60469450

CONTROL DATA
CORPORATION

CDC® CYBER 180 MODELS 810 AND 830

COMPUTER SYSTEMS PLUS OPTIONS

INSTALLATION AND CHECKOUT

HARDWARE MAINTENANCE MANUAL

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REVISION RECORD

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MANUAL TO EQUIPMENT LEVEL CORRELATION SHEET

This manual reflects the equipment configuration listed below.

EXPLANATION: Locate the equipment type and series number, as shown on the equipment FCO log, in the list below. Immediately to the right of the series number is an FCO number. If that number and all of the numbers underneath it match all of the numbers on the equipment FCO log, then this manual accurately reflects the equipment.

EQUIPMENT TYPE	SERIES	WITH FCOs	COMMENTS
AA161-A	27		
AT453-A	05		
AU125-A	02		
AU127-A	13		
AU127-B	12		

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LIST OF EFFECTIVE PAGES

New features, as well as changes, deletions, and additions to information in this manual, are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

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3	A	3-23	A	E-5	A		
4	A	3-24	A	E-6	A		
5	A	3-25	A	E-7	A		
6	A	3-26	A	Divider	A		
7	A	3-27	A	F-1	A		
8	A	3-28	A	F-2	A		
9	A	3-29	A	Divider	A		
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1-3	A	3-36	A	Divider	A		
Divider	A	3-37	A	H-1	A		
2-1	A	3-38	A	Divider	A		
Divider	A	3-39	A	I-1	A		
3-1	A	3-40	A	I-2	A		
3-2	A	3-41	A	I-3	A		
3-3	A	Divider	A	I-4	A		
3-4	A	A-1	A	Divider	A		
3-5	A	A-2	A	J-1	A		
3-6	A	A-3	A	J-2	A		
3-7	A	Divider	A	J-3	A		
3-8	A	B-1	A	J-4	A		
3-9	A	B-2	A	J-5	A		
3-10	A	B-3	A	J-6	A		
3-11	A	Divider	A	Comment Sheet	A		
3-12	A	C-1	A	Back Cover	A		
3-13	A	Divider	A				
3-14	A	D-1	A				
3-15	A	D-2	A				
3-16	A	D-3	A				
3-17	A	D-4	A				
3-18	A	Divider	A				
3-19	A	E-1	A				

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PREFACE

This manual is for use by experienced field personnel who are familiar with CDC® CYBER computing systems and Control Data Corporation installation and checkout practices. The manual provides general and detailed installation and checkout information for the CDC® CYBER 180 Models 810 and 830 Computer Systems which include the following options:

AA161-A	CYBER 180-810/830 Basic Equipment
AT453-A	Second barrel option
AU125-A	Six Channel Increment
AU127-A	Second CPU 400 Hz
AU127-B	Second CPU SW PWR
BS167-A	Memory Increment 2 Megabytes
GK212-A	System Power Control Panel
GK410-A	SPSS Battery Ride Through
GK419-A	400 Hz Terminator Power Supply
FA784-B	Intelligent Small Disk (ISD)
AT417-A	Performance Monitor Option

The first section briefly describes the components of the central computer system.

The second section provides an installation flowchart. Start, stop times and installation notes are to be recorded here.

The third section contains installation procedures. Each procedure is placed on a right hand page. Where a diagram is considered necessary, it is placed on the facing left hand page. If a procedure refers to more than one figure, the additional figures follow the procedure. When the figure is located with an earlier procedure, it is not repeated.

The appendixes are compiled in alphabetical order by title. The appendixes contain useful information in case troubleshooting is necessary during installation.

Additional information for the equipment's physical, power, and cooling requirements is in the Site Preparation Manual and Power Distribution and Warning System Manual. These and other related manuals are listed in the System Publication Index following this preface.

Installation and checkout of the display console are normally part of the system installation and checkout. Information pertaining to the display station is in the Display Station Hardware Reference/CE Manual listed in the System Publication Index.

Information for the installation and checkout of a system 400-Hz motor generator set (MG set) is in the MG manual and the Site Preparation Section 4 Manual listed in the System Publication Index. The Site Preparation Section 4 manual also contains diagrams that show wiring connections to associated power equipment.

The CDC® 18002-2 console is available as an option for CYBER 180 models 810 and 830 systems using NOS 2.3 or later operating systems. This product includes a CDC 634B display terminal (also known as the 721-21 display terminal) and an AV117A cable. This console is referred to throughout the manual as the CC634B.

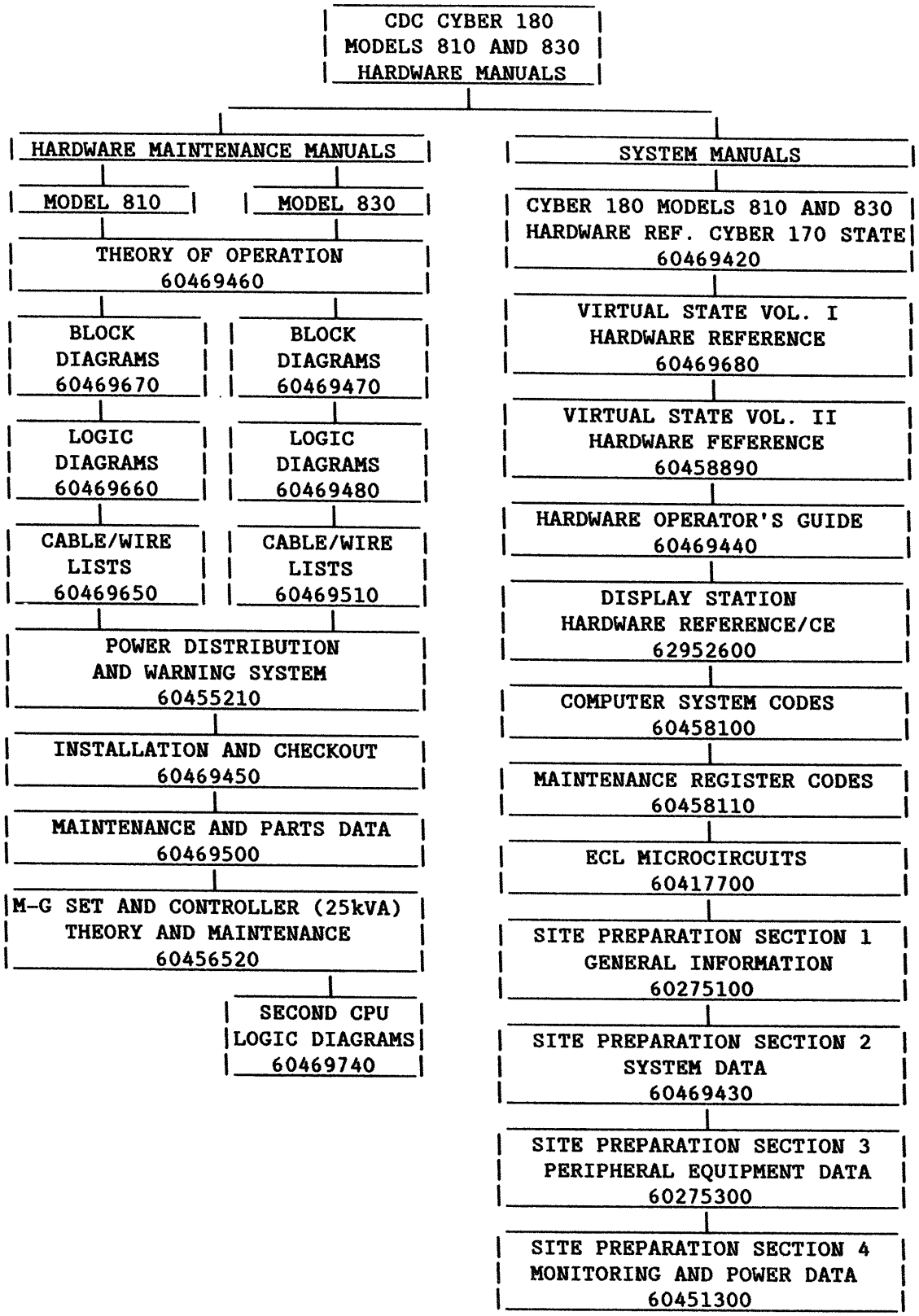
Other manuals referenced in this manual but not listed in the System Publication Index are:

Control Data Publication	Publication Number
Maintenance Software Library MSL 15X Reference Manual	60456530
MSL15X Model Independent Tests Maintenance Software Reference Manual	60469390
MSL151 Model Dependent Tests Maintenance Software Reference Manual	60469400
Packaging Document	59120000
CYBER Initialization Package (CIP) User's Handbook	60457180

Manual ordering information and latest publication revision levels are available from the Control Data Literature and Distribution Services catalog, publication number 90310500. The packaging document is available from:

Corporate Packaging and Material Handling Engineering
8100 34th Avenue South
Minneapolis, Minnesota. U.S.A. 55420

SYSTEM PUBLICATION INDEX



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APPENDIXES

FIGURES

SECTION 1

INTRODUCTION

This manual supports the installation and checkout of a CDC® CYBER 180 Model 810 or CDC® CYBER 180 Model 830 central computer. The central computer consists of modules which form parts of the mainframe. Power requirement is three phase, 50/60 Hz and optional 400 Hz supplied by a motor generator (MG) set.

MAINFRAME

The central computer is housed in the basic cabinet. It consists of one power module and two logic modules which contain:

- One or two central processor units (CPU)
- Input output unit (IOU)
- Central memory unit (CM)

On the right side of the basic cabinet, (rear view), are two optional disk modules called Intelligent small disk (ISD) units. Each ISD contains up to four disks/controllers connected via an ISD adaptor to the central computer.

DISPLAY CONSOLE

A standard CC634B display console and or an optional CC545 display console is connected to the mainframe.

TAPE UNIT

An optional intelligent small magnetic tape drive, (ISMT), is connected to the channel interface.

OPTIONAL POWER REQUIREMENT

MOTOR-GENERATOR SET

The smallest MG set is rated at 12.5 kVA. Larger MG sets require a wall-mounted System Power Control Panel (SPCP). The MG provides three phase, 400-Hz power to the mainframe, peripherals, and 40 V dc terminator power supply.

SPCP

The SPCP is a 400-Hz power control device.

ASSUMPTIONS

The following installations are assumed to be complete, or items available on site before the installation of the mainframe:

- Field Planning and Construction (FP&C) preparation and verification of site.
- Circuit breaker panels and related wiring including Hubbell connectors installed.
- Emergency-off switches installed and tested.
- MG set installed, where applicable.
- SPCP and associated control cables installed, where applicable.
- 40 V dc terminator power supply installed, where applicable.
- Channel cables labelled, installed.
- External peripherals and cables installed.
- ISD formatted at factory.
- Two port multiplexer (TPM) cables for remote terminal assistance (RTA) on site, where applicable.
- Installation tool kit on site.
- Deadstart and CYBER Initialization Package (CIP) tapes on site.
- Electromagnetic compatibility (EMC) kit on site.
- Phone and modem for TPM test on site.
- Mainframe positioned but not uncrated.
- Scratch tape for ISMT read and write tests.
- A table for the CC634 display console.

NOTE

If system is a field transfer, refer to Site Preparation, Section 2 Manual for correct Hubbell Connectors Power overlay and jumper wires. Ensure that they are on site two weeks prior to the mainframe installation.

SECTION 2

INSTALLATION FLOWCHART

Flowchart not available. To be supplied.

SECTION 3

PROCEDURES

The procedures in this section of the manual are provided for use during the installation and checkout of the computer system. Procedures for installation of disk, tape, and console display are supplied with those units separately. Refer to applicable installation procedures in the manuals listed below:

Intelligent small disk (ISD) subsystem	60457210
FA165-A Intelligent small tape (ISMT) adapter	60461100
810-1 Network Processor Unit (NPU)	60461470
Control Data® CYBER 170 Display Station Hardware Reference/Customer Engineering Manual	62952600
CDC® 721 Display Terminal Unpacking/Packing Instructions	62940038
Control Data® 721-21/31 Display Terminal Owner's Manual/ Installation Instructions	62950101

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CHECK BOXES

_____ 1. A CDC Certified Installer (CI) must be present for unpacking.

_____ 2. Locate previously shipped miscellaneous items package containing Installation and Checkout (ICO) Manual, controlware tape, and CYBER Initialization Package (CIP) tape.

_____ 3. Locate envelope marked "Open First" which contains instructions for unpacking. Check contents of all boxes.

_____ 4. Check paks using panel maps in appendix F.

_____ 5. Complete missing/damaged list and send for replacement.

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UNCRATE

_____ 1. A CDC CI must direct uncrating and check for damage.

WARNING

Be careful when cutting packing straps. They may snap outward and cause personal injury.

_____ 2. Uncrate mainframe using the unpacking instructions attached to the outside of the mainframe crate.

_____ 3. Unpack display station using instructions (62940038) attached to the outside of the carton.

_____ 4. Remove outer plastic wrapping. Allow the equipment to reach room temperature before power is applied.

_____ 5. Check equipment for damage. Refer to appendix D for locations.

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POSITION

_____ 1. Verify that peripherals are installed.

_____ 2. Verify mainframe position using site plan.

_____ 3. Position display console.

CAUTION

Do not cut floor tiles inside the computer room.

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DISPLAY CONSOLE

CC634B

CAUTION

Verify that voltage select switch is set for local power requirement.

_____ 1. Locate display console owner's manual and follow the instructions in the installation section.

_____ 2. Locate and connect AV117A data cable (19268593) between console and terminal 0 of mainframe at the I/O Connector Panel. The I/O connector panel is located at the rear of logic module 2. The panel is hinged for easy access to the connectors.

_____ 3. Set up console parameters using procedures in the manual. Also refer to CIP User's Handbook.

CC545 (Optional)

_____ 1. Refer to installation procedures supplied with the console for 400-Hz power wiring.

_____ 2. Locate and connect the two data cables to the CC545 port on the I/O Connector Panel.

_____ 3. Follow deadstart procedures in accordance with site parameters.

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SPCP CABLES (Optional)

_____ 1. Verify that status and control cables are connected to SPCP and run to mainframe position.

_____ 2. Verify that cables were labelled correctly at the factory.

_____ 3. Verify that 50/60-Hz and 400-Hz input power lines are connected properly to the SPCP.

_____ 4. Verify that MG REMOTE ADJUST, MG REMOTE START, MG POWER STATUS connections are complete.

_____ 5. Install the four status and control cables to the I/O Connector Panel as follows:

SPCP	MAINFRAME I/O CONNECTOR PANEL
J7	J6
J8	J7
J9	J4
TB3-3,4	J8

_____ 6. Terminate J5 on I/O connector panel.

_____ 7. Verify operation of SPCP.

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ELECTRICIAN HOOK UP

400 Hz (Optional)

_____ 1. Connect 50/60 Hz power lines to 50/60 Hz power input area J1.

_____ 2. Connect MG control wiring from TB1-1 through -4 to mainframe TB3-1 through -4 (the smaller TB).

_____ 3. Connect power wiring from 400-Hz wall distribution power panel to mainframe J2.

CC545 DISPLAY CONSOLE (Optional)

_____ 1. Connect 400-Hz power wiring to display console as follows:

a) Safety ground to lug E3.
b) Neutral to TB4-1.
c) Line 1 to TB4-2.
d) Line 2 to TB4-3.
e) Line 3 to TB4-4.

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CAUTION

Wear electro static discharge (ESD) wrist strap when handling logic paks.

NOTE

Four board locks (19268398) are installed at the factory to keep the logic modules from loosening. Board locks must be reinstalled if removed for any reason.

NOTE

For deinstallation of computer, remove jumper wire from IOU20-A009/IOU20-B009 and connect it to IOU19-C007/IOU20-D007.

_____ 1. Check visually for loosened connections (Berg blocks).

_____ 2. Remove jumper wire from panel location IOU19-C007/IOU20-D007 and attach it to IOU20-A009/IOU20-B009.

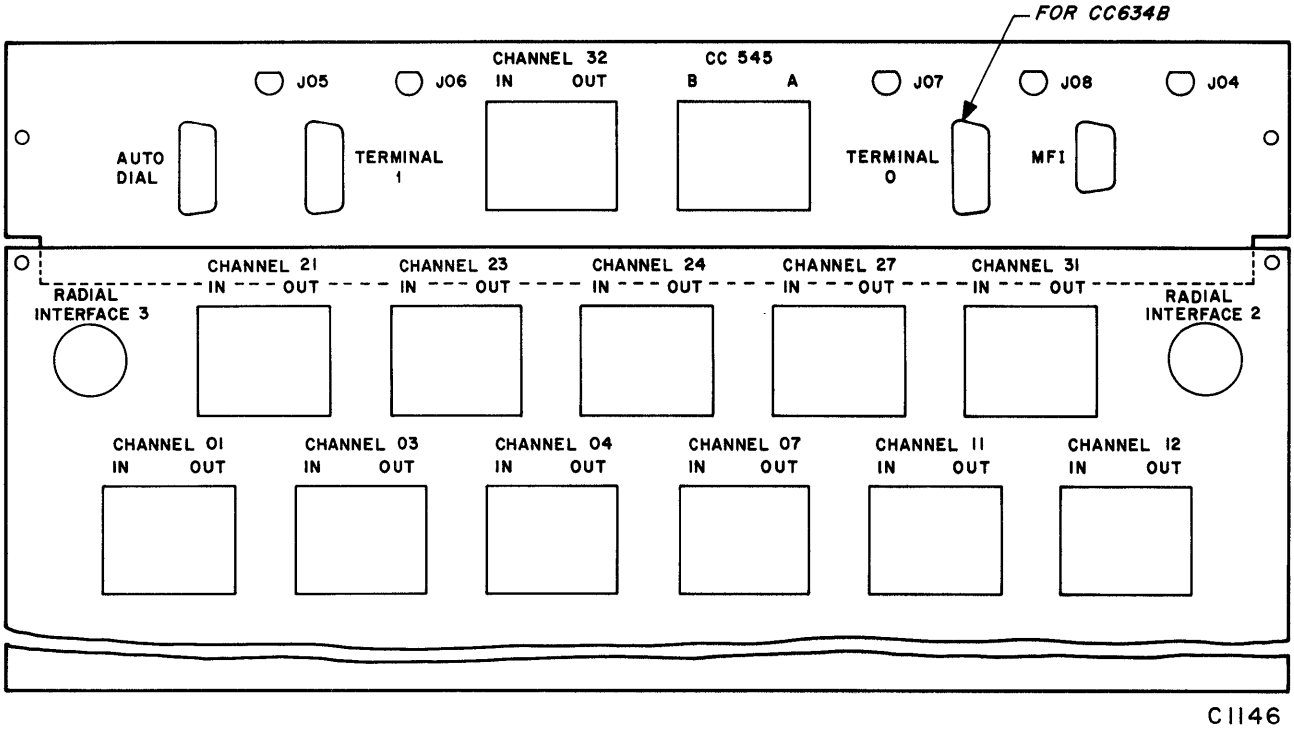


Figure 3-1. I/O Connector Panel (View from bottom, cable connection side)

CONNECT I/O CABLES

_____ 1. Attach all channel cables to I/O connector panel. Refer to figure 3-1. For a complete list of logic backpanel connections, see appendix B.

