

INTERNATIONAL MUSIC SYNTHESIZERS

The completed International 4600 synthesizer.

Completing the 4600 unit.

THIS month's article completes the description of the larger (model 4600) synthesizer.

Interconnections between modules and the patch board are given together with front panel drawings and details of the cabinet woodwork.

Finally, two small modifications are described. The first improves the reliability of the power supply, and the second eliminates a small inconsistency in the operation of the transient generators.

POWER SUPPLY

The power supply is protected against short-circuit to ground of any the output voltages (except +13.4 volts) and this is normally entirely adequate. However during test procedures on our unit, the +14 volts was inadvertently shorted to the +7 volts. This caused the +7 volts to be taken to +14 volts, and correspondingly, the tracking -7 volt rail to go to -14 volts, damaging some of the CMOS IC's.

Whilst the occurrence of such a fault is considered to be a remote possibility, we feel it is advisable to fit Zeners (8.2 volt 1.5 watt) from the plus and minus 7 volt supplies to ground, and also from the +5 volt supply (5.6 volt 1.5 watt) to ground, to protect against any such fault condition.

TRANSIENT GENERATOR 1

The Transient Generator 1 and Envelope Control modules work well and are very reliable. However, over a long period of use, it was found that

occasional latch-ups of the Transient 1 type modules occurred. To understand the cause of this problem we must refer to the operation of the circuit diagram (Fig. 1) on page 50 of the January 1974 edition.

It will be recalled that, when a key is pressed, a 3-millisecond pulse is generated at point A, which resets IC2, discharges C8 and toggles the flip-flop IC6/3/4. This initiates the attack and causes the output to go to +5 volts. On reaching this level the output of IC4 (via IC6/2/1) toggles the flip-flop IC6/3/4 and initiates the first decay. However, if a new trigger occurs at that same instant, the flip-flop receives two commands and may be set either way, depending on which pulse ends first.

To prevent such latch-up ever occurring the following changes should be made with reference to the original circuit diagram and Fig. 1. of this article. Remove C9, D3, R24 and instal a wire link in place of C9. Next cut the copper PC board track between pins 1 and 2 of IC6 and connect pin 1 to pin 13.

The output of IC6/1 is now a level, not a pulse, and therefore cannot be lost. Thus the trigger pulse into IC6/1 will restart the sequence at any time.

To improve the stability of the circuit, when using fast decay times, it is recommended that R14 be reduced to 100 k and C6 to 10 pF.

TRANSIENT GENERATOR 2

The stability of Transient Generator 2 may be improved by reducing R21 to 100 k. No other changes are necessary on this module.

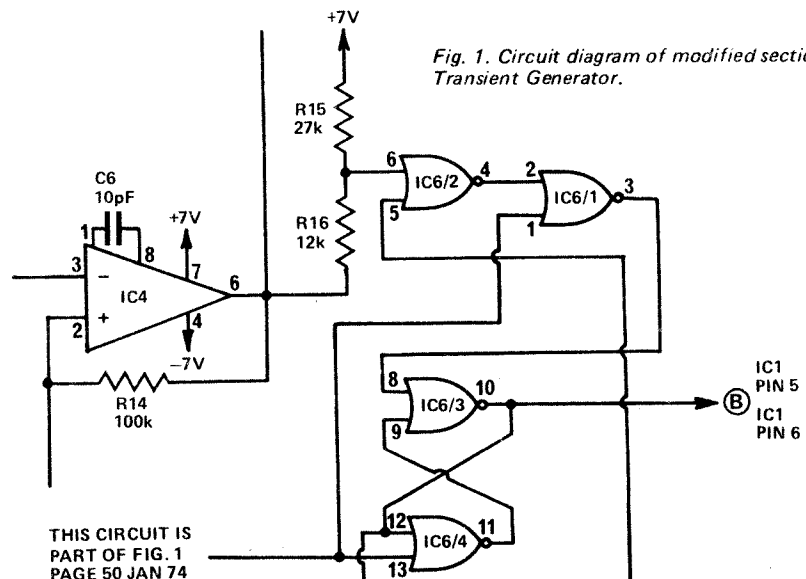


Fig. 1. Circuit diagram of modified section Transient Generator.

