

# SoundLab – A Mini Synthesiser



## Music from Outer Space SoundLab Mini-Synthesiser

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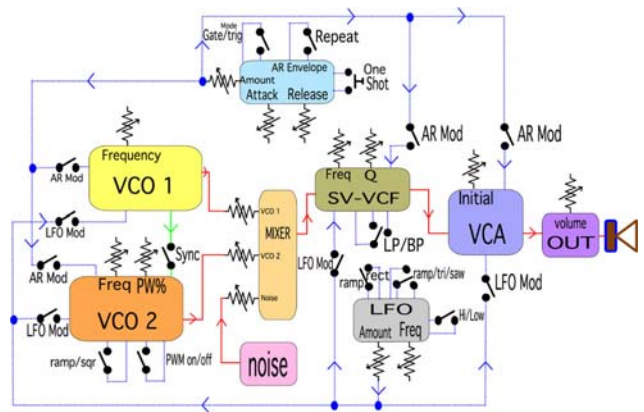
Ray Wilson's original SoundLab

## Preamble

This document draws extensively from the text on the Music From Outer Space (MFOS) website and readers are advised to check on that website for updates and suggested modifications.

## Introduction

This is an intermediate to advanced project for someone who wants to make cool sounds. It makes a great first synthesiser project but is interesting enough for the seasoned synthesiser person too. The SoundLab Mini-Synthesiser is a LOT of fun to play with and makes some very cool sounds. If you like electronic music you will definitely have fun with this. If you have a sampler you can use this unit as an analogue synthesiser sound source to make excellent samples with.



## How does it work

Please refer to the Music From Outer Space website for details on how the SoundLab circuits function.

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## Construction

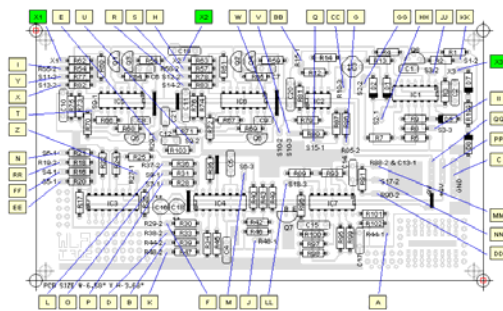
Assembly of the SoundLab PCB is relatively straight forward. It is recommended that you assemble the board in layers starting with the smallest components such as resistors and diodes and building up to the larger components.

PCB pins have been supplied to aid with wiring the board to the panel components. The location of these pins correlates with the pin labels A, B – RR as used in the MFOS drawings, although on the PCB the designations are actually the destination name for the pin. Refer to the drawing and place a pin in each location tagged by a letter(s). Please note that for C, PP and QQ that 2 sets of pins will be required.

With the board assembled we move on to the panels. The SoundLab Console has 2 panels, one for the rear panel and, of course, the main front panel. Dress both of these panels according to the parts list. When placing pots on to the front panel ensure that the legs all point downwards. This not only eases wiring but also ensures that the flat on the shaft is correctly positioned. Pot bodies will have a key-bump which should be snapped off using a pair of pliers. The nut and washer supplied with these pots should both go on the front face side of the panel. When attaching the switches keep one nut on the reverse face side of the panel along with the shakeproof washer. Discard the locating washer (large plain washer with a locating stub on it). Use the remaining nut to secure the switch making sure the switch is exactly vertical (or horizontal in a couple of cases).

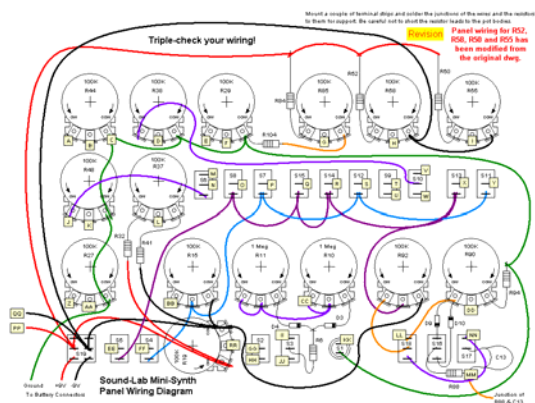
Looking at the reverse side of the panel, the pot legs are numbered left to right 1, 2 & 3 which correspond with Clockwise, Wiper and Anti-clockwise. The pins on the switches are numbered top to bottom 1, 2 & 3 which corresponds with Normally-Open, Common and Normally-Closed. The exception to the naming is the pushbutton switch S1 where pins 1, 2 & 3 corresponds with Common, Normally-Open and Normally-Closed.

