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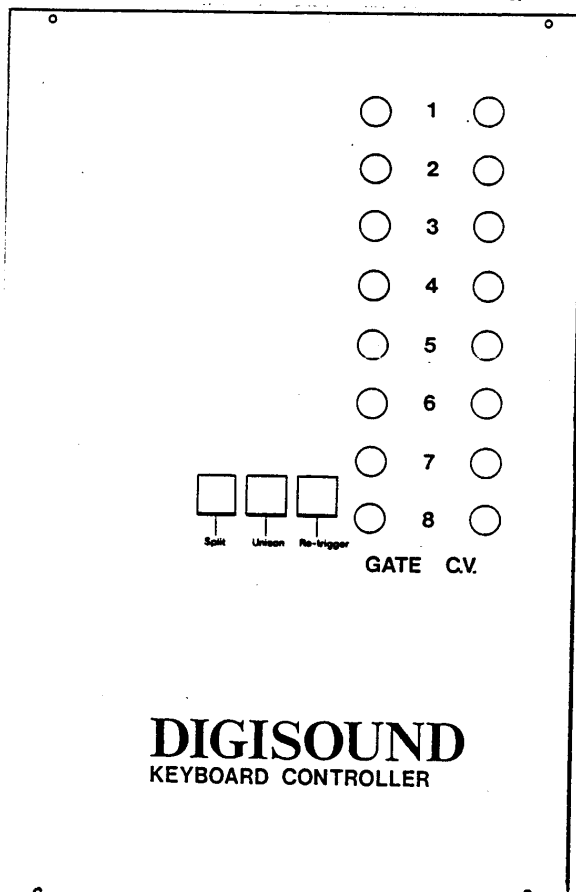
A +5V power supply is required for the controller at about 350 mA. Most of the components fit onto the main PCB, leaving just 16 3.5mm jack sockets to fit onto the two small connector PCBs which connect to the larger board. Therefore the only external wiring needed is two wires for the power supply,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

1 ○
2 ○
3 ○
4 ○
5 ○
6 ○
7 ○
8 ○

Split   Unison   Re-trigger

GATE C.V.

DIGISOUND
KEYBOARD CONTROLLER

The two 8 pin single line connectors
m⁄ be fitted to the 'row' and
'c_lumn' 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.

Ch⌐ck the assembly thoroughly and
1 . 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.

4. POLY KEYBOARD OPERATION.

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)

