

RAiA



NEW PRODUCTS
NEW LOW PRICES

RAiA Electronics, Inc.
1020 W. Wilshire, Oklahoma City, OK 73116 (405)841-9626

STOMP BOX EFFECTS

These new stomp boxes from PAIA are designed to give electronic guitarists the highest quality effect at the lowest possible price. Cases are formed of heavy steel and covered with the most scuff-resistant baked-on finish available. All feature heavy duty switches for long life and electronic effect switching for pop-free punch-in and punch-out. All are high input impedance, low output impedance, non-inverting, low noise devices designed to meet all proposed FX standards. Each provides hour after hour of operation from a single 9 volt battery and provide automatic power switching; you'll never have to worry about forgetting to turn them off.

HOT LYX SUSTAIN

Probably the most used effect by any electronic guitarist, a sustain unit is essentially an amplifier that automatically increases its gain to compensate for a guitar's normal decay characteristics. The result is the ability to hold notes and chords much longer than would otherwise be possible.

Hot Lyx gives you all the control you need, continuously variable sustain from just enough to make your Silvertone sound like a Les Paul to "pedal to the metal" controlled feed-back settings that give rock-guitar its "all-out" quality. Level control allows for either lower or higher volume levels when you're punched into the effect and can also be used as an over-drive control to give you the sweetest fuzz/sustain sounds you've ever heard.

No. 5710 HOT LYX Sustain. \$34.95 (3 lbs.)

AT LOWER THAN
1980 PRICES

MIDRANGER™ Midrange Equalizer

Sure, your amp has bass and treble controls — but what about the all important midrange? When you need more sound from your axe than most amps can give, but don't have the bucks for a fancy equalizer, the MID-RANGER is for you. Featured in Craig Anderton's June 1982 Guitar Player column, this special purpose equalizer gives more presence and "punch" by providing continuously variable boosts of up to 12 db. at switch selectable frequencies of 90, 200, 1000, 2000 or 4000 Hz.

Designed for guitars, voice, rhythm boxes and keyboards, the MIDRANGER features High Input/Low Output Impedance, quiet electronic switching and single 9v. battery supply (not included).

MIDRANGER (tm) Cat. No. 5740. \$32.95 3 lbs.

5750 — AXE GRINDER(tm)

A classic fuzz to FX standards.

The AXE GRINDER might be a pretty routine fuzz if it weren't for a couple of subtle but significant features. Like a Distortion Intensity Knob that provides smooth control of clipping from just a hint when you really get it on to pure square waves when you even think of picking.

And the Distortion Tone, Distortion Level, and Clean Level controls are like having a built in mixer and E.Q., letting you precisely set the amount of distortion and its tone as well as the mix of clean and distorted signal. You probably never realized you could get so many sounds from a "simple" fuzz.

The AXE-GRINDER also features totally pop-free electronic switching and adherence to uniform FX standards that allow any Effect to work with any other without concern for mismatch noises or phase incoherence. 9 volt battery power (not supplied).

5750 Axe Grinder(tm) Kit. \$29.95 3 lbs.

5760 ROCKTAVE DIVIDER(tm)

Whereas most effects that alter the harmonic content of a signal can only produce or accentuate frequencies higher than the fundamental frequency produced by the instrument, the ROCKTAVE DIVIDER fills out your sound by adding in wave-forms that are sub-harmonics of those produced by your axe.

Comporandor stages are used to stabilize input for reliable triggering of the divider circuitry and to impress the original dynamics of your playing onto the newly created subharmonics.

Independent level controls on the extracted fundamental and first and second sub-octaves allow you to produce just the mix you're after and master tone control lets you round the square wave sub-octaves off to near-sinusoidal purity.

The ROCKTAVE DIVIDER also features automatic power switching when in use, pop-free electronic cancel function and single 9 volt battery power source (battery not supplied).

5760 Rocktave Divider(tm). \$39.95 3 lbs.

MOTION FILTER

An envelope follower/filter combination translates the normal dynamic properties of your axe into modulated timbral changes as well, the effect is like a wah-wah pedal being used by someone with magic feet. The first time you get your MOTION FILTER working you won't believe that so much funk and soul can be squeezed into such a tiny box.

Independent Initial Frequency and Sensitivity knobs give you the control you need to realize a wide range of effects and allow the MOTION FILTER to be used with either electric bass or guitar.

No. 5720 MOTION Filter Kit. WAS \$34.95
. NOW \$29.95 (3 lbs.)

GATOR™ Noise Gate/Envelope Controller

The almost un-noticeable "hiss or swish" that each unit in a multiple-effects system adds to your music can sum to annoyingly noticeable background noise just when things are supposed to be quiet. GATOR listens while you play, and when you stop, electronically isolates your effects from your amplifier, zapping noise completely.

And despite its low cost, GATOR has added features that let you do more than just make other effects sound good. It's an important effect in its own right.

The ATTACK control lets you re-shape the normal percussive envelope of your guitar for bowed string and organ effects with attack times up to 1.5 sec. and an AUXILIARY TRIGGER SIGNAL INPUT allows the dynamics of one instrument to be gated by another (drums, for example) to impart unique "synchro sonic" rhythmic characteristics to your sound.

Other features include High Impedance In/Low Impedance Out, Electronic Footswitch for quiet punch in/out, wide range Threshold Control, Single 9v. battery supply (not included).

GATOR (tm) Cat. No. 5730. \$34.95 3 lbs.



NEW

NEW

QUALITY
EFFECTS
AFFORDABLE
PRICES

I-5760 Manual/Demo Tape Evaluation Package — \$10.00 ppd

A SAMPLING OF NEW PRODUCTS

SHEPARD FUNCTION GENERATOR EK-9

In 1964 Roger Shepard used a computer program written by Max Mathews to generate a tone which appeared to increase in pitch eternally, without ever reaching an upper limit. An audio analogy of the illusory stripes on a barberpole.

This intriguing and versatile digital function generator for the electronic sound professional or hobbyist produces 8 sets of precisely phased ramp and triangle control voltage waveforms which allow the Shepard Tone to be produced with analog pitch sources. But that's not the best part.

When Shepard Functions are used to control analog processors like filters, flangers, VCA's, and the like, the result is a whole new class of effects that don't simply swing back and forth, but sweep eternally up or eternally down. And when you start separating individual effects outputs into Quad or Stereo, you're into the totally uncharted territory of spatial effects where sound sources move in strange but predictable ways.

Synchronizable to external events or to tape click tracks with the Paia 6770 Master Synchronizer.

Documentation includes John Simonton's instructive and entertaining Polyphony article, "LAB NOTES: Shepard Functions" **EK-9 Shepard Function Generator Kit \$24.95 . (2.00)**

SSM2011

The 2011 is an ultra low noise preamplifier which excels in high quality audio applications (such as low impedance balanced mic amplification). The input stage uses optimized biasing and geometries to yield a 2.4 nV per root Hz equivalent input noise, and a 110 dB common mode rejection ratio over a $\pm 5V$ input range. A single compensation capacitor provides a 200 MHz gain-bandwidth product (Gain=1000) and a 200 kHz full power bandwidth at Gain=10. The level detector selection consists of a precision rectifier, two internally biased comparators, and two LED drivers. One LED output lights at 3 dB below a 5V peak output level, while the other lights only when the signal is within ± 10 dB of nominal output level.

No. 2011 SSM Microphone Preamp/Level Detector IC \$5.75 (1.00)

VELOCI-TOUCH™ CONTROLLER

The new Veloci-Touch controller from PAIA adds what may be the two most important parameters that any electronic keyboard can have—velocity and second touch pressure sensitivity.

Velocity is a control voltage proportional to how hard you play. Pianissimo and the voltage is low. Fortissimo and it's high. Use this parameter with a VCA and presto . . . output level changes that follow your playing.

But, since "loud" and "soft" mean more in human terms than just level changes, the Veloci-Touch controller also provides a velocity sensitive transient generator with variable decay time and an output control that's continuously variable from normal to inverted transients. Use as a filter parameter control for the most natural timbral changes ever.

Even that's not all. The Veloci-Touch controller also provides an output proportional to the pressure you apply to the key after it's down (second touch). Imagine—tremolo the natural way.

The best part of this minor miracle from PAIA is that it's non-denominational. You can retro-fit it to essentially any synthesizer from any manufacturer.

Get the full story in the Veloci-Touch assembly and using manual, it's only \$5 post paid, and is fully refundable upon purchase of the 8786 or 4786 Kit.

No. 8786 VELOCI-TOUCH™ CONTROLLER KIT \$69.95 3 lbs.

No. 4786 VELOCI-TOUCH™ CONTROLLER MODULE KIT \$44.95 . . . 2 lbs.
(PAIA 4700 Series Compatible)

PAIA Electronics, Inc.

