

Eclipse Series

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Status Tone Generator

Operation and Installation

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STATUS TONE GENERATOR INSTRUCTION MANUAL

1. SCOPE

This document provides the information necessary to install, operate and maintain the RF Technology's 9169 Status Tone Generator (STG). The STG is designed for receiver voting applications to provide a fixed audio tone output when the receiver is squelched and passes the normal audio when the receiver squelch is open. The standard audio tone is 1950 Hz but 2175 Hz and 2700 Hz tones are also available if the optional crystals are fitted.

2. CIRCUIT DESCRIPTION

The 9169 status tone generator is specially designed for RF Technology's Eclipse series receivers. It is an option board which mounts directly on to the receiver pcb or it can be used as an independent module for those applications which use third party receivers.

The 9169 STG is mounted on the RX pcb via the socket SOK1, SOK3 and a mounting screw. Jumpers JP1, JP3 provide the same function as on the RX pcb. Audio signal is buffered by U1D and amplified by U1A. The output level can be adjusted by VR1. The 10Kohm resistor R1 is normally not fitted, it is used only for the applications which need mixed audio and tone signal.

A Logical low from SQL (receiver is muted) enables the oscillator and the frequency divider. U3C and Y1 (or Y2 or Y3) form the crystal oscillator, the oscillation frequency could be 3.944MHz, or 4.4544MHz, 5.5296MHz depending on the crystal. U2 provides 2048 times division to form the 1950Hz, 2175Hz or 2700Hz square wave signal. The square wave is then adjusted by RV2, and filtered by U1B and U1C to form a sine wave signal. The sine wave is brought out as the status tone at DC block capacitor C3, or may be mixed with the audio signal by fitting the 10Kohm resistor R1.

3. INSTALLATION

- **Mounting the STG into the receiver**

Turn the power off by disconnecting the DB25 connector and open the receiver lid. Locate and remove the top-right mounting screw (near the internal speaker) of the receiver pcb, and replace it with the 12mm spacer screw instead.

Please note the positions of JP1 and JP3 and remove the plastic jumpers.

Fit the STG on to the receiver pcb making sure that JP1 and JP3 of receiver pcb are completely inserted into the SOK1 and SOK3 of 9169 STG

Replace the plastic jumpers on JP1 and JP3 in their original positions.

Secure the mounting screw through the top-right corner mounting hole into the spacer The 9169 PCB should be firmly mounted.

4. ALIGNMENT

- **Connect the wires**

Refer to the **Wiring Diagram** in the Appendix.

With the 4 way cable supplied, connect the STG pin1 to the via hole on the front side of R177, pin2 to 5V supply, pin3 to the SQL via hole, and pin4 to Ground.

4. ALIGNMENT

Check that all the wires are correctly connected. Set VR1 and VR2 to approximately half way position. Turn the receiver on without any RF input signal and monitor the line output. A 1950Hz status tone should be observed. Align the tone level pot RV2 on the 9169 PCB until the status tone level is 0.775VRMS or the level required.

Set the RF signal generator to -60dbm RF level and 1KHz audio modulation, with appropriate RF frequency and deviation. When the receiver squelch LED is ON, the 1000Hz audio will replace the status tone signal. Align the pot RV1 on the 9169 PCB until the audio level is 0.775VRMS or the level required.

