

DATABOARD 4680

THE FIELD PROVEN MICROCOMPUTER SYSTEM

DataBoard 4680 provides a flexible, microcomputer system for OEM- and End-users.

1.

A LARGE NUMBER OF BOARDS

More than 60 boards available of which 40 are interface boards. Optional CPU (Z 80, 8080, 2650, 6502 and 6802) without changing bus, memory- or I/O-boards. Colour-Video-RAM for graphics on a colour TV monitor, fully VIEWDATA compatible with support commands in Basic.

2.

EXCELLENT SOFTWARE BACKUP

Multi Task Operative System. Assembler, Fortran IV, Extended Basic, Pascal, Cobol. Utilities as Editor, Debugger/Monitor, ISAM. Protocol for large computer communication.

3.

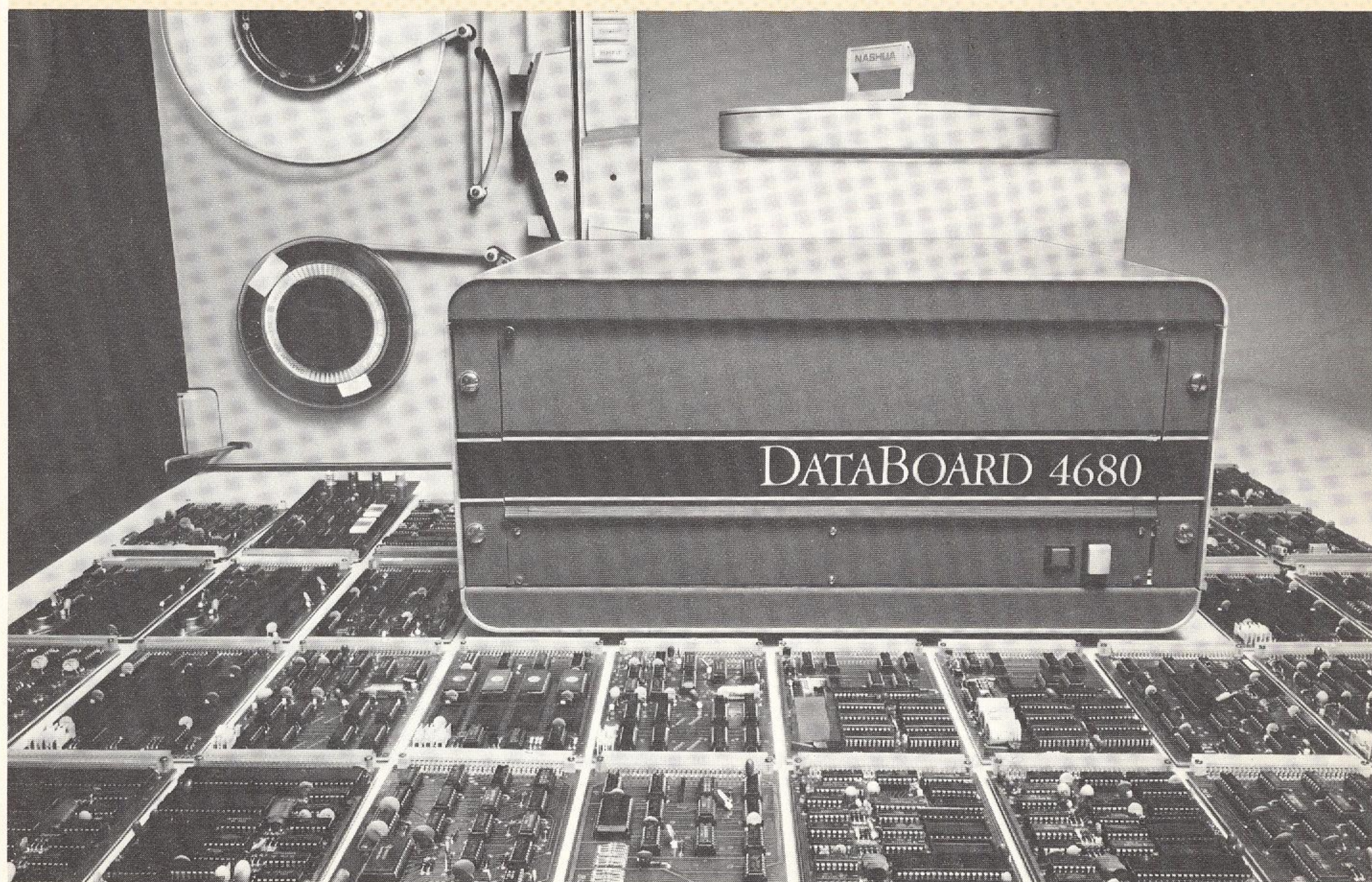
DEVELOPMENT SYSTEM

Floppy-disc based system with built-in dual 5" or dual 8" subsystem drives. Control panel for hardware control of processor functions. I/O-tester for testing interface boards and peripherals. PROM-programming unit provided for one-shot programming of complete 32Kbyte PROM board.

4.

COMPLETE DOCUMENTATION

Datasheets on each board. System Manual for detailed description of the concept. Software Catalogue of available development software. User Manual for each software package.

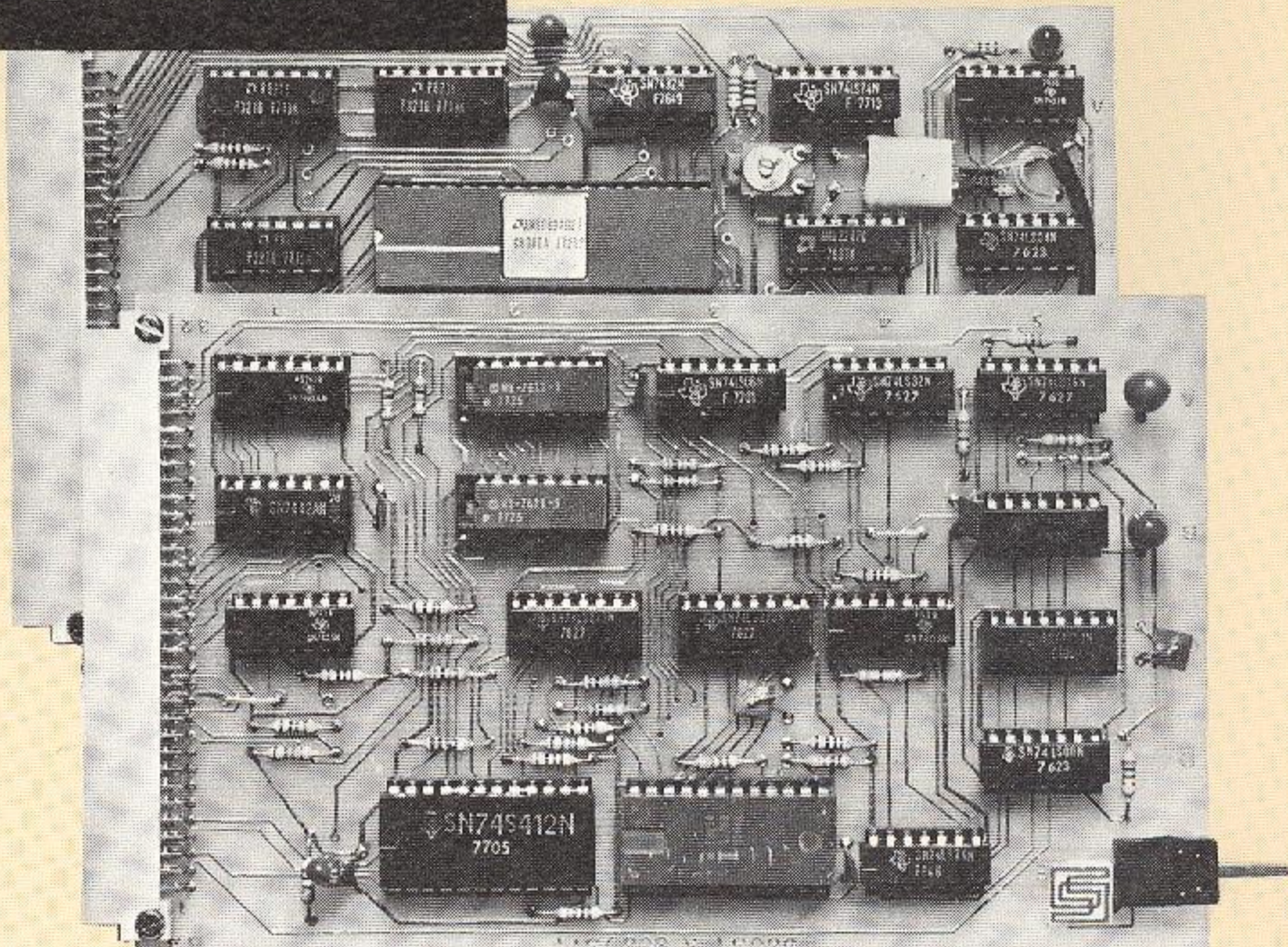


CPU-BOARDS

Single- and Double-Board-Computers are available to optimize in different applications. As new microprocessors with better performance appear in the future, it is simple to tailormake new boards. 16 bit micro-processors will be catered for.

