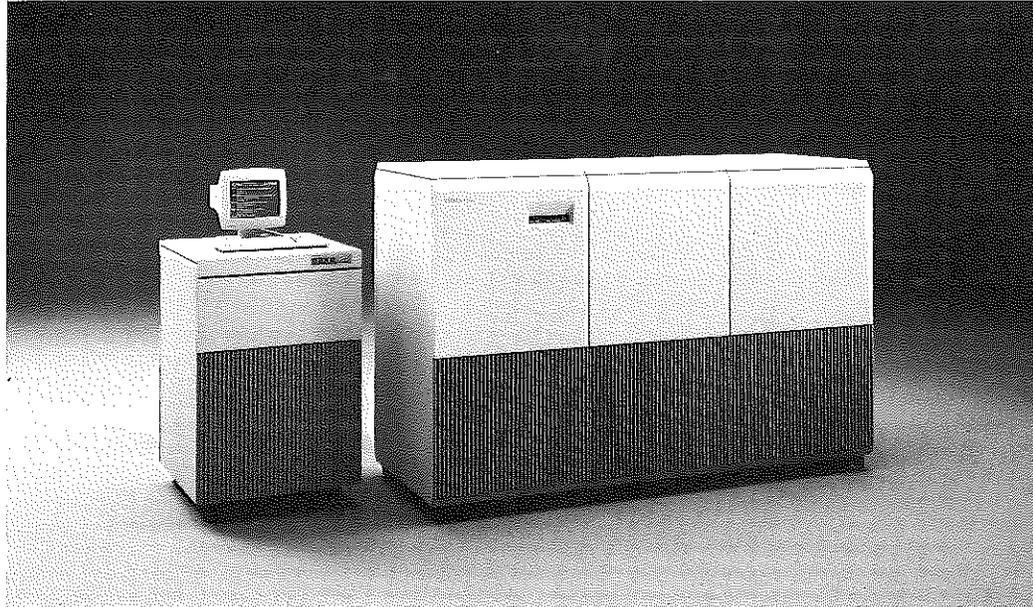# V510
Computer System

UNISYS

General Characteristics

The Unisys V510 is a comprehensive large-scale data processing system for business, industrial, governmental, and financial data processing, as well as engineering and scientific computation.

The V510 is object code compatible with the previously released Unisys B2900/B3900/B4900/V300 systems, thereby protecting one of the biggest investments organizations have in data processing — application programs and data files. Customers currently using B2000/B3000/B4000/V300 systems can move their applications to the V510 with virtually no conversion.

Pipeline Architecture

The V510 is designed for increased performance and capacity over previously released systems through the use of highly advanced pipelining and microprogramming techniques. This advanced architecture uses multiple independent processor modules to concurrently perform:
- Instruction pre-fetch and data address calculation.
- Dynamic branch prediction.
- Data fetching and manipulation.
- Instruction execution.
- Independent input/output initiates and transfers.

System Components

The V510 system consists of the following modules:
- Central Processing Unit.
- Memory Subsystem.
- Input/Output Subsystem.
- Maintenance Subsystem.

Central Processing Unit

The Central Processing Unit (CPU) is a cluster of several semi-autonomous processing elements, each performing a portion of the instruction fetch, decode, and execute function. The function processors within the CPU include:
- Instruction Fetch (IF).
- Operand Fetch (OF).
- Execute Module (XM).
- Memory Control Module (MCACM).

Memory Subsystem

The V510 Memory Subsystem incorporates two separate interfaces to provide concurrent memory access from the CPU and the I/O Subsystem. The Memory Control Module (MCACM) and the I/O Memory Control (IOMC) are both attached directly to the memory bus. The memory subsystem provides up to four-way interleaving.

The V510 Memory Subsystem can be expanded from 20MB to a maximum of 80MB, in increments of 20MB. All memory in the V510 Memory Data Cards (MDCs) utilize the latest 256K bit DRAM (Dynamic Random Access Memory) technology.

Input/Output Subsystem

The V510 Input/Output (I/O) Subsystem is designed with a high level of multiprogramming capabilities. Data Transfer Modules (DTMs) transfer data between main memory and peripheral devices at a rate of up to 8MB per second. Each Data Transfer Module can support up to 32 Data Link Processors (DLPs). These DLPs enable the I/O Subsystem to operate concurrently with the Central System. The V510 system includes one Data Transfer Module. An additional DTM can be installed in the V510, to provide a total peak I/O bandpass of 16MB per second.

Maintenance Subsystem

The Maintenance Subsystem provides for operator interface and system initialization in addition to maintenance and diagnostic facilities. It consists of:
- Maintenance Processor (MP), a B27 system, which provides access to a broad range of hardware and software diagnostic tools.
- System Maintenance Controller (SMC), which provides diagnostic and operational interfaces between the Maintenance Processor and the other components of the V510 system.
- Environmental Control Module (ECM), which monitors and controls the environment (voltage, air flow, temperature, etc.) in the V510 system.
- Remote Link, which extends the capabilities of the Maintenance Processor to a remote support center.
- Maintenance Disk, which provides storage for system initialization files, diagnostic and confidence test routines, and processor performance and fault data.

