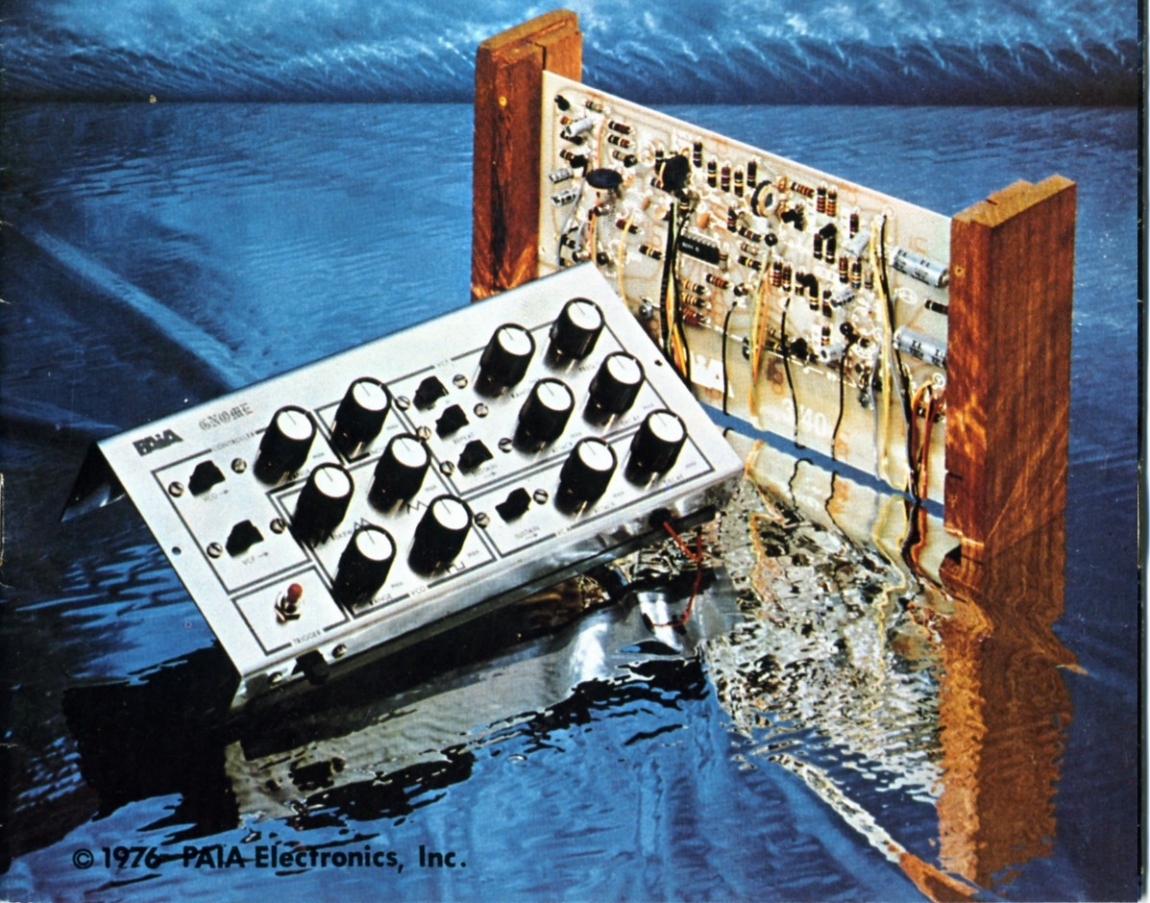
PAiA®

ELECTRONICS, INC.

THE GNOME MICRO-SYNTHESIZER

(SEE PAGE 19)



PAIA®

A PLACE TO START TODAY

SYNTHESIZER KIT PACKAGES

.... for the beginner, a package configuration devised by experienced users removes a lot of the guess work.

As you grow, your system can grow because every PAIA module, from the simplest to the most complex, those you buy today and the ones that we're developing for tomorrow are compatible. Not by accident, by design.

2720/A BASIC KEYBOARD SYNTHESIZER KIT

Everything you need to begin synthesizing sounds ranging from flutes, snare drums and the sound of the wind to conjuring sounds from your own imagination. Shown above, the 2720/A is the ideal place to start for the semi-professional or serious amateur with applications in the small recording studio or radio station and is excellent for grade school through university level music labs. Package includes one each of the following 2720 series modules: VCA, Function (Envelope) Generator, Band-pass and Low-pass filters, Control Oscillator/Noise Source, VCO, Power Supply and Keyboard/Case. Includes Step-by-Step instructions, User's manual and materials for 6 audio patch cords and 12 control voltage patch cords.

No. 2720/A BASIC KEYBOARD SYNTHESIZER KIT $230.00 *24 lbs.

2720/R SYNTHESIZER KIT

If you already know something about electronic music the 2720/R expands your capabilities. You can even process external signals from guitar, microphone, etc. Module complement includes everything that's in the 2720/A plus 2720-11 Envelope Follower Trigger, 2720-12 Inverter/Buffer and 2720-14 Sine Converter/Pulse Width Modulator.

No. 2720/R Synthesizer Kit $269.00 *26 lbs.

4700/S GO ANYWHERE DO ANYTHING SYNTHESIZER PACKAGE

When you combine all of the modules that are part of this package and then throw in keyboard, 12 event sequencer and a four input stereo mixer, it's almost like having two synthesizers in a single package. Wrap them all in sturdy road cases and you have an instrument that goes anywhere and does any job. Module complement includes: Road keyboard with Glide, Two Road module cases, two Balanced Modulator/VCA's, Stereo Mixer, Reverb, three 4720 VCO's, 4730 VCF, two Envelope Generators, three Watt Blocks, Control Oscillator/Noise Source and 12-Event Sequencer.

No. 4700/S Synthesizer Kit $499.00 *40 lbs.