1020 W. Wilshire, Oklahoma City, OK 73116 - (405)843-9626

Whatever your musical involvement; Technical or Artistic — Live or Studio, you're going to find a lot to like in these pages. There are more new products in this catalog than we've ever introduced before.

For the beginner, Electronic Projects For Musicians is THE BOOK. Starting from "this is a resistor", Craig Anderton shows you how to build, modify and maintain your own equipment. The bound-in sound sheet lets you hear each effect and modification before you strip a single wire.

There are two significant additions to our line of studio equipment. The Hyperflanger & Chorus is the ultimate in quiet, clean flanging; and the innovative Master Synchronizer is destined to become an indispensable piece of equipment for multi-tracking.

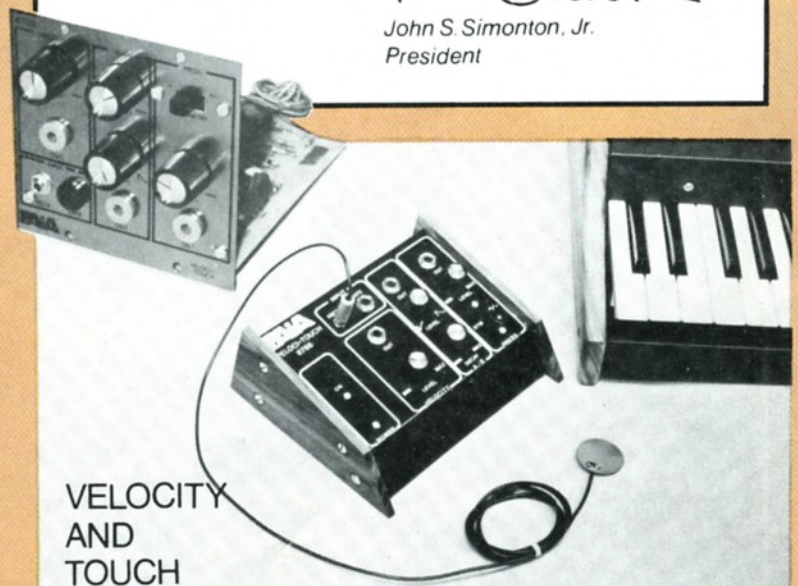
For pedal-board fans there are 4 new compatible Stomp Boxes. In particular you'll want to check out the Rocktave Divider (see it in detail in the March '83 issue of Guitar Player magazine). You can pay many times our special introductory price and not equal this effect. It really works.

We haven't forgotten the advanced experimenters, either. The EK-9 Shepard Function Generator points to some interesting new directions in audio effects and illusions and our Versa-Talker for S-100 buss computers offers surprising quality and features in a low-cost Speech Synthesizer board.

In the new IC department, we've added the incredibly quiet Solid State Music Technology 2011 microphone preamp/level detector IC. The SC-01 Phoneme Synthesizer is a surprisingly easy way to produce human speech and you won't find it at a lower price anywhere.

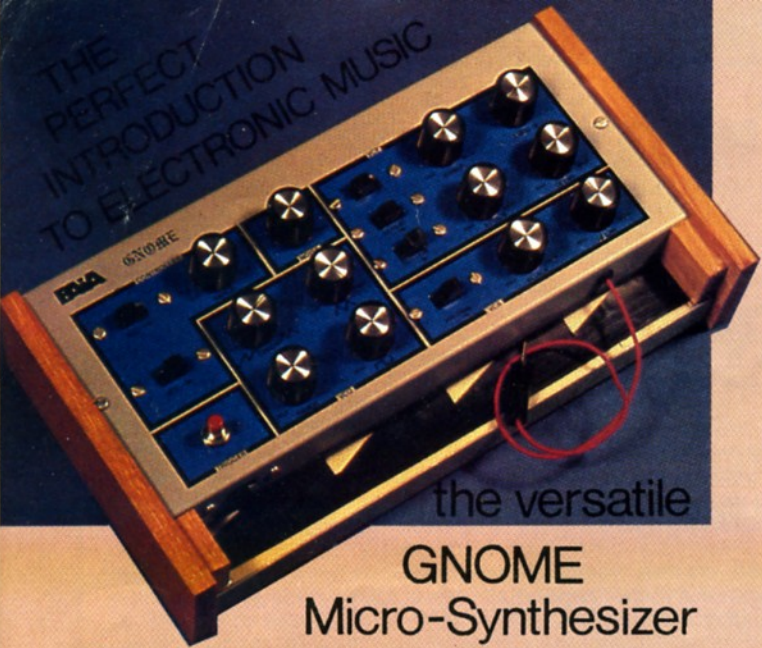
We're sure that you'll like the new low prices on many items. The only possible positive effect of a recession is that the prices of many industrial commodities go down. We're happy to be able to pass these savings along to you. We won't be able to hold these prices forever; but while we do, it's a terrific opportunity for you to get even more for your equipment dollar.

John S. Simonton, Jr.
President



**VELOCITY
AND
TOUCH
FOR ANY KEYBOARD**

THE PERFECT INTRODUCTION TO ELECTRONIC MUSIC



the versatile
GNOME
Micro-Synthesizer

Every day more people discover that the GNOME is the most versatile, cost effective special effects device on the market today.

The Gnome has two function generators (one with repeat for cyclic effects), VCA, VCF and VCO. Use alone with its built in ribbon controller or modify to interface to guitar, electronic piano, polytonic keyboards, etc.

With the Gnome's normalized controls you'll soon be able to produce those far out electronic sounds even if you've never been near a synthesizer before. The Gnome can make outer space sounds for rock musicians, demonstrate principles of music and acoustics for educators, provide rhythmic pulses for modern dance groups and sound effects for theatre companies and is one of the neatest toys in the world for the audiophile.

Complete kit and well illustrated step-by-step instructions and using manual make the GNOME the perfect introduction to electronic music synthesis. **No. 3740 Gnome Micro-Synthesizer Kit \$69.95 (3 lbs.)**



SAVE \$100 OVER OUR 1982 CATALOG PRICES ON THESE SPECIAL PURPOSE KEYBOARDS

SYNTHESIZER MEETS COMBO ORGAN THE RESULT: ORGANTUA

Forget about the "thin" sound of single voice combo organs, ORGANTUA has three individual ranks, each with a five position octave switch, for a thick, textured sound. The multi-voice feature allows ranks to be detuned slightly for flanging or chorusing effects, or ranks can be tuned to wider intervals such as 4ths or 5ths to simulate drawbar organ or multi-oscillator synthesizer effects. Super wide-range sound is possible by tuning the ranks apart in increments of an octave, with up to 5 octaves between voices.

The master rank utilizes a voltage controlled clock to allow pitch bending, vibrato (two waveforms), and percussion effects. The two slave ranks can each be synchronized to either the master clock or an alternate tunable clock. The output amplifier allows variable attack time and overdrive control. A master level control is also provided.

Optional footpedals and foot switches allow the musician to bend pitch up or down, introduce vibrato or trilling, and switch the slave ranks in and out. ORGANTUA also features a unique "octave jump" footswitch capability, which raises all ranks one octave.

If you're not convinced by now that ORGANTUA represents the first major advance in combo organs in 10 years, send for the evaluation package which includes the assembly/using manual and a demonstration tape, it tells the full story. It's cost is refundable upon purchase of the kit.

No. 6780 Organtua Kit was \$399.99 in '82 now only \$299.00 (33 lbs.)
No. I-6780 Manual/Demo Tape \$10.00 ppd.

THE STRING SYNTHESIZER THAT'S MORE THAN JUST STRINGS STRINGZ 'N' THINGZ

We can't possible cover all of the features and options of STRINGZ 'N' THINGZ in this limited space but even in this small space we can say that the 1550 is the most advanced and versatile string ensemble available at any price, from anybody. Features include: Violins/Cello/Piano, separate mixable piano output, synthesizer interface, variable chorusing, variable sustain controls, jacks for foot controls, keyboard split, dual violin/cello mixers, stereo string option. You'll love it.

For the full story order the evaluation package below. The cost is refundable upon purchase of the kit.

No. 1550 Stringz 'n' Thingz Kit was \$399.00 in '82 now only \$299.00 (35 lbs.)
No. I-1550 Manual/Demo Tape Package \$10.00 ppd.

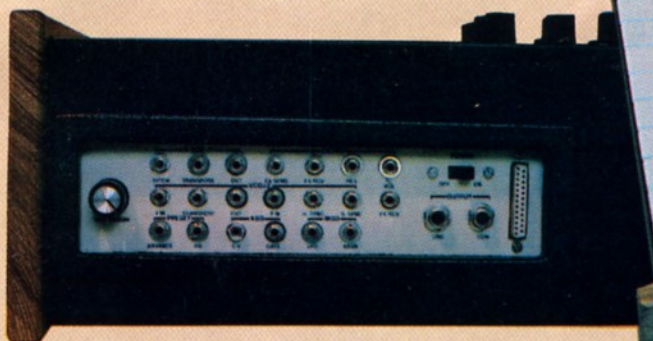


Stringz 'n' Thingz

PROTEUS I T.M.

