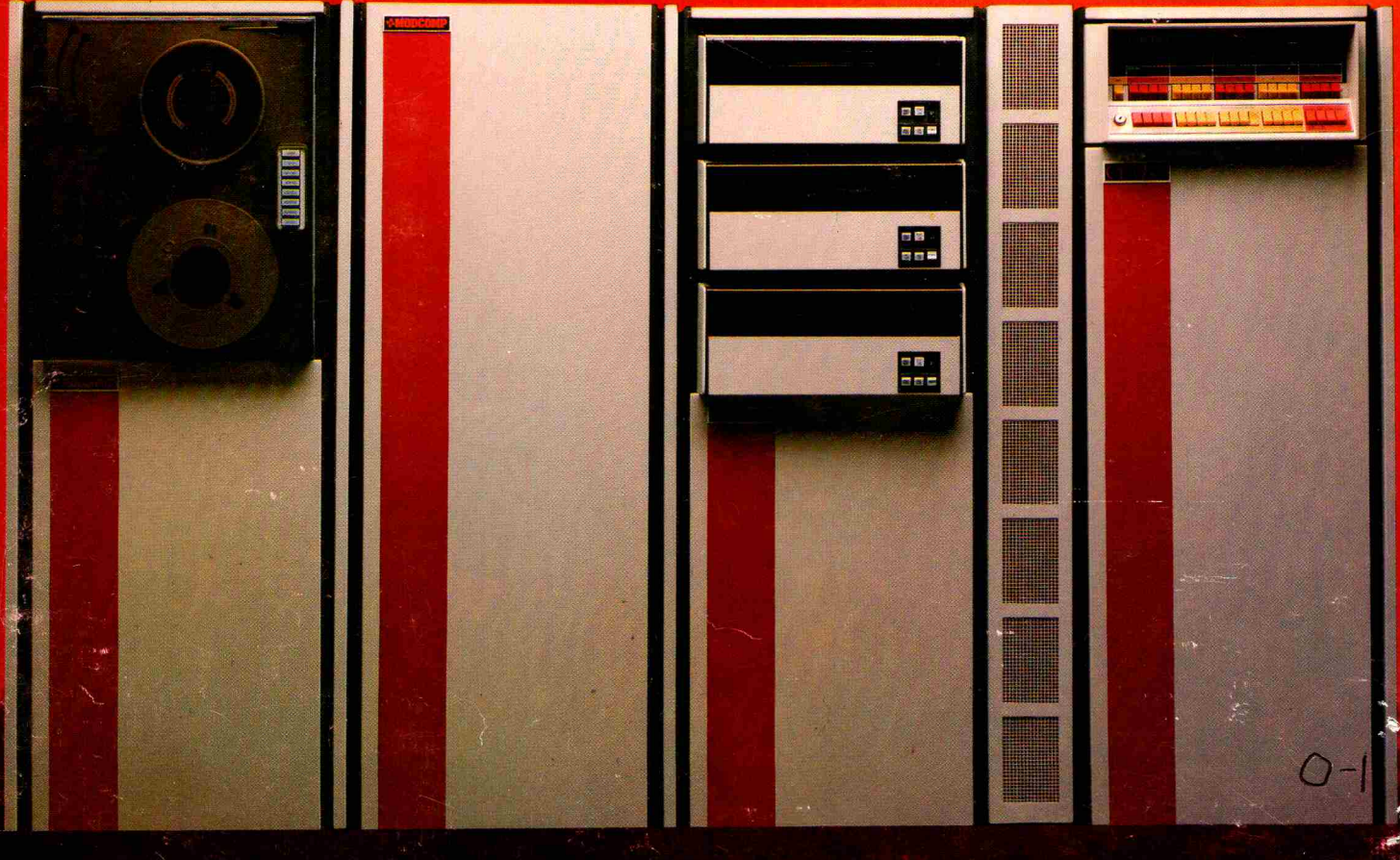
