

GENERAL CATALOG





DATUM CORPORATE HEADQUAR-TERS. General offices, plus all of DATUM's divisions and subsidiaries, are located at the new Corporate Headquarters facility in Anaheim. The 12.6 acre site contains the company's 80,000 square foot plant and office building with 7 acres set aside for future expansion.

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In 1968 DATUM began operations. The company has burgeoned, building an image enables one, or all, of these types of as the "miniperipheral people." At the same time, DATUM has developed a range of products, mostly peripheral to or integrated with minicomputers, and built a reputation for equipment excellence in the process.

The company has created a generic group of storage systems comprising magnetic tape input/output systems, mass memory (drums and/or discs) and digital cassette

systems. A unique design family concept storage media to be interfaced with minicomputers...over thirty different models of minicomputers. A typical system includes a formatter, to which is added a computer adapter - making a controller - and up to four storage devices, be they magnetic tape drives, cassettes, drums, discs, or a daisy-chained mix of several. Packages include inter-connecting hardware and comprehensive diagnostic software.

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CORPORATE STRUCTURE PRODUCTS					
PDC	Peripheral Dynamics Corporation (Subsidiary)	Cassette Transports Cassette Peripherals			
PED	Peripheral Equipment Division	Magnetic Tape I/O Systems for Mini-computers Magnetic Tape Formatters Magnetic Tape Controllers Line Printer Systems Magnetic Tape Transports Optical Mark Reader			
CPD	California Peripherals Division	Drum Memory Systems for Mini-computers Disc Memory Systems Drum & Disc Formatters Drum & Disc Controllers			
CRC	Code Research Corporation (Subsidiary)	Scientific Software Consulting Mini-computer Peripheral Software Packages			
IED	Instrumentation Equipment Division	Automation Systems Data Acquisition Systems System Modules			
GA	Graphic Arts Division	Phototypesetting Magnetic Tape Systems Data Proofreading and Editing Systems			
TD	Timing Division	Time Code Generators, Readers [°] Tape Search Systems Range Timing Systems, Instrumentation			
DISC	DATUM International Sales Corporation	Distribution of DATUM products worldwide			

In general, these DATUM systems offer superior performance to a wider range of minicomputer users than can be offered by individual computer manufacturers. The success of the concept is manifest in customer acceptance: for example, over 2000 installations of magnetic tape systems have been made, here and abroad. To accommodate DATUM customers outside of the U.S. DATUM equipment is also designed to operate on 220 volt, 50 Hz.

DATUM's key personnel have accrued hundreds of man-years of collective systems engineering expertise. Thus, many problems arising from customer needs to automate have resulted in mini-system solutions. So many in fact that DATUM's System 70 evolved as a standard, modularly designed, mini-computer-controlled, system applicable to an extremely wide range of small systems problems.

A vital adjunct to providing systems hardware is the creation of operating software. This is a particular DATUM strength, accomplished through a subsidiary (Code Research Corporation) devoted solely to software consulting, development and implementation.

The company also possesses unique skills in the application of time coded signals. Time code readers, generators, translators and displays are typical instruments used in this specialized field. As with peripheral products, the integration of several types of timing instrumentation frequently results in systems. Complete range timing systems, such as may be used to correlate the masses of data gathered, for example, during a manned space flight, represent the consummate skills of DATUM personnel derived from decades of timing instrumentation experience.

DATUM is split into four main divisions: Peripheral Equipment Division, California Peripherals Division, Instrumentation Equipment Division and Timing Division. A new Graphic Arts division is developing hardware and software systems applicable to the phototypesetting industry. In addition, two affiliated concerns, Code **Research Corporation and Peripheral** Dynamics Corporation, add their specialized talents to particular projects.

PERIPHERAL DYNAMICS

Peripheral Dynamics Corporation is a wholly owned subsidiary of DATUM, producing magnetic tape cassette drives. Its engineers are experienced in the design and manufacture of digital tape drives. They have, for the first time, applied to cassette drives the same digital design approach and rugged construction standards used on large tape decks. The result is miniperipheral cassette drives with the highest performance and reliability in the industry.

