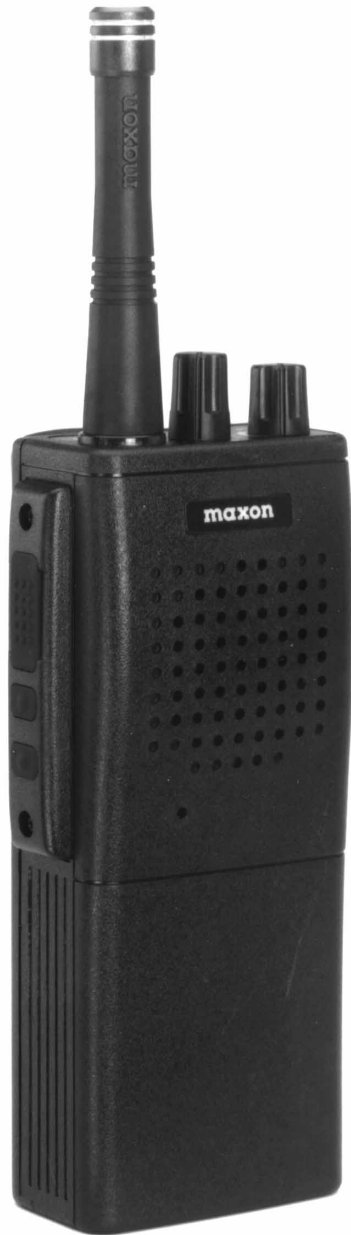


**SP-130 / SP-140**

**maxon<sup>®</sup>**

*A World of Communications*

**SERVICE  
MANUAL**



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**SPECIFICATIONS**

**GENERAL**

<b>Equipment Type</b> .....	Hand portable
<b>Band</b> .....	UHF/ VHF
<b>Channel Spacings</b> .....	12.5 kHz, 25 kHz programmable
<b>RF Output Power</b> .....	5/ 1 watt
<b>Modulation Type</b> .....	F3E
<b>Audio Power</b> .....	400 mW (Ext with 8 ohm) 400 mW (Int with 2 ohm)
<b>Intermediate Frequency</b> .....	45.1 MHz & 455 kHz
<b>Number of Channels</b> .....	16/ 4
<b>Frequency Source</b> .....	Synthesizer
<b>Operation Rating</b> .....	Intermittent 90 : 5 : 5 (Standby: RX: TX)
<b>Power Supply</b> .....	Rechargeable Nickel-Cadium Battery, 7.5 VDC +/- 10 %

**TEMPERATURE RANGE**

<b>Storage</b> .....	From - 40° C to + 80° C
<b>Operating</b> .....	From - 30° C to + 60° C

**CURRENT CONSUMPTION**

<b>Off</b> .....	< 1 mA
<b>Standby (Muted)</b> .....	< 30 mA (Battery Save On) < 60 mA (Battery Save Off)
<b>Unmuted, 100 % Max AF Power</b> .....	< 500 mA
<b>Transmit 5 Watt RF Power</b> .....	< 2.4 A

**BATTERY LIFE (5-5-90% Duty Cycle)**

<b>1200 mAh</b> .....	8 Hrs @ 5 W
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## FREQUENCY BANDS

	RX	TX
VHF: V2	148.000 - 174.000 MHz	148.000 - 174.000 MHz
UHF: U2	440.000 - 470.000 MHz	440.000 - 470.000 MHz

## DIMENSIONS

Radio ..... (141mm)H x (58 mm)W x (37 mm)D

## WEIGHT

Radio ..... 215 grams

With 1200 mAh Battery..... 465 grams

## TRANSMITTER

Carrier Power..... High: 5.0W  
Low: 1.0W

## AUDIO FREQUENCY DEVIATION

### Without Subaudio Tone Modulation:

25 kHz Channel Spacing ..... Max.  $\pm 5.0$  kHz

12.5 kHz Channel Spacing ..... Max.  $\pm 2.5$  kHz

### With Subaudio Tone Modulation @ 10 % Peak Deviation

25 kHz Channel Spacing ..... Max.  $\pm 5.0$  kHz

12.5 kHz..... Max.  $\pm 2.5$  kHz

Audio Frequency Response..... Within  $\pm 1/-3$ dB of 6dB octave

## ADJACENT CHANNEL POWER

25 kHz ..... < 70 dBc

12.5 kHz..... < 60 dBc

Conducted Spurious Emission ..... < -60 dBc

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**Transmitter Audio Distortion (Without CTCSS).....** < 5% @ 1 kHz

## **Hum & Noise:**

**12.5 kHz Channel Spacing .....** > 40 dB (with PSOPH)

**25 kHz Channel Spacing .....** > 40 dB (with no PSOPH)

**Load Stability .....** No osc at  $\pm$  10:1 VSWR all phase angles and suitable antenna

## **Peak Deviation @ 1 kHz (Nom. Dev +20dB)**

**25 kHz Channel Spacing .....** Max. 5.0 kHz

**12.5 kHz Channel Spacing .....** Max. 2.5 kHz

## **RECEIVER**

**Sensitivity (12dB Sinad) .....** UHF: < -117 dBm(.31 $\mu$ V)

VHF: < -118 dBm(.28 $\mu$ V)

**Amplitude Characteristic .....** <  $\pm$ 3 dB

## **Adjacent Channel Selectivity:**

**25 kHz Channel Spacing .....** >60 dB

**12.5 kHz Channel Spacing .....** >50 dB

**Spurious Response Rejection .....** 70 dB

**Intermodulation Response Rejection.....** 65 dB

**Temperature Stability .....** 0.0005% (-30°C to +60°C)

**Conducted and Radiated Spurious Emission .....** Per FCC and IC Rules and Regulations

**AF Distortion .....** < 5%

**Frequency Response .....** 6 dB/octave de-emphasized response in the range 300 Hz - 3000 Hz

## **RX Hum & Noise:**

**25 kHz .....** < 40 dB

**12.5 kHz .....** < 40 dB

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## RX TONE DEMODULATION CHARACTERISTICS

### SUBAUDIO TONES - CTCSS

Tone Range ..... 67 Hz to 250.3 Hz

Non-Standard Tones ..... 50 Hz to 260 Hz

- *Due to continuing research and development the company reserves the right to alter these specifications without prior notice.*

## INTRODUCTION

The SP-130 & SP-140 Series of portable radios from Maxon, utilizes the latest technology in its design and manufacturing. Both the VHF and UHF models are PLL (Phase Lock Loop Synthesizer) / microprocessor controlled, and offer 1 or 5 watts of power with 4 & 16 channel capability. Multiple functions including Scan, CTCSS / DCS signaling and 12.5 & 25 kHz channel spacing are standard in these fully programmable wide bandwidth handheld units.

## FEATURES

### Main Features

- *Wideband*
- *Scan Mode*
- *Busy Channel Lockout/Marked Idle Enable*
- *Standard/Non-Standard CTCSS/DCS Signaling*
- *Transmit Time-Out Timer/Tx Inhibit*
- *Beep Tone Enable/Disable*
- *Low Battery Indication*
- *Memory Protect*
- *External Option Detect*
- *5/1 Watts Programmable RF Power*
- *Battery Save Circuitry*
- *16 Channels*

### Wideband

This software is made to work and control the wide band receiver/transmitter boards.

### Scan Mode

During programming of the radio, any channel can be selected as a scanned channel. When a channel is selected as a scanned channel, it becomes part of the scan list. The scan list will be activated by switching to the channel that was selected as the scan list channel during programming of the system parameters.

The channel that was selected as the scan list channel can still be used as a receive only channel when in scan mode or receive and transmit channel if the channel has been programmed for "wait time transmit".

### Scan Channel Delete

When the unit is in scan mode the monitor button can be pushed to delete a channel from the scan list. If the monitor button is pushed while scanning has stopped to monitor an active channel, that channel will be deleted from the scan list. The channel will remain inactive in the scan list until the scan mode is re-initiated by switching off the scan list channel and switching back to the scan list channel. Any number of channels can be deleted from the scan list in this way. The scan list is always initiated with all the scan list channels active.



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A priority channel can be selected while programming the radio. A priority channel is a channel that can be periodically checked or looked back at while receiving on any channel in the scan list, or in normal operation. It can also be selected for all transmissions during scan mode.

To transmit on a channel in the scan list, the channel selector must be placed on the channel that the transmission is to be made on. As a system programmable option, it is possible to transmit on a scanned channel while the channel selector is on the scan list channel. This is the “wait time transmit” option. If this option is enabled the PTT can be pushed during the scan wait time and the transmission will be on the channel that was just activated. If this option is disabled, the transmission will be on the priority channel (if there is no priority channel programmed the transmission will be inhibited and out-of-lock indicator will be issued).

Any channel, whether it is in the scan list or not, can be designated as a look back channel. When a channel is designated as a look back channel, and the channel is selected, the radio will periodically look back to the priority channel during reception on the selected channel. The radio does not require a scan list to be entered in order to use this function, however, the radio **MUST** have a priority channel selected for the function to work.

- NOTE: The programmer must disallow the programming of a channel as a look back channel if no priority channel was selected.

The channel scan speed is system programmable in a range of 20 milliseconds to 2 seconds in 10 millisecond increments. The default value is 100 milliseconds.

### Scan Delay Time

Scan delay time is system programmable. The scan delay is the time the unit remains on a scanned channel, after receiving or transmitting on that channel. The time is programmable from 1 to 10 in 1 second increments. The default value is 4 seconds.

The scan delay time will be reset each time the receive channel is active and each time the PTT is pushed on that channel. As long as the conversation continues on the channel, the receiver or the transmitter is active before the scan delay time expires, the unit will not resume scanning.

As a programmable option, the LED on the top panel of the unit will flash at the scan rate while in the scan mode. If the “LED scan indication” is programmed to enable the LED will flash. If it is programmed to disable, the LED will not flash.

### Busy Channel Lockout

If this feature is enabled, the unit will not transmit during a received signal, carrier and incorrect tone or carrier and correct tone, a beep tone will sound when the PTT is depressed.

### Marked Idle Enable

If this function is enabled, the unit will transmit provided that the correct programmed CTCSS tone or DCS code has been decoded. This function is essential for repeater operation.

### Normal/Inverted DCS

This function is selected by channel during programming of the radio. During programming of each channel of the radio, a selective signaling option for TX and RX is selected. When the DCS signaling option is elected, it can be selected as either normal or inverted. The selection can be made differently for TX and RX.

### Standard/Non-Standard CTCSS

When programming a channel with CTCSS, any frequency from 55 to 250 Hz can be selected in 0.1 Hz increments. The radio is capable of encoding and decoding two non-standard CTCSS tones.

### Transmit Time-Out-Timer (TOT)/TX Inhibit

The time-out-timer is system programmable for 10 seconds to 990 seconds, in 10 second increments and can also be selected as disabled. The default value is 10 seconds. The addition to this feature is a programmable lock-out-timer that inhibits the radio transmitter for a specified time after the time-out time expires.

When the time-out-timer function is enabled, and the TX inhibit function is disabled, the radio will transmit after the time-out-timer has expired and the PTT button is released and depressed again. With the TOT and TX enabled, the radio will not transmit after the time-out has expired, even if the PTT is released and depressed again. Transmission will not be allowed until the TX inhibit time has expired. TX inhibit time is system programmable from 5 to 60 seconds in 5 second increments. The default value for the TX inhibit is 5 seconds. The radio will beep one time, 5 seconds before the TOT time expires. This will indicate to the user that the transmitter is about to be locked out. If the PTT is released and depressed again anytime before the TOT has expired, the TOT time will be reset. If the beep tone enable/disable is set to disable, the one beep will not be issued. The radio will beep 4 times when the TOT time expires. After the TX inhibit time passes, the radio will beep one final time.

### **VCO Lock Time**

The micro will allow more lock time for the VCO before the out-of-lock beep indication.

### **Low Battery Indication**

Low Battery Indication will be changed so that it does not inhibit RX and will allow one transmission after low cell is indicated. Low cell will not be indicated during transmit mode. If the battery goes below specified limits during the TX mode, low cell will be indicated immediately after releasing the PTT button.

After the low cell indication is issued, the transmitter can only be used one time. When the PTT is pushed again and then released, the transmitter is locked out until the unit is powered down and then powered back up.

### **Memory Protect**

The software is such that if the radio is inadvertently put into program mode it will not lose the contents of the EEPROM memory. Data will only move in and out of the memory when the programmer is attached.

### **External Option Detect**

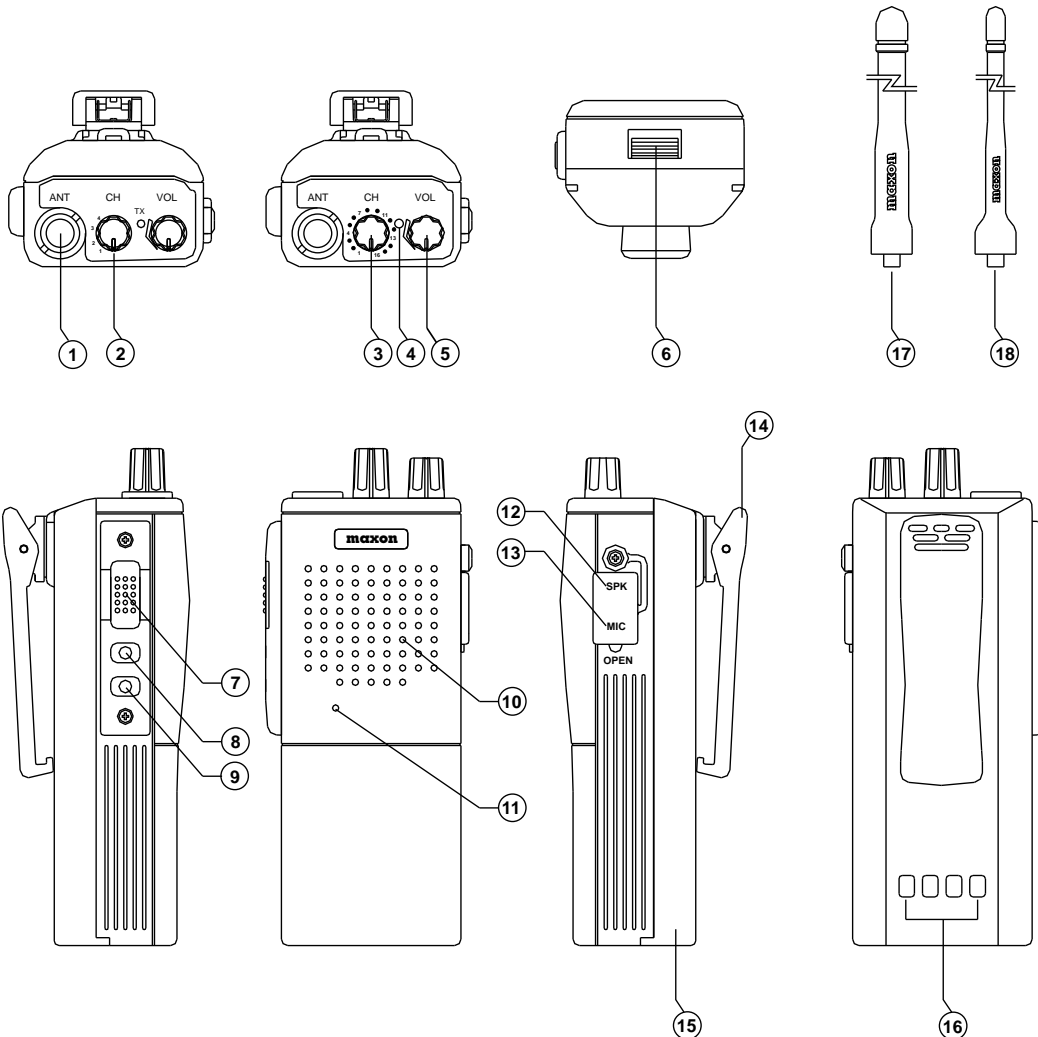
An input to the microprocessor will be available that will indicate to the microprocessor that the external option has been selected. This input should be connected to the external option connector. External option should be selected for each channel. If a channel is selected during programming for external option, this input should be active when the channel is selected during operation of the unit.

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## DESCRIPTION OF CONTROLS

The controls, indicators and antenna connections on the VHF and UHF Scanning Handheld Series radios are all located on the top panel. The accessories socket is located on the radio chassis right hand side. The monitor and PTT buttons are located on the radio chassis left hand side.

ITEM	DESCRIPTION
1. Antenna Connector	1/4" UNEF socket
2. 4 Channel Select Switch	Rotary switch, used to select one of four and to engage in scanning function
3. 16 Channel Select Switch	Rotary switch, used to select one of sixteen and to engage in scanning function
4. Status Indicator (busy TX/BT)	Tri-colored LED indicator
5. ON/OFF Volume Control	Main power switch and volume control. Fully counter-clockwise is OFF position
6. Battery Lock	Used to lock the battery in place
7. Push-To-Talk Button	Push to talk, release to listen
8. Monitor Button	When pressed, monitors the chosen channel
9. Option	Used for controlling installed external option
10. Speaker	Sound reception
11. Microphone	Sound transmission
12. External Speaker	Socket used for external microphone with speaker
13. External MIC, PTT & Charging Jack	Multi-purpose socket used to connect to a remote speaker/microphone, VOX unit or charger
14. Belt Clip	Belt Clip
15. Battery	Power Supply
16. Battery Charger Contacts	Contacts used for charging battery
17. VHF Antenna	Antenna
18. UHF Antenna	Antenna



## THEORY OF OPERATION

The VHF and UHF scanning handheld series radios are comprised of one main PCB. The main PCB contains the transmitter, receiver and control circuits. The control circuits contain the micro controller and associated digital circuits.

### DIGITAL CIRCUITS

IC 411 is a digitally-controlled analog switch which internally consists 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 IC5 is fed into and associated parts, which are the first 2 poles of a 6th order 250 Hz Chebyshev 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 Chebyshev, which consist of IC406C and one of the two operational amplifiers internal to IC407 (MF 6-100) along with associated components. Both the Chebyshev and the Butterworth combines for a 4dB ripple low pass filter when programmed for 250 Hz. 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 preprogrammed frequency. If successful, a Decode occurs, which is shown by a green L.E.D. on the top panel of the VHF and UHF Scanning Handheld 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, 16, and 18 of the micro controller (IC409). The 3-bit digital signal is converted to an analog signal by resistors R478, 479 and 480. 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 IC406B and RV403 (sub-audible gain control), the output of IC406B is then fed to the audio mixer circuit.

### **External Mic/PTT Control Circuit**

The external microphone is connected via 3.6 mm and 2.6 mm 2-pin connector on the right side of the handheld. The internal mic and speaker are disabled by J1 and J2 mechanism. When the Q406 base impedance is low (below 20k ohm), Q406 and Q407 turn on and Q407 collector is low, which is connected to IC409 (micro) Pin-24.

### **Channel Select Circuit**

One of 16 channels(SP-140) or one of 4 channels(SP-130) may be selected, using the channel switch on the top panel. The channel switch encodes the channel number selected into a 4-bit binary code. The binary code plus one 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.

- NOTE: Any of the channel locations may be a scanning position. Refer to Operators Manual for further instructions.

### **Low Battery Indicator Circuit**

When the battery voltage drops below 5.4 VDC, D403 and Q417 turn on. The micro controller disables the transmitter and at the same time enables the red LED and sends an alert tone to warn the user. The battery should be replaced or recharged at this time (one tx allowed after low battery).

### **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 (8x256) capacity and data is written and read serially.

### **High Pass Filter**

The high pass filter is an 8-pole, 1 dB Chebyshev active filter that comprises IC410 and associated components. The de-emphasis is provided by resistor R451 and capacitor C471.

Receive audio is passed to IC410 by Pin 4 of IC411 where sub-audible tones below 300Hz are removed. Mic audio is also fed into IC410 via IC 411 (Pin 4) where sub-audible voice products below 300Hz are also removed.

### **Mute (squelch) Circuit**

The mute circuit which is controlled by the output of IC409 (micro) Pin 77 (386EN) is connected to Q34 via R122 which

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mutes the LM386IC on the RF circuits. Pin 77 also controls IC402B which mutes the audio path to the RF circuits.

### **TX Audio And Filter Circuits**

The TX audio from the internal mic or external mic is fed into IC411 (Pin 3). The TX audio is output on Pin 4 (IC411) and into the high pass filter (IC410), where sub-audible voice products are removed. The TX audio output from IC410 is fed into IC404D & C, with associated parts form a mic amplifier and limiter. The output from Pin 8 IC404C is fed to RV402 (TX Modulation Level Adjust) and fed into IC404A & B to form a 3k low pass filter. The output of IC404A (Pin 1) is then fed into the Audio Mixer Circuit.

### **Analog Ground Supply**

IC406D supplies (2.0V) to operational amplifiers circuits.

### **Audio Mixer And Inverter**

IC405A is an audio mixer where audio and sub-audible tones are combined. RV401 is used as a balance control. IC405B is an inverter.

### **Monitor**

The unit will contain a switch mounted on the PTT assembly for monitor function. This will be enabled or disabled by programming software.

## **RF CIRCUITS**

### **Transmitter**

The transmitter is comprised of:

1. Buffer
2. P.A. Module
3. Low Pass Filter
4. Antenna Switch
5. A.P.C. Circuits

### **Buffer**

VCO output level is -6 dBm and amplified to +10dBm (UHF), +6dBm (VHF). The buffer consists of Q16 and Q17 for isolation and gain.

### **P.A. Module**

The P.A. Module consists of Q501, Q502 and Q503. Three stage amplifier Q501 amplifies the TX signal from +10 dBm to 100 mW. Q502 is amplified to 1.0W. Q503 amplifies to 5W and then matched to 50 OHM using the L.C. network, thereby reducing the harmonics by -30 dB.

### **Low Pass Filter**

L7, L8, L11, C72, C73, C74 and C75 are the 7th order Chebyshev low pass filter. Unwanted harmonic are reduced by -70 dBc.

### **Antenna Switch**

When transmitting, the diodes D5 and D6 are forward biased enabling the RF signal passage to the antenna. D6 is shorted to ground inhibiting the RF signal to the front end. In receive the diodes D5 and D6 are reversed biased passing the signal from the antenna through L13 and C83 to the front end without signal loss.

### **Automatic Power Control (APC) Circuits**

The APC circuit containing the variable resistors RV1, RV3, IC3 and Transistors Q18,Q19,Q21 and Q22. The current from the collector of Q503 is detected at R109, it is converted to voltage at IC3A and compared with the reference voltage at IC3B. In transmit (+5V) is applied to the input of IC3B via the potential divider R45 and R46. The differential signal at the output of IC3B is passed to Q21 and Q22, This voltage controls collector voltage of Q502 that produces a constant power output. RV1 is used to adjust the high power and RV3 is used to adjust the low power.

## RF CIRCUITS PLL SYNTHESIZER

### **12.8 MHz TCXO**

The TCXO contains the 3-stage thermistor network compensation and crystal oscillator and modulation ports. Compensation is +/-5 PPM or less from -30c to +60c.

### **PLL IC Dual Modules Prescaler**

Input frequency of 12.8 MHz to IC2 MC14519 pin 20 is divided to 6.25 kHz or 5 kHz by the reference counter, and then supplied to comparator. RF signal input from VCO is divided to 1/64 at prescaler in IC2, Divided by A and N counter in IC2 to determine frequency steps, and then supplied to the comparator. PLL comparison frequency is 6.25/5 kHz so that minimum programmable frequency step is 5/6.25 kHz. A and N counter is programmed to obtain the desired frequency by serial data in CPU. In comparator, the phase difference between reference and VCO signals is compared. When the phase of reference frequency is leading, Fr is output, but when VCO frequency is leading, Fv is the output. When  $F_v = F_r$ , phase detector out is very small 0v pulse. 64/65 modulus prescaler is comprised in IC2, and has two output ports:

Port A pin 16: tx enable 2

Port B pin 15: prescaler power save control in pll IC pin 13 labeled test2 allows the technician to see the output of the dual modules pre-scaler for trouble shooting purposes, no connection should be made to this pin.

### **Level Shifter & Charge Pump**

The charge pump is used for changing output signals Fr, Fv at PLL IC from 0-5v to 0-12v necessary for controlling vco.

### **Reference Frequency LPF**

The Loop Filter contains R12, C21 and C22. LPF settling time is 12 mS with 1 kHz frequency. This also reduces the residual side-band noise for the best signal-to-noise ratio.

### **DC to DC Converter**

The DC to DC converter converts the 5v to 14-16v to supply the necessary voltage for wide range of frequencies in the VCO.

### **VCO**

The VCO consist of an RX VCO and TX VCO. Is switched TX/RX by power source. It is configured as a colpits oscillator and connected to buffer as cascade bias in order to save power.

The varicap diode D201/D301 are low-resistance elements and produce a change in frequency with a change in reverse bias voltage (2-11v). L203/L303 are resonant coil, which changes

the control voltage by the tuning core. D202 modulation diode, modulates the audio signal. C204 compensate for the non-linearity of the vco due to modulation diode, and maintain a constant modulation regardless of frequency.

## RECEIVER

### **Front End**

The receive signal is routed backward through the low pass filter, then onward to Pin 1 of the Hybrid Receiver Front End Module to a bandpass filter consisting of (VHF C622 through C608, L607 through L604) and (UHF C601 through C610, L601 through L603) is coupled to the base of Q601 which serves as an RF amplifier. Diode D601 serves as protection from static RF overload from nearby transmitters. The output of Q601 is then coupled to a second bandpass filter consisting of (VHF C607 through C601, L603 through L601) and (UHF C612 through C623 and L604 through L607). The output of Pin 6 is then coupled to the doubly balanced mixer D9. The receiver front end module is factory pre-tuned and requires no adjustment. Repair is effected by replacement of the entire module of the proper banded module. These are VHF 148 MHz to 174 MHz and UHF 440 MHz to 470 MHz. The receiver front end module signal pins are as follows:

1. RF Input
2. Input Ground
3. N/A
- 4.. Receive +5V
5. Ground
6. Output

### **First Mixer**

D9, T2 and T3 are double balanced mixers which provide the 45.1 MHz intermediate frequency output. The filtered frequency from the front end module is coupled to T2. The 45.1 MHz IF output is matched to the input of the 2-pole monolithic filter by L14, L31, C69 and C97. The crystal filter provides a bandwidth of +/-7.2 kHz from the operating frequency providing a high degree of spurious and intermodulation protection. Additionally, a 90 MHz trap (XF1) is also placed at the filter output to provide additional attenuation of the second order IMD. The output of the filter is impedance matched by C97 and C69 to the base of the post of filter IF amplifier Q25.