_____ 2. Connect optional cables to CC545 connectors if a CC545 display console is used. Refer to figure 3-1.

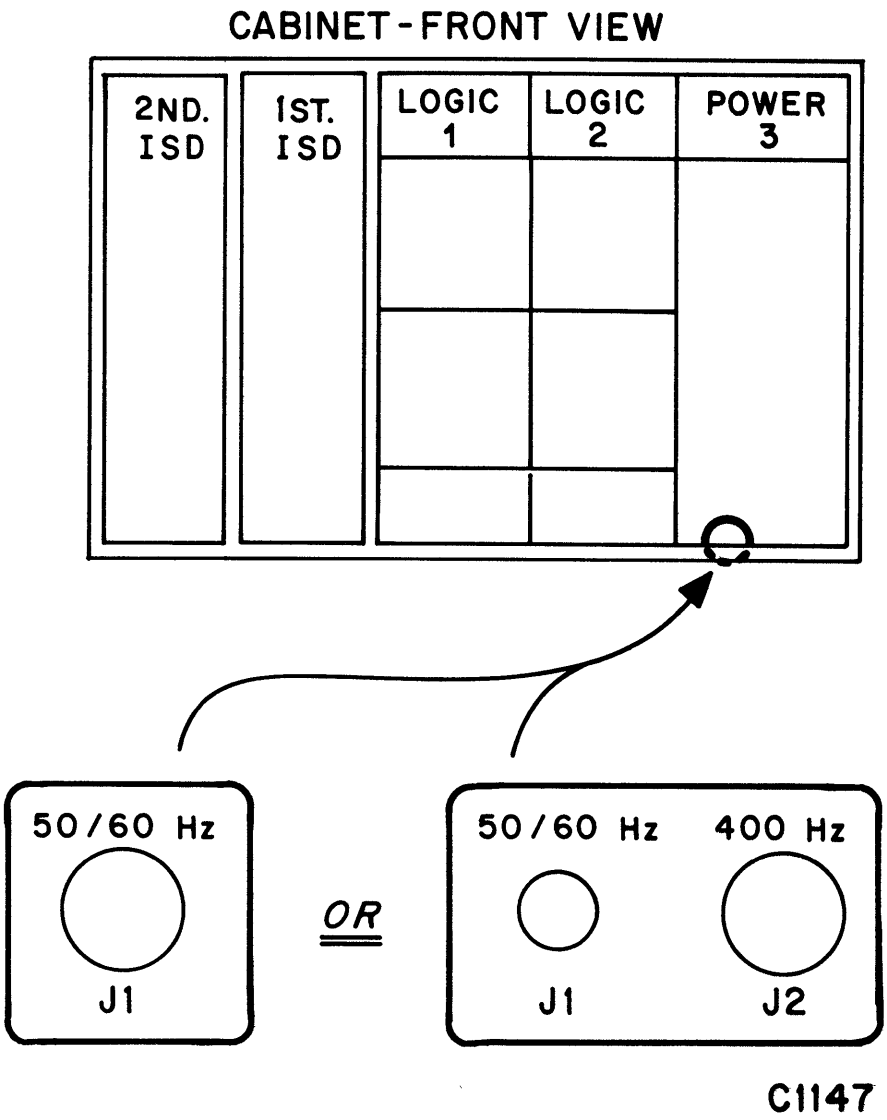


Figure 3-2. Hubbell Connector Power Input Area

ELECTRICAL INSPECTION

_____ 1. Set all circuit breakers to OFF at wall power distribution panel.

_____ 2. Check wiring on connectors according to diagrams in appendix G.

_____ 3. Check that Hubbell connector is seated snuggly in the 50/60 Hz, 3-phase power input connector J1. Turn lock ring to secure. Refer to figure 3-2.

_____ 4. If 400 Hz, 3-phase is required by system, check that larger Hubbell connector is seated snuggly into connector J2. Turn lock ring to secure.

_____ 5. Verify that correct overlay for site power is installed. Refer to the appropriate diagram in figure 3-3.

_____ 6. Verify that tap change jumpers are connected according to the diagram on the overlay.

____ 7. Set BLOWER/CHARGER switch to NORM and all circuit breakers to off. Refer to figure 3-4.

_____ 8. Set mechanical zero adjustment of voltage percent meter to zero.

_____ 9. Set two circuit breakers (AUXILIARY POWER SUPPLY, BLOWER/ CHARGER POWER) to on.

_____ 10. Verify power for ISD. Refer to appendix C.

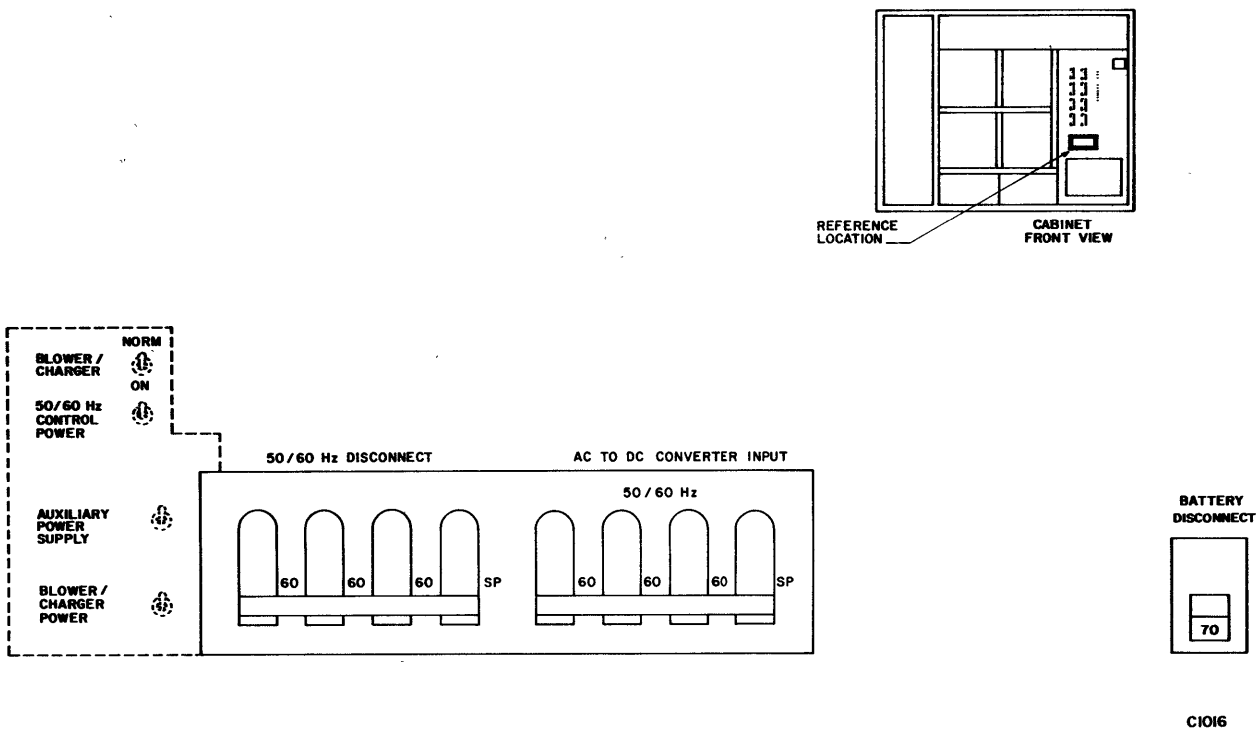
_____ 11. Close and lock power panel door.

NOTE

Electrical safety ground is in place when Hubbell is installed.

Tap change diagram not available.
Correct diagram to be supplied.

Figure 3-3. Power Supply Tap Change Overlays



Note: Blower/Charger is not sequencing when toggle switch is at ON position.

Figure 3-4. Mainframe Switches and Circuit Breakers

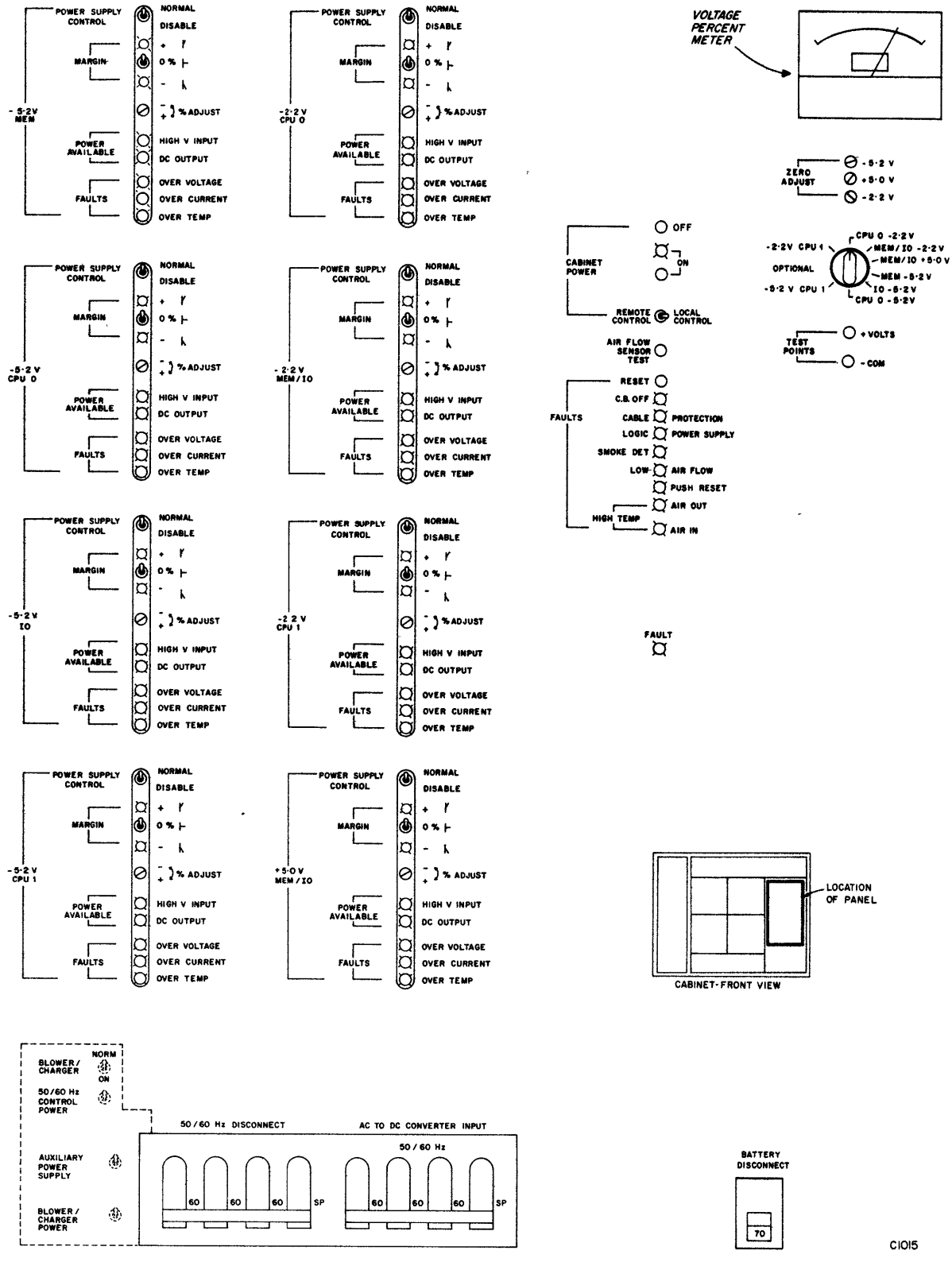


Figure 3-5. Power Module Front (External) View - SPSS

POWER APPLICATION (No SPCP)

_____ 1. Set wall power distribution panel 50/60-Hz and 400-Hz (if applicable) circuit breakers for the mainframe and display console to on.

_____ 2. Set CABINET POWER switch to LOCAL CONTROL position. Refer to figure 3-5.

_____ 3. Switch on all mainframe circuit breakers.

_____ 4. Push FAULTS RESET button and power up mainframe. Refer to figure 3-5.

_____ 5. Check mainframe voltage using digital voltmeter.

_____ 6. Verify that the VOLTAGE PERCENT METER (on mainframe) registers 0% for all power supply locations. Refer to figure 3-5.

_____ 7. Apply power to display console.

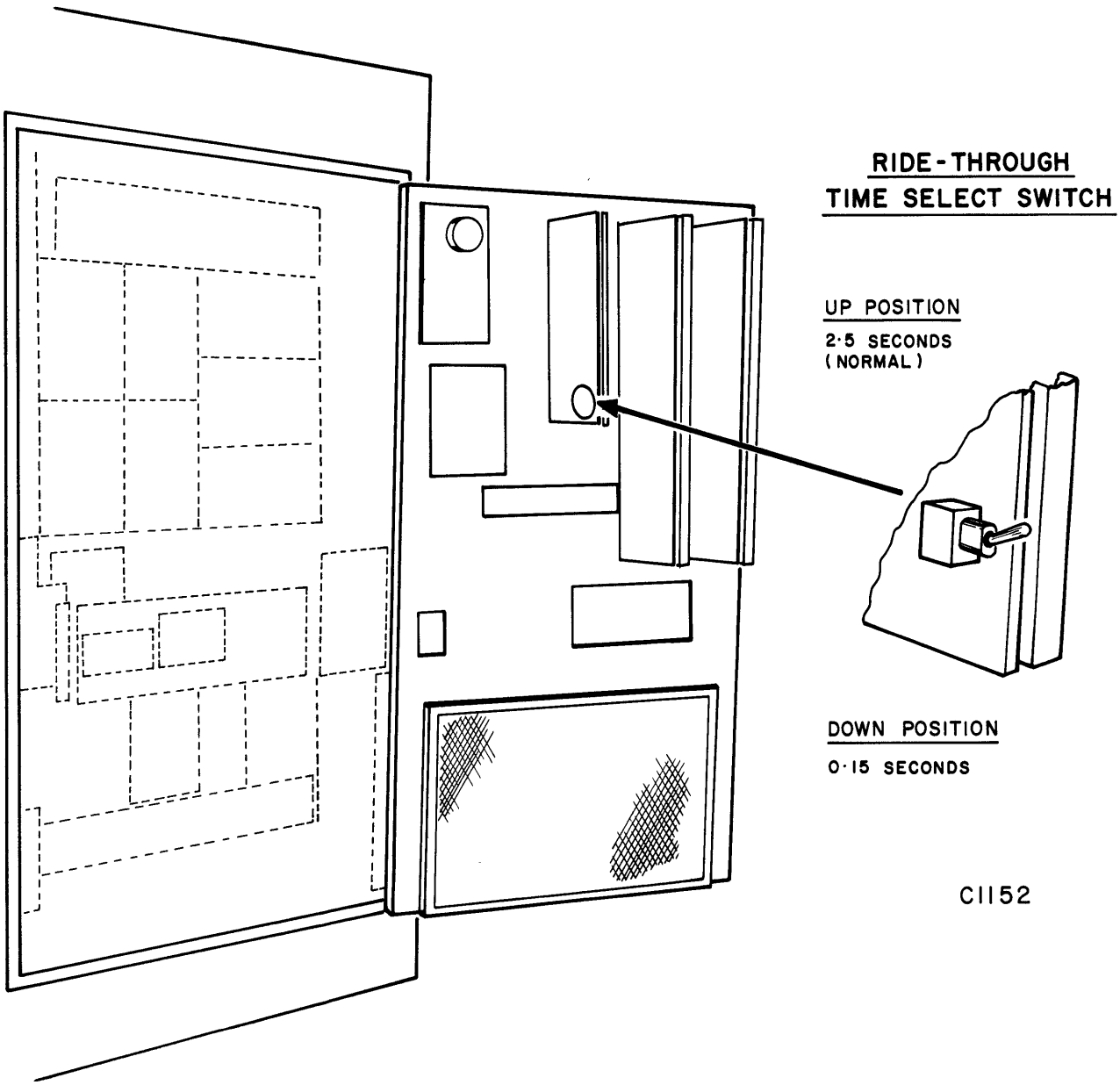


Figure 3-6. Ride Through Time Select Switch

POWER APPLICATION (SPCP)

Use this procedure under normal installation conditions. Refer to appendix J for power application procedures when voltage adjustments are necessary.