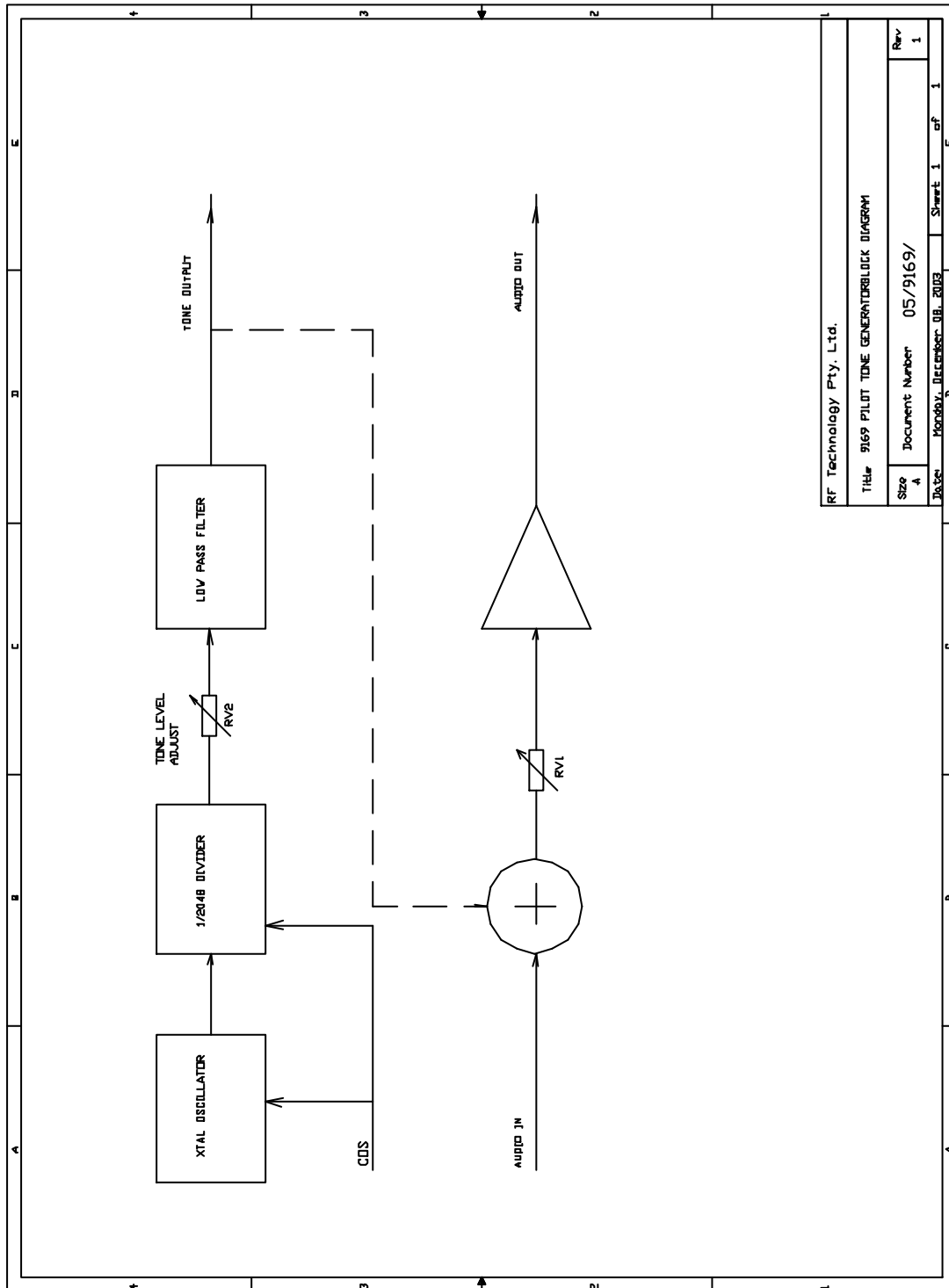
The 9169 STG may have optional crystals for 2150 Hz and 2700 Hz fitted. The appropriate jumper or solder link next to the crystal needs to be in place to select these frequencies. Only one of the three frequencies should be selected at any time. It may be necessary to readjust the tone level if an option frequency is selected.

