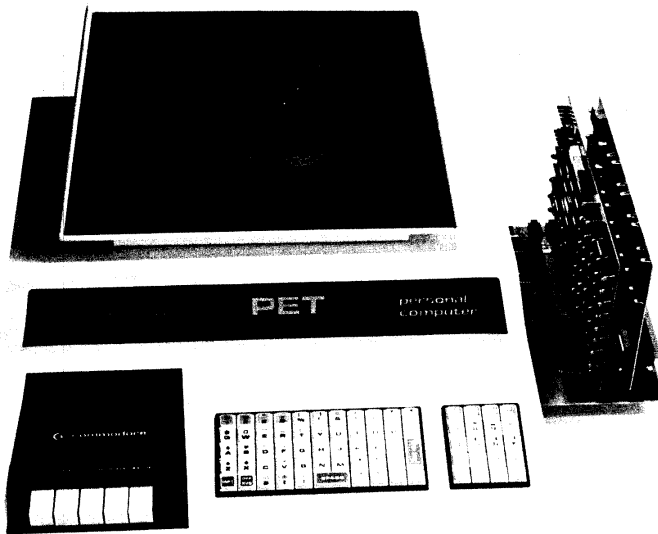


## BETSI — The PET\* to S-100 Interface/Motherboard



Now that you've found how useful your PET computer can be, there's probably only one thing holding you back — E-X-P-A-N-S-I-O-N.

More than 150 different boards are currently available to plug into the S-100 bus. **NOW PLUG THEM INTO YOUR PET!**

**Betsi connects to PET and allows instant use of the many S-100 bus (Imsai/Altair type) boards that are available now.**

**Betsi is an extremely compact unit which contains both interface circuitry and a four slot S-100 motherboard on a single 10" X 5½" card.**

### **Betsi Features —**

#### **Easy Memory Expansion**

With Betsi, you're no longer at the mercy of a few high priced sources for add-on memory. As a customer in the well established S-100 market, you can get the memory you need at very reasonable prices. An 8K RAM board for \$150 (Godbout Electronics, Econoram II) is hard to beat, especially when that's assembled and tested! And since S-100 boards are stocked at virtually every computer store, you don't even have to wait on the mail. In use, PET can't tell the difference between its own internal memory, and memory that's been added on the S-100 bus. PET automatically searches the entire memory area when it's turned on, and uses any extra memory that's present.

#### **Dynamic Memory Controller**

Forethought Products is proud to introduce another first in S-100 interfacing: an on-board controller that allows Betsi to use the high density/low power "Expandoram" dynamic memory board from S.D. Sales. Using the Expandoram memory board with Betsi means that PET can be expanded to its limit (32K) on a single S-100 card! Using either static or dynamic memory with Betsi does not reduce PET's speed in any way.

#### **8K PROM Expansion**

Another money-saving feature of the Betsi board is the four on-board sockets that allow instant expansion with additional software in ROM. Betsi provides room for 8K of 2716 type PROM and the necessary decoding circuitry to make use of plug-in PROM software that will be available for PET in the future. Having software ready to go instantly when turning PET on is a real pleasure. And this Betsi feature saves you both an extra S-100 slot (that would be required for a S-100 PROM board), and the \$100 or more that the PROM board would cost! Jumpers are provided on Betsi to address the PROMs anywhere within PET's ROM area (9000-BFFF).

### Special S-100 boards

Since Betsi is compatible with virtually all of the S-100 boards on the market (including memory and I/O types), you're free to use some of the special purpose S-100 boards that will never be available for direct connection to the PET. These include power and remote control boards for PET to run the house with, modem/communication boards so PET can chat with another machine across town (or across the nation), I/O cards for PET to run the lab with, or even speech and music synthesis boards. Betsi lets you take advantage of the latest boards on the market while retaining the power and convenience of the PET.

### The Direct Connection

You'll be happy to find that all of Betsi's built-in features are really built-in. The single Betsi board contains both the complete interface circuitry and a four slot S-100 motherboard, as well as an 80 pin PET connector. No additional cables, interfaces, back-planes, etc. are needed for operation. Betsi connects to any S-100 type power supply and plugs directly into PET's memory expansion connector on the side of PET's case. No modifications of any kind are needed to PET, and Betsi does not interfere with the IEEE or parallel ports. To move the system, Betsi can be instantly detached from PET.

