Programming (In The Modern Age)

The modern 208C Stored Program Sound Source module brings a variety of new opportunities to expand your vocabulary with the Music Easel instrument. While the 208C manual details these differences, it is worth briefly noting them here.

- Patch points to modulate attack, sustain, and decay
- Independent tini-jack audio from complex and modulation oscillators
- Gate 1 input to replace complex oscillator as gate 1 source
- White noise option for gate 2 input
- Audio rate FM input for modulation oscillator
- CV input for modulation oscillator, or modifiable for modulation of sequencer steps
- CV control of waveshape
- The "off-ext" switch position for pulser allows external pulses to drive the pulser through the CV jack

The new 218 Touch Activated Voltage Source has some additional patch points distinct from the original Music Easel and the 2013 reissue.

- The new Touch Strip outputs a control voltage and pulse
- The green Velocity output provides per-note velocity voltage
- The Arpeggiator's rate can be modified with CV, creating unlikely rhythms
- The Preset Voltage Source pads output a pulse, along with the knob voltage
- MIDI sync for Arpeggiator

While these new details are obviously not part of the original "Directive," they can easily be incorporated by following Allen Strange's encouragements to explore and, above all, be musical!

For example, modulations of the arpeggiator speed will no doubt excite the rhythmic sense, which can be augmented in performance by driving the pulser with independent taps of the touch strip!

Modulating the frequency of the modulation oscillator using the audio from the complex oscillator provides a new timbral landscape of feedback, controlled by the m.o.'s "f.m. in" knob. It's a simple connection that adds a variety of possibility.

Control voltage into the envelope's time parameters is a very attractive means to creating generated soundscapes. The envelope can vary over time while looping, creating constantly shifting changes in volume and timbre.

Engage and explore: The Easel is prepared to create new sounds and music!

Meta-Programming

(In The Modern Age)

The current Music Easels uses some slightly different resistor values than the original.

Conductance Level	Resistance	Color Code
10	120KΩ	Br.-Red-Ye.
9	133KΩ	Br.-Or.-Or.-Or.
8	150KΩ	Br.-Gr.-Ye.
7	174KΩ	Br.-Vi.-Ye.-Or.
6	200KΩ	Red-Bl.-Ye.
5	240KΩ	Red-Ye.-Ye.
4	300KΩ	Or.-Bl.-Ye.
3	390KΩ	Or.-Wh.-Ye.
2	560KΩ	Gr.-Blu.-Ye.
1.5	820KΩ	Gry.-Red-Ye.
1	1.2 MegΩ	Br.-Red-Gr.
0.5*	2.2 MegΩ	Red-Red-Gr.
0.25*	4.7 MegΩ	Ye.-Vi.-Gr.

*Values <1 are generally for adding to others.

The principles for wiring up a program card are the same as they were in 1974. We've added some additional images in the following pages that should make it easier to find the correct resistor values and understand how to make connections. With these additions, we hope to make the process of making the retro program cards more fun and accessible. Scan the QR codes on the following pages to download a printable version of the page.

Figure 22 illustrates the relationship between the switch settings on the 208C's controls, the resistor values required to match those controls, and where the resistors are placed on the Retro Program Card. In most cases, the value of the resistor sets the switch position. However, with the PULSER and ENVELOPE switches, the resistor serves to set the position and the mode.

Figure 23 translates a simple patch chart of slider values into resistors on the Program Card. Unlike patch cords on the 208C that provide a simple connection to a modulation amount slider, the resistors indicate both the presence of a patch cord connection and the amount slider when used on the Program Card. An additional resistor is used to describe the offset for a modulated parameter. For example, in the image, you can see the SEQUENCER voltage is used to modulate pitch only a small amount (an index of 0.5), but the COMPLEX OSCILLATOR pitch is offset with a conductance value of 3.

Figure 24 provides a visual guide of the band colors and their values to help you keep track of your resistors.

It is worth noting that for most modern 208 modules (2015 and later), the 5th step and 5th sequence voltage are always 0 on the Program Card, and the card should remain unpopulated with resistors in those locations.

