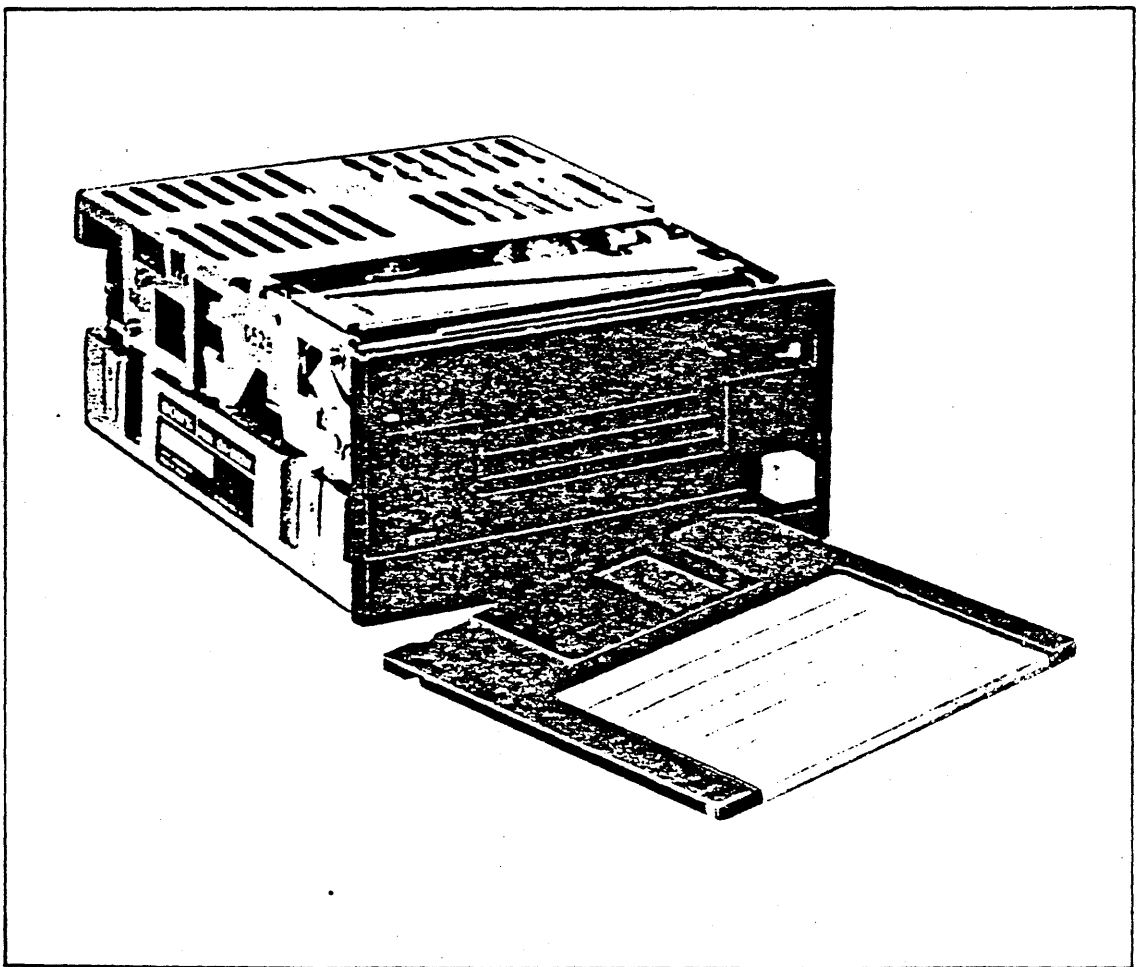


MICRO FLOPPYDISK DRIVE

MODEL 0A-D32W/0A-D32V

OEM MANUAL



SONY

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SECTION 1

INTRODUCTION

1-1. PURPOSE

This material provides the information necessary to interface the OA-D32W/OA-D32V **Micro Floppydisk** drive to floppy disk controllers, and provides the technical specifications for reference in OEM contracts.

1-2. GENERAL DESCRIPTION

The SONY **Micro Floppydisk** Drive represents a technological break through offering extreme compactness, just 4.0" wide by 2.0" high by 5.1" deep, and lightweight, just 1.5 lbs., providing a versatile data storage component for the OEM Systems designer.

SONY's leadership in high-density recording techniques, perfected in video technology, enabled SONY engineers to develop the **Micro Floppydisk**, a new standard, just 3.5". Yet an unformatted, double density capacity of 1.0M (OA-D32W double sided)/0.5M (OA-D32V single sided) bytes in approx 135 tracks per inch provides that of conventional 5.25" disks or more.

This disk is unlike any you have handled before it's floppy, but not too floppy. A semi-rigid protective shell provides protection unique to the **Micro Floppydisk**. When the disk is inserted into the drive (OA-D32W/OA-D32V) or taken out of it, its shutter automatically opens and shuts to protect the disk from dust, dirt, fingerprint and other foreign objects that might degrade performance. A metal centering hub equipped allows positioning with greater ease and more positive accuracy in over 20,000 interchanges with each disk.

Driven by a SONY developed direct drive motor at a speed of 600 RPM, providing better signal to noise ratio while transferring data at a fast rate of 500 K bits per second in double density mode, twice as fast as conventional 5.25" drives.

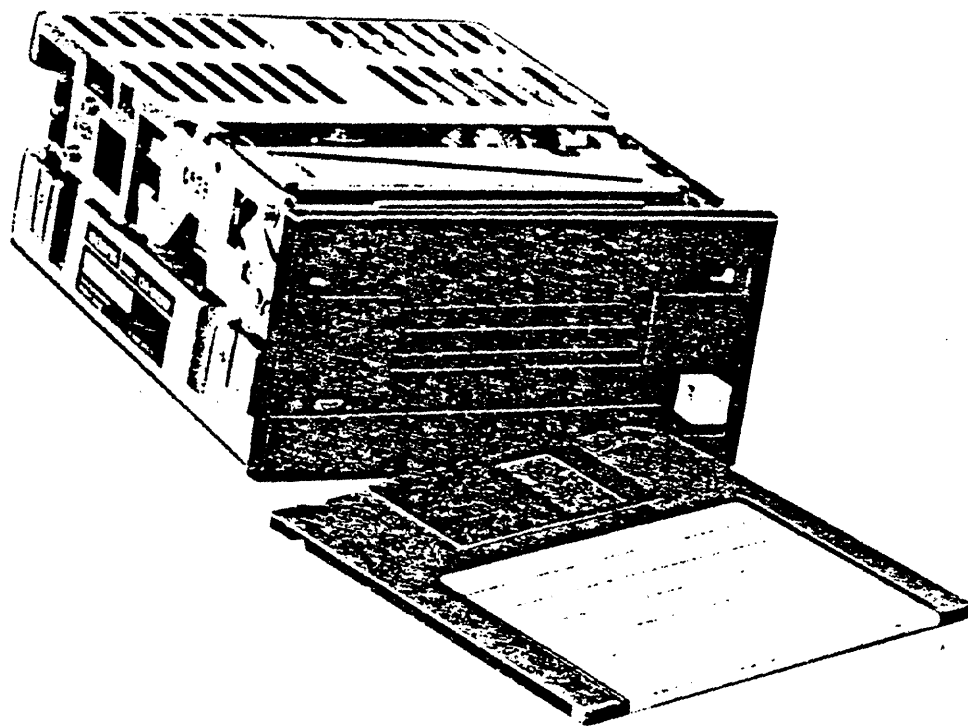
The SONY proprietary read/write and tunnel erase head developed using video techniques is positioned by a precision stepper motor assembly, providing fast access while maintaining positioning accuracy. And high coercivity media provides high data integrity.

The OA-D32W/OA-D32V **Micro Floppydisk** drive is interface compatible with conventional 8" floppy disk drives. Accordingly conventional FDC chips such as Western Digital FD1791, NEC μ PD765 can be used.

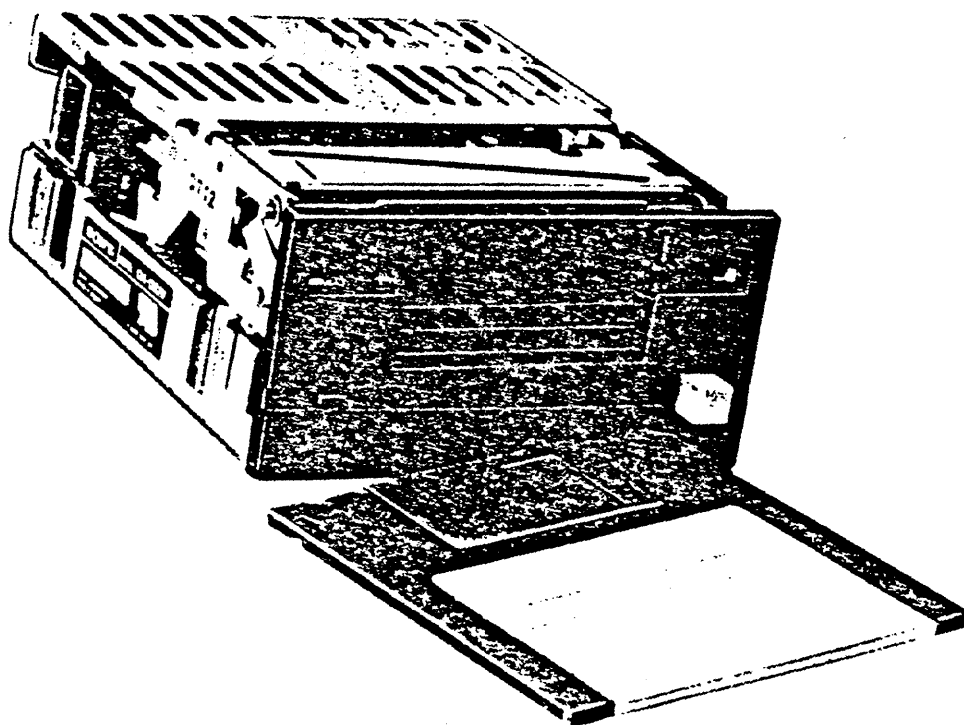
Whether your applications is small business systems, word processing, personal computers or any related application, you will find the **Micro Floppydisk** drive offers a whole new range of possibilities.

The **Micro Floppydisk** drive offers the following features.

- * 3.5" floppy disk media with automatic shutter mechanism
- * Large capacity 1.0M/0.5M bytes
- * High track density approx 135TPI
- * Long life brushless direct drive motor
- * High transfer rate 500 Kbps (MFM)



OA-D32W



OA-D32V

Figure 1-1. MICRO FLOPPYDISK DRIVE, MODEL OA-D32W/OA-D32V

SECTION 2

FUNCTIONAL CHARACTERISTICS

2-1. GENERAL OPERATION

Figure 2-1 shows interface signals for the internal functions of the OA-D32W/OA-D32V.

