Multi-purpose high-performance 32/32 bit computer

The DS90-20 is the latest addition to our Series 90 line of computers. Small but extremely powerful, the DS90-20 is the most sophisticated computer ever produced by DIAB. Here, for the first time at a reasonable price is a multi-user computer (40 users and more!) providing the medium size company, the department or the local office with the economical advantages of the UNIX software standard.

Combined with a wide range of popular languages, utilities and applications, the DS90-20 32/32 bit supermicro provides end users and system builders with the power and tools to produce high performance software applications in minimum development time.

With the DS90-20 'small' no longer means 'slow'. In fact, the user or programmer will benefit from execution and response times significantly faster than those of many more costly minicomputers. In addition, the D-NIX operating system allows you to use and develop true multi-user software, as a base or as complement to the wide range of existing D-NIX/UNIX software. And thanks to the portability of software using the D-NIX operating system, DIAB DS90-20 offers an easy growth path to larger systems in the future.

The DS90-20 is a complete, flexible computer system offering exceptional hardware and software versatility.

Featuring a four to eight megabytes RAM memory, integral hard disk and the flexibility of integrating extra high capacity disks and tape backup options, the DS90-20 is an obvious choice for a large number of users in both business and technical applications.

A wide variety of tools and facilities, including database handlers, office automation and communications packages are available to enhance end-user application systems.

A powerful brain

The processing power is based upon a Motorola 68020 application processor with a powerful numeric co-processor. These are matched with a high speed memory system which allows the processor to operate at full rate without any wait-states. The 68020 processor operates with a paged memory management system and a cache memory.

The virtual memory will handle up to two gigabytes per process. Data transfer to peripherals is handled by a four-channel DMA chip.
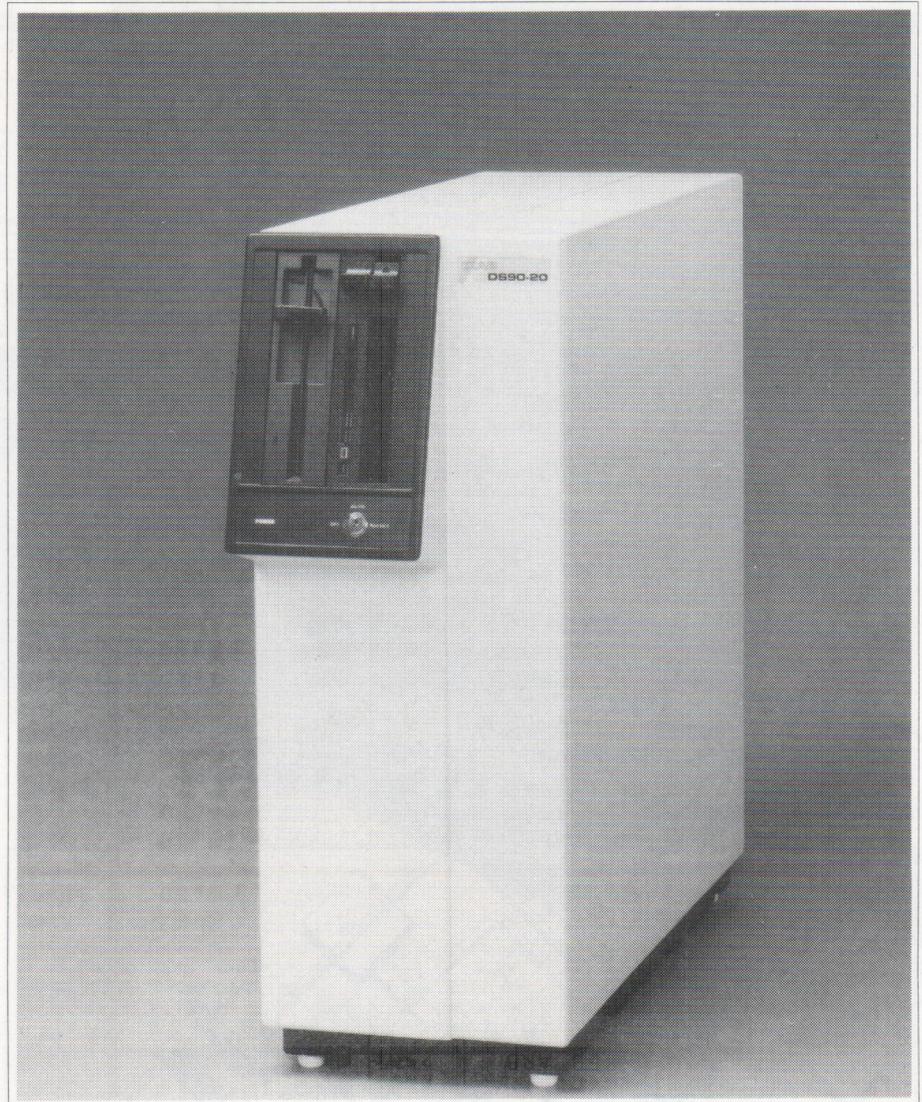
A prioritirized interrupt system, the large main memory and a 16.67 MHz clock all contribute to support high performance multi-user, multi-tasking software.