WOODWORK

The cabinet, detailed herein, is designed for the keyboards described last month. If different keyboards are used, such as those from Kimber Allen, some dimensions will need to be changed.

The stops (part K) and the hinge (part M) should be assembled to the case with the aid of the front panel. Stand the unit on end and place the front panel in its normally closed position with about 2 mm clearance at the top, and 1 mm clearance at the bottom, of the panel. Mark the pivot hole position and the rear edge of the front panel. Repeat the procedure for the other end. Drill the pivot holes 4.8 mm diameter and 10 mm deep. With the unit upright, fit the panel (using

the parts M as pivots) and support it so that it is open and horizontal. Parts K can now be glued in position such that they rest of the edges of the front panel and are aligned with the pencil marks previously made. When the glue is dry parts M may be screwed into position.

The front panel may be secured in the closed position by a self-tapping screw countersunk into each side of the cabinet. The pivots and securing screws should be individually fitted on each unit to ensure proper alignment. All material, unless otherwise specified, is 13 mm particle board.

ALL DIMENSIONS ARE IN MILLIMETRES

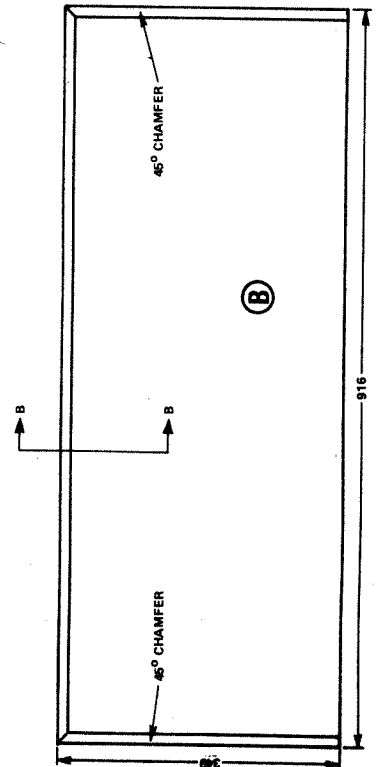
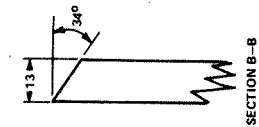
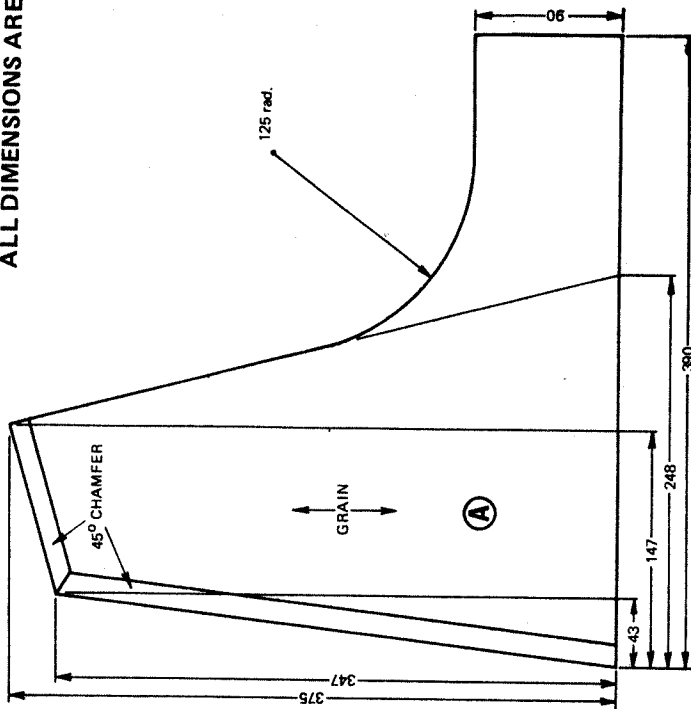
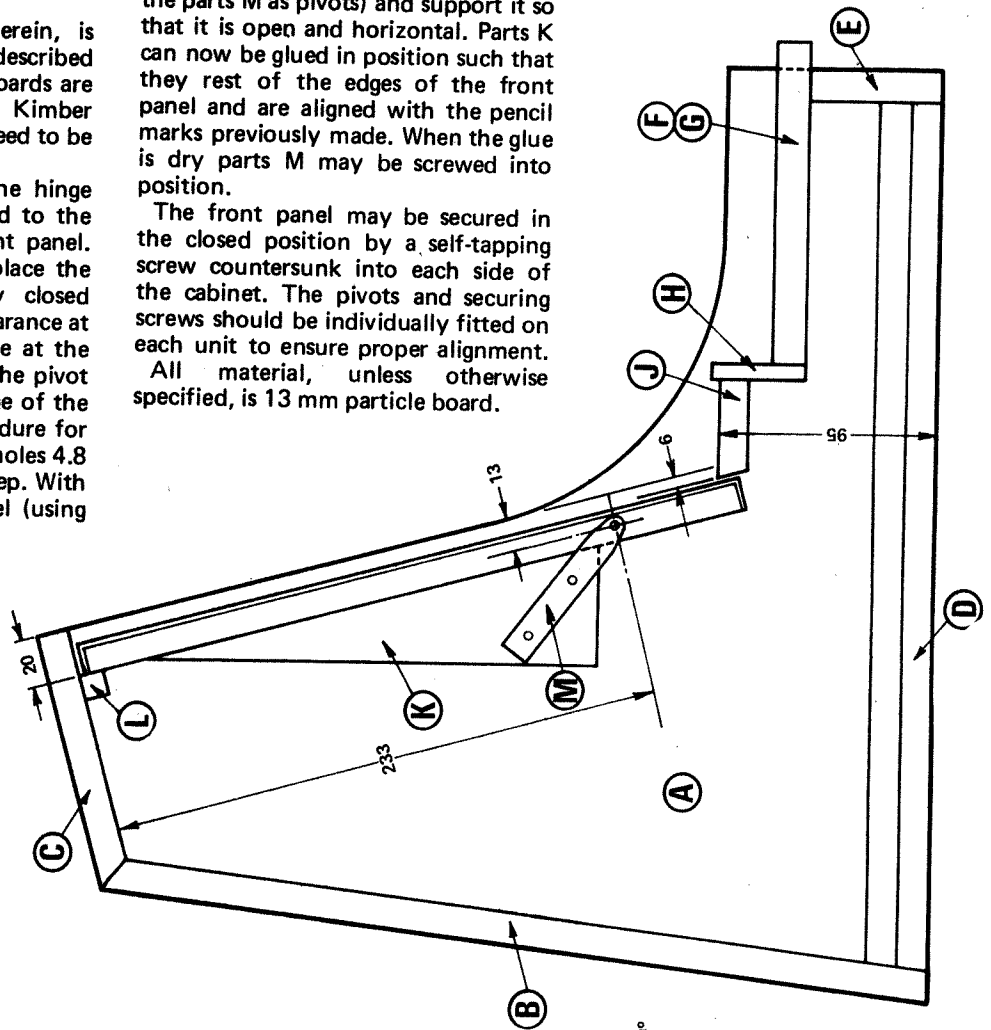
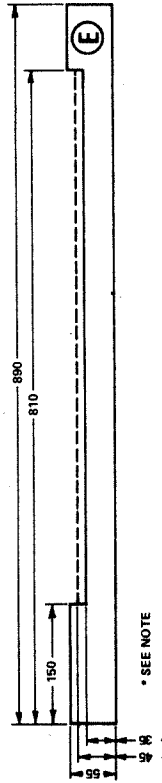
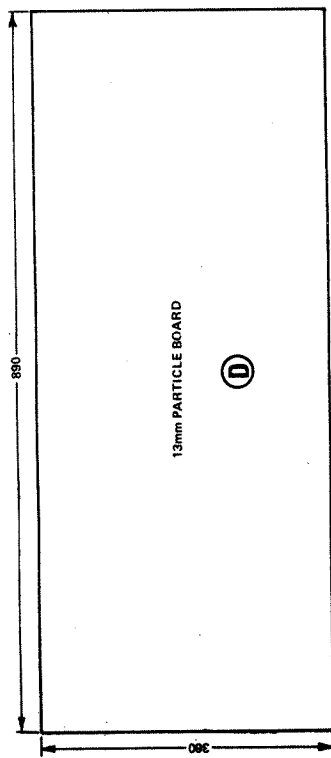
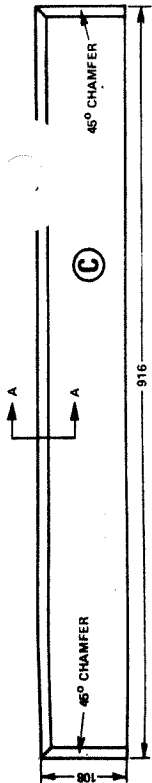
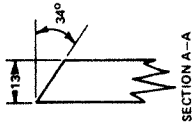
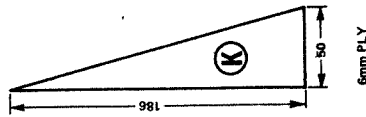
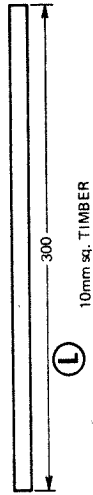
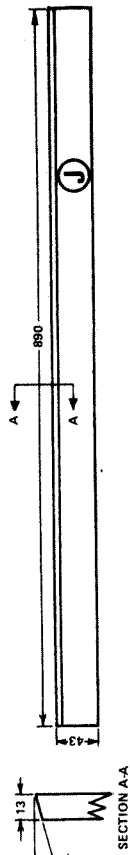
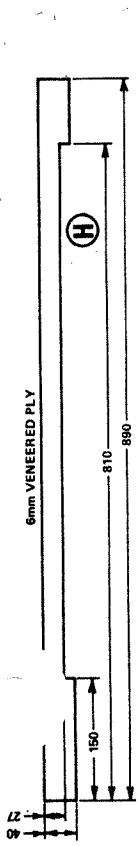
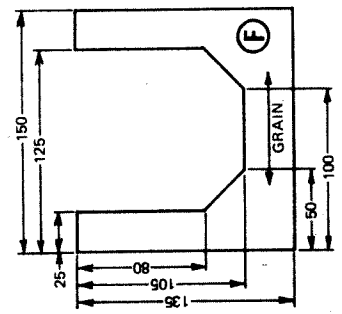
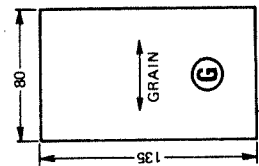