PROGRAMMABLE PRESET LEAD SYNTHESIZER

NOW AT A
NEW LOW PRICE



Proteus I is a quality piece of equipment that offers wide range precision and quiet, pure performance. It's designed around the world recognized Curtis Electromusic Chip Set to realize Oscillators and Filter with 12 octave range, transient generator segments out to 30 seconds long, exceptionally low noise and clean sound. Qualities you need for serious production work.

It's 16 presets make it easy to use on stage or in the studio. You get just the sound you want RIGHT NOW, without a lot of knob twiddling and switch throwing. Easy, natural programming lets you play with the sound and develop just the tone color, texture and feeling that you're after before assigning the setting of every knob and switch to a preset with the push of a single button. Internal memory keep-alive battery keeps presets in place even after months of power-down storage.

The patch bay features the most generous collection of patch over hardware points that you'll find on any synthesizer and lets you integrate external processing elements into Proteus's signal path. Or interface to a wide variety of analog controllers like sequencers and function generators. Or use optional footswitches to control preset functions. Or respond tomorrow to needs that you can't even imagine today.

PRESET FILER

PAIA'S Preset Filer software interfaces the PROTEUS I to a disk based APPLE II computer to provide a quick and convenient means of saving and cataloging up to 800 presets on a single mini-floppy diskette. Using the APPLE II's graphics capabilities the Preset Filer shows knob positions in real time as presets are being developed and displays patch drawing of preset when writing PROTEUS I's internal preset memory. Requires 32K APPLE, DOS 3.3 and PIA based interface card.

No. PPF PAIA's Preset Filer.....\$29.95 (2.00)

ORDER TOLL FREE
WITH VISA OR MASTERCARD
1-800-654-8657

Proteus I's parallel, transparent computer port accesses both panel controls and keyboard to set new standards for versatility and ease of use. This interface doesn't put the computer between you and your music. It puts the computer where it belongs, at your side to help when you want it to store or retrieve presets or keyboard sequences and completely out of the way when you don't want it. There's nothing to remove or rewire, or even any switches to throw. To use the computer, just plug it in.

Yet despite its high-tech complexity Proteus I is easy to assemble and service. The 3 book manual set breaks assembly down into small easily digested chunks with simple tests along the way that let you monitor your progress and go from step to step with complete confidence.

If you're not convinced yet, the Evaluation Package with it's complete manual set and outstanding Demo tape by Craig Anderton will really make a believer of you. Order yours today.

I-8750 Evaluation Package.....\$10.00 ppd.

8750 Proteus I Kit. . . . \$499.00 in '82

NOW ONLY \$399.00
... (26 lbs.)



IDEAL FOR MULTI-TRACK STUDIO USE



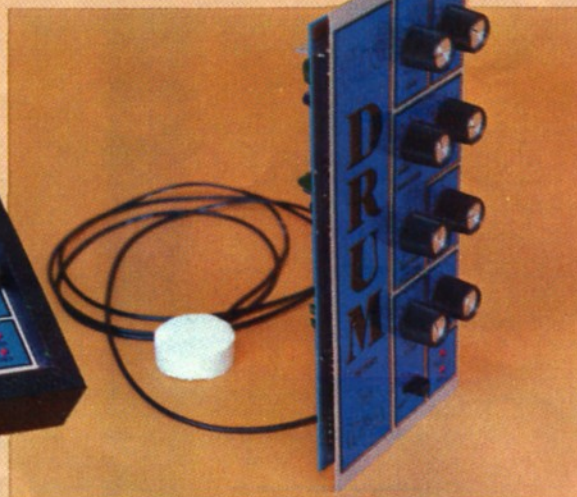
the DRUM PERCUSSION SYNTHESIZER

At PAIA, we've always thought that your instruments should provide the maximum power and versatility available from the technology. That's why where others give you only two options, on and off, the DRUM provides infinitely variable control of: waveform (fade from triangle to square wave or stop in between, sine wave switch selectable), Noise filter, corner frequency (white to various shades of pink), Oscillator/Noise mix (get just the sound you're after).

Add to this innovative PAIA touches like filter modulation setting that lets the filter track the drum envelope and convenience features that include:

- * Variety of sensor mounting options (use your own drum set or practice pads.)
- * Power indicated LED on each card.
- * Trigger LED

As used by Willie Wilcox on the road with UTOPIA



- * Multiple rear panel interfacing and control options.
- * Modular expandability
- * Quick and easy kit assembly.

In the multi-track studio the sensor can be played with pencil or finger tip to produce complete drum tracks or add just the needed fill-in riff to complete a piece. The DRUM is also easily interfaced to electronic control devices such as the PAIA 6770 MASTER SYNCHRONIZER.

For the whole story, order the Evaluation Package with manuals and Demo tape.

I-5700 Evaluation Package \$10.00 ppd.

No. 5700 The DRUM Card Kit \$59.95 (2 lbs.)

PACKAGE OFFER - Buy four cards and the power supply and we'll throw in the case (\$34.95 value)

No P-5700 Four Channel Drum Synthesizer Package Kit \$269.95 (14 lbs.)

the PROGRAMMABLE DRUM SET

While most electronic rhythm units offer only a limited choice of pre-determined rhythm patterns, the PAIA Programmable Drum Set allows you to select percussion sounds - Heavy Bass, Light Bass, Snare Drum, Tom-Tom, Conga, Wood Block or Clave - and structure pattern and time signature in any conceivable combination. And touch sensitive electronic controls allow scores to be entered in seconds with no programming knowledge required.

Without question the Programmable Drum Set advances the state of the art in automatic percussion units with features and abilities too extensive to cover completely, including: Score editing, bridges and intro's, external sync. to sequencers or foot controls, memory save switch and many more.

No. 3750 Programmable Drum Set Kit . ~~\$99.95~~ . . . \$79.95 (5 lbs.)

High Fidelity Magazine describes the 3750 as "An easy project . . . fun to do and yields delightful results . . . an excellent educational tool and versatile aid to the musician who can't afford a live rhythm section."

**NEW
LOW PRICE**

And Peter Gabriel, former vocalist for "Genesis" and solo recording artist on Atlantic Records, says "I like it a lot. I think of it as a composer's tool. It has helped me with my recent songwriting. I like to set up complex timings, and then play against it to find words and music that work well with the pattern."

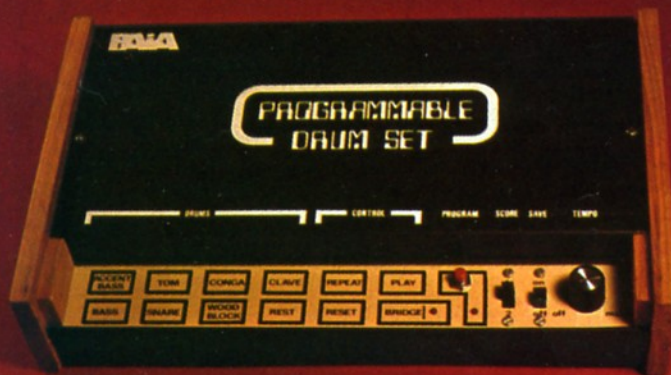
SOUND VALUES FROM PAIA

6760 EQ

For either studio or live performance work, a parametric equalizer is the most powerful and versatile tone control available with applications that range from notching out the feed-back howls in an unruly venue to taming that one note in a run that just won't quit pegging the meters. And this PAIA unit is a true parametric that gives you complete and independent control of frequency (40 Hz. - 16 kHz.), bandwidth (resonance .2-4 octaves) and continuously variable boost or cut.

The 4 separate graphic equalizer sections behind this 1 3/4" rack panel may be used independently or in any combination. Requires ±9 to 15 volt power supply such as PAIA 4771.

No. 6760 Parametric Equalizer Kit **NOW \$20 OFF**
\$59.95 (3 lbs.)



STUDIO GEAR AT THE



CRAIG ANDERTON'S LOW BUDGET LIMITER WITH HIGH BUDGET PERFORMANCE

Until now, low noise, low distortion, quality limiters have been priced beyond the reach of budget studios—just the place where they're most useful. Like a safety valve, a limiter does nothing as long as everything's going as planned. But, when that unexpected loud transient tries to sneak in and ruin hours of careful preparation, the 6790 is there to unobtrusively hold the signal at a level that prevents distortion in the rest of the audio channel.

Craig's design features the new Signetics 570 Componder chip in a configuration that allows switch selection of either two Independent limiters or a "dual" mode which allows the signal on one channel to limit both channels, thereby preserving stereo imaging. The limit point is controllable from the front panel of this 1 1/4 inch high standard rack panel package over a range of approx. -10 to +3 dB. LED indicator shows when limiting is taking place.

