8.0 PCB JUMPER OPTIONS

8.1 DRIVE ADDRESS SELECTION JUMPER

In multidrive configurations, it is necessary to configure each drive with a unique address. A maximum of seven drives is permitted per host controller. The address for the drive is determined by installing the jumper plug in the appropriate jumper location. Table 8•1, Drive Select Jumpers, shows the drive selection jumpers. As shipped from the factory, the DS1 jumper is installed. Removing the jumper entirely is equivalent to a "no select." See Figures 8•1 through 8•6, Drive Jumper Options, and Tables 8•6 through 8•11, Jumper Selections.

DRIVE SELECT NUMBER	JUMPER INSTALLED
1	DS1
2	DS2
3	DS3
4	DS4
5	DS5
6	DS6
7	DS7

Table 8•1
Drive Select Jumpers

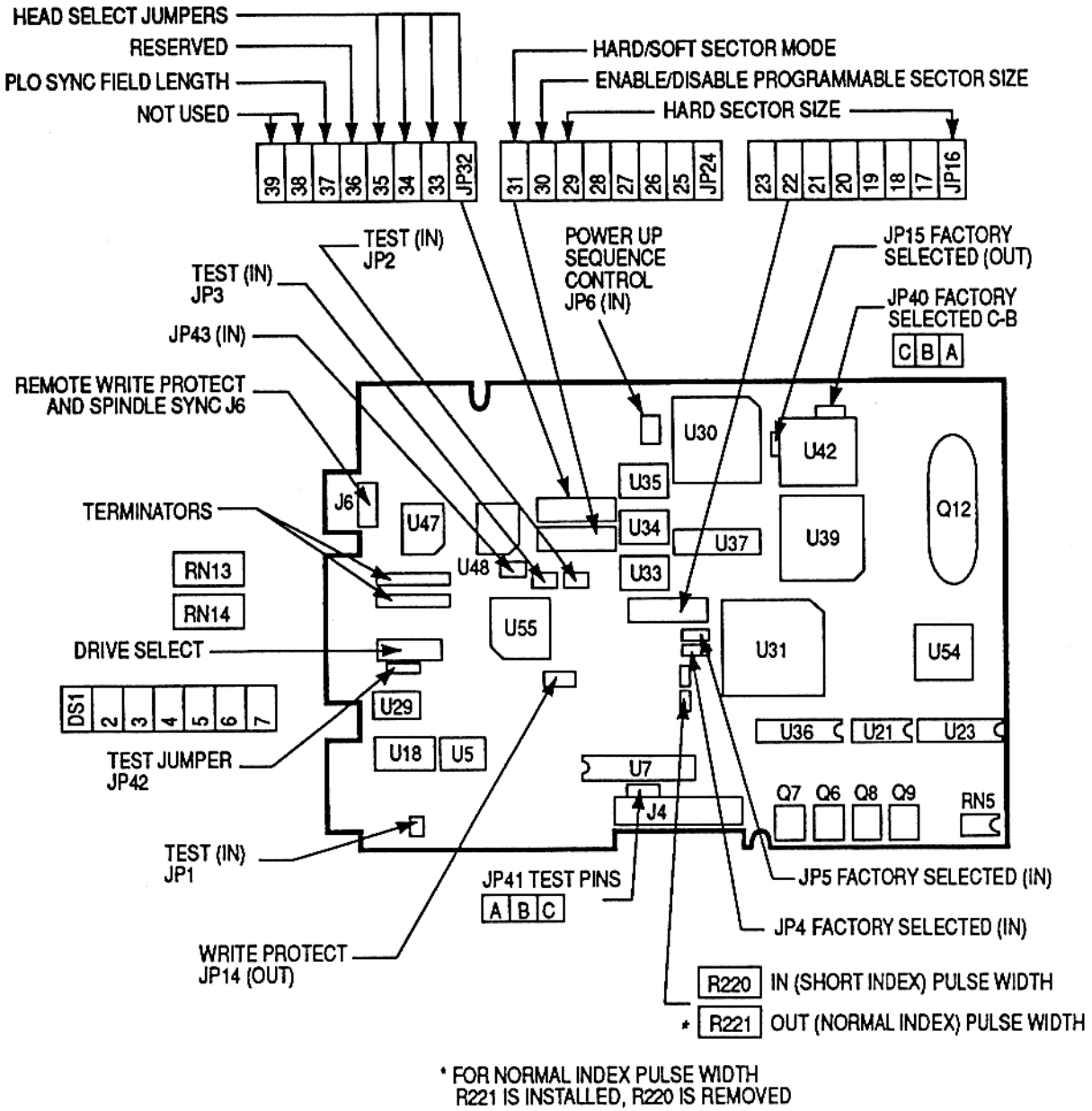


Figure 8-1
Drive Jumper Options (PCB Part Number 1014150)