3741 PYGMY/GNOME Package Kit JUST FOR FUN!

But not really JUST for fun because this package is also a workhorse for applications ranging from rock and theatric group special effects to demonstrating principles of music and acoustics for educators. And when you team the Gnome MicroSynthesizer with a Pygmy Portable Amplifier you gain eternal freedom from the wall plug in the bargain. They go where you do — to school, the beach, the mountains or into your audience.

No. 3741 PYGMY/GNOME Package $84.50 10 lbs.

Because these packaged systems are standard products, they are easier to manufacture, process and ship. These savings are passed along as lower prices (typically 15% discount over separate modules).

LOOK FOR MORE PACKAGES ON PAGE 7 . . .

WITH ROOM TO GROW TOMORROW!

VOLTAGE CONTROLLED AMPLIFIER (VCA)

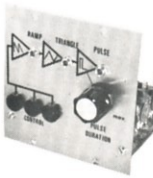
The VCA will most often be used in conjuction with the function generator to give synthesized sounds the desired attack and decay characteristics. The differential input and I.C. op-amp output stages of this module guarantee pop-free performance no matter how fast the control voltage changes. Nominal gain is 0 db. (unity) at full control voltage with minimum 60 db. isolation at 0 control voltage.

No. 2720-1 Voltage Controlled Amplifier $12.95 postpaid

VOLTAGE CONTROLLED OSCILLATOR

The VCO serves as the heart of any synthesizer by providing the other processing elements with a signal of the proper pitch and harmonic content. Features of the 2720-2 include ramp, triangle and variable duration pulse outputs with a frequency range of 20Hz. to 5 kHz. Individual, on board voltage regulators and op-amp control voltage summation assure reliable, drift free operation.

No. 2720-2A Voltage Controlled Oscillator $25.95 postpaid



FUNCTION GENERATOR

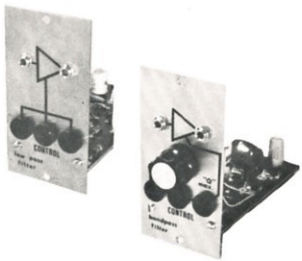
Accepts a trigger pulse from the controller and generates a 0 to 5v. output waveform with independently adjustable rise (attack) and fall (decay) times. Attack is variable from .002 to 1 second and decay is variable from .005 to 1 second, with sustain level maintained as long as input trigger is present. Both variable and fixed amplitude outputs are available. This module may be triggered from the control oscillator to produce an endless variety of repeating waveform shapes.

No. 2720-4 FUNCTION GENERATOR $20.95 postpaid

VOLTAGE CONTROLLED FILTERS

VCF's are key processing elements in synthesized music because they allow you to precisely control the harmonic content of the sound you're working with. Voltage control allows you to place the filters under the automatic control of a function generator or to have the filter follow the controller voltage. Nominal band-pass center frequency range is from 350 to 1200 Hz. with front panel adjustable "Q" control. Low pass filter roll off rate is 12 db/octave adjustable by summation of the control voltages.

No. 2720-3B Band Pass Filter	*$12.95*	*postpaid*
No. 2720-3L Low Pass Filter	*$10.95*	*postpaid*



CONTROL OSCILLATOR/NOISE SOURCE

Typical applications of the control oscillator are as a source of tremolo and vibrato or a means of cyclicly sweeping filters. Frequency range of the oscillator is 1 to 25 Hz. in three ranges and both fixed 5v. peak to peak and variable amplitude outputs are available.

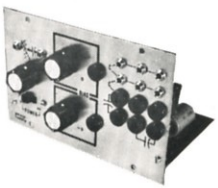
The noise source provides unpitched sound used in wind/surf sounds, cymbals, snare drums, steam and many other special effects.

No. 2720-5 Control Oscillator/Noise Source $20.95 postpaid

POWER SUPPLY

Provides the three voltages required by modules at currents up to 100 ma., sufficient for up to 20 modules. Two variable bias sources of 0 to 5v. and -5 to +5 volts allow the setting of constant parameters for filters, oscillators, amplifiers. Isolated potentiometer can serve as master volume control or attenuator. Patch panel allows more than one module to be driven from the same control source or patching between audio and control lines.

No. 2720-7 Power Supply $24.00 2 lbs.



GLIDE RETRO-FIT

Directly replaces standard control panel on the 2720-8 Keyboard/Case to provide variable rate glissando from one note to the next. Requires ± 9v supply.

No. 2720-9 Glide Retro-fit Kit $10.95 postpaid

ENVELOPE FOLLOWER/TRIGGER

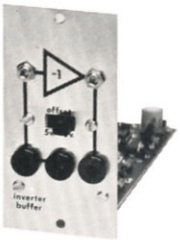
The Envelope Follower/Trigger module allows any electrified musical instrument (including microphones) to serve as signal, control voltage and trigger source for the 2720 series modules. The low level output of the instrument is converted to a DC voltage by a precision full wave rectifier built around two operational amplifiers. A Schmitt trigger circuit provides step and pulse outputs whenever the output level of the instrument exceeds a pre-set level.

2720-11 Envelope Follower/Trigger Kit $19.95 postpaid

INVERTER/BUFFER

The 2720-12 can be used as an audio inverter, high input impedance/low output impedance buffer, inverting summer or level shifter. Also useful with filter modules to produce "super Q" band-pass filter as well as notch and high-pass repsonses. Module provides for summation of audio signal and two control voltages with both direct and AC coupled outputs. Front panel switch selects output offsets of either 0 or 5v.

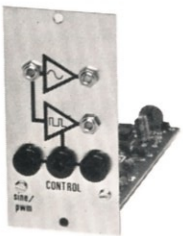
2720-12 Inverter/Buffer Kit $9.95 postpaid



SINE CONVERTER/PULSE WIDTH MODULATOR

The Sine Converter/PWM accepts as an input the triangle output of the VCO and produces at its outputs a sine wave and voltage controlled variable duration pulse. Both of the new waveforms are the same frequency as the triangle input. Pulse duration is variable from less than 5% at 0 control voltage to greater than 50% when the sum of the control voltages equals 5 volts. Negative control voltages turn off the pulse completely. Amplitude of the sine and pulse outputs is .5v peak to peak.