_____ 1. Set wall power distribution panel 50/60-Hz and 400-Hz (if applicable) circuit breakers for the mainframe and display console to on.

_____ 2. Apply power to SPCP by first setting the 50/60 Hz DISCONNECT switch on. Refer to figure 3-5.

_____ 3. Set CABINET POWER CONTROL switch to LOCAL position and set SPCP to LOCAL. Refer to figure 3-5.

NOTE

CABINET POWER CONTROL switch must be set to REMOTE on the mainframe during normal computer system operation.

____ 4. Set the POWER OFF RIDETHROUGH TIME SELECT switch to 2.5 seconds. Refer to figure 3-6.

____ 5. Push POWER ON button on SPCP. MG starts and power is available in approximately one minute.

_____ 6. Verify that the SPCP voltmeter registers 0% and that power is available at the 40 V dc terminator power supply.

_____ 7. Switch on all mainframe circuit breakers.

_____ 8. Push FAULTS RESET and CABINET POWER ON buttons. Refer to figure 3-5.

_____ 9. Select 0% on all POWER SUPPLY CONTROL (voltage) MARGINS.

_____ 10. Verify mainframe voltages using a digital voltmeter.

_____ 11. Verify that the mainframe voltage percent meter registers 0% for all power supply locations.

_____ 12. Turn display console on.

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NOTE

For 810-1 systems, where ISD and ISMT are the peripheral equipment, refer to procedures supplied with the ISD and ISMT.

_____ 1. Load and run Long Deadstart Sequence (LDS) program.

_____ 2. Enter coldstart tape programs from appendix A.

_____ 3. Mount CYBER Initialization Package (CIP) tape and upload tape controlware.

_____ 4. Coldstart/warmstart disk.

_____ 5. Deadstart MSL.

_____ 6. Load controlware to disk controller.

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INSTALL CIP

_____ 1. Select a deadstart disk.

_____ 2. Install CIP tape to disk.

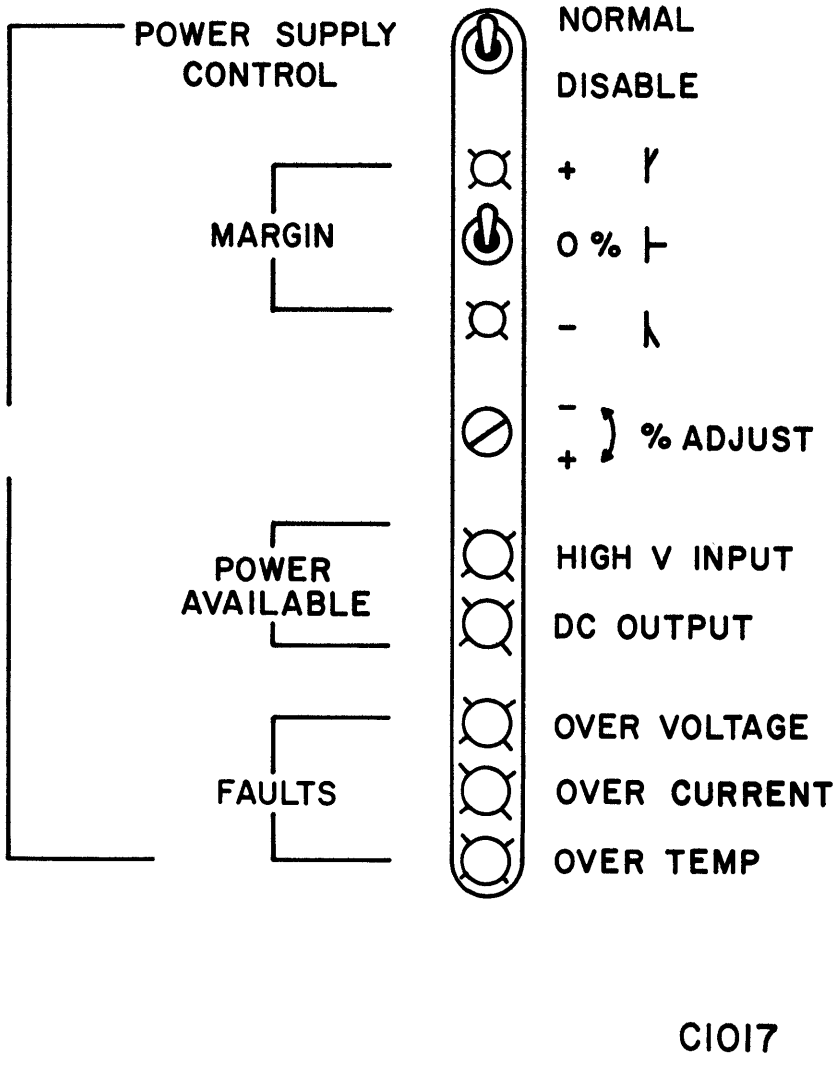

Figure 3-7. Typical Logic Power Supply Controls

The command buffer VERIFY includes automatic margin condition testing. If the command buffer is not available, use the tests listed in appendix H.

The command buffer VERIFY calls a series of diagnostics intended for confidence testing. Execution time is approximately 75 minutes.

To interpret the contents of maintenance registers, refer to appendix E.

_____ 1. Deadstart from disk.

_____ 2. Load command buffer called VERIFY.

_____ 3. Set NORMAL/DISABLE Switch to NORMAL on all of the logic power supply controls (figure 3-7).

_____ 4. Set MARGIN switch to 0% on all of the logic power supply controls (figure 3-7).

_____ 5. Run the VERIFY command buffer by typing GO VERIFY.

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_____ 1. Close mainframe doors.

_____ 2. Connect one of the 4.5 m (15 ft) test leads from the interference generator to a ground connection at the SPCP, if applicable. Connect the other lead to a frame ground close to the power input connector on the mainframe cabinet.

_____ 3. Plug in the interference generator and switch it on.

_____ 4. Run RCT11, one pass. When the test is running, turn the OUTPUT CONTROL (amplitude) on the interference generator until there is a meter reading of 10,000 V. No error should occur.

NOTE

Press the space bar periodically while running this test. This assures the test will not take an indefinite amount of time.

_____ 5. Turn off the interference generator and remove the leads.

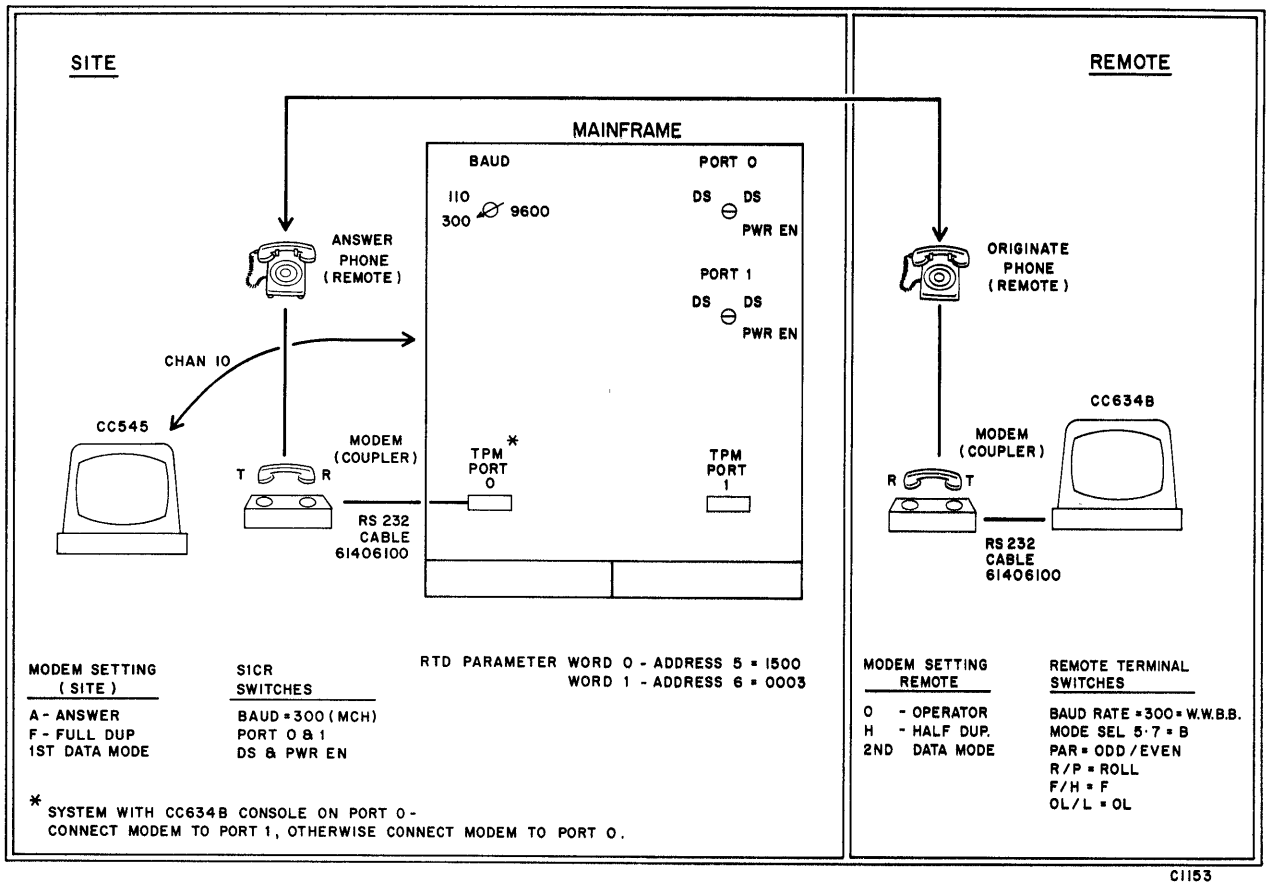

Figure 3-8. Remote Maintenance Access Verification

REMOTE TERMINAL ACCESS TEST

_____ 1. Connect modem to TPM. Refer to figure 3-8.

_____ 2. Run TPM1, one pass.

_____ 3. Contact remote technical assistance (RTA) at Support Services Organization (SSO) for remote capability verification 24 hrs a day.

In U.S. except Minnesota: 800-328-3980
In Canada and Minnesota: 612-931-3131 (collect)

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NOS SYSTEM VALIDATION SUITE

_____ 1. Load and run NOS System Validation Suite (NSVS) for approximately one hour.

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LOAD OPERATING SYSTEM

_____ 1. Have Central Software Field Support (CSFS) load the operating system deadstart tape.

_____ 2. Check the on-line CML diagnostics on peripherals.

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OPERATING SYSTEM VERIFICATION

_____ 1. Central Software Field Support runs the OS verification using customer jobs.

APPENDIX A

DEADSTART PROGRAMS

This appendix contains warmstart and coldstart programs.

Disk warmstart program (usually program 0) for 844/885 ISD
Disk controller is on I/O channel 1.

```
01   1402
02   73cc
03   0017
04   75cc
05   77cc
06   03eu
07   74cc
10   71cc
11   7301
12   0m10
13   0000
14   0000
15   0000
16   0000
17   0000
20   7112
```

Tape warmstart program (usually program 1) for 66x/67x ISMT
Tape controller is on I/O channel 12.

```
01   0000
02   0000
03   0000
04   75cc
05   77cc
06   01eu*                          * On 66x unit replace 01eu by 026u
07   74cc
10   71cc
11   7301
12   0m10
13   0000
14   0000
15   0000
16   0000
17   0000
20   0000
```

Suggested values:

```
cc  Channel:  Disk Controller = 01; Tape Controller = 12
m   Central memory size 3=65k, 4=98k, 5=131k, 6=198k, 7=262k
e   Equipment:  Disk drive 844 = 0; 885 = 4; ISMT, Tape drive 67x = 2
u   Unit number
```

The following four programs are in ROM.

Deadstart Program 4:

Chain test program. It tests out PP transfers in the lower PPs.

Deadstart Program 5:

Chain test program. It tests out PP transfers in the upper PPs.

Deadstart Program 6:

This program master clears IOU, CM, and CPU.

Deadstart Program 7:

This is used to paint characters (AB) on the display station screen.

Disk Coldstart Initialization: 844-7152 (disk no.-controller no.), 885-7152 and so on.

	Chan 0, 12, 13, 32,33	Other Chan
01	75cc	1402
02	77cc	73cc
03	01eu	0007
04	0300	75cc
05		77cc
06		01eu
07		0000
10		0300

Tape Coldstart Initialization: 66X-7152 and so on.

0001	75cc@
0002	1701
0003	0576
0004	2400*
0005	2400*
0006	77cc
0007	007u**
0010	0300

Notes

cc	Channel number.
u	Unit number.
@	If cc=0, this instruction must be 7540.
*	If 6681 or 6684 is on channel, instruction must be 77cc, 2100.
**	Tape unit number must be in the range 10 to 17 octal. For ISMT initialization, replace code 007u by 006u (line 07).
3	Equipment: Disk 844 = 0 885 = 4

APPENDIX B

I/O CONNECTOR PANEL

This appendix contains a list of preferred channel configurations and a table of channel cable/panel pin locations.

Preferred Channel Configurations

Channel	Device	Channel	Device
0 (ICI)	ISD-1	20 (ICI)	ISD-2
1 (170)	RMS-1	21 (170)	RMS-4
2 (INT)	-	22 (INT)	-
3 (170)	RMS-2	23 (170)	OPEN
4 (170)	RMS-3	24 (170)	COMM-2
5 (INT)	-	25 (INT)	-
6 (ICI)	ISMT-1	26 (ICI)	OPEN
7 (170)	COMM-1	27 (170)	OPEN
10 (CONS)	-	30 (INT)	-
11 (170)	OPEN	31 (170)	MAG. TAPE-2
12 (170)	MAG. TAPE-1	32 (170)	MAG. TAPE-3
13 (INT)	-	33 (INT)	-

Abbreviations

COMM	Communications 2550
CONS	Console
ICI	Integrated Controller Interface
INT	Internal (reserved)
ISD	Intelligent Small Disk Unit
ISMT	Intelligent Small Magnetic Tape Unit
RMS	Rotating Mass Storage

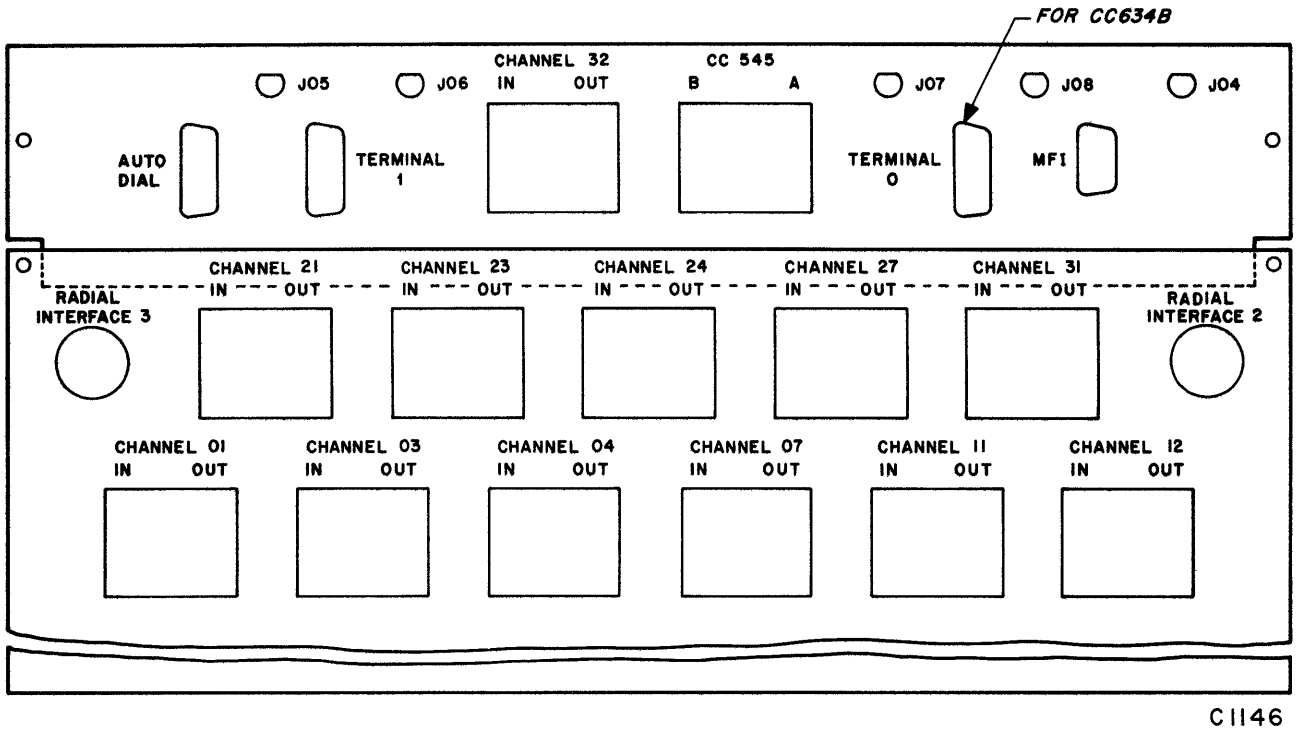


Figure B-1. I/O Connector Panel View from Bottom - Cable Connection Side

FACTORY-INSTALLED USER CHANNEL CABLE CONNECTIONS

CONN PANEL	CABLE NAME	BACKPANEL LOC'N/PIN	CONN PANEL	CABLE NAME	BACKPANEL LOC'N/PIN
Ch1	J22A	D10-A009	Ch21	J11A	D15-A009
	J22B	D10-B009		J11B	D15-B009
Ch3	J16A	D10-A039	Ch23	J12A	D15-A039
	J16B	D10-B039		J12B	D15-B039
Ch4	J17A	D10-A072	Ch24	J13A	D15-A072
	J17B	D10-B072		J13B	D15-B072
Ch7	J18A	D09-A009	Ch27	J14A	D16-A009
	J18B	D09-B009		J14B	D16-B009
Ch11	J19A	D09-A039	Ch31	J15A	D16-A039
	J19B	D09-B039		J15B	D16-B039
Ch12	J20A	D09-A072	Ch32	J10A	D16-A072
	J20B	D09-B072		J10B	D16-B072