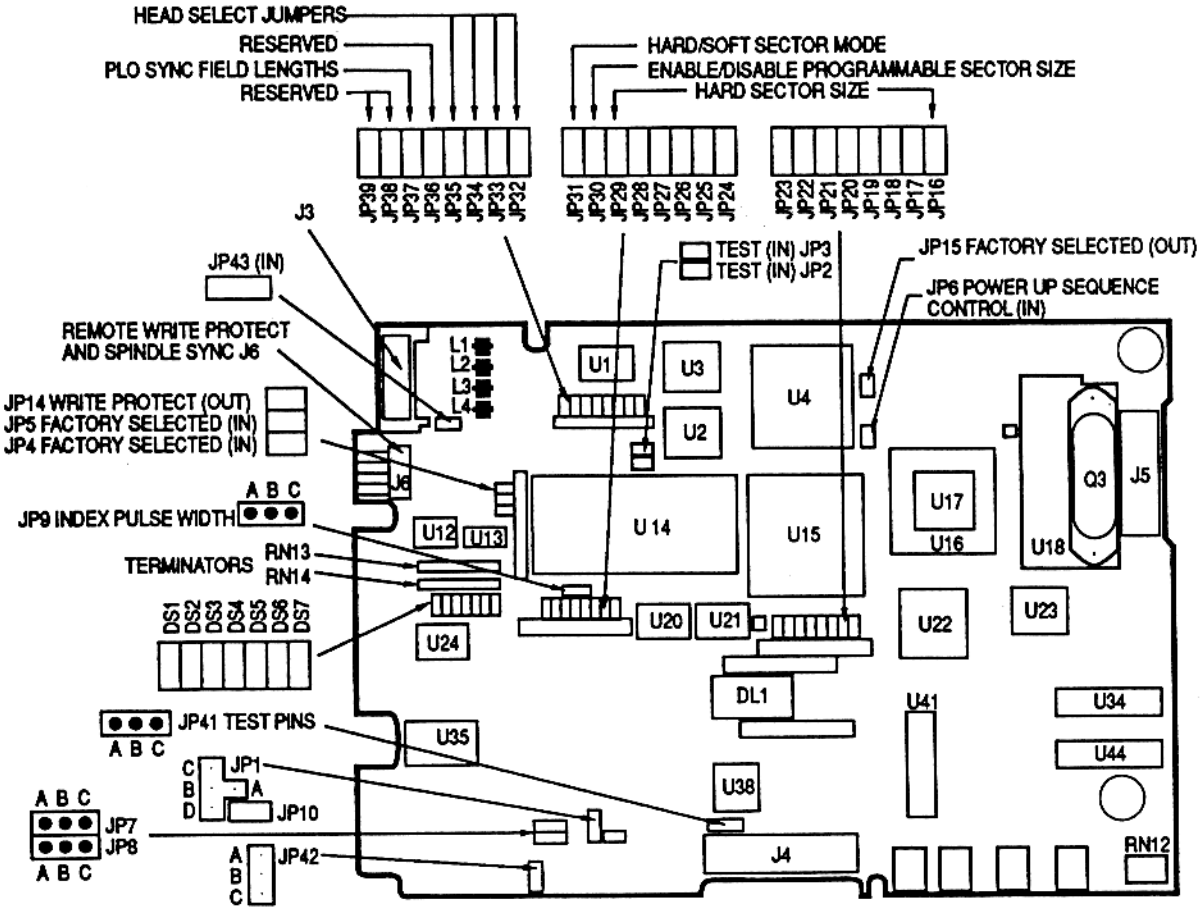
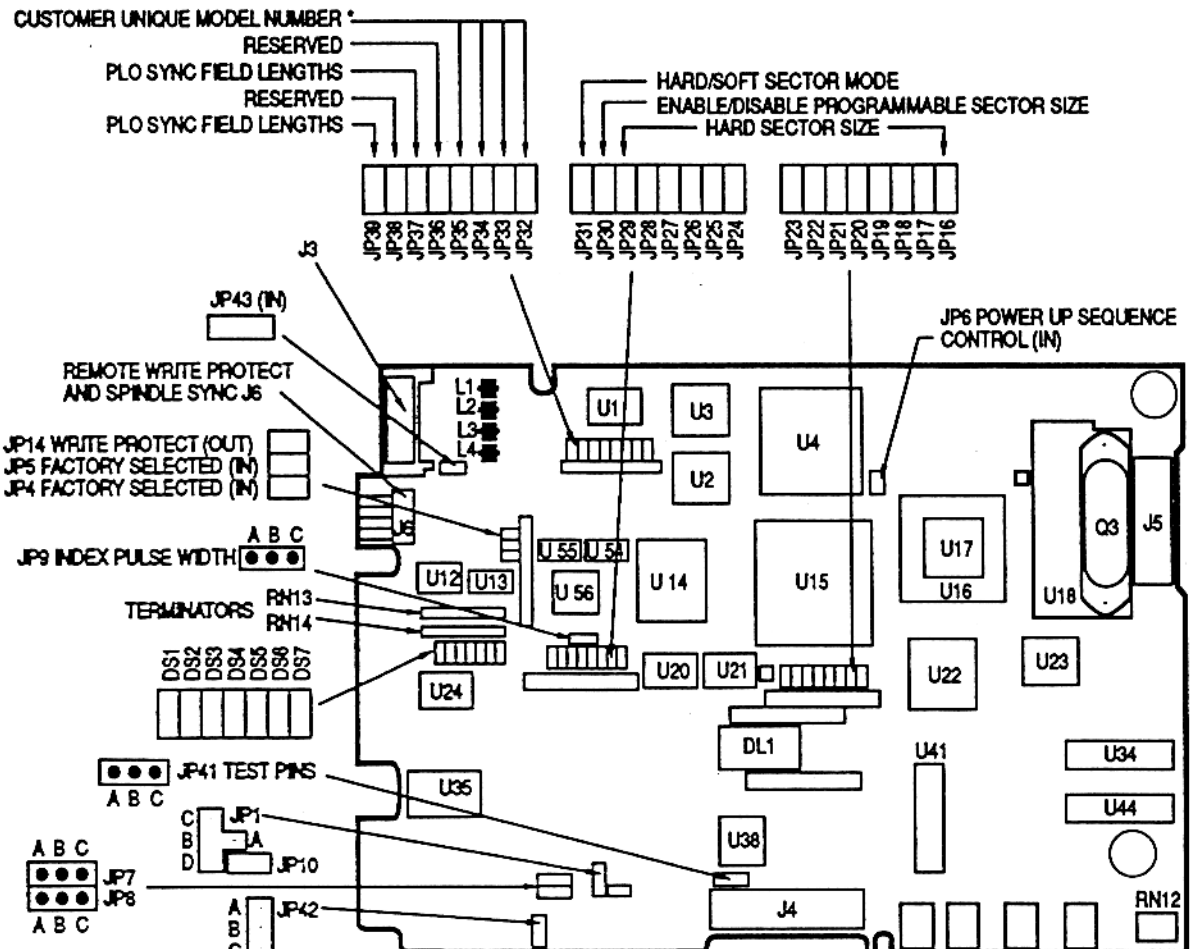