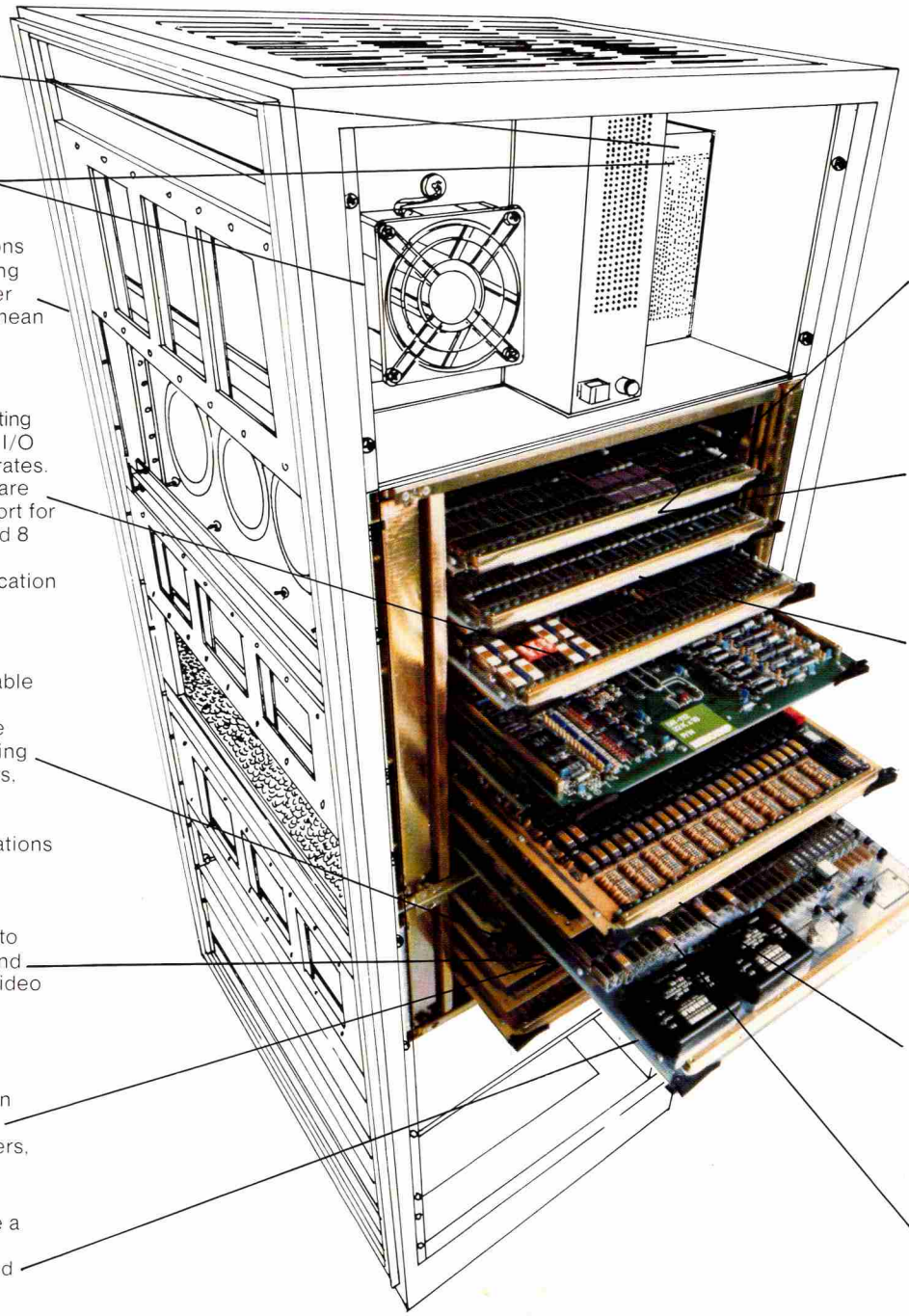
MODCOMP

