

PUBLICATION UPDATE BULLETIN

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REASON FOR CHANGE:

This PUB contains adjustment/alignment procedures for the half height floppy drive part number 278-4033.

INSTRUCTIONS:

Remove pages and insert attached pages as follows:

	REMOVE	INSERT
1.	ix/x	ix/x
2.		J1/2 - J7/8
3.		
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5.		
6.		
7.		
8.		
9.		
10.		

This page is to be used as a permanent record of revisions; place it directly following the title page.



LABORATORIES, INC.

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APPENDIX J

HALF HEIGHT FLOPPY DRIVE CHECKS/ADJUSTMENTS

J.1 SCOPE

This Appendix contains Checks/Adjustments procedures for the Half-Height 360K Floppy Diskette Drive Part Number 278-4033. The checks/adjustment procedures should be performed prior to returning the drive to the FSC for repair.

The following adjustments and checks are contained in the preceding text.

- Read/Write Head Radial Alignment
- Track 00 Detector Check
- Index/Sector Timing Alignment
- Write Protect Check

J.1.2 SPECIAL TOOLS AND TEST EQUIPMENT

The following special tools and test equipment are required to perform field alignment procedures on the Half-Height 360K Floppy Drive.

Wang 360K Drive Alignment Diskette 726-8068
Dual Channel Oscilloscope with three probes (Tektronix 465 or equivalent)

J.2 ELECTRONICS UNIT COVER REMOVAL

Prior to performing floppy drive adjustments, remove the PC electronics cover and remove the screw holding the drive in place (refer to Chapter 5 paragraph 5.6.1 Electronics Unit Disassembly for detailed Removal procedures).

Position the Electronics Unit in the vertical position (Power Supply down) and slide the floppy drive to be aligned out of the chassis as far as the drive cables allow being careful not to apply excessive tension to the cables.

NOTE

THE FLOPPY DRIVE UNDER TEST MUST BE CONNECTED TO THE DRIVE A CABLE. ENSURE PROPER CABLE CONNECTION PRIOR TO PRECEDING.

J.3 PC POWER-UP

Ensure the System Default Drive's door (Drive A or B) is open and power-on the PC. Insert the 360K Floppy Alignment diskette (726-8068) into the drive to be aligned/checked and close the drive's door.

When the BIT test is successfully completed the following message will be displayed on the monitor screen:

WANG PROFESSIONAL COMPUTER REV x.xx

01 Starting From Drive A

Within 5 seconds depress the 'M' key to display the diagnostics menu. One of two menu will be displayed depending on the PROM revision installed in the CPU/System PCA (location L78 and L90 on 8221/9221 PCA or location L94 and L115 on 9521 PCA). Rev 1 PROMS display the following menu:

- 1 RECAL
- 2 CYL 1
- 3 CYL 16
- 4 CYL 40
- 5 RS232 LOOP
- 6 RE-RUN BIT

With Rev 2.0 PROMS installed in the CPU/System PCA the following will be displayed:

19 Manufacturing Diagnostic Menu
Standby, initializing FDC

- 1 RECALIBRATE
- 2 SEEK TRACK 1
- 3 SEEK TRACK 2
- 4 SEEK TRACK 3
- 5 SEEK TRACK 16
- 6 SEEK TRACK 40
- 7 TEST RS232
- 8 COLD RESTART
- 9 WARM RESTART
- 0 TEST KB LEDS and Tones

The floppy drive alignment procedures in this section is written using Rev 2.0 PROM menu selections. Note: Only one head can be verified.

J.4 RADIAL-TRACK ALIGNMENT

Radial-Track Alignment ensures that track 16 position calculated by the head positioning logic coincides with track 16 positioning on the alignment diskette..

1) Set up the oscilloscope as follows (figure J-1):

- Scope Channel A: TP1 on Drive PCA
- Scope Channel B: TP2 on Drive PCA
- Scope Sync: TP7 on Drive PCA
- Ground Probes: TP5 on Drive PCA (Tied to Ground Plane)
- Time Base: 20 msec per division
- Amplitude: 50 mv per division
- Coupling: ac
- Read Differentially: A Plus B, Channel B inverted

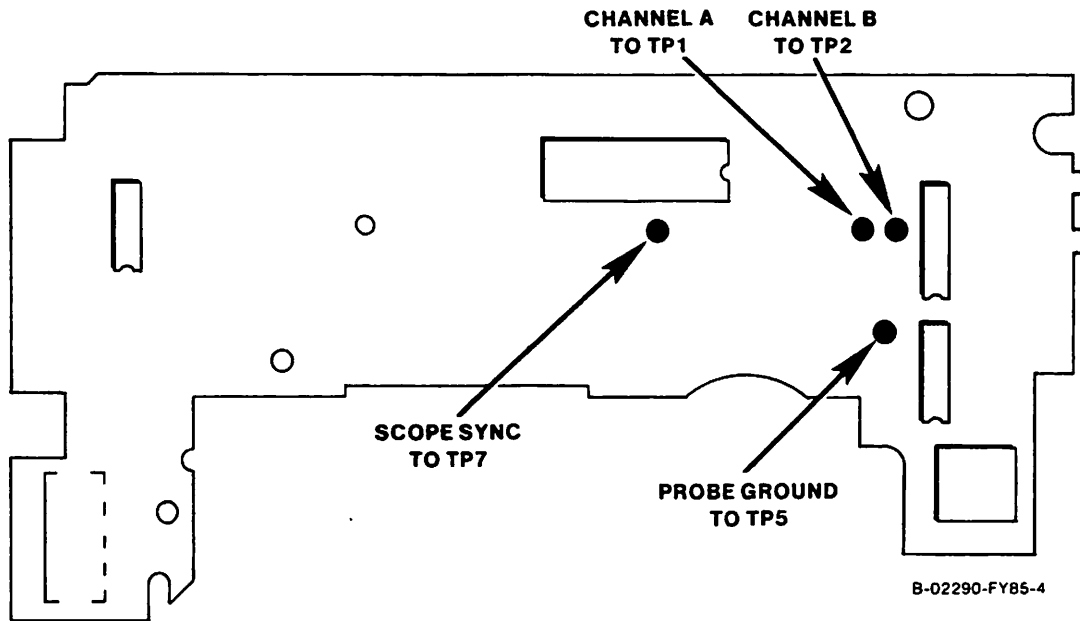


Figure J-1. Half Height Floppy PCA Test Point Locations

- 2) Step the heads to Track 00 by pressing the '1' key.
- 3) Step heads to Track 16 by pressing the '5' key. Adjust the oscilloscope to display the CATS EYE Pattern. Verify that both lobes (CATS EYES) are within 70% of each other (figure J-2).

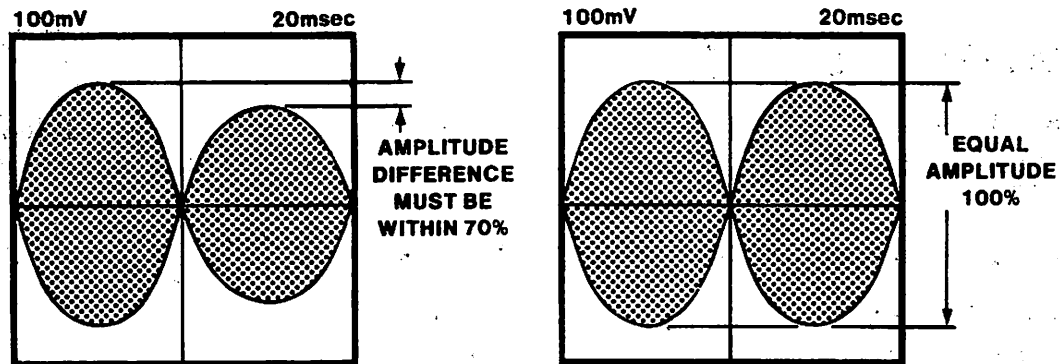


Figure J-2. CATS EYE Alignment Pattern

- 4) Perform the following alignment procedures ONLY if the lobes exhibit an amplitude difference greater than 70%.
 - a) Loosen the two mounting screws that hold the stepper motor to the base casting (figure J-3).

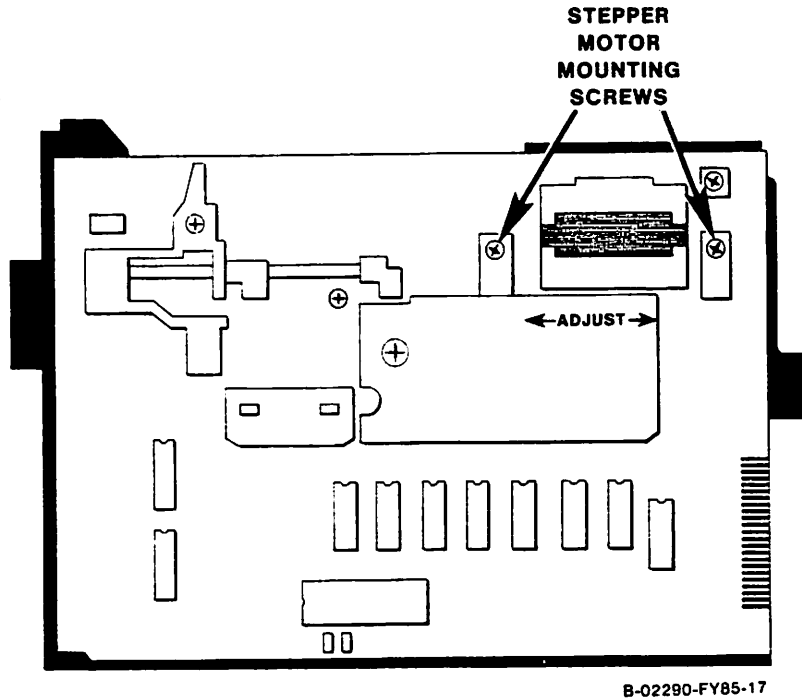


Figure J-3. Stepper Motor Mounting Screw Locations

- b) Adjust stepper motor by sliding backwards or forwards until lobes of equal amplitude are displayed. Tighten motor mounting plate screws.

CAUTION

WHEN TIGHTENING THE MOTOR MOUNTING SCREWS, PRESSURE MUST BE APPLIED TO THE REAR OF THE STEPPER MOTOR THROUGH THE RECTANGULAR HOLE IN THE SIDE CASTING TO KEEP THE MOTOR BRACKET AGAINST THE REGISTERING SURFACES OF THE CASTING. FAILURE TO DO THIS WILL ANGLE THE BAND POSITIONER CAUSING TRACK-TO-TRACK PROBLEMS.

- c) Check adjustment by stepping to track 00 by pressing the '1' key, then step the heads to track 16 by pressing the '5' key. Verify that both lobes (CATS EYES) are within 70% of each other (figure J-2).
 - d) Now, check adjustment by stepping to track 40 by pressing the '6' key, then step the heads to track 16 by pressing the '5' key. Verify that both lobes (CATS EYES) are within 70% of each other (figure J-2).
 - e) Re-adjust the stepper motor as required (refer to step b).

J.5 TRACK ZERO DETECTOR CHECK

Track Zero Detector Adjustment should be checked after Head-radial Track alignment is performed. Perform the following:

- 1) Set up the oscilloscope as follows (figure J-4):

Scope Channel A:	TP1 on Drive PCA
Scope Channel B:	TP2 on Drive PCA
Scope Sync:	TP7 on Drive PCA
Ground Probes:	TP5 on Drive PCA (Tied to Ground Plane)
Time Base:	20 msec per division
Amplitude:	100 mV per division
Coupling:	ac
Read Differentially:	A Plus B, Channel B inverted

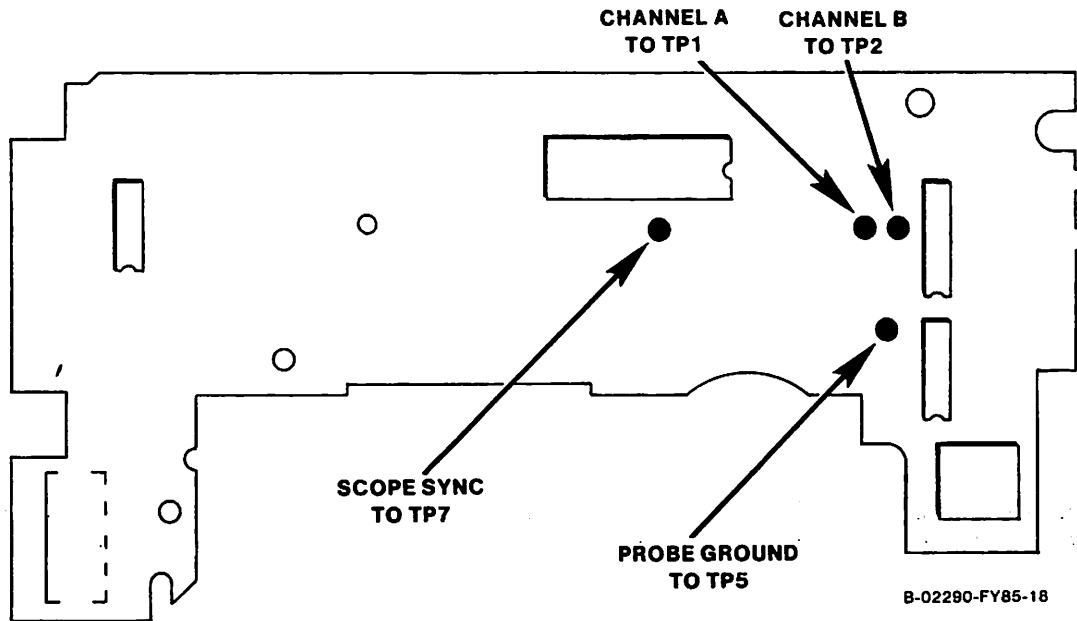


Figure J-4. Track Zero Detector Test Point Locations

- 2) With the alignment diskette loaded in the drive being tested, step the drive to track 00 by pressing the '1' key. A 125 KHz signal should be displayed on the oscilloscope. If not present, drive replacement is required.
- 3) If the 125 KHz signal is present a track 00, disconnect the scope probes from TP1, TP2 and TP7. Set up oscilloscope as follows:

Scope Channel A:	TP8 on Drive PCA
Amplitude:	2V per division
Coupling:	dc
Trigger on Channel A	

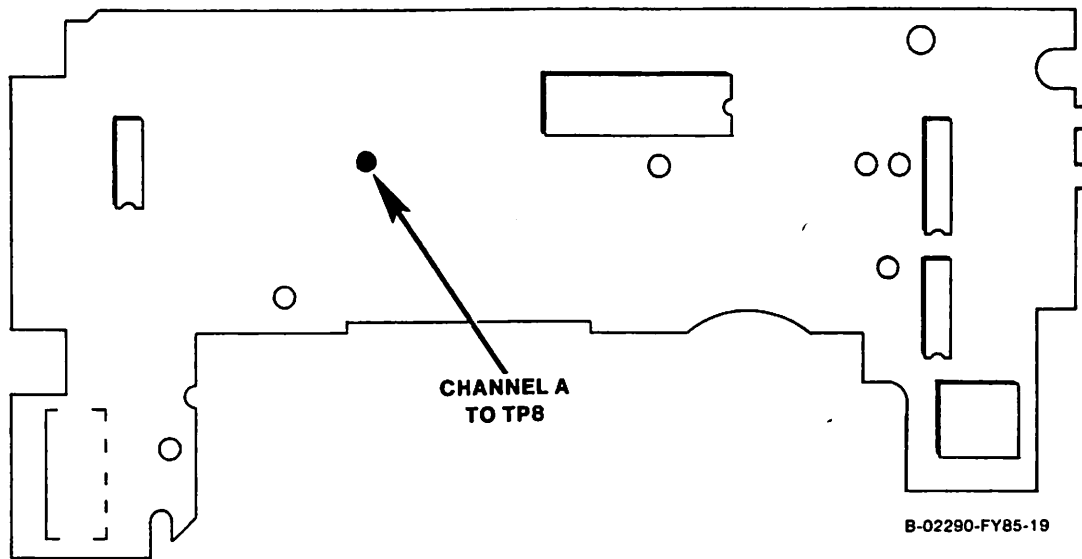


Figure J-5. Track Zero Check Test Point Locations

- 4) Step to track 01 by pressing the '2' key and read the state of TP8. If TP8 goes to zero (Low), track 00 detector adjustment is correct. If not, drive replacement is required.

J.6 INDEX/SECTOR TIMING ALIGNMENT

The Index/Sector Timing Alignment pertains to an interval between the sensing of track-index and the actual transmission of data. A standard index-to-data interval is required to allow the interchangeability of diskettes.

- 1) Set up the oscilloscope as follows (figure J-6):

Scope Channel A:	TP1 on Drive PCA
Scope Channel B:	TP2 on Drive PCA
Scope Sync:	TP7 on Drive PCA
Ground Probes:	TP5 on Drive PCA (Tied to Ground Plane)
Time Base:	50 usec per division
Amplitude:	500 mV per division
Coupling:	ac
Read Differentially:	A Plus B, Channel B inverted

- 2) Insert the alignment diskette into the drive and select track 01 by pressing the '2' key. The data pattern on the oscilloscope should start 200 ± 100 usec from the start of the sweep (figure J-7). If timing is not in tolerance continue to step 3.
- 3) Loosen the Index Detector mounting screw until the Index Detector is just able to be moved (figure J-8).
- 4) Adjust Index Detector until timing is 200 ± 100 useconds. Ensure Index Detector is positioned against the registration surface on the hub frame and tighten the mounting screw.

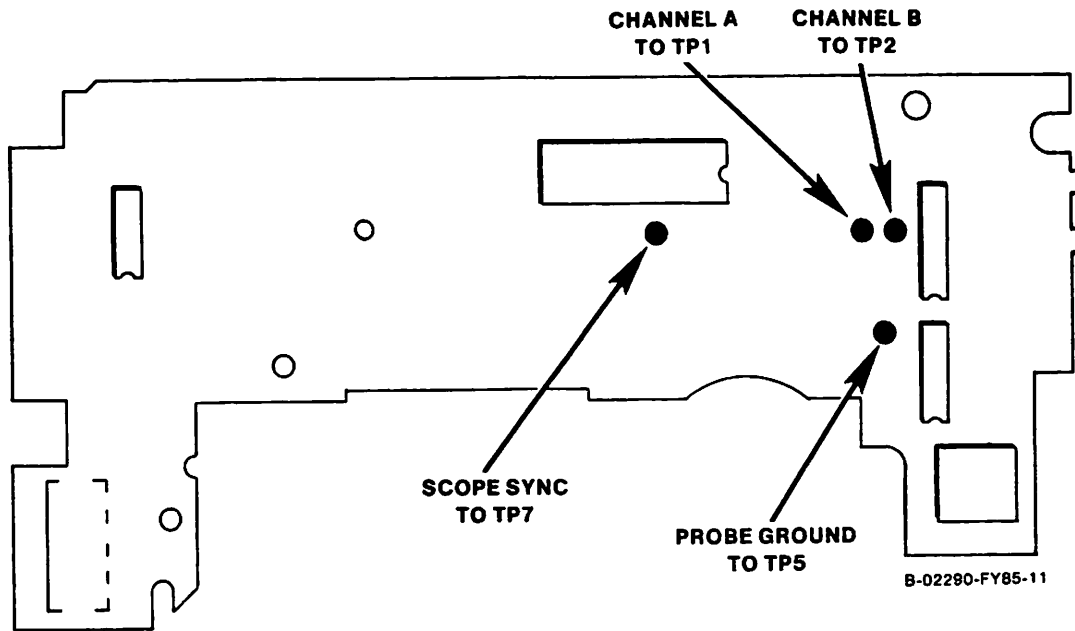


Figure J-6. Index/Sector Test Point Locations

- 5) Step to track 40 by pressing the '6' key then step back to track 01 by pressing the '1' key. Recheck the data pattern timing.
- 6) Repeat step 3 through 5 if required.

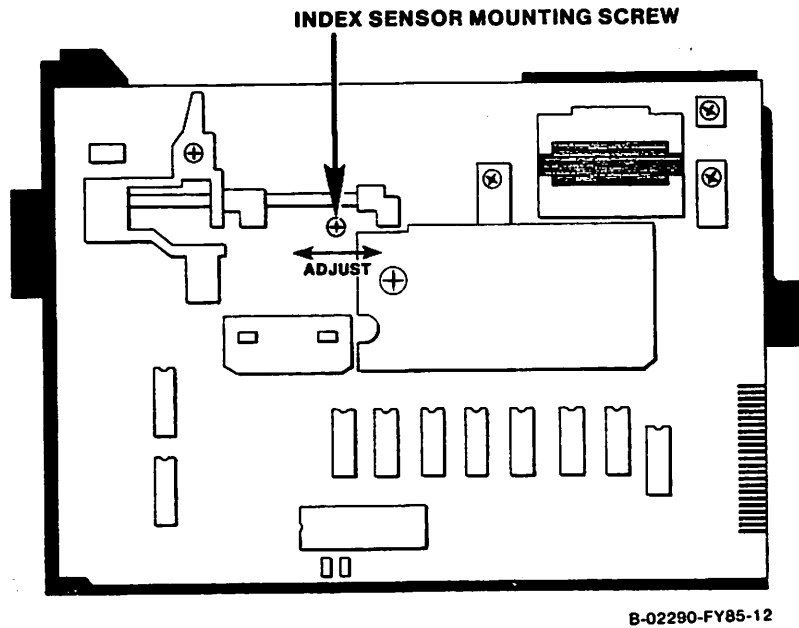
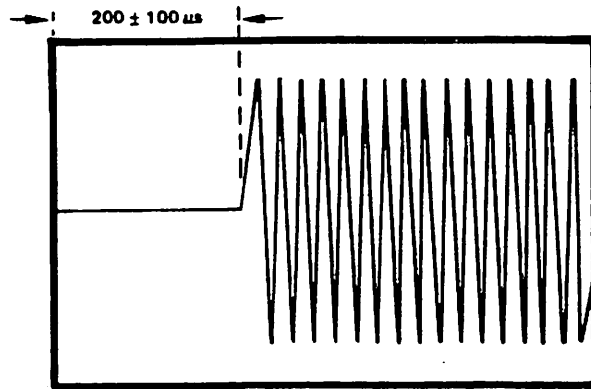


Figure J-7. Index Sensor Mounting Screw Location



B-01527-FY84-17

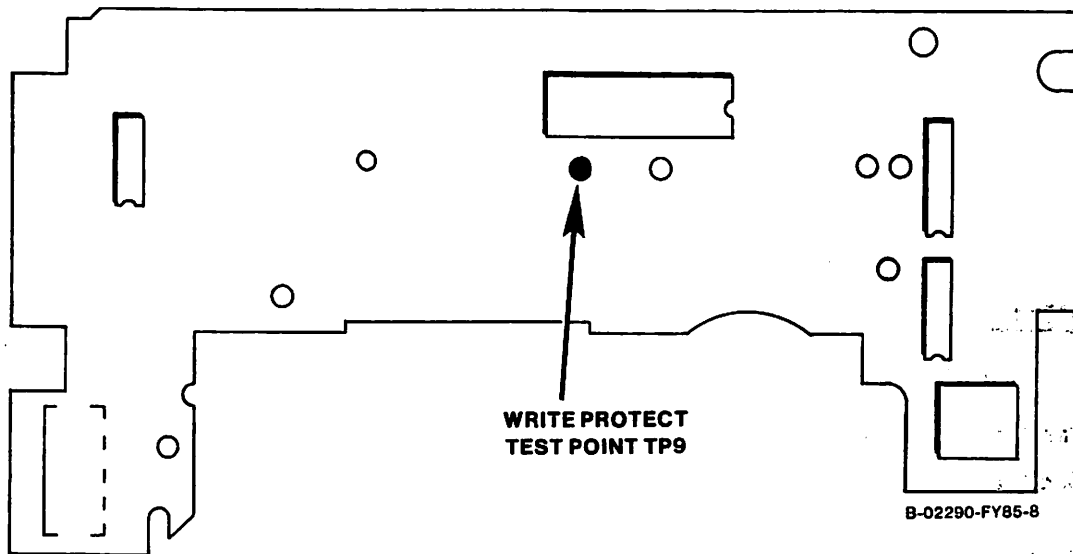
Figure J-8. Index-To-Data Alignment Pattern

J.7 WRITE PROTECT CHECK

Insert a diskette into the drive with the Write Protect notch open. Set the Oscilloscope up as follows (refer to figure J-9 for Test Point location):

Scope Channel A: TP9 on Drive PCA
 Ground Probe to TP5 (Tied to Ground Plane)
 Amplitude: 2V per division

- 1) Read the voltage at TP9. It should read 0 volts (logic 0).
- 2) Slide the diskette out about half way and read the voltage at TP9. It should be +5V (logic 1).



B-02290-FY85-8

Figure J-9. Write-Protect Test Point Location

J.8 SYSTEM ASSEMBLY

This completes the half-height floppy drive check/alignment procedures. If any alignment can not be brought into tolerance replacement of the drive is recommended. Remove the alignment diskette from the drive under test. Install the drive into the chassis and secure in place with the screw removed. Perform system re-assembly procedures as detailed in chapter 5 paragraph 5.6.



TECHNICAL
SERVICE
BULLETIN

FILE CONTROL	CATEGORY	ISSUE DATE	EXP. DATE
950011-A.DOC	MINI / MAIN FRAME	10/06/95	INDEF
AUTHOR	APPROVAL	TSB NUMBER	REVISION
Paul Nolan	VS Continuation Engineering	950011	A

SUBJECT: Replacement floppy drive for the **VS5000** and **VS6000**

In December of 1992 (see HWT-9740) the 725-0258 Panasonic floppy drive model JU-475-???? was obsoleted by the vendor and the Mitsubishi Model MF504C-327UW (Rev P only), Wang Part Number **270-5162**. was the replacement. Well the Mitsubishi drive has now become obsoleted but, all is not lost, a quantity of the Panasonic drives have been located and will share the same Wang part number (**270-5162**) as the Mitsubishi drive. The Panasonic drive will be labeled with the part number. Both drives have had all the jumpers configured for the VS and are interchangeable with the following conditions:

- RCU Code must be REV 1.06.03 or higher.
- When using the Mitsubishi drive Switch Bank 2 on the RCU PCBA, MUST have switch 6 in the OPEN or OFF position.
- When using the Panasonic drive Switch Bank 2 on the RCU PCBA, MUST have switch 6 in the CLOSED or ON position.

FYI: How to ID a Mitsubishi Model MF504C-327UW (Rev P only) drive modified for use on the VS. The drive will have a modified or custom terminator SIP. The SIP modification consisted of the following: Pin 4 on the SIP is cut off and a wire going from Pin 2 to the socket that Pin 4 would have occupied. The custom terminator SIP has Wang part number 333-0988 on it.

NOTE: More floppy information can be found in TSB's HWT-9788 & 9942

MATRIX ID. 3110 PRODUCT/RELEASE# VS5/6/75E/5000/6000 & 2200 CS-D/DS

TITLE: VS/2200 5 1/4" 1.2MB Floppy Drive Compatibility & Configuration Issues

CORRECTIVE ACTION (cont):

The DR jumper is found between rows 'A' & 'B' and chips 4 & 5, next to the DD jumper. The correct jumpers settings are:

DS1 in, DS2,3,4 out	DS/MX - DS
DO in, DC,LR out	BX/CX - BX
AX/AT - AX	SP,IX,DD all out
IRD out	MM,DA in, MS,OA,UA out
HA out	

150 OHM Terminator Chip in at location C1 (next to the I/O cable conn)
** VS5000/6000: if replacing a Mitsubishi, RCU Sw Bk 2, sw 6 must be set to ON
PANASONIC JU-475-2xxx Jumpers: p/n 278-4055/725-0258G

DS1 in, DS2,3,4 out	DS/MX - DS
DO in, DR,DC,LR,RD all out	AX/AT - AX
IRD out	SP out
BX/CX - BX	MM,DA in, MS,HA,OA,UA all out

150 OHM Terminator Chip in (located next to the I/O cable connector)
** VS5000/6000: if replacing a Mitsubishi, RCU Sw Bk 2, sw 6 must be set to ON
PANASONIC JU-475-3xxx Jumpers: p/n 278-4055/725-0258G

DS1 in, DS2,3,4,MX all out	PH/HH - PH
DA in, PA,UA,HA,LA,IM all out	TM in (jpr for termination)
MS/MM MM	TH in, MDA,MDB,DD out
BX in	NAX in

** VS5000/6000: if replacing a Mitsubishi, RCU Sw Bk 2, sw 6 must be set to ON
MITSUBISHI MF504C-327U REV P Jumpers: p/n 270-5162/725-5083VS

The Mitsubishi drives have a silver label on either the top or bottom edge near the rear with the Mitsubishi name, model #, and revision. Only the P rev drives with a special terminator sip are usable with the VS or 2200. There are other floppy drives that fall under the 725-5083 part #, but only the Mitsubishi MF504C-327U Rev P can be converted. If you have a 270-5162 or 725-5083VS, it should be jumpered correctly with the right terminator. If it is jumpered incorrectly you should assume it is a 725-5083 and has the wrong terminator. These incorrect terminators can be used by cutting pin 4 & soldering a wire to pin 2 that inserts into the hole for pin 4. The new terminator is p/n 333-0988, has no missing legs, and is marked 4609X-N74. The correct jumper settings are:

MX in, DS3,0,1,2 out	TPA out
SS in, ND,SB,SG,IP out	
SR,RD,RI,IU,IR,MM,IS,HR in, DC,MS,IL,DD out	

Terminator Sip, p/n 333-0988, in (located next to the I/O cable conn)

** VS5000/6000: RCU Sw Bk 2, sw 6 OFF (ON for Panasonic). Min @MCRCU@ 1.06.03

For questions concerning this TSB contact: Mike Bahia 508-858-7095

GROUP: Continuation Engineering

MAIL STOP: 027-G1D

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TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 9868

REPLACES: _____

DATE: 03/03/94 PAGE 1 OF 01

MATRIX ID. 3702

PRODUCT/RELEASE# 1.2 MB Floppy Drives

TITLE: HANDLES BREAK ON 1.2 MB FLOPPY DRIVES

PURPOSE:

To inform the field about problems with the 1.2 MB Floppy Drive part number 725-5083.

EXPLANATION:

The plastic handle that is used when placing a diskette into the drive breaks. There is a plastic stud (.25" diameter) with splines on it that fits into plastic handle (1.25" long) and when the handle is pushed down too hard or too abruptly, the plastic that surrounds the stud cracks. The handle then slips on the stud each time it is used. This floppy drive is used on several Tempest products including the Tempest 321T, 431T, and Tower I.

CORRECTIVE ACTION:

If the plastic handle is cracked and slipping, you can order the handle (part number 730-1401) and replace it rather than sending the entire drive back for repair.

GROUP: Secure Systems Support Group

MAIL STOP: 027-G1C

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WANG

TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 9374 REPLACES: _____ DATE: 12/26/89 PAGE 1 OF 2
MATRIX ID. 3109 PRODUCT/RELEASE# Floppy Disk Drives
TITLE: Change of Bezel Color

PURPOSE:

To inform the field that the present color Black Bezels on 360Kb, 1.2MB, and 1.44MB floppy disk drives will be changed to Gray Bezels on all future purchases.

EXPLANATION:

As per a Focus article (December 15th issue): Effective immediately all shipments of new Wang products and upgrade model numbers utilizing these drives will have Gray Bezel drives. To receive the correct Bezel color for any replacement drive from logistics care must be exercised when ordering the required part. All present numbers ordered will receive the Black Bezel drive. To receive a Gray Bezel drive add a -G to the present part number and you will receive the Gray bezel equivalent drive. For customer situations requiring a swap of bezel colors the following drive part numbers may be used. As not all bezels are interchangeable the complete drive must be ordered.

1.2 megabyte (MB) 5 1/4 inch Floppy Disk Drives

Floppy disk drives with Wang P/Ns 725-0258 (278-4055) and 725-0232 can be replaced with either 725-0258 (1.2 MB drive with black bezel) or the 725-0258-G (1.2 MB drive with gray bezel).

360 kilobyte (KB) 5 1/4 inch Floppy Disk Drives

Floppy disk drives with Wang P/Ns 725-0142 (278-4033) and 725-0257 can be replaced with either 725-0142 (360 KB drive with black bezel) or 725-0142-G (360 KB drive with gray bezel).

GROUP: Desktop Systems/Peripherals Group

MAIL STOP: 001-140

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TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 9374 REPLACES: _____ DATE: 12/26/89 PAGE 2 OF 2
MATRIX ID. 3109 PRODUCT/RELEASE# Floppy Disk Drives
TITLE: Change of Bezel Color

EXPLANATION (cont'):

1.44 megabyte (MB) 3 1/2 inch Floppy Disk Drives

The 1.44 MB Floppy Disk Drives are currently offered in three bezel color configurations. All shipments of new products will have gray bezel drives with the exception of the MC (microchannel) product line. Spare 1.44 MB drives can be ordered using the following part numbers.

279-0824 - 3 1/2 inch Black bezel drive installed in Black 5 1/4 inch tray.

279-0824-G - 3 1/2 inch Gray bezel drive installed in Gray 5 1/4 inch tray.

725-4035 - 3 1/2 inch White bezel drive installed in White 5 1/4 inch tray (for use in MC product line only).

GROUP: Desktop Systems/Peripherals Group MAIL STOP: 001-140

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5 1/4" DSDD FLOPPY DRIVE

34

TERMINATORS

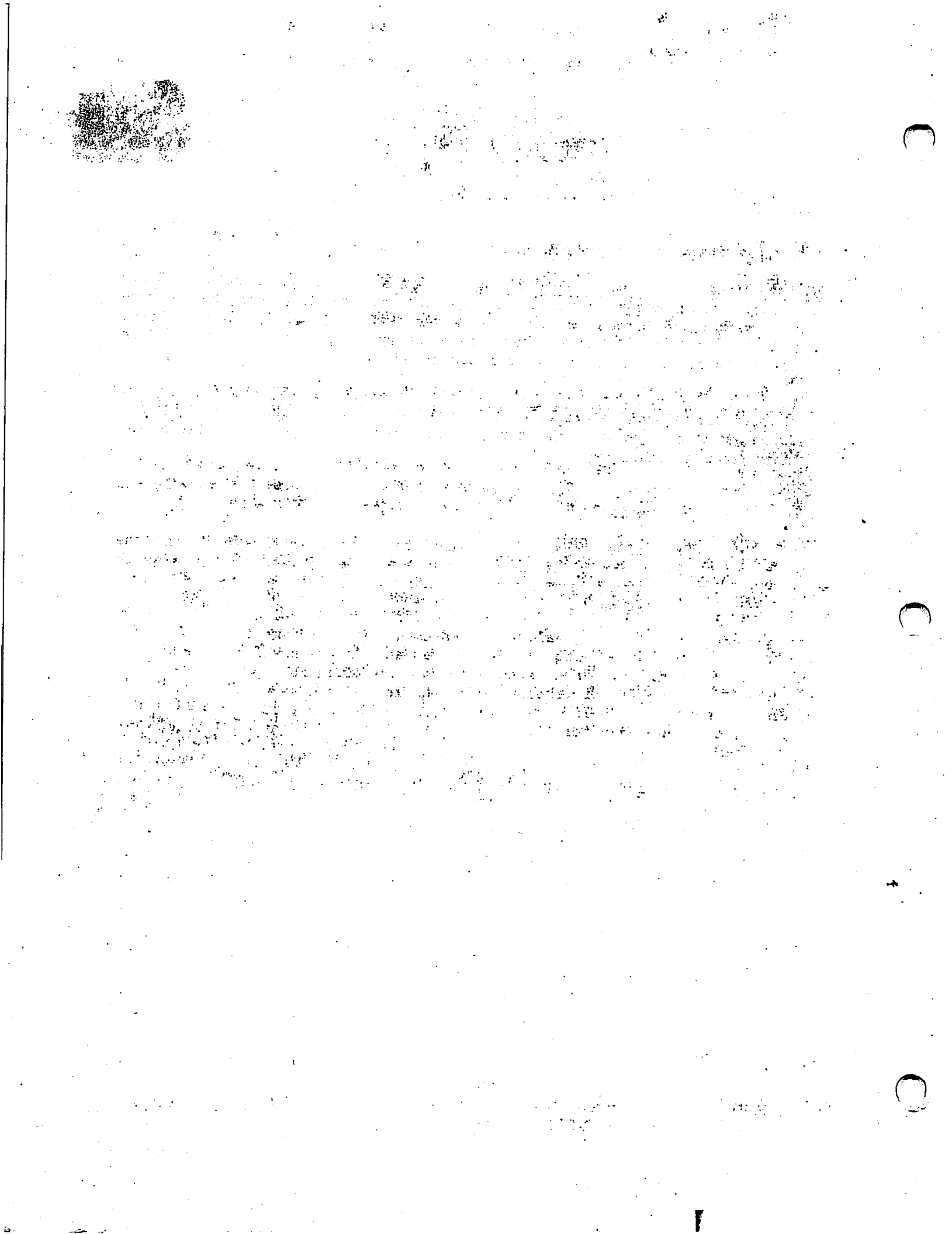
Wang is using two floppy configurations at this time.

Wangwriter Drive (WLN 278-4022): Requires a 330 ohm terminator. Every floppy drive needs a terminator in the system in order to operate properly. The terminator can be ordered under WLN 726-2419. Large number of 278-4022 drives have been shipped with incorrect 150 ohm terminators. The problem has been corrected.

PC/2275/OIS-40/50 Drive (WLN 278-4026): Requires a 150 ohm terminator. The terminator can be ordered under WLN 330-0842. In the Wang PC, the B Drive does not require the terminator. In all other applications the terminator is necessary.

- WARNING:
1. A drive without a terminator will fail during the format operation.
 2. A drive with the wrong terminator will work in the Wangwriter. If this system uses two drives, the drive with the wrong terminator will exhibit problems during the format operation.

278-4026 - TANJON, MPI, CDC



CC: Mike Bahia W0000600 6FLT3
From: Gary Marcotte Security: Limited
Subject: 270-5162 drives Date 02/10/95

Don

I completed the audit of the 97 drives from good stock. I found 18 of the Rev P. These will be returned to good stock today. Steve Maglio spoke to me about doing a scrap package with the remaining units due to the quantities of 5083 drives already in stock.

We also feel that a field purge of 270-5162 is needed. Please contact me about these issues.

Regards
Gary Marcotte
X8250

WANG LABORATORIES, INC.
MANAGEMENT INFORMATION SYSTEMS
REGIONAL SUPPORT CENTER CALL TRACKING SYSTEM
CALL HISTORY

TRACK NO: E992632 CONTACT: PARDOE JOHN C
 COMPANY: GEORGE WASHINGTON UNIVERSITY PHONE (202) 994-4494
 CALL SOURCE: T CALL STATUS: 190 PHONE ANL/CLOSED
 CALLER TYPE: 03 START DATE: 12/01/94 ACCOUNT PRIOR
 PRODUCT LINE: USOP START TIME: 09:48 PRODUCT TYPE:
 REPEAT CALL: N PTR XREF:
 REPEAT XREF: EMPL-NUMBER: 32609
 ANALYST ID: MB1 BAHIA 60256 MIKE
 PROBLEM DESC: VS5000/OS 7.40.01// CE UNABLE GET 360K FLOPPY TO WORK INTERN
 PROBLEM DESC: ISKETTE DRV THINKS HE NEEDS A PATCH
 PROBLEM PRTY: 2

TRX DATE TIME USER CALL STARTED ON 12/01/94 ON 9:48

12/01/94	9:48	PTM ST 000	CALL DIRECTOR	ELAP	0
12/01/94	9:50	PTM ST 110	PHONE ANAL GROUP	ELAP	0
12/01/94	10:09	MB1 ANALYST:	NEW MB1 OLD PRODUCT LINE: NEW OLD		
12/01/94	10:37	MB1	BUG IN O/S 7.40. 1.2M FLOPPY WON'T READ 360K DISKETTES. NEEDS PATCH SYSSERV 7.40.10. SENT VIA WANG OFFICE BY JH. CLOSE CALL.		
12/01/94	10:37	MB1 ST 190	PHONE ANL/CLOSED	ELAP	0

THE FOLLOWING 279 PART NUMBERS ARE USED ON THE COMMERCIAL
11X COMPUTER SYSTEM.

<u>DESCRIPTION</u>	<u>DRIVE NUMBER</u>	<u>11X DRIVE</u>
1.2 MB HH FLOPPY	278-4076/725-0258	279-0760
360KB 5-1/4"HH FLOPPY	278-4077/725-0257	279-0765
720KB 3-1/2" HH FLOPPY	278-4075/725-0259	279-0766
20MB 5-1/4" HH	278-4062/725-0242	279-0767
33MB 5-1/4" FH	278-4069/725-0254	279-0768
42MB 5-1/4" FH	278-4070/725-0255	279-0769
67MB 5-1/4" FH	278-4054/725-0231	279-0770
42MB 5-1/4" HH	725-3493	279-0773
145MB 5-1/4" FH ESDI	725-4033	279-0848
320MB 5-1/4" FH ESDI	725-4034	279-0849
1.MB 3 1/2" FLOPPY	725-3494	279-0824

THE FOLLOWING 279 PART NUMBERS ARE USED ON THE
7500-T 11X COMPUTER SYSTEM. THESE NUMBERS
WILL ONLY SPECIFY TEMPEST QUALIFIED VENDORS.