5. PREVENTIVE MAINTENANCE

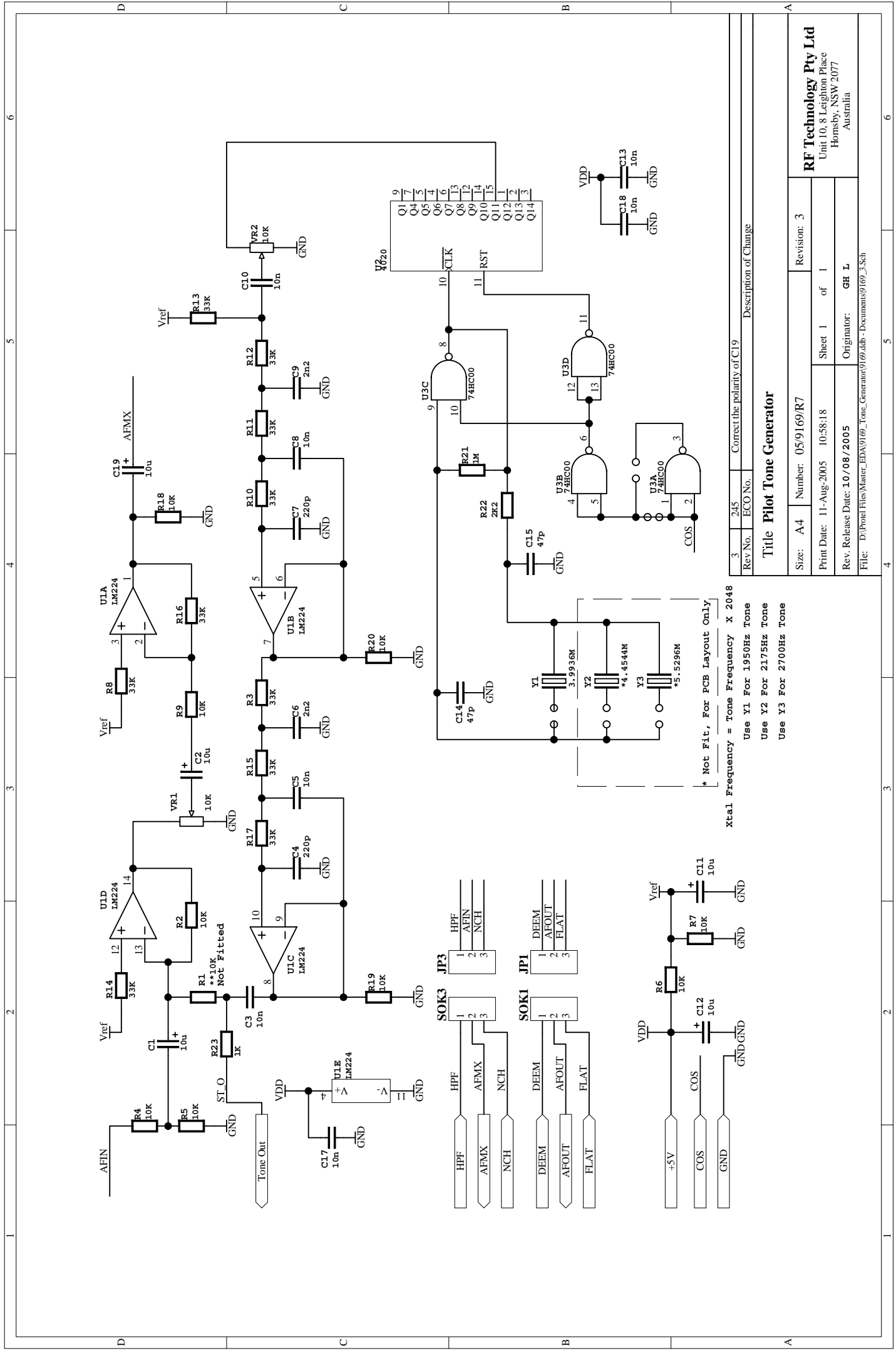
There is no preventive and periodic maintenance requirement for this Status Tone Generator board.