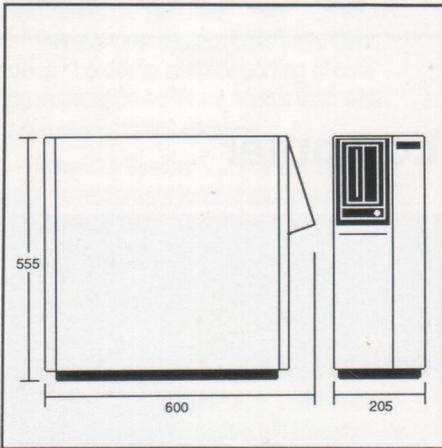There are, quite simply, no bottlenecks in the DS90-20 computer design.

High capacity storage

The supermicro incorporates two independent internal high-speed peripheral buses conforming to the SCSI (Small Computer System Interface) standard, over which data is transferred to integral mass storage devices. The SCSI bus supports arbitration and contention logic and can be controlled via programmed access or DMA, enabling parallel and processor independent operation with device-to-device or device-to-memory transfer speeds at up to 1.5 megabyte per second.

The permanent storage is a high capacity 5.25" hard disk in the range of 75 to 250 megabytes. The drive incorporates a closed-loop, voice-coil head positioning system with an average access time of less than 30 milliseconds. Interfacing to the SCSI bus is done via a high performance controller performing high speed multi-sector I/O as well as error check, drive formatting and alternate sector allocation.

A mix of up to 8 drives can be connected giving a total mass storage of several giga-

bytes by using an external hard disk cabinet.

The floppy interface runs a 5.25" floppy disk with several software selectable compatibility modes, such as IBM XT and IBM AT. File structured PC/AT diskettes can be read and written with the optional MS-DOS file handler.

An 8" floppy disk interface is optional.

An advanced 1/4" streaming tape drive provides high-speed backup of hard disks at a transfer rate of 90 Kbytes per second with a standard tape cartridge capacity of 60 megabytes.

A 1/2" tape drive is optionally available.

Terminals and printers
Up to four terminals or printers can be connected to the quad RS232 ports on the main PCB. Two more boards can be added giving a total of 12 direct communication RS232 ports. If more ports are needed, further boards having ten ports each can be added in the VME expansion cage. The total number of users is well in excess of 40.

