

SST-454 ALIGNMENT PROCEDURE

Test and alignment of the SST-454 must be performed by an authorized RF service technician. Do not attempt service of the SST-454 if not completely familiar with the operation of frequency synthesized radio operation. The SST-454 can operate in either Narrow Band (2.5 KHz deviation) or Wide Band (5 KHz deviation) systems.

RECOMMENDED TEST EQUIPMENT

- 1) 0 to +15 VDC, 2A current-limited power supply
- 2) RF Communications Test Set (to 470 MHz) with:
 - FM Deviation Meter
 - RF Wattmeter
 - Frequency Counter (to 470 MHz)
 - SINAD Measuring Device
- 3) Oscilloscope (to 20 MHz)
- 4) VTVM or DMM
- 5) RITRON PC Programming Kit
- 6) RITRON SST-SRVBD Test Module

RADIO PREPARATION

- 1) Make sure the radio battery is fully charged.
- 2) Install the RITRON SST-SRVBD test assembly and serial programming cable as follows:
 - a) Remove the SST-454 antenna from the radio.
 - b) Plug the SST-SRVBD into the 2.5 mm and 3.5 mm jacks on top of the radio.
 - c) Screw the SST-SRVBD antenna nut fully into the SST-454 antenna connector.
 - d) Set the jumper on the SST-SRVBD assembly to the "UHF" position.
 - e) Connect the serial programming cable from the PC computer (with the RITRON PC programming kit software installed) to the SST-SRVBD test assembly
- 3) Connect the FM communications test set to the BNC connector on the SST-SRVBD test assembly.
- 4) Turn on the radio to place it in operating mode.
- 5) From the PC Programmer on-screen menu, select "SST Alignment". This will program the radio to temporarily operate on the following frequencies:

<u>Alignment Step</u>	<u>Frequency</u>	<u>Tone</u>	<u>TX Power</u>
Reference Frequency	460.075 MHz	No tone	Low power
Modulation Balance	460.075 MHz	20 Hz - Square wave	Low power
Deviation - Low Frequency	450.075 MHz	100.0 Hz - CTCSS	Low power
Deviation - High Frequency	470.075 MHz	100.0 Hz - CTCSS	Low power
Medium TX Power - Low Frequency	470.075 MHz	No tone	Medium power
Medium TX Power - High Frequency	450.075 MHz	No tone	Medium power
High TX Power - Low Frequency	450.075 MHz	No tone	High power
High TX Power - High Frequency	470.075 MHz	No tone	High power
Squelch	460.075 MHz	No tone	Low power

- 6) After you have completed alignment of the SST-454, turn the radio off. This will remove the test frequencies and return to operation on the customer's programmed frequencies.

TUNING MODE

Authorized service personal can perform adjustments to the radio from within the PC Programming software.

- 1) From the PC programmer on-screen menu, select "Access Radio Tech Fields."
- 2) Type "Tune" to allow adjustments using the PC programmer.

REFERENCE FREQUENCY

- 1) Make sure that the unit has been switched on and is at room temperature (approximately +25° C)
- 2) Select "Reference Frequency" from the PC Programmer "SST-454 Alignment" screen.
- 3) Set the RF communications test set to the transmit frequency on the screen.
- 4) Press and hold the PTT switch (SW304) to activate the transmitter.
- 5) Transmitter frequency error should be less than +/- 500 Hz.
- 6) If frequency adjustment is required, select "Reference Frequency Adjust" from the PC programmer menu. The "F7" key will lower the frequency; the "F8" key will raise it.
- 7) Press "F5" to write the new value to memory.

MODULATION BALANCE

Transmitter modulation balance has been set at the factory and should not require adjustment.

- 1) Select "Modulation Balance" from the PC Programmer "SST-454 Alignment" screen.
- 2) Set the RF communications test set to the transmit frequency on the screen.
- 3) With the PTT switch pressed and no voice applied to the microphone, check the de-modulated waveform for a 20 Hz square wave.
- 4) If adjustment of the modulation balance is required to flatten the top of the waveform or reduce overshoot:
 - a) Select "Modulation Balance Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the balance; the "F8" key will raise it.
 - c) Press "F5" to write the new value to memory.

TRANSMITTER TONE DEVIATION

Transmitter tone deviation has been set at the factory and should not require adjustment.

- 1) Select "Deviation - Low Frequency" from the PC Programmer "SST-454 Alignment" screen.
- 2) Set the RF communications test set to the transmit frequency on the screen.
- 3) Select "Narrow Band" from the PC Programmer "SST-454 Alignment" screen.
- 4) With the PTT switch pressed and no voice applied to the microphone, check for 400 to 500 Hz deviation of the programmed tone.
- 5) If adjustment of the tone deviation is required:
 - a) Select "Tone Deviation Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the deviation; the "F8" key will raise it.
 - c) Press "F5" to write the new value to memory.
- 6) Select "Wide Band" from the PC Programmer "SST-454 Alignment" screen.
- 7) With the PTT switch pressed and no voice applied to the microphone, check for 700 to 800 Hz deviation of the programmed tone.
- 8) If adjustment of the tone deviation is required:
 - a) Select "Tone Deviation Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the deviation; the "F8" key will raise it.
 - c) Press "F5" to write the new value to memory.
- 9) Select "Deviation - High Frequency" from the PC Programmer "SST-454 Alignment" screen.
- 10) Set the RF communications test set to the transmit frequency on the screen.
- 11) Repeat Steps 3 - 8 for the High transmit frequency.

TRANSMITTER VOICE DEVIATION

Transmitter voice deviation has been set at the factory and should not require adjustment.

- 1) Select "Deviation - Low Frequency" from the PC Programmer "SST-454 Alignment" screen.
- 2) Set the RF communications test set to the transmit frequency on the screen.
- 3) Select "Narrow Band" from the PC Programmer "SST-454 Alignment" screen.

- 4) With the PTT switch pressed, talk loudly into the SST-454 microphone. Check for +/- 2.5 KHz maximum combined voice and tone deviation.
- 5) If adjustment of the voice deviation is required:
 - a) Select "Voice Deviation Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the deviation; the "F8" key will raise it.
 - c) Press "F5" to write the new value to memory.
- 6) Select "Wide Band" from the PC Programmer "SST-454 Alignment" screen.
- 7) With the PTT switch pressed, talk loudly into the SST-454 microphone. Check for +/- 5 KHz maximum combined voice and tone deviation.
- 8) If adjustment of the voice deviation is required:
 - a) Select "Voice Deviation Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the deviation; the "F8" key will raise it.
 - c) Press "F5" to write the new value to memory.
- 9) Select "Deviation - High Frequency" from the PC Programmer "SST-454 Alignment" screen.
- 10) Set the RF communications test set to the transmit frequency on the screen.
- 11) Repeat Steps 3 - 8 for high transmit frequency.

TRANSMITTER POWER

Transmitter power has been set at the factory and should not require adjustment.

- 1) Select "Low Power - Low Frequency" from the PC Programmer "SST-454 Alignment" screen.
- 2) Set the RF communications test set to the transmit frequency on the screen.
- 3) With the PTT switch pressed, check for 1 Watt of RF power as indicated on the Wattmeter.
- 4) If adjustment of the Transmitter low power is required:
 - a) Select "Low Power Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the power; the "F8" key will raise it.
 - c) Press "F5" to write the new value to memory.
- 5) Select "Medium Power - Low Frequency" from the PC Programmer "SST-454 Alignment" screen.
- 6) With the PTT switch pressed, check for 2 Watts of RF power as indicated on the Wattmeter.
- 7) If adjustment of the Transmitter medium power is required:
 - a) Select "Medium Power Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the power; the "F8" key will raise it.
 - c) Press "F5" to write the new value to memory.
- 8) Select "High Power - Low Frequency" from the PC Programmer "SST-454 Alignment" screen.
- 9) With the PTT switch pressed, check for 5 Watts or less of RF power as indicated on the Wattmeter.
- 10) If adjustment of the Transmitter high power is required:
 - a) Select "High Power Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the power; the "F8" key will raise it
 NOTE: The maximum value is limited to prevent damage to the RF final device or from exceeding the SST-454 rated limits.
 - c) Press "F5" to write the new value to memory.
- 11) Select "Low Power - High Frequency" from the PC Programmer "SST-454 Alignment" screen.
- 12) Set the RF communications test set to the transmit frequency on the screen.
- 13) Repeat Steps 3 - 10 for the High transmit frequency at low, medium and high power.

RECEIVER SENSITIVITY AND SQUELCH

The SST-454 receiver is fixed tuned for a frequency range of 450 - 470 MHz, there are no tuning adjustments required for receiver sensitivity. The SST-454 receiver is configured from the factory for Wide Band operation, with a Narrow Band Model available as an option. The SST-454 receiver bandwidth is configured on a per radio basis, it cannot be switched on a per channel basis. The noise squelch sensitivity is adjusted for a "local" and "distance" level using the PC Programmer, and programmed on a per channel basis to either one of these two settings.

Local and Distance squelch has been set at the factory and should not require adjustment.

