MEMOREX

1270 Terminal Control Unit
1380 Communications Processor

Do you need a programmable front-end?

A System/360 or System/370 communications network must move data efficiently among one or more computers, a number of terminals and other teleprocessing equipment. To improve that efficiency, hard wired terminal control units and programmable communications processors stand between the computer and the outside world.

To improve the efficiency of networks; front-end units protect the CPU from menial translation tasks, allow a variety of terminal attachments and optimize line usage.

They prevent traffic congestion and deadlocks. They maintain data integrity through prevention of data loss and message duplication. And they maintain network integrity by helping to detect and correct network failures.

Hard wired or programmable control?

The hard wired Memorex* 1270 Terminal Control Unit performs communications functions well for System/360 and System/370 users with a single CPU and a network using a mix of standard terminals, operating systems and software (BTAM, TCAM, etc.).

The 1270 has become the industry standard for throughput, reliability and simplicity of configuration. It handles up to 96 communication lines, added modularly as needed, in any combination of asynchronous and synchronous at speeds up to 56,000 bits/second. It translates an assortment of terminal types, line and modem speeds, carrier configurations and software transmission codes to usable CPU information.

Then why a programmable processor? While modular line addition and plug-in options give the 1270 versatility, the characteristics necessary to control various terminals and line disciplines are built into the hardware. In simple and stable networks, this is an advantage. However, as a network becomes more complex, programmable flexibility and control over more functions become necessary.

A programmable processor is necessary when your CPU is becoming overloaded with network control functions. Or when you wish to link several CPUs or support multiple applications. Perhaps you need faster dynamic line switching to adjust to varying loads and applications. You may require programming to support terminals that are not IBM compatible.

For many users, the most important reason for a programmable processor is the need for improved management and control. They need the capability to select alternative paths, control blocks of data, and balance loads throughout the network. They need a better way to detect and correct errors. And they need more accessible statistical data for faster, more thorough analysis.

Programmable processors also become a necessity for handling special application techniques, such as message switching, store and forward, packet switching and message recording.

The Memorex 1380 Communications Processor is just such a programmable processor. A high performance alternative to the IBM 3705, the 1380 emulates the functions of a Memorex 1270 or IBM 270X terminal controller, but with enhanced performance and additional control.

Surprisingly, most programmable processors offer little or no advantage over the hard wired 1270. Instead, they are used to strictly emulate the hard wired IBM 270X. They do not have the peripheral support (discs, video displays, printers) or the resident software necessary to control and monitor independently of the main CPU.

The 1380 is the one programmable processor that displays intelligence in emulation mode. Control and monitoring functions are performed without demanding host CPU time and storage. Through a system console and added video displays, the user has, in effect, a "window" through which to view the network. Diagnostic and utility routines are readily available from the processor's own direct access storage facilities.

The disc-based operating system and video system consoles provide control, monitoring, on-line statistics and advanced diagnostics. As many as eight system consoles allow supervision and monitoring without going through the CPU.

The 1380 delivers more network throughput than competitive processors. It delivers eight times the throughput of the 3705-I, and one and one-half times the throughput of the 3705-II. Aggregate data throughput is over 100,000 characters per second. It handles lines at rates up to 230,400 bits per second. It serves more host CPUs (up to 4) and more lines (up to 216) with faster execution time, memory access and data transfer.

Software provides enhancements for 1270/270X emulation, TCAM/VTAM access methods and future developments. A comprehensive support package is also included.

Hard wired or programmable? Memorex gives you both.

1270 Terminal Control Unit
1380 Communications Processor

Memorex 1380
A powerful solution

The power to reduce overhead

Without using valuable CPU time, the 1380's stored programs control communications lines and terminals, convert codes, buffer and process message blocks, poll, monitor, and handle errors.

Console functions are performed without going through the host CPU. As many as eight 1380 video system consoles, local or remote, allow independent supervision and monitoring of the network. In supervisory mode, the operator can use a system console to examine system parameters, modify them and initiate control functions. Any of the consoles can also be used to monitor up to sixteen classes of system errors, display line statistics, or perform real-time line traces of data, status, error conditions and system reports. An optional printer can permanently record selected information. Diagnostic and utility routines, carried on the processor's own flexible disc file, are brought to 1380 memory on call from any console.