CLASSIC

The Standard of Computing Excellence





"Switching regulator" power supplies to reduce power consumption and improve reliability.

Modular pluggable fan and power assemblies to facilitate quick repairs.

Accessible test connections to facilitate troubleshooting (without awkward extender boards) and reduce the "mean time to repair" problems.

High performance I/O processor capable of supporting up to sixteen channels of I/O and 2 megabyte transfer rates. Up to four of these IOP's are available to provide support for up to 64 IOP channels and 8 megabyte I/O rates in demanding high I/O application environments.

Microprocessor-based peripheral controller capable of supporting up to four separate low performance peripheral devices including console terminals, printers, card readers, paper tape reader/punches, and an asynchronous communications channel.
OR
Disc/console controller capable of supporting up to four 10-megabyte discs and a variety of hardcopy or video terminal devices.
OR
Asynchronous terminal controller capable of supporting up to sixteen local or remote video terminals, keyboard printers, or hard copy terminals.

Plug-in boards to facilitate a fast board-swapping maintenance approach and improve the mean time to repair failures.

High performance central processing unit with instruction preprocessing and 55 special FORTRAN-oriented instructions (e.g. DO-LOOP TERMINATION) to further enhance system performance in demanding industrial and engineering/scientific applications.

Sixteen sets of 15 general purpose registers to enhance systems performance in multi-tasking application environments.

Integral high-speed floating-point processor to provide greater precision (up to 64 bits) and higher performance (up to four times as fast as our previous systems) in computation-oriented applications.

Up to 512K bytes of core, solid state, or mixed core *and* solid state memory to provide a choice of either the non-volatility of core the price/performance of solid state, — or both — to satisfy specific application requirements.

Socket-mounted plug-in components to facilitate component level maintenance and improve overall system reliability.

Designed in Reliabiltiy

CLASSIC has been designed and tested to withstand more than the normal amounts of the vibration, heat and humidity found in an industrial environment.

The majority of integrated circuits are socket-mounted, for easy removal for replacement during repairs. Since only failed components are replaced, you aren't adding new parts that represent new potential failures. All printed circuit boards are plugged into a backplane, permitting quicker repairs via board swapping.

Test connectors on the opposite side of the backplane enable troubleshooting without the use of extender boards. The system diagnostics for the *CLASSIC* Family have a quick scan mode of operation to reduce the time required to isolate system faults. Micro-diagnostics in the execution ROM provide access to internal registers which aren't otherwise accessible by the normal instruction set.

A battery back-up option for use with the semiconductor memory includes an integral set of nickel-cadmium batteries for memory protection. These internal batteries are maintained in a recharged state while normal AC power is on and they provide a minimum of 15 minutes backup for the maximum memory available. External connections are also provided for users to connect their own automotive-type batteries for longer term back-up protection.

Performance with Ease of Implementation

Directly Addressable Memory

With the *CLASSIC* Family, users can write programs that directly address all physical memory. This saves time and means programs are less complicated because it reduces the use of overlays. The system can have 64 direct memory channels to minimize I/O overhead and to provide greater system flexibilty.

FORTRAN—Oriented Instructions

The *CLASSIC* instruction set is a significant expansion of our field proven MODCOMP IV computer. It has an additional 55 FORTRAN oriented instructions to handle specific FORTRAN IV statements. Improved object code efficiently reduces the need for assembly language. Users with demanding real-time applications can take advantage of this feature to realize time and cost savings in implementation of their projects.

Microprogrammability

CLASSIC has the ability to extend the instruction set with custom, microprogrammed instructions. This lets you customize the machine to achieve even faster execution of high usage functions.

Easy Expandability

CLASSIC processors use multi-function controllers, which means a single microprocessor-based peripheral controller can support a variable configuration of peripherals. Add-ons are implemented more easily and inexpensively. Most card slots in the CPU chassis are multi-purpose as well, so that various options can occupy any one of several slots. The chance of requiring an expansion chassis is minimized.

A Bonus

CLASSIC is supported by the same peripheral products and services offered with our MODCOMP II and MODCOMP IV systems.

CLASSIC is program and I/O compatible with the MODCOMP II and IV. It utilizes the same field proven MAX IV and MAXNET operating systems used by our engineering, scientific, and industrial users in hundreds of successful installations. *CLASSIC* also utilizes the same extensive family of peripheral products offered with the MODCOMP II and IV. And, finally, *CLASSIC* is backed by the same Training, Service, and Support organizations that have made MODCOMP systems a standard of excellence for years.

CLASSIC Specifications

PROCESSOR

DATA FORMATS

Fixed-Point Operand Length:
1, 8, 16 and 32 bits

Floating-Point Operand Length:
32, 48 and 64 bits

Instruction Length:
16, 32, 48, 64 and 80 bits

Addressing Modes:
Direct, Indexed, Indirect, Indexed/Indirect, Immediate, Short-Displaced, Short-Indexed, Byte, Bit and Extended: 10 Total

Number of Instructions: 367

Instruction Addressability:
4 Megabytes

Memory Protect:
Virtual Addressing—4 Level
Extended Addressing—Boundary Registers

Interrupt Levels: 16

Interrupt Sublevels: 128

Real-time Clock: 200 Hz

Example Instruction Execution Speeds:
32-bit Fixed-Point Register to Register, ADD—0.4 μsec
32-bit Fixed-Point Register to Register MULT—2.2 μsec
32-bit Floating-Point Register to Register ADD—1.2 μsec
64-bit Floating-Point Register to Register ADD—1.6 μsec