- 1) Select "Squelch" from the PC Programmer "SST-454 Alignment" screen.
- 2) Select "Distance Squelch" from the PC Programmer "SST-454 Alignment" screen.
- 3) Connect an 8 Ohm speaker to the 3.5 mm audio jack on the SST-SRVBD test assembly.
- 4) Set the RF communications test set to:
 - a) Generate the radio receive frequency on the screen.
 - b) Set the RF output to a level required to produce a 12 dB SINAD measurement across the speaker, typically -119 dBm.
 - c) Modulate the RF signal with a 1 KHz tone at 60% system deviation (3 KHz for Wide band receiver and 1.5 KHz for Narrow band).
- 5) Reduce the RF signal level until the radio squelches, then slowly raise the level until squelch opens. This should be at the level required for 12 dB SINAD receiver sensitivity.
- 6) If adjustment of distance squelch is required:
 - a) Select "Distance Squelch Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the squelch sensitivity; the "F8" key will raise it.
 - c) Press "F5" to write the new value to memory.
- 7) Slowly reduce the RF signal level until the radio is squelched. This level should be 3 - 5 dB below that required to open squelch in Step 5.
- 8) If adjustment of squelch hysteresis is required:
 - a) Select "Squelch Hysteresis Adjust" from the PC Programmer menu.
 - b) The "F7" key will decrease the squelch hysteresis; the "F8" key will increase it.
 - c) Press "F5" to write the new value to memory.
- 9) Select "Local Squelch" from the PC Programmer "SST-454 Alignment" screen.
- 10) Set the RF output to a level required to produce a 20 dB SINAD measurement across the speaker, typically -114 dBm.
- 11) Reduce the RF signal level until the radio squelches, then slowly raise the level until squelch opens. This should be at the level required for 20 dB SINAD receiver sensitivity.
- 12) If adjustment of local squelch is required:
 - a) Select "Local Squelch Adjust" from the PC Programmer menu.
 - b) The "F7" key will lower the squelch sensitivity; the "F8" key will raise it.
 - c) Press "F5" to write the new value to memory.

SYNTHESIZER

The synthesizer is preset at the factory for operation between 450 and 470 MHz. There is no manual adjustment to center the control voltage, with all adjustment performed by the factory selection of fixed capacitor C425. Do not attempt to adjust the synthesizer control unless a key component in the synthesizer has been replaced. Key components do not include the Y302 reference frequency TCVCXO or IC401 synthesizer IC. Synthesizer alignment errors cause poor operation at temperature extremes.

Should adjustment of the VCO control voltage be necessary, the radio must first be disassembled and powered up at 7.5 VDC. The following procedure defines testing of the VCO control voltage:

- 1) Select the channel with the lowest receive frequency.
- 2) Connect a VTVM, DVM or oscilloscope to Test Point 400 and measure the VCO control voltage. This voltage should be no less than 1.5 VDC.
- 3) Select the channel with the highest receive frequency and measure Test Point 400. The control voltage should be no higher than 4.5 VDC.
- 4) If adjustment of the VCO control voltage is required:
 - a) Remove the shield top from the synthesizer module.
 - b) Replace C425 with a capacitor value that allows VCO control voltages between 1.5 and 4.5 VDC for the operating frequencies desired. Decreasing the value of C425 will raise the operating frequency of the VCO while increasing the value will lower the VCO frequency.
 - c) Replace the top of the synthesizer shield.

SST-454 VOLTAGE CHART

MEASUREMENT CONDITIONS:

Supply voltage at 7.5 VDC, radio in operating mode, volume control at minimum, power strobe enabled, transmitter set for full power,.

IMPORTANT: Because the SST-454 portable is constructed with grounding sub-planes, use a system ground in the same proximity as the circuit being measured. All readings indicated as GND are true system ground.

KEY: All measurements are in VDC unless indicated otherwise.

NC = No connection → = See note in right column

GND = Ground * = Voltage is strobed in Power Saver mode

SST-454 VOLTAGES

DEVICE	PIN	Transmit	Receive	Standby	DESCRIPTION
CR101	1	0.7	0.0	0.0	TX/RX switching
	2	NC	NC	NC	
	3	GND	GND	GND	
CR102	1	GND	GND	GND	Voltage clamp
	2	GND	GND	GND	
	3	0.0	0.0	*	
CR103	1	GND	GND	GND	Noise detection → amplified receiver noise
	2	0.0	→	*	
	3	0.0	< 0.5	*	
CR201	1	1.4	0.0	0.0	TX/RX switching
	2	NC	NC	NC	
	3	0.7	0.0	0.0	
CR301	C	7.5	7.5	7.5	Overvoltage protection
	A	GND	GND	GND	
CR302	C	7.5	7.5	7.5	Reverse voltage protection
	A	2.2	4.8	4.8	
CR303	1	NC	NC	NC	Turn-on detection
	2	6.8	6.8	6.8	
	3	5.0	5.0	5.0	
CR304	1	2.0	5.0	5.0	PTT switching
	2	2.2	4.8	4.8	
	3	2.5	5.0	5.0	
CR305	1	GND	GND	GND	Voltage clamp
	2	5.0	5.0	5.0	
	3	5.0	5.0	5.0	
CR306	C	7.5	7.5	7.5	Reverse voltage protection → receive audio amp output
	A	0.0	→	*	
CR307	C	7.5	7.5	7.5	Reverse voltage protection
	A	GND	GND	GND	

SST-454 VOLTAGES

DEVICE	PIN	Transmit	Receive	Standby	DESCRIPTION
CR308	1	2.0	2.0	2.0	Voltage clamp
	2	NC	NC	NC	
	3	2.0	2.0	2.0	
CR309	1	6.2	5.6	6.2	TX/RX indicator LED
	2	5.2	6.0	6.0	
	3	7.5	7.5	7.5	
CR310	1	5.0	5.0	5.0	Voltage clamp
	2	NC	NC	NC	
	3	5.0	5.0	5.0	
IC101	1	0.0	4.9	*	RX FM-IF subsystem
	2	NC	NC	NC	
	3	0.0	4.0	*	
	4	0.0	5.0	*	
	5	0.0	4.0	*	
	6	0.0	4.0	*	
	7	0.0	4.0	*	
	8	0.0	5.0	*	
	9	0.0	2.0	*	
	10	0.0	0.6	*	
	11	0.0	2.8	*	
	12	0.0	0.0	*	
	13	NC	NC	NC	
	14	NC	NC	NC	
	15	GND	GND	GND	
	16	0.0	1.8	*	
IC102	1	NC	NC	NC	Double balanced mixer
	2	0.0	5.0	*	
	3	0.0	5.0	*	
	4	0.0	5.0	*	
	5	0.0	5.0	*	
	6	0.0	5.0	*	
	7	GND	GND	GND	
	8	0.0	0.8	*	
IC301	1	5.0	5.0	5.0	+5 VDC voltage regulator
	2	GND	GND	GND	
	3	GND	GND	GND	
	4	NC	NC	NC	
	5	NC	NC	NC	
	6	GND	GND	GND	
	7	GND	GND	GND	
	8	7.5	7.5	7.5	
IC302	1	0.0	5.0	5.0	Microcontroller
	2	0.0	5.0	5.0	
	3	5.0	5.0	5.0	
	4	5.0	5.0	5.0	
	5	5.0	0.0	0.0	
	6	0.0	0.0	5.0	
	7	5.0	5.0	5.0	
	8	→	0.0	0.0	
	9	NC	NC	NC	
	10	NC	NC	NC	

→ 0-5 VDC 15KHz pulses

SST-454 VOLTAGES

DEVICE	PIN	Transmit	Receive	Standby	DESCRIPTION
IC302	11	NC	NC	NC	Microcontroller
	12	5.0	5.0	5.0	
	13	0.0	5.0	0.0	
	14	5.0	0.0	0.0	
	15	0.0	0.0	0.0	
	16	0.0	0.0	0.0	
	17	→	2.0	2.0	→ 0-5 VDC tone encode waveform
	18	→	2.0	2.0	→ 0-5 VDC tone encode waveform
	19	5.0	5.0	5.0	
	20	5.0	0.0	0.0	
	21	GND	GND	GND	
	22	5.0	5.0	5.0	
	23	0.0	5.0	5.0	
	24	5.0	5.0	5.0	
	25	0.0	0.0	0.0	
	26	5.0	5.0	5.0	
	27	0.0	0.0	0.0	
	28	NC	NC	NC	
	29	NC	NC	NC	
	30	5.0	0.0	0.0	
	31	NC	NC	NC	
	32	5.0	0.0	5.0	
	33	0.0	0.0	0.0	
	34	0.0	5.0	0.0	
	35	0.0	0.0	0.0	
	36	→	→	0.0	→ low-pass filtered waveforms for decode
	37	→	→	0.0	→ processed voice waveforms
	38	3.7	3.7	3.7	
	39	0.0	0.2	0.0	
	40	5.0	5.0	5.0	
	41	0.0	0.0	0.0	
	42	5.0	5.0	5.0	
	43	NC	NC	NC	
	44	5.0	5.0	5.0	
	45	GND	GND	GND	
	46	NC	NC	NC	
	47	NC	NC	NC	
	48	NC	NC	NC	
	49	NC	NC	NC	
	50	NC	NC	NC	
	51	NC	NC	NC	
	52	NC	NC	NC	
	53	NC	NC	NC	
	54	5.0	5.0	5.0	
	55	5.0	5.0	5.0	
	56	GND	GND	GND	
	57	2.0	2.0	2.0	
	58	→	→	→	→ 8 MHz reference clock
	59	→	→	→	→ 8 MHz reference clock
	60	5.0	5.0	5.0	
	61	GND	GND	GND	
	62	0.0	0.0	0.0	
	63	5.0	5.0	5.0	
	64	5.0	5.0	5.0	

