

THE MICROCON INSTRUCTION MANUAL

**Steiner Synthesizers
2734 South 2700 West
Salt Lake City, UT 84119
(801) 972-1447**

**copyright 1978 by
Steiner Synthesizers**

The Microcon is a complete basic synthesizer in one small compact box. Designed primarily for melodic voicing, It consists of the following:

- A. Internal 110 Volt A.C. power supply.
- B. Exponential VCO 1V/oct. with sawtooth, square, pulse waveforms and special L.F.O. double sawtooth beat function.
- C. Low Frequency Oscillator (manually controlled) with triangle waveform for f.m. and beat modulation of VCO.
- D. Voltage controlled Low Pass Filter.
- E. Trigger Actuated Audio Gate.
- F. Envelope Generator with Attack, Decay, Sustain and Damp.

Some unique design features of the Microcon enable it to sound like a big machine while using fewer controls and less space making it easier to understand. The simplicity of the Microcon makes changes of setup super fast, almost instantaneous. It is easy for someone who is familiar only with other makes of equipment to hook it up and perform right away.

As well as producing sawtooth, square and pulse waveforms, the VCO has an additional waveform processor to convert pulse width modulation from the L.F.O. into a simulated double sawtooth waveform to sound rich and full as though two sawtooth VCO's are beating together in unison. Many other synthesizers just use pulse width modulation alone to achieve this effect and let it go at that. Pulse width modulation alone does not fully simulate this effect without the additional processing which makes it look like two sawtooth waveforms beating together.

The Low Frequency Oscillator with manual frequency control is used for the above beat modulation effect or for frequency modulation of the VCO to produce vibrato effects. When the L.F.O. is used for beat modulation the frequency of the L.F.O. determines how far apart the two apparent VCOs are tuned. A faster L.F.O. rate gives the effect of two VCOs tuned far apart; a slow rate makes them sound like they are almost perfectly tuned together. Sometimes it is desirable to use a faster L.F.O. rate when playing high notes and a slower rate for playing low notes.

The Voltage Controlled Low Pass Filter is always used in conjunction with the Envelope Generator. The Envelope Generator sweeps only the V.C.F. with a fixed level or amount of frequency sweep. Varying the amount of filter sweep is done by turning the cutoff frequency knob. Research has found that in most cases, this method of controlling the amount of V.C.F. frequency sweep is as effective as having a level pot between the Envelope Generator and the control voltage input of the V.C.F.

Using no VCA at all, it is easy in many cases to achieve complete envelope sound contouring with only one VC low Pass Filter and one Envelope Generator. By setting the V.C.F. cutoff frequency far enough below the VCO frequency that the sound is completely cut off. The Microcon Envelope Generator sweeps the V.C.F. far enough to utilize this principle. By using the sustain level of the Envelope Generator, the V.C.F. sweeps from below the VCO frequency up to the peak of the envelope then back down to the sustain level, giving the normal sound of a sweeping V.C.F. When the trigger is released the V.C.F. frequency then follows the decay down below the VCO frequency cutting the sound off completely without the use of the V.C.A.

In some cases when a fast decay is used in conjunction with a high resonance setting of the V.C.F. it is still desirable to use a V.C.A. since it is not always desirable to hear a highly resonant V.C.F. make an extremely fast sweep below the VCO frequency every time a note is released. For cases like this and others, the Microcon uses a damp function which consists of an audio gate following the V.C.F. turned on and off by the input trigger (gate). This also enables the Envelope Generator to decay very slowly yet release very quickly when the trigger is released much the same way a piano tone decays very slowly while the key is down but is damped very quickly when the key is released.

The Microcon with this combination of one Envelope Generator, V.C.F. and Audio Gate tends to produce the sound of a big expensive synthesizer. This is because of its uniqueness from other low priced

units which use a single Envelope Generator to drive the V.C.F. and V.C.A. simultaneously. They usually connect the Envelope Generator such that it sweeps both the V.C.F. and V.C.A. simultaneously resulting in a sound that grows in amplitude with rise in filter frequency. With the Audio Gate following the V.C.F., each note starts at full amplitude emphasizing the complete filter sweep, a sound usually associated with more sophisticated units. The sweeping V.C.F. alone tends to control both the amplitude and high frequency content of a signal. This is in harmony with the principles of many acoustic instruments which tend to have more high frequency content in their sound as they are played louder.

Research and insight into these techniques are some of the principles involved that make the Microcon such an incredible machine while being so small, light, simple and inexpensive.

On the front of the Microcon are the following:

One six pin Jones Jack to provide up to 35 MA \pm 12 V.D.C to power some external control devices. This plug is not used when the Microcon is interfaced with equipment having its own internal power supply.

