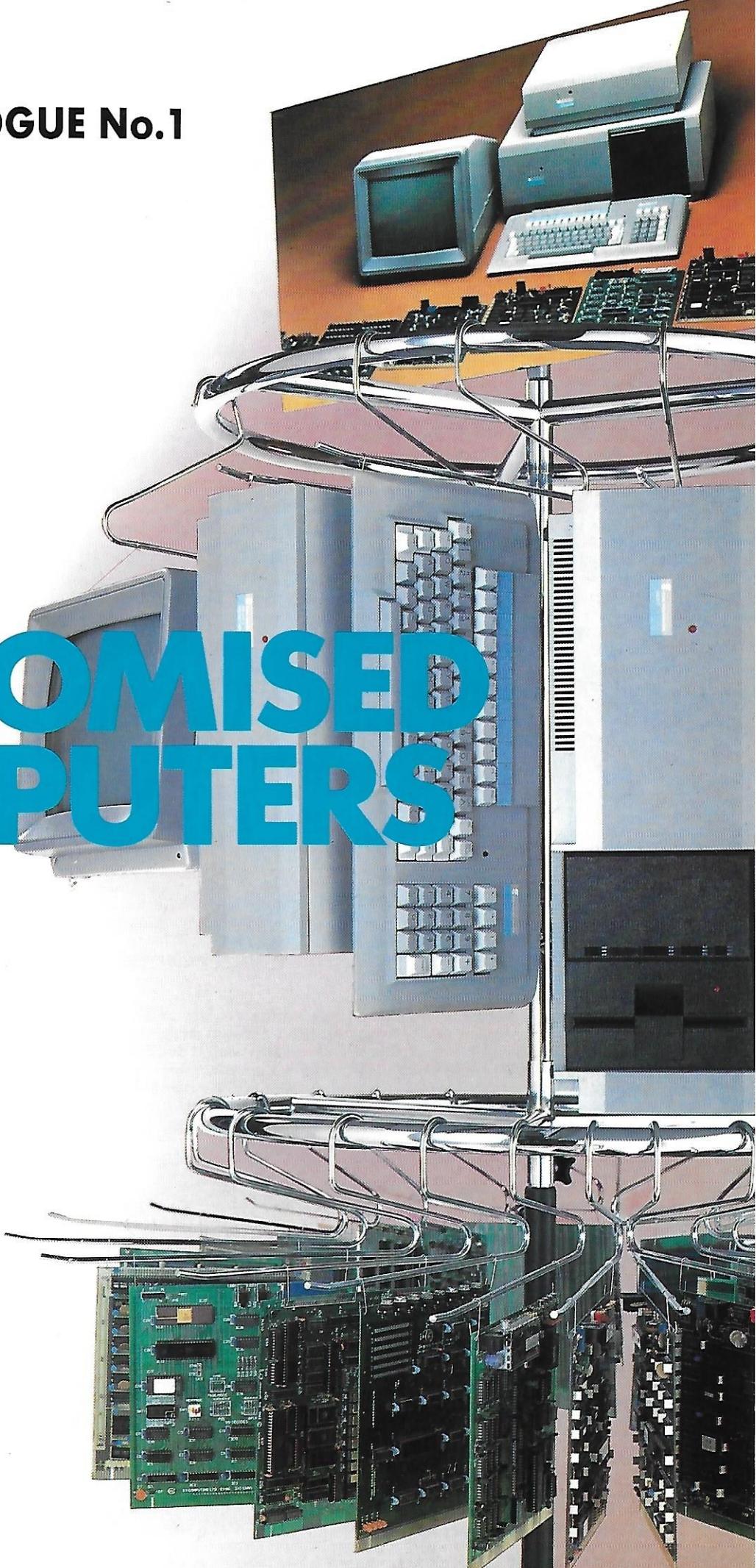


**SYSTEMS CATALOGUE No.1**

# CUSTOMISED COMPUTERS



# company background

**When you are looking for the best long term means of capitalising on today's generation of computers, don't confuse GEMINI with other micro manufacturers.** The Gemini MultiBoard range of systems utilises an industry standard 80-BUS structure. The first specification for 80-BUS was produced in 1978. The version which is now adopted by Gemini and a number of other companies was established in 1980. Unlike alternative BUS structures, the 80-BUS was specifically designed to support systems using the Z80 microprocessor. The Z80 still continues to be the world's largest selling microprocessor.

The latest addition to Gemini's range of products, available in the last quarter of 1984, is a 16-bit co-processor board using the 8088 microprocessor. This board can be retrospectively plugged into a MultiBoard system, and using CP/M-86 will allow the user of any MultiBoard system to have access to the ever growing library of 16 bit software. The future will hopefully also see the implementation of Concurrent CP/M and MSDOS and so allow the user access to a vast range of software packages that covers virtually every conceivable requirement that a computer user may have. Due to the popularity of its first MultiBoard system in 1980, Gemini have continually improved and advanced their products and now manufacture a number of major computer systems, and a growing number of 80-BUS compatible boards and peripherals.