<u>DESCRIPTION</u>	<u>VENDOR</u>	<u>DRIVE NUMBER</u>	<u>11X TEMPEST</u>
33MB 5-1/4" FH	MICROPOLIS	278-4069/725-0254	279-0809
67MB 5-1/4" FH	MICROPOLIS	278-4054/725-0231	279-0810
360KB HH FLOPPY	PANASONIC	278-4077/725-0257	279-0811
1.2MB HH FLOPPY	PANASONIC	278-4076/725-0258	279-0812
720/1.44MB FLOP	MITSUBISHI	725-3494	279-0814
42MB 5-1/4" HH	CDC	725-3493	279-0815
20MB 3-1/2" HH	MINISCRIBE	278-4053/725-0231	279-0817

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2.2.4 3-1/2" DRIVES

<u>TESTED DRIVE P/N</u>	<u>UNTESTED P/N</u>	<u>VENDOR</u>	<u>VENDOR MODEL</u>	<u>CAPACITY</u>
278-4053	725-0235	Miniscribe	8425	20 MB
278-4072	725-1407	JVC	JD3812M	10 MB
Not assigned	725-4150	Miniscribe	8225XT	20 MB

2.2.5 5-1/4" TAPE DRIVES

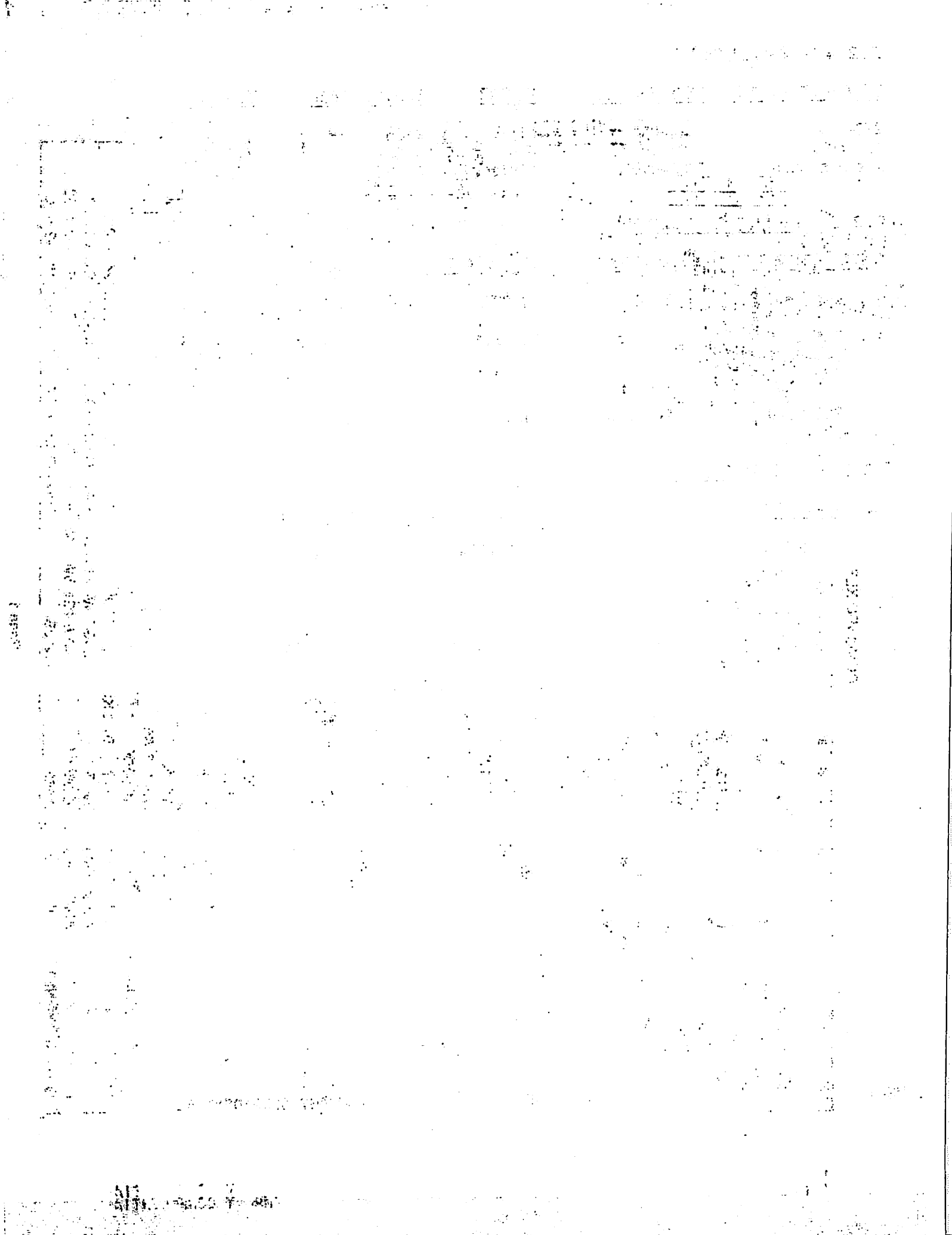
<u>TESTED DRIVE P/N</u>	<u>VENDOR</u>	<u>VENDOR MODEL</u>	<u>CAPACITY</u>
725-1481	Teac	MT-2ST/45DT	50 MB
725-0256 278-4051-711 278-4071-743	Cipher	540-711	60 MB
725-3820	Archive	2150S	150 MB

2.2.6 OPTICAL DRIVES

<u>TESTED DRIVE P/N</u>	<u>VENDOR</u>	<u>VENDOR MODEL</u>	<u>CAPACITY</u>
725-0273,4,5	LMSI	1200/1250	2 GB

2.2.7 HIGH CAPACITY WINCHESTER DRIVES

<u>TESTED DRIVE P/N</u>	<u>VENDOR</u>	<u>VENDOR MODEL</u>	<u>CAPACITY</u>
725-4850	Imprimis	Sabre PA8N1/PA8N2V	1 GB



CQVLINFO.XLS

P/N	Supplier	Vendor Code	Vendor Model	Description	Commodity Code	Spec #	Vendor Order #
7250147	Seagate	S11965009	ST6516J	516MB	RZZZZZZZZZZZZ	191-3019	963001-026
7250193	SEAGATE	S11965009	93137505	DUAL KIT	RAZZZZZZZZZZZZ	191-3061	93137505
7250238	Seagate	S11965009	ST6344J	344MB	RZZZZZZZZZZZZ	191-3061	992001-033
7250273	LMSI	O35155002	LD1200 DESK	12" OD WORM	RAZZZZZZZZZZZZ	191-3194	LD1250
7250275	LMSI	O35155002	LD1200 JB	12" WORM JB	RAZZZZZZZZZZZZ	191-3195	LD1250
7251748	FUJITSU	F73590001	CG004896-001	SCANNER	RZZZZZZZZZZZZ	191-FILL	CG004896-001
7251749	HP	H39500001	C1710A	JB	RACDAEEDFDCID	191-5061	C1710A-WANG
7251933	Exabyte	E82150001	8500	5GB 8mm	RAEDBEBHFEAJC	191-3479	850010-042
7253759	Cygnat	C98884001	LMSI UPGRADE	LMSI 4 to 5	RAZZZZZZZZZZZZ	191-	101-22363-45
7253760	Cygnat	C98884001	LMSI UPGRADE	2 to 3	RAZZZZZZZZZZZZ	191-	101-22363-23
7253761	Cygnat	C98884001	LMSI UPGRADE	3 to 4	RAZZZZZZZZZZZZ	191-	101-22363-34
7253806	ARCHIVE	A77110001	944091-001	TAPE PRODUCT	RAZZZZZZZZZZZZ	191-3260	944091-001
7253820	ARCHIVE	A77110001	2150S	150MB QIC DR	RAEMCCBFFJAJC	191-3301	22303-107
7253990	SEAGATE	S11965009	46584506	I/O KIT	RAZZZZZZZZZZZZ	191-FILL	46584506
7254849	PANASONIC	M00728001	LF-5012G	470MB WORM	RACDBCCDFEAJC	191-3488	LF-5012G
7254850	SEAGATE	S11965009	ST81236J	1.08GB	RAZZZZZZZZZZZZ	191-3396	968001-024
7254893	TEAC	T06005001	MT-2ST/N65-73W	150MB CASS	RAZZZZZZZZZZZZ	191-3468	MT-2ST/N65-73W
7255037	SEAGATE	S11965009	47059608	PANEL KIT	RAZZZZZZZZZZZZ	191-3396	47059608
7255053	PANASONIC	M00728001	LF-J5000	JB	RAZEIECDGDCEC	191-3489	LFJ5000G
7255067	STK	S75988001	4280 A01	18 TRACK	RAEDICBFGDCEC	191-3397	3100210104
7255069	STK	S75988001	9914	9 Track	RAEZZZZZZZZZZ	191-5060	3100010025
7255700	ARCHIVE	A77110001	21145-002	EXT. TAPE	RAZZZZZZZZZZZZ	191-FILL	21145-002
7255701	ARCHIVE	A77110001	20679-009	60M EXT	RAZZZZZZZZZZZZ	191-FILL	20679-009
7255703	ARCHIVE	A77110001	20777-108	60M INT	RAZZZZZZZZZZZZ	191-FILL	20777-108
7255706	ARCHIVE	A77110001	80302-003	CABLE & SW	RAZZZZZZZZZZZZ	191-FILL	80302-003
7255979	ARCHIVE	A77110002	185MX	VG FLOPPY TAPE	RAEACCBFFAAJJC	191-7246	
7255980	ARCHIVE	A77110001	2150	150MB VG	RAEMCCBFFJAJC	191-3301	
7255981	ARCHIVE	A77110001	4320NT	1.3GB DAT VG	RAEDCDBIFEAJC	191-5059	27959-001
7256171	ADAPTEC		AHA1740A	EISA-SCSI ADAAPTER			AHA-1740A
7256172	HP	H39500001	C1705A/M	144 CART. JB	RAZDAEEDADCIQ	191-7367	
7257067	MAXELL	M00788003		4mm 90m DAT Tap	RCSZZZZZZZZDRM	191-7276	
7257541	MAXELL	M00788003	186720	8MM CART	RCZZZZZZZZDKM	191-3480	186720
7257546	EXABYTE	E82150003	725113-A02	8MM CART	RAZZZZZZZZZZZZ	191-3479	725113-A02
7257665	ARCHIVE	A77110001	185-MX	MG FLOPPY TAPE	RAEACABFBAAJJC	191-7246	185-MX
7257917	STK	S75988001	9914 TABLE KIT	DESKTOP KIT	RAZZZZZZZZZZZZ	191-5060	245100091
7257918	ATG	A00273003	GD6001	6.4GB WORM JB	RACEQECBGDCEC	191-7258	GD6001/3B3
7257919	ATG	A00273003	GD6001	S/A 6.4GB WORM	RACEXECBGDCEC	191-7256	GD6001/2B3
7257920	CYGNAT	C98884001	1802	12' JB	RAZZIZCBAJJCZC	191-5060	1802-2-ATG

SUPPLIERS CONTACTED
REPLY CONTACTED & FAXED



TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 5116 REPLACES: _____ DATE: 06/25/85 PAGE 1 OF 1

MATRIX ID. 3110 PRODUCT/RELEASE# Winchester & Floppy Drives

TITLE: Listing of Qualified Suppliers of Winchester & Floppy Drives

PURPOSE:

To inform the field who the vendors are that are authorized to supply Winchester and floppy drives for Wang devices.

EXPLANATION:

Recently, there have been numerous cases of Winchester drives and floppy drives returned to the FSC's for repair, even though these drives were not supplied by Wang and are not on the Wang Qualified Vendor List.

When replacing a failed drive in a customer system, ensure that the drive was actually purchased through Wang by referencing the list of approved vendors shown below. Drives that are used in Wang systems have been specifically designed to meet Wang specifications. An "off the shelf" drive (even if purchased from a Wang qualified vendor) will not necessarily work in any or all Wang systems. At this time there is no method in place for distinguishing between an off the shelf drive and a Wang qualified drive. Until such time as a marking procedure can be implemented, the list of vendors below should be used as a guideline. If a vendor is not on the list below, Wang CE's should not service it. Instead, they should refer the customer to the vendor that they bought the drive from.

- 5 MEG Winchester 278-4027 Tandon (very early build PC's only)
(should only be found on in-house prototype systems)
- 10 MEG Winchester 278-4030 Seagate, IMI, Rodime
- 10 MEG Half High Winchester 278-4035 Seagate, NEC
- 10 MEG Half High Removable Winchester 278-4049 DMA
- 30 MEG Winchester 278-4034 Quantum

- Full Height Floppy 278-4026 Tandon, MPI, CDC
- Half High Floppy 278-4033 Shugart

As more vendors become certified to supply drives, this list will be updated.

GROUP: Peripheral Hardware Support Group MAIL STOP: 0125

COMPANY CONFIDENTIAL

WANG Laboratories, Inc.

SECRET

CONFIDENTIAL

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CONFIDENTIAL

Date: 05/07/91
Time: 08:50 am
Subject: STORAGE MINUTES
From: Steven C. Michaelides

M E M O R A N D U M

TO: DISTRIBUTION
FROM: STEVE MICHAELIDES
SUBJECT: MASS STORAGE MEETING/MINUTES
DATE: MAY 6, 1991

NEXT MEETING

DATE: MAY 9, 1991
TIME: 1:00 P.M. - 1:15 P.M. GUIDE
1:15 P.M. - 1:45 P.M. PC
1:45 P.M. - 2:15 P.M. VS, MIPS
2:15 P.M. - 2:45 P.M. WIIS

LOCATION: TOWER 2, FLOOR 4, CONFERENCE RM. C

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GUIDE STORAGE PRODUCTS

I 3 1/2" FDD 1.4 MB 18mm
Specification # 191-5067

GUIDE

P/N 725-4911

	<u>SCHEDULE:</u>		<u>Pilot</u>
<u>Production</u>	<u>FCS</u>	<u>SIT</u>	
	GUIDE: 12/3		
5/91	6/15/91	6/15/91	

		<u>Original</u>	
		<u>New</u>	<u>Actual</u>
4/30/91	EA SCHEDULE:	Epson	11/15/90

	<u>Q4FY91</u>	<u>Q1FY92</u>	<u>Q2FY92</u>	<u>Q3FY92</u>
Forecast:	400	1200	1600	2000

Epson

Evaluation (D. Locke)
Approval meeting to be scheduled after the SIT testing is complete.
Specification - Epson reviewed the specification.

SIT (Guide) - QA target completion date is 6/15/91.
Drive select instructions to be provided to Pilot.

Agency approvals

FCC passed in the the stand alone enclosure
ESD failed.

II 2 1/2-Inch 40MB AT
Specification 191-XXXX P/N 725-7928 GUIDE

<u>SCHEDULE:</u>	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
	Conner	5/91	6/15/91	6/15/91
	Seagate			

	<u>Original</u>	<u>New</u>	<u>Actual</u>
EA SCHEDULE:	4/1/91	6/1	

	<u>Q4FY91</u>	<u>Q1FY92</u>	<u>Q2FY92</u>	<u>Q3FY92</u>
Forecast:	300	1500	2000	2500

Conner (CP-2044)

Evaluation units received on 4/25/91.
Deliveries started at 50/wk on 4/26/91.
Passed FCC and ESD.

Seagate

Evaluation samples have been received.
Experiencing performance issues when running Norton Utilities benchmark. One unit returned to D. Locke for investigation.

JVC - Two units received and are being tested in the Guide.
Experiencing the same performance issues as the Seagate drive.

PC STORAGE PRODUCTS

I 3 1/2" FDD 1.4 MB 25mm (Vapor Gray Bezel, TTL) EXEC SERIES PC
Specification # 191-3495 P/N 725-3494-VG

<u>SCHEDULE:</u>	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
Mitsubishi	3/15/91	5/91	6/91	Complete
Chinon	6/91	7/71	7/91	5/10/91

<u>EA SCHEDULE:</u>		<u>Original</u>	<u>New</u>	<u>Actual</u>
Mitsubishi	4/15/91	5/1/91		4/15/91
Chinon		5/10/91		

<u>Deliveries</u>	<u>5/31</u>	<u>6/6</u>	<u>6/13</u>	<u>6/20</u>
	250 250	250	250	

Evaluation (D. Locke)

Mitsubishi

- Specification reflecting the new P/N 725-3494-VG expected to be updated by the next meeting.

Chinon

- Vapor gray bezel samples were tested with one bezel out of the three passed the Wang specification.
- Evaluation contingent on SIT testing.
- Low cost replacement for the 725-3494-GK. Medium gray bezel received. Expect approval by the next meeting.

I 3 1/2" FDD 1.4 MB 25mm (VG Bezel, TTL) (ctd) EXEC SERIES PC
Specification # 191-3495 P/N 725-3494-VG

SIT

Chinon - Targetting 5/10/91 to complete SIT.

FCC

Waiting for PCs with Chinon drives. (M. Britko)

II 5 1/4" FDD 1.2 MB (Vapor Gray) EXEC SERIES
Specification # 191-XXXX P/N 725-5083-VG

<u>SCHEDULE:</u>	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
Mitsubishi	3/15/91	5/91	6/91	Complete
Chinon		7/91	7/91	5/10/91

<u>EA SCHEDULE:</u>		<u>Original</u>	<u>New</u>	<u>Actual</u>
Mitsubishi		5/1/91		
Chinon		5/10/91		

<u>Deliveries</u>	<u>5/31</u>	<u>6/6</u>	<u>6/13</u>	<u>6/20</u>
	250 250	250	250	

Evaluation (D. Locke)

Mitsubishi

- Specification reflecting the new P/N 725-5083-VG to be updated by the next meeting.

PC STORAGE PRODUCTS

SIT Drives were send to PCS (S. Konetchy).

Purchasing

- Deliveries will start on 5/31/91.

Chinon

Evaluation (D. Locke)

- Compatability issue in reading 360 KB floppies.
- Vapor gray bezel - one out of three bezels passed.
- LED to change from red to amber.
- Evaluation completion is contingent on SIT testing.
- Replacement drive for P/N 725-5083
Medium gray bezels received and expect results by the next meeting.

SIT

- Drives were tested and were sent to (S. Konetchy) to initiate SIT.

FCC

- Waiting for PCs with Chinon drives.

IV 3 1/2" 40MB IDE EXEC SERIES
 Specification # 191-3400 P/N 725-4860

SCHEDULE:	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
Seagate	6/91	7/91	7/91	TBD
Conner	TBD	TBD	TBD	TBD

EA SCHEDULE:		<u>Original</u>	<u>New</u>	<u>Actual</u>
SEAGATE		6/1/91		
CONNER		6/7/91		

Forecast: Q1FY92
1350

Product requirements

- Low cost replacement by July 1, 1991

SEAGATE

Evaluation (D. Locke)

- Seagate vendor model # ST-351A.
- Targetting to complete the evaluation by June 1, 1991.

SIT

- Units were tested and were sent to (S. Konetchy)

FCC - One unit was received. Targetting 5/16/91 for completion.
(M. Britko)

CONNER

Evaluation (D. Locke)

- Ten evaluation units received on 4/19/91.
- Evaluation targetted for completion on 6/7/91.

PC STORAGE PRODUCTS

SIT

- Send units with specification to (S. Konetchy). (S. Michaelides)

Agency approvals.

- Send one unit to (M. Britko). (S. Michaelides)

V 3 1/2" 124MB AT Interface PC EXEC SERIES
Specification 191-5070 P/N 725-5215

<u>SCHEDULE</u>	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
Seagate	2/15/91	6/7/91	7/1/91	Complete
Conner	TBD	TBD	TBD	TBD

<u>EA SCHEDULE:</u>	<u>Original</u>	<u>New</u>	<u>Actual</u>
Seagate	4/19/91		
Conner	6/7/91		

Initial requirements: 5/31
 170

SEAGATE (Model ST 1144A) A plan is being put together by PCS to replace the 100 MB P/N 725-5056 with 124 MB P/N 725-5215. Targetting July 1, 1991 for phasing P/N 725-5215.

Evaluation (D. Locke)

- Approval contingent on SIT and agency approvals.
- Labels to be on drives starting with May 15 shipments from Seagate.

SIT - Testing in progress on 360/33C. Schedule for completion. (S. Konetchy)

CONNER

Evaluation (D. Locke)

- Ten evaluation units received on 4/19/91.
- Evaluation completion target is 6/7/91.

SIT

- Need drives and specification.

PC, MIPS, EISA, VS STORAGE PRODUCTS

I 5 1/4-inch 320MB HH SCSI WINCHESTER MIPS, VS PC 8-slot
EC-480-25C

Specification # 191-7247 P/N-725-4895 (Single Ended)
 P/N 725-4895-M (Micropolis only))

<u>SCHEDULE:</u>	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
SEAGATE				4/18/91

PC, MIPS, EISA, VS STORAGE PRODUCTS

	<u>Original</u>	<u>New</u>	<u>Actual</u>
EA SCHEDULE: SEAGATE			4/18/91

MICROPOLIS

- A new part number (725-4895-M) has been generated to support the PC product line which requires a formatted capacity of 337 MB.
- The VS product line will continue using P/N 725-4895.

I 5 1/4-inch 320MB HH SCSI WINCHESTER (ctd) MIPS, VS, PC 8-slot
EC-480-25C

Specification # 191-7247	P/N 725-4895 (Single Ended)
	P/N 725-4895-M (Micropolis only)

MICROPOLIS

- The BOM on the PC product line to change to the new P/N (725-4895-M) to guarantee that the PC product line utilizes the 337 MB formatted drive. (S. Konitchy)
- Purge stock in manufacturing to segregate Micropolis from Seagate drives. (J. White)
- Logistics to put a process in place to segregate the Micropolis drives from the Seagate drives and stock the Micropolis drives under the 725-4895-M part number. (J. White/K. Keegan)
- Contact all the Ireland and Taiwan of this change. (S. Michaelides)
- Send memo to Micropolis requesting a label change to include the new P/N 725-4895-M. (V. Mains)
- Generate labels with the new P/N 725-4895-M and have these labels installed on Micropolis drives in manufacturing and logistics.
- Investigate BIOS changes to select type 38 and what the impact is going to be on the PC product line. (S. Konitchy)
- Investigate whether Seagate can increase the capacity to 337 MB formatted. (V. Mains)
- Contact Micropolis to determine whether they can support Q4 total requirements. (B. Jones)

SEAGATE (alternate source)

Evaluation (V. Mains)

- Seagate to be put on hold until the issue of capacity compatibility (337 MB) on the PC is resolved.

II 4 mm Helical Scan (1.3 to 2.0)GB EC480-33C, MIPS, VS

191-5059	725-7931 Drive SE w/5 1/4-Inch Bezel/bracketts
191-7276	725-9178 Media (60 meters)
	725-XXXX Media (90 meters)
	725-9119 (60 meters non-Wang label)

SCHEDULE

	<u>FCS</u>	<u>SIT</u>
PC	4/18/91	Complete
MIPS	TBD TBD	
VS	TBD TBD	
GUIDE	TBD TBD	

PC, MIPS, EISA, VS STORAGE PRODUCTS

FORECAST:	<u>Q4FY91</u>	<u>Q1FY92</u>	<u>Q2FY92</u>	<u>Q3FY92</u>
EC-480-25C	38	68	71	56
MIPS				
VS				
GUIDE				

Verify that units shipping from Archive have the final configuration. (V. Mains/T. Masoud)

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MIPS, TEMPEST EISA

I 3 1/2" 200MB SCSI Interface MIPS, Tempest EISA
Specification 191-3496 P/N 725-5071

SCHEDULE:	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
MIPS		7/91	8/91	Complete
Tempest	6/91	7/91	8/91	TBD

EA SCHEDULE:		<u>Original</u>	<u>New</u>	<u>Actual</u>
CONNER		10/15/90	6/91	
SEAGATE				

FORECAST:	<u>Q1FY92</u>	<u>Q2FY92</u>	<u>Q3FY92</u>	<u>Q4FY92</u>
Tempest	200	200	200	200
MIPS				

Conner Model CP-3200

Evaluation (D. Locke)

- Schedule an approval meeting.
- Mounting in the MIPS requires changes to the mounting plate for the drive. Requested mechanical drawings from MIPS.

SIT (MIPS, TEMPEST EISA)

- MIPS complete. Tempest EISA needs to be done.

II 3 1/2" 420MB SCSI Interface Tempest EISA
Specification 191-5069 P/N 725-7929

SCHEDULE:	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
TEMPEST	5/91	7/91	8/91	TBD

EA SCHEDULE:		<u>Original</u>	<u>New</u>	<u>Actual</u>
SEAGATE		6/1/91		

Evaluation (D. Locke)

- Specification.
- Evaluation was targetted for completion on 6/1/91. A new completion date needs to be determined.

Purchasing (B. Jones)

- Obtain new quote from Seagate to determine when to proceed with a phase-in program for the 320MB 5 1/4-inch HH.

III CD-ROM 5 1/4-Inch HH SCSI PC/PRS

Specification 191-5068 P/N 725-4912

SCHEDULE:	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
PC/PRS	4/30	5/15	5/30/91	

EA SCHEDULE:		<u>Original</u>	<u>New</u>	<u>Actual</u>
TOSHIBA		4/31/91		

MIPS, TEMPEST EISA

FORECAST:	<u>Q4FY91</u>	<u>Q1FY92</u>	<u>Q2FY92</u>	<u>Q3FY92</u>	<u>Q4FY92</u>
PC/PRS	30	150	150	150	150

Product requirements:

- Medium gray bezel.
- Must be compatible with the Storage Module - connector to plug the remote ID switch, support two drives with the 5 Amp power supply. Id labels

Evaluation (D. Locke)

- Bezel colors delivery - Toshiba has stated that because of the low volume an NRE of \$5000 is required before they proceed to provide the Wang medium gray bezel.
- Initial shipments do not require medium gray bezels.

I 5 1/4-inch 1.37 GB FH SCSI WINCHESTER VS, MIPS
 Specification # 191-5071 P/N 725-7930 (SE)

SCHEDULE:	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
SEAGATE	4/1/91	5/1/91	5/91	Complete

Evaluation (D. Locke)

- Specification. Seagate is reviewing the specification.
- S&V 30Gs - Two drives with changes are expected to be in by 5/3/91.
- Production units with the S&V changes are targetted for the end of June, 1991.
- 52 units received status - Shipments are in progress with the MDSC-R. No S&V issues with this enclosure. Shipments with the SSM-C2 require ID cable adapter. Shipments with the MDSC-D are on hold until the S&V issue is resolved.
- Spares and add-on option drives to ship in Seagate packaging.
- Servo resonance - Experiencing head oscillation on two drives. A screen to be implemented at Seagate to screen for servo resonance.
- Voltage threshold - Seagate to implement resistor change to reduce the voltage threshold to +4.5V. Next shipment of drives to include this change.

I 5 1/4-inch 1.37 GB FH SCSI WINCHESTER (ctd) VS, MIPS
 Specification # 191-5071 P/N 725-7930 (SE)

Evaluation (D. Locke)

- ID jumper connector adapter (100) are due on 5/30/91.
- New shipments will include the ID connector that is compatible with the SSM-C2 storage module.
- Failure analysis on failed units.
- Process audit.

Purchasing (D. Higgins)

- New delivery schedule with the final configuration:
- | | | |
|-------------|-------------|-------------|
| <u>5/13</u> | <u>5/17</u> | <u>6/15</u> |
| 50 | 50 | 100 |

VS, MIPS STORAGE PRODUCTS

Compliance testing

ESD - DSC-R failed with the 1.37 Gb and 510 MB optical drive.
Both drives passed in the SSM-C2 and MDSC-D.

II	<u>5 1/4-inch ERASABLE (MO) 510 MB/side</u>	<u>VS</u>
	Specification 191-5062	P/N 725-9023 (Drive)
	191-7274	P/N 725-9056-5 (325 MB Media)
	191-7275	P/N 725-9423 (500 MB Media)

<u>SCHEDULE:</u>	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
Maxtor	3/91	4/91	5/1/91	TBD

<u>EA SCHEDULE:</u>	<u>Original</u>	<u>New</u>	<u>Actual</u>
MAXTOR	1/15/91	5/1/91	

Forecast - the forecast for Q4FY'91 was developed with VS PP&M.
It assumed FCS to start on 5/1/91.

<u>FORECAST:</u>	<u>Q4FY91</u>	<u>Q1FY92</u>	<u>Q2FY92</u>	<u>Q3FY92</u>	<u>Q4FY92</u>
VS	100	200	350	500	500

MAXTOR

Evaluation Drive (V. Mains)

- Approval was targetted for 5/1/91.
- Revision 6.1 has been received for testing. Changes are required to 6.1 to address seek errors.
- Nineteen (19) 2P units that have been received need to be updated to the final code.
- ISO Media interchange.

Purchasing (D. Higgins)

- Pilot (22) units - Four FCC screened units (1P) have been received and are being used for media testing. Ten (10) 2P version received. The balance of seven units should not be shipped until the code issues are resolved.
- Labels needed for the fourteen units received. All new units must have these labels.

Agency approvals (M. Britko)

- ESD needs to be completed with the MDSC-R.

Media (B. Beaudete/Ann Raymond)

- Investigate 20% fallout at PDO.
- Baicel media sample availability.

III	<u>SCSI R/R</u>	<u>DYNAMIX, VS5000/VS7000</u>
	Specification 191-7256	P/N 725-5069 (Drive RKMNT) w/SE PCB
		P/N 725-7915 (SE PCB)
		P/N 725-7917 Stand Alone Kit

New package (V. Mains)

- Expect new design the end of April. First article is targetted for the end of May.

VS, MIPS STORAGE PRODUCTS

Rackmount configuration release. ESD failed at 11KV.

A memo to release for customer shipments will be generated.
(S. Michaelides)

5 1/4" 125 MB Solid State Disk

VS

120 MB 191-XXXX

725-7936

NEC evaluation cancelled. Investigating alternative technology.

A NCPO has been placed with Newer Technology for one unit.
Target date for shipment is 5/6/91.

WIIS STORAGE PRODUCTS

5 1/4-Inch 500 MB MULTI-FUNCTION (PC)

WIIS

Specification 191-5063

P/N 725-XXXX Multifunction Drive

P/N 725-XXXX Cleaning Kit

SCHEDULE:	<u>Pilot</u>	<u>Production</u>	<u>FCS</u>	<u>SIT</u>
			TBD	

EA SCHEDULE:	PANASONIC	<u>Original</u>	<u>New</u>	<u>Actual</u>
		6/15/91		

PANASONIC (model 7012G)

Requirements:

- Mechanically must be compatible with the 470 MB WORM.
- ID connector must be compatible with the 470 MB WORM.
- Medium gray bezels.
- Wang Inquiry command.
- SE (single-ended) drivers/receivers.
- Replacement product for the 470MB WORM in both stand-alone and jukebox configurations.

Evaluation (V. Mains)

- Preliminary specification given to Panasonic.
- Evaluation was targetted for completion on 6/15/91. The FCS schedule needs to be revisited to determine whether to move the evaluation further out.
- Jukebox compatibility.

OS support

- Target date is January, 1992. This date is being reviseted for a possible pull-in.

II High Capacity 12" WORM WIIS

Specification 191-7258

725-7918 DIFF drive for Jukebox

725-7919 DIFF(stand-alone drive)

191-1007

725-8012 (Media)

725-5083

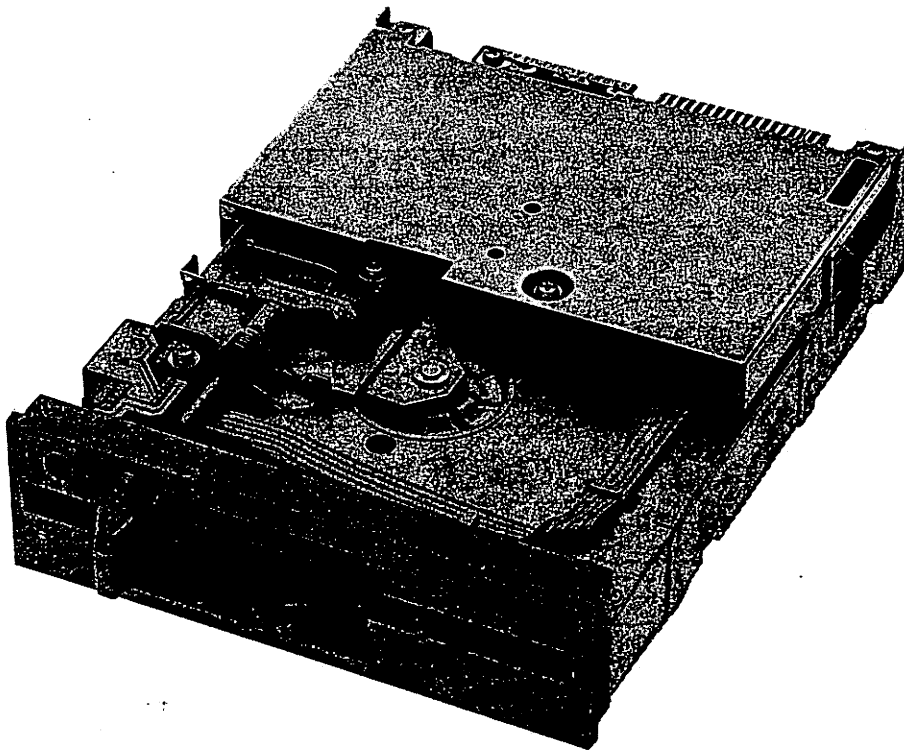
CHINON

5-1/4" FLOPPY DISK DRIVES

NOT SUPPORTED ON VS & 2200 (NO DOOR SW)

SPECIFICATIONS

MODEL: FR-506 (96 TPI, 1.6 MB/1 MB)



CHINON INDUSTRIES, INC.

1. SCOPE

This specification describes 5-1/4" double-sided 1.6 MB/1MB switchable 96-TPI minifloppy disk drive (hereafter abbreviated as FDD) CHINON FR-506 which employs a single CUSTOM IC and a lead screw stepping motor.

2. FEATURES

The features of the FR-506 are as follows:

(1) Large Capacity Up-to 1.6M bytes

The FR-506 is a double-sided, high-density, double-track type and its capacity is 1.6M bytes, in unformatted mode. The read/write selection of the high density 1.6M bytes, 96 TPI and double density 1M bytes, 96 TPI disk can be carried out by changing either the motor speed (360 rpm/300K rpm) or transfer rate (500K BPS/300K BPS). In addition, as the data retrieval from 250K bytes, 48 TPI disk to 500K bytes, 96 TPI disk is possible, the former software packages can be read.

(2) Pop-up Mechanism

With the newly employed pop-up mechanism, the disk can be loaded/unloaded with ease, preventing mischucking at disk insertion.

(3) Low Power Consumption

As a newly designed single CUSTOM IC is employed in the read/write and control circuits, high performance and low power consumption are achieved. In stand-by mode, power consumption is only 0.89W, and in operation mode 5.34W, making system design easy.

(4) Built-in Disk-in-sensor

With the built-in disk-in-sensor, when no disk is loaded, the motor is stopped. This extends the motor service life and reduces power consumption. When the disk is inserted, the DD motor is rotated temporarily to assure the centering of the disk. DISK CHANGE signal will be output by this sensor, also.

(5) Various Disk Readings

With the FR-506, the various disk readings shown below are possible, existing software written in 48 TPI format can be used without any conversion.

Disk Used	Normal Density				High Density
	48 TPI		96 TPI		96 TPI
Track Density					96 TPI
Storage Capacity	250 KB	500 KB	500 KB	1 MB	1.6 MB
Rate of Data Transfer	250K/300K BPS	250K/300K BPS	250K/300K BPS	250K/300K BPS	500K BPS
Rotational Speed	300/360 rpm	300/360 rpm	300/360 rpm	300/360 rpm	360 rpm
Data Read	○	○	○	○	○
Data Write	*○	*○	○	○	○

* Data can be read by this drive, but data can not be read by the drive having a head made solely for 48 TPI use.

3. SPECIFICATIONS

3-1. Specification (1)

Item			CHARACTERISTIC			
			HIGH DENSITY		NORMAL DENSITY	
Recording mode			FM	MFM	FM	MFM
Storage capacity	Unformatted	Per disk	833 KB	1666 KB	500 KB	1000 KB
		Per track	5.208 KB	10.416 KB	3.125 KB	6.25 KB
	Formatted	Per disk	615 KB	1229 KB	327.68 KB	655.36 KB
		Per track	3840 B	7680 B	2048 B	4096 B
		Number of sectors	15		16	
		Per sector	256 B	512 B	128 B	256 B
Recording density			4935 BPI	9870 BPI	2961 BPI	5922 BPI
Rate of data transfer			250K BPS	500K BPS	125K/150K BPS	250K/300K BPS
Access time	Power-on to ready time		0.5 sec or less			
	Single track seek time		3 msec			
	Average access time		94 msec			
	Settling time		15 msec			
	Average latency time		83.3 msec	100 msec/83.3 msec		
Rotation speed			360 rpm	300/360 rpm		
Number of tracks			160			
Number of cylinders			80			
Track density			96 TPI			
Number of heads			2			
Number of index			1			
Radius of track	Outer track	Side 0	57.150 mm			
		Side 1	55.033 mm			
	Inner track	Side 0	36.248 mm			
		Side 1	34.131 mm			

3-2. Specification (2)

Item	Specification			
Physical dimensions	146 (W) × 41 (H) × 193 (D) mm			
Weight	970 g			
Power supply	DC + 12 V ± 5%			
	DC + 5 V ± 5%			
Power consumption		+5 V	+12V	POWER
	Stand-by	230 mA TYP.	16 mA TYP.	1.34 W TYP.
	Read	330 mA TYP.	210 mA TYP.	4.17 W TYP.
	Write	340 mA TYP.	230 mA TYP.	4.46 W TYP.
	Seek	220 mA TYP.	620 mA TYP.	8.54 W TYP.
	Spindle Motor Starting current (0.5 sec. max.)		900 mA MAX.	
Ripple voltage allowance	DC + 12 V	Less than 150 mVp-p (including spike noise)		
	DC + 5 V	Less than 100 mVp-p (including spike noise)		
Noise	Less than 55 phons (class A) (separated from the drive by 1m)			
Cabinet specifications	Front panel	Material: ABS Color: Beige		
	Front lever	Material: ABS Color: Beige		

9. SHORT PLUG AND FRONT LED

9-1. Short Plug

The assignment of each pin is shown Fig. 9-1.

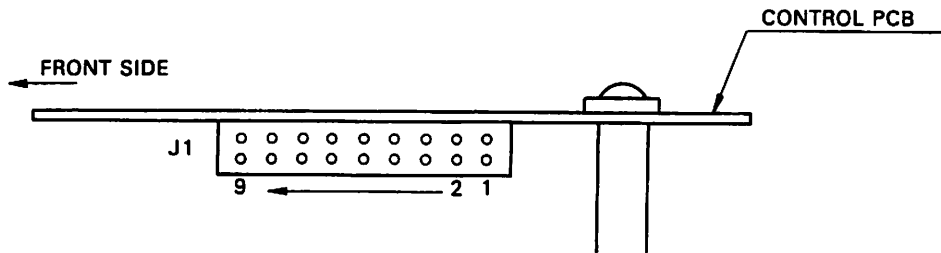


Fig. 9-1 Short Plug

This diagram shows the side of the drive.

CHINON FR-506 high density 1.6MB to 1MB switchable floppy disk drive can be configured in several operation modes using "SHORT-PLUGS" according to the table below.

Mode descriptions	Connector "J1"								
	1	2	3	4	5	6	7	8	9
1.6MB to 1MB variable speed switchable using Pin #2 as change-over input Pin #2: High = 1.6MB (360rpm)/Low = 1MB (300rpm) Pin #2: High = 1MB (300rpm)/Low = 1.6MB (360rpm)	○	○	—	—	—	※	○	※	○
1.6MB to 1MB switchable at 360rpm, IBM PC/AT compatible Pin #2 as change-over input ● Pin #2: High = 1.6MB (360rpm)/LOW = 1MB (360rpm)	○	—	○	—	—	—	○	○	—

●: The short plug is factory set at this position.

"○" = Position closed

"—" = Position open

"※" = Selectable at factory shipment according to NOTES.

NOTES:

- PIN #2: Card-edge Connector (PJ1)-2
- Position 1 through 9 of the "J1" are designated as follows.
 - POS.1: Connect the termination resistors when closed
 - POS.2: Configure the drive as "DRIVE0" when closed
 - POS.3: Configure the drive as "DRIVE1" when closed
 - POS.4: Configure the drive as "DRIVE2" when closed
 - POS.5: Configure the drive as "DRIVE3" when closed

			FDD CONDITION	
POS.6	CLOSED	INPUT to DRIVE SELECT or INUSE		LED "ON"
	OPEN	INPUT to DRIVE SELECT		
POS.7	CLOSED	INPUT to PIN #2	HIGH	1.6MB MODE
			LOW	1MB MODE
	OPEN	INPUT to PIN #2	HIGH	1MB MODE
			LOW	1.6MB MODE
POS.8	CLOSED	OUTPUT from PIN #34		DISK CHANGE
	OPEN			READY
POS.9	CLOSED	Rotation speed of DD motor		360/300RPM switchable
	OPEN			360RPM fixed

3. Only one out of 4 positions (Position 2 through 5) can be closed at user's option.



TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 9704 REPLACES: _____ DATE: 04/28/92 PAGE 1 OF 1
MATRIX ID. 8103 PRODUCT/RELEASE# DISKETTE DRIVES
TITLE: PC FLOPPY DISKETTE DRIVE JUMPER SETTINGS

PURPOSE:

To inform the field of the need to verify jumper settings on PC floppy diskette drives, particularly the Mitsubishi 5.25" 1.2MB floppy diskette drive. Incorrectly jumpered floppy diskette drives may cause 'Invalid Configuration' errors.

EXPLANATION:

When replacing a PC floppy diskette drive, the jumper settings need to be verified and set as required to operate in the PC. Recently, there have been floppy disk drive problems reported that are the result of incorrect jumper settings, particularly on the Mitsubishi 5.25" 1.2MB floppy disk drives. These errors usually result in 'Invalid Configuration' errors when the PC goes through the POST test, and/or, cannot read 360K floppy diskettes. To correct this problem, ensure the following jumpers are set:

JUMPER NAME	JUMPER SETTING
SS	OUT
SB	IN
DS1	IN
DS0	OUT

Additional floppy diskette and hard disk jumper information can be found in TSB HWG 9055.

GROUP: Personal Computer Systems Support MAIL STOP: 013-99A

COMPANY CONFIDENTIAL
Wang Laboratories, Inc.



TECHNICAL SERVICE BULLETIN

SECTION: HardWare Technical

NUMBER: HWT 9592 REPLACES: _____ DATE: 04/23/91 PAGE 1 OF 1

MATRIX ID. 3110 PRODUCT/RELEASE# PC200/300 series PCs

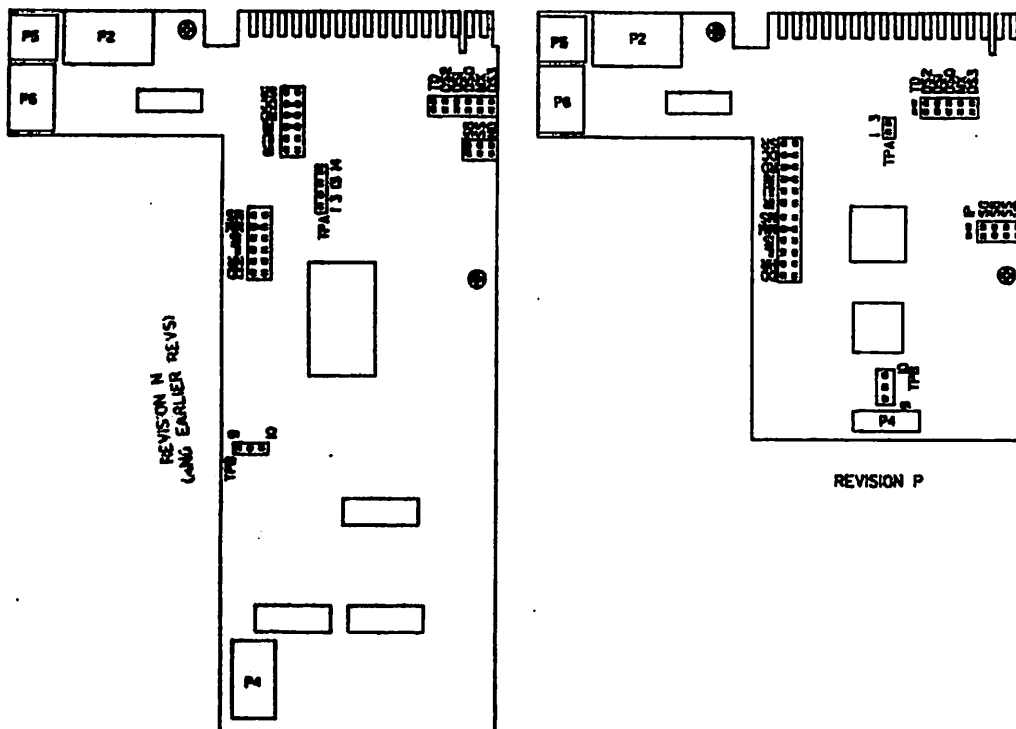
TITLE: 725-5083-VG and 725-5083 floppy drive PCB layout change

PURPOSE:

To inform the field of a change to the PC board layout on the Mitsubishi, model # MF504C-327UW, 725-5083-VG and 725-5083 5 1/4" 1.2Mb floppy disk drive.

EXPLANATION:

Mitsubishi has changed their PC board layout, but there have not been any jumper changes involved in this design change. However, the location of the jumper headers has been altered per the following diagram. There are no labels to designate the change. A Mitsubishi revision level of "P" incorporates this new board design.



GROUP: Peripheral Support Engineering MAIL STOP: 014-490

COMPANY CONFIDENTIAL
WANG Laboratories, Inc.

Intended For:

This Item is In Progress

Author: Mike Bahia

Subject: 2270V7 JUMPER SETTING

To: Mike Bahia
Subject: 2270V7 JUMPER SETTING

From: LLUIS GARCIA SALA
Date Sent: 01/15/96

Hi Mike:

I had a visit to the costumer to verify the sw setting and the SW2 on bank 2 is Off, Excuse me to say you a wrong information. Now I discovered the problem in the terminator of the drive. I cut the pin 4 of terminator and I put a wire between pin 2 and 4 in the hole and now the led of the drive functions ok and mounts volumes without problems. Thats all. Thanks for your attention, patience and help. Best regards.

Lluis Garcia Sala (Barcelona).

Respuesta

A: LLUIS GARCIA SALA
Asunto: 2270V7 JUMPER SETTING

De: Mike Bahia
Enviado: 12/01/96

Lluis,

If using the Mitsubishi 1.2M Floppy, Sw 6 on bank 2 must be in the OFF or OPEN position. As you indicated on your initial memo it also must be a rev P with a special terminator. If you are using the Mitsubishi, make sure the jumpers & the terminator are correct per the TSB I forwarded to you. Also make sure the power cable is making good contact with the drive. The power cable uses cylinder shaped female connectors on the drive end which generally have a m which can begin to spread open resulting in poor contact. If you have any floppy drives exhibiting the problem, you could send it to me for testing if that would help. Let me know.

Regards, Mike

Original Memo

To: Mike Bahia
Subject: 2270V7 JUMPER SETTING

From: LLUIS GARCIA SALA
Date Sent: 01/12/96

Hi Mike:

I changed the drive and RCU Board and Sw 6 on bank 2 in on position. The problem persist and for mount drives we must close the door slowly. If I close the door fast, the drive doesn't mount the volume. There is no problem for customer mount the drive slowly and the led on drive doesn't function properly. Thats all for the moment. There is not a critical problem. Thanks for your help and regards.

Lluis Garcia (Barcelona) Spain

Reply

Lluis,

Thanks for the update. I am glad we were able to help.

Regards, Mike

To: Steve Barker
From: Dick Locke
Subject: Mitsubishi Floppy for VS #725-5083VS
Date: December 21, 1992

As discussed today, the Mitsubishi floppy model# MF504C-327UW used on the VS must be revision level "P". This is the current rev shipping from Mitsubishi today and is the only rev that should be used in the VS. Use of any other revision will have to be evaluated for compatibility with the "P" revision drive. All previous rev drives are being used by the P.C. manufacturing lines.

To: Jeff Pancoast
From: Dick Locke
Subject: 725-5083-VS Floppy Drive from Mitsubishi
Date: February 23, 1993

Mitsubishi has notified me of a revision change to the current REV P drive that we are buying for the VS. As you are aware, on the rev P drive, the terminating resistor pack is removed and a specially configured S.I.P. is installed enabling the drive to work on the VS.

In an effort to continue to reduce cost on the drive, Mitsubishi is in the process of implementing REV S. The main difference that impacts us most is that the terminating resistors are now fixed on the PCB. This will make it difficult to implement the necessary changes for the drive to work on the VS.

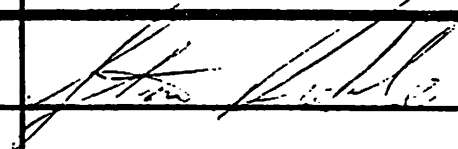
Since REV P is the only drive that we currently have for the VS, it will be necessary to plan for this revision change. I am in the process of working with Mitsubishi to understand availability of REV P drives and the time schedule for implementing REV S.

cc:
K. Arsenault
D. Paradis

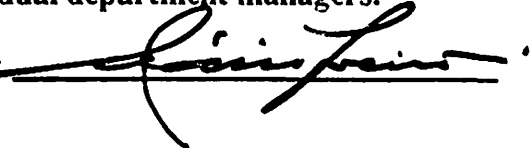
TEMPORARY MANUFACTURING DEVIATION

Originator <i>Mario Soeiro</i>	Date 9/ /92	M/S 018-25B	Ext. 67425	Ref. TMD
Part Number 725-5083	Description 1. 2MB Mitsubishi Foppy		Model Number VS5000/6000	
Customer Work Order Number/Quantity			ECO Number (if applicable) 60841 (attached)	
Effective Date 11/2/92		Expiration Date 12/14/92		

AFFECTED AREAS

AREA AFFECTED *	Y/N	QTY	MANUFACTURING MANAGER
VS Products	Y		
Mass Merchandise	N		
SMT/Wave/Stock Prep	N		
Desk Top	N		
Secure Systems	N		
Wang Puerto Rico	N		
Wang Mexico	N		
SDC	N		

* If multiple manufacturing areas are affected the signature of a business director may be obtained in lieu of individual department managers.

Engineering 
CATA _____

TEMPORARY MANUFACTURING DEVIATION

Completely describe deviation: Include instructions for rework, assembly, and test, etc. Add drawings and visual aids as necessary.

REASON:

Many months ago, Panasonic notified Wang that they would be discontinuing the floppy drive WPN. 725-0258-G that is used in Wang's VS5000/6000 series. This particular drive is specially modified per Wang's specification from many years ago. Unfortunately, there is no direct substitution, but the Mitsubishi drive (WPN.725-5083) comes very close.

REV P ONLY

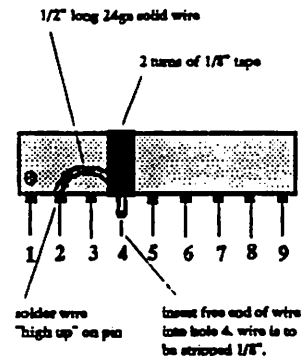
The following pertains to the rework set by R&D to use the Mitsubishi drive in the VS5000/6000 units. It should be noted that these changes cannot be accurately defined as rework; they should be described as a conversion. The only rework that may be required is to the SIP used on the current 725-5083 drive on an interim basis. A new resistor pack is to be manufactured for Wang by the Bourne Company.

FOR VS5000/6000 MIN EMCALCULC 1.06.03 RCU BAD SW BK 2, SW 6 OFF. MUST BE ON FOR PANASONIC.