Firstly you should follow the 'Component on Panel' chart and mount all off-board components. Then follow the Panel-Panel chart to add all the wiring between various points on the panel. Finally you should follow the 'Board to Panel' chart. For this stage I would suggest that the case base with the pcb installed be placed immediately in front of you and the case top be positioned directly above this as shown.



Use the MFOS 'SoundLab\_Labels' picture to identify the cable identification (A, B, PP etc) with the designation on the board (R55-2, S9-1 etc).

The colour coding for the Panel-Panel wiring follows that shown in the MFOS drawing. There is no colour coding used for the Board-Panel wiring which is done with white wire.



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The finished unit is shown in the photo on the right. In this unit I have used lace-cord to tidy up the wiring but cable ties can be used to equal effect.

Ensure there is enough slack in the harnesses going between the two sections to allow the case to be opened and closed yet do not be overly generous.

The wiring charts supplied split the Board to Panel wiring in to two harnesses, one running up each side of the assembly. Although direct point-point wiring will result in much shorter cable runs, the proposed arrangement is much easier to work on should the need arise. Constructors may opt to use multi-colour wiring between the Board and Panel connections to assist with fault finding.



### Calibration

Before calibrating the SoundLab a final check should be made for any wiring and/or soldering faults. Once satisfied that all appears okay, we would suggest removing all IC's from their sockets and then applying power to the unit. With a digital multimeter (DMM) set to DC Volts (20 volt range) you should check the power pins on the IC sockets (refer to schematics for pin identification). If all is okay, then remove power and insert all the IC's paying particular attention to the orientation, IC2, IC3 and IC4 are the reverse orientation to the remaining IC's. Finally, re-apply power and recheck the power pins. If the power pins are reading low then immediately switch off the unit and recheck for solder shorts.

The only calibration required is that for the Volt/Octave settings. The default condition of the trimpots in their centre position will generally work fine for many users and so no adjustment would be necessary.

If you intend to use the SoundLab in conjunction with other musical instruments then you will probably want to set the Volt/Octave adjustments to give better tracking of the oscillators to the external control voltages.

