

# PARASITIC ENGINEERING

PO BOX 6314

ALBANY CA 94706

Dear Gentleperson:

Thank you very much for your order. As one of the first persons to build an EQUINOX-100 kit we would like to ask you cooperation in helping us improve the kit. To that end we seek your comments and suggestions on how the kit went together.

We have attempted to provide you with complete, easy to understand directions for assembly. How successful we have been can only be determined by you, the kit builder. Please write or call us at (415) 547-6612 with your comments and suggestions.

Please read the attached changes to the instructions. They will clarify assembly. In addition we have enclosed an Octal Reference Card.

Thank you again for your order, let us know if there is anything else we can do for you.

Sincerely yours,

Erik Wheaton  
Marketing Manager

## ADDENDUM

Page PS-1

Please add "Power Supply Chassis" to the parts list for the power supply. It is the drilled metal plate included in your power supply parts box.

Pages PS-6, PS-9

On these pages when the "upper" and "lower" bridges are referred to, the upper bridge is the bridge nearest the edge of the power supply chassis.

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Page PS-1

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Pages PS-6, PS-9

On these pages when the "upper" and "lower" bridges are referred to, the upper bridge is the bridge nearest the edge of the power supply chassis.

Pages C-3, C-13

The sheet metal screws installed on these pages will be easier to install if they are VERY SPARINGLY lubricated (use soap, light oil, or a spray such as WD-40). Also, a screwdriver that fits these screws securely will make installation easier.

### NOTE:

A 10 foot length of solder has been included with your kit. Please use this solder, or any good grade of rosin core solder for assembly. Use of an acid core solder will void your warranty.

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## ERRATA

You will be receiving the following items shortly by mail; they are:

- (1) A book (Scelbi) entitled: "Understanding Microprocessors and Small Computer Systems".
- (2) An ID label for the back panel.
- (3) A 3-ring binder to put your EQUINOX documentation in.

WE WELCOME YOUR COMMENTS AND SUGGESTIONS TOWARDS IMPROVING THIS KIT. PLEASE WRITE US IF YOU HAVE ANY COMMENTS.

# PARASITIC ENGINEERING

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ALBANY CA 94706

## IMPORTANT READ THIS FIRST

Your EQUINOX 100 kit is packaged in four sub-assemblies. To reduce errors and avoid confusion we suggest that you do not open a sub-assembly until called for in the instructions.

The four sub-assemblies are:

1. Bus-board.
2. Power Supply
3. C.P.U. Board
4. Cabinet.

The power supply is shipped seperately to avoid damage. The bus-board and its related parts are packed into two plastic bags, inside the cabinet; the bags are stapled together. The C.P.U. board is packed in a plastic bag, and its related parts are packed seperately in a small cardboard box; both are packed inside the cabinet. All of the rest of the parts packed inside the cabinet are part of the cabinet sub-assembly.

To start assembling your kit remove the two screws at the rear of the top of the cabinet. Slide the top off, and locate the instruction package inside the cabinet.

# PARASITIC ENGINEERING

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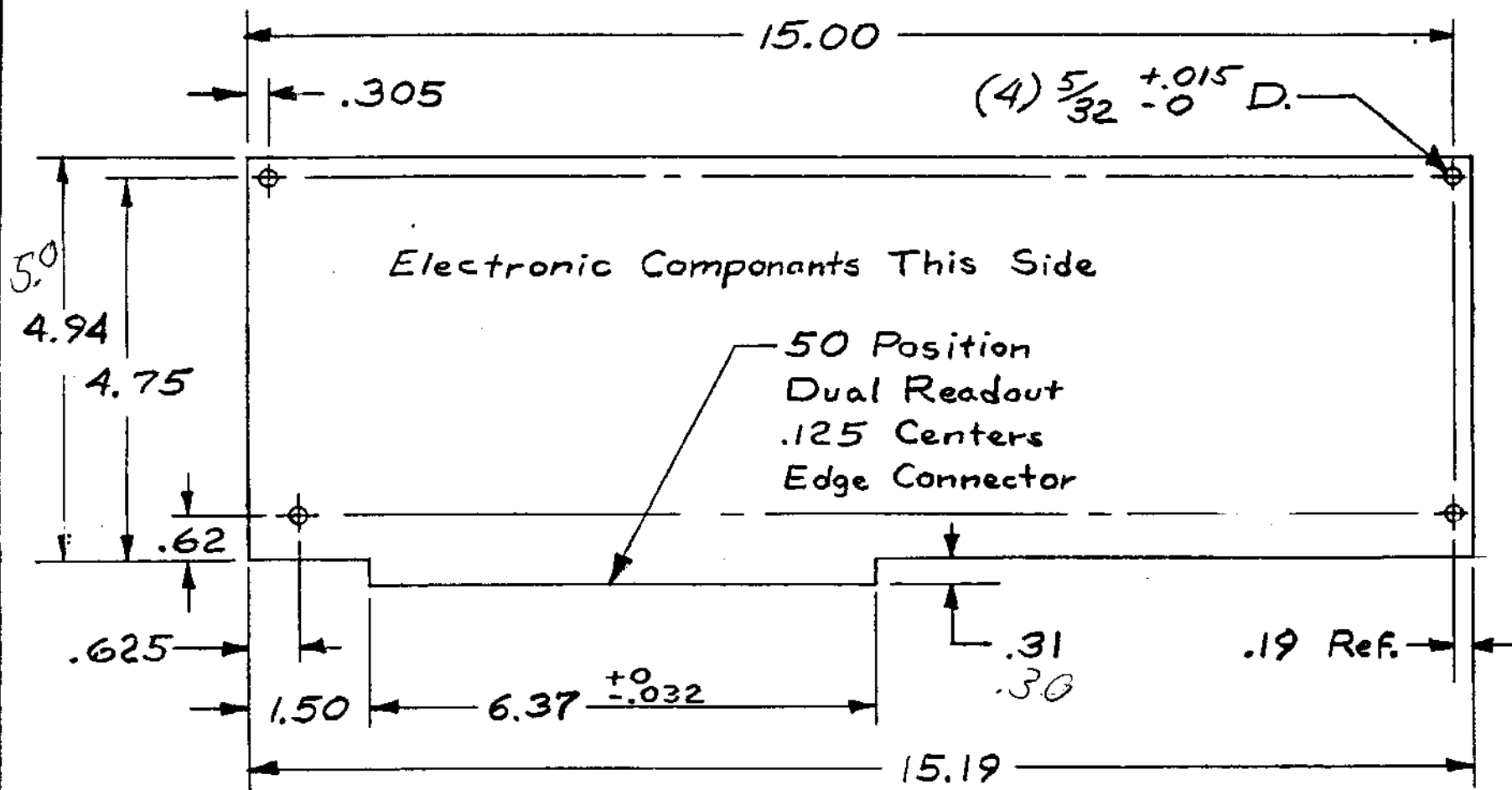
Two different plastic front panels are available for the EQUIBOX. One of these panels has a large rectangular cut-out to accommodate the keyboard on an EQUINOX/THINKERTOY/Morrow's Micro-Stuff CPU board. The other plastic front panel is blank except for the key switch and a 1/4" hole for a reset switch.

If you wish, you may exchange the front panel supplied with your kit for the alternate panel.

Please ship the panel postpaid to:

Parasitic Engineering  
P.O. Box 6314  
Albany, Calif. 94706

If you do wish to mount a THINKERTOY/Morrow's Micro-Stuff CPU board in your EQUIBOX, you will need to trim and drill your CPU board. Follow the dimensions shown on the print on page B-2. Then proceed to Final Assembly page F-1. If you are using a different CPU board then ignore all mentions of the CPU board in the Final Assembly instructions.



B-2

FIG. B-2

TOLERANCE  
 1 Place  $\pm .063$   
 2 Place  $\pm .032$   
 3 Place  $\pm .015$   
 Unless Otherwise Specified

EQUINOX 100  
 CPU/Front Panel

PARALITIC ENGINEERING  
 P.O. Box 6814  
 Albany, CA 94706

5-6-77 DAW

## INTRODUCTION

As you begin each sub-assembly check the parts off against the parts list. Then read over the instructions at least once to be sure you understand them. After you finish a sub-assembly, set it aside until called for.

## SOLDERING

Bad solder joints are the most frequent cause of kit failures. Pictures and instructions on how to solder can be helpful. But if you have never soldered before or are unsure of your soldering capability, personal instruction is invaluable. Your EQUINOX dealer, local electronics store, or repairman should be able to help you.

The following tools will be needed to assemble your EQUINOX:

- 1 Pair Long Nose Pliers (approx. 4")
- 1 Pair Diagonal Cutters (approx. 4")
- 1 Pair Wire Strippers
- 1 Soldering Iron (35 to 50 watt)
- 1 Screw Driver (approx. 1/4" wide blade)
- 1 Screw Driver (approx. 1/8" - 3/16" blade)
- 1 Screw Driver (Phillips #2 blade)

## WARRANTY

All Parasitic Engineering products are warranted against defects in materials for a period of ninety (90) days from date of user purchase. During the warranty period, Parasitic Engineering will replace at no charge any components that prove to be defective.

This warranty does not apply to any components damaged by accident, misuse, or improper assembly.

No other warranty is expressed or implied. Parasitic Engineering is not liable for any damages to equipment used in conjunction with it's products, nor for any consequential damages.



The first assembly you will work on is the bus board. The bus-board is packed in a plastic bag inside the cabinet.

The edge connectors for the bus-board are packed separately with the cabinet parts. The number of edge connectors supplied depends on the options ordered with your kit. For easy expansion of your system we suggest that you install as many edge connectors now as your budget will allow.

NOTE: You will need two (2) 4-40 x 3/4" screws, with nuts and lockwashers for each edge connector not supplied with this kit.

Soldering many edge connectors to the bus-board can be very tedious. Therefore, we suggest that you install all the other parts on the bus-board, and then install a few edge connectors during each session that you work on the kit.

An area near the left rear of the bus-board must be assembled with special procedures. The location of this area is shown in Fig. 4 on page C-8 of the cabinet assembly instructions.

All component leads in this area must be cut-off flush with the board and soldered with a minimum amount of solder so that the soldered lead is almost flush with the board.

After you have assembled the bus-board, turn to page PS-1 of this manual and begin the power supply sub-assembly.

POWER SUPPLY PARTS LIST

<u>QTY.</u>	<u>Part No.</u>	<u>Part Description</u>
1		Transformer
1		10 MFD 440 VAC. Capacitor w/Rubber Boot
1		50,000 MFD 15v. Capacitor
2		5,700 MFD 25v. Capacitor
2		MDA 3500 Bridge Rectifier
1		Keyswitch, w/two (2) keys
1		Fuse Holder
1		Fuse Holder Cap
1		Fuse; 6 $\frac{1}{4}$ A. (Slow Blow)
1		A.C. Receptacle
1		Power Cord
1		Capacitor Bracket
2		Foam Squares
2		Tie-wraps
3		Red Paper Dots



Jumper Wires

1	Long Black
1	Short Black
1	Long Red
1	Short Red
1	Long Violet
1	Short Violet
1	Long Grey
1	Short Grey
1	Long White
1	Short White
1	Short Green

#6 Hardware

2	6-32x3/8" Machine Screws
2	6-32x1" Machine Screws
4	Lock Washers
2	Flat Washers
4	Nuts

POWER SUPPLY PARTS LIST (Cont'd.)

#8 Hardware

4 8-32x1/2" Machine Screws  
4 Lock Washers  
4 Flat Washers  
4 Nuts

#10 Hardware

3 10-32x1/2" Machine Screws  
3 10-32x5/8" Machine Screws  
6 Lock Washers  
11 Flat Washers, Thick; (.063).  
3 Flat Washers, Thin; (.032).  
6 Fibre Shoulder Washers

Tools Needed

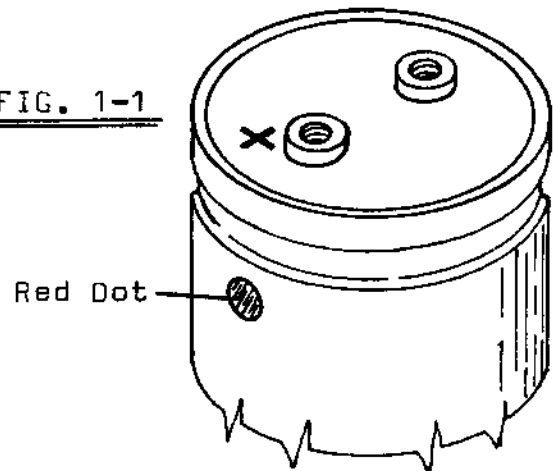
1 Pair Long Nose Pliers, (4" or Longer).  
1 Pair Diagonal Cutters, (4" or Longer).  
1 Screwdriver, (Approx. 1/4" Wide Blade).

## Power Supply Assembly Instructions

( ) Position the power supply chassis as shown in FIGs. 1-A and 1-B.

( ) In the following steps you will mount the three round filter capacitors. Each of these capacitors has one terminal marked '+' as shown in FIG. 1-1. Take the three red paper dots, peel the backing paper off of each dot, and stick the dot on the side of each filter capacitor as shown. This will help you identify the '+' terminal when you mount these capacitors.

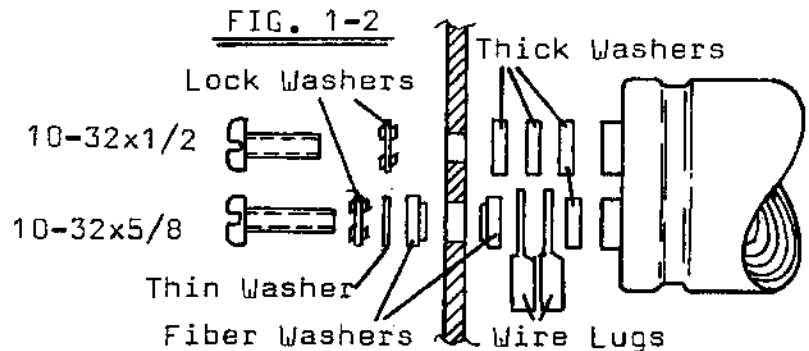
FIG. 1-1



( ) Mount a 5700 MFD capacitor at location C3. On the unmarked terminal, use a 10-32x5/8" screw, two fibre washers, one thick and one thin #10 flat washer, and one #10 lock washer, as shown

in FIG. 1-2. Thread the screw into the capacitor, but do not tighten it. On the '+' terminal use a 10-32x1/2" screw, one #10 lock washer, and three thick #10

FIG. 1-2



flat washers. This is easiest to do if the screw you just installed on the unmarked terminal is quite loose. Rotate the capacitor out of the way, then slide a lock washer over the screw, push the screw through the chassis, and stack the washers over the screw. Do not tighten this screw, either. These screws will be tightened in the next step.

