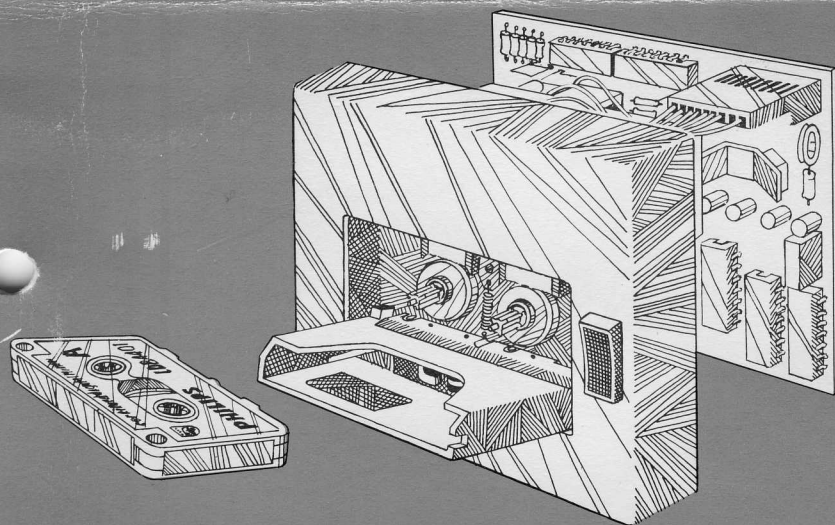


PHILIPS

**Technical
Information
Manual
Mini-DCR**



ERRATA

page 7

WDA : last column to be changed as : PE-encoded data "0" is a negative going signal. Data "1" is a positive going signal. In the gaps signal WDA is at high level.

WDC : add into the column description: also causes erasure of the tape

RDC : seperately generated clock signal to strobe read-data

RDA : last column to be changed as: PE-encoded data "0" is a negative going signal. Data "1" is a positive going signal. In the gaps signal RDA is at high level.

WEN : indicates whether or not a write enable plug is present in the cassette (file protection)

page 9

write data: add the following note: all data blocks have to start with a pre-amble-character to synchronise the read electronics (see fig. 4)

page 10

timing diagram: add the following note: in case of re-writing blocks T₄ shall be at least 100 msec longer as indicated

page 15

timing diagram: in fig. 11 the RDA signal is shown as RDA. It should be noted that the waveform shown is the inverse of that actually appearing at the interface

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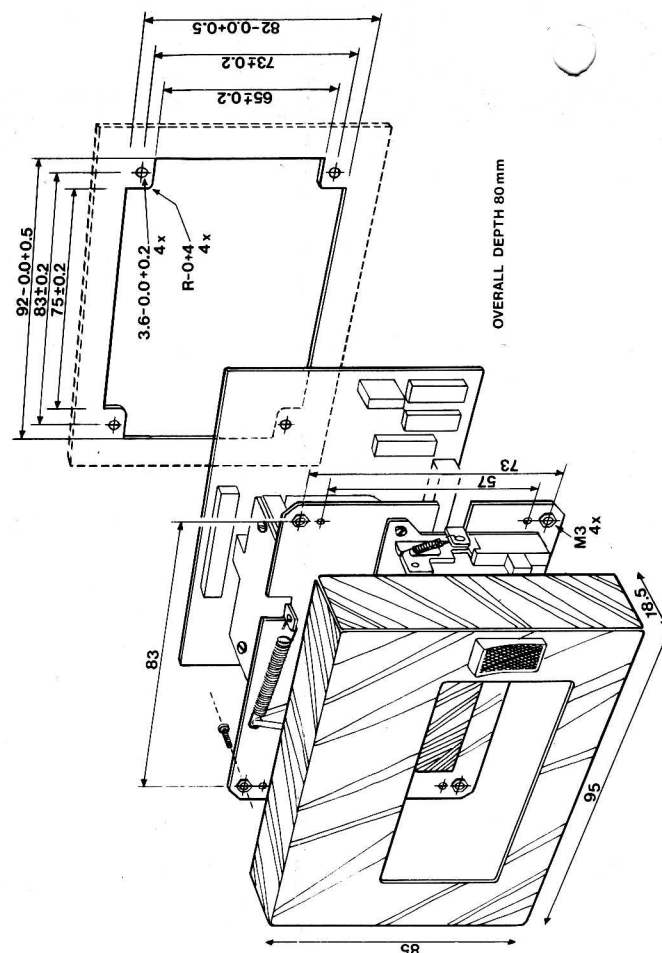


Fig. 1. Mini-DCR — Physical Dimensions.

Data subject to change
without notice.

I. General

1. Introduction

This manual provides the description, timing diagram, interfacing signals as well as operating and maintenance instructions for the Philips mini-digital cassette recorder.

The Philips Mini-DCR has been specially designed for O.E.M.'s and users that need a fast and low-cost serial memory device for data storage and interchange.

The Mini-DCR is available in either a read-only or read-and-write version. The recorder uses the Philips mini-cassettes, certified for freedom from drop-outs.

The whole system is based on Philips' extensive know-how gained in many years experience of digital cassette recording systems and their applications.

Advantages of economy, cassette convenience and high performance have made this technique internationally accepted and Philips quality and reliability have made them a major O.E.M. supplier of this type of equipment.

The Philips Mini-DCR is an ideal unit for micro-processor based systems, terminals, mini-computers and scientific calculators to be used in program loading, memory back-up and data capture applications.

2. Technical specification

Number of heads	: two; a read/write head and an erase head
Recording head	: single gap, single track, half width, read/write head
Number of tracks	: two; A-side and B-side
Recording method	: phase encoding character/bit serial
Tape length	: 36 m
Data transfer rate	: 6000 bits per second
Recording density	: 300 - 500 bpi (12-20 b/mm)
Irrecoverable error rate	: 1 in 10 ⁹ bits
Tape transport	: single motor hub driven 360 rpm $\pm$ 5%
Tape speed	: 12 - 20 ips (300 - 500 mm/sec.)
Start time read/write	: 95 sec. for full tape length
Stop time read/write	: < 100 msec.
Start distance	: 30 - 100 msec.
Stop distance	: 1.8 - 2.0 inch (15 - 50 mm)
Rewind time	: 0.6 - 1.0 inch (5 - 25 mm)
Data capacity	: < 95 sec.
Medium	: 64k octads per track
	: Philips 3.81 mm mini cassette certified for freedom of drop-outs

Electronics

Read/write electronics, tape transport	: one printed circuit board
Control logic	: the signal interface is a MOS-compatible (HEF 4000p series) interface
Signal interface	: logic "1" Vs minus 0.5 V
Signal levels/output signals	: logic "0" < 0.5 V
Signal levels/input signals	: logic "1" 8 V-Vs
Power interface	: logic "0" < 3 V
Power load	: DC-power Vs = 12 volt $\pm$ 5%
	: 400 mA peak (100 msec.)
	: 120 mA nominal
	: 30 mA stand-by
Thermal dissipation	: 1.4 Watt nominal
Electrical connections	: via Amp. connector. 14 Pins cis serie
	: Amp. code 163691-1 (13 pins)
	: Housing 1-163690-3

Environmental conditions

Operating temperature range:	: +5°C to +55°C
Thermal shock	: < 11°C per hour
Relative humidity	: 10% - 90% (no condensation)
Air pressure	: 780 - 1100 mbar
Vibration (IEC 68-2-6)	: 5 - 200 Hz at 1g curve
Heat radiation	: direct sunlight radiation on the cassette drive is not allowed
Physical dimensions	: see fig. 1
Weight of Mini-DCR	: about 400 grams

3. Type-numbers

8920 405 10101	: basic read-only unit (MCR 210)
8920 405 10201	: basic read and write unit (MCR 220)
8920 405 10301	: MCR 210 with front cover (see fig. 1)
8920 405 10401	: MCR 220 with front cover (see fig. 1)
8920 405 10601	: MCR 220 with front cover and write enable switch
8920 440 10101	: certified mini-cassette in plastic cover
	: cleaning kit

II Use of the Mini-DCR

1. Interfacing

The plug connections are given in fig. 6/7 and the interface signals and their function are listed in the following section. The timing diagram in fig. 10 gives information about the various interface signals and commands.