### **Second Oscillator Mixer Limiter And FM Detector**

The output of the post filter amplifier, Q25, is coupled, via C98 to the input of IC5 (MC3371). IC5 is a monolithic single conversion FM transceiver, containing a mixer, the second local oscillator, limiter and quadrature detector. Crystal X1 44.645 MHz is used to provide resultant 455 kHz signal from

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the output of the second mixer. The mixer output is then routed to CF1 (455F) or CF2 (455HT). These ceramic filters provide the adjacent channel selectivity of 25 kHz or 12.5 kHz bandwidth.

### Squelch (mute) Circuit

The squelch circuit switches off the power amplifier when no audio signal is present. The squelch circuit consists of a 16 kHz band pass filter and a noise detector circuit.

### 16 kHz Band Pass Filter

The audio signal from Pin 9 of IC5 (MC3371) is filtered by a 16 kHz band pass filter consisting of L16 and L17. The noise in the IF passband is accepted and voice frequencies and their products are rejected. Any noise present at the output of the filter is applied to the noise detector circuit via RV2. RV2 is used to adjust the squelch circuit sensitivity and is normally adjusted to produce a noise squelch opening sensitivity of 10 dB to 12 dB SINAD.

### Noise Detector

The noise detector in conjunction with IC5 consists of Q26, Q27, D8, D11, TH1, and their associated biasing components. Noise fed from the output of RV2 is amplified by Q27, then rectified by D11. This output is then buffered by Q26 and fed to Diode D8, which controls Q24 providing ground to the mute control Pin 14 of IC5.

### Low Pass Filter

A low pass filter formed by C115, C116 and R91 removes any extraneous 455 kHz energy from the AF output of the FM receiver chip.

### Speaker Audio Amplifier

After signal detection and audio filtering, the low level audio is returned to the RF circuit via VR3. This is then routed to Pin 3 of IC6, (LM386N-3), to provide speaker audio. IC6 is enabled by a logic high applied to Q34 which in turn enables Q33, applying power to Pin 7 of IC6.

**MAINTENANCE AND REPAIR**

**GENERAL**

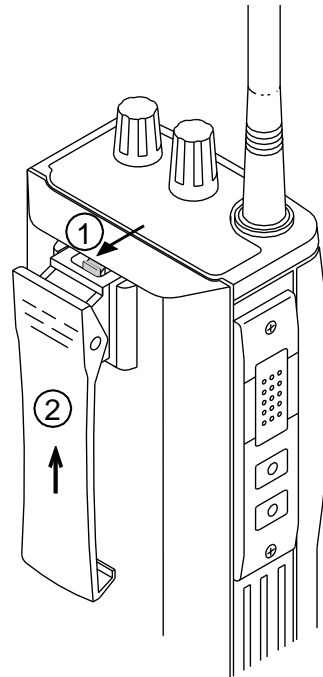
Any repair or adjustment should only be made by or under the supervision of a qualified radio service technician.

When removing or fitting, use the Exploded View and Parts List (Page 51) in conjunction with the following procedures:

**REMOVING & REPLACING THE BELT CLIP**

**Removing the belt clip:**

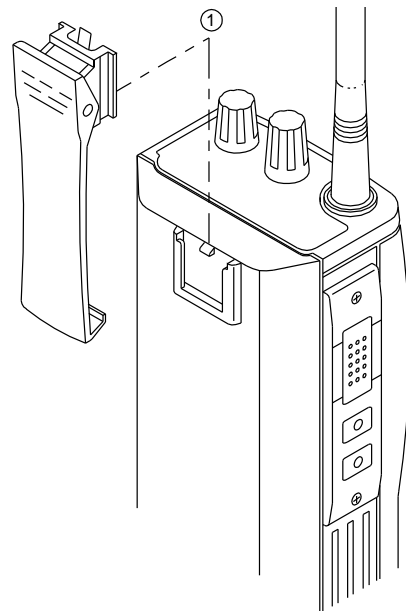
1. Depress the metal release tab located on the top of the belt clip with one hand.
2. With the other hand push the belt clip out of the belt clip rail.



*Figure 1-Belt Clip Removal*

**To replace the belt clip:**

1. With the slides of the belt clip positioned in line with the belt clip guide rails, slide the belt clip into position until a click is heard.



*Figure 2-Belt Clip Installation*



# MAXON SP-130 / SP-140 HAND HELD

## REMOVING & REPLACING THE BATTERY

### To remove the battery:

1. Holding the radio chassis in one hand, press and hold the battery release catch on the bottom side.
2. Using the other hand, slide the battery toward the battery release catch.
3. Remove the battery from the radio.

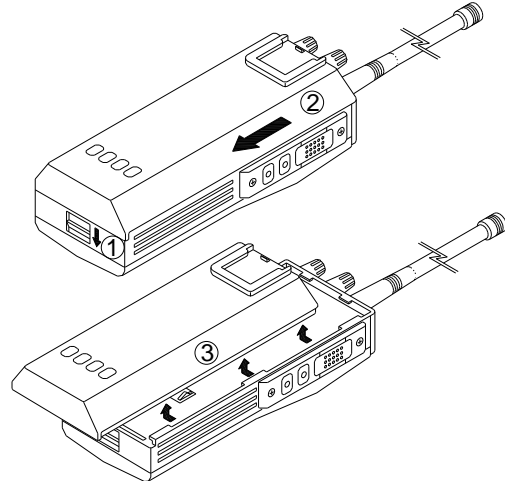


Figure 4-Battery Removal

### To replace the battery:

1. Position the battery in line with the radio battery guide rails.
2. Slide the battery into position until a click is heard.

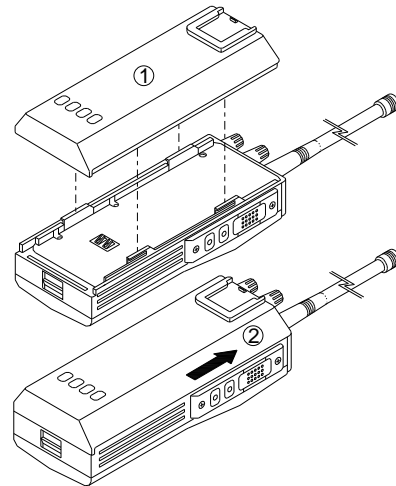


Figure 5-Battery Installation

## REMOVING & REPLACING PTT ASSY.

### To remove the PTT assembly:

1. Remove the 2 screws located at the top and bottom of the PTT switch holder housing. This will allow removal of the PTT holder (A) and PTT pad (B).

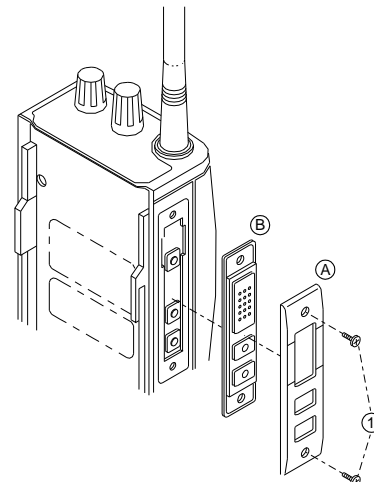
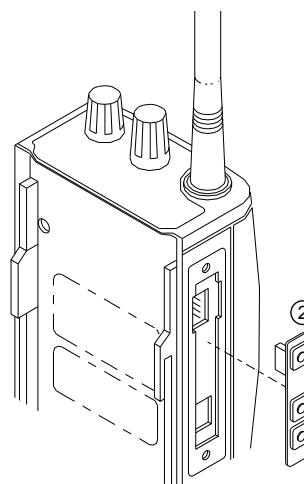


Figure 3-PTT Removal

2. By placing thumb under bottom of the PTT assembly and gently pulling outward, unplug PTT Assembly from Main Board.

**To replace the PTT assembly:**

1. Reverse the steps taken to remove the PTT assembly.
2. Insure that the PTT jack is aligned properly when inserting into Main Board.



*Figure 6-PTT Installation*

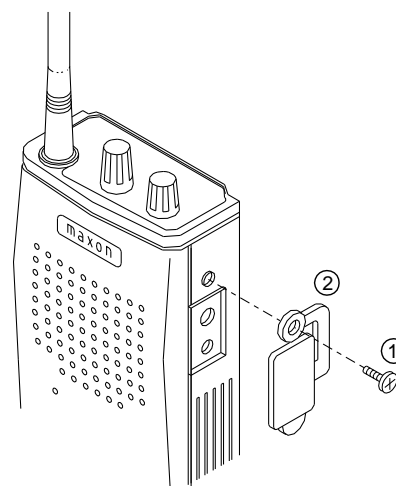
**REMOVING & REPLACING THE DUST CAP**

**To remove the Dust Cap:**

1. Remove the screw located above the SPK/MIC Dust Cap.
2. The Dust Cap can now be easily removed from the radio case.

**To replace the Dust Cap:**

1. Reverse the steps taken to remove the Dust Cap.



*Figure 7-Dust Cap Removal & Installation*

**REMOVING & REPLACING THE ANTENNA & CONTROL KNOBS**

**To remove the Antenna:**

1. Turn the Antenna counterclockwise and remove.

**To replace the Antenna:**

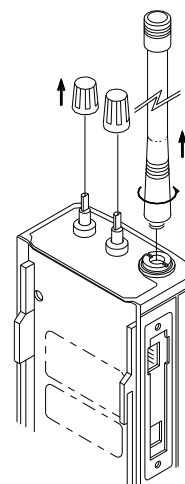
1. Reverse the steps taken to remove the Antenna.

**To remove the Control Knobs:**

1. Grip the control knobs firmly between thumb and index finger and pull in a straight upward direction.

**To replace the Control Knobs:**

1. Reverse the steps taken to remove the Control Knobs.



*Figure 8-Control Knob Removal & Installation*

# MAXON SP-130 / SP-140 HAND HELD

## REMOVING & REPLACING THE BACK COVER

### To remove the Back Cover:

1. Remove battery. (Refer to Removing & Replacing the Battery)
2. Unscrew the six Back Cover mounting screws located on the Back Cover of the radio.

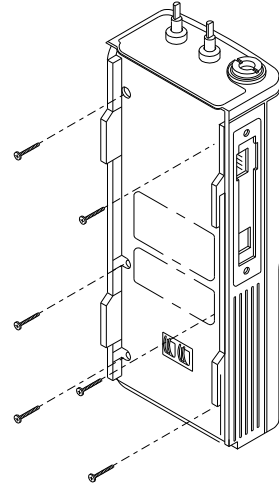


Figure 9-Back Cover Removal & Installation

3. Insert a small straight (Flat Head) screwdriver blade between the Back Cover and the radio chassis.
4. Gently pull backward with the screwdriver until the Back Cover has been unsnapped from the chassis.

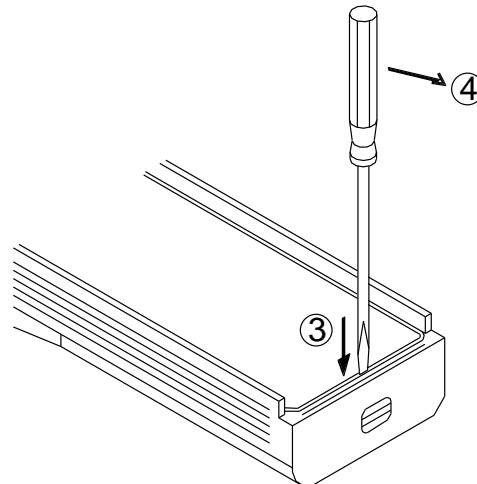


Figure 9A-Back Cover Removal & Installation

5. The Back Cover can now be removed by pulling the Back Cover away from the radio chassis. The self forming gasket ring (A) should remain on the Back Cover.

### To replace the Back Cover:

1. Reverse the steps taken to remove the Back Cover.

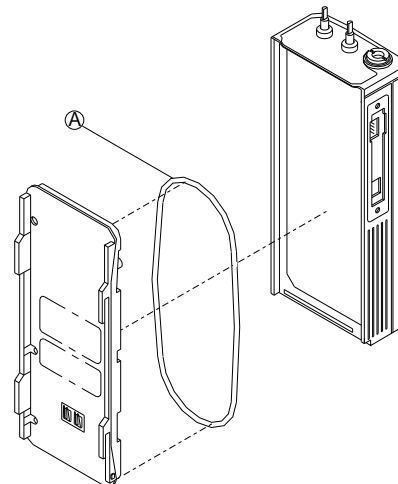
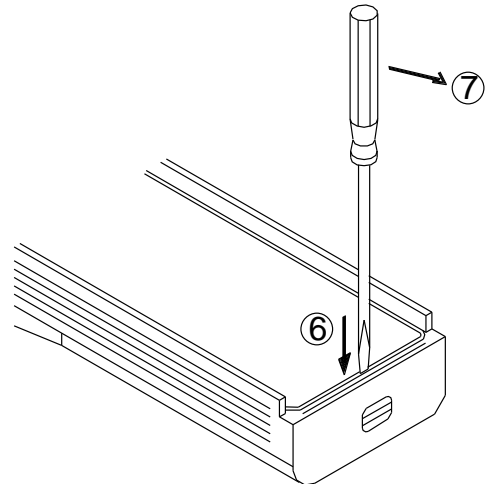


Figure 9B-Back Cover Removal & Installation

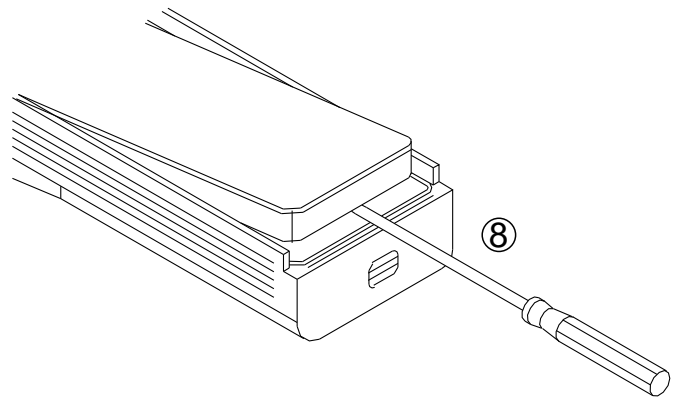
**REMOVING & REPLACING THE MAIN BOARD**

**To remove the Main Board:**

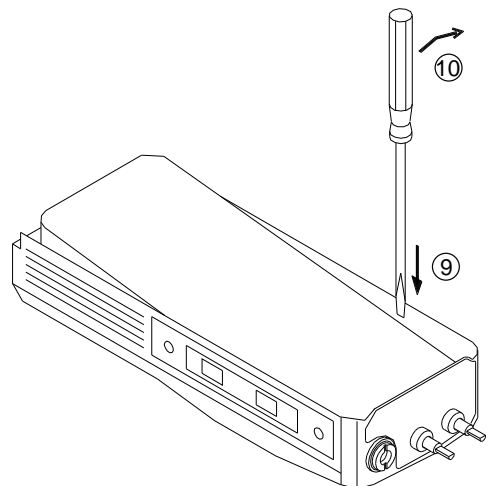
1. Remove the Battery (Refer to Removing & Replacing the Battery).
  2. Remove the PTT Assembly (Refer to Removing & Replacing the PTT Assembly).
  3. Remove the Dust Cap (Refer to Removing & Replacing the Dust Cap).
  4. Remove the Antenna & Control Knobs (Refer to Removing & Replacing the Antenna & Control Knobs).
  5. Remove the Back Cover (Refer to Removing & Replacing the Back Cover).
  6. Insert a small straight (Flat Head) screwdriver blade between the Main Board and the radio chassis.
  7. Gently pull backward with the screwdriver until the Main Board has been unsnapped from the lower section of the chassis.
  8. It may be necessary to pull the Main Board up a little more to gain easier handling for removal.
- **CAUTION:** If performing step 8, insure that the screwdriver is placed on the metal frame of the Main Board and not directly on the Main Board PCB. Damage to the Main Board and Microprocessor could occur.
9. Insert a small straight (Flat Head) screwdriver blade between the Main Board and the radio chassis.
  10. Gently push outward with the screwdriver until the Option Jack is clear of the chassis holes and the Main Board unsnaps from the chassis.



*Figure 10-Main Board Removal & Installation*



*Figure 10A-Main Board Removal & Installation*



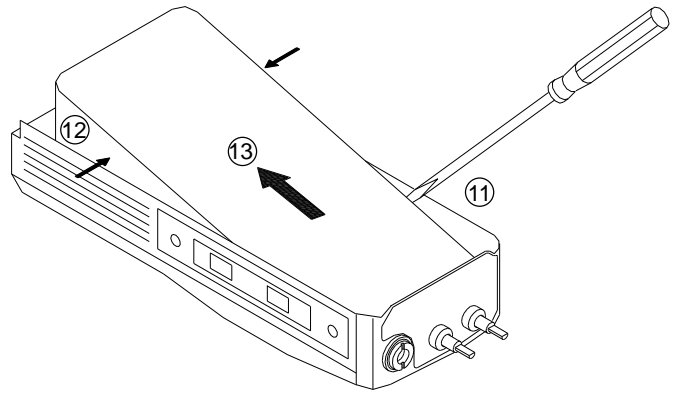
*Figure 10B-Main Board Removal & Installation*

# MAXON SP-130 / SP-140 HAND HELD

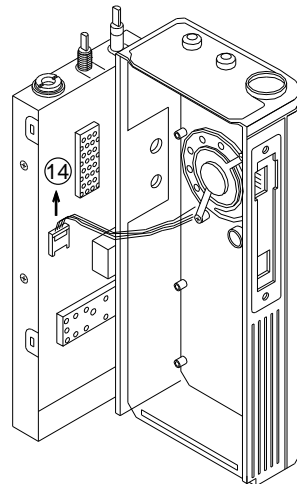
11. Continue to apply slight pressure against the chassis so that the Option Jack will clear the chassis during removal of the Main Board.
  12. Grip the Main Board near the indicated arrows as shown in Figure 10C.
  13. Gently work the Main Board in an up & down motion and pull in the direction indicated by the arrow in Figure 10C.
- CAUTION: Do not use excess force when removing the Main Board from the chassis. Damage to the speaker connection could occur.
  - Note: It is not necessary to remove the stud mount antenna jack from the radio.
14. Remove the Speaker wire connector from the Main Board connector.

## To replace the Main Board

1. Reverse the steps taken to remove the Main Board.
2. When installing the Main Board into the chassis insure that the LED light guide is aligned properly.
3. When installing the Main Board into the chassis, place 2 fingers over the black rubber control knob dust covers to insure that the dust covers do not get pushed out of the appropriate seating position.



*Figure 10C-Main Board Removal & Installation*



*Figure 10D-Main Board Removal & Installation*

## **REMOVING & REPLACING THE DAUGHTER BOARDS**

The Daughter Boards are soldered into the Main Board Assy.

1. Remove the Main Board (Refer to Removing & Replacing the Main Board).
2. Unsolder the appropriate Daughter Board from the Main Board Assembly.

### **To Replace a Daughter Board:**

1. Ensure that the Main Board Assembly and Daughter Board are mechanically clean.
  2. Insert the daughter board in the required position.
  3. Ensure the Daughter Board is properly seated in the Main Board Assembly.
  4. Solder the Daughter Board into position.
- **CAUTION:** To avoid damage to the Main Board Assembly, soldering must be accomplished quickly. Refer to Component Replacement section of manual located on this page.

## **REMOVING & REPLACING THE SPEAKER**

### **To remove the speaker:**

1. Remove the Main Board (Refer to Removing & Replacing the Main Board).
2. Unscrew the two speaker mounting bracket screws from the chassis.
3. Desolder the two pin wire harness from the speaker.
4. Remove the speaker.

### **To replace the speaker**

1. Reverse the steps taken to remove the speaker.

## **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 metalized 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 desoldering 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 metalized 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.

# MAXON

## SP-130 / SP-140 HAND HELD

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.

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.

### 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.

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.

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

## PROGRAMMING

The SP-130 / SP-140 Series portable radios require the QPA-4000 programming cable. With the 25 pin "D" type connector installed on the computer, take the other end of the programming cable and insert it in the receptacle located on the opposite side of the PTT on the radio. For further information, please refer to the SMP-4004C Programming Manual.

### Cloning

Following the steps below, the frequencies and functions can be programmed from radio to radio by using a cloning cable.

1. Ensure that both radios' power switches are in the "OFF" Position.
2. Place master radio (the radio which already has desired program information in the EEPROM) in the data "WRITE" mode by holding the radio's monitor switch and then turning radio power switch to the "ON" position (the green LED on the radio flashes). Release monitor switch on the fourth led flash. (The radio LED will change to alternating red and orange flashes.)
3. Place the slave radio (the radio which is not programmed, or has program information that will be revised) into data "READ" mode by holding monitor switch and then turning the radio power switch to the "ON" position (the green LED on the radio flashes). Release the monitor switch on the third led flash (the LED will change to alternating green and orange flashes).
4. Connect the cloning cable through mic jack.
5. Press the slave radio's monitor switch. The alternating green and orange flashing will stop.
6. Press the master radio's monitor switch. The alternating red and orange flashing will stop. Release the monitor switch, the green led of both radios will flash.
7. After cloning, the slave radio resets and works normally with re-programmed frequency, and the master radio flashes orange led. Press monitor switch, and then the radio will repeat step 2).
8. For cloning other radios, repeat steps 3 through 7.

## ALIGNMENT PROCEDURE

The SP-130 & SP-140 U/V Receiver is by design, broad band, covering UHF(440 to 470 MHz) and VHF(148-174MHz) and should require no special alignment, unless repairs are performed on the receiver portion. The only alignment normally required is to the squelch circuit.

### SQUELCH ADJUSTMENT

1. Select a receiver channel that is programmed for narrow band (12.5kHz) 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 1kHz signal is heard.
4. Adjust the RF signal to the level desired for squelch sensitivity as you monitor SINAD. This is usually 8dB to 12 dB sinad.
5. On the Main board, adjust RV2 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 RV2 was adjusted.
8. Select a receiver channel that is programmed for wide band operation (25kHz).
9. Set the RF signal generator to the receiver frequency. Set the AF modulation signal to 1 kHz at 3K deviation.
10. Adjust the RF output level of the RF signal generator until the 1kHz signal is heard.
11. Adjust the RF signal to the level desired for squelch sensitivity as you monitor SINAD. This is usually 8dB to 12 dB SINAD.
12. On the Main board, adjust RV4 until the squelch is just unmuted (open).
13. Switch off the RF generator (squelch should close).
14. Switch on the RF generator, Squelch should open at the SINAD point where RV4 was adjusted.
15. Disconnect the test equipment.



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Should repairs be required, the following procedures should be applied:

### RX VCO

1. Set the unit to the highest receive frequency, 470 MHz(UHF), 174MHz(VHF) and adjust the VCO L303 to 10 volts.
2. Set the unit to the lowest receive frequency 440 MHz(UHF), 148(VHF) and check that the VCO voltage is above 2.0 volts. Adjust L303 for 2.0 volts.

- *Note: Use TP1 to measure the voltage.*

### RECEIVER

1. Apply a standard test signal to the receiver antenna terminals.
2. Adjust T1 for maximum sensitivity and audio output with minimum audio distortion.

### TRANSMITTER

Connect the unit to a Service Monitor with the power meter setting to the 10 W scale (or autorange).

### TCXO

Set the channel selector to the mid-range frequency 460 MHz, adjust TC701(VHF) on the TCXO board, RV5 (UHF) on the Main board, for a reading of 460 MHz +/-200 Hz (155 MHz VHF models).

### TX VCO

1. Set the unit to the highest transmit frequency, 470 MHz(UHF), 174MHz(VHF) and adjust the VCO L203 to 10 volts.
2. Set the unit to the lowest transmit frequency 440 MHz(UHF), 148(VHF) and check that the VCO voltage is above 2.0 volts. If voltage is below 2.0 volts, adjust L203 for 2.0 volts or more.

### CTCSS, DCS & DEVIATION ALIGNMENT

- 1a. Set the unit to a mid-frequency range and a CTCSS of 67Hz. Push PTT and adjust RV403 for desired CTCSS tone deviation.

- 1b. Switch to a channel with the same frequency and CTCSS of 250.3Hz. Push PTT and adjust RV401 to desired CTCSS tone deviation, same as above step.

- 1c. Switch between the 67Hz channel and the 250.3Hz channel and adjust RV401 until the deviation is the same on both channels. It may be necessary to readjust RV403 to get the desired deviation.

2. Inject a 6mV signal of 1000Hz to the microphone input. This should produce a 3kHz deviation for 25kHz(S) channel spacing and 1.5kHz for 12.5kHz(N) channel spacing, measure transmit distortion, that should be less than 5%. Increase the audio input level to 20mV.