Fig. 2. Cabinet assembly. Letters designate pieces described in separate drawings.





* SEE NOTE

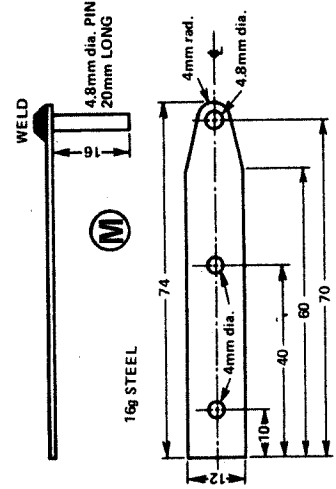


KEYBOARDS

Kimber-Allen have now advised us that whilst they can supply keyboards for the ETI Synthesizer – they cannot fulfill individual orders.

We are currently making arrangements for a bulk purchase of these keyboards.

Readers seeking to purchase should contact ETI.



INTERNATIONAL MUSIC SYNTHESIZERS

To assist constructors, the following negatives are available from ETI.

Full set of printed circuit board negatives \$25.

Front panel artwork, positive or negative (state which required) \$12.50 set. Send cheque/postal order to Electronics Today International, 15-17 Boundary St., Rushcutters Bay, NSW 2011.

ERRATA

May 1974, page 78,
50 watt amplifier.

Lines six and seven in the third column of the parts list should read as follows.

ZD1 Zener diode BZY88C5V6
ZD2 Zener diode BZY88C5V6
ZD3 Zener diode BXZ70C18
(16V or 20V will do)

June 1974, page 86

Reactance Chart.

second paragraph of instructions should read "Note also that 0.7 uF has the same reactance, and an 0.7 uF capacitor and a 10 mH choke will resonate at 2000 Hz.

(Continued on page 109)

AEGIS PTY. Ltd. advises that their factory premises on Thornbury were entered by thieves on the night of Thursday, May 30, and the following items of equipment were stolen — Hewlett Packard HP.35 Calculator, Serial No. 1302S40308. Tektronix Model 422 Double Beam Oscilloscope, Serial No. 140. Sugden Distortion Measuring Unit Type SC453, Serial No. 2128. Sugden Audio Oscillator Type S1453, Serial No. 2059. Odhner Adding & Calculating Machine, Model MX11C/9, Serial No. 21489.

Would anyone knowing anything of the whereabouts of any of the above instruments kindly advise Aegis Pty. Ltd., 347 Darebin Rd., Thornbury, Vic. 3071. Tel: 49-1017 or the Northcote (Victoria) C.I.B.