- To guard against any fire hazard the following measures should be taken:
A. insert a fuse 0.5 A in the positive leads of the 12 Volt supply.
- B. the supply leads and earth leads must each have a minimum cross-section of 0.38 mm².
- It is recommended that cassettes be entirely (re-)wound before they are removed from the recorder.
This prevents the tape from being touched by the fingers during loading and unloading.
- Formation of unwanted loops is also avoided.
- If the direction of the tape movement is changed the start time will be about 50 msec. longer.
- The start distance will be between 30 and 65 mm.
- To prevent false writing the unit shall not be switched-on or -off in case a cassette has been loaded unless the rise/fall time is < 1 µsec.
- Each mini-cassette can be equipped with a write-enable plug in order to prevent writing on a recorded tape.
The position of the write-enable plug determines whether writing is enabled on track 1 or 2 (see fig. 3).

2. Operating instructions

Since the Mini-DCR is intended for use by O.E.M. customers, operation of the device will depend upon individual system requirements.

Cassette loading is accomplished by depressing the button adjacent to the cassette cover and inserting the mini-cassette, open end first, into the cassette cover and closing the cover.

3. Operators maintenance

The only maintenance required for the user is cleaning of the read/write head every working week or 100 hours.
A special cleaning cassette kit is available for this purpose. (Refer to I-3).

4. Survey of interface signals

Name	Stands for:	Cat.	Description:	If "0"	If "1"
<u>WDA</u>	Write data	D	Input channel of the write amplifier accepting information in digital form to be recorded on tape (6000 Hz ± 1%)	According to ECMA data "0" is a neg. going signal. Data "1" is a positive going signal. GAP is continuous "1".	
<u>BET</u>	Begin/end of tape	S	Indicates whether begin of tape or end of tape has been detected.	Begin or end of tape had been detected.	
<u>WCD</u>	Write command	C	Enables information entering via WDA-line.	Gate is open.	Gate is closed.
<u>REV</u>	Reverse	C	Causes tape transport in the reverse direction.	Initiates tape transport.	Stops tape transport.
<u>FWD</u>	Forward	C	Causes tape transport in forward direction.	Initiates tape transport.	Stops tape transport.
<u>RDC</u>	Read clock	D	Separately generated clock to strobe read-data free of jitter.	Positive going edge should be used to clock read-data.	
<u>RDA</u>	Read data	D	Output channel of the read amplifier, supplies digital data that has been read from the tape.	According to ECMA data "0" is a negative going signal. Data "1" is a positive going signal. GAP is continuous "1".	
<u>CIP</u>	Cassette in position	S	Indicates that a cassette is in position and the door has been closed.	Cassette is present.	No cassette.
<u>WEN</u>	Write enable	S	Indicates whether a write enable plug (file protect) is present in the cassette.	Allows writing on tape (plug is present).	Write action prohibited.

Note: C = control signal; D = data signal; S = status signal.

III Service information

1. Technical Description

Cassette Composition

Figure 2 shows the physical composition of the tape.

Figure 4 shows the composition of the data blocks.

Gaps

Initial gaps, interblock gaps and end of data gaps are all erased to the same polarity.

This polarity is called the reference polarity.

For this purpose the WDA-line should remain high.

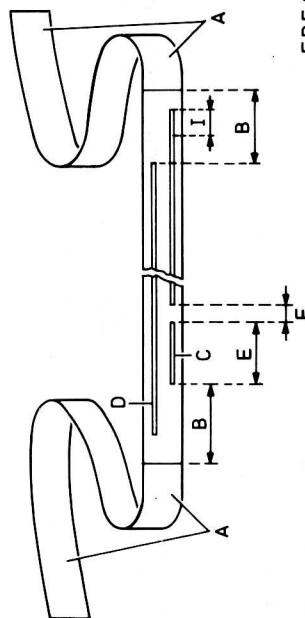
Phase encoding (see fig. 5)

Data bits (i.e. "zeroes" and "ones") are written as flux transitions such that a "1" bit causes a transition to the reference polarity and a "0" bit causes a transition opposite to the reference polarity.

When successive "1" or "0" bits are written, it is necessary to insert extra transitions between the data bits to establish the correct polarity. These transitions are known as phase flux transitions.

Write Data

The phase encoded (PE) WDA-signal is input at 15 IC1 and appears in-phase at 11 IC1 and anti-phase at 9 IC1.



ERE 6381

Fig. 2. Mini-DCR — Physical Composition of Tape.

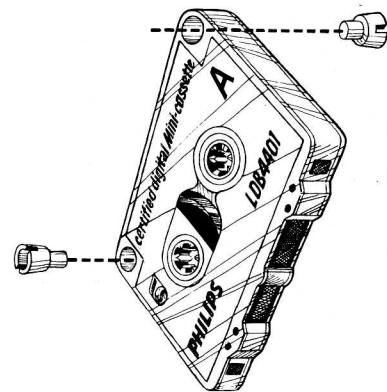


Fig. 3. Mini-DCR — Physical Composition of the Mini-Cassette

These two signals are applied across the read/write head when the WCD signal 9 IC6 is LOW and the WEN switch closed (8, 9 IC9-high). Enabling IC1 (4 IC1-low) also causes a low level; from 2 IC1, to be fed via R56 to the base of TS6 causing current to flow through the erase head.

Read Data

The read signal from the read/write head is amplified via 2, 1 IC2 and applied to the pulse-shaper and rectifier circuit. The negative pulses inverted and amplified via 6, 7 IC2 and recombined with the amplified positive pulses from 8 IC2. Further shaping and squaring is carried out via TS7 and IC6.

Motor Control Logic

A low signal on either the FWD or REV inputs will cause switch "on" of TS2, TS5 or TS3, TS4 respectively. The amount of current flowing through these transistors (and the motor) is controlled by TS1.

TS1 is driven by the servo loop formed by the motor, the tachogenerator and IC's 4, 5 and 6.

BET and Tape Stopped Retector

A sample of the positive output from 8 IC5 is fed to 3 IC5 to hold the BET line high; should the tape jam or the motor stop, the output 8 IC5 goes negative causing a low on the BET line.

Clear Logic

When both REV and FWD lines are high the CLEAR signal output at 11 IC9 goes high causing the following:

- i) BET line high via 2 IC5.
- ii) TS1 cut-off via 12 IC5.
- iii) Preset of the RDA and RDC flip-flops IC7.

The square-wave read data signal is phase-coded via 3, 1 IC7 and appears at output pin 12 (RDA).

