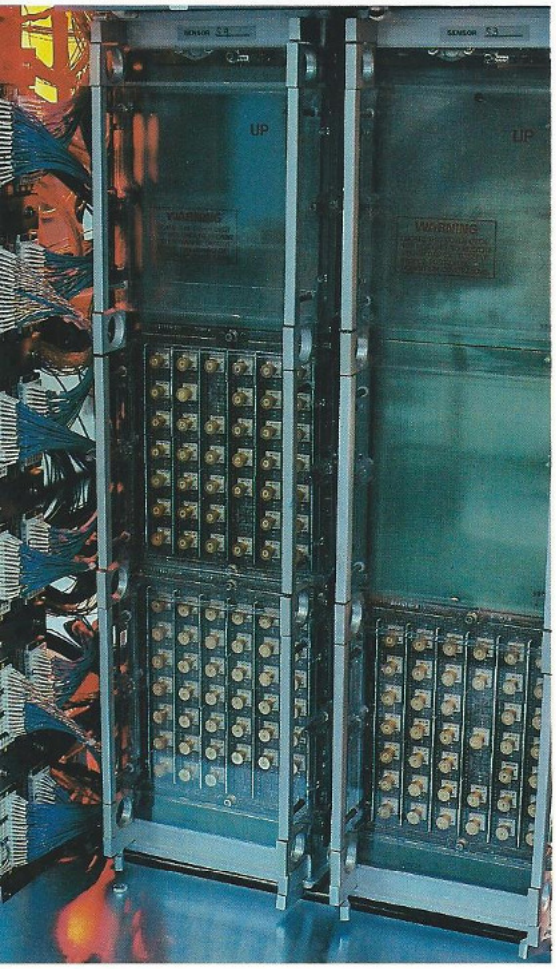
amdahl

470V/8

INSIDE THE AMDAHL 470V/8



The Amdahl 470V/8 is the most powerful high speed, general purpose computer system in the 470 series, and is designed to improve the data processing efficiency of the very largest users. Consisting of a central processing unit, channel unit, main storage memory, operator console system and power distribution unit, the 470V/8, introduced in late 1978, operates 20 to 30 percent faster in an interactive, high supervisor state environment than the 470V/7, the previous Amdahl top-of-the-line CPU. The 470V/8 is more powerful than any other single-CPU business computer designed to use industry-standard software.

Highlights

The Amdahl 470V/8 offers major improvements in performance over other 470 series systems:

Higher operating speed. The 470V/8 operates approximately 20 to 30 percent faster than the 470V/7.