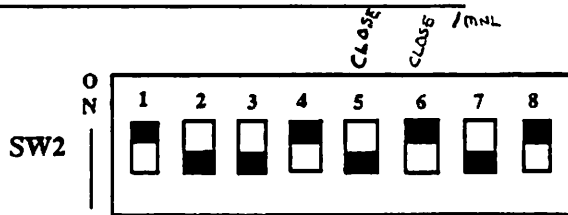
MITSUBISHI Terminator Resistor Pack REWORK INSTRUCTIONS:

Modify as follows:

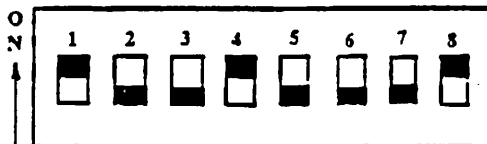
- 1) Remove resistor pack off Mitsubishi drive. R-pack is located near gold-plated finger connector.
- 2) Cut pin 4 completely off right at body of connector.
- 3) Wrap 1/8" tape (permacel) around body of R-pack @ pin 4 location. Wrap two complete turns of tape.
- 4) Attach a 1/2" long piece of 24 ga solid wire (600-9012) to pin 2.
- 5) Insert other end of wire into hole 4 of R-pack socket.
- 6) Insert remaining SIP pins into the respective holes.
- 7) Refer to diagram at right for illustration of modified R-pack.



RCU (9109) SW2 SWITCH SETTINGS:



Using Panasonic drive

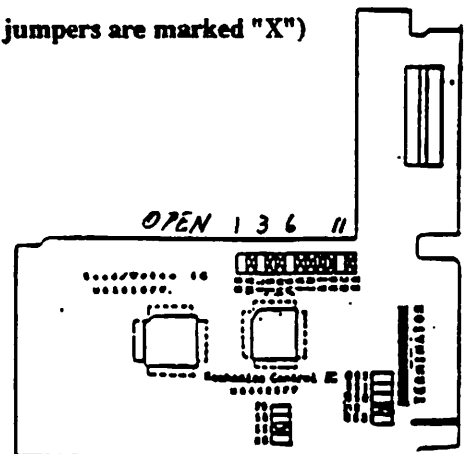


Using Mitsubishi drive

FLOPPY DISK JUMPER SETTINGS

Mitsubishi Model MF504C-3
 Revision P

(All jumpers are marked "X")



TMD COST ANALYSIS

3031
3024

Submitted By: Mario Soeiro Date: _____

TMD Number _____

Part Number(s)	Quantity
<u>725-5083</u>	<u>N/A</u>
_____	_____
_____	_____

Detailed statement of problem:

The Terminator resistor shipped with the Mitsubishi drive must be removed from it's socket and replaced with a new terminator resistor pack designed for Wang [REDACTED] Because the new terminator is yet to be delivered, the Mitsubishi terminator will be modified to allow ship product.

The RCU switch settings, and the drive jumper settings will later be added to the documentation.

Recommended Solution:

- a) Modification of the terminator (supplied w/drive) accordingly to the instructions on page 2 of 3
- b) Set RCU board switch settings accordingly to instructions on page 2 of 3.
- c) Set drive Jumper settings as shown on page 2 of 3.

Indicate the material cost and labor hours associated with the TMD. Labor hours should include assembly, repair, test, material handling, Engineering and Material Acquisition.

FORMULAS:

- A = Total material cost to implement TMD**
- B = (Hours per unit) x (Number of units)**
- C = B x \$17.00**
- D = A + C + \$76.50**

Activity	Hours Per Unit	Total Hours	Labor Rate	Total Cost
Materials	N/A	N/A	N/A	(A)
Labor	.033	(B)	\$17.00	(C)
Administrative	N/A	N/A	N/A	\$76.50
Total				(D)

Comments:

Rework cost cannot be calculated due to the unknown number of units this will apply.
 This TMD will expire on it's expiration date, or upon availability of the Bourns SIP 4609X-TBA-000 (WPN.333-0988) whichever arrives first.

JMDM 3051 4084

WANG ECO

CONTROL NO 60841

PRIORITY 1
 PHASE-IN 2 X
 DOCUMENTATION 3

ORIGINATOR: TOM KYTE DEPT: 022 EXT: 78094 M/S: 014-49A SHEET 1 OF 1
 DATE: 10/26/92

PART(S) AFFECTED: P/N DESCRIPTION:
 187-6000 187-6002 VS6000 CHASSIS ASSEMBLIES
 279-5525 VS1&2 1.2MB FLOPPY ASSEMBLY
 MODEL(S) AFFECTED: DWG(S) AFFECTED:
 VS5300 VS5600
 VS6000

DESCRIPTION OF CHANGE:

CHANGE BOMS 187-6000, 187-6002 AND 279-5525 AS FOLLOWS:

WLI#	DESC	QTY	QTY	COMP	UM
		TYPE	TYPE	TYPE	
DEL. 725-0258-G 5	1/4" 1.2MB FLOPPY	1	1	1	EA
ADD 270-5162	1.2MB FLOPPY W/TERM	1	1	1	EA

CHANGE ITEM STATUS FROM 1 TO 2 FOR BOM 270-5162

CHANGE BUILD SITE CODES FOR BOM 270-5162 AS FOLLOWS:

FROM: TO:
 PRIMARY PRIMARY SECONDARY TERTIARY
 03 07 13, 03

REASON/SYMPOM FOR CHANGE:

CURRENT FLOPPY DRIVE FOR VS5000 & 6000 SYSTEMS ARE NOT AVAILABLE FROM VENDOR. NEW FLOPPY DRIVE ASSEMBLY REPLACES OLD DRIVE
 RELEASE PRODUCT AND CHANGE BUILD SITE CODES TO MANUFACTURING

DISPOSITION CODES:
 1-Use As is 2-Rework
 3-Scrap 4-Next Order 5-See Remarks

Cust. Units	Field Spare	Field Ret.	Fin. Goods	Stock	WIP	Next Order
1	1	1	1	1	1	2

EFFECTIVITY DATE CONFORMANCE DATE

REMARKS:

CURRENT BUILD SITE INFORMATION	PB	PKWD	ME	WPR
	IR	X	TAI	MX
	X		TAI	MX

APPROVALS SIGNATURE DATE

ECO CHAIRPERSON *[Signature]* 10/26/92
 PROGRAM MGR.
 DESIGN ENG.

COMPLIANCE ENG.
 SECURE SYSTEMS
 ORIGINATOR TOM KYTE 10/26/92
 ECO ANALYST
 OTHER

MEMORANDUM

May 25, 1994

To: Tom Masoud
George Reinhart
Jim Davidson
John Frissell

From: Don Paradis
77114

Subject: Mitsubishi Floppy Drive

Once again Mitsubishi has revised their floppy drive, model MF504C-318UG. I have checked the wiring between the terminator and the connector and have found that the wiring is exactly the same as the former revision. In case you have forgotten, we developed a special terminator for this drive a couple of years ago in response to Panasonic obsoleting their drive.

I successfully ran DISKINIT on a VS5000, which included INITIALIZE, REFORMAT, RELABEL, and VERIFY functions--no difficulties were encountered. It's manufacturing's responsibility to do more extensive testing to insure no burn-in problems exist.

The drive which was given to me for verification has a manufacturing date of 9-92. Tom, is this drive the latest and greatest?

Model MF504C-318UG
Ser739975

Signed. Don Paradis

ONLY REV P MITSUBISHI DRIVES WILL WORK ON VS/2200. THIS WAS
A REV P DRIVE.

WANG

**MANUFACTURING
TEST PROCEDURE**

STAMP



PART NO

278-4033/725-0142-G

REV

1

SH

6

DESCRIPTION

5 1/4 " 360 KB FLOPPY DISK DRIVE

TEST TYPE

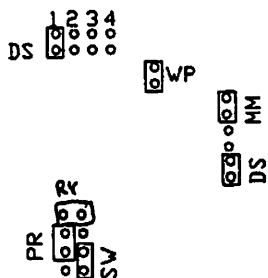
TEST PROCEDURE

JUMPER CONFIG

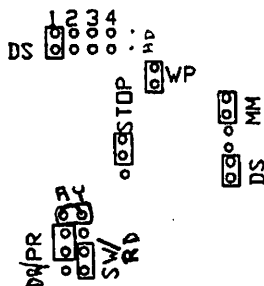
SHUGART 455-2/455-3



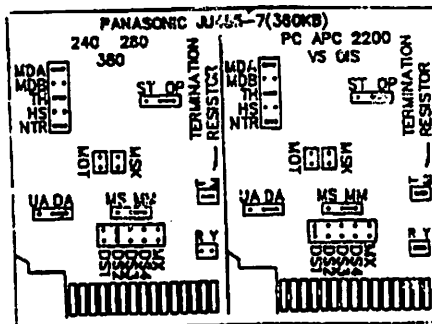
PANASONIC JU-455-5



PANASONIC JU-455-6



PANASONIC JU-455-7



RY MUST BE IN FOR 2200
OR CACHE NOT CLEARED.

5 1/4" PANASONIC FLOPPY 360K

WANG

TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 6192 REPLACES: N/A DATE: 08/19/86 PAGE 1 OF 1
MATRIX ID. 3101 PRODUCT/RELEASE# SA 455 (VLSI)
TITLE: Jumper Configuration JU455-6

PURPOSE:

To inform the field of the jumper configuration for the SA 455 with the VLSI board.

EXPLANATION:

The Panasonic floppy drive (Wang Part No. 278-4033) using the VLSI board uses the following jumpers. A drive configured with these options will work on the Wang Office Assistant, PC, 2275, PIC, and OIS 50/60.

PLUG JUMPER	DESCRIPTION	OPEN	SHORT
DS1	DRIVE SELECT 1		X
DS2,3,4	DRIVE SELECT 2,3,4	X	
WP	WRITE PROTECT		X
MM	ENABLES DRIVE MOTOR WITH MOTOR ON		X
DS	ENABLES DRIVE SELECT IN A MULTI SYSTEM		X
MX	CONSTAN DR SELECT FOR SINGLE DR	X	
MS	ENABLES DR MOTOR WITH DRIVE SELECT	X	
DR	ENABLES DR READY WITH DR SELECT	X	
RR	READY ENABLE FROM +READY OR SW		X
SW	DOOR SWITCH		X
RD	ENABLES TRUE READY	X	
RY	READY SIGNAL		X

Termination for each input line is accommodated by a 150 OHM resistor pack installed in dip socket located on the logic board.

The hardwired jumpers configuration of this board should not be modified.



TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 8042 REPLACES: _____ DATE: 03/29/88 PAGE 1 OF 1
MATRIX ID. 3110 PRODUCT/RELEASE# 360k Floppy Drive(Panasonic #JU-455-6)
TITLE: Jumper configuration for PC/APC and PC 200/300 360k drives

PURPOSE:

To inform the field of the jumper configuration differences between PC/APC and PC 200/300 360K floppy drives.

EXPLANATION:

Some PC 200/300 floppy drive options (DSK-0360-PC2) were recently shipped from manufacturing configured for PC/APC systems. These drives would neither floppy IPL or allow floppy drive access. The following information will allow the field to reconfigure the drive and eliminate the need for unit replacement. The error only occurred on the Panasonic model #JU-455-6 version of the drive. This Panasonic model # is found on a label located on the back of the affected drives.

The only changes required to reconfigure the 360k drive (WLI# 725-0142) from PC/APC to PC 200/300 applications are as follows:

	PC/APC/WLTC	PC 200/300
DS1	in	out
DS2	out	in
RY	in	out

NOTE 1: This applies only to the Panasonic JU-455-6 version drive. Other drive versions may be slightly different.

NOTE 2: The terminating resistor pack RP1 should always be installed on Drive A and removed on Drive B. Terminating resistors are available under the following part numbers.

PC/APC & PC 200/300 applications	150 ohm	WLI# 333-0824
WLTC applications	1000 ohm	WLI# 725-3361

NOTE 3: jumper plugs are available under WLI# 350-4506

GROUP: Desktop Systems/Peripherals Product Support MAIL STOP: 001-140

COMPANY CONFIDENTIAL

WANG Laboratories, Inc.

CC: Mike Bahia W0000600 6FLT3
From: Mike Bahia Security: Limited
Subject: HD Jumper for JU455-6 Date 03/17/95

278-4033

Ray,

Found 2 360K drives that were returned from the field which were Model JU455-6. Both had the HD jumper in & tested out good. Cut the HD jumper & the drive still ran fine. The only difference I noticed was when inserting a disk and latching the door. On both drives, 1 w/ HD in & the other out, the spindle starts to turn when you insert or remove the disk & in either case stops spinning after several seconds if no access is made. The difference is when you latch the door on the drive w/ HD in, the spindle immediately stops turning. With HD out it still spins for several seconds before stopping. I did notice this jumper was out on another version 360K where it could have been hardwired. The test was done in a 2200 DS Cabinet. In conclusion, HD does not appear to make any significant difference.

Regards, Mike

Jumper setting for THE ^{NEW} PANASONIC 360K HALF Height
JU455-6

DS 1
WP
OP
DS
MM
RY
SW
RR(PR)

5 1/4" PANASONIC FLOPPY

WANG

TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 5337 REPLACES: N/A DATE: 01/14/86 PAGE 1 OF 1

MATRIX ID. 3110 PRODUCT/RELEASE# Half-Height Floppy Disk Drive

TITLE: Half-Height Floppy Disk Drive Problems

PURPOSE:

To inform the field of a potential problem with the 360 KB half-height floppy disk drive (WLI P/N 278-4033).

EXPLANATION:

↳ Shugart/Panasonic
The vendor supplying this floppy drive recently switched over to a newer version using VLSI and surface mount technology. These newer version drives can be identified by the Model No. JU455-5 on the rear of the frame, and the drive door handle does not have a hole in it. A problem with this new model drive has been identified as causing alteration or loss of data.

CORRECTIVE ACTIONS:

All drives that have been corrected have been identified in the following manner:

- A 22uf capacitor has been added between Pins 8 and 9 of J6 connector on the component side of the PCB with the plus end attached to Pin 9. The physical location of the added cap is where D1 and D2 are silkscreened on the PCB.

Any drive found to be exhibiting this problem should be checked for this identification, and should it be missing, the drive should be replaced. This problem only affects the JU455-5 model and not the SA455-3 model.

GROUP: Peripheral Hardware Support Group MAIL STOP: 0125

COMPANY CONFIDENTIAL

WANG Laboratories, Inc.

5 1/4" PANASONIC FLOPPY 360K



TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 6193 REPLACES: _____ DATE: 12/02/86 PAGE 1 OF 1

MATRIX ID. 3101 PRODUCT/RELEASE# SA 455 (VLSI) WLN 278-4033

TITLE: DESCRIPTION OF THE TEST POINTS ON VLSI BOARD

PURPOSE:

To inform the field of test point functionality.

EXPLANATION:

The VLSI board on the Half High floppy (WLN 278-4033) uses different test points from the regular TTL board. The following information is needed to verify drive alignments when using an oscilloscope.

Description of the Test Points

TP 1 and 2	:	Differential analog read data signal
TP 7 (wire)	:	Index
TP 8	:	Track Zero
TP 12 (wire)	:	Step
TP 6 (wire)	:	Digital read data
TP 5, 10	:	Ground

Index is located at connector J1 pin #8.
Step is located at connector J1 pin #20.

GROUP: Desktop Systems/Peripherals Group MAIL STOP: 001-250

COMPANY CONFIDENTIAL

WANG Laboratories, Inc.

OEM PRODUCT ASSURANCE ENGINEERING

Barry:
FYI

DC R. T. Ho

TO: Distribution

FROM: Dean Coccozziello *DC*

EXT: 6-4047

M/S: 018-21G

DATE: June 12, 1987

JU475-2 JU455-6

SUBJECT: Jumper Conversion List For Panasonic 1.2MB And 360MB
5.25" Floppy Disk Drives

Listed below are the jumper modifications required to convert Panasonic drives for specific Wang system applications. All jumpers are pluggable. Also, diagrams of board layouts (illustrating jumper locations) and jumper matrices are attached for reference.

PANASONIC 360KB FLOPPY DRIVE ALWAYS CHECK JUMPERS. A PARTICULAR P/N DOES NOT INSURE SPECIFIC JUMPER SETTINGS. ALL 3 DRIVES CAN ALSO BE OBTAINED UNDER 278-4033.
Applications

<u>DRIVE TYPE</u>	<u>PANASONIC MODEL #</u>	<u>WANG UNTESTED PART #</u>	
360KB	JU 455 - 6BBG	725-0142	} 278-4033
360KB	JU 455-6BPM/6BPG	725-0257	
360KB	JU 455-6BSG	725-0267	

Configurations

NOTE: Refer to page 3 for jumper location/matrix.

Modification from ~~725-0142 to 725-0257~~:
PC/APC/WLTC/2200/015 TO PC200/300

- 1) Move jumper from "DS 1" to "DS 2"
- 2) Remove "RY" jumper

Modification from ~~725-0257 to 725-0142~~:
PC200/300 TO PC/APC/WLTC/2200/015

- 1) Move jumper from "DS 2" to "DS 1"
- 2) Install "RY" jumper

WLTC REQUIRES A 1000 Ω T68M, P/N 725-3361. ALL OTHER APPLICATIONS USE 150 Ω , P/N 333-0824.

Modification from 725-0142 to 725-0267
725-0267 to 725-0142
725-0257 to 725-0267
725-0267 to 725-0257

Conversion of these devices is not recommended since board removal and surface-mount component modification is required (warranty could be voided).

DC/lp
0682p

PANASONIC 1.2MB FLOPPY DRIVE

Applications

<u>DRIVE TYPE</u>	<u>PANASONIC MODEL #</u>	<u>WANG UNTESTED PART #</u>
1.2MB	JU 475-2BBG	725-0232 (REPLACED BY 278-4055)
1.2MB	JU 475-2BGM/2BGG	725-0258 (SAME AS 278-4055)

Configurations

NOTE: Refer to page 4 for jumper location/matrix.

Modification from ~~725-0232~~ ^{or} 725-0258 to AT COMPATIBLE
V5/2200 To AT COMPATIBLE

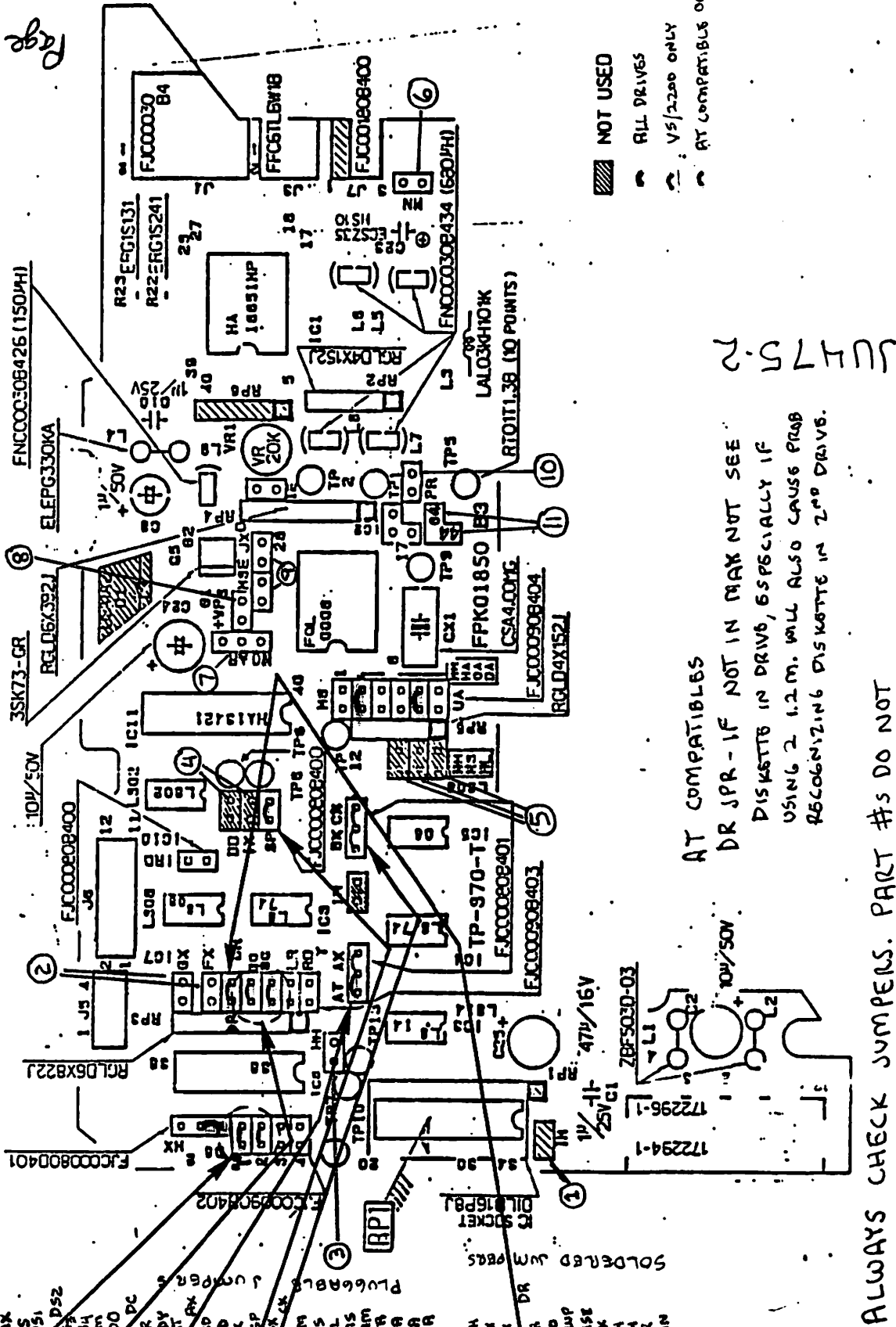
- 1) Move jumper from "DS 1" to "DS 2"
- 2) Install "DR" jumper
- 3) Install "SP" jumper
- 4) Remove "DO" jumper/install "DC" jumper
- 5) Remove "AX" jumper/install "AT" jumper
- 6) Remove "EX" jumper/install "CX" jumper

Modification from ~~725-0258~~ ^{or} ~~725-0232~~ to V5/2200
AT COMPATIBLE To V5/2200

- 1) Move jumper from "DS 2" to "DS 1"
- 2) Remove "DR" jumper
- 3) Remove "SP" jumper
- 4) Remove "DC" jumper/install "DO" jumper
- 5) Remove "AT" jumper/install "AX" jumper
- 6) Remove "CX" jumper/install "BX" jumper

Attachments

1.2 MB Drive



- ▨ NOT USED
- ALL DRIVES
- V5/2200 ONLY
- AT COMPATIBLES ONLY

AT COMPATIBLES
 DR JPR - IF NOT IN MAX NOT SEE
 DISKETTE IN DRIVE, ESPECIALLY IF
 USING 2 I.2 M. WILL ALSO CAUSE PROB
 RECOGNIZING DISKETTE IN 2ND DRIVE.

ALWAYS CHECK JUMPERS. PART #S DO NOT
 INSURE CORRECT JUMPERS.

Material & Size	Process	Remark	FPK0185083	FPK0185083	JU-475-28
Scale	Drawn	Checked	Approved	DWG Name	CIRCUIT BOARD (C)
1:1	10/10/80		SPA	DWG or Part No.	F3602870A3

Date	Revision	Sign	Checked

Part No.	Description	QTY	Notes
725-0258	IC1	1	
278-4055	IC2	1	
Not used	IC3	1	
725-0258	IC4	1	
725-0258	IC5	1	
725-0258	IC6	1	
725-0258	IC7	1	
725-0258	IC8	1	
725-0258	IC9	1	
725-0258	IC10	1	
725-0258	IC11	1	
725-0258	IC12	1	
725-0258	IC13	1	
725-0258	IC14	1	
725-0258	IC15	1	
725-0258	IC16	1	
725-0258	IC17	1	
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725-0258	IC19	1	
725-0258	IC20	1	
725-0258	IC21	1	
725-0258	IC22	1	
725-0258	IC23	1	
725-0258	IC24	1	
725-0258	IC25	1	
725-0258	IC26	1	
725-0258	IC27	1	
725-0258	IC28	1	
725-0258	IC29	1	
725-0258	IC30	1	
725-0258	IC31	1	
725-0258	IC32	1	
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725-0258	IC36	1	
725-0258	IC37	1	
725-0258	IC38	1	
725-0258	IC39	1	
725-0258	IC40	1	
725-0258	IC41	1	
725-0258	IC42	1	
725-0258	IC43	1	
725-0258	IC44	1	
725-0258	IC45	1	
725-0258	IC46	1	
725-0258	IC47	1	
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725-0258	IC51	1	
725-0258	IC52	1	
725-0258	IC53	1	
725-0258	IC54	1	
725-0258	IC55	1	
725-0258	IC56	1	
725-0258	IC57	1	
725-0258	IC58	1	
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725-0258	IC62	1	
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725-0258	IC64	1	
725-0258	IC65	1	
725-0258	IC66	1	
725-0258	IC67	1	
725-0258	IC68	1	
725-0258	IC69	1	
725-0258	IC70	1	
725-0258	IC71	1	
725-0258	IC72	1	
725-0258	IC73	1	
725-0258	IC74	1	
725-0258	IC75	1	
725-0258	IC76	1	
725-0258	IC77	1	
725-0258	IC78	1	
725-0258	IC79	1	
725-0258	IC80	1	
725-0258	IC81	1	
725-0258	IC82	1	
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725-0258	IC84	1	
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725-0258	IC95	1	
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725-0258	IC98	1	
725-0258	IC99	1	
725-0258	IC100	1	

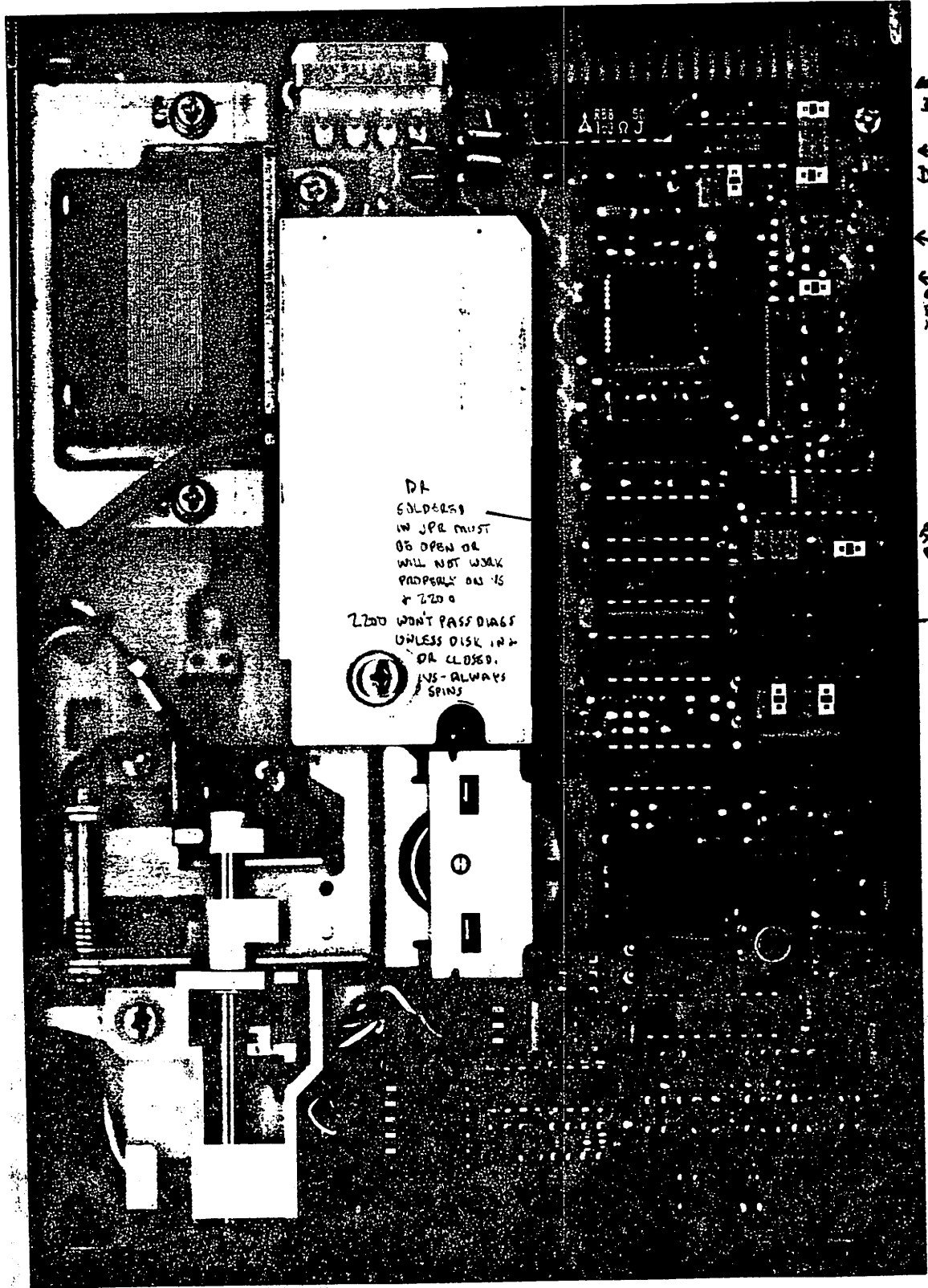
3 : 8

Vertical text on the left side, possibly bleed-through from the reverse side of the page.

Horizontal text in the lower middle section, appearing as a line of characters.

Horizontal text at the bottom of the page, possibly a footer or another line of bleed-through.

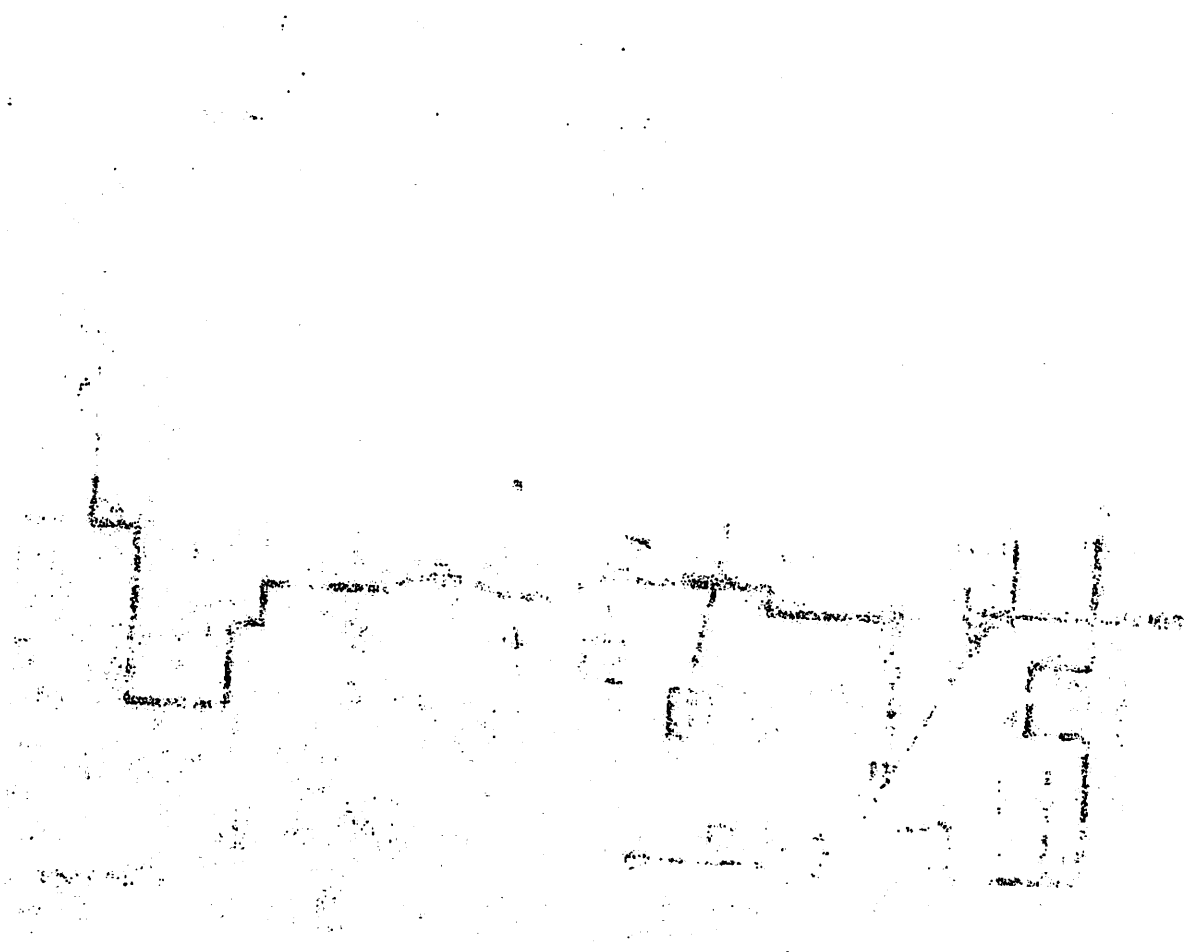
1.2 MEG FLOPPY JU475-1 BBG
PANASONIC



DA
SOLDERING
IN JPB MUST
BE OPEN OR
WILL NOT WORK
PROPERLY ON IS
& Z200

Z200 WON'T PASS DIAGS
UNLESS DISK IN
OR CLOSED.
MS - ALWAYS
SPIN

A1
DS2
← DS MX
← DO
← B X
A A
← IRD OPEN
MM ↓



FOR THE USE OF THE

JANUARY 1900

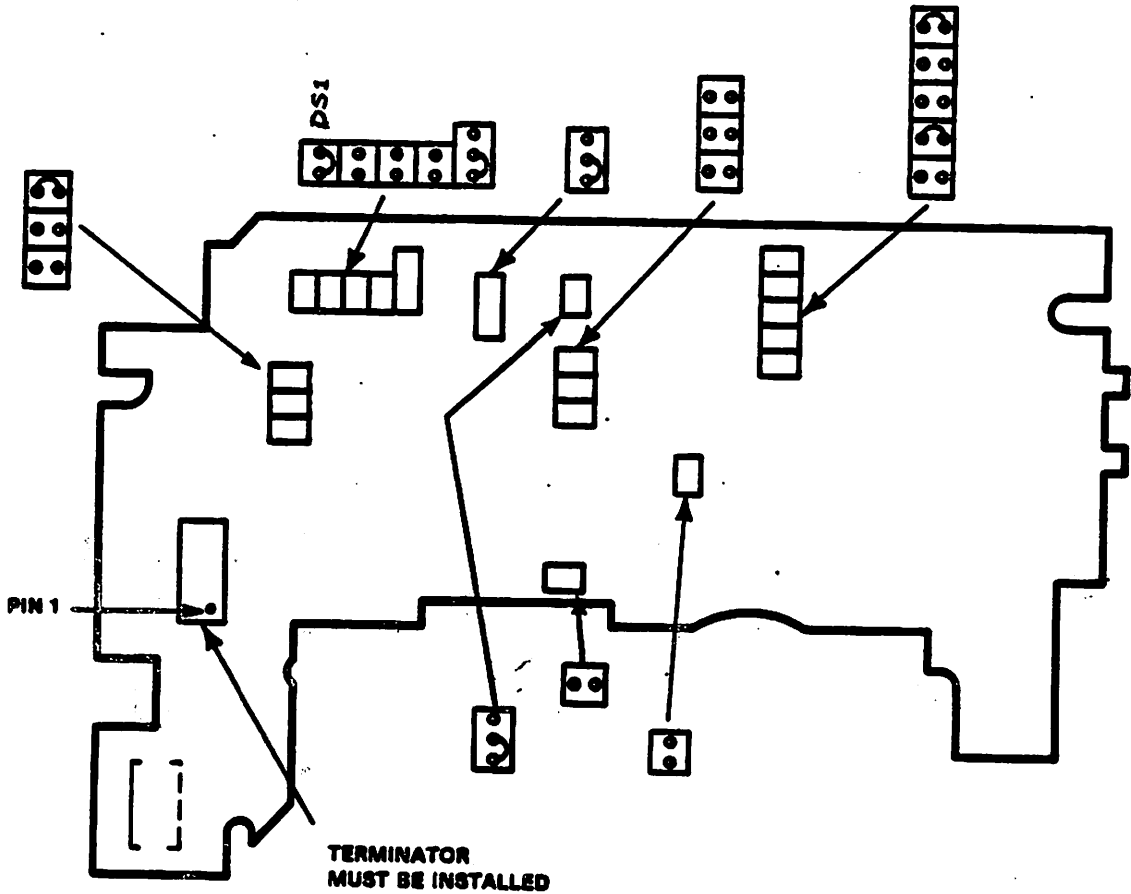
100

10

1.2 MEG FLOPPY

278-4055

JU475-1



8-03009-FY88-2

Figure 7-23. 1.2M Floppy Drive Terminator/Jumper Locations

PANASONIC JU 475-2 BGM



TECHNICAL SERVICE BULLETIN SECTION: HardWare Technical

NUMBER: HWT 8006 REPLACES: _____ DATE: 01/21/88 PAGE 1 OF 1

MATRIX ID. 3110 PRODUCT/RELEASE# 2200 DS Cabinet / VS 5/6

TITLE: New (278-4076) 1.2 Meg floppy jumper configuration

PURPOSE:

To inform the field of a possible jumper problem on the new 1.2 MB Floppy Drive now being shipped for 2200 DS and VS 5/6 product lines.

EXPLANATION:

A new 1.2 Meg floppy drives is now being shipped to the field. Unfortunately these drives were shipped with the incorrect jumper settings. Drives exhibiting this problem can be identified by this vendor model number (JU 475-2 BGM) and 1 of two visual characteristics:

1. 1.2 MB - is embossed on the front face plate of the drive.
- or
2. * - an asterisk or snow flake is embossed on the front face plate.

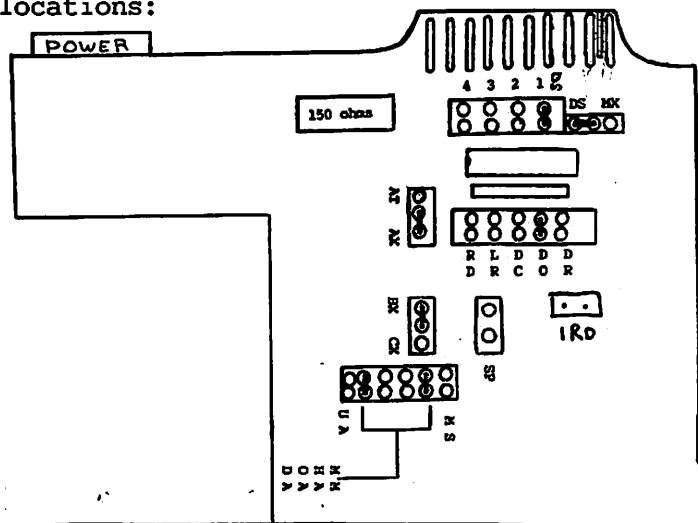
Wang part # of the drive is either 278-4076 , 278-4055 , 725-0258 or 279-0760.

CORRECTIVE ACTION:

Listed below are the proper jumper locations:

- 1) Jumper ON "DS 1"
- 2) Jumper ON "DS"
- 3) Jumper ON "AX"
- 4) Jumper ON "DO"
- 5) Jumper ON "BX"
- 6) Jumper ON "MM"
- 7) Jumper ON "DA"

**All other jumper locations should be open.



GROUP: VS/2200 On-Line Support

MAIL STOP: 001-260

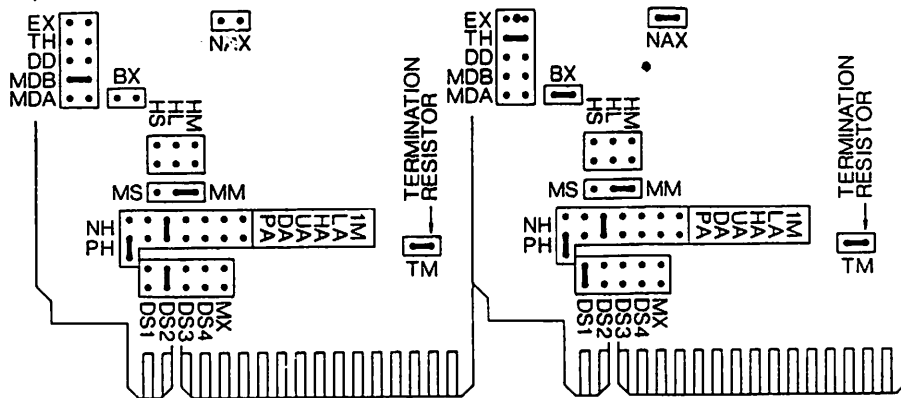
COMPANY CONFIDENTIAL

WANG Laboratories, Inc.

PANASONIC JU-475-3(1.2MB)

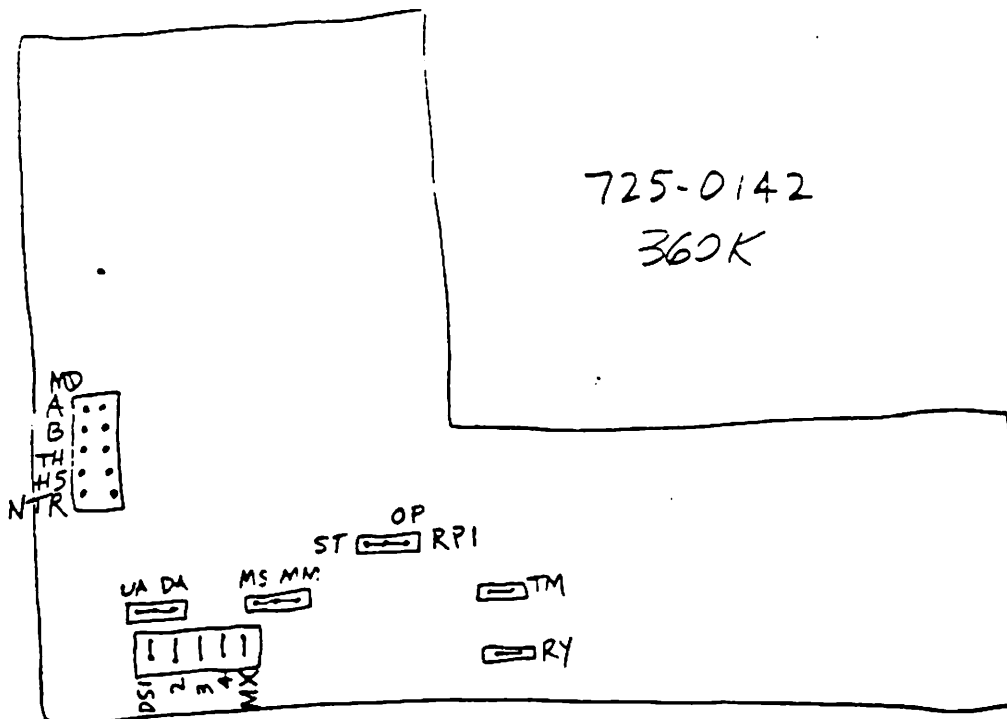
240 280
380

PC APC 2200
VS OIS

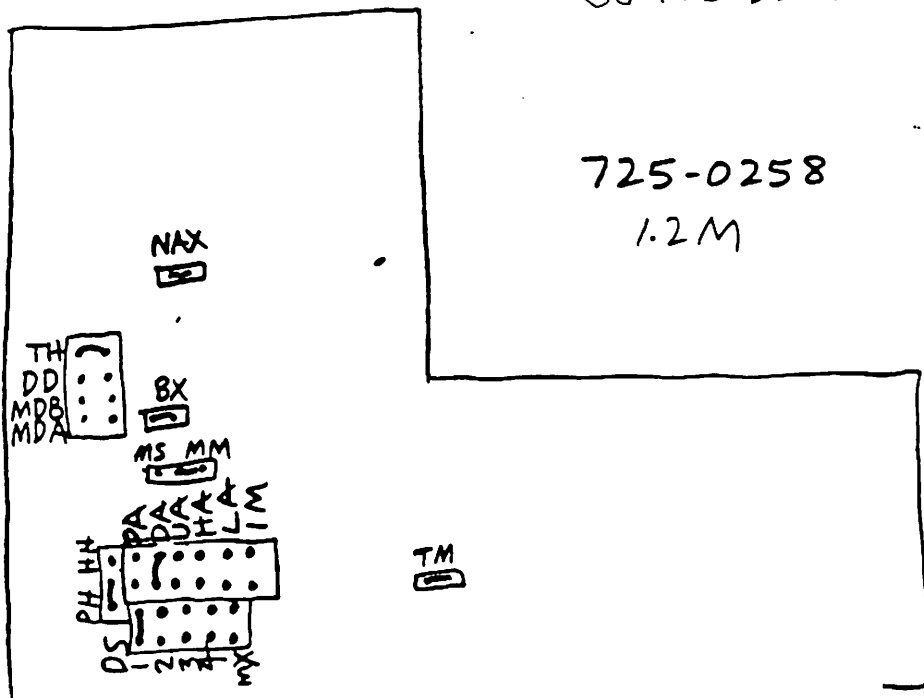


NEW PANASONIC FLOPPY DRIVES

FRONT



FRONT



WANG

**MANUFACTURING
TEST PROCEDURE**

STAMP



PART NO

278-4033/725-0142-G

REV

1

SH

6

DESCRIPTION

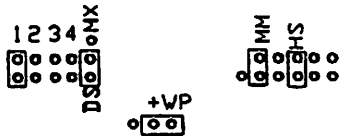
5 1/4 " 360 KB FLOPPY DISK DRIVE

TEST TYPE

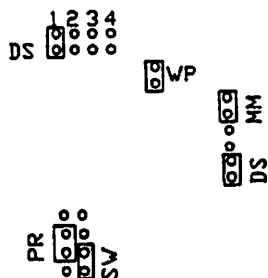
TEST PROCEDURE

JUMPER CONFIG

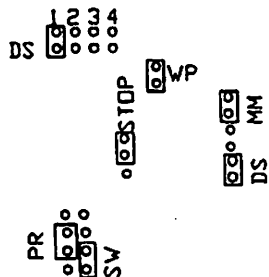
SHUGART 455-2/455-3



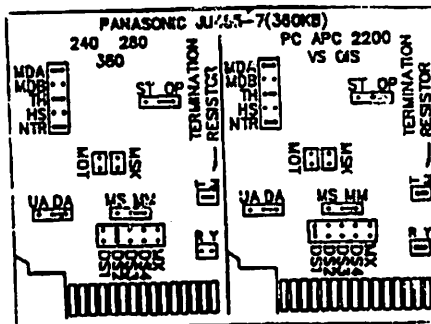
PANASONIC JU-455-5



PANASONIC JU-455-6



PANASONIC JU-455-7





TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 5020 REPLACES: N/A DATE: 2/26/85 PAGE 1 OF 2

MATRIX ID. 3101 PRODUCT/RELEASE# SA 455

TITLE: Jumper Configuration for Shugart 1/2 Height 360K

PURPOSE:

The Shugart Floppy Drive (SA 455), WLN 278-4033 will be configured with the following jumpers before they get tested and shipped into Wang stock. A drive configured with these options will work on the Wang Office Assistant, PC, and OIS 50/60.

