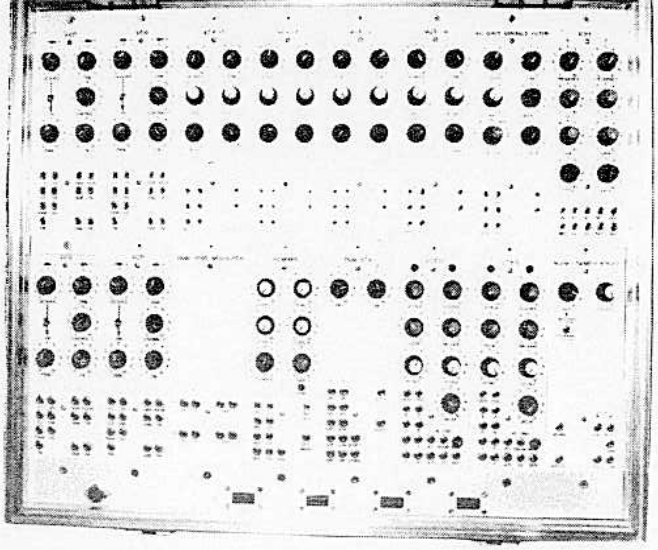
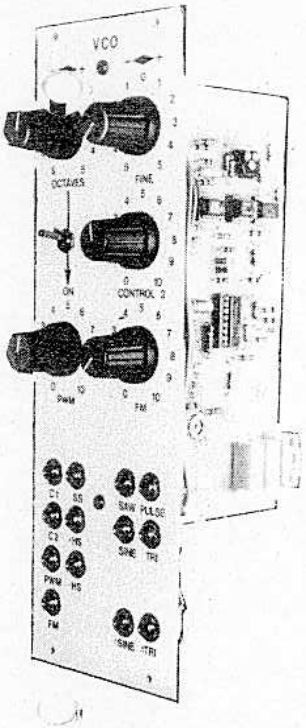
MODULAR SYNTHESISER





The principal of modular sound synthesis has always been regarded as by far the best in terms of flexibility. It also allows an impressive system to be built up gradually and adapted as time goes by along with the needs of the musician and his resources.

More recently, microprocessors have become available to completely control this type of system. This has expanded the possibilities still further whilst keeping the total cost within reasonable limits.

However, because of the relatively limited interest of the general public for this type of system, its price has gradually risen. Strange as it may seem, this suited us, because in turn the majority of the large manufacturers became disinterested, which left room for us to launch our own similar, but unique system, at a sensible price.

kit or ready built

Since the introduction of the Digisound 80 modular synthesiser in February 1980, some tens of thousands of modules have been sold throughout the world. While most customers use them in conjunction with our keyboard controller to consruct a versatile monophonic synthesiser for multi-track recording, many others employ our polyphonic controller to configure systems which cannot be matched by conventional analogue keyboards. Additionally, we have customers who use specific modules to enhance their current equipment or even employ our units for medical and other scientific research.

One of the most interesting facts to emerge in the last five years is that our growth has mostly been due to personal recommendation from customers to other musicians. Furthermore, we are pleased to record that many customers have been with us from the start and are continuing to expand their system.

* COMPATIBILITY

Our modules follow the specifications most widely adopted by the manufacturers of analogue synthesisers : 1 Volt per octave control voltage scale, wide-ranging positive gate voltages, high input impedance, low output impedance and a high signal level to allow multiple patching without introducing significant noise or instabilities in the control and output signal levels.

* HIGH TECHNOLOGY DESIGN

In practically all of the modules we use high technology integrated circuits (e.g. Curtis CEM series) and are in continual contact with their manufacturers' in order to incorporate the latest innovations into them. When improving basic modules such as oscillators, filters and amplifiers we ensure that the new module is fully compatible with earlier versions - even when used within a polyphonic system.

* EXPANDABILITY

Within our system there is a large variety of different modules, ranging from the essential VCO to a versatile envelope generator in which each parameter (A,D,S,R) may be individually voltage controlled, and treatment modules such as our unique solid state reverberation unit.