The Worksheets provide tables and a patch connection matrix that help track your connections, switch, and slider positions to create an inventory of all the resistors needed for your Program.

download and print

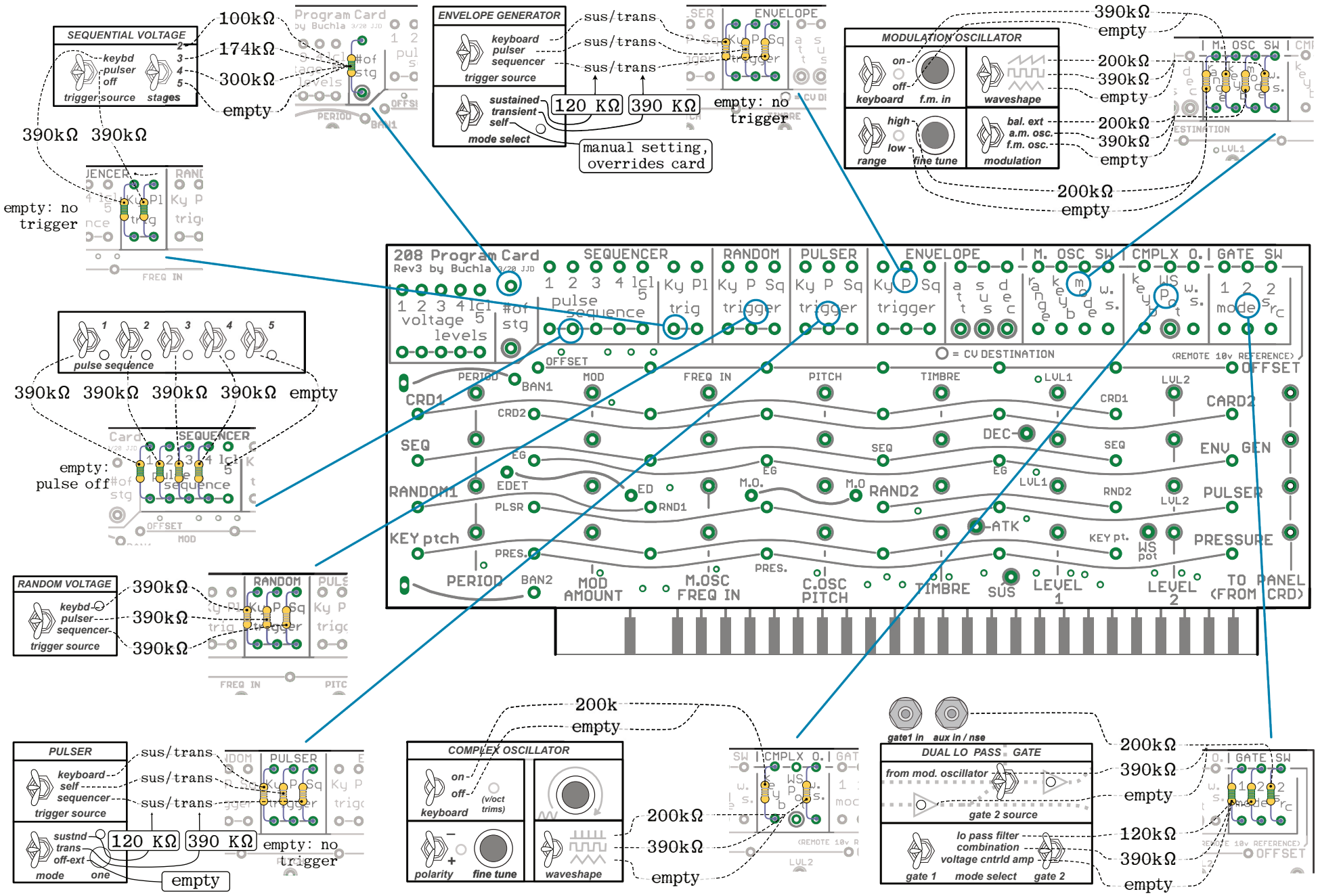


Figure 22

Switch positions and resistor values for the Retro Program Card.