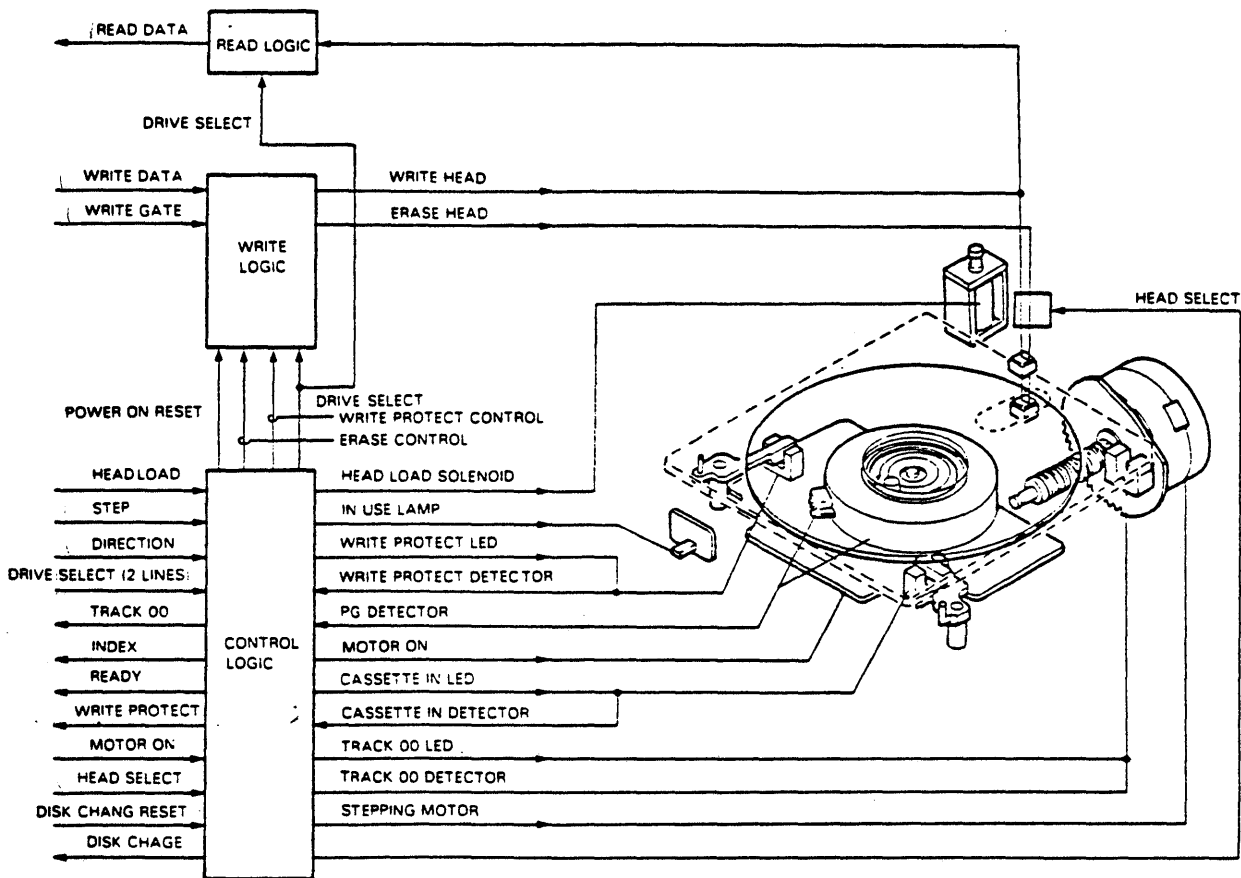


Figure 2-1. FUNCTIONAL DIAGRAM

2-2. READ/WRITE AND CONTROL ELECTRONICS

OA-D32W/OA-D32V has following electronic components.

- (1) Index Circuit
- (2) Head Position Actuator Driver
- (3) Head Load Actuator Driver
- (4) Read Write Amplifier and Transition Detector
- (5) Write Protect
- (6) Drive Ready Detector Circuit
- (7) Drive Select Circuit
- (8) In Use Lamp Circuit
- (9) Head Select Circuit

2-3. DRIVE MECHANISM

The brushless direct drive motor rotates the spindle at 600 rpm. Like conventional 5.25" drives, the OA-D32W/OA-D32V has a Motor on Control signal. Since the drive motor rotates only while Micro Floppy Cartridge is inserted, the power consumption is low. There is no index hole in the **Micro Floppydisk**, because the OA-D32W/OA-D32V positions the Disk precisely and the Index Pulse is generated by a photo sensor and hall element combination.

2-4. POSITIONING MECHANISM

In order to achieve high accuracy in track positioning, the head is positioned by a needle screw mechanism. And a stepping motor (Head Position Actuator) is controlled through the posicast control method to obtain the best performance. The stepping motor rotates the lead screw clockwise or counterclockwise in 45° increments. A 45° rotation of the lead screw moves the read/write head one track position. When +5 V and +12 V Power is on, the Head Positioning Actuator positions the read/write head at TRACK00. And if the head is positioned at TRACK 79, STEP IN command is rejected.

2-5. DISK CHUCKING MECHANISM

Our media utilizes a drive hole which maintains excellent track positioning accuracy without causing eccentricity or chucking wear. (See Figure 2-2.)

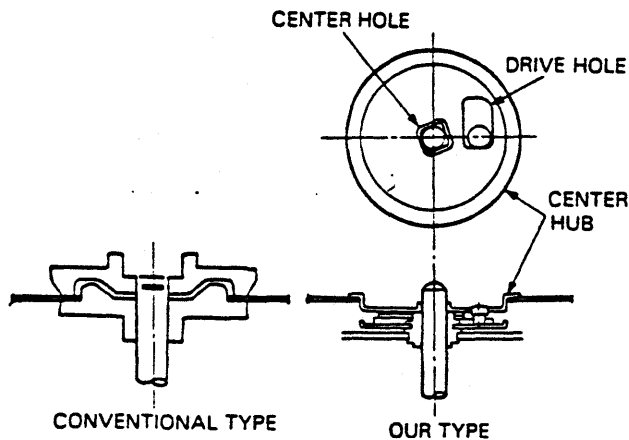


Figure 2-2. DISK CHUCKING MECHANISM

2-6. READ/WRITE HEAD

The OA-D32W/OA-D32V head is a new type of signal element ceramic read/write head with tunnel erase head to provide erase areas between data tracks. The head core is Mn-Zn single crystal ferrite. The data track width is 125 microns and the guard band width is 63 microns.

SECTION 3 SPECIFICATIONS

3-1. DRIVE PERFORMANCE

Table 3-1 lists performance data for the SONY OA-D32W/OA-D32V Micro Floppydisk drive.

TABLE 3-1. PERFORMANCE SPECIFICATIONS

Specification	OA-D32W		OA-D32V	
	SINGLE DENSITY	DOUBLE DENSITY	SINGLE DENSITY	DOUBLE DENSITY
CAPACITY				
Unformatted per disk	500K bytes	1.0M bytes	250K bytes	500K bytes
Unformatted per track	3.125K bytes	6.25K bytes	3.125K bytes	6.25K bytes
Burst TRANSFER RATE	250K bits/SEC	500K bits/SEC	250K bits/SEC	500K bits/SEC
ACCESS TIME				
Track to track	12 msec.		12 msec.	
Average*	350 msec.		350 msec.	
Settling Time	30 msec.		30 msec.	
Head load time	60 msec.		60 msec.	
Average latency	50 msec.		50 msec.	
FUNCTIONAL				
Rotational speed	600 RPM		600 RPM	
Recording density (inside track)	4359 BPI	8717 BPI	4094 BPI	8187 BPI
Track density	approx 135 TPI		approx 135 TPI	
Cylinders	80		80	
Tracks	160		80	
R/W heads	(2)		1	
Encoding method	FM, MFM		FM, MFM	
HEAT DISSIPATION				
Operating mode (Head Load)	6.0W		6.0W	
Standby mode (Head Unload)	3.9W		3.9W	

*Average access time = 1/3 x (Track Nos.) x (Track to track time) + (Settling Time)

3-2. DIMENSIONAL DATA

Table 3-2 lists the dimensional data for the Micro Floppydisk drive.

TABLE 3-2. DIMENSIONAL DATA

Physical Dimension	Value
Height	2.0 in. (51 mm)
Width	4.0 in. (102 mm)
Depth	5.1 in. (130 mm)
Weight	1.5 lbs (650g)

3-3. DC POWER REQUIREMENTS

Table 3-3 lists the DC power requirements for the drive. The user needs only supply DC power, no AC operating voltage is required.

TABLE 3-3. DC POWER REQUIREMENT

MODE	POWER CONSUMPTION	VOLTAGE (V DC)	TOLERANCE	MAXIMUM RIPPLE	CURRENT
Operating (reading)	6W	+12.0	±5%	0.1Vpp	0.30A (typical) 1.50A (maximum)
		+5.0	±5%	0.05Vpp	0.48A (typical) 0.80A (maximum)
Stand-by (head unload)	3.9W	+12.0	±5%	0.1Vpp	0.17A (typical)
		+5.0	±5%	0.05Vpp	0.36A (typical)

3-4. ENVIRONMENTAL CONSIDERATIONS

3-4-1. Reliability and Maintainability

Preventive Maintenance (PM)	Not required
Meantime between failures (MTBF)	8000 POH (Power On Hourtime)
Meantime to repair (MTTR)	30 min.
Component life	5 years or 15,000 POH
Media life	3.0×10^6 passes/track
Disk Interchange	20,000 times
Soft Read Error	1 per 10^9 bits read
Hard Read Error	1 per 10^{12} bits read
Seek Error	1 per 10^6 seeks

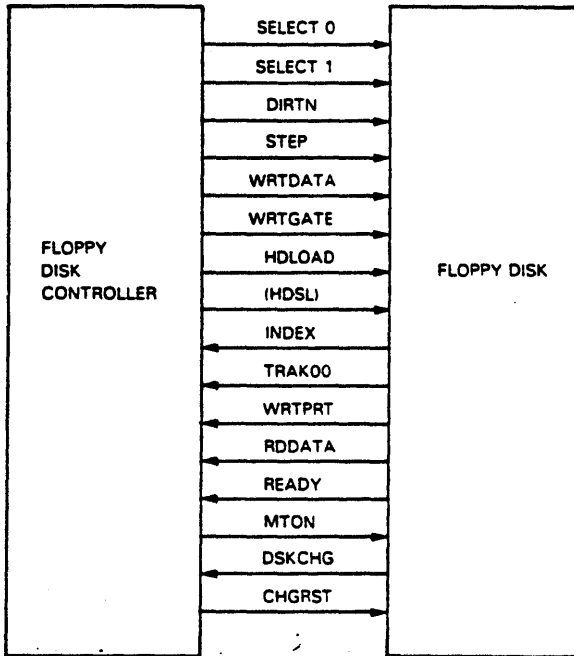
3-4-2. Environmental Limits

Temperature	Operating:	40° F to 115° F (5° C to 45° C)
	Non-Operating: (Storage)	-15° F to 140° F (-20° C to 60° C)
	Transporting:	-40° F to 140° F (-40° C to 60° C)
Humidity	Operating:	20 % to 80 % relative humidity, with a wet bulb temperature of 85° F (29° C) and no condensation.
	Non-Operating: (Storage)	5% to 95% relative humidity and no condensation.
	Transporting:	8 ~ 90% relative humidity and no condensation
Vibration	Operating:	The unit shall perform all read/write operations (no seek) according to specifications, with continuous vibration of less than 0.5G ($\pm 10\%$) from 5 Hz to 100 Hz (along the x, y, z plane).
	Non-Operating:	The unit when packed for shipment shall withstand ± 2.0 G from 5 Hz to 100 Hz along each of the three mutually perpendicular axes.
Shock	Non-Operating:	The unit when unpacked shall withstand 60 G.