PLUGGABLE OPTIONS

JUMPER § DESIGNATIONS	DESCRIPTION	§	OPEN	§	SHORT
DS1	§ Drive select 1	§		§	x
DS2	§ Drive select 2	§	x	§	
DS3	§ Drive select 3	§	x	§	
DS4	§ Drive select 4	§	x	§	
DS	§ Enable drive select in a multi system	§		§	x
MX	§ Constant drive select for single drive	§	x	§	
MS	§ Enables drive motor with drive select	§	x	§	
MM	§ Enables drive motor with motor on	§		§	x
HL	§ Head load	§	x	§	
HM	§ Head load with motor on	§	x	§	
HS	§ Head load with drive select	§		§	x
IU	§ In use, activity light with "UO and HL"	§	x	§	
+WP	§ High true write protect	§		§	x
-WP	§ Low true write protect	§	x	§	

GROUP: Peripheral Hardware Support Group MAIL STOP: 0125

COMPANY CONFIDENTIAL
WANG Laboratories, Inc.



TECHNICAL SERVICE BULLETIN
 SECTION: HardWare Technical

NUMBER: HWT 5020 REPLACES: N/A DATE: 02/26/85 PAGE 2 OF 2
 MATRIX ID. 3101 PRODUCT/RELEASE# SA 455
 TITLE: Jumper Configuration

TRACE OPTIONS

JUMPER	§	DESCRIPTION	§	OPEN	§	SHORT
DR	§	Enables drive ready with drive select	§	x	§	
RR	§	Radial ready	§		§	x
RY	§	Connects ready to interface	§		§	x
SS	§	Side select not delayed	§		§	x *2
SO	§	Side select delayed to allow erase to complete before switching sides	§		§	x *1
SW	§		§	x	§	
UO	§	Activity light with "in use" and HL	§	x	§	
DS	§	Activity light with drive select	§		§	x
HD	§	Provides pull up for HL interface line	§	x	§	
MD	§		§	x *3	§	x *2
MD 1/3	§		§		§	x
MDR	§		§	x	§	
MD2	§		§	x	§	
HLD	§		§	x *2	§	x *3

Termination for each input line is accommodated by a 150 OHM resistor pack installed in a dip socket located on the drive's logic board at location B1.

On early Shugart MLC 2 (PCB MFDS 3672-2) drives some of the R/W boards the +WP pluggable option is hardwired. The +/-WP pluggable option is available on some of the MLC 2 (PCB MFDS 3672-6) and on all the MLC 3's (PCB FPK00420B3).

- *1 = not used on the MLC 3 revision
- *2 = used on the MLC 3 revision only
- *3 = used on MLC 2 revision only without the WP pluggable option

Jumpers MD HLD, MD2, MD3, and MDR are factory configured to control the microprocessor operations and cannot be altered.

GROUP: Peripheral Hardware Support Group MAIL STOP: 0125

COMPANY CONFIDENTIAL

WANG Laboratories, Inc.

278 TESTED DRIVE CROSS

REFERENCE

2.2 WINCHESTER DISK DRIVES

2.2.1 8" DRIVES

<u>TESTED DRIVE P/N</u>	<u>UNTESTED P/N</u>	<u>VENDOR</u>	<u>VENDOR MODEL</u>	<u>CAPACITY</u>
278-4013/-1	725-0086/-1	Shugart	SA 1002	5 MB
278-4013-S/-1S	725-0086/-1	Shugart	SA 1002	5 MB
278-4014/-1	725-0087/-1	Shugart	SA 1004	10 MB
278-4014-S/-1S	725-0087/-1	Shugart	SA 1004	10 MB
278-4018/-1	725-0086/-1	Shugart	SA 1002	5 MB
278-4024/-1	725-0119/-1	Quantum	Q 2020	20 MB
278-4025/-1	725-0120/-1	Quantum	Q 2040	40 MB

2.2.2 5-1/4" FULL HEIGHT DRIVES

<u>TESTED DRIVE P/N</u>	<u>UNTESTED P/N</u>	<u>VENDOR</u>	<u>VENDOR MODEL</u>	<u>CAPACITY</u>
278-4027	725-0128	Tandon	TM 602/Obsolete replaced by 4030	5 MB
278-4030	725-0137	Rodime IMI Seagate	RO 200 5012 H ST 412	10 MB
278-4034	725-0144	Quantum	Q 500	30 MB
278-4054	725-0231	Micropolis	1325	67 MB
278-4069	725-0254	Micropolis	1323	33 MB
278-4070	725-0255	Micropolis	1323A	42 MB
Not Assigned	725-0270	Micropolis	1373	71 MB
Not Assigned	725-0269	Micropolis	1375	142 MB
Not Assigned	725-0271	Maxtor	XT-2190	190 MB
Not Assigned	725-3814	Micropolis	1578	320 MB
Not Assigned	725-4033	Micropolis	1355	145 MB
Not Assigned	725-4034	Micropolis	1558	320 MB

2.2.3 5-1/4" HALF HEIGHT DRIVES

<u>TESTED DRIVE P/N</u>	<u>UNTESTED P/N</u>	<u>VENDOR</u>	<u>VENDOR MODEL</u>	<u>CAPACITY</u>
278-4035	725-0149	Seagate NEC	ST 212 D5124	10 MB
278-4049	725-0195	DMA Ricoh	DMA 360 RH 5130	10 MB
278-4062	725-0242	NEC Seagate	D5126 ST 225	20 MB
Not Assigned	725-3493	CDC	94205	42 MB
Not Assigned	725-3823	Rodime	R05180	145 MB
Not Assigned	725-3822	Rodime	R05125	72 MB



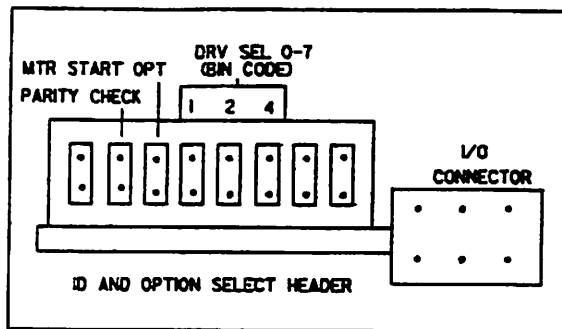
TECHNICAL SERVICE BULLETIN

SECTION: HardWare General

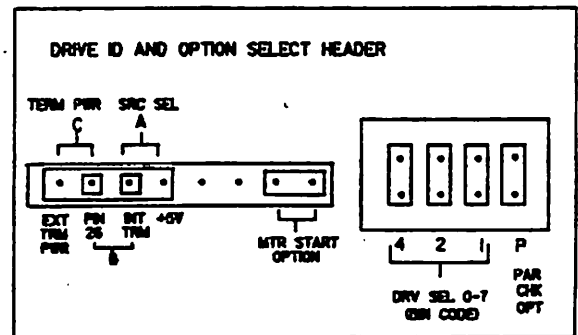
NUMBER: HWG 9055 REPLACES: _____ DATE: 04/23/91 PAGE 1 OF 2
 MATRIX ID. 3110 PRODUCT/RELEASE# 5 1/4" and 3 1/2" disk drives
 TITLE: Disk Drive Labels

PURPOSE:

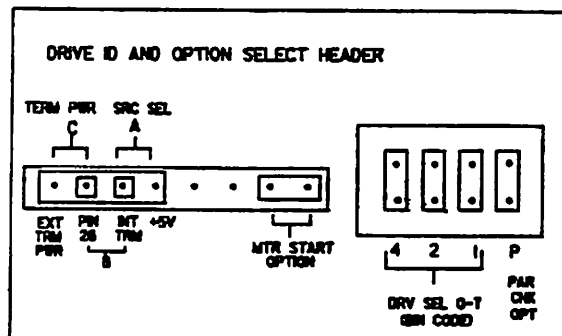
To provide a complete and coherent document containing all OEM vendor disk drive, labels and board layout changes, utilized at any previous time at Wang. Labels will be designated with Wang P/N, OEM vendor, and a brief drive description.



725-4895 Seagate 5 1/4 326Mb HH SCSI



725-3823 Seagate 5 1/4 85Mb UNFORMATTED SCSI



725-3822 Seagate 5 1/4 180Mb HH

	SCSI ID	ID2	ID1	ID0
725-3814	0	OUT	OUT	OUT
	1	OUT	OUT	IN
	2	OUT	IN	OUT
	3	OUT	IN	IN
	4	IN	OUT	OUT
	5	IN	OUT	IN
	6	IN	IN	OUT
	7	IN	IN	IN

725-3814 Micropolis 5 1/4 FH 380Mb WINI

GROUP: Peripheral Support Engineering

MAIL STOP: 014-490

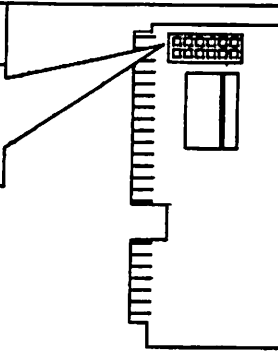
COMPANY CONFIDENTIAL
 WANG Laboratories, Inc.



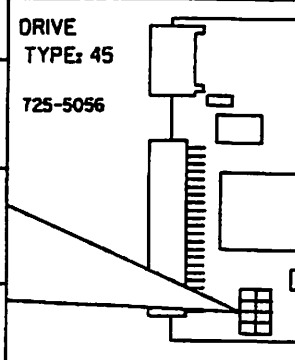
TECHNICAL SERVICE BULLETIN

SECTION: HardWare General

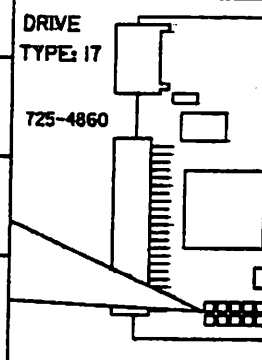
NUMBER: HWG 9055 REPLACES: _____ DATE: 04/23/91 PAGE 2 OF 2
 MATRIX ID. 3110 PRODUCT/RELEASE# 5 1/4" and 3 1/2" disk drives
 TITLE: Disk Drive Labels

CONFIGURATION	JUMPER SETTING				
C: or D:	- 1 2 3 4 5 6 7 8 9 10 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4 5 6 7 8 9 10				
Drive Type: 39 725-4894					
Cylinders	Heads	Write Precomp	Landing Zone	Sectors/Track	MB
1023	9	-1	1023	17	76

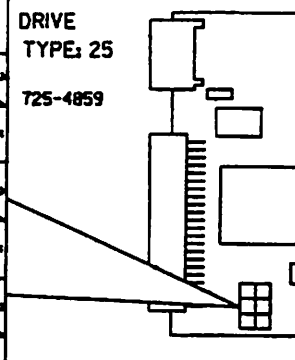
725-4894 Seagate 3 1/2" 80Mb Winl
 725-4894-T Seagate 3 1/2" 80Mb Winl Tempest

CONFIGURATION	JUMPER SETTING	DRIVE TYPE: 45			
Stand-alone (C:)	ACT <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> DSP <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> C/D <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> HSP <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	725-5056			
Master (C:)	ACT <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> DSP <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> C/D <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> HSP <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
Slave (D:)	ACT <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> DSP <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> C/D <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> HSP <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
No defects exist on this drive.					
Cylinders	Heads	Write Precomp	Landing Zone	Sectors/Track	MB
1004	12	-1	1003	17	100

725-5056 Conner 3 1/2" 104Mb AT

CONFIGURATION	JUMPER SETTING	DRIVE TYPE: 17			
Stand-alone (C:)	J4 10 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 2 9 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1	725-4860			
Master (C:)	J4 10 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 2 9 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1				
Slave (D:)	J4 10 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 2 9 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1				
Cylinders	Heads	Write Precomp	Landing Zone	Sectors/Track	MB
977	5	300	977	17	40

725-4860 Miniscribe 3 1/2" 40Mb AT

CONFIGURATION	JUMPER SETTING	DRIVE TYPE: 25			
Stand-alone (C:)	- <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> C: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> D: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	725-4859			
Master (C:)	- <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> C: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> D: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
Slave (D:)	- <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> C: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> D: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
No defects exist on this drive.					
Cylinders	Heads	Write Precomp	Landing Zone	Sectors/Track	MB
615	4	0	615	17	20

725-4859 Seagate 3 1/2" 20Mb AT

GROUP: Peripheral Support Engineering MAIL STOP: 014-490

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TECHNICAL SERVICE BULLETIN
SECTION: Hardware General

NUMBER: HWG 9055

REPLACES: _____

DATE: 04/23/91 PAGE 3 OF 7

MATRIX ID. 3110

PRODUCT/RELEASE# 5 1/4" and 3 1/2" disk drives

TITLE: Disk Drive Labels

CONFIGURATION	JUMPER SETTING	Drive Type: 37			
Stand-alone (C:)		725-5070 			
Master (C:)					
Slave (D:)					
No defects exist on this drive.					
Cylinders	Heads	Write Precomp	Landing Zone	Sectors/Track	MB
1024	16	-1	1023	25	200

725-5070 Conner 3 1/2" HH 200Mb AT

JUMPER USE	DEVICE ID	OUT	OUT	OUT	IN
	1	OUT	OUT	OUT	IN
	2	OUT	IN	OUT	IN
	3	OUT	IN	IN	IN
	4	IN	OUT	OUT	OUT
	5	IN	OUT	IN	IN
	6	IN	IN	OUT	IN
	7	IN	IN	IN	IN
	102	IN	IN	IN	IN

725-4895

DEFAULT SETTINGS

CABLE USE

725-4895 Micropolis 5 1/4" 326Mb HH SCSI

CONFIGURATION	JUMPER SETTING	DRIVE TYPE: 17			
Stand-alone (C:)		725-4860 			
Master (C:)					
Slave (D:)					
No defects exist on this drive.					
Cylinders	Heads	Write Precomp	Landing Zone	Sectors/Track	MB
977	5	300	977	17	40

725-4860 Conner 3 1/2" 40Mb AT

CONFIGURATION	JUMPER SETTING	DRIVE TYPE: 25			
Stand-alone (C:)		725-4859 			
Master (C:)					
Slave (D:)					
No defects exist on this drive.					
Cylinders	Heads	Write Precomp	Landing Zone	Sectors/Track	MB
615	4	0	615	17	20

725-4859 Conner 3 1/2" 20Mb AT

GROUP: Peripheral Support Engineering

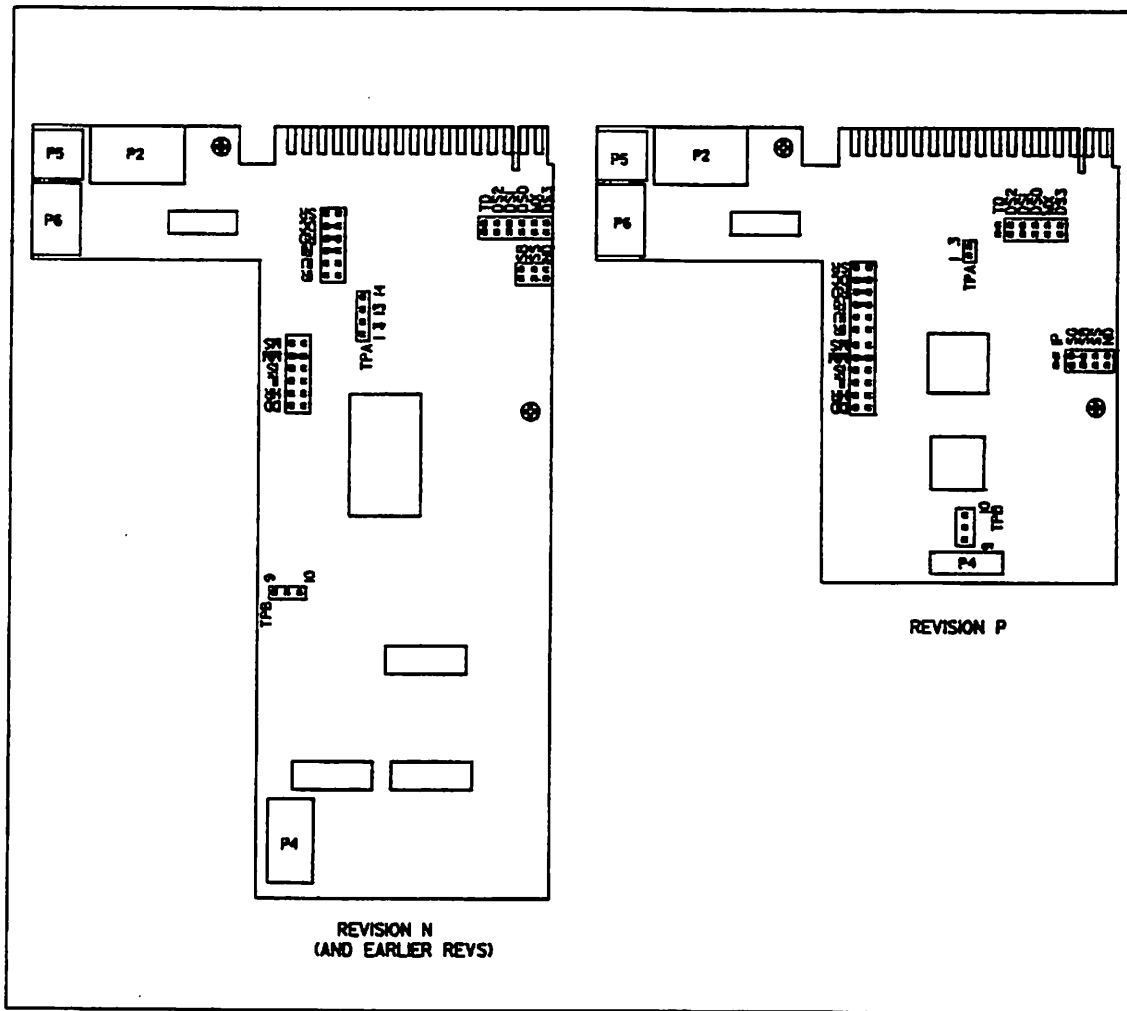
MAIL STOP: 014-490

COMPANY CONFIDENTIAL
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TECHNICAL SERVICE BULLETIN
SECTION: HardWare General

NUMBER: HWG 9055 REPLACES: _____ DATE: 04/23/91 PAGE 4 OF 7
MATRIX ID. 3110 PRODUCT/RELEASE# 5 1/4" and 3 1/2" disk drives
TITLE: Disk Drive Labels



725-5083-VG Mitsubishi 5 1/4" 1.2Mb HH Floppy

GROUP: Peripheral Support Engineering MAIL STOP: 014-490

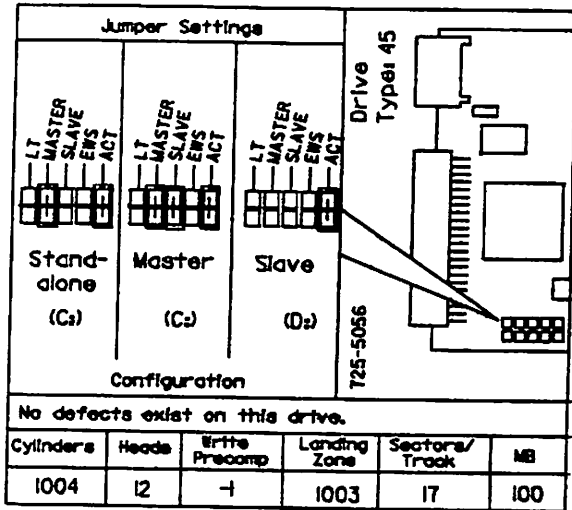
COMPANY CONFIDENTIAL
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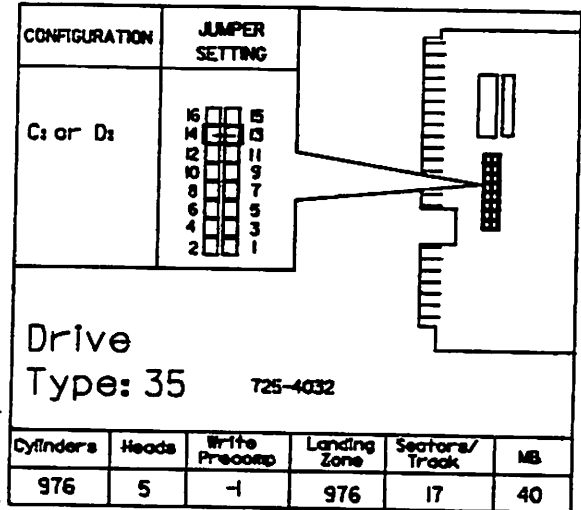
TECHNICAL SERVICE BULLETIN

SECTION: HardWare General

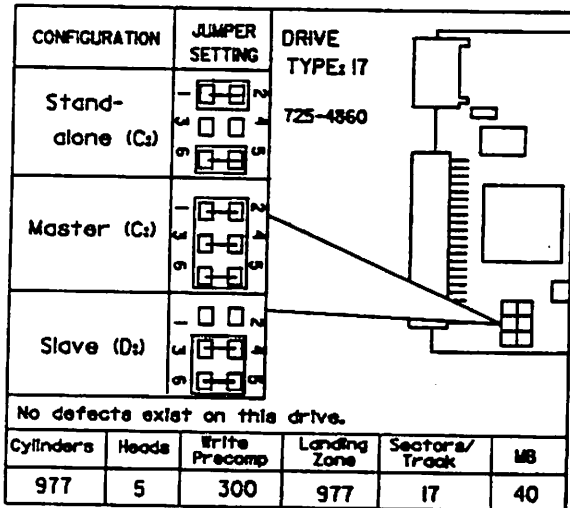
NUMBER: HWG 9055 REPLACES: _____ DATE: 04/23/91 PAGE 5 OF 7
 MATRIX ID. 3110 PRODUCT/RELEASE# 5 1/4" and 3 1/2" disk drives
 TITLE: Disk Drive Labels



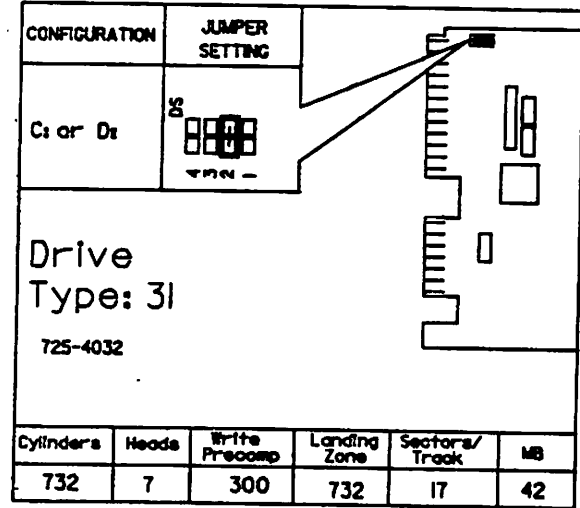
725-5056 Seagate 3 1/2" 104Mb AT



725-4032 Seagate 3 1/2" 40Mb WinI



725-4860 Seagate 3 1/2" 40Mb AT



725-4032 Panasonic 3 1/2" 40Mb WinI

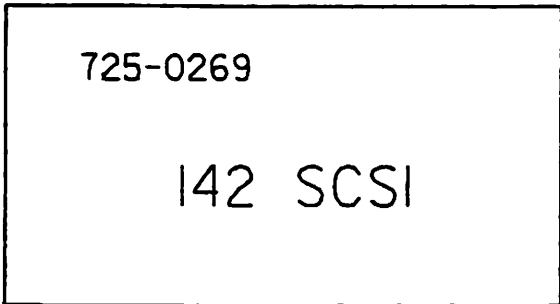
GROUP: Peripheral Support Engineering MAIL STOP: 014-490

COMPANY CONFIDENTIAL
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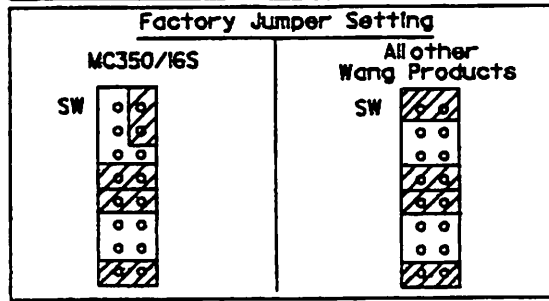
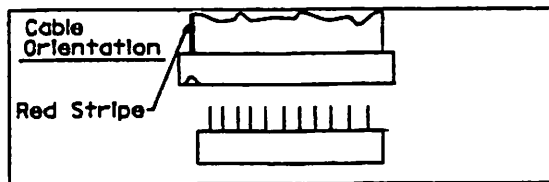


TECHNICAL SERVICE BULLETIN
SECTION: Hardware General

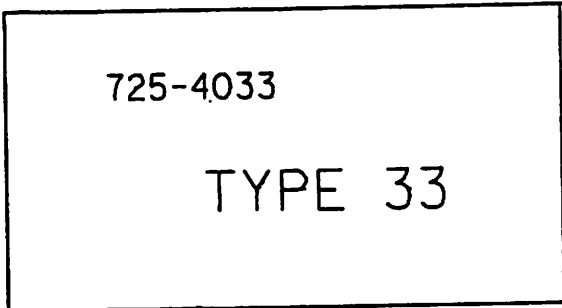
NUMBER: HWG 9055 REPLACES: _____ DATE: 04/23/91 PAGE 6 OF 7
 MATRIX ID. 3110 PRODUCT/RELEASE# 5 1/4" and 3 1/2" disk drives
 TITLE: Disk Drive Labels



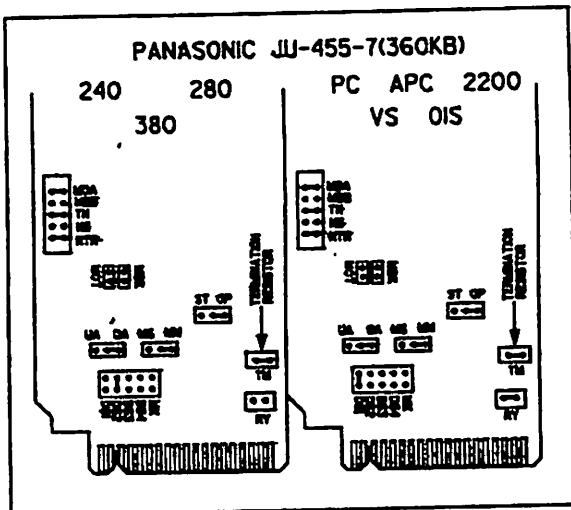
725-0269 Micropolis 5 1/4" FH 170Mb WinI



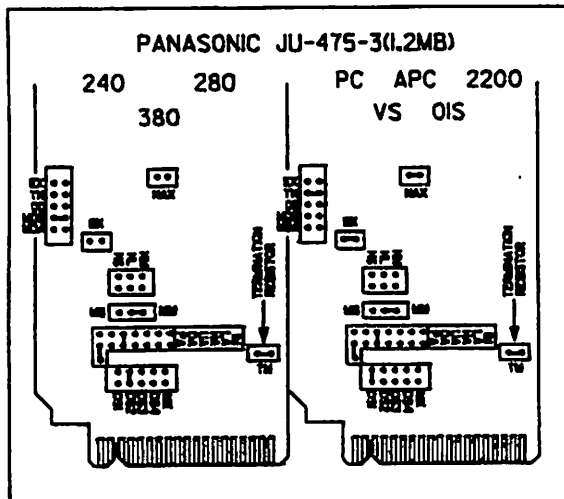
725-4035 Mitsubishi 3 1/2" HH 1.44Mb



725-4033 Micropolis 5 1/4" FH 145Mb ESDI



725-0142 Panasonic 5 1/4" HH 360kb AT
725-0142-G Panasonic 5 1/4" HH 360Mb AT grey bezel



725-0258 Panasonic 5 1/4" HH 1.2Mb AT
725-0258-G Panasonic 5 1/4" HH 1.2Mb AT grey bezel

CDC MAGNETIC PERIPHERALS

42 MEG

HALF HEIGHT

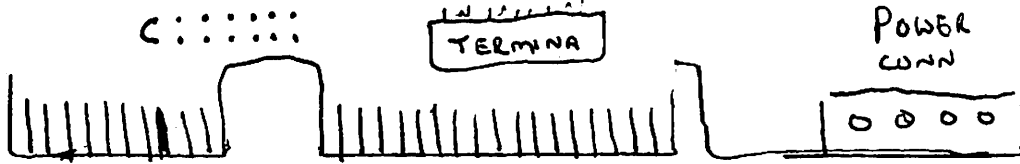
MN 94205-53

PART #

725-3493

TERM BOARD LARGE CONNECTOR

JUMPERS



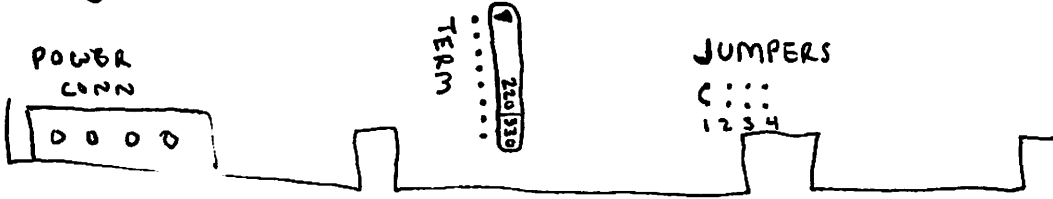
PART #

MINI SCRIBB

MODEL 3053

42 MEG

HALF HEIGHT



TESTING

TESTING

TESTING

TESTING

TESTING

TESTING

TESTING

TESTING

TESTING

W A N G L A B O R A T O R I E S , I N C .
 MANAGEMENT INFORMATION SYSTEMS
 REGIONAL SUPPORT CENTER CALL TRACKING SYSTEM
 CALL HISTORY

TRACK NO: E997201 CONTACT: GRISOFF DONALD
 COMPANY: GRISOFF DONALD PHONE (215) 665-2007
 CALL SOURCE: T CALL STATUS: 190 PHONE ANL/CLOSED
 CALLER TYPE: 03 START DATE: 01/20/95 ACCOUNT PRIOR
 PRODUCT LINE: USOP START TIME: 10:45 PRODUCT TYPE:
 REPEAT CALL: N PTR XREF:
 REPEAT XREF: EMPL-NUMBER: 22098
 ANALYST ID: MB1 BAHIA 87095 MIKE

PROBLEM DESC: PCLN ??? REF TO DOING SWITCH SETTIN ON

PROBLEM DESC: PC382 TRYING TO INSTALL 124MB MAXTOR 7120AT.

PROBLEM DESC: PGR 215 899 7046

PROBLEM PRY: 1

TRX DATE TIME USER CALL STARTED ON 01/20/95 ON 10:45

01/20/95 10:45 MAL ST 000 CALL DIRECTOR ELAP 0

01/20/95 10:47 MAL ST 110 PHONE ANAL GROUP ELAP 40

01/20/95 10:53 JH2 ANALYST: NEW JH2 OLD PRODUCT LINE: NEW OLD

01/20/95 10:54 JH2 PAGED CE.

01/20/95 12:17 LLE PLEASE CALL GRISOFF DONALD 215 864-8800.

01/20/95 13:57 JH2 CALLED ALTERNATE# 215-865-8800, NO ANSWER/LEFT DVX.

01/23/95 13:48 JH2 PAGED CE , AGAIN.

01/23/95 14:59 JH2 ANALYST: NEW MB1 OLD JH2 PRODUCT LINE: NEW OLD

01/23/95 18:50 MB1 CE ~~LOOKING~~ FOR SW SETTINGS FOR THE 210-9785A IDE FLOPPY/HARD

DISK CONTROLLER BRD. SW SETTINGS ARE 1,2,5,6 ON & THE REST

OFF. GETTING HARD DISK CONTROLLER ERROR ON BOOT. TRIED A

2ND 9785A & SAME RESULT. DRIVE CAME FROM ANOTHER PC & WAS

01/23/95 18:52 MB1 WORKING. DRIVE IS A 124MB MAXTOR 7120AT. NOT FAMILIAR W

WANG LABORATORIES, INC.
MANAGEMENT INFORMATION SYSTEMS
REGIONAL SUPPORT CENTER CALL TRACKING SYSTEM
CALL HISTORY

DRIVE. LOOKS LIKE A HARD DRIVE PROBLEM.

01/26/95 15:06 MB1 PROBLEM DESCRIPTION CHANGE. OLD DESCRIPTION WAS:

PCLN ??? REF TO DOING SWITCH SETTIN ON

01/26/95 15:06 MB1 COULD NOT GET THIS MAXTOR 7120AT (120MB) TO WORK W/ THE
210-9785A WINC/FLOP CONTROLLER. SAME RESULTS W/ 2 BRDS,
CONTROLLER ERROR. NO PROBLEM W/ A JCC IDE SUPER CONTROLLER,
P/N JCC-1X514. CLOSE CALL /CE.

01/26/95 15:06 MB1 ST 190 PHONE ANL/CLOSED

ELAP 0



TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 7056 REPLACES: _____ DATE: 04/21/87 PAGE 1 OF 1
MATRIX ID. 3110 PRODUCT/RELEASE# 5.25" Winchester Drives
TITLE: 10 MB Winchester Drive Replacement

PURPOSE:

To provide the field with guidelines on when to replace the 10 MB winchester drives (WPN 278-4030 and 278-4035) with a 20 MB HH winchester drive (WPN 278-4062).

SEAGATE 412 SEAGATE
1M, 5012A NEC
RODINE

EXPLANATION:

The 20 MB HH winchester drive specifications are very similar to the 10 MB drives. It is possible to replace a 10 MB in the field with a 20 MB HH drive out of CE stock.

Drives Specifications:

10 MB - Four heads, four surfaces, a total of 306 cylinders. FH (Full Height) and HH (Half Height) drives specifications are the same.

20 MB HH - Four heads, four cylinders, a total of 612 cylinders. Wang does not support 20 MB FH.

Field Replacement Recommendation - Continue to replace 10 MB drives in the field with 10 MB units out of stock. In case of emergency, if a 20 MB HH unit is available in local stock it can be used to support the customer base. It should never be P-1'd to replace a defective 10 MB drive in the field. If a P-1 is necessary, a 10 MB unit should be ordered. The disk drive controller switch setting should remain selected for 10 MB capacity to limit customer access to 306 cylinders only. For switch setting information refer to the Maintenance Manual on the product that you are working on. The 10 MB and the 20 MB winchester drives will continue to be supported, as two different products.

GROUP: Peripherals Support

MAIL STOP: 001-140

COMPANY CONFIDENTIAL

WANG Laboratories, Inc.

100-100000-100000

100-100000-100000

100-100000-100000

100-100000-100000

100-100000-100000



TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 7201 REPLACES: _____ DATE: 09/29/87 PAGE 1 OF 1

MATRIX ID. 3110 PRODUCT/RELEASE# OIS

TITLE: Shipping Wrong Drives

PURPOSE:

To inform the field that wrong size Winchester Drives were shipped out from our logistic stock.

EXPLANATION:

Several different size Winchester Disk Drives were found to be stocked with the same part number (725-0255) in logistics stock. The drives that were effected were the 10 Meg - Seagate Model 412, 33 Meg - Micropolis Model 1323, and the 42 Meg - Micropolis 1323A. Because of the physical size of the drive, all of the drives look the same. To tell the differences, check for the model number of the drive as indicated below. If an initialization was performed on the wrong drive, the format routine will fail immediately.

The correct drive configuration and minimum software releases for the small OIS Systems are as follows:

<u>SYSTEM</u>	<u>Drive Part Number</u>	<u>Manuf./Model #</u>	<u>Drive Address</u>	<u>Drive Size</u>
OIS 40/50	278-4030	Seagate/412	38	10 Meg
		IMI/5012H	38	10 Meg
OIS 45/55	725-0254	Micropolis/1323	48	33 Meg
OIS 60/60-1	278-4034	Quantum/540	58	33 Meg
OIS 65	725-0255	Micropolis/1323A	28	42 Meg
OIS 70	278-4054	Micropolis/1325W	18	67 Meg

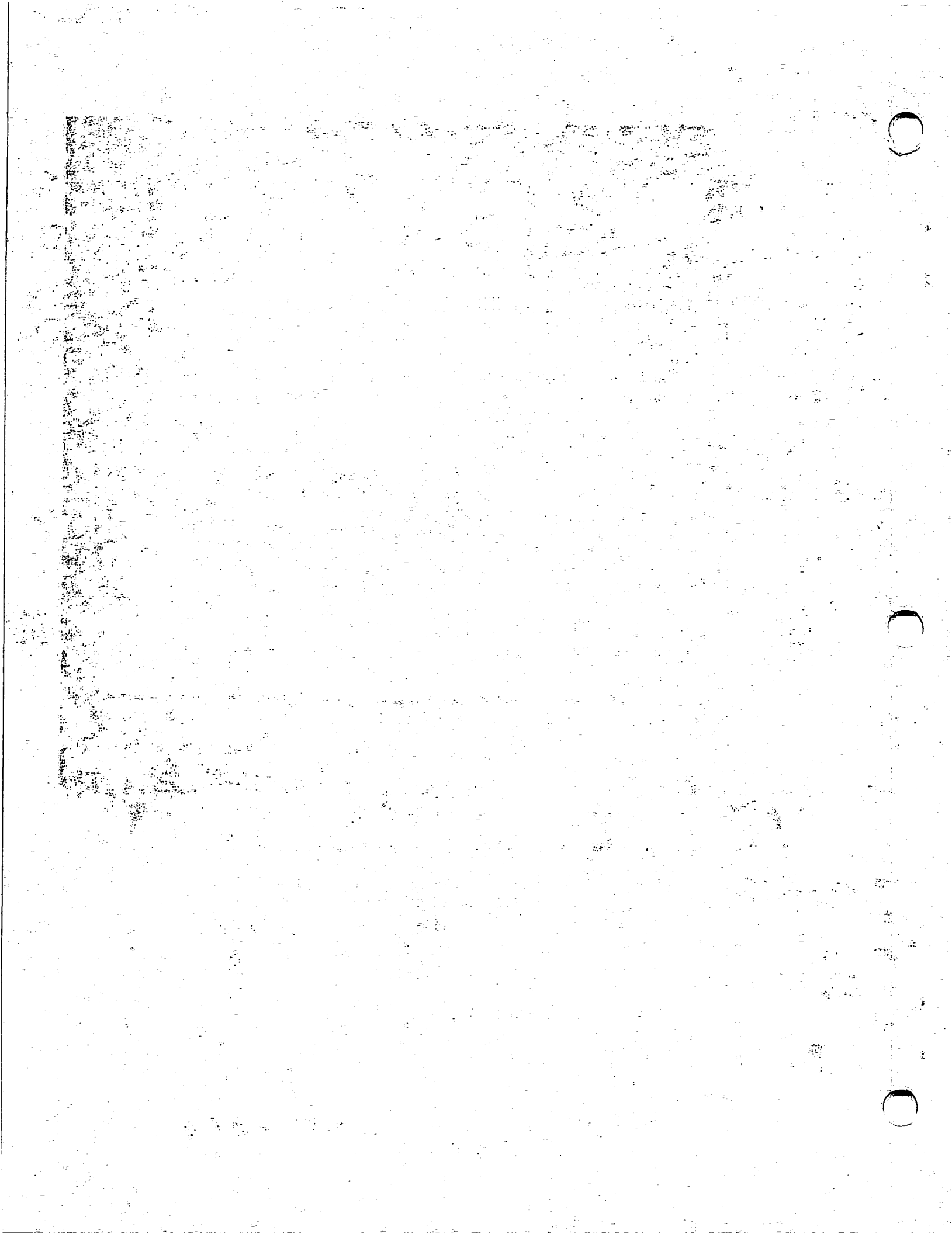
<u>SYSTEM</u>	<u>Minimum Software Rel.</u>	<u>Standard Software</u>
OIS 40/50	10.A.1	195-2394-9
OIS 45/55	10.J	195-5239-9
OIS 60/60-1	10.A.1	195-2394-9
OIS 65	10.J	195-5239-9
OIS 70	10.H	195-4801-9

GROUP: VS Systems Hardware

MAIL STOP: 001-220

COMPANY CONFIDENTIAL

WANG Laboratories, Inc.



WANG

TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 5205 REPLACES: N/A DATE: 09/17/85 PAGE 1 OF 2
MATRIX ID. 3701 PRODUCT/RELEASE# 75PC-PM21CT 10 MB Winchester drive
TITLE: Support Information for DMA Drives

PURPOSE:

To inform the field of the availability of service support literature for DMA 10 MB Removable Media Winchester drives.

EXPLANATION:

Within the past month, shipments of 75PC-PM21CT 10 MB Winchester Drives to the field have increased. As a result, C.E. Product Support has received a number of phone calls wanting information on these drives. C.E.'s who service this product are reminded that PUBLICATION UPDATE BULLETIN 729-1386-4 has been available for order since April of 1985. Those C.E.s who require this FUB should check their branch library for a copy, or place an order through Logistics.

In addition, C.E.'s should be aware that a user guide is shipped with each 75PC-PM21CT. This guide explains how to power up the drive, and how to properly load and unload the media. C.E.'s should ensure that the customer has read this guide in order to prevent destroying the heads or breaking the front door latch mechanism. Special attention should be paid to pages ii and 2-10. These pages explain the emergency interlock release mechanism and also explain that the customer is liable if damage to the drive occurs as a result of the customer using this feature. (An excerpt from the user manual with the proper procedure for using the emergency interlock release is shown on the following page.) A significant number of drives that have been returned to the Home Office have been found to be unrepairable because the media was removed with the heads still loaded. C.E.'s should ensure that their customers have read the user's manual in order to prevent unwanted damage to the drive.

GROUP: Peripheral Hardware Support Group MAIL STOP: 0125

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WANG Laboratories, Inc.

MATRIX ID. 3701PRODUCT/RELEASE# 75PC-PM21CT 10 MB Winchester driveTITLE: Support Information for DMA Drives

EXPLANATION: (con't)

Removing the disk cartridge under conditions of extreme emergency.

The model 75PC-PM21CT Removable Disk Drive is equipped with an emergency interlock mechanism which allows you to remove the disk cartridge from the disk drive when electric service is interrupted during an extreme emergency. When the emergency interlock release is used, the read/write heads can be destroyed and additional damage to the disk drive may occur. Damage caused by the use of the emergency interlock release is not covered under the warranty or maintenance agreement for the Model 75PC-PM21CT. All repair and/or replacement costs resulting from the use of the emergency interlock release by the customer are the responsibility of the customer. In no way shall Wang Laboratories, Inc., or its subsidiaries be liable to the customer for incidental or consequential damages arising from use of the emergency interlock release mechanism.

1. Remove the clear plastic covering the emergency interlock release lever and move the lever up using an unfolded paper clip.
2. While holding up the emergency interlock release lever, rotate the drawer latch lever clockwise until it is pointing upward. Then, release the emergency interlock release lever.
3. Grasp the grip areas on the drive and withdraw the drive drawer from its housing. Open the drive door as far as it can open and pull out the disk cartridge.
4. Close the drive door and rotate the latch lever counterclockwise until it is pointing to the left. Slide the drive drawer back into its housing.

Switch settings for the 210-8855 Winchester controller board are listed below:

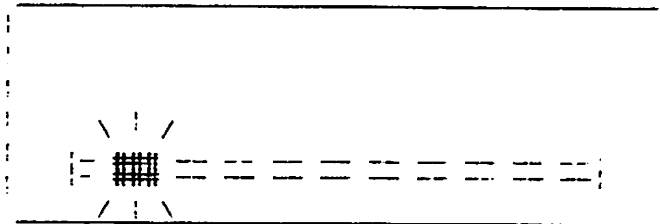
	ON	OFF		ON	OFF
4		*		4	*
3	*			3	*
2	*			2	*
1	*			1	*
	DMA 10 MB			10 MB	
	Removable Media Drive			Fixed Drive	

NOTE:

Incorrect switch settings can cause the servo track to be erased. If this happens, a manual servo write must be done, followed by Winchester initialization.

SMALL WINCHESTER DRIVES

INFORMATION



by Julian Kiszka
On-Line P/S (TAC)

Revision 1.9 02/08/89

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210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off
4[:*]
3[:*]
2[:*]
1[:*]

J3 ! 2 ! 1 !
J4 ! 2 ! 1 !
ALL REMOVED

MINIMUM PROM REVISION ON WINCHESTER CONTROLLER BD. IS R3.
TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

Header Plug or Switch Bank. For WPC/APC/DIS:

1 ON and 2-8 OFF
1 jumpered and rest open

! 1 2 3 4 5 6 7 8 !
! * !
! * * * * * * * !

<— Rear of Drive

For 200 Series PC's:

2 ON and 1, 3-8 OFF
2 jumpered and rest open

PART NUMBERS:

PC/APC/DIS --> 278-4030
PC240/280/380 --> NONE

OTHER INFO:

- > TYPE 1.
- > 4 Heads
- 4 Surfaces
- 306 Cylinders
- Step Rate 30 usec.
- Land Zone @ 305
- Pre-comp? 128
- 17 Sectors
- > Half Height and Full Height Specs are the same.
- > On the DIS 40/50 the address is 38 and min. soft. rel. 10.A.1
- > FDD 1059 R3 PROM will not work with 256K memory expansion bd.
 (TACNL30906) fails on power-up when cold.

NOTE: If static strap wears through, it can be shifted to fresh metal on the strap.

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off

4[:*]

3[:*]

2[:*]

1[:*]

J3 : 2 : 1 :

J4 : 2 : 1 :

ALL REMOVED

MINIMUM PROM REVISION ON WINCHESTER CONTROLLER BD. IS R_.
TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

PART NUMBERS:

OTHER INFO:

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off
 4C :*]
 3C :*]
 2C :*]
 1C :*]

 J3 : 2 : 1 :
 J4 : 2 : 1 :

 ALL REMOVED

MINIMUM PROM REVISION ON WINCHESTER CONTROLLER BD. IS R?.
 TEMPEST controllers are 210-8855-A/8455-A.

DRIVE JUMPERS AND SWITCHES:

Header Plug 2, 4, 8 jumpered and rest open.

 | 8 7 6 5 4 3 2 1 |
 ! * * * !
 ! * * * !