8080 DOUBLE-BOARD-COMPUTER (1013, 1014)

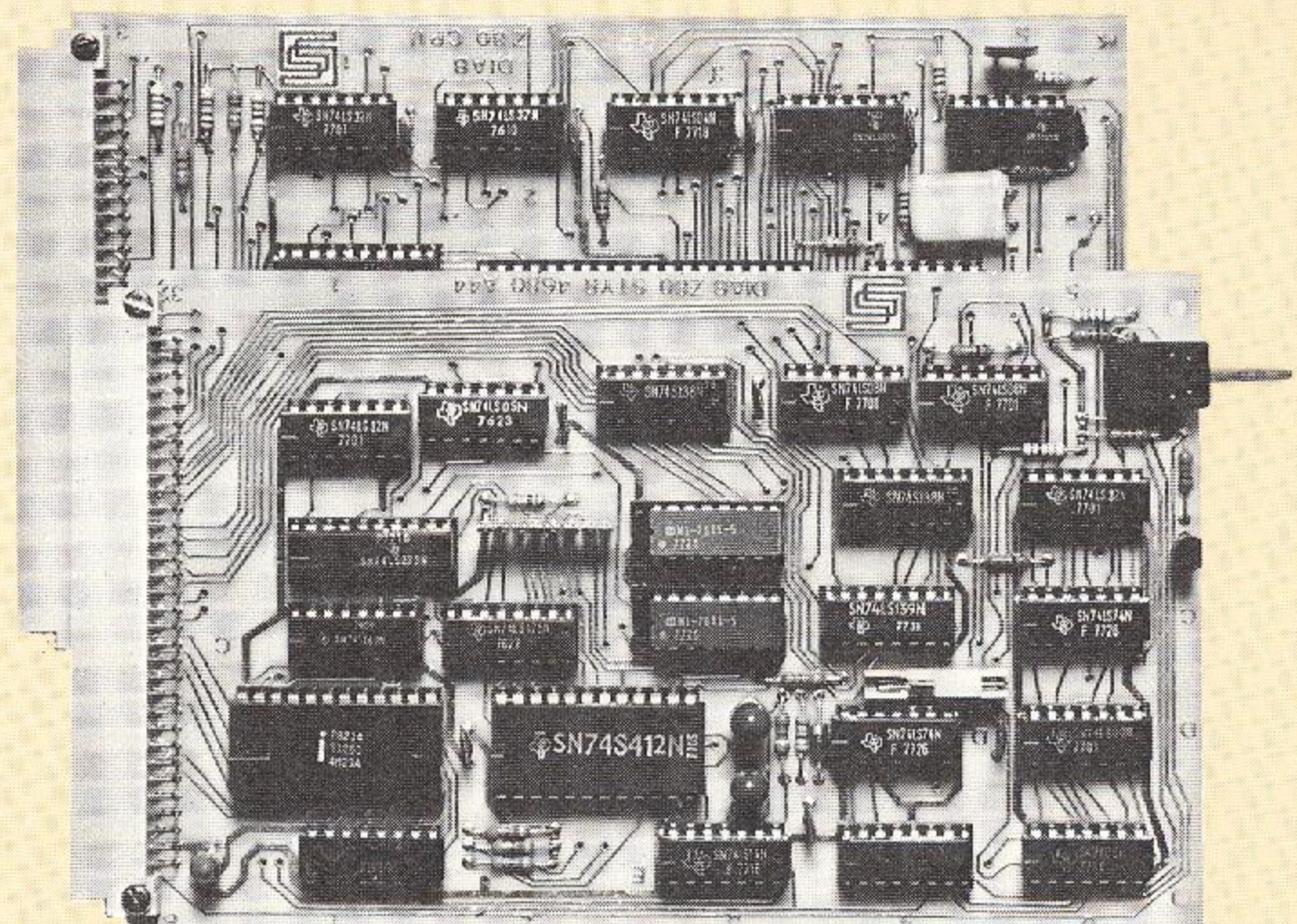
- Instruction time reg.-reg. 2 μ s.
- Up to 1Kbyte PROM for restart
- Supports dynamic and static memories
- DMA-availability
- 8-level vectored interrupt
- Watch-dog for hardware control of program-execution.



8080 DOUBLE-BOARD-COMPUTER

Z 80 DOUBLE-BOARD-COMPUTER (1043, 1044)

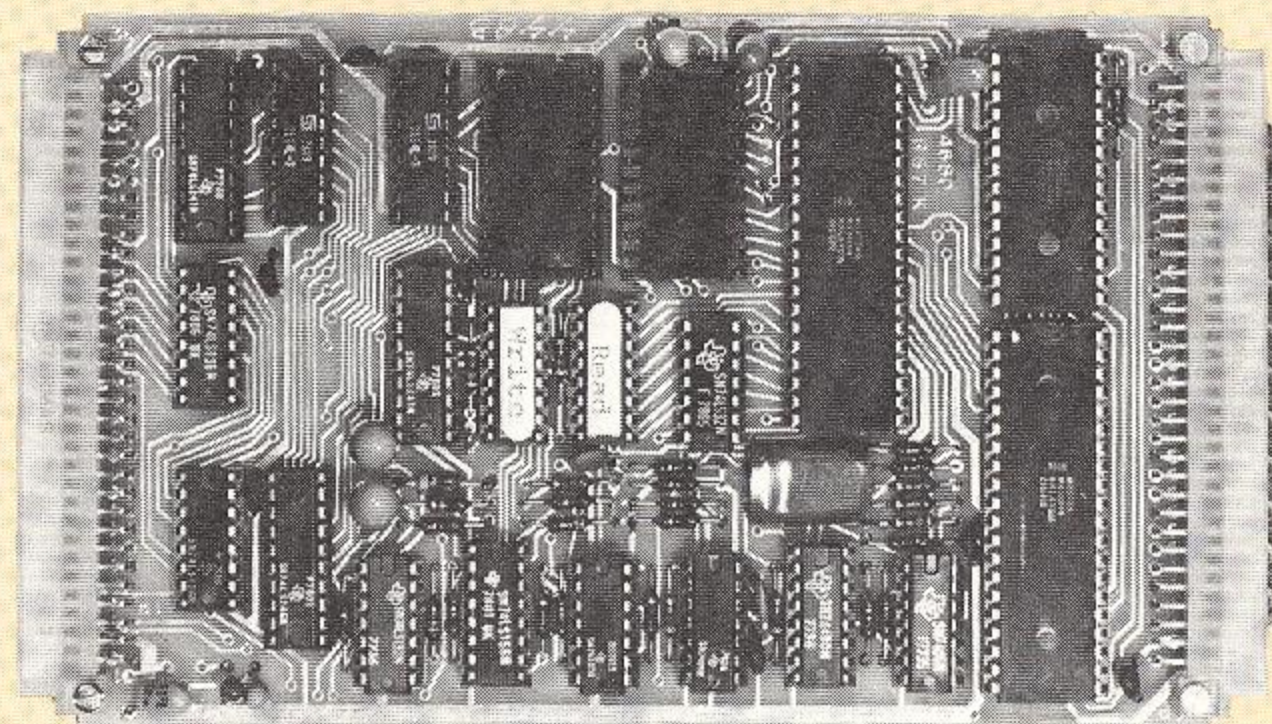
- Instruction time reg.-reg. 1,6 μ s.
- DMA-availability
- Up to 1 Kbyte PROM for restart
- Supports dynamic and static memories
- Watch-dog for hardware control of program-execution
- Extended interrupt with up to 128 vectors and Non-Maskable-Interrupt (NMI)
- Notification in RAM of the last transmitted data for the 64 lowest outputs



Z80 DOUBLE-BOARD-COMPUTER

Z 80 SINGLE-BOARD-COMPUTER (1057)

- Used as a separate unit or with expansion through the 4680-bus
- 1Kbyte static RAM included
- Sockets for up to 8 K PROM
- 2-level vectored interrupt
- Watch-dog for hardware control of program execution
- 4 programmable timers with 4 trigger inputs and 3 pulse outputs
- 2 X 8 bit digital I/O-ports with hand-shake. Z80—PIO.



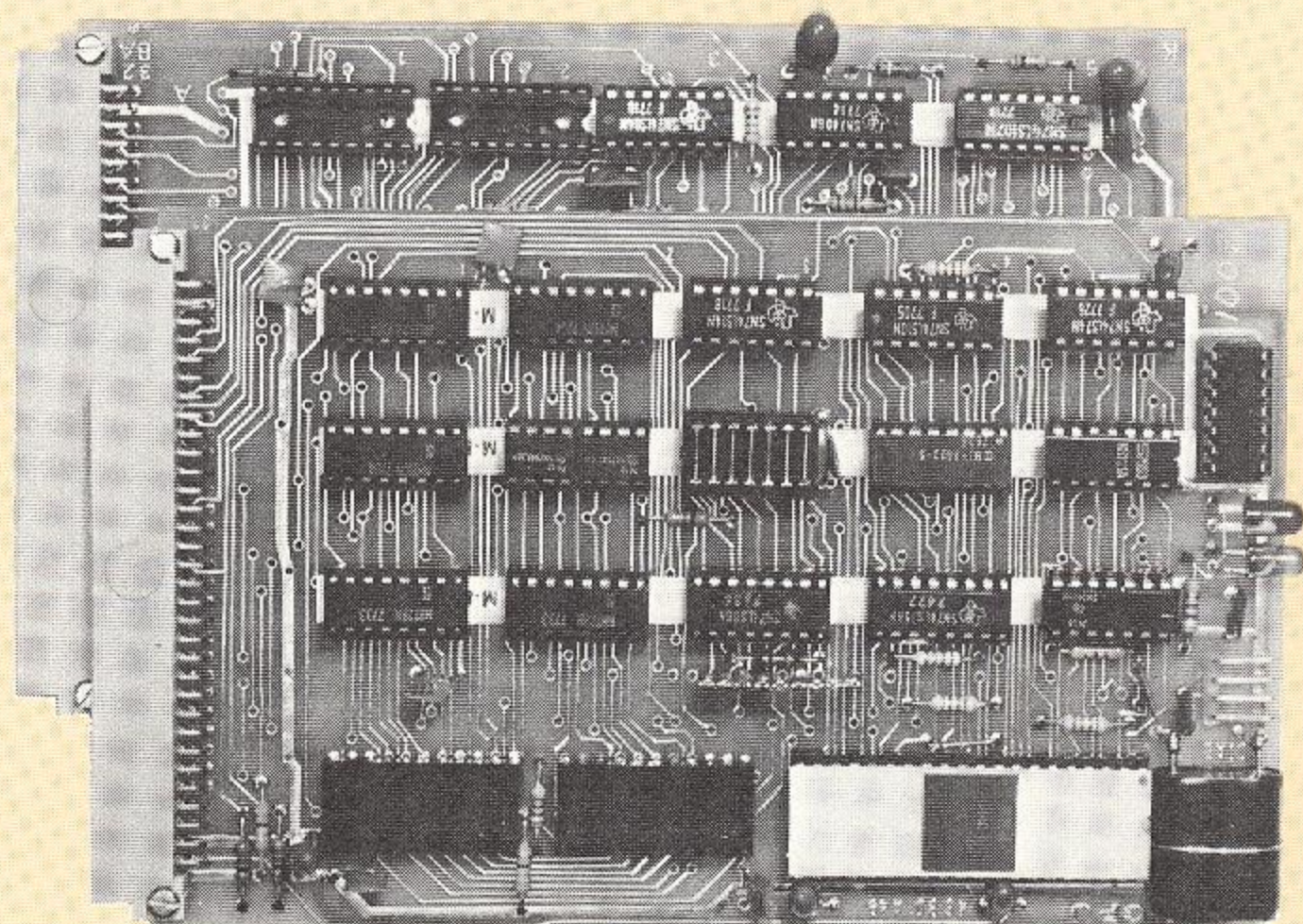
Z80 SINGLE-BOARD-COMPUTER

Z 80 SINGLE-BOARD-COMPUTER (1062)

- Same as 1057, but 2 serial I/O-ports instead of the parallell. Z80—SIO.