No. 2720-14 Sine Converter/PWM $18.95 postpaid



2720-8 Keyboard/Case

The keyboard provides 3 octaves of control voltage (C through C) in a standard 37 note AGO configuration. Pitch knob allows range of keyboard to be raised and lowered a full octave while maintaining the chromatic relationship of semi-tones. Sample/hold circuit provides a minimum of 30 seconds control voltage holding time after keys are released. Pressing any key generates pulse trigger function and voltage step trigger is present while any key is held down. Case measures 31 X 12 X 11 and provides space for 15 single width modules.

Keyboard action manufactured by Pratt, Read & Co. to PAIA Specifications featuring self-wiping gold switch contacts for long, trouble free life. Semi-tone intervals tuned with individual P.C. mounted trimmer potentiometers accessible from the bottom of the case.

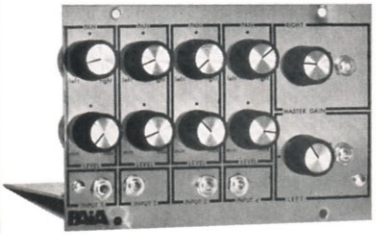
No. 2720-8 Keyboard/Case $118.00 *15 lbs.

BALANCED MODULATOR

Balanced modulators (also known as "ring" modulators) allow the synthesist to construct sounds with non-harmonic frequency components. Signals applied to the carrier and modulation inputs of the module are suppressed and in thier place appears a new output signal containing only the sum and difference frequencies of the original inputs. Essential for realisticly producing the sounds of large gongs, railroad type chime horns and many other natural and purely electronic effects. Can also be used as VCA or frequency doubler. Light Emitting Diode warns of signal overload when processing piano, guitar or other electrified instruments.

Requires +18, ± 9v. supply.

No. 4710 Balanced Modulator Kit $22.50 1 lb.



STEREO MIXER

As the sythesist's talents progress beyond "waa-waa's" and bleep-bleeps" a good mixer becomes essential to realize the subtle, almost natural sounds that express today's music. Op-amp circuitry is significantly better than passive mixers. Individual level controls for each input; pan pots allow each signal source to be placed left, right or in between. Master gain controls for left and right outputs. 10K impedance is compatible with common sound sources, 100 ohm output impedance will drive most loads. 6 db. max. gain; 20 Hz - 20 kHz. frequency response.

Requires ± 9v supply.

No. 4711 Stereo Mixer Kit *$29.88* *3 lbs.*

ENVELOPE GENERATOR

ADSR - Attack/Decay/Sustain/Release. Voltage step or manual push-button causes output voltage to rise at a rate set by attack control, then fall at decay control rate to constant level set by sustain control. Releasing push-button or terminating trigger causes output to fall to 0v. at a rate set by release control. Level control varies output. Light Emitting Diodes indicate module status. Times variable from 2 ms. to 2 seconds, 5v. peak output level.

Requires +18v. supply.

No. 4740 Envelope Generator Kit *$25.95* *2 lbs.*

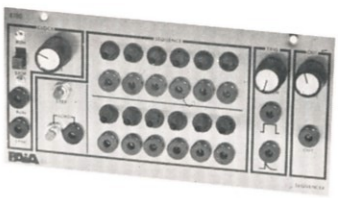
WATT BLOCK

300 ma. power supplies may be wired to provide either +18v. or ± 9v Power requirements vary from module to module but on the average 300 ma. is sufficient for 30 of the 2720 series or 20 of the 4700 series modules. Light Emitting Diode power indicatior. Multiple jack panel consisting of 3 pin jacks and 3 phone jacks aid in complex patches.

No. 4770 Watt Block Kit *$12.95* *3 lbs.*

Since Watt-Block will often be used in groups of 2, line cords for above are sold separately.

No. LC-6 6 foot line cord *$.75* *postpaid*



SEQUENCER

Use for automatic bass lines, super speed arpeggios, any repeating or non-repeating sequence up to 12 events long. "Synch" and "run" inputs to internal clock allow for remote control and series or parallel chaining of multiple sequencers. Built in glide. Clock rate pulse or variable duration step triggers as well as trigger output jacks at each stage. Light Emitting Diodes (not shown in this photo) indicate position in sequence, clock rate and step trigger duration. Includes manual operation pushbuttons.

Requires +18, ± 9v supply.

No. 4780 Sequencer Kit *$59.00* *3 lbs.*

WING CABINET

Space for 7 single width modules in beautifully finished mahogany case. Designed so that two cabinets fit side-by-side on top of 2720 series cases; or stack as "wings" to the main synthesizer case. Includes all hardware, rubber feet and power distribution buss parts. Wood parts fully assembled. Removable back plate.

Modules shown for illustration only.

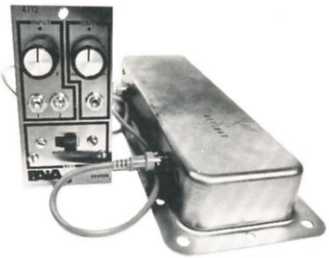
No. 4760 *Wing Cabinet* *$15.00* *3 lbs.*

REVERB "CONCERT HALL" ACCOUSTICS WITH MAXIMUM FLEXIBILITY.

A reverberation unit is a natural addition to any Synthesizer system since it provides an electro-mechanical equivalent to the delays and echos that define the accoustics of a large auditorium. The 4712 optimizes control flexibility by allowing for the mixing of two separate input signals as well as post-mixing of the input signals with the processed reverb signal. Front panel switch allows for instantaneous, pop-free termination of reverb effects without affecting normal signal flow through the module.