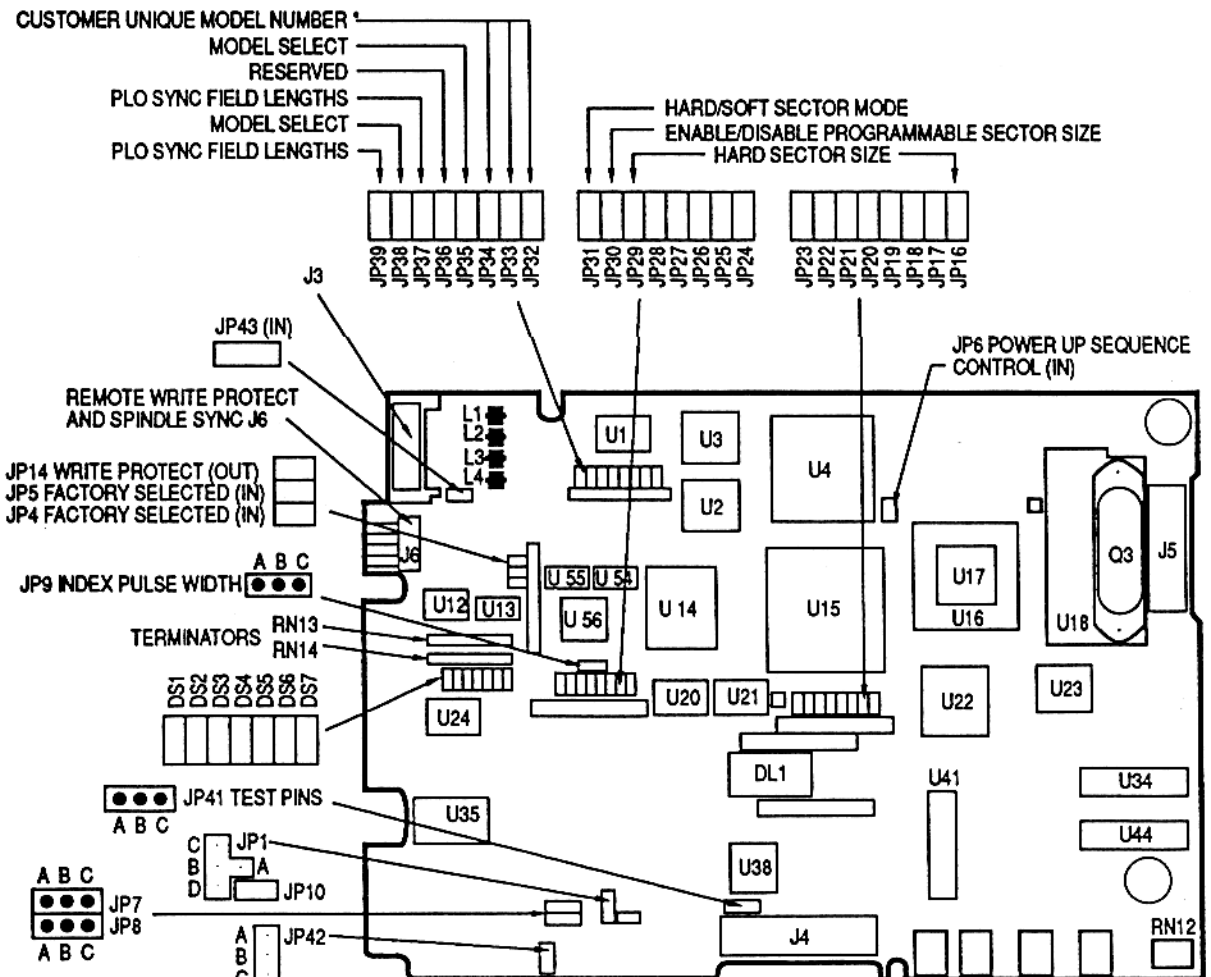