Model 4200 Digital Cassette Tape

Transport = DATUM's Model 4200 digital cassette tape transport offers exceptional performance and reliability for a wide range of OEM applications. The Model 4200 offers recording speeds from 15 to 75 ips. Single-gap read/write or dual-gap read-after-write heads, recording on two tracks, with densities of up to 800 bpi NRZI or 800 bpi phase-encoded, offer unusual storage capacities of over 10 million bits on a Phillips-compatible data cassette. A reel-driven servo mechanism provides constant tape velocity without capstans or pinch rollers. A torque feedback servo maintains precise tape tension. Referenceedge tape guidance maintains minimal skew. Options and accessories include controllers interfacing to multiple minicomputer models. Also, a terminal adapter provides direct access for up to three cassette drives via RS-232 interface, for communications applications.



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DATUM Model 4200 Digital Cassette Tape Transport



Peripheral Equipment Division = Most

products of this group are peripheral devices to mini-computers: magnetic tape I/O systems, formatters, controllers, digital cassette tape transports, communications terminal adapters, interfaces, diagnostic software packages and interconnecting hardware to combine these component parts into operating systems.

Complete systems, using magnetic tapes, cassette drives or a combination of both are available for some 30 different mini-computer designs. More than 2000 such magnetic tape systems have been installed.

Series 5091 Magnetic Tape Systems = DATUM's Series 5091 magnetic tape input/output systems interface with most minicomputers. A system consists of a controller, up to four tape recorders, interconnecting hardware and comprehensive software.

Both 7-track (200, 556, 800 bpi) and 9-track (800 bpi, 1600 bpi) NRZI and/or phase-encoded formats are available; they can be intermixed. Tape speeds from 12.5 ips to 75 ips using either 7-inch or 10½-inch tape reels. The system has read-after-write parity check, generates VRC, LRC and CRC and checks VRC and LRC.

SOFTWARE consists generally of a diagnostic, I/O driver and checkout aids.

Series 5091 Magnetic Tape Formatters = DATUM's Series 5091 Formatters generate and read IBM-compatible NRZ and phaseencoded formats. By adding a computer adapter, the formatter becomes a complete tape controller, capable of controlling up to eight 7- and/or 9-track tape units (four per formatter). Computer adapters are available for most minicomputers, or blank circuit boards for *design-your-own* adapters can be supplied. DATUM Series 5091 Magnetic Tape Formatters are compatible with computer software when handling 7- or 9-track, multiple-speed, multiple-density tapes.



Series 5090 Tape Test System

Series 5090 Tape Test System • The DATUM Model 5090 magnetic tape test system using a PDP-8e computer is rapidly becoming the industry standard for evaluating ½-inch mini tape drives.

Utilizing a comprehensive software system, the unit tests both NRZ and phase-encoded 7- or 9-track all-speed transports. It allows an operator with minimum training to create his own checkout aids, and is supplied with a complete diagnostic program.

Typical applications are in receiving inspection by large OEM users of ½-inch IBM industry compatible tape drives, and in final test by drive manufacturers. The Model 5090 also may be used to generate master tapes for checking skew and to perform worst-case pattern tests of installed tape units.







PERTEC



Each DATUM Series 5091 Magnetic Tape Controller drives from one to four tape decks. 5091 systems may be specified to incorporate any of the popular tape decks, and can be provided for use with any industry compatible tape deck you may already have.



WANGCO





Forms, precisely drawn and printed to assure accurate readings, are supplied by DATUM in standard formats or in custom formats to meet special requirements.



Model 5098 Optical Mark Reader = Useful in dozens of applications such as schooltest scoring, inventory reporting, insurance data entry, medical or clinical data assembly, accounting or billing control, and remote order entry, the DATUM Model 5098 Optical Mark Reader is simple enough for a child to operate, reads up to 2400 forms per hour.

This versatile data entry terminal senses marks made with a regular soft pencil lead on preprinted forms, tags or pages. Normally 8½ x 11-inch forms are employed. Up to 64 columns of 12 bits, as well as clock track information, are printed on the form.

The form is read completely and data assembled into ASCII alphanumeric characters and formatted for asynchronous transmission to an adjacent computer, or by telephone line modem to a remote computer at rates up to 9600 baud. Signal interface is compatible with RS-232C standard. Buffered data can be retransmitted on request for transmission error check, without having to re-read the document.

