

Jacques Kruseo wrote:

> Hello Scott, Justin here. I recently purchased a vintage 2720 keyboard with the standard kits and several other extras. I was wondering if there might be some helpful tips out there on how to get going off from start. I'm new to the modular world.

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> Just wondering if there's some helpful tips floating around on how single flow works, and how power routing is set up.

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> I see that you must be the moderator on the board so I figured I got right to you.

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> Thanks in advance,

> Justin

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Hello Justin.

On the 2720series modular synthesizer analog keyboard, there are connectors for patching control to the modules, and the simplest patch is from a pitch control-voltage (cv) output to a VCO pitch cv input. A waveform of the VCO could be patched straight to an amp and speaker. The pitch cv is simply a dc voltage that increases with increasing key presses on the keyboard. A circuit board kit in the keyboard (2720-8 s/h) works to Sample the voltage for the pressed key and Holds it after the key is released. The VCO pitch should change for the various keys pressed and hold constant (in reality, it slowly drops, but should be steady for a time that would enable long "envelopes"). Sound envelopes are created by patching the sound through a VCA and using a trigger output from the keyboard to activate the Envelope Generator or Function Generator module which makes a dc voltage output that is a cv for the VCA. No sound gets through the VCA unless voltage is to its control input. The Function (Envelope) Generator output rises and falls at controlled rates starting and stopping the sound envelope. The triggering from the analog keyboards was a step (gate) or pulse (spike) trigger. Either of these patched over to the Function Generator (2720-4) would start its cycle (Step-trigger (Gate-trigger) activates it for the duration of the key-pressed).

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Power for 2720 and 4700 series modules is either dual-polarity, $\pm 9\text{vdc}$, and/or 18vdc . These supplies are output from the 2720-7, the 4770 (configured for $\pm 9\text{vdc}$, or 18vdc), or 4771 modules, and extended over buss wires (solid, bare, plated wires supported by four-section terminal strips), as wiring points for the individual modules in a system. A P4700J system with the 8700 Computer/Controller, 8780 D/A, and 8781 Quash included a 5v dc supply and wiring through the D/A connector cable.

I have copied below links to PAiA and Mouser.com where you can get the extras to make the regulated $\pm 9\text{vdc}$ supplies, plus the items for the $+18\text{v}$ supply. The modules which use an 18v supply include the 4710 VCA/Bal. Mod., the 4750/2720-5 Control Osc. and Noise Source, and the 4740 Envelope Generator. The positive rectified and filtered dc on the power supply kit listed below will be about 18v dc and this can be used for the 18v supply, but the 4710 and 4750 modules benefit from the supply being regulated (minimizes hum (sub'ing big electrolytics for the ones on the 18v supply on each

module helps but these are big, and expensive)). Adding a power source and a kit for the 18v supply is a simple way to have regulated supplies on the -9, +9 and +18.

The K-83 kit with 9v regulators and two 12v wall-mount dc supplies, or the 24vac 0.2A transformer, can be used for the dual 9v supplies. The K-60 kit, with a 7818 regulator, and a wall-mount dc supply or a transformer can provide a regulated 18v supply.. Join the grounds on the two supplies (the +and-9 and the +18) so they have appear as one supply with multiple outputs. Using the dc power sources is a bit clunky, but the three could go in a box with a multiple outlet extension cord running into it and then you're not working with the wall-outlet voltage which is more dangerous.

K-83 dual-polarity dc supply kit

<http://www.paia.com/proddetail.asp?prod=K83>

positive 9v regulator

<http://www.mouser.com/Search/ProductDetail.aspx?qs=VOMQJJE%252bBNmmTueoZonUjQ%3d%3d>

negative 9v regulator

<http://www.mouser.com/Search/ProductDetail.aspx?qs=cnleywgme7b49ifD0Z%2fr%252bA%3d%3d>

use two 12v wall mount dc supplies as power source for K-83

<http://www.mouser.com/Search/Refine.aspx?Keyword=412-112013>

or, a single,

24vac 1A ct transformer for K83

<http://www.mouser.com/Search/ProductDetail.aspx?qs=tA%252bmo7TRWBIUehm2XGaqqA%3d%3d>

K-60 single DC supply kit

<http://www.paia.com/KRUKits/K60/K60.pdf>

positive 18v regulator

<http://www.mouser.com/Search/ProductDetail.aspx?qs=H3ExDzP%252bQujO06TUQvlnyg%3d%3d>

24vdc wall-mount dc source for K-60.

