IMPRIMIS

Now a part of Seagate Technology

FIXED STORAGE DRIVE (300/340/515 MB)

PA5XX SMD INTERFACE

GENERAL DESCRIPTION

OPERATION

INSTALLATION AND CHECKOUT

USER'S MANUAL

83327120

WARNING

Do not attempt to install, operate, or repair the unit before you read the important safety information located directly after the revision record in this manual. Failure to follow that and other safety precautions in this manual could cause injury to yourself and others.

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

VORSICHT

Versuchen Sie nicht, das Gerät zu installieren, zu betreiben oder zu reparieren bevor Sie die in der Anlage C aufgeführten Installations- und Betriebserfordernisse sorgfältig gelesen haben. Die Nichtbeachtung dieser und weiterer in diesem Manual gegebenen Informationen kann Verletzungen Ihrer selsbt und Anderer zur Folge haben.

AVERTISSEMENT

Ne tentez pas d'installer, de mettre en marche, ou de dépanner cet appareil avant d'avoir lû les instructions d'installation et de fonctionnement données dans l'appendice D. A défaut d'observer ceci ainsi que les autres informations de ce manuel vous pourriez mettre votre propre santé en danger, ou celle d'autrui.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

PRECAUCION

No intente instala, operar ó reparar está unidad antes de leer los requerimientos de instalación y operación dados en el Apéndice E. Cualquier negli gencia en seguir esta u otra información dada en esta manual puede causarle daños a uno mismo u otros.

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REVISION RECORD

REVISION	DESCRIPTION
A (6-1-88)	Original release documenting series codes 01 thru 23 units. This publication and publication 83327110 replace publications 83324760 and 83325220.
B (01-09-89)	Incorporated the following series codes 24 and 25 changes: ECO DJ30840, technical changes, and editorial changes.
C (06-01-89)	Incorporated the following series codes 26 and 27 changes: ECO DJ30911, technical changes, and editorial changes.

REVISION LETTERS I, O, Q AND X ARE NOT USED.

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Technical Publications Department
5950 Clearwater Drive
Minnetonka, MN 55343

We value your comments. A Comment Sheet is provided at the back of this manual.

Printed in the United States of America

EQUIPMENT LIST

This manual applies to the equipments listed in table f-1.

TABLE f-1. EQUIPMENT LIST

Equipment Number	Interface	Power Supply	Other Characteristics
PA5G1A	SMD-0, S Ch	Remote	340 MB
PA5G1B	SMD-0, S Ch	Remote	340 MB
PA5G1C	SMD-0, S Ch	Remote	340 MB
PA5G1D	SMD-0, S Ch	Integral	340 MB
PA5G1F	SMD-0, S Ch	Integral	340 MB
PA5G1G	SMD-0, S Ch	Integral	340 MB
PA5G1K	SMD-0, S Ch	Remote	340 MB
PA5G1L	SMD-0, S Ch	Integral	340 MB
PA5G1M	SMD-0, S Ch	Integral	340 MB
PA5G1N	SMD-0, S Ch	Integral	340 MB
PA5G1R	SMD-0, S Ch	Integral	340 MB
PA5G1S	SMD-0, S Ch	Integral	340 MB
PA5G1T	SMD-0, S Ch	Integral	340 MB
PA5G1U	SMD-0, S Ch	Integral	340 MB
PA5G2A	SMD-0, D Ch	Remote	340 MB
PA5G2B	SMD-0, D Ch	Remote	340 MB
PA5G2C	SMD-0, D Ch	Integral	340 MB
PA5G2D	SMD-0, D Ch	Integral	340 MB
PA5G2E	SMD-0, D Ch	Integral	340 MB
PA5G2G	SMD-E, D Ch	Integral	340 MB
PA5G2J	SMD-0, S Ch	Integral	340 MB
PA5G2K	SMD-0, D Ch	Remote	340 MB
PA5G2M	SMD-0, D Ch	Integral	340 MB
PA5J1A	SMD-0, S Ch	Remote	300 MB
PA5J1B	SMD-0, S Ch	Integral	300 MB

Continued on Next Page

TABLE f-1. EQUIPMENT LIST (Contd)

Equipment Number	Interface	Power Supply	Other Characteristics
PA5J1C	SMD-0, S Ch	Integral	300 MB
PA5J1D	SMD-0, S Ch	Integral	300 MB
PA5J2A	SMD-0, D Ch	Remote	300 MB
PA5J2B	SMD-0, D Ch	Integral	300 MB
PA5J2C	SMD-0, D Ch	Integral	300 MB
PA5N1A	SMD-0, S Ch	Remote	515 MB
PA5N1B	SMD-0, S Ch	Integral	515 MB
PA5N1C	SMD-0, S Ch	Integral	515 MB
PA5N1D	SMD-0, S Ch	Integral	515 MB
PA5N1E	SMD-0, S Ch	Integral	515 MB
PA5N1F	SMD-0, S Ch	Remote	515 MB
PA5N1G	SMD-0, S Ch	Integral	515 MB
PA5N1H	SMD-0, S Ch	Integral	515 MB
PA5N1K	SMD-0, S Ch	Integral	515 MB
PA5N2A	SMD-0, D Ch	Remote	515 MB
PA5N2B	SMD-0, D Ch	Integral	515 MB
PA5N2C	SMD-E, D Ch	Integral	515 MB
PA5N2D	SMD-E, D Ch	Integral	515 MB
PA5N2E	SMD-0, D Ch	Integral	515 MB
PA5N2F	SMD-0, D Ch	Remote	515 MB
PA5N2G	SMD-0, D Ch	Integral	515 MB
PA5N2K	SMD-0, D Ch	Integral	515 MB
PA5Z1A	SMD-E, S Ch	Remote	515 MB
PA5Z1B	SMD-E, D Ch	Integral	515 MB
PA5Z1C	SMD-E, S Ch	Integral	515 MB
PA5Z2A	SMD-E, D Ch	Remote	515 MB
PA5Z2B	SMD-E, D Ch	Integral	515 MB
PA5Z2C	SMD-E, D Ch	Integral	515 MB
PA5Z2D	SMD-E, D Ch	Integral	515 MB

LIST OF EFFECTIVE PAGES

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D-3	A
D-4	A
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D-7	A
D-8	A
App E Div	-
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Rtn Env	-
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Cover	-

PREFACE

This manual contains user information for the Imprimis PA5XX 300/340/515 MB Fixed Storage Drives (FSDs). It provides instructions to all personnel who operate the FSD and to customer engineers who install and check out the FSD. Customer engineers who troubleshoot and repair FSDs should obtain copies of the manuals listed below. Refer to the Equipment List (table f-1) for a list of equipment numbers that this manual applies to.

Changes to this manual are indicated in the following ways:

- A vertical bar in the outer margin of a page marks a changed area.
- A dot by the page number indicates the entire page contains new or changed information.
- A vertical bar by the page number indicates the information was moved from another page, but there were no technical or editorial changes.

This manual is arranged into the following sections:

Section 1 - General Description. Describes equipment functions and specifications.

Section 2 - Operation. Describes and illustrates the location and use of all controls and indicators, and provides operating procedures.

Section 3 - Installation and Checkout. Describes site requirements, unpackaging and inspection, installation and checkout.

Appendix A - Diagnostic Testing and Status Code Summary. Provides simplified troubleshooting information.

Appendix B - Reference Material for Sector Selection. Provides additional information on sector selection.

Appendix C - Installation and Operating Requirements (German). Contains basic installation and operation information in the German language.

Appendix D - Installation and Operating Requirements (French). Contains basic installation and operation information in the French language.

Appendix E - Installation and Operating Requirements (Spanish). Contains basic installation and operation information in the Spanish language.

The following manuals apply to the FSD and are available from:

Imprimis Technology Incorporated
Customer Services
5950 Clearwater Drive
Minnetonka, MN 55343

Phone: (612) 931-8612
Fax: (612) 931-8817

Publication Number	Title
83327120	PA5XX 300/340/515 MB Users Manual (contains general description, operation, and installation/checkout information)
83327110	PA5XX 300/340/515 MB Parts Data Manual
83327340	PA5XX 300/340/515 MB Maintenance Manual (contains general maintenance, trouble analysis, and repair/replacement information)
83327250	PA5XX 300/340/515 MB Theory Manual
83327020	PA5XX 300/340/515 MB Diagrams Manual
83325450	PA5Z2C Special Supplement
83325320	A Guide for the Disk Drive Operator
83325360	Reference Card (provides status code and diagnostics information)

The following manuals that did apply to the SMD interface FSD have been obsoleted and replaced: 83324760, 83324770, 83324780, 83325220, 83325230, 83325240, 83325480, 83325530, and 83325540.

CONTENTS

A. DIAGNOSTIC TESTING AND STATUS CODE SUMMARY

FIGURES

TABLES

IMPORTANT SAFETY INFORMATION AND PRECAUTIONS

Use of proper safety and repair techniques is important for safe, reliable operation of this unit. Service should be done only by qualified persons. We recommend the procedures in this manual as effective ways of servicing the unit. Some procedures require the use of special tools. For proper maintenance and safety, you must use these tools as recommended.

The procedures in this manual and labels on the unit contain warnings and cautions that must be carefully read and followed to minimize or eliminate the risk of personal injury. The warnings point out conditions or practices that may endanger you or others. The cautions point out conditions or practices that may damage the unit, possibly making it unsafe for use.

You must also understand that these warnings and cautions are not exhaustive. We cannot possibly know, evaluate, and advise you of all the ways in which maintenance might be performed or the possible risk of each technique. Consequently, we have not completed any such broad evaluation. If you use a non-approved procedure or tool, first ensure that the method you choose will not risk either your safety or unit performance.

For the safety of yourself and others, observe the following warnings and precautions.

- Perform all maintenance by following the procedures in this manual.
- Follow all cautions and warnings in the procedures and on unit labels.
- Use the special tools called out in the procedures.
- Use sound safety practices when operating or repairing the unit.
- Use caution when troubleshooting a unit that has voltages present. Remove power from unit before servicing or replacing parts.
- Wear safety glasses when servicing units.
- Wear safety shoes when removing or replacing heavy parts.

(continued on next page)

- Use only designated Imprimis replacement parts. Non-Imprimis replacement parts can adversely affect safety in addition to degrading reliability, increasing maintenance downtime, and voiding warranty coverage.

- Use care while working with the power supply because line voltages are present. For complete safety, remove the ac power plug from the site power outlet.

- In case of fire or other emergency, isolate the drive from main power by removing the drive power plug from the ac outlet. In situations where pulling the plug is not possible or practical, use the system main power disconnect to isolate the drives from main power.

- When the drive is mounted in an equipment rack or cabinet, ensure that the internal temperature of the rack or cabinet will not exceed the limits defined for the drive. Where units are stacked vertically, pay special attention to the top where temperatures are usually highest.

- Follow the precautions listed under Electrostatic Discharge Protection in section 3 of this manual.

- Do not attempt to disassemble the module. It is not field repairable. Replace the entire module assembly if it is defective.

- Do not operate the drive over an extended period of time without the top cover installed.

- Always deenergize drive before removing or installing circuit boards, cables, or any other electrical components.

- This drive is designed to be installed and operated in accordance with IEC380, IEC435, VDE805, and VDE806.

- This drive must be connected to a power distribution system that has a direct connection to earth ground (TT network).

ABBREVIATIONS

A	Ampere
ABV	Above
ac	Alternating Current
ADD	Address
ADDR	Address
ADJ	Adjust
ADRS	Address
AGC	Automatic Gain Control
ALT	Alternate
AM	Address Mark
AME	Address Mark Enable
AMP	Amplifier, Ampere
ASSY	Assembly
BLW	Below
C	Celsius
CB	Circuit Breaker
CDA	Complete Drive Assembly
CH	Channel
CHK	Check
CLK	Clock
CLR	Clear
cm	Centimetre
CNTR	Counter
COMP	Comparator
CONT	Control
CONTD	Continued
CT	Center Tap
CYL	Cylinder
D/A	Digital to Analog
dc	Direct Current
DET	Detect
DIFF	Differential
DIV	Division
DLY	Delay
DRVR	Driver
ECL	Emitter Coupled Logic
ECO	Engineering Change Order
EN	Enable
ENBL	Enable

ABBREVIATIONS (Contd)

EXT	External
F	Fahrenheit, Fuse
FCO	Field Change Order
FDBK	Feedback
FIG	Figure
FLT	Fault
FRU	Field Replaceable Unit
FSD	Fixed Storage Drive
ft	Foot
FTU	Field Test Unit
FWD	Forward
GND	Ground
HD	Head
HEX	Hexagon
Hg	Mercury
HR	High Resolution
HYST	Hysteresis
Hz	Hertz
IC	Integrated Circuit
IDENT	Identification
in	Inch
IND	Index
INTRPT	Interrupt
I/O	Input/Output
IPB	Illustrated Parts Breakdown
IPS	Inches per Second
kg	Kilogram
kPa	Kilopascal
kW	Kilowatt
lb	Pound
lbf	Pounds-Force
LED	Light Emitting Diode
LSI	Large Scale Integration
LTD	Lock to Data
m	Metre
MAX	Maximum
MB	Megabyte
MEM	Memory
MHz	Megahertz
mm	Millimetre

ABBREVIATIONS (Contd)

MPU	Microprocessor Unit	PS	Power Supply
MRK	Mark	PWR	Power Supply
ms	Millisecond	RCVR	Receiver
MTR	Motor	RD	Read
mV	Millivolt	RDY	Ready
N	Newton	REF	Reference
NC	No Connection	REQ	Request
NORM	Normal	RES	Resolution
NRZ	Non Return to Zero	REV	Reverse, Revision
ns	Nanosecond	RGTR	Register
OC	On Cylinder	r/min	Revolutions Per Minute
OS	One-Shot	RTZ	Return to Zero
OSC	Oscillator	R/W	Read/Write
P	Plug	s	Second
PD	Peak Detect	S/C	Series Code
pF	Picofarad	SEC	Second
PG	Page	SEL	Select
PHH	Phillips Head	SEQ	Sequence
PLO	Phase Lock Oscillator	SPD	Speed
PROC	Procedure	SS	Sector Switch
PROG	Programmable	T	Tracks to go

ABBREVIATIONS (Contd)

TF	Thread Forming
TIM	Timer
TP	Test Point
TSP	Troubleshooting Procedure
TTL	Transistor-Transistor Logic
V	Volts, Voltage
Vbb	Bias Voltage
VCC	Bias Voltage
VCO	Voltage Controlled Oscillator
W	Watts
W/	With
W/O	Without
W PROT	Write Protect
W+R	Write or Read
W·R	Write and Read
WRT	Write
XFR	Transfer
Ω	Ohms
$	Hexadecimal Address
uF	Microfarad
us	Microsecond

SECTION 1

GENERAL DESCRIPTION

GENERAL DESCRIPTION 1

INTRODUCTION

The Imprimis PA5G1/PA5G2, PA5J1/PA5J2, PA5N1/PA5N2, and PA5Z1/PA5Z2 Fixed Storage Drives (FSDs) are high speed, random access digital data storage devices that connect to a central processor through a controller. All the equipment specifications for the drives are listed in table 1-1.

The remainder of this section provides a general description of the drives and is divided into the following areas:

- Equipment Interface Description -- Describes available drive interfaces.
- Equipment Functional Description -- Explains the basic function of the drive.
- Equipment Physical Description -- Provides a basic description of the drive's physical characteristics.
- Equipment Configuration -- Describes the various drive configurations and how to identify them.

EQUIPMENT INTERFACE DESCRIPTION

The drive can be configured to operate with either a standard (SMD-O) or an enhanced (SMD-E) interface. Refer to section 3 of this manual for definitions of signals on the interface cables (under Interface Requirements). Section 3 also contains instructions on selecting the various interface options available (under Setting Circuit Board Switches). Refer to the theory manual for a complete description of interface functions.

EQUIPMENT FUNCTIONAL DESCRIPTION

The drive contains all the circuits and mechanical devices necessary to record data on and recover it from its disks. The necessary power for this is provided by the power supply, which receives its input power from the site main power source.

TABLE 1-1. DRIVE SPECIFICATIONS

Characteristics	Conditions	Specifications
Size	Dimensions	See Space Requirements in Section 3
	Weight	
	Drive	31.7 kg (70.0 lb)
	Power Supply	5.4 kg (12.0 lb)
Interface	SMD-0/SMD-E	
Recording	Total Capacity (Unformatted)	
	PA5G1/PA5G2	340 megabytes
	PA5J1/PA5J2	300 megabytes
	PA5N1/PA5N2, PA5Z1/PA5Z2	515 megabytes
	Bytes per track	
	300/340 MB	20 160 bytes
	515 MB	30 240 bytes
	Number of disks	
	300 MB	7
	340/515 MB	8
	Movable data heads	
	300 MB	19
	340/515 MB	24
	Servo Heads	1
	Physical heads per surface	2
	Logical cylinders per head/disk assy	
	300 MB	823 (0-822)
	340/515 MB	711 (0-710)
	Modulation	
	300/340 MB	MFM
	515 MB	2-7 code
Transfer rate	Disk speed at 3600 r/min	
	300/340 MB	9.677 MHz (1.2 MB/s)
	515 MB	14.52 MHz (1.8 MB/s)

Continued

TABLE 1-1. DRIVE SPECIFICATIONS (Contd)

Characteristics	Conditions	Specifications
Latency		Latency is time to reach a particular track address after positioning is complete.
	Average	8.33 milliseconds (disk rotation speed at 3600 r/min)
	Maximum	16.83 milliseconds (disk rotation speed at 3564 r/min)
Seek Time	Full	
	300 MB	45 milliseconds
	340/515 MB	40 milliseconds
	Average	
	300 MB	20 milliseconds
	340/515 MB	18 milliseconds
	Single Track	5 milliseconds maximum
Start Time		35 seconds typical 45 seconds maximum
Stop Time		35 seconds typical 45 seconds maximum

All functions performed by the drive are done under direction of the controller. The controller communicates with the drive via the interface which consists of a number of I/O lines carrying the necessary signals to and from the drive.

Some interface lines, including those that carry commands to the drive, are not enabled unless the drive is selected by the controller. Unit selection allows the controller, which can be connected to more than one drive, to initiate and direct an operation on a specific drive.

All operations performed by the drive are related to data storage and recovery (normally referred to as writing and reading). The actual reading and writing is performed by electromagnetic devices called heads that are positioned over the recording surfaces of the rotating disks. There are two heads for each disk surface, and the heads are positioned in

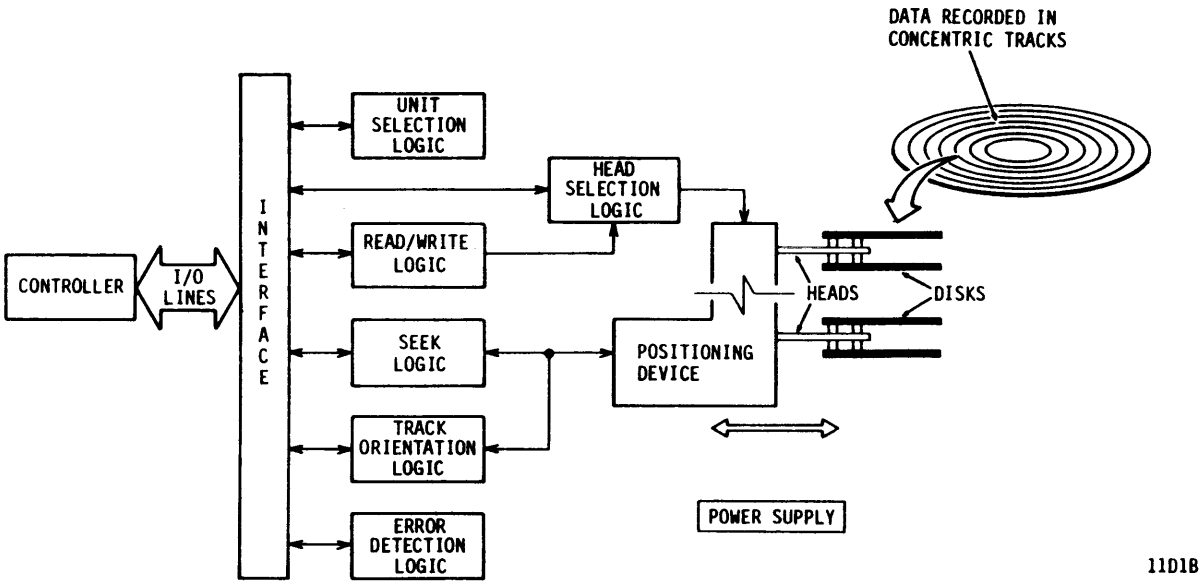


Figure 1-1. Drive Functional Block Diagram

such a way that data is written in concentric tracks around the disk surfaces (see figure 1-1).

Before any read or write operation can be performed, the controller must instruct the drive to position the heads over the desired track (called seeking) and also to use the head located over the surface (head selection) where the operation is to be performed.

After selecting a head and arriving at the data track, the controller still must locate that portion of the track on which the data is to be written or read. This is called track orientation and is done by using the Index and Sector signals generated by the drive. The Index signal indicates the logical beginning of each track, and the Sector signals are used by the controller to determine the position of the head on the track with respect to Index.

When the desired location is reached, the controller commands the drive to actually read or write the data. During a read operation, the drive recovers data from the disks and transmits it to the controller. During a write operation, the drive receives data from the controller, processes it, and writes it on the disks.

The drive is also capable of recognizing certain errors that may occur during its operation. When an error is detected, it is indicated either by a signal to the controller or by a maintenance indicator on the drive itself.

EQUIPMENT PHYSICAL DESCRIPTION

The following paragraphs provide a physical description of the drive. The components mentioned in this discussion are identified in figure 1-2.

A drive installation requires a drive, interconnecting cabling, and a power supply. Site power enters the power supply via the ac power cable. The power supply develops the dc voltages required by the drive. These voltages are supplied to the drive by the dc power cable.

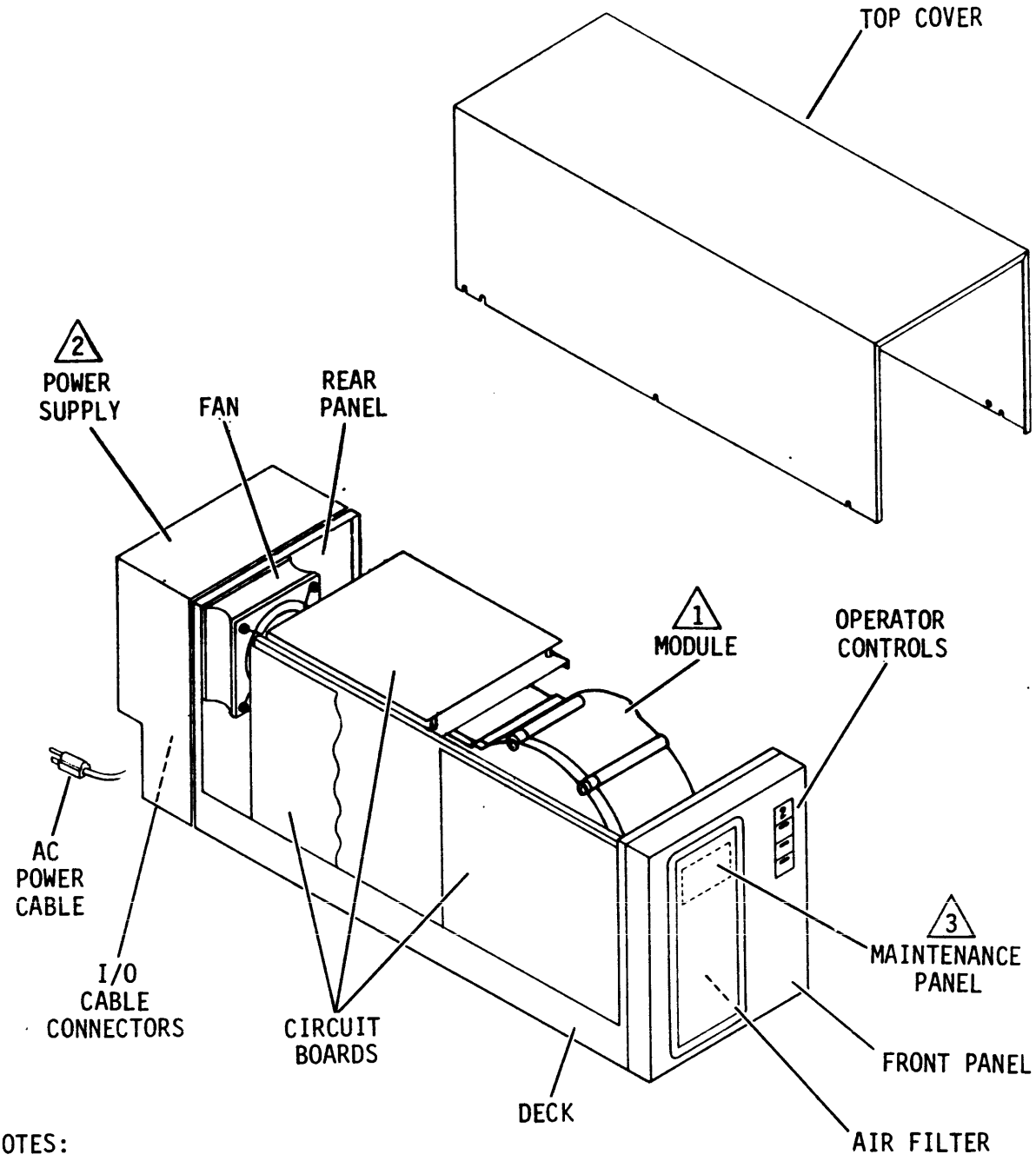
The drive package includes a deck, front and rear panels, and a top cover. Air flow is provided by a fan, mounted on the rear panel, to circulate cooling air around the electronic assemblies. This air enters a port in the front panel, passes through an air filter, and exhausts through the rear panel opening.

The drive front panel contains the operator controls and the maintenance panel (located behind front panel insert and filter). The operator controls consist of the logic plug and all switches and indicators used by the operator to control normal operation of the drive.

The drive's internal components include a set of circuit boards and a module. The circuit boards are interconnected through a mother board, and they contain the electronics required for drive operation. The module is a sealed unit containing the electromechanical components used for data storage and retrieval. These components include the disks, spindle, drive motor, actuator, and heads.

The disks provide the recording medium for the drive. These disks are center-mounted on a spindle, and the spindle is coupled directly to the drive motor. When activated, the drive motor rotates the disks at 3600 r/min and also produces a circulation of air within the sealed module.

The actuator is the assembly that holds the heads and moves the heads over the rotating disks. There are 25 (20 on 300 MB drives) heads; a servo head to control actuator positioning, and 24 (19 on 300 MB drives) data heads used for data transfers to and from the disks. The actuator has a voice coil which moves in and out of a permanent magnetic field in response to signals from the servo positioning circuitry. The voice coil forces the actuator carriage to roll on parallel rails to move the heads accurately across the disk surfaces. When the drive is not in use, the heads rest on the disk surface in the preassigned landing zone (beyond the data zone in the outer area of the disk surface). The actuator is automatically latched in this position, at shutdown, for moving or shipping



NOTES:

1. MODULE CONTAINS THE DISKS, SPINDLE, DRIVE MOTOR, ACTUATOR, AND HEADS.

2. SHOWN WITH INTEGRAL POWER SUPPLY. A REMOTE POWER SUPPLY IS ALSO AVAILABLE.

3. LOCATED BEHIND FRONT PANEL INSERT.

11D5C

Figure 1-2. Drive Major Assemblies

protection. When the drive is activated to bring the disks up to speed, the heads fly on a cushion of air close to the disk surface.

A complete listing of field-replaceable parts is given in the parts data manual. Refer to the theory manual for theory of operation of the drive components.

EQUIPMENT CONFIGURATION

The equipment configuration is identified by labels on the drive and the power supply, and by the Equipment Configuration Log. It is necessary to identify the equipment configuration to determine if the manuals being used are applicable to the equipment. The following describes equipment identification, the Equipment Configuration Log, and the FCO list that is in the parts data manual.

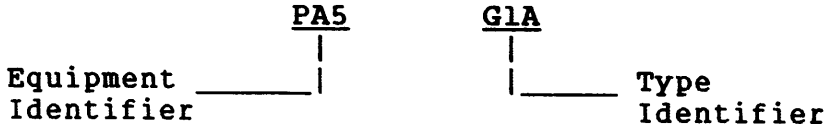
EQUIPMENT IDENTIFICATION

The equipment is identified by labels attached to the drive and to the power supply. The labels identify the basic mechanical and logical configuration of the drive at the time it leaves the factory, and lists the site power requirements for the power supply. The information contained on these labels is defined in the following paragraphs. Refer to the parts data manual for sample drive identification labels and their locations.

Equipment Number

The equipment number is divided into the two parts shown in the example:

EXAMPLE:



The equipment identifier indicates the basic functional capabilities of the drive.

The type identifier indicates differences between drives that have the same equipment identifier. These differences are necessary to adapt a drive to specific system requirements. However, they do not change the overall capabilities of the drive as defined in table 1-1.

Series Code

The series code represents a time period within which a unit is built. All units are interchangeable at the system level, regardless of series code; however, parts differences may exist within units built in different series codes. When a parts difference exists, that difference is noted in the parts data manual.

Part Number

The equipment identification label on the drive contains the part number for the basic disk storage drive. Another label on the drive contains the part number for the equipment package. This number identifies the complete list of parts (drive, power supply, painted panels, etc.) shipped with the drive.

Serial Number

Each drive has a unique serial number assigned to it. Serial numbers are assigned sequentially within a family of drives. Therefore, no two equipments will have the same serial number.

EQUIPMENT CONFIGURATION LOG

Engineering Change Orders (ECOs) are electrical or mechanical changes that are performed at the factory and may cause a series code change. When the factory installs an ECO early (prior to a series code change), it is logged on the units Equipment Configuration Log.

Field Change Orders (FCOs) are electrical or mechanical changes that may be performed either at the factory or in the field. FCO changes do not affect the series code but are indicated by an entry on the Equipment Configuration Log that accompanies each machine. The components of a machine with an FCO installed may not be interchangeable with those of a machine without the FCO; therefore, it is important that you enter the FCO on the Equipment Configuration Log when you install an FCO.

MANUAL FCO LIST

Throughout the life cycle of a machine, changes are made, either in the factory build (a series code change) or by FCOs installed in the field. All of these changes are also reflected in changes to the manuals. In order to assure that

the manual matches the machine, refer to the manual FCO list located in the front of the parts data manual. This list records all the FCOs that are included in the manuals. It should agree with the machine Equipment Configuration Log if all the FCOs have also been installed in the machine.

SECTION 2

OPERATION

OPERATION 2

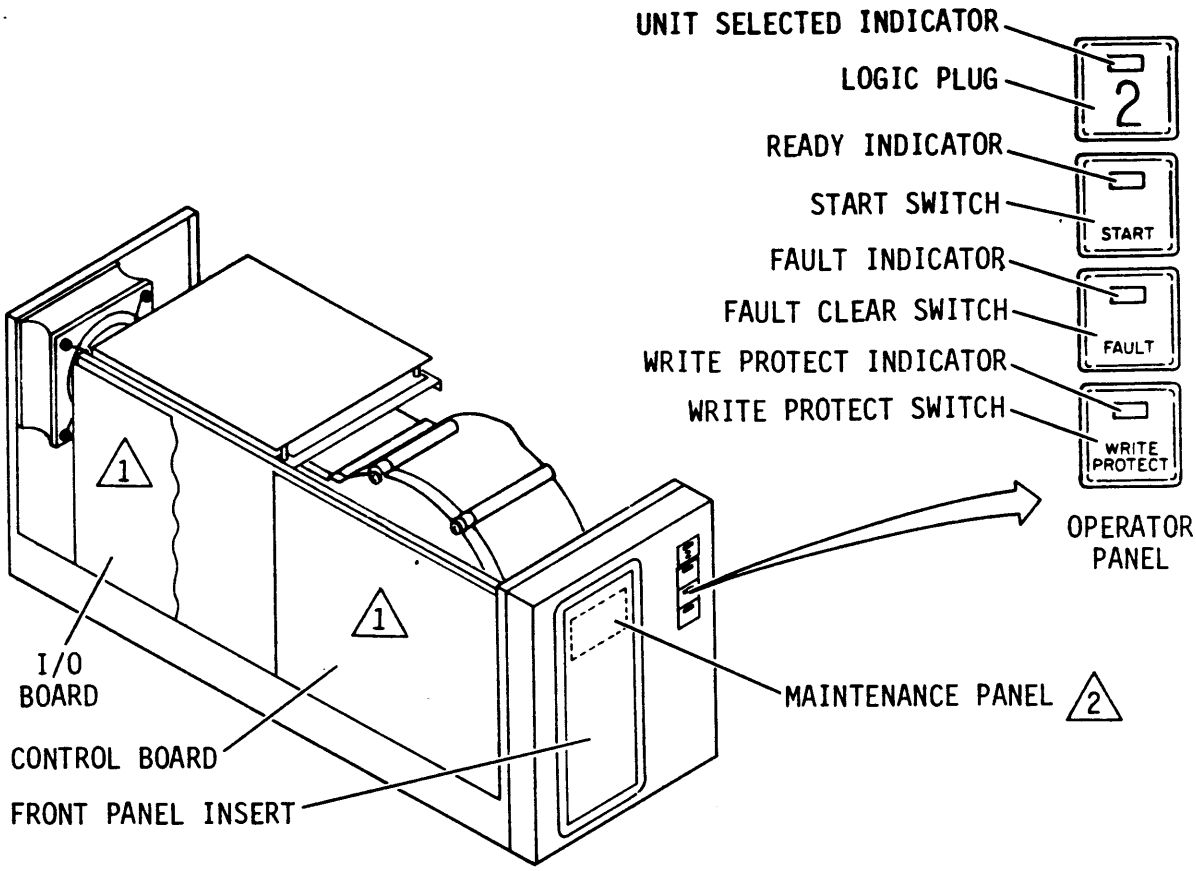
INTRODUCTION

This section provides the information and instructions to operate the drive. It is arranged as follows:

- Switches and Indicators -- locates and describes the switches and indicators used for normal drive operation.
- Power On Procedure -- describes how to turn on the drive.
- Power Off Procedure -- describes how to turn off the drive.
- Filter Replacement and Cleaning -- describes filter maintenance for the drive operator.

SWITCHES AND INDICATORS

Switches and indicators used by the operator are on the power supply and on the drive operator panel. Figure 2-1 shows these switches and indicators, and they are described in table 2-1. Refer to section 3 and to appendix A for information on switches that are not normally used by the drive operator.



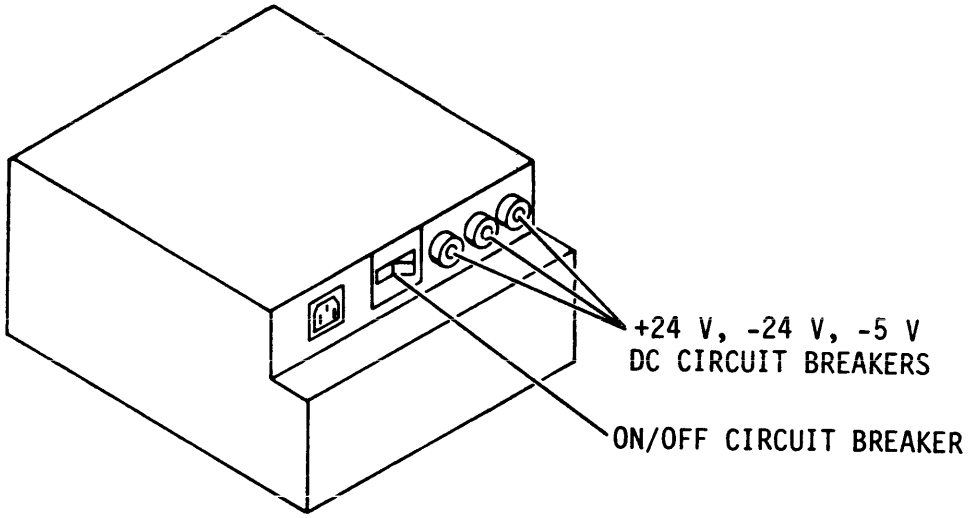
NOTES:

1. SWITCHES LOCATED ON CIRCUIT BOARDS ARE EXPLAINED IN SECTION 3.

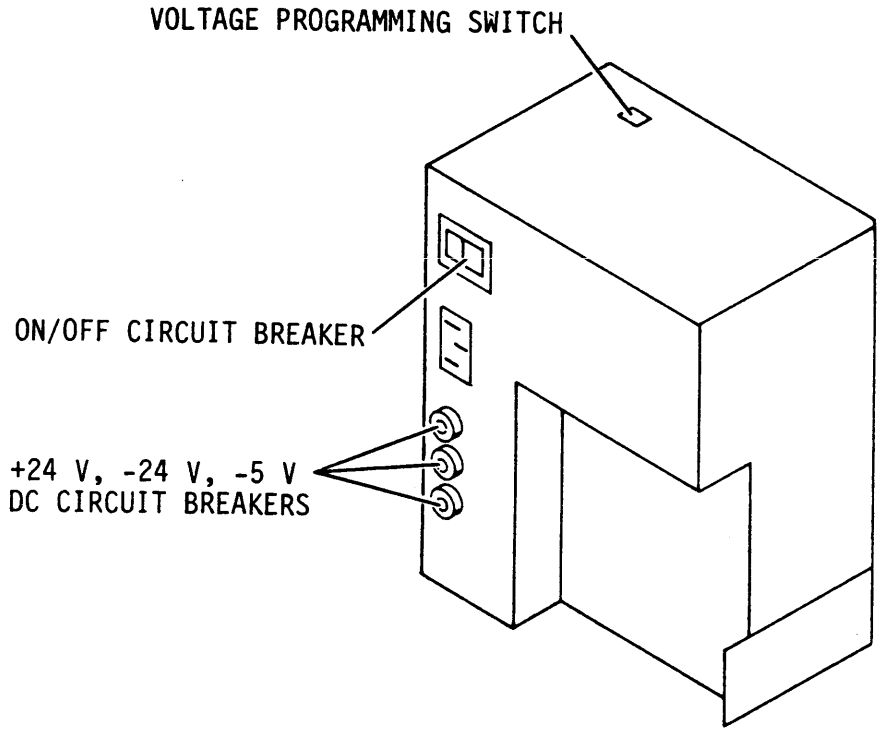
2. INDIVIDUAL FAULT INDICATORS AND ERROR CODE DISPLAY ARE VISIBLE ONLY WHEN FRONT PANEL INSERT AND FILTER ARE REMOVED.

11D2E

Figure 2-1. Switches and Indicators (Sheet 1 of 3)



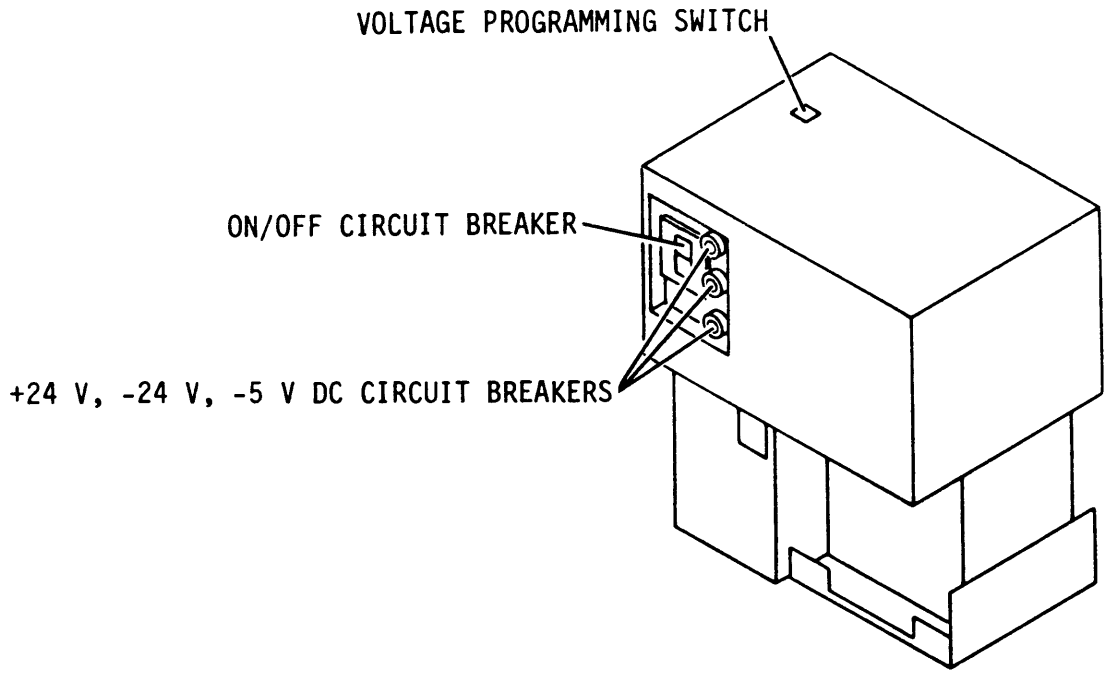
REMOTE POWER SUPPLY (P/N 728965XX)



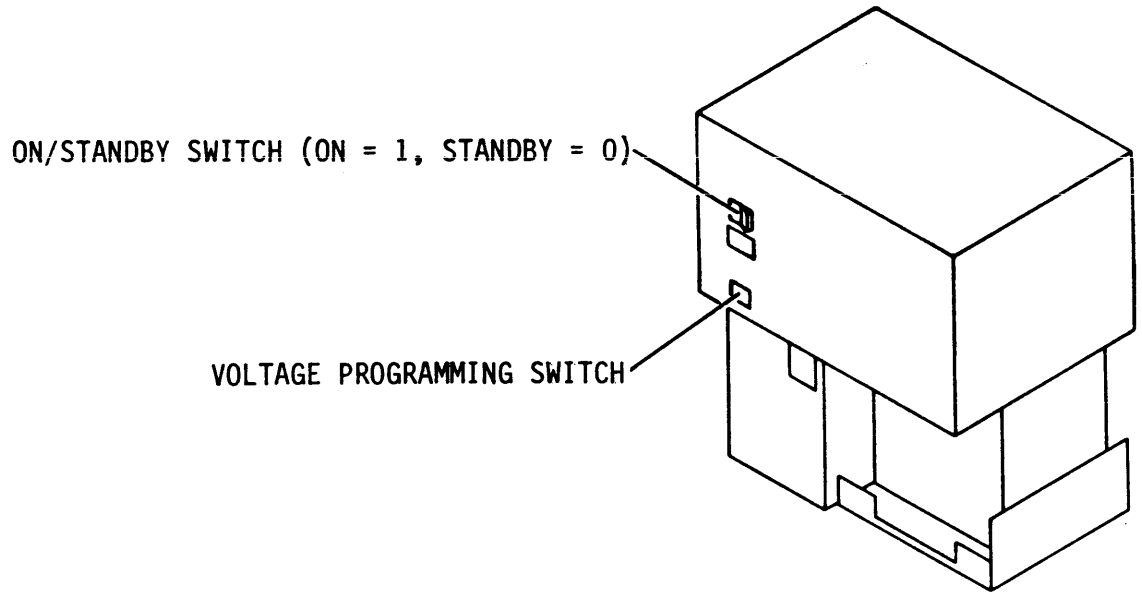
INTEGRAL POWER SUPPLY (P/N 81542300)

11D636

Figure 2-1. Switches and Indicators (Sheet 2)



INTEGRAL POWER SUPPLY (P/N 81542301/02/03)



INTEGRAL POWER SUPPLY (P/N 81542304)

11D637

Figure 2-1. Switches and Indicators (Sheet 3)

TABLE 2-1. DRIVE SWITCHES AND INDICATORS

Switch or Indicator	Function
POWER SUPPLY	
ON (1)/STANDBY (0) Switch (on newer integral supplies) and ON/OFF Circuit Breaker (on other supplies)	Applies dc operating voltages to the drive electronics and fan.
-24 V Circuit Breaker*	Protects the -24 V supply. To reset circuit breaker, press in pop-out element.
+24 V Circuit Breaker*	Protects the +24 V supply. To reset circuit breaker, press in pop-out element.
-5 V Circuit Breaker*	Protects the -5 V supply. To reset circuit breaker, press in pop-out element.
	The +5 and +40 V supplies are protected by current-limiting circuitry in the power supply.
Voltage Programming Switch	Refer to Power Supply Voltage Conversion procedure in section 3.
OPERATOR PANEL	
Logic Plug/Unit Selected Indicator	The logic plug activates switches that establish the logical address of the device. Logic plugs are available with numbers 0 through 15. The Unit Selected indicator is lit if drive is selected.

*Not found on all power supplies. Newer power supplies are internally protected.

