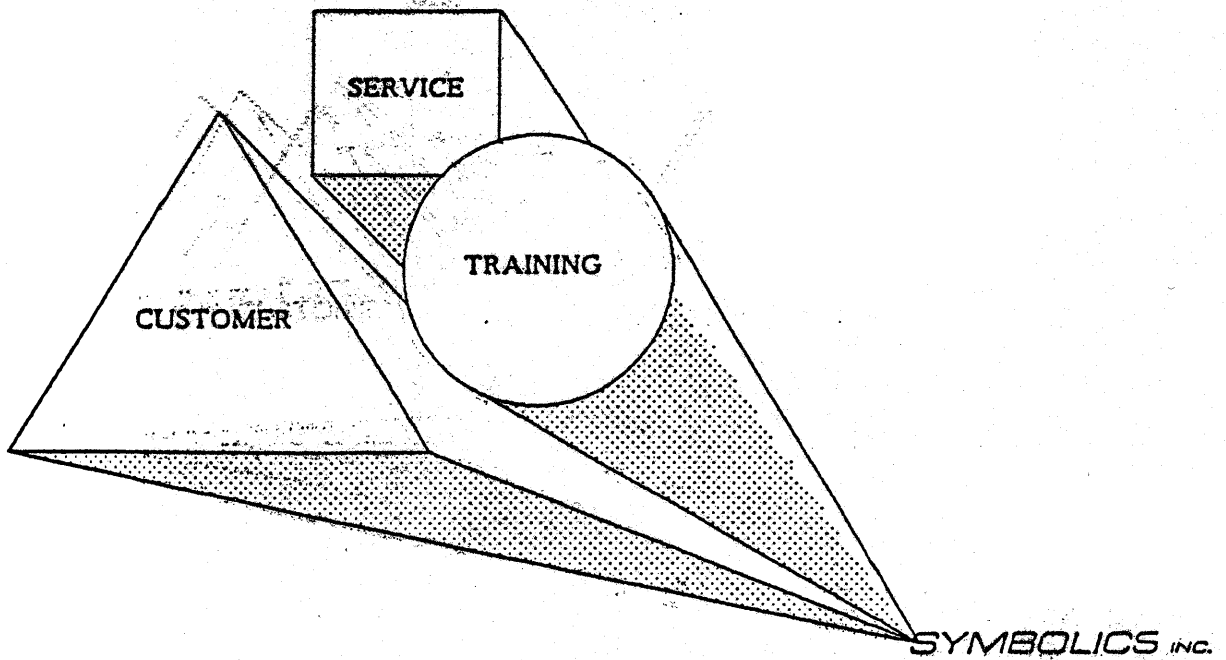


3600 SERIES

BASIC FIELD MAINTENANCE

STUDENT GUIDE



**CUSTOMER SERVICE
STUDENT HANDOUT MATERIAL**

This document was prepared by the Customer Service Technical Training Group of Symbolics, Inc.

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Printed in the USA.

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Technical Training Center

General Student Information for Training Courses

On Arrival at LA International

Take the Van Nuys fly-away bus to terminal at Van Nuys Airport 7610 Woodley Ave., Van Nuys, CA

Take taxi to motel; or take rental car to motel. (see attached map). Round trip fly-away cost approximately \$8.00. One way approximately \$4.50

Motel Locations Preferred

(Billed to Co. for Symbolics students)
TOPANGA INN, 9817 Topanga Canyon Blvd.
Chatsworth, CA 91311
(818) 709-7054

Alternate

COUNTRY SQUIRE
7631 Topanga Canyon Blvd.
Chatsworth, CA 91311
(818) 883-0240

Class Room Locations

9320 Deering Avenue
Chatsworth, CA 91311
(818) 998-3600, Extension 560

Motel and Meal Expenses

Students who are not Symbolics employees are responsible for arranging and paying all costs for travel, hotel accommodations, and automobile rental. Commercial rates at Topanga Inn or Country Squire are approximately \$49/day (single/queen size bed) plus \$6 tax.

Symbolics students who do not have a permanent advance will be paid a sufficient advance to defray the cost of food, telephone calls, laundry, etc. upon arrival (Monday) at Chatsworth. Students who have a permanent advance are expected to pay expenses out of that advance. All long-distance telephone charges, dry cleaning, etc. must be paid by students at the time of check-out. Expense Reports will be submitted weekly while in training. The final expense Report will be mailed back to the Training Manager at Chatsworth for approval.

Class Room Hours

8:15 am to 12:00 noon
1:00 pm to 5:00 pm
Monday through Friday

Emergency Telephone Numbers

Technical Training Mgr. - Paul Dyer
Symbolics - (818) 998-3600, Ext. 561
Home - (818) 712-0761

Emergency Medical Facilities

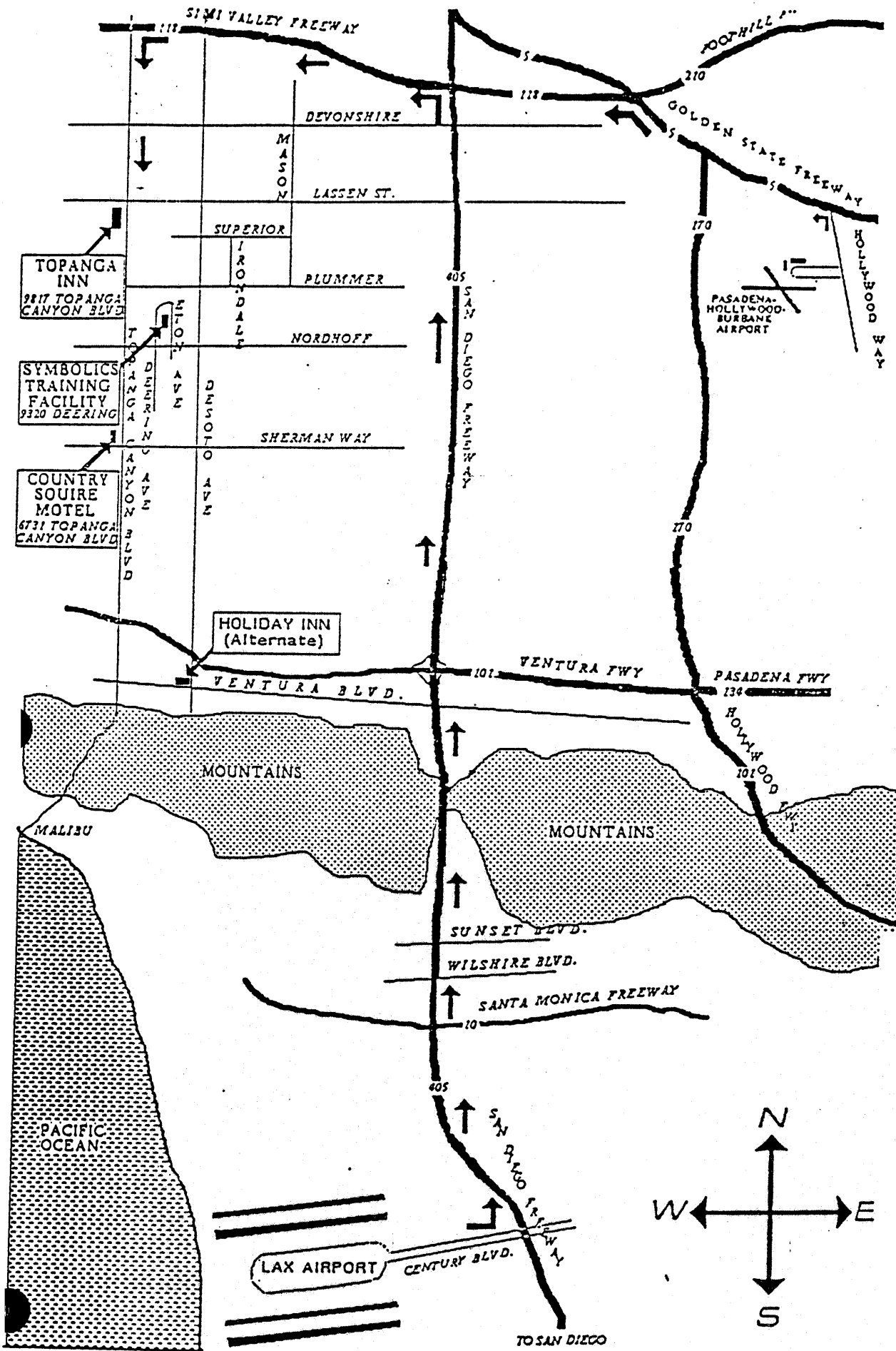
National Industrial Med. Clinic Inc.
21317 Devonshire St.
Chatsworth, CA 91311
(818) 998-3008

Automobiles (Symbolics Students)

Hertz Rental (Corporate Account)
Compact Size
(Billed to Symbolics)
(No Insurance Coverage)
NOTE: Driver must be 25 years of age or over

Company Apartment

10159 De Soto Ave., Unit #217
Corner Devonshire & De Soto Ave.
Chatsworth, CA 91311
(818) 882-9203



Basic Field Maintenance Training Course Outline

Symbolics, Inc., July 1986

Page 1

PREREQUISITES:

1. Formal 30 week electronics training course, or equivalent.
2. Formal training in micro-processor theory and operation.
3. Minimum of three weeks attached to a Symbolics field office, with at least five days accompanying a qualified CSE in the field.
4. Be able to use standard test equipment, such as oscilloscopes and multimeters.
5. Knowledge of proper use of hand tools and soldering equipment.
6. Speak and read English fluently.

OBJECTIVES:

Upon completion of this training course, the student will be able to:

1. Install, configure, and verify proper operation of the Symbolics 3600, 3640, and 3670 systems hardware.
2. Install standard software and set site for Symbolics 3600, 3640, or 3670.
3. Verify 3600, 3640, or 3670 system malfunctions, trouble isolate the problem, repair system, and verify proper system operation.
4. Determine if malfunctions are software related and gather necessary information to communicate effectively with software support personnel.
5. Install, checkout, and adjust the DC Power Supplies in the 3600, 3640, or 3670 systems.
6. Install, checkout, and adjust both black and white or color monitors
7. Communicate effectively with customer personnel and promote good customer relations.

Basic Field Maintenance Training Course Outline

Symbolics, Inc., July 1986

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COURSE LENGTH:

15 Days (3 weeks).

8 Hours/day, with one 10 minute break per hour.

NOTE: For detailed breakdown, see attached Course/Class Schedule

PHASE I INTRODUCTION TO COURSE

1. Class Routine.
2. Course Outline.
3. Student Handout Material.
4. Student Evaluation.

PHASE II INTRODUCTION TO SYSTEM

1. General System Information.
2. Standard And Optional Features.
3. System Walk-Around - Major Assemblies.
 - a. 3600.
 - b. 3670/75.
 - c. 3640/45.
 - d. 3600 Series Consoles.

PHASE III FEP OPERATIONS

1. FEP File System.
2. FEP Commands.
3. Booting Files And Operation.
4. FEP Operational Exercises.

PHASE IV LISP OPERATIONS

1. The Window System.
2. The LISP Window.
3. The ZMACS Window.
4. The FILE SYSTEM MAINTENANCE Window .
5. The DOCUMENT EXAMINER Window.
6. LISP Operational Exercises.

Basic Field Maintenance Training Course Outline

Symbolics, Inc., July 1986

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PHASE V AC AND DC POWER

1. General Description.
2. 3600 AC and DC Power.
3. 3670/75 AC and DC Power.
4. 3640/45 AC and DC Power.
5. Power Supply Adjustments.

PHASE VI DETAILED SYSTEM BLOCK DIAGRAMS

1. LISP System Block Diagram.
2. Detailed Block Diagrams.
3. Mainframe disassembly laboratory.

PHASE VII MONOCHROME MONITORS

1. Black and White Monitors.
2. Black and White Monitor alignment.

PHASE VIII COLOR MONITORS

1. Color Monitors and the Color System.
2. Color Monitor Alignment.
3. Color Console Monitor Alignment.

PHASE IX NETWORKS AND NAMESPACE

1. Local Area Network - Hardware Architecture.
2. Local Area Network - Software Architecture.
3. Local Area Network - Communication.
4. Window Operations Related To Networks and Namespace.

PHASE X RS232C AND MODEMS

1. Remote area networks.
2. RS232C interface to modems and printers.
3. Symbolics' modems.

Basic Field Maintenance Training Course Outline

Symbolics, Inc., July 1986

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PHASE XI DMP-1 PRINTER

1. Standard features and performance specifications.
2. Operator controls and indicators.
3. Theory of operation.
4. Major assemblies.

PHASE XII LGP-2 PRINTER

1. Standard features and performance specifications.
2. Operator controls and indicators.
3. Theory of operation.
4. Major assemblies.

PHASE XIII LGP-1 PRINTER

1. Standard features and performance specifications.
2. Operator controls and indicators.
3. Theory of operation.
4. Major assemblies.

PHASE XIV PRINTER LABORATORY

1. Printer software installation.
2. Location of printer sub-assemblies.
3. Printer hardware installation and preventative maintenance (laboratory).

PHASE XV TAPE DRIVES

1. Fundamentals of magnetic storage media.
2. Features and performance specifications of 3600 SERIES tape drives.
3. Tape drive operator controls and indicators.
4. Tape drive installation and preventative maintenance (laboratory).

Basic Field Maintenance Training Course Outline

Symbolics, Inc., July 1986

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PHASE XVI DISK DRIVES

1. Fundamentals of disk drives.
2. Features and performance specifications of 3600 SERIES disk drives.
3. Disk drive operator controls and indicators.
4. Disk drive installation and preventative maintenance (laboratory).

PHASE XVII FUJITSU DISK DRIVES

1. Major assemblies and theory of operation of M2284 & M2294.
2. Major assemblies and theory of operation of M2351.
3. Fujitsu disk drive disassembly, adjustment, installation, and preventative maintenance.

PHASE XVII SYSTEM INSTALLATION

1. Site Planning.
2. Hardware Installation.
3. Software Installation.
4. Operational Exercises (Laboratory).
 - A. Creating an IFS tape.
 - B. Writing and reading FEP files to/from tape.
 - C. Writing and reading LMFS files to/from tape.
 - D. Disk formatting.
 - E. Initial file system restoration.
 - F. Setting site.
 - G. Initializing LMFS.
 - H. Loading simple software systems.
 - I. Saving the World.

PHASE XVIII DIAGNOSTICS

1. Loading.
2. Utilization.
3. Practical Application.

Basic Field Maintenance Training Course Outline

Symbolics, Inc., July 1986

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PHASE XIX TROUBLE ISOLATION (LABORATORY)

1. 3670.
2. 3640.

PHASE XX CUSTOMER RELATIONS

1. Principles.
2. Role Playing.

PHASE XXI EXAMINATION

1. Examination (Open Book).
2. Review of Examination.

PHASE XXII COURSE CONCLUSION

1. Course Review.
2. Forms.
3. Procedures.

BASIC FIELD MAINTENANCE TRAINING COURSE

7-22-86

08:00	INTRODUCTION TO COURSE				MONOCHROME CONSOLE THEORY OF OPERATION
09:00	INTRODUCTION TO SYSTEM	LISP OPERATIONS	LISP OPERATIONS LABORATORY	MAINFRAME POWER DISTRIBUTION	MONOCHROME CONSOLE DISASSEMBLY AND ADJUSTMENT LABORATORY
10:00					
11:00				MAINFRAME POWER LABORATORY	
12:00	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
13:00	FEP OPERATIONS	LISP OPERATIONS LABORATORY	LISP OPERATIONS LABORATORY	MAINFRAME THEORY OF OPERATION	COLOR SYSTEM OVERVIEW
14:00					
15:00	FEP OPERATIONS LABORATORY	LISP OPERATIONS LABORATORY	LISP OPERATIONS LABORATORY	MAINFRAME DISASSEMBLY LABORATORY	COLOR MONITOR ADJUSTMENT LABORATORY
16:00					
17:00					

WEEK ONE

BASIC FIELD MAINTENANCE TRAINING COURSE 7-22-86

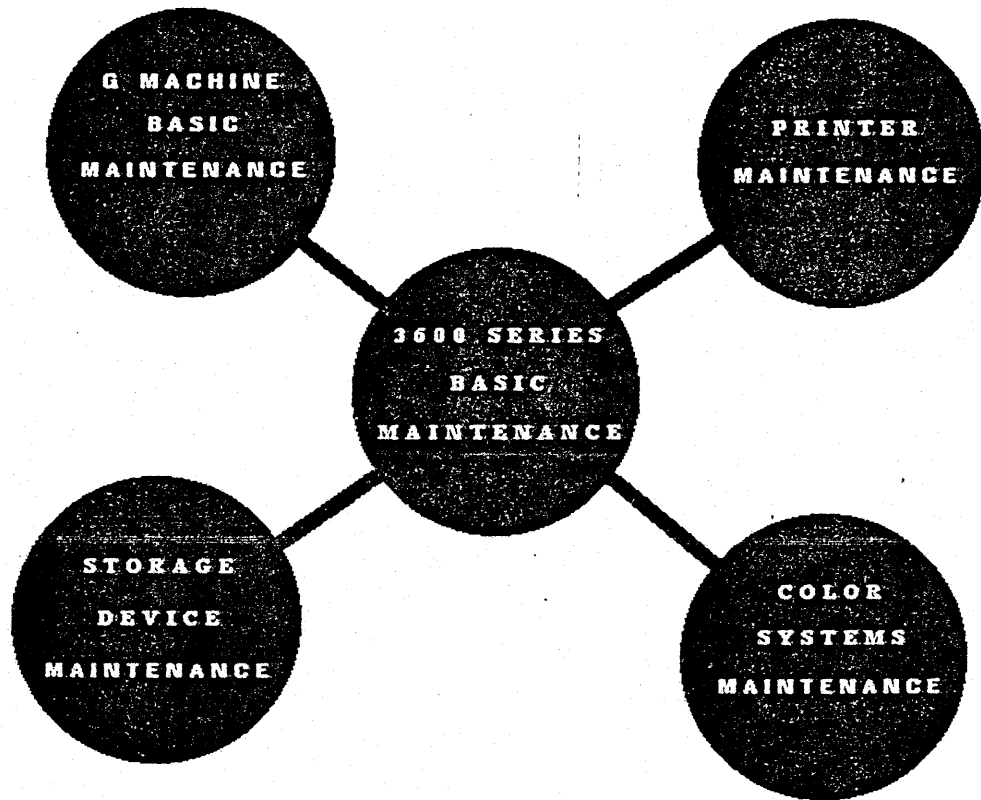
08:00					
09:00	NETWORKS AND NAMESPACE	TAPE DRIVES			
10:00	RS232C AND MODEMS		FUJITSU DISK DRIVES	SYSTEM INSTALLATION	SYSTEM INSTALLATION LABORATORY
11:00	DMP-1 PRINTER	TAPE DRIVES LABORATORY			
12:00	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
13:00	LGP-2 PRINTER	SURVEY OF DISK DRIVES			
14:00	LGP-1 PRINTER		FUJITSU DISK DRIVES LABORATORY	SYSTEM INSTALLATION LABORATORY	SYSTEM INSTALLATION LABORATORY
15:00					
16:00	PRINTER LABORATORY	DISK DRIVES LABORATORY			
17:00					

WEEK TWO

BASIC FIELD MAINTENANCE TRAINING COURSE 7-22-86

08:00					
09:00	DIAGNOSTICS				
10:00		TROUBLE SHOOTING LABORATORY	TROUBLE SHOOTING LABORATORY	CUSTOMER RELATIONS	CUSTOMER RELATIONS
11:00	DIAGNOSTICS LABORATORY				
12:00	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
13:00					
14:00					FINAL EXAMINATION
15:00	DIAGNOSTICS LABORATORY	TROUBLE SHOOTING LABORATORY	TROUBLE SHOOTING LABORATORY	CUSTOMER RELATIONS	REVIEW OF EXAMINATION AND COURSE CONCLUSION
16:00					
17:00					

WEEK THREE



SYMBOLICS CUSTOMER SERVICE TRAINING CURRICULUM

3600 BASIC FIELD MAINTENANCE TRAINING COURSE

- 1. This course is for new hires or for field personnel who have not been previously been trained by the Customer Service Training Department.**
- 2. The course objective is to train field maintenance personnel to perform installation, performance testing, trouble analysis, and repair of all 3600 Series systems.**
- 3. The course covers the following items:**
 - A. Operation of the 3600 Series LISP machines.**
 - B. Hardware and software installation.**
 - C. AC Power distribution and DC power generation and distribution.**
 - D. Detailed system block diagrams.**
 - E. Trouble isolation procedures and practice.**
 - F. Peripheral equipment.**
 - G. Paper work.**
 - H. Customer relations.**
- 4. Course length - 3 Weeks (15 instructional days).**

G MACHINE FIELD MAINTENANCE TRAINING COURSE

- 1. This course is for experienced Symbolics field personnel who have attended the 3600 Basic Maintenance Training Course.**
- 2. The course objective is to train field maintenance personnel to perform installation, performance testing, trouble analysis, and repair of all G Machines.**
- 3. The course covers the following items:**
 - A. Operation of the G Machines.**
 - B. Hardware and software installation.**
 - C. AC Power distribution and DC power generation and distribution.**
 - D. Detailed system block diagrams.**
 - E. Trouble isolation procedures and practice.**
- 4. Course length - 1 Week (5 instructional days).**

PRINTER FIELD MAINTENANCE TRAINING COURSE

- 1. This course is for field personnel who have previously attended the 3600 Basic Maintenance Training Course.**
- 2. The course objective is to train field maintenance personnel to perform installation, performance testing, trouble analysis, and repair of LGP-1, LGP-2, and DMP-1 printers.**
- 3. The course covers the following items on each of the three printers:**
 - A. Operation of the machines.**
 - B. Hardware installation and software requirements.**
 - C. AC Power distribution and DC power generation and distribution.**
 - D. Detailed system block diagrams.**
 - E. Adjustments and preventive maintenance..**
 - F. Module and component replacement.**
 - G. Trouble isolation procedures and practice.**
- 4. Course length - 1 Week (5 instructional days).**

STORAGE DEVICE FIELD MAINTENANCE TRAINING COURSE

- 1. This course is for field personnel who have previously attended the 3600 Basic Maintenance Training Course.**
- 2. The course objective is to train field maintenance personnel to perform installation, performance testing, trouble analysis, and repair to the field replaceable unit level of the Century Data T-306 disk drive.**
- 3. The course covers the following items on the T-306 disk drive.**
 - A. Drive specifications.**
 - B. Operation of the disk drive.**
 - C. Hardware installation and software requirements.**
 - D. FRU level maintenance.**
 - E. Trouble isolation.**
- 4. Course length - 1 Week (5 instructional days).**

COLOR SYSTEM MAINTENANCE COURSE

- 1. This course is for experienced Symbolics field personnel who have attended the 3600 Basic Field Maintenance Course.**
- 2. The course objective is to train field maintenance personnel to perform operation, installation, performance testing, trouble analysis, and repair of 3600 series color system options.**
- 3. The course covers the following items:**
 - A. Basic video theory.**
 - B. Theory of operation of Symbolics' color monitors.**
 - C. Theory of operation of the Color Console unit.**
 - D. Theory of operation of the Standard Color System.**
 - E. Theory of operation of the Broadcast Resolution Color System.**
 - F. Theory of operation of the Cad-Buffer Color System.**
 - G. Color System installation.**
 - H. Color System adjustment and alignment.**
 - I. Color System diagnostics.**
 - J. Operation of S PAINT, S GEOMETRY, S DYNAMICS, and S RENDER.**
 - K. Trouble isolation in the Color System.**
- 4. Course length - 2 weeks (10 instructional days).**

3600 SHARED - MAINTENANCE TRAINING COURSE

- 1. This course is for customer maintenance personnel.**
- 2. The course objective is to train customer maintenance personnel in trouble analysis and repair of all 3600 Series Systems.**
- 3. The course covers the following items:**
 - A. Operation of the 3600 Series LISP machines.**
 - B. AC power distribution and DC power generation and distribution.**
 - C. Detailed system block diagrams.**
 - D. Trouble isolation procedures and practices.**
 - E. Survey of peripheral equipment.**
- 4. Course Length - 2 Weeks (10 instructional days).**

G MACHINE SHARED - MAINTENANCE TRAINING COURSE

- 1. This course is for customer maintenance personnel.**
- 2. The course objective is to train customer maintenance personnel in trouble analysis and repair of all G-Machine Systems.**
- 3. The course covers the following items:**
 - A. Operation of the G-Machines.**
 - B. AC power distribution and DC power generation and distribution.**
 - C. Detailed system block diagrams.**
 - D. Trouble isolation procedures and practices.**
 - E. Survey of peripheral equipment.**
- 4. Course Length - 2 Weeks (10 instructional days).**

STUDENT EVALUATION	O U T S T A N D I N G	E X C E L L E N T	G O O D	P O O R	U N S A T I S F A C T O R Y	NAME _____
						DATE _____
						CLASS _____
						INSTRUCTOR _____
						REMARKS
1. Personal Relations						
2. Ability to work with others						
3. Technical knowledge						
4. Knowledge and use of hand tools						
5. Personal appearance and grooming						
6. Ability to communicate with others orally						
7. Ability to communicate in writing						
8. Attitude						
9. Self-motivation						
10. Ability to troubleshoot logically and methodically						
11. Amount of time taken to isolate malfunctions						
12. Result of written examination						
13. Asks for and accepts assistance when needed						
14. Pays attention in class						
15. Observance of safety precautions						

STUDENT EVALUATION

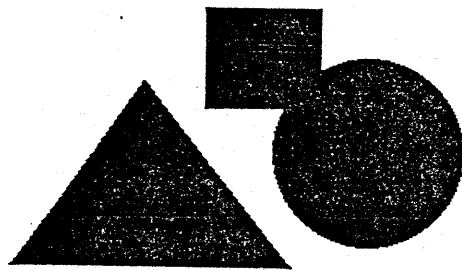
3600 SERIES
BASIC FIELD MAINTENANCE

STUDENT GUIDE

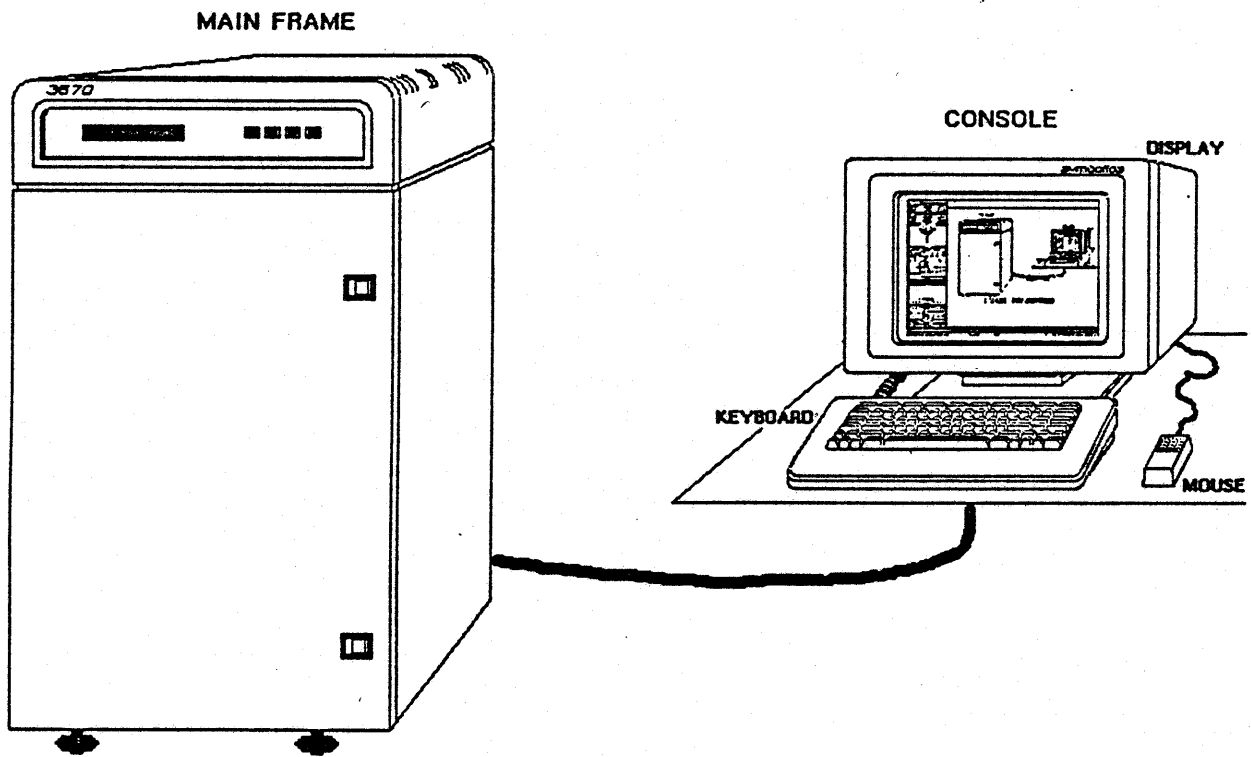
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FEP-LEVEL OPERATION	2
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FUNCTIONAL BLOCK DIAGRAMS	
3600 CONSOLES & COLOR SYSTEM	5
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COLOR MONITORS	
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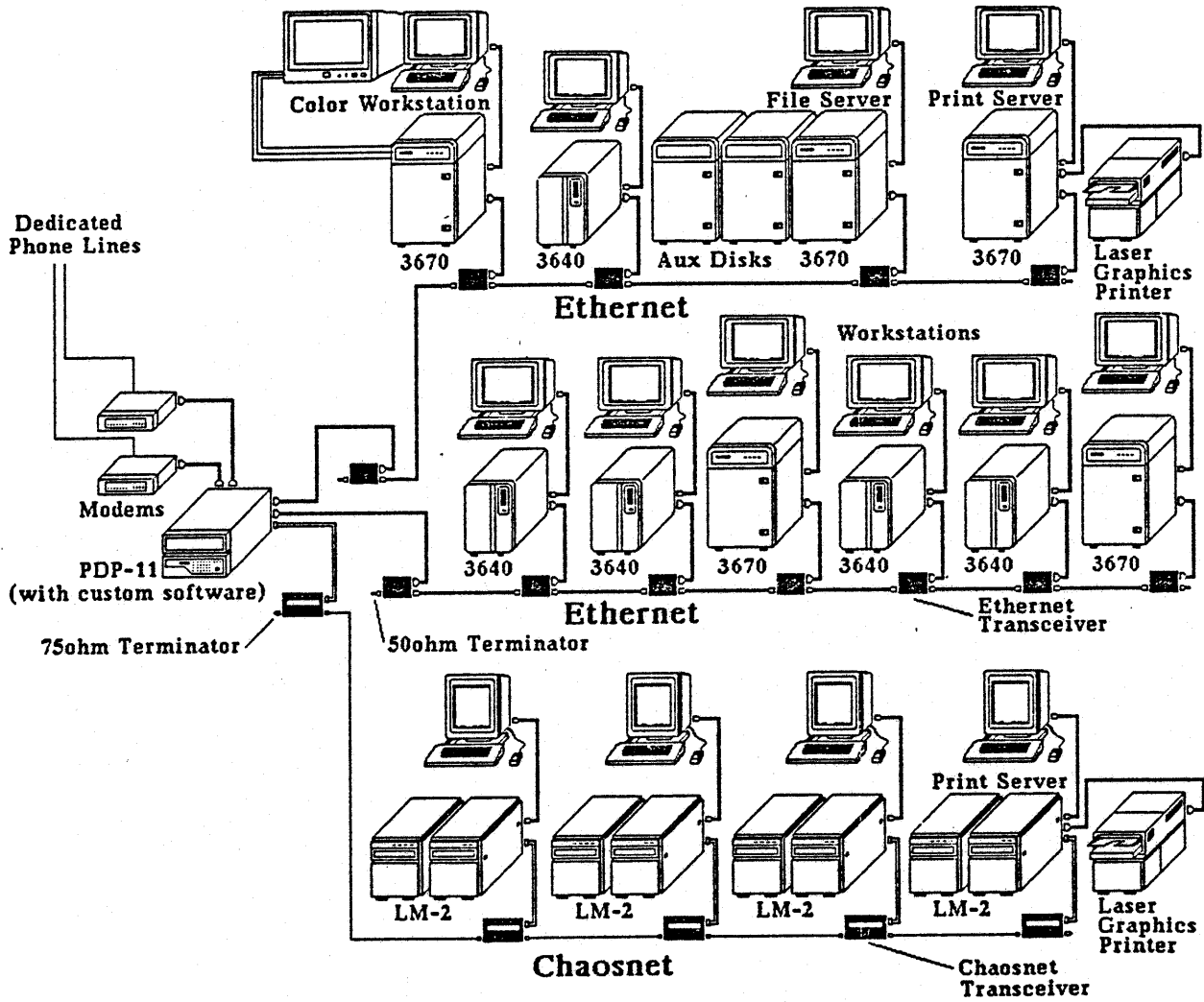
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**3600 SERIES
SYMBOLIC PROCESSORS**



3600 SERIES NETWORKS

MAIN FRAME

FRONT END PROCESSOR (FEP)

LISP PROCESSOR

1/2 Mword MEMORY WITH ECC

STANDARD SERIAL AND PARALLEL I/O

ETHERNET LOCAL AREA NETWORK INTERFACE

DISK DRIVE

LISP WORLD SOFTWARE PACKAGE

CONSOLE

DISPLAY

KEYBOARD

MOUSE

3600 SERIES STANDARD FEATURES

ADDITIONAL MEMORY

ENHANCED PERFORMANCE OPTION

FLOATING POINT ACCELERATOR

INTERFACE TO OTHER SYSTEMS

OPTIONAL COMPUTER LANGUAGE INTERPRETERS

ADDITIONAL PROGRAM SYSTEMS

COLOR SYSTEM OPTIONS

ADDITIONAL DISK DRIVES

TAPE DRIVES

MODEMS

PRINTERS

AUXILLIARY MATCHING CABINET

3600 SERIES OPTIONAL FEATURES

CONFIGURATION CHART

MAIN FRAME

		LM-2	3600	3640/45	3670/75

PERIPHERAL					
	VMI	X			
	PHILIPS-LEMO		X		
CONSOLE	MONITERM-LEMO		X		
DISPLAY	PHILIPS-OLD PEV		(1)	X	X
	MONITERM-OLD PEV		(1)	X	X
	SYMBOLICS-NEW PEV		(1)	X	X
CONSOLE	HALL EFFECT	X	X	X	X
KEYBOARD	CAPACITIVE	X	X	X	X
CONSOLE	D CONNECTOR	X	X		
MOUSE	PEV MODULAR CONNECTOR		(1)	X	X
	HITACHI	X	X	X	X
	AMTRON		X	X	X
COLOR	MITSUBISHI		X	X	X
MONITORS	SYMBOLICS		X	X	X
	CAD-AMTRON		X	X	X
	CAD-TEKTRONIX		X	X	X
REMOVABLE					
MEDIA	CDS T300 300MB	X			
DISK	CDS T306 315MB		X		X
DRIVES	CDC P8A2 368MB			(2)	
	CDC P8N2 515MB				X
	FUJITSU M2284 169MB		X		X
WINCHESTER	FUJITSU M2294 335MB		X		X
DISK	FUJITSU M2351 474MB		X		X
DRIVES	NEC D2257 167MB		X	(2)	X
	MAXTOR XT-1140 143MB			(3)	
	MAXTOR XT-2190 190MB			(3)	
	PRIAM P807 340MB		X	(2)	X
	SYMBOLICS 20MB		X		
CARTRIDGE	MODEL #TD-20				
TAPE	ARCHIVE 45MB			X	
DRIVES	MODEL #5945				
	ARCHIVE 45MB				X
	MODEL #9045				
REEL					
-TO-	KENNEDY 9000	X			
REEL	CYPHER TD-80		X	X	X
TAPE					
DRIVES					
	LGP-1	X	X	X	X
	(CANON 10 and				
PRINTERS	CANON 10II)				
	LGP-2	X	X	X	X
	(APPLE)				
MODEMS	RACAL VEDIC		(4)		
	CDS 224	X	X	X	X

NOTES-

X DENOTES MAIN FRAMES THAT MAY BE EQUIPPED WITH DESIGNATED PERIPHERAL

(1) AVAILABLE TO UPGRADED 3600 MACHINES ONLY

(2) AVAILABLE TO 3640 MACHINES EQUIPPED WITH OPTIONAL SMD INTERFACE ONLY

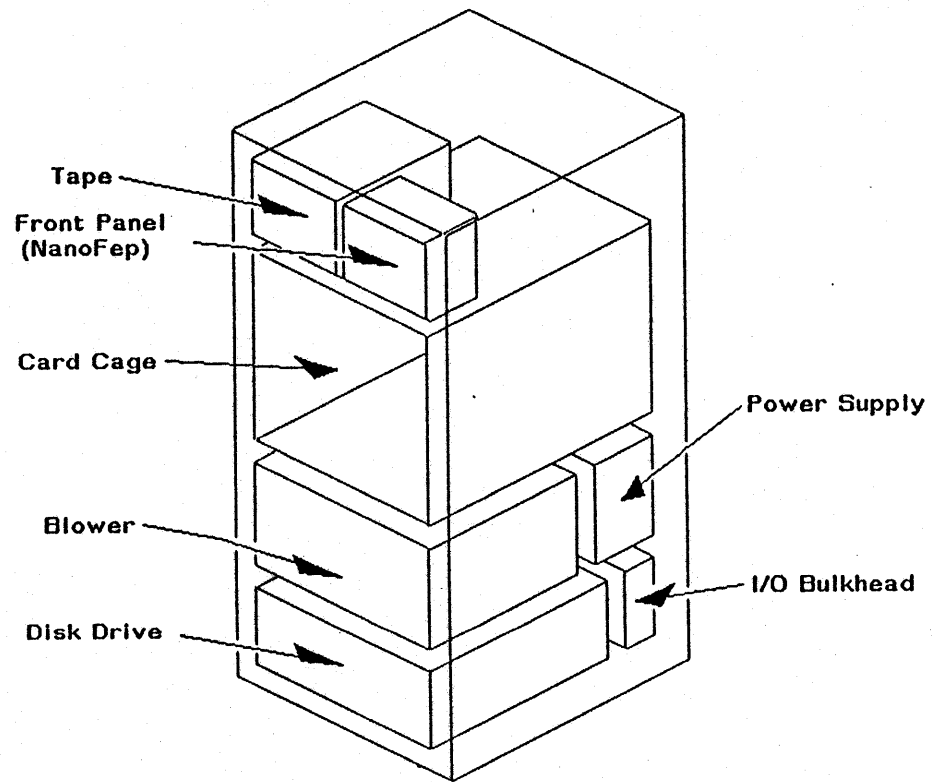
(3) AVAILABLE TO 3640 MACHINES EQUIPPED WITH STANDARD ST506 INTERFACE ONLY

(4) UNIT IS BUILT-IN TO 3600 MACHINE

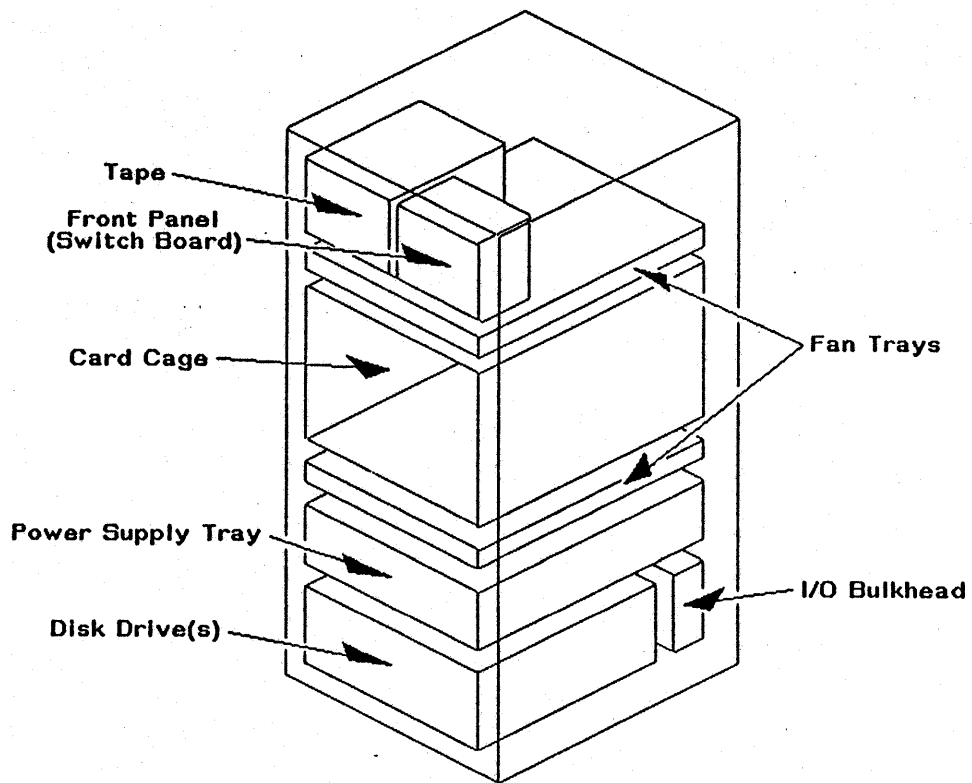
3600 SERIES
SYSTEM SUPPORT LEVELS

EQUIPMENT	INSTALLATION	ADJUSTMENT	FRU LEVEL	
			WHOLE UNIT REPLACEMENT	SUB-ASSY REPLACEMENT (1)
MAIN FRAMES				
3600	X	X		X
3640	X	X		X
3645	X	X		X
3670	X	X		X
3675	X	X		X
CONSOLES				
B/W	X	X		X
COLOR	X	X	X	
PRINTERS				
DMP-1	X	X	X	
LGP-1	X	X		X
LGP-2	X	X		X
DISK DRIVES				
CDC P8A2 368MB	X		X	
CDC PA5N2 515MB	X		X	
CDS T306	X	X		X
FUJITSU M2284	X	X		X
FUJITSU M2294	X	X		X
FUJITSU M2351	X	X		X
MAXTOR XT-1140	X		X	
MAXTOR XT-2190	X		X	
NEC D2257	X		X	
PRIAM 807	X		X	
TAPE DRIVES				
ARCHIVE 5945	X		X	
ARCHIVE 9045	X		X	
SYMBOLICS TD20	X		X	
SYMBOLICS TD80	X	(2)	X	(2)
MODEMS				
CDS 224	X		X	
RACAL-VADIC VA3450	X		X	
OTHER				
INTERLAN EN-11	(3)		(3)	

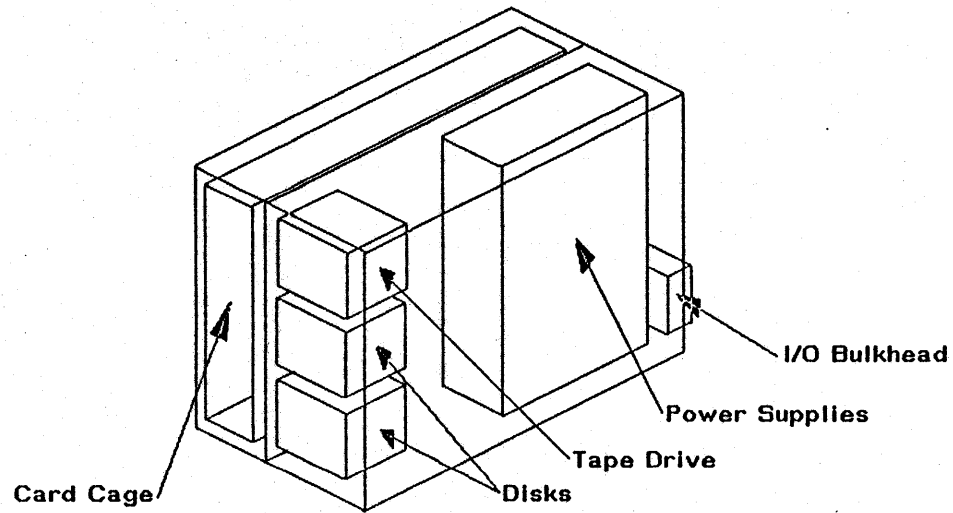
NOTES: (1) - WHOLE UNIT REPLACEMENT OF EQUIPMENT DESIGNATED FRU-(SUB-ASSY) REQUIRES MUR (MAJOR UNIT REPLACEMENT) FACTORY AUTHORIZATION
 (2) - PROPOSED
 (3) - INSTALLATION AND SERVICE PERFORMED IN CONJUNCTION WITH DEC



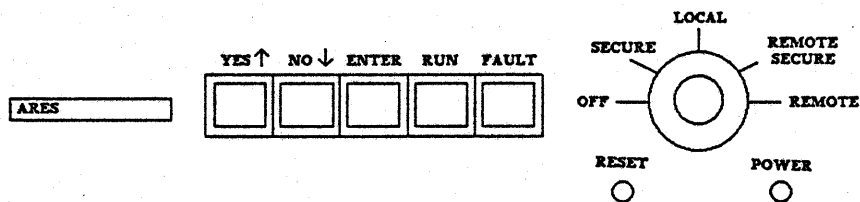
3600 MAJOR ASSEMBLIES



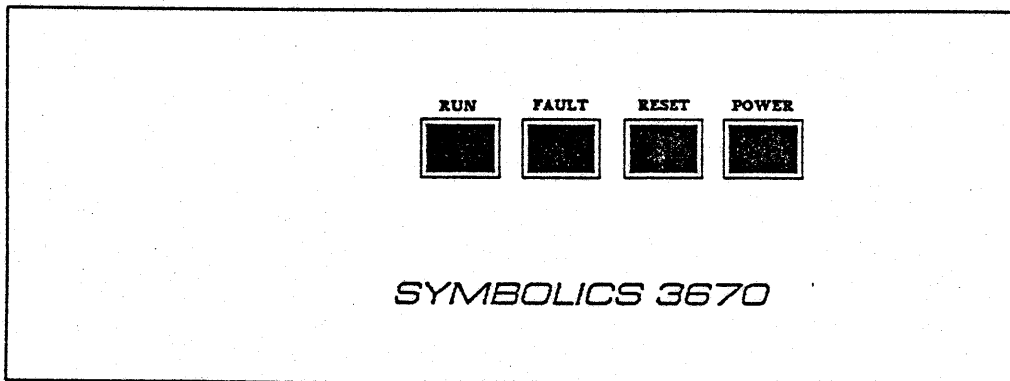
3670 MAJOR ASSEMBLIES



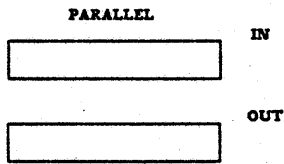
3640 MAJOR ASSEMBLIES



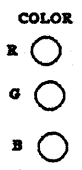
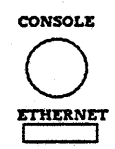
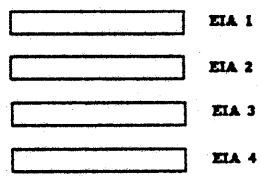
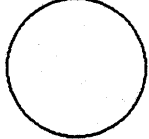
SYMBOLICS 3600 FRONT PANEL



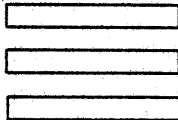
SYMBOLICS 3670 AND 3640 FRONT PANEL



115 VAC
30 AMP 60 HZ



3600 I/O BULKHEAD

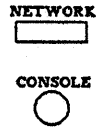


EIA 1
EIA 2
EIA 3

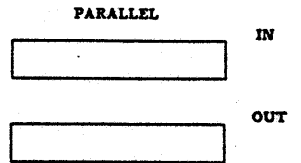
TEST


NORMAL

- PILOT +5 V
- MAIN +5 V
- MAIN -5.2 V
- MAIN -2.8 V
- MAIN +12 V
- MAIN -12 V
- NET +12 V

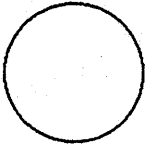


VIDEO

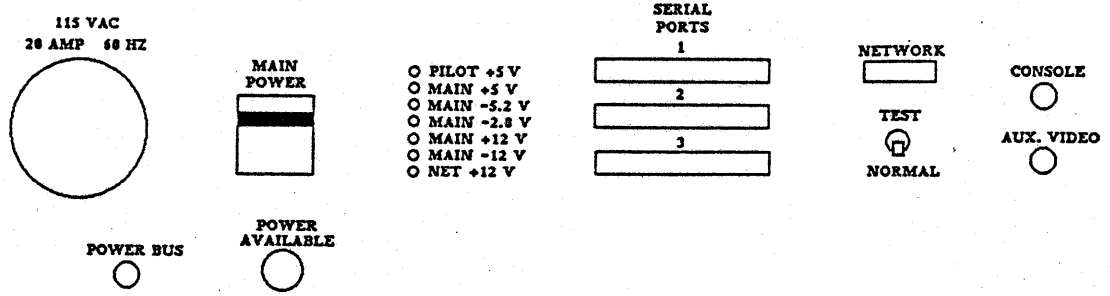
POWER CONTROL
OUTPUT


115 VAC
38 AMP 60 HZ

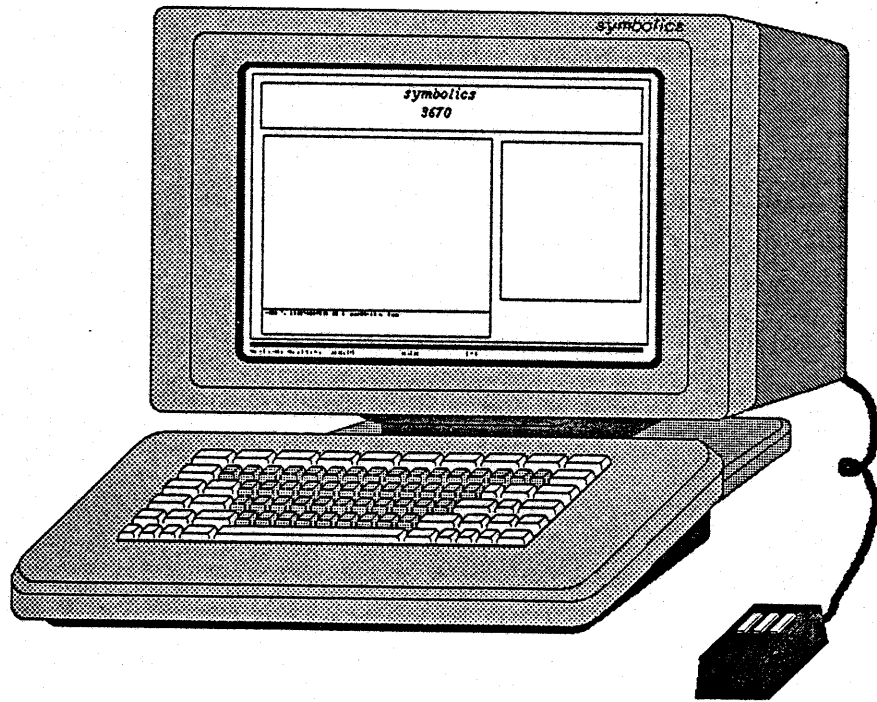


AC ON

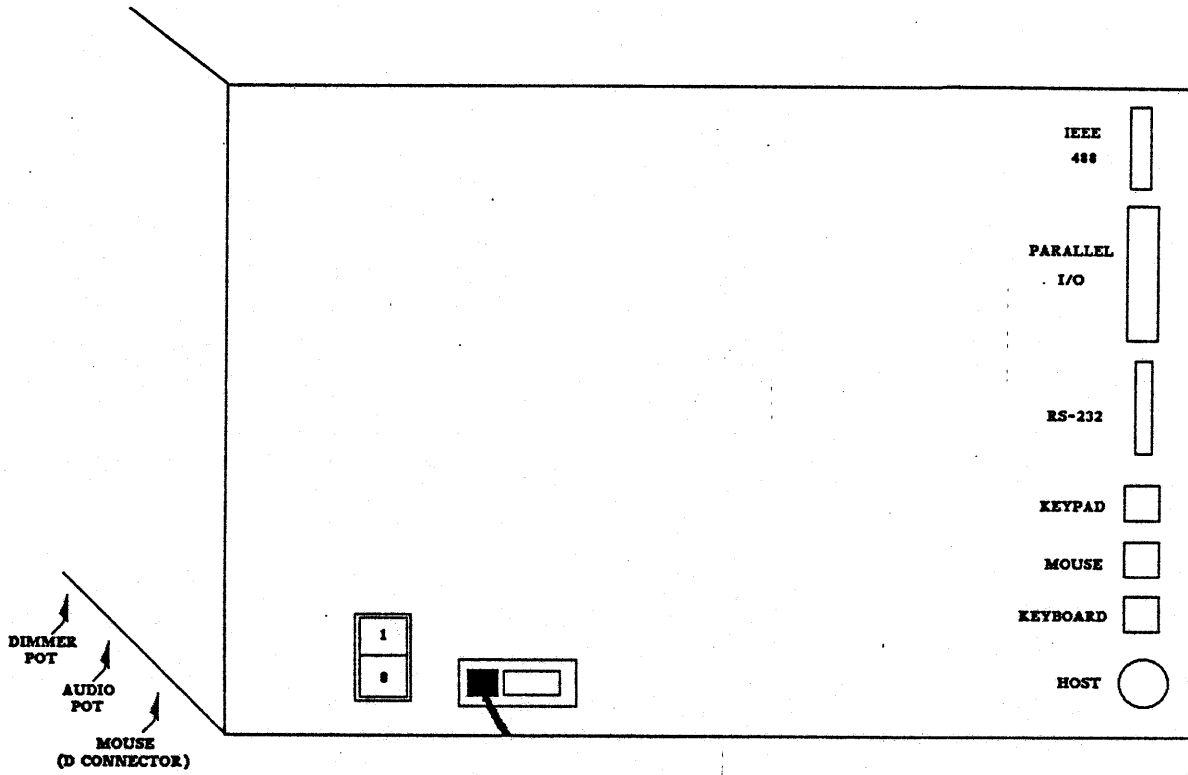

3670 I/O BULKHEAD



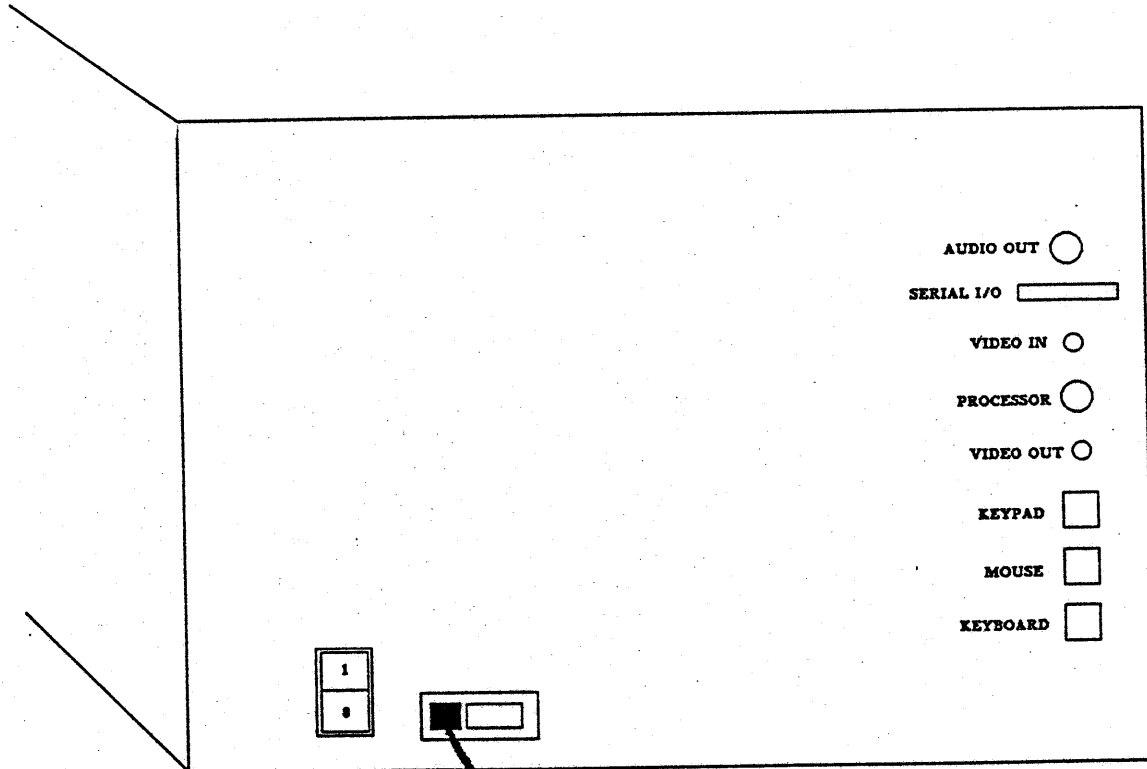
3640 I/O BULKHEAD



3600 SERIES CONSOLE



LEMO REAR PANEL

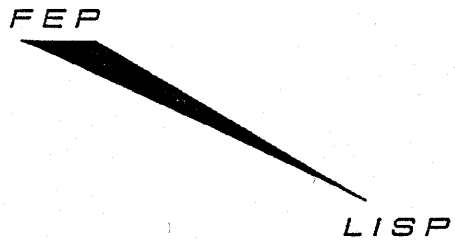


PEV REAR PANEL



VIDEO IN PROCESSOR VIDEO OUT SERIAL I/O HEADPHONE AUDIO OUT KEYPAD MOUSE KEYBOARD

SYMBOLICS REAR PANEL



THE TWO LEVELS OF SYSTEM COMMAND

```

FEP0:>*. *.*
869 free, 109291/110160 used (99%)
109,273 blocks in the files listed
BAD-BLOCKS.FEP.1 83 0(8) @ 07/26/85 11:15:39 [File of bad blocks] Doug Evans
boot.boot.8 1 206(8) 09/30/85 14:48:49 [] paul
DISK-LABEL.FEP.1 24 0(8) @ 07/26/85 11:15:38 [The disk label] Doug Evans
FREE-PAGES.FEP.1 12 0(8) @ 07/26/85 11:15:38 [Free pages map] Doug Evans
large.boot.9 1 277(8) 10/10/85 17:19:36 [] paul
lms.file.1 33000 0(8) @ 10/01/85 14:43:13 [] paul
Moniterm-io4.sync.4 2 1725(8) 04/18/84 15:25:54 [moniterm sync] Zippy
page.page.1 30000 32653440(8) 09/04/85 16:44:47 [Rel 6.0 Exp MUSIC 10.0] Zippy
Philips-io4.sync.1 2 1797(8) 06/21/84 18:47:29 [philips sync] Zippy
rel-6-1-sch-support.load.3 45000 38899584(8) 10/10/85 16:30:08 [] Zippy
Reserve.FEP.1 1000 0(8) 07/26/85 11:15:40 [Reserved for future use] Doug Evans
ROOT-DIRECTORY.DIR.1 1 DIRECTORY @ 07/26/85 11:15:38 [His highness] Doug Evans
sequence-number.fep.1 1 0(8) @ 09/04/85 16:51:58 [] Zippy
tmc5-io4-st506-mic.mic.336 110 125644(8) 09/09/85 11:03:32 [TMC5-IO4-ST506-MIC 336] paul
trash.file.1 0 0(8) 10/10/85 16:44:12 [] paul
V24-2MW.flod.1 2 1684(8) 04/08/85 14:47:31 [loads 1 or 2 mw bd] Zippy
V24-debug.flod.1 30 33710(8) 07/20/84 14:40:26 [debug program] Zippy
V24-unibus.flod.1 4 3604(8) 07/20/84 14:38:23 [unibus program] Zippy

```

FEP FILE SYSTEM DIRECTORY

```
load fep >v24-2mu.f1od  
Reset Video  
Clear Machine  
Load Sync-Program >Monitern-I04.sync  
Load Microcode FEP0:>tnc5-104-st506-nic.nic.336  
Load World FEP0:>rel-6-1-sch-support.load  
Set Chaos-Address 21878  
Start
```

```
ZMACS (Fundamental) boot.boot > FEP0: (8)  
Reading FEP0:>boot.boot.8 ... 206 characters
```

BOOT.BOOT

```
load fep >v24-2nw.flod
Reset Video
Clear Machine
Load Sync-Program >Monitern-I04.sync
Load Microcode FEP0:>tnc5-ia4-st506-nic.nic.336
Load World FEP0:>rel-6-1-sch-support.load
nount 1
add paging-file fep1:>page.page
add paging-file fep1:>aux.page
Set Chaos-Address 21070
Start
```

```
ZMACS (Fundamental) large.boot > FEP0: (9)
Reading FEP0:>large.boot.9 ... 277 characters
```

LARGE.BOOT

FEP> clear machine <RETURN>

FEP> load microcode (default: FEP0:>Microcode1.nic)>TMC5-104-MIC.MIC.319<RETURN>

FEP> load world (default: FEP0:>World1.load)>Release-6-0.load<RETURN>

FEP> set chaos 21070<RETURN> (chaos address as required - in octal)

FEP> start<RETURN>

MANUAL COLD BOOTING COMMANDS

FEP0:>*. *.*

823 free, 146057/146000 used (99%)

146,034 blocks in the files listed

```

aux.page.1      30000 3456000(0)      01/21/86 14:57:26 []      paul
BAD-BLOCKS.FEP.1 112      0(0)      • 12/19/85 00:03:18 [File of bad blocks] System
boot.boot.9     1      137(0)    • 02/04/86 15:28:30 []      paul
DISK-LABEL.FEP.1 24      0(0)      • 12/19/85 00:03:18 [Disk label] System
FREE-PAGES.FEP.1 16      0(0)      • 12/19/85 00:03:18 [Free pages nap] System
fspt.fspt.1     1      18(0)     • 02/04/86 10:49:17 []      paul
fspt.fspt.2     1      37(0)     • 03/03/86 09:12:52 []      JOHN
hello.boot.1    1      231(0)    • 12/19/85 07:45:55 [Standard Hello command file] System
hello.boot.2    1      235(0)    • 01/21/86 14:47:44 []      paul
IFU-I04-ST506-XSQ-MIC.336 200 136163(0) 09/17/85 16:16:34 [IFU-I04-ST506-XSQ-MIC 336 (Rel-6-1)] System
large.boot.3    1      200(0)    • 01/18/86 16:17:29 []      paul
lnfs.file.1     15000 0(0)      • 01/18/86 16:06:46 []      paul
PAGE.PAGE.1     60000 0(0)      • 12/19/85 00:03:19 [Main paging area] System
rel-6-1-sch-training.load.1 40000 33276672(0) 01/18/86 15:51:42 [Rel 6.1 Exp PED 4.0] paul
Reserve.FEP.1   500      0(0)      • 12/19/85 00:03:22 [Reserved for future use] System
ROOT-DIRECTORY.DIR.1 2  DIRECTORY • 12/19/85 00:03:18 [The Root] System
SEQUENCE-NUMBER.FEP.1 1      0(0)      • 12/19/85 07:41:46 [FEP FS sequence nos] System
V127-DEBUG.FLOD.1 40 54613(0) • 10/05/85 16:07:47 [Lisp debugger for Fep V127] System
V127-DISK.FLOD.4 27 30698(0) • 11/14/85 11:39:27 [Disk utilities for Fep V127] System
V127-INFO.FLOD.2 12 19074(0) • 10/07/85 13:33:25 [Information commands for Fep V127] System
V127-LISP.FLOD.2 42 47434(0) • 10/07/85 13:32:12 [Lisp interface for Fep V127] System
V127-LOADERS.FLOD.3 34 38104(0) • 11/05/85 12:11:12 [World / microcode loaders for Fep V127] System
V127-TESTS.FLOD.2 10 10843(0) • 10/07/85 13:34:02 [Hardware diagnostics for Fep V127] System
    
```

ZMACS (Dired) *Dired-2* (RO) FEP0:>*. *.* (Q to exit)

03/03/86 11:48:06 JOHN

USER:

lyl


```
Scan FEP0:>V127-Loaders.flod  
Scan FEP0:>V127-Lisp.flod  
Scan FEP0:>V127-Info.flod  
Scan FEP0:>V127-Debug.flod  
Initialize Hardware Tables
```



ZMACS (Fundamental) hello.boot > FEP0: (2) *

F E P C O M M A N D S

BOOT - executes commands in the boot file specified. unspecified = default.

SHOW

CONFIGURATION - displays hardware configuration.
DIRECTORY - displays the contents of the FEP file system.
DISK LABEL - displays the label of the disk unit specified.
FILE - displays the contents of specified boot file.
STATUS - displays the internal status of machine. used following failure.
VERSION - displays the version number of loaded FEP software.

ADD

DISK TYPE - defines a disk type to FEP.
PAGING FILE - adds a paging file in addition to PAGE.PAGE

CLEAR

DISK TYPE - clears all disk types declared with add disk command
MACHINE - clears the internal states of machine registers & memories
SCREEN - clears the console's screen
PAGING FILES - clears all paging file designations.

CONTINUE - continues machine processes from where they left off.

DISK

FORMAT - formats the disk - overwriting and partitioning disk
RESTORE - transfers data on tape to disk

DISMOUNT - logically disconnects disk drive from system.

HALT - halts the FEP (to restart, push the reset button on the main frame)

LOAD

MICROCODE - loads microcode into LISP machine from tape
FEP - loads program supplied from tape into FEP
SYNC PROGRAM - loads sync program into LISP machine I/O for monitor sync
WORLD - loads LISP world

MOUNT - reads the disk label of the specified disk drive

RESET

CART - resets cartridge tape drive
CLOCK - resets the processor clock
DISK - selects, fault clears, recalibrates specified disk drive.
FEP - master clears FEP, restarts FEP program
L-BUS - resets the L-BUS
MOST - resets clock, L-BUS, sequencer, video, and disks
SEQUENCER - resets sequencer in LISP processor
VIDEO - clears the console screen's sync program

RETURN-KEYBOARD-TO-LISP - returns control of keyboard to LISP processor

SET

CHAOS ADDRESS - sets the machine's network address
DEFAULT-DISK-UNIT - sets the disk unit to respond to subsequent commands
DISK-TYPE - used to define disk ID information to FEP after mounting
MICROCODE-NAME-AND-VERSION - sets microcode after world is loaded

START - runs loaded world

TEST

MAIN MEMORY - tests address and data paths of each memory board
A-MEMORY - tests A-memory on the data path board in the LISP processor
DISK - not used at this time - program flaws will destroy disk software

FEP

LISP

LISP LISTENER

FONT EDITOR

COMMON LISP

PICTURE EDITOR

INSPECTOR

NAMESPACE OBJECT EDITOR

FLAVOR EXAMINER

TERMINAL

ZMACS

FILE SYSTEM MAINTENANCE

DOCUMENT EXAMINER

PEEK

ZMAIL

CONVERSE

NOTIFICATIONS

THE LISP WORLD

Command: █

Symbolics 3600™ System

This machine is *SCH-TRAINING ARES: THE GOD OF WAR*

Symbolics™ System, Release 6.1
Loaded from FEP0:>rel-6-1-sch-training.load
512K words Physical memory, 13750K words Swapping space.

Release 6.1
Print 39.16
Experimental PED 4.0

You are typing to *Lisp Listener 1*. Control characters are interpreted as commands to edit input. Type Control-**HELP** for a list of input editor commands.

Use the "Help" command to display a list of all the Command Processor commands. Type **HELP** D to select the Document Examiner to read online documentation. Type **HELP** **HELP** for a list of programs. Type **HELP** **HELP** for a list of asynchronous and window operations. Click the rightmost mouse button to select the System Menu of programs and window operations. Type Symbol-**HELP** for a list of special function keys and special character keys.

Note: Local System ARES is not currently loaded.

Please login.

[01:33:09 Namespace SCH-TRAINING has become unloaded:
records don't go back far enough
Recent servers contacted are ARES]

[01:33:09 Namespace Lock ARES: Reloading namespace SCH-TRAINING.
Recent servers contacted are ARES]

[01:35:00 This machine has been invoked as an LSP server, but is otherwise free.]

Lisp Listener 1

01/11/86 01:35:38

USER: Tyl

+ A:>HERCULES>request-1.proto-request 23014

Type Select followed by one of these letters to select the corresponding program:

A	Canon Lisp
C	Converse
D	Document Examiner
E	Editor
F	File system maintenance
G	Picture Editor
I	Inspector
L	Lisp
N	Zmail
O	Notifications
P	Namespace Object Editor
T	Peek
X	Terminal
	Flavor Examiner

Hold down the Control key to create a new one.
Type Rubout after Select to do nothing (if you typed Select by accident).

Type a space to refresh the screen:

-3-

The System Menu		
Windows	This window	Programs
Create	Attributes	Lisp
Select	Refresh	Edit
Split Screen	Bury	Inspect
Layouts	Kill	Mail
<u>Edit Screen</u> x	Reset	Font Edit
Set Mouse Screen	Arrest	Trace
	Un-Arrest	Emergency Break
		Namespace
		Flavor Examiner
		Document Examiner
		Hardcopy
		File System
		Picture Editor

edit a screen. Left edits screen the mouse is on, right button gives menu of frames.
01/13/86 15:00:46 PAUL USER: 191

SELECT-HELP AND THE SYSTEM MENU

Special function keys:

Abort	Throw to command level	Suspend	Get read-eval-print loop
c-Abort	To command level immediately	c-Suspend	Suspend immediately
n-Abort	Throw out of all levels	n-Suspend	Get to the debugger
c-n-Abort	Out of all levels immediately	c-n-Suspend	Debugger immediately
Function	Asynchronous commands	Resume	Continues from break/error
Select	Select a program	Return	Carriage return
Refresh	Refresh the screen	Line	Next line and indent (editor)
Clear-Input	Erase typein	End	Terminate input
Network	Telnet commands	Help	Print documentation
Escape	Miscellaneous editor commands	Symbol-Help	Pop up this display
Complete	Completion of partial input	Scroll	Scrolling (not yet implemented)
c-n-Function	Keyboard macros (editor)		

h-c-Function stops the machine and connects you to the FEP.
 Local-G rings the bell (press the Local and G keys simultaneously).
 Local-D makes the screen dinner, Local-B makes it brighter.
 Local-n Local-C (where n is a digit from 1 to 4) changes the contrast.
 Local-Q makes the audio quieter, Local-L makes it louder.
 Square, Circle, Triangle, and Hyper are reserved for users.

Special-character keys:

· Center-Dot	Symbol-'	↓ Down-Arrow	Symbol-h
α Alpha	Symbol-shift-A	β Beta	Symbol-shift-B
∧ And-sign	Symbol-q	¬ Not-sign	Symbol--
ε Epsilon	Symbol-shift-E	π Pi	Symbol-shift-P
λ Lambda	Symbol-shift-L	ξ Ganna	Symbol-shift-G
δ Delta	Symbol-shift-D	↑ Up-Arrow	Symbol-g
+ Plus-Minus	Symbol-+	⊕ Circle-Plus	Symbol-+
∞ Infinity	Symbol-i	∂ Partial-Delta	Symbol-p
⊃ Left-Horseshoe	Symbol-t	⊃ Right-Horseshoe	Symbol-y
⊃ Up-Horseshoe	Symbol-e	⊂ Down-Horseshoe	Symbol-r
∯ Universal-Quantifier	Symbol-u	∃ Existential-Quantifier	Symbol-o
⊙ Circle-X	Symbol-t	↔ Double-Arrow	Symbol-l
← Left-Arrow	Symbol-j	→ Right-Arrow	Symbol-k
≠ Not-Equals	Symbol=-	⬢ Lozenge	Symbol-Escape
≤ Less-Or-Equal	Symbol-.	≥ Greater-Or-Equal	Symbol-.
≡ Equivalence	Symbol-^	∨ Or-sign	Symbol-w
∫ Integral	Symbol-^		

Type a space to refresh the screen: █

Keyboard documentation

01/13/86 14:20:53 PAUL

USER:

Tyl

+ A:>HERCULES>request-11.request.1 792 190848

SYMBOL-HELP

Typing Function followed by:

Rubout	Does nothing. (Use this to cancel Function if you typed it by accident.)
0-9, -	Specifies a numeric argument to the command that follows
Clear-Input	Discards type-ahead
Refresh	Clears and redisplay all windows
End	Insert an EOF indicator into the currently selected I/O buffer
R	Arrests process in the status line (minus means unarrest)
B	Buries the selected window
C	Toggles black-on-white state of whole screen. An argument of 1 means white-on-black; 0 means black-on-white.
Control-C	Toggle black-on-white state of the selected window. Args like C.
Meta-C	Toggle black-on-white state of the mouse documentation line. Args like C.
F	Displays list of ("fingers") users logged in to ARES. 0 prompt, 1 local Lisp Machines.
H	Shows status of CHAOSnet hosts. With an argument, prompts for hosts.
M	Toggles global **MORE** processing. An argument of 1 turns it on; 0 turns it off.
Control-M	Toggles **MORE** for the selected window. An argument of 1 turns it on; 0 turns it off.
O	Selects another exposed window
Q	Hardcopies the screen on HERCULES.
Control-Q	Hardcopies the selected window on HERCULES.
Meta-Q	Hardcopies the screen, without the status line, on HERCULES.
S	Selects the most recently selected window. With an argument, selects the nth previously selected window and rotates the top n windows. (Default arg is 2). With an arg of 1, rotates through all the windows. With a negative arg rotates in the other direction. With an argument of 0, selects a window that requires attention, e.g. to report an error.
T	Controls the selected window's notification properties. Toggles output notification, making input notification the same as output. 0 Input and output notification off 1 Input and output notification on 2 Input off, output on 3 Input on, output off 4 Input on, output proceeds deexposed 5 Input off, output proceeds deexposed (You can also use the Attribute command in the Screen Editor.)
W	Switches which process the status line reports. Default is just to refresh it. 1 means selected-window's process, 2 means freeze on this process, 3 means rotate among all processes, 4 means rotate other direction, 0 gives a menu of all processes
Escape	Assistance with window problems such as "Output Hold" or "Sheet Lock"
Control-A	Arrests all processes except the status line one (minus unarrests then)
Suspend	Gets to cold-load stream (use with caution)
Control-I	Flushes temporary windows (use with caution)
Control-Clear-Input	Clears window-system locks (use with caution)

Press Symbol-Help at any time for a display of special function keys and extended graphic characters.

Type a space to refresh the screen: █

Keyboard documentation

01/13/86 14:18:56 PAUL

USER:

Tyt

* A:>HERCULES>request-11.request.1 672 161312

FUNCTION-HELP

-9-

Input Editor Commands:

Control-number, Control-minus and Control-U provide numeric arguments.

Refresh	Refresh Window	Control-O	Open Line
Page	Erase Typeout	Control-Q	Quote Character
Meta-<	Beginning Of Buffer	Control-C	Yank Input
Meta->	End Of Buffer	Meta-C	Yank Pop
Clear-Input	Clear Input	Control-J	Set Default Font
Control-F	Forward Character	Meta-J	Set Font Map
Control-B	Backward Character	Help	Display Documentation
Control-D	Delete Character	Control-Help	Display Commands
Rubout	Rubout Character	Meta-Help	Display Internal State
Control-T	Exchange Characters	Escape	Display Input History
Control-R	Beginning Of Line	Control-Escape	Display Kill History
Control-E	End Of Line	Control-Y	Yank
Control-P	Previous Line	Meta-Y	Yank Pop
Control-N	Next Line	Control-Meta-Y	Yank Input
Control-K	Kill Line	Control-W	Kill Region
Meta-F	Forward Word	Meta-W	Save Region
Meta-B	Backward Word	Control-Space	Set Mark
Meta-D	Delete Word	Control-<	Mark Beginning
Meta-Rubout	Rubout Word	Control->	Mark End
Meta-T	Exchange Words	Control-Shift-A	Describe Arguments
Control-Meta-F	Forward Parentheses	Control-Shift-U	Describe Variable
Control-Meta-B	Backward Parentheses	Control-Shift-F	Describe Flavor
Control-Meta-K	Delete Parentheses	Control-Shift-D	Document Symbol
Control-Meta-Rubout	Rubout Parentheses	Meta-Shift-A	Lookup Function Documentation
Line	New Line	Meta-Shift-U	Lookup Variable Documentation
Back-Space	Backward Character	Meta-Shift-F	Lookup Flavor Documentation
Control-L	Refresh Window		

↵

Lisp Listener 1

01/13/86 14:23:24 PAUL

USER:

tyl

* R:>HERCULES>request-15.proto-request 3408

CONTROL-HELP

Symbolics Document Examiner

Use the **ESC** key to see commands.

Current Candidates
User's Guide to Symbolics Computers
Reference Guide to Symbolics-Lisp
Text Editing and Processing
Program Development Utilities
Communicating with Other Users
Programming the User Interface
Internals, Processes, and Storage Management
Networks
Installation and Site Operations
Release 6.0 Release Notes
Reference Guide to Streams, Files, and I/O
Release 6.1 Patch Notes

Bookmarks

Viewer: Default Viewer
Commands (Completion; end with Return)
▶

Help
Show
Viewer

Find
Select
Private

Show Documentation: M: Show Overview: F: Find Table of Contents
01/11/86 01:56:51 JOHN USER: lyl

DOCUMENT EXAMINER WINDOW

<i>File System Editing Operations</i>			
Tree Edit Root	Tree Edit Any Help	Tree Edit home dir Local LMFS Operations	Lisp Window
Refresh Display			
<i>Level 2: Local File System Control Operations</i>			
Incremental Dump	Complete Dump	Consolidated Dump	Read Backup Tape
Find Backup Copies	Display Tape Map	List Backup Tape	Compare Backup Tape
List FEP FS Root	Free Records	Flush Free Buffer	Close All Files
Expunge local LMFS	Server Shutdown	Server Errors	Exit Level 2
<i>LMFS Maintenance Operations</i>			
<i>Level 3: Potentially Dangerous Server and Maintenance operations</i>			
Salvage	Initialize	Check Records	Grow Partition
			Remove Partition
			Exit Level 3
			LMFS Internal Tools

These tools are potentially dangerous! If used improperly, you can damage the local Lisp Machine File System (LMFS), and data might be lost irretrievably. Do NOT use these tools unless you are knowledgeable about file system issues, and fully understand the purpose of these tools and the problems they are trying to solve. To exit the Level 3 Menu, click on [Exit Level 3].

If you have any questions, please call Symbolics Software Support.
Command: █

Lisp Interaction Window

Enter Level 3 FSMain menu, containing Local File System maintenance tools for expert use

01/13/86 14:15:58 PAUL

USER: Ty1

* A:>HERCULES>request-11.request.1 102 26128

FILE SYSTEM MAINTENANCE WINDOW

configure rEgion	Create pickUp	Kill putDown	Read Fill	Write Pour	writeAll Magnify	reName Hard	moveView undo	Text
Select Picture *Picture-1* keyboard console-good display console config-1 cons Tops Orthomouse	Text to display: ■						Select Shape Rectangle Filled Rectangle Circle Filled Circle Point Triangle Line Spline Horizontal Line Vertical Line Continuous Lines Continuous HVLine	
								eXplode Implode rOtate Autoregion Mode Off On Ask Drawing Mode Flip Add Set Clr Text Drawing Mode Horiz Vert Rub Spline Mode Open Closed Spline Density: 25 Font: CPTFONT Line Width: 1 Size: 1200x1500 Picture Editor
Freehand Drawing Mode Add Flip Set Fill				Select Region to Blink				
Add some text to the picture. 01/13/86 15:11:06 PAUL USER: tyt								

PICTURE EDITOR

E

E

Set Points	Clear Points	Flip Points
Configure	Grid Size	Center View
Move View	Draw Line	Draw Spline
Erase All	Stretch	Rotate
Reflect	Move Black	
Gray Char	Clear Gray	Swap Gray
Move Gray	Add in Gray	
Edit Font	List Fonts	Save Char
Rename Char	Show Font	Set Sample
Read File	Write File	EXIT
HELP		

Font: CPTFONT
Character: E (185)
Width: 8

Select Character to edit

•	↓	α	β	^	~	ε	π	λ	γ	δ	†	±		
•	ω	θ	ς	ς	n	u	v	!	"	#	\$	%	&	3
#	φ	ς	z	≡	v	-	.	/	θ	1	2	?	•	
4	5	6	7	8	9	:	;	<	=	>	?			
A	B	C	D	E	F	G	H	I	J	K	L	M	Z	
N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
[	\	\]	^	~	'	a	b	c	d	e	f	g		
h	i	j	k	l	m	n	o	p	q	r	s	t		
u	v	w	x	y	z	{	|	}	~	ˆ	˜	˘		

Font parameters (decimal)

Blinker Height: 12
Blinker Width: 8
Base Line: 10
Character Height: 12

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Registers

01/13/86 15:14:11 PAUL USER: Tyt A:HERCULES>request-19.request.1 302 73840

FONT EDITOR

```

15:37:52 GC: About to flip. Dynamic space=2,165,349, Static space=7,915,447, Free space=7,002,112.
15:37:45 GC: Flushing oldspace. 2,387,938 words collected into 2,127,599 words.
15:33:50 Request for PAUL at ARES of 15:14 on HERCULES completed.
15:22:22 GC: About to flip. Dynamic space=2,387,899, Static space=7,915,191, Free space=8,017,920.
15:18:31 Request for PAUL at ARES of 15:11 on HERCULES completed.
15:06:25 Request for PAUL at ARES of 15:00 on HERCULES completed.
14:54:49 Request for PAUL at ARES of 14:24 on HERCULES completed.
14:49:47 Request for PAUL at ARES of 14:19 on HERCULES completed.
14:44:55 Request for PAUL at ARES of 14:19 on HERCULES completed.
14:39:57 Request for PAUL at ARES of 14:20 on HERCULES completed.
14:34:58 Request for PAUL at ARES of 14:20 on HERCULES completed.
14:30:01 Request for PAUL at ARES of 14:16 on HERCULES completed.
14:23:37 Request for PAUL at ARES of 14:11 on HERCULES completed.
14:20:15 Device "HERCULES" is operating again.
14:20:14 Irrecoverable error on device "HERCULES": irrecoverable device error
14:15:22 Request for PAUL at ARES of 14:04 on HERCULES completed.
13:51:45 Request for PAUL at ARES of 13:41 on HERCULES completed.
13:36:33 Request for PAUL at ARES of 13:33 on ACHILLES completed.
13:15:53 Request for PAUL at ARES of 13:15 on ACHILLES completed.
13:15:14 Printing of A:>paul>TRAINING>current-class-schedule-chron.text.9 has been sent to ACHILLES.
12:58:13 Request for PAUL at ARES of 12:57 on ACHILLES completed.
12:57:34 Printing of A:>paul>TRAINING>current-class-schedule-chron.text.8 has been sent to ACHILLES.
12:14:00 Request for PAUL at ARES of 12:13 on ACHILLES completed.
12:13:22 Printing of A:>paul>TRAINING>current-class-schedule-chron.text.7 has been sent to ACHILLES.
11:01:27 Request for PAUL at ARES of 11:00 on ACHILLES completed.
10:54:15 Request for PAUL at ARES of 10:50 on ACHILLES completed.
10:40:08 Request for PAUL at ARES of 10:38 on ACHILLES completed.
10:35:55 Request for PAUL at ARES of 10:33 on HERCULES completed.
10:14:23 Namespace Lock ARES: Reloading namespace SCH-TRAINING.
Recent servers contacted are ARES
10:14:23 Namespace SCH-TRAINING has become unloaded:
records don't go back far enough
Recent servers contacted are ARES
    
```

Notification Scroll Window

01/13/86 15:42:07 Keyboard

USER:

Function:

NOTIFICATIONS WINDOW

-- Fonts: CPTFONT, DT-TR12, DT-TR12B, DT-HL12, DT-HL12B, DT-HL12I, DT-HL19B --

A B C D E F

(si:hardcopy-text-file "px:>paul>training>press-basic-lesson-04.text"

si:*default-hardcopy-device*

:interpret-font-changes t

:fonts 'fonts:(fix9 dp-tr12 dp-tr12b dp-hl12 dp-hl12b dp-hl12I dp-hl19b)

:page-headings nil)

PAGE

Basic Field Maintenance Training Course Outline

Symbolics, Inc., April 1985

Page 1

PREQUISITES:

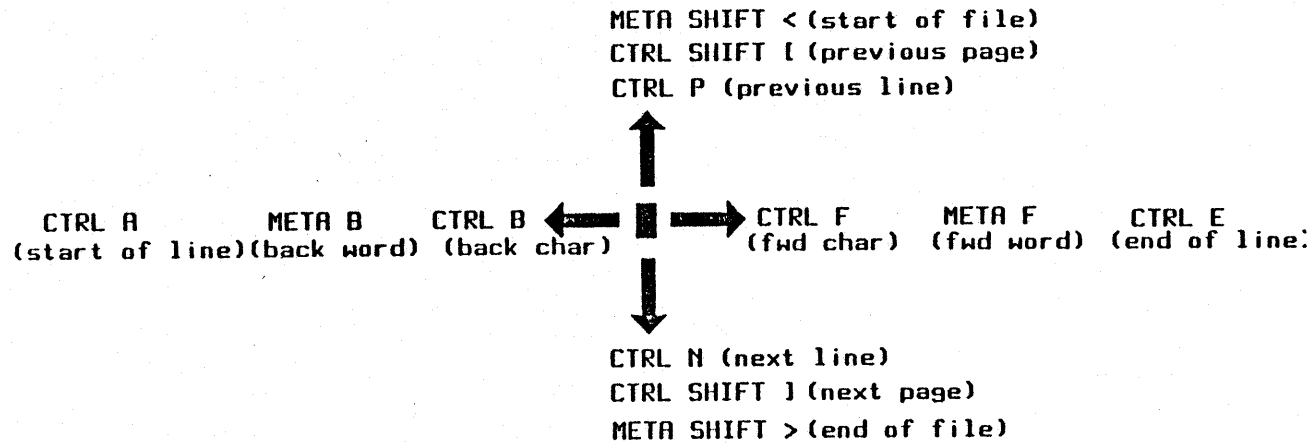
1. Formal 30 week electronics training course, or equivalent.
2. Formal training in micro-processor theory and operation
3. Minimum of three weeks attached to a Symbolics field office, with at least five days accompanying a qualified CSE in the field
4. Be able to use standard test equipment, such as oscilloscopes and multimeters
5. Knowledge of proper use of hand tools and soldering equipment

ZMACS (Text Fill) BASIC-LESSON-OUTLINE.TEXT >paul>TRAINING PX: (10) Font: D (DT-HL12) * [More below]

Symbolics, Inc.

64/11/85 09:52:46 Screen Hardcopy USER: Ty1 2 active servers

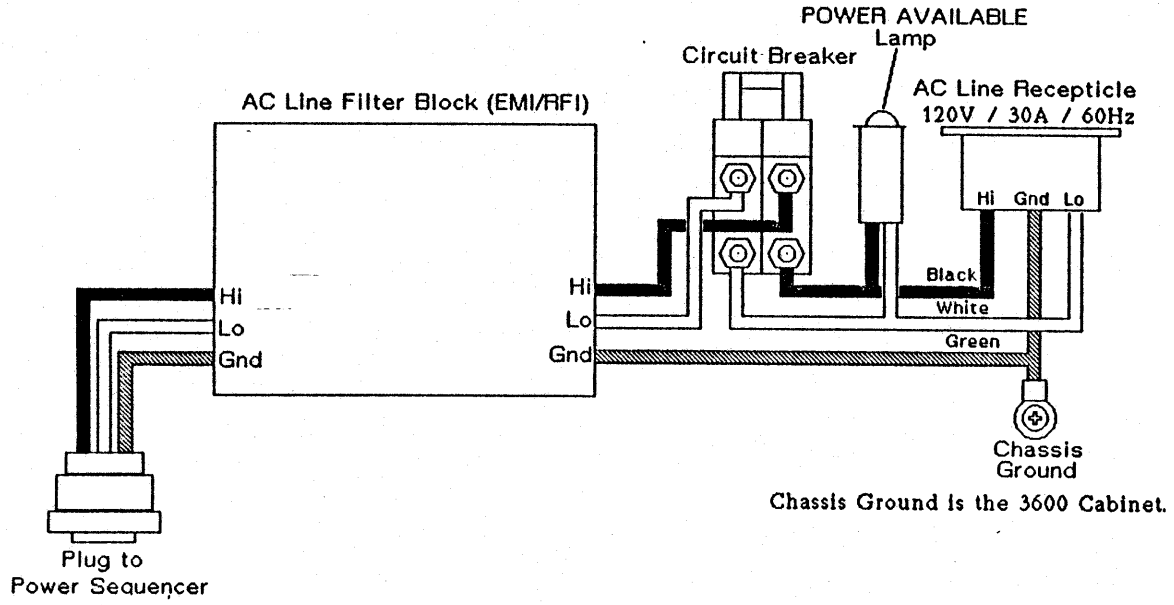
ZMACS EDITOR



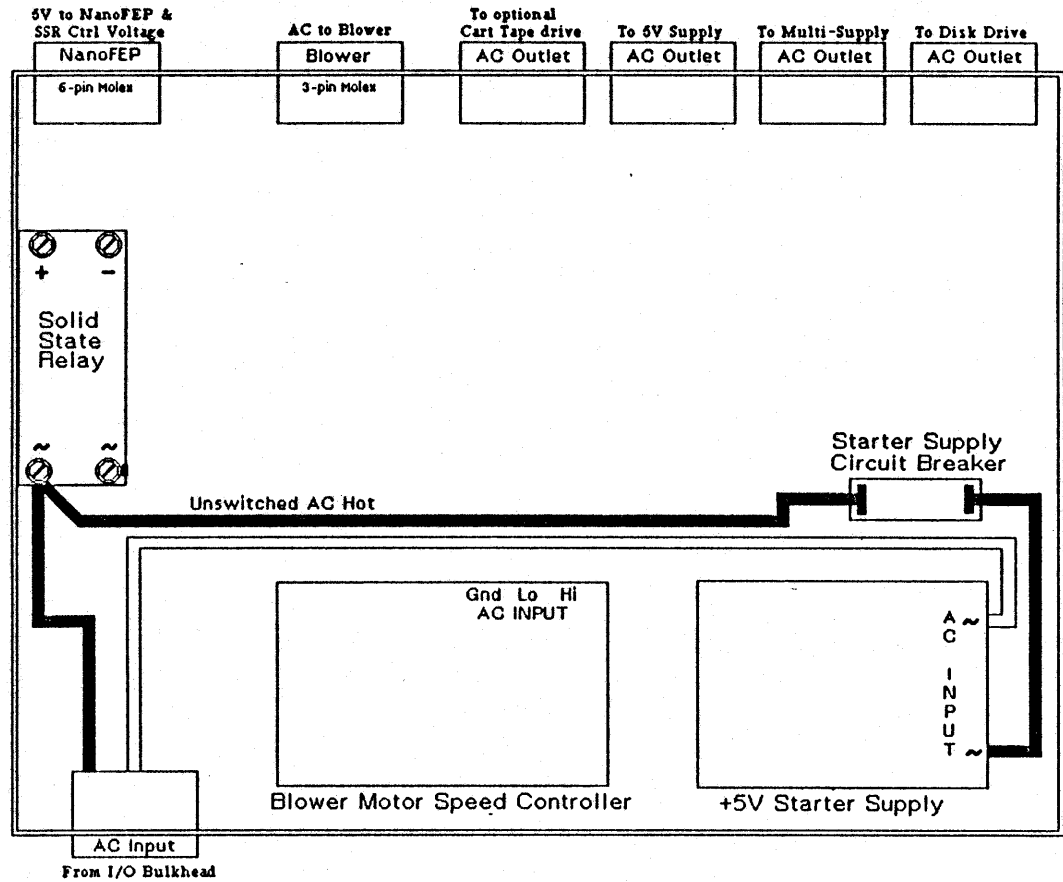
ADDITIONAL CONTROL COMMANDS

- | | |
|-------------------------------------------|-------------------------------------------|
| CTRL D (deletes char under cursor) | CTRL X . CTRL S (saves buff to same name) |
| META D (deletes word fwd of cursor) | CTRL X CTRL W (saves buff to new name) |
| RUB OUT (deletes char behind cursor) | CTRL X K (kills buffer) |
| META RUB OUT (deletes word behind cursor) | ABORT (cancels existing function) |
| CTRL K (kills to end of line) | RESUME (resumes previous function) |
| META K (saves to end of line) | CTRL space (sets up marking) |
| CTRL Y (yanks 1st item) | CTRL W (saves and kills regions) |
| META Y (walks thru' kill ring) | META W (saves region w/o killing) |

MOTION COMMANDS

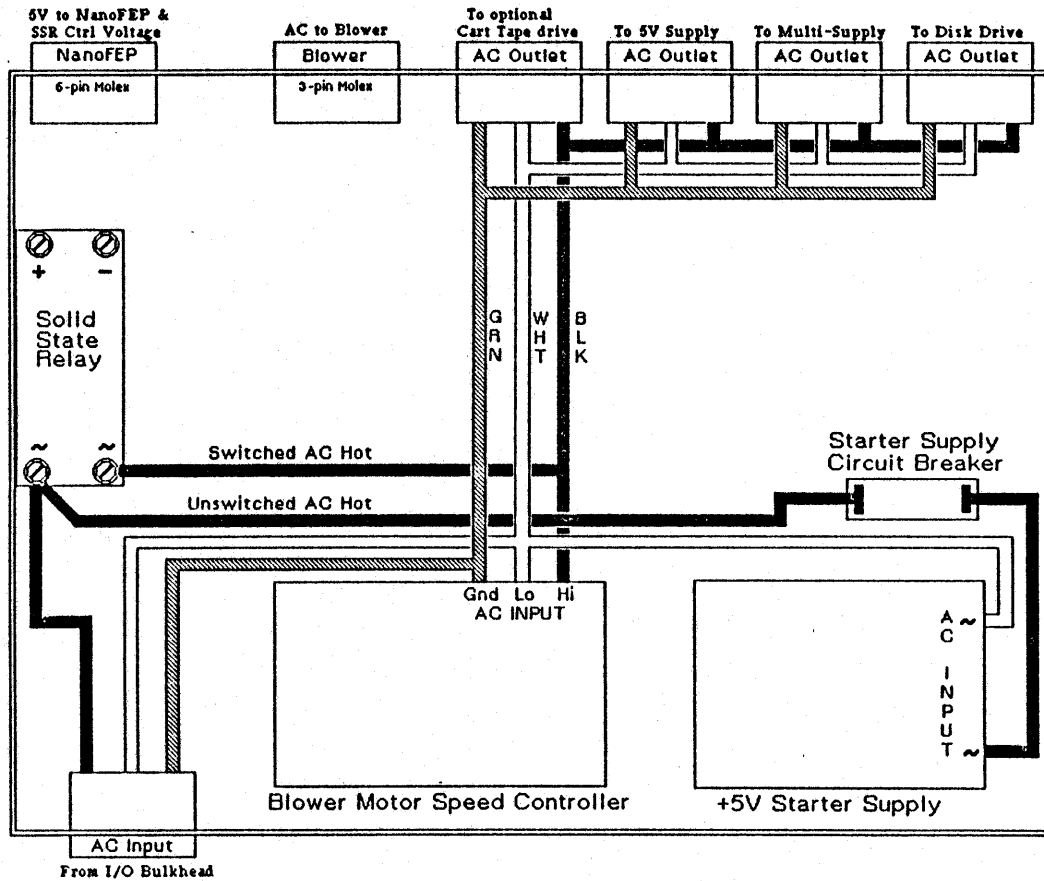


3600 I/O Bulkhead - AC Input Wiring

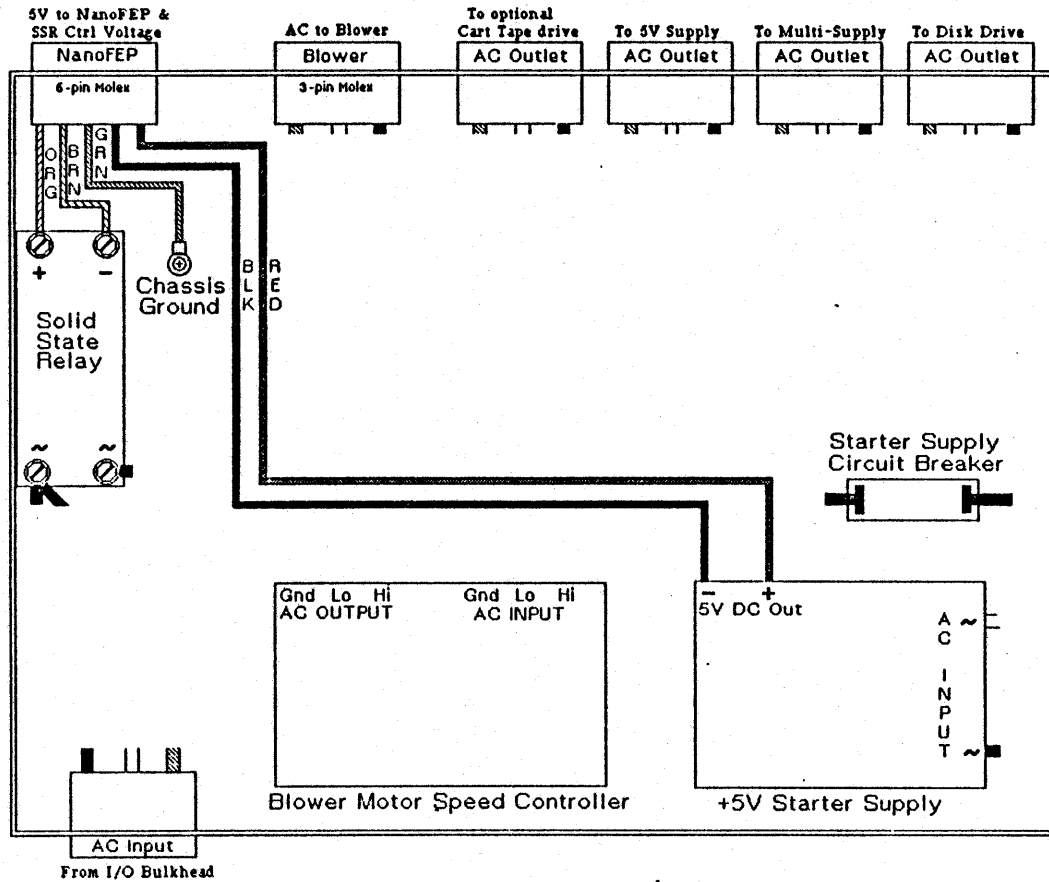


-2-

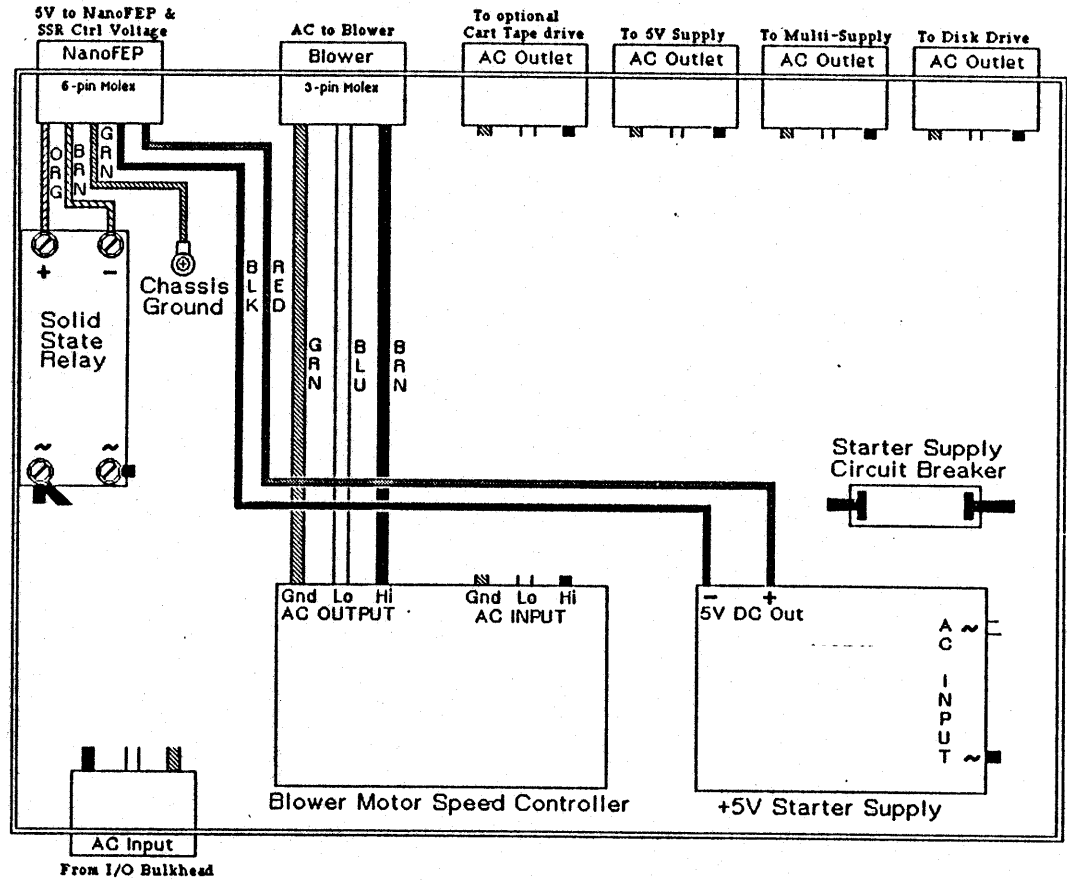
3600 Power Sequencer - AC Wiring Starter Supply



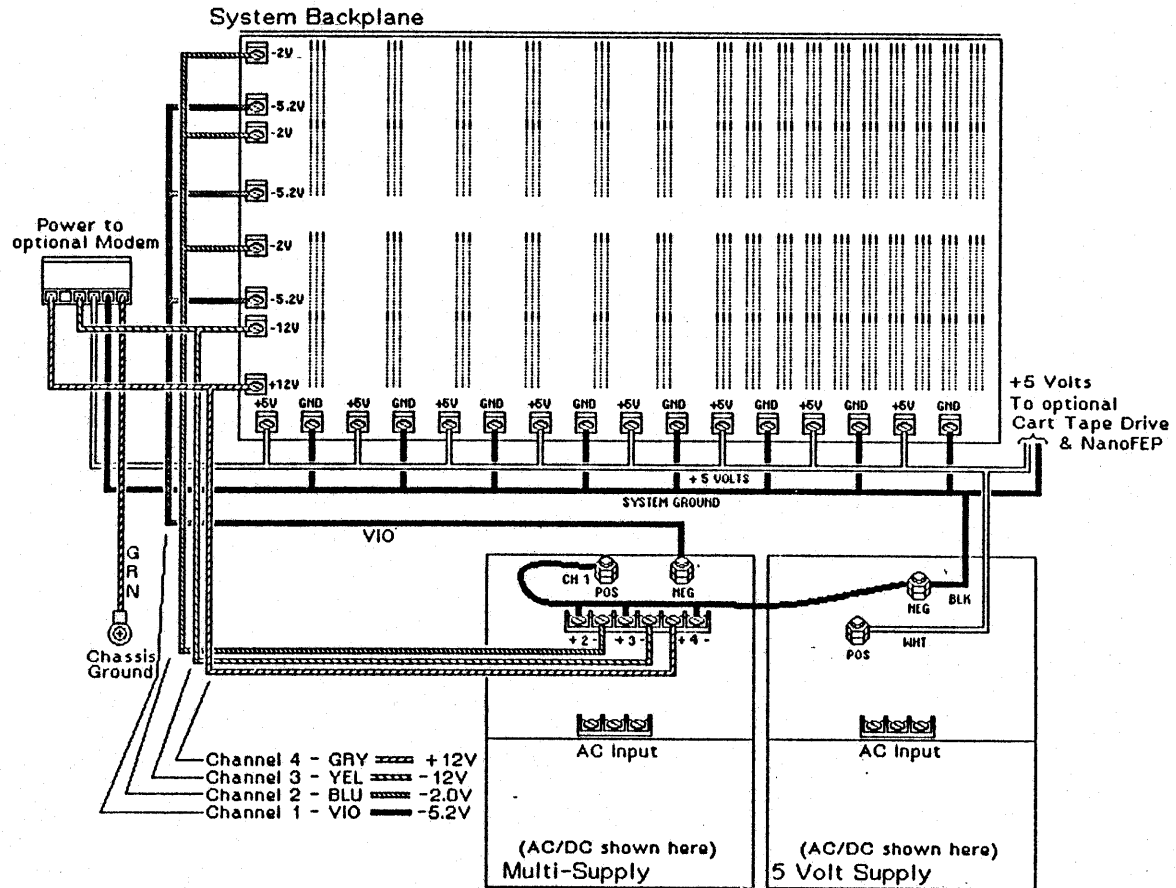
3600 Power Sequencer - AC Wiring Only



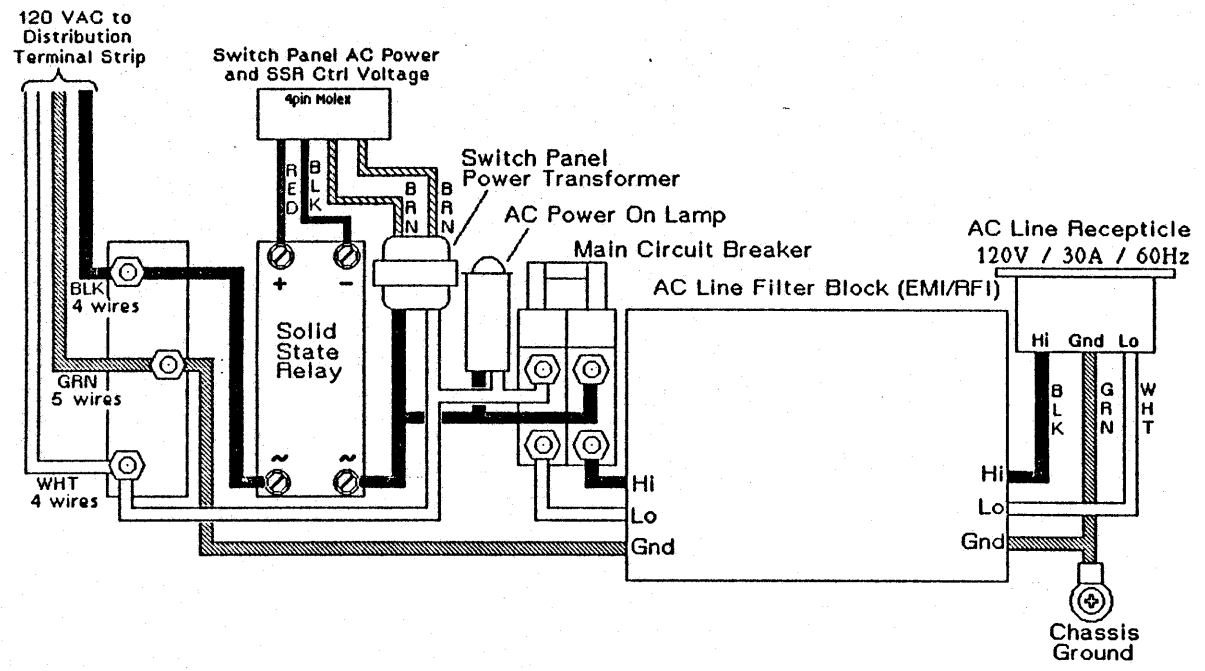
3600 Power Sequencer - DC STARTER



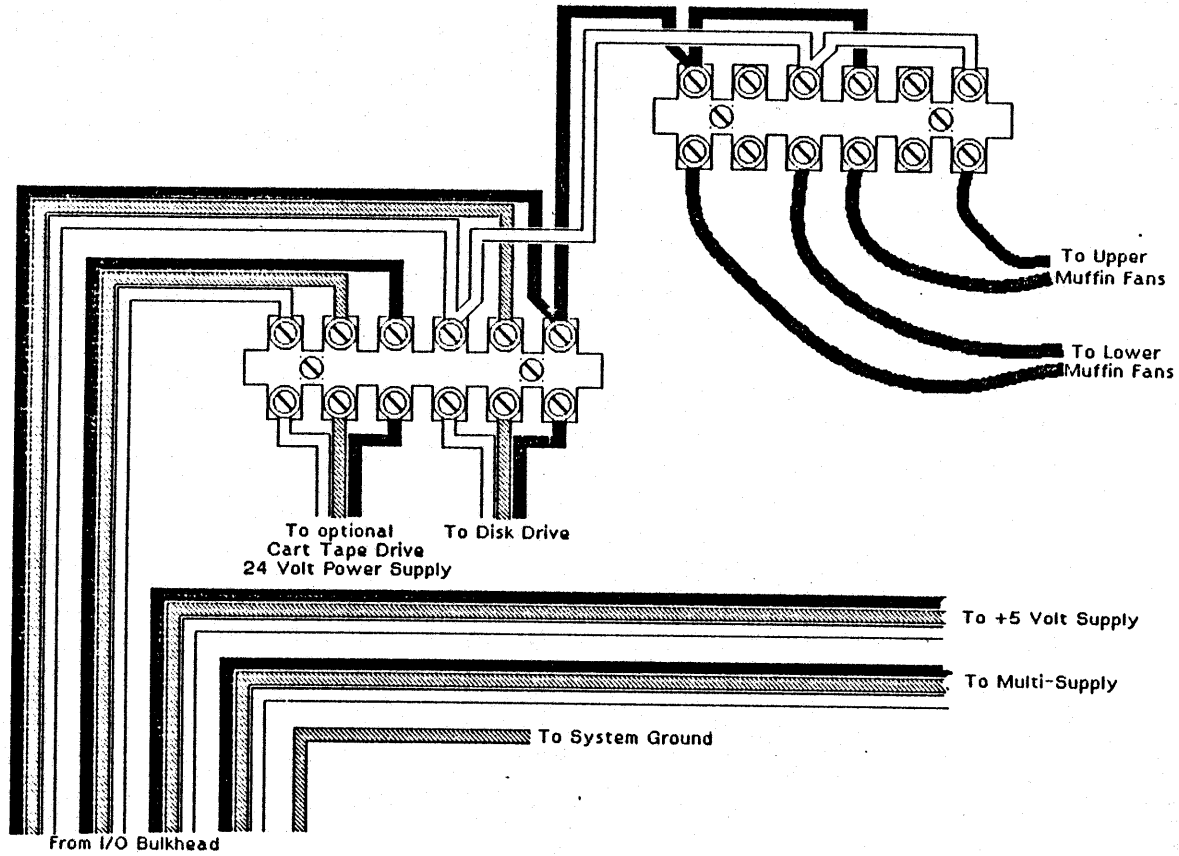
3600 Power Sequencer - DC Wiring & Blower AC Wiring



3600 DC Power Distribution

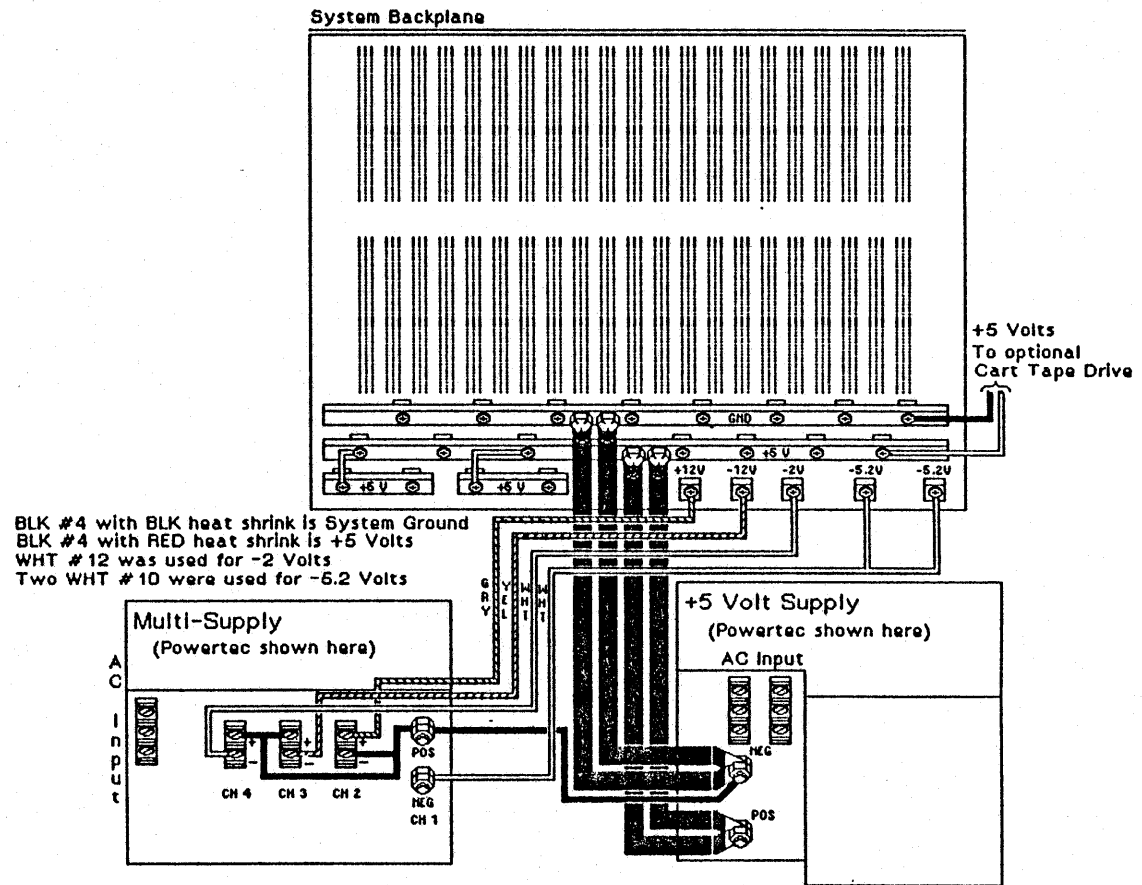


3670 I/O Bulkhead Wiring

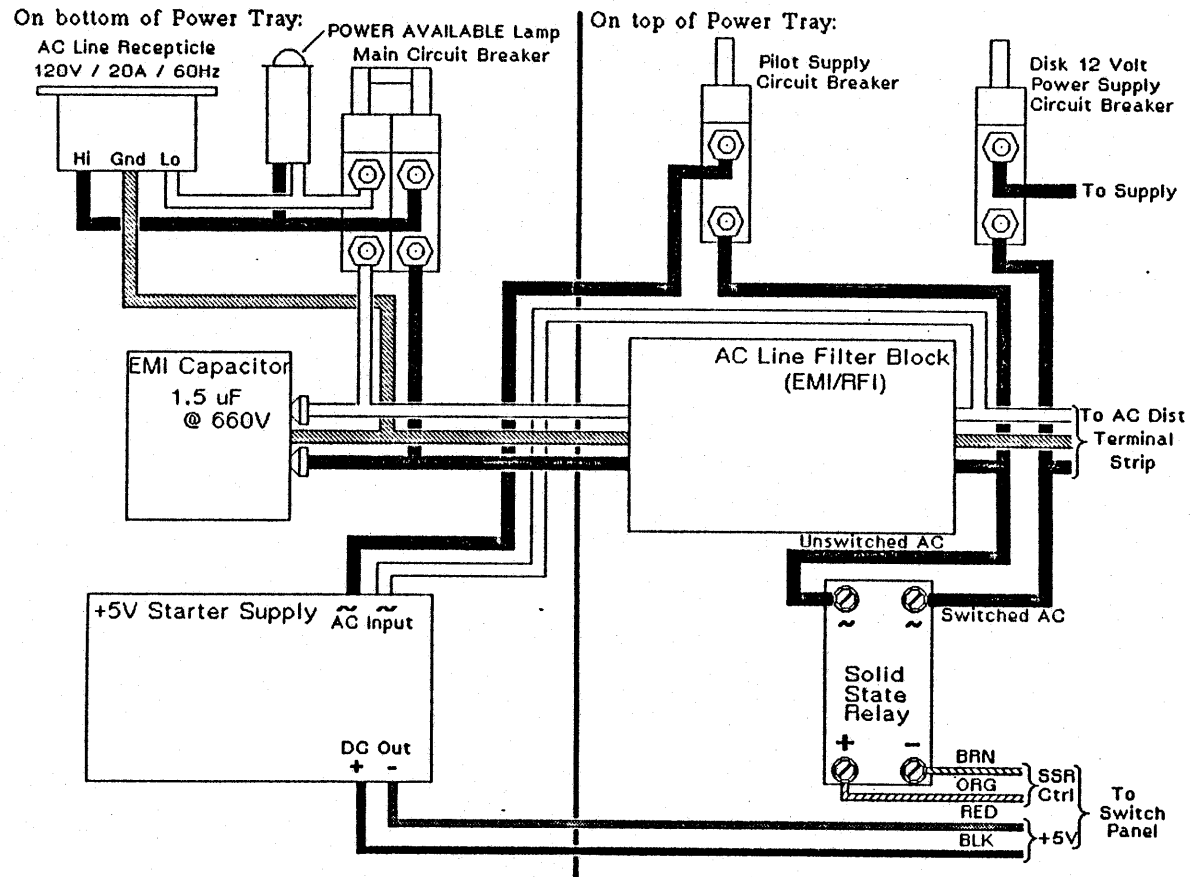


3670 AC Distribution Wiring

View of lower left rear corner of card cage; inside the left cover.

