

## BASF 7/7X Series

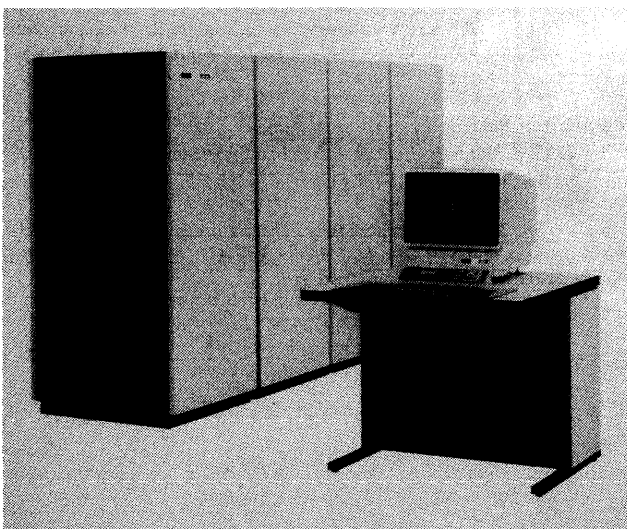
### PRODUCT DESCRIPTION

The BASF 7/7X series now comprises three machines—the 7/73, 7/75 and 7/78, all of which are based on the older 7/70 which is now superseded. These machines are further evidence of BASF's commitment to the IBM plug-compatible market and to the close cooperation of BASF with Hitachi.

All machines use the Hitachi 260H processor and are fully compatible with the IBM 3083 and 3033 series. The 7/73 is approximately equivalent to the IBM 3083 model E, the 7/75 with the IBM 3083 model B, and the 7/78 with the IBM 3083 model J. The 7/7X series is field upgradable from the 7/73 to the 7/78. BASF's strategy is to offer savings of 50% on the corresponding IBM machine price.

The 7/73, 7/75 and 7/78 are in the super-computer category with performance figures in mips (million instructions per second) of 4.5, 6.2, and 7.5 respectively. All models use advanced chip technology and BASF claims high reliability. If a failure does occur, a standard service processor is activated to ensure that the system can continue to be used in spite of the malfunction. The service processor keeps down time to a minimum by initiating recovery procedures.

The standard system in all three machines consists of a processor, 8 megabytes of main memory, an integrated input/output processor with adaptor, two byte multiplexer channels, each with a transfer rate of 100 kilobytes per second, and six high speed block multiplexer channels, each with a transfer rate of 3 megabytes per second. Also included in the standard system are a console display



The BASF 7/73, a 4.5 mips cpu offering high speed buffer storage of 32KB and maximum main memory of 16MB. Based on the Hitachi M260H processor, the 7/73 is equivalent to the IBM 3083 E.

**PRODUCTS ANNOUNCED:** BASF 7/73, 7/75 and 7/78 computers, based on Hitachi's M260H processor and plug compatible with IBM's 3083 series systems.

**COMPETITION:** IBM 3083 models E, B and J. NAS.

**DATE ANNOUNCED:** autumn 1982.

**FIRST DELIVERY:** December 1982.

### BASIC SPECIFICATIONS

**VENDOR:** BASF AG, D6700 Ludwigshafen, West Germany. Telephone (621) 601.

**MANUFACTURER:** Hitachi, Japan.

**CONFIGURATIONS:** the differences between the three machines are restricted entirely to the processor and main memory. The differences are that the 7/73 has a smaller high speed buffer memory than either the 7/75 or 7/78 and the 7/78 processor has a 12½% improvement in cycle time over the 7/73 and 7/75. The I/O capabilities and I/O configurations are identical in the case of all three machines.

The fundamentals of the design in the Hitachi M260H on which the BASF 7/7X series machines are based are:

- use of very advanced chip technology so that even compared with the superseded but fairly recent BASF 7/70, the improvement in packing, and consequently fewer connections, is considerable
- the use of a four stage pipeline
- the use of a maximum 13 nanosecond access time high speed buffer of 32KB (7/73) or 64KB (7/75 and 7/78), thus minimizing instruction fetch times

The basic configuration for all three machines is as follows:

- 8 megabytes of main memory
- one integrated I/O processor and adaptor
- 2 x byte multiplexer channels (100 KB/sec.)
- 6 x block multiplexer channels (3MB/sec.)
- one console display station consisting of VDU, printer adaptor and remote link
- one service processor and power for all units

For all three machines, the number of I/O processors can be increased to a maximum of two, usable concurrently, although on the 7/75 and 7/78 three I/O processors can be physically attached. The maximum number of channels is 8 per I/O processor and 16 per central processor. All 8 channels can be block multiplexer but there can be a maximum of only two byte multiplexer channels. Also common to all three machines are four pipeline stages, 16K

## BASF 7/7X Series

▷ station containing a VDU, a printer adaptor and a remote link, and a power and service processor.