SECTION 4 INTERFACE DESCRIPTION

4-1. HOST SYSTEM INTERFACE

The SONY OA-D32W/OA-D32V drive is compatible with conventional floppy disk controllers. The interface consists of 16 signal lines for data, control and hand-shaking (see Figure 4-1).



* (HDSL) is just for OA-D32W only.

Figure 4-1. INTERFACE SIGNAL DIAGRAM

4-2. INTERFACE CHARACTERISTICS

4-2-1. Input Signal Requirements

The input signals to the drive unit have the following requirements at OA-D32W/OA-D32V input terminal:

Logical "0"	0.0 V to +0.8 V
Logical "1"	+2.0 V to +5.25 V
Input Impedance	1000 ohms

4-2-2. Output Signal Characteristics

The output signals from the drive unit have the following characteristics:

True = Logical "0"	0.0 V to +0.4 V
Output Current	40 mA (max.)
False = Logical "1"	+2.4 V to +5.25 V
Output Current	250 μ A (max.)

4-3. SIGNAL INTERFACE

The drive has 16 interface signals (see Table 7-2 for pin assignments). Eight signals are input to the drive, and five are output. Recommended interface circuitry is shown in Figure 4-2. The ten input signals are listed below, and are described in 4-3-1.

DRIVE INPUT	MNEMONIC
DRIVE SELECT 0	SELECT 0
DRIVE SELECT 1	SELECT 1
DIRECTION SELECT	DIRTN
STEP	STEP
HEAD LOAD	HDLOAD
WRITE DATA	WRTDATA
WRITE GATE	WRTGATE
MOTOR ON	MTON
DISK CHANGE RESET (HEAD SELECT)	CHGRST (HDSL)

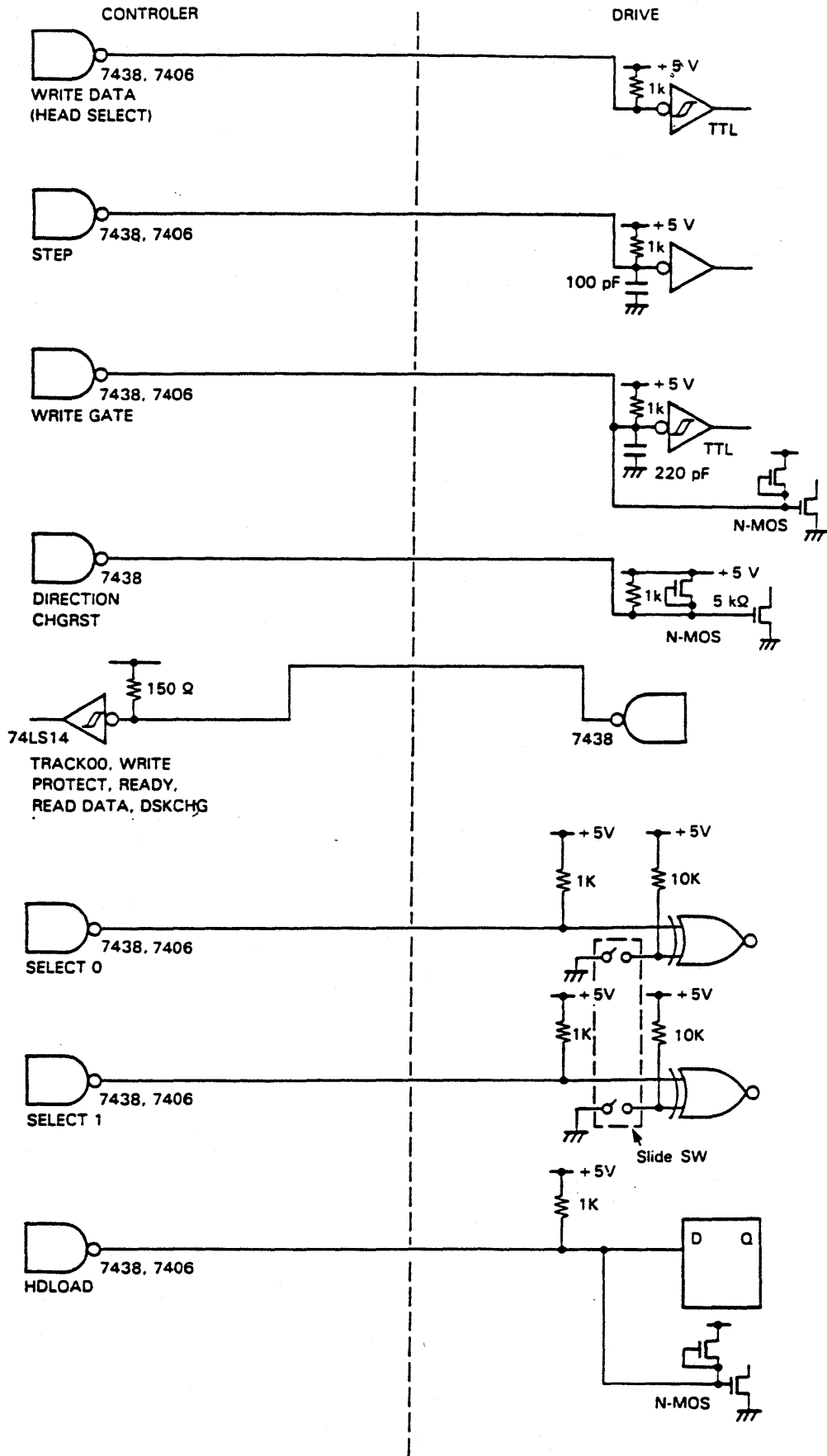
The six output signals are listed below, and are described 4-3-1.

DRIVE OUTPUT	MNEMONIC
INDEX	INDEX
TRACK00	TRK00
WRITE PROTECT	WRTPRT
READY	READY
READ DATA	RDDATA
DISK CHANGE	DSKCHG

4-3-1. Input Signal Descriptions

4-3-1-1. Drive Select 0, 1 (SELECT 0, 1) — Combination of logical level for these lines selects the designated drive (Drive 1, 2, 3 and 4) for operation.

SELECT 0	SELECT 1	ID of selected drive
1	1	Drive 1
0	1	Drive 2
1	0	Drive 3
0	0	Drive 4



INTERFACE CIRCUITRY

4-3-1-2. Direction Select (DIRTN) — This line defines the direction of head movement when the step line is activated.

Logical "1" on this line defines the direction as "out", and when the step line is activated the head will move to the outside of disk. Logical "0" on this line defines the direction as "in", and when the step line is activated the head will move to the center of the disk.

4-3-1-3. STEP (STEP) — This line causes the read/write head to move in the direction defined by the DIRTN line.

The transient from logical "1" to logical "0" initiates the stepping motion.

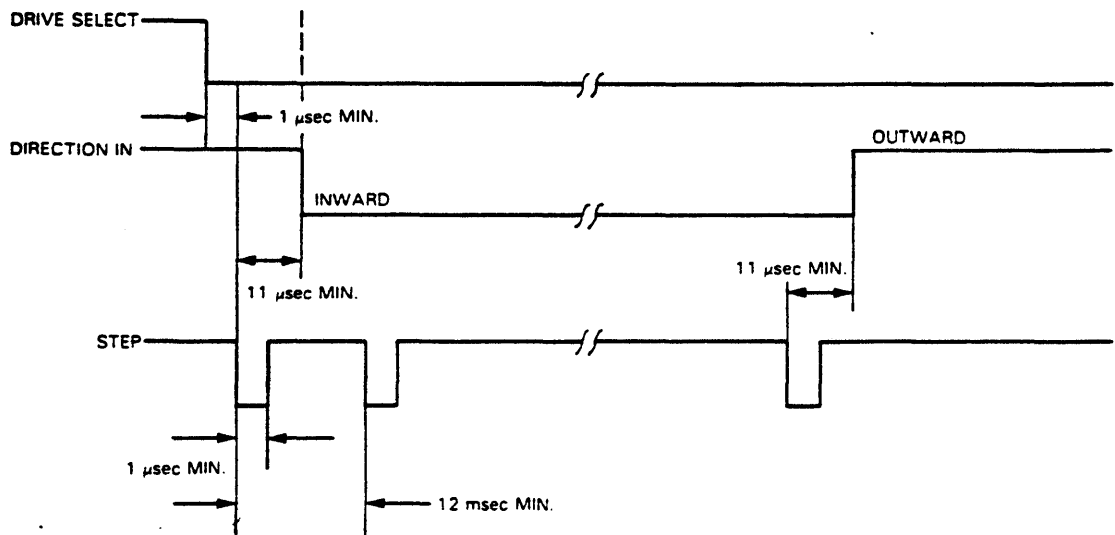


Figure 4-3. TRACK ACCESS TIMING

4-3-1-4. Head Load (HDLOAD) — This line causes the read/write head to contact the disk surface.

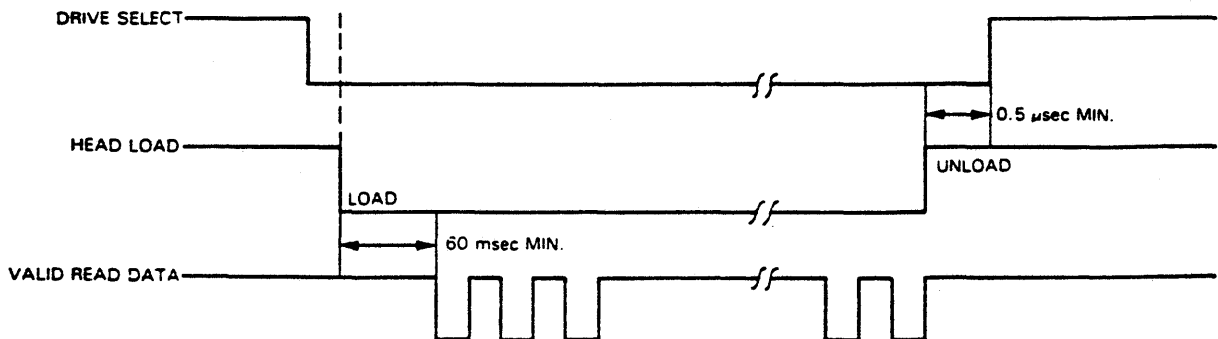


Figure 4-4. HEAD LOAD AND UNLOAD TIMING

4-3-1-5. Write Data (WRTDATA) — This line is used for data that are to be written on the disk. A transition from Logical "1" to Logical "0" changes the polarity of read/write head current and causes data to be written on the disk. This line is active when the WRTGATE and READY signals are Logical "0", and the WRTPRT signal is Logical "1".