The read clock signal is derived from the read data signal via 2, 3 IC3 and appears at output pin 11 (RDC) to indicate a valid RDA output when positive.

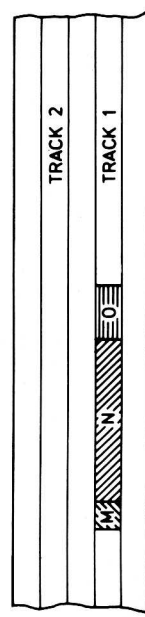


Fig. 4. Mini-DCR — Data Block Composition. ERE 6380

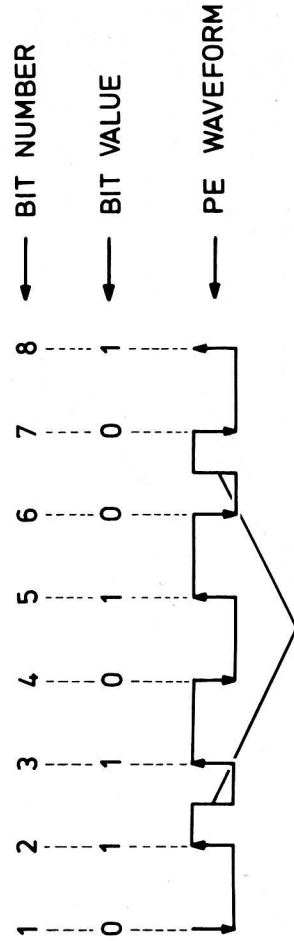


Fig. 5. Mini-DCR — Phase Encoded Write Data.

2. Timing Diagram

T1: The length depends on selected block-length and the relative position on the tape.
T2-T3-T4-T5: Depend on selected block-length, the total number of blocks and the start/stop, distances/times.
T6-T7: The pulses on the FWD line are necessary for clearing the Read Electronics.

How to use tape capacity efficiently

1. Required tape capacity: 32k-bytes per track (128 blocks of 256 bytes each).
T2 = 1/3 T1; T3 = 40 m sec.;
T4 = 250m sec.; T5 = 0. In case of re-write one block T4 = 350m sec.
2. Required tape capacity: 24k-bytes per track (96 blocks of 256 bytes each).
T2 = 198m sec.; T3 = 40m sec.;
T4 = 450m sec.; T5 = 0.
3. Required tape capacity: 40k-bytes per track (40 blocks of 1024 bytes each).
T2 = 198 m sec.; T3 = 40m sec.;
T4 = 450 m sec.; T5 = 0.
4. Required tape capacity: 64k-bytes per track (1 block of 64k-bytes).
T2 = Rewind time till BOT; T3 = time to write end of data gap; T4 is not applicable.

Remarks

- During a continuous write operation (no backspace or control-read) T3 = 0m sec. in order to obtain optimum data capacity.
- Repeated updating of a data-block positioned between two other blocks, may cause overwriting of the first part of the next data block.
- The pre-amble is used to synchronise the Read-clock (see detail A of the timing diagram).
- Read DATA is TRUE at the positive pulse edge of the signal Read clock.
- To read two or more blocks of data continuously it is necessary to reset Read clock in the inter-block gaps. This can be achieved by a pulse on the FWD-line of:

$1 \mu s < T < 0.5m \text{ sec.}$

- During Read operation signal WDA may not change level, because this causes cross-talk on RDA.
- Signal BET indicates both begin and end of tape.

3. Maintenance

The only maintenance required for the Mini-DCR is cleaning of the read/write head every week or 100 working hours.

4. Adjustments

Electronic

1. The motor speed can be adjusted via R4 to give a mean tacho frequency of 11,57 Hz (i.e. approximately 45 seconds after starting forward with a cassette loaded).

Mechanical

1. The mechanical forward/reverse switching element has two stop-screws that should be adjusted individually to give minimum motor current in either direction.

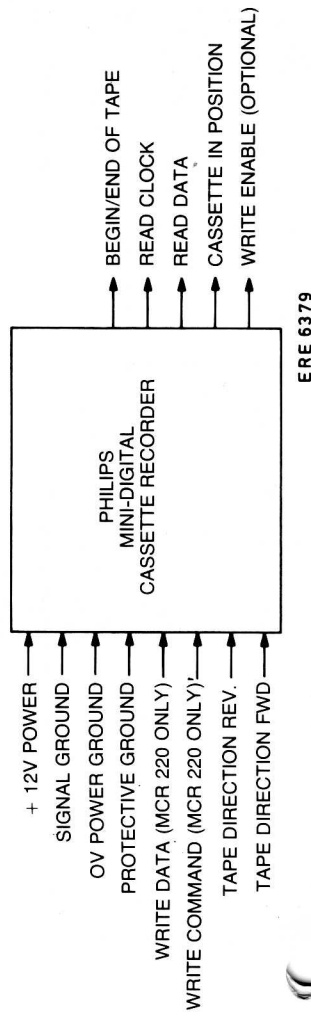
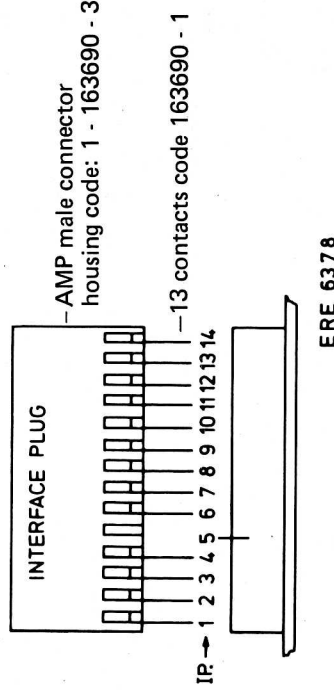


Fig. 6. Mini-DCR - Interface Diagram.



Pin No.	Signal
1	12V
2	OV (Signal Ground)
3	OV (Power)
4	Earth (Protective Ground)
6	WDA
7	BET
8	WCD
9	REV
10	FWD
11	RDC
12	RDA
13	CIP
14	WEN

Fig. 7. Mini-DCR - Interface Connector.