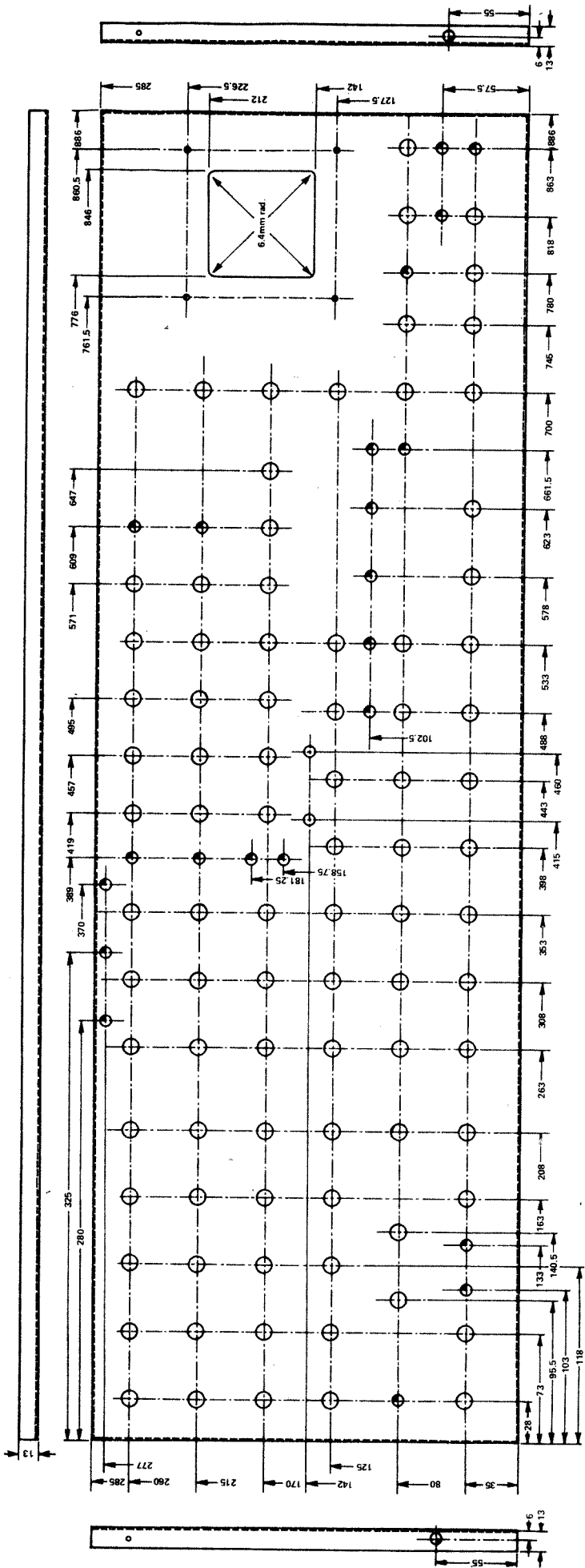


Fig. 3. Front panel metalwork

2 HOLES FOR SELF TAPPERS
POSITION DETERMINED BY
CABINE

● 4 HOLES 4mm dia.

● 24 HOLES 7mm dia.

● 2 HOLES 4.8mm dia.

● 88 HOLES 10.3mm dia.

MATERIAL 16 GAUGE
ALUMINIUM
SATIN ANODISED

MODULE/PATCHBOARD—INTERWIRING

MODULE	INPUTS	OUTPUTS	DESTINATION	MODULE	INPUTS	OUTPUTS	DESTINATION
Oscillator 1	Input	Output	Patchboard 1H Mixer point 2	Transient 1	Key Output Ext. Trigger Key Trigger	Output	Patchboard 16V Ext. Input mod-10 Patchboard 12V Patchboard 13V
Oscillator 2	Input	Output	Patchboard 2H Mixer point 4				
Oscillator 3	Input	Output	Patchboard 3H Mixer point 6	Transient 2	Ext Trigger Key Trigger	Output	Ext. Inp. mod-10 Patchboard 12V Patchboard 14V
Oscillator 4	Input	Output A Output B	Patchboard 4H Mixer point 8 Mixer point 10	VCF 1	Signal Inp. Control Inp.	Output	Patchboard 14H Patchboard 5H Patchboard 7V
Card oller	Transient 2 Patchboard	Trig. Output Key Output Mod Input	Patchboard 14V Patchboard 11H Patchboard 12V Patchboard 16V Patchboard 17V	VCF 2	Signal Inp. Control Inp.	Output	Patchboard 15H Patchboard 6H Patchboard 8V
Noise and Controller	Controller Input	Noise Output Noise Output Cont. Output Cont. Output	Patchboard 10H Osc 4B selector Patchboard 11V Osc 4B selector Patchboard 20V	Amp 1	Signal Inp. Control Inp.	Output	Patchboard 16H Patchboard 7H Patchboard 9V
				Amp 2	Signal Inp. Control Inp.	Output	Patchboard 17H Patchboard 8H Patchboard 10V
Mixers	2 4 6 8 10 RV61 RV62 RV81 RV82	Output 1 Output 2 Output 3 Output 4 Output 5	Osc 1 Output Osc 2 Output Osc 3 Output Osc 4 Output Osc 4B Output Patchboard 18H Patchboard 19H Patchboard 20H Patchboard 21H Patchboard 1V Patchboard 2V Patchboard 3V Patchboard 4V Patchboard 5V	Output Module	Input 1 17 19 21	Output 18 Output 20 Output SW1 Output 22 Phone Out.	Patchboard 22H Horiz. Joystick Vert. Joystick Patchboard 9H Patchboard 18V Patchboard 19V Rear phone jack Patchboard 15V Phone jack
				External Inputs	Ext. Input 1 Ext. Input 2 Ext. Trigger from patch- board	Ext. 1 Out. Ext. 2 Out. Ext. Trigger (10) Out.	Rear phone jack Rear phone jack Patchboard 12H Patchboard 21V Patchboard 22V Envelope Transient 1 Transient 2
Envelope	Keyboard Output Ext. Output Key Trigger Signal Control	Output	Not used Ext. Input mod-10 Patchboard 12V Patchboard 13H Not used ext. Patchboard 6V				

Notes: The patchboard is numbered 1H to 22H left to right and 1V to 22V top to bottom.