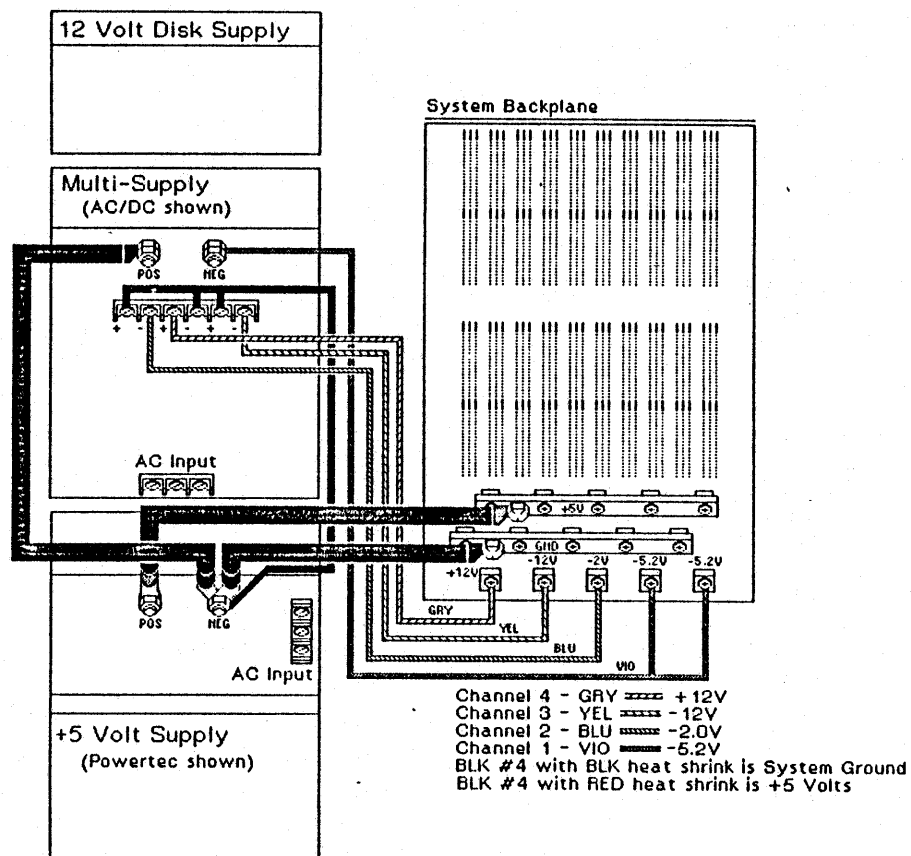


3670 DC Power Distribution

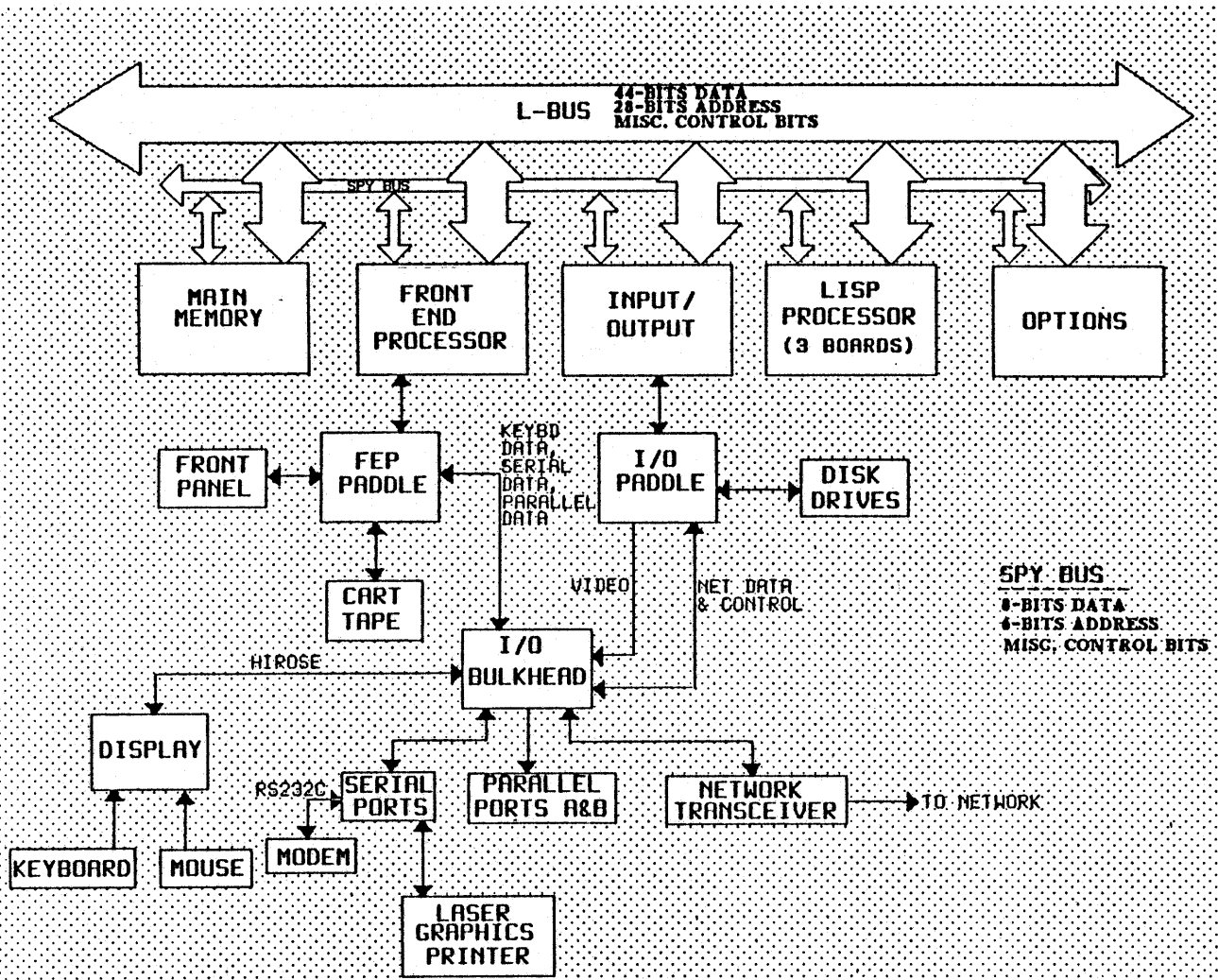


-10-

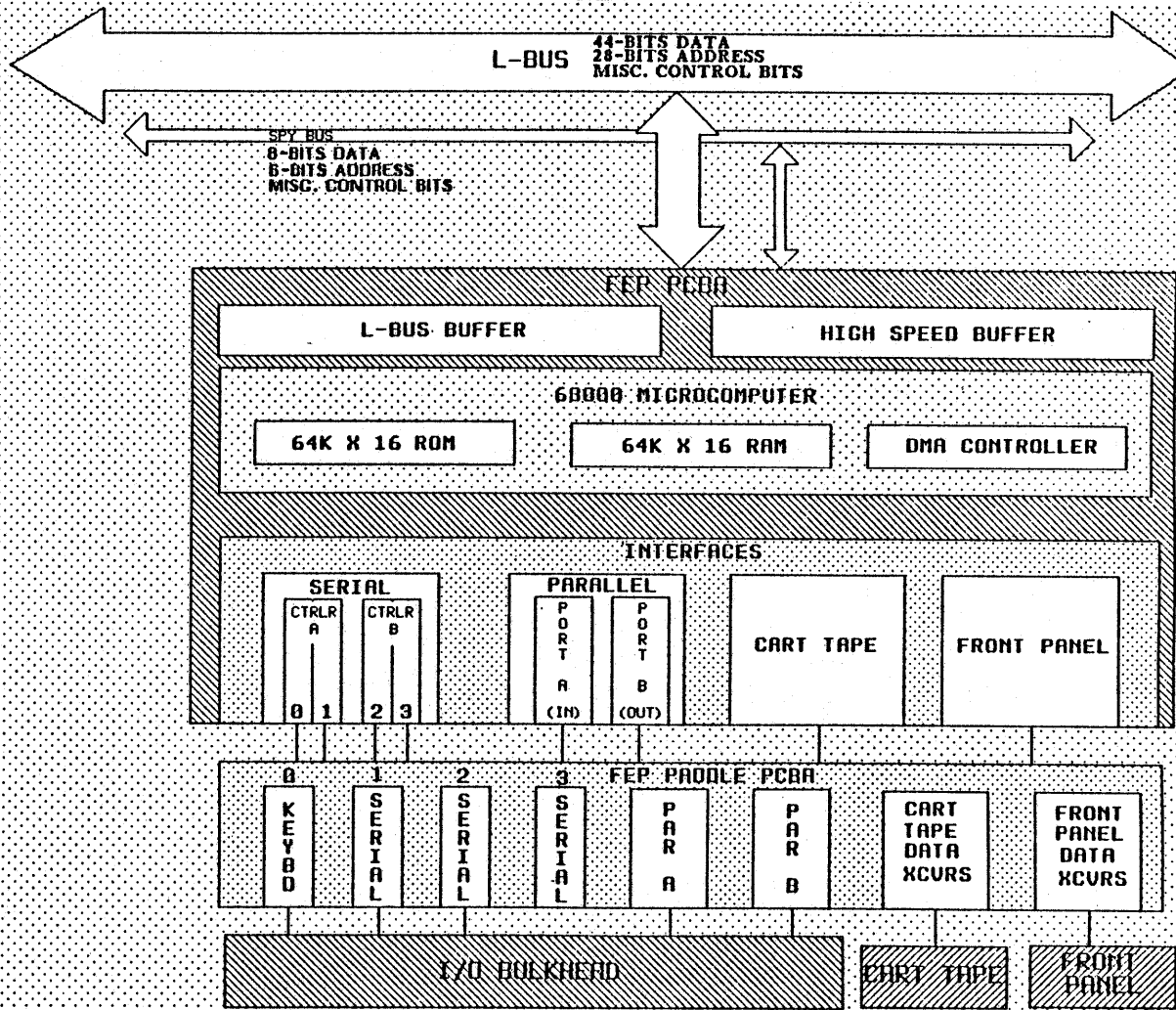
3640 I/O Bulkhead - Power Tray Wiring



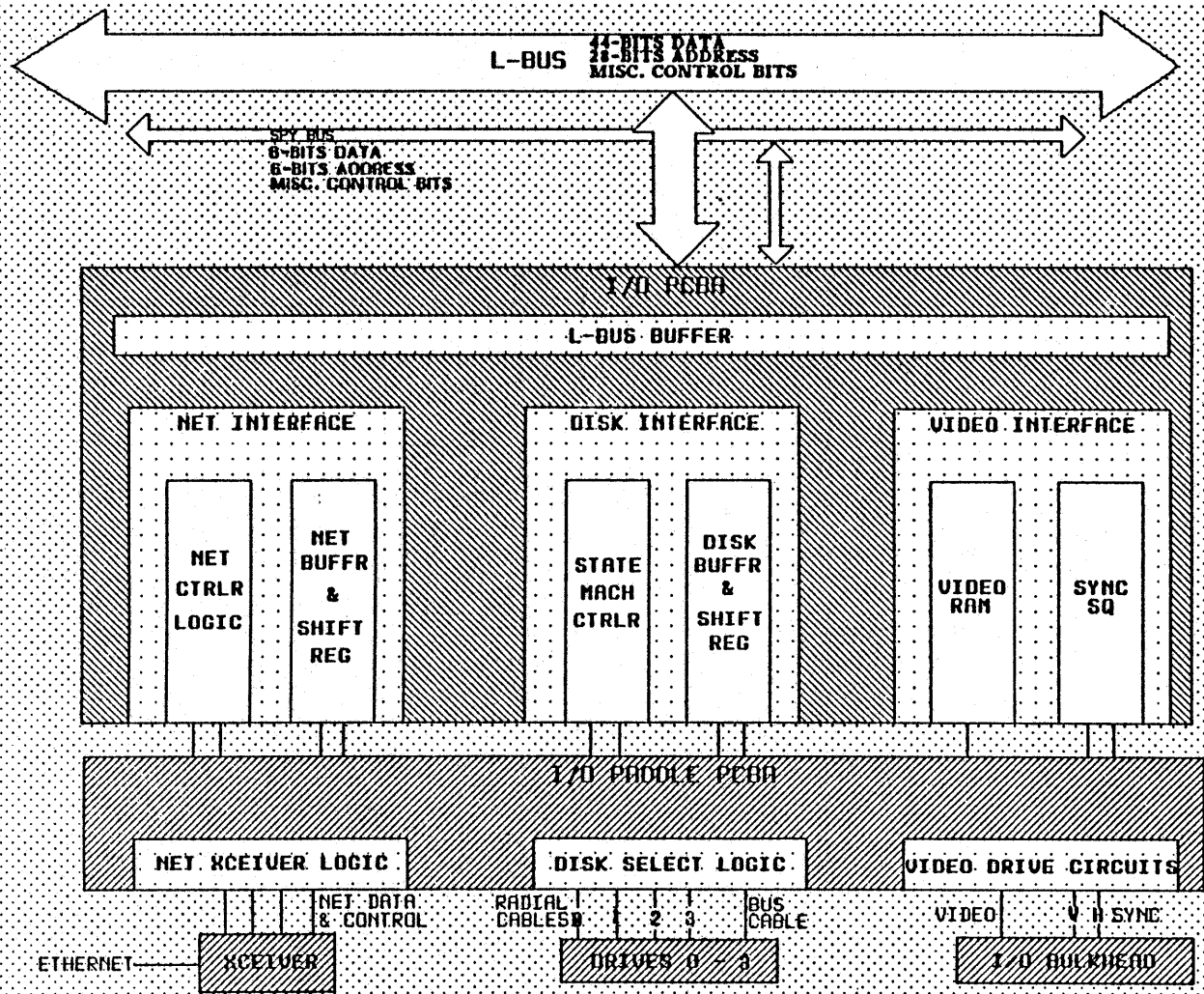
3640 DC Power Distribution



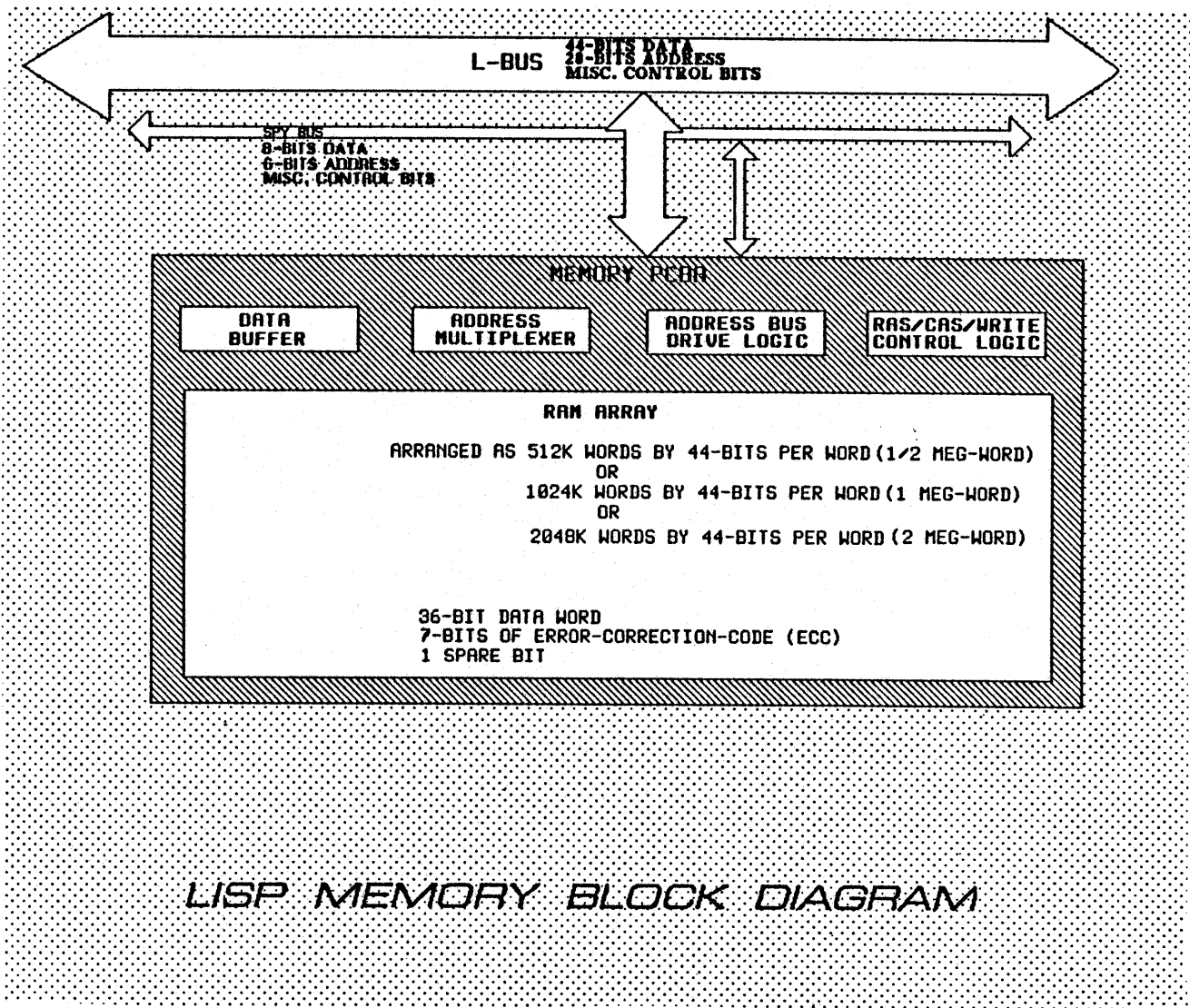
LISP SYSTEM BLOCK DIAGRAM



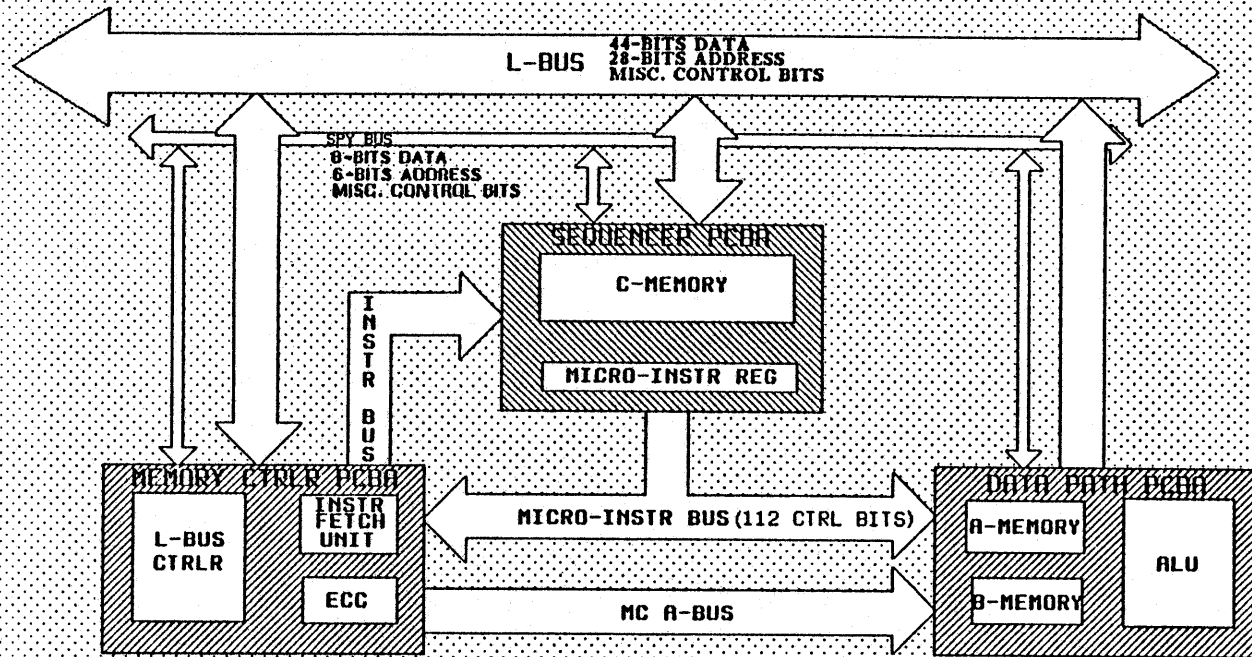
LISP FRONT END PROCESSOR BLOCK



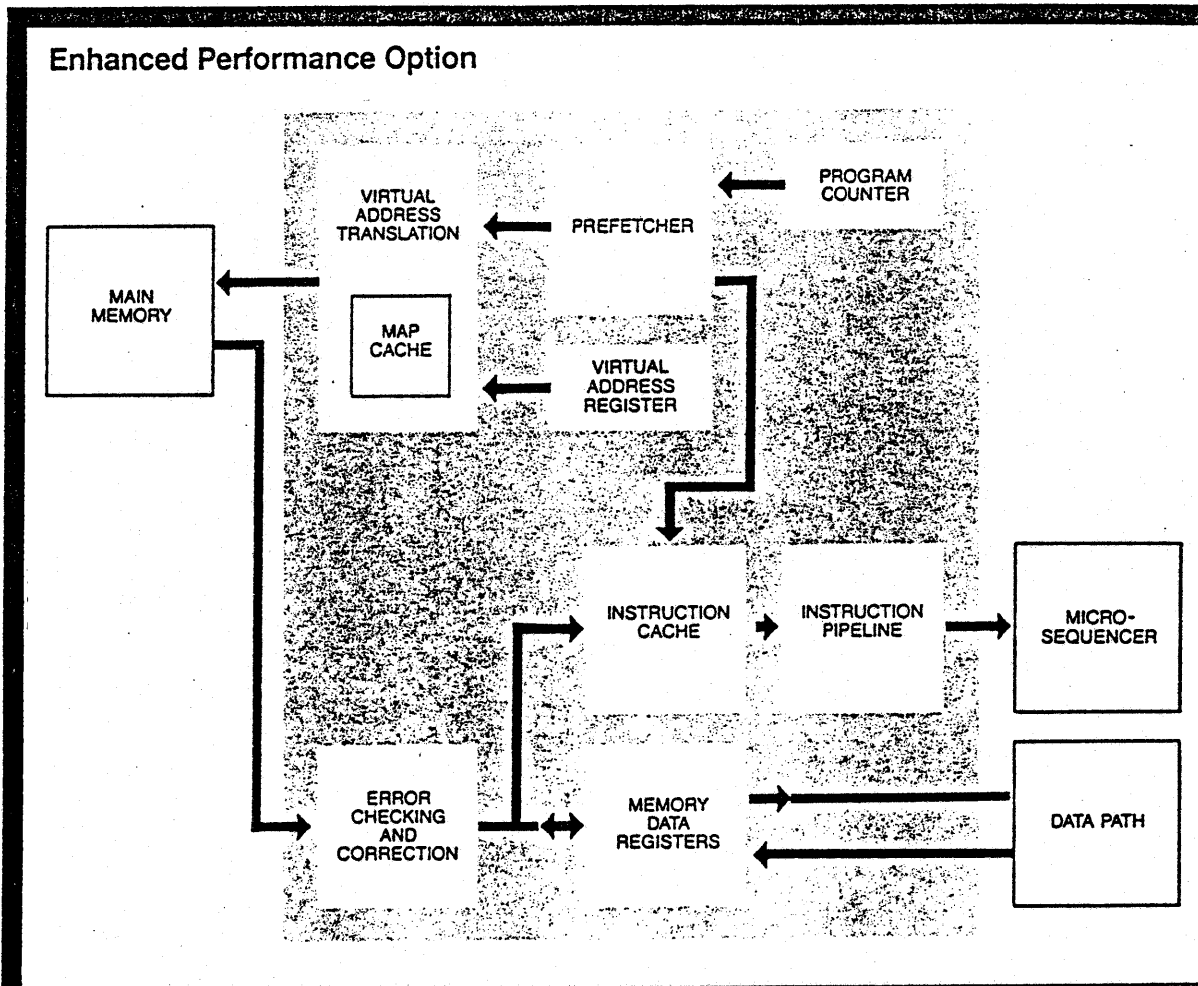
LISP I/O BLOCK DIAGRAM



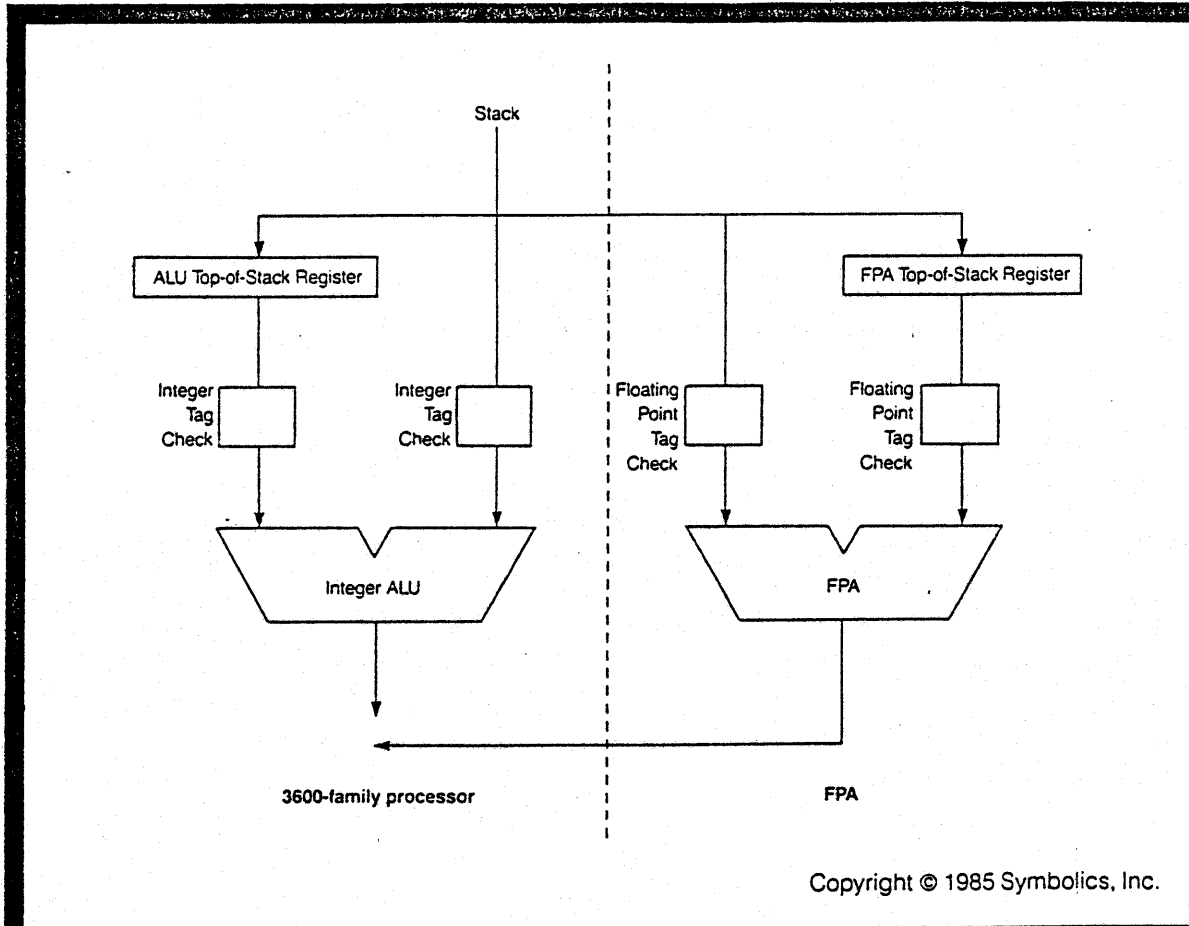
LISP MEMORY BLOCK DIAGRAM



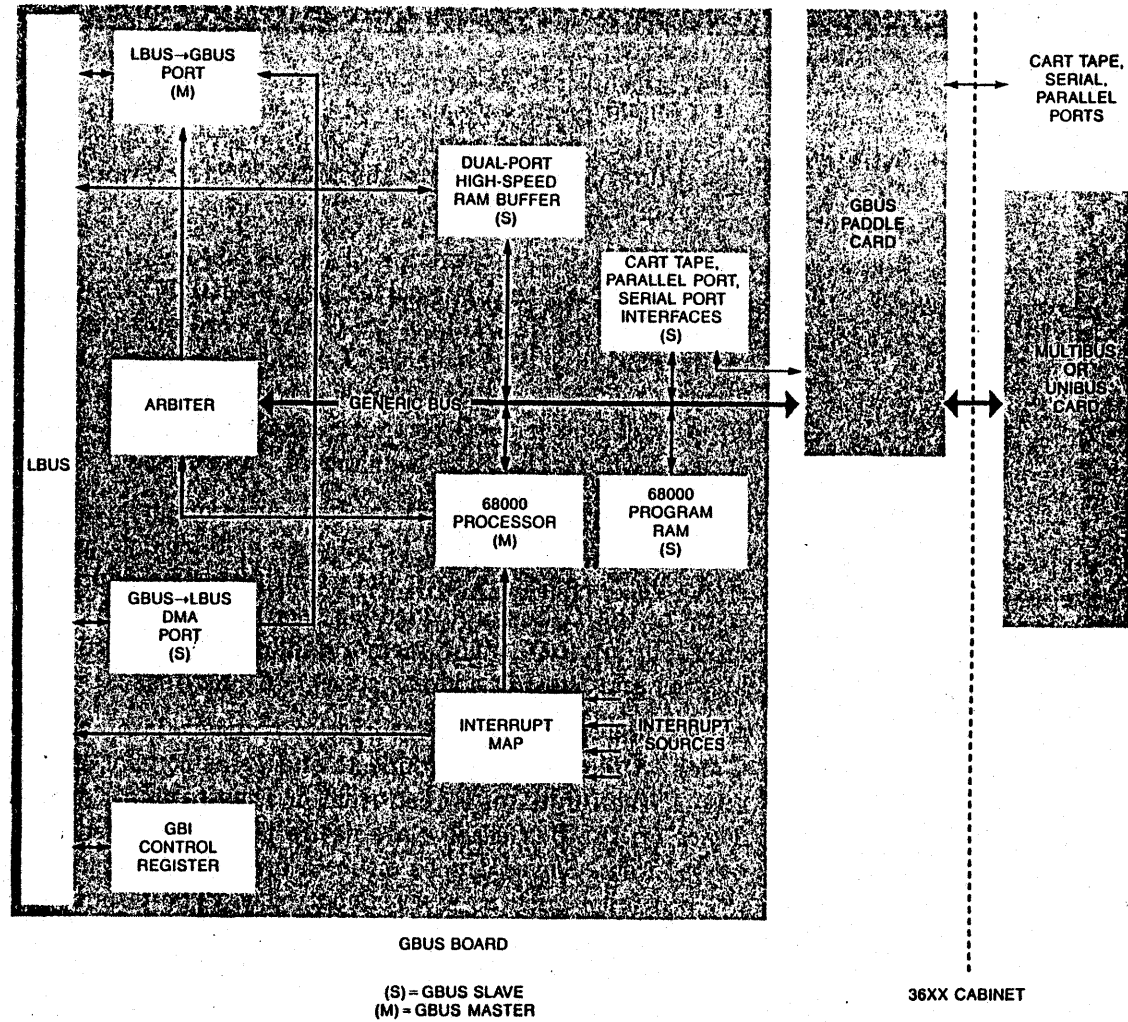
LISP PROCESSOR BLOCK DIAGRAM



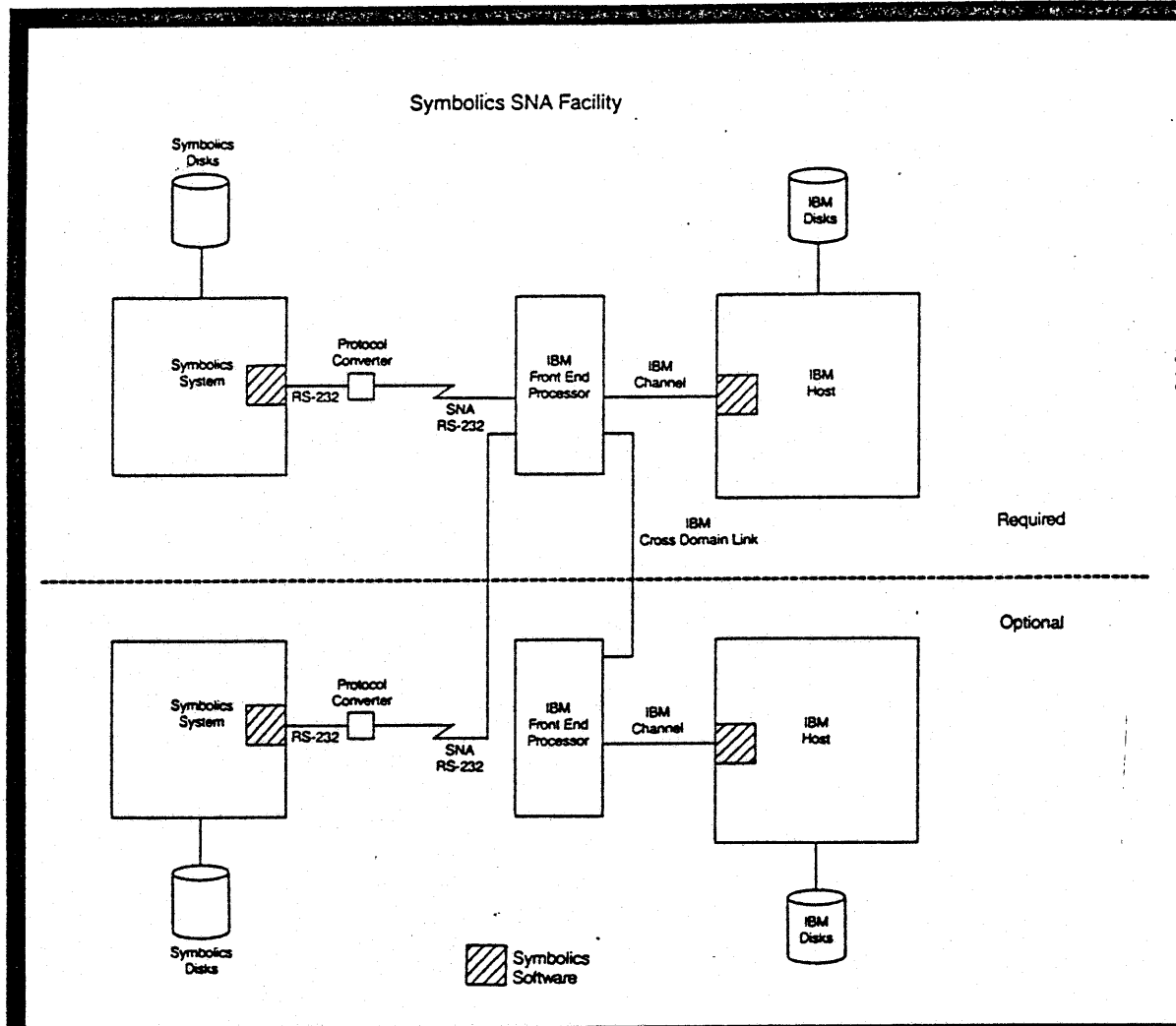
ENHANCED PERFORMANCE OPTION



FLOATING POINT ACCELERATOR



GENERIC BUS INTERFACE



SNA FACILITY

3600 SERIES BOARD COMPATIBILITY CHART

BASIC BOARD COMPLEMENT

BOARD	P/N	VERSION	3600	3600 -EPO	3640	3645	3670	3675	REMARKS
512K MEMORY	170002		X	X	X	X	X	X	512K WORD (2 Mbytes) OF 36-BITS EACH W/ ECC
1 MW MEMORY	170473		X	X	X	X	X	X	REQUIRES 2MW.FL0D LOADED IF NOT USED W/ NFEP
2 MW MEMORY	170309		X	X	X	X	X	X	REQUIRES 2MW.FL0D LOADED IF NOT USED W/ NFEP
FEP	170062	W/ 976002 PAL SET	X	-	-	-	-	-	WIRE-WRAP W/ V24 PROMS & HEADER PALS-DEVNUM.4 IN E21 DEVACK.4A IN C23
	170236	W/ 976002 PAL SET	X	-	-	-	-	-	ETCH W/ V24 PROMS & HEADER PALS-DEVNUM.4 IN E21 DEVACK.4A IN C23
		W/ 976003 PAL SET	-	-	X	-	X	-	ETCH W/ V24 PROMS & HEADER PALS-DV2NUM IN E21 DV2ACK IN C23
NFEP	170062	W/ 976002 PAL SET	X	X	-	-	-	-	WIRE-WRAP W/ V127 PROMS & HEADER PALS-DEVNUM.4 IN E21 DEVACK.4A IN C23
	170236	W/ 976002 PAL SET	X	X	-	-	-	-	ETCH W/ V127 PROMS & HEADER PALS-DEVNUM.4 IN E21 DEVACK.4A IN C23
		W/ 976003 PAL SET	-	-	X	X	X	X	ETCH W/ V127 PROMS & HEADER PALS-DV2NUM IN E21 DV2ACK IN C23
FEP PADDLE	170066		X	X	-	-	-	-	
	170069		-	-	X	X	X	X	
ENHANCED FEP PADDLE	170265		(a)	(a)	-	-	-	-	
I/O BOARD	170082	W/ 976001 PROM SET	X	X	-	-	-	-	WIRE-WRAP / SMD INTERFACE PROMS-DISKU.2.22 IN Q29 DISKU.1.22 IN N29 DISKU.0.22 IN L29
	170157	W/ 976000 PROM SET	-	-	X	X	-	-	ETCH / ST-506 INTERFACE PROMS-SDSKU.2.1 IN E23 SDSKU.1.1 IN J15 SDSKU.0.1 IN H10
		W/ 976001 PROM SET	(a)	(a)	X	X	X	X	ETCH / SMD INTERFACE PROMS-DISKU.2.22 IN E23 DISKU.1.22 IN J15 DISKU.0.22 IN H10
I/O PADDLE	170086		X	X	-	-	-	-	SMD INTERFACE
	170245		-	-	X	X	-	-	ST-506 INTERFACE
	170162		(a)	(a)	X	X	X	X	SMD INTERFACE

3600 SERIES BOARD COMPATIBILITY CHART

BASIC BOARD COMPLEMENT - LISP PROCESSOR

BOARD	P/N	VERSION	3600	3600 -EPO	3640	3645	3670	3675	REMARKS
DATA PATH	170032	WIRE-WRAP W/BASECTL.3 PAL	X	-	-	-	-	-	PAL IN LOCATION AA76
		WIRE-WRAP W/DPIFU.2 PAL	-	X	-	-	-	-	PAL IN LOCATION AA76 (SEE NOTE b)
		ETCH W/BASECTL.3 PAL	X	-	X	-	X	-	PAL IN LOCATION U23K
		ETCH W/DPIFU.2 PAL	-	X	-	X	-	X	PAL IN LOCATION U23K (SEE NOTE b)
SEQUENCER	170042	WIRE-WRAP	X	-	-	-	-	-	
		ETCH	X	-	X	-	X	-	
MEMORY CONTROLLER	170052	WIRE-WRAP	X	-	-	-	-	-	
		ETCH	X	-	X	-	X	-	
INSTRUCTION FETCH UNIT	170260		-	X	-	X	-	X	(IFU) EXPANDED MEMORY CONTROLLER (SEE NOTE b)
EXTENDED SEQUENCER	170299	-1	X	-	X	-	X	-	(XSQ) ADDITIONAL 8K C MEMORY -MC COMPATIBLE
		-2	-	X	-	X	-	X	(XSQ) ADDITIONAL 8K C MEMORY -IFU COMPATIBLE (SEE NOTE b)

BASIC BOARD COMPLEMENT - BOARD TOTALS

TOTAL PADDLE PCBA'S	2	2	2	2	2	2		
TOTAL L BUS PCBA'S EXCLUDING MEMORY	5	5	5	5	5	5		
TOTAL MEMORY PCBA'S (MINIMUM)	1	1	1	1	1	1		
TOTAL L BUS SLOTS USED EXCLUDING MEMORY (ETCH)	5	5	5	5	5	5		PROVIDING 2 Mbytes RAM STORAGE MINIMUM MAXIMUM ADDRESSABLE MAIN MEMORY = 32 Mbytes (4 - 2 MW MEMORY PCBA'S)
TOTAL L BUS SLOTS USED EXCLUDING MEMORY (W/W)	10	10	-	-	-	-		
TOTAL L BUS SLOTS PROVIDED	21	21	10	10	21	21		

BASIC BOARD COMPLEMENT COMPATIBILITY NOTES:

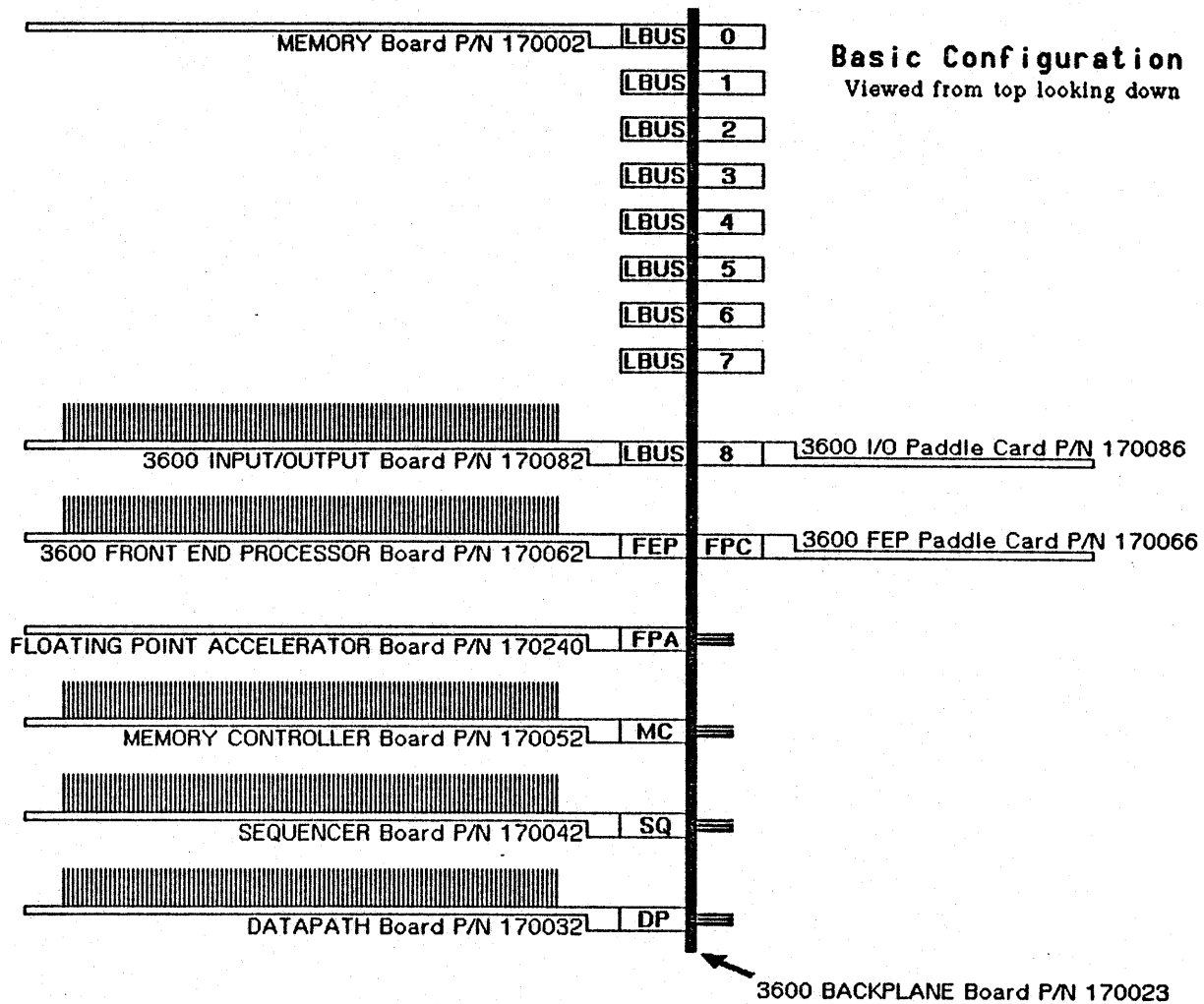
(a) FOR USE IN 3600 MACHINES WITH 3670 ENHANCEMENTS (PEV)

(b) INCLUSION OF IFU, XSQ (170299-2), AND DATA PATH W/ DPIFU-2 PAL (170032) BOARDS CONVERT A STANDARD 3600 TO A 3600 WITH ENHANCED PERFORMANCE OPTION, A 3640 TO A 3645, OR A 3670 TO A 3675. THESE BOARDS MAY BE INSTALLED ONLY INTO MACHINES EQUIPPED WITH NFEP, 336 MICROCODE, AND 6.0 OR LATER WORLDS.

OPTIONS

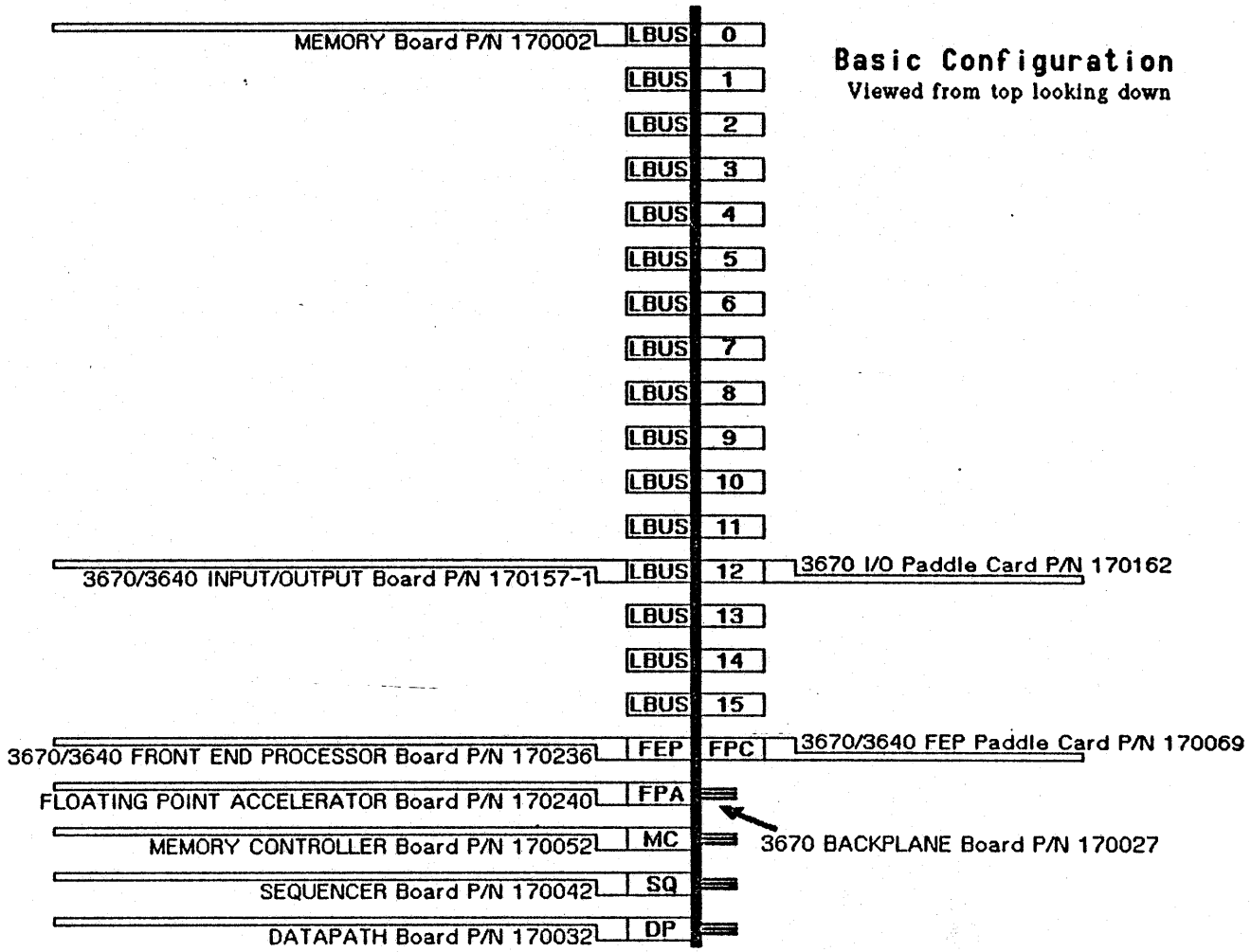
3600 SERIES BOARD COMPATIBILITY CHART

BOARD	P/N	VERSION	3600	3600 -EPO	3640	3645	3670	3675	REMARKS
FLOATING POINT ACCELERATOR									
FPA	170240		X	X	X	X	X	X	
MAGNETIC TAPE INTERFACE (INCLUDES 2 BOARDS):									
MTI	170176		X	X	X	X	X	X	REQUIRED FOR TD80
MTI PADDLE	170213		X	X	X	X	X	X	
DISK DRIVE MULTIPLEX									
AUX DISK PADDLE	170197		X	X	X	X	X	X	PADDLE BOARD INSERTED IN ANY UNUSED PADDLE SLOT. PROVIDES 1 TO 7 DISK DRIVE MULTIPLEX.
G BUS INTERFACE (INCLUDES 3 BOARDS):									
-MINIMAL	170304	-1	X	X	X	X	X	X	GENERIC BUS INTERFACE TO L-BUS USED FOR G BUS-SLAVE OPERATION OR USED FOR G BUS-MASTER OPERATION
-POPULATED	170304	-3	X	X	X	X	X	X	
G BUS PADDLE	170383		X	X	X	X	X	X	
UNIBUS BOARD	170233		X	X	X	X	X	X	G TO L-BUS INTERFACE FOR DEC OR G TO L-BUS INTERFACE FOR INTEL
MULTIBUS BOARD	170360		X	X	X	X	X	X	
COLOR OPTIONS									
STANDARD COLOR SYSTEM (INCLUDES 3 BOARD TYPES):									
COLOR CONTROLLER	170140		X	X	X	X	X	X	
COLOR MEMORY	170136		X	X	X	X	X	X	1 TO 4 BOARDS
COLOR PADDLE	170144		X	X	X	X	X	X	FOR SYSTEMS W/O OVERLAY ONLY FOR SYSTEMS W/ OR W/O OVERLAY
CHROMA PADDLE	170387		X	X	X	X	X	X	
BROADCAST COLOR SYSTEM (INCLUDES 3 BOARDS):									
COLOR CONTROLLER	170140		X	X	X	X	X	X	LOW-RES ONLY
COLOR MEMORY	170136		X	X	X	X	X	X	
BROADCAST PADDLE	170328		X	X	X	X	X	X	
CAD SYSTEM (INCLUDES 2 BOARDS):									
CAD BUFFER	170324		X	X	X	X	X	X	HIGH-RES / NON-INTERLACED
CAD PADDLE	170314		X	X	X	X	X	X	
OTHER:									
FRAME GRABBER	170403		X	X	X	X	X	X	
F.G. PADDLE	170281		X	X	X	X	X	X	
GEN-LOCK PADDLE	170285		X	X	X	X	X	X	



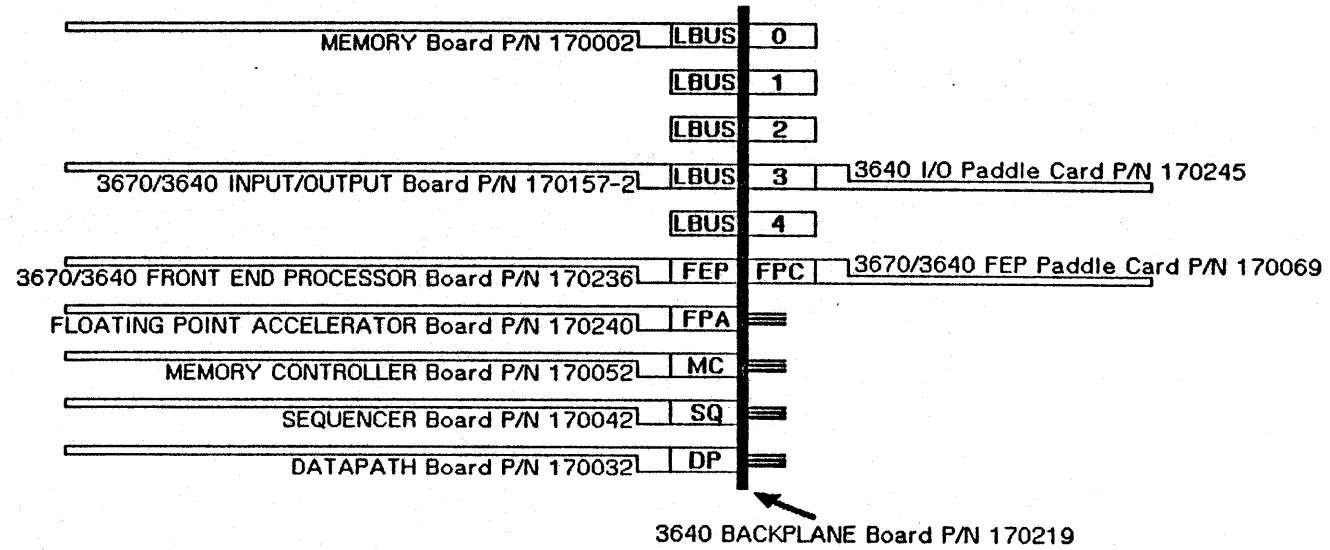
3600 BACKPLANE ASSIGNMENT

Basic Configuration
Viewed from top looking down

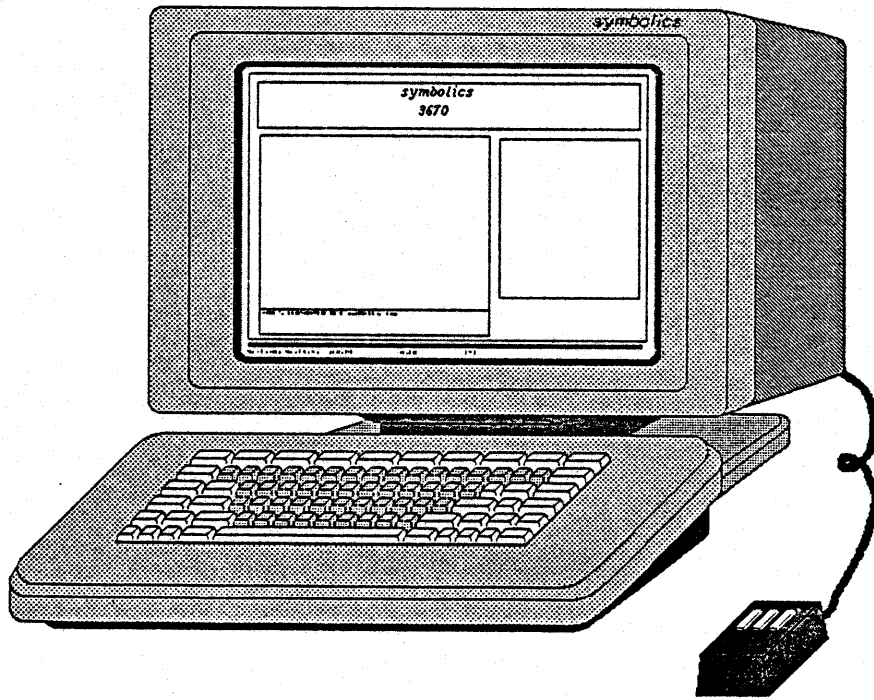


3670 BACKPLANE ASSIGNMENT

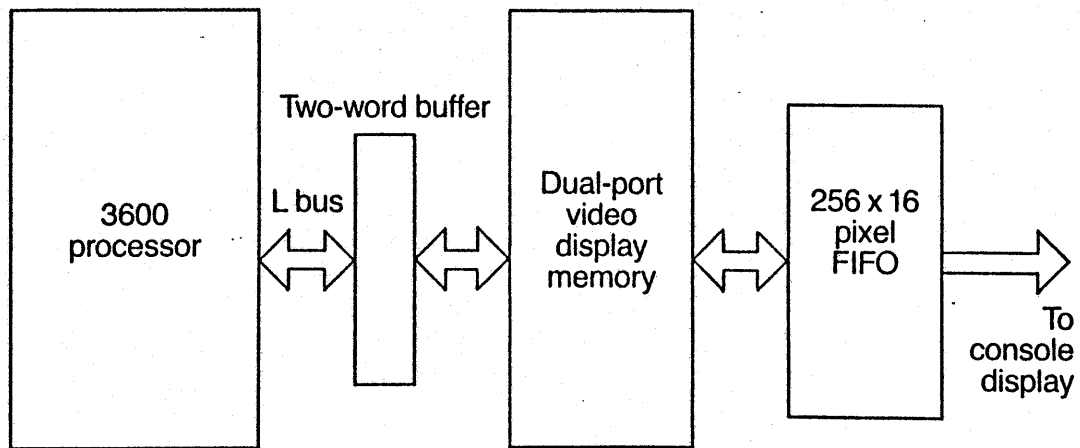
Basic Configuration
Viewed from top looking down



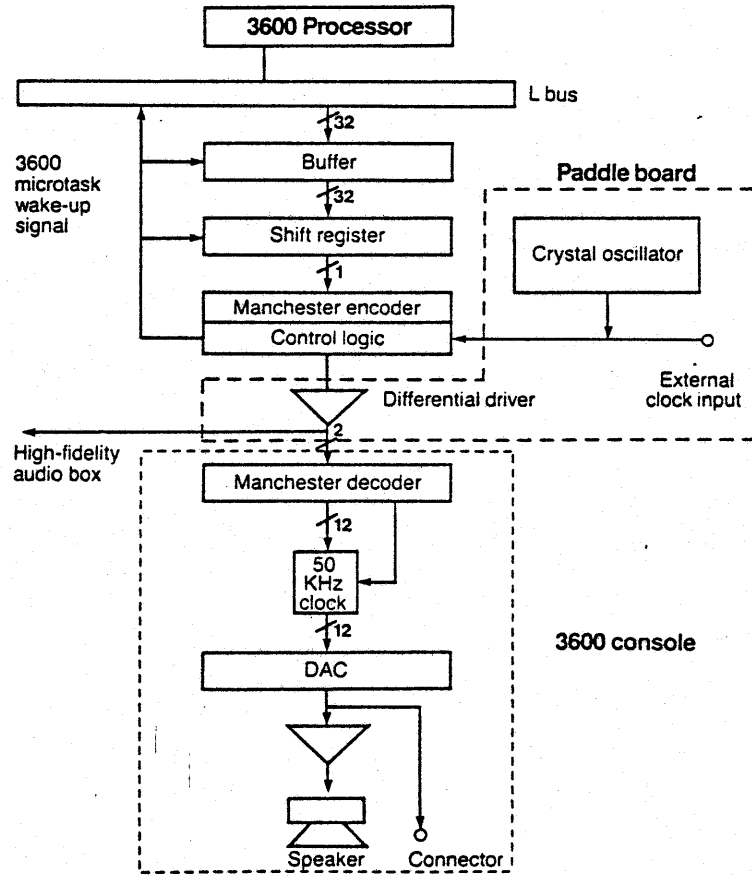
3640 Backplane Assignments



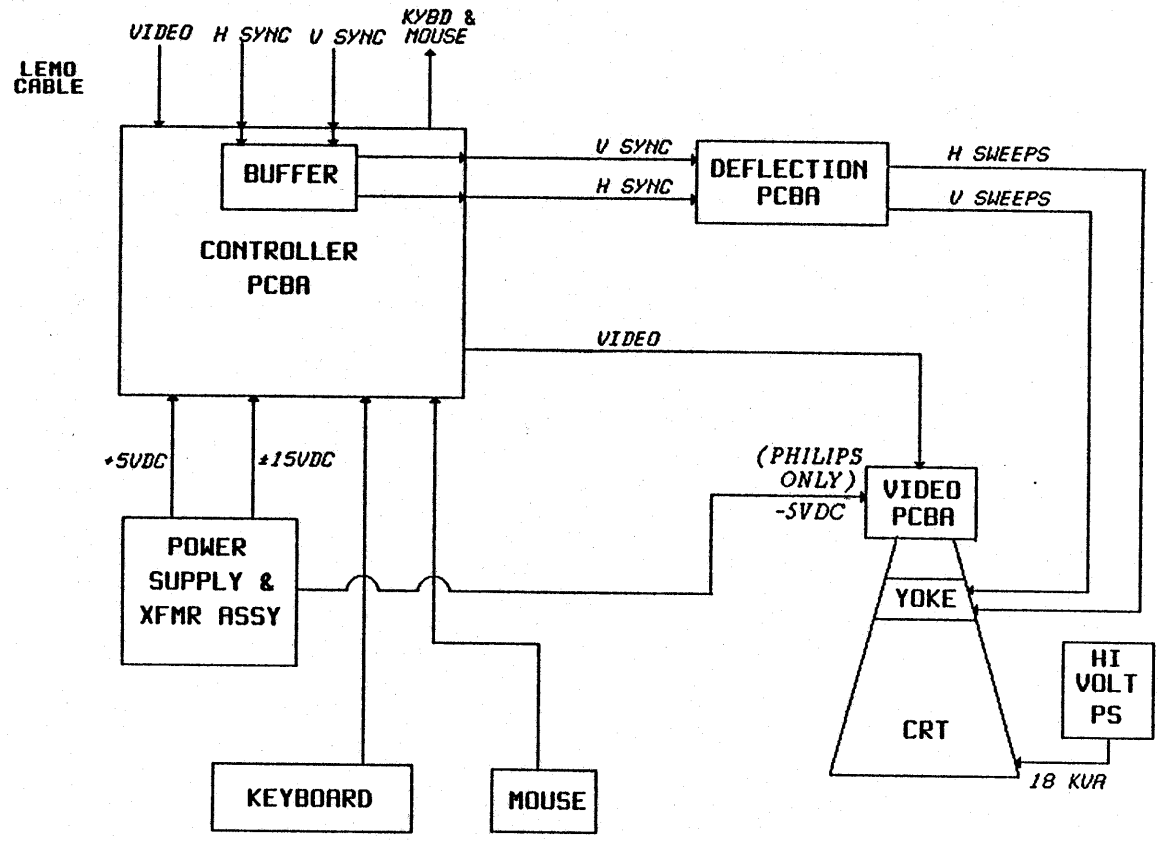
3600 SERIES CONSOLE



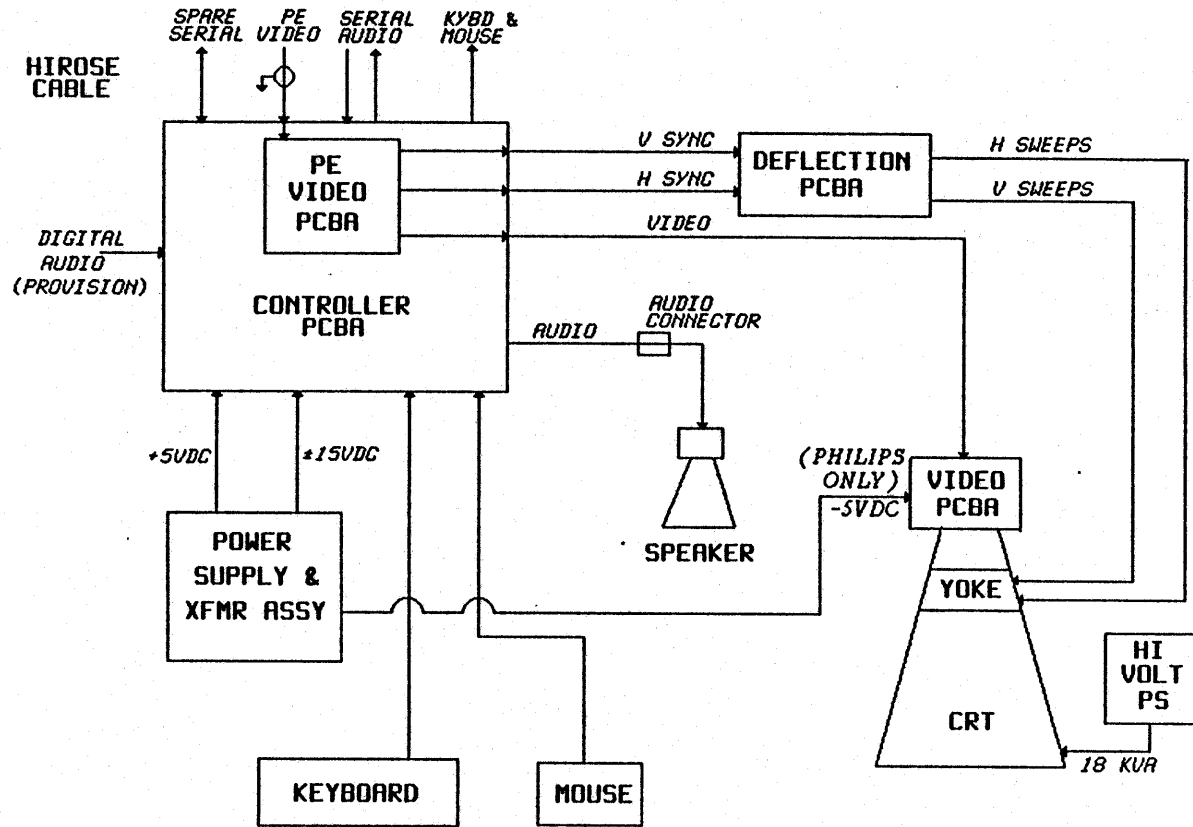
Buffered Datapath to Display



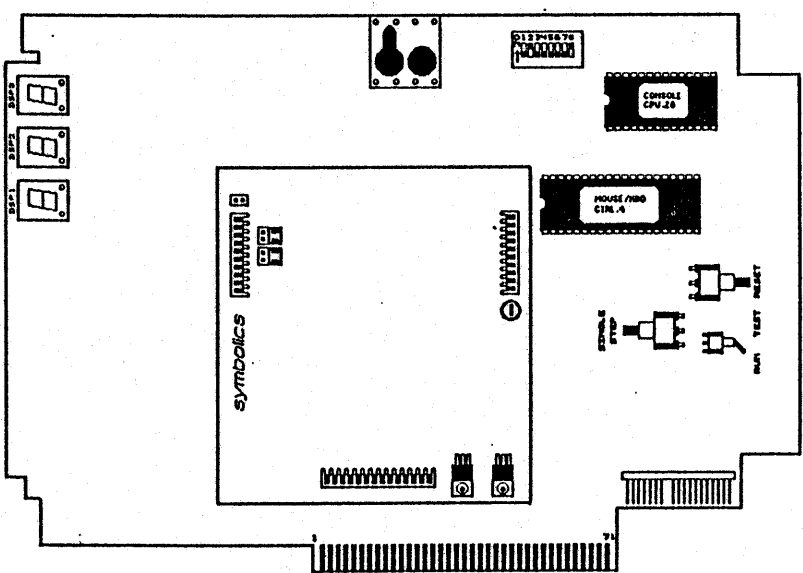
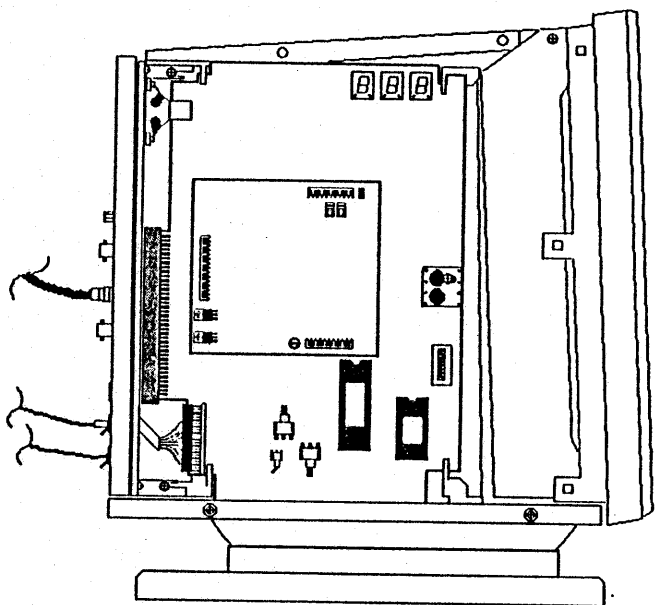
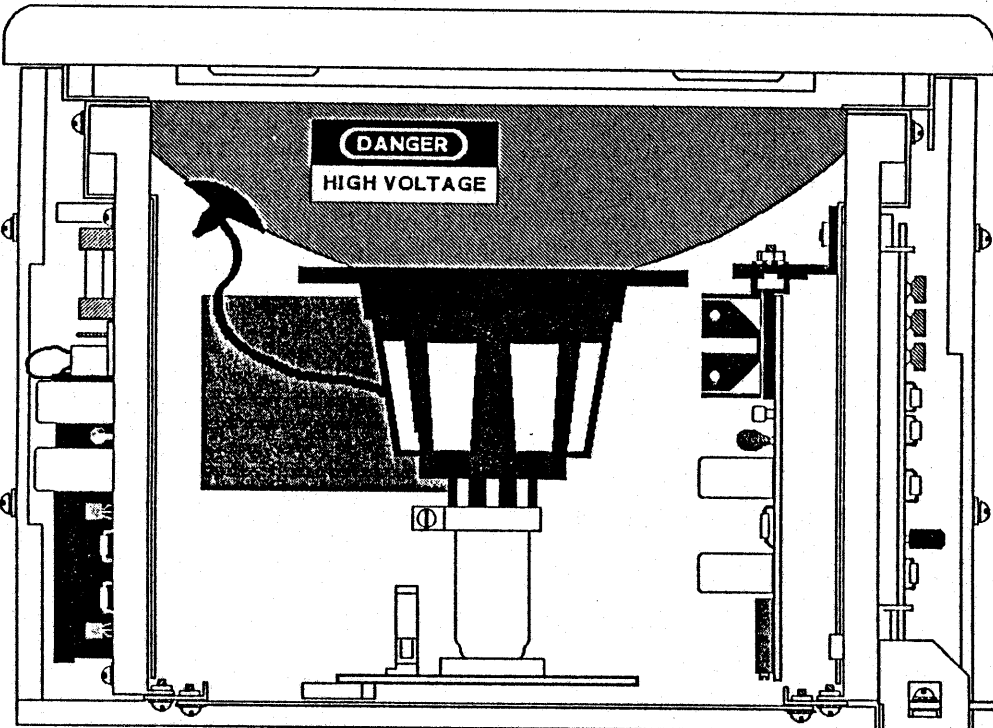
BASIC DIGITAL AUDIO OUTPUT SYSTEM

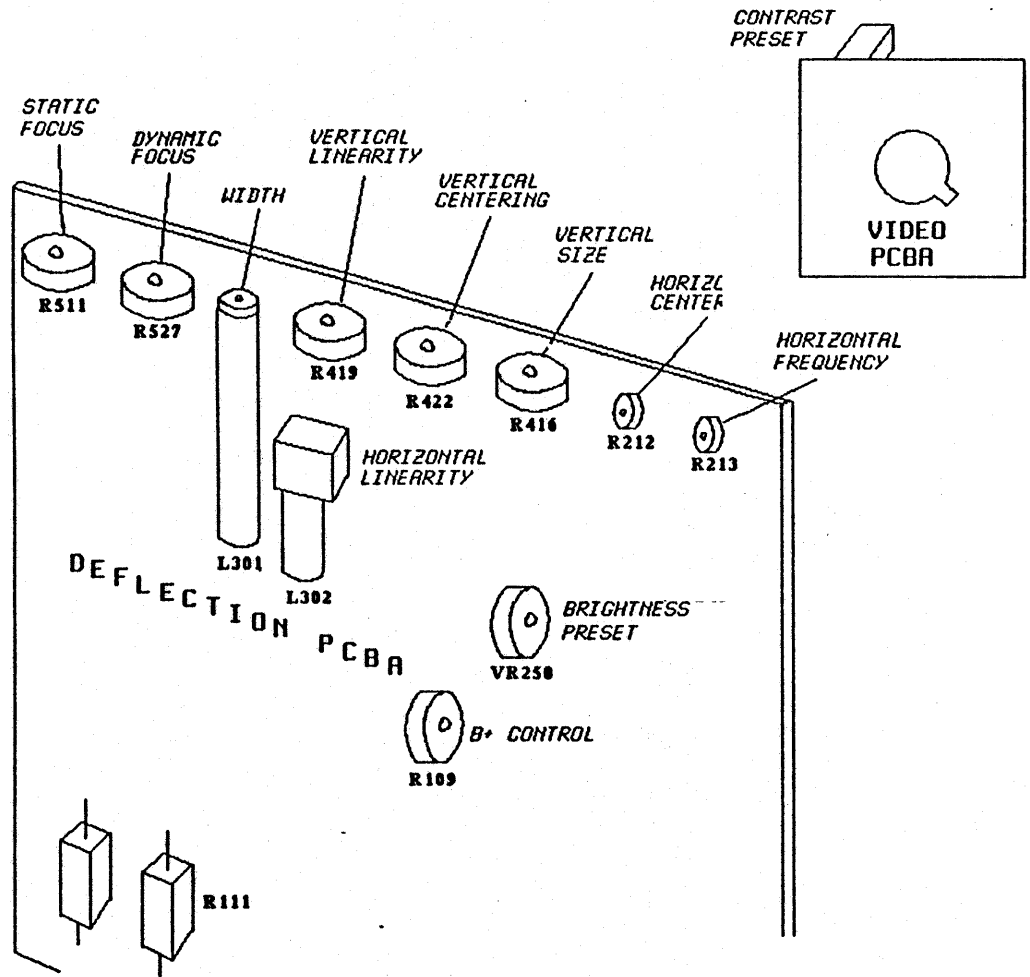


LEMO MONITOR BLOCK DIAGRAM

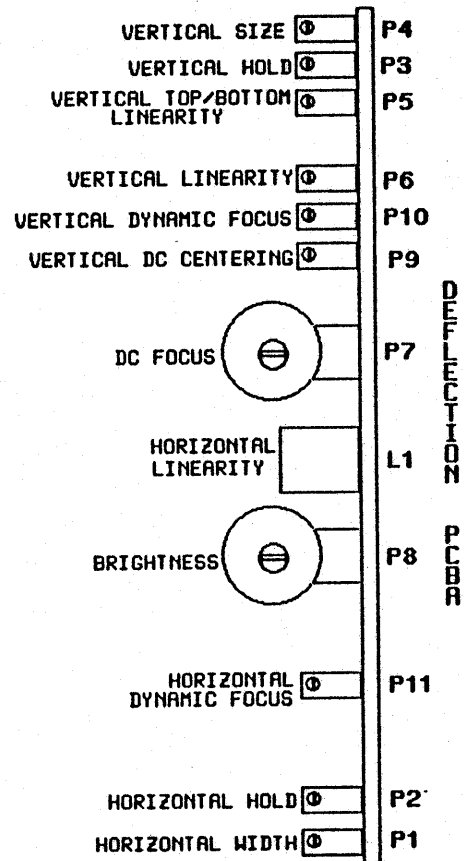


PEV MONITOR BLOCK DIAGRAM

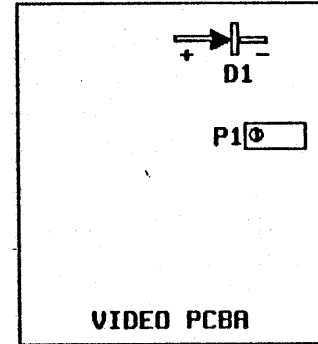




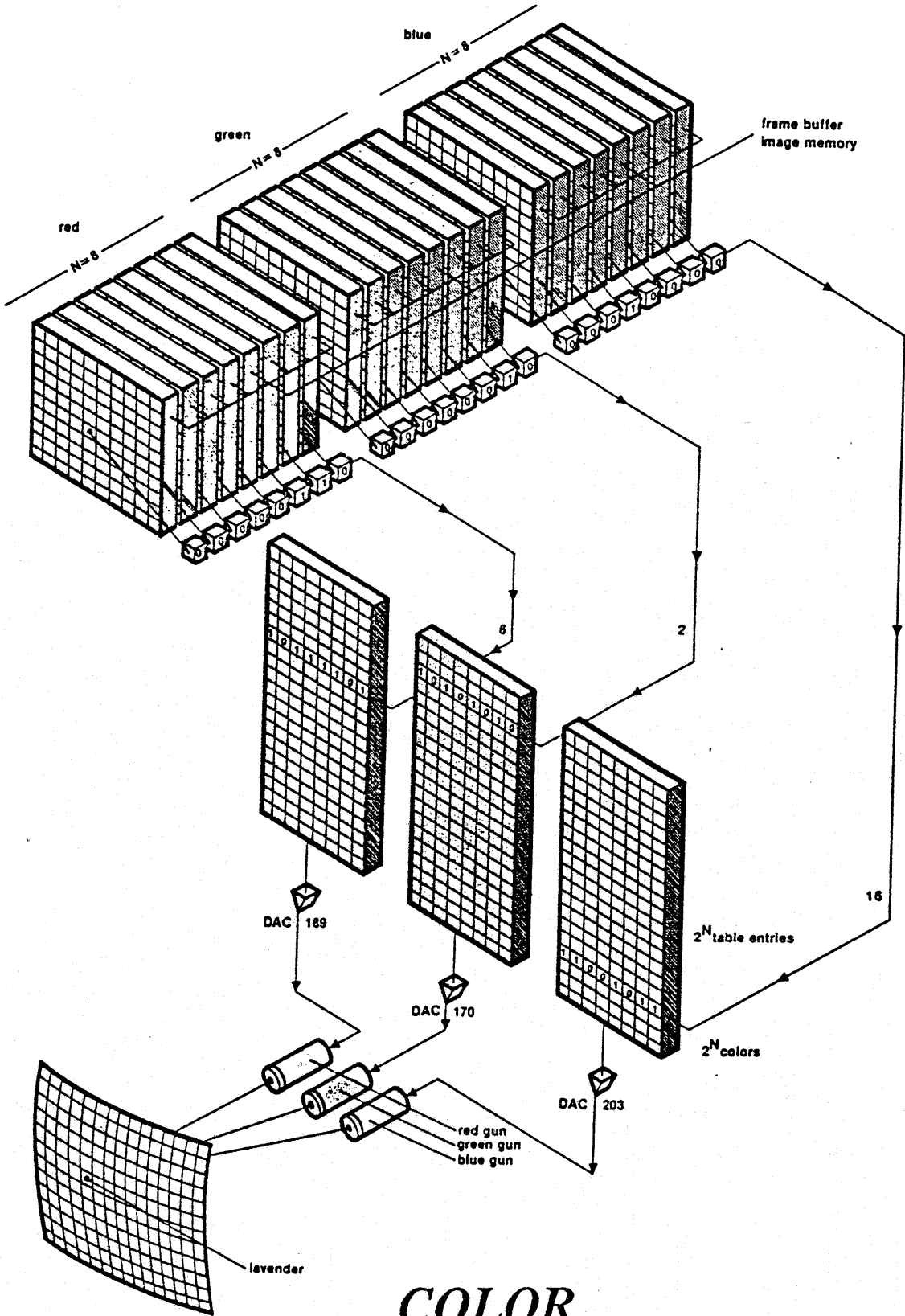
PHILLIPS DISPLAY ADJUSTMENTS



DEFLECTION PCB A



MONITERM DISPLAY ADJUSTMENTS



COLOR SYSTEM HARDWARE OPTIONS

COLOR SYSTEM	COMPONENT PCBA'S							RESOLUTION	CONSOLES
	COLOR CONTROLLER	COLOR PADDLE	CHROMA PADDLE	BROADCAST PADDLE	COLOR MEMORY	CAD BUFFER	CAD BUFFER PADDLE		
	170140	170144	170387	170328	170136	170324	170314		
STANDARD									
8-BIT	1	1 -- or -- 1			1				
8+8	1		1		2				
16-BIT	1	1 -- or -- 1			2				
16+8	1		1		3				
24-BIT	1	1 -- or -- 1			3				
32-BIT	1		1		4				
BROADCAST RESOLUTION									
ALL MODES	1			1	1			b c	HITACHI
(UP TO 24-BITS WITH 8-BIT OVERLAY)									
CAD BUFFER									
8 BITS + 1 O.L.						1	1	e	CAD-AMTRON CAD-TEKTRONIX

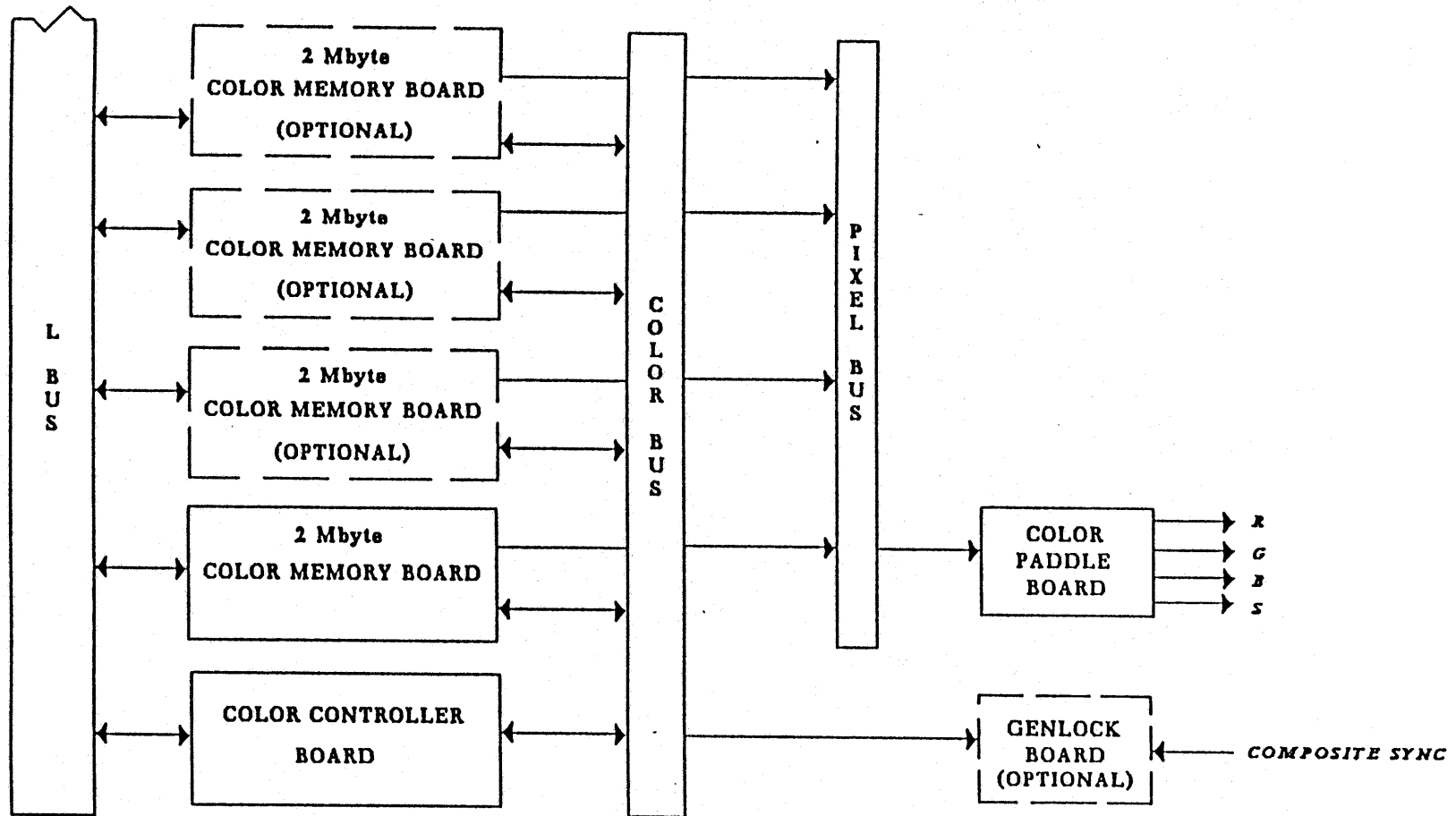
RESOLUTION NOTES:

- a - HI-RES (1280 X 1024) 30 HZ FRAME RATE - INTERLACED
- b - NTSC (640 X 480) 30 HZ FRAME RATE - INTERLACED
- c - PAL (640 X 575) 25 HZ FRAME RATE - INTERLACED
- d - PAL (865 X 575) 25 HZ FRAME RATE - INTERLACED
- e - CAD HI-RES (1024 x 1024) 60 HZ FRAME RATE - NON-INTERLACED

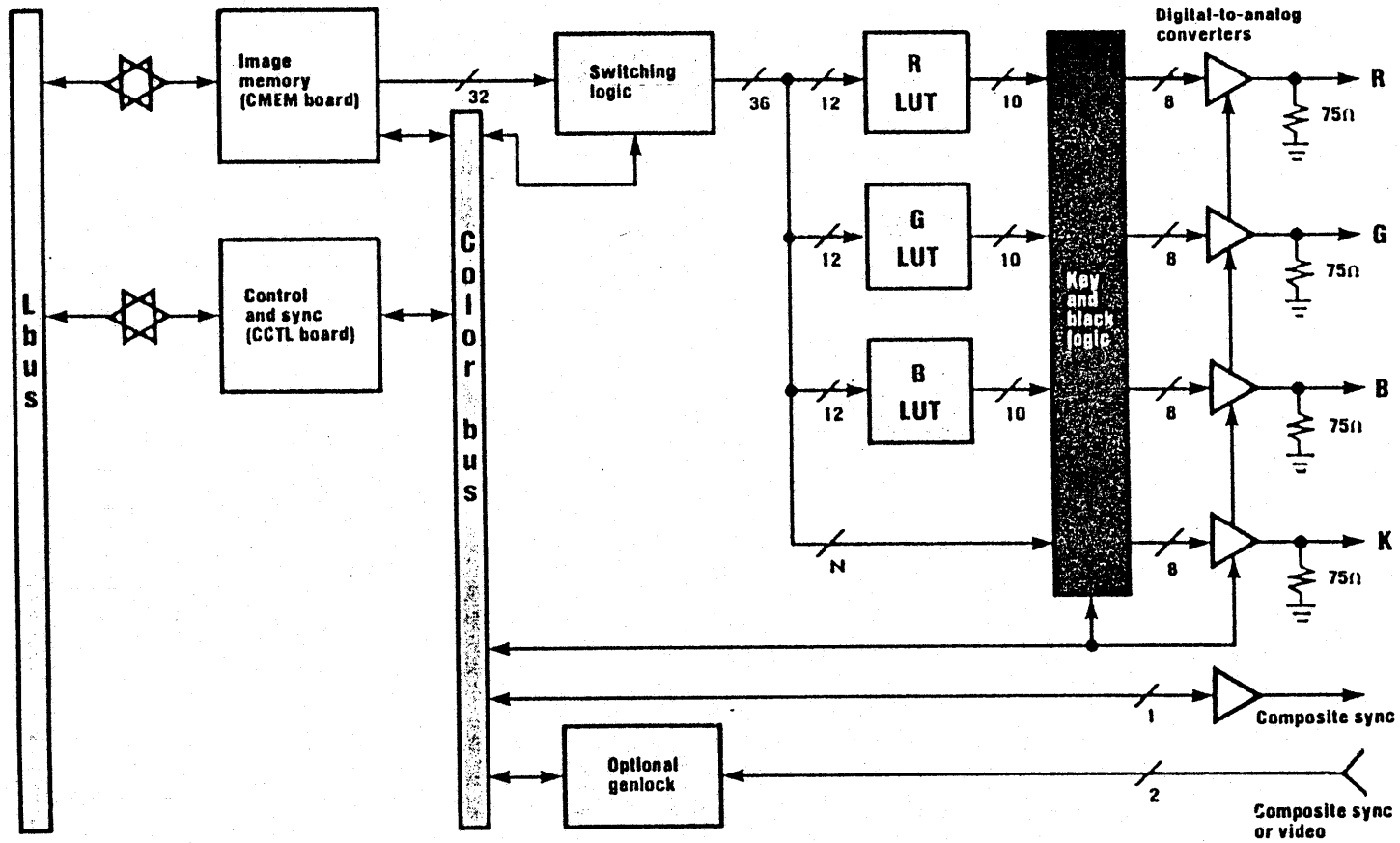
COLOR SYSTEM HARDWARE OPTIONS

OPTION	REQUIRED PCBA'S			NOTES
	FRAME GRABBER 170403	FRAME GRABBER PADDLE 170281	GENLOCK PADDLE 170285	
FRAME GRABBER	1	1		FUNCTIONS INDEPENDENT OF ANY COLOR SYSTEM
GENLOCK			1	MAY BE USED WITH STANDARD SYSTEM OR BROADCAST SYSTEM
GRAPHICS TABLET				MAY BE USED WITH ANY COLOR SYSTEM
SERIAL CONVERTER UNIT	1	1		FUNCTIONS INDEPENDENT OF ANY COLOR SYSTEM
COLOR CONSOLE UNIT				MAY BE USED WITH CAD BUFFER SYS. ONLY REQUIRES CAD COLOR CONSOLE SOFTWARE LOADED

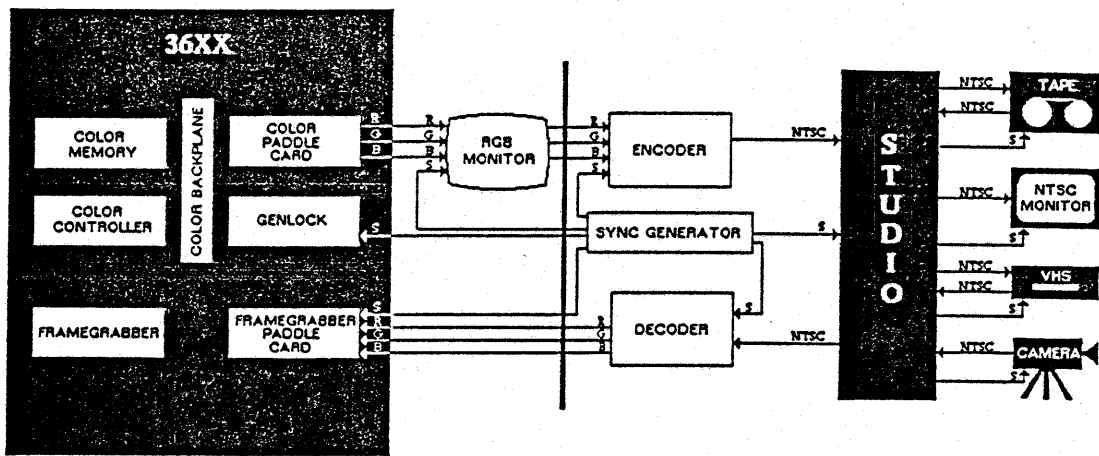
COLOR SOFTWARE OPTIONS



STANDARD COLOR SYSTEM

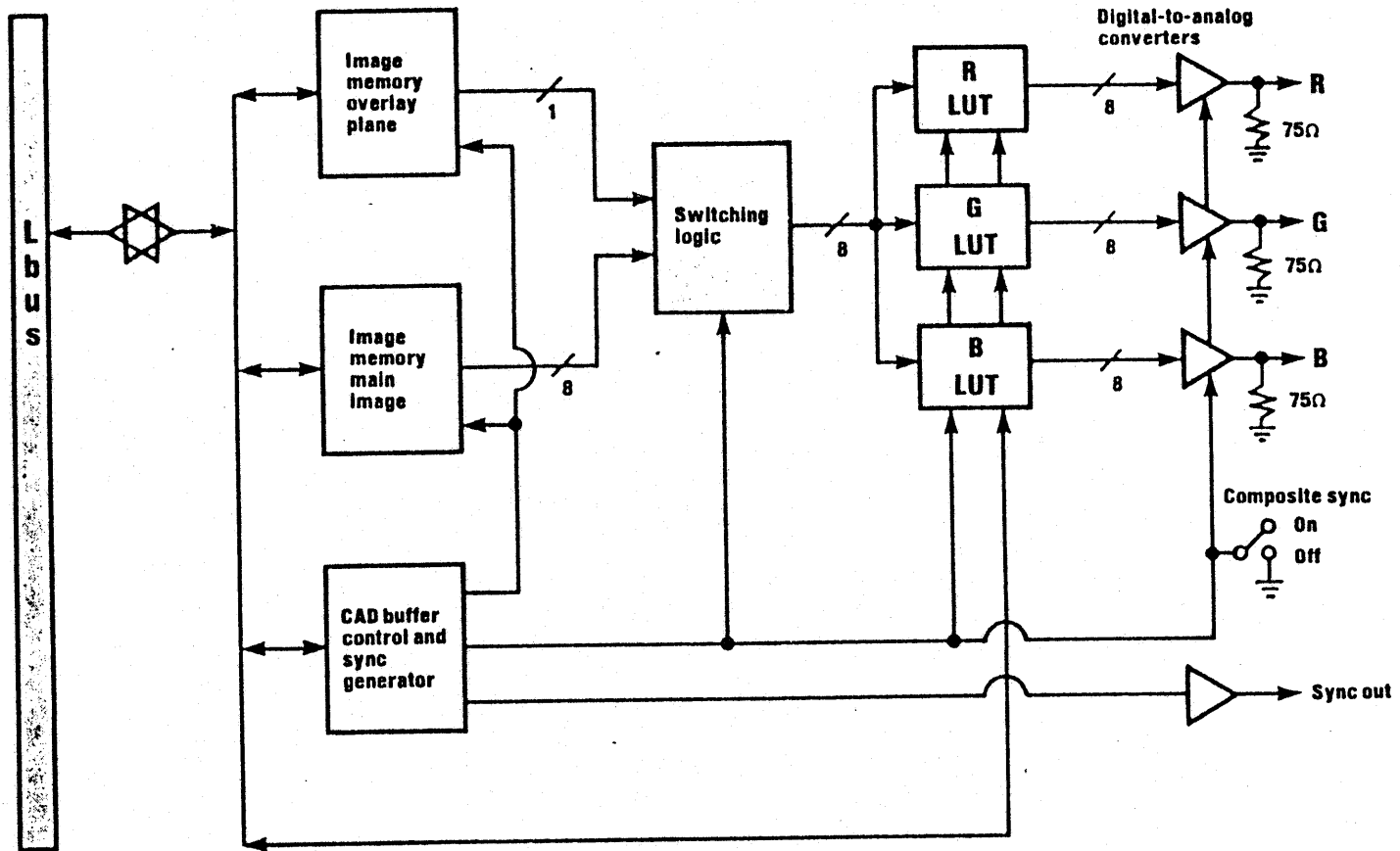


BROADCAST COLOR SYSTEM

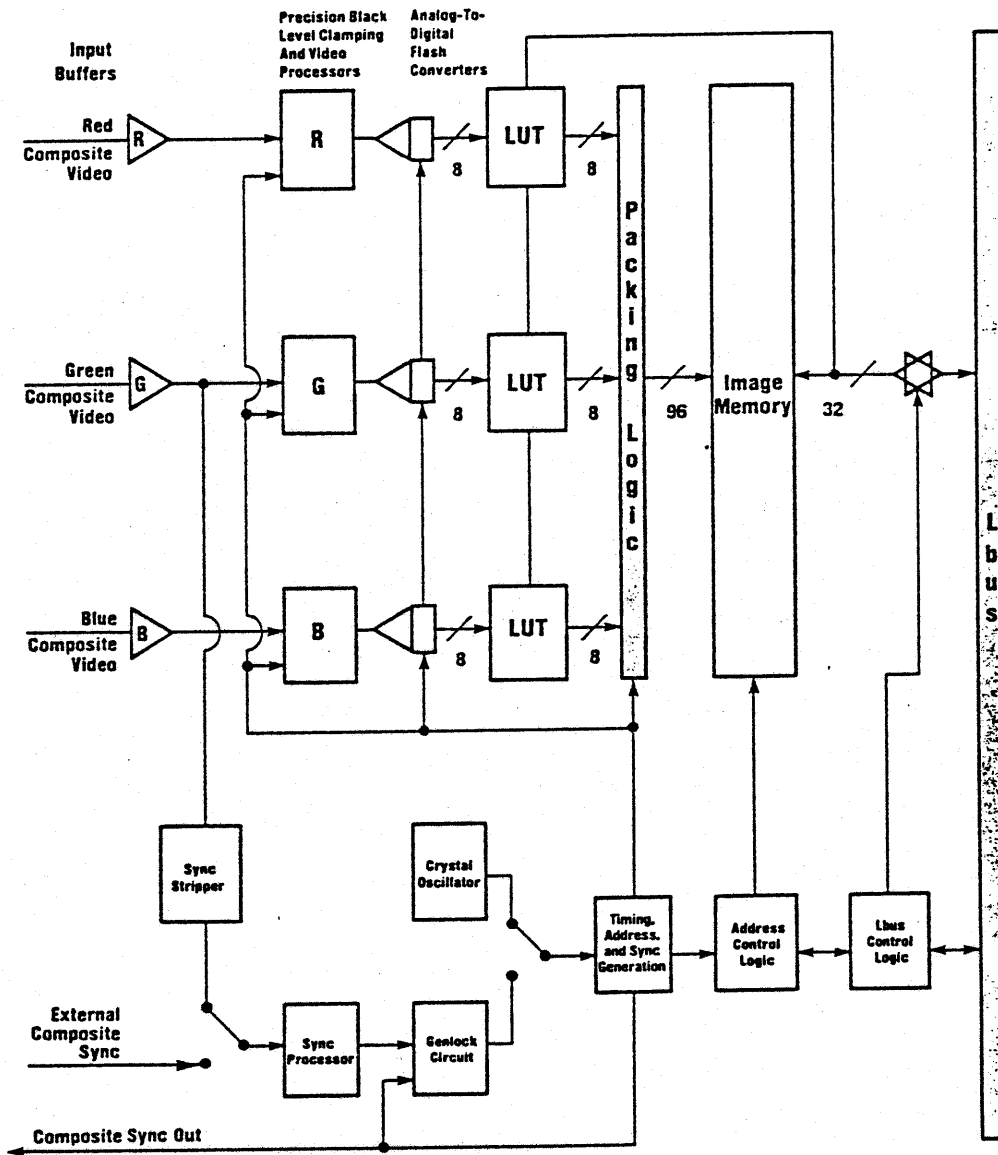


NOTE: The picture is divided in two to show customer responsibilities versus Symbolics supported hardware.