Table Continued on Next Page

TABLE 2-1. DRIVE SWITCHES AND INDICATORS (Contd)

Switch or Indicator	Function
OPERATOR PANEL (Contd)	
START Switch/ Ready Indicator	The START switch has alternate action, in for Start and out for Stop, and it contains the Ready indicator. Pressing the START switch to the Start position enables the power on sequence. The Ready indicator flashes until the disks are up to speed, the heads are loaded, and there are no fault conditions. The Ready indicator is on steadily with power on complete. Pressing the START switch to release it from the Start position causes the Ready indicator to flash until disk rotation has stopped.
FAULT Indicator/ Fault Clear Switch	The FAULT indicator is inside the Fault Clear switch and lights if certain faults exist within the drive. It is turned off by any of the following (provided that the fault condition(s) no longer exist): • Pressing the Fault Clear switch • Fault Clear command from the controller • Reapplying power to the drive
Table Continued on Next Page	

TABLE 2-1. DRIVE SWITCHES AND INDICATORS (Contd)

Switch or Indicator	Function
OPERATOR PANEL (Contd)	
WRITE PROTECT Switch/Indicator	Pressing this switch changes mode from normal to write protect (preventing write operations), or from write protect to normal. (If the drive is in write protect mode from another source, pressing this switch has no effect.) The WRITE PROTECT indicator is lit when the drive is in write protect mode.

POWER ON PROCEDURE

This procedure describes how to turn on the drive. It is assumed that dc power is supplied to the drive because the power supply switch/circuit breaker is normally left in the ON position.

1. Press START switch to engage it in Start position.

   - If the Local/Remote switch on the I/O board was set in the Local position, the power on sequence begins immediately.

   - If the Local/Remote switch was set in the Remote position, the power on sequence begins when power sequence ground is available from the controller. Power on sequence is delayed 5 seconds multiplied by the drive address on unit logic plug (i.e., 0 x 5 = 0 second delay, 1 x 5 = 5 second delay, etc.).

2. Observe that Ready indicator (located in START switch) flashes, indicating that power on is in progress.

3. Observe that Ready indicator lights steadily within 45 seconds, indicating that disks are up to speed and heads are loaded.

4. Ensure that FAULT indicator is off.

The power on sequence is now complete, and the drive is ready to receive commands from the controller.

POWER OFF PROCEDURE

This procedure describes how to turn off the drive.

1. Press START switch to release it from Start position.
2. Observe that Ready indicator (located in START switch) flashes, indicating that power off is in progress.
3. Observe that Ready indicator goes off within 45 seconds, indicating that power off is complete.

With power off complete, the heads are positioned and locked in the landing zone and the disks are not rotating. Normally, the power supply switch/circuit breaker is left ON to continue supplying dc power to the drive.

FILTER REPLACEMENT AND CLEANING

The air filter is located behind the front panel insert (see figure 2-2). To gain access to the filter, you must remove the front panel insert by pulling it forward.

Check the air filter periodically to ensure that it is clean. It should be replaced about every six months in a computer room environment; replace it more often in dirtier locations.

Replace the filter if a new one is available. If it is not available, clean it by washing in a solution of water and mild detergent. Rinse thoroughly and install when the filter is dry.

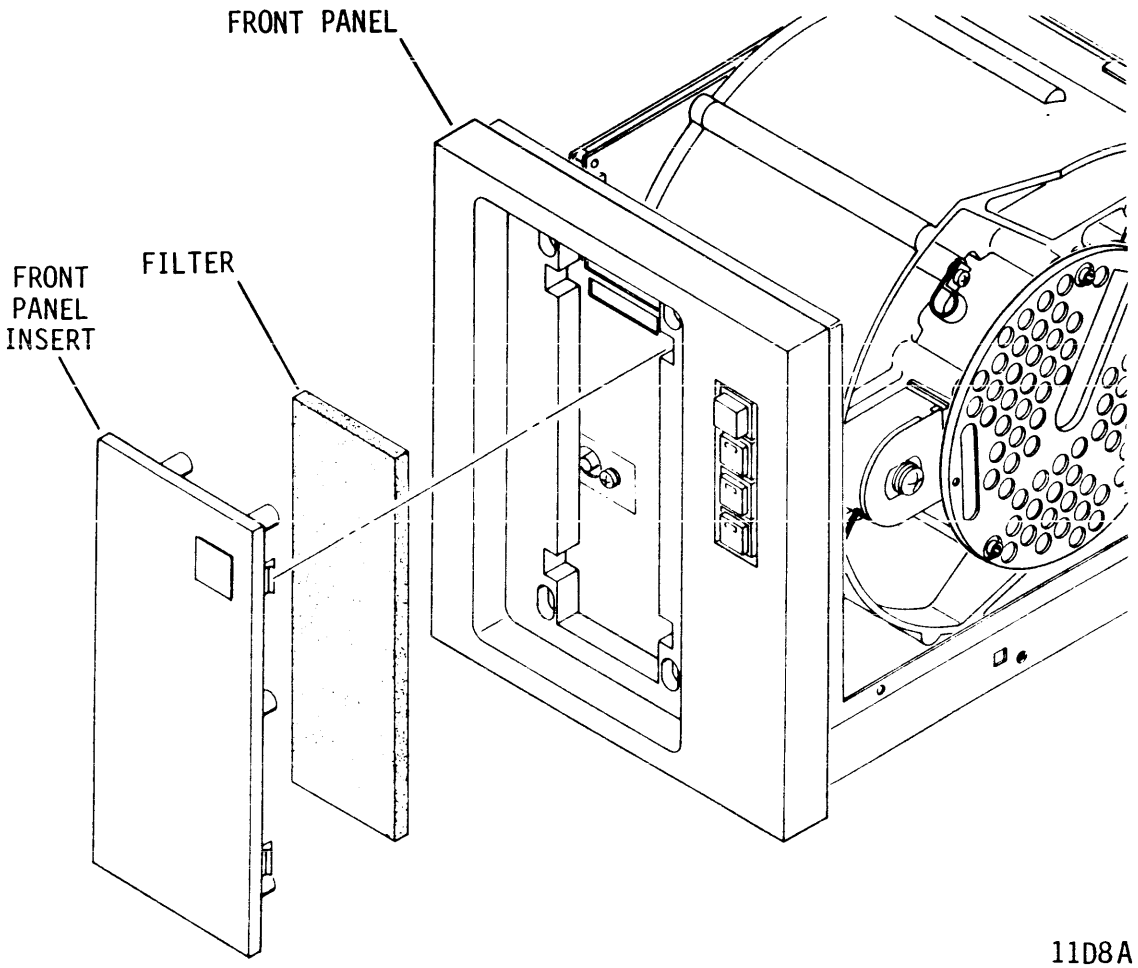


Figure 2-2. Air Filter Replacement

SECTION 3

INSTALLATION AND CHECKOUT

INSTALLATION AND CHECKOUT 3

INTRODUCTION

The information contained in this section describes installation and initial checkout of the drive.

SITE REQUIREMENTS

GENERAL

The site requirements considered are electrostatic discharge protection, environment, space, power, grounding, and interface.

ELECTROSTATIC DISCHARGE PROTECTION

All drive electronic assemblies are sensitive to static electricity, due to the electrostatically sensitive devices used within the drive circuitry. Although some of these devices such as metal-oxide semiconductors are extremely sensitive, all semiconductors as well as some resistors and capacitors may be damaged or degraded by exposure to static electricity.

Electrostatic damage to electronic devices may be caused by a direct discharge of a charged conductor, or by exposure to the static fields which surround charged objects. To avoid damage to drive electronic assemblies, service personnel must observe the following precautions when servicing the drive:

- Ground yourself to the drive whenever the drive electronics are or will be exposed. Connect yourself to ground with a wrist strap (refer to Accessories in the parts data manual for part numbers). Connection may be made to any metal assembly or to the ground lug at the rear of the drive. As a general rule, remember that you, the drive, and the circuit boards must all be at ground potential to avoid potentially damaging static discharges.

- Keep boards in conductive bags - when circuit boards are not installed in the drive, keep them in conductive static shielding bags (refer to Accessories in the parts data manual for part numbers). These bags provide absolute protection from direct static discharge and from static fields surrounding charged objects. Remember that these bags are conductive and should not be placed where they might cause an electrical short circuit.

- Remove boards from bags only when you are grounded - all boards received from the factory are in static shielding bags, and should not be removed unless you are grounded.
- Turn off power to drive before removing or installing any circuit boards.
- Never use an ohmmeter on any circuit boards.

ENVIRONMENTAL REQUIREMENTS

All environmental requirements for the drive are listed in table 3-1.

TABLE 3-1. ENVIRONMENTAL REQUIREMENTS

Conditions	Characteristics	Specifications
TEMPERATURE		
Non-Operating (Unpackaged)	Range	-10 to 50°C (14 to 122°F)
	Maximum change per hour	15°C (27°F)
Storage/Transit (Packaged)	Range	-40 to 60°C (-40 to 140°F)
	Maximum change per hour	20°C (36°F)
Operating	Range 300/515 MB Drives	10 to 40°C (50 to 104°F)
	340 MB Drives	10 to 45°C (50 to 114°F)
	Maximum change per hour	10°C (18°F)

Table Continued on Next Page

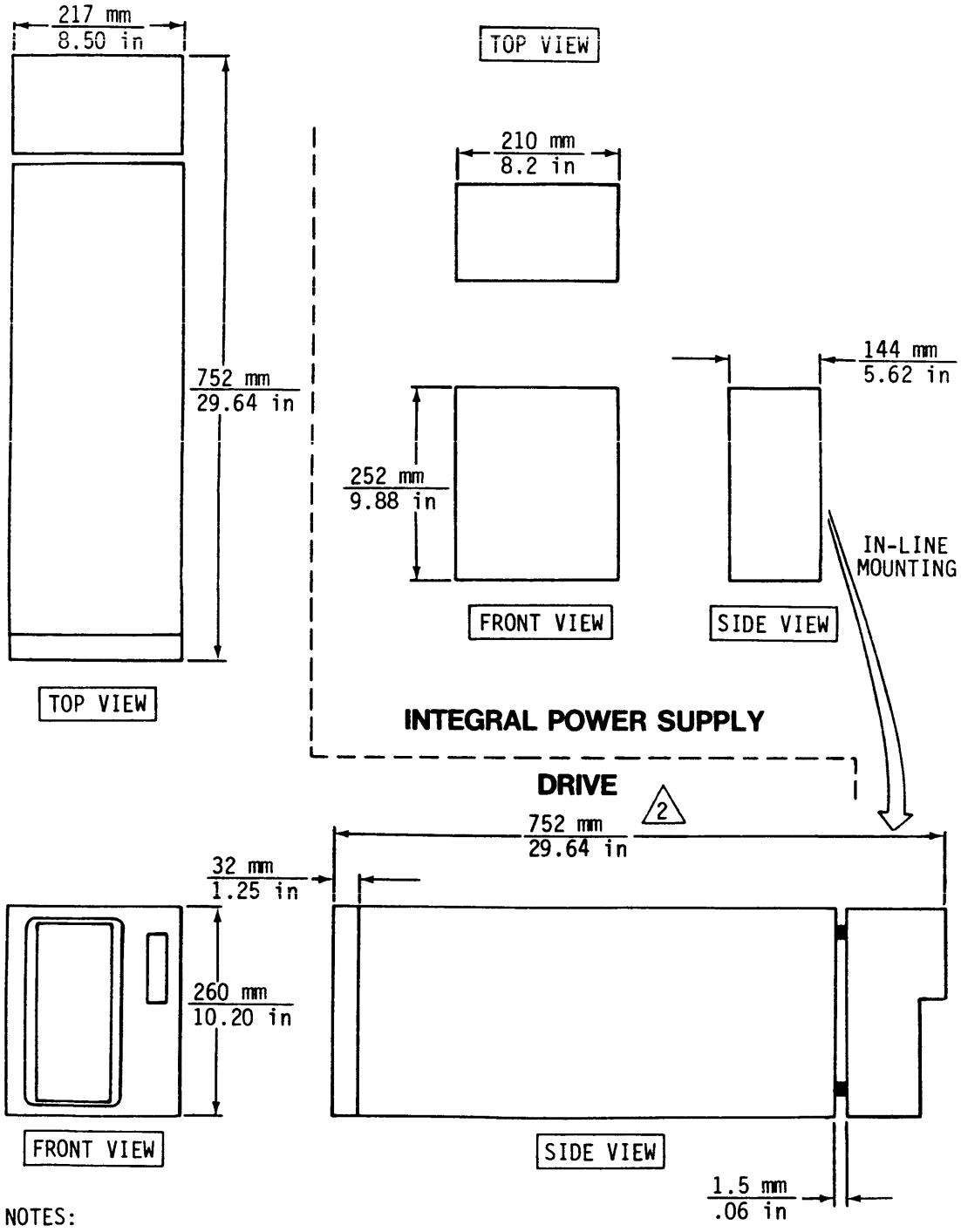
TABLE 3-1. ENVIRONMENTAL REQUIREMENTS (Contd)

Conditions	Characteristics	Specifications
RELATIVE HUMIDITY		
Non-Operating (Unpackaged)	Range	10% to 90% (no condensation allowed)
Storage/Transit (Packaged)	Range	5% to 95% (no condensation allowed)
Operating	Range	20% to 80% 10% per hour maximum change (no condensation allowed)
BAROMETRIC PRESSURE (STANDARD DAY)		
Non-Operating (Unpackaged)	Range	-300 m to 3000 m (-983 ft to 10 000 ft) 105 kPa to 69 kPa (31 in Hg to 20 in Hg)
Storage/Transit (Packaged)	Range	-300 m to 3000 m (-983 ft to 10 000 ft) 105 kPa to 69 kPa (31 in Hg to 20 in Hg)
Operating	Range	-300 m to 3000 m (-983 ft to 10 000 ft) 105 kPa to 69 kPa (31 in Hg to 20 in Hg)

SPACE REQUIREMENTS

The drive slide mounts side-by-side with another drive into a 483 mm (19 in) standard rack. The slide action allows a complete outward extension of either unit for ease of maintenance. The space requirements are shown in figure 3-1.

The combined mass of the drive and power supply is 37.1 kg (82 lb). With both units mounted inline and extended on the slides, the center of gravity is approximately 36 cm (14 in) from the rack front.



NOTES:

1. DIMENSIONS SHOWN ARE NOMINAL.

2. ADD 25 mm (1 INCH) FOR AC POWER CORD IN OLDER POWER SUPPLIES.

11D9B

Figure 3-1. Drive Space Requirements (Sheet 1 of 2)

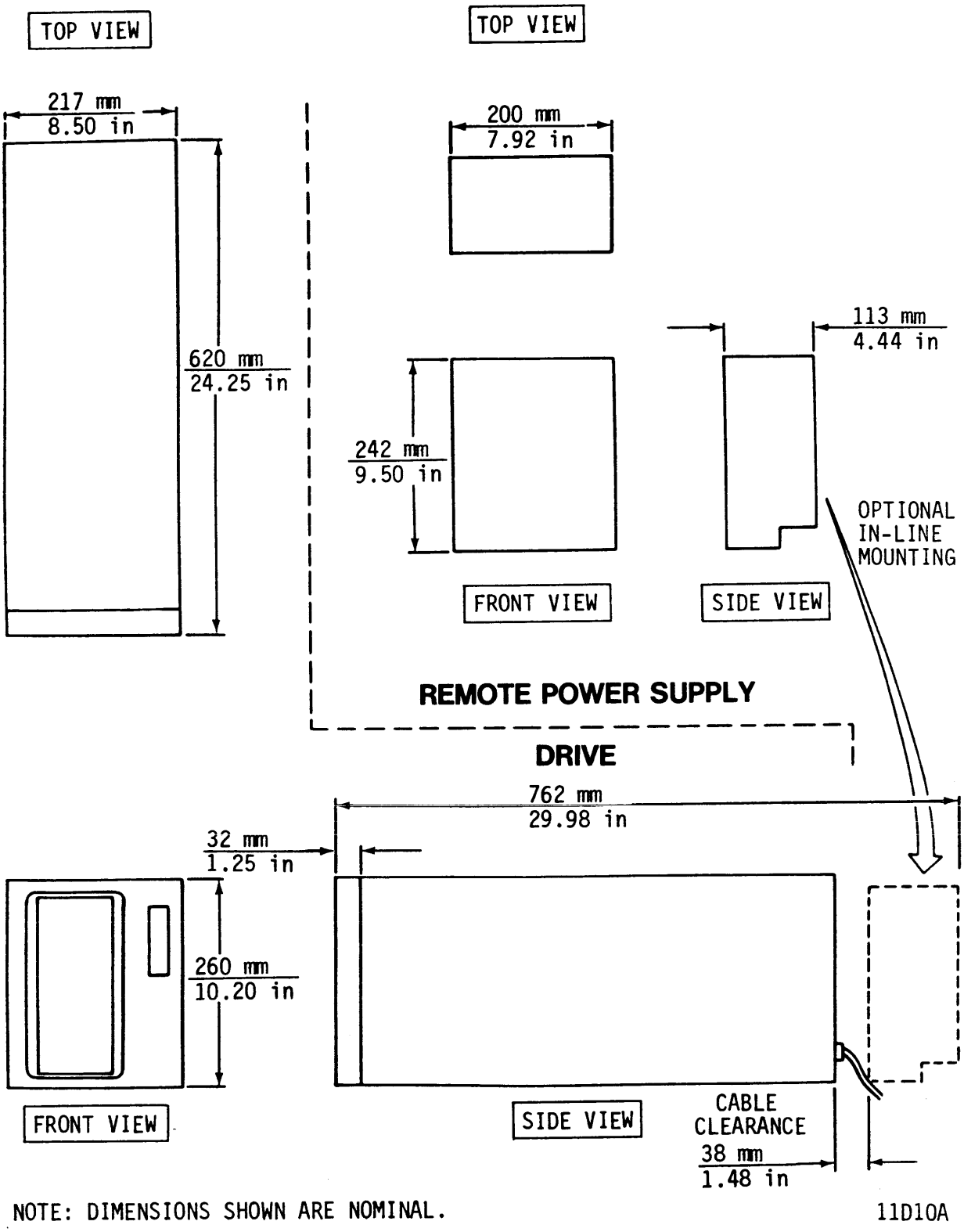


Figure 3-1. Drive Space Requirements (Sheet 2)

POWER REQUIREMENTS

WARNING

This unit has a single-phase power supply with a capacitor input filter (sometimes called a switching type supply). If power to the unit originates from a 3-phase, 4-wire, wye branch or feeder circuit, ensure the circuit meets the latest requirements of the United States National Electrical Code. Failure to meet these requirements may result in hazardous conditions due to high currents (and heating) in the neutral conductors and transformers supplying the system.

Drive ac power requirements are listed in table 3-2. Conversion to the different line voltages is explained in the installation procedures. If an ac cord is not supplied with the unit, either order one from Imprimis (see figure 3-9 and the parts data manual) or obtain one commercially per the specifications in table 3-3. Typical drive current versus start-up time is shown in figure 3-2 for 120 and 220/240 volt connections.

TABLE 3-2. POWER REQUIREMENTS

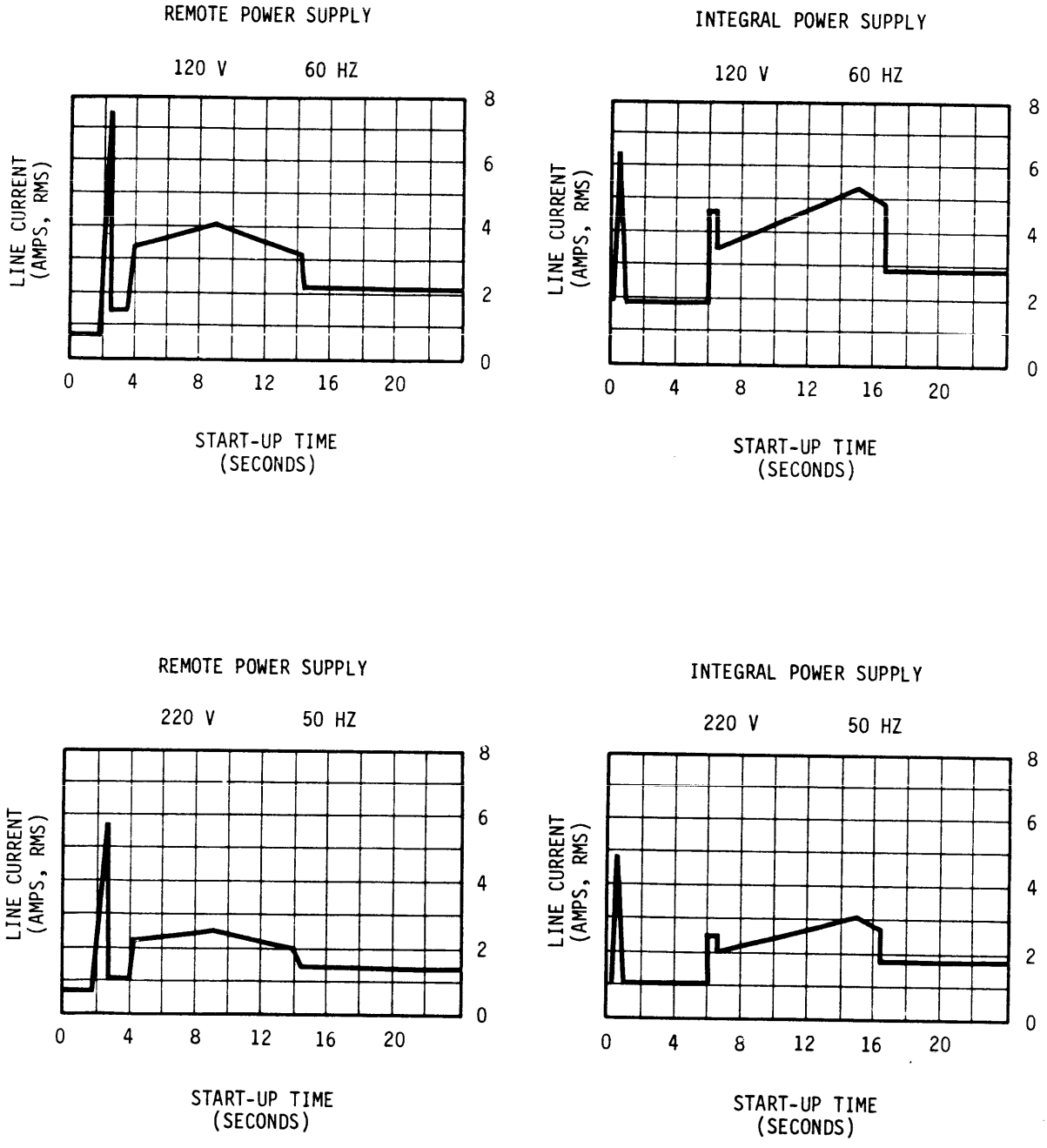
Specifications	VALUES	
	100/120 V ac	208/240 V ac
Voltage Range	85 to 132 V	175 to 264 V
Nominal Line Frequency	50/60 Hz	50/60 Hz
Frequency Range	48.0 to 62.0 Hz	48.0 to 62.0 Hz
Phase Requirements	Single Phase	Single Phase
Power Consumed*		
Integral Pwr Sup	0.225 kW	0.230 kW
Remote Pwr Sup	0.260 kW	0.252 kW
Line Current*		
Integral Pwr Sup	3.95 A	2.25 A
Remote Pwr Sup	3.40 A	2.10 A
Power Factor*		
Integral Pwr Sup	0.570	0.490
Remote Pwr Sup	0.712	0.659
Start Up Current	See figure 3-2.	See figure 3-2.

*Measured when disks are rotating and carriage is moving.

TABLE 3-3. AC CORD SET MINIMUM RATINGS

Used On	Current	Voltage	Conductor Size	Number of Conductors
100 to 120 V 50/60 Hz	13 A	125 V	16 AWG	3
208 to 240 V 50/60 Hz	6 A	250 V	16 AWG	3

Note: Cord set must be U.L. Listed, C.S.A. Certified, and one of the following basic cord types: SV, SP-2, SP-3, S, or SJ. A cord set is defined as a cord with its connectors attached.



11D493A

Figure 3-2. Typical Line Current Versus Start-up Time

GROUNDING REQUIREMENTS

Safety grounding (connecting the drive power cord to a grounded outlet) and system grounding (establishing a common ground between the drives, the power supplies, and the controller) are discussed in the following paragraphs.

Safety Grounding

A safety ground must be provided by the site ac power system. The green (or green and yellow striped) wire in the drive's power cord provides the safety ground connection between the power supply and the site power system. In turn, the site ac power system must tie this connection (safety ground) to earth ground. All site ac power connection points, including convenience outlets for test equipment, must be maintained at the same safety ground potential.

System Grounding

In addition to safety grounding, system ground connections are also required. System ground is established by a set of ground straps connected in a star or daisy chain configuration. The ground straps connect ground on the controller to earth ground and to each power supply in the system. The interconnect cabling between each drive and its power supply connects case ground on the power supply to case ground on the drive. The installation procedures in this section provide detailed grounding instructions and a schematic diagram of the star and daisy chain configurations.

INTERFACE REQUIREMENTS

An important part of site preparation is planning the layout and routing of I/O cables. The I/O cables are designated as A and B cables. The I/O A cables may be connected in either a star or daisy chain configuration as shown in figure 3-3. Each configuration calls for the use of terminators; these too are shown in figure 3-3.

The following discussion of the I/O configurations applies to single channel installations where a set of drives are interfaced to one controller. Extending the discussion to dual channel installations (involving two controllers) requires doubling the quantities of cables and terminators because the two channels have independent cabling.

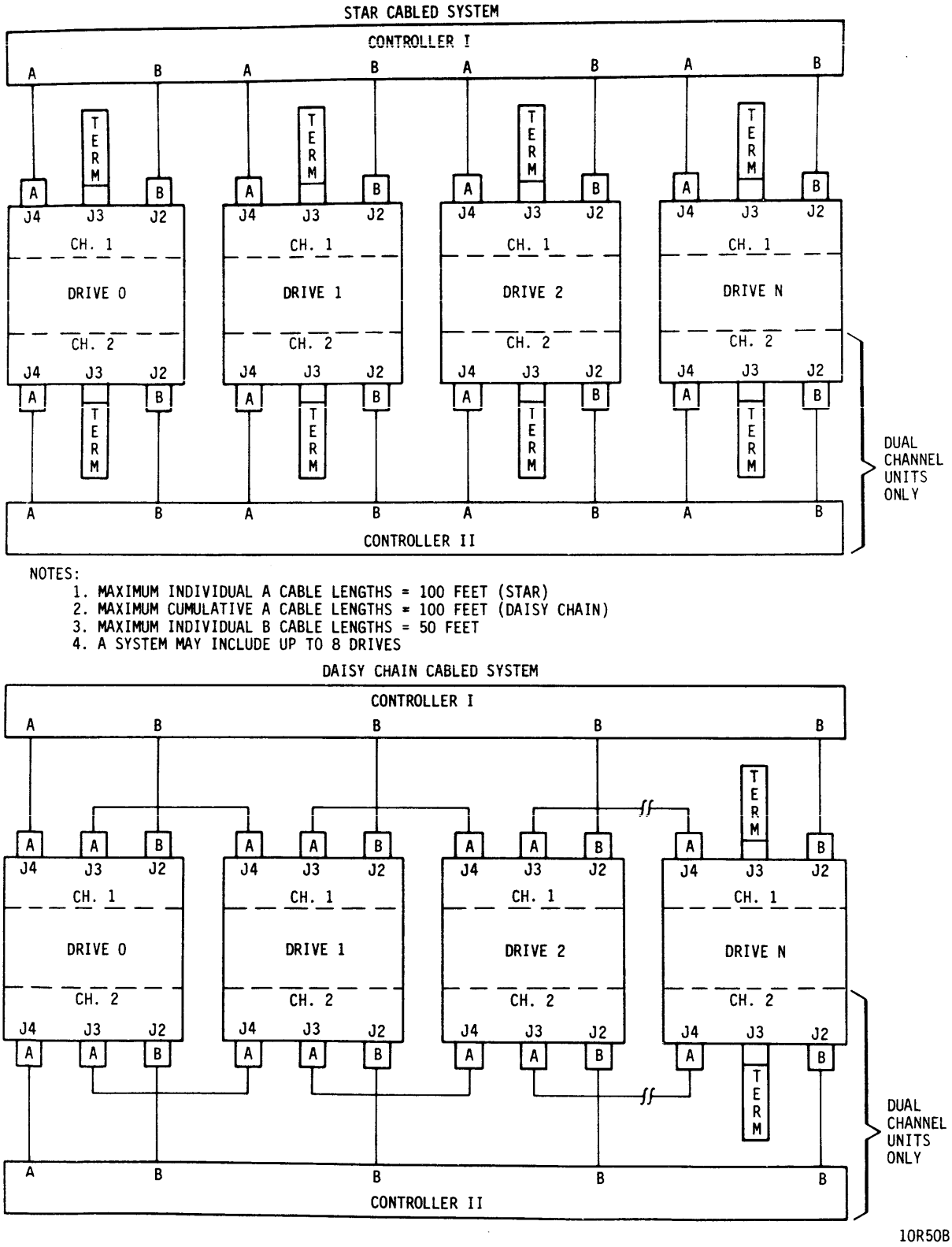


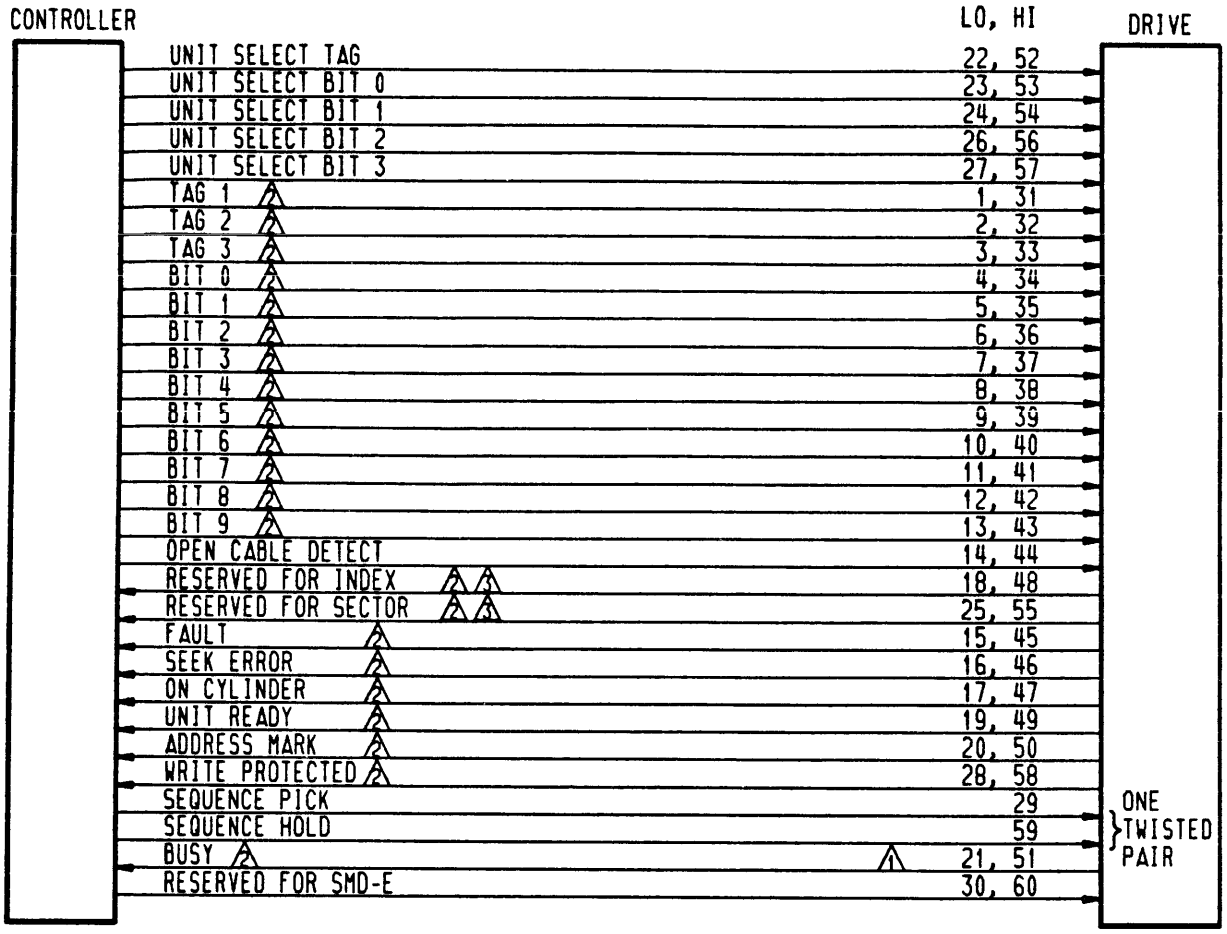
Figure 3-3. System Cabling

The star configuration has individual A and B cables going from the controller to each drive, and each drive has a terminator installed on it. Use this configuration if the controller has a separate I/O connector for each drive.

The daisy chain configuration has individual B cables going from the controller to each drive. However, a single A cable connects the controller to the first drive. Other A cables go from drive to drive, and the last drive in the string has a terminator installed on it. Use this configuration if the controller has only one I/O connector to serve the entire drive string.

In estimating the I/O cables needed for an installation, decide which configuration will be used and allow sufficient length to permit extension of rack-mounted drives. Limitations on I/O cable lengths may influence system layout. The maximum length for each B cable is 15.3 m (50 ft). Each star system A cable or the cumulative A cabling in a daisy chain system cannot exceed 30.6 m (100 ft) in length. Refer to Accessories in the parts data manual for terminator and I/O cable part numbers.

Figure 3-4 shows the pin assignments and signal names for the A cable. Figure 3-5 shows the pin assignments and signal names for the B cable. Detailed information about interface lines is given in the theory manual.



NOTES:

(1) DUAL CHANNEL UNITS ONLY

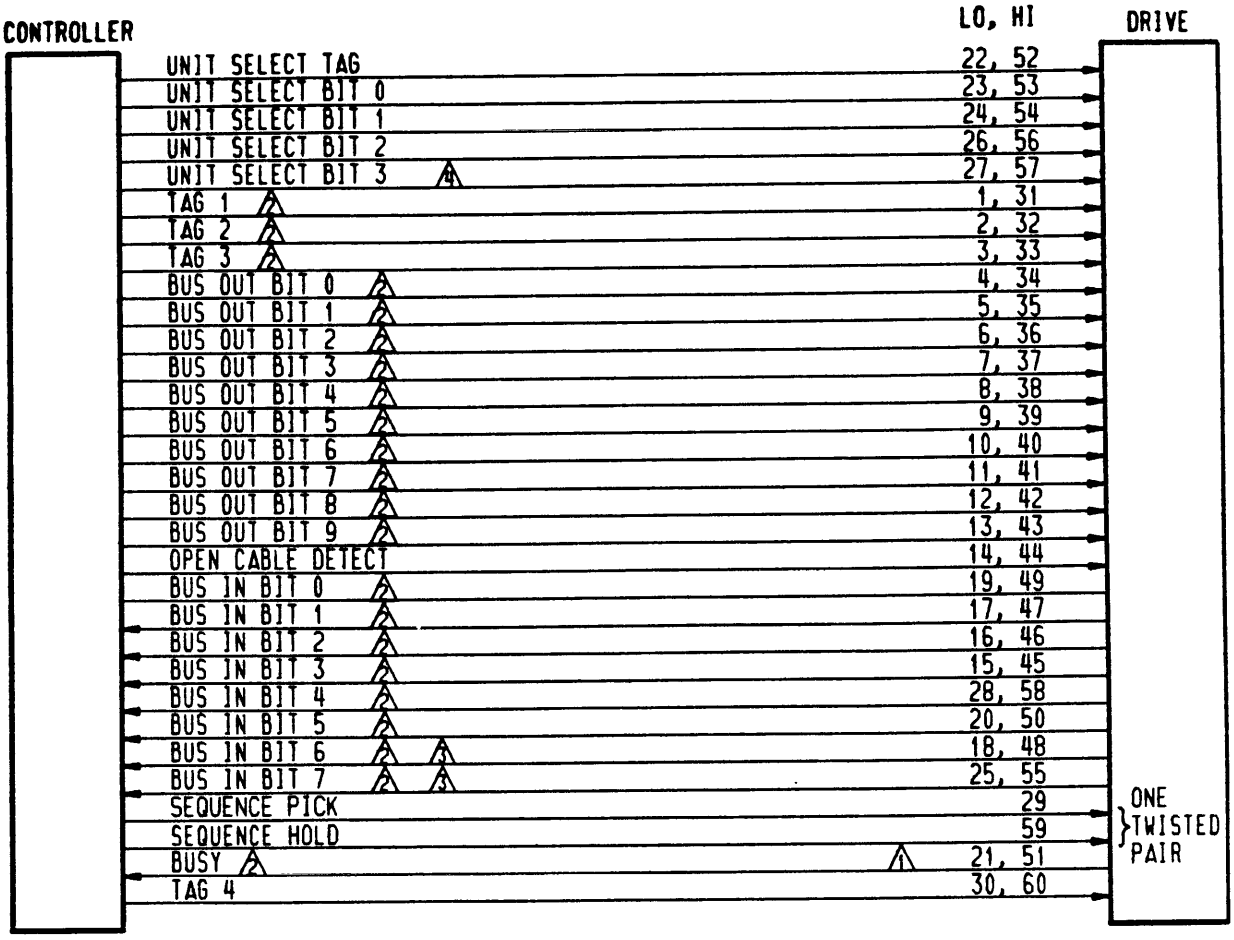
(2) GATED BY UNIT SELECT

(3) INDEX AND SECTOR MAY BE IN "A" CABLE, "B" CABLE, OR BOTH.

SMD-O SIGNAL DEFINITIONS

1163-2

Figure 3-4. A Cable (Sheet 1 of 2)



NOTES:

1. DUAL CHANNEL UNITS ONLY
2. GATED BY UNIT SELECT
3. INDEX AND SECTOR MAY BE IN "A" CABLE, "B" CABLE, OR BOTH.
4. FUNCTIONS AS TAG 5 LINE FOLLOWING UNIT SELECTION.

SMD-E SIGNAL DEFINITIONS

11G3-1

Figure 3-4. A Cable (Sheet 2)

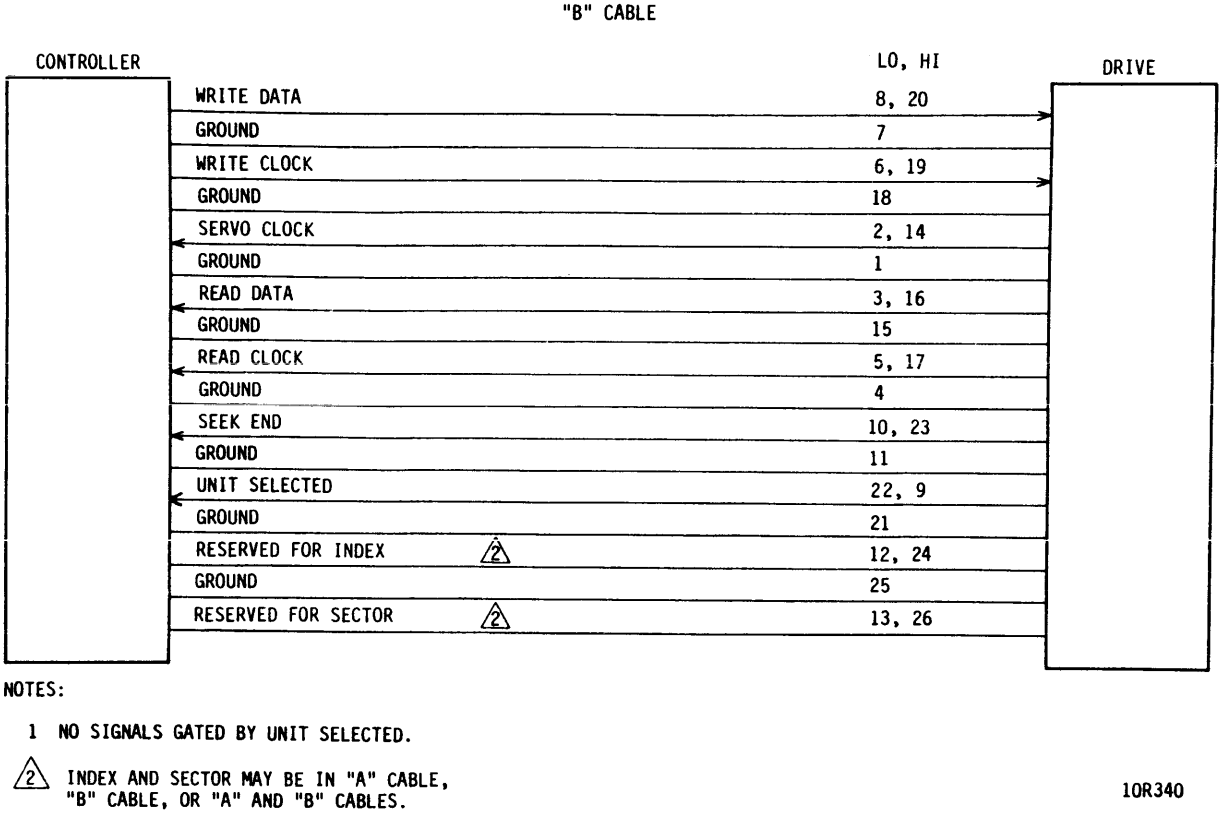


Figure 3-5. B Cable

FINAL UNPACKAGING AND INSPECTION

GENERAL

After removing packaging material according to the unpackaging instructions provided with the drive, inspection for shipping damage should be carried out and several final unpackaging procedures performed. Most packaging materials can be reused if it is necessary to ship the drive at some future date. To obtain packaging instructions, contact:

Imprimis Technology Incorporated
Customer Services
5950 Clearwater Drive
Minnetonka, MN 55343

Phone: 1-800-382-6060
Fax: (612) 931-8817

When ordering packaging instructions, specify the exact equipment number and series code of the drive as shown on the equipment identification label.

UNPACKAGING

1. Open package (save all packaging materials).
2. If drive has a slide mount option, remove packages containing two slide mounts and slide mount hardware kit.
3. Remove package containing ac power cable (and dc power cable for drives with remote power supply).
4. Remove plastic dust cover from around drive and power supply.
5. Check all items against shipping bill for required equipment and hardware to complete installation. Discrepancies, missing items, damaged equipment, etc., should be reported to the Imprimis account sales representative responsible for the equipment.

INSPECTION

Inspect the drive, power supply, and accessory items for possible shipping damage. All claims for shipping damage should be filed with the carrier involved.

INSTALLATION PROCEDURES

GENERAL

The following text provides the procedures necessary to install the drive and power supply. It is assumed that the requirements for site preparation have been completed prior to performing the installation procedures.

The following procedures should be considered in the order presented, but the order may be altered for a specific installation:

- Mounting Drive in Rack
- Remote Power Supply Bracket Installation
- Power Supply Voltage Conversion
- System I/O Cabling
- System Grounding and Interconnect Cabling
- Mounting Remote Power Supply in Rack
- Setting Circuit Board Switches.

MOUNTING DRIVE IN RACK

A drive mounting kit for mounting the drive in a standard rack is available as an accessory (refer to Accessories in the parts data manual for part number). For drives with the integral power supply, the support bracket must be removed prior to slide installation (see figure 3-6). For drives with the remote power supply, the slide assemblies permit inline mounting of the drive and remote power supply. With the slides fully extended, both units are positioned beyond the front surface of the rack for ease of maintenance. The following procedures provide instructions for attaching the drive and power supply to the slides.

NOTE

The procedure describing how to mount the remote power supply on the slide assemblies follows System Grounding and Interconnect Cabling.

Drive Installation (Integral Power Supply)

1. Remove support bracket (one on each side) from drive. Discard brackets and retain screws for inner slide installation on drive (see figure 3-6).

2. Remove screws (4 each) from slide hardware kit.

3. Disengage inner slide from intermediate and outer slides of each slide assembly by pressing lock release and pulling out inner slide.

4. Mount right-hand and left-hand inner slides on drive by installing screws through holes in inner slide into square nuts in drive. Figure 3-6 defines which slide component is used on the right-hand side of the drive.

5. Mount right-hand and left-hand outer slides of slide assemblies in rack in accordance with user requirements. Figure 3-6 defines which slide component mounts on the right side of the rack.

6. Push each intermediate slide to fully retracted position inside outer slide.

7. Lift drive and guide inner slides into intermediate slides of slide assemblies. Continue pushing slides together until their lock releases engage.

