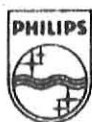


PRELIMINARY

X1215/16 (ABOVE SERIAL NUMBER 2000)
Cartridge Disk Drive Unit



**Data
Systems**

A PUBLICATION OF
PHILIPS DATA SYSTEMS B.V.
THE HAGUE, THE NETHERLANDS

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Great care has been taken to ensure that the information contained in this handbook is accurate and complete. Should any error or omissions be discovered, however, or should any user wish to make a suggestion for improving this handbook, he is invited to send the relevant details to:

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	CONTENTS	page 0-1 thr. 0-6
VOLUME I :	INTRODUCTION	page 1-1 thr. 1-12
1-1	General Description	1-3
1-2	Fixed Disk and Single Disk Cartridge	1-4
2	FUNCTIONAL DESCRIPTION	1-5
3	PHYSICAL DESCRIPTION	1-7
3-1	Covers	1-7
3-2	Cartridge Holder	1-7
3-3	Fixed Disk	1-7
3-4	Spindle	1-7
3-5	Head Positioner Assembly	1-7
3-6	Switching Unit	1-7
3-7	Electronic Assemblies	1-7
3-8	Electronics Cage	1-7
3-9	Cleaning Mechanism	1-9
3-10	Operators Panel	1-9
4	TECHNICAL DATA	1-10
4-1	Performance Characteristics	1-10
4-2	Physical Characteristics	1-10
4-3	Electrical Requirements	1-10
4-4	Environmental Requirements	1-10
5	INTERFACE SIGNALS	1-11
6	OPTIONS	1-12
VOLUME II:	OPERATION	page 2-1 thr. 2-6
1	OPERATORS PANEL	2-2
1-1	General	2-2
1-2	Button and Indicator Functions	2-2
2	CARTRIDGE HANDLING	2-3
2-1	Cartridge Handling and Storage	2-3
2-2	Loading	2-3
2-3	Unloading	2-3
3	DISK DRIVE HANDLING	2-6
3-1	Starting Procedure	2-6
3-2	Stopping Procedure	2-6
VOLUME III:	THEORY	page 3-1 thr. 3-32
1	GENERAL	3-3
2	INTERFACE DIALOGUE	3-5
3	DISK DRIVE ACTIONS	3-7
4	MAJOR ASSEMBLIES	3-9
4-1	Main Drive Motor	3-9
4-2	Brush Motor	3-9
4-3	Index/Sector Transducers	3-9
4-4	Positioner	3-9
4-5	Speed Transducer	3-9
4-6	Displacement Pick-up System	3-9
4-7	Track Zero Indicator	3-9
5	INTERFACE	3-10
5-1	Logic Levels	3-10
5-2	Input Signals	3-10
5-2-1	Unit Select Signal	3-10
5-2-2	Tagline and address busline signals	3-10
5-2-3	Set unit unsafe signal	3-11
5-2-4	Write data signal	3-12
5-3	Output Signals	3-12
5-3-1	Index signal cartridge (Fixed Disk)	3-12
5-3-2	Sector signal cartridge (Fixed Disk)	3-12
5-3-3	Unit ready signal	3-12
5-3-4	On cylinder signal	3-12
5-3-5	Unit unsafe 1 signal	3-12
5-3-6	Unit unsafe 2 signal	3-13
5-3-7	Attention	3-13
5-3-8	Read data signal	3-13