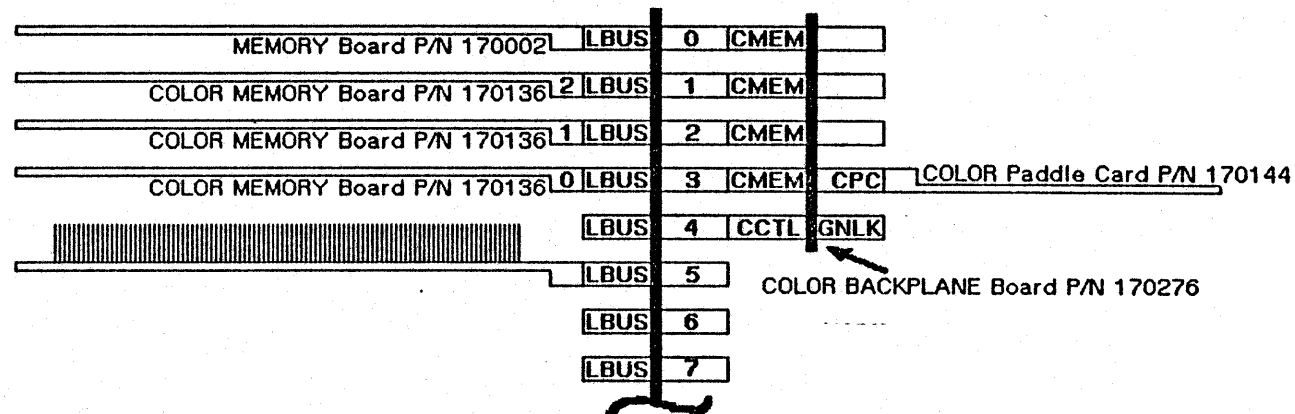
STUDIO ENVIRONMENT



CAD-BUFFER



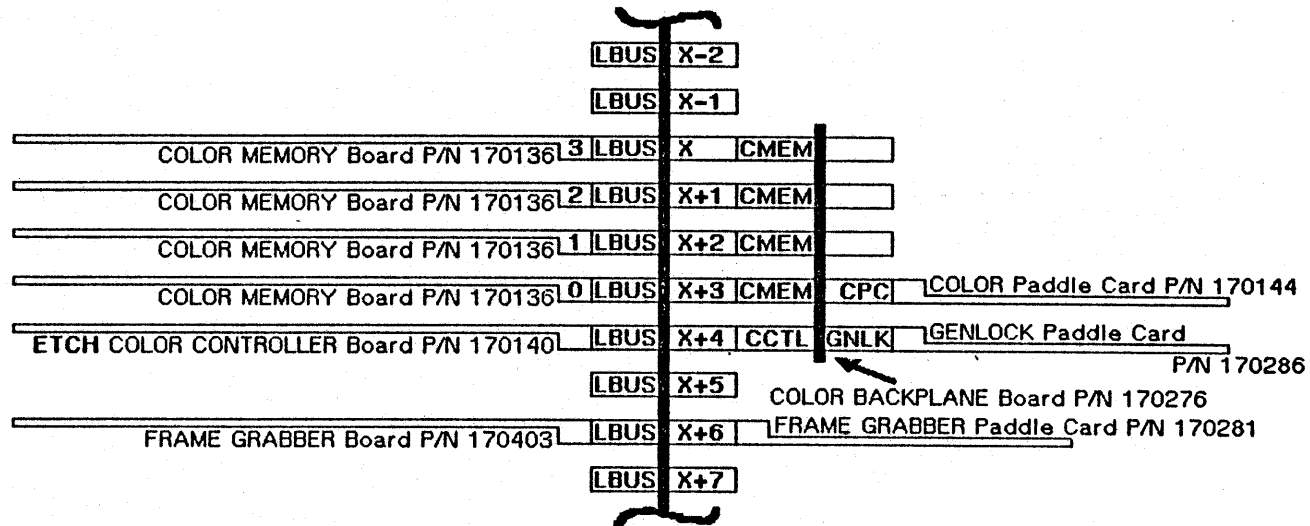
FRAME GRABBER



NOTES:

1. When using a Wire-Wrap Color Controller Board, the Color Backplane board **MUST** be plugged into the first 5 slots of the backplane. There **MUST** be WW connections between LBUS4 and LBUS5.
2. Color memory boards are plugged in, next to each other, starting with the slot to the left of the Color Controller.
3. The Color Paddle Card always goes behind the first Color Memory board.

3670/3600 Color Option Wire-Wrap Color Controller ONLY



NOTES:

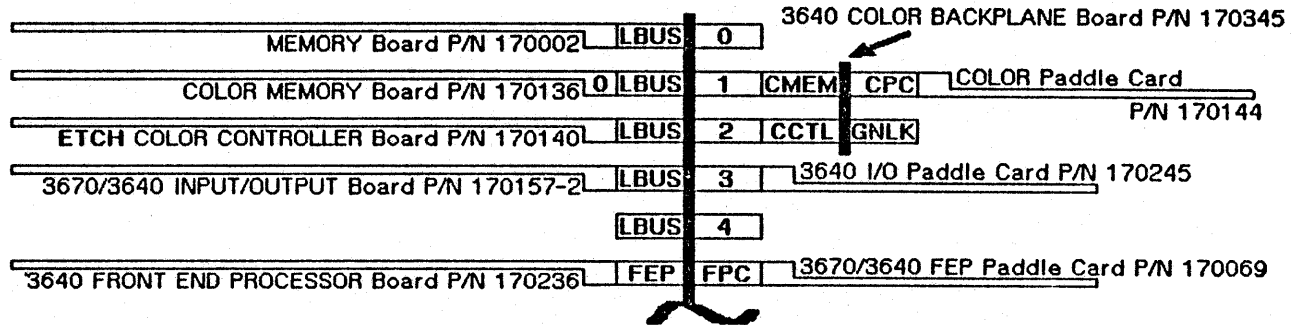
1. When using an ETCH Color Controller Board, the Color Option can be placed ANYWHERE there is five (5) adjacent empty LBUS slots.
2. Color memory boards are plugged in, next to each other, starting with the slot to the left of the Color Controller.
3. The Color Paddle Card always goes behind the first Color Memory board.
4. The OPTIONAL Genlock Paddle Card ALWAYS goes behind the Color Controller Board.
5. The OPTIONAL Frame Grabber Board and its Paddle Card can plug into ANY empty LBUS slot.

3670/3600 Color Options

ETCH Color Controller ONLY

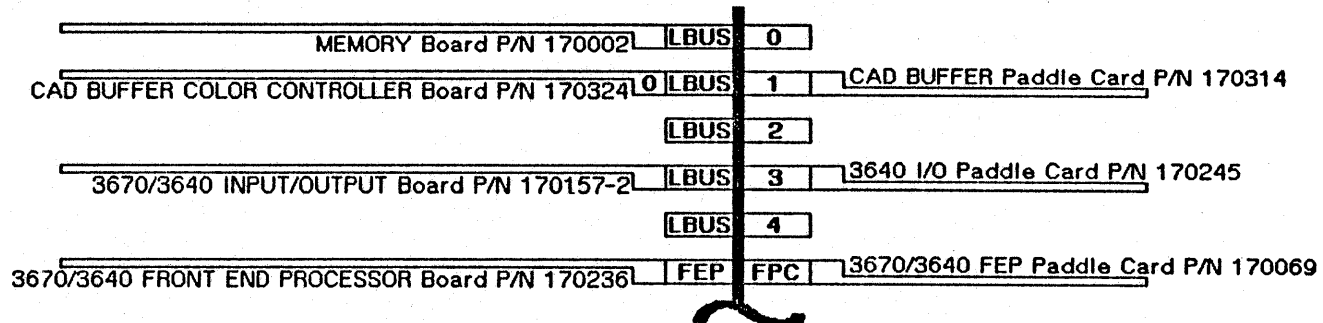
Standard 8-Bit Color Option

Viewed from top looking down

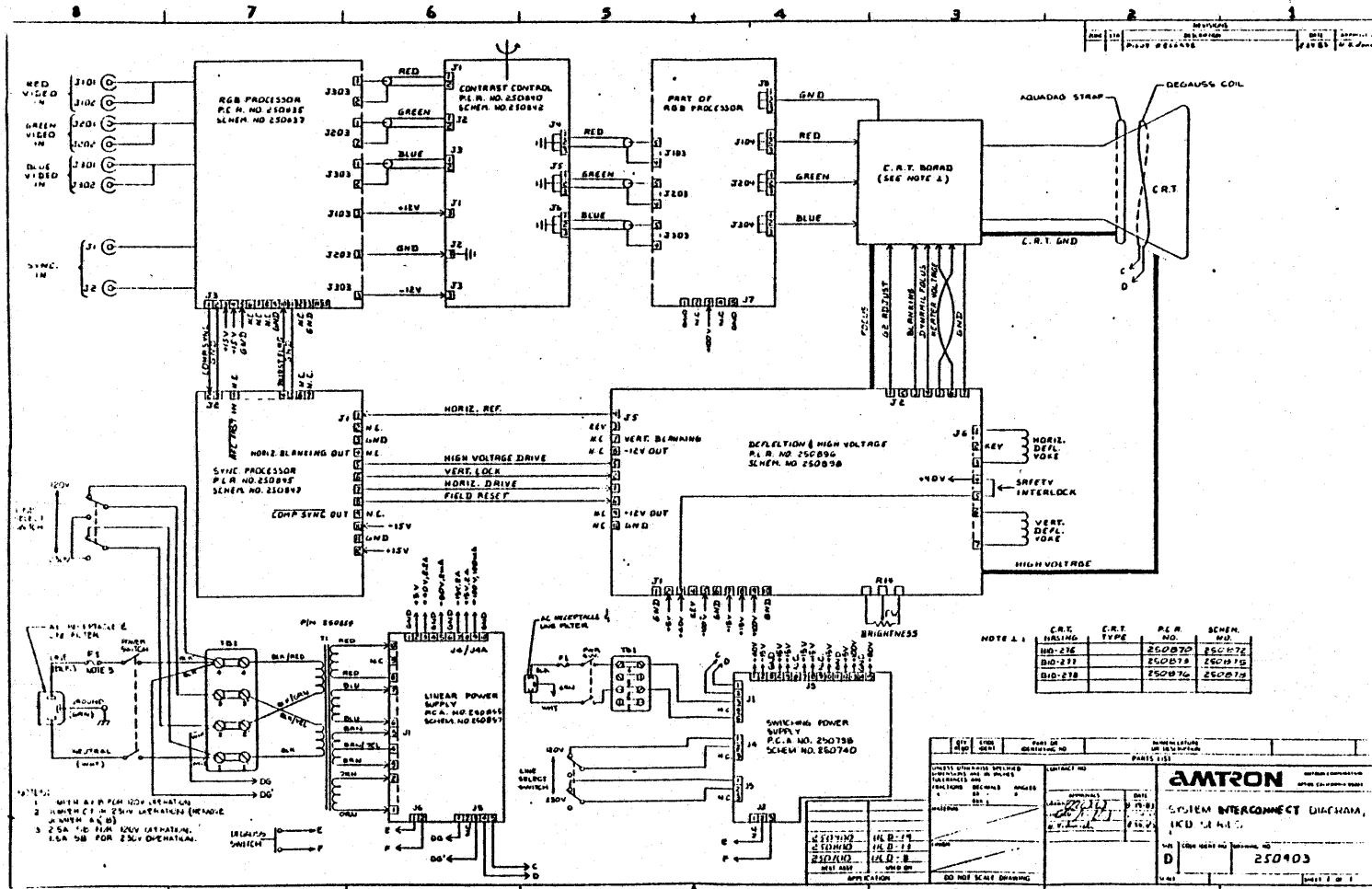


CAD Buffer Color Option

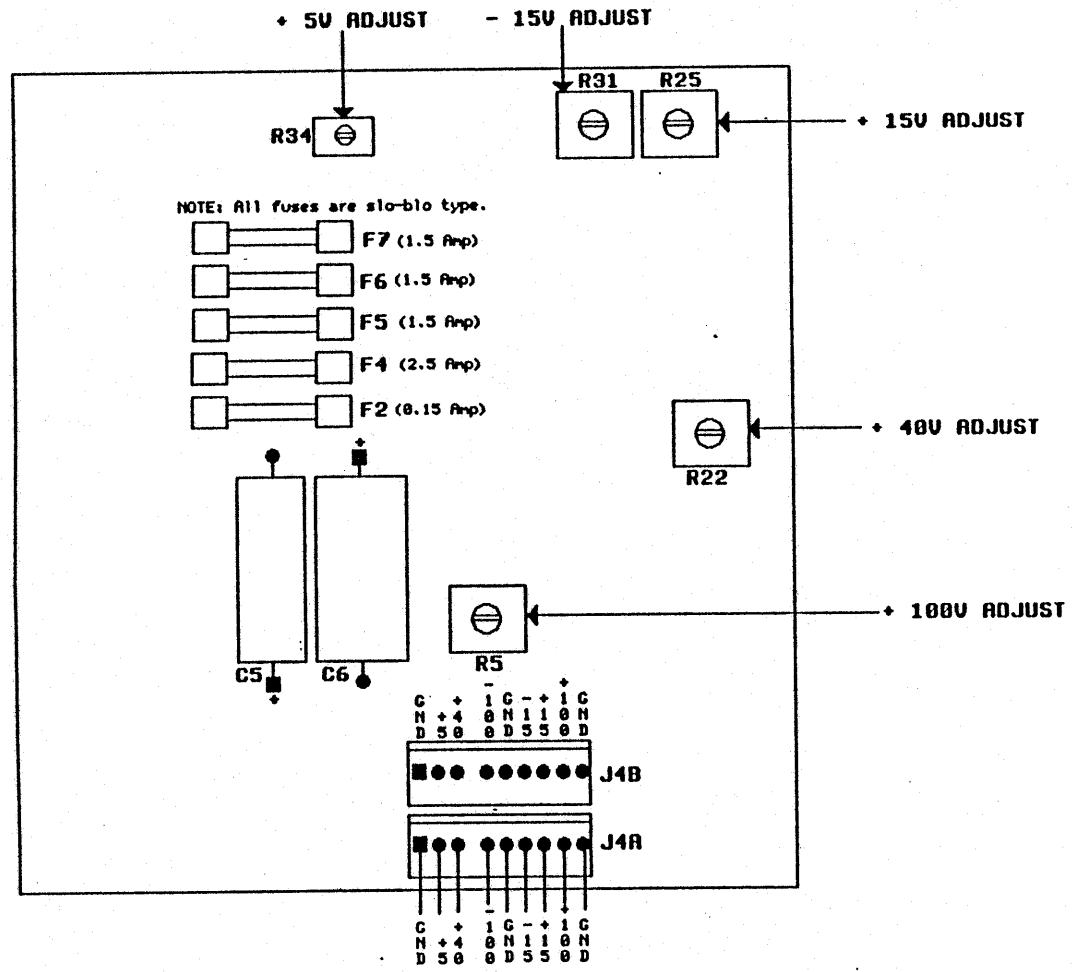
Viewed from top looking down



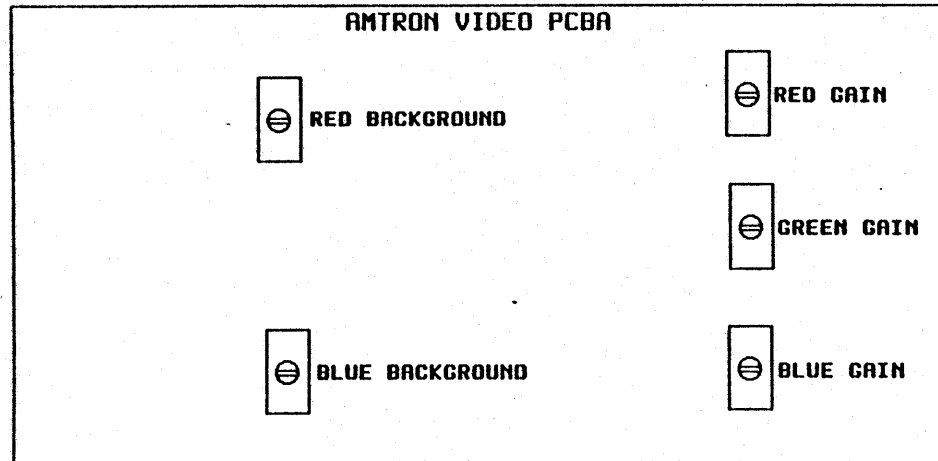
3640 Color Options



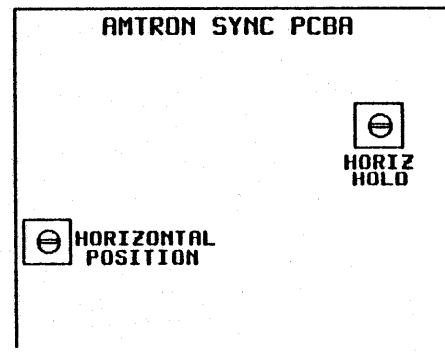
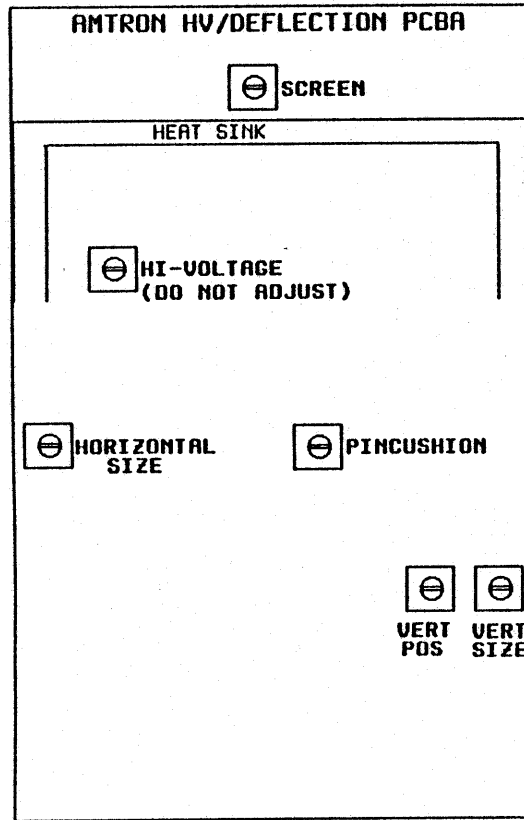
AMTRON SYSTEM INTERCONNECT DIAGRAM



AMTRON LINEAR POWER SUPPLY

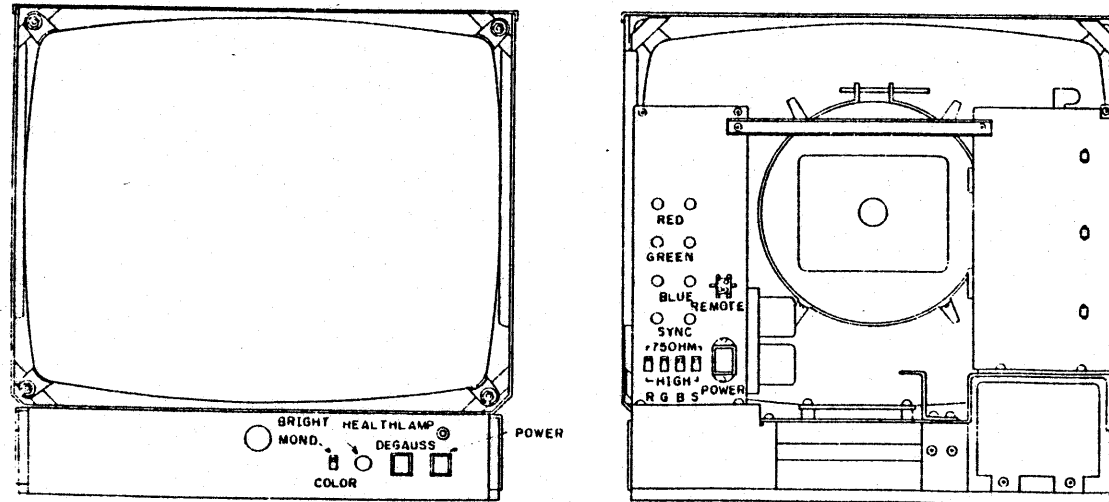


AMTRON VIDEO ADJUSTMENTS

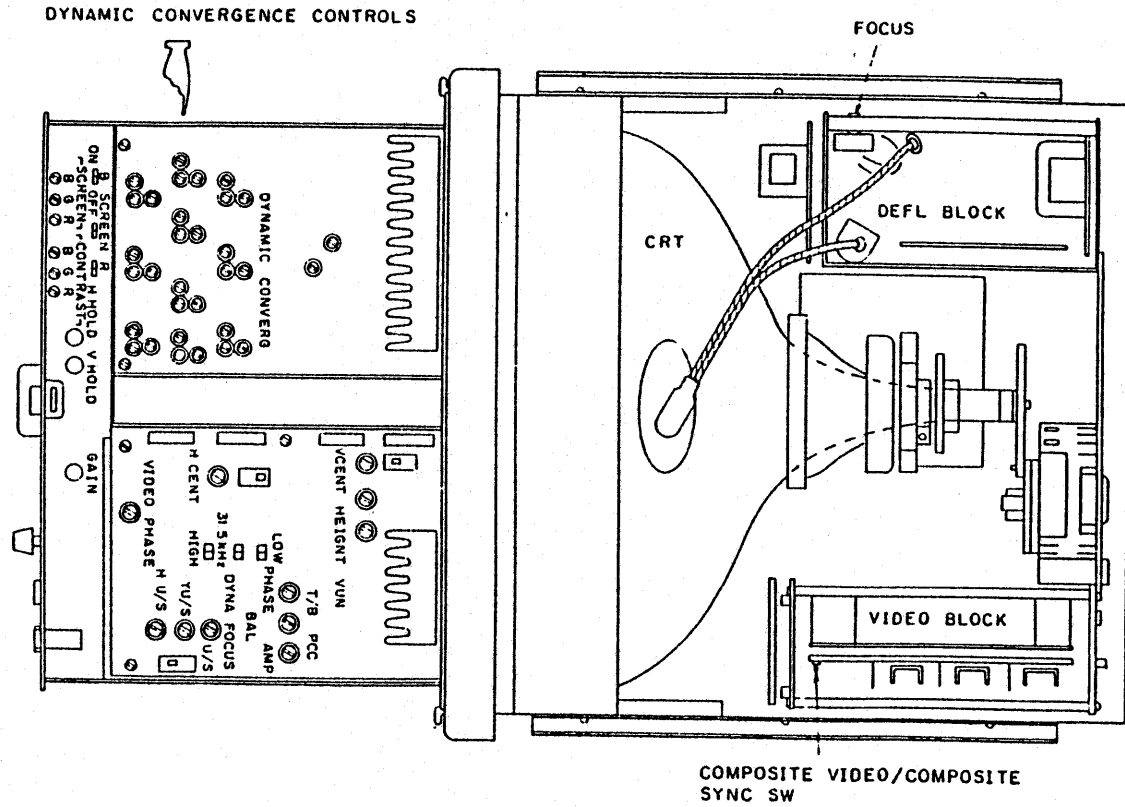


(FRONT OF MONITOR)

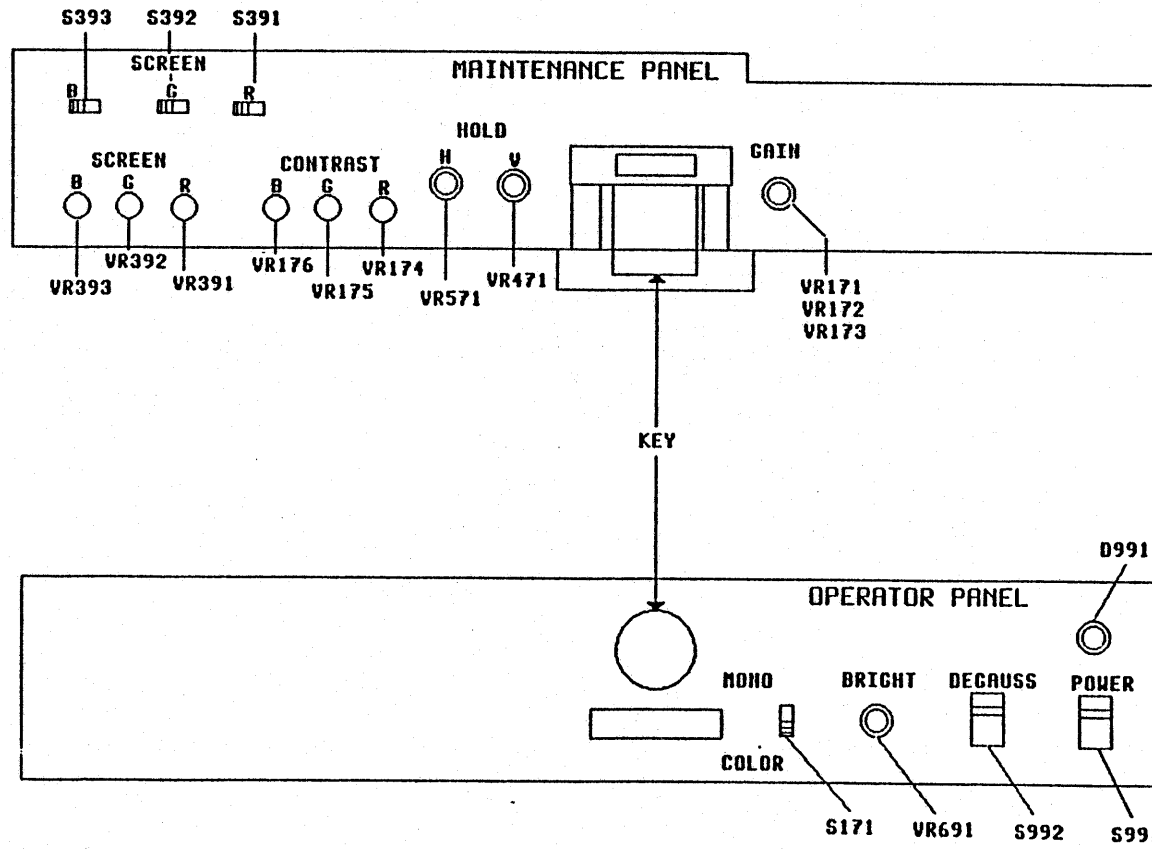
AMTRON DEFLECTION & SYNC ADJUSTMENTS



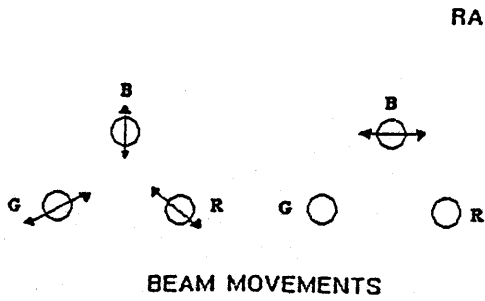
AYDIN FRONT & BACK PANELS



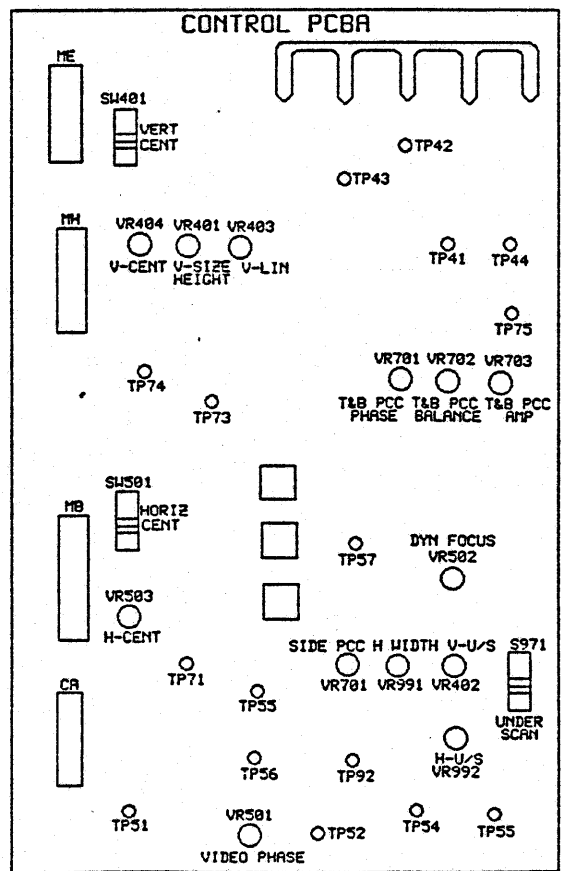
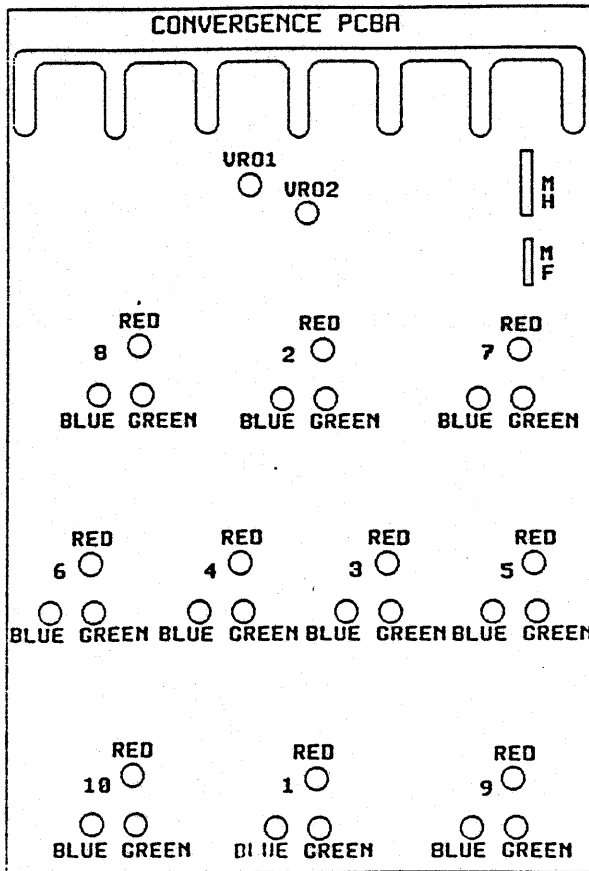
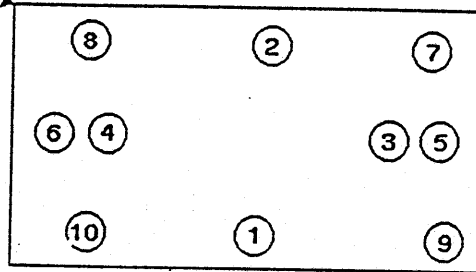
AYDIN BLOCK CONFIGURATION



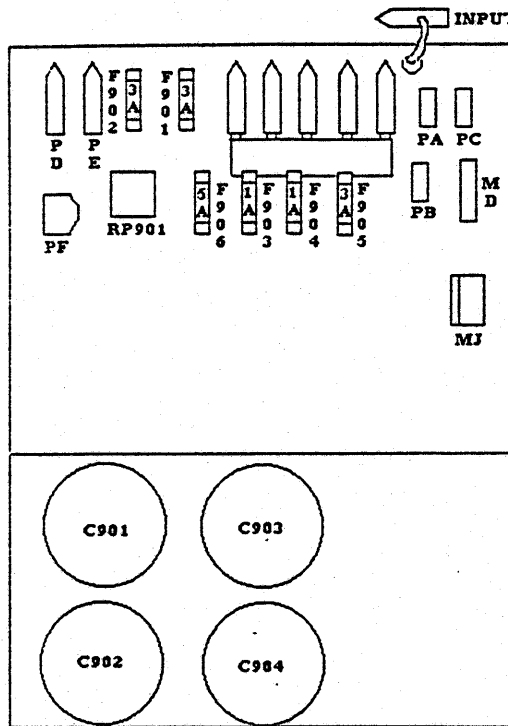
AYDIN MAINTENANCE AND OPERATOR
PANEL ADJUSTMENTS



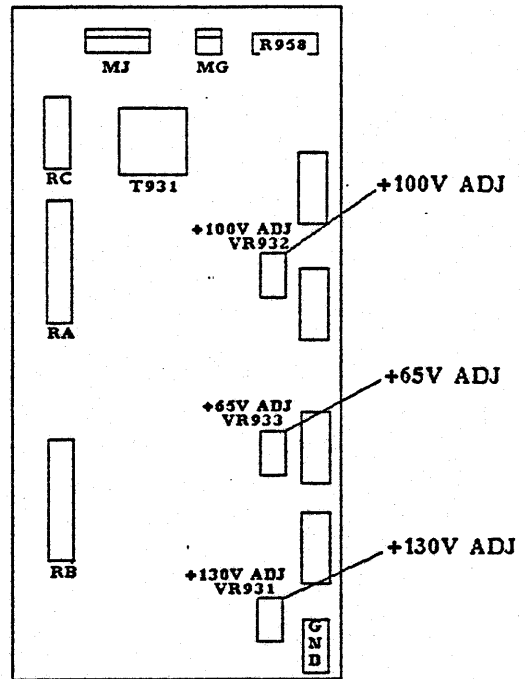
RASTER



AYDIN CONVERGENCE AND DEFLECTION ADJUSTMENTS

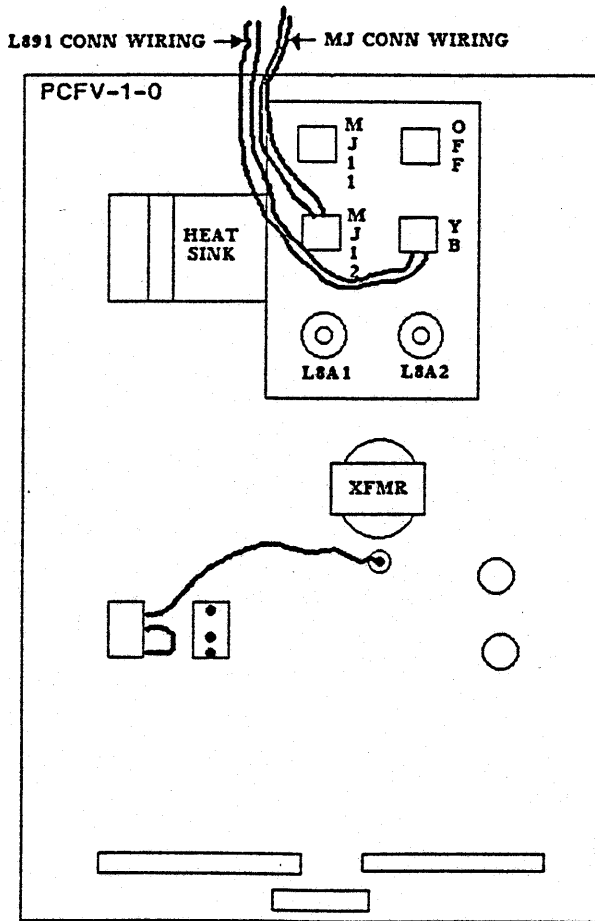


PCB-POWER-RECTIFIER



PCB-POWER-REGULATOR

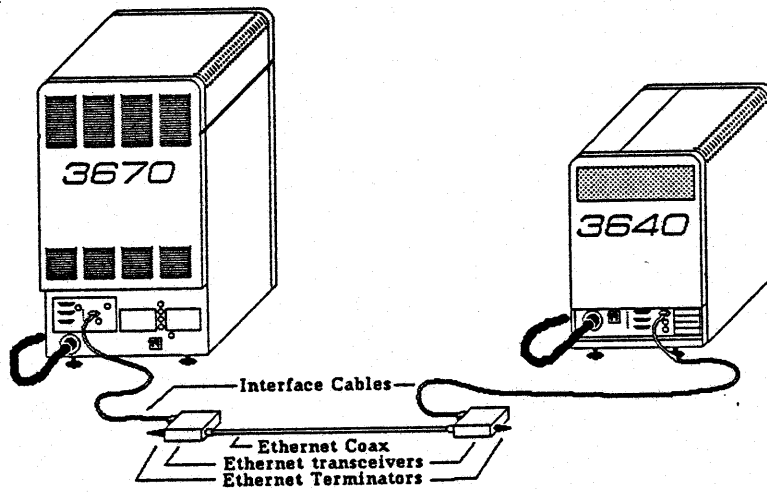
AYDIN PCB - POWER RECT
AND PCB - POWER REG ADJUSTMENTS



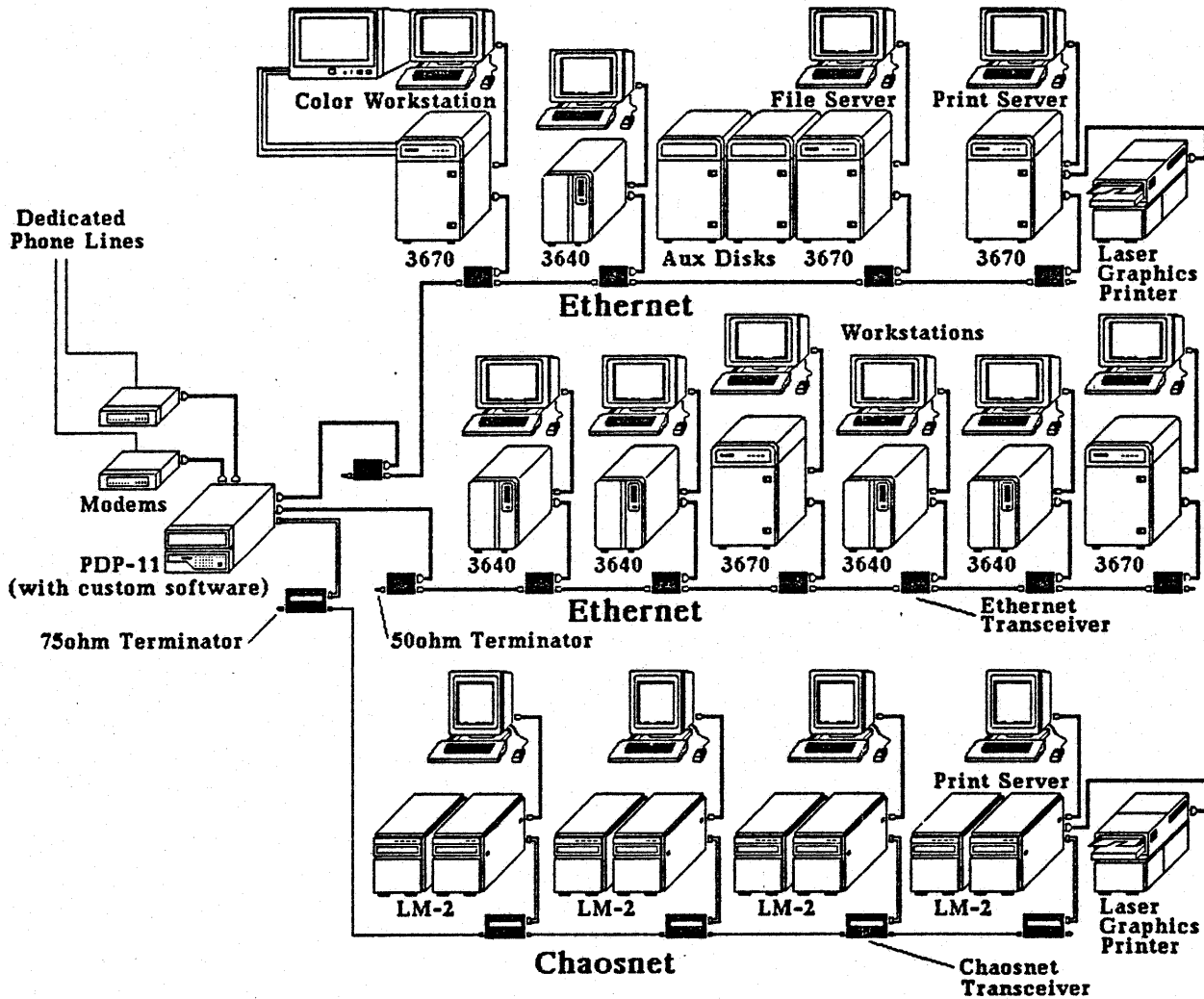
LOCATED ON LEFT REAR OF CHASSIS

VIEW FROM FRONT

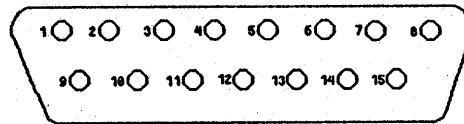
DYNAMIC BLUD ADJUSTMENT



NETWORKING

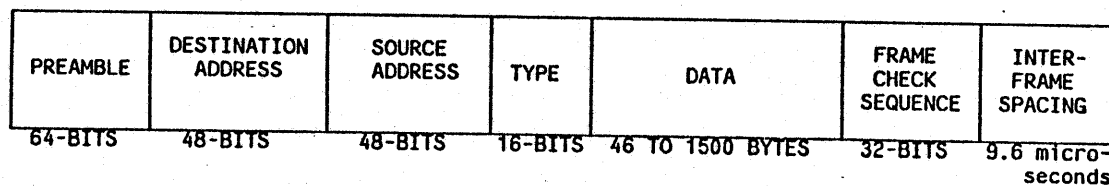


symbolics Local Area Network (LAN)



PIN	SIGNAL	PIN	SIGNAL
1	SHIELD	9	COLLISION PRESENCE -
2	COLLISION PRESENCE +	10	TRANSMIT -
3	TRANSMIT +	11	N/C
4	N/C	12	RECEIVE -
5	RECEIVE +	13	+12V
6	+12V RETURN	14	N/C
7	N/C	15	N/C
8	N/C		

**TRANSCEIVER CABLE CONNECTOR
AND PIN OUT**



NOTE: 1 BYTE = 8-BITS

ETHERNET FRAME FORMAT

CSR SWITCH SETTINGS

OCTAL #	4 2 1	4 2 1	4 2 1	4 2 1	4 2 1	4 2 1
BIT	17 16 15	14 13 12	11 10 9	8 7 6	5 4 3	2 1 0
CSR	7 (HARD-WIRED)	6	4	0	0	0
BINARY	1 1 1	1 1 0	1 0 0	0 0 0	0 0 0	0 0 0
LOCATION (- HARD-WIRED -)	U	U	U U U	U U U	U U -	JUMPERS -
		2	2 2 2	2 2 2	2 2	
		3	2 2 2	2 2 2	2 2	
SWITCH #		7	1 2 3	4 5 6	7 8	
POSITION		ON	OFF ON ON	ON ON ON	ON ON	

NOTE: SWITCH ON = LOGIC 0
SWITCH OFF = LOGIC 1

VECTOR SWITCH SETTINGS

OCTAL #	4 2 1	4 2 1	4 2 1
BIT	8 7 6	5 4 3	2 1 0
VECTOR	3	4	0
BINARY	0 1 1	1 0 0	0 0 0
LOCATION	U U U	U U U	HARD-WIRED
	2 2 2	2 2 2	
	3 3 3	3 3 3	
SWITCH #	1 2 3	4 5 6	
POSITION	ON OFF OFF	OFF ON ON	

NOTES: 1. U23-8 IS TEST/OPERATE SWITCH.
ON = TEST (LOGIC 0).
OFF = OPERATE (LOGIC 1).

2. BITS 0,1, AND 2 ARE HARD-WIRED TO LOGIC 0.

INTERRUPT BUS REQUEST PRIORITY

JUMPER BLOCK LOCATED AT U6: FACTORY SETTING - BR LEVEL 5
(Pins 8 & 9 connected)
ALTERNATE SETTING - BR LEVEL 4
(Pins 1 & 16 connected - reverse
block 180 degrees)

INTERLAN UNIBUS ETHERNET CONTROLLER SWITCH SETTINGS

```
Command: (hostat)
Chaosnet host status report. Type Control-Abort to quit.
Site Name/Status Subnet N-in N-out abort lost crc ran bits other
481 ARES: THE GOD OF WAR 1 0 23 0 0 0 0 0 0
NIL
Command:
Command: █
```

Lisp Listener 1

01/14/86 14:56:53 PAUL

USER:

Run

+ A:>HERCULES>request-20.proto-request 787

HOSTAT FUNCTION

Processes	Areas	Meters	File System	Windows	Servers	Network	Help ^x	Quit	Hostat
<p>This is the Peek utility program. It shows a continually updating display of status about some aspect of the system, depending on what node it is in. The available nodes are listed below. Each has a name, followed by a single character in parentheses, followed by a description. To put Peek into a given node, click on the name of the node, in the command menu above. Alternatively, type the single character shown below.</p> <p>Processes (P): Show all active processes, their states, priorities, quanta, idle times, etc.</p> <p>Areas (A): Show all the areas in virtual memory, their types, allocation, etc.</p> <p>Meters (M): Show storage, disk, and GC meters.</p> <p>File System (F): Show all of our connections to various file servers.</p> <p>Windows (W): Show all the active windows and their hierarchical relationships.</p> <p>Servers (S): Show all active network servers and what they are doing.</p> <p>Network (N): Show all local networks, their state and active connections, and network interfaces.</p> <p>Help (<HELP>): Explain how this program works.</p> <p>Quit (Q): Bury PEEK window, exiting PEEK</p> <p>Hostat (H): Show the status of all hosts on the Chaosnet.</p> <p>There are also the following single-character commands: Z (preceded by a number): Set the amount of time between updates, in seconds. By default, the display is updated every two seconds. <SPACE>: Immediately update the display.</p>									
Hostat									

01/13/86 16:00:50 PAUL

USER:

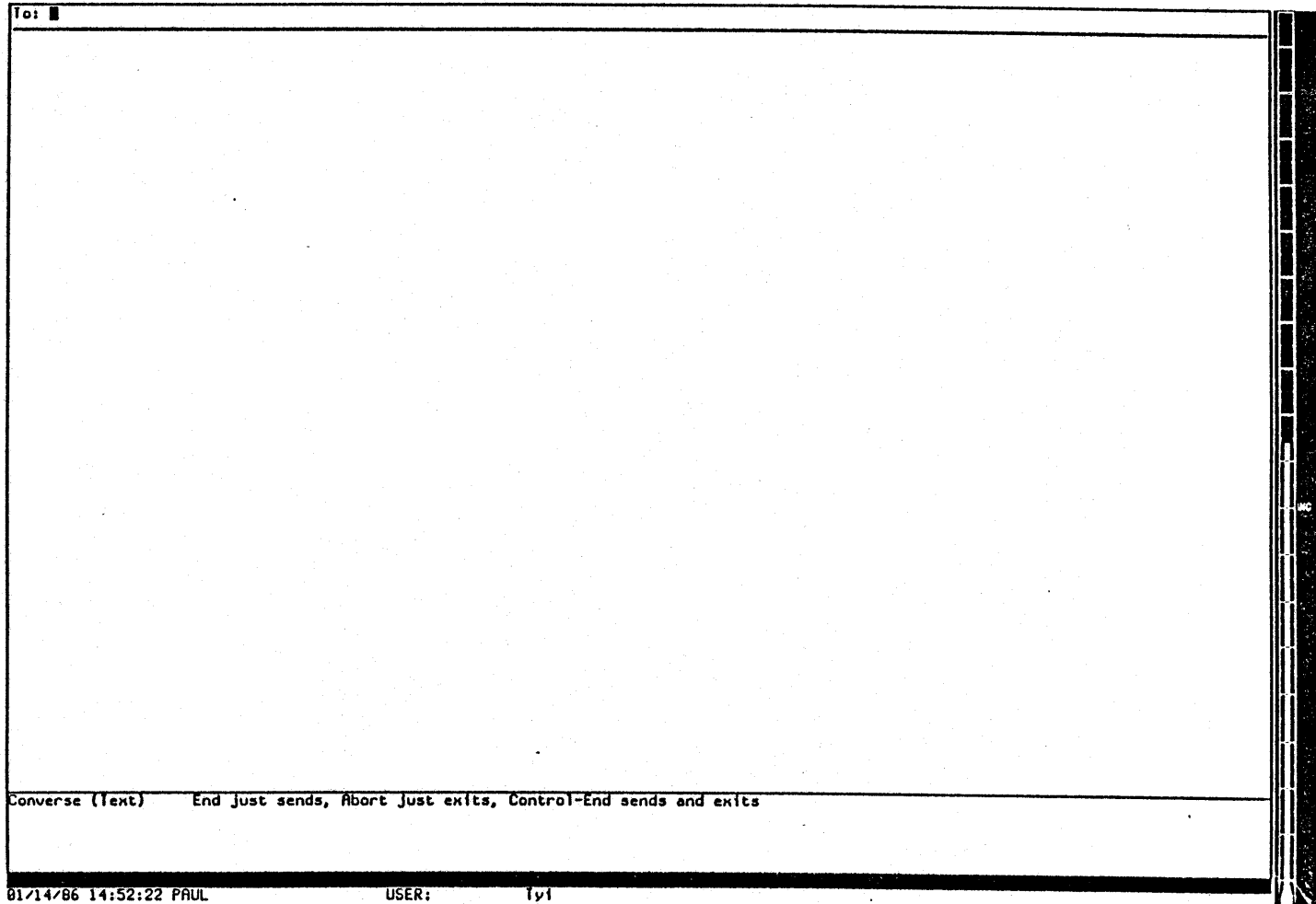
Typ or Timeout

PEEK WINDOW

To: ■

Converse (text) End just sends, Abort just exits, Control-End sends and exits

01/14/86 14:52:22 PAUL USER: Ty1



CONVERSE

No.	Lines	Date	From:To	Subject or Text
Profile Configure Survey Sort		Quit Save Get inbox Map over		Delete Next Jump Move
				Undelete Previous Keywords Select
				Reply Continue Mail Other
Message				

01/14/86 14:53:36 PAUL

USER:

Run

+ R:>HERCULES>request-17.proto-request 768

ZMAIL

The System Menu		
Windows	This window	Programs
Back Create	Attributes	Lisp
Back Select	Refresh	Edit
Back Split Screen	Bury	Inspect
Back Layouts	Kill	Mail
Back Edit Screen	Reset	Font Edit
Back Set Mouse Screen	Arrest	Trace
	Un-Arrest	Emergency Break
		<u>Namespace</u>
		Flavor Examiner
		Document Examiner
		Hardcopy
		File System
		Picture Editor

[13:30:09 Performing Chorus, "Kommt, ihr Toechter", from the "Matthaeus-Passion", by Johann Sebastian Bach]
 [13:38:37 Performing Chorus, "Wir nuessen durch viel Truebsal..", from BWV 146, by Johann Sebastian Bach]
 [13:45:18 Performing Fugue in E-flat, "St. Anne", by Johann Sebastian Bach]
 [13:52:22 Performing Prelude in E-flat, "St. Anne", by Johann Sebastian Bach]
 [15:47:11 Performing Prelude sur les 3eme & 4eme Inns. by Nicolas Giguere.]
 [15:47:50 From ARRAKIS: Request for Screen Hardcopy of 15:50 completed.]

Command:
 Command: [Abort]
 Back to Lisp Top Level in Lisp Listener 1.

Command: .....	.....	.....	.....
Edit Stops	Play Musical Selection	Set Time	Start GC
Enable Services	Quiet	Set User ID	Undelete File
Expunge Directory			

You are entering a Command Processor command.
 The only possible completion of the text you have typed is Show Directory.

⊞ :Show directory [Abort]
 Back to Lisp Top Level in Lisp Listener 1.

⊞ fep1: [Abort]
 Back to Lisp Top Level in Lisp Listener 1.

⊞ [Abort]
 Back to Lisp Top Level in Lisp Listener 1.

⊞ show [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
 Lisp Listener 1

Top

lost	crc	ram	bits	other
0	0	0	0	0

Bottom

Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Copy Locally	Quit	

Lisp Listener 1

01/14/86 14:59:32 PAUL USER: Run A:>HERCULES>request-10.request.1 102 26128

NAMESPACE OBJECT EDITOR

(locally)

Top

Bottom

Help	<u>E</u> dit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	

No current object. Click on Edit, View, or Create.

ach].
h]

ations

ZMACS (Fundamental) *Buffer-1*
[15:04:16 Performing Fugue in G major, "The Jig", by Johann Sebastian Bach]

Edit an existing object
06/18/85 15:39:31 Screen Hardcopy USER: Tyi

NAMESPACE EDITOR MENU

(locally)

Top

Choose the class of object to edit.

- User
- Printer
- Network
- Host
- Site
- Namespace

Help
View
Add Name

ve
ete
it

Create
Primary Name

ach]
h]

ations

ZMRC5 (Fundamental) *Buffer-1*
[15:04:16 Performing Fugue in G major, "The Jig", by Johann Sebastian Bach]

(locally)

Top

Bottom

Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	

Enter a name for the host to be edited: mercury

ech]
h]

ations

ZMRC5 (Fundamental) *Buffer-1*
[15:04:16 Performing Fugue in G major, "The Jig", by Johann Sebastian Bach]

Create a new object by copying this one
06/18/85 15:40:33 Screen Hardcopy

USER: Tyl

HOST NAME

Editing: Host SCH|MERCURY (locally)

More above

Service: **Set:** UPTIME CHAOS-SIMPLE UPTIME-SIMPLE *Global-name*
 Service: **Set:** LOGIN CHAOS TELNET *Global-name*
 Service: **Set:** SEND CHAOS SEND *Global-name*
 Service: **Set:** MAIL-TO-USER CHAOS CHAOS-MAIL *Global-name*
 Service: **Set:** NAMESPACE CHAOS NAMESPACE *Global-name*
 Service: **Set:** NAMESPACE-TIMESTAMP CHAOS-SIMPLE NAMESPACE-TIMESTAMP *Global-name*
 Service: **Set:** LISPM-FINGER CHAOS-SIMPLE LISPM-FINGER *Global-name*
 Service: **Set:** FILE CHAOS QFILE *Global-name*
 Service: **Set:** *Global-name*
 Printer: ARAKEEN
 Bitnap Printer: ARAKEEN
 File Control Lifetime: 150000
 Print Spooler Options: **Set:** **Pair:** *Global-name* Token
 Spooled Printer: **Pair:** **Printer Set:** **Pair:** *Global-name* Token
 Server Machine: Token

More below

Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	

Click on an attribute entry to replace (L), delete (M) or edit (R) it.

ZMACS (Fundamental) *Buffer-1*
 [15:04:16 Performing Fugue in G major, "The Jig", by Johann Sebastian Bach]

Bump blinker against bottom to scroll up by one line. Any button to scroll one page.
 06/18/85 15:41:37 Screen Hardcopy USER: Tyi

HOST EDIT DISPLAY

Editing: User SCH|PAUL

Top

Lisp Name*: paul
 Home Host*: PHOENIX
 Mail Address*: Pair: paul PHOENIX
 Personal Name*: "paul dyer"
 Login Name: Pair: paul PHOENIX
 Login Name: Pair: Token Host
 Work Address: "irondale bldg chatsworth"
 Work Phone: x327
 Home Address: "20643 schoenborn st. canoga park, ca 91306"
 Home Phone: "(818) 882-5737"
 Birthday: 8-8-28
 Project: "technical training"
 Nickname: Token
 Supervisor: Token
 Affiliation: Token

More below

Help View Add Namespace	Edit Copy Locally	Save Delete Quit	Create Primary Name
-------------------------------	-------------------------	------------------------	------------------------

Enter a name for the host to be edited: mercury

(Brahms), by Johannes Brahms]
 aeus-Passion", by Johann Sebastian Bach]
 ron BWV 146, by Johann Sebastian Bach]
 an Bach]
 tian Bach]
 iou]r]
 ted.]

Enable Services
 Expunge Directory

Quiet

Set User ID

Start GC
 Undelete File

You are entering a Command Processor command.
 The only possible completion of the text you have typed is Show Directory.

- ☛ :show directory [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
- ☛ fep1: [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
- ☛ [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
- ☛ show [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
 Lisp Listener 1

Editing: Printer SCH|ARAKEEN

Top

Type: LGP
 Site: SCH
 Pretty Name: Arakeen
 Interface: DR11-C
 Interface Options: *Set: Pair:* PROM-VERSION REV-1H *Pair: Global-name Token*
 Host: ARRAKIS
 Dplt Logo: SYMBOLICS
 Fonts Widths File: Godzilla:>Rel-5>fonts>lgp-1>fonts.widths.newest
 Fornat: *Global-name*
 Protocol: *Global-name*
 Default Font: *Token*
 Header Font: *Token*
 Character Size: *Pair: Token Token*
 Page Size: *Pair: Token Token*
 User Property: *Pair: Global-name Token*

Bottom

Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	

Click on an attribute entry to replace (L), delete (M) or edit (R) it.

(Brahms), by Johannes Brahms]
 aeus-Passion*, by Johann Sebastian Bach]
 ron BWV 146, by Johann Sebastian Bach]
 an Bach]
 tian Bach]
 [oan]h1
 ted.]

Enable Services
 Expunge Directory

Quiet

Set User ID

Start GC
 Undelete File

You are entering a Command Processor command.
 The only possible completion of the text you have typed is Show Directory.

- ☐ :Show directory [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
- ☐ fepl: [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
- ☐ [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
- ☐ show [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
 Lisp Listener 1

Editing: Site SCH

Top

Local Namespace: SCH
 Site Directory: Godzilla:>Rel-5>site>
 Host For Bug Reports: STONY-BROOK
 Timezone: PST
 Pretty Name: "Symbolics Chatsworth"
 Default Printer: TAHOE
 Default Bitmap Printer: TAHOE
 Secure Subnets: Pair: CHAOS Set: 36 37 41 42 43 44 45 46 51 52 53 61 62 63 64
 Secure Subnets: Pair: INTERNET Set: 192.10.38.0 192.10.41.0 192.10.43.0 Token
 Secure Subnets: Pair: Network Set: Token
 Dont Reply To Mailing Lists: Set: SCRC EAST WEST SYMBOLICS SCH SPA BBOARD DO
 Other Sites: Choose the class of object to edit.
 Ternina User
 Ternina Printer
 Ternina Network
 Host
 Site
 Namespace

Save Create
 Delete Primary Name
 Quit

Add N

ext.29 of 17:00 completed.

l-microcode-tp.text"

wapping space.

m18 dp-lpt20 dp-kbd)

NOTE: If a new disk is being installed, before installing the disk save all local files to tape.

Region evaluated.
 Aborted.

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 1977th.

06/21/85 10:03:38 Screen Hardcopy

USER:

Menu Choose

SITE MENU SELECTION

Editing: Site SCH

Top

Local Namespace*: SCH
 Site Directory*: Godzilla:>Rel-5>site>
 Host For Bug Reports*: STONY-BROOK
 Timezone*: PST
 Pretty Name: "Symbolics Chatsworth"
 Default Printer: TAHOE
 Default Bitmap Printer: TAHOE
 Secure Subnets: *Pair*: CHAOS *Set*: 36 37 41 42 43 44 45 46 51 52 53 61 62 63 64
 Secure Subnets: *Pair*: INTERNET *Set*: 192.10.38.0 192.10.41.0 192.10.43.0 *Token*
 Secure Subnets: *Pair*: Network *Set*: Token
 Dont Reply To Mailing Lists: *Set*: SCRC EAST WEST SYMBOLICS SCH SPA BBOARD DO
 Other Sites Ignored In Zmail Summary: *Set*: SCRC SPA SWM Site
 Terminal F Argument: *Triple*: NONE LOCAL-LISP-MACHINES *Set*: Host
 Terminal F Argument: *Triple*: 0 READ *Set*: Host
 Terminal F Argument: *Triple*: 1 LOCAL-LISP-MACHINES *Set*: Host
More below

Help	<u>E</u> dit	Save	Create
View	<u>C</u> opy	Delete	Primary Name
Add Namespace	Locally	Quit	

Enter a name for the site to be edited: sch

ext.29 of 17:08 completed.

l-microcode-tp.text"

wapping space.

m18 dp-lpt20 dp-kbd)

NOTE: If a new disk is being installed, before installing the disk save all local files to tape.

Region evaluated.
 Aborted.

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 iffith.

Edi: an existing object
 06/21/85 10:04:06 Screen Hardcopy

USER: tyi

SITE DISPLAY

Editing: Printer SCH|ARAKEEN (locally)

Top

Type*: LGP
Site: SCH
Pretty Name: Arakeen
Interface: DR11-C
Interface Options: *Set: Pair:* PROM-VERSION REV-1H *Pair: Global-name Token*
Host: ARRAKIS
Dplt Logo: SYMBOLICS
Fonts Widths File: Godzillaa:>Rel-5>fonts>lgp-1>fonts.widths.newest
Format: *Global-name*
Protocol: *Global-name*
Default Font: *Token*
Header Font: *Token*
Character Size: *Pair: Token Token*
Page Size: *Pair: Token Token*
User Property: *Pair: Global-name Token*

Choose in which namespace to edit CHAOS.

Hel
Vie
Add Nam
Enter a na

SWW
SPA
SCRC
SCH

Create
Primary Name

ach]
h]

ations

ZMRC5 (Fundamental) *Buffer-1*
[15:04:16 Performing Fugue in G major, "The Jig", by Johann Sebastian Bach]

Editing: Namespace SCH

Top

Descriptor File: Godzilla:Rel-5>site>sch-namespace.text
 Search Rules*: Set: SCH SCRC SWW SPA INTERNET Namespace
 Primary Name Server: GODZILLA
 Primary Name Server: Host
 Secondary Name Server: RIVERSIDE
 Secondary Name Server: WAIKATO
 Secondary Name Server: RUSSIAN
 Secondary Name Server: STONY-BROOK
 Secondary Name Server: WHITE
 Secondary Name Server: Host
 Internet Domain Name: SCH.Symbolics.COM
 User Property: Pair: Global-name Token

Bottom

Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	

Click on an attribute entry to replace (L), delete (M) or edit (R) it.

(Brahms), by Johannes Brahms]
 aeus-Passion", by Johann Sebastian Bach]
 ron BWV 146, by Johann Sebastian Bach]
 an Bach]
 tian Bach]
 ion[1
 ted.]

Enable Services
 Expunge Directory

Quiet

Set User ID

Start GC
 Undelete File

You are entering a Command Processor command.
 The only possible completion of the text you have typed is Show Directory.

- ☛ :Show directory[Abort]
 Back to Lisp Top Level in Lisp Listener 1.
- ☛ fep1: [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
- ☛ [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
- ☛ show [Abort]
 Back to Lisp Top Level in Lisp Listener 1.
 Lisp Listener 1

(locally)

Top

Bottom

Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	

No current object. Click on Edit, View, or Create.

ach]
h]

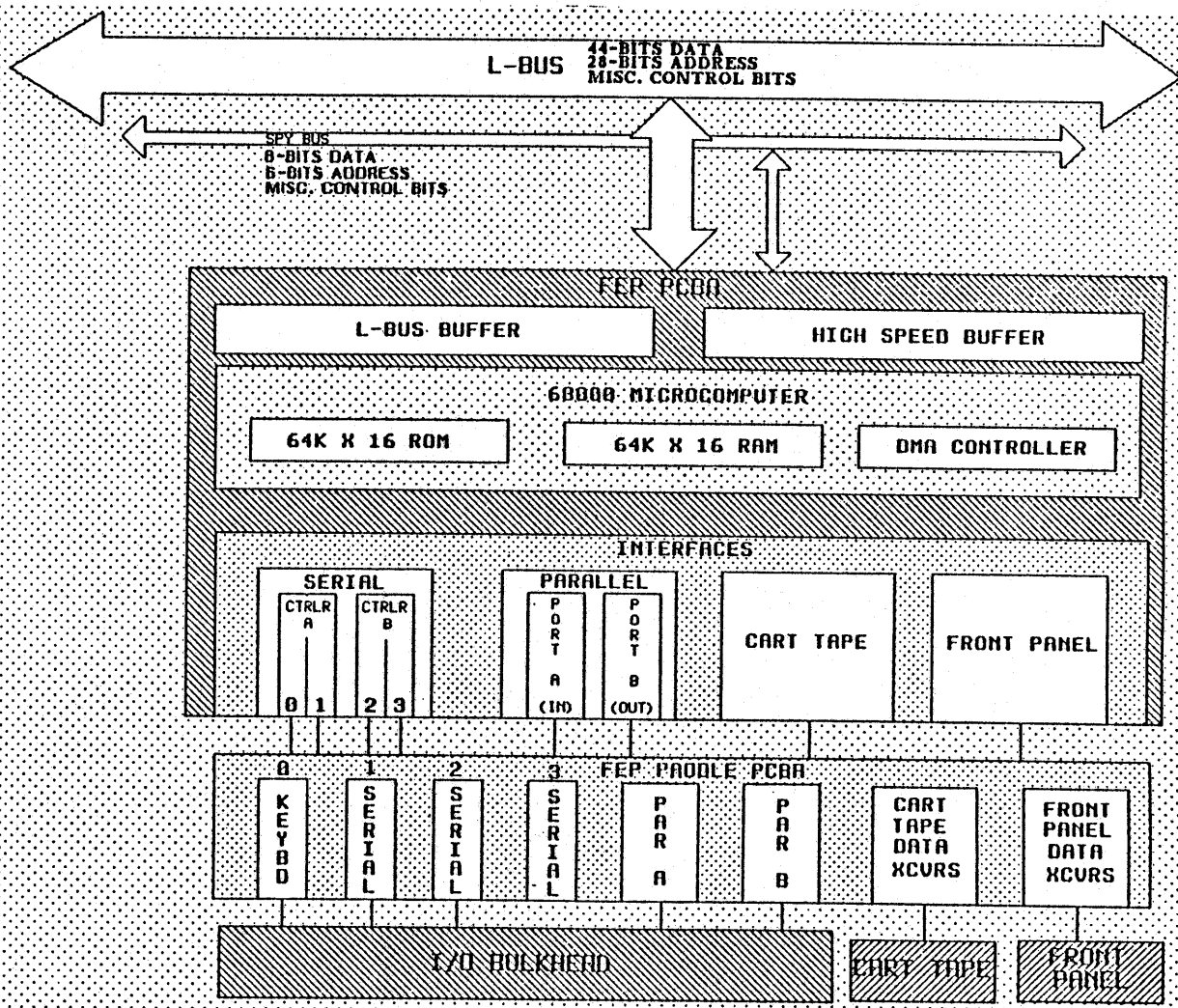
ations

ZMRC5 (Fundamental) *Buffer-1*
[15:04:16 Performing Fugue in G major, "The Jig", by Johann Sebastian Bach]

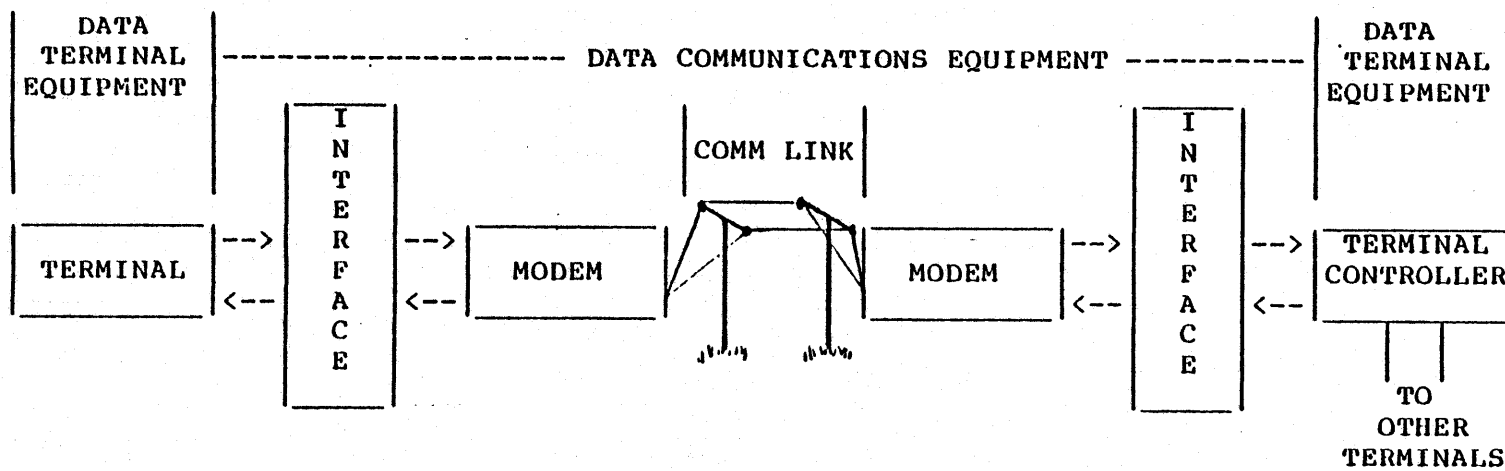
Quit the namespace editor, leaving current object
06/18/85 15:39:12 Screen Hardcopy

USER: Tyi

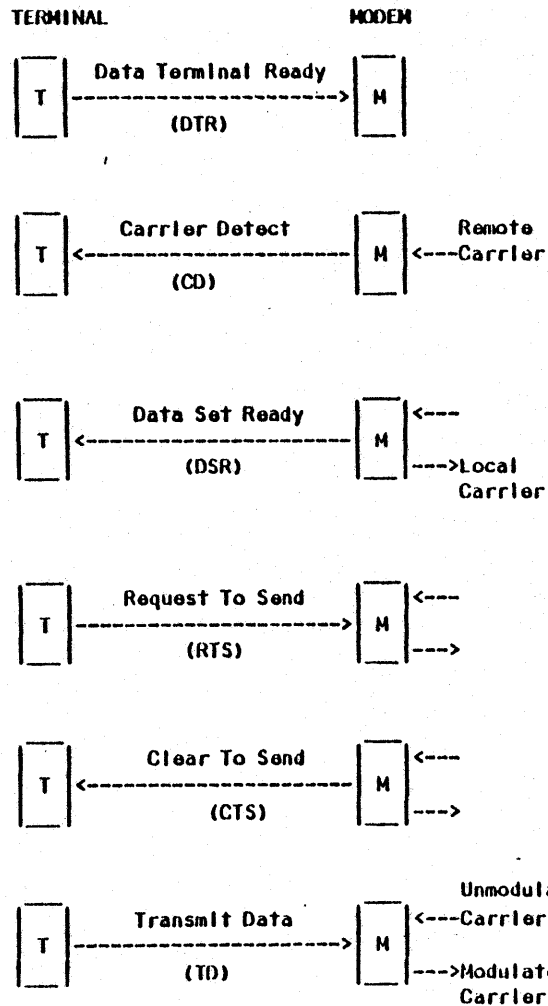
LEAVING NAMESPACE EDITOR



LISP FRONT END PROCESSOR BLOCK



SIMPLIFIED COMPONENTS OF A DATA LINK



1. When communication program is loaded, Terminal sends Modem the Data Terminal Ready signal.

2. When the data link connection is established with the remote site and the remote modem sends a carrier signal to the local Modem, the Modem sends the Terminal the Carrier Detect signal.

3. The Modem sends its carrier to the remote modem, and after a delay of approximately 150 to 300 milliseconds, it sends the Terminal the Data Set Ready signal.

4. When the Terminal wishes to transmit data, it sends the Modem the Request To Send signal.

5. The Modem connects the transmit data line to its transmit circuits and then sends the Clear To Send signal to the Terminal.

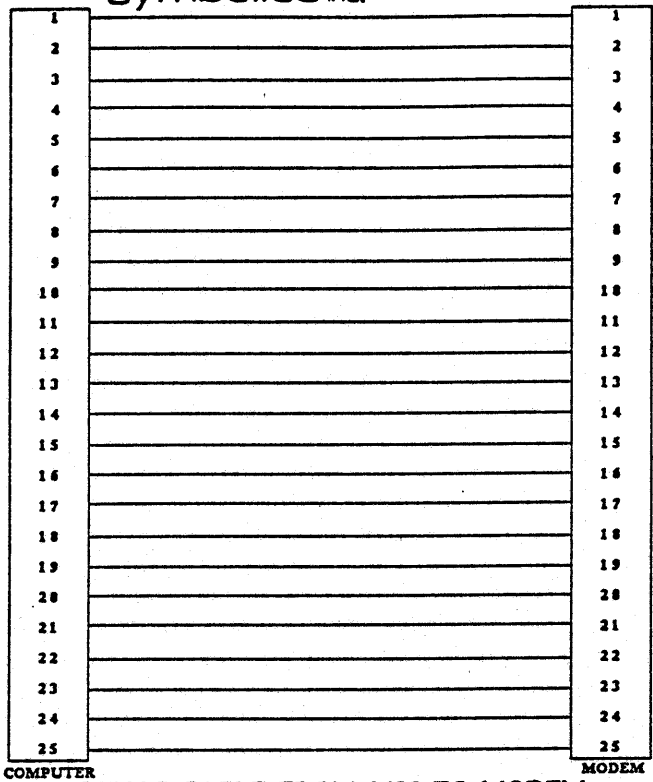
6. The Terminal sends the Transmit Data signals to the Modem, which modulates its carrier, sending the data to the remote site.

RS 232C SIMPLIFIED HANDSHAKING

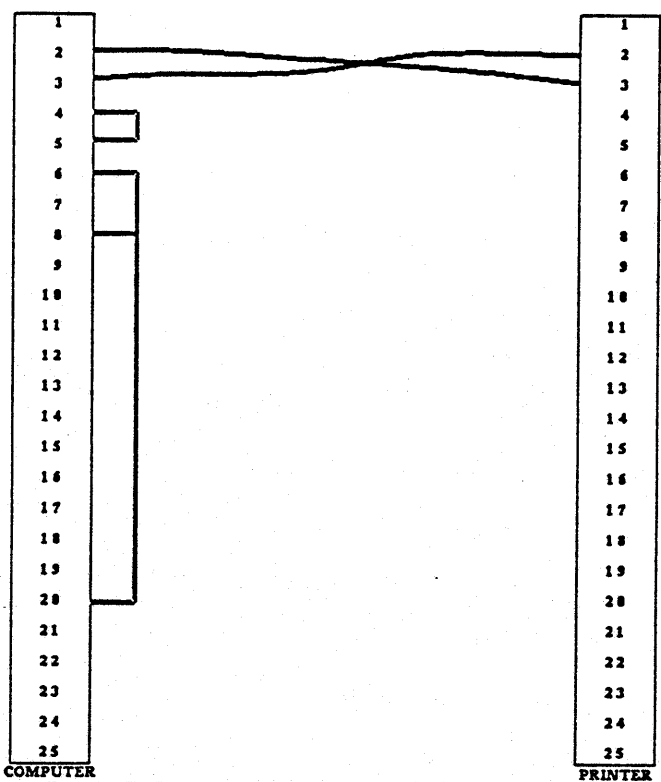
Signal Type & Direction

25 PIN	EIA- RS232C CIRCUIT	CCITT- V.24 CIRCUIT	RS232 DESCRIPTION	GND	DATA		CONTROL		TIMING	
					From DCE	To DCE	From DCE	To DCE	From DCE	To DCE
1	AA	101	Protective Ground	X						
7	AD	102	Signal Ground/Common Return	X						
		102a	DTE Common	X						
		102b	DCE Common	X						
2	BA	103	Transmitted Data			X				
3	BB	104	Received Data		X					
4	CA	105	Request to Send							
5	CB	106	Clear to Send				X			
6	CC	107	Data Set Ready				X			
20	CD	108.2	Data Terminal Ready				X			
22	CE	125	Ring Indicator				X			
8	CF	109	Received Line Signal Detector				X			
21	CG	110	Signal Quality Detector				X			
23	CH	111	Data Signal Rate Selector (DTE)					X		
23	CI	112	Data Signal Rate Selector (DCE)				X			
24	DA	113	Transmitter Signal Element Timing (DTE)							X
15	DB	114	Transmitter Signal Element Timing (DCE)						X	
17	DD	115	Receiver Signal Element Timing (DCE)						X	
14	SBA	118	Secondary Transmitted Data			X				
16	SBB	119	Secondary Received Data		X					
19	SCA	120	Secondary Request to Send				X			
13	SCB	121	Secondary Clear to Send				X			
12	SCF	122	Secondary Received Line Signal Detector				X			
		141	Local Loopback					X		
		140	Remote Loopback					X		
		142	Test Indicator				X			
		118	Select Standby					X		
		117	Standby Indicator				X			
		126	Select Transmit Frequency					X		
								X		
								X		

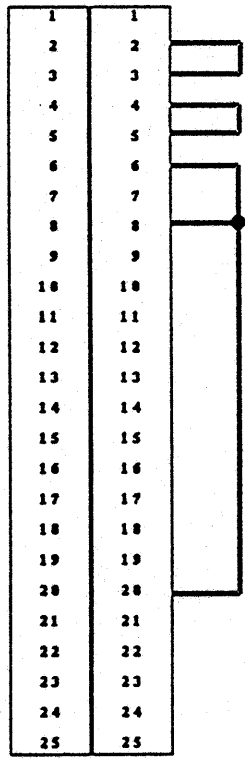
EIA RS232C and CCITT V.24



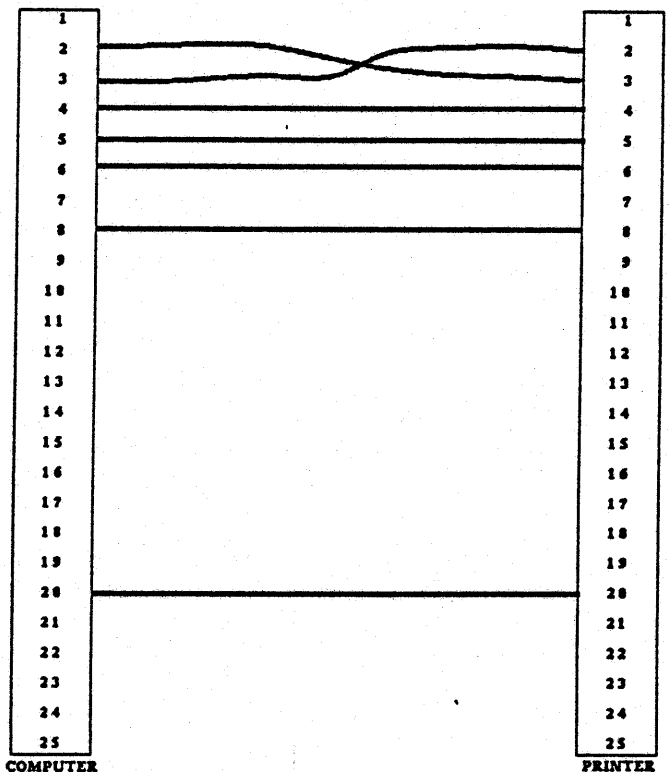
RS232C CABLE FROM 3600 TO MODEM



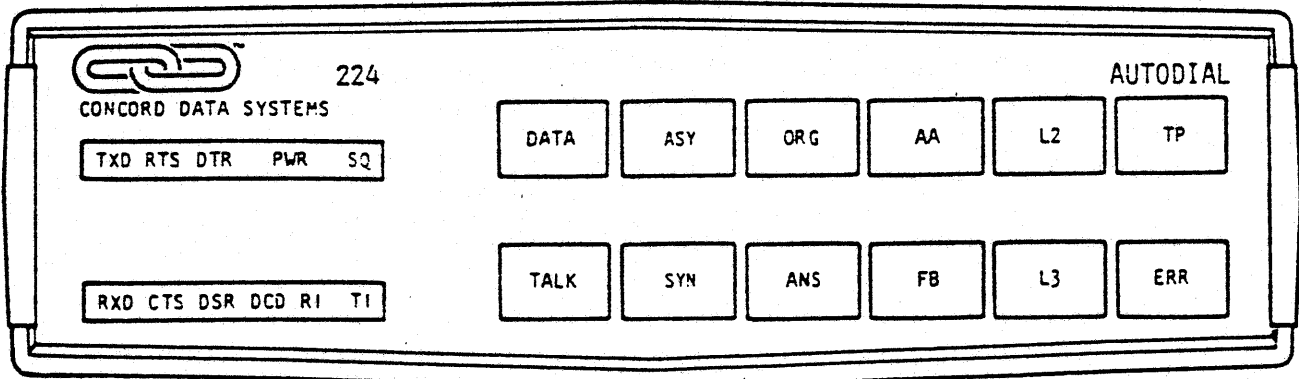
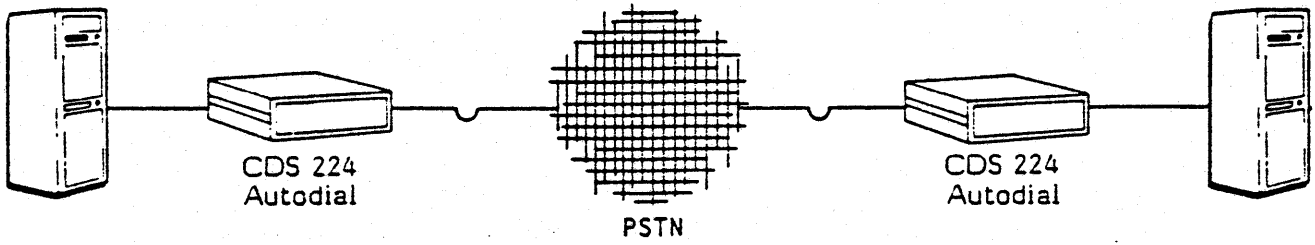
RS232C CABLE FROM 3600 TO DMP-1/LGP-2



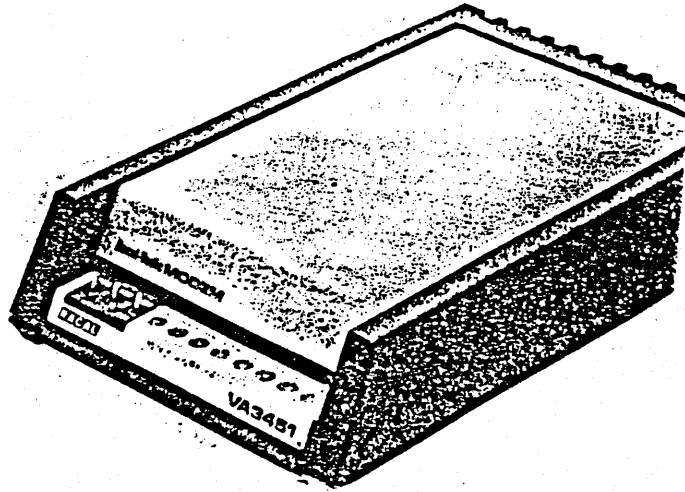
SERIAL LOOPBACK TEST CONNECTOR



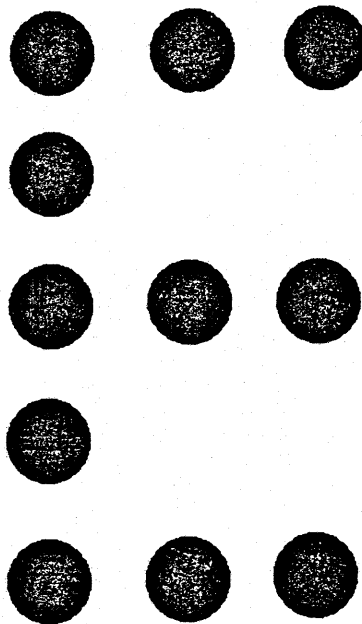
RS232C CABLE FROM 3600 TO LGP-1



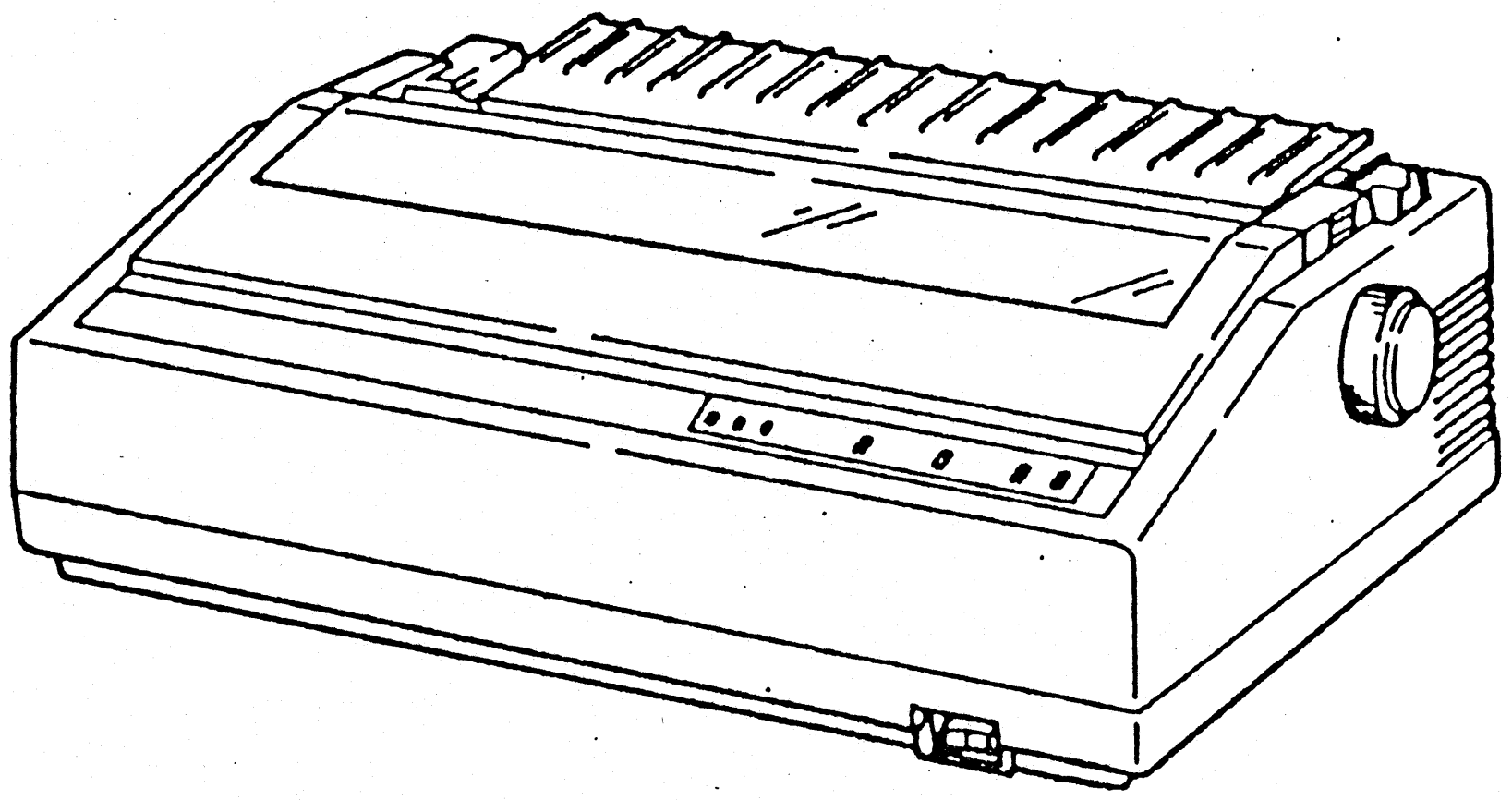
CDS MODEL 224



RACAL-VADIC MODEL VA3450 P/S/G-SERIES



DOT MATRIX PRINTING



DPL24 DOT MATRIX PRINTER

Specifications

(1) General specifications

Printing method: 24-wire dot matrix

Bidirectional printing (shortest distance printing by automatically deciding on a forward or backward direction)

Dot density: Letter mode 1/360 × 1/180 inch
Correspondence mode 1/180 × 1/180 inch
Draft mode 1/120 × 1/180 inch
Graphics mode 1/180 × 1/180 inch and
1/90 × 1/90 inch

Printing speed: Letter mode 80 characters/second (10 cpi)
96 characters/second (10 cpi)
144 characters/second (18 cpi)
Correspondence mode 160 characters/second (10 cpi)
192 characters/second (12 cpi)
Draft mode 240 characters/second (10 cpi)
288 characters/second (12 cpi)

Character sets: 96 ASCII characters
Alphabets of 7 European countries Specified by the software or an operator's panel switch (England, Germany, France, Italy, Spain, Sweden/Finland, and Denmark/Norway)

Font: Letter mode 3 types (Courier 10, Prestige Elite, and Boldface)
Correspondence mode 1 type (Courier 10)
Draft mode 1 type

	Option (font cartridge)	Fixed font
		Up to 4 types (for a 96-character set) Down-loadable font up to 2 types (for a 96-character set)
Print line:	126 columns at 10 cpi 163 columns at 12 cpi 244 columns at 18 cpi	
Character pitch:	1/10, 1/12, 1/18 inch Proportional spacing (switch selectable) 1/18 inch spacings are available only in letter mode.	
Line spacings:	Increments of 1/180 inch	
Line feed pitch:	1/3, 1/6, 1/8 inch (switch selectable)	
Line feed speed:	50 ms (1/6 inch)	
Form feed speed:	4 inches/second	
Forms:	6 to 16 inches (width), up to 0.023 inch (thickness)	
Multicopies:	Original + 4 copies	
Ribbon:	Black, stationary cartridge	
Paper feed:	Rear feed sprocket Friction platen Autoloading is possible for both rear feed sprocket and friction platen.	
Sensors:	Paper-out detection (for continuous forms only) and open cover detection	
Interface:	Parallel: Centronics compatible Serial: RS-232C, current loop (20 mA)	
Noise:	65 dBA or less (Measuring distance: Front side 1m, A scale, slow at letter quality printing)	

(2) Electrical conditions

Voltage: 100 ~ 120/220 ~ 240 VAC ± 10%

Frequency: 50/60 Hz ± 1 Hz

Insulation resistance: AC-FG 10 MΩ or more
SG-FG 5 MΩ or more

Dielectric strength: AC-FG 1 minute or more at AC 1 kV

Leakage current: 3.5 mA or less

Power consumption: Operating 150 VA
Nonoperating 70 VA

(3) Environmental conditions

Temperature: Operating 5 to 38°C (41 to 100°F)
Nonoperating -20 to 60°C (-4 to 140°F)
(Gradient must be 15°C/h or less)

Humidity: Operating 10 - 90% RH
Nonoperating 5 - 95% RH (non condensing)
Gradient: 30% RH/day or less
Max. wet bulb temperature: 29°C

Vibration: Operating 0.2 G (excluding resonant points)
Nonoperating 0.5 G (excluding resonant points)

Shock: Operating 3 G (the printer is not destroyed,
but printing quality is not
guaranteed.)

Tilt: Operating 5°

Electrostatic strength: 5 kV or more (measuring instrument: condenser
method, 100Ω 500 pF)
When executing test printing by the contact method
only (10 Hz, 3 minutes)
UL114/478, CSAC22.2, FCC class B, VDE0871 class B

(4) Physical specifications

Dimensions: Width 550 mm (21.7 in) Depth 380 mm (15 in)
 Height 160 mm (6.3 in)

Weight: 20 Kg (44 lb)

(5) Reliability

MTBF: 4,000 h (MTBF: operating hours include all the power on time, and operating time is 25% duty cycle and 50% page density)

MTRR: 0.5 h

Printer life span: 5 million lines or 5 years

Expendable supplies life span: Print head 2 hundred million strokes or more (without maintenance)
 Ink ribbon 6 million characters

(6) Protection functions

Processing during an overload: To protect the print head, control unit, and power supply, if any of the conditions listed below is detected the print head moves to the left or right margin, the 24 dots are divided into three parts, and unidirectional printing is performed at the mode printing speed.

- The +48 V power falls below the predetermined voltage.
- The print head thermal sensor activates.

Overload does not occur even when printing 66 lines at 30% duty.

(7) Limitation

Print head: Do not perform continuous pattern printing at over 50% duty or for 5 or more minutes, whether overload is detected or not.

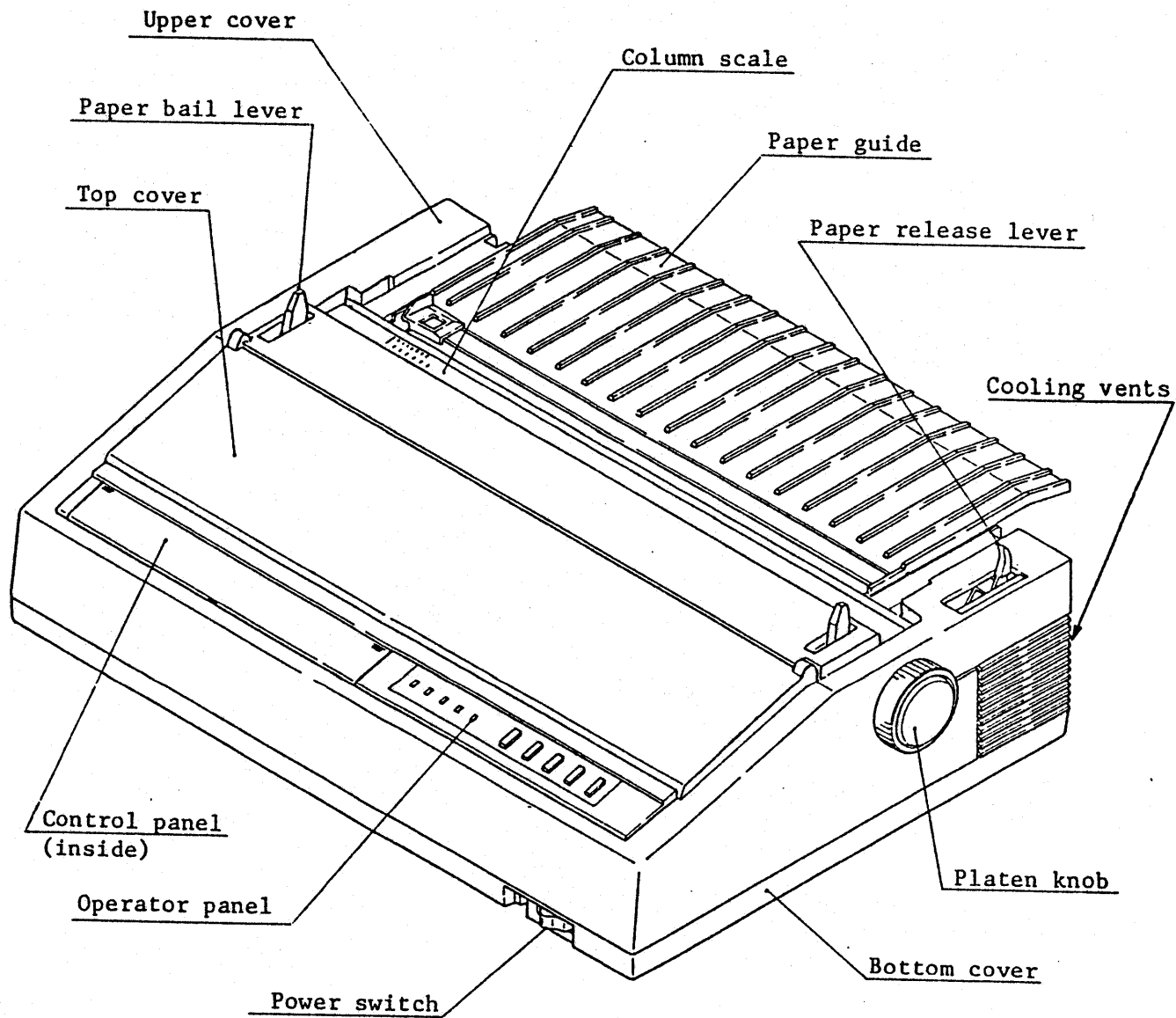


Fig. 4.2 DPL24 basic parts, outside view

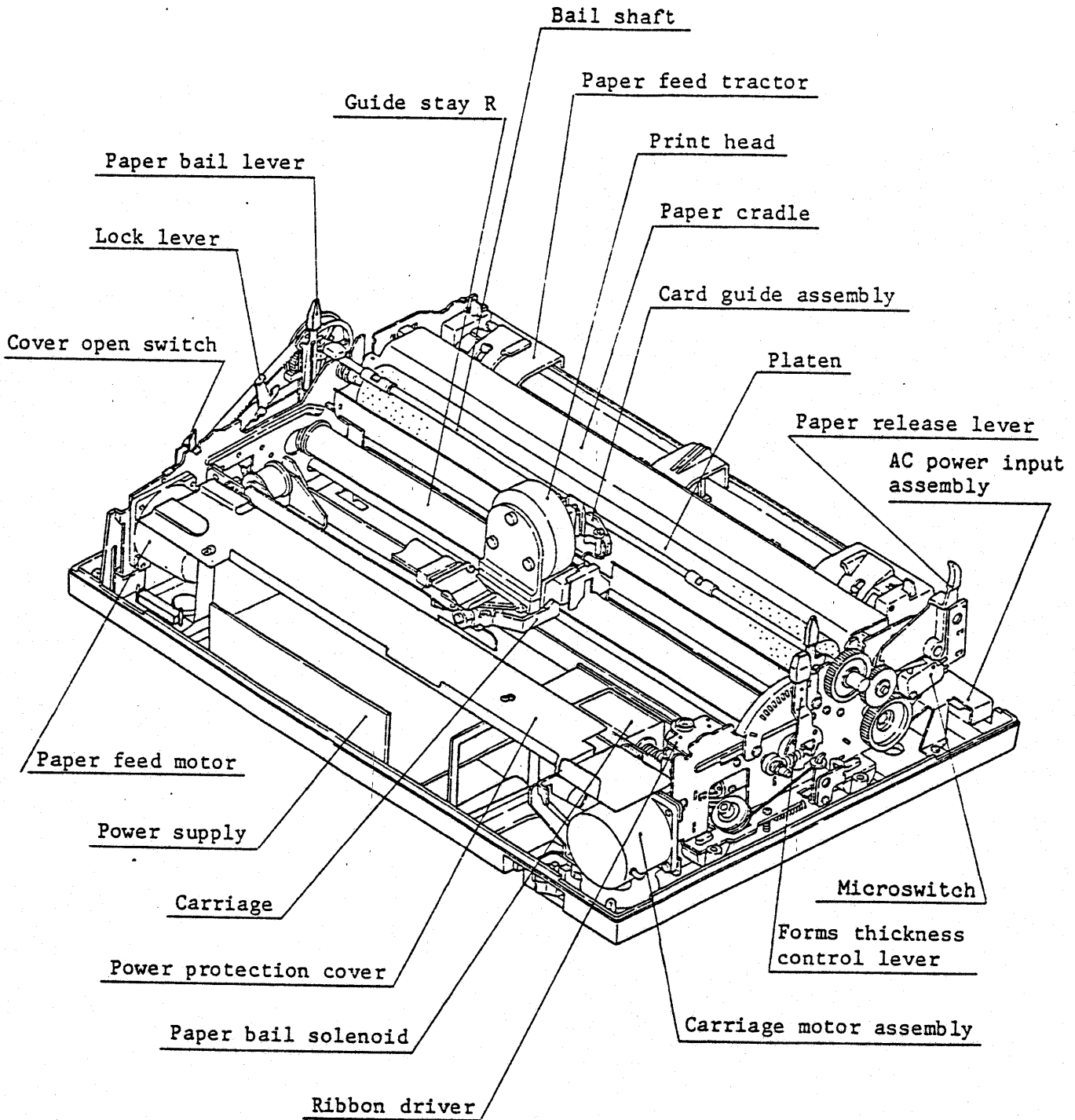


Fig. 4.3 DPL24 basic parts, inside view

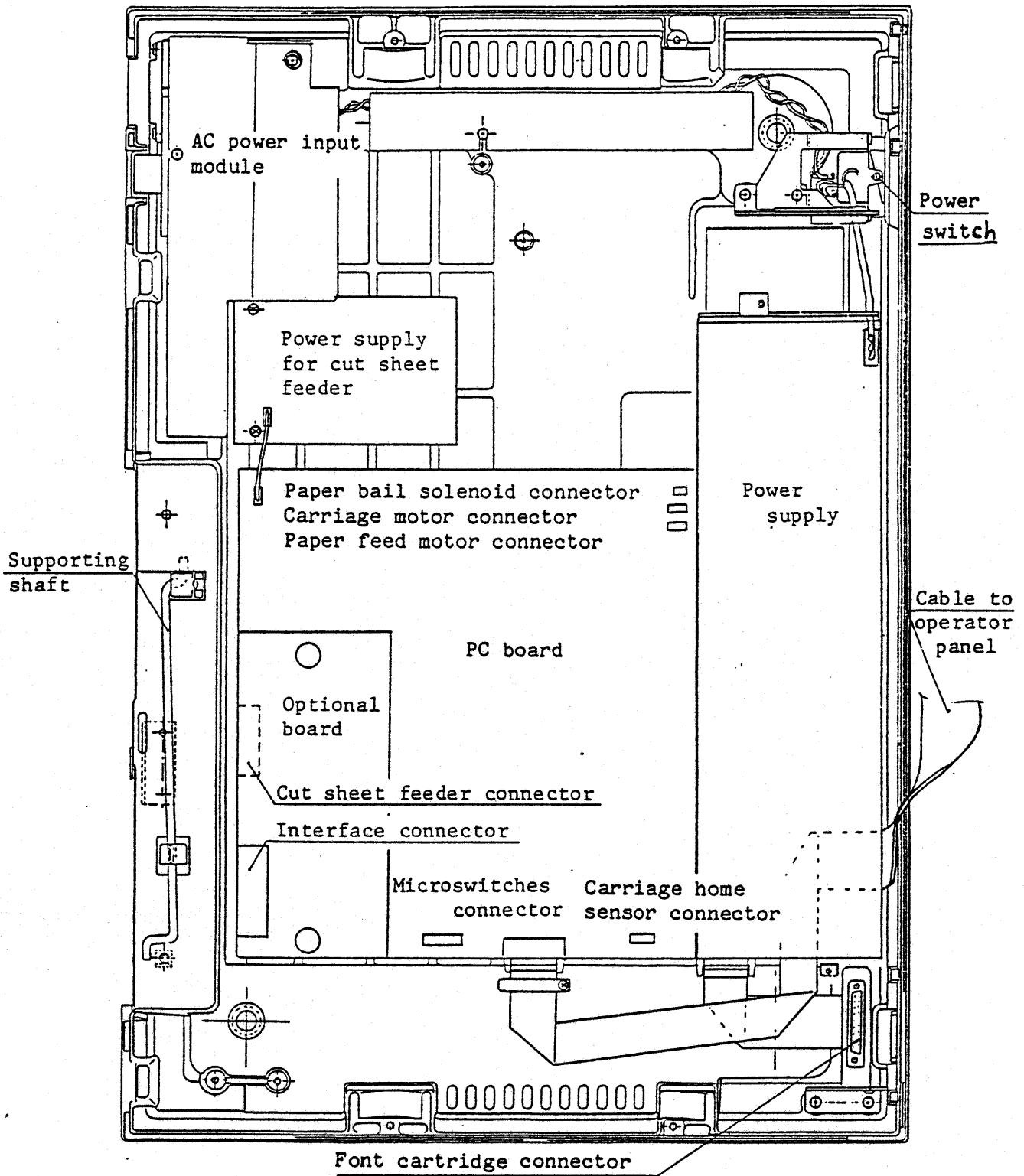
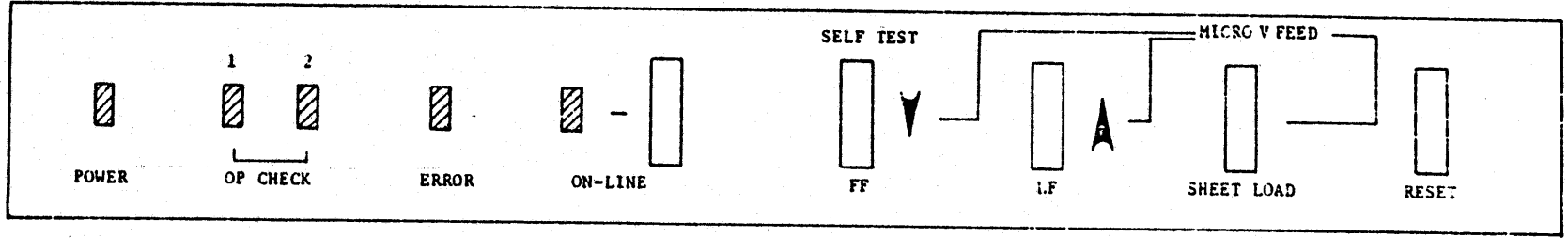
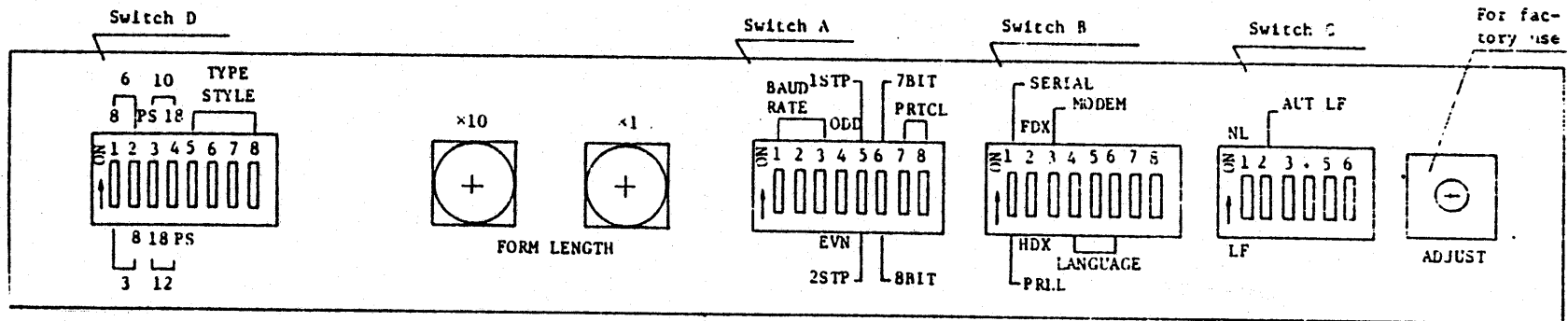


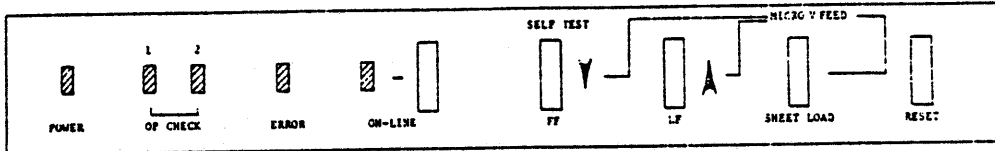
Fig. 4.4 DPL24 basic parts, inside base unit



Operator panel

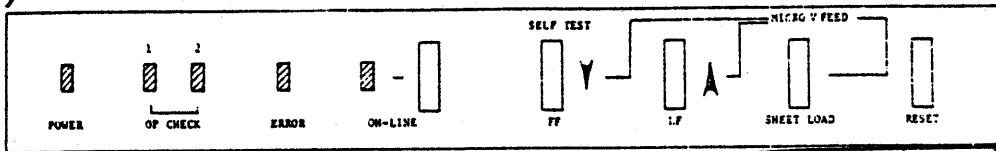


Control Panel



Action	Function	ONLINE switch	FF switch	LF switch	SHEET LOAD switch	RESET switch
Offline/pause	Switches the printer status from online/operating (ONLINE indicator lit) to offline/pause (ONLINE indicator off).	o				
Online/pause reset	Switches the printer status from offline/pause (ONLINE indicator off) to online/restart (ONLINE indicator lit).	o				
Form feed	Feeds the paper up to the next top of form (or top margin if one is set).		o			
Line feed	Feeds the paper up the number of lines specified as the line spacing. Hold the switch down for continuous feeding.			o		
Auto sheet loading	Loads a form inserted at the back of the platen and aligns it at the first printing line.				o	
Micro line feed	Feeds the paper up 1/180th inch. Hold the switches down for continuous micro line feeding.			o	o	
Reverse micro line feed	Feeds the paper down (backward) 1/180th inch. Hold the switches down for continuous reverse micro line feeding.		o		o	
Self test	Performs test printing. This test takes effect only when the printer is powered on.		o			

Table 3.1 Operator panel switch functions



Action	Function	ONLINE switch	FF switch	LF switch	SHEET LOAD switch	RESET switch
Stop self test	Stops self test printing					o
Printer initialize	<ul style="list-style-type: none"> - When no data is in the receive buffer, initializes the printer immediately. - When data is in the receive buffer, notifies the operator of the state by blinking the ONLINE indicator. To initialize the printer, press the RESET switch again. To not initialize and and print the contents of the receive buffer, press ONLINE. - This switch is only valid during the OFFLINE state. 					o
Error clearing	Clears a communication error in the serial interface					o

3.3 Operator Panel Indicators

There are five indicators and an audio alarm on the operator panel, which are described in this section.