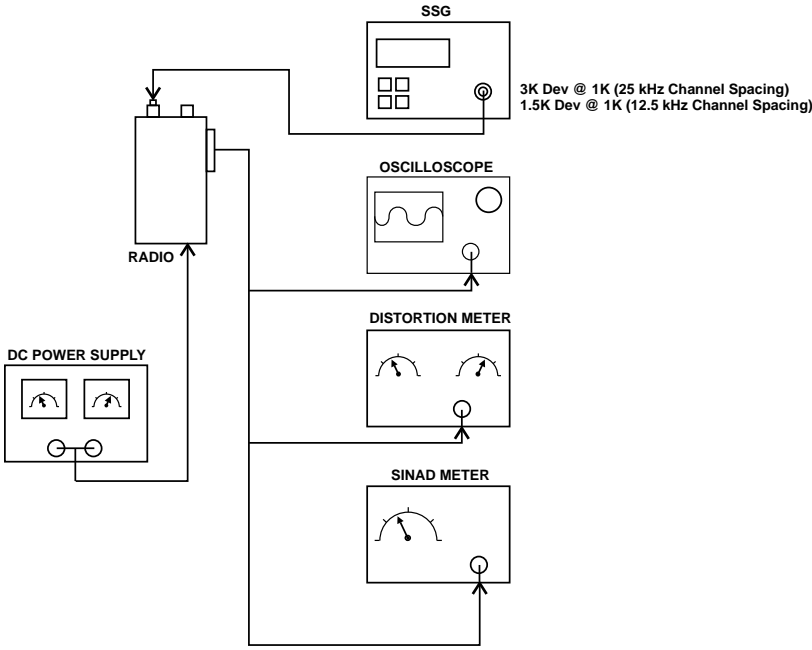
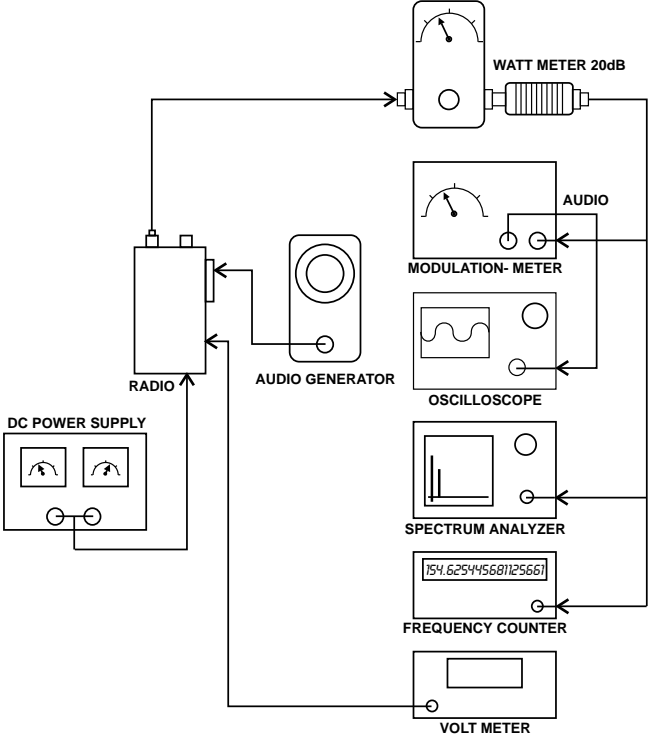
3. Set the deviation by adjusting RV402 to 4.5kHz for 25kHz channel spacing(S) and to 3kHz for 12.5kHz channel spacing(N) on a non-CTCSS or CDCSS channel for the initial setting. Select a CTCSS or CDCSS frequency and verify that the deviation is less than or equal to 5kHz(S) and 3kHz(N).

4. Vary the audio frequency from 300 to 3000Hz and verify that the deviation does not exceed 5kHz(S) and 3kHz(N).

### APC

1. Select a channel which is programmed with high power. While transmitting, adjust RV1 in the APC circuit for 5 watts +/- 0.1 watt.
2. Select a channel which is programmed with low power. While transmitting, adjust RV3 in the APC circuit for 1watt +/-0.1 watt.

**TEST EQUIPMENT SETUP**



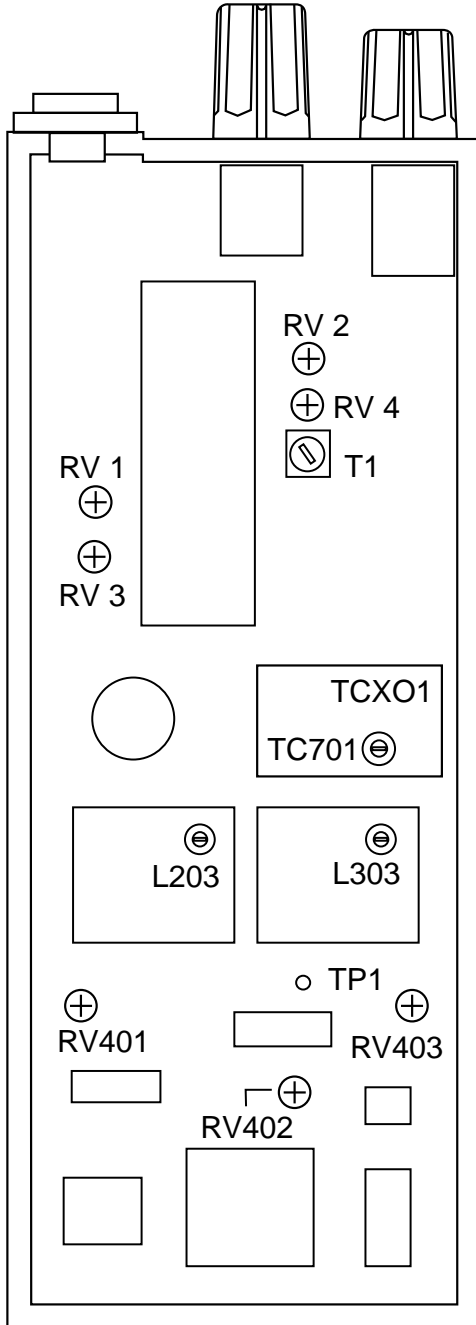
**1. S.S.G. : @ 1kHz Audio:**

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

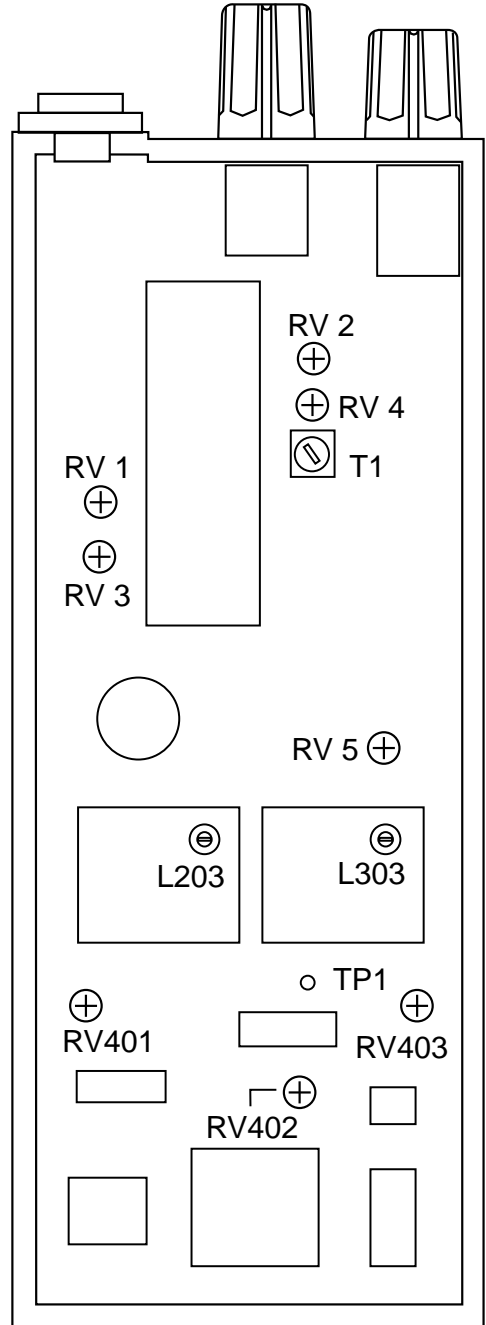
**2. AF Generator : 10mV & 20dB Up.**

**MAXON**  
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**ALIGNMENT POINTS DIAGRAM**



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**TROUBLESHOOTING GUIDE**

SYMPTOMS	CAUSES	COUNTER MEASURES
<b>Unit does not Work</b>	<ol style="list-style-type: none"> <li>1. Complete discharge of battery (7.5v+/-10%)</li> <li>2. Fuse blown up (4a)</li> <li>3. 5v voltage source</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace battery</li> <li>2. Replace fuse</li> <li>3. IC1 (5v+/-0.2v)</li> </ol>
<b>Warning Tone &amp; No Work</b>	<ol style="list-style-type: none"> <li>1. Low battery (lower than 5.6v)</li> <li>2. Pll error</li> <li>3. Filtering error</li> <li>4. EEPROM fail</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace or charge battery</li> <li>2. Check TCXO/ VCO/ PLL IC</li> <li>3. Check LPF (IC407)</li> <li>4. Re-programming</li> </ol>
<b>Defective RX Audio</b>	<ol style="list-style-type: none"> <li>1. No audio at speaker</li> <li>2. Busy lamp (yellow Color) is o.k. but no Audio</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace speaker or check wire</li> <li>2. Check tone ch, audio amp(IC6) 300hz HPF (IC410) Sw IC (IC402B, IC411)</li> </ol>
<b>Bad RX Sensitivity (-10 to -60db)</b>	<ol style="list-style-type: none"> <li>1. Defective ANT sw</li> <li>2. Defective front-end</li> <li>3. Defective dbm</li> <li>4. IF IC</li> <li>5. VCO level drop</li> <li>6. Change of 1st local Frequency</li> </ol>	<ol style="list-style-type: none"> <li>1. Check D5,D6</li> <li>2. Check Q601</li> <li>3. Check D9,T2,T3</li> <li>4. Replace IC5</li> <li>5. Rx VCO level&gt;2dbm</li> <li>6. Retune TCXO</li> </ol>
<b>Defective RX</b>	<ol style="list-style-type: none"> <li>1. VCO frequency change or level drop</li> <li>2. Defective voltage source</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair RX VCO</li> <li>2. Defective IF IC(IC5)</li> <li>3. IC1,Q1,Q3</li> </ol>
<b>PLL Error</b>	<ol style="list-style-type: none"> <li>1. Defective 12.8 MHz TCXO</li> <li>2. Voltage source for Rx VCO/TX VCO</li> <li>3. Defective PLL IC</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace TCXO</li> <li>2. Check RX VCO/TX VCO</li> <li>3. Replace IC2</li> </ol>
<b>Low TX power Output</b>	<ol style="list-style-type: none"> <li>1. APC</li> </ol>	<ol style="list-style-type: none"> <li>1. Re-adjust RV1</li> </ol>
<b>No TX power</b>	<ol style="list-style-type: none"> <li>1. TX buffer</li> <li>2. Power module</li> <li>3. APC control</li> </ol>	<ol style="list-style-type: none"> <li>1. Check Q16,17</li> <li>2. Check Q501,502,503</li> <li>3. Check Q22,D4</li> </ol>
<b>No modulation</b>	<ol style="list-style-type: none"> <li>1. Condenser mic</li> <li>2. Sw IC &amp; mic amp IC</li> </ol>	<ol style="list-style-type: none"> <li>1. Check mic</li> <li>2. Check IC411, 410, 405, 401,404</li> </ol>
<b>No s.a.t.(tone)</b>	<ol style="list-style-type: none"> <li>1. 250 hz LPF</li> <li>2. RV403 adjustment</li> </ol>	<ol style="list-style-type: none"> <li>1. Check IC406,407,411</li> <li>2. Re-adjust RV403</li> </ol>
<b>No programming</b>	<ol style="list-style-type: none"> <li>1. Short protector VCC</li> </ol>	<ol style="list-style-type: none"> <li>1. Check 6v on Q412, 413</li> <li>2. Defective programming lead</li> </ol>

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**VOLTAGE CHARTS**

<b>CONTROL CIRCUIT</b>							
<b>RX</b>				<b>TX</b>			
<b>REF #</b>	<b>B</b>	<b>C</b>	<b>E</b>		<b>B</b>	<b>C</b>	<b>E</b>
Q401	4.4	0.0	5.0		0.3	5.0	5.0
Q403	0.0	4.6	GND		0.0	4.6	GND
Q404	5.0	2.2	2.0		0.0	7.0	0.0
Q405	5.0	1.8	1.7		5.0	1.8	1.7
Q406	4.0	0.0	5.0		2.0	5.0	5.0
Q407	0.0	4.5	GND		5.0	0.0	GND
Q408	0.0	5.0	GND		2.0	0.0	GND
Q410	4.3	0.0	5.0		4.3	0.0	5.0
Q411	0.0	-	GND		0.0	0.0	GND
Q412	0.0	7.5	7.5		0.0	7.5	7.5
Q413	7.5	0.0	GND		7.5	0.0	GND

<b>MAIN CIRCUIT</b>							
<b>RX</b>				<b>TX</b>			
<b>REF #</b>	<b>B</b>	<b>C</b>	<b>E</b>		<b>B</b>	<b>C</b>	<b>E</b>
Q1	0.6	5.0	5.0		0.6	5.0	5.0
Q2	5.0	0.0	5.0		0.3	4.7	5.0
Q3	0.0	4.7	5.0		5.0	0.0	5.0
Q4	0.0	5.0	5.0		0.0	5.0	5.0
Q5	4.7	0.0	5.0		4.7	0.0	5.0
Q6	4.0	18.0	5.0		4.0	18.0	5.0
Q7	18.0	~3.0	18.0		18.0	~4.0	18.0
Q8	5.0	0.0	5.0		5.0	0.0	5.0
Q11	0.0	3.0	0.0		0.0	4.0	0.0
Q12	1.6	4.5	1.0		0.0	0.0	0.0
Q13	4.6	4.6	4.0		0.0	0.0	0.0
Q14	0.0	0.0	0.0		4.6	4.6	4.0
Q16	0.0	0.0	0.0		1.4	4.8	0.8
Q17	0.0	0.0	0.0		0.6	3.0	GND
Q18	0.0	0.0	0.0		5.0	0.2	GND
Q21	0.0	0.0	0.0		~3.0	~5.6	~2.4
Q22	7.5	0.0	7.5		6.9	~7.0	7.5
Q24	0.0	4.5	GND		0.0	0.0	GND
Q25	0.7	4.0	GND		0.0	0.0	GND
Q26	-	-	-		0.0	0.0	0.0
Q27	0.7	NOISE	GND		0.0	0.0	GND
Q33	7.2	4.0	7.5		6.9	7.5	7.5
Q34	0.0	6.6	GND		2.0	0.0	GND

**MAXON  
SP-130 / SP-140 HAND HELD**

<b>RECEIVE STATE</b>							
<b>PIN #</b>	<b>IC1</b>	<b>IC2</b>	<b>IC3</b>	<b>IC5</b>	<b>IC6</b>	<b>IC401</b>	<b>IC402</b>
1	GND	1.6M	-	4.0	1.4	0.0	0.0
2	GND	5.0	-	3.5	GND	1.0	0.0
3	GND	5.0	-	4.0	0.0	1.3	AUDIO
4	5.0	5.0	-	4.1	GND	0.0	0.0
5	GND	5.0	-	3.8	AUDIO	0.0	5.0
6	7.5	0.0	-	3.8	7.5	0.0	0.0
7		0.0	-	3.8	4.0	0.0	0.0
8		0.0	-	4.2	1.5	2.0	0.0
9		5.0		AUDIO		0.0	4.0
10		2.6		0.8		4.0	0.0
11		2.6		1.0		4.0	0.0
12		5.0		0.0		5.0	0.0
13		3.0		4.0		0.0	0.0
14		5.0		GNS		5.0	5.0
15		0.0		0.0			
16		0.0		1.8			
17		5.0					
18		0.0					
19		0.0					
20		2.5					
<b>PIN #</b>	<b>IC404</b>	<b>IC406</b>	<b>IC407</b>	<b>IC408</b>	<b>IC410</b>	<b>IC411</b>	<b>IC412</b>
1	-	3.0	1.9	0.0	AUDIO	2.0	
2	-	1.9	0.0	0.0	AUDIO	AUDIO	
3	-	1.9	1.9	0.0	AUDIO	4.0	
4	-	5.0	1.9	0.0	5.0	AUDIO	
5	-	1.9	1.9	GND	AUDIO	AUDIO	
6	-	1.9	5.0	5.0	AUDIO	GND	
7	-	1.9	1.9	5.0	AUDIO	GND	
8	-	1.9	A	5.0	AUDIO	GND	
9	-	1.9	CLK		AUDIO	0.0	
10	-	1.9	0.0		AUDIO	0.0	
11	-	GND	5.0		5.0	5.0	
12	-	1.9	0.0		AUDIO	0.0	
13	-	1.9	1.9		AUDIO	1.9	
14	-	1.9	1.9		AUDIO	1.9	
15						AUDIO	
16						5.0	
17							
18							
19							
20							

**MAXON  
SP-130 / SP-140 HAND HELD**

<b>TRANSMIT STATE</b>							
<b>PIN #</b>	<b>IC1</b>	<b>IC2</b>	<b>IC3</b>	<b>IC5</b>	<b>IC6</b>	<b>IC401</b>	<b>IC402</b>
1	GND	1.6M	0.0	-	1.3	1.9	0.0
2	GND	5.0	0.0	-	GND	1.9	0.0
3	GND	5.0	0.0	-	0.0	1.9	0.0
4	5.0	5.0	GND	-	GND	1.9	0.0
5	GND	5.0	-	-	1.5	0.0	0.0
6	7.5	0.0	-	-	7.5	0.0	0.0
7		0.0	-	-	7.5	0.0	GND
8		0.0	5.0	-	1.5	1.9	0.0
9		5.0		-		1.9	2.1
10		2.6		-		2.1	0.0
11		2.6		-		2.2	0.0
12		5.0		-		2.2	0.0
13		3.0		-		5.0	0.0
14		0.0		-		5.0	5.0
15		0.0				5.0	
16		5.0				5.0	
17		5.0					
18		0.0					
19		0.0					
20		2.5					
<b>PIN #</b>	<b>IC404</b>	<b>IC406</b>	<b>IC407</b>	<b>IC408</b>	<b>IC410</b>	<b>IC411</b>	<b>IC412</b>
1	A	3.7	1.9	0.0	AUDIO	2.0	
2	AUDIO	1.9	0.0	0.0	AUDIO	4.0	
3	AUDIO	1.9	1.9	0.0	AUDIO	1.9	
4	5.0	5.0	1.9	0.0	5.0	1.9	
5	AUDIO	1.9	1.9	GND	AUDIO	0.0	
6	AUDIO	1.9	5.0	5.0	AUDIO	GND	
7	AUDIO	1.9	1.9	5.0	AUDIO	GND	
8	AUDIO	1.9	A	5.0	AUDIO	GND	
9	AUDIO	1.9	CLK		AUDIO	5.0	
10	AUDIO	1.9	0.0		AUDIO	5.0	
11	GND	0.0	5.0		GND	0.0	
12	AUDIO	1.9	0.0		AUDIO	1.9	
13	AUDIO	1.9	1.9		AUDIO	1.9	
14	AUDIO	1.9	1.9		AUDIO	0.0	
15						0.0	
16						5.0	
17							
18							
19							
20							

# MAXON SP-130 / SP-140 HAND HELD

## SP-130 / SP-140 UHF & VHF DIGITAL SECTION PARTS LIST

REF #	DESCRIPTION	PART #	REF #	DESCRIPTION	PART #
<b>DIGITAL SECTION VHF &amp; UHF (COMMON PARTS)</b>					
	PTT SWITCH BOARD (SEE NOTE 1)	650-180-0017			
	FUSE BOARD ASSY	650-200-0004			
	SP-130 / SP-140 MAIN PCB, BLANK	610-000-0020			
<b>C400</b>	CAP, CER,0.0068UF,50V,5%,X7R,1/16W,0603	130-616-7	<b>C467</b>	CAP, CER,.033UF,10%,50V,0805	130-314-5Y
<b>C404</b>	CAP, CER,.047UF,0603,	130-440-4Y	<b>C468</b>	CAP, CER,.033UF,10%,50V,0805	130-314-5Y
<b>C405</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C469</b>	CAP, CER,.047UF,+80-20%,50V,Y5V,0805	100-823-2473
<b>C406</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>C470</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105
<b>C413</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C471</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104
<b>C414</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C472</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102
<b>C415</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C474</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105
<b>C416</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C476</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104
<b>C417</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C477</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C418</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C478</b>	CAP, TA,10UF, 293D106X0004A2T4V	141-044-8Z
<b>C419</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C479</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C420</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C480</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C421</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C481</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C422</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	<b>C484</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C423</b>	CAP, TA,10UF, 293D106X06R3A2T6.3V	141-059-2	<b>C485</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C427</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>CH404</b>	SW, ROTARY,EC10RP04-66 (4 Channel)	830-010-0010
<b>C429</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>CH404</b>	SW, ROTARY,EC10RP04-66 (16 Channel)	830-010-0011
<b>C430</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>CON401</b>	CONN, SMT STRIPS,MMT-104-01-T-SH-P-TR	422-003-9
<b>C431</b>	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475	<b>CON404</b>	SKT,14P/SIP,STR,LP,52231-1417	140-020-0032
<b>C432</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>CON406</b>	PIN,HDR,4P/SIP,R ANG,SHROUD,WAF,	140-030-0043
<b>C433</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>D401</b>	DIODE,SW,KDS181S,SOT-23	220-010-0004
<b>C434</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>D402</b>	DIODE,SW,KDS181S,SOT-23	220-010-0004
<b>C435</b>	CAP,CER,0.1UF,10%,50V,X7R,0603	100-621-1104	<b>D403</b>	DIODE,SW,KDS193,SOT-23	220-010-0003
<b>C436</b>	CAP, CER, 0.022UF,10%,50V,X7R,0603	100-621-1223	<b>D404</b>	DIODE,SW,KDS184S,SOT-23	220-010-0002
<b>C437</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105	<b>D405</b>	DIODE,ZNR,5.6V,SOT-23,0.225W,MMBZ5232	221-010-0056
<b>C438</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>D406</b>	DIODE,ZNR,5.6V,SOT-23,0.225W,MMBZ5232	221-010-0056
<b>C441</b>	CAP, CER, 0.0018UF,50V,10%, X7R,1/16W,0603	130-A49-5	<b>IC401</b>	IC, SW/MUX,MC14066BDR2,SO-14,A-SW	444-050-0001
<b>C442</b>	CAP, CER, 0.022UF,10%,50V,X7R,0603	100-621-1223	<b>IC402</b>	IC, SW/MUX,MC14066BDR2,SO-14,A-SW	444-050-0001
<b>C443</b>	CAP, CER, 0.0047UF,10%,50V,X7R,0603	100-621-1472	<b>IC404</b>	IC,OP AMP,KIA324F,SO-14,QUAD	441-030-0002
<b>C444</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	<b>IC405</b>	IC, OP AMP,LM358M,SO-8,DUAL OP AMP	441-030-0006
<b>C446</b>	CAP, CER,47PF,5%,50V,COG,0603	100-520-1470	<b>IC406</b>	IC,OP AMP,KIA324F,SO-14,QUAD	441-030-0002
<b>C448</b>	CAP, CER,47PF,5%,50V,COG,0603	100-520-1470	<b>IC407</b>	IC,FILTER,BLP,MF6CWM-100,SO-14	441-090-0001
<b>C449</b>	CAP, CER,0.033UF,10%,16V,X7R,0603	100-601-1333	<b>IC408</b>	IC, EEPROM,AT93C56-10SI,SO-08,2K,VCC 2-5V	442-010-0003
<b>C452</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104	<b>IC409</b>	IC,CPU,OTP,HD4074818H,FP-80A,4 BIT	443-103-0001
<b>C453</b>	CAP, CER, 0.0033UF,50V,10%, X7R,1/16W,0603	100-621-1332	<b>IC410</b>	IC,OP AMP,KIA324F,SO-14,QUAD	441-030-0002
<b>C454</b>	CAP, CER,.68UF,+/-20%,50V,Y5V,0805	130-624-4	<b>IC411</b>	IC, A-MUX/DEMUX,MC14053BD,SO-16,3PDT	440-060-0001
<b>C455</b>	CAP, CER,.082UF,10%,50V,X7R,0805	100-621-2823	<b>J1</b>	JACK MINI, HSJ1501-011010	140-080-0039
<b>C456</b>	CAP, CER,120PF,0603, 5%, 50V	131-241-6Y	<b>J2</b>	JACK, MINI, HSJ1603-011020	140-080-0035
<b>C458</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104	<b>L410</b>	COIL CHIP, 10UH:LER015T100K	310-659-2
<b>C459</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>LED1</b>	LED CHIP, SML-020MLTT86 SMD	251-234-7
<b>C460</b>	CAP, CER,15PF,5%,50V,COG,0603	100-520-1150	<b>Q401</b>	TRANS, BRT,PNP,KRA110SPK,SOT-23,SW,PK	870-010-0010
<b>C461</b>	CAP, CER,15PF,5%,50V,COG,0603	100-520-1150	<b>Q403</b>	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
<b>C462</b>	CAP, CER,.047UF,+80-20%,50V,Y5V,0805	100-823-2473	<b>Q404</b>	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
<b>C463</b>	CAP, CER,.047UF,+80-20%,50V,Y5V,0805	100-823-2473	<b>Q405</b>	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
<b>C464</b>	CAP, CER,.033UF,10%,50V,0805	130-314-5Y	<b>Q406</b>	TRANS,PNP,BRT,KRA101S,SOT-23,SW,PA	870-010-0002
<b>C465</b>	CAP, CER,.033UF,10%,50V,0805	130-314-5Y	<b>Q407</b>	TRANS,NPN,KRC101S,BRT,SOT-23	202-085-9
<b>C466</b>	CAP, CER,.033UF,10%,50V,0805	130-314-5Y	<b>Q410</b>	TRANS,KRA104S,SOT-23	218-057-7Z
			<b>Q411</b>	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
			<b>Q412</b>	TRANS,KRA104S,SOT-23	218-057-7Z
			<b>Q413</b>	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
			<b>Q416</b>	TRANS, BRT,PNP,KRA110SPK,SOT-23,SW,PK	870-010-0010
			<b>Q417</b>	TRANS,PNP,KTA1504(Y),SOT-23,SW	870-100-0004
			<b>R9</b>	RES,TF,68,5%,1/10W,TC250,0805	741-117-2680
			<b>R9A</b>	RES,TF,68,5%,1/10W,TC250,0805	741-117-2680
			<b>R100</b>	RES, TF,470,5%,1/16W,TC250,0603	741-102-1471
			<b>R200</b>	RES, 1.2K 1/16W 5% T 1608	05B-122-2Z

