

# DIGISOUND 80-24

## 8 NOTE POLYPHONIC KEYBOARD CONTROLLER.

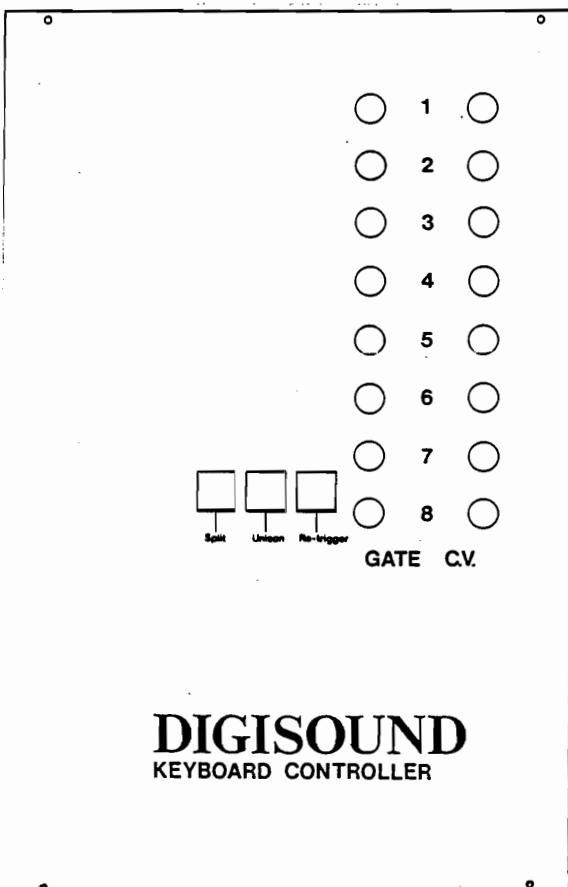
### 1. INTRODUCTION.

The Digisound 80-24 unit is an 8 note polyphonic keyboard controller with separate CV and Gate outputs. It has a split keyboard facility with a fully variable split point and last note priority, together with a note allocation system that prevents erratic VCO swapping. The design incorporates a 16 note buffer to stop 'overflow' notes being lost.

The unit can be used with anything from 1 to 8 voices and the controller automatically detects which outputs are being used. There is also an 8 note Unison mode to aid tuning of the VCOs, and also to create rich sounds with all VCOs being played monophonically. In addition the unit has a switchable staccato / legato re-triggering function.

A +5V power supply is required for the controller at about 350 mA. Most of the components fit onto the main PCB, leaving just 16 3.5mm jack sockets to fit onto the two small connector PCBs which connect to the larger board. Therefore the only external wiring needed is two wires for the power supply, and a 16 way ribbon cable for connection to the keyboard.

The 80-24 Controller operates directly from the standard Digisound 80-15 keyboard set up using the keyboard PCBs and either GJ or GB gold contacts, so this polyphonic controller can replace the 80-15 D1, D2, D3 and E monophonic units used before, without any modification of the keyboard itself.



### 2. CONSTRUCTION.

The printed circuit board has a component overlay silk screened onto it to aid assembly. First of all, insert the track pins from side A of the board at the positions marked with a plain circle on the overlay, and solder both sides. Then insert all the diodes (not LEDs yet) and resistors; solder and crop. Please note that all the components are on side A of the board. Insert and solder IC sockets and all the capacitors ensuring the right polarity of the electrolytic ones. Special care should also be taken with R35-42 and C24-30 so that there is enough clearance for the jack sockets which mount on two separate PCBs; The capacitors will have to be bent over at 90 degrees for this, prior to soldering. Then, insert the push button switches making sure they are square to the PCB.

Prepare the two jack socket strips by soldering 8 jack sockets onto each and then solder a length of tinned copper wire into each of the vacant holes on the jack socket strips, crop on the soldered side and bend the free ends down sharply. Locate the wires from the socket strips onto the main PCB so that the strips are fully home, solder and crop the wires.

#### 4. POLY KEYBOARD OPERATION.

The two 8 pin single line connectors must be fitted to the 'row' and 'column' inputs on the PCB, or ribbon cable soldered directly to the board depending on your preferred method of fixture to the keyboard unit being used.

The LEDs should be fitted just prior to installing the front panel. D9-19 must all be inserted in their correct positions on the PCB. The panel can then be temporarily placed over the PCB with a few jack socket nuts securing it. The whole assembly should then be inverted, ensuring that all LEDs drop neatly into their respective front panel holes. Solder and crop the LEDs. The panel can then be removed ready for PCB inspection and calibration.