8. Connect ac power cable to AC INPUT connector J1 and to site ac power source.

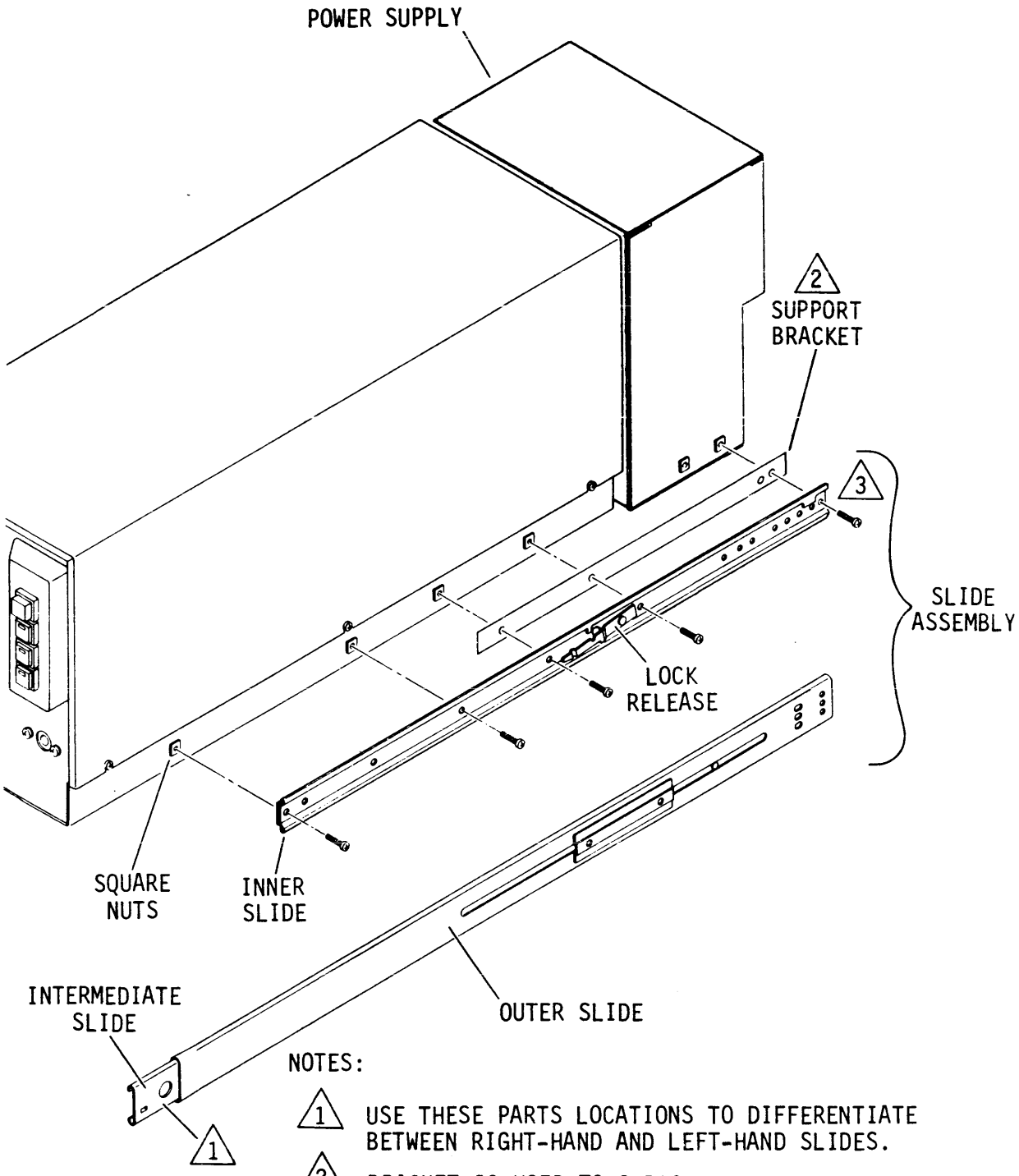


Figure 3-6. Drive Installation (Integral Power Supply)

Drive Installation (Remote Power Supply)

1. Remove screws (8 each) from slide hardware kit. Set aside the remaining screws in kit for remote power supply installation.

2. Disengage inner slide from intermediate and outer slides of each slide assembly by pressing lock release and pulling out inner slide (see figure 3-7).

3. Install remote power supply mounts on inner slides using mounting hardware.

4. Mount right-hand and left-hand inner slides on drive by installing screws through holes in inner slide into square nuts in drive. Figure 3-7 defines which slide component is used on the right-hand side of the drive.

5. Mount right-hand and left-hand outer slides of slide assemblies in rack in accordance with user requirements. Figure 3-7 defines which slide component mounts on the right side of the rack.

6. Push each intermediate slide to fully retracted position inside outer slide.

7. Lift drive and guide inner slides into intermediate slides of slide assemblies. Continue pushing slides together until their lock releases engage.

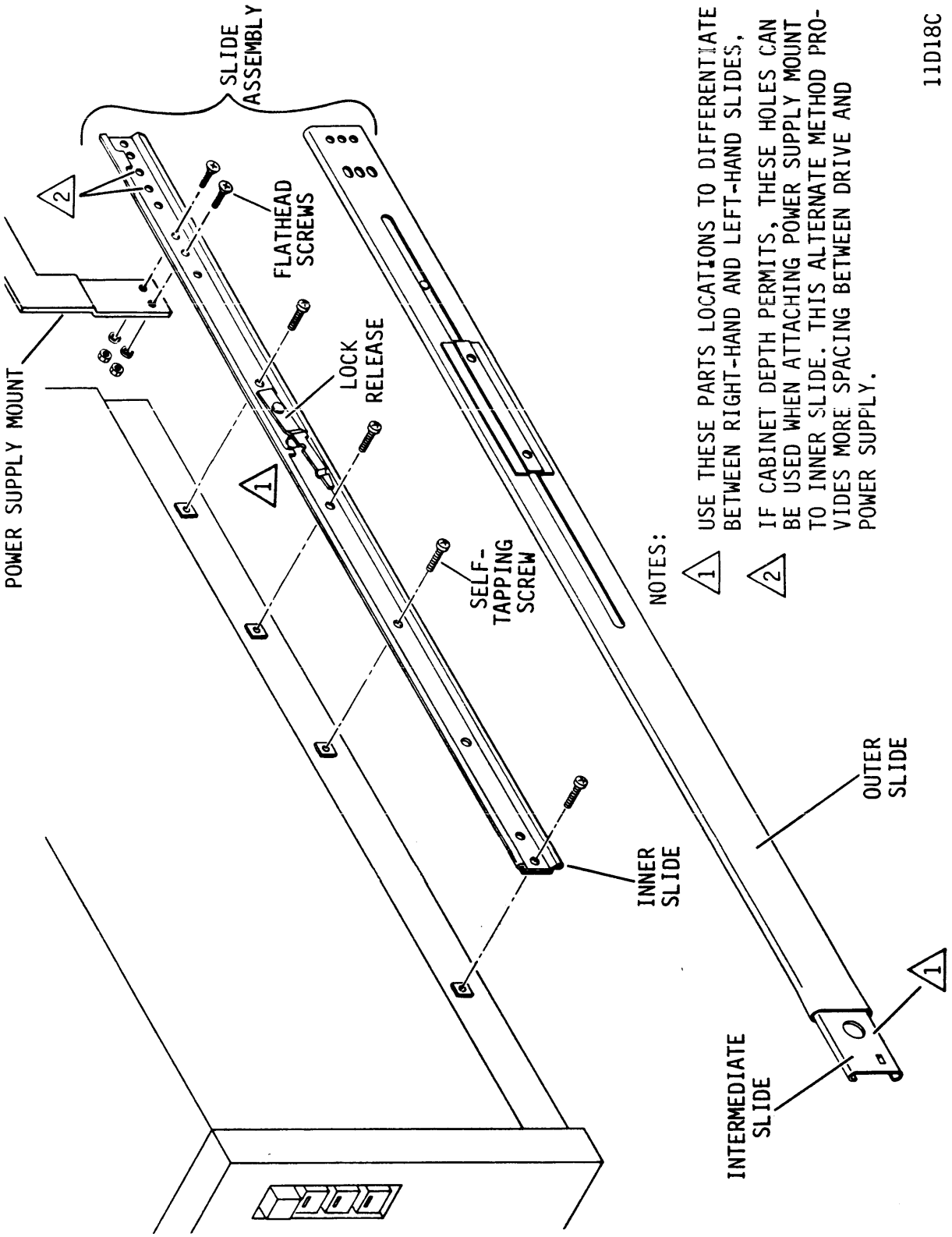


Figure 3-7. Drive Installation (Remote Power Supply)

REMOTE POWER SUPPLY BRACKET INSTALLATION

If the power supply is to be installed on the slide assemblies, a mounting bracket must first be attached to the power supply. Newer drives have the bracket already attached. On older drives, attach bracket as follows:

1. Remove and discard the 4 screws from power supply, where bracket attaches (see figure 3-8).

2. Align the bracket holes with the vacated holes in power supply and secure into place using the four 6-32 x 3/8 **screws supplied with hardware kit.**

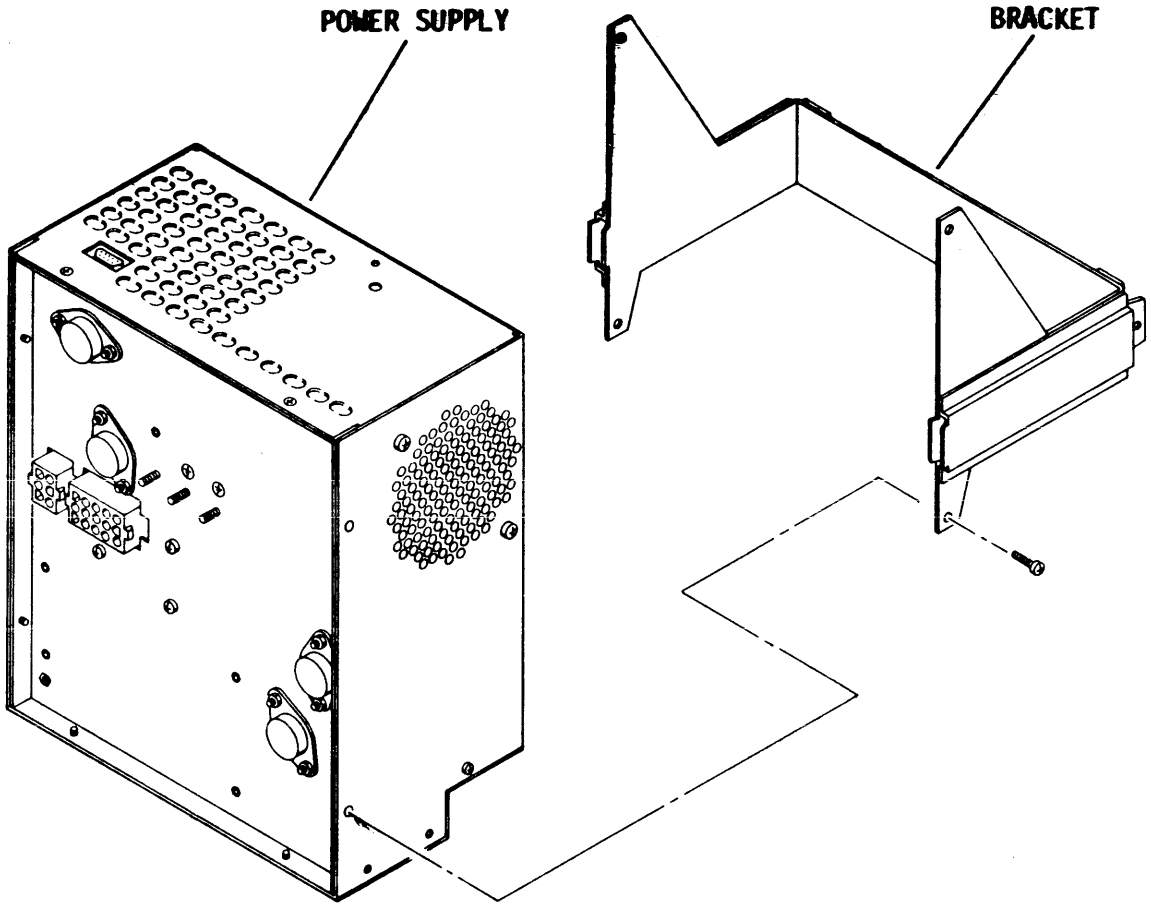


Figure 3-8. Remote Power Supply Bracket Installation

POWER SUPPLY VOLTAGE CONVERSION

The power supply is configured before shipment to operate in one of two ranges of ac input voltages. The equipment label on the power supply indicates the voltage range selected prior to shipment. The voltage range for drives with the integral power supply is determined by setting the voltage programming switch to the desired range. The voltage range for drives with the remote power supply is determined by: 1) on older supplies, which voltage programming plug is installed inside the power supply, or 2) on newer supplies, setting the voltage programming switch to the desired range. The ac power cord must be replaced if the voltage range is changed. Order an Imprimis cord (see figure 3-9 and the parts data manual) or select a commercially available cord per the specifications in table 3-3.

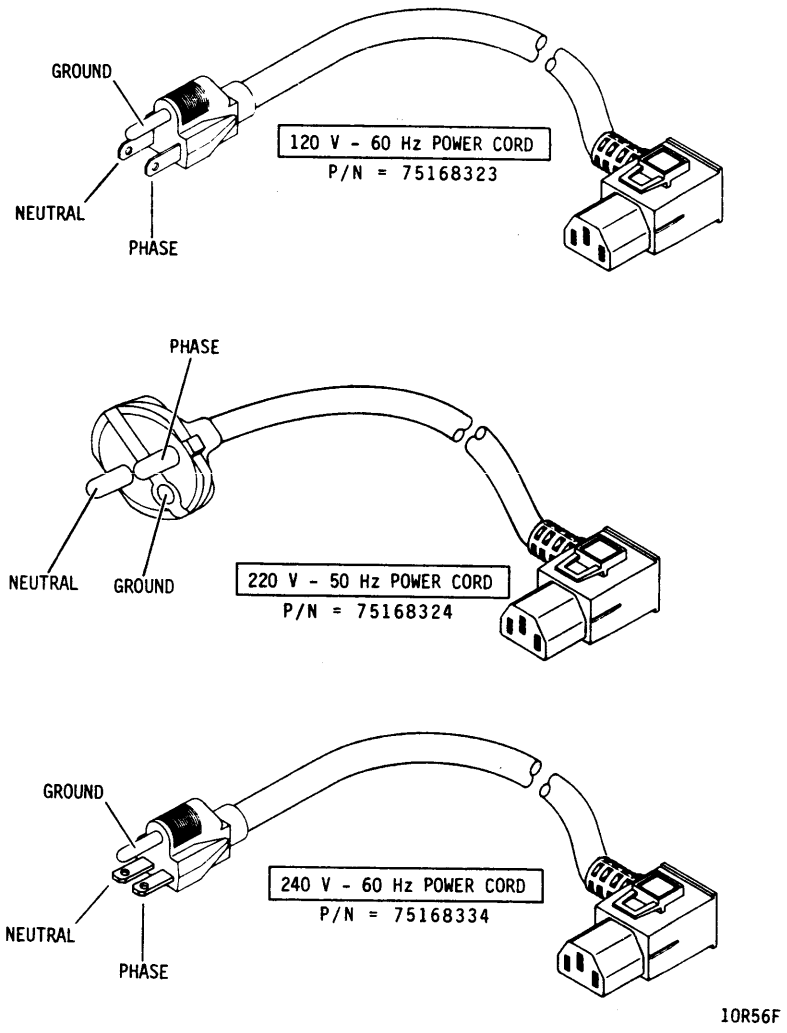


Figure 3-9. AC Power Cables

1. Ensure that ac power cable is disconnected from power supply.

NOTE

Perform step 2 on integral supplies, and on newer remote supplies, which have a voltage programming switch. Perform step 3 on older remote supplies, which do not have a voltage programming switch.

2. Change voltage programming switch to desired setting.

3. On older remote power supplies, perform the following:

   a. Remove attaching hardware (designated "A" in figure 3-10) from power supply.

   b. Place power supply on work surface with bottom cover facing up.

CAUTION

Use caution during the following steps to avoid damaging internal components and wiring.

   c. Slide bottom cover and front panel away from main chassis without straining internal wiring.

   d. Remove attaching hardware (designated "B") and tilt bottom cover away from front panel to expose voltage programming plug.

NOTE

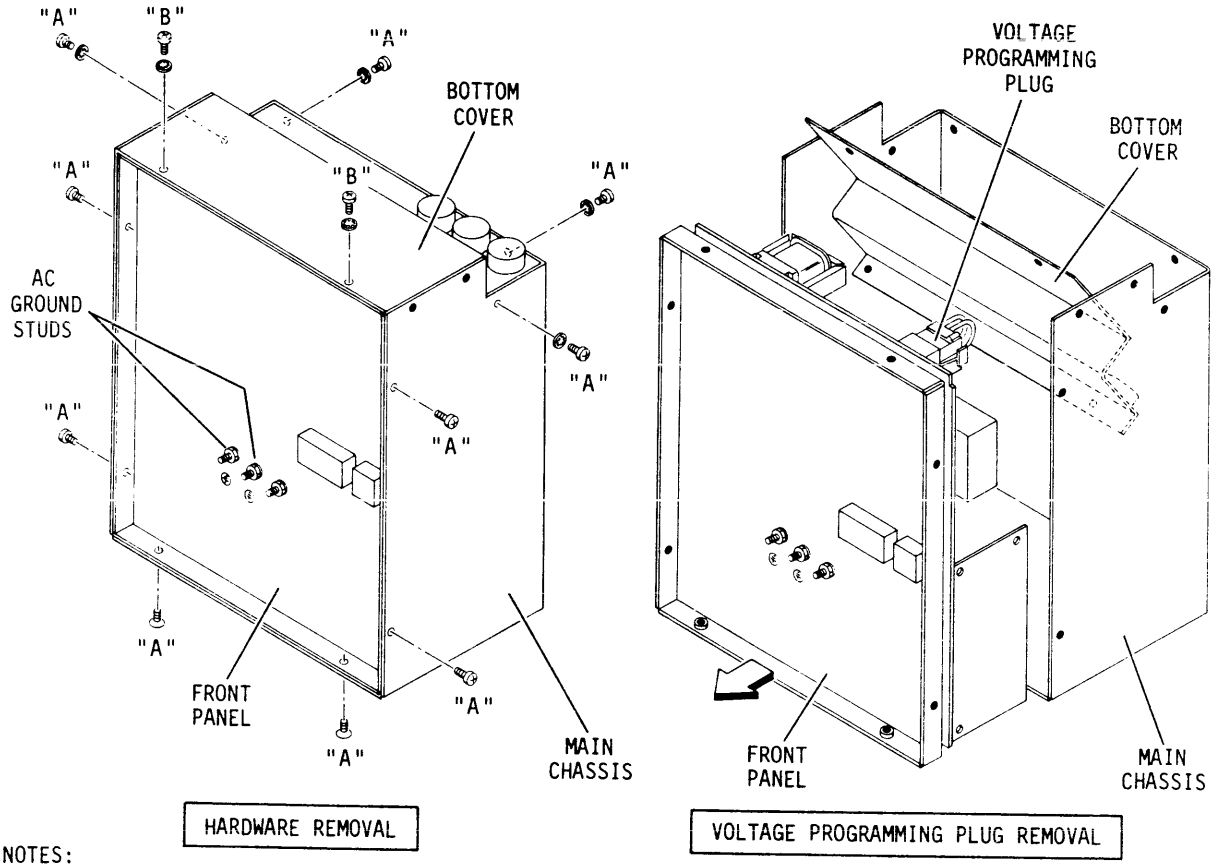
The voltage programming plugs are stamped to indicate their voltage ranges. The plug for 120 V ac has blue jumper wires, and the plug for 220/240 V ac has red jumper wires.

   e. Squeeze retaining tabs and remove voltage programming plug from its socket. Install replacement voltage programming plug in socket.

   f. Align bottom cover with front panel and replace attaching hardware (designated "B").

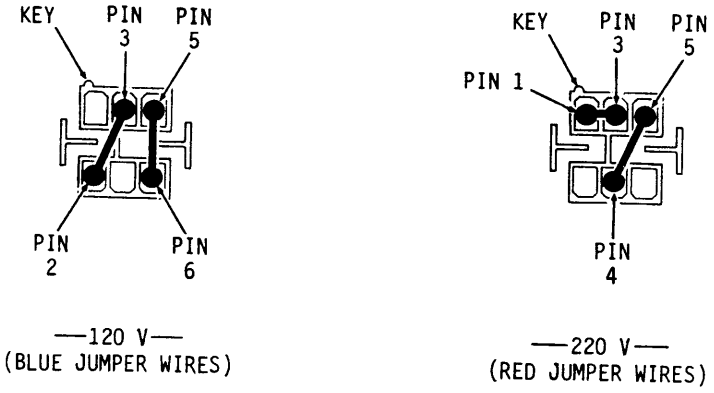
   g. Slide bottom cover and front panel back into alignment with main chassis.

   h. Install hardware (designated "A") to attach bottom cover and front panel to main chassis.



NOTES:

1. REMOVE HARDWARE DESIGNATED "A" PRIOR TO REMOVING HARDWARE DESIGNATED "B"



10R84B

Figure 3-10. Voltage Conversion (Older Remote Power Supplies)

4. Modify equipment label to reflect new ac operating voltage range for power supply.

5. Replace existing ac power cable with the ac power cable specified for new operating voltage.

SYSTEM I/O CABLING

This procedure describes how to connect the I/O cables and terminators. The recommended connections are A cable to J4 and terminator to J3. These connections may be reversed without affecting drive operation. Figure 3-11 shows typical I/O cable connections at the drive I/O plate.

The site preparation information, provided earlier in this section, describes both star and daisy chain cable routing. With the correct number of terminators and lengths of I/O cables available, you are ready to begin connecting the system I/O cabling. Unless otherwise noted, each step in the following procedure applies to all drives in the system.

In installations where the remote power supply is slide mounted directly behind the drive, it is necessary to remove the power supply from the slides to connect or disconnect the I/O cables.

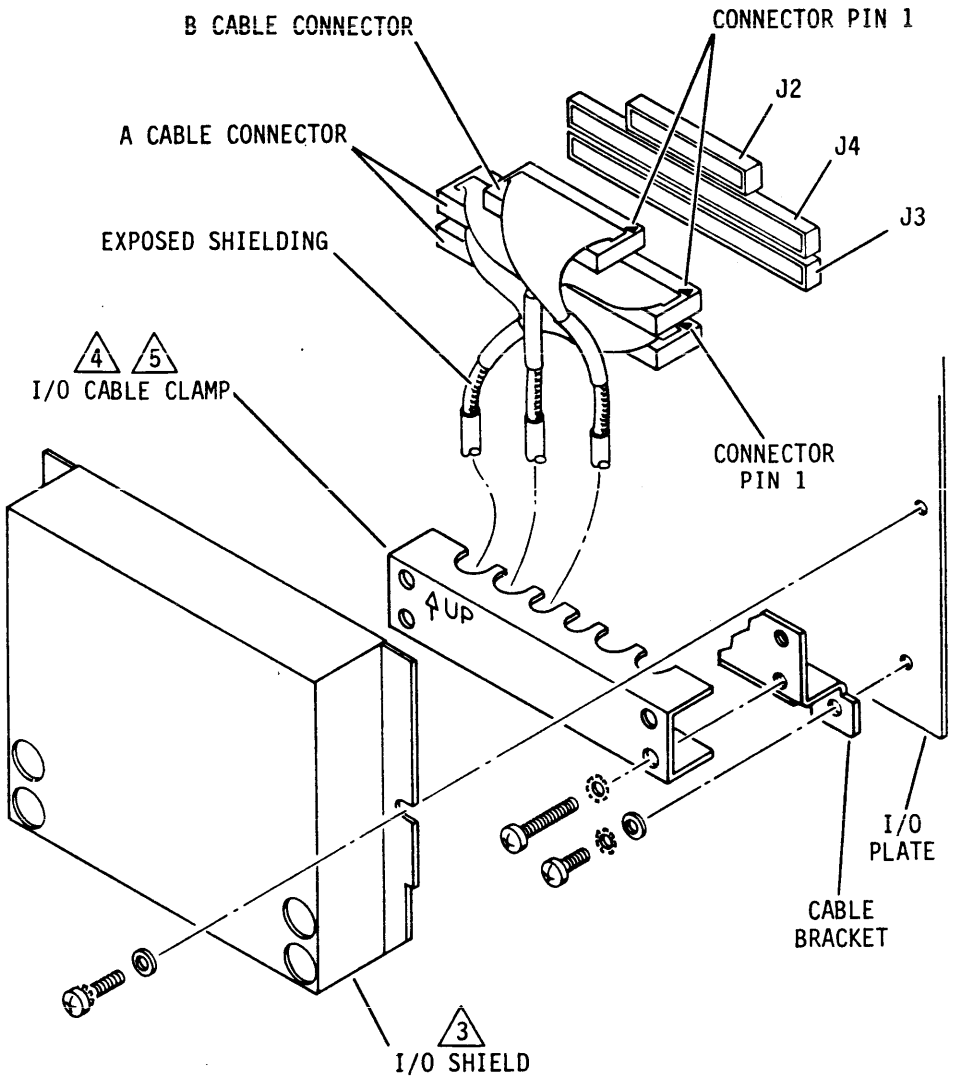
1. Remove I/O shield from I/O plate (see figure 3-11).

2. Install cable bracket on I/O plate (integral power supply drives), or on panel below I/O plate (remote power supply drives) with attaching hardware.

NOTE

Steps 3 through 6 apply to single channel drives and must be repeated for dual channel drives. The I/O plate on dual channel drives has two sets of connectors: 1J2, 1J3, and 1J4 for channel 1, and 2J2, 2J3, and 2J4 for channel 2.

3. Connect B cables from controller to connector J2 on each drive.



NOTES:

1. CABLE BRACKET IS ATTACHED TO EITHER REAR PANEL OR I/O PLATE, DEPENDING ON DRIVE CONFIGURATION.
2. EXACT PLACEMENT OF CONNECTORS J2, J3, AND J4 ON I/O PLATE VARIES.

△3 I/O SHIELD IS USED ON INTEGRAL POWER SUPPLY ONLY.

△4 ORIENT CLAMP WITH ARROW POINTING UP.

△5 OLDER DRIVES HAVE A DUAL-CLAMP CONFIGURATION: A GROUNDING CLAMP AND A STRAIN RELIEF CLAMP. THE GROUNDING CLAMP IS PLACED ABOVE THE STRAIN RELIEF CLAMP.

11D682

Figure 3-11. I/O Cable Attachment (Typical)

NOTE

Figure 3-3 defines star and daisy chain systems. In star systems, repeat step 4 for each drive, and skip to step 6. In daisy chain systems, perform step 4 for first drive in daisy chain and repeat step 5 for remaining drives.

4. Connect A cable from controller to drive connector J4.

5. Connect A cable from connector J3 on each drive to connector J4 on next drive in daisy chain.

6. Install terminator on drive connector J3 and make terminator ground connection (see figure 3-12). Terminators are required on:

   - all drives in a star system.
   - last drive in a daisy chain system.

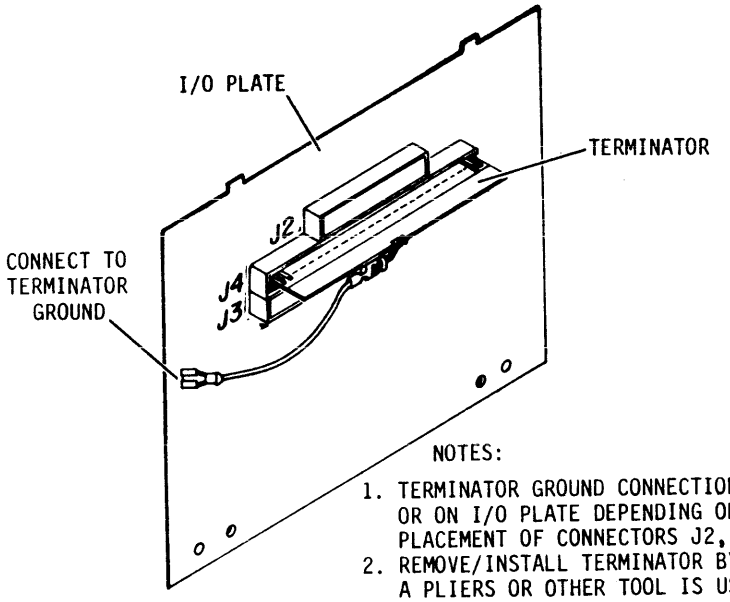


Figure 3-12. Terminator Installation (Typical)

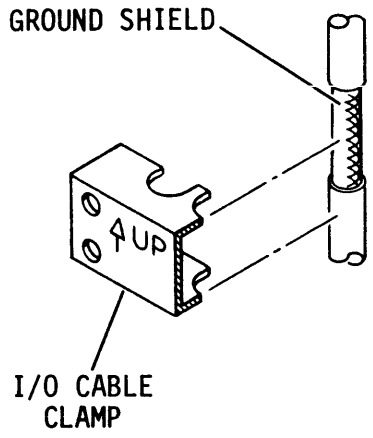
NOTE

There are several locations on each I/O cable where heat shrink tubing can be removed to expose the ground shield. By selecting the proper section of heat shrink for removal in steps 7 or 8, the ground shield will be exposed only where necessary to establish a proper ground.

7. <u>On drives with single-clamp (newer) configuration,</u> install I/O cable clamp as follows:

   a. Strip heat shrink tubing from all cables so that bare shielding will be in contact with the top of the I/O cable clamp and will not be in contact with the bottom of the clamp.

   b. Install I/O cable clamp onto cable bracket with cables and clamp positioned as shown in figure 3-11. Clamp must be installed with arrow pointing up.

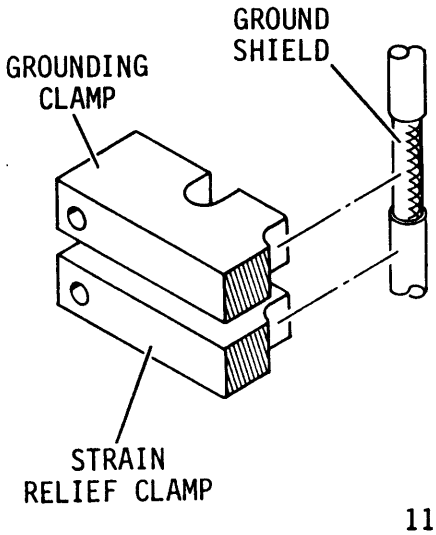


11D685

8. <u>On drives with dual-clamp (older) configuration,</u> install I/O cable clamps as follows:

   a. Strip heat shrink tubing from all cables so that bare shielding will be in contact with grounding clamp and not in contact with strain relief clamp.

   b. Loosely install grounding clamp (grounding clamp has smaller diameter openings than strain relief clamp) onto cable bracket. Ensure that bare shielding on each cable is in contact with grounding clamp.



11D686

c. Position cabling so that outer insulation begins just below grounding clamp; then secure grounding clamp into place. This will ensure that the strain relief clamp (installed in the following step) is in contact with outer insulation of cabling.

d. Install strain relief clamp onto cable bracket.

9. Install I/O shield on I/O plate with attaching hardware.

SYSTEM GROUNDING AND INTERCONNECT CABLING

This section contains instructions on grounding the system and interconnecting the remote power supply and drive. It is assumed that the site has been prepared in accordance with the site requirements information provided earlier in this section. The following procedures describe how to ground the system in a star or daisy chain configuration as shown in figure 3-13.

For drives with the integral power supply, interconnect ground cabling between drive and power supply has already been installed during manufacturing. For drives with remote power supply, interconnect cabling is supplied with each drive and installed on site, between case ground on each drive and case ground on its power supply. Refer to Accessories in the parts data manual for grounding accessories part numbers.

Star Grounding Procedure

This procedure describes how to ground the system in a star configuration. In this configuration, ground straps connect the controller ground to each power supply in the system as shown in figure 3-13.

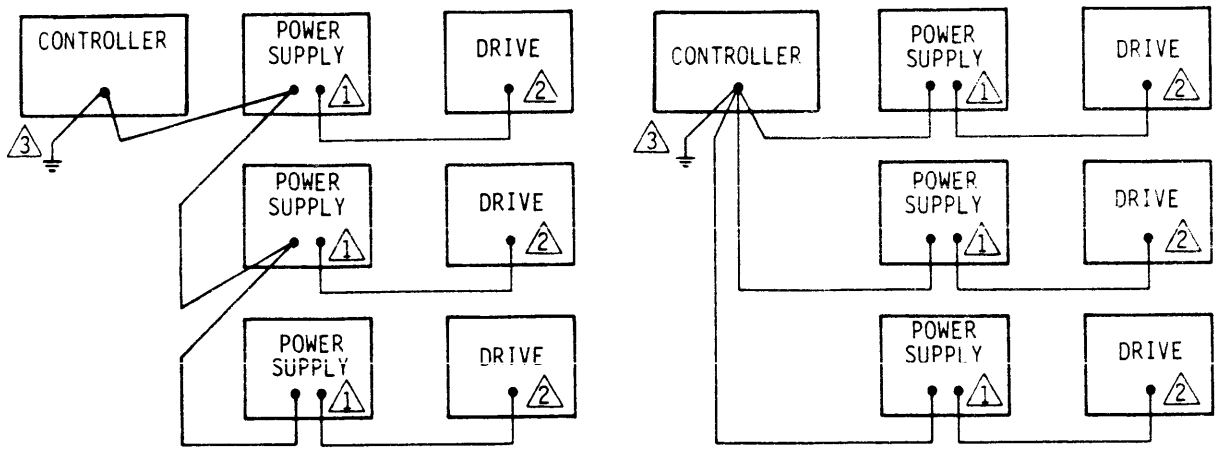
1. Prepare ground straps as follows:

   a. Allowing sufficient length for drive extension, cut ground straps to length needed for the following connections:

      - Controller to earth ground
      - Controller to each power supply

   b. Crimp and solder terminal lugs to both ends of each ground strap.

2. Referring to figure 3-13, connect ground straps to controller as follows:



NOTES:

1. GROUND CONNECTIONS TO POWER SUPPLY USE STUDS MARKED ⏚. THERE MUST BE NO CONNECTION TO STUD MARKED "± 5V RET."
2. DRIVE IS GROUNDED AT "DC GND" SCREW ON DRIVE REAR PANEL.

   IF DRIVE HAS INTEGRAL POWER SUPPLY:
   DC GROUND CABLE BETWEEN DRIVE AND POWER SUPPLY HAS ALREADY BEEN INSTALLED DURING MANUFACTURING.

   IF DRIVE HAS REMOTE POWER SUPPLY:
   DRIVES SUPPLIED WITH ONE-FOOT DC POWER CABLE HAVE A SEPARATE GROUND STRAP THAT CONNECTS BETWEEN POWER SUPPLY AND DRIVE. DRIVES SUPPLIED WITH A LONGER DC POWER CABLE USE THE CABLE SHIELD FOR A GROUND CONNECTION BETWEEN POWER SUPPLY AND DRIVE. EACH END OF THESE CABLES HAS A SEPARATE GROUND STRAP CONNECTED TO GROUND SHIELD.

3. EARTH GROUND CONNECTION

11D15A

Figure 3-13. System Grounding Diagram

a. Connect one end of each of the ground straps to controller ground terminal.

b. Connect one of the ground straps to earth ground.

c. Route the remaining ground straps to the power supplies.

NOTE

For drives with integral power supply, perform step 3 only. For drives with remote power supply, skip to step 4.

3. Connect a ground strap from controller to each power supply as follows:

a. Remove nut and lockwasher from one of the system ground studs on each power supply. These studs are identified by ground symbols. The stud marked "+5V RET" is not used. See figure 3-14.

b. Place lockwasher on ground stud. Then place terminal lug on stud and secure with nut.

NOTE

Ground connections to remote power supply precede installation of power supply in cabinet.

4. Referring to figure 3-10, attach a ground strap from controller to each power supply as follows:

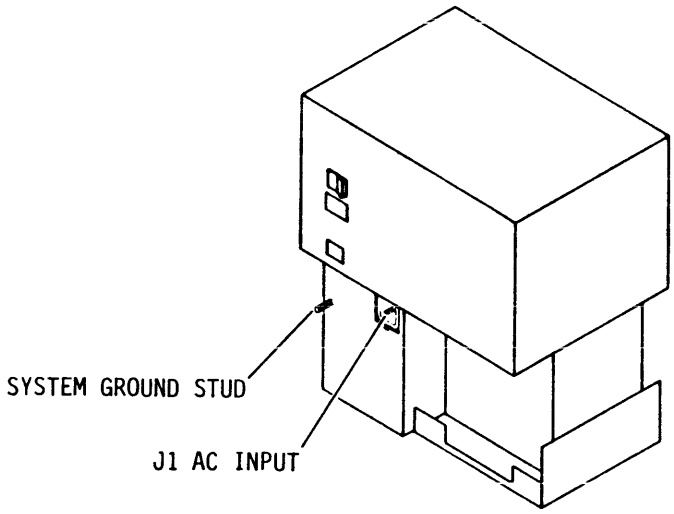
a. Locate power supply close to where it will be installed.

b. Remove nuts and lockwashers from two ground studs on front panel of power supply. These studs are identified by ground symbols. The stud marked "$\pm$5V RET" is not used.

c. Place lockwasher on ground stud farthest from connector J15.

d. Place terminal lug of ground strap on stud and secure with nut.

5. Identify whether dc power cable has a ground shield strap attached at each end. If it does, proceed with step 6. Otherwise, skip to step 7.



NOTE:

1. PLACEMENT OF SYSTEM GROUND STUD AND AC INPUT CONNECTOR IS NOT THE SAME ON ALL INTEGRAL POWER SUPPLIES.

11D387A

Figure 3-14. System Grounding (Integral Power Supply)

6. Referring to figures 3-13 and 3-15, connect shielded dc power cable between power supply and drive as follows:

   a. Connect shielded dc power cable between connector J15 on front panel of power supply and connector J40 on rear panel of drive.

   b. Place lockwasher on remaining ground stud on power supply.

   c. Place terminal lug of ground shield strap over lockwasher on stud and secure with nut.

   d. Remove DC GND screw and lockwasher from rear panel of drive.

   e. Insert screw through terminal lug of ground shield strap and then through lockwasher.

   f. Reinstall screw in rear panel of drive.

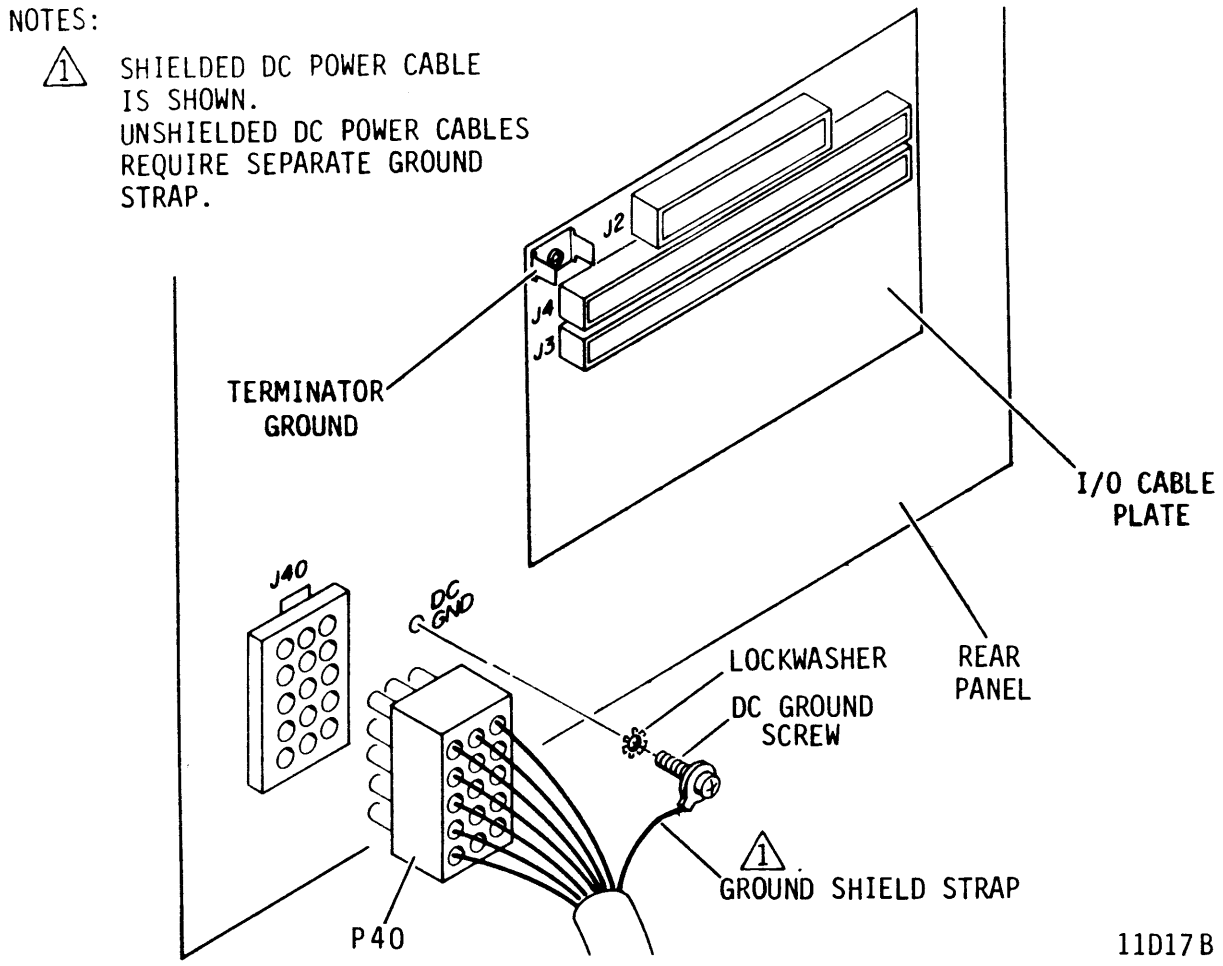


Figure 3-15. Drive Grounding (Remote Power Supply)

7. Referring to figures 3-13 and 3-15, connect the unshielded dc power cable and the ground strap between power supply and drive as follows:

   a. Connect unshielded dc power cable between connector J15 on front panel of power supply and connector J40 on rear panel of drive.

   b. Place lockwasher on remaining ground stud on power supply.

   c. Place terminal lug of ground strap over lockwasher on stud and secure with nut.

   d. Remove DC GND screw and lockwasher from rear panel of drive.

e. Insert screw through terminal lug of ground strap and then through lockwasher.

f. Reinstall screw in rear panel of drive.

Daisy Chain Grounding Procedure

This procedure describes how to ground the system in a daisy chain configuration. In this configuration, a ground strap connects the controller ground to the first power supply in the system. The remainder of the power supplies are connected by grounding straps going from the first power supply to the second, the second to the third, and so on. See figure 3-13.

1. Prepare ground straps as follows:

   a. Allowing sufficient length for drive extension, cut ground straps to length needed for the following connections:

      - Controller to earth ground
      - Controller to nearest drive
      - Each drive to next drive in daisy chain

   b. Crimp and solder terminal lugs to both ends of each ground strap.

2. Referring to figure 3-13, connect ground straps to controller as follows:

   a. Connect two ground straps to controller ground terminal.

   b. Connect one of the ground straps to earth ground.

   c. Route the other ground strap to the first power supply in the daisy chain. Route the remaining ground straps (prepared in step 1) from power supply to power supply.

NOTE

For drives with integral power supply, perform step 3 only. For drives with remote power supply, skip to step 4.

3. Make the daisy chain ground connections at each power supply as follows:

   a. Remove nut and lockwasher from one of the system ground studs on each power supply. These studs are identified by ground symbols. The stud marked "+5V RET" is not used. See figure 3-14.

b. Place lockwasher on ground stud. Then place terminal lug(s) on stud and secure with nut.

NOTE

Ground connections to remote power supply precede installation of power supply in cabinet.

4. Referring to figure 3-10, make daisy chain connections at each power supply as follows:

   a. Locate power supply close to where it will be installed.

   b. Remove nuts and lockwashers from two ground studs on front panel of power supply. These studs are identified by ground symbols. The stud marked "±5V RET" is not used.

   c. Place lockwasher on ground stud farthest from connector J15.

   d. Place terminal lug of ground strap(s) on stud and secure with nut.

5. Identify whether dc power cable has a ground shield strap attached at each end. If it does, proceed with step 6. Otherwise, skip to step 7.

6. Referring to figures 3-13 and 3-15, connect shielded dc power cable between power supply and drive as follows:

   a. Connect shielded dc power cable between connector J15 on front panel of power supply and connector J40 on rear panel of drive.

   b. Place lockwasher on remaining ground stud on power supply.

   c. Place terminal lug of ground shield strap over lockwasher on stud and secure with nut.

   d. Remove DC GND screw and lockwasher from rear panel of drive.

   e. Insert screw through terminal lug of ground shield strap and then through lockwasher.

   f. Reinstall screw in rear panel of drive.