2650 DOUBLE-BOARD-COMPUTER (1049, 1050)

- Addressable memory up to 32Kbyte
- 1K RAM and sockets for 1K PROM
- Serial I/O-signalling
- Vectored interrupt
- Watch-dog



2650 DOUBLE-BOARD-COMPUTER

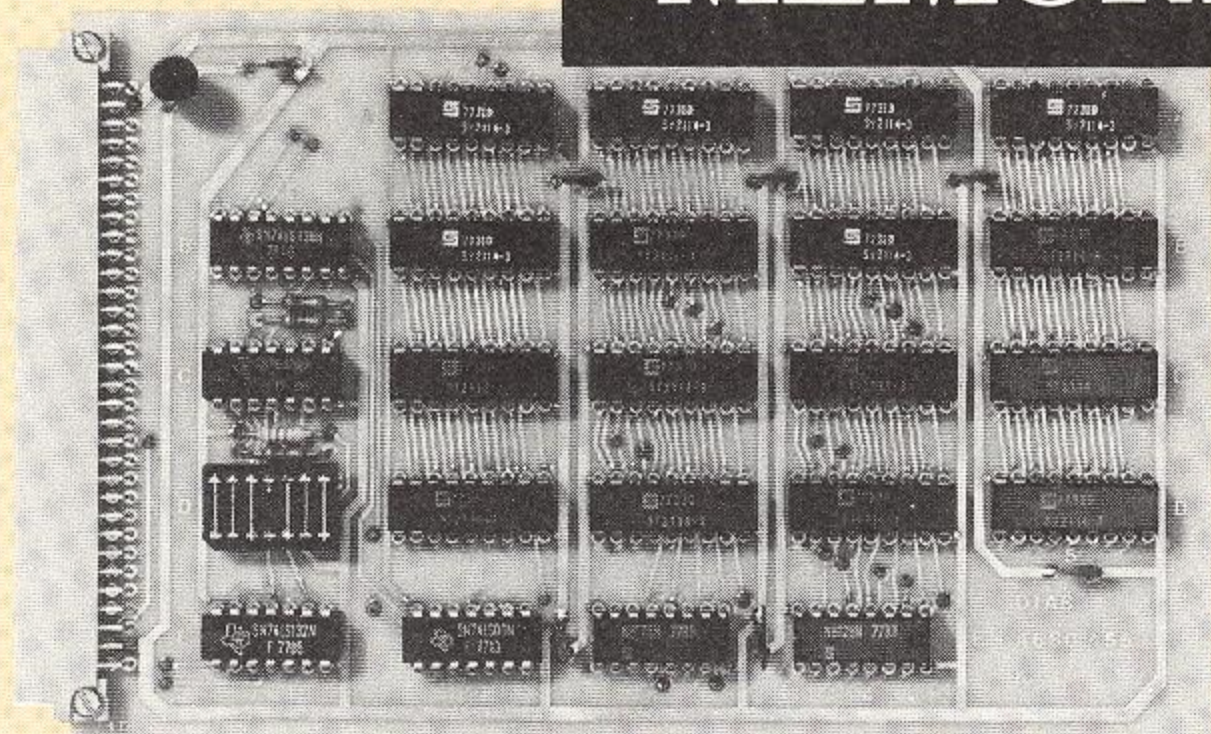
6802 SINGLE-BOARD-COMPUTER (1080)

- Performance similar to board 1057

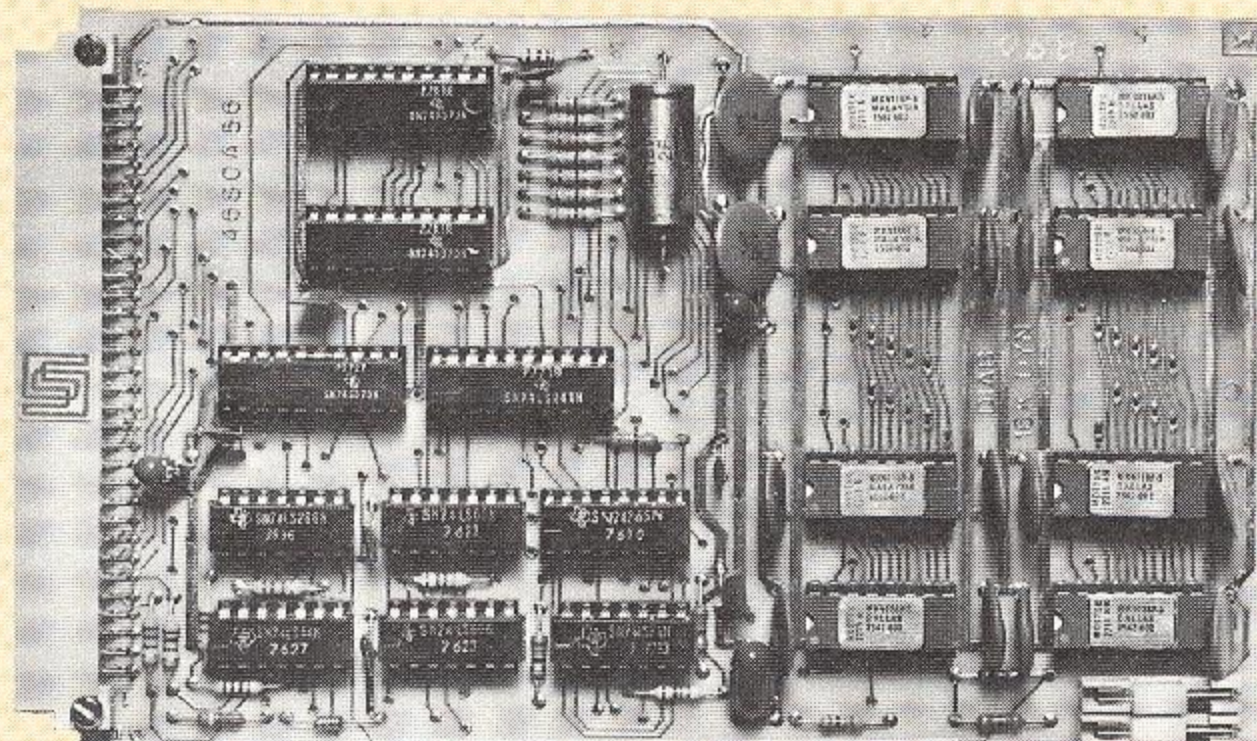
6502 SINGLE-BOARD-COMPUTER (1064)