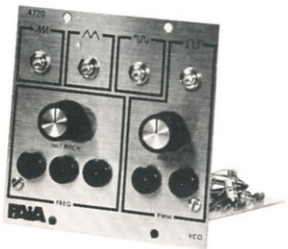
Consists of two units, control head electronics and reverb spring assembly. Control head occupies single module space in standard PAIA equipment and reverb spring assembly fastens to rear of cabinet (mounting hole drilling required).

No. 4712 REVERB MODULE $25.95 shipping wt. 4 lbs.



WIDE RANGE VCO

If you're particular about specifications, this is the oscillator for you. Features 16 Hz. to 16 kHz. guaranteed minimum frequency range, simultaneous ramp, triangle, sine and voltage modulated variable duration pulse outputs. Front panel initial pitch control allows multiple oscillators to be chromatically offset from one another while tracking a keyboard.



No. 4720	VCO	$34.95	1 lb.

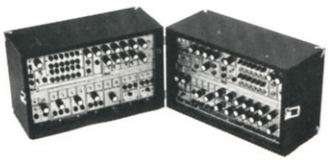
MULTI-MODAL VCF

A filter for the purist, the 4730 multi-filter features simultaneous lowpass, high pass and band pass outputs with Q adjustable from .5 to over 150. Guaranteed corner frequency range from 16 Hz. to 16kHz. Linear control voltage/frequency characteristics provide keyboard tracking and front panel initial frequency control allows multiple filters to be chromatically offset. Requires ±9, +18 volt supplies.

No. 4730	VCF	$37.95	1 lb.

ROAD CABINETS

Anyone who doesn't have their equipment nailed down needs the protection that these sturdy vinyl covered cases provide. The 4761 road cabinets have space for 13 single width modules and include power buss, interface panel (for power distribution) and all hardware. Buy two and we throw in hinges, latch and carrying handle for a fold-up portable package.



No. 4761	Road cabinet	$16.95/each	8 lbs.

ROAD KEYBOARD

The traveling musician needs equipment that is brawny enough to survive the ordeals of the road — and that's what this keyboard unit is all about. Internal electronics are identical to the time-tested 2720-8, but in a trim and sturdy vinyl covered case. Features slip hinges on the keyboard cover and fully hinged top for tuning access. Includes separate power supply for sample and hold electronics.

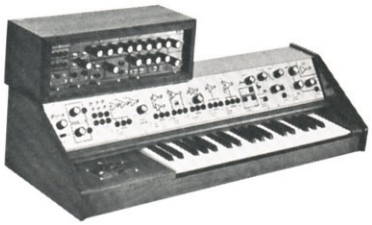
No. 4782	Road Keyboard	$130.00	*20 lbs.

ROAD KEYBOARD RETRO-FIT

Update your old keyboard by housing it in this sturdy road case. The case is identical to that used with the 4782 and includes instructions for installing your 2720-8 innards and a new power supply for these electronics.

No. 4762	**Road Keyboard Case Retro-Fit**	**$34.95**	**12 lbs.**

4700/B EXPANDER PAC



In most cases PAIA equipment is compatible with equipment supplied by ARP, MOOG, Etc. and presents a low cost alternative means of expanding the systems from these manufacturers. Current trends in electronic music are towards subtler, more natural sounds that in many cases aren't possible without multiple processing modules. Package contains: one 4760 Wing cabinet, one 4740 ADSR Envelope Generator, one 4710 Balanced Modulator, one 2720-11 Envelope Follower, and 2720-12 Inverter/Buffer and two 4770 Watt Blocks. (Note: while 2720 and 4700 series are electronically and mechanically compatible, there is a marked appearance difference caused by the heavier, matte finish of the 4700 series panels.)

4700/B Expander Pac Kit *$99.99* *14 lbs.*

4700/A SEQUENCER PACKAGE

This package forms a completley self-contained sequencer which is compatible either with PAIA equipment or units from other manufacturers. Package contains: one 4780 Sequencer, two 4770 Power Supplies, one 4760 Wing Cabinet, and one single width blank panel.

4700/A Squencer Package *$89.95* *10 lbs.*

4700/I and 4700/II MIXER PAC

Whether your interest is electronic music synthesis, stage work, production of film presentations or any of the other areas where precision audio eases the task or enhances the product you always seem to run out of mixers before the job is done. PAIA mixer pacs are an economical solution to this problem. 4700/I contains: one 4760 Wing Cabinet, one 4770 watt block, one 4711 mixer, and one triple width blank panel. 4700/II substitutes a second 4711 mixer module for the blank panel and provides an 8 in/4 out capability for well under $80.00.

4700/I mixer package *$50.00* *9 lbs.*
4700/II 8 in/4 out mixer *$76.00* *12 lbs.*

2720/B OSCILLATOR BANK

The module complement of our standard synthesizer packages are generally of the "one of each" type, intended as a framework to get you started. But for those of you experienced enough with synthesizers to be burdened by the limitations of a single Voltage Controlled Oscillator, WE HAVE NEWS – an expansion package tailored just for you. The 2720/B OSCILLATOR BANK consists of two 2720-2A VCO's one 4781 Manual Transposer, one 4770 Watt Block power supply and a 4760 Wing Cabinet – all for less than you might expect to pay for a single VCO.

2720/B *OSCILLATOR BANK* *$79.95* *shipping wt. 8 lbs.*

You'd really like to add synthesizer to your group but you don't have anyone who's good on keyboards so it's hard to justify the expense. What do you do? You might consider the PAIA 3742 GNOME/SEQUENCER Package. The beauty of this system is that it combines the flexibility and unbelievable versatility of the GNOME with the ease of operation of the SEQUENCER. Add the sounds and effects that set electronic music apart without having to add another man. And even if you're super hot on keyboards, imagine what you could do with a second, completely automated synthesizer at your side.

No. 3742 *GNOME/SEQUENCER package* *$129.95* *shipping wt. 14 lbs.*

INSTRUCTION MANUALS

Instruction manuals for each of the modules listed in this catalog are available for your inspection. Price of each module's instruction booklet is $1.00 refundable with the purchase of the kit.