CALIFORNIA PERIPHERALS DIVISION

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This Division manufactures and markets a range of mass memories and systems addressed both to the OEM and end-user segments of the minicomputer market. Mini-drums that have storage capacities from 16K 16-bit words to 262K words, and offer moderate performance plus very low cost comprise a major portion of the range. They are supplied either as OEM devices or as memory systems with formatters, couplers and software packages. Larger capacity, special-purpose drums (e.g. airborne or mil-spec) also are available. Discs with moving arm, fixed and removable media provide storage capacities to 2.5 million words, with rapid access and excellent economics.

Series 55 Mini-Drum Drive = DATUM's Series 55 rotating drum systems have become an accepted standard for minimemory storage applications where popular capacities are required in everyday environments at the lowest possible cost, and without compromising the inherent high reliability of drums. From one to 64 tracks are offered, with 4096 words per track. Data is processed in a bit-serial stream at over 2 million bits per second.

Applications for these Series 55 drums are extensive; they have been used successfully for point-of-sale systems, inventory control systems and process control systems where initial investments are frequently low and subsequent maintenance-free operation is prerequisite.

The flexibility of being able to select single-track increments for each exact requirement is an important feature for OEM applications.

Standard production Series 55 drums are pre-formatted, though special formats may be ordered optionally. In the standard data track format, one sector-length of data track is set aside for switching purposes. Track address and write-read mode switching normally occur during this period. Switching may, however, occur after other sectors, provided that one sector-time is allowed to lapse before reading or writing. Standard sector format includes a 10-bit preamble, 544 data bits and a 10-bit minimum postamble. Sector formatting is a controller function.



Series 55 Rotating Drum Mini-Memory (cover removed)



Series 4091 Disc Controller Package

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Series 44 Cartridge Disc Drive = DATUM's Series 44 Cartridge Disc Drives are designed primarily to provide both sizeable on-line random-access storage and unlimited off-line storage. A single removable cartridge (IBM 5440-type) and a movable arm, fixed disc are used in the standard configuration.

With storage capacities of up to 48 million bits, they complement the DATUM drum memory product line. Double frequency recording is used, providing a bit density of 2200 bpi and a transfer rate of 2500 kHz.

Average access time is 35 milliseconds (seek). Operating at 2400 RPM, the average latency time is 12 milliseconds. Track-totrack access is 10 milliseconds. Optical head positioning is used. Other 'big system' features are air filtration and brush cleaning cycles. All air drawn into the system passes through an absolute filter. A brush cleaning cycle is performed at each start-up.

Series 4091 Disc System = System comprises a controller, up to four magnetic discs (single- or dual-platter), interconnecting hardware and software, including I/O driver and diagnostic maintenance programs. Storage capacities from 2.5 million to 10 million 16-bit words per controller (i.e. up to four discs).

In common with other DATUM controllers, the design concept of a formatter plus a computer adapter is used. Computer adapters, available for most common minicomputers, are generally on a single circuit board that plugs into the basic formatter chassis to form the stand-alone controller.

Fixed and removable discs (IBM 5440-type cartridges) are used. Other major features of the system include write-protect (enabling each platter to be protected against writing over stored data), and data-error checking.

Series 3091 Drum System

Series 3091 Drum System = This series encompasses the formatter/adapter principle so successfully utilized by DATUM in magnetic tape, disc and cassette systems. Series 3091 systems consist of a formatter, computer adapter, Series 55 head-per-track memory, interconnection cables, diagnostic and I/O driver software.

Computer adapters are available for most popular minicomputers, including DEC PDP-8/e, PDP-11, HP2100 and all Data General series computers.

Series 3091 drum systems are supplied as computer manufacturer replacement units and, as such, are totally software compatible with existing DOS as supplied by Digital Equipment Corporation, Hewlett-Packard and Data General Corporation.

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INSTRUMENTATION EQUIP/DENT DIVISION

Systems problem-solving is the expertise of this Division. Small, modular, flexible systems providing solutions to a wide range of applications, typically in data acquisition, process control, test automation and data communications fields form much of the division's activities. Larger and more complex computercentered systems, complete with specifically designed applications software, are also within the Division's experience and capability.