POLY KBD

SOCKET STRIPS
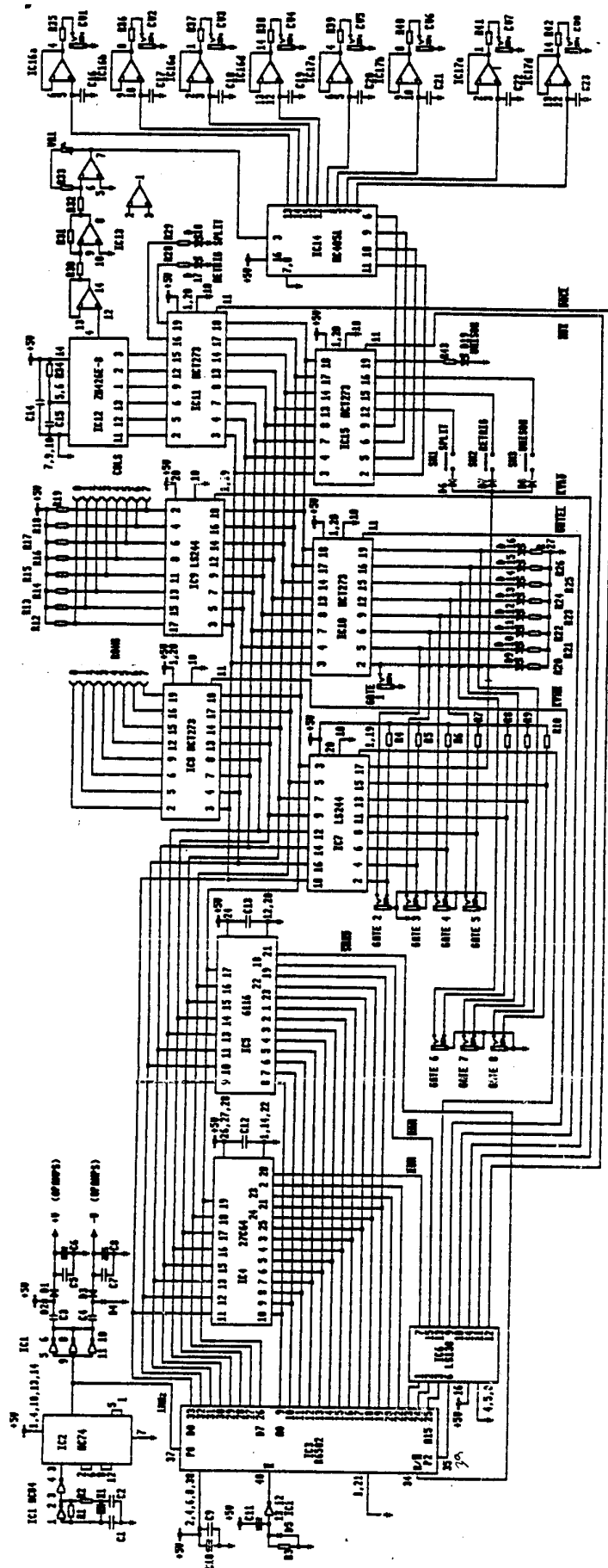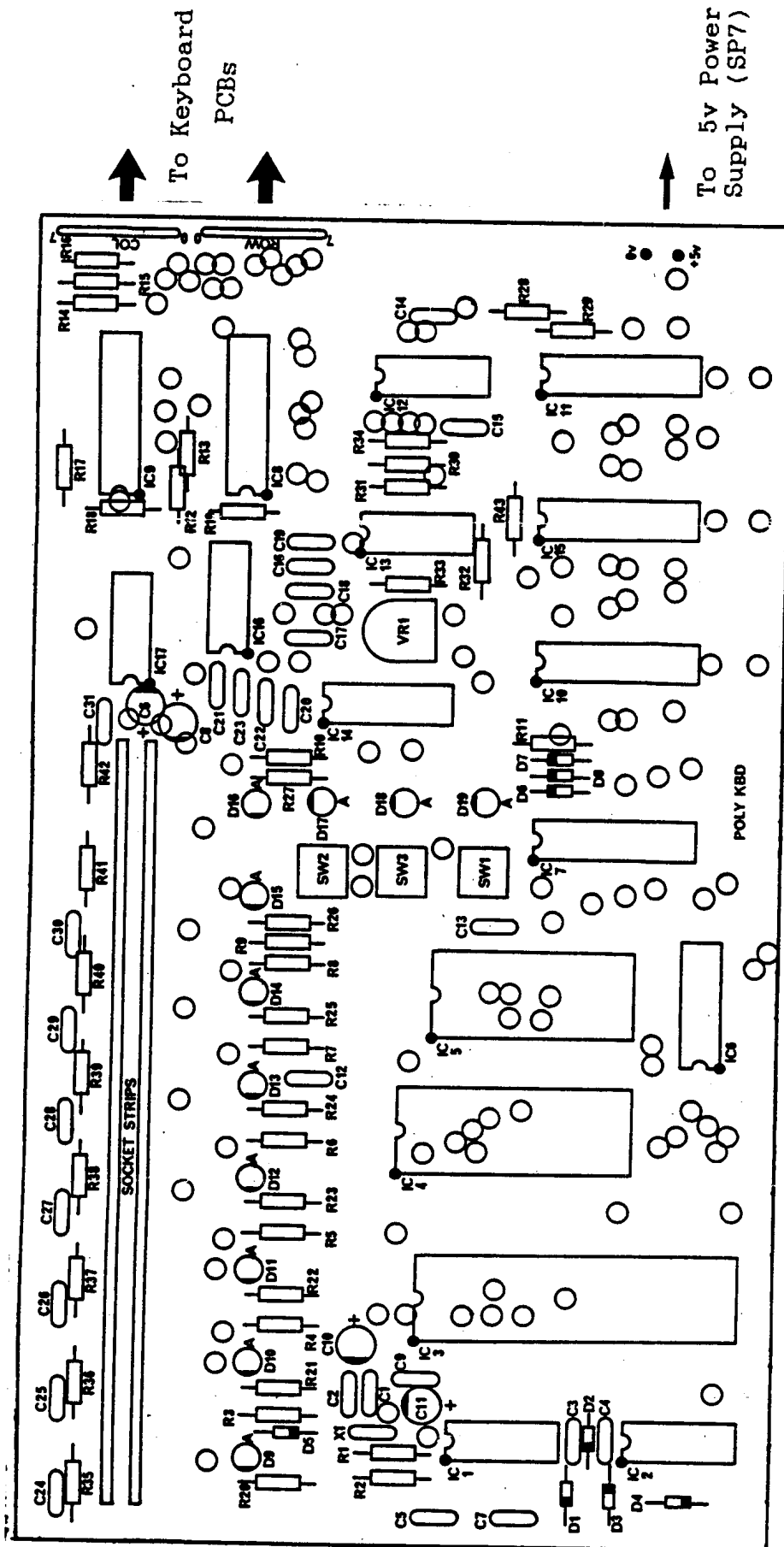
Important PCB Modification.