* MULTIPLE OPTIONS

Our series of modules is available built and tested ready for use (with full technical back-up for those requiring it) or in kit form, more or less complete. In kit form, it is possible to obtain all parts separately (e.g. the printed circuit board (many with component overlay), the electronic components, the front panel, the switches, the jack sockets (3.5 mm), the power connectors, the PCB mounting pillars etc.) so that a customised synthesiser may be constructed, if desired. The kit construction does not require any specialised knowledge, and because of the extensive use of sophisticated integrated circuits, most of the modules require little or no calibration.

* QUALITY

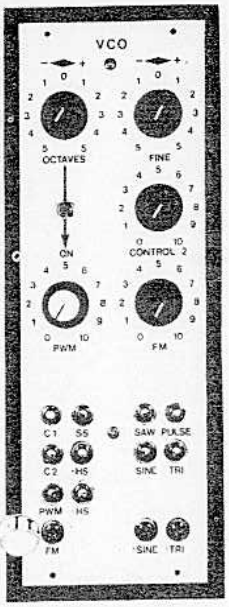
Only first grade components are used to ensure that performance standards are met. The modules are spaciously laid out on glass fibre printed circuit boards. Most modules are mounted on a nine inch by three inch (229 x 76 mm) white panel. These panels are made from long lasting plastic coated steel printed with a scuff resistant black ink and form an attractive set of modules with easy to read markings.

* LOW COST

The majority of our designs have appeared in leading U.K. technical journals, such as "Electronics Today International" and "Electronics and Music Maker". It is therefore available for all to judge that a particular design is 'state of the art' and that the end product is value for money. Furthermore the low cost approach is maintained by allowing direct purchase from DIGISOUND LIMITED or from overseas agents who share the same aims.

* CONTINUING SUPPORT

In mid-1981 we introduced our ALPHADAC 16 synthesiser controller which enables up to sixteen voices to be controlled by the built-in microprocessor and ROM programs. Many of the keyboard control routines were novel in 1981 and even today we are not aware of an analogue system which allows up to sixteen voices to be recorded and played back. Perhaps the greatest advantage of ALPHADAC 16 is the fact that the user does not have to know anything about microprocessors or their application. On the other hand, for those customers familiar with personal computers, our keyboard controller is digital and our synthesiser has been coupled to many micros since 1981.
Not all modules have to incorporate the ubiquitous micro. In November 1983 a dual VCLFO was added to the range and more recently we have brought out our Voice Card and a Voltage Controlled Digital Oscillator.

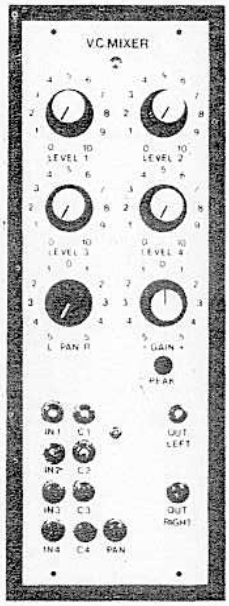


80-2 VOLTAGE CONTROLLED OSCILLATOR

- output levels 0-10V (peak-to-peak)
- 6 outputs available simultaneously : triangle, sawtooth, pulse and sine, together with sine and triangle at +/-5V
- 3 types of synchronisation may be used simultaneously to obtain very specific sounds : hard, from both negative and positive pulses, and soft
- frequency range from 0.1 Hz to 40 kHz, covered in a single range
- linear (true frequency modulation) and exponential voltage control of frequency
- pulse width modulation adjustable from 0 to 100%, either manually or by voltage control
- excellent stability (CEM 3340)

80-4 VOLTAGE CONTROLLED MIXER

- frequency response 0 Hz - 18 kHz
- 4 independent VCAs summed through left and right outputs
- automatic panning of the output by voltage control
- maximum input and output levels : +/-10V
- LED level indicator
- output gain adjustable from -16 to +14 dB