 <--- Rear of Drive

Under Terminator - 1,5,6,7 shorted for WPC (07334038)

PART NUMBERS:

PC/APC/DIS --> 27E-4030
 PC240/280/380 --> NONE

OTHER INFO:

- > 4 Heads
- 4 Surfaces
- 306 Cylinders
- > Half Height and Full Height Specs are the same.
- > On the DIS 40/50 the address is 38 and min. soft. rel. 10.A.1

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off	
4[:*]	J3 ! 2 ! 1 !
3[:*]	J4 ! 2 ! 1 !
2[:*]	
1[:*]	ALL REMOVED

MINIMUM PROM REVISION ON WINCHESTER CONTROLLER BD. IS R__.
TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

UPPER LEFT SWITCH BANK (Back to Left)
ON PC/APC/DIS Switch 1 is ON and rest OFF.
ON PC200's Switch 2 is ON and rest OFF.

ON	! *	!	
OFF	! * * * * *	!	<--(Shown as DS1 Selected)
	! 1 2 3 4 5 6 7 8 !		

LOWER LEFT SWITCH BANK (Back to Left)
ALL ON for First or Only Winchester Drive
ALL OFF for Second Winchester Drive

ON	! *	!	
OFF	! * * * * *	!	<--(Shown as Second Drive)
	! 1 2 3 4 5 6 7 8 !		

5 JUMPERS AT LOWER LEFT (Back to Left)
(If Exist)

..ALL OUT

SWITCH BANK 3 (Lower Right - Back to Left)
(If Exist)

ALL "ON"

ON	! * * * * *	!
OFF	! * * * * *	!
	! 1 2 3 4 !	

PART NUMBERS:

PC/APC/DIS --> 278-4035

OTHER INFO:

- > Type 1
- > 306 Cylinders
- 4 Heads
- PreComp = 128
- Land Zone @ 305
- 17 Sectors/Track
- Capacity = 10 meg.

10 MEG. SEAGATE H/H ()
5-1/4"

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off	
4[:*]	J3 ! 2 ! 1 !
3[:*]	J4 ! 2 ! 1 !
2[:*]	
1[:*]	ALL REMOVED

MINIMUM PROM REVISION ON WINCHESTER CONTROLLER BD. IS R__.
TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

PART NUMBERS:

PC/APC/DIS -> 278-4035

OTHER INFO:

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off

4[*:]

3[*:]

2[*:]

1[*:]

J3 ! 2 ! 1 !

J4 ! 2 ! 1 !

J3-2 + J3-1 + J4-2 + J4-1

MINIMUM FROM REVISION ON WINCH CONT BD. IS R9?. (HWT5097)
TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

PART NUMBERS:

PC/APC --> 278-4049, 289-0391, 725-0195
PC240/280/380 --> NONE

OTHER INFO:

- > Cautions on damage to drive - HWT8012
- > Do not perform Servo Format by insertin paper clip in hole - this will cause compatibility problems (08014075).
- > Incorrect switch settings on the winchester controller bd. can cause the servo tracks to be erased. (HWT-5205)
- > Type 31
 - 2 Heads
 - 612 Cylinders
 - 17 Secotors/Track
 - Precomp = 128
 - Land Zone at 612
 - Capacity = 10.1 Meg.

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off	
4[*]:*	J3 : 2 ! 1 !
3[*]:]	J4 : 2 ! 1 !
2[*]:]	
1[*]:*]	J3-2 to J3-1 to J4-2

MINIMUM PROM REVISION ON WINCHESTER CONTROLLER BD. IS Rxx.
TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

UPPER LEFT SWITCH BANK (Back to Left)

ON PC/APC/DIS Switch 1 is ON and rest OFF.
ON PC200's Switch 2 is ON and rest OFF.

ON	! *	!	
OFF	! * * * * *	!	<--(Shown as DS1 Selected)
	! 1 2 3 4 5 6 7 8	!	

LOWER LEFT SWITCH BANK (Back to Left)

ALL ON

ON	! * * * * *	!	
OFF	! * * * * *	!	<--(Shown as First or Only Drive)
	! 1 2 3 4 5 6 7 8	!	

5 JUMPERS AT LOWER LEFT (Back to Left)

ALL OUT

SWITCH BANK 3 (if exists)

ALL "ON"

ON	! * * * *	!
OFF	! * * * *	!
	! 1 2 3 4	!

PART NUMBERS:

PC/APC/DIS --> 278-4062, 725-0242
PC240/280/380 --> HDD-2001-PC2, 200-1336, 279-0767

OTHER INFO:

- > TYPE 25.
- > 4 Heads
- 4 Surfaces
- 612 Cylinders
- > Half Height and Full Height Specs are the same.
- > 150 units with low servo wedge amplitude
 - ID by NOV/86 - APR/87 in serial number (10% of these bad)
 - SYMPTOMS: load soft. & data then it fails during power-up with diags. - will exhibit seek errors on certain cylinder

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off	
4[:*]	J3 ! 2 ! 1 !
3[* :]	J4 ! 2 ! 1 !
2[* :]	
1[:*]	J3-2 to J3-1 to J4-2

MINIMUM FROM REVISION ON WINCHESTER CONTROLLER BD. IS Rxx.
TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

Facing the drive from the rear and the PC board orientated to the bottom, the jumpers are as follows:

—> For the WPC/APC jumper the 1st and the 6th pair of pins from the left as shown below:

! + + + + ! + +	If these jumpers are completely mirror imaged, the drive will format and the directory can be listed but the drive activity LED will remain out.
! + + + + ! + +	
DS1	

—> For the PC240/280/380 jumper the 2nd and the 6th pair of pins from the left as shown below:

+ ! + + + ! + +
+ ! + + + ! + +
DS2

PART NUMBERS:

PC/APC/DIS —> 278-4062, 725-0242
PC240/280/380 —> HDD-2001-PC2, 200-1336, 279-0767
The Terminator for the drive has 4310R-104-221/331 written on it and has Seagate P/N 10134-001.

OTHER INFO:

- > TYPE 25.
- > 4 Heads
- 4 Surfaces
- 612 Cylinders
- > Half Height and Full Height Specs are the same.
- > The terminator socket is on the non-component side of the PC bd. and has pin 1 to the rear of the drive. The terminator has a small dot on the pin 1 side.

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off
4[:*]
3[*:]
2[*:]
1[:*]

J3 : 2 : 1 :
J4 : 2 : 1 :

J3-2 to J3-1 to J4-2

MINIMUM PROM REVISION ON WINCHESTER CONTROLLER BD. IS Rxx.
TEMPEST controllers are 210-8255-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

PART NUMBERS:

PC/APC/OIS --> 278-4062

OTHER INFO:

--> This drive is referred to in HWT5307.

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off

4[:*]

3[:*]

2[*:]

1[:*]

J3 ! 2 ! 1 !

J4 ! 2 ! 1 !

J3-2 to J4-2

- > MINIMUM PROM REV. ON WINCH. CONT. BD. IS R6 (TAC/NL 41016).
(will reduce read errors on outer cylinders)
- > R9 PROM to correct power-up problem (HWT5097)
- > TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

JUMPER DS1 IN

```

  _____
  |         |
  |   .   . |
  |   .   . |
  |   .   . |
  |   .   . |
  |   .   . |
  |         |

```

← Rear of Drive

E7 - (A-B)

PART NUMBERS:

PC/APC/DIS —> APC-PM025, 278-4034, 177-8205
 PC240/290/380 —> NONE

OTHER INFO:

- > On the DIS 60/60-1 the address is 58 (drive 30A) and min. soft. rel. 10.A.1
- > Noisy static eliminator - replace it with new style strap P/N726-3316.
(HWT7088)
- > R9 PROM to allow 256K expanded memory bd. to run with 30 MEG drive so
won't get "BAD OR MISSING COMMAND INTERPRETER" error message (HWT5095).
- > TYPE 29
 35651584 Bytes
 512 Cylinders
 8 Heads
 17 Sectors / Track
 Precomp = 256
 Land Zone = 512
 Capacity = 34.0 Meg.

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off	
4[:*]	J3 ! 2 ! 1 !
3[:*]	J4 ! 2 ! 1 !
2[:*]	
1[*:]	J4-1 to J4-2

MINIMUM PROM REVISION ON WINCHESTER CONTROLLER BD. IS R11.
 TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

W1 - IN
 W2 - IN
 W2 - IN

From the back of the drive with the interface bd. on the bottom
 the pins are orientated as follows:

! +	++++ !!	<-----	On PC/APC/OIS DS1 is jumpered.
! +	++++ !!	<-----	On PC200/300's DS2 is jumpered.
W W	D D D D W W		
e 7	S S S S 2 1		
	4 3 2 1		

PART NUMBERS:

PC/APC/OIS --> 725-0254
 PC240/280/380 --> HDD-3401-PC2, 200-1337, 279-0768

OTHER INFO:

- > TYPE 26.
- > 1024 Cylinders
- 4 Heads
- 17 Sectors
- 512 Bytes/Sector
- Capacity 35651584 Bytes
- > On the OIS 45/55 the address is 48 and min. soft. rel. 10.J
- > In WPC IBM emulation drive must be partitioned (30 MEG Quantum doesn't have to be - an exception to the rule). The error message obtained is "INVALID DRIVE SPEC"-(07345009 / HWT7006)

DRIVE JUMPERS AND SWITCHES:

PART NUMBERS:

OTHER INFO:

- > TYPE 40.
- > 615 Cylinders
- 8 Heads
- 17 Sectors/Track
- Precomp = 128
- Land Zone = 664
- Capacity = 40.8 Meg.

DRIVE JUMPERS AND SWITCHES:

PART NUMBERS:

OTHER INFO:

- > TYPE 44.
- > Cylinders 820
 - 6 Heads
 - Sectors/Track = 17
 - Precomp = -1
 - Capacity = 40.8 Meg.

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off
4[:*]
3L :*]
2[*:]
1[*:]

J3 ! 2 ! 1 !
J4 ! 2 ! 1 !

J3-2 to J4-1 to J4-2

MINIMUM FROM REVISION ON WINCHESTER CONTROLLER BD. IS R12.
TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

TOP REAR view of jumper pins

+ + + + + + +
+ + + + + + +
D D
S S
1 2

DS1 IN for WPC/APC/OIS
DS2 IN for PC200's
THE REST OUT

PART NUMBERS:

WPC/APC/OIS → 725-3493
PC240/280/380 → HDD-4002-PC2, 200-1340, 279-0773

OTHER INFO:

- TYPE 27.
- Cylinders 1024
- Heads 5
- Sectors/Track 17
- Bytes/Sector 512
- Capacity = 44564480 Bytes
- No static strap installed
- Full Height to Half Height Replacement Kit is 286-0037 to change from Micropolis Full Heights to CDC Half Heights. (HWT8108)

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off
4[:*]
3[:*]
2[*:]
1[*:]

J3 : 2 : 1 !
J4 : 2 : 1 !

J3-2 to J4-1 to J4-2

MINIMUM FROM REVISION ON WINCHESTER CONTROLLER BD. IS R12.
TEMPEST controllers are 210-8855-A/B655-A.

DRIVE JUMPERS AND SWITCHES:

ON PC/APC/OIS DS1 is IN.
ON PC200's DS2 is IN.

PART NUMBERS:

PC/APC/OIS --> 725-0255, 278-4070
PC240/280/380 --> HDD-4201-PC2, 200-1338, 279-0769

OTHER INFO:

--> TYPE 27.
--> On the OIS 65 the drive address is 28 and min. soft. rel. 10.J

210-9025-A BD. SWITCH SETTING: 210-8225-A/9225-A JUMPER SETTINGS:

On/Off	
4[*]:*	J3 ! 2 ! 1 !
3[*]:]	J4 ! 2 ! 1 !
2[*]:*	
1[*]:]	J3-1 to J4-1 to J4-2

MINIMUM FROM REVISION ON WINCHESTER CONTROLLER BD. IS R9.
TEMPEST controllers are 210-8855-A/8655-A.

DRIVE JUMPERS AND SWITCHES:

ON PC/APC/OIS DS1 is IN.
ON PC200's DS2 is IN.
PC386/387 DS2 IS IN FOR DRIVE C: & D:
W1, W2, W8 - IN

PART NUMBERS:

PC/APC/OIS --> 278-4054
PC240/280/380 --> HDD-6801-PC2, 200-1339, 279-0770

OTHER INFO:

- > TYPE 28.
- > Cylinders 1024
- Heads 8
- Sectors/Track 17
- Bytes/Sector 512
- Capacity = 71303168 Bytes
- > On the OIS 70 the drive address is 18 and min. soft. rel. 10.H
- > APC BIOS 1.65 will work fine with this drive.

DRIVE JUMPERS AND SWITCHES:

Facing the drive from the rear with the board to the bottom the jumpers are orientated as follows:

```

+ ! + + + + ! +
+ ! + + + + ! + <----- WA2 & DA2 should be installed.
W W W W W D D D
1 2 3 4 5 A A A
          1 2 3

```

PART NUMBERS:

PC240/280/380/381/382/383 -> HDD-1431-PC2, 200-xxxx, 279-4033

OTHER INFO:

--> TYPE 33

--> STORAGE CAPACITY	<u>FORMATTED</u>	<u>UNFORMATTED</u>
Capacity (MB)	143.7	170.6
Cylinders	1022	1024
Heads	8	8
Disks	5	5
Sectors/Track	36	
Bytes/Track	18432	20832
MB/Surface	17.96	21.33

--> Reference TSB HMT-9002 & Installation Guide (715-2018)

--> Requires PC200 ROM BIOS 3.10 or greater and PC300 ROM BIOS 1.10 or greater.

--> Requires ESDI Controller Bd. DSK-0003-PC2 (725-4117).

--> Rotational Speed = 3600 RPM

--> Transfer Rate = 10 Mbps

--> Seek Time

Track to Track = 6 msec
Average = 23 msec
One-third Stroke = 31 msec
Maximum = 62 msec

--> Rotational Latency

Average = 8.33 msec
Nominal Maximum = 16.67 msec

--> Start Time

Typical to drive ready = 12 sec
Maximum = 20 sec

--> Stop Time = 20 sec

--> Power Dissipation

Standby = 29 W, 99 Btu/hr
Positioning = 35 W, 119 Btu/hr

--> Noise = less than 51 dBA (sound pressure)

--> Environmental

Temperature = 50 F to 122 F (10 C to 50 C)
Relative Humidity (Noncondensing) = 10% to 90%
Maximum Wet Bulb Temperature (noncondensing) = 80 F (28 C)
Altitude = -200 ft. to 10,000 ft.

DRIVE JUMPERS AND SWITCHES:

Facing the drive from the left with the board to the top the jumpers are orientated as follows:

```

+ ! + + + + ! +
+ ! + + + + ! + <----- WA2 & DA2 should be installed.
D D D W W W W W
A A A 5 4 3 2 1
3 2 1

```

PART NUMBERS:

PC240/280/380/381/382/383 --> HDD-3211-PC2, 200-xxxx, 279-4034

OTHER INFO:

--> TYPE 34

--> STORAGE CAPACITY	<u>FORMATTED</u>	<u>UNFORMATTED</u>
Capacity (MB)	322.2	382.3
Cylinders	1222	1224
Heads	15	15
Disks	8	8
Sectors/Track	36	
Bytes/Track	18432	20832
MB/Surface	21.48	25.49

--> Reference TSB HWT-9002 & Installation Guide (715-2018)

--> Requires PC200 ROM BIOS 3.10 or greater and PC300 ROM BIOS 1.10 or greater.

--> Requires ESDI Controller Bd. DSK-0003-PC2 (725-4117).

--> Rotational Speed = 3600 RPM

--> Transfer Rate = 10 Mbps

--> Seek Time

Track to Track = 4 msec

Average = 18 msec

One-third Stroke = 19 msec

Maximum = 40 msec

--> Rotational Latency

Average = 8.33 msec

Nominal Maximum = 16.67 msec

--> Start Time

Typical to drive ready = 12 sec

Maximum = 20 sec

--> Stop Time = 20 sec

--> Power Dissipation

Standby = 29 W, 99 Btu/hr

Positioning = 35 W, 119 Btu/hr

--> Noise = less than 47 dBA (sound pressure)

--> Environmental

Temperature = 50 F to 122 F (10 C to 50 C)

Relative Humidity (Noncondensing) = 10% to 90%

Maximum Wet Bulb Temperature (noncondensing) = 80 F (28 C)

Altitude = -200 ft. to 10,000 ft.

GENERAL WINCHESTER NOTES

R12 winchester controller PROM - FCO 1151C P/N 728-0167C (HWT7240)

J3-2 and J4-2 switched on the 8225-R1 and below winchester controller

DMI 20 MEG (CM6426-S) is not our winchester (07266085)

Remove noisy Micropolis static eliminators on a problem only basis. All future drives shipped will already have them removed. (HWT8028, HWT8044)

210-8855 has extra circuitry for door open interrupt and write protect (08014075).

No information on the MAGNA controller bd.

DIAGS. 2561 does not support reads on 30 MEG partitioned drive. Must use R10 PROM revision with this diagnostic. If 2520 or 2502 revisions are used the diagnostic will hang at the start of the "sequential reads" test.

256K Bd. incompatible with drive / "BAD OR MISSING COMMAND INTERPRETER" (TAC/NL 40501).

Half Height Winchester mounting hardware for WPC/APC:

- >452-0342 -- Standard Mounting Plate
- >449-0837 -- Half Height Mounting Adapter
- >650-3328(4)-- Long Mounting Screws (SCREW, 6-32X1-1/8 PAN HD.)
(Screws Obtained Locally)

FCO Kit for R12 Winchester Controller PROM

on WPC/APC is: (HWT-7240)

FCO Kit 1151C

P/N 728-0167C

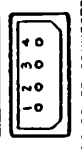
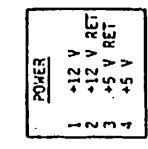
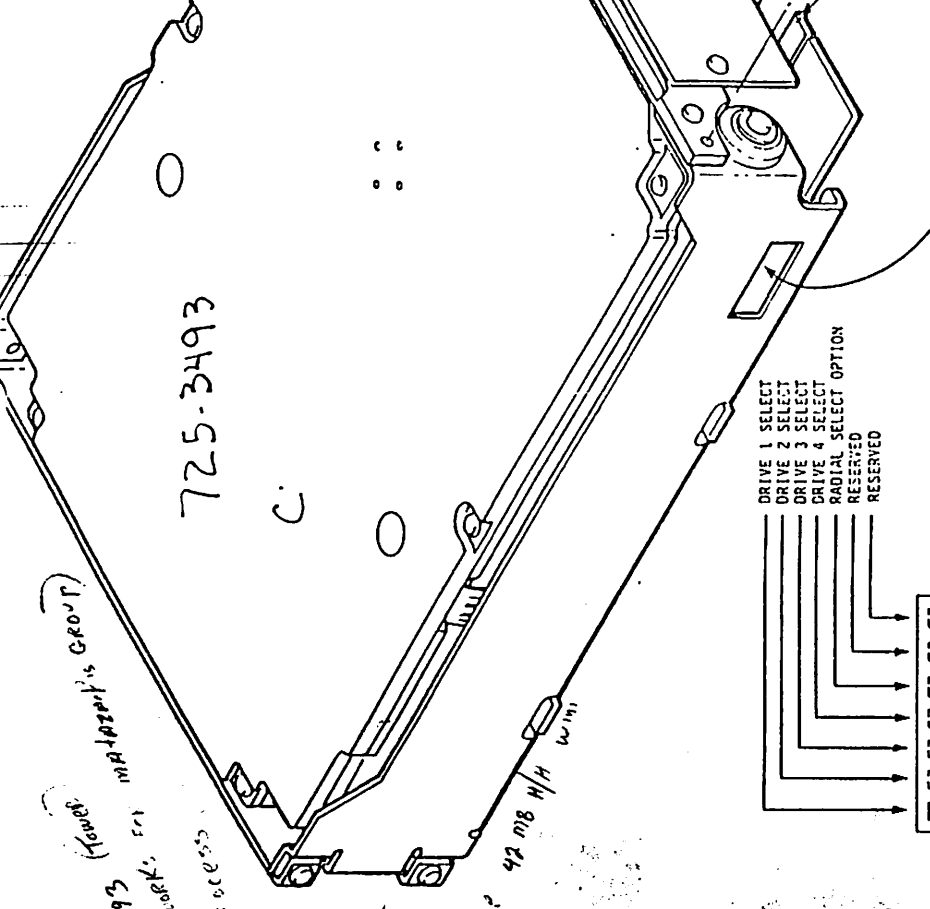
on Tempest 75PCT is: (HWT-7241)

FCO kit 1167B

P/N 728-0183-B

TSB on the maximum allowable "Bad Bytes in Sectors" is TAC/NL 40717.

32/42 MEG WINC FOR 2200 D
 REPLACES 32 MEG MicroPolis 1323
 SAME MODEL #
 42 MEG MicroPolis 1323
 Full Height
 W1, W2, DSI IN



DC POWER CONNECTOR

PIN 1
COMMAND
CABLE
CONNECTOR

PIN 1
DATA
CABLE
CONNECTOR

TERMINATOR RESISTOR
 MOVED BEHIND A CABLE (SEE BELOW)



PHASE IN PLANNED FOR JULY 8th.
 (HARRIS)
 725-3493
 WORKS FOR MATERIALS GROUP
 DRIVE PROCESS
 TEST

289-0850 option
 33MB FH win1 To 1/12
 42 MB M/H win1
 725-3493

11X

MOVE DRIVE SELECT TO 2

PC/2200/OIS

MOVE DRIVE SELECT TO 1

NOTE: TERMINATOR RESISTOR HAS BEEN RELOCATED.

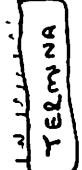
CDC MAGNETIC PERIPHERALS 42 MEG

2200 DS
 725-3493

MIN 94205-53 HALF HEIGHT

TERM BEHIND LARGE CONNECTOR

JUMPERS



POWER
CONN

REPLACES 32 MEG
 (REPLACES) WILL USE 32 MEG MicroPolis

SW SETTINGS, ~~SW SETTINGS~~



SECRET

CONFIDENTIAL - SECURITY INFORMATION

WANG

TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 9192 REPLACES: _____ DATE: 06/06/89 PAGE 1 OF 1

MATRIX ID. 3107 PRODUCT/RELEASE# 2200 DS/CS-D

TITLE: New CDC (Imprimus) Magnetic Peripherals 42 MB HH Winc Disk Drive

PURPOSE:

To provide the field with the necessary information to install this drive properly in the 2200 DS Disk Cabinet or in the CS-D CPU.

EXPLANATION:

A new 42 Meg drive from CDC (Imprimus) Magnetic Peripherals (MN 94205-53) is now being shipped to the field as a replacement for the 32 Meg full height drives (Quantum Q540 and the Micropolis 1323). Although the drive has 42 Meg, it is being used as a 32 Meg (2 16 Meg addresses with 65024 sectors). The following information should allow successful installation:

Drive Type Switch Settings:

DS 210-8826A DPU Brd, Sw Bk 1 &/or 2 - 8 Off, 7,6,5 On for DR1 or DR3
4 Off, 3,2,1 On for DR2 or DR4
CS-D 212-7113 DPU Brd, Sw Bk 3 - 8 Off, 7,6,5 On (1-4 off, n/a)

NOTE: The 32 Meg Quantum Q540 has different switch settings which will not work with the CDC (Imprimus) Magnetic Peripherals 42 Meg drive.

Jumpers: Drive 1 Select only in all cases. A series of 7 jumpers are located behind the A & B cable connectors. The Drive Select 1 jumper is on the end, B Cable side, farthest from the power plug.

Terminator: IN for CS-D or DR1 in DS. OUT for DR2, DR3, & DR4 in DS.
DR1/DR2/DR3/DR4 (Drive Select 1/2/3/4) refer to the connector position on the A cable. The Terminator is located behind A Cable Connector.

Addressing: 2 addresses, each with sectors 0-65023.

Part Numbers:

CDC Magnetic Peripherals MN 94205-53 Half Height 42 Meg - 725-3493
Micropolis 1323 Full Height 32 Meg - 725-0254
Quantum Q540 Full Height 32 Meg - 725-0144

Once installed properly, it would be transparent to the user which winchester was being used.

GROUP: VS On-Line Support MAIL STOP: 001-330

COMPANY CONFIDENTIAL

WANG Laboratories, Inc.

WANG

TECHNICAL SERVICE BULLETIN
SECTION: Hardware Technical

NUMBER: HWT 9187 REPLACES: _____ DATE: 06/06/89 PAGE 1 OF 1
MATRIX ID. 3110 PRODUCT/RELEASE# 42MB Winchester Disk Drives
TITLE: Drive Failures on WLI 725-3493

PURPOSE:

To inform the field of defective EXAR Monochips that may cause drives to fail to spin up or become ready.

EXPLANATION:

A defective chip at location U32 of the drive Read/Write and Control Board has been reported by Imprimis (formally CDC). This chip can cause the drive to fail, by not spinning up or by spinning up but not becoming ready. Lot numbers effected by this failure mode are lots 8810 thru 8848. Drives purchased by Wang within these lot numbers were shipped beginning 07/01/88. Lot numbers can be located on the white label on the HDA portion of the drive just under the drive serial number. This drive is supported on all PCs, VS and OIS systems as a replacement for past ST506 type drives.

CORRECTIVE ACTION:

Due to the projected failure rate of 3 to 7% out of the installed base of lots 8810-8848 over a three year timeframe, these drives will remain as a whole unit swap on failure for this problem. All spares stock has been purged by Purge #890053.

GROUP: Desktop Systems/Peripherals Group

MAIL STOP: 001-140

COMPANY CONFIDENTIAL
WANG Laboratories, Inc.

CDC 42 MEG

TECHNICAL SERVICE BULLETIN
SECTION: Hardware Technical

NUMBER: HWT 8108 REPLACES: _____ DATE: 07/12/88 PAGE 1 OF 1

MATRIX ID. 3110 PRODUCT/RELEASE# 42 MB Half-height Wini

TITLE: 42 MB HH Winchester Replacements

PURPOSE:

To inform the field of the introduction of a Control Data Corporation 42 Megabyte Half-height Winchester Disk Drive.

EXPLANATION:

To take advantage of the new trends in technology and the reduction of the cost per megabyte in winchester drives, Wang will be phasing in for sales, the CDC 42 MB Half-height Drive (725-3493) This is a direct replacement drive in new units shipped from distribution, for the Micropolis Full-height 30MB (725-0254) and 42 MB Drives (725-0255).

TSO logistics will continue to ship Micropolis drives to the field until the depletion of existing stock necessitates ordering new drives. The gradual phasing in of the CDC 42 MB for CE support will begin in July 1988.

The CDC drives are fully plug compatible with the Micropolis drives. However, a full-height to half-height replacement kit (286-0037) will be necessary when replacing a Micropolis with a CDC drive.

NO JUMPERS

GROUP: Peripherals New Products

MAIL STOP: 001-140

IMPRIMIS

CDC 72/145 MB
HH WINC

SMALL DISK DIVISION - OKLAHOMA CITY

TELEFAX - 405/324-3333

DATE: DECEMBER 5, 1988

TO: Mr. Paul Bovaird fax # 508-453-4130
Wang Laboratoaries, Inc.
M/S 014-490
Telephone 508/967-3026

FROM: Mr. Branford Dodoo M/S OKM272

PAGES TO FOLLOW _____

In multiple-device systems, each drive must have its own unique ID bit. Drives are configured as SCSI ID 0 at the factory.

Interface Terminator pack RN9 provides proper termination for the interface lines. For a multiple-drive system, the terminator pack is installed in the last drive on the cable; see Section 3.4.

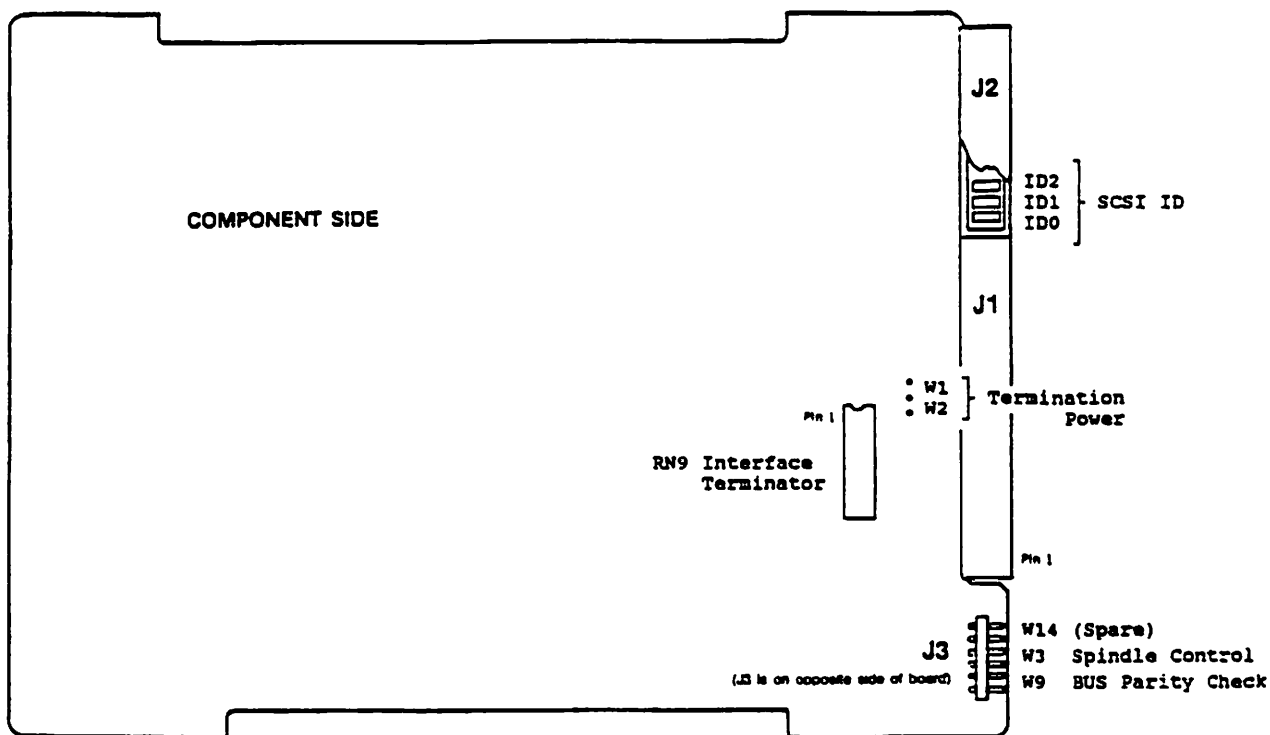


Figure 3-2. Address Jumpers and Interface Terminator

3.3.2 BUS Termination Power Option

A jumper is installed at W1 or W2 to select the source of terminator power (+5V) for the terminator packs on the Device Electronics board.

- When a jumper is installed at W1 (the factory default configuration), the drive provides terminator power to its on-board terminators.
- When a jumper is installed at W2, terminator power is provided by the host system via interface cable J1, pin 26 (TERMPWR); see Section 2.2 for the TERMPWR requirements.

48553 THRU 7774859 REV'D

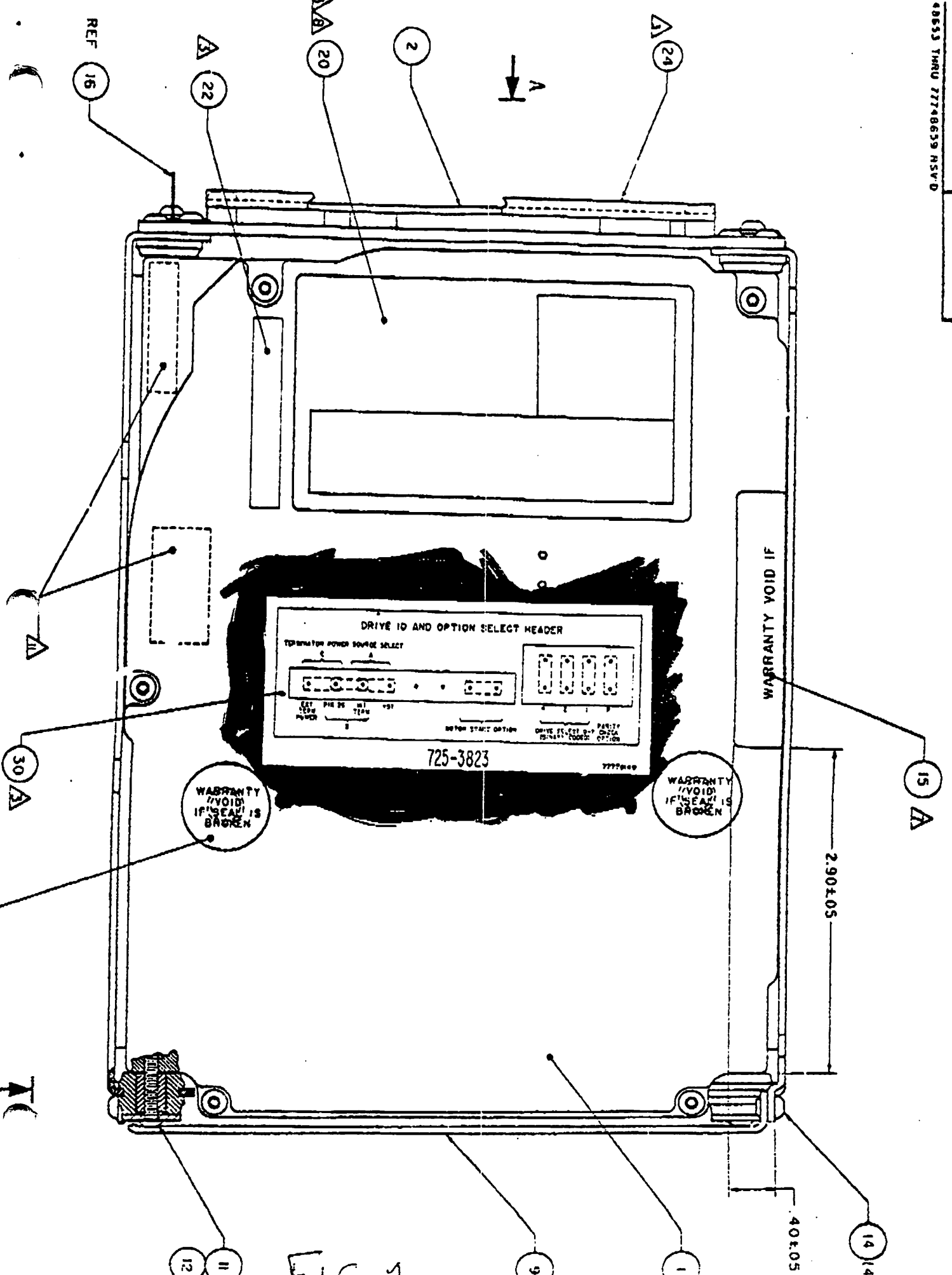
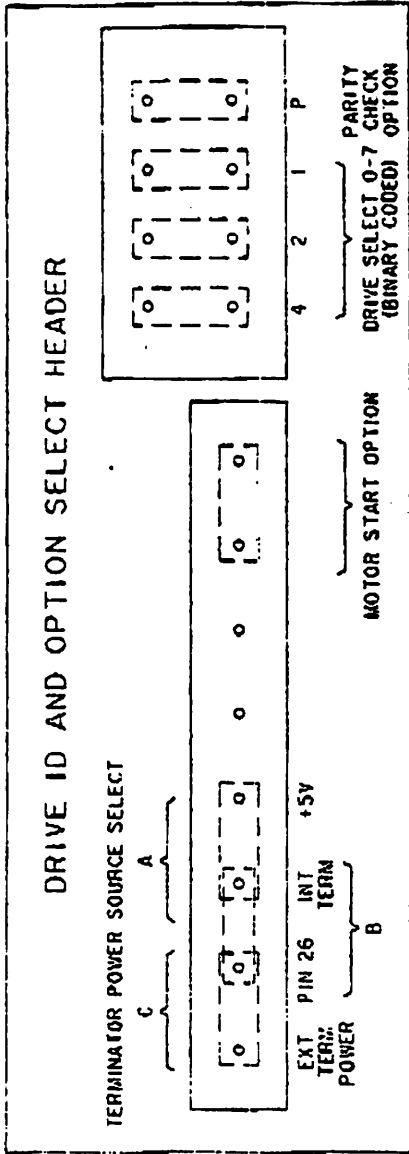


FIG 1

DRIVE ID AND OPTION SELECT HEADER



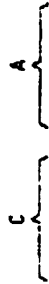
725-3822

77770148

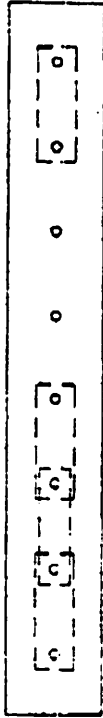
FIG-2

DRIVE ID AND OPTION SELECT HEADER

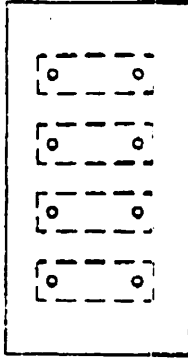
TERMINATOR POWER SOURCE SELECT



EXT PIN 26 INT +5V
TERM TERM
POWER POWER



MOTOR START OPTION



DRIVE SELECT 0-7 CHECK
(BINARY CODED) OPTION

725-3823

77770149

FIG 3

INTERNATIONAL MEMORIES, INC

IMI PART NUMBER 430-02103-001

March 19, 1983

REV B

FROM REPAIR STRATEGY

OEM REFERENCE & MAINTAINCE MANUAL

5.25 INCH WINCHESTER DISK DRIVE,

MODELS 5006H, 5012H, 5018H

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SECTION 1

GENERAL DESCRIPTION

The International Memories, Inc. (IMI) advanced family of high reliability 5.25 inch Winchester disk drives offer such features as an isolated shock mounted head/disk assembly, ultra hard plated media, and enhanced thermal stability. The drives also provide up to 19.14 megabytes of unformatted storage, are ST506 compatible, and offer the latest in data integrity within a wide range of operating environments.

Other advanced and standard features of the drives include the following:

Data Integrity

- o Proven Winchester technology
- o Ultra-hard thin-film plated media lessens possibility of damage due to handling, lowering field service costs
- o Dedicated shipping zone provided for heads at inner diameter of disks
- o Automatic spindle brake acts as a restraint against spindle rotation
- o Manganese zinc recording heads for increased signal amplitude
- o Read preamplifiers located on head stack reduce EMI/RFI noise susceptibility, increasing data reliability
- o Magnetically shielded DC spin motor ensures data integrity
- o Optimized, automatic actuator position thermal compensation to provide minimal off-track error throughout temperature range
- o Short, sturdy head arms minimize resonance effects, improving data reliability
- o Head/disk assembly protected from handling damage by surrounding shock mounted frame
- o 0.9° high torque stepper motor enables full-step positioning, minimizing positioning errors
- o Deeply ribbed base and top cover provide greater heat transfer area for cooling and transfer heat evenly and quickly, minimizing thermal off-track error

Component Reliability

- o Well proven, self aligning, 6 ball bearing linear actuator system low friction independent of position
- o Case-hardened actuator rails
- o Plated capstan to eliminate fretting corrosion
- o Elastomer carriage stop pads for controlled displacement and acceleration
- o Unique patented band preload system minimizes stress concentrations in band, increasing life
- o 0.9° stepper allows larger capstan size, further decreasing band stresses
- o High efficiency recirculating air filtration system for continuous air cleaning
- o HDA totally sealed from contaminated exterior air
 - o Stepper motor sealed
 - o Spindle motor sealed
 - o All mating surfaces gasketed
- o Forced air circulation system to cool electronics

General

- o Industry standard interfaces allow fast system integration
- o Drive requires no adjustments or preventive maintenance
- o DC power allows worldwide installation
- o 5.0 Mbit/second data transfer rate
- o Crystal-controlled brushless DC spindle motor
- o Two piece HDA/frame shock mounted construction minimizes handling and in-service shock damage

1-1 DRIVE CHARACTERISTICS

The IMI 5000 series drive is a fixed disk, sealed environment drive with data recorded on storage surfaces using a modified frequency modulation (MFM) recording technique.

The drive's major components are shown in Figure 1-1. These include the spindle motor, disks (up to three), air filter, stepper motor, linear actuator, and heads (up to six) in a sealed head/disk assembly. The two printed circuit boards are mounted at the bottom of the drive chassis. These consist of one read/write and one motor control board.

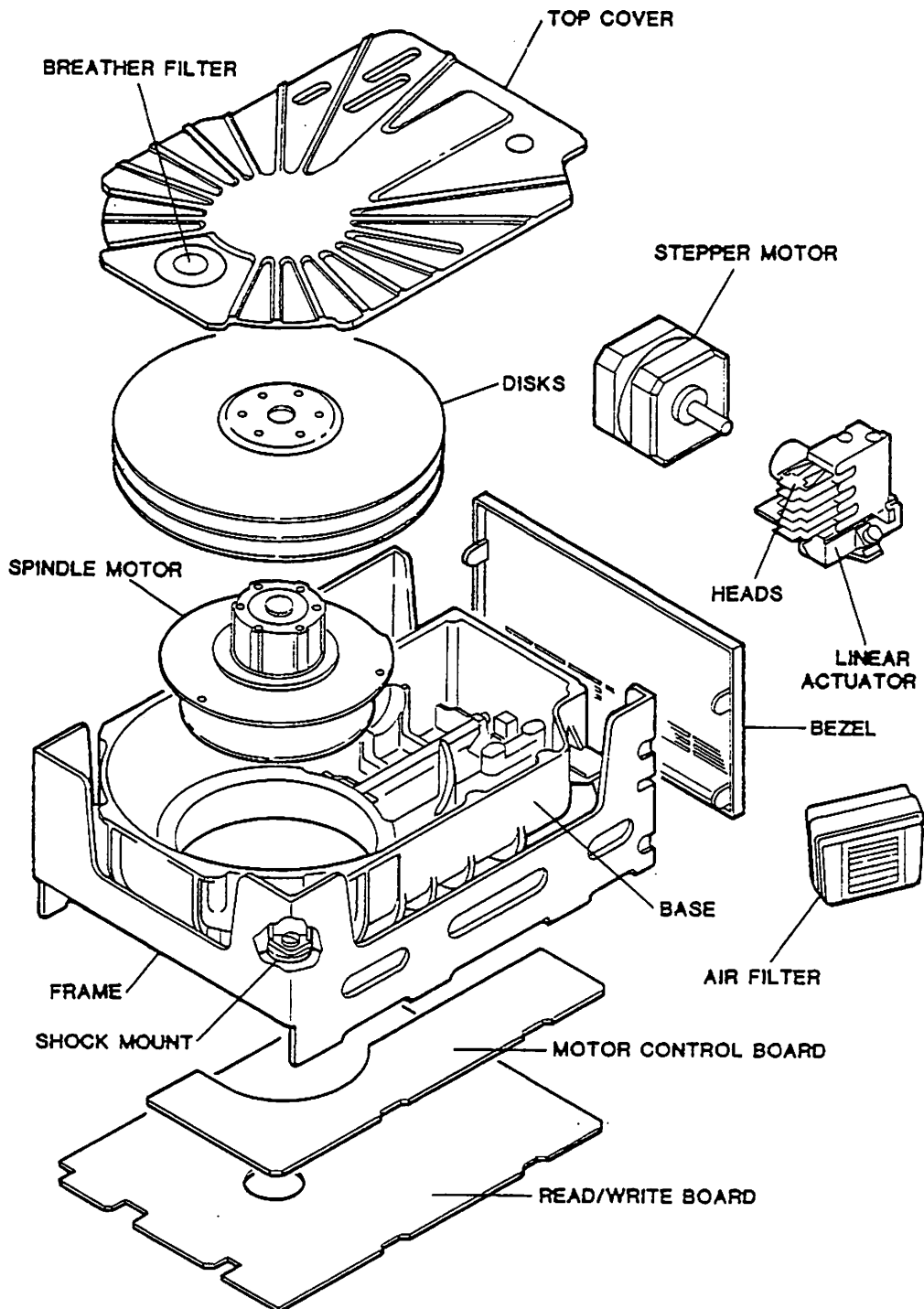


Figure 1-1. Drive Major Components

1.2 SPECIFICATIONS

FUNCTIONAL

Model Number	5018H	5012H	5006H
Capacity (unformatted)			
Drive (Mbytes)	19.125	12.75	6.375
Per surface (Mbytes)	3.1875	3.1875	3.1875
Per track (bytes)	10,417	10,417	10,417
Capacity (formatted)			
Drive (Mbytes)	15.03	10.02	5.01
Per surface (Mbytes)	2.506	2.506	2.506
Per track (bytes)	8,192	8,192	8,192
Sectors per track	32	32	32
Bytes per sector	256	256	256
Recording density(BPI)	9706	9706	9706
Track density(TPI)	303	303	303
Recording surfaces	6	4	2
Heads per surface	1	1	1
Disks	3	2	1
Cylinders	306	306	306

PERFORMANCE

Start time	20 sec. typical
Stop time	15 sec. typical
Rotational Speed	3,600 RPM
	Accurate to $\pm 0.5\%$
	with $\pm 0.2\%$ variation from
	nominal speed
Transfer Rate	5 Mbits/sec
Access Time (including settling)	
Track to Track	18.5 ms
Average	68 ms
Maximum	120 ms
Average Latency	8.3ms
Recording Code	MFM

1.2 Specifications (cont.)

PHYSICAL DIMENSIONS

Width	5.75 inches (14.61 cm)
Depth	8.0 inches (20.32 cm)
Height	3.25 inches (8.26 cm)
Weight (5018H)	5.3 lbs (2.41 Kgm)

RELIABILITY

MTBF	10,000 POH
MTTR	<0.5 hour
Preventive Maintenance	None required
Service Life	>Five years
Error Rates	
Soft	<1 in 10^{10} bits
Hard	<1 in 10^{12} bits
Seek	<1 in 10^6 seeks
Media	
Max Defects 5006H	8 defects maximum,
5012H	16 defects maximum,
5018H	24 defects maximum,
	cylinder 0 certified error-free

ENVIRONMENTAL

	Operating	Non-Operating
Temperature	39°F to 122°F (4°C to 50°C)	-40°F to 140°F (-40°C to 60°C)
Relative Humidity	8% to 80% Non-condensing	8% to 80% Non-condensing
Altitude (max)	10,000 feet (3,048 meters)	50,000 feet (15,240 meters)
Shock, Vibration	Exceeds industry standards - Refer to "IMI 5000H Series Environmental Vibration Shock and Transportation Standard", Specification No. 706-02088-001.	
Temperature Variation	18°F/hour (10°C/hour) maximum	

1.2 Specifications (cont.)

HEAT DISSIPATION

Watts

20

POWER REQUIREMENTS

DC Operating Power

+5 VDC \pm 5%, 1.9

amps typical 2.5 (peak)

+12 VDC \pm 5%, 1.1amps

typical (3.5 amps

surge during motor start).

SECTION 2
INSTALLATION

2.0 GENERAL INFORMATION

This section describes the procedures for unpacking, handling, installation, operation, and packing for reshipment of the IMI 5000H series drive. It is suggested that before attempting installation, please review this document to develop an overall understanding of the drive operation and technical features.