System 70 = A turn-key package, System 70 provides solutions for a wide range of applications in data acquisition, process control and monitoring, test automation, production-line monitoring and data communications.

System 70 affords a package of low-cost modular hardware, assembled from an extensive selection of analog instrumentation, connected to a minicomputer with peripheral devices for virtually any requirement - together with a large library of standard software.

Most important, DATUM's Instrumentation Equipment Division has the systems engineering experience and expertise to make the package operational and reliable.

A block diagram of the System 70 concept follows:

Timeshare System 70 = Timeshare System 70 is an adaptation of DATUM's standard System 70 to the types of problems (accounting, payroll, order-entry, sales forecasting, inventory control, etc.) frequently encountered in normal commercial business environments. Computation precision is programmable 6, 10 or 14 decimal digits.

Timeshare System 70 can be on-line with virtually any data base, constantly, 24 hours a day, seven days a week. The primary system includes a central processor with from 32K to 64K characters of core memory, a disc and/or drum mass memory and a multi-speed 16-port communications multiplexer.

Peripherals to the CPU can include up to four magnetic tape drives, up to eight 5-million-character disc files, one or two drum memories (524K word total capacity), high speed paper tape punch/reader, punched card reader, high speed serial impact printer (132 columns), 600-lineper-minute line printer, and magnetic

tape cassettes. The primary 16-port communications multiplexer can be expanded to serve 32 terminals, local or remote, such as teletypewriters, printers, video displays, optical readers and graphic plotters. System design is such that all terminals can perform different functions concurrently, accessing the same data base, entering or retrieving data as well as preparing new programs.

Operating systems include: Business BASIC Timeshare Operating System with Data File structure and processing commands for complicated business data application; PRINT USING statement for format convenience; Program Chaining for large programs; Management System, providing program security through four selectable levels of file access; Data **Communications System (handles terminals** at eight selectable speeds between 110 and 9600 bits/second on each individual port); and all standard BASIC language statements and commands, plus matrix operations, character string processing and files.

2109 P.G.

2109 P.G. 256 CH

2109 384 CH

2109

1024 CH P.G.





CRC CODE RESEARCH CORPORATION

Code Research Corporation, a wholly owned subsidiary of DATUM, Inc., is a group of systems analysts and consultants with consummate skills in developing special computer systems software, integrating hybrid computer systems and designing simulation systems. CRC works closely with the Instrumentation Equipment Division in developing special software for computer-related hardware systems marketed by IED, and packages for operating mini-systems in which DATUM interfaces peripheral devices with minicomputers.

Typical of the tasks performed by CRC are:

Development and implementation of a real-time programming system for a hybrid system consisting of an XDS Sigma 5 digital computer, two Applied Dynamics AD4 analog computers and interface hardware. The software developed by CRC provided high speed data transfer through a direct memory access input/ output system and added programs to support the Sigma 5 priority interrupt system.

Complex software was developed for a hybrid simulation system using an SEL-840MP digital computer, an Astrodata CI-5000 analog computer and a NASA-developed interface.

Another large simulation system consisting of an XDS Sigma 5, a C1-5000, 96 channels of digital-to-analog conversion, 64 analog-to-digital channels and a Sigma 2 driving an alpha/graphics CRT was substantially modified. Both software augmentation and hardware systems design were performed.

A hybrid simulation was developed for a six-degree-of-freedom object. The simulation was first implemented digitally written in FORTRAN. Execution time was 98 times real time. Further steps in enhancing execution time were to optimize the FORTRAN programming and reprogram some of the routines in assembly language.

Similar studies were performed on a hybrid system using a CDC 6600 and two CI-5000 analog computers. (This system's entire software was designed by CRC to enable the system to run four times faster than real time.)

Systems design for a computer system capable of performing four time-critical tasks, four conventional scientific bath-

processing tasks, and supporting either a remote terminal time-sharing system, or a graphics system simultaneously. The digital computer hardware consisted of five XDS Sigma 5's in a multiprocessing, multiprogramming configuration.

A similar design was provided for a system capable of performing simultaneously up to eight time-critical tasks, twelve interactive batch tasks and one conventional batch-processing task.