Figure 8-2
Drive Jumper Options (PCB Part Number 1015468)



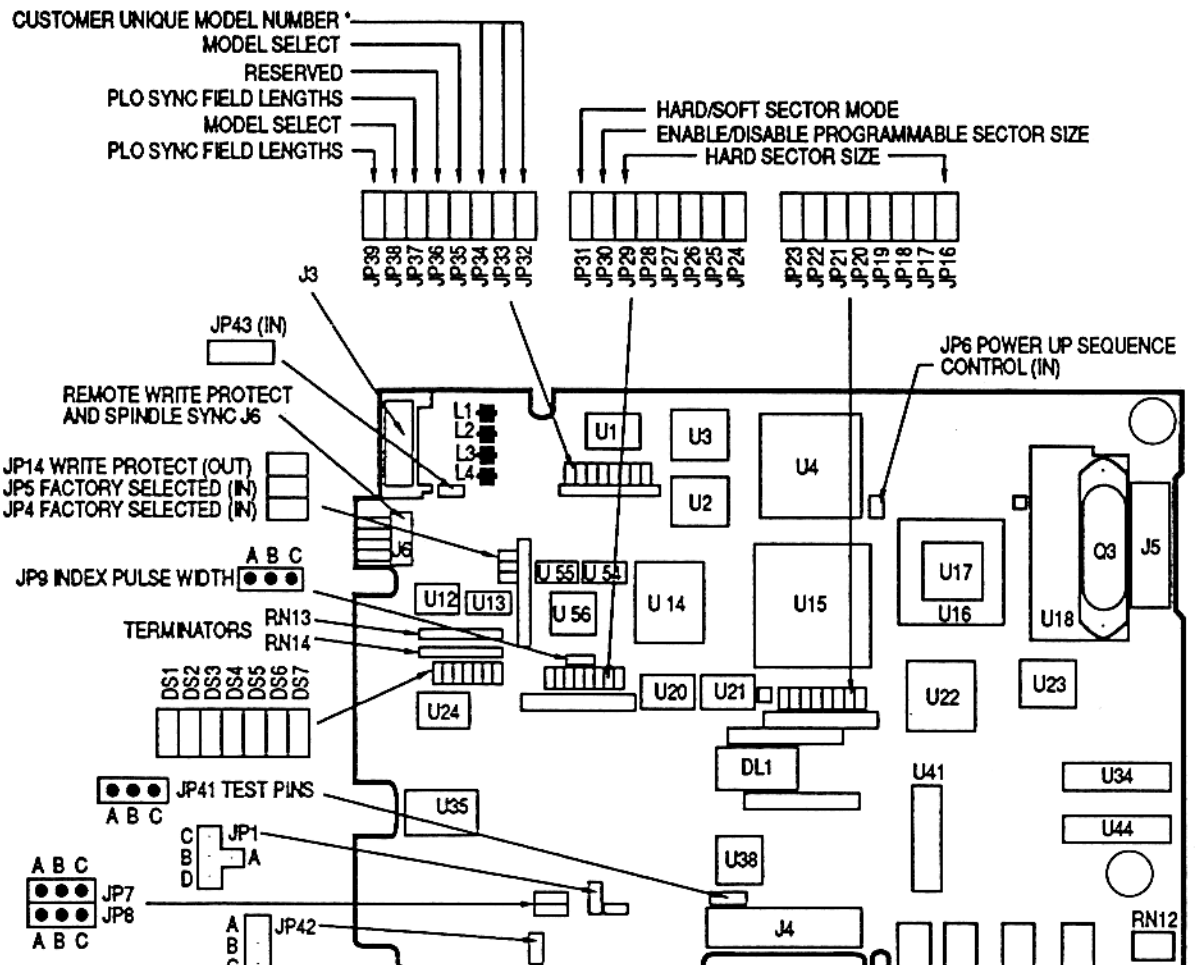
NOTE: CUSTOMER UNIQUE MODEL NUMBER SELECTION IS AVAILABLE ONLY WITH FIRMWARE REVISION LEVEL M2.2 OR HIGHER. SEE U3 AND U2 FOR REVISION LEVEL. IF FIRMWARE REVISION LEVEL IS BELOW M2.2, SEE FIGURE 8-2.

Figure 8-3
Drive Jumper Options (PCB Part Number 1014520)



*NOTE: CUSTOMER UNIQUE MODEL NUMBER SELECTION IS AVAILABLE ONLY WITH FIRMWARE REVISION LEVEL M2.2 OR HIGHER. SEE U3 AND U2 FOR REVISION LEVEL. IF FIRMWARE REVISION LEVEL IS BELOW M2.2, SEE FIGURE 8-2.

Figure 8-4
Drive Jumper Options (PCB Part Number 1023821)



NOTE: CUSTOMER UNIQUE MODEL NUMBER SELECTION IS AVAILABLE ONLY WITH FIRMWARE REVISION LEVEL M2.2 OR HIGHER. SEE U3 AND U2 FOR REVISION LEVEL. IF FIRMWARE REVISION LEVEL IS BELOW M2.2, SEE FIGURE 8-2.