CAUTION

- ▶ ○ The drive must only be operated in the orientation described in the installation paragraph of this section.
- The drive environment (operating and non-operating) must be maintained as described in Section 1 of this document.
- The sealed head/disk assembly must not be opened for any reason.
- ▶ ○ The drive is a precision instrument and must be handled carefully.

2.1 UNPACKING AND INSPECTION

The IMI disk drive unit is shipped in a protective container, Figure 2-1, to prevent handling damage. Upon receipt of a unit from the shipper, carefully inspect the shipping container for damage. Report any damages to the carrier immediately. The warranty regarding reshipment of the unit requires that it be enclosed in the supplied container. Therefore, retain original packaging in case of later reshipment of the drive.

2.2 HANDLING

The disk drive contains a head landing/shipping zone designed to protect active data areas during periods of rough handling (shipping). The zone is located on the farthest inside track area (see Preparation for Reshipment). The drive also has a friction brake mechanism that stops the disk rotation at removal of power to the drive motor. This significantly reduces wear on the heads and the media, and acts as a shipping restraint to prevent disk rotation during shipping and handling. The position of the carriage is held against the inner carriage stop, with the heads in the shipping zone during shipping and handling by the orientation of the drive into shipping container (bezel up) and by the inherent magnetic detent of the stepping motor. (Extreme caution is recommended when handling).

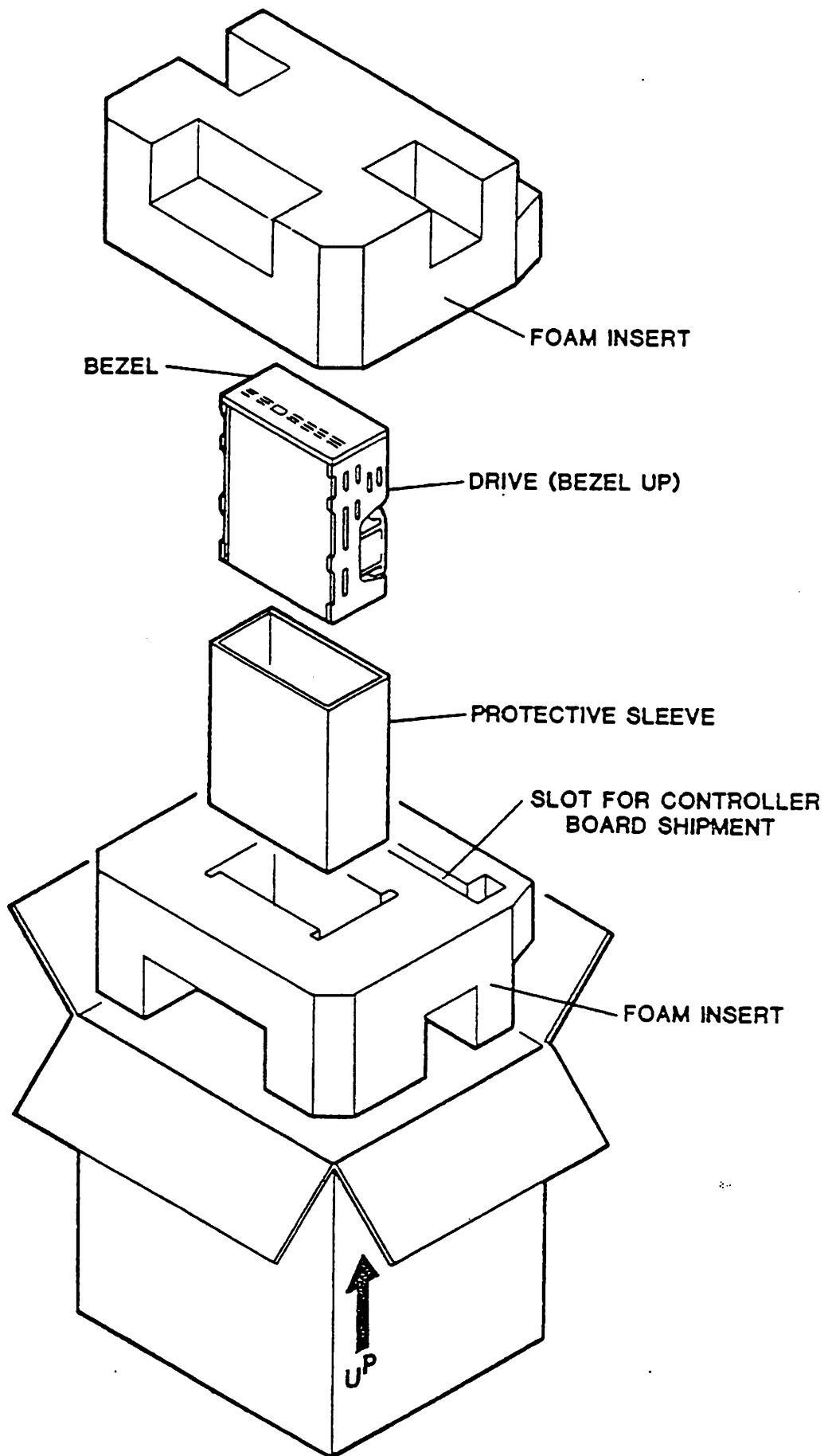


Figure 2-1. Shipping Container and Packaging

2.3 INSTALLATION

NOTE

Prior to installation, read the previous paragraph on handling of the disk drive unit.

The drive may be mounted horizontally (face up - circuit board down), or vertically on either long side (so that the carriage moves horizontally). The drive may be tilted $+15^\circ$ from the horizontal or vertical mounting positions shown in Figure 2.2. For the best shock protection in the vertical mounting position, the drive should be mounted with the stepper motor in the position indicated by the broken line in Figure 2.2. The drive physical and mounting dimensions are shown in Figure 2.2. These diagrams illustrate all the necessary dimensions required for mounting. The drive is secured to the mounting frame using 6-32 machine screws.

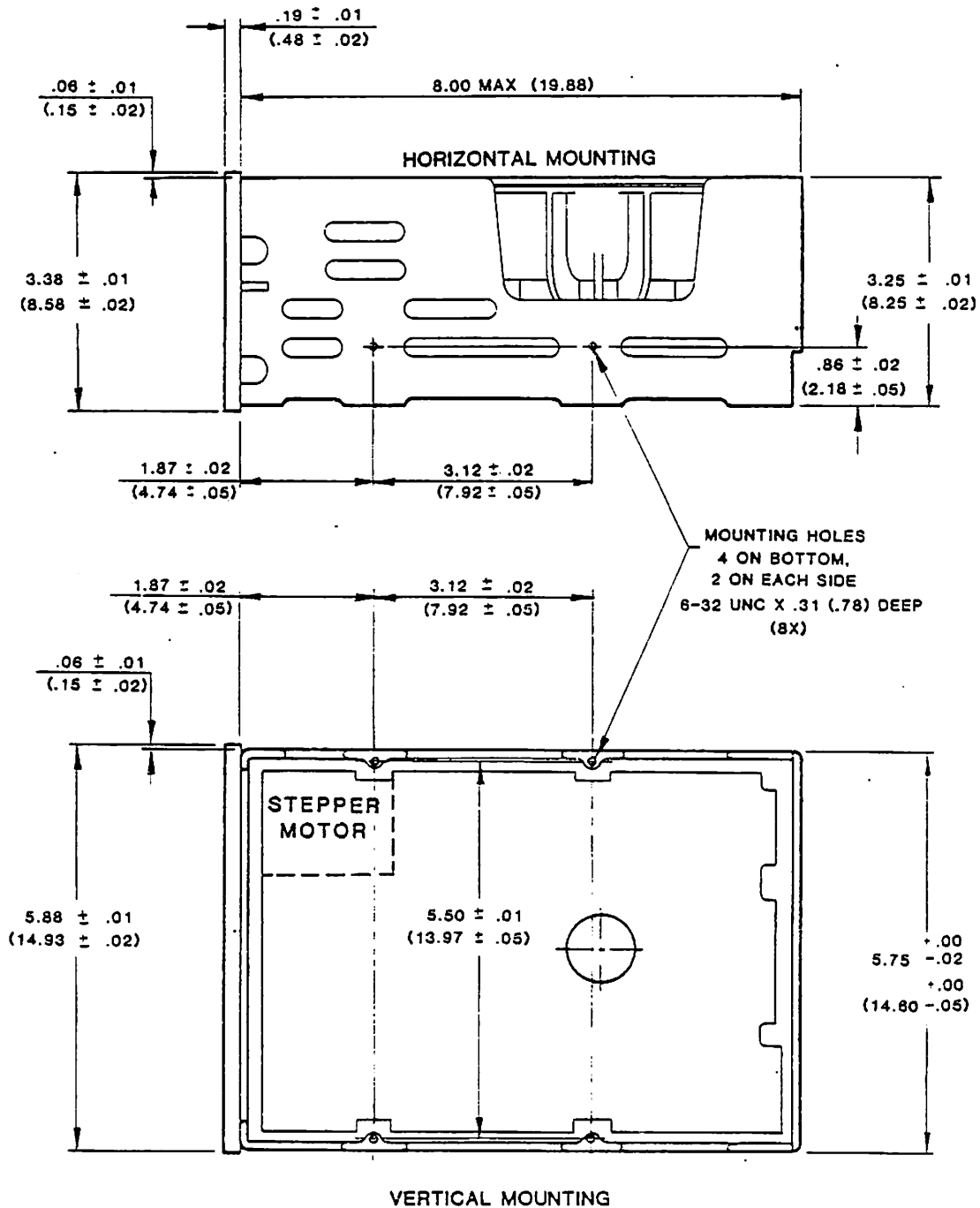


Figure 2-2. Disk Drive Physical and Mounting Dimension

2.3 Installation (cont.)

Cooling for the circuit boards is provided by a centrifugal fan attached to the spin motor and by natural convection. Air is drawn into the fan through a hole in the PC board, and blown out through the gap formed by the underside of the PC board and the base of the drive as shown in Figure 2-3.

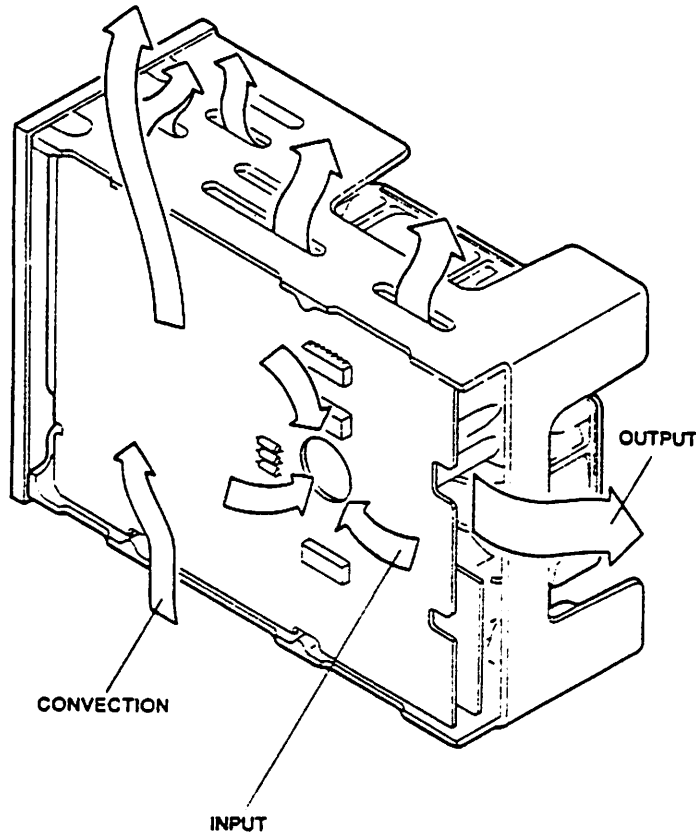


Figure 2-3. Cooling air Intake/Output Locations

It is recommended that clearance be allowed both above and below the protective frame as shown in Figure 2-4 to provide free air flow and clearance for shock mount deflection during severe shock conditions. A clearance of .125 inch is recommended.

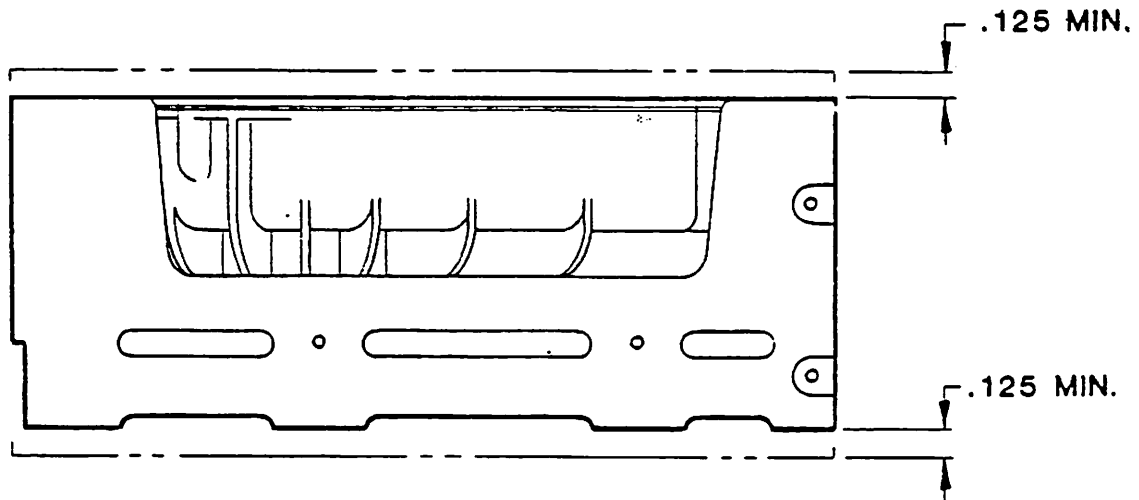


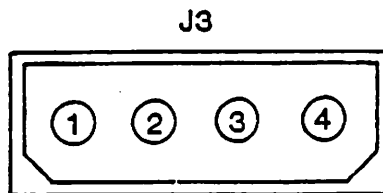
Figure 2-4. Recommended Mounting Clearance

2.3.1 Connecting Power

Connector locations for the following paragraphs are shown in Figure 2-9.

The drive requires only DC power for operation. This is connected to the unit at four pin connector J-3 shown in Figure 2-5. The recommended mating connector for J3 is as follows:

J3/P3 - Amp	P/N 61314-4 (strip form) P/N 60617-4 (loose piece)
Socket housing	No. 1-480424-0
Recommended wire size	18 or 20 awg



VOLTAGE		GROUND	
PIN 1	+12 VOLTS DC	PIN 2	+12 VOLT RETURN
PIN 4	+5 VOLTS DC	PIN 3	+5 VOLT RETURN

Figure 2-5. DC Power Connections

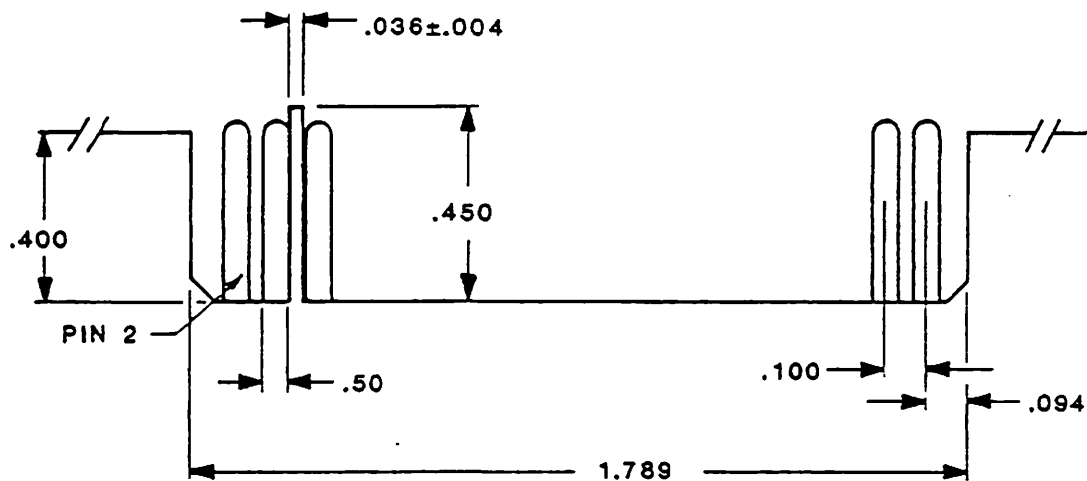
2.3.2 Connecting Signal Cable

The control and status signals to and from the drive and host controller are transferred using connector J1. The data communications (read/write) is over connector J2. Connection to J1 and J2 is via flat ribbon cable. The physical dimensions and pin locations for these connectors are shown in Figures 2-6 and 2-7 respectively (for specific signal information, refer to ELECTRICAL INTERFACE, Section 3). The recommended mating connectors for J1 and J2 are as follows:

J1/P1 - Amp ribbon connector P/N 88373-3 or 3M P/N 3463-0001, or equivalent, polarizing key 3M P/N 3439-0000.

J2/P2 - Amp ribbon connector P/N 88373-6 or 3M P/N 3461-0001.

Polarizing Key 3M P/N 3439-0000.



UNLESS OTHERWISE SPECIFIED:

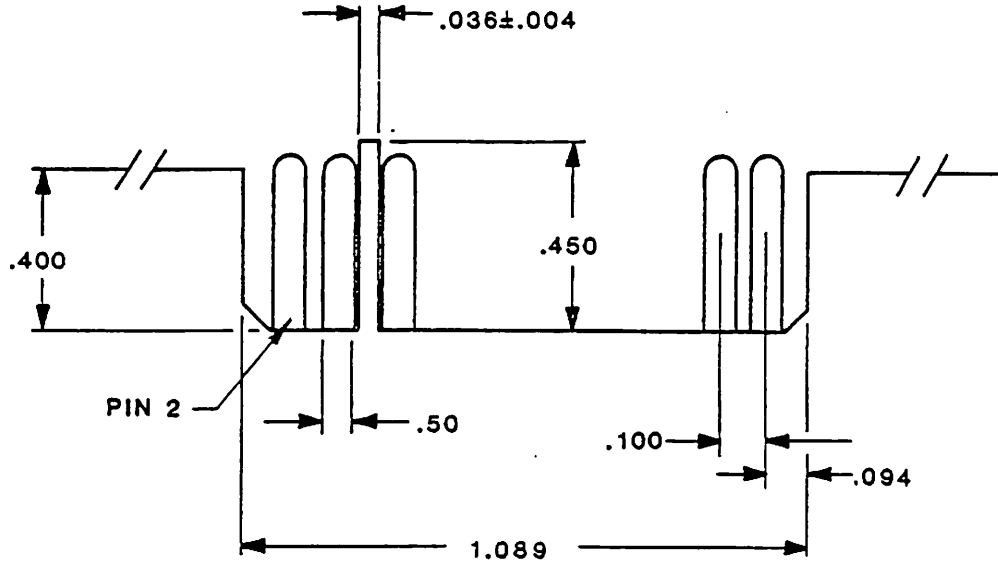
.XX = ±.03

.XXX = ±.010

BOARD THICKNESS: .062 ± .007

Figure 2-6. Control and Status (daisy chain) Connector J1

2.3.2 Connecting Signal Cable (cont.)



UNLESS OTHERWISE NOTED:

.XX = ±.03

.XXX = ±.010

BOARD THICKNESS: .062 ± .007

Figure 2-7. Data Communications (head/write) Connector J2

For connector J1, odd numbered pins are grounds and even pins are for communication signals between the drive and host controller. Key slots are provided for both connectors between pins 4 and 6.

A typical system connection with a host controller and four drive units is shown in Figure 2-8. Maximum cable length is 20 feet.

NOTE

Last drive installed must have a line terminator installed. Refer to Figures 2-8 and 2-9.

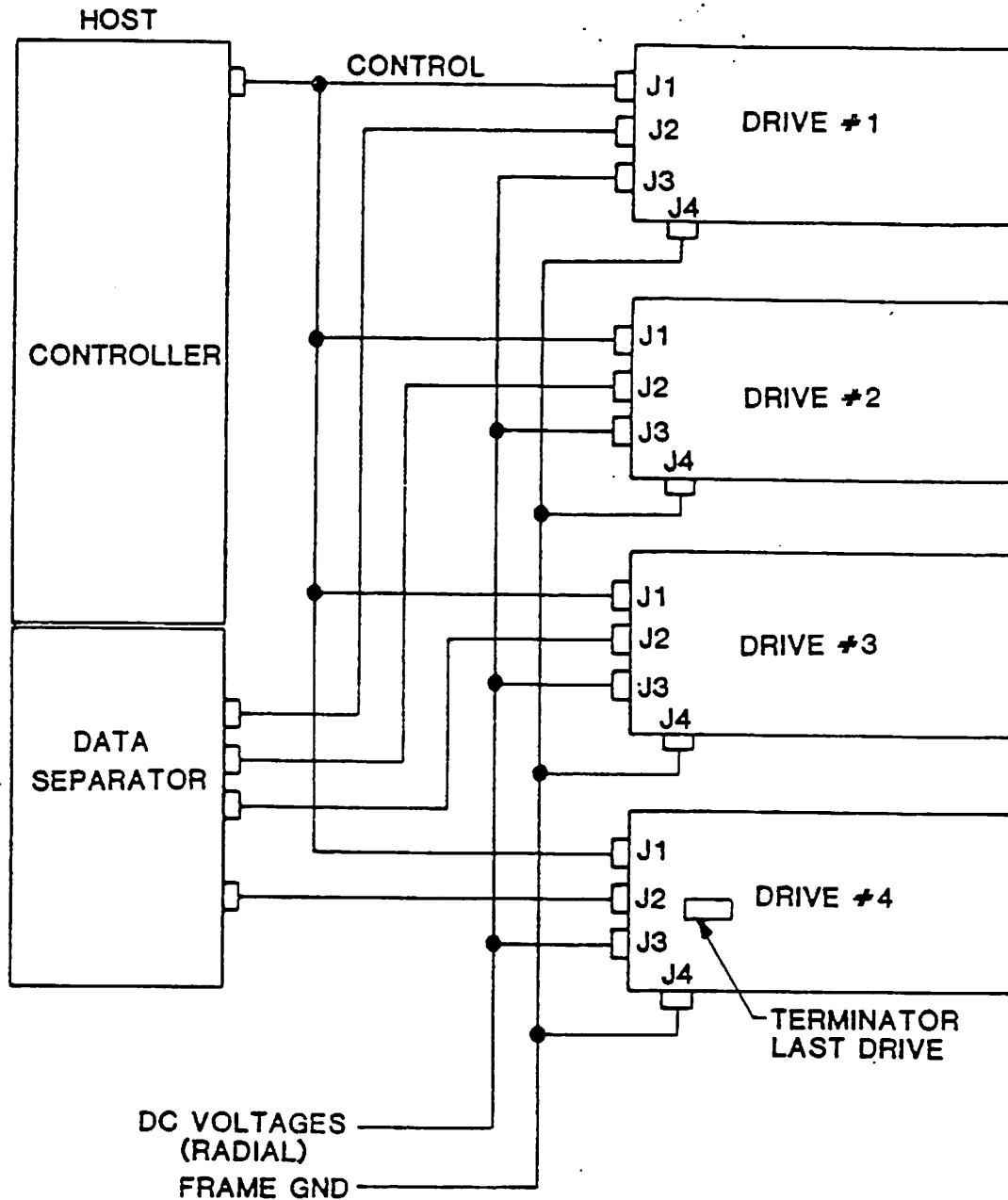


Figure 2-8. Typical Drive/Host Controller Connections (four drives)

2.3.3 Frame Ground

It is very important to supply a good ground between the disk unit and the host system. Failure to do so may result in drive noise susceptibility and random data errors.

A Faston tab is provided on the rear of the unit for this purpose. The mating connector is Amp P/N 60972-1. Recommended wire gauge is 16-18 AWG.

2.4 RESHIPMENT

Upon power-down before shipment, it is recommended that the host controller system command the unit to seek to cylinder 329. This location is dedicated as a shipment zone and is not intended for any other use.

* Always pack the unit in its original shipping container with the BEZEL UP if it is to be moved any distance, Figure 2-1 unless it is installed in equipment that provides a protection which equals or exceeds that of the original container. The upper and lower foam inserts are identical and may be interchanged. No external restraints are required for shipment.

2.5 OPERATION

The paragraphs that follow describe the customer options as to the various configurations in which the drive can be connected, the drive address selection from a host controller, and a description of the power-up sequence with associated timing diagram.

2.5.1 Customer Options

The drive has an eight position jumper header to allow the customer to configure the drive for a particular need. The header is located along one side of the hole in the PCB. The jumpers currently operational are:

Force Select

- S8 - Jumpered, allows drive to be used in radial mode only. All output lines are active regardless of select status. Force select does not light the selected LED on the bezel. - (DRIVE ALWAYS SELECTED)
- S7 - Allows Drive size to be returned to host
- S6 - Allows Drive size to be returned to host
- S5 - Allows optional "reset" from host to recalibrate the drive
- S4 - Drive Select 4
- S3 - Drive Select 3
- S2 - Drive Select 2
- S1 - Drive Select 1

2.5.2 Drive Address Selection

Drive select switches are shown in Figure 2-9. These switches select the proper drive for communications with the host controller when the jumpers match that of the drive select lines. To set the drive to the desired address place a jumper in the desired location as shown in section 2.5.1 above.

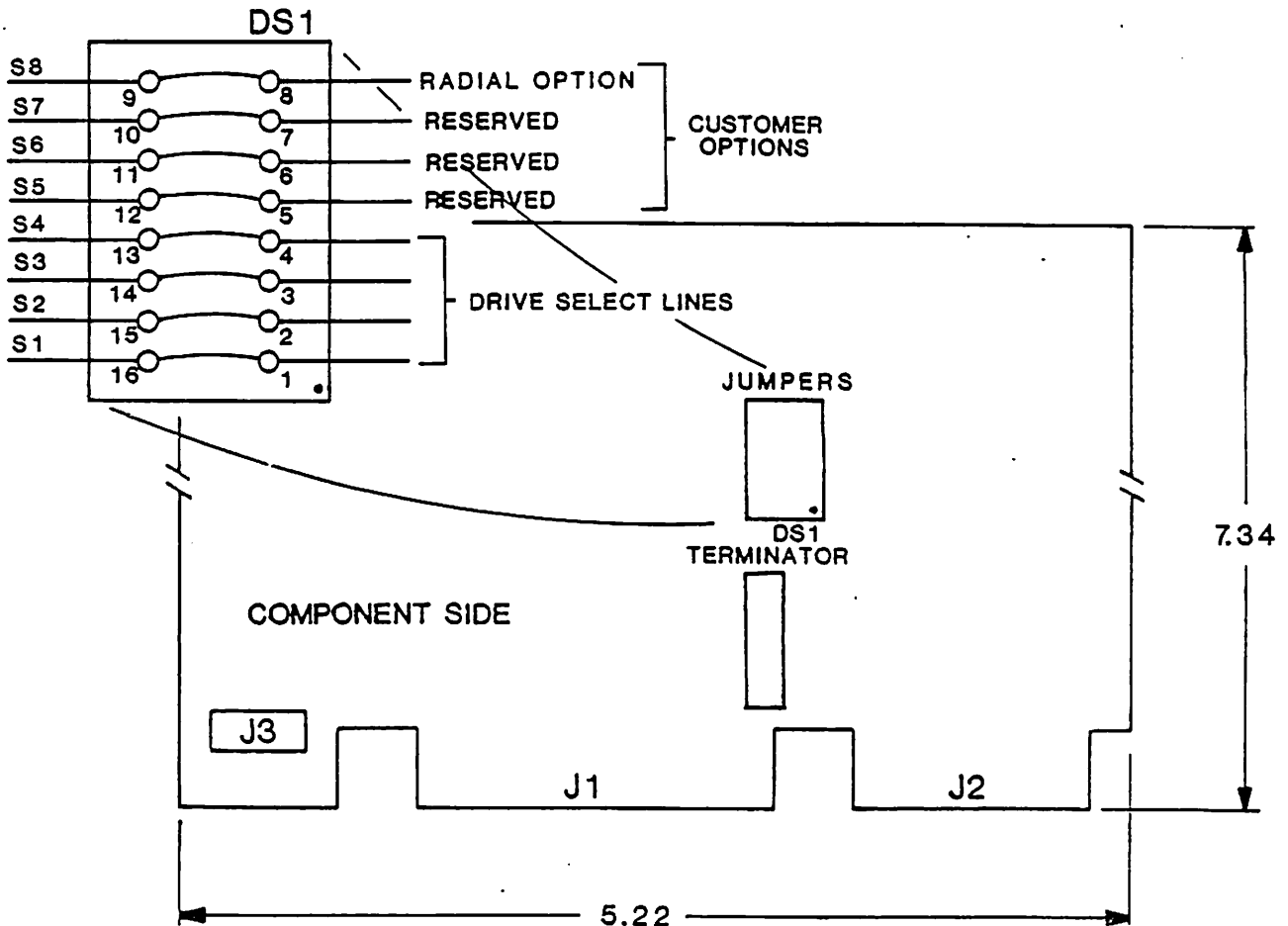


Figure 2-9. Read/Write Circuit Board Terminator, Switches, and Connector

2.5.3 Power-Up Sequence

DC power (+5 and +12) may be supplied in any order. After a time of 25 seconds maximum the heads will automatically recalibrate to TRACK 000. Upon a successful recalibrate, TRACK 000, READY and SEEK COMPLETE status signals will be true. The unit will not perform any read/write or seek functions until READY is true (refer to ELECTRICAL INTERFACE, Section 3 for interface signal definitions). A power up sequence timing diagram is shown in Figure 2-10.

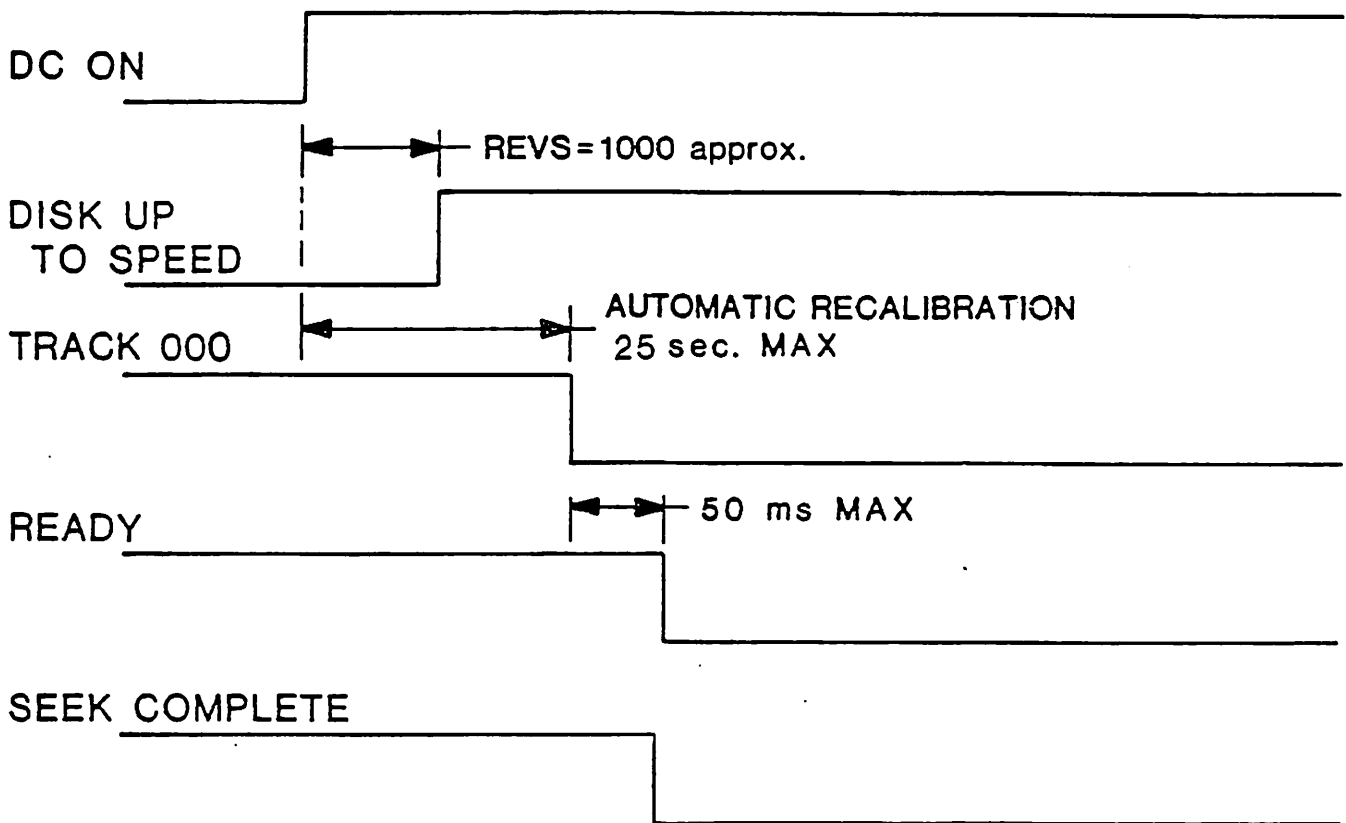


Figure 2-10. Drive Power-Up Sequence Timing Diagram

SECTION 3
ELECTRICAL INTERFACE

3.0 INTRODUCTION

The electrical interface between the host controller and the IMI 5000H series disk drive, is shown in Figures 3-1 and 3-2. The interface utilizes a control and status cable which connects between the host controller and connector J1 of the drive and a read/write circuit board located on the bottom of the drive (refer to Section 2).

The drive uses open collector TTL digital signals to provide communication between the host and drive connector J1. For the data cable, differential drivers and receivers are used for noise immunity purposes.

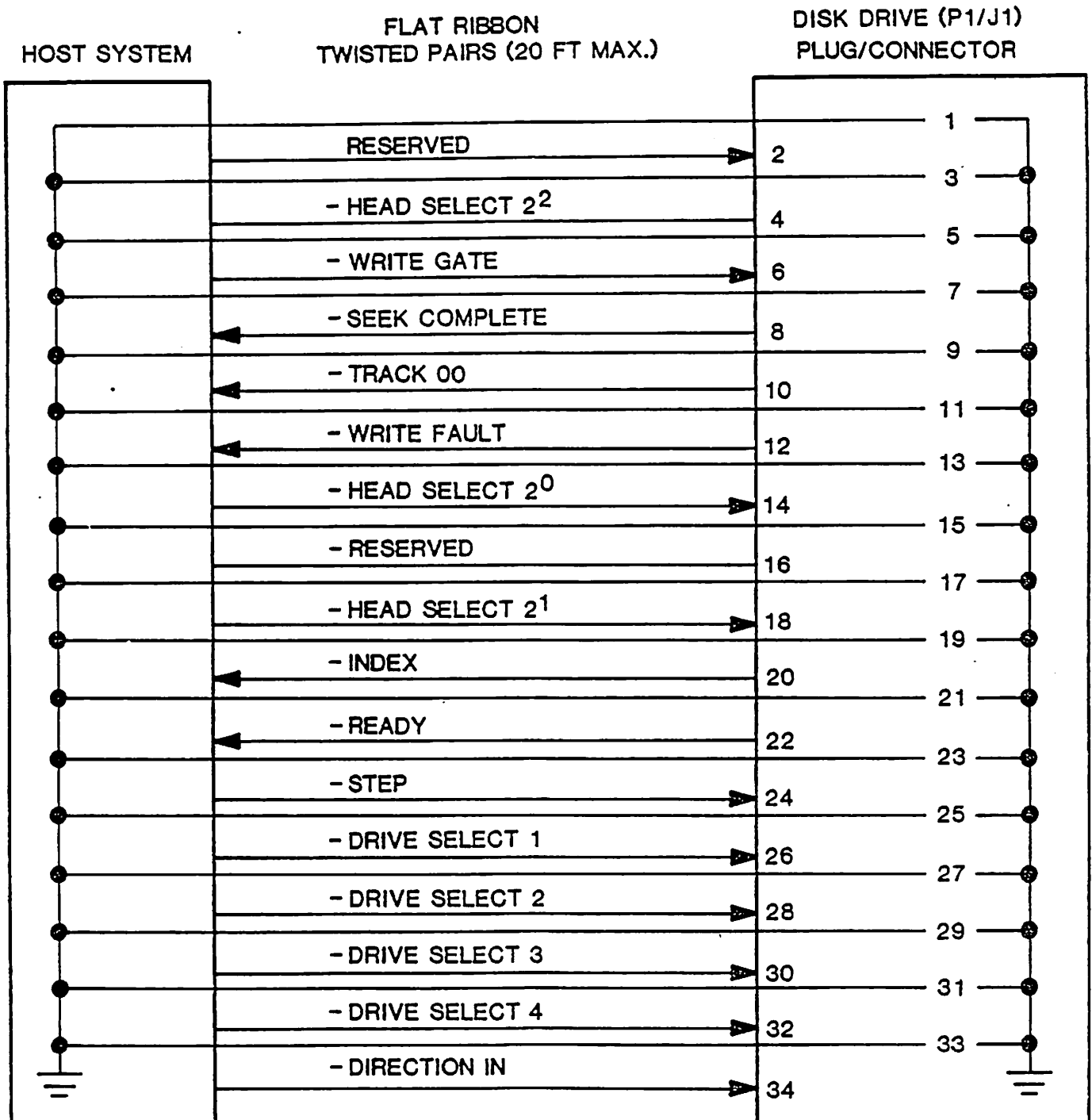


Figure 3-1. Control and Status Interface Cable (P1/J1)

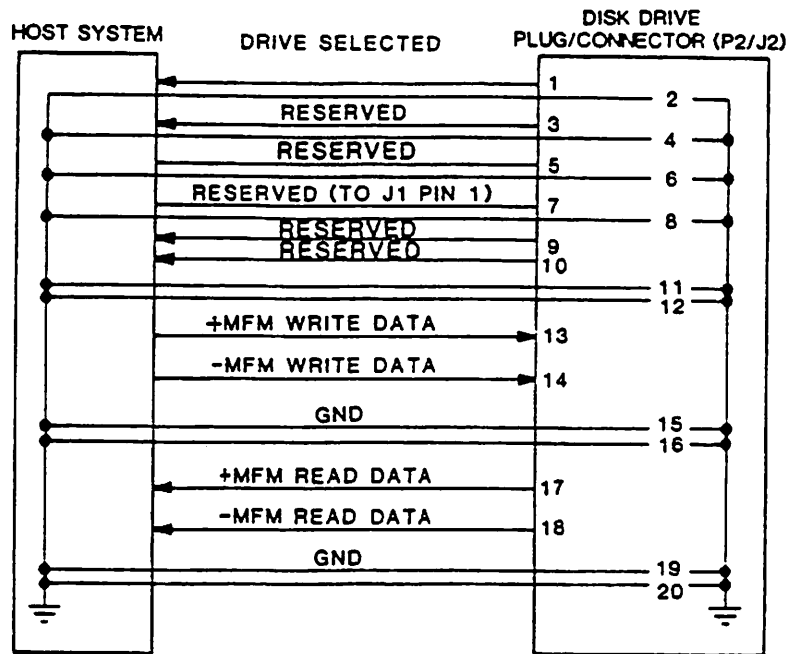


Figure 3-2. Control and Status Interface Drive/Receiver

3.1 CONTROL AND STATUS INTERFACE

The 34-pin flat ribbon interface cable relays control (STEP, DIRECTION and WRITE) and status (READY and SEEK COMPLETE) signals to and from the controller and the drive. These signals are multiplexed to the drive by the DRIVE SELECT signal. This selection also enables all output status signals to the controller. The true and false states of these lines are defined as follows:

Logic "0" (True) = 0.0 Vdc to 0.4 Vdc at -40 ma (max.)

Logic "1" (False) = 2.5 Vdc to 5.25 Vdc at 250 ua (max.)

A typical driver/receiver configuration for the control and status lines is shown in Figure 3-3. Each signal contained on the interface for the control and status cable is listed and the associated function described in table 3-1.

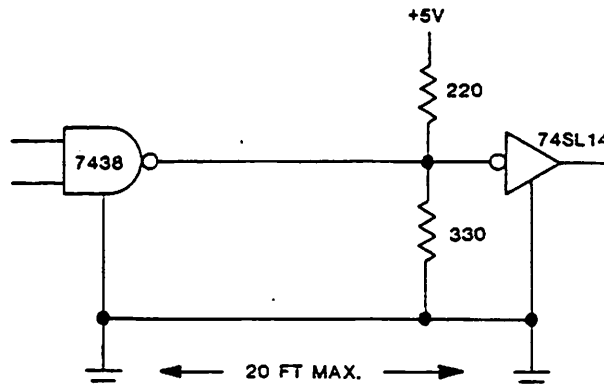


Figure 3-3. Control and Status Interface Drive/Receiver

Table 3-1. Control and Status Interface Signals

SIGNAL	FUNCTION
DRIVE INPUT SIGNALS:	
DRIVE SELECT 1-4	True line selects the corresponding drive for communication with the controller. The four select lines (S1, S2, S3, and S4) allow up to four drives to be daisy-chained to one controller.
DIRECTION IN	Determines direction of carriage movement and is used in conjunction with the STEP signal which moves the carriage one cylinder per STEP pulse. DIRECTION must not change state while STEP pulses are applied to the drive and must not change until 25ns after the last STEP pulse. Logic 1 = movement of carriage away from disk center.
STEP	Used with the DIRECTION signal to move the carriage away or towards the center of disk. Motion is initiated at the leading edge of the STEP pulse, logic one to zero transition. The micro-firmware clears SEEK COMPLETE by 500ns after the leading edge of the first STEP pulse high to low transition. The STEP pulse width is 1us minimum. The reoccurrence rate determines the seek mode. When STEP pulses are between 3us and 200us apart the drive is in BUFFERED STEP MODE. When STEP pulses are more than 3ms apart the drive is in SLOW SEEK STEP MODE. Any pulse train faster than 3us per pulse or between 200us and 3ms per pulse is illegal and may cause seek errors. Refer to Figure 3-4 for timing diagram of normal step mode.

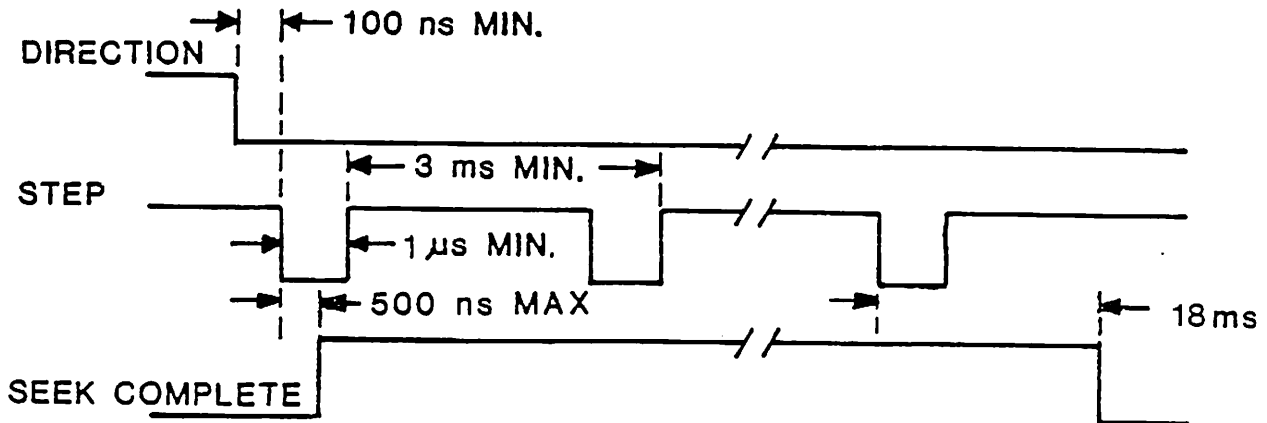


Figure 3-4. Normal Step Mode timing

Table 3-1. Control and Status Interface Signals (cont.)

BUFFERED STEP MODE

Offers reduced seek times for optimum performance. STEP pulses are between 3 μ s and 200 μ s apart. When the time between STEP pulses is decreased, the drive recognizes the pulse rate increase and responds by increasing the actuator speed to locate cylinders with an average access time of 68ms. The micro firmware counts all STEP pulses until:

- o 200 μ sec of time expires since the last STEP
- o 305 STEP pulses have been counted

At this time the micro firmware steps the heads to the proper track using the optimum algorithm for the stepper motor.

Refer to Figure 3-5 for timing diagram of BUFFERED STEP MODE.

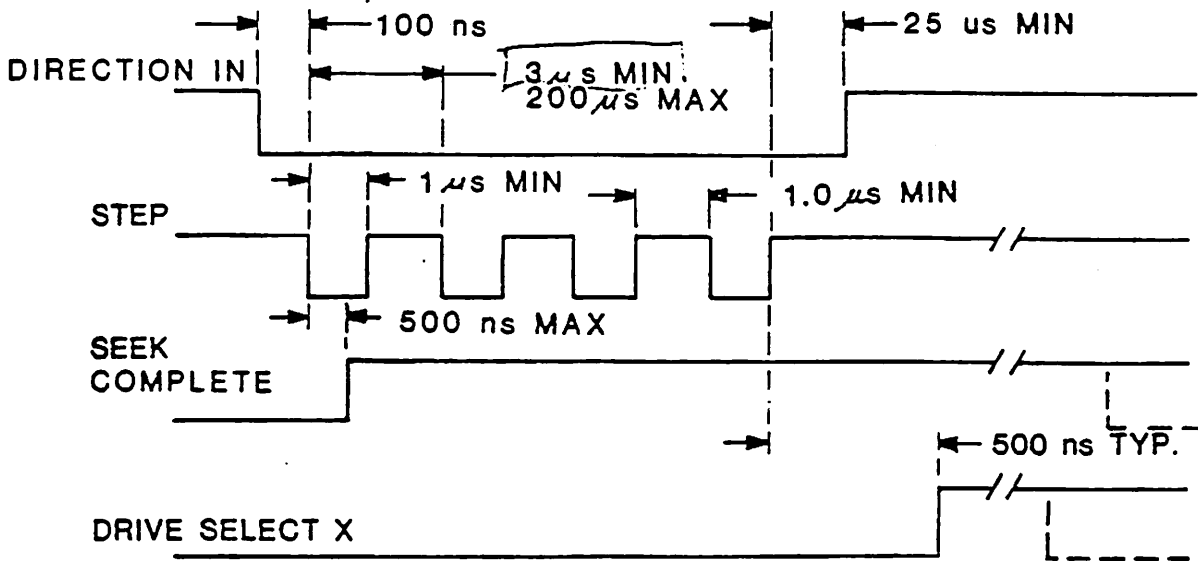


Figure 3-5. Buffered Step Mode Timing

HEAD SELECT ^{0 1 2} 2 , 2 , 2

Three lines provide selection of one of the six (0-5) possible read/write heads available in the IMI 5000H series disks (depending on model number). Heads are addressed 0 through 5. The head selection for the three IMI models is as follows:

Head Select Lines			Heads Selected		
			IMI Models		
² 2	¹ 2	⁰ 2 (LSB)	5006H	5012H	5018H
1	1	1	0	0	0
1	1	0	1	1	1
1	0	1	-	2	2
1	0	0	-	3	3
0	1	1	-	-	4
0	1	0	-	-	5

Table 3-1 Control and Status Interface Signals (cont.)