The limiter is also useful as a special effects device for guitar, etc.

SPECIFICATIONS: Power: +12v. @25 ma., -12v. @ 8 ma. nominal (external supply such as 4771 required); Frequency response: ± 1 dB., 20 Hz. -20 kHz.; Attack time: less than 1 ms.; SNR referenced to 0 dB. output: greater than -65 dB.
No. 6790 Dual Limiter Kit.....\$49.95.....(2 lbs.)

HOT SPRINGS

In general, spring reverbs don't have the best reputation in the world. Their bassy "twang" is only a rough approximation of natural room acoustics. That's a pity because it means that many people will dismiss this exceptional product as "just another spring reverb." And it's not. In this extraordinary design Craig Anderton uses double springs, but much more importantly "hot rods" the transducers so that the muddy sound typical of most springs is replaced with the bright clarity associated with expensive studio plate systems.

Kit consists of circuit board, instructions, all electronic parts and two reverb spring units. User must provide power (±9 to 15 v.) and mounting (reverb units are typically mounted away from the console).

No. 6740 Kit.....\$59.95.....(2 lbs.)

MASTER SYNCHRONIZER

Craig Anderton's "Synchro-Sonic" Controller as featured in **KEYBOARD MAGAZINE**.

Today, a "Master Synchronizer" is not as universal a piece of studio equipment as EQ and Reverb. But for the more progressive electronic musician working in a multi-track environment it can easily become indispensable because this module takes the concept of a click track the next logical step by providing a means of generating and recovering an electronic clock signal to tape.

When the clock signal is recovered and divided into musically significant intervals from 1/32 to whole notes it can be used to precisely lock newly recorded material to tracks already in place. With the MASTER SYNCHRONIZER you won't hesitate to lay down expanded or improved sequencer or drum set parts—the hassle involved in trying to synchronize manually

is gone.

Using the MASTER SYNCHRONIZER to tie the sweep rates of traditional effects to the tempo of music imparts a "Synchro-Sonic" coherence and rhythmic complexity to the sound that is difficult to achieve otherwise.

Other features of the MASTER SYNCHRONIZER include square wave and pulse trigger outputs; Run, Reset and Clock outputs allow easy interfacing and control of a variety of equipment from different manufacturers. Front panel switch selectable +5 and +10 volt logic levels. Accent metronome output with 50—750 Beats Per Minute tempo range. Requires +/- 15 volt 35 mA.

6770 Master Synchronizer Kit.....\$74.95....3 lbs.

HYPERFLANGE & CHORUS

The first thing you'll notice about Craig Anderton's latest PAIA kit is what careful design and input/output companion does for noise levels. This is an incredibly quiet effect useful both in the studio and for live processing.

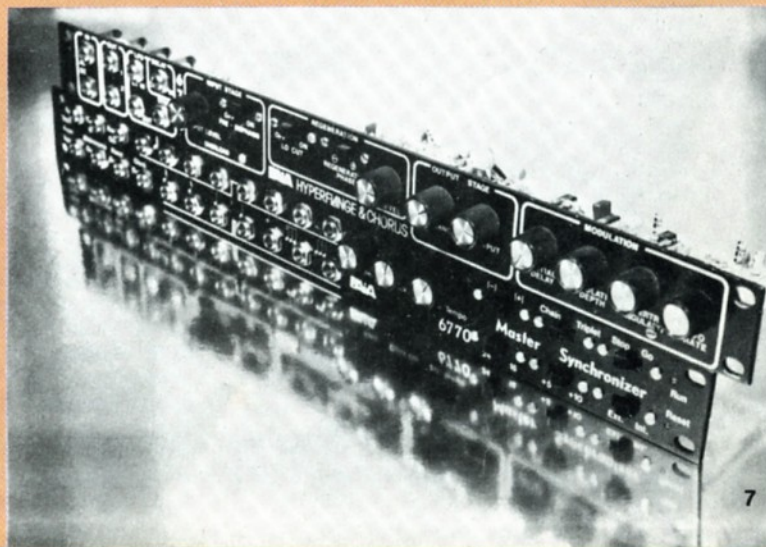
But continuing the PAIA trend to quiet quality isn't the only thing that makes the Hyperflange & Chorus an exceptional value. The Hyper-triangular control oscillator based on a Curtis 3340 VCO chip allows both linear time sweeps (the way everybody else does it) and the exponential sweeps (which is the way your ears really prefer) both over a 72:1 range. And an exclusive Resonance Lock Circuit lets you hang regeneration "on the edge" without having to worry about breaking into feed-back howls.

More? OK, how about control features like a pan pot for dry and processed signal, + or - flanging, clipping indicator LED for precise setting of optimum input signal level, separate external control inputs for both LFO and time delay... even a sync input for the control oscillator.

The Hyperflange & Chorus comes in a standard 1 1/4 in. rack mount configuration compatible with other products in the 6700 series of equipment and requires a ± 12 to 15 volt 200 ma. power supply.

**No. 6750 HYPERFLANGE & CHORUS.....WAS \$184.95
NOW \$149.95 3 lbs.**

NEW



LOWEST POSSIBLE PRICES

CES AUDIO/SYNTHESIZER I.C.'s

The Curtis Electromusic Specialties line of integrated circuits for audio processing and electronic music are wide range, exponential response, low noise, second generation devices which represent a significantly higher degree of integration than similar units available from other sources.

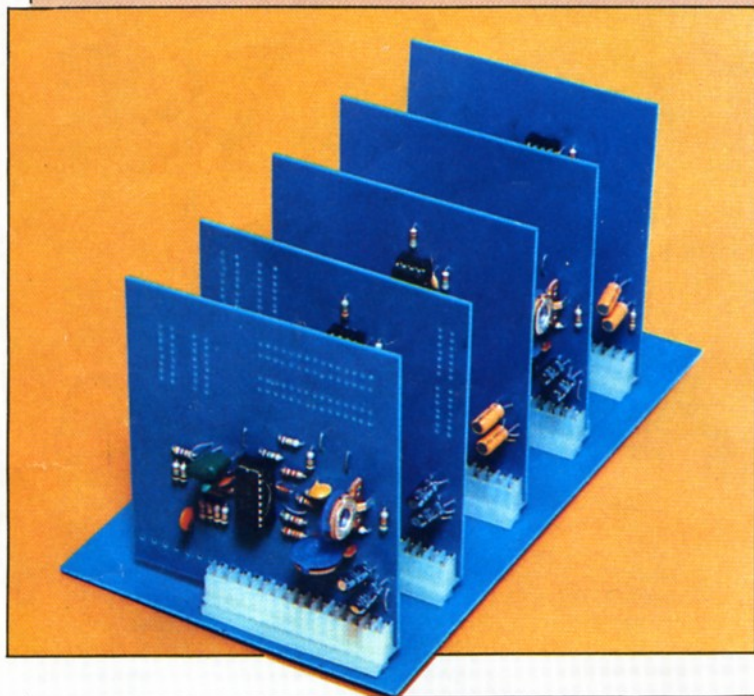
Unmatched features of the Curtis chips include: virtual ground summing nodes on most inputs eliminate external summing amplifiers; internal temperature compensation eliminates the need for "Q81" or similar tempco resistors;

design excellence provides exceptionally low control voltage feedthrough. If you've tried other synthesizer IC's and found them temperamental or difficult to work with, try the CES chips — you'll be pleasantly surprised.

CEM 3310 ADSR \$7.95
CEM 3320 VCF \$8.95
CEM 3330 DUAL VCA \$7.95
CEM 3340 VCO \$10.00
 (Add 2.00 shipping and handling charge for each order for CES Chips whether you order one or the whole set)

EKx MODULE SERIES

Whether you want to evaluate the Curtis chips, expand your present exponential system or custom design your own studio quality synthesizer or laboratory grade audio processing system from the ground up, the PAIA EKx series is for you. Each kit comes complete with all the components required to produce a fully functional high quality voltage controlled module card. All audio and control voltage inputs and outputs are brought out to the edge of the card in a configuration compatible with either Molex connectors or standard 22 pin .156 center edge connectors. All modules require $\pm 15v.$ nominal regulated supplies (PAIA 4771 or equivalent). Each card is a trim 3½" x 4".



EKx-10 ENVELOPE GENERATOR

Voltage controlled ADSR Envelope Generator with exponential control of attack, decay and release times and linear control of 5v. peak sustain voltage. Time ranges are typically 250,000:1 (2ms. to 20 seconds guaranteed) with particular attention paid to high accuracy, repeatability and tracking of parameters. The Curtis IC's are unique in that they provide for all practical purposes no control voltage feed-through.