3.3.1 Audio alarm

The audio alarm notifies the operator that one or more errors has occurred. The alarm sounds for about 1/2 second if any of the following operator check states or a circuit or mechanism error (check condition) occurs:

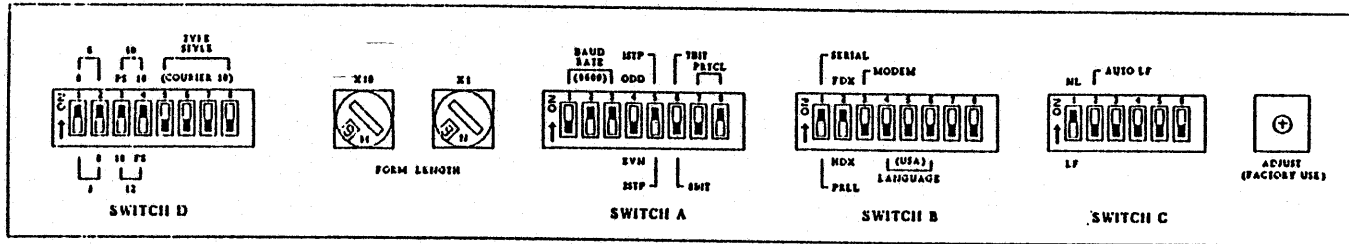
- Cover open
- Paper out
- Sheet feeder empty or jammed

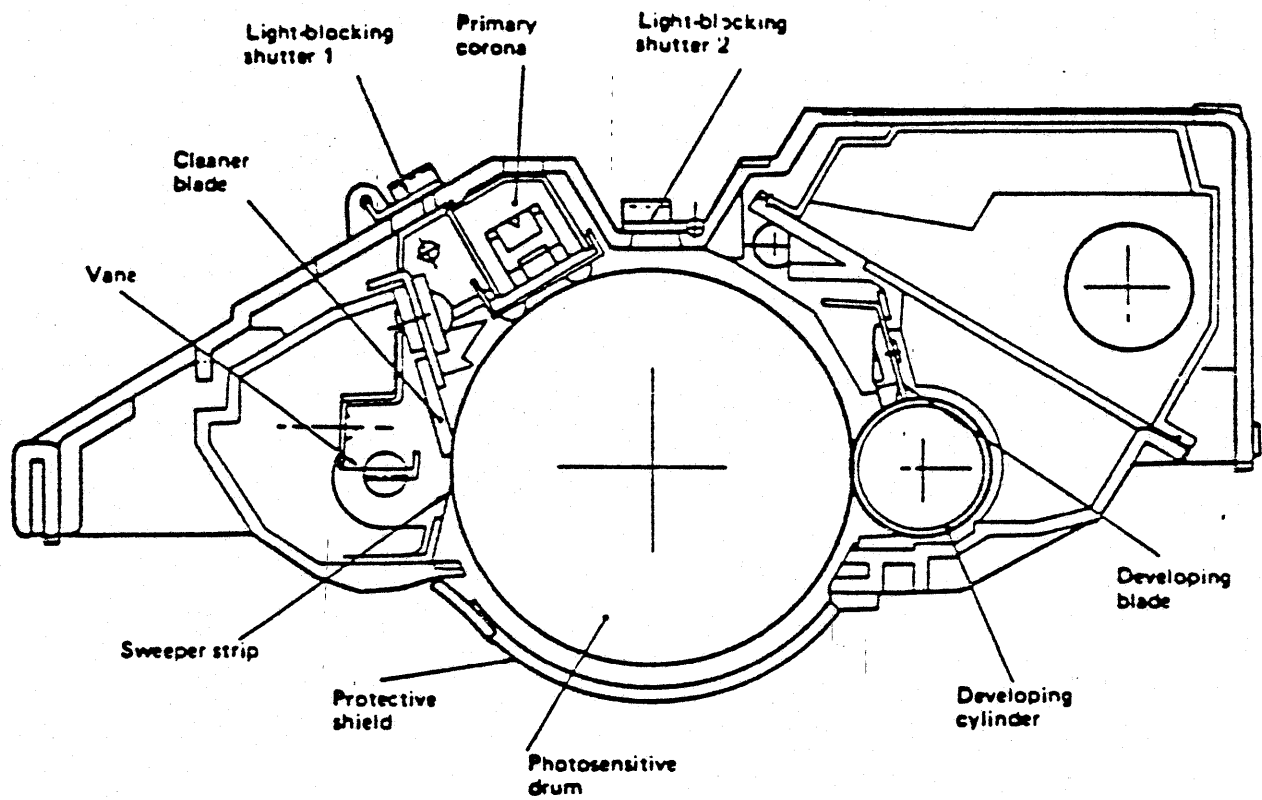
Table 3.1 Operator panel switch functions - continued

symbolics

DMP-1

(SWITCH SETTINGS FOR NORMAL OPERATIONS)

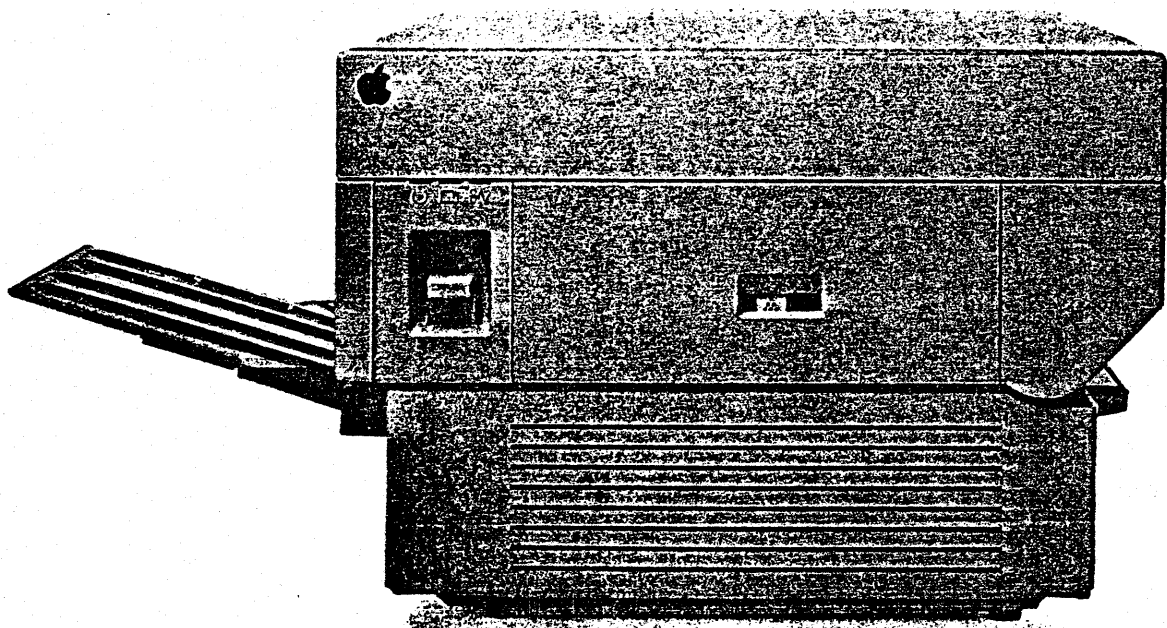




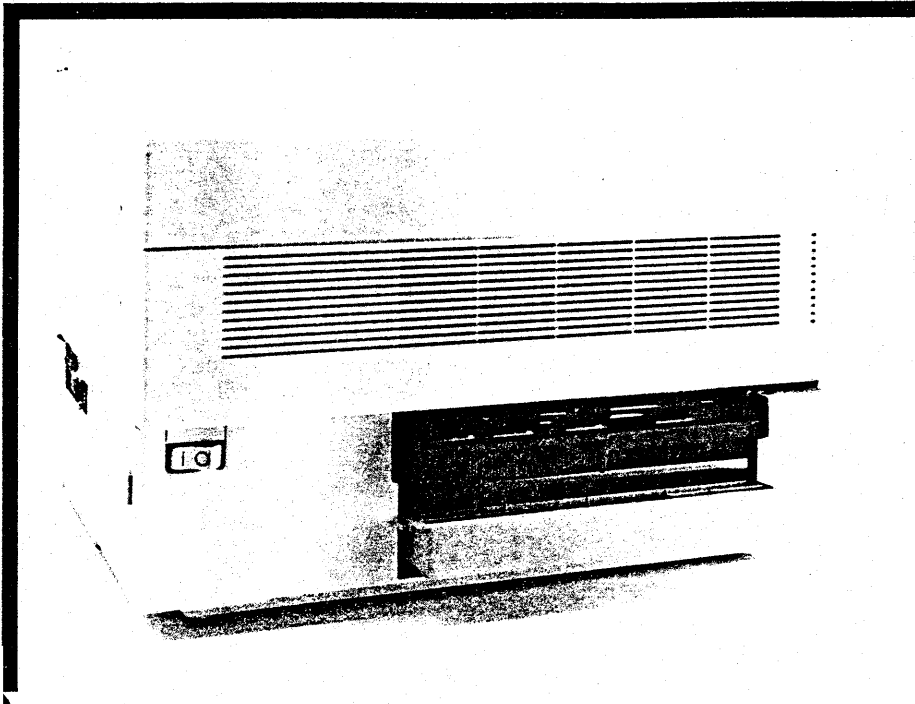
LASER PRINTING

symbolics inc.

LaserWriter



Laser Graphics Printer (LGP2)



Symbolics offers a table top Laser Graphics Printer (LGP2) for use with the 3600 family of symbolic processing systems. This printer is an Apple™ LaserWriter, ideal for applications requiring quality, cost-effective printing. The LGP2 provides professional-looking text and graphics. In addition, Symbolics software allows total support of our hardcopy environment, including compatibility with the Symbolics Document Examiner.™

Utilizes powerful microprocessor

Built into every LaserWriter is a 12 MHz MC 68000 microprocessor. It controls 1½ megabytes of RAM and ½ megabyte of ROM. LaserWriter's software is PostScript,™ the compact, versatile programming language that's becoming a standard in the printing industry.

Art-department-quality documents

LaserWriter's resolution is 90,000 dots per square inch. Even the smallest type is crisp and clear, and graphics can be incredibly detailed. LaserWriter can print full resolution graphics on the entire page.

A typestyle for every application

LaserWriter's diverse type styles give you the versatility you need, from six-point fine print for business forms and spreadsheets, to inch-high headlines for presentation overheads. Some of the world's most popular fonts are built right in: Times,™ Helvetica,® and Courier. There's even a symbol font for scientific applications. You can also download additional fonts to give your documents their own personalized style.

Prints on a wide range of materials

LaserWriter prints on copier paper, bond, or letterhead in letter, legal, or international sizes. Or use LaserWriter with transparencies, labels, or envelopes.

Specifications

Marking engine: Canon LBP-CX laser-xerographic engine

Controller hardware contains: 12 MHz 68000, ½ Mb of ROM, 1½ Mb of RAM, AppleTalk™ and RS-232C interfaces

Support: Full support of multifont software environment including screen dump support and Document Examiner output.

Print Quality: All text and graphics printed at 300 dots per inch.

Built-In Fonts: Times, Helvetica, and Courier in roman, bold, italic, and bold italic styles plus a Symbolics font. Minimum size 4 points. Underline, Shadow and Hollow styles for the above fonts can also be generated (available from Symbolics).

Printing Protocols Supported: Postscript™ and a subset of Diablo® 630 command set.

Printing Materials: 8–34 lb. single side copier, letterhead, colored and overhead transparency stock. Envelopes and labels supported via manual feed.

Printing Material Sizes: Letter, Legal, A4 and B5

Width: 18.5 inches

Depth: (body only) 16.2 inches

Depth: (with trays) 28.2 inches

Height: 11.5 inches

Weight: 77 pounds

Ordering Information

LGP2-A
High Resolution laser graphics printer

LGP2-SW
Hardcopy/Document Examiner software interface for LGP2-A

LGP2-B
Package includes both LGP2-A and LGP2-SW

Laserwriter Spec Sheet

Order M0160

I. Technical Specifications

1. Hardware:

- A. Marking engine: Canon LBP-CX laser-xerographic engine
- B. Controller:
 - a. Microprocessor: 12 MHz MC68000
 - b. Read only memory (ROM): .5 Megabytes
 - c. Random access memory (RAM): 1.5 Megabytes
- C. Interfacing interconnects:
 - a. AppleTalk
 - b. RS-232-C via PostScript
 - c. Special Diablo 630

2. Software:

- A. Printing protocols supported:
 - a. PostScript
 - b. Diablo 630 (a daisy-wheel printer) Emulation with a subset of the Diablo command set
- B. Fonts:
 - a. Resident:
 - Medium and Bold: Times, Helvetica, and Courier
 - Italic and Bold Italic: Times
 - Oblique and Bold Oblique: Helvetica and Courier
 - Symbol: Greek and Scientific characters
 - b. Sources:
 - Allied Corporation: Times and Helvetica
 - PostScript: Symbol
 - c. Styles: Underline, Shadow, Hollow
 - d. Point sizes:
 - Range: 3 to 720 points
 - Limitations
 - 1. Small: Resolution of printer
 - 2. Large: Size of paper
- C. Other Input:

All graphics and Macintosh and international character sets are treated as downloaded bitmaps

3. Printing materials:

A. From Automatic cassette:

- a. Optimum: Single sheet photocopy bond from 16 to 20 lb.
- b. Range: Letterhead and color stock from 8 to 34 lb.

c. Cassette sizes:

Size	Order
Legal	M0182
Letter	M0181
A4	M0183
B5	M0184

d. Cassette capacity: 100 sheets

B. From manual single sheet feed:

a. Stock:

- Sheet Paper: Copier, Letterhead, and Color
- Transparency
- Envelopes
- Labels

b. Sizes:

- Letter
- Legal
- A4
- B5

c. Weight: 8 to 34 lb.

4. Performance

A. Output tray capacity: 20 sheets

B. Maximum printable surface:

	Letter	Legal	A4	B5
Width (inches)	8.0	7.0	7.5	7.0
Length (inches)	10.9	12.5	10.5	10.0

C. Print quality: text and graphics:

- a. 300 dots per inch
- b. 90,000 dots per square inch
- c. over 8 million dots per page

D. Speed

- a. Initial: 2 to 4 pages per minute
- b. Thereafter, the LaserWriter can produce copies of the initial page at a rate of 8 pages per minute.
- c. Actual performance depends on the application and document.

E. Recommended duty cycle: Less than 4000 pages per month.

5. Physical:

	inches
Width	18.5
Depth (body only)	16.2
Depth (with trays)	28.2
Height	11.5
Weight	77 pounds

6. Electrical

US Model M0156	115 VAC (+/- 10 percent) 60 Hz
European Model M0156Z	220 VAC (+/- 10 percent) 50 Hz
	240 VAC (+/- 10 percent) 50 Hz

7. Safety and Environmental Compliance

- UL 660F listed
- CSA LR49439 certified
- FCC Class B
- BRH certified Class I laser product

II. Documentation

Inside Laser Writer from Apple Computer

III. Service

1. Every 2,000 to 3,000 pages: Replace toner cartridge (Order M0180)
2. 100,000 pages (2.5 years given a rate of 3,000 pages per month):
 - Major service

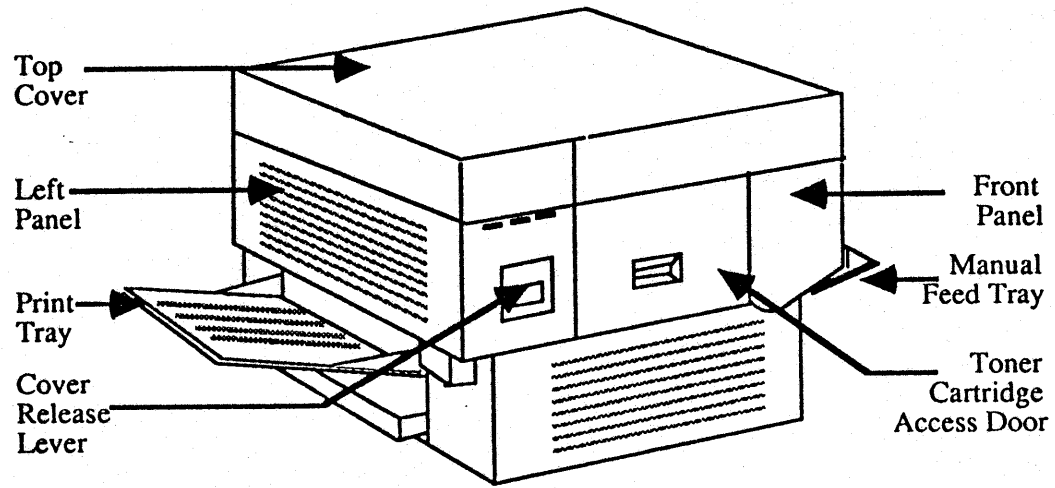


FIGURE 2-3: FRONT VIEW

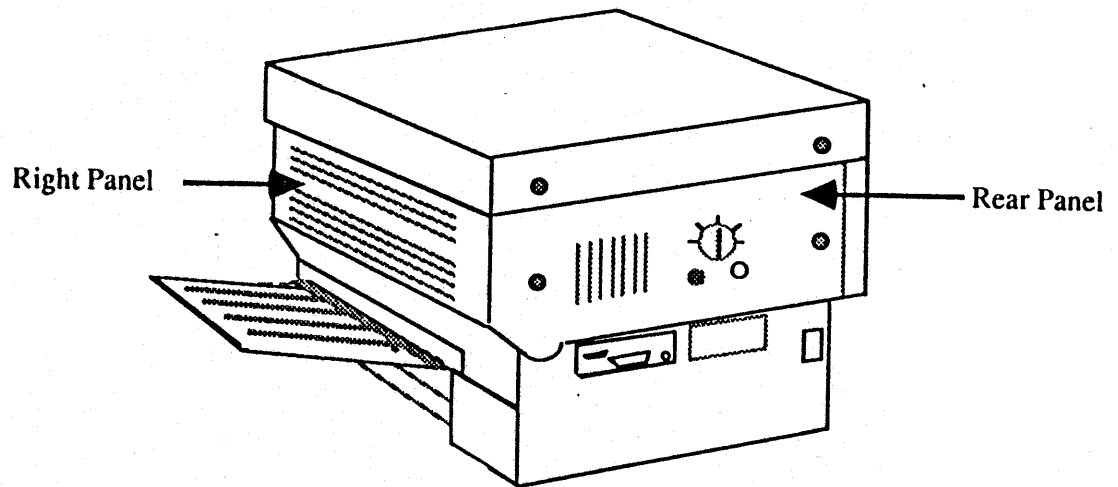


FIGURE 2-4: REAR VIEW

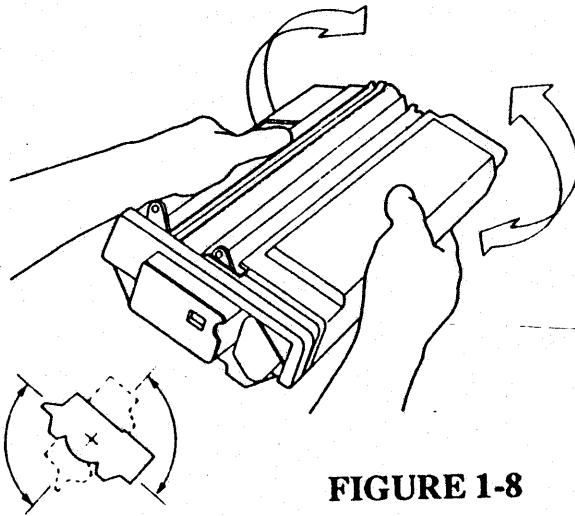
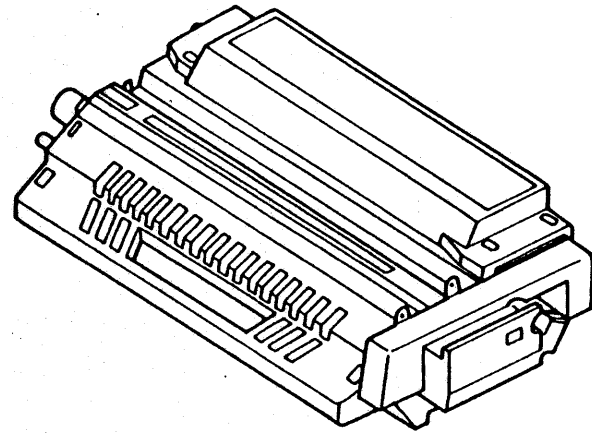


FIGURE 1-8



**FIGURE 1-6
TONER CARTRIDGE,
EXTERNAL VIEW**

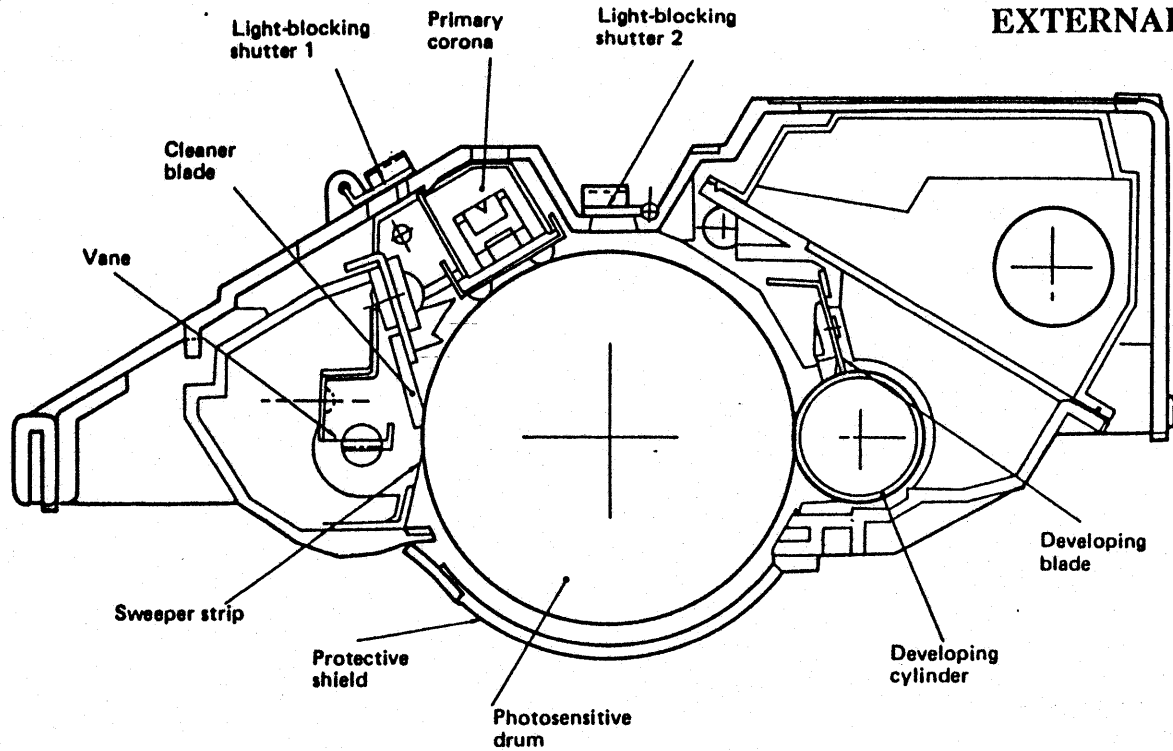


FIGURE 1-7: TONER CARTRIDGE (CROSS SECTION)

Slide the cartridge into the printer

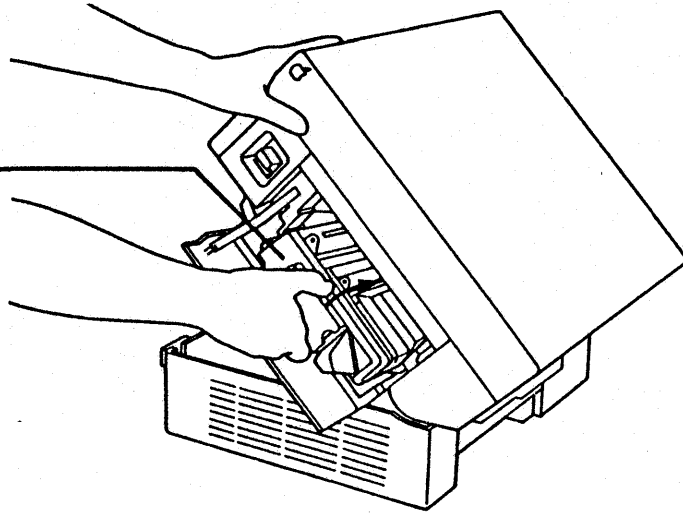


FIGURE 5-9

Flex the black tab until it breaks loose

Pull out the tab and the attached tape

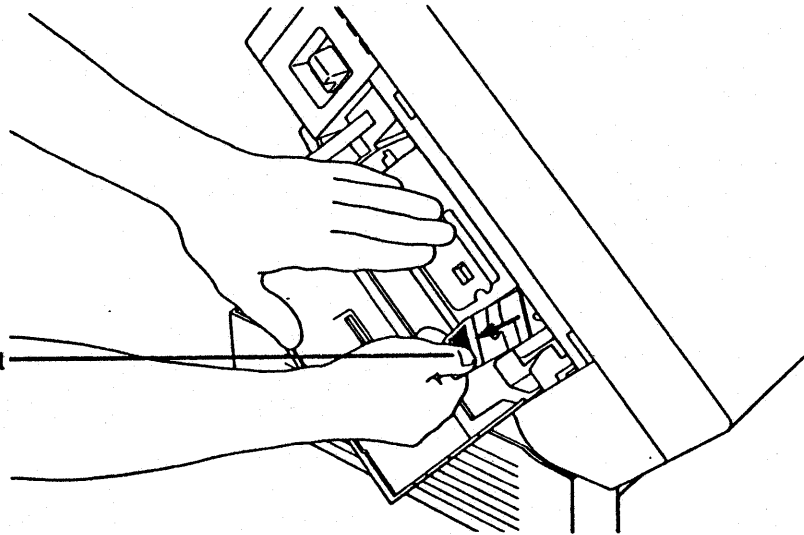


FIGURE 5-10

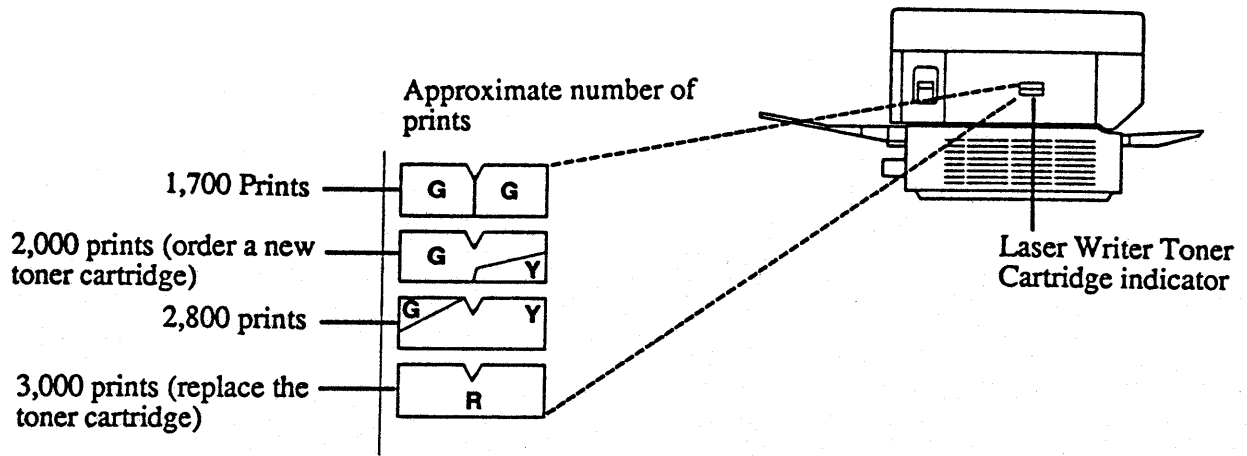


FIGURE 5-5: CARTRIDGE INDICATOR

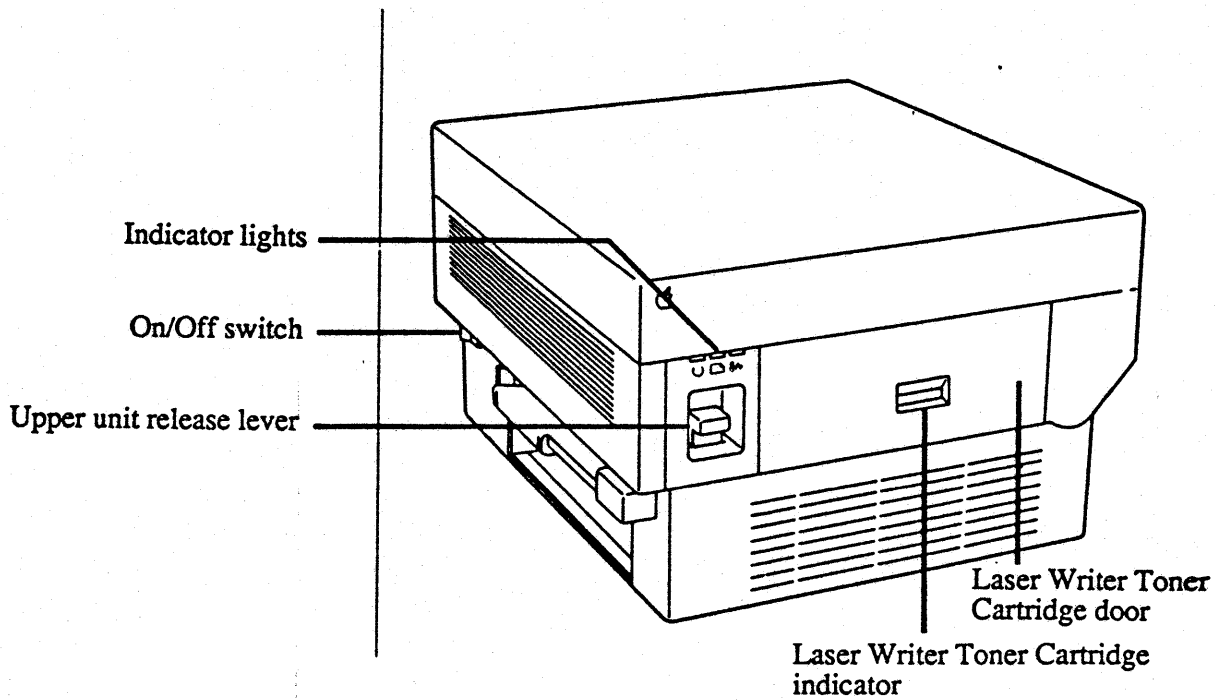


FIGURE 5-6

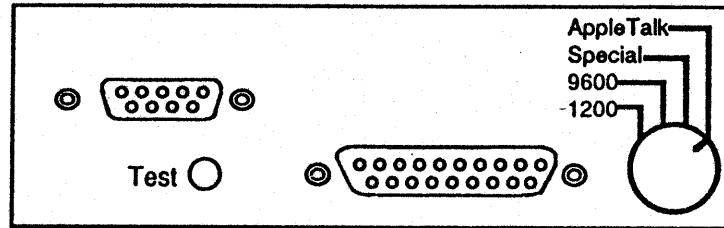


FIGURE 1-9: REAR (I/O) CONNECTOR PLATE

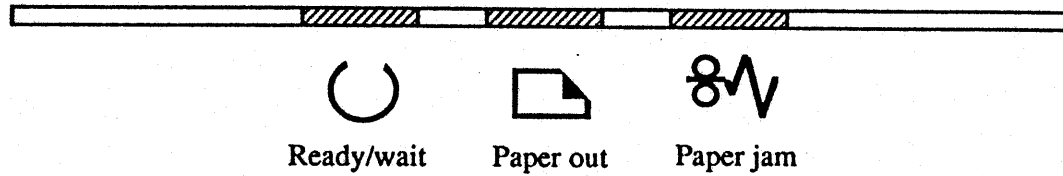


FIGURE 1-10: DISPLAY PANEL LEDs

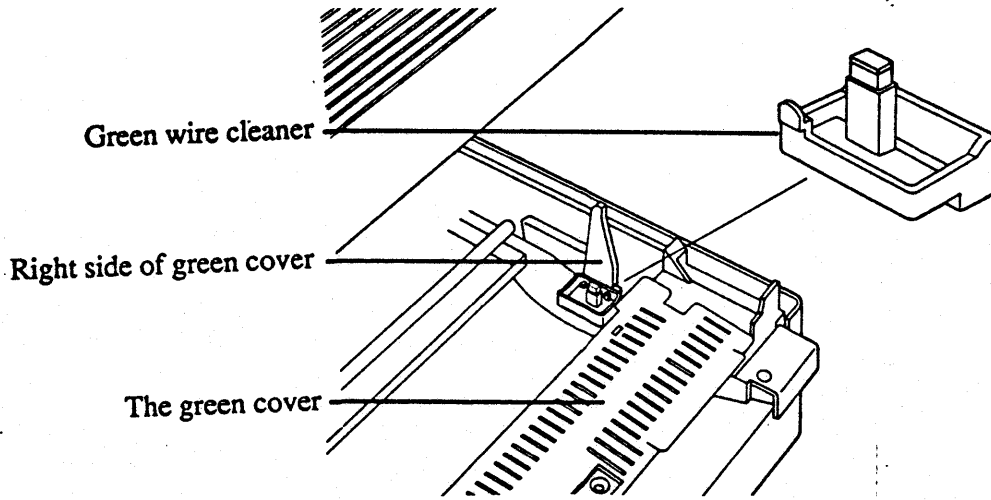


FIGURE 5-16: PRIMARY CORONA WIRE CLEANER

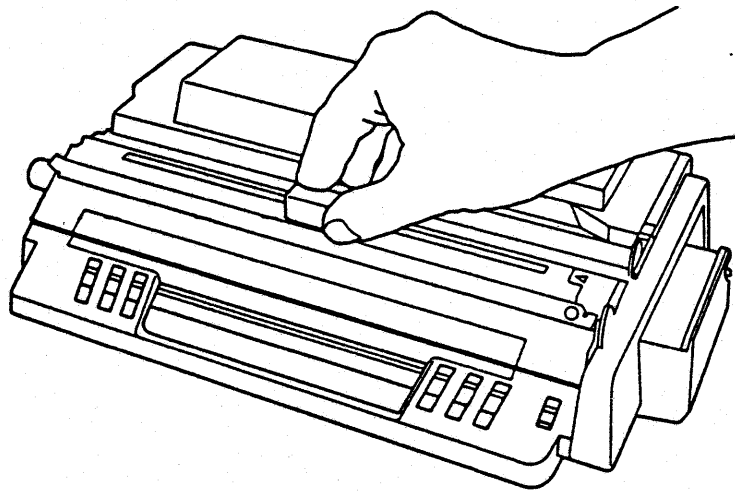


FIGURE 5-17: PRIMARY CORONA CLEANER SLOT

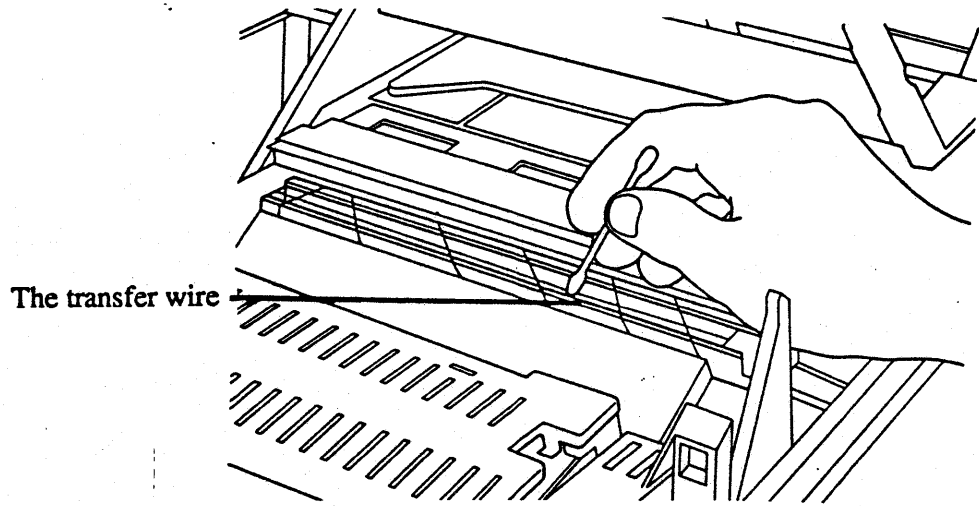


FIGURE 18: TRANSFER CORONA WIRE

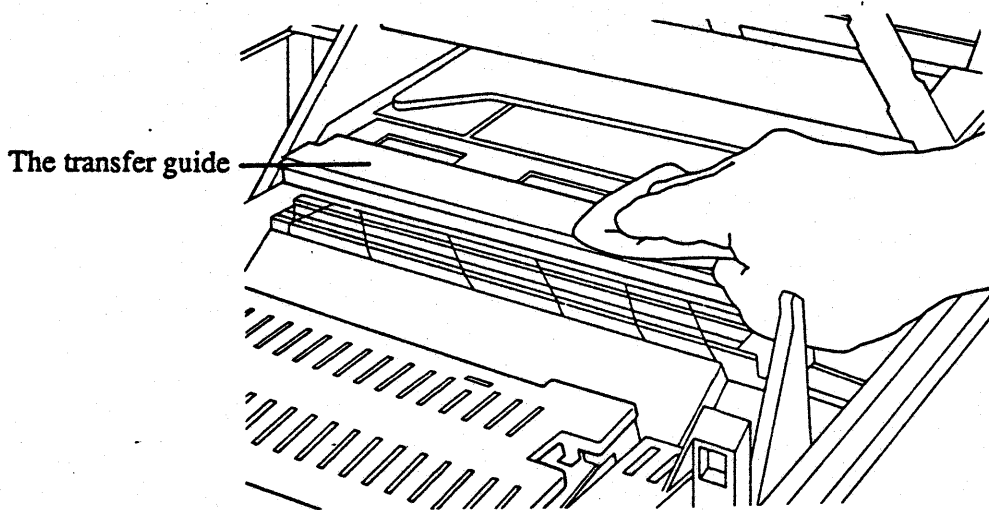


FIGURE 19: TRANSFER GUIDE

LaserWriter

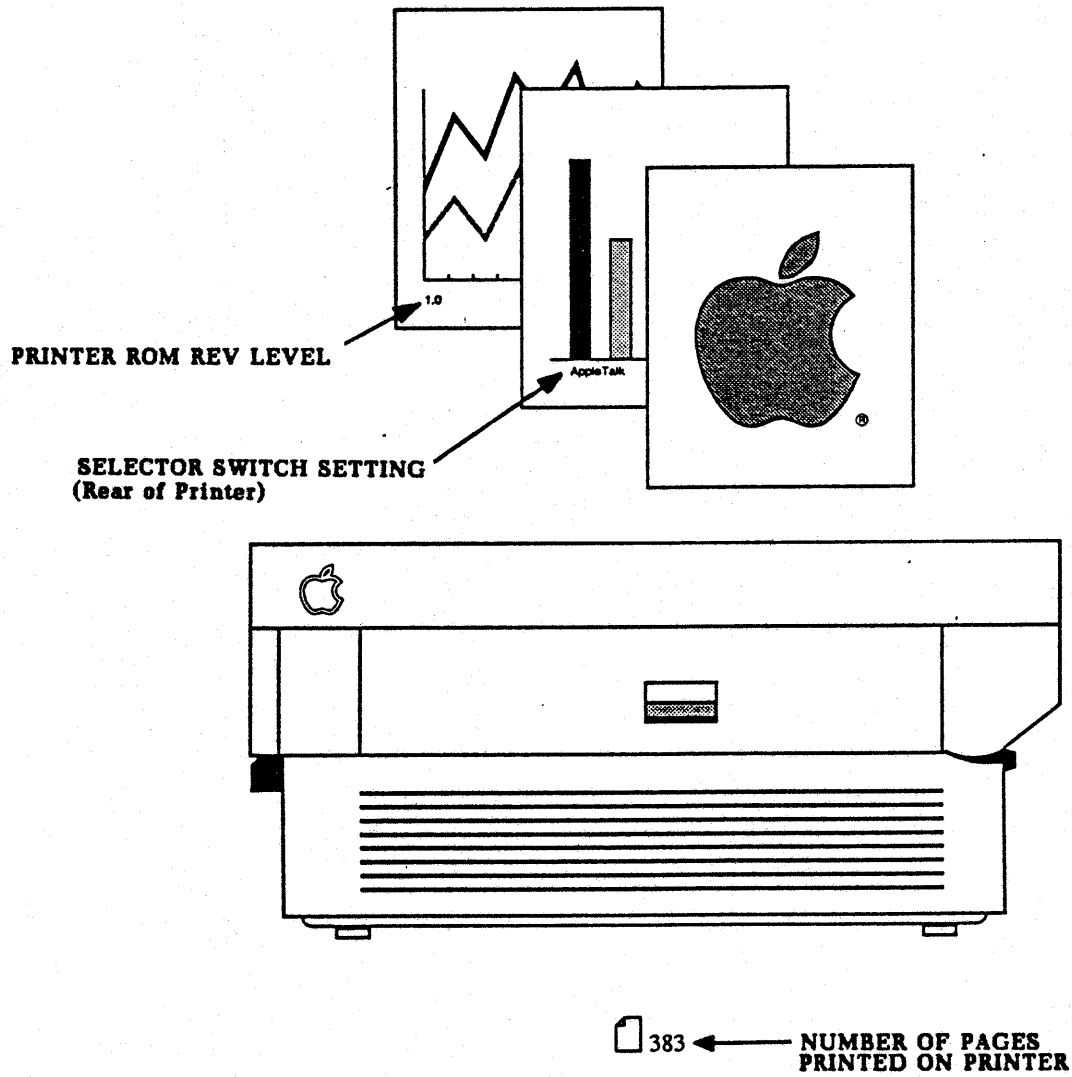
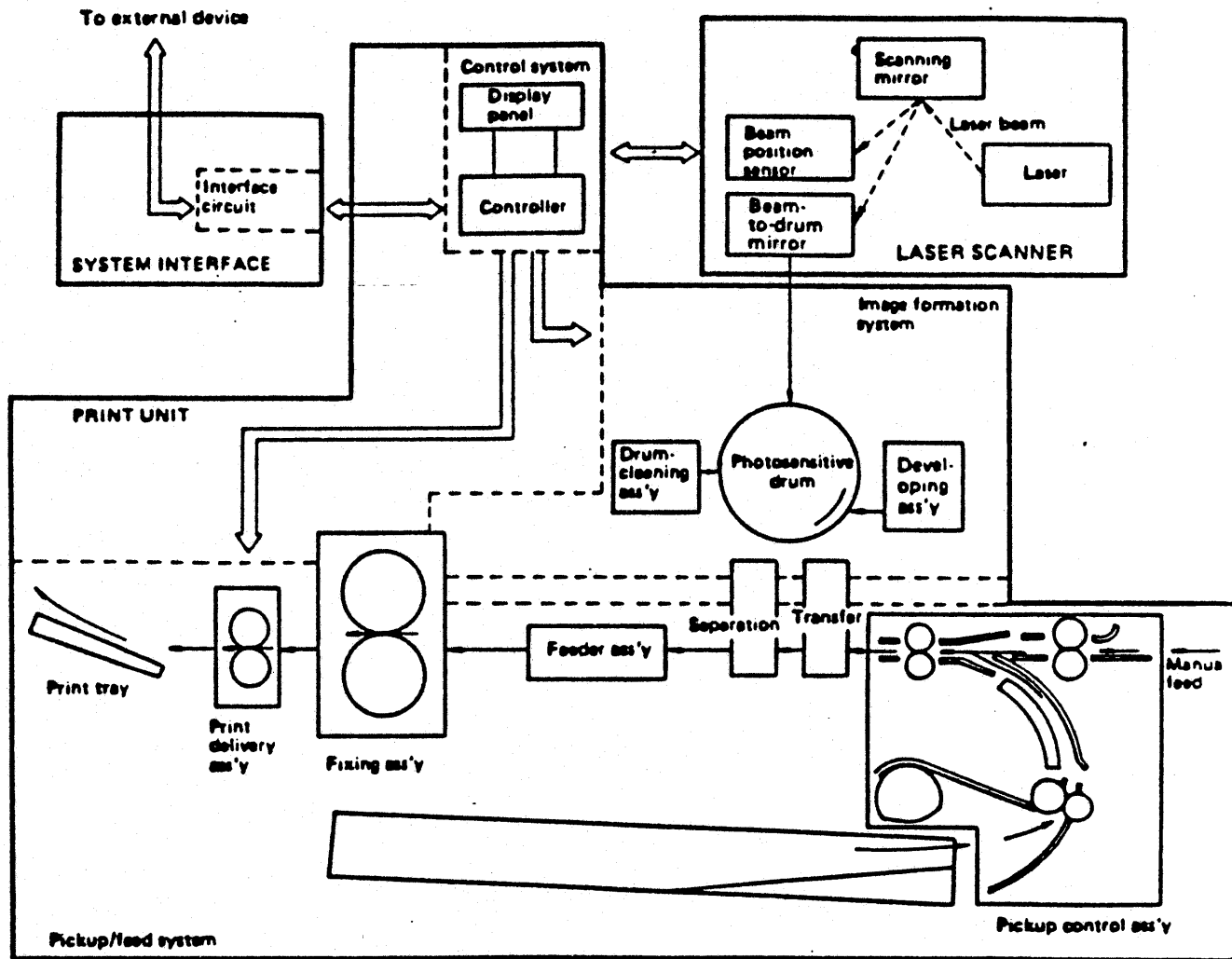


FIGURE 1-5: USER TEST PRINT



Overall Function Block Diagram

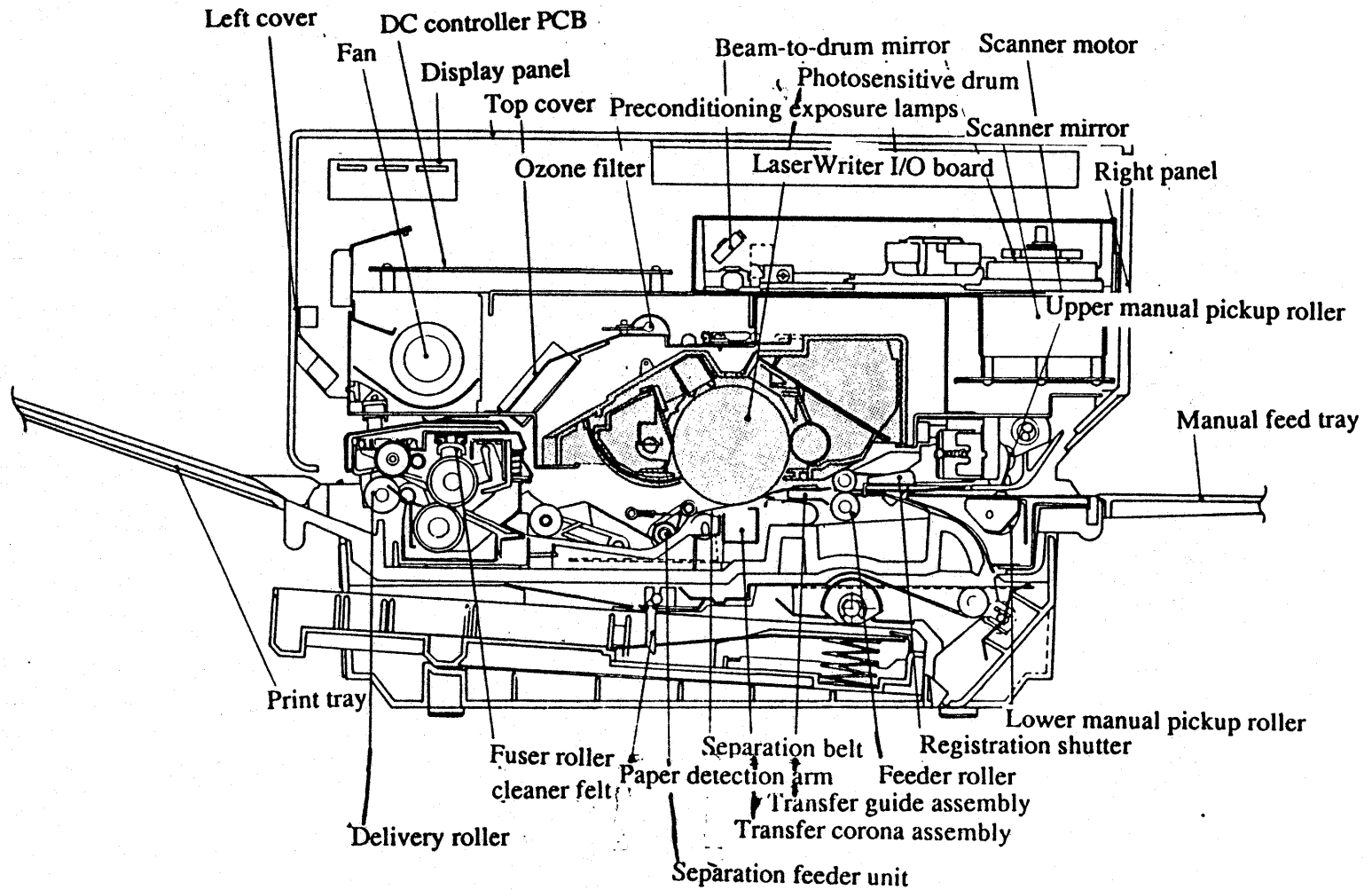
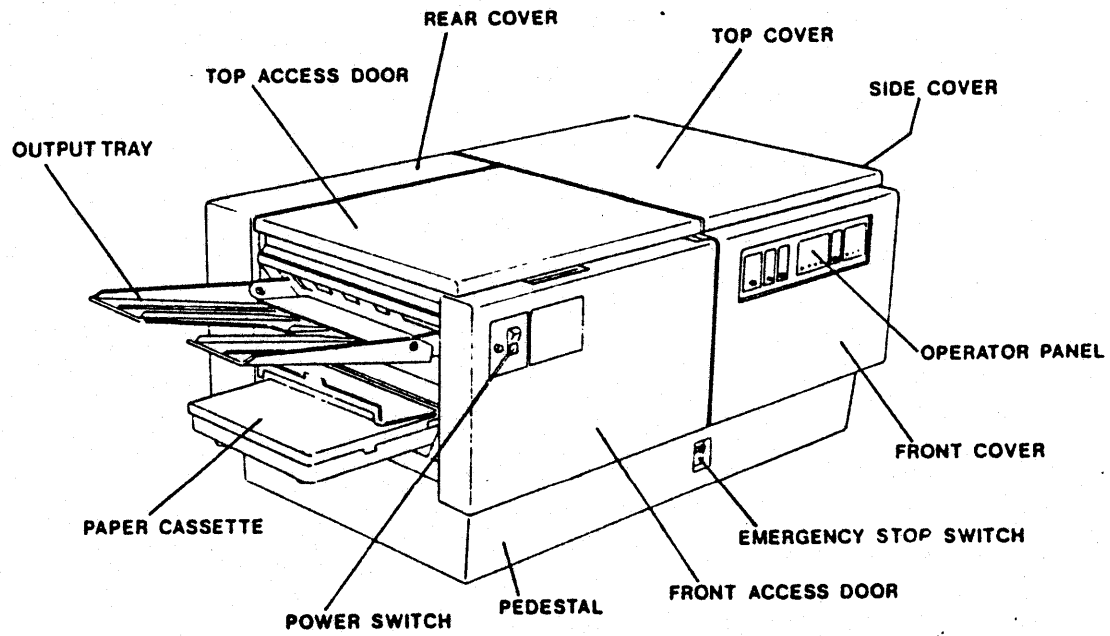
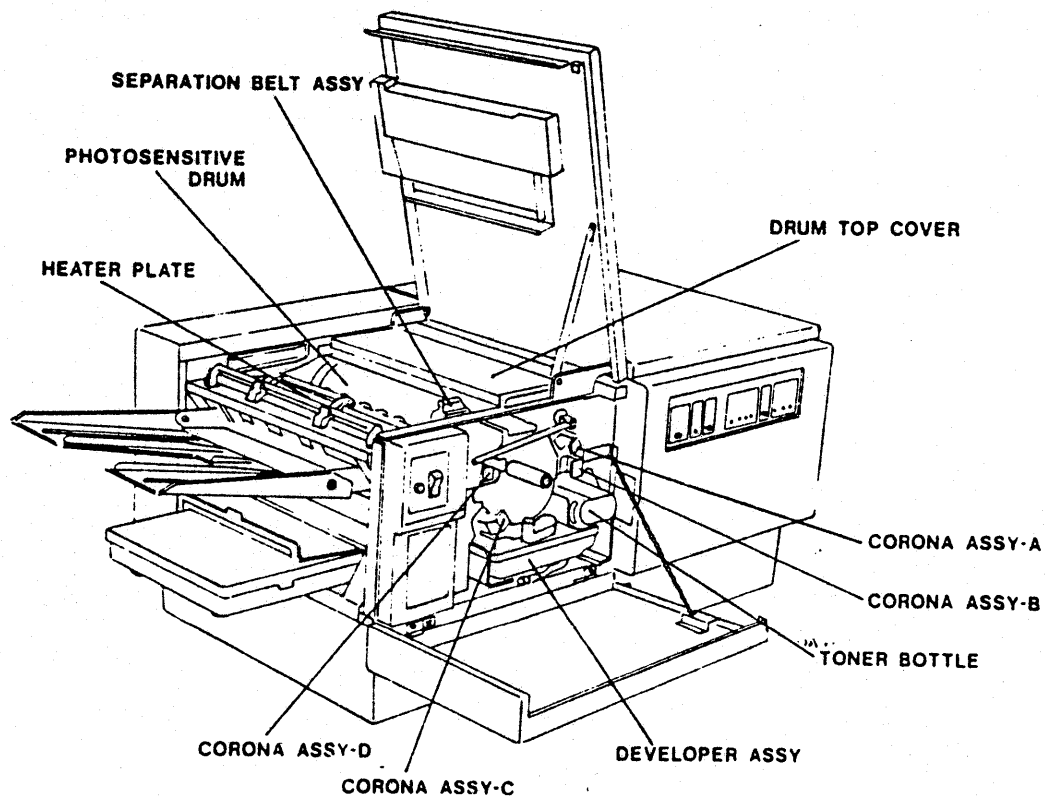


FIGURE 1-2: CROSS SECTION OF THE PRINTER (FRONT VIEW)



EXTERNAL VIEW OF THE LGP-1



INTERNAL VIEW OF THE LGP-1

Diagram

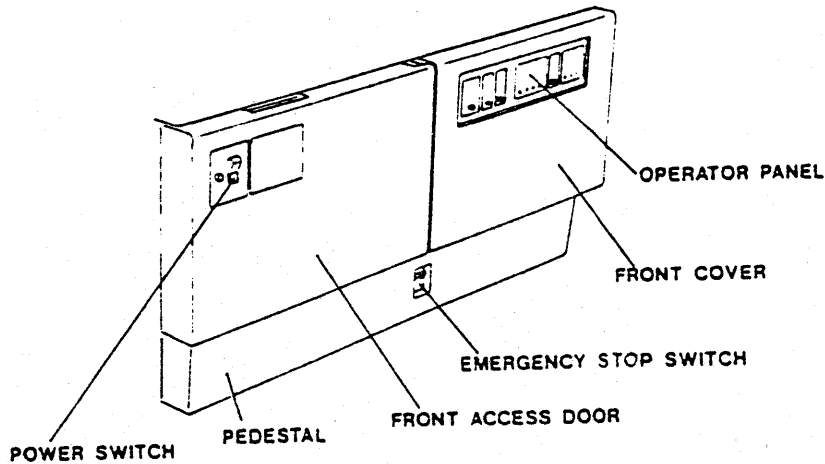
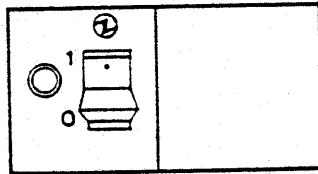


Figure 3. Switches and indicators on the front of the LGP-1.

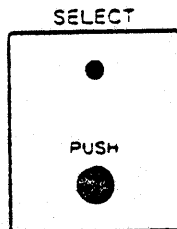
Power Switch



- When set to 1 (the upper portion of the switch is depressed), power is supplied to the entire printer.
- When set to 0 (the lower portion of the switch is depressed), power is turned off to all components except the environment conditioning circuits.

Operator Panel

*SELECT Button
& indicator*



The Select button has not been implemented in this release of the LGP-1.

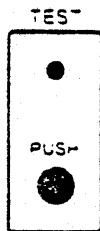
SWITCHES AND INDICATORS

READY/WAIT
indicator



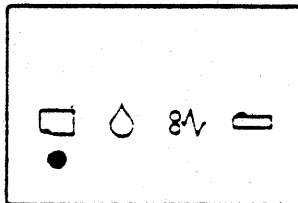
- When the Ready/Wait indicator flashes green, the printer is warming up, and you must wait for the printer to indicate that it is ready.
- When the Ready/Wait indicator is lit continuously, the printer is ready to accept your print command.

TEST button
& indicator



- When the Test button (labelled PUSH) is depressed ONCE, the test indicator is lit red and the LGP-1 prints a prestored pattern continuously; in this way the printer evaluates its own internal functioning.
- When the Test button is depressed AGAIN once it is on, then the red test indicator goes off and the LGP-1 stops printing test patterns.

PAPER OUT
indicator

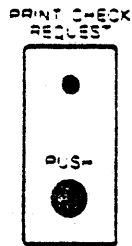


When the Paper Out indicator flashes red, the paper cassette is empty, missing, or installed incorrectly.

After determining the cause of the problem, see How to Load Paper, page 17, or How to Install the Paper Cassette, page 21.

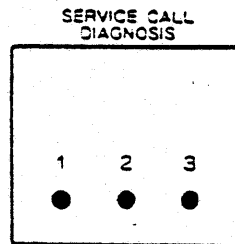
SWITCHES AND INDICATORS, cont'd.

**PRINT CHECK
REQUEST**
indicator &
RESTART button



The Print Check indicator and the Restart button have not been implemented in this release of the LGP-1.

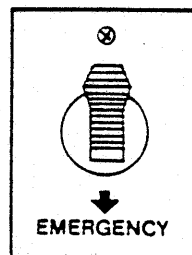
**SERVICE CALL
DIAGNOSIS**
indicators



When any of the three indicators is lit, the printer requires the attention of a trained technician.

Call your serviceperson immediately; be sure to tell him or her which indicators are illuminated.

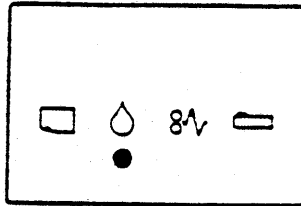
**Emergency
Stop Switch**



- When the Emergency Stop switch is flipped up, the switch is functioning. This switch should be kept on at all times. In the event of an accident, such as fire, smoke, sparks, the Emergency Stop switch shuts off ALL electric power inside the printer.
- When the Emergency Stop switch is flipped down, the switch is not functioning. This switch should be turned off ONLY in an emergency.

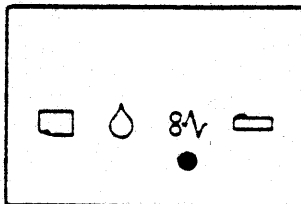
SWITCHES AND INDICATORS, cont'd.

PREMIX OUT
indicator



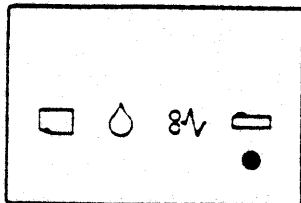
When the Premix Out indicator flashes red, the level of developer liquid is low. Add more premix. See How to Add Premix, page 22.

PAPER JAM
indicator



When the Paper Jam indicator flashes red, a paper jam has occurred. See How to Clear a Paper Jam, page 33.

TONER OUT
indicator



When the Toner Out indicator flashes red, the toner bottle is empty or the toner is clogging the attached black valve.

Open the front access door. Turn the toner bottle counterclockwise and pull it out carefully.

- If the toner bottle is empty, see How to Add Toner, page 23.
- If not, see How to Clear a Clogged Toner Valve, page 47.

Counter

The Counter, located on the right side of the printer, records the total number of pages printed. It cannot be reset.

SWITCHES AND INDICATORS. cont'd.

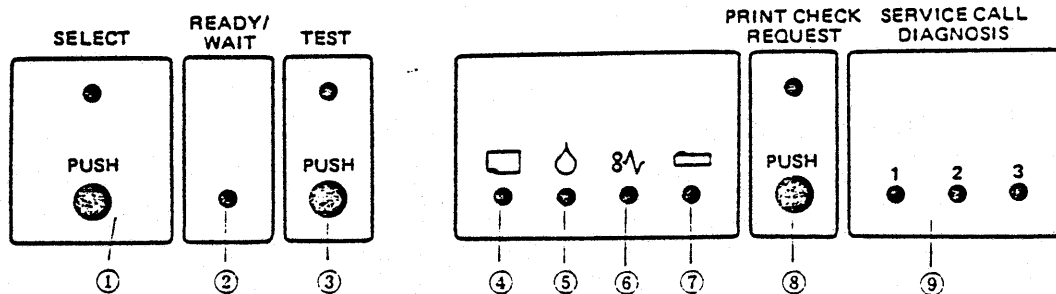


Figure 1 - 8 Control panel

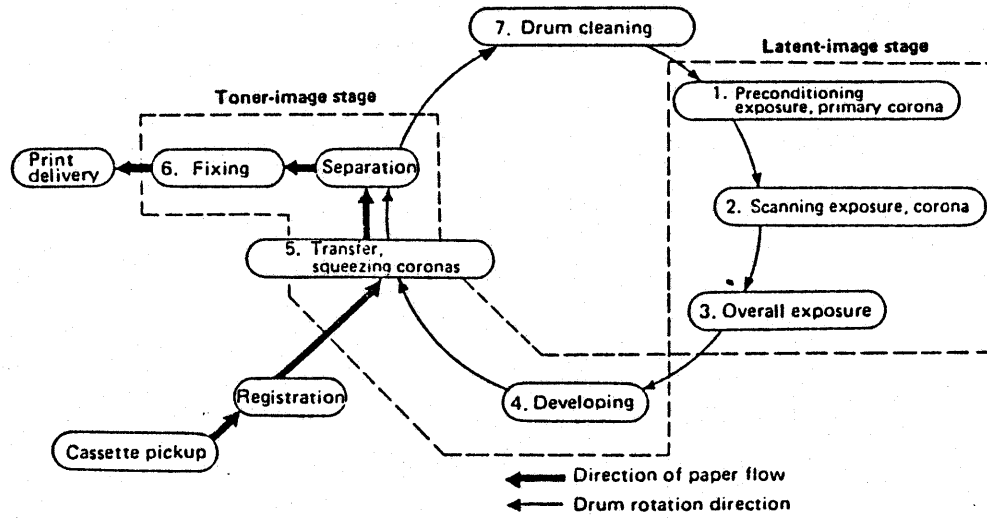
The colors of the LEDs for the LBP-10 are given first; those for the LBP-10II are given in parentheses.

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1) SELECT switch and indicator
yellow (green)</p> <p>2) READY/WAIT indicator
green (green)</p> <p>3) TEST switch and indicator
red (green)</p> <p>4) PAPER OUT indicator
red (orange)</p> <p>5) DEVELOPER OUT indicator
red (orange)</p> <p>6) JAM indicator
red (orange)</p> <p>7) TONER OUT indicator
red (orange)</p> <p>8) PRINT CHECK REQUEST indicator
and RESTART switch
red (orange)</p> <p>9) SERVICE CALL DIAGNOSIS indicators
x3, red (orange)</p> | <p>This switch is usually used to control the linkage to an external device. The yellow (green) LED lights steadily when the linkage is engaged.</p> <p>This green LED flashes when the LBP-10/10II is in the WAIT state and lights steadily when the printer is ready to operate.</p> <p>This switch is usually used to test LBP-10/10II components and functions.</p> <p>This red (orange) LED flashes if the cassette is empty or not installed. Printing is not possible if this indicator is flashing.</p> <p>This red (orange) LED flashes if the amount of developer in the developing assembly drops below the specified minimum. Printing is not possible when this indicator is flashing. Once this indicator has flashed, the printer will not reset until the developer supply has been replenished.</p> <p>This red (orange) LED flashes if paper has jammed inside the printer. Printing is not possible until the jammed paper is removed.</p> <p>This red (orange) LED flashes if the toner supply runs out. Printing is not possible when this indicator is flashing.</p> <p>This red (orange) LED flashes and the printer is switched to the WAIT state if an image problem occurs during printing. Pressing the RESTART button after the problem has been corrected turns the LED off and switches the printer back to the READY state.</p> <p>These LEDs flash alone or in combination to indicate the general location of a malfunction detected by the diagnostic program. The location code is as follows:</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

	LED 1	LED 2	LED 3	Malfunction Location
1	•			Laser driver PCB, laser unit
2		•		Scanner driver PCB, scanner unit
3	•	•		Horizontal sync generator (incl. stationary mirror), laser driver PCB, laser unit, scanner driver PCB, scanner unit
4			•	AC driver PCB, DC controller PCB (fixing control)
5	•		•	Drum clock PCB, main motor
6		•	•	DC controller clock (LBP-10 only)

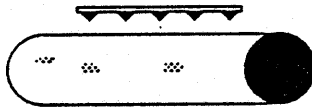
Note: "•" means the indicator is lit.

Table 1-1 Service call LEDs



The Printing Process

STEP 1: PRE-CONDITIONING EXPOSURE

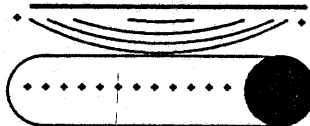


FUNCTION: TO LOWER RESISTANCE OF DRUM

FAILURE MODES AND EFFECTS:

LAMP(S) FAILURE -> DARK SPECKS ON PAGE

STEP 2: PRIMARY CORONA A DISCHARGE



FUNCTION: TO DEPOSIT POSITIVE CHARGES ON DRUM

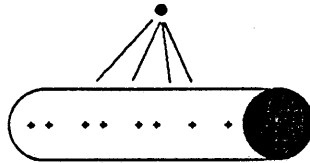
FAILURE MODES AND EFFECTS:

CORONA A UNDERCHARGING -> DARKENED/BLACK PAGE

CORONA A OVERCHARGING -> PRINT DROP-OUT

LGP-1 IMAGE FORMATION

STEP 3: LASER EXPOSURE



FUNCTION: TO DISCHARGE SPECIFIED AREAS OF DRUM

FAILURE MODES AND EFFECTS:

LASER UNDEREXPOSURE -> LIGHTENED/BLANK PRINT

LASER OVEREXPOSURE -> SHORTENED LASER LIFE

STEP 4: SCANNING CORONA B DISCHARGE



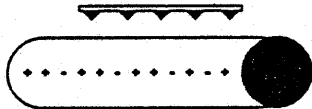
FUNCTION: TO SPRAY NEGATIVE CHARGES ON TO DRUM

FAILURE MODES AND EFFECTS:

CORONA B UNDERCHARGING -> LIGHT/BLANK PRINT

CORONA B OVERCHARGING -> OVER-BOLD PRINT/DARKENED PAGE

STEP 5: OVERALL EXPOSURE

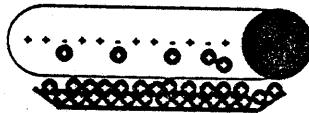


FUNCTION: TO REMOVE FREE NEGATIVE CHARGES FROM DRUM

FAILURE MODES AND EFFECTS:

LAMP(S) FAILURE -> OVER-BOLD PRINT/DARKENED PAGE

STEP 6: TONER APPLICATION



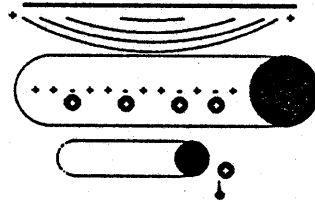
FUNCTION: TO APPLY TONER TO DRUM

FAILURE MODES AND EFFECTS:

TONER UNDER-APPLICATION -> LIGHTENED PRINT

TONER OVER-APPLICATION -> OVER-BOLD PRINT

STEP 7: SQUEEZING CORONA C DISCHARGE AND ELECTRODE ROLLER



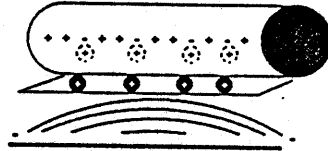
FUNCTION: TO REMOVE EXTRA TONER FROM DRUM

FAILURE MODES AND EFFECTS:

CORONA C UNDERCHARGING -> OVER-BOLD PRINT/DARKENED PAGE

CORONA C OVERCHARGING -> PRINT DROP-OUT

STEP 8: TRANSFER CORONA D DISCHARGE



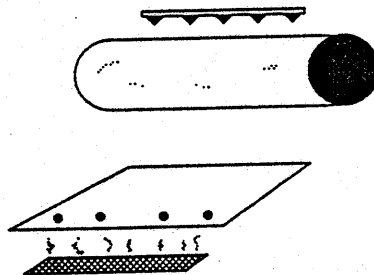
FUNCTION: TO PULL TONER FROM DRUM TO PAPER

FAILURE MODES AND EFFECTS:

CORONA D UNDERCHARGING -> PRINT DROP-OUT

CORONA D OVERCHARGING -> OVER-BOLD PRINT/TONER NOT FIXED

STEP 9: POST-EXPOSURE AND FIXING

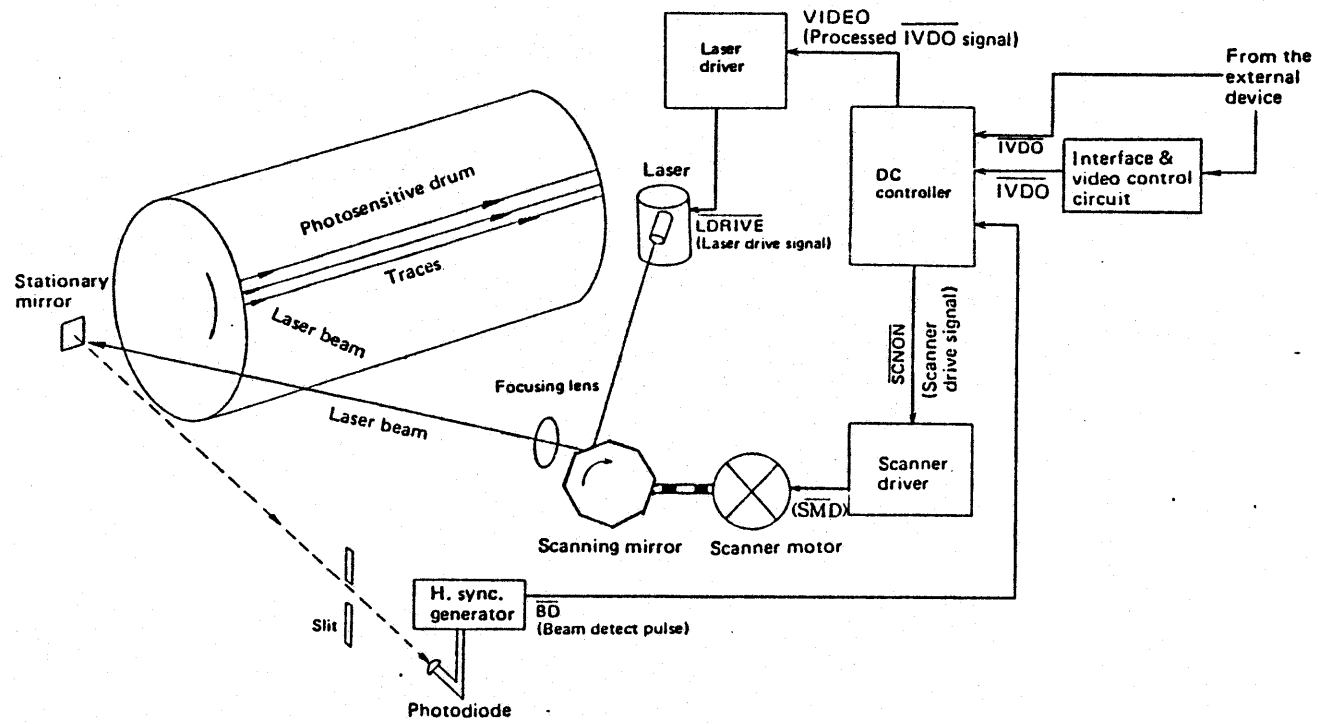


FUNCTION: TO DISCHARGE DRUM AND FIX TONER TO PAPER

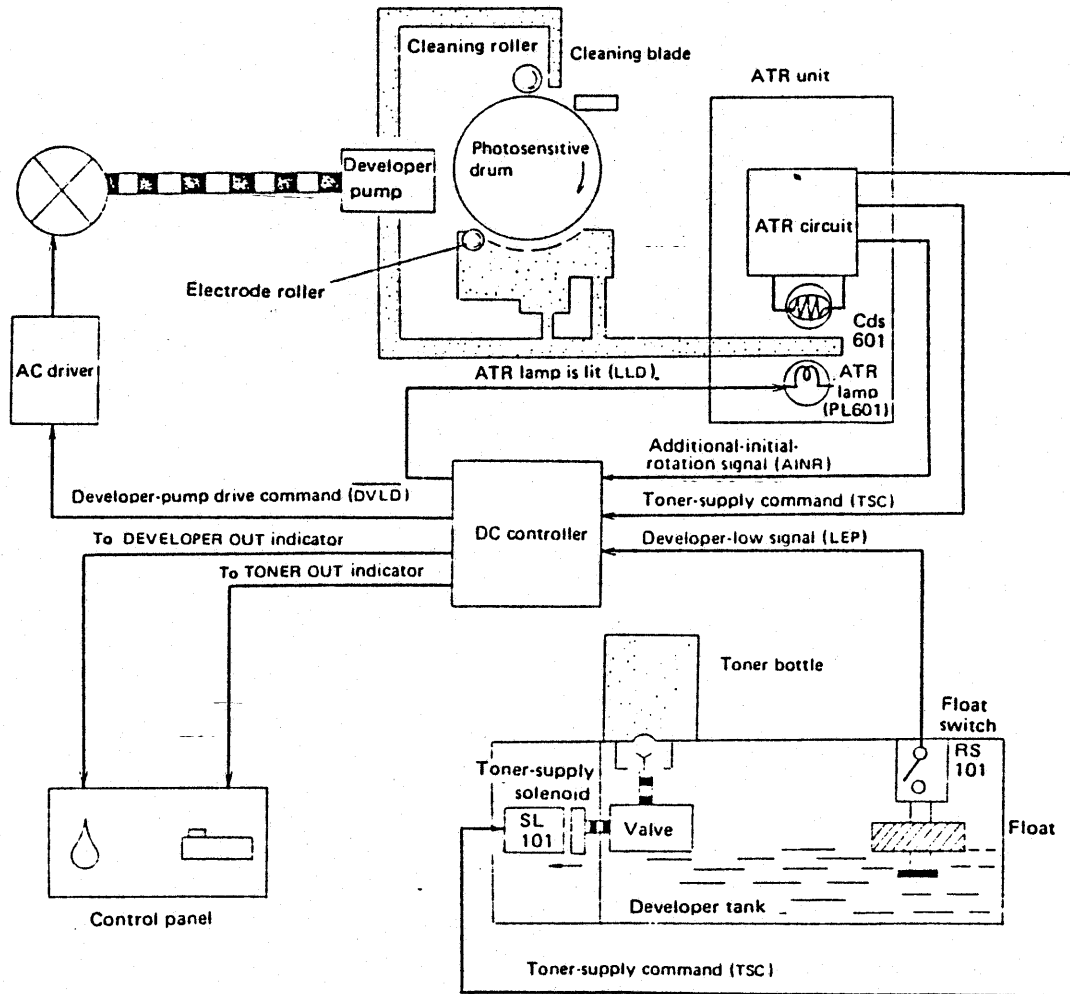
FAILURE MODES AND EFFECTS:

LAMP(S) FAILURE -> GHOST IMAGES APPEAR ON PAGE

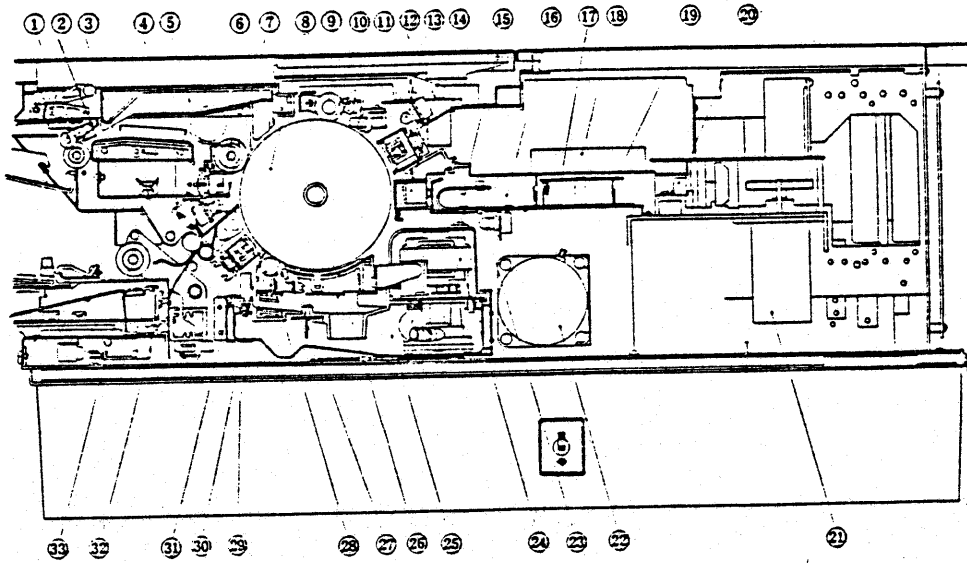
FIXING HEATER FAILURE -> PRINT SMEARS WHEN TOUCHED



LASER SCANNER

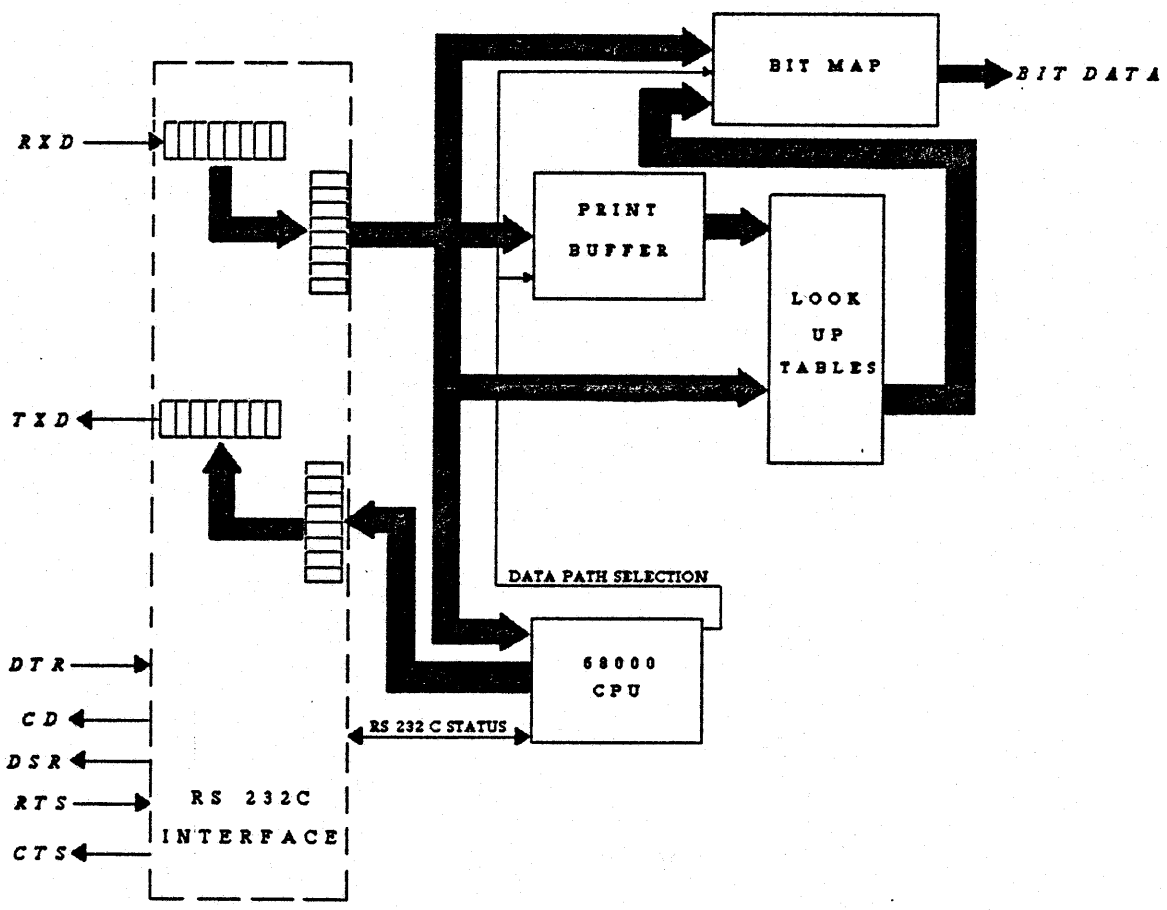


Developing Assembly Control



- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. Paper detection roller 2. Delivery roller 3. Fixing heater 4. Paper delivery guide 5. Post-exposure lamps 6. Transfer corona assembly (D) 7. Separation roller 8. Photosensitive drum 9. Drum cover 10. Cleaning roller 11. Cleaning blade (photosensitive drum) 12. Primary corona assembly (A) 13. Preconditioning-exposure lamps 14. Scanning corona assembly (B) 15. Stationary mirror 16. Light guide 17. H. sync generator PCB | <ol style="list-style-type: none"> 18. Anti-dust fan for the scanning corona assembly (B) 19. ND filter 20. Focusing lens 21. Scanner unit 22. Main motor 23. Overall-exposure lamps 24. Developer pump 25. Developing assembly 26. Developing tray 27. Main scraper 28. Cleaning blade (for electrode roller) 29. Electrode roller 30. Secondary scraper 31. Squeezing corona assembly (C) 32. Paper pickup guide 33. Pickup rollers |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

LBP-10II Cross sectional view



Switch	Function	IF switch	THEN
#1 & #2	Sets baud rate on the serial interface	#1 = ON & #2 = ON #1 = OFF & #2 = ON #1 = ON & #2 = OFF #1 = OFF & #2 = OFF	Baud rate = 300. Baud rate = 1200. Baud rate = 9600. Baud rate = 19200 <i>Note:</i> The software currently expects to use 9600 baud.
#3	Sets host interface to use	#3 = ON #3 = OFF	Host uses serial interface. Host uses parallel interface
#4	Sets printing format	#4 = ON #4 = OFF	Printing is in landscape mode (157 columns by 66 lines). Printing is in portrait mode (113 columns by 80 lines).
#5	Unused		
#6	Sets printer resolution	#6 = ON #6 = OFF	Print is in standard resolution: 240 x 240 dots/inch. Print is in high resolution: 480 dots/inch vertical. <i>Note:</i> #6 MUST always be on.
#7	Sets debug mode	#7 = ON #7 = OFF	Normal operation: no debug. Debugging information is provided over serial line. <i>Note:</i> #7 MUST always be on.
#8	Unused		

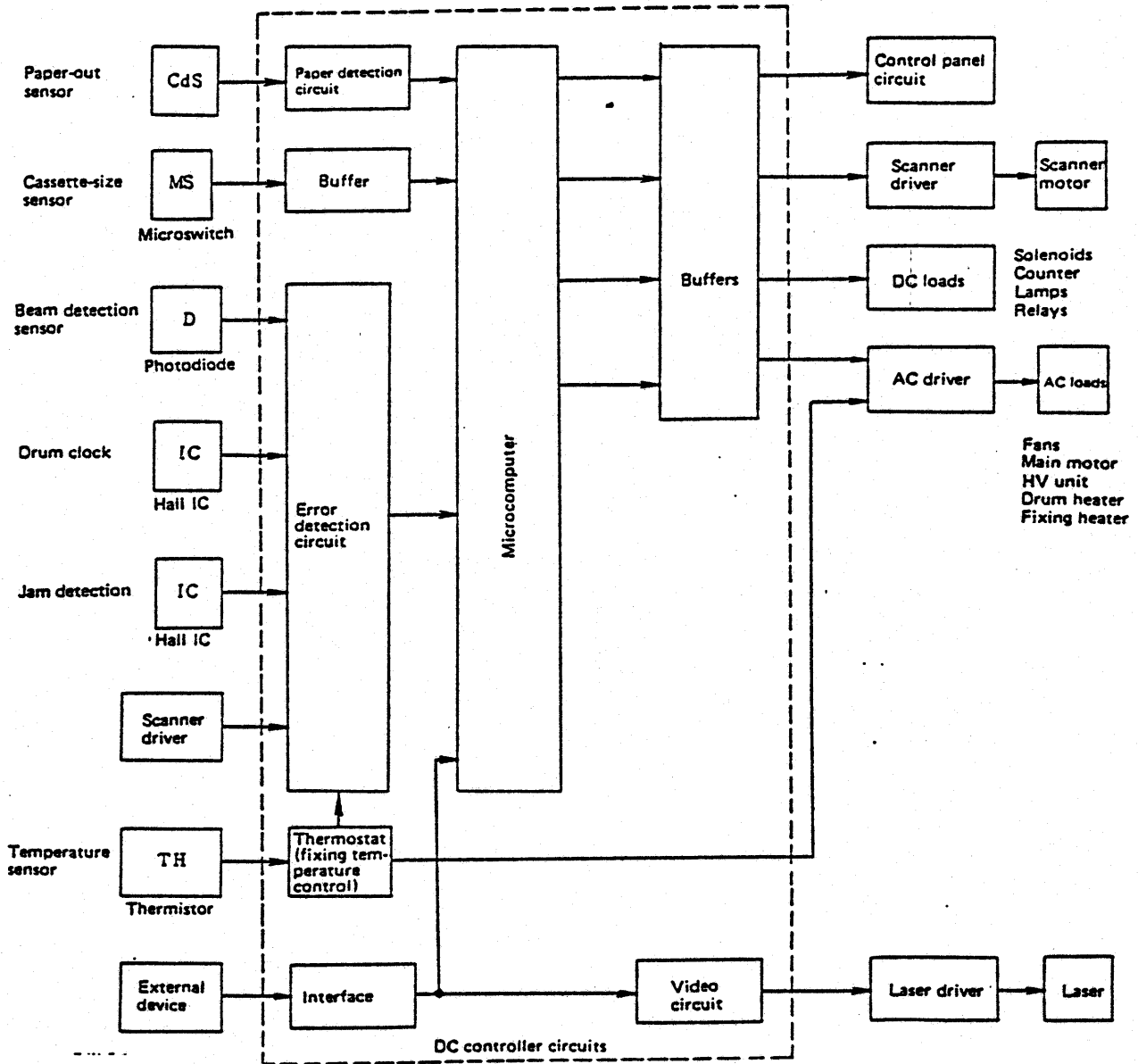
Note on ON and OFF settings: You might occasionally encounter rocker switches that are numbered on one side and blank on the other. In this case:

- to set the switch ON, depress the labelled side
- to set the switch OFF, depress the blank side

SWITCH SETTINGS ON THE CONTROLLER BOARD

(MEMORY PCBA SWITCH SETTINGS SPECIFY BOARD CONFIGURATION. THE ONLY SUPPORTED CONFIGURATION REQUIRES SW. 2 - ON; ALL OTHERS - OFF.)

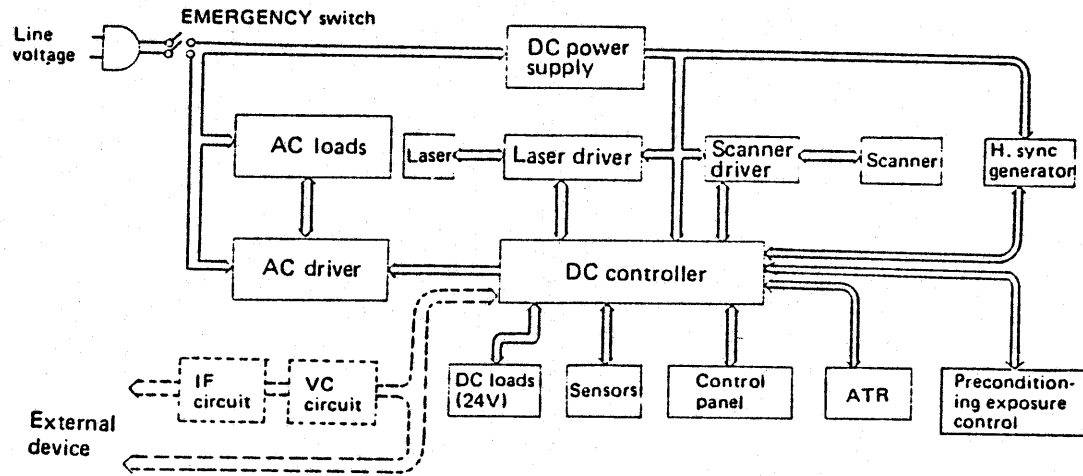
LGP-1 SWITCH SETTINGS



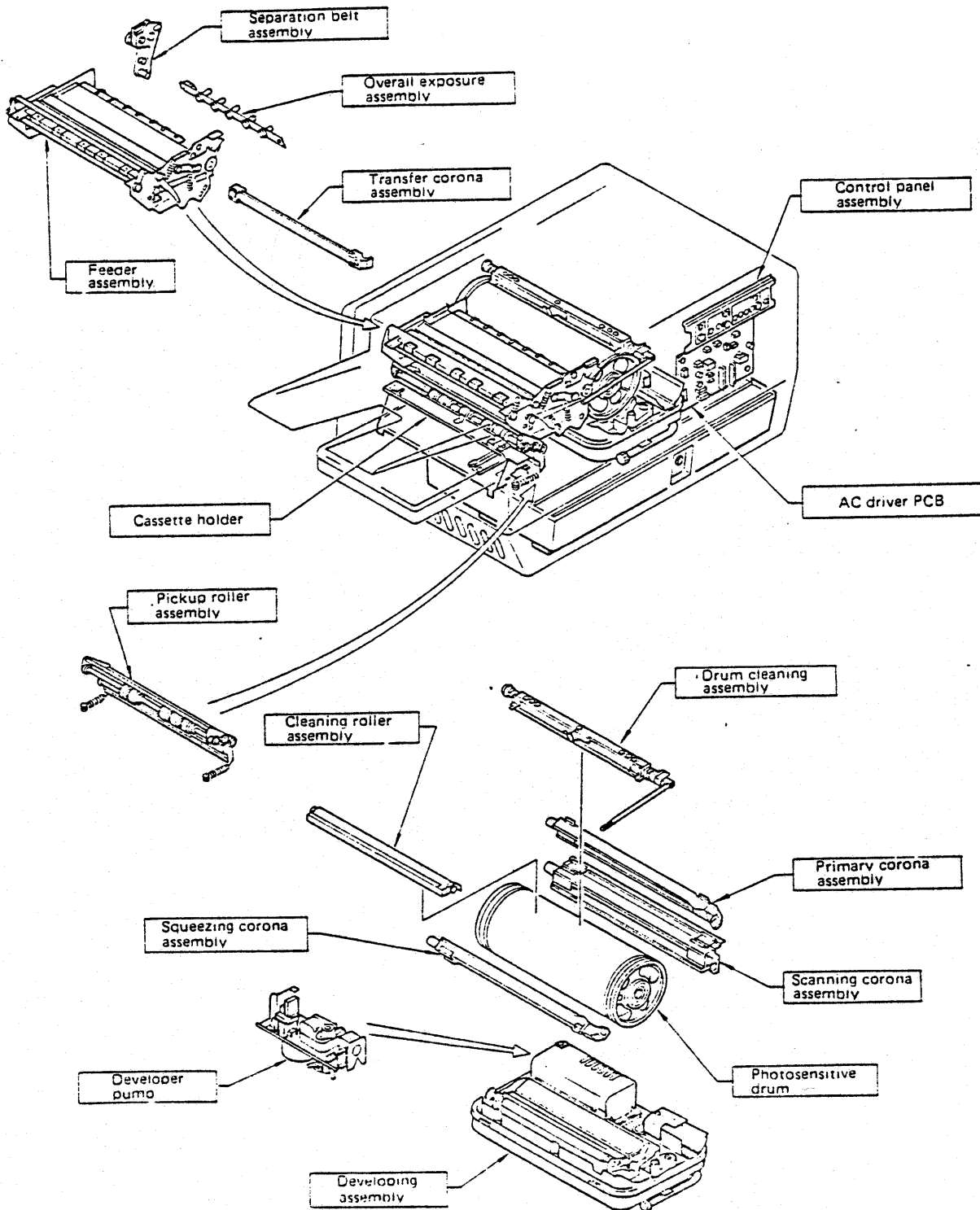
PCB	LED	Reason for lighting
DC controller	LED501	The fixing heater is operating ($\overline{\text{FSRD}}$ is TRUE).
	LED502	The high-voltage power supplies, motor, and developing assembly are operating ($\overline{\text{HVDC}}$ (LBP-10), $\overline{\text{HVFR}}$ (LBP-10II), $\overline{\text{DVLD}}$, and $\overline{\text{DRMD}}$ are TRUE).
	LED503	The ATR lamp (L601) is ON (LLD is TRUE).
	LED504	+5V DC is available.
Laser driver	LED701	The temperature of the laser chip is correct ($\overline{\text{LRDY}}$ is TRUE).
Scanner driver	LED301	The scanner motor is rotating at the correct speed ($\overline{\text{SCNRDY}}$ is TRUE).
ATR	LED601	The concentration of toner in the developer is too low (TSC is TRUE).