6	PRINCIPLES OF OPERATION	page 3-14
6-1	Servo System	3-14
6-2	Velocity and Acceleration	3-14
6-3	Meander System	3-15
6-4	Voice-Coil System	3-15
6-5	Servo Operations	3-15
6-6	Position Servo Loop	3-17
6-7	Additional Control Signals	3-19
6-8	Window Functions	3-19
6-9	Recording Principles	3-19
6-10	Write Operation	3-19
6-11	Read Operation	3-21
6-12	Read/Write Protection	3-21
7	FUNCTIONAL EXPLANATION	3-23
7-1	Power On	3-23
7-2	Start	3-23
7-3	First Seek	3-23
7-4	Normal Seek	3-25
7-5	Track Count Operation	3-27
7-6	Place Positioning	3-27
7-7	Positioning Mode	3-27
7-8	Return to Zero Seek	3-29
7-9	Go to Retracted Position Seek	3-29
7-10	Writing	3-31
7-11	Reading	3-31
7-12	Stop	3-31
8	POWER DISTRIBUTION	3-32
8-1	Power Supply	3-32
VOLUME IV:	DIAGRAMS	page 4-1 thr. 4-52
1	KEY TO DIAGRAMS	
1-1	General	
1-2	Logic Symbols	
2	SIGNAL NAMES	
3	DIAGRAMS	4-15
	Card CUP	4-17
	Card DBC	4-19
	Card DC	4-21
	Card FI	4-23
	Card IC	4-25/27
	Card LAT	4-29
	Card Meander	4-31
	Card PA	4-33
	Card RR	4-35
	Card RW	4-37/39
	Card SE	4-41
	Card SS	4-43
	Power Card	4-45
	Service Card Part A	4-47
	Service Card Part B	4-49
	Power Supply and Distribution	4-51
VOLUME V:	ELECTRONICS	page 5-1 thr. 5-6
1	SPECIAL CIRCUIT	5-2
1-1	Limiter	5-2
1-2	Relay Driver	5-2
1-3	Electronic Switch	5-2
1-4	Differential Amplifier	5-3
1-5	Operational Amplifier	5-4
1-6	Window Circuit	5-4
1-7	Meander Card	5-5
1-8	Voice Coil Current Distribution	5-5
VOLUME VI:	MECHANICS	page 6-1 thr. 6-6
1	UNIT STRUCTURE	
1-1	Dust Covers	6-3
1-2	Switching Unit	6-3
1-3	Cooling and Cleaning Unit	6-3
1-4	Cartridge Holder	6-3
1-5	Spindle Mechanism	6-4
1-6	Positioner Mechanism	6-4
1-7	Electronic Cage	6-5

VOLUME VII:	MAINTENANCE	page 7-1 thr. 7-
1	MAINTENANCE	7-3
1-1	General	7-3
1-2	Special Tools	7-3
1-3	Materials	7-3
1-4	Exerciser	7-5
1-5	Exerciser Operation	7-5
2	PREVENTIVE MAINTENANCE	7-6
2-1	Scheduled Maintenance 1000 hrs	7-6
2-2	Scheduled Maintenance 2000/4000 hrs	7-7
3	ELECTRONIC ADJUSTMENTS	7-8
3-1	Micro-Switches	6-8
3-2	Y-Direction Meander Block	7-9
3-3	Adjustment of the Meander Card potentiometers	7-10
3-4	Optical Zero Adjustment	7-10
3-5	Positioning Speed Adjustment	7-10
3-6	Adjustment of Heads 0 and 1	7-15
3-7	Adjustment of the Index Unit (Cartridge)	7-16
3-8	Adjustment of the Index Unit (Fixed Disk)	7-17
3-9	Adjustment Temp. Compensation	
4	MECHANICAL ADJUSTMENTS	7-18
4-1	Index Unit Cartridge	7-18
4-2	Index Unit Fixed Disk	7-18
4-3	Retracted Switch	7-19
4-4	Cleaning the Heads	7-19
5	REPLACEMENTS	7-21
5-1	General	7-21
5-2	Airfilters	7-21
5-3	Lock Magnet	7-21
5-4	Clamp Switches	7-21
5-5	Cleaning Switch	7-21
5-6	Retracted Switch	7-23
5-7	Positioner Block Magnet	7-23
5-8	Optical Zero Unit	7-23
5-9	Cleaning Brushes	7-23
5-10	Power Supply Card	7-23
5-11	Power Transistors	7-23
5-12	Push Button and Indicators	7-25
5-13	Lamp Push Button and Indicators	7-25
5-14	Index Unit Cartridge	7-25
5-15	Fixed Disk	7-25
5-16	Spindle	7-25
5-17	Pack Motor	7-27
5-18	Heads	7-27
5-19	Switching Unit	7-27
5-20	Meander	7-29
5.21	AFTER HEADCRASH PROCEDURE, AFTER REPAIR PROCEDURE	7-29 7-29
6	TROUBLE SHOOTING	
VOLUME VIII	PARTS LIST	page 8-1 thr 8-68
VOLUME IX	WIRING LIST	page 9-1 thr 9-
VOLUME X	INSTALLATION	page 10-1 thr.10-6
1	INSTALLATION	10-3
1-1	Space location	10-3
1-2	Mounting in the rack	10-3
1-3	Interface connections	10-3
1-4	Power connections	10-3
1-5	Ground connections	10-3
1-6	Input power requirements	10-4
2	CHECK OUT AND START UP PROCEDURE	10-5
VOLUME XI	PACKING AND UNPACKING	page 11-1 thr 11-6
1	GENERAL	11-2
2	MACHINE HANDLING	11-3
3	PAKING AND UNPACKING	11-5
3-1	Packing	11-5
3-2	Unpacking	11-5