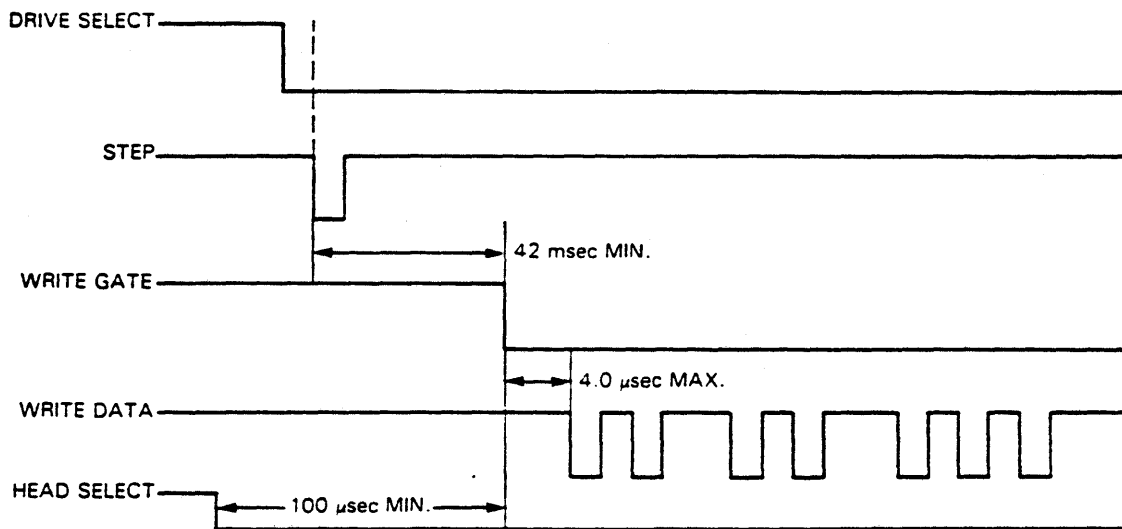


Figure 4-5. WRITE INITIATE TIMING

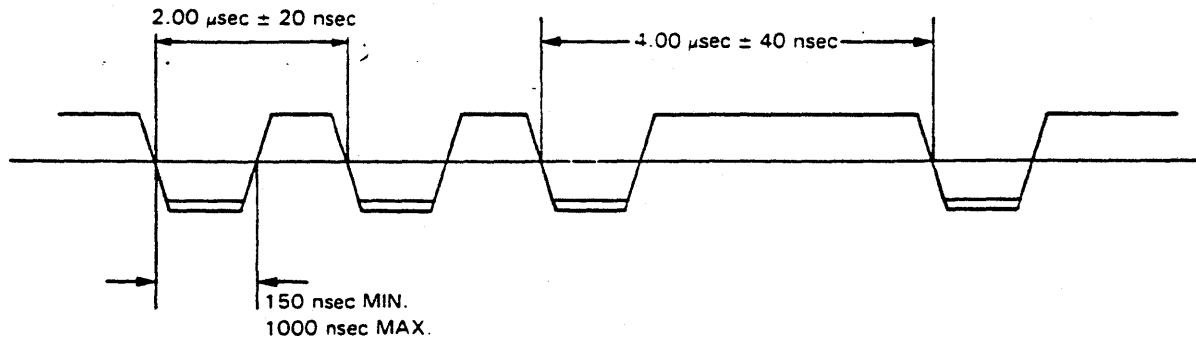


Figure 4-6. WRITE DATA TIMING

4-3-1-6. Write Gate (WRTGATE) — This line defines an operation as read or write. Logical "0" on this line enables data to be written on the disk; logical "1" identifies read operation. And this line controls the tunnel erase head.

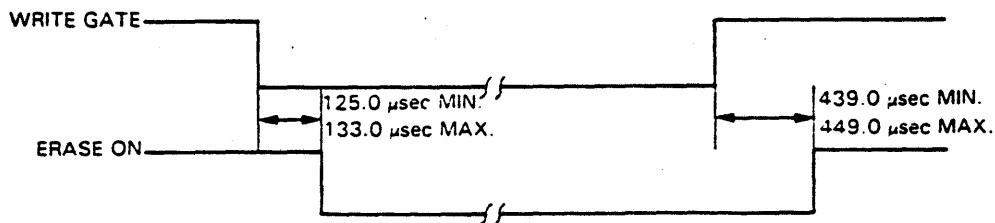


Figure 4-7. ERASE ON AND OFF TIMING

4-3-2. Output Signal Descriptions

4-3-2-1. Index (INDEX) — This line is used to indicate a reference position of a track. The line is usually Logical "1"; it becomes Logical "0" when

the drive senses the index mark. (See Fig. 4-8). The trailing edge of the signal should be used to determine position. The line is Logical "1" statically when the drive is not selected.

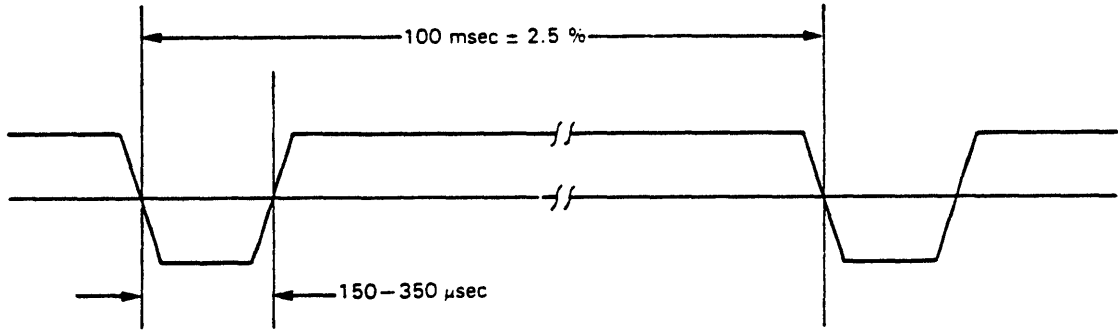


Figure 4-8. INDEX MARK TIMING

4-3-2-2. Track00 (TRK00) — This line indicates that read/write head locates at track00 (the outermost track). Logical "0" on this line indicates that the read/write head is at track00. Logical "1" on

this line indicates that the read/write head is not at track00. When the drive is not selected this line is Logical "1".

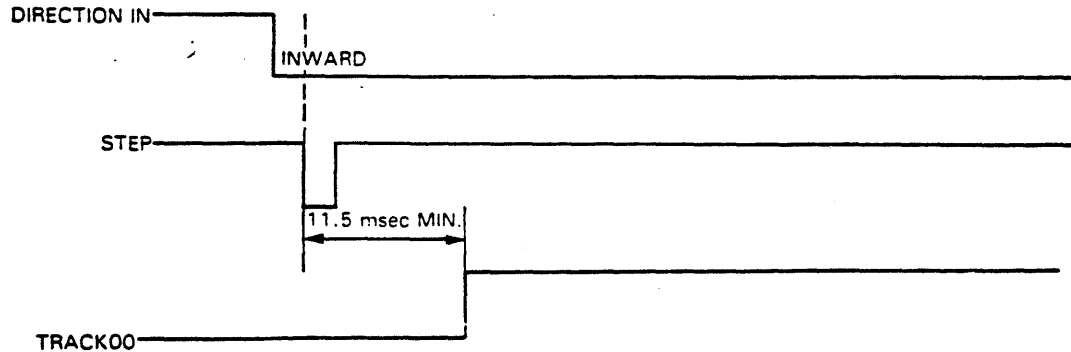


Figure 4-9. TRACK00 TIMING WHEN STEP IN

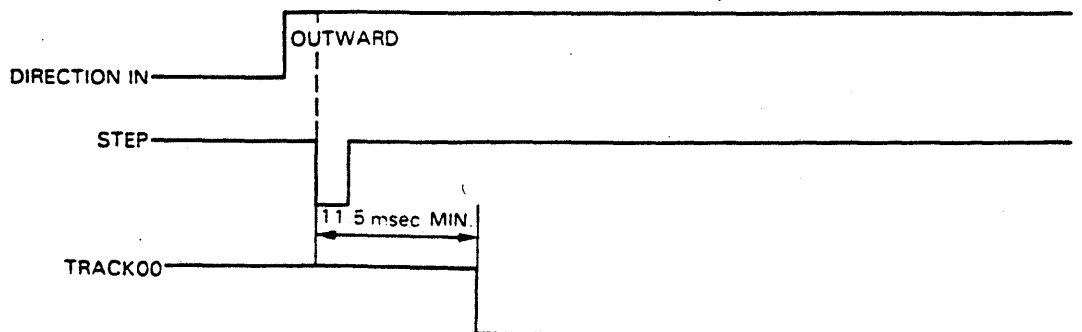


Figure 4-10. TRACK00 TIMING WHEN STEP OUT

4-3-2-3. Write Protect (WRTPRT) — This line indicates that a disk inserted in the drive is write protected. Logical "0" on this line indicates a write protected disk is inserted in the drive. Logical "1" on this line indicates data may be written on the disk. If no disk is inserted in the drive Logical "0" appears on this line. If the drive is not selected this line is Logical "1".

4-3-2-4. Ready (READY) —

This line is Logical "0" when
 a) disk is inserted
 and
 b) motor is rotating
 and
 c) drive unit is selected.

At all other times this line is Logical "1".

4-3-2-5. Read Data (RDDATA) —

This line provides unseparated data (data and clocks combined). The line is normally Logical "1", and falling edge of this line has information.

4-3-2-6. Motor ON (MTON) —

This line is used for control to rotate or stop the disk motor. The disk motor in each drive connected in daisy chain will rotate simultaneously when this line is Logical "0" and will stop when this line is Logical "1".