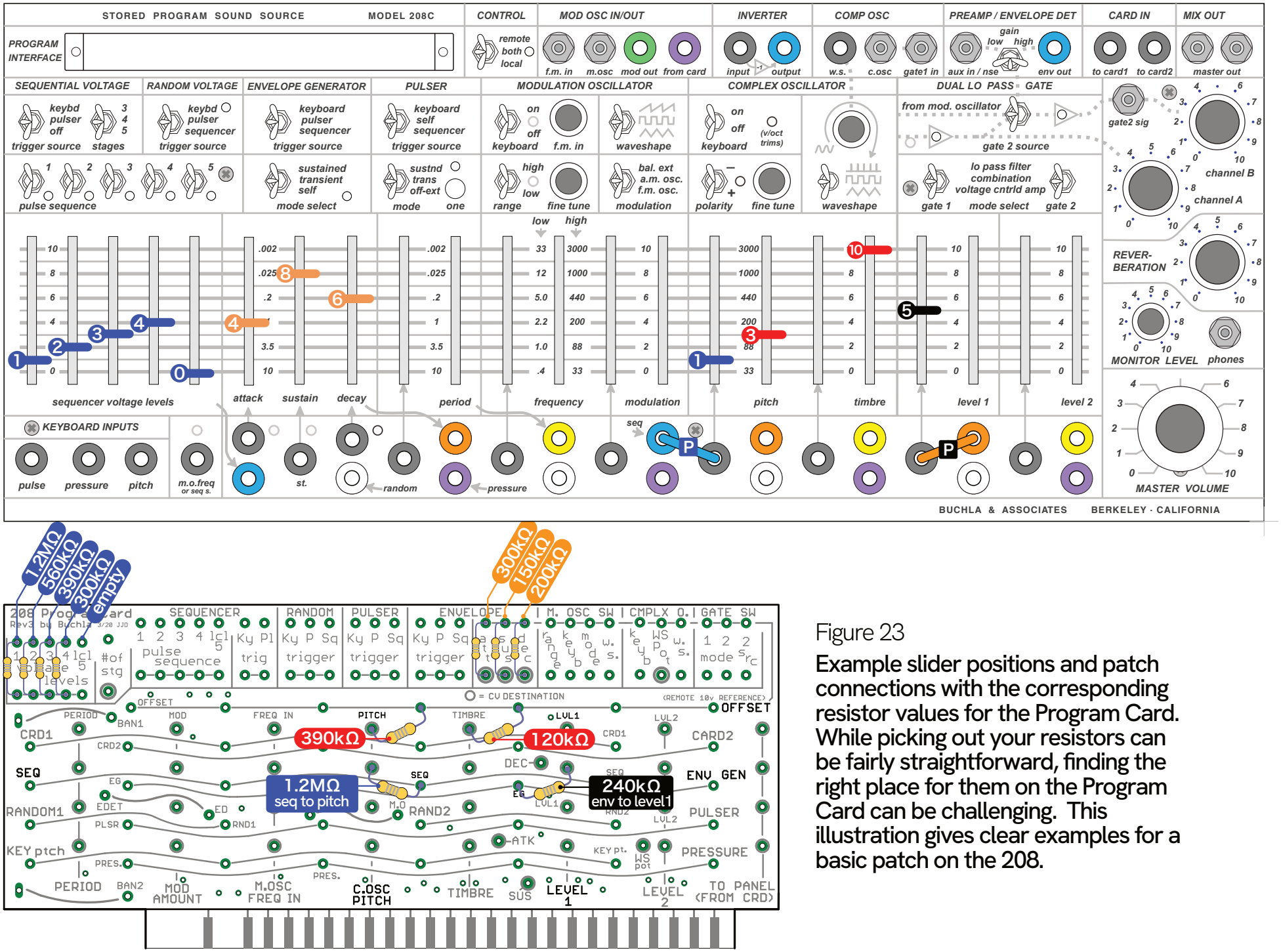


Figure 23

Example slider positions and patch connections with the corresponding resistor values for the Program Card. While picking out your resistors can be fairly straightforward, finding the right place for them on the 208. Card can be challenging. This illustration gives clear examples for a basic patch on the 208.

Switch Position Worksheet

Conductance & resistance			Pulse Seq.					Seq Trigger		Random Trigger			Pulser Trigger			Env Trigger			Modulation Oscillator				Complex Osc.		Gate Switches			
cndct	Ω	seq stgs	1	2	3	4	5	Ky	Pl	Ky	P	Sq	Ky	P	Sq	Ky	P	Sq	range	keyb	mode	wave-shape	keyb	wave-shape	Mode 1	Mode 2	Source 2	Ω
10	120k	2*											sus		sus	sus	sus	sus							lo pass	lo pass		120k
9	133k																											133k
8	150k																											150k
7	174k	3																										174k
6	200k																		high		b.ext	saw	on	spike			aux in	200k
5	240k																											240k
4	300k	4																										300k
3	390k		on	on	on	on		key	pulse	key	pulse	seq	tran	self	tran	tran	tran	tran		on	am	sq		sq	combo	combo	mod osc	390k
2	560k																											560k
1	1.2M																											1.2M
0	empty	5	off	off	off	off	off	none		none			none			none			low	off	fm	tri	off	tri	vca	vca	gate 1	empty

