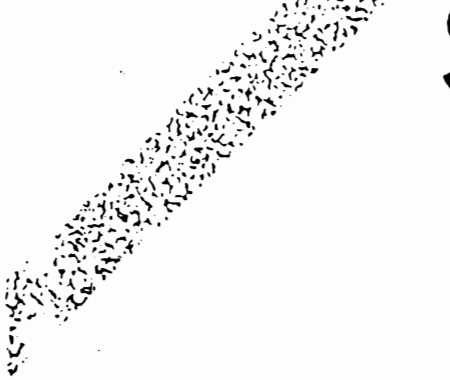
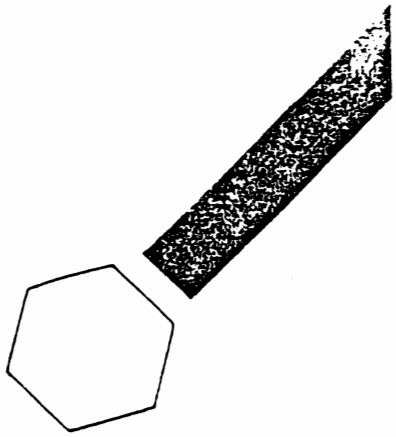
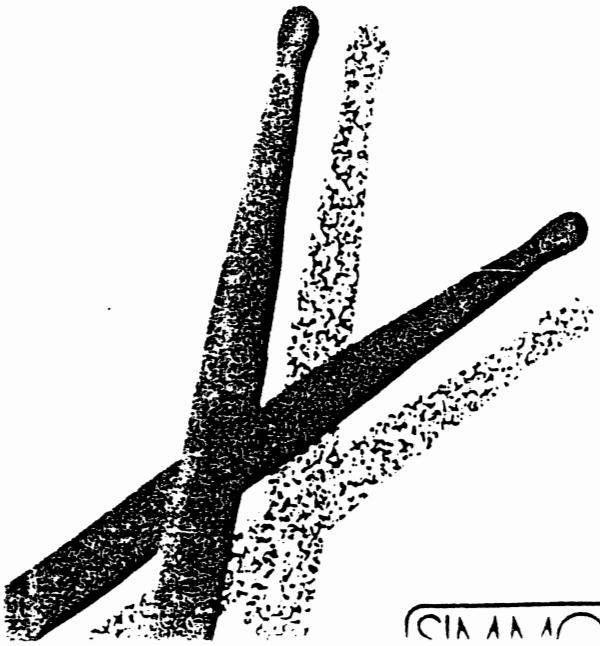
SDS 7







DUAL SAMPLE MODULE

Service Manual

SDS DSM

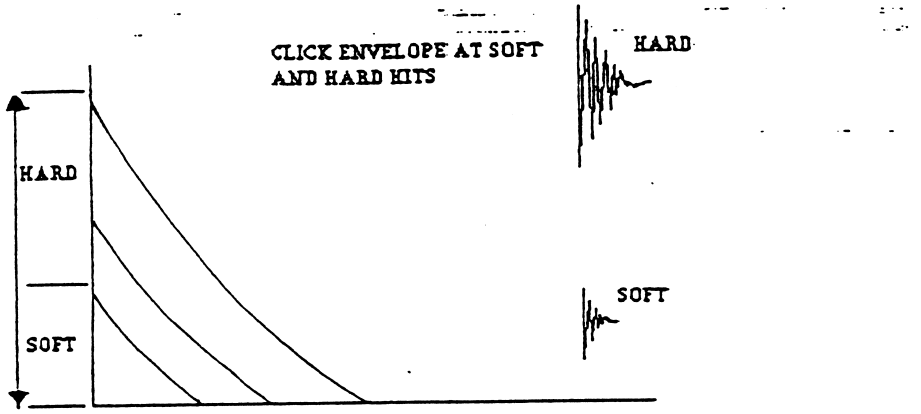
The SDS DSM consits of 4 sound generating circuits, these are:

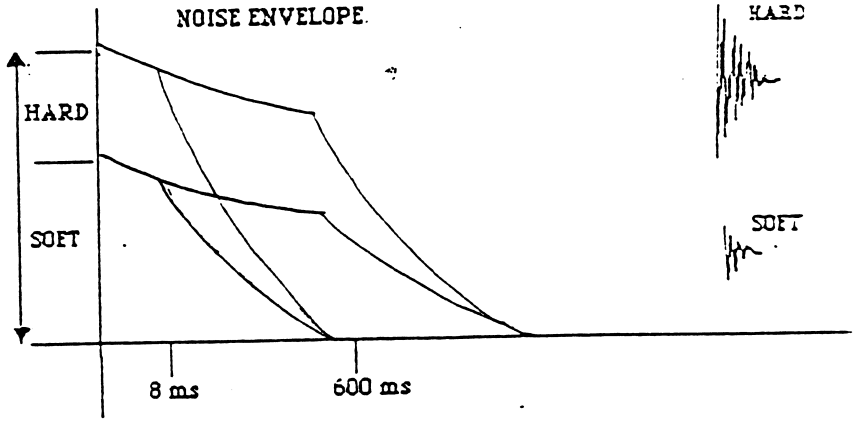
1. Digital 1
2. Digital 2
3. Noise
4. Click

Noise and click circuits

The noise and click are mixed together and fed into one of the filter poles of IC21, both noise and click have an amplitude control which is generated in the hybrid. The click has a fixed click envelope generator consisting of D5 R36 C10 and part of IC3. The amount signal is used to open the filter, the VCA of IC21 is already opened at this point by envelopes 1 or 2 or both.

The noise is again controlled by the hybrid. This time however the decay has two envelope generator curves, the first is formed by C14, R405, the second is formed by C14, R405, IC4, R52, the point at which the second decay curve is started is controlled by the hybrid, ¼ of IC10 and ½ IC8. IC10 and IC8 form a voltage controlled mono stable. The hold off range is between 8ms approx and 600 milliseconds. The noise output levels at IC5 Pin 9 are 3.8v approx click output IC22 Pin 8 7v approx.



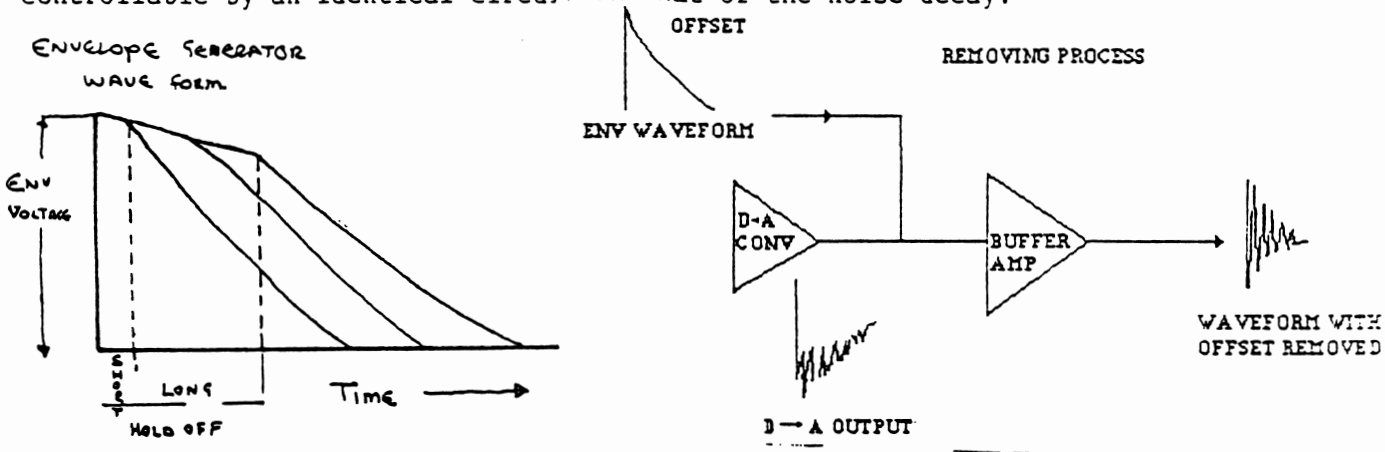


DECAY HOLD OFF TIME

DIGITAL SOUND CIRCUITS

The digital circuits are identical, except the second envelope has a threshold control formed by IC2 Pins 12, 13 and 14. The threshold reference voltage comes from hybrid Pin 39, this ensures a pre-determined input level is reached before the second envelope starts to charge up and DAC 2 gives an output. The digital sound generator/consists of ½ IC10 DAC 1 eprom IC19 IC17 IC18 and the VCO formed by ½ IC12, TR2. The VCO is free running if D7 is low. The VCO runs on turn on but no sound is made because envelope 1 is low; assuming no one has hit the pad during power up. IC17 and IC18 count up and depending upon which part of the sample size switch SW1 is closed, D7 will conduct forcing IC12 Pin 5 high - so stopping the VCO. The envelope is fed into DAC1 Pin 14. This produces a sound waveform which follows the envelope. The only problem is that the output contains a large amount of DC which could cause distortion if not corrected. To do this, a proportion of the envelope is added to the sound waveform and because of the inversion which takes place inside DAC 1 the resulting output from IC10 contains very little or no DC.

The envelope, again, has two envelope curves, the first pre-set,the second controllable by an identical circuit to that of the noise decay.



The signal is routed back to the hybrid to form the click signal and to IC21 mixer circuit,the amount of signal which imerges from IC21 is controlled by Pin 19 of the hybrid. As explained earlier, the counters are stopped and the mono stables have timed out. So when an input signal is received, IC2 Pin 7 goes high (this could be a signal so low in level that no sound would come out). This trips the anti splat circuit IC11. This generates the card reset signal and also stops the incoming signal re-triggering the circuits, which would result in crunchy beginnings to sounds. The VCO has two control voltage inputs. One is a pre-set level called Pitch, this and the second signals voltage level depends on the value stored in the relevant kit number. This second signal called bend is derived from its channels envelope and the amount depends upon how hard the drum is struck and level again stored in memory.

THE FILTER

The filter has two main control signals plus an extra one for the click. The click signal is of a short duration whereas the filter frequency is again a preset signal from the hybrid, the value of which is stored in mem ory. The second sweep is derived from the envelopes of channels 1 and 2 which are mixed and the amount of sweep is again controlled by the hybrid. The hybrid contains demux of 16 channels and also tranconductance op ampsand relevant sample and holds. It is not possible to repair a damaged hybrid so a replacement must be used should the original malfunction.