The disc-based system has still another advantage. It provides useful statistics for analysis and management planning. It can answer important questions—Are there too many errors? What lines have problems, and why? Are certain lines overloaded? How do various terminals or terminal operators compare in performance? How can the network be optimized? What changes are taking place in the network? The answers, in the form of statistical data, can be stored on disc and retrieved on command without the CPU.

The power to adapt

One of the key advantages of a programmable processor is its ability to meet change. Modular software and hardware, a complete array of communication line interfaces, and operator access via the CRT keyboard console simplify 1380 reconfiguration.

Add more terminals or replace with different models. Use additional CPUs for special applications. Change line disciplines. Completely reconfigure the network. The 1380 can do more than match the new requirement. Through down-line supervision and control, it can test and audit performance of various network organizations, procedures and components.

Software is modular. Through system generation language, appropriate software modules can be selected and incorporated into the control program. Hardware is modular. Modularly-packaged, function-oriented logic can be reconfigured in the field.

As many as four channel adapters are available for attachment to the byte multiplexer channel for 270X emulation or to a selector or block multiplexer channel for NCP operation. Each adapter accommodates an alternate-channel switch, allowing attachment of up to eight channels.

The addition of hardware features and storage creates no interface problems. A unique bus system forms a common signal interface path among all circuit boards.

The power to handle big, complex networks

The 1380 can communicate simultaneously with up to four host CPUs, attach up to 208 asynchronous lines, and handle any mix of line speeds, terminals and communications disciplines.

On operator command, the processor can monitor, test and dynamically reroute lines among four CPUs. Various application programs can be switched among the CPUs without changing address codes. The terminal user simply specifies his application. The processor automatically routes the message to the CPU performing that application.