**NOTES:**

1. Components are not available, assembly is non-repairable.
2. All parts shown are for Band 2 configuration.



# MAXON

## SP-130 / SP-140 HAND HELD

REF #	DESCRIPTION	PART #	REF #	DESCRIPTION	PART #
R400	RES, 9.1K 1/16W 5% T 1608	05B-912-9Z	R475	RES,TF,47K, 5%, 1/16W, +/-200, 0603	741-102-1473
R401	RES,TF,680K, 5%, 1/16W, +/-200, 0603	741-102-1684	R476	RES, 360K,1/10W,5%,T2012	060-364-7
R402	RES, 8.2K, 1/16W, 5%, T 1608	05B-822-1Z	R477	RES, TF,120K, 5%, 1/16W, +/-200, 0603	741-102-1124
R403	RES, 8.2K, 1/16W, 5%, T 1608	05B-822-1Z	R478	RES,TF,39K,5%,1/16W,TC250,0603	741-102-1393
R404	RES, 8.2K, 1/16W, 5%, T 1608	05B-822-1Z	R479	RES,TF,20K, 5%, 1/16W, +/-200, 0603	741-102-1203
R405	RES,TF,100K, 5%, 1/16W, +/-200, 0603	741-102-1104	R480	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R406	RES, 8.2K, 1/16W, 5%, T 1608	05B-822-1Z	R483	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222
R408	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223	R484	RES,TF,4.7K, 5%, 1/16W, +/-200, 0603	741-102-1472
R410	RES,TF,3.3K, 5%, 1/16W, +/-200, 0603	741-102-1332	R485	CHIP RESISTOR 220K 1/16W 5% T 1608	741-102-1224
R411	RES, TF,270K,1/16W 5% T 1608	741-102-1274	R486	RES, TF,33K,5%,1/16W,+/-200,0603	741-102-1333
R412	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223	R487	RES, TF,120K, 5%, 1/16W, +/-200, 0603	741-102-1124
R414	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103	R488	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R415	RES,TF,47K, 5%, 1/16W, +/-200, 0603	741-102-1473	R489	RES,TF,4.7K, 5%, 1/16W, +/-200, 0603	741-102-1472
R416	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103	R493	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223
R418	RES,TF,560, 5%, 1/16W, +/-200, 0603	741-102-1561	RV401	POT, ROTARY,47K,3 MM DIA,SMD	901-001-0473
R421	RES,TF,47K, 5%, 1/16W, +/-200, 0603	741-102-1473	RV402	POT, ROTARY, 22K, SMD	901-001-0223
R422	RES,TF,47K, 5%, 1/16W, +/-200, 0603	741-102-1473	RV403	POT, ROTARY,47K,3 MM DIA,SMD	901-001-0473
R423	RES, 1.2K 1/16W 5% T 1608	05B-122-2Z	X401	XTAL,3.579545 MHZ,CP12A,12PF	162-000-0036
R424	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103			
R425	CHIP RESISTOR 220K 1/16W 5% T 1608	741-102-1224			
R426	RES, 1.2K 1/16W 5% T 1608	05B-122-2Z			
R427	RES,TF,100K, 5%, 1/16W, +/-200, 0603	741-102-1104			
R428	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103			
R429	RES, 27K,1/16W 5% T 1608	741-102-1273			
R430	CHIP RESISTOR 220K 1/16W 5% T 1608	741-102-1224			
R431	RES,TF,47K, 5%, 1/16W, +/-200, 0603	741-102-1473			
R432	RES,TF,4.7K, 5%, 1/16W, +/-200, 0603	741-102-1472			
R433	RES,TF,47K, 5%, 1/16W, +/-200, 0603	741-102-1473			
R434	RES,TF,47K, 5%, 1/16W, +/-200, 0603	741-102-1473			
R435	RES,TF,6.8K, 5%, 1/16W, +/-200, 0603	741-102-1682			
R439	RES, TF,3K , 5%,1/16W,T 1608	741-102-1302			
R440	RES,TF,4.7K, 5%, 1/16W, +/-200, 0603	741-102-1472			
R441	RES, 3.9K,1/16W 5% T 1608	05B-392-9Z			
R442	RES, 27K,1/16W 5% T 1608	741-102-1273			
R443	RES, TF,2.4K, 5%, 1/16W, +/-200, 0603	741-102-1242			
R444	RES,TF, 82K, 5%, 1/16W, +/-200, 0603	741-102-1823			
R446	RES, 820, 1/16W, 5%, T 1608	05B-821-0Z			
R447	CHIP RESISTOR 220K 1/16W 5% T 1608	741-102-1224			
R449	RES, TF,20K, 5%, 1/16W, +/-200, 0603	741-102-1203			
R450	RES, TF,33K,5%,1/16W,+/-200,0603	741-102-1333			
R451	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103			
R452	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222			
R453	RES,TF,1M, 5%, 1/16W, +/-200, 0603	741-102-1105			
R454	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223			
R456	RES, TF,22,1/16W, 5%, T 1608	741-102-1220			
R457	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223			
R460	RES,TF,47K, 5%, 1/16W, +/-200, 0603	741-102-1473			
R461	RES,TF,1M, 5%, 1/16W, +/-200, 0603	741-102-1105			
R464	RES,TF,4.7K, 5%, 1/16W, +/-200, 0603	741-102-1472			
R469	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222			
R470	RES, 30K,1/16W 5% T 1608	05B-303-9Z			
R471	RES, 30K,1/16W 5% T 1608	05B-303-9Z			
R472	RES, 36K,1/16W 5% T 1608	05B-363-3			
R473	RES, 43K,1/10W,5%,T2012 MCR10EZH433J	060-433-6Z			
R474	RES, 43K,1/10W,5%,T2012 MCR10EZH433J	060-433-6Z			

### DIGITAL SECTION (VHF PARTS)

C447	CAP, CER, 0.022UF,10%,50V,X7R,0603	100-621-1223
C486	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
R409	RES, TF,150K, 5%, 1/16W, +/-200, 0603	741-102-1154
R417	RES,TF,560, 5%, 1/16W, +/-200, 0603	741-102-1561
R459	RES, 1.2K 1/16W 5% T 1608	05B-122-2Z

### DIGITAL SECTION (UHF PARTS)

C447	CAP,CER,0.0018UF,5%,50V,X7R,0805	100-621-2185
C486	N/A	
R409	RES,TF,220K,5%,1/16W,TC250,0603	741-107-1224
R417	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222
R459	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103

#### NOTES:

1. Components are not available, assembly is non-repairable.
2. All parts shown are for Band 2 configuration.

# MAXON SP-130 / SP-140 HAND HELD

## SP-130 / SP-140 VHF RF SECTION PARTS LIST

REF #	DESCRIPTION	PART #	REF #	DESCRIPTION	PART #
<b>REPLACEMENT MODULES</b>					
	FRONT END ASSY, VHF (SEE NOTE 1)	650-110-0012	<b>C62</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
	VCO TX/RX ASSY, VHF (SEE NOTE 1)	650-030-0021	<b>C63</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
	POWER AMP ASSY, VHF (SEE NOTE 1)	650-230-0012	<b>C64</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
	TCXO ASSY, VHF (SEE NOTE 1)	650-100-0002	<b>C65</b>	CAP, TA,10UF, 20%,10V,B, 3528	102-023-1106
<b>COMPONENTS</b>					
<b>C1</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C66</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C2</b>	CAP, TA,10UF, 293D106X06R3A2T6.3V	141-059-2	<b>C67</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C3</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C68</b>	CAP,CER,0.001UF,5%,50V,COG,0805	100-520-2102
<b>C4</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C72</b>	CAP, CER,6PF,0.5PF,50V,COG,0805	100-120-2060
<b>C5</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C73</b>	CAP,CER,30PF,5%,50V,COG,0805	100-520-2300
<b>C6</b>	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475	<b>C74</b>	CAP, CER,36PF GRM40 COG360J 50V PT	133-611-7Y
<b>C7</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C75</b>	CAP,CER,20PF,5%,50V,COG,0805	100-520-2200
<b>C8</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C76</b>	CAP, CER,8PF,0.5PF,50V,COG,0805	100-120-2080
<b>C9</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C77</b>	CAP,CER,0.001UF,5%,50V,COG,0805	100-520-2102
<b>C11</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>C78</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C12</b>	CAP, TA,10UF, 293D106X06R3A2T6.3V	141-059-2	<b>C79</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104
<b>C15</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>C81</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C16</b>	CAP,CER,2PF,.25%,50V,COG,0603	100-020-1020	<b>C82</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C17</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>C83</b>	CAP, CER,7PF,.5PF,50V,COG,0603	100-120-1070
<b>C18</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C84</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102
<b>C19</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C86</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C20</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C87</b>	CAP,CER,27PF,5%,50V,COG,0603	100-520-1270
<b>C21</b>	CAP, METAL,POLY,0.33UF,63V BOX	180-301-7	<b>C90</b>	CAP, CER,7PF,.5PF,50V,COG,0603	100-120-1070
<b>C22</b>	CAP, METAL,POLY,.022UF,63V BOX	180-209-8	<b>C92</b>	CAP,CER,30PF,5%,50V,COG,0603	100-520-1300
<b>C23</b>	CAP, MYLAR,.01UF, 63V K BOX TYPE	180-126-6	<b>C93</b>	CAP, CER,82PF,5%,COG,50V,0603	100-520-1820
<b>C24</b>	CAP, MYLAR,.01UF, 63V K BOX TYPE	180-126-6	<b>C94</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105
<b>C25</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105	<b>C95</b>	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475
<b>C26</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>C96</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C34</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C97</b>	CAP, CER,33PF,5%,50V,COG,0603	100-520-1330
<b>C35</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C98</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102
<b>C36</b>	CAP,CER,14PF,5%,50V,COG,0805	100-520-2140	<b>C102</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
<b>C37</b>	CAP, CER,33PF,5%,50V,COG,0603	100-520-1330	<b>C103</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C38</b>	CAP, CER,43PF GRM40 COG430J 50V PT	134-301-1Y	<b>C104</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102
<b>C39</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C105</b>	CAP, CER,47PF,5%,50V,COG,0603	100-520-1470
<b>C42</b>	CAP,CER,0.001UF,5%,50V,COG,0805	100-520-2102	<b>C106</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C43</b>	CAP, CER,3PF,.25PF,50V,COG,0603	100-020-1030	<b>C107</b>	CAP, CER,10PF,.5%,50V,COG,0603	100-120-1100
<b>C44</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105	<b>C108</b>	CAP, CER,.0015UF, GRM39 X7R152K 50V PT	130-A48-4Y
<b>C45</b>	CAP, CER,10PF,.5%,50V,COG,0603	100-120-1100	<b>C109</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C46</b>	CAP,CER,9PF,50V,.5PF, COG,1/16W,0603	139-005-0	<b>C111</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
<b>C47</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C112</b>	CAP, CER,0.033UF,10%,16V,X7R,0603	100-601-1333
<b>C50</b>	CAP, CER,24PF,5%,50V,COG,0603	100-520-1240	<b>C113</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
<b>C51</b>	CAP, CER, 22PF,5%,50V,COG,0603	100-520-1220	<b>C114</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C53</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105	<b>C115</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221
<b>C54</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C116</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C55</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C117</b>	CAP, CER,47PF,5%,50V,COG,0603	100-520-1470
<b>C57</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C118</b>	CAP, CER,33PF,5%,50V,COG,0603	100-520-1330
<b>C58</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C121</b>	CAP, CER,20PF,5%,50V,COG,0603	100-520-1200
<b>C59</b>	CAP, CER,0.47UF GRM40 Y5V474Z 16V PT	130-443-7	<b>C122</b>	CAP,CER,0.001UF,5%,50V,COG,0805	100-520-2102
<b>C60</b>	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475	<b>C123</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C61</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C124</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
			<b>C125</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
			<b>C126</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
			<b>C127</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
			<b>C128</b>	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475
			<b>C129</b>	CAP, ELE,10UF,16V 20% 3X5 5.0PT	101-058-9R
			<b>C131</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
			<b>C132</b>	CAP, TA,4.7UF,20V,3528:293D475X0020B2T 20V	144-720-0Z

**NOTES:**

1. Components are not available, assembly is non-repairable.
2. All parts shown are for Band 2 configuration.

# MAXON

## SP-130 / SP-140 HAND HELD

REF #	DESCRIPTION	PART #	REF #	DESCRIPTION	PART #
C133	CAP,TA,1.0UF,20%,16V,3216	102-033-0105	Q1	TRANS,BRT,PNP,KRA102SPB,SOT-23,SW,(PB)	870-010-0007
C134	CAP, CER, .047UF,0603,	130-440-4Y	Q2	TRANS, BRT,PNP,KRA110SPK,SOT-23,SW,PK	870-010-0010
C135	CAP, TA, 10UF, 293D106X0004A2T4V	141-044-8Z	Q3	TRANS, BRT,PNP,KRA110SPK,SOT-23,SW,PK	870-010-0010
C136	CAP, TA, 100UF, 20%, 6.3V, D	102-013-3107	Q4	TRANS, BRT,PNP,KRA110SPK,SOT-23,SW,PK	870-010-0010
C137	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	Q5	TRANS,KRA104S,SOT-23	218-057-7Z
C145	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	Q6	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C146	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	Q7	TRANS,PNP,KTA1504(Y),SOT-23,SW	870-100-0004
C146	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	Q8	TRANS,PNP,KTA1504(Y),SOT-23,SW	870-100-0004
C901	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q11	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C902	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q12	TRANS,NPN,BFR92A,SOT-23,RF AMP,(P2P)	870-200-0020
C903	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q13	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C904	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q14	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C905	CAP, CER,18PF,5%,50V,COG,0603	100-520-1180	Q16	TRANS, 900MHZ AMP,MMBR951,SOT-23	870-200-0026
C906	CAP, CER,18PF,5%,50V,COG,0603	100-520-1180	Q17	TRANS, 900MHZ AMP,MMBR951,SOT-23	870-200-0026
C907	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q18	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
C910	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q19	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C911	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q21	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
CF1	FILTER CERAMIC LT-455FW	310-101-0010	Q22	TRANS,PNP,KTA1663(Y),SOT-89,HC/SW,(HY)	870-150-0002
CF2	FILTER, CER,CFW455HT,455KHZ	310-101-0009	Q23	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D1	DIODE,SW,KDS181S,SOT-23	220-010-0004	Q24	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D5	DIODE,PIN,UPP9401,NEED PKG SIZE	220-020-0001	Q25	TRANS,NPN,BFR92A,SOT-23,RF AMP,(P2P)	870-200-0020
D6	DIODE,PIN,UPP9401,NEED PKG SIZE	220-020-0001	Q26	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
D8	DIODE,SW,KDS193,SOT-23	220-010-0003	Q27	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
D9	DIODE VARICAP CHIP ND433G 5V (SOP-08)	242-020-2	Q28	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D11	DIODE,SW,KDS193,SOT-23	220-010-0003	Q31	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D12	DIODE,SW,KDS193,SOT-23	220-010-0003	Q32	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D13	DIODE,SW,KDS181S,SOT-23	220-010-0004	Q33	TRANS,PNP,KTA1504(Y),SOT-23,SW	870-100-0004
D14	DIODE,SW,KDS181S,SOT-23	220-010-0004	Q34	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D15	DIODE, CHIP,SM4004,400V,1 A,SMD	245-040-5	Q901	TRANS, NPN,KTC4075,UMT3	870-200-0031
D17	DIODE,SCHOTTKY,CHIP,PRLL5817,SOD87	243-092-2	Q902	TRANS, KTA2014, MAX-900K	200-114-2
D18	DIODE, KDS160	243-104-0	Q903	TRANS, NPN,KTC4075,UMT3	870-200-0031
D20	DIODE, KDS160	243-104-0	Q904	TRANS, NPN,KTC4075,UMT3	870-200-0031
D901	DIODE,SW,KDS226,SOT-23	220-010-0005	Q905	TRANS, NPN,KTC4075,UMT3	870-200-0031
D902	DIODE,SW,KDS226,SOT-23	220-010-0005	R1	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
IC1	IC, VREG,TK11450M,+5V,SOT-23L,(R5)	441-010-0002	R2	RES,TF,100K, 5%, 1/16W, +/-200, 0603	741-102-1104
IC2	IC, PLL, MC145191FR2,SO-20,RS-440	440-050-0011	R3	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222
IC3	IC, OP AMP,LM358M,SO-8,DUAL OP AMP	441-030-0006	R4	RES, 1.8K, 1/16W, 5%, T 1608	05B-182-6Z
IC5	IC, VHF RCVR,MC3371D,SO-16,NWRBAND	441-060-0007	R6	RES, TF,2K, 1/16W, 5%, T 1608	741-102-1202
IC6	IC, AUDIO AMP,LM386M-1,0.33W,SO-8	441-040-0002	R8	RES, 910, 1/10W, 5%, T 2012	060-911-1Z
L1	COIL, CHIP,47NH,20%,LL2012-F47NM	371-010-5470	R11	RES,TF,100, 5%, 1/16W, +/-200, 0603	741-102-1101
L3	COIL, 1.2UH:NL252018T-1R2J	311-080-3	R12	RES, TF,3K , 5%,1/16W,T 1608	741-102-1302
L4	COIL, 0.1UH:NL252018T-R10J	311-067-2	R13	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272
L5	COIL, 0.1UH:NL252018T-R10J	311-067-2	R15	RES,TF,100, 5%, 1/16W, +/-200, 0603	741-102-1101
L6	COIL, CHIP, 1.0UH:NL252018T-1R0J	311-079-3	R16	RES, 910, 1/10W, 5%, T 2012	060-911-1Z
L7	COIL SPRING 3X0.55X4T:L SMD	311-298-4	R17	RES,TF,12K, 5%, 1/16W, +/-200, 0603	741-102-1123
L8	COIL SPRING 3X0.55X4T:L SMD	311-298-4	R21	RES,TF,100, 5%, 1/16W, +/-200, 0603	741-102-1101
L11	COIL SPRING 3X0.55X4T:L SMD	311-298-4	R22	RES,TF,4.7K, 5%, 1/16W, +/-200, 0603	741-102-1472
L12	COIL, 1.2UH:NL252018T-1R2J	311-080-3	R23	RES, 120 1/16W 5% T 1608	05B-121-1Z
L13	COIL SPRING 2.8X0.4X8T:L	311-323-3	R24	RES, 5.6K, 1/16W, 5%, T 1608	05B-562-6Z
L14	COIL CHIP, 0.47UH:NL252018T-R47J	311-075-9	R25	RES,TF,3.3K, 5%, 1/16W, +/-200, 0603	741-102-1332
L15	COIL CHIP, 0.15UH:NL252018T-R15J	311-069-4	R26	RES, TF,18, 1/16W, 5%, T 1608	741-102-1180
L16	COIL, CHIP, 1000U, 300SS-102K=CP3	370-013-4102	R27	RES,TF,4.7K, 5%, 1/16W, +/-200, 0603	741-102-1472
L17	COIL, CHIP, 1000U, 300SS-102K=CP3	370-013-4102	R28	RES, 56, 1/16W, 5%, T 1608	05B-560-4Z
L18	COIL, CHIP, 1.0UH:NL252018T-1R0J	311-079-3	R31	RES, TF,300, 1/16W, 5%, T 1608	741-102-1301
L19	COIL CHIP, 10UH:LER015T100K	310-659-2	R32	RES, TF,300, 1/16W, 5%, T 1608	741-102-1301
			R33	RES,TF,3.3K, 5%, 1/16W, +/-200, 0603	741-102-1332
			R34	RES, TF,18, 1/16W, 5%, T 1608	741-102-1180
			R35	RES, 8.2K, 1/16W, 5%, T 1608	05B-822-1Z

### NOTES:

1. Components are not available, assembly is non-repairable.
2. All parts shown are for Band 2 configuration.

# MAXON

## SP-130 / SP-140 HAND HELD

REF #	DESCRIPTION	PART #	REF #	DESCRIPTION	PART #
R36	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000	R99	RES, 1.8K, 1/16W, 5%, T 1608	05B-182-6Z
R37	RES,TF,3.3K, 5%, 1/16W, +/-200, 0603	741-102-1332	R102	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223
R41	RES,TF,100, 5%, 1/16W, +/-200, 0603	741-102-1101	R103	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R42	RES,TF,12K, 5%, 1/16W, +/-200, 0603	741-102-1123	R104	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R43	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103	R105	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223
R45	RES,TF,12K, 5%, 1/16W, +/-200, 0603	741-102-1123	R106	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223
R46	RES, 3.9K,1/16W 5% T 1608	05B-392-9Z	R108	RES, TF,56K,1/16W,5%,T 1608,0603	741-102-1563
R47	RES, TF,2.2,5%,1/10W,TC250,0805	741-117-2229	R109	RES, 0.1 1W 1% 1218	06F-108-3
R48	RES, TF,2.2,5%,1/10W,TC250,0805	741-117-2229	R110	RES,TF,330, 5%,1/16W, +/-200, 0603	741-102-1331
R49	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000	R111	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R50	RES,TF,1M, 5%, 1/16W, +/-200, 0603	741-102-1105	R112	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223
R51	RES, TF,2.2,5%,1/10W,TC250,0805	741-117-2229	R113	RES,TF,470K,5%,1/16W,TC1608,0603	741-102-1474
R52	RES,TF,3.3K, 5%, 1/16W, +/-200, 0603	741-102-1332	R114	RES,TF,100K, 5%, 1/16W, +/-200, 0603	741-102-1104
R53	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103	R114	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272
R54	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102	R115	RES, TF,22,1/16W, 5%, T 1608	741-102-1220
R55	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102	R116	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223
R56	RES, 270 1/16W 5% T 1608	05B-271-3Z	R117	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223
R57	RES, 1.8K, 1/16W, 5%, T 1608	05B-182-6Z	R121	CHIP RESISTOR 220K 1/16W 5% T 1608	741-102-1224
R58	RES,TF,470K,5%,1/16W,TC1608,0603	741-102-1474	R122	RES,TF,4.7K, 5%, 1/16W, +/-200, 0603	741-102-1472
R59	RES, TF,39,5%,50V,0603	741-102-1390	R123	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R61	RES, 68K 1/16W 1% T 1608	05C-683-2Z	R901	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222
R62	RES, 68K 1/16W 1% T 1608	05C-683-2Z	R902	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222
R63	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102	R904	RES, TF,7.5K,5%,1/16W,50V,T 1608,0603	741-102-1752
R64	RES, TF,22,1/16W, 5%, T 1608	741-102-1220	R905	RES, 27K,1/16W 5% T 1608	741-102-1273
R65	RES, 51, 1/16W, 5%, T 1608	05B-510-9Z	R906	RES, TF,7.5K,5%,1/16W,50V,T 1608,0603	741-102-1752
R66	RES,TF,100, 5%, 1/16W, +/-200, 0603	741-102-1101	R907	RES, 27K,1/16W 5% T 1608	741-102-1273
R67	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223	R908	RES,TF,100, 5%, 1/16W, +/-200, 0603	741-102-1101
R68	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223	R909	RES, TF,470,5%,1/16W,TC250,0603	741-102-1471
R69	RES,TF,470K,5%,1/16W,TC1608,0603	741-102-1474	RC56	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R70	RES,TF,470K,5%,1/16W,TC1608,0603	741-102-1474	RL2	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R71	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102	RLK12	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R72	RES,TF,470K,5%,1/16W,TC1608,0603	741-102-1474	RLK16	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R74	RES, 27K,1/16W 5% T 1608	741-102-1273	RLK2	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R75	RES,TF,47K, 5%, 1/16W, +/-200, 0603	741-102-1473	RLK3	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R76	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223	RLK4	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R77	RES,TF,22K, 5%, 1/16W, +/-200, 0603	741-102-1223	RLK5	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R78	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272	RLK7	RES,TF, 0, 5%, 1/16W, +/-200, 0603	741-102-1000
R79	CHIP RESISTOR 1.5K 1/16W 5% T 1608	741-102-1152	RV1	RES, SEMIFIXED,10KB RH0651C100103	901-002-0103
R81	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272	RV2	POT, ROTARY, 1K, 3DIA MM, SMD	901-001-0102
R82	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103	RV3	RES, SEMIFIXED,10KB RH0651C100103	901-002-0103
R83	RES, TF,18K,1/16W 5% T 1608	741-102-1183	RV4	POT, ROTARY, 1K, 3DIA MM, SMD	901-001-0102
R84	RES, TF,18K,1/16W 5% T 1608	741-102-1183	T1	COIL, IFT, SMD, 455KHZ QUAD	321-079-6
R85	RES,TF,39K,5%,1/16W,TC250,0603	741-102-1393	T2	TRANSFORMERS CHIP 617PT-1019	300-223-8
R86	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102	T3	TRANSFORMERS CHIP 617PT-1019	300-223-8
R87	RES,TF,330K, 5%, 1/16W, +/-200, 0603	741-102-1334	TH1	THERM,33K,NTCCS32163SH333KC	700-050-0002
R88	RES,TF,100, 5%, 1/16W, +/-200, 0603	741-102-1101	VR3	POT, 20K,RK0971111 20KA	480-059-2
R89	RES, TF,22,1/16W, 5%, T 1608	741-102-1220	X1	CRYSTAL, 44.645M -30 15PM,32P,RX 3RD,HC-45	263-208-7
R91	RES, TF,470,5%,1/16W,TC250,0603	741-102-1471	XF1	FILTER, CRYSTAL,KFN1045AA(45.1M) (BMO-U)	271-072-3
R92	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272			
R93	RES,TF,100, 5%, 1/16W, +/-200, 0603	741-102-1101			
R94	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102			
R95	RES,TF, 82K, 5%, 1/16W, +/-200, 0603	741-102-1823			
R96	RES,TF,39K,5%,1/16W,TC250,0603	741-102-1393			
R97	RES,TF,100, 5%, 1/16W, +/-200, 0603	741-102-1101			
R98	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103			