- Performance similar to board 1057

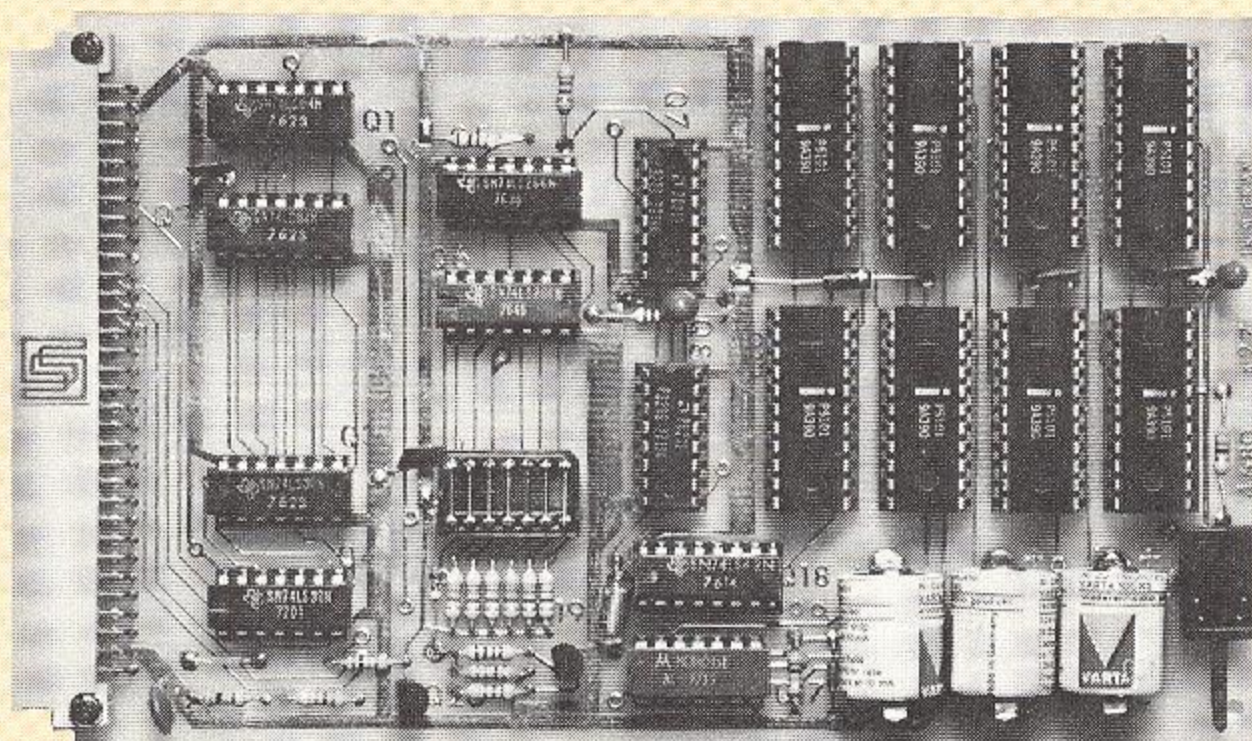
MEMORY-BOARDS



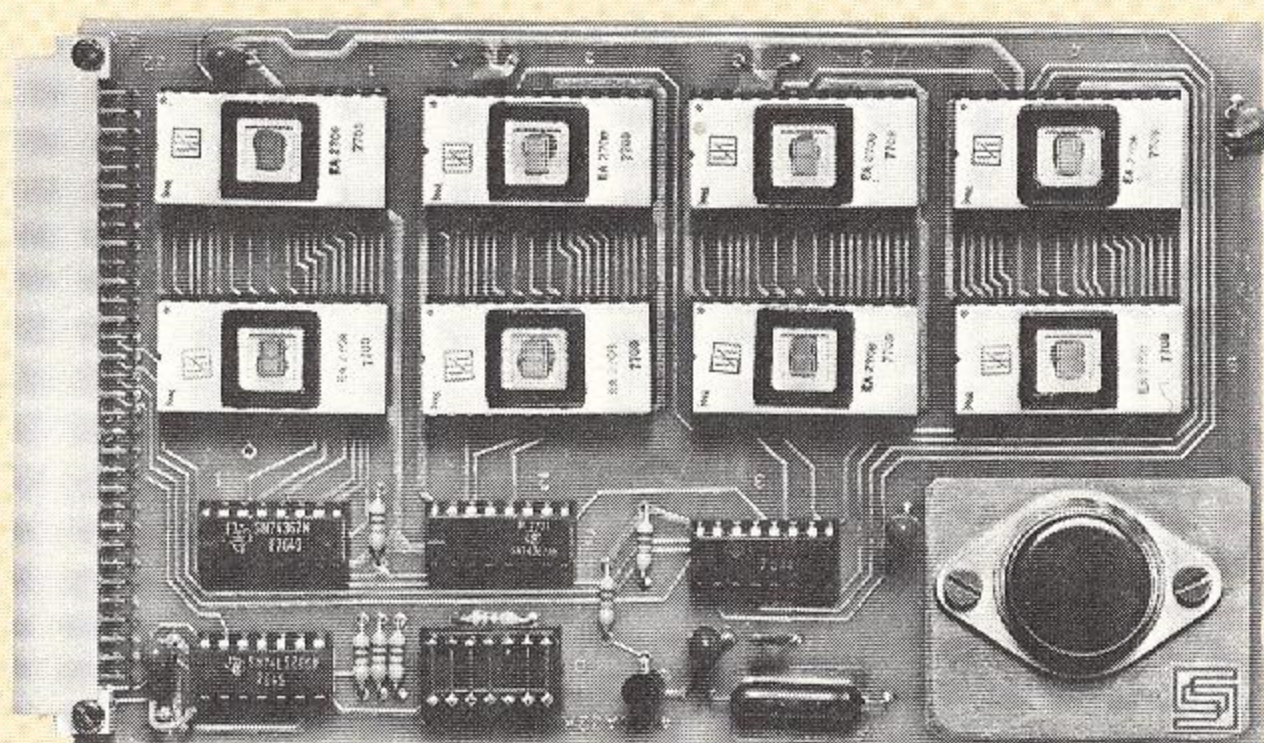
8K RAM



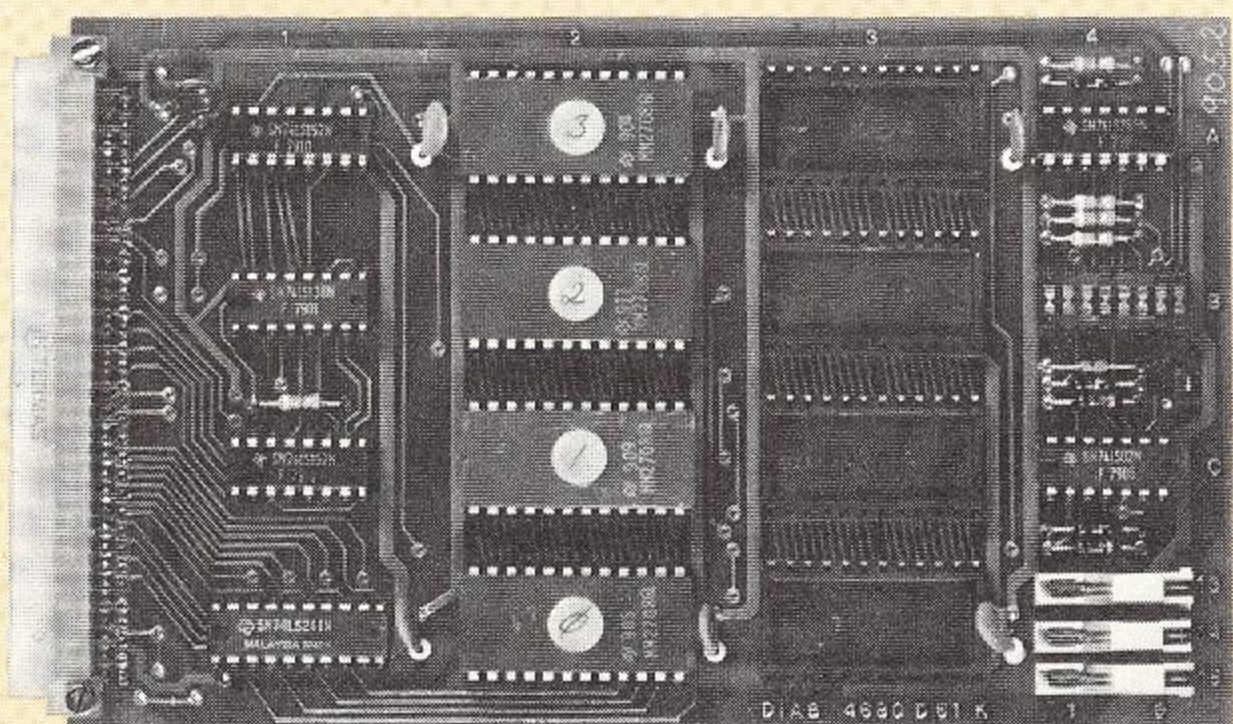
16K RAM



1K CMOS RAM



8K EPROM



8/16/32K EPROM

The most significant advantage of DataBoard 4680 is that it can be easily updated to use new memory techniques without redesigning the basic system.

4/8K RAM (2055)

- Static RAM with 2114L-3
- Addressable with code-plug up to 64K
- Expandable in modules of 1K

16K RAM (2056)

- Dynamic RAM with 4116-2
- Switch for address-selection

1K CMOS RAM (2027)

- Static CMOS RAM with 5101
- Accumulator-back-up for 100 h.
- Automatic recharge of accumulators
- Write protection in software

8K EPROM (3032)

- Designed for PROM 2708
- On-board expansion in steps of 1K

8/16/32K EPROM (3061)

- Based on memory circuits: 2758, 2716 or 2732
- On-board expansion in steps of 1, 2 or 4K depending on circuit
- A complete board can be programmed with PROM-programmer 8071 and a drive routine on disc.

IN ADDITION:

- 2002 2K RAM with 2102 static memory
- 3003 2K EPROM for 1702-circuits
- 3004 2K EPROM for 3621-circuits

I/O-BOARDS

A large selection of I/O-boards makes it easy to interface instruments, controls and peripherals to DataBoard 4680.

16 OUT, 8 IN TTL (4005)

- 2×8 buffered, digital TTL-outputs
- 1×8 digital TTL-inputs

32 OUT, 16 IN TTL (4006)

- 4×8 outputs, three-state TTL
- 2×8 inputs TTL

36 IN TTL (4085)

- 4×8 inputs
- 4 inputs for interrupts

16 TRANSISTOR OUTPUTS (4072)

- 16 latched transistor outputs
- Open collector, optoisolated transistors
- Max load = 1A, 50 V

16 RELAY OUTPUTS (4103)

- 16 latched relay outputs
- Change over contacts (SPDT)
- Max. load = 110V/1A/20W/30VA

16 OPTO INPUTS (4008)

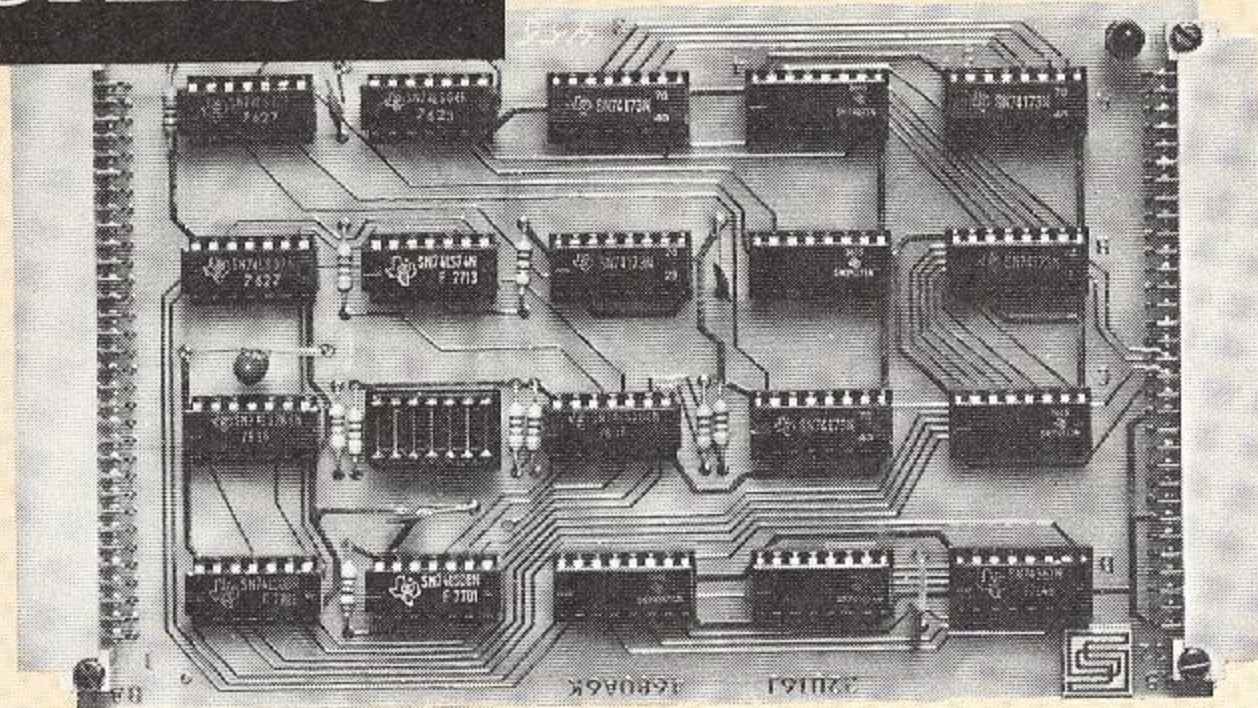
- Nominal extern voltage, 12 V
- 4 kV isolation

IEC-BUS INTERFACE (4025)

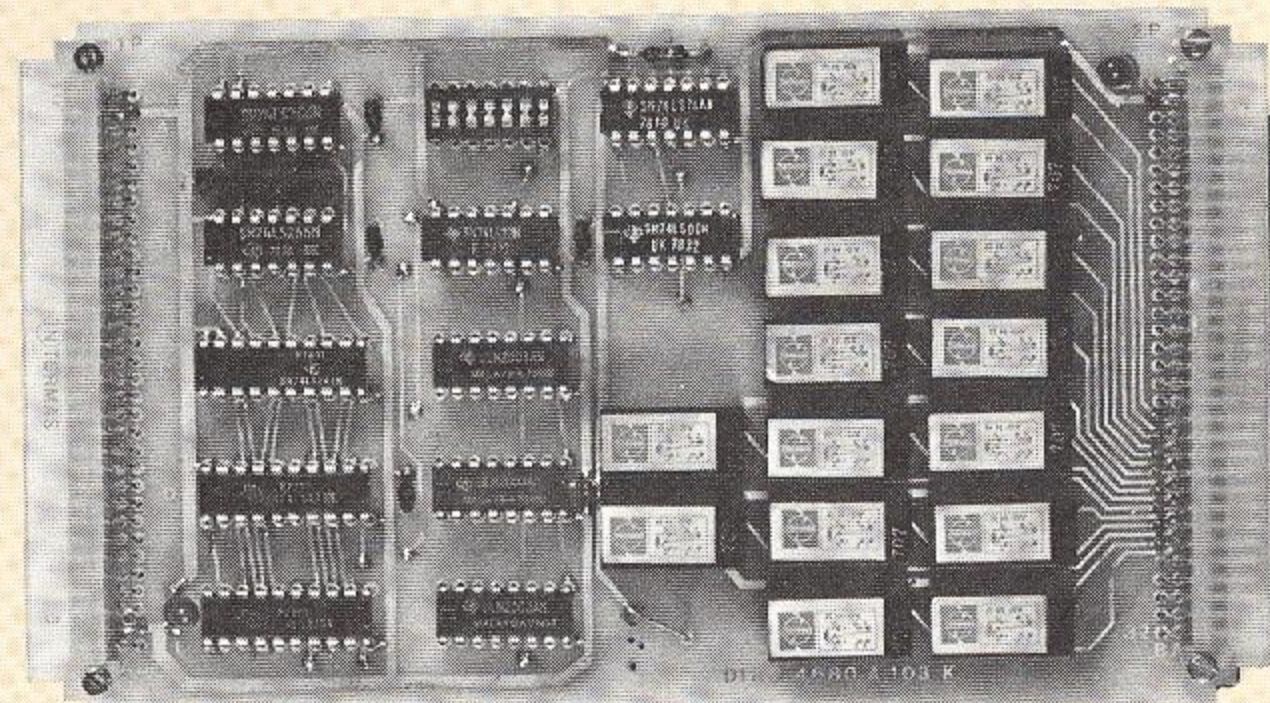
- To convert the 4680-bus signalling to the standard IEC instrument bus (IEEE 488, HP)
- Support commands in Basic