DESC	CABLE NAME	BACKPANEL LOCATION
CC545	J21A	D17-A072
DSPLY	J21B	D17-B072
ATODAL	J01-1*	D20-C034/
2PTMUX	J02-1*	D20-D044/
2PTMUX	J03-1*	D20-D024/

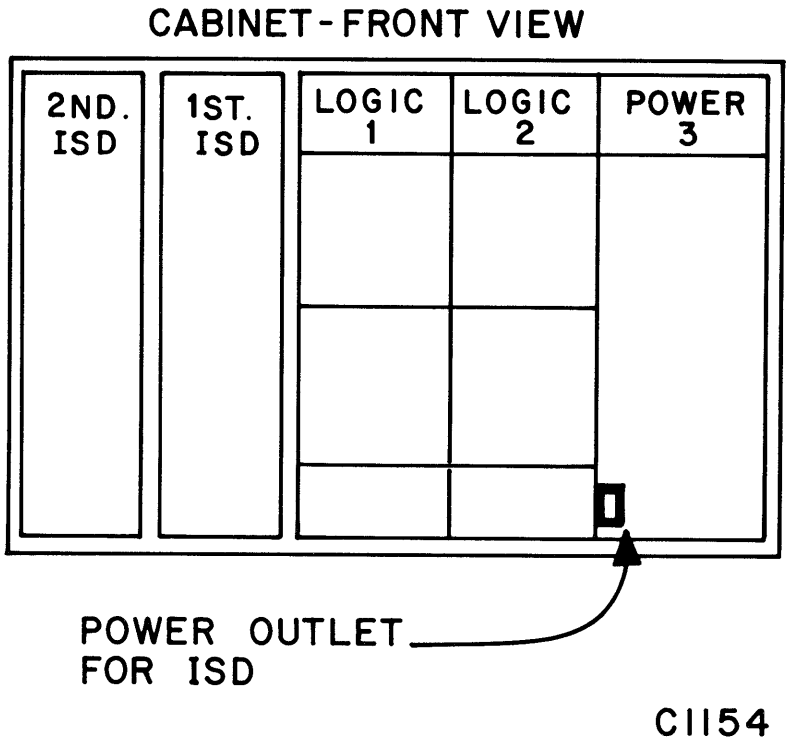
SPCP J9	Mainframe J04
J7	J06
J8	J07
TB3-3,4	J08

Mainframe	J05	TERMINATED
	J09	MFI
	J23	Radial I/F 3
	J24	Radial I/F 2

APPENDIX C

INTELLIGENT SMALL DISK

This appendix illustrates the location of the Intelligent Small Disk Units (ISD) and the location of the power outlet for them.



APPENDIX D

MAINFRAME COMPONENTS

This appendix consists of tables and diagrams identifying the components found in the power supply.

CABINET, FRONT AND REAR VIEWS (SHEET 1 of 2)

Find Number	Description
1	Protect module assembly
2	Voltage percent meter assembly
3	Power supply interface module assembly
4	Power control module assembly, Ride through time sel switch
5	Power control interface
6	Circuit breaker 50/60 Hz
7	AC to DC converter input circuit breaker (50/60 Hz or 400 Hz)
8	Fuse panel
9	Capacitor box assembly
10	Auxillary power supply regulator assembly
11	Circuit breakers: bulk auxillary power supply (top); blower/charger (bottom)
12	AC to DC converter assembly
13	Battery control box assembly circuit breaker
14	Battery pack assembly
15	DC to DC outlet power supply

CABINET, FRONT AND REAR VIEWS (SHEET 2 of 2)

Find Number	Description
16	Tap change panel
17	Air flow sensor assembly
18	RFI filter
19	Switching power supply +5.2 V
20	Switching power supply -2.2 V
21	Switching power supply +5.0 V
22	5 kVA transformer
23	Blower module frame assembly
24	Two port mux box
25	Intelligent small disk
26	I/O connector panel
27	Emergency off switch
28	Air filter assembly

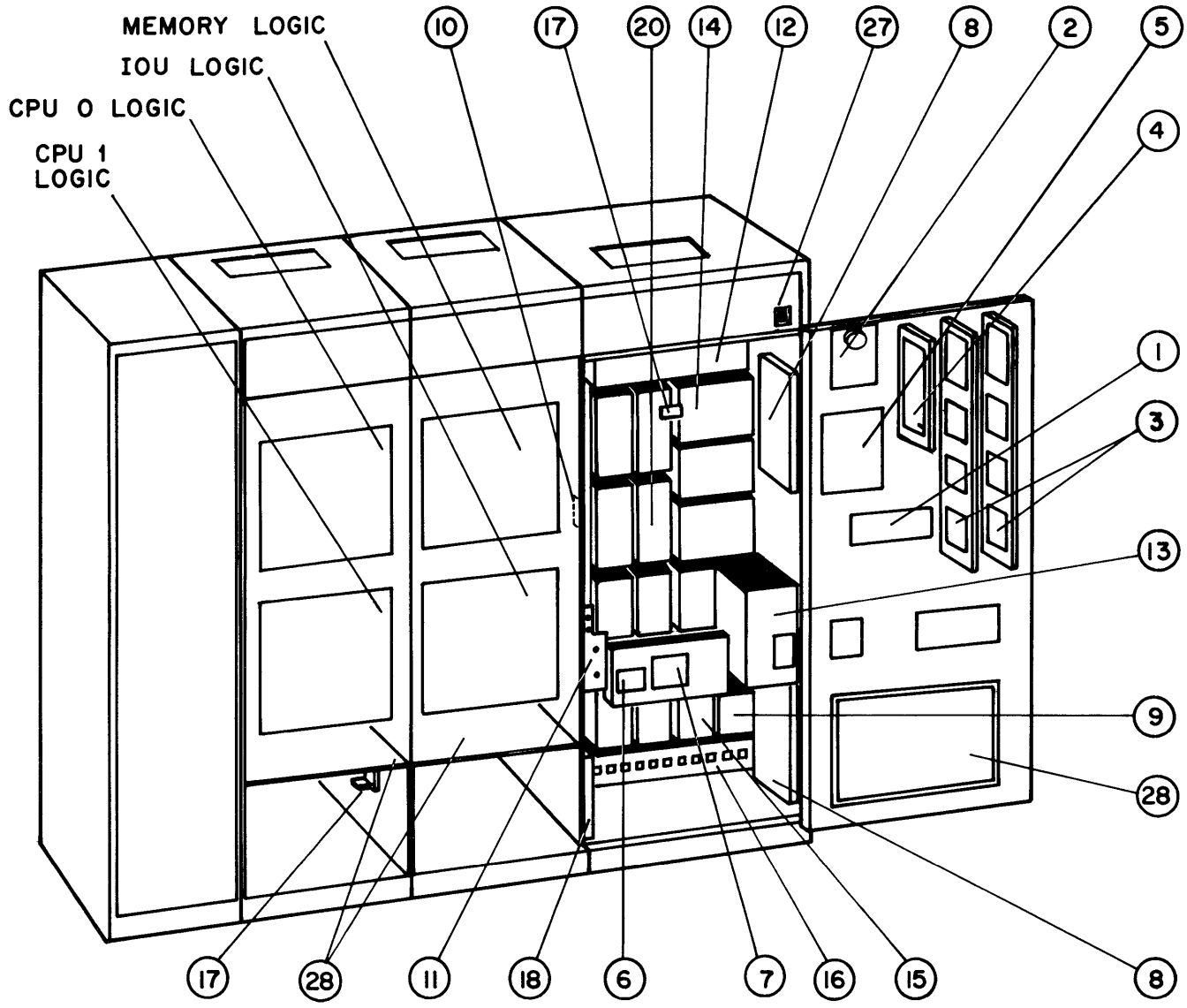
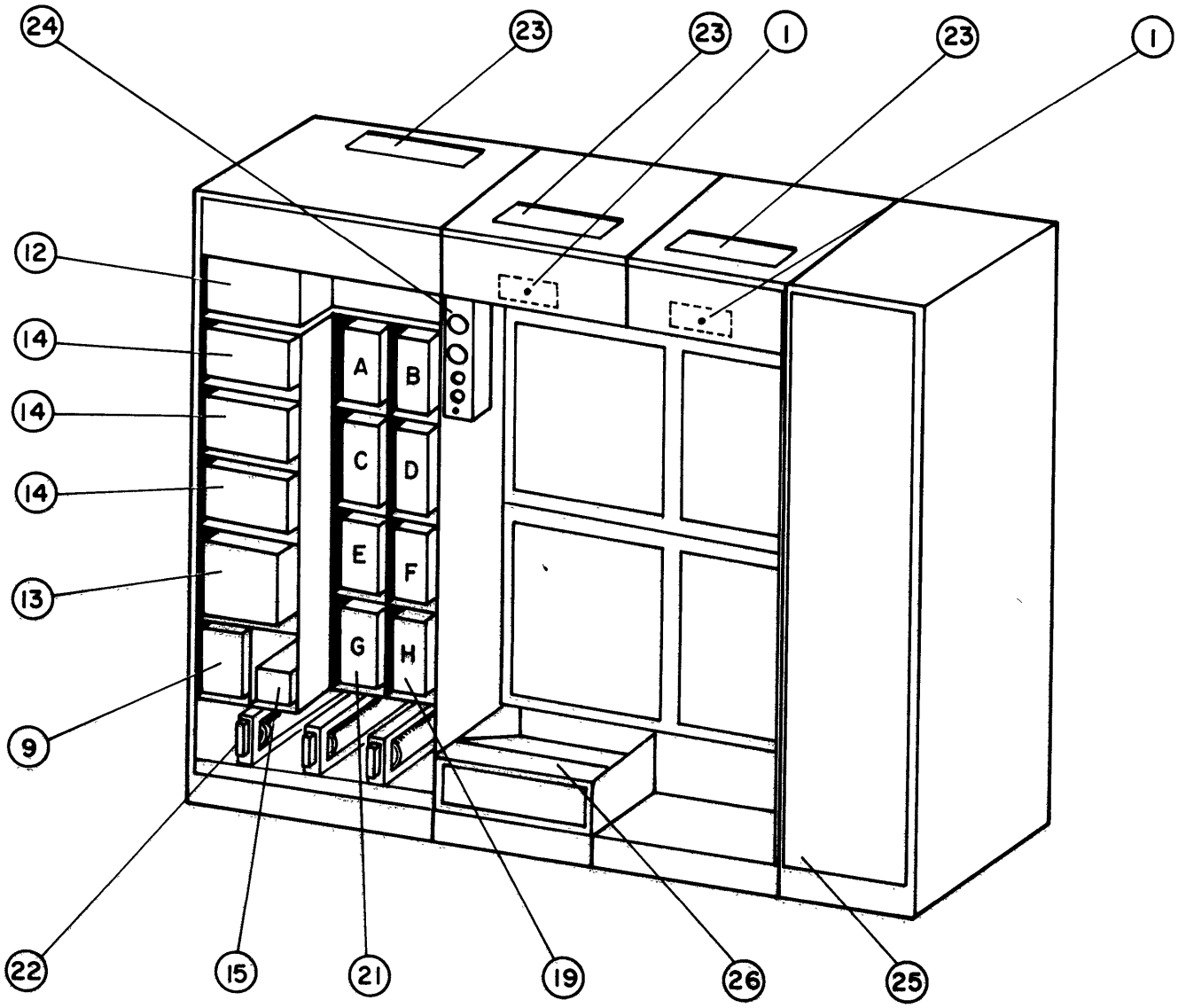


Figure D-1. Computer Cabinet - Front View



A — CPU 0 -2·2V
B — MEM +5·2V
C — MEM I/O -2·2V
D — CPU 0 +5·2
E — CPU 1 -2·2V
F — I/O +5·2V
G — MEM I/O +5 V
H — CPU 1 +5·2 V

C1021

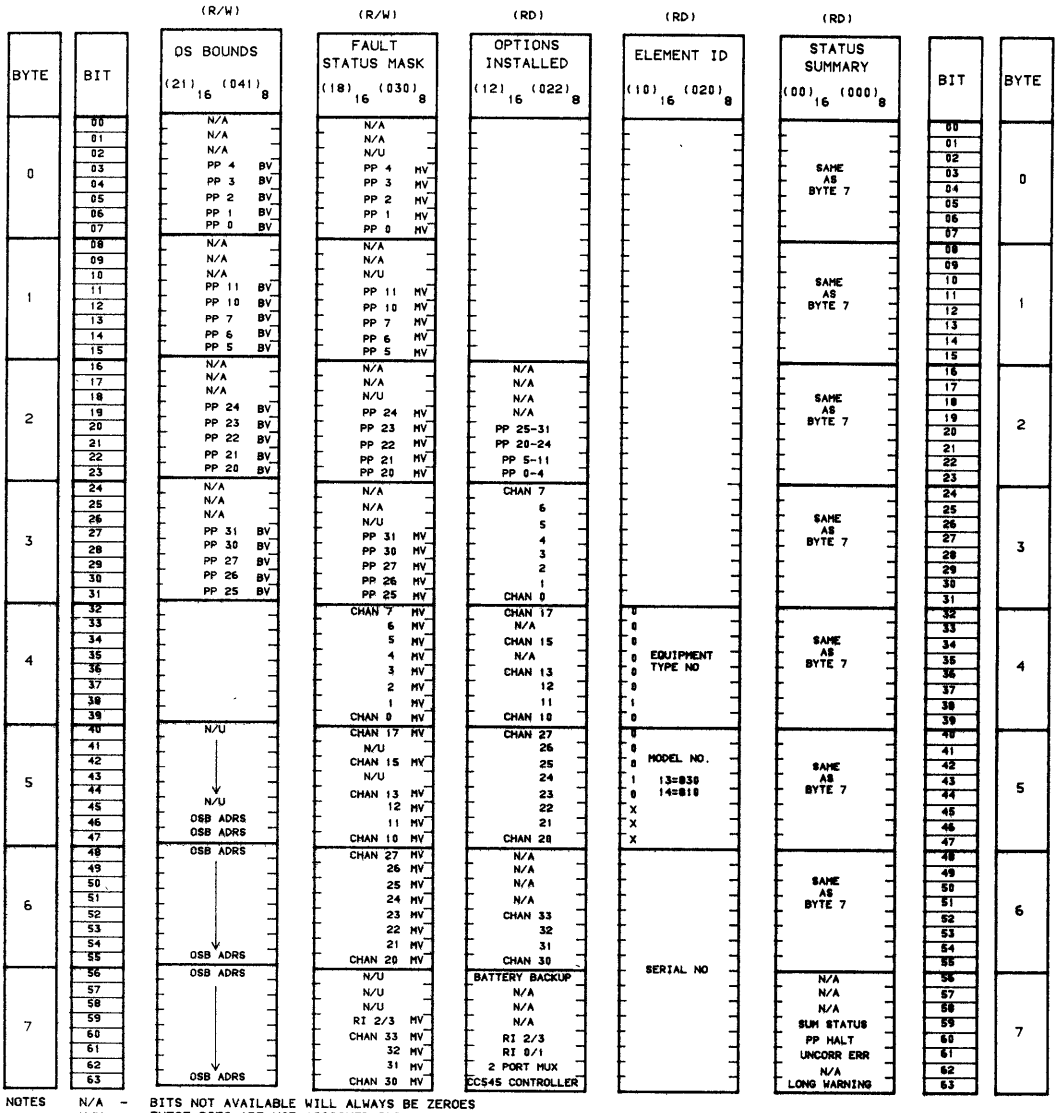
Figure D-2. Computer Cabinet - Rear View

APPENDIX E

MAINTENANCE REGISTERS

This appendix consists of three maintenance registers charts on six pages.

