PHILIPS

X 1210
Monodisk
Volume 1 : Introduction

data systems

Handbook X 1210 Mono Disk Drive

Volume 1	Introduction
Volume 2	Operation
Volume 3	Device logics
Volume 4	Not applicable
Volume 5	Electronics
Volume 6	Mechanics
Volume 7	Maintenance
Volume 8	Parts manual
Supplement	~~Service information~~ Interfaces /Engineering Specification Formatting etc. (in back cover)

VOLUME 1 INTRODUCTION

CONTENTS

ILLUSTRATIONS

1. INTRODUCTION

The model X1210 single disk drive unit is designed to provide a random access "peripheral" data storage device for use in small computer systems and terminals. It uses the Philips mono disk cartridge as the storage medium. This cartridge contains a 14 inch magnetic oxide coated disk with a maximum storage capacity of 25.10^6 bits. The average access time of the X1210 to this storage medium is 162.5 ms, with an output data transfer rate of 833 Kilobits/sec.

The X1210 may be controlled by either a hardware or software orientated system. Due to the serial nature of the X1210 Read/Write data, however, a control unit designed specifically to operate the X1210 would at least contain parallel/serial and serial/parallel converters. Fig. 1.1 illustrates a typical system configuration.

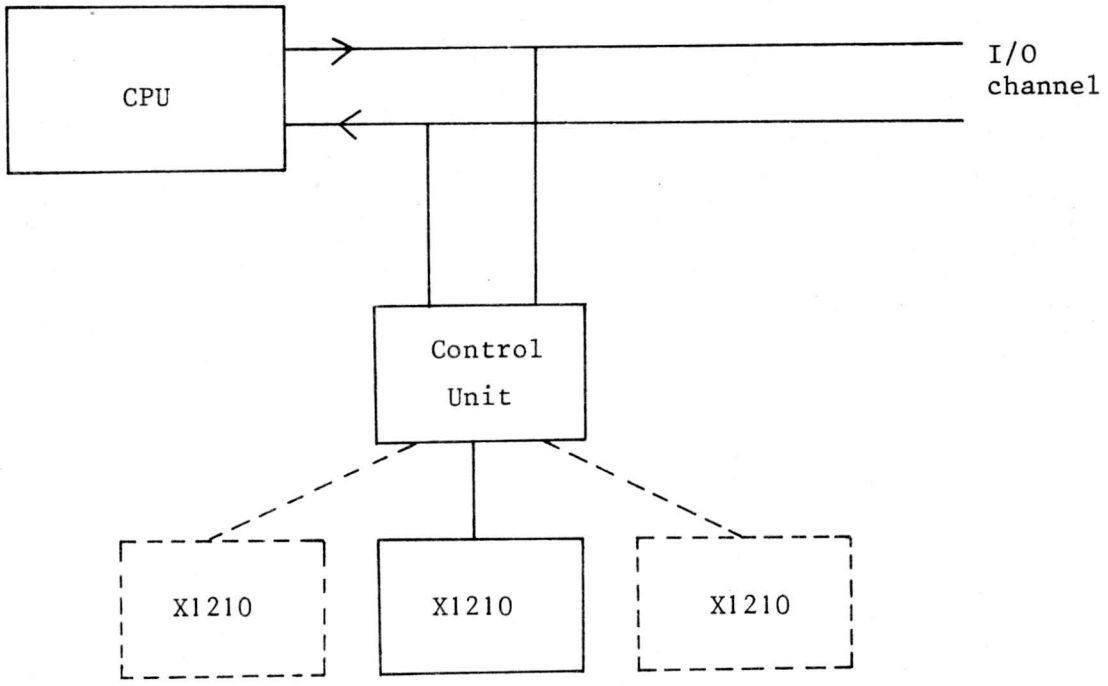

Fig. 1.1 - Typical System Configuration

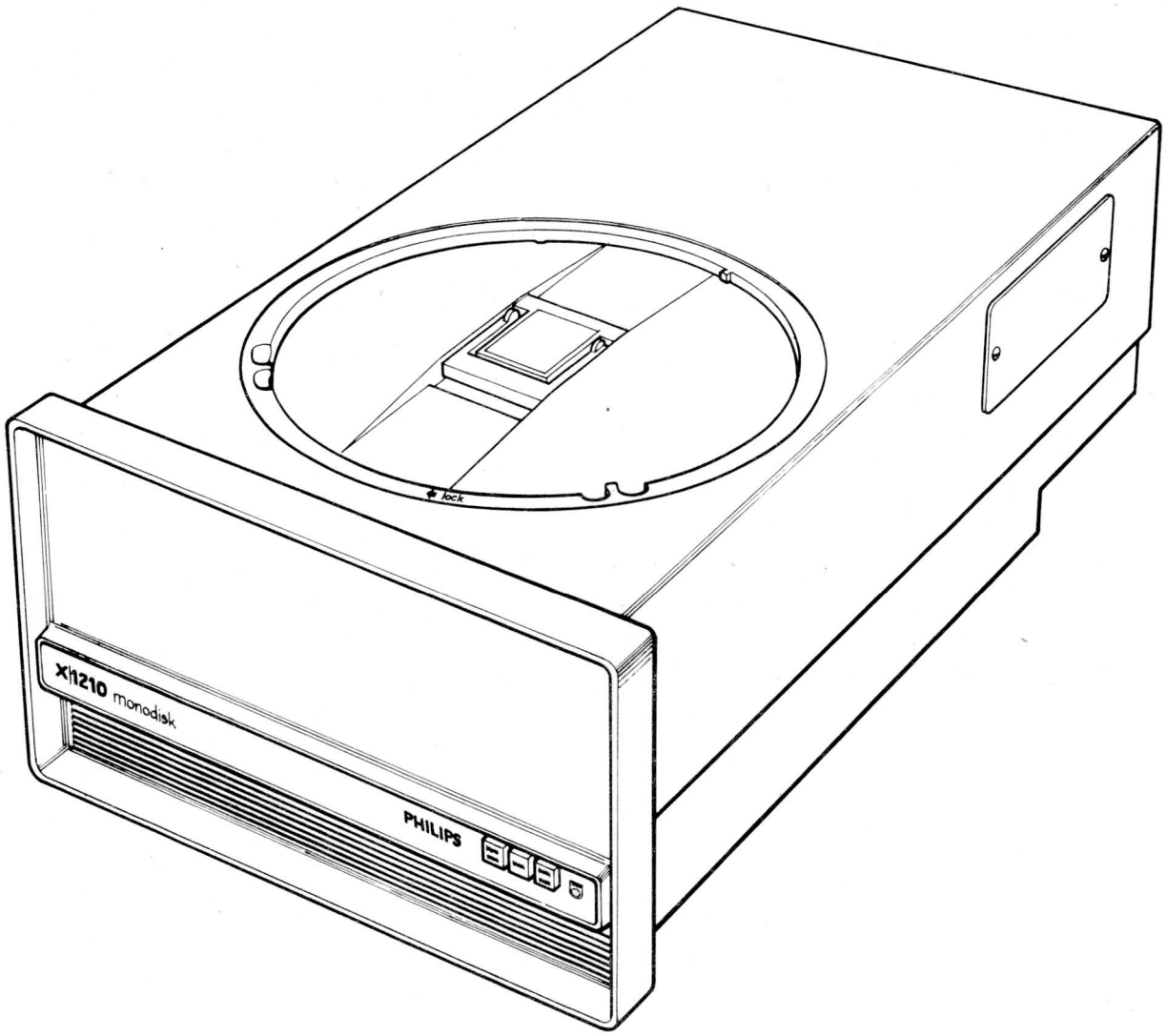

FIGURE 1.2 EXTERIOR VIEW OF X1210

1.1 BRIEF DESCRIPTION

1.1.1 CONSTRUCTION

The X1210 has a drawer type construction designed for installation in a standard 19 inch rack. It houses all the mechanical and electronic assemblies fundamental to X1210 operation. These assemblies comprise of the disk drive assembly, the head positioning mechanism, the electronics rack, the cartridge holder, the index and sector unit and the pneumatic unit. Two other components contained in the X1210 perform ancillary functions associated with these main assemblies. They are the purified air blower and the cooling air blower. Three detachable dust covers; one on the upper surface and two on the under-side provide a sealed dustproof enclosure around the unit interior. For servicing purposes, the top dust cover contains two removeable panels, one providing access to the head positioning mechanism and the other to the electronics rack printed circuit board edge connectors. To facilitate top loading of the Philips mono disk cartridge, the cartridge holder is mounted on the upper surface of the chassis, so forming a circular recess in the top dust cover.

1.1.2 CONTROLS

Supported on the X1210 front panel is the start/stop pushbutton, the cartridge exchange lamp and the fault indication lamp. When a cartridge has been fitted to the X1210, the drawer closed and the start/stop button pressed, the X1210 security logic checks that the cartridge has been correctly fitted and the drawer completely closed before permitting the unit to start.