### More than a bag of parts

Forethought Products doesn't leave you in the cold when you order a kit. Our boards are designed from the start with the kit builder in mind. Large solder pads, precision solder mask, and a detailed instruction manual make assembling Betsi an enjoyable experience, not a frustrating one. The Betsi kit comes complete, right down to the solder, and sockets for all IC's are included at no extra cost.

Of course, if you would rather have your Betsi ready to run right out of the box, the assembled and tested version should fill the bill. Complete operating instructions and a six month warantee are included.

### Our Prices

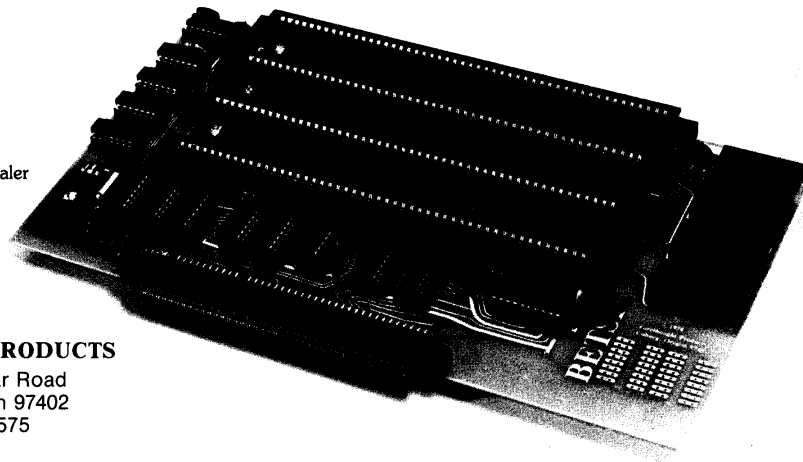
Whether kit or assembled, Betsi is available now, at a price that can't be beat. With Betsi's many built-in features and the low price of S-100 memory, you can see how Betsi literally "pays for itself" in savings.

Betsi Kit - Circuit board, all components, one 100 pin connector, and complete assembly and operating instructions.	#BETSI-K	\$119
Betsi Assembled - Betsi board with four 100 pin connectors, complete operating information, and six month warantee.	#BETSI-A	\$165
100 pin connector (for additional slots on Betsi kits).	#100P	\$5

See Betsi at your local dealer  
or order directly from:

### FORETHOUGHT PRODUCTS

87070 Dukhobar Road  
Eugene, Oregon 97402  
(503) 485-8575

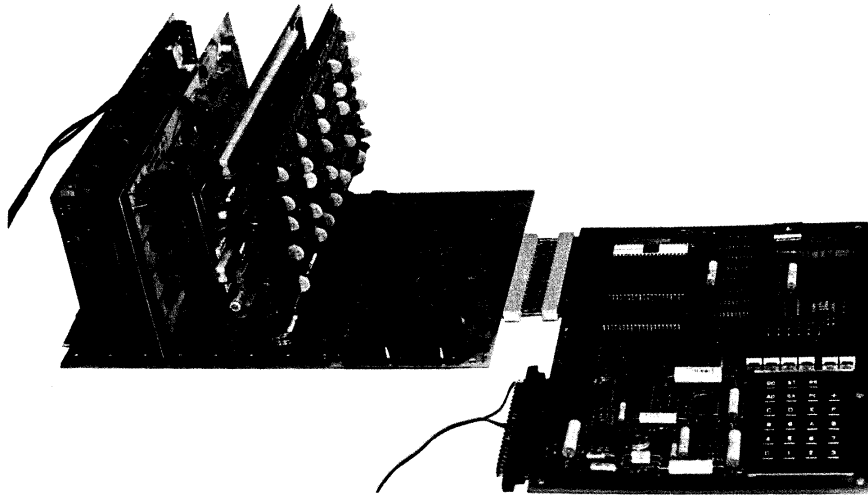


Note: When ordering direct from the factory include \$3 shipping per unit (foreign orders include \$7 shipping and payment in US\$ drawn on a US bank). All units are fully stocked and available for immediate delivery (orders are normally shipped within 48 hours). Visa and Mastercharge accepted.

\*PET is a Commodore product.

Printed on 100% recycled paper.

Has your KIM computer been longing for some memory? Looking for a video board? Or hoping for some I/O ports to keep the house under control? It's no wonder KIM's a little jealous of its 8080 friends; there are over 100 different boards that plug into the S-100 bus. NOW PLUG THEM INTO KIM!