MEMORY

Memory Word Length:
Core—16 bits + 2 Parity
MOS—16 bits + 6 Error Correction

Memory Capacity: 512K Bytes

Memory Increment: 128K Bytes

Effective Memory Cycle Time:

	CORE	MOS
2-way interleaved	450ns	250ns
4-way interleaved	225ns	125ns

INPUT/OUTPUT

Aggregate Direct Memory Transfer Rate *per* I/O Bus:
Input —1.6 Megabytes per second
Output—2.0 Megabytes per second

Maximum number of I/O Buses: 4

I/O Addresses: 63

PHYSICAL

Operating Temperature Range:
0 to 55°C

Brownout Protection: Yes

Power line Ride-through: Yes

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MODCOMP

Dedicated to your success

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Overview

MODCOMP's *CLASSIC* Family of computers represents the very latest in technology and design while retaining and extending the key strengths of our previous systems:

- High performance
- Ease of implementation
- High reliability.

The purpose of this brochure is to provide you with a brief description of how *CLASSIC* has been designed to:

- provide the *best* price/performance in the "super-mini" class;
- Achieve the balance of high performance and high reliability needed in critical industrial and scientific computing environments;
- Provide the balance of high performance and ease of implementation needed to make *CLASSIC* an attractive solution for companies faced by the manpower shortage so prevalent throughout the computer "industry."

Performance

Multi-Word Architecture

The *CLASSIC* Family has multi-word architecture. All instructions are sized in whatever 16-bit word multiple is appropriate for the work being done—from 16 to 32, 48 or 64 bits in length. This means that memory and register space can be optimized around each user's application.

Instruction Pre-processing

System throughput is improved considerably with *CLASSIC* because the processor fetches up to four additional instructions while the current instruction is being executed. This look-ahead feature results in an effective instruction cycle time of 200 nanoseconds.

General Purpose Registers

CLASSIC is ideal for multi-programming use because it has a unique set of 240 general purpose registers to facilitate rapid context switching between several concurrently executing programs. Each of the 16 sets of registers has 15 registers for transfers, calculations, indexing and other tasks. More operations can be performed without unnecessary references to memory since each program is, in effect, given its own set of registers. Less time is consumed in overhead. More time is available for useful work.

Map Files:

Each of the four models in the *CLASSIC* 7860 group has seven map files with a total of 1,024 registers. In addition to permitting the addressing of up to four million bytes of memory, this allows hardware relocation of programs, reduction of memory fragmentation problems and fast switching of program modules or data into the addressing space of any other program. The net result is that you can do more work per unit of time.

Efficient Page Size

Memory can be allocated in increments as small as 512 bytes. This size has been chosen because, on the average, each request for a block of memory to be allocated ends up using only half of a page of memory. By having a smaller page size, the un-utilized space is minimized.

Multiple Bus Structure

The *CLASSIC* system architecture has four internal buses to allow simultaneous transfers without conflicts. The multiple buses provide concurrent paths for I/O, memory and MBC (Modular Bus Control) transfers, resulting in higher throughput for your application.

Mapped I/O Structure

Up to two I/O processors (with a total of four I/O Buses) can be configured in a *CLASSIC* system allowing it to expand to match your application growth. Plus, I/O transfers between computer, memory and I/O devices take place in a mapped mode of operation. A suspended or interrupted program doesn't have to wait for its I/O operation to complete before relinquishing its space to another program. In the past, this has been a severe limitation on the context switching capability of other manufacturers' systems.

Performance and Reliability

MOS & Core Memory

The *CLASSIC* computer is available with up to 512K bytes of either core or solid state error correcting MOS memory, or a mixture of both. This gives you a choice of dependable proven core memory or the price/performance of semiconductor technology by intermixing. You can optimize both cost and memory volatility considerations. And since all memory is either two-way or four-way interleaved, you get effective cycle times as low as 150 nanoseconds.

Program Control of Error Correction

With the solid state memory, error correction is under the control of software. You have the flexibility to choose whether your system runs at maximum speed without correction, or with automatic memory error correction. This simply means you can get higher performance if error correction isn't critical.

High-Speed Floating-Point Processor

The integral high-speed floating-point processor is standard with the *CLASSIC* Family models. It performs operations on 32, 48 and 64-bit operands. And since the FP processor is physically situated on one of the *CLASSIC* CPU boards, the fewer interfaces and signal paths required means you get increased reliability and availabilty.