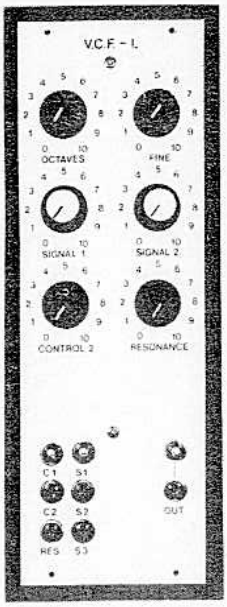


This mixer may be used manually or entirely under voltage control. In the case when just one of its outputs is used, the balance control acts on the overall gain of the output level, giving in effect an entirely automatic 4/1 mixer. It is possible to construct some very complex waveforms by additive or subtractive synthesis (according to the phase of the sources present) and to alter them by voltage control. This mixer will operate just as well on control voltages as on audio signals. By using pulse wave inputs, multiple sequences are also possible. Finally, the output may be passed through the rest of the system for special effects.

80-5 PROCESSOR

This processor allows the use of an audio or control voltage output from another module to simultaneously control up to 4 other modules without any loading problems.
Four channels of this type are available on the processor with individual attenuation of their output levels. Two signal phase inverters are also provided.

Finally, a lag processor is incorporated ; this slows down control signals, transforming for example, a square wave into a triangle.



80-6 VOLTAGE CONTROLLED FILTERS

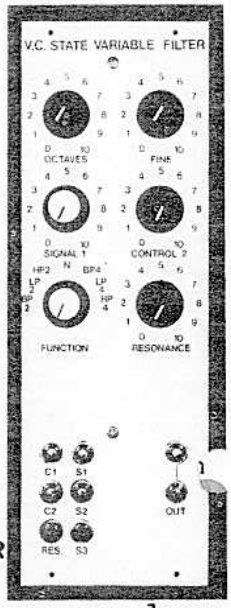
Four types are available :

VCF LP	Low Pass, 24 dB/octave
VCF BP	Band Pass, 12 dB/octave
VCF HP	High Pass, 24 dB/octave
VCF P	Phase Shift, 24 dB/octave

Main features :

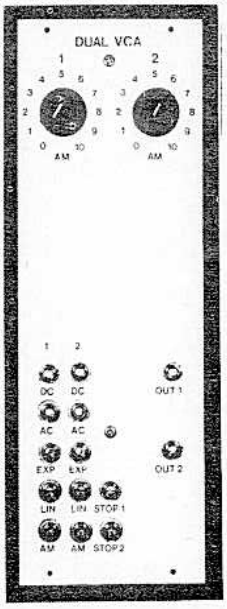
- three signal inputs (two with attenuators)
- voltage control of frequency and resonance (Q)
- the low pass filter may also be used as a sine wave oscillator (1V/octave)
- excellent signal to noise ratio
- precision adjustment by use of the FINE control

These four modules make up a high performance filtering system that may be readily added to all existing synthesisers, considerably expanding the possibilities of audio processing.



80-7 VOLTAGE CONTROLLED STATE VARIABLE FILTER

This module provides 7 different filter functions selectable by means of a rotary switch : low pass, high pass and band pass at 12 or 24 dB/octave plus a notch filter.

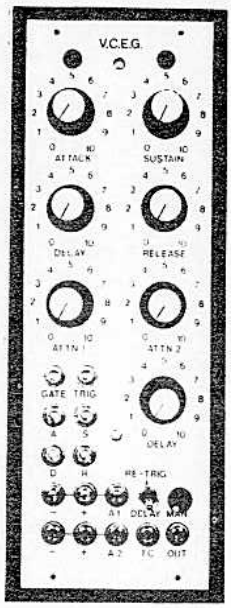


Voltage control of frequency and resonance (Q) is available (but the filter will not self-oscillate).

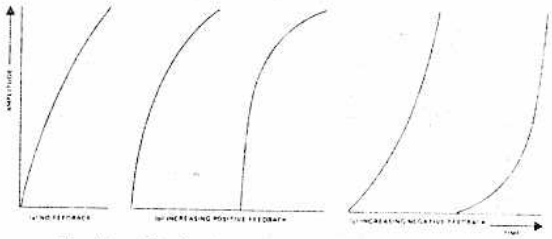
80-9 DUAL VOLTAGE CONTROLLED AMPLIFIER

This module is primarily used with an envelope generator or an LFO in order to control the amplitude of an audio signal through the AC input. It is also possible to control the amplitude of control voltages via the DC input.
The control response may be either exponential (9 dB/octave) or linear (10%/volt).
A "STOP" input readily allows, by means of a negative voltage, the VCA output to be cut off sharply, ensuring synchronisation with other units.