Check the assembly thoroughly and insert the ICs into their sockets and check orientation of all polarised components (i.e. electrolytic capacitors, diodes, LEDs, and ICs). Take anti-static precautions as many of the devices are static sensitive.

#### 3. CALIBRATION.

To calibrate the unit, set unison mode and measure the voltage on the CV outputs with an accurate voltmeter (they should all give identical readings). Press the bottom C key and check that the output voltage is within 20mV of 0V. Press the C key 3 octaves up from bottom C, and adjust the preset (VR1) for 3.00V.

The bottom note on the keyboard produces 0v, above which the scaling is 1v/octave. The Gate signal is 0v (untriggered) to +5v (triggered).

As soon as power is applied all LEDs will turn on for a short while, then all off. This action automatically resets the microprocessor and its associated circuitry so that the unit is ready for use.

The controller detects which outputs are in use by sensing if plugs are present in the Gate sockets. Output 1 is always assumed to be in use.

Notes are allocated to the outputs which are in use in ascending order.

If more keys are pressed than there are sockets in use, the pitch of the last key is fed to the right most output in use, replacing the pitch which is currently being output. If RETRIGGER is on, then the gate signal to that output is turned off for a fraction of a second to re-trigger the envelope shaper.

When a key is pressed, if that pitch has been output in the recent past, then it will be routed to the same output, even if lower order sockets are free. This prevents notes swapping to different VCOs when, for instance, the same chord is played repeatedly.

When the SPLIT function is turned on, the SPLIT LED will flash until a key is struck. This key will then be used as the split point. This key and all those above it will be routed to outputs 5-8 whereas the keys below it will be allocated to outputs 1-4. For the split function to operate usefully, at least one of the high order outputs (5-8) should be in use.

The UNISON function causes the keyboard to operate in monophonic mode where all the outputs follow the same single pitch, and all the gates operate together. SPLIT and UNISON may not be used simultaneously, and pressing either will turn the other off.

## 5. COMPONENTS.

### Resistors - 1/4W 5%

R1	1M	x1
R2	1K2	x1
R3	4K7	x1
R4-19	10K	x16
R20-29, 34, 43	330R	x12
R30	56K	x1
R31, 33	27K	x2
R32	6K8	x1
R35-42	82R	x8
VR1	10K Horiz Preset	x1

### Capacitors

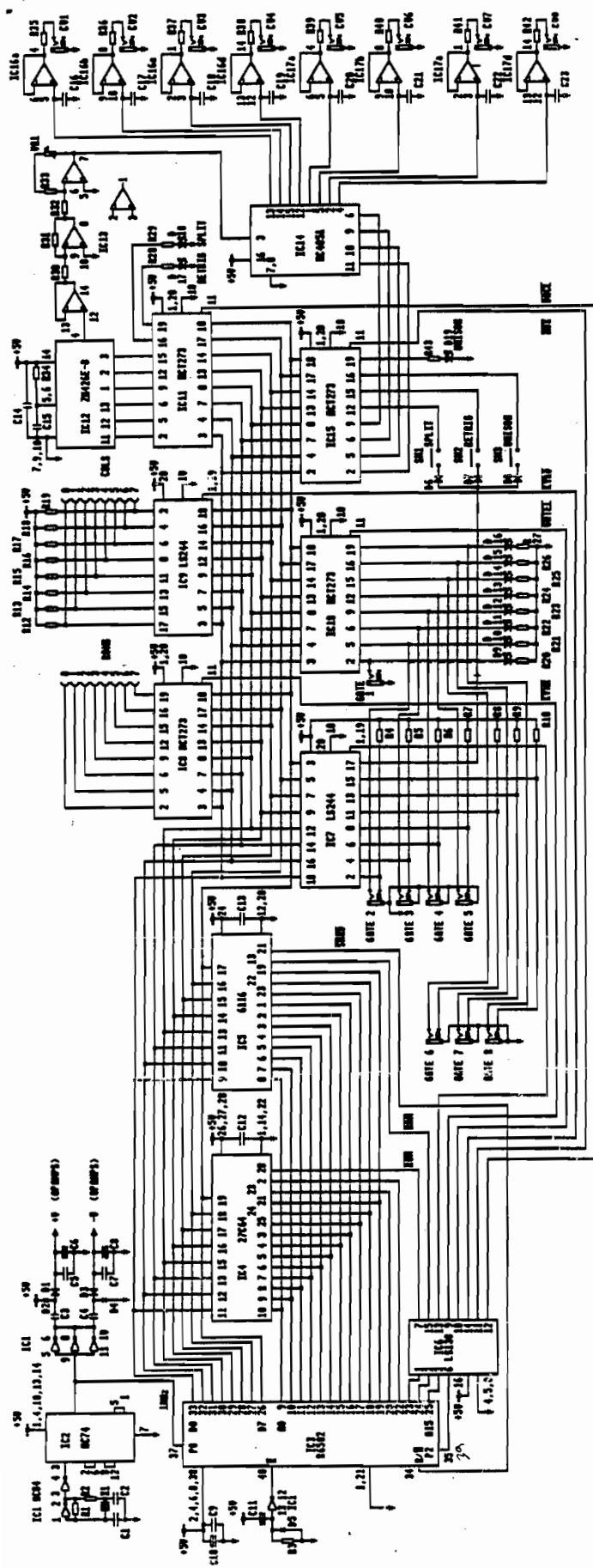
C1, 2	33pf Ceramic	x2
C3-5, 7, 9, 12-15	100nf Ceramic	x9
C6, 8, 10, 11	47uf 16v PCB Elect.	x4
C16-31	22nf Polyester	x16