These facts underline the Gemini MultiBoard philosophy - one of expansion. The MultiBoard systems allow for a totally flexible approach to the configuration of computer systems, thereby allowing each system to be tailored to individual needs. Since it is assumed that many users will at some stage wish to change the configuration of their system, we believe that the majority of competitive systems (Single Board Computers) offer limited features in expansion capability or flexibility. With the MultiBoard system your system can grow with your requirements. With your requirements may be met by as few as one board, or as many as 10 or even more. With Multiboard, an almost unlimited number of system permutations are possible.

Gemini Microcomputers Limited, a British company, have over the last four years developed a comprehensive range of powerful and versatile Z80 based microcomputers designed to meet the broad range of business, educational, and scientific computing needs. In this brochure you will find details of our four separately identifiable ranges being namely Gemini 2, Gemini 3, Gemini 4 MultiNet and the Multi-Format-BIOS Systems (M-F-B).

All of these systems are based upon 3 major 80-BUS boards - the GM 813, providing the Z80A microprocessor, 64K of RAM together with the I/O system; the GM 832 provides the industry standard 80x25 screen display driven by its own Z80B microprocessor and providing 256x256 pixel graphics, user definable character attributes and comprehensive on-board software; and the GM 829 card which provides the interface to floppy drives and a SASI interface for connection to the Winchester drive. This board supports a mixture of 4 floppy drives (be they 3½", 5¼" or/and 8").

All systems are built with expansion as a major consideration. Each system contains a 6 card frame, which, depending on the system, may provide the user with up to 3 spare slots. The standard Gemini 2 is a CP/M based personal computer supplied with twin 800K drives. The Gemini 3 is a Winchester version, and is available in either 10.8 or 16.2 MB capacities, and is fitted with an 800K floppy for back-up purposes. This unit has 2 spare card slots for the addition of other

80-BUS boards. The Gemini 2 and 3 microcomputers are both ideal small business systems, dedicated personal computers, development systems, or nodes within a network. This combination of high performance, low cost systems with a BUS structure, with an easy, and vast upgrade path together with readily available software provides you with cost-effective, easy to implement solutions to both present and future processing needs.

The Gemini 4 MultiNet system comprises a central Winchester based fileserver, and up to 31 workstations. The workstations can be either our standard MultiNet station, or a Gemini 2 or 3 which has been retrospectively upgraded to operate in the network.

One of the great problems in the microcomputer industry is the incompatibility of floppy disks. The answer to this problem is solved with the M-F-B. This system allows the formatting of disks, and the transfer of data between one microcomputer and another. The existing library of formats now covers more than 300 machine type and format combinations, and new ones are being added all the time. Systems are available with the new micro drives i.e. 3.5" where required.

From reading the contents of this brochure we are sure you will agree that the Gemini range of systems provides a comprehensive range of solutions for the majority of microcomputer applications. On the following pages detailed specifications of the complete range are provided. For those of you who are interested in our systems at the component level, in addition to this brochure we also produce a MultiBoard Catalogue which reviews in greater depth the comprehensive and diverse range of MultiBoard products and are available from Gemini or your local dealer.

## Dealers and OEM's

The majority of Gemini MultiBoard systems and peripherals are sold by our dealer network. Our dealer network, currently comprising of some 50 companies, has been responsible for the sale of our products into most major companies within the U.K. An ever increasing amount of our sales are destined for export to Western Europe and further afield, and our overseas dealer network grows.

Gemini does not normally sell directly, although we have a limited number of direct OEM accounts. These sales are invariably to companies purchasing our range of products in volume in order to build their own computer systems, or build into microprocessor controlled machines. As a result of our OEM business it can be seen from our MultiBoard catalogue that we supply a range of cases into which a user's own configuration of system can be built. If the volume of business is of a large enough scale then it is possible for us to produce metalwork, build and repackage systems to specific requirements.

If you wish to find out more about the Gemini MultiBoard range of computers and associated peripherals, our sales staff will be only too happy to supply you with the name of your nearest dealer.

## Maintenance and Warranty

All Gemini products, excluding disk drive heads (90 days) are supplied with a one year warranty. This warranty states that any goods purchased from Gemini or from one of our authorised dealers, if declared faulty, and returned to us, will within the first 12 months be repaired or replaced (at our discretion), and returned to the customer free of charge. All goods must be returned to us by the commissioning dealer. A third party maintenance contract is available on all Gemini Microcomputer systems. The maintenance contract, supplied by one of the U.K.'s leading microcomputer engineering companies, will provide the user with a visit by an engineer on-site within 24 hours of the report of a fault. Details and pricing of such a contract are available on application from your local dealer.