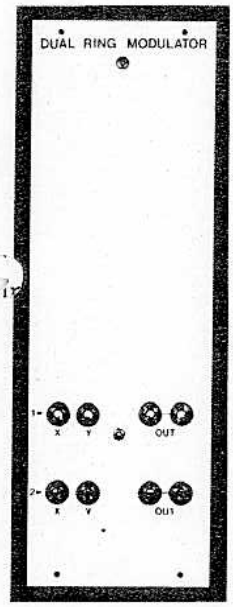
80-10 VOLTAGE CONTROLLED ENVELOPE GENERATOR



- individual voltage control of Attack, Decay, Sustain and Release
- single input (TC) for simultaneous control of the three parameters A, D and R
- A, D and R independently adjustable from 2 mS to 20 seconds
- independent GATE and TRIGGER inputs (+5 to +15V)
- GATE delay control : 0 to 5 seconds
- output : 0 to +10V, which may be inverted
- two attenuators, with or without phase inversion, are provided in order to allow part of an output signal to be reinjected into one or other of the envelope parameters, making the curvature of the envelope more or less convex or concave
- envelope re-triggering for periods up to about 2.5 seconds allowing the production of envelopes with two peaks
-manual gating button



The effect of feedback on the attack response.

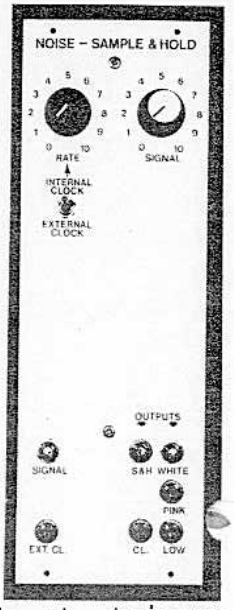


80-11A DUAL RING MODULATOR

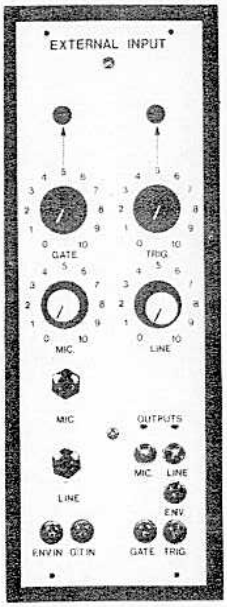
This module produces the sum and the difference of the frequencies within two input signals, ideal for the production of sounds like gongs, bells, chimes etc.

- 2 totally independent ring modulators
- input/output : 10V peak-to-peak
- signal feedthrough via the X input (carrier input) may be supressed to -50 dB, with Y input supressed to -40 dB
- nominal unity gain (or -6 dB when the same output is applied to both inputs i.e. frequency doubling)
- dual ganged output for each circuit

80-12 NOISE GENERATOR & SAMPLE AND HOLD



- 3 types of noise : white, pink and low frequency
- output level : 5 to 10V peak-to-peak
- an input for signal sampling and a corresponding voltage controlled output
- attenuation of input and clock rate incorporated
- input for external clock



80-13 EXTERNAL INPUT

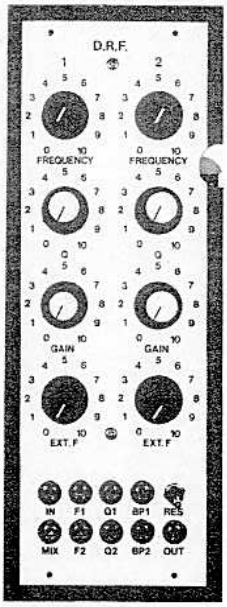
- line input (60 kOhms/+20 dB) and microphone input (5 kOhms/+60 dB), separately attenuatable
- two peak detection circuits generating "GATE" and "TRIGGER" signals at trigger thresholds, individually attenuatable
- envelope follower for audio signals