7. Referring to figures 3-13 and 3-15, connect the unshielded dc power cable and the ground strap between power supply and drive as follows:

   a. Connect unshielded dc power cable between connector J15 on front panel of power supply and connector J40 on rear panel of drive.

   b. Place lockwasher on remaining ground stud on power supply.

   c. Place terminal lug of ground strap over lockwasher on stud and secure with nut.

   d. Remove DC GND screw and lockwasher from rear panel of drive.

   e. Insert screw through terminal lug of ground strap and then through lockwasher.

   f. Reinstall screw in rear panel of drive.

MOUNTING REMOTE POWER SUPPLY IN RACK

NOTE

If the power supply is not installed behind the drive, ensure that the location provides adequate clearance for good airflow, and connect ac power cable to AC INPUT connector J1 and site ac power source.

The following procedure provides instructions for mounting the remote power supply behind the drive on the slide assemblies and connecting ac power cable to the supply. Figure 3-9 shows the ac power cable provided with the power supply.

1. Ensure that power supply mounts have been installed on the slides as directed in Mounting Drive in Rack procedure.

2. Position power supply so that mounts and matching slots in bracket are aligned as shown in figure 3-16.

3. Slide power supply toward drive, until locking holes in bracket align with locking holes in mounts.

4. Secure power supply bracket to mounts with 8-32 x 5/16 screws, washers and lockwashers.

5. Connect ac power cable to AC INPUT connector J1 and to site ac power source.

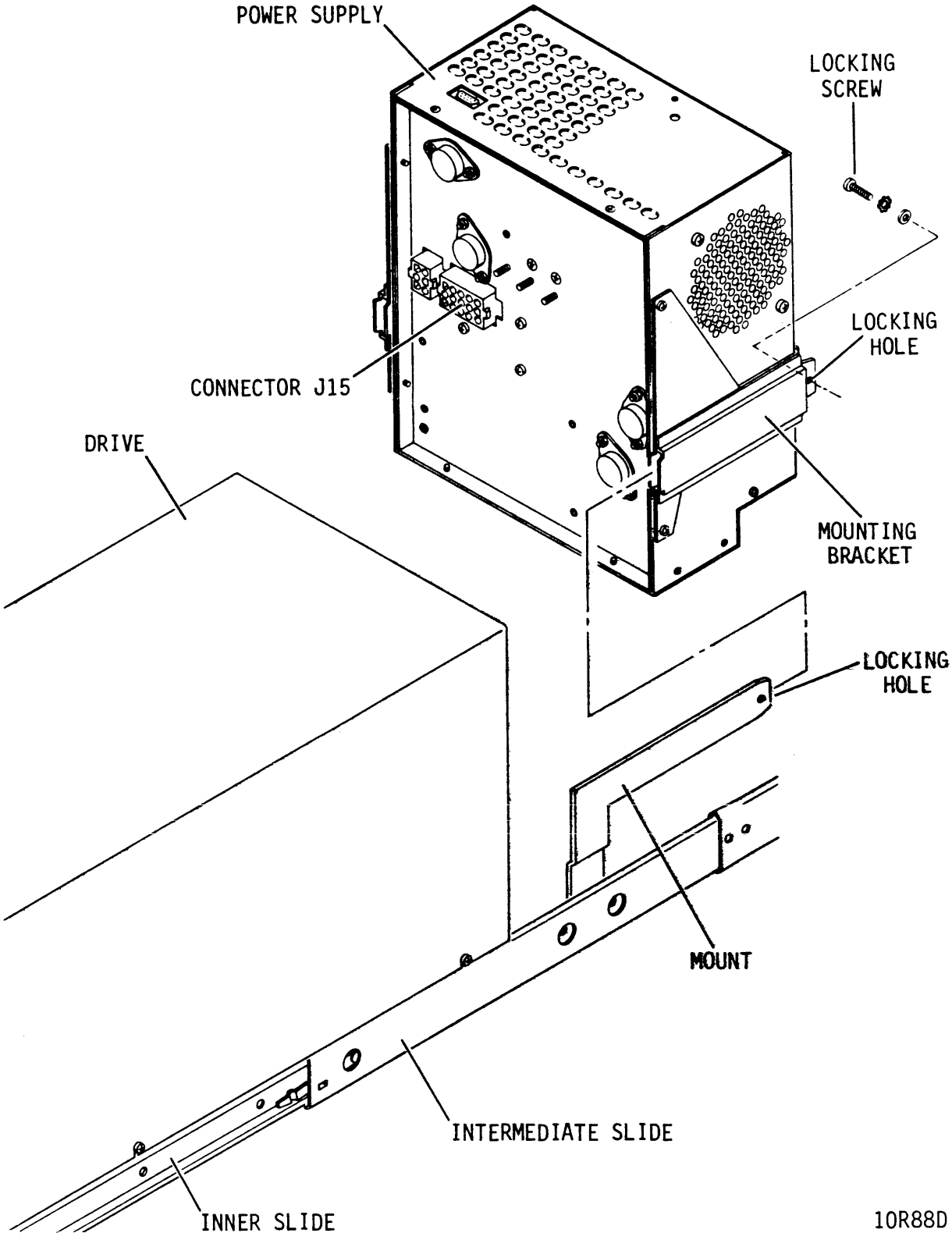


Figure 3-16. Installing Remote Power Supply on Slides

SETTING CIRCUIT BOARD SWITCHES

The I/O and control circuit boards inside the drive contain a number of switches that must be set correctly for normal operation of the drive.

You may encounter two types of switches. Rocker switches are actuated by pressing one end of the actuator or the other (rocking it) to turn the switch on (closed) or off (open). Slide switches are actuated by sliding the actuator one way or the other to turn the switch on or off. Use a slender ball point pen, a straightened paper clip, or any similar object to change switch settings. Do not use a lead pencil point as it may break off and lodge in the switch, or cause the switch to malfunction.

The following illustrations identify the switches, their locations, and their possible settings:

- Figure 3-17 -- how to set DIP switches.
- Figure 3-18 -- switches on _SYX I/O boards.
- Figure 3-19 -- switches on _TQX I/O boards.
- Figure 3-20 -- switches on _VJX I/O boards.
- Figure 3-21 -- switches on _VCX control boards.

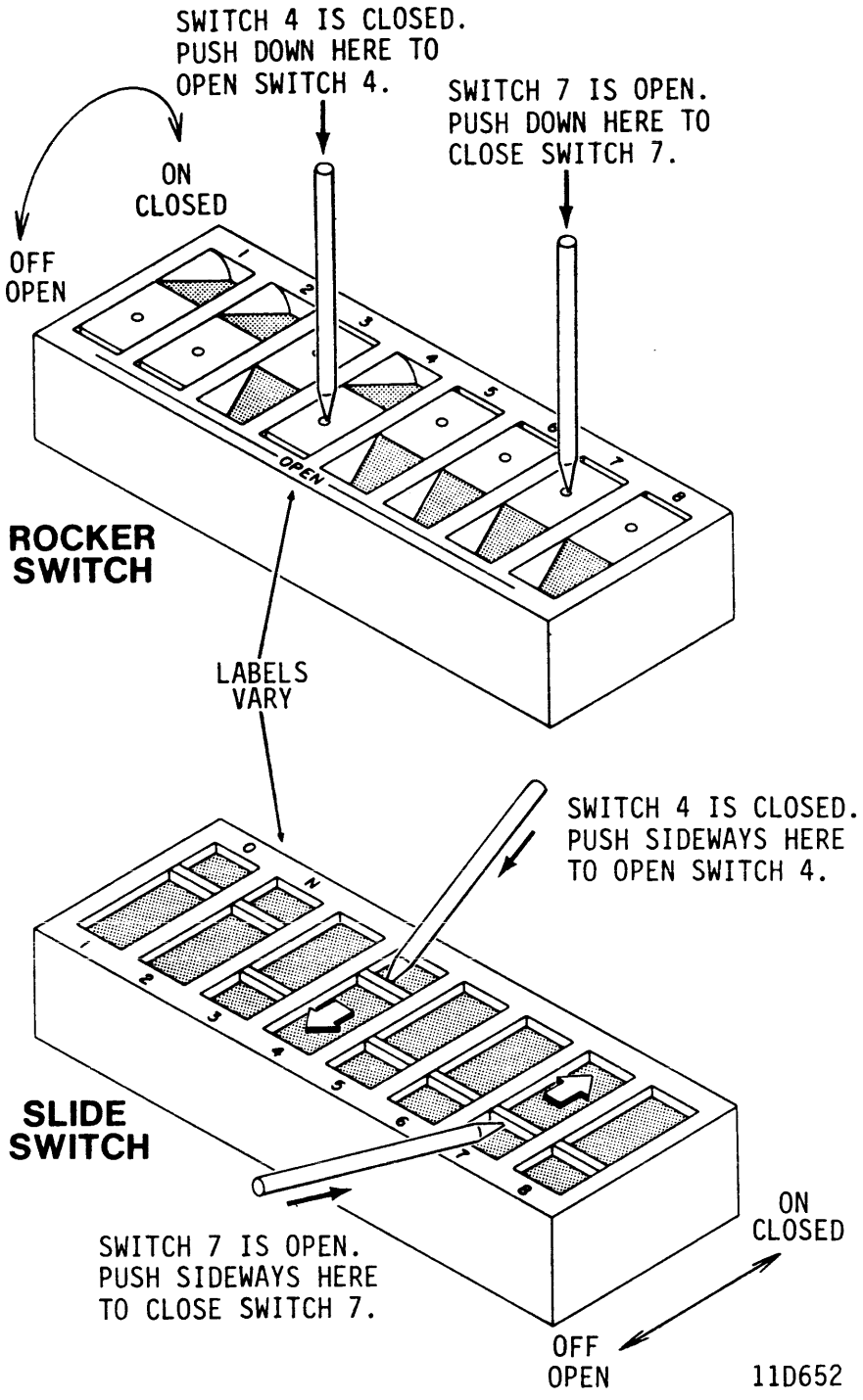
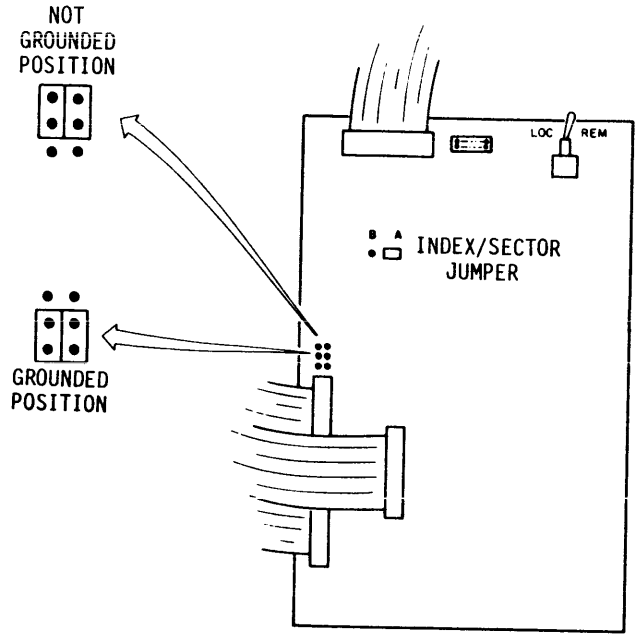


Figure 3-17. How to Set DIP Switches



11D609A

SWITCH	SETTING	DESCRIPTION
LOC/REM	LOC	Drive power on independent of controller.
	REM	Drive power on dependent on controller.
Index/Sector jumper	A	Index and sector signals are in A cable.
	B	Index and sector signals are in B cable.
	Jumper removed	Index and sector signals are in A and B cables.
30/60 Grounding jumpers	Grounded	Pins 30 and 60 are grounded
	Not Grounded	Pins 30 and 60 are not grounded

Figure 3-18. Switch Settings on _SYX I/O Board

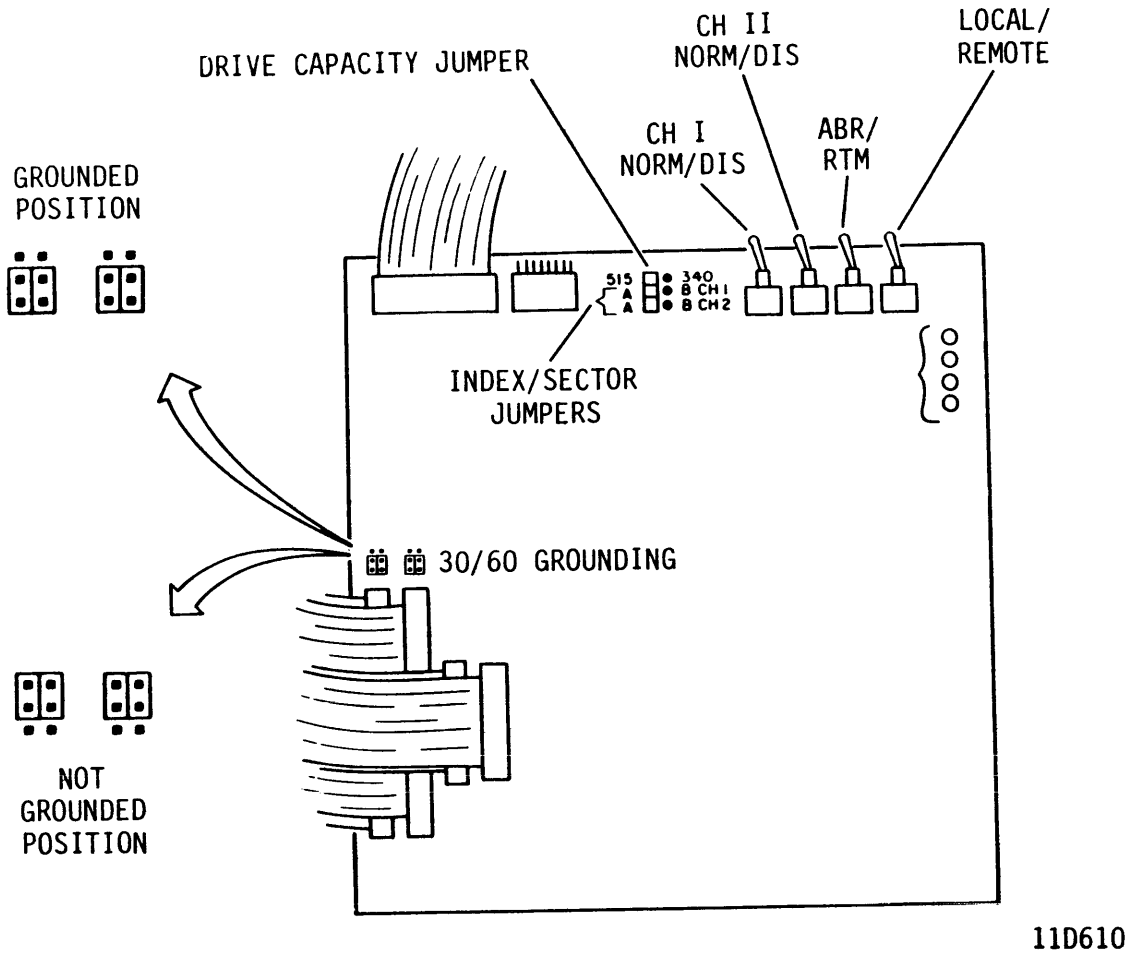
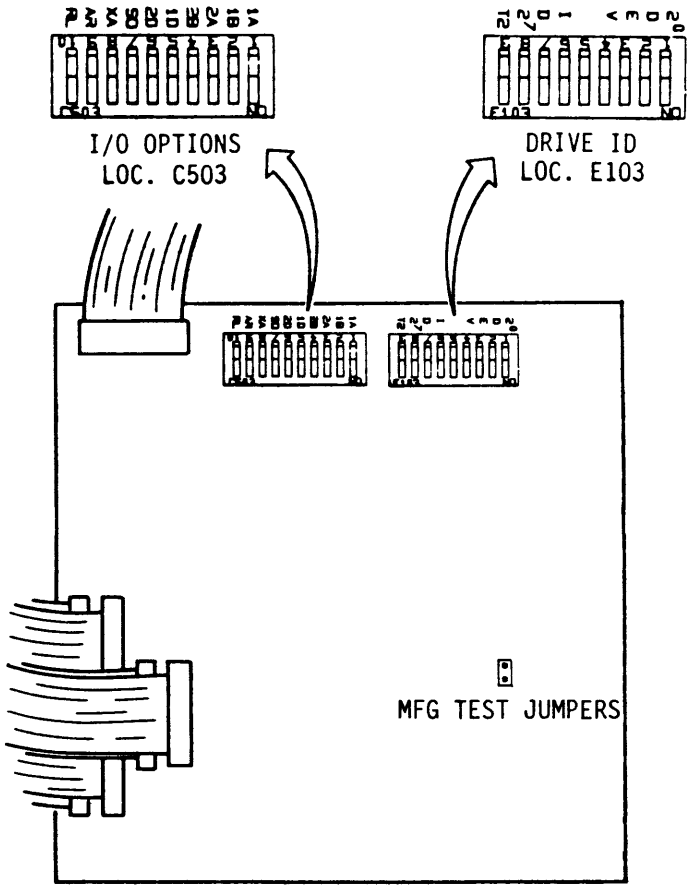


Figure 3-19. Switch Settings on _TQX I/O Board (Sheet 1 of 2)

SWITCH	SETTING	DESCRIPTION
LOCAL/REMOTE	LOCAL	Drive power on independent of controller.
	REMOTE	Drive power on dependent on controller.
ABR/RTM	ABR	Drive remains reserved until it receives release or priority select command.
	RTM	Drive is released from reserved condition approximately 500 ms after being selected.
CH II NORM/DIS	NORM	Setting for normal operation.
	DIS	Disables channel II.
CH I NORM/DIS	NORM	Setting for normal operation.
	DIS	Disables channel I.
Drive Capacity jumper	340	340 MB drives.
	515	515 MB drives.
Index/Sector jumper	A	Index and sector signals are in A cable.
	B	Index and sector signals are in B cable.
	Jumper removed	Index and sector signals are in A and B cables.
30/60 Grounding jumpers	Grounded	Pins 30 and 60 are grounded.
	Not Grounded	Pins 30 and 60 are not grounded.

Figure 3-19. Switch Settings on _TQX I/O Board (Sheet 2)



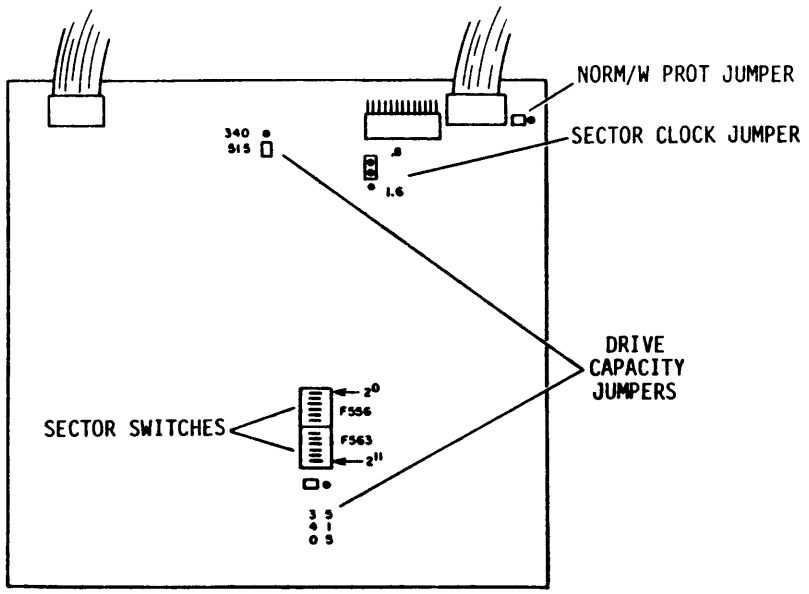
11D611

SWITCH	SETTING	DESCRIPTION
1A	Open (off)	Index and Sector signals are in Channel I A cable.
	Closed(on)	Index and Sector signals are not in Channel I A cable.
1B	Open (off)	Index and Sector signals are in Channel I B cable.
	Closed(on)	Index and Sector signals are not in Channel I B cable.
2A	Open (off)	Index and Sector signals are in Channel II A cable.
	Closed(on)	Index and Sector signals are not in Channel II A cable.

Figure 3-20. Switch Settings on _VJX I/O Board (Sheet 1 of 2)

SWITCH	SETTING	DESCRIPTION
2B	Open (off)	Index and Sector signals are in Channel II B cable.
	Closed(on)	Index and Sector signals are not in Channel II B cable.
1D	Open (off)	Channel I enabled.
	Closed(on)	Channel I disabled.
2D	Open (off)	Channel II enabled.
	Closed(on)	Channel II disabled.
SO	Open (off)	SMD-E mode (tags 1-6).
	Closed(on)	SMD-0 mode (tags 1-3).
XA	Open (off)	Extended cylinder addressing not used in this drive. Set in open (off) position.
AR	Open (off)	Absolute Reserve mode.
	Closed(on)	Reserve Timeout mode.
RL	Open (off)	Drive power on dependent on controller.
	Closed(on)	Drive power on independent of controller.
$2^0 \rightarrow 2^7$		Device ID: set according to customer requirements.
T2	Open (off)	On newer _VJX boards only. For extended cylinder addressing, which is not used in this drive. Set in open (off) position to make tags 4 and 6 usable in SMD-E mode.
Mfg test jumpers		Jumpers preset during manufacturing. Drive will not operate with jumpers removed.

Figure 3-20. Switch Settings on _VJX I/O Board (Sheet 2)



11D612A

SWITCH	SETTING	DESCRIPTION
Drive Capacity jumpers	340	300 and 340 MB drives.
	515	515 MB drives.
Sector switches*		See discussion on programming the sector counter.
NORM/W PROT jumper*	NORM	Normal: enables write operations.
	W PROT	Write Protect: disables write operations.
Sector Clock jumper**	.8	0.8 MHz sector clock frequency.
	1.6	1.6 MHz sector clock frequency.

* On older control boards only (see table 3-4)
**On selected control boards only (see table 3-4)

Figure 3-21. Switch Settings on _VCX Control Board

PROGRAMMING THE SECTOR COUNTER

Before programming the sector counter, you must know the following:

- The number of sectors (or bytes per sector) required by the controller. This information should be in the subsystem or controller manuals.
- Drive capacity. The 300/340 MB drives and the 515 MB drive have different numbers of bytes per track.
- Sector clock frequency. Selecting a different sector clock frequency affects the way you program the sector counter and in some cases the number of bytes per sector.
- Sector selection method. Choose either the round-down or round-up method.
- Control board identification.

Round-down Or Round-up Method

The number of sector clock pulses per revolution is not always evenly divisible by the number of sectors. The problem of an uneven division can be solved by either rounding down or rounding up the result.

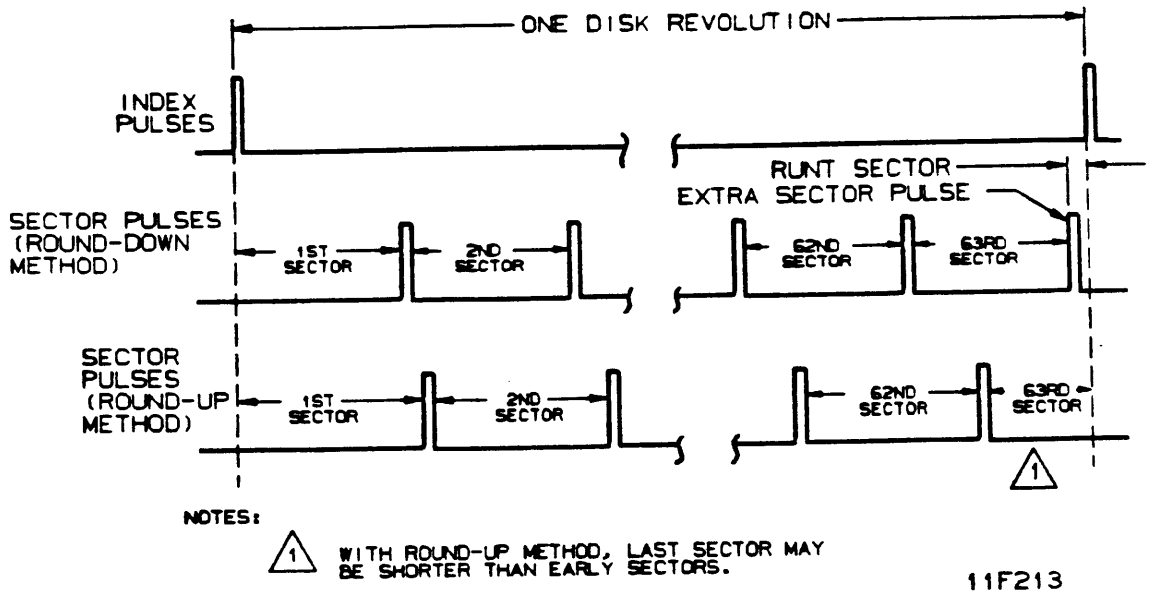
With the round-down method, an extra sector pulse and a runt sector can occur. A runt sector is a short interval following the last usable sector.

With the round-up method, the last sector can be somewhat shorter than the other sectors. There is no runt sector, however.

Changing the sector clock frequency may reduce the size of a runt sector (round-down method) or make the last sector longer (round-up method).

Figure 3-22 uses an example of 63 sectors to show how the round-up and round-down methods differ both in terms of sector lengths and in the presence or absence of an extra sector pulse. This illustration also lists and describes tables 3-5 through 3-12. These tables list sector select switch settings/ maintenance panel entries for sector selection. There are two tables that match your drive capacity and sector clock frequency. Use the one that best matches the sector lengths required by the controller.

Additional background information about sector selection appears in appendix B. For most installations it will not be



SELECTING A TABLE FOR 300/340 MB DRIVES:

	Round-down Method	Round-up Method
0.8 MHz Clock	Table 3-5	Table 3-6
1.6 MHz Clock	Table 3-7	Table 3-8

SELECTING A TABLE FOR 515 MB DRIVES:

	Round-down Method	Round-up Method
0.8 MHz Clock	Table 3-9	Table 3-10
1.6 MHz Clock	Table 3-11	Table 3-12

Figure 3-22. Choosing a Sector Selection Method

necessary to refer to appendix B. However, some systems designers, when matching a disk drive to a specific controller, choose a sector length different from any given here in the tables. In cases like this, the material in the appendix relates arbitrary sector lengths to switch settings.

Control Board Identification

The method used to program the sector counter on older control boards differs from the method used on newer control boards. To identify your control board, perform one of the tests (whichever is easiest) in table 3-4.

TABLE 3-4. CONTROL BOARD IDENTIFICATION

Tests	Older Control Boards	Newer Control Boards
Remove top cover and examine control board -OR-	Have sector switches (12 DIP switches)	Don't have sector switches
Remove top cover and identify the board type of the control board -OR-	Board type in range between EVCX and APVCX	Board type is ASVCX or it has higher prefix
Use Diagnostic Test 0C (instructions are in Appendix A) to read part number of EPROM on maintenance panel	EPROM part number is in the 708991XX or 471139XX series	EPROM part number is in the 471010XX series

Units With Older Control Boards

On units with older control boards (as identified in table 3-4), the sector counter is programmed by setting the sector switches. These switches are in locations F556 and F563 (shown on figure 3-21) on the control board.

The sector switches have twelve independent switches used for selecting sectors. Referring to the table you have chosen to use for sector selection, you will see that across from the number of sectors listed in each table is a row of Cs and Os. C represents the Closed or On position of the sector switch.

O represents the Open or Off position of the sector switch. Set the switches to the positions designated in the table while referring to figure 3-17 for an illustration of the switch positions.

For future reference, you may want to record the switch settings you made. Use the following worksheet:

Table Used: _____

Number of Sectors: _____

Switch Settings:
Switch F556: 1 __ 2 __ 3 __ 4 __ 5 __ 6 __
Switch F563: 1 __ 2 __ 3 __ 4 __ 5 __ 6 __

Units With Newer Control Boards

On units with newer control boards (as identified in table 3-4), you must first select a Sector Clock frequency (0.8 MHz or 1.6 MHz) and then program the sector counter.

If the control board has a Sector Clock jumper (as shown in figure 3-21), set the jumper for the desired frequency. If it does not have the jumper, select the desired frequency by running:

- Diagnostic Test 22 -- Selects the 1.6 MHz clock.
- Diagnostic Test 23 -- Selects the 0.8 MHz clock.

Program the sector counter by performing either of the following:

- Diagnostic Test 17 (described in appendix A) -- Enter the desired number of sectors in hex via the maintenance panel. The MPU calculates the sector length with the round-down method and preloads the sector counter automatically. This method is valid only if the 0.8 MHz Sector Clock is used. The tables provide decimal-to-hex conversion for the number of sectors (in the left-hand column).
- Diagnostic Test 18 (described in appendix A) -- Enter the desired sector length in hex via the maintenance panel. The MPU uses this number to preload the sector counter. This method is valid for either Sector Clock frequency provided you use the appropriate table. Also, you can control whether there is a runt sector by choosing either a round-up or a round-down table. The tables provide a

Test 18 input for sector length (to the right of the conventional switch setting columns).

Detailed instructions for operating the maintenance panel appear in appendix A. Diagnostic Tests 17, 18, and 1F also provide methods for checking previous Sector Clock selection and sector counter programming if there is some question about how it was set.

For future reference, you may want to record how you programmed the sector counter. Use the following worksheet:

Table Used: _____

Sector Clock Used: _____

Diagnostic Test and Numerical Entry Used:
Test 17: Number of Sectors _____
or Test 18: Sector Length _____

WRITE-PROTECTING THE DRIVE VIA THE MAINTENANCE PANEL

On units with newer control boards (see table 3-4) you can write-protect the drive by running Diagnostic Test 15 on the maintenance panel. This write-protects all cylinders on the drive and lights the WRITE PROTECT indicator on the operator panel. To clear the write-protected condition, run Diagnostic Test 16 on the maintenance panel.

Detailed instructions for operating the maintenance panel appear in appendix A. Diagnostic Test 1F provides a method for checking the write protect status if there is some question about how it was set.

PROGRAMMING THE SWEEP CYCLE FUNCTION

On units with newer control boards (see table 3-4), the sweep cycle is a feature that periodically moves the heads to different locations on the disks during intervals when the drive is idle. The following are highlights of the sweep cycle function:

- Using the sweep cycle enhances drive reliability. We encourage you either to enable the drive sweep cycle or to use a sweep cycle driven at the system or subsystem level. Consult with an analyst in making this choice.

- There are several sweep cycle options available at the

drive level. Make sure that the selected option is compatible with system operation.

- Our testing has verified that sweep activity results in lower particle count in the module.
- The sweep routine consumes 7 seconds of a 7.5 hour period. Thus, the drive is available to the system more than 99% of the time.
- You can disable the sweep cycle (described below) without affecting the specified Mean Time Between Failures (MTBF) or warranty agreements.

The drive is preset during manufacturing with a set of sweep cycle options selected. Diagnostic Test 1F provides a method for checking which options were selected if there is some question about how the drive was preset. The following diagnostic tests change different aspects of the sweep cycle programming:

- Test 19 -- enables the sweep cycle function.
- Test 1A -- disables the sweep cycle function. The other tests then have no effect.
- Test 1B -- enables the option to return the heads to their original cylinder following a sweep segment.
- Test 1C -- disables the option to return the heads to the original cylinder following a sweep segment.
- Test 1D -- enables sweep movements to occur only in conjunction with seeks required by the controller.
- Test 1E -- cancels option 1D.
- Test 20 -- enables the drive to issue Write Protected status during each sweep segment.
- Test 21 -- disables the Write Protected option of Test 20.
- Test 25 -- disables the counter restart option of Test 26.
- Test 26 -- instructs the drive to restart the sweep counter each time it executes a seek for the controller.

Detailed instructions for operating the maintenance panel appear in appendix A. With these instructions you will find more detailed descriptions of how each option affects the sweep cycle function.

Checkout instructions follow the sector select tables.

TABLE 3-5. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-DOWN METHOD

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
4/04	C	C	C	C	C	O	O	O	C	O	C	C	D1F	5040	0
5/05	C	C	C	C	C	C	C	O	O	C	O	C	A7F	4032	0
6/06	C	C	C	C	C	C	O	C	O	O	O	C	8BF	3360	0
7/07	C	C	C	C	C	C	C	O	C	C	C	O	77F	2880	0
8/08	C	C	C	C	O	O	O	C	O	C	C	O	68F	2520	0
9/09	O	O	C	O	C	O	C	C	C	O	C	O	5D4	2239.50	4.50
10/0A	C	C	C	C	C	C	O	O	C	O	C	O	53F	2016	0
11/0B	O	O	C	O	O	O	C	C	O	O	C	O	4C4	1831.50	13.50
12/0C	C	C	C	C	C	O	C	O	O	O	C	O	45F	1680	0
13/0D	O	O	O	C	O	O	O	O	O	O	C	O	408	1549.50	16.50
14/0E	C	C	C	C	C	C	O	C	C	C	O	O	3BF	1440	0
15/0F	C	C	C	C	C	C	C	O	C	C	O	O	37F	1344	0
16/10	C	C	C	O	O	O	C	O	C	C	O	O	347	1260	0
17/11	C	O	C	O	C	O	O	O	C	C	O	O	315	1185	15
18/12	C	O	O	C	O	C	C	C	O	C	O	O	2E9	1119	18
19/13	O	C	O	O	O	O	C	C	O	C	O	O	2C2	1060.50	10.50
20/14	C	C	C	C	C	O	O	C	O	C	O	O	29F	1008	0
21/15	C	C	C	C	C	C	C	O	O	C	O	O	27F	960	0
22/16	C	O	O	O	O	C	C	O	O	C	O	O	261	915	30
23/17	C	C	C	O	O	O	C	O	O	C	O	O	247	876	12
24/18	C	C	C	C	O	C	O	O	O	C	O	O	22F	840	0
25/19	O	O	O	C	C	O	O	O	O	C	O	O	218	805.50	22.50
26/1A	C	C	O	O	O	O	O	O	O	C	O	O	203	774	36
27/1B	O	O	O	O	C	C	C	C	C	O	O	O	1F0	745.50	31.50
28/1C	C	C	C	C	C	O	C	C	C	O	O	O	1DF	720	0
29/1D	O	C	C	C	O	O	C	C	C	O	O	O	1CE	694.50	19.50
30/1E	C	C	C	C	C	C	O	C	C	O	O	O	1BF	672	0
31/1F	O	O	O	O	C	C	O	C	C	O	O	O	1B0	649.50	25.50
32/20	C	C	O	O	O	C	O	C	C	O	O	O	1A3	630	0
33/21	O	C	C	O	C	O	O	C	C	O	O	O	196	610.50	13.50
34/22	O	C	O	C	O	O	O	C	C	O	O	O	18A	592.50	15
35/23	C	C	C	C	C	C	C	O	C	O	O	O	17F	576	0
36/24	O	O	C	O	C	C	C	O	C	O	O	O	174	559.50	18
37/25	O	C	O	C	O	C	C	O	C	O	O	O	16A	544.50	13.50
38/26	O	O	O	O	O	C	C	O	C	O	O	O	160	529.50	39
39/27	C	C	C	O	C	O	C	O	C	O	O	O	157	516	36
40/28	C	C	C	C	O	O	C	O	C	O	O	O	14F	504	0
41/29	O	C	C	O	O	O	C	O	C	O	O	O	146	490.50	49.50
42/2A	C	C	C	C	C	C	O	O	C	O	O	O	13F	480	0
43/2B	C	C	C	O	C	C	O	O	C	O	O	O	137	468	36
44/2C	O	O	O	O	C	C	O	O	C	O	O	O	130	457.50	30
45/2D	C	O	O	C	O	C	O	O	C	O	O	O	129	447	45

* C = Closed or On; O = Open or Off

Continued

TABLE 3-5. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-DOWN METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
46/2E	C	C	O	O	O	C	O	O	C	O	O	O	123	438	12
47/2F	O	O	C	C	C	O	O	O	C	O	O	O	11C	427.50	67.50
48/30	C	C	C	O	C	O	O	O	C	O	O	O	117	420	0
49/31	C	O	O	O	C	O	O	O	C	O	O	O	111	411	21
50/32	C	C	O	C	O	O	O	O	C	O	O	O	10B	402	60
51/33	O	C	C	O	O	O	O	O	C	O	O	O	106	394.50	40.50
52/34	C	O	O	O	O	O	O	O	C	O	O	O	101	387	36
53/35	O	O	C	C	C	C	C	C	O	O	O	O	0FC	379.50	46.50
54/36	C	C	C	O	C	C	C	C	O	O	O	O	0F7	372	72
55/37	C	C	O	O	C	C	C	C	O	O	O	O	0F3	366	30
56/38	C	C	C	C	O	C	C	C	O	O	O	O	0EF	360	0
57/39	O	C	O	C	O	C	C	C	O	O	O	O	0EA	352.50	67.50
58/3A	O	C	C	O	O	C	C	C	O	O	O	O	0E6	346.50	63
59/3B	O	C	O	O	O	C	C	C	O	O	O	O	0E2	340.50	70.50
60/3C	C	C	C	C	C	O	C	C	O	O	O	O	0DF	336	0
61/3D	C	C	O	C	C	O	C	C	O	O	O	O	0DB	330	30
62/3E	C	C	C	O	C	O	C	C	O	O	O	O	0D7	324	72
63/3F	O	O	C	O	C	O	C	C	O	O	O	O	0D4	319.50	31.50
64/40	C	O	O	O	C	O	C	C	O	O	O	O	0D1	315	0
65/41	C	O	C	C	O	O	C	C	O	O	O	O	0CD	309	75
66/42	O	C	O	C	O	O	C	C	O	O	O	O	0CA	304.50	63
67/43	C	C	C	O	O	O	C	C	O	O	O	O	0C7	300	60
68/44	O	O	C	O	O	O	C	C	O	O	O	O	0C4	295.50	66
69/45	C	O	O	O	O	O	C	C	O	O	O	O	0C1	291	81
70/46	C	C	C	C	C	C	O	C	O	O	O	O	0BF	288	0
71/47	O	O	C	C	C	C	O	C	O	O	O	O	0BC	283.50	31.50
72/48	C	O	O	C	C	C	O	C	O	O	O	O	0B9	279	72
73/49	C	C	C	O	C	C	O	C	O	O	O	O	0B7	276	12
74/4A	O	O	C	O	C	C	O	C	O	O	O	O	0B4	271.50	69
75/4B	O	C	O	O	C	C	O	C	O	O	O	O	0B2	268.50	22.50
76/4C	C	C	C	C	O	C	O	C	O	O	O	O	0AF	264	96
77/4D	C	O	C	C	O	C	O	C	O	O	O	O	0AD	261	63
78/4E	C	C	O	C	O	C	O	C	O	O	O	O	0AB	258	36
79/4F	C	O	O	C	O	C	O	C	O	O	O	O	0A9	255	15
80/50	C	C	C	O	O	C	O	C	O	O	O	O	0A7	252	0
81/51	O	O	C	O	O	C	O	C	O	O	O	O	0A4	247.50	112.50
82/52	O	C	O	O	O	C	O	C	O	O	O	O	0A2	244.50	111
83/53	O	O	O	O	O	C	O	C	O	O	O	O	0A0	241.50	115.50
84/54	C	C	C	C	C	O	O	C	O	O	O	O	09F	240	0
85/55	C	O	C	C	C	O	O	C	O	O	O	O	09D	237	15
86/56	C	C	O	C	C	O	O	C	O	O	O	O	09B	234	36
87/57	C	O	O	C	C	O	O	C	O	O	O	O	099	231	63

* C = Closed or On; O = Open or Off

Continued

TABLE 3-5. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-DOWN METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
88/58	C	C	C	O	C	O	O	C	O	O	O	O	097	228	96
89/59	O	C	C	O	C	O	O	C	O	O	O	O	096	226.50	1.50
90/5A	O	O	C	O	C	O	O	C	O	O	O	O	094	223.50	45
91/5B	O	C	O	O	C	O	O	C	O	O	O	O	092	220.50	94.50
92/5C	C	O	O	O	C	O	O	C	O	O	O	O	091	219	12
93/5D	C	C	C	C	O	O	O	C	O	O	O	O	08F	216	72
94/5E	C	O	C	C	O	O	O	C	O	O	O	O	08D	213	138
95/5F	O	O	C	C	O	O	O	C	O	O	O	O	08C	211.50	67.50
96/60	C	C	O	C	O	O	O	C	O	O	O	O	08B	210	0
97/61	C	O	O	C	O	O	O	C	O	O	O	O	089	207	81
98/62	O	O	O	C	O	O	O	C	O	O	O	O	088	205.50	21
99/63	O	C	C	O	O	O	O	C	O	O	O	O	086	202.50	112.50
100/64	C	O	C	O	O	O	O	C	O	O	O	O	085	201	60
101/65	O	O	C	O	O	O	O	C	O	O	O	O	084	199.50	10.50
102/66	O	C	O	O	O	O	O	C	O	O	O	O	082	196.50	117
103/67	C	O	O	O	O	O	O	C	O	O	O	O	081	195	75
104/68	O	O	O	O	O	O	O	C	O	O	O	O	080	193.50	36
105/69	C	C	C	C	C	C	C	O	O	O	O	O	07F	192	0
106/6A	C	O	C	C	C	C	C	O	O	O	O	O	07D	189	126
107/6B	O	O	C	C	C	C	C	O	O	O	O	O	07C	187.50	97.50
108/6C	C	C	O	C	C	C	C	O	O	O	O	O	07B	186	72
109/6D	O	C	O	C	C	C	C	O	O	O	O	O	07A	184.50	49.50
110/6E	C	O	O	C	C	C	C	O	O	O	O	O	079	183	30
111/6F	O	O	O	C	C	C	C	O	O	O	O	O	078	181.50	13.50
112/70	C	C	C	O	C	C	C	O	O	O	O	O	077	180	0
113/71	C	O	C	O	C	C	C	O	O	O	O	O	075	177	159
114/72	O	O	C	O	C	C	C	O	O	O	O	O	074	175.50	153
115/73	C	C	O	O	C	C	C	O	O	O	O	O	073	174	150
116/74	O	C	O	O	C	C	C	O	O	O	O	O	072	172.50	150
117/75	C	O	O	O	C	C	C	O	O	O	O	O	071	171	153
118/76	O	O	O	O	C	C	C	O	O	O	O	O	070	169.50	159
119/77	C	C	C	C	O	C	C	O	O	O	O	O	06F	168	168
120/78	C	C	C	C	O	C	C	O	O	O	O	O	06F	168	0
121/79	O	C	C	C	O	C	C	O	O	O	O	O	06E	166.50	13.50
122/7A	C	O	C	C	O	C	C	O	O	O	O	O	06D	165	30
123/7B	O	O	C	C	O	C	C	O	O	O	O	O	06C	163.50	49.50
124/7C	C	C	O	C	O	C	C	O	O	O	O	O	06B	162	72
125/7D	O	C	O	C	O	C	C	O	O	O	O	O	06A	160.50	97.50
126/7E	C	O	O	C	O	C	C	O	O	O	O	O	069	159	126
127/7F	O	O	O	C	O	C	C	O	O	O	O	O	068	157.50	157.50
128/80	O	O	O	C	O	C	C	O	O	O	O	O	068	157.50	0