6. APPENDIX

- Block Diagram



9169 Status Tone Generator Block Diagram

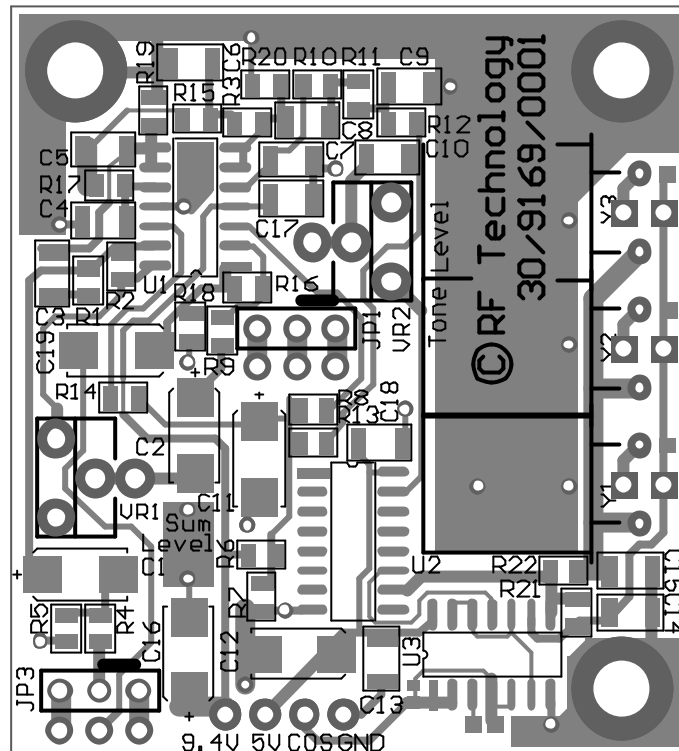


* Not Fit, For PCB Layout Only
 Xtal Frequency = Tone Frequency X 2048
 Use Y1 For 1950Hz Tone
 Use Y2 For 2175Hz Tone
 Use Y3 For 2700Hz Tone

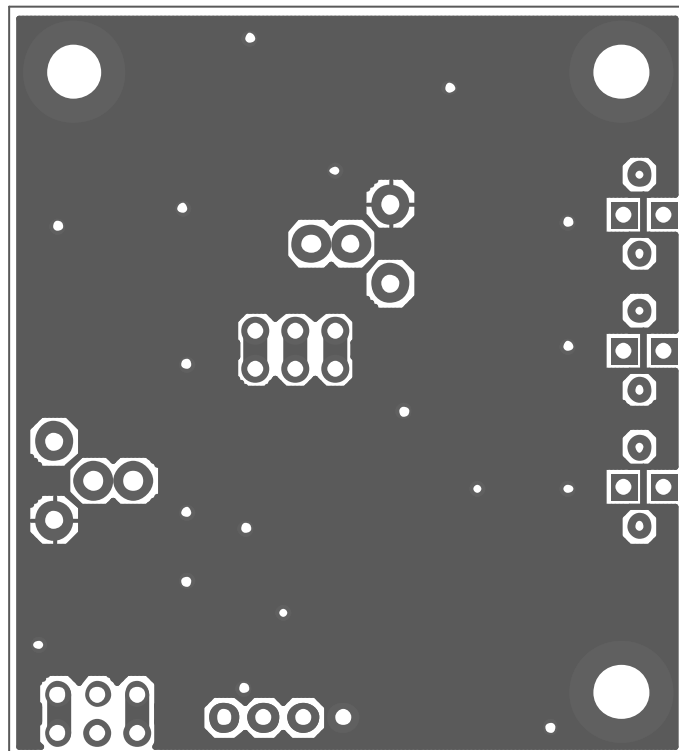
Rev No.	3	ECO No.	245	Description of Change	
Title Pilot Tone Generator					
Size:	A4	Number:	05/9169/R7	Revision:	3
Print Date:	11-Aug-2005	10:58:18	Sheet 1	of 1	
Rev. Release Date:	10/08/2005	Originator:	GH L		
File:	D:\Prol Files\Master_EIDA\9169_Tone_Generator\9169.ddb - Documents\9169_3.Sch				