There are 2 versions of the D.S.M, one is used for Snare, Toms and effects the other is for bass. It has values which suit the trigger wave forms generated by the bass pad.

There is one extra bit of circuitry with values to suit the two applications, that is the minimum dynamic level D402 and R26. The function of this circuit is that if the drum was struck very softly the circuit would trigger and as already mentioned, no sound would come out. This is because of threshold levels in the dacs and VCA etc. So to overcome this problem the reset pulse is used to start to charge envelope 1 to a very small degree to allow the circuit to overcome the offsets of the circuit.

The LED driver consists of a amplifier and an envelope ½ IC1, this allows the LED to respond to very low level signals and very short ones.

Here is a list of relevant signals and pulse widths, these are only approximate as they very slightly from module to module.

At max trigger levels, IE. Envelopes are at least 4v amplitude.

Click output IC22 Pin 8 approx 7v P.P.
Noise output IC5 Pin 9 approx 3.8v P.P.
Digital output levels 1 IC10 Pin 8 approx 1.75v depending upon sample.
Digital out level IC10 Pin 14 approx 1.5v depending upon sample.
Decay hold off 1 IC7 Pin 6 approx 8ms to 600ms.
Decay hold off 2 IC7 Pin 10 approx 8ms to 600ms.
Noise decay hold off Ic8 Pin 6 approx 22ms to 600ms.
Anti splat length IC11 Pin 10 approx 96ms (bass) 35ms (Snare) approx.

NOTE

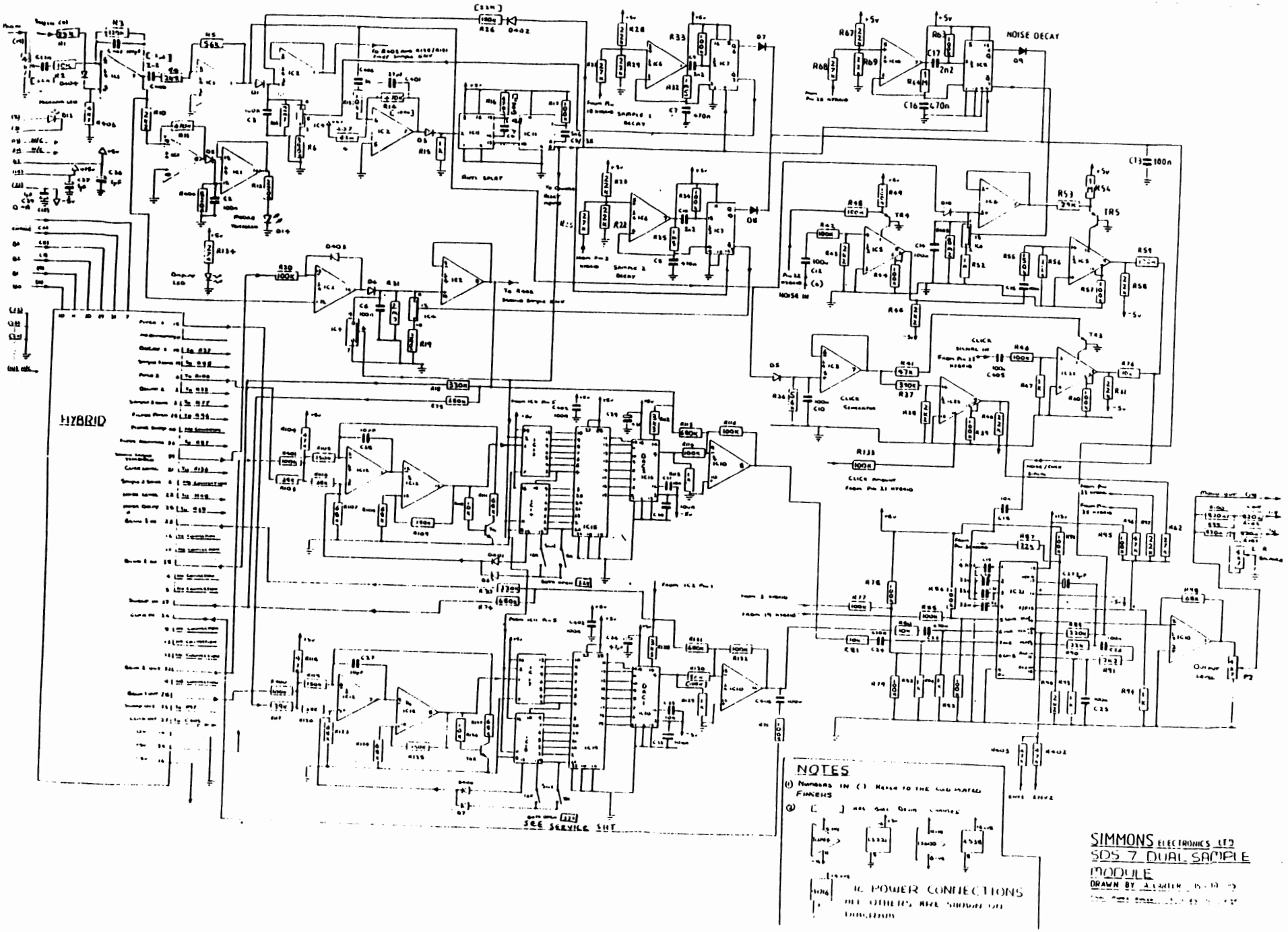
It is possible to play a 32K eprom but it would entail cutting Pin 27 on the eproms and joining it to 13, 14 or IC18 depending on which channel is being modified and then leaving SW1 open for that channel NOT recommended unless you know what you are doing.

When Fault Finding

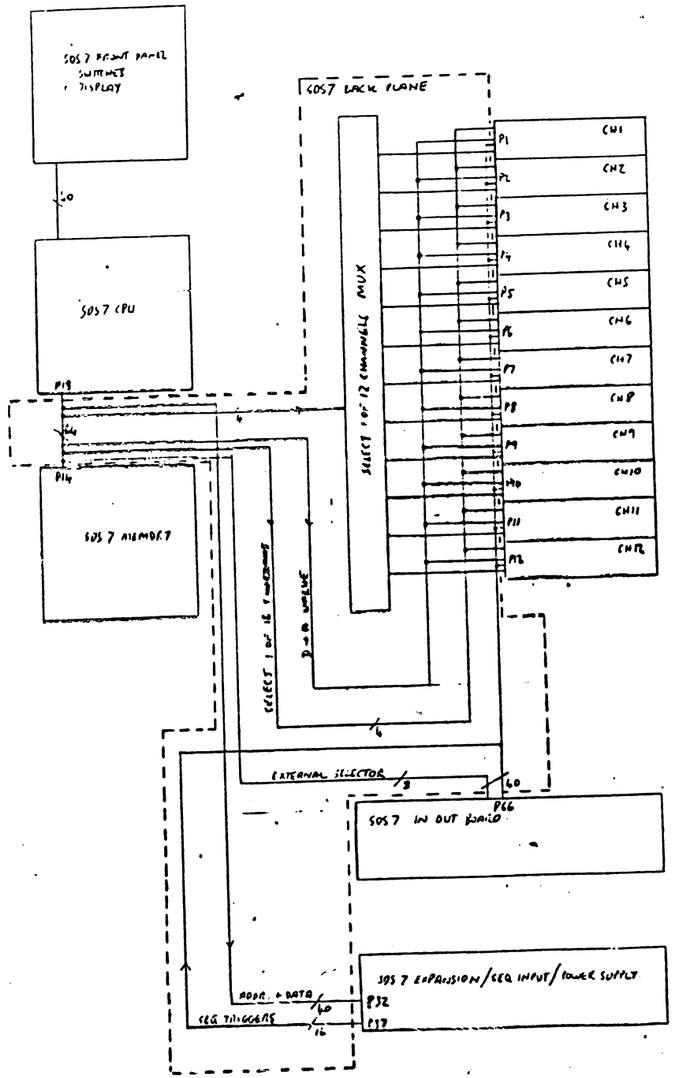
Step 1 is to check supply voltages on the board itself.
Step two, make sure both levels and sensitivity pots are turned up.
Step three, make sure the board is being triggered.

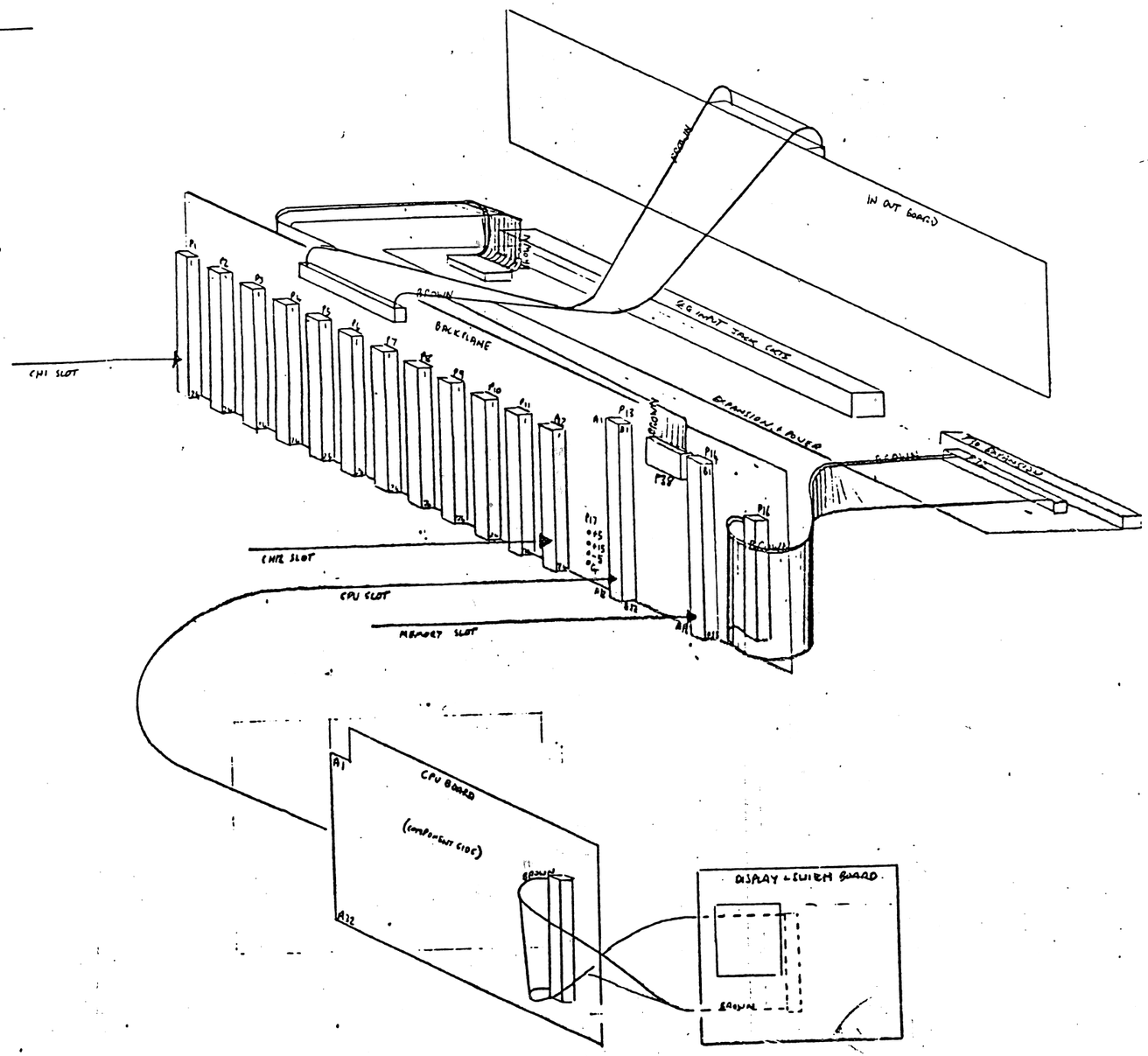
To be used in conjunction with the DSM circuit diagram.