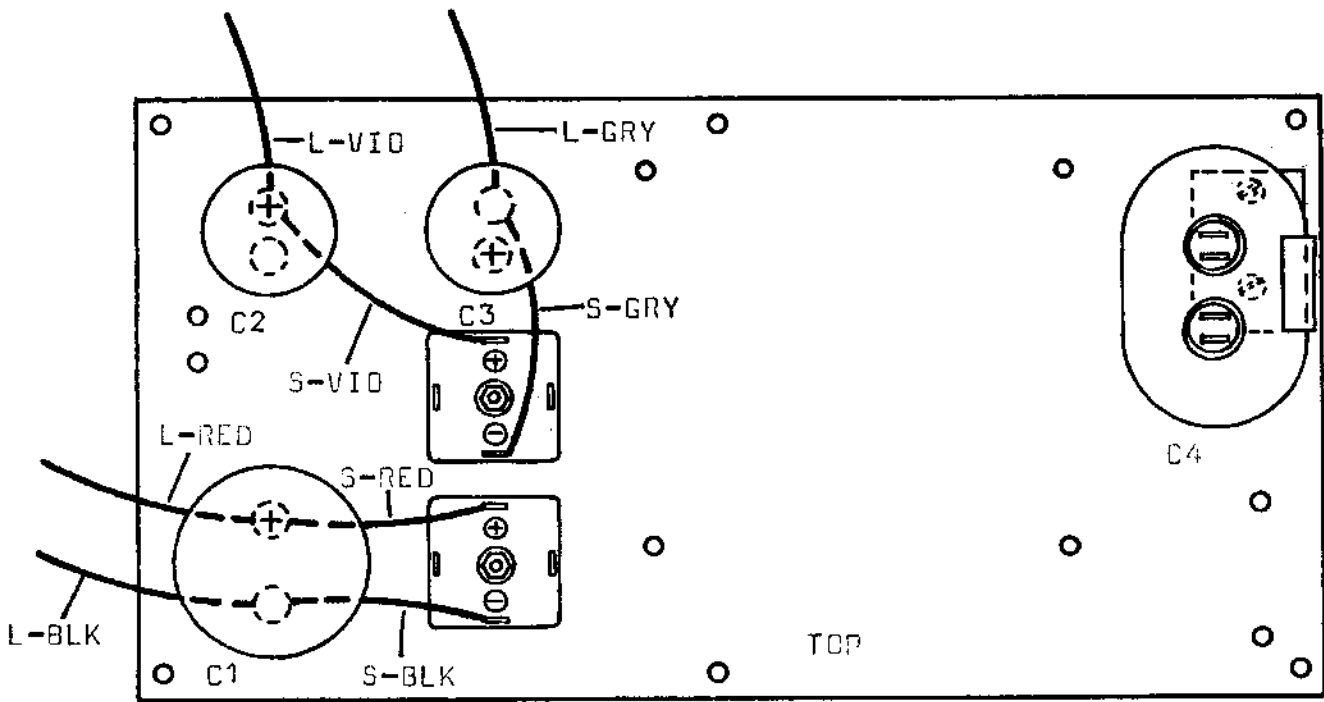


FIG. 1-A

L = Long  
S = Short

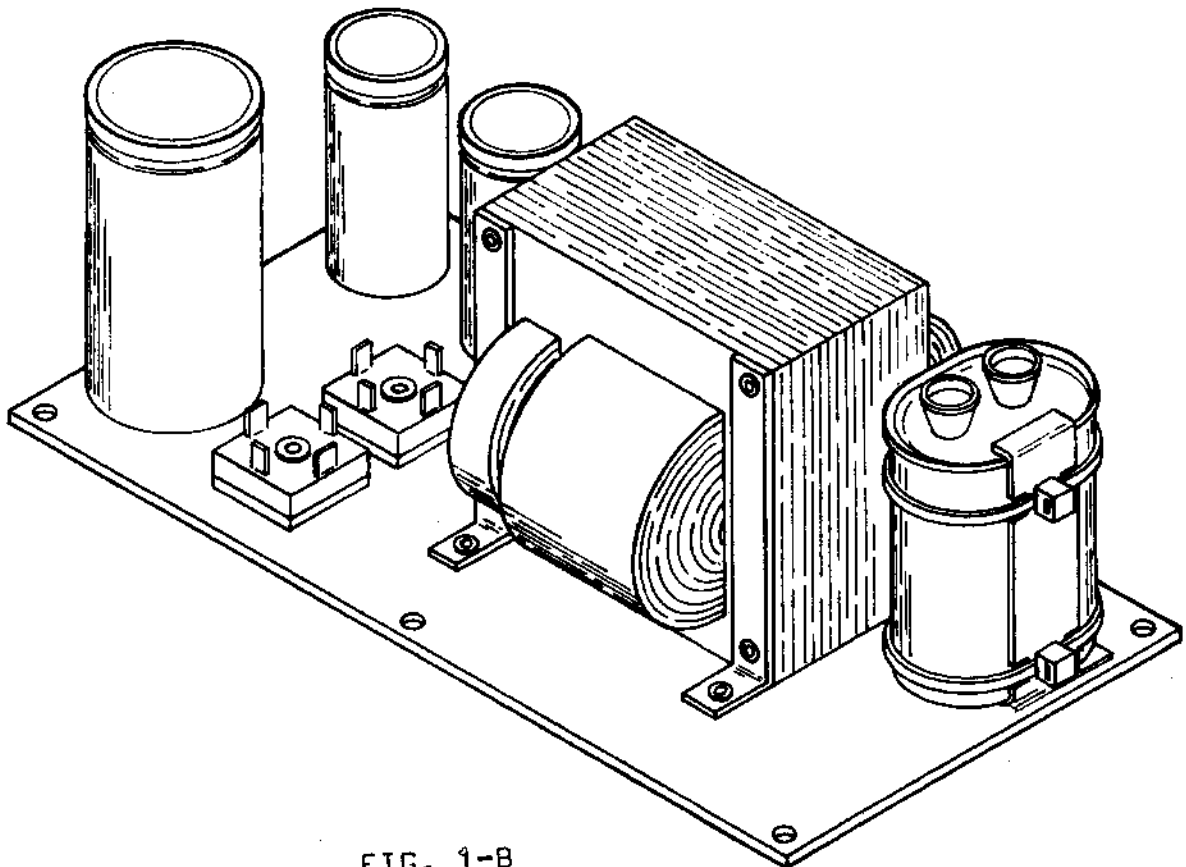


FIG. 1-B

( ) Locate the two grey jumper wires. Slide the spade lug of each wire onto the unmarked terminal of C3. Refer to both Figs. 1-A and 1-2. Tighten the two screws of C3.

( ) Now double check to see that the positive terminal is in the position shown.

( ) Similarly, mount a 5700 MFD capacitor at location C2. However, this time, put the fibre washers and associated hardware on the '+' terminal and use the three thick flat washers and associated hardware on the unmarked terminal.

( ) Install the two violet jumpers as shown. Then tighten down both screws of C2.

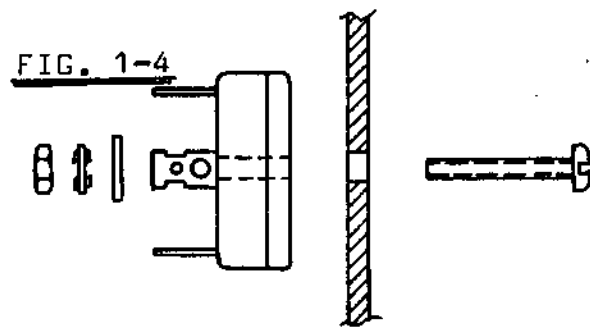
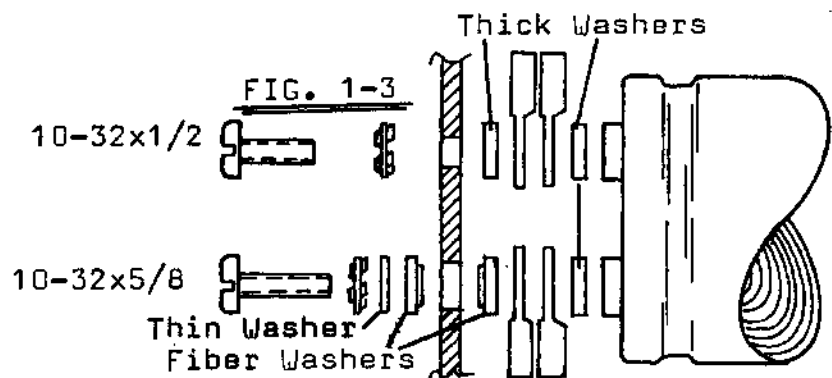
( ) Mount a 50,000 MFD capacitor at location C1. Refer to Fig. 1-3. Use a

10-32x5/8" screw, two fibre washers, one thick and one thin flat washer, and a #10 lock washer on the '+' terminal. Use a 10-32x1/2 screw, two thick #10 flat washers, and a #10 lock washer on the unmarked terminal.

( ) Install the two red jumpers on the '+' terminal, and the two black jumpers on the unmarked terminal of C1. Then tighten both screws of C1 securely.

( ) Now, double check to see that the '+' terminals are positioned properly on the three capacitors you just installed.

( ) Mount the two MDA 3500 rectifier bridges at the locations shown in Fig. 1-A. Use a 6-32x1" screw, a #6 lock washer, a #6 flat



washer, and a 6-32 nut, as detailed in FIG. 1-4. Be sure to position the '+' and '-' terminals correctly.

( ) Plug the four short jumpers from the capacitors into the two MDA 3500 rectifier bridges as follows; (refer to FIG. 1-A):

- ( ) Red jumper to '+' terminal of upper bridge;
- ( ) Black jumper to '-' terminal of upper bridge;
- ( ) Violet jumper to '+' terminal of lower bridge;
- ( ) Grey jumper to '-' terminal of lower bridge.

( ) At location C4, mount the capacitor bracket. Refer to FIG. 2. Use two 6-32x3/8 screws, two #6 lock washers, and two #6 nuts. Be sure to mount the screws with their heads on top of the chassis.

( ) Locate the two foam squares. Peel the paper off of one side only of each foam square. Position the foam squares on the capacitor bracket, then press firmly into place, as shown.

( ) Peel the remaining paper from the foam squares. Position a 10 MFD 440 Vac. capacitor as shown. Then press the capacitor firmly into place against the foam squares.

( ) Wrap two tie-wraps around the capacitor and bracket. Position them in the notches of the bracket. Tighten the tie-wraps using a pair of pliers to pull them as tight as possible. Then, cut off the excess lengths of tie-wraps.

( ) Set the chassis aside for a moment.

( ) Position the transformer as shown in FIG. 3, with the mounting brackets up, and the smaller primary winding on the left.

( ) Pick up the chassis, turn it over, and make sure that C4 is on the right. Now lower the chassis onto the transformer.

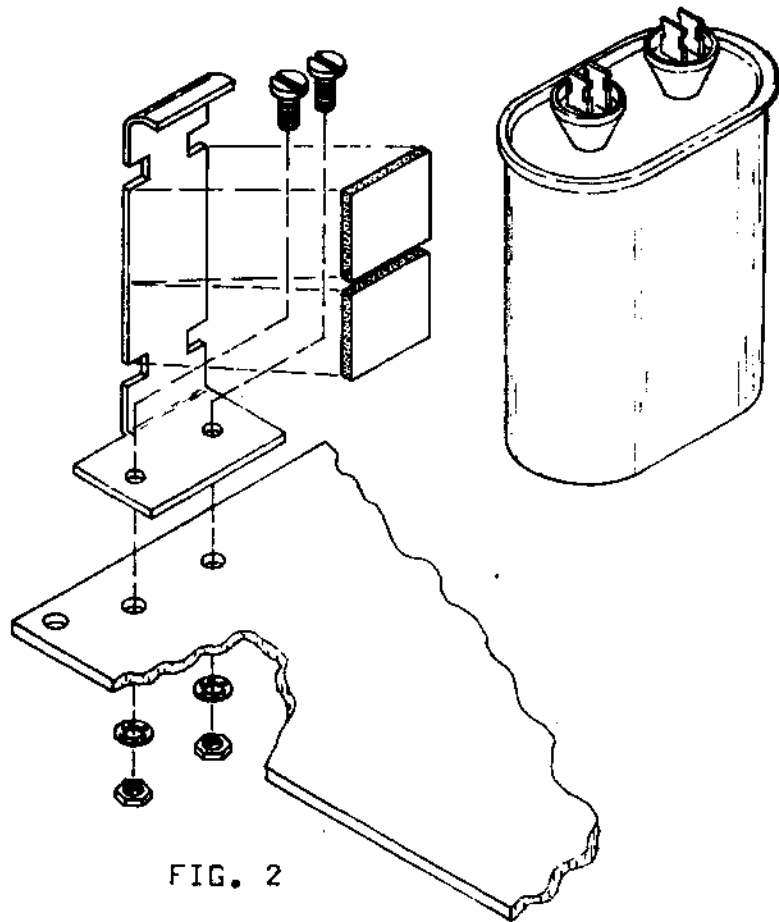


FIG. 2

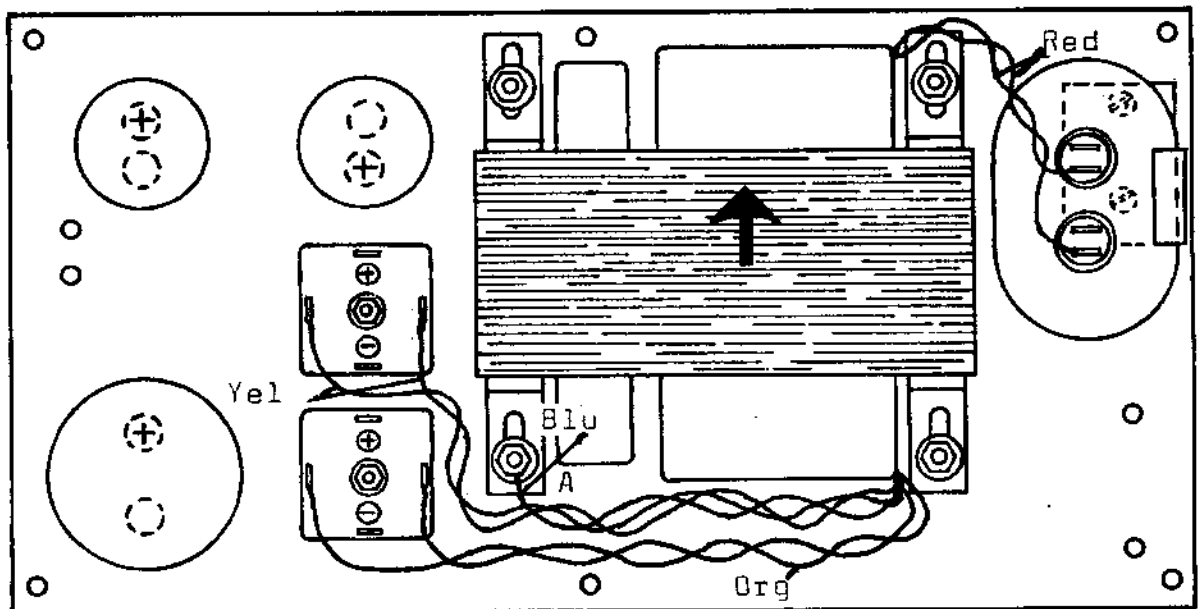
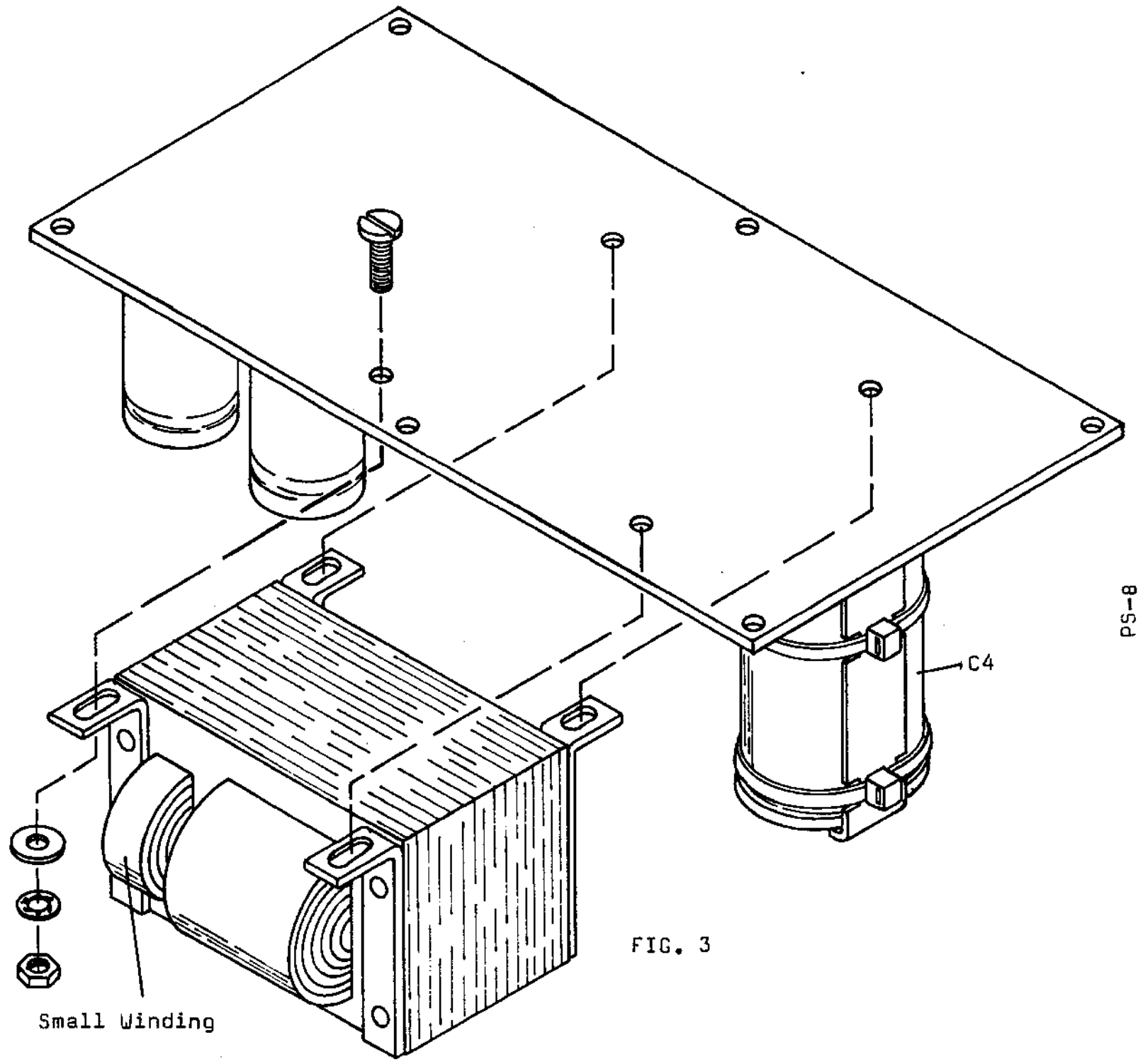


FIG. 4





Small Winding

C4

FIG. 3

( ) Mount the chassis onto the transformer using four 8-32x1/2" screws, #8 flat washers, lock washers, and nuts. Don't tighten these screws yet.

( ) Next, refer to Fig. 4, and push the transformer in the direction of the arrow. Do not tighten the screw at "A". Tighten the other three transformer mounting screws.

( ) Twist together the blue and two yellow wires from the transformer. Position these wires as shown. Slide the lug on the blue wire under the nut on the screw at "A". Now tighten this screw.

