amdahl
470V/6-II

INSIDE THE AMDAHL 470V/6-II

The Amdahl 470V/6-II computer system is a high-speed, general-purpose business system incorporating significant advances in the state of the large-scale computer art. The system consists of a central processing unit, channel unit, main storage memory, operator console system and power distribution unit.

The 470V/6-II is an enhancement of the first system in the 470 series, the V/6, the industry's first IBM software-compatible processor. The 470V/6-II offers up to a 15 percent performance improvement over earlier 470V/6 systems.

Highlights

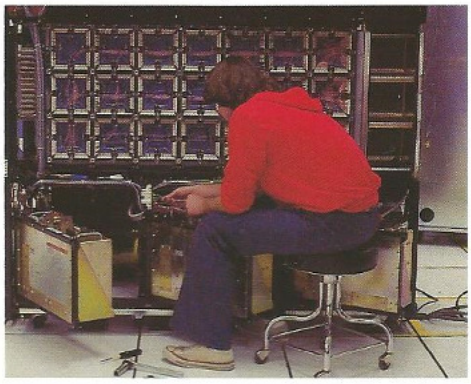
Using technology proven in field experience with Amdahl's V/6, the Amdahl 470V/6-II offers these major improvements in speed and capacity:

Performance. The 470V/6-II operates approximately 50 to 60 percent faster than the 470V/5. CPU cycle time is 32.5 nanoseconds.

Main storage. The 470V/6-II is offered with 4, 6 or 8 megabytes of main storage. No penalty is incurred for unaligned operands. Data path to main storage is 8 bytes wide, with 4-way interleaving.

32K high-speed buffer. The HSB has a basic access time of 65 nanoseconds and can be pipelined. A new request to the buffer can be handled every 32.5 nanoseconds and a buffer transaction completed every 32.5 nanoseconds. The system can be partitioned to bypass buffer errors by reconfiguring out a buffer section.

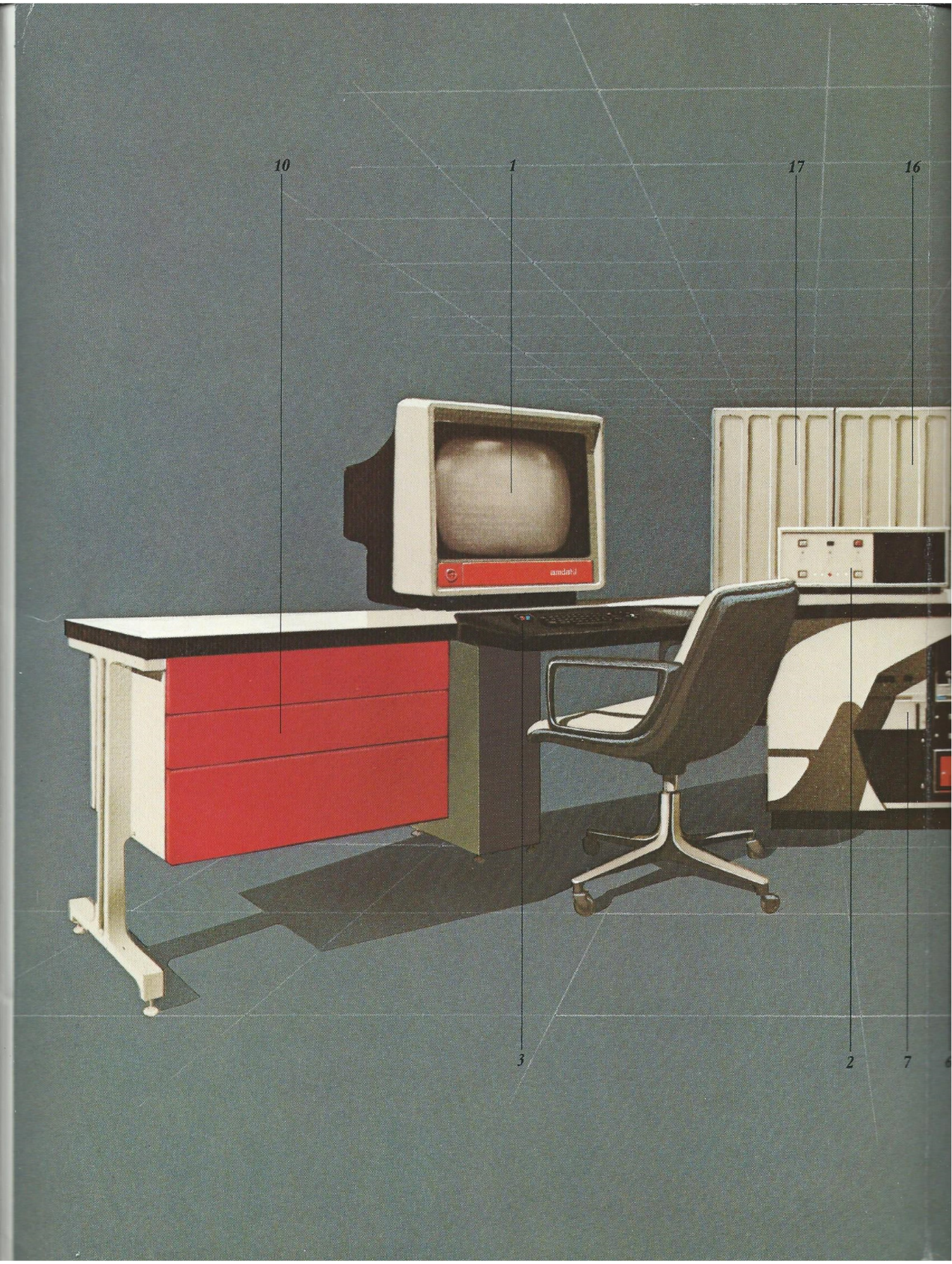
Four instruction pipeline. An optimal four levels of instruction lookahead, with a maximum of six instructions in the pipeline, run concurrently with instruction execution, checking and storage of results.