* C = Closed or On; O = Open or Off

TABLE 3-6. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-UP METHOD

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
4/04	C	C	C	C	C	O	O	O	C	O	C	C	D1F	5040	5040
5/05	C	C	C	C	C	C	C	O	O	C	O	C	A7F	4032	4032
6/06	C	C	C	C	C	C	O	C	O	O	O	C	8BF	3360	3360
7/07	C	C	C	C	C	C	C	O	C	C	C	O	77F	2880	2880
8/08	C	C	C	C	O	O	O	C	O	C	C	O	68F	2520	2520
9/09	C	O	C	O	C	O	C	C	C	O	C	O	5D5	2241	2232
10/0A	C	C	C	C	C	C	O	O	C	O	C	O	53F	2016	2016
11/0B	C	O	C	O	O	O	C	C	O	O	C	O	4C5	1833	1830
12/0C	C	C	C	C	C	O	C	O	O	O	C	O	45F	1680	1680
13/0D	C	O	O	C	O	O	O	O	O	O	C	O	409	1551	1548
14/0E	C	C	C	C	C	C	O	C	C	C	O	O	3BF	1440	1440
15/0F	C	C	C	C	C	C	C	O	C	C	O	O	37F	1344	1344
16/10	C	C	C	O	O	O	C	O	C	C	O	O	347	1260	1260
17/11	O	C	C	O	C	O	O	O	C	C	O	O	316	1186.50	1176
18/12	O	C	O	C	O	C	C	C	O	C	O	O	2EA	1120.50	1111.50
19/13	C	C	O	O	O	O	C	C	O	C	O	O	2C3	1062	1044
20/14	C	C	C	C	C	O	O	C	O	C	O	O	29F	1008	1008
21/15	C	C	C	C	C	C	C	O	O	C	O	O	27F	960	960
22/16	O	C	O	O	O	C	C	O	O	C	O	O	262	916.50	913.50
23/17	O	O	O	C	O	O	C	O	O	C	O	O	248	877.50	855
24/18	C	C	C	C	O	C	O	O	O	C	O	O	22F	840	840
25/19	C	O	O	C	C	O	O	O	O	C	O	O	219	807	792
26/1A	O	O	C	O	O	O	O	O	O	C	O	O	204	775.50	772.50
27/1B	C	O	O	O	C	C	C	C	C	O	O	O	1F1	747	738
28/1C	C	C	C	C	C	O	C	C	C	O	O	O	1DF	720	720
29/1D	C	C	C	C	O	O	C	C	C	O	O	O	1CF	696	672
30/1E	C	C	C	C	C	C	O	C	C	O	O	O	1BF	672	672
31/1F	C	O	O	O	C	C	O	C	C	O	O	O	1B1	651	630
32/20	C	C	O	O	O	C	O	C	C	O	O	O	1A3	630	630
33/21	C	C	C	O	C	O	O	C	C	O	O	O	197	612	576
34/22	C	C	O	C	O	O	O	C	C	O	O	O	18B	594	558
35/23	C	C	C	C	C	C	C	O	C	O	O	O	17F	576	576
36/24	C	O	C	O	C	C	C	O	C	O	O	O	175	561	525
37/25	C	C	O	C	O	C	C	O	C	O	O	O	16B	546	504
38/26	C	O	O	O	O	C	C	O	C	O	O	O	161	531	513
39/27	O	O	O	C	C	O	C	O	C	O	O	O	158	517.50	495
40/28	C	C	C	C	O	O	C	O	C	O	O	O	14F	504	504
41/29	C	C	C	O	O	O	C	O	C	O	O	O	147	492	480
42/2A	C	C	C	C	C	C	O	O	C	O	O	O	13F	480	480
43/2B	O	O	O	C	C	C	O	O	C	O	O	O	138	469.50	441
44/2C	C	O	O	O	C	C	O	O	C	O	O	O	131	459	423
45/2D	O	C	O	C	O	C	O	O	C	O	O	O	12A	448.50	426

* C = Closed or On; O = Open or Off

Continued

TABLE 3-6. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-UP METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
46/2E	O	O	C	O	O	C	O	O	C	O	O	O	124	439.50	382.50
47/2F	C	O	C	C	C	O	O	O	C	O	O	O	11D	429	426
48/30	C	C	C	O	C	O	O	O	C	O	O	O	117	420	420
49/31	O	C	O	O	C	O	O	O	C	O	O	O	112	412.50	360
50/32	O	O	C	C	O	O	O	O	C	O	O	O	10C	403.50	388.50
51/33	C	C	C	O	O	O	O	O	C	O	O	O	107	396	360
52/34	O	C	O	O	O	O	O	O	C	O	O	O	102	388.50	346.50
53/35	C	O	C	C	C	C	C	C	O	O	O	O	0FD	381	348
54/36	O	O	O	C	C	C	C	C	O	O	O	O	0F8	373.50	364.50
55/37	O	O	C	O	C	C	C	C	O	O	O	O	0F4	367.50	315
56/38	C	C	C	C	O	C	C	C	O	O	O	O	0EF	360	360
57/39	C	C	O	C	O	C	C	C	O	O	O	O	0EB	354	336
58/3A	C	C	C	O	O	C	C	C	O	O	O	O	0E7	348	324
59/3B	C	C	O	O	O	C	C	C	O	O	O	O	0E3	342	324
60/3C	C	C	C	C	C	O	C	C	O	O	O	O	0DF	336	336
61/3D	O	O	C	C	C	O	C	C	O	O	O	O	0DC	331.50	270
62/3E	O	O	O	C	C	O	C	C	O	O	O	O	0D8	325.50	304.50
63/3F	C	O	C	O	C	O	C	C	O	O	O	O	0D5	321	258
64/40	C	O	O	O	C	O	C	C	O	O	O	O	0D1	315	315
65/41	O	C	C	C	O	O	C	C	O	O	O	O	0CE	310.50	288
66/42	C	C	O	C	O	O	C	C	O	O	O	O	0CB	306	270
67/43	O	O	O	C	O	O	C	C	O	O	O	O	0C8	301.50	261
68/44	C	O	C	O	O	O	C	C	O	O	O	O	0C5	297	261
69/45	O	C	O	O	O	O	C	C	O	O	O	O	0C2	292.50	270
70/46	C	C	C	C	C	C	O	C	O	O	O	O	0BF	288	288
71/47	C	O	C	C	C	C	O	C	O	O	O	O	0BD	285	210
72/48	O	C	O	C	C	C	O	C	O	O	O	O	0BA	280.50	244.50
73/49	O	O	O	C	C	C	O	C	O	O	O	O	0B8	277.50	180
74/4A	C	O	C	O	C	C	O	C	O	O	O	O	0B5	273	231
75/4B	C	C	O	O	C	C	O	C	O	O	O	O	0B3	270	180
76/4C	O	O	O	O	C	C	O	C	O	O	O	O	0B0	265.50	247.50
77/4D	O	C	C	C	O	C	O	C	O	O	O	O	0AE	262.50	210
78/4E	O	O	C	C	O	C	O	C	O	O	O	O	0AC	259.50	178.50
79/4F	O	C	O	C	O	C	O	C	O	O	O	O	0AA	256.50	153
80/50	C	C	C	O	O	C	O	C	O	O	O	O	0A7	252	252
81/51	C	O	C	O	O	C	O	C	O	O	O	O	0A5	249	240
82/52	C	C	O	O	O	C	O	C	O	O	O	O	0A3	246	234
83/53	C	O	O	O	O	C	O	C	O	O	O	O	0A1	243	234
84/54	C	C	C	C	C	O	O	C	O	O	O	O	09F	240	240
85/55	O	C	C	C	C	O	O	C	O	O	O	O	09E	238.50	126
86/56	O	O	C	C	C	O	O	C	O	O	O	O	09C	235.50	142.50
87/57	O	C	O	C	C	O	O	C	O	O	O	O	09A	232.50	165

* C = Closed or On; O = Open or Off

Continued

TABLE 3-6. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-UP METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
88/58	O	O	O	C	C	O	O	C	O	O	O	O	098	229.50	193.50
89/59	C	C	C	O	C	O	O	C	O	O	O	O	097	228	96
90/5A	C	O	C	O	C	O	O	C	O	O	O	O	095	225	135
91/5B	C	C	O	O	C	O	O	C	O	O	O	O	093	222	180
92/5C	O	C	O	O	C	O	O	C	O	O	O	O	092	220.50	94.50
93/5D	O	O	O	O	C	O	O	C	O	O	O	O	090	217.50	150
94/5E	O	C	C	C	O	O	O	C	O	O	O	O	08E	214.50	211.50
95/5F	C	O	C	C	O	O	O	C	O	O	O	O	08D	213	138
96/60	C	C	O	C	O	O	O	C	O	O	O	O	08B	210	210
97/61	O	C	O	C	O	O	O	C	O	O	O	O	08A	208.50	144
98/62	C	O	O	C	O	O	O	C	O	O	O	O	089	207	81
99/63	C	C	C	O	O	O	O	C	O	O	O	O	087	204	168
100/64	O	C	C	O	O	O	O	C	O	O	O	O	086	202.50	112.50
101/65	C	O	C	O	O	O	O	C	O	O	O	O	085	201	60
102/66	C	C	O	O	O	O	O	C	O	O	O	O	083	198	162
103/67	O	C	O	O	O	O	O	C	O	O	O	O	082	196.50	117
104/68	C	O	O	O	O	O	O	C	O	O	O	O	081	195	75
105/69	C	C	C	C	C	C	C	O	O	O	O	O	07F	192	192
106/6A	O	C	C	C	C	C	C	O	O	O	O	O	07E	190.50	157.50
107/6B	C	O	C	C	C	C	C	O	O	O	O	O	07D	189	126
108/6C	O	O	C	C	C	C	C	O	O	O	O	O	07C	187.50	97.50
109/6D	C	C	O	C	C	C	C	O	O	O	O	O	07B	186	72
110/6E	O	C	O	C	C	C	C	O	O	O	O	O	07A	184.50	49.50
111/6F	C	O	O	C	C	C	C	O	O	O	O	O	079	183	30
112/70	C	C	C	O	C	C	C	O	O	O	O	O	077	180	180
113/71	O	C	C	O	C	C	C	O	O	O	O	O	076	178.50	168
114/72	C	O	C	O	C	C	C	O	O	O	O	O	075	177	159
115/73	O	O	C	O	C	C	C	O	O	O	O	O	074	175.50	153
116/74	C	C	O	O	C	C	C	O	O	O	O	O	073	174	150
117/75	O	C	O	O	C	C	C	O	O	O	O	O	072	172.50	150
118/76	C	O	O	O	C	C	C	O	O	O	O	O	071	171	153
119/77	O	O	O	O	C	C	C	O	O	O	O	O	070	169.50	159
120/78	C	C	C	C	O	C	C	O	O	O	O	O	06F	168	168
121/79	C	C	C	C	O	C	C	O	O	O	O	O	06F	168	0
122/7A	O	C	C	C	O	C	C	O	O	O	O	O	06E	166.50	13.50
123/7B	C	O	C	C	O	C	C	O	O	O	O	O	06D	165	30
124/7C	O	O	C	C	O	C	C	O	O	O	O	O	06C	163.50	49.50
125/7D	C	C	O	C	O	C	C	O	O	O	O	O	06B	162	72
126/7E	O	C	O	C	O	C	C	O	O	O	O	O	06A	160.50	97.50
127/7F	C	O	O	C	O	C	C	O	O	O	O	O	069	159	126
128/80	O	O	O	C	O	C	C	O	O	O	O	O	068	157.50	157.50

* C = Closed or On; O = Open or Off

TABLE 3-7. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-DOWN METHOD

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
7/07	C	C	C	C	C	C	C	C	O	C	C	C	EFF	2880	0
8/08	C	C	C	C	C	O	O	O	C	O	C	C	D1F	2520	0
9/09	C	O	O	C	O	C	O	C	C	C	O	C	BA9	2239.50	4.50
10/0A	C	C	C	C	C	C	C	O	O	C	O	C	A7F	2016	0
11/0B	O	C	O	C	O	O	O	C	C	O	O	C	98A	1832.25	5.25
12/0C	C	C	C	C	C	C	O	C	O	O	O	C	8BF	1680	0
13/0D	O	C	O	O	C	O	O	O	O	O	O	C	812	1550.25	6.75
14/0E	C	C	C	C	C	C	C	O	C	C	C	O	77F	1440	0
15/0F	C	C	C	C	C	C	C	C	O	C	C	O	6FF	1344	0
16/10	C	C	C	C	O	O	O	C	O	C	C	O	68F	1260	0
17/11	O	O	C	C	O	C	O	O	O	C	C	O	62C	1185.75	2.25
18/12	O	O	C	O	C	O	C	C	C	O	C	O	5D4	1119.75	4.50
19/13	C	O	C	O	O	O	O	C	C	O	C	O	585	1060.50	10.50
20/14	C	C	C	C	C	C	O	O	C	O	C	O	53F	1008	0
21/15	C	C	C	C	C	C	C	C	O	O	C	O	4FF	960	0
22/16	O	O	C	O	O	O	C	C	O	O	C	O	4C4	915.75	13.50
23/17	C	C	C	C	O	O	O	C	O	O	C	O	48F	876	12
24/18	C	C	C	C	C	O	C	O	O	O	C	O	45F	840	0
25/19	O	C	O	O	C	C	O	O	O	O	C	O	432	806.25	3.75
26/1A	O	O	O	C	O	O	O	O	O	O	C	O	408	774.75	16.50
27/1B	O	C	O	O	O	C	C	C	C	C	O	O	3E2	746.25	11.25
28/1C	C	C	C	C	C	C	O	C	C	C	O	O	3BF	720	0
29/1D	C	O	C	C	C	O	O	C	C	C	O	O	39D	694.50	19.50
30/1E	C	C	C	C	C	C	C	O	C	C	O	O	37F	672	0
31/1F	O	C	O	O	O	C	C	O	C	C	O	O	362	650.25	2.25
32/20	C	C	C	O	O	O	C	O	C	C	O	O	347	630	0
33/21	C	O	C	C	O	C	O	O	C	C	O	O	32D	610.50	13.50
34/22	C	O	C	O	C	O	O	O	C	C	O	O	315	592.50	15
35/23	C	C	C	C	C	C	C	C	O	C	O	O	2FF	576	0
36/24	C	O	O	C	O	C	C	C	O	C	O	O	2E9	559.50	18
37/25	C	O	C	O	C	O	C	C	O	C	O	O	2D5	544.50	13.50
38/26	O	C	O	O	O	O	C	C	O	C	O	O	2C2	530.25	10.50
39/27	O	O	O	O	C	C	O	C	O	C	O	O	2B0	516.75	6.75
40/28	C	C	C	C	C	O	O	C	O	C	O	O	29F	504	0
41/29	O	C	C	C	O	O	O	C	O	C	O	O	28E	491.25	18.75
42/2A	C	C	C	C	C	C	C	O	O	C	O	O	27F	480	0
43/2B	O	O	O	O	C	C	C	O	O	C	O	O	270	468.75	3.75
44/2C	C	O	O	O	O	C	C	O	O	C	O	O	261	457.50	30
45/2D	O	O	C	O	C	O	C	O	O	C	O	O	254	447.75	11.25
46/2E	C	C	C	O	O	O	C	O	O	C	O	O	247	438	12
47/2F	O	C	O	C	C	C	O	O	O	C	O	O	23A	428.25	32.25
48/30	C	C	C	C	O	C	O	O	O	C	O	O	22F	420	0

* C = Closed or On; O = Open or Off

Continued

TABLE 3-7. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-DOWN METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
49/31	C	C	O	O	O	C	O	O	O	C	O	O	223	411	21
50/32	O	O	O	C	C	O	O	O	O	C	O	O	218	402.75	22.50
51/33	O	C	C	C	O	O	O	O	O	C	O	O	20E	395.25	2.25
52/34	C	C	O	O	O	O	O	O	O	C	O	O	203	387	36
53/35	O	C	O	C	C	C	C	C	C	O	O	O	1FA	380.25	6.75
54/36	O	O	O	O	C	C	C	C	C	O	O	O	1F0	372.75	31.50
55/37	C	C	C	O	O	C	C	C	C	O	O	O	1E7	366	30
56/38	C	C	C	C	C	O	C	C	C	O	O	O	1DF	360	0
57/39	O	C	C	O	C	O	C	C	C	O	O	O	1D6	353.25	24.75
58/3A	O	C	C	C	O	O	C	C	C	O	O	O	1CE	347.25	19.50
59/3B	O	C	C	O	O	O	C	C	C	O	O	O	1C6	341.25	26.25
60/3C	C	C	C	C	C	C	O	C	C	O	O	O	1BF	336	0
61/3D	C	C	C	O	C	C	O	C	C	O	O	O	1B7	330	30
62/3E	O	O	O	O	C	C	O	C	C	O	O	O	1B0	324.75	25.50
63/3F	C	O	O	C	O	C	O	C	C	O	O	O	1A9	319.50	31.50
64/40	C	C	O	O	O	C	O	C	C	O	O	O	1A3	315	0
65/41	O	O	C	C	C	O	O	C	C	O	O	O	19C	309.75	26.25
66/42	O	C	C	O	C	O	O	C	C	O	O	O	196	305.25	13.50
67/43	O	O	O	O	C	O	O	C	C	O	O	O	190	300.75	9.75
68/44	O	C	O	C	O	O	O	C	C	O	O	O	18A	296.25	15
69/45	O	O	C	O	O	O	O	C	C	O	O	O	184	291.75	29.25
70/46	C	C	C	C	C	C	C	O	C	O	O	O	17F	288	0
71/47	C	O	O	C	C	C	C	O	C	O	O	O	179	283.50	31.50
72/48	O	O	C	O	C	C	C	O	C	O	O	O	174	279.75	18
73/49	C	C	C	C	O	C	C	O	C	O	O	O	16F	276	12
74/4A	O	C	O	C	O	C	C	O	C	O	O	O	16A	272.25	13.50
75/4B	C	O	C	O	O	C	C	O	C	O	O	O	165	268.50	22.50
76/4C	O	O	O	O	O	C	C	O	C	O	O	O	160	264.75	39
77/4D	O	O	C	C	C	O	C	O	C	O	O	O	15C	261.75	5.25
78/4E	C	C	C	O	C	O	C	O	C	O	O	O	157	258	36
79/4F	C	C	O	O	C	O	C	O	C	O	O	O	153	255	15
80/50	C	C	C	C	O	O	C	O	C	O	O	O	14F	252	0
81/51	O	C	O	C	O	O	C	O	C	O	O	O	14A	248.25	51.75
82/52	O	C	C	O	O	O	C	O	C	O	O	O	146	245.25	49.50
83/53	O	C	O	O	O	O	C	O	C	O	O	O	142	242.25	53.25
84/54	C	C	C	C	C	C	O	O	C	O	O	O	13F	240	0
85/55	C	C	O	C	C	C	O	O	C	O	O	O	13B	237	15
86/56	C	C	C	O	C	C	O	O	C	O	O	O	137	234	36
87/57	C	C	O	O	C	C	O	O	C	O	O	O	133	231	63
88/58	O	O	O	O	C	C	O	O	C	O	O	O	130	228.75	30
89/59	C	O	C	C	O	C	O	O	C	O	O	O	12D	226.50	1.50
90/5A	C	O	O	C	O	C	O	O	C	O	O	O	129	223.50	45

* C = Closed or On; O = Open or Off

Continued

TABLE 3-7. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-DOWN METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
91/5B	O	C	C	O	O	C	O	O	C	O	O	O	126	221.25	26.25
92/5C	C	C	O	O	O	C	O	O	C	O	O	O	123	219	12
93/5D	O	O	O	O	O	C	O	O	C	O	O	O	120	216.75	2.25
94/5E	O	O	C	C	C	O	O	O	C	O	O	O	11C	213.75	67.50
95/5F	C	O	O	C	C	O	O	O	C	O	O	O	119	211.50	67.50
96/60	C	C	C	O	C	O	O	O	C	O	O	O	117	210	0
97/61	O	O	C	O	C	O	O	O	C	O	O	O	114	207.75	8.25
98/62	C	O	O	O	C	O	O	O	C	O	O	O	111	205.50	21
99/63	O	C	C	C	O	O	O	O	C	O	O	O	10E	203.25	38.25
100/64	C	C	O	C	O	O	O	O	C	O	O	O	10B	201	60
101/65	C	O	O	C	O	O	O	O	C	O	O	O	109	199.50	10.50
102/66	O	C	C	O	O	O	O	O	C	O	O	O	106	197.25	40.50
103/67	C	C	O	O	O	O	O	O	C	O	O	O	103	195	75
104/68	C	O	O	O	O	O	O	O	C	O	O	O	101	193.50	36
105/69	C	C	C	C	C	C	C	C	O	O	O	O	0FF	192	0
106/6A	O	O	C	C	C	C	C	C	O	O	O	O	0FC	189.75	46.50
107/6B	O	C	O	C	C	C	C	C	O	O	O	O	0FA	188.25	17.25
108/6C	C	C	C	O	C	C	C	C	O	O	O	O	0F7	186	72
109/6D	C	O	C	O	C	C	C	C	O	O	O	O	0F5	184.50	49.50
110/6E	C	C	O	O	C	C	C	C	O	O	O	O	0F3	183	30
111/6F	C	O	O	O	C	C	C	C	O	O	O	O	0F1	181.50	13.50
112/70	C	C	C	C	O	C	C	C	O	O	O	O	0EF	180	0
113/71	O	O	C	C	O	C	C	C	O	O	O	O	0EC	177.75	74.25
114/72	O	C	O	C	O	C	C	C	O	O	O	O	0EA	176.25	67.50
115/73	O	O	O	C	O	C	C	C	O	O	O	O	0E8	174.75	63.75
116/74	O	C	C	O	O	C	C	C	O	O	O	O	0E6	173.25	63
117/75	O	O	C	O	O	C	C	C	O	O	O	O	0E4	171.75	65.25
118/76	O	C	O	O	O	C	C	C	O	O	O	O	0E2	170.25	70.50
119/77	O	O	O	O	O	C	C	C	O	O	O	O	0E0	168.75	78.75
120/78	C	C	C	C	C	O	C	C	O	O	O	O	0DF	168	0
121/79	C	O	C	C	C	O	C	C	O	O	O	O	0DD	166.50	13.50
122/7A	C	C	O	C	C	O	C	C	O	O	O	O	0DB	165	30
123/7B	C	O	O	C	C	O	C	C	O	O	O	O	0D9	163.50	49.50
124/7C	C	C	C	O	C	O	C	C	O	O	O	O	0D7	162	72
125/7D	O	C	C	O	C	O	C	C	O	O	O	O	0D6	161.25	3.75
126/7E	O	O	C	O	C	O	C	C	O	O	O	O	0D4	159.75	31.50
127/7F	O	C	O	O	C	O	C	C	O	O	O	O	0D2	158.25	62.25
128/80	C	O	O	O	C	O	C	C	O	O	O	O	0D1	157.50	0

* C = Closed or On; O = Open or Off

TABLE 3-8. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-UP METHOD

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
7/07	C	C	C	C	C	C	C	C	O	C	C	C	EFF	2880	2880
8/08	C	C	C	C	C	O	O	O	C	O	C	C	D1F	2520	2520
9/09	O	C	O	C	O	C	O	C	C	C	O	C	BAA	2240.25	2238
10/0A	C	C	C	C	C	C	C	O	O	C	O	C	A7F	2016	2016
11/0B	C	C	O	C	O	O	O	C	C	O	O	C	98B	1833	1830
12/0C	C	C	C	C	C	C	O	C	O	O	O	C	8BF	1680	1680
13/0D	C	C	O	O	C	O	O	O	O	O	O	C	813	1551	1548
14/0E	C	C	C	C	C	C	C	O	C	C	C	O	77F	1440	1440
15/0F	C	C	C	C	C	C	C	C	O	C	C	O	6FF	1344	1344
16/10	C	C	C	C	O	O	O	C	O	C	C	O	68F	1260	1260
17/11	C	O	C	C	O	C	O	O	O	C	C	O	62D	1186.50	1176
18/12	C	O	C	O	C	O	C	C	C	O	C	O	5D5	1120.50	1111.50
19/13	O	C	C	O	O	O	O	C	C	O	C	O	586	1061.25	1057.50
20/14	C	C	C	C	C	C	O	O	C	O	C	O	53F	1008	1008
21/15	C	C	C	C	C	C	C	C	O	O	C	O	4FF	960	960
22/16	C	O	C	O	O	O	C	C	O	O	C	O	4C5	916.50	913.50
23/17	O	O	O	O	C	O	O	C	O	O	C	O	490	876.75	871.50
24/18	C	C	C	C	C	O	C	O	O	O	C	O	45F	840	840
25/19	C	C	O	O	C	C	O	O	O	O	C	O	433	807	792
26/1A	C	O	O	C	O	O	O	O	O	O	C	O	409	775.50	772.50
27/1B	C	C	O	O	O	C	C	C	C	C	O	O	3E3	747	738
28/1C	C	C	C	C	C	C	O	C	C	C	O	O	3BF	720	720
29/1D	O	C	C	C	C	O	O	C	C	C	O	O	39E	695.25	693
30/1E	C	C	C	C	C	C	C	O	C	C	O	O	37F	672	672
31/1F	C	C	O	O	O	C	C	O	C	C	O	O	363	651	630
32/20	C	C	C	O	O	O	C	O	C	C	O	O	347	630	630
33/21	O	C	C	C	O	C	O	O	C	C	O	O	32E	611.25	600
34/22	O	C	C	O	C	O	O	O	C	C	O	O	316	593.25	582.75
35/23	C	C	C	C	C	C	C	C	O	C	O	O	2FF	576	576
36/24	O	C	O	C	O	C	C	C	O	C	O	O	2EA	560.25	551.25
37/25	O	C	C	O	C	O	C	C	O	C	O	O	2D6	545.25	531
38/26	C	C	O	O	O	O	C	C	O	C	O	O	2C3	531	513
39/27	C	O	O	O	C	C	O	C	O	C	O	O	2B1	517.50	495
40/28	C	C	C	C	C	O	O	C	O	C	O	O	29F	504	504
41/29	C	C	C	C	O	O	O	C	O	C	O	O	28F	492	480
42/2A	C	C	C	C	C	C	C	O	O	C	O	O	27F	480	480
43/2B	C	O	O	O	C	C	C	O	O	C	O	O	271	469.50	441
44/2C	O	C	O	O	O	C	C	O	O	C	O	O	262	458.25	455.25
45/2D	C	O	C	O	C	O	C	O	O	C	O	O	255	448.50	426
46/2E	O	O	O	C	O	O	C	O	O	C	O	O	248	438.75	416.25
47/2F	C	C	O	C	C	C	O	O	O	C	O	O	23B	429	426
48/30	C	C	C	C	O	C	O	O	O	C	O	O	22F	420	420

* C = Closed or On; O = Open or Off

Continued

TABLE 3-8. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-UP METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
49/31	O	O	C	O	O	C	O	O	O	C	O	O	224	411.75	396
50/32	C	O	O	C	C	O	O	O	O	C	O	O	219	403.50	388.50
51/33	C	C	C	C	O	O	O	O	O	C	O	O	20F	396	360
52/34	O	O	C	O	O	O	O	O	O	C	O	O	204	387.75	384.75
53/35	C	C	O	C	C	C	C	C	C	O	O	O	1FB	381	348
54/36	C	O	O	O	C	C	C	C	C	O	O	O	1F1	373.50	364.50
55/37	O	O	O	C	O	C	C	C	C	O	O	O	1E8	366.75	355.50
56/38	C	C	C	C	C	O	C	C	C	O	O	O	1DF	360	360
57/39	C	C	C	O	C	O	C	C	C	O	O	O	1D7	354	336
58/3A	C	C	C	C	O	O	C	C	C	O	O	O	1CF	348	324
59/3B	C	C	C	O	O	O	C	C	C	O	O	O	1C7	342	324
60/3C	C	C	C	C	C	C	O	C	C	O	O	O	1BF	336	336
61/3D	O	O	O	C	C	C	O	C	C	O	O	O	1B8	330.75	315
62/3E	C	O	O	O	C	C	O	C	C	O	O	O	1B1	325.50	304.50
63/3F	O	C	O	C	O	C	O	C	C	O	O	O	1AA	320.25	304.50
64/40	C	C	O	O	O	C	O	C	C	O	O	O	1A3	315	315
65/41	C	O	C	C	C	O	O	C	C	O	O	O	19D	310.50	288
66/42	C	C	C	O	C	O	O	C	C	O	O	O	197	306	270
67/43	C	O	O	O	C	O	O	C	C	O	O	O	191	301.50	261
68/44	C	C	O	C	O	O	O	C	C	O	O	O	18B	297	261
69/45	C	O	C	O	O	O	O	C	C	O	O	O	185	292.50	270
70/46	C	C	C	C	C	C	C	O	C	O	O	O	17F	288	288
71/47	O	C	O	C	C	C	C	O	C	O	O	O	17A	284.25	262.50
72/48	C	O	C	O	C	C	C	O	C	O	O	O	175	280.50	244.50
73/49	O	O	O	O	C	C	C	O	C	O	O	O	170	276.75	234
74/4A	C	C	O	C	O	C	C	O	C	O	O	O	16B	273	231
75/4B	O	C	C	O	O	C	C	O	C	O	O	O	166	269.25	235.50
76/4C	C	O	O	O	O	C	C	O	C	O	O	O	161	265.50	247.50
77/4D	C	O	C	C	C	O	C	O	C	O	O	O	15D	262.50	210
78/4E	O	O	O	C	C	O	C	O	C	O	O	O	158	258.75	236.25
79/4F	O	O	C	O	C	O	C	O	C	O	O	O	154	255.75	211.50
80/50	C	C	C	C	O	O	C	O	C	O	O	O	14F	252	252
81/51	C	C	O	C	O	O	C	O	C	O	O	O	14B	249	240
82/52	C	C	C	O	O	O	C	O	C	O	O	O	147	246	234
83/53	C	C	O	O	O	O	C	O	C	O	O	O	143	243	234
84/54	C	C	C	C	C	C	O	O	C	O	O	O	13F	240	240
85/55	O	O	C	C	C	C	O	O	C	O	O	O	13C	237.75	189
86/56	O	O	O	C	C	C	O	O	C	O	O	O	138	234.75	206.25
87/57	O	O	C	O	C	C	O	O	C	O	O	O	134	231.75	229.50
88/58	C	O	O	O	C	C	O	O	C	O	O	O	131	229.50	193.50
89/59	O	C	C	C	O	C	O	O	C	O	O	O	12E	227.25	162
90/5A	O	C	O	C	O	C	O	O	C	O	O	O	12A	224.25	201.75

* C = Closed or On; O = Open or Off

Continued

TABLE 3-8. SECTOR SELECT SWITCH SETTINGS -- 300/340 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-UP METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
91/5B	C	C	C	O	O	C	O	O	C	O	O	O	127	222	180
92/5C	O	O	C	O	O	C	O	O	C	O	O	O	124	219.75	162.75
93/5D	C	O	O	O	O	C	O	O	C	O	O	O	121	217.50	150
94/5E	C	O	C	C	C	O	O	O	C	O	O	O	11D	214.50	211.50
95/5F	O	C	O	C	C	O	O	O	C	O	O	O	11A	212.25	208.50
96/60	C	C	C	O	C	O	O	O	C	O	O	O	117	210	210
97/61	C	O	C	O	C	O	O	O	C	O	O	O	115	208.50	144
98/62	O	C	O	O	C	O	O	O	C	O	O	O	112	206.25	153.75
99/63	C	C	C	C	O	O	O	O	C	O	O	O	10F	204	168
100/64	O	O	C	C	O	O	O	O	C	O	O	O	10C	201.75	186.75
101/65	O	C	O	C	O	O	O	O	C	O	O	O	10A	200.25	135
102/66	C	C	C	O	O	O	O	O	C	O	O	O	107	198	162
103/67	O	O	C	O	O	O	O	O	C	O	O	O	104	195.75	193.50
104/68	O	C	O	O	O	O	O	O	C	O	O	O	102	194.25	152.25
105/69	C	C	C	C	C	C	C	C	O	O	O	O	0FF	192	192
106/6A	C	O	C	C	C	C	C	C	O	O	O	O	0FD	190.50	157.50
107/6B	C	C	O	C	C	C	C	C	O	O	O	O	0FB	189	126
108/6C	O	O	O	C	C	C	C	C	O	O	O	O	0F8	186.75	177.75
109/6D	O	C	C	O	C	C	C	C	O	O	O	O	0F6	185.25	153
110/6E	O	O	C	O	C	C	C	C	O	O	O	O	0F4	183.75	131.25
111/6F	O	C	O	O	C	C	C	C	O	O	O	O	0F2	182.25	112.50
112/70	C	C	C	C	O	C	C	C	O	O	O	O	0EF	180	180
113/71	C	O	C	C	O	C	C	C	O	O	O	O	0ED	178.50	168
114/72	C	C	O	C	O	C	C	C	O	O	O	O	0EB	177	159
115/73	C	O	O	C	O	C	C	C	O	O	O	O	0E9	175.50	153
116/74	C	C	C	O	O	C	C	C	O	O	O	O	0E7	174	150
117/75	C	O	C	O	O	C	C	C	O	O	O	O	0E5	172.50	150
118/76	C	C	O	O	O	C	C	C	O	O	O	O	0E3	171	153
119/77	C	O	O	O	O	C	C	C	O	O	O	O	0E1	169.50	159
120/78	C	C	C	C	C	O	C	C	O	O	O	O	0DF	168	168
121/79	O	C	C	C	C	O	C	C	O	O	O	O	0DE	167.25	90
122/7A	O	O	C	C	C	O	C	C	O	O	O	O	0DC	165.75	104.25
123/7B	O	C	O	C	C	O	C	C	O	O	O	O	0DA	164.25	121.50
124/7C	O	O	O	C	C	O	C	C	O	O	O	O	0D8	162.75	141.75
125/7D	C	C	C	O	C	O	C	C	O	O	O	O	0D7	162	72
126/7E	C	O	C	O	C	O	C	C	O	O	O	O	0D5	160.50	97.50
127/7F	C	C	O	O	C	O	C	C	O	O	O	O	0D3	159	126
128/80	C	O	O	O	C	O	C	C	O	O	O	O	0D1	157.50	157.50

* C = Closed or On; O = Open or Off

TABLE 3-9. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-DOWN METHOD

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
4/04	C	C	C	C	C	O	O	O	C	O	C	C	D1F	7560	0
5/05	C	C	C	C	C	C	C	O	O	C	O	C	A7F	6048	0
6/06	C	C	C	C	C	C	O	C	O	O	O	C	8BF	5040	0
7/07	C	C	C	C	C	C	C	O	C	C	C	O	77F	4320	0
8/08	C	C	C	C	O	O	O	C	O	C	C	O	68F	3780	0
9/09	O	O	C	O	C	O	C	C	C	O	C	O	5D4	3359.25	6.75
10/0A	C	C	C	C	C	C	O	O	C	O	C	O	53F	3024	0
11/0B	O	O	C	O	O	O	C	C	O	O	C	O	4C4	2747.25	20.25
12/0C	C	C	C	C	C	O	C	O	O	O	C	O	45F	2520	0
13/0D	O	O	O	C	O	O	O	O	O	O	C	O	408	2324.25	24.75
14/0E	C	C	C	C	C	C	O	C	C	C	O	O	3BF	2160	0
15/0F	C	C	C	C	C	C	C	O	C	C	O	O	37F	2016	0
16/10	C	C	C	O	O	O	C	O	C	C	O	O	347	1890	0
17/11	C	O	C	O	C	O	O	O	C	C	O	O	315	1777.50	22.50
18/12	C	O	O	C	O	C	C	C	O	C	O	O	2E9	1678.50	27
19/13	O	C	O	O	O	O	C	C	O	C	O	O	2C2	1590.75	15.75
20/14	C	C	C	C	C	O	O	C	O	C	O	O	29F	1512	0
21/15	C	C	C	C	C	C	C	O	O	C	O	O	27F	1440	0
22/16	C	O	O	O	O	C	C	O	O	C	O	O	261	1372.50	45
23/17	C	C	C	O	O	O	C	O	O	C	O	O	247	1314	18
24/18	C	C	C	C	O	C	O	O	O	C	O	O	22F	1260	0
25/19	O	O	O	C	C	O	O	O	O	C	O	O	218	1208.25	33.75
26/1A	C	C	O	O	O	O	O	O	O	C	O	O	203	1161	54
27/1B	O	O	O	O	C	C	C	C	C	O	O	O	1F0	1118.25	47.25
28/1C	C	C	C	C	C	O	C	C	C	O	O	O	1DF	1080	0
29/1D	O	C	C	C	O	O	C	C	C	O	O	O	1CE	1041.75	29.25
30/1E	C	C	C	C	C	C	O	C	C	O	O	O	1BF	1008	0
31/1F	O	O	O	O	C	C	O	C	C	O	O	O	1B0	974.25	38.25
32/20	C	C	O	O	O	C	O	C	C	O	O	O	1A3	945	0
33/21	O	C	C	O	C	O	O	C	C	O	O	O	196	915.75	20.25
34/22	O	C	O	C	O	O	O	C	C	O	O	O	18A	888.75	22.50
35/23	C	C	C	C	C	C	C	O	C	O	O	O	17F	864	0
36/24	O	O	C	O	C	C	C	O	C	O	O	O	174	839.25	27
37/25	O	C	O	C	O	C	C	O	C	O	O	O	16A	816.75	20.25
38/26	O	O	O	O	O	C	C	O	C	O	O	O	160	794.25	58.50
39/27	C	C	C	O	C	O	C	O	C	O	O	O	157	774	54
40/28	C	C	C	C	O	O	C	O	C	O	O	O	14F	756	0
41/29	O	C	C	O	O	O	C	O	C	O	O	O	146	735.75	74.25
42/2A	C	C	C	C	C	C	O	O	C	O	O	O	13F	720	0
43/2B	C	C	C	O	C	C	O	O	C	O	O	O	137	702	54
44/2C	O	O	O	O	C	C	O	O	C	O	O	O	130	686.25	45
45/2D	C	O	O	C	O	C	O	O	C	O	O	O	129	670.50	67.50

* C = Closed or On; O = Open or Off

Continued

TABLE 3-9. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-DOWN METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
46/2E	C	C	O	O	O	C	O	O	C	O	O	O	123	657	18
47/2F	O	O	C	C	C	O	O	O	C	O	O	O	11C	641.25	101.25
48/30	C	C	C	O	C	O	O	O	C	O	O	O	117	630	0
49/31	C	O	O	O	C	O	O	O	C	O	O	O	111	616.50	31.50
50/32	C	C	O	C	O	O	O	O	C	O	O	O	10B	603	90
51/33	O	C	C	O	O	O	O	O	C	O	O	O	106	591.75	60.75
52/34	C	O	O	O	O	O	O	O	C	O	O	O	101	580.50	54
53/35	O	O	C	C	C	C	C	C	O	O	O	O	0FC	569.25	69.75
54/36	C	C	C	O	C	C	C	C	O	O	O	O	0F7	558	108
55/37	C	C	O	O	C	C	C	C	O	O	O	O	0F3	549	45
56/38	C	C	C	C	O	C	C	C	O	O	O	O	0EF	540	0
57/39	O	C	O	C	O	C	C	C	O	O	O	O	0EA	528.75	101.25
58/3A	O	C	C	O	O	C	C	C	O	O	O	O	0E6	519.75	94.50
59/3B	O	C	O	O	O	C	C	C	O	O	O	O	0E2	510.75	105.75
60/3C	C	C	C	C	C	O	C	C	O	O	O	O	0DF	504	0
61/3D	C	C	O	C	C	O	C	C	O	O	O	O	0DB	495	45
62/3E	C	C	C	O	C	O	C	C	O	O	O	O	0D7	486	108
63/3F	O	O	C	O	C	O	C	C	O	O	O	O	0D4	479.25	47.25
64/40	C	O	O	O	C	O	C	C	O	O	O	O	0D1	472.50	0
65/41	C	O	C	C	O	O	C	C	O	O	O	O	0CD	463.50	112.50
66/42	O	C	O	C	O	O	C	C	O	O	O	O	0CA	456.75	94.50
67/43	C	C	C	O	O	O	C	C	O	O	O	O	0C7	450	90
68/44	O	O	C	O	O	O	C	C	O	O	O	O	0C4	443.25	99
69/45	C	O	O	O	O	O	C	C	O	O	O	O	0C1	436.50	121.50
70/46	C	C	C	C	C	C	O	C	O	O	O	O	0BF	432	0
71/47	O	O	C	C	C	C	O	C	O	O	O	O	0BC	425.25	47.25
72/48	C	O	O	C	C	C	O	C	O	O	O	O	0B9	418.50	108
73/49	C	C	C	O	C	C	O	C	O	O	O	O	0B7	414	18
74/4A	O	O	C	O	C	C	O	C	O	O	O	O	0B4	407.25	103.50
75/4B	O	C	O	O	C	C	O	C	O	O	O	O	0B2	402.75	33.75
76/4C	C	C	C	C	O	C	O	C	O	O	O	O	0AF	396	144
77/4D	C	O	C	C	O	C	O	C	O	O	O	O	0AD	391.50	94.50
78/4E	C	C	O	C	O	C	O	C	O	O	O	O	0AB	387	54
79/4F	C	O	O	C	O	C	O	C	O	O	O	O	0A9	382.50	22.50
80/50	C	C	C	O	O	C	O	C	O	O	O	O	0A7	378	0
81/51	O	O	C	O	O	C	O	C	O	O	O	O	0A4	371.25	168.75
82/52	O	C	O	O	O	C	O	C	O	O	O	O	0A2	366.75	166.50
83/53	O	O	O	O	O	C	O	C	O	O	O	O	0A0	362.25	173.25
84/54	C	C	C	C	C	O	O	C	O	O	O	O	09F	360	0
85/55	C	O	C	C	C	O	O	C	O	O	O	O	09D	355.50	22.50
86/56	C	C	O	C	C	O	O	C	O	O	O	O	09B	351	54
87/57	C	O	O	C	C	O	O	C	O	O	O	O	099	346.50	94.50

* C = Closed or On; O = Open or Off

Continued

TABLE 3-9. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-DOWN METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
88/58	C	C	C	O	C	O	O	C	O	O	O	O	097	342	144
89/59	O	C	C	O	C	O	O	C	O	O	O	O	096	339.75	2.25
90/5A	O	O	C	O	C	O	O	C	O	O	O	O	094	335.25	67.50
91/5B	O	C	O	O	C	O	O	C	O	O	O	O	092	330.75	141.75
92/5C	C	O	O	O	C	O	O	C	O	O	O	O	091	328.50	18
93/5D	C	C	C	C	O	O	O	C	O	O	O	O	08F	324	108
94/5E	C	O	C	C	O	O	O	C	O	O	O	O	08D	319.50	207
95/5F	O	O	C	C	O	O	O	C	O	O	O	O	08C	317.25	101.25
96/60	C	C	O	C	O	O	O	C	O	O	O	O	08B	315	0
97/61	C	O	O	C	O	O	O	C	O	O	O	O	089	310.50	121.50
98/62	O	O	O	C	O	O	O	C	O	O	O	O	088	308.25	31.50
99/63	O	C	C	O	O	O	O	C	O	O	O	O	086	303.75	168.75
100/64	C	O	C	O	O	O	O	C	O	O	O	O	085	301.50	90
101/65	O	O	C	O	O	O	O	C	O	O	O	O	084	299.25	15.75
102/66	O	C	O	O	O	O	O	C	O	O	O	O	082	294.75	175.50
103/67	C	O	O	O	O	O	O	C	O	O	O	O	081	292.50	112.50
104/68	O	O	O	O	O	O	O	C	O	O	O	O	080	290.25	54
105/69	C	C	C	C	C	C	C	O	O	O	O	O	07F	288	0
106/6A	C	O	C	C	C	C	C	O	O	O	O	O	07D	283.50	189
107/6B	O	O	C	C	C	C	C	O	O	O	O	O	07C	281.25	146.25
108/6C	C	C	O	C	C	C	C	O	O	O	O	O	07B	279	108
109/6D	O	C	O	C	C	C	C	O	O	O	O	O	07A	276.75	74.25
110/6E	C	O	O	C	C	C	C	O	O	O	O	O	079	274.50	45
111/6F	O	O	O	C	C	C	C	O	O	O	O	O	078	272.25	20.25
112/70	C	C	C	O	C	C	C	O	O	O	O	O	077	270	0
113/71	C	O	C	O	C	C	C	O	O	O	O	O	075	265.50	238.50
114/72	O	O	C	O	C	C	C	O	O	O	O	O	074	263.25	229.50
115/73	C	C	O	O	C	C	C	O	O	O	O	O	073	261	225
116/74	O	C	O	O	C	C	C	O	O	O	O	O	072	258.75	225
117/75	C	O	O	O	C	C	C	O	O	O	O	O	071	256.50	229.50
118/76	O	O	O	O	C	C	C	O	O	O	O	O	070	254.25	238.50
119/77	C	C	C	C	O	C	C	O	O	O	O	O	06F	252	252
120/78	C	C	C	C	O	C	C	O	O	O	O	O	06F	252	0
121/79	O	C	C	C	O	C	C	O	O	O	O	O	06E	249.75	20.25
122/7A	C	O	C	C	O	C	C	O	O	O	O	O	06D	247.50	45
123/7B	O	O	C	C	O	C	C	O	O	O	O	O	06C	245.25	74.25
124/7C	C	C	O	C	O	C	C	O	O	O	O	O	06B	243	108
125/7D	O	C	O	C	O	C	C	O	O	O	O	O	06A	240.75	146.25
126/7E	C	O	O	C	O	C	C	O	O	O	O	O	069	238.50	189
127/7F	O	O	O	C	O	C	C	O	O	O	O	O	068	236.25	236.25
128/80	O	O	O	C	O	C	C	O	O	O	O	O	068	236.25	0