## Manuals and Documentation

All Gemini systems are supplied with comprehensive hardware and software manuals. System catalogues are bound in an A4 folder, these are supplied along with a Digital Research CP/M Manual and a number of other documents such as the CP/M license, circuit diagrams, and guarantees etc. The manual contains an explanation of the specific Gemini system purchased and describes how to use it, written in a refreshingly friendly style, keeping explanations simple and straightforward. The manual does not set out to teach the user how to 'drive' CP/M, but lists the specific features of the machine and departures from the normal CP/M machine, such as screen editing and the utility programs which are all covered in detail. The in-depth information on how to use CP/M is left to the CP/M guide.

We believe that this approach is more than adequate for the user interested in running typical business applications software but may fall somewhat short of the documentation required to gain an in-depth understanding of the machine. We have overcome this by making all the additional documentation for the individual cards and software available at very modest prices through our dealer network. The user intending to use the Gemini as a development tool need not be worried by the lack of heavy technical documentation as the optional card and software manuals are all easily available and most comprehensive.

The Gemini 80-BUS range of boards, if purchased individually, are all supplied with circuit diagrams and hardware and software manuals where applicable.

# the 'new look' gemini systems

For those of you who already know the Gemini systems, you will notice from this brochure the radical change in the appearance of our family of microcomputers.

We have now upgraded all of our systems to use only high-capacity 800K floppy disk drives, and we no longer provide the 400K option. Similarly, we now only supply the higher capacity 10.8 and 16.2 MB Winchester drives.

The monitor is a significant improvement on its predecessor, with an improved resolution CRT, and is presented in a much more aesthetically pleasing enclosure.

The major changes are not purely that we have re-packaged them in hopefully a much more attractive looking enclosure, but are also of a practical nature. The colour is totally different from the original beige and black, but we still maintain the rugged metal case, with the facia of the new systems now being made of plastic.

The keyboard perhaps shows the most drastic change to the systems. An advance in keyboard design technology provided us with the opportunity to produce a new low profile unit, meeting the international DIN specification. Its facilities have however not changed. With a full 87 key key-pad, a separate numeric keypad and cursor control keys, the keyboard now has a maximum of 90 user programmable function keys, and the addition of a legend strip enables key configuration details to be displayed.

The keyboard is now interfaced to the system by a serial connection, but parallel versions are also available for use by existing MultiBoard users.

We not only supply the keyboard in a standard QWERTY layout for use in English, but also layouts in German, Swedish and Danish are available, together with an (AZERTY) version in French.

We hope that you find the appearance of the NEW Gemini family as attractive as their performance and price.

## Gemini 2 & 3

The Gemini desk top computer systems can be used in education, small business applications, wordprocessing, stock control, and a host of other environments. They are supplied with a full 64K bytes of dynamic memory as standard, and a 'disk boot' ROM to load CP/M automatically when a disk is inserted into the master drive. All Gemini systems are based on a multi-board design allowing easy expansion and upgrade of all systems. Each system is supplied with a 6 card frame of which the Gemini 2 uses only three, and the Gemini 3 and Multinet only 4, so all allowing for the addition of further boards; for example to expand the memory, or to give a colour facility, or to develop the Gemini for particular requirements of education, research, software development etc.

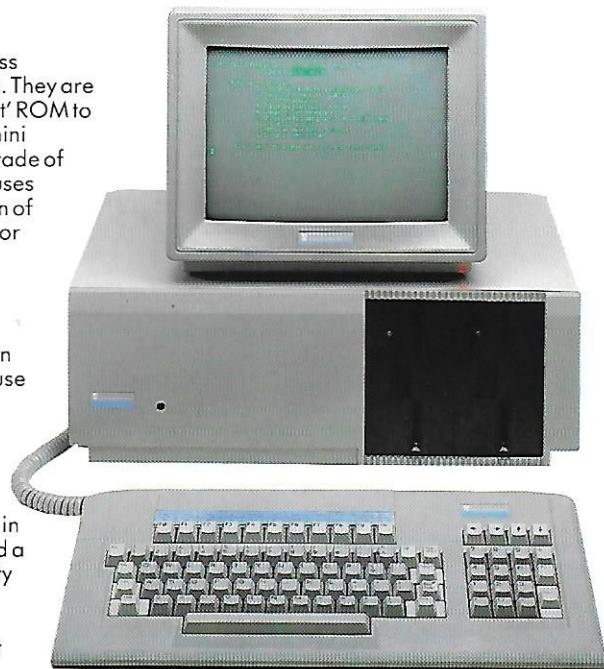
## Gemini 2

The Gemini's disk drives are the twin Micropolis 1115 disk drives. These proven double density drives each offer a total of 800K bytes of on-line storage. Because of the use of the latest generation of disk controller components the user is guaranteed the highest possible data safety and reliability.

By utilising a second Z80 Microprocessor, the Gemini is able to provide a number of sophisticated video facilities. Full cursor control functions are included, offering a comprehensive on screen editing facility. Two text modes are supplied, 80 characters x 25 lines, or 40 x 25. Characters may be displayed in either inverse, normal, blinking, half-tone video, or half-tone background, and a built in programmable character generator provides the Gemini with the ability to define specialised character shapes. A high resolution graphic mode providing 256 x 256 pixel graphics is also supplied.