Instruction sets for all Synthesizer packages are priced at $5.00 per set refundable with the purchase of these packages.

Please Note: These instruction sets are offered to illustrate the format and quality of the instruction only and no guarantees are expressed or implied concerning the operation or performance of equipment assembled using other than PAIA parts. We reserve the right to modify designs and specifications at any time such changes become economically or technically desirable.

A lot of our mail deals with questions about difficulty of assembly. We will go on record now by saying that anybody that knows which end of a soldering iron to hold can assemble one of these kits.

"USING THE PAIA 2720 SYNTHESIZER"

With complete synthesizer packages we supply the 28 page booklet "Using the PAIA 2720 Synthesizer", however, this booklet is also available separately. *Price $1.00 ppd. non-refundable.*

DEMONSTRATION RECORD

We have available a 6½ minute demo record of the PAIA 2720 and 4700 series equipment being used in a variety of applications covering free-form "sound effects" compositions, live performance pieces and an excellent example of what can be accomplished using only an inexpensive stereo recorder. Includes manual with original scores and patch charts for all recorded numbers. 33-1/3 Stereo "sound-sheet".

No. 4700/D *Stereo Demonstration Record* *$1.00* *postpaid*

T-SHIRT FREAKS . . .

Heavy weight cotton T-Shirt with the PAIA logo on the back and the copyright "GNOME" cartoon character on the front. Black ink on white T-Shirt, sizes S, M, L & XL.

No. TS228 PAIA T-Shirt $3.00 postpaid

MANUAL TRANSPOSER

Much of today's most outstanding synthesizer music is performed using more than a single oscillator. The 4781 Manual Transposer allows up to 5 of our 2720-2A Voltage Controlled Oscillators to be offset by a chromatic interval and remain in tune with one another while tracking a single control voltage source.

No. 4781 *Manual Transposer* *$9.95* *Postpaid*

TRACKING LINEAR OSCILLATORS

There seems to be a misconception concerning whether or not linear Voltage Controlled Oscillators can be transposed in pitch from one another and maintain a chromatic interval while tracking a keyboard. At the risk of becoming boring, we would like to use a little space to dispel this myth – reasoning, of course, that the more you know about synthesizers, the more you will realize that PAIA Synthesizers are superior bargains in electronic music systems.

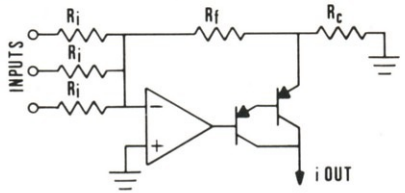
Those who have experience with synthesizers know that to transpose an exponential oscillator into a new key you sum a reference voltage into one of the control voltage inputs. Most realize that this works because the transfer function for this type of oscillator is of the form $F=Ke^{B(V)}$ where F is the frequency of the oscillator and V is the sum of the input control voltages. If the constants B and K are properly chosen then the oscillator frequency will double for every volt increase in the control voltage. This isn't the most complicated equation in the world but it's not really the simplest either and if you have the nagging feeling that it's difficult to exactly match this accellerating curve (which you must to stay in tune) you're partly right and partly wrong. You're wrong because the equation is amazingly close to the equation that describes the behavior of a semi-conductor junction and all exponential oscillators exploit this fact. You're right because the semi-conductor equation has a temperature term in the exponent. It's really not too difficult to get rid of the temperature term – particularly if you can afford to throw money at it – but like the man says, it does require "ultra precise parts carefully matched in temperature characteristics".

At PAIA we take the different approach of generating this exponential function by tapering the voltage divider that forms the keyboard and then using linear VCO's – thereby eliminating the exponential circuitry that must otherwise be duplicated in every oscillator.

A linear oscillator has a transfer function of the form F=K(V)+A which is simply the equation for a straight line that we all learned in high school algebra. If the A term in this equation is anything other than zero you have tracking problems caused by the constant frequency offset that this term represents. Our early oscillators zeroed this term by summing in what was supposed to be a constant reference voltage. This was sufficient for the "Synthesizer idiom" of the day and we didn't try to claim that these early oscillators would track because while they would, it was really a hassle.

When it became obvious that transposable oscillators were an absolute necessity for music the way it would be played in the 70's we worked with making our oscillator designs more elegant and elaborate (and expensive) and for a while the temptation was great to go the established exponential route despite its cost and calibration difficulties.

Then, about a year and a half ago, the schematic below began to circulate through the shops and without straining



at detail it is interesting because it is a design for a voltage controlled current source (the heart of every VCO) that has three strong points in its favor.

1) The darlington transistor that is the actual current source is inside the feedback loop of the operational amplifier. Any nonlinearities or drift that would otherwise originate in this transistor are cancelled by the gain of the op-amp.

2) The feed-back voltage for the summing network appears across the parallel combination of Rc and Rf and since the first of these terminates at ground and the second at a virtual ground, the circuit naturally zero's the A term in the transfer function.

3) It's simple and inexpensive.

With the A term in the transfer function zeroed, transposing by an octave becomes a simple matter of doubling the control voltage (for double the frequency). Since the inputs of the oscillator sum the control voltages and since any number added to itself is the same as doubling the number, transposing by an octave is simply a matter of applying the control voltage to two inputs instead of just one. Intervals greater or smaller than an octave are only slightly more difficult and require that you place a potentiometer in series with one of the control voltage inputs. Pots are inexpensive enough but if you're not in the mood to have one hanging on the end of a wire we sell a "Manual Transposer" module (a fancy name for 4 pots on a front panel) that will allow for the transposition and tracking of 5 oscillators at one time. Best of all, the total price of all 5 oscillators and transposer is less than $140.00.