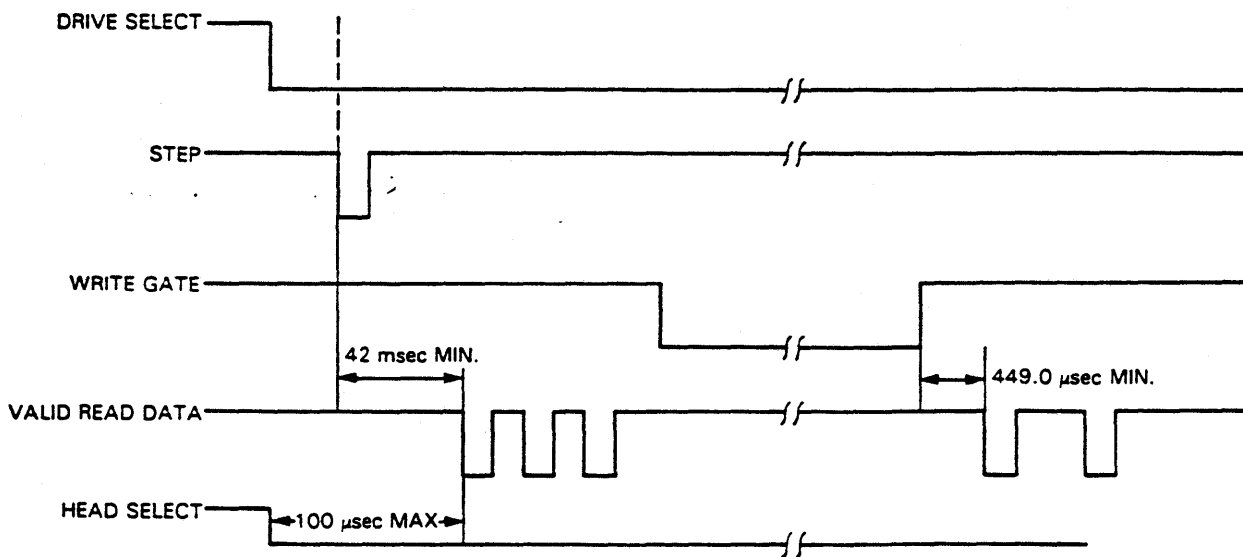


Figure 4-11. READ INITIATE TIMING

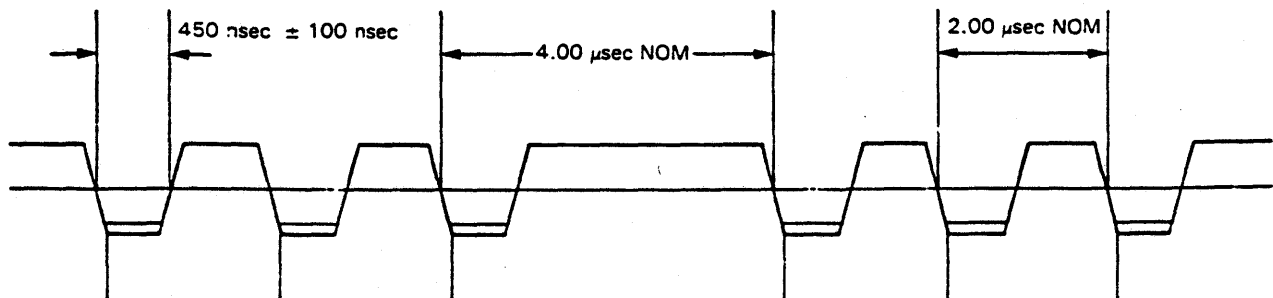


Figure 4-12. READ DATA TIMING

4-3-2-7. Disk Change (DSKCHG) —

This line is used to monitor if disk has been changed. This line goes to Logical "0" when the disk is ejected from the drive and stays "0" until DISK Change Reset is applied. The drive should be selected to monitor its DISK CHANGE.

4-3-2-8. Disk Change Reset (CHGRST) —

This line is used to reset the DISK CHANGE Signal. When the disk is inserted, the drive is selected and this line goes to Logical "0", the DISK CHANGE goes to Logical "1".

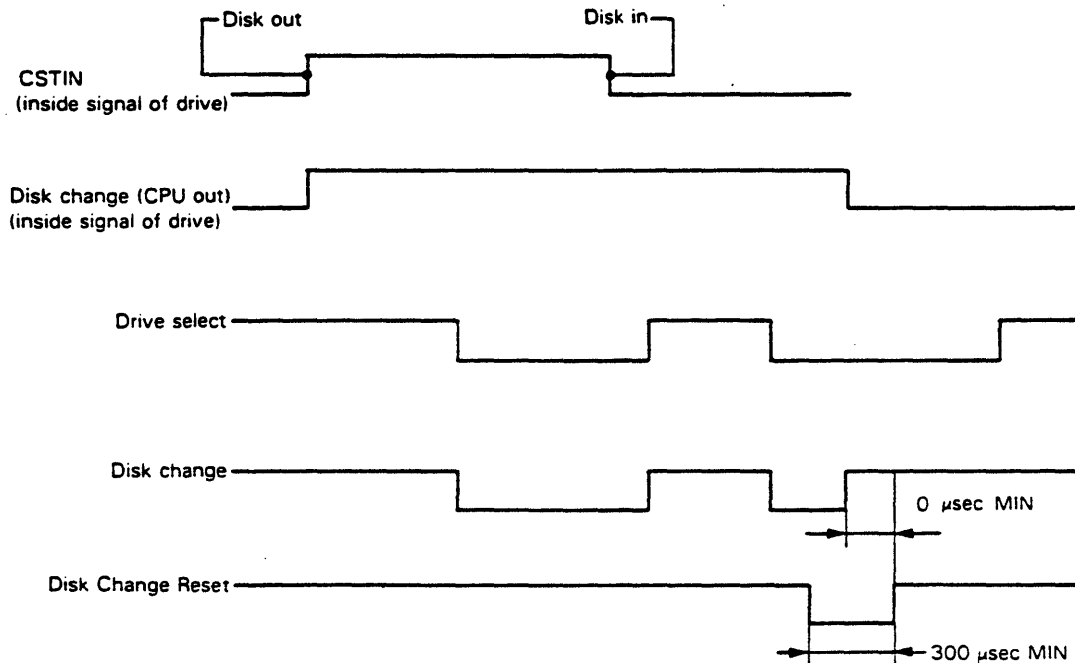
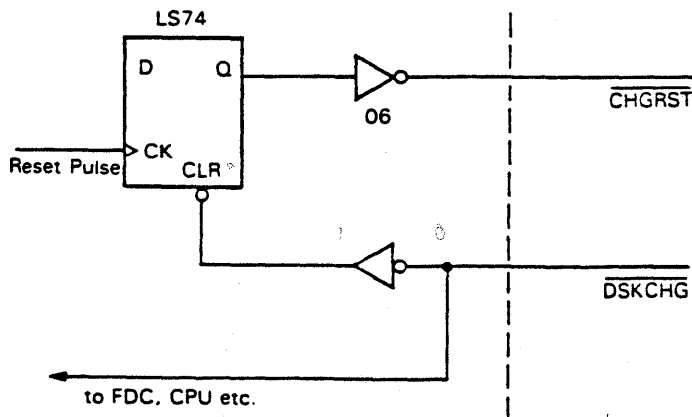


Figure 4-13. DISK CHANGE AND DISK CHANGE RESET TIMING



This recommended circuit automatically sets $\overline{\text{CHGRST}}$ to logical "1" after $\overline{\text{DSKCHG}}$ is reset. By introduction of this circuit, it is not necessary to keep $\overline{\text{CHGRST}}$ logical "0" for 300 μSEC min.

Figure 4-14. RECOMMENDED CIRCUIT TO USE DISK CHANGE SIGNAL

4-3-2-9. Head Select (HDSL) —

This line is used to select head 0 or head 1. Head 0 is the head which is situated at the lower side of disk and the head 1 is the head which is situated at the upper side of disk. Head 1 is selected when Head Select is Logical "0".

4-4. INTERFACE TIMING

Figure 4-15 shows the timing relationship for host/drive interface signals.

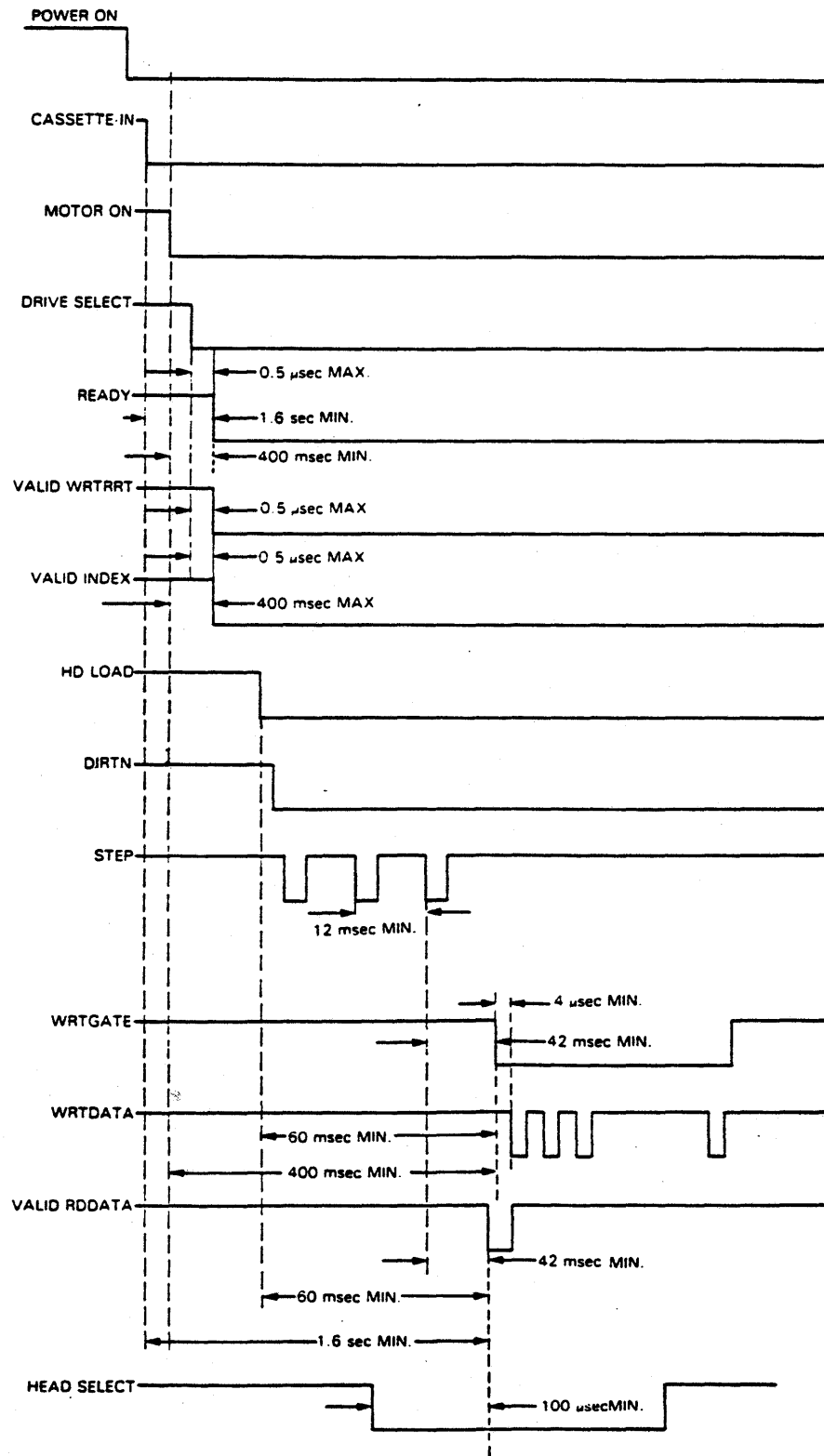


Figure 4-15. SIGNAL INTERFACE TIMING DIAGRAM

SECTION 5 CONTROLS AND FRONT PANEL

5-1. OPERATOR CONTROLS AND FRONT PANEL

5-1-1. Front panel Controls

The eject button (see Figure 5-1) is used to remove a disk cartridge from the unit. Depression of the eject button causes the disk cartridge in the unit to be ejected.

