RETROAKTIV

ARP AVATAR PATCH PANEL INSTALLATION MANUAL

INTRODUCTION

Thank you for purchasing an Avatar Patch Panel Kit! These instructions are intended to guide you through installing and using this kit. Before we get started, let's go over a few guidelines:

Never open the Avatar or perform any service on it when the unit is plugged in to AC power. Take your time when drilling in to the front panel and when making cuts to traces on the circuit boards. Careless work can damage your instrument and diminish its resale value. This work should be performed by persons experienced with electronics and mechanical construction. This modification is considered advanced and should not be undertaken by the novice. Please consider hiring a professional technician or engineer to do this work if you are not comfortable. This kit will take 8-10 hours for an experienced technician to install

KIT CONTENTS

- Polycarbonate Graphic Panel
- (2) Potentiometers
- Heat Shrink Tubing
- (2) 50 pin IDC cables
- 1 PCB
- (36) 1/8" Switching Jacks
- (36) 3/8" Mounting Nuts
- (1) 1M Resistor
- (2) 50-Pin IDC Connectors

TOOLS REQUIRED FOR INSTALLATION

- Electric Drill or Drill Press
- 6.5mm Drill Bit
- Center Punch
- Wire cutters
- Wire strippers
- Solder
- Soldering Iron
- Dremel or Exact-O Knife
- Phillips Head Screwdriver
- Heat Gun or Hair Dryer

POSITIONING, MARKING, AND DRILLING

The vinyl adhesive panel overlay is used as a template for marking and drilling the ARP Avatar front panel.

Line up the graphics horizontally and adjust vertically so the top edge of the vinyl overlay just meets the orange front panel graphic under the LFO Repeat switch. The bottom edge of the vinyl overlay should be approximately 33mm from the bottom edge of the Avatar front panel. Secure in position with removable tape taking care not to obstruct the holes in the overlay.

Accurately mark the center of the openings, remove the overlay, and drill the VCO1 glide and VCO2 glide locations to all other holes to 6.5mm. Deburr the holes on both sides of the panel. If drilling the panel by hand, always remove the front panel and PCBs, and use a sharp center punch to prep each drilling location to minimize the drill bit wandering. If using a drill press, remove the circuit boards from the front panel and remove the panel from the case. Wooden spacer blocks will be needed under the panel to level it while drilling.