The second Z80 also controls the keyboard and provides a 128 character input buffer. This ensures that no key entries are missed. To complete the extensive video capabilities a light pen input is provided.

The range of input and output ports includes both Centronics and RS232 to cater for both parallel and serial printers. There is also a cassette interface. The video output connects directly to the 12" green screen monitor.



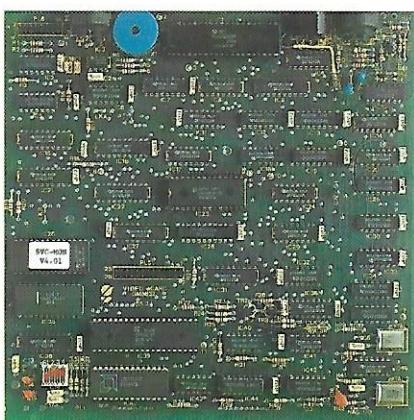
## Gemini 3

In place of one of the floppy disk drives is a Winchester hard disk. The Gemini is available in a choice of two Winchester configurations either 10.8 or 16.2 Megabyte versions, together with a 800K floppy disk drive, providing a vast amount of on-line storage. While the Gemini 3 looks and costs like a desk top microcomputer, it performs like a medium size minicomputer.

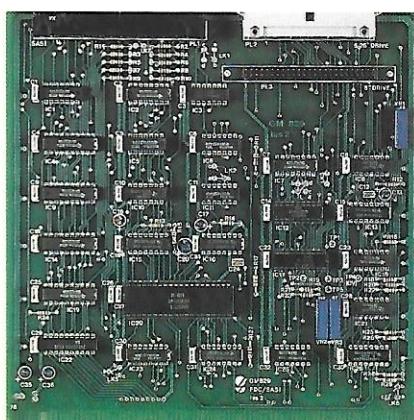
## the backbone of gemini multiboard systems



GM813 CPU/64K RAM BOARD



GM832 SVC BOARD



GM829 FDC/SASI BOARD

# gemini 4 multinet network system

The underlying philosophy of MultiNet is to enable as many people as possible to have access to their own microcomputer for the lowest possible cost.

There are three main software components to the MultiNet Network, and these respectively fulfill the requirements of the fileserver, standard workstations, and workstations fitted with local disk drives, otherwise known as Superstations.

## How is this achieved?

By providing a central 'fileserver'.

## What is the fileserver and what does it do?

The fileserver is the master station of the network, and is a complete microcomputer that is equipped with a Winchester hard disk drive for data storage. This hard disk comprises 'central file' storage for everyone using the network, and the necessary interfaces to allow the connection of printers so that they may be shared by all workstations on the network.

Whilst the network is in operation, the fileserver itself may not be used as a workstation on the network, but is responsible for the transmission and receipt of data to and from the network workstations, and control of the central printer resources.



For printer connection, the server is supplied as standard with an RS232 Serial interface. For Centronics parallel type printers a GM816 Multi I/O board must be added to the fileserver.

The server is fitted with the Gemini GM836 network interface board which contains the circuitry necessary to allow the connection of the hardware to the network. A unique network workstation address is provided on this board by a selectable 5 way DIL switch. For data protection an 800K 5 1/4" floppy disk drive is also fitted into the server cabinet for back-up and data transfer purposes.

Connection of the server and any workstation on the network is via a simple, low cost, single twisted pair cable and a variant of RS422 differential transmission is used.

The server continuously searches all stations on the network to give each user immediate access to its files, application software programs or any shared printer.

Data is transmitted serially at a rate of 250K baud, very fast for a system of this sort. All data packages transmitted end with a CRC (checksum) to detect any errors during transmission. On the receipt of a data packet, the receiving station checks that the packet has been received correctly, and if an error has occurred, signals this to the fileserver, at which point it will retransmit the package.

In use each active workstation is served from its own RAM buffer in the server, reducing disk access, and by doing so, increasing the availability of data, hence increasing the operating speed of the network. If several stations require disk access simultaneously, each station sends and transmits data to and from its buffer in packets, allowing time for other stations to send and receive likewise.

Under normal conditions, system response is very rapid, and is not held up by stations accessing the line for anything other than disk or shared printer access. Each station is connected by an umbilical cord of this cable, via a 3 pin socket, to a wall mounted junction box. The maximum overall length of the network cable is in the region of 600m (2000 feet) and up to 31 workstations may be connected to the cable at any point along its length.

## workstations

The standard MultiNet workstation is a compact unit complete with detachable keyboard, and separate video monitor. Each station is fully intelligent, that is, they are capable of operating, and in fact appears to the user as, a complete Gemini CP/M microcomputer.

The system utilises the Gemini GM813 and GM832 boards, thus providing the user with a complete Gemini system without disk drives. Following the standard Gemini philosophy, an expansion slot is provided, allowing another 80-BUS board to be added to provide further facilities such as allowing for the addition of local disk drives.

