New OEM
Mini-cassette recorder.

# Now-a fast, low-cost serial memory device that's as compact as this.

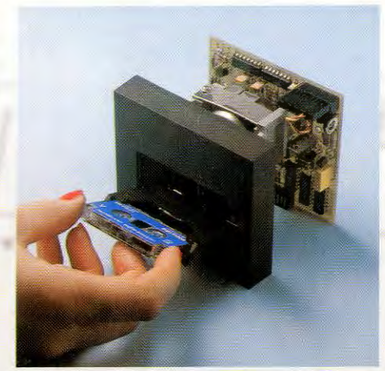
• New mini-size • Low-cost drive • Low-cost medium
• Low power consumption • 128 k byte capacity • Transfer rate: 6,000 b/s


PHILIPS

PHILIPS

# Our new Mini-Digital Cassette Recorder.

A data capacity of 128 k byte in a package you can hold in one hand – that's what the new Philips Mini-Digital Cassette Recorder offers OEMs and users who need a fast, low-cost serial memory device for data storage and interchange.
The Mini-Digital Cassette Recorder (Mini-DCR) is available in either read-only or read-and-write versions. Each model can operate in the following modes: Idle, Read, Write, Backspace and Rewind.
Complementing the quality and reliability of the Mini-Digital Cassette Recorder are Philips mini-cassettes certified for digital data recording applications. These mini-cassettes use tape which is certified for freedom from drop-outs. Mini-cassettes have been widely used for program loading in Philips office computers during the last four years, and over half a million are already in service.
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 OEM supplier of this type of equipment.
Now, the new Mini-Digital Cassette Recorder (Mini-DCR) has all the convenience and reliability of the established range of Philips DCR equipment, but offers an 80 % reduction in both size and cost over full-size DCRs.
Low cost, low power consumption and compact size of the Mini-Digital Cassette Recorders mean they are ideal for program loading and updating applications, as well as providing a highly convenient data capture facility.
Among the equipment which can benefit from the advantages of these units are industrial micro-processor based systems, terminals, programmable


calculators, desk-top computers and automatic typewriters.
Ample capacity for program loading and data interchange is provided by the 128 k byte capacity, and the high data transfer rate of 6000 bits/sec allows quick reading and writing of programs and data.
Accuracy and reliability are other important features of the Mini-DCRs – like all Philips DCR units. The irrecoverable error rate is only 1 in $10^9$ bits, and MTBF is in excess of 5000 hours. Useful life under normal conditions of operation is at least 10,000 hours or 5 years. And if attention or repair should ever become necessary, the mean time to repair is less than 30 minutes, thanks to the simple, robust construction and excellent serviceability of the Mini-DCR.

## Models and options

**M-DCR 210** read-only device for program loading
**M-DCR 220** read-and-write device for program loading, memory back-up and data capture applications
**Options** write-enable switch (file protect) and front cover

## Functional

**Media** standard Philips 3.81 mm digital magnetic tape mini-cassette, certified for freedom from drop outs; the cassette is packed in a closed plastic case and can be equipped with a write-enable plug
**Tape length** about 35 m
**Motor drive transport** single motor, hub driven 338 rpm ± 5 %
**Operating modes** IDLE, READ, WRITE, BACKSPACE, REWIND
**Number of heads** two; a single gap half-width read/write head and an erase head
**Number of tracks** two; A-side/B-side
**Recording method** phase encoding, character/bit serial

## Performance characteristics

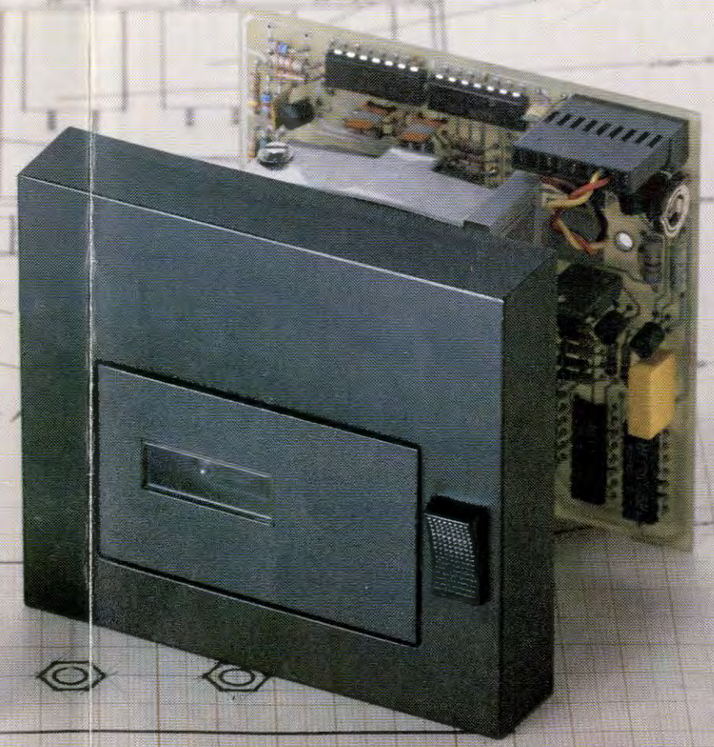
**Data capacity** 128 k bytes max.
**Operations** continuous and start/stop operation
**Status lines** begin of tape (BOT), end of tape (EOT), cassette in position (CIP), write-enable (WEN)
**Recording density** 330 - 560 bpi or 13 - 22 bits/mm
**Read time** about 96 s for full tape length
**Write time** about 96 s for full tape length
**Rewind time** 96 s nominal
**Tape speed (forward and reverse)** 10.6 - 18 ips
**Data transfer rate** 6000 b/s
**Hub speed accuracy** ± 5 %
**Jitter between clock and read data** negligible
**Start time read/write** < 100 ms
**Stop time read/write** 30 - 120 ms
**Start distance** 15 - 50 mm
**Stop distance** 5 - 25 mm
**Tape creepage** no tape creepage during idle mode
**Hard error rate** 1 in $10^9$ bits