System Characteristics

The V510 system offers many advanced features to users:
- Integrated hardware and software design, enhanced by the pipeline architecture.
- Dynamic multiprogramming simplified through abbreviated human/machine communications.
- Expansion without reprogramming.
- Automatic self-regulation under V Series MCP control.
- Dynamic memory management.
- Fixed- and variable-length arithmetics.
- A powerful I/O subsystem with buffering, thus allowing the DLPs to obtain maximum utilization of I/O to memory bandpass.
- Flexible priority scheduling.
- Comprehensive system logging and reporting.
- Remote maintenance/diagnostic capability.
- High level of fault tolerance including:
  - Parity checking of all internal data transfers, incorporating single-bit correction and double-bit detection.
  - Microcode instruction retry.

Operating Characteristics

The V510 Central System includes:
- A Central Processor Unit which is a stored logic processor. The processor is a modularized series of microprogrammed processors operating autonomously to maximize throughput.
- Integrated circuit, error correcting main memory. With a minimum of 20MB, memory is expandable in 20MB increments up to 80MB.
- One independently powered I/O cabinet, containing two I/O base modules, provides connectivity for up to 16 DLPs. Three additional independent I/O cabinets may be added to the V510 system, providing connectivity for a total of 64 DLPs.
- Maintenance Processor, consisting of B27 processor, keyboard, display, disk drives (fixed and removable), and remote diagnostic link.

Optional Features

- Shared System Processor which enables multiple systems to share common disk files (non-DMS).
- Multiprocessor environment with a single high performance "front-end" processor.
- Multiprocessor environment via I/O channel connection (Inter-System Control).
- Flexible peripheral switching capability.
- Additional independent I/O cabinets, allowing up to 64 total Data Link Processors.
- B874 System and Communications Processor for small network environments.
- B974 System and Communications Processor for medium-to-large network environments.
- CP3680 Data Communications System for large network environments.
- Uniline Data Communications DLP for single-line data communications.
- The V510 can be field upgraded to a V530 system, providing additional processing power and memory addressability.

Software

The V510 supports all the software features and benefits of the Unisys V Series family. The V510 uses the functionally rich V Series operating system (MCP/VS), Unisys library of productivity tools, and various Unisys line-of-business software application solutions. All application solutions running on existing B2900/B3900/B4900/V300 systems are object code compatible with the V510 system.

Master Control Program/V Series

Master Control Program/V Series (MCP/VS) is a comprehensive supervisory operating system that controls V Series system operations. This powerful tool is specifically designed for use with Unisys V Series systems to efficiently manage system resources so that human resources can be devoted to constructive problem solving.

MCP/VS is designed to automatically:
- Manage memory.
- Manage input/output functions.
- Communicate with the operator.
- Log and analyze system usage.
- Schedule and execute programs.
- Maintain a library of all files.
- Supervise many other functions.

MCP/VS significantly contributes to simpler programming, ease of operation, and maximum throughput.

Productivity Tools

Unisys productivity software tools are designed to minimize the time and effort required to develop and maintain application software systems and to protect those systems from changes in their computer environment. The following modules are available:
- Network Control:
  —Network Definition Language (B874/B974/Uniline).
- Message Control:
  —Generalized Message Control System (GEMCOS).
  —SWITCH.
  —Remote Job Entry (RJE).
- Data Management:
  —Data Management System II (DMS II).
  —DM/Inquiry.
- Work Management:
  —Workflow Management Language (WFL).
  —Site Management System (SMS).
  —FLAME.
  —Time Analysis and Billing System II (TABS II).
- Report Management:
  —REPORTER III.
  —Online REPORTER III.
- Programmer Productivity:
  —Command and Edit System (CANDE).
  —Programmer Productivity System (PROPS).
  —Interactive RPG Utility.
  —Intelligent Workstation Editor II (IWE II).
  —Image Printer Forms Manager (IPP).
  —Screen Design Facility (SDF).
  —Online Data Entry System (ODESY).
  —B1000 Migration Aids.

- Workstation Integration:
  —Host-Link™.
  —Data Transfer System (DTS).
- Network Management:
  —Burroughs Network Architecture (BNA).
- Fourth Generation Language:
  —LINC II (Logic and Information Network Compiler).

Programming Languages

The V510 supports a wide range of high level languages, including:
- ANSI 74 COBOL.
- ANSI 68 COBOL.
- FORTRAN 77.
- RPG II.
- BPL.
- PASCAL.
- EPLX.
  Interlanguage binding is available with the PASCAL, ANSI 74 COBOL, and FORTRAN 77 compilers.

V510 Central System

Physical Specifications

Height: 58 in. (147cm).
Length: 90 in. (228cm).
Depth: 32 in. (81cm).

Electrical Requirements

- 200 to 240 volts, three phase, 30 amps per phase.
- Consumption: 13 KVA.

Heat Dissipation

- 26,960 BTU per hour (6,790Kcal per hour).

V510 Independent I/O Cabinet

Physical Specifications

Height: 44 in. (112cm).
Length: 29 in. (74cm).
Depth: 29 in. (74cm).

Electrical Requirements

- 200 to 240 volts, single phase, 15 amps.
- Consumption: 3 KVA

Heat Dissipation

- 7,700 BTU per hour (1,900Kcal per hour).