The colour workstation is one of the newer Gemini products. This workstation includes the 'Pluto' high resolution colour graphics display board, and also allows the addition of the 'Mini Palette' board. The rear panel of the workstation is fitted with a number of RS232 ports to support the connection of a colour monitor, colour plotter, and a digitizer pad, and therefore allowing the user immediate access to the Pluto Tool Kit program produced by Gemini called 'Qwikdraw', a simple, yet effective way of producing high quality colour graphics via a digitizer pad and pen.

The operating software is automatically downloaded from the fileserver when the workstation is switched on. Once the user is logged into the network, he is provided with a virtual CP/M 2.2 system. Each user has access to his own set of files, which no other user can access. This protection is further ensured by the provision of a 'password' facility. In addition, there are many applications where it is necessary to share files between users on a 'read only' basis, and this facility is provided by allocating disk areas where files may be read by all users. Each standard workstation will allow the attachment of a serial printer for local printing, whilst still giving it the facility of also using the server to spool print.

The addition to a standard Gemini 2, 3, M-F-B or compatible 80-BUS system of the Gemini GM836 network interface board, will provide you with a superstation. When logged onto the network the software determines whether any CP/M system call is to be handled locally or via the network. All facilities of the network can thus be accessed by this type of user, with the advantages of also having local floppy or hard disk drives and printer—a must for people who wish to create and download software to a network user area without effecting the network operation, or for swift back-up of essential data from the network.

The network will also allow the connection of the Quantum Computer Systems and Kenilworth Portable Computer range of microcomputer systems—both of these ranges of systems utilise Gemini 80-BUS boards.

# multi-format-BIOS

First came the computer.....then came the floppy disk.....then came floppy disk incompatibility.....THEN CAME THE M-F-B. As microcomputers have become less expensive, departmental budgets are now able to afford the purchase of such a machine. Data Processing departments have however always striven to maintain some compatibility within company computer purchasers, and have attempted to discourage the indiscriminate purchase of the newest, most attractive, most powerful or most easily portable machine. But, human nature being what it is, this sound advice is not always heeded.

As a result, the purchase made, a growing number of machines are found throughout the company, and a growing problem of disk size and format incompatibility is found. Gone are the times when a disk could be taken from one machine and put into another machine for it to work immediately. Whereas the majority of microcomputer uses are 'the same', you can guarantee that the disks won't be, particularly now with the advent of the 3.5 inch rigid microfloppy disk. Perhaps the only common denominator between these systems will be that they run or can run the CP/M family of operating systems, or their lookalikes.

One of the original benefits of CP/M was program and data portability which was achieved by the fairly universal use of the IBM3740 8 inch disk format variations. Add to this the IBM PC, the ever increasing number of MSDOS formats, and the microfloppy disks, and it is obvious that this variety has made it difficult and expensive for software houses, and others with a number of computer systems, to supply disks for all the possible formats.

As a result Gemini designed and manufactured the Multi-Format-BIOS range of systems. Our aim was to provide the link between man and his preferred machine, and the other computer users in a business.

The M-F-B system provides the ability to format and transfer data between any of the microcomputer formats currently available within its library. We currently have over 300 machine type and format combinations recorded, and new ones are being added all the time.

This system will copy files from one CP/M type to another such as CP/M-80, CP/M-86, CCPM/86, MP/M, MP/M 86 or Turbo Dos. Additional software is also available to allow the copying from IBM PC-DOS disks, and also a number of mini-computer and mainframe interchange formats are available.

The M-F-B is two things. In its own right it, like the full range of Gemini MultiBoard systems, is a state-of-the-art 8 bit microcomputer, available in a variety of configurations, the top end being supplied with five drives — one 16 megabyte Winchester, one 48 TPI and one 96 TPI 5.25" floppy drives, an 8" double-sided and a 3.5" double sided microfloppy disk drive. The system is supplied with an augmented CP/M operating system which allows the disks other than the Winchester to be used in many different formats and densities. The system will also support the addition of half-megabyte "RAM Disk" boards if required.