SST-454 VOLTAGES

DEVICE	PIN	Transmit	Receive	Standby	DESCRIPTION
IC304	1	0.0	0.0	*	Audio signal switching
	2	2.0	2.0	*	
	3	2.0	2.0	*	
	4	2.0	2.0	*	
	5	0.0	5.0	*	
	6	0.0	0.0	0.0	
	7	GND	GND	GND	
	8	GND	GND	GND	
	9	5.0	0.0	0.0	
	10	5.0	0.0	0.0	
	11	5.0	0.0	0.0	
	12	2.0	2.0	*	
	13	NC	NC	NC	
	14	0.0	2.0	*	
	15	0.0	2.0	*	
	16	5.0	5.0	5.0	
IC305	1	2.0	2.0	*	Audio processing
	2	2.0	2.0	*	
	3	2.0	2.0	*	
	4	GND	GND	GND	
	5	2.0	2.0	*	
	6	2.0	2.0	*	
	7	2.5	2.5	*	
	8	6.0	6.0	*	
IC306	1	2.0	2.0	*	Audio processing
	2	2.0	2.0	*	
	3	2.0	2.0	*	
	4	GND	GND	GND	
	5	2.0	2.0	*	
	6	2.0	2.0	*	
	7	2.0	2.0	*	
	8	5.0	5.0	*	
IC307	1	2.0	2.0	*	Tone low pass filter
	2	2.0	2.0	*	
	3	2.0	2.0	*	
	4	2.0	2.0	*	
	5	2.0	2.0	*	
	6	5.0	5.0	*	
	7	2.0	2.0	*	
	8	2.0	2.0	*	
	9	2.5	2.5	*	
	10	GND	GND	GND	
	11	2.5	2.5	*	
	12	GND	GND	GND	
	13	2.0	2.0	*	
	14	2.0	2.0	*	
IC308	1	1.5	1.5	*	Audio signal level control
	2	1.6	1.6	*	
	3	GND	GND	GND	
	4	1.5	1.5	*	
	5	2.0	2.0	*	
	6	2.0	2.0	*	
	7	2.0	2.0	*	

SST-454 VOLTAGES

DEVICE	PIN	Transmit	Receive	Standby	DESCRIPTION
IC308	8	0.0	0.0	*	Audio signal level control
	9	0.0	0.0	*	
	10	GND	GND	GND	
	11	NC	NC	NC	
	12	0.0	0.0	*	
	13	2.0	2.0	*	
	14	2.0	2.0	*	
	15	2.0	2.0	*	
	16	2.0	2.0	*	
	17	2.0	2.0	*	
	18	5.0	5.0	*	
	19	5.0	5.0	*	
	20	5.0	5.0	*	
IC309	1	NC	NC	NC	Audio amplifier
	2	0.0	0.0	0.0	
	3	GND	GND	GND	
	4	GND	GND	GND	
	5	0.0	3.7	0.0	
	6	0.0	7.5	0.0	
	7	0.0	3.7	0.0	
	8	NC	NC	NC	
Q 101	1	0.0	0.7	*	RX RF amplifier
	2	GND	GND	GND	
	3	0.0	2.7	*	
Q 102	1	0.0	0.7	*	RX 1st LO multiplier/amp
	2	GND	GND	GND	
	3	0.0	4.3	*	
Q 103	1	0.0	0.7	*	RX IF amplifier
	2	GND	GND	GND	
	3	0.0	1.2	*	
Q 201	1	4.5	0.0	0.0	PWM TX power control
	2	3.8	0.0	0.0	
	3	6.0	0.0	0.0	
Q 202	1	5.1	0.0	0.0	TX +V switching
	2	4.5	0.0	0.0	
	3	6.8	7.5	7.5	
Q 203	1	0.0	0.0	0.0	TX RF final amplifier
	2	3.8	0.0	0.0	
	3	7.5	7.5	7.5	
	4	0.0	0.0	0.0	
	5	GND	GND	GND	
Q 204	1	6.8	7.5	7.5	TX +V switching
	2	7.5	7.5	7.5	
	3	6.0	0.0	0.0	
Q 205	1	0.9	0.0	0.0	TX RF driver amplifier
	2	0.3	0.0	0.0	
	3	6.0	0.0	0.0	

SST-454 VOLTAGES

DEVICE	PIN	Transmit	Receive	Standby	DESCRIPTION
Q 301	1	5.0	0.0	0.0	PTT detection
	2	GND	GND	GND	
	3	0.0	5.0	5.0	
Q 302	1	4.4	5.0	5.0	PTT detection
	2	5.0	5.0	5.0	
	3	5.0	0.0	0.0	
Q 303	1	7.0	7.0	*	+6V switching
	2	7.5	7.5	7.5	
	3	6.0	6.0	*	
Q 304	1	5.0	5.0	*	+6V switching
	2	4.4	4.4	*	
	3	7.0	7.0	*	
Q 305	1	4.4	4.4	4.4	Battery +V switching
	2	5.0	5.0	5.0	
	3	7.5	7.5	7.5	
	4	7.5	7.5	7.5	
	5	6.8	6.8	6.8	
	6	6.8	6.8	6.8	
Q 307	1	4.3	4.3	*	+5V switching
	2	5.0	5.0	5.0	
	3	5.0	5.0	*	
Q 308	1	5.0	4.3	*	RX +V switching
	2	5.0	5.0	5.0	
	3	0.0	5.0	*	
Q 310	1	0.0	5.0	0.0	LED indicator switching
	2	GND	GND	GND	
	3	5.0	0.0	0.0	
	4	0.0	6.2	6.2	
	5	6.2	0.0	6.2	
Q 312	1	0.0	5.0	0.0	Audio amplifier enable
	2	0.0	4.3	0.0	
	3	7.5	6.8	7.5	
Q 313	1	7.5	6.8	7.5	Audio amplifier +V switching
	2	7.5	7.5	7.5	
	3	0.0	7.5	0.0	

SST-454 SYNTHESIZER VOLTAGES

DEVICE	PIN	Transmit	Receive	Standby	DESCRIPTION
CR401	1	6.0	6.0	*	Biasing
	2	5.8	5.8	*	
	3	NC	NC	NC	

SST-454 SYNTHESIZER VOLTAGES

DEVICE	PIN	Transmit	Receive	Standby	DESCRIPTION
CR402	1	GND	GND	GND	VCO tuning
	2	NC	NC	NC	
	3	→	→	*	→ 1.5 - 5 VDC VCO tuning voltage
CR403	1	GND	GND	GND	VCO modulation
	2	GND	GND	GND	
	3	2.2	2.2	*	
CR404	1	0.8	0.0	*	TX/RX VCO switching
	2	NC	NC	NC	
	3	0.0	4.8	*	
IC401	1	NC	NC	NC	Frequency synthesizer
	2	5.0	5.0	*	
	3	NC	NC	NC	
	4	NC	NC	NC	
	5	6.0	6.0	*	
	6	→	→	*	→ 1.5 - 5 VDC VCO tuning voltage
	7	GND	GND	GND	
	8	2.2	2.2	*	
	9	NC	NC	NC	
	10	2.7	2.7	*	
	11	2.7	2.7	*	
	12	5.0	5.0	*	
	13	NC	NC	NC	
	14	5.0	5.0	*	
	15	0.0	0.0	*	
	16	NC	NC	NC	
	17	5.0	5.0	*	
	18	0.0	0.0	*	
	19	0.0	0.0	*	
	20	2.2 →	2.2 →	*	→ 14.4 MHz reference signal
Q 401	1	0.7	0.7	*	VCO buffer amplifier
	2	GND	GND	GND	
	3	2.8	2.8	*	
Q 402	1	5.7	5.7	*	VCO voltage de-coupling
	2	5.0	5.0	*	
	3	6.0	6.0	*	
Q 403	1	0.7	0.7	*	VCO buffer amplifier
	2	GND	GND	GND	
	3	2.9	2.9	*	
Q 404	1	2.3	2.3	*	VCO oscillator
	2	1.6	1.6	*	
	3	4.7	4.7	*	
Q 406	1	0.0	5.0	*	TX/RX VCO switching
	2	5.0	5.0	*	
	3	4.9	0.0	*	
Q 407	1	0.0	5.0	*	TX/RX VCO switching
	2	GND	GND	GND	
	3	5.0	0.0	*	

SST-454 SCHEMATIC REFERENCE PARTS LIST

NOTE: This parts list reflects the most current component values. If a component value given in the schematic differs from this list, the parts list should be considered the most current.