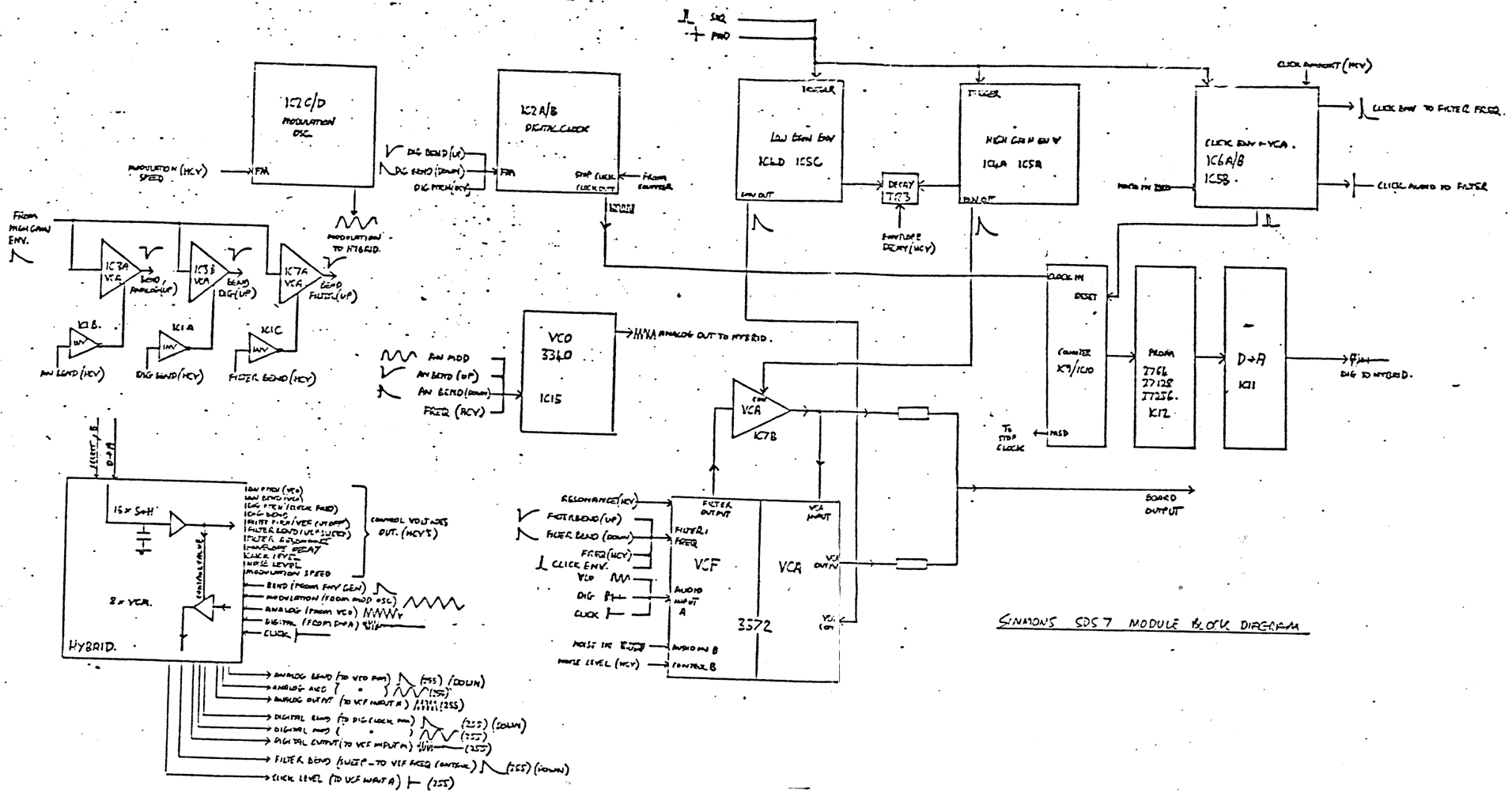
SYMPTOM	POSSIBLE CAUSE	REMEDY
Module totally dead	Not plugged in correctly One of the eproms in backwards. Short circuit component EG. IC's	Clean fingers and check keyway. Replace as it will have been damaged. Trace and replace
Trigger LED only and noise	Anti-splat not functioning IE. No reset for counters etc.	Trace and replace dama ged components.
Only first channel works	Threshold incorrect for second sample or no eprom fitted or fault in envelopes or counter circuits U/S or value stored too low.	Check value and circuit. Fit Eprom correctly. Replace faulty parts Set value high enough to let VCO run.
Only second channel works	Fault in envelope Fault in counter etc or no eprom fitted. Value stored is too low.	As above.
Module works but sound dull.	Filter circuits faulty. Wrong value stored in memory Pitch or sweep.	Check values and circuitry.
No noise.	Noise not getting to board from noise source. Noise circuit fault	Trace to find where it ceases Repair faulty components.
One of the channels plays a sample more than once.	Check dil switches and or diodes in the VCO jamming circuit	
One channel only plays ½ a sample.	Again, check switch positions.	



SDS BOARD LOCATION + RIBBON CONNECTIONS.

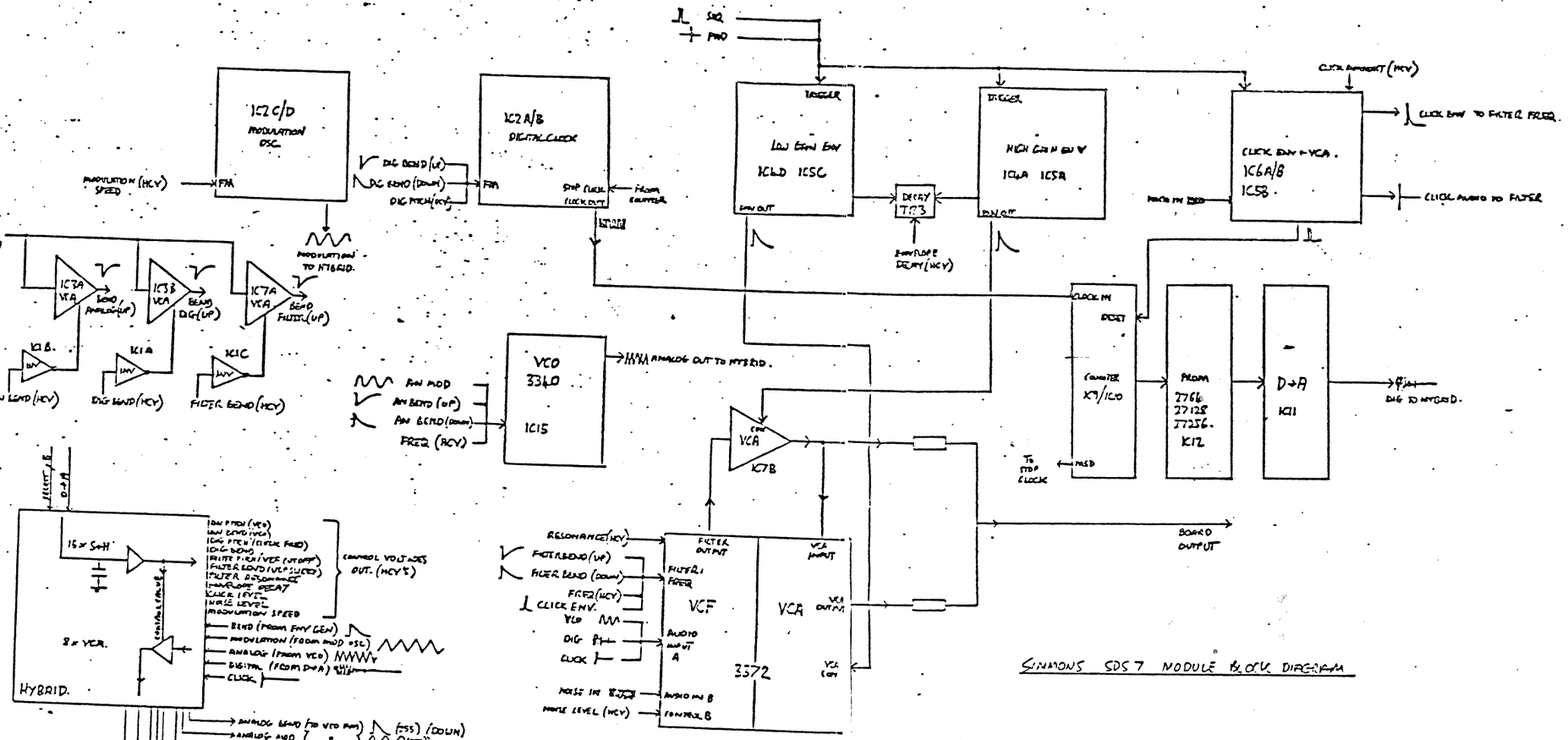






HCV = HYBRID CONTROL VOLTAGE.