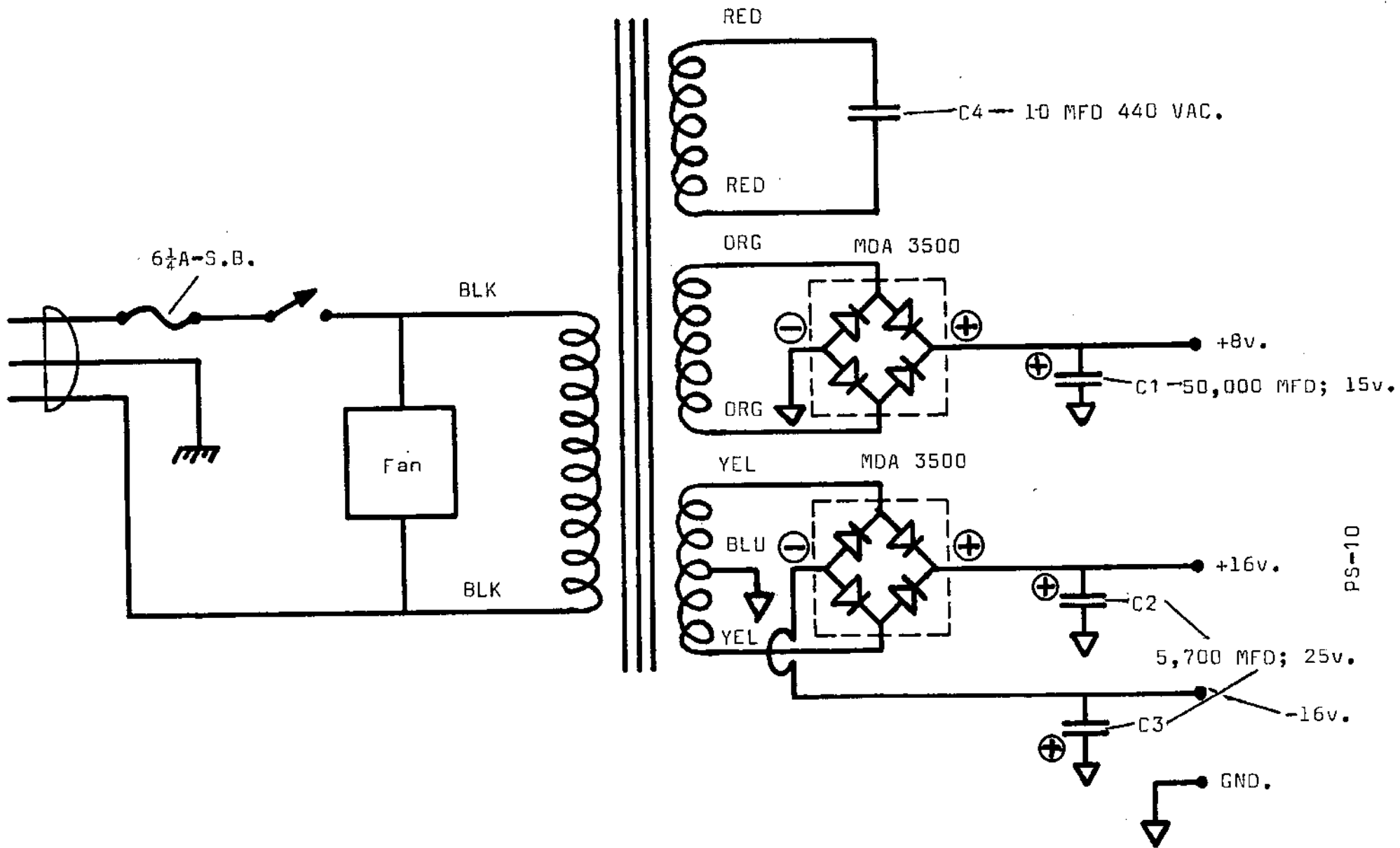
( ) Plug one yellow wire onto each of the unmarked terminals of the lower MDA 3500 bridge.

( ) Twist together the two orange wires from the transformer. Route them as shown. Plug one wire onto each of the unmarked terminals of the upper MDA 3500 bridge.

( ) Twist together the two red wires from the transformer. Slip the rubber boot over these wires. Push one wire onto each terminal of capacitor C4. (CAUTION: There are two lugs on each terminal. Be sure that both wires are not connected to the same terminal.) Refer to Fig. 4.

( ) Now, slip the rubber boot over the lugs on the top of the capacitor and dress the leads along the transformer. **IMPORTANT:** The terminals of the capacitor have 400 volts across them when the computer is running. Be sure that the rubber boot is in place whenever the power supply is in use.

This completes the initial assembly of the power supply. If this supply is part of an EQUINOX-100, then proceed to the cabinet sub-assembly, page C-1.



6 1/2 A-S.B.

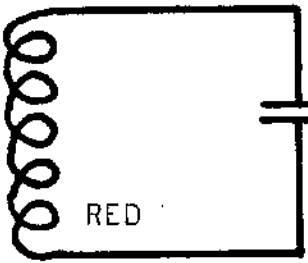
BLK



Fan

BLK

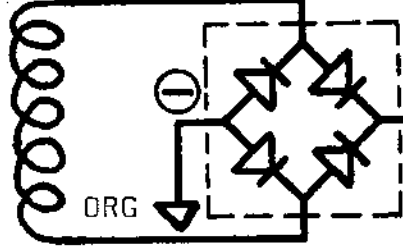
RED



C4 10 MFD 440 VAC.

ORG

MDA 3500

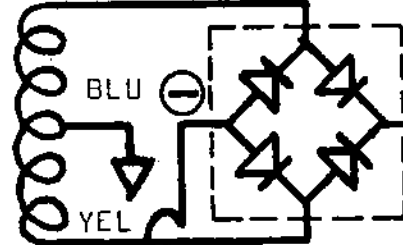


+8v.

C1 50,000 MFD; 15v.

YEL

MDA 3500



+16v.

C2 5,700 MFD; 25v.

PS-10

C3 5,700 MFD; 25v.

-16v.



GND.

EQUINOX CABINET PARTS LIST

<u>QTY.</u>	<u>PART DESCRIPTION</u>
1	Plastic Front Panel
38	Card Guides
1	Fan
1	Fan Guard - Round Wire
1	Fan Screen - Square Mesh
2	Edge Connectors; 100 pin
2	Extruded Rail Long
2	Extruded Rail Short
2	Support Brackets
1	Side Panel
2	Plastic Spacers; 3/16" thick
2	Plastic Spacers; 1/32" thick
4	#6 x #4 Angle Brackets
4	Short Tie-wraps
2	11/32" Hole Plugs
1	1/2" Square Rubber Bumper
1	Cabinet
1 length	Solder Wick
4	Feet (Packed with mounting hardware)
	<u>BAG C</u>
4	4-40 x 1/4" Machine Screws
6	4-40 x 3/4" Machine Screws
10	Lockwashers (4-40)
10	Nuts (4-40)

The following hardware is packed in five (5) bags to assure quality control.

	<u>BAG D</u>
16	6-32 x 3/8" Machine Screws
2	6 x 1/4" Long Tubular Spacers

EQUINOX CABINET PARTS LIST (Cont'd.)

QTY.

PART DESCRIPTION

BAG E

8 6-32 x 3/4" Machine Screws  
8 6 x 3/4" Sheet Metal Screws

BAG F

4 6-32 x 1/2" Machine Screws  
16 Nuts (6-32)  
4 6 x 1" Sheet Metal Screws

BAG G

16 Lockwashers (6-32)

BAG H

4 6-32 x 3/8" Machine Screws; Black  
4 Black Finishing Washers (6-32)  
4 Flat Washers (thin) (6-32)  
4 6-32 x 3/8" Machine Screws  
4 6-32 x 1" Long Threaded Nut Spacers

NOTE: Bag H is not packed in the  
EQUIBOX kit.

Tools Needed

1 Pair Long Nose Pliers (approx. 4")  
1 Screw Driver (approx. 1/4" blade)  
1 Screw Driver (approx. 1/8" - 3/16" blade)  
1 Screw Driver (Phillips #2 blade)

## CABINET ASSEMBLY INSTRUCTIONS

- ( ) Locate the side plate and the two (2) support plates. Position the side plate as shown in Fig. 1, with the 'A' toward the front.
- ( ) Position one of the support plates near the front of the side plate with the 'A' positioned as shown. Mount the support plate to the side plate using two #6 x 3/4" sheet metal screws.
- ( ) Similarly mount the other support plate to the side panel in the position shown in Fig. 1. Again be sure to mount the support plate with the 'A' positioned as shown.
- ( ) There are two pairs of extruded aluminum rails. Observe that there is a gap with no holes near the end of each rail.
- ( ) Locate the four "L" brackets. Each "L" bracket has one larger and one smaller hole. As shown in Fig. 1-1 mount one "L" bracket on the end of each rail. Use the smaller hole in each "L" bracket and a #4-40 x 1/4" screw, nut and lockwasher.
- ( ) One pair of extruded rails is shorter than the other pair. Be sure to use the shorter pair in the following three steps.
- ( ) Using a #6 x 3/4" sheet metal screw mount one of the shorter rails to the upper hole in the front support plate. Use the first hole on the end of the rail without the gap.
- ( ) On the rail you just mounted, you will note that the 13th hole from the front is larger than the surrounding holes. Use a #6 x 3/4" sheet metal screw to mount the rail, through this larger hole, to the upper hole of the rear support plate.
- ( ) In the same manner mount the other short rail to the lower holes in the support plates. Use #6 x 3/4" sheet metal screws.
- ( ) Set this rail assembly aside for a moment.

*1. PUT  
THE  
BRACKETS  
ON THE  
SHORTER RAILS*

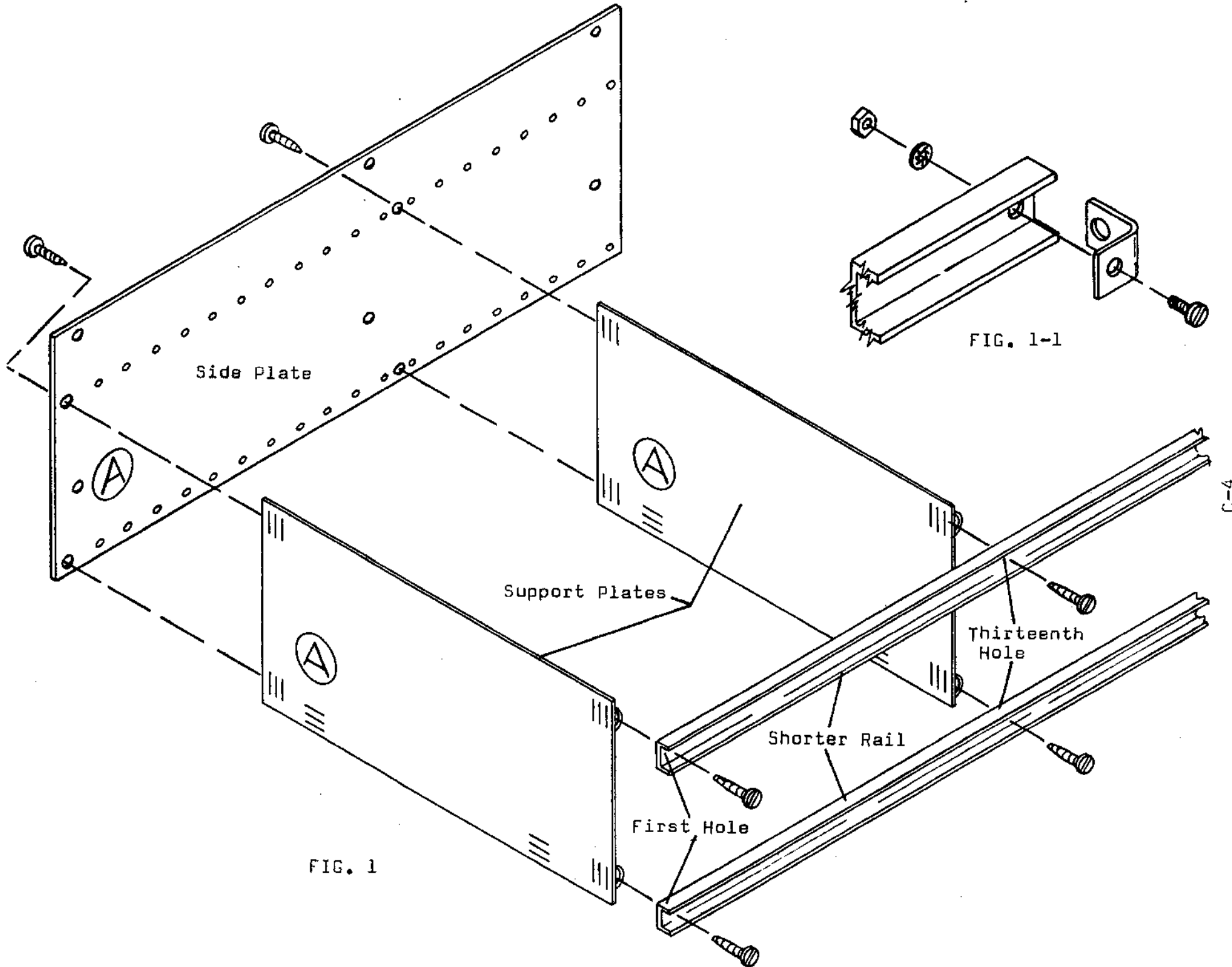


FIG. 1

FIG. 1-1

C-4

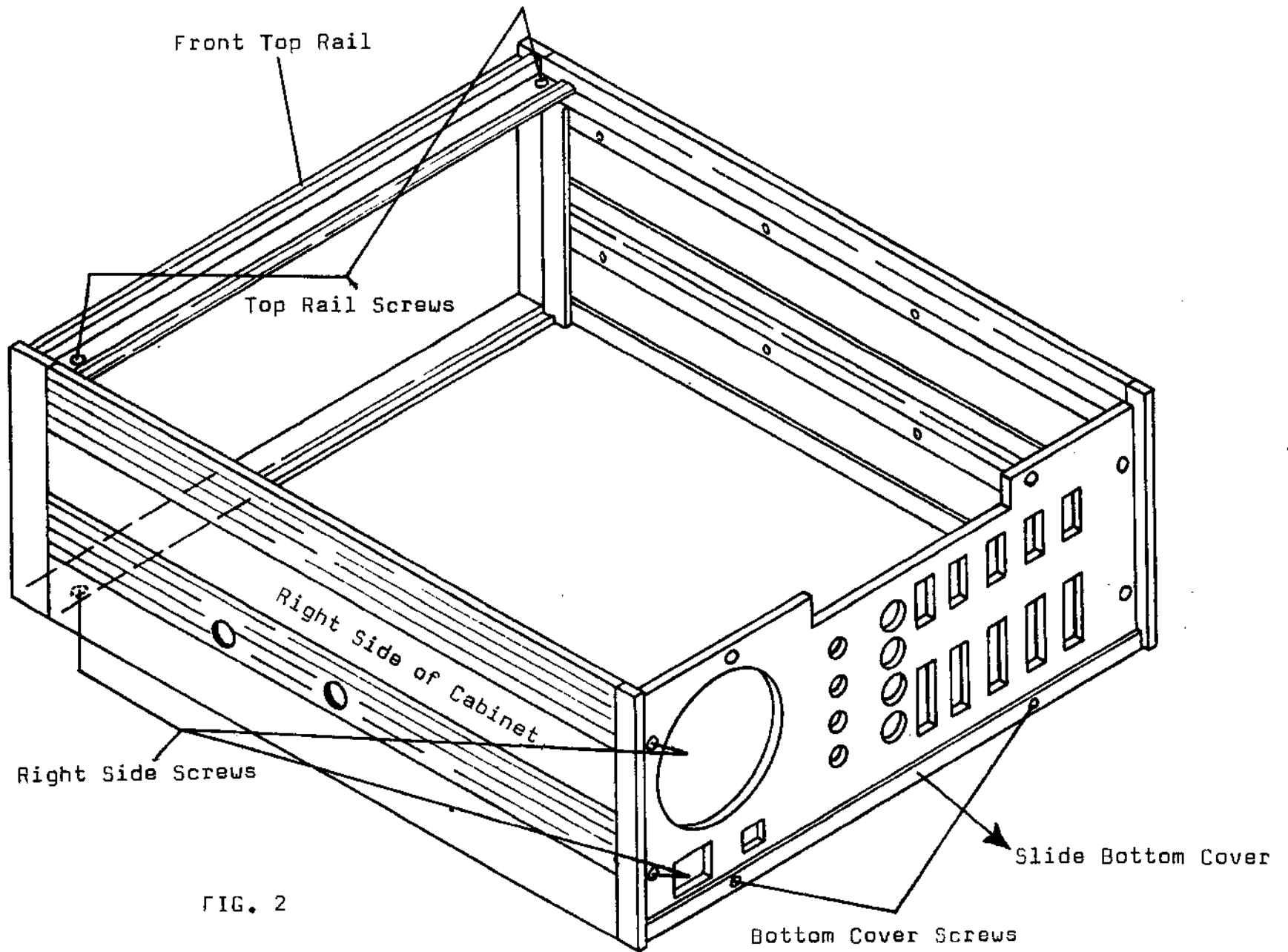


FIG. 2



Refer to Fig. 2 for the following steps. Save all hardware removed in the following steps.

- ( ) Locate the cabinet. Remove the two screws at the bottom of the rear panel. Then slide the bottom cover off.
- ( ) Remove the two screws at the front top corners, then lift off the front top rail.
- ( ) Remove the screw at the lower front corner, and the two screws on the rear right (as viewed from the front). You can now remove the right side of the cabinet.
- ( ) Take the rail assembly you set aside previously and position the side plate on the left side of the cabinet as shown in Fig. 3. Mount the side plate using six #6-32 x 3/8" screws in the positions shown.
- ( ) Mount the "L" brackets, that are attached to the extruded rails, to the rear panel. Use two #6-32 x 3/8" screws with nuts and lockwashers.

Refer to Fig. 4 for the following steps.

In the following steps you will install the bus-board which you assembled earlier. There are components including an integrated circuit on the left rear of the board. See Fig. 4-1. The component leads in this area must be cut off almost flush with the bottom of the board. Inspect your bus-board now. If some or all of the leads are not almost flush then perform the following step.