Ref #	RITRON#	Description	Main PCB Coordinates		
CAPACITORS					
C 101	151708A2	8.2pF NPO 0603 50V CHIP CAPACITOR	0.859	4.302	B
C 102	15170150	15PF NPO 0603 50V CHIP CAPACITOR	0.919	4.367	B
C 103	151706A8	6.8pF NPO 0603 50V CHIP CAPACITOR	1.099	4.367	B
C 104	15170120	12PF NPO 0603 50V CHIP CAPACITOR	1.224	4.367	B
C 105	151706A8	6.8pF NPO 0603 50V CHIP CAPACITOR	1.224	4.292	B
C 106	151708A2	8.2pF NPO 0603 50V CHIP CAPACITOR	1.324	4.322	B
C 107	15170120	12PF NPO 0603 50V CHIP CAPACITOR	1.354	4.422	B
C 108	15170120	12PF NPO 0603 50V CHIP CAPACITOR	1.424	4.352	B
C 109	151705A6	5.6pF NPO 0603 50V CHIP CAPACITOR	1.504	4.259	B
C 110	15170330	33pF NPO 0603 50V CHIP CAPACITOR	1.724	4.290	B
C 111	15170151	150PF NPO 0603 50V CHIP CAPACITOR	- 1.719	4.230	T
C 112	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.634	3.325	B
C 113	15170151	150PF NPO 0603 50V CHIP CAPACITOR	1.569	4.260	B
C 114	151703A3	3.3pF NPO 0603 50V CHIP CAPACITOR	- 1.454	3.985	T
C 115	151703A3	3.3pF NPO 0603 50V CHIP CAPACITOR	- 1.454	4.045	T
C 116	15170120	12PF NPO 0603 50V CHIP CAPACITOR	- 1.225	3.888	T
C 117	15170120	12PF NPO 0603 50V CHIP CAPACITOR	- 1.170	3.888	T
C 118	151708A2	8.2pF NPO 0603 50V CHIP CAPACITOR	- 1.280	3.828	T
C 119	151703A9	3.9pF NPO 0603 50V CHIP CAPACITOR	- 1.419	3.715	T
C 120	15170120	12PF NPO 0603 50V CHIP CAPACITOR	- 1.559	3.810	T
C 121	151708A2	8.2pF NPO 0603 50V CHIP CAPACITOR	- 1.419	3.655	T
C 122	15170100	10 PF NPO 0603 50V CHIP CAPACITOR	- 1.214	3.555	T
C 123	15170120	12PF NPO 0603 50V CHIP CAPACITOR	- 1.154	3.555	T
C 124	151706A8	6.8pF NPO 0603 50V CHIP CAPACITOR	- 1.184	3.460	T
C 125	15170180	18pF NPO 0603 50V CHIP CAPACITOR	1.229	3.478	B
C 126	151708A2	8.2pF NPO 0603 50V CHIP CAPACITOR	1.368	3.525	B
C 127	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.554	3.420	B
C 128	15170150	15PF NPO 0603 50V CHIP CAPACITOR	- 1.254	3.259	T
C 129	151703A9	3.9pF NPO 0603 50V CHIP CAPACITOR	1.623	3.482	B
C 130	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.549	3.010	B
C 131	151708A2	8.2pF NPO 0603 50V CHIP CAPACITOR	1.429	3.030	B
C 132	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	1.305	2.620	B
C 133	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	1.354	2.762	B
C 134	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.429	2.920	B
C 135	152B6106	10uF 10V 3.4 X 2.8 CHIP TANTALUM	- 1.424	2.880	T
C 136	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.478	2.492	B
C 137	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.494	2.600	B
C 138	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	1.646	2.710	B
C 139	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.232	2.631	B
C 140	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.734	2.191	B
C 141	15170220	22pF NPO 0603 50V CHIP CAPACITOR	1.704	1.975	B
C 142	15170330	33pF NPO 0603 50V CHIP CAPACITOR	1.739	2.395	B
C 143	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	1.734	2.602	B
C 144	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	1.734	2.522	B
C 145	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	1.357	1.793	B
C 146	15170390	39pF NPO 0603 50V CHIP CAPACITOR	1.739	2.450	B

<u>Ref #</u>	<u>RITRON#</u>	<u>Description</u>	<u>Main PCB Coordinates</u>		
C 201	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.471	3.815	B
C 202	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	0.561	3.165	B
C 203	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	0.737	3.030	B
C 204	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	- 0.354	2.153	T
C 205	15170101	100PF NPO 0603 50V CHIP CAPACITOR	- 0.394	2.256	T
C 206	15170100	10 PF NPO 0603 50V CHIP CAPACITOR	0.005	2.368	T
C 208	15170560	56pF NPO 0603 50V CHIP CAPACITOR	- 0.070	2.167	T
C 209	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.485	2.947	B
C 210	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.044	3.305	B
C 211	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.044	3.095	B
C 212	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.682	3.760	B
C 213	152A8105	1MFD 16V ~3.2 X 1.6~ CHIP TANTALUM	- 0.983	3.425	T
C 214	15170150	15PF NPO 0603 50V CHIP CAPACITOR	- 0.262	3.816	T
C 215	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.513	3.318	B
C 217	151704A7	4.7pF NPO 0603 50V CHIP CAPACITOR	- 0.142	4.128	T
C 218	15170100	10 PF NPO 0603 50V CHIP CAPACITOR	- 0.419	4.018	T
C 219	151704A7	4.7pF NPO 0603 50V CHIP CAPACITOR	- 0.699	3.845	T
C 220	15170101	100PF NPO 0603 50V CHIP CAPACITOR	- 0.671	3.938	T
C 301	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.905	0.663	B
C 302	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.312	0.767	B
C 303	152B4226	22uF 6.3V 3.4 X 2.8 CHIP TANTALUM CAP	- 1.119	0.737	T
C 304	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.539	4.587	B
C 305	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.479	0.442	B
C 306	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.038	1.459	B
C 307	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.614	4.497	B
C 308	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.089	4.497	B
C 309	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.604	3.010	B
C 310	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.039	1.265	B
C 312	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.377	1.886	B
C 313	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	0.377	0.927	B
C 314	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.189	1.332	B
C 315	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.255	1.886	B
C 316	15170330	33pF NPO 0603 50V CHIP CAPACITOR	0.432	0.579	B
C 317	15170330	33pF NPO 0603 50V CHIP CAPACITOR	0.632	0.579	B
C 318	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.552	3.841	B
C 319	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	- 1.629	0.680	T
C 320	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.190	1.934	B
C 321	15111333	.033MFD X7R 0805 50V CHIP CAP	1.109	2.867	B
C 322	15179472	.0047UF X7R 0603 25V CHIP CAPACITOR	1.566	1.597	B
C 323	15179472	.0047UF X7R 0603 25V CHIP CAPACITOR	1.536	1.507	B
C 324	15119473	.047uF X7R 0805 25V CHIP CAPACITOR	1.754	1.423	B
C 325	15170180	18pF NPO 0603 50V CHIP CAPACITOR	1.715	1.320	B
C 326	15111333	.033MFD X7R 0805 50V CHIP CAP	1.743	1.711	B
C 327	15179222	.0022UF X7R 0603 25V CHIP CAPACITOR	0.610	2.635	B
C 328	15170100	10 PF NPO 0603 50V CHIP CAPACITOR	0.610	2.744	B
C 329	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.322	1.886	B
C 330	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.030	1.153	B
C 331	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.744	1.887	B
C 332	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.039	1.679	B
C 333	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.039	1.569	B
C 334	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.564	2.367	B
C 335	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.031	1.775	B
C 336	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.689	1.886	B
C 337	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.038	1.349	B
C 338	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.039	1.237	B

Ref #	RITRON#	Description	Main PCB Coordinates		
C 339	152A6475	4.7UF 10V A-SIZE TANTALUM CHIP CAP	1.139	2.778	B
C 340	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.183	2.372	B
C 341	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.238	2.373	B
C 342	152B6106	10uF 10V 3.4 X 2.8 CHIP TANTALUM	1.056	1.785	B
C 343	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.438	1.541	B
C 344	152A8105	1MFD 16V ~3.2 X 1.6~ CHIP TANTALUM	1.559	1.203	B
C 345	15111122	.0012MF X7R 0805 50V CHIP	- 1.294	2.166	T
C 346	15110821	820PF NPO 0805 50V CHIP CAP	1.062	1.998	B
C 347	15170221	220PF NPO 0603 50V CHIP CAPACITOR	- 1.227	2.556	T
C 348	15179122	.0012UF X7R 0603 25V CHIP CAPACITOR	- 1.210	2.425	T
C 349	15179122	.0012UF X7R 0603 25V CHIP CAPACITOR	- 1.210	2.365	T
C 350	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	- 1.428	2.265	T
C 351	15170100	10 PF NPO 0603 50V CHIP CAPACITOR	- 1.070	2.221	T
C 352	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	- 0.875	2.318	T
C 353	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	- 0.865	2.589	T
C 354	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	0.756	2.947	B
C 355	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.287	4.005	B
C 356	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	1.108	3.102	B
C 357	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	0.806	3.525	B
C 358	152B6106	10uF 10V 3.4 X 2.8 CHIP TANTALUM	- 0.984	3.570	T
C 359	01503212	220MF 10V ELT CAPACITOR, 5mm HEIGHT	- 1.025	3.940	T
C 360	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	0.947	3.412	B
C 361	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	0.775	3.234	B
C 362	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.446	2.254	B
C 363	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.039	1.210	B
C 364	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.039	1.320	B
C 365	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.033	2.539	B
C 366	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.039	1.624	B
C 367	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.039	1.292	B
C 368	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.711	0.836	B
C 369	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	0.039	1.155	B
C 370	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	0.634	1.886	B
C 371	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.039	1.375	B
C 372	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.094	1.465	B
C 373	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	- 0.583	2.698	T
C 374	15111102	.001MF X7R 0805 50V CHIP CAP			
C 375	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.800	2.003	B
C 376	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.022	2.960	B
C 377	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.526	1.125	B
C 378	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	1.184	1.228	B
C 379	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	1.038	1.404	B
C 380	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	0.473	0.917	B
C 381	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.102	1.627	B
C 382	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.102	1.682	B
C 383	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	0.876	0.837	B
C 384	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	0.305	0.937	B
C 385	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.457	4.005	B
C 386	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.637	0.880	B
C 387	152A8105	1MFD 16V ~3.2 X 1.6~ CHIP TANTALUM	1.615	0.804	B
C 388	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.076	1.572	B
C 389	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	1.042	1.517	B
C 390	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.487	1.887	B
C 391	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.971	1.091	B