12 BIT A/D, 32 CHANNELS (4082)

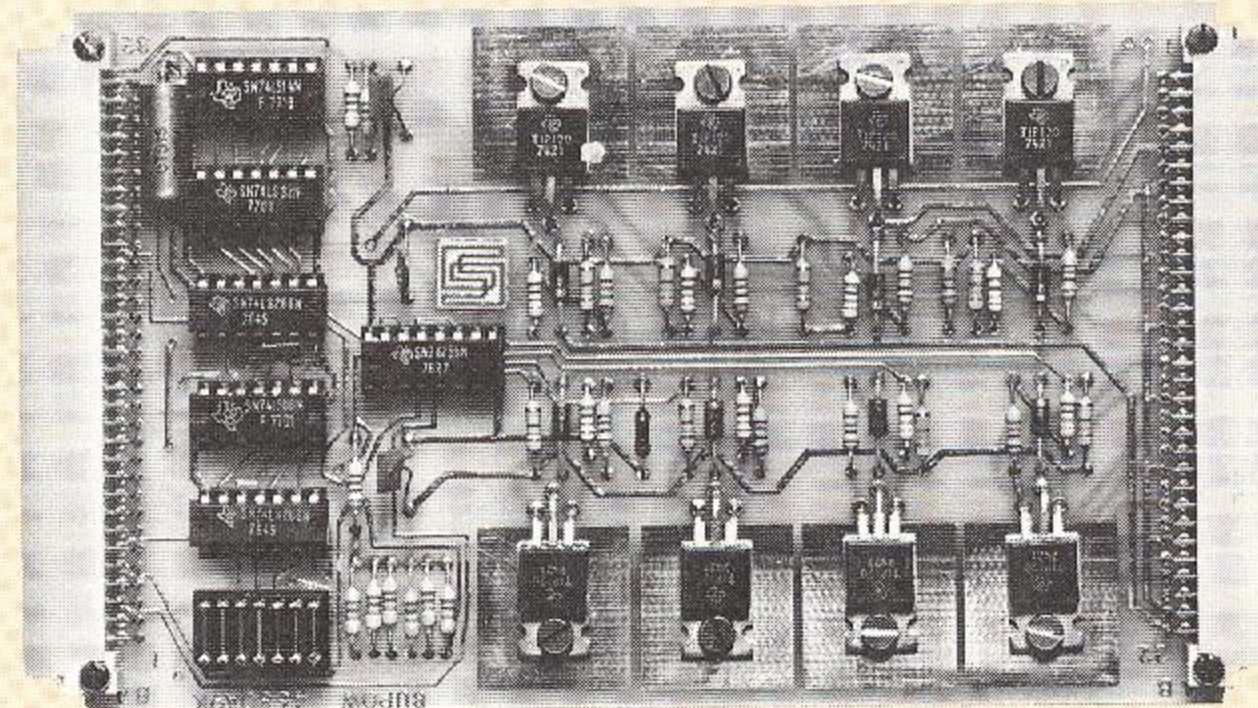
- 32 analog single ended or 16 differential inputs
- 150 μ s conversion time
- Board for galvanic isolation available (4089)
- Analog signal 0—5 V or —5 to +5 V
- Support commands in Basic