Branching hardware. The 470V/6-II incorporates a unique fast branch resolution algorithm that adds a new dimension in pipeline efficiency for branching operations.

Advanced virtual address translation hardware. To increase performance in a virtual operating system such as MVS or VM, the 470V/6-II features state-of-the-art address translation capability. A 256 entry translation lookaside buffer (TLB) provides storage of most recently used virtual address translations. Also provided is a 32 entry segment table origin (STO) stack. These hardware features provide excellent virtual storage operations.

1. *Large-screen 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 an independent console processor.*
5. *Direct computer-to-console interface allows the console processor to perform direct diagnostic tests on the central computer.*
6. *Standard channel interface between computer and console for 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 the CPU and channels.*
14. *Main storage unit contains up to 8 megabytes in two swing-out gates for easy access and service.*
15. *Channel unit contains LSI portion of channel unit logic on 11 MCCs and handles logic of all I/O operations.*
16. *Remote Interface Logic (RIL) frame contains 8, 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. *32K high-speed buffer memory.*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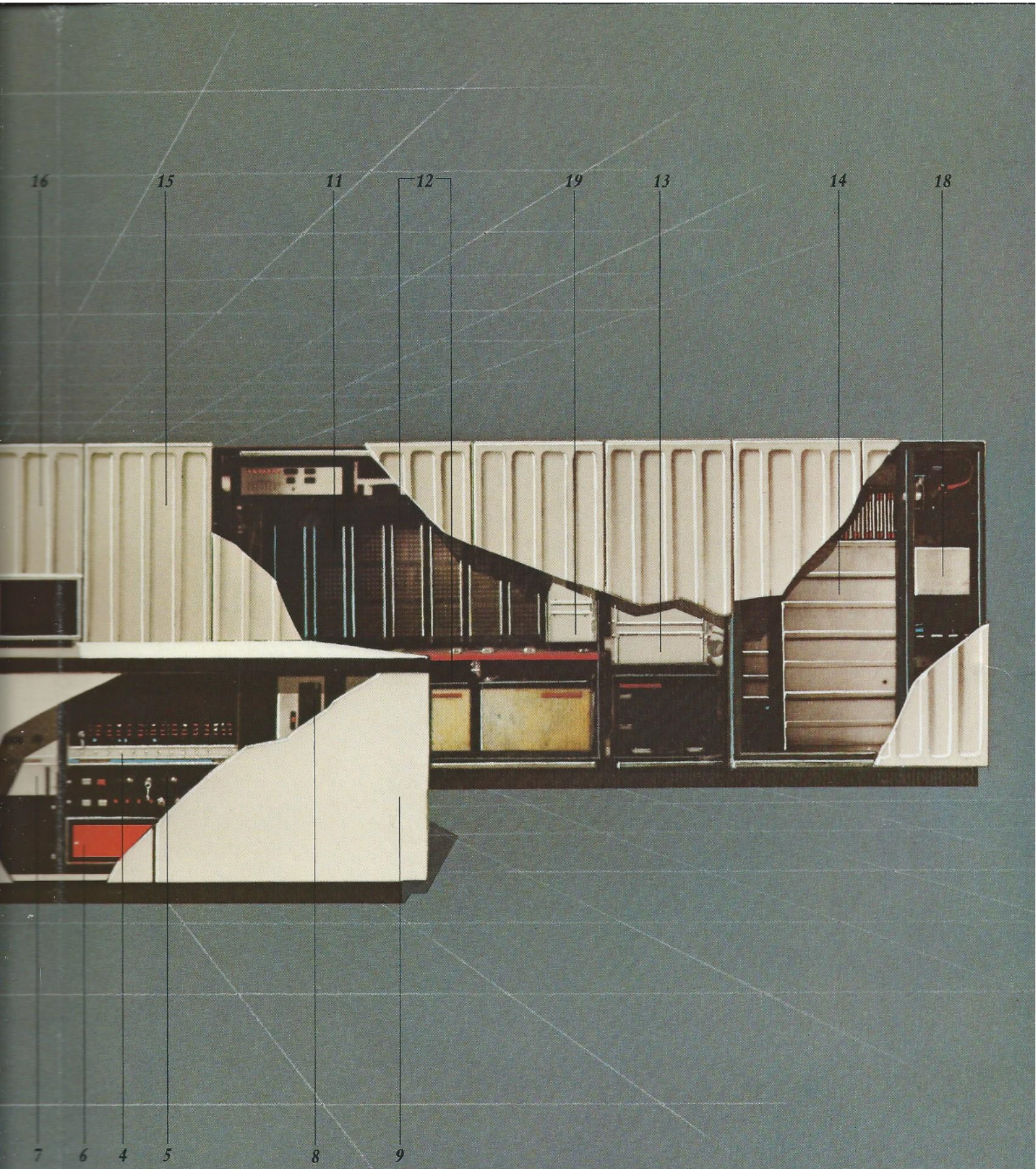
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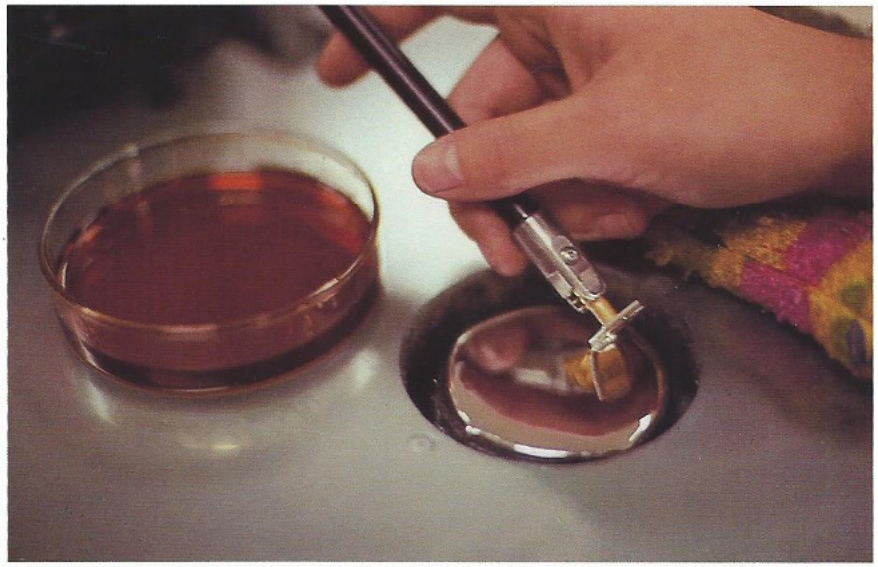
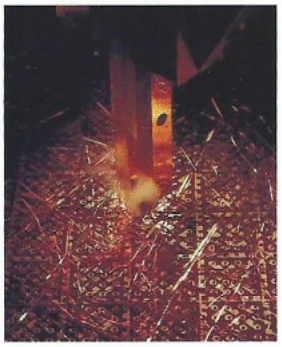
Expandable channel capacity. Eight inboard channels are standard on the 470V/6-II with optional expansion to 12 or 16 channels. The system offers full channel configuration flexibility, with each of the 16 channels configurable as a byte or block multiplexer or a selector channel, in any combination. Selector and block multiplexer channels can handle data transfer rates of 1.9 megabytes/second, and byte multiplexer channels handle 110 kilobytes/second.

