NAME AND DESCRIPTION	Q'TY
1	801-813	ESC	1
2	826-137	KNOB (VOL)	1
3	826-120	KNOB (CH)	1
4	611-388	SCREW	1
5	895-042-A	CAP (JACK)	1
6	895-990	KEYPAD	1
7	650-346	NUT RING	2
8	661-701	WASHER (VOL)	1
9	814-409	ILLUMINATOR	1
10	622-039	BH(+) TAPP SCREW	2
11	895-044-A	GASKET (ESC)	1
12	702-416-B	FRAME	1
13	613-299	BH(+) MACHINE SCREW	2
14	662-310	WASH SPRING	2
15	660-449	WASH SPC	2
16	508-085-A	MIC BRACKET ASS'Y	1
17	621-478	BH(+) TAPP SCREW	2
18	427-411-4A	WIRE EMI GASKET	1
19	772-241	SHIELD PLATE	1
20	427-411-4	WIRE EMI GASKET	1
21	894-650	RING	1
22	895-095	RING	1
23	723-844	BRACKET TR	2
24	662-901	WASHER (CH)	1
25	613-068-S	AUTO SCREW	10
26	772-181	SHIELD CAN	1
27	895-047	GASKET (EXT JACL)	1
28	772-242	SHIELD CAN	1
29	719-020	COVER TOP	1
30	613-253	BH(+) MACHINE SCREW	3
31	752-769	FINGER STRIP	1
32	907-195	FELT	1
33	772-132-A	SHIELD CAN	1
34	795-888	SHEET NAMEPLATE	1
35	504-367-B	2P PLUG ASS'Y	1
36	612-289	BH(+) MACHINE SCREW	6
37	600-798	BH(+) MACHINE SCREW	2
38	723-823	BRACKET TR	1
39	809-043	GASKET (BRKT)	1
40	613-755-SF	(+)AUTO SCREW	4
41	895-075	RUBBER WASHER	4
42	421-677-7	CONNECTOR	1
43	895-041	RING	1
44	895-075	RUBBER WASHER	4
45	613-764-F	(+)AUTO SCREW	4
46	893-700	RUBBER FOOT	4
47	625-007	TH(+) TAPP SCREW	2
48	662-606	WASHER SPRING	2
49	661-605	WASHER (FLAT)	2
50	600-051	SECURING SCREW	2
51	725-834	BRACKET	1
52	613-174	FH(+) MACHINE SCREW	1
53	752-732	PLATE (ESC MTG)	1
54	853-251	BSBM NI PLATE	1
55	772-179	SHIELD CASE (FOR VCD)	1

EXPLODED VIEW

INDEX