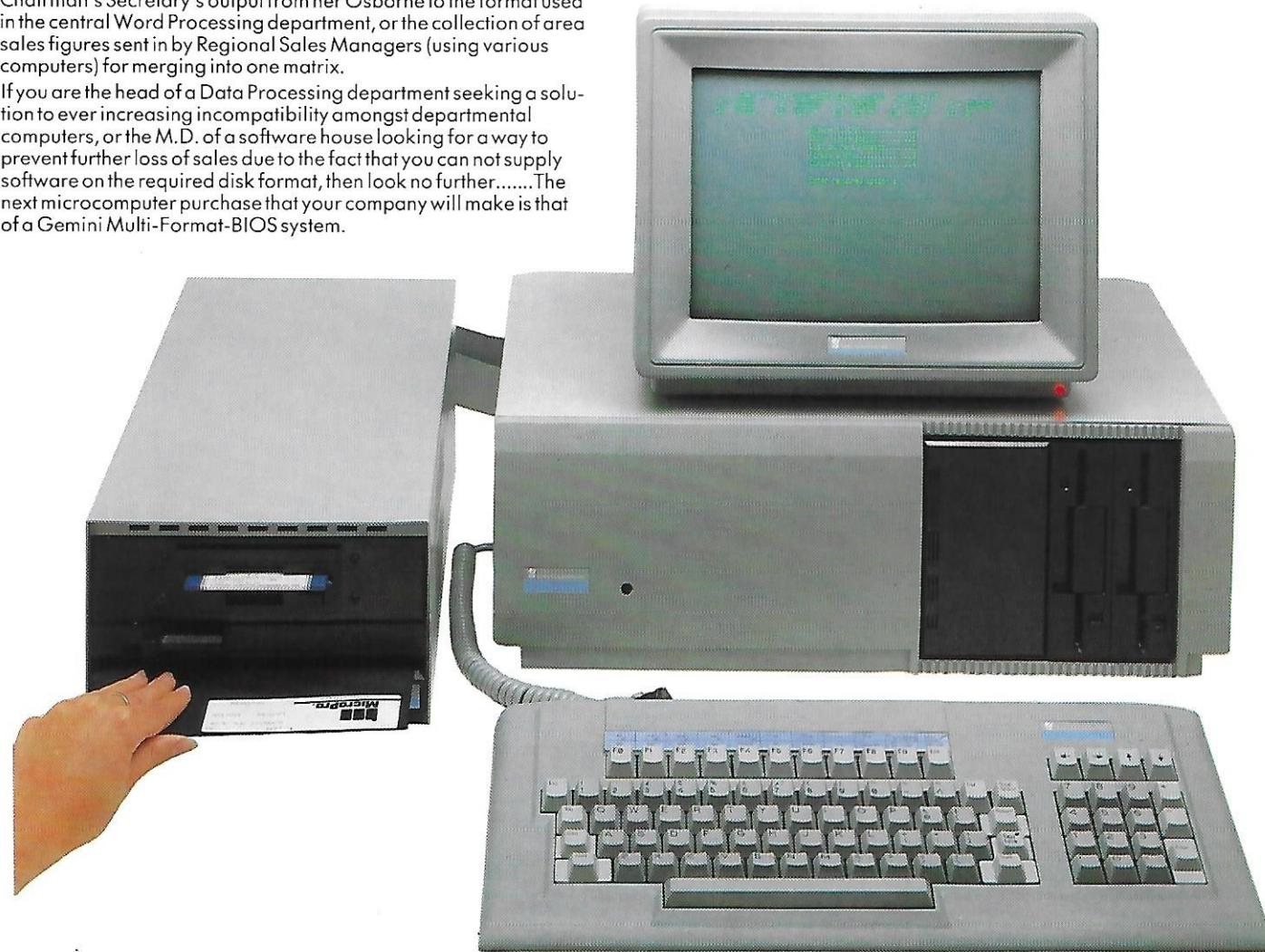
The BIOS is table-driven, there being a table entry for each logical drive on the system. These tables define the physical characteristics of each drive (size, tracks, step rate etc), together with the format to be used. To reconfigure the BIOS for alternative formats, only these tables need to be changed by the SETUP program.

The BIOS will support most current soft-sectored formats, but cannot handle those formats that depend on unique hardware features such as variable speed drives.

To support the M-F-B, four programs (namely SETUP, ANALYSE, WHIG and UPDATE) are supplied. These allow the addition of new formats to the library; determine the physical characteristics of an unknown format; display the current BIOS configuration; and enable the alphabetical sorting of a file, or the merging of two data files together. With the M-F-B system comes a six-month free format update service.

Apart from the examples mentioned above, business uses for the M-F-B are more varied, an example could be the transfer of the Chairman's Secretary's output from her Osborne to the format used in the central Word Processing department, or the collection of area sales figures sent in by Regional Sales Managers (using various computers) for merging into one matrix.

If you are the head of a Data Processing department seeking a solution to ever increasing incompatibility amongst departmental computers, or the M.D. of a software house looking for a way to prevent further loss of sales due to the fact that you can not supply software on the required disk format, then look no further.....The next microcomputer purchase that your company will make is that of a Gemini Multi-Format-BIOS system.



# quantum 2000 systems

The Quantum 2000 range of microcomputer systems is an example of the kind of system that our OEM customers are producing using the extensive range of 80-BUS boards.

A CP/M based range of systems, the Quantum series are based on the three main circuit boards found in the Gemini range of products. Primarily, packaged in a larger case, the basic Quantum system is fitted with three 5.25" floppy disk drives, providing an on-line storage of 2.4 MB. Winchester disk drives are also available in 10.8 or 16.2 MB. options. The monitor for the system is in a pedestal unit, and sits next to the central processing unit.

Quantum also produce a network system. Similarly to the Gemini it can support up to 31 stations over a maximum distance of 2000 feet.

The fileserver on the Quantum consists of a Quantum 2000 computer with a Winchester drive and a cyclops terminal.