F. PCB List

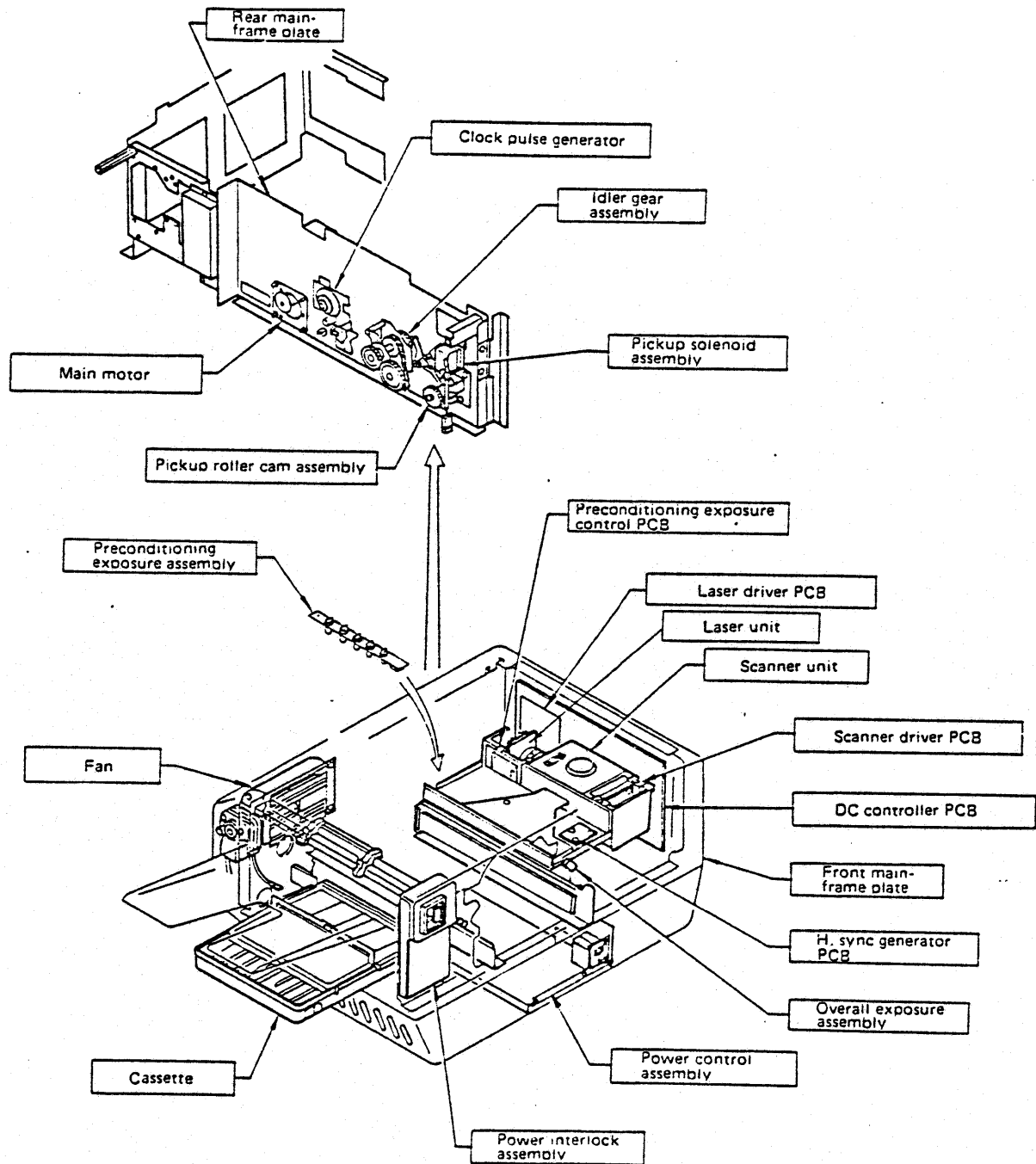
1. DC controller
2. AC driver
3. Control panel
4. Laser driver
5. Scanner driver
6. Horizontal sync generator
7. ATR
8. Preconditioning exposure
9. Overall- and post-exposure
10. Drum clock, paper-detection
11. Preconditioning exposure



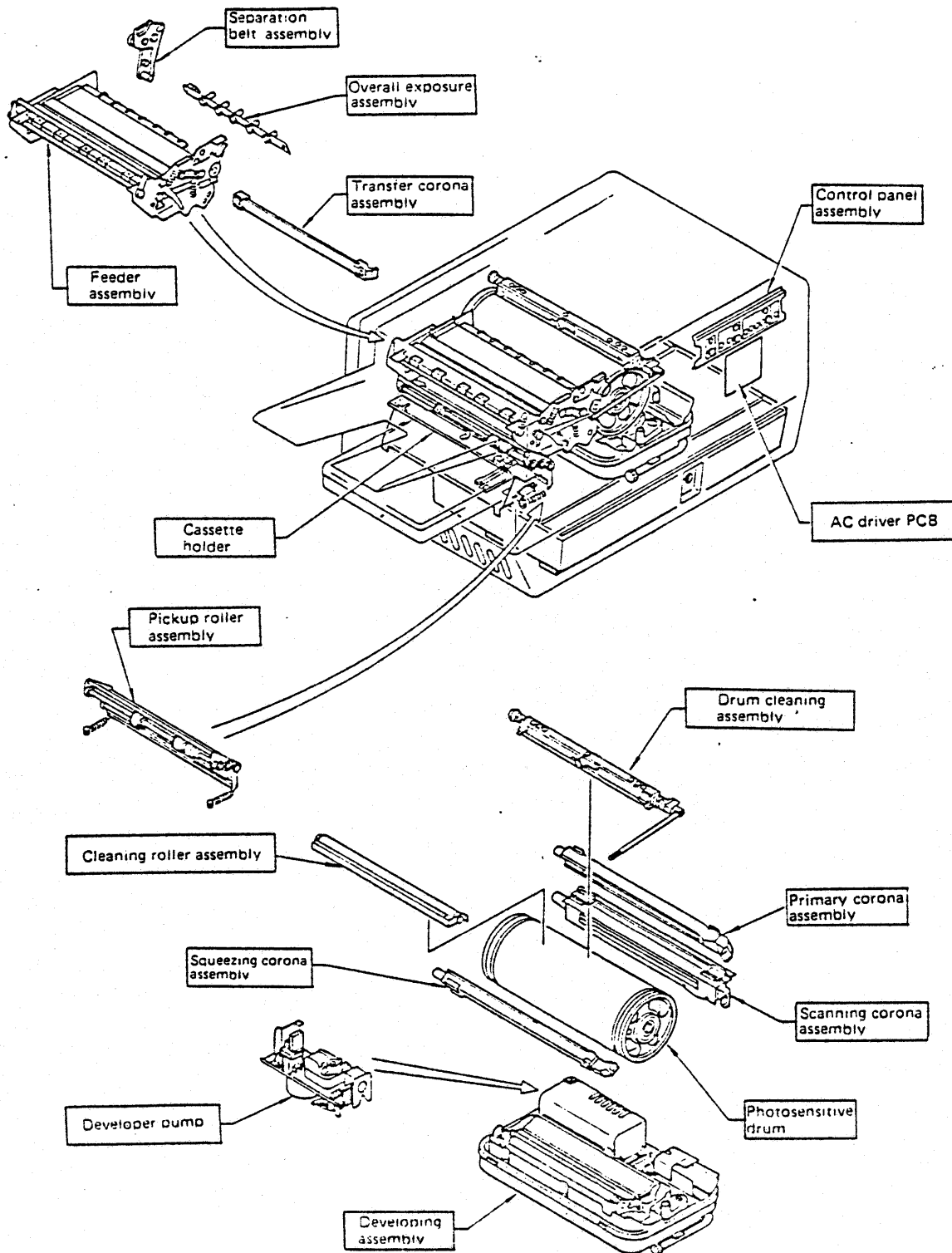
LBP-10/10II electrical system



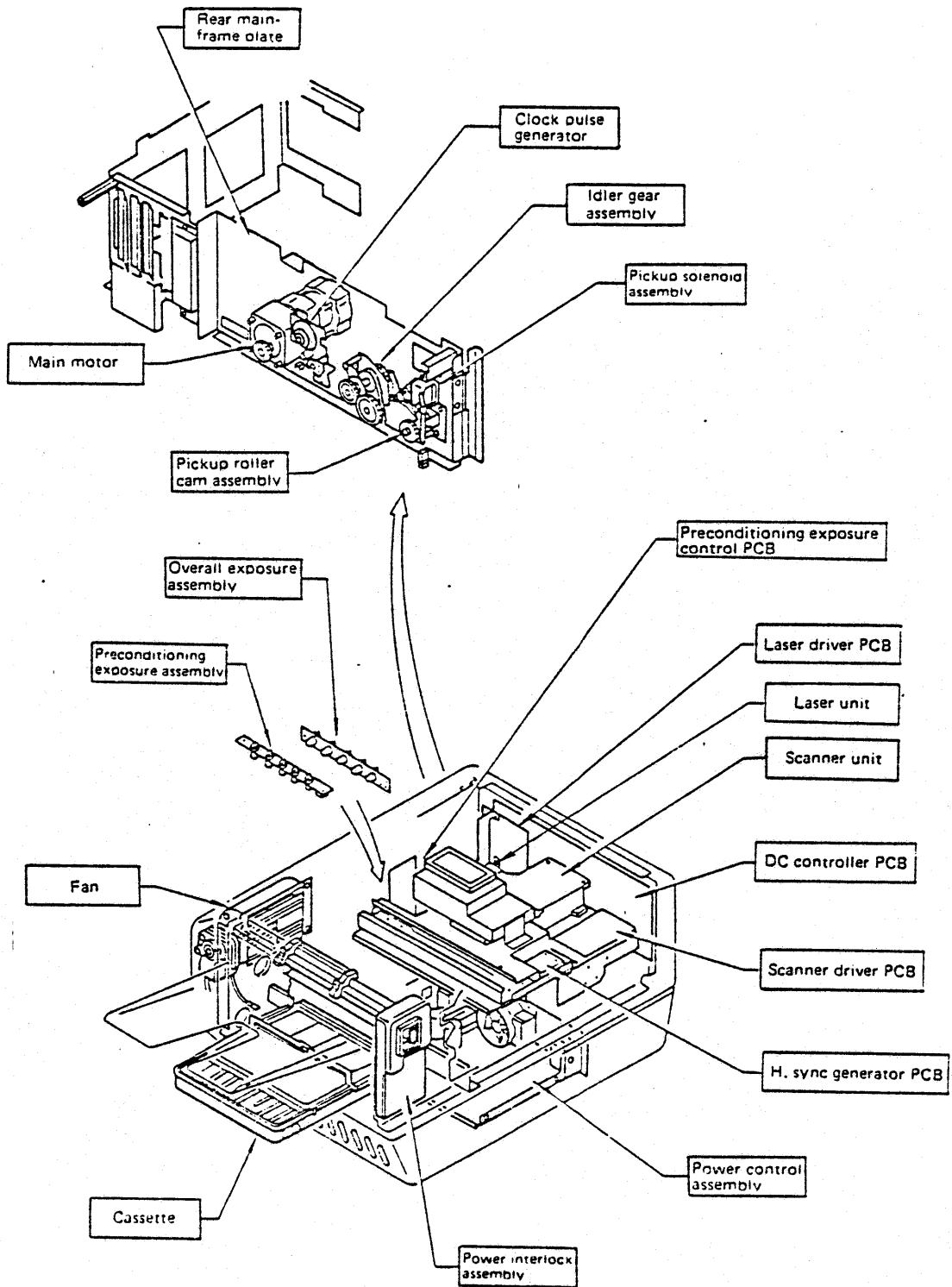
LOCATIONS OF ASSEMBLIES, UNITS FOR LBP-10 (1 of 2)



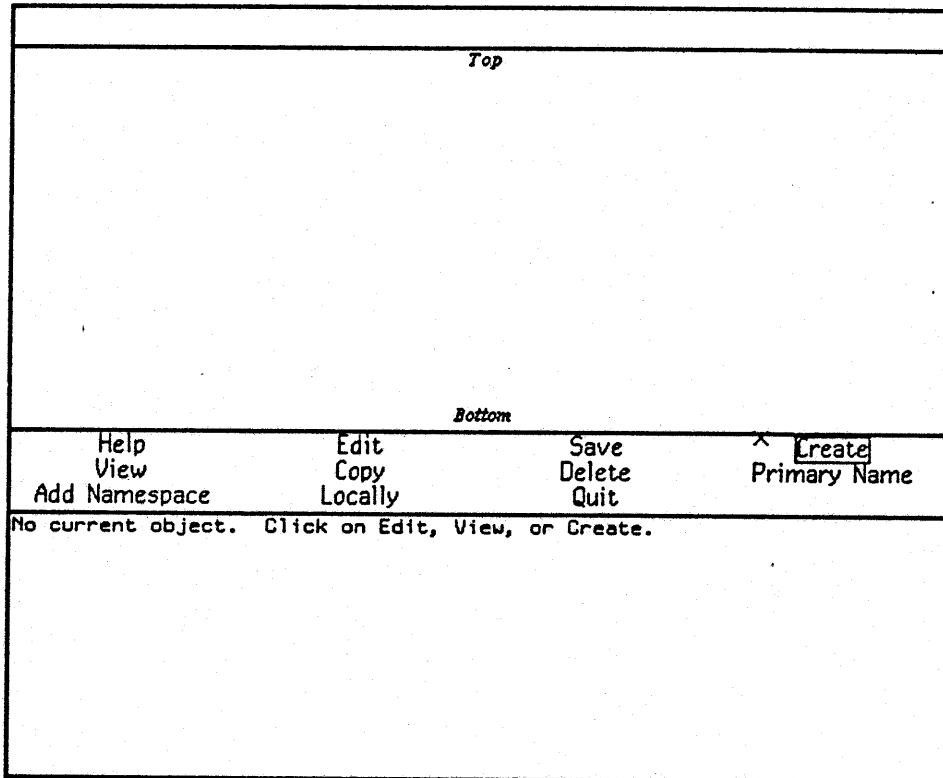
LOCATIONS OF ASSEMBLIES, UNITS FOR LBP-10 (2 of 2)



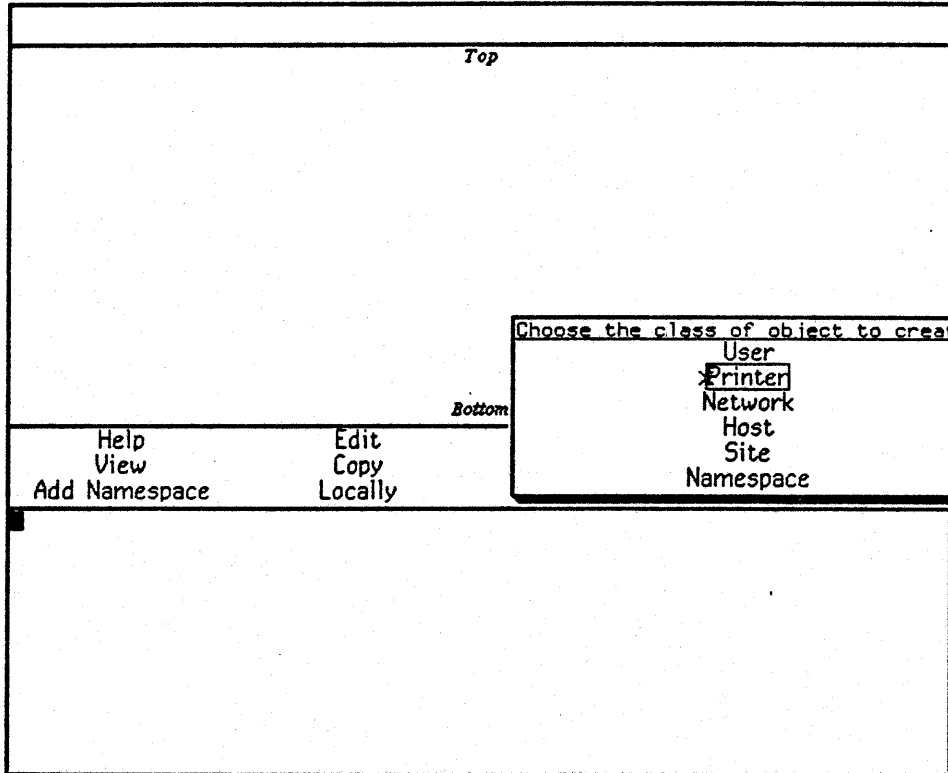
LOCATIONS OF ASSEMBLIES, UNITS FOR LBP-10II (1 of 2)



LOCATIONS OF ASSEMBLIES, UNITS FOR LBP-10II (2 of 2)



PRINTER INSTALLATION



<i>Top</i>			
↖			
<i>Bottom</i>			
Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	
Enter a name for the printer to be edited: silverwood█			

Editing: Printer SCH|SILVERWOOD			
<i>Top</i>			
Type*: LGP2			
Site: SCH-SUPPORT			
Pretty Name: "silverwood lake"			
Interface: SERIAL			
Interface Options: <i>Set: Pair:</i> BAUD 9600 <i>Pair:</i> UNIT 1 <i>Pair: Global-name Token</i>			
Host: MERCURY			
Format: <i>Global-name</i>			
Protocol: <i>Global-name</i>			
Default Font: <i>Token</i>			
Header Font: <i>Token</i>			
Dplt Logo: <i>Global-name</i>			
Character Size: <i>Pair: Token Token</i>			
Page Size: <i>Pair: Token Token</i>			
Fonts Widths File: <i>Token</i>			
User Property: <i>Pair: Global-name Token</i>			
<i>Bottom</i>			
Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	
Click on an attribute entry to replace (L), delete (M) or edit (R) it.			

Editing: Printer SCH|SILVERWOOD			
<i>Top</i>			
Type: LGP2			
Site: SCH-SUPPORT			
Pretty Name: "silverwood lake"			
Interface: SERIAL			
Interface Options: <i>Set: Pair:</i> BAUD 9600 <i>Pair:</i> UNIT 1 <i>Pair: Global-name Token</i>			
Host: MERCURY			
Format: <i>Global-name</i>			
Protocol: <i>Global-name</i>			
Default Font: <i>Token</i>			
Header Font: <i>Token</i>			
Dplt Logo: <i>Global-name</i>			
Character Size: <i>Pair: Token Token</i>			
Page Size: <i>Pair: Token Token</i>			
Fonts Widths File: <i>Token</i>			
User Property: <i>Pair: Global-name Token</i>			
<i>Bottom</i>			
Help	Edit	S ave	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	
Click on an attribute entry to replace (L), delete (M) or edit (R) it.			

Editing: Printer SCH|SILVERWOOD			
<i>Top</i>			
Type*: LGP2 Site: SCH-SUPPORT Pretty Name: "silverwood lake" Interface: SERIAL Interface Options: <i>Set: Pair:</i> BRAUD 9600 <i>Pair:</i> UNIT 1 <i>Pair: Global-name Token</i> Host: MERCURY Format: <i>Global-name</i> Protocol: <i>Global-name</i> Default Font: <i>Token</i> Header Font: <i>Token</i> Dplt Logo: <i>Global-name</i> Character Size: <i>Pair: Token Token</i> Page Size: <i>Pair: Token Token</i> Fonts Widths File: <i>Token</i> User Property: <i>Pair: Global-name Token</i>			
<i>Bottom</i>			
Help	<u>E</u> dit	Save	Create
View	<u>C</u> opy	Delete	Primary Name
Add Namespace	Locally	Quit	
Click on an attribute entry to replace (L), delete (M) or edit (R) it.			

Editing: Printer SCH|SILVERWOOD	
<i>Top</i>	
Type*: LGP2	
Site: SCH-SUPPORT	
Pretty Name: "silverwood lake"	
Interface: SERIAL	
Interface Options: <i>Set: Pair:</i> BAUD 9600 <i>Pair:</i> UNIT 1 <i>Pair: Global-name Token</i>	
Host: MERCURY	
Format: <i>Global-name</i>	
Protocol: <i>Global-name</i>	
Default Font: <i>Token</i>	
Header Font: <i>Token</i>	
Dplt Logo: <i>Global-name</i>	
Character Size: <i>Pair: Token Token</i>	
Page Size: <i>Pair: Token Token</i>	
Fonts	
User Pr	Choose the class of object to edit.
Add N	User
	Printer
	Network
	Host
	Site
	Namespace
	Save
	Delete
	Quit
	Create
	Primary Name

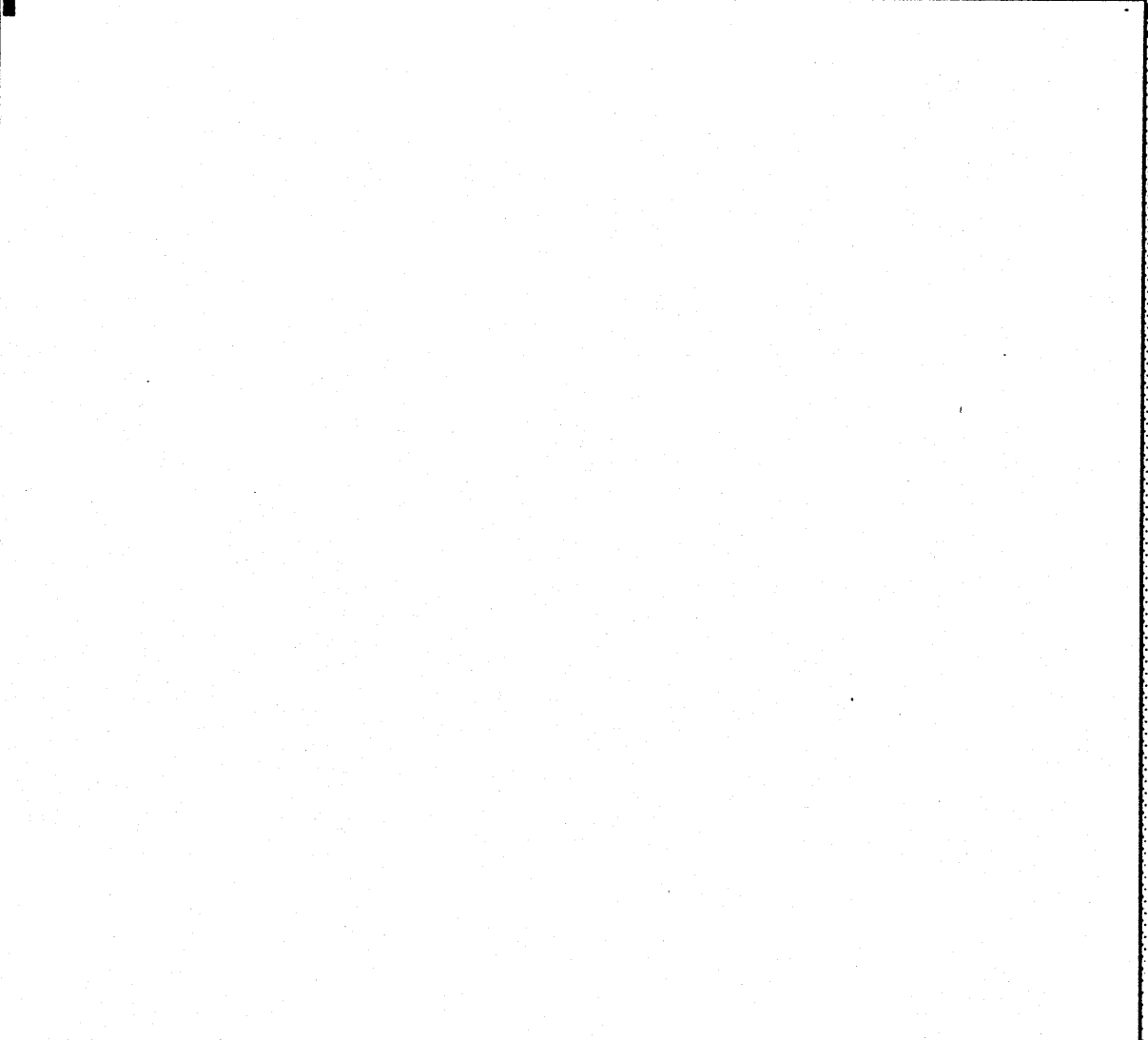
<i>Top</i>			
<i>Bottom</i>			
Help	<u>E</u> dit	Save	Create
View	× Copy	Delete	Primary Name
Add Namespace	Locally	Quit	
Enter a name for the host to be edited: mercury			

Editing: Host SCHMERCURY			
<i>Top</i>			
System Type: LISPM			
Short Name: MY			
Short Name: <i>Name</i>			
Site: SCH-SUPPORT			
Nickname: SCH-MERCURY			
Nickname: <i>Name</i>			
Machine Type: 3640			
Address: <i>Pair</i> : CHAOS 21070			
Address: <i>Pair</i> : <i>Network Token</i>			
Pretty Name: MERCURY			
Finger Location: "Corporate Tech Support"			
Location: <i>Pair</i> : SCH 2			
Service: <i>Set</i> : CHAOS-STATUS CHAOS-SIMPLE CHAOS-STATUS <i>Global-name</i>			
Service: <i>Set</i> : SHOW-USERS CHAOS NAME <i>Global-name</i>			
Service: <i>Set</i> : TIME CHAOS-SIMPLE TIME-SIMPLE <i>Global-name</i>			
<i>More below</i>			
Help	<input checked="" type="checkbox"/> <u>E</u> dit	Save	Create
View	<input type="checkbox"/> Copy	Delete	Primary Name
Add Namespace	<input type="checkbox"/> Locally	Quit	
Click on an attribute entry to replace (L), delete (M) or edit (R) it.			
■			

Editing: Host SCHMERCURY			
<i>More above</i>			
Service: Set: LISPM-FINGER CHAOS-SIMPLE LISPM-FINGER <i>Global-name</i>			
Service: Set: FILE CHAOS QFILE <i>Global-name</i>			
Service: Set: HARDCOPY CHAOS LGP <i>Global-name</i>			
Service: Set: HARDCOPY-STATUS CHAOS LGP-STATUS <i>Global-name</i>			
Service: Set: <i>Global-name</i>			
Printer: SILVERWOOD			
Bitnap Printer: <u>SILVERWOOD</u>			
File Control Lifetime: 150000			
Spooled Printer: Pair: SILVERWOOD Set: Pair: HOME-DIRECTORY ny:>silverwood P			
Spooled Printer: Pair: Printer Set: Pair: <i>Global-name</i> Token			
Print Spooler Options: Set: Pair: <i>Global-name</i> Token			
Server Machine: Token			
Peripheral: Pair: <i>Global-name</i> Set: Pair: <i>Global-name</i> Token			
Default Secondary Name Server: Token			
User Property: Pair: <i>Global-name</i> Token			
<i>Bottom</i>			
Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	Quit	
Click on an attribute entry to replace (L), delete (M) or edit (R) it.			

Editing: Host SCHJMERCURY			
<i>More above</i>			
Service: Set: LISPM-FINGER CHAOS-SIMPLE LISPM-FINGER <i>Global-name</i>			
Service: Set: FILE CHAOS QFILE <i>Global-name</i>			
Service: Set: HARDCOPY CHAOS LGP <i>Global-name</i>			
Service: Set: HARDCOPY-STATUS CHAOS LGP-STATUS <i>Global-name</i>			
Service: Set: <i>Global-name</i>			
Printer: SILVERWOOD			
Bitnap Printer: SILVERWOOD			
File Control Lifetime: 150000			
Spooled Printer: Pair: SILVERWOOD Set: Pair: HOME-DIRECTORY ny:>silverwood P			
Spooled Printer: Pair: Printer Set: Pair: <i>Global-name Token</i>			
Print Spooler Options: Set: Pair: <i>Global-name Token</i>			
Server Machine: <i>Token</i>			
Peripheral: Pair: <i>Global-name Set: Pair: <i>Global-name Token</i></i>			
Default Secondary Name Server: <i>Token</i>			
User Property: Pair: <i>Global-name Token</i>			
<i>Bottom</i>			
Help	Edit	<u>S</u> ave	Create
View	Copy	De <u>l</u> ete	Primary Name
Add Namespace	Locally	Quit	
Click on an attribute entry to replace (L), delete (M) or edit (R) it.			

Editing: Host SCH|MERCURY			
<i>More above</i>			
Service: Set: LISPM-FINGER CHAOS-SIMPLE LISPM-FINGER <i>Global-name</i>			
Service: Set: FILE CHAOS QFILE <i>Global-name</i>			
Service: Set: HARDCOPY CHAOS LGP <i>Global-name</i>			
Service: Set: HARDCOPY-STATUS CHAOS LGP-STATUS <i>Global-name</i>			
Service: Set: <i>Global-name</i>			
Printer: SILVERWOOD			
Bitmap Printer: SILVERWOOD			
File Control Lifetime: 150000			
Spooled Printer: Pair: SILVERWOOD Set: Pair: HOME-DIRECTORY my:>silverwood P			
Spooled Printer: Pair: Printer Set: Pair: <i>Global-name</i> Token			
Print Spooler Options: Set: Pair: <i>Global-name</i> Token			
Server Machine: Token			
Peripheral: Pair: <i>Global-name</i> Set: Pair: <i>Global-name</i> Token			
Default Secondary Name Server: Token			
User Property: Pair: <i>Global-name</i> Token			
<i>Bottom</i>			
Help	Edit	Save	Create
View	Copy	Delete	Primary Name
Add Namespace	Locally	<u>Quit</u>	
Click on an attribute entry to replace (L), delete (M) or edit (R) it.			
<div style="border: 1px solid black; width: 100%; height: 100%;"></div>			



Extended command:	(Completion)
Create Directory	

```

Create directory: (Default is A:>palacio>training) (Completion)
MERCURY:>SILVERWOOD>█

```



```

Edit directory (Default is A:>palacio>training>*. *.* ) (Completion)
MERCURY:>

```

◊ :Edit Nanespace Object

◊ :Edit Nanespace Object

[11:50:10 From PHOENIX: Request for Screen Hardcopy of 11:28 on Firelake completed.]

◊ :Edit Nanespace Object

[11:56:06 From PHOENIX: Request for Screen Hardcopy of 11:29 on Firelake completed.]

[11:58:07 From PHOENIX: Request for Screen Hardcopy of 11:29 on Firelake completed.]

◊ :Help

The following commands are available:

Compile File	Expunge Directory	Renane File	Show Command Processor Status
Compile System	Find Symbol	Replay Composed Song	Show Directory
Compose Song	Halt GC	Report Bug	Show Disabled Services
Copy File	Halt Machine	Reset Network	Show Documentation
Copy Microcode	Hardcopy File	Save File Buffers	Show FEP Directory
Copy World	Hardcopy Musical Selection	Save Mail Buffers	Show File
Create Directory	Help	Save World	Show Font
Create FEP File	Initialize Mail	Select Activity	Show GC Status
Create Link	Initialize Mouse	Serenade	Show Herald
Delete File	Initialize Time	Set Base	Show Hosts
Describe Musical Selection	Inspect	Set Calendar Clock	Show Legal Notice
Disable Services	Load File	Set Command Processor	Show Mail
Edit Definition	Load Patches	Set Input Base	Show Notifications
Edit Directory	Load System	Set Output Base	Show Object
Edit File	Login	Set Package	Show System Modifications
Edit Font	Logout	Set Site	Show Users
Edit Nanespace Object	Music	Set Time	Start GC
Edit Stops	Play Musical Selection	Set User ID	Undelete File
Enable Services	Quiet		

◊ ■

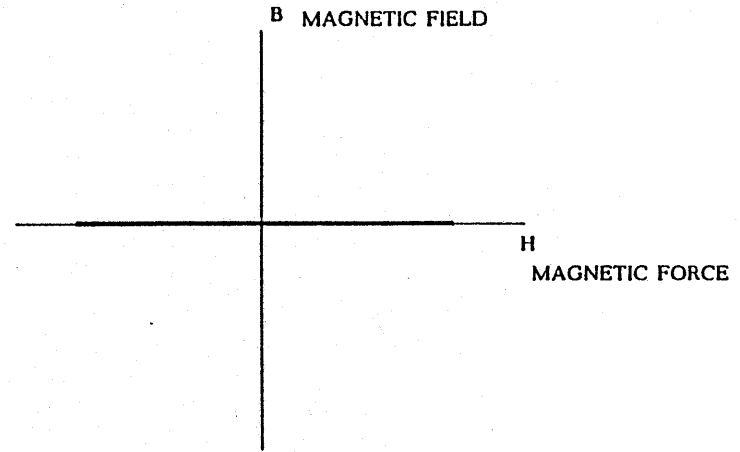
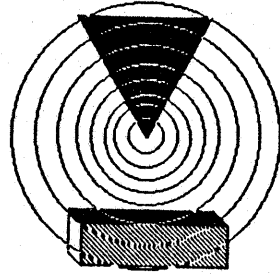
☛ :Create Directory (Pathname [default MY:>*.*.*)>*.*.*) mercury:>silverwood>

Lisp Listener 1

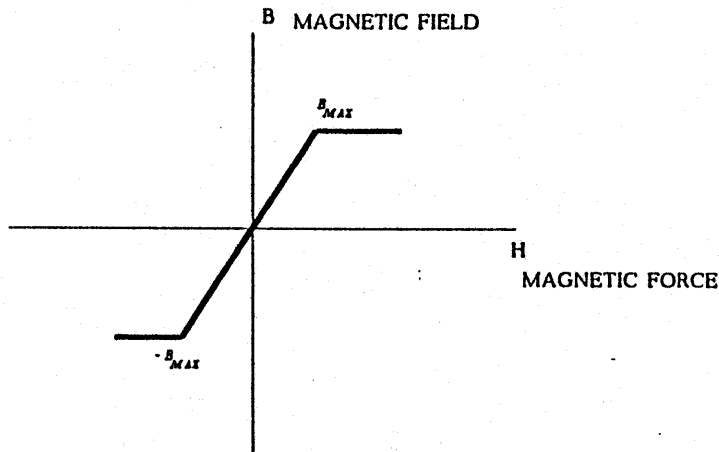
```
MY:>*.***
8118 free, 122/8240 used (12)
2 blocks in the files listed
■ paul.directory.1 1 DIRECTORY | 10/01/85 14:46:29 X=10/01/85 paul
  silverwood.directory.1 1 DIRECTORY | 10/01/85 14:46:12 X=10/01/85 paul
```

↑

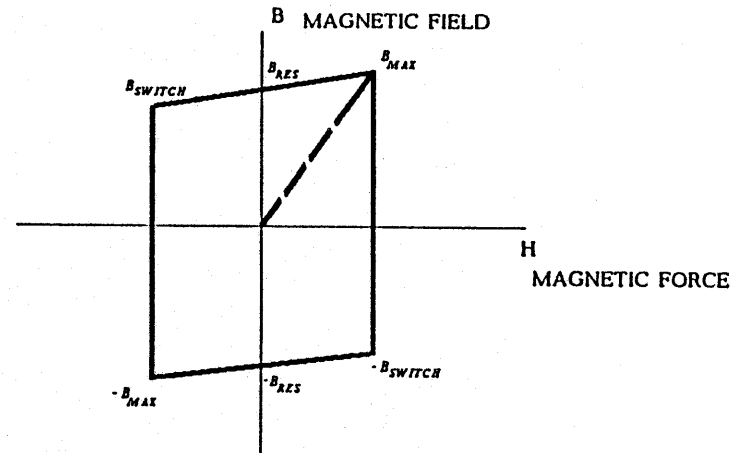
```
ZMACS (Dired) *Dired-5* (RD) MY:>*.*** (Q to exit)
```



NON-MAGNETIC MATERIAL

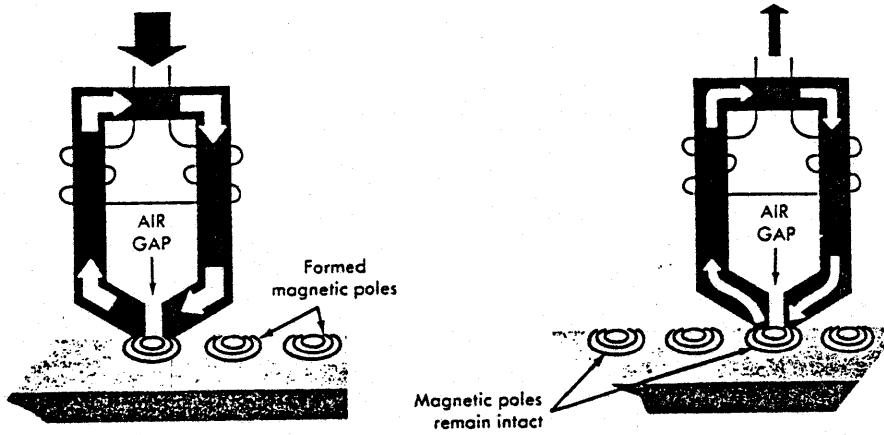


PARA-MAGNETIC MATERIAL



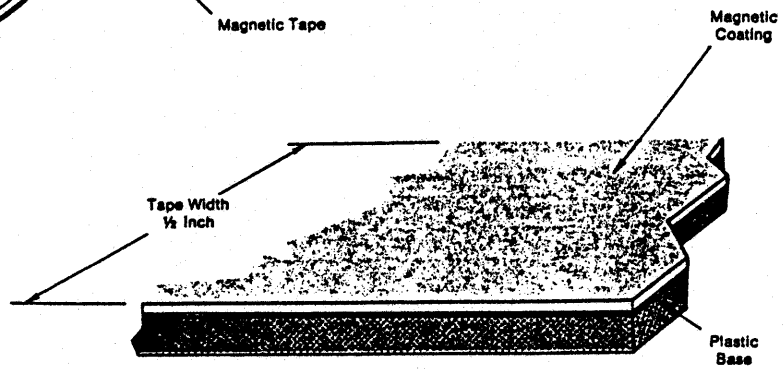
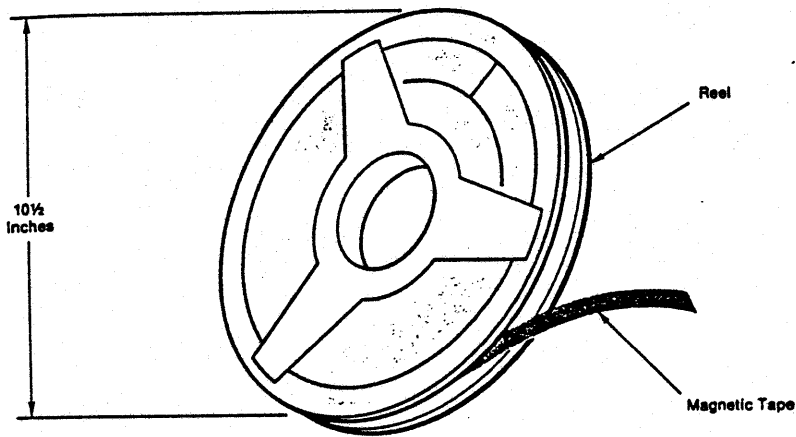
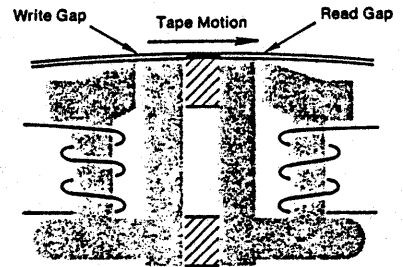
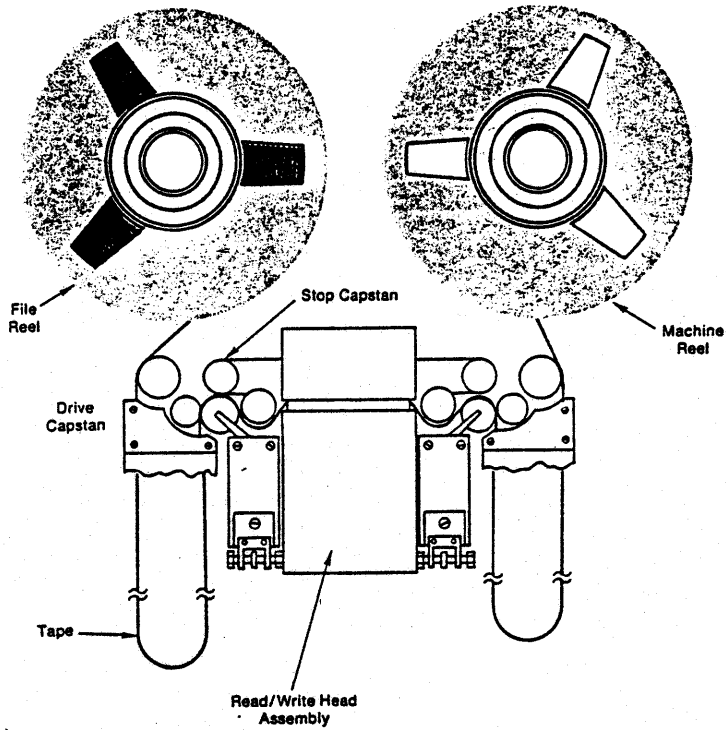
FERRO-MAGNETIC MATERIAL

MAGNETIC STORAGE FUNDAMENTALS



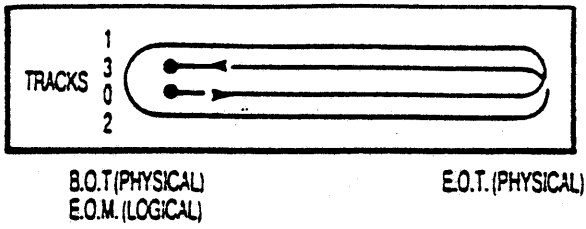
1010111011000010010101

MAGNETIC STORAGE FUNDAMENTALS

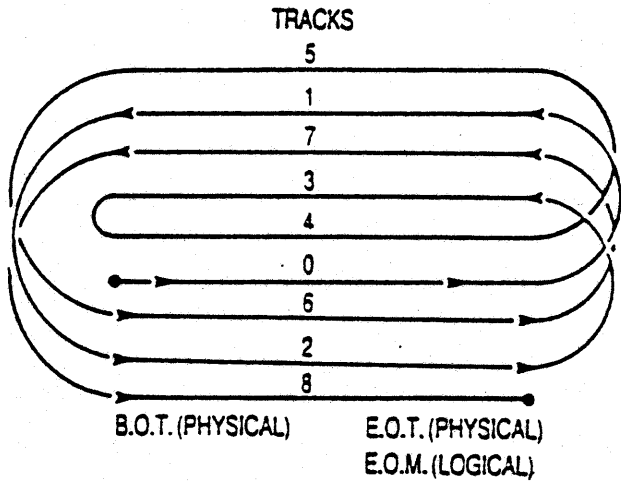


Tape Length
up to 2400 Feet per Reel

TAPE STORAGE

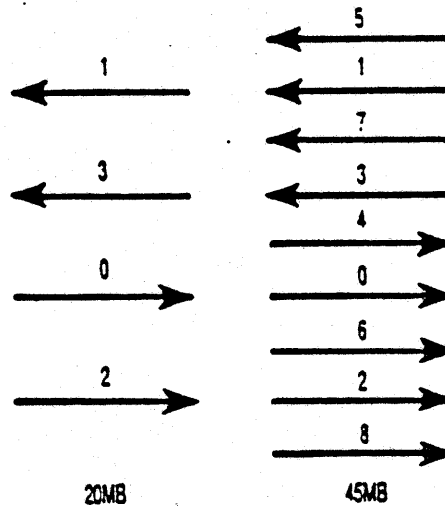


A. Four track recording



B. Nine track recording

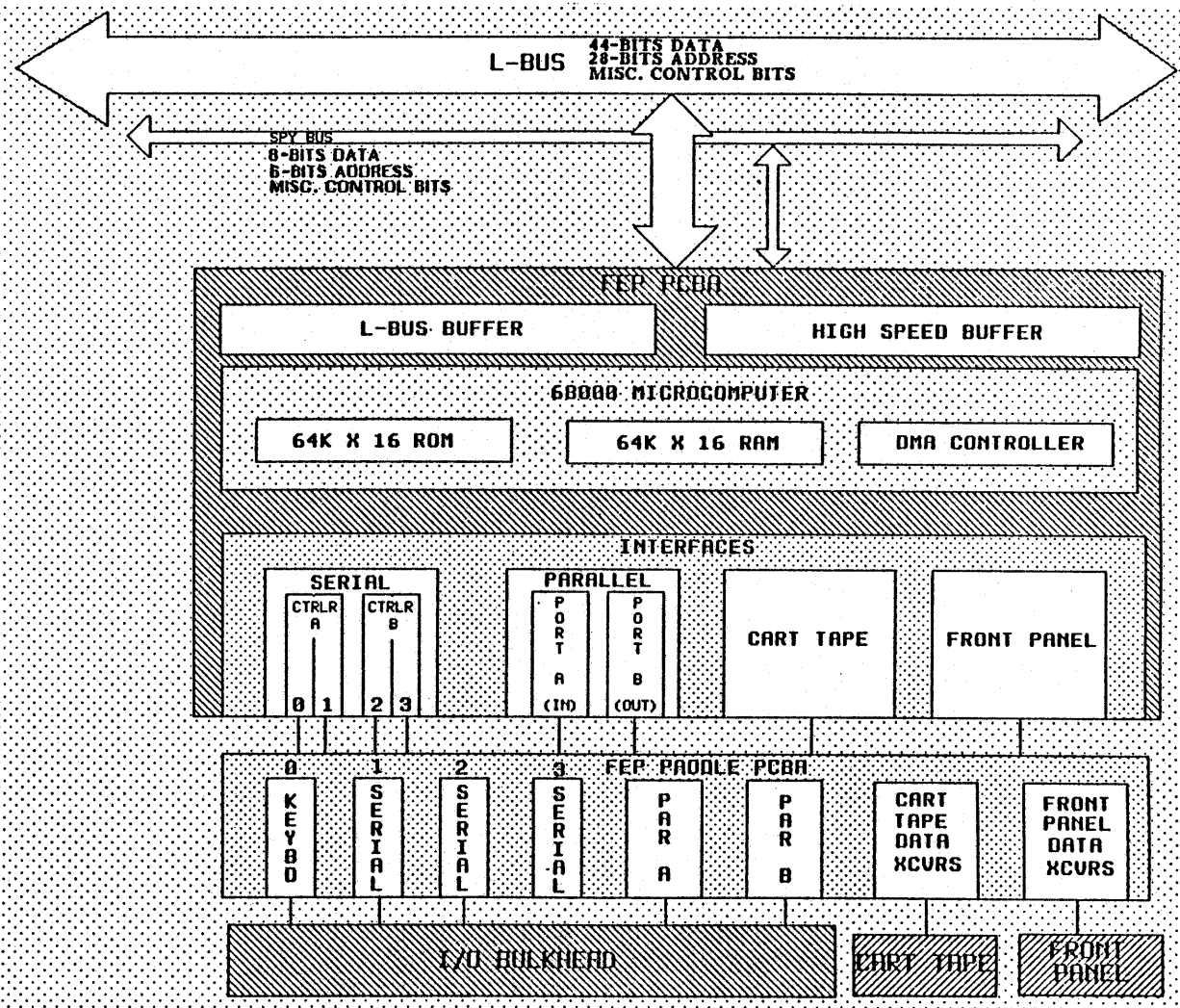
Serpentine Recording



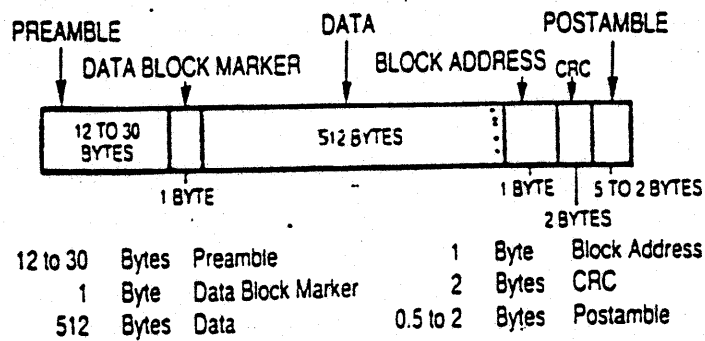
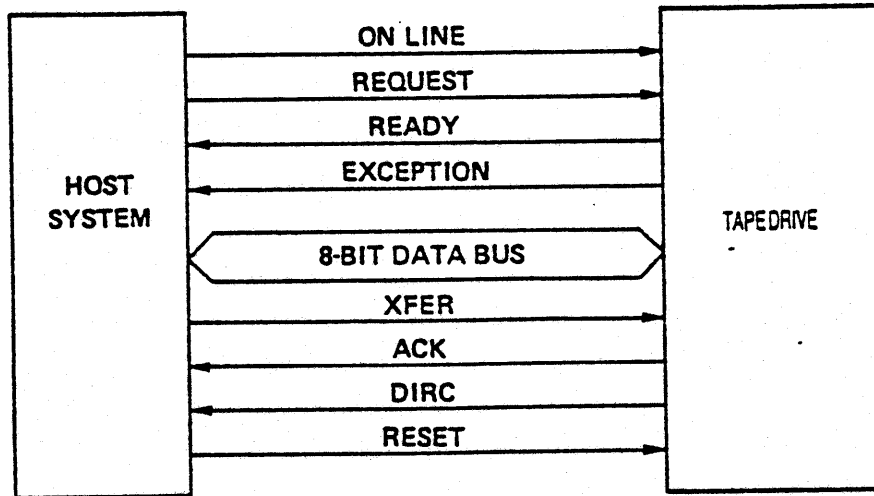
Comparative Track Layout

TAPE DRIVE SPECIFICATIONS

TAPE DRIVE	TYPE	TAPE SPEED	RECORDING DENSITY	TAPES AVAILABLE	TAPE LENGTHS (FEET)	STORAGE PER TRACK (APPROX.)	TRACKS	TOTAL STORAGE	
ARCHIVE MODEL 5945 (SCORPION)	1/4 INCH CART TAPE	90 IPS	8000 BPI	DC300XL	450	5.0 MB	9	45 MB	
				DC600A	600	6.6 MB	9	60 MB	
ARCHIVE MODEL 9045 (SIDEWINDER)	1/4 INCH CART TAPE	90 IPS	8000 BPI	DC300XL	450	5.0 MB	9	45 MB	
				DC600A	600	6.6 MB	9	60 MB	
SYMBOLICS TD 20 (CIPHER QUARTERBACK)	1/4 INCH CART TAPE	90 IPS	8000 BPI	DC300XL	450	5.0 MB	4	20 MB	
				DC600A	600	6.6 MB	4	26 MB	
SYMBOLICS TD 80 (CIPHER F880)	1/2 INCH REEL-TO-REEL	100 IPS	1600 BPI	1.5 MIL	2400	5.1 MB	9	46 MB	
		50 IPS	3200 BPI	1.5 MIL	2400	10.2 MB	9	92 MB	
		(10.5" REELS)	100 IPS	1600 BPI	1.0 MIL	3000	6.8 MB	9	61 MB
			50 IPS	3200 BPI	1.0 MIL	3000	13.5 MB	9	122 MB



LISP FRONT END PROCESSOR BLOCK



QIC-11 1/4-Inch Streaming Tape Format

1/4 INCH TAPE DRIVE INTERFACE

CABLE Descriptions & Related PART NUMBERS

Cartridge Tape

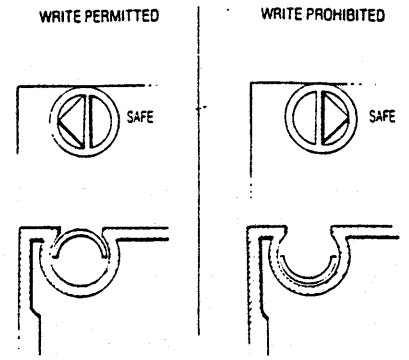
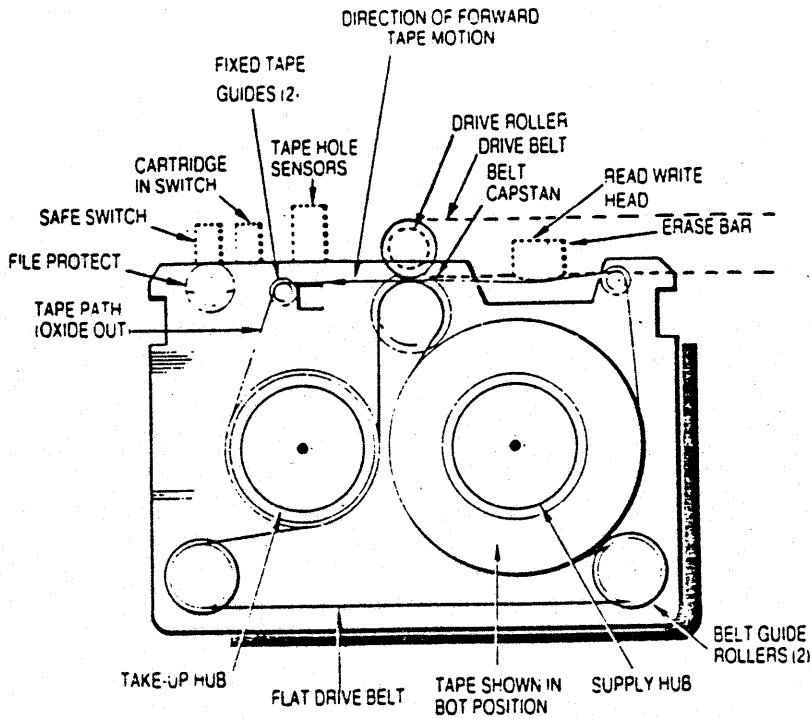
102382	Cartridge Tape Data Cable 3600 System
102420	Cartridge Tape Data Cable 3670 System
102441-1	6 ft. External Auxillary Cabinet TD-80 Cypher Tape Cable
102441-2	11 ft. External Auxillary Cabinet TD-80 Cypher Tape Cable
102509	Cartridge Tape Data Cable 3640 System

Disk

102340	(T300) Disk Radial Cable LM-2 System
102341	(T300) Disk Bus Cable LM-2 System
102363	(T300) Braided Disk Ground Cable LM-2 System
102367	SMD Disk A-Cable Bus Internal LM-2 System
102368	SMD Disk B-Cable Radial Internal LM-2 System
102369	SMD Jumper Cable (SMD to DC) LM-2 System
102376	(T306) 6 ft. SMD Disk A-Cable Bus Internal 3600/70 Systems
102376-2	(T306) 20 ft. SMD Disk A-Cable Bus Internal 3600/70 Systems
102377	(T306) 6 ft. SMD Disk B-Cable Radial Internal 3600/70 Systems
102377-2	(T306) 20 ft. SMD Disk B-Cable Radial Internal 3600/70 Systems
102408	(Nec D2257) SMD Disk A-Cable Bus Internal 3640/70 Systems
102409	(Nec D2257) SMD Disk B-Cable Radial Internal 3640/70 Systems
102439-1	6 ft. External Auxillary Cabinet Disk Cable
102439-2	11 ft. External Auxillary Cabinet Disk Cable
102448	6 ft. SMD Disk A-Cable Bus Internal 3600/40/70 Systems
102451	6 ft. SMD Disk B-Cable Radial Internal 3600/40/70 Systems
102501	Disk Ground Cable 3640 System
102507	(Maxtor XT1140) 6 ft. Disk A-Cable Bus Internal 3640 System
102508	(Maxtor XT1140) 6 ft. Disk B-Cable Radial Internal 3640 System
102523	(Priam) 6 ft. SMD Disk A-Cable Bus Internal 3640 System
102524	(Priam) 6 ft. SMD Disk B-Cable Radial Internal 3640 System

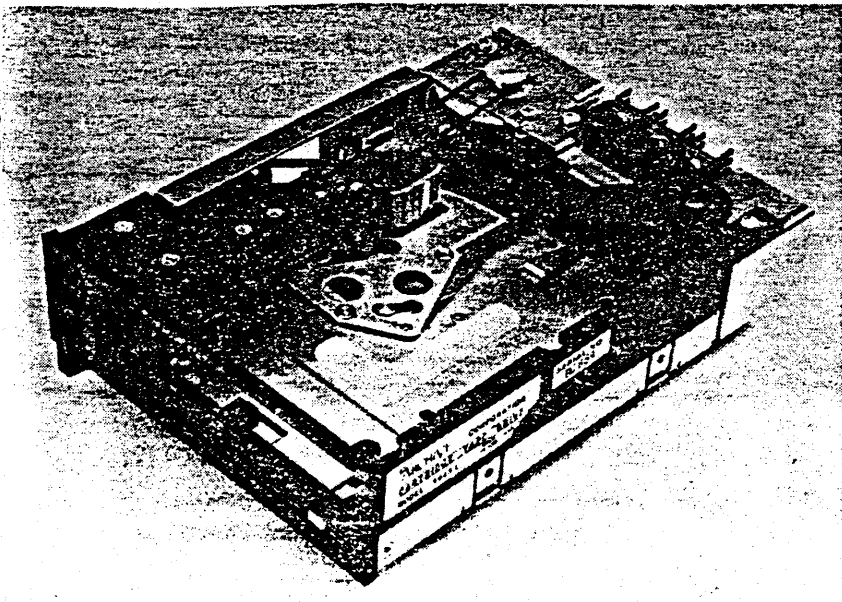
Power

102331	(LM-2) Main Power Cable
102370	(LGP1) AC Power Cable
102381	(Cartridge Tape) AC Power Cable
102396-1	(3600/70) 12 ft. Main Power Cable 60 Hz. 50 Amp.
102396-2	(3600/70) 12 ft. Main Power Cable 50 Hz. (minus plug end)
102425-1	(Auxillary Cabinet) 6 ft. Main Power Cable
102425-2	(Auxillary Cabinet) 11 ft. Main Power Cable
102434	(NEC D2257) AC Disk Power Cable
102502	(3640) Main Power Cable 60 Hz. 20 Amp.
102502-1	(3640) 10 ft. Main Power Cable 60 Hz. 20 Amp.
102502-2	(3640) 10 ft. Main Power Cable 50 Hz. 20 Amp.
127088	(LM-2 Console) AC Power Cable
129052	(3600/40/70 Consoles) AC Power Cable

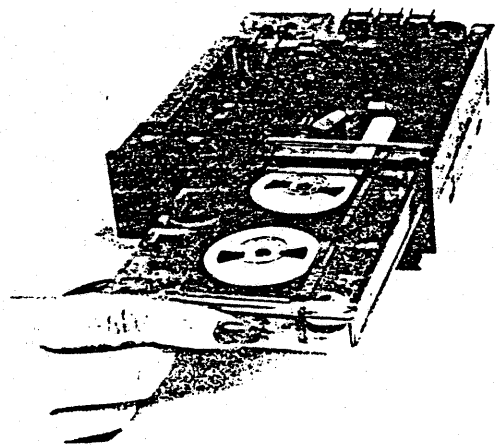


Write Protect Plug

Internal Construction 1/4-Inch Tape Cartridge



Scorpion Basic Tape Drive



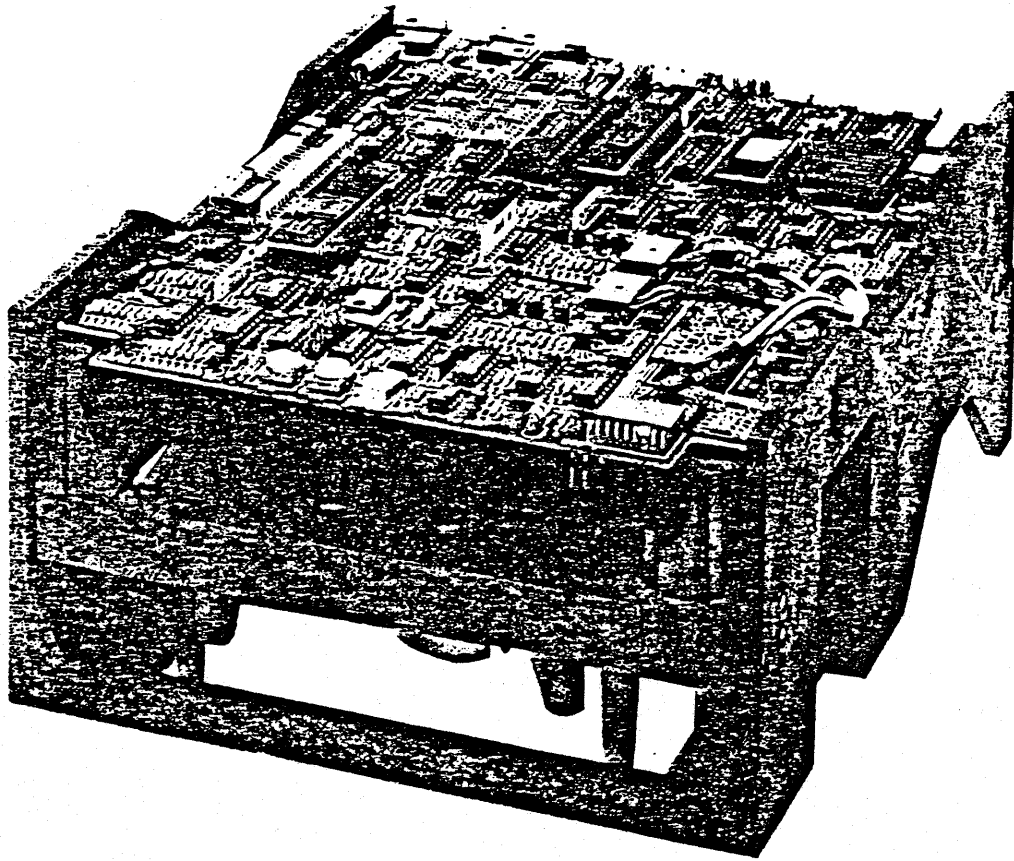
Cartridge Insertion

ARCHIVE MODEL 5945 (SCORPION)

Jumper	Description
A or B to Common	PLL Feedback for Speed Selection <ul style="list-style-type: none"> • A to Common Jumper = 30 IPS • B to Common Jumper = 90 IPS
A1, A2 and A3	Always A1 to A2
B1, B2 and A3	Always B1 to B2
C	Test Jumper for PLL Gain Adjustment <ul style="list-style-type: none"> • Removed for Operation
K	Gain Setting of Read Circuit <ul style="list-style-type: none"> • Jumper Present = 30 IPS • Jumper Removed = 90 IPS
R	Read Data Pulse One Shot Timing <ul style="list-style-type: none"> • Jumper Present = 90 IPS • Jumper Removed = 30 IPS
T	Run in Phase Clip <ul style="list-style-type: none"> • Used by Manufacturing Only Removed for Operation
U	Always Present
Y	Track Number Selection <ul style="list-style-type: none"> • Jumper Present = 9 Track • Jumper Removed = 4 Track
Location between 7B and 8B	Phase for Stepper Motor Set by Archive Manufacturing Do not change from factory setting

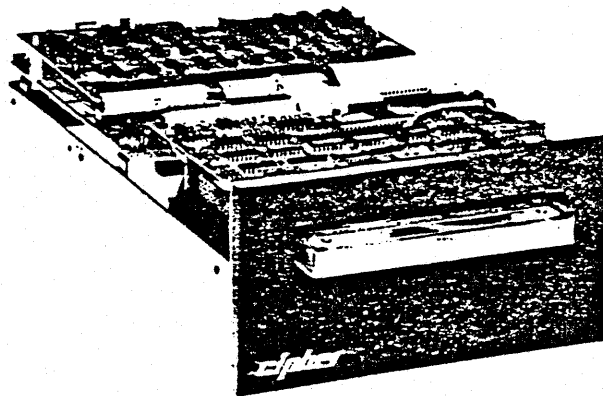
Jumper	Description
AA/BB	Always open
CC	Power-On Default Format Select <ul style="list-style-type: none"> • Jumper Present = QIC-24 Format • Jumper Removed = QIC-11 Format
DD	Speed Definition for Microprocessor <ul style="list-style-type: none"> • Jumper Present = 30 IPS • Jumper Removed = 90 IPS
EE	Interface Parity <ul style="list-style-type: none"> • Jumper Present = Parity Enabled • Jumper Removed = Parity Disabled (Not supported at this time)
FF	Loop on Error Used by Archive Engineering for troubleshooting.
HH	Test Configuration Used by Archive Manufacturing only
KK	Power on Confidence Test <ul style="list-style-type: none"> • Jumper Present = Test run at power on or on reset pulse • Jumper Removed = Test Disabled
ZZ	Defines to the Microprocessor application program that there is an external memory. <ul style="list-style-type: none"> • Jumper always present

ARCHIVE TAPE DRIVES JUMPER CONFIGURATION

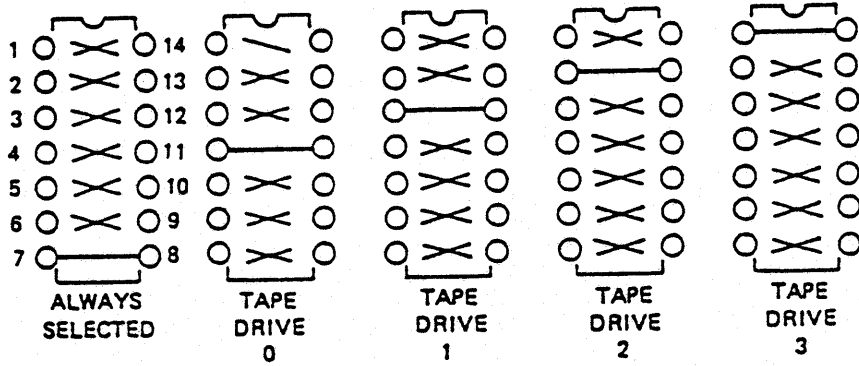


Sidewinder 1/4-Inch Cartridge Streaming Tape Drive

ARCHIVE MODEL 9045 (SIDEWINDER)



SYMBOLICS MODEL TD20 (CIPHER QUARTERBACK)



Multiple Tape Drive Address Shunt

LOCATION 28 ON MAIN PCB

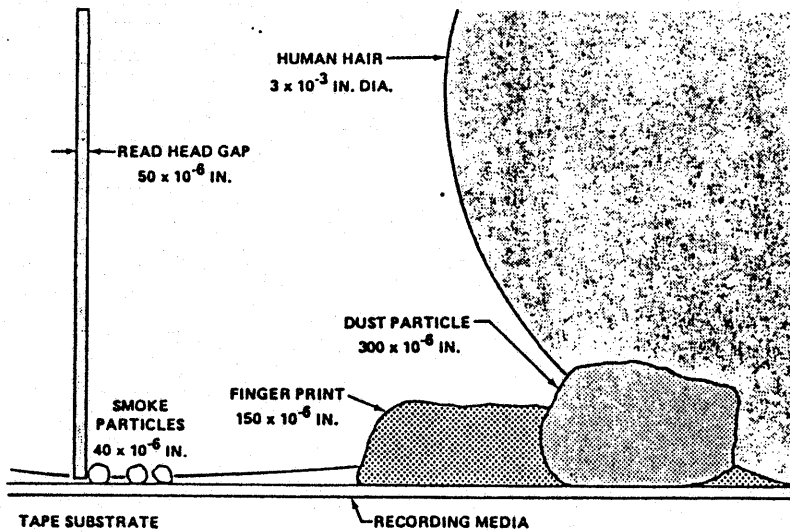
LOCATION 5C ON MAIN PCB

1 2 3 4 1 2 3 4



JUMPER INSTALLED BY FACTORY

TD 20 JUMPER CONFIGURATION

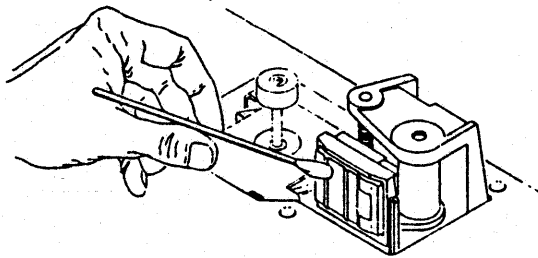


Contamination Particle Sizes in Relation to Width of Read Head Gap

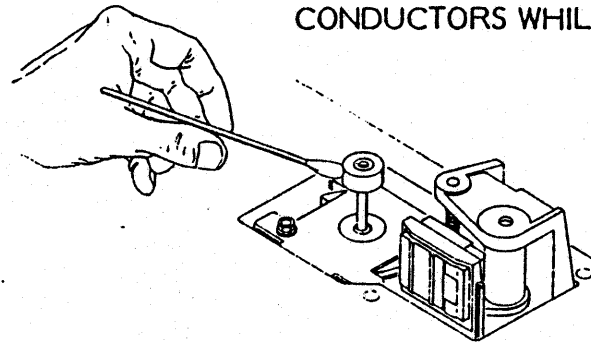
Maintenance Task	Interval (In Operating Hours)
Clean head and tape cleaner	8
Clean and check condition of capstan surface	8
Eliminate Tape Tension	As required

WARNING

VERIFY POWER IS OFF BEFORE CLEANING. ELECTRICAL SHOCK OR EQUIPMENT DAMAGE MAY OCCUR IF BODY PARTS OR JEWELRY TOUCHES ELECTRICAL CONDUCTORS WHILE POWER IS ON.

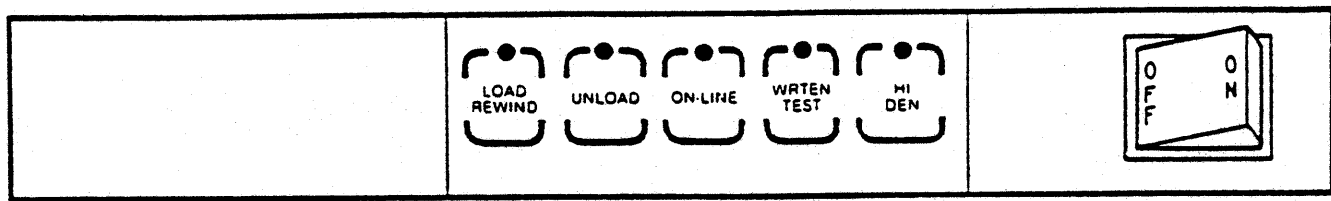
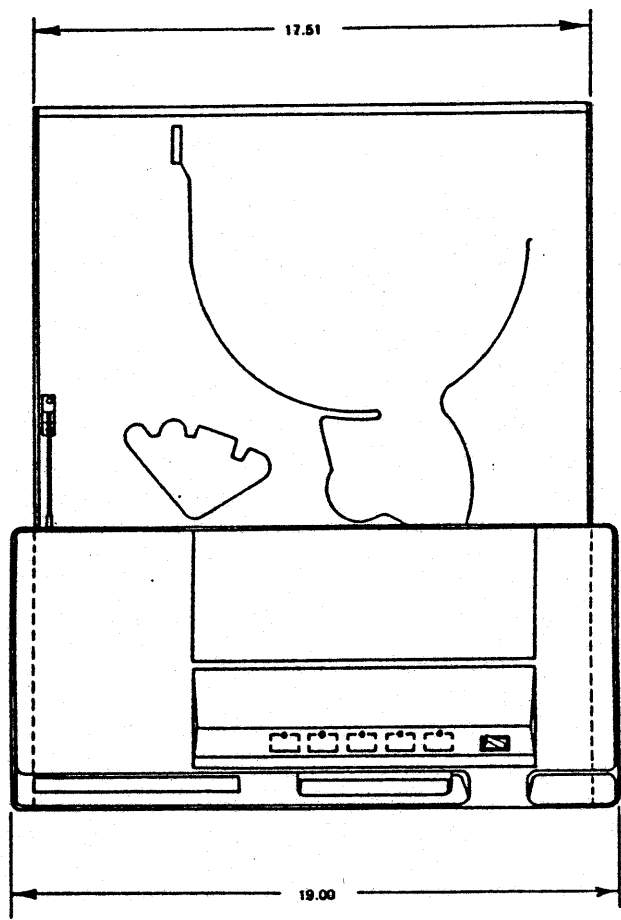


Head Assembly and Tape Cleaner Cleaning



Capstan Cleaning

PREVENTATIVE MAINTENANCE



SYMBOLICS MODEL TD80 (CIPHER MODEL F880)

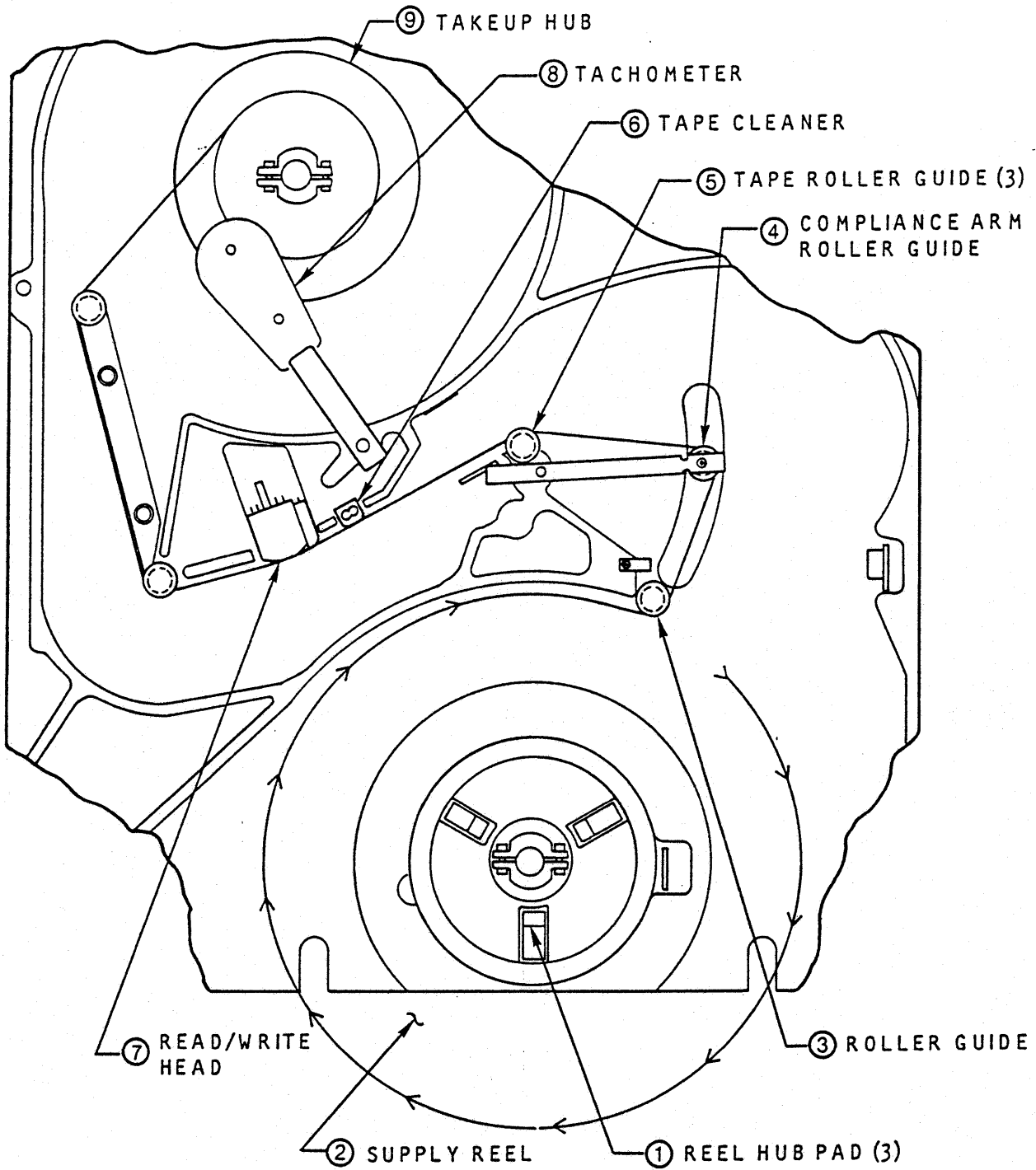
CONTROL/ INDICATOR	TYPE	FUNCTION	CONDITIONS
POWER	ON/OFF Rocker Switch and Indicator	Switches line power on and off.	Fuse installed. Line cord connected.
LOAD REWIND	Tactile Switch and indicator	Loads tape to BOT marker. Rewinds tape to BOT marker. Illuminates to indicate BOT tab is positioned at photo- sensor. When pulsing, transport is executing a load or a rewind sequence.	Tape inserted in front panel door. Top cover and front panel door closed. Transport in off-line mode (ON- LINE indicator not illuminated).
UNLOAD	Tactile Switch and Indicator	Unloads tape from any point. UNLOAD indi- cator flashes during unload se-quence, then remains illuminated.	Transport in off-line mode. (ON-LINE indi- cator not illuminated.)
ON-LINE	Tactile Switch and Indicator	Switches transport to on-line mode. Illumi- nates to indicate transport is on line. Second actuation switches transport off line. Indicator extin- guished to indicate transport is off line.	During load sequence actuation of ON-LINE switch will place transport on line when BOT marker is sensed. Transport is in on-line mode. (ON-LINE in- dicator illuminated.)
TEST	Tactile Switch	Selects alternate operational mode for other switches.	Refer to paragraph 3-3.
WRT EN (Write Enable)	Indicator	Illuminates to indicate write function may be performed.	Tape reel write enable ring installed mounted on supply hub and tape loaded.
HI DEN (High Density)	Tactile Switch and Indicator	First actuation (indi- cator illuminated): high-density mode, 3200 bpi; second actuation (indicator extinguished): lower density, 1600 bpi.	3200 bpi transport must be in off-line mode (ON-LINE indi- cator extinguished.)

INDICATION	ERROR CONDITION
All indicators flashing	After four automatic retries the transport did not successfully complete the load sequence. The tape leader should be checked for excessive damage. If a second attempt at loading fails the unit must be manually loaded.
All indicators except LOAD flashing	The BOT marker was not detected within the first 35 feet of tape.
All indicators except UNLOAD flashing	Tape reel was inserted upside-down. Write ring must be down.
All indicators except ON-LINE flashing	A load operation was attempted with the front-panel door or top cover in the open position.
All indicators except TEST flashing	A load operation was attempted without a reel of tape inserted in the unit.

INDICATION	CONDITIONS
UNLOAD, ON-LINE, and TEST indicators flashing	Because of a controller error, tape travel beyond the EOT marker exceeded 18 feet.
LOAD, UNLOAD, ON-LINE, and TEST indicators flashing	Not Used
HI DEN indicator flashing	Not Used
LOAD and HI DEN indicators flashing	The supply servo tension arm has exceeded its free travel limits during any operation except those functions of the load and unload sequence where tape tension is not under arm control.
UNLOAD and HI DEN indicators flashing	Tape speed variations in excess of the ANSI maximum of $\pm 10\%$ deviation from the normal operating speed occurred. This test is also performed as part of the power-up diagnostic routine and may be bypassed to allow access to other diagnostic tests by depressing the TEST switch for 5 seconds during power up.

INDICATION	CONDITIONS
LOAD indicator flashing	Not Used
UNLOAD indicator flashing	Not Used
LOAD and UNLOAD indicators flashing	The Model F880 detected more than 3700 feet of tape beyond the BOT marker.
ON-LINE indicator flashing	The tension arm swing exceeded the range of normal operation during the load sequence.
LOAD and ON-LINE indicators flashing	The Model F880 received an interface command prior to completion of the previous command.
UNLOAD and ON-LINE indicators flashing	The Model F880 received a write command with a write-protected reel of tape loaded on the transport.
LOAD, UNLOAD, and ON-LINE indicators flashing	An illegal or undefined command was received by the Model F880.
TEST indicator flashing	A failure of the supply hub locking mechanism occurred.
LOAD and TEST indicators flashing	Not Used
UNLOAD and TEST indicators flashing	The auto-zero function of the digital-to-analog converter failed during the power-up sequence.
LOAD, UNLOAD, and TEST indicators flashing	Not Used
ON-LINE and TEST indicators flashing	Supply reel was not seated on hub, or a failure of the file protect circuit occurred.
LOAD, ON-LINE, and TEST indicators flashing	Supply reel did not remain unlocked during tape unload operation.

TD80 FAULT CODES



TD80 TAPE

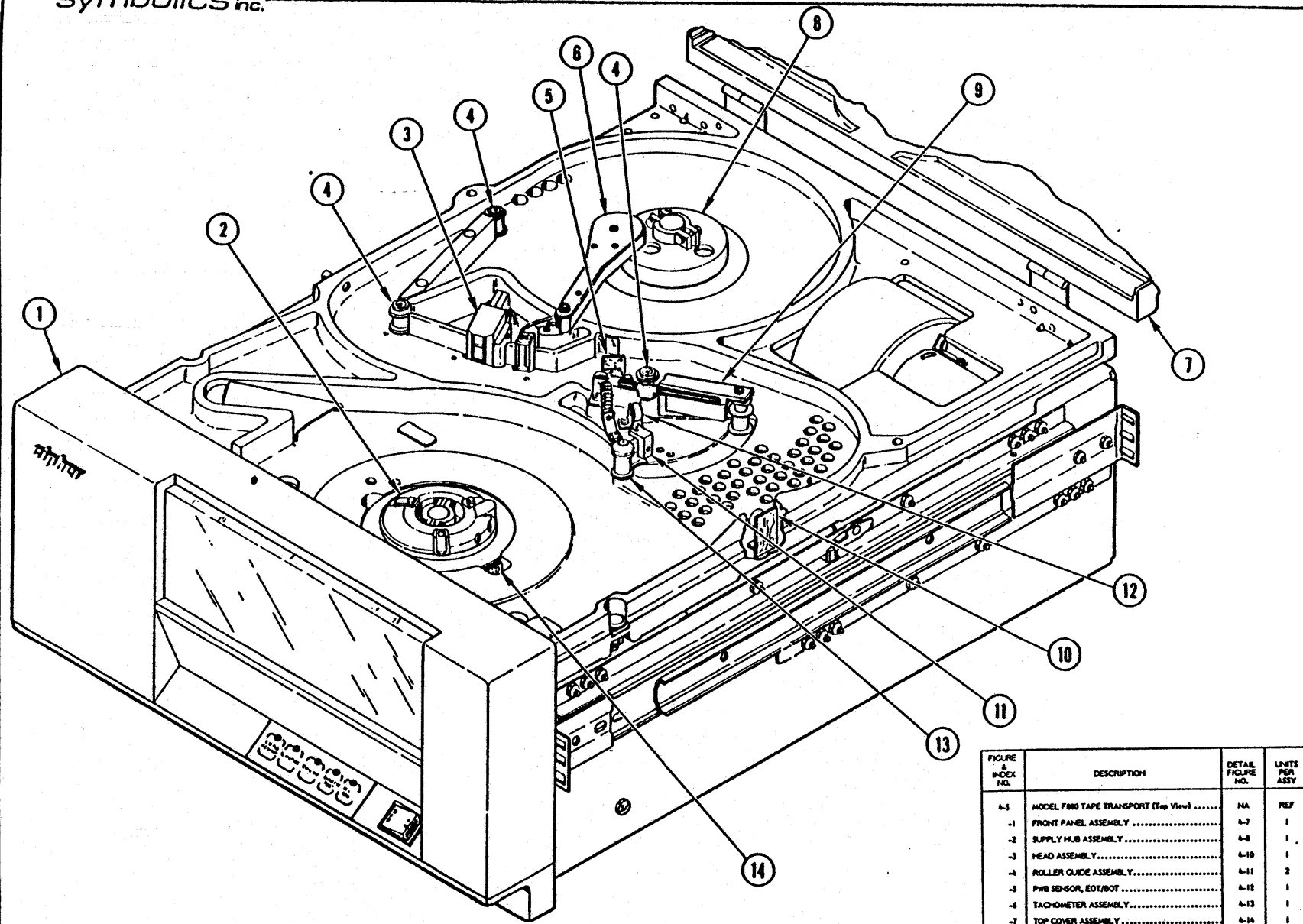


Figure 4-5. Model F880 Tape Transport (Top View)

FIGURE & INDEX NO.	DESCRIPTION	DETAIL FIGURE NO.	UNITS PER ASSY
4-5	MODEL F880 TAPE TRANSPORT (Top View)	NA	REF
-1	FRONT PANEL ASSEMBLY	4-7	1
-2	SUPPLY HUB ASSEMBLY	4-8	1
-3	HEAD ASSEMBLY	4-10	1
-4	ROLLER GUIDE ASSEMBLY	4-11	2
-5	PHB SENSOR, EOT/BOT	4-12	1
-6	TACHOMETER ASSEMBLY	4-13	1
-7	TOP COVER ASSEMBLY	4-16	1
-8	TAKEUP HUB ASSEMBLY	4-15	1
-9	COMPLIANCE ARM ASSEMBLY	4-17	1
-10	TAPE-IN-PATH SENSOR, TRANSMITTER	4-18	1
-11	TAPE-IN-PATH SENSOR, RECEIVER	4-19	1
-12	COMPLIANCE ARM BUMPER ASSEMBLY	4-20	2
-13	ROLLER TAPE GUIDE ASSEMBLY (S&H)	4-21	1
-14	FILE-PROTECT SENSOR	4-22	1

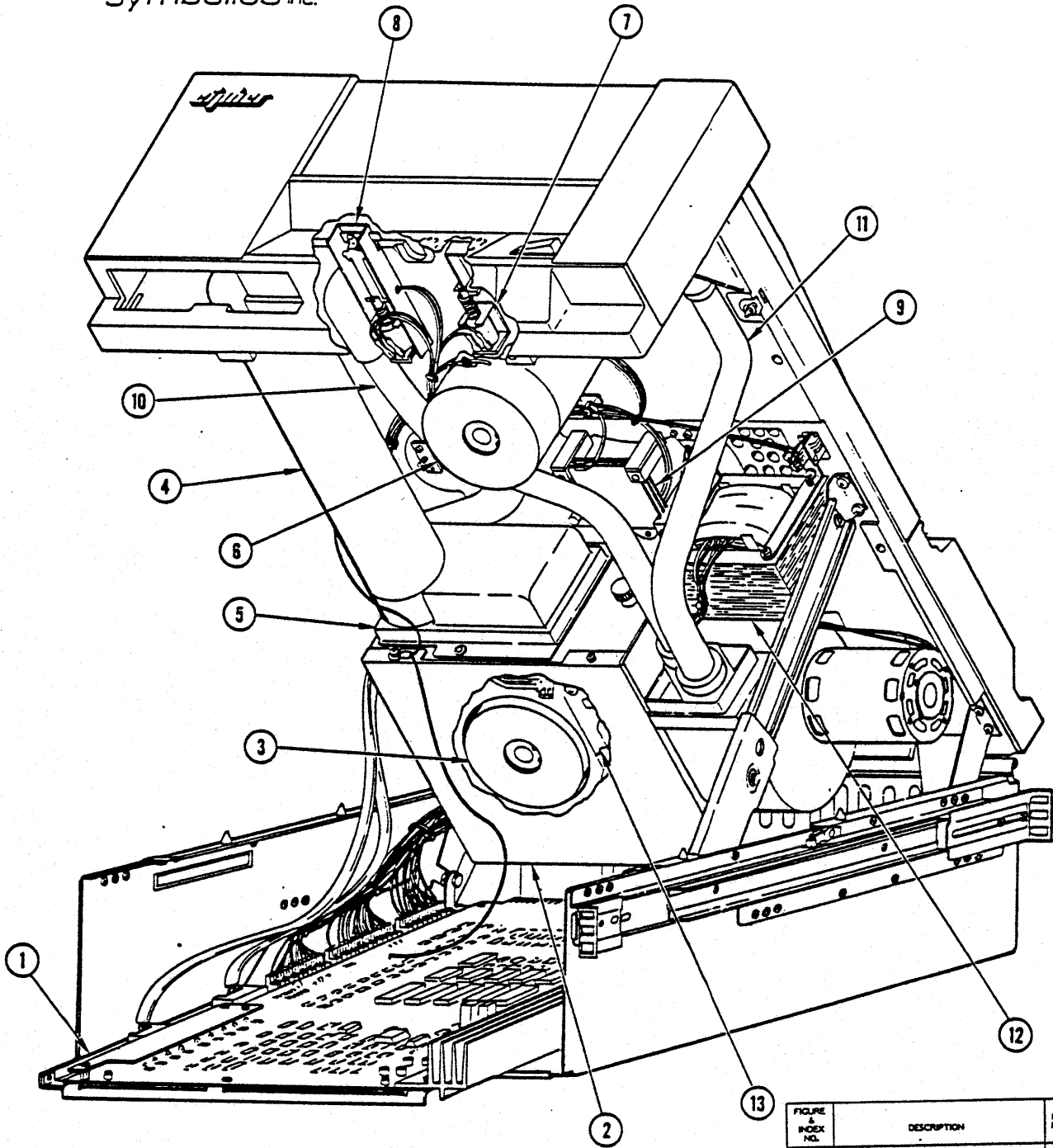


Figure 4-6. Model F880 Tape Transport (Bottom View)

FIGURE & INDEX NO.	DESCRIPTION	DETAIL FIGURE NO.	UNITS PER ASSY
4-6	MODEL F880 TAPE TRANSPORT (Bottom View) ...	NA	REF
-1	DRIVE MAIN PWB & STIFFENER ASSEMBLY	4-23	1
-2	POWER SUPPLY ASSEMBLY	4-25	1
-3	TAKELUP MOTOR ASSEMBLY	4-26	1
-4	TUBE, air intake	4-27	1
-5	ADAPTER, filter (air)	4-27	1
-6	SUPPLY MOTOR ASSEMBLY	4-28	1
-7	HUB LOCK ASSEMBLY	4-29	1
-8	DOOR LOCK ASSEMBLY	4-30	1
-9	CAPACITOR PLATE ASSEMBLY	4-17	1
-10	AIR DUCT, top-plate	4-27	1
-11	AIR DUCT, front panel	4-27	1
-12	TRANSFORMER ASSEMBLY	4-21	1
-13	POWER SUPPLY PWB	4-24	1

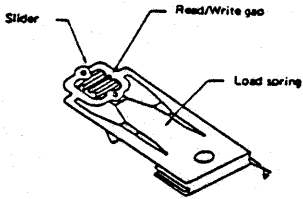
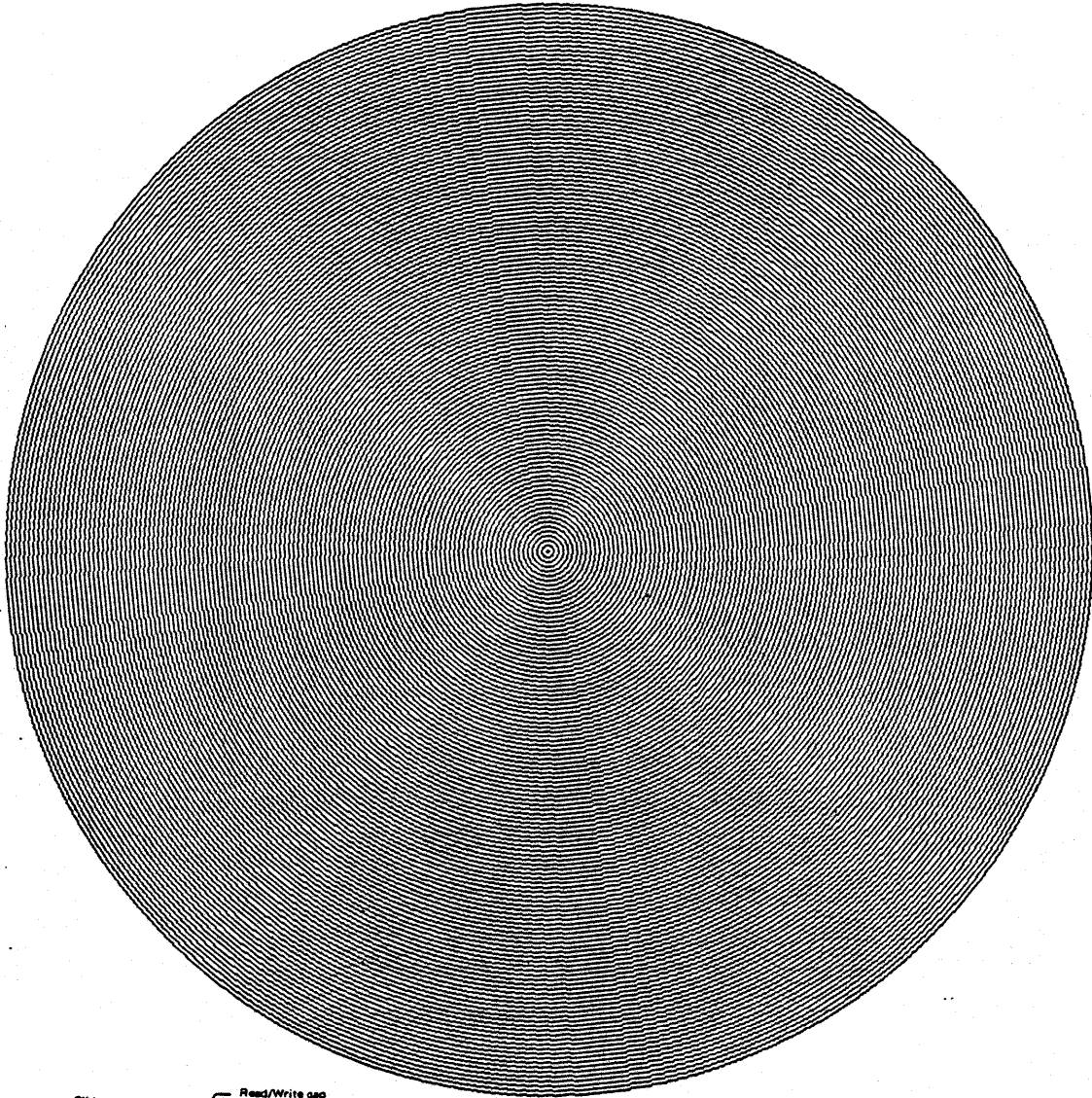
VOLTAGE	SELECTION CARD	AMPERES	FREQUENCY
85 - 110	100	3.0	50/60 Hz
102 - 132	120	3.0	50/60 Hz
187 - 242	220	1.5	50/60 Hz
204 - 264	240	1.5	50/60 Hz

Operating Voltage Selection

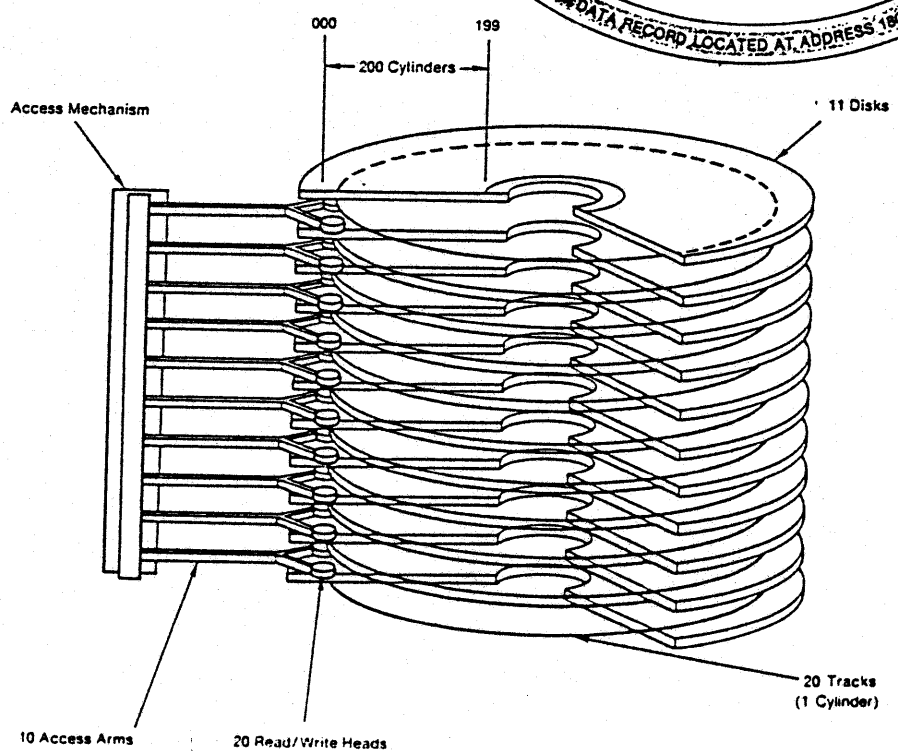
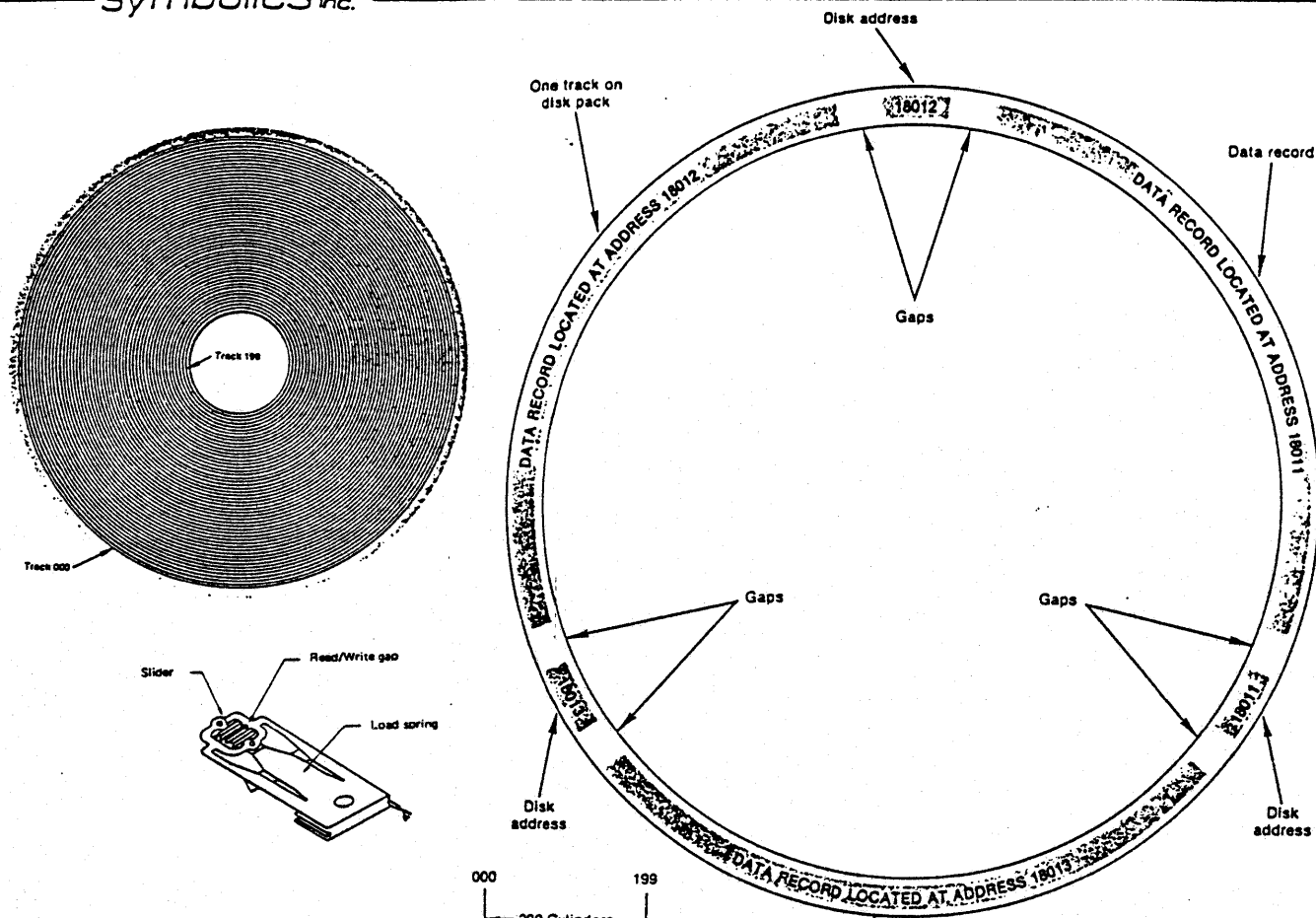
ADDRESS	IFAD	ITAD 0	ITAD 1	S1	S2	S4
0	0	0	0	1	1	1
1	0	0	1	1	1	0
2	0	1	0	1	0	1
3	0	1	1	1	0	0
4	1	0	0	0	1	1
5	1	0	1	0	1	0
6	1	1	0	0	0	1
7	1	1	1	0	0	0

0 = False Interface Level 0 = Open
 1 = True Interface Level 1 = Closed

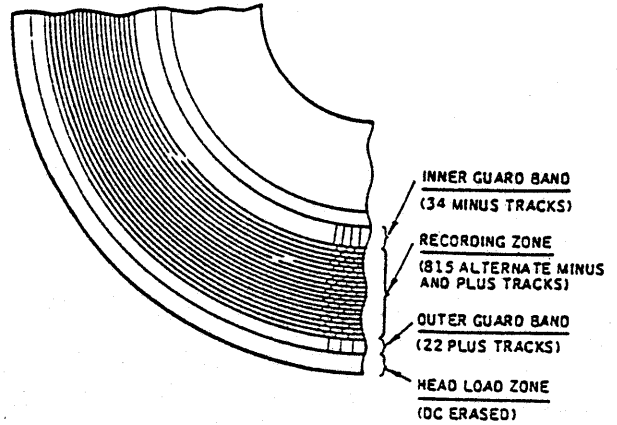
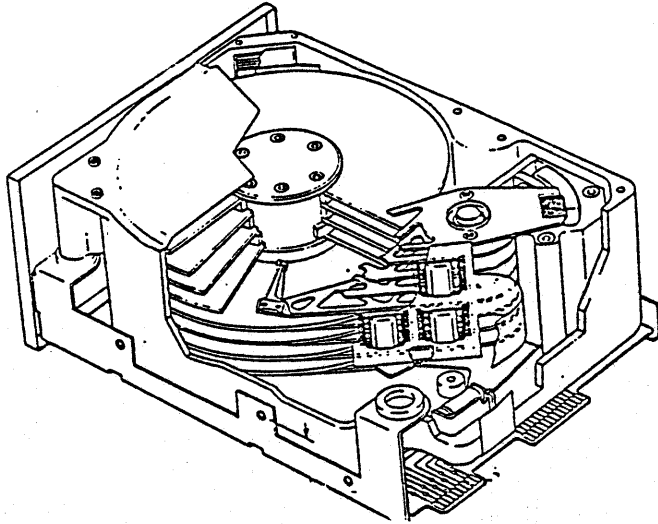
Address Line Decoding



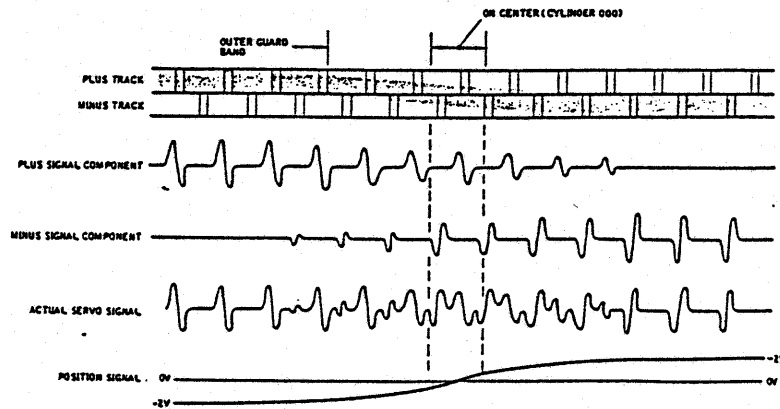
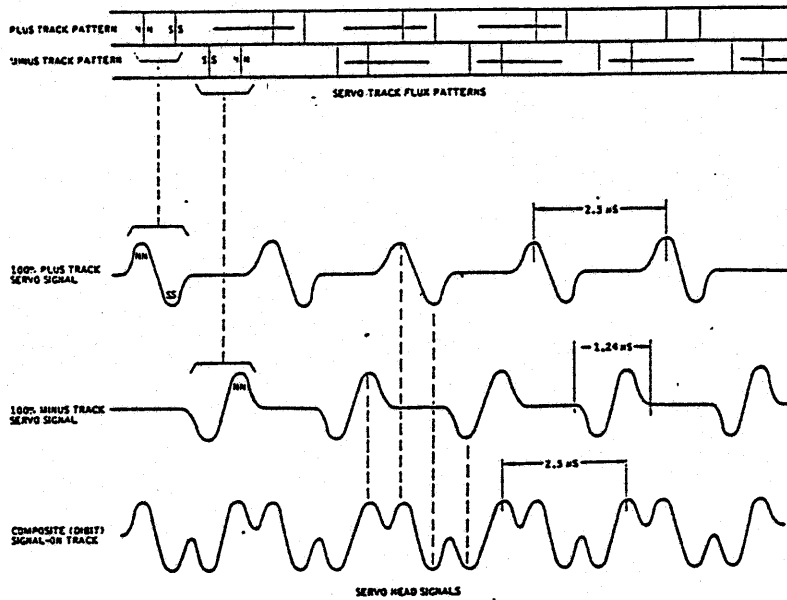
DISK STORAGE



DISK STORAGE



Servo Surface Format

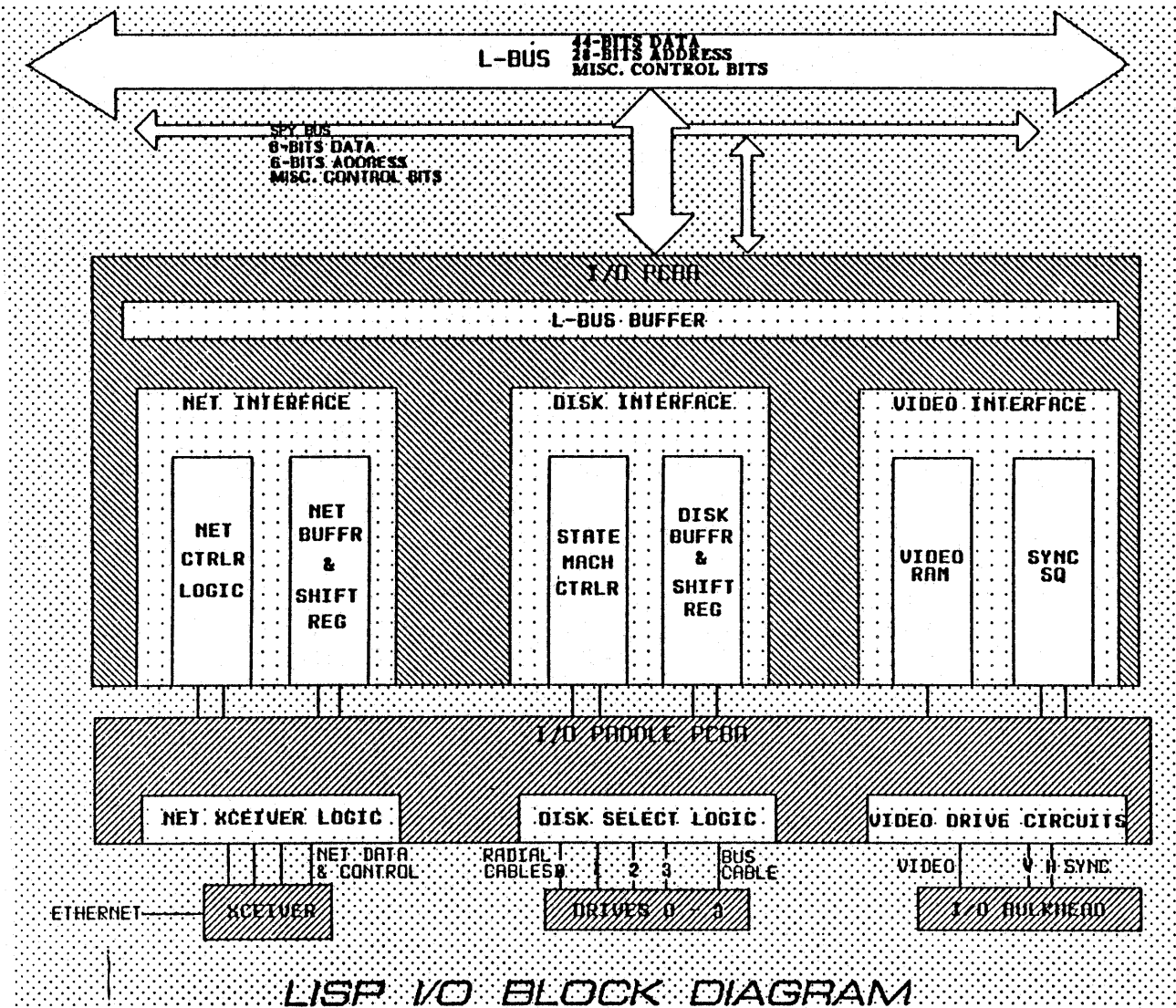


SERVO TRACK FOLLOWING

CYLINDER TRACKING

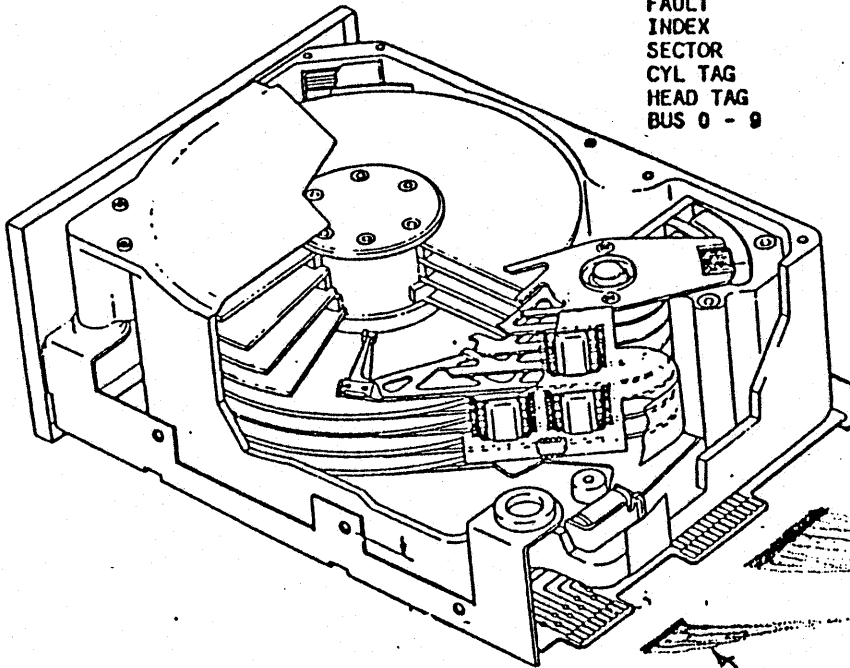
DISK DRIVE SPECIFICATIONS

DISK DRIVE	TOTAL STORAGE	HEADS	CYLINDERS	SECTORS/CYLINDER	TOTAL SECTORS	g1	g2	g3	fast
CDC EMD368	368.0 MB	10	1217	24	292080	27	31	32	1
CDC EMD515	515.0 MB	24	711	24	409536	27	31	32	1
CDS T306	315.0 MB	19	823	16	250192	27	31	32	0
FUJITSU M2284	168.5 MB	10	823	16	131680	27	31	52	0
FUJITSU M2294	335.0 MB	16	1024	16	262144	27	31	52	0
FUJITSU M2351	474.0 MB	20	842	22	370480	32	34	44	1
MAXTOR XT-1140	143.0 MB	15	918	8	110160	49	31	49	0
MAXTOR XT-2190	191.5 MB	15	1224	8	146880	49	31	49	0
NEC D2257	167.0 MB	8	1024	16	131072	27	31	52	0
PRIAM 807	340.0 MB	11	1552	16	273152	26	14	50	0



A CABLE (BUS CABLE)

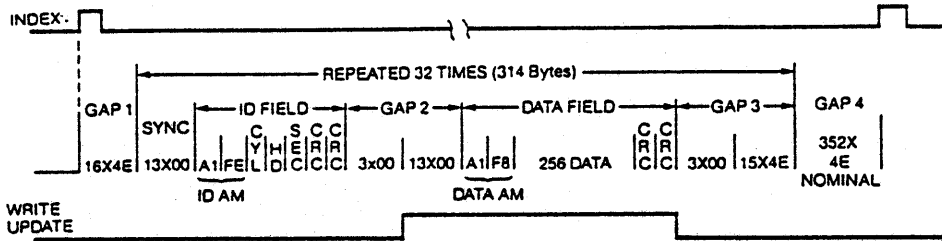
SIGNAL	FROM PROCESSOR TO DISK DRIVE	FROM DISK DRIVE TO PROCESSOR
UNIT READY		X
WRITE PROTECTED		X
PICK	X	
HOLD	X	
UNIT SELECT 1	X	
UNIT SELECT 2	X	
UNIT SELECT 4	X	
UNIT SELECT 8	X	
SELECT	X	
ON CYLINDER		X
SEEK ERROR		X
FAULT		X
INDEX		X
SECTOR		X
CYL TAG	X	
HEAD TAG	X	
BUS 0 - 9	X	



B CABLE (DATA OR RADIAL CABLE)

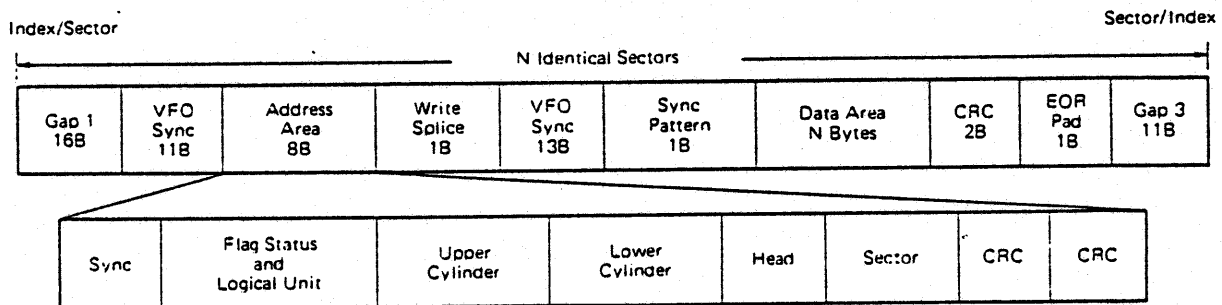
SIGNAL	FROM PROCESSOR	FROM DISK	FROM DISK DRIVE TO PROCESSOR
WRITE DATA	X		
WRITE CLOCK		X	
READ DATA		X	
READ CLOCK		X	

DISK DRIVE INTERFACE



- NOTES:
1. NOMINAL TRACK CAPACITY = 10416 BYTES UNFORMATTED
 2. TOTAL DATA BYTES/TRACK = 256 x 32 = 8,192
 3. SECTOR INTERLEAVE FACTOR IS 4. SEQUENTIAL ID FIELDS ARE SECTOR NUMBERED 0, 8, 16, 24, 1, 9, 17, 25, 2, 10, 18, 26...ETC.
 4. DATA FIELDS CONTAIN THE BIT PATTERN 0000 AS SHIPPED
 5. CRC FIRE CODE = $x^{16} + x^{12} + x^5 + 1$
 6. BIT 7 OF HEAD BYTE ID FIELD EQUALS 1 IN A DEFECTIVE SECTOR (CYLINDER 0 IS ERROR FREE)
 7. BIT 6 OF HEAD BYTE IS CYLINDER 2⁸ BIT
 8. BIT 5 OF HEAD BYTE IS CYLINDER 2⁹ BIT
 9. BIT 4 OF HEAD BYTE IS RESERVED FOR CYLINDER 2¹⁰ BIT
 10. BIT 0-3 OF HEAD BYTE ARE HEAD 2⁰ TO HEAD 2³ RESPECTIVELY

ST-506 INTERFACE (MAXTOR 1140)



SMD INTERFACE (FUJITSU M2284)

CABLE Descriptions & Related PART NUMBERS

Cartridge Tape

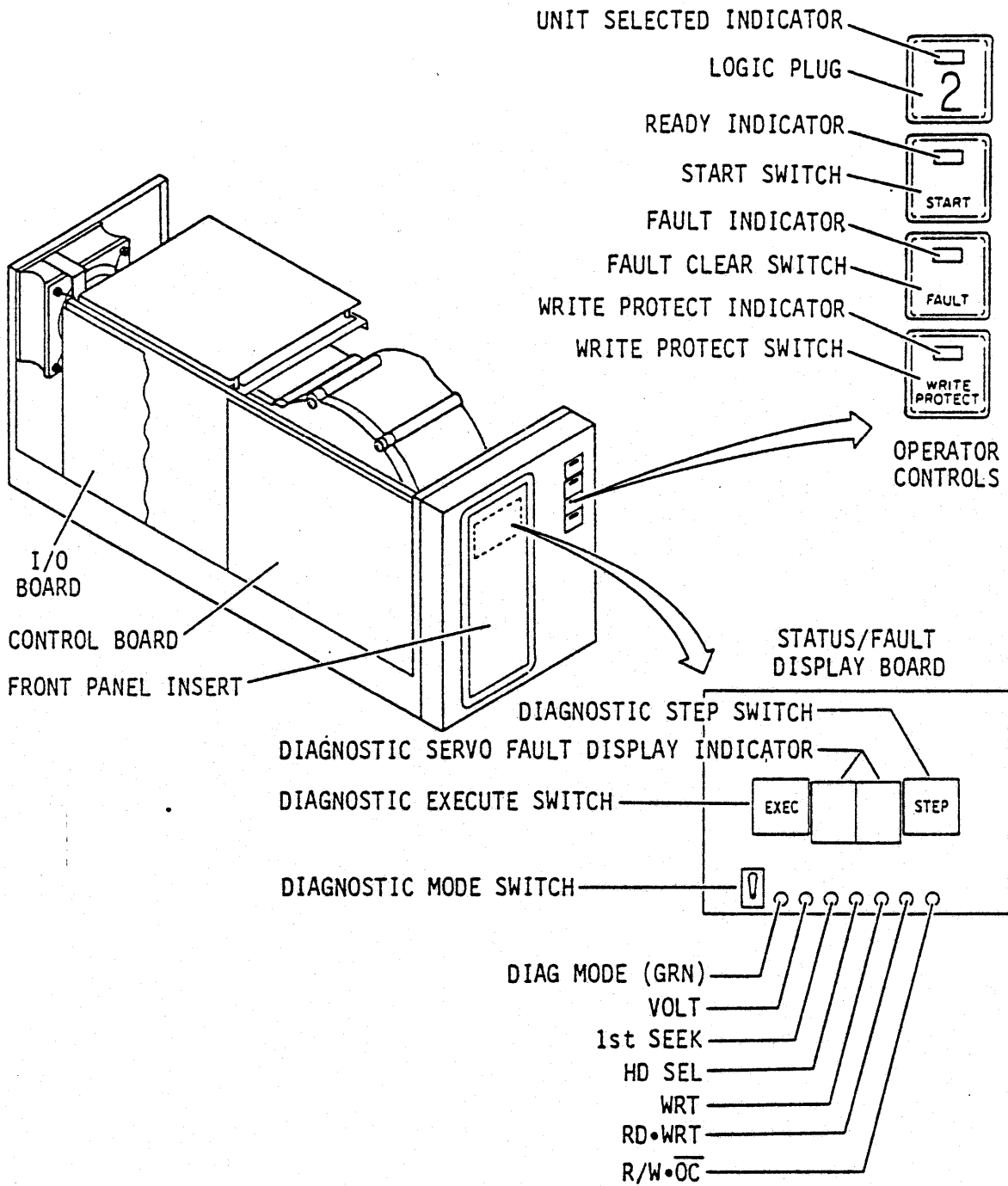
102382	Cartridge Tape Data Cable 3600 System
102420	Cartridge Tape Data Cable 3670 System
102441-1	6 ft. External Auxillary Cabinet TD-80 Cypher Tape Cable
102441-2	11 ft. External Auxillary Cabinet TD-80 Cypher Tape Cable
102509	Cartridge Tape Data Cable 3640 System

Disk

102340	(T300) Disk Radial Cable LM-2 System
102341	(T300) Disk Bus Cable LM-2 System
102363	(T300) Braided Disk Ground Cable LM-2 System
102367	SMD Disk A-Cable Bus Internal LM-2 System
102368	SMD Disk B-Cable Radial Internal LM-2 System
102369	SMD Jumper Cable (SMD to DC) LM-2 System
102376	(T306) 6 ft. SMD Disk A-Cable Bus Internal 3600/70 Systems
102376-2	(T306) 20 ft. SMD Disk A-Cable Bus Internal 3600/70 Systems
102377	(T306) 6 ft. SMD Disk B-Cable Radial Internal 3600/70 Systems
102377-2	(T306) 20 ft. SMD Disk B-Cable Radial Internal 3600/70 Systems
102408	(Nec D2257) SMD Disk A-Cable Bus Internal 3640/70 Systems
102409	(Nec D2257) SMD Disk B-Cable Radial Internal 3640/70 Systems
102439-1	6 ft. External Auxillary Cabinet Disk Cable
102439-2	11 ft. External Auxillary Cabinet Disk Cable
102448	6 ft. SMD Disk A-Cable Bus Internal 3600/40/70 Systems
102451	6 ft. SMD Disk B-Cable Radial Internal 3600/40/70 Systems
102501	Disk Ground Cable 3640 System
102507	(Maxtor XT1140) 6 ft. Disk A-Cable Bus Internal 3640 System
102508	(Maxtor XT1140) 6 ft. Disk B-Cable Radial Internal 3640 System
102523	(Priam) 6 ft. SMD Disk A-Cable Bus Internal 3640 System
102524	(Priam) 6 ft. SMD Disk B-Cable Radial Internal 3640 System

Power

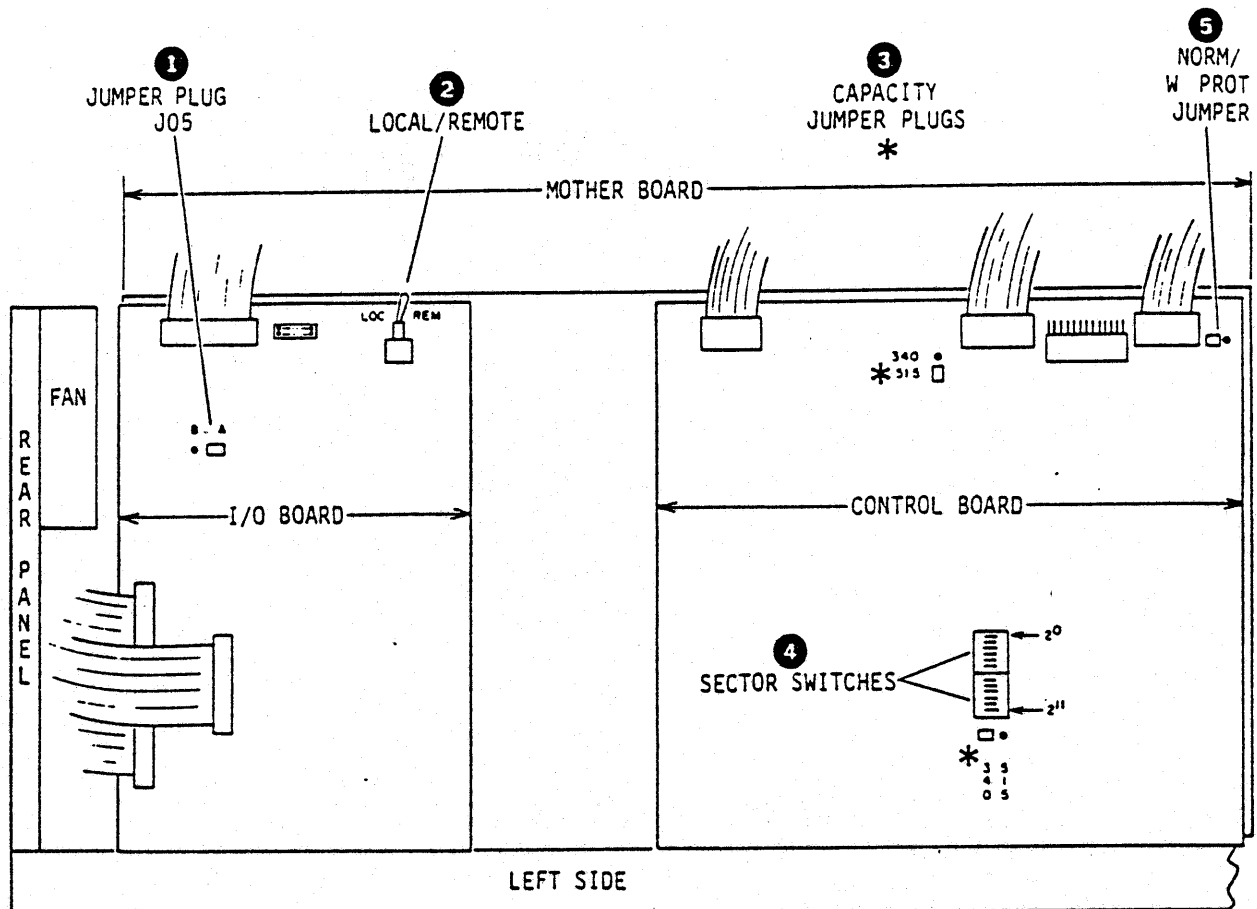
102331	(LM-2) Main Power Cable
102370	(LGP1) AC Power Cable
102381	(Cartridge Tape) AC Power Cable
102396-1	(3600/70) 12 ft. Main Power Cable 60 Hz. 50 Amp.
102396-2	(3600/70) 12 ft. Main Power Cable 50 Hz. (minus plug end)
102425-1	(Auxillary Cabinet) 6 ft. Main Power Cable
102425-2	(Auxillary Cabinet) 11 ft. Main Power Cable
102434	(NEC D2257) AC Disk Power Cable
102502	(3640) Main Power Cable 60 Hz. 20 Amp.
102502-1	(3640) 10 ft. Main Power Cable 60 Hz. 20 Amp.
102502-2	(3640) 10 ft. Main Power Cable 50 Hz. 20 Amp.
127008	(LM-2 Console) AC Power Cable
129052	(3600/40/70 Consoles) AC Power Cable



STATUS/FAULT DISPLAY BOARD IS LOCATED
BEHIND FRONT PANEL INSERT AND FILTER.