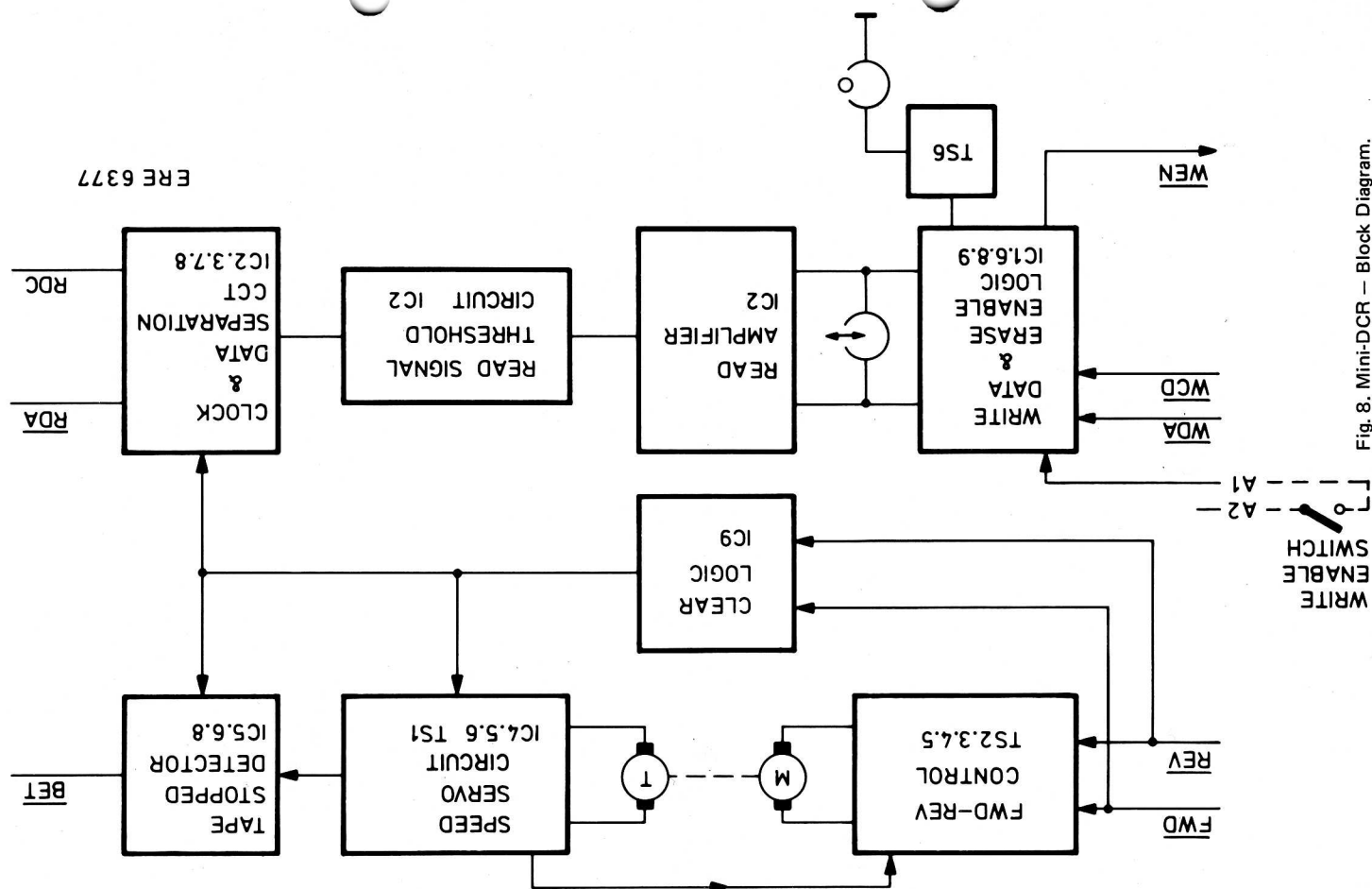


Fig. 8. Mini-DCR – Block Diagram.

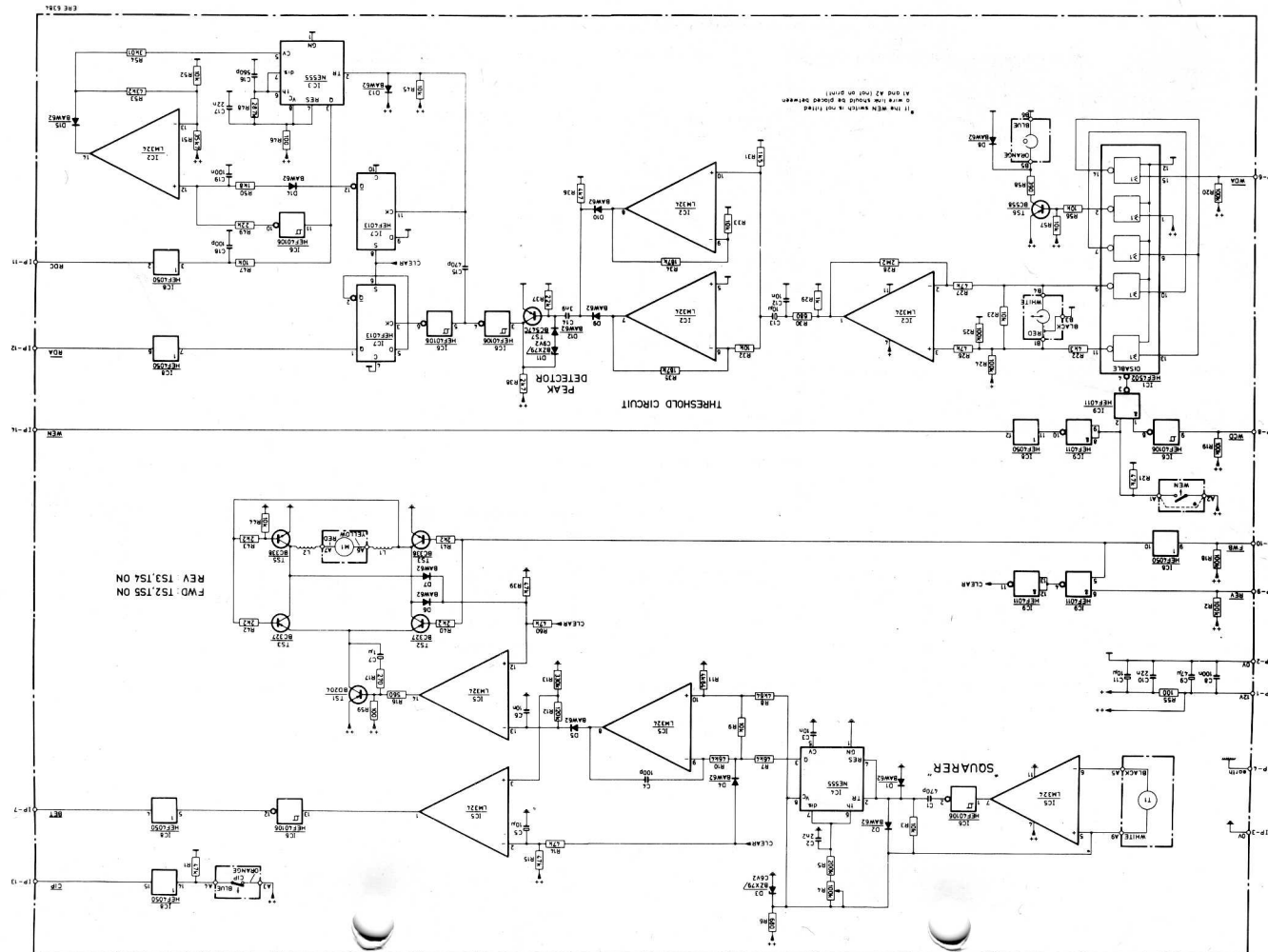
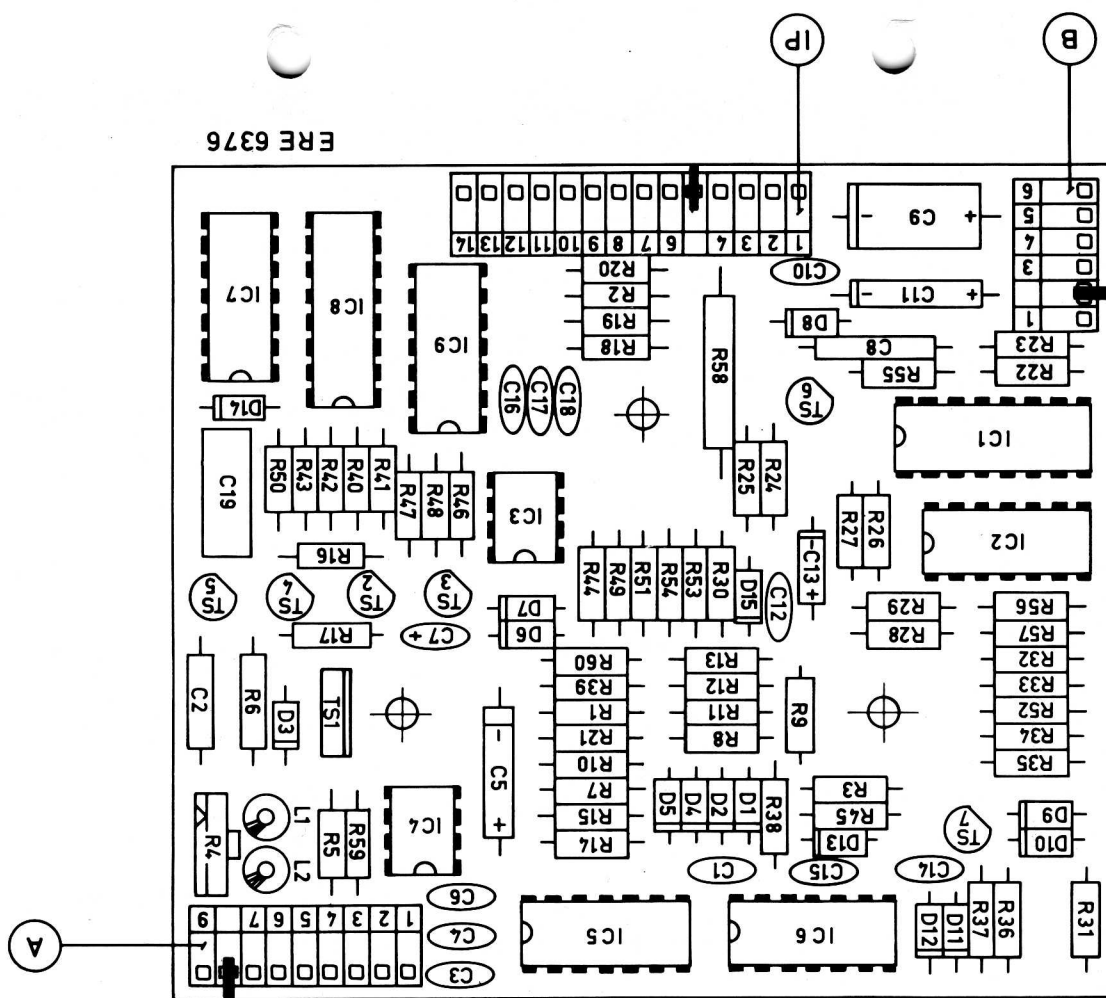