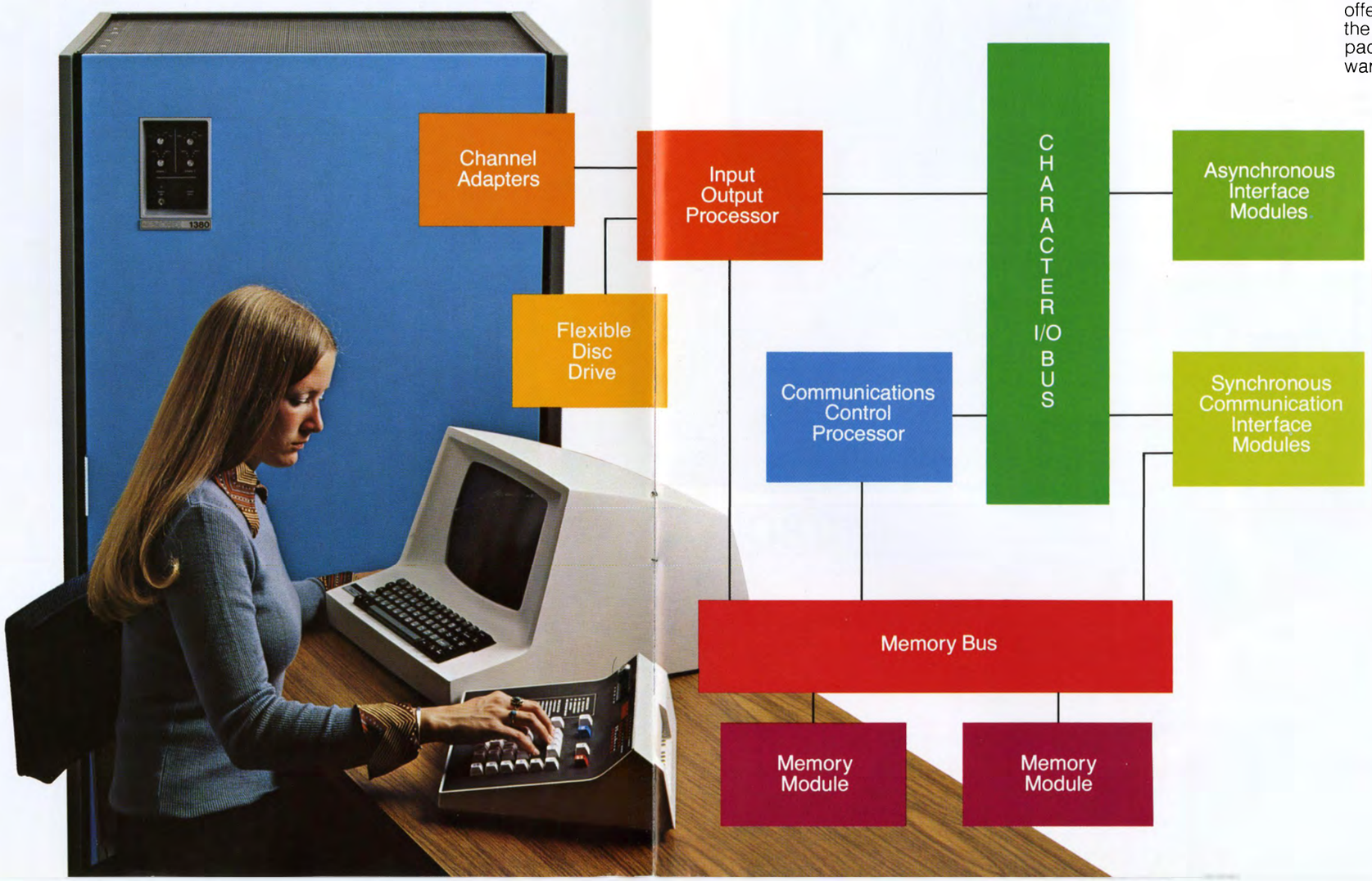
Powerful architecture

A high-performance digital computer, designed specially for data communications and real-time control, the 1380 features a high speed independent processor for input/output operations, an independent character bus, and independent memory bus with high speed to memory of 3.7 megabytes per second, and up to 512K of resident disc storage.

Eight problem program levels (the IBM 3705 has only five), each served by eight primary and eight secondary registers, allow more multiprogramming depth to improve throughput of high priority work.

With 32 memory interrupt locations, each supporting up to eight lines or internal devices, the 1380 provides for 256 hardware interrupt conditions. The interrupt signal generator causes the communications and control processor to be interrupted to announce program faults, hardware faults, interval timing and system alarms.

The architecture is open-ended. Processing 900,000 bytes per second, the I/O processor can support seven peripherals with four channel adapters. Without changing architecture, the 1380 has the potential to handle future applications, such as fail-safe systems, sharing of host disc, IFA disc attachment, full string attachments, or internal discs with fixed head capability. It offers the opportunity to tailor the processor to accommodate packet switching, store and forward networks, etc.



Powerful software

Users report lack of software support and limited flexibility as primary disadvantages of competitive processors. For this reason, Memorex has developed comprehensive disc-stored software.

The Network Control System is an evolutionary operating system. Basic NCS provides intelligent emulation and enhancements. NCP (Network Control Program) capability can be added as a second program. Emulation and NCP programs can operate simultaneously on different lines. Under either of these programs, the user can add his own software options.

The disc-based operating system supports multiple CPUs and maintains overlay capability. Real-time systems monitor facilities, display statistics and status, and perform supervisory functions, line switching, diagnostics and line tracing. Front-end polling (Autopoll) and automatic baud rate detection (Autospeed) are also included.

Enhancements include extended polling, error detection and correction, terminal-initiated line switching, additional diagnostics, DOS support, code conversion and non-IBM terminal support.

NCP capability with SNA compatibility supports VTAM, SDLC and partitioned emulation.

While NCP adds further enhancements to disc capability, all programs allow use of the operating system and disc to perform supervision and diagnostics at the processor's system console.

Support

A comprehensive support package, consisting of an assembler, linkage-editor, program and file management routines, system generation programs, and utilities is available for all standard IBM operating systems. Initialization may optionally include diagnostic capability to validate all major hardware components prior to network start-up.

The Future

While 1380 software can accommodate current NCP implementations, its open-ended design will allow use of new promising network systems, such as SNA (Systems Network Architecture). These systems offer the potential of ring networks, pooled front-ends, better distribution of functions among network components and more user options.

Throughput Power

The 1380 moves more data faster. Aggregate data rate is up to 50% faster than that of an IBM 3705. This allows synchronous communications in excess of 100,000 characters per second.

Execution time is faster. The 1380 communications and control processor executes some commands in 360 nanoseconds, and accesses memory in 540 nanoseconds. The 3705 requires a full microsecond. Eight program levels, rather than the 3705's five, allow more overlapping activities, further improving execution time efficiency.