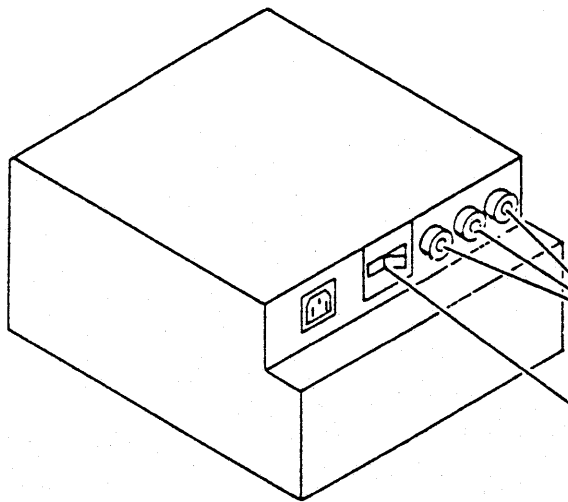
CDC EMD515

SINGLE CHANNEL DRIVES



INDEX	SWITCH	SETTING
ON I/O BOARD:		
1	INDEX/SECTOR JUMPER PLUG	LEAVE J05 IN "A" POSITION FOR INDEX/SECTOR IN "A" CABLE OR PLACE IN "B" POSITION FOR INDEX/SECTOR IN "B" CABLE. WITH JUMPER REMOVED, INDEX AND SECTOR IS IN "A" AND "B" CABLES.
2	LOCAL/REMOTE	LOCAL: DRIVE POWER UP INDEPENDENT OF CONTROLLER. REMOTE: DRIVE POWER UP INDEPENDENT OF CONTROLLER.
ON CONTROL BOARD:		
3	DRIVE CAPACITY JUMPER PLUGS 340/515	PRESET IN FACTORY ACCORDING TO CURRENT CONFIGURATION.
4	SECTOR SWITCHES	SEE DISCUSSION ON SETTING CIRCUIT BOARD SWITCHES.
5	NORM/W PROT JUMPER PLUG	NORM

CDC EMD515 SWITCH SETTINGS



REMOTE POWER SUPPLY

DC CIRCUIT BREAKERS
CB2, CB3, CB4

AC
CIRCUIT
BREAKER
CB1

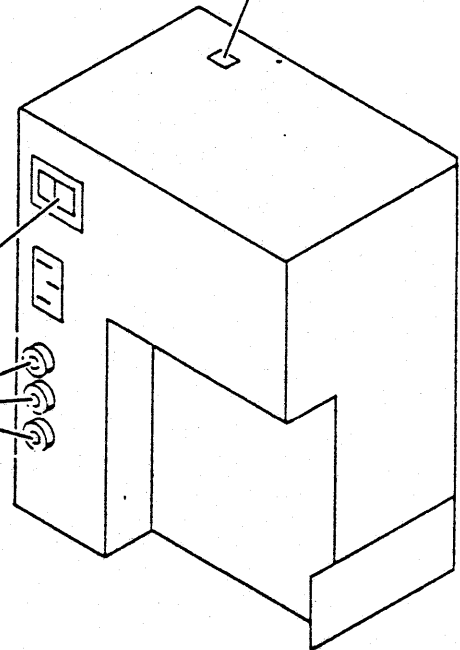
VOLTAGE
PROGRAMMING
SWITCH

AC
CIRCUIT
BREAKER
CB1

VOLTAGE
PROGRAMMING
SWITCH

AC
CIRCUIT
BREAKER
CB1

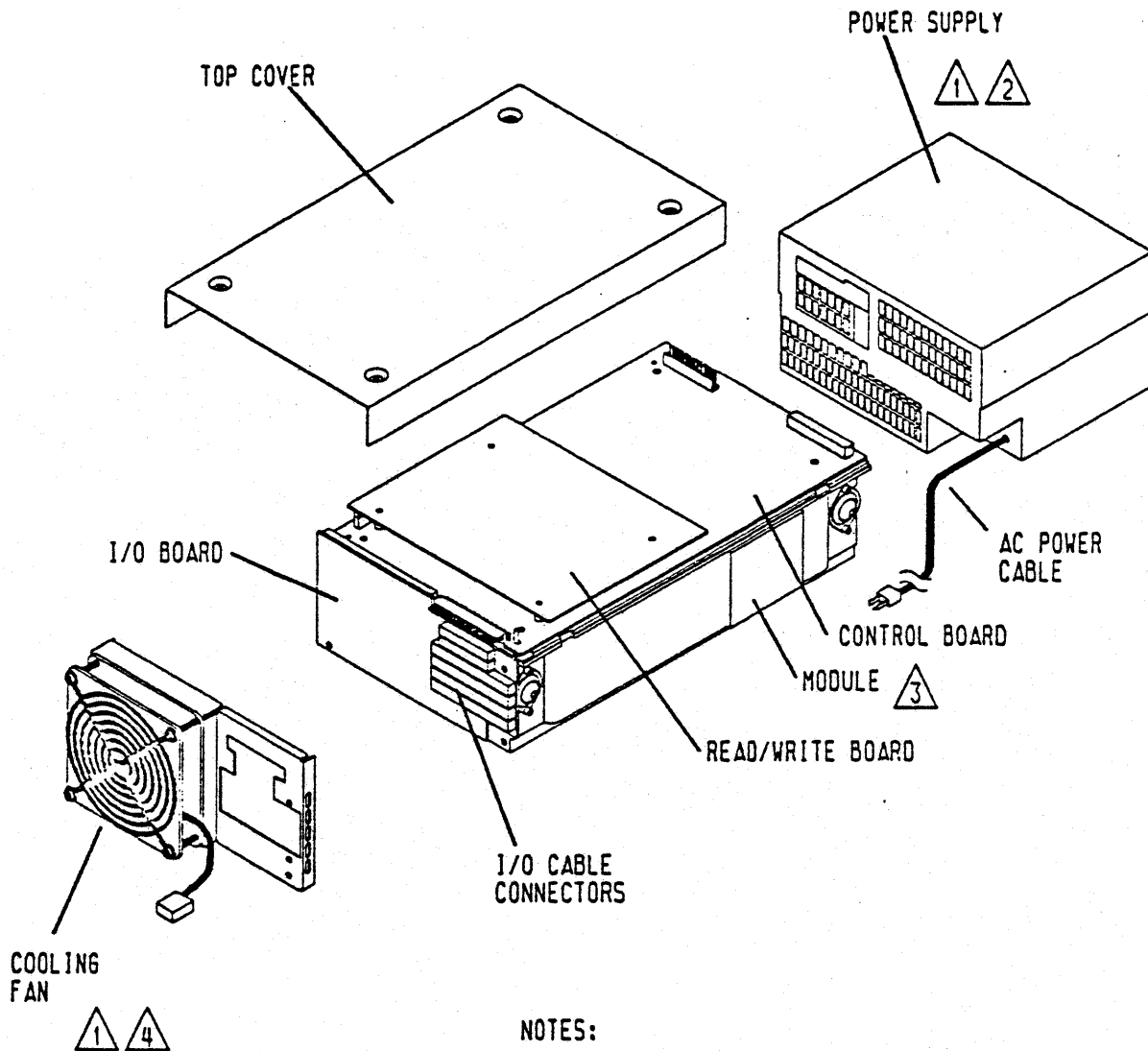
DC CIRCUIT
BREAKERS
CB2, CB3,
CB4



INTEGRAL POWER SUPPLIES

DC CIRCUIT
BREAKERS
CB2, CB3,
CB4

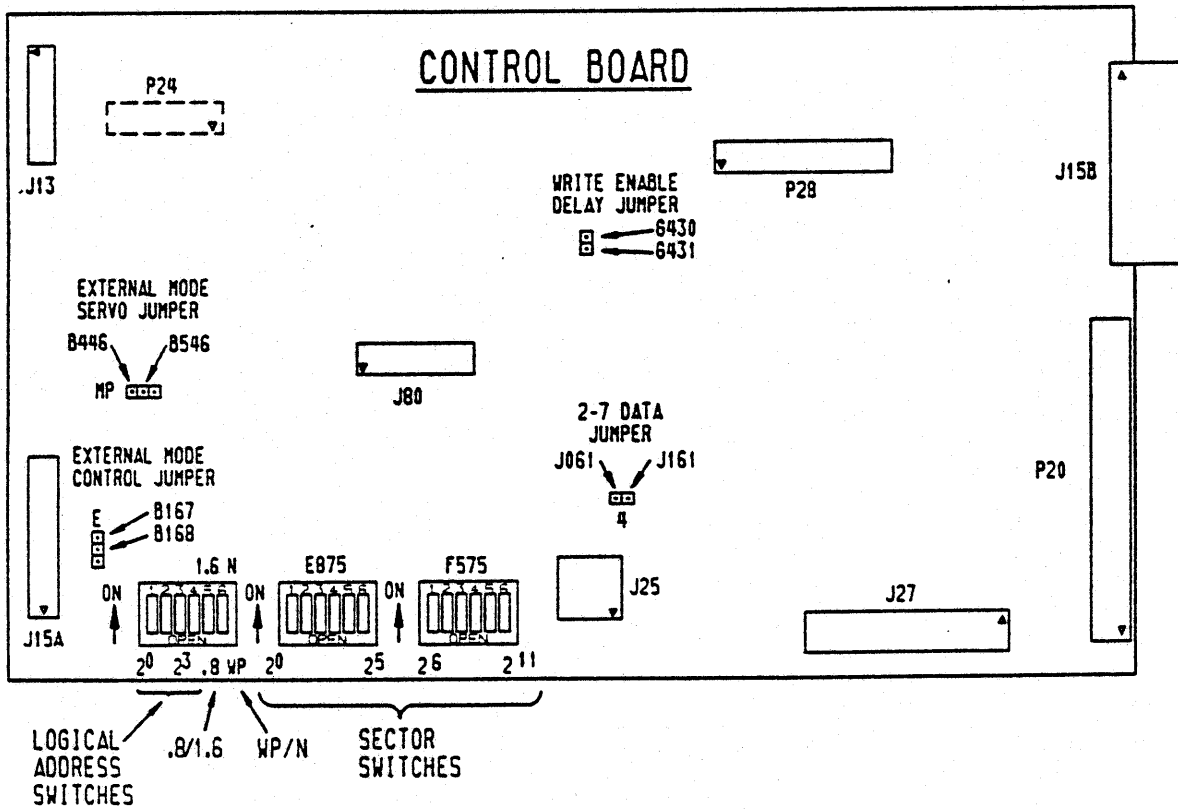
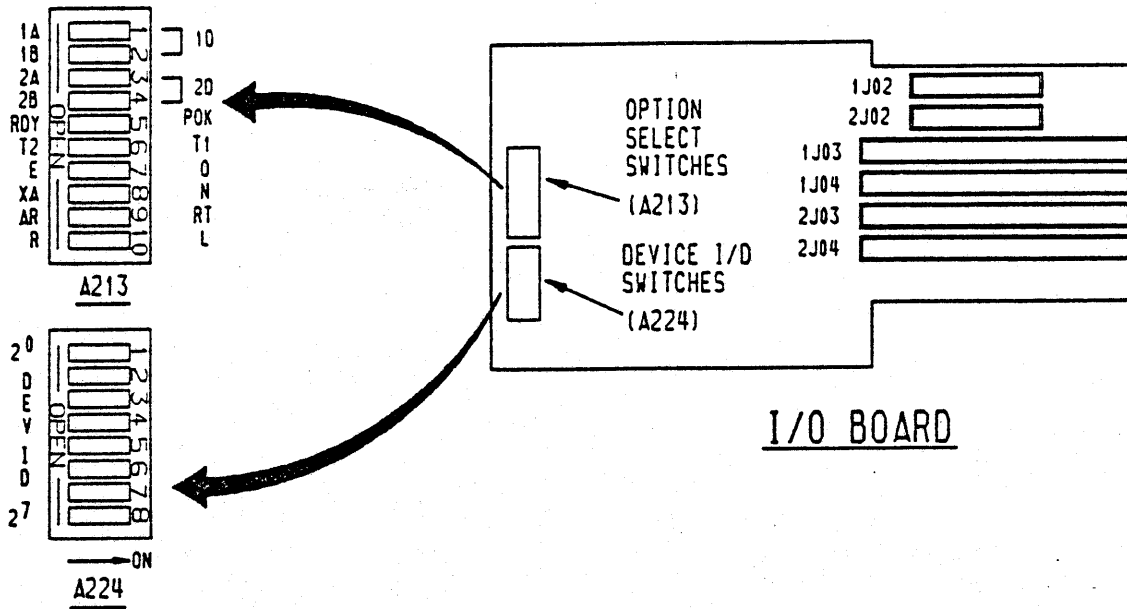
CDC EMD515 POWER SUPPLY



NOTES:

- ① OPTIONAL
- ② MOUNTED DIRECTLY IN FRONT OF DRIVE (IN 2X DRAWER) OR MOUNTED IN REMOTE LOCATION
- ③ MODULE CONTAINS THE DISKS, SPINDLE, DRIVE MOTOR, ACTUATOR, AND THE HEADS.
- ④ USED WHEN POWER SUPPLY IS MOUNTED IN REMOTE LOCATION.

CDC EMD368



CDC EMD368 SWITCH SETTINGS

I/O BOARD SWITCH SETTINGS

SWITCH	SETTING	DESCRIPTION
1A/1D, 1B/1D		<p>Enable/Disable CH 1 and select an option for sending Index & Sector to CH 1 controller. The four combinations of switch settings are as follows:</p>
1A/1D 1B/1D	1A 1D	This pair of switch settings enables CH 1 & sends I & S on A cable only
1A/1D 1B/1D	1D 1B	This pair of switch settings enables CH 1 & sends I & S on B cable only
1A/1D 1B/1D	1A 1B	This pair of switch settings enables CH 1 & sends I & S on A and B cables
1A/1D 1B/1D	1D 1D	This pair of switch settings disables CH 1
2A/2D, 2B/2D		<p>Enable/Disable CH 2 and select an option for sending Index & Sector to CH 2 controller (see description of CH 1 switches)</p>
RDY/POK	RDY POK	<p>Normal I/O Ready status (Up to speed, heads loaded and no fault exists)</p> <p>POK (Power OK) line active: In addition to above conditions (when switch is in RDY), Ready status also indicates ac input voltage to the power supply is present.</p>

Table Continued on Next Page

I/O BOARD SWITCH SETTINGS (Contd)

SWITCH	SETTING	DESCRIPTION
		POK (Power OK) line inactive: Indicates a loss of ac input voltage. The Ready line will go inactive (immediately). The +Voltage Fault line will remain inactive for a minimum of 850 microseconds (after the POK line goes inactive).
T2/T1	T2	Enables Extended Cylinder Address bits 2^{10} and 2^{11} , via Tag 2 (Head Select).
	T1	Enables Extended Cylinder Address bit 2^{10} , via Tag 1 (Cylinder Select).
E/O	E	SMD-E mode
	O	SMD-O mode
XA/N	XA	Extended Cylinder Address (cylinders 0-1217)
	N	Normal Cylinder Address (cylinders 0-1023)
AR/RT	AR	Absolute Release (Dual CH)
	RT	Release Timer (Dual CH)
R/L	R	Remote power up
	L	Local power up
DEV ID 2 ⁰⁻²⁷	(Closed)	Set according to customer requirements.

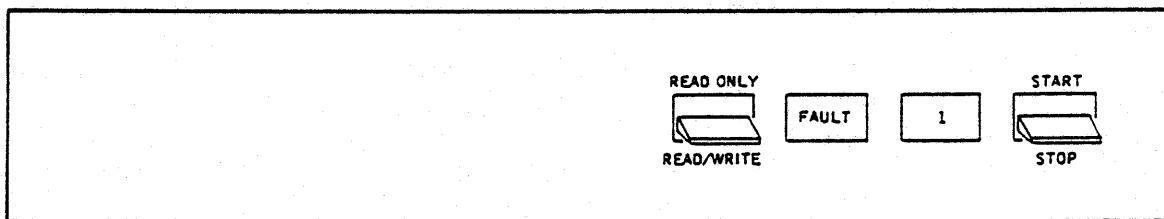
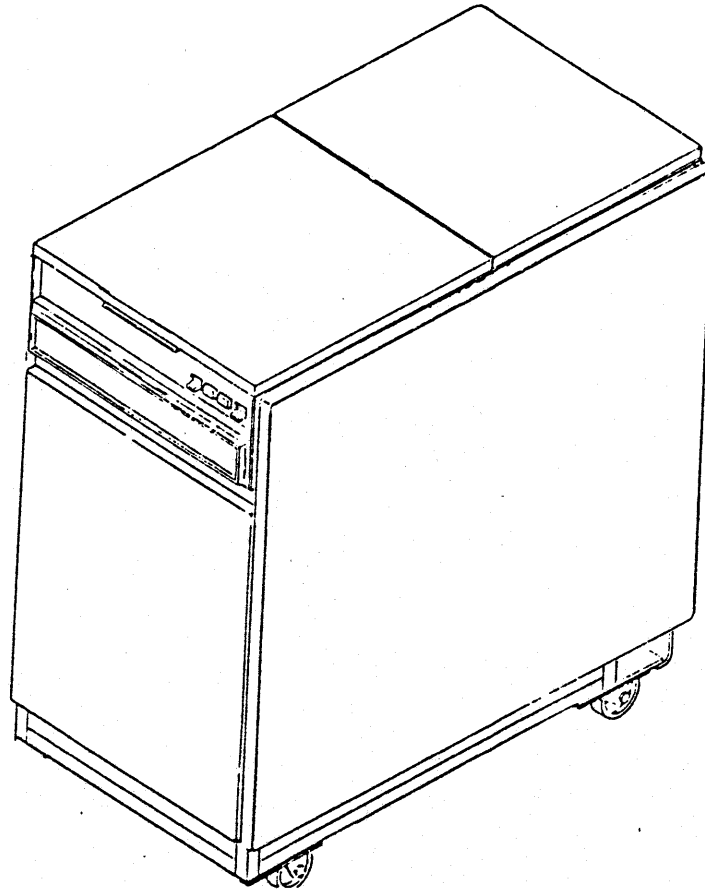
CONTROL BOARD SWITCH SETTINGS

SWITCH	SETTING	DESCRIPTION
Sector Switches		See discussion on Setting Circuit Board Switches.
Logical Address Switches		Used on drives without status/control panel. See discussion on Setting Circuit Board Switches.
.8/1.6	.8	806 kHz Sector Clock
	1.6	1.6 MHz Sector Clock
WP/N	WP	Write Protect.
	N	Normal
2-7 Data Jumper	4	Jumper preset during manufacturing between J061 and J161.
Write Enable Delay Jumper		Jumper preset during manufacturing between G430 and G431.
External Mode Control Jumper	E	Jumper preset during manufacturing between B167 and B168.
External Mode Servo Jumper	MP	Jumper preset during manufacturing between B446 and B546.

CONTROL BOARD LOGICAL ADDRESS SWITCH SETTINGS

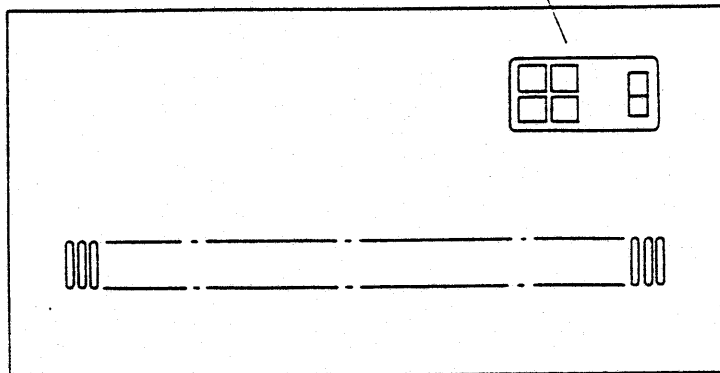
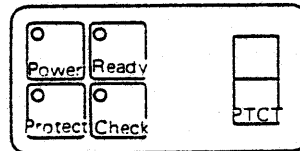
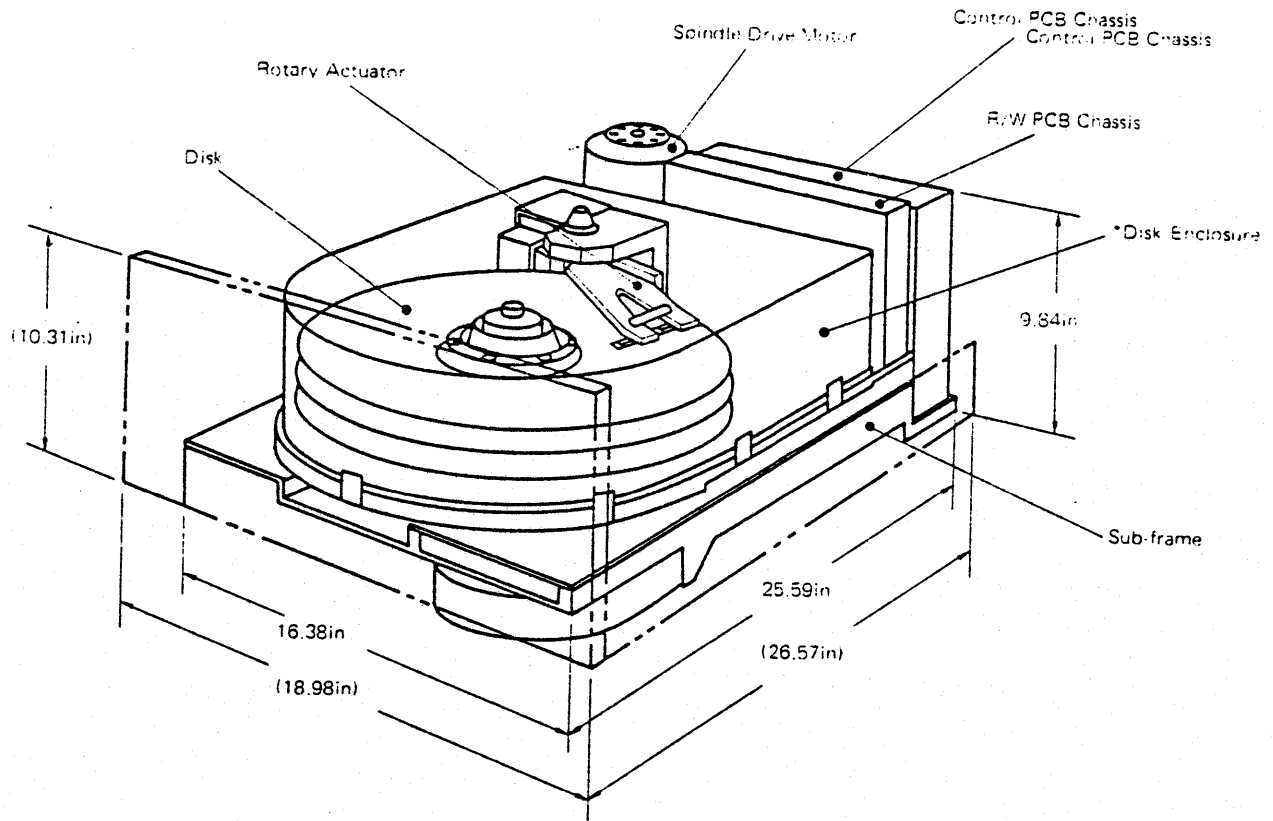
Logical Address	Switch (Binary Value) *			
	2 ⁰	2 ¹	2 ²	2 ³
0	C	C	C	C
1	O	C	C	C
2	C	O	C	C
3	O	O	C	C
4	C	C	O	C
5	O	C	O	C
6	C	O	O	C
7	O	O	O	C
8	C	C	C	O
9	O	C	C	O
10	C	O	C	O
11	O	O	C	O
12	C	C	O	O
13	O	C	O	O
14	C	O	O	O
15	O	O	O	O

* O = Open (Off), C = Closed (On)

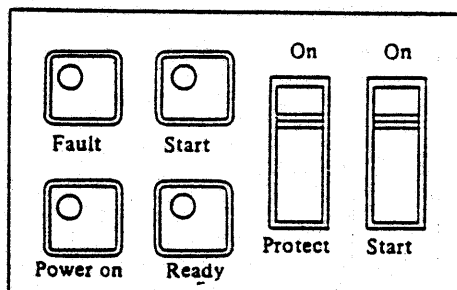
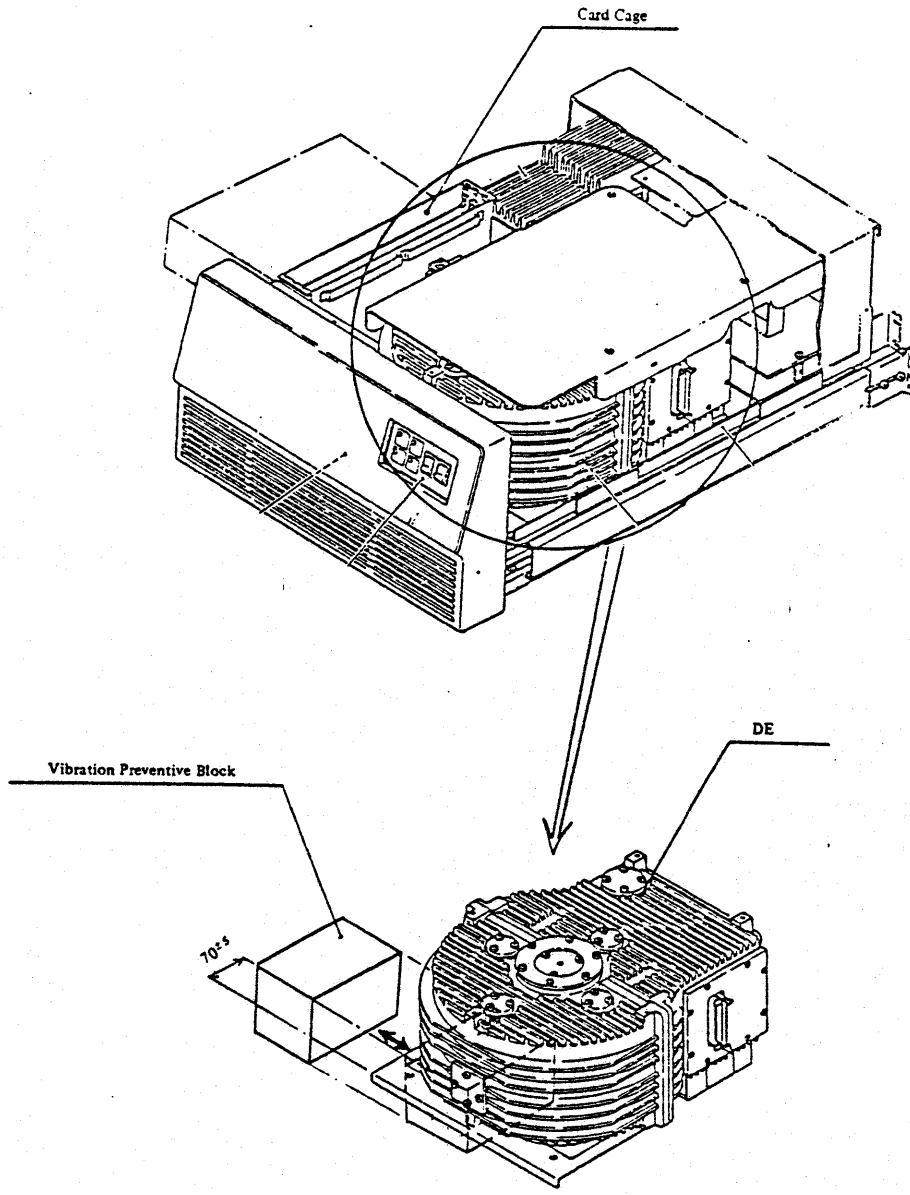


SINGLE-ACCESS CONTROL PANEL

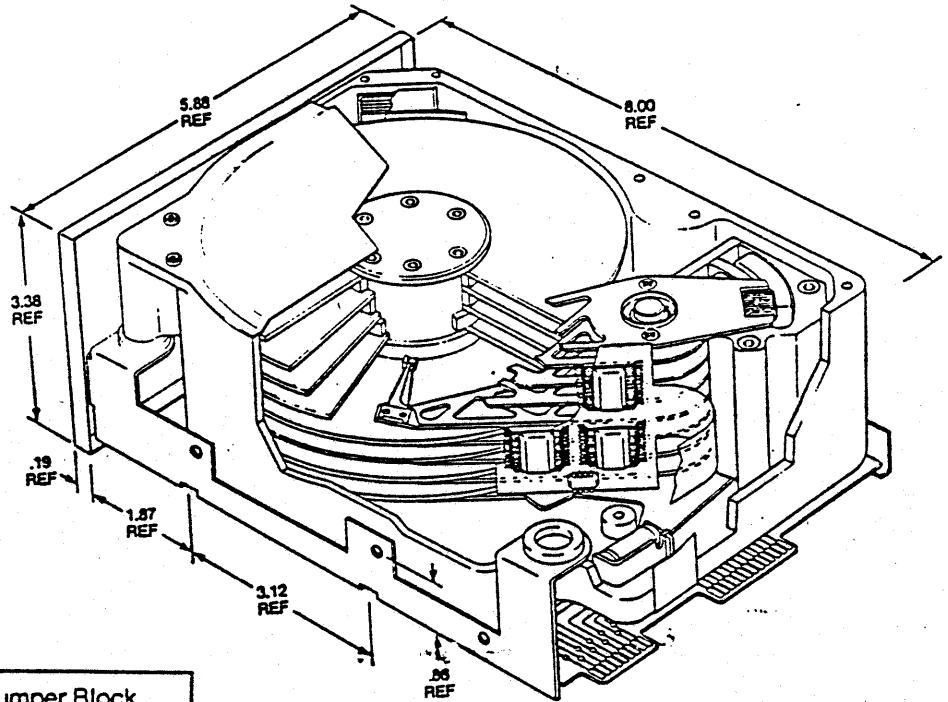
CDS MODEL T306



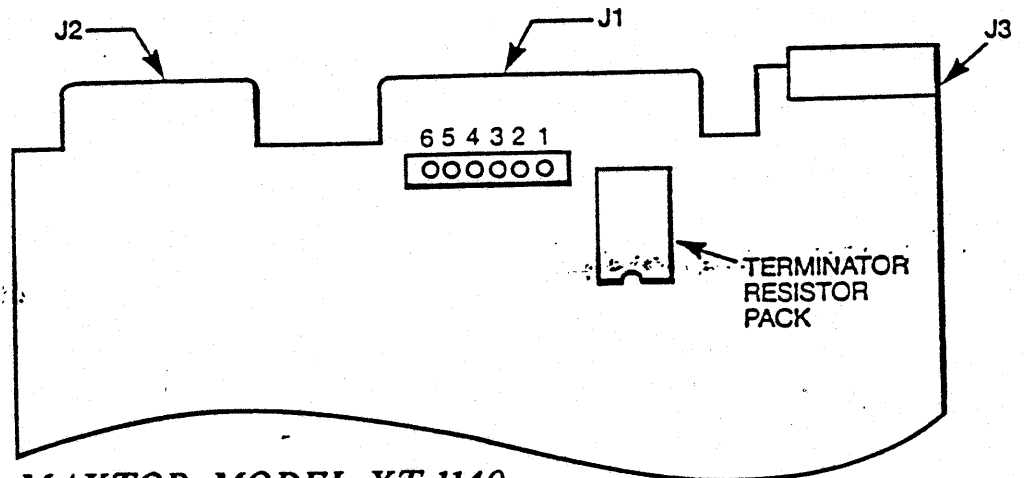
FUJITSU MODELS M2284 AND M2294



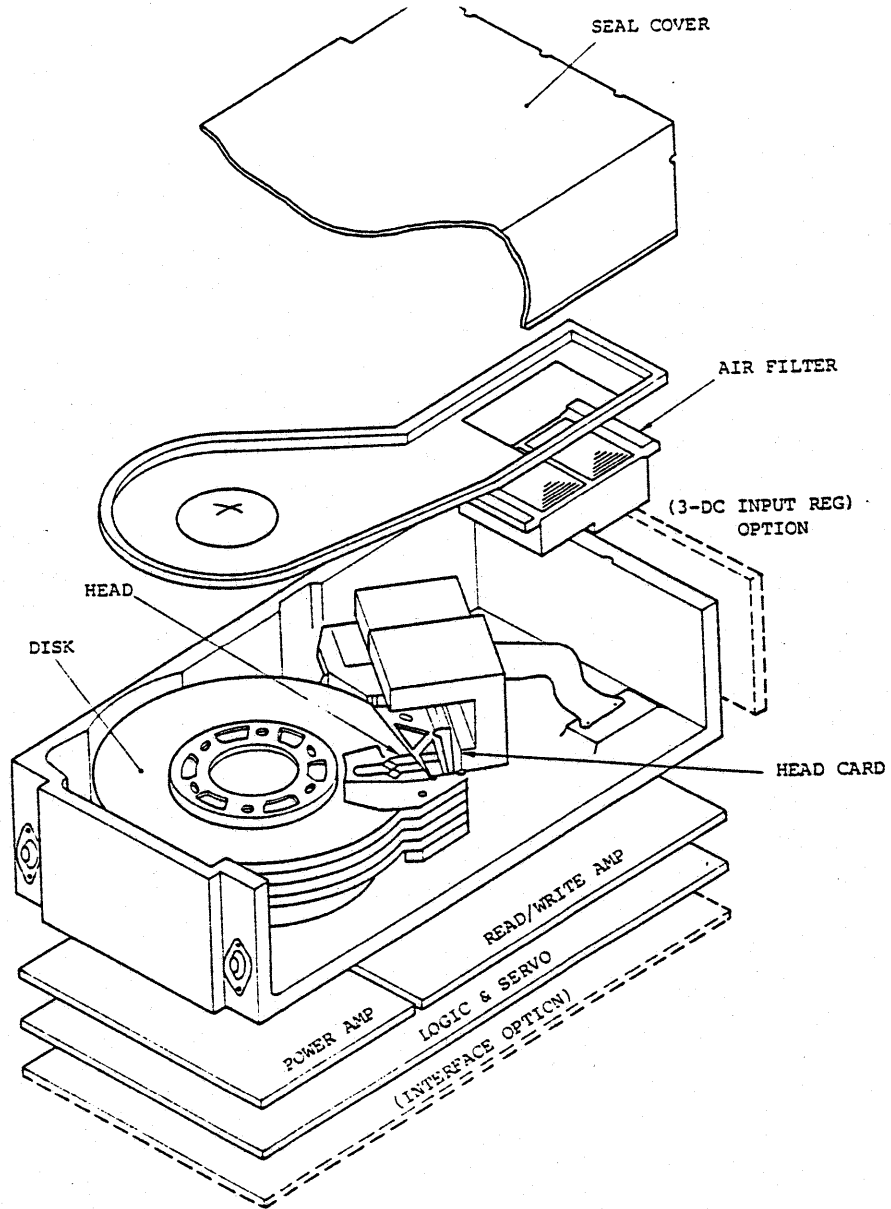
FUJITSU MODEL M2351



Function	Jumper Block Pin Numbers
Drive Select 0	1, 2
Drive Select 1	2, 3
Drive Select 2	4, 5
Drive Select 3	5, 6

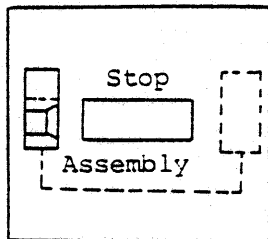


MAXTOR MODEL XT-1140

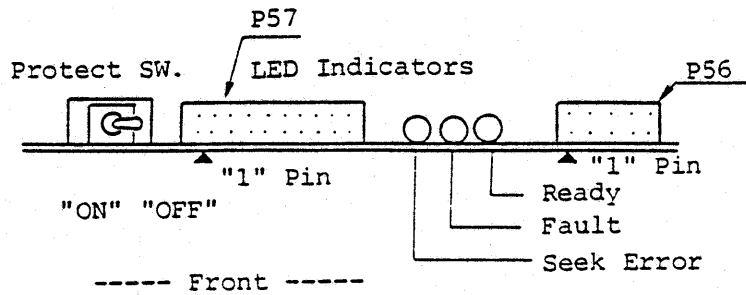


Lock

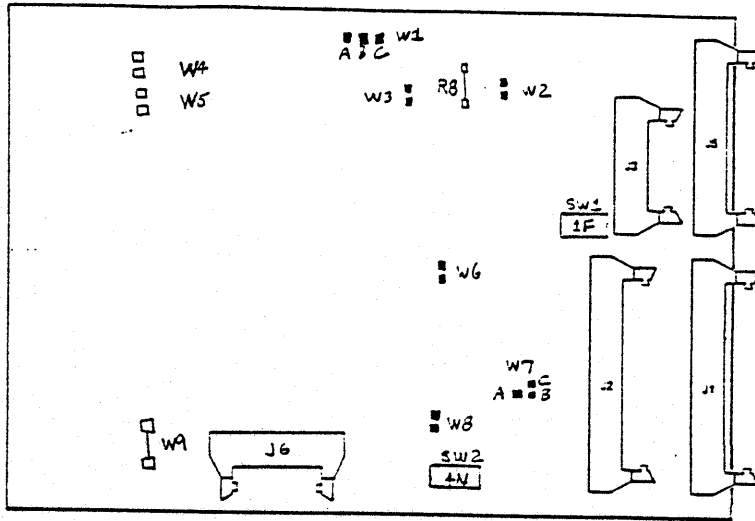
Free



Lock Control Level



NEC MODEL D2257



SHO R/W PCB ASSEMBLY

PCB ASSEMBLY P/N 200834-2
200835-2

DRIVE MODEL NUMBER 806-2X
807-2X

■ ■ ■ CONDUCTIVE TAB
□ □ WIRE OR TRACE

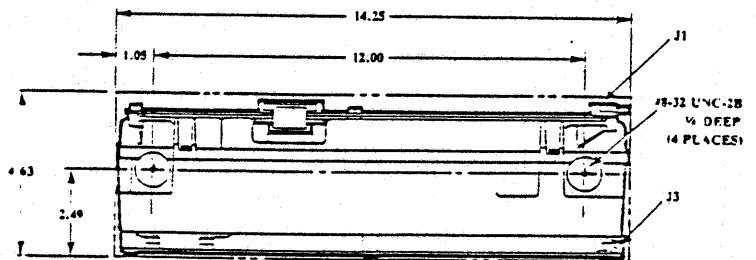
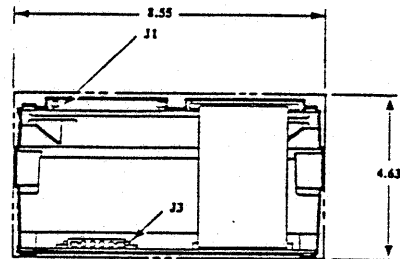
JUMPER SETTINGS

JUMPER SETTINGS		SHIPPING CONFIGURATION
W1	B-C	3-C
W2	IN = ENABLE SECTOR AT INDEX	OUT
W3	IN = AUTOMATIC PICK AND HOLD	IN
W4	IN	IN
W5	IN	IN
W6	OUT = READ IS NOT DISABLED AT INDEX OR SECTOR	
	IN = READ IS DISABLED AT INDEX OR SECTOR	OUT
W7	A-B = ENABLE BIT 10	
	B-C = DISABLE BIT 10	B-C
W8	OUT = FAULT SETS NOT-READY	
	IN = READY IS INDEPENDENT OF FAULT	IN
R8	IN = DISABLE SHORT SECTOR	
	OUT = ENABLE SHORT SECTOR	IN
W9	IN = 806	
	OUT = 807	

SWITCH SETTINGS

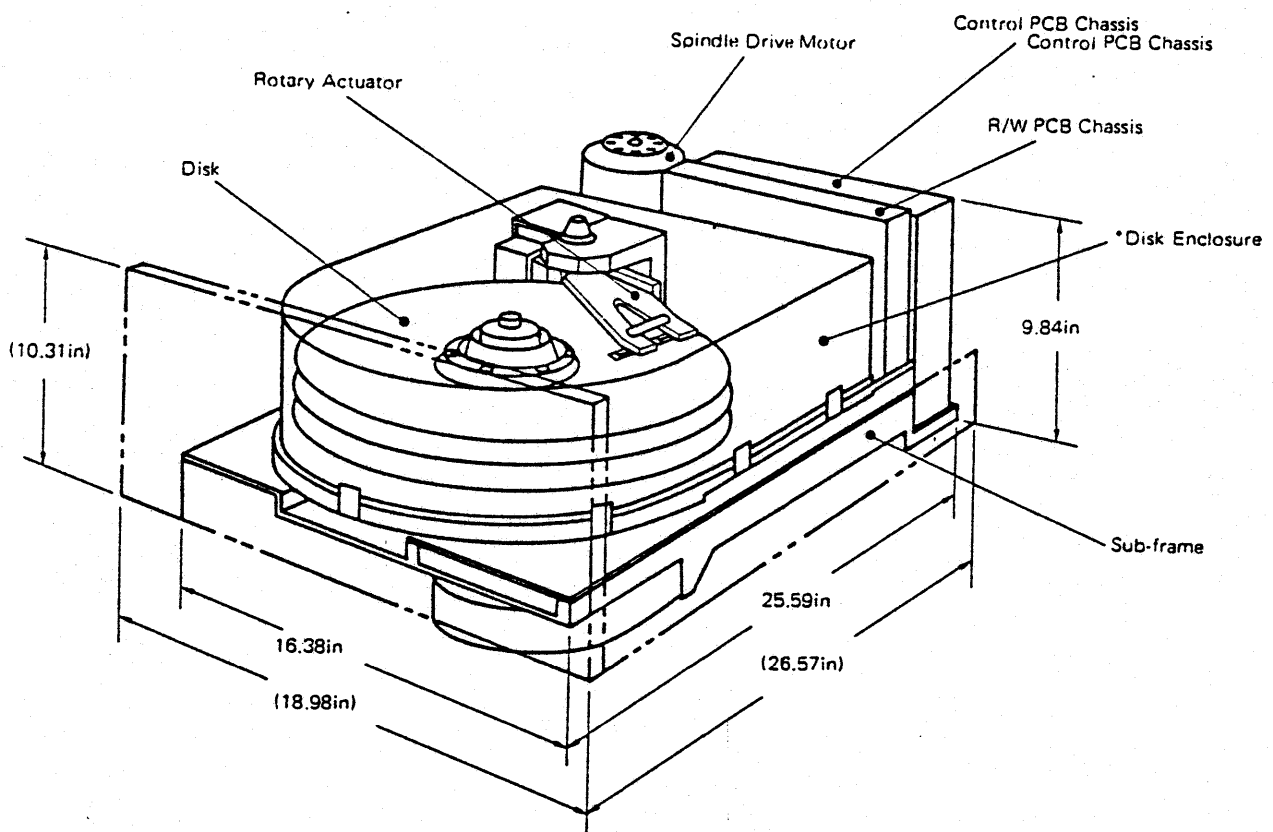
SWITCH LOCATION		4N (SW-2)	SHIPPING CONFIGURATION
NUMBER	1	DRIVE SELECT 1	ON
	2	DRIVE SELECT 2	OFF
	3	DRIVE SELECT 4	OFF
	4	DRIVE SELECT 3	OFF
AND	5	Not Used	OFF
	6	Not Used	OFF
FUNCTION	7	ON = DELAYED READ GATE	OFF
	8	ON = WRITE PROTECT	OFF
SWITCH LOCATION		1F (SW-1)	
NUMBER	1	1 S/T 10 3/S	ON
	2	2 12	OFF
	3	3 14	OFF
	4	4 16	OFF
AND	5	5 18	OFF
	6	6 20	OFF
FUNCTION	7	7 22 212	OFF
	8	8 24 1025	ON
		OFF = SECTORS/TRACK	
		ON = BYTES/SECTOR	OFF

PCBA P/N 200834/5-2 Switch and Jumper Settings



PRIAM MODEL 807

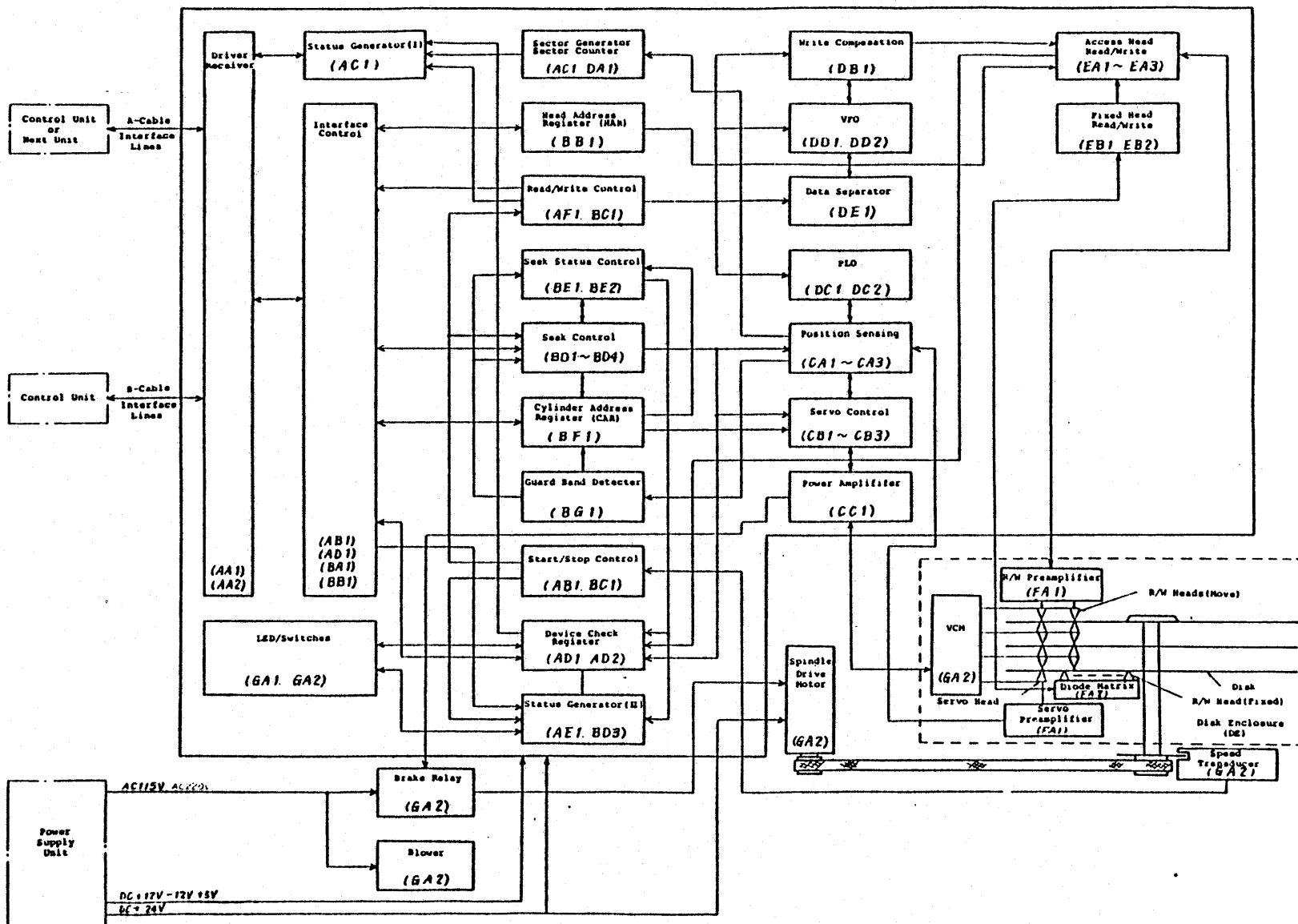
Priam 8-Inch Disc Drive Dimensions and Mounting

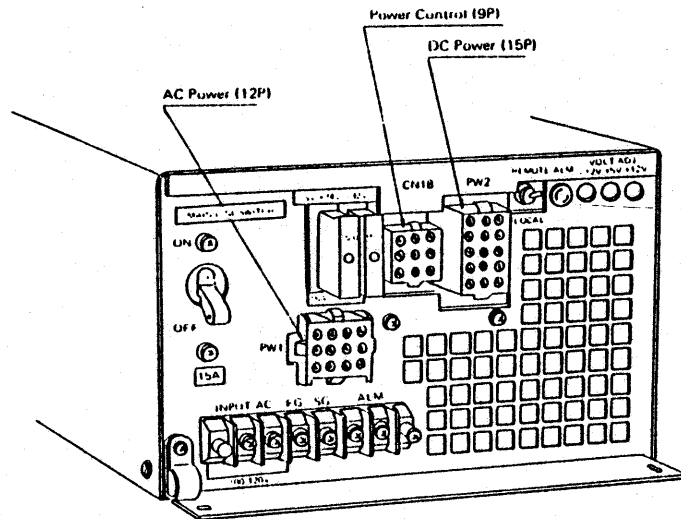


FUJITSU MODELS M2284 & M2294

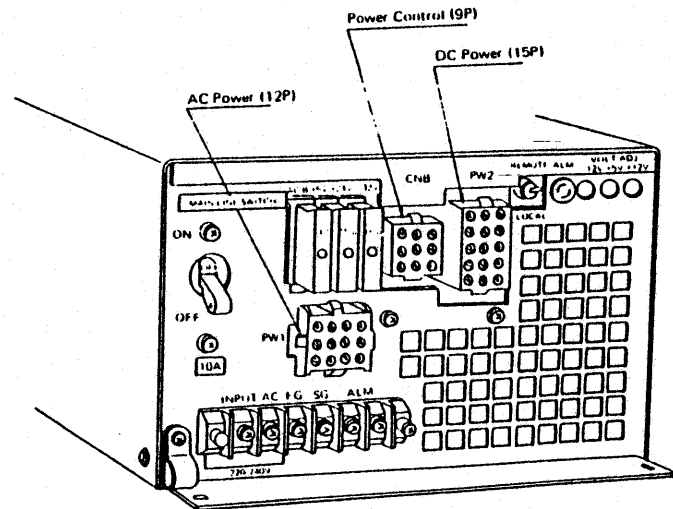
2284 and 2294 OPERATIONAL SPECIFICATIONS

ITEM	2284 SPECIFICATION	2294 SPECIFICATION
UNFORMATTED STORAGE CAPACITY	168.5 MB	335.5 MB
HEADS	10	16
UNFORMATTED TRACK CAPACITY	20,480 BYTES	20,480 BYTES
SINGLE TRACK POSITIONING TIME	6 ms	6 ms
AVERAGE POSITIONING TIME	27 ms	27 ms
MAXIMUM POSITIONING TIME	55 ms	55 ms
ROTATIONAL SPEED	2,964 RPM	2,964 RPM
AVERAGE LATENCY TIME	10.12 ms	10.12 ms
BIT DENSITY	6,500 BPI	6,500 BPI
TRACK DENSITY	793 TPI	793 TPI
TRANSFER RATE	1,012 KB/S	1,012 KB/S
RECORDING CODE	MFM	MFM
INTERFACE CODE	NRZ	NRZ
START TIME	40 SEC NOMINAL	40 SEC NOMINAL
STOP TIME	30 SEC NOMINAL	30 SEC NOMINAL

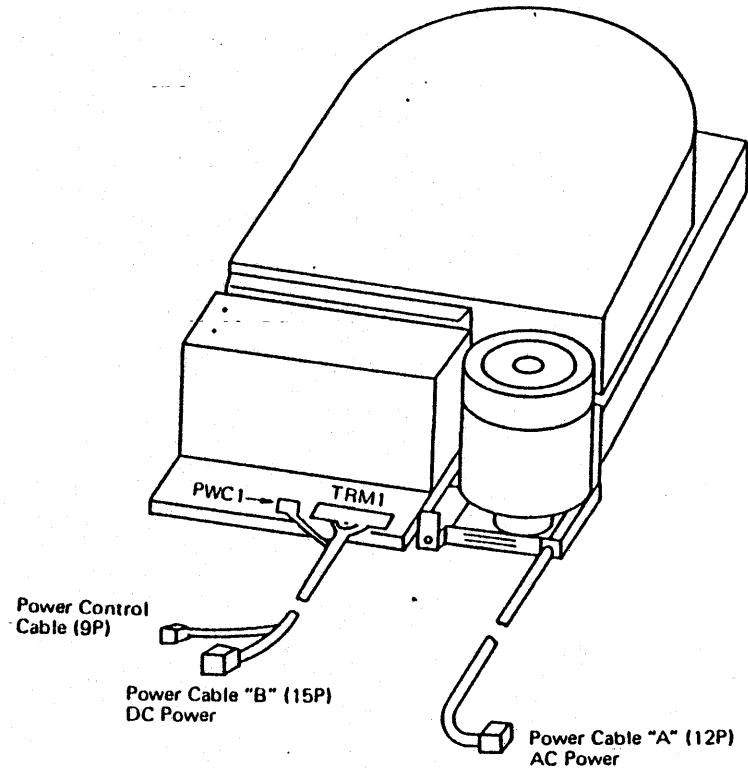


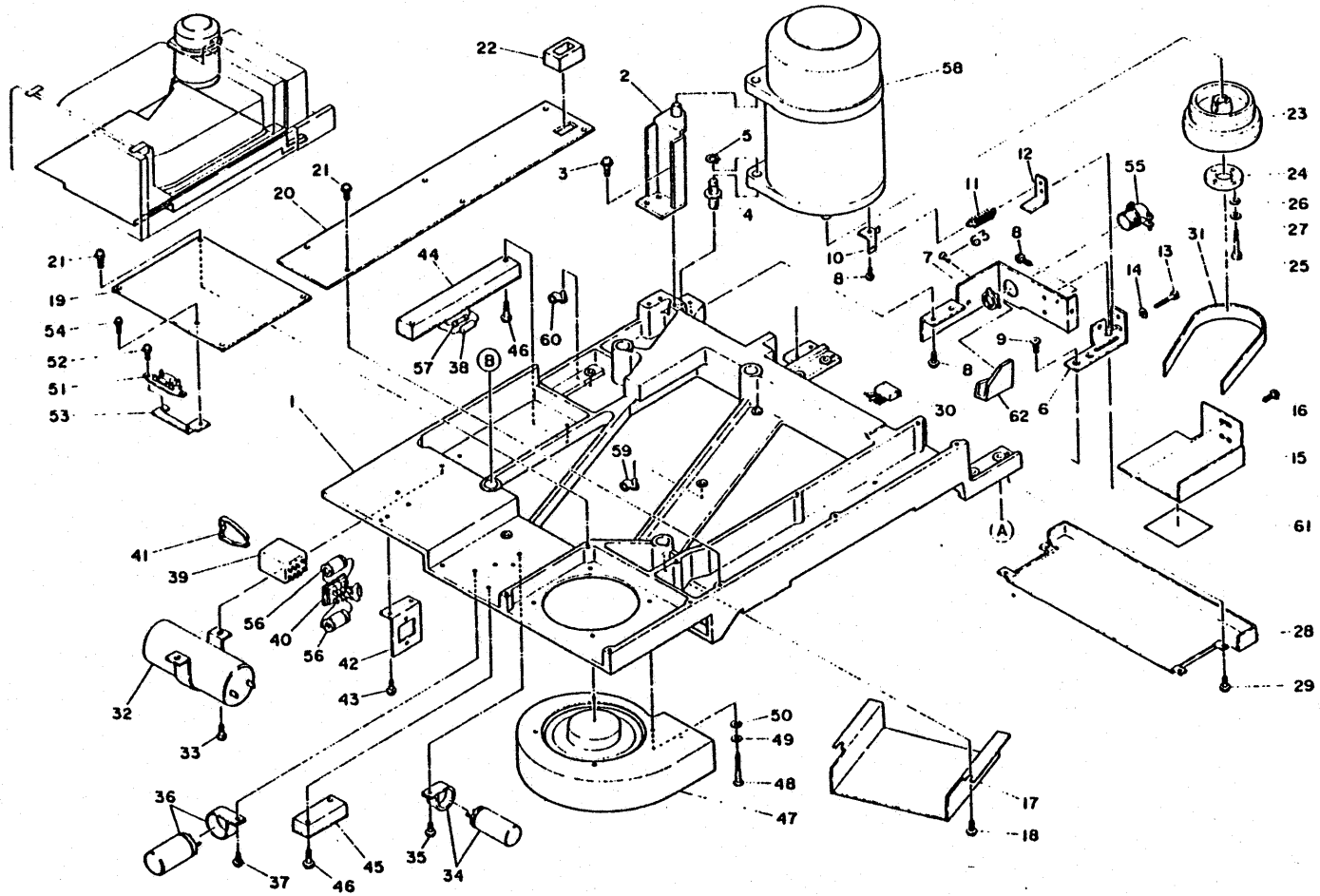


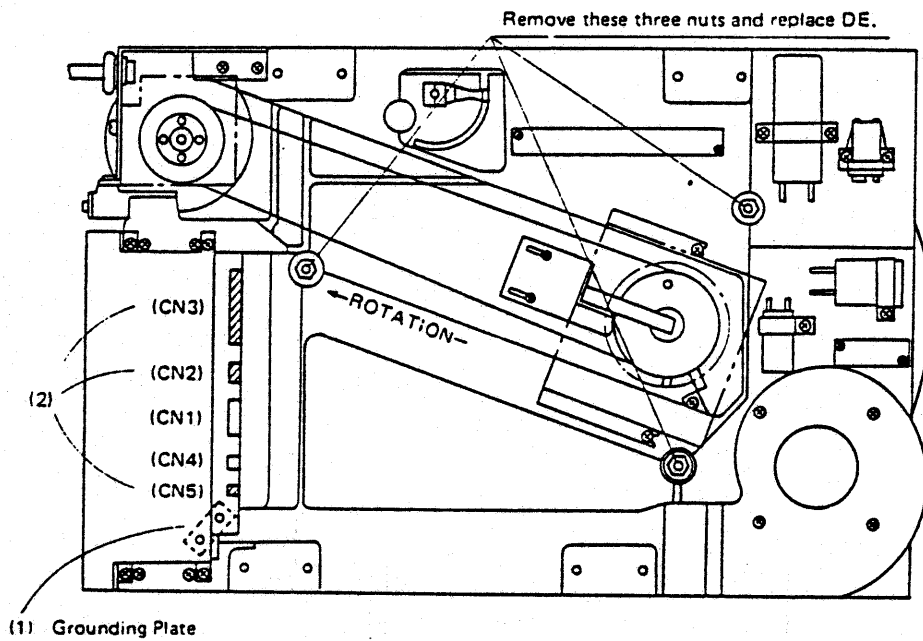
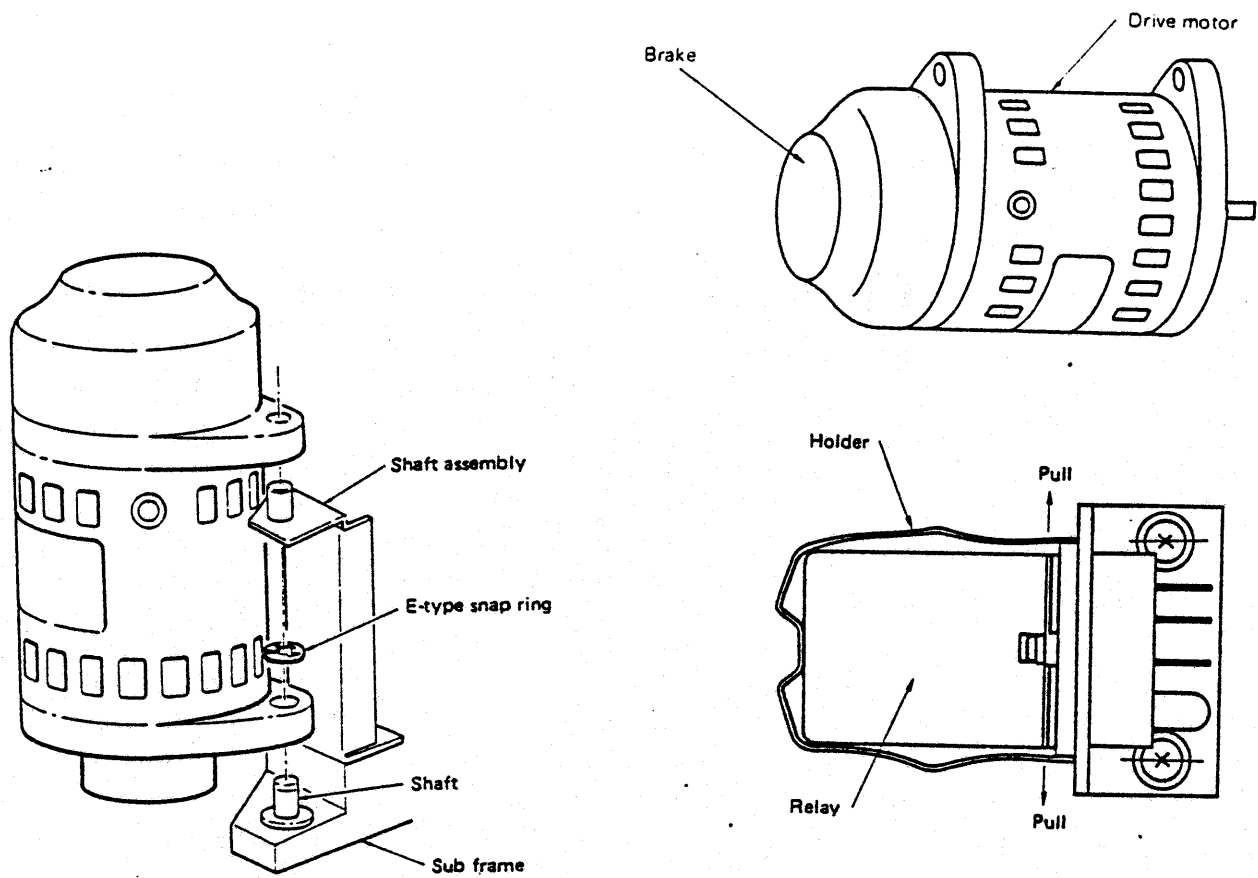
(1) USA Version Power Supply Unit

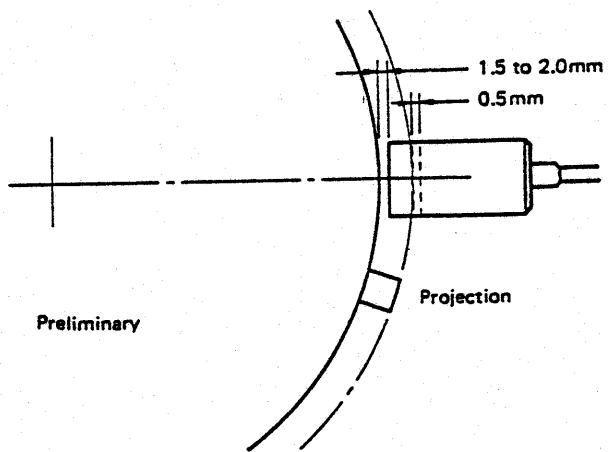
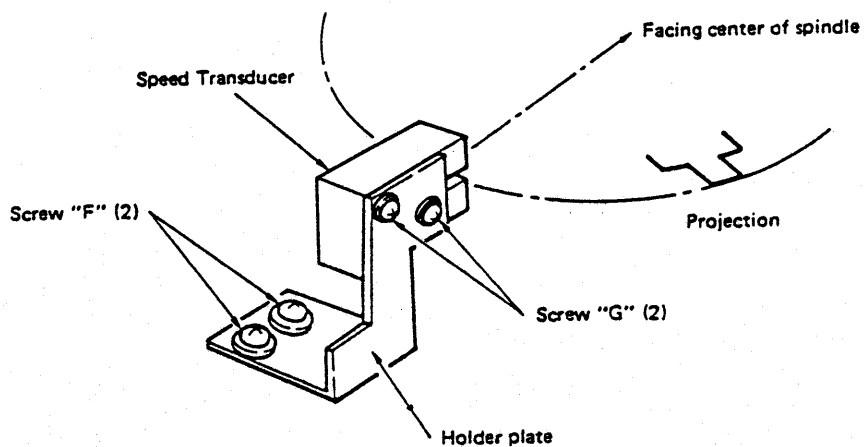


(2) European Version Power Supply Unit

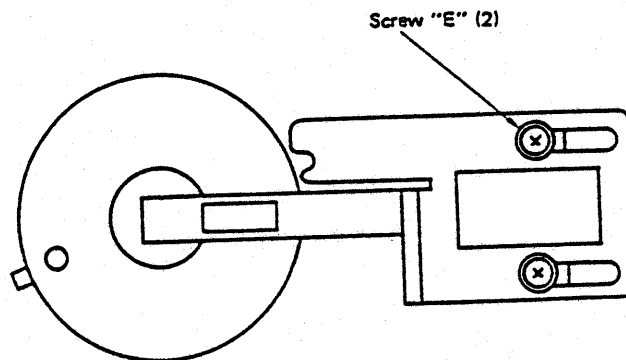
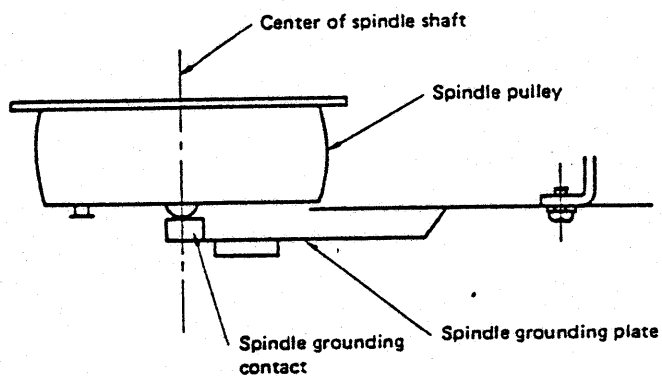




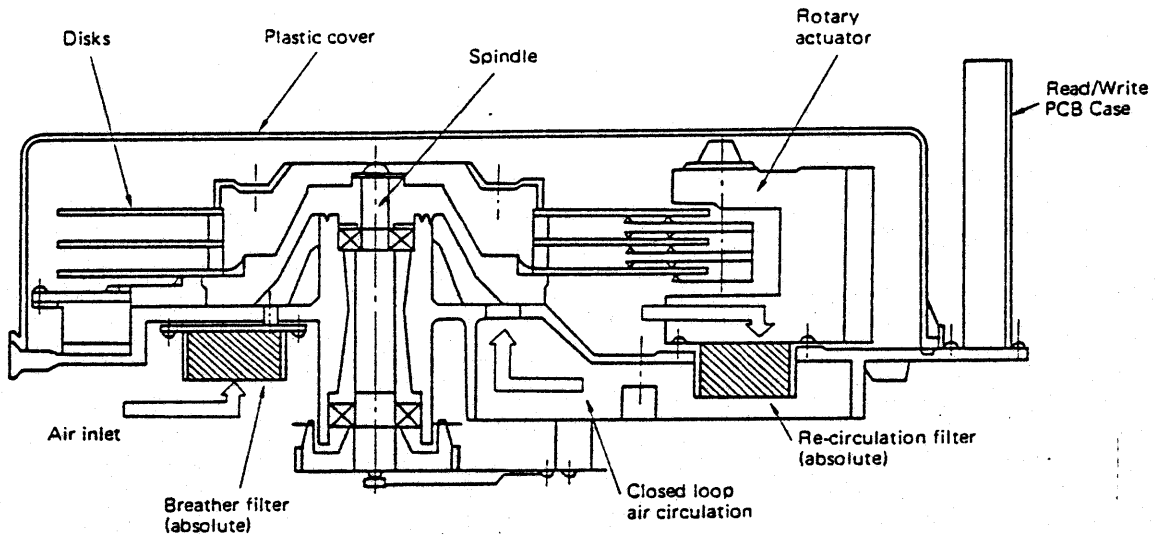




Speed Transducer

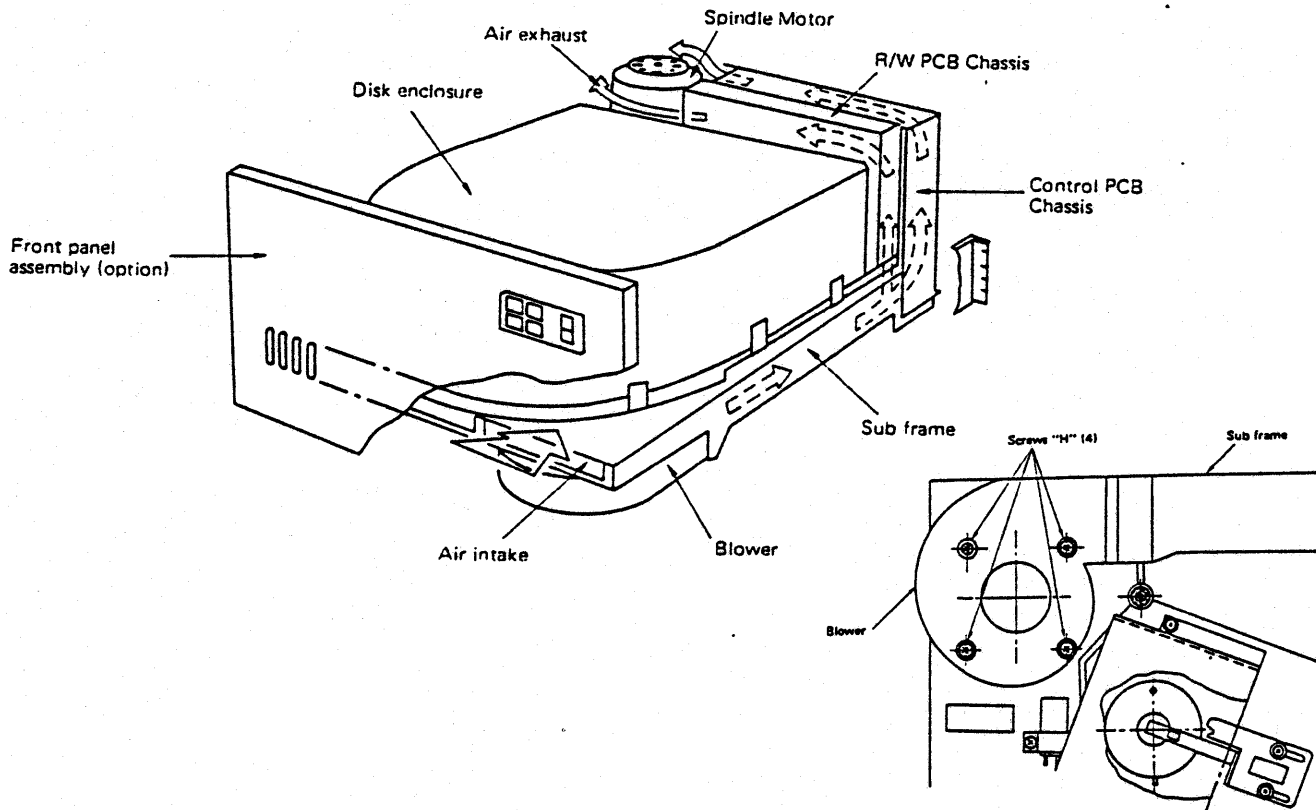


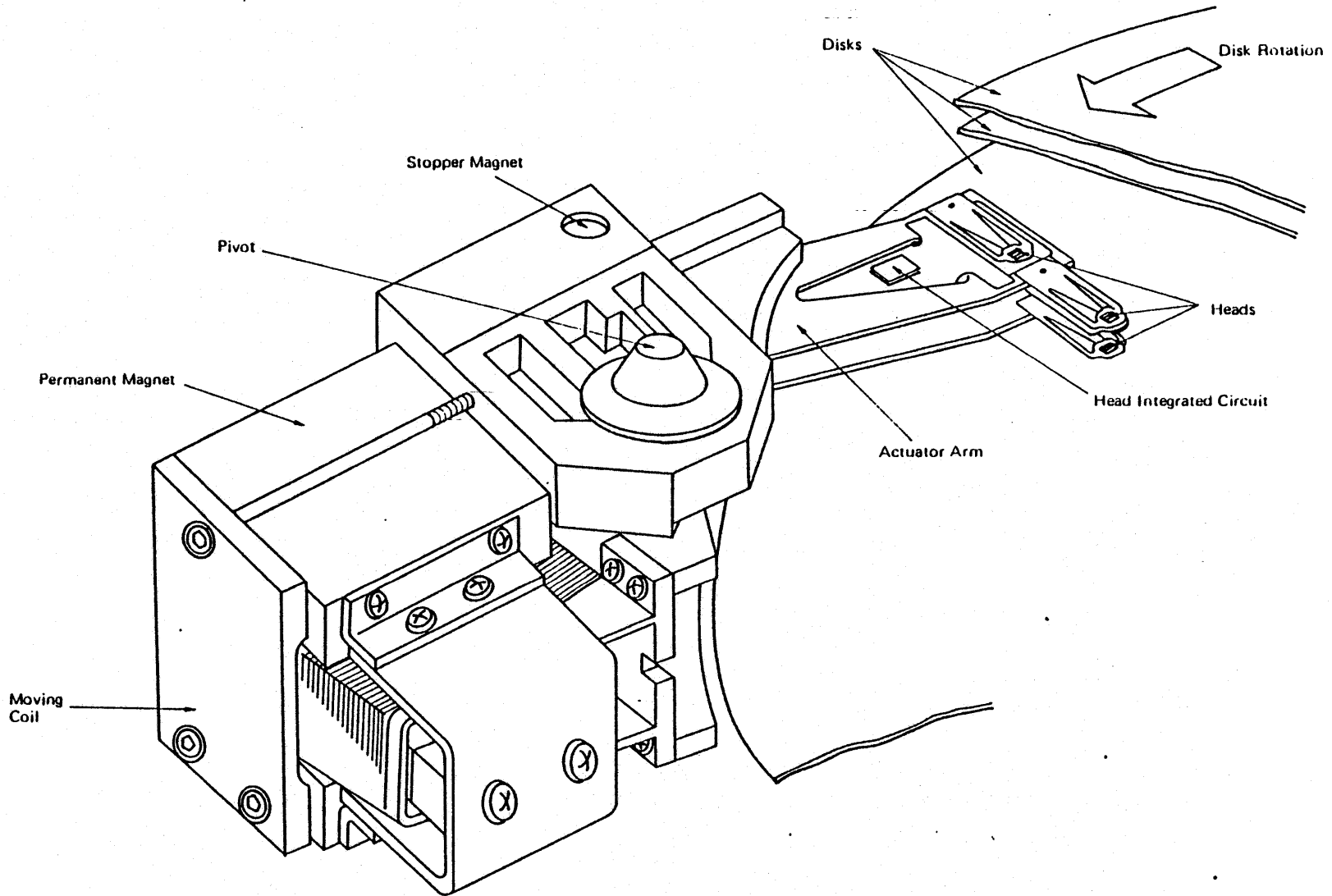
Spindle Grounding Plate Replacement and Adjustment



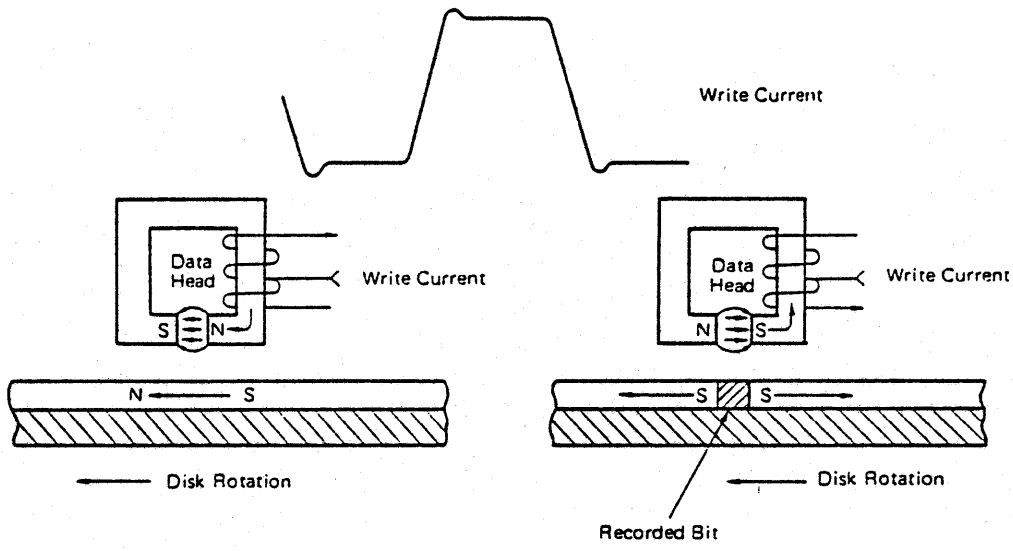
M2282 contains two disks in DE.
 M2280 contains two disks in DE.
 M2283 contains three disks in DE.
 M2284 contains three disks in DE as shown in this figure.

Air Circulation inside DE

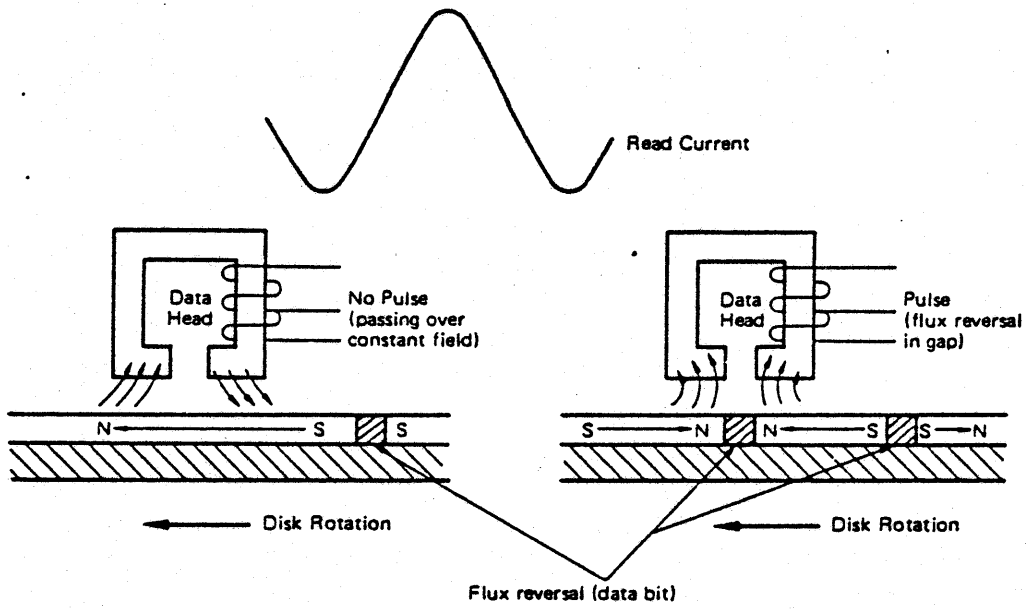




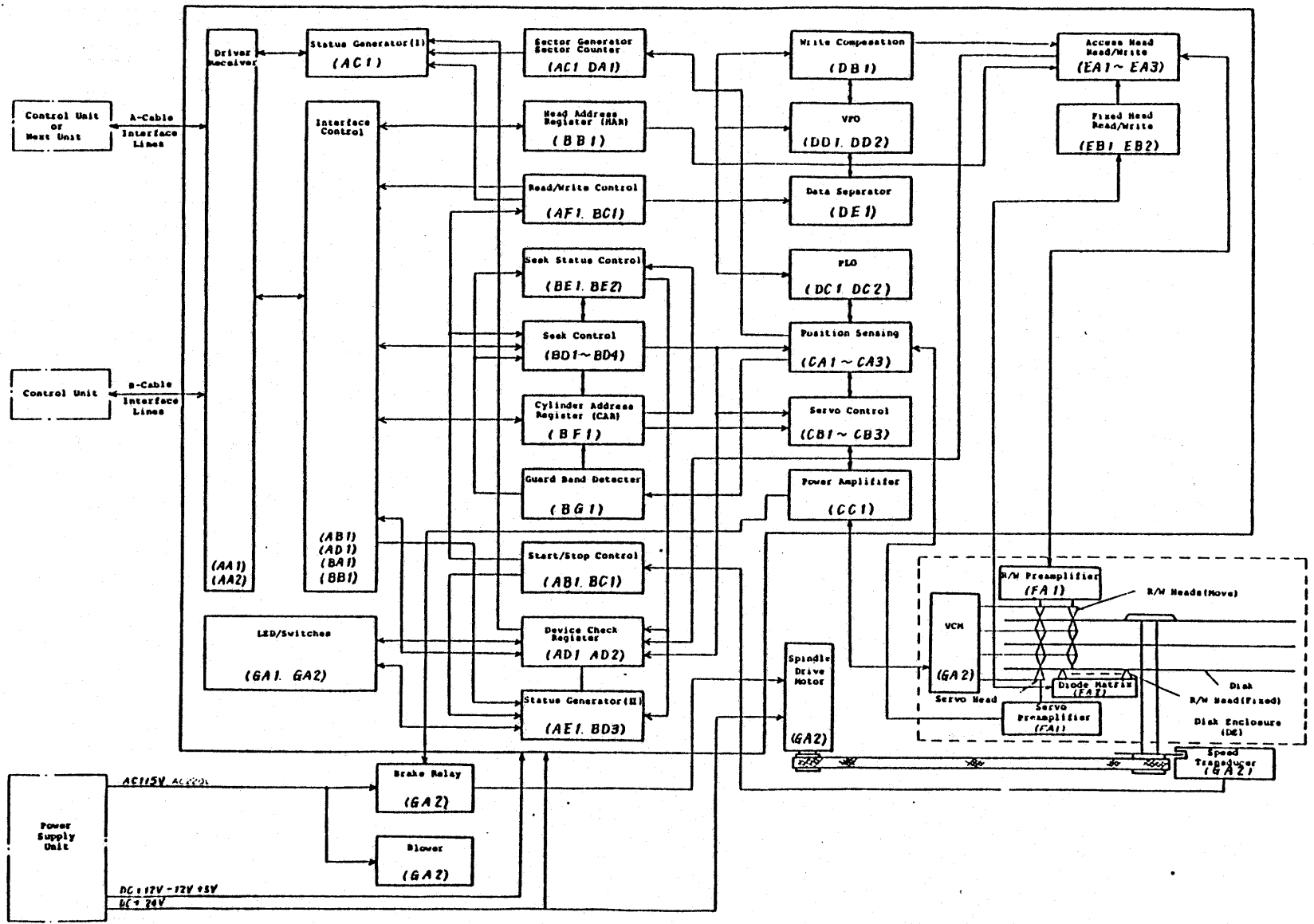
Actuator Arm Assembly

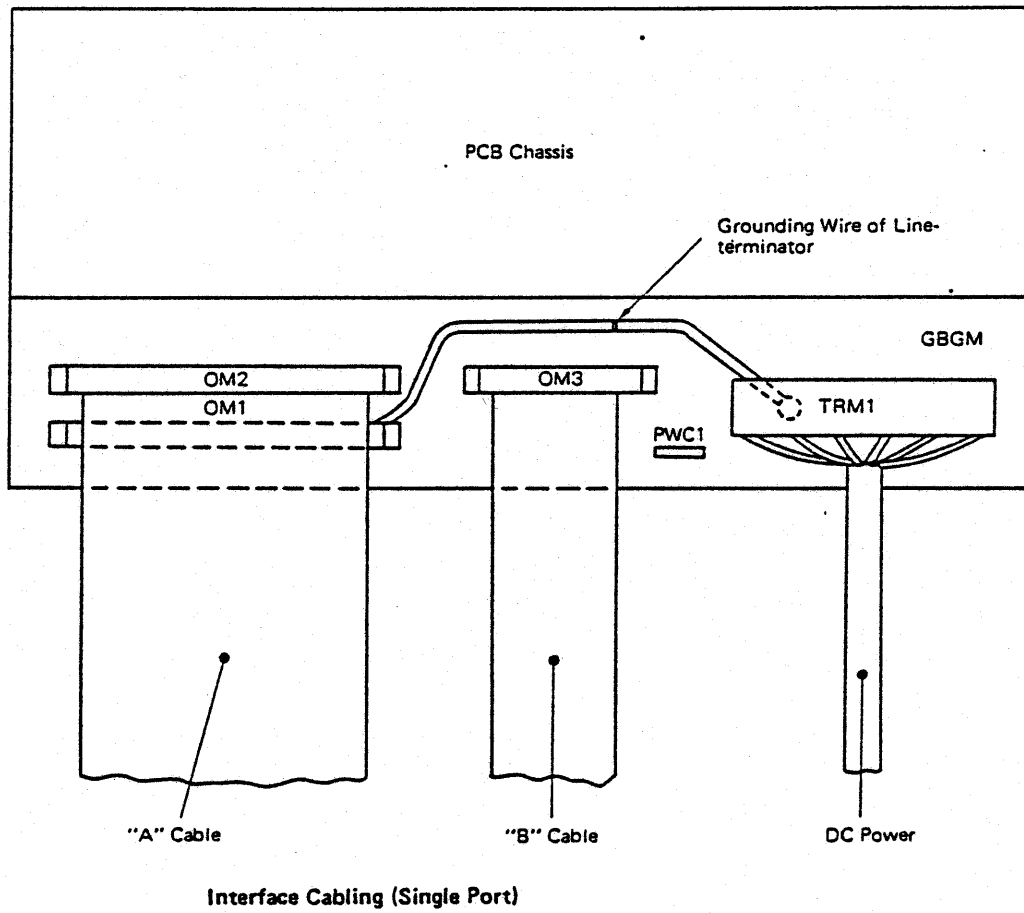


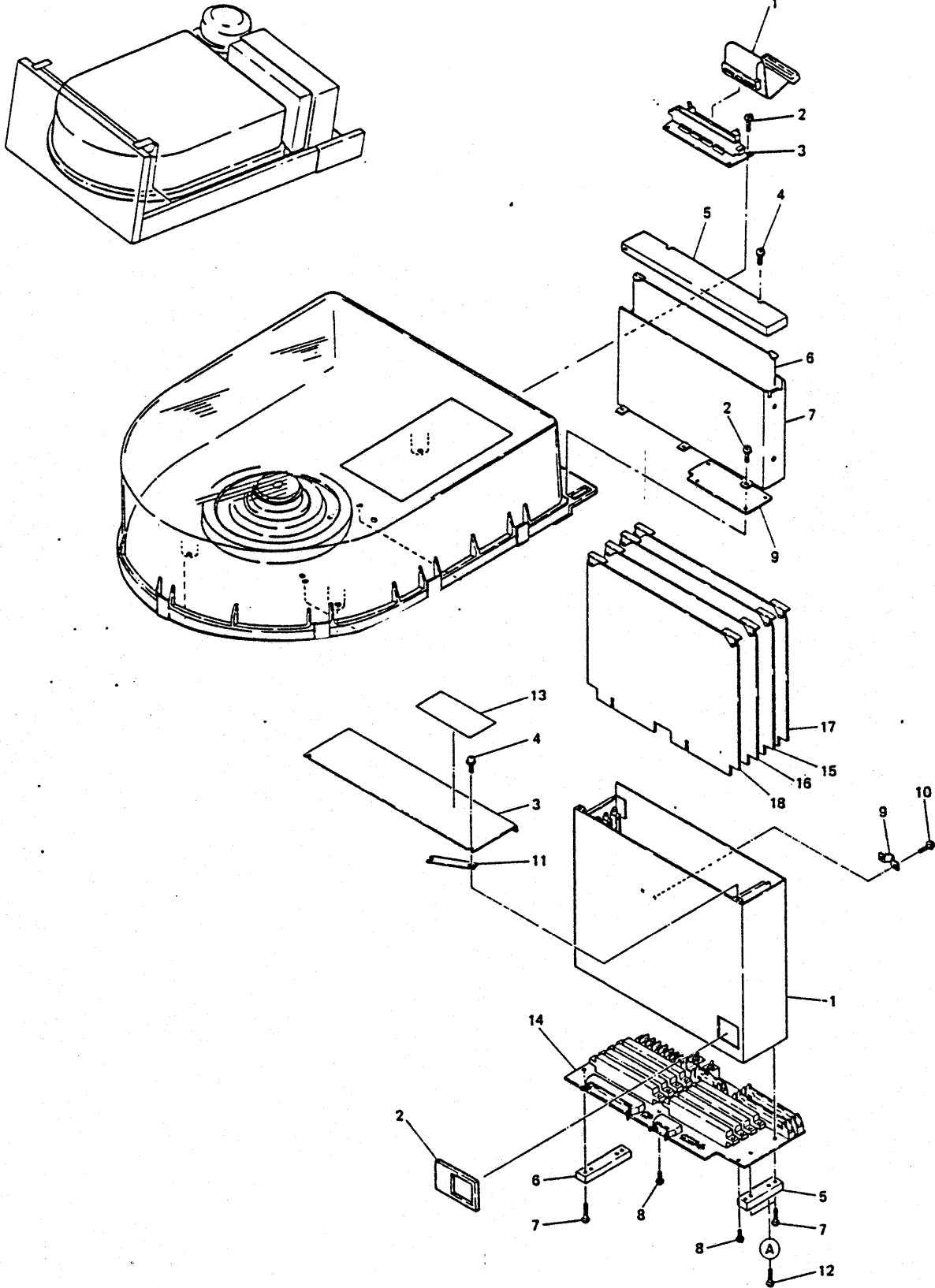
Data Write



Data Read







6.6 PCB ASSEMBLY REPLACEMENT/ADJUSTMENT

6.6.1 PCB Assembly Arrangement

The following Printed Circuit Board assemblies are mounted in the PCB chassis. To remove these PCB's, remove the top cover of the PCB chassis by loosening to screws, and then pull the levers on the PCB assemblies.

The PCB arrangement of the FDU M228X is shown in Table 6-6-1.

Table 6-6-1 PCB Arrangement

	M2282 M2280 M2283 M2284	M2286 M2289 M2287 M2288	Function
PCB Chassis	RQWM	RQVM	Read/Write Circuit
PCB Chassis	SDIM		Servo Circuit
	CMIM		Seek Control
	VOFM		PLO/VFO
	CQFM/CMKM		Interface Control

6.6 PCB ASSEMBLY REPLACEMENT/ADJUSTMENT

6.6.1 PCB Assembly Arrangement

The following Printed Circuit Board assemblies are mounted in the PCB chassis. To remove these PCB's, remove the top cover of the PCB chassis by loosening to screws, and then pull the levers on the PCB assemblies.

The PCB arrangement of the FDU M2294 is shown in Table 6.6.1.

Table 6.6.1 PCB Arrangement

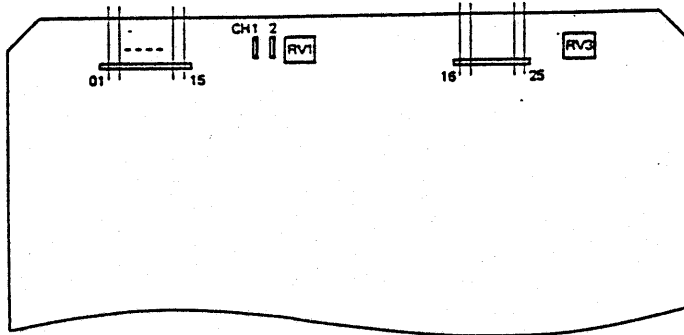
	M2294	Function
PCB Chassis	ROTM	Read/Write Circuit
PCB Chassis	SDQM	Servo Circuit
	CWWM	Seek Control
	VOHM	PLO/VFO
	CQFM	Interface Control

6.6.2 Test Point Arrangement on the PCB

Each PCB assembly is provided with test points and potentiometers to check and/or adjust the circuit functions.

(1) RQVM/RQWM PCB

The test points and potentiometers are located on the RQVM/RQWM PCB assembly as shown in Fig. 6-6-1.



Note: No Adjustments are required when the PCB is replaced.