Fig. 9. Mini-DCR – Circuit Diagram.

Fig. 10. Mini-DCR — PCB Layout.



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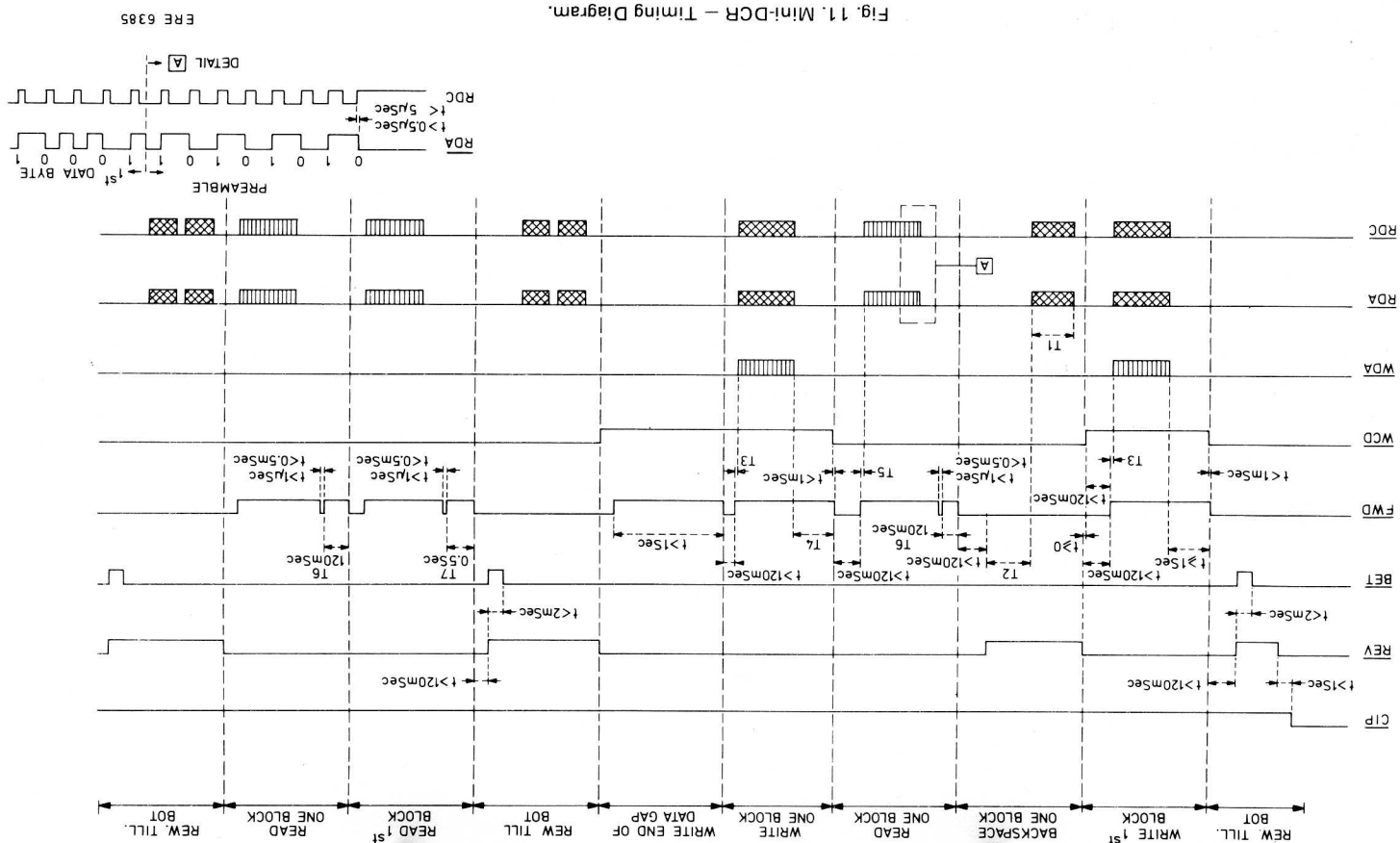


Fig. 11. Mini-DCR — Timing Diagram.

ERE 6385

**Neuer OEM
Mini-Kassettenrecorder**

Ein schnelles, preisgünstiges, äußerst kompaktes serielles Speichergerät.