Six Jacks along the top of the panel:

V.C. In (farthest left input Jack at top) Feeds control voltage to V.C.O. and V.C.F. simultaneously. This input goes through a front panel trimmer to calibrate the V.C.O. to 1V/oct. A control voltage applied to this input causes both the V.C.O. and V.C.F. to track.

V.C. In (second Jack from the left) Auxiliary control voltage input to V.C.O. only. This input is approximately 1V/oct. but does not have trimmer.

VCF (third Jack from the left) This is an auxiliary control voltage input to the V.C.F. A typical use for this Jack would be to control the V.C.F. from an external source such as a foot pedal.

-Trig Any negative trigger (gate) which pulls from a positive voltage state to the zero voltage state will gate the envelope generator and triggered audio gate inside the Microcon. Triggers from any Steiner-Parker equipment or S trig from Moog equipment should be connected to this Jack.

+Trig Any positive gate or trigger which pulls from a zero state to a plus voltage state will gate the envelope generator and triggered audio gate inside the Microcon. This input is used when using ARP or similar equipment. A typical use would be to connect an ARP gate out Jack to the Microcon trig Jack.

Out This is the signal output from the Microcon which can be connected to almost any audio amplifier, guitar amp, studio mixer, or Hi Fi system. Two or more Microcon signal outputs can be connected in parallel to mix them together. There will be a little loss in volume but the signals will mix properly. The drop in volume can be compensated by adjusting the amplifier gain.

The eight knobs on the front of the Microcon are as follows:

F. Freq (top left) Fine tune for V.C.O.

Freq. (top right) Coarse frequency to tune V.C.O. anywhere within the audio range.

Level Varies the depth of vibrato from the LFO (amount of frequency modulation). This knob only operates when the beat-vib switch is in the vib position.

Rate Controls the rate (frequency) of the LFO.

Freq (located near the large letters VCF) This controls the cutoff frequency of the VCF. The amount of sweep from the envelope generator is set at a fixed amount. Therefore the apparent amount of VCF sweep from the envelope generator is controlled with this knob.

Gain This is the volume control for the signal output of the Microcon. This knob can be used to control dynamics while playing the Microcon.

Attack Controls the attack time of the Envelope Generator.

Decay Controls the decay time of the Envelope Generator.

Switches on the front panel are as follows:

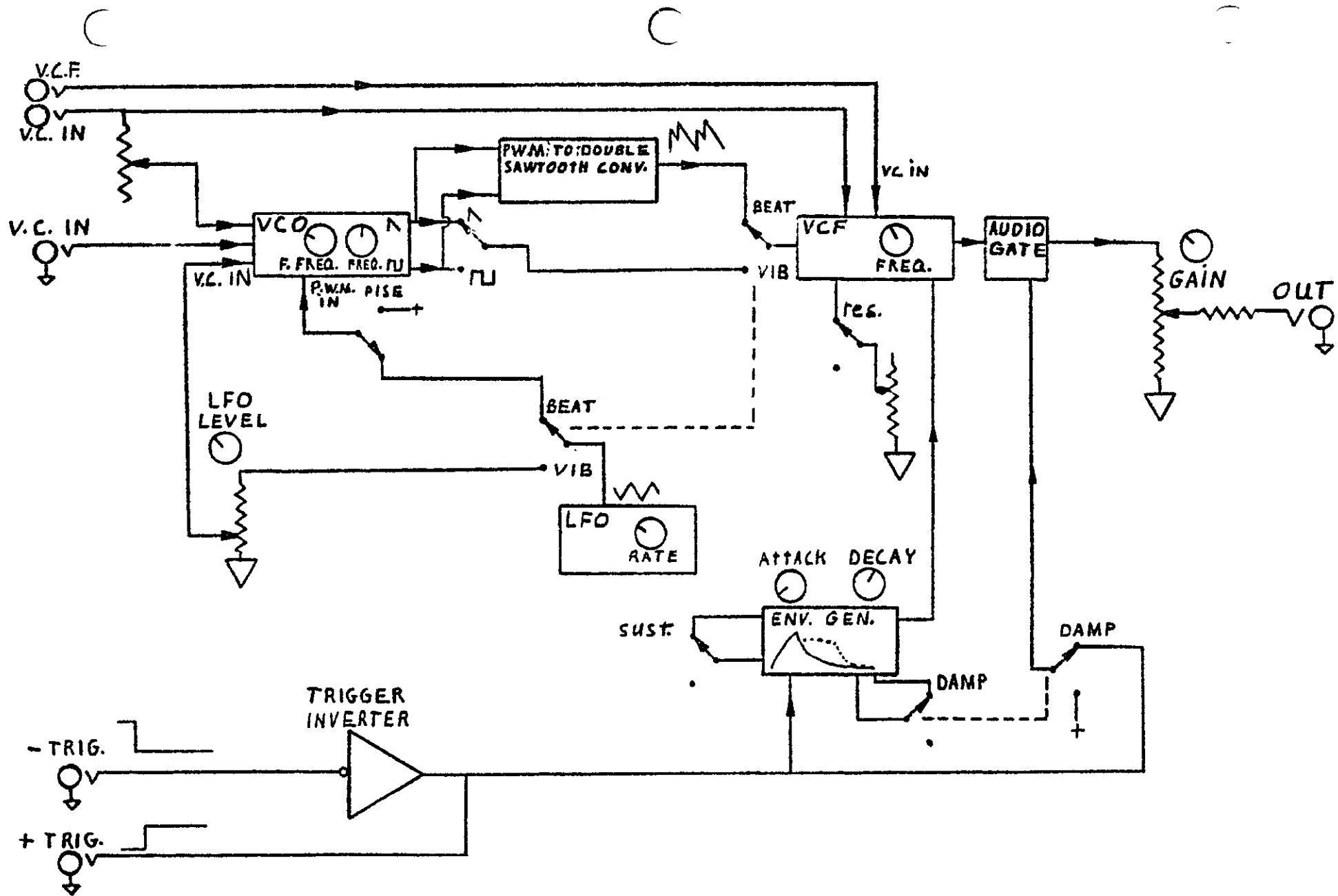
N-N The operation of this switch is dependant upon the position of the beat-vib switch, and the pulse switch. When in the position (up) the output from the VCO is a sawtooth waveform. When down, the waveform from the VCO is a square wave. The duty cycle of this square wave can be changed to produce a pulse waveform by flipping up the pulse switch.

