

# Texas Instruments announces for the 980A minicomputer interactive terminal processing

DX980 is a general purpose operating system that supports the 980A computer in various applications including batch processing, interactive terminal processing, and real-time processing. It can support all of these applications simultaneously or each one individually.

The Memory Protect/Privileged Instruction feature of the 980A provides a "hardware protected" environment so that an executing program cannot destroy the operating system or another job.

DX980 features a modular organization. Executive functions common to several application environments are included in the nucleus, while executive functions unique to specific environments are embodied in subsystems.

The nucleus is partially memory resident and partially disc resident with the disc resident portions called into memory as required using a dynamic allocation technique. The nucleus provides for such functions as: **Job Management** – to provide the facilities for job submission, resource allocation, job initiation, execution management, and job termination. The number of jobs active is limited only by available resources.

**Task Management** – for task creation, scheduling, synchronization, and termination. Multi/tasking is supported both across several programs and within a single program.

**Memory Management** – for dynamic memory allocation and release.

**I/O Management** – to provide I/O functions from programs to peripherals on a device independent basis.

**File Management** – to provide a device independent interface from a program to data stored on disc. Three file types are supported:

Linked Sequential File – has an



*Multi-terminal 980A System*

access interface identical to that used for the various sequential devices (magnetic tape, line printer, card reader, etc.). Consistency between sequential device and disc is achieved with the Linked Sequential File.

**Relative Record File** – provides a low overhead direct disc access to a contiguous section where I/O transfers may be either blocked or unblocked.

**Indexed File** – provides a directory-supported random access method based on a record identifier whose size is user specified. File operations include record addition, insertion, modification, deletion, and retrieval using either a random or sequential access method. A multiway balanced tree directory provides random access with extremely low disc access for search.

**Operator Communications** – provides an extensive command language that may be used from the system

operator's console. Subsystems are individually activated and deactivated by the systems operator as needed. When active, a subsystem operates in privileged mode and is essentially part of the operating system. Main memory is allocated to the subsystem only when it is active so a user who is not interested in a particular operating environment does not pay a penalty for the ability of DX980 to support the environment.

## **Batch Processing**

A batch processing environment is supported by three separate modules, referred to collectively as the Batch Processing Subsystem:

**Batch Input Reader** – is used to effect direct assignment of a sequential input device to a sequence of serially executed programs.

**Batch Input Spooler** – is used to effect spooled input from a sequential input device to a sequence of programs



# DX980—an operating system that supports batch processing, and real-time...simultaneously.

which may execute in parallel.

**Batch Output Spooler** — is used to effect spooled output to a sequential output device.

## Interactive Terminal Processing

DX980 provides for interactive communication between the system and local or remote terminals through the Interactive Terminal Subsystem. The features provided include:

- An interface to support multi-user interactive applications programs
- Interactive file editing
- Remote job entry
- Job status retrieval

## Real-Time Processing

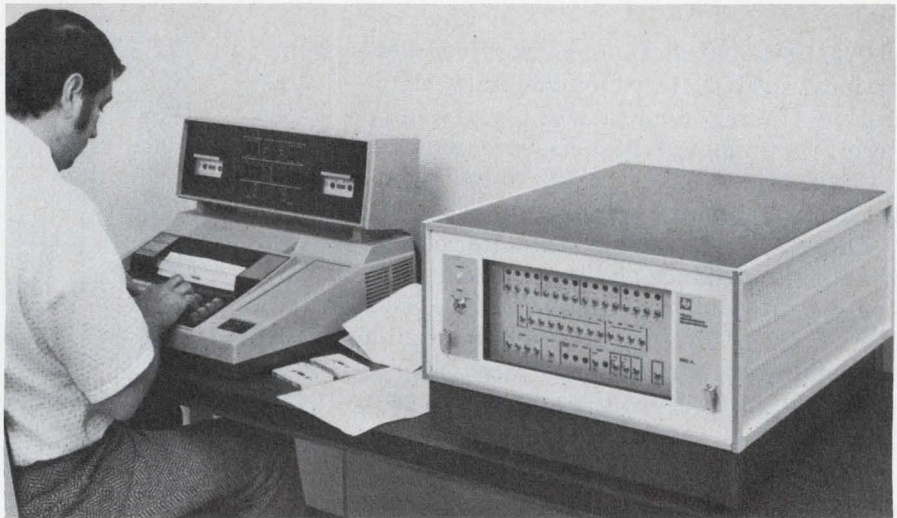
DX980 provides for multi/tasking on a priority scheduling basis. The processor may be switched from task to task by an I/O request, a supervisor call, a device interrupt or at the end of a task. It provides a roll-out/roll-in feature to insure real-time response to high priority requests.

## Other Software

DX980 supports a variety of software including FORTRAN IV, symbolic assemblers, the TI language translator and the linkage editor.

It will operate on any 980A system with at least 16K memory, an interval timer, an operator's console and a disc. The modular structure allows expansion to include:

- Multiple 3330 type disc drives
- Multiple disc cartridge drives
- Magnetic tape drives
- *Silent 700\** ASR or KSR data terminals
- Card readers
- Line printers
- Alphanumeric CRT terminals
- Paper tape readers and/or punches



*Low-cost 980A Software Development System*

- Communications interfaces
- Hardware vectored interrupts
- Up to 64K words main memory

DX980 allows users with big jobs to do their processing in an economical manner. However, Texas Instruments also offers software to support the many users who do not need a large disc-based system to solve their problems. For this class of user TI offers the Program Development System shown above. This system may be as simple as a \$9725 package of an 8K 980A with a twin cassette *Silent 700* ASR terminal. It enables fast and easy development of new software. Speed, simplicity, and reduced noise level are the major advantages over a system equipped with a 33 ASR.

Standard software includes:

- Loader
- I/O support package
- Assembler
- Linkage editor
- Source editor
- Debug aids
- A wide variety of additional

peripherals, plus expansion capabilities to support FORTRAN

## Hardware

This software has been designed to take advantage of the powerful features of the 980A, which include:

- Hardware multiply/divide
- Memory parity
- Memory protect
- Privileged instructions
- Power fail interrupt
- ROM bootstrap loader
- Removable control panel with keylock
- Hardware breakpoint and program sense switches
- DMA interface port, expandable to 8 ports
- Four I/O bus ports, up to 256
- Auxiliary processor port

The 980A is the price/performance leader in the computer world.

Want more information? Get answers by writing or calling Texas Instruments Incorporated, P.O. Box 2909, Austin, Texas 78767; phone (512) 258-5121.



**TEXAS INSTRUMENTS**  
INCORPORATED