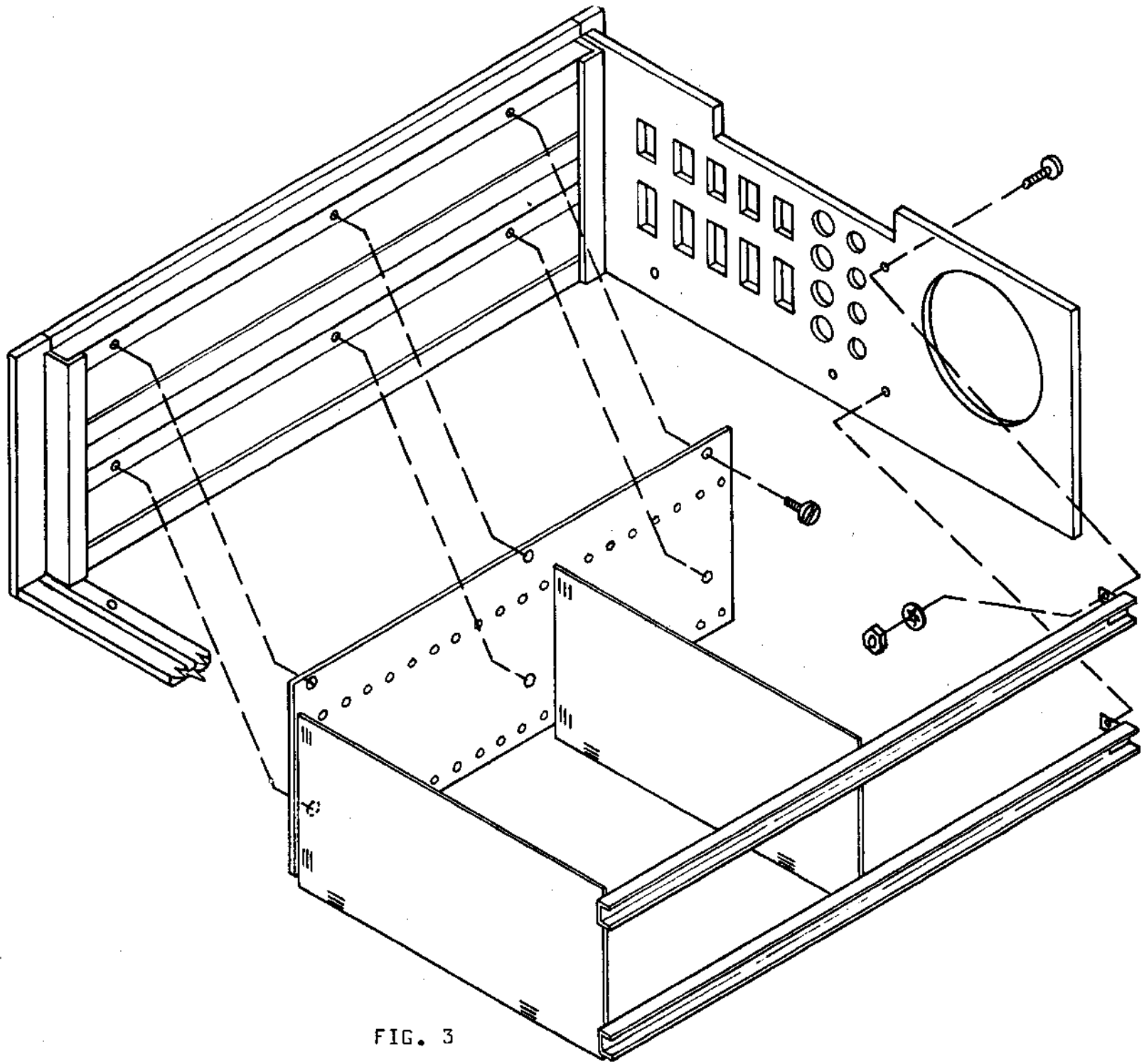
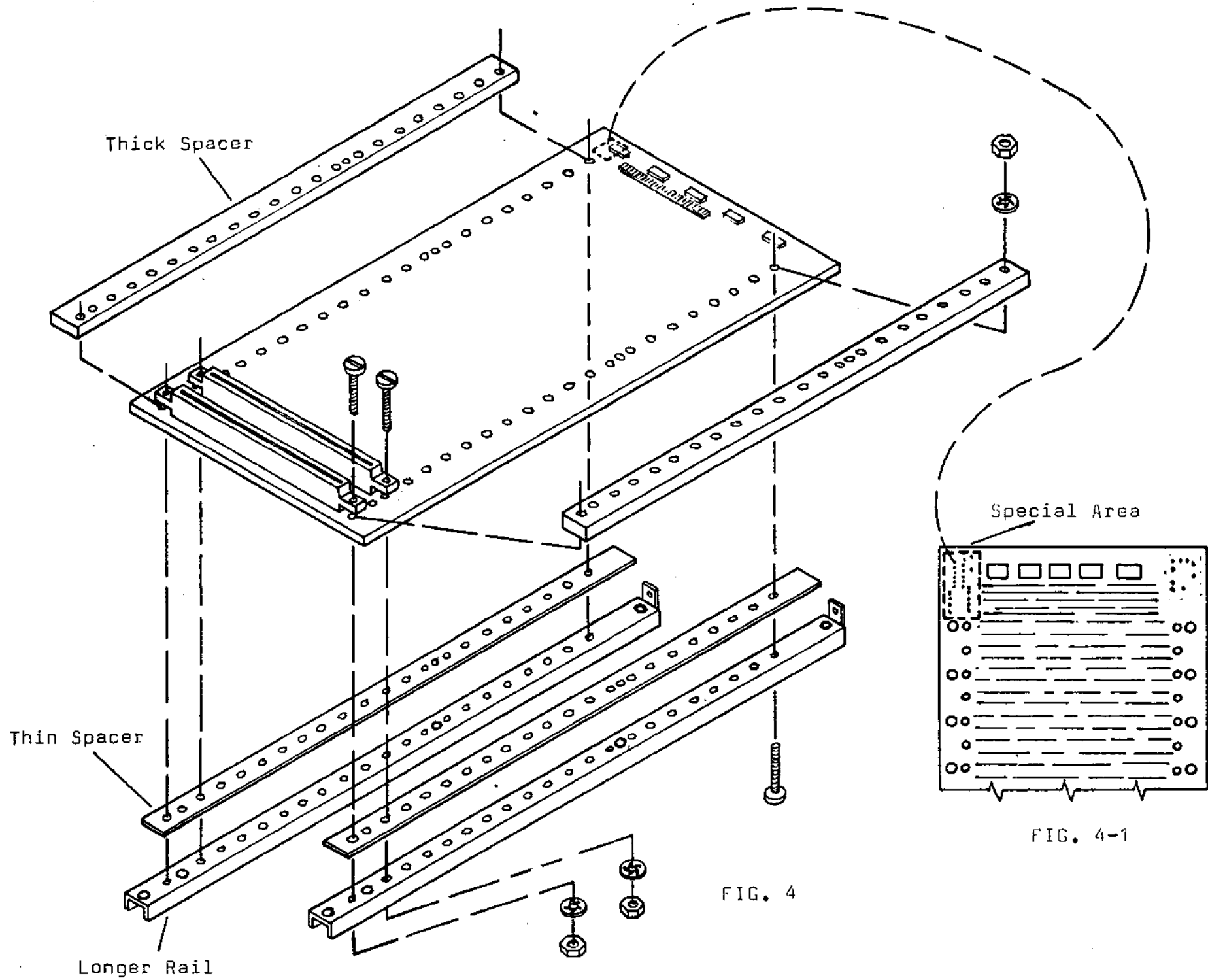


FIG. 3



Perform the following step for each lead which is not almost flush.

- ( ) Take the piece of solder wick provided and place one end of it over the lead. If the component lead is sticking up from the solder, then push the solder wick down onto the lead. Apply the soldering iron on top of the solder wick. If a component lead is sticking up, be sure and position the soldering iron to the side of the lead and firmly against the solder wick, the lead, and the bus-board. After a few seconds the solder should begin to melt and be sucked up into the wick. After about 10 seconds remove the soldering iron and solder wick. Now cut the exposed component lead flush with the board, then if necessary, resolder the lead. Be sure and use a minimum of solder so that the finished lead is almost flush.

NOTE: It is easier to install the edge connectors with the bus-board not installed in the cabinet. Therefore, we recommend that you install as many edge connectors as your budget allows before installing the bus-board. You will also need two (2) #4-40 x 3/4" screws, nuts and lockwashers for every edge connector not supplied with your kit.

- ( ) Locate the two thick plastic spacers. On one end they have two holes or slots which are close together. Position this end toward the front of the bus-board, and slide the spacers between the edge connector mounting ears and the bus-board. See Fig. 4.
- ( ) Position one of the thin plastic spacers under the bus-board with the two closely spaced holes or slots toward the front. Mount one of the remaining extruded rails to the left side of the bus-board. Position the end with the "L" bracket toward the rear of the bus-board. Use a #4-40 x 3/4" screw through the first edge connector, the first hole of both plastic spacers, and the SECOND hole of the extruded rail. Use a nut and lockwasher on the screw, but do not tighten the screw at this time.

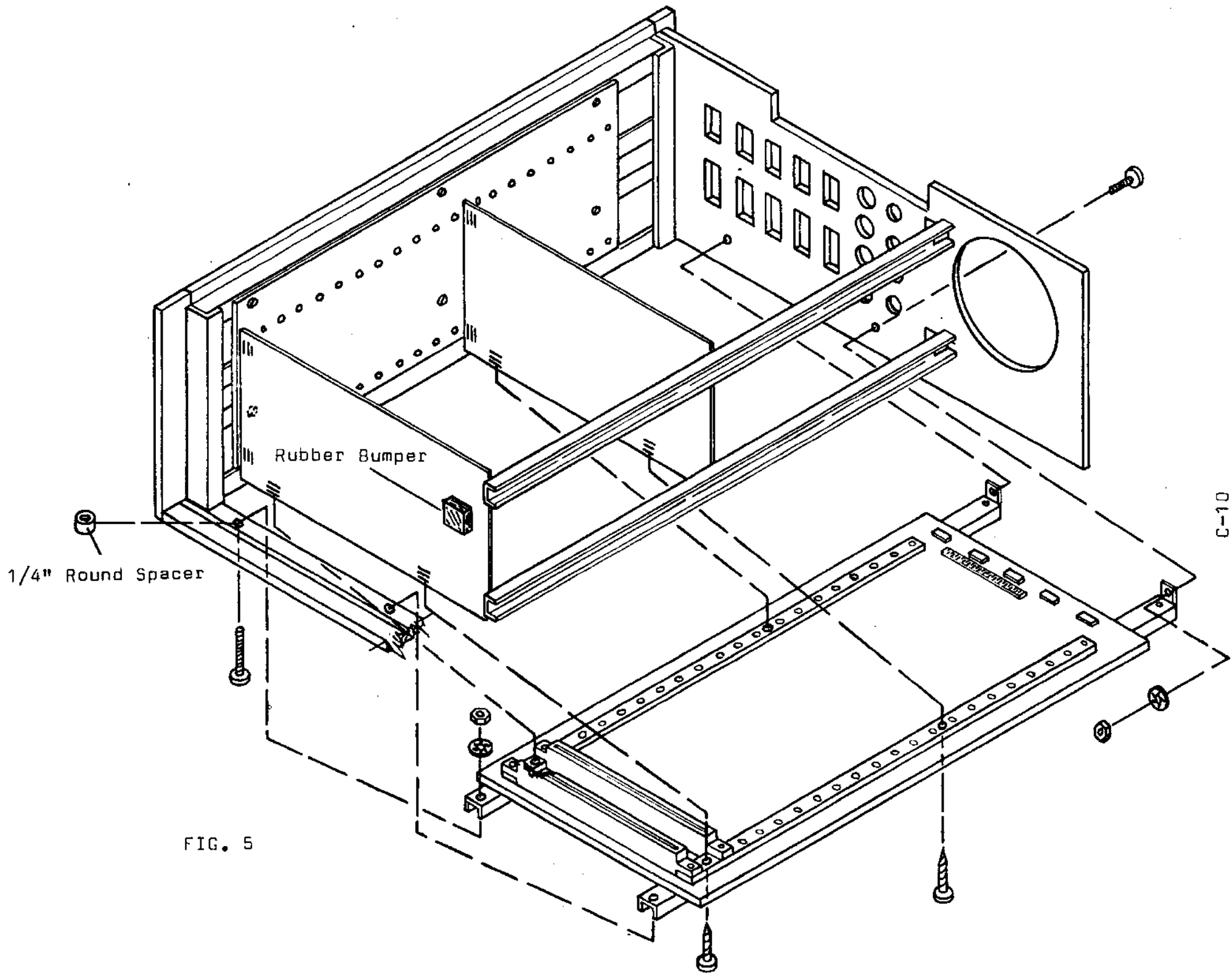


FIG. 5

- ( ) If you have installed an edge connector near the rear of the bus-board, then attach the plastic spacers and rails to the bus-board using a #4-40 x 3/4" screw in the same fashion as the previous step.
- ( ) If you do NOT have an edge connector installed near the rear of the bus-board, then attach the plastic spacers and extruded rail to the bus-board using the hole of the last edge connector location on the bus-board. Use a #4-40 x 3/4" screw, but install this screw in the opposite direction. That is, put the screw through the extruded rail first, then the thin plastic, bus-board, and thick plastic. Use a #4 nut and lockwasher and again do not tighten this screw.
- ( ) Using the same procedures described above, install two plastic spacers and an extruded rail on the right side of the bus-board.
- ( ) Install two #4-40 x 3/4" screws, nuts and lockwashers through every edge connector on the motherboard. Do not completely tighten these screws.
- ( ) Referring to Fig. 5, position the bus-board into the cabinet. The front support plate goes between the first and second edge connector locations on the bus-board. The front of each of the two bus-board extruded rails goes on top of the front lower rail of the cabinet.
- ( ) Push a 1/4" round spacer into the front of each bus-board rail. Then put a #6-32 x 1/2" screw through the lower front cabinet rail, the spacer, and the bus-board rail. Use #6 nuts and lockwashers on the screws, but don't tighten them yet.
- ( ) Mount the "L" brackets on the rear of each bus-board rail to the rear panel of the cabinet. Use #6-32 x 3/8" screws, nuts and lockwashers. Again do not tighten these screws.

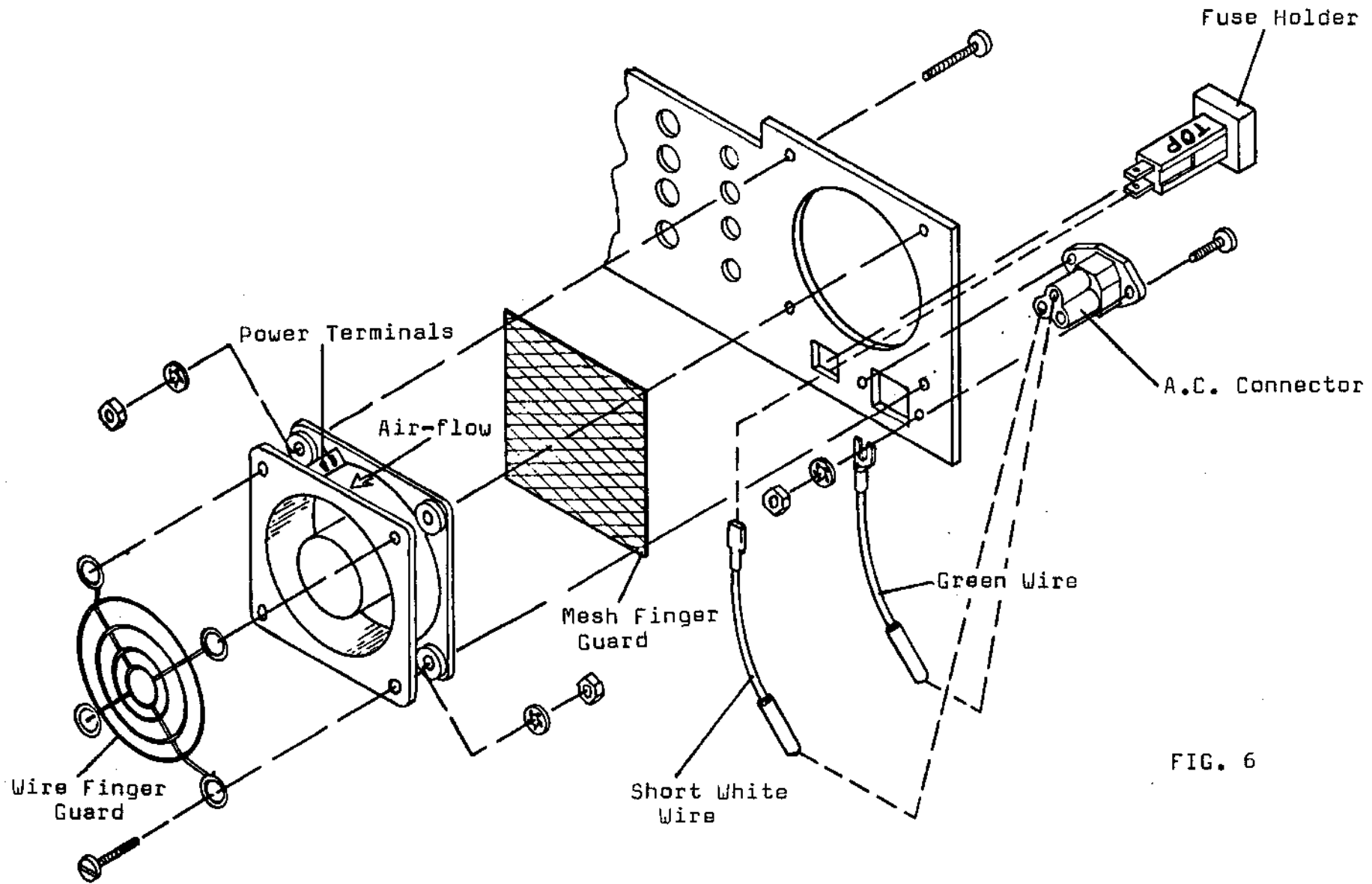


FIG. 6

- ( ) Mount the two support plates to the bus-board using two #6 x 1" sheet metal screws for each plate. Do not tighten these screws, either.
- ( ) Locate the fan. Observe the location of the power terminals and the air-flow arrow. See Fig. 6.
- ( ) Mount the round wire finger guard to the fan. Use four #6-32 x 3/4" screws, a nut and a lockwasher for each screw.
- ( ) Mount the fan and square mesh finger guard to the rear panel of the cabinet. Use four #6-32 x 3/4" screws with lockwashers and nuts for each screw. Be sure to position the fan with the power terminals and air-flow arrow in the positions indicated.