**NOTES:**

1. Components are not available, assembly is non-repairable.
2. All parts shown are for Band 2 configuration.

# MAXON

## SP-130 / SP-140 HAND HELD

### SP-130 / SP-140 UHF RF SECTION PARTS LIST

REF #	DESCRIPTION	PART #	REF #	DESCRIPTION	PART #
<b>REPLACEMENT MODULES</b>					
	FRONT END ASSY, UHF (SEE NOTE 1)	650-110-0013	<b>C58</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
	VCO TX/RX ASSY, UHF (SEE NOTE 1)	650-030-0020	<b>C59</b>	CAP, CER,0.47UF GRM40 Y5V474Z 16V PT	130-443-7
	POWER AMP ASSY, UHF (SEE NOTE 1)	650-230-0013	<b>C60</b>	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475
<b>COMPONENTS</b>					
<b>C1</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C61</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C2</b>	CAP, TA,10UF, 293D106X06R3A2T6.3V	141-059-2	<b>C62</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C3</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C63</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C4</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C64</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C5</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C65</b>	CAP, TA,10UF, 20%,10V,B, 3528	102-023-1106
<b>C6</b>	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475	<b>C66</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C7</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C67</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C8</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C68</b>	CAP, CER,27PF,5%,50V,COG,0805	100-520-2270
<b>C9</b>	CAP, CER,0.01UF,10%,50V,X7R,0805	100-621-2103	<b>C70</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105
<b>C10</b>	CAP, TA,10UF, 293D106X0004A2T4V	141-044-8Z	<b>C73</b>	CAP,CER,3PF,0.25PF,50V,COG,0805	100-020-2030
<b>C11</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>C74</b>	CAP, CER,10PF, .25PF%,COG,50V,0805	100-020-2100
<b>C12</b>	CAP, TA,10UF, 293D106X06R3A2T6.3V	141-059-2	<b>C75</b>	CAP, CER,4.7PF GRM40 COG4R7C 50V PT	134-767-0Y
<b>C13</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	<b>C76</b>	CAP, CER,2PF,0.25PF%,50V,COG,0805	100-020-2020
<b>C14</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C77</b>	CAP,CER,470PF,10%,50V,X7R,0805	100-621-2471
<b>C15</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>C78</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C16</b>	CAP,CER,2PF,.25%,50V,COG,0603	100-020-1020	<b>C79</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
<b>C17</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>C81</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C18</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C82</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C19</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C83</b>	CAP, CER,12PF,5%,50V,COG,0603	100-520-1120
<b>C20</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C84</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C21</b>	CAP, METAL,POLY,0.33UF,63V BOX	180-301-7	<b>C86</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C22</b>	CAP, METAL,POLY,.022UF,63V BOX	180-209-8	<b>C87</b>	CAP, CER, 22PF,5%,50V,COG,0603	100-520-1220
<b>C23</b>	CAP, MYLAR,.01UF, 63V K BOX TYPE	180-126-6	<b>C88</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104
<b>C24</b>	CAP, MYLAR,.01UF, 63V K BOX TYPE	180-126-6	<b>C90</b>	CAP, CER,7PF,.5PF,50V,COG,0603	100-120-1070
<b>C25</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105	<b>C92</b>	CAP,CER,30PF,5%,50V,COG,0603	100-520-1300
<b>C26</b>	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	<b>C93</b>	CAP, CER,82PF,5%,COG,50V,0603	100-520-1820
<b>C34</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C94</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105
<b>C35</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C95</b>	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475
<b>C36</b>	CAP, CER,7PF,0.5PF,50V,COG,0805	100-110-2070	<b>C96</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C37</b>	CAP, CER,5.6PF,.25PF,50V,COG,0603	100-020-15R6	<b>C97</b>	CAP,CER,30PF,5%,50V,COG,0603	100-520-1300
<b>C38</b>	CAP,CER,15PF,5%,50V,COG,0805	100-520-2150	<b>C98</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102
<b>C39</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C102</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
<b>C41</b>	CAP, CER,6PF,0.5PF,50V,COG,0805	100-120-2060	<b>C103</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C42</b>	CAP, CER,27PF,5%,50V,COG,0805	100-520-2270	<b>C104</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102
<b>C43</b>	CAP, CER,5PF,.25PF,50V,COG,0603	100-020-1050	<b>C105</b>	CAP, CER,47PF,5%,50V,COG,0603	100-520-1470
<b>C44</b>	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475	<b>C106</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C45</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C107</b>	CAP, CER,10PF,.5%,50V,COG,0603	100-120-1100
<b>C46</b>	CAP, CER,3PF,.25PF,50V,COG,0603	100-020-1030	<b>C108</b>	CAP, CER,.0015UF, GRM39 X7R152K 50V PT	130-A48-4Y
<b>C47</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C109</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471
<b>C49</b>	CAP, CER,2PF,0.25PF%,50V,COG,0805	100-020-2020	<b>C111</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
<b>C50</b>	CAP, CER,12PF,5%,50V,COG,0603	100-520-1120	<b>C112</b>	CAP, CER,0.033UF,10%,16V,X7R,0603	100-601-1333
<b>C51</b>	CAP, CER,6PF,.25PF,50V,COG,0603	100-020-1060	<b>C113</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
<b>C53</b>	CAP, CER,1UF,+80-20%,16V,Y5V,0805	100-803-2105	<b>C114</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C54</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	<b>C115</b>	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221
<b>C55</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C116</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C56</b>	CAP, CER,12PF,5%,50V,COG,0603	100-520-1120	<b>C117</b>	CAP, CER,47PF,5%,50V,COG,0603	100-520-1470
<b>C57</b>	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	<b>C118</b>	CAP, CER,33PF,5%,50V,COG,0603	100-520-1330
<b>NOTES:</b>					
1. Components are not available, assembly is non-repairable.					
2. All parts shown are for Band 2 configuration.					
<b>C121</b>	CAP, CER,20PF,5%,50V,COG,0603	100-520-1200	<b>C122</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102
<b>C122</b>	CAP,CER,0.001UF,10%,50V,X7R,0603	100-621-1102	<b>C123</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103
<b>C123</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	<b>C124</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
<b>C124</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104	<b>C125</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104
<b>C125</b>	CAP, CER, 0.1UF,10%,25V,X7R,0805	100-611-2104	<b>C126</b>	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103

# MAXON SP-130 / SP-140 HAND HELD

REF #	DESCRIPTION	PART #	REF #	DESCRIPTION	PART #
C127	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	L15	COIL CHIP, 0.15UH:NL252018T-R15J	311-069-4
C128	CAP, TA, 4.7UF,20%,10V,3216	102-023-0475	L16	COIL, CHIP, 1000U, 300SS-102K=CP3	370-013-4102
C129	CAP, ELE,10UF,16V 20% 3X5 5.0PT	101-058-9R	L17	COIL, CHIP, 1000U, 300SS-102K=CP3	370-013-4102
C131	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	L18	COIL, CHIP, 1.0UH:NL252018T-1R0J	311-079-3
C132	CAP, TA,4.7UF,20V,3528:293D475X0020B2T 20V	144-720-0Z	L19	COIL CHIP, 10UH:LER015T100K	310-659-2
C133	CAP,TA,1.0UF,20%,16V,3216	102-033-0105	Q1	TRANS,BRT,PNP,KRA102SPB,SOT-23,SW,(PB)	870-010-0007
C134	CAP, CER,,047UF,0603,	130-440-4Y	Q2	TRANS, BRT,PNP,KRA110SPK,SOT-23,SW,PK	870-010-0010
C135	CAP, TA,10UF, 293D106X0004A2T4V	141-044-8Z	Q3	TRANS, BRT,PNP,KRA110SPK,SOT-23,SW,PK	870-010-0010
C136	CAP, TA, 100UF, 20%, 6.3V, D	102-013-3107	Q4	TRANS, BRT,PNP,KRA110SPK,SOT-23,SW,PK	870-010-0010
C137	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	Q5	TRANS,KRA104S,SOT-23	218-057-7Z
C145	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	Q6	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C146	CAP, CER,220PF,5%,50V,COG,0603	100-520-1221	Q7	TRANS,PNP,KTA1504(Y),SOT-23,SW	870-100-0004
C152	CAP, CER,470PF,10%,50V,X7R,0603	100-621-1471	Q8	TRANS,PNP,KTA1504(Y),SOT-23,SW	870-100-0004
C901	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q11	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C902	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q12	TRANS,NPN,BFR92A,SOT-23,RF AMP,(P2P)	870-200-0020
C903	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q13	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C904	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q14	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C905	CAP, CER,18PF,5%,50V,COG,0603	100-520-1180	Q16	TRANS,NPN,BFR92A,SOT-23,RF AMP,(P2P)	870-200-0020
C906	CAP, CER,18PF,5%,50V,COG,0603	100-520-1180	Q17	TRANS, 900MHZ AMP,MMBR951,SOT-23	870-200-0026
C907	CAP, CER,0.1UF,+80-20%,25V,Y5V,0603	100-813-1104	Q18	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
C908	CAP, CER,33PF,5%,50V,COG,0603	100-520-1330	Q19	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C910	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q21	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
C911	CAP, CER, 0.01UF,5%,50V,X7R,0603	100-521-1103	Q22	TRANS,PNP,KTA1663(Y),SOT-89,HC/SW,(HY)	870-150-0002
CF1	FILTER, CER,CFW455F,455KHZ	310-010-0010	Q23	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
CF2	FILTER, CER,CFW455HT,455KHZ	310-101-0009	Q24	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D1	DIODE,SW,KDS181S,SOT-23	220-010-0004	Q25	TRANS,NPN,BFR92A,SOT-23,RF AMP,(P2P)	870-200-0020
D5	DIODE,PIN,U9P9401,NEED PKG SIZE	220-020-0001	Q26	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
D6	DIODE,PIN,U9P9401,NEED PKG SIZE	220-020-0001	Q27	TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL)	870-200-0006
D8	DIODE,SW,KDS193,SOT-23	220-010-0003	Q28	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D9	DIODE,SCHOTTKY,CHIP,HSMS-2817#L31	243-122-6	Q31	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D11	DIODE,SW,KDS193,SOT-23	220-010-0003	Q32	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D12	DIODE,SW,KDS193,SOT-23	220-010-0003	Q33	TRANS,PNP,KTA1504(Y),SOT-23,SW	870-100-0004
D13	DIODE,SW,KDS181S,SOT-23	220-010-0004	Q34	TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND	870-020-0001
D14	DIODE,SW,KDS181S,SOT-23	220-010-0004	Q901	TRANS, NPN,KTC4075,UMT3	870-200-0031
D15	DIODE, CHIP,SM4004,400V,1 A,SMD	245-040-5	Q902	TRANS, KTA2014, MAX-900K	200-114-2
D17	DIODE,SCHOTTKY,CHIP,PRLL5817,SOD87	243-092-2	Q903	TRANS, NPN,KTC4075,UMT3	870-200-0031
D18	DIODE, KDS160	243-104-0	Q904	TRANS, NPN,KTC4075,UMT3	870-200-0031
D20	DIODE, KDS160	243-104-0	Q905	TRANS, NPN,KTC4075,UMT3	870-200-0031
D901	DIODE,SW,KDS226,SOT-23	220-010-0005	R1	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
D902	DIODE,SW,KDS226,SOT-23	220-010-0005	R2	RES,TF,100K, 5%, 1/16W, +/-200, 0603	741-102-1104
IC1	IC, VREG,TK11450M,+5V,SOT-23L,(R5)	441-010-0002	R3	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222
IC2	IC, PLL, MC145191FR2,SO-20,RS-440	440-050-0011	R4	RES, 1.8K, 1/16W, 5%, T 1608	05B-182-6Z
IC5	IC, VHF RCVR,MC3371D,SO-16,NWRBAND	441-060-0007	R5	RES, 1.8K, 1/16W, 5%, T 1608	05B-182-6Z
L1	COIL, CHIP,18NH,20%,LL2012-F18NM	371-010-5180	R6	RES, TF,2K, 1/16W, 5%, T 1608	741-102-1202
L2	COIL, CHIP,18NH,20%,LL2012-F18NM	371-010-5180	R7	RES, 1.8K, 1/16W, 5%, T 1608	05B-182-6Z
L3	COIL, 0.1UH:NL252018T-R10J	311-067-2	R8	RES, 910, 1/10W, 5%, T 2012	060-911-1Z
L4	COIL, CHIP,18NH,20%,LL2012-F18NM	371-010-5180	R11	RES,TF,100,5%,1/16W,TC250,0603	741-107-1101
L5	COIL, CHIP,18NH,20%,LL2012-F18NM	371-010-5180	R12	RES, 5.6K, 1/16W, 5%, T 1608	05B-562-6Z
L6	COIL CHIP, 0.82UH:NL252018T-R82J	311-078-2	R13	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272
L7	COIL SPRING, 2X0.75X3T:L SMD	311-301-3	R14	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272
L8	COIL SPRING, 2X0.75X3T:L SMD	311-301-3	R15	RES,TF,100,5%,1/16W,TC250,0603	741-107-1101
L11	COIL SPRING, 2X0.75X3T:L SMD	311-301-3	R16	RES, 910, 1/10W, 5%, T 2012	060-911-1Z
L12	COIL, 1.2UH:NL252018T-1R2J	311-080-3	R17	RES,TF,12K, 5%, 1/16W, +/-200, 0603	741-102-1123
L13	COIL SPRING, 2X0.75X3T:L SMD	311-301-3	R18	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
L14	COIL CHIP, 0.47UH:NL252018T-R47J	311-075-9	R21	RES, 33, 1/16W 5% T 1608	05B-330-3Z
			R22	RES,TF,4.7K,5%,1/16W,TC250,0603	741-107-1472
			R23	RES,TF,100,5%,1/16W,TC250,0603	741-107-1101
			R24	RES, 5.6K, 1/16W, 5%, T 1608	05B-562-6Z

**NOTES:**

1. Components are not available, assembly is non-repairable.
2. All parts shown are for Band 2 configuration.

# MAXON

## SP-130 / SP-140 HAND HELD

REF #	DESCRIPTION	PART #	REF #	DESCRIPTION	PART #
R25	RES,TF,4.7K,5%,1/16W,TC250,0603	741-107-1472	R93	RES,TF,100,5%,1/16W,TC250,0603	741-107-1101
R26	RES, TF,18, 1/16W, 5%, T 1608	741-102-1180	R94	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102
R27	RES,TF,4.7K,5%,1/16W,TC250,0603	741-107-1472	R95	RES,TF,82K,5%,1/16W,TC250,0603	741-107-1823
R28	RES, TF,220,1/16W, 5%, T 1608	741-102-1221	R96	RES,TF,39K,5%,1/16W,TC250,0603	741-107-1393
R31	RES, TF,300, 1/16W, 5%, T 1608	741-102-1301	R97	RES,TF,10, 5%, 1/16W, +/-200, 0603	741-102-1100
R32	RES, TF,300, 1/16W, 5%, T 1608	741-102-1301	R98	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R33	RES,TF,6.8K, 5%, 1/16W, +/-200, 0603	741-102-1682	R99	RES, 100K 1/16W 1% T 1608	05C-104-6Z
R34	RES, TF,18, 1/16W, 5%, T 1608	741-102-1180	R102	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223
R35	RES, 5.6K, 1/16W, 5%, T 1608	05B-562-6Z	R103	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R37	RES, 1.2K 1/16W 5% T 1608	05B-122-2Z	R104	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R41	RES, TF,22,1/16W, 5%, T 1608	741-102-1220	R105	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223
R42	RES,TF,12K, 5%, 1/16W, +/-200, 0603	741-102-1123	R106	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223
R43	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103	R108	RES, TF,56K,1/16W,5%,T 1608,0603	741-102-1563
R45	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223	R109	RES, 0.1 1W 1% 1218	06F-108-3
R47	RES, TF,2.2,5%,1/10W,TC250,0805	741-117-2229	R110	RES, 270 1/16W 5% T 1608	05B-271-3Z
R48	RES, TF,2.2,5%,1/10W,TC250,0805	741-117-2229	R111	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R50	RES,TF,1M, 5%, 1/16W, +/-200, 0603	741-102-1105	R112	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223
R51	RES, TF,2.2,5%,1/10W,TC250,0805	741-117-2229	R113	RES,TF,470K,5%,1/16W,TC250,0603	741-107-1474
R52	RES,TF,3.3K,5%,1/16W,TC250,0603	741-107-1332	R114	RES,TF,100K, 5%, 1/16W, +/-200, 0603	741-102-1104
R53	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103	R115	RES, TF,47,5%,1/16W,50V,T1608,0603	741-102-1470
R54	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102	R116	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223
R55	RES, 1.2K 1/16W 5% T 1608	05B-122-2Z	R117	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223
R56	RES, 270 1/16W 5% T 1608	05B-271-3Z	R121	RES,TF,220K,5%,1/16W,TC250,0603	741-107-1224
R57	RES, 100K 1/16W 1% T 1608	05C-104-6Z	R122	RES,TF,4.7K,5%,1/16W,TC250,0603	741-107-1472
R58	RES,TF,470K,5%,1/16W,TC250,0603	741-107-1474	R125	RES, TF,22,1/16W, 5%, T 1608	741-102-1220
R59	RES, TF,39,5%,50V,0603	741-102-1390	R126	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R61	RES, 68K 1/16W 1% T 1608	05C-683-2Z	R128	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103
R62	RES, 68K 1/16W 1% T 1608	05C-683-2Z	R130	RES,TF,100,5%,1/16W,TC250,0603	741-107-1101
R63	RES, 150, 1/16W, 5%, T 1608	05B-151-8Z	R132	RES, 5.6K, 1/16W, 5%, T 1608	05B-562-6Z
R64	RES, TF,22,1/16W, 5%, T 1608	741-102-1220	R901	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222
R65	RES, 51, 1/16W, 5%, T 1608	05B-510-9Z	R902	RES,TF,2.2K,5%,1/16W,TC250,0603	741-102-1222
R66	RES,TF,100,5%,1/16W,TC250,0603	741-107-1101	R903	RES,TF,4.7K,5%,1/16W,TC250,0603	741-107-1472
R67	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223	R904	RES, TF,7.5K,5%,1/16W,50V,T 1608,0603	741-102-1752
R68	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223	R905	RES,TF,27K,5%,1/16W,TC250,0603	741-107-1273
R69	RES,TF,470K,5%,1/16W,TC250,0603	741-107-1474	R906	RES, TF,7.5K,5%,1/16W,50V,T 1608,0603	741-102-1752
R70	RES,TF,470K,5%,1/16W,TC250,0603	741-107-1474	R907	RES,TF,27K,5%,1/16W,TC250,0603	741-107-1273
R71	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102	R908	RES,TF,10, 5%, 1/16W, +/-200, 0603	741-102-1100
R72	RES,TF,220K,5%,1/16W,TC250,0603	741-107-1224	R909	RES, TF,470,5%,1/16W,TC250,0603	741-107-1471
R74	RES,TF,22K,5%,1/10W,TC250,0805	741-117-2223	RLK2	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R75	RES,TF,47K,5%,1/16W,TC250,0603	741-107-1473	RLK3	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R76	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223	RLK4	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R77	RES,TF,22K,5%,1/16W,TC250,0603	741-107-1223	RLK5	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R78	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272	RLK7	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R79	RES,TF,10, 5%, 1/16W, +/-200, 0603	741-102-1100	RLK12	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R81	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272	RLK16	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R82	RES,TF,10K, 5%, 1/16W, +/-200, 0603	741-102-1103	RLK36	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R83	RES, TF,18K,1/16W 5% T 1608	741-102-1183	RLK49	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R84	RES, TF,18K,1/16W 5% T 1608	741-102-1183	RLK123	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R85	RES,TF,39K,5%,1/16W,TC250,0603	741-107-1393	RLK488	RES,TF,0,5%,1/16W,TC250,0603	741-107-1000
R86	RES,TF,1K, 5%, 1/16W, +/-200, 0603	741-102-1102	RV1	RES, SEMIFIXED,10KB RH0651C100103	067-103-4Y
R87	RES,TF,330K, 5%,1/16W, +/-200, 0603	741-102-1334	RV2	POT, ROTARY, 1K, 3DIA MM, SMD	901-001-0102
R88	RES,TF,100,5%,1/16W,TC250,0603	741-107-1101	RV3	RES, SEMIFIXED,10KB RH0651C100103	067-103-4Y
R89	RES, TF,22,1/16W, 5%, T 1608	741-102-1220	RV4	POT, ROTARY, 1K, 3DIA MM, SMD	901-001-0102
R91	RES, TF,470,5%,1/16W,TC250,0603	741-107-1471	RV5	RES, SEMIFIXED,10KB RH0651C100103	067-103-4Y
R92	RES,TF,2.7K, 5%, 1/16W, +/-200, 0603	741-102-1272	T1	COIL, IFT, SMD, 455KHZ QUAD	321-079-6
			T2	TRANSFORMERS CHIP 617PT-1019	300-223-8
			T3	TRANSFORMERS CHIP 617PT-1019	300-223-8
			TCXO	TCXO, KXN1343A,12.8M,2.0PPM	269-009-4

### NOTES:

1. Components are not available, assembly is non-repairable.
2. All parts shown are for Band 2 configuration.

# MAXON SP-130 / SP-140 HAND HELD

<u>REF #</u>	<u>DESCRIPTION</u>	<u>PART #</u>
TH1	THERM,33K,NTCCS32163SH333KC	700-050-0002
U3	IC, OP AMP,LM358M,SO-8,DUAL OP AMP	441-030-0006
U6	IC, AUDIO AMP,LM386M-1,0.33W,SO-8	441-040-0002
U8	IC, OP AMP,LM358M,SO-8,DUAL OP AMP	441-030-0006
VR3	POT, 20K,RK0971111 20KA	480-059-2
X1	CRYSTAL, 44.645M -30 15PM,32P,RX 3RD,HC-45	263-208-7
XF1	FILTER, CRYSTAL,KFN1045AA(45.1M) (BMO-U)	271-072-3


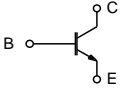
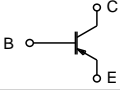
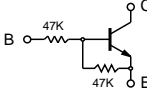
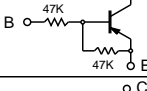
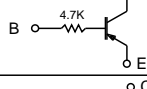
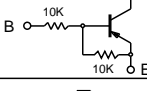
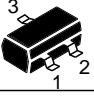







**NOTES:**

1. Components are not available, assembly is non-repairable.
2. All parts shown are for Band 2 configuration.


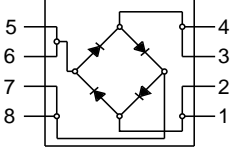

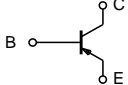

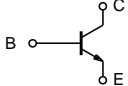
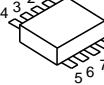





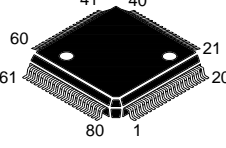


# MAXON SP-130 / SP-140 HAND HELD

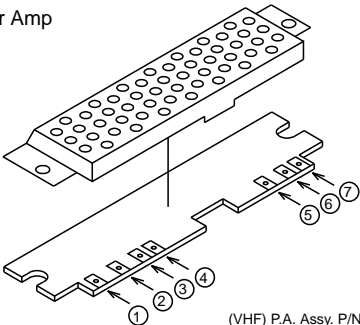
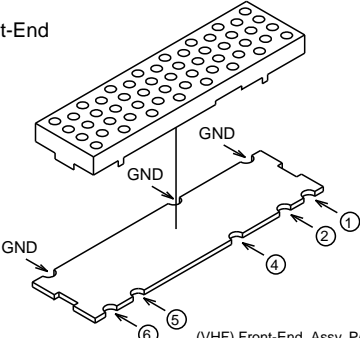
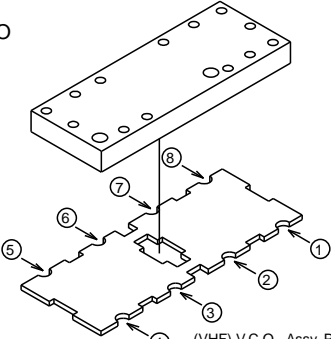
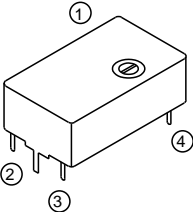
## COMPONENT PINOUT

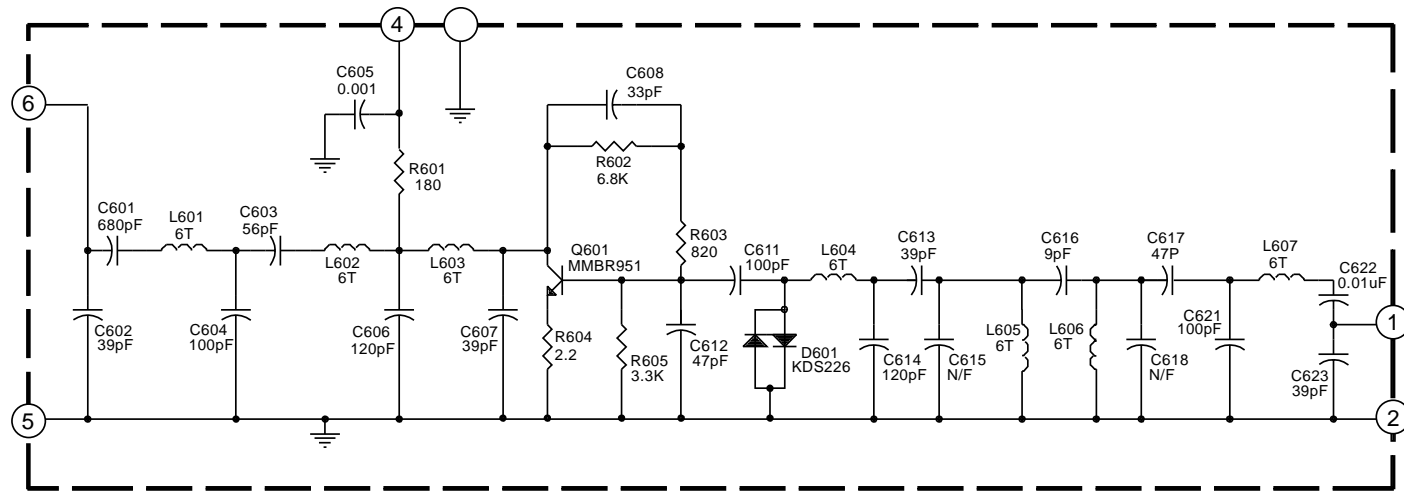
BASE DIAGRAM	MANUFACTURER'S PART NUMBER	REFERENCE NO.	SCHEMATIC
	2SC5084	Q202,203,302,303,601	
	MMBR951	Q16,17,501,601	
	BFR92A	Q12,16,25	
	KTC3875S (BL)	Q6,11,13,14,21,26,27	
	KTA1504SY	Q7,8,33	
	KRC104S (ND)	Q18,23,24,28,31,32,34,403, Q404,405,411,413	
	KRA104S (PD)	Q5,410,412	
	KRA101S (PA)	Q406,407	
	KRA110S (NK)	Q2,3,4,401,416	
KRA102S (PB)	Q1		
	MMBZ5232B	D405, 406, 407	
	KDS181 (A3)	D1,13,14,401,402,501	
	KDS193 (F3)	D8,11,12,403	
	KDS226 (C3)	D601,901,902	
	KDS184 (B3)	D404	
	UPP9401	D5,6	