X1215/16 (ABOVE SERIAL NUMBER 2000)

Cartridge Disk Drive Unit

Vol.I: Introduction



**Data
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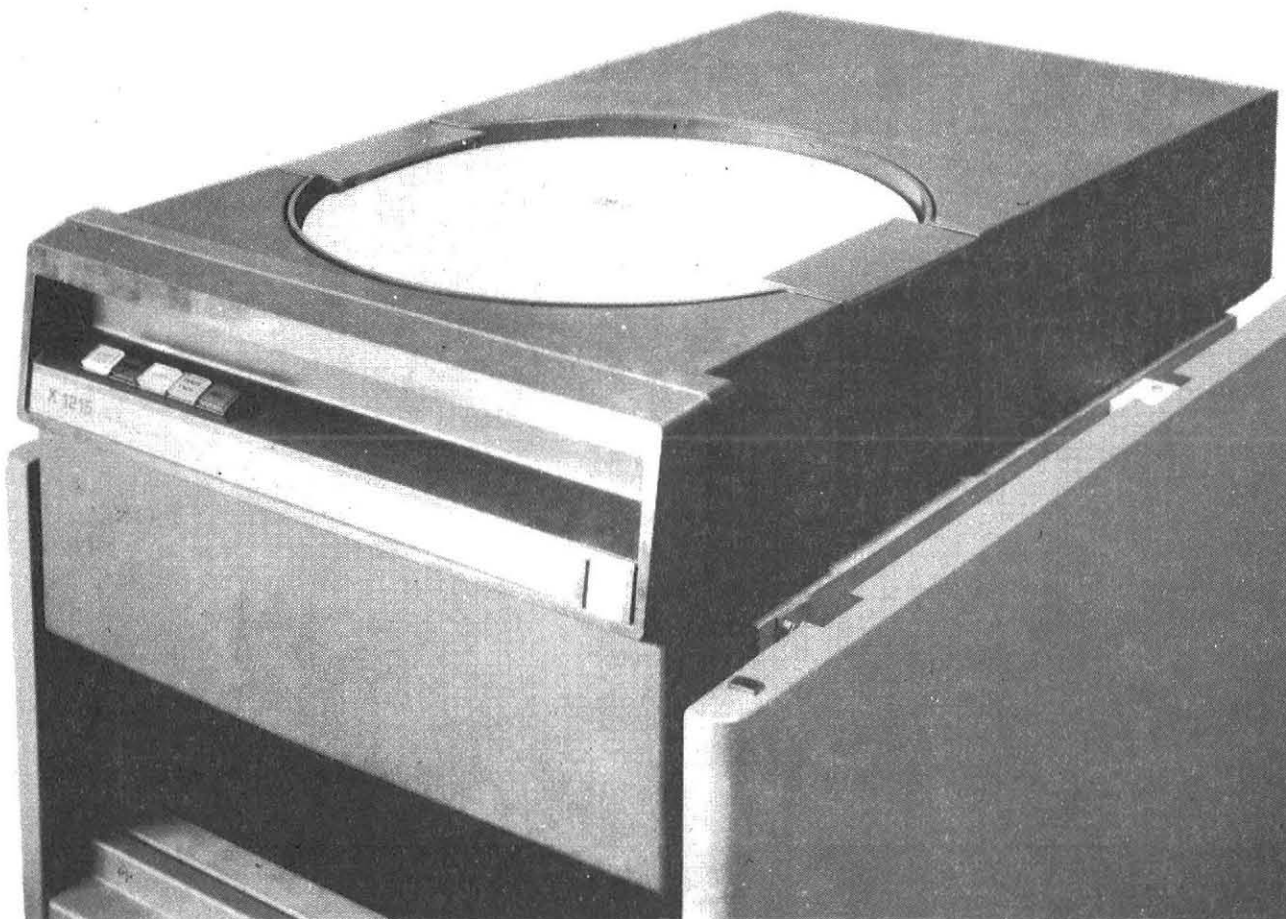


Fig. 1-1 CARTRIDGE DISC DRIVE UNIT

1.1 GENERAL DESCRIPTION. (figure 1-1, 1-2)

The X 1215 CDD is a random access data storage device especially designed for use in a star configuration, it is suitable for rack-cabinet installations or stand alone situation. The purpose of a CDD is to provide for the storage of data in a form which allows easy retrieval of these data when required. These requirements are satisfied by the use of discs which are provided with a magnetic coating.

The X1215 CDD is equipped with two independent discs, one of which is permanently mounted in the unit, the second disc is a top loading, operator interchangeable disc cartridge, on which can be written 204 data per side tracks at a nominal speed of 2400 r.p.m.

The data is stored on the discs (write operation) and recovered when required (read operation) by means of magnetic heads which float just clear of the disc surfaces.