EKx-10 Voltage Controlled Envelope Generator . . . \$24.95 (2.00)

EKx-20 VOLTAGE CONTROLLED FILTER

The CES 3320 VCF chip features 4 low or high pass sections in a single chip with onboard temperature compensation and resonance control cell. The EKx-20 provides exponential voltage control of pole frequency over greater than a 10 octave range and voltage control of resonance from 0 to low distortion oscillation. This card is a programmable filter element that can be wired by the user for high pass, low pass, band pass or all pass operation with 4 pole (24 dB/octave) response. Forget about noise, this filter is specified at a quiet -86 dB below maximum rated signal output. **EKx-20 Voltage Controlled Filter** . . . \$26.95 (2.00)

EKx-30 DUAL VOLTAGE CONTROLLED AMPLIFIER

There's no need to run out of VCA's when you get them with these features at these prices. EKx-30 card provides two independent low noise, low distortion, wide bandwidth VCA's with high control scale accuracy and low control voltage feed-through. Both exponential and linear control voltage inputs are provided and may be used simultaneously.

EKx-30 DUAL VCA . . . \$24.95 (2.00)

EKx-40 VOLTAGE CONTROLLED OSCILLATOR

Because of the CEM 3340's minimum support circuitry requirements we can offer this card at an exceptionally low price. But, don't be fooled; this is a full feature oscillator providing ramp, triangle and pulse outputs. The card provides such outstanding features as exponential frequency control over a highly accurate and temperature stable 100,000:1 range, voltage controlled pulse width, linear FM input and provision for both hard and soft sync inputs. **EKx-40 VCO** . . . \$29.95 (2.00)

SERIES 9000 AGO KEYBOARDS

Pratt-Read's lightest, most reliable keyboard ever, these new Series 9000 Keyboards offer several advantages over previous models.

Low-Bounce membrane switches (single Normally Open contact per key) are positive acting for low electrical switch noise — Switch Bounce problems common in interfacing are practically non-existent. Since the switches are completely enclosed, you'll never be troubled with erratic operation caused by dirty contacts.

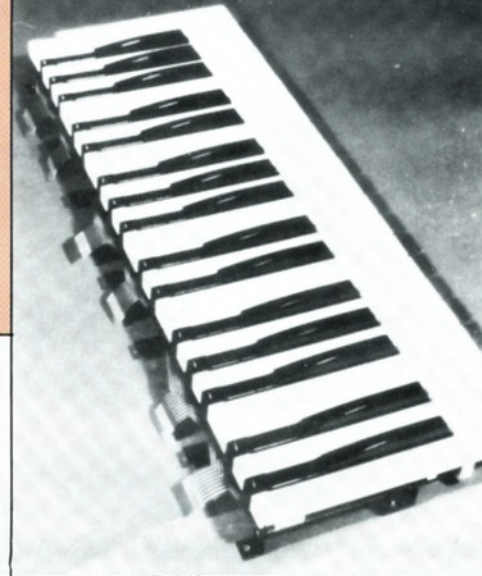
Key switches are organized in groups of 8 for easy digital matrixing but common lines may be joined for switched voltage divider or direct tone selection applications.

New flexible circuits from the key switches mean easy termination to circuit boards. Flex circuit connectors are provided and allow the keyboard to be easily disconnected and removed from other circuitry.

AGO37 — 37 Note Keyboard . . . \$ 98.50 . . . (8 lbs.)
AGO61 — 61 Note Keyboard . . . \$159.95 . . . (10 lbs.)

NEW

KEYBOARDS



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TECHNICAL SERVICE

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9am to 5pm CST MWF

These kits are light on construction details—heavy on theory and applications.

EXPERIMENTER'S KITS

TOP-OCTAVE EXPERIMENTER'S KIT

A full octave of equally tempered semi-tones plus one note from a single LSI circuit. Instructions outline use as a simple organ, push-button chord box, random voltage source, random melody generator, more. Includes 50240 type top-octave divider circuit, 4001 CMOS quad nor gate (for clock signal generation), circuit board with space for additional components. Requires common value resistors and capacitors.

No. EK-1 TOP OCTAVE EXPERIMENTER'S KIT . . . \$15.95 (2.00)

COMPUTER DRUMS

The ultimate electronic percussion unit-drum oscillators interfaced to your computer/micro-processor. Provides seven drum sounds: Heavy Bass (down beat), Light Bass, Snare Drum, Tom-Tom, Conga, Clave and Wood Block. Circuitry includes hand-shaking logic with data ready and data accepted lines. Theory text includes both analog and digital analysis and multiple programming examples for a variety of machines. Useable on even the smallest system. Kit includes circuit board and ALL parts. SEE DRUMSYS PROGRAM

No. EK-2 COMPUTER DRUMS \$24.95 (2.00)

DRUM-SYS. SOFTWARE

An 8700/EK-2 Computer Drums operating system that produces the most advanced automatic percussion unit ever offered. Provides all of the features of a 3750 Programmable Drum Set plus dumps and loads drum scores to tape, computer control of drum dynamics, extensive editing of scores, special effects that make drums almost a lead instrument and a unique tempo setting control that requires only the tap of a finger.

Drumsys Cassette (includes documented listing & interfacing details) \$4.95 (2.00)

EK-3 KEYBOARD ENCODER EXPERIMENTER'S KIT

Up-date PAIA (or other) keyboards to the new digital format. Consists of encoder circuit board and all parts required to modify your present keyboard for use with computers and/or the 8780 D/A converter. Off-print instructions from "Computer Music Without the Computer", Polyphony 4/76.

No. EK-3 KEYBOARD ENCODER EXPERIMENTER'S KIT \$19.95 (2.00)

EK-5 ANALOG DELAY EXPERIMENTER'S KIT

This kit provides a circuit board which holds a Reticon SAD-1024 analog delay IC, a 4013 clock conditioner, and several passive components required to set up the SAD-1024 for proper operation. Spare IC locations are provided for on-board clocks, output filters, mixers, companders, or other types of features which will vary from one application to the next. The circuitry supplied exploits Reticon's use of dual 512 stage delay lines in their SAD-1024. Thus, two complete delay lines are provided which can be used independently or strapped together in various configurations.

Additional user supplied components vary with application, but generally consist of a bipolar power supply, clock components (4001, 4011, 566, etc. ICs), and op amps for signal

conditioning. Any additional components required are common and easily available experimenter's parts.

EK-5 ANALOG DELAY EXPERIMENTER'S KIT \$24.95 (2.00)

3-OCTAVE TONE BOARD

When we first introduced the EK-1 top octave generator experimenter's kit people loved it and right away and started using it to build mini-organs, bass pedals, chord boxes, random voltage generators, etc. (there's a lot you can do with one as it is pointed out in its instruction manual) but many people had a common complaint — not enough notes.

So now, here's the EK-6, very similar to the EK-1 but with three times the notes simultaneously available. And at a reasonable price. Provides 3 octaves (37 notes) of equally tempered pitch using a 50240 type IC for the top octave and 4013 type dual flip-flops for lower octaves.

The EK-6 is identical to the tone boards used in Craig Anderton's Organtua and can be used with that instrument to provide additional tone ranks, or use it to develop your own Organtua-type instrument customized to your specific needs at absolutely minimum cost.

Requires clock frequency in the range of 1 MHz to 50 kHz, depending on pitches desired.

EK-6 3 OCTAVE TONE BOARD \$34.95 (2.00)

EK-7 DUAL DIGITIZER

Of course, you can always enter parameter data into a computer from some kind of keyboard; but in cases where real time control is needed, it's hard to beat an analog controller. The EK-7 digitizes the position of knobs, joysticks, etc. to 16 levels (4 bits) and packs a pair of them into a byte. This is a flash type converter which operates for all practical purposes instantaneously with no conversion software overhead required. The output connector is pin compatible with our own 8700's input ports or can be connected to an 8 bit input port on any computer. Liberal software examples illustrate reading values, scaling, multiplexing and other tricks that make the EK-7 useful in both low resolution and high resolution applications.

EK-7 DUAL DIGITIZER \$15.95 (2.00)

EK-8 HEX VCA

Lots of Voltage Controlled Amplifiers for very little money. Six independently controllable amplifiers mix to a single output. Invaluable in computer assisted synthesis or for use as voltage controlled mixers. Circuit board fits behind normal PAIA double width module space. Kit consists of circuit board, instructions and all electronic components. Does not include jacks or other hardware items. Requires $\pm 9v$. nominal power supply.

EK-8 \$15.95 (2.00)

SUPER INEXPENSIVE PRE-AMP

A single stage transistor amplifier that will find numerous applications in the audiophile/musician's shop. Useful as a signal booster for many electronic music processing elements and a sure cure for problems associated with low signal levels into special effects boxes. This kit includes ALL parts, circuit board and step-by-step instructions.

