

General Notes:

-Resistor, capacitor, and transistor value are divided into two groups on the PCB, with each group corresponding to a separate schematic sheet. Values from schematic sheet 1 have conventional labels (R1, C1, Q1, etc.), while values from schematic sheet 2 have an added "B" (RB1, CB1, QB1, etc.).

Resistors - Schematic Sheet 1 (1/4 watt, +/- 5%)

Value	Reference	Total	Description	Mouser # (or option)
220R	R59, R69, R89	3		660-MF1/4LCT52R221J
1K	RX1	1		660-MF1/4LCT52R102J
1K5	R51	1		660-MF1/4LCT52R152J
2K2	R15, R33, R49, R88	4		660-MF1/4LCT52R222J
3K3	R2, R4, R20, R22, R36, R38, R52, R53, R65, R66, R71, R73, R84	13		660-MF1/4LCT52R332J
3K57	R61, R62	2		603-MFR-25FRF523K57
3K9	R13, R31, R47, R82	4		279-RR01J3K9TB
4K7	R9, R27, R43, R78	4		660-MF1/4LCT52R472J
6K8	R7, R25, R41, R76, R87	5		660-MF1/4LCT52R682J
10K	R90	1		660-MF1/4LCT52R103J
15K	R5, R6, R10, R11, R16, R23, R24, R28, R29, R34, R39, R40, R44, R45, R50, R57, R58, R60, R63, R64, R67, R68, R74, R75, R79, R80, R85, R86	28		71-CCF0715K0JKE36
33K	R77, RX2	2		71-CCF0733K0JKE36
68K	R26, R42	2		279-RR02J68KTB
100K	R8, R12, R30, R46, R81	5		660-MF1/4LCT52R104J
150K	R17, R18, R56	3		594-SFR16S0001503JA5
22M	R1, R19, R35, R70	4		594-VR2522M5%
1K	R3, R21, R37, R54, R55, R72	6	3296 trimmer	652-3296W-1-102LF
5K	R14, R32, R48, R83	4	3296 trimmer	652-3296W-1-502LF
A50K	R91, R92	2	potentiometer	https://www.taydaelectronics.com/b10k-ohm-linear-taper-potentiometer-round-shaft-pc-mount-l.html
B10K	R93	1	potentiometer	https://www.taydaelectronics.com/b10k-ohm-linear-taper-potentiometer-round-shaft-pc-mount-l.html

Resistors - Schematic Sheet 2 (1/4 watt, +/- 5%)

Value	Reference	Total	Description	Mouser # (or option)
2R2	RB88	1	1/2 watt	660-CF1/2CT52R2R2J
150R	RB42, RB87	2		660-MF1/4LCT52R151J
220R	RB51, RB61, RB85	3		660-MF1/4LCT52R221J
1K	RB58	1		660-MF1/4LCT52R102J
1K5	RB14, RB22, RB30, RB41, RB43	5		660-MF1/4LCT52R152J
3K3	RB7, RB9, RB15, RB17, RB23, RB25, RB31, RB33, RB44, RB45, RB56, RB57, RB75, RB84	14		660-MF1/4LCT52R332J
3K57	RB53, RB62	2		603-MFR-25FRF523K57
4K7	RB65	1		660-MF1/4LCT52R472J
6K8	RB4, RB5, RB13, RB21, RB29, RB37, RB38	7		660-MF1/4LCT52R682J
10K	RB11, RB19, RB27, RB35, RB63, RB86	6		660-MF1/4LCT52R103J
15K	RB12, RB20, RB28, RB36, RB40, RB49, RB50, RB52, RB54, RB55, RB59, RB60	12		71-CCF0715K0JKE36
33K	RB39, RB70, RB79, RB89	4		71-CCF0733K0JKE36
68K	RB69, RB71, RB74, RB76, RB80, RB83	6		279-RR02J68KTB
100K	RB66, RB72, RB77, RB81	4		660-MF1/4LCT52R104J
150K	RB2, RB48, RB67, RB73, RB78, RB82	6		594-SFR16S0001503JA5
220K	RB1, RB64	2		279-RR01J220KTB
470K	RB3	1		71-CCF07470KJKE36
10M	RB68	1		603-CFR-25JT-52-10M
22M	RB10, RB18, RB26, RB34	4		594-VR2522M5%
1K	RB8, RB16, RB24, RB32, RB46, RB47	6	3296 trimmer	652-3296W-1-102LF
A50K	RB90	1	potentiometer	https://www.taydaelectronics.com/b10k-ohm-linear-taper-potentiometer-round-shaft-pc-mount-l.html
B10K	RB93, RB94, RB95	3	potentiometer	https://www.taydaelectronics.com/b10k-ohm-linear-taper-potentiometer-round-shaft-pc-mount-l.html