80-14 STEREO POWER AMPLIFIER

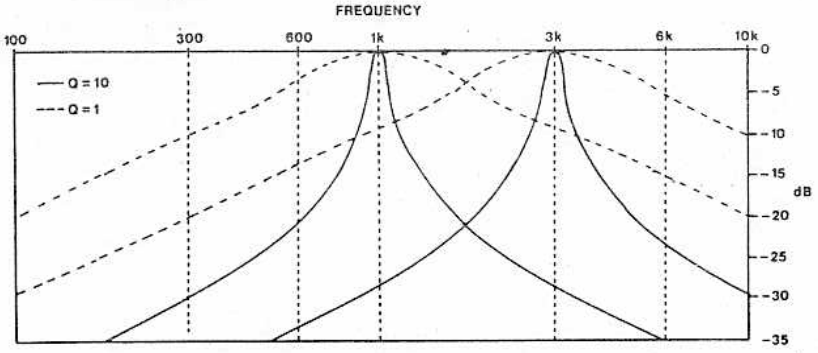
10 W into 8 Ohm speakers with switched headphone output

80-16 DUAL RESONANT FILTER

Two filter circuits, individually controllable and producing two independent resonant peaks



- frequency range of 30 to 3500 Hz
- Q variable from 0.5 to 10
- maximum gain : 13 dB

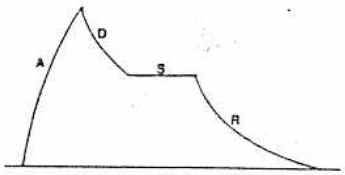


EFFECT OF Q ON BANDPASS RESPONSE

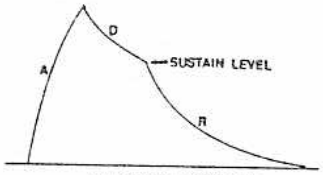
- voltage control of frequency and Q
- separate band pass outputs for each filter
- additional output for the combined signals in phase, with a switch permitting mixing of the (inverted) input with the combined output
- provision for reinjection of the output signal (phase inverted) to produce special effects

80-18 DUAL MULTIFUNCTION ENVELOPE GENERATOR

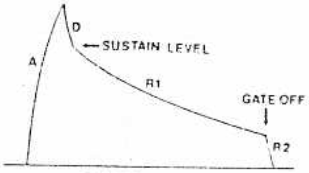
- two independent envelope generators
- may be triggered manually or by external input (+5 to +15V)
- separate GATE and TRIGGER (allows rapid retriggering) inputs
- three modes of operation
  - . normal : Attack, Decay, Sustain, Release
  - . automatic : a short pulse triggers a complete ADR envelope
  - . damped : a gate signal produces an ADRR envelope (piano-like)
- cycle length for each parameter : 2 mS to 20 seconds



NORMAL ADSR ENVELOPE



AUTOMATIC ENVELOPE

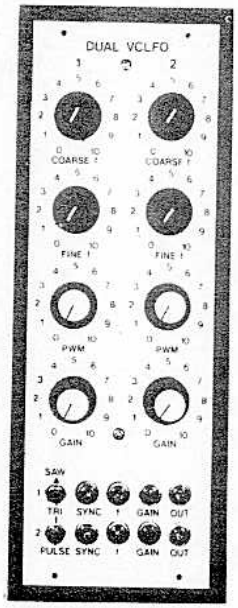


DAMPED ENVELOPE

80-18A DUAL ADSR ENVELOPE GENERATOR

Same as 80-18 but functioning only in the normal ADSR mode

80-19 DUAL VOLTAGE CONTROLLED LOW FREQUENCY OSCILLATOR



- 2 VCLFOs in the same module
- frequency response from 150 Hz to 1 cycle every 10 minutes (1:50,000) in a single range
- two frequency adjustments for precise control (coarse and fine)
- three output waveforms available : triangle, sawtooth and pulse
- manual control of pulse width
- attenuation of output level from 0 to +10V
- voltage control of LFO frequency and gain

- two types of sync input, one allowing the LFO to reset and start from zero from a positive edge, and the other causing it to reverse direction from a positive edge.

As a result of these features, a number of effects which are not normally available from a single module may be obtained.