Ref #	RITRON#	Description	Main PCB Coordinates		
DIODES					
CR101	48D100A2	MA4CP101A PIN DIODE, SOT-23	0.968	4.077	B
CR102	48A1005C	MMBD7000 DUAL DIODE SOT-23	1.559	4.392	B
CR103	48A1005C	MMBD7000 DUAL DIODE SOT-23	1.464	2.762	B
CR201	48D100A2	MA4CP101A PIN DIODE, SOT-23	- 0.254	3.934	T
CR301	48B61012	1N4742A ZENER DIODE, 12V 1W DL-41	- 1.284	0.507	T
CR302	48A60001	1N4001 DIODE, 50V DL-41 MELF	- 1.463	0.507	T
CR303	48A1005C	MMBD7000 DUAL DIODE SOT-23	1.133	0.626	B
CR304	48A100A3	MMBD2835, DUAL DIODE SOT-23	- 1.624	0.427	T
CR305	48A1005C	MMBD7000 DUAL DIODE SOT-23	0.174	0.764	B
CR306	48A60001	1N4001 DIODE, 50V DL-41 MELF	- 0.929	3.710	T
CR307	48A60001	1N4001 DIODE, 50V DL-41 MELF	- 1.124	0.507	T
CR308	48A1005C	MMBD7000 DUAL DIODE SOT-23	1.337	2.236	B
CR309	24510001	LED, RED/GREEN, SOT-23	- 1.349	4.310	T
CR310	48A1005C	MMBD7000 DUAL DIODE SOT-23	1.161	1.086	B
FUSE					
F 301	06000040	WIRE; #40AWG TINNED BUS (INCHES)	0.935	0.598	B
INTEGRATED CIRCUITS					
IC101	31030003	MC3371D SUBSYSTEM IC, SO-16	- 1.594	2.592	T
IC102	31510001	MIXER, DOUBLE BALANCED, MC13143D	- 1.464	3.310	T
IC301	31010006	LM2931 5vDC Low Volt Reg, SO-8	- 1.394	0.822	T
IC302	314J0005	MCU,FLASH,64-PIN QFP,AZ60 FP	0.544	1.397	B
IC304	311k0003	SWITCH,ANALOG,TRIPLE SPDT,4053,TSSOP-16	0.857	2.786	B
IC305	31010008	LM2904D DUAL OP AMP SO-8	- 1.014	2.460	T
IC306	31010008	LM2904D DUAL OP AMP SO-8	1.504	1.364	B
IC307	31020001	MF6CWM-50 6 POLE FILT. SOLIC	0.906	2.263	B
IC308	310K0001	DS1806E 6 PROG POTS 10K OHM 20-PIN	- 0.644	2.467	T
IC309	31010004	LM386MX-1 AUDIO AMP SO-8	1.013	3.257	B
JACKS					
J 301	02100001	2.5MM PC-MT JACK; ANT-CHGR	- 0.611	4.668	T
J 303	02100053	3.5MM STEREO JACK; PANEL MOUNT	- 0.229	4.646	T
INDUCTORS					
L 101	18433103	3T AIRCOIL, SMT, 8.0nH, .120 X .145	- 0.914	4.280	T
L 102	18433103	3T AIRCOIL, SMT, 8.0nH, .120 X .145	- 1.149	4.305	T
L 103	18414105	5.5T AIRCOIL #24AWG .0625"ID RHH SMT	- 1.514	4.280	T
L 104	18414104	4.5T AIRCOIL #24AWG .0625"ID RHH SMT	- 1.699	4.120	T
L 105	18433103	3T AIRCOIL, SMT, 8.0nH, .120 X .145	- 1.269	4.025	T
L 106	18433103	3T AIRCOIL, SMT, 8.0nH, .120 X .145	- 1.444	3.850	T
L 107	18433103	3T AIRCOIL, SMT, 8.0nH, .120 X .145	- 1.229	3.690	T
L 108	18433103	3T AIRCOIL, SMT, 8.0nH, .120 X .145	- 1.399	3.530	T
L 109	18110391	CHIP INDUCTOR .39uhy	- 1.367	3.031	T
L 110	18110391	CHIP INDUCTOR .39uhy	- 1.505	3.030	T

<u>Ref #</u>	<u>RITRON#</u>	<u>Description</u>	<u>Main PCB Coordinates</u>		
L 111	18110681	CHIP INDUCTOR .68uhy	- 1.684	2.298	T
L 201	18110150	INDUCTOR, CHIP, 15nH	- 0.283	2.301	T
L 208	18414104	4.5T AIRCOIL #24AWG .0625"ID RHH SMT	- 0.804	3.505	T
L 209	18110102	CHIP INDUCTOR 1.0uhy	- 0.565	3.736	T
L 210	18414105	5.5T AIRCOIL #24AWG .0625"ID RHH SMT	- 0.060	3.973	T
L 211	18414104	4.5T AIRCOIL #24AWG .0625"ID RHH SMT	- 0.288	4.080	T
L 212	18414104	4.5T AIRCOIL #24AWG .0625"ID RHH SMT	- 0.529	3.949	T
L 213	18414105	5.5T AIRCOIL #24AWG .0625"ID RHH SMT	- 0.748	4.112	T

MICROPHONE

M 301 05500037 MICROPHONE; ELECTRET, MINIATURE

HEADERS

P 201	25500700	CONTACT, PCB MNT, ANTENNA,SST	- 0.892	4.550	T
P 302	21310021	HEADER, 2 PIN SIDE ENTRY SHROUDED	- 0.935	0.737	T

PRINTED CIRCUIT BOARD

PC301 1750120F PCB ML4 FR4 5UPM .062 MIX, SST450+

TRANSISTORS

Q 101	4821007Y	MMBR941LT1 LO POWER RF, SOT-23	1.714	4.120	B
Q 102	4821003B	MMBT918LT1 VHF SOT23 (3B)	1.724	2.292	B
Q 103	4821003B	MMBT918LT1 VHF SOT23 (3B)	1.354	3.130	B
Q 201	4801001Q	MMBT-5088 "SOT-23"	0.590	2.968	B
Q 202	4801001Q	MMBT-5088 "SOT-23"	0.682	3.629	B
Q 203	04801503	M68710H 2W RF MODULE 450-470 MHz 6.0V	0.030	2.710	T
Q 204	4801002A	MMBT3906 "SOT23"	0.576	3.753	B
Q 205	4821007Y	MMBR941LT1 LO POWER RF, SOT-23	- 0.109	2.299	T
Q 301	48010R02	MUN2211T1 NPN W/BIAS RES. SOT-23	1.265	0.937	B
Q 302	4801002A	MMBT3906 "SOT23"	- 1.629	0.787	T
Q 303	480100DH	BCW68GLT1 .8AMP PNP SOT-23	1.619	0.487	B
Q 304	4801001Q	MMBT-5088 "SOT-23"	1.629	0.687	B
Q 305	480A0001	TRANSISTOR,DUAL,PNP/NPN,UMZINTR	1.390	0.587	B
Q 307	4801002A	MMBT3906 "SOT23"	1.395	1.178	B
Q 308	4801002A	MMBT3906 "SOT23"	0.103	1.877	B
Q 310	480A0002	TRANSISTOR, DUAL NPN W/10K UMG9N	1.371	4.107	B
Q 312	4801001Q	MMBT-5088 "SOT-23"	0.947	3.578	B
Q 313	480100DH	BCW68GLT1 .8AMP PNP SOT-23	0.803	3.416	B

RESISTORS

R 101	47170223	22K OHM 0603 1/16W CHIP RESISTOR	- 1.719	4.290	T
R 102	47170153	15K OHM 0603 1/16W CHIP RESISTOR	1.724	4.220	B
R 103	47170470	47 OHM 0603 1/16W CHIP RESISTOR	1.579	3.325	B
R 104	47170470	47 OHM 0603 1/16W CHIP RESISTOR	1.524	3.325	B
R 105	47170223	22K OHM 0603 1/16W CHIP RESISTOR	1.459	3.125	B
R 106	47170221	220 OHM 0603 1/16W CHIP RESISTOR	1.524	3.125	B