### Checking it out

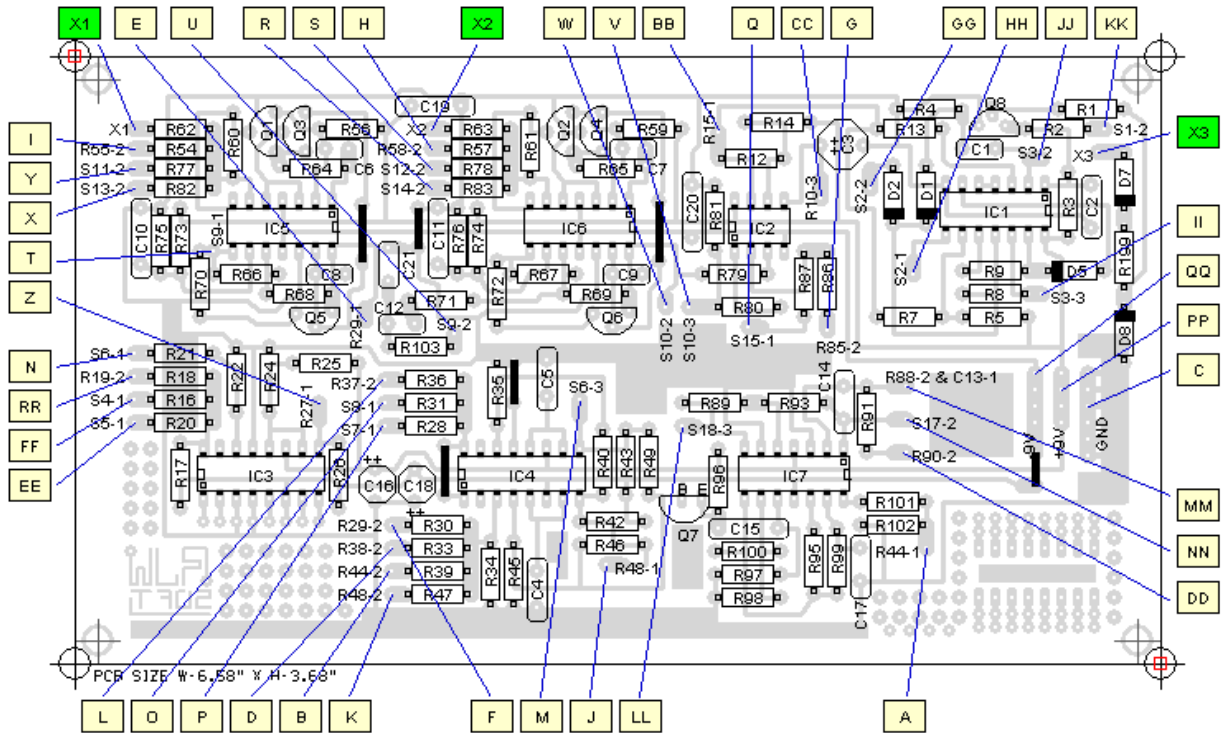
Please refer to the Music From Outer Space website for instructions on checking out the operation of your SoundLab unit.



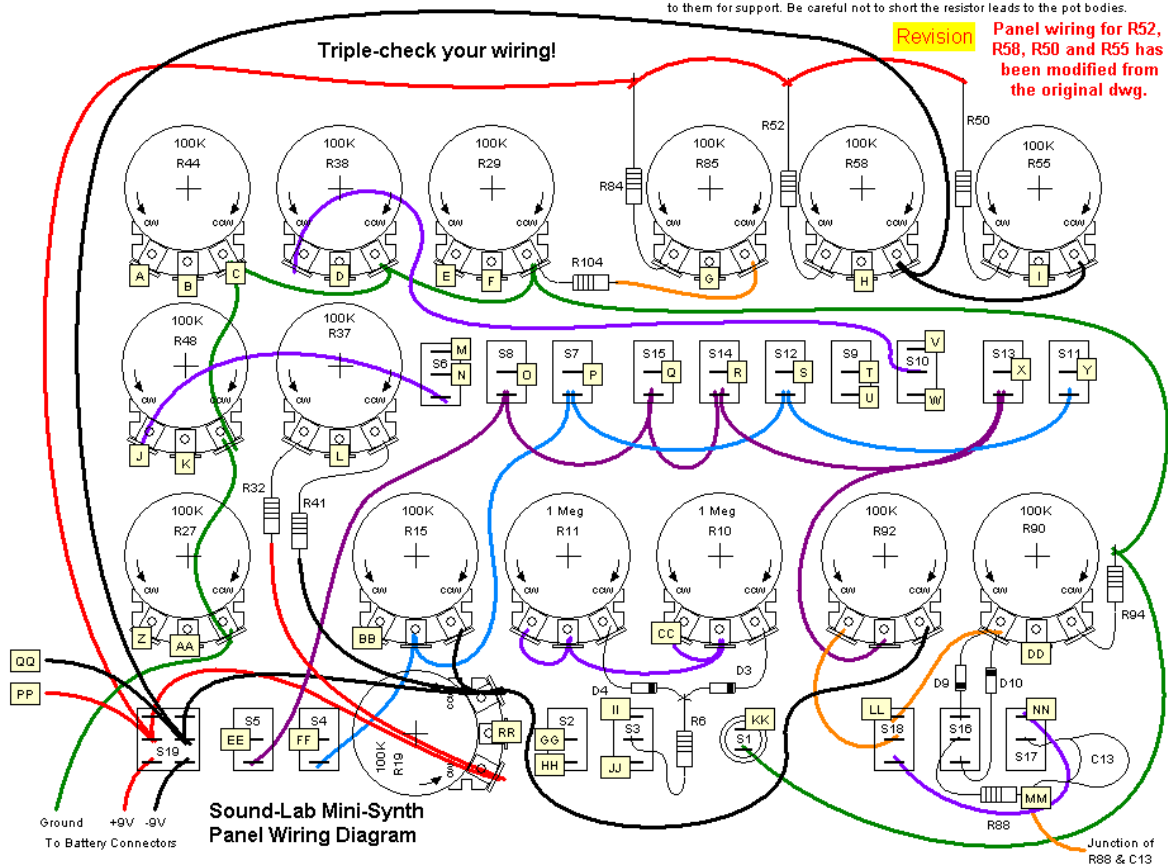
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## APPENDIX A