**MAXON**  
**SP-130 / SP-140 HAND HELD**

BASE DIAGRAM	MANUFACTURER'S PART NUMBER	REFERENCE NO.	SCHEMATIC
	ND433G	D9	
 <p>1.BASE 2.COLLECTOR 3.EMITTER</p>	KTA1663	Q22	
 <p>1.EMITTER 2.BASE 3.EMITTER 4.COLLECTOR</p>	BLT50	Q502	
 <p>1,4,5,8:EMITTER 2,3:BASE 6,7:COLLECTOR</p>	BLT52	Q503	
	1SV229	D201,202,301	
	SM4004	D15	
	HD4074818	IC409	CPU IC

# MAXON SP-130 / SP-140 HAND HELD

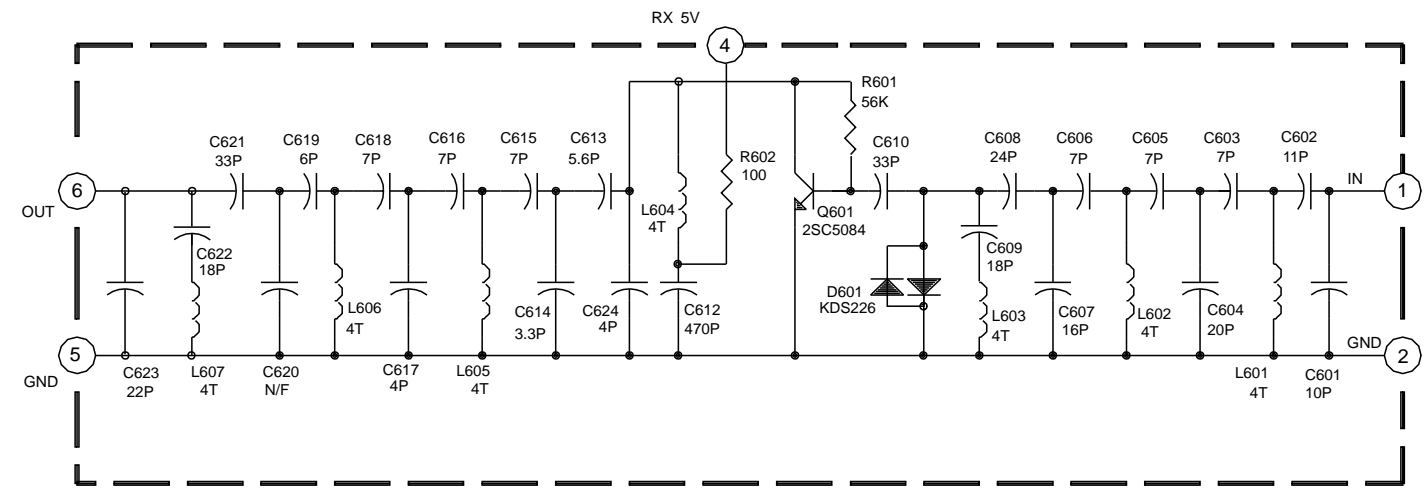
BASE DIAGRAM	PIN DESCRIPTION
<p>RF Power Amp</p>  <p>(VHF) P.A. Assy. P/N: 650-230-0012 (UHF) P.A. Assy. P/N: 650-230-0013</p>	<p>No Description</p> <ul style="list-style-type: none"> <li>① Input</li> <li>② GND</li> <li>③ Vcc (Pre Drive)</li> <li>④ Vcc Control (Drive)</li> <li>⑤ Vcc (Final)</li> <li>⑥ Output</li> <li>⑦ GND</li> </ul>
<p>RX Front-End</p>  <p>(VHF) Front-End Assy. P/N: 650-110-0012 (UHF) Front-End Assy. P/N: 650-110-0013</p>	<ul style="list-style-type: none"> <li>① Input</li> <li>② GND</li> <li>④ B+(4V)</li> <li>⑤ GND</li> <li>⑥ Output</li> </ul>
<p>RX/TX VCO</p>  <p>(VHF) V.C.O. Assy. P/N: 650-030-0021 (UHF) V.C.O. Assy. P/N: 650-030-0020</p>	<ul style="list-style-type: none"> <li>① NC</li> <li>② RX Streering</li> <li>③ TX Moduation</li> <li>④ TX Streering</li> <li>⑤ TX Vcc</li> <li>⑥ TX Out</li> <li>⑦ RX Vcc</li> <li>⑧ TX Out</li> </ul>
<p>12.8 MHz TCXO</p>  <p>(VHF ONLY) TCXO Assy. P/N: 650-100-0002</p>	<ul style="list-style-type: none"> <li>① Modulation</li> <li>② GND</li> <li>③ Out</li> <li>④ Vcc (5V)</li> </ul>



NOTES:

1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

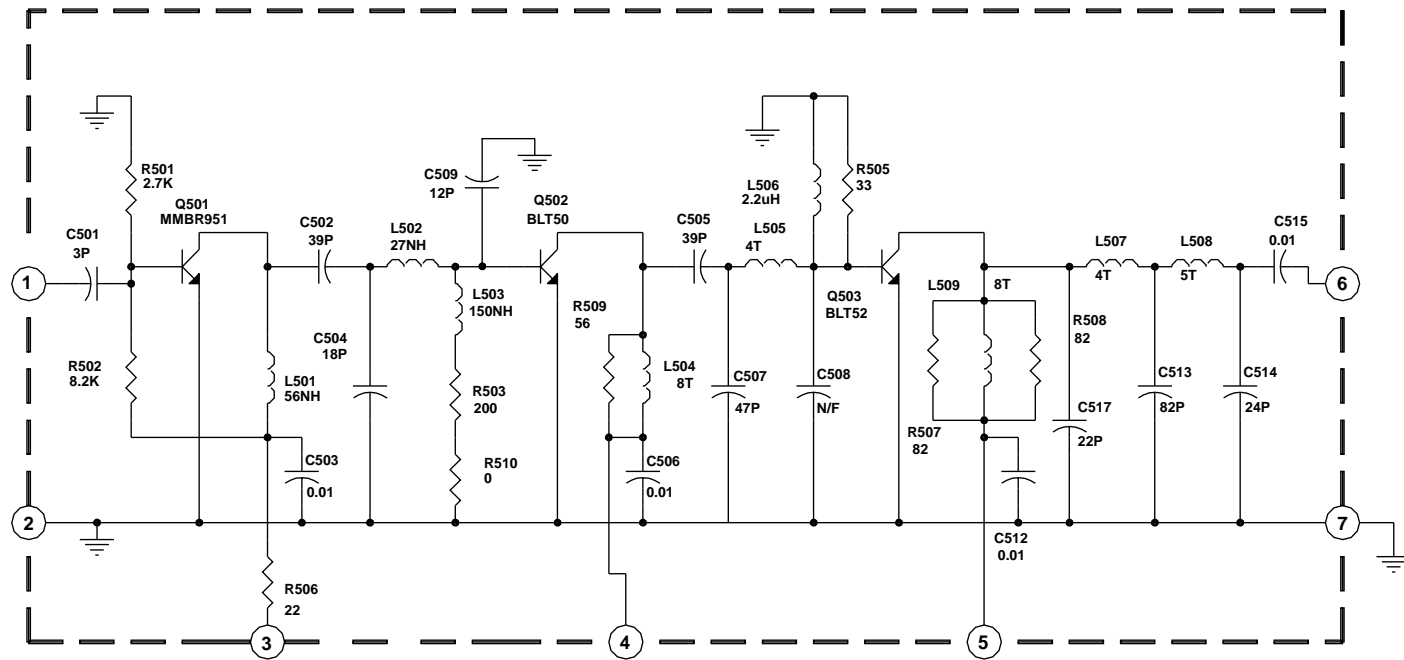
**VHF FRONT-END**  
770-110-0012  
VHF Band 2 shown



NOTES:

1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

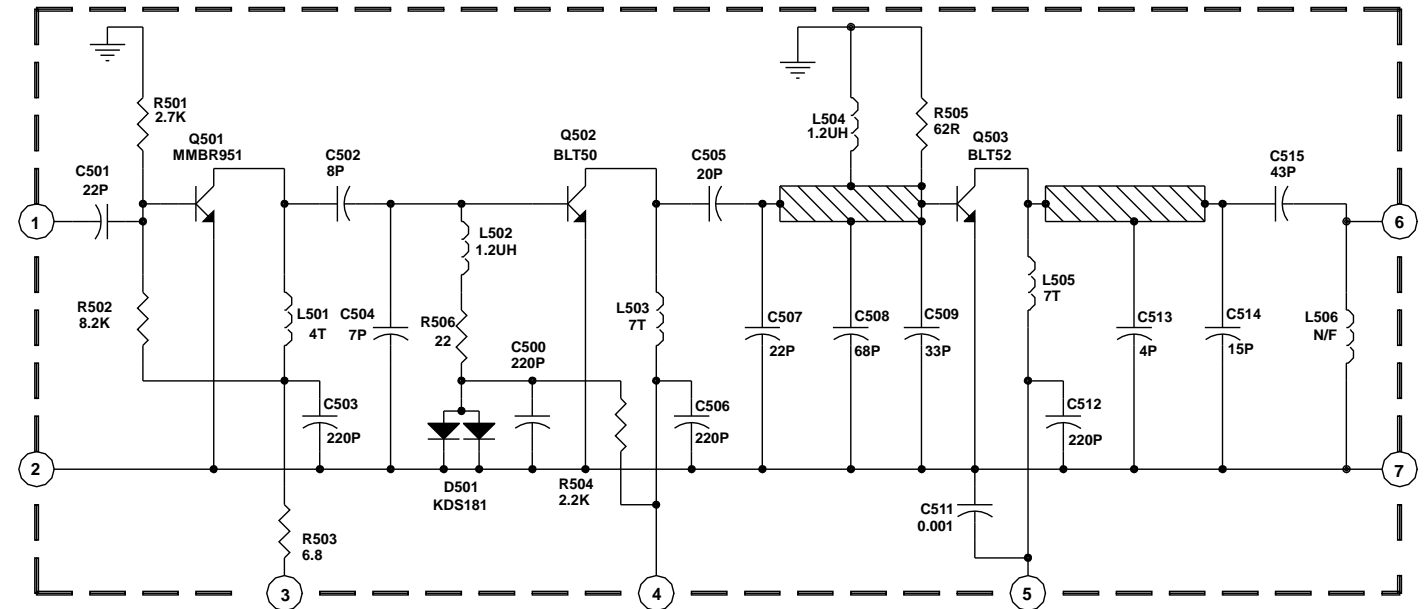
**UHF FRONT-END**  
770-110-0013  
UHF Band 2 shown



NOTES:

1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

**VHF POWER AMP**  
770-230-0012  
VHF Band 2 shown

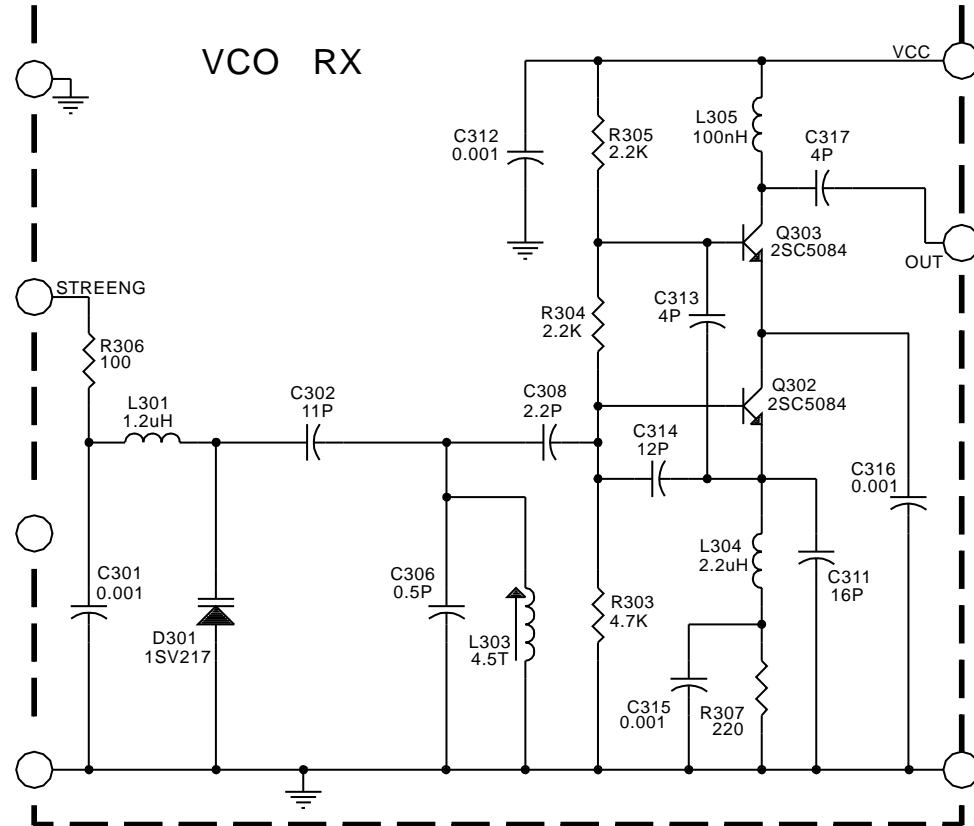
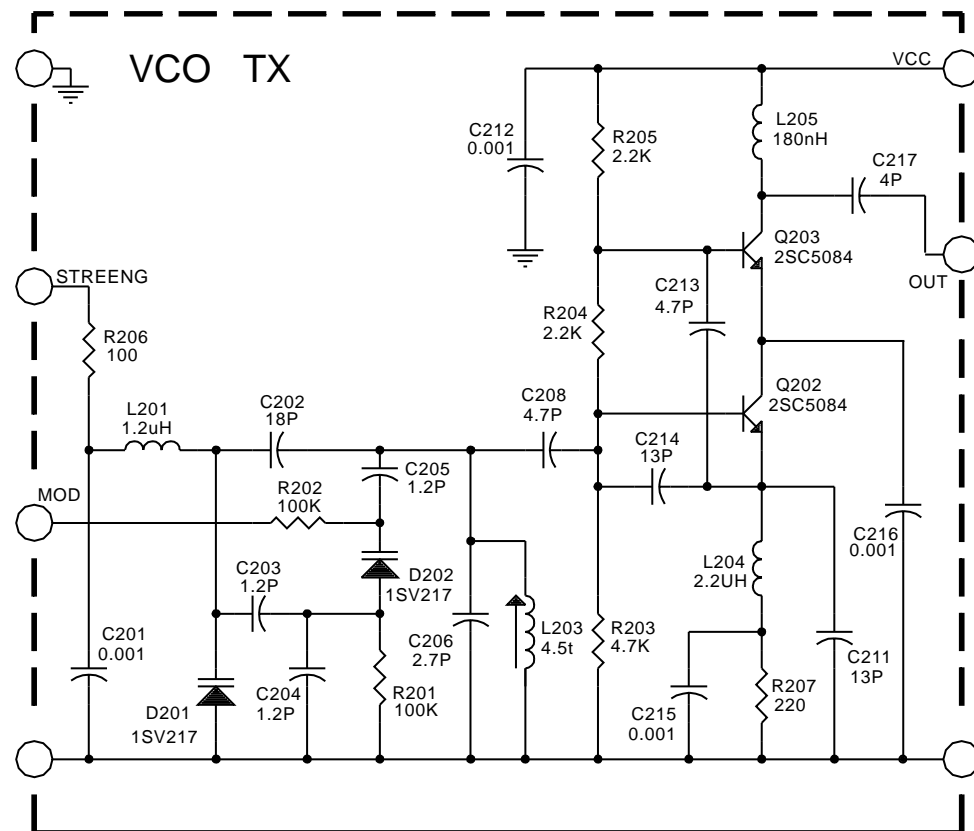


NOTES:

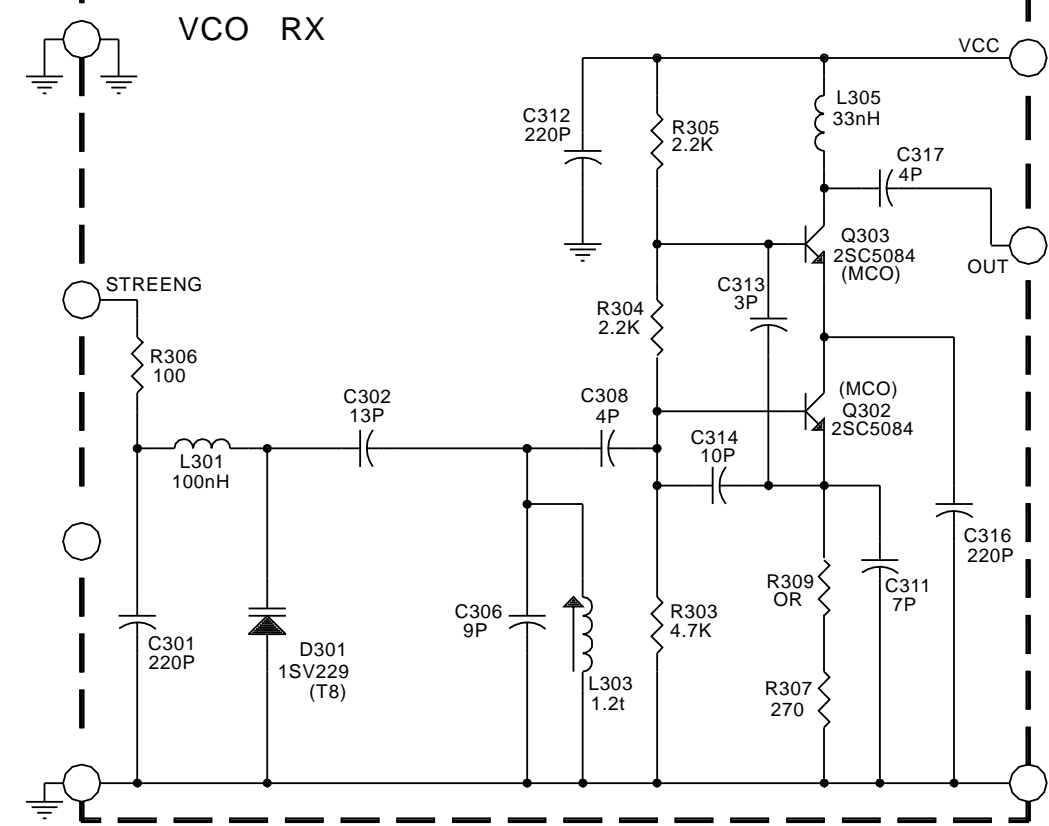
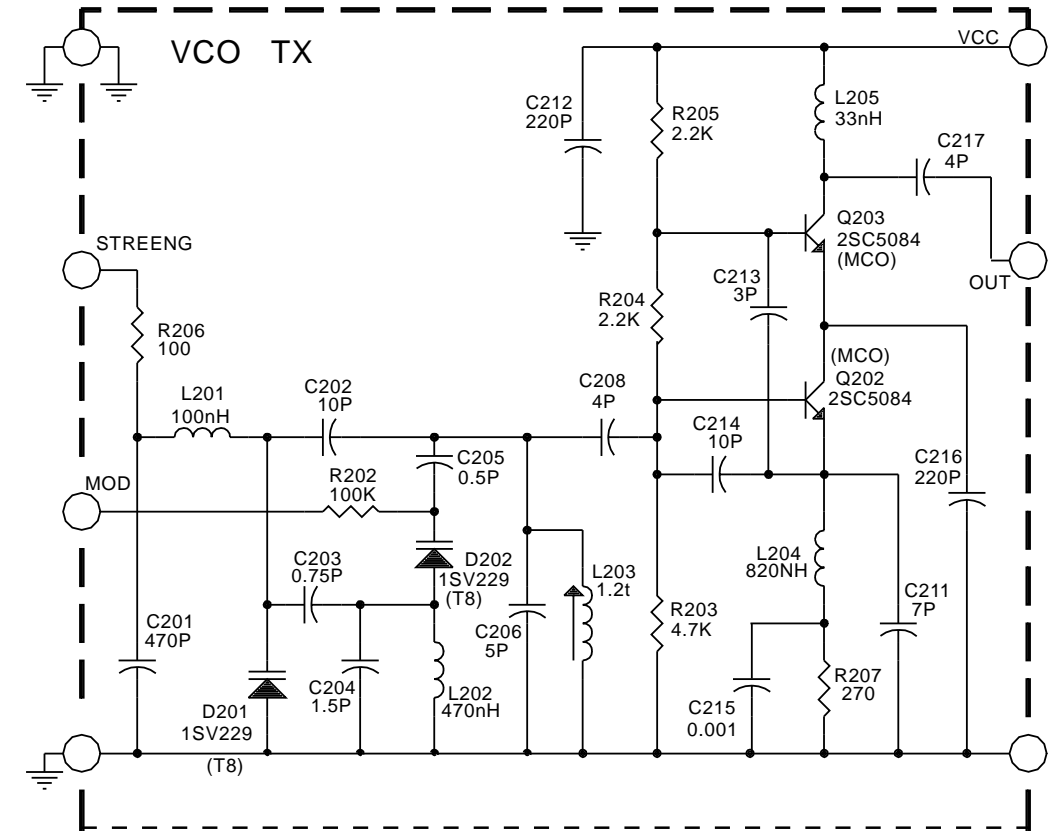
1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

**UHF POWER AMP**  
770-230-0013  
UHF Band 2 shown

● *Note: Schematics are for reference only. Based on band selection, reference designators and part values may differ from schematics shown.*



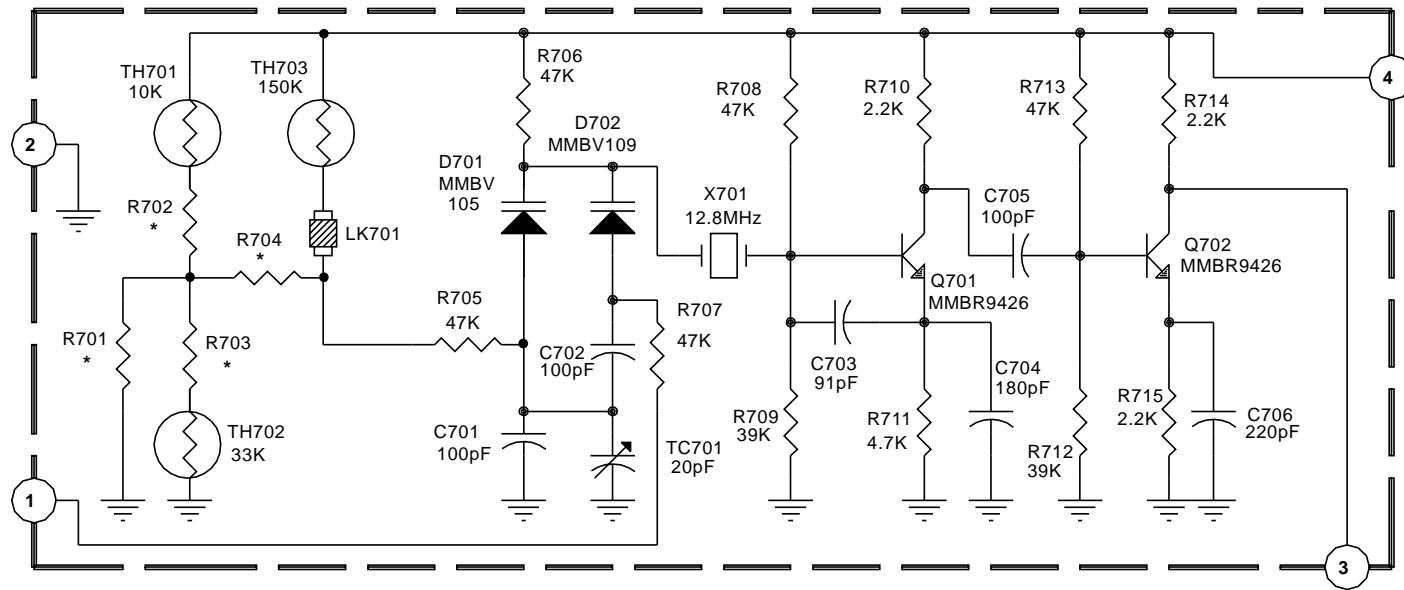
**VHF V.C.O.**  
770-030-0017  
VHF Band 2 shown



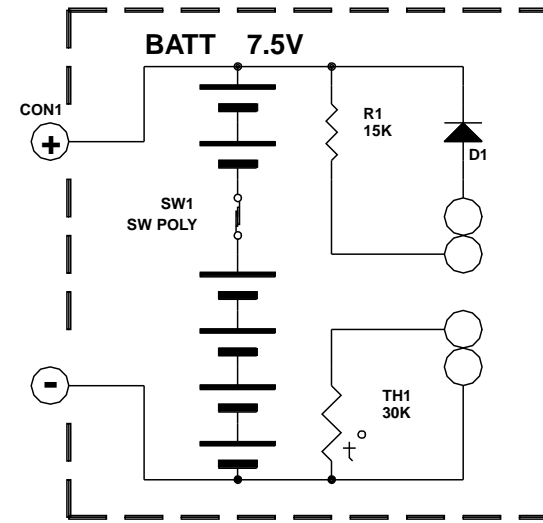
**UHF V.C.O.**  
770-030-0018  
UHF Band 2 shown

NOTES:

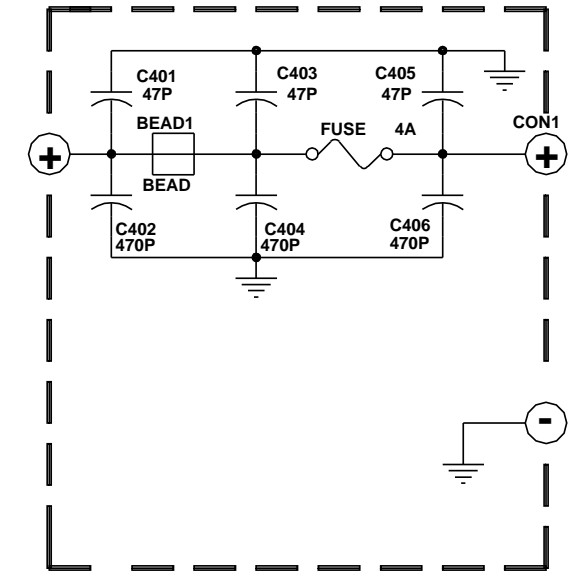
1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.