The jumper wires, A.C. receptacles and fuseholder used in the next steps are packaged with the power supply.

- ( ) Mount the fuseholder at the position indicated in the rear panel. Position the fuseholder as shown, then push it onto the rear panel.
- ( ) Push the uninsulated pin on one end of the green wire into the center hole of the A.C. receptacle.
- ( ) Position the A.C. receptacle shell with the middle lug position up. Then mount it to the rear panel with two #6-32 x 1/2" screws with nuts and lockwashers. Mount the spade lug of the green jumper wire under one of the screws as shown.
- ( ) Take the short white jumper wire, push the uninsulated pin into the A.C. receptacle lug position closest to the fuseholder. Push the other end of this wire onto the lower lug of the fuse holder.



- ( ) If your kit includes the carrying handle option, install the handle in the holes on the right side of the cabinet. Use the nuts and lockwashers provided with the handle.
- ( ) If your kit has no handle, then push the two hole plugs into the large holes in the right side of the cabinet.

Refer to Fig. 7.

- ( ) Mount the power supply to the right side of the cabinet. Position C4 toward the rear of the side. Secure the supply using six #6-32 x 3/8" screws.
- ( ) Now mount the right side of the cabinet to the cabinet. Use the screws you removed earlier. Two in the rear panel, and one in the front lower rail. Push the cabinet pieces together as you tighten these screws.
- ( ) Re-install the top front rail on the cabinet using the screws you removed earlier. Again push the cabinet against the rail as you tighten the screws.
- ( ) Check the rear panel, and the two front rails to make sure they are flush against the sides of the cabinet. If necessary loosen the screws and push these pieces flush against the cabinet sides as you tighten the screws.

Now tighten all the screws which you left loose earlier. Tighten them in the following order:

- ( ) 1. The front most screws on the bus-board rails.
- ( ) 2. The screws that attach the bus-board and rails to the support plates.
- ( ) 3. All of the "L" bracket screws.
- ( ) 4. All of the other screws through the edge connectors and bus-board.

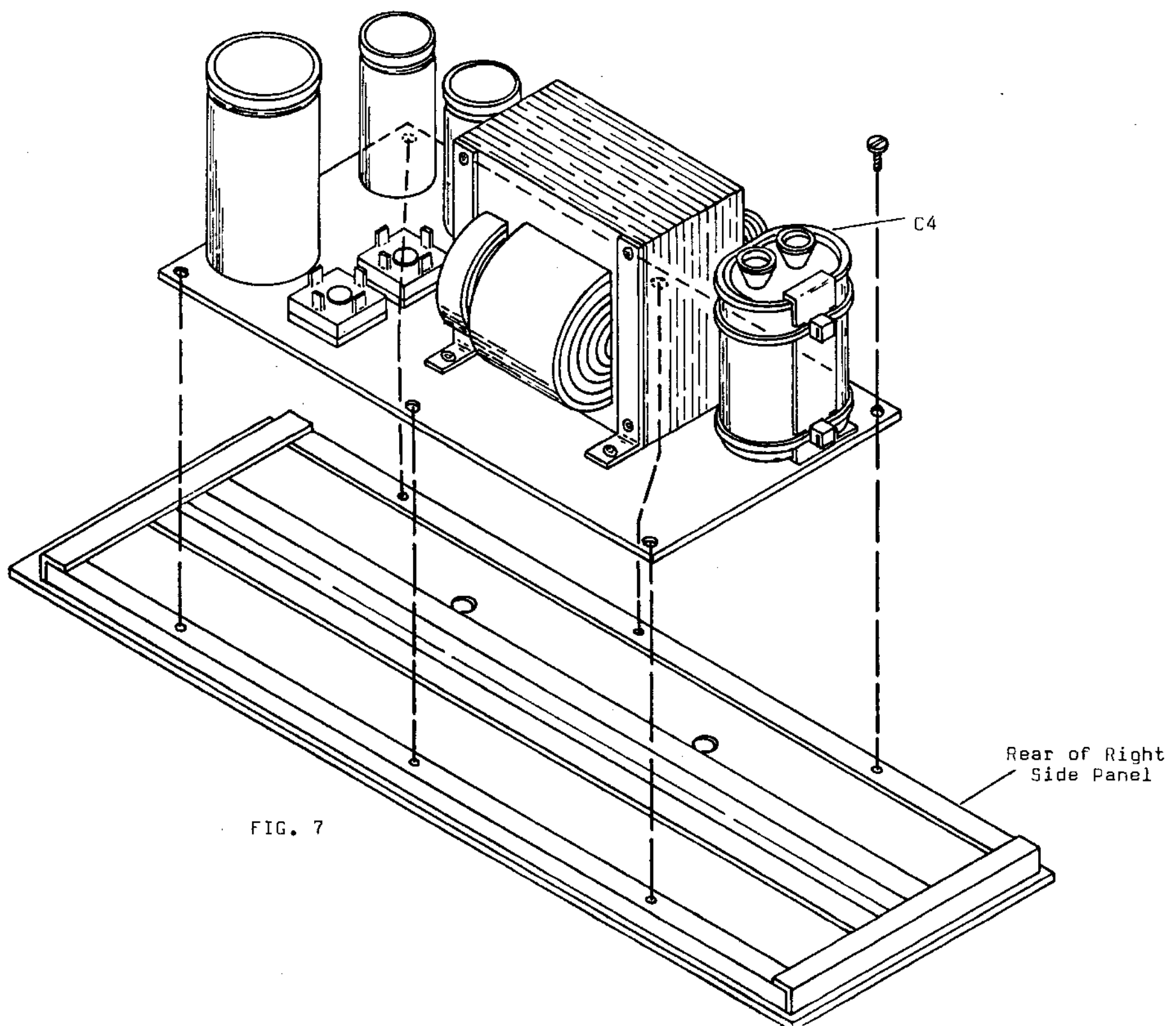


FIG. 7

- ( ) Peel the backing paper from the rubber bumper. Position the bumper on the front support plate as shown in Fig. 5 and press it firmly in place.
- ( ) Locate the 38 Card guides. Referring to Fig. 8 and the insert position a card guide with the "fingers" pointing down. Then push the guide into the front most holes in the side plate. This is best done by rocking the guide as you push the plastic pin through the hole. It is also easier if you push each end of the card guide in separately. You may also find it helpful to squeeze together the plastic pins with a pair of pliers before you push them in place.
- ( ) Similarly mount the rest of the card guides along the side plate and extruded rails.

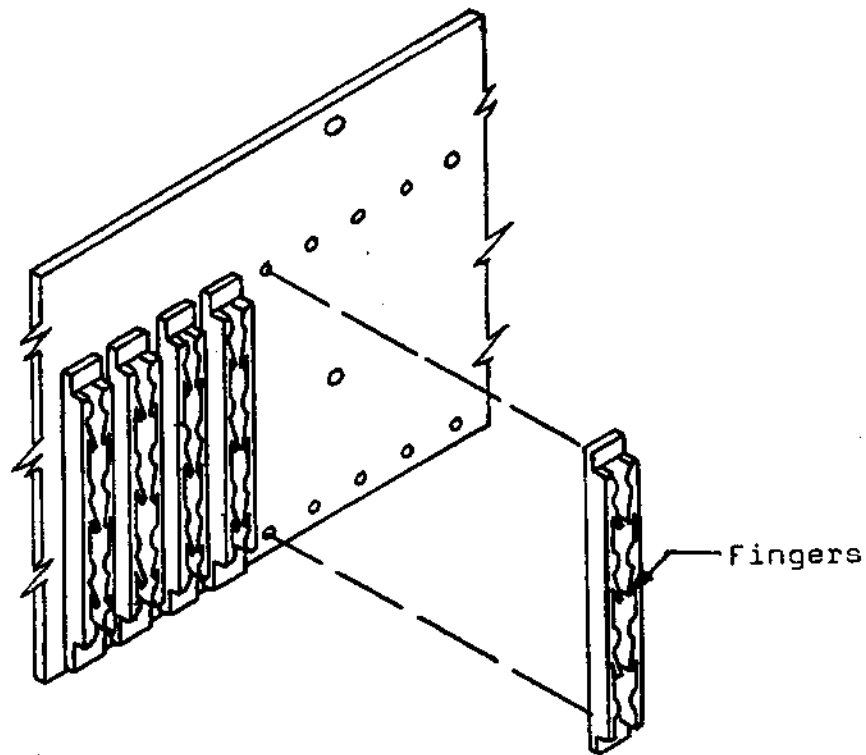


FIG. 8

- ( ) Position the cabinet upside down as shown in Fig. 9.
- ( ) Each black wire from the transformer has a blue wire attached to it at the lug. Twist the two black wires together three turns. Be sure not to twist the blue wires with the black wires here.
- ( ) Starting at the lug, twist the long blue and black wires together. Route this twisted pair towards the front of the cabinet.
- ( ) Twist part of the remaining length of the long blue wire with the other black wire, and route this twisted pair toward the rear of the cabinet. Do not twist the short blue wire attached to this black wire. Push the pin into the remaining hole in the A.C. receptacle.
- ( ) Twist together the rest of the long blue wires and the short blue wire that now comes from the A.C. receptacle. Route this twisted pair up the side of the fan and over the top of the fan. Push one of these blue wires onto each of the fan terminals.
- ( ) Locate the long white jumper wire. This wire was packed with the power supply. One end has a larger connector on it. Push this end onto the remaining terminal of the fuse holder.
- ( ) Wrap this wire around the black wires from the transformer and route it to the front of the cabinet.

This completes the initial assembly of the cabinet, power supply and bus-board. If this is part of an EQUINOX-100 then proceed to the CPU board sub-assembly. Otherwise, go directly to the check-out instructions starting on page CK-1. After assembling the CPU board, do this check-out before attempting to check-out the CPU board.

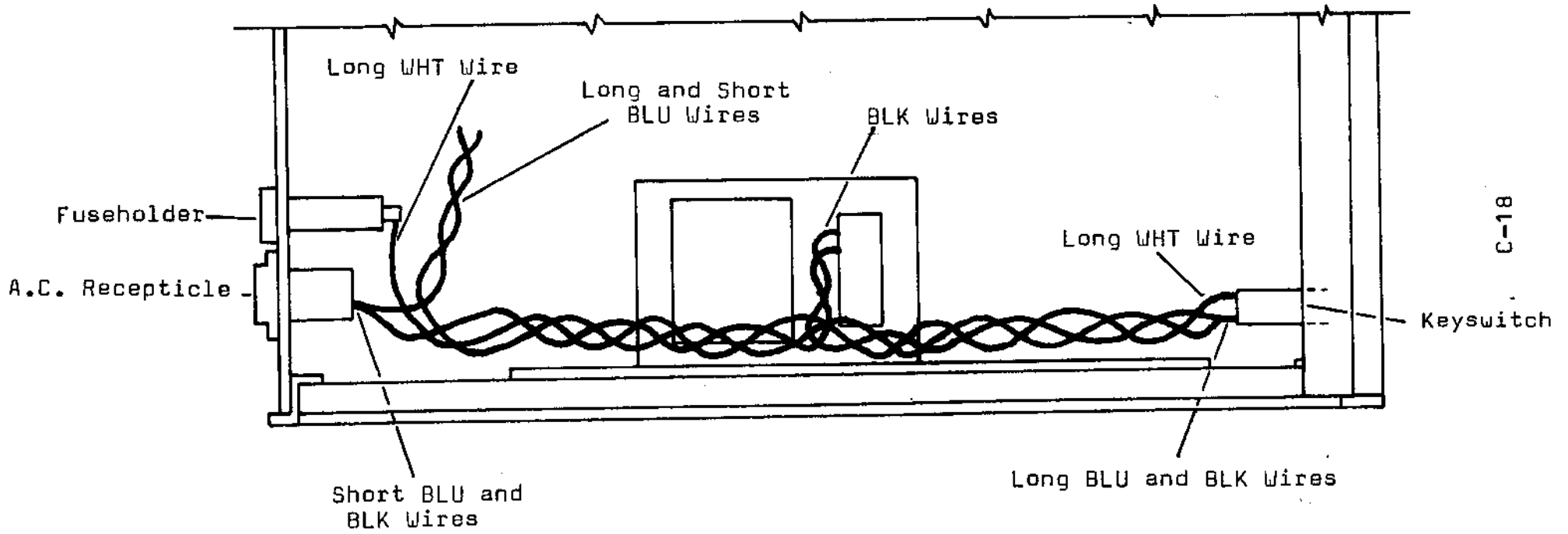


FIG. 9

## POWER SUPPLY, BUS-BOARD CHECKOUT

The following checkout procedure requires a volt-ohmmeter. If you do not have a meter, suitable ones are available for around \$20 at most electronic suppliers. Or alternatively your EQUINOX dealer can probably do the checkout for you.

- ( ) Install the  $6\frac{1}{4}$  amp fuse in the fuse holder.
- ( ) Position the key switch near the right front of the cabinet and plug the two connectors onto the key switch. Be sure and put the connector on the white wire onto the thinner lug of the key switch.
- ( ) Insert a key into the key switch and make sure the key is rotated full counter clockwise.
- ( ) Plug the power cord into the A.C. connector on the rear panel.
- ( ) Plug the other end of the power cord into a source of 120 volt 60HZ ONLY!!!!!!
- ( ) If you do not get the correct readings in any of the following steps, immediately unplug the A.C. power cord and recheck your wiring.
- ( ) Set the meter for reading DC volts. Set to a range that will read up to 20 volts.
- ( ) Connect the negative meter lead (may be marked -, or black) to the black wire from the power supply. Connect the positive meter lead (may be marked +, or red) to the red wire from the power supply.
- ( ) Turn the key switch clockwise. The fan should run and the meter should read approx. 9 to 11 volts. Turn off the key switch.

- ( ) Disconnect the positive meter lead. Now connect the positive meter lead to the violet wire from the power supply. Although the power is turned off, you may obtain a meter reading from the capacitors at this time and in the following steps.
- ( ) Turn on the key switch. The meter should read between 15 and 20 volts. Turn off the key switch.
- ( ) Disconnect both meter leads.
- ( ) Connect the positive meter lead to the black wire from the power supply. Connect the negative meter lead to the grey power supply wire.
- ( ) Turn on the key switch. The meter should read between 15 and 20 volts. Turn off the key switch.
- ( ) Disconnect the meter leads.
- ( ) Disconnect the A.C. power cord.
- ( ) Set the meter to the ohms X100 range. Connect the negative lead to the ground connector on the side of the bus-board.
- ( ) Connect the positive meter lead to the +16 volt connector on the bus-board. The meter should indicate a large resistance. (10K ohms or higher.) If the meter reads a much lower resistance than this, then reverse the meter lead connections. If both readings are low, then recheck your board assembly. Otherwise, leave the meter leads connected in the direction that gives the highest reading.
- ( ) Remove the meter lead from the +16 volt connector and connect this lead to the +8 volt connector on the mother-board. The meter should still read over 10K ohms.

- ( ) Remove the meter lead from the +8 volt connector and connect this lead to the -16 volt connector. The meter should read over 500 ohms.
- ( ) Reverse the meter lead connections. The meter should now read over 10K ohms.
- ( ) Move the meter lead from the -16 volt connector to the +16 volt terminal. It should read over 500 ohms.
- ( ) Move the meter lead from the +16 volt connector to the +8 volt connector. The reading should be over 500 ohms.
- ( ) Disconnect the meter leads from the bus-board.
- ( ) Connect the negative meter lead to the black wire from the power supply.
- ( ) Touch the positive meter lead to the power supply chassis. The meter should read  $\infty$  ohms.
- ( ) Now touch the positive meter lead to the +8 volt terminal on the bus-board. The needle on the meter should not move, indicating an infinite resistance.
- ( ) Similarly touch the positive meter lead to the +16 volt, -16 volt and GND terminals of the bus-board. In each case the reading should be infinite.
- ( ) Route the violet and grey wires from the power supply towards the front of the cabinet, then twist these wires together.
- ( ) Twist together the red and black wires from the power supply, then position the twisted pair toward the bottom of the cabinet, along the side of the power supply chassis.



- ( ) The two twisted pairs should meet at the lower front corner of the power supply chassis. Twist these two pairs together and route them over to the bus-board.
- ( ) Plug the four power supply wires into the bus-board as follows:

<u>WIRE</u>	<u>BUS-BOARD CONNECTOR</u>
Red	+8 volt
Violet	+16 volt
Grey	-16 volt
Black	Ground

- ( ) Use the four small tie-wraps to secure the power supply wires to the extruded rails. Each power supply wire should come straight from the bus-board to the extruded rail, so that the wires will be clear of any boards plugged into the bus-board.
- ( ) Set the meter to DC volts. Set the range to easily read 2.4 volts.
- ( ) Connect the negative meter lead to one of the connectors marked ground at the rear of the bus-board.
- ( ) Connect the positive meter lead to the point marked (A) in Fig. 11.
- ( ) Plug the A.C. power cord in.
- ( ) Turn the key switch on. The meter should read between 2 and 3 volts. If you do not get the correct reading in this step, then recheck the bus-board assembly. Turn the key switch off. Disconnect the meter leads.