<u>Ref #</u>	<u>RITRON#</u>	<u>Description</u>	<u>Main PCB Coordinates</u>		
R 107	47170152	1.5K OHM 0603 1/16W CHIP RESISTOR	1.429	2.975	B
R 108	47170122	1.2K OHM 0603 1/16W CHIP RESISTOR	1.494	2.655	B
R 109	47170154	150K OHM 0603 1/16W CHIP RESISTOR	1.558	2.420	B
R 110	47170224	220K OHM 0603 1/16W CHIP RESISTOR	1.538	2.545	B
R 111	47170123	12K OHM 0603 1/16W CHIP RESISTOR	1.423	2.545	B
R 112	47170104	100K OHM 0603 1/16W CHIP RESISTOR	1.409	2.632	B
R 113	47170103	10K OHM 0603 1/16W CHIP RESISTOR	1.279	2.752	B
R 114	47170152	1.5K OHM 0603 1/16W CHIP RESISTOR	1.294	2.528	B
R 115	47170103	10K OHM 0603 1/16W CHIP RESISTOR	1.459	1.938	B
R 116	47170471	470 OHM 0603 1/16W CHIP RESISTOR	- 1.719	4.350	T
R 117	47170681	680 OHM 0603 1/16W CHIP RESISTOR	1.737	2.030	B
R 118	47170103	10K OHM 0603 1/16W CHIP RESISTOR	1.704	2.130	B
R 119	47170102	1K OHM 0603 1/16W CHIP RESISTOR	1.618	2.283	B
R 202	47170153	15K OHM 0603 1/16W CHIP RESISTOR	0.746	3.158	B
R 203	47170153	15K OHM 0603 1/16W CHIP RESISTOR	0.654	3.135	B
R 204	47170223	22K OHM 0603 1/16W CHIP RESISTOR	0.485	3.062	B
R 205	47100121	120 OHM 0805 CHIP RES	0.657	3.400	B
R 206	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.742	3.760	B
R 208	47170181	180 OHM 0603 1/16W CHIP RESISTOR	0.552	3.539	B
R 209	47170102	1K OHM 0603 1/16W CHIP RESISTOR	- 0.726	3.938	T
R 211	47170182	1.8K OHM 0603 1/16W CHIP RESISTOR	- 0.135	2.168	T
R 213	47100270	27 OHM 0805 CHIP RESISTOR	0.003	2.219	T
R 214	47170471	470 OHM 0603 1/16W CHIP RESISTOR	0.667	3.486	B
R 215	47170822	8.2K OHM 0603 1/16W CHIP RESISTOR	- 0.221	2.153	T
R 301	47170103	10K OHM 0603 1/16W CHIP RESISTOR	1.629	0.588	B
R 302	47170472	4.7K OHM 0603 1/16W CHIP RESISTOR	1.432	0.757	B
R 303	47170103	10K OHM 0603 1/16W CHIP RESISTOR	1.479	0.507	B
R 304	47170104	100K OHM 0603 1/16W CHIP RESISTOR	1.134	0.475	B
R 305	47170103	10K OHM 0603 1/16W CHIP RESISTOR	1.487	0.757	B
R 306	47170104	100K OHM 0603 1/16W CHIP RESISTOR	1.266	0.475	B
R 307	47170471	470 OHM 0603 1/16W CHIP RESISTOR	1.261	0.592	B
R 308	47170102	1K OHM 0603 1/16W CHIP RESISTOR	1.502	0.597	B
R 309	47170104	100K OHM 0603 1/16W CHIP RESISTOR	1.133	0.757	B
R 310	47170104	100K OHM 0603 1/16W CHIP RESISTOR	0.080	1.100	B
R 311	47170104	100K OHM 0603 1/16W CHIP RESISTOR	0.579	1.886	B
R 312	47170104	100K OHM 0603 1/16W CHIP RESISTOR	1.266	1.071	B
R 313	47170104	100K OHM 0603 1/16W CHIP RESISTOR	0.910	1.887	B
R 314	47170472	4.7K OHM 0603 1/16W CHIP RESISTOR	1.244	1.332	B
R 315	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.208	1.784	B
R 316	47170105	1M OHM 0603 1/16W CHIP RESISTOR	0.531	0.609	B
R 317	47170103	10K OHM 0603 1/16W CHIP RESISTOR	- 1.634	0.595	T
R 318	47170103	10K OHM 0603 1/16W CHIP RESISTOR	- 1.634	0.535	T
R 319	47170103	10K OHM 0603 1/16W CHIP RESISTOR	1.135	1.934	B
R 320	47170153	15K OHM 0603 1/16W CHIP RESISTOR	1.137	2.662	B
R 321	47170154	150K OHM 0603 1/16W CHIP RESISTOR	1.749	1.568	B
R 322	47170104	100K OHM 0603 1/16W CHIP RESISTOR	1.506	1.597	B
R 323	47170473	47K OHM 0603 1/16W CHIP RESISTOR	1.775	1.320	B
R 324	47170273	27K OHM 0603 1/16W CHIP RESISTOR	1.750	1.495	B
R 325	47170102	1K OHM 0603 1/16W CHIP RESISTOR	0.609	2.854	B
R 326	47170104	100K OHM 0603 1/16W CHIP RESISTOR	0.609	2.799	B
R 327	47170224	220K OHM 0603 1/16W CHIP RESISTOR	0.610	2.689	B
R 328	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.564	2.312	B
R 329	47170473	47K OHM 0603 1/16W CHIP RESISTOR	0.922	2.539	B
R 330	47170563	56K OHM 0603 1/16W CHIP RESISTOR	0.867	2.539	B
R 331	47170103	10K OHM 0603 1/16W CHIP RESISTOR	1.294	1.186	B

Ref #	RITRON#	Description	Main PCB Coordinates		
R 332	47170393	39K OHM 0603 1/16W CHIP RESISTOR	1.183	2.487	B
R 334	47170104	100K OHM 0603 1/16W CHIP RESISTOR	1.294	2.373	B
R 335	47170103	10K OHM 0603 1/16W CHIP RESISTOR	- 0.864	2.465	T
R 336	47170273	27K OHM 0603 1/16W CHIP RESISTOR	1.300	1.332	B
R 337	47170183	18K OHM 0603 1/16W CHIP RESISTOR	1.383	1.541	B
R 338	47100333	33K OHM 0805 CHIP RES.	1.194	2.243	B
R 339	47170394	390K OHM 0603 1/16W CHIP RESISTOR	- 1.226	2.611	T
R 340	47170104	100K OHM 0603 1/16W CHIP RESISTOR	- 1.270	2.480	T
R 341	47170104	100K OHM 0603 1/16W CHIP RESISTOR	- 1.300	2.394	T
R 342	47170184	180K OHM 0603 1/16W CHIP RESISTOR	- 1.210	2.310	T
R 343	47170473	47K OHM 0603 1/16W CHIP RESISTOR	0.977	2.539	B
R 344	47170104	100K OHM 0603 1/16W CHIP RESISTOR	- 1.355	2.342	T
R 345	47170471	470 OHM 0603 1/16W CHIP RESISTOR	0.184	0.869	B
R 346	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.164	0.659	B
R 347	47170471	470 OHM 0603 1/16W CHIP RESISTOR	0.277	0.734	B
R 348	47170473	47K OHM 0603 1/16W CHIP RESISTOR	- 1.070	2.166	T
R 349	47170563	56K OHM 0603 1/16W CHIP RESISTOR	- 0.607	2.228	T
R 350	47170474	470K OHM 0603 1/16W CHIP RESISTOR	- 0.662	2.228	T
R 351	47100475	4.7M OHM 0805 CHIP RESISTOR	- 0.735	2.196	T
R 352	47170683	68K OHM 0603 1/16W CHIP RESISTOR	- 0.810	2.204	T
R 353	47170274	270K OHM 0603 1/16W CHIP RESISTOR	- 0.928	2.189	T
R 354	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.821	0.837	B
R 355	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.766	0.836	B
R 356	47170102	1K OHM 0603 1/16W CHIP RESISTOR	1.081	3.615	B
R 357	47170102	1K OHM 0603 1/16W CHIP RESISTOR	1.213	3.132	B
R 358	47170153	15K OHM 0603 1/16W CHIP RESISTOR	1.213	3.262	B
R 359	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.816	3.608	B
R 360	47170273	27K OHM 0603 1/16W CHIP RESISTOR	0.763	3.315	B
R 361	47170100	10 OHM 0603 1/16W CHIP RESISTOR	1.081	3.412	B
R 362	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.482	2.129	B
R 363	47170224	220K OHM 0603 1/16W CHIP RESISTOR	1.404	2.372	B
R 364	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.432	1.887	B
R 365	47170823	82K OHM 0603 1/16W CHIP RESISTOR	1.349	2.372	B
R 366	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.623	2.205	B
R 367	47170102	1K OHM 0603 1/16W CHIP RESISTOR	1.645	0.975	B
R 368	47170221	220 OHM 0603 1/16W CHIP RESISTOR	- 1.404	4.176	T
R 369	47170221	220 OHM 0603 1/16W CHIP RESISTOR	- 1.339	4.175	T
R 370	47170824	820K OHM 0603 1/16W CHIP RESISTOR	0.855	1.887	B
R 371	47170104	100K OHM 0603 1/16W CHIP RESISTOR	0.800	1.887	B
R 372	47170104	100K OHM 0603 1/16W CHIP RESISTOR	0.960	0.867	B
R 373	47170222	2.2K OHM 0603 1/16W CHIP RESISTOR	1.030	1.036	B
R 374	47170102	1K OHM 0603 1/16W CHIP RESISTOR	0.892	2.624	B
R 375	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.238	0.957	B
R 376	47170153	15K OHM 0603 1/16W CHIP RESISTOR			

