

LOW-GAIN ELECTRONICS, INC.

DUB MATRIX CONTROL PANEL PCB

QTY	DESIGNATOR	VALUE	FOOTPRINT	DESCRIPTION	VENDER
10	SPDT SWITCH	SPTD MINIATURE (PIN OR LUG)	*SEE NOTES	E-Switch	Mouser: 612-100SP1T1B2M1QE
30	Potentiometer	B100K 9MM Snap-In	**SEE NOTES	Modular Addict	B100K 9mm Potentiometer
10	3.5MM Jack	16PJ301M-12	16PJ301M-12	Modular Addict	16PJ301M-12 3.5mm Jack
25	Resistor	10K 1% Metal Film 1/4W 100ppm	RES400	Yageo	Mouser: 603-MFR-25FRF5210K
4	Stand-Off	M3x11mm Hex Stand-Off			McMasterCarr: 95947A509
8	Machine Screw	Button Head Screw	M3x11mm	(100pc/\$2.76)	McMasterCarr: 92005A116
8	Split Washer	Split Washer	M3	(100pc/\$2.44)	McMasterCarr: 92153A416
2	I_EXP, O_EXP	Shroud Boxed Header 10P	2x5		Tayda: A-2939
1	Header	2X40 PIN 2.54MM Double Row Pin Header Strip Male	2x8 (cut to size)		Tayda: A-198
16	Jumper	2.54 Termination Jumper	Optional for passive operation		Tayda: A-1324
5	Medium Knob	Medium MXR 19MM Style Knob	***See Notes	Modular Addict	Medium MXR 19MM Style Knob
25	Small knob	Davies 1900 Style Knob (black)	***See Notes	Modular Addict	Davies 1900 Style Knob (black)

Control Panel Build Notes:

*Switches: Pin Mount or Lug Miniature Style Toggles, avoid toggles with elevated based around Bushing, Install without nut or washer behind panel
 **Pots: Use which ever panel mounted shaft you prefer (Round, T 18 or D-Shaft) based on the knobs you'd like to use.
 Install with flat washer behind the panel.
 ***Knobs: Builders Choice here, I've simply referenced what I prefer for knobs. Just keep in mind if you use a D-Shaft pot, keeps it's orientation in mind.

1: Install Resistors on top side of pcb
 2. Cut the 2x40 Pin header down to two 2x8 pieces and solder on rear side of pcb
 3. Install 2x5 10P shroud boxed headers on rear side of pcb. *Square Pad = Pin 1 = Arrow on header*
 4. Install the four M3x11mm hex stand-offs onto rear side of pcb using four M3x6mm Screws and four M3 Split Washers
 5. When assembling the front panel, **DO NOT SOLDER PANEL MOUNTED PARTS** until they've been mounted to the panel first. Install the panel mounted parts last, place panel on parts to use as a Jig to install nuts. Once mounted, solder panel mounted parts to pcb, This can be a little tricky at first, please take your time, it's not a race, the idea is to get all the panel mounted parts at the same height against the Panel.
 Control Panel should now be complete.
 Passive Operation: It is possible to run the Dub Matrix passively. Simply run Termination Jumpers across (HORIZONTALLY) both 2x8 headers.

DUB MATRIX BUFFER PCB

QTY	DESIGNATOR	VALUE	FOOTPRINT	DESCRIPTION	VENDER
2	C1-C2	10uF@50V Aluminum Electrolytic	CAPPR-2.54/5.08		
10	C3-C12	100nF @ 50V CERAMIC X7R	CAP_1206	Vishay	Mouser: 77-VJ1206Y104JXAAT
10	C13-C22	33pF @ 50V C0G *SEE NOTES	CAP_1206	Vishay	Mouser: 77-VJ1206A330JFAAT
2	J1-J2	HDR-2x8 2.54MM Double Row Header Female	HDR-2x8		Tayda: A-1686
1	J3	IDC10M 2x5 2.54MM Double Row Right Angle Header Male	IDC2X5M		Tayda: A-2943
1	J4	Optional for MU format operation	DNP		
2	R1-R2	10R 1% Metal Film 1/4W 100ppm (10 Ohm)	RES400	Yageo	Mouser: MFR-25FRF52-10R
5	R3, R7, R9, R11, R13	332R 1% Metal Film 1/4W 100ppm (332 Ohm, 330 Ohm)	RES_1206	Vishay	Mouser: 71-CRCW1206332RFKEAC
5	R4, R8, R10, R12, R14	10K 1% Metal Film 1/4W 100ppm	RES_1206	Vishay	Mouser: 71-CRCW120610K0FKEAC
5	R6, R16, R18, R20, R22	100K 1% Metal Film 1/4W 100ppm	RES_1206	Vishay	Mouser: 71-CRCW1206100KFKEAC
5	R5, R15, R17, R19, R21	200K 1% Metal Film 1/4W 100ppm **SEE NOTES	RES_1206	Vishay	Mouser: 71-CRCW1206200KFKEAC
2	U1-U2	TL074	SOIC-14/150mil		Mouser: 595-TL074CD
2	U3-U4	TL071	SOIC-8/150mil		Mouser: 595-TL071CDR

Buffer PCB Build Notes:

*33pF Caps are located in the feedback of the op-amps and are optional if you experience oscillation, they can be omitted if you don't want to use them
 **R5, R15, R17, R19, R21 set the gain of the input buffers, For unity Gain, use 100K, 2x Gain: use 200K, etc. 200K provides unity gain at 12 o'clock and soft clipping fully clockwise

1: Install IC's
 2. Install SMD Resistor/Capacitors: you can use 0805 in place of 1206 parts to make it really easy
 3. Install Thru Hole Resistors, Ferrite Beads may also be used in place of 10R
 4. Install the two 2x8 headers, and 2x5 right angle power header and two 10uF Electrolytic Capacitors, I sometimes mount the pcb down on the Control Panel PCB to act as an alignment jig for the headers.

Congrats! You've completed your DubMatrix assembly! You can now mount the Buffer PCB to the Control Panel PCB using the last of the hardware to secure it in place. The power header is sandwiched between the pcb's to keep the Dub Matrix as low profile as it can be. Enjoy!