If this cabinet is part of an EQUINOX-100 then proceed with the C.P.U. board check-out instructions in the C.P.U. board manual. After verifying proper operation of the C.P.U. board, do the final assembly starting on page FA-1.

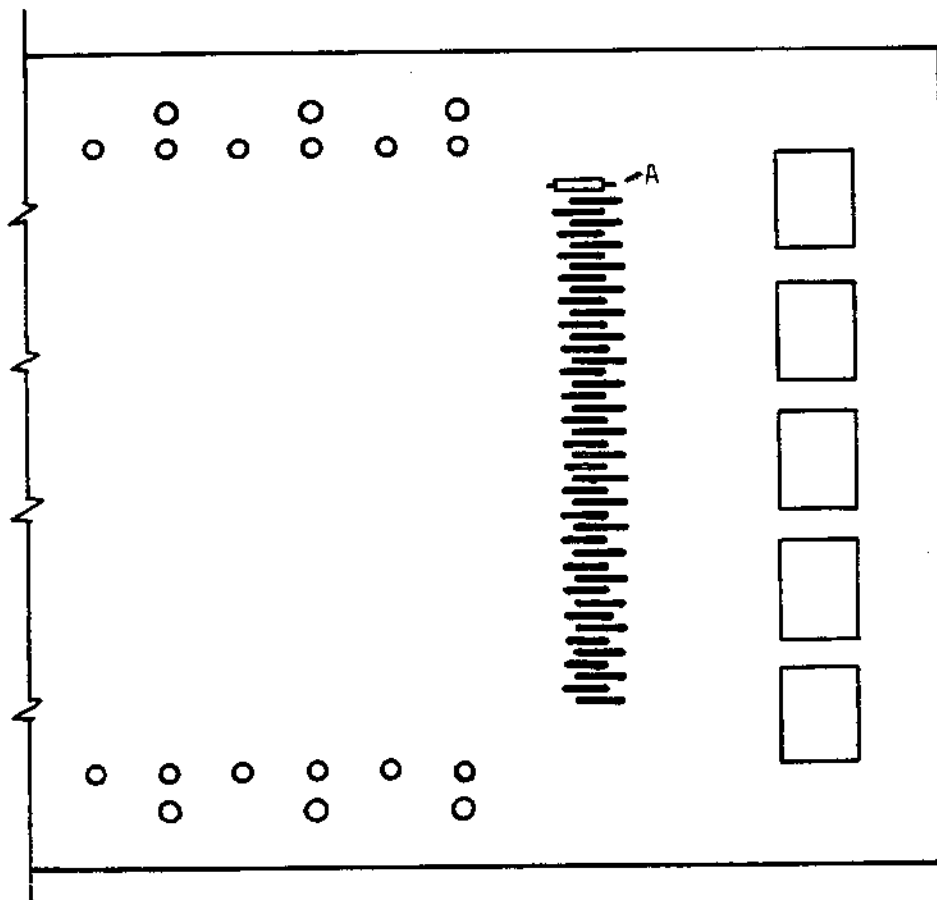


FIG. 11

## FINAL ASSEMBLY

- ( ) Disconnect the A.C. power cord.
- ( ) Disconnect the key switch.
- ( ) Carefully remove the wrapping and any backing paper from the plexiglass front panel.
- ( ) Mount the key switch to the front panel. Use the hardware supplied with the switch.
- ( ) Locate the reset switch, remove the finishing nut, the flat washer, and the lockwasher from the switch. Discard the flat washer and lockwasher.
- ( ) Position the hex nut on the reset switch as shown in Fig. 10-1.
- ( ) Mount the reset switch to the front panel with the finishing nut. Be sure to orient the reset switch as indicated.
- ( ) As shown in Fig. 10, cut, with wire cutters, the upper left hand "finger" from the upper left hand heat-sink on the CPU board.
- ( ) Refer to Fig. 10. Mount the four 1" spacers to the front panel. Use four black #6-32 x 3/8" screws, four black finishing washers, and four #6 flat washers. Do not tighten these four screws at this time.

Take the CPU board and mount it to the plastic front panel as follows:

- ( ) Orient the CPU board as shown in Fig. 10. Position the leads from the reset switch through the holes in the CPU board.

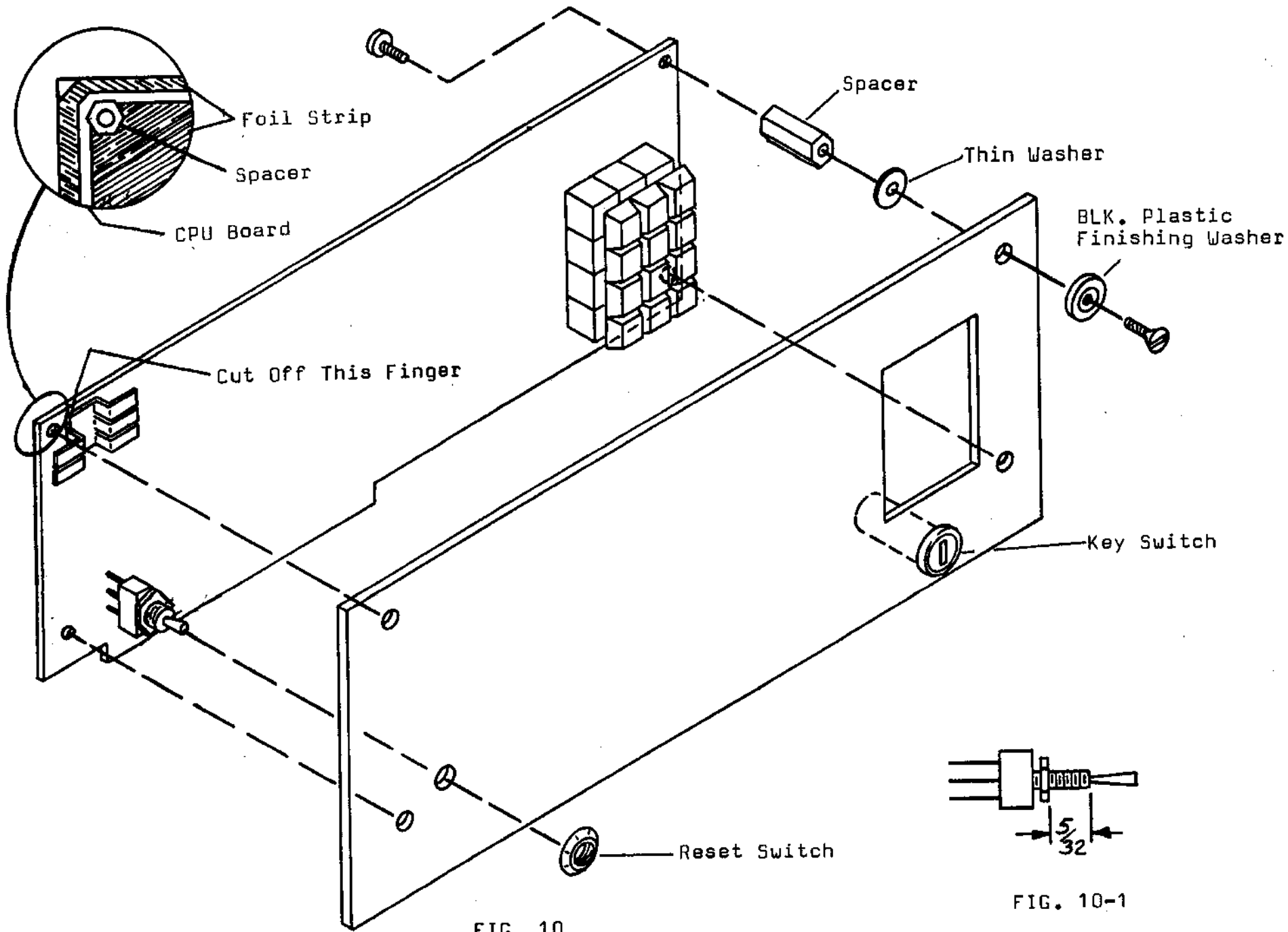


FIG. 10

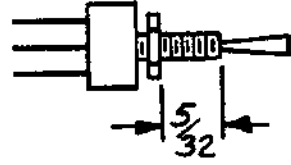


FIG. 10-1

- Where does it say to mount the key switch*
- ( ) Attach the CPU board to the four (4) 1" spacers with four (4) #6-32 x 3/8" screws. Position the spacer on the upper left hand corner according to the detail drawing on Fig. 10. Be sure the spacer clears the foils as shown, otherwise it could short between the CPU board foils.
  - ( ) Solder the three reset switch leads to the CPU board. Cut off any excess leads.
  - ( ) Remove the front top rail from the cabinet. Save the two screws.
  - ( ) Slide the front panel assembly into the grooves in the front of the box. You may have to bow the CPU circuit board slightly to clear the rubber bumper on the support plate.
  - ( ) Flex the assembly slightly, if necessary, and line up the card edge with the edge connectors on the bus-board. Then push the front panel in place. The circuit board should be fully plugged into the card edge connector, and the plastic front panel should be into the groove on all sides.
  - ( ) Center the keyboard in the cutout on the plastic, then tighten the four black screws.
  - ( ) Plug the two wires onto the key switch. Remember the white wire goes on the narrow lug.
  - ( ) Reinstall the top front rail on the cabinet, use the screws you saved earlier.

If your kit is equipped with deluxe hardware options, then install them now, following the instructions supplied with them.

- ( ) Mount the four feet to the bottom of the cabinet. Use the hardware supplied with the feet.

- ( ) Slide the bottom of the cabinet onto the cabinet. Bow it slightly so that the screw heads from the feet will clear the back panel.
- ( ) Attach the bottom cover with the screws you saved earlier.
- ( ) Similarly install to top on the cabinet.

This completes assembly of your kit.

PARTS LIST FOR DELUXE HARDWARE KITS NOS. 1 AND 2

QTY.

PART DESCRIPTION

1	Carrying Handle
2	1" Plastic Feet/Cord Wraps (packed with mounting hardware)
1	Plastic Wiring Channel with Cover
3	Short Tie-wraps
1	Tilt-up Stand; consisting of: One (1) Wire Stand Two (2) 1/2" Plastic Feet (packed with mounting hardware)

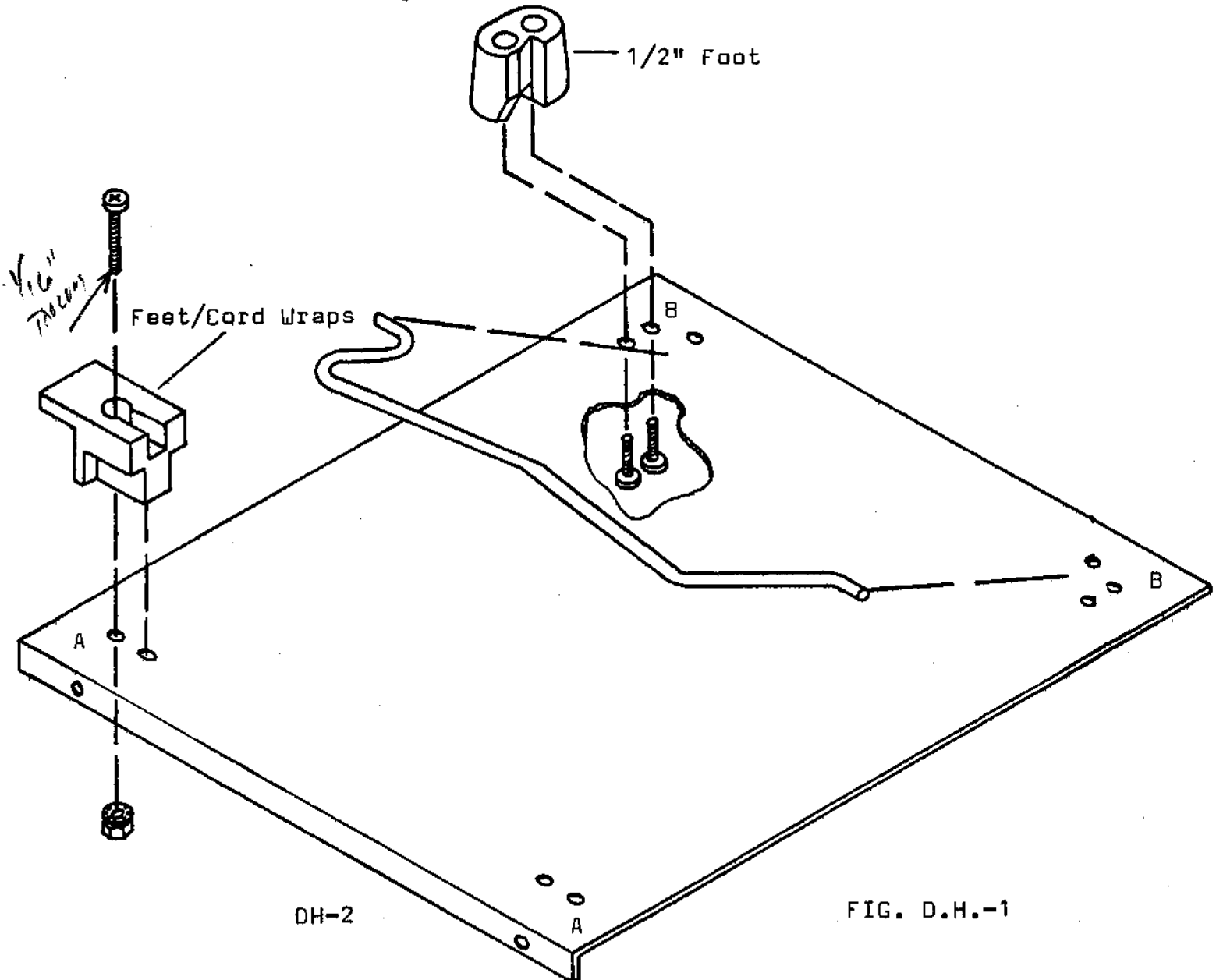
KIT #1

4	Edge Connectors
8	4-40 x 3/4" Machine Screws
8	#4 Lockwashers
8	#4 Nuts

KIT #2

18	Edge Connectors
36	4-40 x 3/4" Machine Screws
36	#4 Lockwashers
36	#4 Nuts

- ( ) Refer to Fig. DH-1. Position the bottom cover as shown.
- ( ) Mount two feet/cord wraps at positions A.
- ( ) Mount two 1/2" feet at positions B. Position the notches toward the center of the bottom cover.
- ( ) Snap the wire stand into the 1/2" feet.
- ( ) Refer to Fig. DH-2. Attach the wiring channel to the extruded rail inside the cabinet using the tie-wraps. Be sure and position the tie-wraps between the card guides. Then pull the tie-wraps tight and cut off the excess lengths.