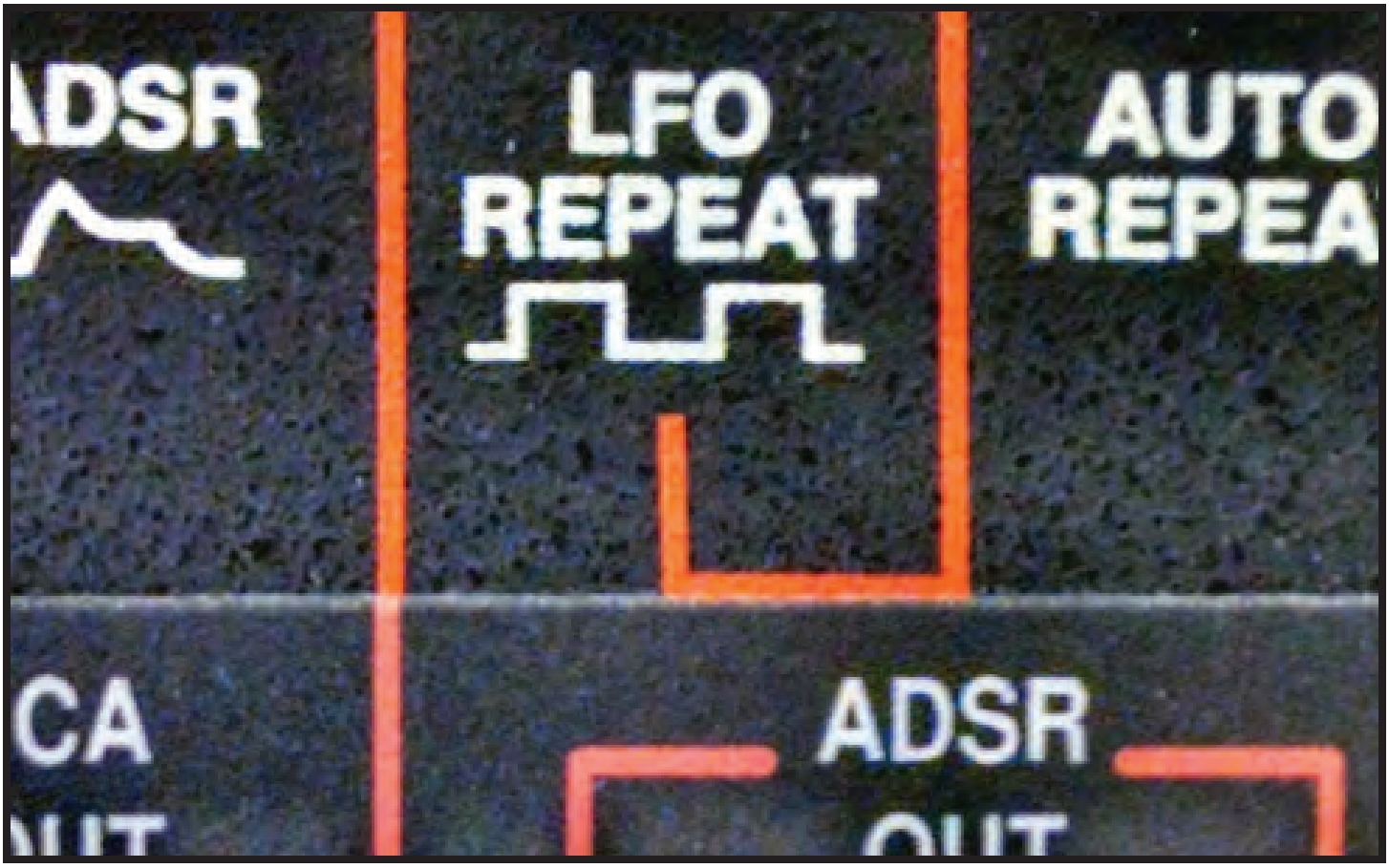
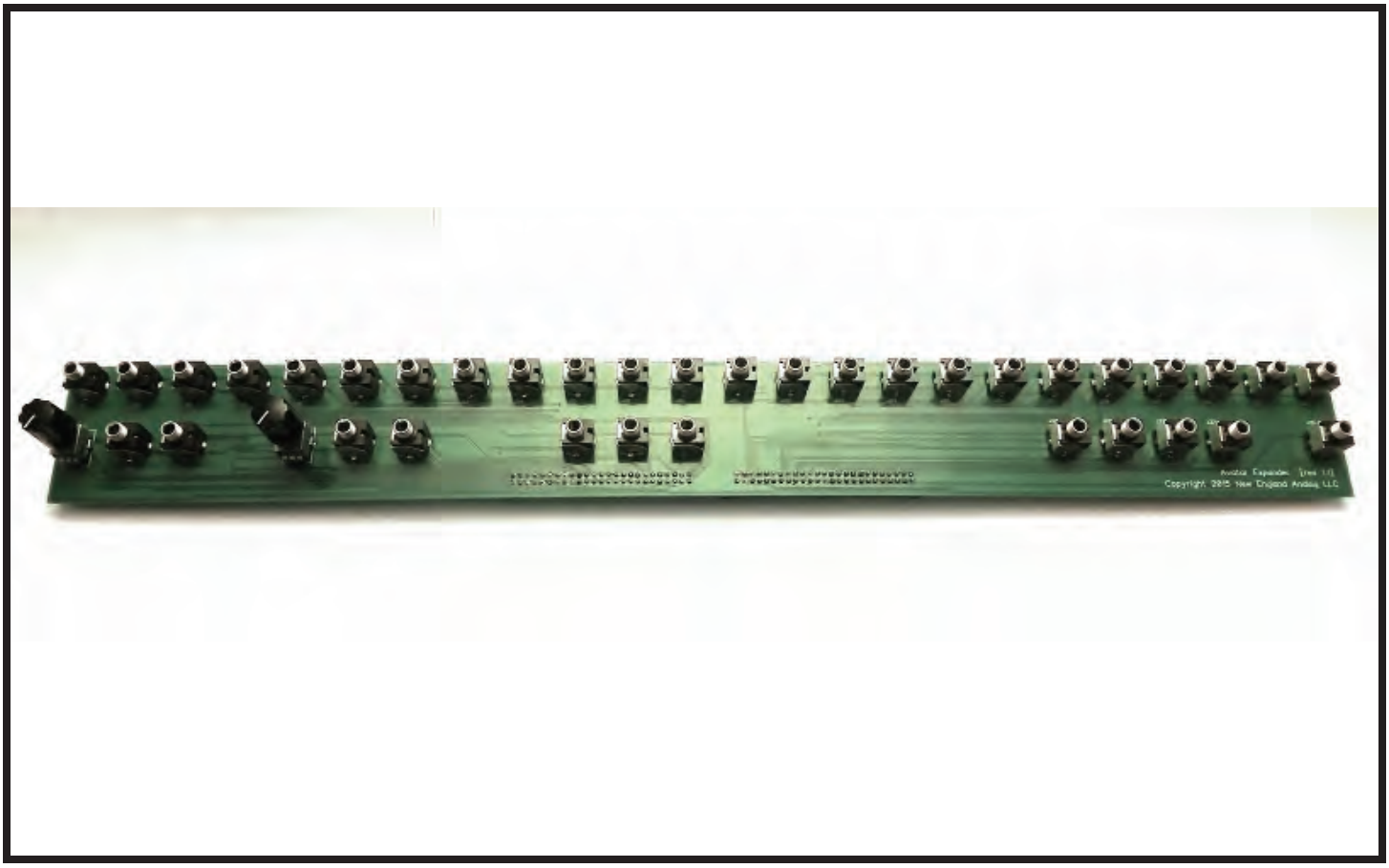
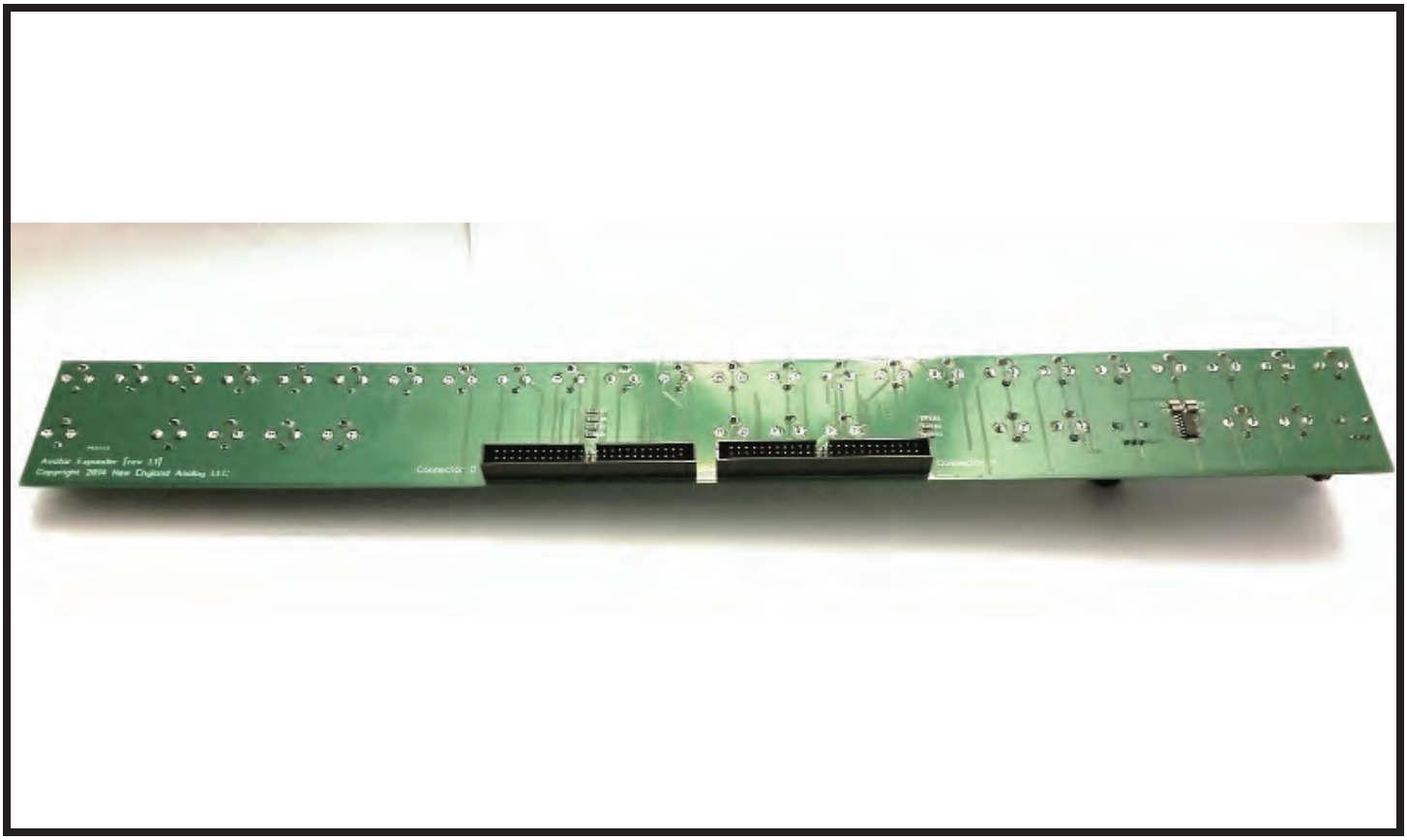