### **KIMSI\* INTERFACE/MOTHERBOARD**

Expand your KIM with Kimsi, the bridge between low cost S-100 type boards and the power of the 6502!

Kimsi connects to any unmodified KIM-1 computer and converts all its signals to the S-100 (Imsai/Altair) bus format. On a single board Kimsi contains both the interface logic *and* a fully buffered mother-board with eight S-100 slots.

Kimsi makes S-100 cards plug-in compatible with KIM, but doesn't alter the operation of KIM in any way. All instructions are executed in the normal manner, at full speed. No extra instructions or software modifications are needed.

Kimsi's complete interface section facilitates many functions from the S-100 bus including control of the 6502, use of slow PROM boards, and even high speed DMA. Complete "board-enable" decoding is provided so that KIM's on-board memory remains in use, and Kimsi's built in regulators provide +5 and +12 volts for KIM from the S-100 voltages, allowing a single supply to run the entire Kimsi system.

Whether you need a rigid or a flexible cable connection between KIM and Kimsi, you'll appreciate Kimsi's "mirror-image" connector pattern that matches KIM's expansion connector pin for pin. At the other end of the board there's another handy connector — BUSTAP. For those who like to tinker with hardware now and then, the BUSTAP puts all 100 bus lines at your fingertips. Press a regular 100 pin connector onto BUSTAP and solder, wrap, or clip to any line you wish.

If quality and reliability are high on your list, you'll be pleased with the carefully laid out, plated thru Kimsi board with its special no-glare solder mask. And, we include sockets for all IC's at no additional cost.

\*Trademark Forethought Products

### **KIT . . .**

If you've never put a kit together before, relax — the Kimsi board is arranged for easy assembly and soldering, and our instructions are written for everyone, not just engineers. If you still lack confidence, *have some of ours!* We'll be waiting at the other end of your phone line. If everything isn't going together easily, or just isn't as clear as it could be, give us a call. We'll be there to help. Taking the time to assemble your Kimsi gives you both the savings of a kit and the satisfaction of knowing your system from the inside out.

### **OR ASSEMBLED**

If you don't have time for a kit and you'd like to see Kimsi up and running right out of the box, we'll be glad to send you a Kimsi completely assembled and tested. We include complete operating information and a six month warranty.



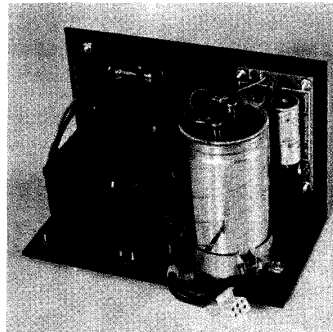
### **KIMSI-PLUS\* POWER SUPPLY**

After putting together our first Kimsi system, we noticed that there was something missing . . . a power supply.

When it comes to powering an S-100 type system most computer owners have two choices: hunting forever to find surplus parts that will do the job or paying an arm and a leg for several commercial supplies that will provide the proper voltages.

We offer an alternative — a low cost 'open frame' type supply with all the necessary voltages, and enough power for KIM, Kimsi, and a full load of S-100 boards.

The 'Kimsi-Plus' provides all three S-100 bus voltages (+8, +16 and -16) and runs on either 110 VAC (USA) or 220 VAC (Europe). It features a 16 amp high efficiency transformer and a hefty 30 amp rectifier to deliver full power output without the forced air cooling that other high output supplies require. This heavy duty supply comes complete with fused overload protection, LED 'power-on' indicator, and power output connector pair.



When it's time to put your KIM/Kimsi system in an enclosure, you won't have to leave the Kimsi-Plus behind. Measuring only 4½ x 8½ inches, it's always at home with Kimsi since it's the same height as an S-100 card!

Whether stand-alone or enclosed with Kimsi, the Kimsi-Plus Power Supply will take care of your system power needs for good!

## QUESTIONS?

Now that you have an idea of what a Kimsi board will do for you, you might have some questions like: "I'll need a motherboard for my system, but why buy a Kimsi when the KIM-4 motherboard is only \$119?" or "All those S-100 boards sound great, but how can I afford \$125 just to be able to use them?" Well, even if your plans don't call for a video display, A/D's, I/O ports, floppy disk interface, or other S-100 boards, you can pay for Kimsi with the savings on memory expansion alone.

In the highly competitive S-100 market, prices are falling every month. How about an 8K low power static RAM board (from Godbout Electronics; Box 2355; Oakland Airport, CA 94614) assembled and tested for \$150! Or Base 2's (Box 9941; Marina Del Rey, CA 90291) 8K low power static RAM kit for \$125!