The first oscillator to use the naturally zeroed current pump is our 2720-2A and when we began substituting it for our original oscillator (the price was the same – a lot of people didn't realize they were getting a new design) we didn't make a big deal out of it because we were honestly a little embarrassed that we hadn't seen it sooner. Maybe we were wrong – apparently some still haven't seen it.

SYNTHESPIN MK - II

* INTEGRATED CIRCUIT DESIGN
* WIDE "ROTATING" SPEED RANGE
  (.2 to 15 Hz)
* VOLTAGE CONTROL OPERATION

For years electronic organs have used mechanical rotating speakers to produce a tremolo effect. Recently these speakers have gained added popularity with musicians because the sound they produce is totally unlike electronic forms of tremolo. However, mechanical speakers are too bulky and heavy to be conveniently carried from one date to the next and their cost puts them beyond the means of many amateur and semi-professional musicians. The synthespin was designed as a low cost, portable electronic simulator of the rotating speaker effect.

The Synthespin MK-II is an updated and improved version of a similar unit sold by PAIA for several years. In addition to the rotating speaker effect the MK-II also produces numerous effects ranging from very slow phasing type sounds to a bubbling pseudo-reverb. Electrical inputs on the rear of the case provide for optional foot pedal control of the rotating effect as well as allowing for instantaneous foot switch cancellation and bypass functions.

Complete kit includes: circuit board, all parts, wire & hardware, pre-finished case and step-by-step instructions.

No. 1702K	*Synthespin MK-II Kit*	*$24.95*	*3 lbs.*

Note: The 1702K is not a Phaser.

Drummer Boy

DRUMMER BOY

Eleven Rhythms: Waltz, Vienna Waltz, Jazz Waltz, Polka, Fox Trot, Samba, Boss Nova, Funk, Cha-Cha, Rhumba, Tango. Rhythms are switch selected and can be combined two or more at a time for an almost unlimited range of effects. Drum sounds include Bass, Snare, Conga, Clave, and wood block. Rocker switches allow individual drum sounds to be interchanged within the framework of a rhythm pattern. Down-Beat emphasis is switch selectable. Plugs into any guitar, organ or hi-fi amplifier. Case is pre-punched sturdy guage aluminum with oiled hardwood end panels. ** Magazine article re-print instructions*

No. 7701K	*Drummer Boy Kit*	*$59.00*	*6 lbs.*

guitar Attack Delay Unit

VARY "ATTACK" TIME AN EFFECT NEVER BEFORE POSSIBLE FOR LIVE PERFORMANCES

The Attack Delay Unit provides an effect never before possible for live performances. Instead of the instantaneous percussive attack characteristic of guitars, the ADU produces a variable duration swell that makes the instrument sound like it has been pre-recorded and the tape is being played in reverse. Rear jack provided for foot control switch. Complete kit includes all parts, pc board case, hardware and instructions. Case Unfinished. * *Magazine article re-print instructions*

Attack Delay Unit kit	*No. 1069*	*$19.25*	*3 lbs.*

INFINITY PLUS

LOW DISTORTION SUSTAIN

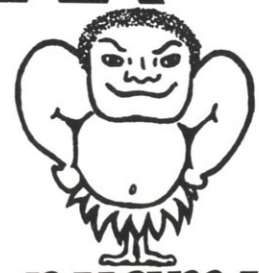
"Infinity Plus" may seem like an ambitious name to call a sustain but once you hear this one you'll have to agree—it fits. Sustain duration control lets you pull out notes or chords as long as you like without changing over-all volume. Maximum sustain allows controlled feed back guitar techniques that hold a note until you decide to let it go. Rear panel jack for optional foot switch allows the sustain to be switched in or out at the touch of a toe.

The Infinity Plus is a low distortion sustain that adds little coloration and no fuzz to the original sound. The use of two low noise Integrated Circuit operational amplifiers plus fully imprinted circuit board and "modular" design add up to a trouble free unit that is easy to build and a gas to use.

Complete kit includes circuit board, pre-finished case, instructions, wire, all parts.

Kit Name	Stock No.	Price	Shipping Wt.
Infinity Plus	*No. 9711*	*$22.95*	*4 lbs.*

PAIA



pygmy

Take it anywhere!

The new battery powered portable amps are the slickest things to come along in a while. They're tiny, light weight, only slightly ugly and LOUD. You can use them for practicing on the road, headphone listening while others sleep, distortion boosters at full volume, stage monitors, spontaneous open air concerts – you name it.

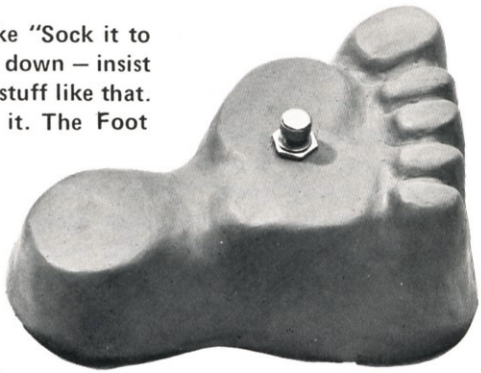
Eight penlight batteries are good for about a month's use and drive the PYGMY'S 5 inch accoustic suspension speaker to a room filling 1.2 watts RMS (up to 8 watts peak). The speaker's hefty 10 oz. magnet assures that what goes in as signal comes out as SOUND. Internal 3 position switch selects speaker/headphones/line level outputs. Road worthy 1/2 inch ply case is supplied to you pre-covered with heavy black vinyl and all hardware (corners, hinges, strap pegs, latch and speaker bezel) is provided.

The Pygmy's integrated circuit design and step-by-step instructions make assembly a snap – figure about 3 hours tops. Batteries and strap not included.

No. 1750 *PYGMY AMP.* *$39.95* *shipping wt. 6 lbs.*

PAIA's FOOT Switch

You're probably expecting tricky comments like "Sock it to 'em with a PAIA foot switch" or "Put your foot down – insist on PAIA" but we wouldn't come up with corny stuff like that. We just say try it – you'll get a boot out of it. The Foot Switch is a fully assembled solidly cast block and comes with 9 feet of cord terminated in a phone plug that matches the control jack of our special effects equipment. The switch is a push on – push off type; pushing once starts the effect, pushing again stops it. Carries an eternal unconditional repair/replacement guarantee.