<http://www.mouser.com/Search/Refine.aspx?Keyword=412-124013>

or,

24vac .2A transformer ac source for K-60

<http://www.mouser.com/Search/ProductDetail.aspx?qs=JoKHnkunWL5hassiBk6nxQ%3d%3d>

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The patch cords for the modules consisted of 1/8" mini phone plugs for the audio cables and pin plugs for the control voltages/triggers. Flexible, rubberized test lead cable is good for the patch cords.

The pin plugs aren't as readily available as the 1/8" phone plugs, but Mouser 800-346-6873 has them (stk #530-105-0302-1) but they describe them as tip plugs. Mouser has the rubberized test cable too. Solid, 14ga insulated wire with about an inch stripped off at each end can be used for the cv patches. Test leads as used on inexpensive multi-testers are often the right size. Since everything in the 2720 or 4700 series systems is on the same power supply, they already have a common ground, so the cables need only be a single conductor wire. When patching to the external equipment, or between a 4700 series analog keyboard controller, one cord will need to be patched between a ground circuit jack (could be a black one?) on the synth and the device ground to establish a common ground between them.

flexible, rubber insulation, test-lead cable

<http://www.mouser.com/Search/ProductDetail.aspx?qs=sGAEpiMZZMtW9UaYX5J1tC1Hv8XIqifgHHyhpXoKZdw%3d>

Tip (pin) plugs

<http://www.mouser.com/Search/Refine.aspx?Keyword=530-105-0302-1>

Mini (3.5mm) Phone Plugs

<http://www.mouser.com/Search/ProductDetail.aspx?qs=XuGxIpNJLihY4R8jdQS%252bvQ%3d%3d>

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FatMan's Pitch and Velocity control voltage outputs and Gate trigger output are compatible with the inputs on the 4700 and 2720 series. To patch or connect one to the other, special cables would need to be made with a RCA Phono plug on one end and pin (tip) plugs on the other. Mouser Electronics website/catalog has Tip plugs and Phono plugs that can be soldered to wire or cable to make the patch cords. On the FatMan end, the center post on the RCA Plug is the control voltage or trigger and the shell is the ground/common. The 4700/2720 end would have two, and in some instances one, pin/tip plug. One is for the control voltage and the other for a ground/common at a multiple panel. If there isn't a multiple panel with a row of three ground pin/tip jacks, a 'dummy' mini-phone plug into an unused patch point can be used to establish a common ground with the sleeve terminal attached to the FatMan RCA Phono connector ground wire.

The most obvious patch would be to use FatMan's Pitch CV and Gate trigger as a substitute for the set from a keyboard controller in the 4700 or 2720 system. Velocity CV could be patched to a VCA input or VCF input for modulation according to the playing dynamics on the MIDI keyboard controller

connected to FatMan.

A Phone plug to mini-phone plug cable can be used to patch the FatMan audio output to a VCF, VCA, or Mixer input on the modular system being controlled for further processing and or layering.

<http://www.paia.com/fatman.asp>

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This reprint of an article by John Simonton describing building and using the 2720R synthesizer is a good practical guide which you might find useful for connecting and using older 2720 and 4700 series synthesizer modules.

<http://www.paia.com/manuals/docs/2720-buildamodular-article.pdf>

This article and a manual which you might find useful, Using the 4700S are in the Documentation and Manuals section of the PAiA Talk Forum.

Thank you.

Sincerely, Scott Lee