Figure 1A - Alignment of Overlay

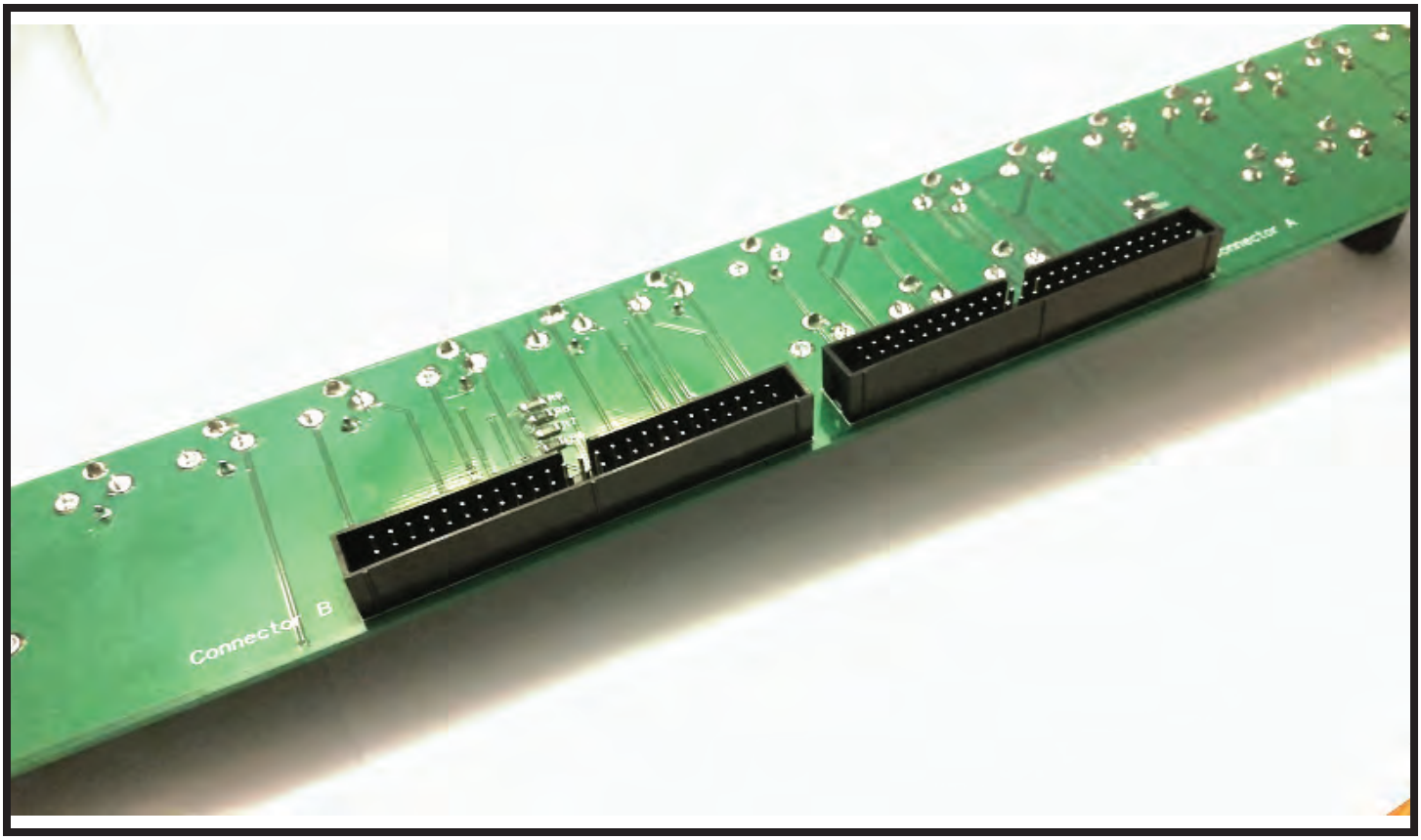
Figure 1B - Alignment of Overlay



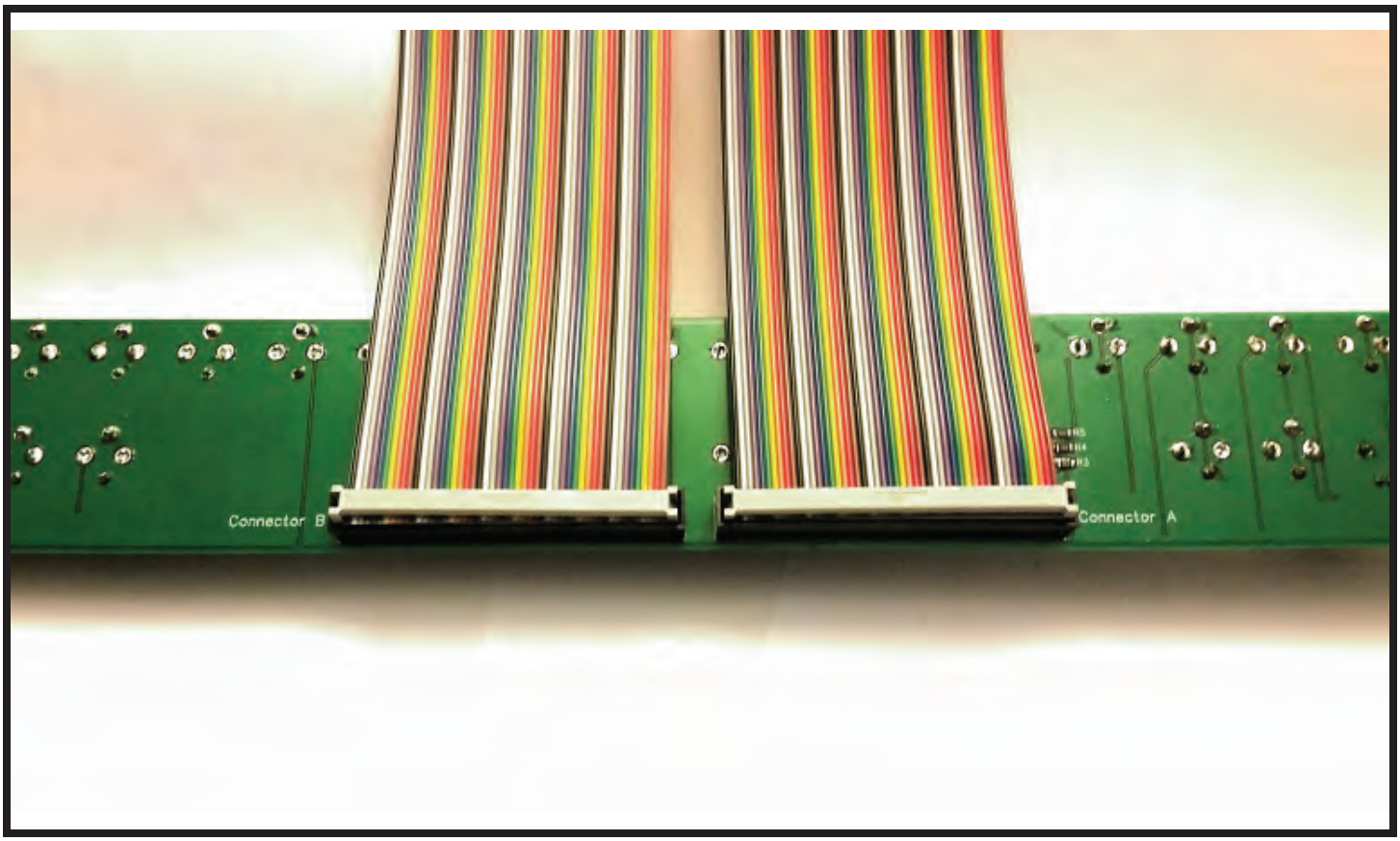
Assembled PCB (Top View)



Assembled PCB (Bottom View)



IDC Headers Mounted to PCB



Proper Orientation of Ribbon Cables

PANEL MOUNTING AND PCB MOUNTING

Before affixing the vinyl overlay to the Avatar panel, dry fit and verify the alignment of the overlay, panel holes, and patch board hardware, securing the jack hardware only loosely in place. Inaccurately drilled panel holes may result in a slight buckling or misalignment of the overlay which can be remedied by slightly enlarging the misaligned holes. The vinyl overlay has a strong adhesive, so use care in affixing it to the panel.

Attach the 36 1/8" switching jacks and pots to the top of the PCB. Attach IDC connectors to the bottom of the PCB. Pay close attention to the keying of the IDC connectors as well. Pin 1 is always marked on the IDC header with either a 1 or a triangle pointing to pin 1. Make sure you know which pin is pin 1 (brown wire) before you start wiring. IDC Header A is on the left side of the PCB (contains VCOs, S&H, etc) and Header B is on the right side (VCF, VCA, Envelopes.)

ELECTRICAL MODS AND CONNECTIONS

Several conductive traces must be cut (electrically open) on the Avatar circuit boards. This is best done with a rotary tool such as a Dremel but can also be accomplished with a sharp utility or hobby knife.