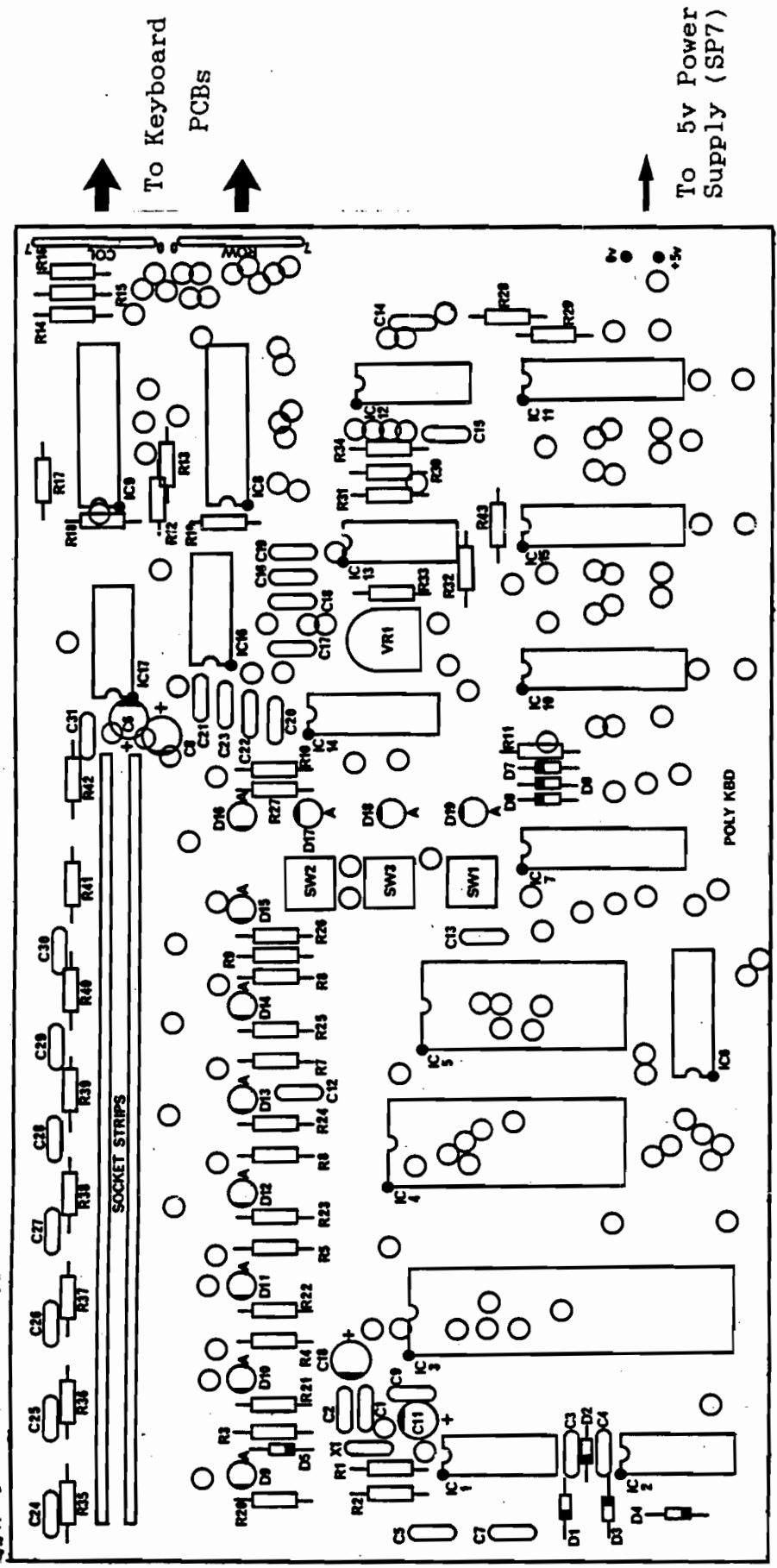
### Semiconductors

X1	4MHz Crystal	x1
D1-8	1N4148	x8
D9-16	Red 3mm LED	x8
D17-19	Green 3mm LED	x3
IC1	74HC04	x1
IC2	74HC74	x1
IC3	R6502 Processor	x1
IC4	27C64 Prog. EPROM	x1
IC5	6116 RAM	x1
IC6	74LS138	x1
IC7, 9	74LS244	x2
IC8, 10, 11, 15	74HCT273	x4
IC12	ZN426E-8	x1
IC14	74HC4051	x1
IC13, 16, 17	TL064	x3

### Miscellaneous

Track pins	x143
14 Way IC Socket	x6
16 Way IC Socket	x2
20 Way IC Socket	x6
24 Way IC Socket	x1
28 Way IC Socket	x1