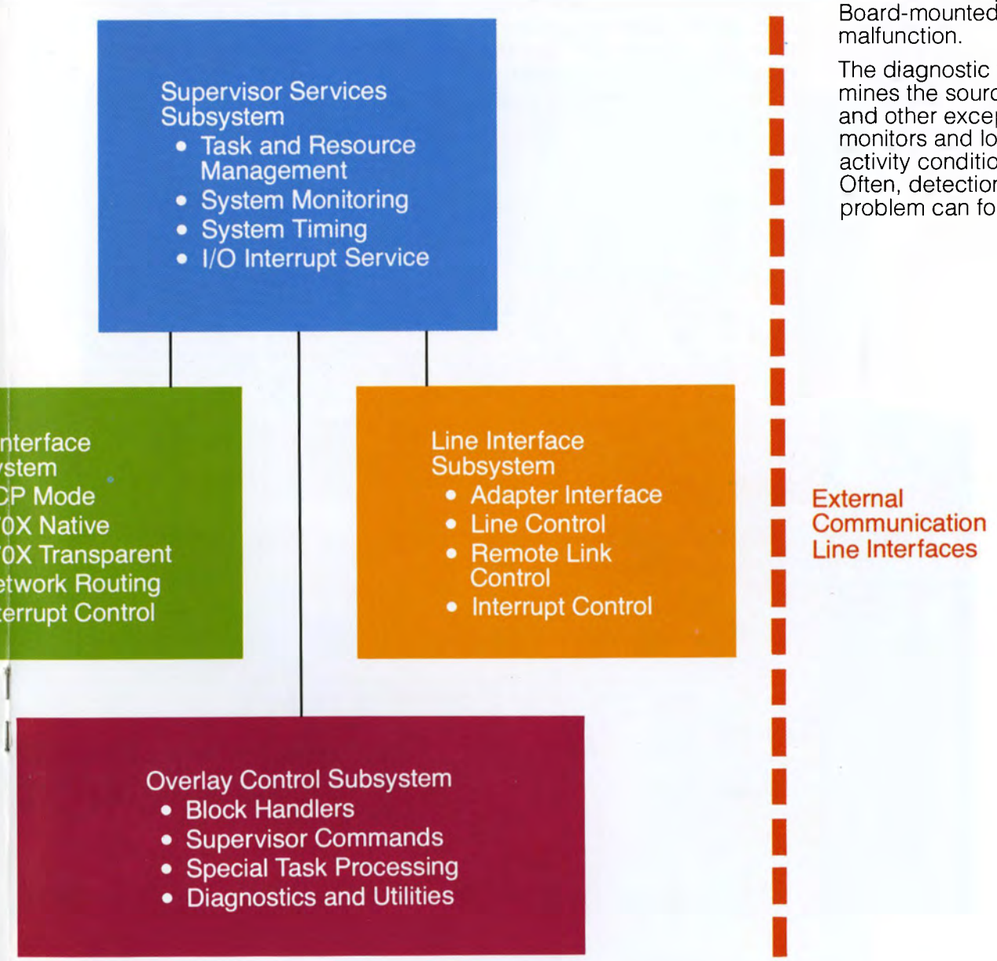
Maintainable Power

Built-in reliability and a complete diagnostic package ensure continuing network performance.

Proven technology and Memorex quality assurance give the 1380 inherent reliability. Factory testing of every individual component and a comprehensive system checkout simplify in-field installation and startup. UL, CSA and VDE approval certify safety.

Reliable MSI and LSI logic minimize device interconnections. Ceramic packaged components in heat-sensitive areas protect against failures. Function-oriented logic and modular printed circuit boards are easy to maintain. Board-mounted LEDs signal malfunction.

The diagnostic package determines the source of malfunctions and other exceptions. The system monitors and logs line errors and activity conditions as they occur. Often, detection of an intermittent problem can forestall line failure.



Memorex—Experience, Commitment, Service

Memorex introduced the 1270 terminal control unit in 1970. Since that time, over 1500 units have been installed. This wide acceptance has given Memorex the opportunity to develop a special expertise in network control. It has also enabled the development of an extensive support system devoted to communications products.

The 1270 terminal control unit and the 1380 communications processor are supported by a world-wide network of communications specialists, engineers, software analysts and service personnel. This technical support, supplemented by strategically located parts depots, comprehensive documentation, and continuing educational programs, is unequalled in the industry.