In addition to these more specific scientific tasks, CRC has undertaken much general software development. For example, many routines pertaining to the use of Data General's NOVA minicomputers, specifically applicable to control of peripherals as in DATUM's systems, have been developed.

GA GRAPHIC ARTS DIVISION

Applications of computer technology in the typesetting industry have been rapid in recent years. An adaptation of DATUM's basic magnetic tape storage systems, for example, provided an efficient alternative to the phototypesetter laboring with computer outputs on paper tape. From there, several related product developments have continued. Since the marketing concept for these products varies from the normal computer peripheral environment with which DATUM personnel are so familiar, a new division addressing its expertise to the publishing and print media markets has been formed.

5095 Magnetic Tape System = DATUM's Series 5095 magnetic tape system enables phototypesetters customarily accepting computer output from punched paper tape to accept these text and function commands from the computer-compatible magnetic tape. Computer output rate is accelerated from about the hundred cps typical of paper tape to about 60,000 magnetic tape characters per second. A standard system comprises 9-channel, 800 bpi tape drive, controller and interconnecting hardware. The controller contains a 1024-character buffer storage. Interfaces are available for phototypesetters like Photon's Pacesetter, Mergenthaler 505, Star Parts CompStar, etc., though the system can accommodate any phototypesetter whose paper tape characteristics can be emulated.

Texedit • The basic Texedit system consists of a central processing unit, storage, a video display with keyboard, all mounted in a desk-sized console.



5095 Magnetic Tape System Shown with Phototypesetter

Computer-originated data reaches the system via RS-232 interface and is stored on magnetic tape (either IBM-compatible 1/2-inch tape units, tape cassettes, or both). Data also may be stored on rapid-access, reliable drum memories. For copy editing, a CRT displays data alphanumerically using an upper and lower case font. By using a keyboard entry, changes may be made and corrected data returned to storage. Storage capacity can be expanded to over 10 million words, using up to four drums. Several video displays also can be added. Data input can be via magnetic tape to drum storage. Following editing on the CRT, data can be output via RS-232 interface to another remotely located on-line system.

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DATUM's Timing Division operates within a highly specialized market segment. designing, manufacturing and developing applications for equipment concerned with the use of coded time signals. Time codes appear, for example, on magnetic tape as one of several information tracks, enabling data from all tracks to be correlated to time. Instruments for generating any of about two dozen commonly-used time codes, instruments for reading these codes, for translating them, for searching magnetic tapes for them are designed. built and marketed. Several of these instruments are computer-compatible. Entire systems for instrumenting spacecraft launch centers or missile test ranges have been built around these timing devices.



Time Generators, Readers, Tape Search.

The **9300 Generator/Reader** — key instrument in the 9300 Series. Features 1¾-inch packaging and low cost. Unique modular design, even to component modules, allowing simple maintenance and modification. Although the IRIG family is most common, other code series are available. Wide input range is standard. Options allow adaptation to many applications.



Additional related instruments: 9200 Reader, 9100 Generator, 9240 Control Unit. The 9240 Control Unit combined with a 9300 Time Code Generator/Reader comprises a typical Tape Search System.



The **9310 Generator/Translator**, key instrument in a series meeting most requirements for data acquisition and data reduction. It feature 2.6 MHz bandwidth, multiple code translation, tape search compatibility, IRIG B generation and a wide variety of options. Unique features: front panel error and input loss indicators; **16**-frame bypass.

Additional related instruments: 9210 10 Translator, 9110 Generator.



The **9241 Search Control** offers optional resolution from milliseconds to day-of-year. Standard features such as pushbutton control, multiplexer sequencer and "Auto Record" make the unit unique. Computer control optional in several versions including full input/output controller operation. Momentary or constant contact closures, as well as selectable delays, makes the unit compatible with all typical instrumentation recorders.



Airborne Systems & Equipment

The **9150 Airborne Generator** offers custom airborne configurations to meet all data acquisition requirements. Available in ½ ATR to full ATR packages, plus special configurations as necessary, the units feature fully automatic and manual synchronization, multiple code outputs, AC and DC power, battery standby, computer interfaces and many other functions.

Additional airborne generators, some compliant with full military specifications, some with remote controls, some with standby battery operation are available in various packages.