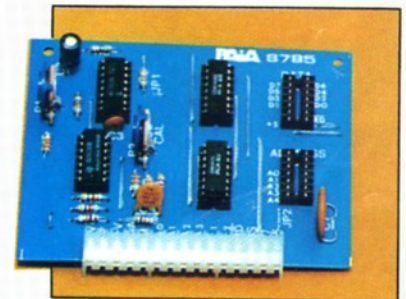
No. 1710 PRE-AMP KIT \$4.95 (1.00)

8785 LINEAR DIGITAL TO ANALOG CONVERTER

There are a lot of ARP and MOOG fans around. But we wouldn't want past allegiances to stand in the way of your realizing the maximum that your equipment has to offer when teamed with PAIA's leadership in digital control.

This linear digital to analog converter matches the output structure of our 8700 computer/controller at one end and QuASH bus at the other. Behaves according to all PAIA protocols to provide over 5 octaves of control voltage output plus software control of glide and gate signal. Up to 16 channels easily supported, more if you like. Can be modified to provide over 10 octaves control. Requires regulated +5v. (tapped from computer in most cases) and $\pm 15v$ a 50 ma. nominal ($\pm 9v$. from PAIA 4770 works well also)

8785 LINEAR DAC Kit \$24.95 (2.00)



ARP is a registered trademark of Tonus, Inc. MOOG is a trademark of MOOG Music, Inc.

PAIA Electronics, Inc., 1020 W. Wilshire Blvd., Oklahoma City, OK 73116 - (405)843-9626

BALANCED MODULATOR/VCA

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 their place appears a new output signal containing only the sum and difference frequencies of the original inputs. Essential for realistically 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, $\pm 9v.$ supply.

No. 4710 Balanced Modulator Kit \$22.50 (1 lb.)

STEREO MIXER

As the synthesist'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 $\pm 9v.$ supply.

No. 4711 Stereo Mixer Kit \$29.88 (1 lbs.)

REVERB

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 acoustics 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 Kit \$26.95 (2 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 Ov. 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 (1 lb)

WIDE RANGE VCO

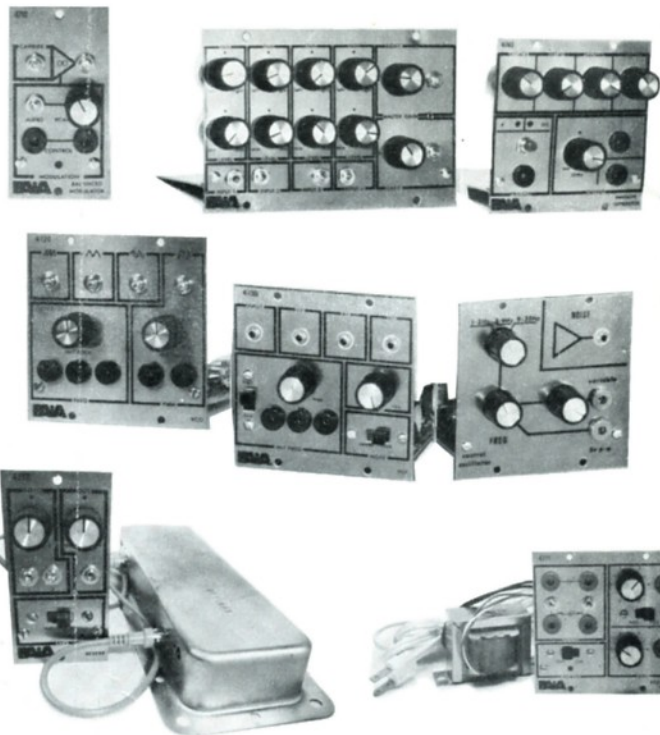
If you're particular about specifications, this is the oscillator for you. Features 16 Hz. to 16 kHz. guaranteed minimum frequency range, simultaneous ramp, triangle, sine and voltage modulated variable duration pulse outputs. Front panel initial pitch control allows multiple oscillators to be chromatically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

No. 4720 VCO Kit \$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 16 kHz. Linear control voltage/frequency characteristics provide

SYNTHESIZER MODULES



keyboard tracking and front panel initial frequency control allows multiple filters to be chromatically offset. Requires $\pm 9, +18$ volt supplies.

No. 4730 VCF Kit \$37.95 (1 lb.)

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. 4750 Control Osc./Noise Source Kit . \$21.95, . (1lb)**

4771 REGULATED POWER SUPPLY

Provides the three supply voltages commonly required by the PAIA synthesizer modules, plus several front panel convenience features. Voltages available include: +18 volts unregulated, and positive and negative regulated voltages adjustable to provide from ± 5 volts to ± 15 volts. Each supply line provides up to 200 mA. This variable voltage feature makes the 4771 an excellent choice for low cost precision power supplies for your homebrew projects, or a variable supply for your workbench. Front panel features include two variable bias supplies, each can be trimmed to provide exactly 0 to 5 volts. One bias provides only positive voltage, the other is switch selectable for positive or negative bias. A patch bay section allows AC coupling of control voltages, and conversion of audio signals to control lines. Front panel power switch and LED provide positive indication of power status. Line cord included. Power transformer must mount on the enclosure.

No. 4771 Regulated Power Kit \$29.95 (3 lbs.)

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EXPAND OR CUSTOMIZE



WATT BLOCK

300 ma. power supplies may be wired to provide either +18v. or \pm 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 indicator. Multiple jack panel consisting of 3 pin jacks and 3 phone jacks aid in complex patches.

No. 4770 Watt Block Kit\$14.95 (3 lbs.)

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

No. LC-6 6 ft. line cord\$1.00 postpaid

QuASH [Quad Addressable Sample and Hold]

The least expensive way to provide multiple control voltage channels in a computer based synthesizer system is to multiplex the output of the D/A using multiple, computer addressable, sample and hold circuits. The QuASH provides four of these outputs in a single module. Other features of the module include: adjustable glide rate for each channel with the glide selected or de-selected under computer control, individual trigger "gate" signal associated with each output channel and an individual modulation input for each channel that is non-interactive with other channels. On-board address decoding allows up to four QuASH to be bussed together in a single system without external logic and Bank Select input allows external logic expansion beyond this point. NOTE: THE QuASH MUST BE OPERATED UNDER COMPUTER/PROCESSOR CONTROL.

No. 8781 Quad Addressable Sample & Hold Kit\$34.95 (1 lb.)

ROAD CABINETS

Anyone who doesn't have their equipment nalled 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 Module Cabinet Kit\$24.95 each (9 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. Simple, time tested analog electronics includes sample and hold, Glide (portamento) and power supply. The keyboard is exponentially scaled for use with PAIA 4700 series linear response synthesizer modules. Trim and sturdy vinyl covered case features slip hinges on the keyboard cover and fully hinged top for tuning access.

No. 4782 Road Keyboard Kit.....\$199.00 (30 lbs.)

DIGITALLY ENCODED KEYBOARD

A scanning, matrix encoder tied to a 37 note AGO keyboard provides 6 bits of data and both STROBE and STROBE control outputs. Input control lines to the encoder include SCAN (starts and stops the encoder clock). RESET, START and RANDOM making the keyboard universally applicable to all computer/processors from the very largest to the very smallest. Housed in a trim and sturdy vinyl covered road case, the kit consists of all parts including keyboard, power supply and detailed assembly instructions; software overview for computer applications and detailed instructions for digital sample and hold.

No. 8782 ENCODED KEYBOARD KIT.....\$199.95 (30 lbs)

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 synthesizer. 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 preset level.

No. 2720-11 Envelope Follower/Trigger kit \$19.95 (1 lb)

PATCH CORD SETS

. . . Something you never seem to have enough of. Set consists of 16 audio and 24 control voltage connectors with 15 ft. of cord.

No. PTCH KIT\$15.00 (2.00)

THE CRAIG ANDERTON MUSIC TAPE

You may recognize the name from his monthly columns in Guitar Player and Contemporary keyboard or from his prolific contributions to other magazines or his book "Electronic Projects for Musicians". Now you can see a side of Craig that few have seen before, the composer/performing artist.

This recording is a collection of ten original works ranging from the semi-classical "Dog Dreams 1/11" to the totally bizarre "Roy Herful". Using a lot of our equipment as well as many devices of his own design, Craig composed, performed and recorded the tape singlehandedly in his home studio. An explanatory booklet is included with the cassette including lyrics and details on how the effects were accomplished.

We're not promoting this as a demo tape but as thoroughly enjoyable listening. We think you'll like it.

No. CAMT

The Craig Anderton Music Tape . . .
.....\$5.95 (1.00)



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ENVIRONMENTAL SOUND EFFECTS

LOW COST BATTERY POWERED USE WITH ANY HI-FI AMP

SURF SYNTHESIZER

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.

No. 3711K Surf Synthesizer Kit \$19.95 (2.00)

ELECTRONIC WIND CHIMES

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.

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.