Stock No.	*Price*	*Shipping wt.*
***FOOT**	$10.95	3lbs.

PING ★ PONG

An outa-sight stage effect for live performances. The Ping-Pong accepts an input from any electronic musical instrument and alternately routes it to two seperate amplifiers. Independent left and right depth controls allow for a gentle undulation of the sound back and forth or a fantastic stroboscopic jump from one end of the stage to the other. Front panel switch allows the sound to be routed to one or both of the amps when the unit is switched out. Effect can be initiated or terminated either with front panel switch or optional foot switch plugged into the rear panel jack. Powered by a single 9v. transistor battery. Complete kit includes case with oiled walnut end panels, circuit board, all parts and hardware, instructions, wire, etc. Less battery.

Ping Pong Kit	*No. 3712*	*$22.50*	*3 lbs.*

THUMPA-THUMPA BOX

A truly inexpensive electronic rhythm section. The TTB simulates the sound of a bass drum and wood block with amazing realism and generates a practically unlimited variety of rhythms. Battery powered and designed to plug into your amplifier or organ. The prepunched, heavy guage aluminum case and fully imprinted circuit board make this one a snap to assemble. Why buy a metronome when for a few dollars less you can have a full rhythm section?

* *Magazine article re-print instructions*
* *Case Unfinished*

No. 118	*Thumpa Thumpa Box Kit*	*$18.95*	*2 lbs.*

YES THE SALE IS STILL ON!

In a sale you ordinarily try to get rid of your slow moving items. But the Omni-Alarm can't be described as a slow mover - more like a disaster. And we can't figure out why!

We think it's one of the best investments for your automobile next to insurance. Six simple splices tie the Omni-Alarm to your car's ignition, headlights, and idiot lights (those dim little gadgets that Detroit so thoughtfully provides to let you know that catastrophic failure is imminent) and if anything goes wrong it lets out a Star Trek type beep-beep. It even reminds you to turn off your headlights - that alone is worth the price. All of these marvels of modern engineering come to you attractively packaged in a vacuum formed ABS housing (like your telephone - indestructable). The kit is complete with all parts, circuit board, case, cable and instructions.

OMNI ALARM COMPLETE KIT

No. 115

~~$12.95~~
~~$9.95~~

NOW ONLY
$7.95
postpaid

NEED A HOME FOR YOUR LATEST PROJECT?

TRY OUR

COMMERCIAL GRADE CASE

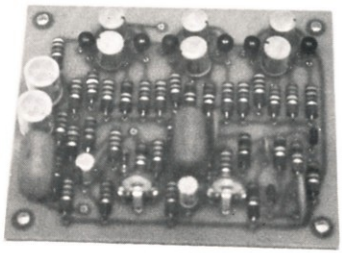
Every experimenter has had the experience of investing long hours in a pet project only to have to house the end result in an ugly square steel box. But not anymore, now you can turn out custom projects with the designer look of a commercial product. Inside measurements of the case are 3" high sloping to 1 5/8" by 6" wide by 4 1/4" deep. End pieces are solid Hardwood and metal parts are easily worked aluminum. Supplied assembled with rubber feet and metal primed to accept the color of your choice.

COMMERCIAL GRADE CASE

$4.50 each plus postage for 1 lb.

surf synthesizer

WILL BACKGROUND SOUND REPLACE BACKGROUND MUSIC?



★ *LOW COST*

★ *BATTERY POWERED*

★ *USE WITH ANY HI-FI*

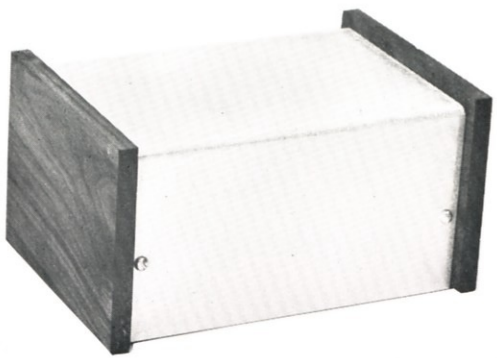
The roar of the ocean is one of the most relaxing sounds imaginable. Now you can have the sound of the surf electronically synthesized and played through your hi-fi. Complete in this low cost package is a special purpose synthesizer consisting of a pink noise source, random voltage generator, voltage controlled attenuator, and voltage controlled low pass filter. Use as a background sound generator, mood setter. An unbeatable conversation piece. Powered by two 2U5 type batteries (not supplied). Complete kit includes: circuit board, all parts, battery connectors and clips, miniature type phone output jack and plug, detailed instructions.

3711K *$12.95 postpaid*

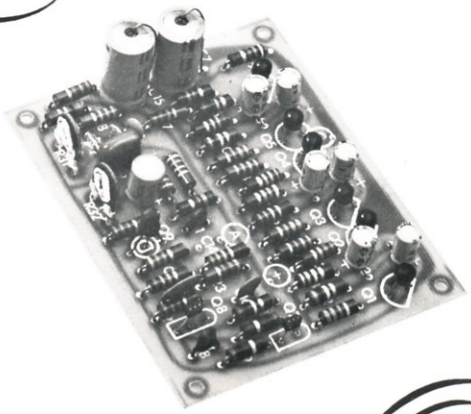
Houses the Surf Synthesizer, The Wind or the Wind Chimes interchangeably. Heavy aluminum body with oiled walnut end pieces blends with contemporary audio and hi-fi equipment. Aluminum top and bottom are completely pre-punched with provision for power switch and output jack on the rear apron of the case. The case is supplied unpainted.