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- PCB Layout

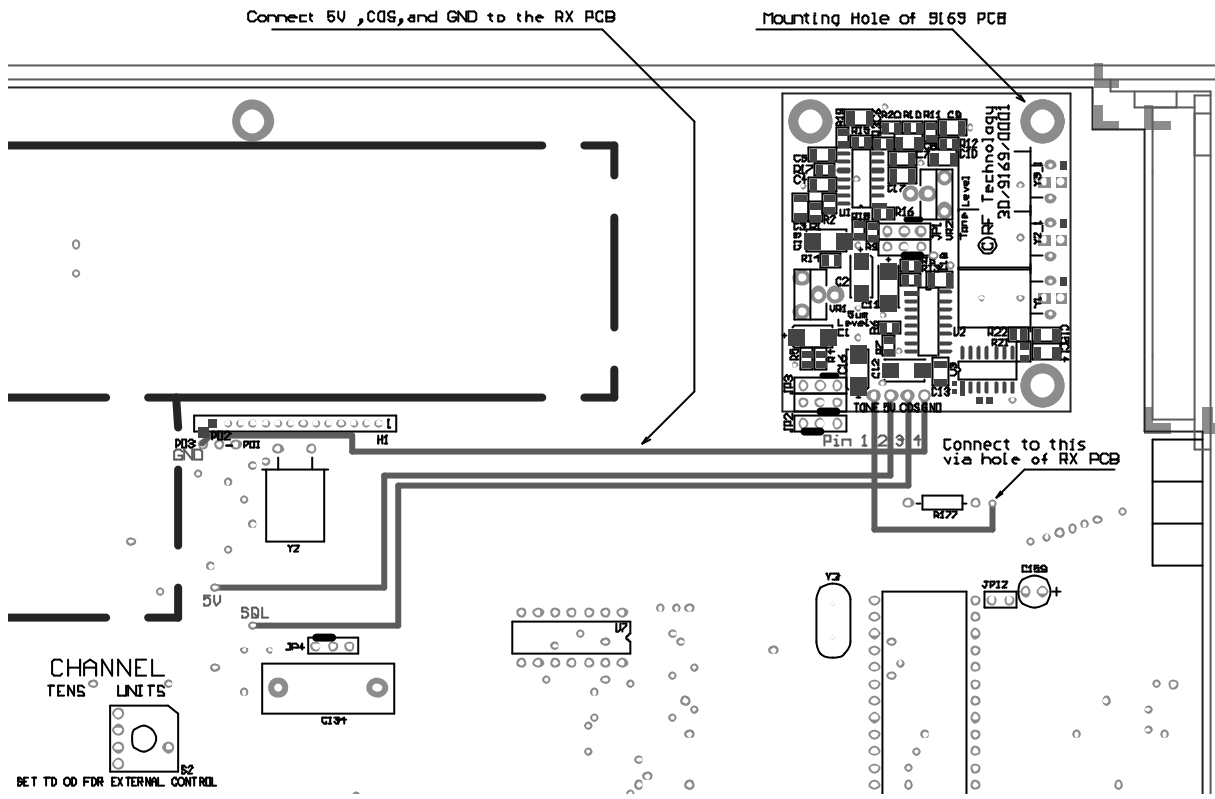


Top Side of 9169 PCB

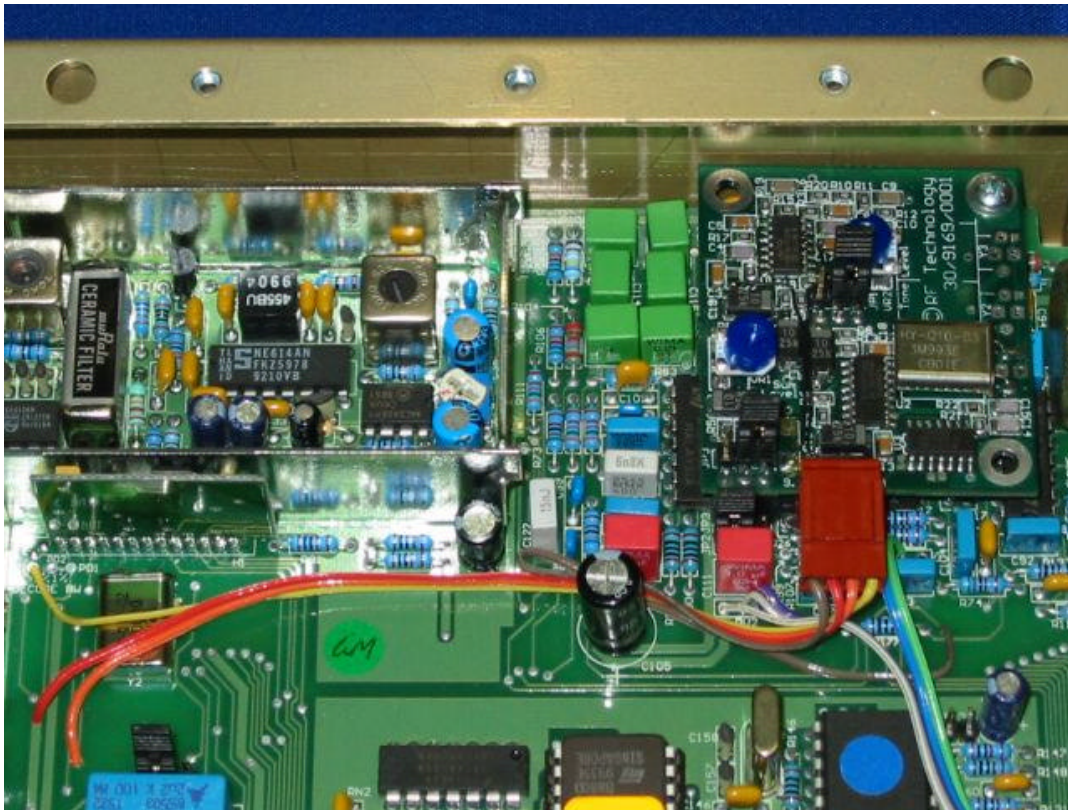


Bottom side of 9169 PCB (view from Top)