Beat-vib The position of the N-N switch is totally irrelevant when the beat-vib switch is up. As shown in fig. 1, the VCF receives its signal from the double sawtooth converter in the beat position and from the N-N switch when in the vib position. When in the vib position, the LFO frequency modulates the VCO to produce vibrato effects. The amount of modulation is controlled by the LFO level pot.

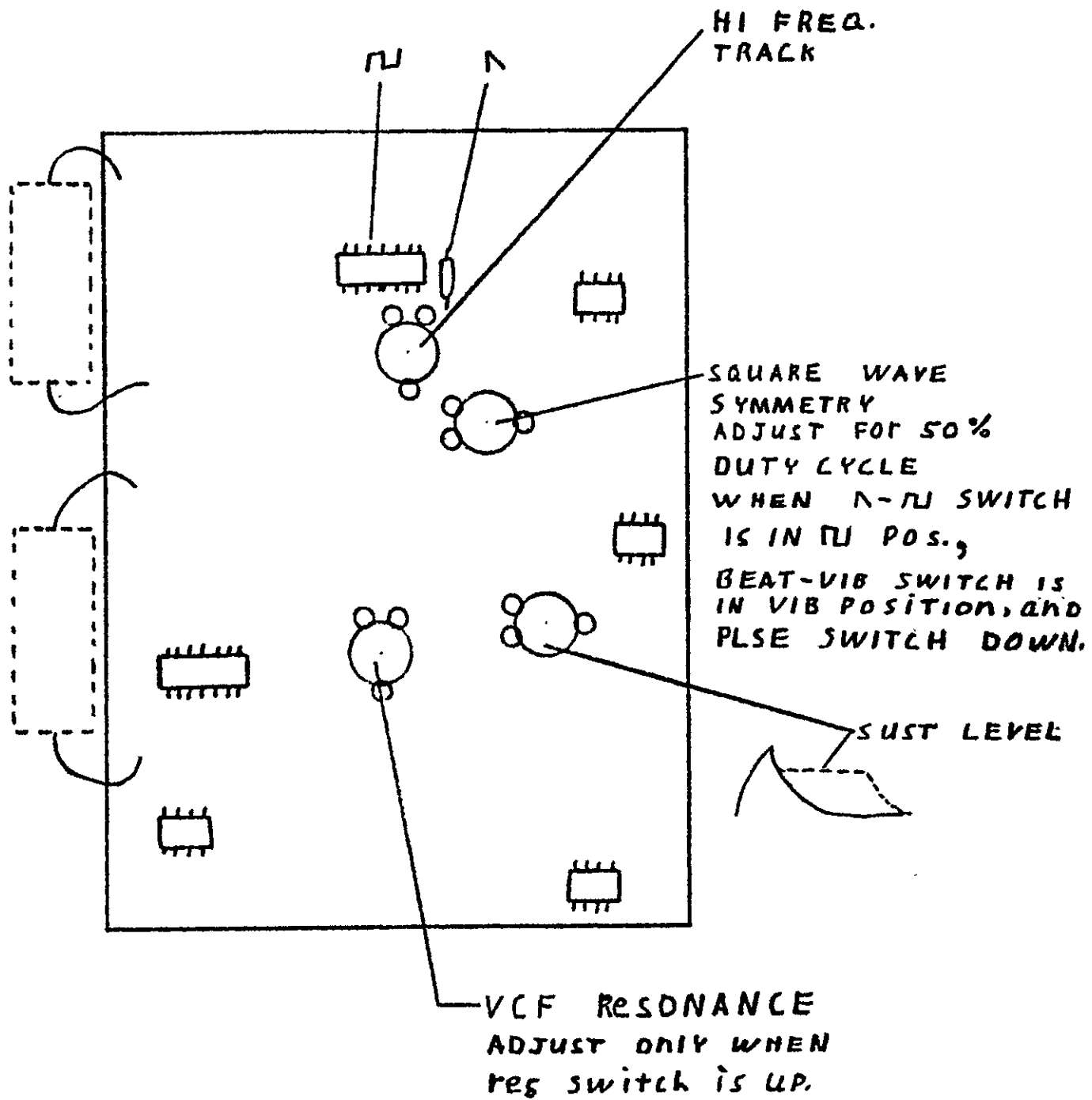
Res Switches the VCF from a low resonance state to a high resonance state. The resonance of the VCF is high when this switch is in the Res position. The amount of resonance when the switch is up is adjustable with a trim-pot inside the Microcon. See fig. 2.

