

P9700S tips/suggestions

Power cabling and module arrangement.

Each of the 9710, 9720, and 9730 module accessories have power supply connector kits that are four wires, terminals and a cover, and a four-circuit header. The wires and terminals/cover solder to the module, and the header, to the one to the left, with the 9700K as the starting module with a header from the 9720FRM kit. The 9720K then plugs into the 9700K, the 9730K plugs into the 9720K and the 9710K plugs into the 9730K. Notice there is a variation in the direction the header is installed on the 9700K (it faces opposite the way the ones do on the other three modules. The important thing is to get Plus to plus, and minus to minus, G to G, and SG to SG.

It is OK to put the wires and 4-pin header in either of the two spots on the rear edge of the 9720, 9730, and 9710 modules (the order they appear on the right of the 9700 MIDI2CV8); however, it is best to have the wires at the edge and the header connector behind them. Using the power connector kit in the 9720, solder the wires to the edge of the 9720, solder the terminals on the end of the wires, and insert the terminals in the cover. Solder the 4-pin header in the connector kit to the module to which the cable assembly will connect (the 9700 MIDI2CV8 in this instance. Then, do the same on the 9730, but the header for this goes on the 9720. Then the 9710...

MIDI2CV8 Pitch CV adjustment

The DAC Tune trim can be set by connecting the pitch cv output to a multimeter set to measure dc volts in a 0-10v range and then pressing octave spaced keys on the connected MIDI controller while adjusting the trim for 1v change.

Later the VCO will be adjusted with this adjusted MIDI2CV8 output. Note too, it is easier to adjust the VCO pitches when they are in the lower range obtained when the Low-key transpose option is selected as outlined at the top of the Operating Modes pull-out (power-up the MIDI2CV8 while a the lowest key on the connected MIDI controller is pressed--then, the first message received is a note-off (when the pressed key is released) which selects the low-key transpose option).

While a tuner can be useful, it can throw you off if the input is overloaded, clipping the wave and introducing harmonics.

Here's a way to get them by ear... First set the MIDI2CV8 to be outputting 0V for the low key pressed on the controller, by powering the 9700K while holding the low key on the controller so that releasing the key will cause the first message input to the MIDI2CV8 to be a note-off (it interprets this as a signal to output zero volts for this note number). A dvm can now be used to check that octave spaced key presses are outputting a 1v pitch cv change (down to a hundredth of a volt or so) as set by the trim on the MIDI2CV8. The most accurate setting will be obtained if you press octaves that start a few notes above the lowest key, ie if your low key is a C, press D or higher for the lowest octave reading.

The usual tuned setting for the VCO scale trims is about a 1:00 setting for the pointer of there disk which covers a cw range from about 7:00 (ccw) to 5:00 (cw). Start with the trim at 1 o'clock.

After having been powered for a minute or two patch the low-key transposed pitch CV over to the VCOA P2 input. Set the two pitch controls to they're both in-tune at unison at about a mid-rotation setting for the low key pressed on the controller. Play an octave higher and the adjust scaleA for an octave relationship with B. Go back to the low note and adjust the A panel pitch control for unison and then, again, press an octave higher and adjust the scaleA for an octave relationship with B. After going back and forth like this another time or two, you should find the scale is about as close as it can get. Then, do this all again pressing some note a few keys higher than the lowest key (with VCOB adjusted to match at this new low pitch) and confirm/tweak the scale to match for higher pressed octave relationships with B (using the A panel pitch to realign A with B after adjusting the scale). When the scaleA adjustment is complete, move the pitch control over to VCOB P2 and make the panel Pitch and scaleB trim adjustments to get unison and octaves with the VCOA pitch (adjusted to match B for the low key pressed and pitch CV sent to it).

After the scaleB is set, move the Pitch CV over to the VCOA P1 input and listen to the two vcOs tracking across the keyboard range (again with the low-key transpose asserted) after aligning their pitch while a higher note is pressed, say the third or fourth octave. Confirm they track for a higher octave pressed and hold as you press keys going down towards the low key. You should be able to turn up the sound of the controller or some other MIDI Sound Module and hear that the tones made from the VCOs can be aligned using the panel pitch controls and follow as you play different ranges on the keyboard (make the alignment between the two when a key pressed in the middle C, A 440 range is pressed--its easier to hear the beating slow as they are tuned).

It helps to keep the VCO Modulation control at minimum so there isn't any possible pw modulation which can make the VCOB pitch change slightly (often, a change of R59 from 91k to 27k prevents this interaction).

A good start patch.

A common configuration is to start with the vc oscillators as the tone generator, to the L and R VCAs for a mix, run through the vc filter for emphasis or demphasis of parts of that tone, and then through the vc amplifier to 'frame' the sound. On the FatMan, two sawtooth (ramp) waves from the VCOs go to a LowPass VCF and then to the VCA. Envelope generators modulate the VCF and VCA in response to the Gate trigger which indicates the key pressed/released state. A Pitch CV amount according to the note pressed sets the VCO pitch.

A simple way to implement this lead, mono synth patch on your P9700s is to make the following connections (patches). You may need to make some new cords along the way.

First, we'll make the connections from the MIDI2CV8 operating in mode 1 for a mono voice complement of outputs (power-up with the low note pressed on the MIDI controller and release it a couple of seconds later to put the pitch cv in the best range). Use a single patch cord to go from the Pitch CV output on the MIDI2CV8 to the P1 control on VCO A. This allows you to control both oscillators and the Glide control setting can be adjusted to set the amount of time it takes for the oscillator frequency (pitch) to change for a Pitch CV change. The Pitch control of each oscillator can be adjusted so they are in unison or other relationship (the rest of the patch will need to be made to hear this).