IOU MAINTENANCE REGISTER

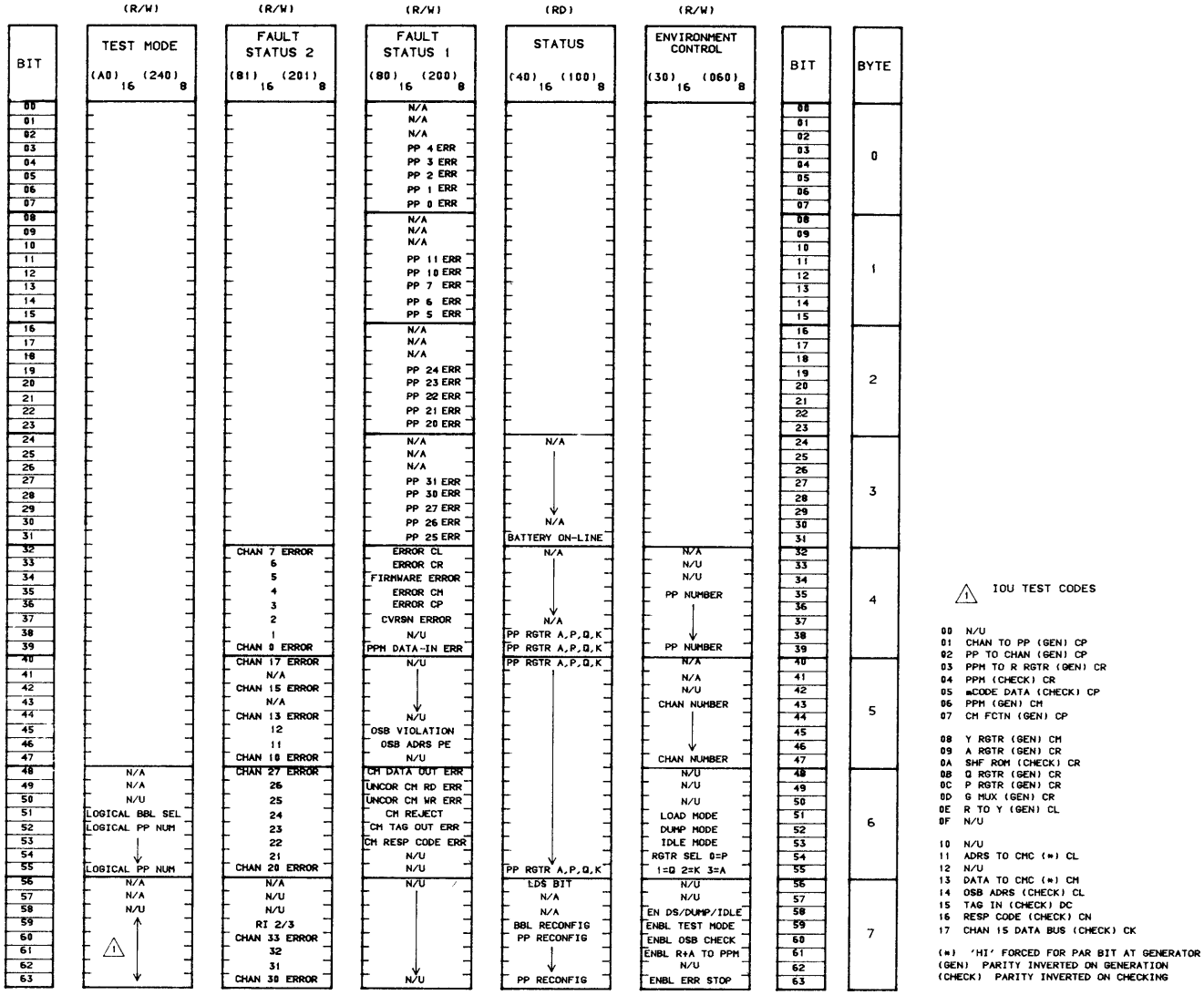


NOTES
N/A - BITS NOT AVAILABLE WILL ALWAYS BE ZEROES
N/U - THESE BITS ARE NOT ASSIGNED BUT MAY BE READ OR WRITTEN
(RD) - READ ONLY REGISTER
(R/W) - READ/WRITE REGISTER
MV - MASK VECTOR
BV - BIT VECTOR
UNANNOTATED BYTES = N/A

C1088

IOU Maintenance Register (1 of 2)

IOU MAINTENANCE REGISTER



NOTES
N/A - BITS NOT AVAILABLE WILL ALWAYS BE ZEROES
N/U - THESE BITS ARE NOT ASSIGNED BUT MAY BE READ OR WRITTEN
(RD) - READ ONLY REGISTER
(R/W) - READ/WRITE REGISTER
UNANNOTATED BYTES=N/A

C1089

⚠ IOU TEST CODES

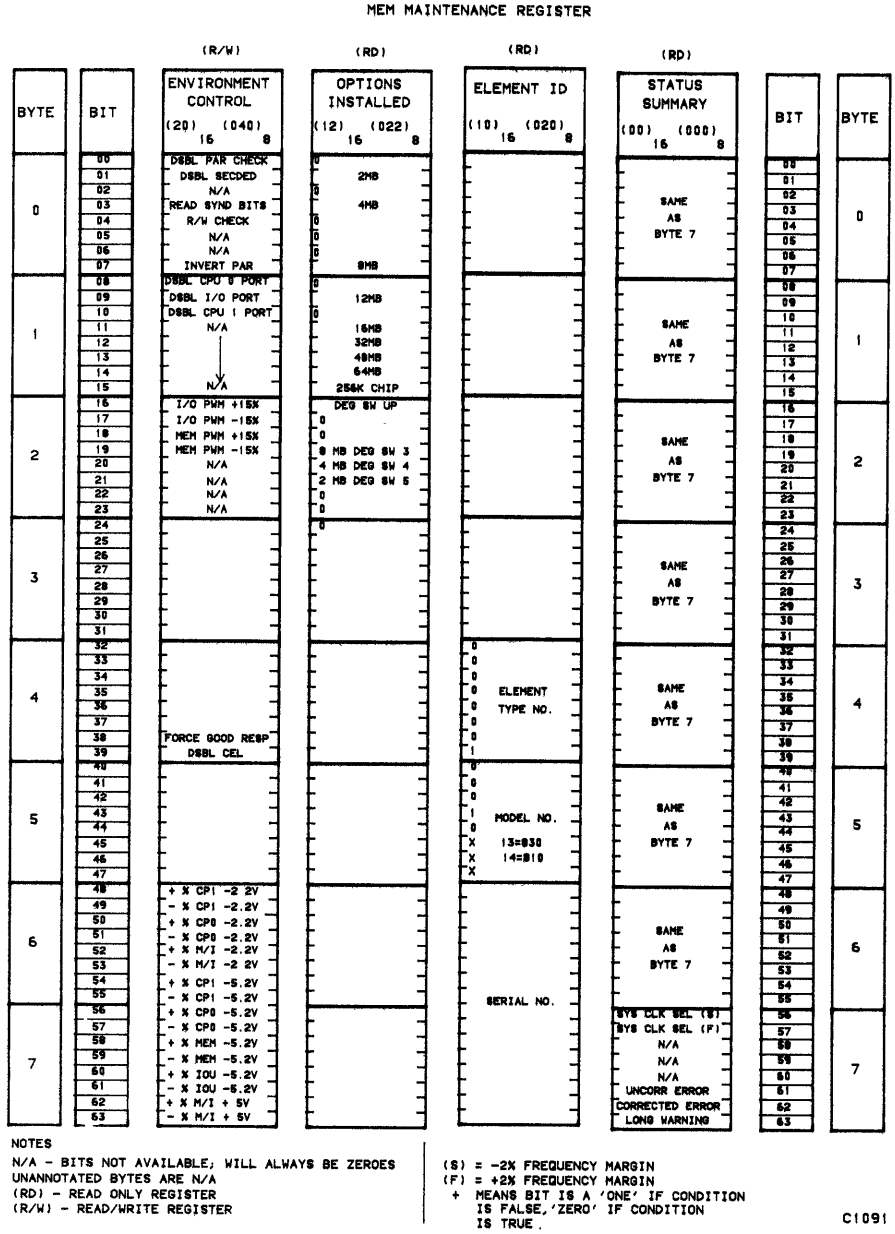
00 N/U
01 CHAN TO PP (GEN) CP
02 PP TO CHAN (GEN) CP
03 PPM TO R RGTR (GEN) CR
04 PPM (CHECK) CR
05 ▫CODE DATA (CHECK) CP
06 PPM (GEN) CM
07 CM FCTN (GEN) CP

08 Y RGTR (GEN) CM
09 A RGTR (GEN) CR
0A SHF ROM (CHECK) CR
0B Q RGTR (GEN) CR
0C P RGTR (GEN) CR
0D G MUX (GEN) CR
0E R TO Y (GEN) CL
0F N/U

10 N/U
11 ADRS TO CMC (*) CL
12 N/U
13 DATA TO CMC (*) CM
14 OSB ADRS (CHECK) CL
15 TAG IN (CHECK) DC
16 RESP CODE (CHECK) CN
17 CHAN 15 DATA BUS (CHECK) CK

(*) 'HI' FORCED FOR PAR BIT AT GENERATOR
(GEN) PARITY INVERTED ON GENERATION
(CHECK) PARITY INVERTED ON CHECKING

IOU Maintenance Register (2 of 2)



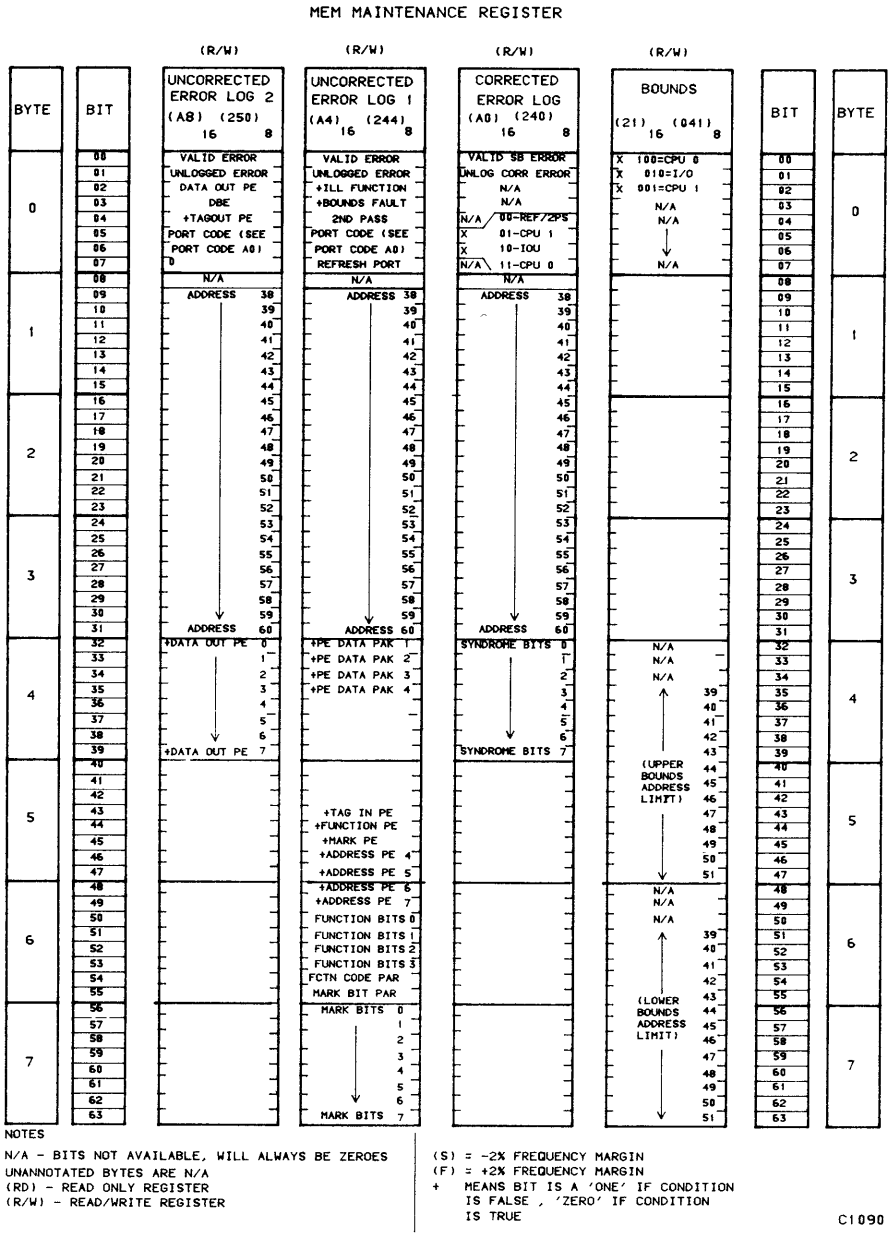
NOTES

N/A - BITS NOT AVAILABLE; WILL ALWAYS BE ZEROES
UNANNOTATED BYTES ARE N/A
(RD) - READ ONLY REGISTER
(R/W) - READ/WRITE REGISTER

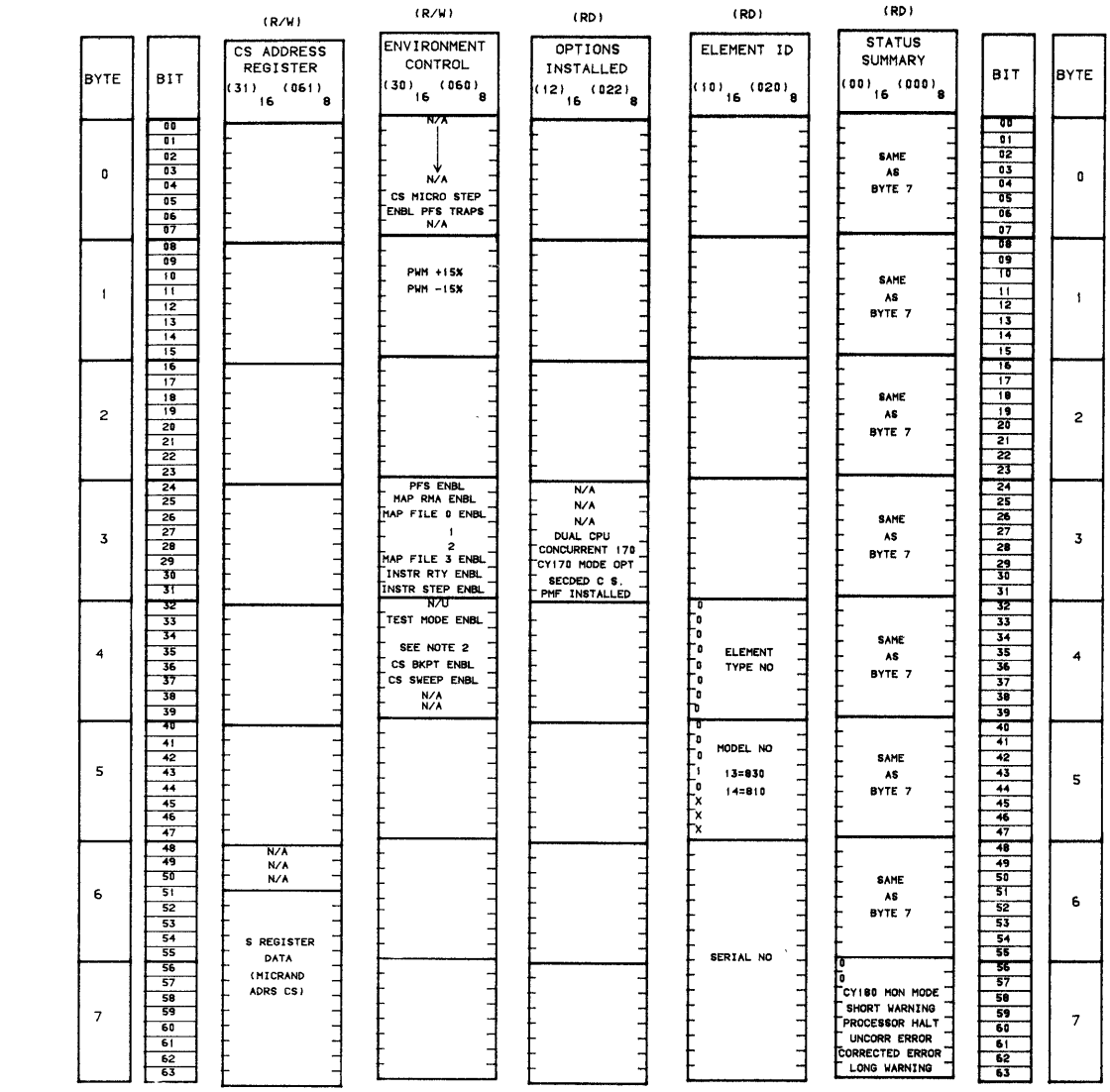
(S) = -2% FREQUENCY MARGIN
(F) = +2% FREQUENCY MARGIN
\+ MEANS BIT IS A 'ONE' IF CONDITION IS FALSE, 'ZERO' IF CONDITION IS TRUE.