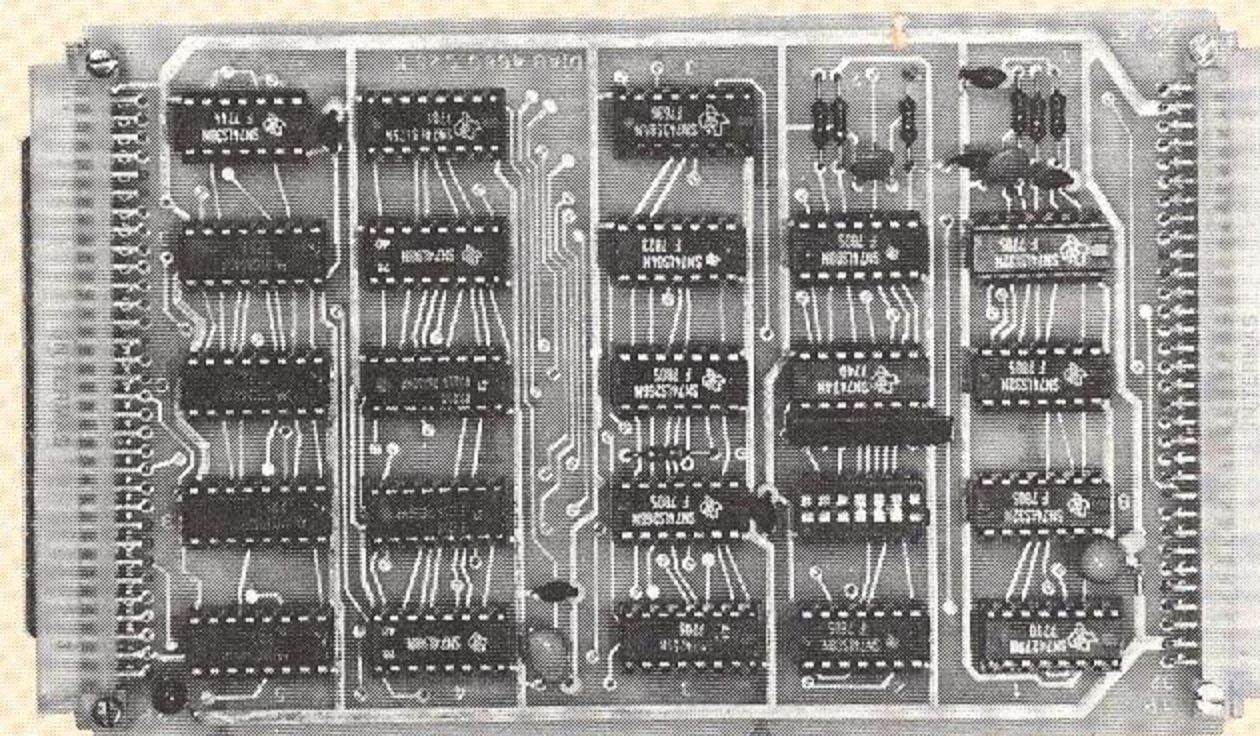
32 OUT, 16 IN TTL



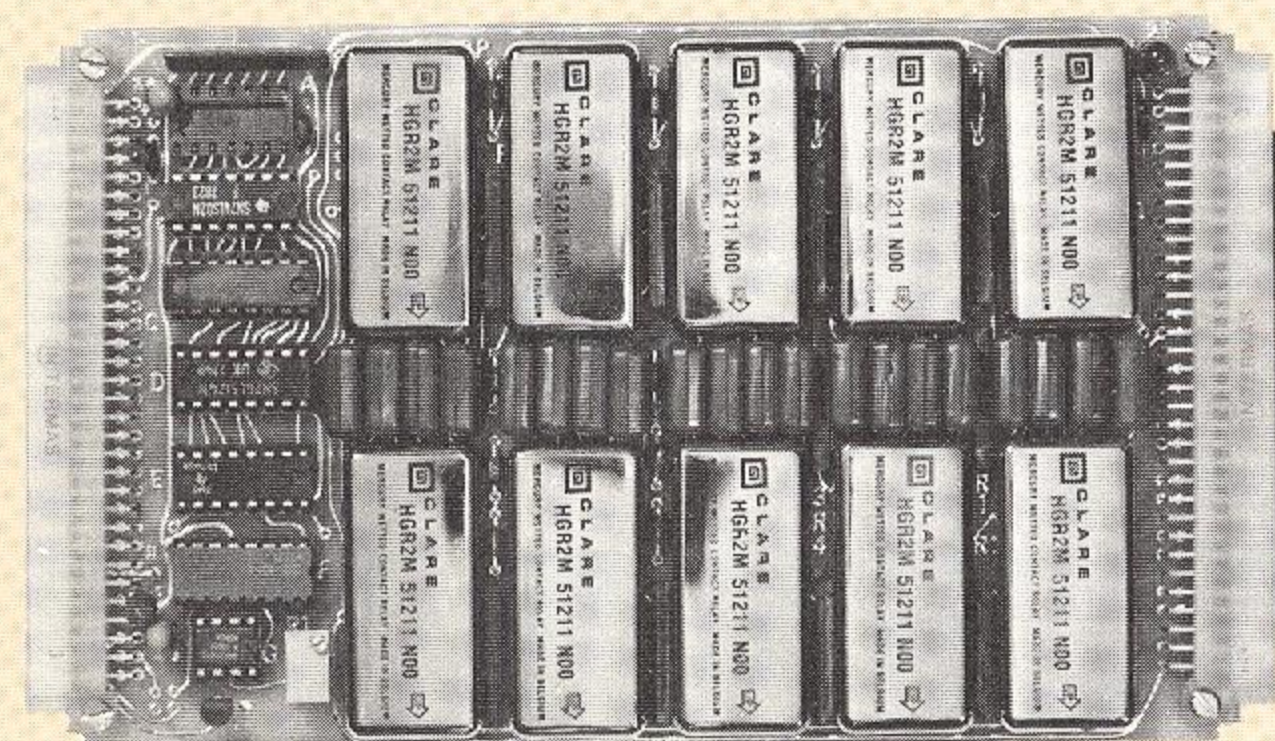
16 RELAY OUTPUTS



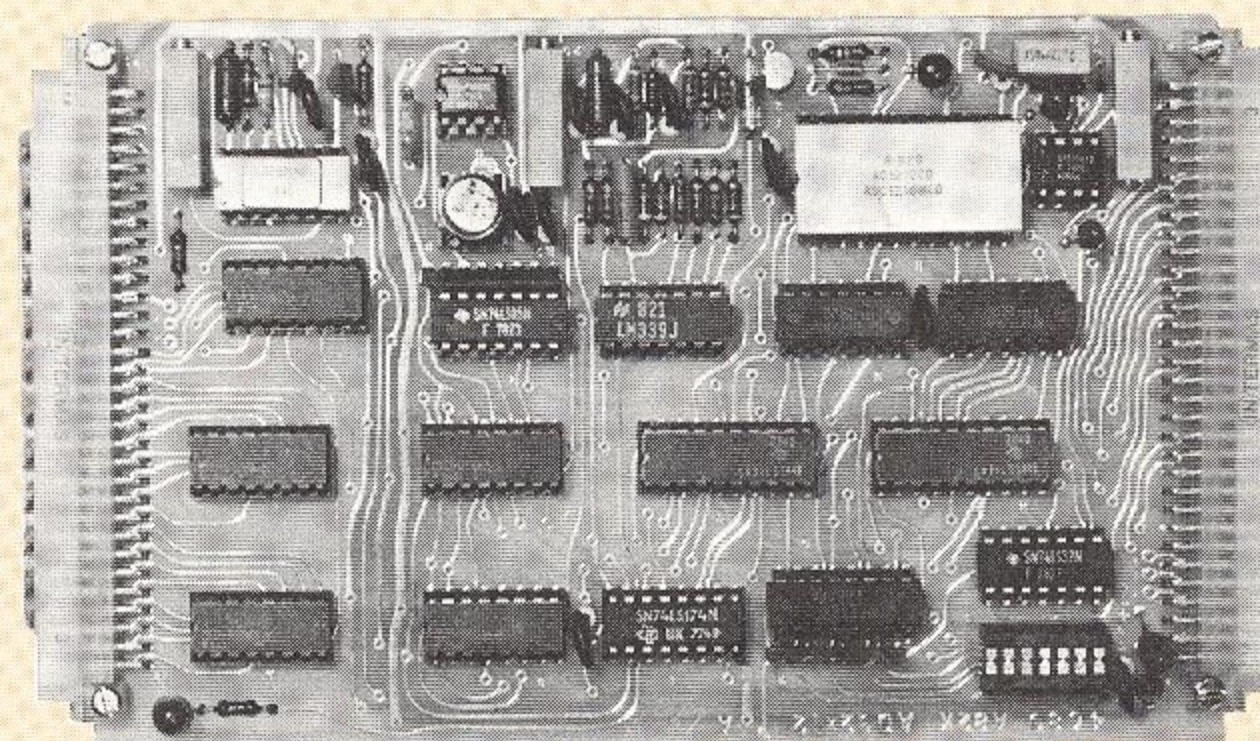
8 TRANSISTOR OUTPUTS



IEC-BUS INTERFACE

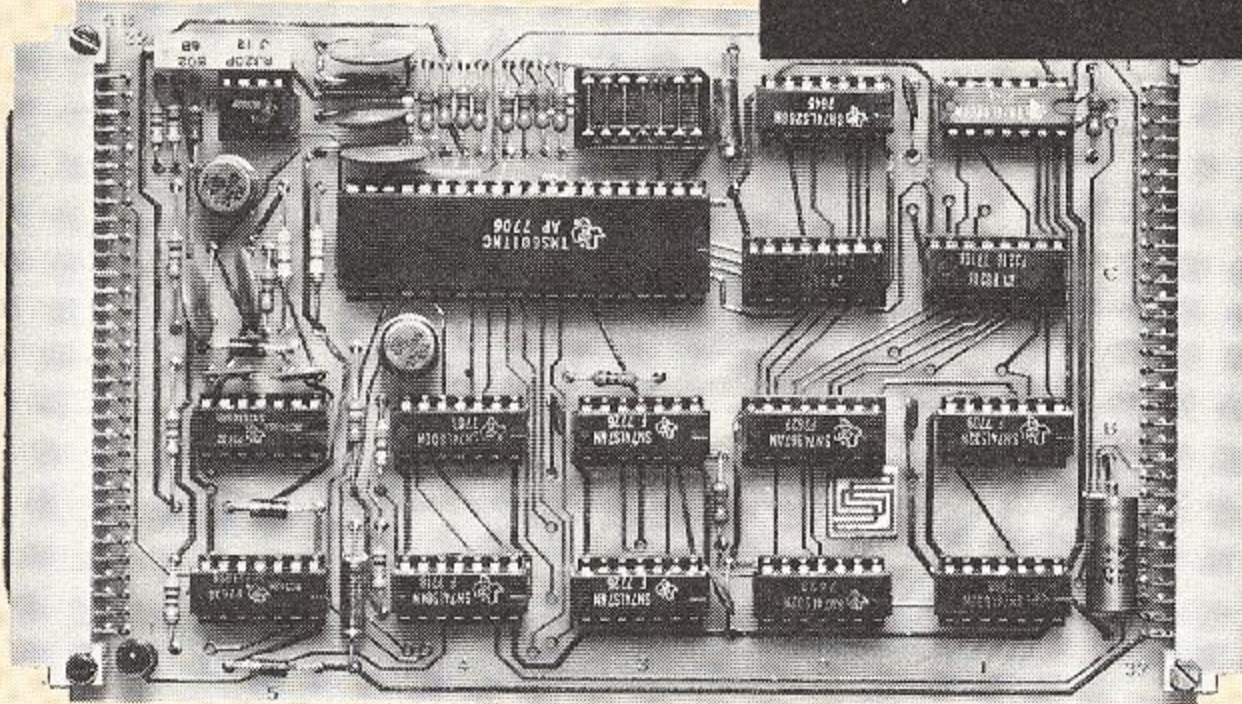


ANALOG MULTIPLEXER



12 BIT A/D, 32 CHANNELS

I/O-BOARDS



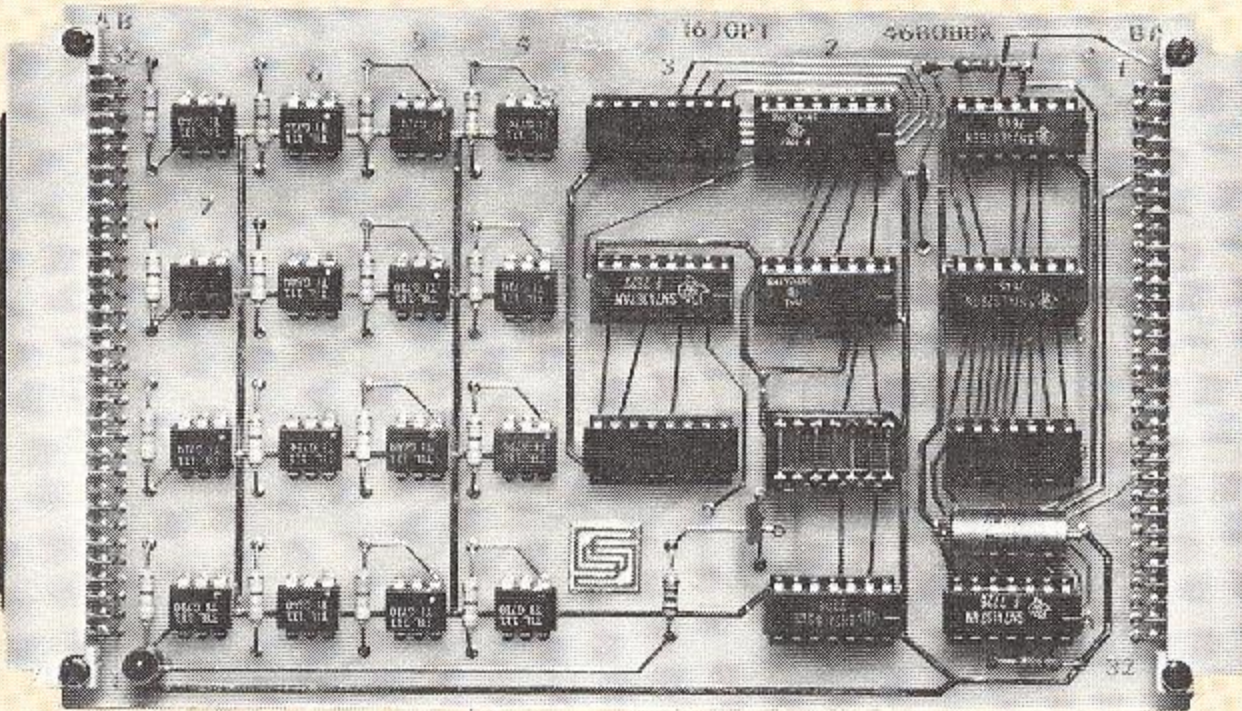
UART

UART (4017)

- RS 232 C/V24 or current loop interface
- Interfaces serial peripherals as TTY, CRT, modem etc.
- Data rate up to 9600 baud

ANALOG MULTIPLEXER (4089)

- 10 analog inputs
- Galvanic isolation provided with mercury relays and flying capacitors



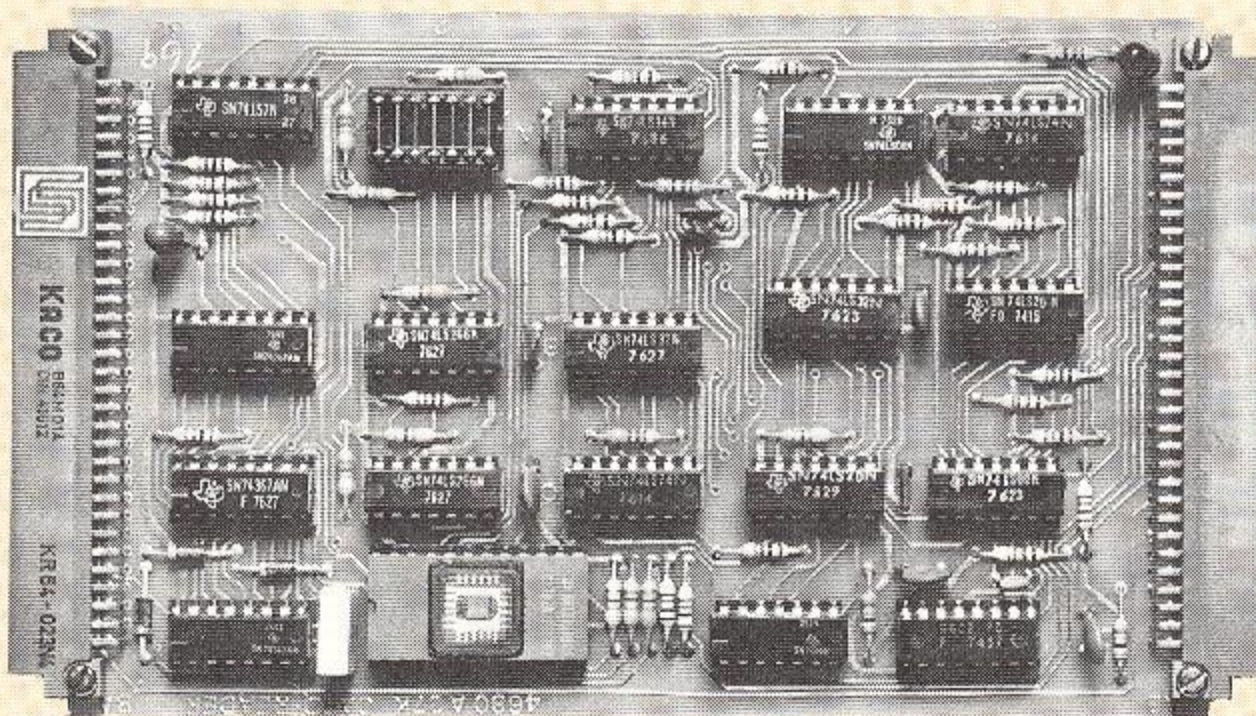
16 OPTO INPUTS

COLOUR-VIDEO-RAM (2081)

- Viewdata compatible
- Support commands in Basic
- 1K video-memory
- Coaxial outputs for R, G, B and Sync-signals
- Alphanumerical and graphic signs in 7 colours
- For colour-monitor or modified colour TV

