

INTRODUCTION

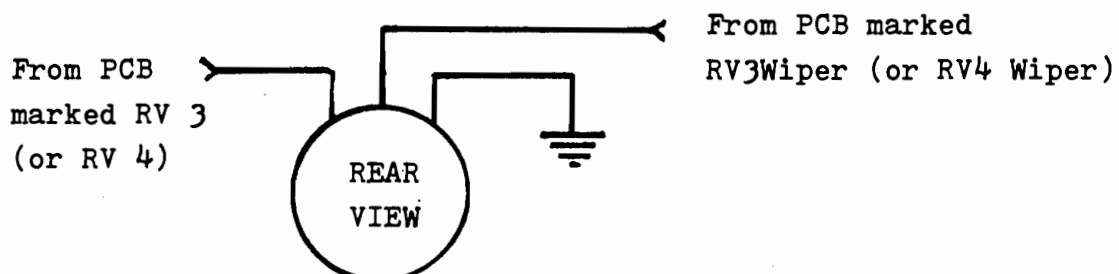
The 80-13 External Input Module allows interfacing of the Digisound 80 synthesiser with external sources, such as other live musical instruments or with pre-recorded material. It contains high quality pre-amplifiers to bring both microphone and line signals up to a level where they can be treated in the synthesiser, for example, by filtering or modulation. With or without filtering the sound envelopes from external sources may then be extracted, using a full wave rectifier principle, and these envelopes used to drive a voltage controlled amplifier whose sound source is derived from the synthesiser. The external source, or its envelope, may be connected to the gate/trigger extractor in order to control ADSR's (80-8 or 80-10) so as to generate different envelope shapes as an alternative approach for modifying the external sound source. The ADSR's may also be used to control VCF's and this combination of envelope following and dynamic treatment of the synthesiser sound has wide application.

CONSTRUCTION AND SETTING UP

The circuit diagram for the External Input Module is shown in Figure 1 and the component overlay illustrated in Figure 2. Orientation of I.C.'s, diodes, zeners and the electrolytic capacitors requires the usual care and the only other point to note is the use of screened wire to the inputs of the pre-amplifiers. This wiring should be kept as short and neat as possible and one end of the screen connects to the jack socket and the other end to the points marked 'screen' on the PCB overlay. To save too many short external connections between the miniature jack sockets the output of the envelope follower may be wired direct to the jack socket connection going to the peak detectors. The wiring is to the connection of the latter input which is disabled on insertion of a jack plug.

The only setting up required is to ground the input to the microphone pre-amplifier (IC 1) and adjust PR 1 for zero voltage at its output. The latter voltage should be measured between R5 and C9.

Note that RV 3 and RV 4 should be 'reverse' wired, as illustrated below, so as to provide increased sensitivity with clockwise rotation of the potentiometers.



COMPONENTS FOR 80-13.

RESISTORS, $\frac{1}{4}$ w, 5%, carbon film

R 1,12,15,18	10k	R 14	51k
R 2	22k	R 16	5k6
R 3,7	1M0	R 20,25	3k9
R 4,5,9,17	1k0	R 21,26	2k7
R 6	150k	R 22,27	150R
R 10,11,13	20k	R 23,28	2k2
R 8,19	100k	R 24,29	1k2

CAPACITORS

C 1,2	47u,25V PCB electrolytic
C 3,4,5,6,	100n polyester
C 7,9,10,12,13,14	470n polyester
C 8,11	22p ceramic
C 15,16	10u, 25V PCB electrolytic

POTENTIOMETERS/TRIMMERS

RV 1	10k log.
RV 2	100k log.
RV 3,4	1M0 lin.

SEMICONDUCTORS

IC 1	NE 5534AN
IC 2	NE 5534N
IC 3	LM 1458
IC 4,5,6,7	CA 3140E
Q 1,2,3,4	BC 548
D 1,2	IN 4148
ZD 1,2	6V8 400mW zener diode
D 3,4	Red LED

MISCELLANEOUS: $\frac{1}{4}$ in. mono jack sockets (2)

NOTES ON THE 80-13

The line input has a nominal impedance of about 60k and is therefore suitable for connecting to the line output (tape,etc) of most audio equipment. Maximum gain =11.