C1091

MEM Maintenance Register (1 of 2)



MEM Maintenance Register (2 of 2)



NOTES

N/A - BITS NOT AVAILABLE, WILL ALWAYS BE ZEROES
UNANNOTATED BYTES ARE N/A

N/U - THESE BYTES ARE NOT ASSIGNED BUT MAY BE READ OR WRITTEN

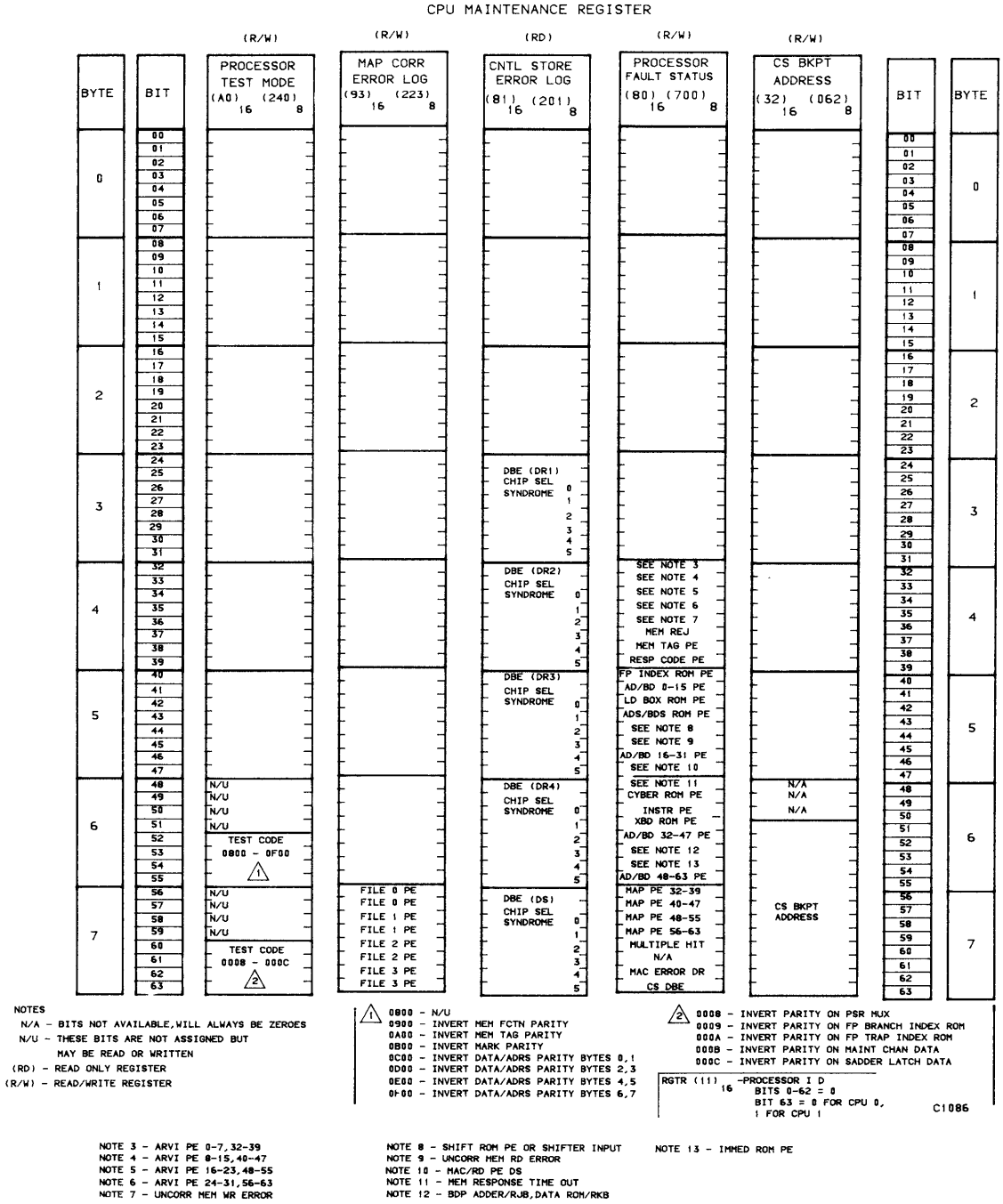
(RD) - READ ONLY REGISTER

(R/W)- READ/WRITE REGISTER

RGTR (11) -PROCESSOR I D BITS 0-62=0
16 BIT 63=0 FOR CPU-0, 1 FOR CPU-1

NOTE 2 - DSBL CORR ERROR TO P1 SS

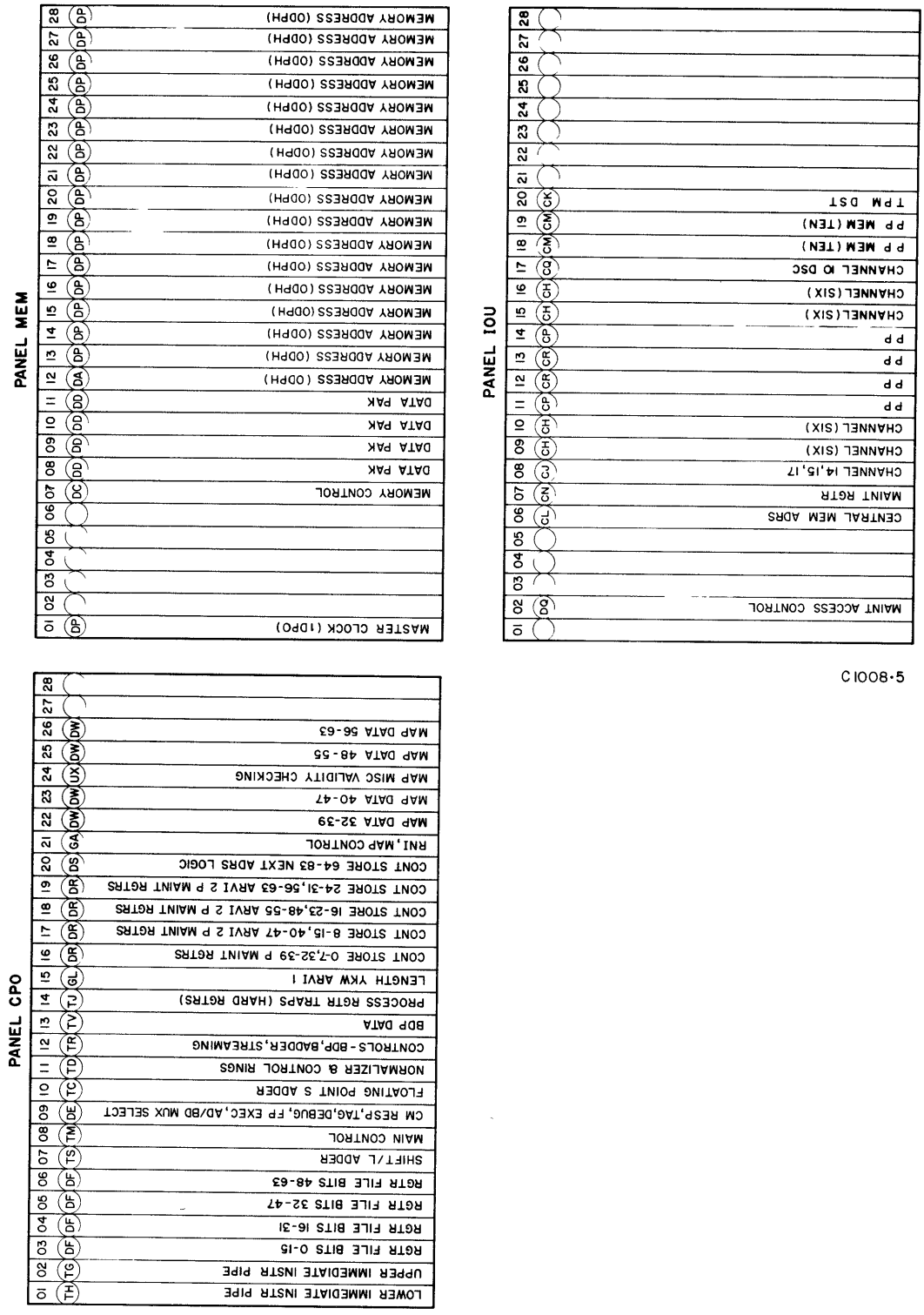
CPU Maintenance Register (1 of 2)



CPU Maintenance Register (2 of 2)

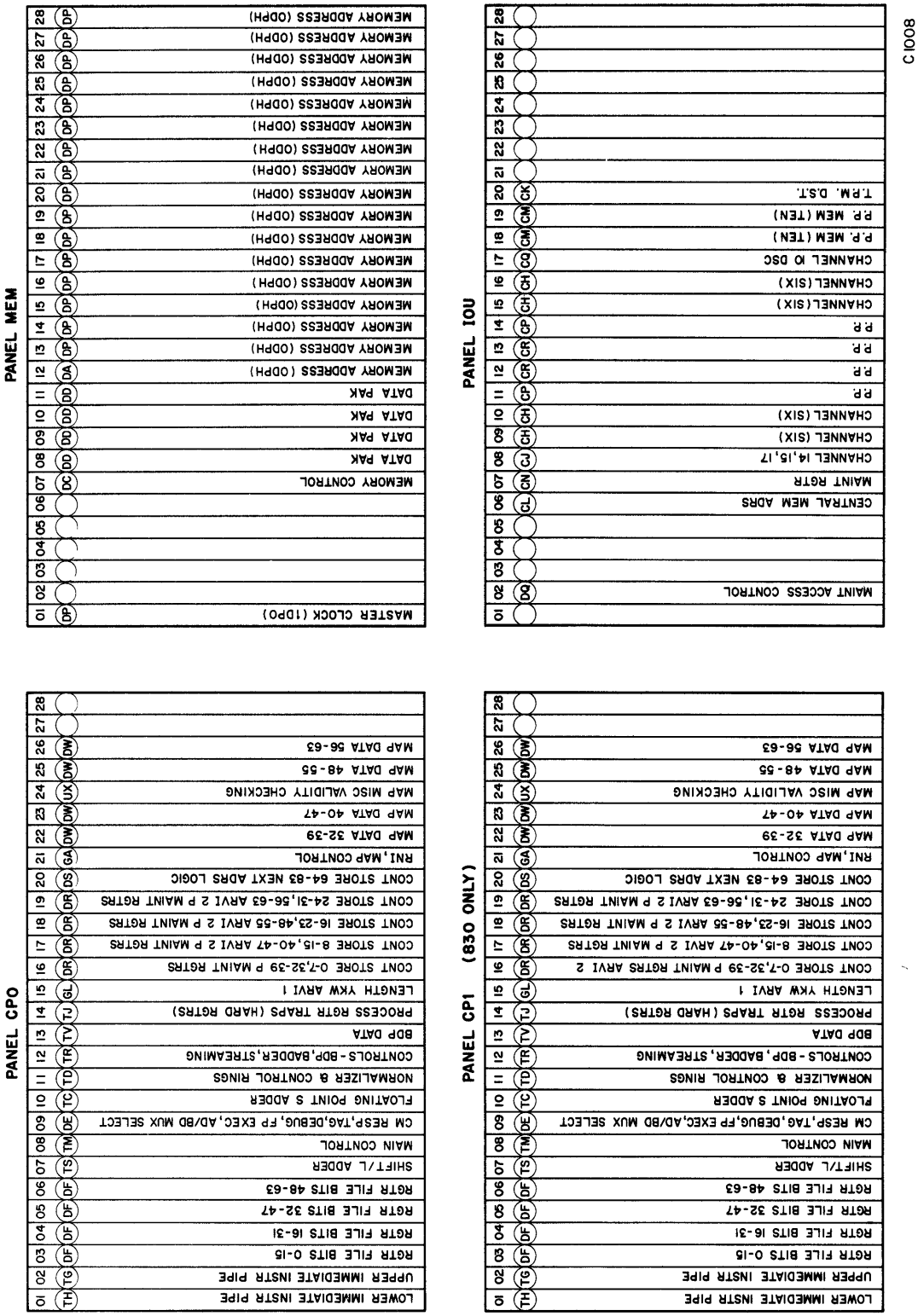
APPENDIX F

PANEL MAP



C1008-5

Panel Map - Model 810/830



Panel Map - Model 830 With Dual CPU Option

APPENDIX G

POWER DISTRIBUTION DIAGRAMS

This appendix contains three power distribution diagrams followed by a common set of notes.

50/60 Hz only
50/60 Hz and 25 kVA or larger 400 Hz with SPCP
25 kVA or larger 400 Hz with SPCP