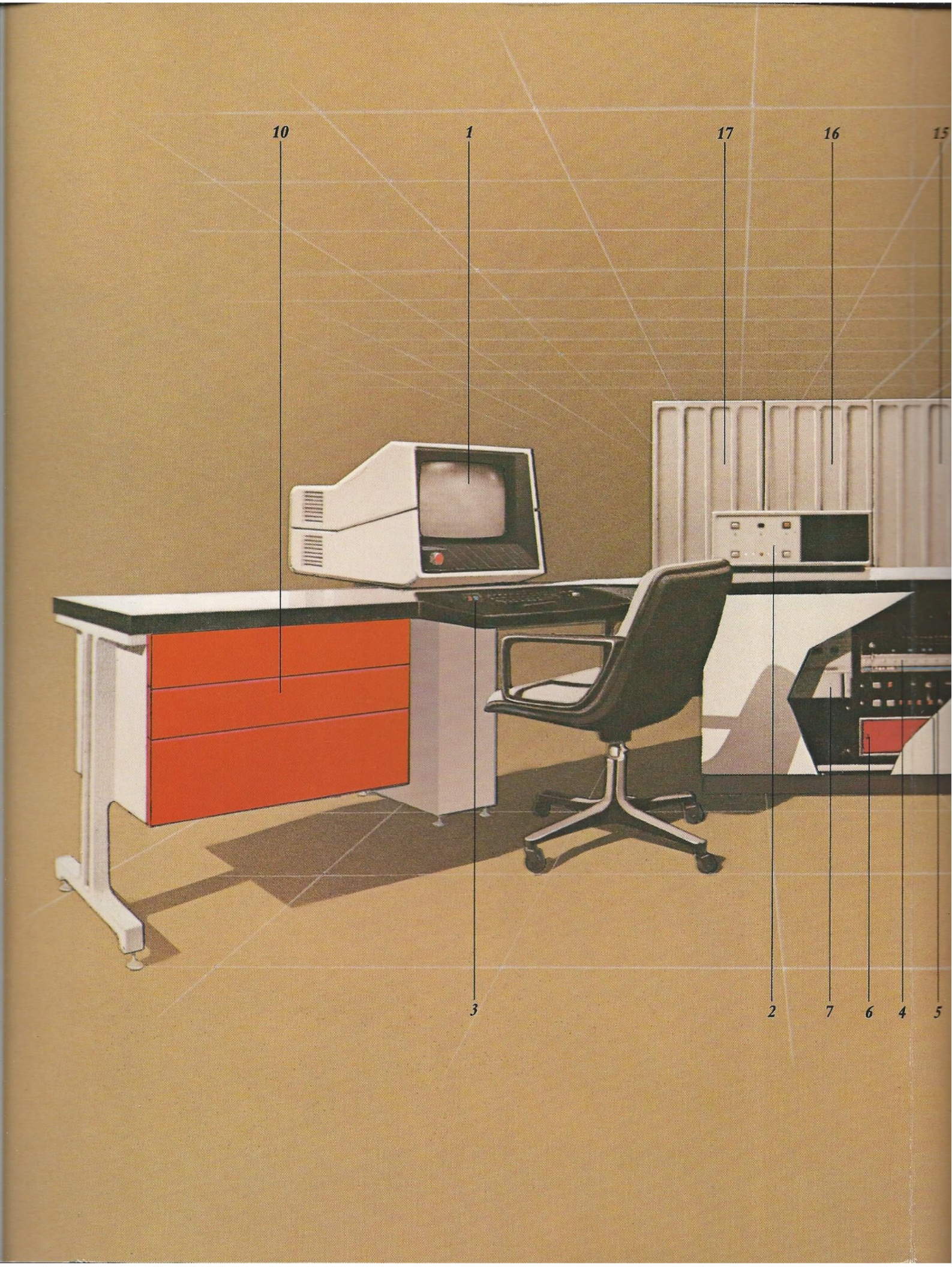
Faster cycle time. The 470V/8 CPU internal processing speed has been increased by reducing the basic cycle time to approximately 26 nanoseconds. All areas of the 470 architecture benefit from this improvement.