To allow the complete disc surfaces to be used the discs are made to rotate and the magnetic heads are attached to a positioning mechanism which can move in and out across the disc surfaces. The disc unit receives instructions about positioning and data handling from a Control Unit and supplies status information to the Control Unit via an assymetric interface. As it is possible to use more than one CDD on one Control Unit a Unit Select line is used to indicate which CDD is being addressed.

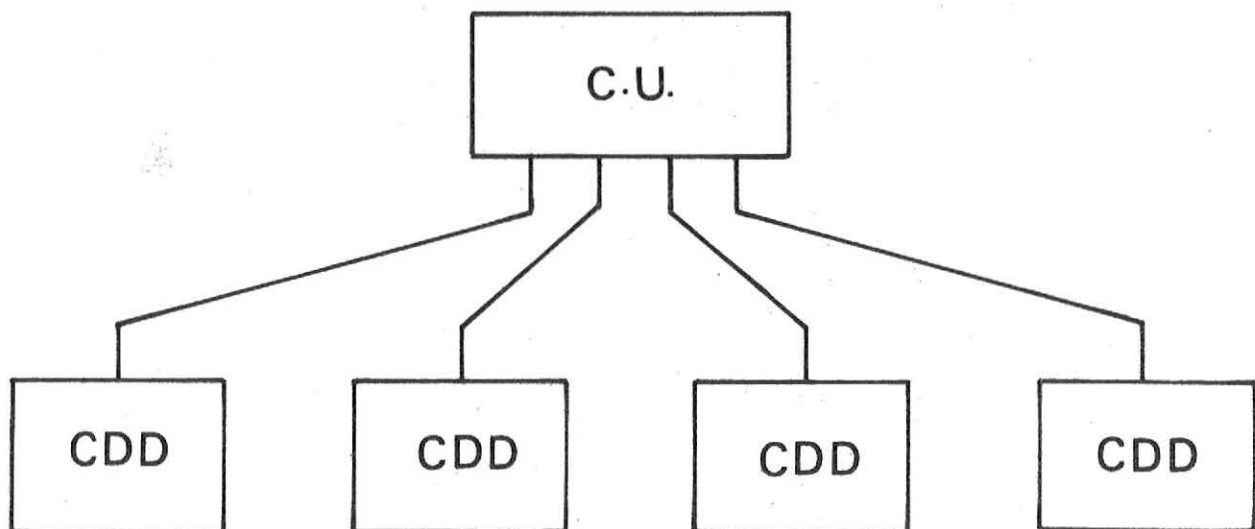


Figure 1-2 STAR CONFIGURATION

FIXED DISC AND SINGLE DISC CARTRIDGE (figure 1-3)

The disc used has a diameter of fourteen inches and is organised in the following way:

On each surface there are 204 tracks and as both sides of the disc are oxide coated and can consequently be used, it can be said that a disc has 204 cylinders each containing 2 tracks. The maximum storage capacity being 50×10^6 bits.