Stock No.	*Price*	*Shipping wt.*
3711-C	$3.50 when ordered with 3711K, 3730K or 3721K $4.50 if ordered seperately.	1lb.

3711C -- CASE



The Wind

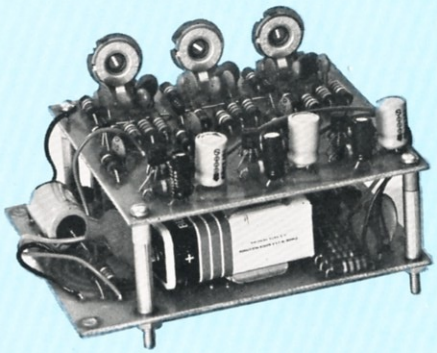


Don't be surprised if you feel like running for your coat when you hear the wind, it's so realistic that people who have heard it report they actually feel cooler. Trimmer adjustments provide a range of effects from moderate breeze to full gale. Great for background sound, special effect accessory for organs or other musical instruments, or just as a party starter. May be used with any hi-fi or musical instrument amplifier, powered by two standard transistor batteries (batteries not included). May be housed in the 3711C case shown on facing page.

Complete kit includes: circuit board, all parts, hardware and wire; battery connectors and clips, miniature type phone output jack and matching plug, detailed instructions.

No. 3730 $12.95 postpaid

Wind Chimes 常



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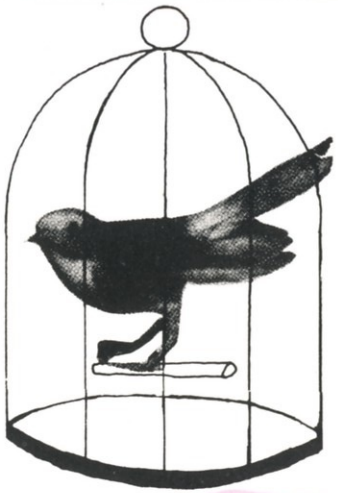
You'll feel like you've been transported to the Mikado's palace for the afternoon tea ceremony as you settle back and relax to the gentle random tinkling of these electronic wind chimes. Internal trimmer adjustments allow you to select either the ring of brass chimes or the percussive resonance of bamboo rods. The wind chimes are completely self contained, battery powered (battery not supplied) and may be used with any hi-fi or musical instrument amplifier. May be housed in the 3711C case shown on facing page.

Complete Kit includes circuit boards with parts placement designators, all parts, hardware and wire, power switch, co-ax output lead with RCA type plug, detailed instructions.

WIND CHIMES • No. 3721 $17.95 postpaid

SOLID–STATE BIRD



If you like the sweet, warbling song of a canary but don't dig that cage to be cleaned, try this electronic bird – a real solid–state singer. When turned on the bird whistles down-scale for a few seconds, breaks into a warble and shuts itself off only to start again–a few seconds later.

Kit includes circuit board, instructions, parts, wire, switch and speaker, Powered by four AA pencells (not included)

Bird Kit No. 110 $7.95 postpaid

All Electronic STEAM WHISTLE

Shades of John Henry – An electronic package that sounds so much like an old time steam whistle you'll keep looking over your shoulder to make sure ol' 99's not steaming through the door. Use with any amplifier to provide realistic sound effects for model railroads, recordings, parties. Or really wild, how about a steam whistle car horn.

Kit includes circuit board, instructions, wire, battery connectors, all parts. Powered by two 9 volt transistor batteries (not supplied).

STEAM WHISTLE Kit No. 6710K $8.95 postpaid

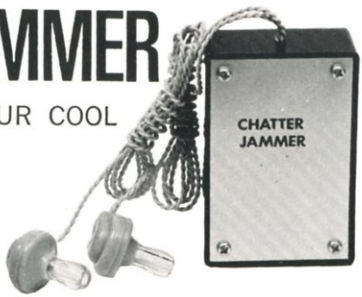
Build the CHATTER JAMMER

CUT OUT NOISE POLLUTION AND KEEP YOUR COOL

Technically speaking, Pink noise is an equal probablilty distribution of an all frequencies within a given bandwidth.

If you still have trouble visualizing what it sounds like there are many natural phenomena that come close to being pink noise. The sound of falling rain and the roar of the ocean are two good examples.

Strangely enough, most people find these sounds relaxing.



We make only one claim for the Chatter Jammer; if you must work in a noisy environment the Chatter Jammer will help you to concentrate by blocking out distracting outside sounds and substituting the gentle "rushing" sound of pink noise. Thousands of these units have been bought by students and businessmen. Hundreds have been sold to doctors of various disciplines (MD, DDS, PHD, etc.).

The Chatter Jammer is shirt pocket size, completely self contained and can be assembled in less than an hour. Kit includes circuit board, case, earphones, selected noise diode and instructions. Requires two 9 volt transistor batteries (not supplied).

CHATTER JAMMER kit No. 111 $6.95 postpaid

If you think that you could really get into synthesizers but are having trouble justifying the heavy cash outlay on pure speculation, the PAIA Gnome is designed just for you. It's a micro-synthesizer at a mini-price; but really big on performance and ease of operation.

"Normalized" controls completely eliminate patch cords and jumpers so that even if you've never been near a synthesizer before you'll still be able to produce those far-out electronic sounds the first time you turn it on. With a little practice you'll be doing far more subtle, natural sounds like the whisper of the wind, flutes and many more. The ribbon controller is so easy to use that even non-musicians can pick out tunes in the first few minutes.

On the beach, at a party or carried out into the middle of your audience; the PAIA Gnome is an instrument that you have to hear to believe. Requires two 9v. transistor batteries (not included).

No. 3740 GNOME micro-synthesizer kit.

$48.95 *4 lbs.*

Note: The Gnome is not designed to be compatible with external synthesis equipment but it can be controlled by the PAIA 4780 Sequencer.

PAIA ELECTRONICS INC.
P.O. BOX 14359
OKLAHOMA CITY, OK 73114

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