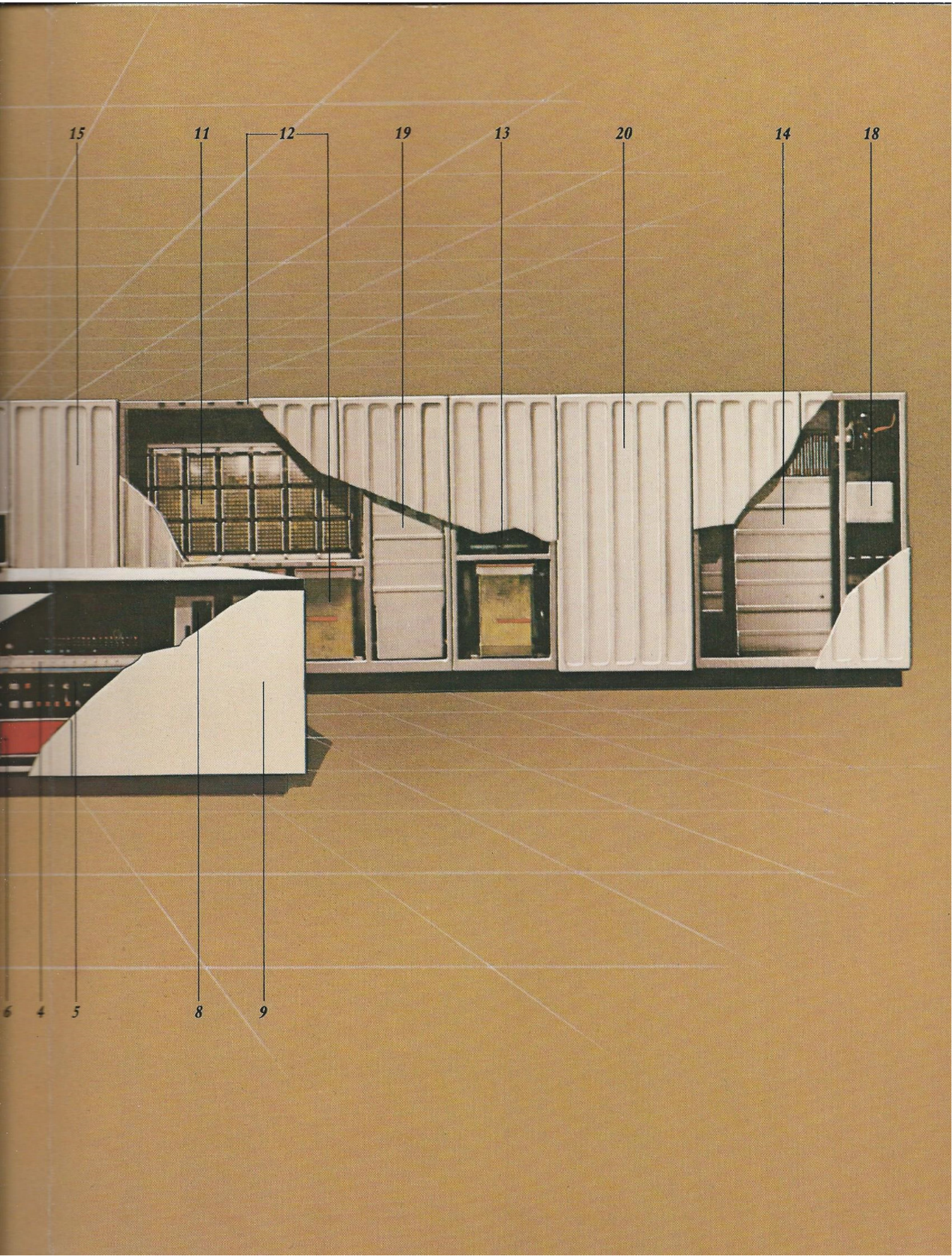
Larger high speed buffer with prefetching. The 470V/8 incorporates a 64K high speed buffer (HSB), double the size in other 470 systems. The HSB has a basic access time of 52 nanoseconds, and it can be pipelined. A new request to the buffer can be handled every 26 nanoseconds and a buffer transaction completed every 26 nanoseconds. The 470V/8 buffer includes enhanced error checking and isolation and correction features. The system can be partitioned 4 ways to bypass buffer errors by reconfiguring out a buffer section.

The HSB incorporates a prefetching technique which predicts the next most logical consective data to be called into the buffer from main storage and then moves the data into that buffer.

Improved console display screen. The 470V/8 console features a high performance 15-inch display screen formatted identically to the display screens on other 470 systems. Physically smaller and brighter, the design reduces reflective glare and eye movement to improve operator visibility in a brightly lighted computer room.

1. *15-inch, 3200 character CRT displays scan-out of all CPU latches and operator console output functions.*
2. *Operator's panel controls system software loading and displays status.*
3. *Keyboard enters console input functions.*
4. *16-bit minicomputer serves as independent console processor.*
5. *Direct computer-to-console interface allows console processor to perform direct diagnostic test on central computer.*
6. *Standard channel interface between computer and console for normal console operation.*
7. *Fixed head disk drive used by console operating system.*
8. *Floppy disk drives load diagnostic programs.*
9. *Modem connects to AMDAC remote diagnostic service.*
10. *Floppy disk storage area.*
11. *CPU (Instruction and Execution units). All system logic implemented in 40 7½-square-inch Multiple Chip Carriers (MCCs).*
12. *Fans mounted above and below MCCs provide all necessary cooling.*
13. *Storage Control unit handles all memory access from CPU and channels in 8 MCCs.*
14. *Main storage units contain up to 8 megabytes per unit in two swing-out gates for easy access and service.*
15. *Channel unit contains channel unit logic on 11 MCCs and handles logic of all I/O operations.*
16. *Remote Interface Logic (RIL) frame contains 12 or 16 standard I/O channels (selector, block multiplexer and/or byte).*
17. *Cable entry unit and optional channel-to-channel adapter for loosely coupled multi-processor operation.*
18. *Main storage power supply.*
19. *64K high speed buffer memory.*
20. *Cable connecting frame (for systems with over 8 megabytes of main memory).*


10
1
17
16
15
3
2
7
6
4
5


15
11
12
19
13
20
14
18
6
4
5
8
9

Main storage. The 470V/8 is offered with 4, 6, 8, 12 or 16 megabytes of main storage. All LSI storage control logic reduces memory access time. No penalty is incurred for unaligned operands. Data path to main storage is 8 bytes wide, with 16-way interleaving.