SIMMONS SDS 7 MODULE BLOCK DIAGRAM

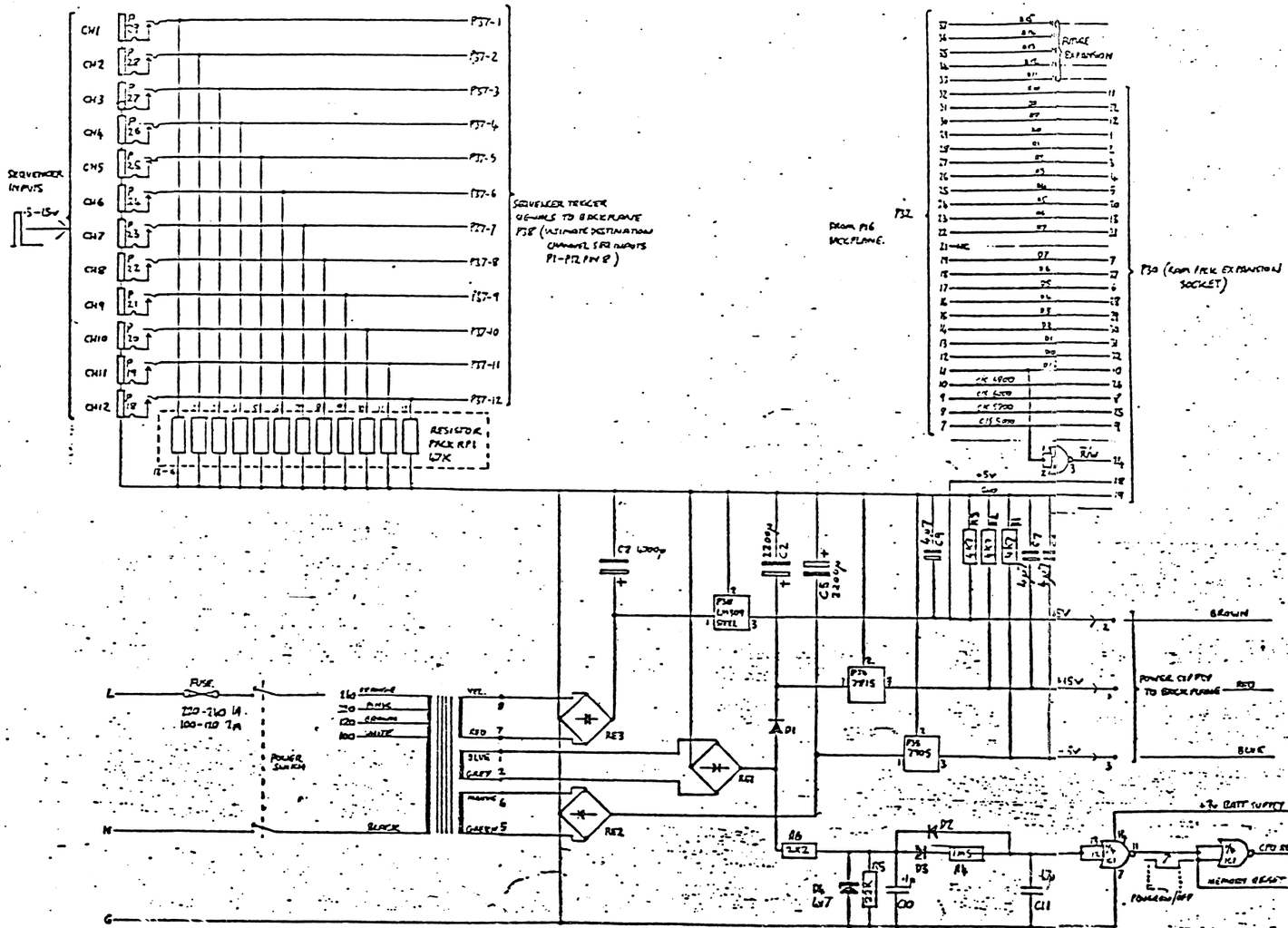


SIMMONS SDS 7 MODULE BLOCK DIAGRAM

HCV = HYBRID CONTROL VOLTAGE.

SDS 7 CPU + MEMORY SIMMONS ELECTRONICS LTD

SCX7 EXPANSION & POWER SUPPLY. CUMANA ELECTRONICS LTD.



NOTE.

SER No's 0-100
R6 WAS 10K } CAUSED RE-SET
R4 WAS 2M7 } PROBLEM WHEN HOT.

SDS7 BACK PLANE CIRCUIT. 2/L/84. SIMMONS ELECTRONICS. LTD.

IC4 = TL084 QUAD FET OP. AMP
IC5 = LM301AH WIDEBAND OP AMP
IC6 = 74LS154 1 OF 16 MULTIPLEXER.
P1-P12 = SINGLE SIDE 24 WAY EDGE CONNECTORS TO ACCOMODATE 12 x SDS7 VOICE MODULES.
P13 = 64 WAY (32x2) WAY EDGE CONNECTOR FOR SDS7 CPU BOARD.
P14 = 64 WAY (32x2) FOR SDS7 MEMORY BOARD.

TO IN/OUT BOARD. P66 (ULTIMATE DESTINATION XLR OUTPUTS)

RS AUDIO OUT

FROM EXPANSION P37 (SINGLE = SEQUENCER INPUT 24WAY SOCKETS)

P38 SEQ INPUTS

FROM M/OUT P66 (SOURCE = XLR INPUTS)

P15 PAD TRIG INPUTS

+5V IN
PROG LED COMMON A
MUX CHANNEL ENABLE
FUNCTION SEL. B3
NOISE INPUT
FUNCTION SEL B2
SEQ TRIG INPUT
FUNCTION SEL B1
N/C
FUNCTION SEL B0
D→A FUNCTION VALUE
N/C
N/C
+5V IN
AUDIO OUT RIGHT
AUDIO OUT LEFT
AUDIO OUT MONO
PAD TRIGGER IN
HI HAT PED IN
-5V IN
GND
GND
GND.

CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8 CH9 CH10 CH11 CH12

D→A VALUE

P17
+5 IN
+15 IN
-5 IN

AUDIO GROUND TO EXPANSION

COMPUTER GROUND TO EXPANSION

TO IN/OUT BOARD P66 (ULTIMATE DESTINATION-SELECTX PAD SOCKET P66)

TO EXPANSION P32 (ULTIMATE DESTINATION RAM PACK EXPANSION P30)

SELECTED PAD IN 1
SELECTED PAD IN 2
SELECTED PAD IN 3
SELECTED PAD OUT 1
SELECTED PAD OUT 2
SELECTED PAD OUT 3
SELECTED PAD OUT
MEMORY EXPANSION CS. READ
MEMORY EXPANSION CS. WRITE
MEMORY EXPANSION CS. CLOCK
MEMORY EXPANSION CS. DATA

TOP VIEW P38

TOP VIEW P15-P16

P16-1 MEM RE-SET IN
P16-2 5V BATT SUPPLY
P16-3 CPU RE-SET IN

TO EXPANSION P32 (ULTIMATE DESTINATION RE-SET CIRCUIT IC1)

TO EXPANSION P32 (ULTIMATE DESTINATION RAM PACK EXPANSION SOCKET P30)

SDS 7

(90)

④ = RESISTOR PACK PIN NUMBER

PAD TRIGGER INPUTS.

CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8 CH9 CH10 CH11 CH12

P63 P62 P61 P60 IS7 P58 P57 P56 P55 P54 P53 P52

RP1

1 TRIG IN (DRUM) 2
2 TRIG IN (DRUM) 3
3 TRIG IN (DRUM) 5
4 HI HAT TRIG IN
5 GND
6 SELECTOR PAD
7 SELECTOR PAD
8 SELECTOR PAD
9 SELECTOR PAD
10 SELECTOR PAD
11 TRIG IN (DRUM) 4
12 TRIG IN (DRUM) 1
13 TRIG IN (DRUM) 6
14 TRIG IN (DRUM) 7
15 TRIG IN (DRUM) 8
16 TRIG IN (DRUM) 9
17 TRIG IN (DRUM) 10
18 TRIG IN (DRUM) 11
19 TRIG IN (DRUM) 12
20 +15
21 CH12 OUT R14 3K9
22 CH11 OUT R15 3K9
23 CH9 OUT R13 3K9
24 CH12 OUT R16 3K9
25 AUDIO OUT LEFT R4 3K9
26 AUDIO OUT RIGHT R5 3K9
27 SELECTOR PAD
28 SELECTOR PAD
29 SELECTOR PAD
30
31 R1 3K9 R2 3K9
32 GND
33 CH1 OUT R3 3K9
34 CH2 OUT R6 3K9
35 CH3 OUT R7 3K9
36 CH5 OUT R9 3K9
37 CH6 OUT R10 3K9
38 CH4 OUT R8 3K9
39 CH8 OUT R12 3K9
40 CH7 OUT R11 3K9

P65 SELECTOR PAD.

8 7 6 5

4 3 2 1

P66
40 WAY
RIBBON
FROM
BASE-PLANE
(P15)