Figure 8-5
Drive Jumper Options (PCB Part Number 1023856)

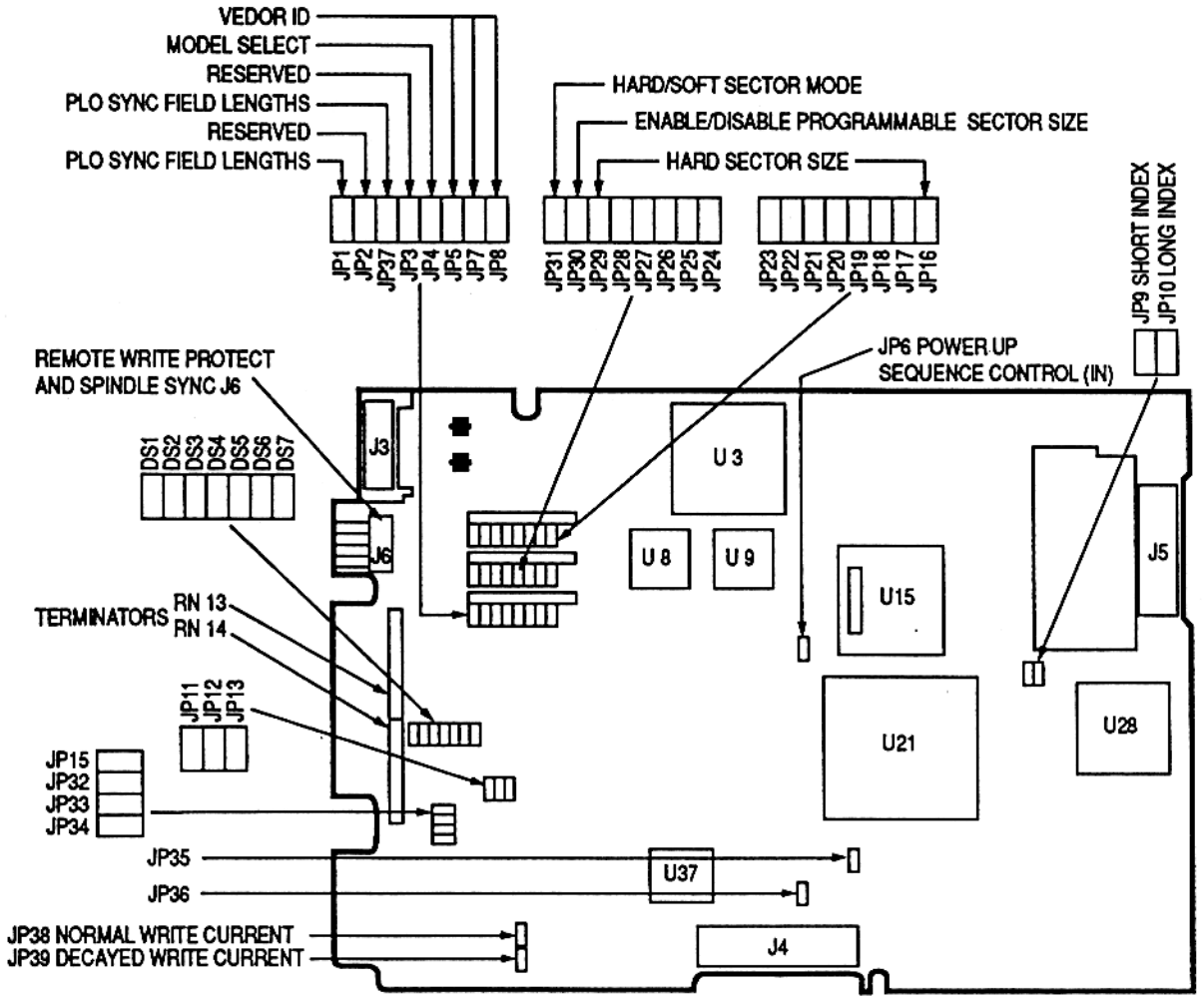


Figure 8-6
Drive Jumper Options (PCB Part Number 1023051)

JUMPER				REQUEST CONFIGURATION, VENDOR ID (3F00h)			
				BEFORE THE FIRST START SPINDLE COMMAND IS EXECUTED (5300h) *	AFTER DRIVE IS READY		
JP35	JP34	JP33	JP32		8380E	8760E	8610E
In	In	In	In	0801h	0802h	0801h	0806h
In	In	In	Out	0821h	0822h	0821h	0826h
In	In	Out	In	0841h	0842h	0841h	0846h
In	In	Out	Out	0861h	0862h	0861h	0866h
In	Out	In	In	0881h	0882h	0881h	0886h
In	Out	In	Out	08A1h	08A2h	08A1h	08A6h
In	Out	Out	In	08C1h	08C2h	08C1h	08C6h
In	Out	Out	Out	08E1h	08E2h	08E1h	08E6h
Out	In	In	In	0802h	0802h	0801h	0806h
Out	In	In	Out	0822h	0822h	0821h	0826h
Out	In	Out	In	0842h	0842h	0841h	0846h
Out	In	Out	Out	0862h	0862h	0861h	0866h
Out	Out	In	In	0882h	0882h	0881h	0886h
Out	Out	In	Out	08A2h	08A2h	08A1h	08A6h
Out	Out	Out	In	08C2h	08C2h	08C1h	08C6h
Out	Out	Out	Out	08E2h	08E2h	08E1h	08E6h

* *NOTES: 1) The information in this table assumes that JP6 is out; drive is in the remote spin mode. If JP6 is in, ignore this column.*
2) This table applies only to drives with firmware revision level M2.2 and higher. See Figure 8-3