80-15 KEYBOARD CONTROLLER

The keyboard controller is based on a digitally scanned keyboard so that it may be readily interfaced with a microprocessor, such as our ALPHADAC 16 system. As a monophonic controller it is, however, generally easier to construct, has a sample & hold which will not droop plus more accurate scaling than most analogue designs. For ease of construction and expansion we recommend that the logic controller (80-15D1) is housed within the keyboard case and the digital to analogue converter (80-15D2 or ALPHADAC 16) is housed in the module rack.

80-15A, 80-15B OR 80-15C - KEYBOARD PCBs

These sets of PCBs suit 37, 49 and 61 note keyboards and are glued direct to the keyboard frame as a base for both key contacts and diodes. They are suitable for keyboards from Maplin, Clef Products and Kimber-Allen. We prefer the quality of the latter and our keyboard case only accepts the 49 note SKA keyboard from Kimber-Allen. The key contacts only need to be a single make type and the Kimber-Allen GJ types are suitable. Many customers have used other key contacts as well as upgraded existing analogue keyboards without using these PCBs.

80-15D1 - KEYBOARD LOGIC CONTROLLER

This scans the diode matrix of the keyboard and encodes the output. It will modify to the microprocessor control version (80-15D1A).

80-15D2 - DIGITAL TO ANALOGUE CONVERTER

This module converts the digital data from 80-15D1 to an analogue output for driving the DIGISOUND 80 modules. It also provides the gate output for the envelope generators. Portamento and modulation controls are included.

80-15D3 - LOGIC STATUS INDICATOR

The 80-15D2 panel accomodates this unit which will display, using miniature LEDs, the data bits from the keyboard controller as well as the gate status.

80-15E - OCTAVE SHIFT, X-Y CONTROLLER AND TOUCH TRIGGER

This provides switchable octave shift of keyboard range by -2, -1, +1, +2 and +3 octaves. It has an X-Y joystick controller (for pitch bend etc.) with zero volts at bottom left hand corner and a range for both X and Y outputs of just over one volt. These values may be altered by the user. A touch trigger for use with the 80-10 module is also included.

ALPHADAC 16 SYNTHESISER CONTROLLER

This is a microprocessor based controller which when used with a keyboard and the 80-15D1A controller (or compatible type) will control up to 16 voices, or may be used to control most other synthesisers with external control inputs. ALPHADAC is, however, more than a polyphonic controller since its basic programs (DIGI-2 EPROM) have many keyboard control routines. The latter include:- split keyboard in which the keyboard may be split at any point such that either the top or bottom of the keyboard is monophonic and the remainder polyphonic; transpose in any interval from 1 to 15 semitones and may be applied to either part of a split keyboard; select glide (on or off), again on either side of a split keyboard; arpeggiation routines on up to 16 keys and include up or down, up and down, hold, legato and staccato modes as well as selection of speed. The unique feature of ALPHADAC is the ability to operate these programs in real time, that is, the system is controlled via a 16-key pad and by pressing the appropriate button the effect may be brought into play in time with the music. Even more important is that many of the routines may be in operation simultaneously. This gives unique control capabilities for analogue synthesisers and the routines even make ALPHADAC worthwhile when only one or two voices are available. DIGI-2 also includes some short sequencer routines which may be programmed in real time or by pressing single notes. Furthermore has a 'Tune' program which, in addition to being used for tuning to any key, allows all the voices available to be played monophonically producing a really 'fat' sound.

Late in 1981 four new composing, recording and sequencing programs were introduced in EPROM form and designated REC-1. These programs are:-

REC 1. This is a real time four channel recording system with automatic repeat facilities.

REC 2. With REC 1 up to four channels are recorded monophonically and combined on playback whereas REC 2 is a polyphonic recording system and may be used for as many channels as you have available (maximum of 16).