LEFT OUT P50 RP2 ②
RIGHT OUT P49 RP2 ③
MIX OUT P51

+15v → P64

← PEDAL TRIG
HI HAT PED.
CLOSE OPEN

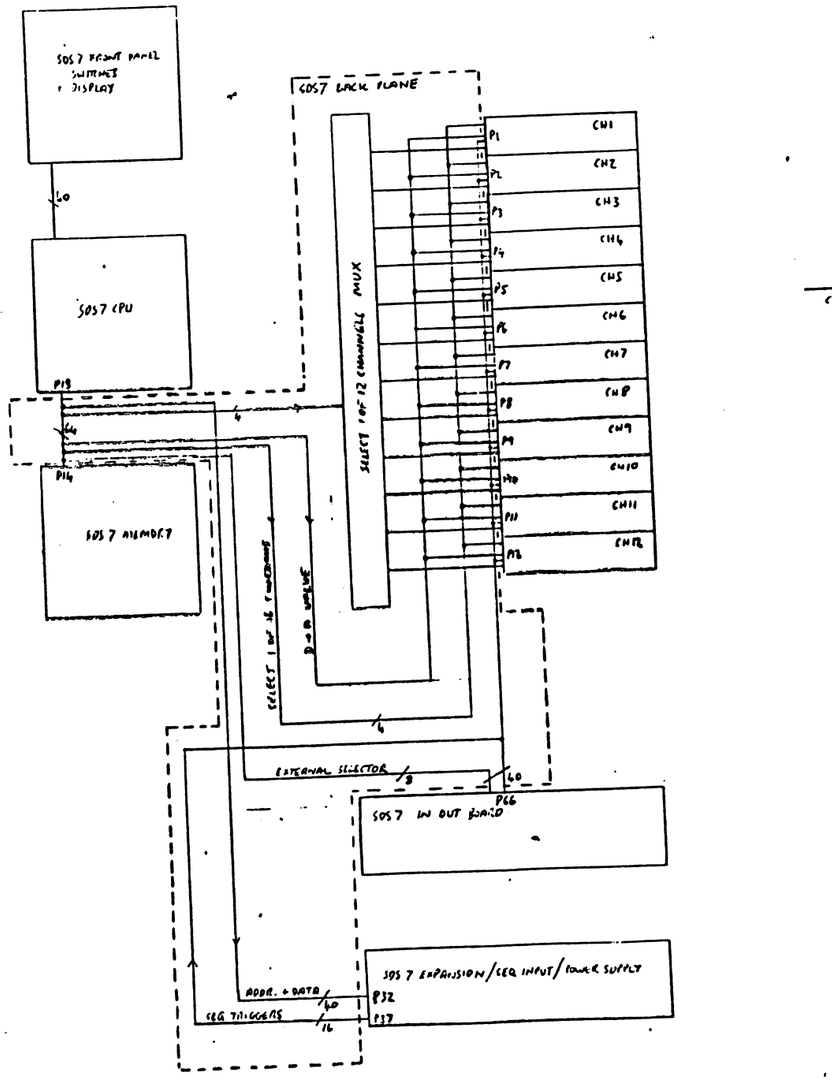
SDS7 IN/OUT BOARD
2/1/86
DRW. D. SIMMONS
SIMMONS ELECTRONICS LTD.

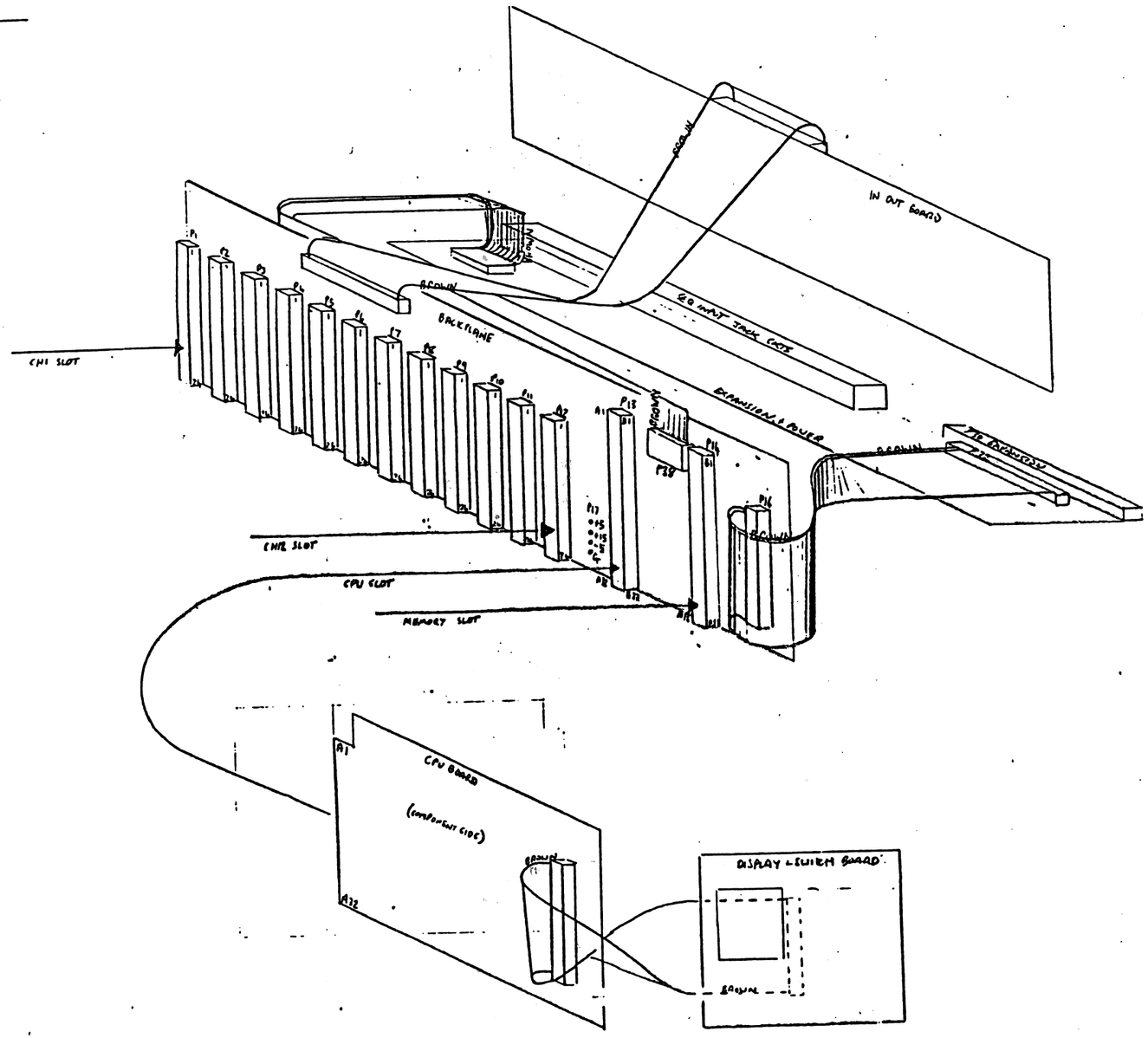
P48 CH1 RP3 ④
P47 CH2 RP3 ⑤
P46 CH3 RP3 ⑥
P45 CH4 RP3 ⑦
P44 CH5 RP2 ⑦
P43 CH6 RP2 ⑥
P42 CH7 RP2 ⑧
P41 CH8 RP2 ⑨
P40 CH9 RP2 ⑤
P39 CH10 RP2 ④
P38 CH11 RP2 ③
P37 CH12 RP2 ②

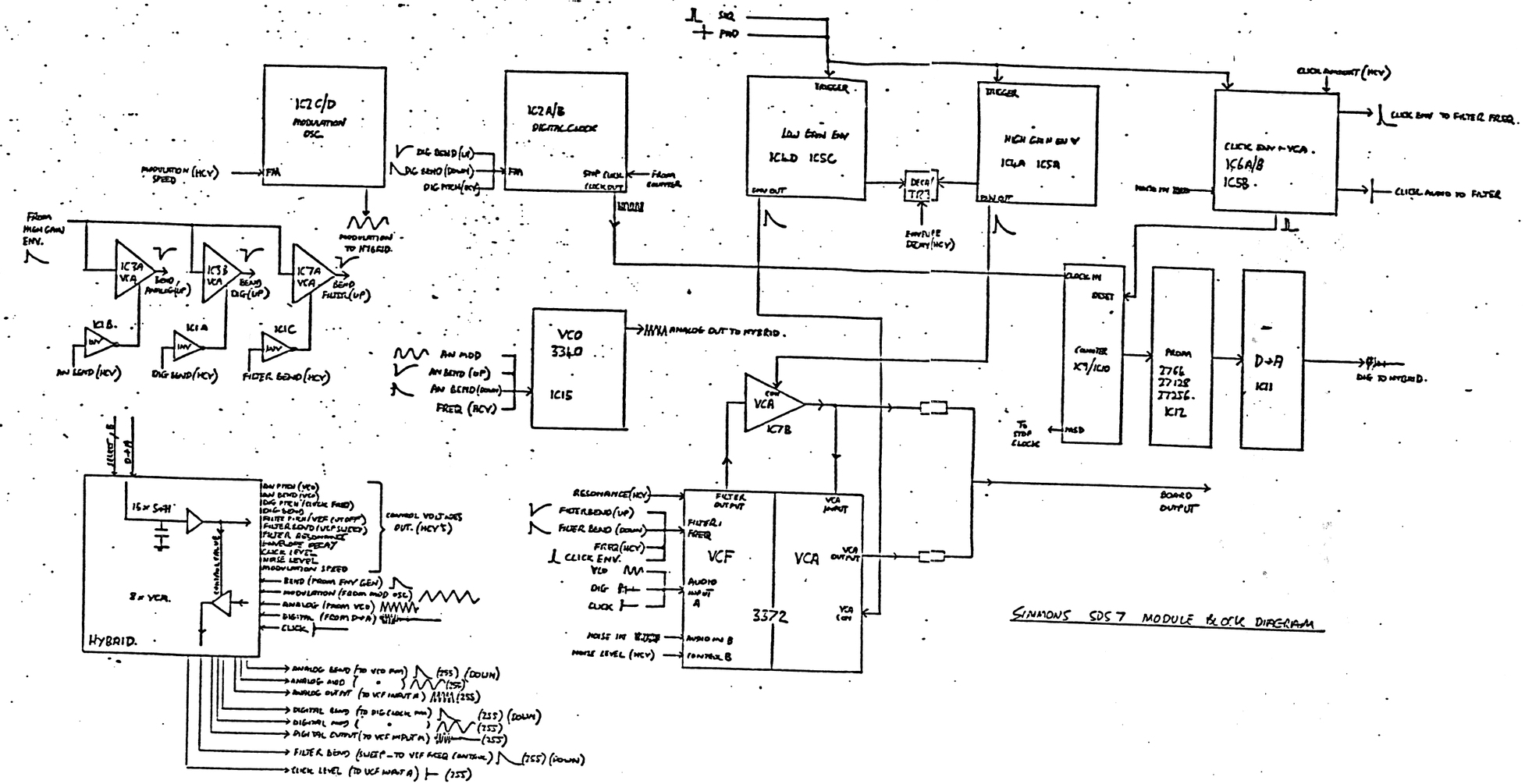
① ①

R22 + R23 = 6.7k

SDS BOARD LOCATION + RIBBON CONNECTIONS.