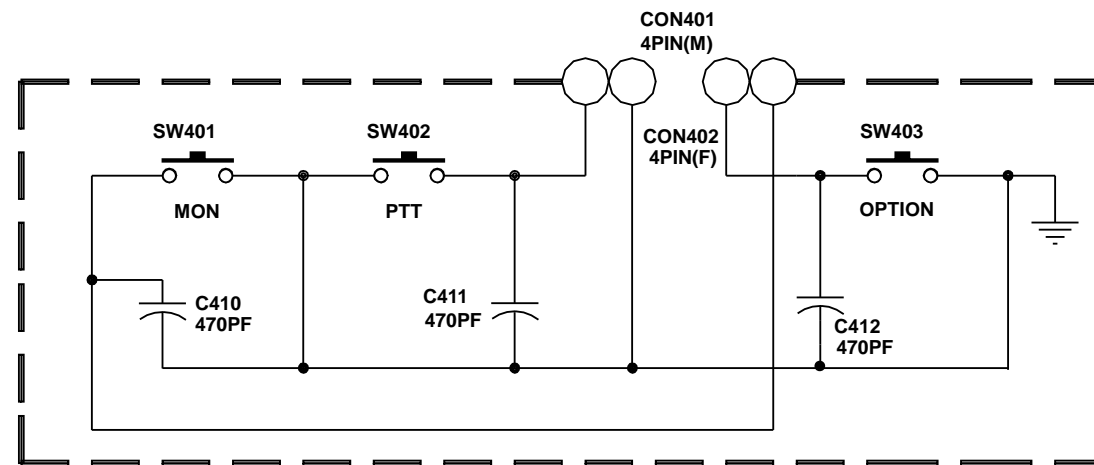
**TCXO (VHF)**  
770-100-0002



**MPA-1200 BATTERY**  
770-210-0010



**FUSE**  
770-200-0004

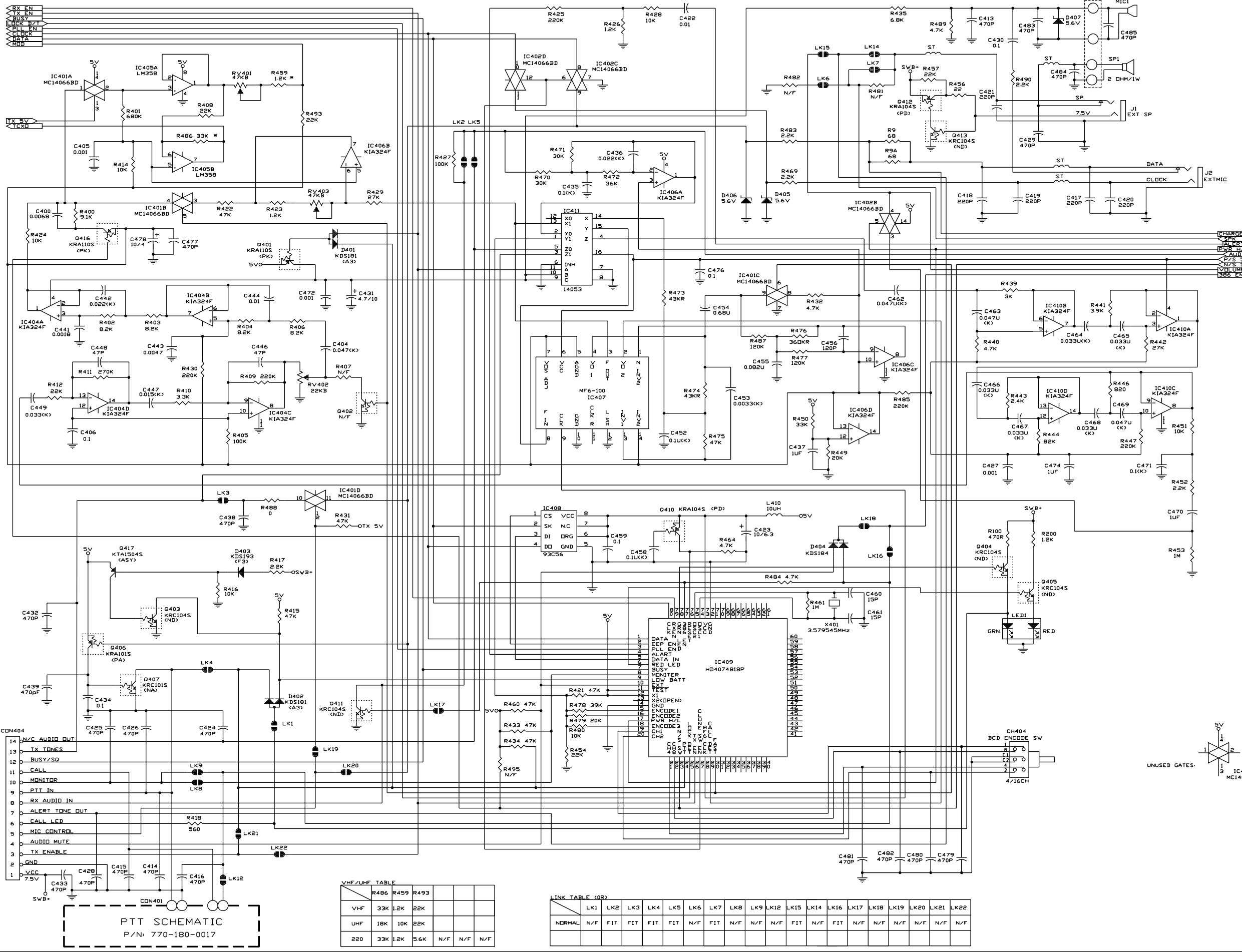


**P.T.T.**  
770-180-0017

NOTES:

1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

REVISIONS		
REV	DESCRIPTION	CHG BY DATE
A	RELEASED TO MANUFACTURING	JPW 09/97



SP130/SP140 VHF (DIGITAL SECTION)  
 MAIN BD. SCHEMATIC, SHEET 1, DIGITAL SECTION  
 130-140V.SCH (SHEET 1) DIGITAL SECTION, VHF  
 5000002.SCH (SHEET 2) RF SECTION, VHF

LIBRARIES:  
 PADS FILE: P0000021.JOB  
 SP130 VHF MAIN BOARD ASSEMBLY, P/N 650-000-0021  
 SP140 VHF MAIN BOARD ASSEMBLY, P/N 650-000-0020  
 CIRCUIT MATCHES MAXCOR PRODUCT CODE: 6748 (4 CHANNEL, VHF)  
 6742 (16 CHANNEL, VHF)

NOTES:  
 1. ALL VALUES ARE IN OHMS, MICROHENRIES, OR MICROFARADS UNLESS OTHERWISE SPECIFIED.  
 2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.  
 3. SP130 IS 4 CHANNEL. SP140 IS 16 CHANNEL. ONLY PART AFFECTED IS CH404.  
 4. C485 IS ATTACHED TO TERMINALS OF MIC ELEMENT, MIC1.

VHF/UHF TABLE

	R486	R459	R493
VHF	33K 1.2K	22K	
UHF	18K 10K	22K	
220	33K 1.2K	5.6K	N/F N/F N/F

LINK TABLE (OR)

	LK1	LK2	LK3	LK4	LK5	LK6	LK7	LK8	LK9	LK12	LK15	LK14	LK16	LK17	LK18	LK19	LK20	LK21	LK22
NORMAL	N/F	FIT	FIT	FIT	FIT	N/F	FIT	N/F	N/F	N/F	FIT	N/F	FIT	N/F	N/F	N/F	N/F	N/F	N/F

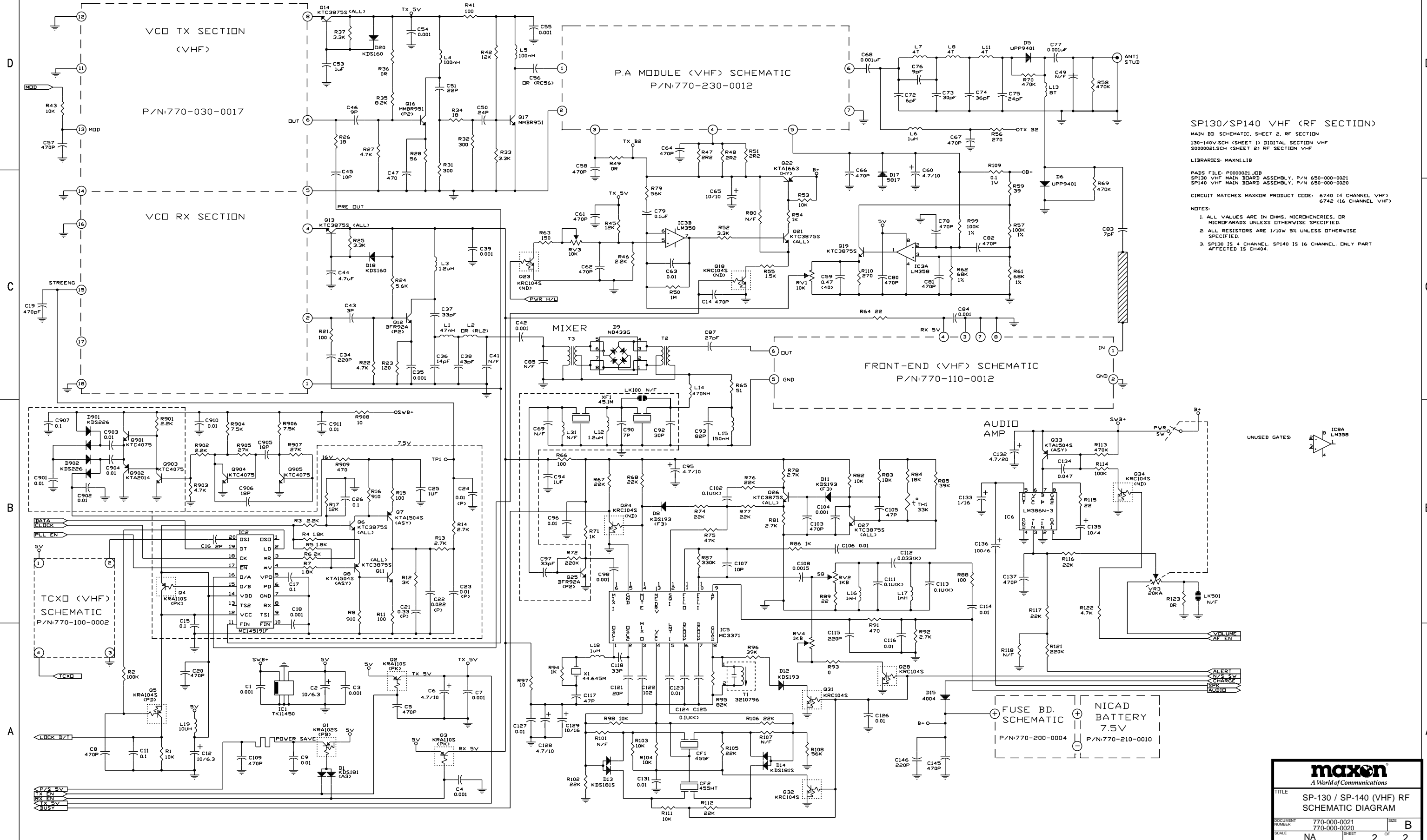
**maxon**  
 A World of Communications

TITLE: SP-130 / SP-140 (VHF) DIGITAL SCHEMATIC DIAGRAM

DOCUMENT NUMBER: 770-000-0021  
 770-000-0020

SCALE: NA SHEET 1 OF 2

REVISIONS		
REV	DESCRIPTION	CHG BY DATE
A	RELEASED TO MANUFACTURING	JPW 09/97



SP130/SP140 VHF (RF SECTION)  
 MAIN BD. SCHEMATIC, SHEET 2, RF SECTION  
 SP130 VHF MAIN BOARD ASSEMBLY, P/N 650-000-0021  
 SP140 VHF MAIN BOARD ASSEMBLY, P/N 650-000-0020

LIBRARIES: MAXNLIB

PADS FILE: P0000021.JOB  
 SP130 VHF MAIN BOARD ASSEMBLY, P/N 650-000-0021  
 SP140 VHF MAIN BOARD ASSEMBLY, P/N 650-000-0020

CIRCUIT MATCHES MAXKOR PRODUCT CODE: 6740 (4 CHANNEL VHF)  
 6742 (16 CHANNEL VHF)

NOTES:  
 1. ALL VALUES ARE IN OHMS, MICROHENRIES, OR MICROFARADS UNLESS OTHERWISE SPECIFIED.  
 2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.  
 3. SP130 IS 4 CHANNEL SP140 IS 16 CHANNEL. ONLY PART AFFECTED IS CH404.

**maxon**  
 A World of Communications

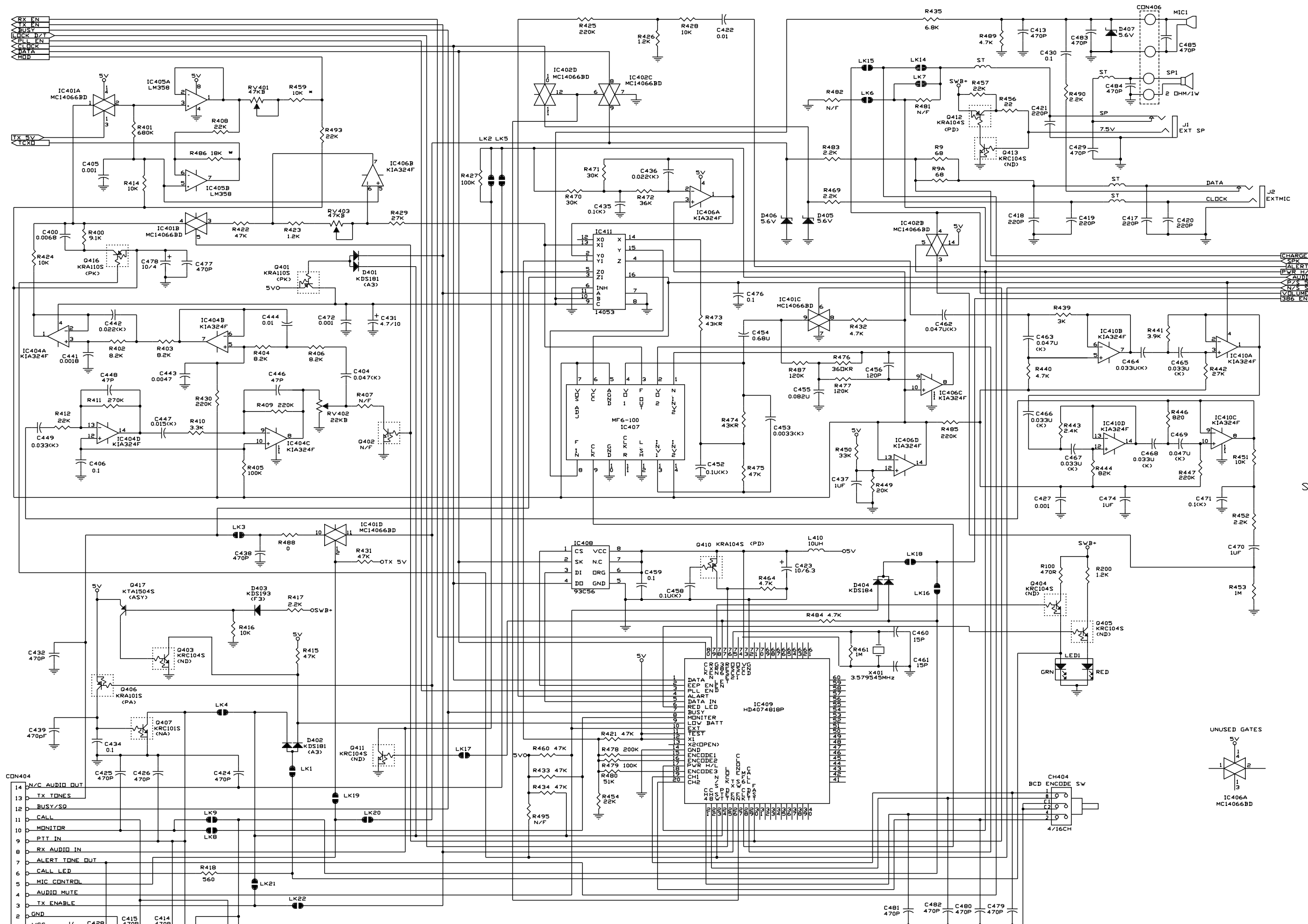
TITLE: SP-130 / SP-140 (VHF) RF SCHEMATIC DIAGRAM

DOCUMENT NUMBER: 770-000-0021  
 770-000-0020

SCALE: NA SHEET: 2 OF 2



REVISIONS		CHG BY	DATE
REV	DESCRIPTION		
A	RELEASED TO MANUFACTURING	JFW	09/97



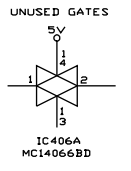
SP130/SP140 UHF (DIGITAL SECTION)

MAIN BD. SCHEMATIC, SHEET 1, DIGITAL SECTION  
 130-140USCH (SHEET 1) DIGITAL SECTION, UHF  
 S000002SCH (SHEET 2) RF SECTION, UHF

LIBRARIES:  
 PADS FILE: P0000021.JOB  
 SP130 UHF MAIN BOARD ASSEMBLY P/N: 650-000-0022  
 SP140 UHF MAIN BOARD ASSEMBLY P/N: 650-000-0023

CIRCUIT MATCHES MAXXDR PRODUCT CODE: 6741 (4 CHANNEL UHF)  
 6743 (16 CHANNEL UHF)

- NOTES:
1. ALL VALUES ARE IN OHMS, MICROHENRIES, OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
  2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.
  3. SP130 IS 4 CHANNEL. SP140 IS 16 CHANNEL. ONLY PART AFFECTED IS CH404.
  4. C485 IS ATTACHED TO TERMINALS OF MIC ELEMENT, MIC1.



VHF/UHF TABLE

	R486	R459	R493
VHF	33K	12K	22K
UHF	18K	10K	22K
220	33K	12K	5.6K
			N/F
			N/F
			N/F

LINK TABLE (OR)

	LK1	LK2	LK3	LK4	LK5	LK6	LK7	LK8	LK9	LK12	LK15	LK14	LK16	LK17	LK18	LK19	LK20	LK21	LK22
NORMAL	N/F	FIT	FIT	FIT	FIT	N/F	FIT	N/F	N/F	N/F	FIT	N/F	FIT	N/F	N/F	N/F	N/F	N/F	N/F

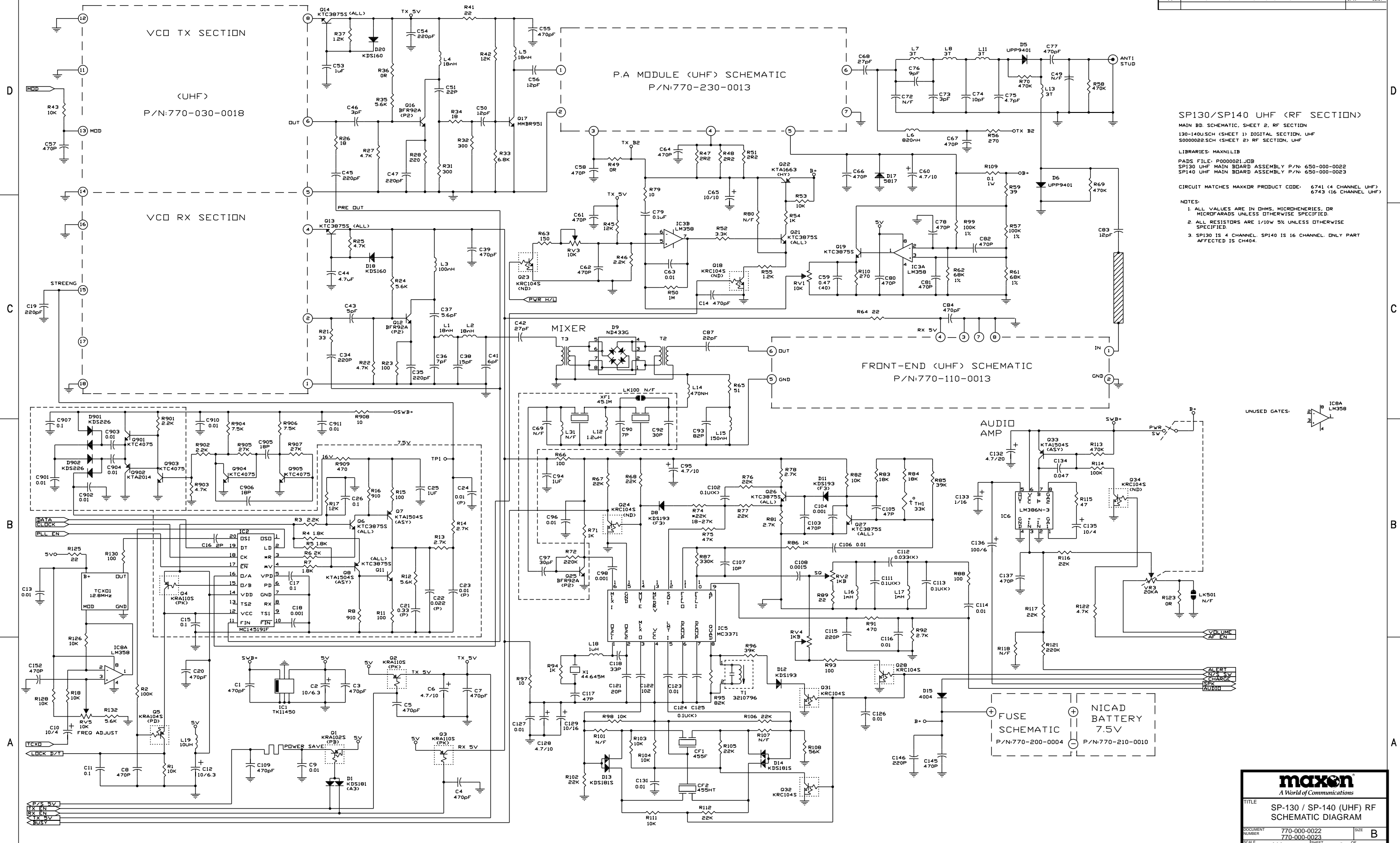
**maxon**  
A World of Communications

TITLE: SP-130 / SP-140 (UHF) DIGITAL SCHEMATIC DIAGRAM

DOCUMENT NUMBER: 770-000-0022  
 770-000-0023

SCALE: NA SHEET 1 OF 2

REVISIONS		
REV	DESCRIPTION	CHG. BY DATE
A	RELEASED TO MANUFACTURING	JPW 09/97

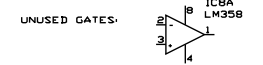


**SP130/SP140 UHF (RF SECTION)**  
 MAIN BD. SCHEMATIC, SHEET 2, RF SECTION  
 130-140USCH (SHEET 1) DIGITAL SECTION, UHF  
 S000002SCH (SHEET 2) RF SECTION, UHF

LIBRARIES: MAXMLIB  
 PADS FILE: P0000021JOB  
 SP130 UHF MAIN BOARD ASSEMBLY P/N: 650-000-0022  
 SP140 UHF MAIN BOARD ASSEMBLY P/N: 650-000-0023

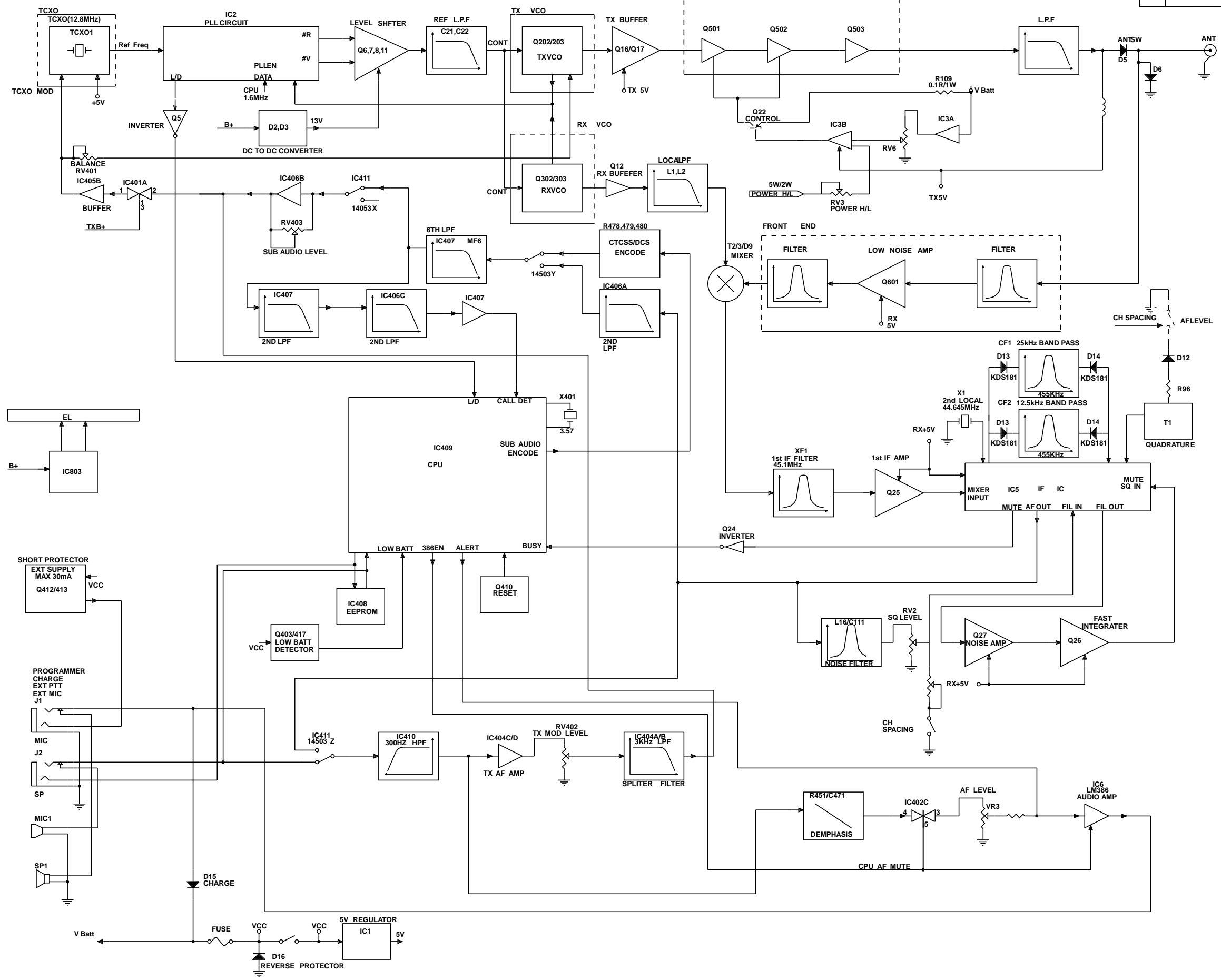
CIRCUIT MATCHES MAXMOR PRODUCT CODE: 6741 (4 CHANNEL UHF)  
 6743 (16 CHANNEL UHF)

NOTES:  
 1. ALL VALUES ARE IN OHMS, MICROHENRIES, OR MICROFARADS UNLESS OTHERWISE SPECIFIED.  
 2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.  
 3. SP130 IS 4 CHANNEL. SP140 IS 16 CHANNEL. ONLY PART AFFECTED IS CH404.