You'll save plenty on the cost of memory, and the time spent on assembling a kit is both enjoyable and rewarding. Stacked up against a MOS Technology 8K RAM board for \$289, you save \$139 on an assembled board and \$164 if you have a few hours to spend on a kit! With figures like these you can see that Kimsi literally "pays for itself."

## DELIVERY

Rather than give you a lot of promises about quick service and instant delivery, we'll try and stick to the facts. The facts are: excepting our first production run, 85% of all Kimsi orders have been shipped within 2 working days. Excluding units that we have to assemble, 92% of our kit orders are shipped within 24 hours.

We know that you don't have a month or two to get your system started, and we don't ask you to wait on us.

## OUR PRICES

KIMSI KIT — Circuit board, all components, one 100 pin connector, and complete assembly and operating instructions. #KIMSI-K \$125

KIMSI ASSEMBLED AND TESTED — Kimsi board, one 100 pin connector (soldered in place), operating information, and six month warranty. #KIMSI-A \$165

KIMSI-PLUS POWER SUPPLY — Input 110 or 220 VAC, output (unregulated) + 8 at 12A, + 16 at 1A, - 16 at 1A.  
Kit #KPPS-K \$69.50  
Assembled #KPPS-A \$89.00

Rigid connector assembly — For direct connection between KIM and Kimsi.  
Kit #44PB-K \$6.00  
Assembled #44PB-A \$8.50

100 pin motherboard connector #100P \$5.00

100 pin motherboard connector — Soldered in place and tested.  
(order with assembled Kimsi only). #100P-A \$7.50

KIM — The KIM-1 computer, completely assembled and tested. #KIM-A ~~\$245~~  
Now \$179

... over 100 different boards ready for KIM to use!

- 4, 8 and 16K RAM
- Serial I/O
- Parallel I/O
- Video Boards
- A/D's, D/A's
- Prom Programmer
- Tape I/O
- Disk Controller
- Real-time Clock
- Joystick Interface

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QTY.	TYPE NUMBER	UNIT COST	TOTAL

We prefer to ship UPS. Please give street address.

SHIP TO \_\_\_\_\_  
 \_\_\_\_\_

VISA / MASTERCHARGE (give all numbers):  
 \_\_\_\_\_

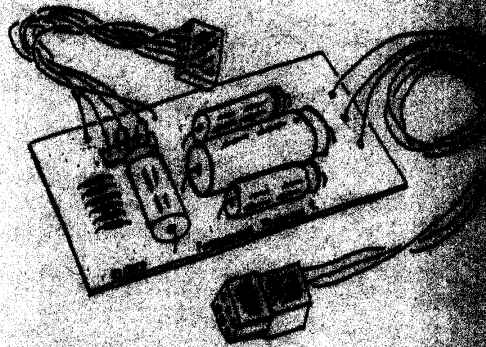
Exp. date \_\_\_\_\_

SUB-TOTAL	
ADD 2% SHIPPING*	
ENCLOSED	

\*We pay shipping charges when check or money order accompanies order.

COD and charge card orders may be made by phone at (503) 485-8575.

NEW!  
 "MINI SUPPLY"  
 FOR -  
**Easier than  
 ever PET<sup>\*</sup>  
 expansion**



Expanding your PET with the Betsi (PET to S-100 Interface/Motherboard) is easier than ever with the new Betsi Power Supply.

The Betsi Power Supply fits **INSIDE** your PET and allows you to operate the Betsi board without an external S-100 power supply!

The Betsi Power Supply eliminates the bulk and clutter of an external power supply.

The versatility and ease of operation that the Betsi Interface/Motherboard offers.

The Betsi Power Supply may be "mini" in size, but don't let the size fool you. It will easily power a Betsi and S.D. Systems Expanderam memory board to expand your PET to a full 32k. There's power to spare for S-100 I/O boards that your system may require as well!

**INSTALLS EASILY**

Mounting your Betsi Power Supply inside the PET is simple and quick. Internal drilling or disassembly is not required.

The connectors provided at both input and output leads of the Betsi make for truly "instant" installation. Just open the PET and plug in; it couldn't be much easier. The Betsi Power Supply is compatible with both USA and European models of PET.

After installing the Betsi Power Supply, you'll find it so convenient

along with the PET. And like the Betsi itself, the Betsi Power Supply is a high quality unit that won't let you down.