Capacitors - Schematic Sheet 1

Value	Reference	Total	Description	Mouser # (or option)
220pf	C2, C5, C7, C12	4		505-FKP2O102201D00JO
470pf	C1, C4, C6, C11	4		505-FKP2G004701D00KS
1nf	C8, C10, C17, C18, C19, C20	6		80-R82EC1100SH50J
1uf	C3, C9, C13, C16, C21, C22	6		581-TAP105K025CRS
100uf	C14, C15	2		80-ESC107M035AE3AA

Capacitors - Schematic Sheet 2

Value	Reference	Total	Description	Mouser # (or option)
100pf	CB3, CB5, CB7, CB9	4		505-FKP2D001001D00JO
1nf	CB11, CB14	2		80-R82EC1100SH50J
4.7nf	CB2, CB4, CB6, CB8	4		80-R82MC1470AA50K
1uf	CB1, CB13	2		581-TAP105K025CRS
15uf	CB10, CB12	2		581-TAP156K016SCS
2000uf	CB16	1		667-ECA-1HM222E

Transistors - Schematic Sheet 1

It is wise to socket the J175 transistors.

References in parentheses [()] are matched pairs.

Value	Reference	Total	Description	Mouser # (or option)
2N3904	(Q1-A, Q1-B), (Q7-A, Q7-B), (Q13-A, Q13-B), (Q27-A, Q27-B), Q3, Q4, Q5, Q9, Q10, Q11, Q15, Q16, Q17, Q19, Q20, Q22, Q23, Q24, Q29, Q30, Q31, Q33	26		610-2N3904
2N3906	Q6, Q12, Q18, Q21, Q25, Q26, Q32	7		610-2N3906
J175	Q2, Q8, Q14, Q28	4		512-J175D26Z

Transistors - Schematic Sheet 2

It is wise to socket the J175 transistors.

References in parentheses [()] are matched pairs.

Value	Reference	Total	Description	Mouser # (or option)
2N3904	(QB2-A, QB2-B), (QB5-A, QB5-B), (QB8-A, QB8-B), (QB11-A, QB11-B), QB1, QB4, QB7, QB10, QB13, QB14, QB15, QB16, QB17, QB19, QB20, QB21, QB24, QB25, QB26, QB28, QB29	25		610-2N3904
2N3906	QB2, QB18, QB22, QB23, QB30	5		610-2N3906
J175	QB3, QB6, QB9, QB12	4		512-J175D26Z

Miscellaneous

	Total	Description	Mouser # (or option)
Banana jacks (black)	4	Ext. CV inputs	530-108-0903-1
Switchcraft Tini Jax	12	Audio inputs, Audio outputs	502-41
SPDT ON-NONE-ON	4	Ext. / Int. CV	633-M201203
Rotary Switch	1		706-71B30-02-4-02N
Lamps	2		645-6123132130F
Standoffs	4	14mm, M3	855-R30-3011402
Pointer knob	1		5164-2300BT
Small Davies knobs	3		5164-1610AA
Large Davies knobs	4		5164-1600BM
EDAC power connector	1	<i>optional</i>	587-306-50-010