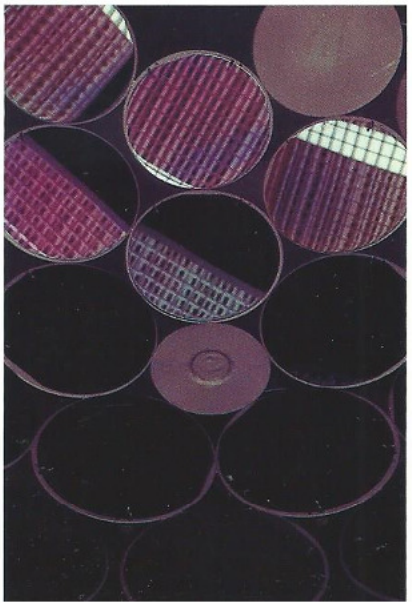
Channel optional features. A two-byte interface is available on all selector and block multiplexer channels. This effectively doubles the channel bandwidth for control units that support this feature. A channel-to-channel feature is also available for loosely coupled operation with another Amdahl or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

Systems Control Program support. Amdahl provides full programming systems support to 470V/6-II customers for OS/MVT, SVS, MVS, VM/370 and VS1. 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 has also assisted customers in modifications to the recovery management system for other system control programs, including TSS, ACP, MTS and VP/CSS.

Field upgrade from 470V/5. Users of Amdahl 470V/5 systems can upgrade to the 470V/6-II when the need for additional capacity arises. This upgrade, involving a minimum of downtime and no additional physical facilities, provides approximately 50 to 60 percent more CPU processing power.







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