A 'Y' cord or one plug with two wires and plugs on it can be used to connect the Gate trigger output from the MIDI2CV8 to the Gate trigger (G) inputs on the VCF and VCA modules. This will cause their envelope generator modulators to start when a key is pressed.

Connect the two sawtooth waves from the VCOs to the L and R VCA inputs. The mix of the two waves is set with the pan control and the L+R output is the output of this mix and goes to VCF A In. We'll take the output from VCF B LowPass, or the bottom of the six connectors on the right-hand side with the graphic response symbols. Its best to keep the Q controls at midway or so and the Frequency controls slightly different till you develop a feel for the way the filter can accentuate or provide a boost on the signal. This boost can kick the filter into oscillation or overdrive the VCA. The more the Q the more the boost, the less the Q, the less 'dramatic' the filter effect. The more similar the settings of the two series connected filters, the more critical the Q setting. A cyclic VCF modulation is a neat effect too (instead of just an envelope generator sweep in response to the Gate). A Gate plus the cycle setting gives a cycle sync'ed to the key presses.

The VCA A section takes the VCF LowPass output with a single patch cord. The VCA A output could patch to a mixer or amp/speaker, etc.

The ADSR controls set the dynamics of the sound as the keys are pressed and the envelope is generated and 'opens' the VCA.

Note the VCO waveform outputs are high level and you may need to set input levels lower than for usual stuff, or, a special patch cord to attenuate the output can be made. I have one that puts a couple of fixed resistors in series from the tip to sleeve circuits on the plug at 9700 end of the cable and the signal is tapped at the junction of the resistors for a more typical 'line-level'. The two resistors are a 10k and a 1k and the 10k attaches to the tip and the 1k at the sleeve. The tap for the signal that wires on to the tip of the plug for the mixer, amp/speaker, etc is from the junction of the two resistors. The ground circuit is as usual--sleeve terminal to sleeve terminal. The reason its needed here but not on module to module patches is that the modules all share a ground already--the power supply ground circuit--but the synth and the external device don't until one connection is made between them establishing a common ground.

There are many more possibilities. Experiment. Use the testing and calibration sections of the manuals and the descriptions of the controls and connectors as a guide in these experiments.

In the preceding example, only the Pitch CV and Gate trigger outputs derived from MIDI note messages were used. I'll touch on possibilities for all the outputs available in the MIDI converter 'mode one'.

1) Pitch CV - to VCO to control pitch and perhaps to VCF to so filter response varies according to keyboard range.

2) Attack Velocity - a cv output proportional to the speed keys are pressed that is interesting patched to filter control inputs and vca control inputs.

3) Gate - a trigger activated for keys pressed and active for the duration of a key(s) pressed.

4) Trigger Pulse - a trigger activated for a short duration as a key(s) is/are pressed. When this goes to the envelope generators along with the Gate trigger, the envelopes are reiterated for multiple key-downs.

5) Pitch Wheel - a cv output proportional to the setting of the MIDI Controller's Pitch Wheel.

6) Mod Wheel - a cv output proportional to the setting of the MIDI Controller's Modulation (amount) wheel.

7) Aftertouch - a cv output proportional to the value of the MIDI Controller's Channel Pressure message (according to force against keys on the keyboard).

8) Release Velocity - a cv output proportional to the speed a key is released on the MIDI controller. Filter and Amplifier control would be typical.

Its a lot of fun and interesting just to interconnect the modules for sound effects, perhaps introducing external controls (cvs or triggers) from things other than the MIDI converter for these (ie the Theremax, envelope follower/trigger devices, drum machines, etc). The VCO modulator slowly cycling and controlling the LFO frequency of oscillator A and these patched to the filter with it's modulator slowly cycling is an interesting effect. FM or VCA modulator sweeps with the VCO outputs and other 'shortwave radio tuning - like' effects can be accomplished by sending in an external audio signal.

9700K MIDI2CV8 tips

Just to be sure, for MIDI2CV8 operating-mode 1 on MIDI Channel 1, press all DIP Switch levers down, or on (closed).

Then, it is important to remember that changes in settings are only acknowledged on power-up. So if you make a change, power-down and the power-back-up to get the uC to read the settings.

Most likely, the Low-Key transpose option will need to be asserted to put the pitch cv output in the best range. Power-up with the low note on the MIDI controller pressed, wait a second or two and release this note. The pitch cv to the VCO will now operate it in an optimum range.

The two voice and four voice modes 2 and 3 aren't so useful except as a special effect in getting the 'voicing' to change as you play, unless you go to the Multi mode by sending in a program change #0 message to start. Then, the pitch cv and gate trigger sets are 'addressable'. You can control the sets according to MIDI Channel.

Mode 4 gives cvs out according to MIDI Control Change, continuous controller messages--good for remote control sorts of operations.

Mode 5 gives cvs out that are momentary pulses with the amplitude set by the velocity of the note messages (the first eight on a typical five-octave controller). This is good for sounding analog percussion voicing (or digital with analog input triggering).

Mode 6 combines monophonic synth control with the DIN Sync signals that can be adapted over to a DIN Sync plug from the mini-phone jacks with a custom made cable.

There is no mode 7, and Mode 8 is the Self-Test (output test unless MIDI is input and then, MIDI Test).