SPEAKER

SP301 05500045 SPEAKER, 45MM, 1W, LOW PROFILE SST

<u>Ref #</u>	<u>RITRON#</u>	<u>Description</u>	<u>Main PCB Coordinates</u>		
SWITCHES					
SW301	05100024	MINIATURE PTT SWITCH	- 1.521	4.587	T
SW302	05100024	MINIATURE PTT SWITCH	- 1.001	4.588	T
SW303	05100046	SWITCH, TACT LO PROFILE RT ANGLE	- 1.657	2.999	T
SW304	05100046	SWITCH, TACT LO PROFILE RT ANGLE			
CRYSTALS					
Y 101	02302004	CERAMIC DISCRIMINATOR, CDBM450C18	- 1.389	1.999	T
Y 301	02300115	8 MHz AT-49 uP REFERENCE CRYSTAL	- 0.432	0.700	T
Y 302	23050003	TCVCXO, 14.400 MHz, 1.5 PPM, VC=30	- 1.643	1.055	T
FILTERS					
YF101	02301403	43.650 MHz Crystal Filter +/-6.0KHz UM-1	- 1.734	3.455	T
YF102	02301013	FILTER,CERAMIC,450KHz,+/-7.5KHz,6 POLE	- 1.669	1.997	T
MAIN PCB HARDWARE					
	06001021	#28 AWG STRANDED WIRE; RED (INCHES)			
	06001023	#28 AWG STRANDED WIRE;GREEN INCHES			
	06001026	#28 AWG STRANDED WIRE; BLACK INCHES			
	06001029	#28 AWG STRANDED WIRE; BLUE INCHES			
	25500700	CONTACT, PCB MNT, ANTENNA,SST			
	25603000	FOAM, MOUNTING, SPEAKER,SST			
	25605700	MICROPHONE HOLDER, SST-PLUS			
	25603900	SPACER, MIC FOAM, SST			
	25900700	ADHESIVE, MTG, MIC HOLDER			
	26200800	HEATSINK, TOP, SST+			
	26200900	HEATSINK, BOTTOM, SST+			
	2811H401	SCREW #4-40 X .25 LG TRIM HEAD PHILLIPS			

SST-454 SYNTHESIZER SCHEMATIC REFERENCE PARTS LIST

<u>Ref #</u>	<u>RITRON#</u>	<u>Description</u>	<u>Synthesizer PCB Coordinates</u>		
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CAPACITORS

C 401	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.872	1.090	T
C 402	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.043	1.090	T
C 403	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.989	0.975	T
C 404	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.412	1.056	T
C 405	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.603	0.699	T
C 406	15170101	100PF NPO 0603 50V CHIP CAPACITOR	1.000	0.458	T
C 407	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.320	0.485	T
C 408	15179103	.01UF X7R 0603 25V CHIP CAPACITOR	0.641	0.845	T
C 409	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.872	0.798	T
C 410	151701A5	1.5pF NPO 0603 50V CHIP CAPACITOR	0.465	0.909	T
C 411	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.003	0.459	T
C 412	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.322	1.136	T
C 413	151704A7	4.7pF NPO 0603 50V CHIP CAPACITOR	0.276	0.776	T
C 414	151704A7	4.7pF NPO 0603 50V CHIP CAPACITOR	0.465	0.799	T
C 415	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.646	1.111	T
C 416	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.499	0.361	T
C 417	15110A68	.68pf NPO 0805 50V CHIP CAP	0.001	0.699	T
C 419	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.377	1.196	T
C 420	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.131	0.224	T
C 421	15111222	.0022uF X7R 0805 50V CHIP CAPACITOR	0.905	0.189	T
C 422	152AB334	.33MF 35V ~3.2X1.6~ CHIP TANTALUM	1.015	0.243	T
C 423	15111333	.033MFD X7R 0805 50V CHIP CAP	1.037	0.588	T
C 424	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.945	0.717	T
C 425	151101A2	CAPACITOR, CHIP 0805 1.2PF NPO 50V	0.169	0.592	T
C 426	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.619	0.173	T
C 427	151704A7	4.7pF NPO 0603 50V CHIP CAPACITOR	0.177	0.721	T
C 428	152B6106	10uF 10V 3.4 X 2.8 CHIP TANTALUM	0.006	0.835	T
C 429	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.669	0.314	T
C 430	15170101	100PF NPO 0603 50V CHIP CAPACITOR	0.540	0.699	T
C 431	151708A2	8.2pF NPO 0603 50V CHIP CAPACITOR	0.276	0.717	T
C 432	15119104	.1uF X7R 0805 25V CERAMIC CHIP CAP	0.249	1.076	T
C 433	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.674	0.173	T
C 434	15179102	.001UF X7R 0603 25V CHIP CAPACITOR	0.730	0.172	T

DIODES

CR401	48A1005C	MMBD7000 DUAL DIODE SOT-23	0.002	1.022	T
CR402	48C1004E	MMBV-105G DIODE VVC, SOT-23	0.281	0.616	T
CR403	48C1004G	MMBV-2101L DIODE VVC SOT-23	0.140	1.174	T
CR404	48A1004D	MMBV3401TI UHF DIODE SOT-23	0.216	0.414	T

INTEGRATED CIRCUIT

IC401	313K0002	SYNTHESIZER, MC145190DT,TSSOP20 PIN	0.801	0.517	T
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<u>Ref #</u>	<u>RITRON#</u>	<u>Description</u>	<u>Synthesizer PCB Coordinates</u>		
INDUCTORS					
L 401	18414107	7.5T AIRCOIL #24 .0625"ID RHH SMT	0.025	0.330	T
L 402	18110101	CHIP INDUCTOR 0.1uhy	0.772	0.800	T
L 403	18433209	9T AIRCOIL, SMT, 9.85 nH, .159 X .056	0.086	0.568	T
L 404	18110101	CHIP INDUCTOR 0.1uhy	0.431	0.695	T
L 405	18110820	INDUCTOR, CHIP 82nH	0.261	0.269	T
HEADERS					
P 401	21344051	HEADER, 5-PIN VERT .344H .064SO .079LS			
P 402	21344081	HEADER, 8-PIN VERT .344H .064SO .079LS			
TRANSISTORS					
Q 401	4821007Y	MMBR941LT1 LO POWER RF, SOT-23	0.600	1.010	T
Q 402	4801001Q	MMBT-5088 "SOT-23"	0.156	0.968	T
Q 403	4821007Y	MMBR941LT1 LO POWER RF, SOT-23	0.769	1.010	T
Q 404	4821007Y	MMBR941LT1 LO POWER RF, SOT-23	0.312	0.877	T
Q 406	4801006A	TRANSISTOR, PNP W/10K BIAS, SC-59	0.424	0.559	T
Q 407	48010R02	MUN2211T1 NPN W/BIAS RES. SOT-23	0.397	0.354	T
RESISTORS					
R 401	47170471	470 OHM 0603 1/16W CHIP RESISTOR	0.531	1.111	T
R 402	47170272	2.7K OHM 0603 1/16W CHIP RESISTOR	0.496	1.001	T
R 403	47170102	1K OHM 0603 1/16W CHIP RESISTOR	0.593	0.909	T
R 404	47170472	4.7K OHM 0603 1/16W CHIP RESISTOR	0.002	1.123	T
R 406	47170221	220 OHM 0603 1/16W CHIP RESISTOR	0.934	0.975	T
R 407	47170272	2.7K OHM 0603 1/16W CHIP RESISTOR	0.761	1.111	T
R 408	47170470	47 OHM 0603 1/16W CHIP RESISTOR	0.322	1.008	T
R 409	47170561	560 OHM 0603 1/16W CHIP RESISTOR	0.465	0.854	T
R 410	47170153	15K OHM 0603 1/16W CHIP RESISTOR	0.177	0.836	T
R 411	47170153	15K OHM 0603 1/16W CHIP RESISTOR	0.122	0.776	T
R 412	47170104	100K OHM 0603 1/16W CHIP RESISTOR	0.292	1.227	T
R 414	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.554	0.361	T
R 415	47170102	1K OHM 0603 1/16W CHIP RESISTOR	0.399	0.224	T
R 416	47170102	1K OHM 0603 1/16W CHIP RESISTOR	0.884	0.116	T
R 417	47170473	47K OHM 0603 1/16W CHIP RESISTOR	1.000	0.116	T
R 418	47170153	15K OHM 0603 1/16W CHIP RESISTOR	0.909	0.287	T
R 419	47170103	10K OHM 0603 1/16W CHIP RESISTOR	0.909	0.342	T
R 420	47170223	22K OHM 0603 1/16W CHIP RESISTOR	1.000	0.717	T
R 421	47170102	1K OHM 0603 1/16W CHIP RESISTOR	0.730	0.910	T
R 422	47170101	100 OHM 0603 1/16W CHIP RESISTOR	0.958	1.060	T
R 423	47170470	47 OHM 0603 1/16W CHIP RESISTOR	0.411	1.111	T
R 425	47100100	10 ohm 0805 CHIP RESISTOR	0.563	0.556	T
R 426	47170221	220 OHM 0603 1/16W CHIP RESISTOR	0.872	0.975	T
SYNTHESIZER PCB HARDWARE					
	25105500	SHIELD, SST-PLUS SYNTHESIZER			