* C = Closed or On; O = Open or Off

TABLE 3-10. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-UP METHOD

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
4/04	C	C	C	C	C	O	O	O	C	O	C	C	D1F	7560	7560
5/05	C	C	C	C	C	C	C	O	O	C	O	C	A7F	6048	6048
6/06	C	C	C	C	C	C	O	C	O	O	O	C	8BF	5040	5040
7/07	C	C	C	C	C	C	C	O	C	C	C	O	77F	4320	4320
8/08	C	C	C	C	O	O	O	C	O	C	C	O	68F	3780	3780
9/09	C	O	C	O	C	O	C	C	C	O	C	O	5D5	3361.50	3348
10/0A	C	C	C	C	C	C	O	O	C	O	C	O	53F	3024	3024
11/0B	C	O	C	O	O	O	C	C	O	O	C	O	4C5	2749.50	2745
12/0C	C	C	C	C	C	O	C	O	O	O	C	O	45F	2520	2520
13/0D	C	O	O	C	O	O	O	O	O	O	C	O	409	2326.50	2322
14/0E	C	C	C	C	C	C	O	C	C	C	O	O	3BF	2160	2160
15/0F	C	C	C	C	C	C	C	O	C	C	O	O	37F	2016	2016
16/10	C	C	C	O	O	O	C	O	C	C	O	O	347	1890	1890
17/11	O	C	C	O	C	O	O	O	C	C	O	O	316	1779.75	1764
18/12	O	C	O	C	O	C	C	C	O	C	O	O	2EA	1680.75	1667.25
19/13	C	C	O	O	O	O	C	C	O	C	O	O	2C3	1593	1566
20/14	C	C	C	C	C	O	O	C	O	C	O	O	29F	1512	1512
21/15	C	C	C	C	C	C	C	O	O	C	O	O	27F	1440	1440
22/16	O	C	O	O	O	C	C	O	O	C	O	O	262	1374.75	1370.25
23/17	O	O	O	C	O	O	C	O	O	C	O	O	248	1316.25	1282.50
24/18	C	C	C	C	O	C	O	O	O	C	O	O	22F	1260	1260
25/19	C	O	O	C	C	O	O	O	O	C	O	O	219	1210.50	1188
26/1A	O	O	C	O	O	O	O	O	O	C	O	O	204	1163.25	1158.75
27/1B	C	O	O	O	C	C	C	C	C	O	O	O	1F1	1120.50	1107
28/1C	C	C	C	C	C	O	C	C	C	O	O	O	1DF	1080	1080
29/1D	C	C	C	C	O	O	C	C	C	O	O	O	1CF	1044	1008
30/1E	C	C	C	C	C	C	O	C	C	O	O	O	1BF	1008	1008
31/1F	C	O	O	O	C	C	O	C	C	O	O	O	1B1	976.50	945
32/20	C	C	O	O	O	C	O	C	C	O	O	O	1A3	945	945
33/21	C	C	C	O	C	O	O	C	C	O	O	O	197	918	864
34/22	C	C	O	C	O	O	O	C	C	O	O	O	18B	891	837
35/23	C	C	C	C	C	C	C	O	C	O	O	O	17F	864	864
36/24	C	O	C	O	C	C	C	O	C	O	O	O	175	841.50	787.50
37/25	C	C	O	C	O	C	C	O	C	O	O	O	16B	819	756
38/26	C	O	O	O	O	C	C	O	C	O	O	O	161	796.50	769.50
39/27	O	O	O	C	C	O	C	O	C	O	O	O	158	776.25	742.50
40/28	C	C	C	C	O	O	C	O	C	O	O	O	14F	756	756
41/29	C	C	C	O	O	O	C	O	C	O	O	O	147	738	720
42/2A	C	C	C	C	C	C	O	O	C	O	O	O	13F	720	720
43/2B	O	O	O	C	C	C	O	O	C	O	O	O	138	704.25	661.50
44/2C	C	O	O	O	C	C	O	O	C	O	O	O	131	688.50	634.50
45/2D	O	C	O	C	O	C	O	O	C	O	O	O	12A	672.75	639

* C = Closed or On; O = Open or Off

Continued

TABLE 3-10. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-UP METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
46/2E	O	O	C	O	O	C	O	O	C	O	O	O	124	659.25	573.75
47/2F	C	O	C	C	C	O	O	O	C	O	O	O	11D	643.50	639
48/30	C	C	C	O	C	O	O	O	C	O	O	O	117	630	630
49/31	O	C	O	O	C	O	O	O	C	O	O	O	112	618.75	540
50/32	O	O	C	C	O	O	O	O	C	O	O	O	10C	605.25	582.75
51/33	C	C	C	O	O	O	O	O	C	O	O	O	107	594	540
52/34	O	C	O	O	O	O	O	O	C	O	O	O	102	582.75	519.75
53/35	C	O	C	C	C	C	C	C	O	O	O	O	0FD	571.50	522
54/36	O	O	O	C	C	C	C	C	O	O	O	O	0F8	560.25	546.75
55/37	O	O	C	O	C	C	C	C	O	O	O	O	0F4	551.25	472.50
56/38	C	C	C	C	O	C	C	C	O	O	O	O	0EF	540	540
57/39	C	C	O	C	O	C	C	C	O	O	O	O	0EB	531	504
58/3A	C	C	C	O	O	C	C	C	O	O	O	O	0E7	522	486
59/3B	C	C	O	O	O	C	C	C	O	O	O	O	0E3	513	486
60/3C	C	C	C	C	C	O	C	C	O	O	O	O	0DF	504	504
61/3D	O	O	C	C	C	O	C	C	O	O	O	O	0DC	497.25	405
62/3E	O	O	O	C	C	O	C	C	O	O	O	O	0D8	488.25	456.75
63/3F	C	O	C	O	C	O	C	C	O	O	O	O	0D5	481.50	387
64/40	C	O	O	O	C	O	C	C	O	O	O	O	0D1	472.50	472.50
65/41	O	C	C	C	O	O	C	C	O	O	O	O	0CE	465.75	432
66/42	C	C	O	C	O	O	C	C	O	O	O	O	0CB	459	405
67/43	O	O	O	C	O	O	C	C	O	O	O	O	0C8	452.25	391.50
68/44	C	O	C	O	O	O	C	C	O	O	O	O	0C5	445.50	391.50
69/45	O	C	O	O	O	O	C	C	O	O	O	O	0C2	438.75	405
70/46	C	C	C	C	C	C	O	C	O	O	O	O	0BF	432	432
71/47	C	O	C	C	C	C	O	C	O	O	O	O	0BD	427.50	315
72/48	O	C	O	C	C	C	O	C	O	O	O	O	0BA	420.75	366.75
73/49	O	O	O	C	C	C	O	C	O	O	O	O	0B8	416.25	270
74/4A	C	O	C	O	C	C	O	C	O	O	O	O	0B5	409.50	346.50
75/4B	C	C	O	O	C	C	O	C	O	O	O	O	0B3	405	270
76/4C	O	O	O	O	C	C	O	C	O	O	O	O	0B0	398.25	371.25
77/4D	O	C	C	C	O	C	O	C	O	O	O	O	0AE	393.75	315
78/4E	O	O	C	C	O	C	O	C	O	O	O	O	0AC	389.25	267.75
79/4F	O	C	O	C	O	C	O	C	O	O	O	O	0AA	384.75	229.50
80/50	C	C	C	O	O	C	O	C	O	O	O	O	0A7	378	378
81/51	C	O	C	O	O	C	O	C	O	O	O	O	0A5	373.50	360
82/52	C	C	O	O	O	C	O	C	O	O	O	O	0A3	369	351
83/53	C	O	O	O	O	C	O	C	O	O	O	O	0A1	364.50	351
84/54	C	C	C	C	C	O	O	C	O	O	O	O	09F	360	360
85/55	O	C	C	C	C	O	O	C	O	O	O	O	09E	357.75	189
86/56	O	O	C	C	C	O	O	C	O	O	O	O	09C	353.25	213.75
87/57	O	C	O	C	C	O	O	C	O	O	O	O	09A	348.75	247.50

* C = Closed or On; O = Open or Off

Continued

TABLE 3-10. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 0.8 MHz CLOCK AND ROUND-UP METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
88/58	O	O	O	C	C	O	O	C	O	O	O	O	098	344.25	290.25
89/59	C	C	C	O	C	O	O	C	O	O	O	O	097	342	144
90/5A	C	O	C	O	C	O	O	C	O	O	O	O	095	337.50	202.50
91/5B	C	C	O	O	C	O	O	C	O	O	O	O	093	333	270
92/5C	O	C	O	O	C	O	O	C	O	O	O	O	092	330.75	141.75
93/5D	O	O	O	O	C	O	O	C	O	O	O	O	090	326.25	225
94/5E	O	C	C	C	O	O	O	C	O	O	O	O	08E	321.75	317.25
95/5F	C	O	C	C	O	O	O	C	O	O	O	O	08D	319.50	207
96/60	C	C	O	C	O	O	O	C	O	O	O	O	08B	315	315
97/61	O	C	O	C	O	O	O	C	O	O	O	O	08A	312.75	216
98/62	C	O	O	C	O	O	O	C	O	O	O	O	089	310.50	121.50
99/63	C	C	C	O	O	O	O	C	O	O	O	O	087	306	252
100/64	O	C	C	O	O	O	O	C	O	O	O	O	086	303.75	168.75
101/65	C	O	C	O	O	O	O	C	O	O	O	O	085	301.50	90
102/66	C	C	O	O	O	O	O	C	O	O	O	O	083	297	243
103/67	O	C	O	O	O	O	O	C	O	O	O	O	082	294.75	175.50
104/68	C	O	O	O	O	O	O	C	O	O	O	O	081	292.50	112.50
105/69	C	C	C	C	C	C	C	O	O	O	O	O	07F	288	288
106/6A	O	C	C	C	C	C	C	O	O	O	O	O	07E	285.75	236.25
107/6B	C	O	C	C	C	C	C	O	O	O	O	O	07D	283.50	189
108/6C	O	O	C	C	C	C	C	O	O	O	O	O	07C	281.25	146.25
109/6D	C	C	O	C	C	C	C	O	O	O	O	O	07B	279	108
110/6E	O	C	O	C	C	C	C	O	O	O	O	O	07A	276.75	74.25
111/6F	C	O	O	C	C	C	C	O	O	O	O	O	079	274.50	45
112/70	C	C	C	O	C	C	C	O	O	O	O	O	077	270	270
113/71	O	C	C	O	C	C	C	O	O	O	O	O	076	267.75	252
114/72	C	O	C	O	C	C	C	O	O	O	O	O	075	265.50	238.50
115/73	O	O	C	O	C	C	C	O	O	O	O	O	074	263.25	229.50
116/74	C	C	O	O	C	C	C	O	O	O	O	O	073	261	225
117/75	O	C	O	O	C	C	C	O	O	O	O	O	072	258.75	225
118/76	C	O	O	O	C	C	C	O	O	O	O	O	071	256.50	229.50
119/77	O	O	O	O	C	C	C	O	O	O	O	O	070	254.25	238.50
120/78	C	C	C	C	O	C	C	O	O	O	O	O	06F	252	252
121/79	C	C	C	C	O	C	C	O	O	O	O	O	06F	252	0
122/7A	O	C	C	C	O	C	C	O	O	O	O	O	06E	249.75	20.25
123/7B	C	O	C	C	O	C	C	O	O	O	O	O	06D	247.50	45
124/7C	O	O	C	C	O	C	C	O	O	O	O	O	06C	245.25	74.25
125/7D	C	C	O	C	O	C	C	O	O	O	O	O	06B	243	108
126/7E	O	C	O	C	O	C	C	O	O	O	O	O	06A	240.75	146.25
127/7F	C	O	O	C	O	C	C	O	O	O	O	O	069	238.50	189
128/80	O	O	O	C	O	C	C	O	O	O	O	O	068	236.25	236.25

* C = Closed or On; O = Open or Off

TABLE 3-11. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-DOWN METHOD

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
7/07	C	C	C	C	C	C	C	C	O	C	C	C	EFF	4320	0
8/08	C	C	C	C	C	O	O	O	C	O	C	C	D1F	3780	0
9/09	C	O	O	C	O	C	O	C	C	C	O	C	BA9	3359.25	6.75
10/0A	C	C	C	C	C	C	C	O	O	C	O	C	A7F	3024	0
11/0B	O	C	O	C	O	O	O	C	C	O	O	C	98A	2748.37	7.87
12/0C	C	C	C	C	C	C	O	C	O	O	O	C	8BF	2520	0
13/0D	O	C	O	O	C	O	O	O	O	O	O	C	812	2325.37	10.12
14/0E	C	C	C	C	C	C	C	O	C	C	C	O	77F	2160	0
15/0F	C	C	C	C	C	C	C	C	O	C	C	O	6FF	2016	0
16/10	C	C	C	C	O	O	O	C	O	C	C	O	68F	1890	0
17/11	O	O	C	C	O	C	O	O	O	C	C	O	62C	1778.62	3.37
18/12	O	O	C	O	C	O	C	C	C	O	C	O	5D4	1679.62	6.75
19/13	C	O	C	O	O	O	O	C	C	O	C	O	585	1590.75	15.75
20/14	C	C	C	C	C	C	O	O	C	O	C	O	53F	1512	0
21/15	C	C	C	C	C	C	C	C	O	O	C	O	4FF	1440	0
22/16	O	O	C	O	O	O	C	C	O	O	C	O	4C4	1373.62	20.25
23/17	C	C	C	C	O	O	O	C	O	O	C	O	48F	1314	18
24/18	C	C	C	C	C	O	C	O	O	O	C	O	45F	1260	0
25/19	O	C	O	O	C	C	O	O	O	O	C	O	432	1209.37	5.62
26/1A	O	O	O	C	O	O	O	O	O	O	C	O	408	1162.12	24.75
27/1B	O	C	O	O	O	C	C	C	C	C	O	O	3E2	1119.37	16.87
28/1C	C	C	C	C	C	C	O	C	C	C	O	O	3BF	1080	0
29/1D	C	O	C	C	C	O	O	C	C	C	O	O	39D	1041.75	29.25
30/1E	C	C	C	C	C	C	C	O	C	C	O	O	37F	1008	0
31/1F	O	C	O	O	O	C	C	O	C	C	O	O	362	975.37	3.37
32/20	C	C	C	O	O	O	C	O	C	C	O	O	347	945	0
33/21	C	O	C	C	O	C	O	O	C	C	O	O	32D	915.75	20.25
34/22	C	O	C	O	C	O	O	O	C	C	O	O	315	888.75	22.50
35/23	C	C	C	C	C	C	C	C	O	C	O	O	2FF	864	0
36/24	C	O	O	C	O	C	C	C	O	C	O	O	2E9	839.25	27
37/25	C	O	C	O	C	O	C	C	O	C	O	O	2D5	816.75	20.25
38/26	O	C	O	O	O	O	C	C	O	C	O	O	2C2	795.37	15.75
39/27	O	O	O	O	C	C	O	C	O	C	O	O	2B0	775.12	10.12
40/28	C	C	C	C	C	O	O	C	O	C	O	O	29F	756	0
41/29	O	C	C	C	O	O	O	C	O	C	O	O	28E	736.87	28.12
42/2A	C	C	C	C	C	C	C	O	O	C	O	O	27F	720	0
43/2B	O	O	O	O	C	C	C	O	O	C	O	O	270	703.12	5.62
44/2C	C	O	O	O	O	C	C	O	O	C	O	O	261	686.25	45
45/2D	O	O	C	O	C	O	C	O	O	C	O	O	254	671.62	16.87
46/2E	C	C	C	O	O	O	C	O	O	C	O	O	247	657	18
47/2F	O	C	O	C	C	C	O	O	O	C	O	O	23A	642.37	48.37
48/30	C	C	C	C	O	C	O	O	O	C	O	O	22F	630	0

* C = Closed or On; O = Open or Off

Continued

TABLE 3-11. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-DOWN METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
49/31	C	C	O	O	O	C	O	O	O	C	O	O	223	616.50	31.50
50/32	O	O	O	C	C	O	O	O	O	C	O	O	218	604.12	33.75
51/33	O	C	C	C	O	O	O	O	O	C	O	O	20E	592.87	3.37
52/34	C	C	O	O	O	O	O	O	O	C	O	O	203	580.50	54
53/35	O	C	O	C	C	C	C	C	C	O	O	O	1FA	570.37	10.12
54/36	O	O	O	O	C	C	C	C	C	O	O	O	1F0	559.12	47.25
55/37	C	C	C	O	O	C	C	C	C	O	O	O	1E7	549	45
56/38	C	C	C	C	C	O	C	C	C	O	O	O	1DF	540	0
57/39	O	C	C	O	C	O	C	C	C	O	O	O	1D6	529.87	37.12
58/3A	O	C	C	C	O	O	C	C	C	O	O	O	1CE	520.87	29.25
59/3B	O	C	C	O	O	O	C	C	C	O	O	O	1C6	511.87	39.37
60/3C	C	C	C	C	C	C	O	C	C	O	O	O	1BF	504	0
61/3D	C	C	C	O	C	C	O	C	C	O	O	O	1B7	495	45
62/3E	O	O	O	O	C	C	O	C	C	O	O	O	1B0	487.12	38.25
63/3F	C	O	O	C	O	C	O	C	C	O	O	O	1A9	479.25	47.25
64/40	C	C	O	O	O	C	O	C	C	O	O	O	1A3	472.50	0
65/41	O	O	C	C	C	O	O	C	C	O	O	O	19C	464.62	39.37
66/42	O	C	C	O	C	O	O	C	C	O	O	O	196	457.87	20.25
67/43	O	O	O	O	C	O	O	C	C	O	O	O	190	451.12	14.62
68/44	O	C	O	C	O	O	O	C	C	O	O	O	18A	444.37	22.50
69/45	O	O	C	O	O	O	O	C	C	O	O	O	184	437.62	43.87
70/46	C	C	C	C	C	C	C	O	C	O	O	O	17F	432	0
71/47	C	O	O	C	C	C	C	O	C	O	O	O	179	425.25	47.25
72/48	O	O	C	O	C	C	C	O	C	O	O	O	174	419.62	27
73/49	C	C	C	C	O	C	C	O	C	O	O	O	16F	414	18
74/4A	O	C	O	C	O	C	C	O	C	O	O	O	16A	408.37	20.25
75/4B	C	O	C	O	O	C	C	O	C	O	O	O	165	402.75	33.75
76/4C	O	O	O	O	O	C	C	O	C	O	O	O	160	397.12	58.50
77/4D	O	O	C	C	C	O	C	O	C	O	O	O	15C	392.62	7.87
78/4E	C	C	C	O	C	O	C	O	C	O	O	O	157	387	54
79/4F	C	C	O	O	C	O	C	O	C	O	O	O	153	382.50	22.50
80/50	C	C	C	C	O	O	C	O	C	O	O	O	14F	378	0
81/51	O	C	O	C	O	O	C	O	C	O	O	O	14A	372.37	77.62
82/52	O	C	C	O	O	O	C	O	C	O	O	O	146	367.87	74.25
83/53	O	C	O	O	O	O	C	O	C	O	O	O	142	363.37	79.87
84/54	C	C	C	C	C	C	O	O	C	O	O	O	13F	360	0
85/55	C	C	O	C	C	C	O	O	C	O	O	O	13B	355.50	22.50
86/56	C	C	C	O	C	C	O	O	C	O	O	O	137	351	54
87/57	C	C	O	O	C	C	O	O	C	O	O	O	133	346.50	94.50
88/58	O	O	O	O	C	C	O	O	C	O	O	O	130	343.12	45
89/59	C	O	C	C	O	C	O	O	C	O	O	O	12D	339.75	2.25
90/5A	C	O	O	C	O	C	O	O	C	O	O	O	129	335.25	67.50

* C = Closed or On; O = Open or Off

Continued

TABLE 3-11. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-DOWN METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Usable Sectors	Bytes in Runt Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
91/5B	O	C	C	O	O	C	O	O	C	O	O	O	126	331.87	39.37
92/5C	C	C	O	O	O	C	O	O	C	O	O	O	123	328.50	18
93/5D	O	O	O	O	O	C	O	O	C	O	O	O	120	325.12	3.37
94/5E	O	O	C	C	C	O	O	O	C	O	O	O	11C	320.62	101.25
95/5F	C	O	O	C	C	O	O	O	C	O	O	O	119	317.25	101.25
96/60	C	C	C	O	C	O	O	O	C	O	O	O	117	315	0
97/61	O	O	C	O	C	O	O	O	C	O	O	O	114	311.62	12.37
98/62	C	O	O	O	C	O	O	O	C	O	O	O	111	308.25	31.50
99/63	O	C	C	C	O	O	O	O	C	O	O	O	10E	304.87	57.37
100/64	C	C	O	C	O	O	O	O	C	O	O	O	10B	301.50	90
101/65	C	O	O	C	O	O	O	O	C	O	O	O	109	299.25	15.75
102/66	O	C	C	O	O	O	O	O	C	O	O	O	106	295.87	60.75
103/67	C	C	O	O	O	O	O	O	C	O	O	O	103	292.50	112.50
104/68	C	O	O	O	O	O	O	O	C	O	O	O	101	290.25	54
105/69	C	C	C	C	C	C	C	C	O	O	O	O	0FF	288	0
106/6A	O	O	C	C	C	C	C	C	O	O	O	O	0FC	284.62	69.75
107/6B	O	C	O	C	C	C	C	C	O	O	O	O	0FA	282.37	25.87
108/6C	C	C	C	O	C	C	C	C	O	O	O	O	0F7	279	108
109/6D	C	O	C	O	C	C	C	C	O	O	O	O	0F5	276.75	74.25
110/6E	C	C	O	O	C	C	C	C	O	O	O	O	0F3	274.50	45
111/6F	C	O	O	O	C	C	C	C	O	O	O	O	0F1	272.25	20.25
112/70	C	C	C	C	O	C	C	C	O	O	O	O	0EF	270	0
113/71	O	O	C	C	O	C	C	C	O	O	O	O	0EC	266.62	111.37
114/72	O	C	O	C	O	C	C	C	O	O	O	O	0EA	264.37	101.25
115/73	O	O	O	C	O	C	C	C	O	O	O	O	0E8	262.12	95.62
116/74	O	C	C	O	O	C	C	C	O	O	O	O	0E6	259.87	94.50
117/75	O	O	C	O	O	C	C	C	O	O	O	O	0E4	257.62	97.87
118/76	O	C	O	O	O	C	C	C	O	O	O	O	0E2	255.37	105.75
119/77	O	O	O	O	O	C	C	C	O	O	O	O	0E0	253.12	118.12
120/78	C	C	C	C	C	O	C	C	O	O	O	O	0DF	252	0
121/79	C	O	C	C	C	O	C	C	O	O	O	O	0DD	249.75	20.25
122/7A	C	C	O	C	C	O	C	C	O	O	O	O	0DB	247.50	45
123/7B	C	O	O	C	C	O	C	C	O	O	O	O	0D9	245.25	74.25
124/7C	C	C	C	O	C	O	C	C	O	O	O	O	0D7	243	108
125/7D	O	C	C	O	C	O	C	C	O	O	O	O	0D6	241.87	5.62
126/7E	O	O	C	O	C	O	C	C	O	O	O	O	0D4	239.62	47.25
127/7F	O	C	O	O	C	O	C	C	O	O	O	O	0D2	237.37	93.37
128/80	C	O	O	O	C	O	C	C	O	O	O	O	0D1	236.25	0

* C = Closed or On; O = Open or Off

TABLE 3-12. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-UP METHOD

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
7/07	C	C	C	C	C	C	C	C	O	C	C	C	EFF	4320	4320
8/08	C	C	C	C	C	O	O	O	C	O	C	C	D1F	3780	3780
9/09	O	C	O	C	O	C	O	C	C	C	O	C	BAA	3360.37	3357
10/0A	C	C	C	C	C	C	C	O	O	C	O	C	A7F	3024	3024
11/0B	C	C	O	C	O	O	O	C	C	O	O	C	98B	2749.50	2745
12/0C	C	C	C	C	C	C	O	C	O	O	O	C	8BF	2520	2520
13/0D	C	C	O	O	C	O	O	O	O	O	O	C	813	2326.50	2322
14/0E	C	C	C	C	C	C	C	O	C	C	C	O	77F	2160	2160
15/0F	C	C	C	C	C	C	C	C	O	C	C	O	6FF	2016	2016
16/10	C	C	C	C	O	O	O	C	O	C	C	O	68F	1890	1890
17/11	C	O	C	C	O	C	O	O	O	C	C	O	62D	1779.75	1764
18/12	C	O	C	O	C	O	C	C	C	O	C	O	5D5	1680.75	1667.25
19/13	O	C	C	O	O	O	O	C	C	O	C	O	586	1591.87	1586.25
20/14	C	C	C	C	C	C	O	O	C	O	C	O	53F	1512	1512
21/15	C	C	C	C	C	C	C	C	O	O	C	O	4FF	1440	1440
22/16	C	O	C	O	O	O	C	C	O	O	C	O	4C5	1374.75	1370.25
23/17	O	O	O	O	C	O	O	C	O	O	C	O	490	1315.12	1307.25
24/18	C	C	C	C	C	O	C	O	O	O	C	O	45F	1260	1260
25/19	C	C	O	O	C	C	O	O	O	O	C	O	433	1210.50	1188
26/1A	C	O	O	C	O	O	O	O	O	O	C	O	409	1163.25	1158.75
27/1B	C	C	O	O	O	C	C	C	C	C	O	O	3E3	1120.50	1107
28/1C	C	C	C	C	C	C	O	C	C	C	O	O	3BF	1080	1080
29/1D	O	C	C	C	C	O	O	C	C	C	O	O	39E	1042.87	1039.50
30/1E	C	C	C	C	C	C	C	O	C	C	O	O	37F	1008	1008
31/1F	C	C	O	O	O	C	C	O	C	C	O	O	363	976.50	945
32/20	C	C	C	O	O	O	C	O	C	C	O	O	347	945	945
33/21	O	C	C	C	O	C	O	O	C	C	O	O	32E	916.87	900
34/22	O	C	C	O	C	O	O	O	C	C	O	O	316	889.87	874.12
35/23	C	C	C	C	C	C	C	C	O	C	O	O	2FF	864	864
36/24	O	C	O	C	O	C	C	C	O	C	O	O	2EA	840.37	826.87
37/25	O	C	C	O	C	O	C	C	O	C	O	O	2D6	817.87	796.50
38/26	C	C	O	O	O	O	C	C	O	C	O	O	2C3	796.50	769.50
39/27	C	O	O	O	C	C	O	C	O	C	O	O	2B1	776.25	742.50
40/28	C	C	C	C	C	O	O	C	O	C	O	O	29F	756	756
41/29	C	C	C	C	O	O	O	C	O	C	O	O	28F	738	720
42/2A	C	C	C	C	C	C	C	O	O	C	O	O	27F	720	720
43/2B	C	O	O	O	C	C	C	O	O	C	O	O	271	704.25	661.50
44/2C	O	C	O	O	O	C	C	O	O	C	O	O	262	687.37	682.87
45/2D	C	O	C	O	C	O	C	O	O	C	O	O	255	672.75	639
46/2E	O	O	O	C	O	O	C	O	O	C	O	O	248	658.12	624.37
47/2F	C	C	O	C	C	C	O	O	O	C	O	O	23B	643.50	639
48/30	C	C	C	C	O	C	O	O	O	C	O	O	22F	630	630

* C = Closed or On; O = Open or Off

Continued

TABLE 3-12. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-UP METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
49/31	O	O	C	O	O	C	O	O	O	C	O	O	224	617.62	594
50/32	C	O	O	C	C	O	O	O	O	C	O	O	219	605.25	582.75
51/33	C	C	C	C	O	O	O	O	O	C	O	O	20F	594	540
52/34	O	O	C	O	O	O	O	O	O	C	O	O	204	581.62	577.12
53/35	C	C	O	C	C	C	C	C	C	O	O	O	1FB	571.50	522
54/36	C	O	O	O	C	C	C	C	C	O	O	O	1F1	560.25	546.75
55/37	O	O	O	C	O	C	C	C	C	O	O	O	1E8	550.12	533.25
56/38	C	C	C	C	C	O	C	C	C	O	O	O	1DF	540	540
57/39	C	C	C	O	C	O	C	C	C	O	O	O	1D7	531	504
58/3A	C	C	C	C	O	O	C	C	C	O	O	O	1CF	522	486
59/3B	C	C	C	O	O	O	C	C	C	O	O	O	1C7	513	486
60/3C	C	C	C	C	C	C	O	C	C	O	O	O	1BF	504	504
61/3D	O	O	O	C	C	C	O	C	C	O	O	O	1B8	496.12	472.50
62/3E	C	O	O	O	C	C	O	C	C	O	O	O	1B1	488.25	456.75
63/3F	O	C	O	C	O	C	O	C	C	O	O	O	1AA	480.37	456.75
64/40	C	C	O	O	O	C	O	C	C	O	O	O	1A3	472.50	472.50
65/41	C	O	C	C	C	O	O	C	C	O	O	O	19D	465.75	432
66/42	C	C	C	O	C	O	O	C	C	O	O	O	197	459	405
67/43	C	O	O	O	C	O	O	C	C	O	O	O	191	452.25	391.50
68/44	C	C	O	C	O	O	O	C	C	O	O	O	18B	445.50	391.50
69/45	C	O	C	O	O	O	O	C	C	O	O	O	185	438.75	405
70/46	C	C	C	C	C	C	C	O	C	O	O	O	17F	432	432
71/47	O	C	O	C	C	C	C	O	C	O	O	O	17A	426.37	393.75
72/48	C	O	C	O	C	C	C	O	C	O	O	O	175	420.75	366.75
73/49	O	O	O	O	C	C	C	O	C	O	O	O	170	415.12	351
74/4A	C	C	O	C	O	C	C	O	C	O	O	O	16B	409.50	346.50
75/4B	O	C	C	O	O	C	C	O	C	O	O	O	166	403.87	353.25
76/4C	C	O	O	O	O	C	C	O	C	O	O	O	161	398.25	371.25
77/4D	C	O	C	C	C	O	C	O	C	O	O	O	15D	393.75	315
78/4E	O	O	O	C	C	O	C	O	C	O	O	O	158	388.12	354.37
79/4F	O	O	C	O	C	O	C	O	C	O	O	O	154	383.62	317.25
80/50	C	C	C	C	O	O	C	O	C	O	O	O	14F	378	378
81/51	C	C	O	C	O	O	C	O	C	O	O	O	14B	373.50	360
82/52	C	C	C	O	O	O	C	O	C	O	O	O	147	369	351
83/53	C	C	O	O	O	O	C	O	C	O	O	O	143	364.50	351
84/54	C	C	C	C	C	C	O	O	C	O	O	O	13F	360	360
85/55	O	O	C	C	C	C	O	O	C	O	O	O	13C	356.62	283.50
86/56	O	O	O	C	C	C	O	O	C	O	O	O	138	352.12	309.37
87/57	O	O	C	O	C	C	O	O	C	O	O	O	134	347.62	344.25
88/58	C	O	O	O	C	C	O	O	C	O	O	O	131	344.25	290.25
89/59	O	C	C	C	O	C	O	O	C	O	O	O	12E	340.87	243
90/5A	O	C	O	C	O	C	O	O	C	O	O	O	12A	336.37	302.62

* C = Closed or On; O = Open or Off

Continued

TABLE 3-12. SECTOR SELECT SWITCH SETTINGS -- 515 MB DRIVES USING 1.6 MHz CLOCK AND ROUND-UP METHOD (Contd)

Number of Sectors (Dec/Hex)	Location F556 Switch Number						Location F563 Switch Number						Test 18 Input (Hex)	Bytes in Early Sectors	Bytes in Last Sector
	1	2	3	4	5	6	1	2	3	4	5	6			
91/5B	C	C	C	O	O	C	O	O	C	O	O	O	127	333	270
92/5C	O	O	C	O	O	C	O	O	C	O	O	O	124	329.62	244.12
93/5D	C	O	O	O	O	C	O	O	C	O	O	O	121	326.25	225
94/5E	C	O	C	C	C	O	O	O	C	O	O	O	11D	321.75	317.25
95/5F	O	C	O	C	C	O	O	O	C	O	O	O	11A	318.37	312.75
96/60	C	C	C	O	C	O	O	O	C	O	O	O	117	315	315
97/61	C	O	C	O	C	O	O	O	C	O	O	O	115	312.75	216
98/62	O	C	O	O	C	O	O	O	C	O	O	O	112	309.37	230.62
99/63	C	C	C	C	O	O	O	O	C	O	O	O	10F	306	252
100/64	O	O	C	C	O	O	O	O	C	O	O	O	10C	302.62	280.12
101/65	O	C	O	C	O	O	O	O	C	O	O	O	10A	300.37	202.50
102/66	C	C	C	O	O	O	O	O	C	O	O	O	107	297	243
103/67	O	O	C	O	O	O	O	O	C	O	O	O	104	293.62	290.25
104/68	O	C	O	O	O	O	O	O	C	O	O	O	102	291.37	228.37
105/69	C	C	C	C	C	C	C	C	O	O	O	O	0FF	288	288
106/6A	C	O	C	C	C	C	C	C	O	O	O	O	0FD	285.75	236.25
107/6B	C	C	O	C	C	C	C	C	O	O	O	O	0FB	283.50	189
108/6C	O	O	O	C	C	C	C	C	O	O	O	O	0F8	280.12	266.62
109/6D	O	C	C	O	C	C	C	C	O	O	O	O	0F6	277.87	229.50
110/6E	O	O	C	O	C	C	C	C	O	O	O	O	0F4	275.62	196.87
111/6F	O	C	O	O	C	C	C	C	O	O	O	O	0F2	273.37	168.75
112/70	C	C	C	C	O	C	C	C	O	O	O	O	0EF	270	270
113/71	C	O	C	C	O	C	C	C	O	O	O	O	0ED	267.75	252
114/72	C	C	O	C	O	C	C	C	O	O	O	O	0EB	265.50	238.50
115/73	C	O	O	C	O	C	C	C	O	O	O	O	0E9	263.25	229.50
116/74	C	C	C	O	O	C	C	C	O	O	O	O	0E7	261	225
117/75	C	O	C	O	O	C	C	C	O	O	O	O	0E5	258.75	225
118/76	C	C	O	O	O	C	C	C	O	O	O	O	0E3	256.50	229.50
119/77	C	O	O	O	O	C	C	C	O	O	O	O	0E1	254.25	238.50
120/78	C	C	C	C	C	O	C	C	O	O	O	O	0DF	252	252
121/79	O	C	C	C	C	O	C	C	O	O	O	O	0DE	250.87	135
122/7A	O	O	C	C	C	O	C	C	O	O	O	O	0DC	248.62	156.37
123/7B	O	C	O	C	C	O	C	C	O	O	O	O	0DA	246.37	182.25
124/7C	O	O	O	C	C	O	C	C	O	O	O	O	0D8	244.12	212.62
125/7D	C	C	C	O	C	O	C	C	O	O	O	O	0D7	243	108
126/7E	C	O	C	O	C	O	C	C	O	O	O	O	0D5	240.75	146.25
127/7F	C	C	O	O	C	O	C	C	O	O	O	O	0D3	238.50	189
128/80	C	O	O	O	C	O	C	C	O	O	O	O	0D1	236.25	236.25

* C = Closed or On; O = Open or Off

CHECKOUT

After completing installation of the drive, follow the sequence outlined below for initial startup. Refer to section 2 of this manual for information about operation of the drive.

1. Install logic plug in operator panel. Logic plug for each drive in a system must have a unique number.

2. Remove drive top cover and set LOCAL/REMOTE switch to LOCAL position.

3. Set power supply switch/circuit breaker to ON position, and observe that the drive cooling fan operates.

4. Press START switch on drive operator panel, and observe that the following events occur:

   - The drive motor starts.

   - The Ready indicator (inside the START switch) lights steadily within 45 seconds of startup. This indicates that the drive motor is up to speed and that the heads are at track 0.

   If either of these events do not occur, a problem exists in the drive. Then refer to troubleshooting information either in appendix A of this manual or in the maintenance manual.

5. Power off drive.

6. Set LOCAL/REMOTE switch to REMOTE position if remote operation is desired and install top cover.

7. Return drive to normal operating position in equipment rack.

8. Drive is now ready for online operation.

APPENDIX A

DIAGNOSTIC TESTING AND STATUS CODE SUMMARY

DIAGNOSTIC TESTING AND STATUS CODE SUMMARY A

INTRODUCTION

This appendix is a summary of diagnostic information and status codes.

The summary briefly explains:

- Switches and Indicators
- Test Selection Procedure
- Test Descriptions
- Status Code Summary

To use this summary you must understand the more detailed test descriptions found in the maintenance manual.

Before doing any troubleshooting you should be familiar with the troubleshooting information contained in the maintenance manual.

SWITCHES AND INDICATORS

The offline diagnostics are initiated and monitored via switches and indicators on the maintenance panel (see figure A-1). This panel is located behind the front panel insert and filter. Table A-1 describes the function of the switches and indicators.

TABLE A-1. MAINTENANCE PANEL SWITCHES AND INDICATORS

Description	Function
Diagnostic Mode Switch	Setting the switch to the up position places the unit in diagnostic mode and disables the interface. The diagnostic mode indicator lights when the switch is set to diagnostic mode. Setting the switch to the down position permits normal controller selection on the interface. This also causes the drive to do an RTZ.
STEP Switch	Steps the hex display pattern from 0 to F. Holding the switch down for about one-half second causes the numbers to increment continuously and wrap around from F to 0. Refer to EXEC switch.

Continued

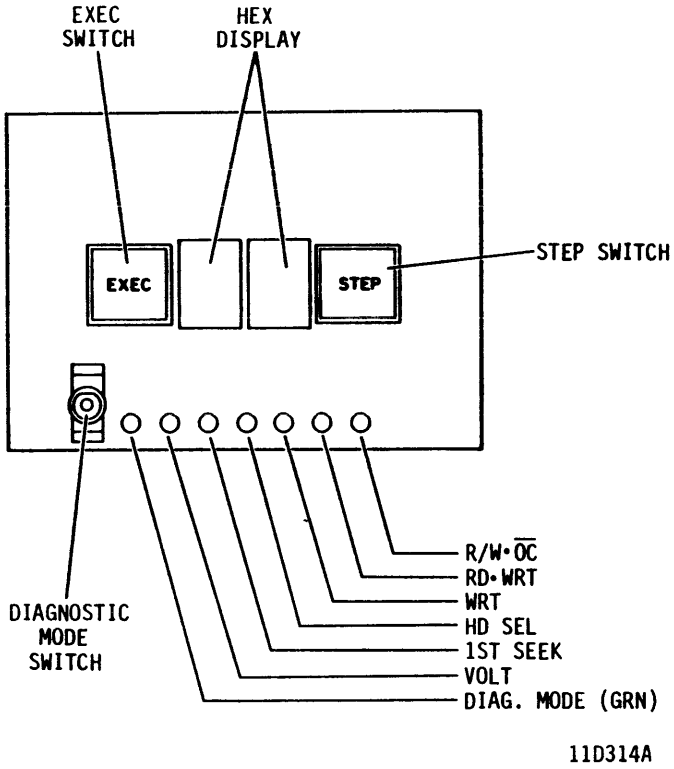


Figure A-1. Maintenance Panel

TABLE A-1. MAINTENANCE PANEL SWITCHES AND INDICATORS (Contd)

Description	Function
EXEC Switch (Execute)	Enters values in memory. The entries are test selection, test parameters, and test deselection. The switch must be pressed for about one-half second to activate.
Hex Display	Used to display current status when unit is operating in normal mode, or diagnostic options and error codes when operating in diagnostic mode.
Diagnostic Mode Indicator	Indicates that drive is in diagnostic mode.
First Seek Indicator*	Indicates drive failed first seek/load attempt.
Read or Write and Not On Cylinder Indicator*	Indicates read or write conditions existed during a seek operation (an off cylinder condition).
Write Indicator*	Indicates that a write fault has occurred.
Read and Write Indicator*	Indicates that a write and read command were active simultaneously.
Voltage Indicator*	Indicates a below normal voltage condition has occurred.
Head Select Indicator*	Indicates a multiple head selection condition has occurred.

* When cylinder logging is enabled via Test 10, the fault indicators do not display meaningful information. Disregard fault indicators until cylinder logging has been disabled.

TEST SELECTION PROCEDURE

The following procedure selects and starts any test listed in table A-2:

1. Place Diagnostic Mode switch in up position. Display goes to test selection state ("00" displayed).

   NOTE

   For descriptive purposes, Test 0F will be selected and started.

2. Press STEP switch to increment least significant (right) number to desired value. Example display = 0F.

3. Press EXEC switch to store "F" into memory.

4. In this example, most significant (left) number is already at desired value (0). Example display = 0F. If it were not at desired value, press STEP switch to increment display to desired value.

5. Press EXEC switch to store "0" into memory and start test.

   NOTE

   Pressing EXEC switch starts test execution, except if additional parameters are needed. In the example, the test executes and returns to test selection state ("00" displayed).

6. Refer to individual test descriptions for any additional information needed for test execution.

7. When testing is completed, place the Diagnostic Mode switch to the down position to enable the interface.

To determine if an error occurred during execution, observe the display with the Diagnostic Mode switch in the down position, or execute Test 00.

TABLE A-2. SUMMARY OF DIAGNOSTIC TESTS

Test Number	Name of Test
00	Display Status/Error Log
01	Display Fault Log or Cylinder Log
02	Perform MPU Initialization
03	Switch Display Test
04	Calculate Four Most Likely Failed Field Replaceable Units
05	Servo Test
06	Clear Status/Error Log
07	Clear Fault Log
08	Direct Seek
09	Random Seek
0A	Display/Alter Load Delay (Scan Cycle)
0B	Not Used
0C	Display EPROM Part Number
0D	Load Cylinder Address
0E	Return to Zero
	NOTE Remaining tests are not available on all drives.
0F	Disable Cylinder Log
10	Enable Cylinder Log
11	Disable Fan Fault
12	Enable Fan Fault
13	Not Used
14	Not Used
15	Set Write Protect
16	Clear Write Protect
17	Set Number of Sectors
18	Set Sector Length

Continued

TABLE A-2. SUMMARY OF DIAGNOSTIC TESTS (Contd)

Test Number	Name of Test
19	Enable Sweep Cycle
1A	Disable Sweep Cycle
1B	Enable Return to Original Cylinder After Sweep Segment
1C	Disable Return to Original Cylinder After Sweep Segment
1D	Enable Option to Sweep only on Seeks
1E	Disable Option to Sweep only on Seeks
1F	Display Nonvolatile Memory Status
20	Enable Write Protected Status During Sweep
21	Disable Write Protected Status During Sweep
22	Select the 1.6 MHz Sector Clock
23	Select the 0.8 MHz Sector Clock
24	Not Used
25	Disable Restart of Sweep Counter After Seek
26	Enable Restart of Sweep Counter After Seek

TEST DESCRIPTIONS

TEST 00 -- DISPLAY STATUS/ERROR LOG

This test displays the sixteen most recently generated status/error codes stored in memory locations 20 through 2F. Pressing the STEP switch displays memory starting at location 20. At the completion of a successful power up, the contents are: 00 (most recent code), 6D, 08, 07, 2E, 03, 02, 71, 70 (oldest code), with 00 in all remaining locations.

TEST 01 -- DISPLAY FAULT LOG OR CYLINDER LOG

This test displays eight bytes stored in memory at locations 31

through 38. Pressing the STEP switch displays the contents of these locations starting at location 31. Following Test 10, the last four cylinder addresses are displayed (two bytes per the last four cylinder addresses are displayed (two bytes per address). Otherwise, the eight most recent fault conditions are displayed. The definition of each bit within the fault byte is:

Bit		Definition
0	(LSB)	Not Used (01)
1		Voltage Fault (02)
2		Write Fault (04)
3		Read • Write Fault (08)
4		(Read + Write) • Off Cylinder Fault (10)
5		Head Select Fault (20)
6		First Seek Fault (40)
7	(MSB)	Not Used (80)

TEST 02 -- PERFORM MPU INITIALIZATION

This test reexecutes the MPU initialization routine. If the spindle motor is operating, the test also reexecutes the first seek operation (spindle motor is not recycled). The expected contents for drive initialization with spindle stopped are: 03 (latest status), 02, 71, 70, with 00 in all remaining locations. The expected contents for drive initialization with spindle operating are: 51 (latest status), 6D (D1 on older control boards), 18, 70, with 00 in all remaining locations.

TEST 03 -- SWITCH DISPLAY TEST

This test exercises the switches and indicators on the maintenance panel and is divided into three parts. Part 1 tests the hex display and fault indicators. Part 2 tests the switches (except STEP and EXEC switches). Part 3 tests the STEP and EXEC switches.

TEST 04 -- CALCULATE FOUR MOST LIKELY FAILED FIELD-REPLACEABLE UNITS

This test uses the fault and status history as displayed by Tests 00 and 01 to predict the most likely cause of drive failure. The field-replaceable unit corresponding to each display is:

Hex Display	Field-Replaceable Unit
1	Power Supply
2	Control Board
3	Power Amplifier
4	Module
5	Read/Write Board
6	Module
7	Cooling Fan
8	I/O Board
9	Operator Panel
A	Mother Board
B	Module
C	Module
D	Maintenance Panel
F	Air Filter

TEST 05 -- SERVO TEST

This test automatically performs a series of RTZ, one-track, velocity recalibrate, and maximum-length seek operations.