MODCOMP
MODULAR COMPUTER SYSTEMS INC.
P.O. Box 6099/1650 West McNab Road/Ft. Lauderdale, Florida 33310/Tel. (305) 974-1380/Twx 510-956-9414

Dear Sir:

As you may already know, MODCOMP is a leader in providing computer systems to support a wide range of scientific data processing needs. Our computer systems are already in use in many high energy research, experiment monitoring and control, and other such exacting environments.

We'd like to do more for users like you, however, and we need your help. Recently we introduced a new family of computer products designed specifically to extend these scientific capabilities further, to make them even more practical for a broader range of scientific applications. You can help us to better understand your specific needs and develop new products to meet your type of application needs by taking a few minutes to complete the following questionnaire. The more we know about your needs, the better we can design our products to be of use to you.

As a token of our appreciation for your help, we'd like to send you an attractive thermographic digital desktop thermometer. If you would like to receive the thermometer, just check the appropriate box and return the completed questionnaire to us.

Thank you for your help. We look forward to hearing from you.

Sincerely,

E. Lee Saylor

E. Lee Saylor
Senior Vice President-Marketing

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Ft. Lauderdale,
Florida

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MINICOMPUTER APPLICATION QUESTIONNAIRE

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MINICOMPUTER APPLICATION QUESTIONNAIRE

YOUR USE OF MINICOMPUTERS

1. Does your organization currently use minicomputers in industrial or research applications?

   ( ) Yes ( ) No ( ) Don't Know

2. Are minicomputers used in these applications at your particular location?

   ( ) Yes ( ) No ( ) Don't Know

3. What applications are they used in?

   ( ) Data Collection
   ( ) Data Acquisition and Control
   ( ) Environmental Control
   ( ) Experiment Monitoring
   ( ) Front End Processing
   ( ) Information Systems

   ( ) Instrument Automation
   ( ) Laboratory Automation
   ( ) Multiplexing/Concentration
   ( ) Production Monitoring
   ( ) Industrial Process Control
   ( ) Simulation
   ( ) _____
   Other (please specify)

4. How are they used?

   ( ) In single computer stand-alone systems
   ( ) In multicomputer networks

5. How many minicomputers are currently installed at your location?

   ( ) 1-5 ( ) 5-10 ( ) More than 10

6. How many have you acquired in 1977-78?

   ( ) 1-5 ( ) 5-10 ( ) More than 10 ( ) None

7. Which minicomputer vendors did you consider in your last procurement?

   ( ) _____ ( ) _____ ( ) _____

8. What factors were considered in selecting the vendor chosen for your last application? Please indicate the relative importance of each factor by circling the appropriate number.

Relative Importance High				Low	Factors Considered
5	4	3	2	1	. . . . . Vendor reputation
5	4	3	2	1	. . . . . Past experience with vendor
5	4	3	2	1	. . . . . Hardware related factors such as the ones listed on the following page
5	4	3	2	1	. . . . . Software related factors such as the ones listed on the following page
5	4	3	2	1	. . . . . Completeness of product line
5	4	3	2	1	. . . . . Published prices
5	4	3	2	1	. . . . . Price flexibility
5	4	3	2	1	. . . . . Delivery schedules
5	4	3	2	1	. . . . . Availability of price/delivery/technical data
5	4	3	2	1	. . . . . Quality of field service
5	4	3	2	1	. . . . . Field service location
5	4	3	2	1	. . . . . Application engineering support
5	4	3	2	1	. . . . . Availability of product training
5	4	3	2	1	. . . . . Availability of vendor-supplied application software
5	4	3	2	1	. . . . . Availability of user-developed application software
5	4	3	2	1	. . . . . Availability of custom software from vendor ( ) or third party ( )
5	4	3	2	1	. . . . . Please indicate other: _____

9. What factors were considered in selecting the minicomputer products chosen for your last application? Please indicate the relative importance of each factor by circling the appropriate number.