What could make PET expansion so economical and easier than ever? The Betsi Power Supply that fits **INSIDE** your PET!!

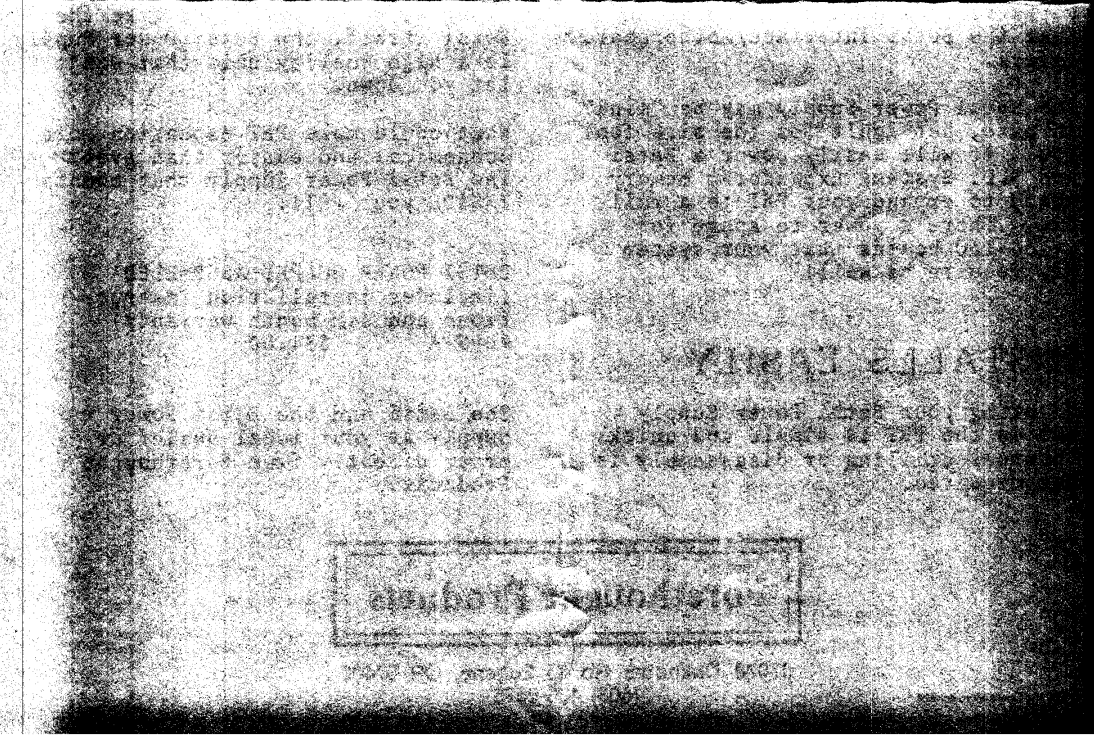
**BETSI POWER SUPPLY ASSEMBLED**  
 (includes installation instructions and six month warranty)  
 #BPS-A      \$34.90

See Betsi and the Betsi Power Supply at your local dealer or order directly from Forethought Products.

**Forethought Products**

87070 Dukhoobar Rd. □ Eugene, OR 97402  
 (503) 485-8575

\* PET is a registered trademark of Atari.





## Forethought Products

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(503) 485-8575

### BETSI POWER SUPPLY INSTALLATION INSTRUCTIONS

1. Remove the four screws (under the left and right front edges of PET) that hold PET's top to its base.
2. Prop open the top of the PET using the rod on the left side of the enclosure. Locate the area to the left of the main circuit board where the Betsi Power Supply will be installed (refer to drawing). Wipe any dust from the area and press the power supply in place after peeling the backing off the four adhesive feet.
3. Remove the 5 pin power connector from PET's main logic board and connect it to the Betsi Power Supply. Plug the short 5 wire cable from the Betsi Power Supply into PET's main logic board. These connectors can be oriented in either direction (end to end) but they must be properly positioned over all five posts (make sure all five posts enter the connector body).