<b>maxon</b> A World of Communications			
TITLE: SP-130 / SP-140 (UHF) RF SCHEMATIC DIAGRAM			
DOCUMENT NUMBER: 770-000-0022	SIZE: B	SCALE: NA	
SHEET 2		OF 2	

REVISIONS		
REV	DESCRIPTION	CHG BY DATE
A	RELEASED TO MANUFACTURING	JPW 09/97

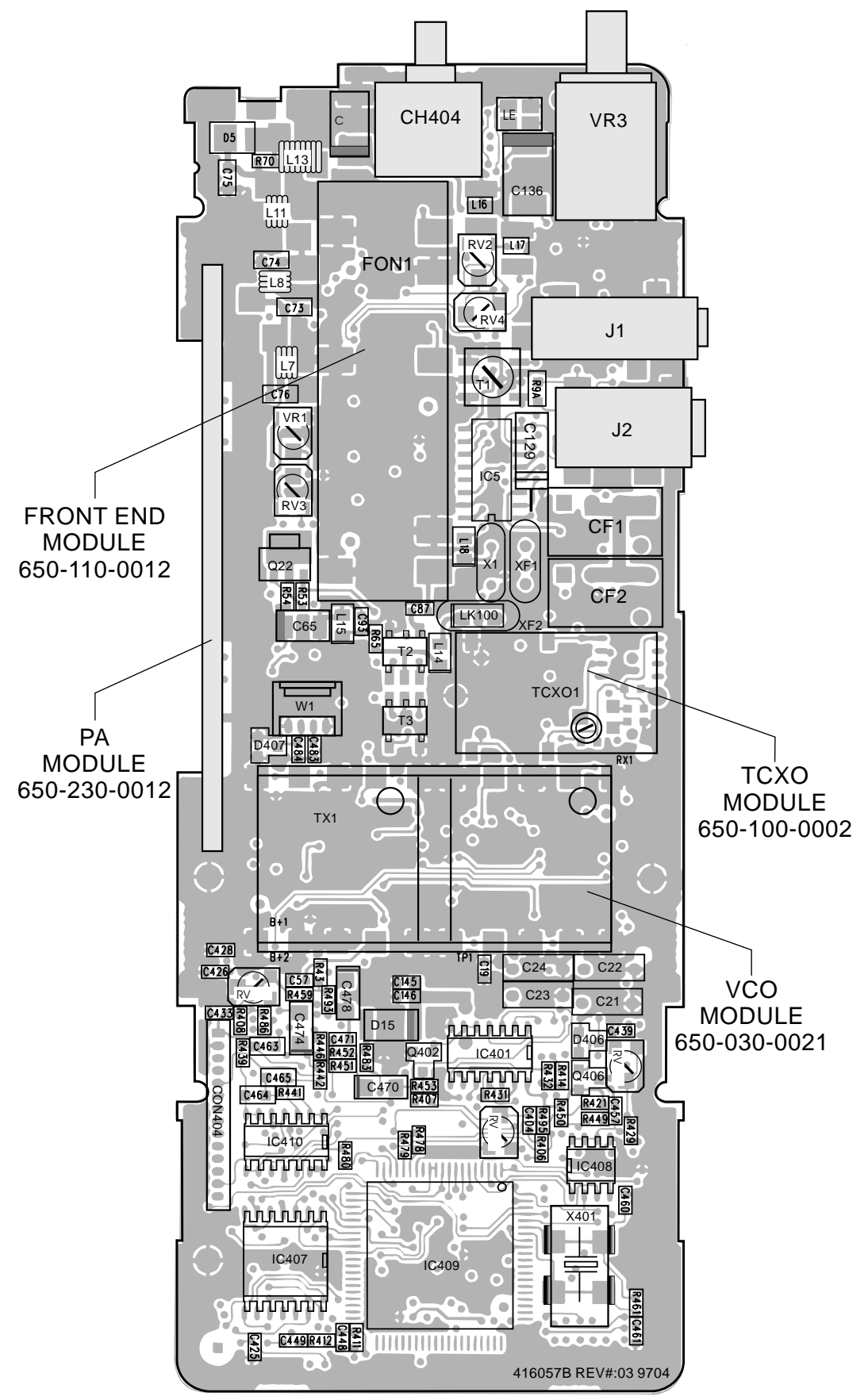


**maxon**  
A World of Communications

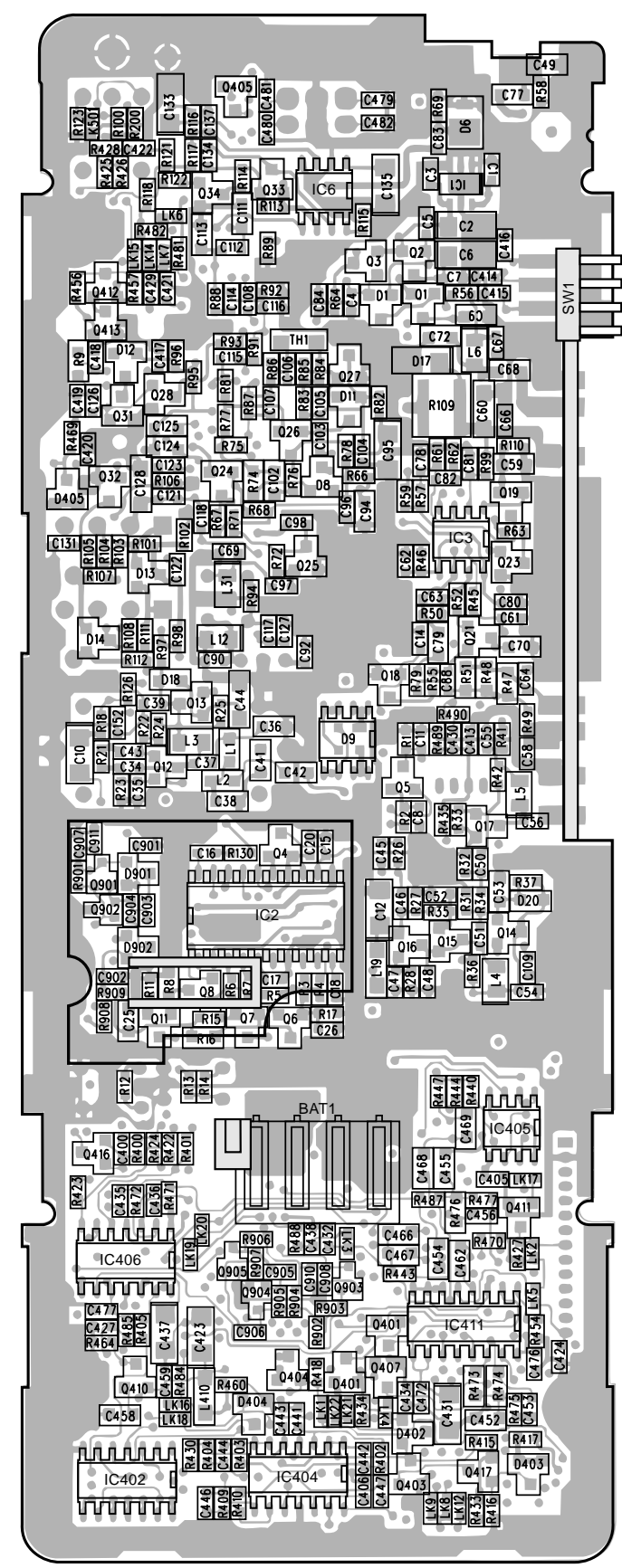
TITLE SP-130 / SP-140  
SYSTEM ELECTRICAL  
BLOCK DIAGRAM

DOCUMENT NUMBER 060-010-0031 SIZE B

SCALE NA SHEET 1 OF 1



Main Board Assembly 416057B Rev. 03  
650-000-0021 (4 Channel VHF) 650-000-0020 (16 Channel VHF)

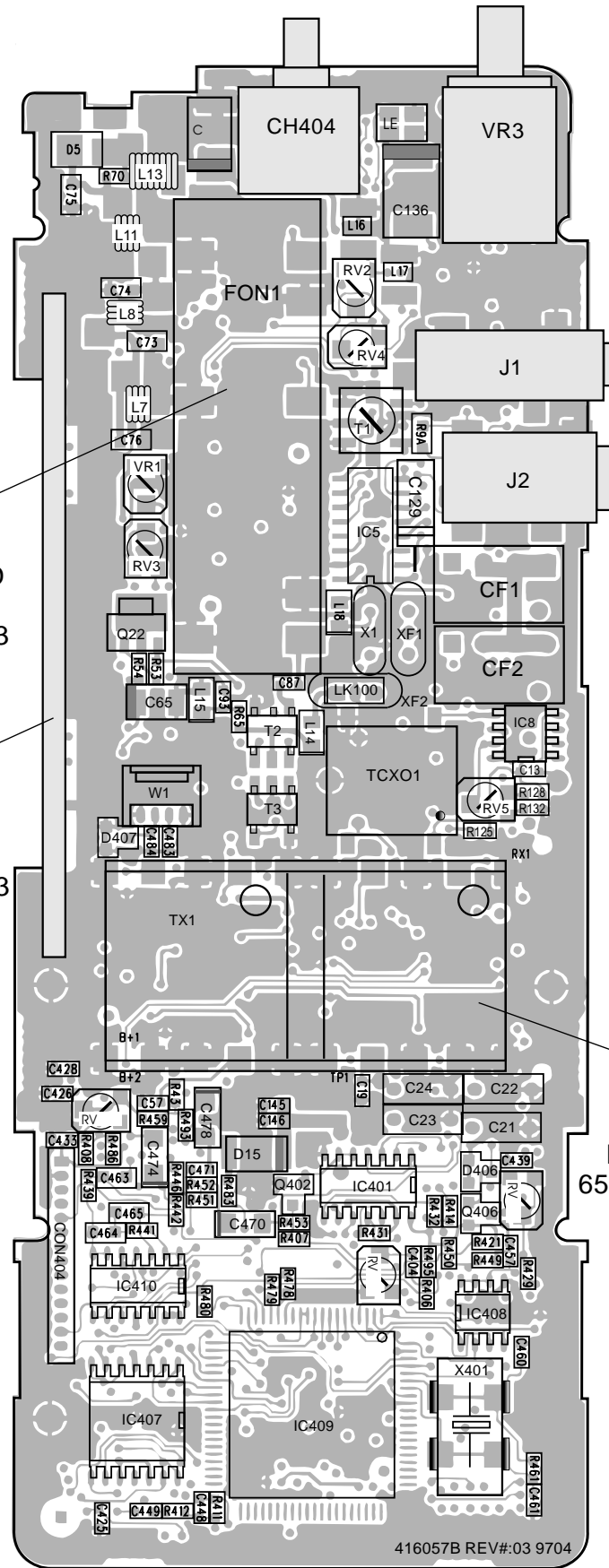


Main Board Assembly 416057B Rev. 03  
650-000-0021 (4 Channel VHF) 650-000-0020 (16 Channel VHF)

FRONT-END  
MODULE  
650-110-0013

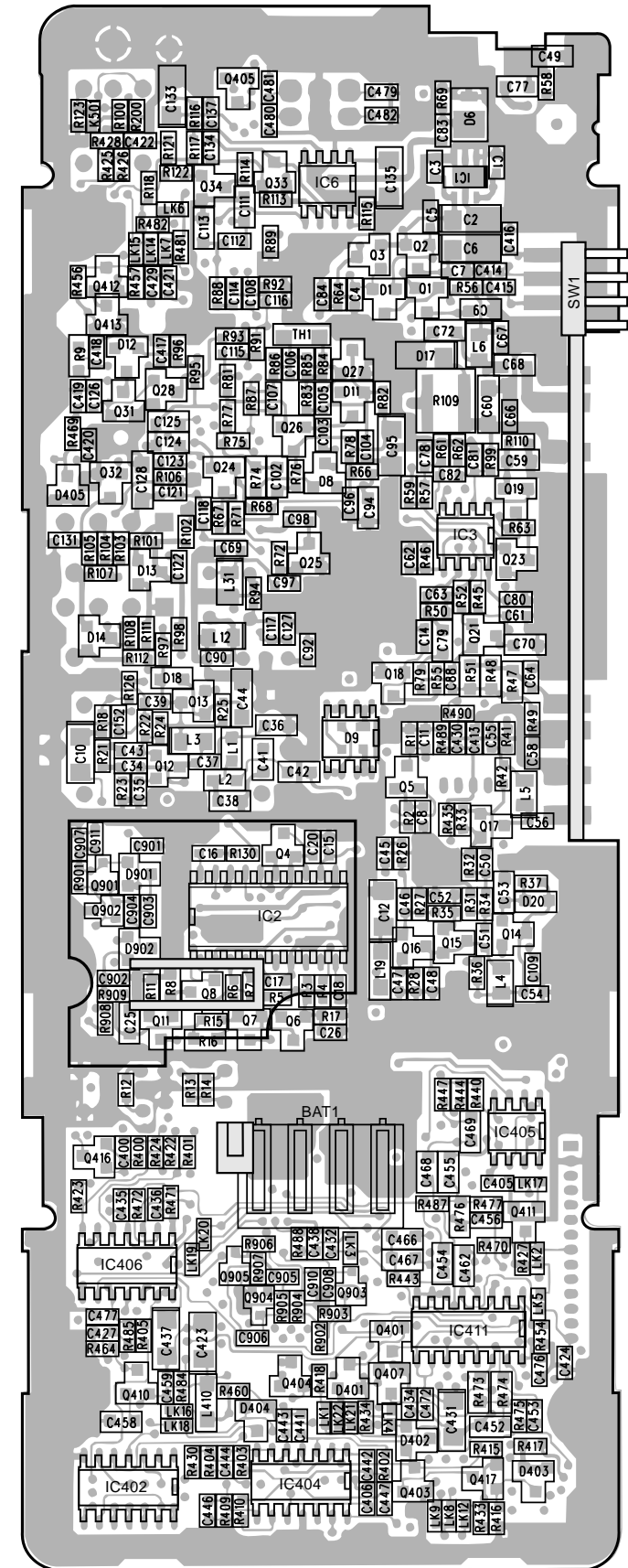
PA  
MODULE  
650-230-0013

VCO  
MODULE  
650-030-0020

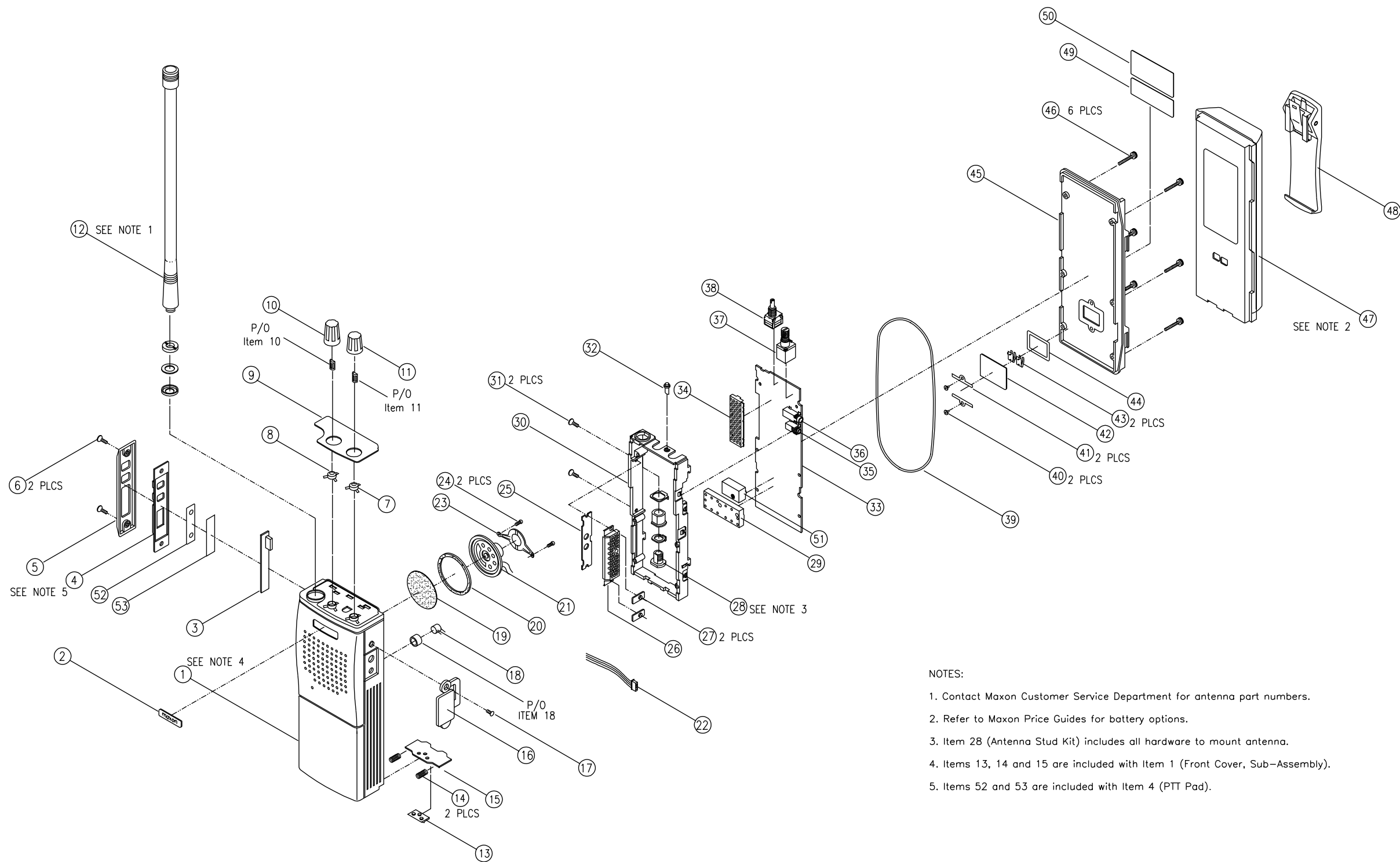


416057B REV#03 9704

Main Board Assembly 416057B Rev. 03  
650-000-0022 (4 Channel UHF) 650-000-0023 (16 Channel UHF)



Main Board Assembly 416057B Rev. 03  
650-000-0022 (4 Channel UHF) 650-000-0023 (16 Channel UHF)



NOTES:

1. Contact Maxon Customer Service Department for antenna part numbers.
2. Refer to Maxon Price Guides for battery options.
3. Item 28 (Antenna Stud Kit) includes all hardware to mount antenna.
4. Items 13, 14 and 15 are included with Item 1 (Front Cover, Sub-Assembly).
5. Items 52 and 53 are included with Item 4 (PTT Pad).

REPAIRABLE/REPLACEABLE PARTS LIST

ITEM #	QUANTITY	PART NUMBER	DESCRIPTION
1	1	550-020-0037	FRONT COVER, SUB ASSEMBLY
2	1	490-070-0019	OVERLAY
3	1	650-180-0017	PTT ASSEMBLY
4	1	760-040-0020	PTT PAD
5	1	560-050-0039	PTT HOLDER
6	2	330-110-0134	SCREW
7	1	330-220-0017	VOLUME KNOB GASKET
8	1	330-220-0018	CHANNEL KNOB GASKET
9	1	490-200-0045	TOP OVERLAY (4 CHANNEL)
9	1	490-200-0046	TOP OVERLAY (16 CHANNEL)
10	1	660-090-0097	CHANNEL KNOB
11	1	660-090-0096	VOLUME KNOB
12	1	SEE NOTE 1	ANTENNA
13	1	NOT AVAILABLE	LOCK KNOB
14	2	NOT AVAILABLE	SPRING
15	1	NOT AVAILABLE	BATTERY LATCH
16	1	760-020-0009	DUST CAP
17	1	330-110-0133	SCREW
18	1	050-020-0002	MICROPHONE
19	1	NOT AVAILABLE	FELT
20	1	NOT AVAILABLE	GASKET
21	1	050-010-0024	GASKET
22	1	950-010-0030	4 PIN WIRE HARNESS
23	1	560-090-0043	SPEAKER BRACKET
24	2	330-111-0069	SCREW
25	1	560-040-0028	HEAT SINK
26	1	650-230-0012	P.A. MODULE (VHF)
26	1	650-230-0013	P.A. MODULE (UHF)
27	2	560-090-0012	BRACKET
28	1	480-020-0017	ANTENNA STUD KIT
29	1	650-030-0021	VCO MODULE (VHF)
29	1	650-030-0020	VCO MODULE (UHF)
30	1	560-070-0011	CHASSIS
31	2	330-110-0131	SCREW
32	1	660-160-0047	CLEAR LENS (LIGHT GUIDE)
33	1	650-000-0020	MAIN BOARD ASSY (SP-140V)
33	1	650-000-0021	MAIN BOARD ASSY (SP-130V)
33	1	650-000-0022	MAIN BOARD ASSY (SP-130U)
33	1	650-000-0023	MAIN BOARD ASSY (SP-140U)
34	1	650-110-0012	FRONT END MODULE (VHF)
34	1	650-110-0013	FRONT END MODULE (UHF)
35	1	140-080-0035	JACK MINIATURE
36	1	140-080-0039	JACK MINIATURE
37	1	480-059-2	VOLUME (ON/OFF) SWITCH
38	1	830-010-0010	CHANNEL SELECT (4 CHANNEL)
38	1	830-010-0011	CHANNEL SELECT (16 CHANNEL)
39	1	330-220-0026	GASKET RING
40	2	NOT AVAILABLE	SCREW
41	2	NOT AVAILABLE	BRACKET
42	1	650-200-0004	FUSE BOARD ASSEMBLY
43	2	NOT AVAILABLE	TERMINAL
44	1	NOT AVAILABLE	DOUBLE SIDED TAPE
45	1	550-030-0023	BACK COVER ASSEMBLY
46	6	330-110-0130	SCREW
47	1	SEE NOTE 2	BATTERY PACK
48	1	660-110-0019	BELT CLIP ASSEMBLY
49	1	NOT AVAILABLE	FCC COMPLIANCE LABEL
50	1	NOT AVAILABLE	MODEL/SN FCC ID LABEL
51	1	650-100-0002	TCXO MODULE (VHF ONLY)
52	1	NOT AVAILABLE	TENSION PLATE
53	1	NOT AVAILABLE	CLEAR POLYESTER FILM

AVAILABLE PARTS FOR SP-130 & SP-140 COMMON

RV1, RV402	2	901-001-0223	VARIABLE RESISTOR 22K
RV401, RV403	2	901-001-0473	VARIABLE RESISTOR 47K
RV2	1	901-001-0102	VARIABLE RESISTOR 1K
FUSE	1	700-020-0002	FUSE 4-A 60V
LED1	1	251-234-7	LED CHIP
TC701	1	910-009-0200	TRIMMER CAP 5-20pF
CF1	1	310-010-0010	CERAMIC FILTER LT-455FW
X1	1	263-208-7	XTAL HC-45, 44.645M
XF1	1	271-0745	XTAL FILTER, 45.1M