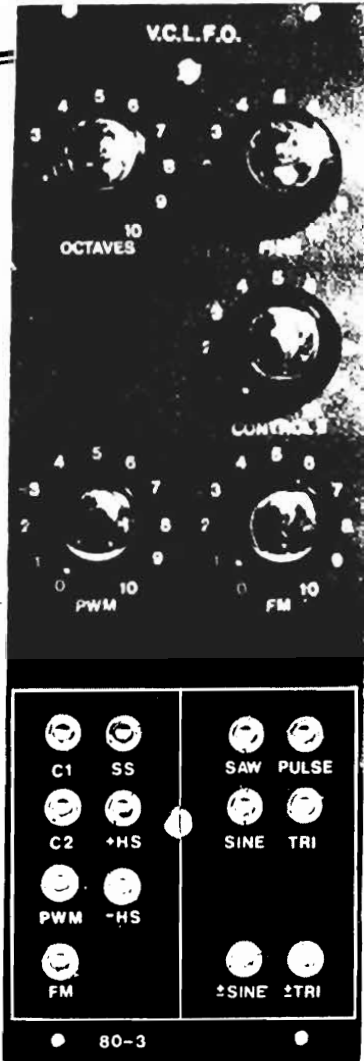


MODULE 1: POWER SUPPLY



Above: both versions of the VCO, panel mounted for rack fixing. Note that all inputs/outputs are at the bottom of the panel to prevent wiring fouling the controls.

A ± 15 V power supply is used for the modules except for the power amplifier which has its own supply. A design based on the 723 regulator is used and the circuit is shown in Figure 1. The circuit incorporates the recommended features for stability and both rails can be adjusted to a precise 15 V output.

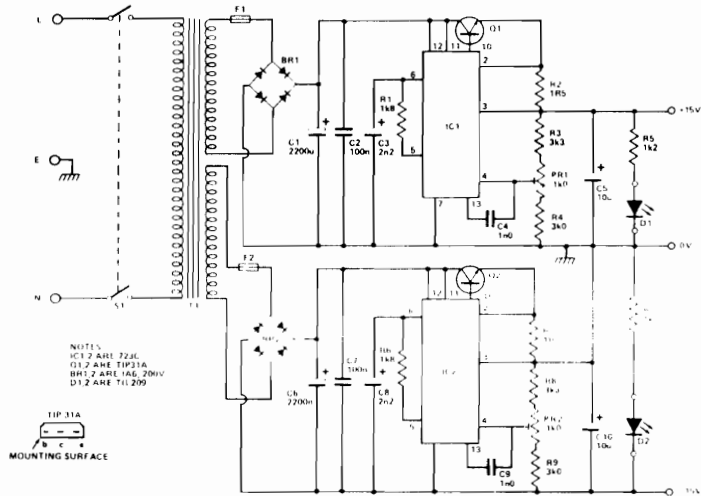
Construction

The PCB has been designed to suit the mounting holes in the recommended case and these same holes can be used

for vertical mounting of the power supply in the keyboard housing by means of L brackets. A 100 mm x 65 mm heatsink provides generous heat dissipation from the plastic box and this is secured to the outside of the rear panel. The transformer should be bolted onto a small piece of aluminium plate which is screwed down to mounting lugs moulded into the box. Addition of plastic feet to the box will ensure adequate ventilation through the grills.

Before connecting to the mains supply ensure that all mains connections

Fig 1 (below). Circuit diagram for the Project 80 power supply.



HOW IT WORKS - PSU

Power Supply

A synthesiser requires very stable power supplies because in most designs the voltage is used to establish reference currents in the exponential generators. It is also desirable that the voltages are set at the precise 15 V levels. The ± 15 V power supply for this project is based on the 723 voltage regulator. The circuit comprises two identical positive 15 V supplies with one of the outputs tied to the ground rail of the other to generate the ± 15 V required.

The circuit will supply up to 300 mA per rail at full voltage and the current sensing resistor R2 (R7) limits output to about 450 mA under overload or short circuit conditions. R3, TP 1 and R4 allow precise adjust-

ment of output voltages; R1 improves temperature stability; C3 increases ripple rejection; C4 is for compensation; and C5 reduces noise on the output which originates from the voltage reference diode in the IC.

The output is adequate for the basic project but if extension is envisaged then the same circuit board can be used for much greater outputs. The only changes required are: increased power rating of the transformer; appropriate increase in value of fuses; adjusting R2 (R7), i.e. halving this resistor will double the current limit and the PCB has provision for two resistors in parallel to facilitate obtaining the correct value. Wire-wound 2W5 resistors are also used since low

ohmic values are more easily obtained and the resistors are physically smaller than 1 W carbon types; increasing power rating of transistors and when more than 1 A per rail is required the latter should be mounted on separate heatsinks.