Figure 6-6-1 RQVM/RQWM PCB Test Points

Table 6-6-2 RQVM/RQWM PCB Test Points

TP No.	Abbreviation	Signal Name	Schematic Page Code
1	*DIGLT	Diag Latch	EA1
2	Not Used	-	-
3	PLSH 1	Pulse Shaper 1	EA2
4	PLSH 2	Pulse Shaper 2	EA2
5	SMPCK	Sample Clock	EA2
6	RAWDT 1	Raw Data 1	EA2
7	RAWDT 2	Raw Data 2	EA2
8	INTLT 1	Integrator Latch 1	EA2
9	INTLT 2	Integrator Latch 2	EA2
10	DFROT 1	Differentiator Output 1	EA2
11	DFROT 2	Differentiator Output 2	EA2
12	AGCOT 1	AGC Output 1	EA2
13	AGCOT 2	AGC Output 2	EA2
14 (CH1)	PROT 1	Pre-Amp. Output 1	EA2
15 (CH2)	PROT 2	Pre-Amp. Output 2	EA2
16	MLTSL	Multi-Selected	EA3
17	PWRDY	Power Ready	EA3
18	AHWC A	AHD Write Current A	EA1
19	AHWC B	AHD Write Current B	EA1
20	*UNSF	Unsafe	EA1
21	Not Used	-	-
22	FHPRT	FHD Protect	EB1
23	FHWC A	FHD Write Current A	EB1
24	FHWC B	FHD Write Current B	EB1
25	*SQCHG	Squelch Gate	EA2

The RQVM/RQWM PCB assembly is provided with two/one potentiometers, however, no adjustments are required when the PCB is replaced. Each potentiometer function is shown in Table 6-6-3.

Table 6-6-3 RQVM/RQWM Potentiometer Function

Pot No.	Function/Adjustment	Reference TP
RV1	Access Head Write Current	TP18/TP19
*RV3	Fixed Head Write Current	TP22/TP23/TP24

* This potentiometer is for only, RQVM, however, is not adjustable in field.

(2) SDIM PCB

The test points, potentiometers, and switches are located on SDIM PCB assembly as shown in Fig. 6-6-2.

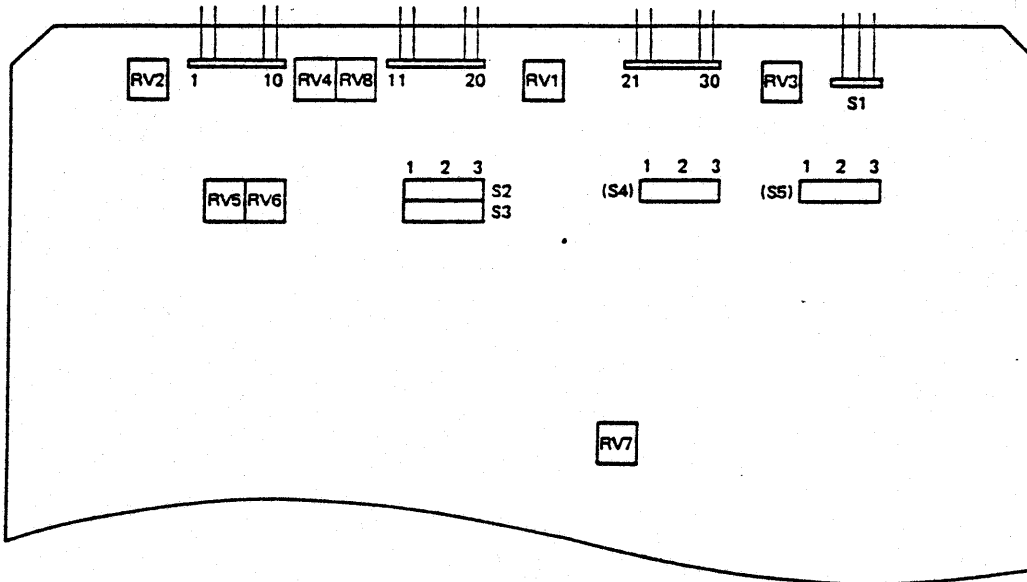


Figure 6-6-2 SDIM PCB Test Points

Each test point function is shown in Table 6-6-4.

Table 6-6-4 SDIM PCB Test Points

TP No.	Abbreviation	Signal Name	Schematic Page Code
1	SERVO	Servo Signal	CA1
2	*ODG	Odd Gate	CA3
3	*EVG	Even Gate	CA3
4	AGC	AGC Control	CA1
5	ODP	Odd Peak	CA3
6	EVP	Even Peak	CA3
7	+POS	Position Signal	CA3
8	VCX1	Control Voltage 1	CA2
9	Not Used	-	-
10	SVPWD	Servo Pulse Window	CA1
11	SVSLT	Servo Slice Out	CA1
12	SVPL	Servo Pulse	CA1
13	PLOSS	PLO Single Shot	CA1
14	PLOLT	PLO Latch	CA2
15	1/8 F	1/8 Frequency	CA2
16	EIX	Even Index	CA2
17	TRFL	Track Follow	CB1
18	TXPL	Track Crossing Pulse	CB1
19	DRLM	Drive Linear Motor	CB1
20	FWDD	Forward Drive	CB1
21	CMAG	Current Magnitude	CB2

Table 6-6-4 SDIM PCB Test Points (Continued)

TP No.	Abbreviation	Signal Name	Schematic Page Code
22	PER	Position Error	C82
23	FUNC	Function	C83
24	VEL	Velocity	C82
25	SMTH	Smoother	C82
26	DA	DA Convertor	C83
27	TVEL	Tach Velocity	C82
28	-CSNS	Current Sense	CC1
29	VER	Velocity Error	C83
30	PADR	Power Amp Drive	C83

The SDIM PCB is provided with eight potentiometers and five selecting switches, however, only the three potentiometers (RV1, RV2 and RV4) must be adjusted when the PCB is replaced.

The potentiometer and switch functions are shown in Table 6-6-5 and 6-6-6.

Table 6-6-5 SDIM Potentiometer Function

Pot No.	Function/Adjustment	Reference TP/S
RV1	Positioning Time*	TP19
RV2	Position Signal Gain*	TP7
RV3	Function Offset	TP23
RV4	Over-shoot*	TP24
RV5	PLO Free Frequency	TP15, S2, S3
RV6	PLO Phase	TP13
RV7	DA Output	TP26
RV8	Servo Pulse Window	TP10

* The potentiometer RV1, RV2 and RV4 require adjustment when the SDIM PCB is replaced.

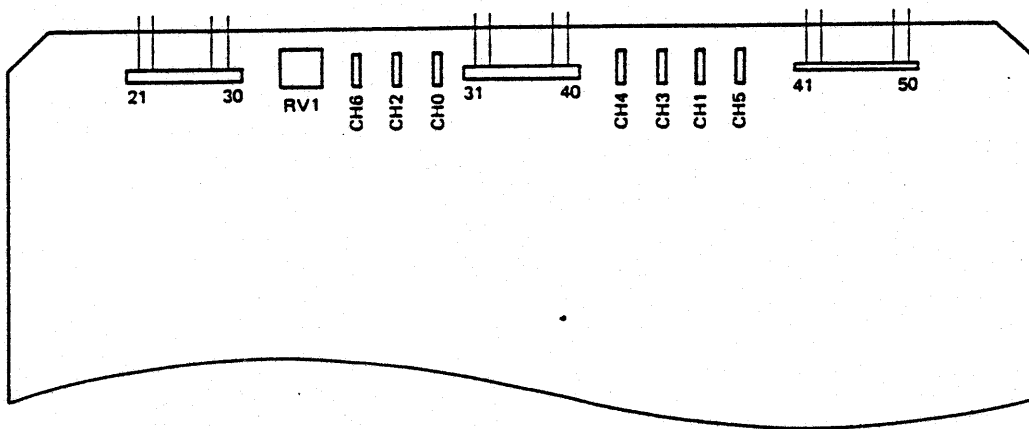
Table 6-6-6 SDIM Switch Function

Switch No.	Function	Reference TP
S1	Power Amp. Drive Cut	None
S2, S3	VCO Select	TP15

Note: S4 and S5 functions are not used.

(3) CMIM PCB

The test points, check terminals and a potentiometer are located on CMIM PCB assembly as shown in Fig. 6-6-3.



Note: No adjustments are required when the CMIM PCB assembly is replaced.

Figure 6-6-3 CMIM PCB Test Points

Each test point function is shown in Table 6-6-7 and 6-6-8.

Table 6-6-7 CMIM Check Terminals

CH No.	Abbreviation	Signal Name	Schematic Page Code
0	GND	Ground	-
1	VFOFS	VFO Fast Sync	BE1
2	STL 1	Settling 1	BE1
3	STL 2	Settling 2	BE1
4	STL 3	Settling 3	BE1
5	OVCYTM	Over Cylinder Timer	BE2
6	GBTM	Guard Band Timer	BE2

Table 6-6-8 CMIM Test Points

TP No.	Abbreviation	Signal Name	Schematic Page Code
21	GND	-	-
22	OGB	Outer Guard Band	8G1
23	IGB 1	Inner Guard Band 1	8G1
24	IGB 2	Inner Guard Band 2	8G1
25	-	-	-
26	SKEND	Seek End	8E2
27	ONCYL	On Cylinder	8E2
28	URDY	Unit Ready	8E2
29	SKERR	Seek Error	8E2
30	SKC	Seek Complete	8E1
31	GND	-	-
32	SUBEN	Sub Enable	8D4
33	EVEN	Even	8D4
34	PSDR	Position Drive	8D4
35	LNMD	Linear Mode	8D4
36	-	-	-

Table 6-6-8 CMIM Test Points (Continued)

TP No.	Abbreviation	Signal Name	Schematic Page Code
37	DRLM	Drive Linear Motor	8D4
38	LSPD	Low Speed	8D4
39	FWDD	Forward Drive	8D3
40	*OVTXPL	Over Track Crossing	8D2
41	GND	-	-
42	TMOTP	Time Out Pulse	8D2
43	RTRM	Retract Mode	8D1
44	SEKM	Seek Mode	8D1
45	GTZM	Go To Zero Mode	8D1
46	*PLO 1B	PLO 1 Byte Clock	8D1
47	-	-	-
48	*OFACT	Offset Active	8B1
49	AHDSL	Access Head Select	8B1
50	USLD	Unit Selected	8B1

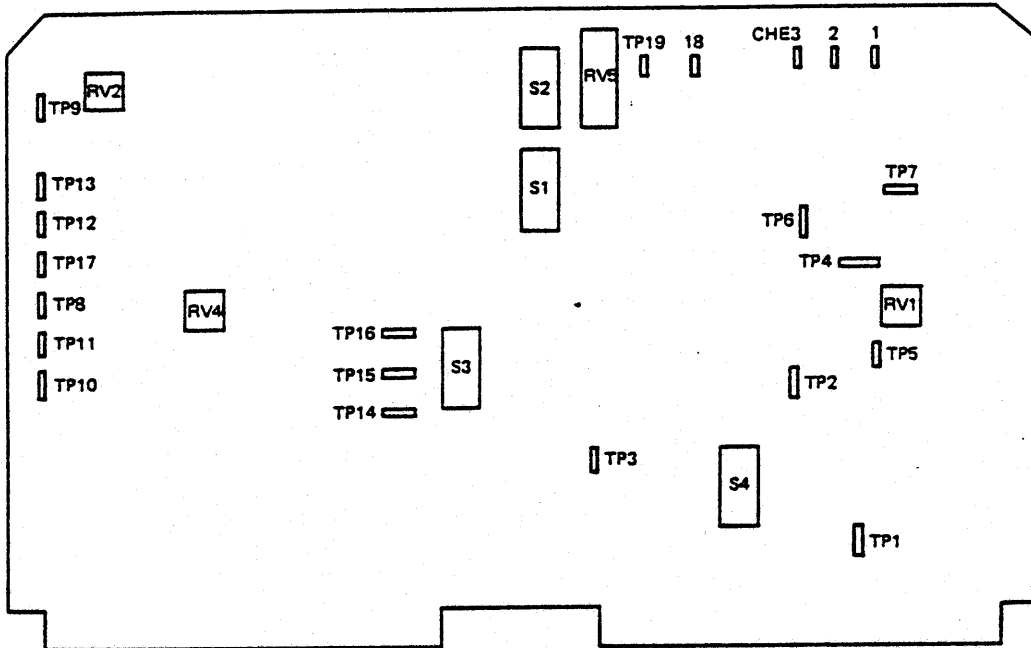
The CMIM PCB is provided with a potentiometer (RV 1), however, no adjustment is required when the PCB is replaced. The potentiometer function is shown in Table 6-6-9.

Table 6-6-9 CMIM Potentiometer Function

Pot No.	Function/Adjustment	Reference CH
RV 1	Settling Time 1	CH2

(4) VOFM PCB

The check terminals, switches, and potentiometers are located on the VOFM PCB assembly as shown in Fig. 6-6-4.



Note: S1 and S2 must be selected when the PCB is replaced.

Figure 6-6-4 VOFM PCB Test Points

Each test point function is shown in Table 6-6-10.

Table 6-6-10 VOFM Check Terminals

TP No.	Abbreviation	Signal Name	Schematic Page Code
1	VFOSS	VFO Single Shot	DD1
2	VFODIF	VFO Difference	DD1
3	TROT	Trigger Data	DD1
4	VC VFO	Control Voltage VFO	DD2
5	VCOT	VCO Output	DD2
6	FLCNT	Filter Control	DD2
7	FLTSQH	Filter Squelch	DD2
8	PLOSS1	PLO Single Shot 1	DC1
9	*1/16 FP	1/16 F Pulse	DC1
10	DLTP	Delta Positive	DC2
11	DLTN	Delta Negative	DC2
12	FLTOT	Filtered Out	DC2
13	VC PLO	Control Voltage PLO	DC2
14	2F EY	2F Early	DB1
15	2F OT	2F Ontime	DB1
16	2F LT	2F Late	DB1
17	PLOSS 2	PLO Single Shot 2	DC1
18	SCT	Sector	DA1
19	INX	Index	DA1

Table 6-6-10 VOFM Check Terminals (Continued)

No.	Abbreviation	Signal Name	Schematic Page Code
CHE 1	DTSMP	Data Sample	DE1
CHE 2	DTWD	Data Window	DE1
CHE 3	VC VFO	Control Voltage VFO	DD2

The VOFM PCB assembly is provided with potentiometers and switches, however, no adjustments except SW1 and SW2 are required when the PCB is replaced. These functions are shown in Table 6-6-11.

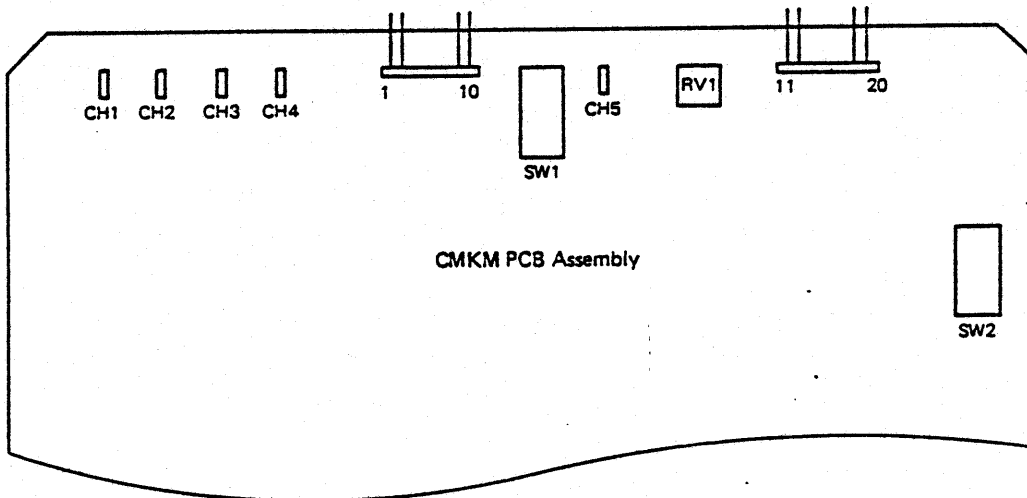
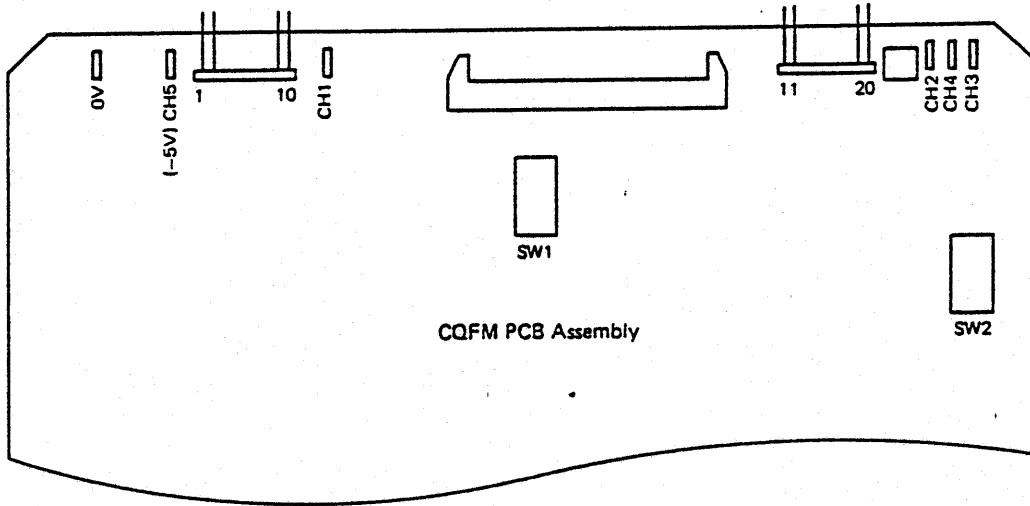
Table 6-6-11 VOFM Potentiometer/Switch Function

No.	Function/Adjustment	Reference TP
RV1	VFO Frequency	TP4
RV2	PLO Frequency	TP13
RV4	PLO SS2	TP17
RV5	Time Margin Measurement	CHE1/CHE2
S1	Sector Counting 1	TP18/TP19
S2	Sector Counting 2	TP18/TP19
S3	VFO Single Shot	TP1
S4	Write Compensation	TP14/TP15/TP16

(5) CQFM/CMKM PCB

CQFM PCB assembly is for an interface control logic to support dual port or single port function, and CMKM PCB assembly is only to support single port function.

The test points and potentiometers are located on the CQFM/CMKM PCB assembly are shown in Figure 6-6-5. Each test point function is shown in Table 6-6-12.



Note: No potentiometer adjustment is required when the PCB is replaced, however, the switch selecting should be performed to meet the customer's configuration.

Figure 6-6-5 CQFM/CMKM PCB Test Points

Table 6-6-12 CQFM/CMKM Test Points

No.	Abbreviation	Signal Name	Schematic Page Code
TP1	GND	-	-
TP2	LPLO	Lock to PLO	AF1
TP3	LDATA	Lock to Data	AF1
TP4	AMFD	AM Found	AF1
TP5	RG	Read Gate	AF1
TP6	PWRCNF	Power Conflict	AD2
TP7	VCMHT	VCM Heat	AD2
TP8	-	-	-
TP9	INTMOT	Initial Time Out	AD2
TP10	DVCK	Device Check	AD2
TP11	GND	-	-
TP12	WENB	Write Enable	AD2
TP13	AHDSL	Access Head Select	AD1
TP14	INX	Index	AC1
TP15	SCT	Sector	AC1
TP16	START	Start	AB1
TP17	GBENB	Guard Band Enable	AB1
TP18	SPOK	Speed OK	AB1
TP19	-	-	-
TP20	CHAENB/ CHENB 2	Channel A Enable/ Channel Enable 2	AB1
CH1	SPSG	Speed Signal	AB1
CH2	SPTM	Speed Timer	AB1
CH3	INHECH	Inhibit Echo	AD2
CH4	DLWG	Delayed Write Gate	AD2
CH5	-5V	-5V	AA3/AA2

The CQFM/CMKM PCB is provided with a potentiometer (RV1) and switches. These functions are shown in Table 6-6-13.

Table 6-6-13 CQFM/CMKM Potentiometer/Switch Function

No.	Function	Reference CH
RV1	Speed Timer	CH2
SW1	Disk Address	
SW2	Device Type/Sector Mode/TAG 4/5	

2.3.2 PCB Chassis

The unit contains a PCB chassis with Maintenance Aid Display (LED's), a Device Check Clear switch and File-protect switch.

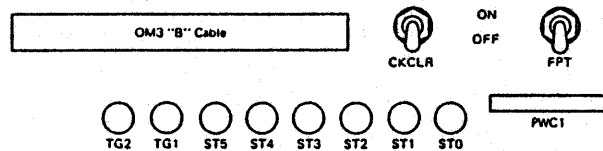


Figure 2-3-2 Maintenance Aid Display and Switches

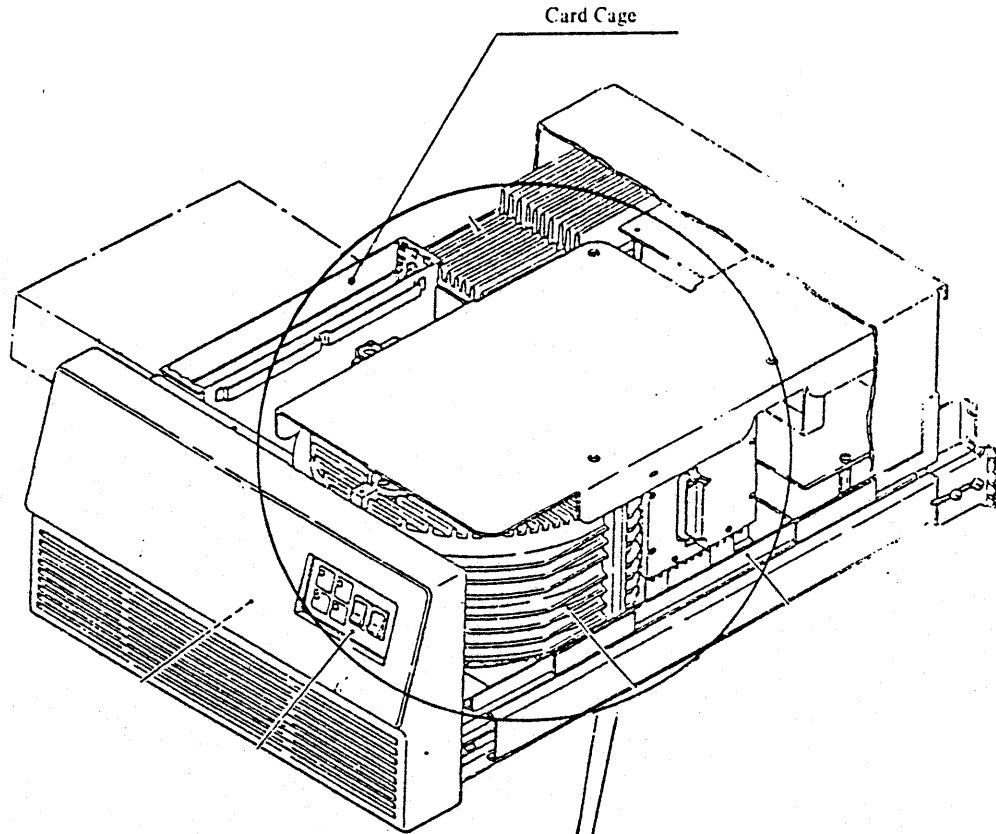
- (1) CKCLR (Check Clear) switch: (momentary)
This switch resets a Device Check status.
- (2) FPT (File Protect) switch
This switch inhibits the write operation. When an optional operator panel is installed on the unit, this switch should be in the OFF position.
- (3) TG1, 2 (Status Tag 1, 2) LED's: Red
Two LED's indicate four basic disk conditions in binary coded decimal, which are Not-Ready status, Device-Check status, Unit status and Seek-Check status.
- (4) ST0 to ST5 (Status 0 to 5) LED's: Red
Six status conditions are displayed for each Status Tag 1 and 2 combination as shown in Table 2-3-1.

Table 2-3-1 Maintenance Aid Display Conditions

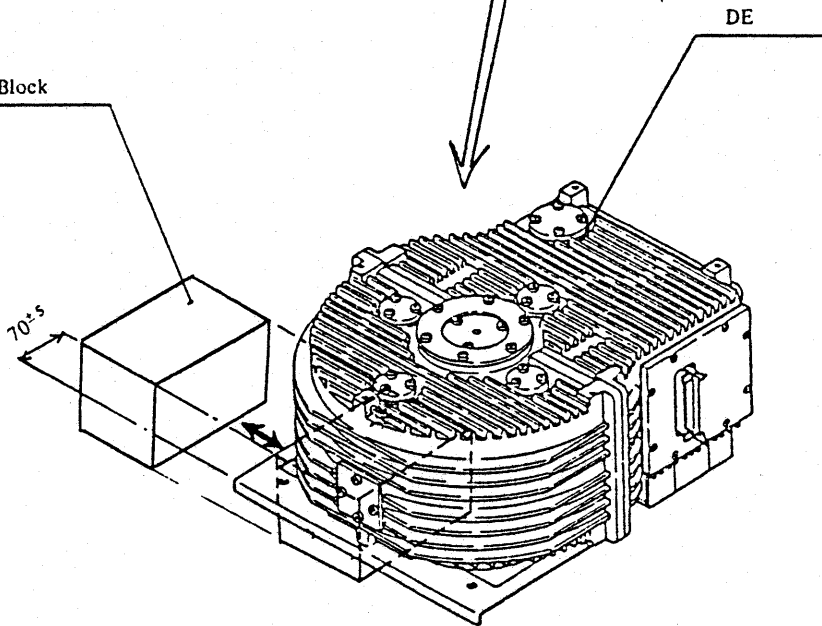
TG	Tag Decode 0	Tag Decode 1	Tag Decode 2	Tag Decode 3
ST	Not Ready	Device Check	Unit Status	Seek Check
0	Power Ready	Control Check 1	Unit Selected	RTZ or Seek Timeout
1	Channel Ready	Control Check 2	Fixed Sector Mode	Seek Guard Band
2	Speed OK	Read/Write Check 1	On Cylinder	Linear Mode Guard Band
3	Start 1 (GBENB)	Read/Write Check 2	File Protected	RTZ Outer Guard Band
4	Start 2	Read/Write Check 3	Busy	Over Track Crossing Pulse
5	Initial Seek Timeout	Read/Write Check 4	Access Head Selected	Illegal Cylinder

- (1) Not Ready Status
 - (a) Power Ready
Indicates that +5V, ±12V DC power is up to nominal voltage.
 - (b) Channel Ready
Indicates the Channel Ready signal is true.

- (c) Speed OK
Indicates that the rotational speed is up to 2,370 RPM (80%).
 - (d) Start 1
Indicates that the Start Counter has output the GBENB (Guard Band Enable) signal.
 - (e) Start 2
Indicates that the Start Counter has output the STARTP (Start Pulse) to initiate the Initial Seek sequence.
 - (f) Initial Seek Time Out
Indicates that the Initial Seek sequence was not accomplished within 640 ms after the STARTP signal.
- (2) Device Check Status
 - (a) Control Check 1
Indicates that a read/write instruction was issued during Busy Status.
 - (b) Control Check 2
Indicates that Write Gate was issued during a fault condition.
 - (c) Read/Write Check 1
Indicates that Write Gate was issued during an off-track status or VCM-overheating has occurred.
 - (d) Read/Write Check 2
Indicates that write current to the data head did not flow during a write operation or that write current flows without a write gate command.
 - (e) Read/Write Check 3
Indicates that Write Gate was issued during file-protected status.
 - (f) Read/Write Check 4
Indicates that Read or Write Gate was issued during a multi-head-selected condition.
 - (3) Unit Status
 - (a) Unit Selected
Indicates that the unit is selected.
 - (b) Fixed Sector Mode
Indicates the fixed sector mode is selected.
 - (c) On Cylinder
Indicates On Cylinder status.
 - (d) File Protected
Indicates Write-protected status.
 - (e) Busy
Indicates that the heads are in motion.
 - (f) Access Head Selected
Indicates that an access head is selected
 - (4) Seek Check Status
 - (a) RTZ Time Out
Indicates that an RTZ sequence was not terminated within 640 ms.
 - (b) Seek Guard Band
Indicates that a Guard Band was detected during a direct seek operation.
 - (c) Linear Mode Guard Band
Indicates that a guard band was detected during a linear mode operation.
 - (d) RTZ Outer Guard Band
Indicates that an outer guard band was detected during an RTZ operation.
 - (e) Over Track Crossing Pulse
Indicates that the head overshot the new cylinder address during settling time (2.5ms).
 - (f) Over Cylinder
Indicates that an illegal cylinder address (923 < CYL < 895) was specified by the control unit.



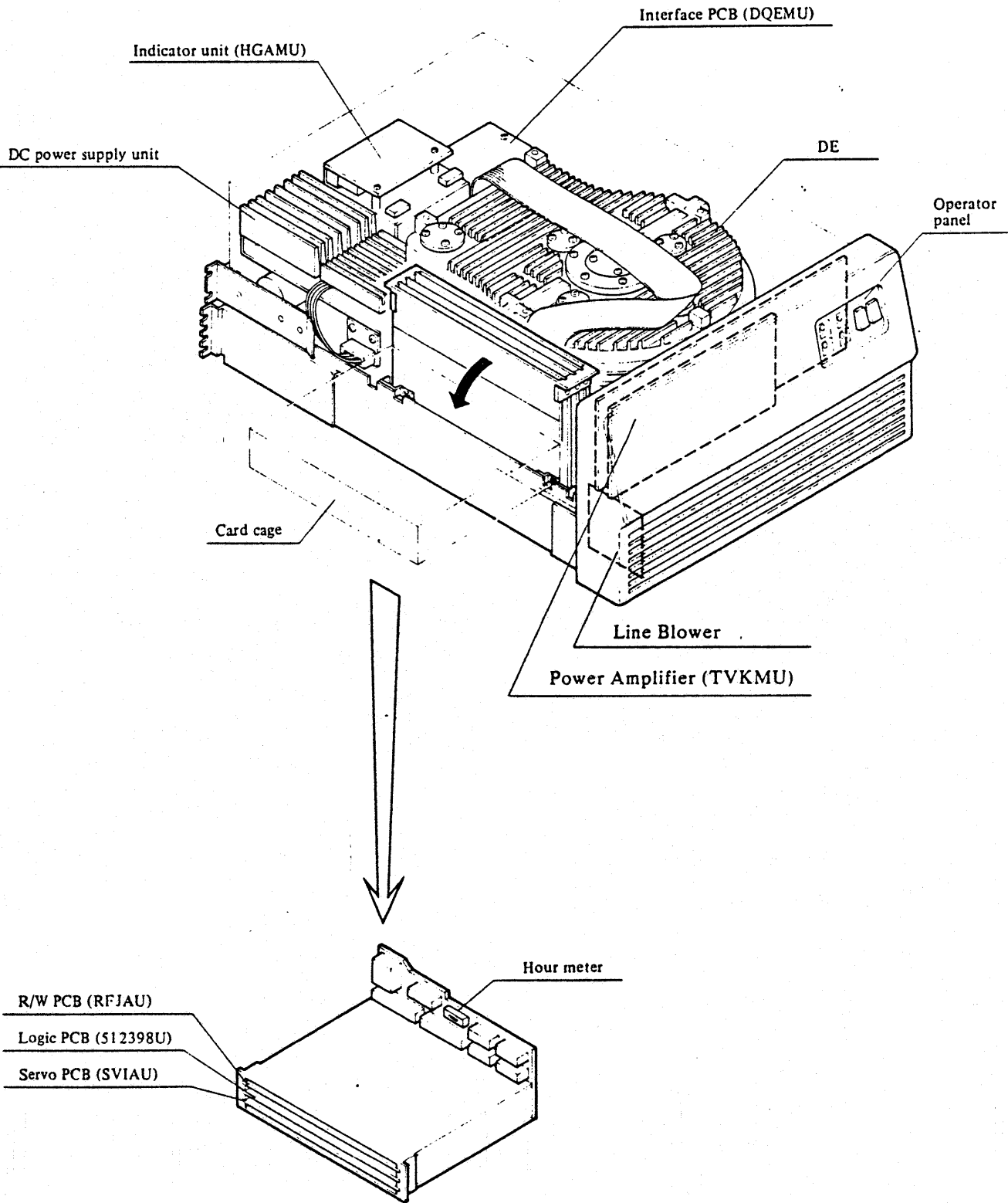
Vibration Preventive Block

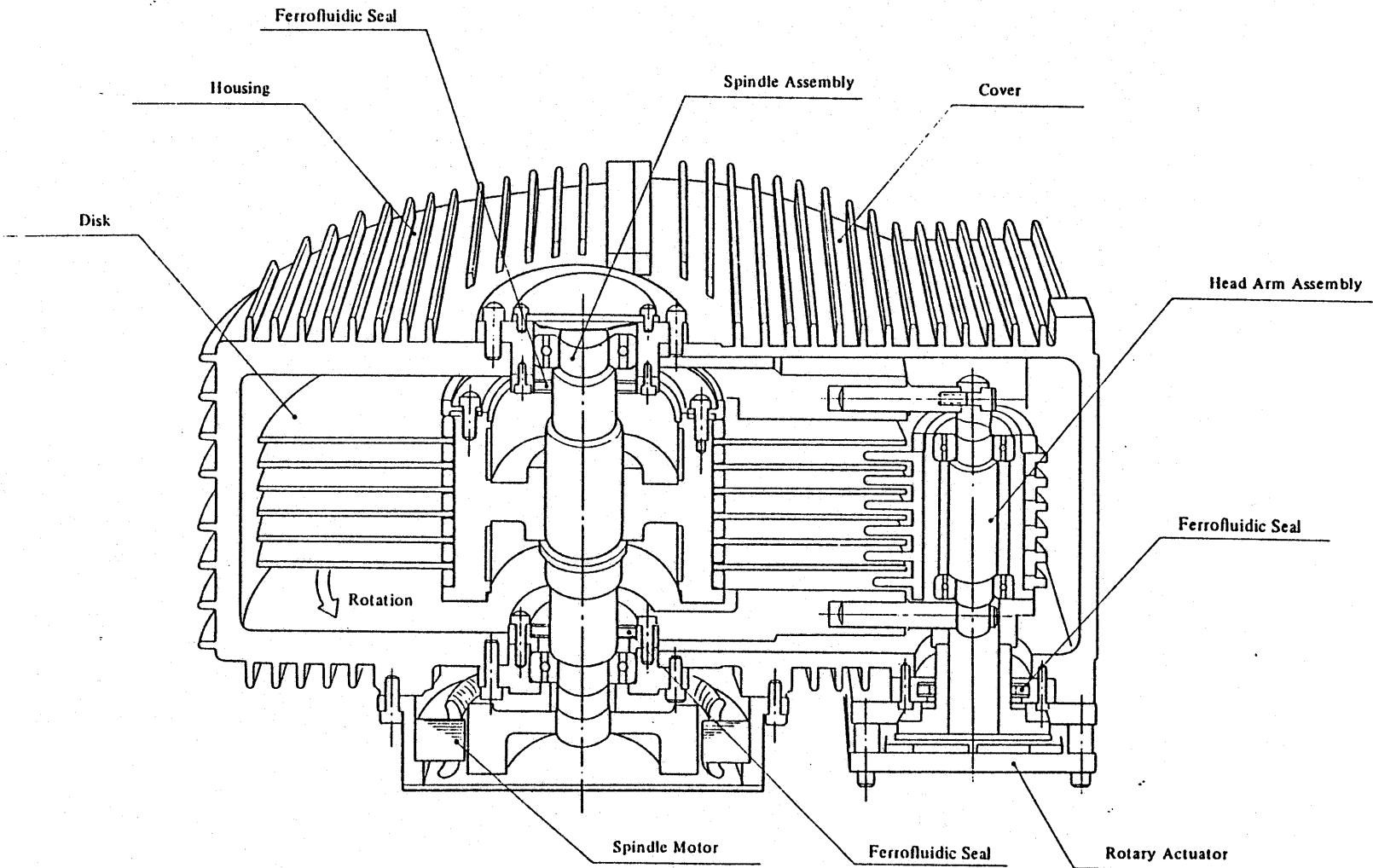


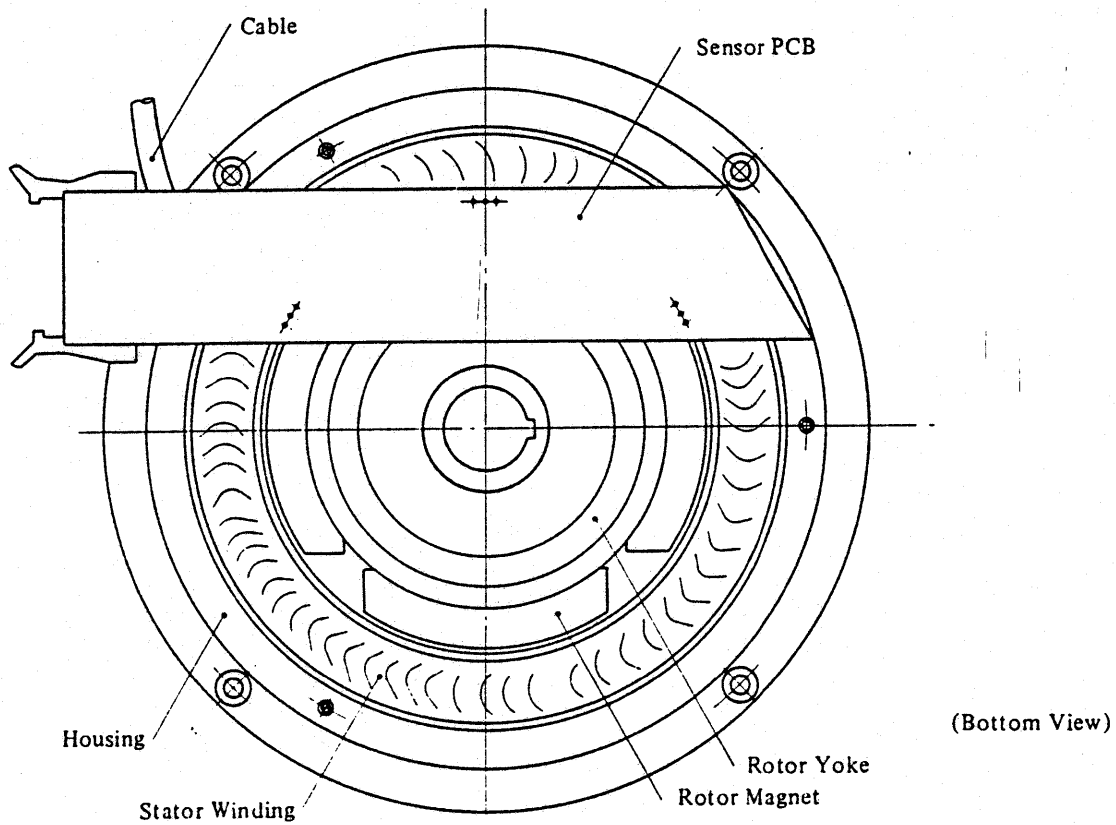
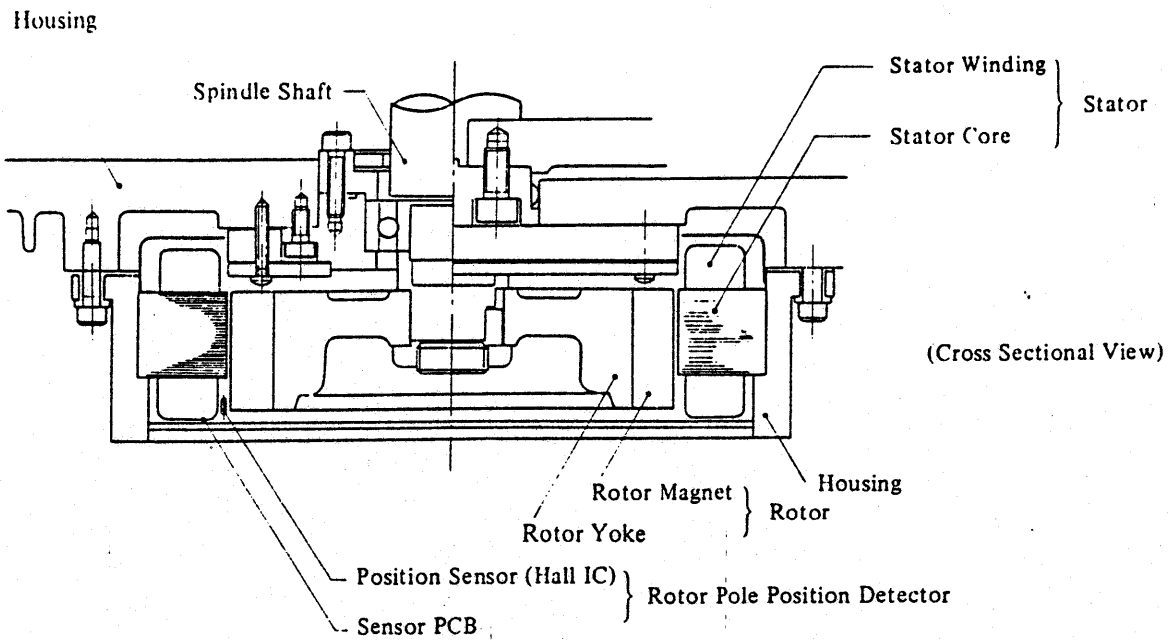
FUJITSU MODEL M2351

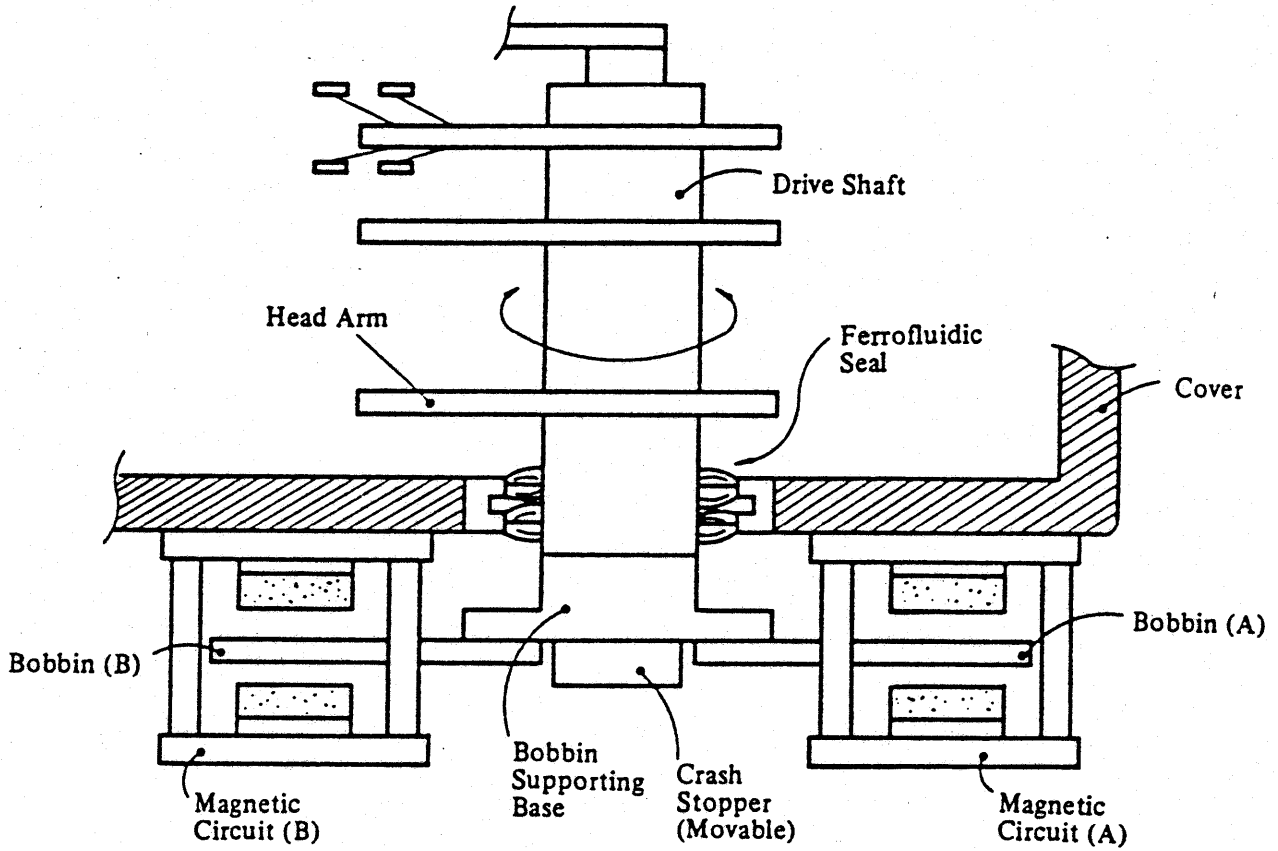
Specifications

Capacity	/Drive (MB)	474.2 (Unformatted)
	/Track (KB)	28.160 (Unformatted)
Configuration of Disks and Heads		<p>Fixed heads</p> <p>6 5 4 3 2 1</p> <p>19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0</p> <p>Data heads Servo head</p>
Fixed Head (M2351AF Only)	Tracks	60 (3 Cylinders)
	Capacity (MB)	1.69 (Unformatted)
Rotational Speed (RPM)		3,961
Latency (ms)		7.5
Disk	Diameter (Inch)	10.5
	Number	6
Heads	/Drive	20 + 1 (Servo)
	/Surface	2
Cylinders		842
Data Transfer Rate (MB/sec)		1.859
Positioning Time (ms)	Maximum	35
	Average	18
	Minimum	5
Track Density (TPI)		880
Bit Density (BPI)		12,800
Data Coding	on interface	NRZ
	on disk surface	MFM

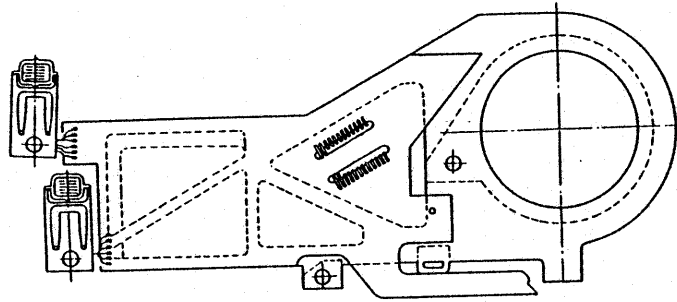




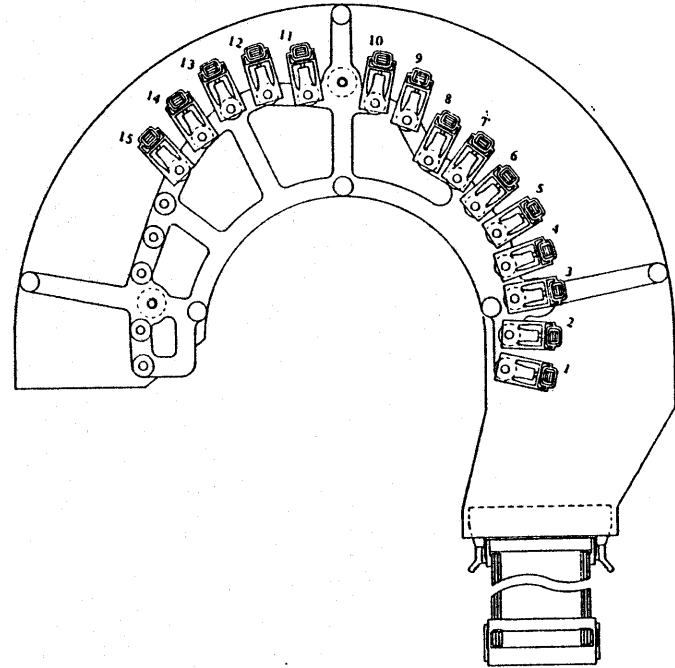




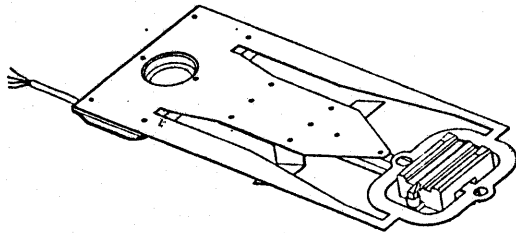
Construction of the Actuator



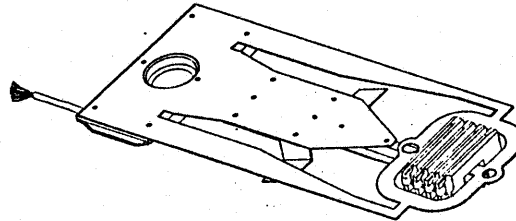
Moving Head Arm Assembly



Fixed Head Block



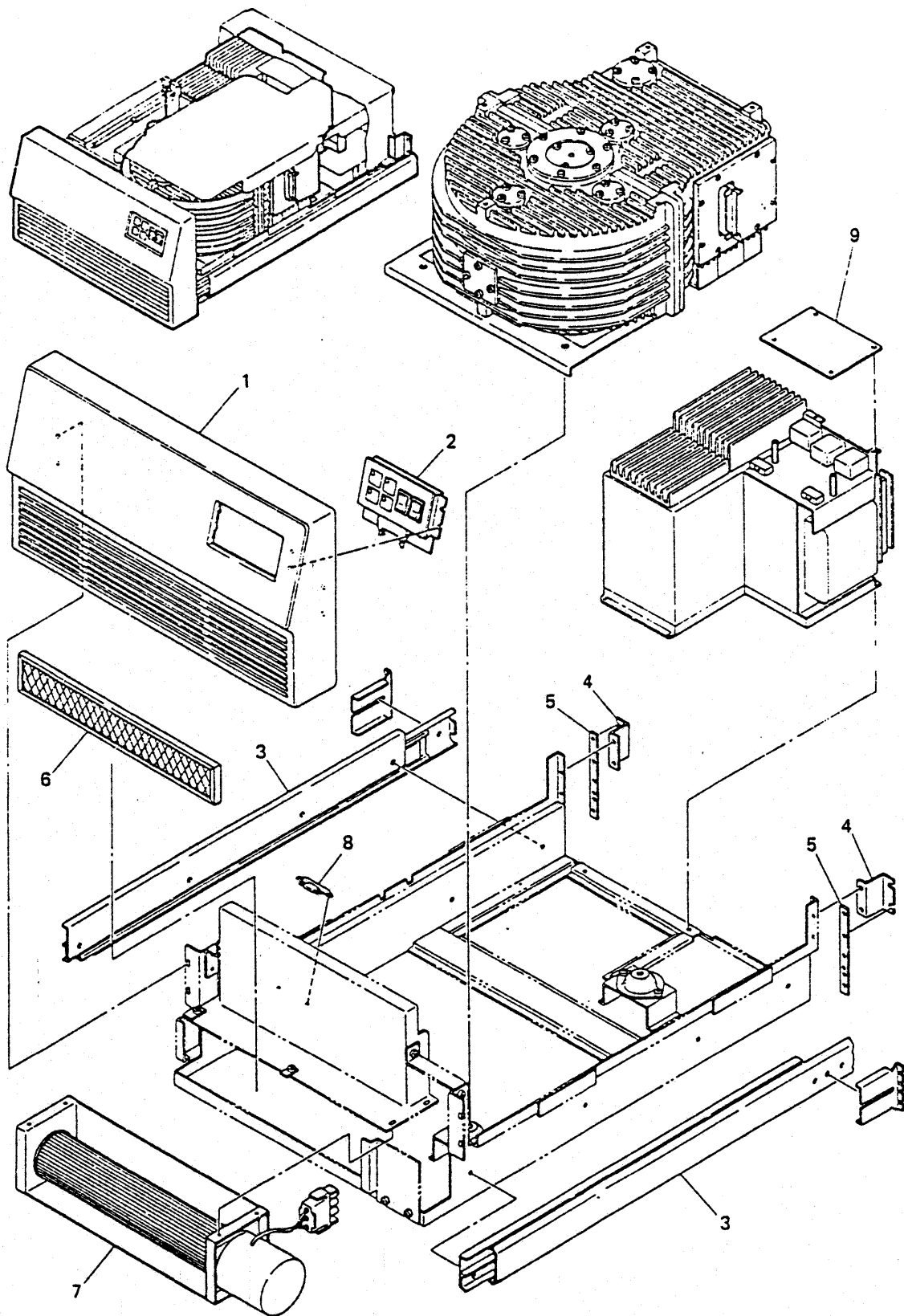
Moving Head

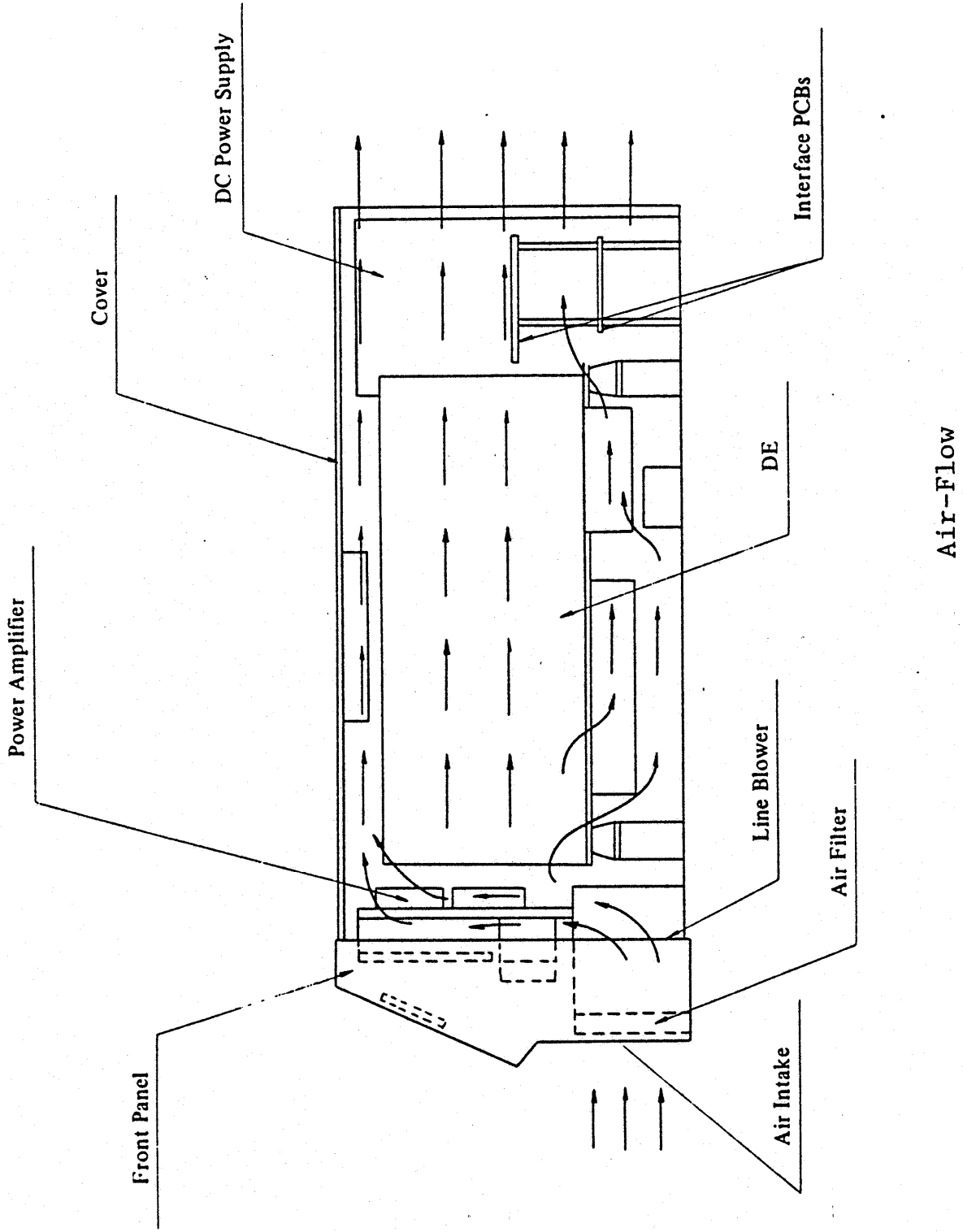


Fixed Head

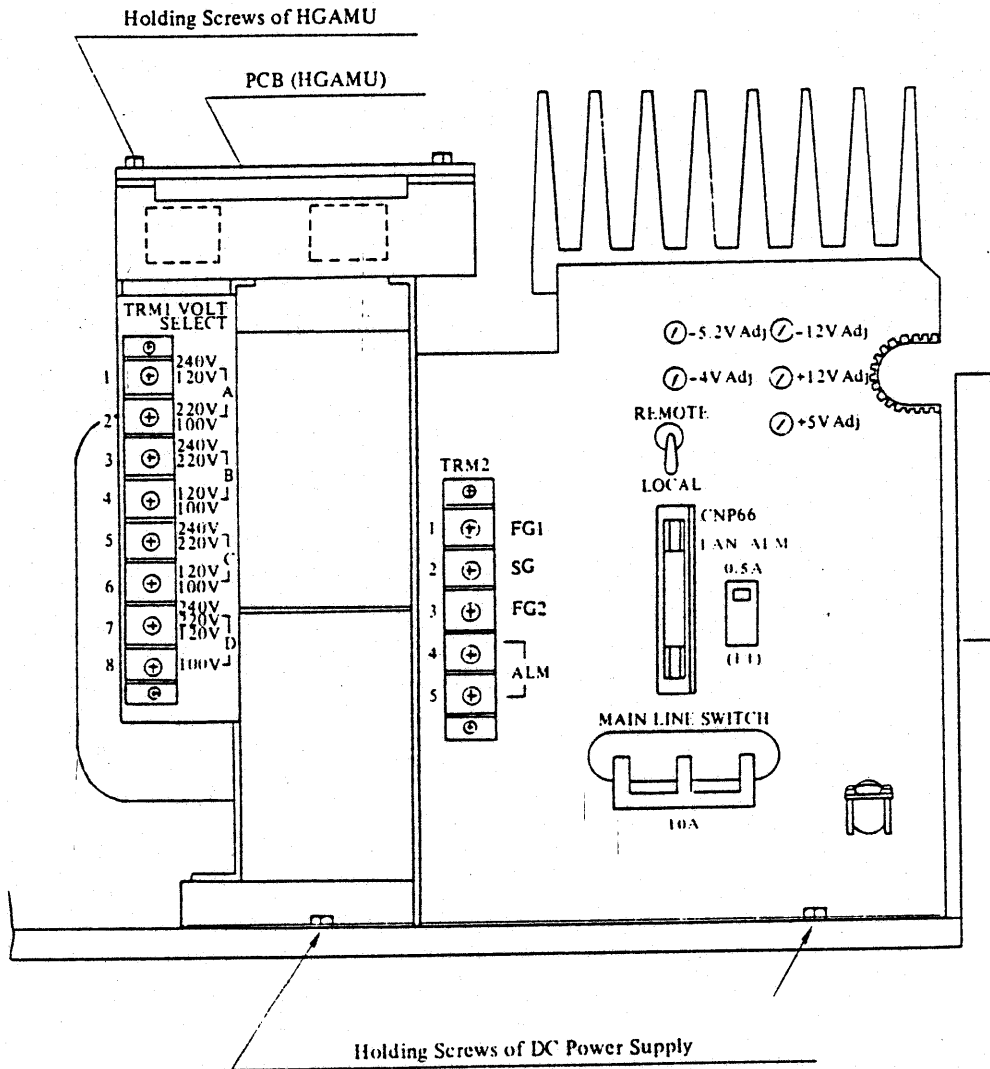
Slider No. Vs. Cylinder/Head Address

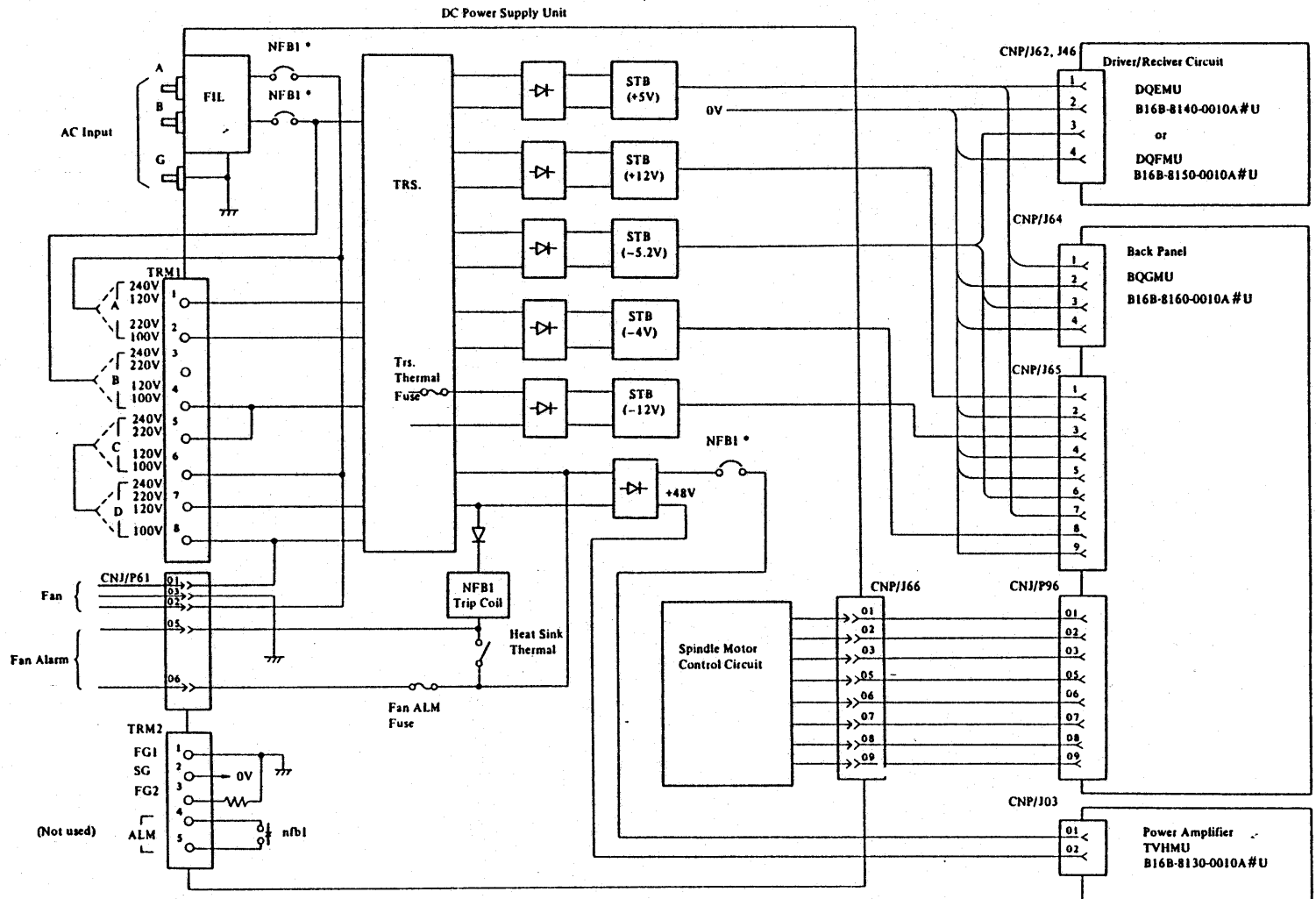
Slider No.	Address		Slider No.	Address		Slider No.	Address	
	CYL	HD		CYL	HD		CYL	HD
1	897	08 ~ 11	6	896	08 ~ 11	11	898	00 ~ 03
2	897	04 ~ 07	7	896	12 ~ 15	12	898	04 ~ 07
3	897	00 ~ 03	8	896	16 ~ 19	13	898	08 ~ 11
4	896	00 ~ 03	9	897	12 ~ 15	14	898	12 ~ 15
5	896	04 ~ 07	10	897	16 ~ 19	15	898	16 ~ 19



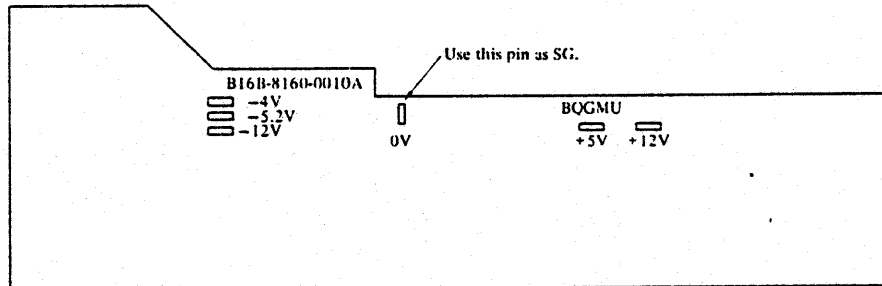
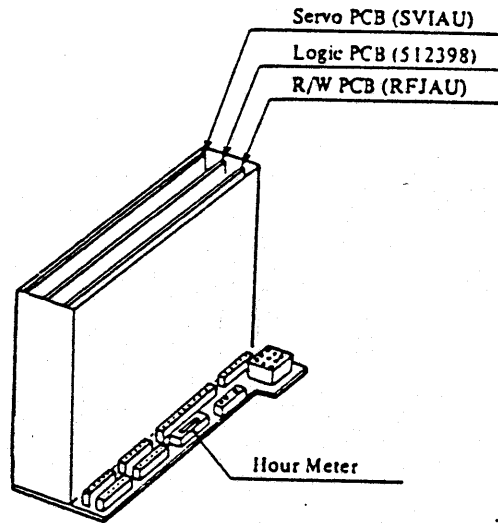


Air-Flow





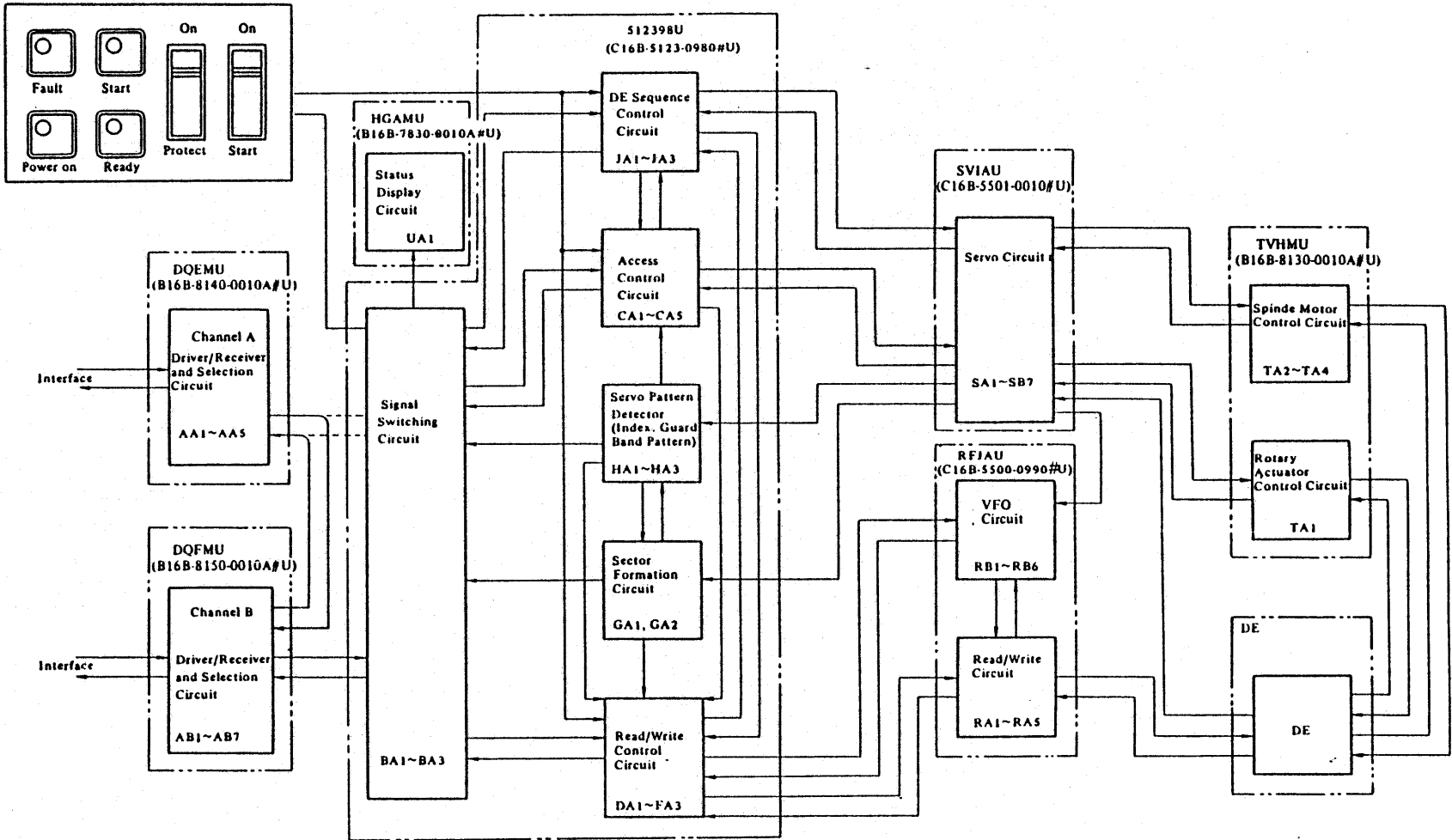
Functional Block Diagram of the DC Power Supply Unit



Top View of Back Panel

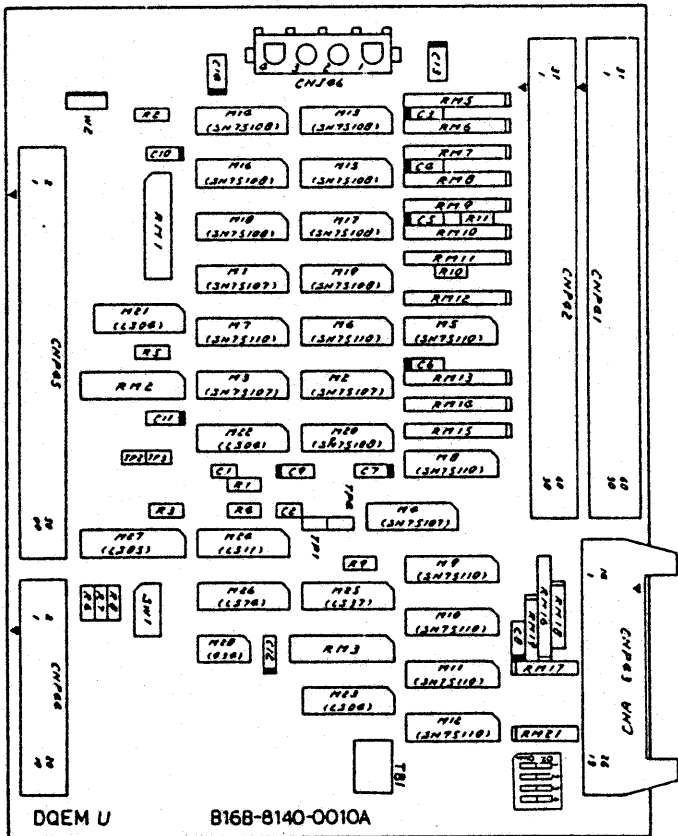
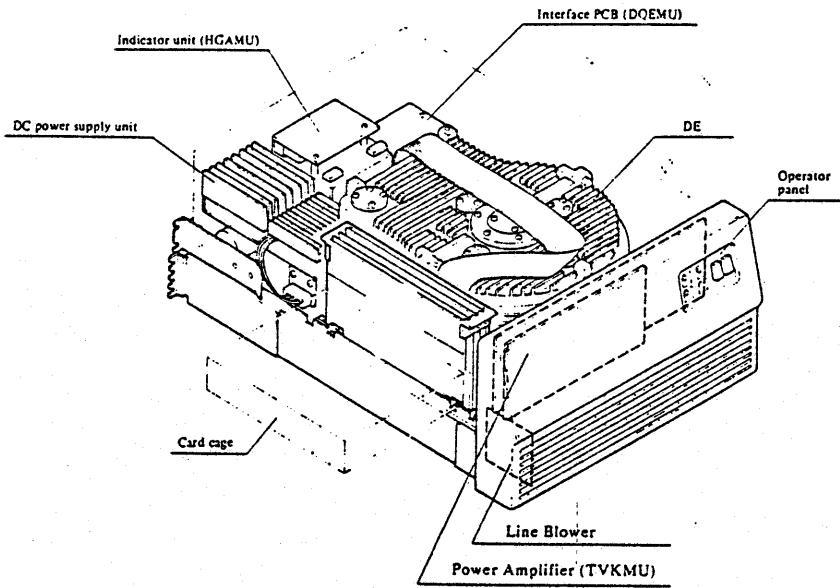
Acceptable Range of DC Voltages

DC Voltage	Acceptable Range
+12 V	11.4 ~ 12.6 V
+5 V	4.75 ~ 5.25 V
-4 V	-3.8 ~ -4.2 V
-5.2 V	-4.94 ~ -5.46 V
-12 V	-11.4 ~ -12.6 V



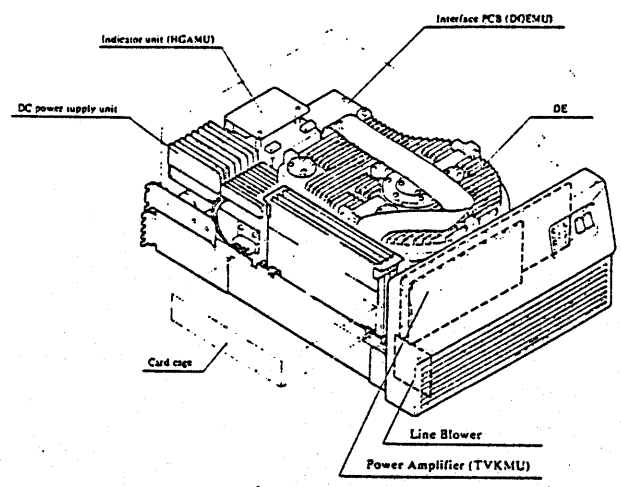
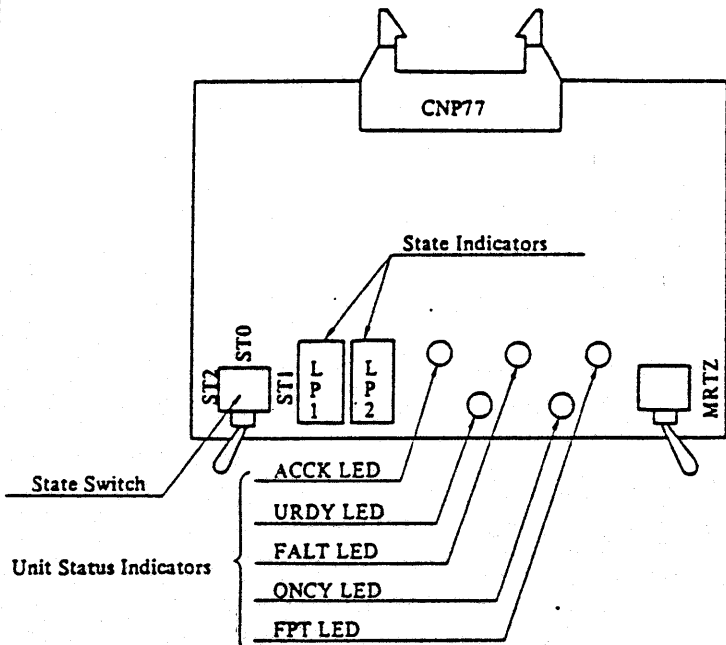
The number at the bottom of each box indicates the circuit diagram number in chapter 17.

Drive Circuit Configuration Diagram (Included Dual Channel Option)



Drive Addressing

Drive Address	Switch Position				Not Used
	1	2	3	4	
0	OFF	OFF	OFF		Not Used
1	ON	OFF	OFF		
2	OFF	ON	OFF		
3	ON	ON	OFF		
4	OFF	OFF	ON		
5	ON	OFF	ON		
6	OFF	ON	ON		
7	ON	ON	ON		



Switches and Indicators

Status and State

State Switch Position	Center (ST 0)	Right (ST 1)	Left (ST 2)
STATE LED Bit	DE Sequence State	Write/Read Check State	Access State
LP1	1	DE Sequence Latch 1	Index Check
	2	DE Sequence Latch 2	Control Check
	4	DE Sequence Latch 4	Multi Head Check
	8	Hall Alarm	Head Short Check
LP2	1	Motor At Speed	Servo Latch
	2	Inhibit DE Seq. Recycle	Write Transition Check
	4	Unit Ready	Delta I Write Check
	8	Access Busy	Servo Off-Track

Unit Status Indicators

Name of LED	Color of LED	Content
URDY	Green	Unit Ready
ONCY	Green	On Cylinder
ACCK	Red	Seek Error (Access Check)
FALT	Red	Fault
FPT	Yellow	Write Protected (File Protect)

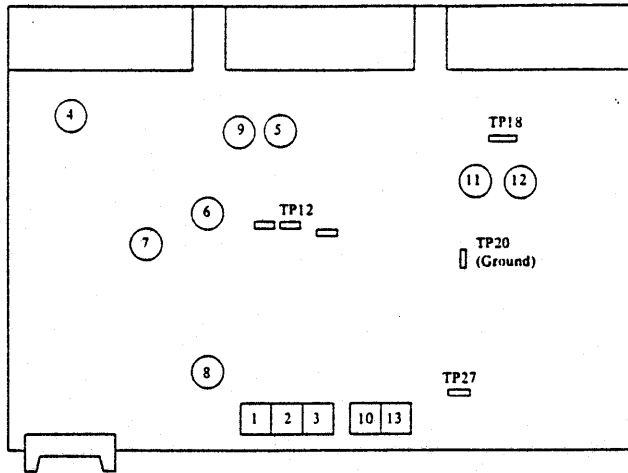
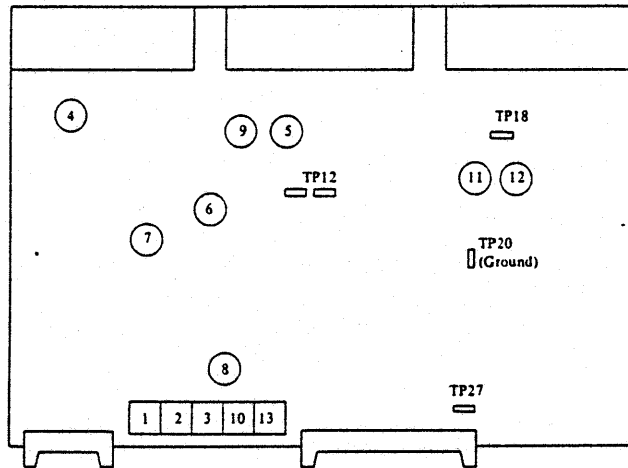
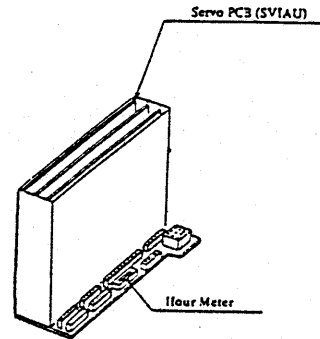


Figure 14.2-1 RVs and TPs on PCB SVIAU/01



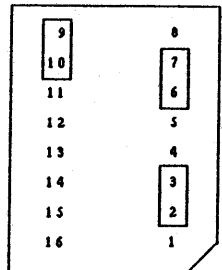
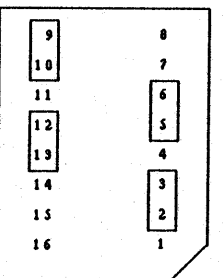
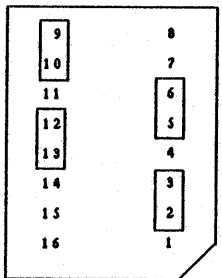
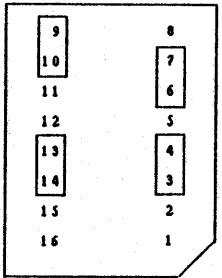
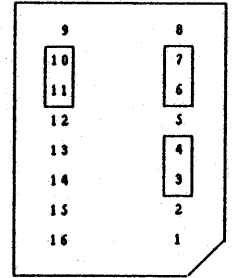
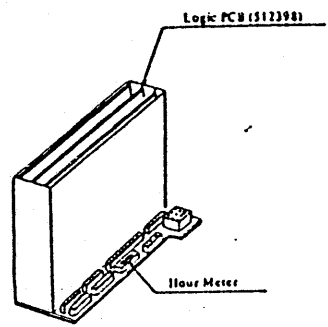
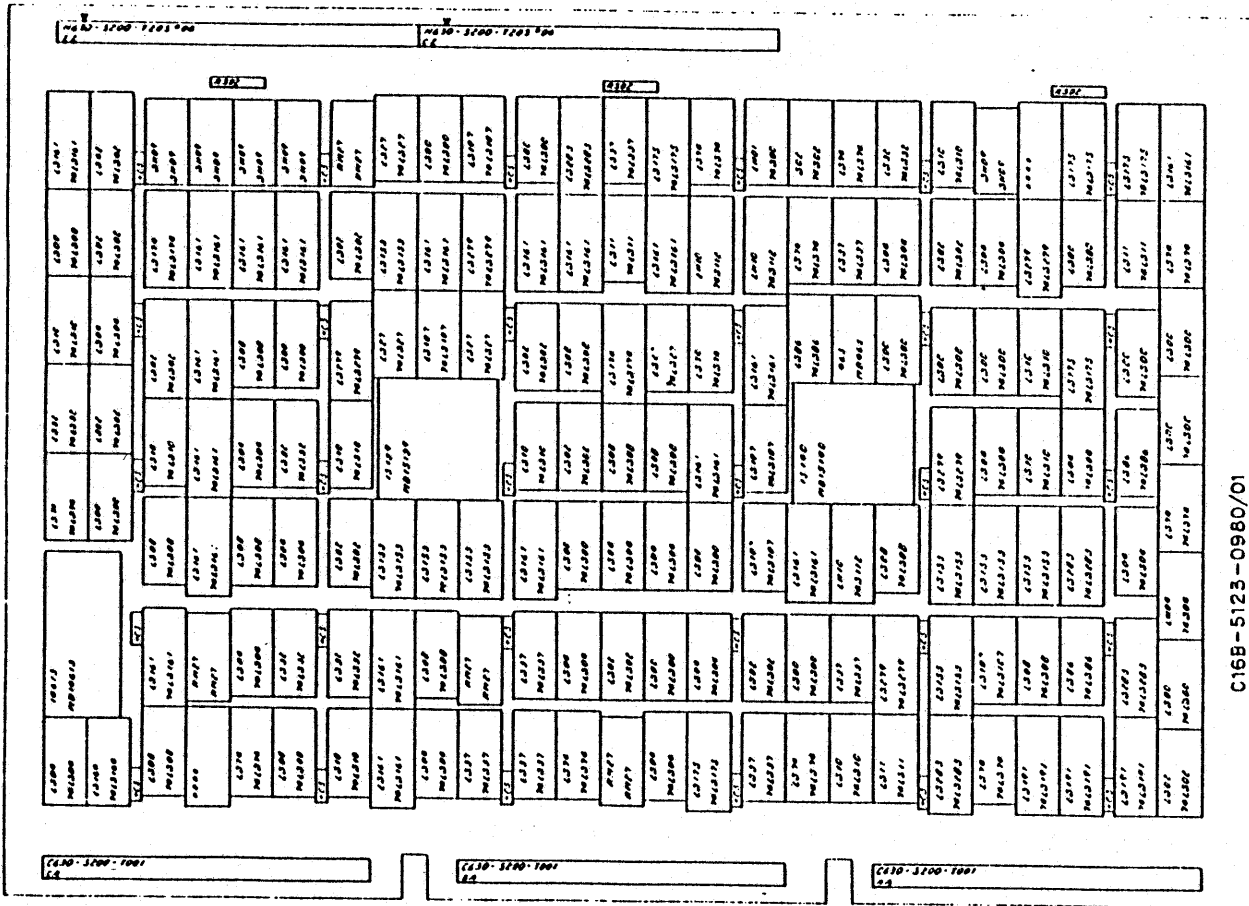
RVs and TPs on PCB SVIAU/02



Function of RVs

RV No.	Function/Adjustment	Sealed
1	AGC Amplifier gain	No
2	Over - shooting	No
3	Access time	No
4	-5V	Yes
5	Offset voltage of the desired velocity curve	Yes
6	VCU free - running frequency	Yes
7	Timer - Gate pulse width	Yes
8	Sync. - Gate timing	Yes
9	D/A Converter gain	Yes
10	Velocity offset	No
11	Access Time Out pulse width	Yes
12	Track Following Timer pulse width	Yes
13	Settling in Fine Control	No

* Do not touch the sealed RVs unless adjustments are required.



SECTOR COUNT

INTERFACE

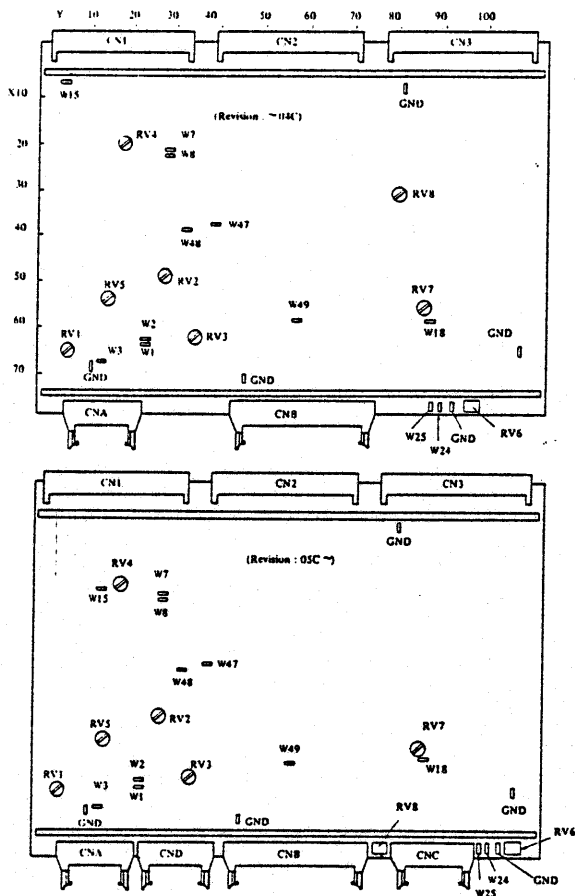
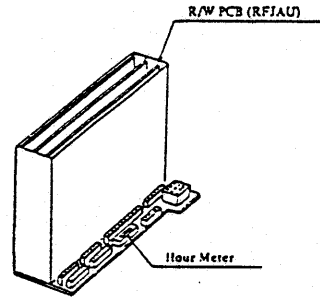
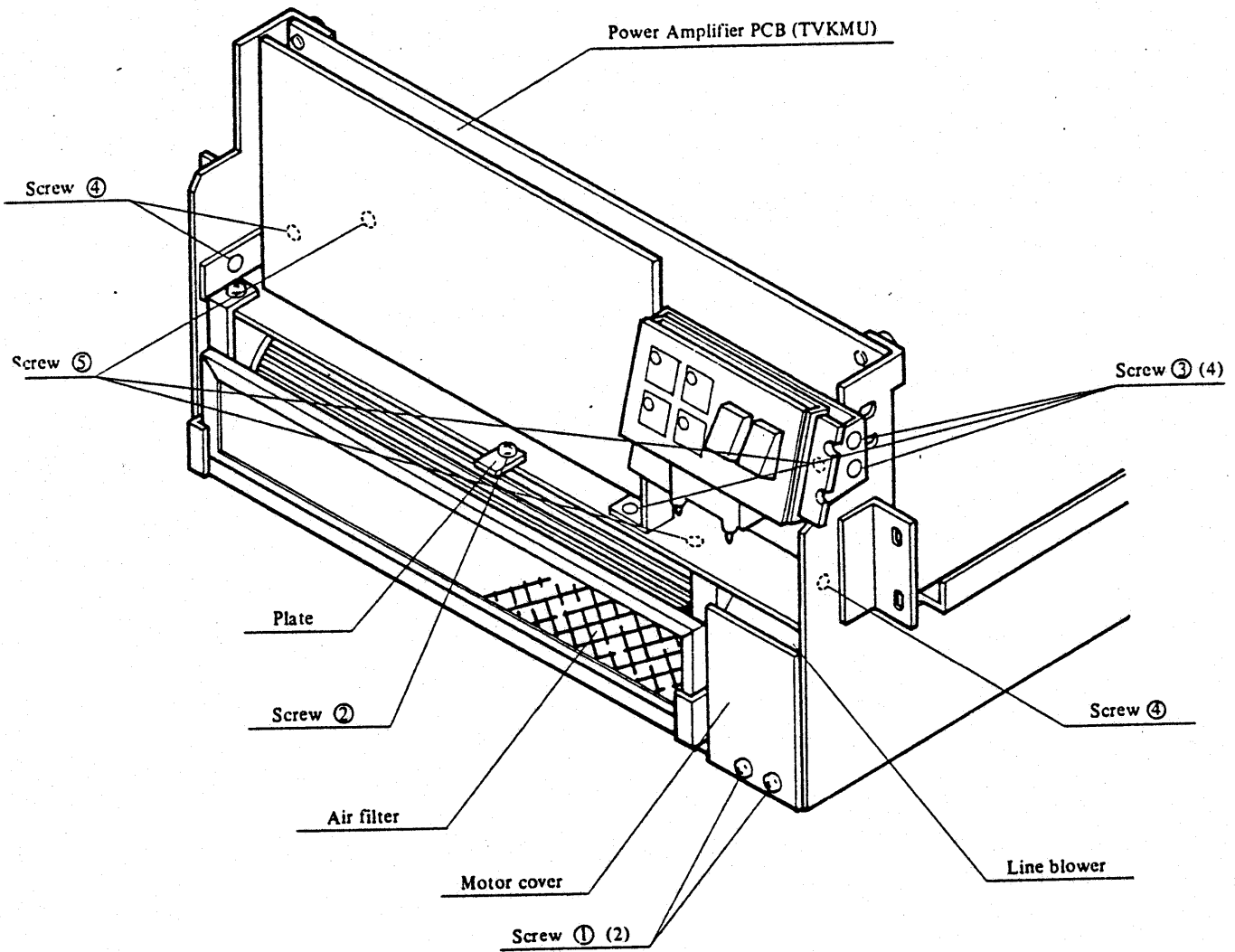


Figure 14.3-1 Variable Resistors on PCB RFJAU



Variable Resistors in Read/Write Circuit

Item	RV No.	Test point	Specification
-5.2V (DC Voltage)	RV1	AB2 (or W3)	-5.2V±0.2V
+6V (DC Voltage)	RV5	W15	+6V±0.2V
Balance of Read Signal	RV2	W7 W8 (ADX) (AEX)	Refer to (1)
Write Current	RV3	W1 W2	Refer to (2)
Jitter of Read Signal	RV4	W49	Refer to (3)



SYSTEM INSTALLATION

- 1. DETERMINE PHYSICAL LOCATION OF MACHINES**
- 2. DETERMINE SITE ELECTRICAL AND ENVIRONMENTAL REQUIREMENTS**
- 3. DETERMINE CABLE TYPES, CONFIGURATION, AND LENGTHS**
- 4. DETERMINE SITE NAME**
- 5. DETERMINE HOST NAMES AND CHAOS ADDRESSES**
- 6. DETERMINE NAMESPACE, FILE, AND PRINT SERVERS**
- 7. DETERMINE PRIMARY USERS**
- 8. INSTALL HARDWARE**
- 9. INSTALL SOFTWARE**
- 10. SET SITE ON NAMESPACE SERVER**
- 11. SET UP NAMESPACE ASSIGNMENTS**
- 12. SET SITE ON BALANCE OF NETWORK**

SOFTWARE INSTALLATION

-WHEN A PRIMARY DISK NEEDS REFORMATTING, SOFTWARE IS INSTALLED ON TO THE DISK FROM TAPES-
TAPES

IFS TAPE - contains microcode, disk label, root directory (headers), free pages, and bad blocks. One IFS tape is shipped with each disk.

V.24 FORMATTING TAPE - used to erase and repartition disk. Applicable for 3648 only or anytime disk cannot be formatted by disk format fep command.

DISTRIBUTION WORLDS (2 EACH)-

5.2 DISTRIBUTION WORLD - 5.2 world and 296 microcodes
6.0 DISTRIBUTION WORLD - 6.0 world and 319 microcodes
6.1 DISTRIBUTION WORLD - 6.1 world and 336 microcodes

SOURCES - lisp source code for insertion to lmfs

DOC & EXAMPLES - 11 volume symbolics document for insertion to lmfs and demos

LGP-2/DMP-1 support - printer software package

PROLOG - prolog interpreter

INTERLISP - interlisp interpreter

IP/TCP - network software

FORTRAN '77 - fortran interpreter

PASCAL - pascal interpreter

COLOR - color option software

V.24 files tape - V.24 debug., flod, V.24 Unibus flod, V.24 2MW flod, etc.
(made up by CE's)

BREATH OF LIFE (B.O.L.) - Contains NFEP overlay files for loading to FEP RAM and world microcodes for loading to LISP processor. Used to bring to life NFEP units with defective disks.

NFEP OVERLAY FILES - V.127 files for NFEP formatted for transfer to file server.

DIAGNOSTICS - system check out

FORMATS

STREAM FORMAT - conventional format of FORMATTING tapes and the microcode on IFS tapes, this format is used for data transferred from tape directly into an area of lisp machine (eg. microcode transferred from IFS tape to C memory). Stream format tapes are read at FEP level via specific commands (eg. LOAD MICROCODE or LOAD FEP) and are written via operations contained in the disk tools program.

IFS FORMAT - back up tapes of disk image, this is the conventional format of distribution worlds and the balance of files on IFS tape. IFS format tapes are read at FEP level via DISK RESTORE command and written at LISP via lisp command - (TAPE: WRITE-FEP-FILES-TO-TAPE)

DISTRIBUTION FORMAT - format for storing programs or files such as SOURCES for loading into LMFS. Distribution format tapes are created via a distribution dump which pulls files relevant to a program system or text library from various places in LMFS and stores them on tape. DISTRIBUTION format tapes are read from LISP via lisp command - (DIS: LOAD-DISTRIBUTION-TAPE) and are written from LISP via lisp command - (DIS: WRITE-DISTRIBUTION-TAPE). A menu allows selection of systems for storing.

CARRY FORMAT - format for storing programs or files for loading into LMFS. Carry format tapes are created via a carry dump which pulls only specified files from LMFS. CARRY format tapes are read from LISP via lisp command - (TAPE: CARRY-LOAD) and are written from LISP via lisp command - (TAPE: CARRY-DUMP) specifying files to be saved.

LMFS FORMAT - format for storing back-ups for restoration to LMFS. LMFS format tapes are both read and written from the FILE SYSTEM MAINTENANCE window via menu.

SOFTWARE INSTALLATION
CASE I

PRE-NFEP

COMPLETE FEP FILE SYSTEM IN PLACE ON DISK AND CORRECT MICROCODE ON DISK

1. Boot machine
2. Set site
3. Load any other software system required (e.g., print)
4. Run garbage collection
5. Save world into another area on disk
 - A. Rename aux.page to custom world name
 - B. Rename old world to aux.page
 - C. Save world
 - D. Revise boot.boot and large.boot files
6. Return system to FEP and verify system operation

SOFTWARE INSTALLATION
CASE II

PRE-NFEP

COMPLETE FEP FILE SYSTEM IN PLACE ON DISK AND INCORRECT MICROCODE ON DISK

1. Insert WORLD distribution tape (5.2, 6.0, or 6.1). Type "DISK RESTORE".
2. Load microcode from WORLD distribution tape into existing header in FEP FILE SYSTEM on disk.
3. Boot machine
4. Set site
5. Load any other software system required (e.g., print)
6. Run garbage collection
7. Save world into another area on disk
 - A. Rename aux.page to custom world name
 - B. Rename microcode header to correct name
 - C. Rename old world to aux.page
 - D. Save world
 - E. Revise boot.boot and large.boot files
8. Return system to FEP and verify system operation

SOFTWARE INSTALLATION
CASE III

PRE-NFEP

NO FEP FILE SYSTEM IN PLACE ON DISK

1. Insert IFS tape
2. Clear machine
3. Load microcode tape:(return)
-The microcode is loaded into Lisp processor
4. Reformat disk
 - A. Reformatting a 3640 or any problem unit
 1. Insert formatting tape
 2. Type:Load fep()tape:(return)
-Special formatting tape is loaded into FEP
 3. Type "DISK FORMAT"
 - B. Reformatting all others - type "DISK FORMAT"
5. Re-insert IFS tape
6. Type "DISK RESTORE"
 - A. In response to "Is there a microcode to skip?", type "YES"
 - B. The IFS is loaded to the Fep file system on disk
7. Insert WORLD distribution tape (5.2, 6.0, or 6.1). Type "DISK RESTORE".
8. Load microcode from WORLD distribution tape into header provided in FEP FILE SYSTEM on disk
9. Load WORLD (Transferring data from tape to FEP FILE SYSTEM on disk)
10. Manually boot machine
11. Set site
12. Load any other software system required (e.g., print)
13. Initialize LMFS
14. Run garbage collection
15. Save world into another area on disk
 - A. Rename aux.page to custom world name
 - B. Rename microcode header to correct name
 - C. Rename old world to aux.page
 - D. Save world
 - E. Revise boot.boot and large.boot files
16. Return system to FEP and verify system operation

M I C R O C O D E A P P L I C A B I L I T Y

MICROCODE PATHNAME COMPONENT	APPLICABILITY
-tmc5-	FOR USE WITH A MEMORY CONTROLLER PCBA ONLY
-ifu-	FOR USE WITH AN INSTRUCTION FETCH UNIT PCBA ONLY.
-st506-	FOR USE WITH STANDARD 3640 (MAXTOR) INTERFACE ONLY
-io4-	FOR USE WITH REV 6 OR LATER I/O PCBA ONLY. (WHEN THIS IS NOT IN THE PATHNAME IT IS USED FOR REV 2A I/O OR EARLIER.
-fpa-	FOR USE WITH FLOATING POINT ACCELERATOR
-egc-diag-	FOR USE AS A DIAGNOSTIC TO CHECK GARBAGE COLLECTION ASSISTED HARDWARE
-prolog-	FOR USE WITH THE PROLOG LANGUAGE. EXTENDED SEQUENCER NEEDED FOR LARGE MICROCODES.
-xsq-	FOR USE WITH THE EXTENDED SEQUENCER
-noxsq-	FOR USE WITH PROLOG AND NO EXTENDED SEQUENCER PCBA.

VERSION	APPLICABILITY
.296	RELEASE 5.2 WORLDS
.319	RELEASE 6.0 WORLDS
.336	RELEASE 6.1 WORLDS

LOADING AND STARTING SELECTED SYSTEMS SUMMARY

-HOW TO LOAD SOFTWARE SYSTEMS TO HOSTS FROM FILE SERVER-
-HOW TO START SYSTEM OPERATION-

I. PREREQUISITES

- A. SOFTWARE SYSTEM IS RESIDENT IN THE FILE SERVER
- B. SERVICES ARE ENABLED IN THE FILE SERVER
- C. HOST IS EQUIPPED WITH A 6.0 OR LATER WORLD

II. SYSTEM LOADING AND STARTING PROCEDURE SUMMARY FOR SELECTED SYSTEMS

A. PRINT SYSTEM

- 1. PRINT SYSTEMS NEED ONLY BE LOADED INTO PRINT SERVERS.
- 2. IF NOT DONE, CONFIGURE NAMESPACE FOR HOST(S) AND PRINTER(S).
- 3. TO LOAD PRINT SYSTEM-

IN LISP WINDOW, ENTER COMMAND PROCESSOR COMMAND:

LOAD SYSTEM PRINT

- 4. TO START THE PRINT SPOOLER-

IN LISP WINDOW, ENTER LISP COMMAND:

(PRINT:INITIALIZE-PRINT-SPOOLER)

- 5. ENABLE SERVICES ON PRINT SERVER TO ALLOW OTHER HOSTS ACCESS TO PRINTER.

B. EXPERIMENTAL PICTURE EDITOR SYSTEM (PEDS)

- 1. TO LOAD PEDS-

IN LISP WINDOW, ENTER COMMAND PROCESSOR COMMAND:

LOAD SYSTEM PED

- 2. TO START PEDS OPERATION, DEPRESS <SELECT> G

- 3. IN CASE OF IRRECOVERABLE ERROR DURING PED OPERATION, TO RECONSTRUCT THE PED FRAME-

IN LISP WINDOW, ENTER LISP COMMAND:

(PICTURE-EDITOR:MAKE-PED-FRAME)

C. COLOR DEMONSTRATION SYSTEM

- 1. TO LOAD COLOR SOFTWARE WITH COLOR DEMO SYSTEM-

IN LISP WINDOW, ENTER COMMAND PROCESSOR COMMAND:

LOAD SYSTEM COLOR-DEMO

- 2. TO START COLOR-DEMO OPERATION-

IN LISP WINDOW, ENTER LISP COMMAND:

(COLOR:DEMO)

D. DIAGNOSTICS SYSTEM

- 1. THE DIAGNOSTICS SYSTEM SHOULD ONLY BE RESIDENT ON FILE SERVERS WITHIN SYMBOLICS COMPANY SITES.