- Neues Miniformat • Preisgünstiges Gerät • Preisgünstiger Datenträger
- Geringe Leistungsaufnahme • Kapazität 128 kByte • Übertragungsrate: 6000 b/s

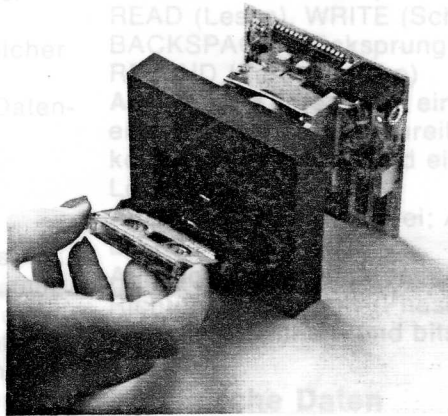


PHILIPS

Der neue Mini-Digital-Kassettenrecorder

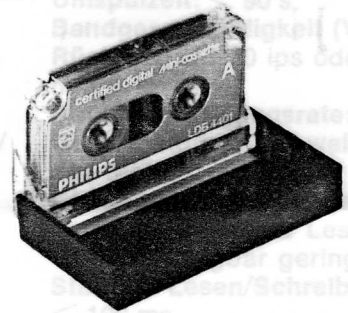
Eine Datenkapazität von 128 kByte, verpackt in einem Gerät, das Sie mit einer Hand halten können – das bietet der neue Philips Mini-Digital-Kassettenrecorder OEMs und Anwendern, die ein schnelles, preisgünstiges serielles Speichergerät für Datenspeicherung und -austausch benötigen.

Der Mini-Digital-Kassettenrecorder (Mini-DCR) ist entweder als Nur-Lese- oder als Lese/Schreib-Version lieferbar. Beide Ausführungen sind für folgende Betriebsarten geeignet: Leerlauf, Lesen, Schreiben, Rücksprung und Rücklauf. Die Philips Mini-Kassetten für die digitale Datenaufzeichnung entsprechen der Qualität und Zuverlässigkeit des Mini-Digital-Kassettenrecorders. Die Dropout-Freiheit des Magnetbandes dieser Kassetten wird von uns garantiert. Mini-Kassetten finden schon seit vier Jahren verbreitete Anwendung als Programmbänder in Philips Büro-Computern. Z.Zt. befinden sich mehr als eine halbe Million dieser Kassetten in Gebrauch. Das ganze System beruht auf dem bei Philips in langjähriger Erfahrung mit Digital-Kassetten-Aufzeichnungssystemen und ihrer Anwendung gesammelten Wissen.



Durch ihre Wirtschaftlichkeit, die Handlichkeit der Kassetten und die hohe Leistung hat sich diese Technik international durchgesetzt. Durch die Qualität und Zuverlässigkeit unserer Produkte erwarb sich der Name Philips auch auf diesem Gebiet unter den OEMs einen guten Klang. Der Mini-Digital-Kassettenrecorder besitzt nicht nur alle guten Eigenschaften der bereits eingeführten Philips DCR-Geräte, sondern bietet außerdem gegenüber den „großen“ DCR noch eine 80 %ige Raum- und Kostenersparnis! Durch seinen günstigen Preis und sein kompaktes Format ist der Mini-Digital-Kassettenrecorder in idealer Weise zum Programmladen und für Programmänderungen sowie zur sehr bequemen Datenerfassung geeignet. Zu den Geräten u. Anlagen, denen die Vorteile dieses Recorders zugute kommen, zählen Industrie-anlagen

auf Mikroprozessorbasis, Terminals, programmierbare Rechner, Tischrechner und Schreibautomaten.



Mit 128 kByte ist seine Programm- und Datenaustauschkapazität sehr groß, und die hohe Datenübertragungsrate von 6000 bits/sec gestattet schnelles Auslesen und Einschreiben von Daten. Wir erwähnten bereits die Genauigkeit und Zuverlässigkeit, welche die Mini-DCR mit allen Philips-DCR-Einheiten gemein haben. Die „irrecoverable error rate“ beträgt nur 1 auf 10^9 bits und die MTBF mehr als 5000 Stunden, die Nutzlebensdauer unter normalen Betriebsbedingungen mindestens 10000 Stunden oder 5 Jahre. Sollten einmal Wartungsarbeiten oder eine Reparatur erforderlich werden, dann beträgt die mittlere Reparaturzeit weniger als 30 Minuten, dank der einfachen, robusten Konstruktion und ausgezeichneten Servicefreundlichkeit des Mini-DCR.



Philips-führend in der Digital-Kassettenaufzeichnungstechnik

Modelle und Wahlzubehör

M-DCR 210: Nur-Lese-Speicher zum Programm laden

M-DCR 220: Lese/Schreibspeicher zum Programm laden, zur Speicherunterstützung und Datenerfassung

Funktionelle Angaben

Datenträger: Standard Philips Digital-Mini-Kassette mit 3,81 mm breitem Magnetband, garantiert frei von Dropouts. Die Kassette wird in einem geschlossenen Kunststoffgehäuse geliefert und ist mit einem Datensicherungsstopfen ausgestattet.

Bandlänge: 36 m

Antriebsmotor: ein Motor, Nabenantrieb, 360 U/min $\pm 5\%$

Betriebsarten: IDLE (Leerlauf), READ (Lesen), WRITE (Schreiben), BACKSPACE (Rücksprung), REWIND (Zurückspulen)

Anzahl der Köpfe: Zwei; ein einzelner Halbspur-Schreib-Lesekopf mit Einzelspalt und ein Löschkopf

Anzahl der Spuren: Zwei; A-Seite/B-Seite

Aufzeichnungsverfahren: Richtungstaktschrift (Phase encoded) Zeichen- und bitseriell

Technische Daten

Datenkapazität: 128 kByte

Betriebsarten: Kontinuierlicher und Start/Stopp-Betrieb

Statussignale: Bandanfang (BOT), Bandende (EOT), Kassette eingesetzt (CIP), Schreibfreigabe (WEN)

Aufzeichnungsdichte: 300 - 500 bpi oder 12-20 b/mm

Lesezeit: 90 s für volle Bandlänge

Schreibzeit: 90 s für volle Bandlänge

Umspulzeit: < 90 s

Bandgeschwindigkeit (Vorlauf und Rücklauf): 12-20 ips oder 300-500 mm/s

Datenübertragungsrate: 6000 b/s

Geschwindigkeitsabweichungen des Motors: $\pm 5\%$

Gleichlaufschwankungen zwischen Takt und Lesedaten: vernachlässigbar gering

Startzeit Lesen/Schreiben: < 100 ms

Stoppzeit Lesen/Schreiben:

30 - 100 ms

Anlauflänge: 0,6 - 1,0 inch oder 15 - 25 mm

Stopplänge: 0,2 - 1,0 inch oder 5 - 25 mm

Bandkriechen: Kein Bandkriechen im Leerlauf

Nicht korrigierbare Fehlerrate: 1 in 10^9 bits

Wahlzubehör: Schreibfreigabe-Schalter (Datensicherung) Frontkappe

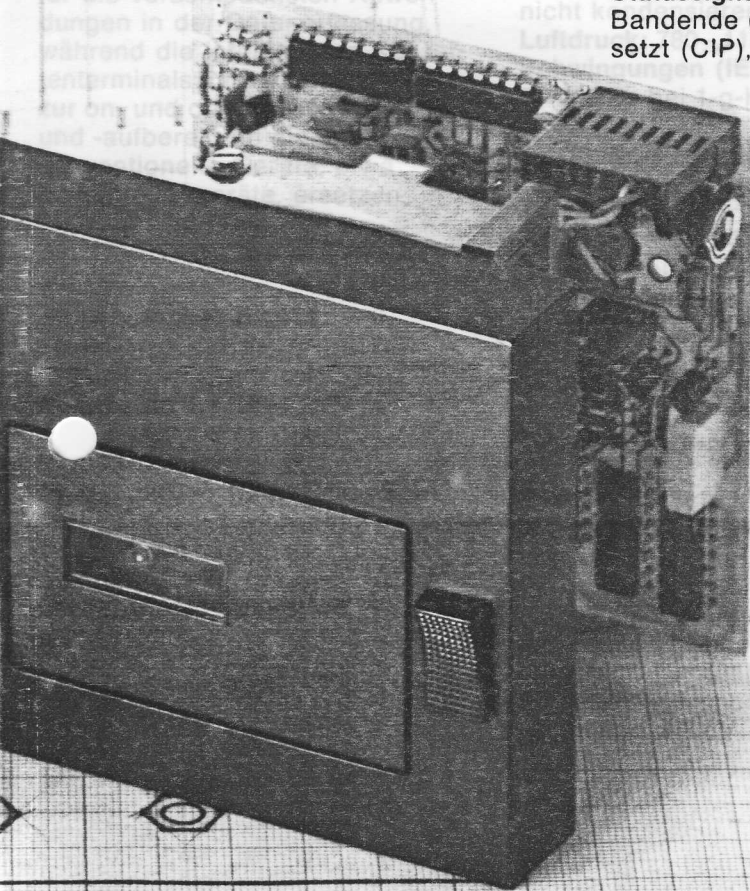
Zuverlässigkeit/Servicefreundlichkeit

Mittlere störungsfreie Zeit (MTBF): > 5000 h

Mittlere Reparaturzeit (MTTR): < 30 min

Nutzlebensdauer: > 10000 h oder 5 Jahre

Wartung: zur Wartung des Geräts ist nur die regelmäßige Reinigung der Köpfe erforderlich. Besondere Reinigungskassetten sind lieferbar.



Philips-führend in der Digital-Kassettenaufzeichnungstechnik

Philips hat sich weltweit durch moderne, hochwertige Produkte auf fast allen Gebieten der Elektronik einen guten Namen erworben. Durch unsere Erfahrung und unser Know-How bei der Entwicklung und Fertigung von Digital-Kassettenaufzeichnungssystemen nach höchsten professionellen Normen haben wir in Europa eine Spitzenposition in Technologie und Markterrungen.

Das DCR-Gerätelieferprogramm von Philips umfaßt außer den neuen Mini-Digital-Kassettenrecordern eine ganze Familie von Kassettenrecordern und Anschlußgeräten, die alle mit dem bekannten Kassettenformat nach ECMA-Norm arbeiten. Die Modelle DCR 3 und DCR 4 sind professionelle, hochwertige Digital-Kassettenrecorder für die verschiedensten Anwendungen in der Datenerfassung, während die intelligenten Kassetterminals LDB 4201 und 4101 zur on- und off-line-Dateneingabe und -aufbereitung dienen und konventionelle Geräte, etwa Lochstreifengeräte, ersetzen.

Abmessungen und Umgebungsbedingungen

Abmessungen (Mini-DCR):

3 3,4 x 3,1 inch oder
95 x 85 x 77 mm

Abmessungen (Mini-Cassette):

1,84 x 1,36 x 0,3 inch oder
46 x 34 x 7,4 mm

Gewicht: 0,4 kg

Betriebslage: waagrecht oder senkrecht



Betriebsbedingungen

Temperatur: +5° C - +55° C

Wärmeschock: < 11° C pro Stunde

Relative Feuchtigkeit: 10 - 90 %

nicht kondensierend

Luftdruck: 780 - 1100 mb

Schwingungen (IEC 68-2-6):

5 - 200 Hz bei 1-g-Kurve

Lagerbedingungen

Temperatur: -40° C - +70° C

Wärmeschock: < 14° C pro Stunde

Relative Feuchtigkeit: 5 - 95 %

nicht kondensierend

Luftdruck: 480 - 1100 mb

Schwingungen (IEC 68-2-6):

5 - 200 Hz bei 5-g-Kurve

Schnittstellen

Elektrische Schnittstelle: MOS-kompatibel (HEF 4000 p-Serie)

Logiksignale: Vorlauf, Rücklauf, Schreibbefehl, Schreibfreigabe (wahlweise), Schreibdaten, Bandanfang oder -ende, Kassette eingelegt, Lesedaten, Lesetakt, Signalerde, Sicherheitserde, Spannung +12 V, 0 V

Stromversorgungsschnittstelle:

12 V $\pm$ 5 %, Belastung 400 mA

Spitze, 120 mA nominal, 30 mA

Bereitschaft

Steckverbinder für Schnittstellen-

kabel: 14 poliger AMP-Stecker,

AMP-Kode 164333-3, Gehäuse

AMP-Kode 1-163690-3

Bestellnummern

~~8920 405 10101: Nur-Lese-Gerät (M-DCR 210)~~

~~8920 405 10301: Nur-Lese-Gerät mit Frontkappe~~

~~8920 405 10201: Schreib/Lesegerät (M-DCR 220)~~

~~8920 405 10401: Schreib/Lesegerät mit Schreibfreigabeschalter~~

8920 405 10601: Schreib/Lesegerät mit Frontkappe und Schreibfreigabeschalter

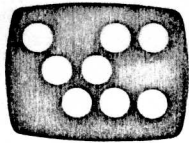
8920 440 10101: Garantierte Digital-Mini-Kassette