VME and DataBoard expansion
The computer is equipped with a system expansion backplane having three slots for VME cards and four slots for DataBoard cards. These slots are used for expansion as regards communication, color graphics (medium and high resolution), networks, terminal concentrator, etc. The VME and DataBoard expansion facility also makes it easy to integrate the DS90-20 in industry applications.
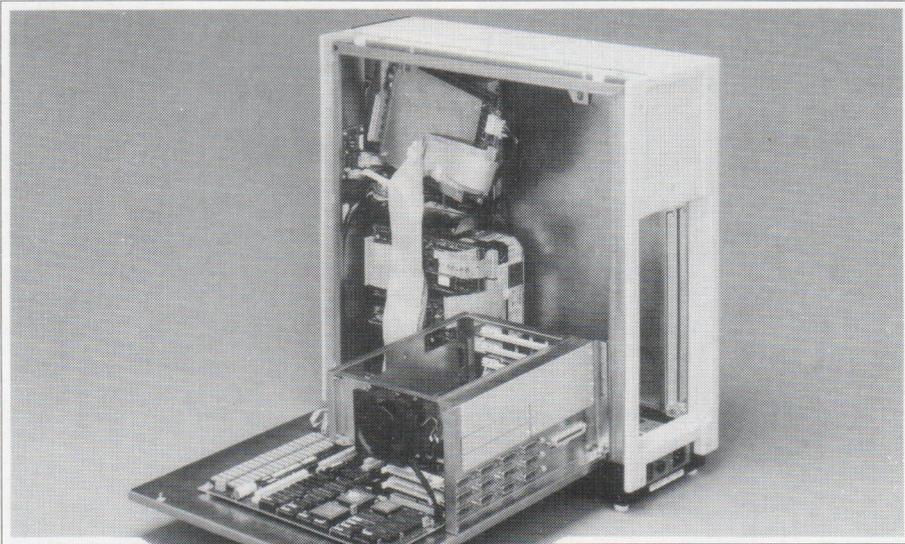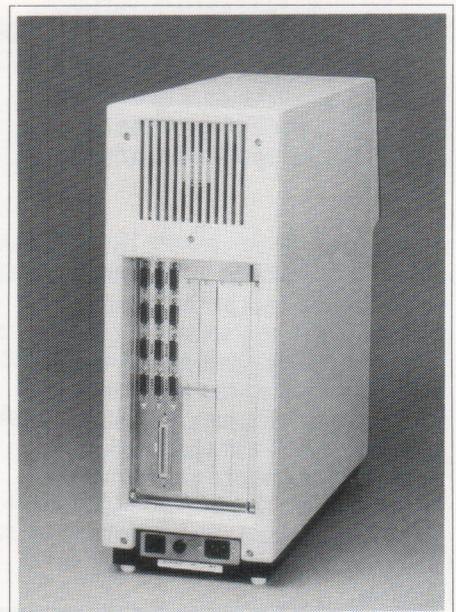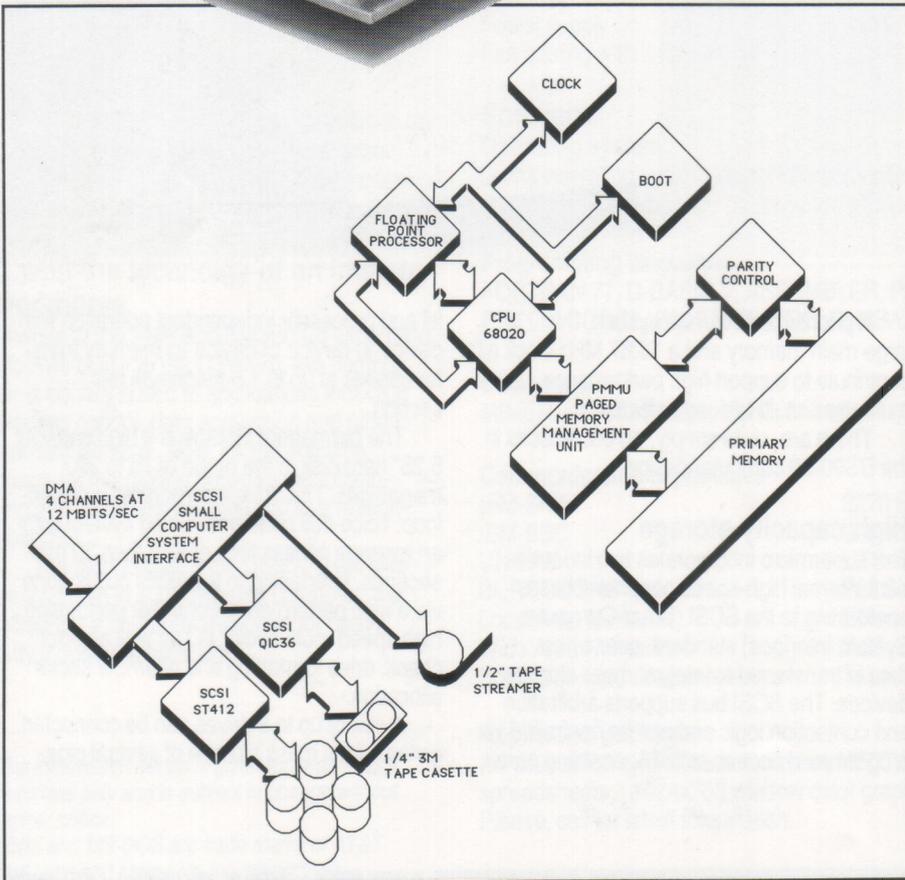
Communication
Thanks to the DS90-20 real time performance, the system is uniquely suited to applications involving online communication with other loacal or remote computers. Local Area Networks, Wide Area Networks, asynchronous and synchronous communication protocols are fully supported through advanced communication hardware and software.