- 2. TO LOAD DIAGNOSTICS SYSTEM-

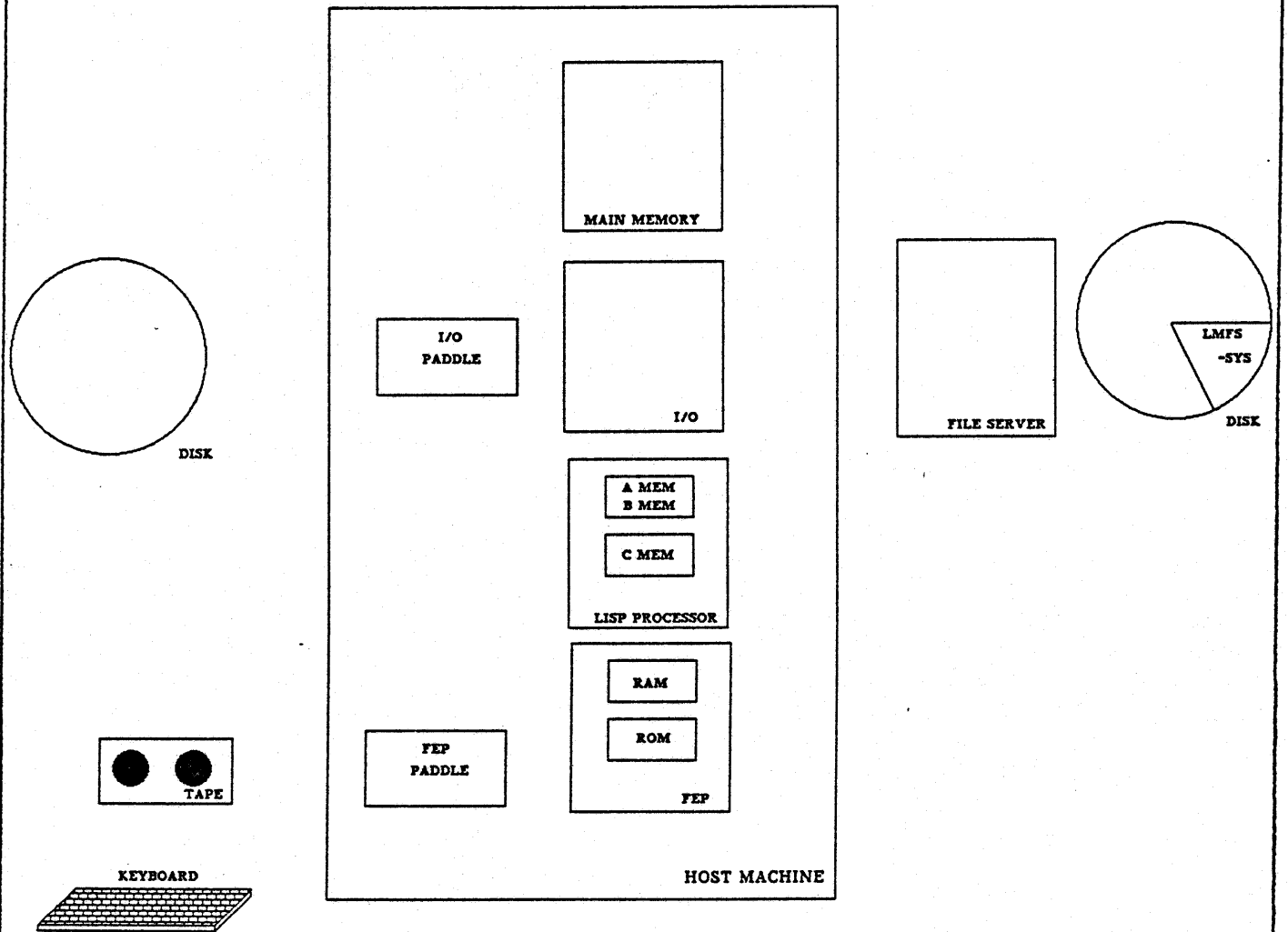
IN LISP WINDOW, ENTER COMMAND PROCESSOR COMMAND:

LOAD SYSTEM DIAGNOSTICS

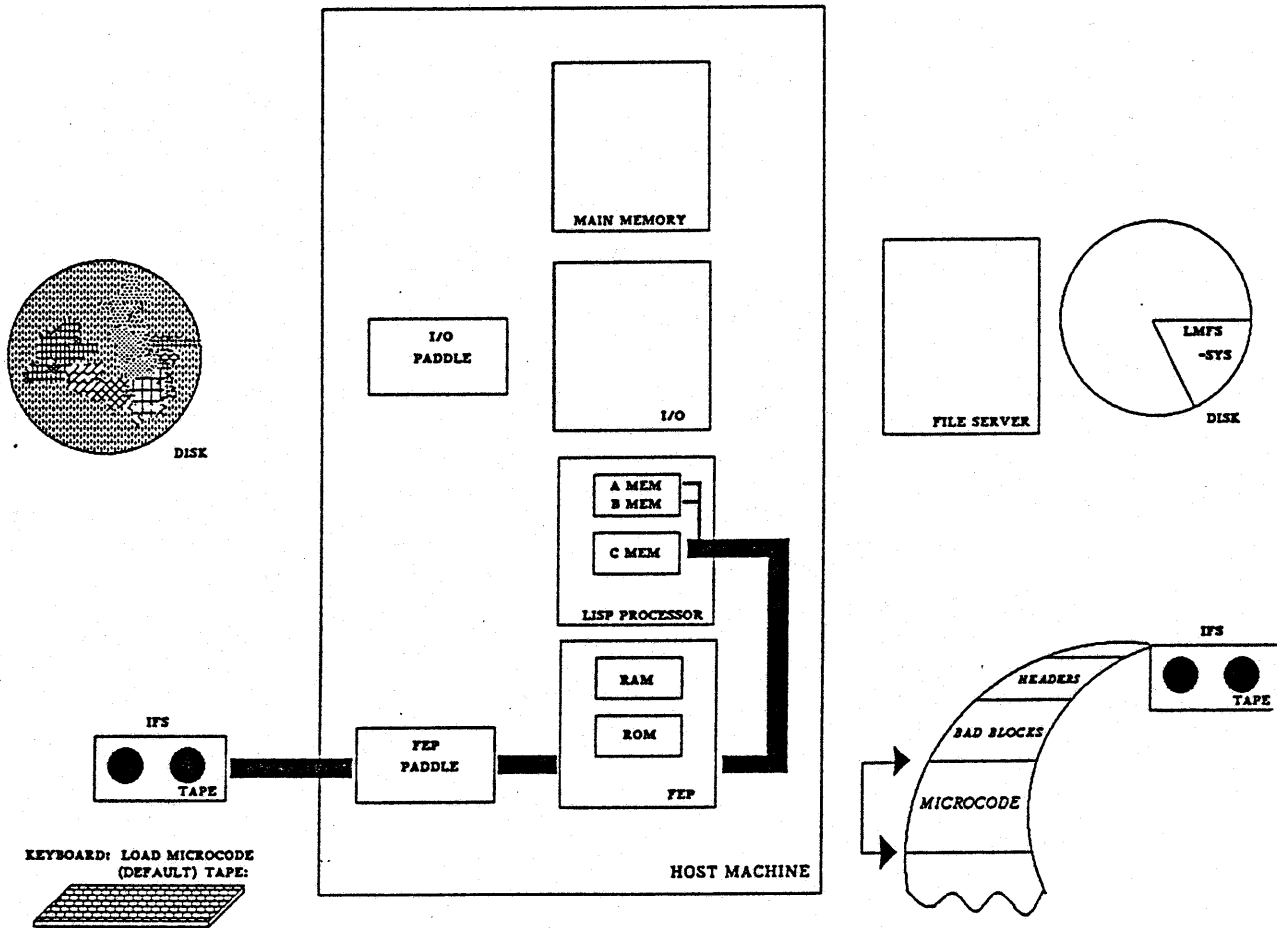
- 3. TO START DIAGNOSTICS OPERATION-

IN LISP WINDOW, ENTER LISP COMMAND:

(LOAD "SYS:DIAGNOSTICS;LISPM-INIT")

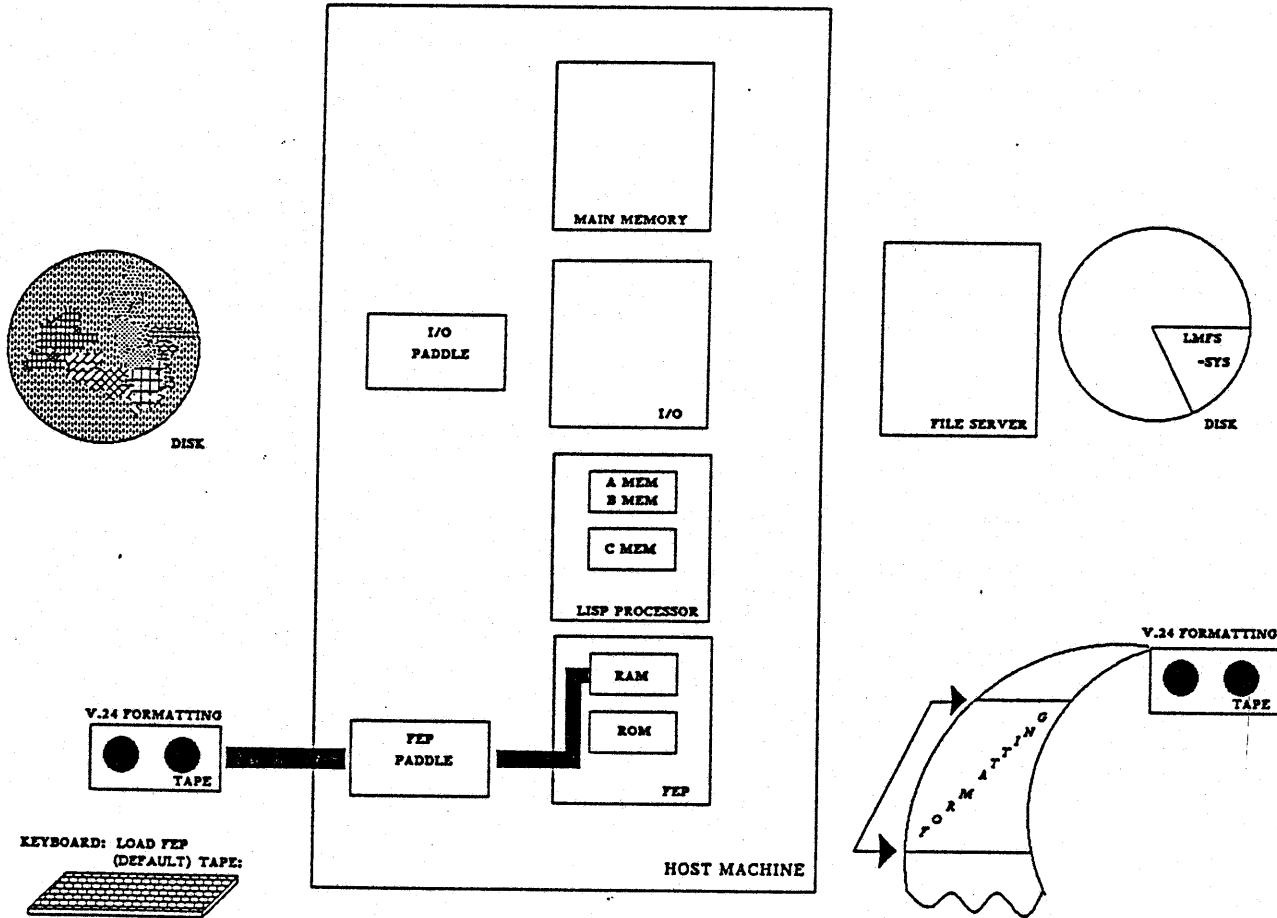


SOFTWARE INSTALLATION
HIGHLIGHTS



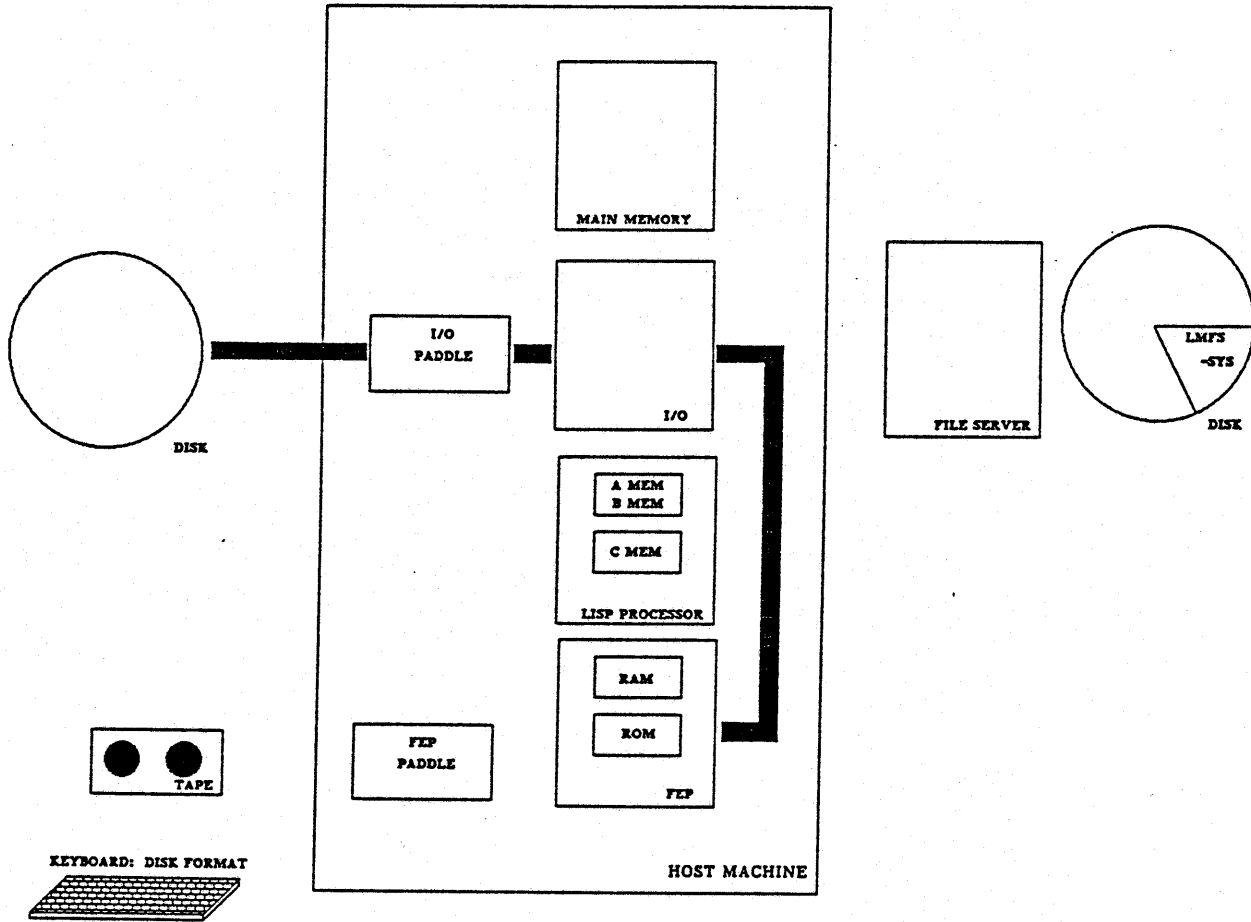
STEP 1: TRANSFER MICROCODE FROM IFS TAPE TO LISP PROCESSOR
ALLOWING DISK WRITES AT THE FEP LEVEL

PRE-NFEP SOFTWARE INSTALLATION



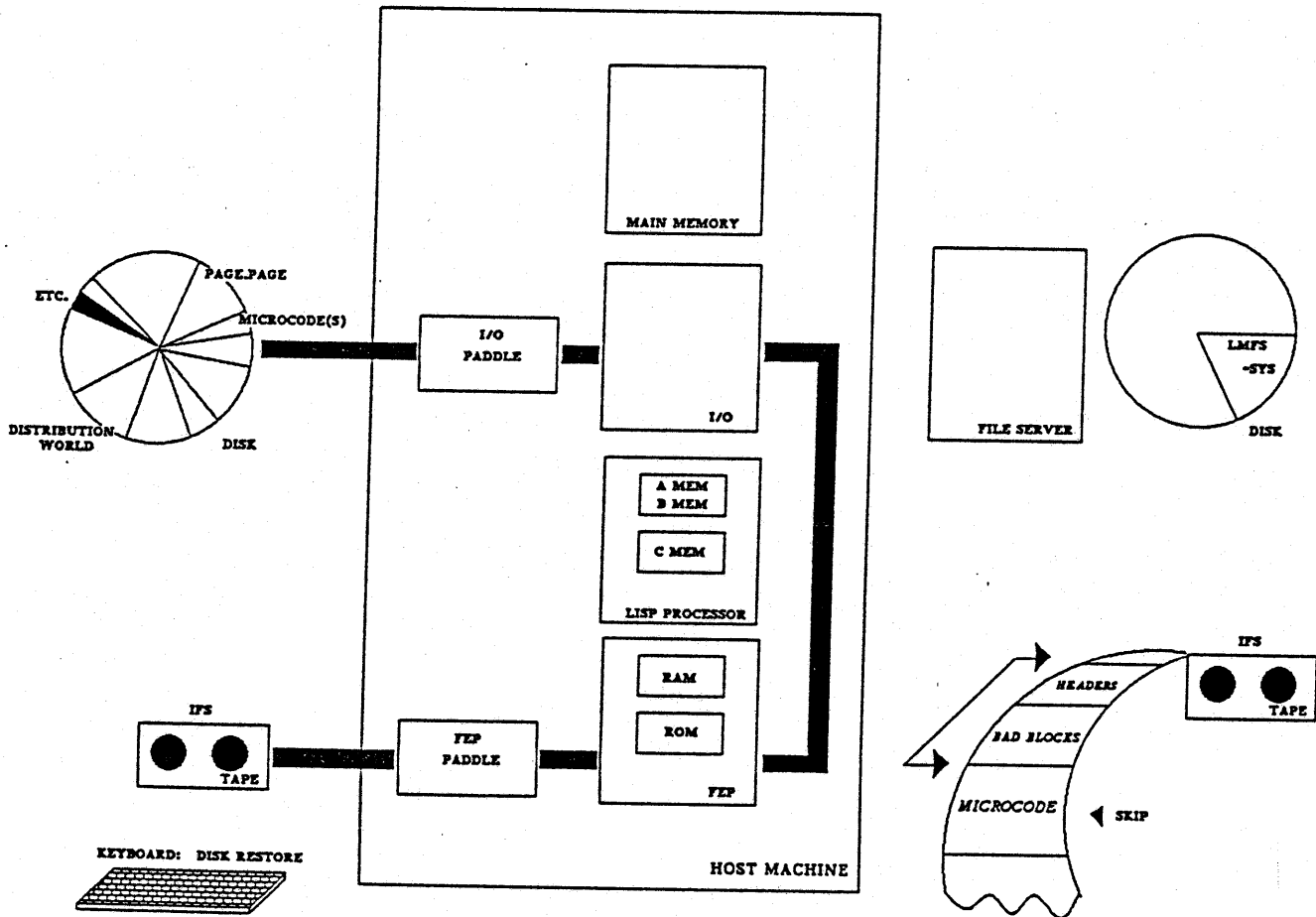
STEP 2: LOAD V.24 FORMATTING PROGRAM TO FEP RAM
 (APPLICABLE FOR 3640 OR ANY UNIT OUTSIDE OF RESIDENT FEP FIRMWARE CAPABILITIES)

PRE-NFEP SOFTWARE INSTALLATION



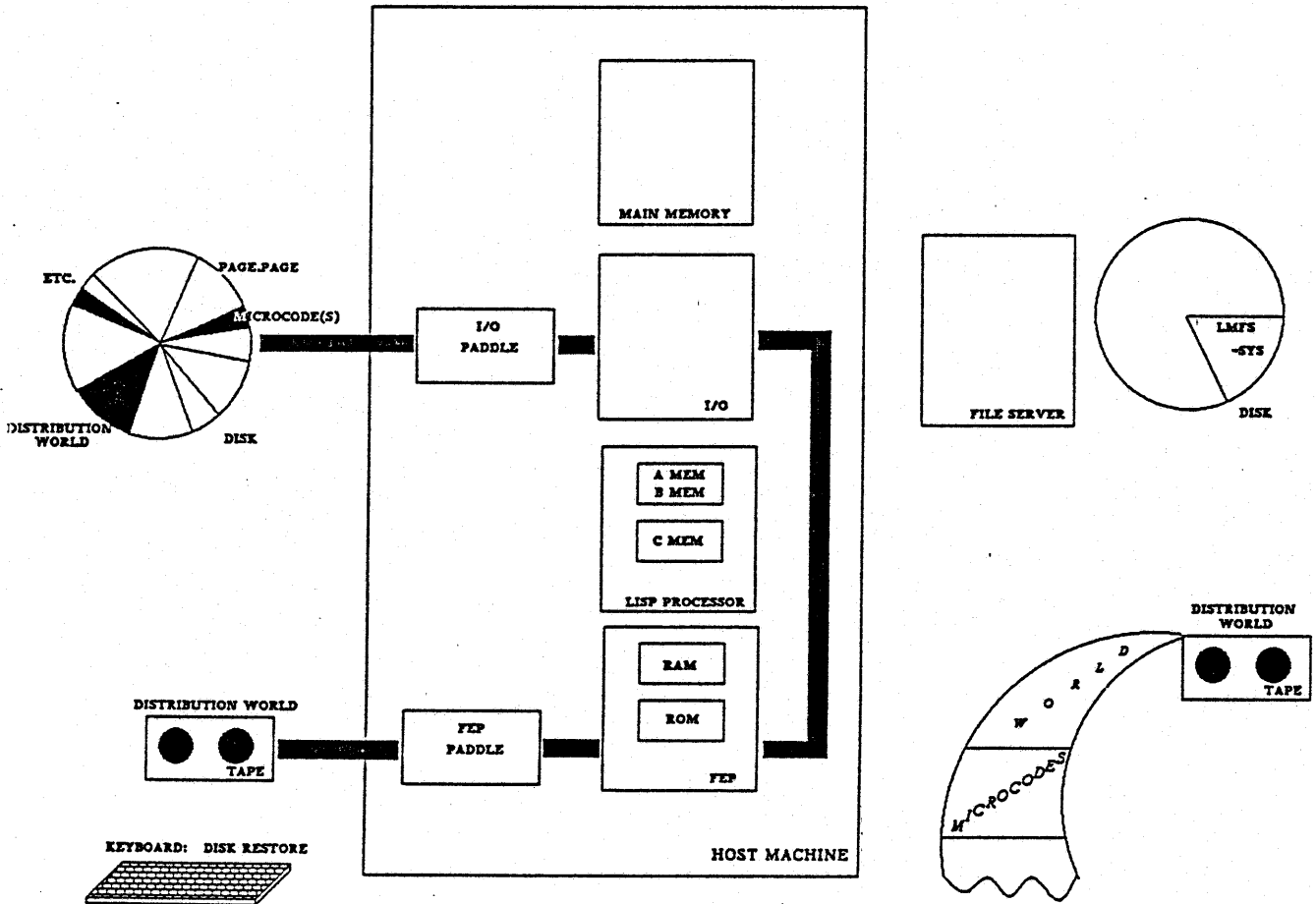
STEP 3: FORMAT DISK

PRE-NFEP SOFTWARE INSTALLATION



STEP 4: TRANSFER HEADERS AND BAD BLOCKS FROM IFS TAPE TO DISK

PRE-NFEP SOFTWARE INSTALLATION

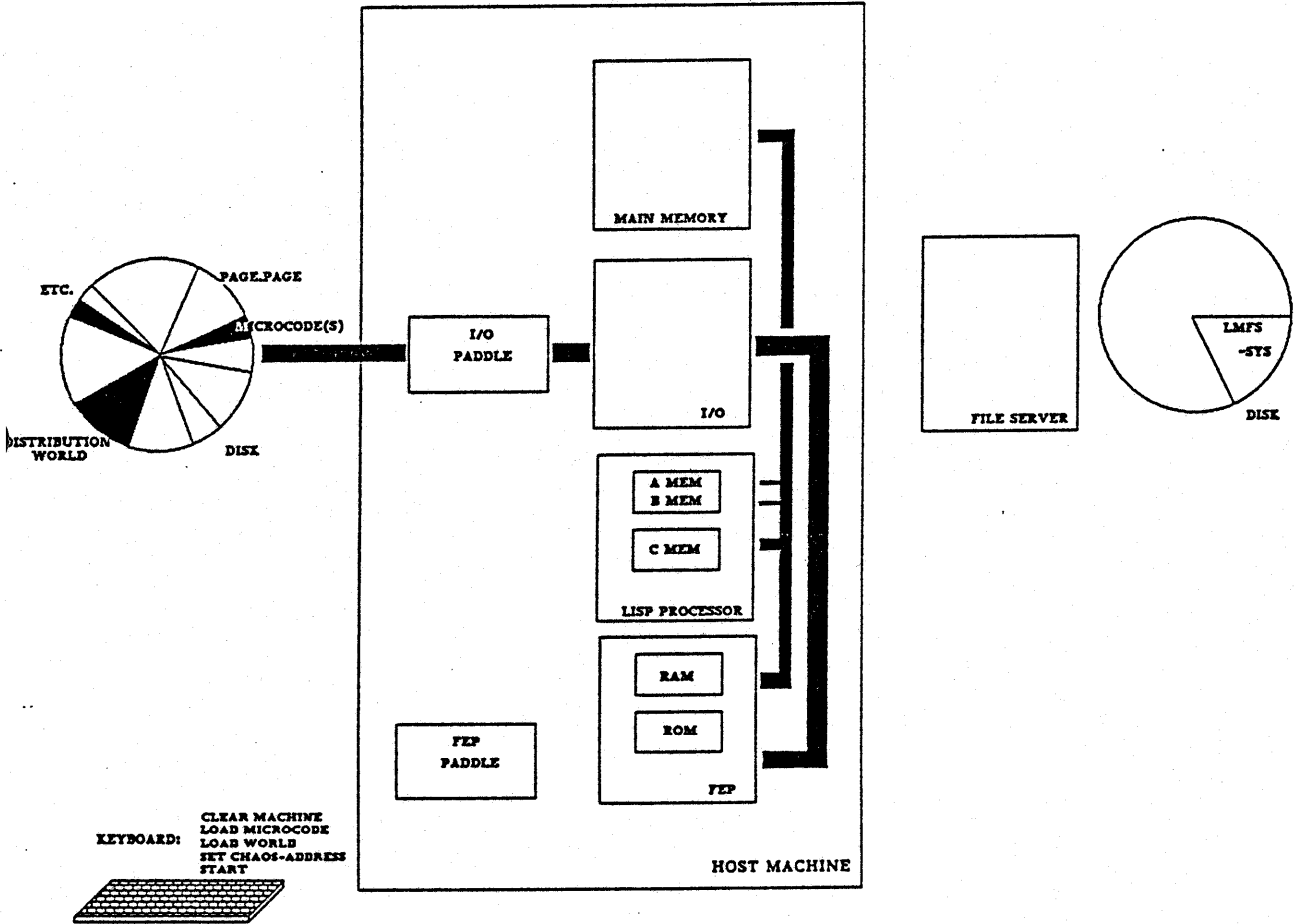


STEP 5: TRANSFER MICROCODE(S) AND WORLD
 FROM DISTRIBUTION WORLD TAPE TO DISK UNDER HEADERS PROVIDED

PRE-NFEP SOFTWARE INSTALLATION

THE WORLD OF THE BUFFER

- A MERE FACELESS CLONE
OF THE
DISTRIBUTION WORLD
WITH NO INDIVIDUAL IDENTITY -



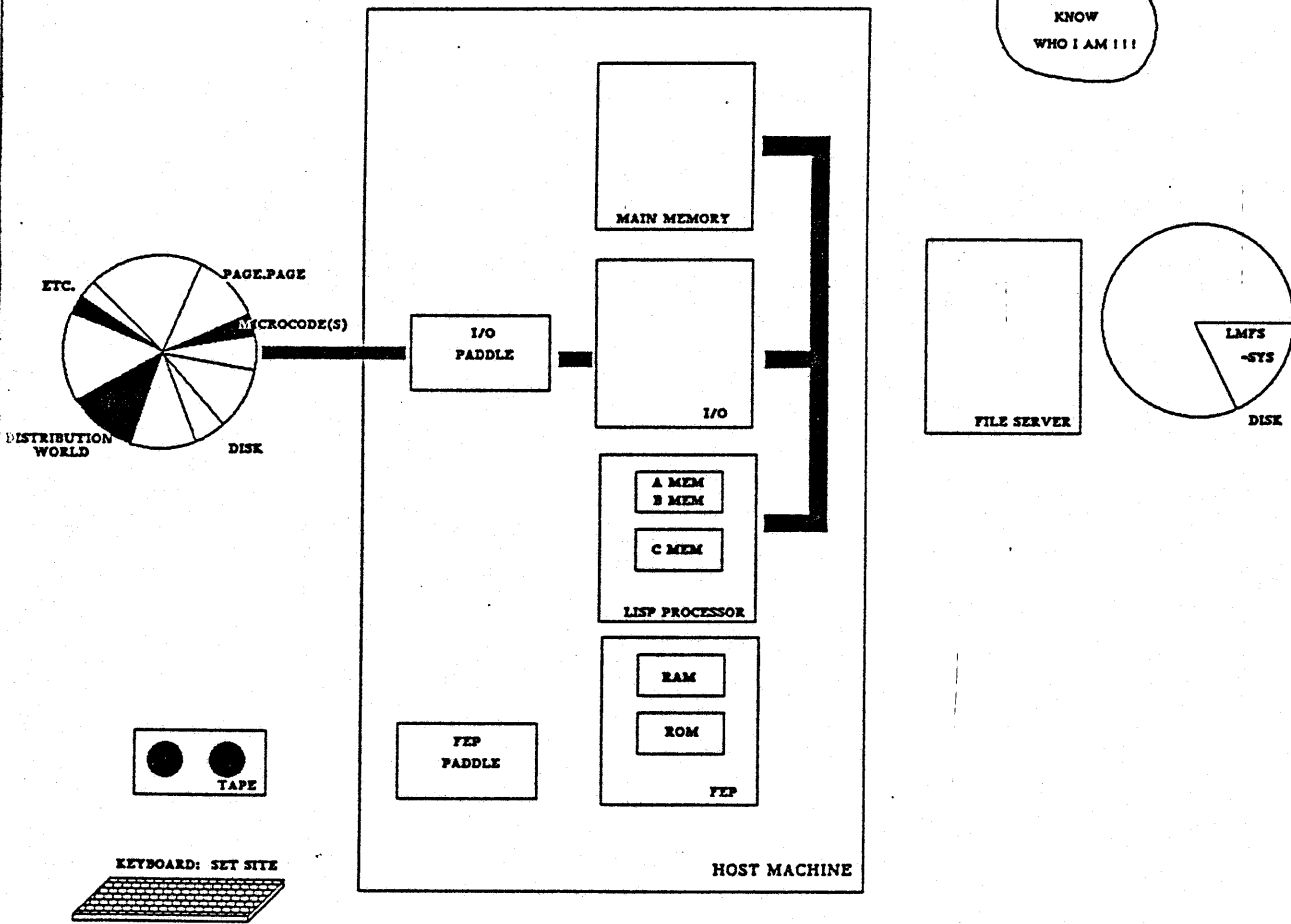
STEP 6: MANUALLY BOOT -
BRINGING TO LIFE
"THE WORLD OF THE BUFFER"

PRE-NFEP SOFTWARE INSTALLATION

THE WORLD OF THE BUFFER



NOW
I
KNOW
WHO I AM !!!

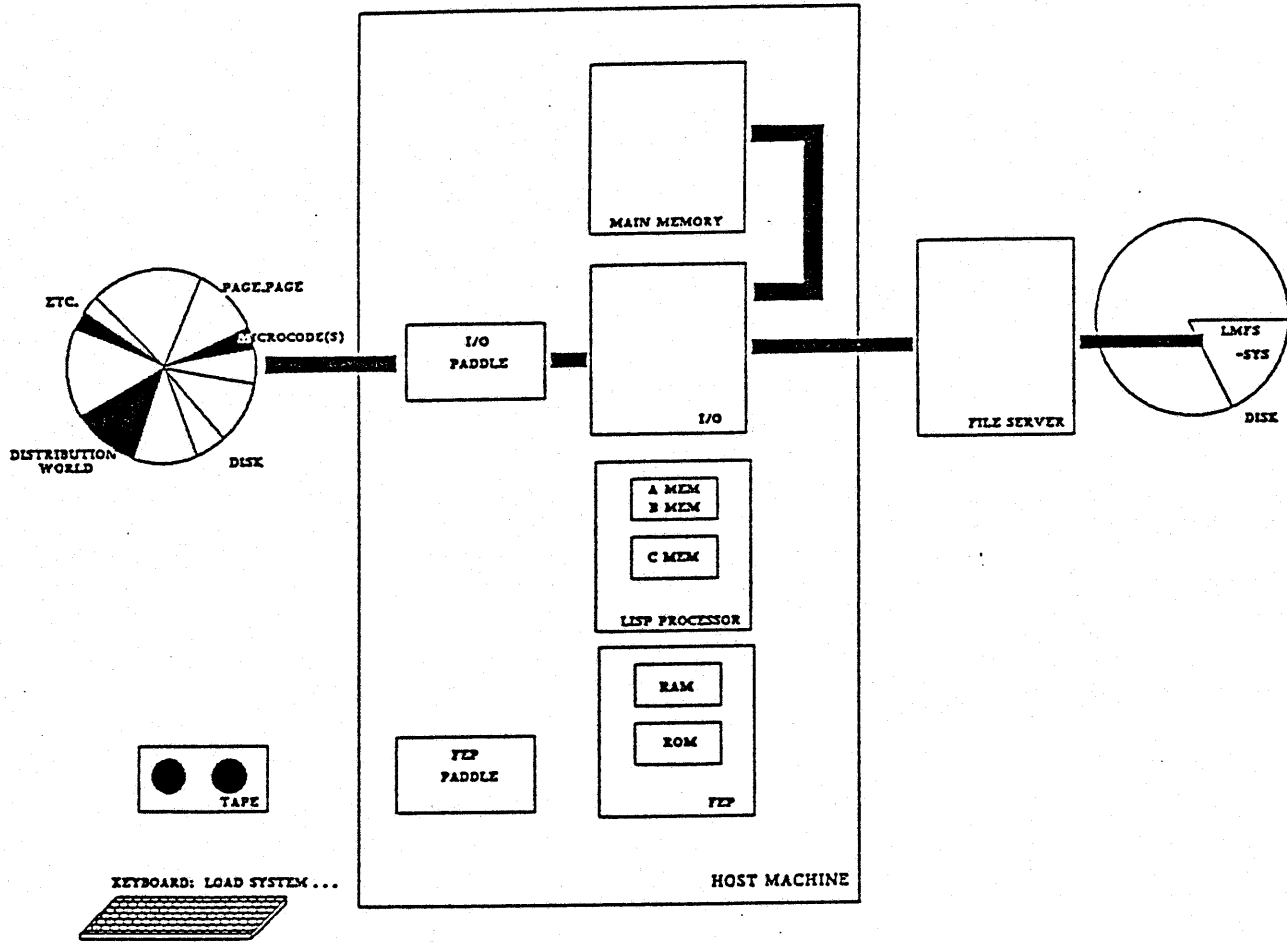


STEP 7: SET SITE - SITE CONFIGURING

"THE WORLD OF THE BUFFER"

PRE-NFEP SOFTWARE INSTALLATION

THE WORLD OF THE BUFFER

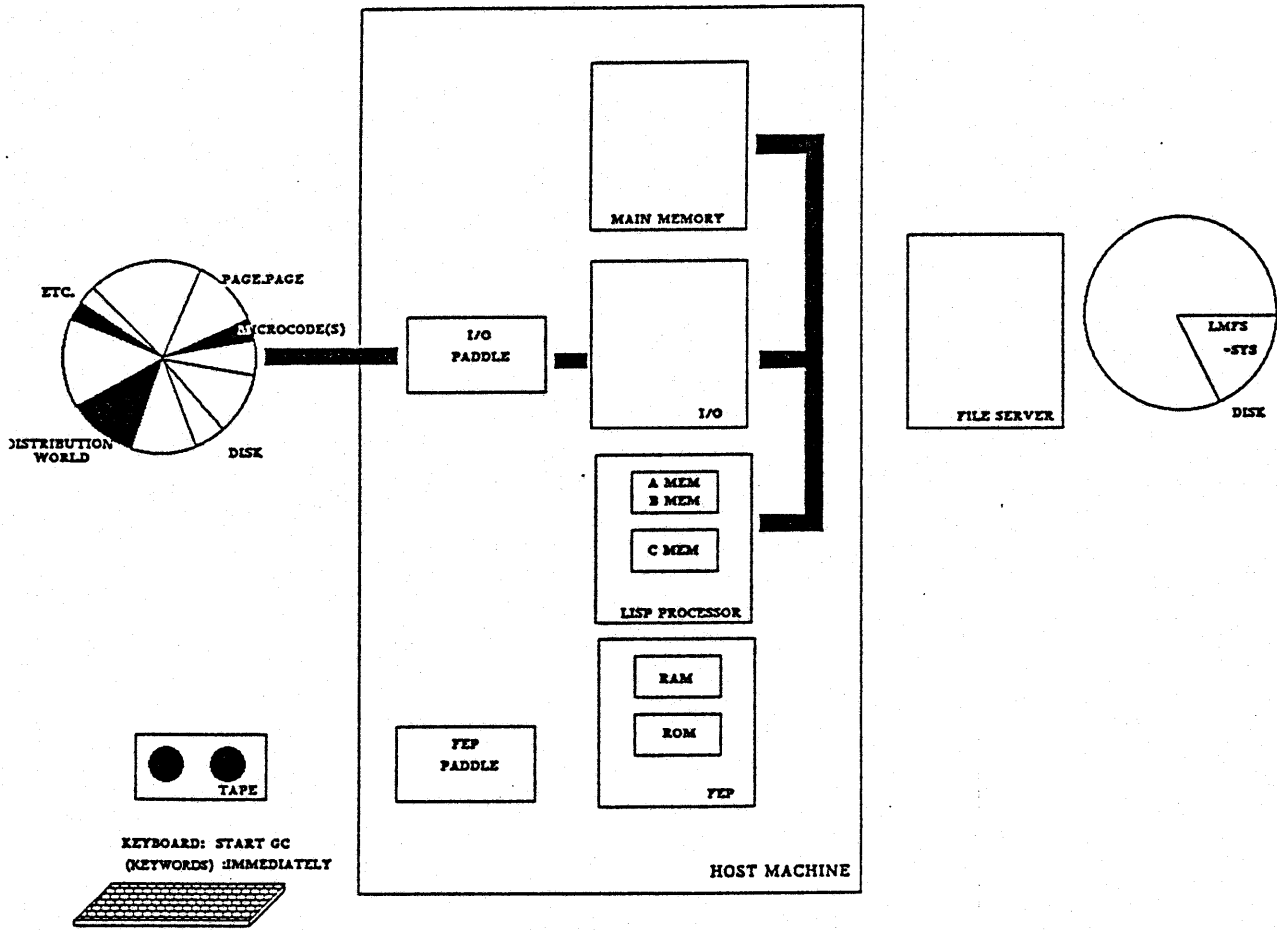
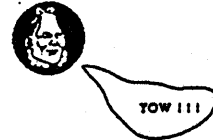


STEP 8: LOAD APPLICABLE SOFTWARE SYSTEMS FURTHER INDIVIDUALIZING

"THE WORLD OF THE BUFFER"

PRE-NFEP SOFTWARE INSTALLATION

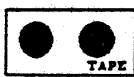
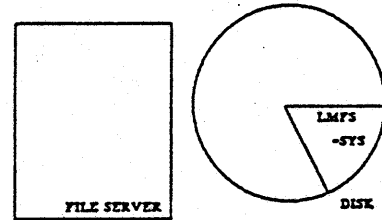
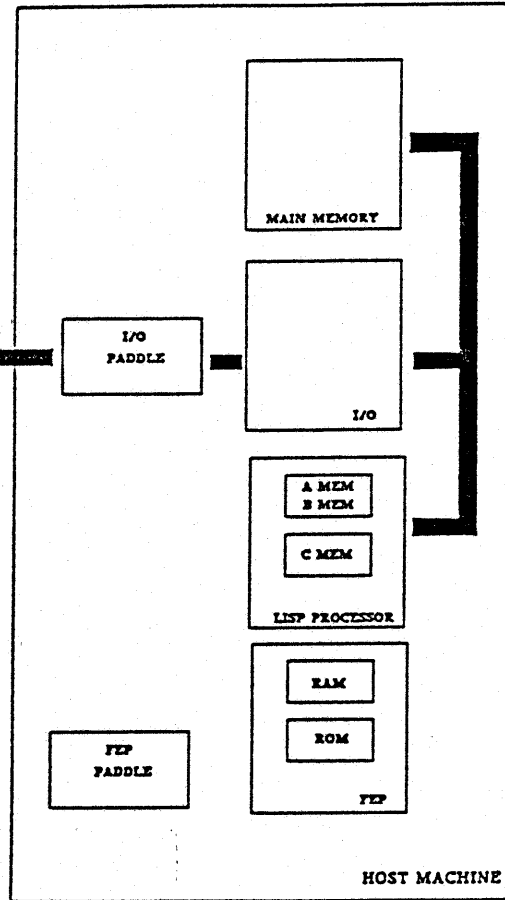
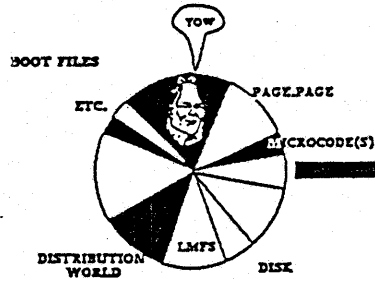
THE WORLD OF THE BUFFER



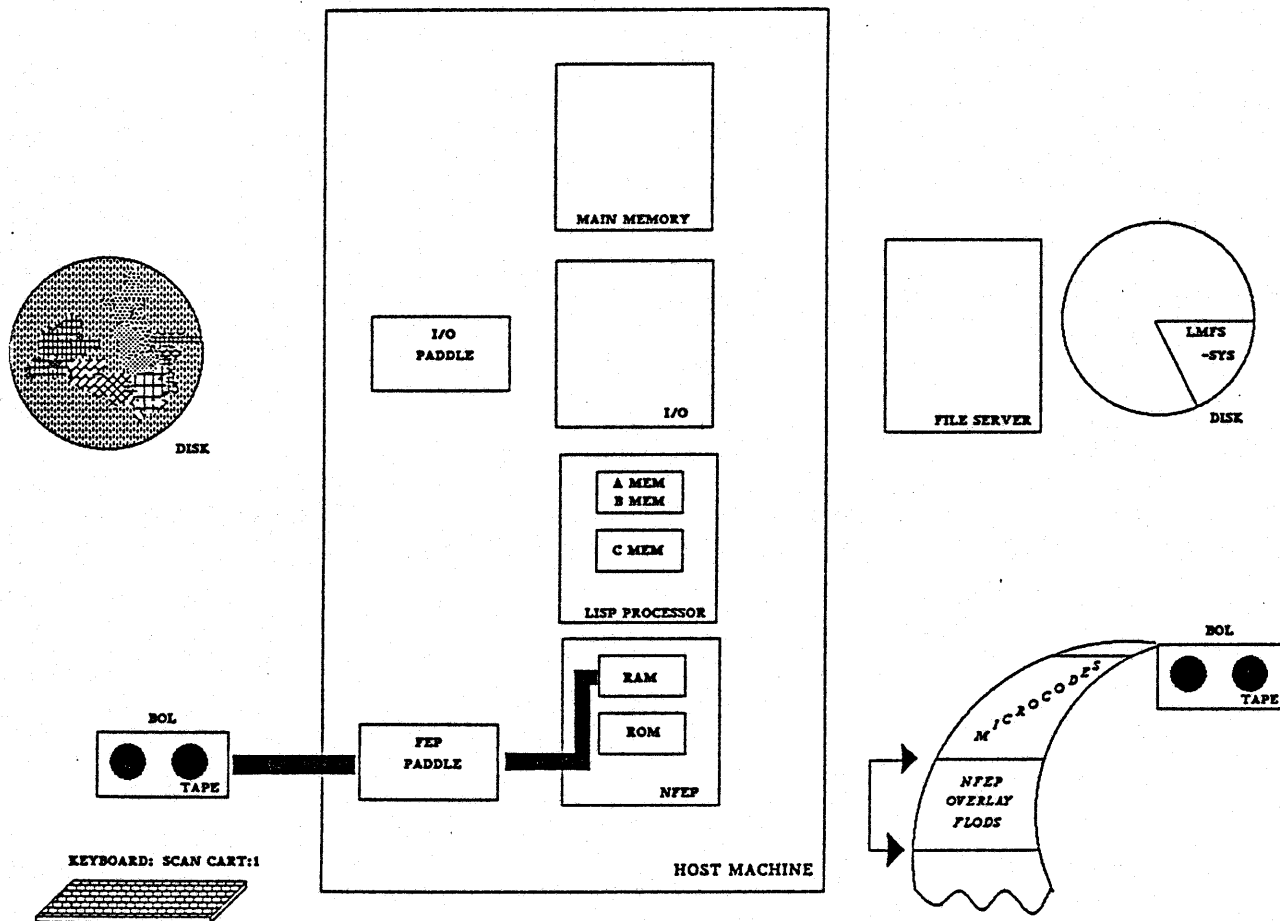
STEP 9: RUN GC TRIMMING DOWN
"THE WORLD OF THE BUFFER"

PRE-NFEP SOFTWARE INSTALLATION

THE WORLD OF THE BUFFER

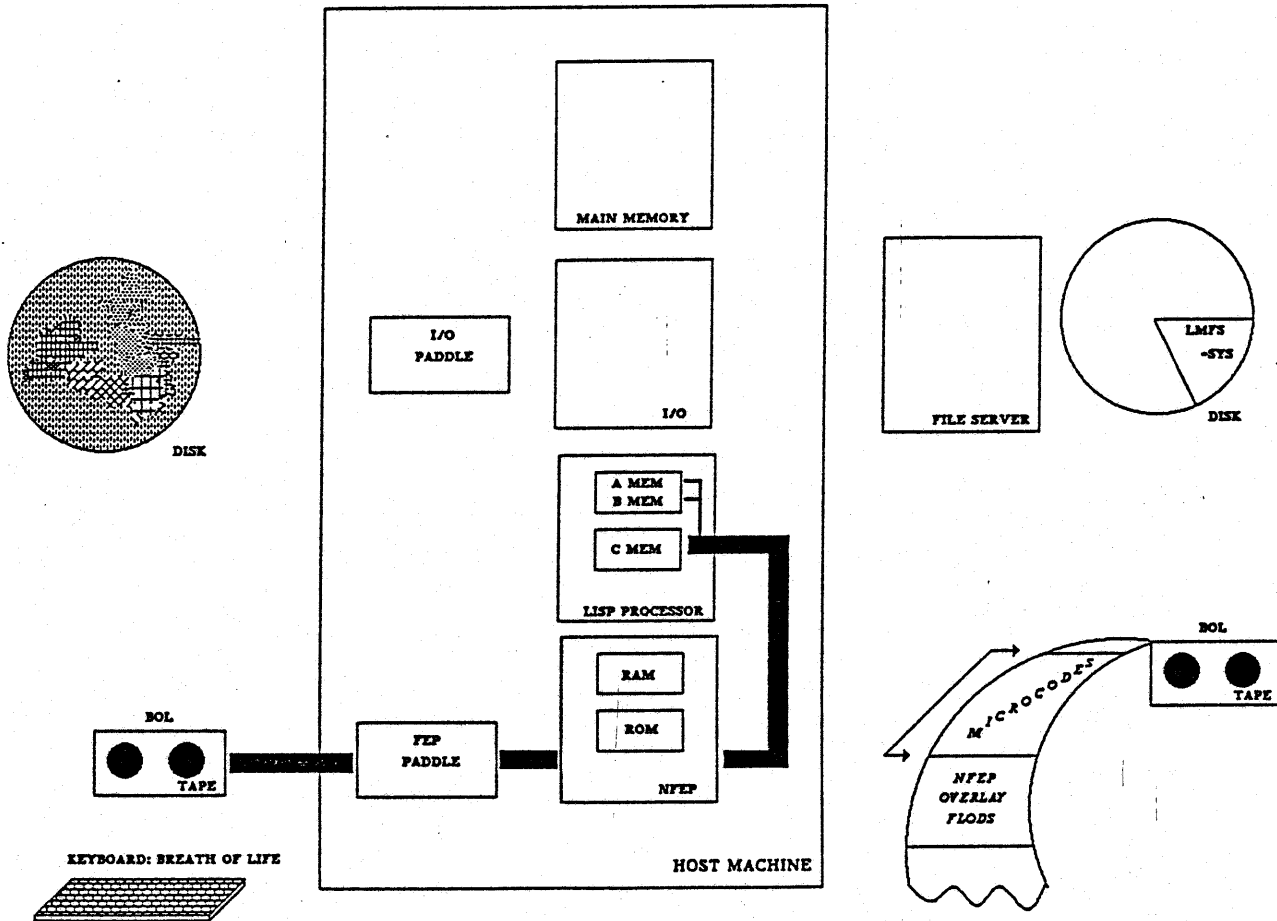


STEP 10: SAVE WORLD TO A NEW AREA ON DISK
AS NECESSARY, CREATE OR MODIFY BOOT FILES
INITIALIZE LMFS
PRE-NFEP SOFTWARE INSTALLATION



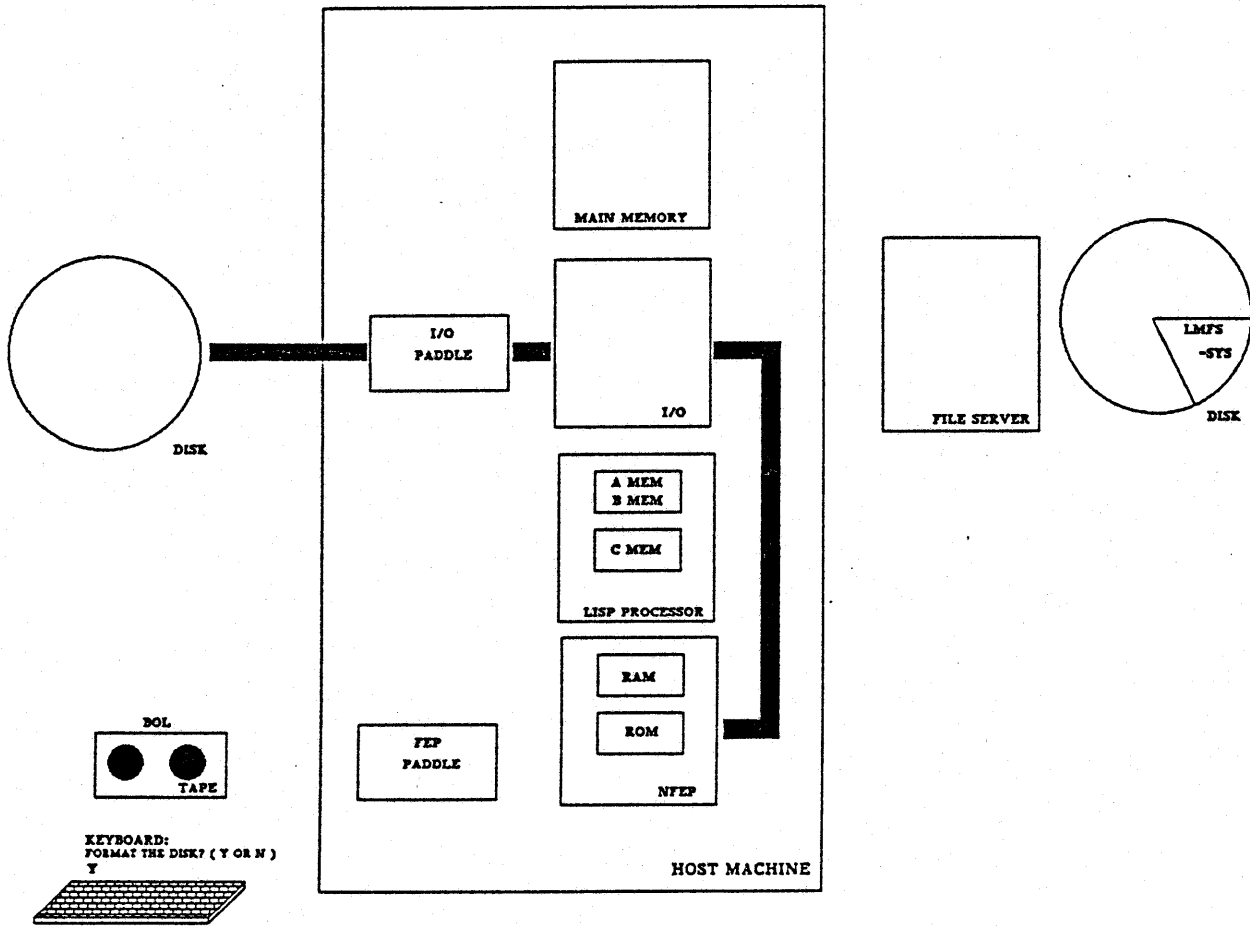
STEP 1: TRANSFER NFEP OVERLAYS FROM BOL TAPE TO NFEP RAM
EXPANDING NFEP COMMAND CAPABILITIES

NFEP SOFTWARE INSTALLATION



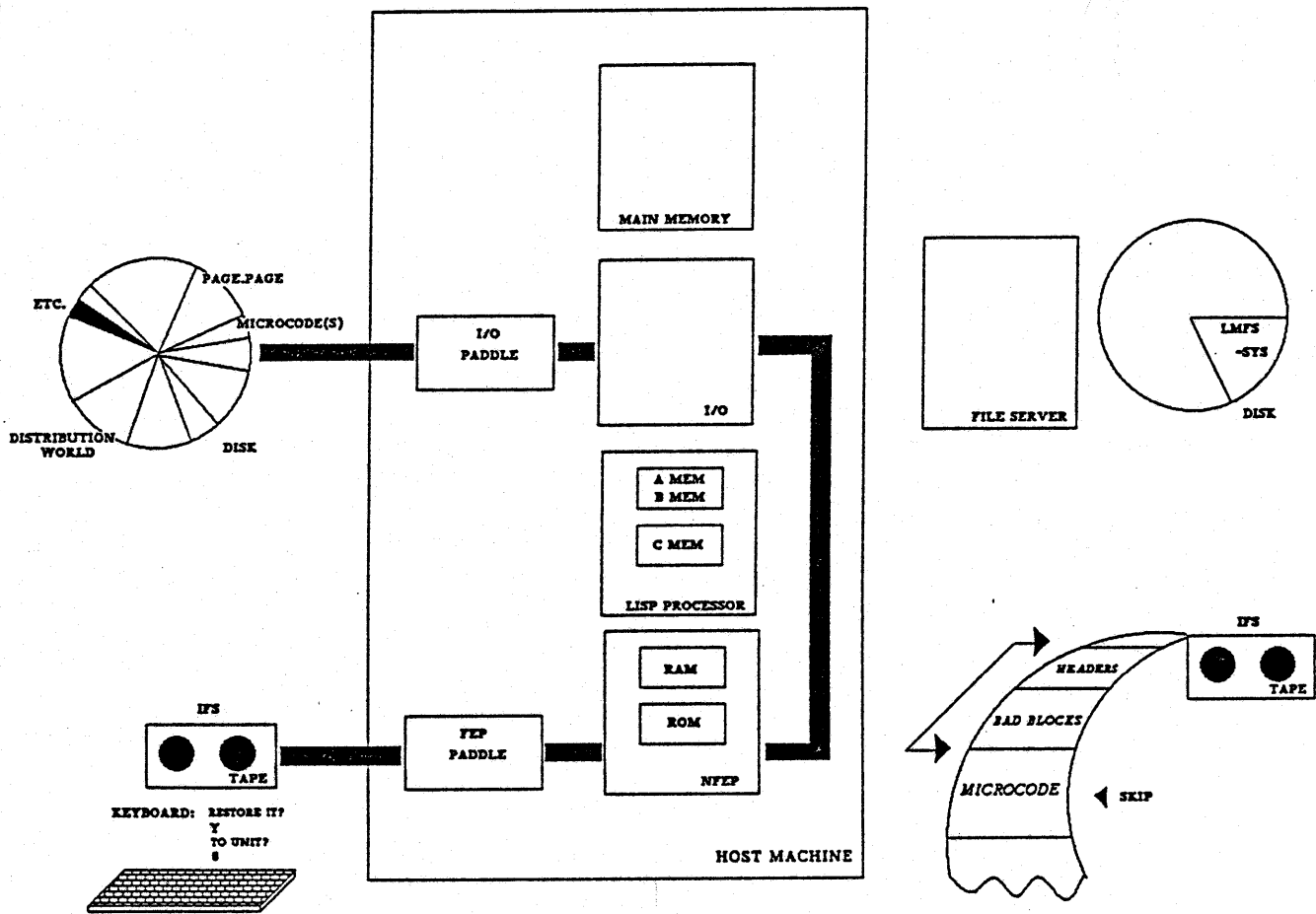
STEP 2: TRANSFER MICROCODE FROM BOL TAPE TO LISP PROCESSOR
 ALLOWING DISK WRITES AT THE FEP LEVEL

NFEP SOFTWARE INSTALLATION



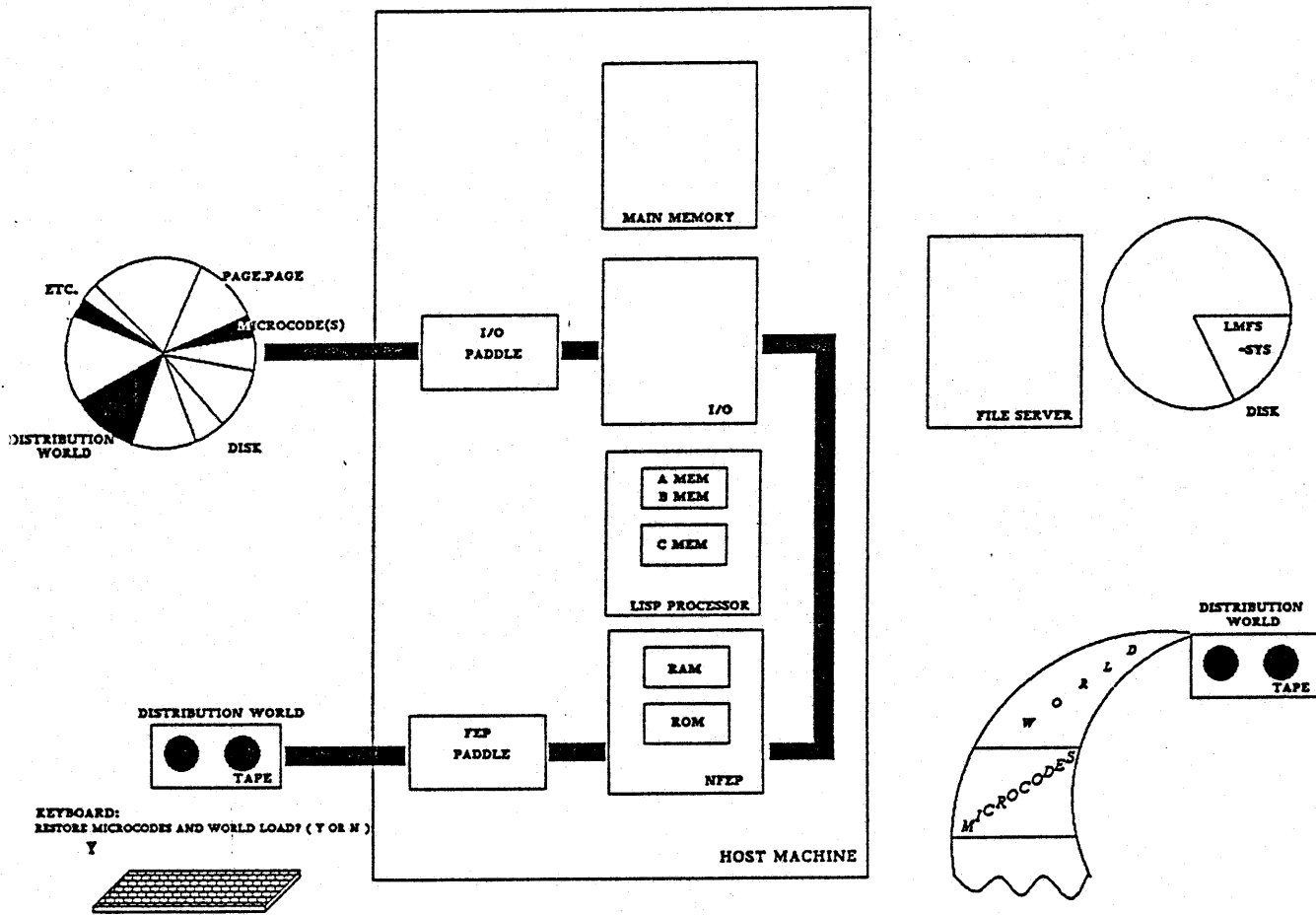
STEP 3: FORMAT DISK

NFEP SOFTWARE INSTALLATION



STEP 4: TRANSFER HEADERS AND BAD BLOCKS FROM IFS TAPE TO DISK

NYEP SOFTWARE INSTALLATION

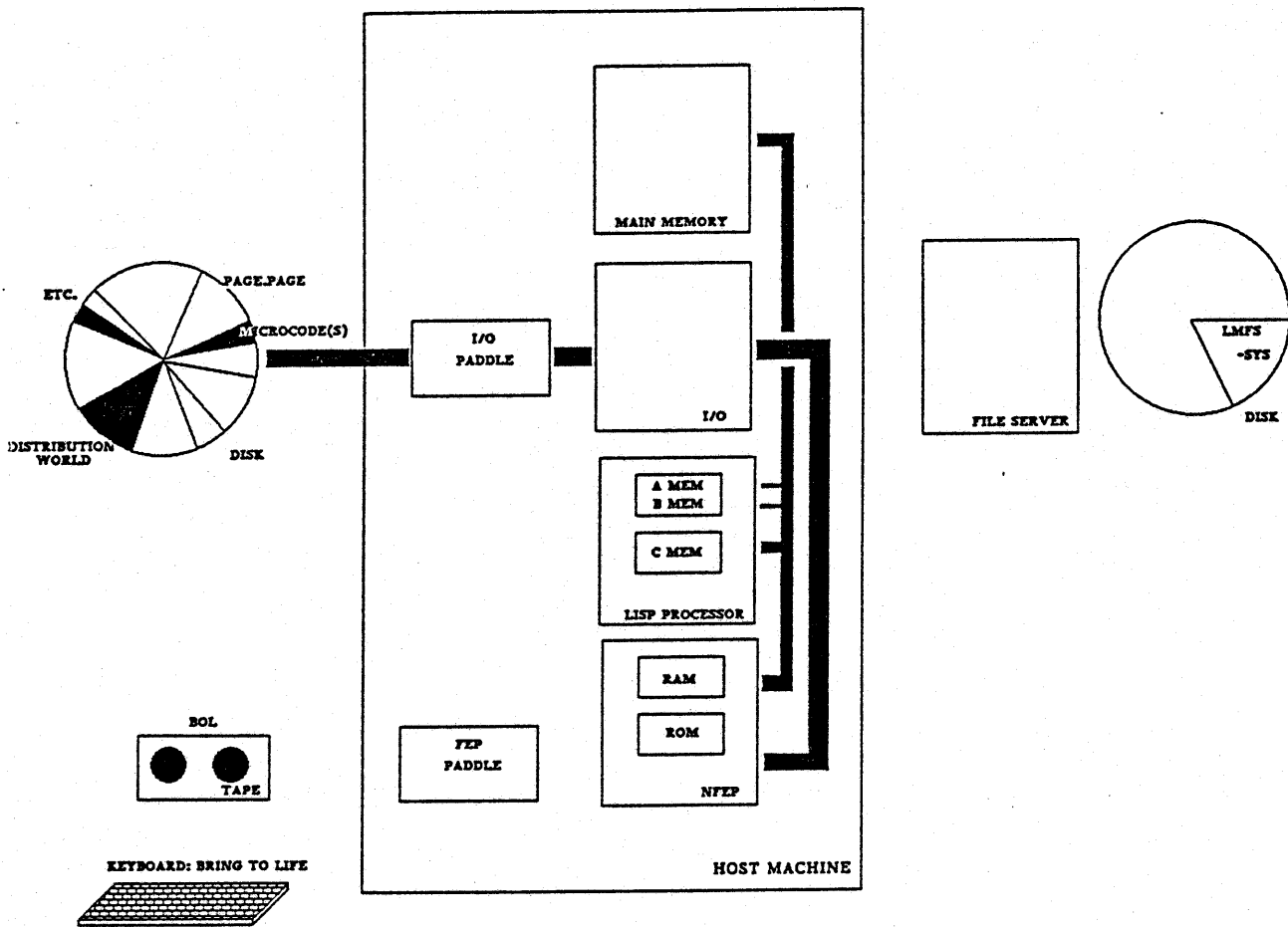


STEP 5: TRANSFER MICROCODE(S) AND WORLD
FROM DISTRIBUTION WORLD TAPE TO DISK UNDER HEADERS PROVIDED

NFEP SOFTWARE INSTALLATION

THE WORLD OF THE BUFFER

- A MERE FACELESS CLONE
OF THE
DISTRIBUTION WORLD
WITH NO INDIVIDUAL IDENTITY -

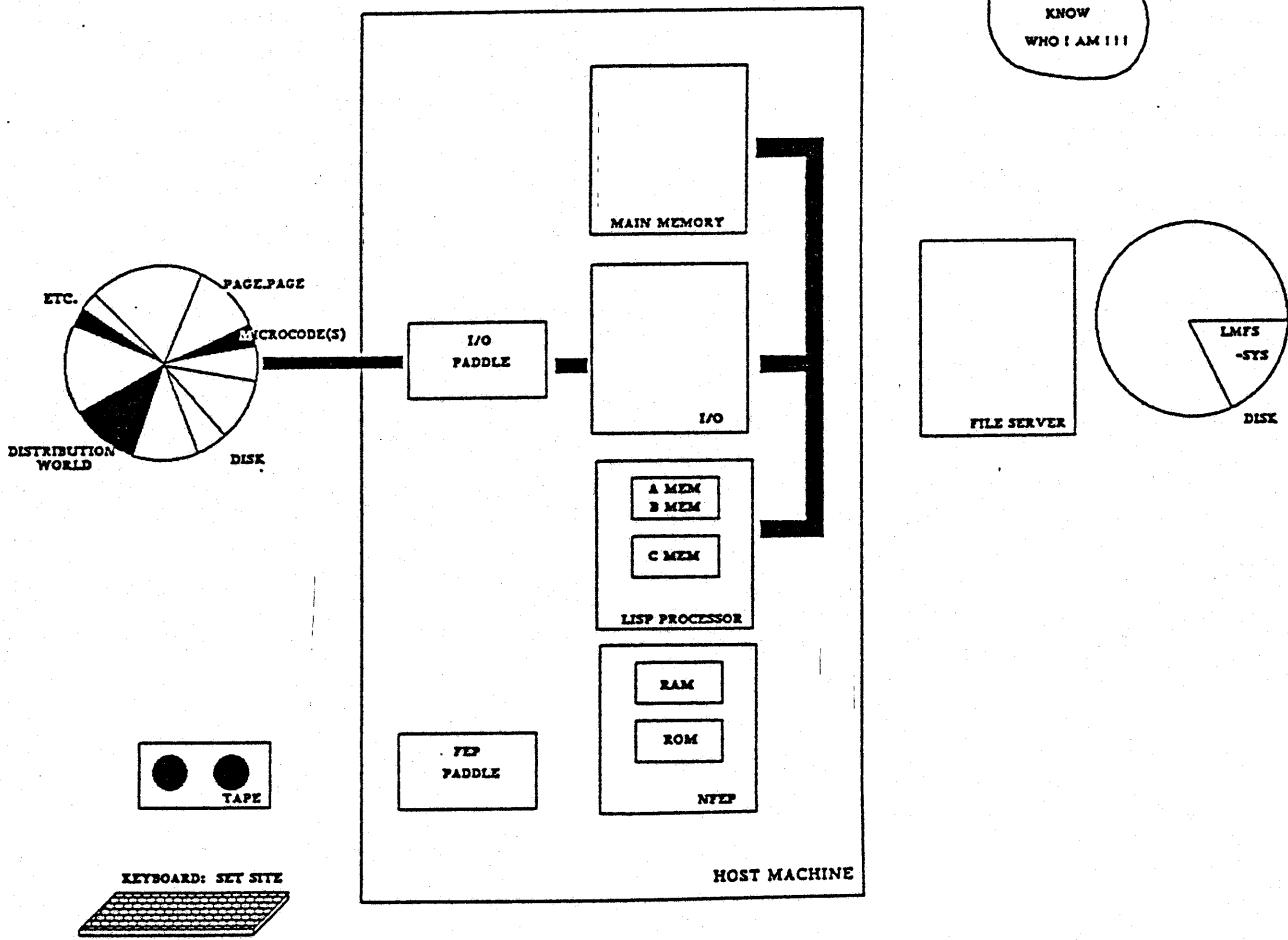


STEP 6: BOOT THE MACHINE WITH A "BRING TO LIFE" COMMAND
BRINGING TO LIFE
"THE WORLD OF THE BUFFER"

NFEP SOFTWARE INSTALLATION

THE WORLD OF THE BUFFER

NOW
I
KNOW
WHO I AM!!!

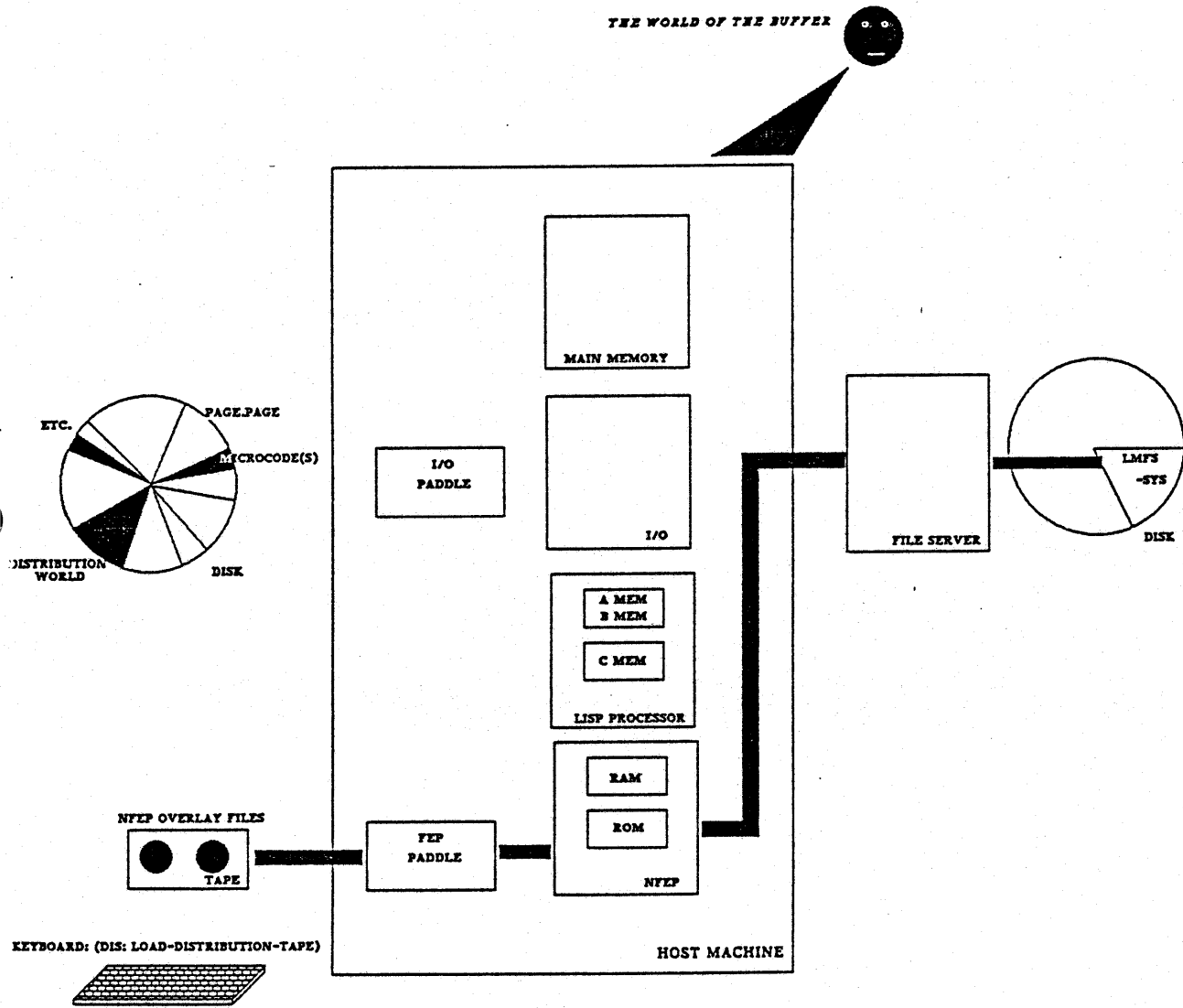


STEP 7: SET SITE - SITE CONFIGURING

"THE WORLD OF THE BUFFER"

NFEP SOFTWARE INSTALLATION

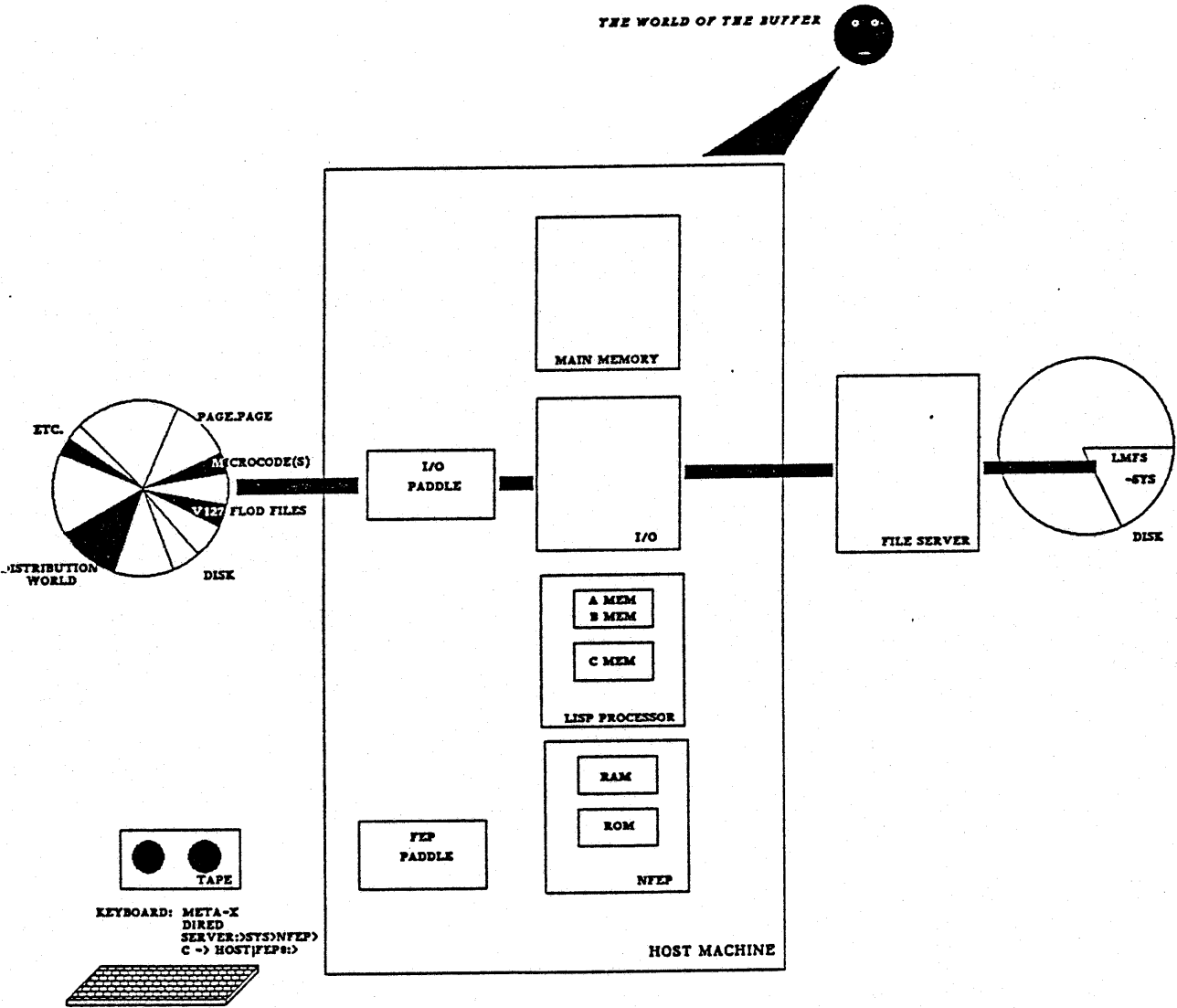
THE WORLD OF THE BUFFER



STEP 3: IF THE FILE SERVER DOES NOT ALREADY HOLD NFEP OVERLAY FILES
TRANSFER NFEP OVERLAY FILES FROM TAPE TO FILE SERVER

NFEP SOFTWARE INSTALLATION

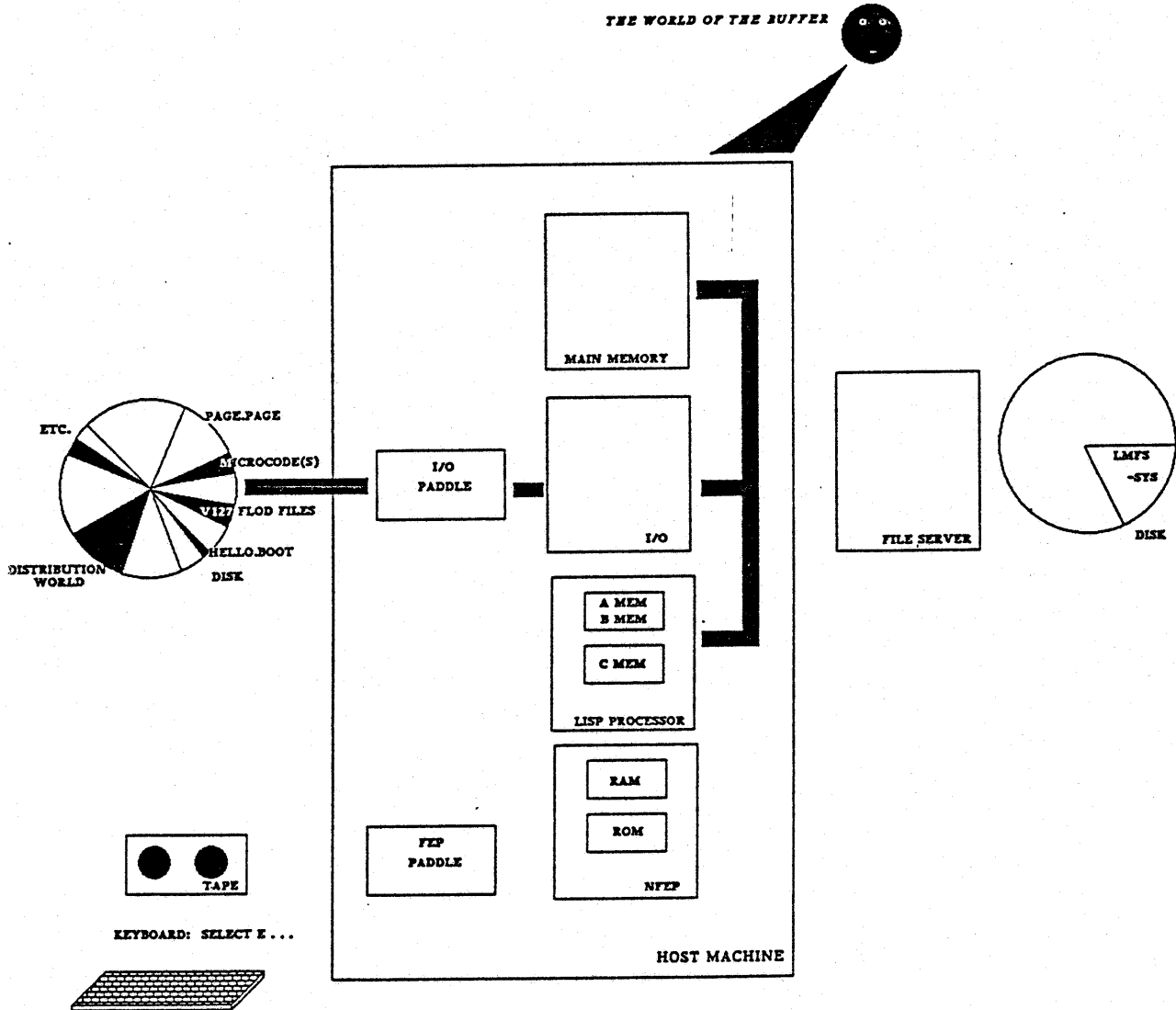
THE WORLD OF THE BUFFER



STEP 9: COPY NFEP OVERLAY FILES FROM FILE SERVER TO LOCAL FEP FILE SYSTEM

NFEP SOFTWARE INSTALLATION

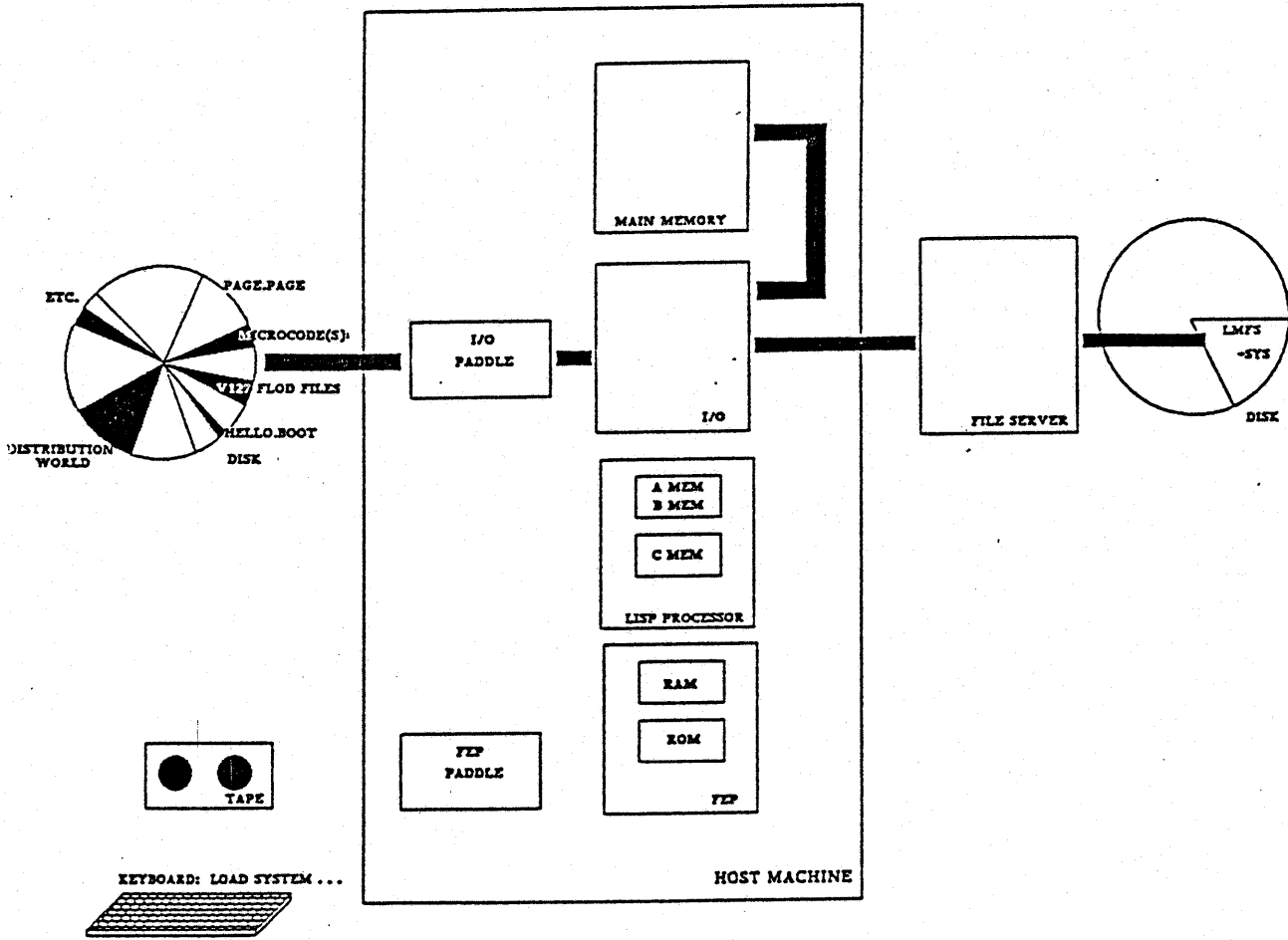
THE WORLD OF THE BUFFER



STEP 10: USING THE EDITOR WRITE A HELLO.BOOT FILE

NFEP SOFTWARE INSTALLATION

THE WORLD OF THE BUFFER



STEP 11: LOAD APPLICABLE SOFTWARE SYSTEMS FURTHER INDIVIDUALIZING

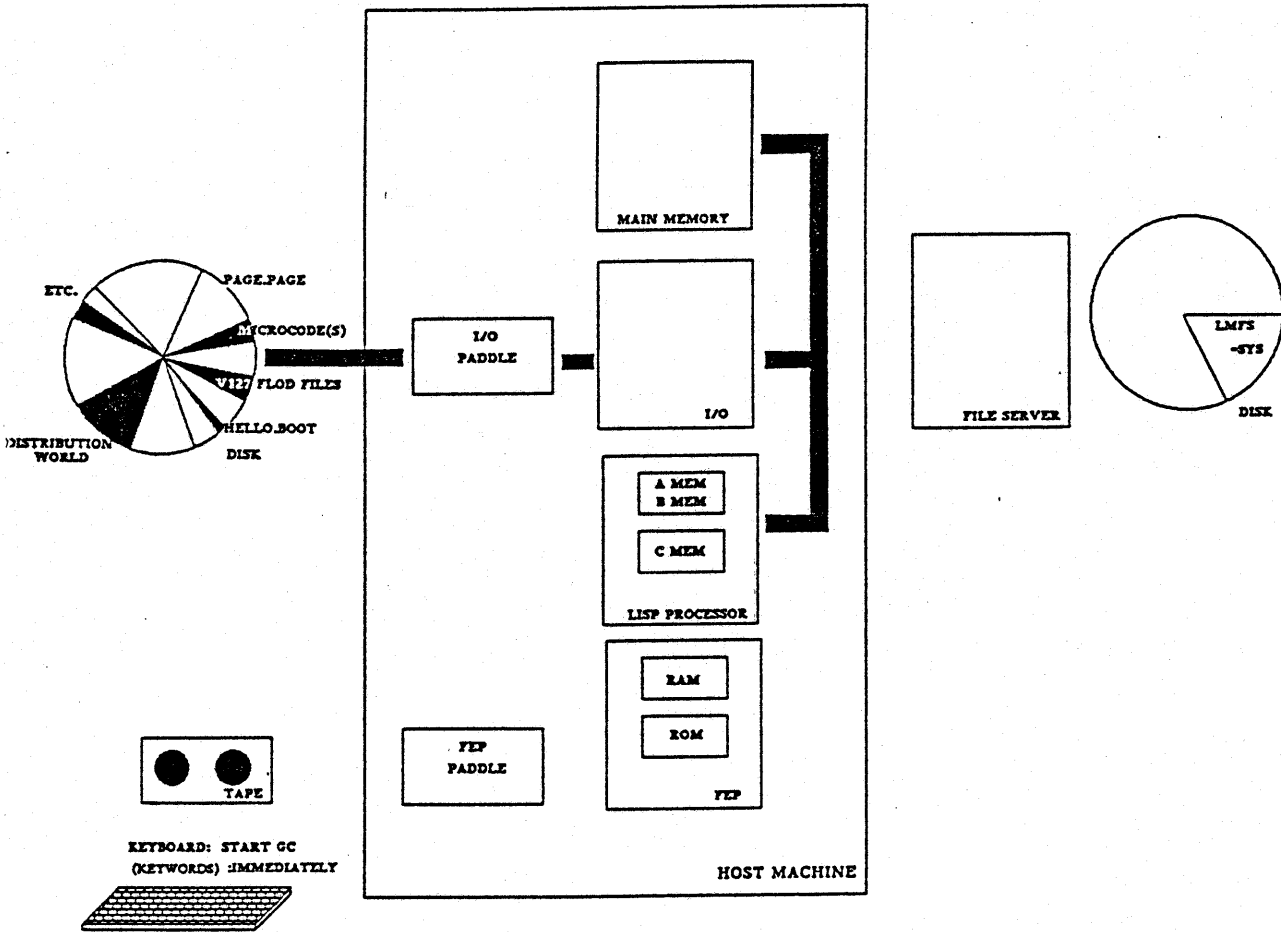
"THE WORLD OF THE BUFFER"

NFEP SOFTWARE INSTALLATION

THE WORLD OF THE BUFFER



YOW!!!



STEP 12: RUN GC TRIMMING DOWN

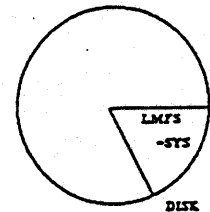
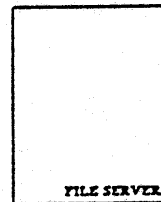
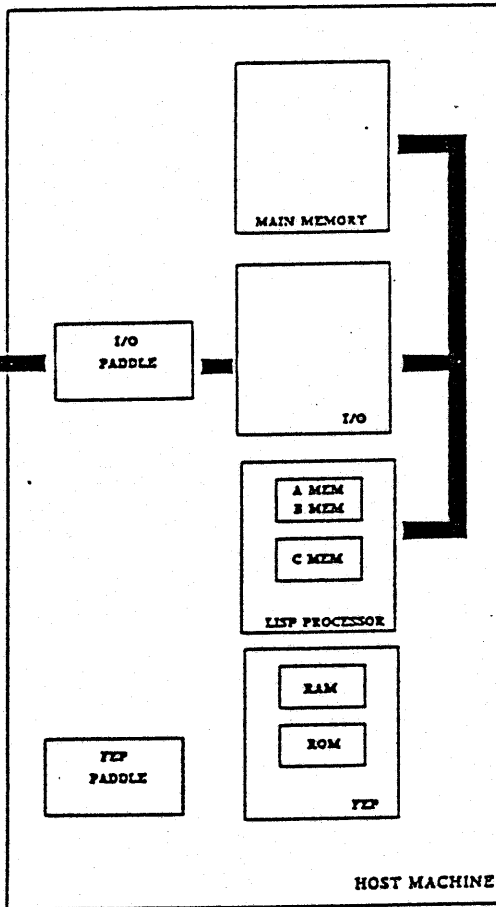
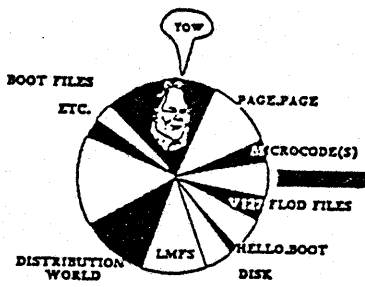
"THE WORLD OF THE BUFFER"

NFEP SOFTWARE INSTALLATION

THE WORLD OF THE BUFFER



YOW !!!



STEP 13: SAVE WORLD TO A NEW AREA ON DISK
 AS NECESSARY, CREATE OR MODIFY BOOT FILES
 INITIALIZE LMFS

NFEP SOFTWARE INSTALLATION

PRE-NFEP FILE TRANSFER
TRANSFERRING FEP FILES FROM TAPE TO DISK

a) Prerequisites

1) Valid microcode is loaded into host C memory

In order to write to disk a valid microcode must be loaded into the host C memory.
- a microcode may be loaded into a host C memory from the tape with the FEP command-

feP> LOAD MICROCODE (default is >microcode.lmic) TAPE: [RETURN]

2) Disk is formatted correctly

a)) Reformat 3600 and 3670 disk via the FEP command- feP0>DISK FORMAT

b)) Reformat 3640 non-NFEP disk or any other non-NFEP disk for which
DISK FORMAT does not work by loading formatting program
from formatting tape with the FEP command-

feP> LOAD FEP (default is >feP.flod) TAPE: [RETURN]

and then enter FEP command- feP0>DISK FORMAT

3) FEP files headers are in place and allocated with proper space.

a)) In order to write to disk initially the disk must have a bad blocks file,
free page file, and FEP file headers in place and allocated with proper space.
Place the initial file system on to disk from IFS tape with the FEP command-

feP>DISK RESTORE

b)) Additional FEP files may be created and allocated with proper space

1)) To create a FEP file prior to 6.1 use LISP commands-

(WITH-OPEN-FILE (A "FEPO:>filename" :direction :output)
(SEND A :ALLOCATE file-size-in blocks.))

-substitute appropriate entries for filename and file-size-in-blocks-
-substitute appropriate FEP # in place of FEPO:> as necessary-
-a period after the file size in blocks number indicates number is decimal-

-or-

Create a new file with c-x, c-f in the ZMACS editor
and save the empty file to the FEP FILE SYSTEM via c-x, c-s

Grow the zero-size FEP file to a larger size, use the following LISP commands-

(DEFUN GROW-FEP-FILE(LENGTH)
(WITH-OPEN-FILE (STREAM NAME :DIRECTION :BLOCK :IF-EXISTS :OVERWRITE)
(SEND STREAM :ALLOCATE LENGTH)))

then input the command-

(GROW-FEP-FILE "FEPO:>filename"file size in blocks.)

-substitute appropriate entries for filename and file-size-in-blocks-
-substitute appropriate FEP # in place of FEPO:> as necessary-
-a period after the file size in blocks number indicates number is decimal-

2)) To create a 6.1 FEP file use command processor command- :CREATE FEP FILE

b) FEP files (WORLD, etc) are transferred from tape into pre-created
files with the DISK RESTORE FEP command

PRE-MFEP FILE TRANSFER

TRANSFERRING FEP FILES FROM DISK TO DISK

a) Prerequisites

- 1) Lisp worlds are loaded in both the transmitting and receiving hosts
- 2) Enough total free space exist on disk to accept new files; FEP file headers, however, need not be in place nor individually allocated with enough space.
- 3) The host machine is not doing an intra-host transfer running 5.2 software (it does not work, 5.2 machines must be loaded from tape).

b) Transferring FEP files from disk to disk

- 1) Transfer 5.2 FEP file between disks within a host or 6.0 FEP files either inter- or intra-host via LISP COMMAND-
(SI:RECEIVE-BAND "transmitting-machine-name" "transmitting-machine-file-name"
"receiving-machine-file-name")
- 2) Transfer 6.1 FEP files via command processor command :COPY FILE or :COPY WORLD
(files names from host are formatted- HOST/FEPO:>file name)

TRANSFERRING FEP FILES FROM DISK TO TAPE

a) Prerequisites

- 1) FEP files exist
- 2) Tape installed in cart tape

- b) FEP files are written to tape from the Lisp world level via the LISP command-
(TAPE:WRITE-FEP-FILES-TO-TAPE)

PRE-NFEP FILE TRANSFER

TRANSFERRING LMFS FILES FROM TAPE TO DISK

a) Prerequisites

- 1) LISP world is in place on host machine
- 2) Initial LMFS file is initialized

The LMFS file is initialized from the FILE SYSTEM MAINTENANCE window by clicking left on LOCAL LMFS OPERATIONS in level 1, LMFS MAINTENANCE OPERATIONS in level 2, and INITIALIZE in level 3

NOTE: Auxilliary LMFS file partitions (eg. on additional disks) may be initialized by clicking left on LOCAL LMFS OPERATIONS in level 1, clicking left on LMFS MAINTENANCE OPERATIONS in level 2, and clicking right on INITIALIZE in level 3

Click left on and input file name following "PARTITION FEP FILE"

Click left on "AUXILLIARY PARTITION"

Following prompt, input file size in blocks

An auxilliary partition is created and zeroed and an fspt.fspt file is automatically created on the initial disk linking the auxilliary partition to the initial LMFS file

- b) LMFS files in DISTRIBUTION format are transferred from tape to disk from the LISP window via lisp command - (DIS: LOAD-DISTRIBUTION-TAPE)
- c) LMFS files in CARRY format are transferred from tape to disk from the LISP window via lisp command - (TAPE: CARRY-LOAD)
- d) LMFS files in LMFS format are transferred from tape to disk from the FILE SYSTEM MAINTENANCE window by clicking on LOCAL LMFS OPERATIONS in level 1 and READ BACKUP TAPE in level 2

TRANSFERRING LMFS FILES FROM DISK TO DISK

a) Prerequisites

- 1) LISP world is in place on both hosts
 - 2) LMFS file is initialized
- b) LMFS files are copied from disk to disk via ZMACS operations and wildcards
- 1) Wildcards are asterisks used in place of directory or file names
 - 2) Wildcard example:

A:>*>*. *.*

specifies host /directories/files/types/versions

TRANSFERRING LMFS FILES FROM DISK TO TAPE

- a) DISTRIBUTION format LMFS files are transferred from disk to tape from LISP via lisp command (DIS: WRITE-DISTRIBUTION-TAPE)
- b) CARRY format LMFS files are transferred from disk to tape from LISP via lisp command (TAPE: CARRY-DUMP)
- c) LMFS format LMFS files are written to tape from the FILE SYSTEM MAINTENANCE window by clicking on LOCAL LMFS OPERATIONS in level 1 and COMPLETE DUMP or INCREMENTAL DUMP in level 2

3600 SERIES PREVENTATIVE MAINTENANCE PROGRAM

THE FOLLOWING IS A RECOMMENDED PREVENTATIVE MAINTENANCE PROGRAM FOR 3600 SERIES SYSTEMS. PM'S FOR EQUIPMENT LISTED IN ENTRIES II. THROUGH VI. ARE EXCERPTED FROM APPLICABLE VENDOR MANUALS. PM FREQUENCY FOR ITEMS MARKED "AS REQUIRED" ARE DISCRETIONARY (i.e., MAY BE SET BY INDIVIDUAL FIELD OFFICES).

EQUIPMENT	RECOMMENDED FREQUENCY
I. 3600/3640/3645/3670/3675 SYMBOLIC PROCESSING UNITS	
A. CLEAN SPU EXTERIOR WITH WINDEX OR OR EQUIVALENT COMMERCIAL GRADE PLASTIC CLEANER	AS REQUIRED
B. CLEAN SPU INTERIOR OF DUST	AS REQUIRED
C. CLEAN MOUSE WITH 95% ISOPROPYL ALCOHOL OR EQUIV.	AS REQUIRED
D. OPTIONALLY CHECK DC VOLTAGES AND ADJUST TO 0.5% ACCURACY	AS REQUIRED
II. B & W AND COLOR CONSOLES	
A. CLEAN INSIDE OF CHASSIS OF DUST	AS REQUIRED
B. CLEAN SCREEN WITH OCLI CLEANER (P/N 128295). WIPE AND DRY.	AS REQUIRED
C. CLEAN CHASSIS EXTERIOR WITH WINDEX OR OR EQUIVALENT COMMERCIAL GRADE PLASTIC CLEANER	AS REQUIRED
D. OPTIONALLY CHECK DC VOLTAGES AND ADJUST TO 0.5% ACCURACY	AS REQUIRED
E. INSPECT PICTURE QUALITY AND PERFORM ANY ADJUSTMENTS INDICATED	AS REQUIRED

III. TAPE DRIVES

A. CIPHER TD 20 (3600)

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1. CLEAN HEAD ASSEMBLY AND TAPE CLEANER
WITH CLEAN, LINTLESS COTTON SWAB DAMPENED WITH IBM HEAD CLEANING SOLUTION
OR 95% ISOPROPYL ALCOHOL (TAPE HEAD CLEANER P/N 180142, REFILL 180148) | 8 HOUR INTERVALS IN NORMAL USE
2 HOUR INTERVALS WHEN USING
NEW TAPE CARTRIDGES |
| 2. CLEAN CAPSTAN WITH CLEAN, LINTLESS COTTON SWAB
MOISTENED WITH DISTILLED WATER WHILE MANUALLY ROTATING CAPSTAN.
DO NOT TOUCH CAPSTAN WITH FINGERS. | 8 HOUR INTERVALS IN NORMAL USE
2 HOUR INTERVALS WHEN USING
NEW TAPE CARTRIDGES |

B. ARCHIVE #5945 SCORPION (3640)

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1. CLEAN HEAD ASSEMBLY AND TAPE HOLE SENSOR WITH CLEAN, LINTLESS COTTON SWAB
DAMPENED WITH IBM HEAD CLEANING SOLUTION OR 95% ISOPROPYL ALCOHOL | 8 HOUR INTERVALS IN NORMAL USE
2 HOUR INTERVALS WHEN USING
NEW TAPE CARTRIDGES |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|

C. ARCHIVE #9045 SIDEWINDER (3670)

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1. CLEAN HEAD ASSEMBLY AND TAPE HOLE SENSOR WITH CLEAN, LINTLESS COTTON SWAB
DAMPENED WITH IBM HEAD CLEANING SOLUTION OR 95% ISOPROPYL ALCOHOL | 8 HOUR INTERVALS IN NORMAL USE
2 HOUR INTERVALS WHEN USING
NEW TAPE CARTRIDGES |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|

D. CIPHER TD 80

- | | |
|--------------------------------------------------------------------------------------------------------------|--------------------------------|
| 1. CLEAN HEADS
USING LINT-FREE COTTON SWAB MOISTENED WITH TRICHLOROETHANE OR EQUIV HEAD CLEANER | DAILY |
| 2. CLEAN HOUSING WITH WINDEX OR EQUIVALENT PLASTIC CLEANER | AS REQUIRED |
| 3. CLEAN TACHOMETER ROLLER AND GUIDES
USING LINT-FREE COTTON SWAB MOISTENED WITH TRICLORO-TRIFLUOROETHANE | DAILY |
| 4. CLEAN TAPE CLEANER MOISTENED WITH TRICHLOROETHANE OR EQUIV HEAD CLEANER | DAILY |
| 5. CLEAN REEL-HUB PADS
USING LINT-FREE COTTON SWAB MOISTENED WITH TRICLORO-TRIFLUOROETHANE | DAILY |
| 6. REPLACE REEL MOTORS | AFTER 5000 HOURS OF NORMAL USE |
| 7. CLEAN FILTER (BLOW OFF LOOSE DIRT) | AFTER 1000 HOURS OF NORMAL USE |

IV. DISK DRIVES

A. CDS T300 AND T306

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1. CLEAN EXTERNAL CABINET SURFACES WITH WINDEX OR EQUIV. | BI-MONTHLY |
| 2. EXTEND HEADS INTO DISK PACK NO MORE THAN 3/8-INCH. INSPECT READ-WRITE HEADS FOR DAMAGE OR CONTAMINATION. REPLACE OR CLEAN WITH LINT-FREE CLOTH DAMPENED WITH FREON TF AS NECESSARY. | BI-MONTHLY |
| 3. INSPECT AND CLEAN CARRIAGE AND WAY ASSEMBLY RAILS FOR POSSIBLE DUST, DIRT, OR CONTAMINATION | BI-MONTHLY |
| 4. WIPE THE INSIDE OF THE AIR SHROUD WITH A LINT-FREE CLOTH DAMPENED WITH ALCOHOL. WIPE DRY AND REMOVE RESIDUE. CLEAN THE INSIDE OF THE PACK ARE LID WITH ALCOHOL DAMPENED CLOTH. WIPE DRY AND REMOVE RESIDUE. INSPECT LID GASKET AND WIPE CLEAN WITH ALCOHOL-DAMPENED CLOTH. CLEAN THE SPINDLE SURFACE WITH 30% SOLUTION ALCOHOL. USE ALCOHOL-MOISTENED Q-TIP TO CLEAN CLEAN THREADS OF SPINDLE HOLE - WIPE DRY WITH SWAB. | BI-MONTHLY |
| 5. INSPECT AND CLEAN SPINDLE GROUNDING BRUSH.
(RESISTANCE BETWEEN BRUSH AND SPINDLE SHOULD BE LESS THAN 0.5 OHMS.) | BI-MONTHLY |
| 6. INSPECT SPINDLE DRIVE BELT FOR FRAYING OR DAMAGE. REPLACE AS NECESSARY. | BI-MONTHLY |
| 7. INSPECT INTAKE FILTER. CLEAN WITH VACCUUM. REPLACE IF BADLY CLOGGED. | BI-MONTHLY |
| 8. INSPECT AIR SYSTEM BOOT FOR DETERIORATION. REPLACE AS NECESSARY. | BI-MONTHLY |
| 9. CLEAN INTERNAL CABINET SURFACES WITH SOFT BRUSH OR VACCUUM. | SEMI-ANNUALLY |
| 10. CHECK DC VOLTAGES (EXCEPT + OR - 50 V). ADJUST TO 0.5% ACCURACY AS NECESSARY. | SEMI-ANNUALLY |
| 11. CHECK HEAD ALIGNMENT. | SEMI-ANNUALLY |
| 12. CHECK PROPER OPERATION OF ALL MICROSWITCHES. ADJUST OR REPLACE AS NECESSARY. | SEMI-ANNUALLY. |
| 13. CHECK PROPER OPERATION OF SPINDLE DRIVE SYSTEM. ADJUST AS NECESSARY. | SEMI-ANNUALLY |
| 14. REPLACE ABSOLUTE AIR FILTER. | ANNUALLY |

B. FUJITSU M2284

-NO ROUTINE PM REQUIRED

C. FUJITSU M2294

-NO ROUTINE PM REQUIRED

D. FUJITSU M2351

- | | |
|-----------------------|--------------------------|
| 1. REPLACE AIR FILTER | ANNUALLY OR AS NECESSARY |
|-----------------------|--------------------------|

E. NEC D2257

-NO ROUTINE PM IS REQUIRED.

F. MAXTOR XT-1140

-NO ROUTINE PM IS REQUIRED.

G. MAXTOR XT-2190

-NO ROUTINE PM IS REQUIRED.

H. PRIAM P807

-NO ROUTINE PM IS REQUIRED.

I. CDC EMD368

-NO ROUTINE PM NECESSARY

J. CDC EMD515

-NO ROUTINE PM NECESSARY

V. PRINTERS

A. DMP-1

- | | |
|-------------------------------------------------------------------------|-------------|
| 1. WIPE OUT INK RIBBON DEBRIS AT TIP OF PRINT HEAD AND CARD GUIDE ASSY. | AS REQUIRED |
| 2. CLEAN THE PLATEN WITH FEDRON OR TYPEWRITER PLATEN CLEANER. | AS REQUIRED |
| 3. CLEAN THE PRINTER CASE WITH WINDEX OR EQUIV. | AS REQUIRED |
| 4. INSPECT PRINT QUALITY AND PERFORM ANY ADJUSTMENTS INDICATED | AS REQUIRED |

B. LGP-1

1. REPLACE THE FOLLOWING ASSEMBLIES:

SEPARATION BELT CLEANER	8,000 PRINTS
SEPARATION BELT	24,000 PRINTS
CASSETTE SIDE RETAINERS	48,000 PRINTS
CORONA WIRES	48,000 PRINTS
SCRAPER	48,000 PRINTS
SECONDARY SCRAPER	48,000 PRINTS
CLEANING BLADE, ELECTRODE ROLLER	48,000 PRINTS
PUMP FILTER	96,000 PRINTS
AIR FILTER	96,000 PRINTS
ANTI-DUST AIR FILTER (LBP10II ONLY)	96,000 PRINTS
SEPARATION ROLLER	96,000 PRINTS
CLEANING BLADE, PHOTSENSITIVE DRUM	96,000 PRINTS
EXPOSURE LAMP	96,000 PRINTS
CLEANING ROLLER	96,000 PRINTS
BUSHING	96,000 PRINTS
SPACER ROLLER	96,000 PRINTS
2. CHECK AND CLEAN CORONAS	AS REQUIRED
3. CHECK AND CLEAN SEPARATION BELT ASSY.	AS REQUIRED
4. CHECK AND CLEAN EDGE OF CLEANING BLADE FOR THE ELECTRODE ROLLER	AS REQUIRED
5. CHECK AND REPLACE AS NECESSARY THE TONER-SUPPLY VALVE	AS REQUIRED
6. CHECK AND CLEAN TWO DRAIN HOLES IN DEVELOPER TRAY	AS REQUIRED
7. REMOVE ACCUMULATED TONER ON THE DRUM FLANGE	AS REQUIRED
8. INSPECT PRINT QUALITY AND PERFORM ANY ADJUSTMENTS INDICATED	AS REQUIRED

C. LGP-2

1. INSPECT THE FOLLOWING ITEMS AND REPLACE IF NECESSARY:

SEPARATION BELT	50,000 PRINTS
FUSING ASSY	100,000 PRINTS
PRE-EXPOSURE UNIT	100,000 PRINTS
TRANSFER CORONA ASSY	100,000 PRINTS
SEPARATION/FEEDER UNIT	100,000 PRINTS
FEED ROLLER	100,000 PRINTS
PAPER FEED ROLLER	100,000 PRINTS
PAPER PICKUP ROLLER	100,000 PRINTS

2. INSPECT THE LIGHT BLOCKING SHUTTER AND REPLACE IF NECESSARY.

AS REQUIRED

3. CLEAN THE FOLLOWING ITEMS:

SEPARATION CLAWS	AS REQUIRED
DELIVERY GUIDE	AS REQUIRED
SEPARATION GUIDE	AS REQUIRED
PAPER GUIDE	AS REQUIRED
TONER FEED ROLLERS	AS REQUIRED
TRANSFER GUIDES	AS REQUIRED
TRANSFER CORONA ASSEMBLY	AS REQUIRED
SEPARATION BELT	AS REQUIRED
SEPARATION ROLLER	AS REQUIRED
SEPARATION GUIDE	AS REQUIRED
FUSING FEED ROLLER	AS REQUIRED
PRIMARY CORONA WIRE	AS REQUIRED
PROTECTIVE SHEILD OF PHOTSENSITIVE DRUM	AS REQUIRED
PHOTSENSITIVE DRUM SURFACE	AS REQUIRED

4. INSPECT PRINT QUALITY AND PERFORM ANY ADJUSTMENTS INDICATED

AS REQUIRED

VI. MODEMS

A. RACAL VEDIC VA 3450 P/S/G-SERIES

-NO ROUTINE PM IS REQUIRED.

B. CONCORD 224

-NO ROUTINE PM IS REQUIRED.