No. 3721 Wind Chimes Kit \$24.95 (2.00)

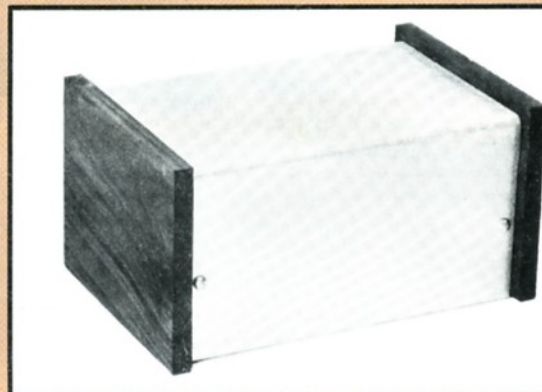
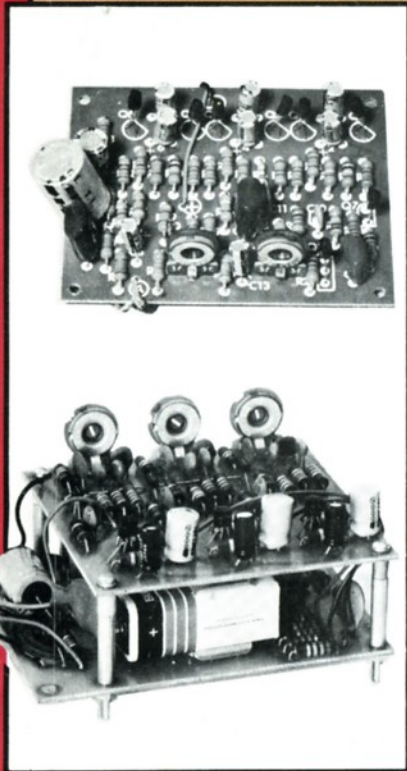


THE WIND

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).

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 Wind Kit \$19.95 (2.00)



A CASE FOR YOUR FINISHED PROJECT

This attractively styled case houses the Surf Synthesizer, The Wind or the Wind Chimes interchangeably. Heavy aluminum body with oiled hardwood 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. **No. 3711-C \$5.50 (1 lb.)**

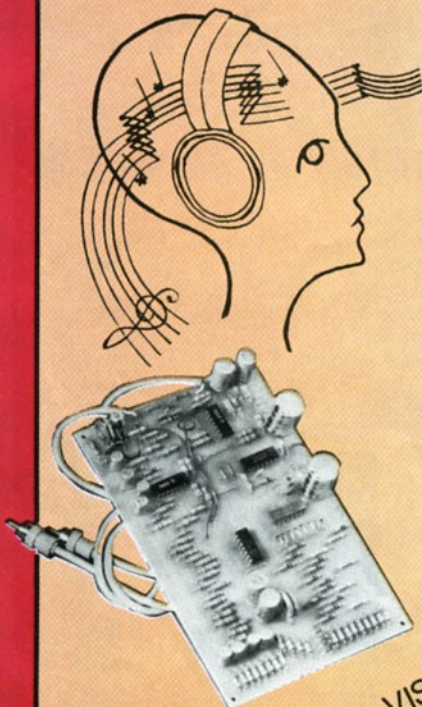
STEREO CHORD EGG*

The EGG plugs into any stereo amplifier to create soothing, flowing environmental sound textures — and through headphones it's incredible. The chords and notes exist in your mind, they pan and swell and phase their way through your psyche in unpredictable patterns, never repeating.

The combination of LSI organ technology with synthesizer-type processing and digital randomizing/control elements make the EGG and altogether intriguing package from either technological or metaphysical viewpoints. Kit includes: circuit board, all parts and step-by-step instructions. No case available — requires 8 "AA" penlight batteries.

No. 3790 Stereo Chord EGG Kit \$29.95 (2.00)

*EGG Encephalo-Gratification Generator



shut out noise pollution and keep your cool with the CHATTER JAMMER

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.).

Technically speaking, Pink noise is an equal probability 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.

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).

No. 111 Chatter-Jammer Kit \$9.95 (2.00)



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EFFECTS

PHLANGER

Phil Spector's original "Big Hurt" sound, which can only be approximated by using frequency dependent phase shifters, is exactly duplicated using our new constant time delay PHLANGER. This unit features a 1024 stage Charge Coupled Device analog shift register that exactly duplicates the effect of two tape recorders running slightly out of synchronization. Multiple user controls allow effects ranging from chorusing, voice doubling and reverb to full "jet plane" effects. Optional foot pedals provide hands free control of internal oscillator sweep speed or manual spectrum sweeping.

No. 1500 Phlanger Kit \$ 69.95 (4 lbs.)

PING PONG

An outa site effect for live performances. The Ping-Pong accepts an input from any electronic musical instrument and alternately routes it to two separate 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 then the unit is switched out. Effect can be initiated or terminated with either 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 hardwood end panels, circuit board, all parts and hardware, step-by-step instructions. Battery not included.

No. 3712 PING-PONG KIT \$39.95 (wt. 3 lbs.)

SYNTHESPIN MKII

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 \$39.95 (3 lbs.)

Note: The 1702K is not a Phaser.



PYGMY

Battery powered portable amps are the slickest things to come along in a while. They are tiny, light weight, and LOUD. 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 acoustic suspension speaker to a room filling 1.2 watts RMS (up to 8 watts peak). The speaker's hefty 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 KIT \$39.95 (6 lbs.)

USE YOUR PYGMY AMP TO GET "TALKING GUITAR" EFFECTS

Convert your Pygmy Amp to produce the new "Talking Guitar" effects. Modification kit includes a replacement speaker bezel which concentrates the sound from the speaker and emits this higher pressure signal from a small hole. The sound pressure is then fed through a 6 ft. length of tubing to your mouth for formant processing.

ELECTRO/LARYNX RETRO-FIT \$10.00 (1.00)

FOOT SWITCH

A positive action, push on, push off switch housed in a ruggedly constructed stamped steel frame with scuff-proof cover of moulded neoprene. The switch can be activated from any position and its circular serrated top gives you non-slip contact. Switch comes complete with 8 foot connecting cable and standard phone plug.

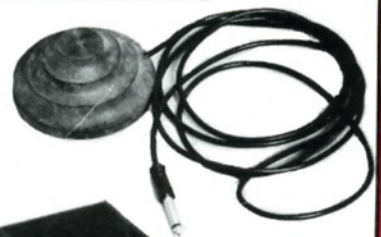
No. 1650 PAIA/DeArmond Foot Switch \$12.95 (2.00)

PEDAL VOLUME CONTROL

We've made special arrangements with Rowe/DeArmond to sell their model 1600 as a PAIA/DeArmond foot pedal. If you're familiar with this pedal you know that it's one of the toughest made and is an industry standard. We've made it available in a volume control expression pedal configuration for use with synthesizers, guitars, or whatever you've got. Included with the pedal are two interesting and informative articles from POLYPHONY. The first, by Marvin Jones describes a multitude of ways to use foot pedals with synthesizers as well as simple modifications that provide foot operated control voltage sources. The second, "Build a Wa/Anti-Wa Pedal" by Craig Anderton describes a unique special effects unit that can be housed in the pedal. DeArmond's recommended list price is \$54.00 but we sell them for \$39.95.

No. 1600 PAIA/DeARMOND FOOT CONTROL \$39.95 (4 lbs.)

VERSATILE ACCESSORIES



ELECTRONIC PROJECTS FOR MUSICIANS

BY: CRAIG ANDERTON

THE BOOK

Even if you don't know an ohm from a volt, Craig Anderton's newly revised and expanded book shows you how to build 27 accessories that enhance your sound and broaden your musical horizons.

If you're an old hand at musical electronics, you'll really appreciate that all of these processors, from Tube Sound Fuzz to Phase Shifter are compatible and work together without creating noise, signal loss, bandwidth compression or any of the other problems

common to interconnecting effects from different manufacturers. There's even a complete chapter on how to modify and combine effects to produce your own custom pedal board.

Low cost project kits available from PAIA help make even your first exposure to electronics a pleasant, hassle-free experience and thanks to the sound sheet demo record bound into the book you know just how the completed device will sound before you even start.