- **Wiring Diagram**



Wiring between 9169 PCB and Receiver PCB



- **Part List**

REF	DESCRIPTION	PART NUMBER
C1	CAP ELECCTRO 10U 16V M6032	42/3300/010U
C10	CAPACITOR 1206 10NF 10% X7R	46/3310/010N
C11	CAP ELECCTRO 10U 16V M6032	42/3300/010U
C12	CAP ELECCTRO 10U 16V M6032	42/3300/010U
C13	CAPACITOR 1206 10NF 10% X7R	46/3310/010N
C14	CAPACITOR 1206 47PF 5% NPO	46/3300/047P
C15	CAPACITOR 1206 47PF 5% NPO	46/3300/047P
C16	CAP ELECCTRO 10U 16V M6032	42/3300/010U
C17	CAPACITOR 1206 10NF 10% X7R	46/3310/010N
C18	CAPACITOR 1206 10NF 10% X7R	46/3310/010N
C19	CAP ELECCTRO 10U 16V M6032	42/3300/010U
C2	CAP ELECCTRO 10U 16V M6032	42/3300/010U
C3	CAPACITOR 1206 10NF 10% X7R	46/3310/010N
C4	CAPACITOR 1206 220PF 5% NPO	46/3300/220P
C5	CAPACITOR 1206 10NF 10% X7R	46/3310/010N
C6	CAPACITOR 1206 2.2NF 10% X7R	46/3310/02N2
C7	CAPACITOR 1206 220PF 5% NPO	46/3300/220P
C8	CAPACITOR 1206 10NF 10% X7R	46/3310/010N
C9	CAPACITOR 1206 2.2NF 10% X7R	46/3310/02N2
JP1	3WAY VERTICAL HEADER	35/2501/0003
JP3	3WAY VERTICAL HEADER	35/2501/0003
R1	RESISTOR 0805 10K+/-5% 1/8W	*NOT FITTED
R10	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R11	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R12	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R13	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R14	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R15	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R16	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R17	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R18	RESISTOR 0805 10K+/-5% 1/8W	51/8511/010K
R19	RESISTOR 0805 10K+/-5% 1/8W	51/8511/010K
R2	RESISTOR 0805 10K+/-5% 1/8W	51/8511/010K
R20	RESISTOR 0805 10K+/-5% 1/8W	51/8511/010K
R21	RESISTOR 0805 1.0M+/-5% 1/8W	51/8511/01M0
R22	RESISTOR 0805 2.2K+/-5% 1/8W	51/8511/02K2
R3	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R4	RESISTOR 0805 10K+/-5% 1/8W	51/8511/010K
R5	RESISTOR 0805 10K+/-5% 1/8W	51/8511/010K
R6	RESISTOR 0805 10K+/-5% 1/8W	51/8511/010K
R7	RESISTOR 0805 10K+/-5% 1/8W	51/8511/010K
R8	RESISTOR 0805 33K+/-5% 1/8W	51/8511/033K
R9	RESISTOR 0805 10K+/-5% 1/8W	51/8511/033K
SOK1	3WAY FEMAL HEADER	35/2501/0003
SOK3	3WAY FEMAL HEADER	35/2501/0003
U1	IC LOW POWER QUAD OPAMP	26/1000/M224
U2	IC 14 STAGE BINARY COUNTER	29/2000/4020
U3	IC QUAD NAND	29/2000/HC00
VR1	TRIMPOT 10K 1TURN VERT	53/1020/010K
VR2	TRIMPOT 10K 1TURN VERT	53/1020/010K
Y1	XTAL HC49 F=3.9936MHz	32/XTL3/9936
Y2	XTAL HC49 F=4.4544MHz	*NOT FITTED
Y3	XTAL HC49 F=5.5296MHz	*NOT FITTED