The following pages have diagrams of the circuit boards to be modified. There are certain conventions that must be followed when using the diagrams. A cut to the PCB is indicated with a yellow line. Each cut will require that a wire be tack soldered on to each side of the cut. A trace that does not need to be cut, but still has a wire attached to it will be indicated with a yellow dot. A wire will be needed on the oscillator board, and it is indicated by a purple line.

The diagrams have a letter and a number indicating which wires should be soldered to each point. The letter A indicates that a wire is on the left front panel PCB cable. The letter B indicates that the wire is in the right front panel PCB cable. There are 50 wires on each cable. The brown wire indicates pin 1. For example, A12 would mean wire 12 on the left front panel PCB cable. Trim the wires in the cables to the lengths needed to reach the point on the PCB where they will be soldered.

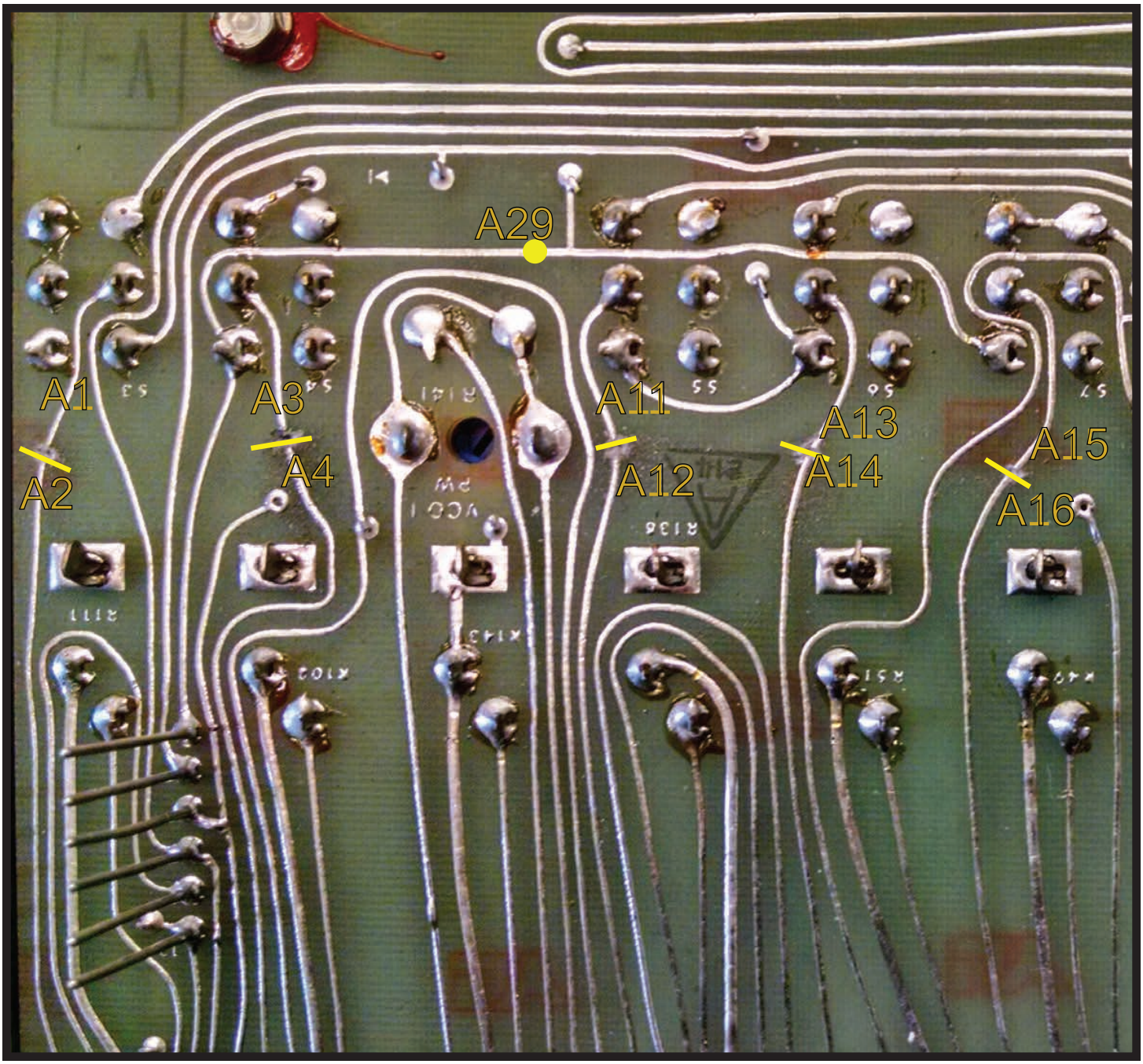


Figure 2.
Board B Top Left

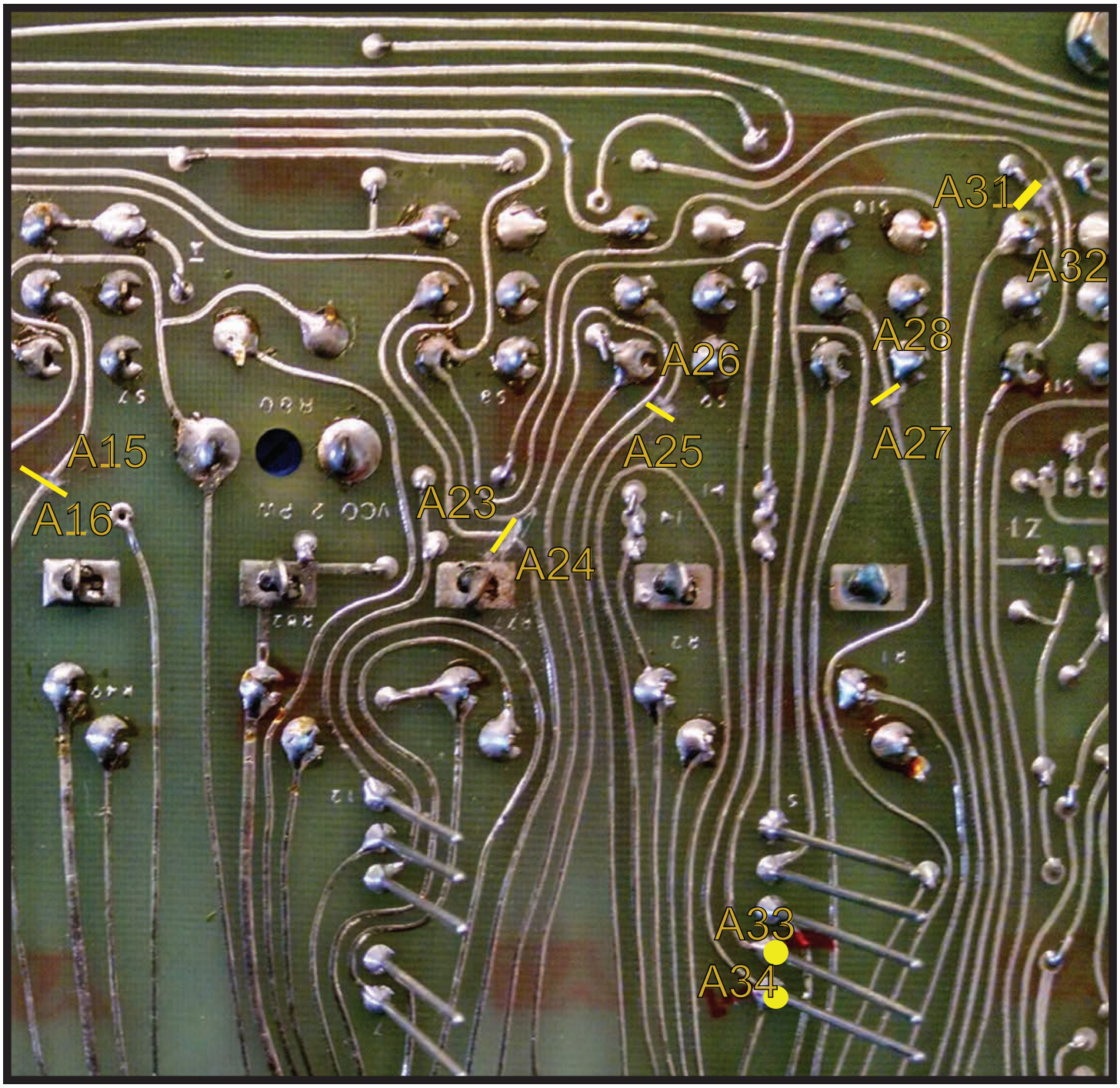


Figure 3.
Board B Top Center