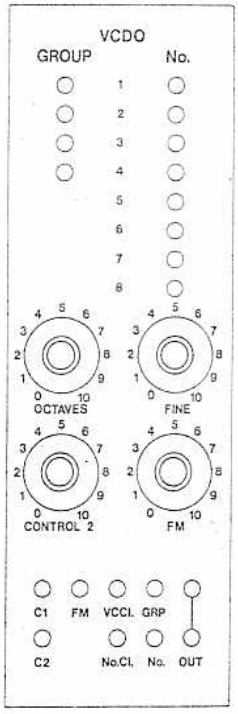
REC 3a and REC 3b. These are not real time (NRT) polyphonic sequencers/composers fixed at a maximum of four channels. They allow entry from the keyboard or control keypad respectively.

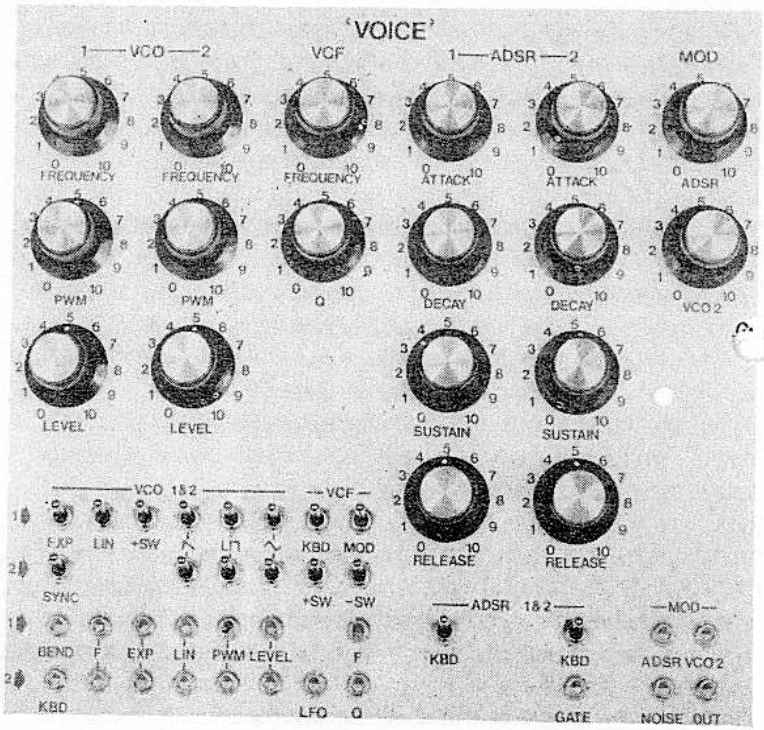
80-17 - REVERBERATION UNIT

We believe that this was the first solid state alternative to the somewhat suspect spring line reverberation units. It is based on the MN 3011 BBD, which has six tapped delays with the longest delay available being 166 mS which gives a useful reverberation time of about 3 seconds. The reverberated bandwidth is limited to 3.6kHz, much the same as spring lines, and to compensate for this the original signal is mixed with the treated signal. A major advantage of this unit is the ability to vary the reverberation time. The PCB has a ground plane which greatly inhibits interference with other modules.

80-21 - VOLTAGE CONTROLLED DIGITAL OSCILLATOR

This module adds exciting new possibilities to existing synthesisers by combining the flexibility of analogue voltage control with the clarity and realism of digitally generated waveforms. The design is fully compatible with most other systems (1V/octave frequency control, 10V peak-to-peak output, linear and exponential modulation inputs) and offers the versatility of 32 different waveforms (encoded in a 2716 EPROM) covering a wide variety of sound textures.