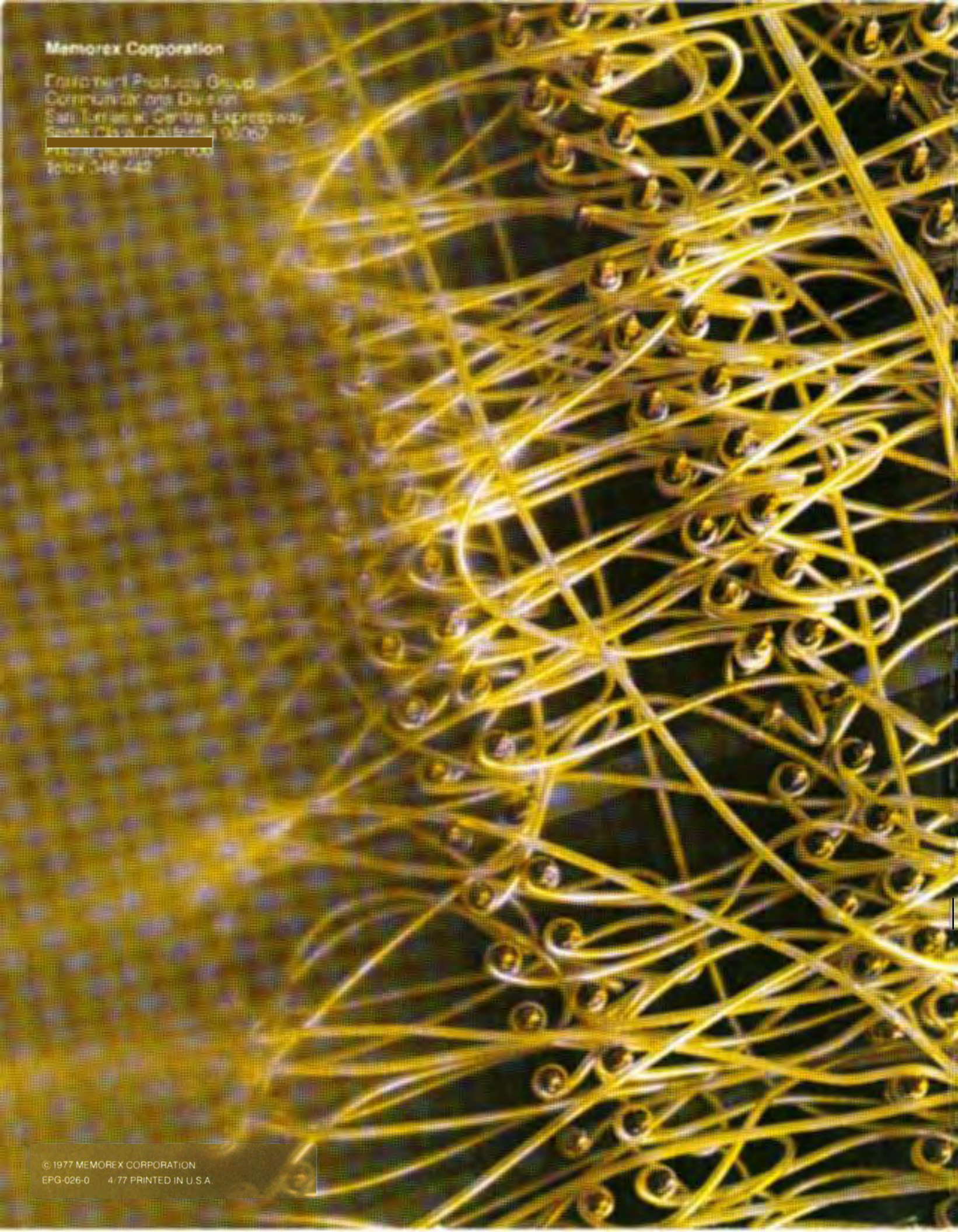
Systems engineers, backed by our Sales Technical Services department can help you configure the system to your network requirements. And after the system is installed, on-line diagnostics help you maintain high performance.

Memorex is committed to leadership in front-end communications systems. Continuing enhancements in hardware and software, technical service and logistical support will assure that leadership.

This commitment to quality, reliability and service has earned Memorex the reputation inherent in its name—Memory Excellence. From its beginning as a leading manufacturer of magnetic recording media for rotating data storage, Memorex has led the industry in the development, manufacture, distribution, and service of a wide range of products.

Today, Memorex employs over 6,000 highly skilled people in more than 100 locations throughout the world. With modern headquarters and major manufacturing facilities in Santa Clara, California, Memorex also has production facilities in Liege, Belgium; Nogales, Mexico; Eau Claire, Wisconsin; and Irvine, California, plus a large network of regional warehousing and distribution centers.

Memorex: the standard of value.



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EPG-026-0 4/77 PRINTED IN U.S.A.