This special terminal is fitted with a switch which will allow it to be used either as a workstation, or as a monitor for the fileserver. When used as a monitor it will allow the fileserver to be used as a normal Quantum 2000 for purposes of file maintenance e.g. for adding a new piece of software to the system.

When the network is actually operating it will display the user areas currently being accessed by each terminal. A flick of the switch will then allow it to be used as a workstation. The Cyclops workstations are simply Quantum 2000 computers without disk drives.

Each has its own 64K memory and its own serial printer port should a local printer be required. Each Cyclops behaves as a normal Quantum 2000 system. The central processing unit of all systems is fitted with an 8 card frame of which in a standard system only three are used, so providing the user with a great deal of available board space for the addition of other 80-BUS boards. Gemini and Quantum computers, if fitted with a network interface board, can be used as workstations on the network.

## kenilworth

The Kenilworth is another example of an OEM client using the Gemini MultiBoard range of 80-BUS boards, in this instance to produce a very professionally finished portable microcomputer.

Unlike so many portables that are as space consuming as a desk top computer, the Kenilworth, when not in use, is as small as your filing tray; release the keyboard and away you go. This system, very compact and ergonomically shaped to aid ease of carrying, has an overall size of 19" x 14.5" x 9.5" and weighs 28 pounds.

Fitted with an 80 x 25 screen display on a 9" monitor full screen editing under CP/M is provided via a standard QWERTY layout keyboard with a numeric keypad and cursor control keys. The disk storage is provided on dual TEAC fast seek single or double sided double density 96TPI drives, offering a maximum possible storage of 1.5 MB. Using the 80-BUS range of boards the system is supplied with all I/O facilities as provided on the Gemini and Quantum range of systems.



# multiboards

Expansion of Gemini systems is possible in a number of ways, below are just one or two examples, and below that a selection of 80-BUS boards which enable your MultiBoard system to be used for applications such as Process Control, Batch Counting, Robotics, Colour Graphics Display, CAD/CAM, CNC; in Manufacturing, Telecommunications, Instrumentation, Laboratory Testing, Security Systems, Plant Control, Data Collection and Distribution as well as every-day office procedures. These are not hypothetical uses of the Gemini MultiBoard family....these are uses that we know they are being put to. There are a lot more however of which we do not!

## Ways in which Gemini systems can be expanded:

Colour graphics can be provided with either the GM837 or the IO828 'Pluto' card from I.O. Research. The basic number of colours provided by the IO828 can be dramatically increased by the addition to Pluto of a Mini-Palette board.

Using a 16 bit processor and 192K of on-board RAM, the Pluto has the ability to draw at speeds over 160,000 pixels per second. Providing an 8 colour display with a resolution of 640H x 576V a software selectable interlaced display can be used to combine two full colour screens of memory together.

Inbuilt Pluto functions enable it to draw lines, rectangles, circles and arcs; flood fills and pattern fills of complex shapes and much more. This makes it extremely quick and easy to draw charts, graphs and diagrams, by simply sending Pluto a few commands.

Additional boards in the Pluto family allow a display of 256 simultaneous colour shades from a choice of 16.7 million.

Supplementary floppy disks or hard disks can be added to the existing Gemini systems. The GM829 will support up to 4 floppy drives and provides a SASI interface for connection to Winchester drive sub-systems.

Additional parallel and serial I/O can be added. The GM816 Multi I/O board provides parallel I/O plus a real-time clock, the addition of the GM818 daughter board will provide RS232 serial I/O. Alternatively, if only serial I/O is required then the GM848 will suffice.

**Some of these represent the means by which the expansion is possible, but are just a small selection from the range of over 25 cards**

### GM813 CPU/64K RAM BOARD

Controlled by a 4MHz processor, Z80 CPU, 64K of RAM, 2 parallel ports, 1 serial RS232, cassette interface, extended addressing, memory page mode capability. Total memory capability of 2 Megabytes!

### GM811 CPU BOARD

An industry standard 4MHz, Z80 controller board with parallel and RS232 serial I/O together with a variable Bytewide memory capacity. Cassette Interface.

### GM832 SUPER VIDEO CARD

Controlled by a 6MHz Z80B, high resolution graphics mode of 256 x 256, line/circle draw, polygon fill, 80 x 25 display or 40 x 25. Includes foreign character sets and full keyboard support.

### GM888 CPU BOARD

A NEW CARD featuring the 8MHz Intel 8088 16-bit processor to provide a dual processor environment. Real time clock and battery back-up. 8087 arithmetic board socket. This board can support CP/M-86, Concurrent-DOS and MSDOS.

### GM862 256K RAM CARD

A NEW CARD supporting both page mode and extended addressing facilities and can be used with all the Gemini CPU cards.

### GM833 512K RAM-DISK CARD

Provides 'pseudo disk' facility. Appears to CP/M as an extremely high speed disk drive—over 30 times faster than a conventional floppy in certain applications. Multiple boards can be supported to 8 MB!