Considerable expansion of this basic configuration is possible, with the major differences being the processor speed and main memory capacity. The input/output capability of all three machines is identical regardless of configuration. The expansion capabilities are detailed in the Basic Specifications section of this report.

### RELATIONSHIP TO CURRENT PRODUCT LINE:

The Hitachi based 7/7X series is currently the top of the product line at BASF. The earlier and less powerful BASF range is based on the Hitachi M240H, whereas the 7/7X series uses the M260H processor. The 7/65 and 7/68 form the earlier series and since these two machines are also IBM compatible (4300 series), there is a close resemblance between the 7/7X series and the 7/65 and 7/68.

In terms of power, the 7/7X series takes over where the 7/68 stops. The difference in power is considerable and stems mainly from two sources—enhanced processor capability and increased I/O handling ability. The 7/7X processors have the advantage of pipelining as well as an increase of 30-45% in CPU power over the 7/6X range. The 7/7X I/O capabilities are also considerably enhanced in comparison with the 7/65 and 7/68 by the provision of at least one input/output processor on each of the 7/7X series machines; the lower numbered machines are not so equipped.

▷ words of control storage, each word comprising 126 bits and one or two console VDUs. The 370 and 3033 extension features together with Virtual Machine Assist and Extended Architecture are common options. The 7/73 has main memory expansion capabilities in 4MB increments to 16MB maximum and high speed buffer storage fixed at 32KB. The 7/75 has main memory expansion capabilities in 4MB increments to 32MB with high speed buffer storage of either 32 or 64KB and an optional High Speed Arithmetic (HSA) unit. The 7/78 has main memory expansion capabilities in 4MB increments to 32MB with high speed buffer storage of either 32 or 64MB. Optionally available are a high speed arithmetic (HSA) unit, an Attached Processor (AP), and a Multiprocessor (MP).

Some of the standard features on all three machines are worth a more detailed look. Among these are the Dynamic Address Translation facility which handles virtual to real address translation. Up to 512 address pairs can be accommodated in the buffer.

Another standard feature of considerable importance is the data streaming capability on all block multiplexer channels, which allows a transfer rate of up to 3MB per second.

The high speed buffer of either 32KB (7/73) or 64KB (7/75 and 7/78) can be regarded as a cache memory, although there is no reference to "hit rates" in the current literature on the systems.

The 370 Extension Feature (EF), available as an option on all three machines, is claimed to "increase system performance by from 10-15% by the implementation of new instructions."

The 3033 Extension Feature option includes extended addressing usual dual address space; 26-bit real addressing and 31-bit virtual addressing; start I/O fast queueing and suspend/resume I/O.

Amongst the other optional features are the High Speed Arithmetic unit (HSA), offered on the 7/75 and 7/78 only, and the Attached Processor (7/78) and Multiprocessor (7/78). The HSA speeds up multiply and divide in both fixed and floating point formats. The Attached Processor (AP) option, available for the 7/78 only, is a coupled unit with no channels, but which uses the same operating system and the same memory as the basic processor. It is claimed that processor power is improved by 1.7 to 2.0 times with this option. The Multiprocessor option, again on the 7/78 alone, is a coupled processor which does have input/output processors as well. It produces the same increases in processor power as the AP and offers additional channel groups to increase channel throughput and load balancing.

### PRICING

In common with most European manufacturers and suppliers of data processing equipment, BASF does not offer detailed price lists. However, the following typical configuration prices are currently valid:

BASF 7/73: 8MB main memory, 8 channels, one console; purchase price DM 2,908,500; rental DM 84,500 per month, service charge DM 9,700/month.

BASF 7/73: 16MB main memory, 16 channels, 2 consoles; purchase price DM 3,552,440; rental DM 103,437/month, service charge DM 10,750/month.

BASF 7/75: 8MB main memory, 8 channels, one console; purchase price DM 3,402,540; rental DM 102,633/month, service and maintenance charge DM 11,300/month.

BASF 7/75: 16MB main memory, 16 channels, 2 consoles; purchase price DM 4,046,480; rental DM 121,570/month, service and maintenance DM 12,350/month.

BASF 7/78: 8MB main memory, 8 channels, one console; purchase price DM 4,230,540; rental DM 118,533/month, service DM 13,473/month.

BASF 7/78: 16MB main memory, 16 channels, 2 consoles; purchase price DM 4,874,480; rental DM 137,470/month, service and maintenance DM 14,673/month. ■