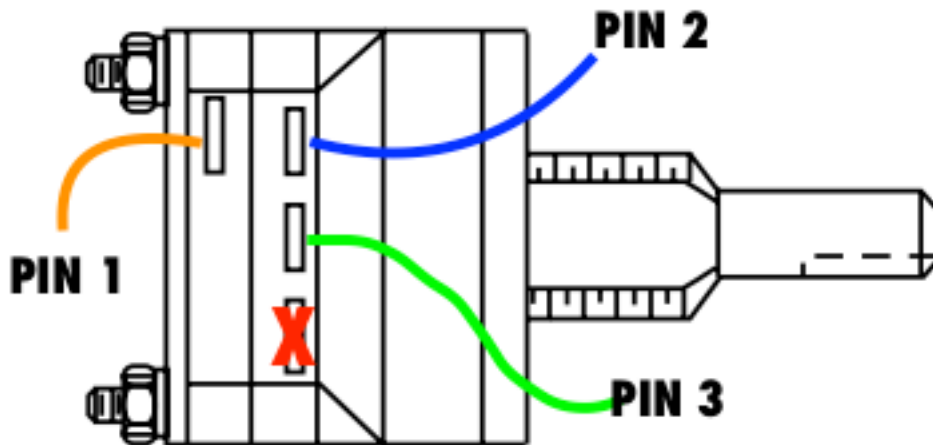
Mouser Cart

**NB: potentiometers, screws, EDAC power connector are not included in the Mouser Cart.*

**Some items may be backordered.*

<https://www.mouser.com/ProjectManager/ProjectDetail.aspx?AccessID=ff33126f2d>

Rotary Switch Wiring



Eg:

A1-1: Pin 1

A1-2: Pin 2

A1-3: Pin 3

The Grayhill rotary included in the BOM is a 2-deck, 4-pole, 2-position switch, for a total of 8 individual 2 position switches. On the pcb, individual switches are numbered in decks (i.e. A1 through A4, B1 through B4). All 8 switches are independent, except for the shared control knob.

The opening in the PCB through which the switch body passes does not allow much room for untidy wiring. It is advisable that you solder the leads for the eyelets located closest to the front panel prior to installing the switch in its mounting hole, keeping the leads as tight to the switch body as possible. A dry fit to assure proper clearance will likely be necessary.

Calibration

LP section: *This section is unlikely to produce sound before calibration. This is normal.*

Each pole is adjusted individually. This is done in chronological order. The following resistor/trimmer pairings each correspond to a pole in the LP section:

- R12/R14: pole 1
- R30/R32: pole 2
- R46/R48: pole 3
- R81/R83: pole 4

The same adjustments are made in each pole section. They are:

1. Using an oscilloscope, probe the side of R12(R30, etc.) marked on the diagram below.
2. Turn R14 CCW (lowering DC offset) until waveform appears. Continue lowering until it disappears. Then, slowly raise DC offset (turning CW) until waveform regains maximum amplitude without further raising DC offset.

R54: sets the "range" of the LP section. Adjust it so that the filter closes completely at your VCO's lowest frequency.

R55: adjust the "span" of the LP section. It affects the "range" and may prevent the filter from closing fully if it is set too far CW. I found that R55 fully CCW sounded best.

HP Section: *This section is likely to produce sound before calibration.*

Set RB8, RB16, RB24, RB32 to roughly their midway point. I did not find that these trimmers had much impact on the filter's behaviour, though.

RB46: sets the "range" of the HP section. Adjust it so that the filter closes completely at your VCO's highest frequency.

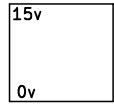
RB47: sets the "span" of the HP section. It affects the "range" and may prevent the filter from closing fully if it is set too far CW. I found that RB47 almost fully CCW sounded best.