Table 8-2
Drive Vendor ID Selection Jumpers

JUMPER				REQUEST CONFIGURATION, VENDOR ID (3F00h)		
				BEFORE THE FIRST START SPINDLE COMMAND IS EXECUTED (5300h) *	AFTER DRIVE IS READY	
JP8	JP7	JP5	JP4		8380EH	8760EH
In	In	In	In	0801h	0802h	0801h
Out	In	In	In	0821h	0822h	0821h
In	Out	In	In	0841h	0842h	0841h
Out	Out	In	In	0861h	0862h	0861h
In	In	Out	In	0881h	0882h	0881h
Out	In	Out	In	08A1h	08A2h	08A1h
In	Out	Out	In	08C1h	08C2h	08C1h
Out	Out	Out	In	08E1h	08E2h	08E1h
In	In	In	Out	0802h	0802h	0801h
Out	In	In	Out	0822h	0822h	0821h
In	Out	In	Out	0842h	0842h	0841h
Out	Out	In	Out	0862h	0862h	0861h
In	In	Out	Out	0882h	0882h	0881h
Out	In	Out	Out	08A2h	08A2h	08A1h
In	Out	Out	Out	08C2h	08C2h	08C1h
Out	Out	Out	Out	08E2h	08E2h	08E1h

* ***NOTES:*** *1) The information in this table assumes that JP6 is out; drive is in the remote spin mode. If JP6 is in, ignore this column.*
2) This table applies only to drives with firmware revision level M2.2 and higher. See Figure 8-3

Table 8-3
Drive Vendor ID Selection Jumpers for PCB 1023051

JP39	JP37	BYTES PER PLO SYNC FIELD
Out	Out	14
Out	In	24
In	Out	14
In	In	*12

*NOTE: This value applies only to drives with firmware revision level M2.2 or higher, otherwise this value is undefined. See Figure 8-3.

Table 8-4
JP37 and JP39 Jumper Selections

JP37	JP1	BYTES PER PLO SYNC FIELD
Out	Out	14
In	Out	24
Out	In	14
In	In	*12

*NOTE: This value applies only to drives with firmware revision level M2.2 or higher, otherwise this value is undefined. See Figure 8-3.

Table 8-5
JP37 and JP1 Jumper Selections (PCB 1023051)

JUMPER	TYPE *	DESCRIPTION
JP1 (In)	F	Encoded Write Data, TTL
JP2 (In)	F	Need for Phase Margin Testing: ECL Level Clock Output = Pin 18. Input = Pin 19.
JP3 (In)	F	Used for Phase Margin Testing: ECL Level Data Output = Pin 20. Input = Pin 21.
JP4 (In)	F	In = 2, 7 Encoding
JP5 (In)	F	In = 15 Mbit/sec Transfer Rate
JP6 (In)	C	In = Motor Remote Spinup Option Disabled Out = Motor Spinup Option Enabled
DS1-DS7	C	Drive Select
JP14 (Out)	C	In = Write Protect
JP15 (Out)	F	Not Used
JP16-JP29	C	Hard Sector Size
JP30	C	Out = Disable ESDI Programmable Sector Size (Hard Sector Mode Only) In = Enable ESDI Programmable Sector Size (Hard Sector Mode Only)
JP31	C	In = Soft Sector Mode; Out = Hard Sector Mode
JP32-JP35	F	Head Configuration
JP36	F	Reserved
JP37	C	In for 24-Byte PLO Sync Field, Out for 14-Byte PLO Synchronization Field
JP38	F	Reserved
JP39	F	Reserved
JP40	F	Test Jumper
JP41	F	Test Pins (Differential Data Read Signals)
JP42 (In)	F	Test (WRITE GATE to Flex Circuit)
JP43 (In)	F	Test Out Disables Onboard RAM
R220 (In)	F	Short INDEX Pulse Width (2.8 µsec)
R221 (Out)**	F	Normal INDEX Pulse Width (70 µsec)

* C = Customer Configurable
F = Factory Select
** For normal INDEX pulse width, R221 is installed, R220 is removed.

Table 8-6
Jumper Selections (PCB Part Number 1014150)

JUMPER	TYPE *	DESCRIPTION
JP1 (B-C)	F	Encoded Write Data, TTL
JP2 (In)	F	Need for Phase Margin Testing: ECL Level Clock Output = Pin 18. Input = Pin 19.
JP3 (In)	F	Used for Phase Margin Testing: ECL Level Data Output = Pin 20. Input = Pin 21.
JP4 (In)	F	In = 2, 7 Encoding
JP5 (In)	F	In = 15 Mbit/sec Transfer Rate (Hard Wired)
JP6 (In)	C	In = Motor Remote Spinup Option Disabled Out = Motor Spinup Option Enabled
JP7 (B-C)	C	Read Gate Delay Option
JP8 (Out)	C	Read Gate Delay Option
JP9 (A-B)	C	INDEX Width Selection, AB = 2.8 µsec. BC = 70 µsec.
JP10 (Out)	F	Write Current Selection
DS1-DS7	C	Drive Select
JP14 (Out)	C	In = Write Protect
JP15 (Out)	F	Not Used
JP16-JP29	C	Hard Sector Size
JP30 (In)	C	Out = Disable ESDI Programmable Sector Size (Hard Sector Mode Only) In = Enable ESDI Programmable Sector Size (Hard Sector Mode Only)
JP31 (Out)	C	In = Soft Sector Mode. Out = Hard Sector Mode.
JP32-JP35	F	Head Configuration
JP36 (Out)	F	Reserved
JP37 (Out)	C	In for 24-Byte PLO Sync Field, Out for 14-Byte PLO Synchronization Field
JP38 (Out)	F	Reserved
JP39 (Out)	F	Reserved
JP41	F	Test Pins (Differential Data Read Signals)
JP42 (In, A-B)	F	Test (WRITE GATE to Flex Circuit)
JP43 (In)	F	Test Out Disables Onboard RAM