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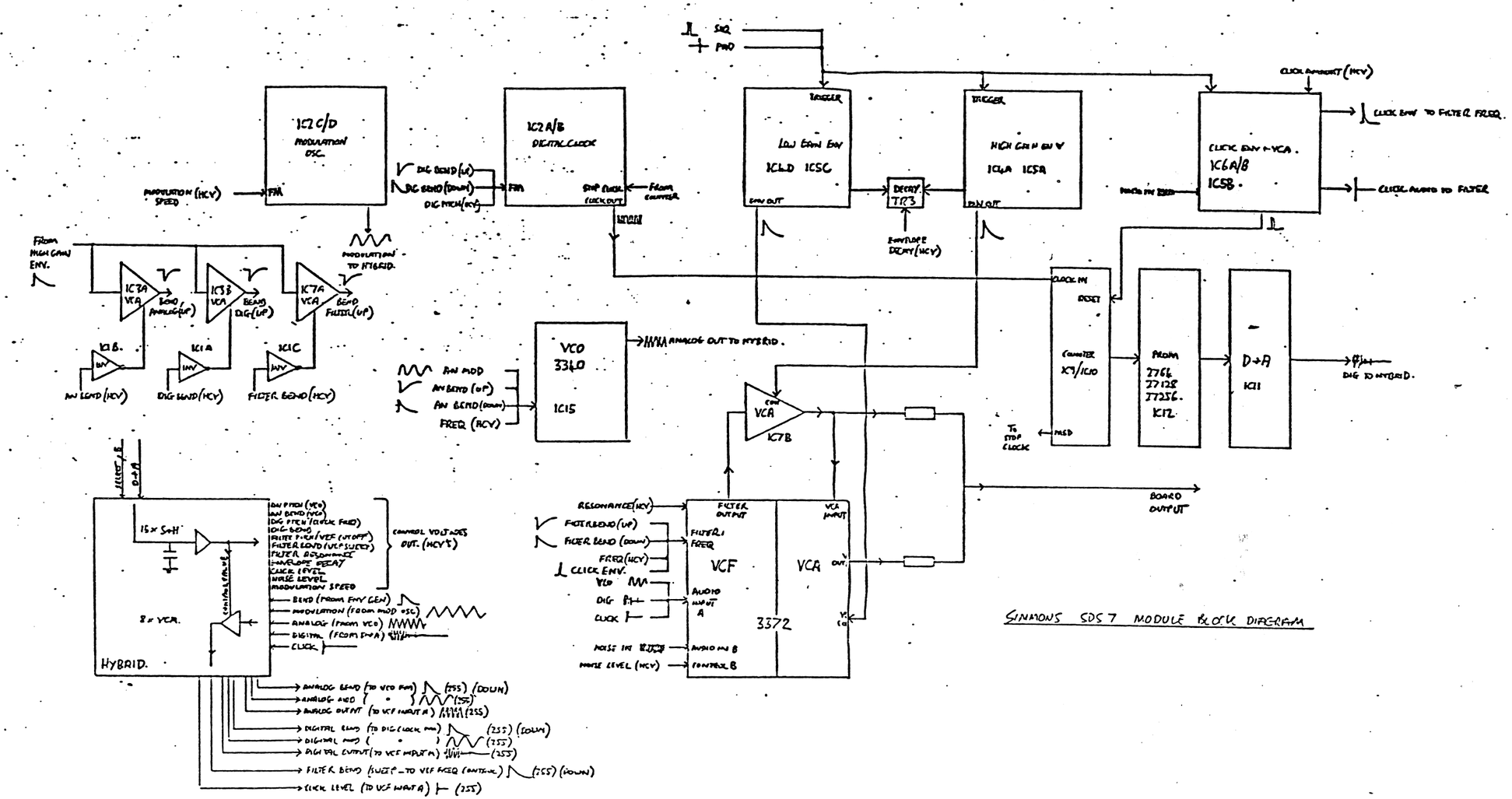


SIMMONS SDS 7 MODULE BLOCK DIAGRAM

HCV = HYBRID CONTROL VOLTAGE.

SOS 7 CPU + MEMORY SIMMONS ELECTRONICS LTD

PROGRAMMER PANEL.

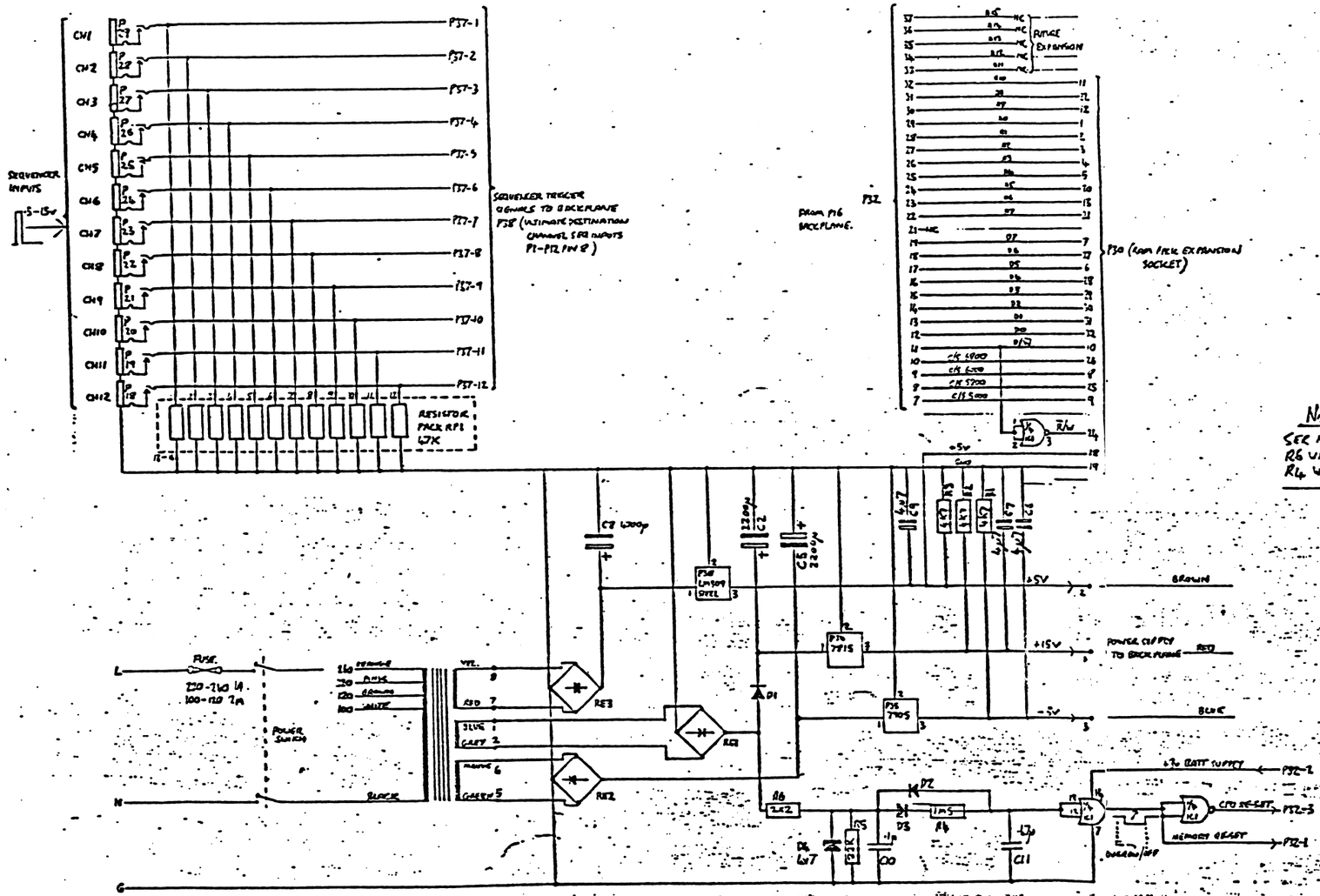
MEMORY BOARD.

SDS 7 CPU + MEMORY SIMMONS ELECTRONICS LTD

PROGRAMMER PANEL.

MEMORY BOARD.

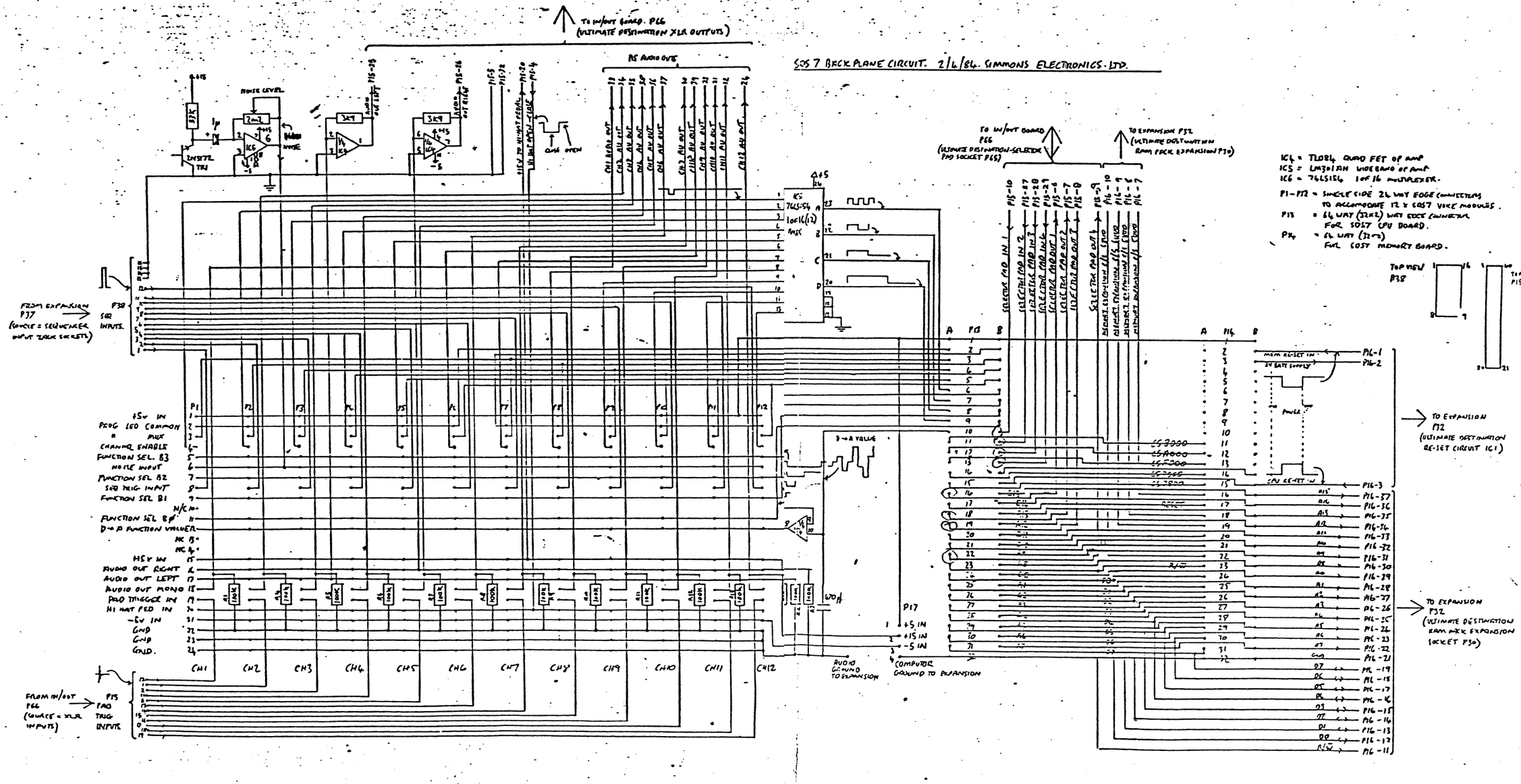
SCX7 EXPANSION & POWER SUPPLY. CUMMANS ELECTRONICS LTD.