Setting up voltage controlled synthesiser modules requires a voltage source that can be quickly adjusted to a precise value. A ten turn potentiometer which can be switched to positive or negative voltage is an asset. This is shown on the boxed module. Two commoned outputs are provided, one for the output to the unit being calibrated while the other may be used for direct connection to a voltmeter. Installation of this variable voltage source is optional and components are not listed.

to plug, switch and transformer are properly insulated. The calibration consists of setting TP 1 and TP 2 to obtain, as accurately as possible, +15 V and -15 V respectively.

PARTS LIST - PSU

RESISTORS All 1/4W, 5%

R1,6 1k8
 R2,7 1R5, 2.5W wirewound
 R3,8 2k3, metal film, 100ppm T.C.
 R4,9 2k2, 25V tantalum
 R5,10 1k2
 TP1,2 100 ohm trimmer

CAPACITORS

C1,6 2200uF, 35V electrolytic
 C2,7 100nF, polyester
 C3,8 2u2, 25V tantalum
 C4,9 1nF, polyester
 C5,10 10uF, 25V tantalum

SEMICONDUCTORS

BR1,2 1A6 200 V
 IC1,2 LM 723CN
 Q1,2 TIP 31A
 D1,2 Red LED

MISCELLANEOUS

T1 0 - 17V5, 0 - 17V5
 secondaries, 20 VA
 transformer.
 F1,2 1A fuses with PCB holders.
 S1 DPST rocker switch.
 Heatsink (4°C/W); mains connector;
 output socket.
 The above will fit into a Teko Alba A23
 case.

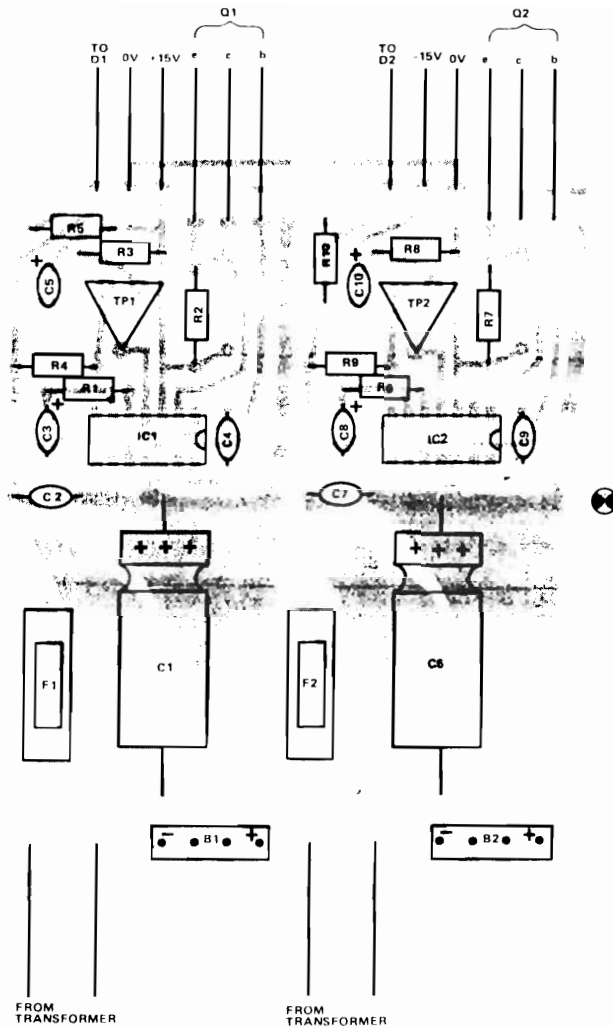
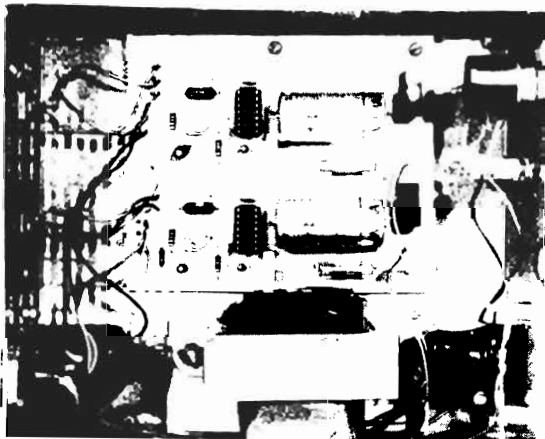


Fig. 2 (above). Component overlay for the PSU project.



Left: the inside story on the PSU project. The heatsink is mounted on the rear panel of the case.