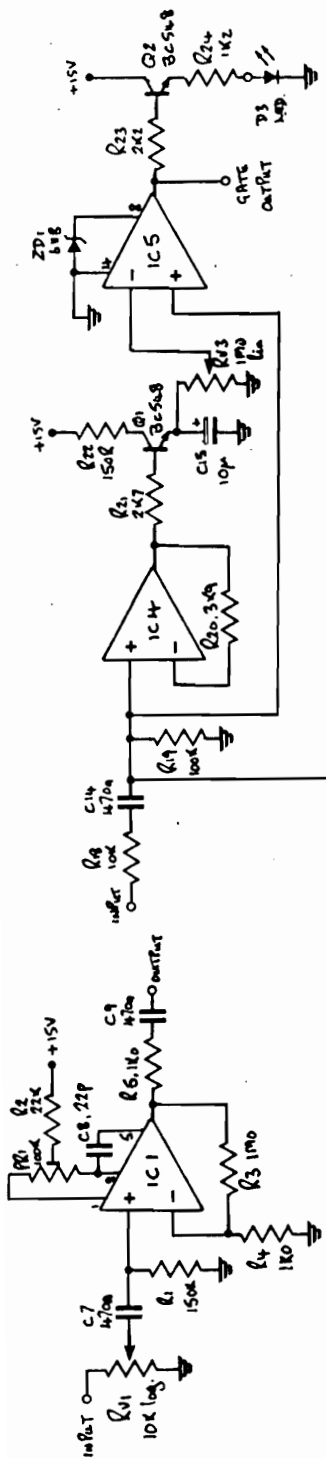
The microphone input has a nominal impedance of about 5k and will work with most microphones. Maximum gain = 1000

In the envelope follower the value of C 13 has been chosen to suit general applications and its value is a compromise between smoothing and time lag. If normally used for a specific application then the value can be altered. For example, when interfaced to a drum pick-up the value may be reduced.

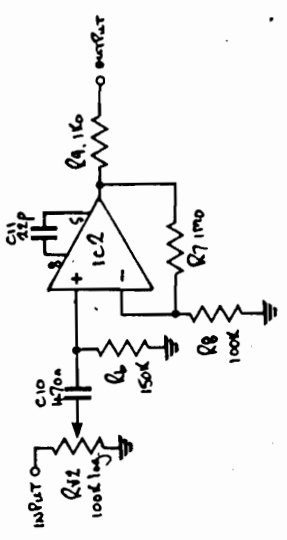
The dual gate/trigger detector may cause most confusion. The design is based on selecting signal peaks as a proportion of the input signal so as to avoid many of the problems arising from signals of varying amplitude. With complex envelopes it is best to make use of the smoothing effect of the envelope follower prior to passing the signal to the peak detectors. In this mode the outputs from the peak detectors would go to an envelope generator controlling a VCA and the envelopes of the original sound will thus be transformed. A more complex patch is to use the envelope follower to reproduce the sound envelope of the input signal and to use the peak detectors to gate an ADSR connected to a VCF which is treating sounds generated by the synthesisers VCO's.

