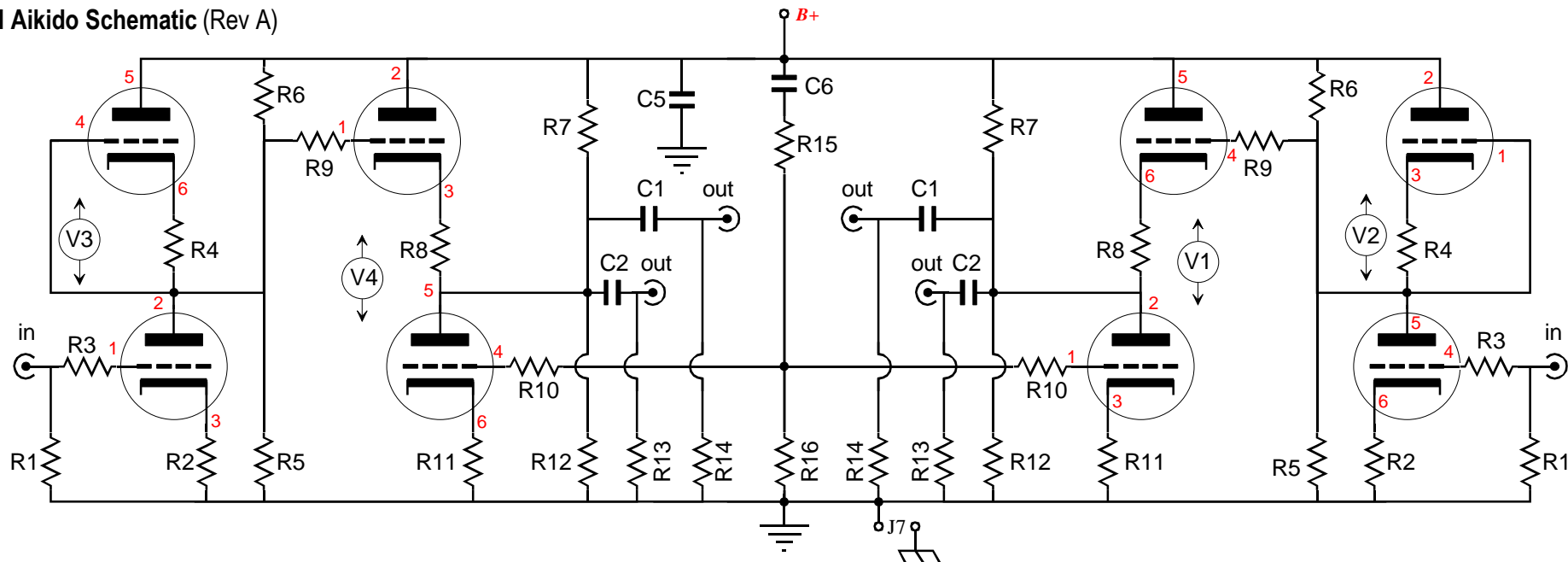


Octal Aikido Schematic (Rev A)



Part Values

R1, R6, R5, R7, R12, R13, R14 = 1M
 R3, R9, R10 = 100 - 470 ohm*
 R2, R4 = 200 - 2k (depends on tube)*
 R8, R11 = 100 - 1k (depends on tube)*
 $R15 = R16 \times (\mu - 2) / (\mu + 2)$ eg 82k for 6SN7
 R16 = 100k

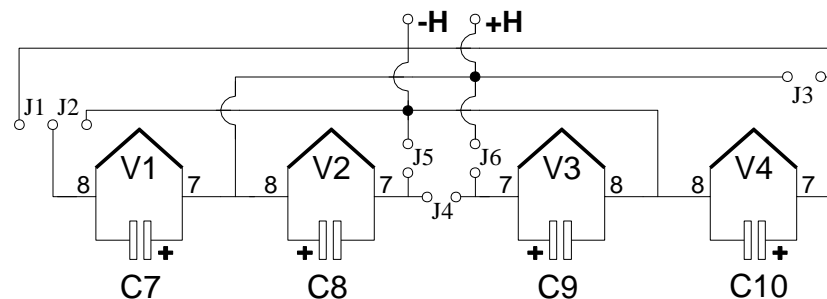
*High-quality resistors

All resistors 1/2W or higher

C1 = 0.1 - 4 μ F (voltage rating must exceed B+ voltage)
 C2 = 0.1 - 4 μ F (voltage rating must exceed B+ voltage)
 C5 = 1 - 10 μ F (voltage rating must exceed B+ voltage)
 C6 = 0.1 μ F (voltage rating must exceed B+ voltage)
 C7, C8, C9, C10 = 10-100 μ F (Use only with DC power supply; heater-shunting capacitors, from pins 7 to 8; voltage rating must exceed heater power-supply voltage)
 (inputs) V2, V3 = 6SL7, 6SN7, 12SL7, 12SN7, 12SX7, 5691, 5692, B65, ECC32, ECC33

(outputs) V1, V4 = 6AS7, 6BL7, 6BX7, 6SN7, 8SN7, 12SN7, 12SX7, 5692, 6080, B65, ECC32, ECC33

Filament Jumper Wire Schedule



With a 6.3V heater PS

Use J2, J3, J5, and J6 only.