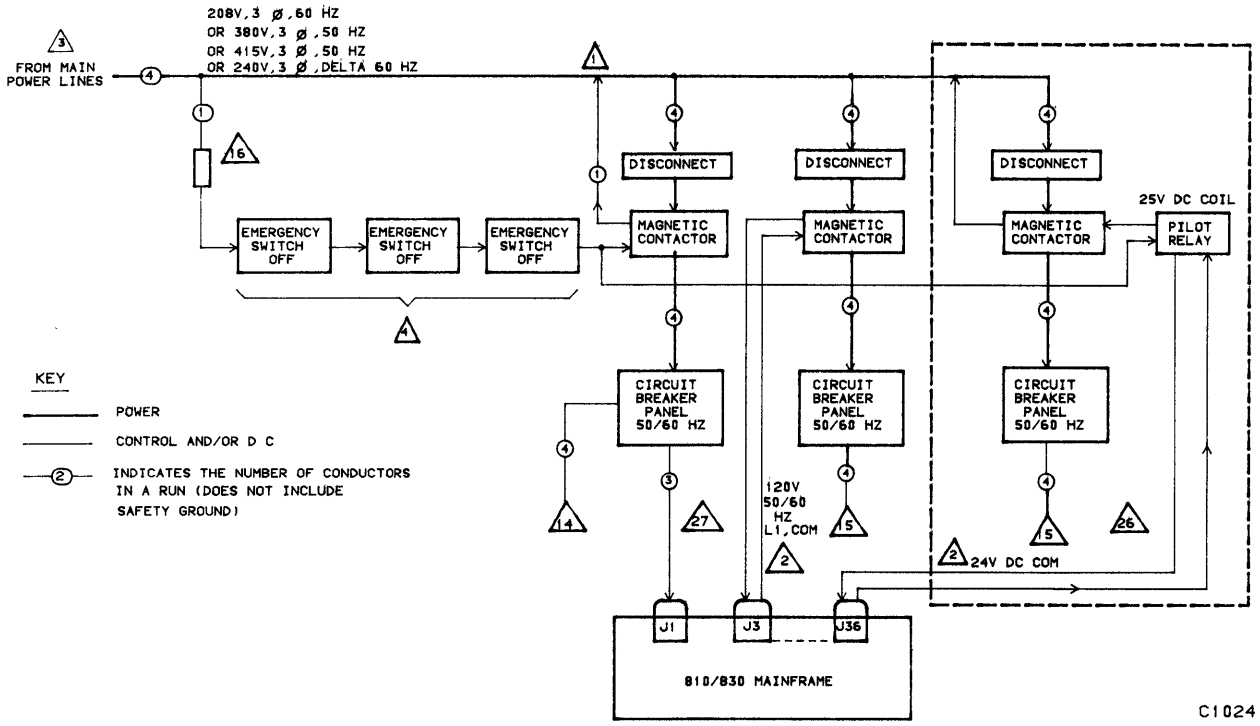


Figure G-1. Power Distribution Diagram 50/60 Hz Only

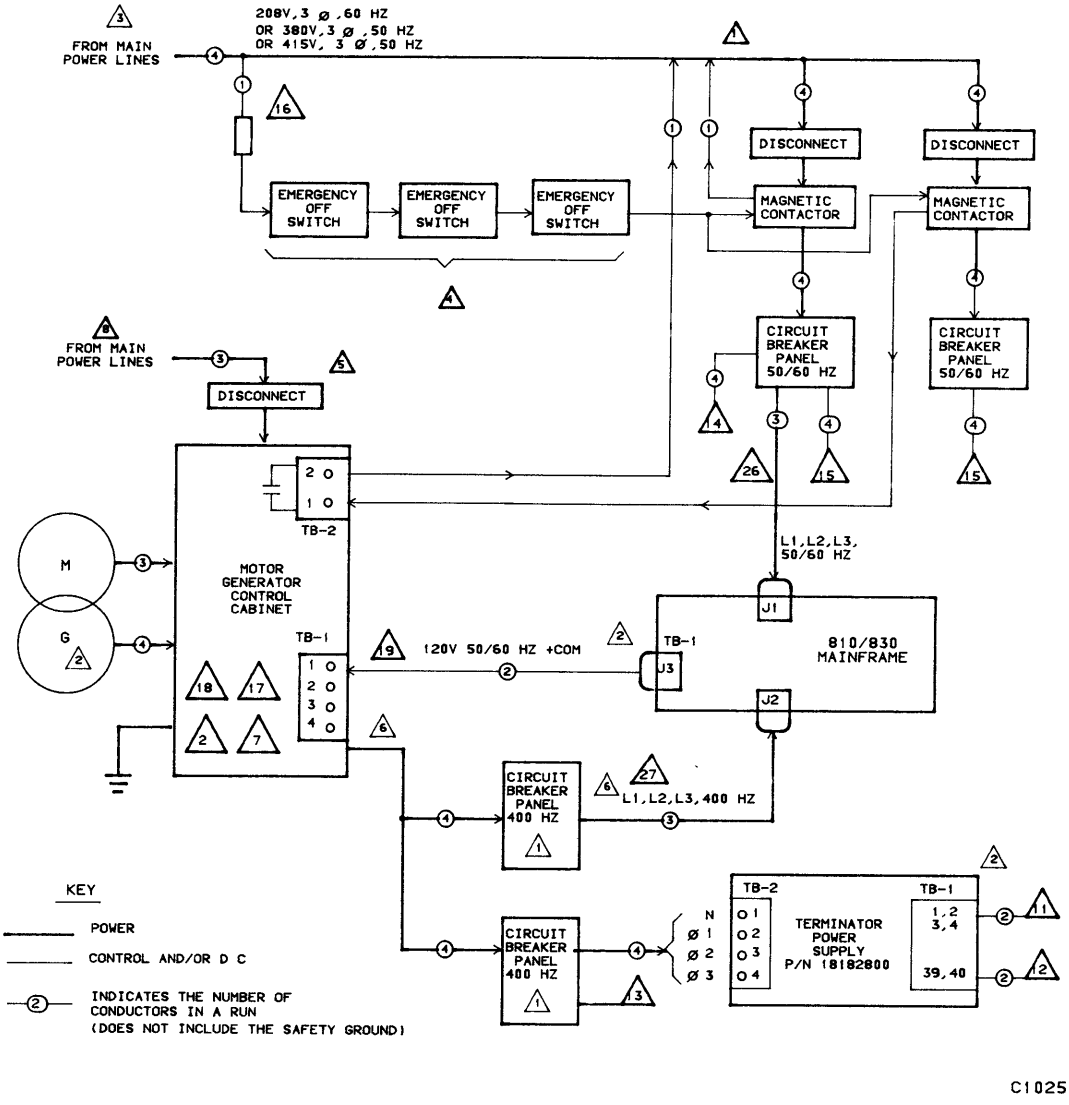


Figure G-2. Power Distribution Diagram 50/60 Hz and 12.5 kVA MG Set

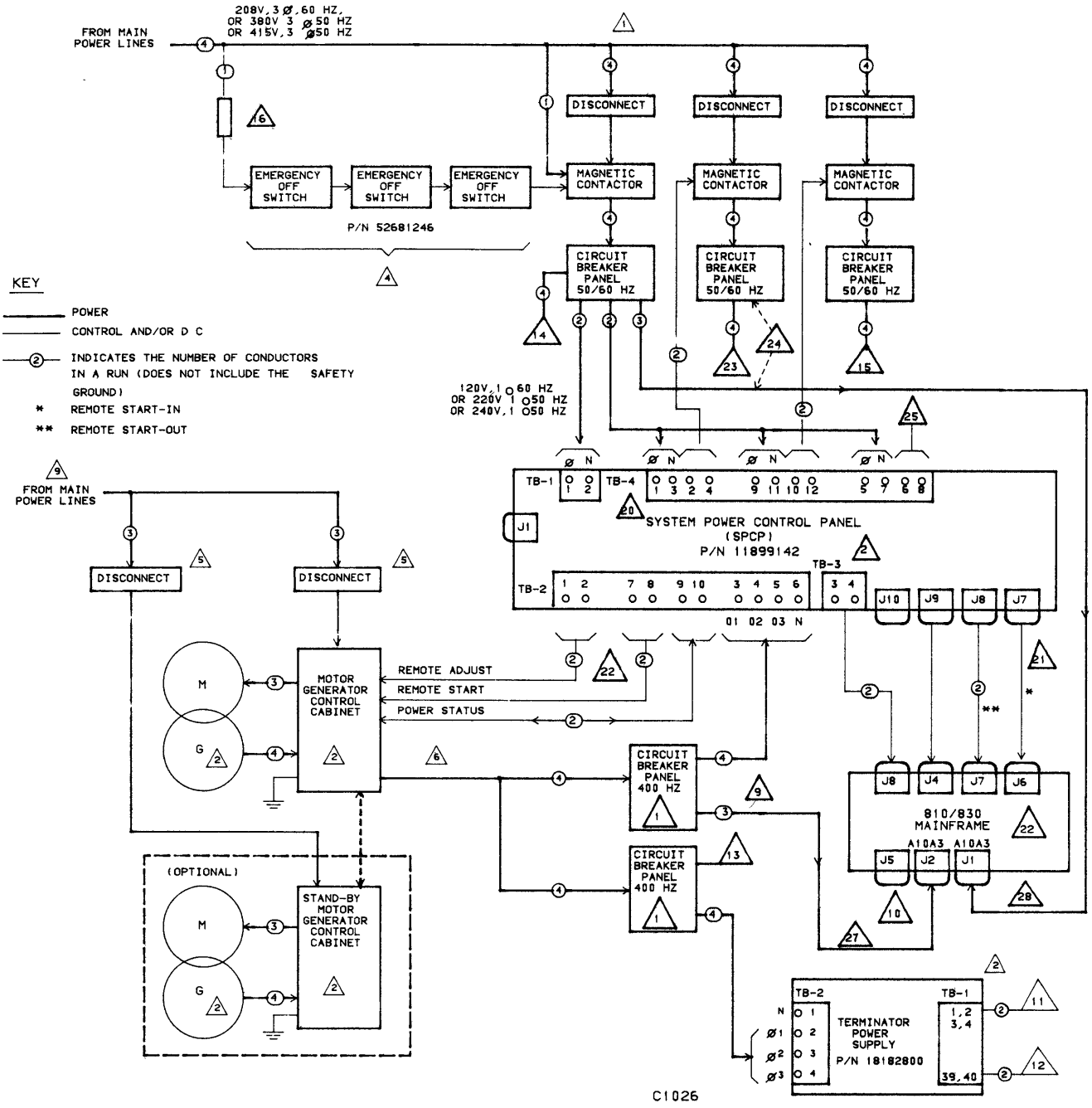


Figure G-3. Power Distribution Diagram 50/60 Hz and 25 kVA or Larger MG Set

1. Circuit breakers, breaker panels, magnetic contactors, main disconnect switches, junction boxes, and associated wiring must be customer furnished and installed prior to computer equipment installation.

2. Part furnished by Control Data and installed by customer.

3. All wiring must be in accordance with applicable local and national codes and must be labeled for identification of source and termination.

4. Emergency off switches should be located approximately 1.5 m (5 ft) from the floor with one near each exit and shall be wired in series.

5. Size of MG input power disconnect and motor power wiring shall be based on motor power characteristics. Refer to Site Preparation section 4 Manual.

6. Voltage loss between MG and computer equipment must not exceed two percent of the MG rated output.

7. MG output is 12.5 kVA, 208 V, 3 phase, 400 Hz.

8. Power input for 12.5 kVA MG: 208 V, ±10%, 3 phase, 60 Hz.

9. Power input for 25 kVA MG: 208/220/440/460 V ±10%, 3-phase, 60 Hz
   or: 398 V, ±15%, 3-phase, 50 Hz

10. J5 is terminated.

11. ±20-V dc terminator power to 405 card reader (if used).

12. ±20-V dc terminator power to 580-XXX line printer (if used).

13. To associated peripheral equipments that require 400-Hz power.

14. Provides 50/60-Hz power to items which should always remain on except when the wall-mounted emergency off switch is pulled (that is, test equipment service outlets).

15. Provides 50/60-Hz power to equipment that requires power when 400-Hz is available.

16. Fuse, customer furnished and installed.

17. MG must be placed in close proximity to the mainframe because 400-Hz voltage adjustment is done at MG cabinet front panel.

18. When 400-Hz load is increased or decreased, MG output may have to be readjusted to 208 V.

Notes for Power Distribution Diagrams (1 of 2)

19. Connections:

M-G	to	Mainframe
TB1-1		J3
TB1-2		J3
TB1-3		J3
TB1-4		J3

20. Numbered to show wiring connections; TB-4 terminals are actually numbered sequentially.

21. SPCP should be located approximately 1.5 m (5 ft) from the floor. Unit is supplied with 15.2 m (50 ft) monitor cables P/N 53615357. Connect between SPCP and mainframe as indicated. The SPCP must be installed close enough to the mainframe that the 15.2 m monitor cables will reach, taking into consideration the cable drop lengths from the SPCP to the room floor (below the raised floor) and the rise back up and 457 mm (18 in) into the mainframe.

22. MG remote adjust, remote start, and power status wiring between SPCP and MG control cabinet must have seperate raceways (three independent runs of two each) unless adequately shielded from one another by use of conduit, greenfield, or braided shield within the power cables.

23. Same as 14 except breaker panel may be shut off via the service switch within the SPCP.

24. 50/60-Hz power to the mainframe may be supplied from this panel also.

25. Circuit may be used to switch control power for an additional magnetic contactor. The circuit may be adjusted to come on 0 to 5 minutes prior to 400-Hz power and to stay on 0 to 5 minutes after 400-Hz power is removed.

26. Circuitry shown inside dashed line is an alternate remote control to that shown connected to J3. This alternate circuit is used if 120 V coil magnetic contactors are not available (that is at 50-Hz sites).

27. Main power supply to the logics (-5.2 V, -2.2 V, +5.0 V).

28. Power to auxiliary power (+5 V, -12 V, +12 V), auxiliary battery charger, blowers, and so forth.

Notes for Power Distribution Diagrams (2 of 2)

APPENDIX H

SOFTWARE TESTS AND LIMITS

This appendix provides a table showing software tests and limits.

Test	Time Limits	Command Buffer	Parameters Selected at Stop	Comments
		IOU MARGINS		
FII1	1 Pass	FII10	Wide: CM,O,S or SWM (set wide margin)	Load microcode after completion of test.
TPM1	1 Pass	TPM10	Narrow: CM,O,F or SNM (set narr marg)	Two port mux test.
		CM MARGINS		
CMT1	1 Pass	CMT10	Wide: EP,X,123,1 Narrow: EP,X,123,2	X=PP number on which test is loaded. Display command buffer CMT10 by typing AE,CMT10.
CMEM	5 Min	CMEM1	Narrow: CM,1,F Wide: CM,1,S	
		CPU MARGINS		
FIS1 *	1 Pass (15 Min)	FIS10	Wide: CM,2,S or SWM Narrow: CM,2,F or SNM	
RCT1	5 Min	RCT11		
RCT2	5 Min	RCT21		
170 MODE	5 Min	EXC1	(CU8, CT8, MY1, FS8)	C.B. EXC1 will load CU8, CT8, MY1, and FS8 tests. Other tests can be loaded by typing L,XXX,XXX,XXX,XXX (up to 4 tests)
170 MODE	5 Min		L,IMC,BGK,FDT,LAT	
170 MODE	5 Min		L,POP,RTJ,FM2,CM6	
FCT1	1 Pass	FCT11		
FCT2	2 Min	FCT21		
FCT3	1 Pass (20 Min)	FT3G01 FT3G11 FT3G21 FT3G31 FT3S11 FT3S21 FT3BD1 FT3FP1	 EB, A04E, 20 (cr) EB, A04E, 20 (cr) EB, A04E, 20 (cr) EB, A04E, 28 (cr)	To speed up the tests, turn the display screen off.
FCT5	1 Pass	FCT51		
FCT9	1 Pass	FCT91		Run clear 1 first
EXCH	1 Pass	EXCH1		

* Available only to customers with a Control Data Maintenance Services agreement.

APPENDIX I

SWITCHES AND INDICATORS

This appendix illustrates the power supply switches and indicators.