**Use 100k for 2 stages*

Common switch resistors:

Fader Position (Offset) Worksheet

		sequencer					env faders			pulser	mod osc		complex osc			lpg		
fader	Ω	1	2	3	4	5	a	s	d	period	freq	mod	pitch	timbre	waveshape	level 1	level 2	Ω
10	120k																	120k
9	133k																	133k
8	150k																	150k
7	174k																	174k
6	200k																	200k
5	240k																	240k
4	300k																	300k
3	390k																	390k
2	560k																	560k
1	1.2M																	1.2M
0	empty																	empty

Patch Connections Matrix

Fill in a CV amount to modulate a destination with a source. For example, if you have a patch cord connecting **sequence** to **level 2** with an amount of **5**, write "*5-240kΩ*" here.

destinations →

sources ↓

	seq	envelope			pulser	mod oscillator		complex oscillator			dual lo pass gate		from card
	# stages	attack	sustain	decay	period	freq	amount	pitch	timbre	waveshape	Level 1	Level 2	To panel
seq													
random 1													
random 2													
envelope generator													
pressure													
pulser													
keyboard pitch													
mod osc													
card 1													
card 2													
envelope detector													
banana 1													
banana 2													

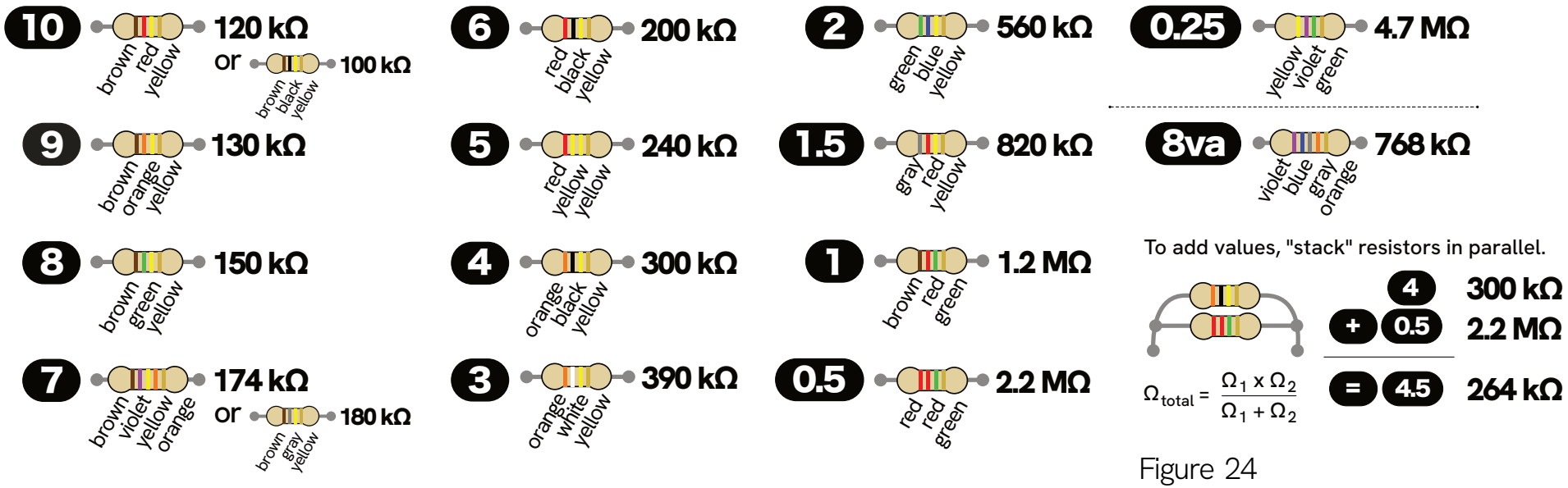
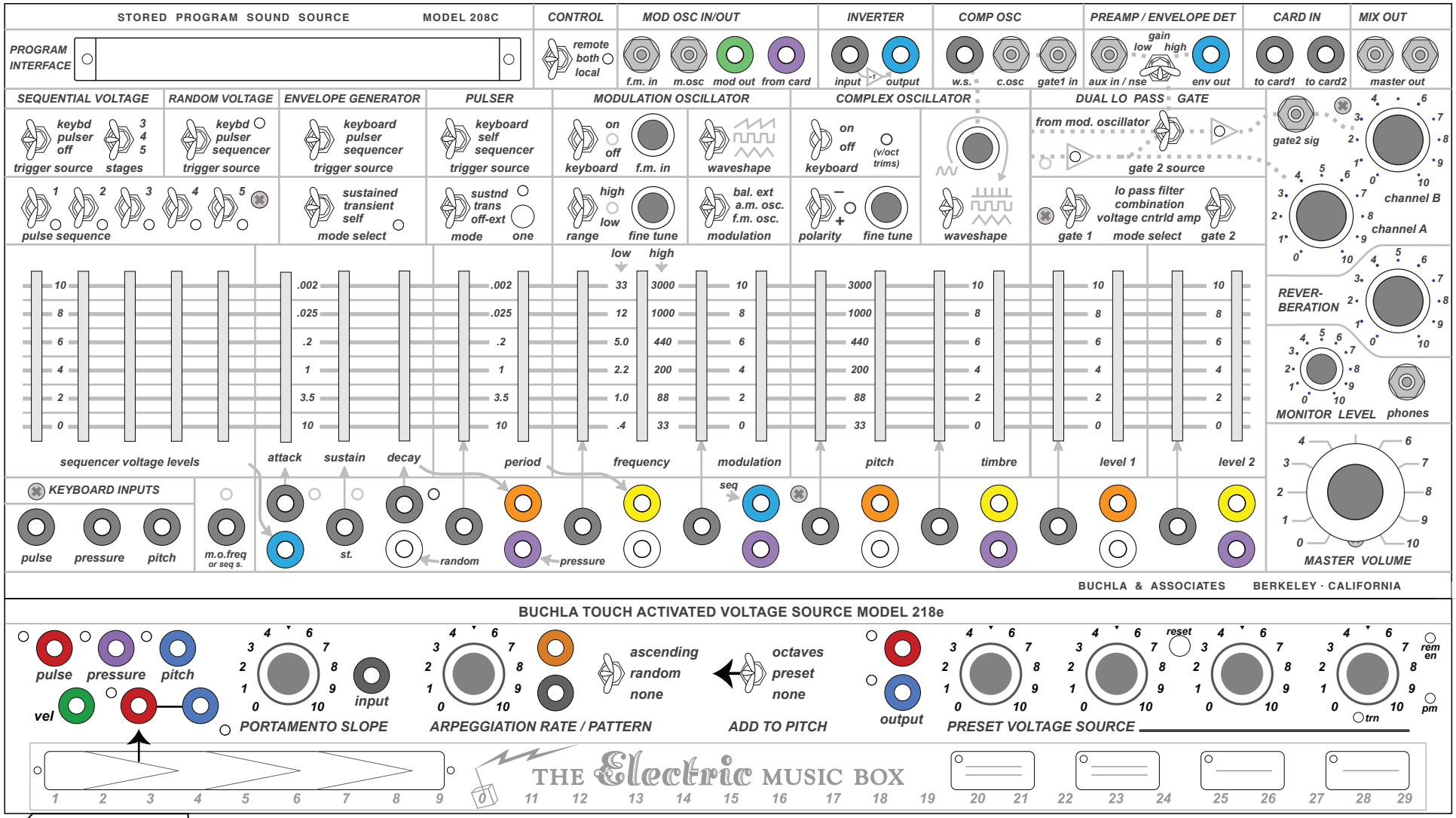
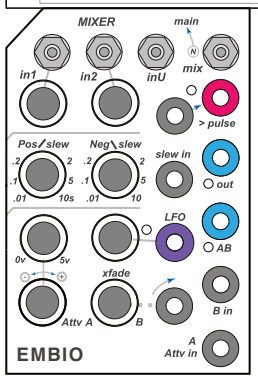


Figure 24
Conductance values and equivalent resistors.





Buchla Music Easel Patch Chart

Patch Name:

Author:

Date:

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