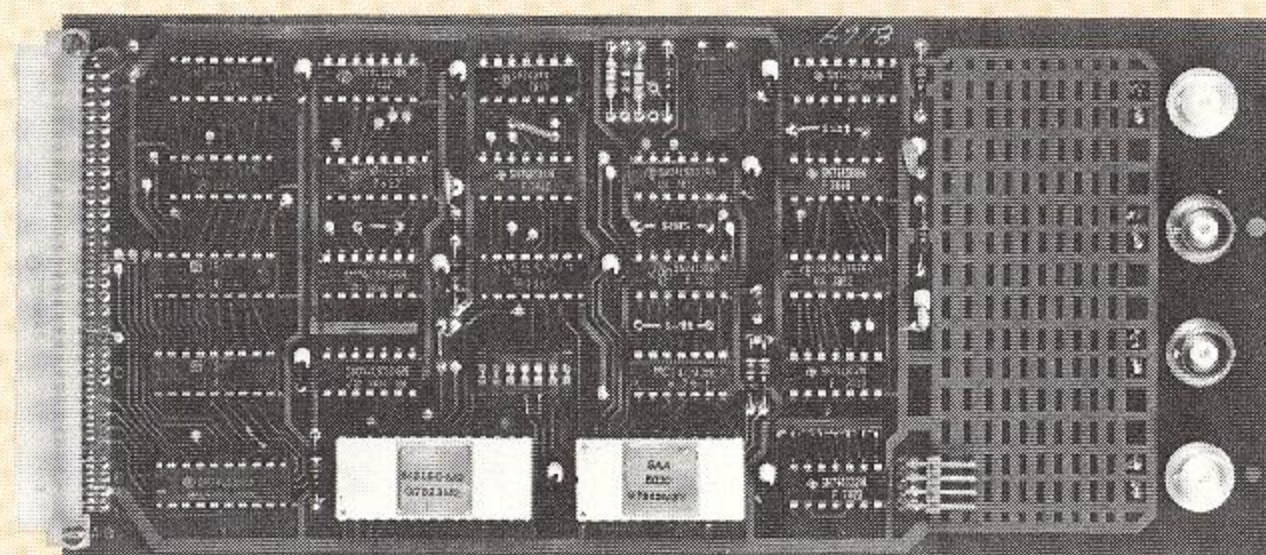
IN ADDITION (EXAMPLE):

- 4026 USART asynchronous/synchronous data communication
- 2066 Video-RAM black and white
- 4083 12 bits D/A, 2 channels
- 4084 8 bits D/A, 4 channels
- 4074 Audio-tape-interface
- 4037 CDC card reader interface
- 4038 Centronic fast printer interface
- 4039 Relay outputs, one of sixteen
- 4060 CDC fast printer interface
- 4007 8 Relay outputs
- 4009 8 Transistor outputs
- 4015, 4016 SPI interface



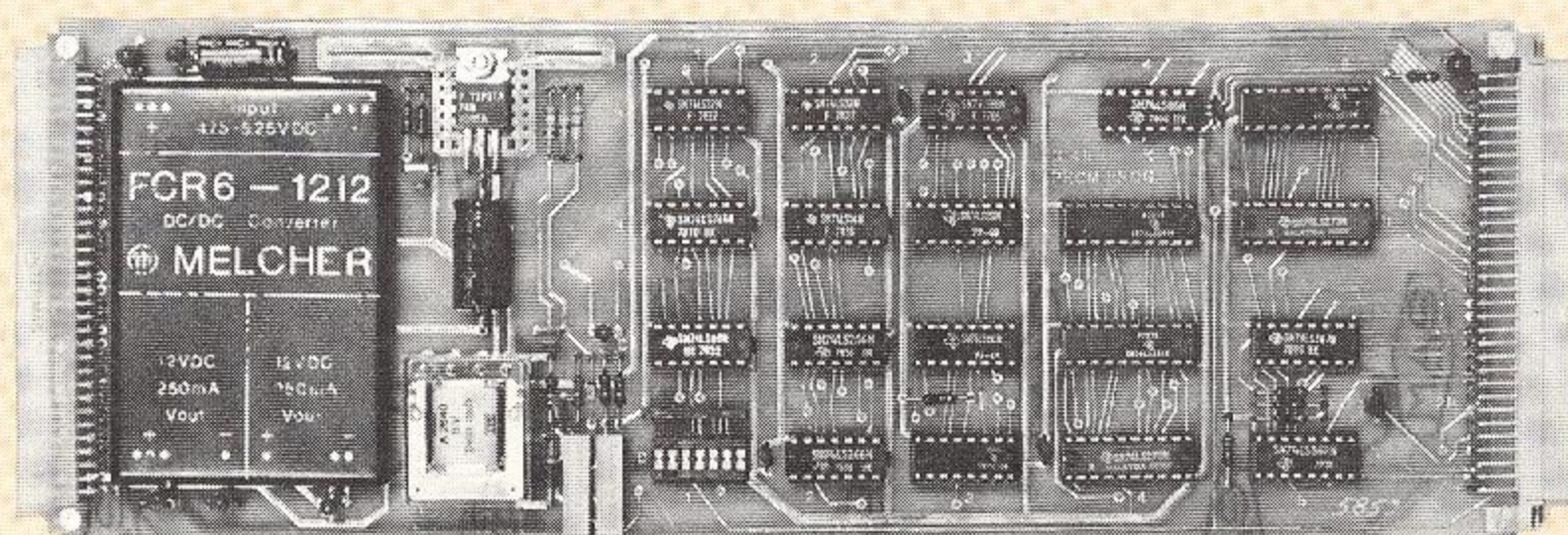
CDC CARD READER

OTHER BOARDS



COLOUR-VIDEO-RAM

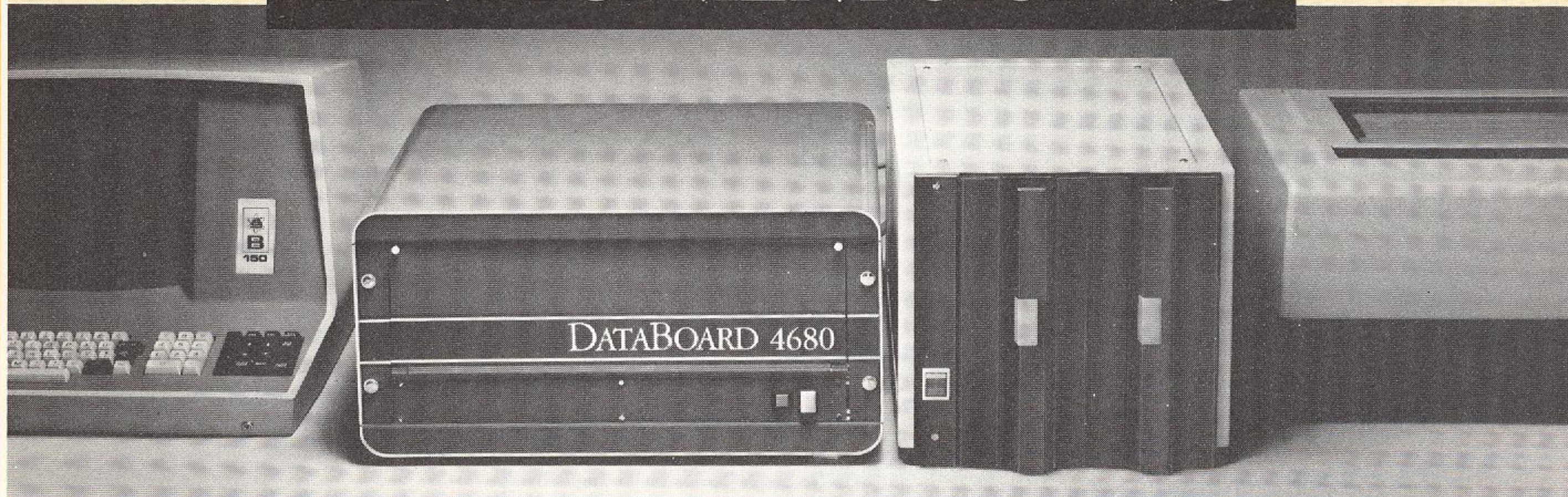
- 5001 Prototype board
- 5018 Interval clock, 1 ms to 10 s
- 5023 Busexpansion board with cable
- 5033 DMA-controller
- 5070 Prototype board with businterface



PROM — PROGRAMMING KIT (8071)

With the PROM-PROGRAMMING-BOARD and the appropriate drive routine on disc, a complete 8/16/32 Kbyte PROM-board can be programmed in the system. No handling of individual EPROM-circuits are necessary.

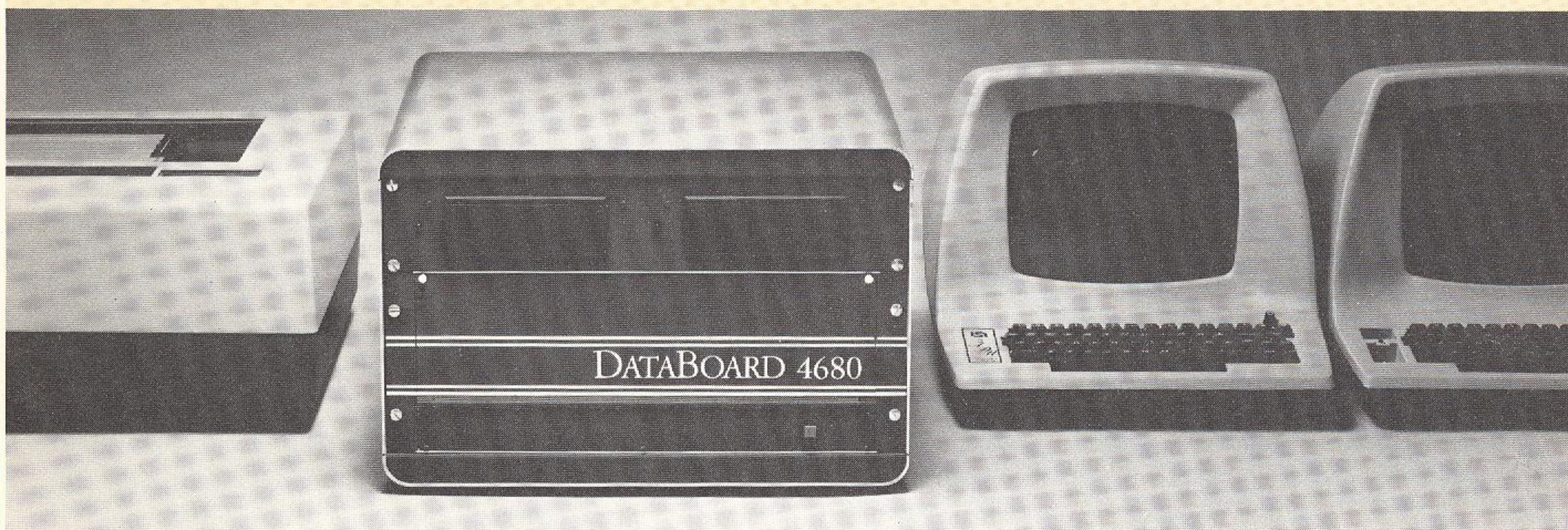
DEVELOPMENT SYSTEMS



ALPHA DEVELOPMENT SYSTEM

α Floppy-disc based system with Z 80 Double-Board-Computer, up to 64K RAM, interface boards for terminal and printer, DMA and Bootstrap. Dual 8" 270K floppy-disc subsystem. Possible to drive 10M disc and magtape station. One shot programming of up to 32K PROM-