The following drawings are taken directly from the MFOS website and should be used in conjunction with the wiring charts provided at the end of this document.



Mount a couple of terminal strips and solder the junctions of the wires and the resistors to them for support. Be careful not to short the resistor leads to the pot bodies.



Sound-Lab Mini-Synth  
Panel Wiring Diagram

# SoundLab – A Mini Synthesiser

## APPENDIX B

The following pages provide wiring charts to assist you with wiring up your SoundLab system.

Terminal identification is derived from the original MFOS drawings as provided on the MFOS website as is the colour coding of the Panel-to-Panel wiring.

Recommended wire is 7/0.2mm up to 16/0.2mm or 24AWG to 22AWG.

Music From Outer Space  
SoundLab Console Wiring (1)

FROM	PIN		TO	PIN	INSTALLED	CHECKED
SK4	TIP	-	R23	FLY-1		
R23	FLY-2	-	C22	FLY-1		
R84	FLY-1	-	R85	CW		
R52	FLY-1	-	R58	CW		
R50	FLY-1	-	R55	CW		
R94	FLY-1	-	R90	CCW		
R104	FLY-1	-	R29	CCW		
R32	FLY-1	-	R37	CW		
R41	FLY-1	-	R37	CCW		

D4	ANODE	-	R11	CCW		
D3	CATHODE	-	R10	CCW		
R6	FLY-1	-	S3	COM		
D3	ANODE	-	R6	FLY-2		
D4	CATHODE	-	R6	FLY-1		

D9	CATHODE	-	S16	NO		
D10	ANODE	-	S16	NC		
D9	ANODE	-	D10	CATHODE		

R88	FLY-1	-	S16	COM		
C13	FLY-1	-	S17	COM		
C13	FLY-2	-	R88	FLY-2		

Music From Outer Space  
SoundLab Console Wiring (2)

FROM	PIN		TO	PIN	mm	INSTALLED	CHECKED
R48	CW	-	S6	NO	90		
R38	CW	-	S10	COM	150		
R11	W	-	R11	CW	7		
R11	CW	-	R10	CW	58		
R10	CW	-	R10	W	7		

S18	COM	-	S17	NO	30		
					342		

FROM	PIN		TO	PIN	mm	INSTALLED	CHECKED
R27	CCW	-	S1	COM	170		
S1	COM	-	R48	CCW	130		
R48	CCW	-	R29	CCW	65		
R29	CCW	-	R38	CCW	65		
R38	CCW	-	R44	CCW	80		
R44	CCW	-	R104	FLY-2	100		
R104	FLY-2	-	R94	FLY-2	80		

SK1	BODY	-	SK2	BODY	40		
SK2	BODY	-	SK3	BODY	40		
SK3	BODY	-	SK4	BODY	50		
BATTERY	B1 -VE	-	BATTERY	B2 +VE	40		
BATTERY	B2 +VE	-	SK1	BODY	130		
					990		

FROM	PIN		TO	PIN	mm	INSTALLED	CHECKED
S4	NC	-	R15	W	80		
R15	W	-	S7	NC	45		
S7	NC	-	S12	NC	125		
S12	NC	-	S11	NC	80		
					330		

