

FEATURES

- 16-Bit Addressing Capability
- Look-Ahead™ Pipeline
- Extensive Interrupt Handling
- Ten On-Chip Interrupt Vectors
- 70ns Cycle Time
- 35ns Clock-to-Address Delay
- 64-Word RAM for Storing Subroutine Linkage
- Jump Addresses
- Counters
- Status Register
- Low-Power TTL-Compatible 1.5 Micron CMOS Technology
- 150mW Max Power Dissipation
- 48-Pin DIP (Ceramic or Low-Cost Plastic)

GENERAL DESCRIPTION

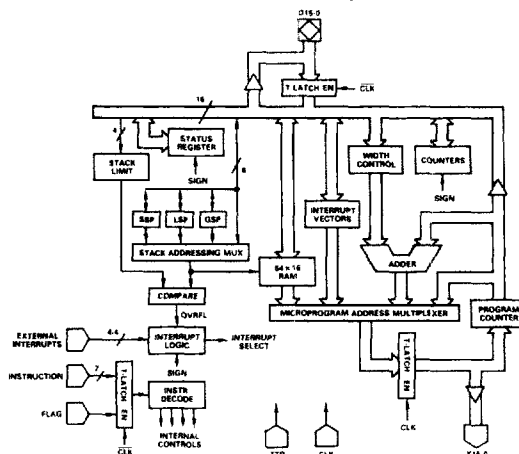
The ADSP-1401 is a high-speed microprogram controller optimized for the demanding sequencing tasks found in digital signal processors and general purpose computers (e.g. looping, jumping, branching, subroutines, condition testing and interrupts). In addition to high speed and large addressing range, it has unique features that make it highly versatile:

- on-chip control of ten prioritized and maskable interrupts
- four decrementing event counters
- absolute, relative and indirect addressing capabilities
- download capability (writeable control store)
- a dynamically configurable 64-word RAM

During each micro-instruction, the ADSP-1401 monitors status indicators and the current instruction to determine the next microprogram address. This address can come from one of several sources: the stack, the jump address, the 64-word RAM, the data port, the interrupt vectors, or the microprogram counter. An extensive set of conditional instructions is available, including jumps, branches, subroutines, interrupts, and writeable control store.

The ADSP-1401's internal 64-word RAM is used for interrupt and subroutine linkage via the stack. It also provides the ability to associate counters, jump addresses, and the status register with nested interrupts and subroutines.

ADSP-1401 PROGRAM SEQUENCER



Interrupts are handled entirely on chip. The ADSP-1401's internal interrupt control logic includes registers for eight external interrupt vectors, a stack register, and a priority decoder. Two additional vectors are reserved for internally-generated interrupts resulting from underflow and stack limit violation.

The ADSP-1401's four decrementing 16-bit counters are used to track loop and event counts. These counters are referenced by several conditional instructions and can also trigger an internal interrupt.

The ADSP-1401's Look-Ahead pipeline eliminates the need for an external microcode pipeline register by internally latching instructions and addresses. A complementary latching arrangement allows a new instruction to be decoded (in preparation for the following cycle) while the program memory address for the current cycle is held constant.

The ADSP-1401 is available for both commercial and military temperature ranges. Extended temperature range parts are available with high-reliability processing ("PLUS" parts). MIL-grade parts are available processed fully to MIL-STD-883, Class B. Packaging options include a 48-pin ceramic DIP and a low-cost 48-pin plastic DIP.

ORDERING INFORMATION

ADSP-1401TD/883B	— Processing Package	Performance/Temp. Range
	Performance, Temp. Range	J - Standard, 0 to +70°C
	Part Number	K - High Speed, 0 to +70°C
	Analog Devices Digital Signal Processing	S - Standard, -55°C to +125°C
		T - High Speed, -55°C to +125°C
	Package	
	D - Ceramic DIP	
	N - Plastic DIP	
	Processing	
	Blank - Standard	
	+ - High Reliability	
	883B - MIL-STD-883	