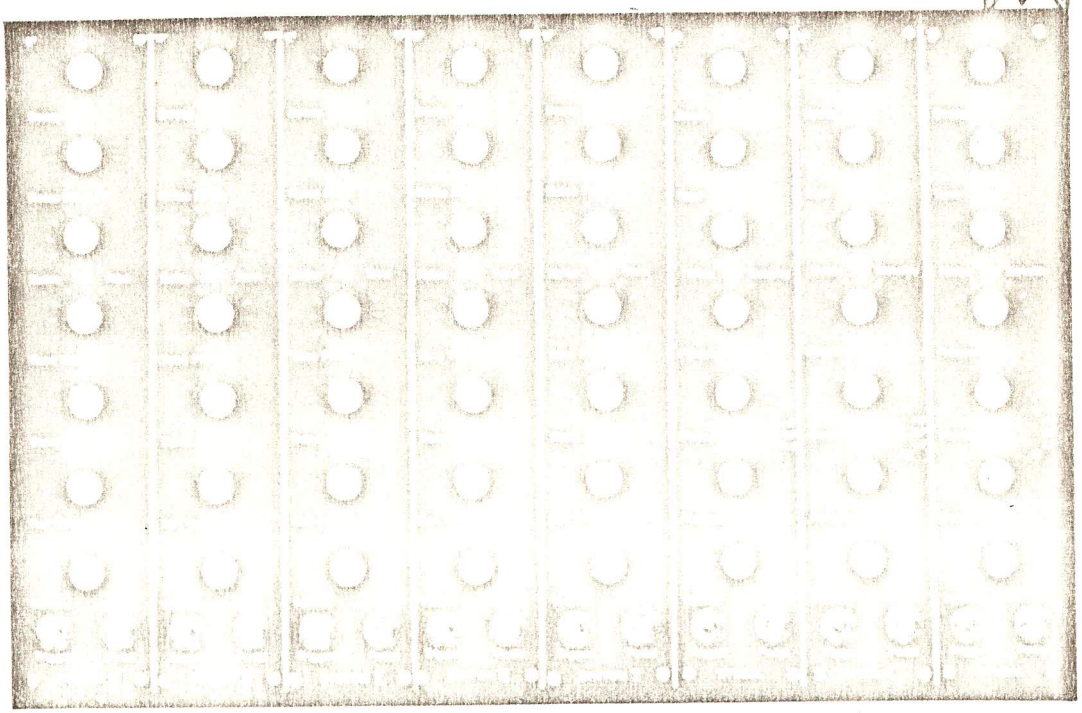
SYNTOM II

by Kenneth McAlpine

PARTS COST GUIDE with Pre-sets £11.50



Modular percussion system.

- ★ Tone and Noise Voicings
- ★ Dynamic Response
- ★ Built-in Roll oscillator
- ★ Modular construction
- ★ Optional Stereo Output

Syntom II is the second of our two modules which are intended to provide a complete range of electronic percussion. This unit can provide drum sounds such as Bass, Snare or Tom-Tom while the 'metallic' sounds such as Cymbal or Hi-Hat can be obtained using the Synbal circuit described in the February 1983 issue.

The modules can be built up in any combination to create a custom percussion system, sounds being continuously variable, or pre-set.

Drum Synthesis

When a drum is struck, sound is produced by the vibrating skin. This may seem obvious, but the nature of the tone is influenced by several factors, amongst which are: the size of the skin, larger diameters producing lower tones; the tension of the skin, slack skins producing longer decays and the striking force, hard hits 'bend' the skin causing a slight change in pitch as well as a louder sound.

To synthesise a drum correctly we must therefore have a sound source which can be varied in pitch and duration as well as responding to a striking force both in terms of pitch and amplitude. In the case of the Syntom II the basic layout is shown in the block diagram, Figure 1.

Since all drums have some noise content apart from the basic tone, two types of sound are provided, these are filtered noise and triangle wave tone. Both can be varied in pitch and the balance can be adjusted using the mix control.

When the circuit is triggered the envelope generator produces a voltage which is connected to the Voltage Controlled Amplifier (VCA) and controls the level of the Noise/Tone mix. Thus a percussive envelope of sound is produced with variable pitch and decay. Some of the envelope voltage can be fed to both the noise - Voltage Controlled Filter (VCF) and tone - Voltage Controlled Oscillator (VCO) to produce the required bend.

The Low Frequency Oscillator (LFO) can be used to create drum rolls when a foot pedal is connected.

To allow the modules to be placed in the stereo field an optional panning network is also provided.

Trigger inputs are level sensitive which gives the sound a dynamic 'feel' when using a drum pad as the source - the harder the pad is struck the louder the output and greater the bend.

Circuitry

The complete circuit diagram is shown in Figure 2.

Noise is generated by making TR1 (a standard NPN) zener - reverse biasing the emitter - base junction. The value of R1 may have to be varied, however, to provide a suitable noise level although the value given is a good starting point. Signals from the transistor are decoupled by C1 and amplified by IC1a. This is then connected to a -12dB/Octave VCF based around IC3 a dual transconductance amplifier. A Bandpass output is provided at pin 8 and is connected to one side of the Mix control, RV6. The cut-off frequency of the filter is set by the current flowing into pins 1 and 16. This current is provided by the setting on RV4, via R21, for Noise Pitch, and RV3, via R20, for Bend. To prevent the filter cutting off when both

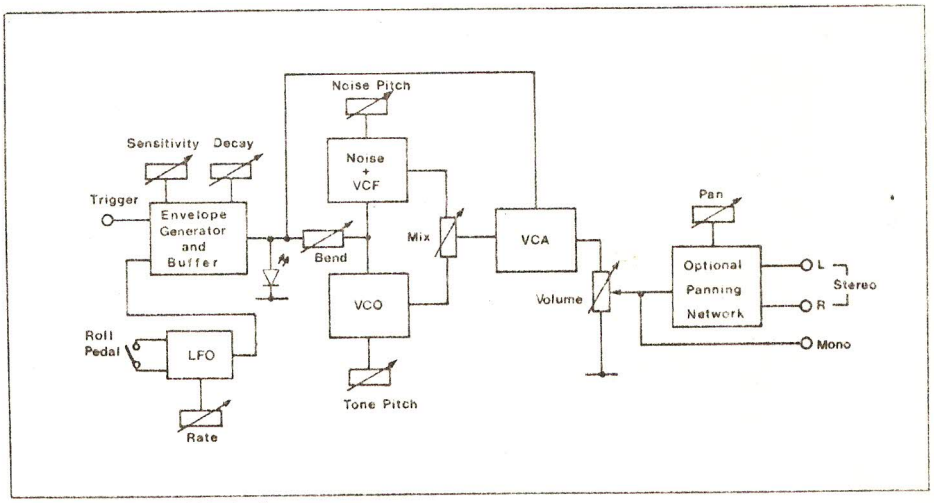


Figure 1. Syntom II block diagram.