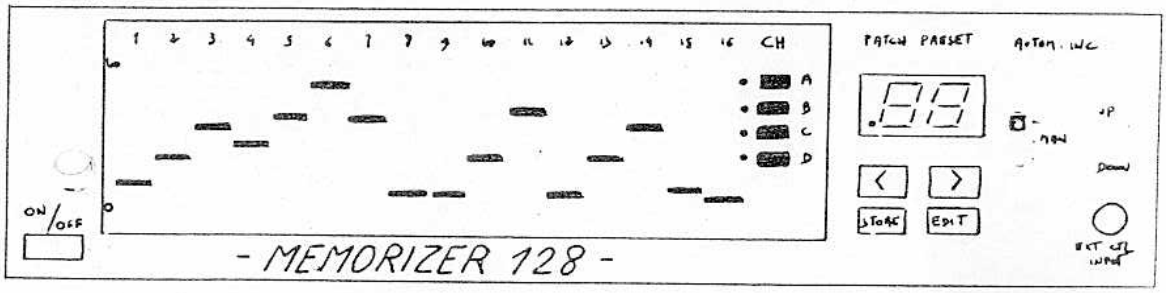


80-C9 - VOICE CARD

The Voice Card provides the complete sound processing circuitry for a monophonic synthesiser voice. On-board design includes two VCOs, a four pole low pass VCF, two ADSR envelope generators and five VCAs which together comprise a relatively elaborate synthesiser voice. Some of the interconnections between the above circuit blocks are hardwired, but a degree of flexibility has been maintained by the use of electronic analogue switches. The routing of these enables the most popular synthesiser patches/effects to be selected. The circuit functions are controlled either by means of manual potentiometers which are disabled on insertion of a jack plug into the appropriate CV input socket or by independent potentiometers and external CV input sockets.
An accurately scalable keyboard control input is provided and may be calibrated to the usual +1V/octave control voltage standard. Inputs are also provided to enable connection to external equipment such as LFOs, sample and hold networks and other control voltage generators. An audio input is also available, allowing an external noise source (or additional oscillators) to be mixed with the audio output of VCO 1.

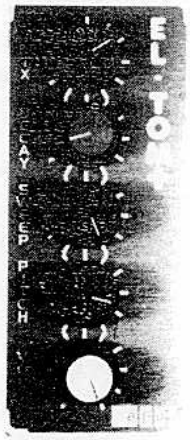
The MEMORIZER

A complete control system for any modular analog synthesizer.
Not only all the settings but also all the patchings of the modules to be memorised. (128 programs of 32 control voltages minimum).
Another interesting point is that this system is fully expandable (by 16 Control Voltages at a time). So the musician can start with a minimum investment and let the system grow with his needs and his financial capabilities.

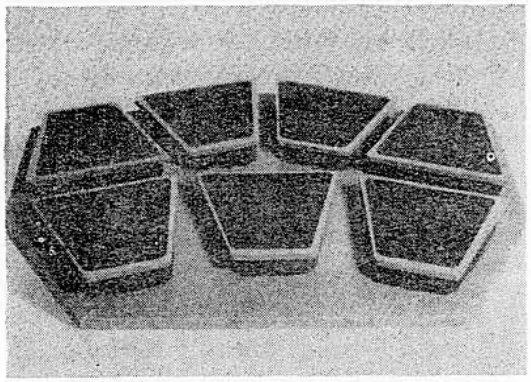


RANGE OF ELECTRONIC DRUM MODULES

- power supply - 9V battery or external
- incorporates triggering by piezoelectric transducer
- external microphone input
- trigger input for sequencer



- any combination of 7 modules may be mounted in a 19" rack having its own power supply
- several modules may be connected in parallel and used with a single trigger



EL-TOM

All the sounds of electronic drums, from a bass drum to toms and bongos

EL-TOM+

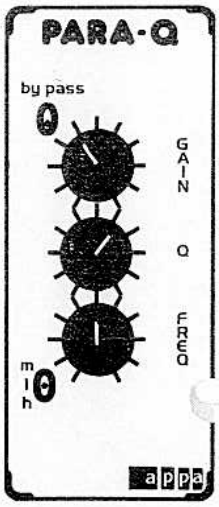
(noise generator included)
Clear electronic drums and special effects

EL-CYMB

Cymbal sounds, handclaps, explosions etc.

MODULAR PARAMETRIC FILTER

- gain : +/-18 dB
- Q variable from 1 to 25
- smooth frequency control in 3 selectable ranges : 36Hz-7.5kHz, 45Hz-10kHz or 65Hz-15kHz
- maximum output level : +26 dBV
- low noise (even with controls at maximum)
- no insertion loss
- possibility of connecting the modules in series (cascade, multiple correction), or in parallel
- available in individual case (57x132x73mm), or in a 19" rack (which holds 7 modules and a power supply)
- power supply : +/-15V or 2 x 9V batteries



AVAILABILITY

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