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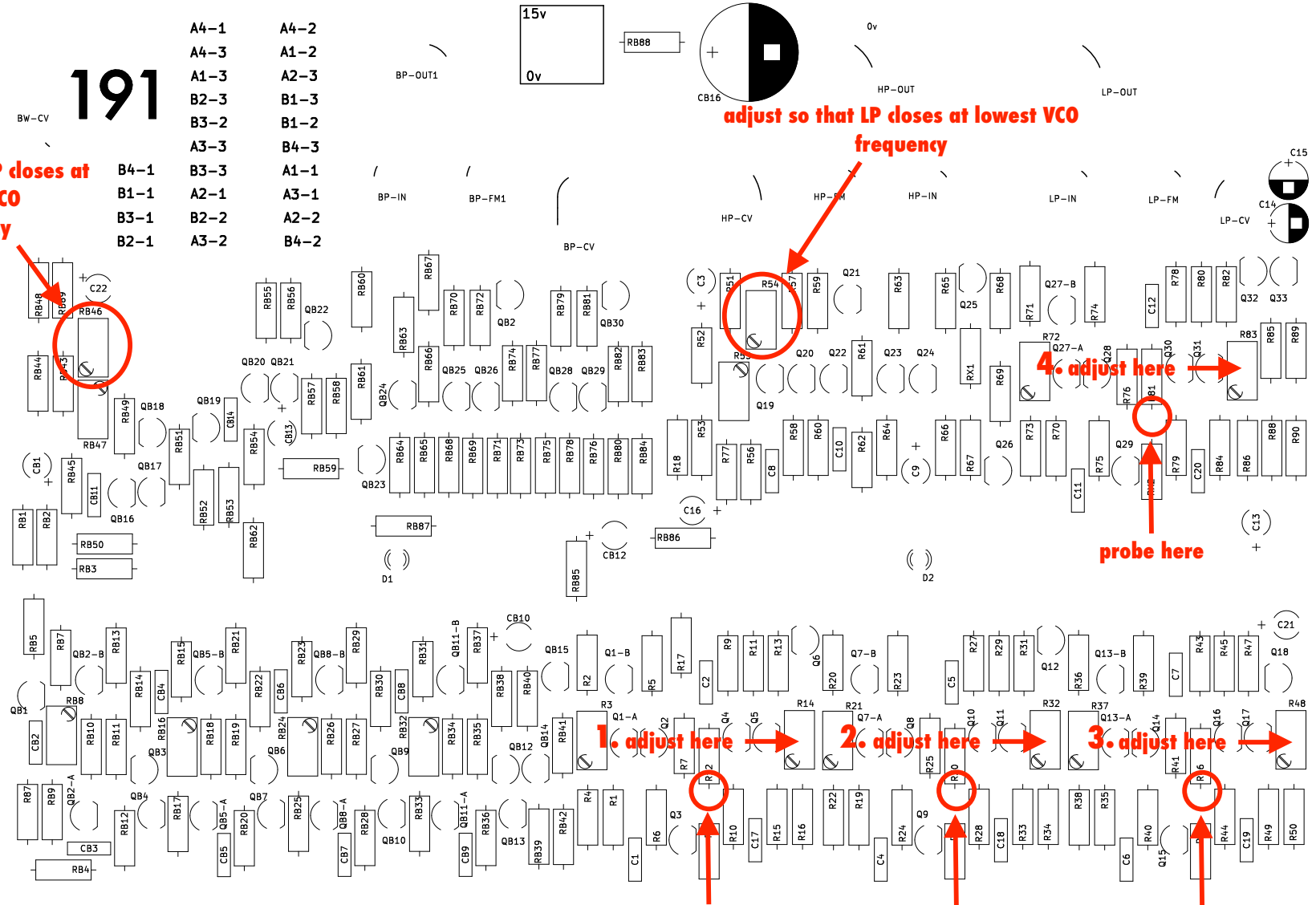
BW-CV

adjust so that HP closes at highest VCO frequency

- | | |
|------|------|
| A4-1 | A4-2 |
| A4-3 | A1-2 |
| A1-3 | A2-3 |
| B2-3 | B1-3 |
| B3-2 | B1-2 |
| A3-3 | B4-3 |
| B4-1 | B3-3 |
| B1-1 | A2-1 |
| B3-1 | B2-2 |
| B2-1 | A3-2 |
| | A1-1 |
| | A3-1 |
| | A2-2 |
| | B4-2 |



adjust so that LP closes at lowest VCO frequency



PCB BY LA 67

1. adjust here

2. adjust here

3. adjust here

4. adjust here

probe here

probe here

probe here

probe here