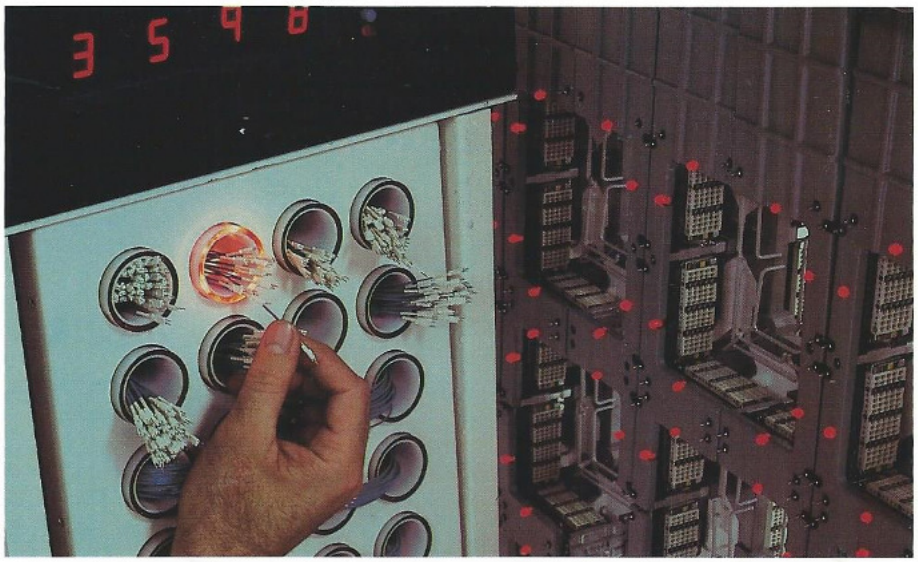
Four instruction pipeline. An optimal four levels of instruction lookahead, with a maximum of six instructions in the pipeline, run concurrently with instruction execution, checking and storage of results.

Branching hardware. The 470V/8 incorporates a fast branch resolution algorithm that adds a new dimension in pipeline efficiency for branching operations.

Availability and serviceability. Fault isolation and correcton instructions, as well as features to improve serviceability, have been incorporated in the 470V/8 design.

Advanced virtual address translation hardware. To optimize performance in a virtual operating system such as MVS or VM, the 470V/8 features advanced address translation capability. A 512 entry translation lookaside buffer (TLB) provides storage of most recently used virtual address translations. Also provided is an expanded, 128 entry segment table origin (STO) stack. These hardware enhancements are coupled with innovative creation and maintenance algorithms to provide superior virtual storage operations.

Expandable channel capacity. 12 channels are standard on the 470V/8 with four additional channels available.



2048 sub-channels are standard. The 470V/8 offers full channel configuration flexibility, with each of the 12 or 16 channels configurable as a byte or block multiplexer or a selector channel, in any combination. Selector and block multiplexer channels can handle data transfer rates of approximately 2 megabytes/second, and byte multiplexer channels handle 110 kilobytes/second.

Channel optional features. A two-byte interface is available on all selector and block multiplexer channels. This effectively doubles the channel bandwidth for control units that support this feature. A channel-to-channel feature is also available for loosely coupled operation with another Amdahl or compatible CPU.

Field upgrade from 470V/7. The 470V/7 can be upgraded to a 470V/8 when the need for additional capacity arises. This upgrade, involving a minimum of downtime and no additional physical facilities, provides approximately 20 to 30 percent more CPU processing power.

Systems Control Program support. Amdahl provides full programming systems support to 470V/8 customers for OS/MVT*, SVS*, MVS, VM/370 and VS/1*. Included in this support are major subsystems such as HASP, ASP, TSO, TCAM, JES2, JES3, VTAM, RSCS, CMS and IPCS. Amdahl support includes diagnostic capability for all software failures, repair of failures and distribution of all repairs and new releases. Amdahl also has assisted customers in modifications to the recovery management system for other system control programs, including TSS, ACP, MTS and VP/CSS.

*Supported only on 470V/8 configuration of 8MB or less.

M1004.0-01A

Printed in U.S.A. ©*Amdahl Corp. 1979* amdahl *and Amdahl 470 are trademarks of Amdahl Corporation*