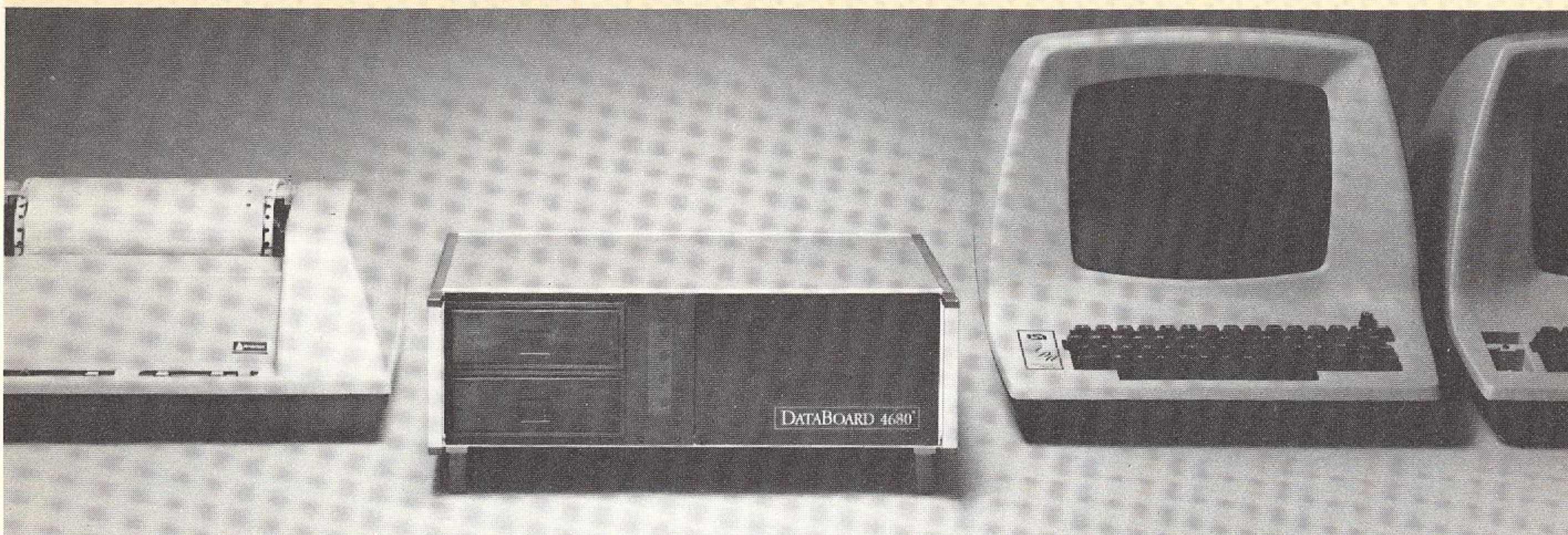
board possible in the system. Software for development: DOS, RTE, Assembler, Fortran IV, Cobol, Extended Basic, Pascal, Monitor/Debugger, PROM-programming plus other utilities. A major advantage of DataBoard is that there is no difference between development and application system.



BETA DEVELOPMENT SYSTEM

β Similar to the above, but with built-in dual 5" 80 Kbyte mini-floppy-drives. Double density will be available during

1980. No limitation in software compared with the larger system.



GAMMA DEVELOPMENT SYSTEM

γ A small size, inexpensive unit with built-in dual 5" 80 Kbyte drives. Double density available during 1980. Space for

up to 48 K RAM or PROM. Slot for Interface boards for printer and terminal and one more I/O-board. No limitation in software compared with the larger systems.

SOFTWARE

for Z 80-based system only



OPERATIVE SYSTEMS

OS. 8MT — Operating System Multi Tasking

with multiprogramming capabilities. It can monitor both real time tasks and batch processing. The OS is modular in design with file handling (DOS. 8MT) for discs and/or magtape station.

DOS 6 — Disc Operating System is for disc handling in the normal configured development system and for data management in general.

PROGRAMMING LANGUAGES

Basic — a fully interactive language with line-at-a-time entry. 24K semicompiling, extended Basic for fast execution. String arithmetic gives up to 32 digits accuracy. Commands are provided for the DataBoard I/O-boards as well as IEC-bus and Viewdata. Multi-user version available. Comparable with the best Basics provided for mini-computers.

Pascal — including string- and file handling and I/O-board control.

Cobol — ANSI 74 level 1 with a number of important features from level 2.

Fortran IV — an effective high level language for fast and easy programming. The compiler produces a highly optimized, directly executable code. Powerful extensions allow hardware manipulations. Machine code language can be implemented in the Fortran program version which generate assembler source code available.

Assembler — to be used when highly optimized code and fast execution are needed. The Assembler is relocable and provided with an object library updating program and establisher. Macro facility included.

UTILITIES

Debugger/Monitor — is one of the most powerful and useful utilities. The Monitor includes a large set of commands to read, write and manipulate data and program in several number notations. The Debugger provides commands for single step, step on jumps, secret trace and free run execution. Even the I/O-boards can

be controlled by the Debugger for testing. An 8K PROM version is available.

Editor — to generate modify and update source files of any kind. An extensive set of commands make editing handy.

ISAM — Indexed Sequential Access Method for fast access to individual elements in large textfiles.

Protocol — line procedures for communication with e.g. IBM 2780, 3780, 3270, 360 HASP etc; UNIVAC 1004; SIEMENS SV1; ICL 7020; BURROUGHS Poll-select; CDC UT 200.

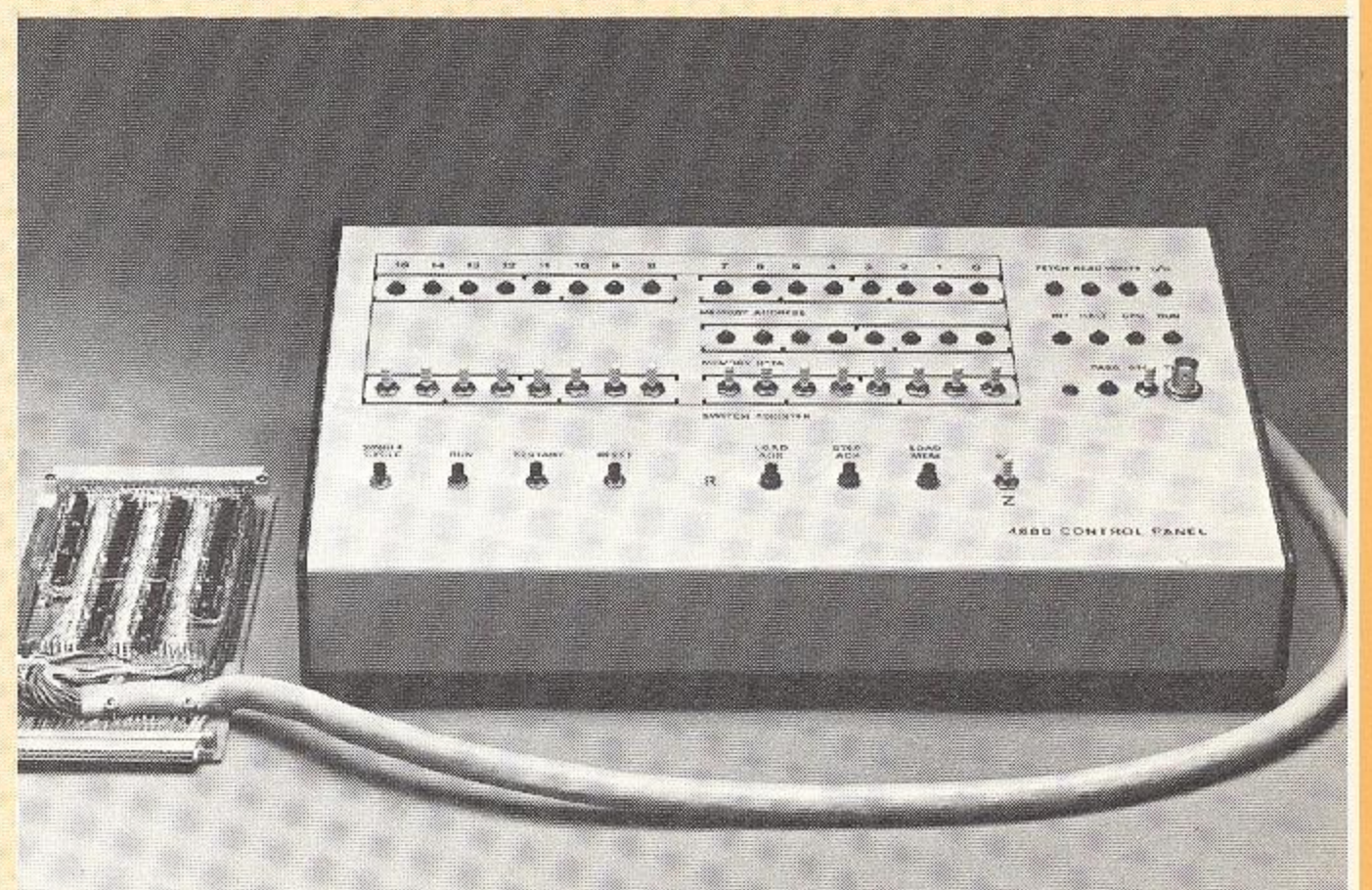
ACCESSORIES

- Rack 19", 20 slot backplane.
- Rack 19", 14 slot backplane plus slots for the power modules.
- Desk box with 8 slot backplane
- Power supplies.

Data Color — a fully graphic colour processor to be connected between a standard TV or monitor with RGB inputs and the DataBoard 4680 system, 320 X 256 dots presentation in 8 colours and two light levels. Drive routines for picture generating in the DataBoard 4680 extended Basic.

I/O-Tester (8022) — Unique unit for complete testing of I/O-functions and peripherals. No programs are required. The extension board can be connected in any slot in the I/O-bus or between an I/O-board and the bus.

Control — Panel (8021) — Used for hardware controlled debugging of a system with Z 80 or 8080 CPU's. The extension-board is connected between the CPU-board and the 4680-bus.



LARGE COMPUTER FACILITIES

Hard- and software support to drive several 10—80 Mbyte CDC discs, 10—40 Mbyte Winchester discs and magtape stations, managed by the operative system OS. 8MT.

FIELD PROVEN



DataBoard 4680 was first introduced in 1973. Since then more than 600 rack systems and over 1000 Single Board Computers have been installed.

Process and production control, monitoring systems, intelligent terminals, communication systems, data processing, scientific and technical computing are common applications.

The reference list contains users in the following sectors: Mining, Motor industry, Industrial robots, Newspaper production, Security, Hospitals, Military, Banking, TV-manufacturer, Stock control, Medical research, Paper pulp manufacturing and Viewdata information provider.



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