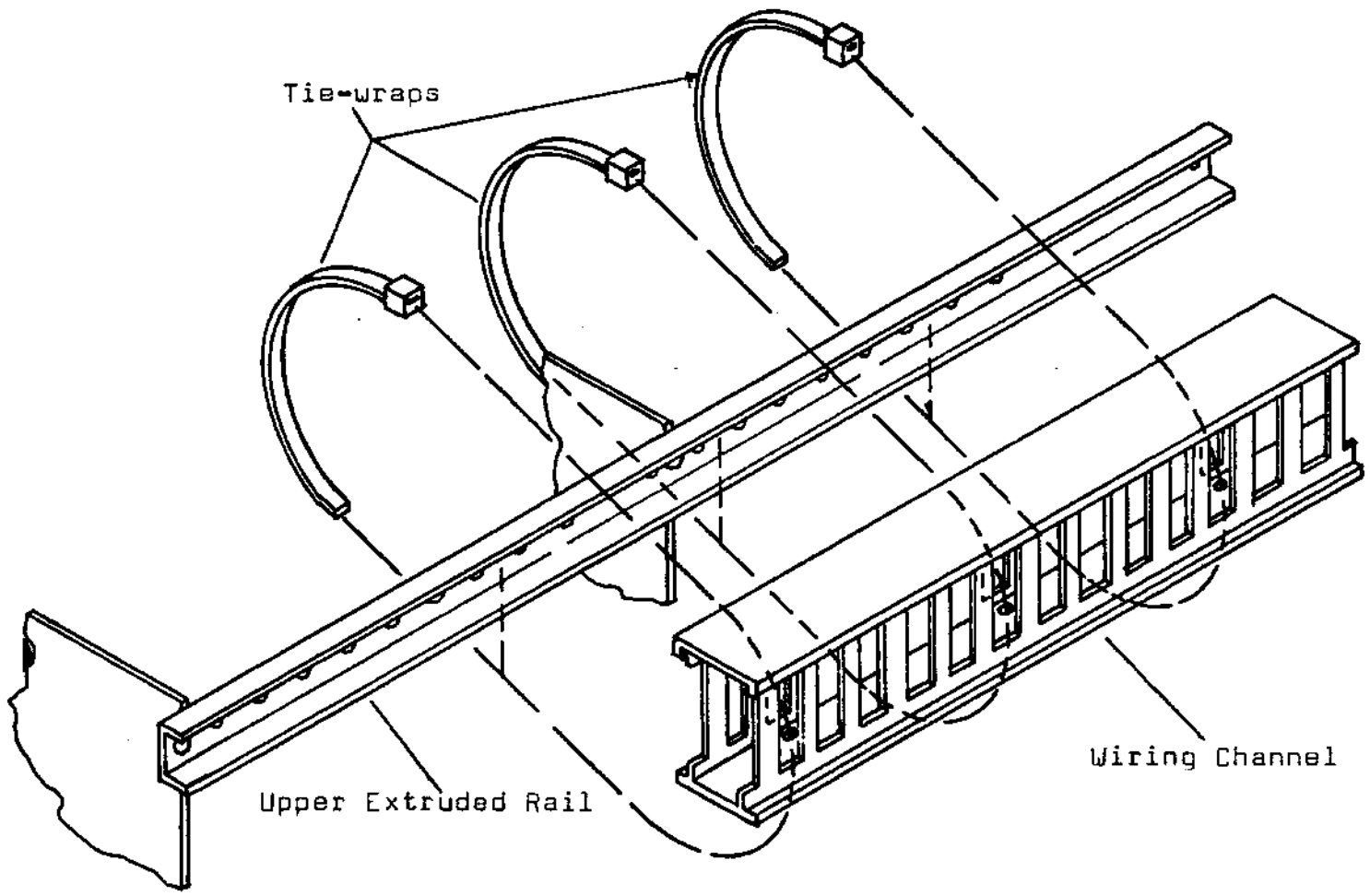
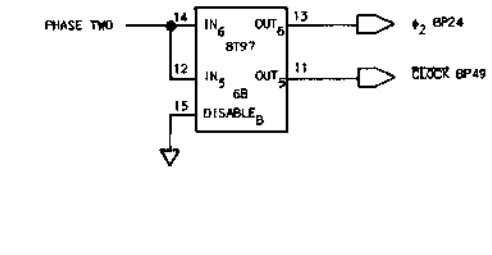
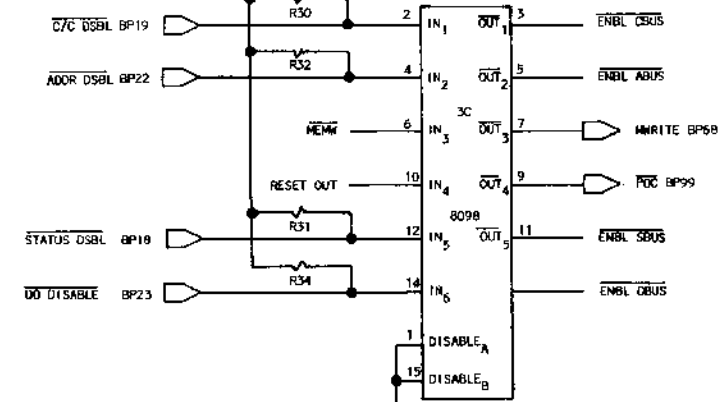
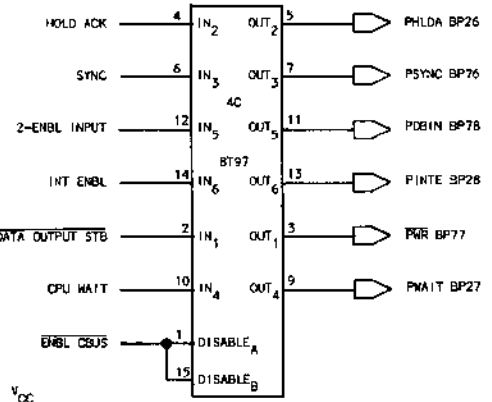
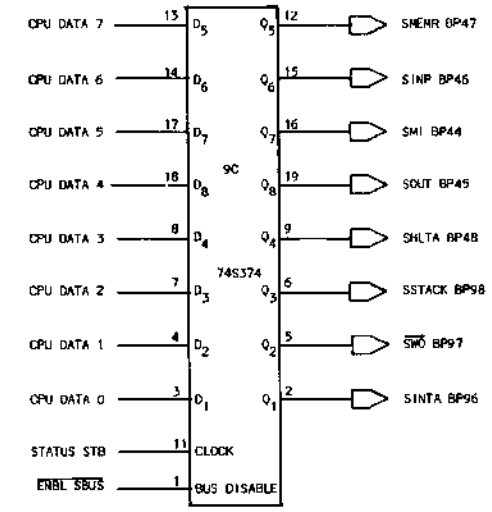
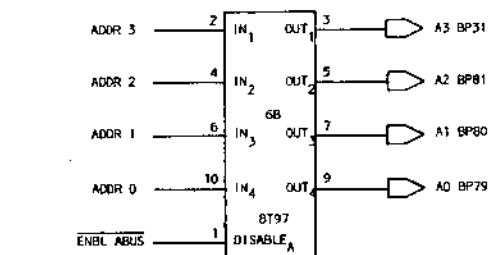
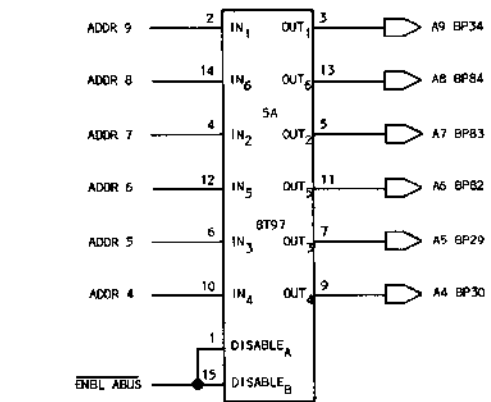
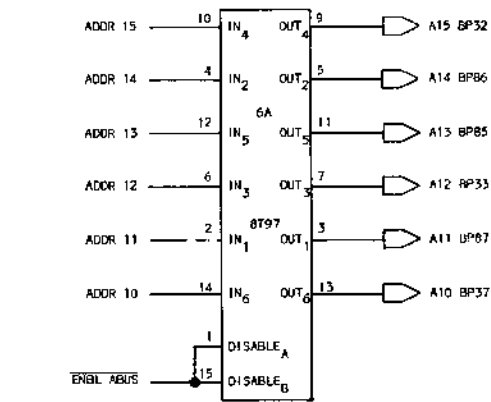
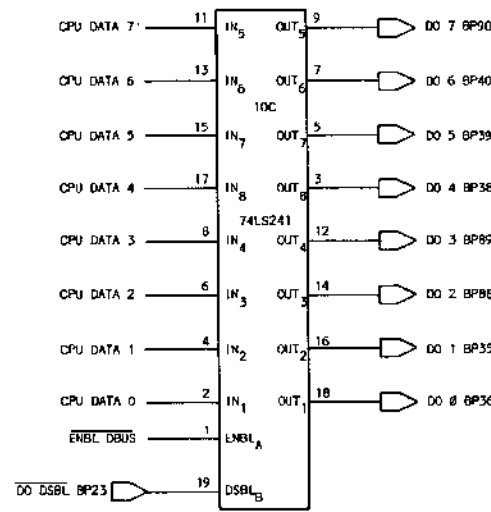
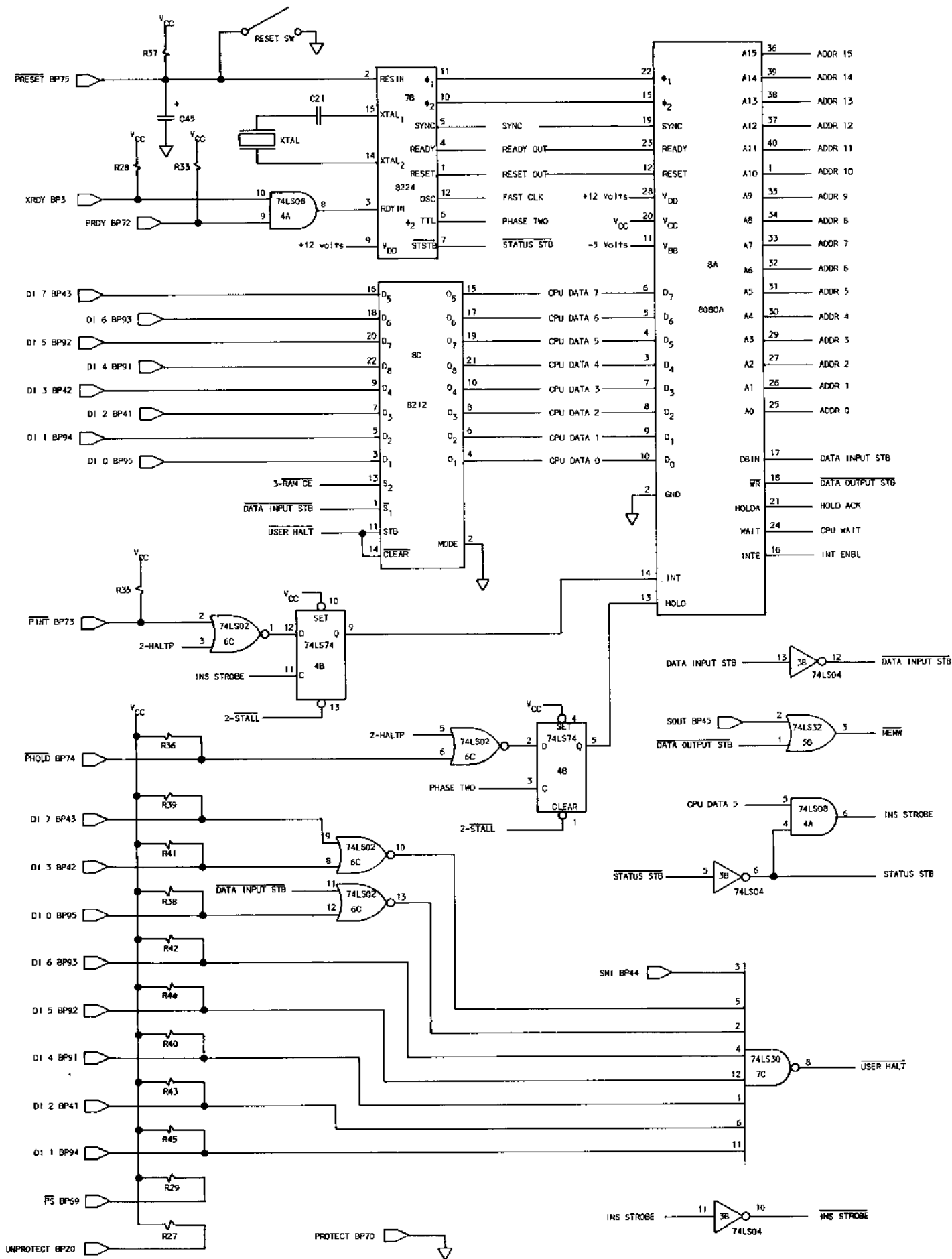
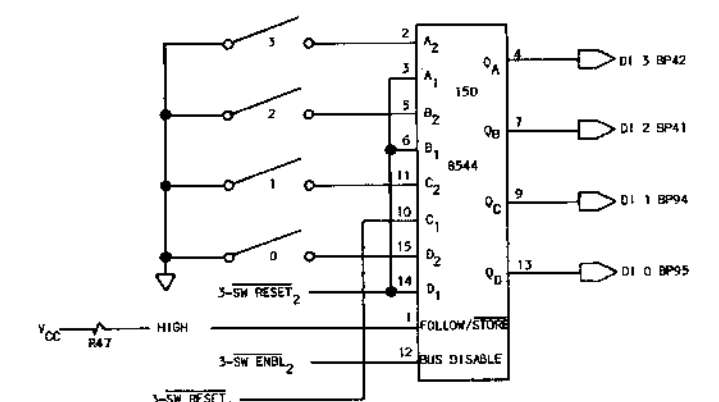
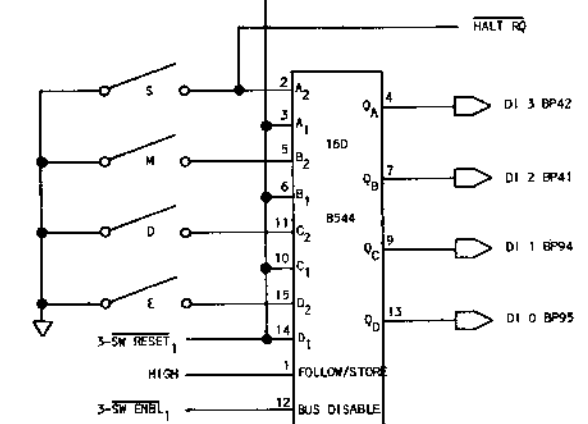
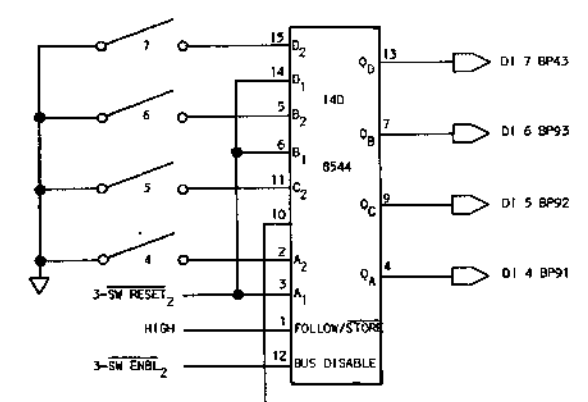
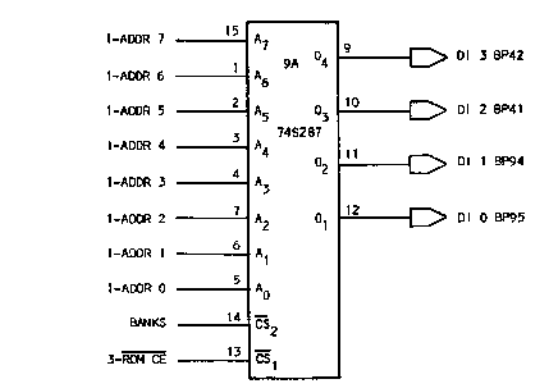
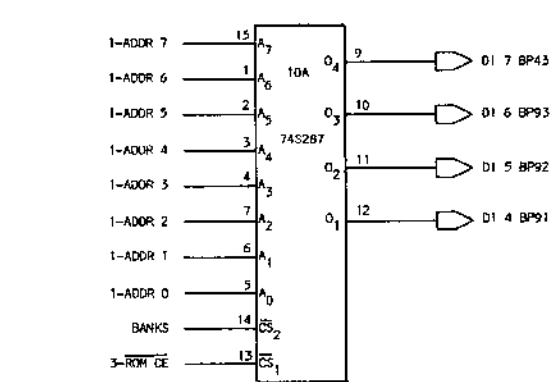
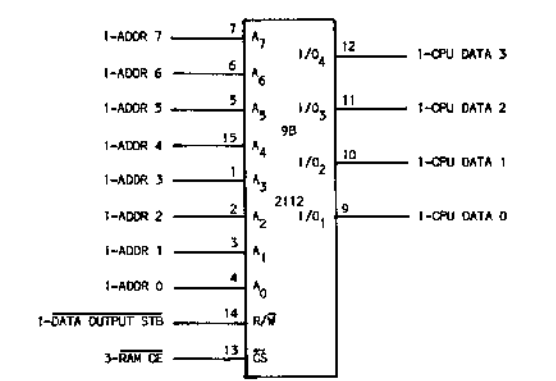
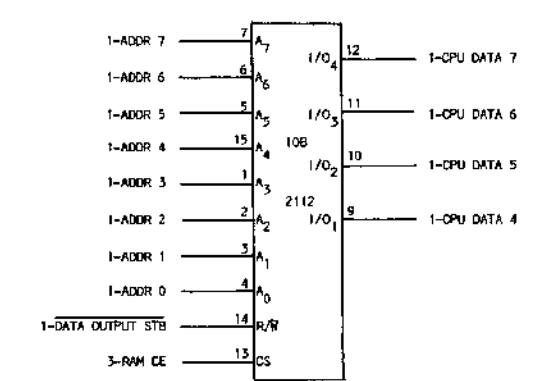
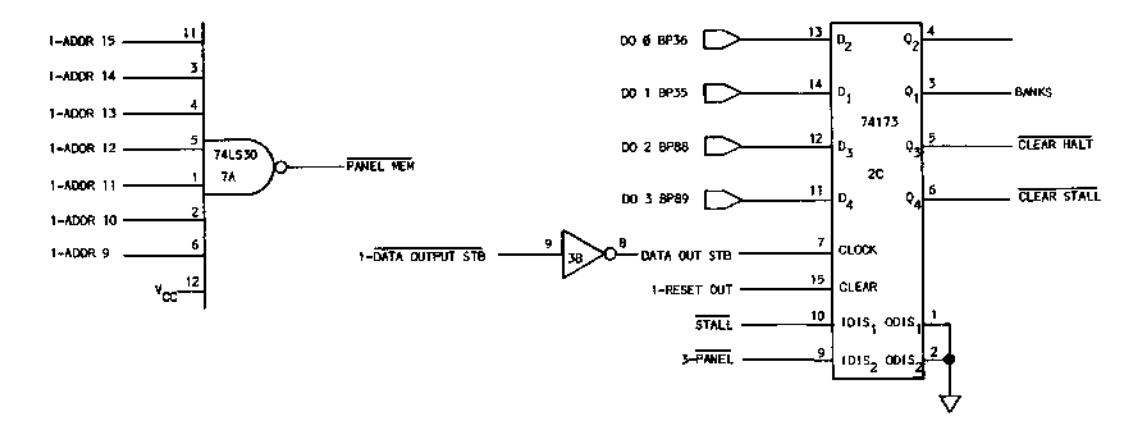
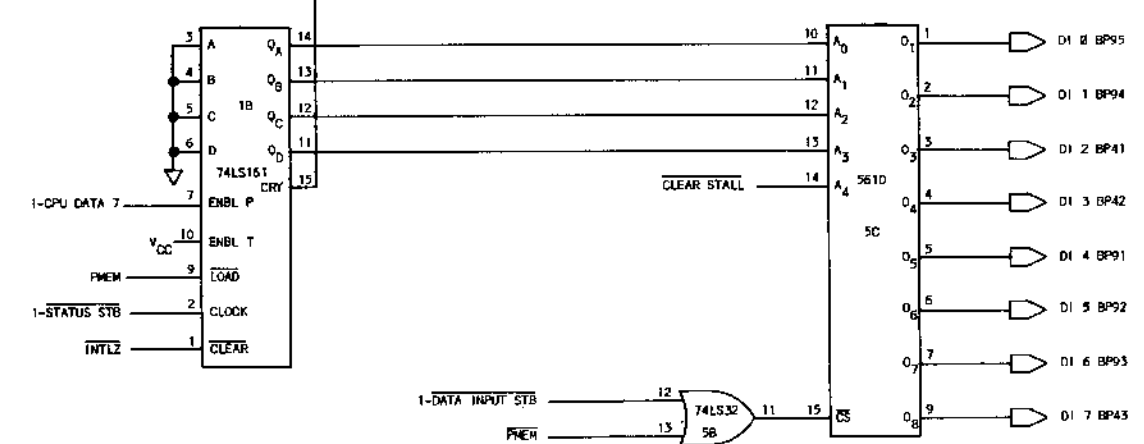
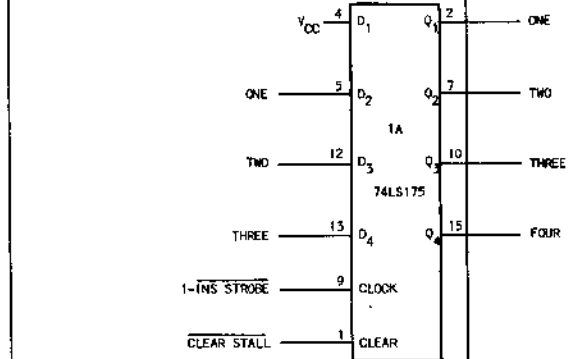
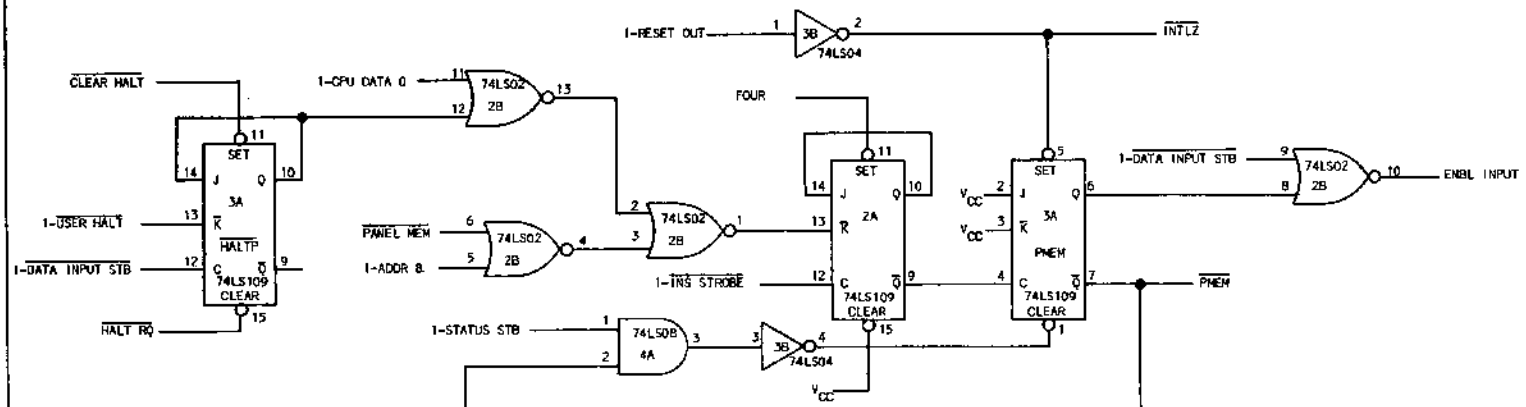
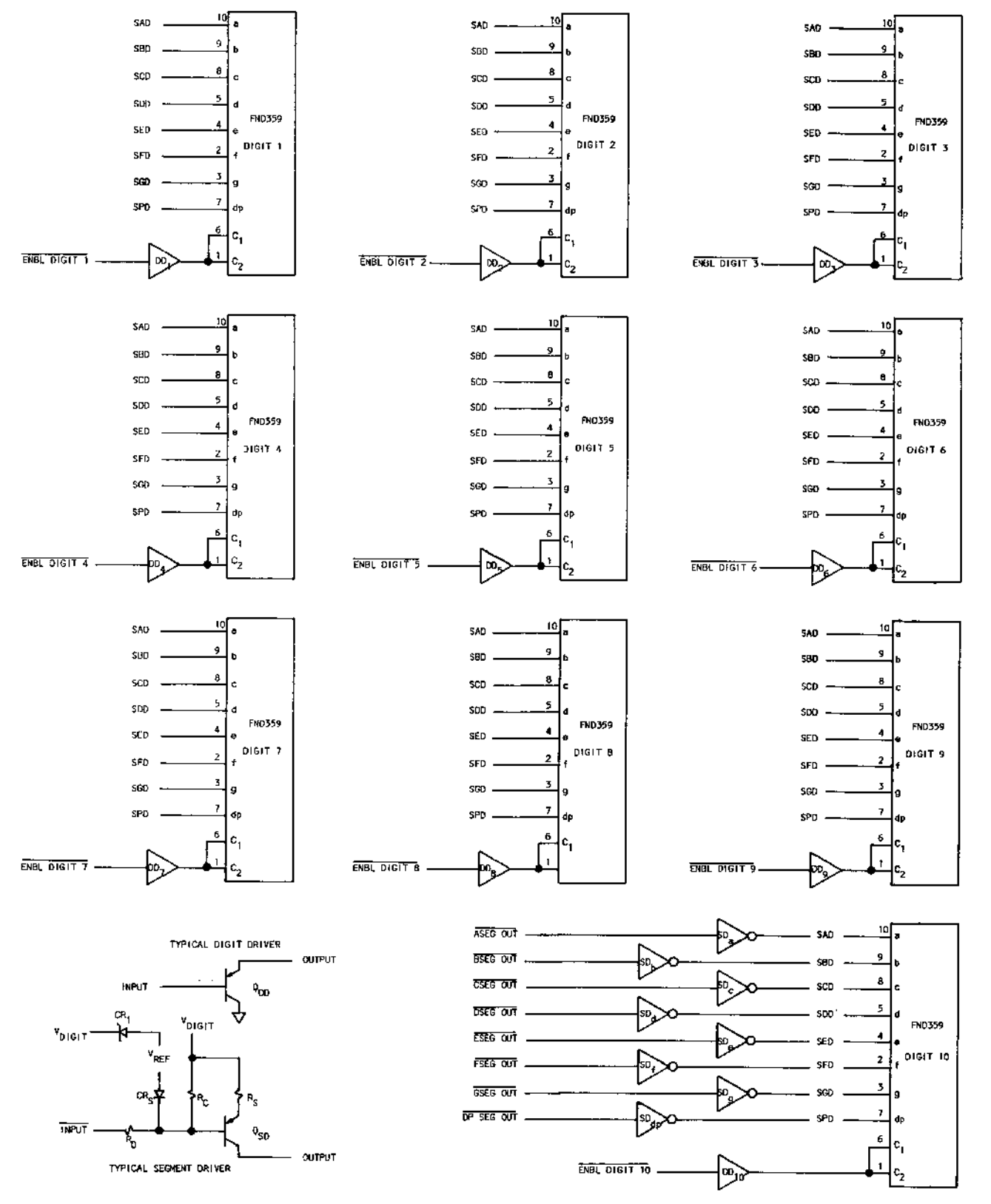
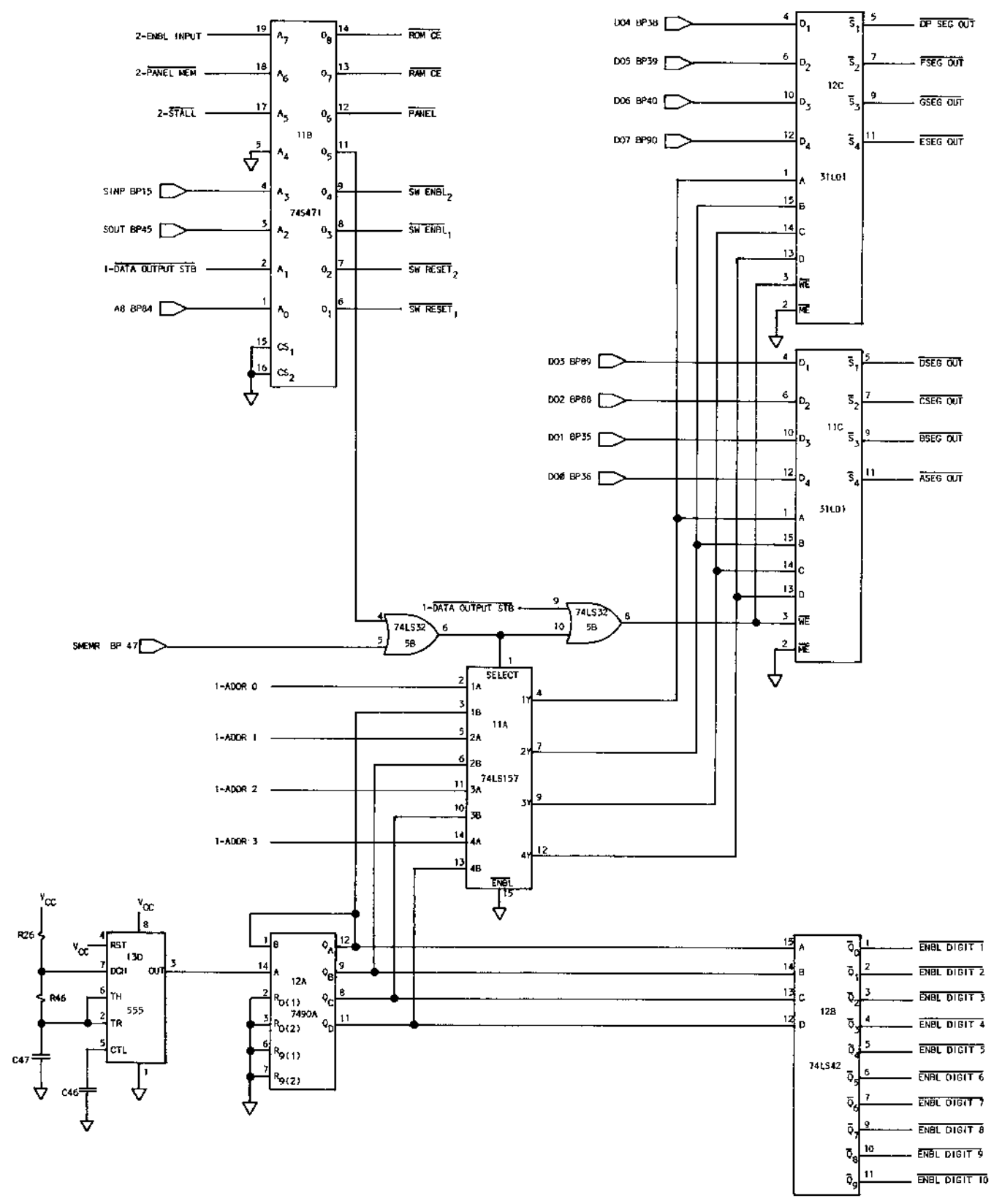
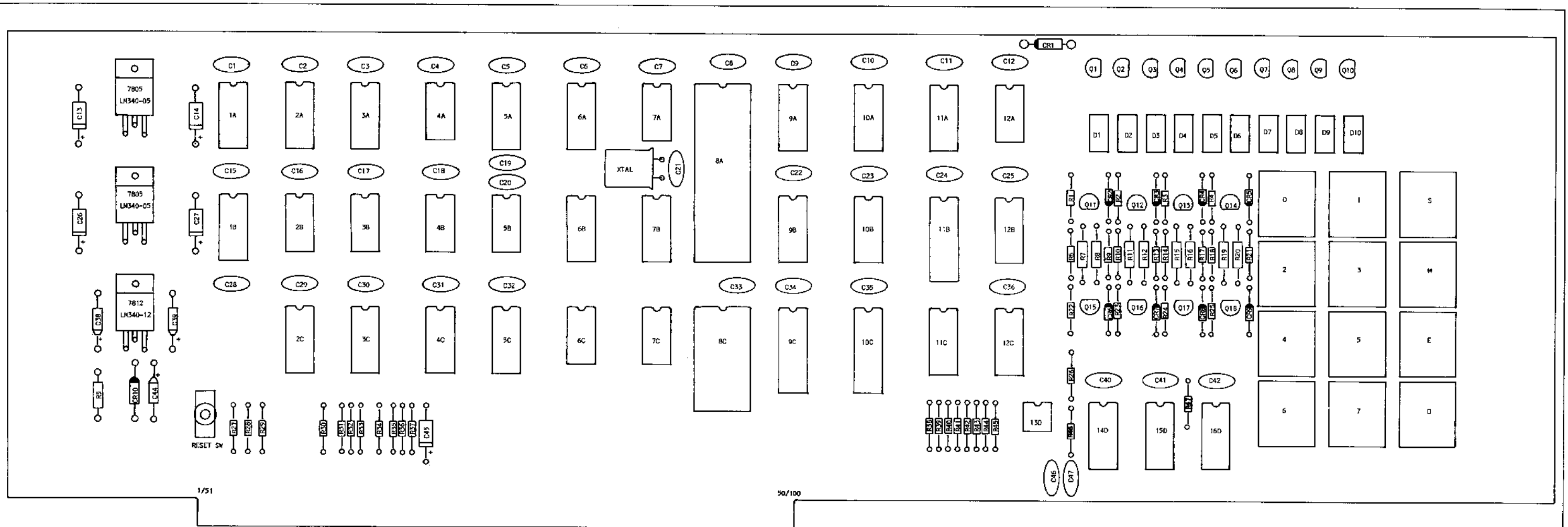