NOTES.

SEE No's 0-100
R6 WAS 10K
R4 WAS 2M7
} CAUSED RE-SET PROBLEM WHEN HOT.

SOS 7 BACK PLANE CIRCUIT. 2/6/84. SIMMONS ELECTRONICS. LTD.



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P13 = 64 WAY (32x2) WAY EDGE CONNECTOR FOR SDS7 CPU BOARD.
P14 = 64 WAY (32x2) FOR SDS7 MEMORY BOARD.

TO I/O BOARD. P66 (ULTIMATE DESTINATION XLR OUTPUTS)

P5 AUDIO OUT

FROM EXPANSION P37 (SOURCE = SEQUENCER INPUT JACK SOCKETS)

P38 SEQ INPUTS.

FROM I/O BOARD P66 (SOURCE = XLR INPUTS)

P13 PAD TRIG INPUTS

+5v IN
PROG LED COMMON
B MUX
CHANNEL ENABLE
FUNCTION SEL. B3
NOISE INPUT
FUNCTION SEL B2
SEQ TRIG INPUT
FUNCTION SEL B1
N/C
FUNCTION SEL B0
D→A FUNCTION VALUE
N/C
N/C
+5V IN
AUDIO OUT RIGHT
AUDIO OUT LEFT
AUDIO OUT MONO
PAD TRIGGER IN
HI HAT PED IN
-5v IN
GND
GND
GND.

CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8 CH9 CH10 CH11 CH12

D→A VALUE

P17
+5 IN
+15 IN
-5 IN
COMPUTER GROUND TO EXPANSION

A10 GOING TO EXPANSION

TO I/O BOARD P66 (ULTIMATE DESTINATION-SELECTED PAD SOCKET P65)

TO EXPANSION P32 (ULTIMATE DESTINATION RAM PACK EXPANSION P30)

SELECTED PAD IN 1
SELECTED PAD IN 2
SELECTED PAD IN 3
SELECTED PAD IN 4
SELECTED PAD OUT 1
SELECTED PAD OUT 2
SELECTED PAD OUT 3
SELECTED PAD OUT 4

TO EXPANSION P32 (ULTIMATE DESTINATION RE-SET CIRCUIT IC1)

TO EXPANSION P32 (ULTIMATE DESTINATION RAM PACK EXPANSION P30)

TOP VIEW P38

TOP VIEW P15-P16

SDS 2

(90 upside)

'66 WAY RIBBON MOTHER-PLANE 5)

(N) = RESISTOR PACK PIN NUMBER

PAD TRIGGER INPUTS.

CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8 CH9 CH10 CH11 CH12

RP1

P63 P62 P61 P60 P59 P58 P57 P56 P55 P54 P53 P52

1 TRIG IN (DRUM) 2
2 TRIG IN (DRUM) 3
3 TRIG IN (DRUM) 5
4 HI HAT TRIG IN
5 GND
6 SELECTOR PAD
7 SELECTOR PAD
8 SELECTOR PAD
9 SELECTOR PAD
10 SELECTOR PAD
11 TRIG IN (DRUM) 4
12 TRIG IN (DRUM) 1
13 TRIG IN (DRUM) 6
14 TRIG IN (DRUM) 7
15 TRIG IN (DRUM) 8
16 TRIG IN (DRUM) 9
17 TRIG IN (DRUM) 10
18 TRIG IN (DRUM) 11
19 TRIG IN (DRUM) 12
20 +15
21 CH10 OUT — R14 3K9
22 CH11 OUT — R15 3K9
23 CH9 OUT — R13 3K9
24 CH12 OUT — R16 3K9
25 AUDIO OUT LEFT — R4 3K9
26 AUDIO OUT RIGHT — R5 3K9
27 SELECTOR PAD
28 SELECTOR PAD
29 SELECTOR PAD
30
31 R1 3K9, R2 3K9
32 GND
33 CH1 OUT — R3 3K9
34 CH2 OUT — R6 3K9
35 CH3 OUT — R7 3K9
36 CH5 OUT — R9 3K9
37 CH6 OUT — R10 3K9
38 CH4 OUT — R8 3K9
39 CH8 OUT — R12 3K9
40 CH7 OUT — R11 3K9

P65 SELECTOR PAD.

8 7 6 5
4 3 2 1

LEFT OUT — P50 — RP2 ②
RIGHT OUT — P49 — RP2 ③
MIX OUT — P51

+15v → P64

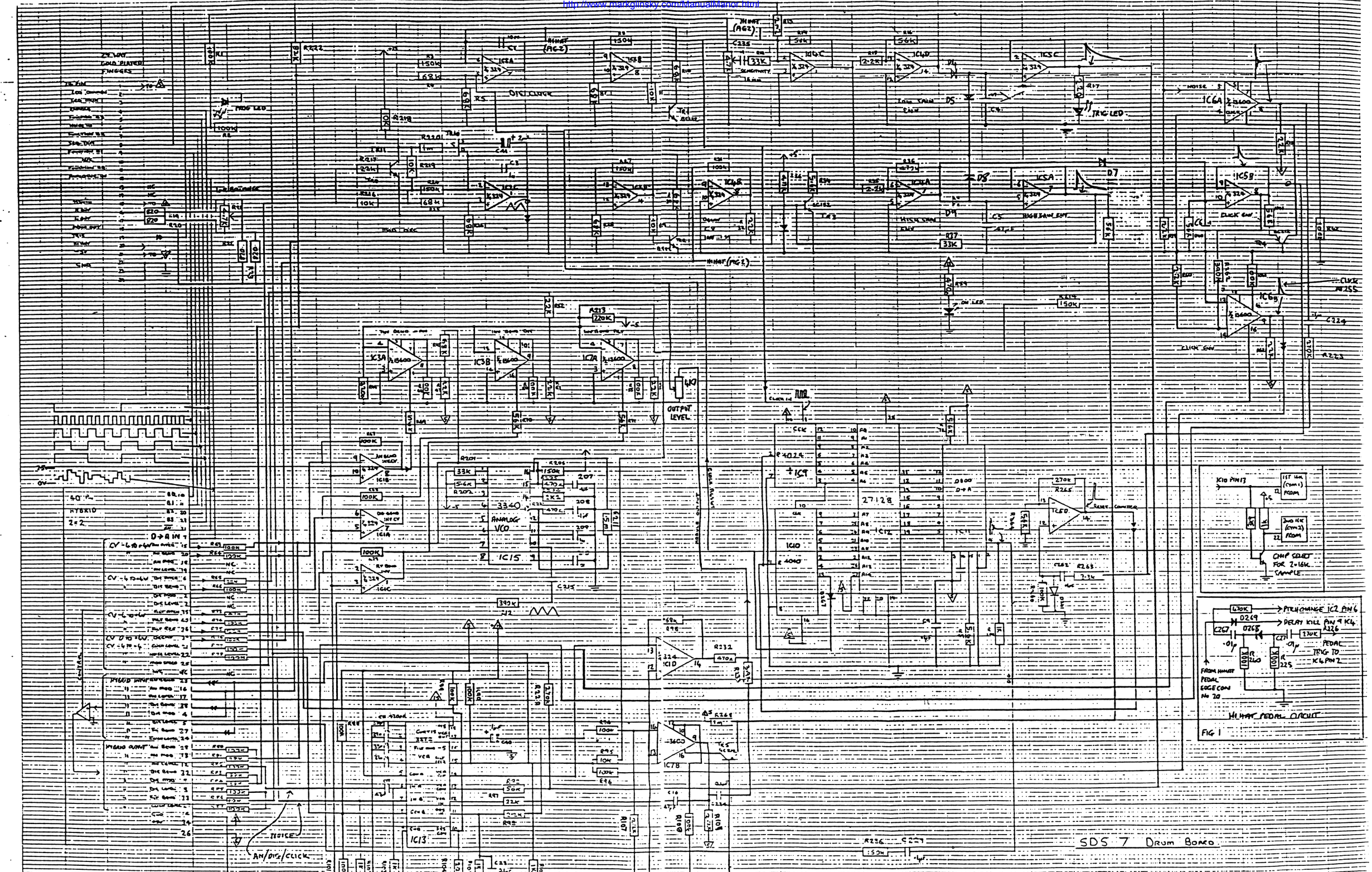
PEDAL TRIG — CLOSE — OPEN
HI HAT PED.