40 Way IC Socket	x1
Push button Switch	x3
Switch Cap	x3
3.5mm PCB Jack Socket + Nuts	x16
Main PCB	x1
Socket PCB	x2
10 Way PCB Connector	x2
9" x 6" Front Panel	x1

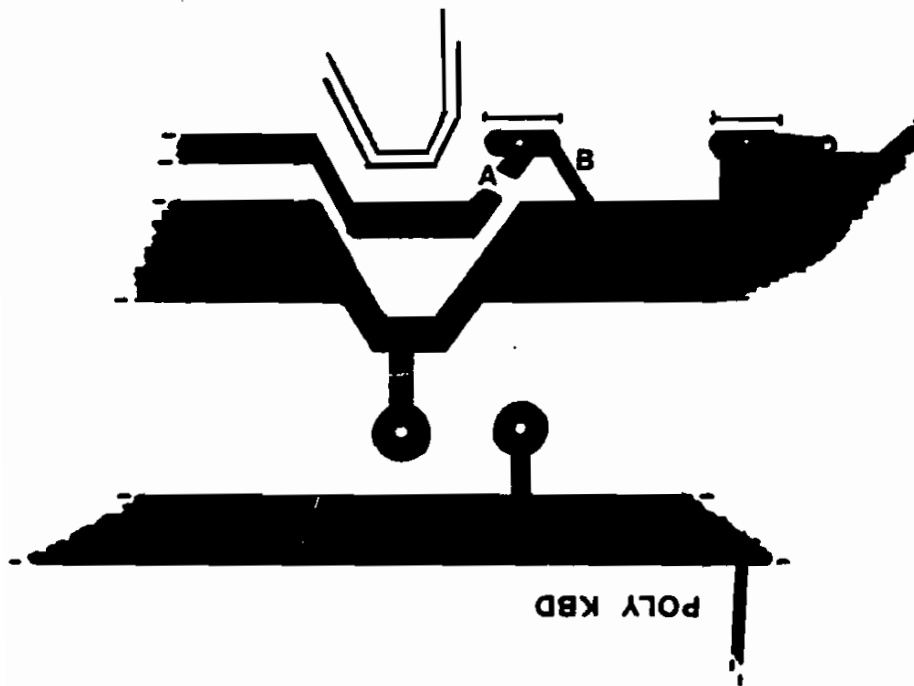




↑ To Keyboard PCBs

↑ To 5v Power Supply (SP7)

## Important PCB Modification.



Please make the following modification on the PCB track leading to pin 1 of IC 4 on the underneath of the board:

**Cut the track at 'A'**

and

**Make a fresh link at 'B'**

according to the above diagram.