The two peak detectors are annotated 'GATE' and 'TRIGGER' but

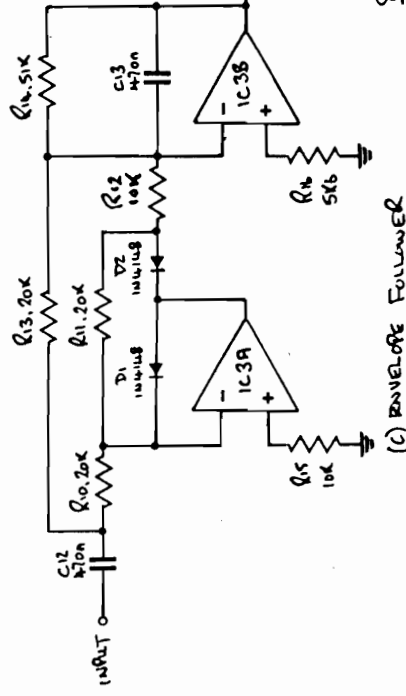
CONTD. ON PAGE 4



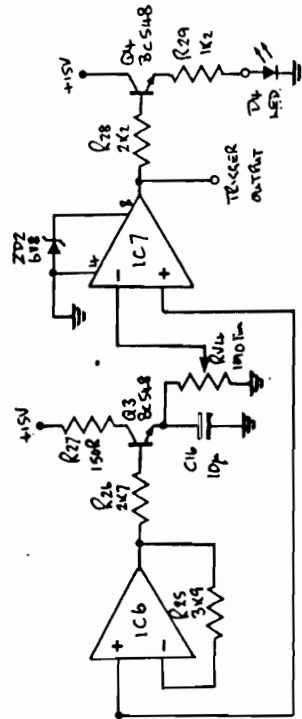
(a) MICROPHONE PRE-AMPLIFIER



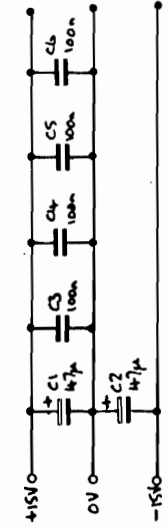
(b) LINE PRE-AMPLIFIER



(c) BUFFER FOLLOWER



(d) GATE AND TRIGGER GENERATORS



- IC1. NE5534AN
- IC2. NE5534N
- IC3. LM11458
- IC4. S.I.7 CA 3140E

FIGURE 1.
80-13 EXTERNAL INPUT MODULE

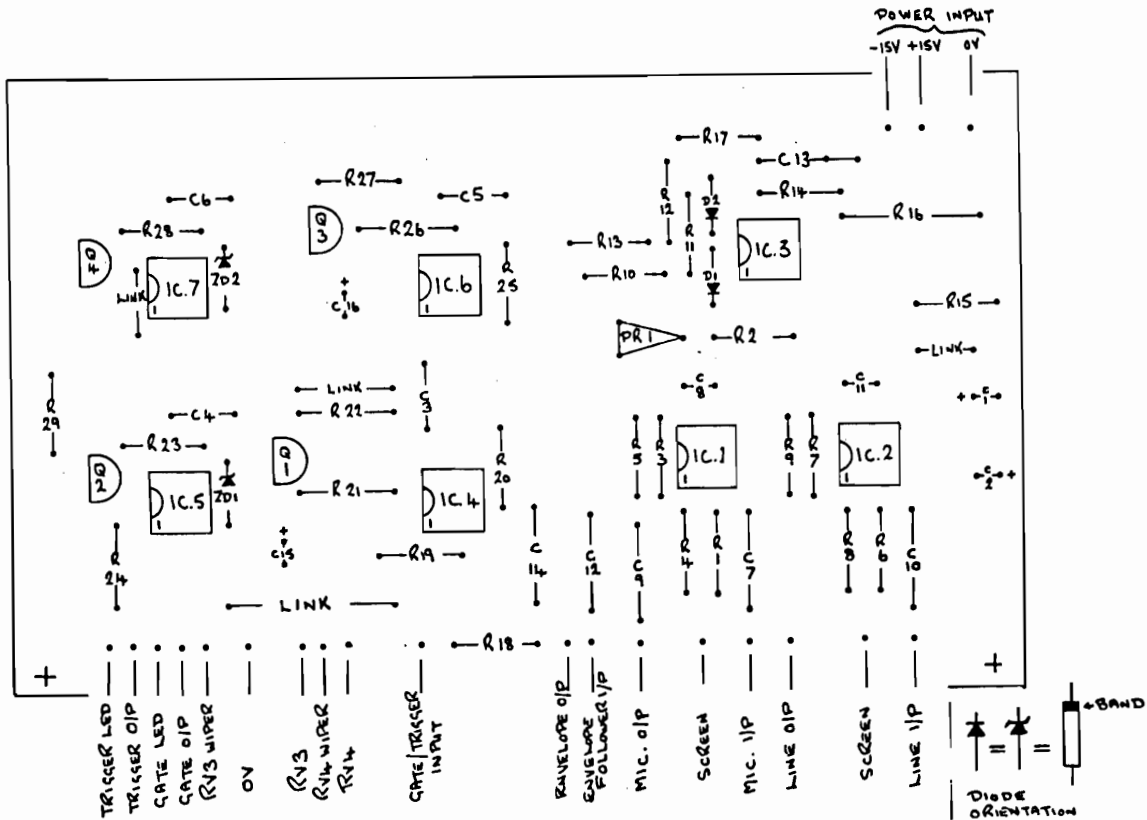


FIGURE 2. COMPONENT OVERLAY

NOTES ON 80-13 CONTD.

they are not totally independent, i.e., they are peak detecting the same signal input. Thus in the context of the logic applicable to the 80-8 and 80-10 envelope generators the gate and trigger concept will only operate satisfactorily if the trigger transients are greater in amplitude than the voltage generating the gate pulse. The advantage of two detectors is, however, the ability to select two levels of sound, such as from two instruments, and using the outputs to gate two separate ADSR's.

THE LED'S CAN BE CONFUSING. With a weak signal the LED's may illuminate but the output voltage swing for the ADSR's may not be adequate to gate the latter units satisfactorily. So if you do not get adequate gating (audibly obvious or as shown by LED indicators on 80-10) then increase the input voltage. ALSO the LED's may illuminate when the unit is not in use due to stray voltages charging up capacitors C 15 and/or C 16. Swapping the CA 3140E's around may cure it or transfer the fault from one output to another but since it does not affect the proper operation of the module these changes are not necessary.

Learning to use the module is best accomplished by trying it out with some pre-recorded music which should either be a straight percussion piece or music with a distinct percussion beat. The latter may be filtered to more clearly separate the percussion.