5-1-2. Front Panel Indicator

The activity indicator (see Figure 5-1) indicates that a disk is in the unit and head is loaded.

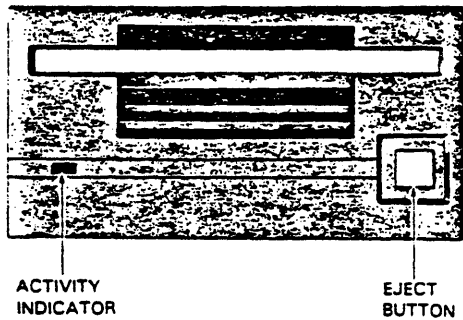


Figure 5-1. FRONT PANEL INDICATOR

5-1-3. Drive Select Controls

Drive Select switch S101 located on the rear side of FC-9 board (OA-D32W)/FC-14 board (OA-D32V) is used to designate drive 1 up to drive 4 in a daisy chain application. The **Micro Floppydisk** drive is shipped from the factory designated as drive 1. If the drive is designated as other than drive 1, set the Drive Select S101 to the applicable position as shown below.

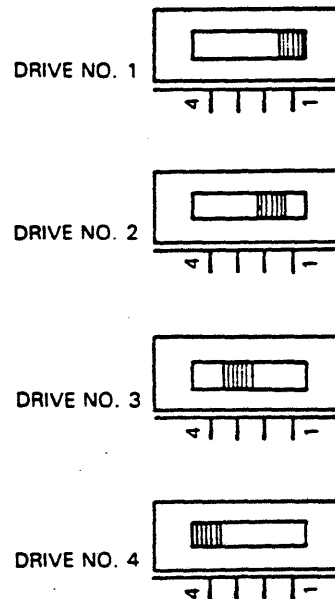
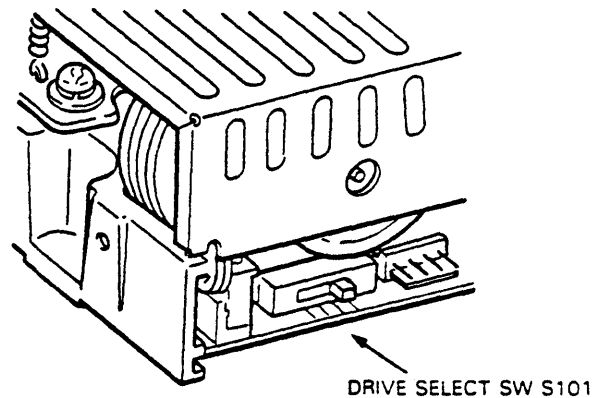


Figure 5-2. DRIVE SELECT CONTROL (S101)
LOCATION AND SETTING

5-1-4. Disk Motor Control

The Disk Motor Control S102 (which is located on the PCB at the bottom side of the drive, refer to Figure 5-3) allows you to control the disk motor as follows:

- 1) If the switch is at side A, the disk motor rotates
· whether or not the disk cartridge is in the unit,
but only when the Motor on signal is logical "0".
- 2) If the switch is at side B, the disk motor rotates
only when the disk cartridge is in the unit and
the Motor on signal is logical "0".

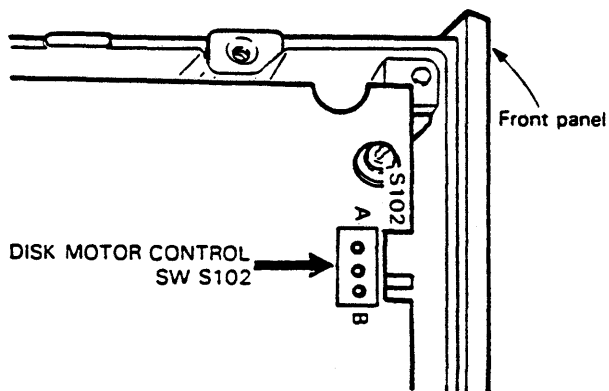


Figure 5-3. DISK MOTOR CONTROL SW (S102) LOCATION

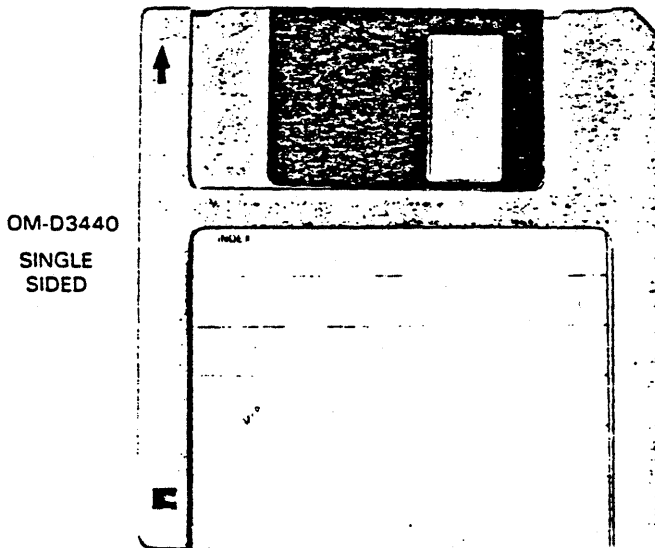
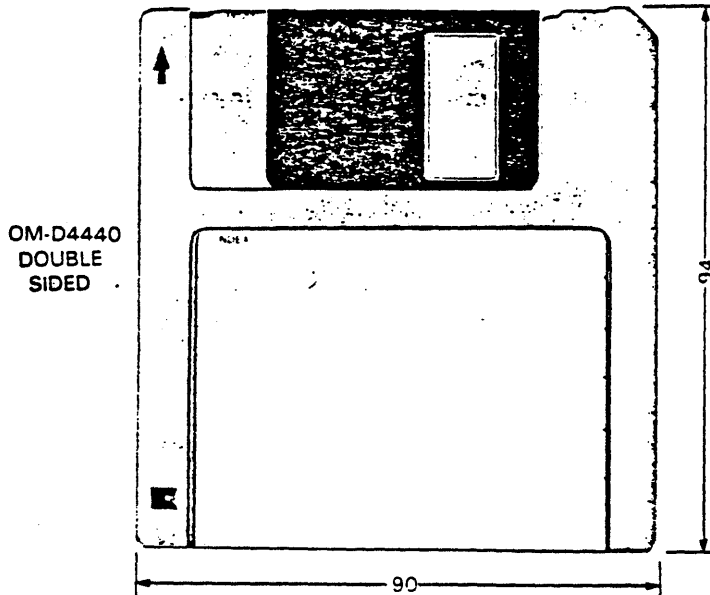
SECTION 6 OPERATION

6-1. DISK CARTRIDGE DESCRIPTION

Two kinds of SONY Micro Floppydisk cartridge are now available for use with the OA-D32W/OA-D32V. These are OM-D4440 (double-sided) and OM-3440 (single-sided). Both of these have an automatic shutter mechanism which opens when the disk is inserted, and closes when it is removed from the drive (OA-D32W and OA-D32V).

These disks are enclosed in a semi-rigid plastic shell for extra protection and reduced disk-to-case friction (see Figure 6-1). A metal center hub ensures rapid and accurate positioning when the disk is inserted in the drive. SONY's exclusive shutter mechanism protects the recording surface from foreign object contamination. The shutter

FRONT VIEW



prevents dust, dirt and fingerprints from degrading the integrity of the stored data.

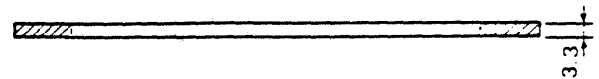
6-1-1. Disk Cartridge Preparation for Write Protection

The Micro Floppydisk cartridge is write unprotected as shipped from the manufacturer. To prepare the disk cartridge for write protected operation, push down write protect slide (coloured red) located on back side of cartridge. To restore the disk cartridge to its unprotected condition (i.e. write enabled), the red slide should be pushed back to the upper position (see Fig. 6.1).

BACK VIEW



WRITE
PROTECT
SLIDE



ALL DIMENSIONS IN MM.

Figure 6-1. MICRO FLOPPYDISK CARTRIDGE

6-2. OPERATION

6-2-1. Disk Cartridge Eject Mechanism

SONY's fail-safe eject mechanism prevents damage to disk or drive by ejecting the **Micro Floppydisk** in the event it is improperly inserted.

6-2-2. Disk Cartridge Insertion

Do not apply any force to a disk cartridge. With metal center hub downwards, insert the disk, shutter edge first, into the disk drive. When the Motor on signal is logical "0", the Drive Motor Control S102 is at side B and the disk cartridge is in the drive, the motor will rotate; motor rotation stops only when disk cartridge is removed from the drive. The **Micro Floppydisk** drive is now ready for operation. Operation of the double sided **Micro Floppydisk** (OM-D4440) does not require any extra handling (such as removal and reinsertion).

6-2-3. Disk Cartridge Removal

Depress eject button to remove disk cartridge. Do not depress eject button if activity indicator is illuminated.

6-3. DISK PRECAUTIONS

- 1) The following precautions will assure full disk life and maximum data integrity:
 - a) When handling disk, do not touch exposed disk surface itself.
 - b) Keep disks away from magnetic materials.
 - c) Do not expose disks to excessive heat or direct sunlight.
 - d) Never attempt to clean disk surface. This may result in damage to disk or drive head.

- 2) The **Micro Floppydisk** cartridges OM-D4440 (double-sided) and OM-D3440 (single-sided) are recommended for use with drives OA-D32W and OA-D32V respectively in order to ensure longer life and high reliability of disk surface.

- 3) A Disk cartridge with no auto-shutter mechanism (OM-D3310) can not be inserted into either the OA-D32W or OA-D32V for reasons of data protection and mechanical incompatibility.

6-4. DISK ENVIRONMENTAL LIMITS

Operating: Temperature 50 ~ 140°F (10 ~ 60°C)
Humidity 8 ~ 80 % RH

Storage: Temperature 50 ~ 140°F (10 ~ 60°C)
Humidity 8 ~ 80 % RH

Transporting: Temperature -40 ~ 140°F (-40 ~ 60°C)
Humidity 8 ~ 80 % RH

(Maximum wet bulb temperature \leq 85°F (29.4°C))

SECTION 7 ELECTRICAL CONNECTORS

7-1. POWER CONNECTOR

7-1-1. Frame Ground

The drive unit should be frame grounded to the host system. A frame ground screw for this purpose is positioned on the back of the unit.

7-1-2. DC Power Connector (CN108)

DC power connector (CN108) is a 4-pin male plug which is located at the rear of the drive unit. This connector should be used to satisfy the power requirements of the unit.