WRITE GATE

When this line is true stepping is prohibited.

Writing data to the drive is accomplished as follows:

- o Drive Selection
- o Drive READY true
- o Selecting Required Track (Cylinder and Head)
- o No WRITE FAULT exists
- o SEEK COMPLETE true
- o Activating WRITE GATE
- o Transferring data on WRITE DATA lines

NOTE

The controller does not control REDUCED WRITE CURRENT because the onboard processor automatically decreases write current as necessary.

DRIVE OUTPUT SIGNALS:

READY

Indicates drive is up to speed. READY together with SEEK COMPLETE, indicates drive is ready to SEEK, READ or WRITE and all I/O signals are valid. WRITE and SEEK commands are prohibited when READY is false. Typically the time for READY to go true after power-on is 25 seconds.

TRACK 000

When true, notifies the controller that the read/write heads are positioned over cylinder zero.

SEEK COMPLETE

Notifies the controller that the read/write head has settled on a cylinder at the end of a seek. SEEK COMPLETE must be true before attempting to read or write. SEEK COMPLETE goes false under the following conditions:

- o At power on
- o 500ns after the leading edge of a STEP pulse.

SEEK COMPLETE goes true when Heads are ready for R/W operations.

INDEX

Occurs once every revolution to indicate the beginning of data track. A transition period from logical "one" (normal) to logical "zero" is used as INDEX time. A typical waveform of the INDEX timing is one TTL negative pulse 200us in length occurring every 16.67ms.

WRITE FAULT

This signal is used to indicate a condition exists at the drive that may cause improper writing on the disk. When this line is a low level or true, further writing and stepping is inhibited at the drive until the condition is corrected. WRITE FAULT cannot be reset via the interface.

Note: The controller should edge detect this signal.

Write False goes true under the following conditions:

- o DC Voltages out of tolerance (READY will also go not true)
- o Write current in a head without WRITE GATE active or no write current with WRITE GATE active.

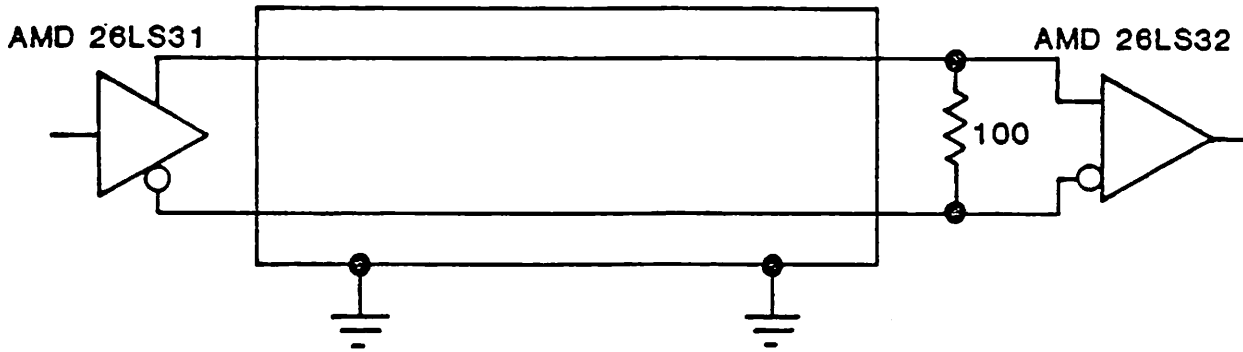
- o Multiple heads selected, no head selected or improperly selected
- o Invalid cylinder

.2 READ/WRITE DATA INTERFACE

The data transfer to and from the controller is over the flat ribbon cable that connects to drive connector J2.

1. The data is transferred via differential drivers and receivers.
2. The DRIVE SELECTED line is a TTL open collector.
3. Two pairs of balanced signal lines are used for both the MFM WRITE AND READ DATA.

A typical example of these circuits is shown in Figure 3-6. Each signal on the cable and its associated function is listed and described in table 3-2.



NOTES: 1. FLAT RIBBON OR TWISTED PAIR
MAXIMUM OF 12 FEET.

2. ANY RS422 DRIVE/RECEIVER PAIR
IS SUFFICIENT

Figure 3-6. Read/Write Data Interface Drivers and Receivers

Table 3-2. Read/Write Data Interface Signals

SIGNAL	FUNCTION
<u>+MFM WRITE DATA</u>	The WRITE DATA differential pair is used to cause MFM data to be written on a track by flux reversals which are caused by the transition of the +MFM WRITE DATA line going more positive than the -MFM WRITE DATA line. During a read operation +MFM WRITE DATA must be held more negative than -MFM WRITE DATA by the controller.
<u>+MFM READ DATA</u>	The READ DATA line transmits MFM data from the drive to controller. A differential pair is used for this purpose. The transition of the +MFM READ DATA line going more positive than the -MFM READ DATA line indicates the sensing of a flux transition on the disk surface.
-DRIVE SELECTED	TTL open collector circuit indicates to the controller that the drive has recognized and responded to its DRIVE SELECT address.

THEORY OF OPERATION

4.0 INTRODUCTION

This section describes the overall operation of the drive including functional descriptions of the major electrical and mechanical components that make up the drive, general timing, air cooling system, format recommendations and other important features of the disk drive system.

4.1 DRIVE FUNCTIONAL DESCRIPTION

A simplified block diagram of the drive's major components and related interfaces is shown in Figure 4-1. As shown, the drive system consists of spindle and stepper motors, control logic, read/write and head selection logic, and index and track detect sensors.

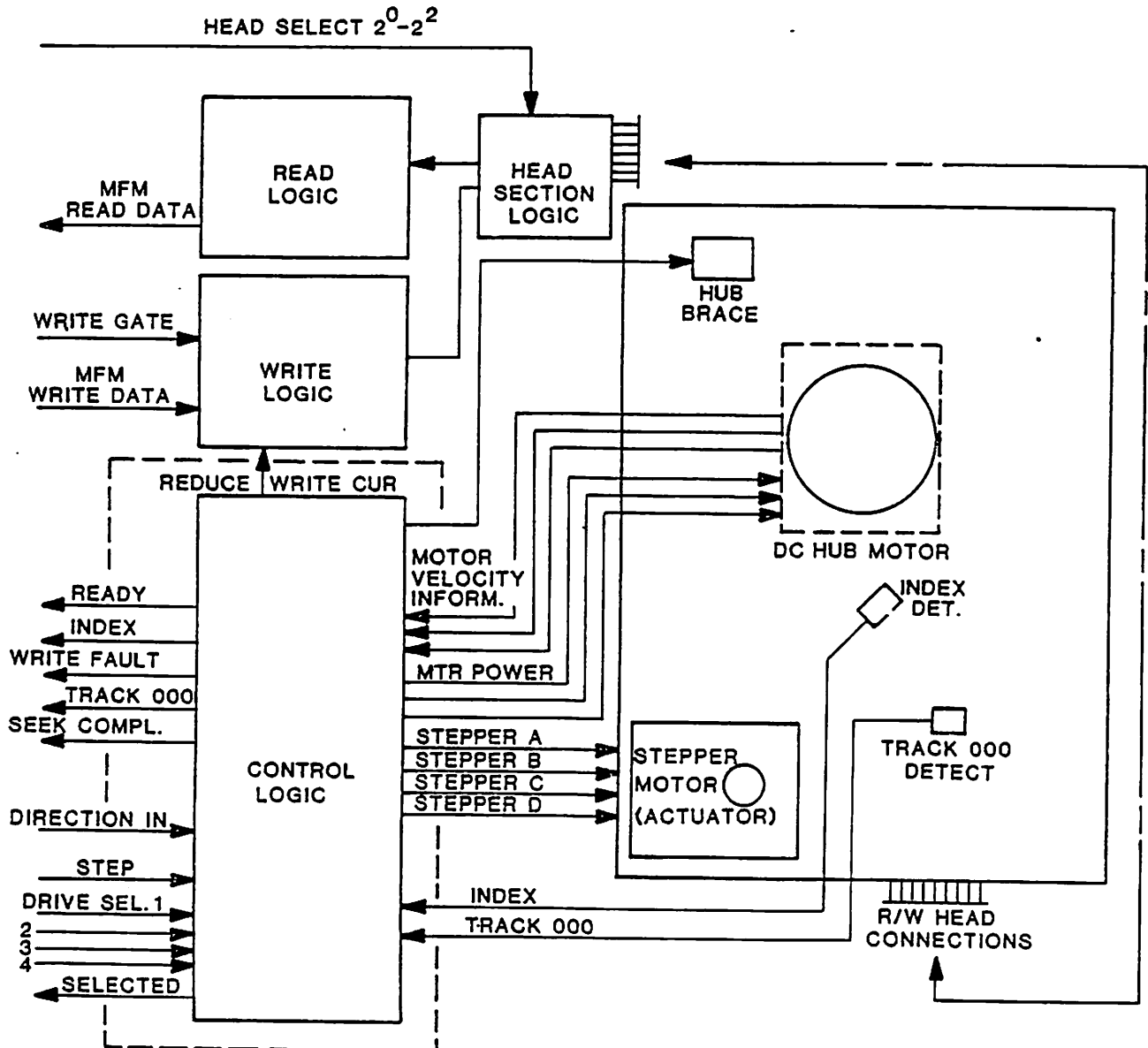


Figure 4-1. IMI 5000H Series Disk Drive Functional Block Diagram

4.1.1 Control Electronics

The control logic consists of two circuit boards. These include the read/write and motor control boards. The read/write board detects the drive status and in turn issues the necessary control signals to operate the drive. The general board functions include the following:

- o Read/write head positioning
 - Stepper motor control
 - Track 000 detect
- o Write fault detection
- o Head selection

The read and write data are fed directly to the media with the data transfer rate directly related to spindle speed.

The motor control board is mounted to the baseplate above the read/write board. This board obtains its operating power from the read/write board and provides power and speed control to the spindle drive motor.

4.1.2 General Timing Sequence

The general timing for an overall operating sequence of events is shown in Figure 4-2. The diagram shows the timing for a seek and a read/write operation and represents a six-track seek (0-5), a read, then a write.

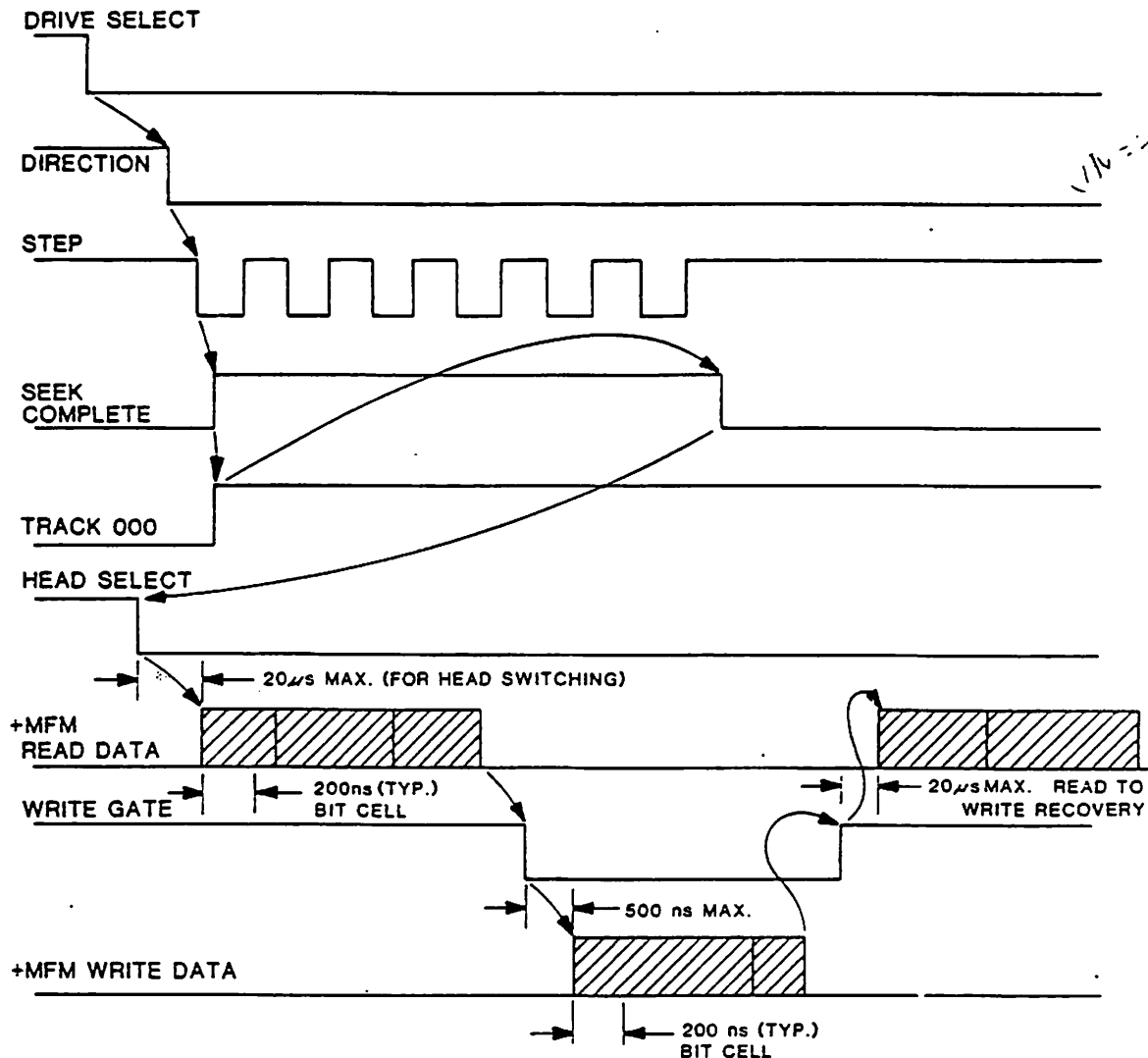


Figure 4-2. General Timing Sequence

4.1.3 Write Precompensation

The controller is responsible for encoding, decoding, address mark construction and detection, and write precompensation. Figure 4-3 shows examples of patterns to be compensated. The optimum amount of precompensation is 12ns for both early and late written bits. All other patterns are written "on time". Writing should occur out of a shift register which is used to observe the pattern. "On time" represents a nominal delay. Early and late represent less or more delay respectively. Precompensation is required while writing on cylinders 214 through 305.

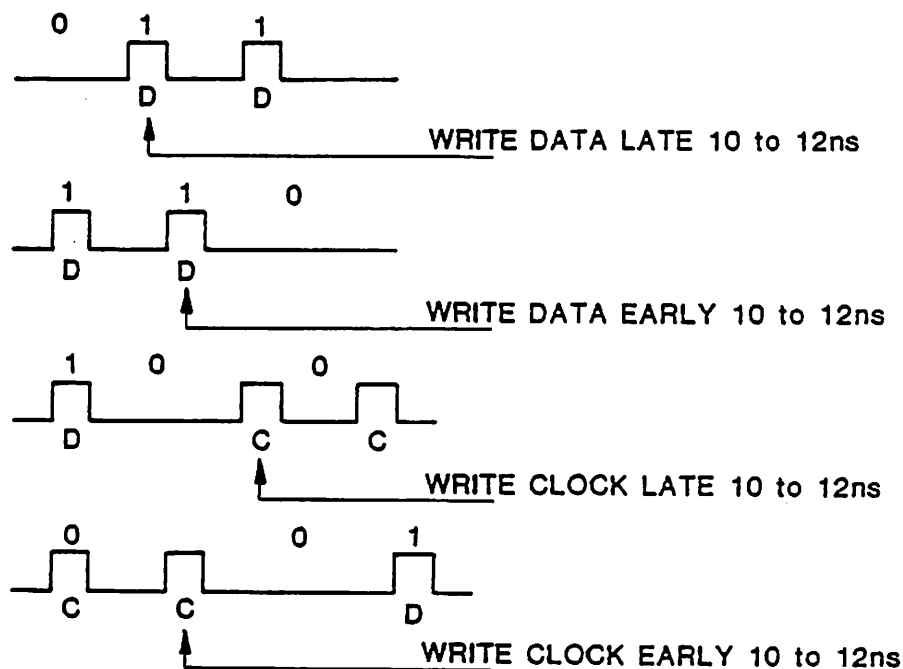


Figure 4-3. Write Precompensation Patterns

4.1.4 Read/Write Data Operation

Examples of both the read and write timing are shown in Figure 4-4. The data is recovered by reading a pre-recorded track on the disk. Aligned magnetized domains generated beneath the head cause a flux reversal on the track for a selected head. The timing diagram shows related timing for MFM data and standardized NRZ data required at the interface. Note where the MFM transitions occur in relation to the NRZ data within a bit cell.

During a write data operation, the controller supplies information to be written on the disk.

Data is written on the disk by passing a current through the read/write head, which generates a flux field across the head gap. This magnetizes the film particles directly beneath the head with an orientation (polarity) related to the direction of the current flow through the head.

4.1.4. Read/Write Data Operation (cont.)

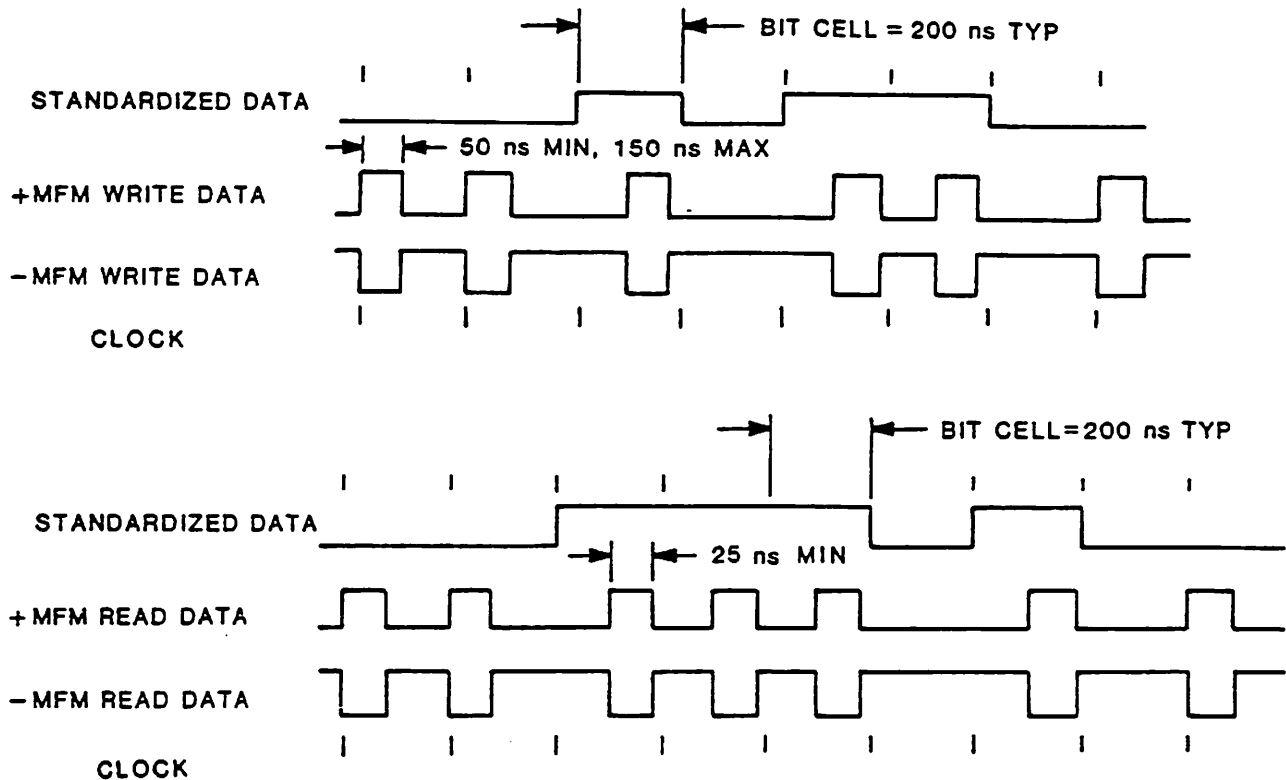


Figure 4-4. Read/Write Data Timing Diagram

Because of changes in bit shift due to differences in head-to-disk reaction at inner or outer tracks, certain write data patterns must be pre-compensated by the controller to ensure specified data integrity. This is described in the previous paragraph along with examples of data pattern.

As previously mentioned, data is fed directly to the media with the data transfer rate controlled by the spindle speed.

4.1.5 Media Defects

IMI performs media analysis on each unit to identify any media problem areas. During this testing, each problem area is logged on a "Defect Table" that is included with every drive. The table lists any unusable bit locations with reference to cylinder head. Maximum defects allowed are 8 for 5006, 16 for 5012 and 24 for 5018 with cylinder 000 certified as defect-free.

4.1.6 Drive Mechanism

The brushless direct driven DC drive motor rotates the spindle at 3600 rpm. The motor is thermally isolated from the baseplate to minimize temperature rise in the sealed chamber containing the heads and disks. The motor and spindle are dynamically balanced to ensure a low vibration level. An automatic friction brake is used to provide a fast stop to the spindle motor upon power-down.

4.1.7 Position Mechanism

The position mechanism including the stepper motor, carriage and associated devices are shown in Figure 4-5. The stepper motor is thermally isolated from the baseplate to minimize temperature rise in the sealed chamber containing the heads and disks. The read/write heads are attached to a precision ball bearing, 3 point self aligning carriage. A highly polished stainless steel band connects the actuator to the stepper motor. A large diameter capstan aids in increased band life.

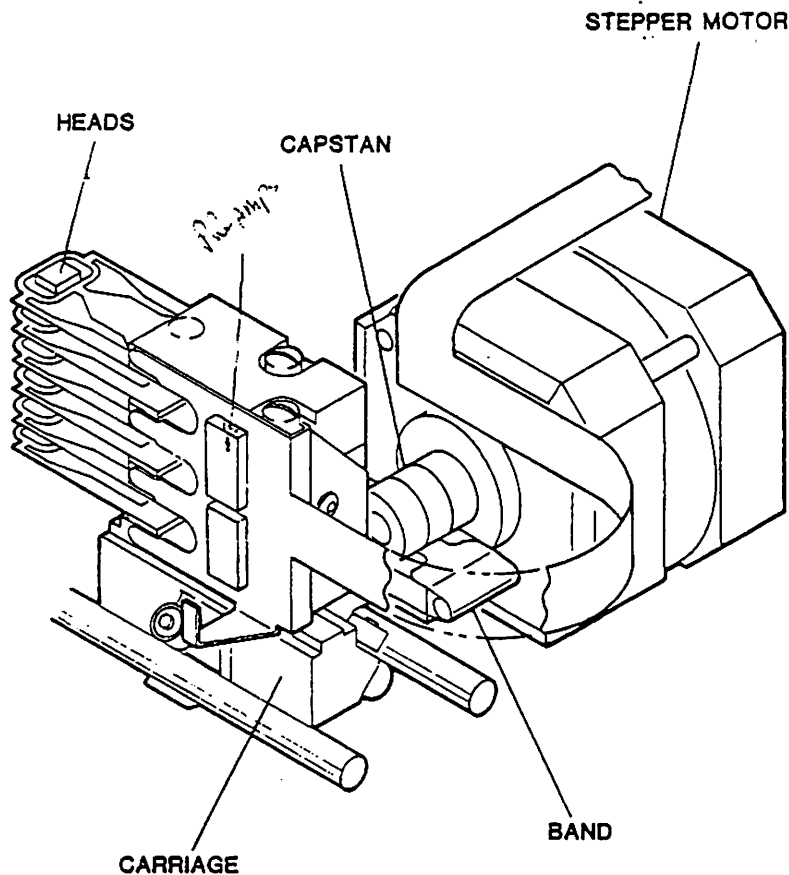


Figure 4-5. Position Mechanism

4.1.8 Air Flow and Filtration

The air flow and filtration system is shown in Figure 4-6. The disks and read/write heads are enclosed in a sealed module having an integral recirculation air system with an absolute filter which maintains a clean environment. The filter system provides better than a Class 100 environment to provide the increased reliability required in Winchester product lines.

A breather filter, located on the head/disk assembly top cover, permits continual ambient to internal pressure equalization without contaminate entry.

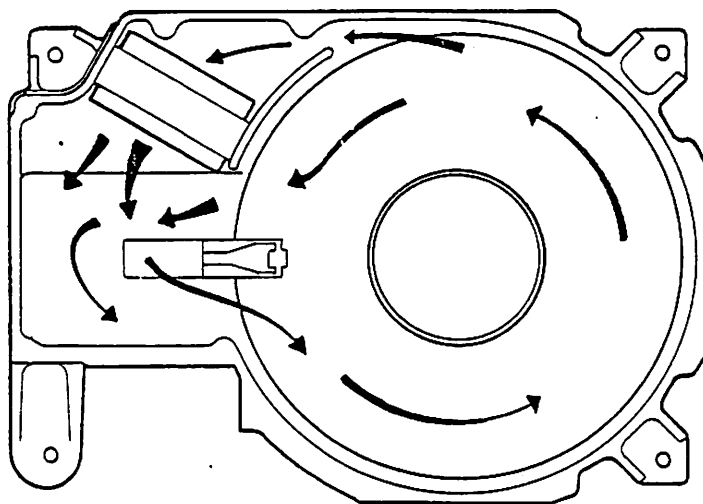


Figure 4-6. Air Flow and Filtration System

SECTION 5

TRACK FORMAT RECOMMENDATIONS

5.0 INTRODUCTION

This section describes the general format recommendations, for the IMI 5000 series drives.

5.1 GENERAL REQUIREMENTS

The purpose of formatting or arranging a data track is to provide maximum use of the media. The format used with the IMI 5000H series disk drive may vary for customer requirements so long as required basic timing requirements are met.

This model of the IMI disk drive is a soft sectored device which means that the controller must read the track and sector heads to determine the location of the heads relative to the rotational position of the disk.

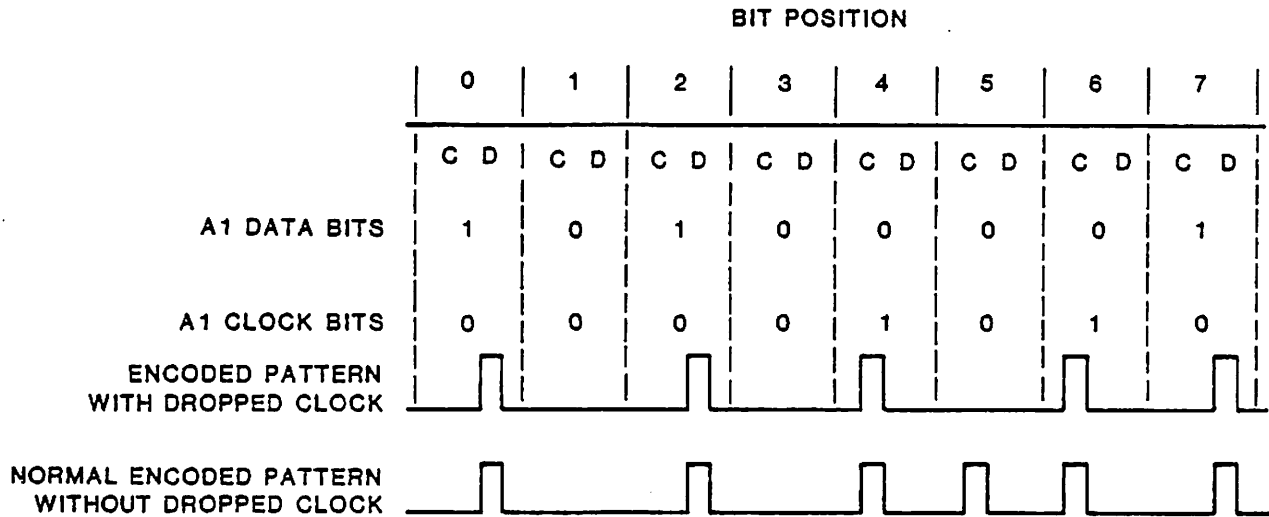
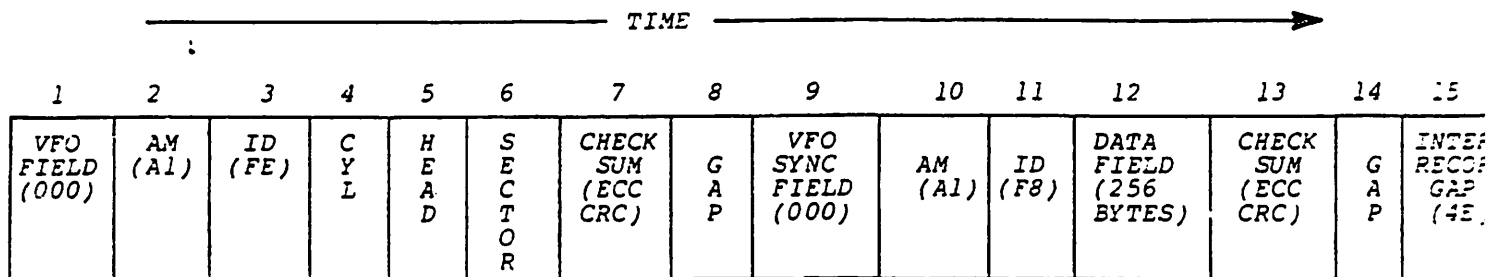


Figure 5-1. Address Mark Data Pattern

5.2 RECOMMENDED DATA FORMAT

The data format shown in Figure 5-2 illustrates and explains the most commonly used format in the industry. It consists of 32 equally divided sectors per track. Considering all tolerance gaps and required sync fields, this format provides 256-bytes of data space per sector, 8192-bytes per track, and 2.506-megabytes per surface. The A1 pattern shown in Figure 5-1 is created by dropping one clock bit normally required in MFM coding to create a unique recognizable pattern for an address mark.



- 1) VFO Sync Field - Recommended 13-bytes long, all zeros, to provide VFO lock-on prior to data retrieval. Minimum number of bytes dependent on VFO lock-up performance of host data separator.
- 2) Address Mark - Hex pattern "A1", 1-byte long, identifies beginning of sector or data field.
- 3) Address Mark ID Field Identifier - Hex pattern "FE", 1-byte long, identifies with previous address mark the beginning of ID field.
- 4) Cylinder Address - 1-byte long, part of header indicating cylinder address 00 - FF Hex.
- 5) Head Address - 1-byte long, part of header indicating head number 00-07 Hex. Bit 7 of this byte commonly used to identify defective sector.
- 6) Sector Address - 1-byte long, part of header indicating sector number 00 - FF Hex.
- 7) Check Sum - 3-bytes long, available for ECC or CRC for ID field verification.
- 8) Write splice (GAP) - 2-bytes long, all zeros, to allow time for a write turn-on for an update write routing (read header then write data field).
- 9) VFO Sync Field - Recommended all zeros, 13-bytes long, to provide VFO lock-on prior to data retrieval. Minimum number of bytes dependent on VFO lock-up performance of host data separator.
- 10) Address Mark - Hex pattern "A1" 1-byte long, identifies beginning of sector or data field.
- 11) Address Mark Data Field Identifier - Hex pattern "F8", 1-byte long, identifies with previous address mark the beginning of data field.
- 12) Data Field - 256-bytes with 32-sector format.
- 13) Check Sum - 3-bytes long, available for ECC or CRC for data field verification.
- 14) Write Turn Off Gap - 2-bytes long, all zeros, to provide write turn-off time before next sector.
- 15) Inter Record Gap - Hex pattern "4E", 15-bytes long. Tolerance gap to allow for spindle speed variations. 15-bytes allows for approximately +3% variation. For 32-sectors, minimum gap is 8-bytes long.

Figure 5-2. Recommended Data Format (32 Sectors)

5.3 INDEX GAP

A gap is required at the beginning of INDEX to allow for head switching recovery. This is because sequential sectors may be read without losing a complete disk revolution. Minimum length is 12-bytes, hex pattern "4E". Normal recommendations are 16-bytes lengths.

5.4 SPEED TOLERANCE GAP

A tolerance gap is required at the end of the last physical sector (before INDEX) to provide a spindle speed tolerance buffer for the entire track. A full track format routine begins and ends with detection of INDEX. For this example, the gap consists of 353-bytes of hex pattern "4E", but the actual number depends on media speed during the format operation.

5.5 SECTOR INTERLEAVING

This variation in format enhances data throughput of typical read/write operations by allowing multiple sector transfer during a single revolution. The process involves renaming sector addresses, which produces time between sequential sectors.

Interleaving factor numbers equal the number of sequential sectors on any given track. An example of interleaving factors for a 32-sector format is shown in Figure 5-3.

		<u>1 TO 1 INTERLEAVE</u>																															
Physical	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Logical	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

		<u>7 TO 1 INTERLEAVE</u>																															
Physical	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Logical	0	7	14	21	28	3	10	17	24	31	6	13	20	27	2	9	16	23	30	5	12	19	26	1	8	15	22	29	4	11	18	25	

Figure 5-3. Sector Interleaving

SECTION 6
MAINTENANCE

6.0 INTRODUCTION

The following paragraphs describe the services that may be performed on the IMI 5000H series disk drive outside of the manufacturer's facilities. Included are a list of tools required for performance of the services, procedures for removal and replacement of the particular item being serviced, and recommended spare parts for reducing maintenance turnaround time and extra shipping expenses. The assemblies that can be replaced by the user include the following:

- o Read/Write Circuit Board
- o Motor Control Circuit Board
- o Brake Assembly
- o Index Sensor
- o HDA Ground Strap

6.1 PREVENTIVE MAINTENANCE

Preventive maintenance is not required to maintain drive operational status.

6.2 TOOLS REQUIRED

The following tools (or equivalent) are required to perform the maintenance procedures described in this section.

- o Screw driver, 1/4 inch flat blade
- o Socket Driver, 3/16 inch hex
- o Gauges, .015 ± .001 inch, .010 ± .001 inch, .007 ± .001 inch
- o Torque driver, 5/64 inch hex, 8 inch pounds torque
- o Allen wrenches .035, .050, .062, .078, .094, .156

6.3 REPLACEMENT PROCEDURES

The following procedures give step-by-step instructions for removing, adjusting, and replacing the assemblies listed in paragraph 6.0. Prior to performing any of the procedures, please perform the pre-maintenance procedure steps listed in the following paragraph.

6.3.1 Pre-Maintenance Requirements (Figure 6-1)

1. Before drive power-down, position drive to cylinder 329.
2. Remove power from drive.
3. Remove screw (4) securing drive unit to mounting surface.
4. Slide drive away from mounting to expose attached cables.
5. Disconnect power cable J3, control and status cable J1, and read/write cable J2 from drive.
6. Disconnect HDA DC ground cable from Faston tab.
7. Observe the following caution:

CAUTION

Extreme care must be exercised in removing the electronics PCB to prevent possible ribbon cable damage.

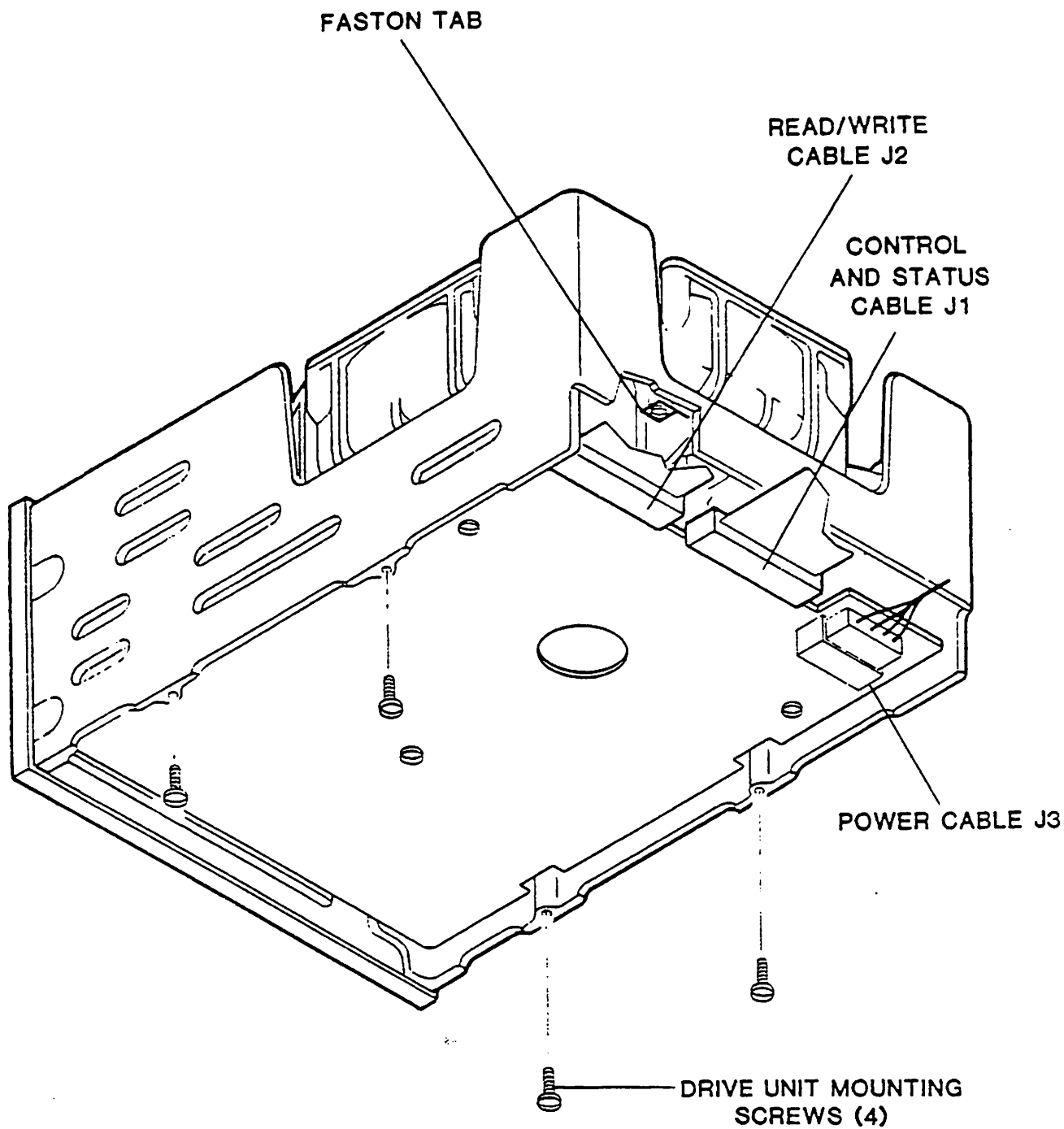


Figure 6-1. Drive Unit and Cabling Removal and Replacement

6.3.2 Read/Write Board Removal and Replacement (Figure 6-2)

1. Disconnect LED cable.
2. Separate R/W cable from board using flat bladed screwdriver while board is still attached to base. Remove three standoffs securing R/W board to base. Lift board away from motor control board connector and tilt board away from unit frame.
3. Disconnect stepper motor cable from read/write board.
4. To reinstall, connect the stepper motor cable. Guide the R/W board into the frame lining up the Motor Control Board connector with the socket on the R/W board. Secure the R/W board with the three standoffs, completely mate the R/W cable with a flat blade screwdriver . . . after the board is attached to the base. This technique is required to prevent damaging the flat cable to connector contacts.

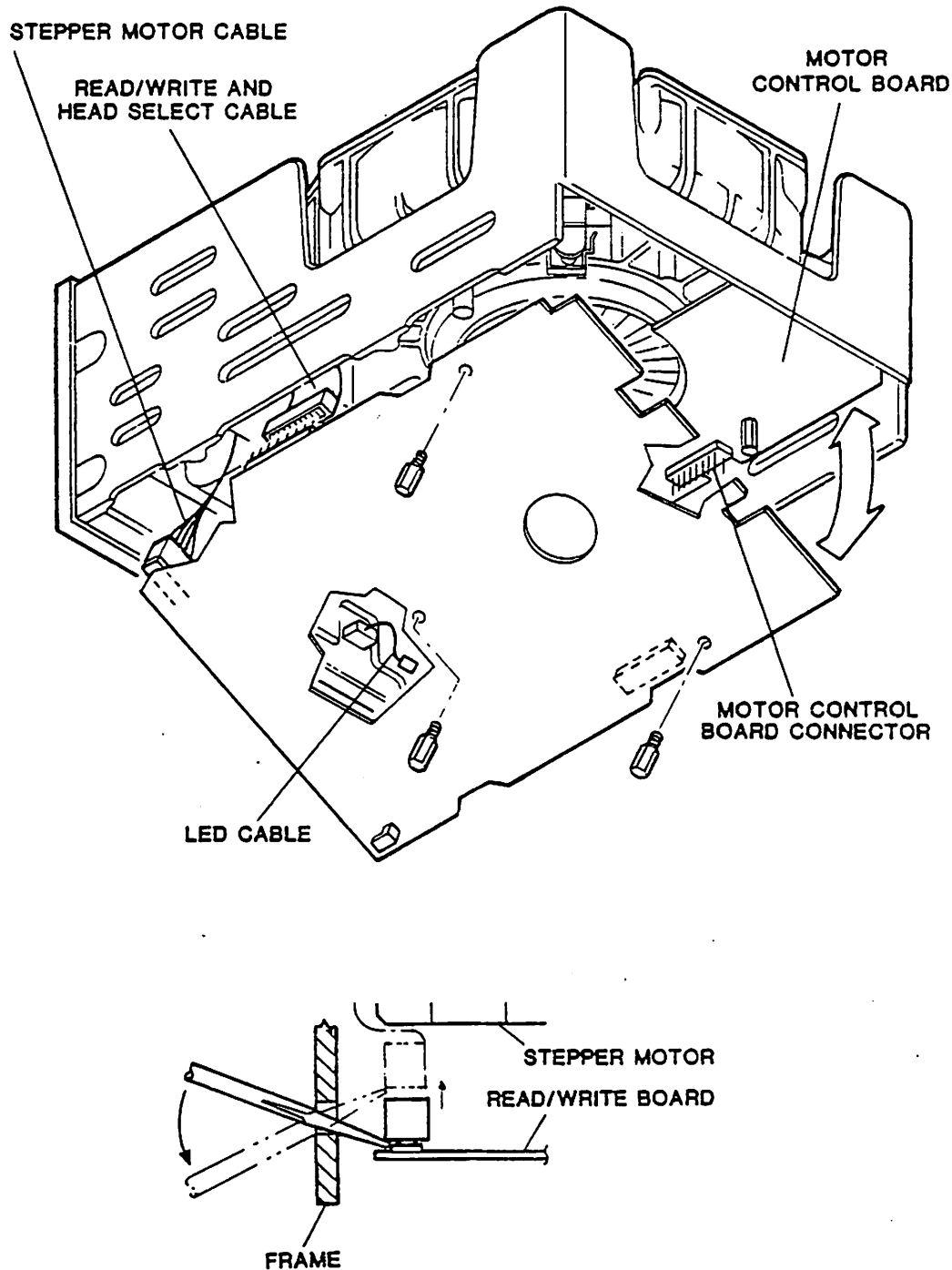


Figure 6-2. Read/Write Board Removal and Replacement

6.3.3 Motor Control Board Removal and Replacement (Figure 6-3)

1. Perform paragraph 6.3.2, steps 1 through 3.
2. Disconnect zero track sensor cable.
3. Disconnect index sensor.
4. Disconnect spindle motor and brake cable.
5. Remove two standoffs and screw securing board to unit frame.
6. Reinstall new board by reversing steps 1 through 5.
7. Reinstall read/write board by performing paragraph 6.3.2, step 4.

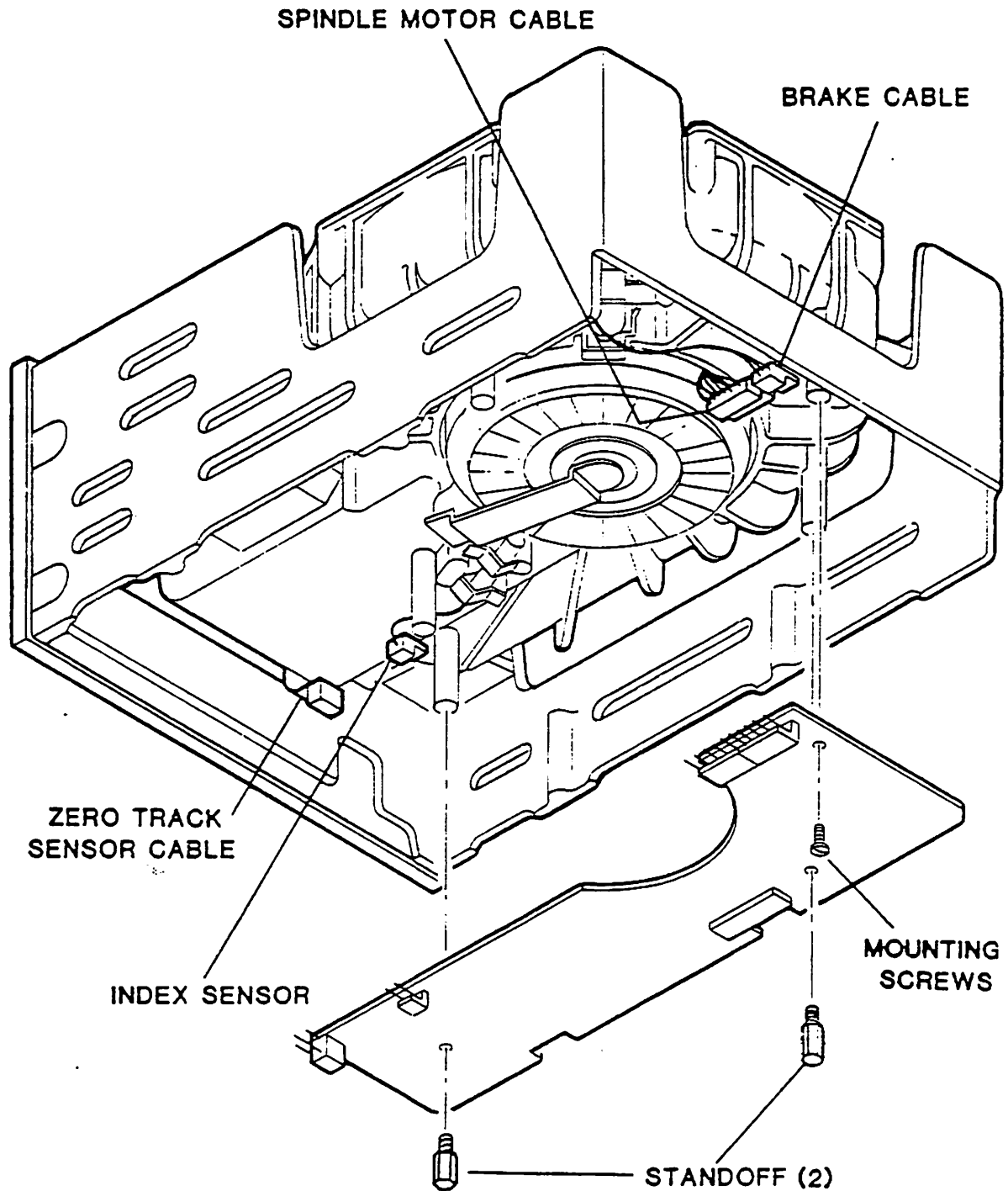


Figure 6-3. Motor Control Board Removal and Replacement

6.3.4 Brake Assembly Removal and Replacement (Figure 6-4)

1. Perform paragraph 6.3.2, steps 1 through 3.
2. Disconnect brake cable from motor control board.
3. Remove two screws securing brake assembly to unit base.
4. Reinstall new brake assembly by reversing steps 2 and 3 (do not tighten mounting screws at this time).
5. Perform brake adjustment as follow:

With mounting screws loosened, grip brake assembly with thumb, fore and middle fingers as shown in Figure 6-4. Squeeze assembly together and slide forward and against lateral location bosses. At the same time place .007 gauge between spindle motor and brake. Tighten and torque brake assembly mounting screws to eight inch pounds. Following torqueing of screws, check to ensure that the brake pad is spaced .007 from the braking surface when the plunger is fully retracted $.007 \pm .003$.