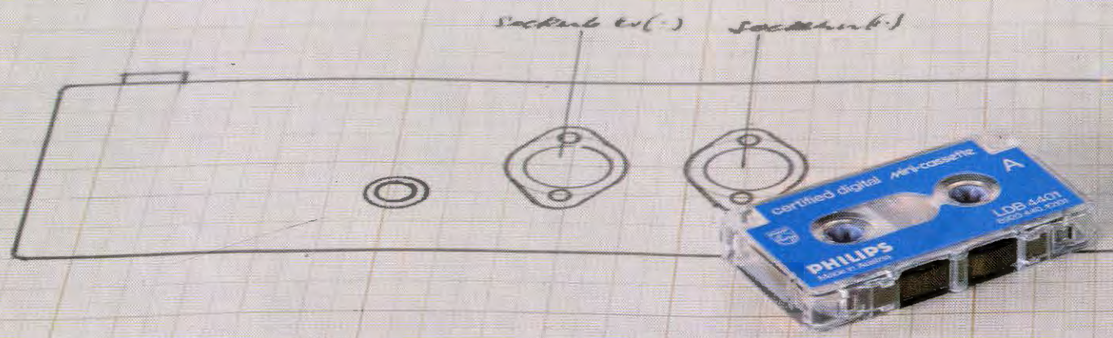
## Reliability/serviceability

**Mean-time between failures (MTBF)** > 5000 h
**Mean-time to repair (MTTR)** < 30 min
**Useful life** > 10000 h or 5 years
**Maintenance** the only preventive maintenance required is to clean the heads. Special cleaning cassettes are available

## Dimensions and environment

**Dimensions (Mini-DCR)** 96.5 x 86.5 x 80 mm
**Dimensions (mini-cassette)** 56 x 33 x 7.4 mm
**Weight** (Mini-DCR) 0.4 kg
**Operating position** horizontal or vertical






# Philips-the leader in digital cassette recording.

The worldwide reputation of Philips was earned by our advanced, high quality products in almost every field of electronics. Our experience and know-how in developing and producing digital cassette recording systems to the highest industrial standards have made us Europe's technology and market leader in this field.
In addition to the new Mini-Digital Cassette Recorder, the Philips range of DCR equipment includes a family of digital cassette recorders and interfaces using the established professional tape cassette format. DCR 3 and DCR 4 models are industrial high-quality digital cassette recorders for a wide range of data collection applications.

## Operating conditions

**Temperature** +5° C to +55° C
**Thermal shock** < 11° C per hour
**Relative humidity** 10 - 90 % no condensation
**Air pressure** 780 - 1100 mb
**Vibration (IEC 68-2-6)** 5 - 200 Hz at 1 g curve

## Non-operating conditions

**Temperature** –40° C to +70° C
**Thermal shock** < 14° C per hour
**Relative humidity** 5 - 95 % no condensation
**Air pressure** 480 - 1100 mb
**Vibration (IEC 68-2-6)** 5 - 200 Hz at 5 g curve

## Interfaces

**Signal interface** MOS-compatible (HEF 4000 p-series)
**Logic interface signals** forward, reverse, write command (M-DCR 220 only), write-enable (option), write data (M-DCR 220 only), begin or end of tape, cassette in position, read data, read clock, signal ground, safety ground, power +12 V, 0 V
**Power interface** 12 V ± 5 %; 120 mA nominal, 30 mA stand-by
**Interface connector for interface cable** 14 pin AMP connector. AMP code 1-163690-3, contacts AMP code 163691-1

## Order numbers

**8920 405 10101** basic read-only unit (M-DCR 210) optional
**8920 405 10301** read-only unit with front cover optional
**8920 405 10201** basic read-write unit (M-DCR 220) optional
**8920 405 10401** read-write unit with write-enable switch optional
**8920 405 10601** read-write unit with front cover and write-enable switch standard
**8920 440 10101** certified digital mini-cassette standard in boxes of 6 pcs.

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