7-1-3. DC Power Cable Fabrication

The DC power from the host system should be delivered to the drive unit over a cable with the following recommended parts:

Receptacle (4-pin)	AMP 171822-4
Contact	AMP 170262-1
Wire	AWG 20 (or equivalent)

Table 7-1 is a list of pin assignments for connector CN108. Figure 7-1 illustrates power interconnection.

TABLE 7-1. DC POWER CONNECTOR PIN ASSIGNMENTS

Pin No.	Description
1	+5 V DC
2	GND (+5 V Return)
3	GND (+12 V Return)
4	+12 V DC

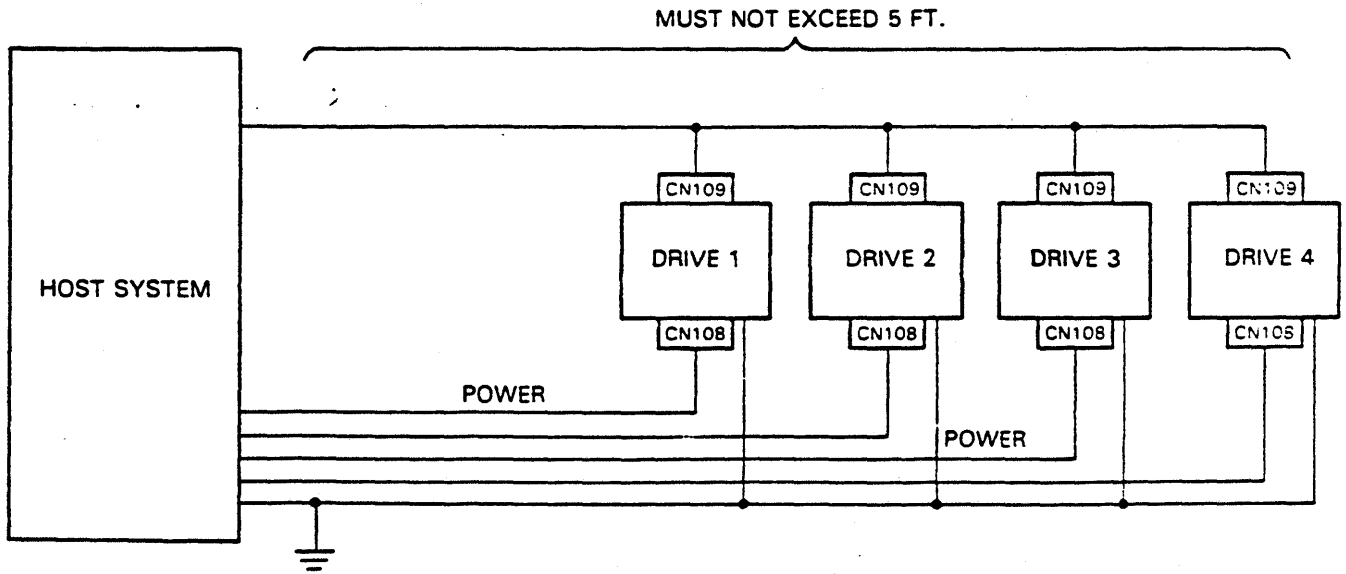


Figure 7-1. PHYSICAL INTERCONNECTION FOR DAISY CHAIN APPLICATION

7-2. SIGNAL INTERFACE CONNECTOR

7-2-1. Signal Interface Connector (CN109)

Signal interface connector (CN109) is a 26-pin male plug located at the rear of the unit. This connector should be used to interface drive logic with the host system. When mating a receptacle with connector CN109, the polarizing key should be placed upwards. Figure 7-3 shows CN109 connector dimensions.

7-2-2. Signal Interface Cable Fabrication

The drive unit signal interface cable must not exceed 5 feet in length. A 26-pin receptacle is required to mate with signal connector CN109. The following parts are recommended for host system to drive unit signal cable fabrication:

Receptacle (26-pin) (JAE PS-26SE0-D4P1-1C)

Receptacle (26-pin) for "daisy chain" application. (JAE PS-26SE0-D4P1-1D)

Cable (3M 3365/26)

Table 7-2 is a list of pin assignments for signal interface connector CN109. Figure 7-1 illustrates signal interface connection. (If you need more detail, please contact your Sony Office Products dealer.)

TABLE 7-2 SIGNAL INTERFACE CONNECTOR PIN ASSIGNMENTS

PIN NO	Description	Mnemonic
1	Motor On	MTON
2	Drive Select 0	SELECT 0
3	Disk Change	DSKCHG
4	Drive Select 1	SELECT 1
5	Disk Change Reset	CHGRST
6	Direction Select	DIRTN
7	Return	RETURN
8	Step	STEP
9	Return	RETURN
10	Write Data	WRTDATA
11	Return	RETURN
12	Write Gate	WRTGATE
13	Return	RETURN
14	Head Load	HDLOAD
15	Return	RETURN
16	Head Select	HDSL
17	Return	RETURN
18	Index	INDEX
19	Return	RETURN
20	Track00	TRK00
21	Return	RETURN
22	Write Protect	WRTPRT
23	Return	RETURN
24	Read Data	RDDATA
25	Return	RETURN
26	Ready	READY

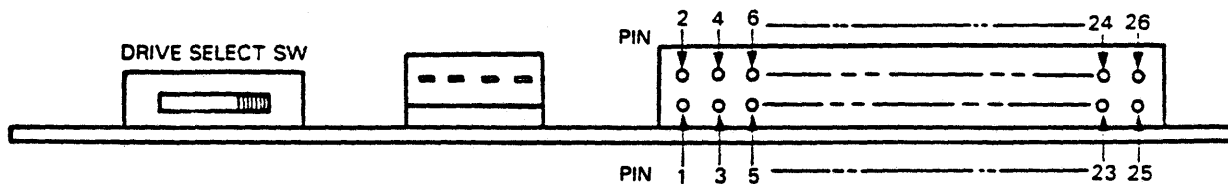


Figure 7-2. CN109 PIN ARRANGEMENT (REAR VIEW OF DRIVE)

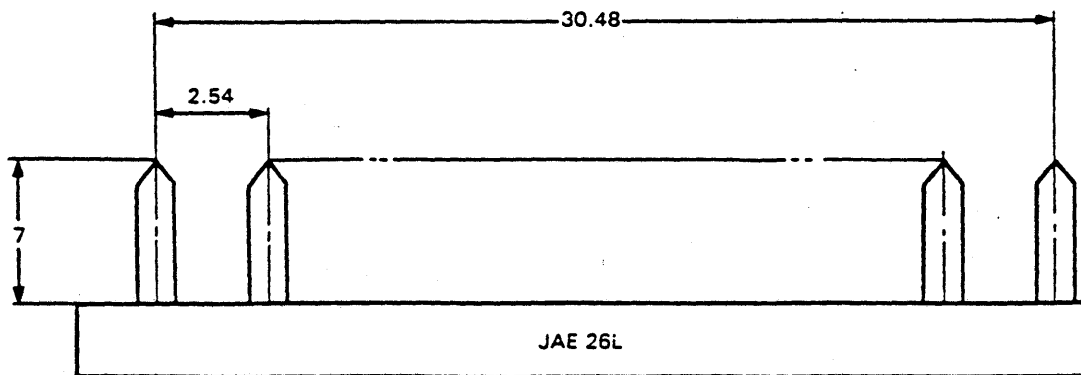


Figure 7-3. CN109 CONNECTOR DIMENSIONS

SELECTION 8 MOUNTING AND INSTALLATION

8-1. ORIENTATION

The drive may be mounted in either a horizontal or vertical position. (See Figure 8-1) In the horizon-

tal position the drive must be positioned with the printed circuit board on bottom. No other restrictions concerning orientation exist.

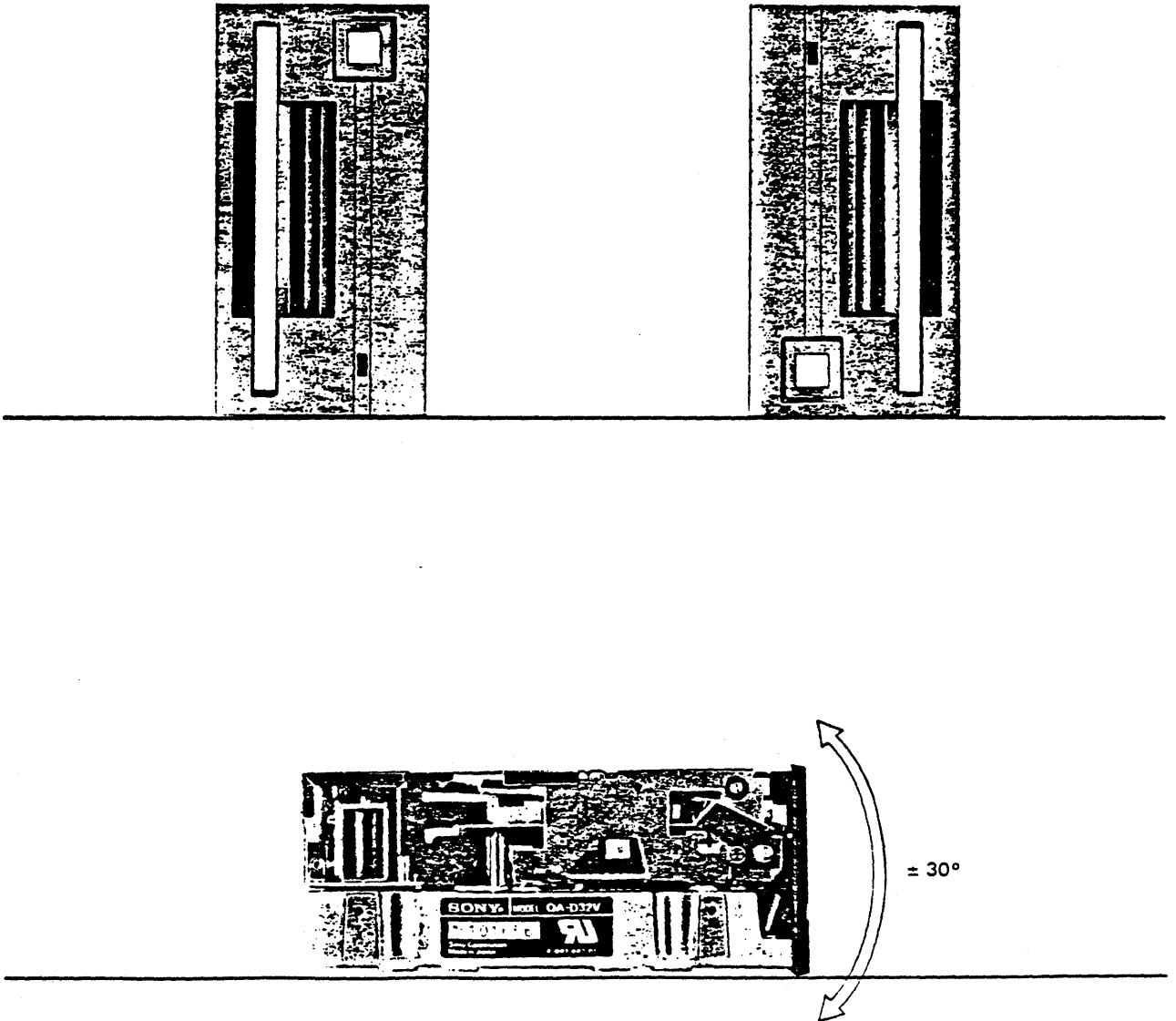


Figure 8-1. PERMITTED DRIVE ORIENTATION

8-2. INSTALLATION

The drive is designed for installation in an area 4.0 in. wide by 2.0 in. high by 5.1 in. deep. See Figure 8-2 for dimensional data. Eight mounting holes

are provided on the unit to facilitate installation (see Figure 8-2.) The unit has two mounting holes on each side, and four mounting holes on bottom.