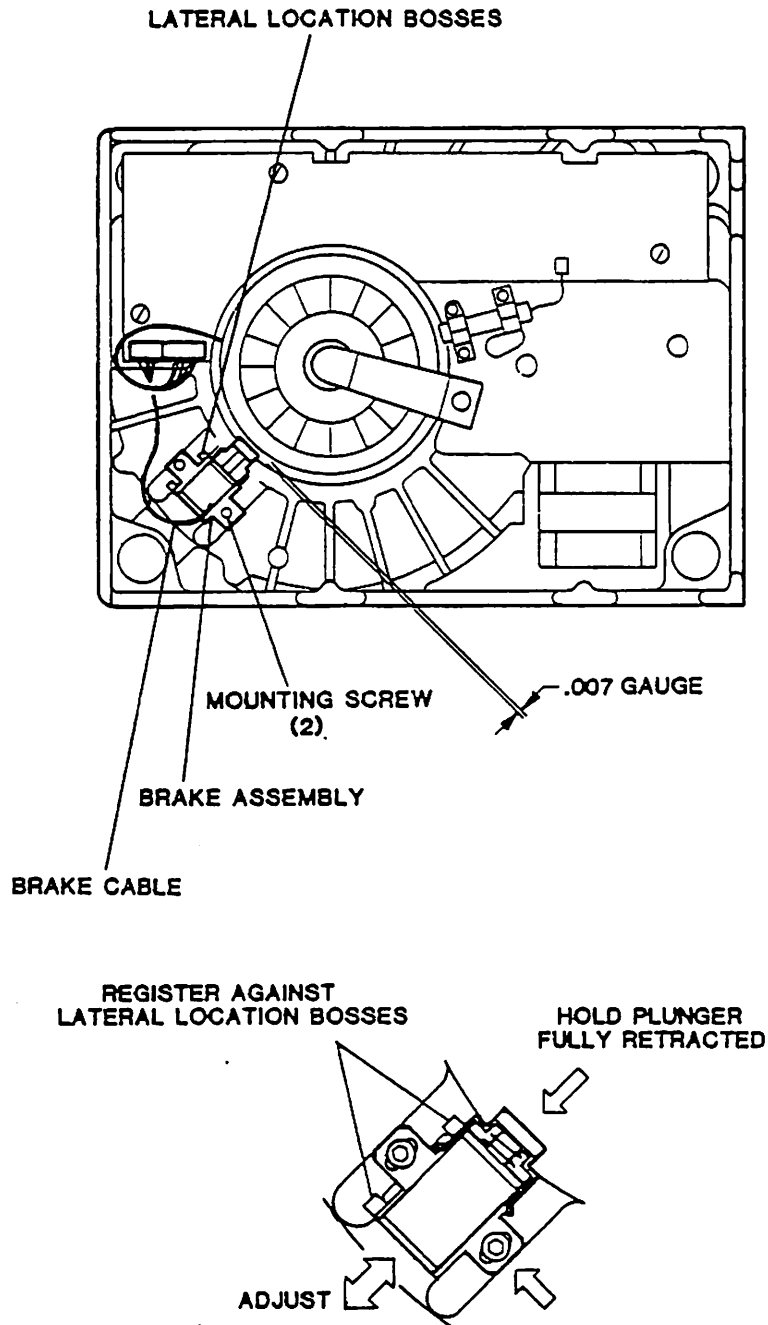


Figure 6-4. Brake Assembly Removal and Replacement

6.3.4 (cont.)

6. Reinstall read/write board by performing paragraph 6.3.2, step 4.

6.3.5 Index Sensor Removal and Replacement (Figure 6-5)

1. Perform paragraph 6.3.2, steps 1 through 3.
2. Disconnect index sensor cable from motor board.
3. Remove two mounting screws securing index sensor to unit base.
4. Remove two retaining clips.
5. Place new sensor into mount. Attach clips and mounting screws (do not tighten).
6. Rotate motor until index timing tab lines up with index.
7. Place .015 gauge between sensor and tab. Slide sensor forward against gauge and flange. Tighten and torque screws to eight inch pounds.
8. Connect index sensor cable connector to motor control board.
9. Reinstall read/write board by performing procedure described in paragraph 6.3.2, step 4.

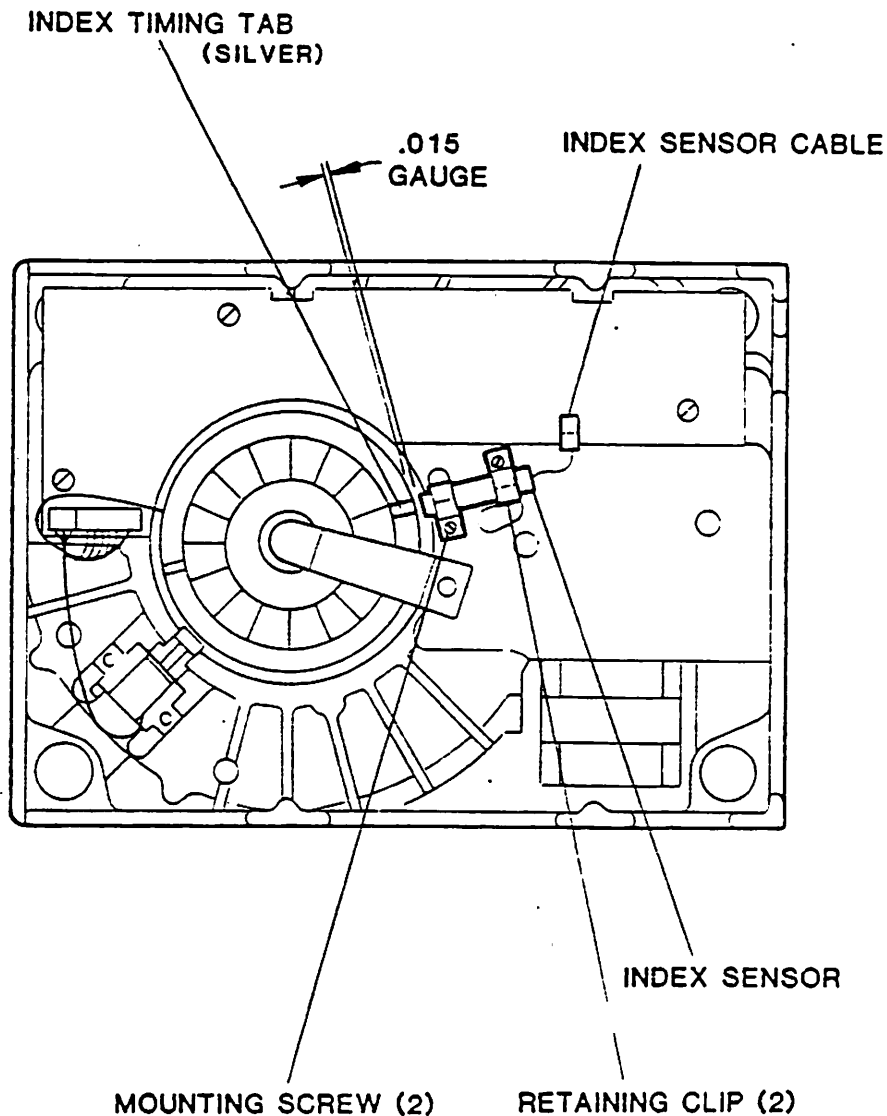


Figure 6-5. Index Sensor Removal and Replacement

6.3.6 HDA Ground Strap (Figure 6-6)

1. Perform paragraph 6.3.2, steps 1 through 3.
2. Remove screw and lockwasher securing ground strap to unit base.
3. To reinstall, position strap against three locating bosses and install and tighten screw and lockwasher. Torque screw to 8 inch pounds.
4. Reinstall read/write board by performing procedure described in paragraph 6.3.2, step 4.

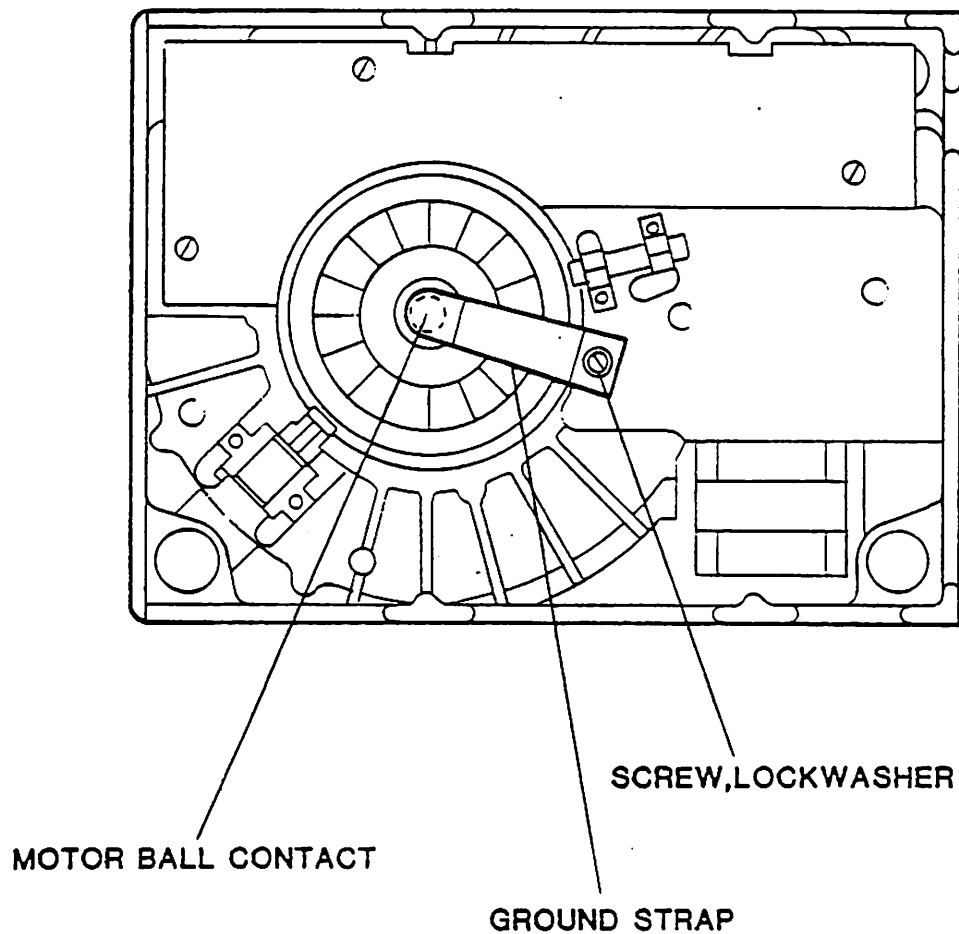


Figure 6-6. HDA Ground Strap Removal and Replacement

7.0 REPAIR SERVICE

Should your disk drive fail to operate properly, return the drive to International Memories Inc., in accordance with the steps listed below.

7.1 USA Shipping Information (in & out of warranty)

Contact International Memories, Inc. order entry department for a Return Material Authorization (RMA) number.
Telephone (408) 446-9779 Telex 910/ 338-7347

Order entry will give you the appropriate address to return the drive to and issue a RMA number. Always reference the RMA number on all correspondence.

INTERNATIONAL MEMORIES, INC.
10381 Bandlely Drive
Cupertino, CA 95014
Attn: RMA XXXXX

Pack the disk drive in its original shipping container or equivalent and return to International Memories, Inc. freight prepaid.

7.2 European Shipping Information (in warranty)

Contact International Memories, Inc. International RMA Department for a Return Material Authorization (RMA) number. Include a description of the suspected problem.

Kode Services Limited is the approved repair facility for the United Kingdom, Scandinavia and Europe. You will receive authorization to send the unit to:

KODE SERVICES LIMITED
Station Road, Calne
Wiltshire, SN11 0JR, England
Attn: RMA XXXXX

European Shipping Information (out of warranty)

Contact Kode Services Limited direct for RMA number, repair charges and shipping instructions.

7.3. General shipping Information

Shipping costs to the International Memories factory or to Kode Services are the customer's responsibility. International Memories, Inc. or Kode Services Limited cannot assume any responsibility for loss or damage to shipments. For your protection, please send your disk drives insured.

International Memories will return the repaired drive to the customer freight prepaid when the drive is in warranty and COD or COLLECT for non-warranty repairs.

All drives returned to Kode Services for repair (in or out of warranty) will be returned to the customer at the customer's expense.

To reduce the risk of shipping damage, disk drives should be shipped in their original container. Containers can be purchased from the factory if you have discarded the original (5 1/4" IMI PN 736-02102-001. Customers who do not return equipment to the factory in the original shipping container or equivalent may void the warranty on the unit and will be invoiced for the cost of a new container.

Handwritten notes:
UNIT # 101
263 - X X X X - 101 Schematic
711 - X X X X 101 ASSY D/C, BOM
357 - X X X X 101 25 weeks
A Rev #

Microport 15 Specs.

1.3 SPECIFICATIONS (continued)

Environmental Requirements

	Operating	Storage
Ambient Temperature	10°C to 46°C (50°F to 115°F)	-40°C to 65°C (-40°F to 149°F)
Relative Humidity	10% to 80% non-condensing 26.7°C (80°F) maximum wet bulb non-condensing	10% to 80% non-condensing 26.7°C (80°F) maximum wet bulb non-condensing
Altitude	-200 ft to 10,000 ft	-1000 ft to 50,000 ft
Thermal Shock	2°C/5 Minutes (3.6°F/5 Minutes)	24°C/Hour * (43.2°F/Hour)

* This gradient should not be exceeded when moving the drive from storage to operation.

Power Dissipation (nominal voltage)

Stand-by:	28 Watts; 96 BTU/hr
Positioning:	38 Watts; 130 BTU/hr

Acoustic Noise

Less than 51 dBA (sound pressure)

Reliability

Soft Read Errors	≤ 10 in 10^{11} bits read
Hard Read Errors	≤ 10 in 10^{13} bits read
Seek Errors	≤ 10 in 10^7 seeks
Unit MTBF	20,000 Power-On Hours

Maintainability

MTTR	Less than 15 minutes
------	----------------------

1.3 SPECIFICATIONS (continued)

Vibration

Operating

5- 40 Hz	0.006 inches, peak-peak
40-300 Hz	0.5 G peak

Non-Operating

Packaged (in original Micropolis shipping container)

5- 10 Hz	0.2 inches, peak-peak
10- 44 Hz	1 G peak
44- 98 Hz	0.01 inches, peak-peak
98-300 Hz	5 G peak

Unpackaged

5- 31 Hz	0.02 inches, peak-peak
31- 69 Hz	1 G peak
69- 98 Hz	0.004 inches, peak-peak
98-300 Hz	2 G peak

Shock

Operating

1/2 Sinusoidal	5 msec, 3 G peak
	20 msec, 1 G peak

Non-Operating




Packaged (in original Micropolis shipping container)

Free-fall drop	36 inches
1/2 Sinusoidal	20 msec, 50 G max

Unpackaged

Free-fall drop	0.75 inches
Topple test	1.5 inches
1/2 Sinusoidal	5 msec, 40 G max
	11 msec, 20 G max
	20 msec, 15 G max
	50 msec, 15 G max
	100 msec, 20 G max

1.3 SPECIFICATIONS (continued)

<u>Capacity</u>			
Unformatted			
	1323	Model Number 1324	
Unit Total MBytes	42.7	64.0	85.3
MBytes Per Surface	10.67	10.67	10.67
Disks	3	4	5
Data Surfaces/Heads	4	6	8
Cylinders	1024	1024	1024
Bytes per Track	10,416	10,416	10,416
Transfer rate (Mbits/sec)	5.00	5.00	5.00
Formatted *			
32 Sectors, 256 Bytes per sector:			
	1323	Model Number 1324	
Unit Total MBytes	33.6	50.3	67.1
Bytes Per Track	8192	8192	8192
MBytes Per Surface	8.39	8.39	8.39
33 Sectors, 256 Bytes per sector:			
	1323	Model Number 1324	
Unit Total MBytes	34.6	51.9	69.2
Bytes Per Track	8448	8448	8448
MBytes Per Surface	8.66	8.66	8.66
* MFM format; see Section 4.3 for format parameters.			

1.3 SPECIFICATIONS

General Performance Specifications

Seek Time (includes settling time) *

Track-to-Track	6 msec
Average **	28 msec
One-Third Stroke **	31 msec
Maximum	62 msec

* Assumes step pulses at a rate of one pulse per 20 usec or faster.

** See Section 2.3

Rotational Latency

Average	8.33 msec
Nominal Maximum	16.67 msec

Start Time	25 seconds maximum to Drive Ready
Stop Time	20 seconds maximum

General Functional Specifications

Cylinders	1024
Encoding Method	MFM
Spindle Speed (rpm)	3600
Speed Variation (%)	+0.5

General Physical Specifications

Drive:	Height	3.25 in (82.6 mm)
	Width	5.75 in (146 mm)
	Depth	8.00 in (203 mm)
Bezel:	Height	3.375 in (85.7 mm)
	Width	5.88 in (149 mm)
	Depth	0.185 in (4.7 mm)
Weight:		6.0 lbs (2.7 kg) nominal



TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 8044 REPLACES: HWT 8028 DATE: 03/29/88 PAGE 1 OF 1
MATRIX ID. 3110 PRODUCT/RELEASE# Micropolis Full Height Winchester
TITLE: Micropolis Noisy Drive (Replacement TSB)

PURPOSE:

This TSB replaces HWT 8028. To inform the field that there is a method for eliminating the noise generated by the static elimination spring on the Micropolis 33 Meg, 42 Meg, 67 Meg, 71 Meg, and 167 Meg Full Height Winchester Disk Drives. WLI part numbers for these drives are 278-4054, 278-4069, 278-4070, 279-0768, 279-0769, 279-0770, 289-0911, 289-0862, and 289-0912.

EXPLANATION:

After a few hours of operation the static elimination spring attached to the PCB can cause an objectionable noise. The procedure for eliminating the noise is to remove the spring from the drive. Drives received through Logistics will already have the spring removed.

PROCEDURE:

To remove the static elimination spring from the drive, follow the procedure below:

1. Remove 4 screws holding the PCB to the drive.
2. Tilt the front of the PCB forward and remove the screw, nut, and washer holding the static elimination spring to the PCB.
3. Remove and discard the spring.
4. Reinstall the PCB.

GROUP: Desktop-Systems/Peripherals Support Group MAIL STOP: 001-140

COMPANY CONFIDENTIAL
WANG Laboratories, Inc.

TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

WANG

NUMBER: HWT 8028 REPLACES: _____ DATE: 03/01/88 PAGE 1 OF 1
MATRIX ID. 3110 PRODUCT/RELEASE# Micropolis Full Height Winchesters
TITLE: Micropolis Noisy Drive Problem Fix

PURPOSE:

To inform the field that there is a method for eliminating the noise generated by the static elimination spring on the Micropolis 33 Meg, 42 Meg, 67 Meg, 71 Meg, and 167 Meg Full Height Winchester Disk Drives. WLI part numbers for these drives are 278-4069, 278-4070, 278-0231, 289-0911, 289-0862, and 289-0912.

EXPLANATION:

After a few hours of operation the static elimination spring attached to the PCB can cause an objectionable noise. The procedure for eliminating the noise is to remove the spring from the drive. This procedure is to be used only on drives which experience the noise problem.

CORRECTIVE ACTION:

To remove the static elimination spring from the drive, follow the procedure below:

1. Remove 4 screws holding the PCB to the drive.
2. Tilt the front of the PCB forward and remove the screw, nut, and washer holding the static elimination spring to the PCB.
3. Remove and discard the spring.
4. Reinstall the PCB.

GROUP: Desktop Systems/Peripheral Support Group MAIL STOP: 001-140

COMPANY CONFIDENTIAL
WANG Laboratories, Inc.

MICHAEL E BAHIA
PROJ# H592 (

1 COPIES)
M/S: 001-260

Group

TAC

INFORMATION CALL

CONTROL NUMBER 08012097

CONTACT NAME LEE SORENSON POSITION CE
RDL # 3030 TDX # PHONE # 509 523 9804 EXT #

SYSTEM TYPE 2000 DEVICE TYPE ~~DS~~
UTILITY NAME SOFTWARE LEVEL

METHOD OF CALL F = TELETYPE, P = PHONE, M = MEMO, E = EMS
HAS THE AREA OR DISTRICT BEEN CONTACTED
N = AREA, C = DISTRICT, B = BOTH, N = NONE
IS THIS INQUIRY PERTAINING TO A NATIONAL ACCOUNT ?
Y = YES, N = NO, U = UNKNOWN

USE THE FOLLOWING AREA TO DESCRIBE THE SITE THAT CREATED THIS REQUEST

CUST/OFFICE NAME PHONE #
ADDRESS CITY STATE
LN SITE CONTACT NAME

QUESTION (+) / ANSWER (+)

*EMP#24130
*DSF#315614
*NEED INFO ON THE DS IS THERE SOME ALT. DRIVE OR
*PROBLEMS WITH NOISY DRIVES.
*ON SITE# 303-828-7878
+ ~~REPAIRING SPRING ON THE 32 NEG MICROPLIS 1322W & THE 64
NEG MICROPLIS 1322W KEEP WEARING DOWN & MAKING EXCESSIVE
NOISES WANTS TO KNOW IF SPRING CAN BE ORDERED OR IF ENTIRE
DRIVE MUST BE REPLACED. PART # FOR THE SPRING WHICH IS THE
SAME FOR BOTH DRIVES IS 372-3756. THE 64 NEG DRIVE IS ALSO
USED ON THE 35576. SPRING DOES NOT APPEAR TO HAVE THAT LONG
A LIFE. RDL IS TRYING TO FIND A MORE PERMANENT FIX.~~
(25MIN) MIKEE

NEC 1/2 H 10MEG WINCHESTER

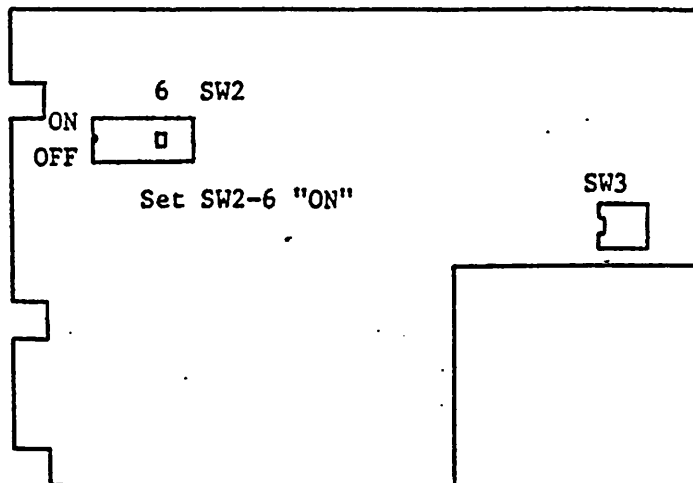
SW SETTINGS

8. DIAGNOSIS PROGRAM AND ERROR STATUS

SW BANK 1 1 ON, 2-8 OFF
SW BANK 2 ALL ON TO TERMINATE
SW BANK 3 ALL ON

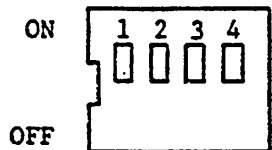
8.1 Diagnosis Program

D5104 diagnosis program is available under the following condition of SW2 and SW3.

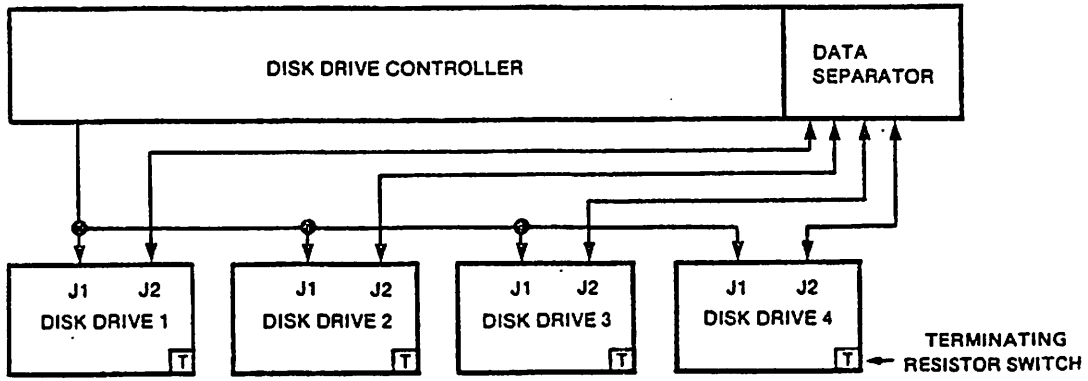


SW3-1	
SW3-2	Octal coded
SW3-3	
SW3-4	Test Enable

(1) Normal Position



; SW3 must be reset for read/
write operation.
ALL ON NORMAL



NOTE

IN THE DAISY-CHAIN SYSTEM, THE TERMINATING RESISTOR SWITCH ON DRIVES 1, 2, AND 3 SHOULD BE SET TO THE OFF POSITION, AND THE SWITCH ON DRIVE 4 TO THE ON POSITION.

Figure 1-4 Daisy-Chain System

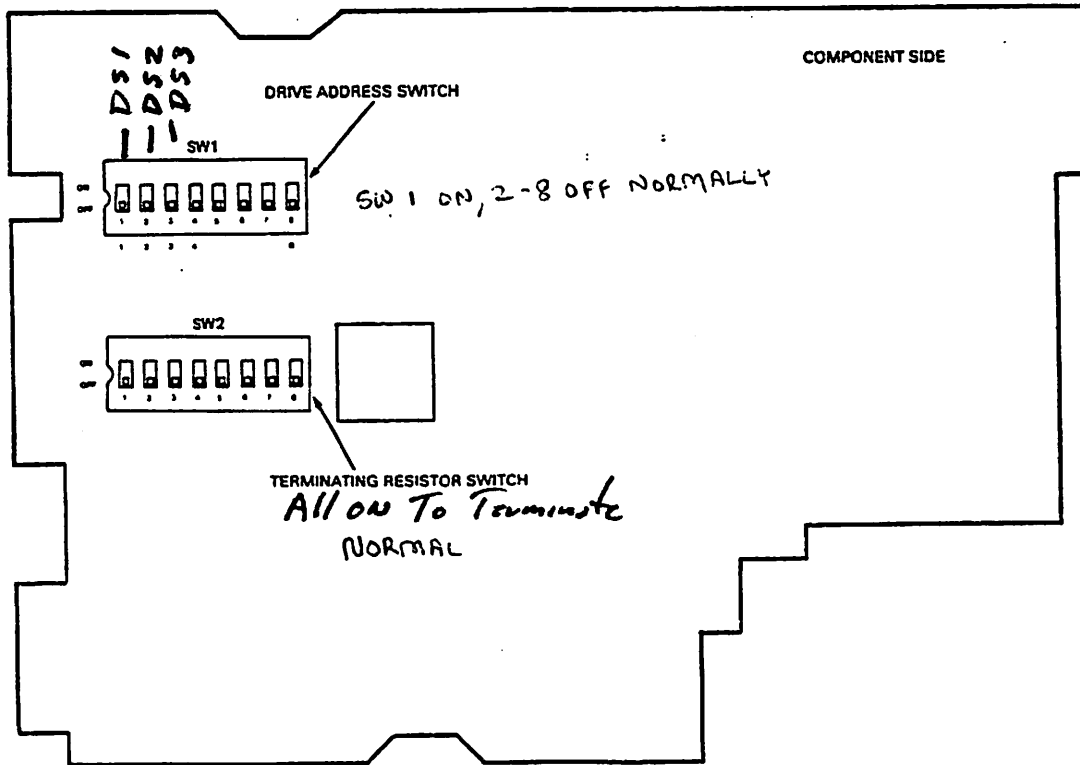


Figure 1-5 DIP Switch Locations

2.4.2 DRIVE SELECT

5 1/4" 30 MEG QUANTUM

Q500

Five jumpers are provided for logical drive number assignment. DS1, DS2, DS3, DS4 cause the drive to be selected when the active drive select line matches the installed jumper. Jumper G, when installed, causes the drive to be selected constantly. The Quantum part number for the jumper plug is 22-10036.

2.4.3. CONTROL CABLE TERMINATION

If the Model Q500 is the last drive at the end of the control signal cable, a 220/330 ohm terminator pack must be installed at PCB location RN 3. The terminator must be removed from RN 3 if the drive is not at the end of a string of drives. The Quantum part number for the terminator pack is 13-12302.

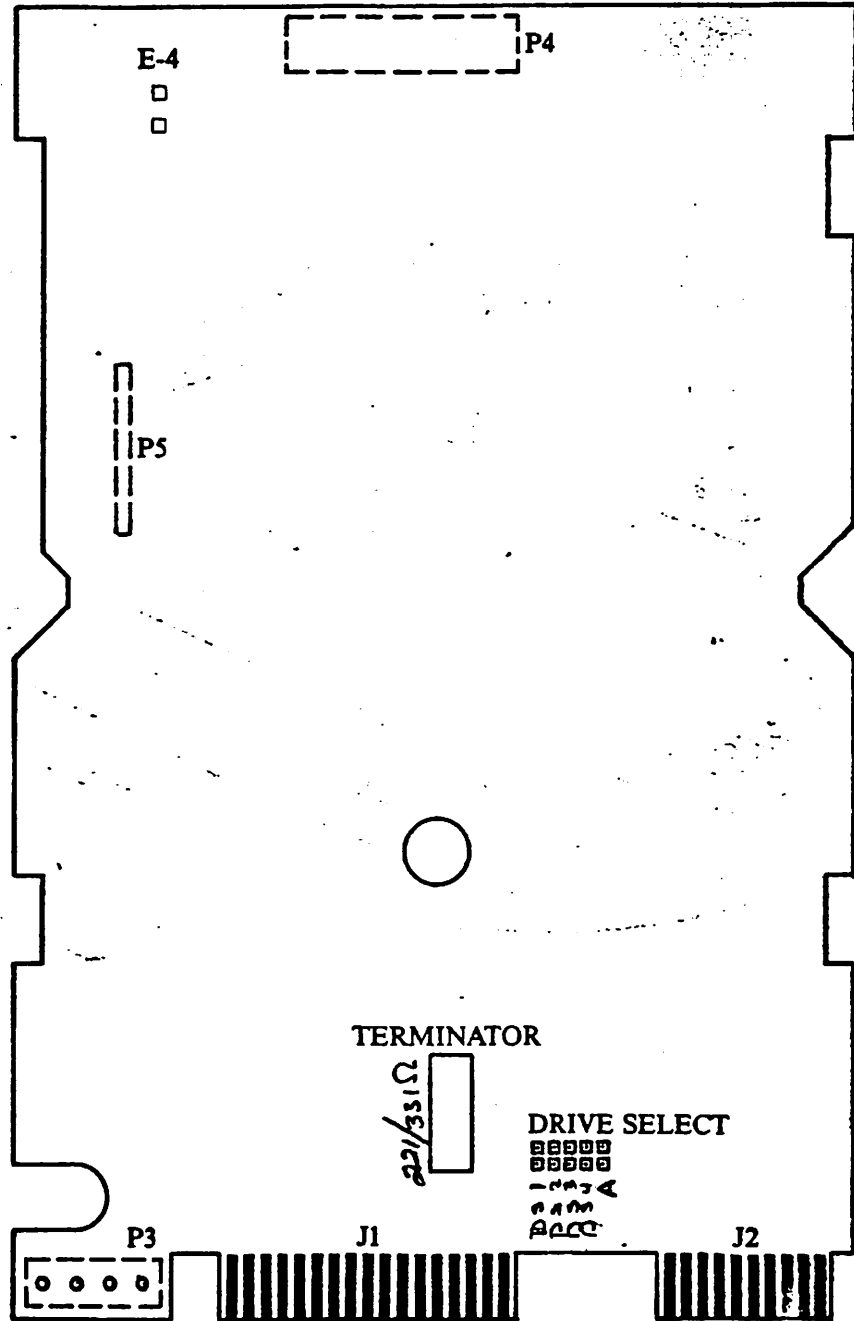


FIGURE 2-8
MODEL Q500 JUMPER OPTIONS

Jumper 2

1/5 System with one drive - Install DS1 and the terminator
 1/5 system with two drives - for the first drive install DS1 and remove the terminator for the second drive install DS2 and the terminator.

USED ON:
 2275
 15 15/65 ← very few in the field.
 OIS 50/60

QUANTUM Q500 "5 1/4 Inch"
 WLN 278-4034

WANG

TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 7088 REPLACES: _____ DATE: 09/01/87 PAGE 1 OF 1
MATRIX ID. 3110 PRODUCT/RELEASE# WPN 278-4034 (5.25" QUANTUM Drive)
TITLE: Ground Spring Assembly (WPN 726-4034)

PURPOSE:

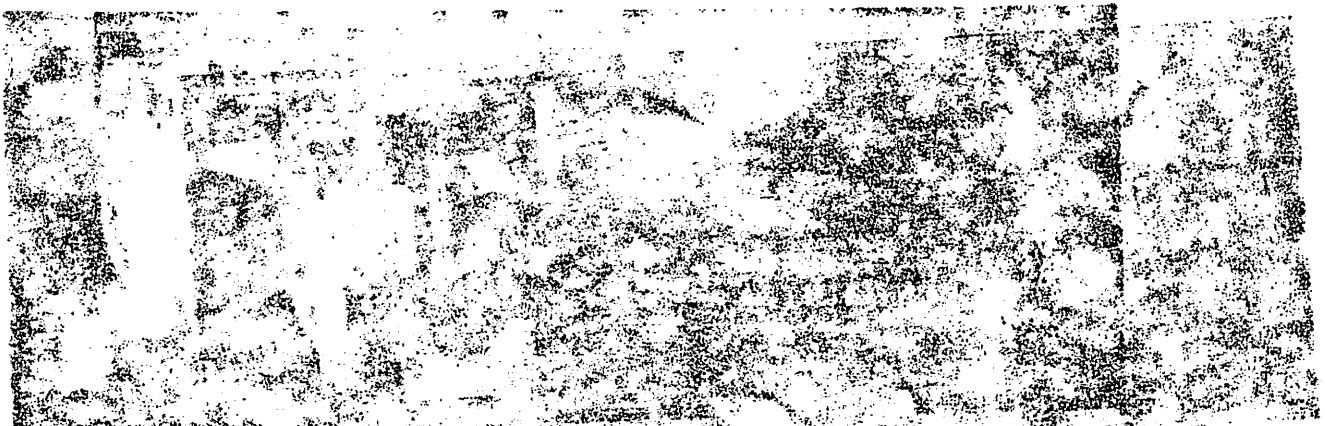
To inform the field of the availability of a new ground strap for the 5.25" Quantum drive.

EXPLANATION:

It has been reported that some of the Quantum drives in the field are generating a high pitch noise. The noise is generated by the spindle ground strap attached to the R/W board.

To correct the noise, remove the board from the drive. Replace the old ground strap on the board with a new style ground strap. The new style ground strap (WLN 726-3316) can be ordered through Logistics.

SPECIAL INSTRUCTIONS: Attach the new style ground strap assembly with the hardware. When soldering the ground strap to the board the ground strap should sit on the center of the hole to assure proper contact with the spindle. Reassemble the drive, reinstall the drive into the CPU and verify if the noise level is acceptable to the customer.



GROUP: Desktop System/Peripherals Support Group MAIL STOP: 001-140

COMPANY CONFIDENTIAL

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TECHNICAL SERVICE BULLETIN
SECTION: HardWare Technical

NUMBER: HWT 9911 REPLACES: _____ DATE: 07/20/94 PAGE 1 OF 1

MATRIX ID. 8101 PRODUCT/RELEASE# 200/300/400 PC's & ISA PC's

TITLE: ST506 Winchester Low Level Format

PURPOSE:

To inform the field that ST506 type Winchester disk drives used in Wang PC's and some MVPS PC's must be low level formatted as part of installation.

PROBLEM:

It has been determined that upon occasion ST506 Winchester disk drives are returned tagged as DOA "Can't Format", because a low level format had not been performed during installation.

PROBLEM SOLUTION:

When installing a new/repaired ST506 Winchester disk drive use the followings steps: Install the drive in the PC. Boot from a floppy and run the low level utility supplied with the PC, if you have an option to run several passes run at least 4, then run the DOS partitioning utility FDISK supplied with the PC, then run the DOS format utility with the desired switches set to format the partitions. The drive is now ready to have software loaded.

GROUP: VS Continuation Engineering Peripherals Support MAIL STOP: 014-490

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TECHNICAL SERVICE BULLETIN
SECTION: HARDWARE GENERAL

NUMBER: HWT 9900 REPLACES: _____ DATE: 5/ 9/94 PAGE 1 OF 1

MATRIX ID. 3701 PRODUCT/RELEASE# ST506 80 MB Drives

TITLE: NO VENDOR DEFECT MAP ON DRIVES

PURPOSE:

To provide information to the field regarding 80 MB ST506 drives that come from the vendor without vendor defect maps.

EXPLANATION:

CSO Logistics has observed that too many ST506 type 80 MB drives are being returned for repair but do not have any defects. Of the drives that are not defective, many do not have vendor defect maps. CSO repair suspects that if a CRE is trying to install one of these drives and finds no map, then the CRE may think the drive is defective and is reluctant to invest time loading up the drive.

CORRECTIVE ACTION:

Do not return an 80MB drive just because it does not have a vendor defect map. Run the 12 pass HDINIT to find out if the drive is good or bad.

ADDITIONAL INFORMATION:

None

GROUP: Secure Systems Product Support Group MAIL STOP: 027-G1C

C O M P A N Y C O N F I D E N T I A L

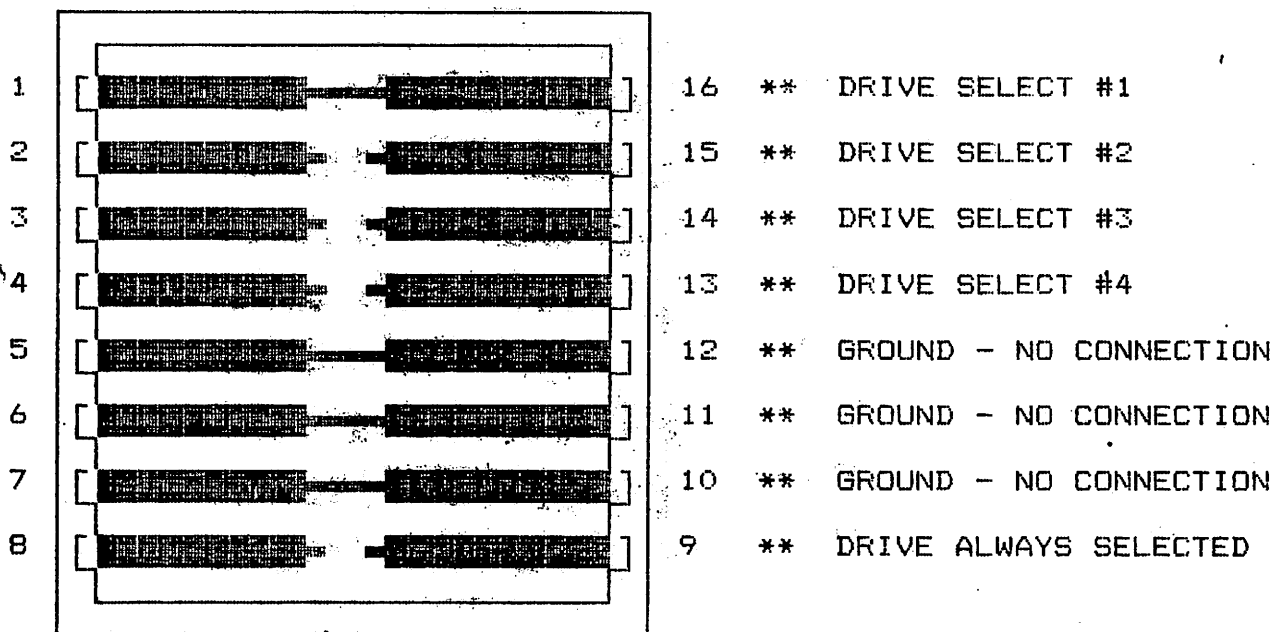
WANG Laboratories, Inc.

SEAGATE MODEL ST225

20 MEG

COMES W/ JUMPERS 1 + 5 CLOSED

HEADER FOR SEAGATE WINCHESTER



FN/TAB TO RETURN TO MENU

TSB

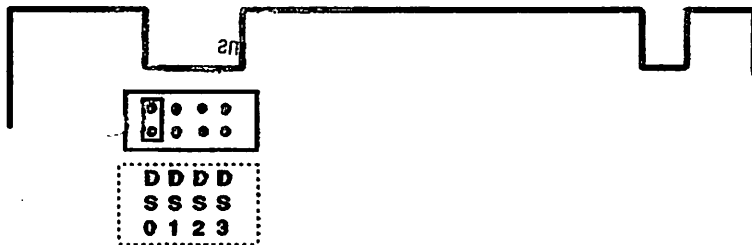
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FILE CONTROL	CATEGORY	ISSUE DATE	EXP. DATE
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AUTHOR	APPROVAL	TSB NUMBER	REVISION
Norman Lussier	Services Engineering	960012	R

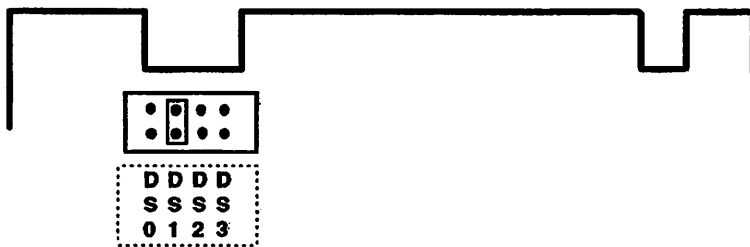
SUBJECT: Drive Jumpers for ST4026 20MB ST506 Disk Drives (SEAGATE 730-7066-mvps)


To avoid confusion on the DS jumper setting for the model ST4026, 20MB ST506 hard drive use the following settings:

For Wang installations use the jumper setting of DS0.



For IBM installations use the jumper setting of DS1.



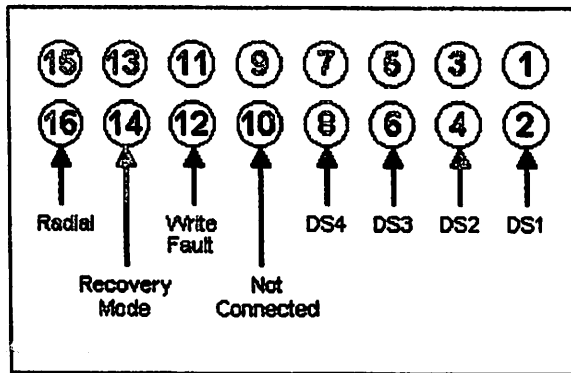
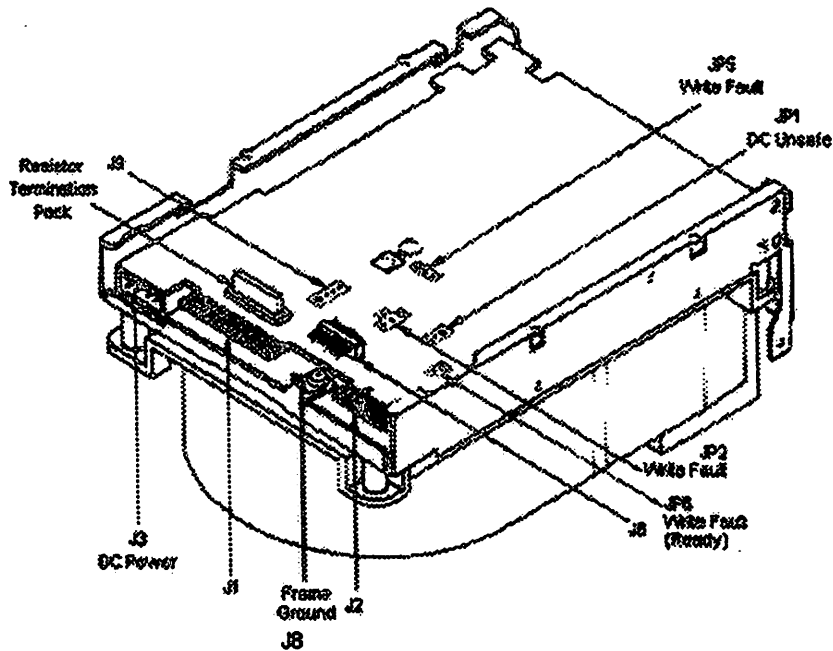

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ST4096
ST412 Family

730-7671MVPs
WILL WORK IN PLACE OF 64M

Cylinders: 1024
Heads: 9
Sectors: 17

Capacity: 80.2 MB
Speed: 3600 rpm
Seek time: 28 ms avg
SeaFAX#: 4096



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