Cat. No. EPFM \$14.95 plus \$1.00 postage

THE KITS

SPECIAL INTRODUCTORY OFFER 10% OFF



Proj. #	Title	Regular Price	Sale Price	Proj. #	Title	Regular Price	Sale Price
1	Preamp (less XLR and VU)	\$22.95	\$20.65	14	Treble Booster	\$12.95	\$11.65
2	Metronome	\$19.95	\$17.94	15	Electronic Footswitch	\$19.95	\$17.95
3	Passive Tone Control	\$16.95	\$15.25	16	Tuning Standard	\$39.95	\$35.95
4	Headphone Amp.	\$19.95	\$17.95	17	Super Tone Control	\$29.95	\$26.95
5	Mini-Amp	\$29.95	\$26.95	18	8 in, 1 out Mixer (less XLR)	\$28.98	\$26.06
6	Ultra-Fuzz	\$19.95	\$17.95	19	No kit available		
7	Bass-Fuzz	\$21.95	\$19.65	20	Practice Play Along	\$24.95	\$22.45
8	Compressor/Limiter	\$27.95	\$25.25	21	Phase Shifter	\$54.95	\$49.45
9	Ring Modulator	\$29.95	\$26.95	22	No kit available		
10	Dual Filter Voicing Unit	\$29.95	\$26.95	23	No kit available		
11	No kit available			24	Tube Sound Fuzz	\$22.95	\$20.65
12	No kit available			25	Envelope Follower	\$26.95	\$24.25
13	Bipolar AC Adapter	\$34.95	\$31.45	26	Spluffer (less optional parts)	\$14.95	\$13.45
				27	Noise Gate	\$32.95	\$29.65

ADD \$3.00 POSTAGE AND HANDLING WITH YOUR ORDER.

These are kits of parts and circuit board only, to allow maximum flexibility in their application no cases or enclosure are included. Instructions for the assembly of each item are part of the book Electronics Projects For Musicians and are not duplicated with the kit.

PROJECT KITS NOW AVAILABLE EXCLUSIVELY FROM PAIA

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BOOKS THAT HELP YOU LEARN



MUSIC, PHYSICS, AND ENGINEERING, Harry Olson

Harry Olson, who worked on the first RCA synthesizer, brings you a thorough discussion of the physical properties and design of traditional musical instruments plus a chapter on electronic music.

No. MPE Music Physics & Engineering..... \$6.50 (1.00)

ELECTRONIC MUSIC SYNTHESIZERS, Delton Horn

The first half features descriptions and functions of commercial electronic music synthesizers (Moog, Arp, PAIA, Oberheim, EML and RMI); the second section provides schematics and projects for the experimenter.

No. EMS Electronic Music Synthesizers..... \$6.95 (1.00)

THE BYTE BOOK OF COMPUTER MUSIC, edited by Christopher Morgan

Describes computer control of electro-mechanical instruments, Fourier analysis circuits and loads of software.

No. BYTE Byte Book of Computer Music..... \$10.00 (1.00)

SCIENCE OF SOUND

ON THE SENSATIONS OF TONE, Hermann Helmholtz

The physical and psycho-acoustical background to music is an important part of musical synthesis. Helmholtz's SENSATIONS OF TONE, a century after its original publication, is still the standard text for physiological acoustics.

No. SENS On The Sensation of Tone \$8.95 (1.00)

PSYCHOLOGY OF MUSIC, Carl E. Seashore

Carl Seashore, developer of the Seashore Music Test, provides an in-depth analysis of musical style and performance characteristics of many instruments.

No. PSYCH Psychology of Music \$6.00 (1.00)

MUSIC, SOUND and SENSATION, Fritz Winckel

Much like the Helmholtz work with a bit less detail and more concentration of the psycho-acoustics.

No. MSS Music, Sound and Sensation \$4.50 (1.00)

ELECTRONICS

IC OP-AMP COOKBOOK, Walter Jung

Should be required reading for the synthesist.

No. OACB IC Op-Amp Cookbook \$15.95 (1.50)

AUDIO OP-AMP APPLICATIONS, Walter Jung

An edited version of the IC Op Amp Cookbook containing only audio applications.

No. AUOA Audio IC Op-Amp Applications \$8.95 (1.00)

REFERENCE

Often used reference materials to answer the many questions encountered in electronic music applications.

ELECTRONIC MUSIC CIRCUITS, Barry Klein

Synthesizer system design, power supplies, control voltage generators, VCOs, filters, analog multipliers and more. Lots of schematics and data sheets on the most popular music-oriented ICs. An excellent technical reference.

No. EMCR Electronic Music Circuits \$16.95 (1.00)

AUDIO CYCLOPEDIA, Howard Tremaine

1760 pages with 3650 entries and hundreds of drawings and schematics to answer any question about audio. HARDBOUND

No. CYCLO Audio Cyclopeda \$44.95 (4.00)

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HOW TO MAKE AND SELL YOUR OWN RECORD, Diane Sward Rapaport

With the major labels having severe economic problems, many insiders feel that the future of the music industry may be in independent record production. Learn the ropes with Diane Sward Rapaport's indispensable handbook of how to get started.

No. MASR How to Make and Sell Your Own Record \$11.95 (1.00)

MAKING MONEY MAKING MUSIC, James W. Dearing

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No. MMM Making Money Making Music \$12.95 (1.00)

MULTI-TRACK PRIMER, TEAC Corp.

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No. TEAC Multi-Track Primer \$4.95 (1.00)

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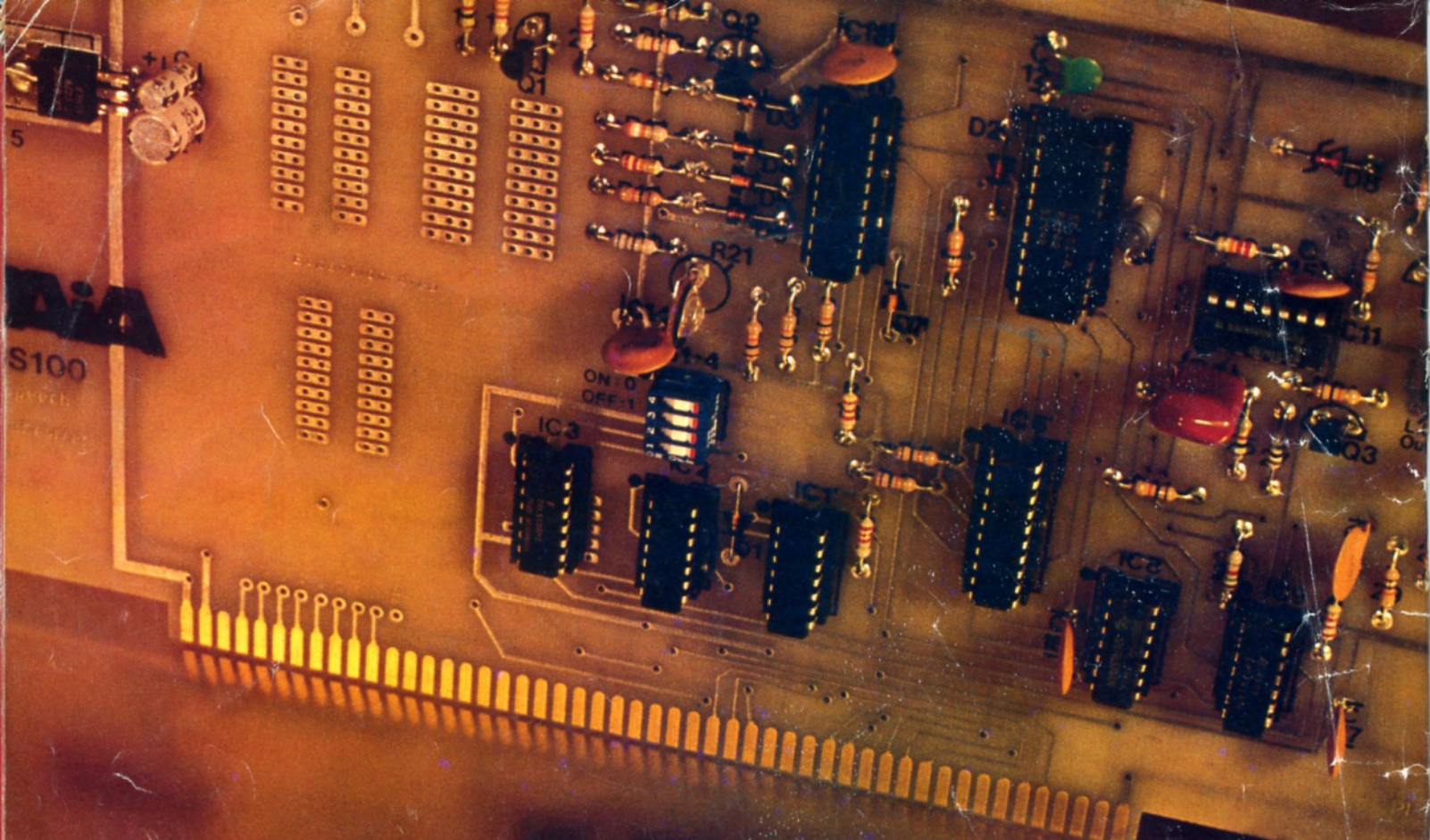
ENHANCING YOUR APPLE II VOL. 1, Don Lancaster

Software tricks and simple, reversible hardware modifications that let you exactly lock to video timing for wipes, split screen displays, mixed HIRES LORES and text plus much more.

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