1.1.3 OPERATION

When the start/stop button is pressed, the disk drive motor is run up to speed. When full speed is reached, a disk cleaning cycle is automatically performed before the X1210 is available for instructions from the control unit. This cycle takes approximately 7 seconds to complete. During this cycle, the positioning mechanism is moved forward into the cartridge and the nylon cleaning brushes swept over both surfaces of the disk until the innermost track (track 200) is reached. Dust or loose oxide partides dislodged by the brushes are removed from the cartridge by the closed loop air filtration system. At the instant the positioning mechanism reaches the inntermost track, the brushes are retracted into the head assemblies and the read-write heads loaded into the flying position. The positioning mechanism then reverses and moves the heads back until they are aligned over track 000.
This position is maintained until the computer system initiates a search mission.
When the computer system requires to read or write data on the magnetic disk the control unit instructs the head positioning mechanism to align the heads over the required track position. A signal is sent from the X1210 informing the control unit when this position is reached.

Access to the precise sector of the track is gained by feeding timing pulses generated by the index and sector unit to the control unit. The timing pulses accurately relate the angular position of the magnetic disk relative to the heads at all times during machine operation. Thus, the control unit can energize either the upper or lower head at the precise instant the relevant sector of the track passes beneath the heads. Serial bit data read by the X1210, is amplified and shaped and fed out via coaxial line to the control unit. There, it undergoes serial/parallel conversion for transfer in parallel form to the central processor.

1.2 THE INTERFACE

All dc and ac supplies for the X1210 circuits are supplied from an external source. Connection of the power supplies and control signals is effected by means of multicore circular and flat cables which enter the rear of the X1210 via two multiway electrical connectors. The logic signals on these control lines vary between 0 and 5.3 volts.

1.3 OPTIONS

1.3.1 RACK UNIT SLIDES

The XMX1405 rack unit slides are designed to provide three alternative positions of the X1210 in the rack unit.
These positions are:

The Operational Position - this is the read/write position, i.e. the X1210 is completely in the rack, its front panel being flush with the rack.

The Cartridge Exchange Position - the drawer is partly withdrawn from the rack for cartridge installation or removal.

The Service Position - the X1210 is completely clear of the rack unit.

1.3.2 THE CABLE GUIDE

The XMX1406 rack unit cable guide provides a safe and flexible means of maintaining the supplies and control signals to the X1210 whilst withdrawn to the cartridge exchange or servicing position.

1.3.3 MONO DISK CARTRIDGE

Two types are available. Both contain a standard 14 inch oxide coated disk coupled with an index and sector ring. The XMX1416 cartridge has one index slot and 16 sector slots per ring whilst the XMX1424 cartridge has one index slot and 24 sector slots.

1.3.4 POWER SUPPLY UNIT

The XMX1407 power supply unit is designed for installation in a standard 19 inch rack unit. It supplies one X1210 with +5V, -12V and +24V stabilized dc supplies and 220V single phase ac. The unit operates from a 220V single phase ac supply.

1.3.5 TEST MODULE

The XMX1408 test module is designed to test the X1210 head positioning mechanism. The module comprises a control box and printed circuit card coupled together to form an integral unit. During the test, the module is plugged into a reserved position in the electronics rack.

1.4 TECHNICAL DATA

1.4.1 RECORDING TECHNOLOGY

recording method	double frequency
recording medium	standard oxide coated 14 inch disk
bit density	2200 bits per inch (innermost track)
track density	100 tracks per inch
number of read/write heads	2
number of tracks per surface	200 (with 4 spare)
data transfer rate	833 Kbits per second

1.4.2 RECORDING CAPACITY

capacity without formatting	62500 bits nominal per track 25×10^6 bits per drive
formatting	16 or 24 sectors available, depending on cartridge

1.4.3 START/STOP TIME

start sequence	7 seconds
stop sequence	5 seconds

1.4.4 ACCESS TIME

head positioning (incl. head setting)

track-to-track	50	milliseconds
full stroke (200 tracks)	260	milliseconds
random average	125	milliseconds

average rotational delay	37,5 milliseconds

1.4.5 ERROR RATE

recoverable errors	1 in 10^{10} bits

1.4.6 ENVIRONMENTAL CONDITIONS

temperature	
operating	+10 to +32°C
non-operating	-15 to +65°C
relative humidity	
operating	20 to 80%
non-operating	5 to 85%