Sust This turns on an envelope sustain voltage level following the attack for the duration of the input trigger. See fig. 3. This sustain level is preset at the factory to be approximately 3/4 of the peak envelope voltage, a good optimum setting for producing most kinds of envelope shapes with fewer controls.

Damp This switch when up, turns on the triggered audio gate and also causes the envelope voltage to return instantly to zero upon release of an input trigger (gate).

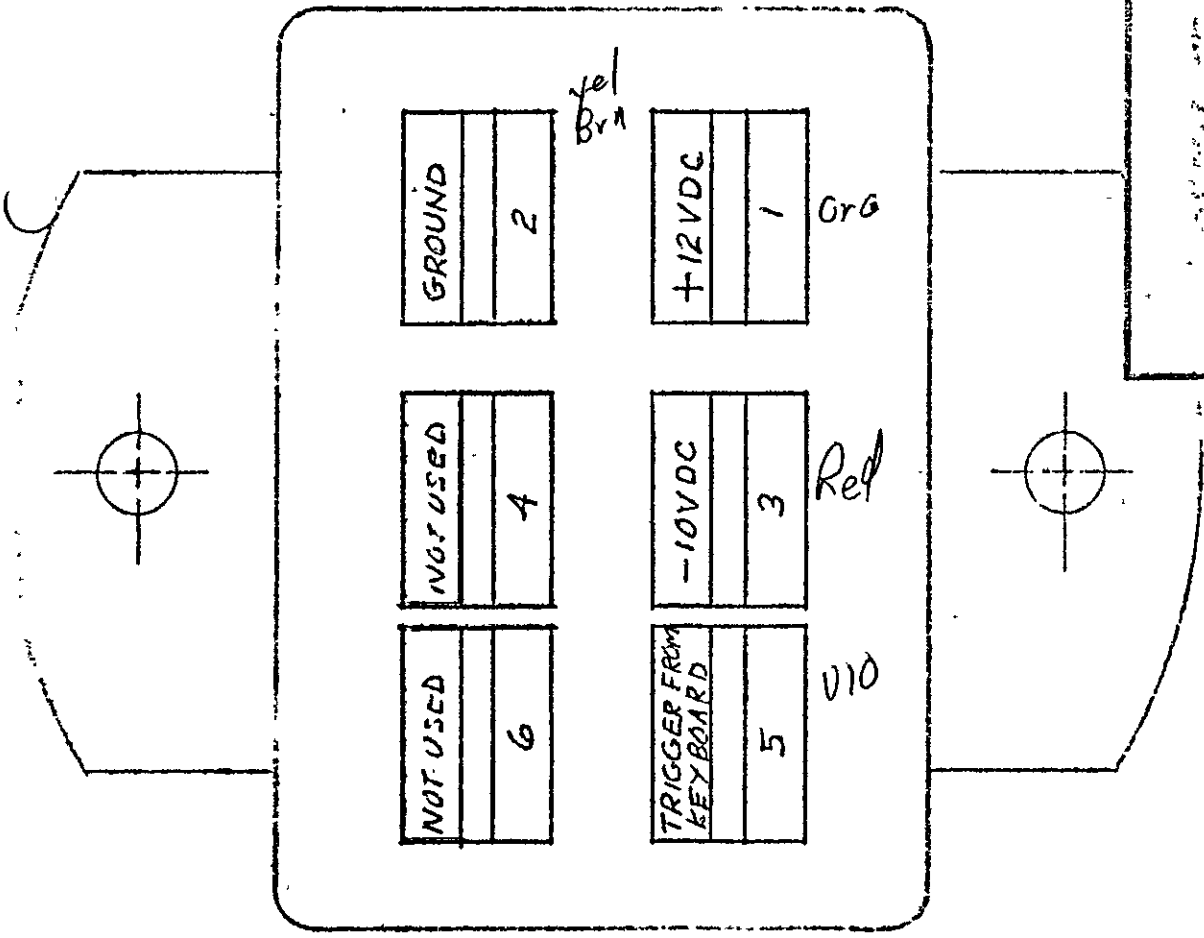


MICROCON BLOCK DIAGRAM
FIG 1.



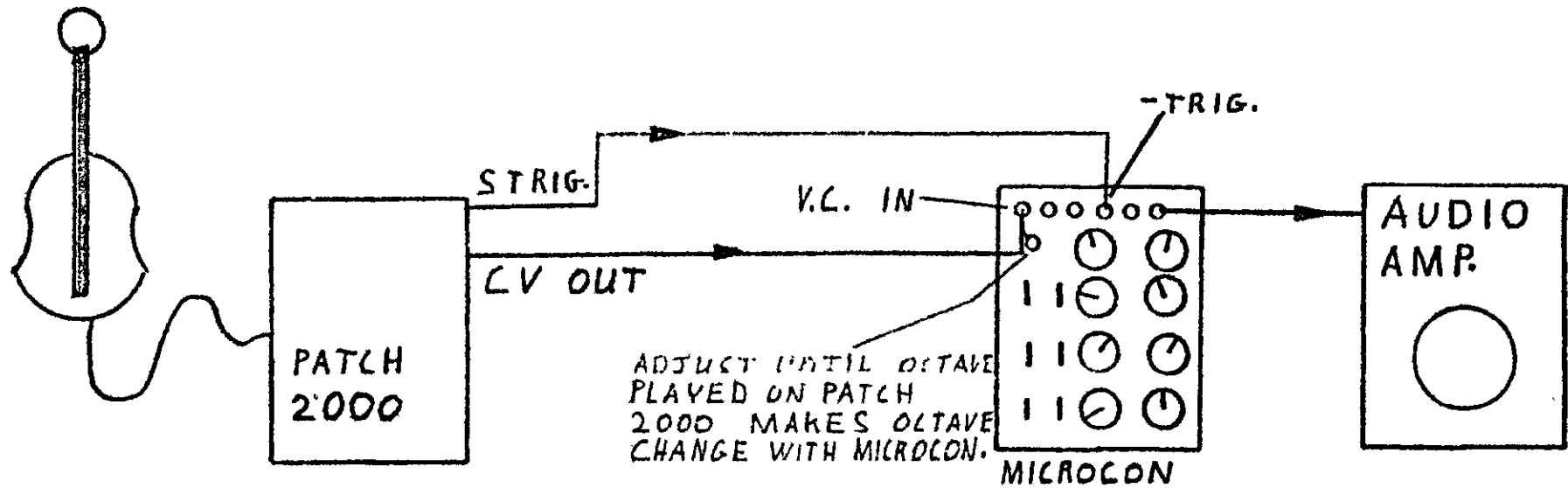
MICROCON INTERNAL ADJUSTMENTS

FIG. 2



SCALE: X 5		APPROVED BY: <i>H. Fisher</i>	DRAWN BY: <i>MFE</i>
DATE: MAR-7-75		REVISED 12-31-75	
ACCESSORY PLUG			
MICRO-CON.			0140-0121

MICROCON WITH PATCH 2000 GUITAR SYNTH.