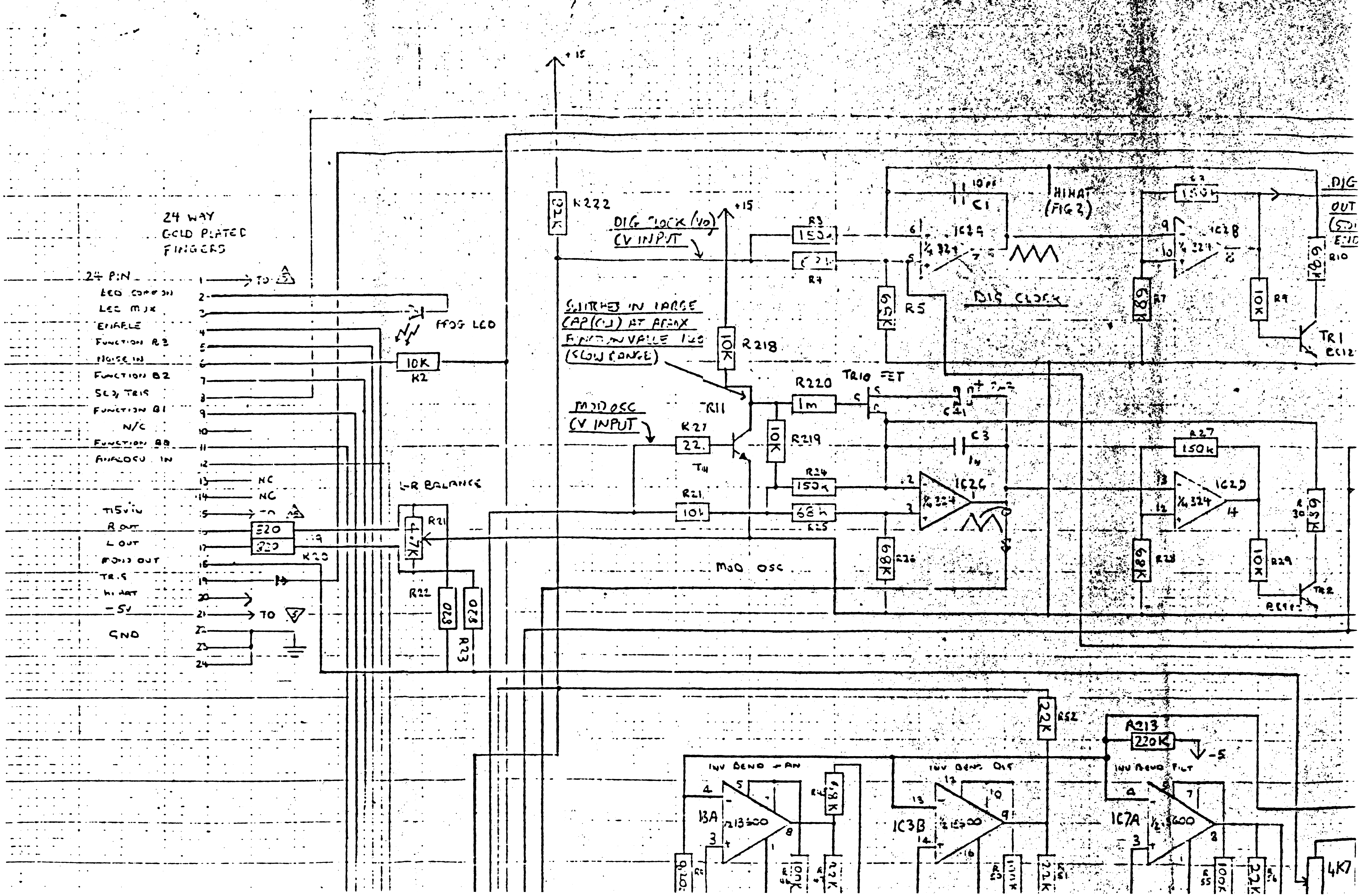
SDS7 IN/OUT BOARD
2/1/86
DRW. D. SIMMONS
SIMMONS ELECTRONICS LTD.

P48 CH1 — RP3 ④
P47 CH2 — RP3 ⑤
P46 CH3 — RP3 ⑥
P45 CH4 — RP3 ⑦
P44 CH5 — RP2 ⑦
P43 CH6 — RP2 ⑥
P42 CH7 — RP2 ⑧
P41 CH8 — RP2 ⑨
P40 CH9 — RP2 ⑤
P39 CH10 — RP2 ④
P38 CH11 — RP2 ③
P37 CH12 — RP2 ②

① ①

RP2 + RP3 - 1.7K





HYBRID 2×2

40 Pin

CV -4 TO +4V

CV 0 TO +4V

CONTROL

OUTPUT SIGNAL LEVELS PROPORTIONAL TO FUNCTION VALVE

ANALOG VCO

IC15

LINK 32 FOR 27256
LINK 16 FOR 27128
LINK 8 FOR 2764
(STOP AT END OF SAMPLE)

MIXER OUTPUT LEVEL

VCF FREQ CON 0-2CONV

CURTIS 3320

IC13

IC7B

IC7D

MAIN FILTER INPUT

FILTER NOISE LEVEL CV

90 COPIES reduced in size

DIG CLOCK OUT (SEQ'S AT E:10 OF R10 SHAPE)

R1 EC122

4-40 KHZ

HIHAT (SG2)

R12 2.2K

C235 .01

R13 33K

SENSITIVITY 16 mm

IC4C ¼ 324

R14 56K

R15 2.2K

IC4D ¼ 324

D4

LOW GAIN ENV

D5

C4 .47

IC5C ¼ 324

HARD HITS ONLY

R17 220

TRIG LED

NOISE

IC6A ½ 13600

CLICK

R31 100K

IC4B ¼ 324

DECAY CV INV

R32 22K

+5

R33 4.7K

R34 5.6K

BC182

TR3

R35 2.2K

R36 47K

IC4A ¼ 324

D8

D9

HIGH GAIN ENV

C5 .47μF

R37 33K

IC5A ¼ 324

D7 ACC HITS

56K

R59 470

ON LED

R214 150K

HIHAT (FIG 2)

4K7

CLICK IN

R58 2.2K

R60 2.2K

R62 2.2K

CLICK ENV

OPENS VCF MOMENTARILY WHEN DRUM IS HIT (FUNCTION (CLICK) > 0)

R73 2.2K

IC5B ¼ 324

CLICK ENV

R41 5.6K

C6 .1

R40

TR4 BC212

R42 100K

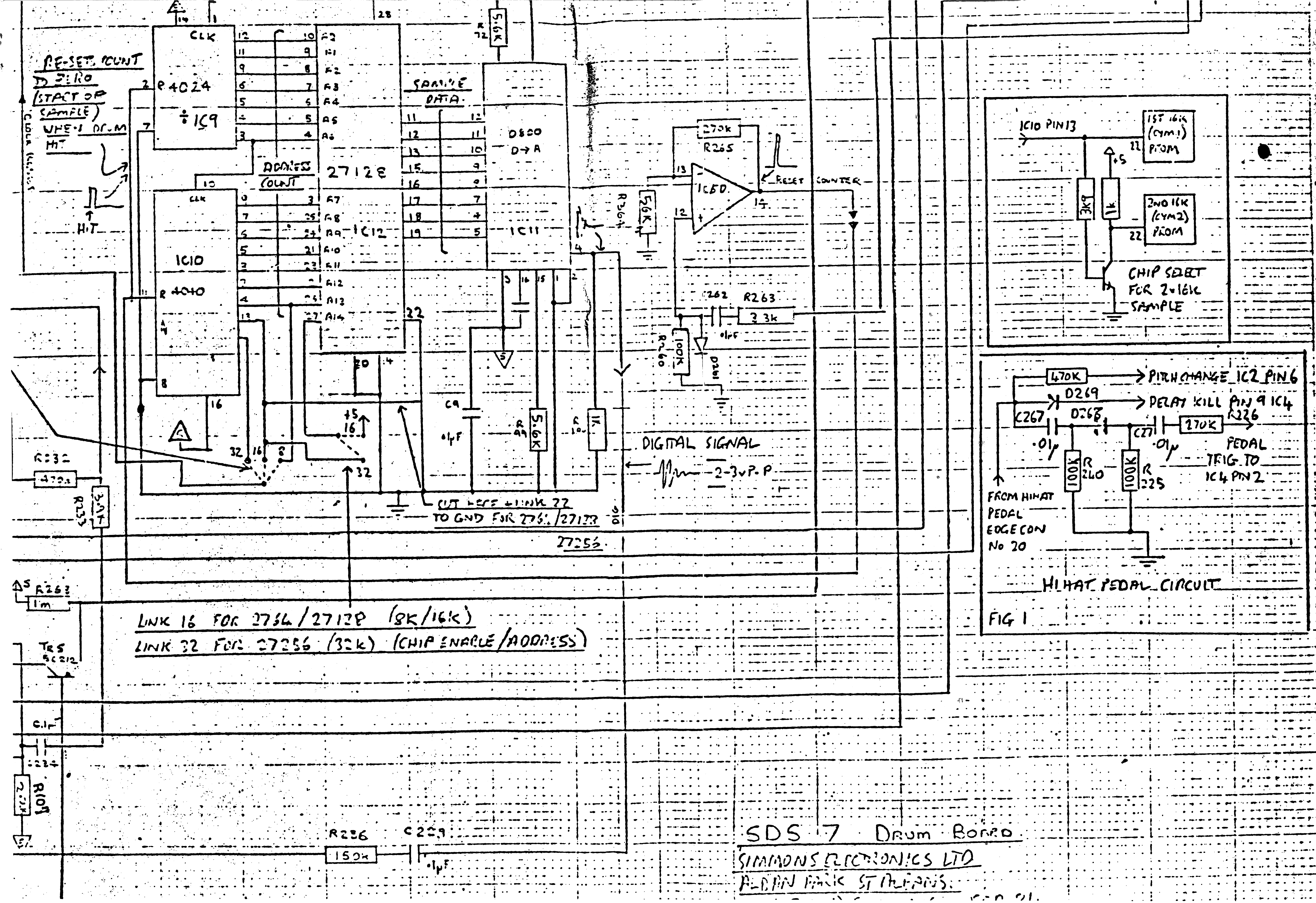
R61 100K

IC6B ½ 13600

CLICK AT 255

C224 .1μ

R223 220K


RE-SET COUNT TO ZERO (START OF SAMPLE) WHEN DRUM HIT
HIT
CLK
R 4024
÷ IC9
ADDRESS COUNT
27128
IC12
SAMPLE DATA
IC10
R 4040
DAC
D→A
IC11
R265 270k
IC5D
RESET COUNTER
R264 56K
C262
R263 3.3k
R260 100k
D261
C9 .1μF
R99 5.6K
R 1K
DIGITAL SIGNAL
2-3vP.P
CUT HERE + LINK 22 TO GND FOR 2764/27128
27256
R232 470k
R233 3.3K
R262 1m
LINK 16 FOR 2764/27128 (8K/16K)
LINK 32 FOR 27256 (32K) (CHIP ENABLE/ADDRESS)
TR5
C.1μF
R107
R236 150k
C229 .1μF
IC10 PIN 13
1ST 16K (CYM1) PROM
2ND 16K (CYM2) PROM
CHIP SELECT FOR 2×16K SAMPLE
470K
PITCH CHANGE IC2 PIN 6
D269
DELAY KILL PIN 9 IC4
C267 .01μ
D268
C271 .01μ
270K
R226
PEDAL TRIG TO IC4 PIN 2
R260 100K
R225 100K
FROM HIHAT PEDAL EDGE CON No 20
HIHAT PEDAL CIRCUIT
FIG 1
SDS 7 DRUM BOARD
SIMMONS ELECTRONICS LTD
ALBAN PARK ST ALBANS