* C = Customer Configurable
F = Factory Select

Table 8-7
Jumper Selections (PCB Part Number 1015468)

JUMPER	TYPE *	DESCRIPTION
JP1 (B-C)	F	Encoded Write Data
JP4 (out)	F	Out = 1,7 Encoding
JP5 (In)	F	In = 15 Mbit/sec Transfer Rate (Hard Wire)
JP6 (In)	C	In = Motor Remote Spinup Option Disabled Out = Motor Spinup Option Enabled
DS1-DS7	C	Drive Select
JP7 (B-C)	C	Read Gate Delay Option
JP8 (Out)	C	Read Gate Delay Option
JP9 (A-B)	C	INDEX Width Selection. A-B = 2.8µsec. B-C = 70µsec.
JP10 (In)	F	Write Current Select
JP14 (Out)	C	In = Write Protect
JP16-JP29	C	Hard Sector Size
JP30 (In)	C	Out = Disable ESDI Programmable Sector Size (Hard Sector Mode Only) In = Enable ESDI Programmable Sector Size (Hard Sector Mode Only)
JP31 (Out)	C	In = Soft Sector Mode. Out = Hard Sector Mode.
JP32-JP35	F	Drive Model Selection. See Table 8•2.
JP36 (Out)	F	Reserved
JP37	F	Bytes per PLO Sync Field. See Table 8•3.
JP38 (Out)	F	Reserved
JP39	F	Bytes per PLO Sync Field. See Table 8•3.
JP41 (Out)	F	Test Pins (Differential Data Read Signals)
JP42 (B-C)	F	Write Enable Select
JP43 (In)	F	Test Out Disables Onboard ROM

* C = Customer Configurable
F = Factory Select

Table 8•8
Jumper Selections (PCB Part Number 1014520)

JUMPER	TYPE *	DESCRIPTION
JP1 (B-C)	F	Encoded Write Data
JP4 (Out)	F	Out = 1,7 Encoding
JP5 (In)	F	In = 15 Mbit/sec Transfer Rate (Hard Wired)
JP6 (In)	C	In = Motor Remote Spinup Option Disabled Out = Motor Spinup Option Enabled
DS1-DS7	C	Drive Select
JP7 (B-C)	C	Read Gate Delay Option
JP8 (Out)	C	Read Gate Delay Option
JP9 (A-B)	C	INDEX Width Selection. A-B = 2.8µsec. B-C = 70µsec.
JP10 (In)	F	Write Current Select (Hard Wired)
JP14 (Out)	C	In = Write Protect
JP16-JP29	C	Hard Sector Size
JP30 (In)	C	Out = Disable ESDI Programmable Sector Size (Hard Sector Mode Only) In = Enable ESDI Programmable Sector Size (Hard Sector Mode Only)
JP31 (Out)	C	In = Soft Sector Mode. Out = Hard Sector Mode.
JP32-JP34	F	Drive Model Selection. See Table 8•2.
JP36 (Out)	F	Reserved
JP37 (In)	F	Bytes per PLO Sync Field. See Table 8•3.
JP38	F	Model Select 1
JP39 (In)	F	Bytes per PLO Sync Field. See Table 8•3.
JP41 (Out)	F	Test Pins (Differential Data Read Signals)
JP42 (B-C)	F	Write Enable Select
JP43 (In)	F	Test Out Disables Onboard ROM
JP 35	F	Model Select 0

* C = Customer Configurable
F = Factory Select

Table 8•9
Jumper Selections (PCB Part Number 1023821)

JUMPER	TYPE *	DESCRIPTION
JP1 (A-B)	F	Encoded Write Data
JP4 (Out)	F	Out = 1,7 Encoding
JP5 (In)	F	In = 15 Mbit/sec Transfer Rate (Hard Wired)
JP6 (In)	C	In = Motor Remote Spinup Option Disabled Out = Motor Spinup Option Enabled
DS1-DS7	C	Drive Select
JP7 (B-C)	C	Read Gate Delay Option
JP8 (Out)	C	Read Gate Delay Option
JP9 (A-B)	C	INDEX Width Selection. A-B = 2.8µsec. B-C = 70µsec.
JP10 (In)	F	Write Current Select (Hard Wired)
JP14 (Out)	C	In = Write Protect
JP16-JP29	C	Hard Sector Size
JP30 (In)	C	Out = Disable ESDI Programmable Sector Size (Hard Sector Mode Only) In = Enable ESDI Programmable Sector Size (Hard Sector Mode Only)
JP31 (Out)	C	In = Soft Sector Mode. Out = Hard Sector Mode.
JP32-JP34	F	Drive Model Selection. See Table 8-2.
JP36 (Out)	F	Reserved
JP37 (In)	F	Bytes per PLO Sync Field. See Table 8-3.
JP38	F	Model Select 1
JP39 (In)	F	Bytes per PLO Sync Field. See Table 8-3.
JP41 (Out)	F	Test Pins (Differential Data Read Signals)
JP42 (B-C)	F	Write Enable Select
JP43 (In)	F	Test Out Disables Onboard ROM
JP 35	F	Model Select 0

* C = Customer Configurable
F = Factory Select

Table 8-10
Jumper Selections (PCB Part Number 1023856)