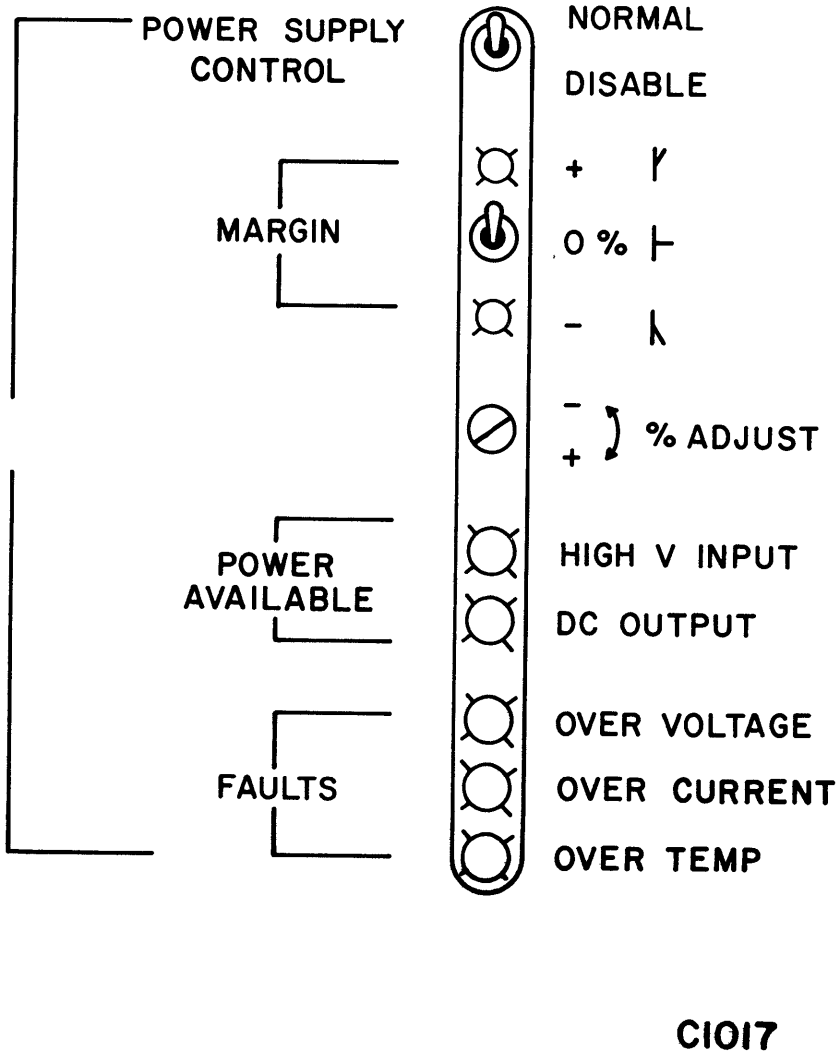


Figure I-1. Typical Logic Power Supply Control

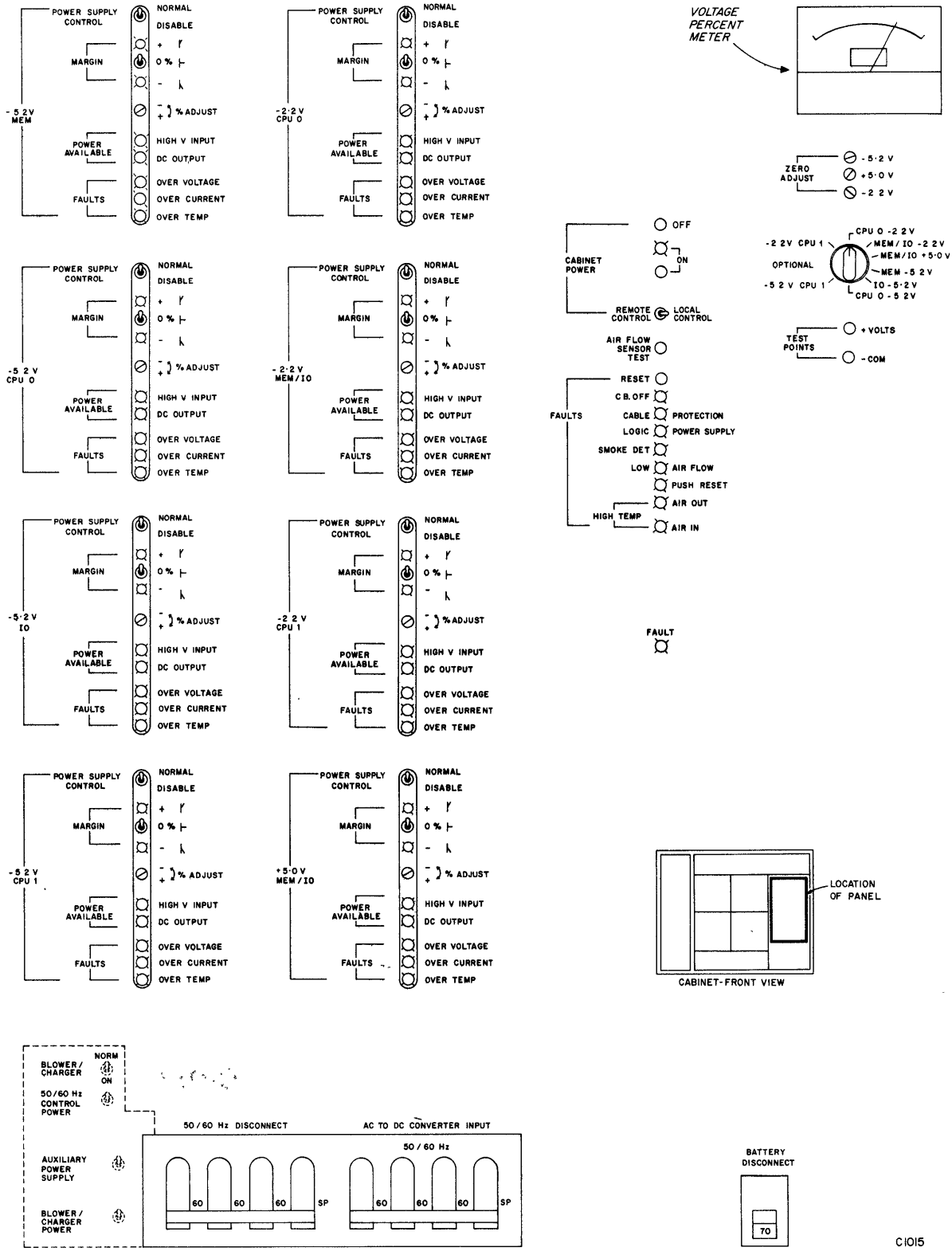


Figure I-2. Power Supply Switches and Indicators

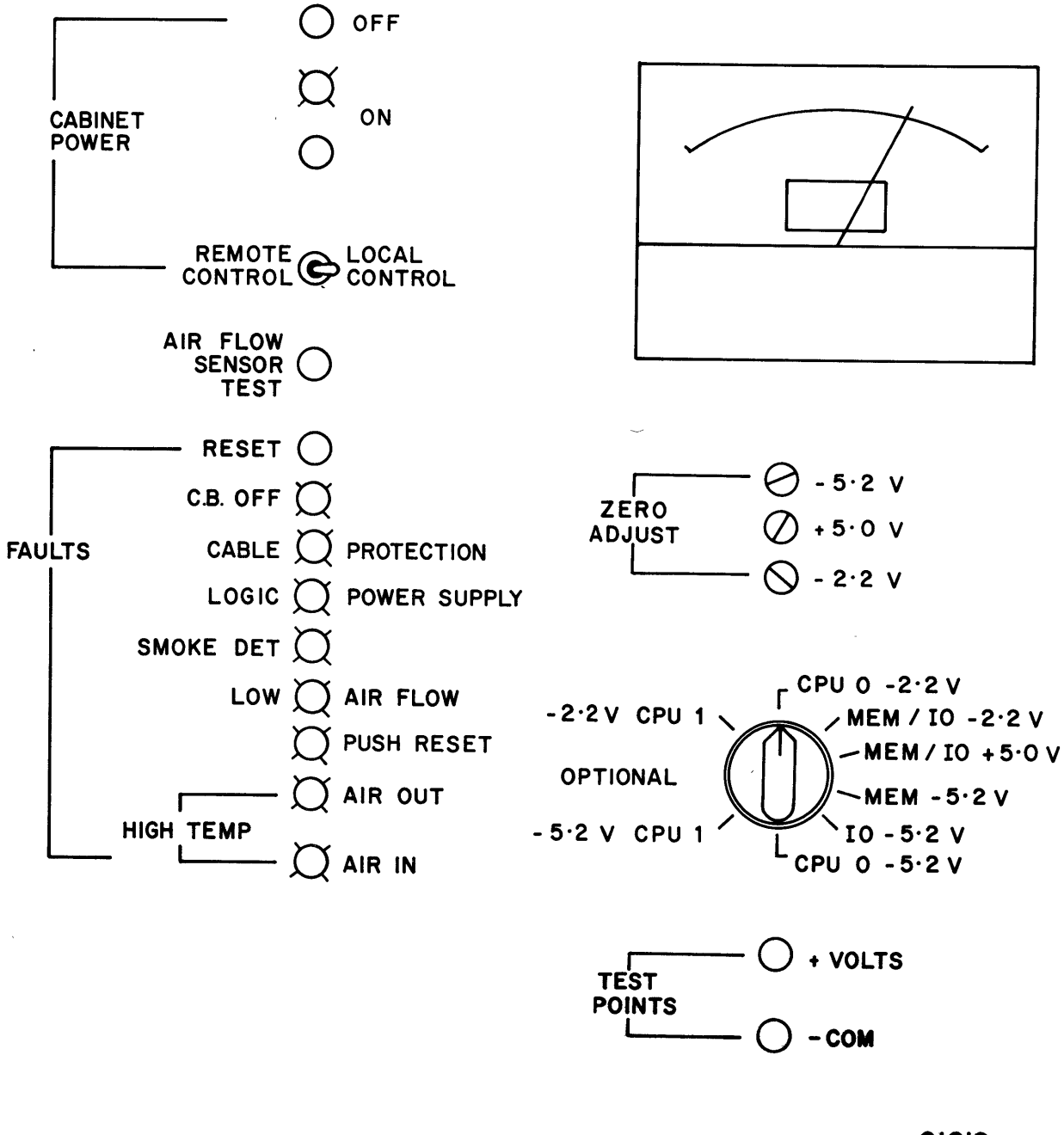


Figure I-3. Fault Indicators and Voltage Percent Meter

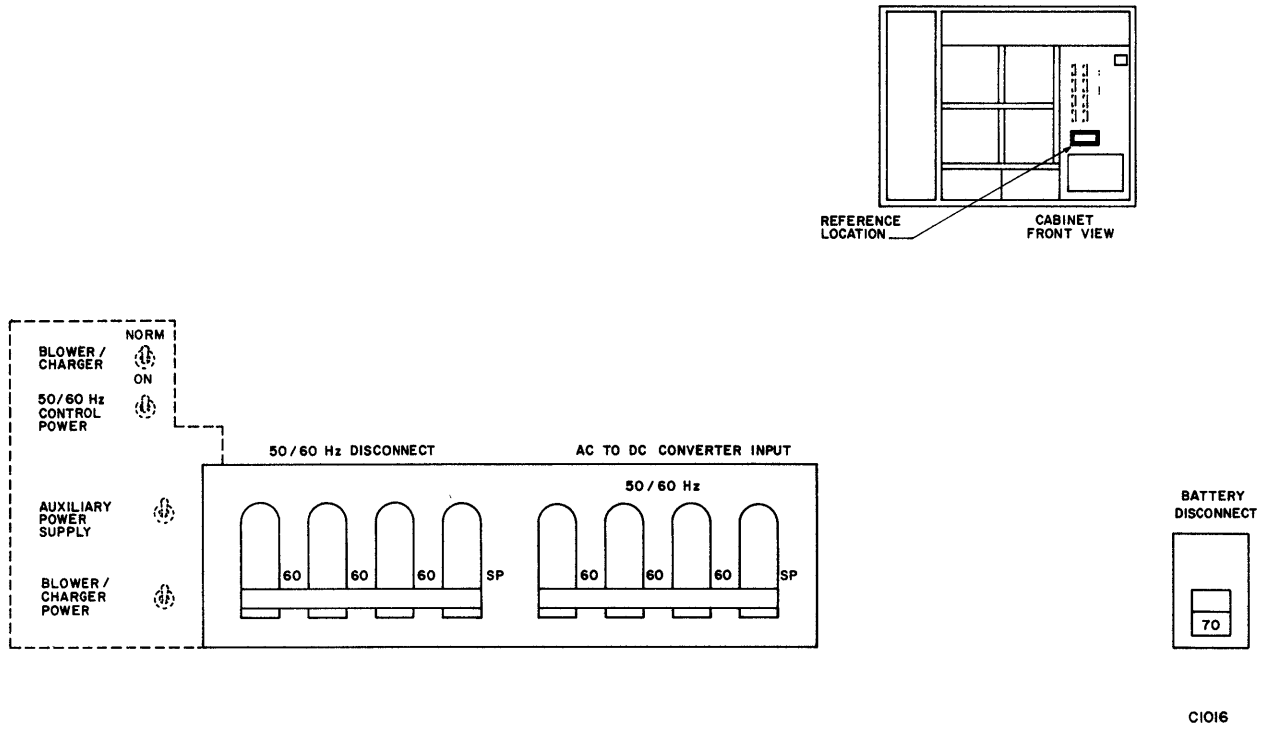


Figure I-4. Circuit Breakers

APPENDIX J

SYSTEM POWER CONTROL PANEL SETTINGS

Use the following procedures to apply power to the MG set from the SPCP in the event voltage adjustments are necessary.

NOTE

When the MG is to be powered up without the mainframe, jump J7 to J8 with a jumper wire before applying power.

MG SET POWER APPLICATION

This procedure requires a digital voltmeter (Flake model 8020A or equivalent).

____ 1. Set 50/60-Hz and 400 Hz wall mounted circuit breaker for SPCP to ON.

____ 2. Press and release REMOTE ENABLE/LOCAL START button on SPCP.

____ 3. Allow MG set to stabilize for at least one minute.

____ 4. Adjust MG set output voltage as follows:

____ a) Locate TB2 inside the SPCP. See figure J-1.

____ b) Connect the voltmeter between TB2-6 (neutral) and successively TB2-3/4/5 (three phases). Record voltage readings:

TB2-3 _____
TB2-4 _____
TB2-5 _____

____ c) Circle the phase voltage reading which is between the other two phases in step 4b above. Connect the voltmeter between this and TB2-6.

____ d) Adjust VOLTAGE ADJUST setscrew on front of SPCP until the voltmeter indicates 120 V ac.

____ 5. Read 400 Hz VOLTAGE meter in front of SPCP. Adjust potentiometer R95 (figure J-1) in SPCP until meter indicates 0 percent.

SPCP POWER APPLICATION

Use the following procedures to apply 50/60-Hz power to the SPCP.

____ 1. Apply 50/60 Hz power as follows:

____ a) Set LOCAL/REMOTE switch on left side of SPCP to LOCAL.

____ b) Set SYSTEM DISCONNECT switch on left side of SPCP to ON.

____ c) Set wall-mounted 50/60 Hz circuit breaker for SPCP to ON.

____ 2. Verify that the following conditions are present:

____ a) The SPCP fan is running.

____ b) POWER AVAILABLE indicator is lit.

____ c) Fuse indicators F1, F2, F3 are not lit.

NOTE

If conditions are not as listed, check all electrical connections to ensure that they are correct.

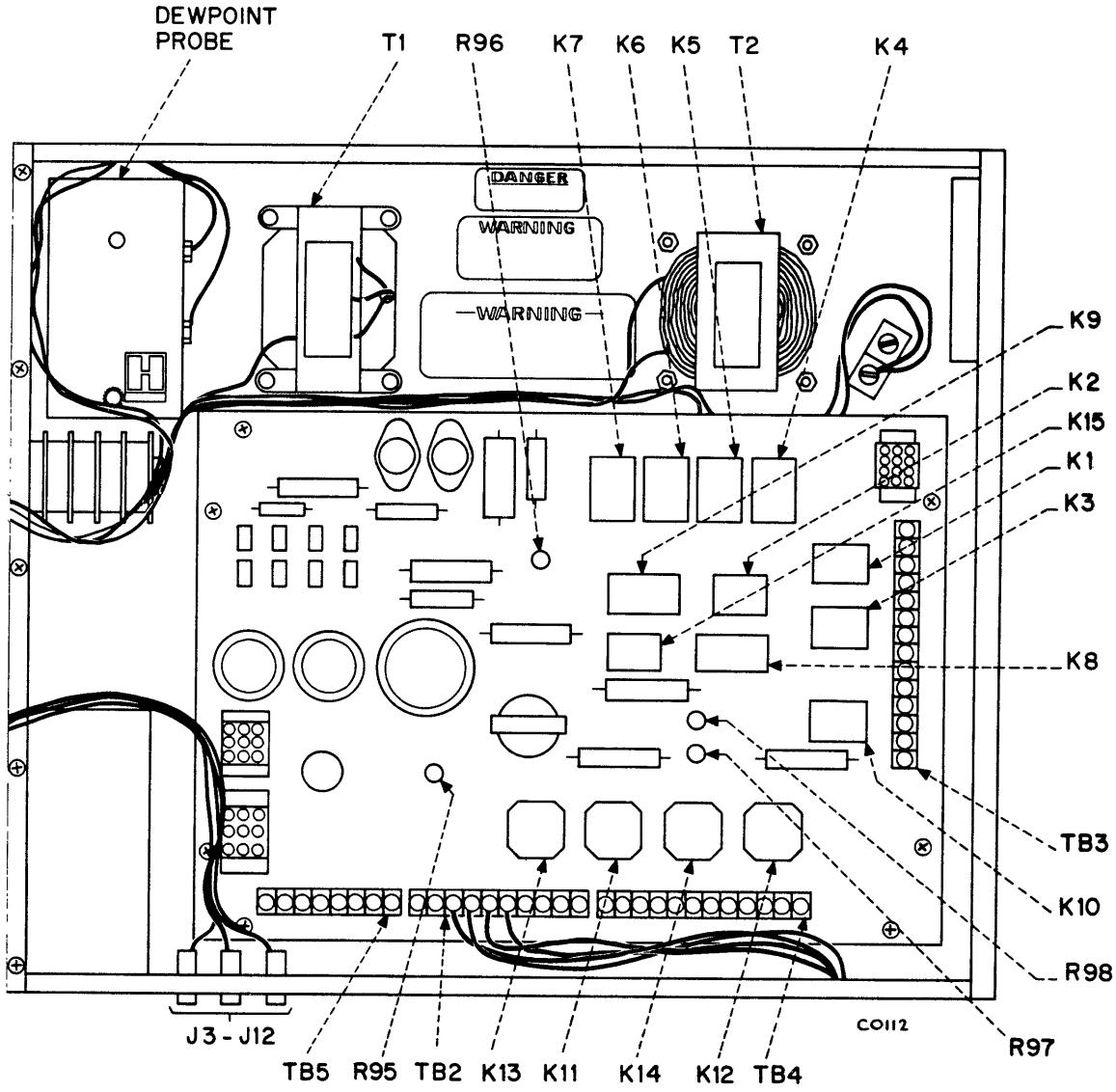


Figure J-1. System Power Control Panel - Internal View

S1 - Remote enable local start switch
S2 - Stop switch
M1 - 400 Hz voltage meter
M2 - Running hours meter
T1 - Transformer #1
T2 - Transformer #2
R1 - 120V, Voltage adjust variable resistor
R95 - 0 percent adjust variable resistor
R96 - 2.5 second adjust variable resistor
R97 - 2 minutes adjust variable resistor
R98 - 0 minute adjust variable resistor
TB2 - Terminal Block
TB3 - Terminal Block
TB4 - Terminal Block
TB5 - Terminal Block
K1 - Relay
K2 - Relay
K3 - Relay
K4 - Relay
K5 - Relay
K6 - Relay
K7 - Relay
K8 - Relay
K9 - Relay
K10 - Relay
K11 - Relay
K12 - Relay
K13 - Relay
K14 - Relay
K15 - Relay
L1 - Power on indicator light
L2 - Power available indicator light
F1 - 0.125A fuse
F2 - 5A fuse
F3 - 0.5A fuse

Notes for Figure J-1. System Power Control Panel - Internal View

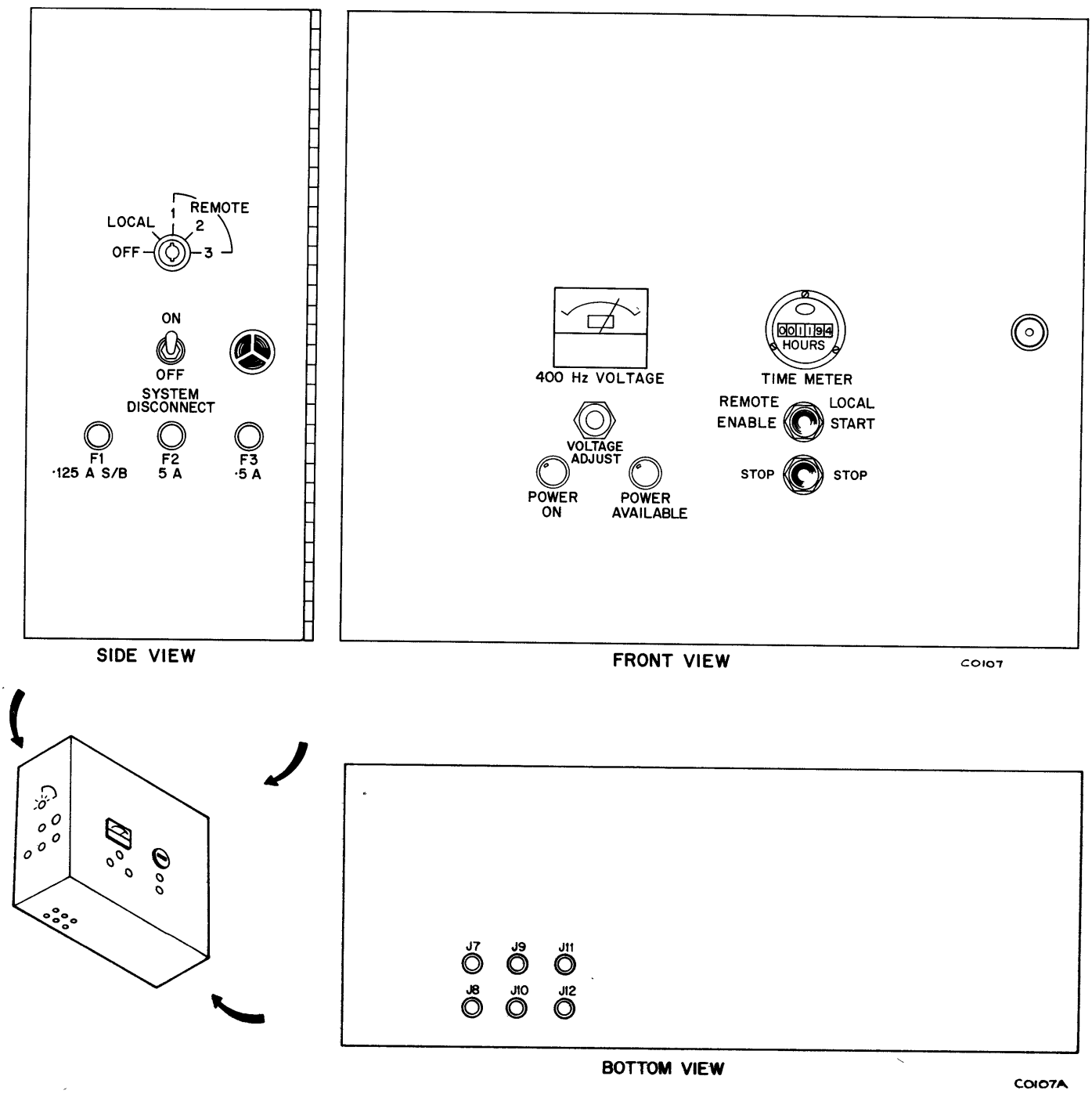


Figure J-2. SPCP-Front, Side, and Bottom Views

Local/Remote Setting on SPCP and Cabinet for Power On

	SPCP LOCAL/ REMOTE SETTING	CABINET LOCAL/ REMOTE SETTING
12.5-kVA MG system or systems sharing an MG controlled by another SPCP or TMCP (no SPCP)	Not applicable	LOCAL MG and mainframe are powered on by pressing CABINET POWER ON switch on 50/60-Hz Power Control Box.
25-kVA M-G system (with SPCP)	LOCAL Set SYSTEM DISCONNECT Switch to ON. Power on MG by pressing REMOTE ENABLE/ LOCAL START switch on SPCP, and holding for two seconds.	LOCAL After MG is powered on for approximately 1 minute, power on mainframe by pressing CABINET POWER ON switch on 50/60-Hz Power Control Box.
25-kVA MG system (with SPCP)	LOCAL Set SYSTEM DISCONNECT switch to ON. Power on MG by pressing REMOTE ENABLE/ LOCAL START switch and holding for two seconds.	REMOTE System (mainframe and MG) is powered on by pressing REMOTE ENABLE/ LOCAL START switch on SPCP.
25-kVA M-G system (with SPCP)	REMOTE 1/2/3 (See Hardware Operator's Guide for description.)	REMOTE

COMMENT SHEET

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Plus Options Installation and Checkout

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