Communication in the DS90-20 system employs a 'gateway' technique, utilizing auxiliary processors which results in very little overhead to the main processor.

All types of networking function in the system in exactly the same way so the users will not even be aware that they are communicating with another computer.

D-NIX – the operating system
The DIAB operating system D-NIX and the DS90-20 have been created for each other as an optimised pair. D-NIX fully conforms to the UNIX System V interface definition

555
600
205

CLOCK
BOOT
FLOATING POINT PROCESSOR
PARITY CONTROL
CPU 68020
PMMU PAGED MEMORY MANAGEMENT UNIT
PRIMARY MEMORY
DMA 4 CHANNELS AT 12 MBITS/SEC
SCSI SMALL COMPUTER SYSTEM INTERFACE
SCSI QIC36
SCSI ST412
1/2" TAPE STREAMER
1/4" 3M TAPE CASETTE

Top board diagram labels: SCSI · RS232 · RS232 · RS232 · RS232 · POWER · ADD-ON 8X RS232 · CACHE MEMORY · FLOAT POINT · DMA 4 CHANNELS · PMMU · CPU 68020 · KERNEL LOGICS · EXPANSION CONNECTOR · SCSI · ADD-ON 4 MBYTE MEMORY · PWR OPT · FLOPPY DISKS 5.25", 3.5" · REAL TIME CLOCK · CTRL PANEL · 4 MEGABYTE INTERNAL MEMORY
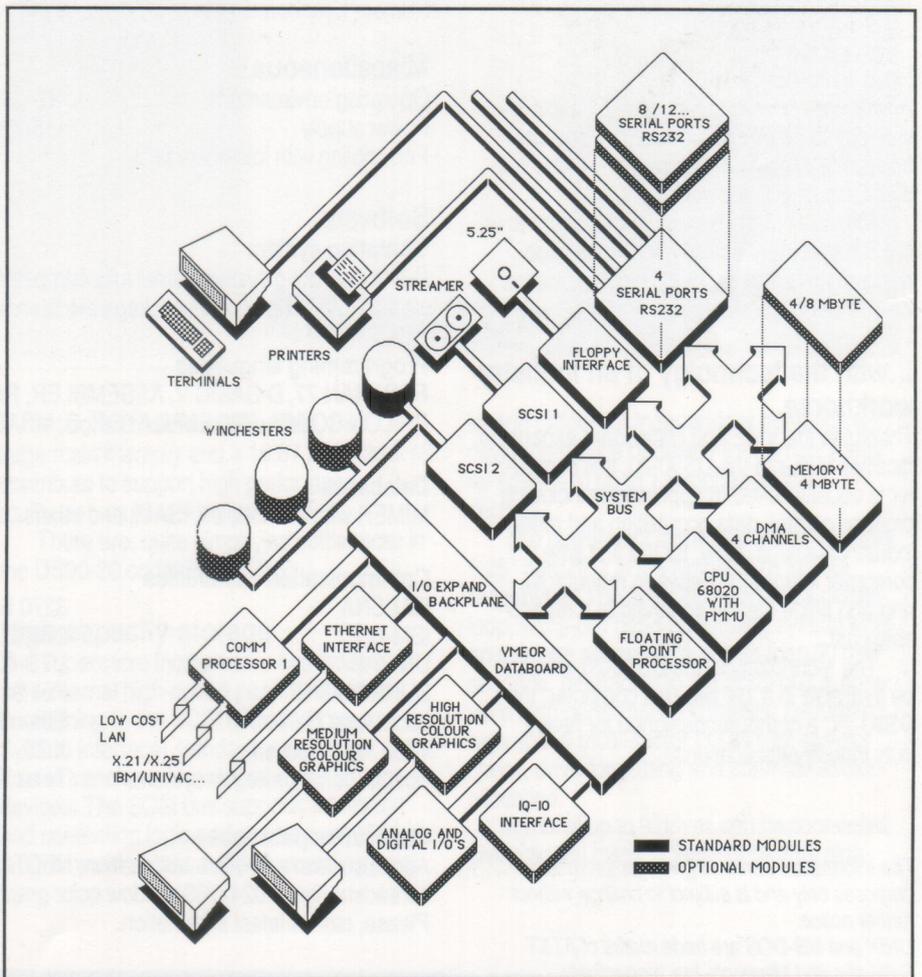
(SVID) while providing the execution speed, real time performance and robustness necessary for demanding technical and administrative applications. D-NIX is a multi-tasking, time-sharing operating system where each user can invoke any number of tasks during an interactive session. Memory is efficiently utilized since only the small non-swappable kernel resides in memory to provide the most essential services.