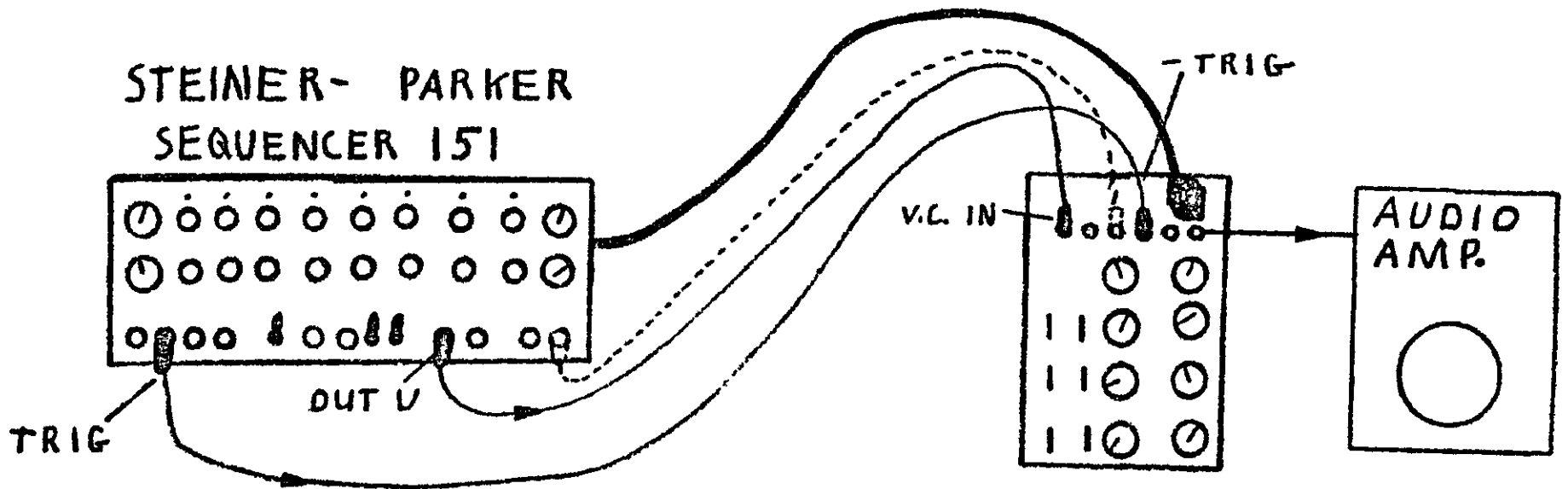


CORDS REQUIRED:

3 - 1/4" Phone to 1/8" Phone.

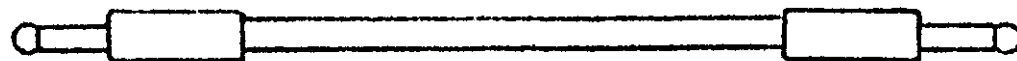


MICROCON WITH SEQUENCER 151



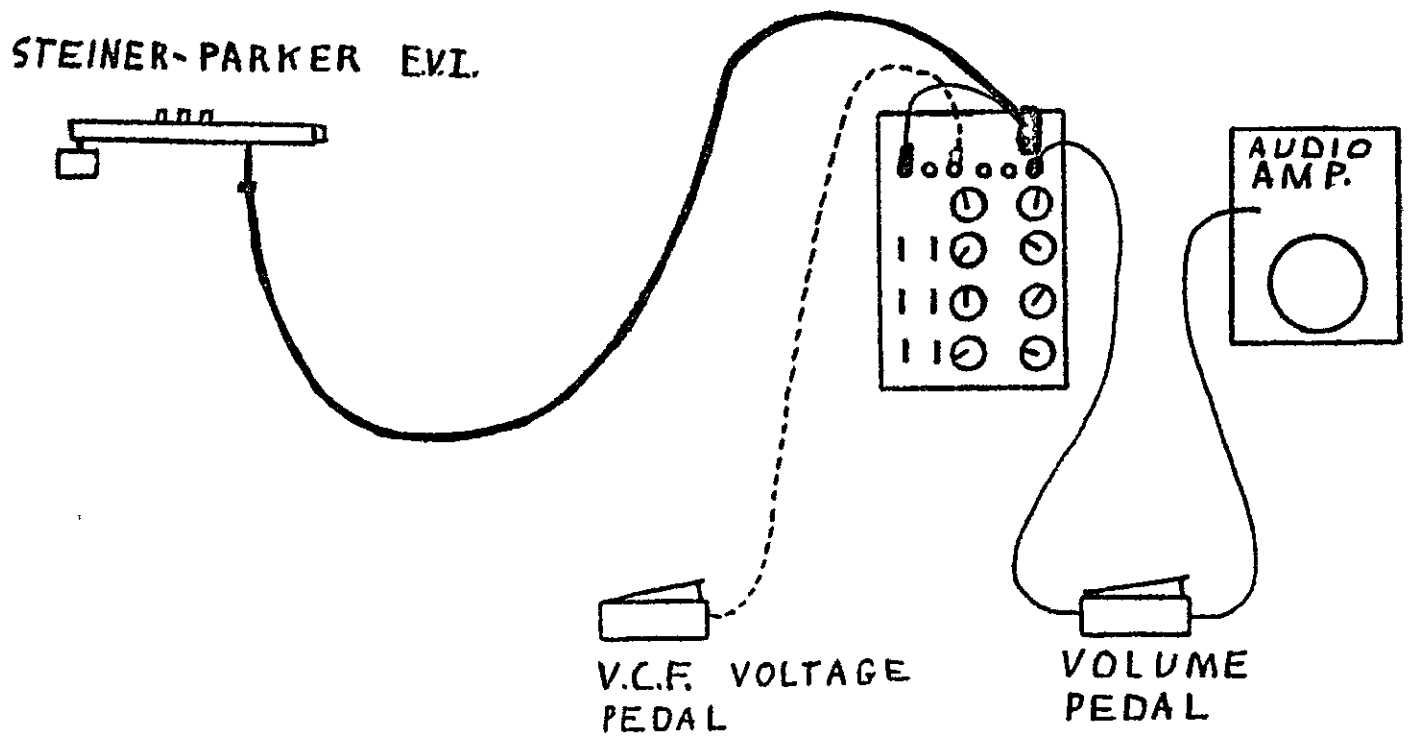
CORDS REQUIRED:

AT LEAST 2- 1/8" Phone to 1/8" Phone



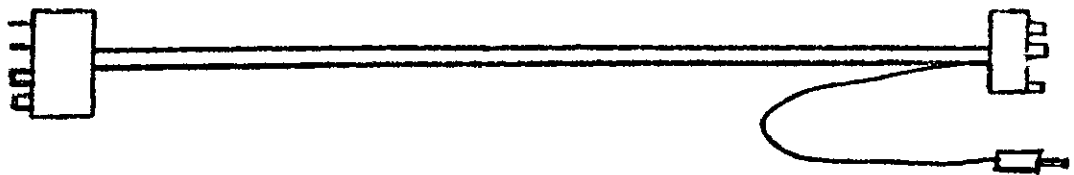
1- 1/8" Phone to AMP.

MICROCON WITH STEINER-PARKER E.V.I.



CORDS REQUIRED:

1-STEINER-PARKER EVI TO MICROCON
CORD.

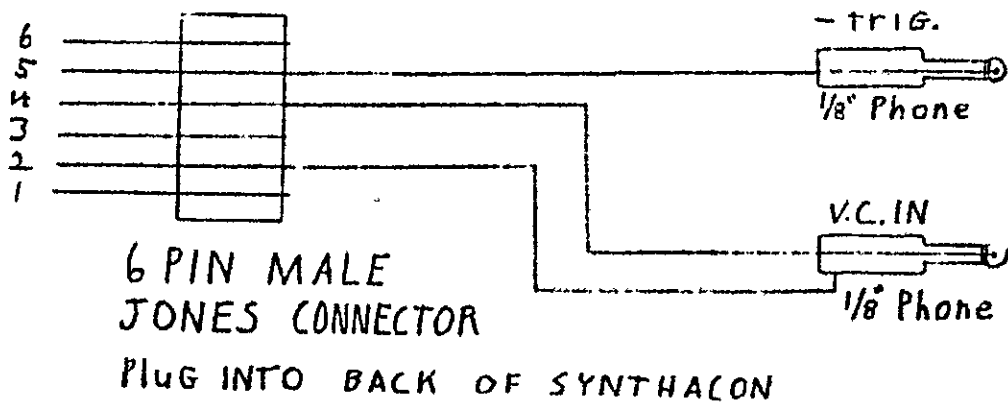
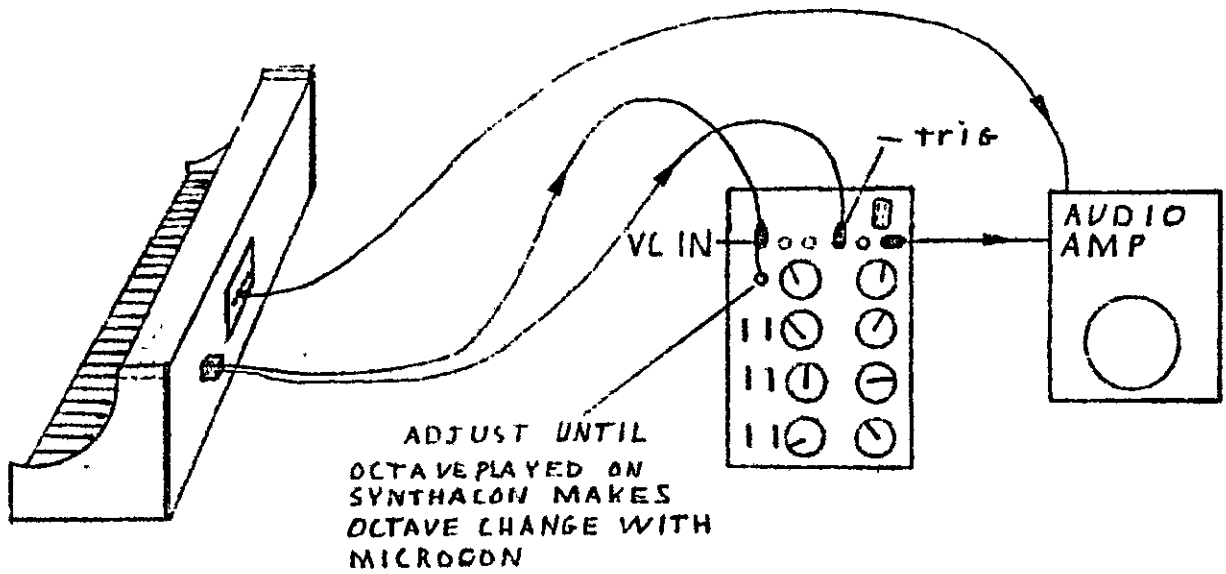