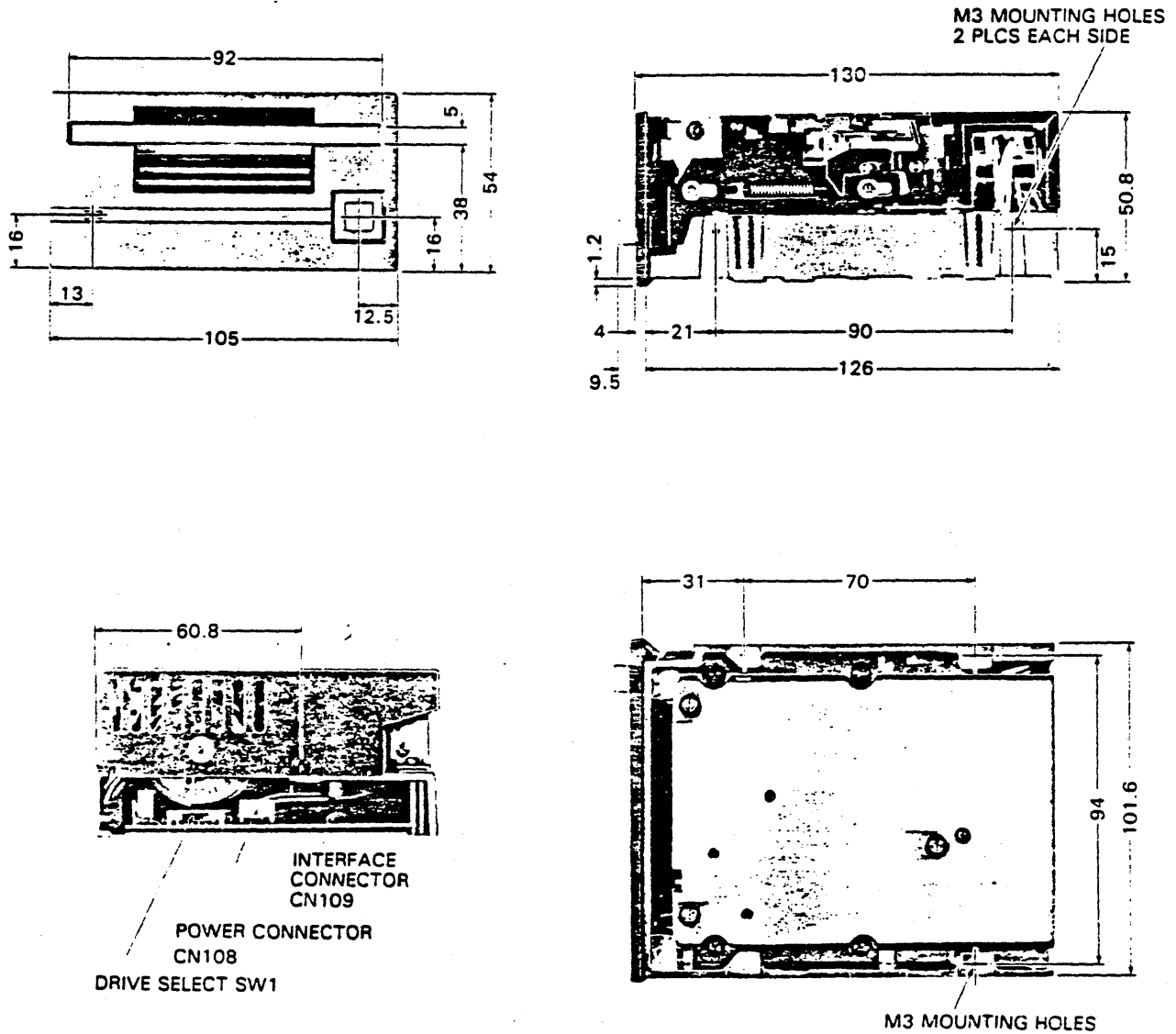
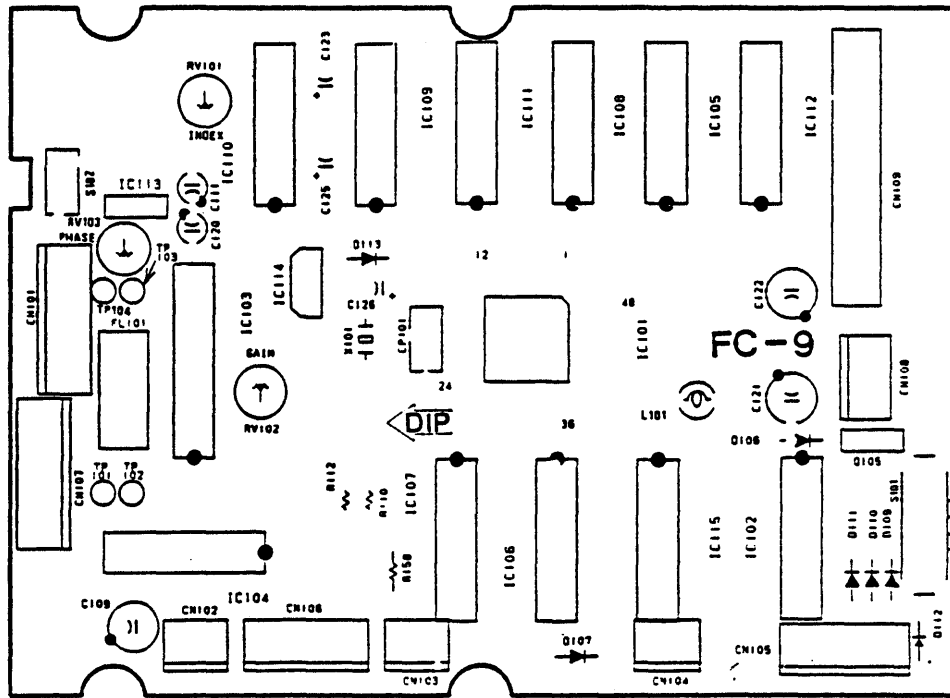


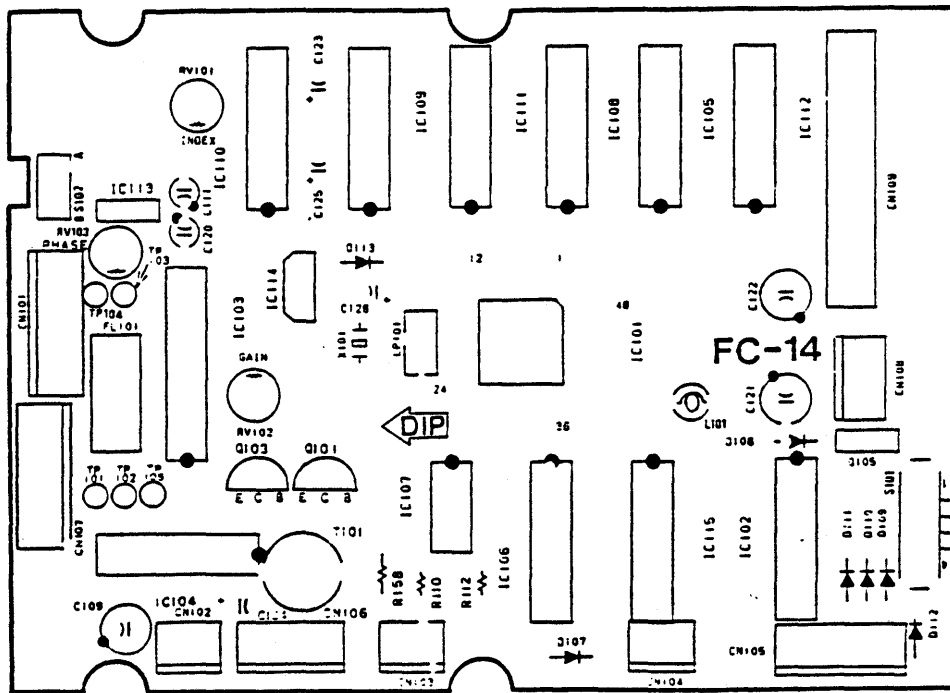
Figure 8-2. DRIVE DIMENSIONAL DATA

8-3. COMPONENT LOCATION ON PCB

Figure 8-3 shows the location of components on the PCB.



(a) FC-9 Board (OA-D32W)



(b) FC-14 Board (OA-D32V)

Figure 8-3. COMPONENT LOCATION ON PCB

SECTION 9

ERROR DETECTION AND CORRECTION

9-1. WRITE ERROR

If an error occurs during a write operation, it will be detected on the next revolution by doing a read operation, commonly called a "write check." To correct the error, another write and write check operation must be done. If the write operation is not successful after ten (10) attempts have been made, a read operation should be attempted on another track to determine if the media or the drive is failing. If the error still persists, the disk should be considered defective and discarded.

9-2. READ ERROR

Most errors that occur will be "soft" errors; that is, by performing an error recovery procedure the data will be recovered.

Soft errors are usually caused by:

1. Airborne contaminants that pass between the read/write head and the disk. These contaminants will generally be removed by the cartridge self-cleaning wiper.
2. Random electrical noise which usually lasts for a few μ sec.
3. Small defects in the written data and/or track not detected during the write operation which may cause a soft error during a read.

The following procedures are recommended to recover from the above mentioned soft errors:

1. Reread the track ten (10) times or until such time as the data is recovered.
2. If data is not recovered after using step 1, access the head to the adjacent track in the same direction previously moved, then return to the desired track.
3. Repeat step 1.
4. If data is not recovered, the error is not recoverable.

MOTOR ON	1	←	COULD STAY IN
DRIVE SELECT 0	2	←	14 DRIVE SELECT 1
DISC CHANGE	3	→	34
DRIVE SELECT 1	4	←	12 DRIVE SELECT 2
DISC CHANGE RESET	5	←	COULD STAY IN
DIRECTION SELECT	6	←	18
STEP	8	←	20
WRITE DATA	10	←	22
WRITE GATE	12	←	24 WRITE ENABLE
HEAD LOAD	14	←	MOTEN
HEAD SELECT	16	←	32
INDEX	18	←	8
TRACK 00	20	→	26
WRITE PROTECT	22	→	28
READ DATA	24	→	30
READY	26	→	