4. The enclosed connector assembly (with bare wires at one end) should be soldered to the Betsi board as follows:

Wire color	Hole marking on Betsi
Red	+8
Yellow	+16
Green	-16

(there is no connection to GND)

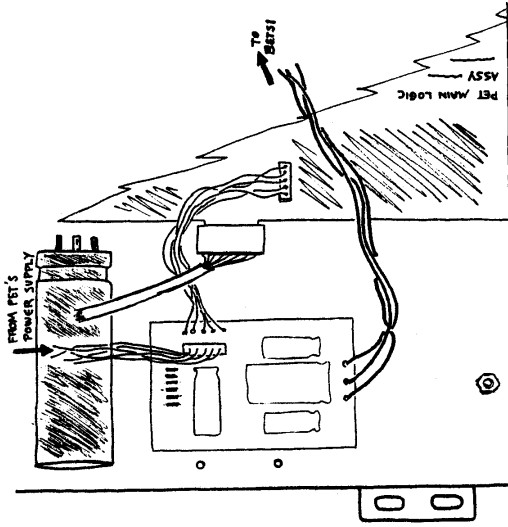
5. Connect the Betsi to PET and plug the power supply connectors together.
6. Close the PET keeping the power connector to Betsi outside of the PET (to allow for unplugging the Betsi if the system is moved). Turn the PET ON and check for normal operation of the PET.
7. Turn the PET OFF and insert an S-100 board into Betsi. Power-up the PET again and check for normal operation. If the system works properly, reinstall the four screws on the PET.

In operation, remember that the Betsi receives power whenever the PET is on. DO NOT insert or remove S-100 boards from Betsi unless the PET is turned OFF.

Warranty - If the Betsi Power Supply fails within six months of purchase, return it (via UPS, if possible) directly to Forethought Products for repair or replacement at no charge.

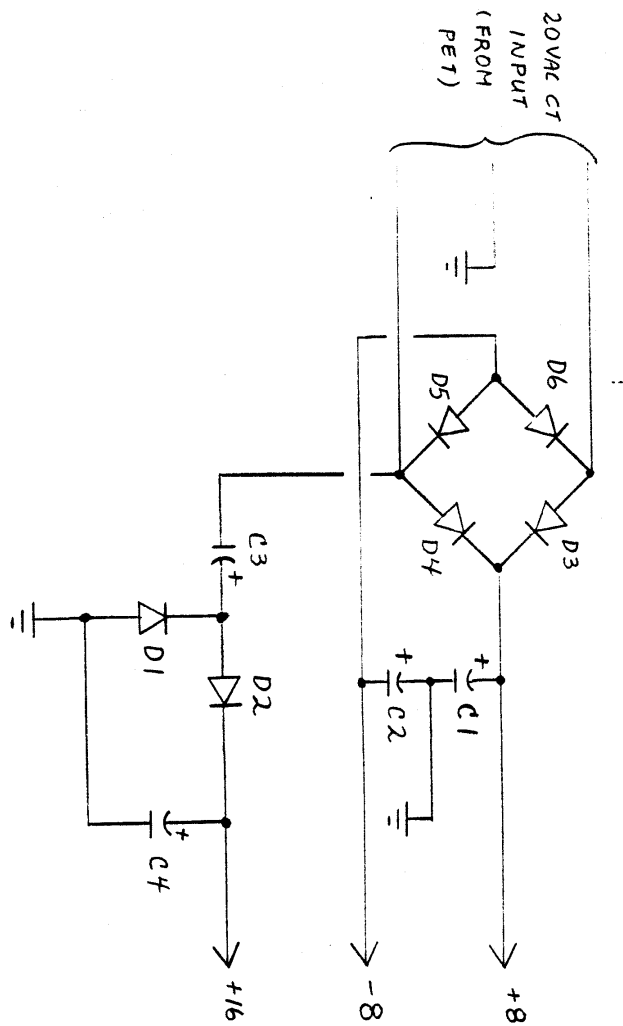
The Betsi Power Supply delivers approximately +8V @ 3A, -8V @ 1A and +14V @ 300 ma. These ratings are adequate for most uses of a PET/Betsi system, but some combinations of S-100 boards may require more power than is available from this supply. As delivered the supply can easily run a 24K Expandram memory board and two or three I/O boards. If static RAM boards are used, two 8K boards and one I/O board are usually the limit. For other combinations of S-100 boards, check the manufacturer's specifications against the power available as noted above.

Note: The +14-16V section of the Betsi Power Supply can be easily modified for a greater output if needed; contact Forethought Products for further information.



(INSIDE THE PET)

*Allen*



BETSI POWER SUPPLY PARTS LIST

D1, D2, D5, D6	1N4001 (1A @ 50V)
D3, D4	R300 (3A @ 50V)
C1	2200uf @ 25 WVDC
C2	1000uf @ 16 WVDC
C3, C4	470uf @ 25 WVDC

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