TEST 06 -- CLEAR STATUS/ERROR LOG

This test clears the status/error log.

TEST 07 -- CLEAR FAULT LOG

This test clears the fault log.

TEST 08 -- DIRECT SEEK

This test performs continuous seeks between cylinder zero and the cylinder address loaded by Test 0D.

TEST 09 -- RANDOM SEEK

This test performs random seeks within the limits of cylinder zero and the maximum cylinder address.

TEST 0A -- DISPLAY/ALTER LOAD DELAY

This test stores and displays a count corresponding to the amount of delay between seeks during the scan cycle portion of the load operation. A load delay count of 00 represents a default.

TEST 0C -- DISPLAY EPROM PART NUMBER

This test displays the eight-digit decimal part number of the EPROM located on the control board.

TEST 0D -- LOAD CYLINDER ADDRESS

This test allows the operator to load a number to be used as the upper cylinder address in Test 08 (Direct Seek).

TEST 0E -- RETURN TO ZERO

This test executes a return to zero (RTZ) seek.

NOTE

Remaining tests are not available on all drives.

TEST 0F -- DISABLE CYLINDER LOG

This test disables cylinder address logging and enables fault logging.

TEST 10 -- ENABLE CYLINDER LOG

This test causes cylinder addresses, rather than fault conditions, to be loaded into the fault log. Test 01 is used to display the last four cylinder addresses that were accessed.

TEST 11 -- DISABLE FAN FAULT

This causes the MPU to disable the fan fault.

TEST 12 -- ENABLE FAN FAULT

This causes the MPU to enable the fan fault.

TEST 15 -- SET WRITE PROTECT

This test replaces the Write Protect jumper that is found on earlier control boards. This test sets the write protect bit stored in nonvolatile memory. When this bit is set, the drive is placed in WRITE PROTECT mode (prevents write operation) and the WRITE PROTECT indicator on the operator panel is lit. The write protect bit must be cleared by Test 16 in order for write operations to occur.

To execute Test 15, perform the following steps:

1. Select and start Test 15.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 16 -- CLEAR WRITE PROTECT

This test replaces the Write Protect jumper that is found on earlier control boards. This test clears the write protect bit stored in nonvolatile memory. When this bit is clear (and the operator panel WRITE PROTECT switch is Off), the drive is taken out of WRITE PROTECT mode (allowing write operations) and the WRITE PROTECT indicator on the operator panel is turned off. The write protect bit may be set by Test 15 to inhibit write operations.

To execute Test 16, perform the following steps:

1. Select and start Test 16.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 17 -- SET NUMBER OF SECTORS

This test allows you to program the sector counter by specifying directly (in hex) the number of sectors on a track. Sector Select Switch Settings tables in section 3 contain decimal and hexadecimal equivalents for the number of sectors. The MPU takes your hex input and uses the round-down method to calculate a 12-bit value that is periodically loaded into the sector counter. The number you entered and the 12-bit value are stored in nonvolatile memory. Each time that dc power is applied to the drive, the MPU places the 12-bit value into a register for use by the sector counter circuit.

By performing Test 17, you also change the contents of nonvolatile memory controlled by Test 18.

NOTE

If the 1.6 MHz sector clock is selected (either by a jumper or by Test 22), you must use Test 18 to set the sector length properly.

In the example we will set the number of sectors to 20_{16} (32_{10}) and assume the 0.8 MHz sector clock is selected.

To execute Test 17, perform the following steps:

1. Select and start Test 17.
2. Display now contains the hex number of sectors currently programmed for the drive.

   At this point you have two choices:

   - If current sector setting is OK, press EXEC switch twice to exit test. Display returns to test selection state ("00" displayed).
   - If sector setting needs to be changed, continue with procedure.

3. Press STEP switch to increment right display to 0.
4. Press EXEC switch to store 0 in nonvolatile memory.
5. Press STEP switch to increment left display to 2.
6. Press EXEC switch to store 2 in nonvolatile memory and exit test. Display returns to test selection state ("00" displayed).

TEST 18 -- SET SECTOR LENGTH

This test allows you to program the sector counter by entering the 12-bit value used to load the sector counter. This method allows more flexibility than Test 17 does. You can elect any of the following:

- Use of the 1.6 MHz sector clock (selected by a control board jumper or by Test 22).
- Use of the round-up method. With the round-up method, the last sector can be somewhat shorter than the other sectors. There is no runt sector, however.
- Use of a customized sector length.

The 12-bit value is entered in the form of three hexadecimal numbers. The first byte displayed on the maintenance panel contains zero on the left and the most significant hex number on the right. The second byte displayed on the maintenance panel contains the middle hex number on the left and the least significant hex number on the right.

The MPU takes your hex input and enters it and the equivalent number of sectors per track in nonvolatile memory. Each time that dc power is applied to the drive, the MPU places the 12-bit value into a register for use by the sector counter circuit.

Sector Select Switch Settings tables in section 3 give the values to load directly into Test 18. They are listed under the column headed Test 18 Input.

By performing Test 18, you also change the contents of nonvolatile memory controlled by Test 17.

In the example we want the number of sectors to be 20_{16} (32_{10}) with the 0.8 MHz sector clock selected. For this number of sectors we will enter a software 12-bit value of $1A3_{16}$.

To execute Test 18, perform the following steps:

1. Select and start Test 18.
2. Righthand character displayed is most significant hex number of 12-bit value currently stored.
3. Press STEP switch to increment right display to 1.
4. Press EXEC switch to store 1 in nonvolatile memory.
5. Lefthand character in display should always be 0. Press EXEC switch to store 0 in nonvolatile memory and shift display to show remaining two hex characters of 12-bit value.
6. Press STEP switch to increment righthand display to 3.
7. Press EXEC switch to store 3 in nonvolatile memory.
8. Press STEP switch to increment lefthand display to A.
9. Press EXEC switch to store A in nonvolatile memory and exit test. Display returns to test selection state ("00" displayed).

TEST 19 -- ENABLE SWEEP CYCLE

This test enables the drive to perform a periodic sweep of the disks. While a sweep of the disks is being performed, the drive drops On Cylinder and Seek End to alert the controller that the drive cannot accept any commands at this time (unless modified by Test 20).

To execute Test 19, perform the following steps:

1. Select and start Test 19.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 1A -- DISABLE SWEEP CYCLE

This test disables the sweep cycle and all its options from occurring.

To execute Test 1A, perform the following steps:

1. Select and start Test 1A.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 1B -- ENABLE RETURN TO ORIGINAL CYLINDER AFTER SWEEP

If the drive has been selected during the 14.5 minutes prior to a sweep, the drive performs the sweep and returns to the original cylinder (where it was before the sweep occurred). The drive does not return to the original cylinder if it was not selected, or if the sweep was initiated by a Seek command (see Test 1D). If the drive has not been selected during the 14.5 minutes prior to a sweep, the heads stay on a cylinder accessed during the sweep segment.

To execute Test 1B, perform the following steps:

1. Select and start Test 1B.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 1C -- DISABLE RETURN TO ORIGINAL CYLINDER AFTER SWEEP

This test disables the option selected by Test 1B. The heads always stay on a cylinder accessed during the sweep segment with the following exception: if the sweep was initiated by a seek command, the drive performs the sweep function and then moves the heads to the cylinder requested by the controller.

To execute Test 1C, perform the following steps:

1. Select and start Test 1C.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 1D -- ENABLE OPTION TO SWEEP ONLY ON SEEKS

This test allows sweep movements to occur only in conjunction with seeks required by the controller. Each time the drive performs a sweep cycle, it starts a 14.5 minute timeout. When the timeout has elapsed, the drive performs another sweep cycle only when it receives a Seek command (Tag 1). When combining a sweep cycle with a seek, the drive performs the sweep cycle first and then executes the Seek command.

To execute Test 1D, perform the following steps:

1. Select and start Test 1D.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 1E -- DISABLE OPTION TO SWEEP ONLY ON SEEKS

This test disables the option selected by Test 1D. Sweep segments can be initiated within the drive or they may accompany controller seeks.

To execute Test 1E, perform the following steps:

1. Select and start Test 1E.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 1F -- DISPLAY NONVOLATILE MEMORY STATUS

This test displays the contents of nonvolatile memory. The left digit shows the contents of memory and the right digit is used as a pointer to show where you are.

To execute Test 1F, perform the following steps:

1. Select and start Test 1F.

2. Observe the hex character to the left of pointer 0. This character is the most significant number of the 12-bit value loaded into the sector counter (bits 2^{11}-2^{8}).

3. Press STEP switch. Observe the hex character to the left of pointer 1. This character is the middle number of the 12-bit value loaded into the sector counter (bits 2^{7}-2^{4}).

4. Press STEP switch. Observe the hex character to the left of pointer 2. This character is the least significant number of the 12-bit value loaded into the sector counter (bits 2^{3}-2^{0}).

5. Press STEP switch. Observe the hex character to the left of pointer 3. This character is the most significant number of the numbers of sector per track.

6. Press STEP switch. Observe the hex character to the left of pointer 4. This character is the least significant number of the numbers of sector per track.

7. Press STEP switch. Observe the hex character to the left of pointer 5. The display indicates whether sweep cycle is enabled or disabled (controlled by Tests 19 and 1A).

   - Display 05 = sweep enabled
   - Display 85 = sweep disabled

8. Press STEP switch. Observe the hex character to the left of pointer 6. The display indicates whether the feature is enabled or disabled that returns the heads to original cylinder after a sweep (controlled by Tests 1B and 1C).

   - Display 86 = return enabled
   - Display 06 = return disabled

9. Press STEP switch. Observe the hex character to the left of pointer 7. The display indicates whether the feature is enabled or disabled that allows sweep movements to

occur only in conjunction with seeks required by the controller (controlled by Tests 1D and 1E).

- Display 87 = sweep only on seeks enabled
- Display 07 = sweep only on seeks disabled

10. Press STEP switch two times. Pointers 8 and 9 are not used.

11. Press STEP switch. Observe the hex character to the left of pointer A. The display indicates whether the feature is enabled or disabled that causes the drive to issue Write Protected status during each sweep segment (controlled by Tests 20 and 21).

    - Display 8A = Write Protected status is enabled
    - Display 0A = Write Protected status is disabled

12. Press STEP switch. Observe the hex character to the left of pointer B. The display indicates whether the feature is enabled or disabled that causes the drive to restart its sweep counter after each seek (controlled by Tests 25 and 26).

    - Display 8B = Restart is enabled
    - Display 0B = Restart is disabled

13. Press STEP switch. Observe the hex character to the left of pointer C. The display indicates whether the 0.8 MHz sector clock or 1.6 MHz sector clock is selected (controlled by Tests 22 and 23).

    - Display 8C = 1.6 MHz is selected
    - Display 0C = 0.8 MHz is selected

14. Press STEP switch. Observe the hex character to the left of pointer D. The display indicates whether the feature is enabled or disabled that write protects the drive independent of the operator panel (controlled by Tests 15 and 16).

    - Display 8D = write protect is enabled
    - Display 0D = write protect is disabled

15. Press STEP switch two times. Pointers E and F are not used.

16. Pressing the STEP switch after pointer F is displayed starts Test 1F over again at pointer 0.

17. To exit this test, place the DIAG MODE switch in the down position and then back up.

TEST 20 -- ENABLE WRITE PROTECTED STATUS DURING SWEEP

This test enables the drive to issue Write Protected status during each sweep segment. This alerts the controller that the drive cannot accept any commands at this time. On Cylinder and Seek End status remain active.

To execute Test 20, perform the following steps:

1. Select and start Test 20.

2. When test ends, display returns to test selection state ("00" displayed).

TEST 21 -- DISABLE WRITE PROTECTED STATUS DURING SWEEP

This test instructs the drive not to issue Write Protected status during sweep segments. While a sweep of the disks is being performed, the drive drops On Cylinder and Seek End to alert the controller that the drive cannot accept any commands at this time.

To execute Test 21, perform the following steps:

1. Select and start Test 21.

2. When test ends, display returns to test selection state ("00" displayed).

TEST 22 -- SELECT THE 1.6 MHZ SECTOR CLOCK

This test selects a 1.6 MHz signal as the clock for the sector counter. This clock selection may help to optimize the lengths of data sectors and runt sectors. You should run Test 18 after running Test 22.

To execute Test 22, perform the following steps:

1. Select and start Test 22.

2. When test ends, display returns to test selection state ("00" displayed).

TEST 23 -- SELECT THE 0.8 MHZ SECTOR CLOCK

This test selects a 0.8 MHz signal as the clock for the sector counter. This was the standard frequency provided on early control boards. You should run Test 17 or Test 18 after running Test 23.

To execute Test 23, perform the following steps:

1. Select and start Test 23.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 25 -- DISABLE RESTART OF SWEEP COUNTER AFTER SEEK

This test disables the option selected by Test 26. The sweep counter will not restart each time the drive executes a seek for the controller. Sweep segments will occur approximately 14.5 minutes apart.

To execute Test 25, perform the following steps:

1. Select and start Test 25.
2. When test ends, display returns to test selection state ("00" displayed).

TEST 26 -- ENABLE RESTART OF SWEEP COUNTER AFTER SEEK

This test instructs the drive to restart its sweep counter each time it executes a seek for the controller. It is designed to inhibit sweep cycles whenever there is sufficient seek activity. A sweep segment will occur if approximately 14.5 minutes elapse without any seeks.

To execute Test 26, perform the following steps:

1. Select and start Test 26.
2. When test ends, display returns to test selection state ("00" displayed).

STATUS CODE SUMMARY

Table A-3 provides a summary of the status codes. Refer to the maintenance manual for descriptions, probable causes, and maintenance actions applicable to each status code.

TABLE A-3. STATUS CODE SUMMARY

Status Code	Description
	Normal On Cylinder
00	Normal On Cylinder
	Normal Motor Stop
01	Retracting Heads to Landing Zone
02	Stopping Motor
03	Motor Stopped OK
	Normal Motor Start
07	Motor Start in Progress (No Jog)
08	Motor Start in Progress (Including Jog)
09	Speed OK Too Soon
0A	Too Long to Get up to Speed (Retry)
0B	Too Long to Get up to Speed (Sensor Fault)
0C	Too Many Startup Failures (No Retry)
0D	Too Many Startup Failures (Sensor Fault)
0E	Motor Speed Too High
0F	Motor Speed Too Low
10	Speed Loss Recovery With Seek Error
	Motor Stop During Recovery From Speed Drop
11	Retracting Heads to Landing Zone
12	Stopping Motor
18	Motor Start in Progress (Including Jog)
19	Speed OK Too Soon
1A	Too Long to Get up to Speed (Retry)
1B	Too Long to Get up to Speed (Sensor Fault)
1C	Too Many Startup Failures (No More Retries)

Continued

TABLE A-3. STATUS CODE SUMMARY (Contd)

Status Code	Description
	Motor Stop During Recovery From Speed Drop (Contd)
1D	Too Many Startup Failures (Sensor Fault)
1E	Motor Speed Too High
1F	Motor Speed Too Low
	Normal Load
21	Heads Loaded Before Load Begins
22	Fault After Power Amplifier Driver Enabled
25	Demodulator Active Timeout
26	Cylinder Pulse Timeout
27	Fault After Load Complete
28	Code 22 and Too Many Retries
2B	Code 25 and Too Many Retries
2C	Code 26 and Too Many Retries
2D	Code 27 and Too Many Retries
2E	Power Sequence Delay
2F	Backup Into Outer Guard Band
	Normal RTZ
30	Can't Move In From Outer Guard Band
31	Lost Demodulator Active Before Turnaround
33	Timeout During RTZ
34	Backup Into Outer Guard Band
35	Turnaround
36	Out of Guard Band Too Soon
37	Can't Find Cylinder Pulse at Track -1
38	Can't Find Fine Enable
39	Settle In on Track 0

Continued

TABLE A-3. STATUS CODE SUMMARY (Contd)

Status Code	Description
	Normal Guard Bands
40	Inner Guard Band Detected During Normal Seek
41	Inner Guard Band Detected During On Cylinder Routine
42	Inner Guard Band Detected While On Cylinder
43	Outer Guard Band Detected During Normal Seek
44	Outer Guard Band Detected During On Cylinder Routine
45	Outer Guard Band Detected While On Cylinder
	Normal Seek Timeout
46	Seek Timeout
	(Normal) Can't Stop on Track During On Cylinder Routine
47	Too Long to Get On Cylinder Sense
48	Demodulator Active Lost During On Cylinder Routine
49	Too Many Cylinder Pulses During Settle In
4A	Too Many On Cylinder Sense Dropouts
	Normal On Track
4B	Lost On Cylinder Sense
4C	Lost Demodulator Active While On Cylinder
4D	Illegal Seek Address
4E	Voltage Fault While On Cylinder
	Reset Dummy RTZ Mode Canceled
50	Recovery From Low Vcc Reset
51	Recovery From MPU Hang Reset
52	Recovered From Low Vcc Reset and Subsequent Speed Loss
53	Recovered From MPU Hang Reset and Subsequent Speed Loss
58	Non Maskable Interrupt

Continued

TABLE A-3. STATUS CODE SUMMARY (Contd)

Status Code	Description
	Reset Dummy RTZ Mode Canceled (Contd)
59	Software Interrupt
5A	PTM Test Failure
5B	Too Many Fan Faults (Greater Than 10)
5C	Fan Fault
5D	Seek Error During Scan
5F	PIA Test Failure
	Servo Test Diagnostics
60	Servo Test Failure During RTZ
61	Servo Test Failure During Recalibrate
62	Servo Test Failure During 1 Track Seek
63	Servo Test Failure During Maximum Length Seek
64	Failed Recalibrate Test
65	1 Track Seek Time Too Long
66	1 Track Seek Time Too Short
67	Maximum Length Seek Time Too Long
68	Maximum Length Seek Time Too Short
69	Bad Preseek Status
6A	No Speed Signal During Seek Test
6B	Bus Change During Diagnostic Test
6C	No Tag 5 at End of Diagnostic Routine
6D	Scan Active/Unit in Sweep Cycle
6E	Read/Write Diagnostic Failure (Not SMD-E)
6F	Illegal Sector Number
70	Self Test Complete
71	Fan On
72	Execute Switch Does Not Release
7C	Missing On Cylinder in I/O

Continued

TABLE A-3. STATUS CODE SUMMARY (Contd)

Status Code	Description
	Servo Test Diagnostics (Contd)
7D	I/O MPU Is Not Functional
80	Fault Before Seek Begins
90	Recovered From Speed Loss
	Load and Fault Detected Before Seek Error Was Set
A1	Unable to Retract Heads Before Load Begins
A2	Fault After Power Amplifier Driver Enabled
A5	Demodulator Active Too Late
A6	Cylinder Pulse Timeout
A7	Fault After Load Complete
A8	Code 22 and Too Many Retries
AB	Code 25 and Too Many Retries
AC	Code 26 and Too Many Retries
AD	Code 27 and Too Many Retries
	RTZ and Fault Detected Before Seek Error Was Set
B0	Can't Move In From Outer Guard Band
B1	Lost Demodulator Active Before Turnaround
B3	Timeout During RTZ
B4	Backup Into Outer Guard Band
B5	Turnaround
B6	Out of Guard Band Too Soon
B7	Can't Find Cylinder Pulse at Track -1
B8	Can't Find Fine Enable
B9	Settle In on Track 0

Continued

TABLE A-3. STATUS CODE SUMMARY (Contd)

Status Code	Description
	Guard Bands and Fault Detected Before Seek Error Was Set
C0	Inner Guard Band Detected During Normal Seek
C1	Inner Guard Band Detected During On Cylinder Routine
C2	Inner Guard Band Detected While On Cylinder
C3	Outer Guard Band Detected During Normal Seek
C4	Outer Guard Band Detected During On Cylinder Routine
C5	Outer Guard Band Detected While On Cylinder
	Seek Timeout and Fault Detected Before Seek Error Was Set
C6	Seek Timeout
	Can't Stop on Track During On Cylinder Routine and Fault Detected Before Seek Error Was Set
C7	Too Long to Get On Cylinder Sense
C8	Demodulator Active Lost During On Cylinder Routine
C9	Too Many Cylinder Pulses During Settle In
CA	Too Many On Cylinder Sense Dropouts
	On Track and Fault Detected Before Seek Error Was Set
CB	Lost On Cylinder Sense
CC	Lost Demodulator Active While On Cylinder
CD	Illegal Cylinder Address
CE	Voltage Fault While On Cylinder
	Reset Dummy RTZ Mode Active
D0	Recovery From Low Vcc Reset
D1	Recovery From MPU Hang Reset
	MPU Power On Test
FF	MPU Failed Power On Test

APPENDIX B

REFERENCE MATERIAL FOR SECTOR SELECTION

REFERENCE MATERIAL FOR SECTOR SELECTION B

INTRODUCTION

The information in this appendix supplements the instructions for sector selection given in section 3. Section 3 provides a number of options for sector selection and uses tables to indicate switch settings and sector lengths. For most installations section 3 provides all the information required.

The information in this appendix is intended more for systems designers who are matching the drive's sector length to the nonstandard requirements of certain controllers. This information is organized as follows:

- How Sector Pulses are Generated
- How to Set Desired Numbers of Sectors
- How to Set Desired Sector Lengths
- How to Calculate Sector Lengths

HOW SECTOR PULSES ARE GENERATED

The sector counter circuit uses a preset count to determine the interval between sector pulses. As described in section 3 under Programming the Sector Counter, there are two ways to program the preset count, depending on whether the control board has sector switches.

On drives with older control boards, this count is supplied by 12 sector switches. On drives with newer control boards, the count is entered through the maintenance panel during installation. Each time power is applied to the drive, the MPU loads a 12-bit register, and the value in this register presets the sector counter circuit.

This circuit counts sector clock pulses, starting at the preset value when index appears and after each new sector pulse is issued. When the sector counter has received a specific number of clock pulses, it issues another sector pulse and begins at the preset value to count again. With older control boards, the sector clock frequency is 0.8 MHz. With newer control boards, sector clock frequency can be set to either 0.8 MHz or 1.6 MHz.

Two numbers enter into all of the calculations presented here. They are the number of sector clock pulses per disk rotation and the number of bytes per track. Table B-1 summarizes these numbers.

TABLE B-1. SECTOR CALCULATION DATA

Characteristics	300 MB Drives	340 MB Drives	515 MB Drives
Bytes per track	20 160	20 160	30 240
Sector clock pulses per disk rotation			
Sector Clock frequency = .8	13 440	13 440	13 440
Sector Clock frequency = 1.6	26 880	26 880	26 880
Bytes per sector clock pulse			
Sector Clock frequency = .8	1.50	1.50	2.250
Sector Clock frequency = 1.6	0.75	0.75	1.125

SECTOR SWITCHES

On drives with older control boards, you must set sector switches to enter the sector length calculated with any of the procedures in this appendix. The groups of sector switches are identified by their component locations on the control board (see section 3). Each sector switch represents a binary and decimal value of clock pulses (as counted in the logic). The values related to each switch are as follows:

Switch No. Loc. F556	Binary Value	Decimal Value
1	2^0	1
2	2^1	2
3	2^2	4
4	2^3	8
5	2^4	16
6	2^5	32

Switch No. Loc. F563	Binary Value	Decimal Value
1	2^6	64
2	2^7	128
3	2^8	256
4	2^9	512
5	2^{10}	1024
6	2^{11}	2048

DIAGNOSTIC TEST 18

On drives with newer control boards, you must use Diagnostic Test 18 to enter the sector length calculated with any of the procedures in this appendix. Detailed instructions for operating the maintenance panel appear in appendix A.

HOW TO SET DESIRED NUMBERS OF SECTORS

This topic describes the process used for programming the sector counter to achieve a desired number of sectors per disk rotation. It also provides examples of the calculation. The process makes use of numbers given in table B-1. Here are the steps required:

1. Calculate the number of selected clock pulses per sector. Use the following formula:

$$\text{Selected Clock Pulses} = \frac{\text{Sector Clock Pulses/Rotation}}{\text{Number of Sectors Desired}} - 1$$

2. If the result in step 1 is not an integer, either round it up or round it down. (The number 313.6, for example, can be rounded up to 314 or can be rounded down to 313.) Figure B-1 shows the effects of using the round-up and round-down methods, and section 3 contains some discussion of the two methods.

3. For drives with newer control boards, convert the result of step 2 from a decimal to a hexadecimal number. Use Diagnostic Test 18 to enter 3 hex characters.

4. For drives with older control boards, express the result of step 2 as a sum of individual sector switch values (see previous page). When a switch value appears in the sum, that switch must be placed in the Closed or On position.

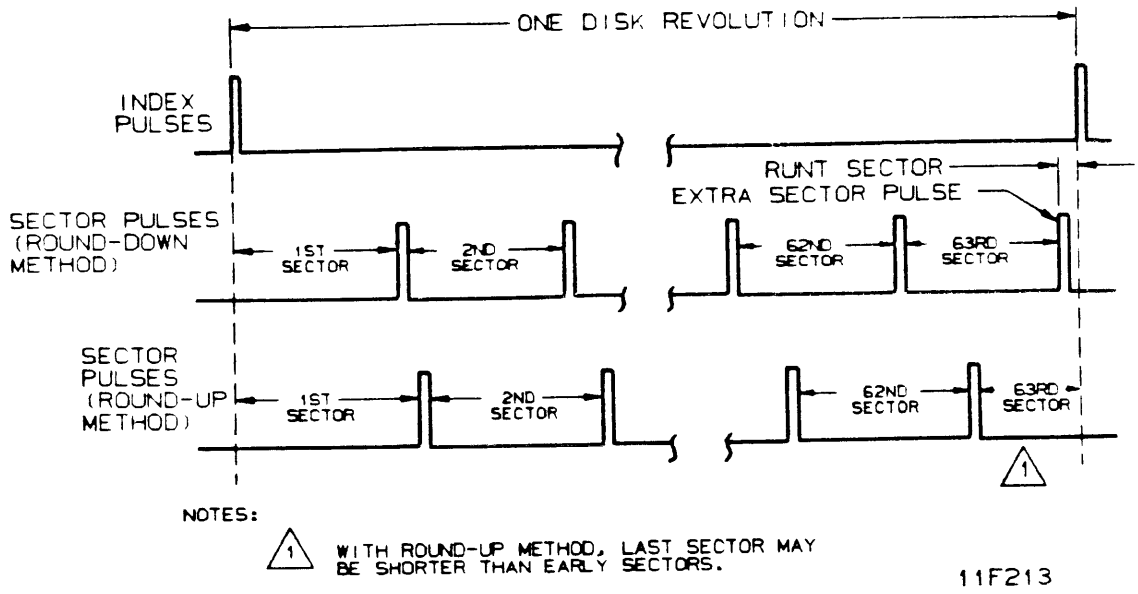


Figure B-1. Round-up and Round-down Methods

Here are examples of programming the sector counter to select 63 sectors on a 515 MB drive, using the 0.8 MHz Sector Clock and the round-down method. Example 1 applies to drives with newer control boards, and example 2 applies to drives with older control boards.

Example 1

1. Selected Clock Pulses $= (\frac{13\ 440}{63} - 1) = (213.33 - 1)$

   $= 212.33$

2. For the round-down method, this result becomes 212. (For the round-up method, it would be 213.)

3. Convert 212 from decimal to hexadecimal:

   $212_{10} = 0D4_{16}$

4. Use Diagnostic Test 18 to enter a sector length of 0D4. This produces 63 sectors. Since a remainder existed in the formula and was rounded down, an additional sector pulse will appear just before index.

For future reference, you may want to record how you programmed the sector counter. Use the following worksheet:

Number of Sectors: _____

Entry Used With Diagnostic Test 18: _____

Sector Clock Frequency Used:
___ 0.8 MHz ___ 1.6 MHz

Sector Length: _____ bytes

Example 2

1. Selected Clock Pulses = $(\frac{13\ 440}{63} - 1) = (213.33 - 1)$
   $= 212.33$

2. For the round-down method, this result becomes 212. (For the round-up method, it would be 213.)

3. Determine which switches to place in the Closed or On position as follows:

Selected clock pulses	212
Clock pulses selected by switch F563-2	-128
(Difference)	84
Clock pulses selected by switch F563-1	-64
(Difference)	20
Clock pulses selected by switch F556-5	-16
(Difference)	4
Clock pulses selected by switch F556-3	-4
(Difference)	0

Thus, placing switches F556-3, F556-5, F563-1, and F563-2 in the Closed or On position selects 63 sectors. Since a remainder existed in the formula and was rounded down, an additional sector pulse will appear just before index.

For future reference, you may want to record the switch settings you made. Use the following worksheet:

Number of Sectors: _____

Switch Settings:
Switch F556: 1 __ 2 __ 3 __ 4 __ 5 __ 6 __
Switch F563: 1 __ 2 __ 3 __ 4 __ 5 __ 6 __

Sector Length: _____ bytes

HOW TO SET DESIRED SECTOR LENGTHS

This topic describes the process used for programming the sector counter to achieve a desired sector length. It also provides examples of the calculation.

With this method, there is no attempt to divide the disk rotation into nearly equal segments. Instead, the method starts with a known sector length (data field plus overhead, expressed in bytes). The process makes use of numbers given in table B-1. Here are the steps required:

1. Calculate the number of selected clock pulses per sector. Use the following formula:

$$\text{Selected Clock Pulses} = \frac{\text{Sector Length in Bytes}}{\text{Bytes per Sector Clock Pulse}} - 1$$

2. If the result in step 1 is not an integer, round it up. (The number 313.6, for example, would be rounded up to 314.)

3. For drives with newer control boards, convert the result of step 2 from a decimal to a hexadecimal number. Use Diagnostic Test 18 to enter 3 hex characters.

4. For drives with older control boards, express the result of step 2 as a sum of individual sector switch values (see page B-2). When a switch value appears in the sum, that switch must be placed in the Closed or On position.

Here are examples of programming the sector counter to select 572-byte sectors (512-byte data field plus 60 bytes of overhead) on a 515 MB drive, using the 0.8 MHz Sector Clock. Example 3 applies to drives with newer control boards, and example 4 applies to drives with older control boards.

Example 3

1. Selected Clock Pulses = $(\frac{572}{2.25} - 1) = (254.2 - 1) = 253.2$

2. Because this is not an integer, round it up to 254.

3. Convert 254 from decimal to hexadecimal:

   $254_{10} = OFE_{16}$

4. Use Diagnostic Test 18 to enter a sector length of OFE. This produces the needed sector length. Because it was necessary to round up in the calculation, the actual sector length is 573.75 bytes (see the next topic).

For future reference, you may want to record how you programmed the sector counter. Use the following worksheet:

Sector Length: _____ bytes

Entry Used With Diagnostic Test 18: _____

Sector Clock Frequency Used:
___ 0.8 MHz ___ 1.6 MHz

Example 4

1. Selected Clock Pulses = $(\frac{572}{2.25} - 1) = (254.2 - 1) = 253.2$

2. Because this is not an integer, round it up to 254.

3. Determine which switches to place in the Closed or On position as follows:

Selected clock pulses	254
Clock pulses selected by switch F563-2	-128
(Difference)	126
Clock pulses selected by switch F563-1	- 64
(Difference)	62
Clock pulses selected by switch F556-6	-32
(Difference)	30
Clock pulses selected by switch F556-5	-16
(Difference)	14
Clock pulses selected by switch F556-4	-8
(Difference)	6
Clock pulses selected by switch F556-3	-4
(Difference)	2
Clock pulses selected by switch F556-2	-2
(Difference)	0

Thus, placing switches F556-2, F556-3, F556-4, F556-5, F556-6, F563-1, and F563-2 in the Closed or On position selects the needed sector length. Because it was necessary to round up in the calculation, the actual sector length is 573.75 bytes (see the next topic).

For future reference, you may want to record the switch settings you made. Use the following worksheet:

Sector Length: _____ bytes

Switch Settings:
Switch F556: 1 __ 2 __ 3 __ 4 __ 5 __ 6 __
Switch F563: 1 __ 2 __ 3 __ 4 __ 5 __ 6 __

HOW TO CALCULATE SECTOR LENGTHS

There are two methods for calculating sector lengths. For drives with newer control boards, you use a number from the maintenance panel to calculate the number of bytes per sector. For drives with older control boards, you use the actual sector switch settings as a starting point. These methods work regardless of how the sector counter was programmed. For each method, this topic describes the process involved and provides an example of how to do the calculation.

METHOD USED WITH NEWER CONTROL BOARDS

1. Run Diagnostic Test 1F (described in appendix A), and note the following hex characters:

   - To the left of pointer 0 -- most significant hex character
   - To the left of pointer 1 -- next hex character
   - To the left of pointer 2 -- least significant hex character
   - To the left of pointer C -- If the control board has no Sector Clock jumper, 8 indicates that the 1.6 MHz sector clock is selected. 0 indicates 0.8 MHz is selected.

   The remaining information available through Test 1F is not needed with this procedure.

2. Take the 3-character hex number noted in step 1, and convert it to a decimal number. If you used the calculation formula in the previous topic to program a given sector length, take note. The decimal number in this step is the same number derived in step 2 of the previous topic.

3. Add 1 to the result in step 2 to obtain the length of a sector expressed in sector clock pulses.

4. If the control board has a Sector Clock jumper, note the position of the jumper (0.8/1.6).

5. Multiply the result in step 3 by the number of bytes per sector clock pulse to obtain the number of bytes per sector.

Here is an example of determining the sector length for a 515 MB drive with no Sector Clock jumper:

1. By running Diagnostic Test 1F, you note the following hex characters:
   - To the left of pointer 0 -- character 0
   - To the left of pointer 1 -- character C
   - To the left of pointer 2 -- character 3
   - To the left of pointer C -- character 0
2. Convert 0C3 from hex to decimal:

   $0C3_{16} = 195_{10}$
3. By adding 1, you get 195 + 1 = 196.
4. Note from step 1 (pointer C) that the Sector Clock is 0.8 MHz.
5. Multiply the result in step 3 by the number of bytes per sector clock pulse (2.25) to find the number of bytes per sector: 196 X 2.25 = 441 bytes.

You may be wondering at this point how long the last sector is. You have found that each of the early sectors is 441 bytes long. Refer to table B-1 to find the number of bytes per track (30 240 for this drive).

To find the number of full-length sectors, divide 30 240 by 441. It is 68 with a remainder of 252. Thus, there are 68 sectors, each 441 bytes long, followed by a runt sector of 252 bytes.

METHOD USED WITH OLDER CONTROL BOARDS

1. Examine the sector switches and note which ones are in the Closed or On position.
2. For each sector switch noted in step 1, write down its decimal value given on page B-2.
3. Add the numbers accumulated in step 2. If you used the calculation formula in the previous topic to obtain the sector switch settings, take note. The sum in this step is the same number derived in step 2 of the previous topic.

4. Add 1 to the result in step 3 to obtain the length of a sector expressed in sector clock pulses.

5. Multiply the result in step 4 by the number of bytes per sector clock pulse to obtain the number of bytes per sector.

Here is an example of determining the sector length for a 515 MB drive:

1. You observe that the following switches are in the Closed (On) position: F556-1, F556-2, F563-1, and F563-2.

2. The Closed sector switches have the following values:

F556-1	1
F556-2	2
F563-1	64
F563-2	128

3. These numbers total 1 + 2 + 64 + 128 = 195.

4. By adding 1, you get 195 + 1 = 196.

5. Multiply this number by the number of bytes per sector clock pulse (2.25) to find the number of bytes per sector: 196 X 2.25 = 441 bytes.

You may be wondering at this point how long the last sector is. You have found that each of the early sectors is 441 bytes long. Refer to table B-1 to find the number of bytes per track (30 240 for this drive).

To find the number of full-length sectors, divide 30 240 by 441. It is 68 with a remainder of 252. Thus, there are 68 sectors, each 441 bytes long, followed by a runt sector of 252 bytes.

ANHANG C

INSTALLATIONS- UND BETRIEBSERFORDERNISSE

INSTALLATIONS- UND BETRIEBSERFORDERNISSE C

EINLEITUNG

Dieser Anhang enthält Informationen für gefahrlose(n) Anschluß, Betrieb und Wartung des Laufwerks.

SICHERHEITSHINWEISE

- Um die Zuverlässigkeit der im Laufwerk eingebauten Sicherheitseinrichtungen zu gewährleisten, darf die Installation und Wartung des Gerätes nur von qualifiziertem Wartungspersonal unter Verwendung von Original-Imprimis-Ersatzteilen durchgeführt werden.

- Beim Ausbrechen von Feuer oder in anderen Notfällen ist die Verbindung zum Hauptstromnetz durch das Ziehen des Netzsteckers aus der Steckdose zu unterbrechen. Sollte dies nicht möglich oder unpraktisch sein, so ist der Hauptstromunterbrecher des Systems zu bedienen, um die Laufwerke vom Hauptstromnetz zu trennen.

- Wenn das Laufwerk in einem Geräteeinschub oder Gehäuse montiert ist, versichern Sie sich, daß die Temperatur im Einschub oder Gehäuse die in diesem Handbuch festgelegten Werte nicht überschreitet. Sind Geräte übereinander angeordnet, achten Sie besonders auf das obere Gerät, da dort die Temperatur gewöhnlich am höchsten ist.

- Das Gerät ist konstruiert zum Anschluß und Betrieb in Übereinstimmung mit IEC380, IEC435, VDE805 und VDE806.

- Wird das Laufwerk mit einem empfohlenen Imprimis-Netzgerät betrieben im Anschluß an ein Netz, das keine direkte Erdung hat (IT-Netz), ist die Eingangsspannung des Netzgeräts wie folgt zu begrenzen:

  - Bei Netzgeräten mit den Nummern 81542300 bis 81542302 oder 72896500 bis 72896503 auf 230V Wechselspannung.

  - Bei anderen empfohlenen Imprimis-Netzgeräten auf 240V Wechselspannung.

- Falls kein empfohlenes Imprimis Netzgerät verwendet wird, stellen Sie bitte sicher, daß das Netzgerät den Spezifikationen in diesem Manual entspricht und konstruiert ist für den Betrieb entsprechend IEC380, IEC435, VDE805 und VDE806.

ANSCHLUSS-ERFORDERNISSE

Der Installationsort muß dem in den folgenden Tabellen und Skizzen dargelegten Vorschriften entsprechen:

TABELLE C-1. UMGEBUNGSBEDINGUNGEN

TEMPERATUR	BEREICH	MAX. ÄNDERUNGSWERT
im Stillstand (unverpackt)	-10 bis 50°C	15°C / h
Lagerung/Transit (verpackt)	-40 bis 60°C	20°C / h
in Betrieb		
340 MB Geräte	10 bis 45°C	10°C / h
300/515 MB Geräte	10 bis 40°C	10°C / h
RELATIVE FEUCHTE		
im Stillstand (unverpackt)	10% bis 90% (keine Kondensation erlaubt)	
Lagerung/Transit (verpackt)	5% bis 95% (keine Kondensation erlaubt)	
in Betrieb	20% bis 80% mit 10% Änderung pro Stunde (keine Kondensation erlaubt)	
ATMOSPHÄRENDRUCK	-300 m bis 3000 m oder 105 kPa bis 69 kPa	

TABELLE C-2. ERFORDERNISSE FÜR EL. ANSCHLUSS

SPEZIFIKATION	WERTE	
	100/120 V GERÄT	208/240 V GERÄT
Spannungsbereich	85 bis 132 V	175 bis 264 V
Nominale Netz-Frequenz	50/60 Hz	50/60 Hz
Frequenzbereich	48,0 bis 62,0 Hz	48,0 bis 62,0 Hz
Phase	einphasig	einphasig
Leistungsbedarf*		
integriertes Netzgerät	0,225 kW	0,230 kW
separates Netzgerät	0,260 kW	0,252 kW
Stromaufnahme*		
integriertes Netzgerät	3,95 A	2,25 A
separates Netzgerät	3,40 A	2,10 A
Phasenwinkel *Cos phi		
integriertes Netzgerät	0,570	0,490
separates Netzgerät	0,712	0,659
Anlaufstrom	siehe Abbildung C-1	siehe Abbildung C-1

* gemessen bei rotierendem Plattenstapel und Kopfschlitten in Bewegung.