### GM829 FDC/SASI BOARD

Combines floppy disk controller and SASI board. Supports up to 4 floppy drives (3½", 5¼" or 8") software supplied. Allows connection of floppy or Winchester hard disk sub-systems such as GM825 or GM835

### GM837 COLOUR GRAPHICS BOARD

256 x 256 graphic resolution in 16 colours. Output to either PAL UHF or RGB.

### GM816 MULTI I/O BOARD

3 Z80A PIOs providing 6 bi-directional 8-bit data ports. CTC and battery backed clock. Daughter board provision

### GM848 SERIAL I/O BOARD

Utilises two Z80A SIO chips to provide 4 synchronous/asynchronous serial channels and PIO with software selectable baud rates between 75 and 9600 baud.

### GM836 NETWORK INTERFACE BOARD

Small add-on board which provides RS422 communication protocol for networking of MultiBoard systems.

### PLUTO COLOUR GRAPHICS

A range of high resolution boards. The 'Pluto' combines 192K RAM with a fast 16 bit processor. 640 x 576 pixels with 8 colours running at 8MHz. Expandable to 256 colours simultaneously.



# technical specification

<b>Processors</b>	Twin Z80 Main Processor - 4 MHz Video Processor - 6 MHz (No wait states)
<b>Memory - Z80-1</b>	64K Dynamic RAM 2K Phantom ROM
<b>Memory - Z80-2</b>	8K Monitor ROM 8K Screen / Character / Graphics RAM 2K Workspace RAM
<b>Keyboard</b>	64 Character Input Buffer Full ASCII Encoding 87 Key n Key Rollover Caps-Lock Function Edit Key 90 User Definable Function Keys Numeric Key Pad
<b>Video</b>	80x25 or 40x25 Display Format Inverse, Blinking, Half Tone Video, Half Intensity Background 256x256 Pixel Graphics Programmable Character Sets Programmable Special Functions Line / Circle Draw Polygon Fill Software Clock Foreign Character Sets
<b>Monitor</b>	High Resolution 12" Monitor Green Phosphors
<b>Serial I/O</b>	RS232 Interface Programmable Baud Rates Cuts Cassette Interface
<b>Parallel I/O</b>	Centronics Parallel Interface
<b>Other I/O</b>	Light Pen Input 1 V P-to-P Video Output
<b>Software Included</b>	CP/M 2.2 Operating System and Utilities MFB Software (MFB Only)
<b>DISK DRIVES</b>	
<b>Gemini 2</b>	2x5.25" Drives 800K Storage Per Drive Formatted Double Density



<b>Gemini 3 &amp; 4</b>	1x5.25" Winchester Hard Disk 10.8, 16.2 MB Capacities Formatted 1x800K Double Sided Drive Formatted
<b>M-F-B SYSTEM</b>	
<b>GM 916</b>	5MB + 96TPI DS + 48TPI DS 5.4MB 5.25" Drives
<b>GM 921</b>	As above but 16MB
<b>GM 922</b>	96TPI SS + 96TPI DS + 48TPI DS 5.25" Drives
<b>GM 825</b>	8" SS + DS Drives Available 3.5" DS Drives Available
<b>GM 835</b>	Floppy Drive Unit Sub-System (In Case with PSU) 1 or 2 800K 5.25" Options
<b>Network</b>	Winchester Drive Sub-System (In Case with PSU) Winchester Capacities As Above
	RS422 Communication 250 KBAud Data Transfer Rate

## software

The principal advantages of a Z80 based system is the abundance of software that is available. The majority of packages available operate under the CP/M disk operating system. With CP/M, software becomes machine independent, providing the user with literally the widest range of software available.

However, due to the increase in the market place of the 16 bit microcomputer new operating systems have been developed, and therefore an increasing volume of 16 bit software under these systems is becoming available.

As a result of current demand, Gemini have produced a 16 bit co-processor card which can support CP/M-86, Concurrent CP/M and MSDOS, and may therefore allow the Gemini MultiBoard range of computers to support software written under these operating systems, and provide the user with an even greater library of software from which to choose.

Listed below is some software currently available on the Gemini family.

<b>Languages</b>	<b>MBasic</b> , C Basic, Comal-80, PL/I, Pascal, Fortran-80, Cobol, <b>APL</b> , <b>Compas</b> , UCSD.....
<b>Databases</b>	<b>DBase II</b> , Dataflex, Superfile, Cardbox, Brainstorm, Friday.....
<b>Micropro</b>	<b>Wordstar</b> , Calcstar, <b>Spellstar</b> , Star Index, Supersort, Infostar, <b>Mailmerge</b> , <b>Wordstar Professional</b> ....

**Graphics** Graphitas, **Qwikdraw**, **Cad-8**, **Gem-Graphpac**.....

**Communications** BSTMS, Bisync 3780/3720, **Easylink**.....

**Gemini** **Gempen** - Text Editor & Formatter  
**Gemdebug** - Z-80 Debugger  
**Gemzap** - Z-80 Assembler

Software with **Bold Titles** are available from Gemini.

### Your Local Gemini Dealer is:

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