Mounted on the spindle is the index and sector ring which indicates the sectors by slots. Different types of cartridges can have a different number of slots:

The speed of a rotating disc is 2400 revolutions per minute and an average access time of 33 milliseconds is realised.

A magnetic ring keeps the cartridge in a fixed position. The fixed disc is permanently mounted inside the unit.

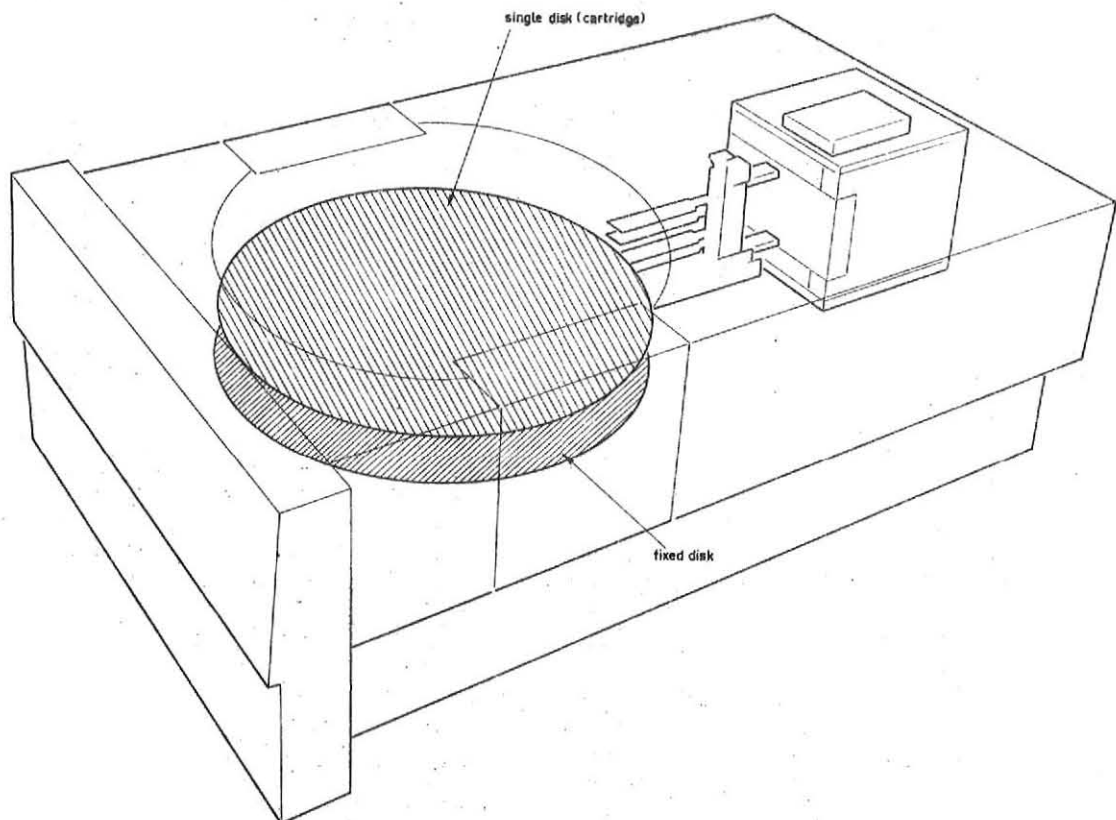
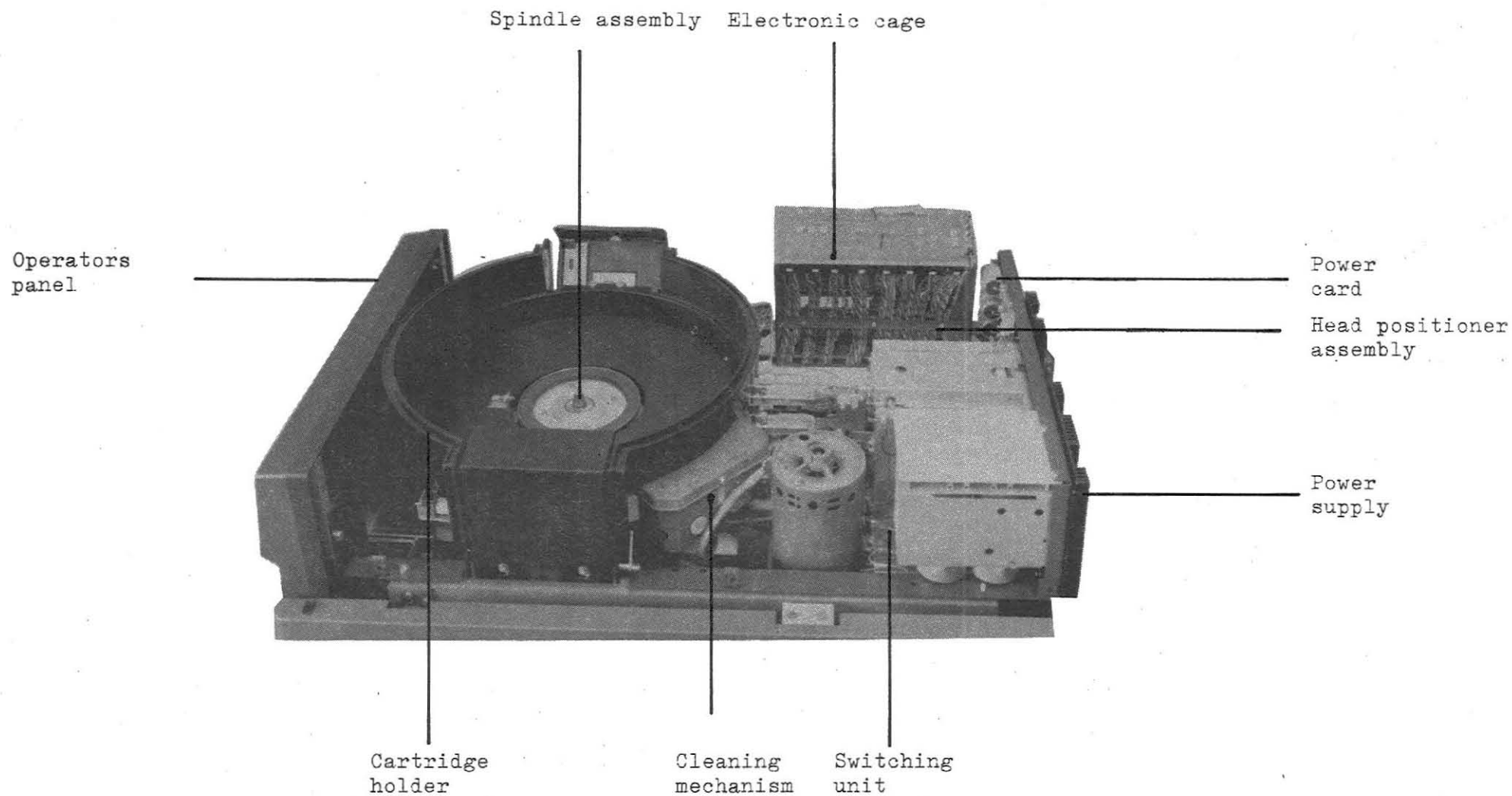