The 9509 Remote Display provides a simple display for photo panel application. It operates from aircraft 24 volt DC power. Power supply is isolated from aircraft ground for maximum system protection. BCD inputs are converted to the 7-segment display.

Additional remote displays include the 9506 using Nixie-type indicators. Several 9850 Battery Supplies are available for emergency operation in case of primary power failure.



Another 9508 Remote Display can be rack-mounted or wall-mounted. Many of the remote units are available for airborne as well as ground requirements.



The 9100 Digital Clock and the 9100 Countdown Clock provide front-panel decimal displays, the latter counting 99 hours 59 minutes, 59 seconds.

The 9610 TIMING TERMINAL UNIT is a

"do-it-yourself" system offering a complete choice of power supplies, terminal modules and chassis. In many cases, line termination and distribution requires only signal conditioning or impedance matching. For example:



DC Camera Driver



IRIG Camera Driver

Dual Line Amplifier

Dual DC Driver





Many other functions are available as custom or standard configurations. Modular construction allows combinations of functions or multiple modules of the same function.



Timing Systems

Special systems for range timing requirements have been built. This typical system is a highly precise range generating station. Fully redundant, the system also has unique nanosecond pulse correlation. Other features include cesium-standard precision, fault isolation, battery back-up, multiple user distribution and full time synchronization. DATUM's timing system capability is unparalleled. For example, over 100 man-years of range instrumentation experience were drawn upon in designing and building this system.



This system is a combination time code format generator and stored program control system. Up to ten different time codes to 75 remote locations can be programmed providing ON/OFF control to each location with millisecond resolution. An internal countdown system provides ON/OFF control indexing. An internal circulating MOS memory and teletypewriter program the system. Countdown sequence or individual circuits are enabled by either front panel controls or remote inputs. Entire operation is preprogrammed by internal memory at discretion of operator. A printout is provided of all system communications.

SALES AND SERVICE

DATUM has 23 sales and service offices in principal cities across the nation and internationally. The map indicates locations of offices.

To request additional sales information, simply indicate your product interest on the attached reply card, call your local DATUM representative, or contact DATUM at the Corporate Headquarters address.

DATUM SERVICE

DATUM service contracts spell out clearly all charges and rates for installation, maintenance, service and emergency service. This lets you budget effectively without worrying about expensive overruns and mounting overhead.

The DATUM service organization is set up to efficiently serve customers of all of the company's divisions and subsidiaries. Every service contract is assigned to an Account Manager at the DATUM main plant in Anaheim. rle is the one man you look to for all service needs. Whenever DATUM equipment needs service in the U.S., you call him **collect**. He locates and contacts the Customer Engineer in your area, who is expected to be at your facility within hours of a malfunction report.

All DATUM service personnel are proficient in handling the complete spectrum of DATUM peripherals and full systems. Our Customer Engineers are equipped with tools and instrumentation to make them among the best outfitted service men in the industry.

At this moment, there is a DATUM Customer Engineer within 120 minutes travel of 85% of our customers.

ORDERING INFORMATION

For detailed price and delivery information on an item of equipment or a system configured to your requirements, write to DATUM at the Corporate Headquarters address shown below. We will have a sales engineer contact you with the information you need, or make an appointment to meet with you, answer your questions and help you order the exact DATUM system tailored to your operation or application.

DATUM SALES OFFICES

SALES REPRESENTATIVES

SERVICE REPRESENTATIVES

Datum inc



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Please send me additional information on:

Cassette Transports	Drum Memory System	Timeshare System 70	Phototypesetting Mag Tape System			
Magnetic Tape System	Disk Memory Unit	Data Acquisition System	Data Proofreading & Editing System			
Magnetic Tape Controller	Disk Formatter	System Modules	Time Code Generators / Beaders			
Line Printer Systems	Disk Memory System	Scientific Software	Tana Coareb Sustama			
Optical Mark Reader	Automation System	Consulting	rape Search Systems			
Drum Memory Unit	System 70	Minicomputer Software Packages	Range Timing Systems and Instrumentation			
MY INTEREST IS FOR PERIPHERALS ASSOCIATED WITH THE MINICOMPUTER.						
Please send literature only.						
Please have a salesman call for appointment.						
NAME						
ADDRESS						
CITY		STATE	ZIP			
TELEPHONE: ()					