SST-454 CASE ASSEMBLY PARTS LIST

<u>Ref #</u>	<u>RITRON#</u>	<u>Description</u>
	13250000	CASE W/INSERT, PLASTIC, SST BLACK
	13564000	CASE, BOTTOM, PLASTIC, SST 2-PC
	13578000	DOOR, BATTERY, PLASTIC, SST 2-PC
	13588000	LATCH, BATTERY DOOR, PLASTIC SST 2-PC
	14220006	LABEL, CONTROLS, SST+
	14222060	LABEL, NAMEPLATE, SST PLUS SERIES
	2142D021	CONNECTOR, CABLE ASSEMBLY, 2-POS, SST+
	25201500	RETAINER, PLASTIC, PTT, SST
	25202300	LIGHT PIPE, SST+
	25300600	INSULATOR, BATTERY, FIBRE, SST
	25400600	BUSHING, THREADED, PLATED, ANTENNA SST
	25400800	SPRING CONTACT, BATTERY, SST W/O TABSC
	25400900	CONTACT BATTERY SST-PLUS (POLARIZED)
	25604800	SPACER, PCB, FOAM, SST 2-PC
	25603300	GRILLE CLOTH, SPEAKER, SST
	25603400	DUAL JACK PLUG, RUBBER,SST
	25800500	ACTUATOR, RUBBER,PTT,SST
	25800600	ACTUATOR, RUBBER, TACT, SST
	28233G02	SPANNER NUT, ANTENNA SST
	02802026	NUT; KNURLED; M4PO.5;/2.5MM JACK
	02802027	NUT; KNURLED; M6PO.5/3.5MM JACK
	28112401	SCREW 4-40 X 1/4" PHFLST
	25601600	BATTERY SHIM; ASSEMBLY ~X~ SERIES
	AFS-450	ANTENNA UHF MOLDED, 450-470 REG LEN SST
	14200037	LABEL SST/JMX MFG DATE CODE
	14200067	LABEL, FCC SERIAL, SST-454
	14210004	LOW BATTERY NOTICE LABEL
	25201600	BELT CLIP, PLASTIC, SST BLACK
	2811B600	SCREW 6-32 X 1/4" PHTRST

BATTERY PACK

BPS-6N-MH BATTERY,RECHG,7.2V,NIMH,1500 mAh,SST+

SHIPPING MATERIALS

01451188 MANUAL, USER, SST
14312006 SHIPPING CARTON, CARDBOARD,SST
14321002 FOAM INSERT, PACKING, SST/MINI

TYPE OF EXHIBIT: SEMICONDUCTOR FUNCTION

FCC PART: 2.983 (d) (6)

MANUFACTURER: RITRON, INC.
505 West Carmel Drive
Carmel, IN 46032

MODEL: SST-454

TYPE OF UNIT: UHF-FM Handheld Transceiver

FCC ID: AIERIT06-450

DATE: December 28, 1998

DESCRIPTION:

The following list specifies the manufacturer, identification and function of each semiconductor device used in the SST-454 handheld transceiver.

<u>Schem ID</u>	<u>RITRON PN#</u>	<u>Manufacturer</u>	<u>Manufacturer ID</u>	<u>Function</u>
CR101	48D100A2	M/A Com, Inc.	MA4CP101A	TX/RX switching
CR102	48A1005C	Motorola Semiconductors	MMBD7000LT1	Voltage clamp
CR103	48A1005C	Motorola Semiconductors	MMBD7000LT1	Noise detection
CR201	48D100A2	M/A Com, Inc.	MA4CP101A	TX/RX switching
CR301	48B61012	Diodes, Inc.	ZM4742A-07	Overvoltage protection
CR302	48A60001	Diodes, Inc.	DL4001T	Reverse voltage protection
CR303	48A1005C	Motorola Semiconductors	MMBD7000LT1	Turn-on detection
CR304	48A100A3	Motorola Semiconductors	MMBD2835LT1	PTT switching
CR305	48A1005C	Motorola Semiconductors	MMBD7000LT1	Voltage clamp
CR306	48A60001	Diodes, Inc.	DL4001T	Reverse voltage protection
CR307	48A60001	Diodes, Inc.	DL4001T	Reverse voltage protection
CR308	48A1005C	Motorola Semiconductors	MMBD7000LT1	Voltage clamp
CR309	24510001	Sun LED	ZMGUR48M-CA	TX/RX indicator LED
CR310	48A1005C	Motorola Semiconductors	MMBD7000LT1	Voltage clamp
CR401	48A1005C	Motorola Semiconductors	MMBD7000LT1	Biasing
CR402	48C1004E	Motorola Semiconductors	MMBV-105GLT1	VCO tuning
CR403	48C1004G	Motorola Semiconductors	MMBV-2101L	VCO modulation
CR404	48A1004D	Motorola Semiconductors	MMBV3401TI	TX/RX VCO switching
IC101	31030003	Motorola Semiconductors	MC3371BD	RX FM-IF subsystem
IC102	31510001	Motorola Semiconductors	MC13143D	Double balanced mixer
IC301	31010006	Motorola Semiconductors	LM2931AD-5.0R2	+5 VDC voltage regulator
IC302	314J0005	Motorola Semiconductors	MC68HC908AZ60CFU	Microcontroller
IC304	311K0003	Philips Components	74LV4053PWDH	Audio signal switching
IC305	31010008	Motorola Semiconductors	LM2904D	Audio processing
IC306	31010008	Motorola Semiconductors	LM2904D	Audio processing
IC307	31020001	National Semiconductors	MF6CWM-50	Tone low pass filter
IC308	310K0001	Dallas Semiconductor	DS1806E	Audio signal level control
IC309	31010004	National Semiconductors	LM386MX-1	Audio amplifier
IC401	313K0002	Motorola Semiconductors	MC145190DT	Frequency synthesizer

Schem ID	RITRON PN#	Manufacturer	Manufacturer ID	Function
Q 101	4821007Y	Motorola Semiconductors	MMBR941LT1	RX RF amplifier
Q 102	4821003B	Motorola Semiconductors	MMBT918LT1	RX 1st LO multiplier/amp
Q 103	4821003B	Motorola Semiconductors	MMBT918LT1	RX IF amplifier
Q 201	4801001Q	Motorola Semiconductors	MMBT-5088LT1	PWM TX power control
Q 202	4801001Q	Motorola Semiconductors	MMBT-5088LT1	TX +V switching
Q 203	04801503	Misubishi Electronic Device	M68710H	TX RF final amplifier
Q 204	4801002A	Motorola Semiconductors	MMBT3906LT1	TX +V switching
Q 205	4821007Y	Motorola Semiconductors	MMBR941LT1	TX RF driver amplifier
Q 301	48010R02	Motorola Semiconductors	MUN2211T1	PTT detection
Q 302	4801002A	Motorola Semiconductors	MMBT3906LT1	PTT detection
Q 303	480100DH	Motorola Semiconductors	BCW68GLT1	+6V switching
Q 304	4801001Q	Motorola Semiconductors	MMBT-5088LT1	+6V switching
Q 305	480A0001	Rohm Electronics	UMZINTR	Battery +V switching
Q 307	4801002A	Motorola Semiconductors	MMBT3906LT1	+5V switching
Q 308	4801002A	Motorola Semiconductors	MMBT3906LT1	RX +V switching
Q 310	480A0002	Rohm Electronics	UMG9N	LED indicator switching
Q 312	4801001Q	Motorola Semiconductors	MMBT-5088LT1	Audio amplifier enable
Q 313	480100DH	Motorola Semiconductors	BCW68GLT1	Audio amplifier +V switching
Q 401	4821007Y	Motorola Semiconductors	MMBR941LT1	VCO buffer amplifier
Q 402	4801001Q	Motorola Semiconductors	MMBT-5088LT1	VCO voltage de-coupling
Q 403	4821007Y	Motorola Semiconductors	MMBR941LT1	VCO buffer amplifier
Q 404	4821007Y	Motorola Semiconductors	MMBR941LT1	VCO oscillator
Q 406	4801006A	Motorola Semiconductors	MUN2111LT1	TX/RX VCO switching
Q 407	48010R02	Motorola Semiconductors	MUN2211T1	TX/RX VCO switching

TYPE OF TEST: PHOTOGRAPHS AND DRAWINGS

FCC PART: 2.983 (f) (g)

MANUFACTURER: RITRON, INC.
505 West Carmel Drive
Carmel, IN 46032

MODEL: SST-454

TYPE OF UNIT: UHF-FM Handheld Transceiver

FCC ID: AIERIT06-450

DATE: December 28, 1998

The following 8" x 10" photographs are of the RITRON Model SST-454 UHF-FM handheld transceiver.

Thes photographs are of sufficient clarity to indicate:

1. Equipment construction
2. Printed circuit board layout
3. Labels for controls
4. Internal construction to define component placement and chassis assembly
5. Location of FCC ID label
6. Nameplate label