Figure 1-3 FIXED DISC AND SINGLE CARTRIDGE

Operation of the Power-on switch on the rear of the unit activates the power supplies, retracts the positioner and unlocks after 30 seconds the right clamp to load the cartridge as well as the positioner lock magnet. If the Start/Stop button is now pressed the disc drive motor starts and the brushes move in to clean the disc surfaces; when the cleaning cycle is completed the positioner moves in towards cylinder 000 and the heads are loaded. This is the First Seek and is used to position the heads on cylinder 000 before sending a Ready signal to the Control Unit. On a Normal Seek the Control Unit supplies the number of the required cylinder and the positioner begins moving towards it. Each time the positioner passes a cylinder the track count system generates a pulse which is used to determine whether the required cylinder has been reached.

When the heads are on the selected cylinder the Control Unit gives a signal to select one of the four heads, after this a write or read command is sent to the CDD by the Control Unit.



ASSEMBLY LOCATOR

Fig. 1-4

The Cartridge Disc Drive consists of several main parts. These major items are described in the following paragraphs. For the several assemblies see figure 1-4 and 1-5.

3.1 COVERS

A total of three covers are present, two on top and one on the bottom. All these covers are removable.

3.2 CARTRIDGE HOLDER

The cartridge holder consists of two parts, namely:

- a) A cartridge holder ring which includes two clamps. The right clamp is associated with it a protection unit (solenoid).
- b) The first bottom plate at the centre of the cartridge holder ring is attached to the ring with four screws.

3.3 FIXED DISC

The fixed disc is mounted under the cartridge holder bottom plate and located on the spindle.

3.4 SPINDLE

The spindle is coupled to the drive motor via a belt. The spindle incorporates a metal disc with blades, which, when the spindle is rotating, sucks in external air via two filters. This air is used for cooling purposes and also keeping the discs clean. The spindle is earthed to eliminate static electricity acquired by the movement of the spindle.

3.5 HEAD POSITIONER ASSEMBLY

The positioner mechanism selectively positions the read/write heads over the data track of any particular address on the fixed or removable disc. The positioner assembly contains the following components: a voice-coil actuator, which moves a carriage; the carriage which supports the heads, and carriage guides, on which the carriage moves; head loading/unloading cam, which engage the head arms; and a position transducer.

3.6 SWITCHING UNIT

The switching unit contains a time meter, one fuse, three relays and the Power on/off switch.

The relays are:

- The brush motor relay.
- The drive motor relay.
- The brake motor relay, used to brake the main drive motor.

3.7 ELECTRONIC ASSEMBLIES

The main electronic assemblies are the power supply and an electronic cage. The power supply is situated in the rear of the CDD furnishes the operating voltages for all electronic assemblies, the positioner and the spindle and brush motor. The logics, servo-electronics, read/write electronics and interface-circuits are mounted together in an electronics cage.

3.8 ELECTRONICS CAGE

The electronic cage contains all the electronics and logic needed for the unit except the read pre-amplifier and meander card.

The read/write card is located against the cartridge holder and is placed as close as possible to the heads.

The meander card is screened to prevent electrical interference to other circuits, and is positioned on the top of the magnet house.

Plugs and cabling connect the power supply, read write card and the meander circuit to the electronics cage.