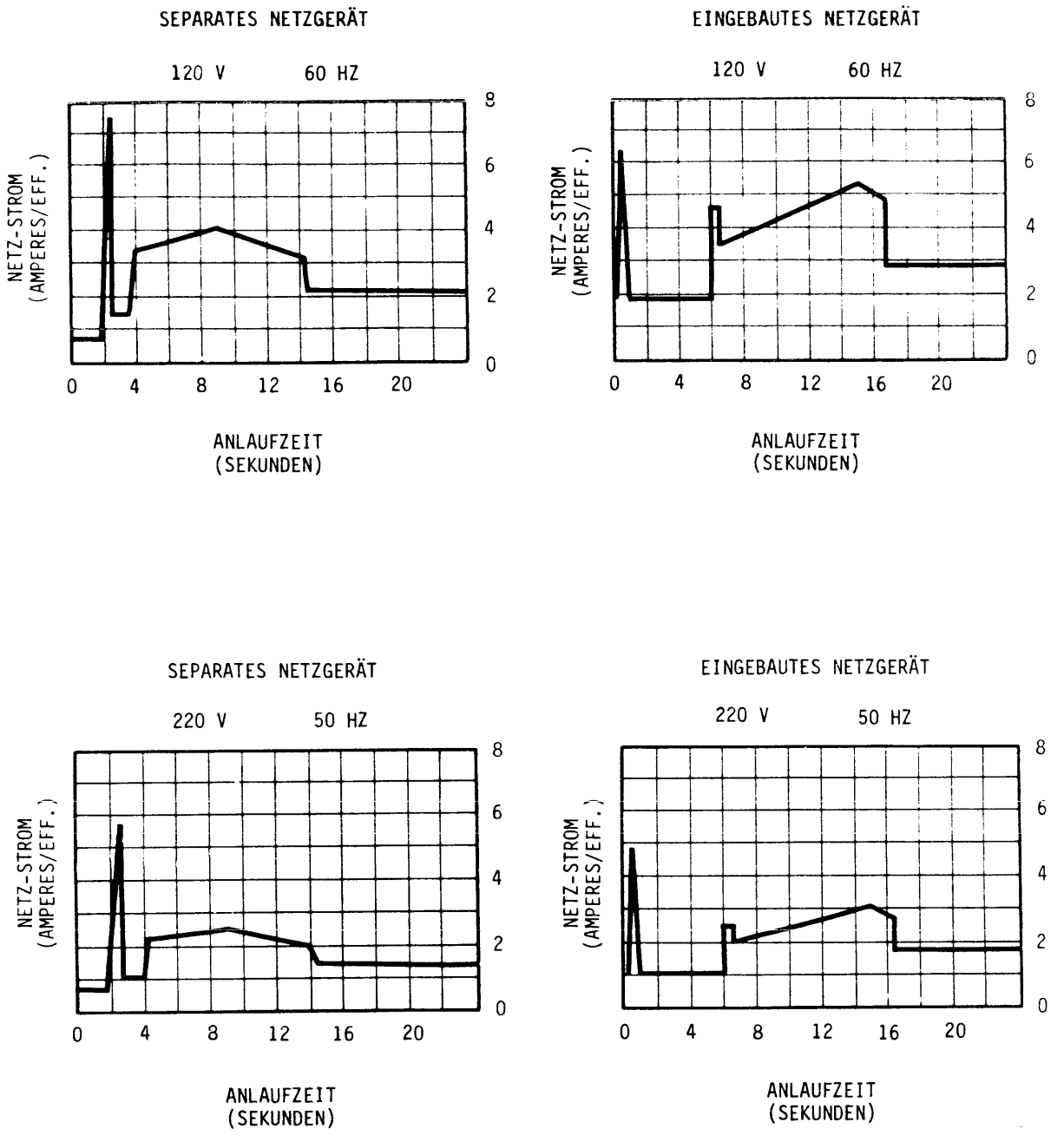
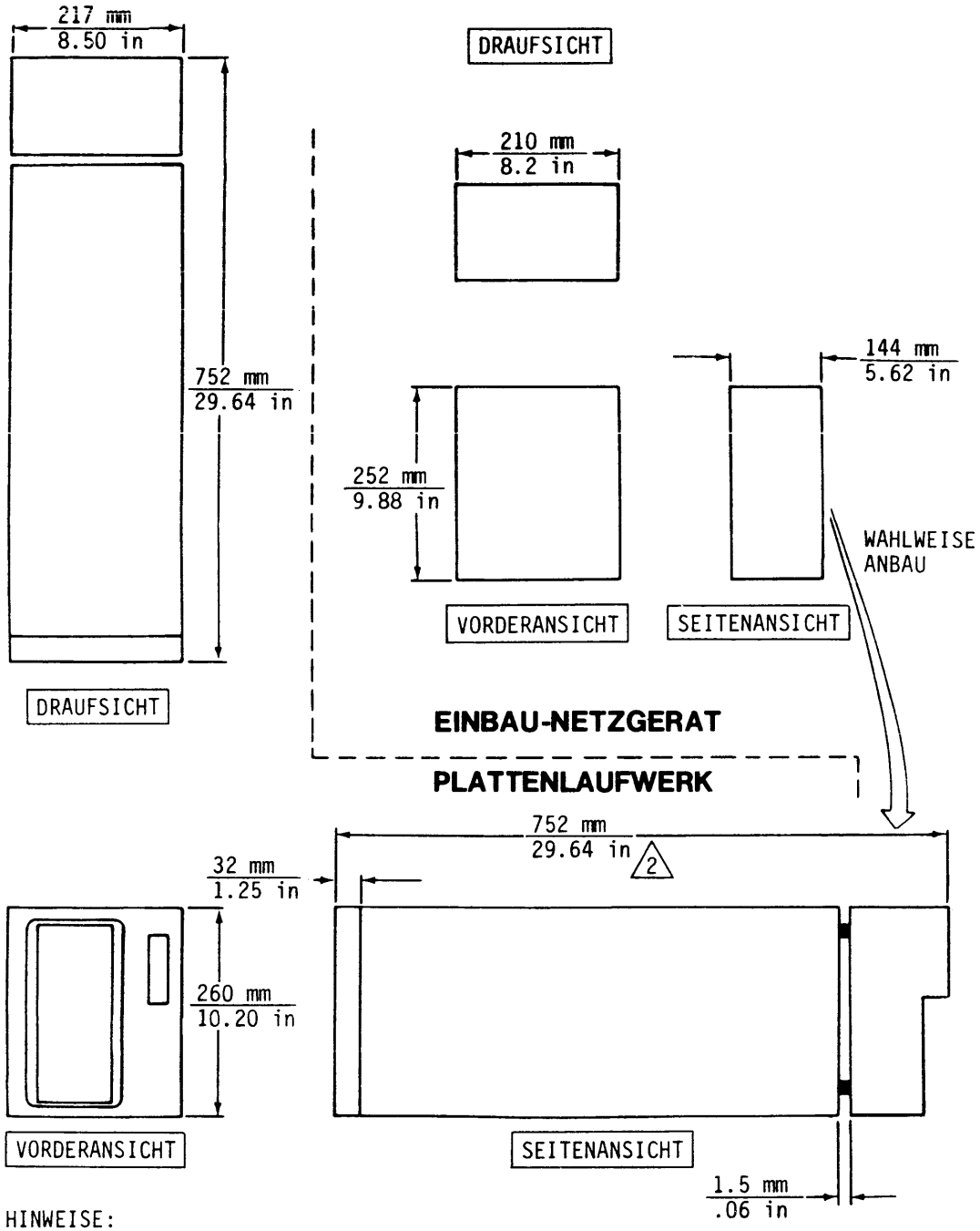


Abbildung C-1. Typischer Anlaufstrom im Verhältnis zur Zeit

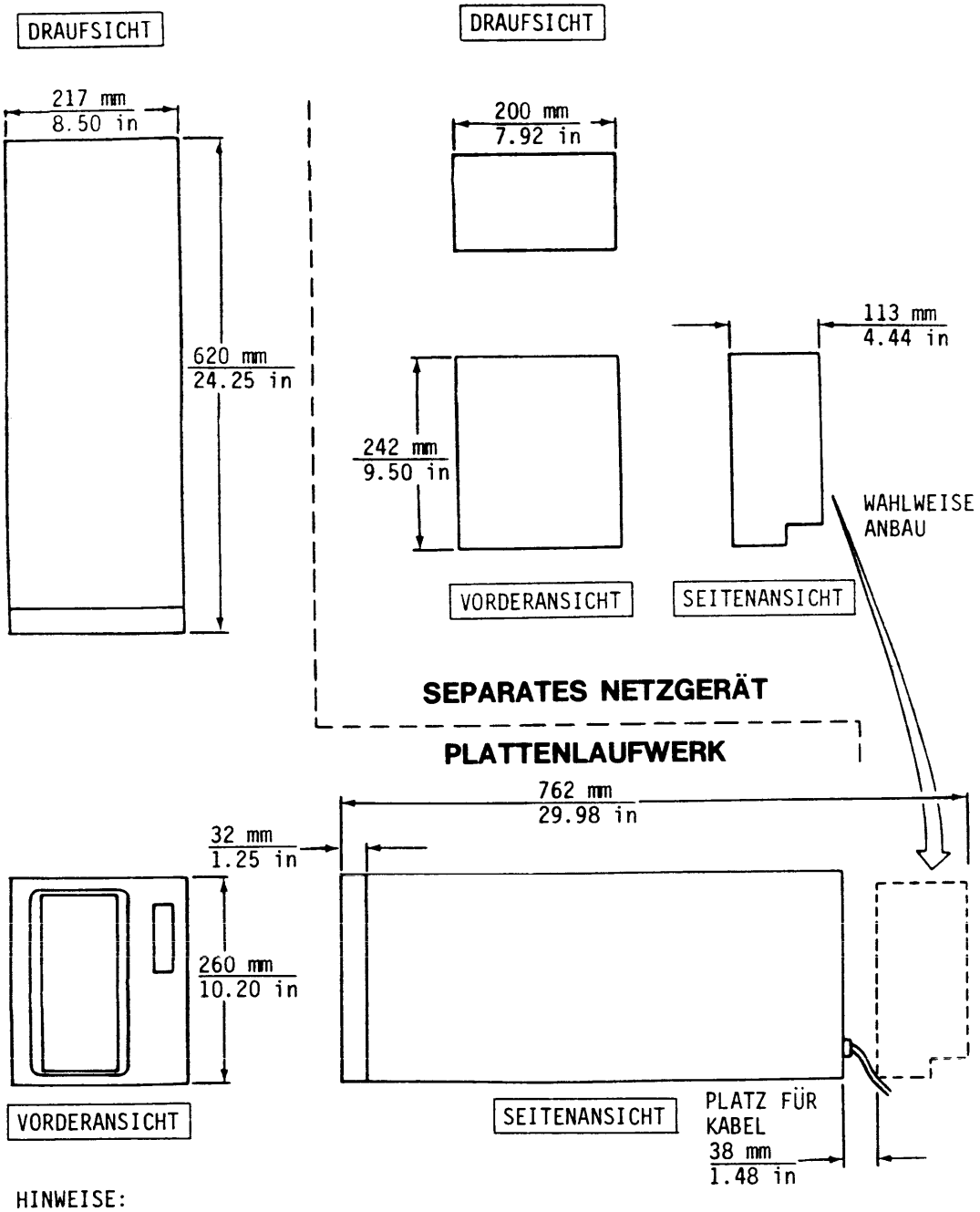


HINWEISE:

1. GEWICHT = 37.1 kg (82 lb)
2. BEI ÄLTEREN NETZGERÄTEN SIND 25 mm ZUGEGEBEN FÜR NETZKABEL.
3. DIE ANGEGENEN ABMESSUNGEN SIND NOMINAL-WERTE.

12J23

Abbildung C-2. Abmessungen und Gewicht des Laufwerks (1)



HINWEISE:

1. GEWICHT
   GERÄT ALLEINE = 31.7 kg (70.0 lb)
   NETZGERÄT ALLEINE = 5.4 kg (12.0 lb)

2. DIE ANGEGEBENEN NETZGERÄTEN SIND NOMINAL-WERTE.

I2J24

Abbildung C-3. Abmessungen und Gewicht des Laufwerks (2)

BETRIEBSANLEITUNG

EINSCHALTSEQUENZ

1. Am Netzgerät Schalter ON/STANDBY (CB1 an einigen Geräten) auf ON stellen.

2. START-Schalter drücken und in START-Position rasten.

   - Wurde während des Installationsvorgangs der Schalter LOCAL/REMOTE an der I/O-Karte auf "LOCAL" gestellt, beginnt die Einschaltsequenz unmittelbar.

   - Wurde der LOCAL/REMOTE-Schalter dagegen in die "REMOTE"-Position gesetzt, ist die Einschaltsequenz verzögert, bis das Laufwerk das entsprechende Signal vom Kontroller erhält.

3. Die Bereitschaftsanzeige (im START-Schalter integrierte Blinklampe) blinkt, solange die Startsequenz abläuft.

4. Beobachten Sie, daß Bereitschaftsanzeige innerhalb von 45 sec auf Dauerlicht wechselt, nachdem das Laufwerk Nenndrehzahl erreicht hat und die Magnetköpfe eingefahren sind.

5. Die FAULT-Anzeige muß unbeleuchtet sein, zum Zeichen, daß kein Fehler auftrat und das Gerät zum Lesen oder Schreiben von Daten bereit ist.

AUSSCHALTSEQUENZ

1. START-Schalter drücken, um aus der START-Position auszurasten. Wurde während des Installationsvorgangs der LOCAL/REMOTE-Schalter an der I/O-Karte auf "REMOTE" eingestellt, kann der Kontroller das Laufwerk veranlassen, die Ausschaltsequenz zu starten (Drücken der START-Taste nicht erforderlich).

2. Die Bereitschaftsanzeige blinkt (im START-Schalter integrierte Blinklampe), solange die Ausschaltsequenz abläuft.

3. Beobachten Sie, daß die Bereitschaftsanzeige innerhalb von 45 sec verlöscht, zum Zeichen, daß die Ausschaltsequenz abgeschlossen ist. Die Magnetköpfe sind jetzt in der Landezone positioniert und der Plattenstapel rotiert nicht mehr.

4. Gleichstromverbindung vom Laufwerk abtrennen durch:

   - Schalter ON/STANDBY auf STANDBY stellen, falls das Netzgerät einen solchen hat.

   - CB1 auf OFF schalten, soweit das Netzgerät CB1 hat.

APPENDICE D

INSTRUCTIONS D'INSTALLATION ET DE FONCTIONNEMENT

INSTRUCTIONS D'INSTALLATION ET DE FONCTIONNEMENT D

INTRODUCTION

Cet appendice contient les informations sécuritaires indispensables pour l'installation, le fonctionnement et la maintenance de l'appareil.

INFORMATION DE SECURITE

- Afin d'assurer l'intégralité des conditions sécuritaires installées dans l'appareil, l'installation et la maintenance doivent être accomplies exclusivement par un personnel qualifié utilisant des pièces recommandées Imprimis.

- En cas d'incendie ou autres états d'urgence, isolez l'appareil de la source de courant en retirant la fiche secteur de la prise de courant. Pour les situations ou il n'est pas possible ou praticable de retirer la fiche, utilisez la déconnection générale du système pour isoler les appareils de la source de courant.

- Si l'appareil est monté en rack ou en armoire, assurez-vous que la température interne du rack ou de l'armoire ne dépasse pas les limites définies pour l'appareil. Lorsque les appareils sont empilés verticalment, portez votre attention sur la partie supérieure du rack ou de l'armoire où les températures sont généralement plus élevées.

- Cet appareil est concu pour être installé et de fonctionner en accordance avec IEC380, IEC435, VDE805 et VDE806.

- Si l'appareil utilise une alimentation recommandée Imprimis et est branché à réseau sans prise de terre directe (réseaux IT), limitez la tension d'entrée de l'alimentation comme suit:

  - Pour les alimentations depuis le numéro 81542300 jusqu'au numéro 81542302, ou du numéro 72896500 jusqu'au numéro 72896503, limitez la tension alternative à 230V.

  - Pour les autres alimentations recommendées Imprimis, limitez la tension alternative à 240V.

- Si vous n'utilisez pas une alimentation recommandée Imprimis, assurez vous que l'alimentation soit conforme aux spécifications de ce manuel et qu'elle soit concue pour être utilisée en accordance avec IEC380, IEC435, VDE805 et VDE806.

CONDITIONS D'INSTALLATION

Le lieu d'installation doit être conforme aux spécifications données dans les tableaux et figures suivants.

TABLEAU D-1. CONDITIONS DE L'ENVIRONNEMENT

TEMPERATURE	MARGE	FLUCTUATION MAXIMALE
Hors service (Déballée)	-10 à 50°C	15°C par heure
Stockage/Transport (Emballée)	-40 à 60°C	20°C par heure
En service		
Unités de 340 MB	+10 à 45°C	10°C par heure
Unités de 300/515 MB	+10 à 40°C	10°C par heure
HUMIDITE RELATIVE		
Hors service (Déballeé)	10% à 90% (pas de condensation autorisée)	
Stockage/Transport (Emballée)	5% à 95% (pas de condensation autorisée)	
En service	20% à 80% avec une fluctuation de 10% par heure (pas de condensation autorisée)	
PRESSION BAROMETRIQUE	-300 m à 3000 m ou 104 kPa à 69 kPa	

TABLEAU D-2. EXIGENCES POUR L'ALIMENTATION

SPECIFICATIONS	VALEURS	
	Appareils de 100/120 V	Appareils de 208/240 V
Marge de tension	85 à 132 V	175 à 264 V
Fréquence nominale du réseau	50/60 Hz	50/60 Hz
Marge de fréquence	48.0 à 62.0 Hz	48.0 à 62.0 Hz
Phase éxigée	Monophasé	Monophasé
Puissance consomée*		
Alimentation intégrée	0.225 kW	0.230 kW
Alimentation séparée	0.260 kW	0.252 kW
Courant au réseau*		
Alimentation intégrée	3.95 A	2.25 A
Alimentation séparée	3.40 A	2.10 A
Cosinus Phi*		
Alimentation intégrée	0.570	0.490
Alimentation séparée	0.712	0.659
Courant de mise en route	voir figure D-1	voir figure D-1

* Mesuré lorsque les disques sont en rotation et que le chariot soit en mouvement.

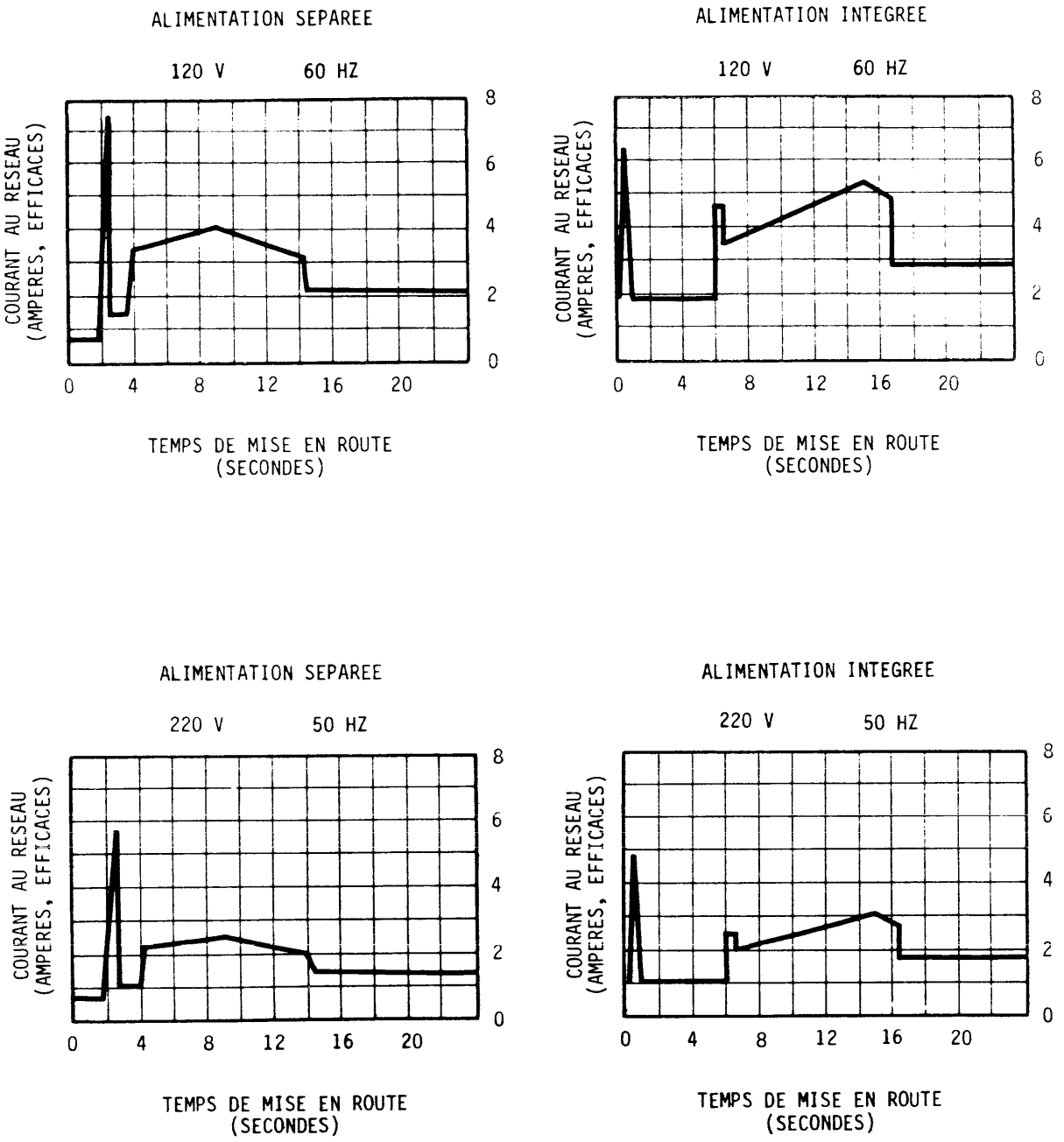
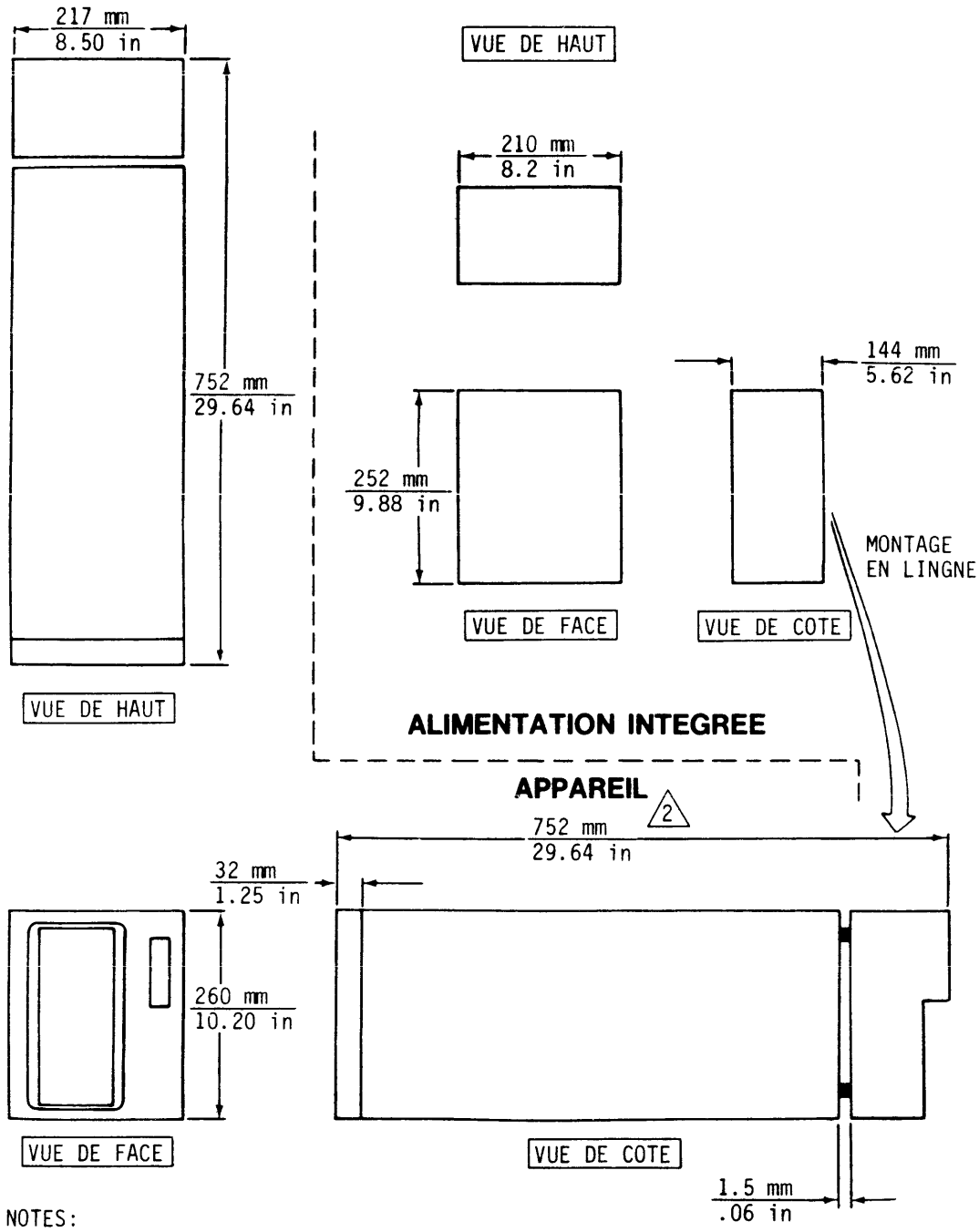


Figure D-1. Courant typique par rapport au temps de mise en route

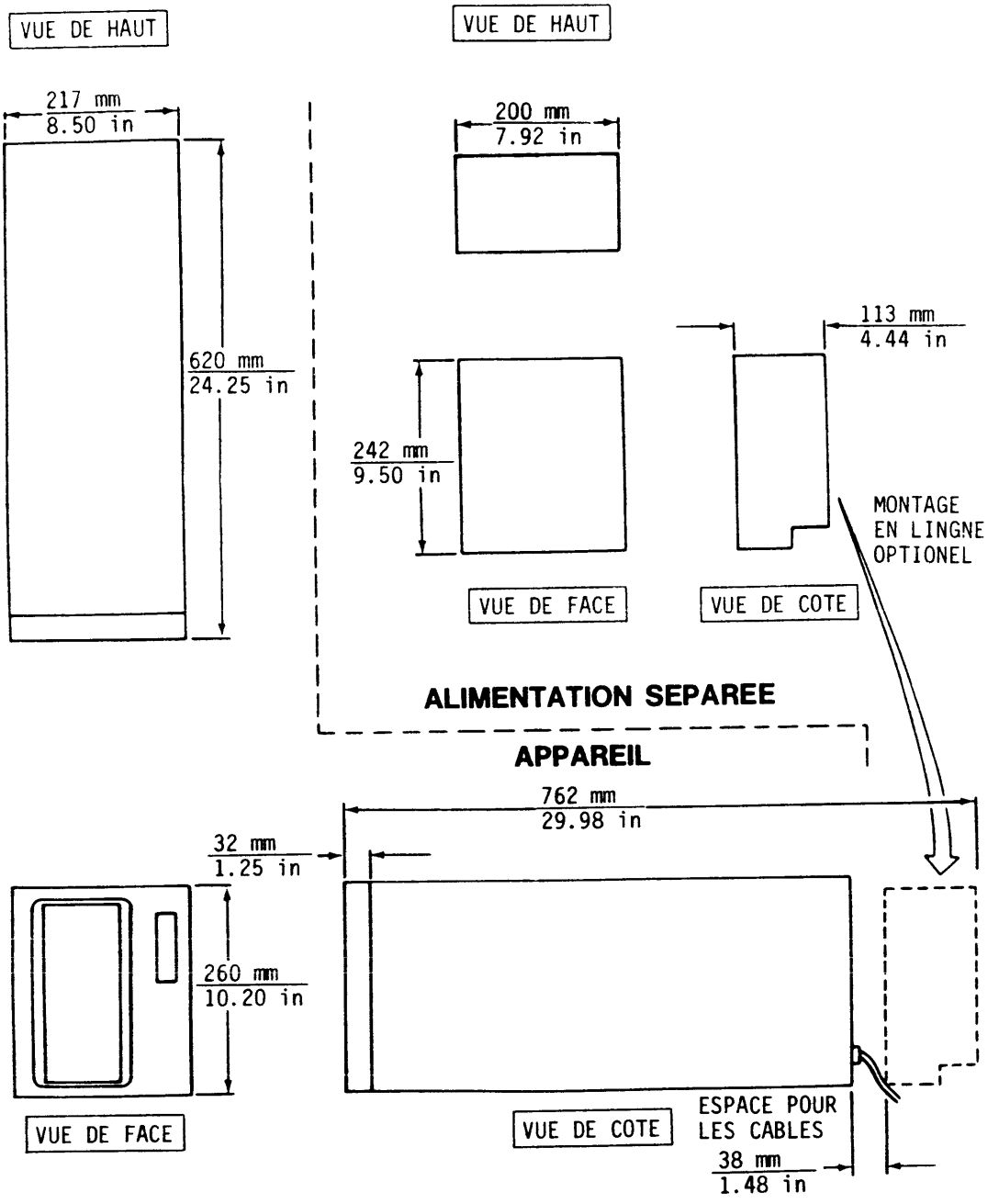


NOTES:

1. MASSE = 37.1 kg (82 lb)
2. ADDITIONNEZ 25 mm (1 INCH) POUR LE CABLE SECTEUR DES ANCIENNES ALIMENTATIONS.
3. LES DIMENSIONS DONNEES SONT NOMINALES.

12J26

Figure D-2. Dimensions et poids des appareils (1)



NOTES:

1. MASSE
   APPAREIL SEUL = 31.7 kg (70.0 lb)
   ALIMENTAIRE SEULE = 5.4 kg (12.0 lb)

2. LES DIMENSIONS DONNEES SONT NOMINALES.

12J27

Figure D-3. Dimensions et poids des appareils (2)

INSTRUCTIONS DE FONCTIONNEMENT

PROCEDURE DE MISE EN ROUTE

1. Placez l'interrupteur On/Standby de l'alimentation (CB1 sur certains appareils) sur ON.

2. Pressez l'interrupteur START afin de le bloquer en position Start.

   - Si le commutateur LOCAL/REMOTE situé sur la carte I/O à été placé sur LOCAL à l'installation, la séquence de mise en route démarre aussitôt.

   - Si le commutateur LOCAL/REMOTE à été placé sur REMOTE à l'installation, la séquence est retardée jusqu'a ce que l'appareil recoive le signal approprié du contrôleur.

3. Observez que l'indicateur READY (situé dans l'interrupteur START) clignote pour signaler que la séquence de démarrage est en progression.

4. Observez que l'indicateur READY luise continuellement dans un délai de 45 secondes pour signaler que les disques ont atteints leur vitesse nominale et que les têtes sont chargées.

5. Observez que l'indicateur FAULT soit éteint pour signaler l'absence d'erreurs et que l'appareil est prêt à lire ou écrire des données.

PROCEDURE D'ARRET

1. Pressez l'interrupteur START afin de le dégager de la position Start. Si le commutateur LOCAL/REMOTE sur la carte I/O à été placé sur REMOTE à l'installation, le contrôleur peut signaler à l'appareil de démarrer la séquence d'arrêt (Il n'est pas nécessaire de presser l'interrupteur START).

2. Observez que l'indicateur READY (situé dans l'interrupteur START) clignote pour signaler que la séquence d'arrêt est en progression.

3. Observez que l'indicateur READY s'éteigne dans un délai de 45 secondes pour signaler que l'arrêt est complet. Les têtes sont maintenant positionnées dans la zone d'atterrissage et les disques ne sont pas en rotation.

4. Retirez la tension continue de l'appareil en:

   - Placant l'interrupteur sur STANDBY si l'alimentation possàde un interrupteur On/Standby.

   - Placant CB1 vers OFF si l'alimentation possàde un interrupteur CB1.

APENDICE E

REQUISITOS DE INSTALACION Y OPERACION

REQUISITOS DE INSTALACION Y OPERACION E

INTRODUCCION

Este apéndice contiene información pertinente a la instalación, operación y mantenimiento seguro del disco.

INFORMACION DE SEGURIDAD

- Para asegurar la integridad de las características de seguridad integradas en el disco, la instalación y el mantenimiento deben ser realizadas solamente por personal de servicio cualificado utilizando solamente piezas originales de Imprimis.

- En caso de fuego u otra emergencia, aislar el disco de la fuente principal de energía, desenchufando el cable de corriente del disco de la salida de corriente alterna. En situaciones donde quitar el enchufe no es posible ni práctico, utilize el sistema de desconexión principal para aislar los discos de las fuentes de energía.

- Cuando el disco está montado en un estante de equipos o en un armario, asegúrese de que la temperatura interna del armario no sobrepase los límites definidos para el disco. Cuando las unidades están almacenadas verticalmente, preste particular atención a la parte superior donde las temperaturas son normalmente más altas.

- Este disco está diseñado para ser instalado y operado de acuerdo a las normas IEC380, IEC435, VDE805 y VDE806.

- Si el disco utiliza una fuente de alimentación recomendada por Imprimis y toma energía de un circuito que no tiene conexión directa a tierra (IT), limite la tensión de entrada a la fuente de alimentación de la forma siguiente:

  - Para fuentes de alimentación con número de referencia de 81542300 a 81542302 ó 72896500 a 72896503, limite la entrada a 230 voltios alterna.

  - Para otros números de referencia, limite la entrada a 240 voltios alterna.

- Si no utiliza una fuente de alimentación recomendada por Imprimis asegúrese que la fuente de alimentación cumple las especificaciones de este manual y está diseñada para ser usada de acuerdo con las normas IEC380, IEC435, VDE805 y VDE806.

REQUISITOS DE INSTALACION

El local de la instalación debe cumplir las especificaciones dadas en las siguientes tablas y cifras.

TABLA E-1. REQUISITOS AMBIENTALES

TEMPERATURA	RANGO	VARIACION MAXIMO
Sin operar (desempaquetada)	-10 a 50º C	15º C por hora
Almacenada (embalada)	-40 a 60º C	20º C por hora
Operando		
unidades 340 Mb	10 a 45º C	10º C por hora
unidades 300/515 Mb	10 a 40º C	10º C por hora
HUMEDAD RELATIVA		
Sin operar (desempaquetada)	10% a 90% (sin condensación)	
Almacenada (embalada)	5% a 95% (sin condensación)	
Operando	20% a 80% con 10% de variación por hora (sin condensación)	
PRESION BAROMETRICA	-300 m a 3.000 m ó 105 Kpa a 69 Kpa	

TABLA E-2. REQUISITOS DE ENERGIA

ESPECIFICACIONES	VALORES	
	Unidad de 100/120	Unidad de 208/240
Margen de tensión	85 a 132 V	175 a 264 V
Frecuencia nominal	50/60 Hz	50/60 Hz
Margen de frecuencia	48 a 62 Hz	48 a 62 Hz
Fases	Monofásico	Monofásico
Consumo de potencia*		
Fuente integrada	0,225 Kw	0,230 Kw
Fuente remota	0,260 Kw	0,252 Kw
Consumo de corriente*		
Fuente integrada	3,95 A	2,25 A
Fuente remota	3,40 A	2,10 A
Factor de potencia		
Fuente integrada	0,570	0,490
Fuente remota	0,712	0,659
Corriente de arranque	Vea la figura E-1	Vea la figura E-1

* Medidas cuando los discos están girando y el actuador moviendose.

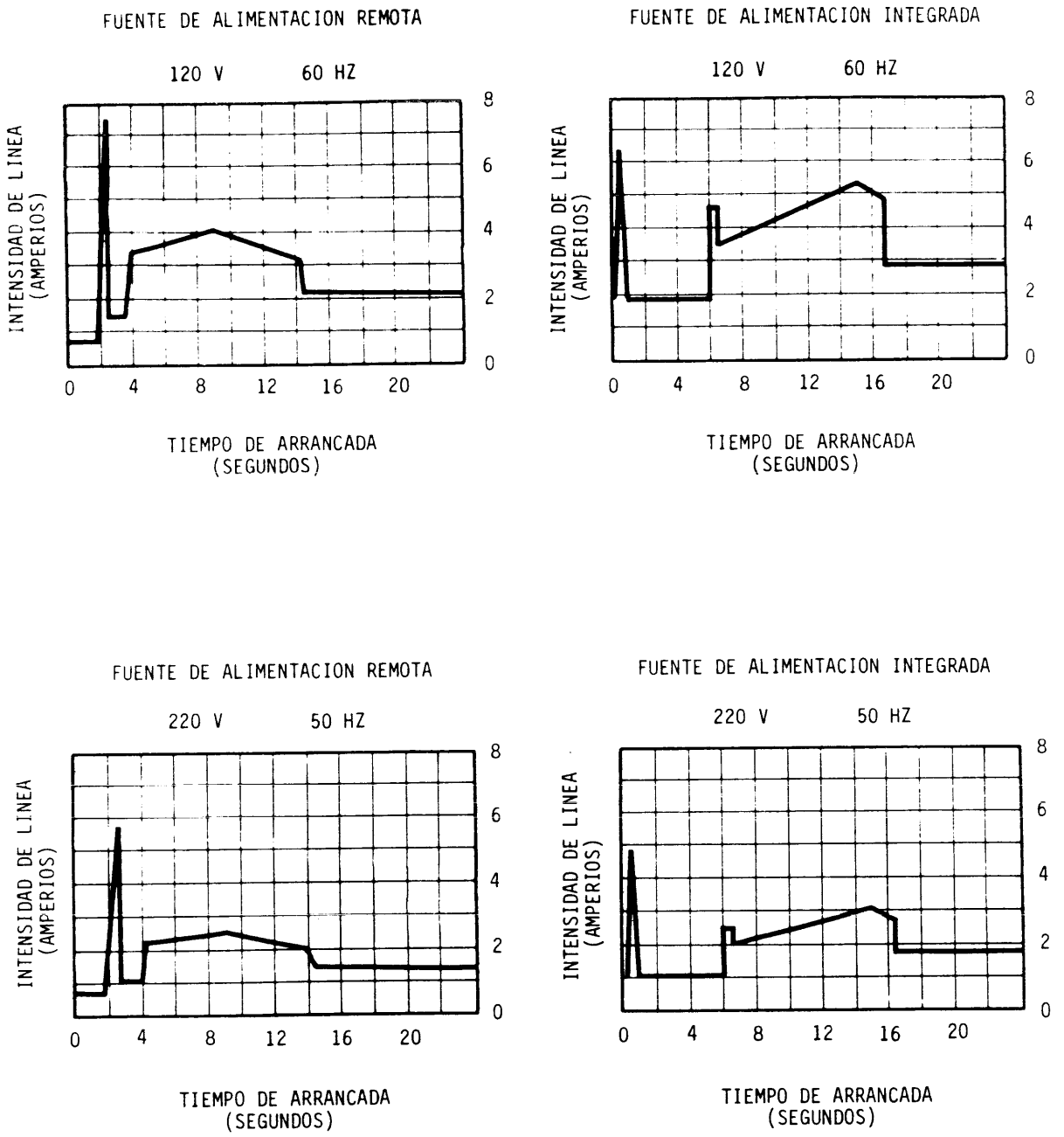
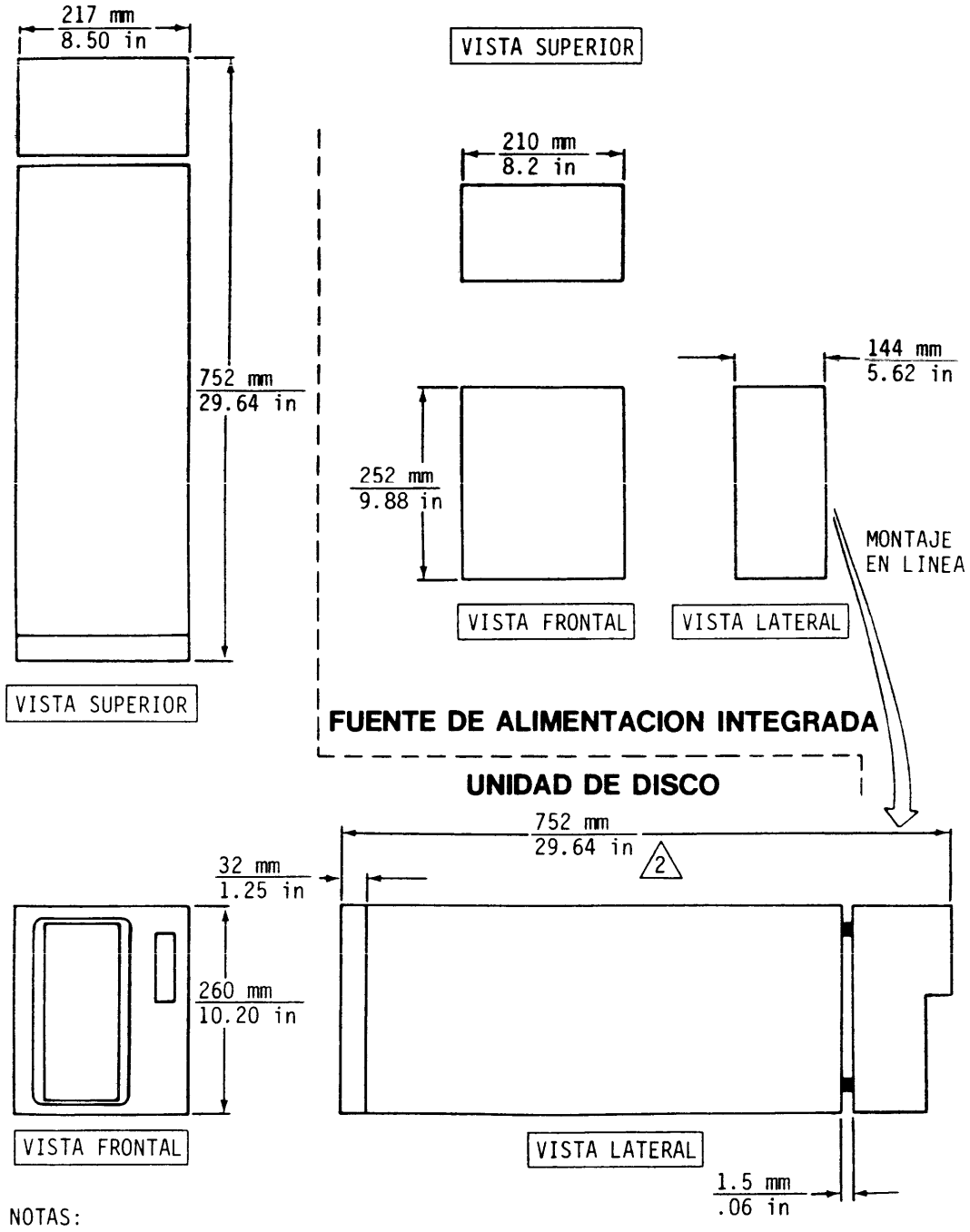


Figura E-1. Intensidad de linea y tiempos de arrancada



NOTAS:

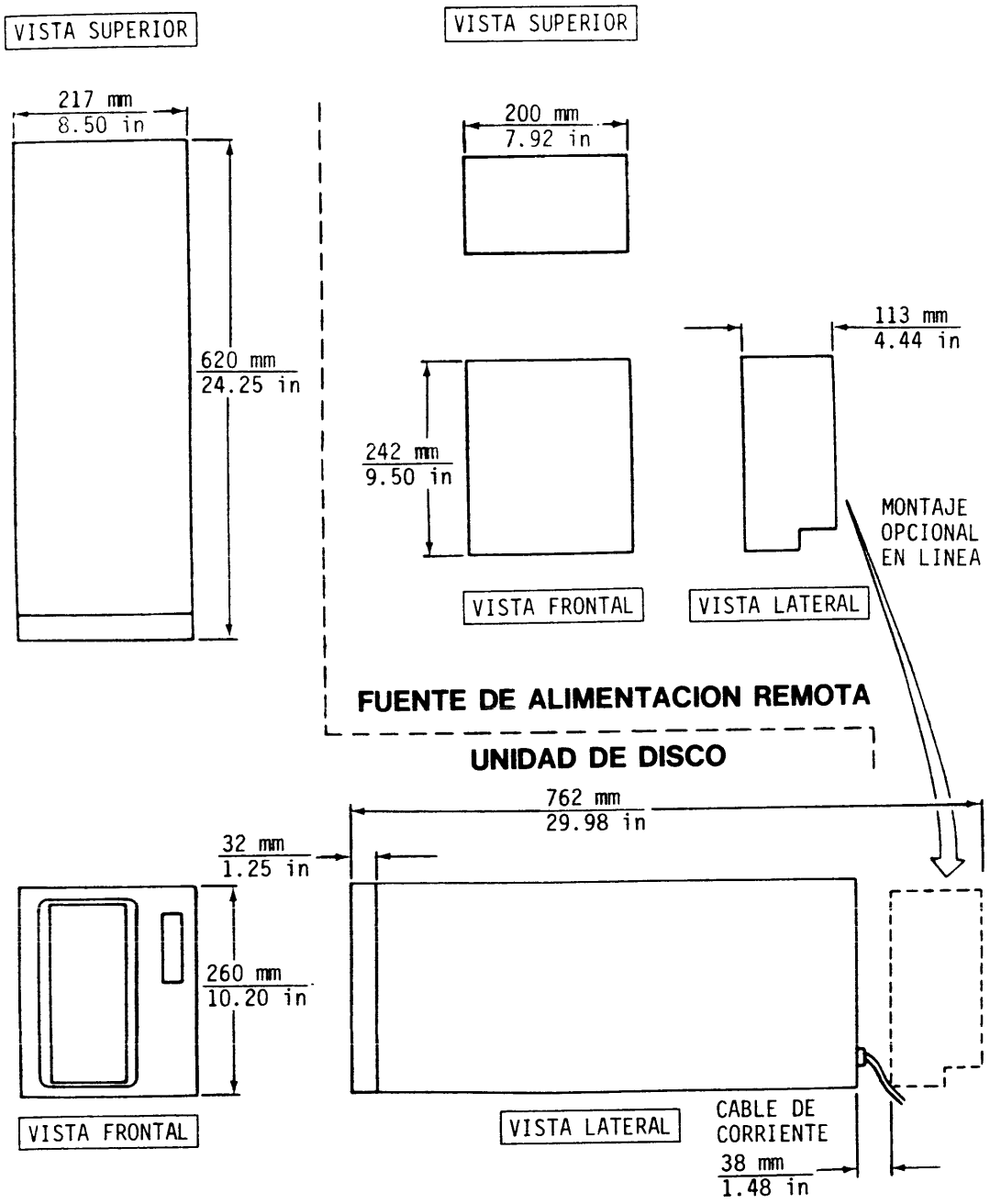
1. MASA = 37.1 kg (82 lb)

2. AÑADIR 25 mm (1 PULGADA) PARA EL CABLE DE CORRIENTE EN LAS FUENTES DE ALIMENTACION DE ESTILO ANTIGUO.

3. LAS DIMENSIONES SON NOMINALES.

12J29

Figura E-2. Dimensiones y peso de la unidad de disco (1)



NOTAS:

1. MASA
   UNIDAD DE DISCO SOLAMENTE = 31.7 kg (70.0 LIBRAS)
   FUENTE DE ALIMENTACION SOLAMENTE = 5.4 kg (120 LIBRAS)

2. LAS DIMENSIONES SON NOMINALES.

12J30

Figura E-3. Dimensiones y peso de la unidad de disco (2)

INSTRUCCIONES DE OPERACION

PROCEDIMIENTO DE ENCENDIDO

1. Fijar a "ON" el interruptor "On/Standby" de la fuente de alimentación (CB1 en algunas unidades).

2. Pulsar el interruptor "START" para engranarlo en la posición "start".

   - Si el interruptor LOCAL/REMOTE de la tarjeta de I/O ha sido puesto en LOCAL durante la instalación, la secuencia de encendido empieza inmediatamente.

   - Si el interruptor LOCAL/REMOTE ha sido puesto en REMOTE durante la instalación, la secuencia se retrasa hasta que la unidada de disco recibe la señal adecuada desde el controlador.

3 Observe que el indicador de "READY" (localizado en el interruptor de "START") parpadea indicando que la secuencia de encendido está en marcha.

4. Observe que a los 45 segundos el indicador de "READY" queda encendido fijo indicando que los discos alcanzaron la velocidad de régimen y las cabezas están cargadas.

5. Observe que el indicador de "FAULT" está apagado indicando que no ha ocurrido ningún error y los discos están dispuestos para leer ó escribir datos.

PROCEDIMIENTO DE APAGADO

1. Presione el interruptor "START" para liberarlo de la posición encendido. Si el interruptor LOCAL/REMOTE de la tarjeta de I/O ha sido puesto en REMOTE durante la instalación, el controlador puede indicar al disco que inicie la secuencia de apagado (entonces no sería necesario presionar el interruptor "START").

2. Observe que el indicador "READY" (localizado en el interruptor "START") parpadea indicando que la secuencia de apagado está en marcha.

3. Observe que a los 45 segundos el indicador de "READY" se apaga indicando que la secuencia de apagado ha finalizado. Las cabezas están ahora posicionadas en la zona de aterrizaje y los discos no están girando.

4. Retire la corriente continua del disco, según:

   - Si la fuente tiene un interruptor "On/Standby," fije este interruptor en la posición "Standby."

   - Si la fuente tiene CB1, fije CB1 en la posición "OFF."

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