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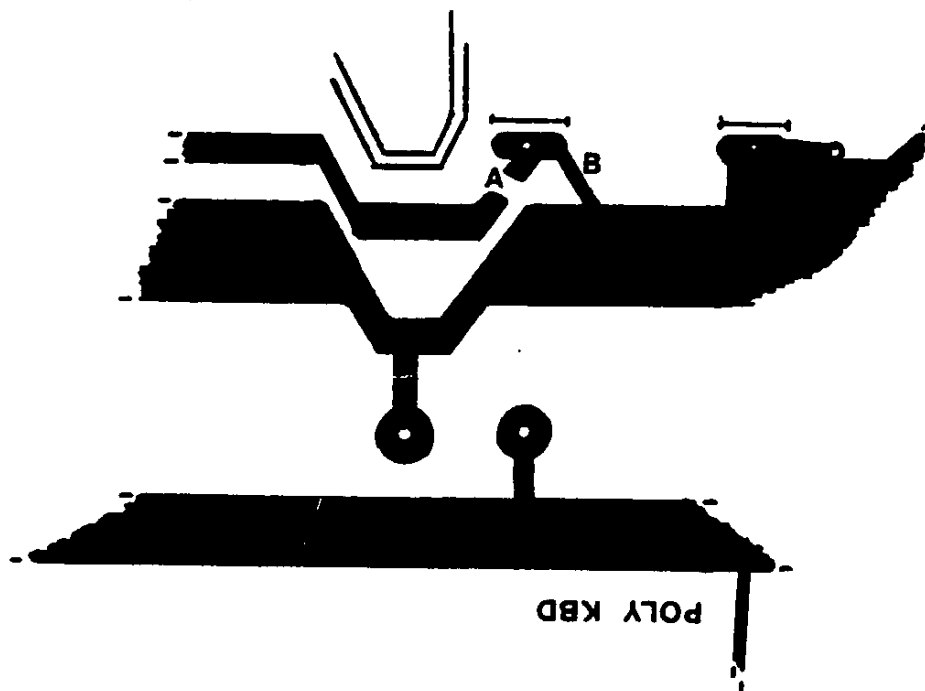
Please make the following modification on the PCB track leading to pin 1 of IC 4 on the underneath of the board:

Cut the track at 'A'

and

Make a fresh link at 'B'

according to the above diagram.