Guaranteed response time to interrupts assures timely servicing of external requests, making the DS90-20 particularly well suited to data communication, data logging and office automation.

D-NIX runs with 'no-wait' system calls and event queues are employed to further speed up response times.

Bit mapped disk structure is used to improve speed of disk access and reduce the vulnerability of file systems to occasional "bad spots". Furthermore, this structure permits the creation of contiguous files and copes with variable block sizes.

A concept of handlers has been implemented to increase efficiency of D-NIX and to provide programmers with a new dimension in software development. Normally, handlers are employed to perform different system functions, such as handling files or databases, networks, communication protocols, etc. Serveral different file handlers can be employed simultaneously. The D-NIX file handler can be used in parallel with, for instance,

Block diagram labels: 8 /12... SERIAL PORTS RS232 · 4 SERIAL PORTS RS232 · 4/8 MBYTE · 5.25" · STREAMER · FLOPPY INTERFACE · TERMINALS · PRINTERS · WINCHESTERS · SCSI 1 · SCSI 2 · MEMORY 4 MBYTE · SYSTEM BUS · DMA 4 CHANNELS · CPU 68020 WITH PMMU · I/O EXP AND BACKPLANE · VME OR DATABOARD · FLOATING POINT PROCESSOR · COMM PROCESSOR 1 · ETHERNET INTERFACE · LOW COST LAN · X.21/X.25 IBM/UNIVAC... · MEDIUM RESOLUTION COLOUR GRAPHICS · HIGH RESOLUTION COLOUR GRAPHICS · ANALOG AND DIGITAL I/O'S · IQ-IO INTERFACE · ▆ STANDARD MODULES · ▨ OPTIONAL MODULES

an MSDOS file handler.