JUMPER	TYPE *	DESCRIPTION
JP1 (In)	F	Bytes per PLO Sync Field
JP2 (Out)	F	Reserved
JP3 (Out)	F	Reserved
JP4 (In)	F	In for 8760 Out for 8380
JP5 (In)	F	Vendor ID
JP6 (In)	C	In = Motor Spinup Option Disabled Out = Motor Spinup Option Enabled
JP7 (In)	F	Vendor ID
JP8 (In)	F	Vendor ID
JP9 (In)	C	Short Index
JP10 (Out)	C	Long Index
JP11 (Out)	F	Decayed Write Current
JP12 (In)	F	Normal Write Current
JP13 (Out)	F	Hardware DC Erase
JP14 (Out)	C	In = Write Protect
JP15 (In)	F	Read Gate Nominal Delay
JP16-JP29	C	Hard Sector Size
JP30 (In)	C	In = Enable ESDI Programmable Sector Size Out = Disable ESDI Programmable Sector Size
JP31 (Out)	C	In = Soft Sector Mode Out = Hard Sector Mode
JP32 (In)	F	Read Gate Nominal Delay
JP33 (Out)	F	Read Gate Nominal Delay
JP34 (Out)	F	Read Gate Nominal Delay
JP35 (In)	F	In = Normal Write Current Out = Decay Write Current
JP36 (Out)	F	In = Write Unsafe Disable Out = Write Unsafe Enable
JP37 (In)	F	Bytes per PLO Sync Field
JP38 (In)	F	Normal Write Current
JP39 (Out)	F	Decayed Write Current

* C = Customer Configurable
F = Factory Select

Table 8-11
Jumper Selections (PCB Part Number 1023051)

8.2 Read Gate Delay Jumpers

Jumpers JP15, JP32, JP33 and JP34 on PCB number 1023051 and jumpers JP7 and JP8 on all other PCBs have been provided to allow a specified delay to be set on the read gate received by the controller. As shipped by the factory the jumpers for PCB number 1023051 are configured for a delay of 533 nsec. All other PCBs are configured for zero delay. See Tables 8-12 and 8-13 below for reference.

NOMINAL DELAY nsec	O = OPEN		S = SHORT	
	JP8		JP7	
	A - B	B - C	A - B	B - C
0	O	O	O	S
423	S	O	S	O
533	O	S	S	O
633	S	O	O	O
933	O	S	O	O
1233	O	O	S	O

Table 8-12
Read Gate Delay Jumper Settings

NOMINAL DELAY nsec	O = OPEN		S = SHORT	
	JP32	JP33	JP34	JP15
45	O	S	O	O
423	S	O	S	O
533	S	O	O	S
633	O	O	S	O
933	O	O	O	S
1233	S	O	O	O

Table 8-13
Read Gate Delay Jumper Settings (PCB 1023051)

8.3 WRITE PROTECT SELECTION JUMPER (JP14)

Jumper JP14 is the write project jumper. When the jumper is present (installed), the drive is write protected and can only be read; no writing can take place. As shipped from the factory, jumper JP14 is removed.

8.4 SEQUENTIAL SPINDLE MOTOR SPINUP JUMPER (JP6)

The spindle motor spinup jumper (JP6) allows a string of drives to be started sequentially by the controller. When the jumper is present (installed), the drive automatically spins up as soon as power is applied. If JP6 is removed, the drive is started by issuing the appropriate command from the controller. As shipped from the factory, jumper JP6 is installed.

8.5 TEST JUMPERS (JP1-JP3)

These jumpers provide access to certain test signals. The specific signals and the normal factory settings are shown below in Table 8•14, Test Pin Jumpers.

JUMPER	FACTORY SETTING	NOTES ON FUNCTION
JP 1	In	Encoded Write Data; TTL
JP2	In	Used for Phase Margin Testing; ECL Level Clock. Output = Pin 18. Input = Pin 19
JP 3	In	Used for Phase Margin Testing; ECL Level Data. Output = Pin 20. Input = Pin 21.

Note: These jumper settings and functions do not apply to those on PCB number 1023051.

Table 8•14
Test Pin Jumpers

8.6 HARD SECTOR CONFIGURATION JUMPERS (JP16-JP29)

Jumper JP31 selects the mode of operation. Jumper JP31 installed configures the drive as a soft sector drive; removed, it configures the drive as a hard sectored drive.

Jumpers JP16 through JP29 allow the user to configure the drive's hard sector size. The sector size can range from a minimum of 123 to a maximum of 31,410 unformatted bytes per sector, with 1 byte granularity.

The hard sector configuration jumpers are encoded in a binary fashion, with JP16 being the least significant byte and JP29 being the most significant byte. An installed jumper selects the binary value. See Table 8•15, Customer Selectable Jumpers.

Jumper JP30, if installed, enables setting the hard sector size over the ESDI. The drive must be in hard sector mode, that is, JP31 removed.

JUMPER	BINARY VALUE FOR EACH JUMPER*
JP16	1
JP17	2
JP18	4
JP19	8
JP20	16
JP21	32
JP22	64
JP23	128
JP24	256
JP25	512
JP26	1,024
JP27	2,048
JP28	4,096
JP29	8,192

** Used to Determine the Number of Unformatted Bytes/Sector*

Example: 54 Sectors Desired

1. $\frac{31,410}{54}$ = *581 Unformatted Bytes/Sector*

2. *Install Jumpers J25, +J22, J18, +J16*
   # Bytes/Sector 512 + 64 + 4 + 1 = 581

Table 8-15
Customer Selectable Jumpers