FROM	PIN		TO	PIN	mm	INSTALLED	CHECKED
R92	CW	-	S18	COM	80		
S18	NO	-	R90	CW	130		
S18	NO	-	D9-D10	FLY-2	55		

R27	W	-	C22	FLY-2	50		
SK4	LEFT	-	SK4	RIGHT	40		
					355		

FROM	PIN		TO	PIN	mm	INSTALLED	CHECKED
R84	FLY-2	-	R52	FLY-2	80		
R52	FLY-2	-	R50	FLY-2	60		
R50	FLY-2	-	R32	FLY-2	140		
R32	FLY-2	-	R19	CW	115		

S19	NO1	-	BATTERY	B1 +VE	260		
					655		

FROM	PIN		TO	PIN	mm	INSTALLED	CHECKED
S5	NC	-	S8	NC	115		
S8	NC	-	R92	W	80		
R92	W	-	S15	NC	100		
S15	NC	-	S14	NC	90		
S14	NC	-	S13	NC	90		
					475		

FROM	PIN		TO	PIN	mm	INSTALLED	CHECKED
R19	CCW	-	R15	CCW	100		
R15	CCW	-	R92	CCW	110		
R92	CCW	-	R41	FLY-2	90		
R41	FLY-2	-	R58	CCW	115		
R58	CCW	-	R55	CCW	90		

S19	NO-2	-	BATTERY	B2 -VE	160		
					665		



Music From Outer Space  
SoundLab Console Wiring (3)

FROM	DESIGNATION		TO	PIN	mm	INSTALLED	CHECKED
X2	X2	-	SK2	TIP	300		
H	R58-2	-	R58	W	405		
S	S12-2	-	S12	COM	425		
R	S14-2	-	S14	COM	385		
U	S9-2	-	S9	NC	405		
E	R29-1	-	R29	CW	415		
X1	X1	-	SK1	TIP	290		
I	R55-2	-	R55	W	280		
Y	S11-2	-	S11	COM	300		
X	S13-2	-	S13	COM	285		
T	S9-1	-	S9	COM	365		
N	S6-1	-	S6	COM	490		
RR	R19-2	-	R19	W	570		
FF	S4-1	-	S4	COM	590		
EE	S5-1	-	S5	COM	560		
Z	S8-1	-	R27	CW	670		
L	R37-2	-	R37	W	500		
O	S8-1	-	S8	COM	510		
P	S7-1	-	S7	COM	530		
F	R29-2	-	R29	W	505		
D	R38-2	-	R38	W	540		
B	R44-2	-	R44	W	570		
K	R48-2	-	R48	W	555		
FROM	DESIGNATION		TO	PIN	mm	INSTALLED	CHECKED
W	S10-2	-	S10	NC	700		
V	S10-3	-	S10	NO	720		
BB	R15-1	-	R15	CW	445		
Q	S15-1	-	S15	COM	690		
CC	R10-3	-	R10	CW	370		
G	R85-2	-	R85	W	690		
GG	S2-2	-	S2	COM	310		
HH	S2-1	-	S2	NC	305		
JJ	S3-2	-	S3	NC	330		
KK	S1-2	-	S1	NO	260		
X3	X3	-	SK3	TIP	310		
II	S3-3	-	S3	NO	340		
QQ(2)	-9V	-	R19	CCW	390		
QQ(1)	-9V	-	S19	COM-1	400		
PP(2)	+9V	-	R19	CW	390		
PP(1)	+9V	-	S19	COM-2	400		
C(2)	GND	-	BATTERY	COM	130		
C(1)	GND	-	R27	CCW	430		
MM	R88-2 & C13-1	-	R88	FLY-2	540		
NN	S17-2	-	S17	NO	550		
DD	R90-2	-	R90	W	595		
A	R44-1	-	R44	CW	590		
LL	S18-3	-	S18	NO	560		
J	R48-1	-	R48	CW	520		
M	S6-3	-	S6	NO	570		

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