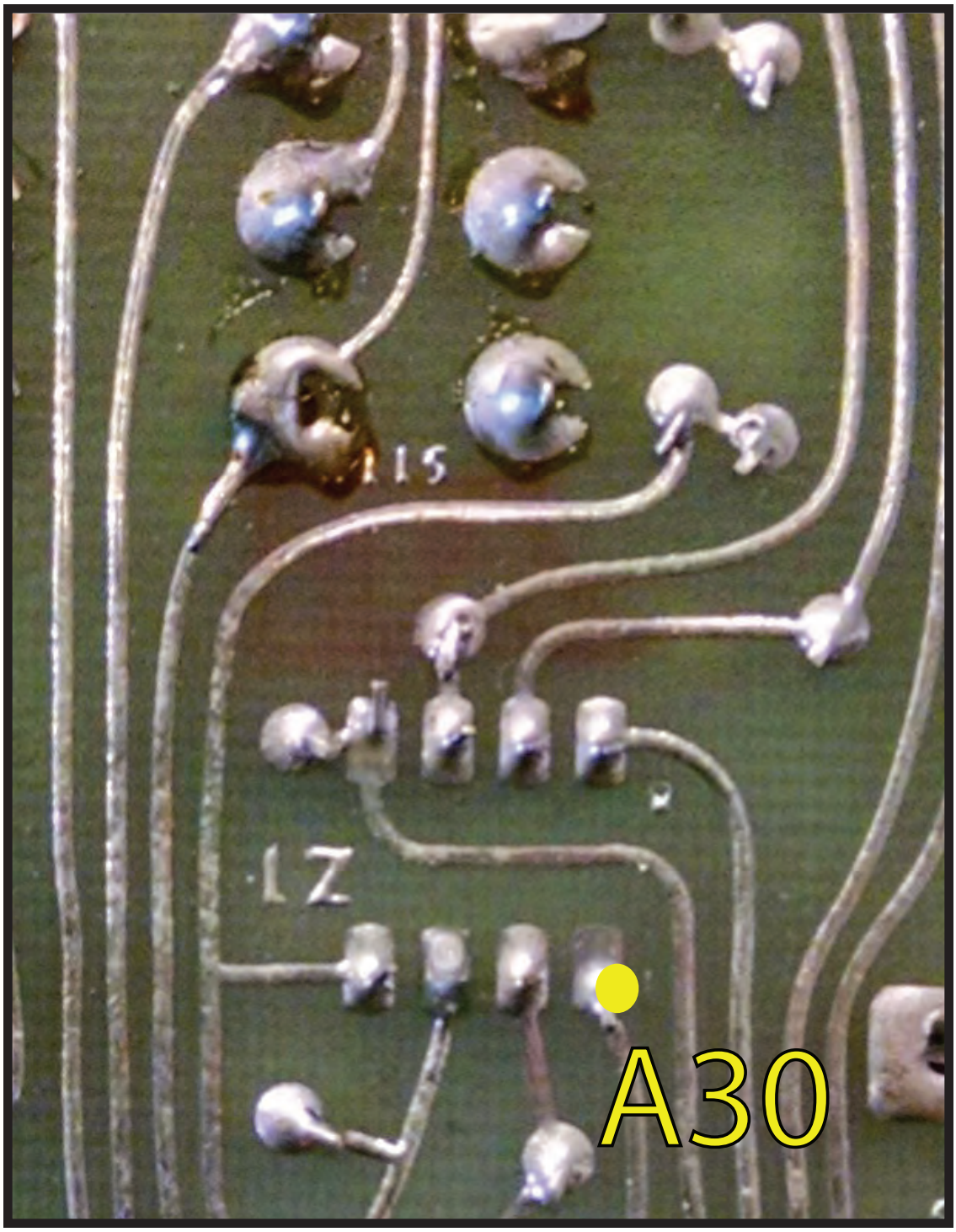


Figure 4.
Board B Top Right

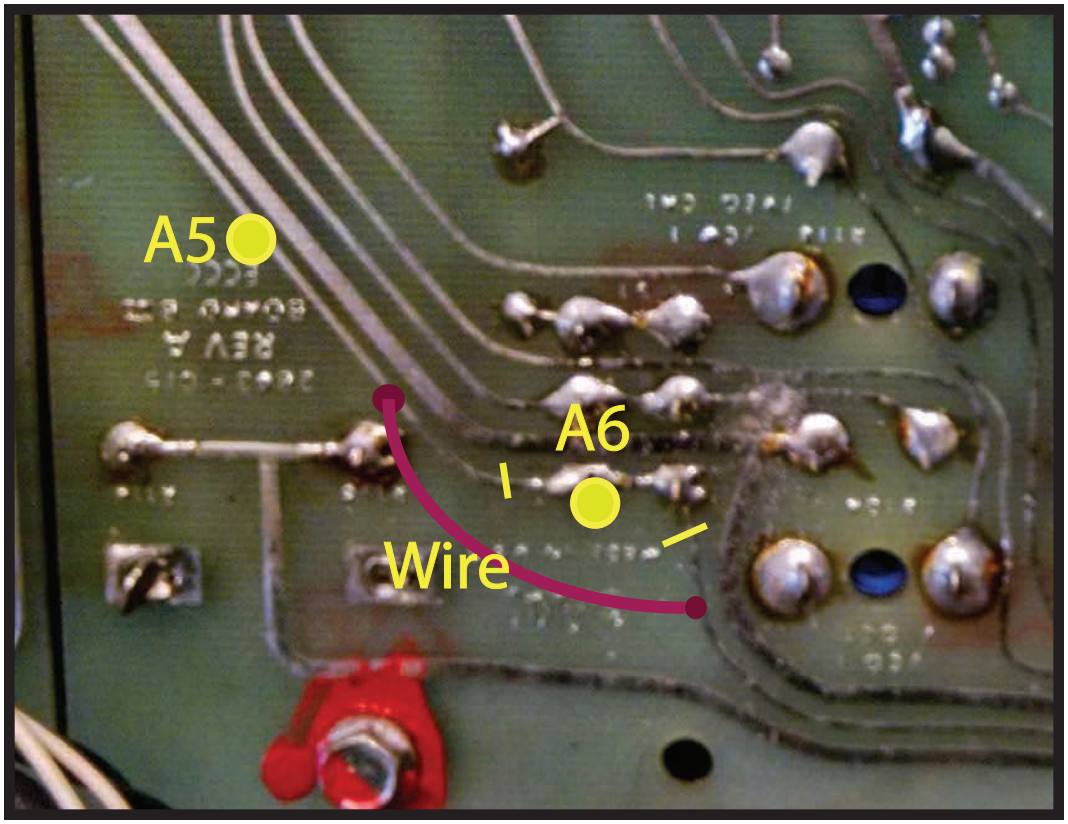


Figure 5.
Board B Bottom Left

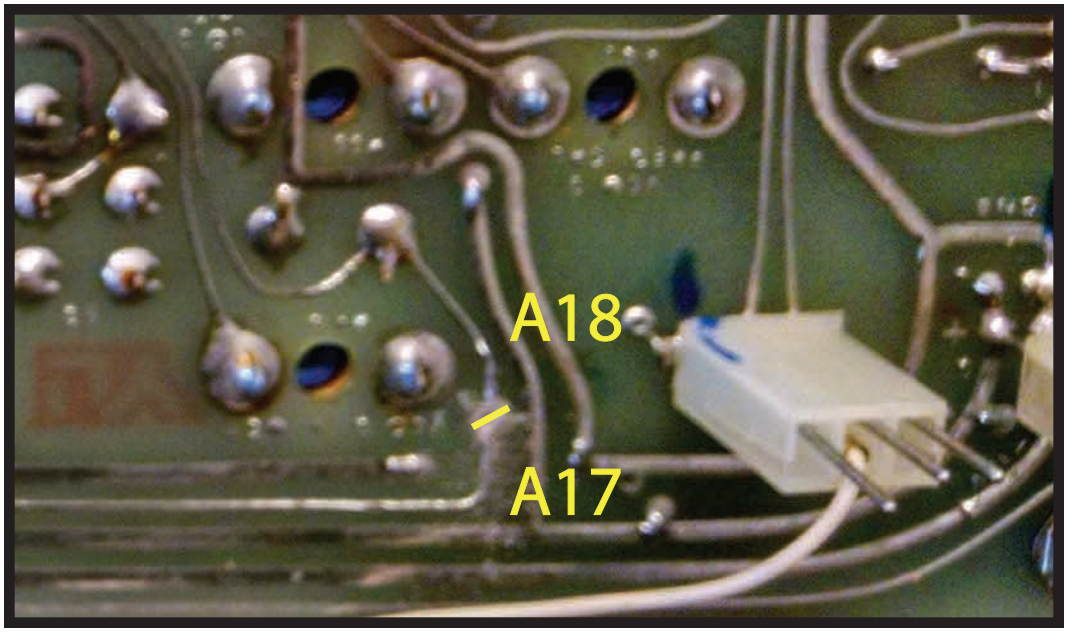


Figure 6.
Board B Bottom Center

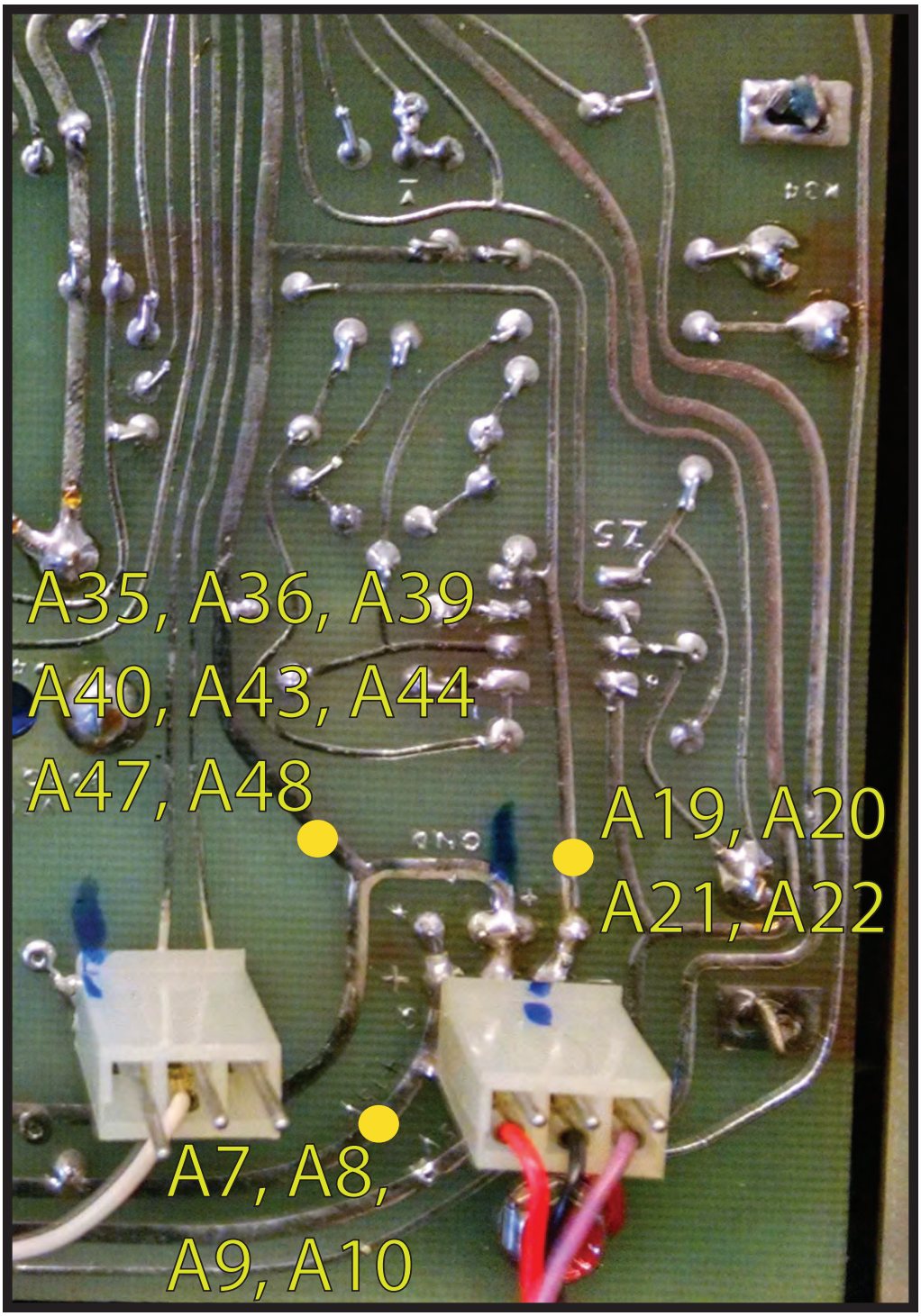


Figure 7.
Board B Bottom Right

Figure 8.
Board C Top Left

Figure 9.
Board C Top Center

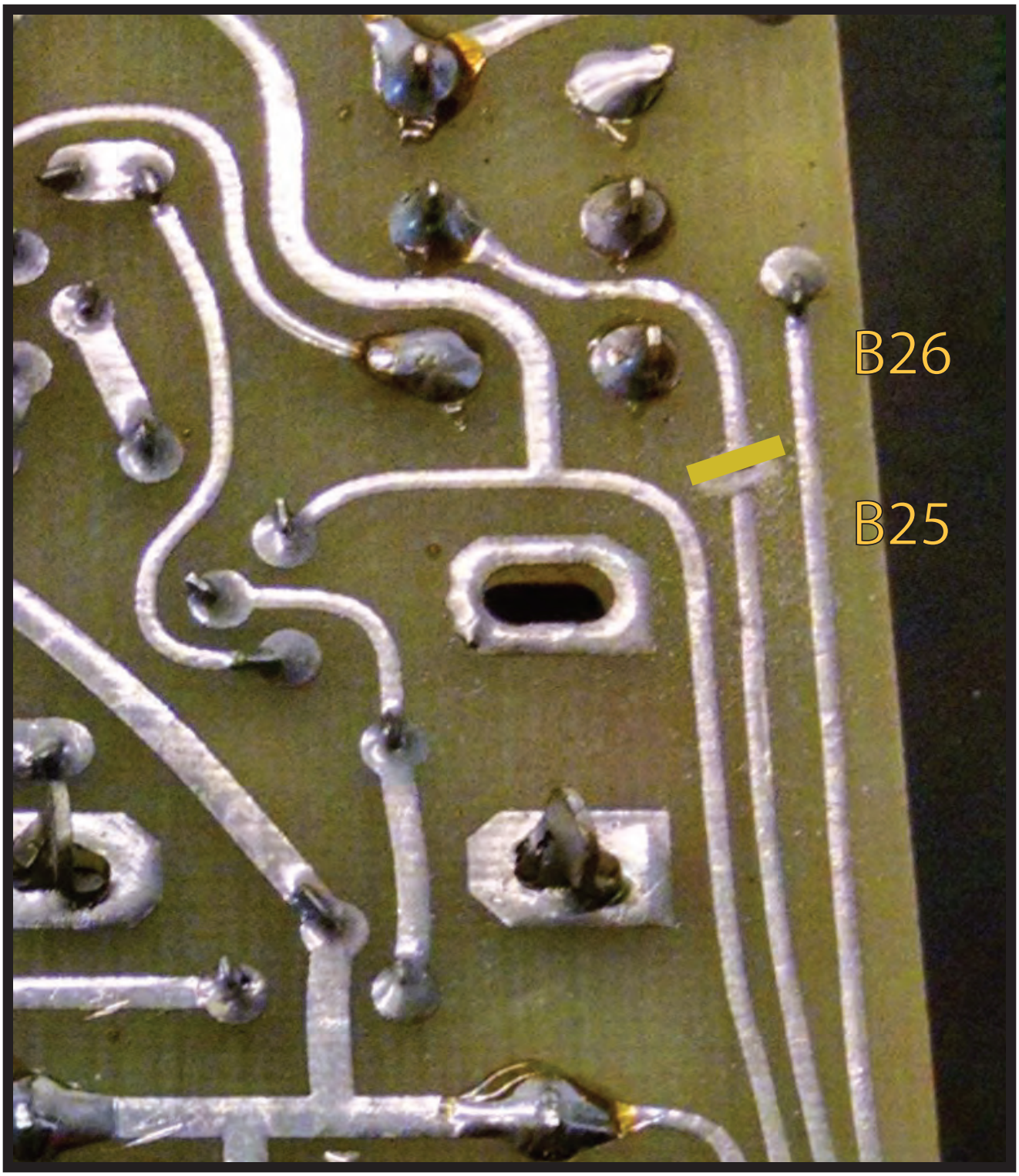


Figure 10.
Board C Top Right

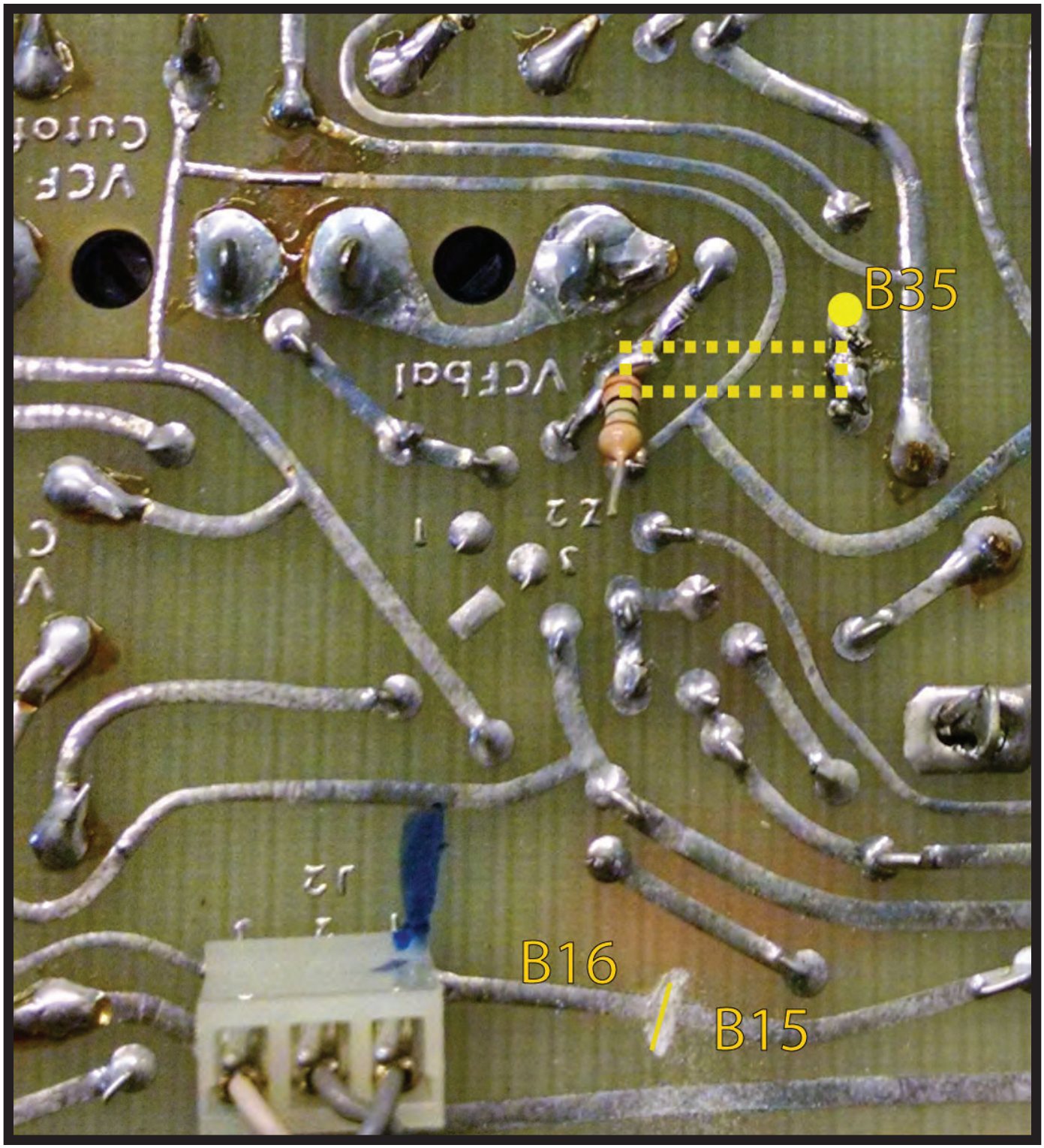


Figure 11
Board C Bottom Left

VCF CONNECTIONS

When connecting the VCF portion of the patch panel to the Avatar PCB, mote that a resistor must be removed, and two wires of the IDE cable must be connected and soldered together.

Figure 11 has a yellow dotted box to indicate that the 1M resistor in the pcb above must be removed. This can be done easily if you have a vacuum desoldering tool. We recommend removing the solder from the PCB side and then using a wire to gently poke the loose resistor from the mounting holes. Be sure to recover the old resistor so it isn't left in the chassis. If you have removed board C, you can simply clip the resistor out.