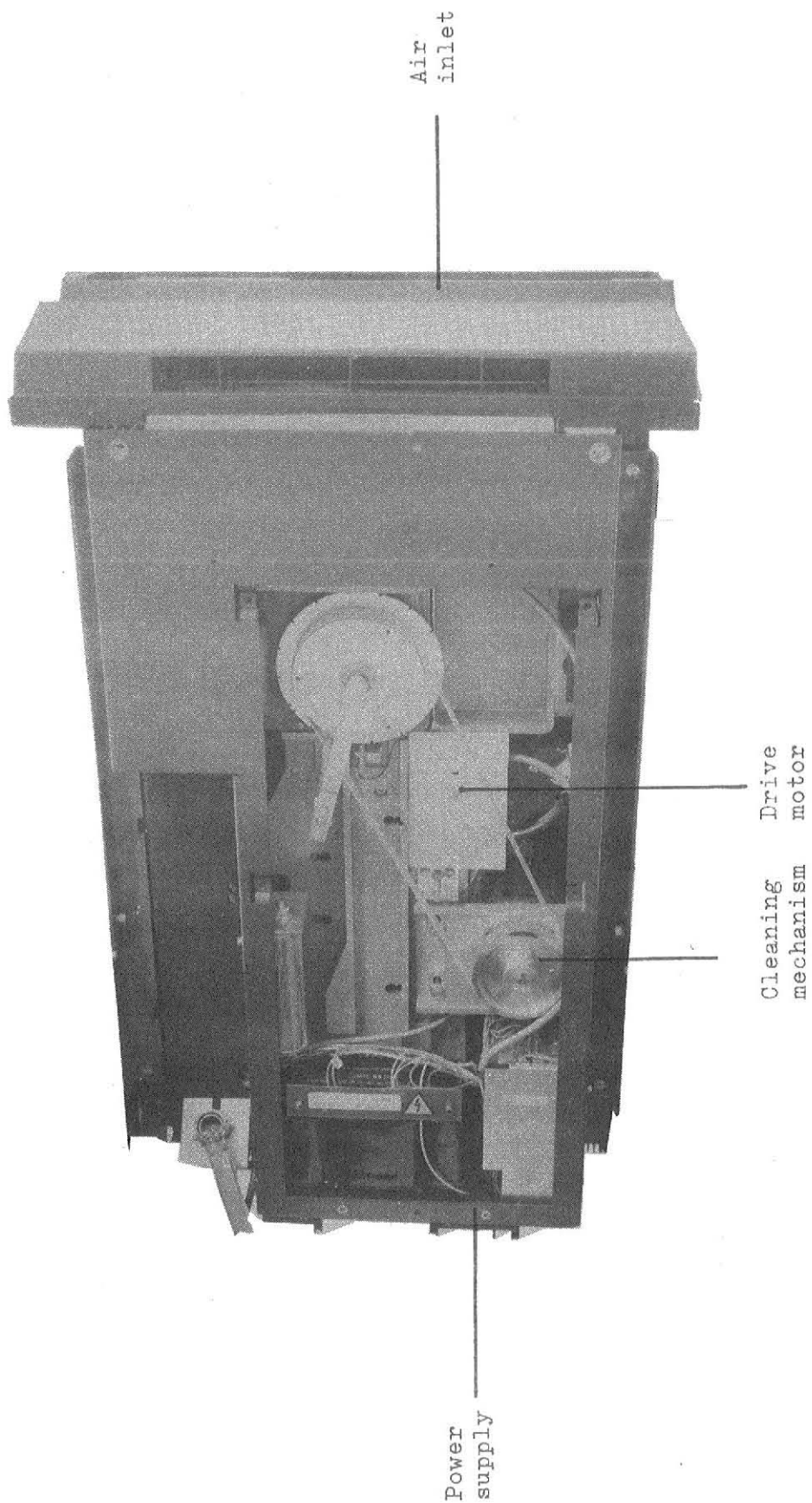


Fig. 1-5 ASSEMBLY LOCATOR LOWER

3.9

CLEANING MECHANISM

Each time a cartridge is installed the discs must be cleaned. This is done by a cleaning mechanism which consists of four brushes driven by a cleaning motor.

3.10

OPERATORS' PANEL

The Operators' panel is located at the front of the unit. The functions of each indicator are explained in Volume II.

4.1 PERFORMANCE CHARACTERISTICS

Details Disc (both discs are the same)

Disc diameter	356 mm (14 inches)
recording surfaces	2
tracks per side	204
track pitch	0,254 mm (0,01 inch)
tracks per cylinder	2
recording method	double frequency
sectors	optional
index pulse	1 per revolution
disc speed	2400 rpm. counter clockwise
storage capacity	50 x 10 ⁶ bits maximum

Details unit

data transfer rate	2.5M bits/s
average access time	33 ± 2m sec.

4.2 PHYSICAL CHARACTERISTICS

Width	480 mm
height	262 mm
depth	797 mm
weight	66 kg approximately

4.3 ELECTRICAL REQUIREMENTS

Mains voltage	240, 220 [*] , 115, 110 AC single phase with earth
mains frequency	50 Hz; 60 Hz (optional)
power consumption	500 W

* normally installed.

4.4 ENVIRONMENTAL REQUIREMENTS

	<u>Operating</u>	<u>Non-operating</u>
Temperature	+16°C to +38°C	-15°C to +65°C
Thermal shock	0,2°C per minute	1°C per minute
Relative humidity	8% to 80%	5% to 90%
Air pressure	1 BAR + 5 to -30%	1 BAR + 5 to 50%

Input signals		Output signals	
pin*	signal	pin*	signal
48	AB 0	24	IPC
51	Ground	27	Ground
47	AB 1	35	IPF
50	Ground	38	Ground
46	AB 2	23	SPC
49	Ground	26	Ground
54	AB 3	30	SPF
57	Ground	33	Ground
53	AB 4	29	CON
56	Ground	32	Ground
52	AB 5	02	UR
55	Ground	05	Ground
60	AB 6	34	USA 1
64	Ground	37	Ground
59	AB 7	03	USA 2
63	Ground	07	Ground
36	USL	28	AT
39	Ground	31	Ground
10	CS	01	RDDA
13	Ground	04	Ground
11	HS		
14	Ground		
17	CTS		
21	Ground		
58	SUS		
62	Ground		
08	WRDA		
12	Ground		

*Pin numbers of the interface plug AM6-75p.

Table 1-1

