Am7970

Compression/Expansion Processor (CEP)

PRELIMINARY

DISTINCTIVE CHARACTERISTICS

- Compression/Expansion of digital two-tone image data using run-length and relative address coding.
  - Full-duplex capability for simultaneous independent compression and expansion.
  - High-performance 2 to 8 Mbps throughput with a 5-MHz clock.
- Compatible with CCITT recommendations T.4 and T.6 for Group 3 and Group 4 facsimile apparatus.
  - One-Dimensional, Modified Huffman Coding with optional Wraparound Mode.
  - Two-Dimensional, Modified READ (MR and MMR) coding with programmable K-Parameter.
- CPU Bus and optional local Document Store Bus with on-chip, dual-bus DMA controller.
  - 16-Mbyte physical addressing range on each bus.
- Transparent Mode transfer of unmodified data.
- Programmable paper width up to 16K picture elements and programmable top, left, and right margins.
- Optional Express Mode during compression and Granularity Mode during expansion.

GENERAL DESCRIPTION

The Am7970 Compression/Expansion Processor (CEP) is a high-performance peripheral which compresses and expands two-tone bit image data in accordance with internationally-accepted CCITT recommendations. These fully image-preserving compression protocols allow highly efficient storage and transmission of two-tone pictures and documents.

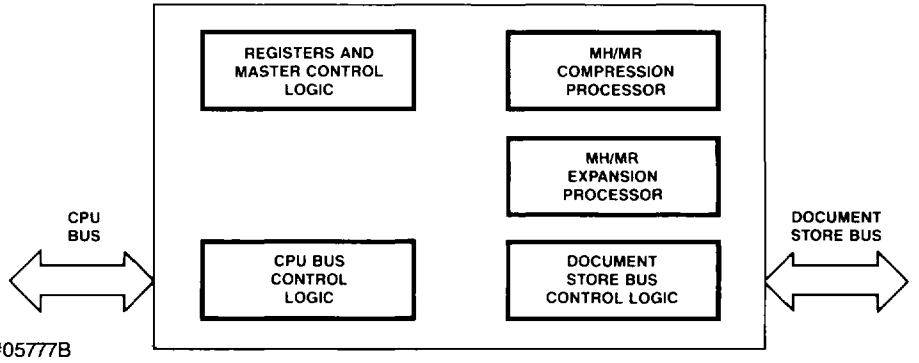
The CEP performs Modified Huffman One-Dimensional Coding or Modified READ Two-Dimensional Coding. This is compatible with CCITT recommendations T.4 and T.6 for Group 3 and Group 4 digital facsimile apparatus. Typical compression of the eight CCITT test documents is 5x to 50x. (The compression ratio is very dependent on the document, the compression mode, and the image resolution.)

The Am7970 has a standard Am8088-like microprocessor bus interface for easy implementation. CEP operation is set by programming internal control registers. CEP status is available through polled registers; exception conditions may be signalled using an external interrupt. The 38 on-chip registers allow very easy and highly flexible system implementation. After initialization, the CEP processes data with minimal intervention by the host processor.

The Compressor and Expander, which operate in full-duplex, can be independently programmed for One-Dimensional encoding/decoding, Two-Dimensional encoding/decoding, or Transparent data transfer.

In Two-Dimensional operation, the programmable K-Parameter defines the number of lines to be encoded in each Two-Dimensional coding sequence. For error-less systems (Group 4), "K=infinity" allows maximum compression.

Accelerated image processing is supported with a Compressor Express Mode, which compresses only every "Nth" line (N=1 to 255) and an Expander Granularity Mode which repeats each line "N" times (N=1 to 7).



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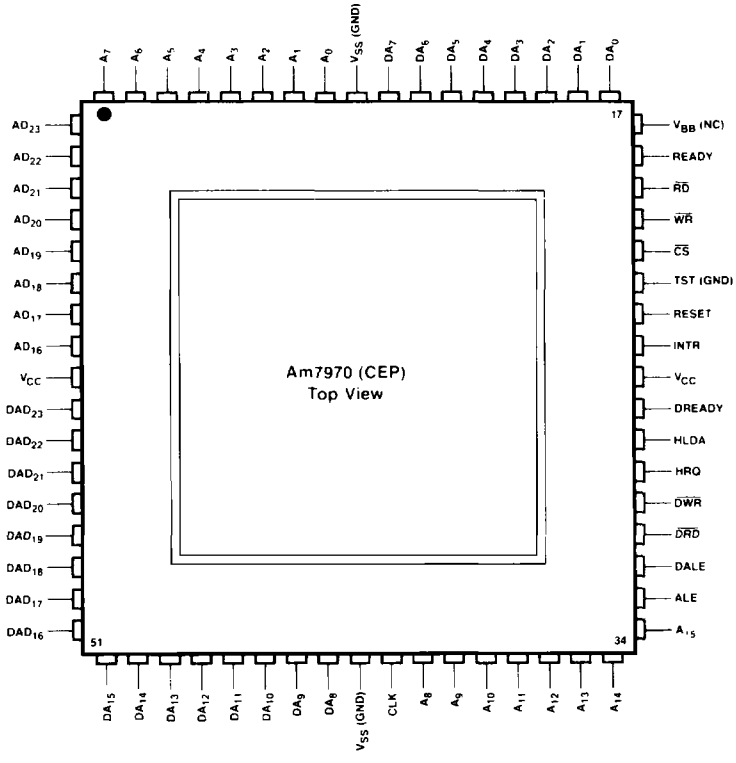
Document format controls include line length and margins. Line lengths or document widths of up to 16K picture elements may be selected. Programmable top, left, and right margins specify "white space" around image data, supporting normal margin requirements, and also "windowing," which is the overlaying of multiple image blocks or image blocks and character blocks.

The Am7970 CEP includes a secondary, local Document Store bus for optional use in conjunction with the CPU bus. The local storage buffer is highly desirable within many system architectures to optimize CPU bus performance. The CEP can linearly address up to 16 Mbytes of memory on each bus, for a total of 32 Mbytes. Starting address, buffer length, and current address for raw and processed data are stored within internal registers independently for both the Compressor and the Expander.

The Am7970 is packaged in a 68-pin LCC or Pin Grid Array and uses a single +5 V power supply.



Am7970 (CEP) Pin Out for LCC Package

Am7970 L C

Device Type
Compression/Expansion Processor
(CEP)

Package
L 68-Pin Ceramic LCC
J 68-Pin Plastic LCC*
G 68-Pin PGA*

Temperature (see Operating Range)
C Commercial (0 to +70°C)

Valid Combinations

Am7970	LC JC GC

*Package to be announced. Contact factory.

ORDERING INFORMATION