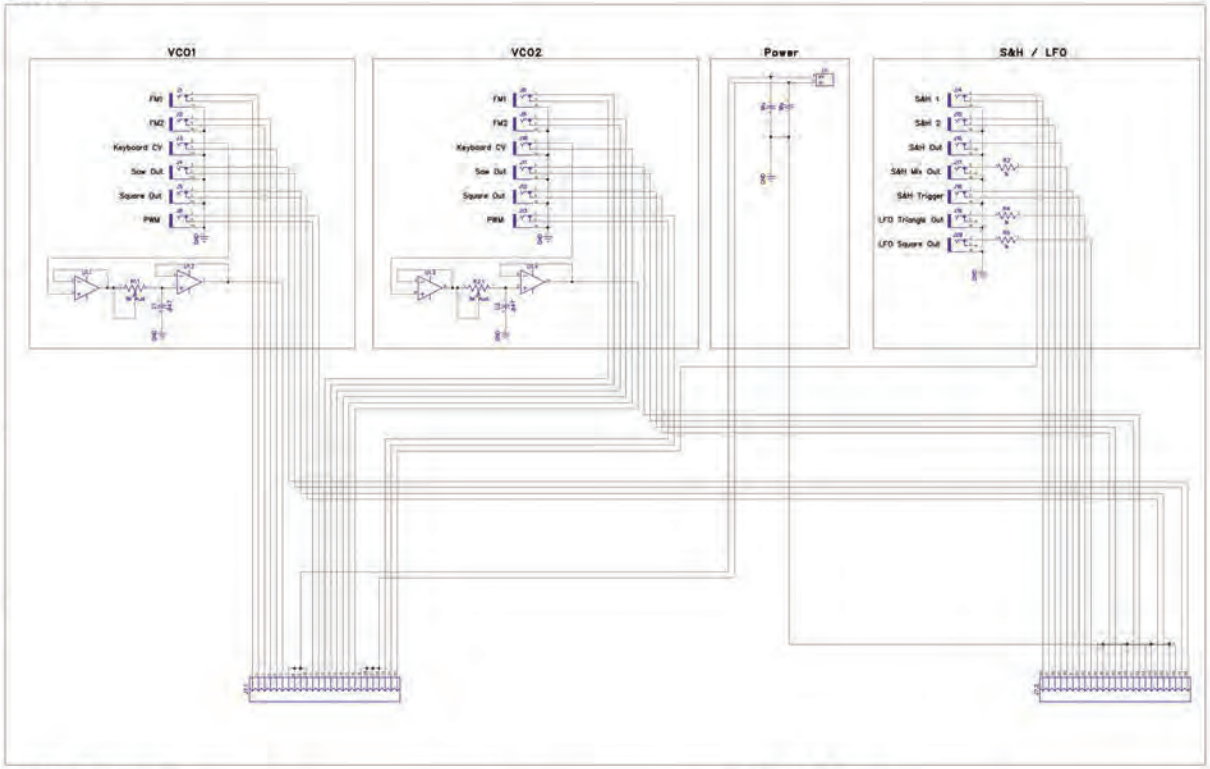
Once the resistor is removed, solder the 1M resistor to the PCB as shown in figure 11. Attach wire B31 to the other end of the resistor. Be sure to use some of the heat shrink tubing included in the kit to prevent exposed metal and shorts.
Now, connect B36 to B32. This can be done using the wires or simply by connecting those pins on the IDC header.

REASSEMBLY AND TESTING

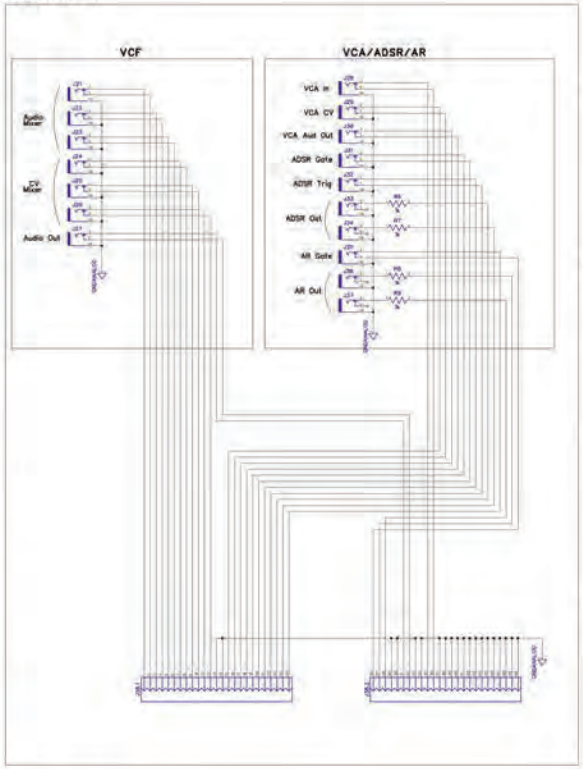
Be sure to test all of the functions on the patch panel and check your work before reassembling the avatar. Take care not to leave any metal shavings or loose debris in the case before closing. You're finished! Enjoy your newly expanded Avatar.

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

BOARD 1



BOARD 2



BOARD 1 Header

1	VCO1 FM1 Tab	22	V-	43	GND
2	VCO1 FM1 Tip	23	VCO2 PWM Tab	44	GND
3	VCO1 FM2 Tab	24	VCO2 PWM Tip	45	VCO1 Square Out Tab
4	VCO1 FM2 Tip	25	S&H1 Tip	46	VCO1 Square Out Tip
5	VCO1 Keyboard CV Tab	26	S&H1 Tab	47	GND
6	VCO1 Keyboard CV Tip -> Portamento	27	S&H2 Tip	48	GND
7	V+	28	S&H2 Tab	49	VCO1 Saw Out Tab
8	V+	29	S&H Out Tip	50	VCO1 Saw Out Tip
9	V+	30	S&H Mix Out Tip -> Resistor		
10	V+	31	S&H Trigger Tip		
11	VCO1 PWM Tab	32	S&H Trigger Tab		
12	VCO1 PWM TipVCO1 FM1 Tab	33	LFO Triangle Out Tip -> Resistor		
13	VCO2 FM1 Tab	34	LFO Square Out Tip -> Resistor		
14	VCO2 FM1 Tip	35	GND		
15	VCO2 FM2 Tab	36	GND		
16	VCO2 FM2 Tip	37	VCO2 Square Out Tab		
17	VCO2 Keyboard CV Tab	38	VCO2 Square Out Tip		
18	VCO2 Keyboard CV Tip -> Portamento	39	GND		
19	V-	40	GND		
20	V-	41	VCO2 Saw Out Tab		
21	V-	42	VCO2 Saw Out Tip		

BOARD 2 Header

1	VCF Audio Mixer Tip	22	ADSR Trig Tab	43	GND
2	VCF Audio Mixer Tab	23	ADSR Out -> Resistor	44	GND
3	VCF Audio Mixer Tip	24	ADSR Out -> Resistor	45	GND
4	VCF Audio Mixer Tab	25	AR Gate Tip	46	GND
5	VCF Audio Mixer Tip	26	AR Gate Tab	47	GND
6	VCF Audio Mixer Tab	27	AR Out Tip -> Resistor	48	GND
7	VCF CV Mixer Tip	28	AR Out Tip -> Resistor	49	GND
8	VCF CV Mixer Tab	29	GND	50	GND
9	VCF CV Mixer Tip	30	GND		
10	VCF CV Mixer Tab	31	VCA In Tip		
11	VCF CV Mixer Tip	32	VCA In Tab		
12	VCF CV Mixer Tab	33	GND		
13	GND	34	GND		
14	GND	35	VCF Out Tip		
15	VCA Audio Out Tip	36	VCF Out Tab		
16	VCA Audio Out Tab	37	GND		
17	VCA CV Tip	38	GND		
18	VCA CV Tab	39	GND		
19	ADSR Gate Tip	40	GND		
20	ADSR Gate Tab	41	GND		
21	ADSR Trig Tip	42	GND		

SIZE	FSCM NO.	DWG NO.	REV
SCALE		Sheet 1	