FIG. D.H.-2









C1	.01	wfd	R1	620	Ω	CR1	1N5221	1A	74175/74LS175
C2	"	"	R2	"	"	CR2	1N914/4820-0201	2A	74109/74LS109
C3	"	"	R3	"	"	CR3	"	3A	"
C4	"	"	R4	"	"	CR4	"	4A	74LS08
C5	"	"	R5	"	"	CR5	"	5A	8T97 SIGNETICS
C6	"	"	R6	1.5	kΩ	CR6	"	6A	"
C7	"	"	R7	24	Ω	CR7	"	7A	74LS30
C8	"	"	R8	"	"	CR8	"	8A	8080A
C9	"	"	R9	1.5	kΩ	CR9	"	9A	745287/6301/6303
C10	"	"	R10	"	"	CR10	1N751A	10A	"
C11	"	"	R11	24	Ω	01	2N4403/NS443620-1	11A	74LS157/74LS257
C12	"	"	R12	"	"	02	"	12A	7490/74LS90
C13	39	"	R13	1.5	kΩ	03	"	1B	74LS161
C14	"	"	R14	"	"	04	"	2B	7402/74LS02
C15	.01	"	R15	24	Ω	05	"	3B	74LS04
C16	"	"	R16	"	"	06	"	4B	7474/74LS74
C17	"	"	R17	1.5	kΩ	07	"	5B	7432/74LS32
C18	"	"	R18	"	"	08	"	6B	8T97 SIGNETICS
C19	"	"	R19	24	Ω	09	"	7B	8224
C20	"	"	R20	"	"	10	"	8B	2112/5039927 MOS A
C21	100	pfd M/c	R21	1.5	kΩ	11	"	10B	"
C22	.01	wfd	R22	620	Ω	12	"	11B	745471
C23	"	"	R23	"	"	13	"	12B	7442/74LS42
C24	"	"	R24	"	"	14	"	"	"
C25	"	"	R25	"	"	15	"	"	"
C26	39	"	R26	47	kΩ	16	"	2C	74175/8T10
C27	"	"	R27	910	Ω	17	"	3C	74368/8098/74LS368
C28	.01	"	R28	"	"	18	"	4C	8T97 SIGNETICS
C29	"	"	R29	"	"	19	"	5C	745288/6351/5610/8223
C30	"	"	R30	"	"	20	"	6C	7402/74LS02
C31	"	"	R31	"	"	21	"	7C	7430/74LS30
C32	"	"	R32	"	"	22	"	8C	8212/745412/74LS412
C33	"	"	R33	"	"	23	"	9C	745373/745374/74LS373
C34	"	"	R34	"	"	24	"	10C	745241/74LS241
C35	"	"	R35	"	"	25	"	11C	31101/9011818-03
C36	"	"	R36	"	"	26	"	12C	"
C37	"	"	R37	7.5	kΩ	1 SW	"	130	555
C38	2.7	wfd	R38	910	Ω	2 SW	"	140	8544 NATIONAL
C39	"	"	R39	"	"	3 SW	"	150	"
C40	.01	"	R40	"	"	4 SW	"	160	"
C41	"	"	R41	"	"	5 SW	"	"	"
C42	"	"	R42	"	"	6 SW	"	"	"
C43	"	"	R43	"	"	7 SW	"	"	"
C44	2.7	wfd	R44	"	"	8 SW	"	D1	FND359 FAIRCHILD
C45	.01	"	R45	"	"	9 SW	"	D2	"
C46	.01	"	R46	47	kΩ	M SW	"	D3	"
C47	.01	Hylar	R47	910	Ω	E SW	"	D4	"
			R48	"	"	D SW	"	D5	"
								D6	"
								D7	"
								D8	"
								D9	"
								D10	"