8 Cords as required for Amp & Pedals.

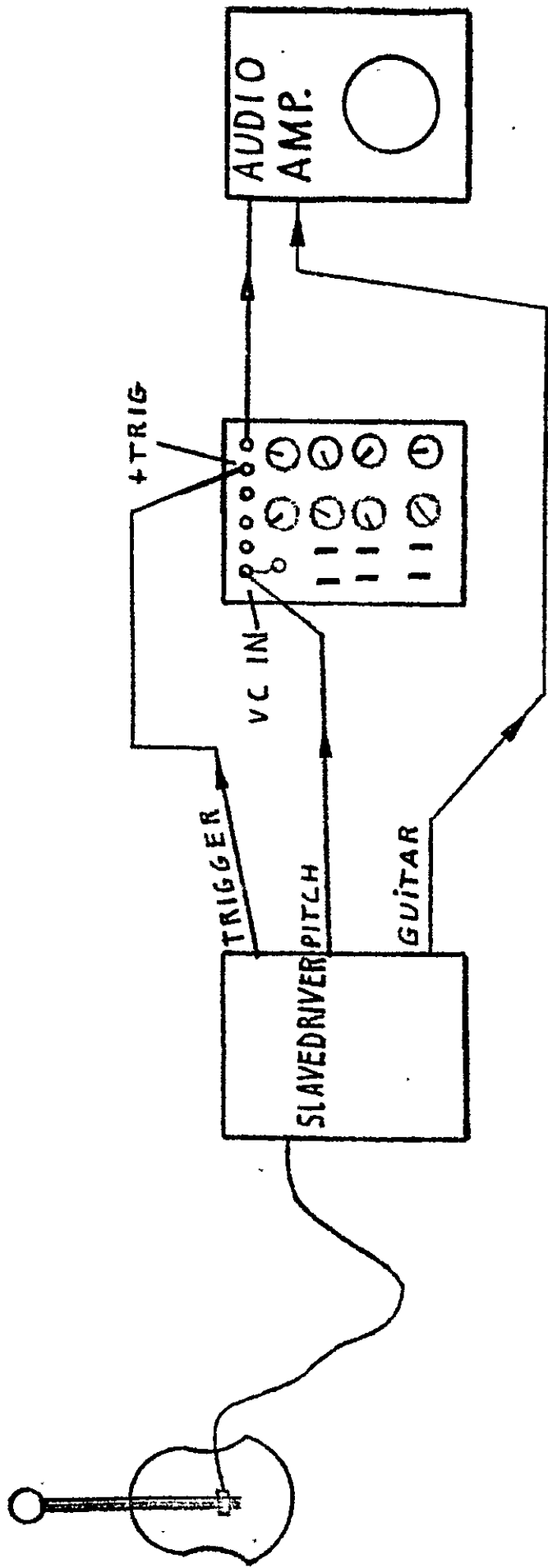
MICROCON WITH
STEINER-PARKER MULTIPHONIC KEYBOARD.

SAME AS WITH E.V.I.

MICROCON WITH STEINER-PARKER SYNTHALCON



MICROCON WITH 360 SYSTEMS SLAVEDRIVER



CORDS REQUIRED:

4- 1/4" Phone to 1/8" Phone