Several new system calls have been added in order to simplify porting of existing application software easier than with conventional UNIX systems.

Powerful System V.2 standard software development tools, including all AT&T standard utilities, allow programmers to produce efficient code that is easily maintainable with the utilities included.

NECTAR

NECTAR constitutes an advanced software development environment, a test bench for application prototyping and a framework for versatile production runs. NECTAR meets the demands placed on a true application generator, but, at the same time, it gives access to traditional programming and software development tools. It features an interactive operation, in both the development and the production mode. Users can freely select and shift the level of sophistication, from that of strictly end users, through do-it-yourself application generator, up to advanced software development.

DS90-20 – the business machine...

DS90-20 is ideal for office automation with functions and performance at a fully professional level. Among office packages implemented on the DS90-20 are:

- o UNIPLEX II Plus
- o Q-OFFICE
- o LEX68 /Q-CALC

All are easy to use, fully integrated and provide a high degree of functionality and total transportability of data among any of the modules included in the packages.

Menues enable inexperienced users to utilize the system effectively, while the experienced users can choose between function keys or direct commands.

...with the technolgy of an industry workhorse.

Thanks to the VME and DataBoard expansion facilities built into the DS90-20, this computer is equally suited to applications including process control, data acquisition and other industry systems. Now, for the first time, computer integration between manufacturing and office can be achieved at a reasonable cost.

The technology of the DS90-20 will also be available in a 19" two-unit computer, the DS90-21, a computer designed for heavy duty industry applications.

Computer hardware

Processor	Motorola 68020
Clock speed	16.67 MHz (Designed for 20 MHz operation)
Wait-states	No wait-state cache
PMMU	68851
Co-Processor (floating point)	68881 (option)
Memory	4 megabytes (4 more megabytes optional)
DMA capacity	4 channels at 12 megabits each

Mass storage

Hard disk	1 off
Form factor of disk	5.25"
Disk capacity	20, 75, 126, 170, 240 MB...
Number of hard disks as option	7 off
Form factor of optional disk	5.25", 8", 14" winchester or hard disk
Optional disk capacity	20 to 600 MB
Standard tape unit	Cartridge streamer 3M cassette
Streamer capacity	60 megabytes with DC-600A
Optional tape unit	1/2" tape unit /tape streamer
Optional tape unit capacity	800, 1600, 6250 bpi
Standard floppy unit	5.25" floppy disk
Floppy unit capacity	1.2 megabyte

Ports

Number of standard ports	4 off RS232
Number of optional ports (A)	8 off RS232 using 2 cards with 4 ports each
Number of optional ports (B)	30 off RS232 using 3 VME cards
Total number of ports	more than 40 off RS232

VME and DataBoard Expansion

Number of VME slots	3 off
Number DataBoard slots	4 off

Miscellaneous

Operating environment	10 - 35°C
Power supply	115/220 VAC, 47 - 440 Hz ,350 W

Fan cooling with low-noise fans.

Software

Operating system

D-NIX operating system kernel fully compatible with UNIX Version V. 2.
Utilities and development package are licensed products from AT&T.

Programming languages

FORTRAN 77, D-BASIC V, ASSEMBLER, PASCAL, R/M COBOL, APL, SIMULA, PHILON COBOL, Z80 EMULATOR, C, MBASIC, and others...

Databases

MIMER with all modules, ISAM, and others...

Communication capabilities

IBM-SNA	3270 SNA/SDLC, 3770 SNA/RJE
IBM-BSC	2780/3780 RJE, 3270 BSC
UNIVAC	UTS-400
BURROUGHS	Poll Select
Local Area Networks	Ethernet 802.3, D-NET, D-LINK
Wide Area Networks	X.25
Special communication systems	Telex, Teletex

Application packages

Administration and office automation, NECTAR 4GL tool box, word processing, spreadsheets, 1024x768 window color graphics, and much more...
Please, call for latest information.