**Philips GmbH Unternehmensbereich
Elektronik für Wissenschaft
und Industrie,
Miramstraße 87,
3500 Kassel**



**Feltron Elektronik
GmbH & Co. Vertriebs KG
521 Troisdorf
Postfach 1169**

PHILIPS

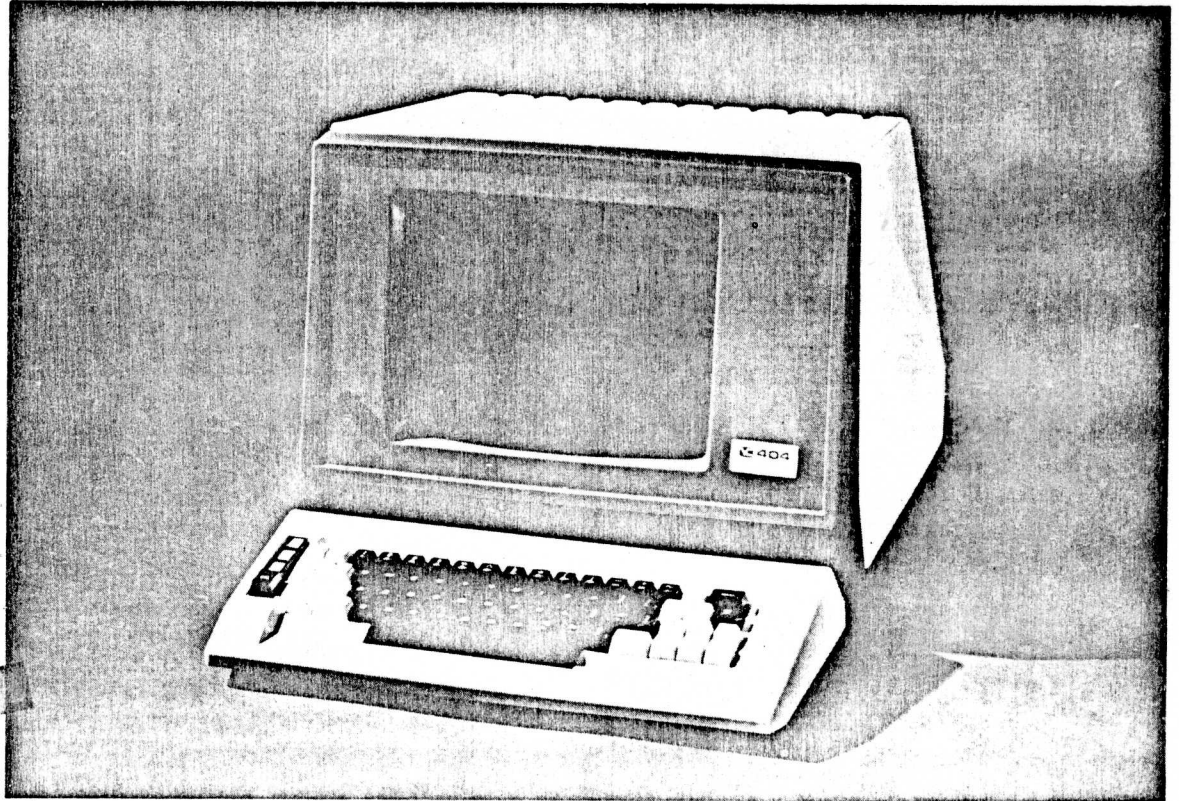


Volker-Craig

VC404 / The Standard

**Leader
Among
Data Terminals:**

- ☐ Cost Effective
- ☐ Reliable
- ☐ Fast
- ☐ Versatile
- ☐ Quiet



The Volker-Craig VC404 is a new, low cost, teletype compatible data terminal. A detachable keyboard, 1920 highly legible characters, quiet operation, fast transmission speed and numerous standard features make it an extremely attractive terminal for both OEM's and end users.

Keyboard reliability, tactile feedback, auto repeat, switch selectable upper/lower case and a complete cursor control key cluster for operator convenience are standard.

Options including bidirectional serial peripheral interface, numeric pad and function keys, and APL character set provide maximum flexibility to meet each user's particular requirements.

Both domestic and export versions of the VC404 are available now. Write or call us today for more information on prices, quantity discounts and delivery.

VC404 Standard Features

- ☐ Detachable Upper/Lower Case Typewriter Style Keyboard.
- ☐ Switch Selectable Upper/Lower Case.
- ☐ 12" Non-Glare Screen.
- ☐ Teletype Compatible (ASCII) Serial Asynchronous EIA Standard RS232C (CCITT V24) Interface (Half/Full Duplex).
- ☐ 1920 Character Display (24 Lines of 80 Characters).
- ☐ Eight Data Rates Externally Switch Selectable From 110 to 19,200 Baud.
- ☐ Cursor Control Keys and Direct X-Y Cursor Addressing.
- ☐ Clear to 'End of Line' and 'End of Screen'
- ☐ Transparent/Tape Mode.
- ☐ Composite Video Output for Slave Monitors.
- ☐ Switch Reversible Video.
- ☐ Optional:
 - Bidirectional Serial Peripheral Interface.
 - Numeric Pad and Function Keys.
 - APL Character Set.
 - Foreign Keyboards and Character Sets.

VC404 Specifications

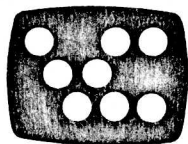
Terminal Type	TTY compatible	
Configuration	VC404	Export version 230V, 50/60 Hz. Receive only terminal (Deletes keyboard from VC404).
	VC404/EXP	
	VC404/RO	
Communication	Code	ASCII
	Type	Serial asynchronous.
	Speed	110, 300, 600, 1200, 2400, 4800, 9600, 19200, baud externally switch selectable.
	Method	Character by character (conversational).
	Mode	Half or full duplex.
	Parity	Odd/Even/Mark/Space, switch selectable.
	Interface	EIA RS232C, CCITT-V.24 (20 mA current loop accessory available).
Screen Presentation	Display Unit	12 inch non-glare CRT. Rear panel composite video output for use with an external video monitor.
	Display Format	24 line X 80 character, 1920 characters.
	Character Type	5 X 7 dot matrix (7 X 10 field).
	Character Size	12" Screen: .20".
	Character Generation	ROM/PROM.
	Refresh Rate	60 Hz., 50 Hz. switch selectable.
	Refresh Memory	Static RAM.
	Character Set	128 ASCII characters, upper/lower case.
Keyboard	Detached typewriter keyboard with Auto Repeat, Line Feed, Back Space, Cursor Up, Cursor Right, Home, Clear Screen, Escape, Break, Tab, and Caps Lock Keys.	
Data Entry	Roll Mode: Bottom line with single line roll-up. Page Mode: Page overwrite.	
Terminal Functions	Cursor	Non-destructive, blinking block cursor.
	Control Functions	Left, Right, Up, Down, Home, Clear and Home, Direct X-Y cursor addressing using cursor control command, EOL (Clear to End of Line), EOS (Clear to End of Screen).
Audible Alarm	On receipt of Control G (BEL code) from computer or keyboard.	
Operator Controls	Front Panel: Power Off/On, Display Brightness.	
	Rear Panel: Baud Rate, Parity, Transparent/Tape Mode. Keyboard: Local/Remote, Half/Full Duplex, Roll/Page, ASCII/APL.	
Indicators	Caps Lock Key on keyboard.	
	Lighted Print Key (with Option SPI).	
Power	115 $\pm$ 10 VAC, 50/60 Hz, 35 VA. CSA Approved. Optional: 230 $\pm$ 20 VAC, 50/60 Hz, 35 VA.	
Overload Protection	Terminal: 3A Fast Blow. (1.5A Fast Blow with 230V option).	
	Display: Internal 3A Fast Blow.	
Physical	VC404	41 cm. W X 52 cm. D X 34 cm. H, 14 kg.
	VC404/RO	41 cm. W X 37 cm. D X 34 cm. H, 12 kg.
	Keyboard (Standard)	41 cm. W X 20 cm. D X 7 cm. H, 2 kg.
	Keyboard (KB1)	53 cm. W X 22 cm. D X 7 cm. H, 3 kg.
Documentation	VC404 Operator's Manual.	
	VC404 Service Manual (Optional).	

Options

Option APL:	APL/ASCII Switchable Character Sets — Typewriter Paired (no overstrikes)	MTI:	Multiple Terminal Interface. Connects up to five terminals to one serial printer.
Option SPI:	Switched Serial Bidirectional Peripheral Interface	BRI:	Bar Code Reader Interface.
Option PIP:	Auxiliary Parallel Input	Interface Cables CE01-2M: RS232C (CCITT-V.24) Terminal to Data Set Cable CI04-2M. 20 mA. Current Loop Adaptor Cable.	
Option CDS:	Coloured Anti-Glare Display Screen (specify Amber, Green)		
Option KB1:	Numeric Pad and Twelve Function Keys		

Specifications subject to revision without notice.

Manufactured in Canada by:



volker-craig limited

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Computer Systems, m.b.H.
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