All tubes must be 6.3V heater types, such as 6BL7, 6SN7.

With a 12.6V heater PS

Output Tubes V1 and V4:

If tubes are 6.3V, use J1 only.
If tubes are 12.6V, use J2 and J3 only.

Input Tubes V2 and V3:

If tubes are 6.3V, use J4 only.
If tubes are 12.6V, use J5 and J6 only.

Tube	mu	Rp Ohms	Rk Ohms	Ik (mA)	B+ Volts	R15 Ohms	R16 Ohms	Input Gain	Input Gain dBs	Output Gain	Output in dBs	Zo Ohms
6AS7	2.23	234	55	100.0	100	5437	100k	1.1	0.9	0.60	-4.47	95
6AS7	2.0	310	205	75.0	150	0	100k	1.0	0.0	0.61	-4.28	220
6AS7	1.87	441	530	50.0	200	0	100k	0.9	-0.6	0.61	-4.24	456
6BL7	14.80	3140	196	10.0	150	76190	100k	7.4	17.3	0.91	-0.83	343
6BL7	15.40	2470	94	20.0	200	77011	100k	7.7	17.7	0.91	-0.86	219
6BL7	15.40	2540	165	20.0	250	77011	100k	7.7	17.7	0.91	-0.79	283
6BL7	15.90	2200	114	30.0	300	77654	100k	7.9	18.0	0.91	-0.79	219
6BX7	8.96	1760	267	10.0	100	63504	100k	4.5	13.0	0.87	-1.24	370
6BX7	9.44	1420	182	20.0	150	65035	100k	4.7	13.5	0.87	-1.21	273
6BX7	9.80	1270	158	30.0	200	66102	100k	4.9	13.8	0.87	-1.16	239
6BX7	10.10	1170	147	40.0	250	66942	100k	5.0	14.0	0.88	-1.13	220
6BX7	9.52	1730	542	20.0	300	65278	100k	4.7	13.5	0.89	-1.04	565
6SL7	70.00	43000	1000	1.3	300	94444	100k	31.4	29.9	0.98	-0.17	1174
6SN7	20.50	10200	583	3.0	150	82222	100k	10.0	20.0	0.93	-0.59	827
6SN7	21.10	8960	397	5.0	200	82684	100k	10.4	20.3	0.93	-0.59	657
6SN7	21.00	9250	626	5.0	250	82609	100k	10.3	20.2	0.94	-0.56	820
6SN7	21.90	7530	243	10.0	300	83264	100k	10.8	20.7	0.93	-0.60	489
6SN7	21.10	9000	680	5.8	300	82684	100k	10.3	20.3	0.94	-0.54	846
6SN7	21.40	8360	470	7.2	300	82906	100k	10.5	20.4	0.94	-0.56	685
6SN7	20.80	9840	1000	4.5	300	82456	100k	10.1	20.1	0.94	-0.53	1063
12SL7	See 6SL7											
12SN7	See 6SN7											
12SX7*	21.20	8750	218	5.0	80	82759	100k	10.5	20.4	0.93	-0.64	519
5691	See 6SL7											
5692	See 6SN7											
6080	See 6AS7											
6082	See 6AS7											
B65	See 6SN7											
ECC32	See 6SN7											
ECC33	35.00	9700				89189	100k	17.3	24.8	0.95	-0.48	248

*12SX7 can also use 6SN7's data.

The table above lists many triodes suitable for the octal-based Aikido amplifier PCB. The table lists the same tube under different B+ voltages and with different cathode resistor values. Two gains are listed: the first is the gain the tube realizes in the input position in the Aikido; the second is the gain of the same tube in the output stage. To calculate the final gain multiply the two voltage gains together (or add the gain in dBs together). For example, given an Aikido line amplifier with a B+ voltage of 300V, and a 6SN7 input tube with cathode resistors of 680, and a 6BX7 output tube with cathode resistors of 542 ohms, the final voltage gain equals 10.3 from the 6SN7 against the 0.89 gain of the 6BX7, with a product of 9.17. or, working with dBs instead, 20.3dB plus -1.04dB, for a total of 19.26dB. (Aren't decibels great?)

If you have additional data, send it in and I'll add to the list.