Relative Importance High				Low	System Hardware Factors Considered
5	4	3	2	1	Hardware architecture
5	4	3	2	1	Performance
5	4	3	2	1	Reliability
5	4	3	2	1	Price
5	4	3	2	1	Modularity, expandability
5	4	3	2	1	"Real-time" response
5	4	3	2	1	Ease of implementation
5	4	3	2	1	Ease of maintenance
5	4	3	2	1	Communications features
5	4	3	2	1	Other features (Example: _____)
5	4	3	2	1	Your customer's preference
5	4	3	2	1	Please describe other: _____

Relative Importance High				Low	System Software Factors Considered
5	4	3	2	1	Compatibility within vendors line
5	4	3	2	1	Compatibility with existing system
5	4	3	2	1	Real time operating system
5	4	3	2	1	Network software
5	4	3	2	1	Time sharing software
5	4	3	2	1	Data base management software
5	4	3	2	1	Communications emulators
5	4	3	2	1	Multiuser software
5	4	3	2	1	FORTRAN
5	4	3	2	1	COBOL
5	4	3	2	1	Other language processors: _____
5	4	3	2	1	System utilities (sort, edit, copy, etc.)
5	4	3	2	1	Process Control Languages
5	4	3	2	1	Please describe other: _____

Relative Importance High				Low	Input/Output Factors Considered
5	4	3	2	1	Data processing peripherals (printers, readers, etc.)
5	4	3	2	1	Process interface devices in general
5	4	3	2	1	IEEE 488 interface
5	4	3	2	1	CAMAC interface
5	4	3	2	1	Special user interface (eg: graphics terminal)
5	4	3	2	1	Terminals
5	4	3	2	1	Communications interfaces: ( ) Bisync ( ) SDLC/HDLC ( ) Direct connect ( ) Dedicated modem ( ) Dial circuits
5	4	3	2	1	Host processor interfaces: ( ) IBM ( ) CDC ( ) Other

10. What kind of premium would you have been willing to pay for a significant improvement in the most significant factors mentioned above? For example:

Factor	Percent Premium
• Reliability	0 2 5 10 20
• Ease of Implementation	0 2 5 10 20
• Compatibility	0 2 5 10 20
• Real time operating system	0 2 5 10 20
• _____	0 2 5 10 20
• _____	0 2 5 10 20
• _____	0 2 5 10 20

11. Who plays a role in specifying and selecting minicomputer products within your organization? Please indicate their relative influence by circling the appropriate number.

Relative Influence High				Low	Individuals Involved in Specifying and Selecting Minicomputer Products
5	4	3	2	1	Agency Director ( )/General Manager ( )
5	4	3	2	1	Facility Director ( )/Plant Manager ( )
5	4	3	2	1	Director of Research ( )/Chief Engineer ( )/Plant Engineer ( )
5	4	3	2	1	Project Manager ( )/Project Director ( )
5	4	3	2	1	ResearchScientist ( )/Process Engineer ( )
5	4	3	2	1	Central Engineering ( )/Corporate Engineering ( )/Funding Agency Staff ( )
5	4	3	2	1	Computer Specialists ( )
5	4	3	2	1	Buyer / Purchasing / Procurement
5	4	3	2	1	Please indicate other: _____

YOUR FUTURE USE OF MINICOMPUTERS

1. What specific improvements in products and services would you like to see from your minicomputer vendors to ensure that they meet your future requirements?

_____

_____

_____

YOUR CURRENT REQUIREMENTS

1. Do you have a current requirement for minicomputer products?

( ) Yes ( ) No ( ) Don't Know

2. What is the application? _____

_____

3. What are your target dates for:

a. Initiating the project? _____
b. Definding the specifications? _____
c. Selecting the minicomputers? _____
d. Installing the system? _____
e. Bringing the systems on-line? _____

4. Which vendors do you plan to consider?

a. _____ b. _____ c. _____

5. Based on what you know about MODCOMP and its products, do you feel that we may be able to meet your minicomputer system requirements?

( ) Yes ( ) No ( ) Don't Know

6. If MODCOMP were able to demonstrate to you that we could meet your minicomputer system requirements, would you be willing to consider us in your next procurement.?

( ) Yes ( ) No ( ) Don't Know

7. If you have a current minicomputer system requirement, would you be willing to discuss it with a MODCOMP sales engineer?

( ) Yes ( ) No ( ) Don't Know

TO CLASSIFY YOUR RESPONSE

1. How many people are currently employed at your facility?

( ) 1-100 ( ) 101-500 ( ) 501-1000 ( ) 1001-2500 ( ) Over 2500

2. What is your principal "business"?

( ) University Research Facility ( ) Government Research Facility ( ) Industrial Research Lab ( ) Other _____

_____

PLEASE COMPLETE AND RETURN TO MODCOMP

( ) Please send additional product information on: _____
( ) Please retain my name on your mail list
( ) Please remove my name from your mail list
( ) Please send me the digital desk thermometer

NAME _____ TITLE _____

DEPARTMENT/GROUP _____ MAIL CODE _____

COMPANY _____ DIVISION _____

TELEPHONE _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____